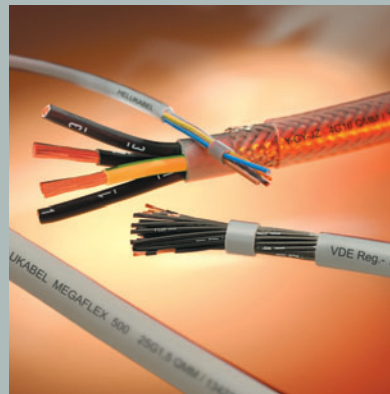
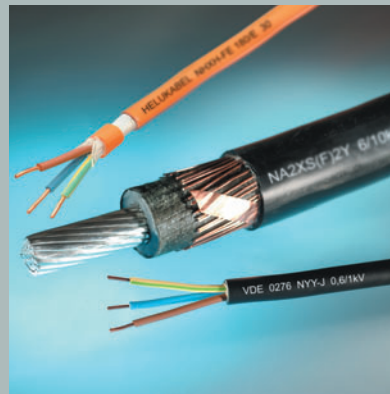
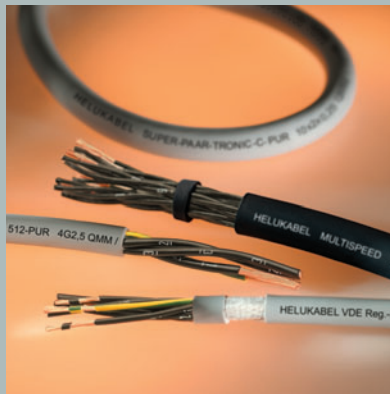
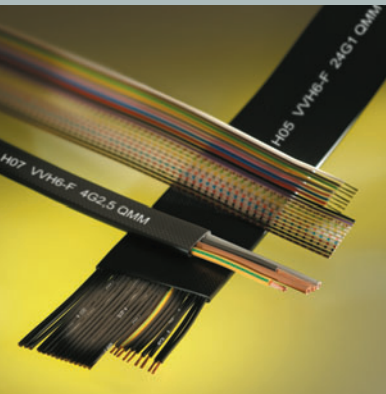




HELUKABEL®



CABLES & WIRES

2012/2013

Welcome



Photo: HELUKABEL® – Headquarters Hemmingen

HELUKABEL® are today one of Germany's leading cable companies, boasting an extensive range of cables, wires, special cables, media technology, cable accessories, as well as Data, Network & Bus Technology and cable protection systems for robotics and handling systems.

Today, we produce for all markets and for every purpose. Our extensive warehouse stock, containing over 33,000 articles, enables us to deliver your order within extremely short delivery times.

The catalogue provides a full overview of cables according to overseas standards, which is constantly being expanded according to the market's requirements. The employees of our internal and field sales teams are happy to advise and assist you in finding the best solution for your needs.

You can reach us at:

HELUKABEL® GmbH · Headquarters
Dieselstr. 8-12 · 71282 Hemmingen · Germany
Phone +49 7150 9209-0
Fax +49 7150 81786
info@helukabel.de · www.helukabel.de

Domestic sales: Monday to Friday	7:00 a.m. to 6:00 p.m.
Export:	7:00 a.m. to 6:00 p.m. (German time)

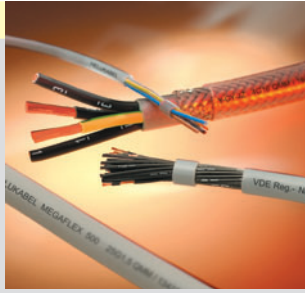
List of contents

Type	Page
Prefix	
Table of Contents	2 to 3
Our product ranges.....	4 to 5
Research & development	6 to 7
The Production Windsbach/Nuremberg.....	8
The Logistic Centre	9
Mounting parts for cable protection systems	10
Pre-assembled cable protection systems for Robotics.....	11
Kabelmat – winding systems	12 to 13
The way to HELUKABEL - Germany / worldwide.....	14 to 15
Our registered trademarks	16
Achieving Success through Quality and Innovation.....	17
CCC-Zertification for China	18
Clean Room Qualified cables.....	19
DESINA-Cables	20 to 21
British Standard	22
Selection tables	
Selection table flexible control cables / halogen-free.....	24 to 26
Cables halogen-free	27
Cables for foreign standards	28 to 29
Selection tables – cables in Drag Chain	30 to 35
Installation manual – cable installation in drag chains	36
Questionnaire for Energy Drag Chain Systems	37
Assembly instructions / laying reel cables NSHTÔU / (N)SHTÔU	38 to 39
Selection table for low voltage joints	40 to 42
Industrial Cables & Wires	
Flexible Control Cables	A 1 to A 96
Data and Computer Cables	B 1 to B 34
Cables for Drag Chains	C 1 to C 36
Motor, Servo & Feedback Cables	D 1 to D 26
Heat-resistant Cables	E 1 to E 20
Allweather and Rubber Cables.....	F 1 to F 14
Trailing Cables	G 1 to G 10
Robot Cables	H 1 to H 10
Water resistant Cables.....	I 1 to I 8
Flat and Ribbon Cables.....	J 1 to J 10
Single Conductors	K 1 to K 44
Compensating Cables	L 1 to L 12
Coaxial Cables	M 1 to M 12
Cables according to International Approvals.....	N 1 to N 157
Infrastructure Cables and Wires	
Installation Cables.....	O 1 to O 10
Telephone and Fire Warning Cables	P 1 to P 12
Power Cables, Security Cables and Medium Voltage Cables	Q 1 to Q 63
Data, Network and Bus Technology	
Media Technology	
Special Cables	
Pre-assembled Cables	
Spiral Cables	
Shipwiring and Marine Cables	
Technical Information	
Glossary of Therms.....	X 114 to X 125
Part Number Index.....	X 126 to X 142
Enquiry Special Cables	T 55
Enquiry Spiral Cables	V 13
Fax Request.....	X 147

Table of Contents

A 1 – 96

Flexible Control Cables



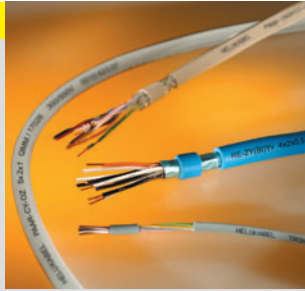
G 1 – 10

Trailing Cables



B 1 – 34

Data and Computer Cables



H 1 – 10

Robot Cables



C 1 – 36

Cables for Drag Chains



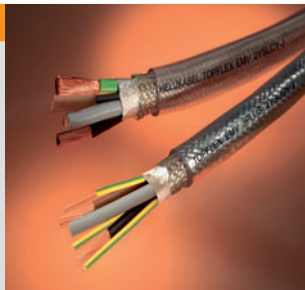
I 1 – 8

Water resistant Cables



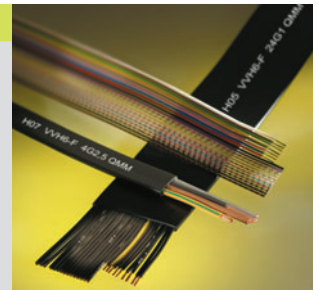
D 1 – 26

Motor, Servo & Feedback Cables



J 1 – 10

Flat and Ribbon Cables



E 1 – 20

Heat-resistant Cables



K 1 – 44

Single Conductors



F 1 – 14

Allweather and Rubber Cables



L 1 – 12

Compensating Cables

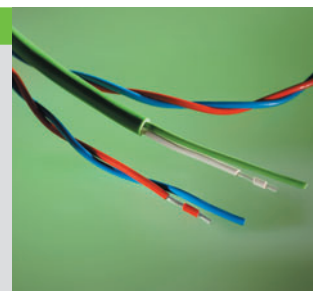
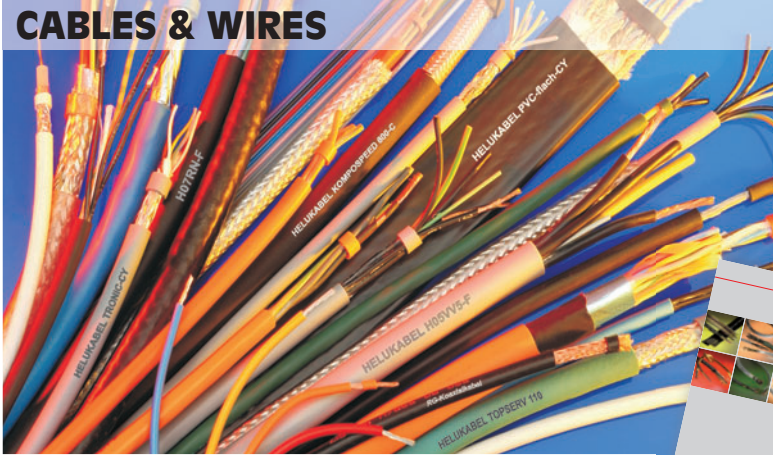


Table of Contents

M 1 – 12		S 1 – 31	
Coaxial Cables		Media Technology	
N 1 – 157		T 1 – 55	
Cables according to International Approvals		Special Cables	
O 1 – 10		U 1 – 63	
Installation Cables		Pre-assembled Cables	
P 1 – 12		V 1 – 13	
Telephone and Fire Warning Cables		Spiral Cables	
Q 1 – 63		W 1 – 23	
Power Cables, Security Cables and Medium Voltage Cables		Shipwiring and Marine Cables	
R 1 – 163		X 1 – 113	
Data, Network and Bus Technology		Technical Information	

Our product ranges

CABLES & WIRES

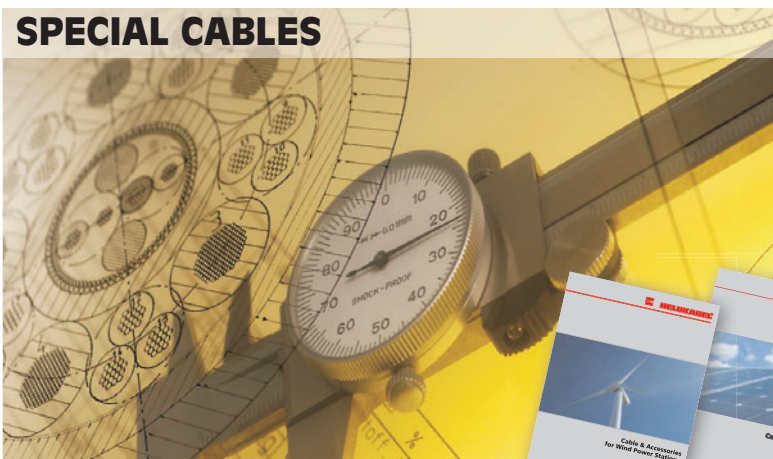


HELUKABEL® can deliver cables and wires for any industrial application. Our extensive warehouse stock, containing over 33,000 articles, enables us to deliver order within extremely short delivery times.

You can find more information about this in our actually catalogue CABLES & WIRES.



SPECIAL CABLES



We supply cables and wires for both standard applications and bespoke solutions to meet customers' individual and application-specific requirements. Those cables can be designed, constructed and produced in our own factory, included cables for photovoltaic and wind power.

Just give us a call – our team will be happy to advise you.



CABLE ACCESSORIES



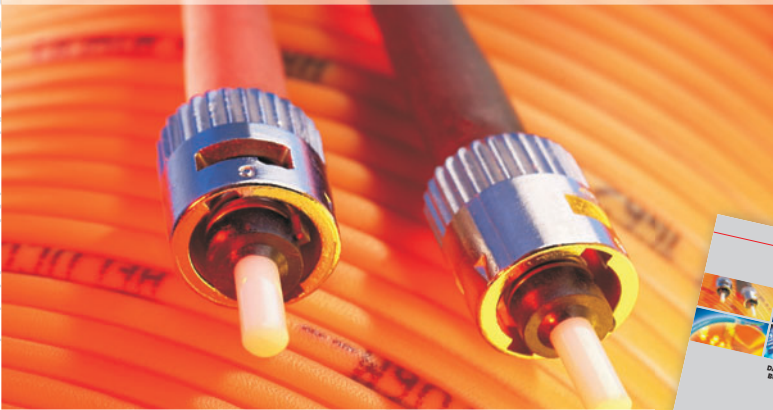
As a significant addition to the extensive program of cables and wires, HELUKABEL® provides a cables accessories program according to the latest guidelines and standards. For example: Cable glands, cable glands accessories, protective tubes, drag and guidance chains.

More information and all products in our catalogue CABLE ACCESSORIES.



If you require additional copies of any catalogues or brochures below, simply fill out the request from provided at the back of this catalogue or at the internet.

DATA, NETWORK & BUS TECHNOLOGY



HELUKABEL® can offer an extensive range of equipment for networking heterogeneous systems using fibre optic and copper techniques. HELUKABEL® is able to meet with its brands HELUCOM®, HELUCOM Connecting Systems®, HELUKAT® and HELUKAT Connecting Systems® all of your cable and accessories you needs.

All products to find in the catalogue DATA, NETWORK & BUS TECHNOLOGY.



MEDIA TECHNOLOGY



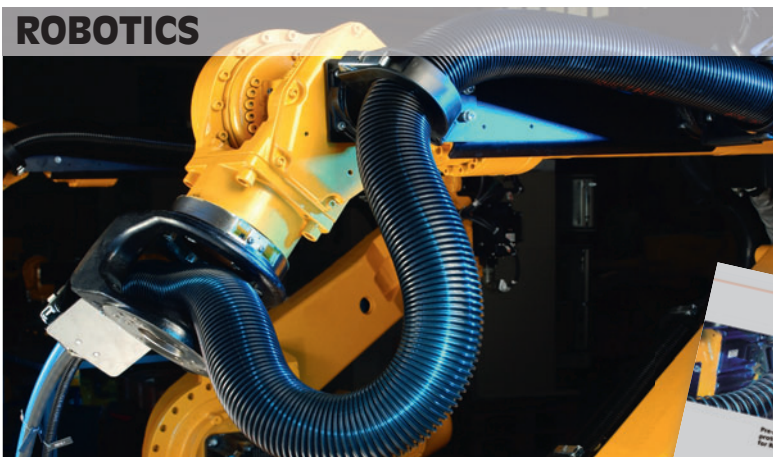
For years, our cables have ensured perfect performances on Europe's leading musical and theatrical stages. They are also used in professional television, radio and studio equipment and at large-scale events such as the football world championships.

Our product range for media equipment encompasses cables for both indoor and outdoor use. It guarantees high transmission quality for fixed installations or for mobile use.

More information in our new catalogue MEDIA TECHNOLOGY.



ROBOTICS



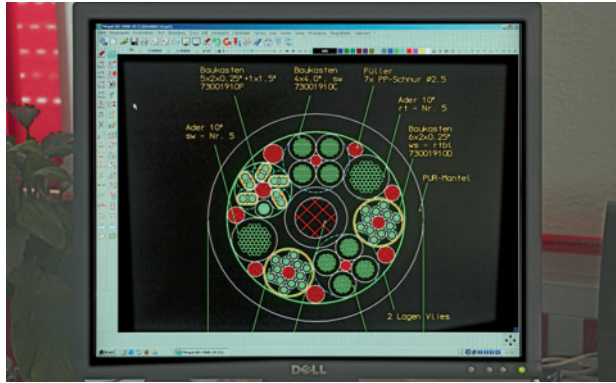
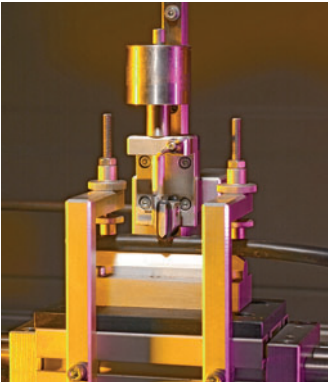
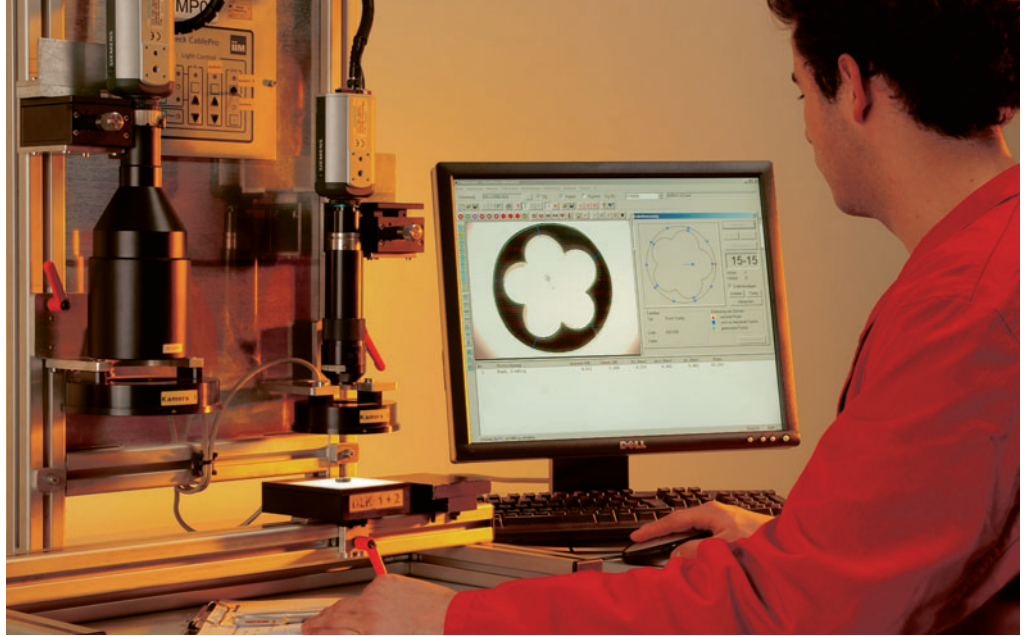
HELUROBOTICS® covers the complete service spectrum, including system analysis, consulting, planning, installation, service and warranty, for mass-produced cable protection systems for robots in automation systems.

Our specialists select with you the correct cables, lines, supplemental systems and cable protection systems to be used with your specific application, conceive and construct the suitable system, and, with our partners, perform installation and service on site.



Research & development

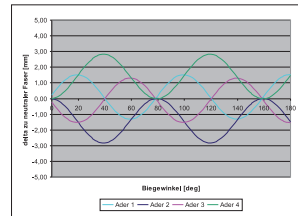
We devise optimised cable solutions for our customers.



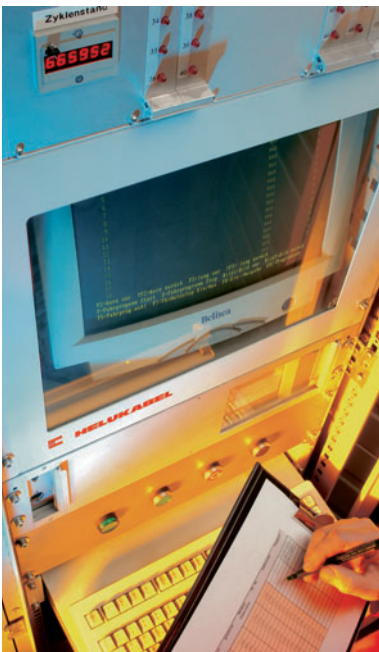
Photos: HELUKABEL®

The focus is very much on products for mobile use with a high level of vertical integration. Our customers expect extreme resistance to chemical, electrical and mechanical stresses combined with small bending radii, a high number of flexing cycles and outstanding service lives – we are happy to comply.

Our design engineers rely on the latest software to develop our cables. This software makes the cores' movement scenarios in the cable sheath visible.



Once these prerequisites are met, we can optimize the products - according to the type of stranding, lay-length and material - and the corresponding manufacturing technique.

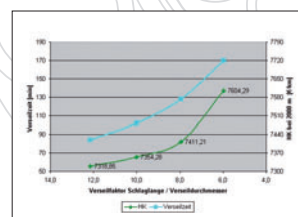
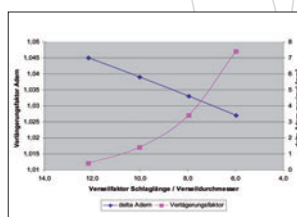


HELUKABEL GMBH			
Schleppketten-Testergebnis			
Types: JZ-HF / -CY			
Art. Nr	Aderzahl x Nennquerschnitt mm	Außendurchmesser mm	gesch
7	15023	760,75	8,30
8	15005	760,5	7,50
9	15041	761	8,60
10	15058	561,5	9,10
11	15006	1020,5	9,10
12	15075	462,5	15,40
13	15967	1861	13,10
14	15986	1460,75	13,10
15	15966	1261	14,40
16	15966	762,5	12,70
17	15928	562,5	14,50

New products are tested in the state-of-the-art Test Center in Windsbach/Nuremberg to ensure their suitability for daily use and readiness for standard production. Our stringent quality standard is also upheld with measurements and random sample checks carried out during production.

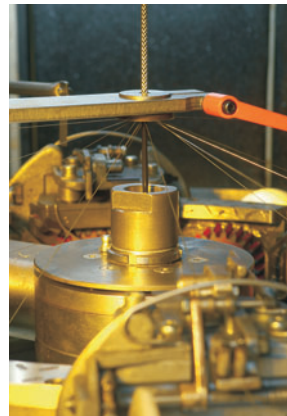
In order to provide information on the service life, we document the real-life tests we carry out on our cables suitable for use in drag chains.

The effect of changing the lay-length



The Production Windsbach/Nuremberg

Here we are realizing standard cables, special cables and customer-specific special solutions.



The annual production of our own plant in Windsbach/Nuremberg, which has a production surface area over 10,000 m² and approx. 145 employees, this equates to approx. 50,000 km of cable or 340,000 core kilometres.

The products include shielded, unshielded and steel wire reinforced control cables with PVC/PUR sheath or thermoplastic elastomers and halogen-free, flame-resistant and heat-resistant shielded and unshielded cables. Our range is rounded off by special-purpose cables produced to customer requirements.

The Logistics Centre

A large part of the product assortment, which has over 33,000 articles, is held starting from the Hemmingen storage.



To meet the increasing demands of the market, HELUKABEL® opened a logistics centre. The goal of the logistics centre is to increase the order to delivery process through automation.

Innovative warehouse engineering and high-tech information techniques make this installation unique in the cable business.

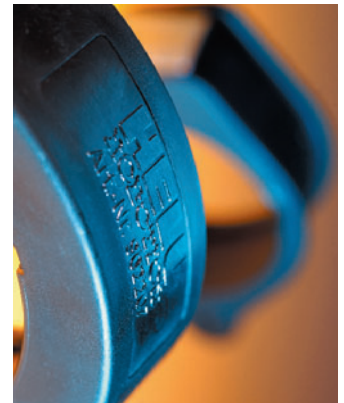
“State of the Art” automation allows hundreds of orders to be filled daily. Our “Just in Time” system pulls product from over 16,000 pallet storage locations.

Mounting parts for cable protection systems

Components for mounting the dress package systems



HELU
ROBOTICS



Photos: HELUKABEL®



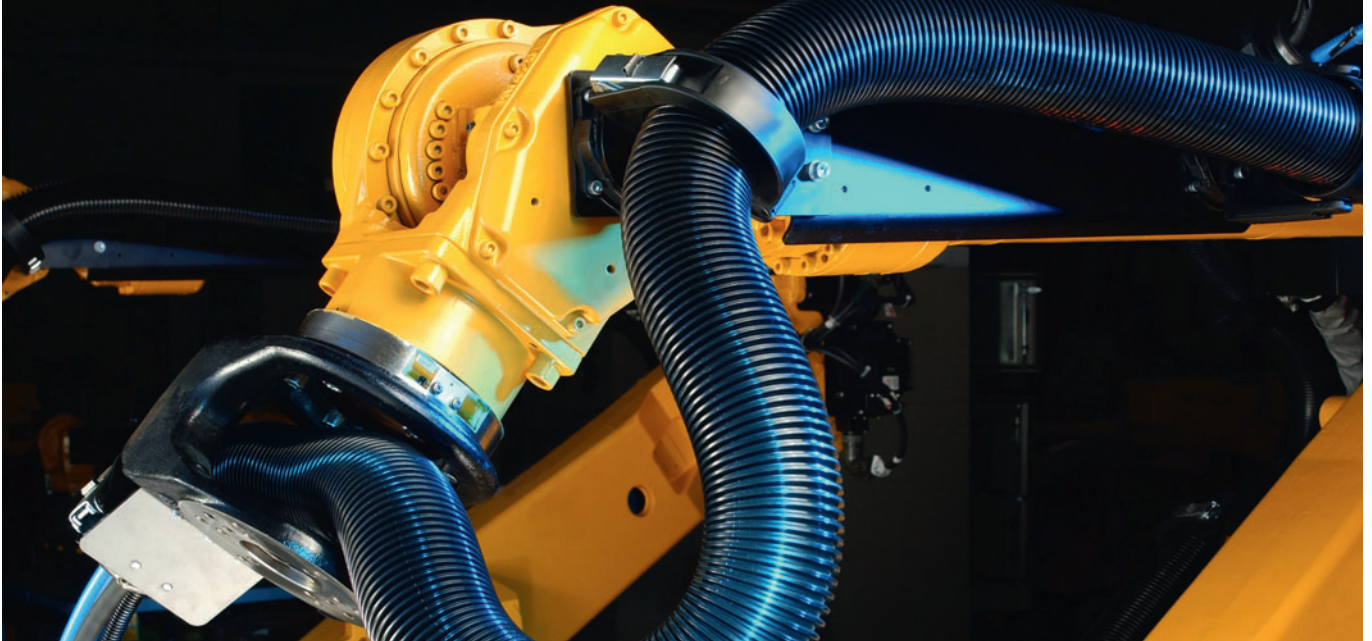
The pre-assembled cable protection systems for robotics also include the manufacture and development of the metal components, for handling, MAG and spot-welding, as series, individual or special solutions as well as service and installation. HELUKABEL® provides extensive warehouse stock here for fast availability.

Simply call Phone +49 7150 9209-765 or -182.
We will be happy to advise you.

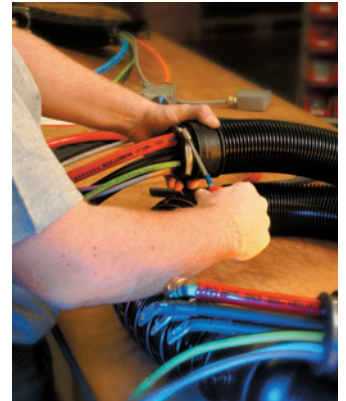
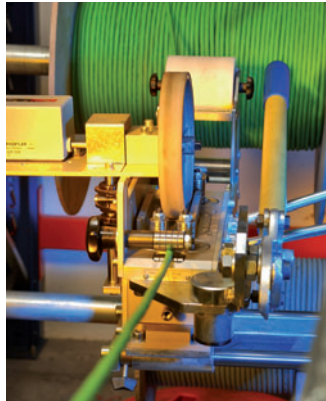
Simply request further documentation from our website – www.helukabel.de

Pre-assembled cable protection systems for Robotics

**Our own pre-assembled cable protection systems
as tailored solution**



**HELU
ROBOTICS**



Photos: HELUKABEL®

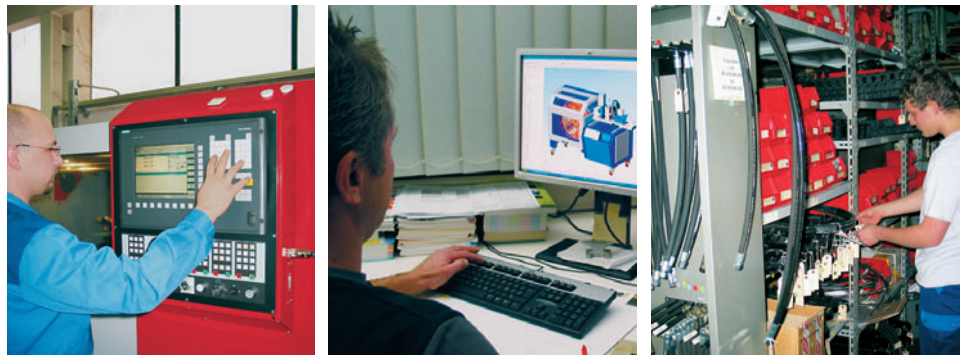


Simply request further documentation from our website – www.helukabel.de

With HELUROBOTICS, we offer specially assembled cable protection systems. From the planning, engineering and assembly to installation and servicing, we offer a wide range of complex solutions as individual or special solutions. The cables, wires, add-on systems and the cable protection system that is used are then tuned to the application, built and installed.

Simply call Phone +49 7150 9209-765 or -182.
We will be happy to advise you.

The System Provider for Winding, Measuring & Warehouse Systems



Kabelmat® Wickeltechnik GmbH's history goes back to the sixties and for a long time, the company has been among the market leaders for winding systems for the cable and wire industry and/or processing. Customers include manufacturers, retailers and processors of cables and wires as well as fitters, electrical installers, machine construction companies and many more.

The product portfolio includes almost all devices and machines for storage, winding and hanging of cables and wires, steel cables, pipes, hoses and profiles. The tasks completed worldwide by Kabelmat® products include winding from and to drums, as well as from drums to rings.



TROMTRAK 1250

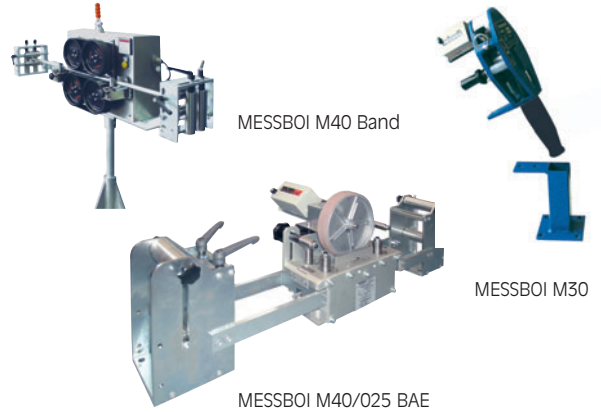
TISCHROL II

Manual winding systems

These are Kabelmat® winding devices and machines without electromotive actuation. When it comes to winding systems, Kabelmat® differentiates between rewinding and unwinding. Kabelmat® offers different designs and sizes for rewinders as well as unwinders, for drums and rings.

Measuring systems

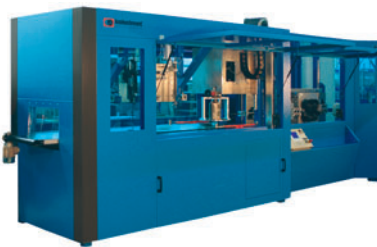
Our length measuring devices are available in different designs and sizes. The size depends on the maximum diameter of the material to be measured. The MESSBOI 40, for example, is qualified for measuring round material up to a diameter of 40 mm. Flat materials can also be measured. We currently have measuring devices for a maximum of 100 mm diameters in our program.



MESSBOI M40 Band

MESSBOI M30

MESSBOI M40/025 BAE



Ringrol 300 / 400 / 500



MOTROL 1000 AUF

Machine winding systems

These are Kabelmat® winding devices and machines with electromotive actuation. Efficient, cost-effective cutting, measuring and winding of cables and wires, steel cables, pipes, hoses and profiles requires high-performing but easily operatable machines. Modern control systems and drive technologies of well-known German suppliers are used by Kabelmat® in the field.

Warehouse systems

These are Kabelmat® cable drum or cable ring storage and unwinding systems. With its warehouse systems MATBOI, SPULBOI®, LAGBOI® and LAGROL®, Kabelmat® offers to organize your cable warehouse. In addition, the LAGROL system provides the option to use a manual or machine-driven winder for direct unwinding.



LAGBOI® S

SPULBOI®

MATBOI® 450 / 650



Become acquainted with our complete winding, measuring & warehouse product range. Just download our catalogue via www.kabelmat.com

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Bahnhofstraße 9

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Zum Mühlenfließ 1

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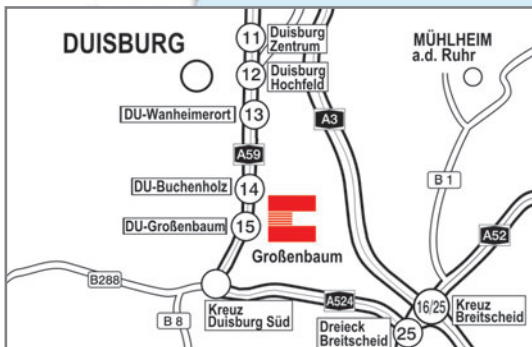


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D-47269 Duisburg

Am Handwerkshof 2-4

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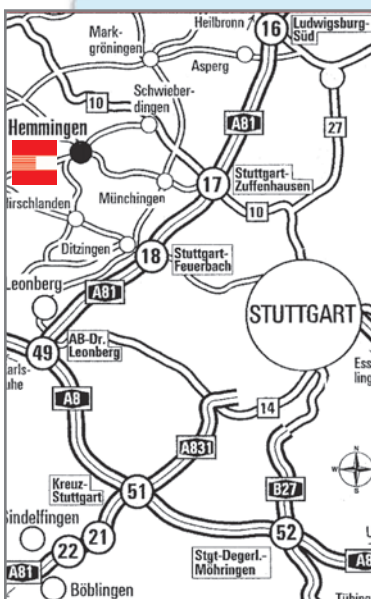
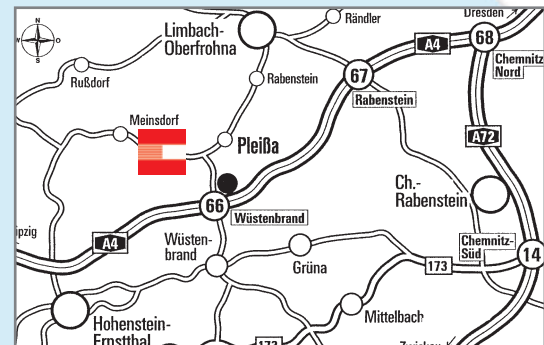


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Eichelbergstraße 7

Telephone +49 3722 6086-0 • Fax +49 3722 6086-420



Headquarters

D-71282 Hemmingen

Dieselstraße 8-12

Telephone +49 7150 9209-0

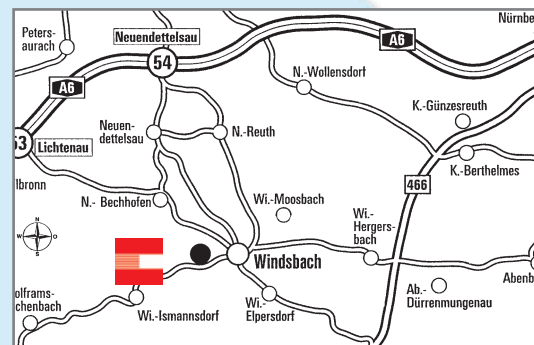
Fax +49 7150 81786

Development & production

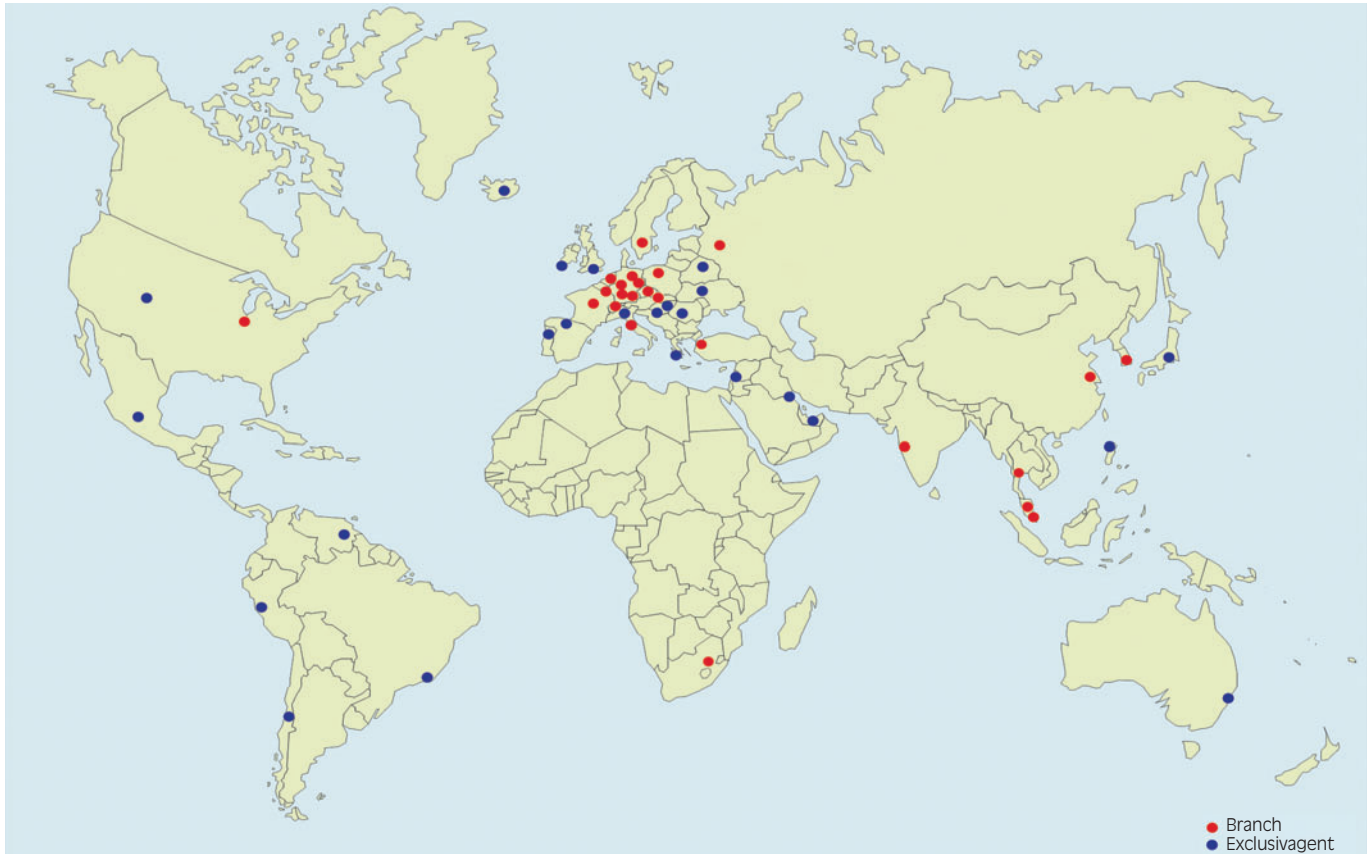
D-91575 Windsbach/Nuremberg

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sales@helukabel.com.my

Our registered trademarks

CABLES AND WIRES

BIOFLEX-500®	Bio-Oil resistant Cables
DATAFLAMM®	Data and Computer Cables halogen-free
DATAPUR-C®	Data and Computer Cables
GALVANICABLE®	High-current cathode Cables
HELUFLON®	Heat resistant Cables
HELUTHERM®	Heat resistant Cables
HELUTRAIN®	Train Cables
HELUTRUCK®	Vehicle Cables / Truck Cables
HELUWIND®	Cables for Wind Power
KOMPOFLEX®	Microbial resistant Cables
KOMPOSPEED®	Bio-Oil resistant Cables for Drag Chains
LIFT-TRAGO®	Lift hoist control Cables
MEGAFLEX®	Flexible Control Cables halogen-free (UL/CSA)
MULTIFLEX 512®	Cables for Drag Chains PUR
MULTISPEED®	Cables for Drag Chains
SENSORFLEX®	Sensor Cables
SOLARFLEX®	Cables for photovoltaic
SUPER-PAAR-TRONIC-C-PUR®	Cables for Drag Chains halogen-free
SUPERTRONIC®	Cables for Drag Chains
THERMFLEX®	Heat resistant Cables
TOPFLEX®	Servo, Feedback and Motor Cables
TOPSERV®	Servo, Feedback and Motor Cables
TRAYCONTROL®	Cable for open installation, exposed run
TROMMPUR®	Trailing Cables
UNIPUR®	Flexible Control Cables PUR

DATA, NETWORK AND BUS TECHNOLOGY

HELUCOM®	Fibre optic Cables
 HELUCOM CONNECTING SYSTEMS	Fibre optic connecting equipment
HELUKAT®	Copper data Cables
 HELUKAT CONNECTING SYSTEMS	Copper connecting equipment

MEDIA TECHNOLOGY

HELULIGHT	Cables for light control
HELUSOUND	Audio Cables

CABLE ACCESSORIES

HELUCHAIN®	Cables for Drag Chains program
HELUTECH®	Industrial connectors series
HELUTOP®	Cable glands program

HELUROBOTICS

HELUROBOTICS®	Pre-assembled dress package systems for Robotics
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Achieving Success through Quality and Innovation

Product certificates document the tested quality level of our products

ISO 9000ff is used as the basis for quality management processes carried out at HELUKABEL®. Product certificates issued by accredited institutions also make it easier for you to evaluate your suppliers.



Our continuous quality improvement process enables us not only to maintain a consistently high quality standard, it also ensures continued development and new product development.

Our commitment to protecting the environment can be seen in our state-of-the-art environment management systems.



CCC-Certification for China

The HELUKABEL® GmbH had obtain for their products the CCC-Certification for the following products:

中国国家强制性产品认证证书

证书编号: 2003010105076366

委托人名称、地址
德国和声电气有限公司
德国赫明恩 (Hemmingen) 建造街8/12号

生产者(制造商)名称、地址
德国和声电气有限公司
德国赫明恩 (Hemmingen) 建造街8/12号

生产企业名称、地址
德国和声电气有限公司
德国韦德利巴赫 (Wiedelbach) 威希特瓦森 (Wichtrasson) 26号

产品名称和系列、规格、型号
聚氯乙烯绝缘聚氯乙烯护套油软电缆
60227 IEC 74(RVVY) 300/500V 0.5-2.5(2-60芯); 60227 IEC 75 (RVVY) 300/500V 0.5-2.5(2-60芯); (颜色: 灰色)

产品标准和技术要求
GB/T 5023.7-2008/IEC 60227-7:2003

上述产品符合强制性产品认证实施规则
CNCA-01C-002:2007的要求, 特此认证。

发证日期: 2010年04月26日 有效期至: 2015年04月26日

证书有效期内本证书的有效性依据发证机构的定期监督获得保持。
本证书为变更证书, 证书首次颁发日期: 2003年08月13日
本证书的相关信息可通过国家认证委员会www.cca.gov.cn查询

主任: 
中国质量认证中心
中国·北京·朝阳区望京东路188号9区 100070
http://www.cqc.com.cn

CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

No.: 2003010105076366

NAME AND ADDRESS OF THE APPLICANT
HELJU KABEL GmbH
Dieselstrasse 8-12, D-71282 Hemmingen / Stuttgart, Germany

NAME AND ADDRESS OF THE MANUFACTURER
HELJU KABEL GmbH
Dieselstrasse 8-12, D-71282 Hemmingen / Stuttgart, Germany


NAME AND ADDRESS OF THE FACTORY
HELJU KABEL GmbH
Wichtrasson 26, D-91575 Wiedelbach, Germany

NAME, MODEL AND SPECIFICATION
PVC insulated and PVC sheathed oil-resistant flexible cables
60227 IEC 74(RVVY) 300/500V 0.5-2.5(2-60 cores); 60227 IEC 75(RVVY) 300/500V 0.5-2.5(2-60 cores); (color: grey)

THE STANDARDS AND TECHNICAL REQUIREMENTS FOR THE PRODUCTS
GB/T 5023.7-2008/IEC 60227-7:2003

This is to certify that the above mentioned products have met the requirements of implementation rules for compulsory certification (IEC CNCA-01C-002:2007).

Date of issue: Apr. 26, 2010 Date of expiry: Apr. 26, 2015
Validity of this certificate is subject to positive result of the regular follow up inspection by issuing certification body until the expiry date.
Date of original certification: Aug. 13, 2003
This certificate can be verified through CNCA's website: www.cca.gov.cn

President: 
Wang Kejiao
CHINA QUALITY CERTIFICATION CENTRE
Section 9, No. 188, Nansihuan Xilu, Beijing 100070 P.R. China
http://www.cqc.com.cn

PVC insulated and PVC sheathed oil-resistant flexible cables according to GB 5023.7-1997 227 IEC 74 (RVVYP) 300/500V 0,5-2,5 mm² (2-60 cores) 227 IEC 75 (RVVY) 300/500V 0,5-2,5 mm² (2-60 cores) Colour: grey
H05 VV5-F
H05 VVC4V5-K

中国国家强制性产品认证证书

证书编号: 2003010105076365

委托人名称、地址
德国和声电气有限公司
德国赫明恩 (Hemmingen) 建造街8/12号

生产者(制造商)名称、地址
德国和声电气有限公司
德国赫明恩 (Hemmingen) 建造街8/12号

生产企业名称、地址
德国和声电气有限公司
德国韦德利巴赫 (Wiedelbach) 威希特瓦森 (Wichtrasson) 26号

产品名称和系列、规格、型号
聚氯乙烯绝缘无护套电线电缆
60227 IEC 02(RV) 450/750V 1.5-240; 60227 IEC 06(RV) 300/500V 0.5-1;

产品标准和技术要求
GB/T 5023.3-2008/IEC 60227-3:1997

上述产品符合强制性产品认证实施规则
CNCA-01C-002:2007的要求, 特此认证。

发证日期: 2010年04月26日 有效期至: 2015年04月26日

证书有效期内本证书的有效性依据发证机构的定期监督获得保持。
本证书为变更证书, 证书首次颁发日期: 2003年08月13日
本证书的相关信息可通过国家认证委员会www.cca.gov.cn查询

主任: 
中国质量认证中心
中国·北京·朝阳区望京东路188号9区 100070
http://www.cqc.com.cn

CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

No.: 2003010105076365

NAME AND ADDRESS OF THE APPLICANT
HELJU KABEL GmbH
Dieselstrasse 8-12, D-71282 Hemmingen / Stuttgart, Germany

NAME AND ADDRESS OF THE MANUFACTURER
HELJU KABEL GmbH
Dieselstrasse 8-12, D-71282 Hemmingen / Stuttgart, Germany

NAME AND ADDRESS OF THE FACTORY
HELJU KABEL GmbH
Wichtrasson 26, D-91575 Wiedelbach, Germany

NAME, MODEL AND SPECIFICATION
PVC insulated non-sheathed cables and wires
60227 IEC 02(RV) 450/750V 1.5-240; 60227 IEC 06(RV) 300/500V 0.5-1;

THE STANDARDS AND TECHNICAL REQUIREMENTS FOR THE PRODUCTS
GB/T 5023.3-2008/IEC 60227-3:1997

This is to certify that the above mentioned products have met the requirements of implementation rules for compulsory certification (IEC CNCA-01C-002:2007).

Date of issue: Apr. 26, 2010 Date of expiry: Apr. 26, 2015
Validity of this certificate is subject to positive result of the regular follow up inspection by issuing certification body until the expiry date.
Date of original certification: Aug. 13, 2003
This certificate can be verified through CNCA's website: www.cca.gov.cn

President: 
Wang Kejiao
CHINA QUALITY CERTIFICATION CENTRE
Section 9, No. 188, Nansihuan Xilu, Beijing 100070 P.R. China
http://www.cqc.com.cn

PVC insulated non-sheathed cables and wires according to GB 5023.3-1997 227 IEC 02 (RV) 450/750 1,5-240 mm² 227 IEC 06 (RV) 300/500 0,5-1 mm²
H05 V-K
H07 V-K

中国国家强制性产品认证证书

证书编号: 2004010105106701

委托人名称、地址
德国和声电气有限公司
德国赫明恩 (Hemmingen) 建造街8/12号

生产者(制造商)名称、地址
德国和声电气有限公司
德国赫明恩 (Hemmingen) 建造街8/12号

生产企业名称、地址
德国和声电气有限公司
德国韦德利巴赫 (Wiedelbach) 威希特瓦森 (Wichtrasson) 26号

产品名称和系列、规格、型号
聚氯乙烯绝缘软电线电缆
60227 IEC 53(RVV) 300/500V 0.75-2.5(2-3芯, 颜色: 灰色); RVV 300/500V 0.75-2.5(6芯) 0.75-1.5(7-8芯); 0.75-1(10-11芯);

产品标准和技术要求
GB/T 5023.5-2008/IEC 60227-5:2003及聚氯乙烯绝缘软电线电缆补充要求 (CNCA-01C-002:2007 附件6)

上述产品符合强制性产品认证实施规则
CNCA-01C-002:2007的要求, 特此认证。

发证日期: 2010年04月26日 有效期至: 2015年04月26日

证书有效期内本证书的有效性依据发证机构的定期监督获得保持。
本证书为变更证书, 证书首次颁发日期: 2004年02月10日
本证书的相关信息可通过国家认证委员会www.cca.gov.cn查询

主任: 
中国质量认证中心
中国·北京·朝阳区望京东路188号9区 100070
http://www.cqc.com.cn

CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

No.: 2004010105106701

NAME AND ADDRESS OF THE APPLICANT
HELJU KABEL GmbH
Dieselstrasse 8-12, D-71282 Hemmingen / Stuttgart, Germany

NAME AND ADDRESS OF THE MANUFACTURER
HELJU KABEL GmbH
Dieselstrasse 8-12, D-71282 Hemmingen / Stuttgart, Germany


NAME AND ADDRESS OF THE FACTORY
HELJU KABEL GmbH
Wichtrasson 26, D-91575 Wiedelbach, Germany

NAME, MODEL AND SPECIFICATION
PVC insulated flexible cables and wires
60227 IEC 53(RVV) 300/500V 0.75-2.5(2-3C, color: grey); RVV 300/500V 0.75-2.5(6C) 0.75-1.5(7-8C); 0.75-1(10-11C);

THE STANDARDS AND TECHNICAL REQUIREMENTS FOR THE PRODUCTS
GB/T 5023.5-2008/IEC 60227-5:2003 and PVC insulated flexible cables and wires supplementary requirements (CNCA-01C-002:2007 Annex 6)

This is to certify that the above mentioned products have met the requirements of implementation rules for compulsory certification (IEC CNCA-01C-002:2007).

Date of issue: Apr. 26, 2010 Date of expiry: Apr. 26, 2015
Validity of this certificate is subject to positive result of the regular follow up inspection by issuing certification body until the expiry date.
Date of original certification: Feb. 10, 2004
This certificate can be verified through CNCA's website: www.cca.gov.cn

President: 
Wang Kejiao
CHINA QUALITY CERTIFICATION CENTRE
Section 9, No. 188, Nansihuan Xilu, Beijing 100070 P.R. China
http://www.cqc.com.cn

PVC insulated flexible cables and wires according to GB 5023.5-1997 227 IEC 06 (RV) 300/500 0,75-2,5 mm² (2-41 cores)
JZ-500, OZ-500, JB-500, OB-500, Y-CY-JZ, Y-CY-OZ, Y-CY-JB, Y-CY-OB SY-JZ, SY-OZ, SY-JB, SY-OB JZ-HF, OZ-HF, JZ-HF-CY, OZ-HF-CY F-CY-JZ, F-CY-OZ, OZ-BL, OZ-BL-CY

Clean Room Qualified Cables

Type	Page
F-CY-JZ	A 27 - A 28
F-CY-OZ (LIY-CY)	A 25 - A 26
(H)05 Z1Z1-F	A 70
JB-500	A 21
JB-750 HMH	A 68
JB-750	A 22 - A 23
JZ-500	A 6 - A 10
JZ-500 HMH	A 62 - A 63
JZ-500 HMH-C	A 71 - A 72
JZ-600	A 16 - A 17
JZ-602	N 7 - N 8

Type	Page
JZ-602-CY	N 17 - N 18
JZ-750	A 14 - A 15
JZ-HF	C 5 - C 6
JZ-HF-CY	C 8 - C 9
MULTIFLEX 512®-C-PUR	C 19 - C 20
MULTIFLEX 512®-PUR	C 14 - C 15
MULTISPEED® 500-C-TPE	C 24
MULTISPEED® 500-TPE	C 22 - C 23
SY-JB	A 40 - A 41
SY-JZ	A 34 - A 35

HELUKABEL® goes Clean Room

HELUKABEL®, one of the leading worldwide sources of cables, connections and cable accessories is working to consolidate its market position in the field of energy-saving systems by the increased application of Clean Room principles. Various cable types are tested under Clean Room conditions for cleanliness and suitability for use in Clean Rooms, in co-operation with the Fraunhofer Institute for Production Techniques and Automation.







As a result of measurements of airborne particles, classified according to US Federal Standard, 209E, ISO 14644-1 or VDI 2083 Page 1, we are able to provide a Statement on deployment of cables in Clean Room areas.

Simply call us for further information:
we will be happy to advise you.

Kombination Energiekette mit Kabeltyp:	Eignung des Systems für den Einsatz in Reinräumen der Luftreinheitsklasse Class (nach ISO 14644) bei einer Verfahrensgeschwindigkeit von:		
	0,2 (m/sec)	0,6 (m/sec)	1,4 (m/sec)
MULTISPEED 500-C-TPE 5G1,5 Reinraum	1	3	3
MULTISPEED 512-C-PUR 7G1 Reinraum	2	3	3
JZ-HF-CY 5G1 Reinraum	2	2	2
OZ-500 5x1,5 Reinraum	1	3	3
SY-JB 5G1,5 Reinraum	2	3	3
JZ-602 SGAWG 18 (1,0) Reinraum	2	5	3
F-CY-CY 5G1,5 Reinraum	2	2	3
JZ-500 HMH 5G1 Reinraum	5	3	5



Please complete in your order type and part-number by cleanroom

orange RAL 2003		Power cable: e.g. servo drives, frequency controlled drives application specific design	
green RAL 6018		Measurement cable: e.g. measuring systems, analog sensors application specific and case specific design	
magenta RAL 4001		Hybrid-fieldbus cable: e.g. fieldbus systems 2 x optical fibres and 4x1,5 mm ² copper wires	fibre optic: fieldbus Cu 1: 24V Cu 2: 0V Cu 3: 24V (switched) Cu 4: 0V
yellow RAL 1021		Actor-sensor cable: e.g. proximity switches, valves 4 x 0,34 mm ² , 2 x prefabricated M12 connectors	1: 24V 2: signal (digital Inp.) 3: 0V 4: signal (anal. Inp. or digital Output)
black RAL 9005		Power cable: e.g. three-phase AC motors 5 x 1,5 mm ² or case specific design	
grey RAL 7040		Control cable: 24 V technology, e.g. control voltage, power supply multiwire, case specific design	

The wiring has to be resistant against cooling lubricants used in industrial applications

DESINA® -Cables and Wires

VDW (Verein Deutscher Werkzeugmaschinenfabriken) association of German tooling and machinery factories) set a study group of representatives from a number of leading German tools and machinery manufacturers. This study groups has worked out solutions for decentralised and standardised installation techniques. Also contributing to this concept are representatives from the branches in industry of machinery construction, automobile production, automation engineering and various suppliers. The objective here is to realise considerable cost reductions by standardising parts and assemblies (e. g. cables and wires). This can be achieved by:

- Straightforward assembly for preventing errors
- Fast failure diagnosis
- Reduction of the expenditure for construction
- Reduction of type variety
- Increase of availability by reducing the type variety.

For cables and lines, existing standards are used. However, to increase availability and simplify cable installation, VDW have specified a certain sheath colour for the individual areas of application. It is particularly important for us as manufacturer and supplier of the products cited above, to be among those suppliers who can offer DESINA®-compliant cables. We therefore stock these for shortnotice delivery to our customers.

An overview of DESINA® suppliers has been made available on the Internet by VDW, in which HELUKABEL® is included.

We are certain that DESINA® will assert itself on the market because this is a standard for all participating companies and will be a key for more success. For us as well.

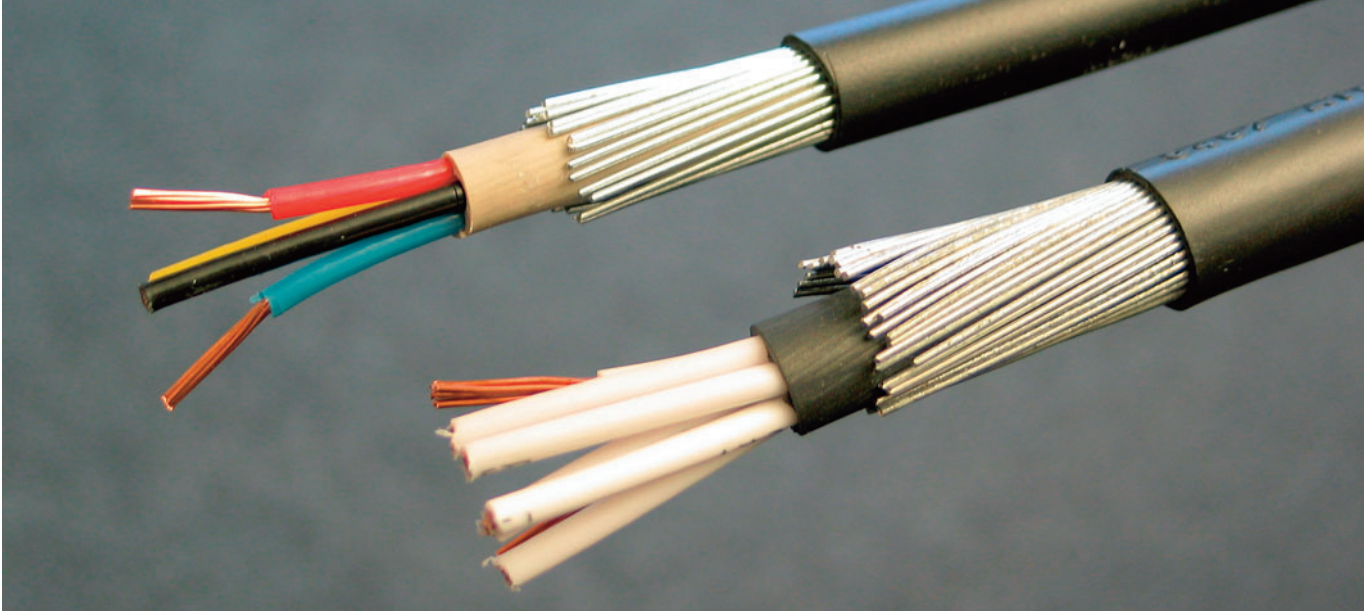
Type	Page	Type	Page
TOPSERV® 108 PVC	N 127	TOPSERV® 109 PUR	N 131
TOPSERV® 112 PVC	N 128	TOPSERV® 113 PUR	N 132 - N 133
TOPSERV® 119 PVC	N 129	TOPSERV® 121 PUR	N 134
TOPGEBER® 511 PVC	N 130	TOPGEBER® 512 PUR	N 135 - N 136

If you should require further information about DESINA®, please call us.



British Standard

**Steel wire armoured cable
is used particularly in the Middle/
Far East Asia.**



A particularly high level of mechanical protection is ensured thanks to the armouring of galvanic round steel wire. The insulation materials used are PVC, networked polyethylene (XLPE), or halogen-free materials (LSOH Low Smoke Zero Halogen). Paper Insulated Lead Cover (PILC) cable variants are in demand in the medium-voltage and high-voltage area. Lines in accordance with British Standard are also required for fire alarm systems and emergency lighting systems. Fire-resistant and naturally halogen-free with low smoke density, are criteria that must be satisfied by the insulation materials.

However cable and lines in accordance with British Standard, does not necessarily mean a special production variant. Often the information relative to permissible temperature ranges, strand make-up, or nominal voltage classes is hidden behind the classification. Thus usually after transcoding the required standard, the supply requirements can be easily satisfied with stock products.

Selection table flexible control cable

Operational criteria		Cable and conductor description																															
△ fixed installation ▲ fixed installation/flexing ▲ flexing		JZ-500	JZ-500 COLD	JZ-500 black	Single 600-J-O	Single 600-CY -J-O	JZ-600	JZ-500-C black	JZ-600-Y-CY	JZ-600 UL/CSA	JZ-600-Y-CY UL/CSA	JZ-750	JB-500	JB-750	JZ-500 orange	JB-750 yellow	SY-JZ	SY-JB	JZ-602	JZ-602-CY	JZ-602 PUR DC / AC	JZ-602-PUR	JZ-602-C-PUR	JZ-603	JZ-603-CY	JZ-500 PUR	JZ-500-FC-PUR	PUR6-JZ	F-C-PUR6-JZ				
Page		A6	A8	A9	N120	N121	A16	A24	A36	N10	N20	A14	A21	A22	A10	A23	A34	A40	N7	N17	N48	N46	N51	N9	N19	A43	A52	A44	A54				
Technical Data	Standards	according to DIN / VDE	●	●			●	●	●			●		●		●		●									●	●	●	●			
		adapted with VDR Reg No.	●											●		●		●	●														
		adapted with HAR approbation				●	●				●	●								●	●	●	●	●	●	●							
		adapted with UL approbation				●	●				●	●									●	●	●	●	●	●	●						
		adapted with CSA approbation				●	●				●	●									●	●	●	●	●	●	●						
	Temperature range	+ 100 °C																			▽	▽				▽	▽						
		+ 90 °C		▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽													
		+ 80 °C	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽													
		+ 75 °C																															
		+ 70 °C																								▽	▽						
		+ 60 °C																															
		- 5 °C				▲	▲		▲		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
		- 15 °C	▲		▲			▲		▲					▲				▲	▲													
		- 20 °C																															
		- 25 °C																															
- 30 °C		▲																															
- 40 °C	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
- 50 °C																																	
Nominal voltage	250 V																																
	300 / 300 V																																
	300 / 500 V	●	●	●				●					●		●		●	●							●	●	●	●	●	●	●		
	600 V acc. UL/CSA																			●	●	●	●	●	●	●							
	450 / 750 V												●		●		●	●															
	600 / 1000 V				●	●	●		●	●	●	●																					
Cable structure	Core insulation	PVC / special PVC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		PUR																															
		special material																															
		rubber																															
	Core identification	numbering according to DIN VDE 0293	●	●	●			●	●	●	●	●	●			●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	
		colour code according to DIN VDE 0293															●																
		JB colour code (varicoloured cores)				●	●							●	●				●														
	Screening	Cu-braiding					●		●		●										●					●							
		steel wire braiding																															
	Outer sheath	PVC / special PVC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
PUR																						●	●	●			●	●	●	●			
special material																																	
Sheath colour	grey	●										●	●	●						●	●	●	●	●	●	●	●	●	●	●			
	black		●	●	●	●	●	●	●	●	●																						
	orange															●																	
	yellow																																
	green																																
	blue																																
	transparent																																
Application	Application in drag chains	see selection table cable in drag chains / prefix page 30 to 35																															
	for intrinsic safety power circuit																																
	warning indication																																
	interlocking purposes																																
	open air	●	●	●	●	●	●	●	●	●	●	●																					
Properties	halogen-free	see selection table flexible control cable halogen-free																															
	chemicals resistant	see selection table chemical resistance in chapter X page X 64 and X 65																															
	EMV-preferred type					●			●	●											●		●		●		●	●	●	●			
	resistant to weathering effects	●	●	●	●	●	●	●	●	●	●	●																					
	abrasion resistance																																

Selection table flexible control cable halogen-free

Operational criteria		Cable and conductor description																																				
△ fixed installation ▲ fixed installation / flexing ▲ flexing		MEGAFLEX 500	MEGAFLEX 500-C	MEGAFLEX 600	MEGAFLEX 600-C	PUR 750	PUR-C-PUR	UNIPUR	UNIPUR CP	KOMPOFLEX JZ-500	KOMPOFLEX JZ-500-C	SIHF	SIHF/OL-P	SIHF-C-Si	SIHF UL/CSA	SIHF-C-Si UL/CSA	THERMIFLEX 180 EWKF	THERMIFLEX 180 EWKF-C	H05SS-F / H05SS-F-F	HELUTHERM 145 MULTI	HELUTHERM 145 MULTI-C	JZ 500 HMH	JZ 500 HMH-C	JB 750 HMH	JB 750 HMH-C	JZ 600 HMH	JZ 600 HMH-C	DATAFLAMM	DATAFLAMM-C	DATAFLAMM-C-PAAR	(H)03 Z1Z1-F	(H)05 Z1Z1-F						
Page		N54	N56	N58	N60	A51	A60	A49	A58	A87	A88	E7	E16	E17	N75	N77	E9	E19	E10	E5	E14	A62	A71	A68	A77	A66	A75	B8	B23	B24	A69	A70						
Technical Data	Standards	according to DIN / VDE	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						
		adapted with VDR Reg No.						●																														
		adapted with HAR approbation																		●													●	●				
		adapted with UL approbation	●	●	●	●										●	●																					
		adapted with CSA approbation	●	●	●	●										●	●																					
	Temperature range	+ 180 °C											▼	▼	▼	▼	▼	▼	▼	▼																		
		+ 150 °C after UL/CSA														▼	▼																					
		+ 145 °C																			▽	▽																
		+ 120 °C																				▼	▼															
		+ 90 °C								▼	▼	▼	▼																									
		+ 80 °C	▼	▼	▼	▼	▼	▼																														
		+ 70 °C																						▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼			
		+ 5 °C																													▲	▲	▲	▲	▲	▲		
		- 5 °C						▲																											▲	▲		
		- 15 °C																						▲	▲	▲	▲	▲	▲	▲						▲	▲	
		- 20 °C																																				
		- 25 °C																		▲	▲																	
		- 30 °C	▲	▲	▲	▲						▲	▲																									
- 35 °C																					▲	▲																
- 40 °C	△	△	△	△	▲	△	▲	▲	△	△												△	△	△	△	△	△	△	△	△	△	△	△	△	△			
- 50 °C after UL/CSA															▲	▲					△	△																
- 55 °C																					△	△																
- 60 °C																					▲	▲																
Nominal voltage	Operating peak voltage																																					
	300 / 300 V																																					
	300 / 500 V	●	●			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	600 V acc. UL/CSA															●	●																					
	450 / 750 V					●		●	●												●	●				●	●											
600 / 1000 V			●	●																							●	●										
Cable structure	core insulation	Special Elastomer						●	●																													
		PUR					●	●																														
		Silicon											●	●	●	●	●	●	●	●																		
		PE																												●	●	●						
	Special Polymer	●	●	●	●						●	●									●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	Core identification	numbering according to DIN VDE 0293	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
		colour code according to DIN VDE 0293					●	●	●	●			●	●	●	●	●	●	●	●	●															●	●	
		colour code according to DIN 47100																																				
		JB colour code (varicoloured cores)																																				
	screening	Cu-braiding	●		●			●		●		●				●		●				●			●		●		●	●	●	●	●	●	●	●		
		steel wire braiding													●																							
	Outer sheath	Silicon												●	●	●	●	●	●	●																		
		Special Polymer	●	●	●	●					●	●										●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
PUR						●	●	●	●																													
Sheath colour	grey	●	●				●	●	●														●	●	●	●												
	black			●	●					●	●					●	●	●	●	●	●							●	●							●	●	
	yellow								●	●																											●	●
	orange					●			●	●																											●	●
	red-brown												●	●	●																						●	●
Vapour- cation	Application in drag chains	see selection table cable in drag chains / prefix page 30 to 35																																				
	open air	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Properties	chemicals resistant	●	●	●	●																																	
	EMV-preferred type		●	●	●		●	●	●	●	●			●		●		●				●		●		●		●	●	●	●	●	●	●	●	●		
	resistant to weathering effects	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	abrasion resistance	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

Cables halogen-free

Type	Page
AIRPORT 400 Hz	T 49 - T 50
BUS-Cables/I-BUS	R 142
DATAFLAMM	B 8
DATAFLAMM-C	B 23
DATAFLAMM-C-Paar	B 24
FMGCH (FMGCG)	W 7
FMGSGO	W 8
FMSGGO	W 9
FZ-LSi, FZ-LS, Neon-Light-Cable	K 26
GALVANICABLE	T 11
H05Z-K, H07Z-K	K 16 - K 17
H07 ZZ-F	F 12 - F 13
(H)03 Z1Z1-F	A 69
(H)05 Z1Z1-F	A 70
HELUTHERM 1200	K 32
HELUTHERM 1200-ES	K 32
HELUTHERM 145	K 22 - K 23
HELUTHERM 145 MULTI	E 5 - E 6
HELUTHERM 145 MULTI-C	E 14 - E 15
HELUTHERM 145 UL/CSA approved	N 117
HELUTHERM 145	N 118
HELUTHERM 600/600-ES	K 30
HELUTHERM 800/800-ES	K 31
HELUWIND WK fire warning cable Torsion	T 35
HELUWIND Thermflex 145	T 39
J-2Y(St)H	P 12
J-H(St)H	P 10
J-H(St)HBMK red	P 11
JB-750 HMH	A 68
JB-750 HMH-C	A 77 - A 78
JE-H(St)H BMK red	Q 29
JE-H(St)H orange	Q 28
JE-H(St)HRH BMK	Q 30
JE-LiHCH	B 33
JZ-500 HMH	A 62 - A 63
JZ-500 HMH-C	A 71 - A 72
JZ-600 HMH	A 66 - A 67
JZ-600 HMH-C	A 75 - A 76
KOMPOFLEX JZ-500	A 87
KOMPOFLEX JZ-500-C	A 88 - A 89
KOMPOSPEED 600/600-C	K 37
KOMPOSPEED JZ-HF-500	C 29
KOMPOSPEED JZ-HF-500-C	C 30
LFMGSSGO	W 10
LFMSGSSGO	W 11
LMGSGO	W 6
MEGAFLEX 500	A 64 - A 65
MEGAFLEX 500 UL/CSA	N 54 - N 55
MEGAFLEX 500-C	A 73 - A 74
MEGAFLEX 500-C UL/CSA	N 56 - N 57
MEGAFLEX 600	N 58 - N 59
MEGAFLEX 600-C	N 60 - N 61
MGSGO	W 4
MULTIFLEX 512-C-PUR	C 19 - C 20
MULTIFLEX 512-PUR	C 14 - C 15
MULTIFLEX 512-PUR UL/CSA	N 87 - N 88
MULTIFLEX 512-C-PUR UL/CSA	N 92 - N 93
MULTISPEED 500-C-PUR UL/CSA	N 94 - N 95
MULTISPEED 500-C-TPE	C 24
MULTISPEED 500-C-TPE UL/CSA	N 98 - N 99
MULTISPEED 500-PUR	C 16

Type	Page
MULTISPEED 500-PUR UL/CSA	N 89 - N 90
MULTISPEED 500-TPE	C 22 - C 23
MULTISPEED 500-TPE UL/CSA	N 96 - N 97
MULTISPEED 600-PUR-J/-O	N 124
MULTISPEED 600-C-PUR-J/-O	N 125
MULTISPEED TRONIC-C-PUR	N 106
MULTISPEED TRONIC-PUR	N 105
MULTITHERM 400	E 13
MULTITHERM 400-ES	E 20
(N)HMH-J	O 8
(N)HMH-O	O 7
N2XCH Power and Control cable	Q 26 - Q 27
N2XCH-FE 180/E30	Q 33 - Q 34
N2XCH-FE 180/E90	Q 41 - Q 42
N2XH Power and Control cable	Q 24 - Q 25
N2XH-FE 180/E30	Q 31 - Q 32
N2XH-FE 180/E90	Q 39 - Q 40
NHXCH-FE 180/E90	Q 45 - Q 46
NHXCH-FE 180/E30	Q 37 - Q 38
NHXH-FE 180/E30	Q 35 - Q 36
NHXH-FE 180/E90	Q 43 - Q 44
NHXMH-J/-O	O 9
NSHXAFö	K 36
PUR 750	A 51
PUR-C-PUR	A 60
PUR-Single Core	K 15
RD-H(St)H	B 34
ROBOFLEX-sewer robot	H 10
ROBOFLEX 156-flat	H 9
ROBOFLEX 150, 151, 152, 153	H 7 - H 8
ROBOFLEX 2001 / 2001-C	H 6
Sensorflex-H	T 46 - T 47
SiD, SiD/GL, SiF/GL	K 25
SiF, SiFF	K 24
SiHF	E 7 - E 8
SiHF UL/CSA	N 75 - N 76
SiHF-C-Si UL/CSA	N 77
SiHF/GL-P	E 16
SOLARFLEX	T 18 - T 19
Ship's Power Cables MPRX	W 14
Ship's Power Cables MPRXCX	W 15
SUPER-PAAR-TRONIC-C-PUR	C 35
SUPERTRONIC-330-PURö	N 102
SUPERTRONIC-330-C-PURö	N 103
SUPER-PAAR-TRONIC-340-C-PUR	N 104
SUPERTRONIC-C-PURö	C 34
THERMFLEX 180 EWKF	E 9
THERMFLEX 180 EWKF-C	E 19
TOPFLEX 611-PUR	D 5
TOPFLEX 611-C-PUR	D 7
TOPFLEX MOTOR EMV 1/1	N 147
TOPFLEX-PUR	D 14/D 16
TOPSERV 109 PUR	N 131
TOPSERV 110/120	D 9
TROMM-PUR	G 5
TROMM-PUR-H	G 4
UL-Style 3135	N 119
UNIPUR	A 49 - A 50
UNIPUR-CP	A 58 - A 59

Cables to foreign standards

Type	Page UL/CSA	Page GOST
A		
A07 RN-F		F 8
A-BUS	R 147 - R 150	
C		
CAN BUS	R 132 - R 141	
CC LINK BUS	R 157	
Command Cables UL approved/screened	N 65 - N 73	
D		
DREINORM HAR-UL-CSA	N 111 - N 112	
F		
F-C-PURö-JZ		A 54 - A 55
F-CY-JZ		A 27 - A 28
F-CY-OZ (LIY-CY)		A 25 - A 26
FIVENORM	N 113 - N 114	N 113 - N 114
FOUNDATION™ Fieldbus Basic, NFPA 79 Ed. 2007	R 122	
H		
H03 VV-F		A 18
H05 RN-F / RR-F		F 5
H05 V-K		K 6 - K 7
H05VV5-F, (NYSLYÖ-JZ)		A 11 - A 12
(H)05VV5-F, ((N) YSLYÖ-JZ)		A 13
H05VVC4V5-K, (NYSLYCYÖ-JZ)		A 29 - A 30
(H)05VVC4V5-K ((N)YSLYCYÖ-JZ)		A 31
H05VV-F		A 19 - A 20
H05VV-F/SJT	N 12 - N 13	N 12 - N 13
H05VV-F/UL	N 14	
(H)05 Z1Z1-F		A 70
H07 RN-F		F 6 - F 7
H05 V-K / H07 V-K		K 13
H07 V-R, H05 V-K, (H)07 V-K		K 12
H07 V-K, (H)07 V-K		K 8 - K 9
HELUKABEL FOUNDATION™	R 122 - R 125	
HELUTHERM 120		E 4
HELUTHERM 145 UL/CSA approved	N 117 - N 118	
HELUWIND WK 103w EMV	T 27	T 27
HELUWIND WK 135-Torsion		T 29
HELUWIND WK Fire Warning Cables Torsion		T 35
HELUWIND WK DLO 2kV		T 37
HELUWIND WK H07BN4N4-F WIND-Torison		T 33
HELUWIND Thermflex 145		T 39
HELUWIND WK (N)A2XH		T 40
I		
I-BUS	R 142 - R 144	
J		
JB-500		A 21
JB-750		A 22
JB-750 yellow		A 23
JZ-500		A 6 - A 7
JZ-500 HMH		A 62 - A 63
JZ-500 HMH-C		A 71 - A 72
JZ-500 orange		A 10
JZ-500 PUR		A 43
JZ-500-FC-PUR		A 52 - A 53
JZ-600		A 16 - A 17
JZ-600 HMH		A 66 - A 67
JZ-600 HMH-C		A 75 - A 76
JZ-600 UL/CSA	N 10 - N 11	
JZ-600-PUR	N 49 - N 50	

Type	Page UL/CSA	Page GOST
JZ-600-YC-PUR	N 52 - N 53	
JZ-600-Y-CY		A 36 - A 37
JZ-600-Y-CY UL/CSA	N 20 - N 21	
JZ-602	N 7 - N 8	N 7 - N 8
JZ-602-PUR DC/AC	N 48	N 48
JZ-602 RC	N 83	N 83
JZ-602 RC-C-PUR	N 91	
JZ-602 RC-CY	N 85	N 85
JZ-602 RC-PUR	N 86	
JZ-602-C-PUR	N 51	N 51
JZ-602-CY	N 17 - N 18	N 17 - N 18
JZ-602-PUR	N 46 - N 47	N 46 - N 47
JZ-603	N 9	N 9
JZ-603-CY	N 19	N 19
JZ-604-FCY TC TRAY CABLE	N 33	N 33
JZ-604-TC TRAY CABLE	N 25 - N 26	N 25 - N 26
JZ-604-YCY TC TRAY CABLE	N 34	N 34
JZ-750		A 14 - A 15
JZ-HF		C 5 - C 6
JZ-HF-CY		C 8 - C 9
K		
KOMPOFLEX JZ-500		A 87
KOMPOFLEX JZ-500-C		A 88 - A 89
KOMPOSPEED 600		K 37
KOMPOSPEED JZ-HF 500		C 29
KOMPOSPEED JZ-HF 500-C		C 30
M		
MEGAFLEX 500	N 54 - N 55	N 54 - N 55
MEGAFLEX 500-C	N 56 - N 57	N 56 - N 57
MEGAFLEX 600	N 58 - N 59	
MEGAFLEX 600-C	N 60 - N 61	
MULTIFLEX-512-C-PUR	C 19 - C 20	C 19 - C 20
MULTIFLEX-512-PUR	C 14 - C 15	C 14 - C 15
MULTIFLEX 600	N 62	
MULTIFLEX 600-C	N 63	
MULTISPEED 600 PUR-J/-O	N 124	
MULTISPEED 600-C-PUR-J/-O	N 125	
MULTISPEED-500-C-PUR UL/CSA	N 94 - N 95	
MULTISPEED-500-C-PVC UL/CSA	N 84	
MULTISPEED-500-C-TPE UL/CSA	N 98 - N 99	
MULTISPEED-500-PUR UL/CSA	N 89 - N 90	
MULTISPEED-500-PVC UL/CSA	N 82	
MULTISPEED-500-TPE UL/CSA	N 96 - N 97	
MULTISPEED-TRONIC-C-PUR	N 106	
MULTISPEED-TRONIC-PUR	N 105	
N		
N2XH		Q 24 - Q 25
N2XCH Power and Control cable		Q 26 - Q 27
N2XCH-FE 180/E30		Q 33 - Q 34
N2XH-FE 180/E30		Q 31 - Q 32
N2XH-FE 180/E90		Q 39 - Q 40
N2XSY		Q 50 - Q 51
N2XS2Y		Q 54 - Q 55
N2XS(F)2Y		Q 58 - Q 59
N2XSEY		Q 62
NAYY-J		Q 9
NHXCH-FE 180/E30		Q 37 - Q 38
NHXCH-FE 180/E90		Q 45 - Q 46

Cables to foreign standards

Type	Page UL/CSA	Page GOST	Type	Page UL/CSA	Page GOST
NHXX-FE 180/E30		Q 35 - Q 36	SUPERTRONIC-330-PURö	N 102	
NHXX-FE 180/E90		Q 43 - Q 44	SUPER-PAAR-TRONIC-340-C-PUR	N 104	
NYCWW		Q 16 - Q 17	SY-JB		A 40 - A 41
NYCY		Q 12 - Q 13	SY-JZ		A 34 - A 35
NYM-J/ NYM-O		O 5	T		
NYY-J und NYY-O		Q 6 - Q 7	TOPFLEX® 1002	T 7	
O			TOPFLEX® 300	T 6	
OB-BL-PAAR-CY		A 82	TOPFLEX® 301/301-C	T 9	
OZ-BL		A 80	TOPFLEX® 302/302-UL	T 8	
OZ-BL-CY		A 81	TOPFLEX® 600-C-PVC		D 6
P			TOPFLEX® 600-PVC		D 4
PAAR-CY-OZ		B 13	TOPFLEX® 600 VFD	N 137	
PAAR-TRONIC		B 6 - B 7	TOPFLEX® 611-C-PUR		D 7
PAAR-TRONIC-CY		B 11 - B 12	TOPFLEX® 611-PUR		D 5
PROFIBUS	R 107 - R 121		TOPFLEX® 650 VFD	N 138	
PROFInet Type A, B, C	R 101 - R 106		TOPFLEX®-EMV-UV-2YSLCYK-J	N 141 - N 142	
PURö-JZ		A 44 - A 45	TOPFLEX®-EMV 2YSLCY-J		D 17 - D 18
PURö-JZ-HF		C 12 - C 13	TOPFLEX®-EMV-3PLUS 2YSLCY-J		D 21 - D 22
PURö-JZ-HF-YCP		C 17 - C 18	TOPFLEX®-EMV-UV-3PLUS 2YSLCYK-J	N 143 - N 144	
PUR-YELLOW		A 47	TOPFLEX® Motor 103	N 150	
PUR-ORANGE		A 46	TOPFLEX® Motor EMV 1/1	N 147	
PVC+Nylon-Single cores THHN/THWN	N 115		TOPFLEX® Motor EMV 3/3	N 148 - N 149	
PVC-single cores UL/CSA ap. Style 1007	N 108		TOPSERV® 109 PUR	N 131	N 131
PVC-single cores UL/CSA ap. Style 1015	N 110	N 110	TOPSERV® 110		D 9
PVC-single cores UL/CSA ap. Style 1569	N 109		TOPSERV® 120		D 9
R			TOPSERV® 600 VFD	N 139	
RE-2Y(St)YV		B 28	TOPSERV® 650 VFD	N 140	
RE-2Y(St)YV PiMF		B 29	TRAYCONTROL® 300	N 38 - N 39	
RG-Coaxial cables	M 4 - M 7		TRAYCONTROL® 300 TP	N 42 - N 43	
ROBOFLEX 150 ... 153		H 7 - H 8	TRAYCONTROL® 300-C	N 40 - N 41	
ROBOFLEX 2001		H 6	TRAYCONTROL® 300-C TP	N 44 - N 45	
ROBOFLEX 2001-C		H 6	TRAYCONTROL® 500	N 27 - N 28	
Rubber/Neoprene Control Cable UL+CSA	N 81		TRAYCONTROL® 500-C	N 35 - N 36	
S			TRAYCONTROL® 600	N 30 - N 31	
SHIPFLEX 109	W 20 - W 21		TRAYCONTROL® 600-C	N 37	
SHIPFLEX 113	W 22		TRONIC (LiYY)		B 4 - B 5
SHIPFLEX 121	W 23		TRONIC-CY (LiY-CY)		B 9 - B 10
SHIPFLEX 512	W 17		U		
SHIPFLEX 330	W 18		UL-Style 3135	N 119	
SHIPFLEX 340	W 19		UNIPUR		A 49 - A 50
SiF/SiIF/GL/SiFF/SiD/SiD/GL		K 24 - K 25	UNIPUR-CP		A 58 - A 59
SiHF		E 7 - E 8	V		
SiHF UL/CSA	N 75 - N 76		Verteilerflex	N 151 - N 152	
SiHF/GL-P		E 16	Y-CY-JB		A 38 - A 39
SiHF-C-Si		E 17 - E 18	Y-CY-JZ		A 32 - A 33
SiHF-C-Si UL/CSA	N 77		YÖ-C-PURö-JZ		A 56 - A 57
Single 600-J/-O	N 120	N 120			
Single 600-CY-J/-O	N 121	N 121			
Single 602-RC-CY-J/-O	N 123	N 123			
Single 602-RC-J/-O	N 122	N 122			
SOLARFLEX-X PV1-F		T 18			
SUPER-PAAR-TRONIC-C-PUR		C 35			
SUPERTRONIC-C-PURö		C 34			
SUPERTRONIC-C-PVC		C 32			
SUPERTRONIC-PVC		C 31			
SUPERTRONIC-310-C-PVC	N 101				
SUPERTRONIC-310-PVC	N 100				
SUPERTRONIC-330-C-PURö	N 103				

Selection table cables in drag chains

Other Technical Details can be found in the Product Pages of our Catalogue.

Control Cable, screened and unshielded

Type	Application				Cable Structure				Technical Data				Resistance				Standards		
	Movement Distance	Min. Bending Radius	Speed	Acceleration	Cycle	Core Insulation	Outer Sheath	Nominal Voltage	Temperature Range	halogen-free	extensively oil resistant	oil resistant	Jacket flame retardant	microbes	lye	coolant		radiation resistant 80/100 Mrad	uv-rays
	max.	D=Outer diameter	max.	max.	min.	PVC special	PUR special	300/500 V 300/500 V 600 V/UL-CSA 1000 V	-40 -30 -20 -10 -5 70 80 90										
MULTISPEED® 600-PUR-J/-0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 600-C-PUR-J/-0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-PVC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-PVC UL/CSA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-PUR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-PUR UL/CSA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-TPE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-TPE UL/CSA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-C-PVC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-C-PVC UL/CSA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-C-PUR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-C-PUR UL/CSA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-C-TPE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MULTISPEED® 500-C-TPE UL/CSA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The table indicates the main application.

In case of moving cables at higher speeds, over longer distances or higher cycling rates please contact our Technical Support.

Phone +49 7150 9209-0 or techsupport@helukabel.de.

A cycle is a double lift: a representative sample has been tested and measured in our Test Workshop.

The cycle count is only valid when appropriate and professionally installed (see the installation advice; rules for connections, page 36, and under permitted environment conditions).

Selection table cables in drag chains

Other Technical Details can be found in the Product Pages of our Catalogue.

Electronic-Data-BUS-Cables, screened and unscreened

Type	Application				Cable Structure				Technical Data				Resistance				Standards		
	Movement Distance max.	Min. Bending Radius D=Outer diameter	Speed max.	Acceleration max.	Cycle min.	Core Insulation	Inner sheath	Outer Sheath	Nominal Voltage	Temperature Range in °C	halogen-free	extensively oil resistant	oil resistant	Jacket flame retardant	microbes	Ive		coolant	radiation resistant 80/100 Mrad
SUPERTRONIC-PVC	5 m	5 x D	2 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	300/300 V	-40	x	x	x	x	x	x	x	x	UL/CSA-approved
SUPERTRONIC-C-PVC	15 m	7,5 x D	3 m/s	4 m/s	1 Mio	PVC special	PE	PUR special	300/500 V	-20	x	x	x	x	x	x	x	x	UL/CSA-approved
SUPERTRONIC 310-PVC	30 m	10 x D	4 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	600 V/UL-CSA	-10	x	x	x	x	x	x	x	x	VDE-Register-No.
SUPERTRONIC 310 C-PVC	100 m	12,5 x D	5 m/s	10 m/s²	5 Mio	PVC special	PE	PUR special	1000 V	90	x	x	x	x	x	x	x	x	adapted to V DE 0245/0281/0282
SUPERTRONIC-PURö	15 m	5 x D	2 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	300/300 V	-40	x	x	x	x	x	x	x	x	DESINA®
SUPERTRONIC-C-PURö	15 m	7,5 x D	3 m/s	4 m/s	1 Mio	PVC special	PE	PUR special	300/300 V	-20	x	x	x	x	x	x	x	x	UL/CSA-approved
SUPERTRONIC 330 PURö	30 m	10 x D	4 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	600 V/UL-CSA	-10	x	x	x	x	x	x	x	x	VDE-Register-No.
SUPERTRONIC 330 C PURö	100 m	12,5 x D	5 m/s	10 m/s²	5 Mio	PVC special	PE	PUR special	1000 V	90	x	x	x	x	x	x	x	x	adapted to V DE 0245/0281/0282
SUPER-PAAR-TRONIC-C-PUR	15 m	5 x D	2 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	300/300 V	-40	x	x	x	x	x	x	x	x	UL/CSA-approved
SUPER-PAAR-TRONIC 340 C PUR	30 m	7,5 x D	3 m/s	4 m/s	1 Mio	PVC special	PE	PUR special	300/500 V	-20	x	x	x	x	x	x	x	x	VDE-Register-No.
MULTISPEED-TRONIC-PUR	100 m	10 x D	4 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	600 V/UL-CSA	-10	x	x	x	x	x	x	x	x	adapted to V DE 0245/0281/0282
MULTISPEED-TRONIC-C-PUR	30 m	12,5 x D	5 m/s	10 m/s²	5 Mio	PVC special	PE	PUR special	1000 V	90	x	x	x	x	x	x	x	x	DESINA®
S FTP Drag chain 4x2xAWG 24 PUR	15 m	5 x D	2 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	300/300 V	-40	x	x	x	x	x	x	x	x	UL/CSA-approved
PROFIBUS L21x20.64	30 m	7,5 x D	3 m/s	4 m/s	1 Mio	PVC special	PE	PUR special	300/500 V	-20	x	x	x	x	x	x	x	x	VDE-Register-No.
PROFIBUS CAN, high flexible	100 m	10 x D	4 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	600 V/UL-CSA	-10	x	x	x	x	x	x	x	x	adapted to V DE 0245/0281/0282
I-BUS Drag chain	30 m	12,5 x D	5 m/s	10 m/s²	5 Mio	PVC special	PE	PUR special	1000 V	90	x	x	x	x	x	x	x	x	DESINA®
POF mit PUR-Jacket, simplex duplex	15 m	5 x D	2 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	300/300 V	-40	x	x	x	x	x	x	x	x	UL/CSA-approved
TOPGEBER 512 PUR	30 m	7,5 x D	3 m/s	4 m/s	1 Mio	PVC special	PE	PUR special	300/500 V	-20	x	x	x	x	x	x	x	x	VDE-Register-No.
Tachofeedback-Cable-C-Pur	100 m	10 x D	4 m/s	5 m/s	1 Mio	PVC special	PE	PUR special	600 V/UL-CSA	-10	x	x	x	x	x	x	x	x	adapted to V DE 0245/0281/0282

The table indicates the main application. In case of moving cables at higher speeds, over longer distances or higher cycling rates please contact our Technical Support. Phone +49 7150 9209-0 or techsupport@helukabel.de. A cycle is a double lift: a representative sample has been tested and measured in our Test Workshop. The cycle count is only valid when appropriate and professionally installed (see the installation advice; rules for connections, page 36, and under permitted environment conditions).

Selection table cables in drag chains

Other Technical Details can be found in the Product Pages of our Catalogue.

Environment friendly cables, screened and unscreened

Type	Application				Cable Structure			Technical Data				Resistance				Standards								
	Movement Distance		Min. Bending Radius	Speed	Acceleration	Cycle	Core Insulation	Outer Sheath	Nominal Voltage	Temperature Range in C°				halogen-free	extensively oil resistant	oil resistant	Jacket flame retardant	microbes	Ive	coolant	radiation resistant 80/100 Mrad	uv-rays	VDE-Registrier-No.	adapted to V DE 0245/0281/0282
max.	min.	D=Outer diameter	max.	max.	min.	PVC special				TPE special	PUR special	Cu-braid, Cu-layer	PVC special											
BIOFLEX® 500 JZ-HF	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
BIOFLEX® 500 JZ-HF-C	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
KOMPOSPEED® 600	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
KOMPOSPEED® 600-C	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
KOMPOSPEED® JZ-HF-500	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
KOMPOSPEED® JZ-HF-C-500	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Ship Cables

SHIFFLEX 512	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SHIFFLEX 330	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SHIFFLEX 340	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SHIFFLEX 109	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SHIFFLEX 109	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SHIFFLEX 113	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SHIFFLEX 121	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

The table indicates the main application.

In case of moving cables at higher speeds, over longer distances or higher cycling rates please contact our Technical Support.

Phone +49 7150 9209-0 or techsupport@helukabel.de.

A cycle is a double lift: a representative sample has been tested and measured in our Test Workshop.

The cycle count is only valid when appropriate and professionally installed (see the installation advice: rules for connections, page 36, and under permitted environment conditions).

Selection Table for Energy Drag Chains

	Drag chains Type from					
	IGUS®	Kabel- schlepp®	EKD Celenkronn®	Murrplastik®	BS Brevetti Stendaito®	Flexatec
HELUKABEL® for drag chains						
All cables and chains in fields of the same colour can be used in combination.						
Control and connecting cables JZ+HF+CY PURÖ-JZ-HF+YCP MULTIFLEX 512®-PUR+C-PUR MULTISPEED 500+C (alle Typen) JZ-602 RC+CY	Zipper Easy-Chain® E 2 micro E 2 mini E 2 medium E 2 R 100	Mono Uniflex KC KE MC ME/AMK	PFR PKK PLE Kolibri	MP®-Serie	Serie SR Light Medium Heavy Sliding Protection <u>Serie Steel</u>	P/PL/PLT PC PCT PCA S 5 S 7 / SUT 7
Data cables SUPERTRONIC-PURÖ+C-PURÖ SUPER-PAAR-TRONIC-C-PUR SUPERTRONIC-PVC+C-PVC TOPGEBER 500+502+503+510 Tachofeedback-cable -C-PUR Incremental feedback cable -C-PUR	E 2 R E 4 / 0 E 4 / 4 E 4 / 100 E 6	XLC Profile® Quantum				S 10 / SUT 10 S 12 / SUT 12 S 17
Servo and Motor cables TOPSERV® 100 bis 124 TOPFLEX® 116 TOPFLEX® 611-PUR+611-C-PUR						
ECO Cable KOMPOSPEED® JZ HF500+C KOMPOSPEED® 600+C BIOFLEX 500® JZ H+C						
Robotic cables MULTISPEED 500 ROBOFLEX 2001 / 2001 C (for movement in 3 dimensions)	Easy Triflex® Twister Chain®	Robotrax®	Interflex® K	MP® Rotary movement on request	Robot Serie	Available on request
Clean room cables JZ-HF-CY MULTIFLEX 512®-C-PUR MULTISPEED 500-C-TPE	E-Band E 6	Quantum	Reintec	MP® 44	SR 305 A	PL35-34 PL35-44 PL35-64 PL35-79 PL 35-109
Certified for Clean Room use	IPA Certificate	IPA Certificate	IPA Certificate	IPA Certificate	IPA Certificate	IPA Certificate

For installation of the chain please observe the manufacturers advice.

The mentioned types, brands and certifications represent our state of knowledge. Changes are possible.

Installation manual

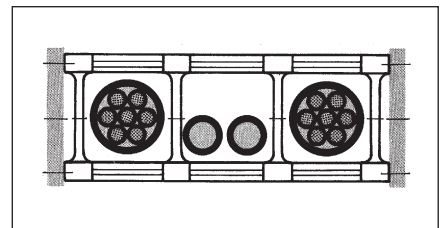
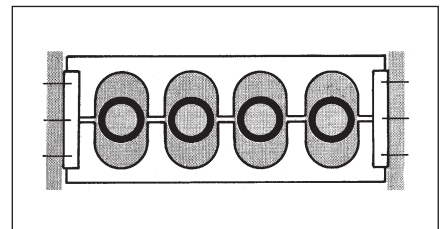
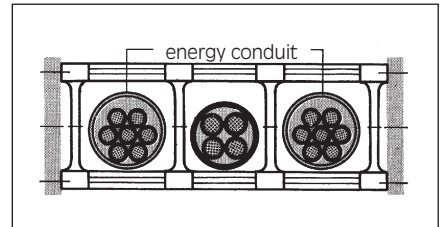
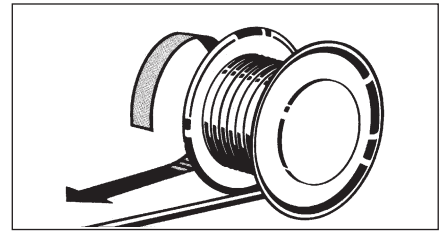
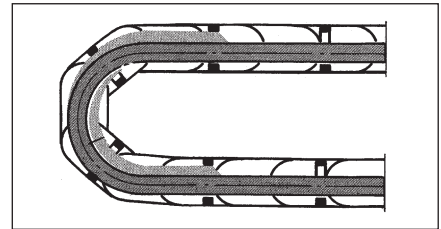
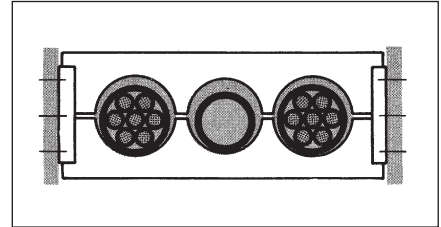
Cable installation in drag chains

The control cables in drag chains undertake an important task for the controlling and power technique, must be good synchronized with each other in the power chain systems. Further the installation of the cables and protection tubes in the power drag chains must be conducted with great care. An efficient usage upon accurate and exact cable installation. The following basic points should be noticed:

1. Where flat and round cables are mixed in one drag tray, then these should be installed loosely next to one another. The guide stays should be installed between the cables laid side by side. Try and avoid placing different sizes of round cables next to one another. Due to the limited space relationship cables arranged one above the other, frame stays are to be installed.
2. The cables must be installed with guide stays, dividers or in separate hole stays so as to move freely in the drag tray guides. As free space for the cables in the guide stay should be at least 10% of the cable \varnothing .
3. Always ensure that the cable can follow the drag trays motions without appearing to be forced.
4. If the cables are to be installed in the drag tray in layers then it is important to check upon installation that the cables are laid in such a way that they do not block each other when the drag tray alters direction.
5. Cables should always be installed in nonkinking and nontwisting flat position into the drag trays. The cables must be reeled down tangential from the reels or drums; the cables should not be lifted up in twisted or looping form over head. Before the installation, the cables must be laid in straight and non-twisted form on plane surface. The cables must have an additional length of at least 10% of the whole length so that these can be laid freely without twisting in drag chains.
6. In case that is not possible to lay the cables as described under 5, in order to lay several multi core high flexible cables with an outer diameter < 10 mm, we recommend the use of a guiding tube, in which these cables should loosely laied. This tube is than integrated into the drag system.
The cross section of this tube has to be much larger as the sum of the cross sections of the cables. For the free movement of the flexible energy conduits, the guide or divider stays must be installed.
7. In case that pressure- or hydraulic tubes are integrated in a power drag system, those should be able to expand and to shrink under alternating charges without interrupting the functionality of the drag system.
8. In order to maintain a balanced running of the drag chain it is necessary to ensure that the weight of the cables inside is divided up evenly, with the heavier cables installed on the edges and the lighter types in the middle.
All cables must be securely fixed at one end of the drag chain. Thus assuring that the cores are securely fastened to one side with the other, open, side allow-ing enough slack to take up the drag chain's motion.

Generally it is recommended, if possible, not to use cables with a multi layer construction, e.g. >25 cores, but to split the necessary number of conductors over several cables.

**If you have any further questions
please call our special cable department.**



Questionnaire for Energy Drag Chain Systems

HELUKABEL® GmbH

Dieselstraße 8 – 12, 71282 Hemmingen/Germany

Phone +49 7150 9209-0, Fax +49 7150 81786

www.helukabel.de, info@helukabel.de

Customer _____
 Installation site _____
 Kind of machine _____
 In operation since _____
 date _____

Sender _____
 Contact _____
 Phone _____ Fax _____

1. Drag Chain-Parameter

- Chain length/chain width m/mm _____
- Chain pitch mm _____
- Bending radius mm _____
- Guide stays existing yes no
- Frame stays existing yes no
- Layout/Installation horizontal vertical

3. Cable-Parameter

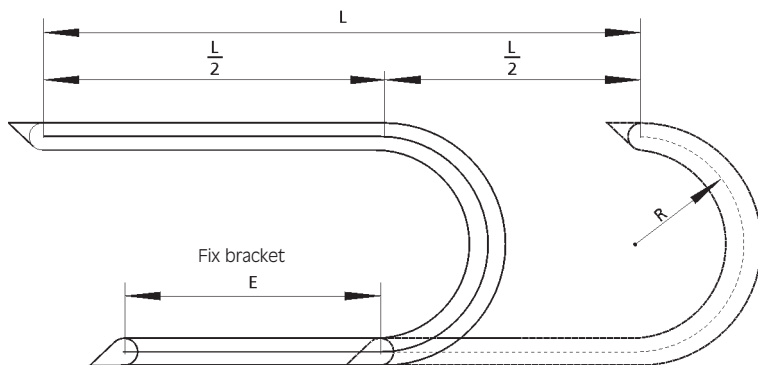
- Cable length (total) m _____
- Cable length (mobile) m _____
- Number of cables n _____
- Cable clamping without strain yes no
- Number of cores per cable n _____
- Cable screened yes no
- Cable halogen-free yes no

2. Installation and Movement-Parameter

- Movement distance (max.) m _____
- Speeds m/s _____
- Acceleration m/s² _____
- Frequency per time unit x/h _____
- Average movement distance/cycle m _____
- Daily working duration h _____
- Feeding at mid of moving distance yes no
- Additional weight/chain kg _____

4. Environmental-Parameter

- Operating temperature °C _____
- Kind of chemical influences _____
- Other environmental influences _____



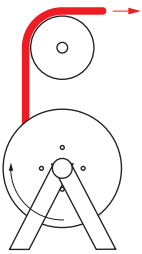
L = Movement distance
 R = Radius
 E = Distance between cable entrance and mid of moving distance

5. Cross-section and size of power cables

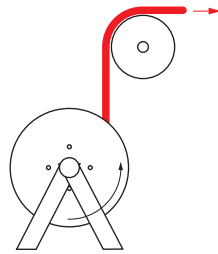
No.	Part-No.	Cable type	No. cores/cross-sec.	Notes
1.				
2.				
3.				

Assembly instructions/laying reel cables NSHTÖU / (N)SHTÖU

Correct



Incorrect



1. The cables are to be pulled from the reeling drum without twisting, using a drawing cable and cable grip. Deflecting or pulling the cable over edges should be avoided.

In the case of rings, the cable should be unwound tangential.

Correct



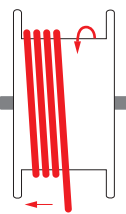
Incorrect



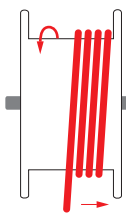
2. The cables must always be attached to the equipment drum without torsion.

Select the largest possible distance between the reeling drum and operating drum.

Correct

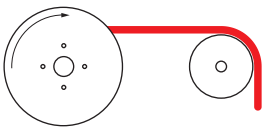


Incorrect

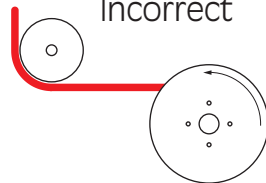


4. The cables are to be rolled onto the operating drums so that the cable moves to the left when started.

Correct

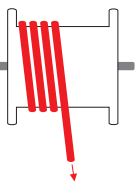


Incorrect



5. The S-shaped deflection of cables is to be avoided.

Correct



6. 2-3 windings on the operating drum must remain when the cable is extended.

Correct



7. In order to avoid crushing when fixing the cable to the end, a cable grip is to be used.

Record form for reel cables

HELUKABEL® GmbH

Dieselstraße 8 – 12, 71282 Hemmingen/Germany
 Phone +49 7150 9209-0, Fax +49 7150 81786
 www.helukabel.de, info@helukabel.de

Customer _____

Installation site _____

Type of machine _____

In operation since _____

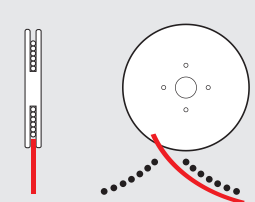
Date _____

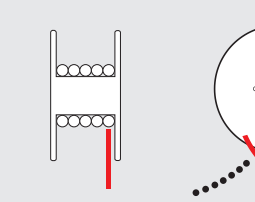
Sender _____

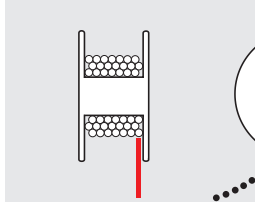
Contact _____

Phone _____ Fax _____

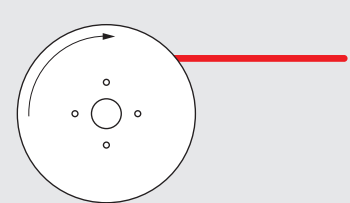
1. Drum configuration

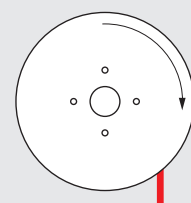
1.1. Monospiral


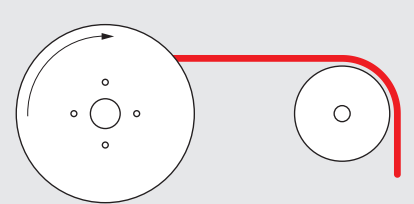
1.2. Single layer


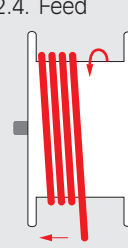
1.3. Multi layer


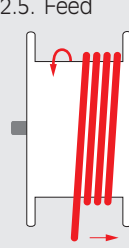
2. Arrangement of cables

2.1. Horizontal


2.2. Vertical


2.3. With deflection


2.4. Feed


2.5. Feed


2.6. Different feed (please enclose sketch or photo)

3. Track end cable fixing

3.1. Cable grip

3.2. Clamp

3.3. Other _____

4. Motion parameters

4.1. Travel (m) _____

4.2. Travel speed (m/s) _____

4.3. Travel acceleration (m/s²) _____

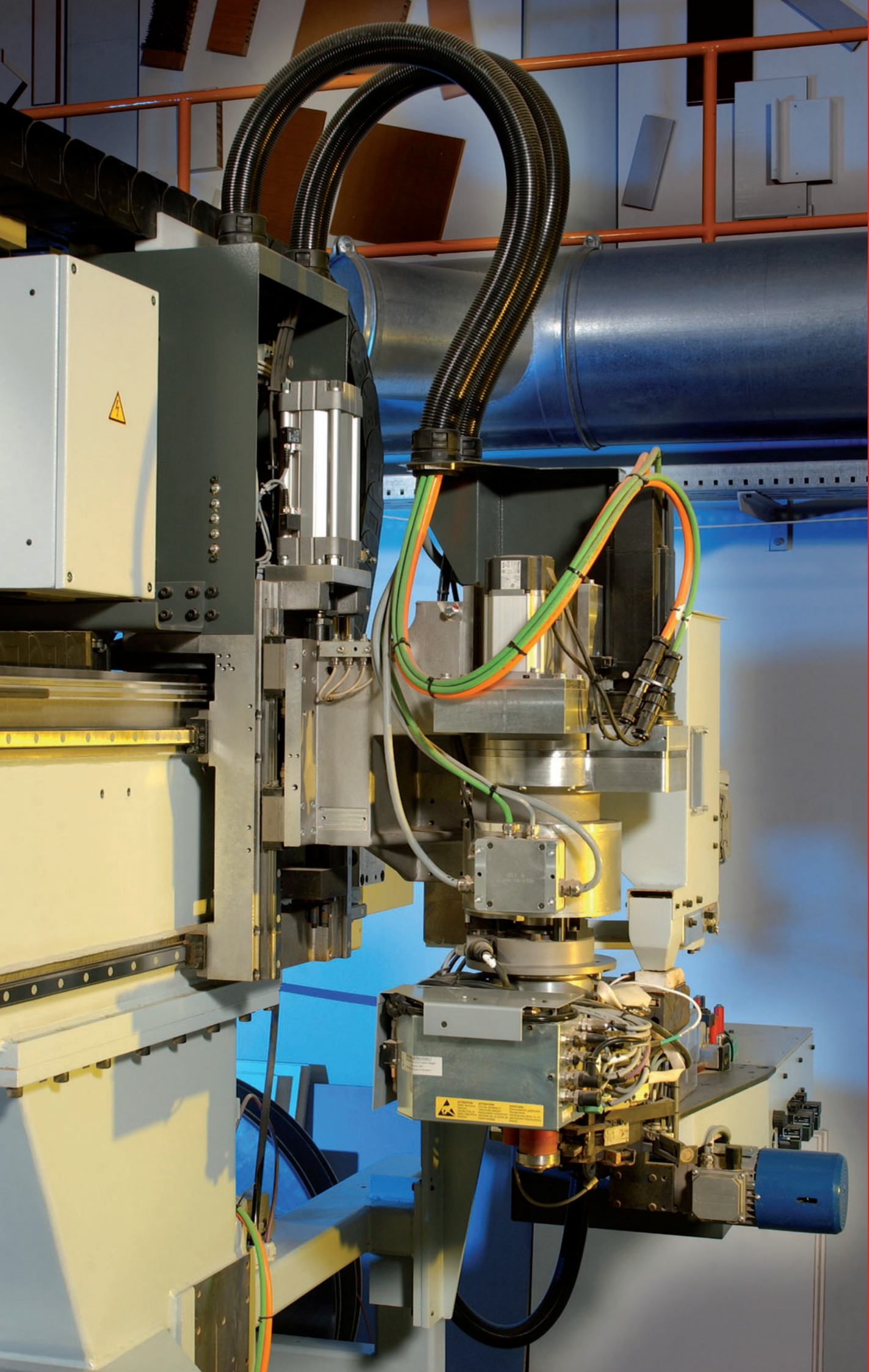
4.4. Number of cycles/time unit _____

Selection table low voltage joints

Cable	joints																										
	NSVM-S 3X1,5-10	NSVM-S 4X1,5-10	NSVM-S 5X1,5-6	NSVM-S 3X6-25	NSVM-S 4X6-25	NSVM-S 5X6-16	NSVM-S 1X16-35	NSVM-S 3X16-50	NSVM-S 4X16-50	NSVM-S 5X16-35	NSVM-S 1X35-95	NSVM-S 3X35-150	NSVM-S 4X35-150	NSVM-S 5X70-150	NSVM-S 1X95-100	NSVM-S 1X95-300	NSVM-S 3X95-300	NSVM-S 4X95-300	NSVM-S 4X16/16-4X35/16	NSVM-S 4X50/25-4X95/50	NSVM-S 4X95/50-4X240/120	NSVM-SVK 7X1,5-2,5	NSVM-SVK 14X1,5-2,5	NSVM-SVK 21X1,5-2,5	NSVM-SVK 40X1,5-2,5	NSVM-SVK 75X1,5-2,5	
NYJ-J 1X16RE							●																				
NYJ-J 1X25RM							●																				
NYJ-J 1X35RM							●																				
NYJ-J 1X50RM											●																
NYJ-J 1X70RM											●																
NYJ-J 1X95RM											●																
NYJ-J 1X120RM																	●										
NYJ-J 1X150RM																	●										
NYJ-J 1X185RM																	●										
NYJ-J 1X240RM																	●										
NYJ-J 1X300RM																	●										
NYJ-J 3X1,5RE	●																										
NYJ-J 3X2,5RE	●																										
NYJ-J 3X4RE	●																										
NYJ-J 3X6RE	●																										
NYJ-J 3X10RE	●																										
NYJ-J 3X16RE				●																							
NYJ-J 3X25RM				●																							
NYJ-J 3X50SM												●															
NYJ-J 3X70SM												●															
NYJ-J 3X95SM												●															
NYJ-J 3X120SM												●															
NYJ-J 3X25RM/16RE								●																			
NYJ-J 3X35SM/16RE								●																			
NYJ-J 3X50SM/25RM								●																			
NYJ-J 3X70/35SM													●														
NYJ-J 3X95/50SM													●														
NYJ-J 3X120/70SM													●														
NYJ-J 3X150/70SM													●														
NYJ-J 3X185/95SM																		●									
NYJ-J 3X240/120SM																		●									
NYJ-J 4X1,5RE	●																										
NYJ-J 4X2,5RE	●																										
NYJ-J 4X4RE	●																										
NYJ-J 4X6RE	●																										
NYJ-J 4X10RE	●																										
NYJ-J 4X16RE					●																						
NYJ-J 4X25RM					●																						
NYJ-J 4X35SM								●																			
NYJ-J 4X50SM								●																			
NYJ-J 4X70SM													●														
NYJ-J 4X95SM													●														
NYJ-J 4X120SM													●														
NYJ-J 4X150SM													●														
NYJ-J 4X185SM																		●									
NYJ-J 4X240SM																		●									
NYJ-J 5X1,5RE			●																								
NYJ-J 5X2,5RE			●																								
NYJ-J 5X4RE			●																								
NYJ-J 5X6RE			●																								
NYJ-J 5X10RE						●																					
NYJ-J 5X16RE						●																					
NYJ-J 5X25RM									●																		
NYJ-J 7X1,5RE																						●					
NYJ-J 10X1,5RE																							●				
NYJ-J 12X1,5RE																							●				
NYJ-J 14X1,5RE																							●				
NYJ-J 16X1,5RE																								●			
NYJ-J 19X1,5RE																								●			
NYJ-J 21X1,5RE																								●			
NYJ-J 24X1,5RE																									●		

Selection table low voltage joints

Cable	joints																										
	NSVM-S 3X1,5-10	NSVM-S 4X1,5-10	NSVM-S 5X1,5-6	NSVM-S 3X6-25	NSVM-S 4X6-25	NSVM-S 5X6-16	NSVM-S 1X16-35	NSVM-S 3X16-50	NSVM-S 4X16-50	NSVM-S 5X16-35	NSVM-S 1X35-95	NSVM-S 3X35-150	NSVM-S 4X35-150	NSVM-S 5X70-150	NSVM-S 1X95-100	NSVM-S 1X95-300	NSVM-S 3X95-300	NSVM-S 4X95-300	NSVM-S 4X16/16-4X35/16	NSVM-S 4X50/25-4X95/50	NSVM-S 4X95/50-4X240/120	NSVM-SVK 7X1,5-2,5	NSVM-SVK 14X1,5-2,5	NSVM-SVK 21X1,5-2,5	NSVM-SVK 40X1,5-2,5	NSVM-SVK 75X1,5-2,5	
NYCY 0,6/1KV 3X16RE								●																			
NYCY 0,6/1KV 4X1,5RE	●																										
NYCY 0,6/1KV 4X2,5RE	●																										
NYCY 0,6/1KV 4X4RE	●																										
NYCY 0,6/1KV 4X6RE	●																										
NYCY 0,6/1KV 4X10RE	●																										
NYCY 0,6/1KV 4X16RE																				●							
NYCY 0,6/1KV 5X1,5RE			●																								
NYCY 0,6/1KV 5X2,5RE			●																								
NYCY 0,6/1KV 5X4RE			●																								
NYCY 0,6/1KV 5X6RE			●																								
NYCY 0,6/1KV 5X10/RE						●																					
NYCY 3X300/150SM																			●								
NYCWY 0,6/1KV 3X10	●																										
NYCWY 0,6/1KV 3X16								●																			
NYCWY 0,6/1KV 3X25RM								●																			
NYCWY 0,6/1KV 3X35SM								●																			
NYCWY 0,6/1KV 3X50SM								●																			
NYCWY 0,6/1KV 3X70SM													●														
NYCWY 0,6/1KV 3X95SM													●														
NYCWY 0,6/1KV 3X120S													●														
NYCWY 0,6/1KV 3X150S													●														
NYCWY 0,6/1KV 3X185S																		●									
NYCWY 0,6/1KV 3X240S																		●									
NYCWY 0,6/1KV 3X25R								●																			
NYCWY 0,6/1KV 3X35SM								●																			
NYCWY 0,6/1KV 3X50SM								●																			
NYCWY 0,6/1KV 3X70SM													●														
NYCWY 0,6/1KV 3X95 S													●														
NYCWY 0,6/1KV 3X120													●														
NYCWY 0,6/1KV 3X150													●														
NYCWY 0,6/1KV 3X185																		●									
NYCWY 0,6/1KV 4X10RE					●																						
NYCWY 0,6/1KV 4X16RE																				●							
NYCWY 0,6/1KV 4X25RM																				●							
NYCWY 0,6/1KV 4X35SM																				●							
NYCWY 0,6/1KV 4X50SM																					●						
NYCWY 0,6/1KV 4X70SM																					●						
NYCWY 0,6/1KV 4X95SM																					●						
NYCWY 0,6/1KV 4X120S																						●					
NYCWY 0,6/1KV 4X150S																						●					
NYCWY 0,6/1KV 4X185S																						●					
NYCWY 0,6/1KV 4X240S																						●					
NYCY 3X150SM												●															
NYCY 3X185SM																				●							
NYCY 3X240SM																				●							
NYCY 3X150SM												●															
NYCY 3X185SM																				●							
NYCY 3X240SM																				●							
NYCWY 0,6/1KV 3X240																			●								
NYCY 5 X 35 QMM											●																
NAYY-J 4 X 16 QMM											●																
NAYY-J 4 X 25 QMM											●																
NAYY-J 4 X 35 QMM											●																
NAYY-J 4 X 50 QMM											●																
NAYY-J 4 X 70 QMM													●														
NAYY-J 4 X 95 QMM													●														
NAYY-J 4 X 120 QMM													●														
NAYY-J 4 X 150 QMM													●														
NAYY-J 4 X 185 QMM																			●								
NAYY-J 4 X 240 QMM																			●								



Industrial Cables and Wires

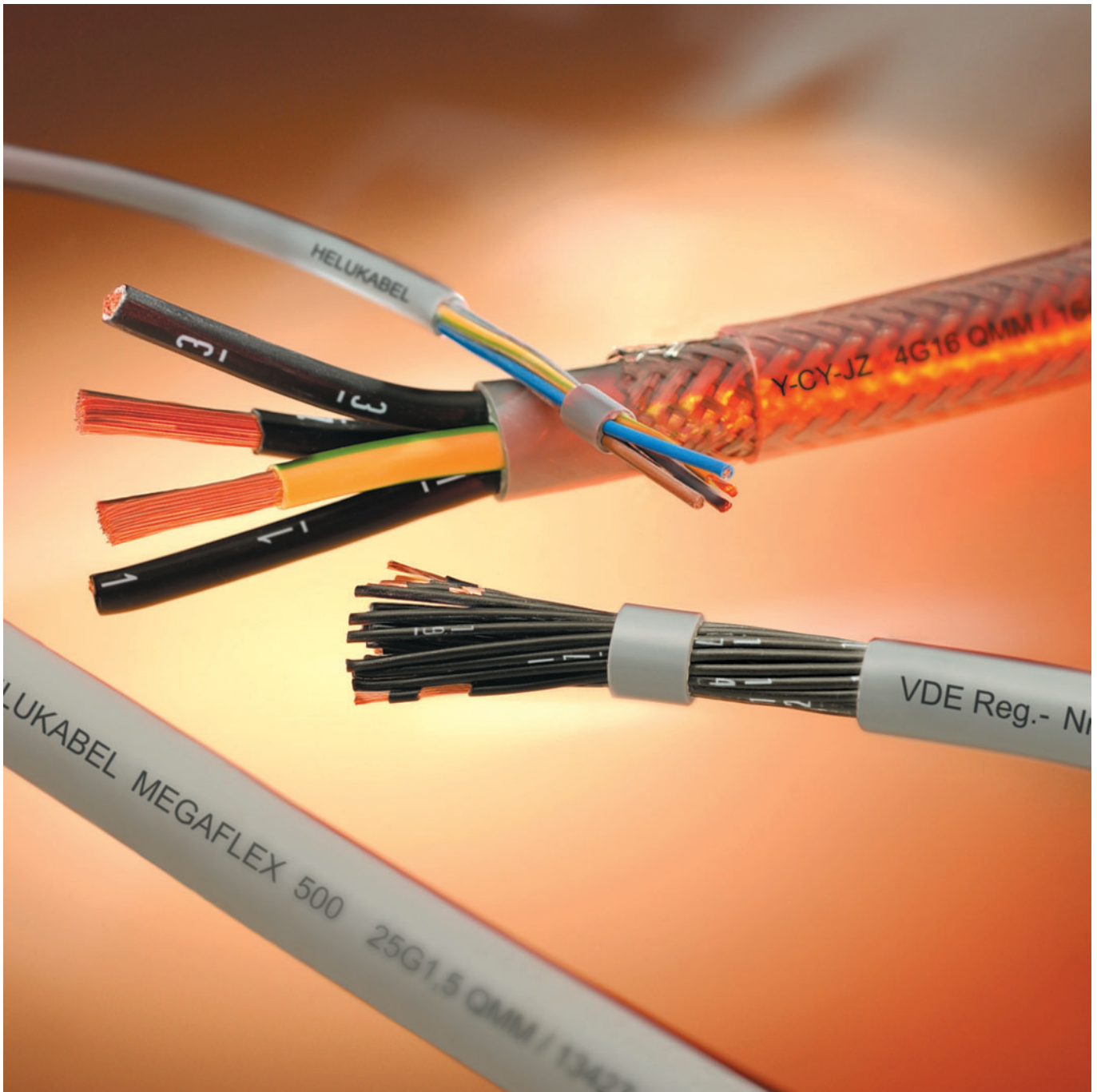


Photo: HELUKABEL®

Flexible Control Cables

Flexible Control Cables

For generations people have tried to build machines and plants which take on different functions. To raise, sink, slide, drill, transport and much more, and have attained fantastic results.

Today we control, inform, weld, pack and transport automatically by electric control and data cables.

These cables are necessary to ensure a frictionless flow of data and material. We are able to offer most of these cables for many applications. On the following pages we present cables for the corresponding applications.

If you cant find a suitable cable in our catalogue, we can fabricate this special cable on request already from **100 m** or maybe we can offer you a similar cable from our stock.
















HELUKABEL® has one of the biggest stocks of special and standard cables in Germany and excellent logistics and wants to prove itself every day.

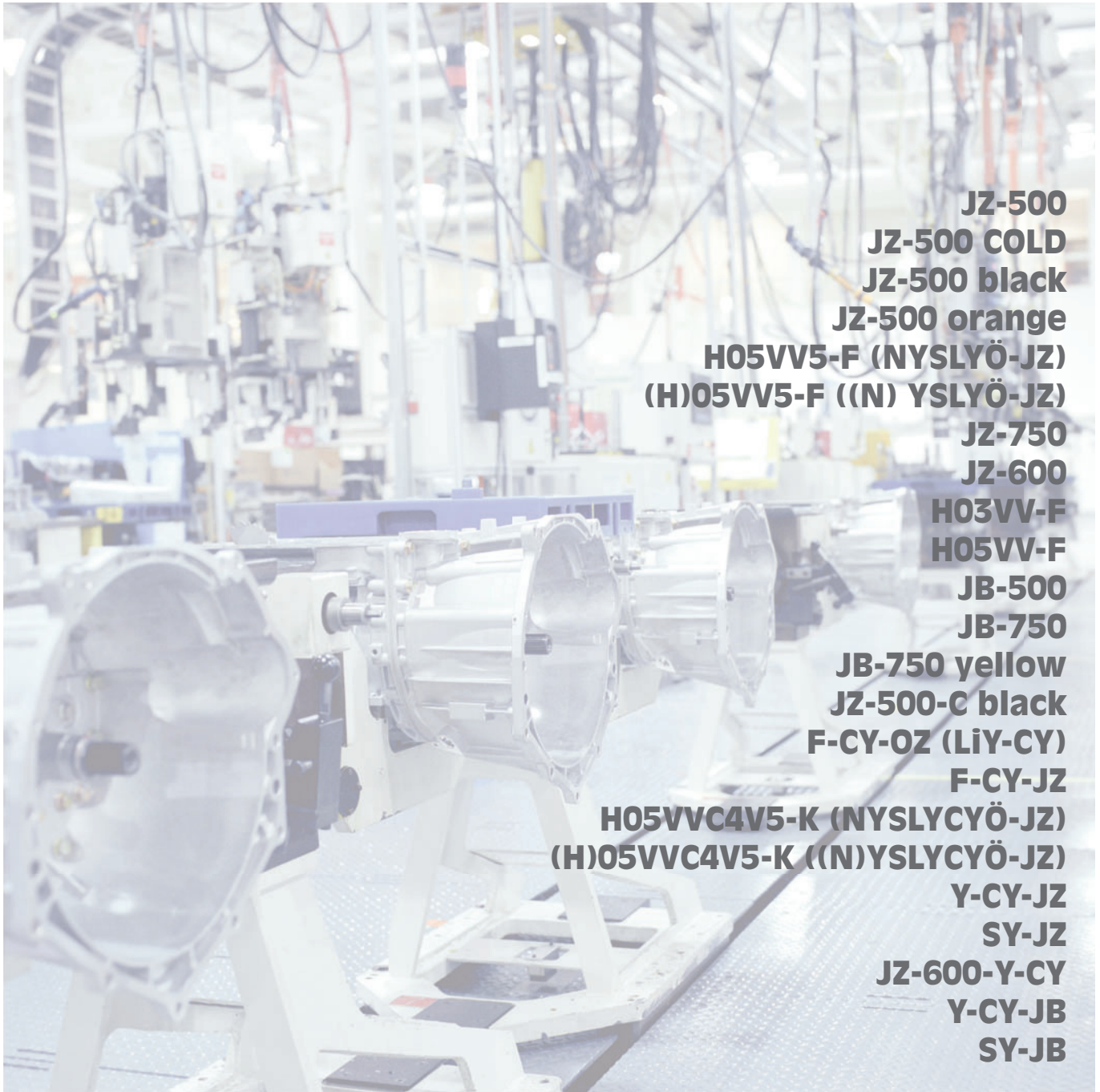
Stocks in:
Hemmingen/Stuttgart, Neuenhagen/Berlin,
Pleißä/Chemnitz, Windsbach/Nuremberg.

Contents

Description	Page
PVC Control Cables	
JZ-500, flexible, number coded, meter marking	A 6
JZ-500 COLD, flexible at low temperature, number coded, meter marking	A 8
JZ-500 black, flexible, meter marking	A 9
JZ-500 orange, flexible, orange cores, control cable for interlocking purposes, meter marking	A 10
H05VV5-F (NYSLYÖ-JZ), flexible, number coded, oil resistant, meter marking	A 11
(H)05VV5-F ((N)YSLYÖ-JZ), flexible, number coded, oil resistant, meter marking	A 13
JZ-750, flexible, number coded, 750V, meter marking	A 14
JZ-600, flexible, number coded, 0,6/1kV, meter marking	A 16
H03VV-F, according to DIN VDE 0281	A 18
H05VV-F, according to DIN VDE 0281	A 19
H05VV-F, according to DIN VDE 0281	A 20
JB-500, flexible, colour coded, meter marking	A 21
JB-750, flexible, colour coded, 750V, meter marking	A 22
JB-750 yellow, flexible, colour coded, 750V, connection cable for warning indication, meter marking	A 23
JZ-500-C black, EMC-preferred type, Cu-screened, flexible, meter marking	A 24
F-CY-OZ (LiY-CY), flexible, Cu-screened, EMC-preferred type, meter marking	A 25
F-CY-JZ, flexible, Cu-screened, EMC-preferred type, meter marking	A 27
H05VVC4V5-K (NYSLYCYÖ-JZ), flexible, number coded, oil resistant, EMC-preferred type	A 29
(H)05VVC4V5-K ((N)YSLYCYÖ-JZ), number coded, screened, oil resistant, EMC-preferred type	A 31
Y-CY-JZ, flexible, CU-screened, transparent, EMC-preferred type, meter marking	A 32
SY-JZ, flexible, number coded, with steel wire braiding, meter marking	A 34
JZ-600-Y-CY, flexible, number coded, 0,6/1kV, Cu screened meter marking, EMC-preferred type	A 36
Y-CY-JB, flexible, CU-screened, transparent, EMC-preferred type, meter marking	A 38
SY-JB, flexible, colour coded, with steel wire braiding, meter marking	A 40
PUR Control Cables	
JZ-500 PUR, tear and coolant resistant, meter marking	A 43
PURÖ-JZ, tear and coolant resistant, increased oil resistant, meter marking	A 44
PUR-ORANGE, high abrasion, coolant resistant, meter marking	A 46
PUR-YELLOW, PVC-inner jacket, high abrasion, coolant resistant, meter marking	A 47
H05 BQ-F / H07 BQ-F (NGMH11YÖ)	A 48
UNIPUR®, flexible at low temperature, with customer markings, halogen-free, wear resistant, robust, meter marking	A 49
PUR-750, halogen-free, meter marking	A 51
JZ 500-FC-PUR, EMC-preferred type, tear and coolant resistant, screened, without inner sheath, meter marking	A 52
F-C-PURÖ-JZ, tear and coolant resistant, Cu-screened, without inner sheath, increased oil resistant, EMC-preferred type, meter marking	A 54
YÖ-C-PURÖ-JZ, tear and coolant resistant, Cu-screened, with inner sheath, increased oil resistant, EMC-preferred type, meter marking	A 56
UNIPUR-CP, flexible at low temperature, with customer markings, halogen-free, wear resistant, robust, screened, EMC-preferred type, meter marking	A 58
PUR-C-PUR, Cu-screened, extrem conditions, halogen-free, EMC-preferred type, meter marking	A 60

Contents

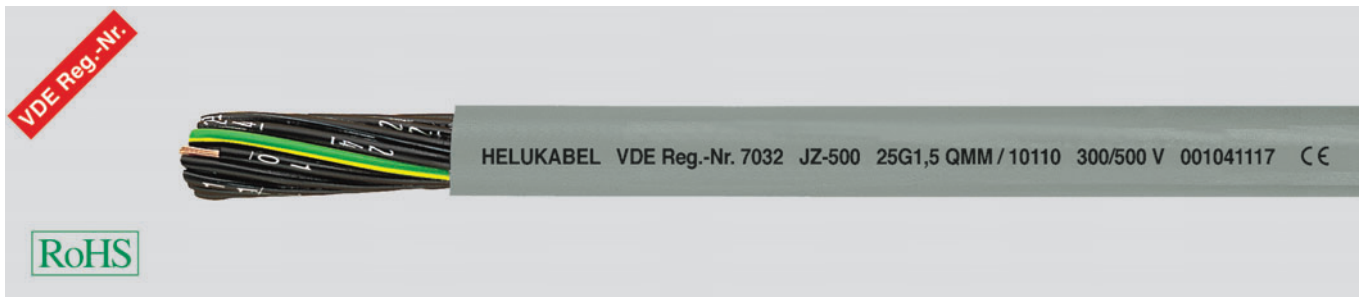
Description	Page
Halogen-free Control Cables	
JZ-500 HMH, flexible control cable, halogen-free, extremely fire resistant, oil resistant ¹⁾ , meter marking 	A 62
MEGAFLEX® 500, halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking 	A 64
JZ-600 HMH, flexible control cable, halogen-free, extremely fire resistant, oil resistant ¹⁾ , 0,6/1kV, meter marking 	A 66
JB-750 HMH, flexible control cable, coloured core, halogen-free, extremely fire resistant, oil resistant ¹⁾ , meter marking 	A 68
(H)03 Z1Z1-F, halogen-free, meter marking	A 69
(H)05 Z1Z1-F, halogen-free, meter marking	A 70
JZ-500 HMH-C, flexible control cable, halogen-free, extremely fire resistant, oil resistant ¹⁾ , Cu-screened, EMC-preferred type 	A 71
MEGAFLEX® 500-C, halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, screened, EMC-preferred types, meter marking 	A 73
JZ-600 HMH-C, flexible control cable, halogen-free, extremely fire resistant, oil resistant ¹⁾ , 0,6/1kV, screened, EMC-preferred type, meter marking 	A 75
JB-750 HMH-C, flexible control cable, coloured core, halogen-free, screened, extremely fire resistant, oil resistant ¹⁾ , EMC-preferred type, meter marking . 	A 77
PVC Control Cables for Intrinsically Safe Circuits	
OZ-BL, outer jacket blue, intrinsic safety, flexible, meter marking 	A 80
OZ-BL-CY, outer jacket blue, intrinsic safety, flexible, meter marking 	A 81
OB-BL-PAAR-CY, outer jacket blue, intrinsic safety, EMC-preferred type, meter marking 	A 82
Bio-Oil and microbial resistant Cables	
BIOFLEX-500®-JZ, Bio-fuel resistant, abrasion resistant, recyclable environment friendly, bio-oil resistant ¹⁾ , meter marking 	A 84
BIOFLEX-500®-JZ-C, Bio-fuel resistant, abrasion resistant, recyclable environment friendly, bio-oil resistant ¹⁾ , Cu-screened, EMC-preferred type, meter marking . 	A 85
KOMPOFLEX® JZ-500, halogen-free, microbes resistant, low adhesion, meter marking 	A 87
KOMPOFLEX® JZ-500-C, halogen-free, microbes resistant, Cu-screened, EMC-preferred type, meter marking 	A 88
NANOFLEX® HC*500, cut-resistant, meter marking	A 91
NANOFLEX® HC*500-C, EMC preferred type, cut-resistant, screened, no inner sheath, meter marking	A 92
NANOFLEX® HC*TRONIC, flexible, colour code to DIN 47100, meter marking	A 93
NANOFLEX HC*TRONIC-C, EMC preferred type, flexible, colour code to DIN 47100, screened, meter marking	A 95



JZ-500
JZ-500 COLD
JZ-500 black
JZ-500 orange
H05VV5-F (NYSLYÖ-JZ)
(H)05VV5-F ((N) YSLYÖ-JZ)
JZ-750
JZ-600
H03VV-F
H05VV-F
JB-500
JB-750
JB-750 yellow
JZ-500-C black
F-CY-OZ (LiY-CY)
F-CY-JZ
H05VVC4V5-K (NYSLYCYÖ-JZ)
(H)05VVC4V5-K ((N)YSLYCYÖ-JZ)
Y-CY-JZ
SY-JZ
JZ-600-Y-CY
Y-CY-JB
SY-JB

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PVC Control Cables



Technical data

- Control cables, special PVC
- Conforms to DIN VDE 0281, 0293, 0295
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 part 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with continuous white numbering according to DIN VDE 0293 (also available with other core colours)
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Outer sheath of special PVC, TM2 to DIN VDE 0281 part 1 and HD 21.1
- colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- Important for assemblers: We supply any "desired length" of stranded cores without outer sheath, core insulation colour acc. RAL 9005 with number combination acc. customers requirement.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please note the cleanroom qualification when ordering.
- **screened analogue type:**
F-CY-JZ, see page A 27
F-CY-OZ (LiY-CY), see page A 25
Y-CY-JB, see page A 38
Y-CY-JZ, see page A 32

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, as measuring and control cables in tool machines, conveyor belts, production lines in machinery production, in air-conditioning and in steel production.

The earth core is laid in the outer layer. Selected PVC-compounds guarantee a good flexibility as well as an economic and fast installation.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10001	2 x 0,5	4,9	9,6	40,0	20
10002	3 G 0,5	5,2	14,4	46,0	20
10003	3 x 0,5	5,2	14,4	46,0	20
10004	4 G 0,5	5,6	19,0	56,0	20
10005	4 x 0,5	5,6	19,0	56,0	20
10006	5 G 0,5	6,3	24,0	65,0	20
10007	5 x 0,5	6,3	24,0	65,0	20
10008	6 G 0,5	6,9	29,0	75,0	20
10009	7 G 0,5	6,9	33,6	80,0	20
10010	7 x 0,5	6,9	33,6	80,0	20
10011	8 G 0,5	7,4	38,0	97,0	20
10012	8 x 0,5	7,4	38,0	97,0	20
10013	10 G 0,5	8,3	48,0	116,0	20
10014	12 G 0,5	8,8	58,0	135,0	20
10015	12 x 0,5	8,8	58,0	135,0	20
10016	14 G 0,5	9,7	67,0	150,0	20
10183	16 G 0,5	10,2	76,0	175,0	20
10017	18 G 0,5	11,0	86,0	196,0	20
10018	20 G 0,5	11,5	96,0	215,0	20
10019	21 G 0,5	11,5	101,0	240,0	20
10020	25 G 0,5	12,9	120,0	270,0	20
10021	30 G 0,5	13,8	144,0	310,0	20
10022	32 G 0,5	14,3	154,0	323,0	20
10023	34 G 0,5	14,9	163,0	362,0	20
10024	40 G 0,5	15,6	192,0	434,0	20
10025	42 G 0,5	16,1	202,0	449,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10025	50 G 0,5	17,9	240,0	513,0	20
10169	52 G 0,5	17,9	252,0	534,0	20
10026	61 G 0,5	19,0	293,0	625,0	20
10027	65 G 0,5	19,7	312,0	682,0	20
10028	80 G 0,5	21,8	384,0	780,0	20
10029	100 G 0,5	24,3	480,0	980,0	20
10030	2 x 0,75	5,3	14,4	46,0	18
10031	3 G 0,75	5,6	21,6	54,0	18
10032	3 x 0,75	5,6	21,6	54,0	18
10033	4 G 0,75	6,3	28,8	66,0	18
10034	4 x 0,75	6,3	29,0	66,0	18
10035	5 G 0,75	6,9	36,0	80,0	18
10036	5 x 0,75	6,9	36,0	80,0	18
10037	6 G 0,75	7,5	43,0	99,0	18
10177	6 x 0,75	7,5	43,0	99,0	18
10038	7 G 0,75	7,5	50,0	110,0	18
10039	7 x 0,75	7,5	50,0	110,0	18
10040	8 G 0,75	8,2	58,0	130,0	18
10173	8 x 0,75	8,2	58,0	130,0	18
10041	9 G 0,75	8,8	65,0	153,0	18
10042	10 G 0,75	9,2	72,0	162,0	18
10043	12 G 0,75	9,8	86,0	179,0	18
10044	12 x 0,75	9,8	86,0	179,0	18
10045	14 G 0,75	10,6	101,0	214,0	18
10046	15 G 0,75	11,4	108,0	218,0	18
10047	18 G 0,75	12,2	130,0	257,0	18

Continuation ▶

JZ-500 flexible, number coded, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10533	19 G 0,75	12,7	137,0	264,0	18
10048	20 G 0,75	12,7	144,0	286,0	18
10049	21 G 0,75	12,7	151,0	320,0	18
10050	25 G 0,75	14,3	180,0	365,0	18
10534	27 G 0,75	15,2	195,0	382,0	18
10051	32 G 0,75	15,9	230,0	455,0	18
10052	34 G 0,75	16,7	245,0	510,0	18
10182	37 G 0,75	17,2	266,0	537,0	18
10053	40 G 0,75	17,2	288,0	595,0	18
10054	41 G 0,75	18,0	296,0	607,0	18
10055	42 G 0,75	18,0	302,0	612,0	18
10056	50 G 0,75	19,8	360,0	735,0	18
10057	61 G 0,75	21,2	439,0	845,0	18
10178	65 G 0,75	21,7	468,0	895,0	18
10058	80 G 0,75	24,3	576,0	1070,0	18
10059	100 G 0,75	27,0	720,0	1322,0	18
10060	2 x 1	5,6	19,2	60,0	17
10061	3 G 1	5,9	29,0	72,0	17
10062	3 x 1	5,9	29,0	72,0	17
10063	4 G 1	6,6	38,4	86,0	17
10064	4 x 1	6,6	38,4	86,0	17
10065	5 G 1	7,3	48,0	104,0	17
10066	5 x 1	7,3	48,0	104,0	17
10067	6 G 1	8,1	58,0	125,0	17
10068	7 G 1	8,1	67,0	141,0	17
10069	7 x 1	8,1	67,0	141,0	17
10070	8 G 1	8,7	77,0	175,0	17
10071	9 G 1	9,8	86,0	200,0	17
10180	10 G 1	9,8	96,0	217,0	17
10170	10 x 1	9,8	96,0	217,0	17
10072	12 G 1	10,4	115,0	230,0	17
10073	12 x 1	10,4	115,0	230,0	17
10074	14 G 1	11,4	134,0	271,0	17
10075	16 G 1	12,3	154,0	300,0	17
10076	18 G 1	12,9	173,0	343,0	17
10174	18 x 1	12,9	173,0	343,0	17
10197	19 G 1	13,0	182,0	355,0	17
10077	20 G 1	13,7	192,0	375,0	17
10184	20 x 1	13,7	192,0	375,0	17
10179	21 G 1	13,7	205,0	420,0	17
10175	24 G 1	14,7	230,0	440,0	17
10078	25 G 1	15,4	240,0	485,0	17
10176	25 x 1	15,4	240,0	485,0	17
10196	26 G 1	15,6	252,0	500,0	17
10198	27 G 1	15,8	259,0	534,0	17
10168	30 x 1	16,4	308,0	550,0	17
10079	34 G 1	17,9	326,0	650,0	17
10080	36 G 1	17,9	346,0	668,0	17
10199	37 G 1	18,4	355,0	701,0	17
10081	40 G 1	18,5	384,0	755,0	17
10167	40 x 1	18,5	384,0	755,0	17
10082	41 G 1	19,4	394,0	770,0	17
10083	42 G 1	19,4	403,0	810,0	17
10084	50 G 1	21,2	480,0	936,0	17
10085	56 G 1	21,9	538,0	920,0	17
10086	61 G 1	22,5	586,0	1100,0	17
10087	65 G 1	23,5	628,0	1180,0	17
10088	80 G 1	26,0	768,0	1294,0	17
10089	100 G 1	29,2	960,0	1644,0	17
10090	2 x 1,5	6,4	29,0	70,0	16
10091	3 G 1,5	6,8	43,0	90,0	16
10092	3 x 1,5	6,8	43,0	90,0	16
10093	4 G 1,5	7,4	58,0	109,0	16
10094	4 x 1,5	7,4	58,0	109,0	16
10095	5 G 1,5	8,3	72,0	131,0	16
10096	5 x 1,5	8,3	72,0	131,0	16
10097	6 G 1,5	9,2	86,0	157,0	16
10098	7 G 1,5	9,2	101,0	184,0	16
10099	7 x 1,5	9,2	101,0	184,0	16
10100	8 G 1,5	9,9	115,0	216,0	16
10101	9 G 1,5	10,9	129,0	259,0	16
10181	10 G 1,5	10,9	144,0	275,0	16
10102	11 G 1,5	12,0	158,0	300,0	16
10103	12 G 1,5	12,0	173,0	309,0	16
10104	12 x 1,5	12,0	173,0	309,0	16
10105	14 G 1,5	13,0	202,0	345,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10106	16 G 1,5	13,9	230,0	386,0	16
10107	18 G 1,5	14,6	259,0	440,0	16
10185	19 G 1,5	15,2	279,0	445,0	16
10108	20 G 1,5	15,5	288,0	490,0	16
10109	21 G 1,5	15,5	302,0	555,0	16
10110	25 G 1,5	17,4	360,0	620,0	16
10535	27 G 1,5	19,0	389,0	670,0	16
10111	32 G 1,5	19,5	461,0	790,0	16
10112	34 G 1,5	20,2	490,0	850,0	16
10536	37 G 1,5	20,2	533,0	892,0	16
10113	41 G 1,5	21,8	591,0	996,0	16
10114	42 G 1,5	21,8	605,0	1007,0	16
10115	50 G 1,5	24,2	720,0	1250,0	16
10116	56 G 1,5	24,9	806,0	1352,0	16
10117	61 G 1,5	25,8	878,0	1440,0	16
10187	65 G 1,5	26,7	936,0	1602,0	16
10118	80 G 1,5	29,8	1152,0	1871,0	16
10119	100 G 1,5	33,2	1440,0	2353,0	16
10120	2 x 2,5	7,8	48,0	112,0	14
10121	3 G 2,5	8,3	72,0	148,0	14
10122	3 x 2,5	8,3	72,0	148,0	14
10123	4 G 2,5	9,2	96,0	178,0	14
10124	4 x 2,5	9,2	96,0	178,0	14
10125	5 G 2,5	10,1	120,0	221,0	14
10126	5 x 2,5	10,1	120,0	221,0	14
10127	7 G 2,5	11,2	168,0	306,0	14
10128	7 x 2,5	11,2	168,0	306,0	14
10129	8 G 2,5	12,3	192,0	363,0	14
10130	12 G 2,5	14,8	288,0	498,0	14
10131	14 G 2,5	16,0	336,0	569,0	14
10132	18 G 2,5	18,2	432,0	764,0	14
10133	21 G 2,5	19,1	504,0	914,0	14
10134	25 G 2,5	21,6	600,0	1044,0	14
10135	34 G 2,5	25,0	816,0	1470,0	14
10136	42 G 2,5	27,2	1008,0	1790,0	14
10137	50 G 2,5	30,0	1200,0	2095,0	14
10138	61 G 2,5	32,0	1464,0	2750,0	14
10139	100 G 2,5	41,4	2400,0	4450,0	14
10140	2 x 4	9,3	77,0	195,0	12
10141	3 G 4	9,8	115,0	250,0	12
10142	4 G 4	11,0	154,0	295,0	12
10143	5 G 4	12,3	192,0	361,0	12
10144	7 G 4	13,6	269,0	458,0	12
10145	8 G 4	14,6	307,0	590,0	12
10146	12 G 4	17,8	461,0	790,0	12
10147	3 G 6	11,9	173,0	355,0	10
10148	4 G 6	13,0	230,0	424,0	10
10149	5 G 6	14,5	288,0	525,0	10
10150	7 G 6	16,2	403,0	625,0	10
10151	3 G 10	14,8	288,0	540,0	8
10152	4 G 10	16,4	384,0	701,0	8
10153	5 G 10	18,3	480,0	858,0	8
10154	7 G 10	20,2	672,0	1106,0	8
10190	3 G 16	18,2	461,0	827,0	6
10155	4 G 16	20,0	614,0	1035,0	6
10156	5 G 16	22,6	768,0	1259,0	6
10157	7 G 16	24,8	1075,0	1780,0	6
10191	3 G 25	22,2	720,0	1186,0	4
10158	4 G 25	24,9	960,0	1582,0	4
10159	5 G 25	27,7	1200,0	1999,0	4
10160	7 G 25	30,6	1680,0	2825,0	4
10192	3 G 35	25,6	1008,0	1585,0	2
10161	4 G 35	28,4	1344,0	2105,0	2
10162	5 G 35	31,7	1680,0	2633,0	2
10193	3 G 50	30,9	1440,0	2550,0	1
10163	4 G 50	34,2	1920,0	2940,0	1
10188	5 G 50	38,3	2400,0	2936,0	1
10194	3 G 70	36,5	2016,0	3180,0	2/0
10164	4 G 70	40,3	2688,0	4090,0	2/0
10189	5 G 70	45,3	3360,0	5443,0	2/0
10195	3 G 95	41,1	2736,0	4680,0	3/0
10165	4 G 95	45,8	3648,0	5540,0	3/0
10533	5 G 95	52,7	4560,0	6931,0	3/0
10166	4 G 120	51,4	4608,0	7000,0	4/0
13139	4 G 150	58,5	5760,0	8340,0	300 kcmil
13140	4 G 185	61,1	7104,0	9904,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RA01)

JZ-500 COLD flexible at low temperature, number coded, meter marking

A



Technical data

- Control cables, special PVC
- Requirements adapted to DIN VDE 0281, 0293, 0295
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Y14
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Cold flexible outer sheath of special PVC
- colour black (RAL 9005)
- with meter marking

Properties

- Extensively oil resistant, öl-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).

Application

This cold-flexible PVC hose cable is used under average stress for flexible applications with free movement, without tensile load and without forced motion guide in dry, moist, wet rooms and outside, as measuring and control cable at machine tools, conveyor belts and transport belts, production streets, in plant construction, in air condition construction and in refrigerated warehouses.

Selected PVC mixtures guarantee good flexibility, efficient and fast installation.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10750	2 x 0,5	4,9	9,6	40,0	20
10751	3 G 0,75	5,6	21,6	54,0	18
10752	3 x 0,75	5,6	21,6	54,0	18
10753	4 G 0,75	6,3	28,8	66,0	18
10754	4 x 0,75	6,3	29,0	66,0	18
10755	5 G 0,75	6,9	36,0	80,0	18
10756	5 x 0,75	6,9	36,0	80,0	18
10757	7 G 0,75	7,5	50,0	110,0	18
10758	7 x 0,75	7,5	50,0	110,0	18
10759	12 G 0,75	9,8	86,0	179,0	18
10760	18 G 0,75	12,2	130,0	257,0	18
10761	25 G 0,75	14,3	180,0	365,0	18
10762	2 x 1	5,6	19,2	60,0	17
10763	3 G 1	5,9	29,0	72,0	17
10764	3 x 1	5,9	29,0	72,0	17
10765	4 G 1	6,6	38,4	86,0	17
10766	4 x 1	6,6	38,4	86,0	17
10767	5 G 1	7,3	48,0	104,0	17
10768	5 x 1	7,3	48,0	104,0	17
10769	7 G 1	8,1	67,0	141,0	17
10770	7 x 1	8,1	67,0	141,0	17
10771	12 G 1	10,4	115,0	230,0	17
10772	18 G 1	12,9	173,0	343,0	17
10773	25 G 1	15,4	240,0	485,0	17

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10774	2 x 1,5	6,4	29,0	70,0	16
10775	3 G 1,5	6,8	43,0	90,0	16
10776	3 x 1,5	6,8	43,0	90,0	16
10777	4 G 1,5	7,4	58,0	109,0	16
10778	4 x 1,5	7,4	58,0	109,0	16
10779	5 G 1,5	8,3	72,0	131,0	16
10780	5 x 1,5	8,3	72,0	131,0	16
10781	6 G 1,5	9,2	86,0	157,0	16
10782	7 G 1,5	9,2	101,0	184,0	16
10783	7 x 1,5	9,2	101,0	184,0	16
10784	12 G 1,5	12,0	173,0	309,0	16
10785	18 G 1,5	14,6	259,0	440,0	16
10786	25 G 1,5	17,4	360,0	620,0	16
10787	2 x 2,5	7,8	48,0	112,0	14
10788	3 G 2,5	8,3	72,0	148,0	14
10789	3 x 2,5	8,3	72,0	148,0	14
10790	4 G 2,5	9,2	96,0	178,0	14
10791	4 x 2,5	9,2	96,0	178,0	14
10792	5 G 2,5	10,1	120,0	221,0	14
10793	5 x 2,5	10,1	120,0	221,0	14
10794	7 G 2,5	11,2	168,0	306,0	14
10795	7 x 2,5	11,2	168,0	306,0	14
10796	4 G 6	13,0	230,0	424,0	10
10797	5 G 6	14,5	288,0	525,0	10

Dimensions and specifications may be changed without prior notice. (RA01)

JZ-500 black flexible, meter marking

new



HELUKABEL JZ-500 black 25G1,5QMM/10371 300/500V 0010917711 CE



Technical data

- Control cables, special PVC
- adapted to DIN VDE 0281, 0293, 0295
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 part 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Outer sheath of special PVC, TM2 to DIN VDE 0281 part 1 and HD 21.1
- colour black (RAL 9005)
- with meter marking

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **UV- resistant**

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **screened analogue type:**
JZ-500-C black, see page A 24

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms and **in open air**. Must not be laid directly in soil or water. When screened for measurement, control and control line etc. in mechanical and plant engineering, machine tools, production lines and conveyor belts.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10340	2 x 0,5	5,5	9,6	40,0	20
10341	3 G 0,5	5,8	14,4	46,0	20
10342	4 G 0,5	6,2	19,0	56,0	20
10343	5 G 0,5	6,9	24,0	65,0	20
10344	7 G 0,5	7,5	33,6	80,0	20
10345	12 G 0,5	9,8	58,0	135,0	20
10346	18 G 0,5	11,8	86,0	196,0	20
10347	25 G 0,5	13,7	120,0	270,0	20
10348	2 x 0,75	5,9	14,4	46,0	20
10349	3 G 0,75	6,2	21,6	54,0	20
10350	4 G 0,75	6,7	28,8	66,0	20
10351	5 G 0,75	7,5	36,0	80,0	20
10352	7 G 0,75	8,3	50,0	110,0	20
10353	12 G 0,75	10,8	86,0	179,0	20
10354	18 G 0,75	12,8	130,0	257,0	20
10355	25 G 0,75	15,1	180,0	365,0	20
10356	2 x 1	6,2	19,2	60,0	20
10357	3 G 1	6,5	29,0	72,0	20
10358	4 G 1	7,2	38,4	86,0	20
10359	5 G 1	7,9	48,0	104,0	20
10360	7 G 1	8,7	67,0	141,0	20
10361	12 G 1	11,4	115,0	230,0	20
10362	18 G 1	13,7	173,0	343,0	20
10363	25 G 1	16,2	240,0	485,0	20

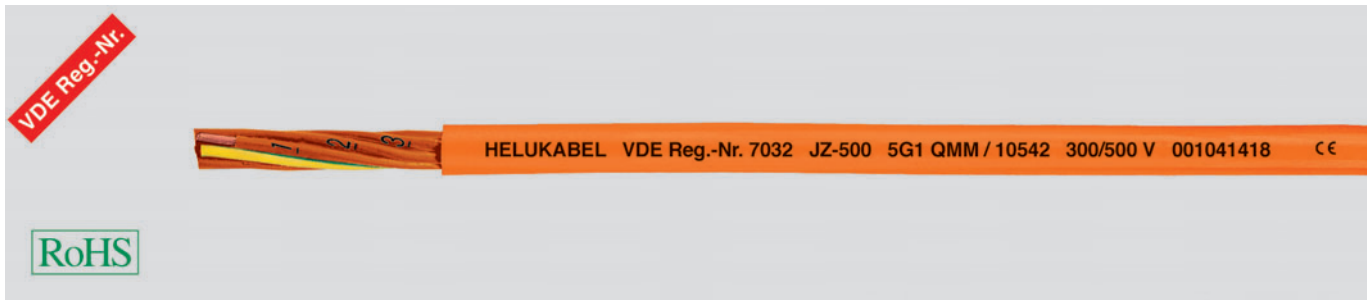
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10364	2 x 1,5	7,0	29,0	70,0	20
10365	3 G 1,5	7,4	43,0	90,0	20
10366	4 G 1,5	8,2	58,0	109,0	20
10367	5 G 1,5	9,1	72,0	131,0	20
10368	7 G 1,5	9,8	101,0	184,0	20
10369	12 G 1,5	13,6	173,0	309,0	20
10370	18 G 1,5	15,6	259,0	440,0	20
10371	25 G 1,5	18,4	360,0	620,0	20
10372	2 x 2,5	8,4	48,0	112,0	20
10373	3 G 2,5	8,9	72,0	148,0	20
10374	4 G 2,5	9,8	96,0	178,0	20
10375	5 G 2,5	10,9	120,0	221,0	20
10376	7 G 2,5	12,0	168,0	306,0	20
10377	12 G 2,5	15,9	288,0	498,0	20
10378	18 G 2,5	19,0	432,0	764,0	20
10379	25 G 2,5	22,6	600,0	1044,0	20
10380	4 G 4	11,6	154,0	295,0	20
10381	5 G 4	12,9	192,0	361,0	20
10382	4 G 6	13,1	230,0	424,0	20
10383	5 G 6	14,5	288,0	525,0	20
10384	4 G 10	17,0	384,0	701,0	20
10385	4 G 16	20,9	614,0	1035,0	20
10386	4 G 25	25,6	960,0	1582,0	20
10387	4 G 35	30,0	1344,0	2105,0	20

Dimensions and specifications may be changed without prior notice. (RA01)

JZ-500 orange flexible, orange cores, control cable for interlocking purposes, meter marking



A



Technical data

- Special PVC control cable for interlocking purposes
- Requirements adapted to DIN VDE 0281, 0293, 0295
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Cores orange with continuous black numbering according to DIN VDE 0293
- JZ-version with green-yellow earth core: 3 cores and above
- OZ-version without green-yellow earth core
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1 and HD 21.1
- Colour orange (RAL 2003)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ Chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, as control cable according to EN 60204 part 1 and VDE 0113 part 1.

As per recommendation of the specified standards the insulated conductors of control current circuits should be coloured orange, when they are used for interlocking purposes. These control circuits are supplied with an external power and remain active under current when the main switch is disconnected or switched off.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10537	2 x 1	5,6	19,2	60,0	17
10538	3 G 1	5,9	29,0	72,0	17
10539	3 x 1	5,9	29,0	72,0	17
10541	4 x 1	6,6	38,4	86,0	17
10540	4 G 1	6,6	38,4	86,0	17
10542	5 G 1	7,3	48,0	104,0	17
10544	2 x 1,5	6,4	29,0	70,0	16
10545	3 G 1,5	6,8	43,0	90,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10546	4 G 1,5	7,4	58,0	109,0	16
10547	5 G 1,5	8,3	72,0	131,0	16
10747	3 G 2,5	8,3	72,0	148,0	14
10748	4 G 2,5	9,2	96,0	178,0	14
10749	5 G 2,5	10,1	120,0	221,0	14

Dimensions and specifications may be changed without prior notice. (RA01)

H05VV5-F (NYSLYÖ-JZ) flexible, number coded, oil resistant, meter marking



Technical data

- Control cable, special PVC with oil resistant outer jacket to DIN VDE 0281 part 13, HD 21.13S1 and IEC 60227/75
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 2000 V, 5 min.
- **Breakdown voltage** min. 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire stranded conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 and IEC 60228 cl. 5
- Special PVC core insulation TI2 to DIN VDE 0281 part 1
- Black cores with white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC outer jacket, TM5 to DIN VDE 0281 part 1, HD 21.1.S4/A16
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Oil resistant to DIN EN 60811-2-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
H05VVC4V5-K (NYSLYCYÖ-JZ),
see page A 29

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air. These are designed as control and connecting cables to machines, tool machineries, conveyor belts and production lines.

These cables are not effected to the chemical influences. Cables for moist and wet rooms, specially used for machines in breweries, bottling plants and car washing stations.

These cables may be allowed to move once installed provided that the cables are not mechanically stressed during movement.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13122	2 x 0,5	5,2 - 6,6	9,7	46,0	20
13001	3 G 0,5	5,5 - 7,0	14,4	54,0	20
13002	4 G 0,5	6,2 - 7,9	19,0	65,0	20
13003	5 G 0,5	6,8 - 8,6	24,0	80,0	20
13004	6 G 0,5	7,6 - 9,6	29,0	104,0	20
13005	7 G 0,5	8,3 - 10,4	35,6	119,0	20
13920	8 G 0,5	8,9 - 10,8	38,0	134,0	20
13006	9 G 0,5	9,7 - 12,1	43,0	136,0	20
13921	10 G 0,5	10,0 - 12,2	48,0	166,0	20
13007	12 G 0,5	10,4 - 12,9	58,0	186,0	20
13922	14 G 0,5	10,8 - 13,2	67,0	215,0	20
13008	18 G 0,5	12,3 - 15,3	86,0	251,0	20
13009	25 G 0,5	15,1 - 18,8	120,0	349,0	20
13923	27 G 0,5	15,1 - 18,6	129,6	373,0	20
13010	34 G 0,5	16,8 - 20,8	163,0	480,0	20
13924	36 G 0,5	17,0 - 20,9	172,0	510,0	20
13125	41 G 0,5	18,3 - 22,4	196,0	570,0	20
13011	50 G 0,5	20,3 - 25,3	240,0	658,0	20
13012	61 G 0,5	21,8 - 27,0	293,0	780,0	20
13925	65 G 0,5	24,3 - 29,8	312,0	810,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13123	2 x 0,75	5,7 - 7,2	14,1	52,0	18
13013	3 G 0,75	6,0 - 7,6	21,6	68,0	18
13014	4 G 0,75	6,6 - 8,3	29,0	82,0	18
13015	5 G 0,75	7,4 - 9,3	36,0	107,0	18
13016	6 G 0,75	8,1 - 10,1	43,0	132,0	18
13017	7 G 0,75	9,0 - 11,3	50,0	145,0	18
13926	8 G 0,75	10,0 - 12,2	58,0	189,0	18
13018	9 G 0,75	10,7 - 13,4	65,0	194,0	18
13019	12 G 0,75	11,0 - 13,7	86,0	231,0	18
13927	14 G 0,75	11,9 - 14,6	101,0	274,0	18
13020	18 G 0,75	13,2 - 16,4	130,0	313,0	18
13021	25 G 0,75	16,0 - 19,9	180,0	461,0	18
13928	27 G 0,75	16,2 - 19,9	195,0	493,0	18
13022	34 G 0,75	18,0 - 22,3	245,0	614,0	18
13929	36 G 0,75	18,2 - 22,4	259,0	646,0	18
13126	41 G 0,75	19,7 - 24,1	295,0	730,0	18
13023	50 G 0,75	21,9 - 27,1	360,0	896,0	18
13024	61 G 0,75	24,3 - 30,2	439,0	1030,0	18
13930	65 G 0,75	25,8 - 31,7	468,0	1071,0	18

Continuation ▶

H05VV5-F (NYSLYÖ-JZ) flexible, number coded, oil resistant, meter marking



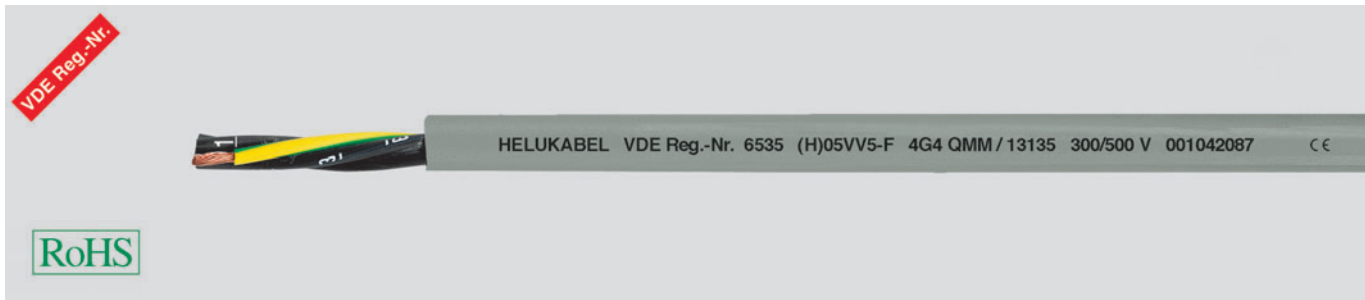
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Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13119	2 x 1	5,9 - 7,5	19,0	66,0	17
13025	3 G 1	6,3 - 8,0	29,0	78,0	17
13026	4 G 1	6,9 - 8,7	38,0	104,0	17
13027	5 G 1	7,8 - 9,8	48,0	123,0	17
13028	6 G 1	8,7 - 10,8	58,0	152,0	17
13029	7 G 1	9,5 - 11,8	67,0	183,0	17
13931	8 G 1	10,5 - 12,9	77,0	220,0	17
13030	9 G 1	11,3 - 14,0	86,0	230,0	17
13031	12 G 1	11,8 - 14,6	115,0	269,0	17
13932	14 G 1	12,7 - 15,6	134,0	361,0	17
13032	18 G 1	14,0 - 17,2	173,0	400,0	17
13933	19 G 1	14,5 - 17,6	185,0	413,0	17
13033	25 G 1	16,8 - 20,6	240,0	546,0	17
13934	27 G 1	17,0 - 21,0	259,0	582,0	17
13034	34 G 1	19,2 - 23,6	326,0	724,0	17
13124	36 G 1	19,4 - 23,8	348,0	775,0	17
13935	37 G 1	19,8 - 24,5	355,0	785,0	17
13127	41 G 1	20,8 - 25,5	392,0	822,0	17
13035	50 G 1	22,9 - 28,0	480,0	1052,0	17
13036	61 G 1	24,3 - 29,8	586,0	1265,0	17
13936	65 G 1	26,5 - 32,7	624,0	1315,0	17
13120	2 x 1,5	6,8 - 8,6	29,0	77,0	16
13037	3 G 1,5	7,4 - 9,4	43,0	97,0	16
13038	4 G 1,5	8,2 - 10,2	58,0	128,0	16
13039	5 G 1,5	9,1 - 11,4	72,0	149,0	16
13040	6 G 1,5	10,2 - 12,6	86,0	196,0	16
13041	7 G 1,5	11,3 - 14,1	101,0	216,0	16
13937	8 G 1,5	12,5 - 15,4	115,0	271,0	16
13042	9 G 1,5	12,9 - 16,1	130,0	282,0	16
13043	12 G 1,5	13,8 - 17,0	173,0	324,0	16
13121	14 G 1,5	14,3 - 18,0	202,0	372,0	16
13044	18 G 1,5	16,5 - 20,3	259,0	485,0	16
13938	19 G 1,5	16,2 - 20,0	274,0	495,0	16
13045	25 G 1,5	20,8 - 25,6	360,0	671,0	16
13939	27 G 1,5	20,3 - 24,9	389,0	695,0	16
13046	32 G 1,5	21,4 - 26,4	461,0	820,0	16
13047	34 G 1,5	23,1 - 28,4	490,0	881,0	16
13940	36 G 1,5	23,0 - 28,2	518,0	905,0	16
13941	37 G 1,5	23,0 - 28,2	532,0	920,0	16
13128	41 G 1,5	24,3 - 29,8	590,0	1085,0	16
13048	50 G 1,5	27,7 - 34,1	720,0	1381,0	16
13049	61 G 1,5	29,6 - 36,3	878,0	1640,0	16
13942	65 G 1,5	30,4 - 37,2	963,0	1730,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13943	2 x 2,5	8,4 - 10,6	48,0	110,0	14
13050	3 G 2,5	9,2 - 11,4	72,0	154,0	14
13051	4 G 2,5	10,1 - 12,5	96,0	212,0	14
13052	5 G 2,5	11,2 - 13,9	120,0	242,0	14
13053	7 G 2,5	13,6 - 16,8	168,0	350,0	14
13945	8 G 2,5	14,9 - 18,7	192,0	379,0	14
13054	12 G 2,5	16,8 - 20,6	288,0	543,0	14
13946	14 G 2,5	17,5 - 22,1	336,0	611,0	14
13055	18 G 2,5	20,2 - 24,8	432,0	787,0	14
13056	25 G 2,5	24,6 - 30,2	600,0	1175,0	14
13947	27 G 2,5	24,7 - 30,2	648,0	1280,0	14
13057	34 G 2,5	27,9 - 34,1	816,0	1529,0	14
13948	36 G 2,5	28,0 - 34,2	864,0	1791,0	14
13949	41 G 2,5	30,3 - 36,9	984,0	1905,0	14
13058	50 G 2,5	33,0 - 40,5	1200,0	2290,0	14
13059	61 G 2,5	35,0 - 42,9	1464,0	2724,0	14

Dimensions and specifications may be changed without prior notice. (RA01)

(H)05VV5-F ((N)YSLYÖ-JZ) flexible, number coded, oil resistant, meter marking



Technical data

- Control cable, special PVC with oil resistant outer jacket adapted to VDE 0281 part 13, HD 21.13S1 and IEC 60227/75 deviation of conductor cross sections.
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 2000 V, 5 min
- **Breakdown voltage** min. 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire stranded conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and HD 383
- Special PVC core insulation TI2 to DIN VDE 0281 part 1
- Black cores with white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC outer jacket, TM5 to DIN VDE 0281 part 1, HD 21.1.S4/A16
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Oil resistant to DIN EN 60811-2-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
(H)05VVC4V5-K, see page A 31

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air. These are designed as control and connecting cables to machines, tool machineries, conveyor belts and production lines.

These cables are not effected to the chemical influences. Cables for moist and wet rooms, specially used for machines in breweries, bottling plants and car washing stations.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13133	2 x 4	10,7	77,0	195,0	12
13134	3 G 4	11,3	115,0	230,0	12
13135	4 G 4	12,4	154,0	295,0	12
13136	5 G 4	13,9	192,0	361,0	12
13138	7 G 4	16,6	269,0	466,0	12
13141	12 G 4	20,8	461,0	810,0	12
13142	2 x 6	12,0	116,0	280,0	10
13143	3 G 6	12,9	173,0	358,0	10
13144	4 G 6	14,2	230,0	424,0	10
13145	5 G 6	15,9	288,0	525,0	10
13146	7 G 6	18,9	403,0	625,0	10
13148	3 G 10	16,3	288,0	540,0	8
13149	4 G 10	18,1	384,0	701,0	8
13150	5 G 10	20,3	480,0	858,0	8
13151	7 G 10	24,3	672,0	1106,0	8

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13153	3 G 16	18,8	461,0	827,0	6
13154	4 G 16	20,9	614,0	1035,0	6
13155	5 G 16	23,4	768,0	1259,0	6
13156	7 G 16	28,5	1075,0	1780,0	6
13159	4 G 25	26,3	960,0	1582,0	4
13160	5 G 25	29,5	1200,0	1852,0	4
13161	3 G 35	26,5	1008,0	1614,0	2
13162	4 G 35	29,5	1344,0	2110,0	2
13163	5 G 35	32,8	1680,0	2652,0	2
13164	3 G 50	32,2	1440,0	2560,0	1
13165	4 G 50	36,1	1920,0	2972,0	1
13166	5 G 50	40,3	2400,0	3948,0	1

Dimensions and specifications may be changed without prior notice. (RA01)



HELUKABEL JZ-750 25G2,5 QMM / 10880 450/750 V 001041521 CE



Technical data

- Special PVC control cable
- Requirements adapted to DIN VDE 0281 part 13 and IEC 60227/7
- identical with H05VV-F to VDE 0281 part 13 and IEC 60227/7 type 227 IEC 75, but without increased oil resistant outer sheath
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 450/750 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Black cores with white figure imprints to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC, outer sheath TM2, to DIN VDE 0281 part 1
- Colour grey (RAL 7001)
- With meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, wherever internationally recognized PVC cables are required. E.g. as a control or measurements cable on industrial machinery, on conveyor systems or in industrial plants, etc. The number coding has been brought onto the cores in such a way that it is easily identifiable and the core numbers are individually underlined to avoid confusion. The green-yellow earth core is laid in the outer layer.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10800	2 x 0,5	5,7	9,6	48,0	20	10834	3 G 1	7,0	29,0	92,0	17
10801	3 G 0,5	6,0	14,5	65,0	20	10835	3 x 1	7,0	29,0	92,0	17
10802	4 G 0,5	6,8	20,0	81,0	20	10836	4 G 1	7,8	39,0	122,0	17
10803	5 G 0,5	7,4	24,0	98,0	20	10837	4 x 1	7,8	39,0	122,0	17
10804	7 G 0,5	8,3	34,0	123,0	20	10838	5 G 1	8,6	48,0	137,0	17
10805	8 G 0,5	9,1	38,0	155,0	20	10839	7 G 1	9,5	68,0	186,0	17
10806	10 G 0,5	10,0	48,0	180,0	20	10840	7 x 1	9,5	68,0	186,0	17
10807	12 G 0,5	10,8	58,0	208,0	20	10841	8 G 1	10,3	77,0	240,0	17
10808	14 G 0,5	11,7	67,0	248,0	20	10842	12 G 1	12,7	116,0	293,0	17
10809	16 G 0,5	12,5	76,0	260,0	20	10843	14 G 1	13,4	134,0	340,0	17
10810	18 G 0,5	13,2	87,0	285,0	20	10844	16 G 1	14,4	154,0	400,0	17
10811	21 G 0,5	13,8	96,0	375,0	20	10845	18 G 1	15,1	173,0	437,0	17
10812	25 G 0,5	15,5	118,0	400,0	20	10846	21 G 1	16,1	205,0	505,0	17
10813	30 G 0,5	16,6	144,0	475,0	20	10847	25 G 1	18,0	240,0	606,0	17
10814	40 G 0,5	18,7	192,0	590,0	20	10848	34 G 1	20,9	326,0	770,0	17
10815	50 G 0,5	21,5	240,0	710,0	20	10849	41 G 1	22,6	394,0	880,0	17
10816	61 G 0,5	23,0	293,0	880,0	20	10850	50 G 1	24,8	480,0	1400,0	17
10817	2 x 0,75	6,2	15,0	60,0	18	10851	61 G 1	26,5	586,0	1450,0	17
10818	3 G 0,75	6,5	22,0	78,0	18	10852	2 x 1,5	7,2	29,0	90,0	16
10819	4 G 0,75	7,3	29,0	104,0	18	10853	3 G 1,5	7,8	43,0	120,0	16
10820	5 G 0,75	8,0	36,0	116,0	18	10854	3 x 1,5	7,8	43,0	120,0	16
10821	7 G 0,75	8,9	51,0	148,0	18	10855	4 G 1,5	8,5	58,0	150,0	16
10822	8 G 0,75	9,6	58,0	160,0	18	10856	4 x 1,5	8,5	58,0	155,0	16
10823	10 G 0,75	10,7	72,0	195,0	18	10857	5 G 1,5	9,6	72,0	177,0	16
10824	12 G 0,75	11,6	87,0	248,0	18	10858	7 G 1,5	10,4	101,0	220,0	16
10825	15 G 0,75	13,2	108,0	295,0	18	10859	8 G 1,5	11,4	115,0	248,0	16
10826	18 G 0,75	14,1	130,0	346,0	18	10860	9 G 1,5	12,5	130,0	278,0	16
10827	21 G 0,75	14,8	151,0	395,0	18	10861	12 G 1,5	14,1	173,0	364,0	16
10828	25 G 0,75	16,6	180,0	505,0	18	10862	14 G 1,5	14,9	202,0	390,0	16
10829	34 G 0,75	19,3	245,0	684,0	18	10863	16 G 1,5	16,0	250,0	490,0	16
10830	41 G 0,75	20,9	296,0	780,0	18	10864	18 G 1,5	17,0	259,0	550,0	16
10831	50 G 0,75	22,9	360,0	940,0	18	10865	21 G 1,5	18,0	302,0	670,0	16
10832	61 G 0,75	24,5	440,0	1125,0	18	10866	25 G 1,5	20,2	360,0	745,0	16
10833	2 x 1	6,6	20,0	80,0	17	10867	32 G 1,5	22,6	461,0	810,0	16

Continuation ▶

JZ-750 flexible, number coded, 750V, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10868	34 G 1,5	23,4	490,0	1010,0	16
10869	42 G 1,5	25,5	605,0	1115,0	16
10870	50 G 1,5	27,9	720,0	1430,0	16
10871	61 G 1,5	30,0	878,0	1750,0	16
10872	2 x 2,5	8,6	48,0	110,0	14
10873	3 G 2,5	9,5	72,0	190,0	14
10874	4 G 2,5	10,2	96,0	240,0	14
10875	5 G 2,5	11,4	120,0	270,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10876	7 G 2,5	12,6	168,0	350,0	14
10877	12 G 2,5	16,9	288,0	600,0	14
10878	14 G 2,5	18,2	336,0	870,0	14
10879	18 G 2,5	20,4	432,0	1050,0	14
10880	25 G 2,5	24,4	600,0	1170,0	14

Dimensions and specifications may be changed without prior notice. (RA01)

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Technical data

- In accordance to DIN VDE 0262/12.95 and DIN VDE 0281 part 13, with insulation wall thickness for 1 kV
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 0,6/1 kV
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Current carrying capacity**
in accordance to VDE 0298 part 4
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 part 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, as per DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Black cores with white figure imprints to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **UV- resistant**

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Different dimensions are also available with red resp. blue cores.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
JZ-600-Y-CY see page A 36

Application

Wiring cable for measuring and controlling purposes in tool machinery, conveyor belts and production lines, for plant installations, air conditioning and in steel production plants and rolling mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation). Is not suitable to be used as direct burial- or as underwater cable. The cores have been numbered in such a way that the numbers are easily identifiable, even if the cable has only been stripped back a few cm. The core numbers have been underlined to avoid confusion. The earth core is located in the outer layer. The black, special PVC outer sheath is resistant to the ultra violet radiation. Mainly used in South-European, Eastern and Arabian countries.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10550	2 x 0,5	6,3	9,6	56,0	20	10582	2 x 0,75	6,6	14,4	66,0	18
10551	3 G 0,5	6,6	14,4	68,0	20	10583	3 G 0,75	6,9	21,6	74,0	18
10552	3 x 0,5	6,6	14,4	68,0	20	10584	3 x 0,75	6,9	21,6	74,0	18
10553	4 G 0,5	7,2	19,0	100,0	20	10585	4 G 0,75	7,5	29,0	126,0	18
10554	4 x 0,5	7,2	19,0	100,0	20	10586	4 x 0,75	7,5	29,0	126,0	18
10555	5 G 0,5	8,0	24,0	117,0	20	10587	5 G 0,75	8,4	36,0	140,0	18
10556	5 x 0,5	8,0	24,0	117,0	20	10588	5 x 0,75	8,4	36,0	140,0	18
10557	6 G 0,5	8,7	29,0	126,0	20	10589	6 G 0,75	9,3	43,0	170,0	18
10558	7 G 0,5	8,7	33,6	138,0	20	10590	6 x 0,75	9,3	43,0	170,0	18
10559	7 x 0,5	8,7	33,6	138,0	20	10591	7 G 0,75	9,3	50,0	190,0	18
10560	8 G 0,5	9,5	38,0	150,0	20	10592	7 x 0,75	9,3	50,0	190,0	18
10561	8 x 0,5	9,5	38,0	150,0	20	10593	8 G 0,75	10,0	58,0	212,0	18
10562	10 G 0,5	10,6	48,0	176,0	20	10594	8 x 0,75	10,0	58,0	212,0	18
10563	12 G 0,5	11,4	58,0	200,0	20	10595	9 G 0,75	10,9	65,0	227,0	18
10564	12 x 0,5	11,4	58,0	200,0	20	10596	10 G 0,75	11,1	72,0	238,0	18
10565	14 G 0,5	12,3	67,0	230,0	20	10597	12 G 0,75	12,2	86,0	257,0	18
10566	16 G 0,5	12,9	76,0	250,0	20	10598	12 x 0,75	12,2	86,0	257,0	18
10567	18 G 0,5	13,8	86,0	276,0	20	10599	14 G 0,75	12,9	101,0	286,0	18
10568	20 G 0,5	14,4	96,0	293,0	20	10600	15 G 0,75	13,8	108,0	319,0	18
10569	21 G 0,5	14,4	96,0	305,0	20	10601	18 G 0,75	14,5	130,0	362,0	18
10570	25 G 0,5	16,1	120,0	335,0	20	10602	20 G 0,75	15,4	144,0	394,0	18
10571	30 G 0,5	17,2	144,0	348,0	20	10603	21 G 0,75	15,4	151,0	422,0	18
10572	32 G 0,5	18,0	154,0	355,0	20	10604	25 G 0,75	17,2	180,0	486,0	18
10573	34 G 0,5	18,7	163,0	520,0	20	10605	32 G 0,75	19,0	230,0	595,0	18
10574	40 G 0,5	19,5	192,0	590,0	20	10606	34 G 0,75	19,9	245,0	638,0	18
10575	42 G 0,5	20,1	202,0	595,0	20	10607	37 G 0,75	19,9	260,0	696,0	18
10576	50 G 0,5	22,1	240,0	715,0	20	10608	40 G 0,75	20,6	288,0	726,0	18
10577	52 G 0,5	22,1	252,0	740,0	20	10609	41 G 0,75	20,6	296,0	750,0	18
10578	61 G 0,5	23,6	293,0	840,0	20	10610	42 G 0,75	21,5	302,0	770,0	18
10579	65 G 0,5	24,4	312,0	880,0	20	10611	50 G 0,75	23,7	360,0	895,0	18
10580	80 G 0,5	27,2	384,0	960,0	20	10612	61 G 0,75	25,3	439,0	1070,0	18
10581	100 G 0,5	31,2	480,0	1050,0	20	10613	65 G 0,75	26,0	468,0	1110,0	18
						10614	80 G 0,75	28,9	576,0	1500,0	18
						10615	100 G 0,75	33,2	720,0	1889,0	18

Continuation ▶

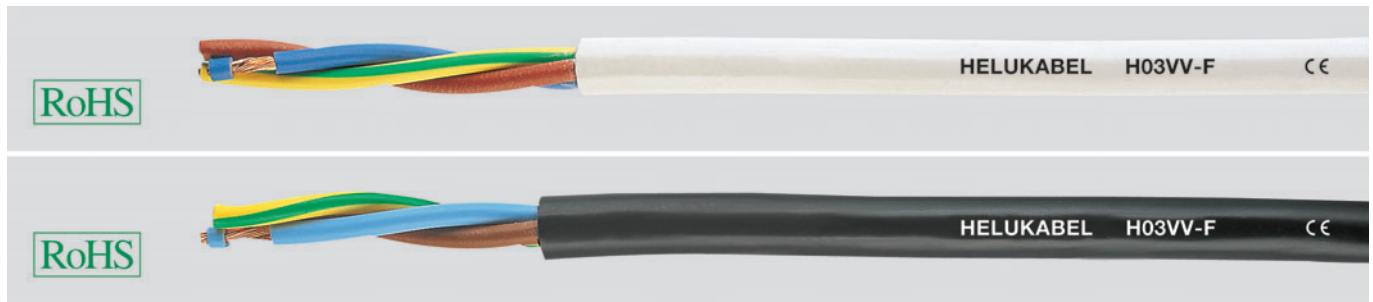
JZ-600 flexible, number coded, 0,6/1kV, meter marking



Part no.	No.cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10616	2 x 1	7,0	19,2	80,0	17
10617	3 G 1	7,4	29,0	96,0	17
10618	3 x 1	7,4	29,0	96,0	17
10619	4 G 1	8,2	38,4	100,0	17
10620	4 x 1	8,2	38,4	100,0	17
10621	5 G 1	9,2	48,0	130,0	17
10622	5 x 1	9,2	48,0	130,0	17
10623	6 G 1	9,9	58,0	150,0	17
10624	7 G 1	9,9	67,0	170,0	17
10625	7 x 1	9,9	67,0	170,0	17
10626	8 G 1	10,9	77,0	230,0	17
10627	9 G 1	11,6	86,0	250,0	17
10628	10 G 1	11,9	96,0	270,0	17
10629	10 x 1	11,9	96,0	270,0	17
10630	12 G 1	13,1	115,0	290,0	17
10631	12 x 1	13,1	115,0	290,0	17
10632	14 G 1	14,0	134,0	320,0	17
10633	16 G 1	14,8	154,0	360,0	17
10634	18 G 1	15,7	173,0	405,0	17
10635	18 x 1	15,7	173,0	405,0	17
10636	20 G 1	16,7	192,0	450,0	17
10637	20 G 1	16,7	192,0	480,0	17
10638	21 G 1	16,7	205,0	510,0	17
10639	24 G 1	18,4	236,0	550,0	17
10640	25 G 1	18,6	240,0	570,0	17
10641	25 x 1	18,6	240,0	570,0	17
10642	26 G 1	18,8	252,0	590,0	17
10643	30 x 1	19,8	308,0	650,0	17
10644	34 G 1	21,5	326,0	750,0	17
10645	36 G 1	21,5	346,0	790,0	17
10646	40 G 1	22,5	384,0	850,0	17
10647	40 x 1	22,5	384,0	850,0	17
10648	41 G 1	23,2	394,0	890,0	17
10649	42 G 1	23,2	403,0	900,0	17
10650	50 G 1	25,6	480,0	1100,0	17
10651	56 G 1	26,4	538,0	1190,0	17
10652	61 G 1	27,5	586,0	1266,0	17
10653	65 G 1	28,3	628,0	1560,0	17
10654	80 G 1	31,4	786,0	1810,0	17
10655	100 G 1	36,0	960,0	1950,0	17
10656	2 x 1,5	8,2	29,0	95,0	16
10657	3 G 1,5	8,6	43,0	112,0	16
10658	3 x 1,5	8,6	43,0	112,0	16
10659	4 G 1,5	9,6	58,0	139,0	16
10660	4 x 1,5	9,6	58,0	139,0	16
10661	5 G 1,5	10,7	72,0	170,0	16
10662	5 x 1,5	10,7	72,0	170,0	16
10663	6 G 1,5	11,6	86,0	190,0	16
10664	7 G 1,5	11,6	101,0	225,0	16
10665	7 x 1,5	11,6	101,0	225,0	16
10666	8 G 1,5	13,8	115,0	250,0	16
10667	9 G 1,5	15,2	130,0	280,0	16
10668	10 G 1,5	15,2	144,0	300,0	16
10669	11 G 1,5	15,5	158,0	330,0	16
10670	12 G 1,5	15,5	173,0	370,0	16
10671	12 x 1,5	15,5	173,0	370,0	16
10672	14 G 1,5	16,6	202,0	400,0	16
10673	16 G 1,5	17,5	230,0	450,0	16
10674	18 G 1,5	18,6	259,0	520,0	16
10675	19 G 1,5	18,6	279,0	550,0	16
10676	20 G 1,5	19,7	288,0	600,0	16
10677	21 G 1,5	20,6	302,0	600,0	16
10678	25 G 1,5	22,5	360,0	730,0	16
10679	32 G 1,5	24,5	461,0	880,0	16
10680	34 G 1,5	25,6	490,0	950,0	16
10681	40 G 1,5	26,7	576,0	990,0	16
10682	42 G 1,5	27,6	605,0	1120,0	16
10683	50 G 1,5	30,4	720,0	1400,0	16
10684	56 G 1,5	31,5	806,0	1530,0	16
10685	61 G 1,5	32,6	878,0	1700,0	16
10686	65 G 1,5	34,8	936,0	1900,0	16
10687	80 G 1,5	37,4	1152,0	2300,0	16
10688	100 G 1,5	41,6	1440,0	2700,0	16
10689	2 x 2,5	9,6	48,0	160,0	14

Part no.	No.cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10690	3 G 2,5	10,1	72,0	175,0	14
10691	3 x 2,5	10,1	72,0	175,0	14
10692	4 G 2,5	11,2	96,0	203,0	14
10693	4 x 2,5	11,2	96,0	203,0	14
10694	5 G 2,5	12,5	120,0	251,0	14
10695	5 x 2,5	12,5	120,0	251,0	14
10696	7 G 2,5	13,8	168,0	330,0	14
10697	7 x 2,5	13,8	168,0	330,0	14
10698	8 G 2,5	15,1	192,0	400,0	14
10699	12 G 2,5	18,3	288,0	553,0	14
10700	14 G 2,5	19,6	336,0	630,0	14
10701	18 G 2,5	22,0	432,0	795,0	14
10702	21 G 2,5	23,3	504,0	930,0	14
10703	25 G 2,5	26,2	600,0	1110,0	14
10704	34 G 2,5	30,4	816,0	1450,0	14
10705	42 G 2,5	33,0	1008,0	1750,0	14
10706	50 G 2,5	36,2	1200,0	2100,0	14
10707	61 G 2,5	38,8	1464,0	2540,0	14
10708	100 G 2,5	50,2	2400,0	3850,0	14
10709	2 x 4	11,1	77,0	180,0	12
10710	3 G 4	11,7	115,0	230,0	12
10711	4 G 4	13,0	154,0	310,0	12
10712	5 G 4	14,5	192,0	410,0	12
10713	7 G 4	16,0	269,0	540,0	12
10714	8 G 4	17,4	307,0	710,0	12
10715	12 G 4	21,4	461,0	860,0	12
10716	3 G 6	13,1	173,0	370,0	10
10717	4 G 6	14,5	230,0	430,0	10
10718	5 G 6	16,2	288,0	650,0	10
10719	7 G 6	18,0	403,0	860,0	10
10720	3 G 10	16,5	288,0	660,0	8
10721	4 G 10	18,2	384,0	790,0	8
10722	5 G 10	20,3	480,0	960,0	8
10723	7 G 10	22,5	672,0	1300,0	8
10724	3 G 16	20,1	461,0	700,0	6
10725	4 G 16	22,3	614,0	1100,0	6
10726	5 G 16	25,0	768,0	1600,0	6
10727	7 G 16	27,4	1075,0	1890,0	6
10728	3 G 25	24,8	720,0	1450,0	4
10729	4 G 25	27,4	960,0	1600,0	4
10730	5 G 25	30,5	1200,0	2050,0	4
10731	7 G 25	33,8	1680,0	2900,0	4
10732	3 G 35	27,1	1008,0	1900,0	2
10733	4 G 35	30,0	1344,0	2400,0	2
10734	5 G 35	33,3	1680,0	2900,0	2
10735	3 G 50	32,4	1440,0	2700,0	1
10736	4 G 50	35,8	1920,0	3400,0	1
10742	5 G 50	40,0	2400,0	4361,0	1
10737	3 G 70	36,9	2016,0	3300,0	2/0
10738	4 G 70	40,9	2688,0	4400,0	2/0
10743	5 G 70	45,5	3360,0	5807,0	2/0
10739	3 G 95	41,7	2736,0	5050,0	3/0
10740	4 G 95	46,2	3648,0	6010,0	3/0
10744	5 G 95	51,7	4560,0	7752,0	3/0
10741	4 G 120	51,6	4608,0	7500,0	4/0
10745	4 G 150	58,5	5760,0	8640,0	300 kcmil
10746	4 G 185	61,1	7104,0	10380,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RA01)



Technical data

- PVC-control cables to DIN VDE 0281 part 5 and IEC 60227-5, HD 21.5 S3
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U₀/U 300/300 V
- **Max. permissible operating voltage**
in three-phase and one-phase
a.c. system U₀/U 330/330 V
in direct current system
U₀/U 495/495 V
- **Test voltage** 2000 V
- **Breakdown voltage**
min. 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and HD 383
- PVC core insulation TI2 to DIN VDE 0281 part 1
- Cores colour coded to DIN VDE 0293-308 6 and more cores number coded
1x green-yellow earth core incl.
- Green-yellow earth-core, 3 cores and above
- Cores stranded in layers with optimal lay-length
- PVC outer jacket in black, white or as per requirement
- PVC outer jacket TM2 to DIN VDE 0281 part 1

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- 5 core and above in adaption (H).
- The above list contains a selection of the types we carry es stock.
Other sizes available on request.

Application

These cable types are especially suited to use on small appliances with low mechanical stress and for connection for light household appliances, e.g. kitchen utensils, desk lamps, floor lamps, vacuum cleaners, office machines, radios, etc., as far as this cable is admitted to the relevant specifications of the equipment.

These cables are not permitted to use with cooking or heating apparatus.

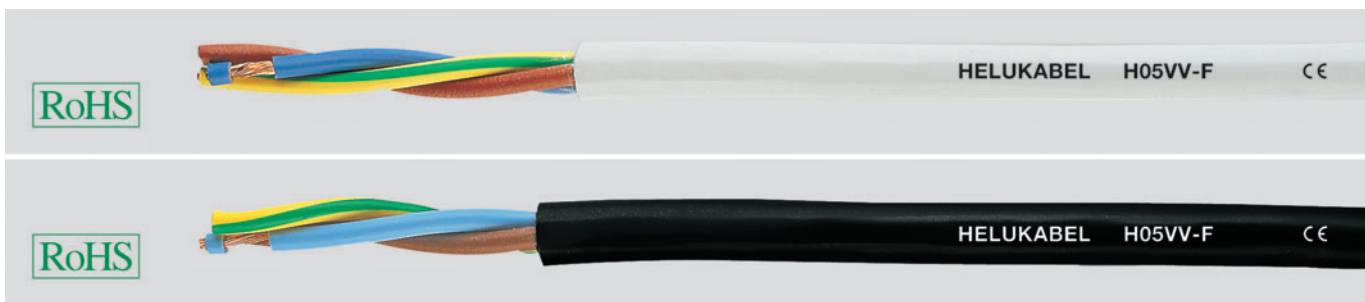
Cables with cross-section 0,75 mm² are not suitable for outdoor use or use of industrial or farmer machineries.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Jacket colour	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
29736	2 x 0,5	black	4,6 - 5,9	9,6	40,0	20
29737	2 x 0,5	white	4,6 - 5,9	9,6	40,0	20
29738	2 x 0,5	other colours	4,6 - 5,9	9,6	40,0	20
29739	3 G 0,5	black	5,0 - 6,4	14,4	49,0	20
29740	3 G 0,5	white	5,0 - 6,4	14,4	49,0	20
29741	3 G 0,5	other colours	5,0 - 6,4	14,4	49,0	20
29742	4 G 0,5	black	5,4 - 7,0	19,2	61,0	20
29743	4 G 0,5	white	5,4 - 7,0	19,2	61,0	20
29744	4 G 0,5	other colours	5,4 - 7,0	19,2	61,0	20
29400	2 x 0,75	black	4,9 - 6,3	14,4	49,0	18
29401	2 x 0,75	white	4,9 - 6,3	14,4	49,0	18
29402	2 x 0,75	other colours	4,9 - 6,3	14,4	49,0	18
29403	3 G 0,75	black	5,2 - 6,7	21,6	59,0	18
29404	3 G 0,75	white	5,2 - 6,7	21,6	59,0	18
29405	3 G 0,75	other colours	5,2 - 6,7	21,6	59,0	18

Part no.	No. cores x cross-sec. mm ²	Jacket colour	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
29406	4 G 0,75	black	5,7 - 7,3	29,0	72,0	18
29407	4 G 0,75	white	5,7 - 7,3	29,0	72,0	18
29408	4 G 0,75	other colours	5,7 - 7,3	29,0	72,0	18
29409	5 G 0,75	black	6,4 - 8,2	36,0	87,0	18
29410	5 G 0,75	white	6,4 - 8,2	36,0	87,0	18
29411	5 G 0,75	other colours	6,4 - 8,2	36,0	87,0	18
29412	6 G 0,75	black	7,1 - 9,0	43,0	98,0	18
29413	6 G 0,75	white	7,1 - 9,0	43,0	98,0	18
29414	6 G 0,75	other colours	7,1 - 9,0	43,0	98,0	18
29415	7 G 0,75	black	7,1 - 9,0	50,0	108,0	18
29416	7 G 0,75	white	7,1 - 9,0	50,0	108,0	18
29417	7 G 0,75	other colours	7,1 - 9,0	50,0	108,0	18

Dimensions and specifications may be changed without prior notice. (RA01)



Technical data

- PVC-control cables to DIN VDE 0281 part 5 and IEC 60227-5, HD 21.5 S3
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage**
U₀/U 300/500 V
- **Max. permissible operating voltage**
in three-phase and one-phase
a.c. system U₀/U 318/550 V
in direct current system
U₀/U 413/825 V
- **Test voltage** 2000 V
- **Breakdown voltage**
min. 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and HD 383
- PVC core insulation TI2 to DIN VDE 0281 part 1
- Cores colour coded to DIN VDE 0293-308 1x green-yellow earth core incl.
- Green-yellow earth core, 3 cores and above
- Cores stranded in layers with optimal lay-length
- PVC outer jacket in white or black
- PVC outer jacket TM2 to DIN VDE 0281 part 1

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- These types are also available with UL-approbation.
- The above list contains a selection of the types we carry es stock. Other sizes available on request.
- Cables with 7 cores are only available as "A"-type.
- 6 mm² in adaption (H).

Application

These cables are especially suited to use for the appliance with medium mechanical stress in households, kitchens and offices, also for household appliances in damp and wet areas, e.g. refrigerators, washing machines, spin-driver etc. As far as this cable is admitted to the relevant specifications of the equipment.

These cables are suited to be used for cooking and heating apparatus under the condition that cable does not come in direct contact with hot parts of the apparatus and no other influences of heat.

The cables are suitable for fixed installation in furnitures, partition walls, decoration covering and in hollow spaces of prefabricated building parts.

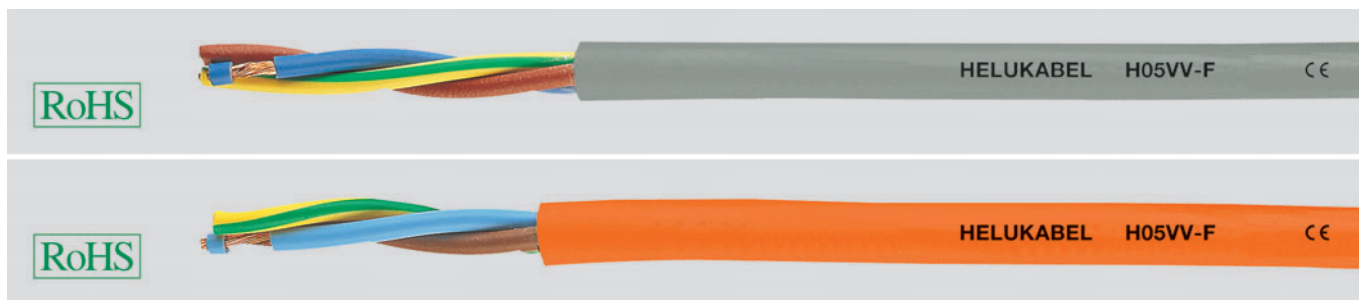
They are not qualified for use in outdoors or for use with industrial and farmer machineries, exceptionally in tailoring, etc.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Jacket colour	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
29450	2 x 0,75	black	5,7 - 7,2	14,4	50,0	18
29451	2 x 0,75	white	5,7 - 7,2	14,4	50,0	18
29452	3 G 0,75	black	6,0 - 7,6	21,6	60,0	18
29453	3 G 0,75	white	6,0 - 7,6	21,6	60,0	18
29454	4 G 0,75	black	6,6 - 8,3	29,0	73,0	18
29455	4 G 0,75	white	6,6 - 8,3	29,0	73,0	18
29456	5 G 0,75	black	7,4 - 9,3	36,0	88,0	18
29457	5 G 0,75	white	7,4 - 9,3	36,0	88,0	18
29458	2 x 1	black	5,9 - 7,5	19,0	57,0	17
29459	2 x 1	white	5,9 - 7,5	19,0	57,0	17
29460	3 G 1	black	6,3 - 8,0	29,0	73,0	17
29461	3 G 1	white	6,3 - 8,0	29,0	73,0	17
29462	4 G 1	black	7,1 - 9,0	38,0	85,0	17
29463	4 G 1	white	7,1 - 9,0	38,0	85,0	17
29464	5 G 1	black	7,8 - 9,8	48,0	105,0	17
29465	5 G 1	white	7,8 - 9,8	48,0	105,0	17
29466	7 G 1	black	9,3 - 12,0	67,0	131,0	17
29467	7 G 1	white	9,3 - 12,0	67,0	131,0	17
29484	2 x 1,5	black	6,8 - 8,6	29,0	82,0	16
29485	2 x 1,5	white	6,8 - 8,6	29,0	82,0	16
29468	3 G 1,5	black	7,4 - 9,4	43,0	95,0	16
29469	3 G 1,5	white	7,4 - 9,4	43,0	95,0	16
29470	4 G 1,5	black	8,4 - 10,5	58,0	117,0	16
29471	4 G 1,5	white	8,4 - 10,5	58,0	117,0	16
29472	5 G 1,5	black	9,3 - 11,6	72,0	144,0	16
29473	5 G 1,5	white	9,3 - 11,6	72,0	144,0	16

Part no.	No. cores x cross-sec. mm ²	Jacket colour	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
29474	7 G 1,5	black	10,8 - 13,5	101,0	183,0	16
29475	7 G 1,5	white	10,8 - 13,5	101,0	183,0	16
29478	3 G 2,5	black	9,2 - 11,4	72,0	152,0	14
29479	3 G 2,5	white	9,2 - 11,4	72,0	152,0	14
29480	4 G 2,5	black	10,1 - 12,5	96,0	192,0	14
29481	4 G 2,5	white	10,1 - 12,5	96,0	192,0	14
29482	5 G 2,5	black	11,2 - 13,9	120,0	243,0	14
29483	5 G 2,5	white	11,2 - 13,9	120,0	243,0	14
29486	7 G 2,5	black	13,0 - 17,0	168,0	316,0	14
29487	7 G 2,5	white	13,0 - 17,0	168,0	316,0	14
29825	3 G 4	black	10,5 - 13,1	115,0	235,0	12
29826	3 G 4	white	10,5 - 13,1	115,0	235,0	12
29488	4 G 4	black	11,5 - 14,3	154,0	300,0	12
29489	4 G 4	white	11,5 - 14,3	154,0	300,0	12
29490	5 G 4	black	13,0 - 16,1	192,0	361,0	12
29491	5 G 4	white	13,0 - 16,1	192,0	361,0	12
29492	4 G 6	black	13,2 - 16,3	230,0	490,0	10
29493	4 G 6	white	13,2 - 16,3	230,0	490,0	10

Dimensions and specifications may be changed without prior notice. (RA01)



Technical data

- PVC-control cables to DIN VDE 0281 part 5 and IEC 60227-5, HD 21.5 S3
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U₀/U 300/500 V
- Max. permissible **operating voltage** in three-phase and one-phase a.c. system U₀/U 318/550 V in direct current system U₀/U 413/825 V
- **Test voltage** 2000 V
- **Breakdown voltage**
min. 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and HD 383
- PVC core insulation TI2 to DIN VDE 0281 part 1
- Cores colour coded to DIN VDE 0293-308
- Green-yellow earth core, 3 cores and above
- Cores stranded in layers with optimal lay-length
- PVC outer jacket TM2 to DIN VDE 0281 part 1
- Jacket colour in accordance to the customer

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **Colour code:**
0 = blue (approx. RAL 5015)
1 = green (approx. RAL 6018)
2 = brown (approx. RAL 8003)
3 = yellow (approx. RAL 1021)
4 = red (approx. RAL 3000)
5 = orange (approx. RAL 2003)
6 = violet (approx. RAL 4005)
7 = grey (approx. RAL 7001/7032)
8 = gold
9 = dusty gold
- Please add the individual part no. for order with the identification colour code. Further colours on request.

Application

These cable are especially suited to use for the appliance with medium mechanical stress in households, kitchens and offices, also for household appliances in damp and wet areas, e.g. refrigerators, washing machines, spin-driver etc. As far as this cable is admitted to the relevant specifications of the equipment.

These cables are suited to be used for cooking and heating apparatus under the condition that cable does not come in direct contact with hot parts of the apparatus and no other influences of heat.

The cables are suitable for fixed installation in furnitures, partition walls, decoration covering and in hollow spaces of prefabricated building parts.

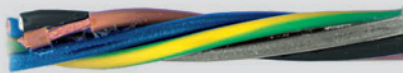
They are not qualified for use in outdoors or for use with industrial and farmer machineries, exceptionally in tailoring, etc.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3011_	2 x 0,75	5,7 - 7,2	14,4	50,0	18
3012_	3 G 0,75	6,0 - 7,6	21,6	60,0	18
3013_	4 G 0,75	6,6 - 8,3	29,0	73,0	18
3014_	5 G 0,75	7,4 - 9,3	36,0	88,0	18
3015_	2 x 1	5,9 - 7,5	19,0	57,0	17
3016_	3 G 1	6,3 - 8,0	29,0	73,0	17
3017_	4 G 1	7,1 - 9,0	38,0	85,0	17
3018_	5 G 1	7,8 - 9,8	48,0	105,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3020_	2 x 1,5	6,8 - 8,6	29,0	82,0	16
3021_	3 G 1,5	7,4 - 9,4	43,0	95,0	16
3022_	4 G 1,5	8,4 - 10,5	58,0	117,0	16
3023_	5 G 1,5	9,3 - 11,6	72,0	144,0	16
3024_	3 G 2,5	9,2 - 11,4	72,0	152,0	14
3025_	4 G 2,5	10,1 - 12,5	96,0	192,0	14
3026_	5 G 2,5	11,2 - 13,9	120,0	243,0	14

Dimensions and specifications may be changed without prior notice. (RA01)



HELUKABEL VDE Reg.-Nr. 7032 JB-500 5G1,5 QMM / 11082 300/500 V 001041518 CE



Technical data

- In accordance to DIN VDE 0281, 0293, 0295
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable Ø
fixed installation 4x cable Ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 Teil 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Cores colour coded as per JB/OB colour code
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011
- from 5 cores with VDE-Reg-Nr.

Properties

- Extensively oil resistant, oil-/ chemical resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OB).
- **screened analogue type:**
Y-CY-JB, see page A 38

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, as measuring and control cables in tool machinery, conveyor belts, production lines, as well as in machinery production, in air-conditioning and steel production plants. The earth core is located immediately below the outer jacket. JB cables are suitable for use in all electrical equipment either in dry or damp areas. They should not, however, be installed in the open air.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11001	2 x 0,5	4,9	9,6	40,0	20
11002	3 G 0,5	5,2	14,4	46,0	20
11003	3 x 0,5	5,2	14,4	46,0	20
11004	4 G 0,5	5,6	19,2	56,0	20
11005	4 x 0,5	5,6	19,2	56,0	20
11006	5 G 0,5	6,3	24,0	65,0	20
11007	5 x 0,5	6,3	24,0	65,0	20
11008	6 G 0,5	6,9	29,0	75,0	20
11009	7 G 0,5	6,9	34,0	80,0	20
11010	7 x 0,5	6,9	34,0	84,0	20
11011	8 G 0,5	7,4	38,0	97,0	20
11012	10 G 0,5	8,5	48,0	116,0	20
11013	12 G 0,5	8,8	58,0	135,0	20
11014	14 G 0,5	9,7	67,0	150,0	20
11015	16 G 0,5	10,2	77,0	172,0	20
11019	30 G 0,5	13,8	144,0	310,0	20
11026	2 x 0,75	5,3	14,4	46,0	18
11027	3 G 0,75	5,6	21,6	54,0	18
11028	3 x 0,75	5,6	21,6	54,0	18
11029	4 G 0,75	6,3	28,8	66,0	18
11030	4 x 0,75	6,3	28,8	66,0	18
11031	5 G 0,75	6,9	36,0	80,0	18
11032	5 x 0,75	6,9	36,0	80,0	18
11033	6 G 0,75	7,5	43,2	99,0	18
11034	7 G 0,75	7,5	50,0	110,0	18
11035	7 x 0,75	7,5	50,0	110,0	18
11036	8 G 0,75	8,2	58,0	130,0	18
11037	9 G 0,75	8,8	65,0	153,0	18
11038	10 G 0,75	9,2	72,0	162,0	18
11039	12 G 0,75	9,8	86,0	179,0	18
11040	15 G 0,75	11,2	108,0	218,0	18
11041	18 G 0,75	12,2	130,0	257,0	18
11042	21 G 0,75	12,7	151,0	320,0	18
11043	25 G 0,75	14,3	180,0	365,0	18
11050	2 x 1	5,6	19,2	60,0	17
11051	3 G 1	5,9	29,0	72,0	17
11052	3 x 1	5,9	29,0	72,0	17
11053	4 G 1	6,6	38,4	86,0	17
11054	4 x 1	6,6	38,4	86,0	17
11055	5 G 1	7,3	48,0	104,0	17
11056	5 x 1	7,3	48,0	104,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11057	6 G 1	8,1	58,0	125,0	17
11058	6 x 1	8,1	58,0	125,0	17
11059	7 G 1	8,1	67,0	141,0	17
11060	7 x 1	8,1	67,0	141,0	17
11061	8 G 1	8,7	77,0	175,0	17
11062	9 G 1	9,8	87,0	200,0	17
11063	10 G 1	9,8	96,0	207,0	17
11064	12 G 1	10,4	115,0	230,0	17
11065	14 G 1	11,4	134,0	271,0	17
11066	16 G 1	12,3	154,0	300,0	17
11067	18 G 1	12,9	173,0	343,0	17
11068	20 G 1	13,7	192,0	375,0	17
11069	24 G 1	14,7	230,0	468,0	17
11070	25 G 1	15,4	240,0	485,0	17
11077	2 x 1,5	6,4	29,0	70,0	16
11078	3 G 1,5	6,8	43,0	90,0	16
11079	3 x 1,5	6,8	43,0	90,0	16
11080	4 G 1,5	7,4	58,0	109,0	16
11081	4 x 1,5	7,4	58,0	109,0	16
11082	5 G 1,5	8,3	72,0	131,0	16
11083	5 x 1,5	8,3	72,0	131,0	16
11084	6 G 1,5	9,2	86,4	157,0	16
11085	7 G 1,5	9,2	101,0	184,0	16
11086	7 x 1,5	9,2	101,0	184,0	16
11087	8 G 1,5	9,9	115,0	216,0	16
11088	11 G 1,5	12,0	158,0	300,0	16
11089	12 G 1,5	12,0	173,0	309,0	16
11090	14 G 1,5	13,0	202,0	345,0	16
11091	16 G 1,5	13,9	230,0	386,0	16
11092	18 G 1,5	14,6	259,0	440,0	16
11093	20 G 1,5	15,5	288,0	490,0	16
11094	25 G 1,5	17,4	360,0	620,0	16
11104	2 x 2,5	7,8	48,0	112,0	14
11105	3 G 2,5	8,3	72,0	148,0	14
11106	3 x 2,5	8,3	72,0	148,0	14
11107	4 G 2,5	9,2	96,0	178,0	14
11108	4 x 2,5	9,2	96,0	178,0	14
11109	5 G 2,5	10,1	120,0	221,0	14
11110	5 x 2,5	10,1	120,0	221,0	14
11111	6 G 2,5	11,2	144,0	293,0	14
11112	7 G 2,5	11,2	168,0	306,0	14

Dimensions and specifications may be changed without prior notice. (RA01)



Technical data

- Special PVC control cables
- Requirements adapted to DIN VDE 0281, 0293, 0295 and IEC 60227-5
- to H05VV-F VDE 0281 part 5 and IEC 60227-5 Type 60227 IEC 57
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 450/750 V
- fixed installation, under protection U₀/U 600/1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Cores colour coded as per JB/OB colour code
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OB).
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **screened analogue type:**
Y-CY-JB, see page A 38

Application

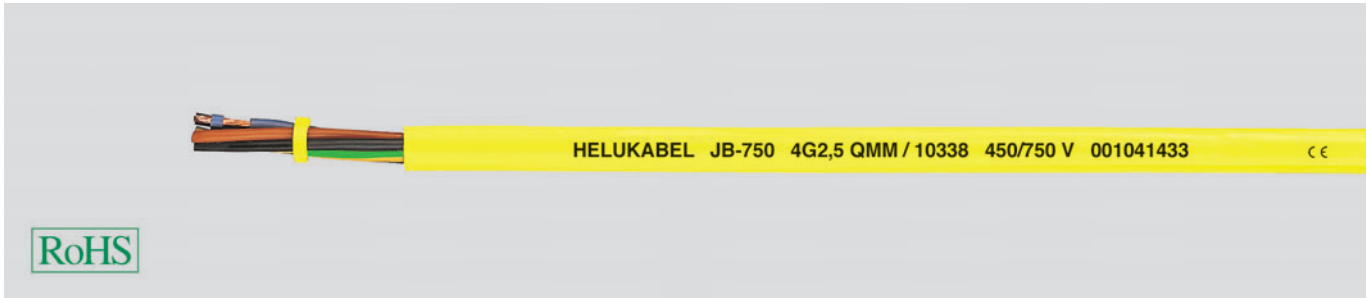
These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, as measuring and control cables in tool machinery, conveyor belts, production lines, as well as in machinery production, in air-conditioning and steel production plants. The earth core is located immediately below the outer jacket. JB cables are suitable for use in all electrical equipment either in dry or damp areas. They should not, however, be installed in the open air.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11161	2 x 2,5	8,8	48,0	130,0	14	11155	3 G 25	24,4	720,0	1388,0	4
11162	3 G 2,5	9,3	72,0	164,0	14	11136	4 G 25	26,8	960,0	1581,0	4
11163	3 x 2,5	9,3	72,0	164,0	14	11137	5 G 25	29,9	1200,0	1997,0	4
11164	4 G 2,5	10,2	96,0	200,0	14	11156	3 G 35	26,5	1008,0	1767,0	2
11165	4 x 2,5	10,2	96,0	200,0	14	11138	4 G 35	29,4	1344,0	2105,0	2
11166	5 G 2,5	11,4	120,0	247,0	14	11139	5 G 35	32,7	1680,0	2636,0	2
11167	5 x 2,5	11,4	120,0	247,0	14	11157	3 G 50	31,8	1440,0	2556,0	1
11168	6 G 2,5	12,6	144,0	301,0	14	11140	4 G 50	35,0	1920,0	2940,0	1
11169	7 G 2,5	12,6	168,0	321,0	14	11145	5 G 50	39,2	2400,0	3936,0	1
11121	2 x 4	10,7	76,8	195,0	12	11158	3 G 70	36,1	2016,0	3182,0	2/0
11144	3 G 4	11,3	115,0	235,0	12	11141	4 G 70	39,9	2688,0	4090,0	2/0
11122	4 G 4	12,6	154,0	295,0	12	11146	5 G 70	44,9	3360,0	5443,0	2/0
11123	5 G 4	14,1	192,0	361,0	12	11159	3 G 95	40,9	2736,0	4676,0	3/0
11124	7 G 4	15,6	269,0	498,0	12	11142	4 G 95	45,4	3648,0	5540,0	3/0
11125	11 G 4	20,8	422,0	767,0	12	11147	5 G 95	50,7	4560,0	6931,0	3/0
11126	3 G 6	12,7	173,0	355,0	10	11160	3 G 120	46,2	3456,0	5630,0	4/0
11127	4 G 6	14,1	230,0	424,0	10	11143	4 G 120	51,6	4608,0	7000,0	4/0
11128	5 G 6	15,8	288,0	525,0	10	11148	4 G 150	58,5	5760,0	8340,0	300 kcmil
11129	7 G 6	17,6	405,0	625,0	10	11149	4 G 185	61,1	7104,0	9904,0	350 kcmil
11153	3 G 10	16,1	290,0	611,0	8						
11130	4 G 10	17,9	384,0	701,0	8						
11131	5 G 10	19,9	480,0	858,0	8						
11132	7 G 10	22,2	672,0	1106,0	8						
11154	3 G 16	19,7	461,0	912,0	6						
11133	4 G 16	21,7	614,0	1035,0	6						
11134	5 G 16	24,4	768,0	1259,0	6						
11135	7 G 16	26,8	1075,0	1780,0	6						

Dimensions and specifications may be changed without prior notice. (RA01)

JB-750 yellow flexible, colour coded, 750V, connection cable for warning indication, meter marking



Technical data

- Special PVC as connection cable for warning indication
- Requirements adapted to 0281 part 5, HD 21.5 and IEC 60227/5 type 227 IEC 57
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 450/750 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Cores colour coded to DIN VDE 0293
- Green-yellow earth core: 3 cores and above
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour yellow (RAL 1016)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, as connection cable with yellow outer sheath as a special warning indication. Recommendation in adapted to EN 60204 part 1 and DIN VDE 0113 part 1.

C€= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10334	3 G 1,5	7,8	43,0	100,0	16
10335	4 G 1,5	8,5	58,0	121,0	16
10336	5 G 1,5	9,6	72,0	148,0	16

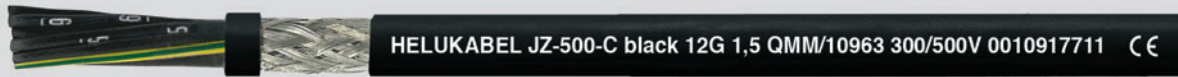
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10337	3 G 2,5	9,3	72,0	154,0	14
10338	4 G 2,5	10,2	96,0	208,0	14
10339	5 G 2,5	11,4	120,0	229,0	14

Dimensions and specifications may be changed without prior notice. (RA01)

JZ-500-C black EMC-preffered type, Cu-screened, flexible, meter marking

A

new



Technical data

- Special PVC control cables, adapted to DIN VDE 0245, 0281, 0293, 0295
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage**
core/core 4000 V
core/screen 2000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Coupling resistance**
max. 250 Ohm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Foil separator
- Tinned copper braided screening, approx. 85% coverage
- Special PVC outer sheath TM2, to special PVC, TM2 to DIN VDE 0281 part 1 and HD 21.1
- Colour black (RAL 9005)
- with meter marking

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **UV- resistant**

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **unscreened analogue type:**
JZ-500 black, see page A 9

Application

For medium mechanical stress for flexible use with free movement without tensile stress or forced movements in dry, damp, wet rooms and in **open air**. Must not be laid directly in soil or water. When screened for measurement, control and control line etc. in mechanical and plant engineering, machine tools, production lines and conveyor belts.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
10934	2 x 0,5	6,1	35,0	45,0	20	10958	2 x 1,5	7,6	63,0	88,0	20
10935	3 G 0,5	6,4	42,0	55,0	20	10959	3 G 1,5	8,0	80,0	100,0	20
10936	4 G 0,5	6,8	47,0	61,0	20	10960	4 G 1,5	8,8	97,0	126,0	20
10937	5 G 0,5	7,5	56,0	74,0	20	10961	5 G 1,5	9,7	119,0	160,0	20
10938	7 G 0,5	8,1	69,0	98,0	20	10962	7 G 1,5	10,4	147,0	208,0	20
10939	12 G 0,5	10,4	108,0	157,0	20	10963	12 G 1,5	13,8	267,0	338,0	20
10940	18 G 0,5	12,6	145,0	217,0	20	10964	18 G 1,5	16,4	374,0	479,0	20
10941	25 G 0,5	14,5	240,0	314,0	20	10965	25 G 1,5	19,2	526,0	705,0	20
10942	2 x 0,75	6,5	40,0	59,0	20	10966	2 x 2,5	9,0	96,0	130,0	20
10943	3 G 0,75	6,8	52,0	66,0	20	10967	3 G 2,5	9,5	144,0	167,0	20
10944	4 G 0,75	7,3	60,0	77,0	20	10968	4 G 2,5	10,4	148,0	195,0	20
10945	5 G 0,75	8,1	71,0	93,0	20	10969	5 G 2,5	11,7	181,0	223,0	20
10946	7 G 0,75	8,9	91,0	130,0	20	10970	7 G 2,5	12,8	255,0	344,0	20
10947	12 G 0,75	11,6	142,0	202,0	20	10971	12 G 2,5	16,7	441,0	570,0	20
10948	18 G 0,75	13,6	212,0	292,0	20	10972	18 G 2,5	19,8	570,0	681,0	20
10949	25 G 0,75	15,9	281,0	415,0	20	10973	4 G 4	12,4	230,0	310,0	20
10950	2 x 1	6,8	50,0	65,0	20	10974	5 G 4	13,7	273,0	385,0	20
10951	3 G 1	7,1	60,0	80,0	20	10975	4 G 6	13,9	305,0	415,0	20
10952	4 G 1	7,8	71,0	98,0	20	10976	5 G 6	15,3	439,0	509,0	20
10953	5 G 1	8,5	88,0	127,0	20	10977	4 G 10	17,8	535,0	783,0	20
10954	7 G 1	9,3	111,0	158,0	20	10978	4 G 16	23,3	740,0	880,0	20
10955	12 G 1	12,2	184,0	260,0	20	10979	4 G 25	28,4	1140,0	1570,0	20
10956	18 G 1	14,5	260,0	380,0	20	10980	4 G 35	31,0	1576,0	2070,0	20
10957	25 G 1	17,0	349,0	534,0	20						

Dimensions and specifications may be changed without prior notice. (RA01)

F-CY-OZ (LiY-CY) flexible, Cu-screened, EMC-preferred type, meter marking



Technical data

- Special PVC data cables, adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
for 1 core (LiYDY) 1200 V
- **Test voltage** core/core 4000 V
core/screen 2000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Mutual capacitance** according to different cross-sections
core/core approx. 150 nF/km
core/screen approx. 270 nF/km
- **Coupling resistance**
max. 250 Ωm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with continuous numbering in white according to DIN VDE 0293
- Cores stranded in layers with optimal lay-length
- Core wrapping with foil
- Tinned copper braided screen, approx. 85% coverage
- For 1 core cable copper screen of helically wound (type LiYDY), approx. 85% coverage
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1 and HD 21.1
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- x = without green-yellow earth core (OZ).
- For 1 core cable screen of helically wound.
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
For more information, see introduction
- **unscreened analogue type:**
JZ 500, see page A 6

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, as data cables in control technologies, in the tool making and machine industries, in computers and as a signal cable for the electronics branch. A stabilizing separator between core bundle and braid reduces essentially the external diameter and allows smaller bending radius, lower weight etc.

The dense screening assures disturbance-free transmission of all signals and impulses. An ideal disturbance-free control cable for the above applications.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16531	1 x 0,5	3,7	15,0	41,0	20
16532	2 x 0,5	5,7	35,0	45,0	20
16533	3 x 0,5	5,9	42,0	55,0	20
16534	4 x 0,5	6,4	47,0	61,0	20
16535	5 x 0,5	6,9	56,0	74,0	20
16536	6 x 0,5	7,6	67,0	89,0	20
16537	7 x 0,5	7,6	69,0	98,0	20
16538	8 x 0,5	8,7	80,0	117,0	20
16539	10 x 0,5	9,6	94,0	135,0	20
16540	12 x 0,5	9,7	108,0	157,0	20
16541	14 x 0,5	10,2	116,0	190,0	20
16542	16 x 0,5	11,0	129,0	210,0	20
16543	18 x 0,5	11,5	145,0	217,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16544	20 x 0,5	12,2	172,0	240,0	20
16545	21 x 0,5	12,7	188,0	250,0	20
16546	24 x 0,5	13,5	235,0	300,0	20
16547	25 x 0,5	13,6	240,0	314,0	20
16548	30 x 0,5	14,4	295,0	360,0	20
16549	32 x 0,5	14,9	301,0	425,0	20
16550	34 x 0,5	15,6	312,0	433,0	20
16551	36 x 0,5	15,6	318,0	446,0	20
16552	40 x 0,5	16,9	343,0	475,0	20
16553	50 x 0,5	18,5	406,0	573,0	20
16554	61 x 0,5	19,7	508,0	653,0	20
16555	80 x 0,5	22,6	680,0	784,0	20
16556	100 x 0,5	24,9	804,0	995,0	20

Continuation ►

F-CY-OZ (LiY-CY) flexible, Cu-screened, EMC-preferred type, meter marking

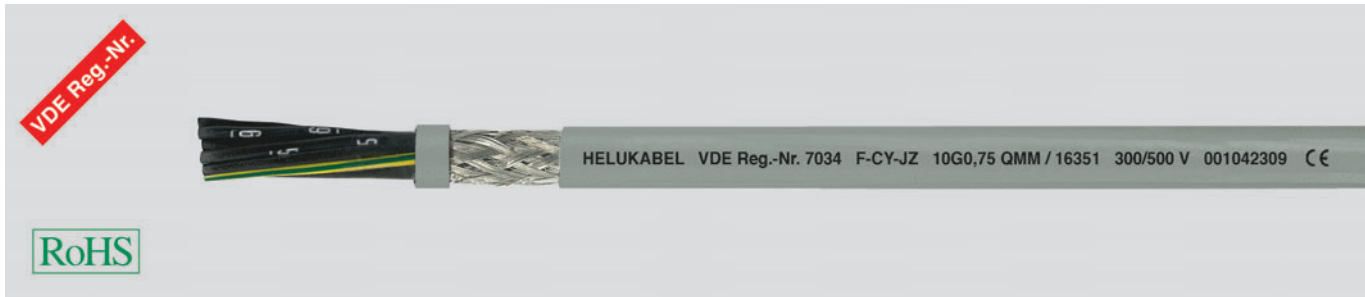


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Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16557	1 x 0,75	4,0	19,0	44,0	18
16558	2 x 0,75	6,1	40,0	59,0	18
16559	3 x 0,75	6,3	52,0	66,0	18
16560	4 x 0,75	6,8	60,0	77,0	18
16561	5 x 0,75	7,4	71,0	93,0	18
16562	6 x 0,75	8,2	80,0	113,0	18
16563	7 x 0,75	8,2	91,0	130,0	18
16564	8 x 0,75	9,6	110,0	145,0	18
16565	10 x 0,75	10,3	137,0	180,0	18
16566	12 x 0,75	10,5	142,0	202,0	18
16567	14 x 0,75	11,3	180,0	225,0	18
16568	16 x 0,75	11,9	200,0	275,0	18
16569	18 x 0,75	12,7	212,0	292,0	18
16570	19 x 0,75	12,7	230,0	308,0	18
16571	20 x 0,75	13,3	238,0	320,0	18
16572	21 x 0,75	14,0	246,0	378,0	18
16573	24 x 0,75	14,9	270,0	435,0	18
16574	25 x 0,75	15,0	281,0	415,0	18
16575	27 x 0,75	15,0	304,0	435,0	18
16576	30 x 0,75	15,8	320,0	450,0	18
16577	32 x 0,75	16,7	342,0	484,0	18
16578	34 x 0,75	17,2	345,0	502,0	18
16579	36 x 0,75	17,2	350,0	535,0	18
16580	37 x 0,75	17,2	361,0	592,0	18
16581	40 x 0,75	18,6	369,0	610,0	18
16582	50 x 0,75	20,3	461,0	777,0	18
16583	61 x 0,75	21,7	540,0	900,0	18
16584	80 x 0,75	24,8	711,0	1210,0	18
16585	100 x 0,75	27,6	900,0	1445,0	18
16050	1 x 1	4,6	21,0	47,0	17
16051	2 x 1	6,4	50,0	65,0	17
16052	3 x 1	6,7	60,0	81,0	17
16053	4 x 1	7,2	71,0	98,0	17
16054	5 x 1	8,0	88,0	127,0	17
16055	6 x 1	8,7	97,0	144,0	17
16056	7 x 1	8,7	111,0	158,0	17
16057	8 x 1	10,1	127,0	197,0	17
16058	10 x 1	11,2	150,0	232,0	17
16059	12 x 1	11,4	184,0	260,0	17
16060	14 x 1	12,0	196,0	302,0	17
16061	16 x 1	12,8	209,0	345,0	17
16062	18 x 1	13,5	260,0	380,0	17
16063	20 x 1	14,3	317,0	440,0	17
16064	24 x 1	16,0	320,0	495,0	17
16065	25 x 1	16,2	349,0	534,0	17
16066	28 x 1	17,0	408,0	595,0	17
16067	30 x 1	17,0	441,0	616,0	17
16068	34 x 1	18,5	486,0	741,0	17
16069	40 x 1	19,9	510,0	835,0	17
16070	50 x 1	21,8	625,0	1025,0	17
16071	61 x 1	23,3	702,0	1200,0	17
16072	80 x 1	26,6	920,0	1440,0	17
16073	100 x 1	29,7	1120,0	1610,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16074	1 x 1,5	5,0	27,0	70,0	16
16075	2 x 1,5	7,0	63,0	88,0	16
16076	3 x 1,5	7,5	80,0	100,0	16
16077	4 x 1,5	8,1	97,0	126,0	16
16078	5 x 1,5	9,0	119,0	160,0	16
16079	7 x 1,5	9,8	147,0	208,0	16
16080	8 x 1,5	11,4	170,0	244,0	16
16081	10 x 1,5	12,6	193,0	316,0	16
16082	12 x 1,5	12,8	267,0	338,0	16
16083	14 x 1,5	13,5	283,0	383,0	16
16084	16 x 1,5	14,4	315,0	424,0	16
16085	18 x 1,5	15,5	374,0	479,0	16
16086	20 x 1,5	16,4	396,0	545,0	16
16087	24 x 1,5	18,2	458,0	690,0	16
16088	25 x 1,5	18,4	526,0	705,0	16
16089	28 x 1,5	19,1	541,0	810,0	16
16090	30 x 1,5	19,1	555,0	830,0	16
16091	35 x 1,5	20,8	645,0	890,0	16
16092	40 x 1,5	22,6	725,0	1060,0	16
16093	50 x 1,5	24,7	885,0	1440,0	16
16094	61 x 1,5	26,4	1100,0	1700,0	16
16095	80 x 1,5	30,3	1324,0	2000,0	16
16096	100 x 1,5	33,6	1641,0	2500,0	16
16097	1 x 2,5	5,8	39,0	50,0	14
16098	2 x 2,5	8,3	96,0	130,0	14
16099	3 x 2,5	9,0	144,0	167,0	14
16100	4 x 2,5	9,8	148,0	195,0	14
16101	5 x 2,5	10,9	181,0	223,0	14
16102	7 x 2,5	11,9	255,0	344,0	14
16103	12 x 2,5	15,8	441,0	522,0	14
16104	2 x 4	9,8	120,0	185,0	12
16105	3 x 4	10,6	174,0	240,0	12
16106	4 x 4	11,5	230,0	310,0	12
16107	5 x 4	12,7	273,0	400,0	12
16108	7 x 4	14,0	316,0	500,0	12
16109	2 x 6	11,7	173,0	268,0	10
16110	3 x 6	12,5	240,0	330,0	10
16111	4 x 6	13,8	305,0	415,0	10
16112	5 x 6	15,3	439,0	509,0	10
16113	7 x 6	16,9	505,0	672,0	10
16114	2 x 10	14,7	255,0	425,0	8
16115	3 x 10	15,7	350,0	500,0	8
16116	4 x 10	17,3	535,0	783,0	8
16117	5 x 10	19,2	592,0	856,0	8
16118	7 x 10	21,4	810,0	1300,0	8

Dimensions and specifications may be changed without prior notice. (RA01)



Technical data

- Special PVC control cables, adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage**
core/core 4000 V
core/screen 2000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Mutual capacitance** according to different cross-sections
0,5 mm² to 2,5 mm²:
core/core approx. 150 nF/km
core/screen approx. 270 nF/km
- **Coupling resistance**
max. 250 Ωm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Foil separator
- Tinned copper braided screening, approx. 85% coverage
- Special PVC outer sheath TM2, to special PVC, TM2 to DIN VDE 0281 part 1 and HD 21.1
- Colour grey (RAL 7001)
- With meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please note the cleanroom qualification when ordering.
- To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.
- **unscreened analogue type: JZ-500**, see page A 6

Application

For use as a data cable in control circuits, in tool-making and machine industries as well as a signal cable in computer systems and electronics. The more usual PVC inner sheath has been replaced in these cables by a stabilising foil separator, thus reducing the total diameter of the cables considerably and thereby reducing the bending radius, total weight etc. The high covering percentage of the copper screening offers interference-free signal transfer etc.

The dense screening assures disturbance-free transmission of all signals and impulses. An ideal disturbance-free control cable for the above application.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16320	2 x 0,5	5,7	35,0	45,0	20	16333	21 G 0,5	12,7	188,0	250,0	20
16321	3 G 0,5	5,9	42,0	55,0	20	16334	24 G 0,5	13,5	235,0	300,0	20
16322	4 G 0,5	6,4	47,0	61,0	20	16335	25 G 0,5	13,6	240,0	314,0	20
16323	5 G 0,5	6,9	56,0	74,0	20	16336	30 G 0,5	14,4	295,0	360,0	20
16324	6 G 0,5	7,6	67,0	89,0	20	16337	32 G 0,5	14,9	301,0	425,0	20
16325	7 G 0,5	7,6	69,0	98,0	20	16165	34 G 0,5	15,6	312,0	433,0	20
16326	8 G 0,5	8,7	80,0	117,0	20	16338	36 G 0,5	15,6	318,0	446,0	20
16327	10 G 0,5	9,6	94,0	135,0	20	16339	40 G 0,5	16,9	343,0	475,0	20
16328	12 G 0,5	9,7	108,0	157,0	20	16490	41 G 0,5	16,9	348,0	486,0	20
16329	14 G 0,5	10,2	116,0	190,0	20	16340	50 G 0,5	18,5	406,0	573,0	20
16330	16 G 0,5	11,0	129,0	210,0	20	16341	61 G 0,5	19,7	508,0	653,0	20
16331	18 G 0,5	11,5	145,0	217,0	20	16342	80 G 0,5	22,6	680,0	784,0	20
16332	20 G 0,5	12,2	172,0	240,0	20	16343	100 G 0,5	24,9	804,0	995,0	20

Continuation ▶

F-CY-JZ flexible, Cu-screened, EMC-preferred type, meter marking

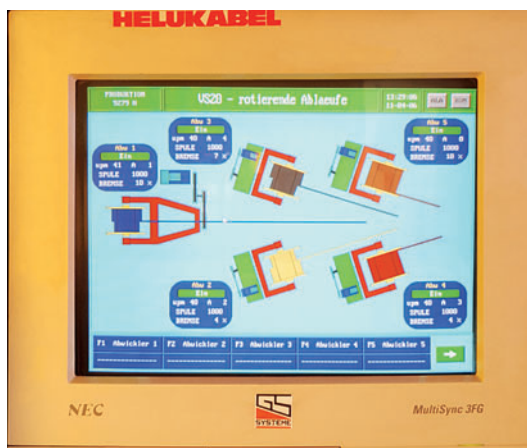


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Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16344	2 x 0,75	6,1	40,0	59,0	18
16345	3 G 0,75	6,3	52,0	66,0	-
16346	4 G 0,75	6,8	60,0	77,0	18
16347	5 G 0,75	7,4	71,0	93,0	18
16348	6 G 0,75	8,2	80,0	113,0	18
16349	7 G 0,75	8,2	91,0	130,0	18
16350	8 G 0,75	9,6	110,0	145,0	18
16351	10 G 0,75	10,3	137,0	180,0	18
16353	12 G 0,75	10,5	142,0	202,0	18
16354	14 G 0,75	11,3	180,0	225,0	18
16355	16 G 0,75	11,9	200,0	275,0	18
16356	18 G 0,75	12,7	212,0	292,0	18
16447	19 G 0,75	12,7	230,0	308,0	18
16357	20 G 0,75	13,3	238,0	320,0	18
16358	21 G 0,75	14,0	246,0	378,0	18
16359	24 G 0,75	14,9	270,0	435,0	18
16360	25 G 0,75	15,0	281,0	415,0	18
16361	27 G 0,75	15,0	304,0	435,0	18
16362	30 G 0,75	15,8	320,0	450,0	18
16363	32 G 0,75	16,7	342,0	484,0	18
16166	34 G 0,75	17,2	345,0	502,0	18
16364	36 G 0,75	17,2	350,0	535,0	18
16448	37 G 0,75	17,2	361,0	592,0	18
16365	40 G 0,75	18,6	369,0	610,0	18
16491	41 G 0,75	18,6	400,0	622,0	18
16366	50 G 0,75	20,3	461,0	777,0	18
16367	61 G 0,75	21,7	540,0	900,0	18
16368	80 G 0,75	24,8	711,0	1210,0	18
16369	100 G 0,75	27,6	900,0	1445,0	18
16370	2 x 1	6,4	50,0	65,0	17
16371	3 G 1	6,7	60,0	80,0	17
16372	4 G 1	7,2	71,0	98,0	17
16373	5 G 1	8,0	88,0	127,0	17
16374	6 G 1	8,7	97,0	144,0	17
16375	7 G 1	8,7	111,0	158,0	17
16376	8 G 1	10,1	127,0	197,0	17
16377	10 G 1	11,2	150,0	232,0	17
16378	12 G 1	11,4	184,0	260,0	17
16379	14 G 1	12,0	196,0	302,0	17
16380	16 G 1	12,8	209,0	346,0	17
16381	18 G 1	13,5	260,0	380,0	17
16352	19 G 1	13,5	280,0	412,0	17
16382	20 G 1	14,3	317,0	440,0	17
16383	24 G 1	16,0	320,0	493,0	17
16384	25 G 1	16,2	349,0	534,0	17
16439	27 G 1	16,2	400,0	562,0	17
16385	28 G 1	17,0	408,0	595,0	17
16386	30 G 1	17,0	441,0	616,0	17
16387	34 G 1	18,5	486,0	741,0	17
16446	37 G 1	18,5	519,0	790,0	17
16388	40 G 1	19,9	510,0	835,0	17
16492	41 G 1	19,9	531,0	843,0	17
16389	50 G 1	21,8	625,0	1025,0	17
16390	61 G 1	23,3	702,0	1205,0	17
16391	80 G 1	26,6	920,0	1445,0	17
16392	100 G 1	29,7	1120,0	1613,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16393	2 x 1,5	7,0	63,0	88,0	16
16394	3 G 1,5	7,5	80,0	100,0	16
16395	4 G 1,5	8,1	97,0	126,0	16
16396	5 G 1,5	9,0	119,0	160,0	16
16397	7 G 1,5	9,8	147,0	208,0	16
16398	8 G 1,5	11,4	170,0	244,0	16
16399	10 G 1,5	12,6	193,0	315,0	16
16400	12 G 1,5	12,8	267,0	338,0	16
16401	14 G 1,5	13,5	283,0	383,0	16
16402	16 G 1,5	14,4	315,0	424,0	16
16403	18 G 1,5	15,4	374,0	479,0	16
16449	19 G 1,5	15,4	386,0	508,0	16
16404	20 G 1,5	16,1	396,0	545,0	16
16405	21 G 1,5	17,0	425,0	560,0	16
16406	24 G 1,5	18,2	458,0	690,0	16
16407	25 G 1,5	18,4	526,0	705,0	16
16450	27 G 1,5	18,4	531,0	774,0	16
16408	28 G 1,5	19,1	541,0	810,0	16
16409	30 G 1,5	19,1	555,0	830,0	16
16410	35 G 1,5	20,8	645,0	890,0	16
16451	37 G 1,5	20,8	674,0	945,0	16
16411	40 G 1,5	22,6	725,0	1060,0	16
16493	41 G 1,5	22,6	801,0	1071,0	16
16412	50 G 1,5	24,7	885,0	1290,0	16
16413	61 G 1,5	26,4	1100,0	1705,0	16
16414	80 G 1,5	30,3	1324,0	2010,0	16
16415	100 G 1,5	33,6	1641,0	2505,0	16
16416	2 x 2,5	8,3	96,0	130,0	14
16417	3 G 2,5	9,0	144,0	167,0	14
16418	4 G 2,5	9,8	148,0	195,0	14
16419	5 G 2,5	10,9	181,0	223,0	14
16420	7 G 2,5	11,9	255,0	344,0	14
16421	10 G 2,5	15,5	340,0	460,0	14
16438	12 G 2,5	15,8	441,0	570,0	14
16452	18 G 2,5	18,9	570,0	681,0	14
16422	2 x 4	9,8	120,0	185,0	12
16423	3 G 4	10,6	174,0	240,0	12
16424	4 G 4	11,5	230,0	310,0	12
16425	5 G 4	12,7	273,0	385,0	12
16426	7 G 4	14,0	316,0	500,0	12
16427	2 x 6	11,7	173,0	268,0	10
16428	3 G 6	12,5	240,0	330,0	10
16429	4 G 6	13,8	305,0	415,0	10
16430	5 G 6	15,3	439,0	509,0	10
16431	7 G 6	16,9	505,0	672,0	10
16432	2 x 10	14,7	255,0	425,0	8
16433	3 G 10	15,7	350,0	500,0	8
16434	4 G 10	17,3	535,0	783,0	8
16435	5 G 10	19,2	592,0	856,0	8
16436	7 G 10	21,4	810,0	1305,0	8
16440	4 G 16	20,4	740,0	880,0	6
16437	5 G 16	22,6	895,0	1295,0	6
16441	4 G 25	24,9	1140,0	1570,0	4
16442	5 G 25	27,8	1380,0	1965,0	4
16443	4 G 35	28,4	1576,0	2070,0	2
16444	5 G 35	31,6	1930,0	2690,0	2
16445	4 G 50	34,6	2155,0	3015,0	1

Dimensions and specifications may be changed without prior notice. (RA01)



Process control for a large cabling machine at our Windsbach factory.

H05VVC4V5-K (NYSLYCYÖ-JZ) flexible, number coded, oil resistant, EMC-preferred type



Technical data

- Control cable, special PVC with oil resistant outer jacket to DIN VDE 0281 part 13, HD 21.13S1 and IEC 60227/74
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage**
core/core 2 kV, 5 min
core/screen 2 kV, 5 min
- **Breakdown voltage** min. 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Coupling resistance**
at 30 MHz ≤ 250 Ω/km
- **Minimum bending radius**
flexing 10x cable \varnothing
fixed installation 5x cable \varnothing
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire stranded conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 and IEC 60228 cl. 5
- Special PVC core insulation TI2 to DIN VDE 0281 part 1
- Black cores with white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC inner sheath, TM2 to DIN VDE 0281 part 1
- Tinned copper braided screening, covering approx. 85%
- Special PVC outer jacket, TM5 to DIN VDE 0281 part 1, HD 21.1.S4/A16
- Colour grey (RAL 7001)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Oil resistant to DIN EN 60811-2-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
H05VV5-F (NYSLYÖ-JZ), see page A 11

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air. These are designed as control and connecting cables to machines, tool machineries, conveyor belts and production lines. These cables are not effected to the chemical influences. Cables for moist and wet rooms, specially used for machines in breweries, bottling plants and car washing stations.

These cables may be allowed to move once installed provided that the cables are not mechanically stressed during movement. The interconnection of parts of machines used for manufacturing purposes including machine tools where some degree of protection against electromagnetic interference is required.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13951	2 x 0,5	8,0	41,0	92,0	20	13957	2 x 0,75	8,3	46,0	102,0	18
13060	3 G 0,5	8,4	45,0	109,0	20	13072	3 G 0,75	8,8	57,0	115,0	18
13061	4 G 0,5	9,1	54,0	126,0	20	13073	4 G 0,75	9,8	63,0	150,0	18
13062	5 G 0,5	10,1	66,0	156,0	20	13074	5 G 0,75	10,8	76,0	173,0	18
13063	6 G 0,5	10,7	73,0	176,0	20	13075	6 G 0,75	11,4	82,0	195,0	18
13064	7 G 0,5	11,4	79,0	192,0	20	13076	7 G 0,75	12,1	100,0	235,0	18
13952	8 G 0,5	12,5	82,0	211,0	20	13958	8 G 0,75	12,7	112,0	268,0	18
13065	9 G 0,5	12,5	94,0	230,0	20	13077	9 G 0,75	13,8	130,0	285,0	18
13066	12 G 0,5	13,5	137,0	280,0	20	13078	12 G 0,75	14,3	175,0	327,0	18
13953	14 G 0,5	14,2	142,0	302,0	20	13959	14 G 0,75	14,4	190,0	362,0	18
13067	18 G 0,5	15,8	156,0	384,0	20	13079	18 G 0,75	16,9	240,0	488,0	18
13068	25 G 0,5	18,6	250,0	556,0	20	13080	25 G 0,75	20,0	306,0	654,0	18
13954	27 G 0,5	18,6	255,0	599,0	20	13960	27 G 0,75	20,0	326,0	708,0	18
13069	34 G 0,5	20,8	316,0	634,0	20	13081	34 G 0,75	22,1	346,0	821,0	18
13955	36 G 0,5	20,8	320,0	620,0	20	13961	36 G 0,75	22,1	358,0	899,0	18
13129	41 G 0,5	23,0	348,0	770,0	20	13130	41 G 0,75	23,9	403,0	970,0	18
13070	50 G 0,5	25,0	407,0	970,0	20	13082	50 G 0,75	26,8	470,0	1160,0	18
13071	61 G 0,5	26,8	520,0	1072,0	20	13083	61 G 0,75	29,4	550,0	1402,0	18
13956	65 G 0,5	28,4	563,0	1198,0	20	13962	65 G 0,75	31,2	594,0	1504,0	18

Continuation ▶

H05VVC4V5-K (NYSLYCYÖ-JZ) flexible, number

coded, oil resistant, EMC-preferred type



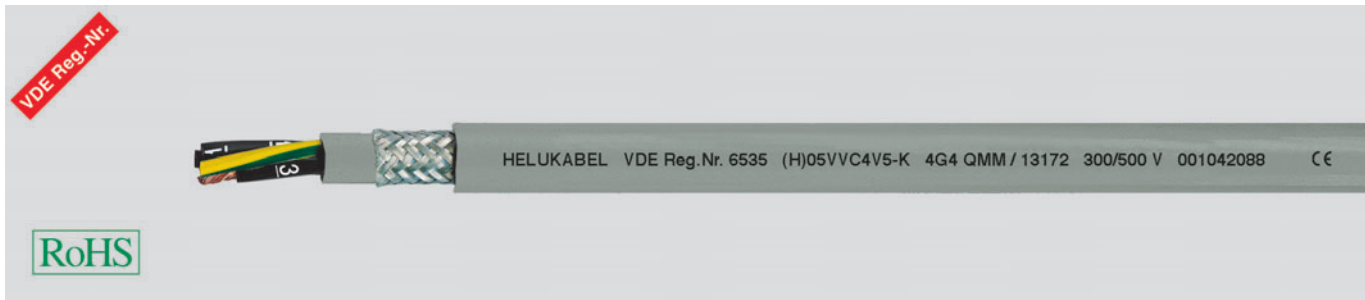
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Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13963	2 x 1	8,6	54,0	114,0	17
13084	3 G 1	9,3	64,0	142,0	17
13085	4 G 1	10,2	76,0	175,0	17
13086	5 G 1	11,0	89,0	205,0	17
13087	6 G 1	11,8	101,0	236,0	17
13088	7 G 1	12,9	114,0	264,0	17
13964	8 G 1	13,6	130,0	301,0	17
13089	9 G 1	14,4	144,0	335,0	17
13090	12 G 1	15,6	186,0	420,0	17
13965	14 G 1	15,7	198,0	433,0	17
13091	18 G 1	17,4	284,0	561,0	17
13966	19 G 1	17,4	307,0	584,0	17
13092	25 G 1	21,1	387,0	766,0	17
13967	27 G 1	21,9	410,0	822,0	17
13093	34 G 1	24,1	500,0	996,0	17
13968	36 G 1	23,8	511,0	1001,0	17
13969	37 G 1	25,1	523,0	1018,0	17
13131	41 G 1	26,0	578,0	1155,0	17
13094	50 G 1	28,5	681,0	1300,0	17
13095	61 G 1	30,1	710,0	1500,0	17
13970	65 G 1	32,4	769,0	1510,0	17
13971	2 x 1,5	9,1	64,0	146,0	16
13096	3 G 1,5	10,2	82,0	176,0	16
13097	4 G 1,5	10,9	99,0	207,0	16
13098	5 G 1,5	11,6	123,0	235,0	16
13099	6 G 1,5	12,4	125,0	279,0	16
13100	7 G 1,5	13,5	148,0	314,0	16
13972	8 G 1,5	15,6	172,0	345,0	16
13101	9 G 1,5	15,6	187,0	380,0	16
13102	12 G 1,5	16,8	274,0	500,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13973	14 G 1,5	18,3	294,0	560,0	16
13103	18 G 1,5	20,0	386,0	707,0	16
13974	19 G 1,5	20,4	394,0	723,0	16
13104	25 G 1,5	24,2	531,0	950,0	16
13975	27 G 1,5	24,6	546,0	1014,0	16
13105	32 G 1,5	26,0	638,0	1133,0	16
13106	34 G 1,5	26,3	671,0	1204,0	16
13976	36 G 1,5	27,7	700,0	1261,0	16
13977	37 G 1,5	27,7	720,0	1300,0	16
13132	41 G 1,5	29,1	840,0	1453,0	16
13107	50 G 1,5	34,0	997,0	1663,0	16
13108	61 G 1,5	36,5	1120,0	1852,0	16
13978	65 G 1,5	38,1	1197,0	1971,0	16
13985	2 x 2,5	11,4	110,0	190,0	14
13109	3 G 2,5	11,7	148,0	243,0	14
13110	4 G 2,5	12,8	169,0	280,0	14
13111	5 G 2,5	13,9	220,0	342,0	14
13112	7 G 2,5	15,9	284,0	439,0	14
13979	8 G 2,5	18,7	314,0	489,0	14
13113	12 G 2,5	20,6	470,0	760,0	14
13980	14 G 2,5	22,5	504,0	890,0	14
13114	18 G 2,5	24,3	572,0	1052,0	14
13115	25 G 2,5	29,0	740,0	1375,0	14
13981	27 G 2,5	29,8	971,0	1507,0	14
13116	34 G 2,5	33,0	1179,0	1892,0	14
13982	36 G 2,5	33,3	1268,0	1998,0	14
13983	41 G 2,5	36,0	1473,0	2286,0	14
13117	50 G 2,5	38,5	1660,0	2673,0	14
13118	61 G 2,5	42,0	1992,0	3085,0	14

Dimensions and specifications may be changed without prior notice. (RA01)

(H)05VVC4V5-K ((N)YSLYCYÖ-JZ) number coded, screened, oil resistant, EMC-preferred type



Technical data

- Control cable, special PVC with oil resistant outer jacket to DIN VDE 0281 part 13, HD 21.13S1 and IEC 60227/74
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage**
core/core 2 kV, 5 min
core/screen 2 kV, 5 min
- **Breakdown voltage** min. 4000 V
- **Insulation resistance**
min. 20 MΩ x km
- **Coupling resistance**
at 30 MHz ≤ 250 Ω/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire stranded conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 and IEC 60228 cl. 5
- Special PVC core insulation TI2 to DIN VDE 0281 part 1
- Black cores with white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC inner sheath, TM2 to DIN VDE 0281 part 1
- Tinned copper braided screening, covering approx. 85%
- Special PVC outer jacket, TM5 to DIN VDE 0281 part 1, HD 21.1.S4/A16
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Oil resistant to DIN EN 60811-2-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type: (H)05VV5-F ((N)YSLYÖ-JZ)**, see page A 13

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air. These are designed as control and connecting cables to machines, tool machineries, conveyor belts and production lines. These cables are not effected to the chemical influences. Cables for moist and wet rooms, specially used for machines in breweries, bottling plants and car washing stations.

These cables may be allowed to move once installed provided that the cables are not mechanically stressed during movement.

The interconnection of parts of machines used for manufacturing purposes including machine tools where some degree of protection against electromagnetic interference is required.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13170	2 x 4	12,5	124,0	236,0	12
13171	3 G 4	13,9	178,0	361,0	12
13172	4 G 4	15,7	234,0	430,0	12
13173	5 G 4	17,1	284,0	509,0	12
13175	7 G 4	20,5	321,0	660,0	12
13178	12 G 4	25,5	581,0	979,0	12
13179	2 x 6	14,6	176,0	296,0	10
13180	3 G 6	15,7	245,0	420,0	10
13181	4 G 6	17,3	316,0	579,0	10
13182	5 G 6	19,5	442,0	719,0	10
13183	7 G 6	23,1	530,0	1031,0	10
13185	3 G 10	19,9	367,0	655,0	8
13186	4 G 10	22,0	549,0	894,0	8
13187	5 G 10	24,6	604,0	927,0	8
13188	7 G 10	29,5	820,0	1518,0	8

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13190	3 G 16	22,9	653,0	993,0	6
13191	4 G 16	25,5	807,0	1340,0	6
13192	5 G 16	27,9	940,0	1626,0	6
13193	7 G 16	33,9	1345,0	2080,0	6
13196	4 G 25	31,6	1169,0	1692,0	4
13197	5 G 25	35,1	1420,0	1972,0	4
13198	3 G 35	31,1	1250,0	1704,0	2
13199	4 G 35	34,4	1680,0	2320,0	2
13189	5 G 35	37,4	2020,0	2780,0	2
13194	3 G 50	36,9	1887,0	2661,0	1
13195	4 G 50	40,3	2370,0	3194,0	1
13184	5 G 50	44,9	2880,0	4247,0	1

Dimensions and specifications may be changed without prior notice. (RA01)



Technical data

- Special PVC control cables, adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Mutual capacitance** according to different cross-sections
0,5 mm² to 2,5 mm²:
core/core approx. 150 nF/km
core/screen approx. 270 nF/km
- **Coupling resistance**
max. 250 Ωm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 part 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with continuous white numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC inner sheath
- Tinned copper, braided screen, approx. 85% coverage
- Transparent special PVC outer sheath
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **unscreened analogue type: JZ-500**, see page A 6

Application

For use as a data and control cable in machinery, computer systems etc. as well as a signal cable for electronics. The high level of screening ensures a high degree of interference protection. The screening density assures disturbancefree transmission of all signals and impulses. The PVC-inner sheaths of those cables raise the mechanical stress. The applied clear transparent PVC outer sheath accentuates the optical view of the tinned copper braid.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16200	2 x 0,5	7,1	41,0	67,0	20
16169	3 x 0,5	7,2	45,0	83,0	20
16201	3 G 0,5	7,4	45,0	83,0	20
16202	4 G 0,5	8,0	54,0	94,0	20
16170	4 x 0,5	7,8	54,0	94,0	20
16203	5 G 0,5	8,5	66,0	108,0	20
16171	5 x 0,5	8,3	66,0	108,0	20
16204	6 G 0,5	9,3	73,0	125,0	20
16205	7 G 0,5	9,3	79,0	136,0	20
17172	7 x 0,5	9,5	79,0	136,0	20
16206	8 G 0,5	9,8	82,0	150,0	20
16207	10 G 0,5	10,9	107,0	170,0	20
16208	12 G 0,5	11,6	137,0	195,0	20
16209	14 G 0,5	12,4	142,0	223,0	20
16210	16 G 0,5	12,9	147,0	250,0	20
16211	18 G 0,5	13,5	156,0	277,0	20
16212	20 G 0,5	14,2	173,0	310,0	20
16315	21 G 0,5	14,2	189,0	331,0	20
16213	24 G 0,5	15,6	236,0	390,0	20
16214	25 G 0,5	15,6	250,0	407,0	20
16215	30 G 0,5	16,4	297,0	520,0	20
16216	32 G 0,5	17,1	312,0	550,0	20
16217	36 G 0,5	17,9	320,0	585,0	20
16218	40 G 0,5	18,4	345,0	654,0	20
16453	41 G 0,5	19,1	348,0	671,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16219	50 G 0,5	20,9	407,0	740,0	20
16220	61 G 0,5	22,4	520,0	850,0	20
16221	80 G 0,5	25,2	690,0	1080,0	20
16222	100 G 0,5	28,4	805,0	1350,0	20
16223	2 x 0,75	7,7	46,0	87,0	18
16224	3 G 0,75	8,0	57,0	98,0	18
16173	3 x 0,75	7,8	57,0	98,0	18
16225	4 G 0,75	8,5	63,0	113,0	18
16196	4 x 0,75	8,3	63,0	113,0	18
16226	5 G 0,75	9,3	76,0	130,0	18
16174	5 x 0,75	9,1	76,0	130,0	18
16227	6 G 0,75	9,9	82,0	156,0	18
16228	7 G 0,75	10,1	100,0	184,0	18
16175	7 x 0,75	10,4	100,0	184,0	18
16229	8 G 0,75	10,6	112,0	221,0	18
16230	10 G 0,75	11,7	140,0	270,0	18
16231	12 G 0,75	12,7	175,0	292,0	18
16232	14 G 0,75	13,3	190,0	315,0	18
16233	16 G 0,75	14,1	204,0	335,0	18
16234	18 G 0,75	14,9	240,0	358,0	18
16235	20 G 0,75	15,4	262,0	420,0	18
16316	21 G 0,75	15,4	274,0	454,0	18
16236	24 G 0,75	17,3	291,0	480,0	18
16237	25 G 0,75	17,3	306,0	508,0	18
16238	27 G 0,75	17,7	326,0	535,0	18
16239	30 G 0,75	18,5	340,0	640,0	18

Continuation ▶

Y-CY-JZ flexible, CU-screened, transparent, EMC-preferred type, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16240	32 G 0,75	19,1	349,0	688,0	18
16241	36 G 0,75	19,9	358,0	730,0	18
16242	40 G 0,75	20,6	371,0	950,0	18
16454	41 G 0,75	21,2	403,0	971,0	18
16243	50 G 0,75	23,2	470,0	1100,0	18
16244	61 G 0,75	25,0	550,0	1290,0	18
16245	80 G 0,75	28,3	715,0	1510,0	18
16246	100 G 0,75	31,6	910,0	1640,0	18
16248	2 x 1	8,0	54,0	97,0	17
16249	3 G 1	8,3	64,0	103,0	17
16176	3 x 1	8,2	64,0	103,0	17
16250	4 G 1	9,0	76,0	146,0	17
16177	4 x 1	8,9	76,0	146,0	17
16251	5 G 1	9,7	89,0	169,0	17
16178	5 x 1	9,5	89,0	169,0	17
16252	6 G 1	10,3	101,0	199,0	17
16253	7 G 1	10,5	114,0	219,0	17
16179	7 x 1	11,0	114,0	219,0	17
16254	8 G 1	11,2	130,0	270,0	17
16255	10 G 1	12,5	156,0	330,0	17
16256	12 G 1	13,3	186,0	350,0	17
16257	14 G 1	14,1	198,0	400,0	17
16258	16 G 1	14,8	214,0	422,0	17
16259	18 G 1	15,6	284,0	514,0	17
16260	20 G 1	16,3	325,0	545,0	17
16261	24 G 1	18,2	366,0	640,0	17
16262	25 G 1	18,4	387,0	689,0	17
16263	28 G 1	19,2	421,0	710,0	17
16264	30 G 1	19,6	457,0	762,0	17
16265	34 G 1	20,9	500,0	910,0	17
16266	40 G 1	21,5	536,0	1070,0	17
16455	41 G 1	22,2	578,0	1092,0	17
16267	50 G 1	25,4	681,0	1315,0	17
16268	61 G 1	26,1	710,0	1370,0	17
16269	80 G 1	29,8	940,0	1610,0	17
16270	100 G 1	34,2	1180,0	1840,0	17
16271	2 x 1,5	8,6	64,0	130,0	16
16272	3 G 1,5	9,2	82,0	152,0	16
16180	3 x 1,5	9,0	82,0	152,0	16
16273	4 G 1,5	9,8	99,0	168,0	16
16181	4 x 1,5	9,6	99,0	168,0	16
16274	5 G 1,5	10,8	123,0	202,0	16
16182	5 x 1,5	10,5	123,0	202,0	16
16275	7 G 1,5	11,7	148,0	304,0	16
16183	7 x 1,5	12,1	148,0	304,0	16
16276	8 G 1,5	12,6	172,0	336,0	16
16277	10 G 1,5	13,8	198,0	420,0	16
16278	12 G 1,5	14,9	274,0	434,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16279	14 G 1,5	15,8	294,0	480,0	16
16280	16 G 1,5	16,7	318,0	525,0	16
16281	18 G 1,5	17,4	386,0	640,0	16
16282	20 G 1,5	18,5	401,0	690,0	16
16317	21 G 1,5	18,5	447,0	720,0	16
16283	24 G 1,5	20,4	487,0	770,0	16
16284	25 G 1,5	20,6	531,0	805,0	16
16285	28 G 1,5	21,6	562,0	900,0	16
16286	30 G 1,5	21,6	598,0	950,0	16
16287	35 G 1,5	23,2	685,0	1100,0	16
16288	40 G 1,5	25,0	759,0	1350,0	16
16456	41 G 1,5	25,0	840,0	1381,0	16
16289	50 G 1,5	27,4	997,0	1675,0	16
16290	61 G 1,5	29,2	1120,0	1800,0	16
16291	80 G 1,5	33,4	1360,0	2300,0	16
16292	100 G 1,5	37,6	1690,0	2600,0	16
16293	2 x 2,5	10,1	110,0	180,0	14
16294	3 G 2,5	10,8	148,0	216,0	14
16295	4 G 2,5	11,5	169,0	267,0	14
16296	5 G 2,5	12,8	220,0	347,0	14
16297	7 G 2,5	14,1	284,0	407,0	14
16298	10 G 2,5	16,4	369,0	660,0	14
16318	12 G 2,5	17,9	470,0	722,0	14
16299	2 x 4	11,8	124,0	302,0	12
16300	3 G 4	12,5	178,0	340,0	12
16301	4 G 4	13,7	234,0	410,0	12
16302	5 G 4	15,0	284,0	502,0	12
16303	7 G 4	16,4	321,0	638,0	12
16304	2 x 6	13,7	176,0	350,0	10
16305	3 G 6	14,4	245,0	450,0	10
16306	4 G 6	15,7	316,0	559,0	10
16307	5 G 6	17,3	442,0	702,0	10
16308	7 G 6	19,0	530,0	907,0	10
16309	2 x 10	16,6	260,0	500,0	8
16310	3 G 10	17,6	367,0	750,0	8
16311	4 G 10	19,4	549,0	1020,0	8
16312	5 G 10	21,3	604,0	1115,0	8
16313	7 G 10	23,6	820,0	1500,0	8
16460	4 G 16	23,4	807,0	1380,0	6
16314	5 G 16	26,0	940,0	1553,0	6
16461	4 G 25	28,3	1169,0	1890,0	4
16462	5 G 25	31,5	1420,0	2270,0	4
16463	4 G 35	32,4	1680,0	2390,0	2
16464	5 G 35	36,5	2020,0	2885,0	2
16465	4 G 50	38,6	2370,0	3315,0	1
16157	5 G 50	43,0	2880,0	4150,0	1
16466	4 G 70	46,1	3257,0	4600,0	2/0
16158	5 G 70	50,9	4032,0	5750,0	2/0
16467	4 G 95	51,1	4060,0	6060,0	3/0
16159	5 G 95	56,0	5244,0	7580,0	3/0
16468	4 G 120	56,5	5231,0	7315,0	4/0
16160	5 G 120	62,1	6624,0	9150,0	4/0
16167	4 G 150	64,6	7760,0	9680,0	300 kcmil
16168	5 G 150	70,6	8496,0	10170,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RA01)



Technical data

- Special PVC control cable in accordance to DIN VDE 0281, 0293, 0295
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 20x cable ø
fixed installation 6x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 part 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC inner jacket
- Galvanized steel wire braid
- Special PVC outer jacket
- Colour transparent (also available in grey)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) for outer jacket grey
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- Further dimensions available on request.
- These cables can be also delivered with coloured conductors (SY-JB).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **screened analogue type: SY-JB**, see page A 40

Application

SY-JZ cables are used as measuring and control cables in tool machinery, plant installation, power stations and in data equipment. The braided screen offers best possible protection against mechanical damage. The galvanized coating on the steel wire braiding not only helps protect against corrosion, but also notably improves the soldering performance.

The clear transparent outer sheath gives the cable in addition an optical reevaluation.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12001	2 x 0,5	7,3	9,6	80,0	20	12027	18 G 0,75	15,0	130,0	388,0	18
12002	3 G 0,5	7,6	14,4	92,0	20	12028	21 G 0,75	15,5	151,0	474,0	18
12003	4 G 0,5	8,2	19,2	102,0	20	12029	25 G 0,75	17,3	180,0	503,0	18
12004	5 G 0,5	8,9	24,0	119,0	20	12030	32 G 0,75	19,1	230,0	644,0	18
12005	7 G 0,5	9,5	33,6	157,0	20	12031	34 G 0,75	19,9	245,0	663,0	18
12006	10 G 0,5	11,1	48,0	205,0	20	12032	41 G 0,75	21,2	296,0	741,0	18
12007	12 G 0,5	11,8	58,0	218,0	20	12033	50 G 0,75	23,2	360,0	925,0	18
12008	14 G 0,5	12,5	67,0	242,0	20	12034	61 G 0,75	25,2	439,0	1082,0	18
12009	18 G 0,5	13,6	86,0	340,0	20	12035	2 x 1	8,2	19,2	112,0	17
12010	21 G 0,5	14,3	101,0	370,0	20	12036	3 G 1	8,5	28,8	132,0	17
12114	25 G 0,5	15,7	120,0	406,0	20	12037	4 G 1	9,2	38,4	143,0	17
12012	30 G 0,5	16,4	144,0	439,0	20	12038	5 G 1	9,9	48,0	166,0	17
12013	35 G 0,5	17,9	168,0	500,0	20	12039	6 G 1	10,5	58,0	22,0	17
12014	40 G 0,5	18,4	192,0	565,0	20	12040	7 G 1	10,7	67,0	227,0	17
12015	42 G 0,5	19,1	202,0	593,0	20	12041	8 G 1	11,3	77,0	277,0	17
12016	50 G 0,5	20,9	240,0	690,0	20	12042	9 G 1	12,6	86,0	295,0	17
12017	61 G 0,5	22,4	293,0	843,0	20	12043	12 G 1	13,4	115,0	340,0	17
12018	80 G 0,5	25,4	384,0	1050,0	20	12044	14 G 1	14,2	134,0	420,0	17
12011	100 G 0,5	28,6	480,0	1240,0	20	12045	18 G 1	15,7	173,0	500,0	17
12019	2 x 0,75	7,9	14,4	98,0	18	12046	20 G 1	16,3	192,0	532,0	17
12020	3 G 0,75	8,2	21,6	103,0	18	12047	25 G 1	18,4	240,0	664,0	17
12021	4 G 0,75	8,7	28,8	122,0	18	12048	34 G 1	20,9	326,0	845,0	17
12022	5 G 0,75	9,5	36,0	142,0	18	12049	36 G 1	20,9	346,0	857,0	17
12112	6 G 0,75	10,1	43,2	180,0	18	12050	41 G 1	22,2	394,0	993,0	17
12023	7 G 0,75	10,3	50,0	185,0	18	12051	50 G 1	24,4	480,0	1112,0	17
12188	8 G 0,75	10,8	57,6	201,0	18	12052	56 G 1	25,5	538,0	1225,0	17
12024	9 G 0,75	11,8	65,0	249,0	18	12053	61 G 1	26,3	586,0	1306,0	17
12113	10 G 0,75	11,8	72,0	252,0	18	12054	65 G 1	26,9	624,0	1504,0	17
12025	12 G 0,75	12,8	86,0	292,0	18	12055	80 G 1	30,0	768,0	1750,0	17
12026	15 G 0,75	14,2	108,0	335,0	18	12056	100 G 1	34,6	960,0	1950,0	17

Continuation ▶

SY-JZ flexible, number coded, with steel wire braiding, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12057	2 x 1,5	8,8	29,0	129,0	16
12058	3 G 1,5	9,4	43,0	149,0	16
12059	4 G 1,5	10,0	58,0	185,0	16
12060	5 G 1,5	10,9	72,0	205,0	16
12109	6 G 1,5	11,8	87,0	255,0	16
12061	7 G 1,5	11,8	101,0	285,0	16
12062	8 G 1,5	12,7	115,0	340,0	16
12063	9 G 1,5	13,9	130,0	347,0	16
12064	10 G 1,5	13,9	144,0	418,0	16
12065	11 G 1,5	15,0	158,0	430,0	16
12066	12 G 1,5	15,0	173,0	444,0	16
12067	14 G 1,5	15,8	202,0	535,0	16
12068	18 G 1,5	17,4	259,0	593,0	16
12069	25 G 1,5	20,6	360,0	781,0	16
12070	32 G 1,5	22,3	461,0	1015,0	16
12071	34 G 1,5	23,2	490,0	1124,0	16
12072	42 G 1,5	25,2	605,0	1401,0	16
12073	50 G 1,5	27,6	720,0	1583,0	16
12074	61 G 1,5	29,4	878,0	1810,0	16
12075	80 G 1,5	33,8	1152,0	2316,0	16
12076	100 G 1,5	38,0	1440,0	2900,0	16
12077	2 x 2,5	10,2	48,0	185,0	14
12078	3 G 2,5	10,9	72,0	248,0	14
12079	4 G 2,5	11,6	96,0	290,0	14
12080	5 G 2,5	12,9	120,0	347,0	14
12081	7 G 2,5	14,2	168,0	420,0	14
12082	12 G 2,5	17,7	288,0	660,0	14
12083	14 G 2,5	18,8	336,0	750,0	14
12084	18 G 2,5	21,0	432,0	893,0	14
12085	20 G 2,5	22,1	480,0	1169,0	14
12086	25 G 2,5	24,4	600,0	1458,0	14
12087	30 G 2,5	26,0	720,0	1686,0	14
12088	34 G 2,5	28,4	816,0	1869,0	14
12089	50 G 2,5	34,0	1200,0	2200,0	14
12090	61 G 2,5	36,3	1464,0	3000,0	14

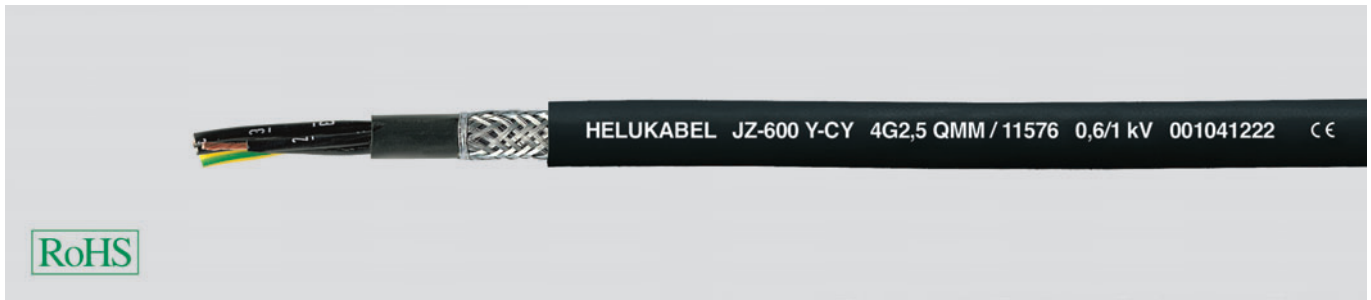
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12115	3 G 4	12,6	117,0	350,0	12
12091	4 G 4	13,8	154,0	428,0	12
12092	5 G 4	15,1	192,0	504,0	12
12093	7 G 4	16,4	269,0	640,0	12
12094	11 G 4	21,2	422,0	1204,0	12
12095	4 G 6	15,8	230,0	571,0	10
12096	5 G 6	17,3	288,0	671,0	10
12097	7 G 6	19,0	403,0	845,0	10
12098	4 G 10	19,4	384,0	943,0	8
12099	5 G 10	21,3	480,0	1065,0	8
12100	7 G 10	23,6	672,0	1551,0	8
12101	4 G 16	23,8	614,0	1360,0	6
12102	5 G 16	26,6	768,0	1740,0	6
12103	7 G 16	29,2	1075,0	2166,0	6
12104	4 G 25	29,3	960,0	2020,0	4
12105	5 G 25	32,5	1200,0	2465,0	4
12106	4 G 35	33,4	1344,0	2570,0	2
12107	5 G 35	37,1	1680,0	3185,0	2
12108	4 G 50	39,8	1920,0	3513,0	1
12116	5 G 50	44,1	2400,0	4248,0	1
12111	4 G 70	46,3	2688,0	4810,0	2/0
12117	5 G 70	50,9	3360,0	5880,0	2/0
12110	4 G 95	51,4	3648,0	6360,0	3/0
12118	5 G 95	56,5	4560,0	8071,0	3/0
12119	4 G 120	56,6	4608,0	8170,0	4/0
12327	4 G 150	64,3	5760,0	9970,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RA01)

JZ-600-Y-CY flexible, number coded, 0,6/1kV, Cu screened meter marking, EMC-preferred type



A



Technical data

- In accordance to DIN VDE 0262/12.95 and DIN VDE 0281 part 13
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage** U₀/U 0,6/1 kV
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Power rating**
according to DIN VDE 0298
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ohm/km
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 part 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Black cores with sequential numbering imprinted in white, according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- PVC-insulated inner sheath
- Braided screen of tinned Cu wires, coverage approx. 85%
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV resistant

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Further sizes are available upon request.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
JZ-600, see page A 16

Application

Wiring cable for measuring and controlling purposes in tool machinery, conveyor belts and production lines, for plant installations, air conditioning and in steel production plants and rolling mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation). Is not suitable to be used as direct burial- or as underwater cable. The cores have been numbered in such a way that the numbers are easily identifiable, even if the cable has only been stripped back a few cm. The core numbers have been underlined to avoid confusion. The earth core is located in the outer layer. The black, special PVC outer sheath is resistant to the ultra violet radiation. Mainly used in South-European, Eastern and Arabian countries. Interference-free transmission of signals and pulses is assured by the high degree of screening.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11464	2 x 0,5	8,5	41,0	129,0	20
11465	3 G 0,5	8,8	45,0	150,0	20
11466	4 G 0,5	9,6	54,0	170,0	20
11467	5 G 0,5	10,2	66,0	199,0	20
11469	7 G 0,5	11,1	79,0	235,0	20
11472	12 G 0,5	14,0	137,0	320,0	20
11475	18 G 0,5	16,2	156,0	428,0	20
11478	25 G 0,5	19,1	250,0	503,0	20
11489	2 x 0,75	8,8	46,0	143,0	18
11490	3 G 0,75	9,3	57,0	155,0	18
11491	4 G 0,75	9,9	63,0	190,0	18
11492	5 G 0,75	10,8	76,0	228,0	18
11494	7 G 0,75	11,5	100,0	323,0	18
11498	12 G 0,75	14,8	175,0	410,0	18
11501	18 G 0,75	17,1	240,0	560,0	18
11504	25 G 0,75	20,2	306,0	730,0	18

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11516	2 x 1	9,4	54,0	150,0	17
11517	3 G 1	9,8	64,0	163,0	17
11518	4 G 1	10,6	76,0	200,0	17
11519	5 G 1	11,4	89,0	239,0	17
11521	7 G 1	12,5	114,0	289,0	17
11525	12 G 1	15,7	186,0	464,0	17
11528	18 G 1	18,4	284,0	628,0	17
11532	25 G 1	21,6	387,0	855,0	17
11546	2 x 1,5	10,6	64,0	162,0	16
11547	3 G 1,5	11,1	82,0	187,0	16
11548	4 G 1,5	11,8	99,0	240,0	16
11549	5 G 1,5	13,1	123,0	289,0	16
11551	7 G 1,5	14,2	148,0	383,0	16
11556	12 G 1,5	18,1	274,0	592,0	16
11559	18 G 1,5	21,4	386,0	806,0	16
11563	25 G 1,5	24,9	531,0	1241,0	16

Continuation ▶

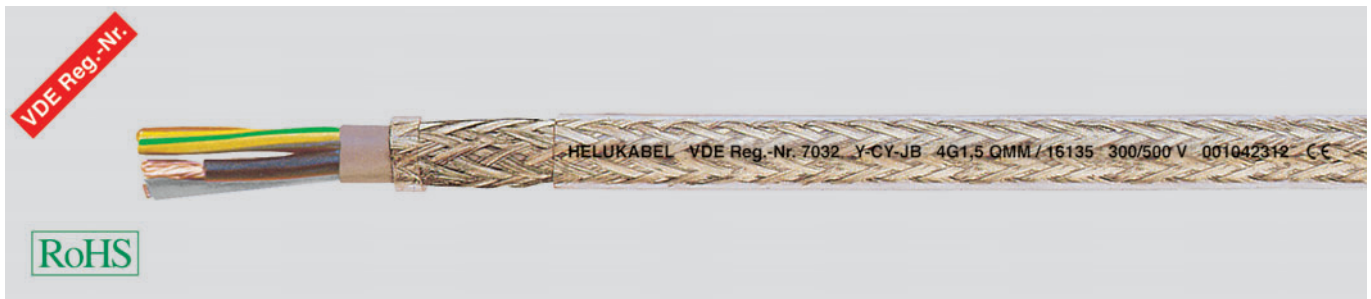
JZ-600-Y-CY flexible, number coded, 0,6/1kV, Cu screened meter marking, EMC-preferred type



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11574	2 x 2,5	12,1	110,0	272,0	14
11575	3 G 2,5	12,7	148,0	298,0	14
11576	4 G 2,5	13,8	169,0	345,0	14
11577	5 G 2,5	15,1	220,0	427,0	14
11578	7 G 2,5	16,6	284,0	561,0	14
11580	12 G 2,5	21,3	470,0	857,0	14
11582	18 G 2,5	25,4	572,0	1355,0	14
11584	25 G 2,5	29,6	740,0	1995,0	14
11590	2 x 4	13,8	124,0	306,0	12
11591	3 G 4	14,4	178,0	391,0	12
11592	4 G 4	15,7	234,0	527,0	12
11593	5 G 4	17,3	284,0	700,0	12
11594	7 G 4	19,0	321,0	920,0	12
11596	12 G 4	24,4	581,0	1510,0	12
11597	2 x 6	15,2	176,0	420,0	10
11598	3 G 6	15,9	245,0	629,0	10
11599	4 G 6	17,3	316,0	731,0	10
11600	5 G 6	19,2	442,0	1105,0	10
11601	7 G 6	21,0	530,0	1465,0	10
11602	2 x 10	18,6	260,0	845,0	8
11603	3 G 10	19,7	367,0	1125,0	8
11604	4 G 10	21,5	549,0	1345,0	8
11605	5 G 10	23,7	604,0	1635,0	8
11606	7 G 10	26,0	820,0	2210,0	8
11607	2 x 16	22,4	491,0	1150,0	6

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11608	3 G 16	23,7	653,0	1395,0	6
11609	4 G 16	26,1	807,0	1870,0	6
11610	5 G 16	29,0	940,0	2720,0	6
11611	7 G 16	31,8	1345,0	3213,0	6
11612	3 G 25	28,7	920,0	2465,0	4
11613	4 G 25	31,7	1169,0	2750,0	4
11614	5 G 25	35,0	1420,0	3490,0	4
11615	7 G 25	38,4	1921,0	4980,0	4
11616	3 G 35	31,2	1250,0	3250,0	2
11617	4 G 35	34,5	1680,0	4100,0	2
11618	5 G 35	38,1	2020,0	4950,0	2
11619	3 G 50	36,9	1887,0	4590,0	1
11620	4 G 50	40,7	2370,0	5780,0	1
11621	5 G 50	45,2	2880,0	7210,0	1
11622	3 G 70	41,8	2516,0	5610,0	2/0
11623	4 G 70	46,0	3257,0	7480,0	2/0
11624	5 G 70	50,4	4032,0	9390,0	2/0
11625	3 G 95	46,8	3086,0	8585,0	3/0
11626	4 G 95	51,3	4060,0	10220,0	3/0
11627	5 G 95	56,4	5244,0	13800,0	3/0
11628	3 G 120	51,9	4176,0	11105,0	4/0
11629	4 G 120	56,4	5231,0	13750,0	4/0
13137	4 G 150	64,3	7760,0	15990,0	300 kcmil
13147	4 G 185	67,5	8104,0	18470,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RA01)



Technical data

- Special PVC control cable in accordance to E DIN VDE 0281 part 13
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
U₀/U 300/500 V to 1,5 mm²
U₀/U 450/750 V at 2,5 mm²
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Mutual capacitance** according to different cross-sections
0,5 mm² to 2,5 mm²:
core/core approx. 150 nF/km
core/screen approx. 270 nF/km
- **Coupling resistance**
max. 250 Ohm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 part 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Core colour coded to JB/OB colour code
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC inner sheath
- Tinned copper, braided screen, approx. 85% coverage
- Transparent special PVC outer sheath
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OB).
- by 5 cores with VDE-Reg. No.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
JB-500, see page A 21
JB-750, see page A 22

Application

For use as a data and control cable in machinery, computer systems etc. as well as a signal cable for electronics. The high level of screening ensures a high degree of interference protection. The screening density assures disturbance-free transmission of all signals and impulses. The PVC-inner sheaths of those cables raise the mechanical stress. The applied clear transparent PVC outer sheath accentuates the optical view of the tinned copper braid. These cables are suitable for flexible use for medium mechanical stresses with free movements. The dense screening assures disturbance-free transmission of all signals and impulses. An ideal disturbance-free control cable for the above application.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16121	2 x 0,5	7,1	41,0	67,0	20	16137	2 x 2,5	11,3	110,0	180,0	14
16122	3 G 0,5	7,4	45,0	83,0	20	16138	3 G 2,5	11,8	148,0	216,0	14
16123	4 G 0,5	8,0	54,0	94,0	20	16139	4 G 2,5	12,7	169,0	267,0	14
16124	5 G 0,5	8,5	66,0	108,0	20	16140	5 G 2,5	14,1	220,0	347,0	14
16125	2 x 0,75	7,7	46,0	87,0	18	16141	2 x 4	13,4	124,0	302,0	12
16126	3 G 0,75	8,0	57,0	98,0	18	16142	3 G 4	14,2	178,0	340,0	12
16127	4 G 0,75	8,5	63,0	113,0	18	16143	4 G 4	15,3	234,0	410,0	12
16128	5 G 0,75	9,3	76,0	130,0	18	16144	5 G 4	16,8	284,0	502,0	12
16129	2 x 1	8,0	54,0	97,0	17	16145	2 x 6	14,7	176,0	350,0	10
16130	3 G 1	8,3	64,0	103,0	17	16146	3 G 6	15,4	245,0	450,0	10
16131	4 G 1	9,0	76,0	146,0	17	16147	4 G 6	16,8	316,0	559,0	10
16132	5 G 1	9,7	89,0	169,0	17	16148	5 G 6	18,6	442,0	702,0	10
16133	2 x 1,5	8,6	64,0	130,0	16	16149	2 x 10	18,0	260,0	500,0	8
16134	3 G 1,5	9,2	82,0	152,0	16	16150	3 G 10	19,1	367,0	750,0	8
16135	4 G 1,5	9,8	99,0	168,0	16	16151	4 G 10	21,1	549,0	1020,0	8
16136	5 G 1,5	10,8	123,0	202,0	16	16152	5 G 10	23,3	604,0	1115,0	8

Continuation ▶

Y-CY-JB flexible, CU-screened, transparent, EMC-preferred type, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16153	4 G 16	25,3	807,0	1380,0	6
16154	5 G 16	28,2	940,0	1553,0	6
16469	4 G 25	31,2	1169,0	1890,0	4
16155	5 G 25	34,5	1420,0	2270,0	4
16470	4 G 35	33,8	1680,0	2390,0	2
16156	5 G 35	37,5	2020,0	2885,0	2

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16471	4 G 50	40,2	2370,0	3315,0	1
16119	5 G 50	44,8	2880,0	4150,0	1
16472	4 G 70	45,9	3257,0	4600,0	2/0
16473	4 G 95	51,3	4060,0	6060,0	3/0
16474	4 G 120	56,5	5231,0	7315,0	4/0
16247	4 G 150	64,6	7760,0	9340,0	300 kcmil
16319	4 G 185	67,4	8104,0	11120,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RA01)

Conduits

Corrugated tubes

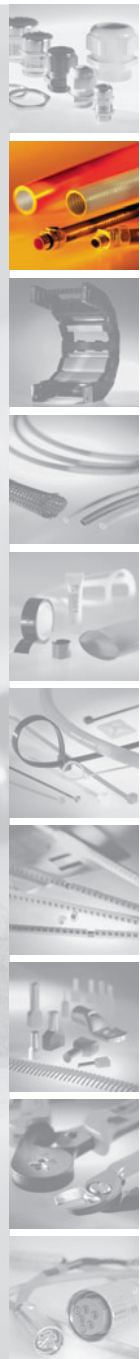
- for standard applications
- for larger sizes
- scissile corrugated tubes
- conduit glands

High flexible conduits

- plastic conduits with spiral spring
- metal conduits
- conduits glands

Conduit for heavy mechanical duty

- metal conduits with plastic sheat
- plastic conduits
- conduits glands for metal conduits



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Technical data

- Special PVC control cables
- Adapted to DIN VDE 0281, 0293, 0295
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
U₀/U 300/500 V up to 2,5 mm²
U₀/U 450/750 V as of 4,0 mm²
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 20x cable ø
fixed installation 6x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 part 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Cores colour coded as per JB/OB colour code, see Technical Informations
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC inner jacket
- Galvanized steel wire screening
- Special PVC outer jacket
- Colour transparent (also available in grey)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OB).
- Further dimensions available on request.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please note the cleanroom qualification when ordering.
- **screened analogue type: SY-JZ**, see page A 34

Application

SY-JB cables are used as measuring and control cables in tool machinery, plant installation, power stations and in data equipment. The braided screen offers best possible protection against mechanical damage. The galvanized coating on the steel wire braiding not only helps protect against corrosion, but also notably improves the soldering performance.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12200	2 x 0,5	7,3	9,6	80,0	20	12277	2 x 2,5	10,2	48,0	185,0	14
12201	3 G 0,5	7,6	14,4	92,0	20	12278	3 G 2,5	10,9	72,0	248,0	14
12202	4 G 0,5	8,2	19,2	102,0	20	12279	4 G 2,5	11,6	96,0	290,0	14
12203	5 G 0,5	8,9	24,0	119,0	20	12280	5 G 2,5	12,9	120,0	347,0	14
12204	7 G 0,5	9,5	33,6	157,0	20	12281	7 G 2,5	14,2	168,0	420,0	14
12205	10 G 0,5	11,1	48,0	205,0	20	12282	12 G 2,5	17,7	288,0	660,0	14
12206	12 G 0,5	11,8	58,0	218,0	20	12291	2 x 4	13,5	77,0	330,0	12
12218	2 x 0,75	7,9	14,4	98,0	18	12318	3 G 4	14,3	115,0	375,0	12
12219	3 G 0,75	8,2	21,6	103,0	18	12292	4 G 4	15,4	154,0	428,0	12
12220	4 G 0,75	8,7	28,8	122,0	18	12293	5 G 4	16,9	192,0	504,0	12
12221	5 G 0,75	9,5	36,0	142,0	18	12294	7 G 4	16,4	269,0	640,0	12
12312	6 G 0,75	10,1	43,2	180,0	18	12295	3 G 6	15,5	173,0	543,0	10
12222	7 G 0,75	10,3	50,0	185,0	18	12296	4 G 6	16,9	230,0	571,0	10
12223	9 G 0,75	11,8	65,0	249,0	18	12297	5 G 6	18,6	288,0	671,0	10
12313	10 G 0,75	11,8	72,0	252,0	18	12298	7 G 6	20,6	403,0	845,0	10
12224	12 G 0,75	12,8	86,0	292,0	18	12319	3 G 10	19,1	288,0	735,0	8
12234	2 x 1	8,2	19,2	112,0	17	12299	4 G 10	21,1	384,0	943,0	8
12235	3 G 1	8,5	28,8	132,0	17	12300	5 G 10	23,3	480,0	1065,0	8
12236	4 G 1	9,2	38,4	143,0	17	12301	7 G 10	25,4	672,0	1551,0	8
12237	5 G 1	9,9	48,0	166,0	17	12320	3 G 16	23,1	461,0	1080,0	6
12238	6 G 1	10,5	58,0	220,0	17	12302	4 G 16	25,5	614,0	1360,0	6
12239	7 G 1	10,7	67,0	227,0	17	12303	5 G 16	28,2	768,0	1740,0	6
12240	8 G 1	11,3	77,0	277,0	17	12304	7 G 16	31,0	1075,0	2166,0	6
12241	9 G 1	12,6	86,0	295,0	17	12521	3 G 25	28,4	720,0	1630,0	4
12242	12 G 1	13,4	115,0	340,0	17	12305	4 G 25	31,2	960,0	2020,0	4
12256	2 x 1,5	8,8	29,0	129,0	16	12306	5 G 25	34,5	1200,0	2465,0	4
12257	3 G 1,5	9,4	43,0	149,0	16	12322	3 G 35	30,9	1008,0	1932,0	2
12258	4 G 1,5	10,0	58,0	185,0	16	12307	4 G 35	34,0	1344,0	2570,0	2
12259	5 G 1,5	10,9	72,0	205,0	16	12308	5 G 35	37,7	1680,0	3185,0	2
12260	6 G 1,5	11,8	87,0	255,0	16	12323	3 G 50	37,0	1440,0	2679,0	1
12261	7 G 1,5	11,8	101,0	285,0	16	12309	4 G 50	40,6	1920,0	3513,0	1
12262	8 G 1,5	12,7	115,0	340,0	16	12314	5 G 50	45,2	2400,0	4248,0	1
12263	9 G 1,5	13,9	130,0	347,0	16	12324	3 G 70	42,3	2016,0	2790,0	2/0
12264	10 G 1,5	13,9	144,0	418,0	16	12310	4 G 70	46,3	2688,0	4810,0	2/0
12265	11 G 1,5	15,0	158,0	430,0	16	12315	5 G 70	50,7	3360,0	5880,0	2/0
12266	12 G 1,5	15,0	173,0	444,0	16						

Continuation ▶

SY-JB flexible, colour coded, with steel wire braiding, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12325	3 G 95	47,1	2736,0	4870,0	3/0
12311	4 G 95	51,3	3648,0	6360,0	3/0
12316	5 G 95	56,3	4560,0	8071,0	3/0

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12326	3 G 120	51,8	3456,0	6230,0	4/0
12317	4 G 120	56,4	4608,0	8170,0	4/0
12328	4 G 150	64,2	5760,0	9970,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RA01)

Tools

- Cable shears
- Box spanners
- Strippers
- Crimping tools
- Pliers
- Skinning knife



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PURÖ-JZ
PUR-ORANGE
PUR-YELLOW
H05 BQ-F / H07 BQ-F (NGMH11YÖ)
UNIPUR
PUR-750
JZ 500-FC-PUR
F-C-PURÖ-JZ
YÖ-C-PURÖ-JZ
UNIPUR-CP
PUR-C-PUR

Photo: Hüller Hille GmbH

PUR Control Cables

The machinery and plant industries but especially the tool making industries are working particularly with mineral oils, alkalis and aggressive coolant emulsions and under difficult working environmental conditions.

Due to these conditions the electrical control cables, data cables as well as cables for trailing chains have to perform to exceptionally high standards. Flexibility, abrasion and oil resistance have to be guaranteed.

HELUKABEL® in co-operation with the leading machine and plant industries have developed suitable and application orientated cables.

These cables are tested, among other things, with PUR cables are tested among the others, mineral and synthetic oils, cutting oils, coolant emulsions, etc. For the operation in power trailing chains, these cables are tested to multimillion alternating bending cycles.

Consequently we believe that we can deliver the right cable for your application needs.



Technical data

- Special PUR cables adapted to DIN VDE 0281
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, according to DIN VDE 0281 part 1
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special **full-polyurethane** outer jacket TMPU, to DIN EN 50363-10-2
- Sheath colour grey (RAL 7001)
- Jacket also available in other colours
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-Radiation, Oxygene, Ozone and hydrolysis Microbes
- Low adhesion, matt surface
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
JZ-500-FC-PUR, see page A 52

Application

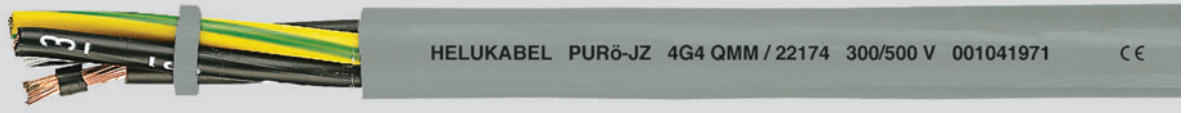
JZ-500 PUR is an extremely robust control cable with high abrasion and tear resistant properties. Due to its high resistance coolant emulsions, it is especially suited for use in the machine, tool making and plant industries as well as in the steel industry for difficult and problem areas. The high flexibility of this cable type makes it quick and easy to install. Suitable for outdoor lying.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23314	2 x 0,5	4,9	9,6	45,0	20
23315	3 G 0,5	5,2	14,4	55,0	20
23316	3 x 0,5	5,2	14,4	55,0	20
23317	4 G 0,5	5,6	19,0	65,0	20
23318	4 x 0,5	5,6	19,0	65,0	20
23319	5 G 0,5	6,3	24,0	75,0	20
23320	5 x 0,5	6,3	24,0	75,0	20
23321	7 G 0,5	6,9	33,6	90,0	20
23322	7 x 0,5	6,9	33,6	90,0	20
23323	10 G 0,5	8,3	48,0	120,0	20
23324	12 G 0,5	8,8	58,0	135,0	20
23325	18 G 0,5	11,0	86,0	205,0	20
23326	25 G 0,5	12,9	120,0	270,0	20
23327	34 G 0,5	14,9	163,0	380,0	20
23328	42 G 0,5	16,1	202,0	415,0	20
23329	2 x 0,75	5,3	14,4	44,0	18
23330	3 G 0,75	5,6	21,6	53,0	18
23331	3 x 0,75	5,6	21,6	53,0	18
23332	4 G 0,75	6,3	29,0	64,0	18
23333	4 x 0,75	6,3	29,0	64,0	18
23334	5 G 0,75	6,9	36,0	76,0	18
23335	5 x 0,75	6,9	36,0	76,0	18
23336	7 G 0,75	7,5	50,0	96,0	18
23337	7 x 0,75	7,5	50,0	96,0	18
23338	10 G 0,75	9,2	72,0	140,0	18
23339	12 G 0,75	9,8	86,0	170,0	18
23340	18 G 0,75	12,2	130,0	260,0	18
23341	25 G 0,75	14,3	180,0	282,0	18
23342	34 G 0,75	16,7	245,0	475,0	18
23343	42 G 0,75	18,0	302,0	600,0	18
23344	2 x 1	5,6	19,0	53,0	17
23345	3 G 1	5,9	29,0	63,0	17
23346	3 x 1	5,9	29,0	63,0	17
23347	4 G 1	6,6	38,0	75,0	17
23348	4 x 1	6,6	38,0	75,0	17
23349	5 G 1	7,3	48,0	89,0	17
23350	5 x 1	7,3	48,0	89,0	17
23351	7 G 1	8,1	67,0	115,0	17

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23352	7 x 1	8,1	67,0	115,0	17
23353	10 G 1	9,8	96,0	166,0	17
23354	12 G 1	10,4	115,0	201,0	17
23355	18 G 1	12,9	173,0	289,0	17
23356	25 G 1	15,4	240,0	380,0	17
23357	34 G 1	17,9	326,0	645,0	17
23358	42 G 1	19,4	403,0	730,0	17
23359	50 G 1	21,2	480,0	890,0	17
23360	2 x 1,5	6,4	29,0	68,0	16
23361	3 G 1,5	6,8	43,0	87,0	16
23362	3 x 1,5	6,8	43,0	87,0	16
23363	4 G 1,5	7,4	58,0	106,0	16
23364	4 x 1,5	7,4	58,0	106,0	16
23365	5 G 1,5	8,3	72,0	131,0	16
23366	5 x 1,5	8,3	72,0	131,0	16
23367	7 G 1,5	9,2	101,0	173,0	16
23368	7 x 1,5	9,2	101,0	173,0	16
23369	12 G 1,5	12,0	173,0	293,0	16
23370	18 G 1,5	14,6	259,0	454,0	16
23371	25 G 1,5	17,4	360,0	641,0	16
23372	30 G 1,5	18,6	410,0	800,0	16
23373	2 x 2,5	7,8	48,0	110,0	14
23374	3 G 2,5	8,3	72,0	146,0	14
23375	4 G 2,5	9,2	96,0	183,0	14
23376	5 G 2,5	10,1	120,0	222,0	14
23377	7 G 2,5	11,2	168,0	293,0	14
23378	12 G 2,5	14,8	288,0	512,0	14
23379	4 G 4	11,0	154,0	291,0	12
23380	5 G 4	12,3	192,0	355,0	12
23381	7 G 4	13,6	269,0	503,0	12
23382	4 G 6	13,0	230,0	468,0	10
23383	5 G 6	14,5	288,0	570,0	10
23384	7 G 6	16,2	403,0	808,0	10
23385	4 G 10	16,4	384,0	720,0	8
23386	5 G 10	18,3	480,0	894,0	8
23387	7 G 10	20,2	672,0	1295,0	8
23388	4 G 16	20,0	614,0	1063,0	6

Dimensions and specifications may be changed without prior notice. (RA02)



Technical data

- Special PUR cable in accordance to DIN VDE 0281
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- **Oil resistant** PVC core insulation TI2, in adapted to DIN VDE 0281 part 1, for better sliding abilities
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special **full-polyurethane** outer jacket TMPU, to DIN EN 50363-10-2
- Sheath colour grey (RAL 7001)
- Jacket also available in other colours
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-Radiation, Oxygene, Ozone
Hydrolysis, Microbes
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
F-C-PURö-JZ, see page A 54
Yö-C-PURö-JZ, see page A 56

Application

PURö-JZ is an extremely robust control cable with high abrasion and tear resistant properties. With high-grade oil resistant PVC core insulation. Due to its high resistance to mineral oils and especially to coolant emulsions, it is especially suited for use in the machine, tool making, plant construction as well as in the steel industry for difficult and problem areas. For medium mechanical stress for flexible use with free movement without tensile stress or forced movements in dry, damp and wet rooms and in open air. The high flexibility of this cable type makes it quick and easy to install.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22100	2 x 0,5	4,9	9,6	45,0	20	22132	2 x 1	5,6	19,0	53,0	17
22101	3 G 0,5	5,2	14,4	55,0	20	22133	3 G 1	5,9	29,0	63,0	17
22102	4 G 0,5	5,6	19,0	65,0	20	22134	4 G 1	6,6	38,0	75,0	17
22103	5 G 0,5	6,3	24,0	75,0	20	22135	5 G 1	7,3	48,0	89,0	17
22104	7 G 0,5	6,9	33,6	90,0	20	22136	7 G 1	8,1	67,0	115,0	17
22105	8 G 0,5	7,4	38,0	105,0	20	22137	8 G 1	8,7	77,0	131,0	17
22106	10 G 0,5	8,3	48,0	120,0	20	22138	10 G 1	9,8	96,0	166,0	17
22107	12 G 0,5	8,8	58,0	135,0	20	22139	12 G 1	10,4	115,0	201,0	17
22108	14 G 0,5	9,7	67,0	170,0	20	22140	14 G 1	11,4	134,0	230,0	17
22109	18 G 0,5	11,0	86,0	205,0	20	22141	18 G 1	12,9	175,0	289,0	17
22110	21 G 0,5	11,5	96,0	225,0	20	22142	21 G 1	13,7	196,0	306,0	17
22111	25 G 0,5	12,9	120,0	270,0	20	22143	25 G 1	15,4	240,0	380,0	17
22112	30 G 0,5	13,8	144,0	315,0	20	22144	32 G 1	17,1	308,0	620,0	17
22113	34 G 0,5	14,9	163,0	380,0	20	22145	34 G 1	17,9	326,0	645,0	17
22114	42 G 0,5	16,1	202,0	415,0	20	22146	42 G 1	19,4	403,0	730,0	17
22115	50 G 0,5	17,9	240,0	550,0	20	22147	50 G 1	21,2	480,0	890,0	17
22116	2 x 0,75	5,3	14,4	44,0	18	22148	2 x 1,5	6,4	29,0	68,0	16
22117	3 G 0,75	5,6	21,6	53,0	18	22149	3 G 1,5	6,8	43,0	87,0	16
22118	4 G 0,75	6,3	29,0	64,0	18	22150	4 G 1,5	7,4	58,0	106,0	16
22119	5 G 0,75	6,9	36,0	76,0	18	22151	5 G 1,5	8,3	72,0	131,0	16
22120	7 G 0,75	7,5	50,0	96,0	18	22152	7 G 1,5	9,2	101,0	173,0	16
22121	8 G 0,75	8,2	58,0	111,0	18	22153	8 G 1,5	9,9	115,0	199,0	16
22122	10 G 0,75	9,2	72,0	140,0	18	22154	10 G 1,5	10,9	144,0	245,0	16
22123	12 G 0,75	9,8	86,0	170,0	18	22155	12 G 1,5	12,0	173,0	293,0	16
22124	14 G 0,75	10,6	101,0	202,0	18	22156	14 G 1,5	13,0	202,0	347,0	16
22125	18 G 0,75	12,2	130,0	260,0	18	22157	18 G 1,5	14,6	259,0	454,0	16
22126	21 G 0,75	12,7	151,0	269,0	18	22158	21 G 1,5	15,5	302,0	534,0	16
22127	25 G 0,75	14,3	180,0	282,0	18	22159	25 G 1,5	17,4	360,0	641,0	16
22128	30 G 0,75	15,3	216,0	400,0	18	22160	30 G 1,5	18,6	410,0	800,0	16
22129	34 G 0,75	16,7	245,0	475,0	18	22161	34 G 1,5	20,2	490,0	945,0	16
22130	42 G 0,75	18,0	302,0	600,0	18	22162	42 G 1,5	21,8	605,0	1100,0	16
22131	50 G 0,75	19,8	360,0	720,0	18	22163	50 G 1,5	24,2	720,0	1250,0	16

Continuation ▶

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22164	2 x 2,5	7,8	48,0	110,0	14
22165	3 G 2,5	8,3	72,0	146,0	14
22166	4 G 2,5	9,2	96,0	183,0	14
22167	5 G 2,5	10,1	120,0	222,0	14
22168	7 G 2,5	11,2	168,0	293,0	14
22169	12 G 2,5	14,8	288,0	512,0	14
22170	18 G 2,5	18,2	432,0	740,0	14
22171	25 G 2,5	21,6	600,0	940,0	14
22172	2 x 4	9,3	77,0	147,0	12
22173	3 G 4	9,8	115,0	228,0	12
22174	4 G 4	11,0	154,0	291,0	12
22175	5 G 4	12,3	192,0	355,0	12
22176	7 G 4	13,6	269,0	503,0	12
22177	3 G 6	11,9	173,0	362,0	10
22178	4 G 6	13,0	230,0	468,0	10
22179	5 G 6	14,5	288,0	570,0	10
22180	7 G 6	16,2	403,0	808,0	10

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22181	3 G 10	14,8	288,0	555,0	8
22182	4 G 10	16,4	384,0	720,0	8
22183	5 G 10	18,3	480,0	894,0	8
22184	7 G 10	20,2	672,0	1295,0	8
22185	4 G 16	20,0	614,0	1063,0	6
22186	5 G 16	22,6	768,0	1400,0	6
22187	7 G 16	24,8	1075,0	1800,0	6
22188	4 G 25	24,9	960,0	1590,0	4
22189	4 G 35	28,4	1344,0	2200,0	2
22190	4 G 50	34,2	1920,0	2400,0	1
22191	4 G 70	40,3	2688,0	4400,0	2/0
22192	4 G 95	45,8	3648,0	6000,0	3/0

Dimensions and specifications may be changed without prior notice. (RA02)

Signal and power circular connectors

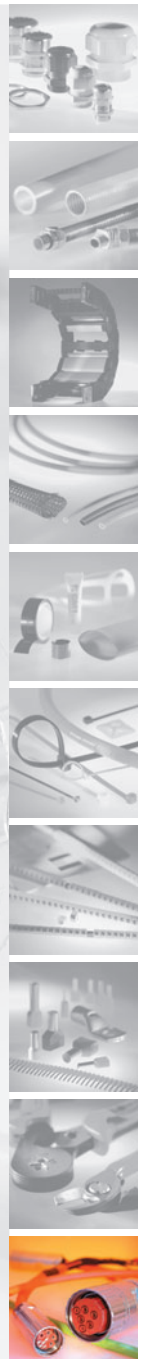
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Technical data

- Special PVC/PUR control cable, adapted to DIN VDE 0281, 0282
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper conductor, fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, according to DIN VDE 0281 part 1
- Cores numbered or colored according to DIN VDE 0293-308
- For 2-cores cable without green-yellow earth core, core colours brown, blue black
- cores with continuous white numbering and green-yellow earth core (up to 7 cores) or cores colour coded with green-yellow earth core (up to 5 cores)
- Cores stranded in layers with optimal lay-length
- PVC-inner jacket guarantees a good insulation cut-back
- PUR-outer jacket TPU, to DIN EN 50363-10-2
- Colour orange (RAL 2003)
- with meter marking, change-over in 2011

Properties

- High flexibility at low temperature
- High abrasion resistance
- **Resistant to**
Oils and fats
Non-alcoholic fuels and kerosene
Atmospheric influences
UV-radiation, Oxygene and ozone
Microbes and rotting
Sea and waste water, vibrations
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ/OB).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Robust control cable with an outstanding resistance to oil and abrasion. Suitable for use in tool making and machine industries, steel works, on building sites and in the oil and coal industries. The cable can also be used for portable tools etc. To be recommended if the cable comes into contact with chemical agents.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

PUR-jacket orange, cores numbered OZ/JZ

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22001	2 x 0,75	6,4	14,4	50,0	18
22002	3 G 0,75	6,8	21,6	70,0	18
22003	4 G 0,75	7,3	28,8	80,0	18
22004	5 G 0,75	8,2	36,0	100,0	18
22005	7 G 0,75	9,2	50,0	140,0	18
22006	2 x 1	7,2	19,2	63,0	17
22007	3 G 1	7,6	29,0	76,0	17
22008	4 G 1	8,0	38,0	95,0	17
22009	5 G 1	8,8	48,0	120,0	17
22010	7 G 1	10,0	67,0	170,0	17
22015	2 x 1,5	7,8	29,0	80,0	16
22016	3 G 1,5	8,3	43,0	105,0	16
22017	4 G 1,5	9,0	58,0	135,0	16
22018	5 G 1,5	9,7	72,0	158,0	16
22019	7 G 1,5	11,2	101,0	221,0	16
22025	2 x 2,5	9,2	48,0	150,0	14
22026	3 G 2,5	9,6	72,0	173,0	14
22027	4 G 2,5	11,0	96,0	203,0	14
22028	5 G 2,5	12,0	120,0	253,0	14
22029	7 G 2,5	13,7	168,0	356,0	14
22033	3 G 4	11,8	115,0	250,0	12
22034	4 G 4	13,2	154,0	300,0	12
22035	5 G 4	14,8	192,0	370,0	12
22036	7 G 4	16,4	269,0	500,0	12
22037	4 G 6	15,4	230,0	480,0	10
22038	5 G 6	17,0	288,0	583,0	10
22039	7 G 6	20,8	403,0	780,0	10
22040	4 G 10	20,8	384,0	740,0	8
22041	5 G 10	22,6	480,0	920,0	8
22042	4 G 16	23,0	614,0	1100,0	6
22043	5 G 16	27,4	768,0	1400,0	6

PUR-jacket orange OB/JB, cores colour coded to DIN VDE 0293

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22250	2 x 0,75	6,4	14,4	50,0	18
22251	3 G 0,75	6,8	21,6	70,0	18
22252	4 G 0,75	7,3	28,8	80,0	18
22253	5 G 0,75	8,2	36,0	100,0	18
22254	2 x 1	7,2	19,2	63,0	17
22255	3 G 1	7,6	29,0	76,0	17
22256	4 G 1	8,0	38,0	95,0	17
22257	5 G 1	8,8	48,0	120,0	17
22258	2 x 1,5	7,8	29,0	80,0	16
22259	3 G 1,5	8,3	43,0	105,0	16
22260	4 G 1,5	9,0	58,0	135,0	16
22261	5 G 1,5	9,7	72,0	158,0	16
22262	2 x 2,5	9,2	48,0	150,0	14
22263	3 G 2,5	9,6	72,0	173,0	14
22264	4 G 2,5	11,0	96,0	203,0	14
22265	5 G 2,5	12,0	120,0	253,0	14
22266	4 G 4	13,2	154,0	300,0	12
22267	5 G 4	14,8	192,0	370,0	12
22268	4 G 6	15,4	230,0	480,0	10
22269	5 G 6	17,0	288,0	583,0	10
22270	4 G 10	20,8	384,0	740,0	8
22271	5 G 10	22,6	480,0	920,0	8
22272	4 G 16	23,0	614,0	1100,0	6
22273	5 G 16	27,4	768,0	1400,0	6
22044	4 G 25	30,0	960,0	1600,0	4
22045	5 G 25	32,2	1200,0	2000,0	4
22046	4 G 35	33,0	1344,0	2100,0	2

Dimensions and specifications may be changed without prior notice. (RA02)



Technical data

- Special PVC/PUR cable in accordance to DIN VDE 0281, 0282
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U0/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Core identification to DIN VDE 0293-308 up to 5 cores, colour coded as of 7 cores, cores number 1 to 6
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- PVC inner sheath guarantees easy cable stripping
- PUR-outer jacket, TPU to DIN EN 50363-10-2
- Colour yellow (RAL 1021)
- with meter marking, change-over in 2011

Properties

- High flexibility at low temperature
- High abrasion resistance
- **Resistant to**
Oils and fats
Non-alcoholic fuels and kerosene
Atmospheric influences
UV-radiation
Oxygene and ozone
Microbes and rotting
Sea and waste water
Vibrations
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OB).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Further jacket colours e.g. black, green etc. on request.
- Art.no. 22212 = JB.
- Art.no. 22220 = JZ.

Application

Robust control cable with an outstanding resistance to oil and abrasion. Suitable for use in tool making and machine industries, steel works, on building sites and in the oil and coal industries. The cable can also be used for portable tools. etc. To be recommended if the cable comes into contact with chemical agents.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22200	2 x 0,75	6,4	14,4	50,0	18
22201	3 G 0,75	6,8	21,6	70,0	18
22202	4 G 0,75	7,3	28,8	80,0	18
22203	5 G 0,75	8,2	36,0	100,0	18
22204	7 G 0,75	9,2	50,0	140,0	18
22205	2 x 1	7,2	19,2	63,0	17
22206	3 G 1	7,6	29,0	76,0	17
22207	4 G 1	8,0	38,0	95,0	17
22208	5 G 1	8,8	48,0	120,0	17
22209	7 G 1	10,0	67,0	170,0	17
22210	2 x 1,5	7,8	29,0	80,0	16
22211	3 G 1,5	8,3	43,0	105,0	16

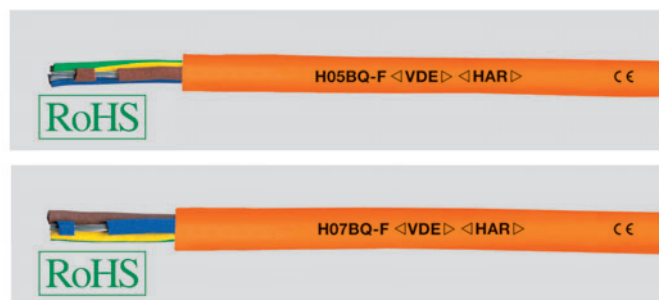
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22212	4 G 1,5	9,0	58,0	135,0	16
22220	4 G 1,5	13,7	58,0	135,0	16
22213	5 G 1,5	9,0	72,0	158,0	16
22214	7 G 1,5	9,7	101,0	221,0	16
22215	2 x 2,5	11,2	48,0	150,0	14
22216	3 G 2,5	9,2	72,0	173,0	14
22217	4 G 2,5	9,6	96,0	203,0	14
22218	5 G 2,5	11,0	120,0	253,0	14
22219	7 G 2,5	12,0	168,0	356,0	14
22221	4 G 4	14,6	153,6	310,0	12
22222	5 G 4	14,8	192,0	370,0	12
22233	4 G 35	33,0	1344,0	2100,0	2

Dimensions and specifications may be changed without prior notice. (RA02)

H05 BQ-F / H07 BQ-F (NGMH11YÖ)



A



Technical data

- EPR/PUR-insulated power cable according to DIN VDE 0282 part 10 and HD 22.10 S1
- **Temperature range**
flexing -40 °C to +80 °C
fixed installation -50 °C to +90 °C
- Permissible **operating temperature** at conductor 90 °C
- **Nominal voltage** a.c., 50 Hz
H05BQ-F: U₀/U 300/500 V up to 1 mm²
H07BQ-F: U₀/U 450/750 V as of 1,5 mm²
- **Test voltage**
H05BQ-F: 2000 V up to 1 mm²
H07BQ-F: 2500 V as of 1,5 mm²
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Plain copper conductor, stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and HD 383 cl. 5
- Insulating jacket of rubber, compound EI6 according to DIN VDE 0282 part 1
- Core identification according to DIN VDE 0293-308 and HD308 S2
- Green-yellow earth core in the outer layer
- Cores stranded in layers with optimal lay-length (inner fill compound permissible)
- PUR-insulated outer jacket TMPU, to DIN EN 50363-10-2
- Colour orange (RAL 2003)
- Minimum imprinted designation BQ

Properties

- Abrasion resistant
- Notch resistant
- Resistant to tearing and cutting
- **Resistant to**
Oils, fats, Petrol
Water and weathering effects
Oxygene and ozone
UV-radiation, Hydrolysis and Microbial attack
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- 7 G 1,5 mm² and 12 G 1,5 mm² are not contained in VDE, adapted to VDE, (H)07BQ.

Application

These cables can be used for medium mechanical loads in dry, damp or wet environments, e.g. for connecting agricultural and commercial equipment and heaters provided there is no danger of contact with the hot parts or by radiation of heat. These robust and flexible cables are used for electrical tools such as drills and hand-held circular saws, as well as for portable motors and machinery in agriculture, at building sites, docks and refrigeration plants.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

H05BQ-F

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22050	2 x 0,75	5,7 - 7,4	14,4	52,0	18
22051	3 G 0,75	6,2 - 8,1	21,6	63,0	18
22052	4 G 0,75	6,8 - 8,8	29,0	80,0	18
22053	5 G 0,75	7,6 - 9,9	36,0	96,0	18
22054	2 x 1	6,1 - 8,0	19,2	59,0	17
22055	3 G 1	6,5 - 8,5	29,0	71,0	17
22056	4 G 1	7,1 - 9,3	38,4	89,0	17
22057	5 G 1	8,0 - 10,3	48,0	112,0	17

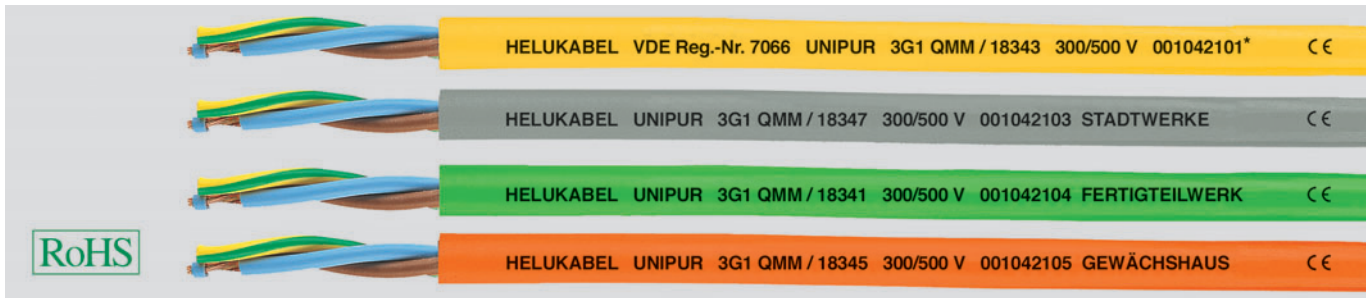
H07BQ-F

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22058	2 x 1,5	7,6 - 9,8	29,0	92,0	16
22059	3 G 1,5	8,0 - 10,4	43,0	109,0	16
22060	4 G 1,5	9,0 - 11,6	58,0	145,0	16
22061	5 G 1,5	9,8 - 12,7	72,0	169,0	16
22062	7 G 1,5	12,5 - 16,3	101,0	230,0	16
22063	12 G 1,5	16,5 - 21,5	173,0	398,0	16
22064	2 x 2,5	9,0 - 11,6	48,0	121,0	14
22065	3 G 2,5	9,6 - 12,4	72,0	164,0	14
22066	4 G 2,5	10,7 - 13,8	96,0	207,0	14
22067	5 G 2,5	11,9 - 15,3	120,0	262,0	14
22072	2 x 4	10,6 - 13,7	77,0	194,0	12
22068	3 G 4	11,3 - 14,5	115,0	224,0	12
22069	4 G 4	12,7 - 16,2	154,0	327,0	12
22080	5 G 4	14,1 - 17,9	192,0	415,0	12
22073	2 x 6	11,8 - 15,1	115,0	311,0	10
22070	3 G 6	12,8 - 16,3	173,0	310,0	10
22071	4 G 6	14,2 - 18,1	230,0	496,0	10
22081	5 G 6	15,7 - 20,0	288,0	586,0	10

H07BQ-F

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22074	2 x 10	15,6 - 19,9	192,0	428,0	8
22076	3 G 10	16,8 - 21,4	288,0	640,0	8
22078	4 G 10	18,6 - 23,6	384,0	738,0	8
22082	5 G 10	20,4 - 25,9	480,0	968,0	8
22075	2 x 16	17,9 - 22,8	307,0	600,0	6
22077	3 G 16	19,5 - 24,7	461,0	758,0	6
22079	4 G 16	21,3 - 27,0	614,0	1187,0	6
22083	5 G 16	23,7 - 30,0	768,0	1475,0	6
22828	4 G 25	26,8 - 31,9	960,0	1550,0	16
22829	5 G 25	29,0 - 35,0	1220,0	1920,0	16
22830	4 G 35	29,0 - 35,0	1344,0	2120,0	16
22831	5 G 35	33,3 - 39,7	1680,0	2600,0	16
22832	4 G 50	34,8 - 41,2	1920,0	2920,0	16
22833	5 G 50	39,7 - 46,7	2400,0	3700,0	16
22835	4 G 70	39,5 - 46,5	2688,0	3900,0	16
22836	5 G 70	46,3 - 53,3	3368,0	5020,0	16
22837	4 G 95	45,5 - 52,5	3648,0	5150,0	16
22838	5 G 95	52,0 - 60,0	4560,0	6520,0	16
22839	4 G 120	51,5 - 60,5	4608,0	6550,0	16
22840	5 G 120	56,7 - 65,7	5760,0	8050,0	16
22841	4 G 150	56,3 - 65,3	5760,0	7950,0	16
22842	5 G 185	59,5 - 68,5	7104,0	9350,0	16
22843	4 G 240	68,3 - 77,3	9216,0	12200,0	16

Dimensions and specifications may be changed without prior notice. (RA02)



Technical data

- Spezial TPE/PUR connecting cable adapted to DIN VDE 0282 part 10
- **Temperature range**
flexing -40 °C to +90 °C
- **Nominal voltage**
up to 1 mm² U₀/U 300/500 V
above 1,5 mm² U₀/U 450/750 V
- **Test voltage** 3000 V
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductions bunch stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of termoplastic elastomere (TPE)
- Core colours according DIN VDE 0293-308
- Core colour
 - up to 5 cores one-coloured
 - up 6 and more cores, black with white numbering
 - 3 and above, with green-yellow earth core
 - 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- PUR outer sheath TPU in adapted to DIN EN 50363-10-2
- Jacket colour by request
- with meter marking, change-over in 2011

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Abrasion resistant, Notch resistant
- Resistant to tearing and cutting
- Good flexibility at low temperatures down to -40 °C
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OB).
- Colour code:
 - 0 = RAL 5015, blue
 - 1 = RAL 6018, green
 - 2 = RAL 8003, brown
 - 3 = RAL 1021, yellow
 - 4 = RAL 3000, red
 - 5 = RAL 2003, orange
 - 6 = RAL 4005, violet
 - 7 = RAL 7001/7032, grey
 Please add the individual part no. for order with the identification colour code. Further colours on request.
- **screened analogue type:**
UNIPUR®-CP, see page A 58

Application

These robust and flexible cables are used for electrical tools such as drills, hand-held circular saws, and garden equipment as well as for portable motors and machinery in agriculture, at building sites, for hobbies, docks and refrigeration plants. Extremely good mechanical characteristics e.g. compressive load, good abrasion and near-resistant.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
1812_	2 x 0,5	6,0	9,6	40,0	20
1813_	3 G 0,5	6,2	14,4	47,0	20
1814_	4 G 0,5	7,0	19,0	57,0	20
1815_	5 G 0,5	7,5	24,0	65,0	20
1816_	7 G 0,5	9,2	33,6	94,0	20
1817_	12 G 0,5	11,5	58,0	150,0	20
1818_	18 G 0,5	13,2	86,0	208,0	20
1819_	25 G 0,5	15,9	120,0	276,0	20
1820_	34 G 0,5	18,8	163,0	393,0	20
1821_	41 G 0,5	20,2	197,0	460,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
1822_	2 x 0,75	6,3	14,0	52,0	18
1823_	3 G 0,75	6,9	21,6	62,0	18
1824_	4 G 0,75	7,5	28,8	80,0	18
1825_	5 G 0,75	8,3	36,0	94,0	18
1826_	6 G 0,75	9,0	43,0	111,0	18
1827_	7 G 0,75	9,8	50,0	160,0	18
1828_	12 G 0,75	12,2	86,0	191,0	18
1829_	18 G 0,75	14,1	130,0	267,0	18
1830_	25 G 0,75	17,5	180,0	376,0	18
1831_	34 G 0,75	20,3	245,0	506,0	18
1832_	41 G 0,75	21,9	296,0	596,0	18

Continuation ▶

UNIPUR® flexible at low temperature, with customer markings, halogen-free, wear resistant, robust, meter marking



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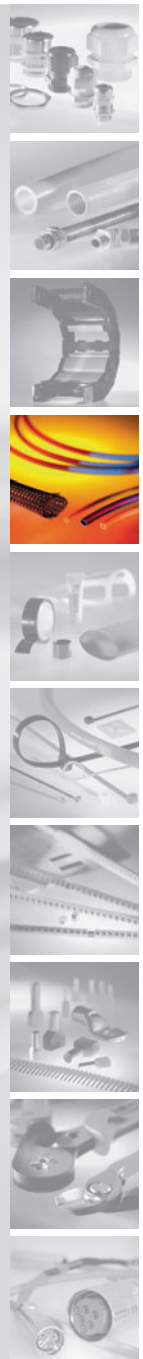
Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
1833_	2 x 1	6,8	19,2	59,0	17
1834_	3 G 1	7,2	29,0	70,0	17
1835_	4 G 1	7,8	38,0	87,0	17
1836_	5 G 1	8,8	48,0	100,0	17
1837_	6 G 1	9,6	58,0	131,0	17
1838_	7 G 1	10,5	67,0	182,0	17
1839_	12 G 1	13,0	115,0	230,0	17
1840_	18 G 1	15,1	173,0	325,0	17
1841_	25 G 1	18,7	240,0	476,0	17
1842_	34 G 1	21,6	326,0	616,0	17
1843_	41 G 1	23,2	394,0	724,0	17
1844_	2 x 1,5	8,3	29,0	92,0	16
1845_	3 G 1,5	8,8	43,0	108,0	16
1846_	4 G 1,5	9,9	58,0	144,0	16
1847_	5 G 1,5	10,8	72,0	168,0	16
1848_	6 G 1,5	11,9	86,0	201,0	16
1849_	7 G 1,5	12,9	101,0	230,0	16
1850_	12 G 1,5	14,7	173,0	306,0	16
1851_	18 G 1,5	17,9	259,0	464,0	16
1852_	25 G 1,5	20,8	360,0	641,0	16
1853_	34 G 1,5	24,9	490,0	857,0	16
1854_	41 G 1,5	26,7	590,0	1010,0	16

Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
1855_	2 x 2,5	10,0	48,0	120,0	14
1856_	3 G 2,5	10,5	72,0	148,0	14
1857_	4 G 2,5	11,8	96,0	184,0	14
1858_	5 G 2,5	13,0	120,0	224,0	14
1859_	7 G 2,5	14,7	168,0	301,0	14
1860_	12 G 2,5	18,0	288,0	489,0	14
1861_	2 x 4	11,6	77,0	149,0	12
1862_	3 G 4	12,3	115,0	240,0	12
1863_	4 G 4	13,7	154,0	297,0	12
1864_	5 G 4	15,2	192,0	360,0	12
1865_	7 G 4	20,8	268,0	540,0	12
1866_	2 x 6	13,2	115,0	240,0	10
1867_	3 G 6	14,2	173,0	370,0	10
1868_	4 G 6	15,8	230,0	472,0	10
1869_	5 G 6	17,5	288,0	581,0	10
1870_	7 G 6	22,0	403,0	698,0	10
1871_	3 G 10	18,6	288,0	560,0	8
1872_	4 G 10	20,5	384,0	718,0	8
1873_	5 G 10	22,7	480,0	896,0	8
1874_	3 G 16	23,5	461,0	940,0	6
1875_	4 G 16	25,7	614,0	1068,0	6
1876_	5 G 16	28,5	768,0	1810,0	6

Dimensions and specifications may be changed without prior notice. (RA02)

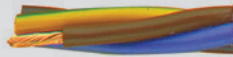
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PUR-750 halogen-free, meter marking



HELUKABEL PUR-750 3G2,5 QMM / 49733 450/750 V 001041930 CE



Technical data

- Special PUR cables adapted to DIN VDE 0282 part 10
- **Temperature range** flexing
-40 °C to +80 °C
(up to +100 °C for short periods)
- **Nominal voltage**
U₀/U 300/500 V up to 1 mm²
U₀/U 450/750 V as of 1,5 mm²
- **Test voltage**
2000 V up to 1 mm²
2500 V as of 1,5 mm²
- **Insulation resistance**
min. 20 MΩm x km
- **Tensile strength** 20 N/mm² (Cu)
- **Minimum bending radius**
flexing 10xcable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- PUR core insulation
- Colour coded to DIN VDE 0293-308 and as of 6 cores number coded
- For two cores: brown, blue
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- PUR outer jacket halogen-free
- Sheath colour orange (RAL 2004)
- with meter marking, change-over in 2011

Properties

- High flexibility at low temperature
- Usable for foodstuffs
- High abrasion resistance
- **Resistant to**
Oils and fats
Non-alcoholic fuels and kerosene
Atmospheric influences, UV-radiation
Oxygene and ozone
Microbes and rotting
Sea and waste water, vibrations
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Especially suited for installation in all areas demanding good performance under extreme conditions. These cable types have been successfully in use in areas such as steel works, heating and air-conditioning systems, in machinery and industrial plant equipment and on building sites etc.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49700	2 x 0,75	6,3	15,0	44,0	18
49701	3 G 0,75	6,8	22,0	55,0	18
49702	4 G 0,75	7,4	29,0	70,0	18
49703	5 G 0,75	8,3	36,0	91,0	18
49704	7 G 0,75	9,7	50,0	130,0	18
49705	12 G 0,75	12,1	86,0	192,0	18
49706	18 G 0,75	14,2	130,0	290,0	18
49707	25 G 0,75	17,6	180,0	405,0	18
49708	2 x 1	6,8	20,0	50,0	17
49709	3 G 1	7,2	29,0	65,0	17
49710	4 G 1	7,8	38,0	87,0	17
49711	5 G 1	8,7	48,0	106,0	17
49712	6 G 1	9,5	58,0	135,0	17
49713	7 G 1	10,2	67,0	160,0	17
49714	8 G 1	11,2	77,0	185,0	17
49715	10 G 1	12,6	96,0	210,0	17
49716	12 G 1	12,8	115,0	240,0	17
49717	16 G 1	14,3	154,0	310,0	17
49718	18 G 1	15,3	173,0	353,0	17
49719	20 G 1	16,2	192,0	390,0	17
49720	25 G 1	18,8	240,0	495,0	17
49721	2 x 1,5	8,2	29,0	70,0	16
49722	3 G 1,5	8,7	43,0	95,0	16
49723	4 G 1,5	9,7	58,0	120,0	16
49724	5 G 1,5	10,6	72,0	164,0	16
49725	7 G 1,5	12,8	101,0	210,0	16
49726	10 G 1,5	15,5	150,0	290,0	16
49727	12 G 1,5	15,8	172,0	340,0	16
49728	16 G 1,5	17,9	230,0	440,0	16
49729	18 G 1,5	19,0	259,0	508,0	16
49730	20 G 1,5	20,0	300,0	560,0	16
49731	25 G 1,5	23,5	360,0	722,0	16
49732	2 x 2,5	9,8	48,0	110,0	14
49733	3 G 2,5	10,5	72,0	150,0	14
49734	4 G 2,5	11,6	96,0	180,0	14
49735	5 G 2,5	13,0	120,0	240,0	14
49736	7 G 2,5	15,5	168,0	340,0	14
49737	12 G 2,5	19,3	288,0	520,0	14
49738	16 G 2,5	21,6	394,0	680,0	14

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49739	18 G 2,5	23,0	432,0	778,0	14
49740	20 G 2,5	24,4	480,0	860,0	14
49741	25 G 2,5	28,5	600,0	1083,0	14
49742	3 G 4	12,2	115,0	220,0	12
49743	4 G 4	13,4	154,0	280,0	12
49744	5 G 4	15,1	192,0	350,0	12
49745	7 G 4	18,2	269,0	470,0	12
49746	4 G 6	15,8	230,0	400,0	10
49747	5 G 6	17,5	288,0	500,0	10
49748	7 G 6	21,0	405,0	700,0	10
49749	4 G 10	20,6	384,0	640,0	8
49750	5 G 10	22,7	480,0	800,0	8
49751	7 G 10	26,6	672,0	1180,0	8
49752	4 G 16	23,6	614,0	920,0	6
49753	5 G 16	26,2	768,0	1180,0	6
49754	4 G 25	29,4	960,0	1400,0	4
49755	5 G 25	32,7	1200,0	1740,0	4
49756	4 G 35	33,1	1344,0	1870,0	2
49757	5 G 35	36,8	1680,0	2320,0	2
49758	4 G 50	38,4	1920,0	2700,0	1
49759	5 G 50	43,0	2400,0	3300,0	1
49760	4 G 70	44,0	2688,0	3700,0	2/0
49761	5 G 70	49,5	3660,0	4900,0	2/0
49918	4 G 95	51,2	3648,0	4850,0	3/0
49762	5 G 95	57,5	4560,0	6000,0	3/0
49763	4 G 120	55,0	4610,0	6005,0	4/0

Dimensions and specifications may be changed without prior notice. (RA02)

JZ 500-FC-PUR EMC-preferred type, tear and coolant resistant, screened, without inner sheath, meter marking



A



Technical data

- Special polyurethane sheathed cable adapted to DIN VDE 0245 part 201 to 1,5 mm², adapted to DIN VDE 0245 part 102 from 2,5 mm²
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage**
min. 6000 V
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper conductor, fine wire to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and/or IEC 60228 cl. 5
- Core insulation of special PVC T12 to DIN VDE 0281, part 1
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Separating foil
- Tinned copper braided screening, coverage approx. 85%
- Core wrapping from fleece guarantees good stripping capability
- Outer sheath from special **full polyurethane** Tmpu acc. to DIN EN 50363-10-2
- Sheath colour grey (RAL 7001)
- Also available in other sheath colours
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-radiation, Oxygen, Ozone, Hydrolyse and Microbes
- Low adhesion, matt surface
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **unscreened analogue type:**
JZ-500-PUR, see page A 43

Application

Extremely robust cable noted for its good abrasion resistance and notch resistance. Due to its resistance to coolant emulsions, this cable is well suited for use in mechanical engineering, tool making, and systems engineering, and in steel mills and rolling mills in particularly critical areas. Good flexibility means that installation is quick and easy. Suitable for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms, and in open air (fixed installation). The dense screening assures interference-free transmission of all signals and impulses. An ideal interference-free control cable for the above applications.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23414	2 x 0,5	5,7	35,0	47,0	20	23429	2 x 0,75	6,1	40,0	60,0	18
23416	3 x 0,5	5,9	42,0	57,0	20	23430	3 G 0,75	6,3	52,0	67,0	18
23415	3 G 0,5	5,9	42,0	57,0	20	23431	3 x 0,75	6,3	52,0	67,0	18
23418	4 x 0,5	6,4	47,0	60,0	20	23432	4 G 0,75	6,8	60,0	76,0	18
23417	4 G 0,5	6,4	47,0	60,0	20	23433	4 x 0,75	6,8	60,0	76,0	18
23419	5 G 0,5	6,9	56,0	75,0	20	23434	5 G 0,75	7,4	71,0	92,0	18
23420	5 x 0,5	6,9	56,0	75,0	20	23435	5 x 0,75	7,4	71,0	92,0	18
23422	7 x 0,5	7,6	69,0	97,0	20	23436	7 G 0,75	8,2	91,0	131,0	18
23421	7 G 0,5	7,6	69,0	97,0	20	23437	7 x 0,75	8,2	91,0	131,0	18
23423	10 G 0,5	9,6	94,0	133,0	20	23438	10 G 0,75	10,3	137,0	180,0	18
23424	12 G 0,5	9,7	108,0	158,0	20	23439	12 G 0,75	10,5	142,0	204,0	18
23425	18 G 0,5	11,5	145,0	218,0	20	23440	18 G 0,75	12,7	212,0	290,0	18
23426	25 G 0,5	13,6	240,0	315,0	20	23441	25 G 0,75	15,0	281,0	413,0	18
23427	34 G 0,5	15,6	312,0	420,0	20	23442	34 G 0,75	17,2	345,0	492,0	18
23428	42 G 0,5	17,0	355,0	487,0	20	23443	42 G 0,75	18,6	407,0	624,0	18

Continuation ▶

JZ 500-FC-PUR EMC-preferred type, tear and coolant resistant, screened, without inner sheath, meter marking



Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23444	2 x 1	6,4	50,0	66,0	17
23446	3 x 1	6,7	60,0	82,0	17
23445	3 G 1	6,7	60,0	82,0	17
23447	4 G 1	7,2	71,0	100,0	17
23448	4 x 1	7,2	71,0	100,0	17
23449	5 G 1	8,0	88,0	128,0	17
23450	5 x 1	8,0	88,0	128,0	17
23451	7 G 1	8,7	111,0	157,0	17
23452	7 x 1	8,7	111,0	157,0	17
23453	10 G 1	11,2	150,0	230,0	17
23454	12 G 1	11,4	184,0	262,0	17
23455	18 G 1	13,5	260,0	381,0	17
23456	25 G 1	16,2	349,0	535,0	17
23457	34 G 1	18,5	486,0	740,0	17
23458	42 G 1	20,2	545,0	867,0	17
23459	50 G 1	21,8	625,0	1027,0	17
23460	2 x 1,5	7,0	65,0	87,0	16
23462	3 x 1,5	7,4	80,0	102,0	16
23461	3 G 1,5	7,4	80,0	102,0	16
23464	4 x 1,5	8,1	97,0	127,0	16
23463	4 G 1,5	8,1	97,0	127,0	16
23465	5 G 1,5	9,0	119,0	159,0	16
23466	5 x 1,5	9,0	119,0	159,0	16
23468	7 x 1,5	9,8	147,0	207,0	16
23467	7 G 1,5	9,8	147,0	207,0	16
23469	12 G 1,5	12,8	267,0	340,0	16
23470	18 G 1,5	15,5	374,0	480,0	16
23471	25 G 1,5	18,5	526,0	704,0	16
23472	30 G 1,5	19,6	555,0	817,0	16

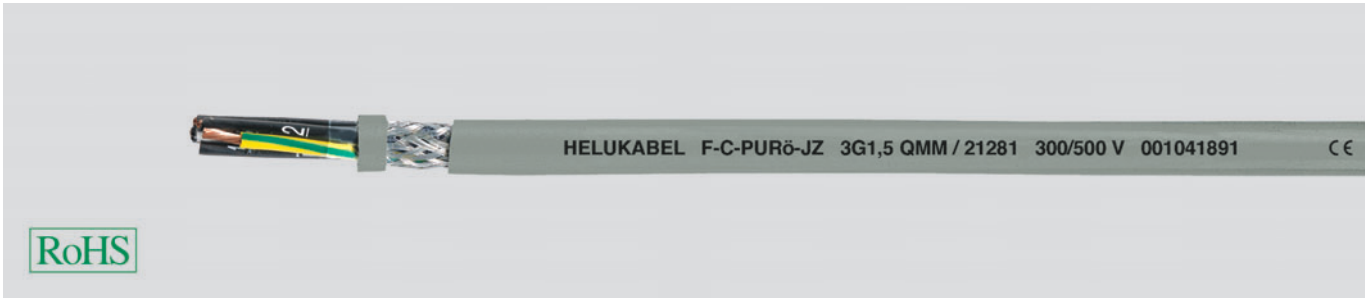
Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23473	2 x 2,5	8,4	96,0	131,0	14
23474	3 G 2,5	8,8	144,0	168,0	14
23475	4 G 2,5	9,8	148,0	194,0	14
23476	5 G 2,5	10,8	181,0	222,0	14
23477	7 G 2,5	11,9	255,0	345,0	14
23478	12 G 2,5	15,8	441,0	570,0	14
23479	4 G 4	11,6	230,0	310,0	12
23480	5 G 4	12,9	273,0	386,0	12
23481	7 G 4	14,2	316,0	498,0	12
23482	4 G 6	13,8	305,0	414,0	10
23483	5 G 6	15,3	439,0	510,0	10
23484	7 G 6	16,9	505,0	673,0	10
23485	4 G 10	17,1	535,0	591,0	8
23486	5 G 10	19,1	592,0	768,0	8
23487	7 G 10	21,2	810,0	976,0	8
23488	4 G 16	20,0	740,0	1196,0	6

Dimensions and specifications may be changed without prior notice. (RA02)

F-C-PURÖ-JZ tear and coolant resistant, Cu-screened, without inner sheath, increased oil resistant, EMC-preferred type, meter marking



A



Technical data

- Special polyurethane-sheathed multicore cable on the basis of DIN VDE 0245 part 201 up to 1,5 mm², on the basis of DIN VDE 0245 part 102 as of 2,5 mm²
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Plain copper conductor, finely stranded, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- **Oil resistant** PVC core insulation TI2, in adapted to DIN VDE 0281 part 1, for better sliding abilities
- Cores black with sequential numbering imprinted in white according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Separating foil
- Braided screen of tinned Cu wires, coverage approx. 85%
- Fleece separator, ensure good dismantling ability
- Special **full-polyurethane** outer jacket TMPU, to DIN EN 50363-10-2
- Sheath colour grey (RAL 7001)
- Outer jacket also available in other colours
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-Radiation
Oxygene
Ozone and hydrolysis
Microbes
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (0Z).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type: PURÖ-JZ**, see page A 44

Application

Extremely robust control cable characterised by high abrasion and notch resistance properties. Used for critical areas in such applications as machinery, tooling and plant construction, in rolling mills and steel works because of the resistance to mineral oils and to coolant emulsions in particular. Rapid and safe installation assured by the good flexibility of the cable. Suitable for outdoor installation.

An interference-free transmission of signals and pulses is assured by the high screening density. The ideal interference-protected control cable for such applications as given above.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21200	2 x 0,5	5,7	35,0	44,0	20
21201	3 G 0,5	5,9	42,0	56,0	20
21202	4 G 0,5	6,4	47,0	60,0	20
21203	5 G 0,5	6,9	56,0	75,0	20
21205	7 G 0,5	7,6	69,0	97,0	20
21207	10 G 0,5	9,6	94,0	135,0	20
21208	12 G 0,5	9,7	108,0	158,0	20
21209	14 G 0,5	10,2	116,0	190,0	20
21211	18 G 0,5	11,5	145,0	218,0	20
21213	21 G 0,5	12,7	188,0	252,0	20
21215	25 G 0,5	13,6	240,0	315,0	20
21217	30 G 0,5	14,4	295,0	362,0	20
21220	36 G 0,5	15,6	318,0	447,0	20
21221	40 G 0,5	16,9	343,0	475,0	20
21224	50 G 0,5	18,5	406,0	572,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21227	2 x 0,75	6,1	40,0	60,0	18
21228	3 G 0,75	6,3	52,0	67,0	18
21229	4 G 0,75	6,8	60,0	76,0	18
21230	5 G 0,75	7,4	71,0	92,0	18
21232	7 G 0,75	8,2	91,0	131,0	18
21234	10 G 0,75	10,3	137,0	180,0	18
21235	12 G 0,75	10,5	142,0	204,0	18
21236	14 G 0,75	11,3	180,0	226,0	18
21238	18 G 0,75	12,7	212,0	290,0	18
21240	21 G 0,75	14,0	246,0	376,0	18
21242	25 G 0,75	15,0	281,0	413,0	18
21245	32 G 0,75	16,7	342,0	485,0	18
21249	41 G 0,75	18,6	400,0	611,0	18
21251	50 G 0,75	20,3	461,0	775,0	18

Continuation ▶

F-C-PURÖ-JZ

tear and coolant resistant, Cu-screened, without inner sheath,
increased oil resistant, EMC-preferred type, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21253	2 x 1	6,4	50,0	66,0	17
21254	3 G 1	6,7	60,0	82,0	17
21255	4 G 1	7,2	71,0	100,0	17
21256	5 G 1	8,0	88,0	128,0	17
21257	6 G 1	8,7	97,0	145,0	17
21258	7 G 1	8,7	111,0	157,0	17
21259	8 G 1	10,1	127,0	198,0	17
21261	10 G 1	11,2	150,0	230,0	17
21262	12 G 1	11,4	184,0	262,0	17
21263	14 G 1	12,0	196,0	302,0	17
21264	16 G 1	12,8	209,0	345,0	17
21265	18 G 1	13,5	260,0	381,0	17
21267	21 G 1	14,3	319,0	480,0	17
21268	25 G 1	16,2	349,0	535,0	17
21273	34 G 1	18,5	486,0	740,0	17
21276	41 G 1	19,9	531,0	855,0	17
21278	50 G 1	21,8	625,0	1027,0	17
21280	2 x 1,5	7,0	63,0	87,0	16
21281	3 G 1,5	7,4	80,0	102,0	16
21282	4 G 1,5	8,1	97,0	127,0	16
21283	5 G 1,5	9,0	119,0	159,0	16
21285	7 G 1,5	9,8	147,0	207,0	16
21286	8 G 1,5	10,5	170,0	245,0	16
21287	10 G 1,5	12,6	193,0	313,0	16
21288	12 G 1,5	12,8	267,0	340,0	16

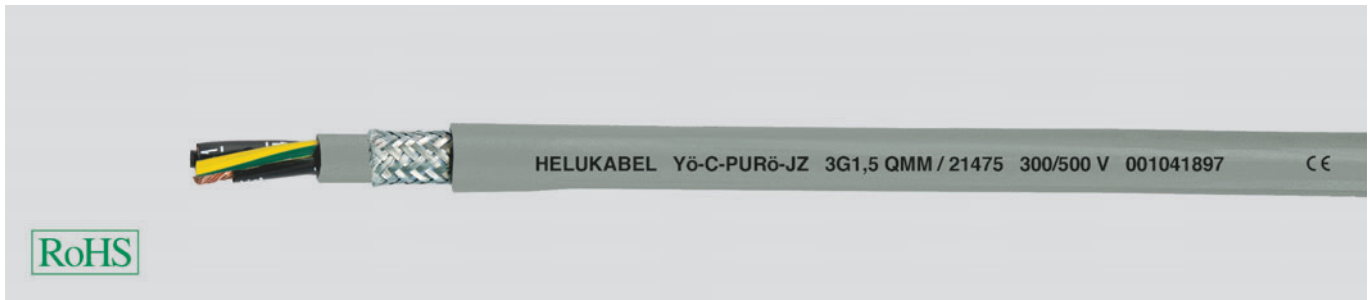
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21290	14 G 1,5	13,5	283,0	384,0	16
21291	16 G 1,5	14,4	315,0	425,0	16
21292	18 G 1,5	15,5	374,0	480,0	16
21295	21 G 1,5	16,4	425,0	563,0	16
21296	25 G 1,5	18,5	526,0	704,0	16
21297	34 G 1,5	21,2	629,0	870,0	16
21298	42 G 1,5	21,9	819,0	1040,0	16
21299	50 G 1,5	25,0	885,0	1292,0	16
21300	2 x 2,5	8,4	96,0	131,0	14
21301	3 G 2,5	8,8	144,0	168,0	14
21302	4 G 2,5	9,8	148,0	194,0	14
21303	5 G 2,5	10,8	181,0	222,0	14
21304	7 G 2,5	11,9	255,0	345,0	14
21305	10 G 2,5	15,2	340,0	462,0	14
21306	12 G 2,5	15,8	441,0	570,0	14
21313	2 x 4	10,0	120,0	187,0	12
21314	3 G 4	10,7	174,0	243,0	12
21315	4 G 4	11,6	230,0	310,0	12
21316	5 G 4	12,9	273,0	386,0	12
21317	7 G 4	14,2	316,0	498,0	12
21319	3 G 6	12,6	240,0	333,0	10
21320	4 G 6	13,8	305,0	414,0	10
21321	5 G 6	15,3	439,0	510,0	10
21322	7 G 6	16,9	505,0	673,0	10

Dimensions and specifications may be changed without prior notice. (RA02)

Yö-C-PURö-JZ tear and coolant resistant, Cu-screened, with inner sheath, increased oil resistant, EMC-preferred type, meter marking



A



Technical data

- Special polyurethane-sheathed multicore cable on the basis of DIN VDE 0245 part 202/03.92 up to 1,5 mm², on the basis of DIN VDE 0281 part 13 as of 2,5 mm²
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V as of cross section 4 mm²
U₀/U 450/750 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Plain copper conductor, finely stranded, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- **Oil resistant** PVC core insulation TI2, in adapted to DIN VDE 0281 part 1, for better sliding abilities
- Cores black with sequential numbering imprinted in white according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- **Oil resistant** PVC inner sheath
- Screen of tinned Cu braid, coverage approx. 85%
- Fleece separator, ensure good dismantling ability
- Special **full-polyurethane** outer jacket TMPU, to DIN EN 50363-10-2
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-Radiation
Oxygene
Ozone and hydrolysis
Microbes
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (0Z).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type: PURö-JZ**, see page A 44

Application

Extremely robust control cable characterised by high abrasion and notch resistance properties. Used for critical areas in such applications as machinery, tooling and plant construction, in rolling mills and steel works because of the resistance to mineral oils and to coolant emulsions in particular. The mechanical strength of the cable is increased by the additional oil-resistant inner sheath. The ideal interference-protected control cable for such applications as given above. Suitable for outdoor installation.

These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications (electromagnetic compatibility).

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21400	2 x 0,5	6,6	41,0	68,0	20	21425	2 x 0,75	7,2	46,0	88,0	18
21401	3 G 0,5	7,1	45,0	84,0	20	21426	3 G 0,75	7,7	57,0	98,0	18
21402	4 G 0,5	7,6	54,0	95,0	20	21427	4 G 0,75	8,2	63,0	112,0	18
21403	5 G 0,5	8,2	66,0	107,0	20	21428	5 G 0,75	8,8	76,0	130,0	18
21405	7 G 0,5	9,4	79,0	135,0	20	21430	7 G 0,75	10,1	100,0	185,0	18
21407	10 G 0,5	11,2	107,0	170,0	20	21432	10 G 0,75	12,2	140,0	270,0	18
21408	12 G 0,5	11,3	137,0	195,0	20	21433	12 G 0,75	12,3	175,0	294,0	18
21409	14 G 0,5	11,9	142,0	222,0	20	21434	14 G 0,75	13,0	190,0	317,0	18
21411	18 G 0,5	12,9	156,0	278,0	20	21436	18 G 0,75	14,6	240,0	357,0	18
21413	21 G 0,5	14,7	189,0	330,0	20	21438	21 G 0,75	16,0	274,0	455,0	18
21415	25 G 0,5	15,9	250,0	406,0	20	21440	25 G 0,75	17,8	306,0	510,0	18
21416	30 G 0,5	16,2	297,0	520,0	20	21443	32 G 0,75	18,7	349,0	688,0	18
21419	36 G 0,5	17,8	320,0	587,0	20	21446	41 G 0,75	21,5	403,0	951,0	18
21420	40 G 0,5	19,1	345,0	655,0	20	21447	50 G 0,75	23,1	470,0	1100,0	18
21421	50 G 0,5	20,9	407,0	742,0	20						

Continuation ▶

Yö-C-PURÖ-JZ **tear and coolant resistant, Cu-screened, with inner sheath, increased oil resistant, EMC-preferred type, meter marking**



Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21451	2 x 1	7,7	54,0	98,0	17
21452	3 G 1	8,0	64,0	102,0	17
21453	4 G 1	8,6	76,0	145,0	17
21454	5 G 1	9,1	89,0	170,0	17
21456	7 G 1	11,0	114,0	220,0	17
21457	8 G 1	11,6	130,0	270,0	17
21458	10 G 1	12,6	156,0	350,0	17
21459	12 G 1	13,1	186,0	350,0	17
21460	14 G 1	13,8	198,0	402,0	17
21461	16 G 1	14,6	214,0	420,0	17
21462	18 G 1	15,6	284,0	515,0	17
21463	20 G 1	16,4	325,0	545,0	17
21465	25 G 1	18,9	387,0	690,0	17
21468	34 G 1	20,9	500,0	912,0	17
21469	41 G 1	22,3	578,0	1070,0	17
21470	50 G 1	24,6	681,0	1318,0	17
21474	2 x 1,5	8,2	64,0	150,0	16
21475	3 G 1,5	8,6	82,0	152,0	16
21476	4 G 1,5	9,3	99,0	167,0	16
21477	5 G 1,5	10,4	123,0	203,0	16
21479	7 G 1,5	12,0	148,0	305,0	16
21480	8 G 1,5	12,9	172,0	355,0	16
21481	10 G 1,5	14,2	198,0	422,0	16
21482	12 G 1,5	14,6	274,0	435,0	16
21483	14 G 1,5	15,4	294,0	480,0	16
21484	16 G 1,5	16,1	318,0	525,0	16
21485	18 G 1,5	17,2	386,0	642,0	16
21487	21 G 1,5	19,0	447,0	722,0	16
21489	25 G 1,5	20,8	531,0	803,0	16
21492	34 G 1,5	23,2	671,0	1068,0	16
21494	42 G 1,5	26,1	890,0	1370,0	16
21495	50 G 1,5	27,4	997,0	1677,0	16
21499	2 x 2,5	9,8	110,0	180,0	14
21500	3 G 2,5	10,7	148,0	215,0	14
21501	4 G 2,5	11,4	169,0	268,0	14
21502	5 G 2,5	12,5	220,0	349,0	14
21503	7 G 2,5	14,9	284,0	406,0	14
21504	12 G 2,5	18,4	470,0	720,0	14

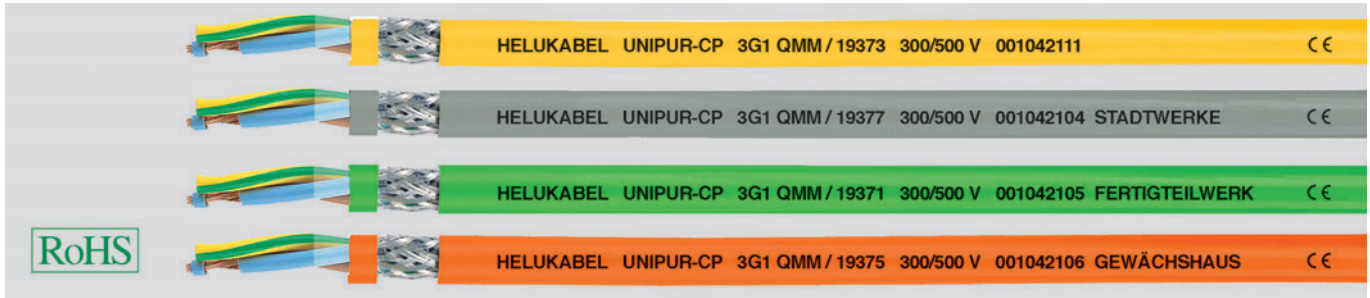
Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21507	2 x 4	12,0	124,0	300,0	12
21508	3 G 4	12,6	178,0	340,0	12
21509	4 G 4	14,2	234,0	408,0	12
21510	5 G 4	15,6	284,0	504,0	12
21511	7 G 4	17,1	321,0	640,0	12
21512	3 G 6	14,8	245,0	453,0	10
21513	4 G 6	16,1	316,0	560,0	10
21514	5 G 6	18,0	442,0	700,0	10
21515	7 G 6	19,6	530,0	905,0	10
21516	3 G 10	18,2	367,0	750,0	8
21517	4 G 10	20,3	549,0	1023,0	8
21518	5 G 10	22,4	604,0	1114,0	8
21519	7 G 10	24,7	820,0	1505,0	8
21521	4 G 16	23,4	807,0	1385,0	6
21522	5 G 16	26,0	940,0	1550,0	6
21524	4 G 25	29,7	1169,0	1894,0	4
21525	5 G 25	33,0	1420,0	2272,0	4
21526	4 G 35	33,9	1680,0	2395,0	2
21527	5 G 35	37,5	2020,0	2890,0	2
21528	4 G 50	39,0	2370,0	3312,0	1
21529	5 G 50	43,4	2880,0	4100,0	1
21530	4 G 70	46,6	3257,0	4605,0	2/0
21531	5 G 70	51,1	4032,0	5710,0	2/0
21532	4 G 95	50,9	4060,0	6055,0	3/0
21533	5 G 95	55,9	5244,0	7520,0	3/0
21534	4 G 120	55,5	5231,0	7318,0	4/0

Dimensions and specifications may be changed without prior notice. (RA02)

UNIPUR-CP flexible at low temperature, with customer markings, halogen-free, wear resistant, robust, screened, EMC-preferred type, meter marking



A



Technical data

- Special TPE/PUR screened connecting cable adapted to DIN VDE 0282 part 10
- **Temperature range**
flexing -40 °C to +90 °C
- **Nominal voltage**
up to 1 mm² U₀/U 300/500 V
above 1,5 mm² U₀/U 450/750 V
- **Test voltage** 3000 V
- **Minimum bending radius**
flexing 12,5x cable ø
fixed installation 7,5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors bunch stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of thermoplastic elastomere (TPE)
- Core colours according DIN VDE 0293-308
- Core colour:
 - up to 5 cores one-coloured
 - up 6 and more cores, black with white numbering
 - up 3 and above, with green-yellow earth core
 - 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Core wrapping with foil
- Tinned copper braided screening, coverage approx. 85%
- PUR outer sheath TPU in adapted to DIN EN 50363-10-2
- Jacket colour by request
- with meter marking, change-over in 2011

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- **Resistant to**
 - Oils and fats
 - Water and weathering effects
 - Ozone and oxygen
 - UV-radiation
 - Hydrolysis
 - Microbial attack
- Abrasion resistant
- Notch resistant
- Resistant to tearing and cutting
- Good flexibility at low temperatures down to -40 °C
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OB).
- Colour code:
 - 0 = RAL 5015, blue
 - 1 = RAL 6018, green
 - 2 = RAL 8003, brown
 - 3 = RAL 1021, yellow
 - 4 = RAL 3000, red
 - 5 = RAL 2003, orange
 - 6 = RAL 4005, violet
 - 7 = RAL 7001/7032, grey
 Please add the individual part no. for order with the identification colour code.
Further colours on request.
- **unscreened analogue type:**
UNIPUR®, see page A 49

Application

These robust and flexible cables are used for electrical tools such as drills, hand-held circular saws, and garden equipment as well as for portable motors and machinery in agriculture, at building sites, for hobbies, docks and refrigeration plants. Extremely good mechanical characteristics e.g. compressive load, good abrasion and near-resistant.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
1915_	2 x 0,5	6,1	35,0	46,0	20	1925_	2 x 0,75	6,8	40,0	60,0	18
1916_	3 G 0,5	6,3	42,0	56,0	20	1926_	3 G 0,75	7,1	52,0	68,0	18
1917_	4 G 0,5	6,8	47,0	62,0	20	1927_	4 G 0,75	7,7	60,0	78,0	18
1918_	5 G 0,5	7,4	56,0	75,0	20	1928_	5 G 0,75	8,4	71,0	95,0	18
1919_	7 G 0,5	8,8	69,0	98,0	20	1929_	6 G 0,75	9,1	80,0	112,0	18
1920_	12 G 0,5	10,9	108,0	158,0	20	1930_	7 G 0,75	10,0	91,0	138,0	18
1921_	18 G 0,5	13,0	145,0	216,0	20	1931_	12 G 0,75	12,3	142,0	207,0	18
1922_	25 G 0,5	15,6	240,0	315,0	20	1932_	18 G 0,75	14,8	212,0	293,0	18
1923_	34 G 0,5	17,2	312,0	371,0	20	1933_	25 G 0,75	18,4	281,0	413,0	18
1924_	41 G 0,5	19,4	348,0	442,0	20	1934_	34 G 0,75	20,3	345,0	523,0	18
						1935_	41 G 0,75	22,0	400,0	609,0	18

Continuation ▶

UNIPUR-CP flexible at low temperature, with customer markings, halogen-free, wear resistant, robust, screened, EMC-preferred type, meter marking



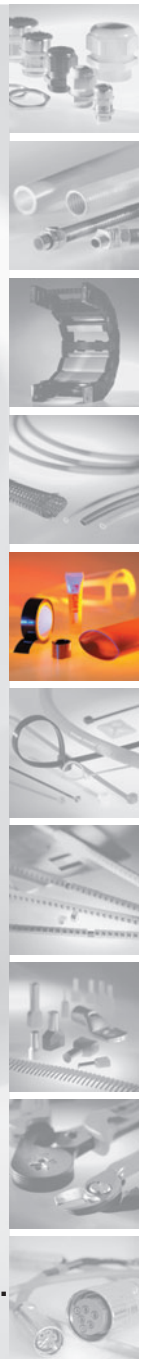
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
1936	2 x 1	7,1	50,0	65,0	17
1937	3 G 1	7,4	60,0	76,0	17
1938	4 G 1	8,1	71,0	89,0	17
1939	5 G 1	8,8	88,0	108,0	17
1940	6 G 1	9,7	97,0	141,0	17
1941	7 G 1	10,7	111,0	187,0	17
1942	12 G 1	12,9	184,0	240,0	17
1943	18 G 1	15,7	260,0	335,0	17
1944	25 G 1	19,3	349,0	484,0	17
1945	34 G 1	21,6	486,0	627,0	17
1946	41 G 1	23,3	531,0	738,0	17
1947	2 x 1,5	8,4	65,0	97,0	16
1948	3 G 1,5	8,8	80,0	119,0	16
1949	4 G 1,5	9,8	97,0	152,0	16
1950	5 G 1,5	10,9	119,0	168,0	16
1951	6 G 1,5	12,1	121,0	218,0	16
1952	7 G 1,5	13,2	147,0	243,0	16
1953	12 G 1,5	16,5	267,0	317,0	16
1954	18 G 1,5	19,6	374,0	481,0	16
1955	25 G 1,5	24,2	526,0	674,0	16
1956	34 G 1,5	27,0	629,0	881,0	16
1957	41 G 1,5	29,3	801,0	1027,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
1958	2 x 2,5	10,0	96,0	129,0	14
1959	3 G 2,5	10,7	144,0	158,0	14
1960	4 G 2,5	11,9	148,0	196,0	14
1961	5 G 2,5	13,2	181,0	241,0	14
1962	7 G 2,5	16,0	255,0	317,0	14
1963	12 G 2,5	19,8	441,0	496,0	14
1964	2 x 4	11,8	120,0	158,0	12
1965	3 G 4	12,4	174,0	261,0	12
1966	4 G 4	13,8	230,0	316,0	12
1967	5 G 4	15,6	273,0	384,0	12
1968	7 G 4	18,9	316,0	592,0	12
1969	2 x 6	13,4	173,0	259,0	10
1970	3 G 6	14,3	240,0	394,0	10
1971	4 G 6	16,0	305,0	483,0	10
1972	5 G 6	17,9	439,0	592,0	10
1973	7 G 6	21,6	505,0	714,0	10
1974	3 G 10	18,1	350,0	576,0	8
1975	4 G 10	20,2	535,0	729,0	8
1976	5 G 10	22,5	592,0	914,0	8
1977	3 G 16	20,6	585,0	960,0	6
1978	4 G 16	23,0	740,0	1813,0	6
1979	5 G 16	25,6	895,0	1827,0	6

Dimensions and specifications may be changed without prior notice. (RA02)

Terminations and straight-through joints

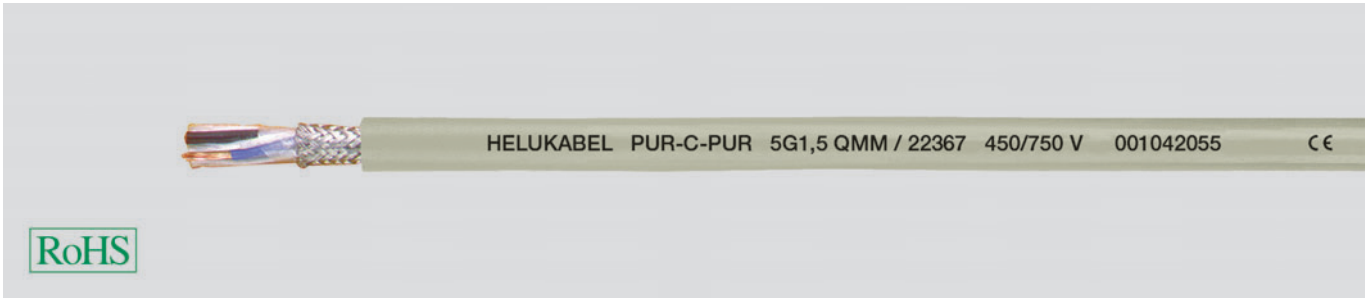
Telephone cables
Low voltage
Medium voltage
Accessories



You can find terminations and straight-through joints in our catalogue Cable Accessories. Request it now at www.helukabel.de

PUR-C-PUR Cu-screened, extrem conditions, halogen-free, EMC-preferred type, meter marking

A



Technical data

- Special PUR control cables, screened, adapted to DIN VDE 0250
- **Temperature range**
-40 °C to +80 °C
- **Nominal voltage**
U₀/U 300/500 V until 1 mm²
U₀/U 450/750 V from 1,5 mm²
- **Test voltage**
until 1 mm² 2000 V
from 1,5 mm² 2500 V
- **Insulation resistance**
min. 20 MOhm x km
- **Mutual capacitance** (800 Hz)
core/core approx. 150 pF/m
core/screen approx. 320 pF/m
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PUR insulation
- Core identification according to DIN VDE 0293-308
- Green-yellow earth core (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Foil taped
- Copper braided screening with 80-85% coverage
- PUR outer jacket
- Colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- High flexibility at low temperatures
- High abrasion resistance
- Break and cut resistant
- Tear resistant
- **Resistant to**
Oils and fats
Coolant and chemicals
Non-alcoholic fuels and kerosene
Atmospheric influences
UV-radiation
Oxygene and ozone
Microbes and rotting
Sea and waste water
Vibrations
Acids and Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (0).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

PUR-C-PUR screened cables are well suited as data transfer and connection cables for the machine and motor industries due to the good level of copper screening which blocks strong electrical disturbances.

This cable type has proven to be especially suited to use in extreme weather and environmental conditions due to its good thermal and chemical properties. (Temperature range -40 °C to +80 °C). In addition to this it also possesses excellent mechanical properties, e.g. pressure resistance and good abrasive resistant qualities, all of which go to guarantee a long life.

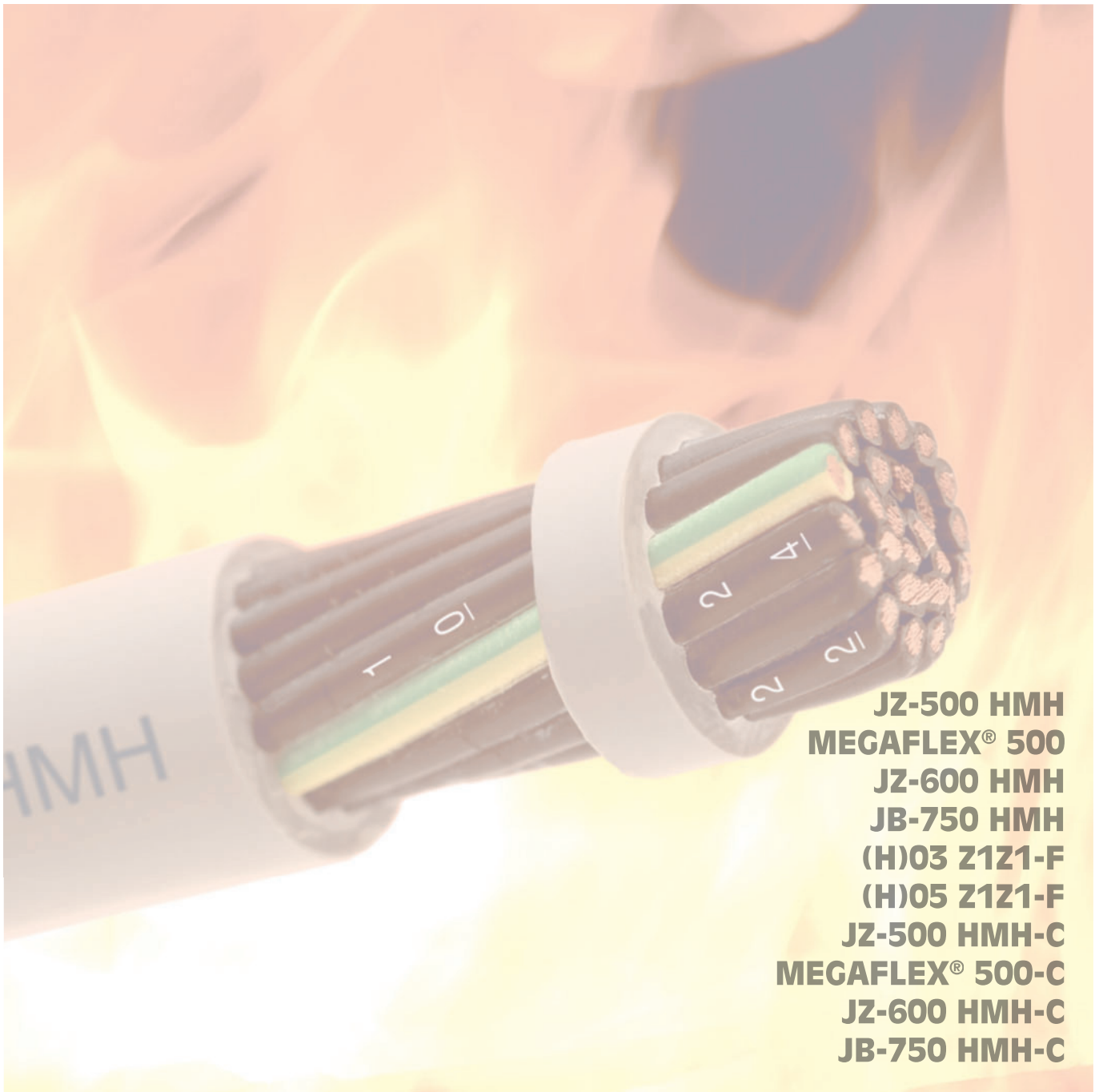
EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22315	2 x 0,75	6,8	40,0	65,0	18	22364	2 x 1,5	8,8	63,0	101,0	16
22316	3 G 0,75	7,4	52,0	80,0	18	22365	3 G 1,5	9,3	80,0	125,0	16
22317	4 G 0,75	8,0	60,0	95,0	18	22366	4 G 1,5	10,3	97,0	150,0	16
22318	5 G 0,75	8,8	71,0	126,0	18	22367	5 G 1,5	11,2	119,0	210,0	16
22319	6 G 0,75	9,5	80,0	150,0	18	22385	2 x 2,5	10,2	96,0	142,0	14
22339	2 x 1	7,3	50,0	80,0	17	22386	3 G 2,5	10,8	144,0	169,0	14
22340	3 G 1	7,7	60,0	95,0	17	22387	4 G 2,5	12,0	148,0	225,0	14
22341	4 G 1	8,3	71,0	106,0	17	22388	5 G 2,5	13,2	181,0	275,0	14
22342	5 G 1	9,2	88,0	149,0	17						

Dimensions and specifications may be changed without prior notice. (RA02)



JZ-500 HMH
MEGAFLEX® 500
JZ-600 HMH
JB-750 HMH
(H)03 Z1Z1-F
(H)05 Z1Z1-F
JZ-500 HMH-C
MEGAFLEX® 500-C
JZ-600 HMH-C
JB-750 HMH-C

Photo: HELUKABEL®

Halogen-free Control Cables

In all locations, due to damages of large amount of materials and more of importance to protect human life and technical equipment against damages caused by fire and also for technical enquiries of insurance, the installation of halogen-free security cables are required.

You will find on the following pages the instructions for installation as well as the test methods and laying instructions for the halogen-free security cables.

The most important advantages:

- No fire propagation from point of fire
- Functionality for important systems
- No corrosion and damage caused by released corrosive gases and vapours
- Protection of human life and valuable materials, especially for high quality machines, EDP systems etc.
- Prevention of heavy and unexpected subsequent damages
- Low smoke density helps rescue and fire extinguishing

JZ-500 HMH flexible control cable, halogen-free, extremely fire resistant, oil resistant¹⁾, meter marking



A



Technical data

- Halogen-free flexible control cable, core construction adapted to DIN VDE 0281 part 14 and DIN VDE 0281 part 13
- **Temperature range**
flexing -15 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Minimum bending radius**
flexing approx. 12,5x cable \varnothing
fixed installation approx. 4x cable \varnothing
- **Radiation resistance**
up to 100×10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free compound TI6, to E DIN VDE 0281 part 14
- Black cores with white continuous numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layer with optimal lay-length
- Halogen-free sheath compound TM7, to E DIN VDE 0281 part 14
- Outer jacket colour grey (RAL 7001)
- with meter marking, change-over in 2011
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- ¹⁾ For the critical applications we advise for consultation
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Please note the cleanroom qualification when ordering.
- **screened analogue type:**
JZ-500 HMH-C, see page A 71

Application

Halogen-free, flame retardant cables are used as measuring and control cable in machine tools, conveyor belts, production lines as well as in plant installations, in air-conditioning and steel production works. For fixed installation or flexible application, directed without forcing by casual, not constantly recurring free movements and without tensile stress, for medium mechanical strain. This cable is suitable for the application in dry, damp and wet environments and also for laying on, in and under plaster as well as in concrete and masonry excluding in direct laying in shaked or stamped concrete, not suitable for imbedding in solidified or compressed concrete.

C€ = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11201	2 x 0,5	4,9	9,6	43,0	20
11202	3 G 0,5	5,2	14,4	50,0	20
11332	3 x 0,5	5,2	14,4	50,0	20
11203	4 G 0,5	5,6	19,0	60,0	20
11333	4 x 0,5	5,6	19,0	60,0	20
11204	5 G 0,5	6,3	24,0	71,0	20
11334	5 x 0,5	6,3	24,0	71,0	20
11205	7 G 0,5	6,9	33,6	84,0	20
11206	8 G 0,5	7,4	38,0	101,0	20
11207	10 G 0,5	8,3	48,0	121,0	20
11208	12 G 0,5	8,8	58,0	142,0	20
11209	16 G 0,5	10,2	76,0	183,0	20

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11210	18 G 0,5	11,0	86,0	204,0	20
11211	20 G 0,5	11,5	96,0	227,0	20
11212	25 G 0,5	12,9	120,0	283,0	20
11213	30 G 0,5	13,8	144,0	324,0	20
11214	34 G 0,5	14,9	163,0	367,0	20
11215	37 G 0,5	14,9	178,0	381,0	20
11216	41 G 0,5	16,1	197,0	417,0	20
11217	42 G 0,5	16,1	202,0	454,0	20
11218	50 G 0,5	17,9	240,0	519,0	20
11219	61 G 0,5	19,0	293,0	635,0	20
11220	65 G 0,5	19,7	312,0	694,0	20

Continuation ▶

JZ-500 HMH flexible control cable, halogen-free, extremely fire resistant, oil resistant¹⁾, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11221	2 x 0,75	5,3	14,4	47,0	18
11222	3 G 0,75	5,6	21,6	56,0	18
11223	3 x 0,75	5,6	21,6	56,0	18
11223	4 G 0,75	6,3	29,0	69,0	18
11224	4 x 0,75	6,3	29,0	69,0	18
11224	5 G 0,75	6,9	36,0	83,0	18
11225	5 x 0,75	6,9	36,0	83,0	18
11225	7 G 0,75	7,5	50,0	114,0	18
11226	7 x 0,75	7,5	50,0	114,0	18
11226	8 G 0,75	8,2	58,0	136,0	18
11227	8 G 0,75	9,2	72,0	172,0	18
11228	10 G 0,75	9,8	86,0	185,0	18
11228	12 G 0,75	11,4	115,0	241,0	18
11229	16 G 0,75	12,2	130,0	266,0	18
11230	20 G 0,75	12,7	144,0	291,0	18
11231	25 G 0,75	14,3	180,0	374,0	18
11232	30 G 0,75	15,3	216,0	450,0	18
11233	34 G 0,75	16,7	245,0	517,0	18
11234	37 G 0,75	16,7	260,0	541,0	18
11235	41 G 0,75	18,0	296,0	611,0	18
11236	42 G 0,75	18,0	302,0	621,0	18
11237	50 G 0,75	19,8	360,0	742,0	18
11238	61 G 0,75	21,2	439,0	853,0	18
11239	65 G 0,75	21,7	468,0	909,0	18
11240	2 x 1	5,6	19,2	63,0	17
11241	3 G 1	5,9	29,0	74,0	17
11242	3 x 1	5,9	29,0	74,0	17
11243	4 G 1	6,6	38,4	90,0	17
11243	4 x 1	6,6	38,4	90,0	17
11244	5 G 1	7,3	48,0	109,0	17
11245	7 G 1	8,1	67,0	151,0	17
11246	8 G 1	8,7	77,0	184,0	17
11247	10 G 1	9,8	96,0	224,0	17
11248	12 G 1	10,4	115,0	243,0	17
11249	16 G 1	12,3	154,0	314,0	17
11250	18 G 1	12,9	173,0	361,0	17
11251	20 G 1	13,7	192,0	387,0	17
11252	25 G 1	15,4	240,0	496,0	17
11253	34 G 1	17,9	326,0	670,0	17
11254	37 G 1	17,9	355,0	713,0	17
11255	41 G 1	19,4	394,0	784,0	17
11256	42 G 1	19,4	405,0	824,0	17
11257	50 G 1	21,2	480,0	952,0	17
11258	61 G 1	22,5	586,0	1140,0	17
11259	65 G 1	23,5	628,0	1201,0	17
11260	2 x 1,5	6,4	29,0	70,0	16
11261	3 G 1,5	6,8	43,0	94,0	16
11261	3 x 1,5	6,8	43,0	94,0	16
11262	4 G 1,5	7,4	58,0	112,0	16
11263	5 G 1,5	8,3	72,0	141,0	16
11264	7 G 1,5	9,2	101,0	191,0	16
11265	8 G 1,5	9,9	115,0	224,0	16
11266	10 G 1,5	10,9	144,0	282,0	16
11267	12 G 1,5	12,0	173,0	311,0	16
11268	16 G 1,5	13,9	230,0	392,0	16
11269	18 G 1,5	14,6	259,0	450,0	16
11270	20 G 1,5	15,5	288,0	497,0	16
11271	25 G 1,5	17,4	360,0	630,0	16
11272	34 G 1,5	20,2	490,0	842,0	16
11273	37 G 1,5	20,2	533,0	897,0	16
11274	50 G 1,5	24,2	720,0	1277,0	16
11275	61 G 1,5	25,8	878,0	1460,0	16
11276	65 G 1,5	26,7	936,0	1612,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11277	2 x 2,5	7,8	48,0	118,0	14
11278	3 G 2,5	8,3	72,0	151,0	14
11279	4 G 2,5	9,2	96,0	181,0	14
11280	5 G 2,5	10,1	120,0	224,0	14
11281	7 G 2,5	11,2	168,0	316,0	14
11282	8 G 2,5	12,3	192,0	370,0	14
11283	10 G 2,5	13,9	240,0	451,0	14
11284	12 G 2,5	14,8	288,0	499,0	14
11285	16 G 2,5	17,1	384,0	720,0	14
11286	18 G 2,5	18,2	432,0	769,0	14
11287	20 G 2,5	19,1	480,0	911,0	14
11288	25 G 2,5	21,6	600,0	1047,0	14
11289	30 G 2,5	23,0	720,0	1280,0	14
11290	2 x 4	9,3	77,0	199,0	12
11291	3 G 4	9,8	115,0	247,0	12
11292	4 G 4	11,0	154,0	299,0	12
11293	5 G 4	12,3	192,0	369,0	12
11294	7 G 4	13,6	269,0	463,0	12
11295	8 G 4	14,6	307,0	601,0	12
11296	10 G 4	17,8	384,0	698,0	12
11297	12 G 4	18,2	461,0	790,0	12
11298	16 G 4	20,6	614,0	1130,0	12
11299	18 G 4	21,9	691,0	1280,0	12
11300	2 x 6	11,0	115,0	266,0	10
11301	3 G 6	11,9	173,0	360,0	10
11302	4 G 6	13,0	230,0	429,0	10
11303	5 G 6	14,5	288,0	529,0	10
11304	7 G 6	16,2	403,0	631,0	10
11305	2 x 10	14,0	192,0	440,0	8
11306	3 G 10	14,8	288,0	550,0	8
11307	4 G 10	16,4	384,0	708,0	8
11308	5 G 10	18,3	480,0	862,0	8
11309	7 G 10	20,2	672,0	1124,0	8
11310	2 x 16	16,8	307,0	642,0	6
11311	3 G 16	18,2	461,0	830,0	6
11312	4 G 16	20,0	614,0	1060,0	6
11313	5 G 16	22,6	768,0	1270,0	6
11314	7 G 16	24,8	1075,0	1794,0	6
11315	3 G 25	22,2	720,0	1190,0	4
11316	4 G 25	24,9	960,0	1594,0	4
11317	5 G 25	27,7	1200,0	2014,0	4
11318	3 G 35	25,6	1008,0	1590,0	2
11319	4 G 35	28,4	1344,0	2200,0	2
11320	5 G 35	31,7	1680,0	2693,0	2
11321	3 G 50	30,9	1440,0	2571,0	1
11322	4 G 50	34,2	1920,0	3087,0	1
11323	5 G 50	38,3	2400,0	3980,0	1
11324	3 G 70	36,5	2016,0	3207,0	2/0
11325	4 G 70	40,3	2688,0	4077,0	2/0
11326	5 G 70	45,3	3560,0	5501,0	2/0
11327	3 G 95	41,1	2736,0	4708,0	3/0
11328	4 G 95	45,8	3648,0	5590,0	3/0
11329	5 G 95	50,7	4560,0	6972,0	3/0
11330	3 G 120	47,0	3456,0	5515,0	4/0
11331	4 G 120	51,4	4608,0	7100,0	4/0

Dimensions and specifications may be changed without prior notice. (RA03)

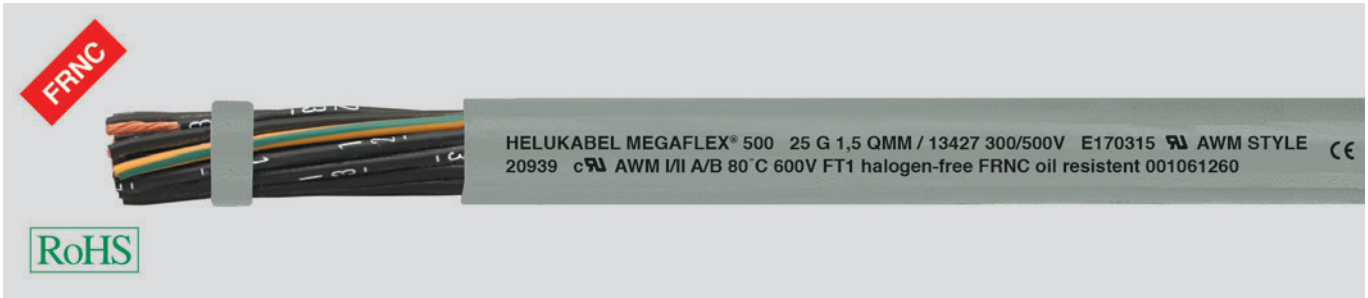


Quality assurance inspections with the aid of a stereo microscope at our Windsbach factory.

MEGAFLEX® 500 halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking



A



Technical data

- Halogen-free flexible control cable, core-structure adapted to DIN VDE 0281 part 14, to UL-Style 20939, UL-Std. 758
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
flexing approx. 10x cable ø
fixed installation approx. 4x cable ø
- **Flexible**
Alternate bending test according to DIN VDE 0281-2

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free special polymer
- Black cores with white continuous numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layer with optimal lay-length
- Outer sheath, halogen-free special polymer
- Outer jacket colour grey (RAL 7001)
- with meter marking, change-over in 2011
- The materials used in manufacture are cadmium-free and contain no silicone and are free from substances harmful to the wetting properties of lacquers
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free
- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Hydrolysis resistant
- Flexible, abrasion- and wear-resistant
- Ozone-resistant
- Recyclable

Tests

- Flame test to VDE 0482-332-3/ BS 4066 part 3/
DIN EN 60332-3/ IEC 60332-3-24 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN/IEC 60332-1 (previously DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to NF X 10-702
- Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN EN 60811-2-1
- Hydrolysis-resistant to DIN EN 61234-1
- Ozone-resistant to DIN EN 60811-2-1 / DIN VDE 0281-2



Approved to UL/CSA
see section N, page N 54

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Also available as a 0,6/1 kV cable under consideration of economical minimum quantities. MEGAFLEX® 600
- **screened analogue type:**
MEGAFLEX® 500-C, see page A 73, N 56

Application

For fixed installation or flexible application, with free movements without forcing which do not constantly recur and without tensile stress, for high mechanical strain. As a measuring and control cable primarily in machinery and plant construction, in building and air-conditioning systems, in warehousing and conveying systems, in ship-building and for regenerative types of energy such as in the construction of wind power stations. Especially well-suited for use in public buildings, such as airports and train stations, where personal injuries and subsequent damage must be prevented in the event of a fire. The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13344	2 x 0,5	4,8	9,6	43,0	20
13345	3 G 0,5	5,1	14,4	50,0	20
13346	3 x 0,5	5,1	14,4	50,0	20
13347	4 G 0,5	5,7	19,0	60,0	20
13348	4 x 0,5	5,7	19,0	60,0	20
13349	5 G 0,5	6,2	24,0	71,0	20
13350	5 x 0,5	6,2	24,0	71,0	20
13351	7 G 0,5	7,4	33,6	84,0	20
13352	8 G 0,5	8,0	38,0	101,0	20
13353	10 G 0,5	8,8	48,0	121,0	20
13354	12 G 0,5	9,1	58,0	142,0	20
13355	16 G 0,5	10,0	76,0	183,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13356	18 G 0,5	10,7	86,0	204,0	20
13357	20 G 0,5	11,2	96,0	227,0	20
13359	25 G 0,5	12,7	120,0	283,0	20
13360	30 G 0,5	13,5	144,0	324,0	20
13361	34 G 0,5	14,5	163,0	367,0	20
13362	37 G 0,5	15,0	178,0	381,0	20
13363	41 G 0,5	15,8	197,0	417,0	20
13364	42 G 0,5	15,8	202,0	454,0	20
13365	50 G 0,5	17,3	240,0	519,0	20
13366	61 G 0,5	19,4	293,0	635,0	20
13367	65 G 0,5	19,4	312,0	694,0	20

Continuation ▶

MEGAFLEX® 500

halogen-free, flame retardant, oil-resistant,
UV-resistant, flexible, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13368	2 x 0,75	5,2	14,4	47,0	19
13369	3 G 0,75	5,5	21,6	56,0	19
13370	3 x 0,75	5,5	21,6	56,0	19
13371	4 G 0,75	6,2	29,0	69,0	19
13372	4 x 0,75	6,2	29,0	69,0	19
13373	5 G 0,75	6,8	36,0	83,0	19
13374	5 x 0,75	6,8	36,0	83,0	19
13375	7 G 0,75	8,1	50,0	114,0	19
13376	7 x 0,75	8,1	50,0	114,0	19
13377	8 G 0,75	8,9	58,0	136,0	19
13378	10 G 0,75	9,6	72,0	172,0	19
13379	12 G 0,75	9,9	86,0	185,0	19
13380	16 G 0,75	11,2	115,0	241,0	19
13381	18 G 0,75	11,9	130,0	266,0	19
13382	20 G 0,75	12,6	144,0	291,0	19
13383	25 G 0,75	14,1	180,0	374,0	19
13384	30 G 0,75	15,4	216,0	450,0	19
13385	34 G 0,75	16,4	245,0	517,0	19
13386	37 G 0,75	17,2	260,0	541,0	19
13387	41 G 0,75	17,6	296,0	611,0	19
13388	42 G 0,75	17,6	302,0	621,0	19
13389	50 G 0,75	19,8	360,0	742,0	19
13390	61 G 0,75	20,9	439,0	853,0	19
13392	65 G 0,75	21,5	468,0	909,0	19
13393	2 x 1	5,5	19,2	63,0	18
13394	3 G 1	6,0	29,0	74,0	18
13395	3 x 1	6,0	29,0	74,0	18
13396	4 G 1	6,6	38,4	90,0	18
13397	4 x 1	6,6	38,4	90,0	18
13398	5 G 1	7,2	48,0	109,0	18
13399	7 G 1	8,6	67,0	151,0	18
13400	8 G 1	9,4	77,0	184,0	18
13401	10 G 1	10,4	96,0	224,0	18
13402	12 G 1	10,7	115,0	243,0	18
13403	16 G 1	12,0	154,0	314,0	18
13404	18 G 1	12,7	173,0	361,0	18
13405	20 G 1	13,5	192,0	387,0	18
13406	25 G 1	15,2	240,0	496,0	18
13407	34 G 1	17,4	326,0	670,0	18
13408	37 G 1	18,4	355,0	713,0	18
13409	41 G 1	18,9	394,0	784,0	18
13410	42 G 1	18,9	405,0	824,0	18
13411	50 G 1	21,0	480,0	952,0	18
13412	61 G 1	22,2	586,0	1140,0	18
13413	65 G 1	22,8	628,0	1201,0	18
13414	2 x 1,5	6,1	29,0	70,0	16
13415	3 G 1,5	6,5	43,0	94,0	16
13416	3 x 1,5	6,5	43,0	94,0	16
13417	4 G 1,5	7,2	58,0	112,0	16
13418	5 G 1,5	7,9	72,0	141,0	16
13419	7 G 1,5	9,5	101,0	191,0	16
13420	8 G 1,5	10,4	115,0	224,0	16
13421	10 G 1,5	11,3	144,0	282,0	16
13422	12 G 1,5	11,7	173,0	311,0	16
13423	16 G 1,5	13,3	230,0	392,0	16
13425	18 G 1,5	14,0	259,0	450,0	16
13426	20 G 1,5	14,9	288,0	497,0	16
13427	25 G 1,5	16,8	360,0	630,0	16
13428	34 G 1,5	19,4	490,0	842,0	16
13429	37 G 1,5	20,2	533,0	897,0	16
13430	50 G 1,5	23,4	720,0	1277,0	16
13431	61 G 1,5	24,8	878,0	1460,0	16
13432	65 G 1,5	26,0	936,0	1612,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13433	2 x 2,5	7,6	48,0	118,0	14
13434	3 G 2,5	8,3	72,0	151,0	14
13435	4 G 2,5	9,1	96,0	181,0	14
13436	5 G 2,5	10,2	120,0	224,0	14
13437	7 G 2,5	12,1	168,0	316,0	14
13438	8 G 2,5	13,2	192,0	370,0	14
13439	10 G 2,5	14,6	240,0	451,0	14
13440	12 G 2,5	15,2	288,0	499,0	14
13441	16 G 2,5	16,8	384,0	720,0	14
13442	18 G 2,5	18,1	432,0	769,0	14
13443	20 G 2,5	19,0	480,0	911,0	14
13444	25 G 2,5	22,2	600,0	1047,0	14
13445	30 G 2,5	22,9	720,0	1280,0	14
13446	2 x 4	9,2	77,0	199,0	12
13447	3 G 4	9,9	115,0	247,0	12
13448	4 G 4	11,0	154,0	299,0	12
13449	5 G 4	12,1	192,0	369,0	12
13450	7 G 4	13,3	269,0	463,0	12
13451	8 G 4	15,9	307,0	601,0	12
13452	10 G 4	17,3	384,0	698,0	12
13453	12 G 4	18,3	461,0	790,0	12
13454	16 G 4	20,2	614,0	1130,0	12
13455	18 G 4	21,8	691,0	1280,0	12
13456	2 x 6	10,8	115,0	266,0	10
13457	3 G 6	11,7	173,0	360,0	10
13458	4 G 6	13,0	230,0	429,0	10
13459	5 G 6	14,5	288,0	529,0	10
13460	7 G 6	16,0	403,0	631,0	10
13461	2 x 10	14,0	192,0	440,0	8
13462	3 G 10	15,0	288,0	550,0	8
13463	4 G 10	16,8	384,0	708,0	8
13464	5 G 10	18,7	480,0	862,0	8
13465	7 G 10	20,6	672,0	1124,0	8
13466	2 x 16	16,5	307,0	642,0	6
13467	3 G 16	17,6	461,0	830,0	6
13468	4 G 16	19,7	641,0	1060,0	6
13469	5 G 16	21,9	768,0	1270,0	6
13470	7 G 16	24,4	1075,0	1794,0	6
13471	3 G 25	22,5	720,0	1190,0	4
13472	4 G 25	25,2	960,0	1594,0	4
13473	5 G 25	27,9	1200,0	2014,0	4
13474	3 G 35	26,3	1008,0	1590,0	2
13475	4 G 35	29,2	1344,0	2200,0	2
13476	5 G 35	32,7	1680,0	2693,0	2
13477	3 G 50	31,5	1440,0	2571,0	1
13478	4 G 50	35,0	1920,0	3087,0	1
13479	5 G 50	38,7	2400,0	3980,0	1
13480	3 G 70	37,2	2016,0	3207,0	2/0
13481	4 G 70	42,2	2688,0	4077,0	2/0
13482	5 G 70	47,4	3560,0	5501,0	2/0
13483	3 G 95	42,1	2736,0	4708,0	3/0
13484	4 G 95	47,0	3648,0	5590,0	3/0
13485	5 G 95	52,3	4560,0	6972,0	3/0
13486	3 G 120	46,6	3456,0	5515,0	4/0
13487	4 G 120	51,4	4608,0	7100,0	4/0
13488	3 G 150	53,0	4320,0	6279,0	300 kcmil
13489	4 G 150	59,0	5760,0	7781,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RA03)

JZ-600 HMH flexible control cable, halogen-free, extremely fire resistant, oil resistant¹⁾, 0,6/1kV, meter marking



A



Technical data

- Halogen-free, flexible control cable, adapted to DIN VDE 0281 part 14 and DIN VDE 0281 part 13
- **Temperature range**
flexing -15 °C to +70 °C
fixed -40 °C to +70 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
for permanent bending
approx. 15x cable \varnothing
- **Radiation resistance**
up to 100×10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and/or IEC 60228 cl. 5
- Halogen-free polymer core insulation, TI6 acc. to E DIN VDE 0281 Part 14
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Halogen-free polymer sheath, TM7 acc. to E DIN VDE 0281 Part 14
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- ¹⁾ For critical applications recommend you request a consultation
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test acc. to VDE 0482-332-3 BS 4066 Part 3/ DIN EN 60332-3/IEC 60332-3 (as per DIN VDE 0472 Part 804 Test Method C)
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Corrosiveness of corrosive gases acc. to VDE 0482, Part 267/ DIN EN 50267-2-2/ IEC 607542 (as per DIN VDE 0472, Part 813)
- Halogen-free acc. to VDE 0482, Part 267/ DIN EN 50267-2-1/ IEC 60754-1 (as per DIN VDE 0472, Part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **screened analogue type:**
JZ-600 HMH-C, see page A 75

Application

Halogen-free, flame retardant cables are used as measuring and control cable in machine tools, conveyor belts, production lines as well as in plant installations, in heating and air-conditioning systems and steel production works. For fixed installation or flexible application, directed without forcing by casual, constantly recurring free movements and without tensile stress, for medium mechanical strain. This cable is suitable for the application in dry, damp and wet environments and outdoors (fixed installation) and for laying on, in and under plaster as well as in concrete and masonry excluding in direct laying in vibration, compacted or compressed concrete.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12723	2 x 0,5	6,3	9,6	57,0	20	12735	2 x 0,75	6,6	14,4	68,0	18
12724	3 G 0,5	6,6	14,4	69,0	20	12736	3 G 0,75	6,9	21,6	77,0	18
12725	3 x 0,5	6,6	14,4	69,0	20	12737	3 x 0,75	6,9	21,6	77,0	18
12726	4 G 0,5	7,2	19,0	104,0	20	12738	4 G 0,75	7,5	29,0	136,0	18
12727	4 x 0,5	7,2	19,0	104,0	20	12739	4 x 0,75	7,5	29,0	136,0	18
12728	5 G 0,5	8,0	24,0	121,0	20	12740	5 G 0,75	8,4	36,0	152,0	18
12729	5 x 0,5	8,0	24,0	121,0	20	12741	5 x 0,75	8,4	36,0	152,0	18
12730	7 G 0,5	8,7	33,6	145,0	20	12742	7 G 0,75	9,3	50,0	208,0	18
12731	10 G 0,5	10,6	48,0	186,0	20	12743	10 G 0,75	11,1	72,0	250,0	18
12732	12 G 0,5	11,4	58,0	224,0	20	12744	12 G 0,75	12,2	86,0	271,0	18
12733	18 G 0,5	13,8	86,0	292,0	20	12745	18 G 0,75	14,5	130,0	387,0	18
12734	25 G 0,5	16,1	120,0	357,0	20	12746	25 G 0,75	17,2	180,0	498,0	18

Continuation ▶

JZ-600 HMH flexible control cable, halogen-free, extremely fire resistant, oil resistant¹⁾, 0,6/1kV, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12747	2 x 1	7,0	19,2	82,0	17
12748	3 G 1	7,4	29,0	99,0	17
12749	3 x 1	7,4	29,0	99,0	17
12750	4 G 1	8,2	38,4	140,0	17
12751	4 x 1	8,2	38,4	140,0	17
12752	5 G 1	9,2	48,0	160,0	17
12753	5 x 1	9,2	48,0	160,0	17
12754	7 G 1	9,9	67,0	217,0	17
12755	10 G 1	11,9	96,0	271,0	17
12756	12 G 1	13,1	115,0	301,0	17
12757	18 G 1	15,7	173,0	417,0	17
12758	25 G 1	18,6	240,0	576,0	17
12759	2 x 1,5	8,2	29,0	97,0	16
12760	3 G 1,5	8,6	43,0	119,0	16
12761	3 x 1,5	8,6	43,0	119,0	16
12762	4 G 1,5	9,6	58,0	148,0	16
12763	4 x 1,5	9,6	58,0	148,0	16
12764	5 G 1,5	10,7	72,0	172,0	16
12765	5 x 1,5	10,7	72,0	172,0	16
12766	7 G 1,5	11,6	101,0	243,0	16
12767	10 G 1,5	15,2	144,0	311,0	16
12768	12 G 1,5	15,5	173,0	392,0	16
12769	18 G 1,5	18,6	259,0	529,0	16
12770	25 G 1,5	22,5	360,0	741,0	16
12771	2 x 2,5	9,6	48,0	160,0	14
12772	3 G 2,5	10,1	72,0	177,0	14
12773	3 x 2,5	10,1	72,0	177,0	14
12774	4 G 2,5	11,2	96,0	209,0	14
12775	4 x 2,5	11,2	96,0	209,0	14
12776	5 G 2,5	12,5	120,0	272,0	14
12777	5 x 2,5	12,5	120,0	272,0	14
12778	7 G 2,5	13,8	168,0	340,0	14
12779	10 G 2,5	16,7	288,0	561,0	14
12780	12 G 2,5	18,3	432,0	799,0	14
12781	18 G 2,5	22,0	480,0	940,0	14
12782	25 G 2,5	26,2	600,0	1121,0	14

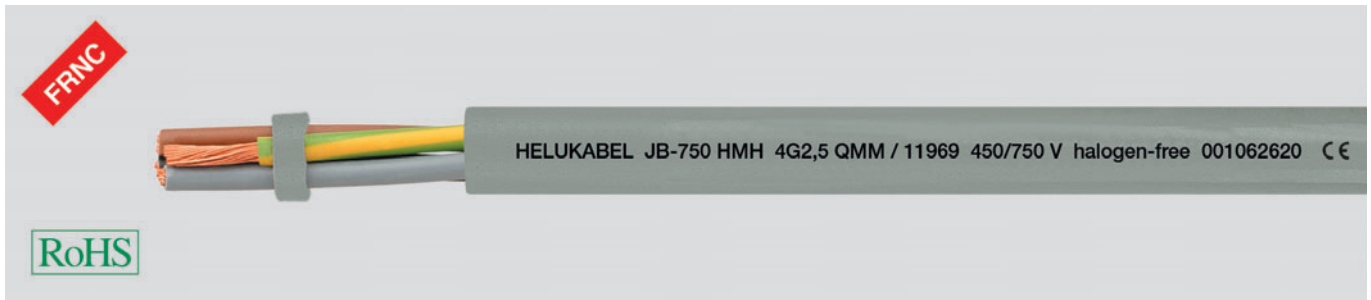
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12783	3 G 4	11,7	115,0	255,0	12
12784	4 G 4	13,0	154,0	319,0	12
12785	5 G 4	14,5	192,0	423,0	12
12786	3 G 6	13,1	173,0	380,0	10
12787	4 G 6	14,5	230,0	441,0	10
12788	5 G 6	16,2	288,0	657,0	10
12789	3 G 10	16,5	288,0	668,0	8
12790	4 G 10	18,2	384,0	796,0	8
12791	5 G 10	20,3	480,0	972,0	8
12792	3 G 16	20,1	461,0	832,0	6
12793	4 G 16	22,3	614,0	1122,0	6
12794	5 G 16	25,0	768,0	1604,0	6
12795	3 G 25	24,8	720,0	1457,0	4
12796	4 G 25	27,4	960,0	1611,0	4
12797	5 G 25	30,5	1200,0	2070,0	4
12798	3 G 35	27,1	1008,0	1914,0	2
12799	4 G 35	30,0	1344,0	2424,0	2
12800	5 G 35	33,3	1680,0	2970,0	2
12801	4 G 50	35,8	1920,0	3467,0	1
12802	4 G 70	40,9	2688,0	4491,0	2/0
12803	4 G 95	46,2	3648,0	6170,0	3/0
12804	4 G 120	51,6	4608,0	7618,0	4/0

Dimensions and specifications may be changed without prior notice. (RA03)

JB-750 HMH flexible control cable, coloured core, halogen-free, extremely fire resistant, oil resistant¹⁾, meter marking



A



Technical data

- Halogen-free flexible control cable, adapted to DIN VDE 0281 part 14 and DIN VDE 0281 part 13
- **Temperature range**
flexing -15 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U_0/U 450/750 V
- **Test voltage** 3000 V
- **Minimum bending radius**
flexing approx. 12,5x cable \varnothing
fixed installation approx. 4x cable \varnothing
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free compound TI6, to E DIN VDE 0281 part 14
- Colour coded to DIN VDE 0293-308
- Green-yellow earth core in the outer layer
- Cores stranded in layer with optimal lay-length
- Halogen-free sheath compound TM7, to E DIN VDE 0281 part 14
- Outer jacket colour grey (RAL 7001)
- with meter marking, change-over in 2011
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- ¹⁾ For the critical applications we advise for consultation
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test to VDE 0482-332-3 BS 4066 part 3/ DIN EN 60332-3/IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Please note the cleanroom qualification when ordering.
- **screened analogue type:**
JB-750 HMH-C, see page A 77

Application

Halogen-free, flame retardant cables are used as measuring and control cable in machine tools, conveyor belts, production lines as well as in plant installations, in air-conditioning and steel production works. For fixed installation or flexible application, directed without forcing by casual, not constantly recurring free movements and without tensile stress, for medium mechanical strain. This cable is suitable for the application in dry, damp and wet environments and also for laying on, in and under plaster as well as in concrete and masonry excluding in direct laying in shaked or stamped concrete, not suitable for imbedding in solidified or compressed concrete.

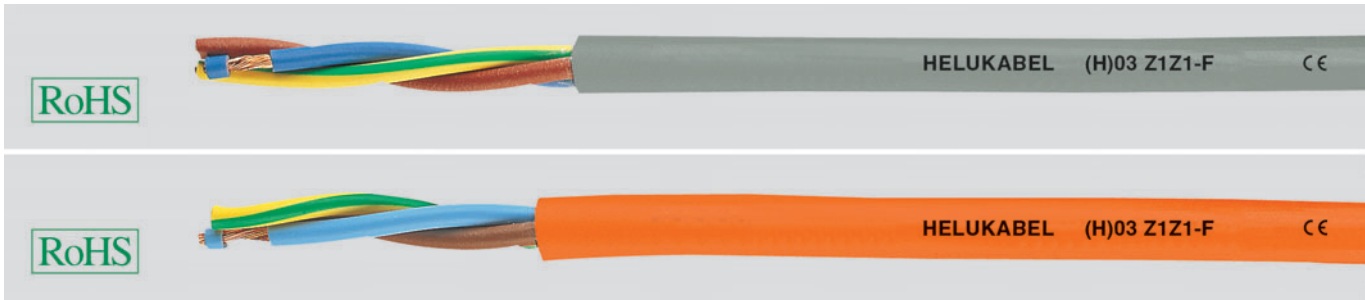
CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11965	3 G 1,5	6,8	43,0	110,0	16
11966	4 G 1,5	7,4	58,0	140,0	16
11967	5 G 1,5	8,3	72,0	181,0	16
11968	3 G 2,5	8,3	72,0	181,0	14
11969	4 G 2,5	9,2	96,0	223,0	14
11970	5 G 2,5	10,1	120,0	269,0	14
11971	3 G 4	9,8	115,0	238,0	12
11972	4 G 4	11,0	154,0	292,0	12
11973	5 G 4	12,3	192,0	357,0	12
11974	4 G 6	13,0	230,0	392,0	10
11975	5 G 6	14,5	288,0	501,0	10

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11976	4 G 10	16,4	384,0	750,0	8
11977	5 G 10	18,3	480,0	916,0	8
11978	4 G 16	20,0	614,0	1037,0	6
11979	5 G 16	22,6	768,0	1280,0	6
11980	4 G 25	24,9	960,0	1504,0	4
11981	5 G 25	27,7	1200,0	1883,0	4
11982	4 G 35	28,4	1344,0	2057,0	2
11983	5 G 35	31,7	1680,0	2575,0	2
11984	4 G 50	34,2	1920,0	2808,0	1
11985	4 G 70	40,3	2688,0	3964,0	2/0
11986	4 G 95	45,8	3648,0	4951,0	3/0
11987	4 G 120	51,4	4608,0	6387,0	4/0

Dimensions and specifications may be changed without prior notice. (RA03)

(H)03 Z1Z1-F halogen-free, meter marking



Technical data

- flexible halogen-free control cable according E DIN VDE 0281 part 14 pr HD 21.14 S1
- Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- Nominal voltage**
U₀/U 300/300 V
- Test voltage** 2000 V
- Breakdown voltage** min. 4000 V
- Minimum bending radius**
approx. 7,5x cable ø
- Radiation resistance**
up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

- Bare copper, fine wire conductor, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5, HD 383
- Insulating jacket thermoplastic compound, TI6 according to DIN VDE 0281 part 14, appendix A
- Core identification according to DIN VDE 0293-308
- Green-yellow earth core, 3 cores and above
- Core stranded with optimal lay-length
- Outer sheath, thermoplastic compound, TM7 according DIN VDE 0281 part 14, appendix B
- Jacket colour by request
- with meter marking, change-over in 2011

Properties

- Tests**
Tested for flame retardation to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Smoke density to VDE 0482 part 268-2
- Halogen-free to HD 21.14 appendix C
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Colour code:
0 = RAL 9005, black
1 = RAL 9003, white
2 = RAL 5015, blue
3 = RAL 6018, green
4 = RAL 8003, brown
5 = RAL 1021, yellow
6 = RAL 3000, red
7 = RAL 2003, orange
8 = RAL 4005, violet
9 = RAL 7001/7032, grey
- Please add the individual part no. for order with the identification colour code.
Further colours on request.

Application

These cables may be used when halogen-free, low smoke and corrosive gas properties are required in case of fire. For low mechanical demands in the house, kitchen and office, for small equipment such as, for example, office machines, radios, table and stranded lamps. Not suitable for:

Cooking and heating equipment, use in high temperature areas (for example, in lighting equipment), outside use, industrial use or industrial electrical tools, cables with a nominal cross-section of 0,75 mm² comply with the same recommendations as for cable (H)05 Z1Z1-F.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

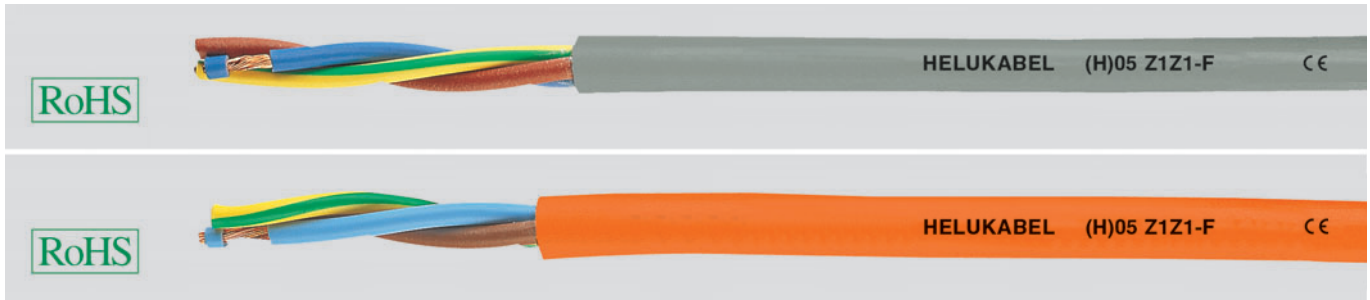
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3233_	2 x 0,5	5,0	9,6	39,0	20
3234_	3 G 0,5	5,3	14,4	46,0	20
3235_	4 G 0,5	5,8	19,2	56,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3236_	2 x 0,75	5,4	14,4	47,0	18
3237_	3 G 0,75	5,7	21,6	55,0	18
3238_	4 G 0,75	6,3	29,0	69,0	18

Dimensions and specifications may be changed without prior notice. (RA03)

(H)05 Z1Z1-F halogen-free, meter marking

A



Technical data

- flexible halogen-free control cable according E DIN VDE 0281 part 14 pr HD 21.14 S1
- Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- Nominal voltage**
U₀/U 300/500 V
- Test voltage** 2500 V
- Breakdown voltage** min. 5000 V
- Minimum bending radius**
approx. 7,5x cable ø
- Radiation resistance**
up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

- Bare copper, fine wire conductor, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5, HD 383
- Insulating jacket thermoplastic compound, TI6 according to DIN VDE 0281 part 14, appendix A
- Core identification according to DIN VDE 0293-308
- Green-yellow earth core, 3 cores and above
- Core stranded with optimal lay-length
- Outer sheath, thermoplastic compound, TM7 according DIN VDE 0281 part 14, appendix B
- Jacket colour by request
- with meter marking, change-over in 2011

Properties

- Tests**
Tested for flame retardation to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Smoke density to VDE 0482 part 268-2
- Halogen-free to HD 21.14 appendix C
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Colour code:
0 = RAL 9005, black
1 = RAL 9003, white
2 = RAL 5015, blue
3 = RAL 6018, green
4 = RAL 8003, brown
5 = RAL 1021, yellow
6 = RAL 3000, red
7 = RAL 2003, orange
8 = RAL 4005, violet
9 = RAL 7001/7032, grey
- Please add the individual part no. for order with the identification colour code.
Further colours on request.

Application

These cables may be used when halogen-free, low smoke and corrosive gas properties are required in case of fire. For moderate mechanical demands in the house, kitchen and office, for house equipment in damp rooms (for example: washing machines, spin-dryers and refrigerators). Suitable for cooking and heating equipment, providing the cable is not in contact with hot components or heat radiation.

Not suitable for:

in high temperature areas (for example, in lighting equipment), outside buildings, in industrial or agricultural buildings, connection of electrical power tools.

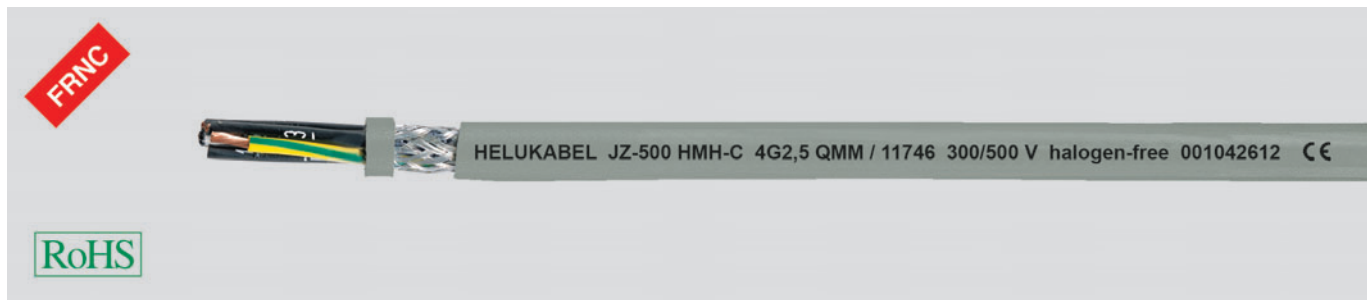
CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3027_	2 x 0,75	6,2	14,4	58,0	18
3028_	3 G 0,75	6,6	21,6	68,0	18
3029_	4 G 0,75	7,1	29,0	81,0	18
3050_	5 G 0,75	8,0	36,0	102,0	18
3031_	2 x 1	6,6	19,0	67,0	17
3032_	3 G 1	6,9	29,0	81,0	17
3034_	4 G 1	7,7	38,0	101,0	17
3035_	5 G 1	8,4	48,0	107,0	17
3036_	2 x 1,5	7,4	29,0	87,0	16
3037_	3 G 1,5	8,1	43,0	109,0	16
3038_	4 G 1,5	9,1	58,0	117,0	16
3039_	5 G 1,5	10,1	72,0	169,0	16
3040_	2 x 2,5	9,3	48,0	138,0	14
3041_	3 G 2,5	10,1	72,0	172,0	14
3042_	4 G 2,5	11,0	96,0	210,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3043_	5 G 2,5	12,3	120,0	260,0	14
3044_	2 x 4	10,6	76,8	190,0	12
3045_	3 G 4	11,5	115,2	242,0	12
3046_	4 G 4	12,5	153,6	298,0	12
3047_	5 G 4	14,1	192,0	371,0	12

Dimensions and specifications may be changed without prior notice. (RA03)

JZ-500 HMMH-C flexible control cable, halogen-free, extremely fire resistant, oil resistant¹⁾, Cu-screened, EMC-preferred type



Technical data

- Halogen-free core flexible control cable adapted to DIN VDE 0281 part 14 and DIN VDE 0281 part 13
- **Temperature range**
flexing -15 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 2000 V
- **Minimum bending radius**
flexing approx. 12,5x cable ø
fixed installation approx. 4x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free compound TI6, to E DIN VDE 0281 part 14
- Black cores with white continuous numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores laid up in layers with optimal lay-length
- Separating layer
- Screen braid of tinned copper wires, coverage approx. 85%
- Halogen-free sheath compound TM7, to E DIN VDE 0281 part 14
- Jacket colour grey (RAL 7001)
- with meter marking, change-over in 2011
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- ¹⁾ For the critical applications we advise for consultation
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **unscreened analogue type:**
JZ-500 HMMH, see page A 62

Application

Halogen-free, flame retardant control cables are used for instrumentation and control cables in tooling machinery, conveyor and transportation belts, production lines, in plant construction, air-conditioning systems as well as in iron and steel works. For fixed installation or for flexing applications, for casual, not constantly recurring free movement without forced motion and without tensile stress for medium mechanical loads. The cable is suitable for use in dry, damp and wet environments for installation above, on, in and beneath plaster as well as in masonry and concrete walls except for direct embedding in vibrated, compacted or tamped concrete, not suitable for imbedding in solidified or compressed concrete.

An interference-free transmission of signals and pulse is assured by the high degree of screening.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11656	2 x 0,5	5,7	35,0	46,0	20
11657	3 G 0,5	5,9	42,0	56,0	20
11342	3 x 0,5	5,9	42,0	56,0	20
11658	4 G 0,5	6,4	47,0	62,0	20
11343	4 x 0,5	6,4	47,0	62,0	20
11659	5 G 0,5	6,9	56,0	75,0	20
11660	7 G 0,5	7,6	69,0	98,0	20
11663	12 G 0,5	9,7	108,0	158,0	20
11665	18 G 0,5	11,5	145,0	216,0	20
11667	25 G 0,5	13,6	240,0	315,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11678	2 x 0,75	6,1	40,0	60,0	18
11679	3 G 0,75	6,3	52,0	68,0	18
11344	3 x 0,75	6,3	52,0	68,0	18
11680	4 G 0,75	6,8	60,0	78,0	18
11345	4 x 0,75	6,8	60,0	78,0	18
11681	5 G 0,75	7,4	71,0	95,0	18
11346	5 x 0,75	7,4	71,0	95,0	18
11682	7 G 0,75	8,2	91,0	130,0	18
11347	7 x 0,75	8,2	91,0	130,0	18
11685	12 G 0,75	10,5	142,0	203,0	18
11687	18 G 0,75	12,7	212,0	290,0	18
11689	25 G 0,75	15,0	281,0	413,0	18

Continuation ▶

JZ-500 HMH-C flexible control cable, halogen-free, extremely fire resistant, oil resistant¹⁾, Cu-screened, EMC-preferred type



A

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11700	2 x 1	6,4	50,0	66,0	17
11701	3 G 1	6,7	60,0	80,0	17
11348	3 x 1	6,7	60,0	80,0	17
11702	4 G 1	7,2	71,0	100,0	17
11349	4 x 1	7,2	71,0	100,0	17
11703	5 G 1	8,0	88,0	130,0	17
11704	7 G 1	8,7	111,0	160,0	17
11707	12 G 1	11,4	184,0	260,0	17
11709	18 G 1	13,5	260,0	382,0	17
11711	25 G 1	16,2	349,0	540,0	17
11722	2 x 1,5	7,0	65,0	88,0	16
11723	3 G 1,5	7,4	80,0	100,0	16
11350	3 x 1,5	7,4	80,0	100,0	16
11724	4 G 1,5	8,1	97,0	125,0	16
11725	5 G 1,5	9,0	119,0	158,0	16
11726	7 G 1,5	9,8	147,0	210,0	16
11729	12 G 1,5	12,8	267,0	340,0	16
11731	18 G 1,5	15,5	374,0	480,0	16
11733	25 G 1,5	18,5	526,0	702,0	16
11744	2 x 2,5	8,4	96,0	132,0	14
11745	3 G 2,5	8,8	144,0	168,0	14
11746	4 G 2,5	9,8	148,0	195,0	14
11747	5 G 2,5	10,8	181,0	222,0	14
11748	7 G 2,5	11,9	255,0	345,0	14
11751	12 G 2,5	15,8	441,0	572,0	14
11766	2 x 4	9,9	120,0	184,0	12
11768	3 G 4	10,4	174,0	238,0	12
11769	4 G 4	11,6	230,0	305,0	12
11770	5 G 4	12,9	273,0	388,0	12
11771	7 G 4	14,2	316,0	504,0	12
11781	2 G 6	11,7	173,0	270,0	10
11782	3 G 6	12,5	240,0	328,0	10
11783	4 G 6	13,8	305,0	416,0	10
11784	5 G 6	15,3	439,0	510,0	10
11785	7 G 6	16,9	505,0	670,0	10
11786	2 x 10	14,5	255,0	420,0	8
11787	3 G 10	15,5	350,0	495,0	8
11788	4 G 10	17,1	535,0	785,0	8
11789	5 G 10	19,1	592,0	855,0	8
11790	7 G 10	21,2	810,0	1308,0	8
11793	4 G 16	20,8	740,0	882,0	6

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11794	5 G 16	23,4	895,0	1293,0	6
11812	7 G 16	25,6	1282,0	2149,0	6
11795	3 G 25	23,0	1070,0	1432,0	4
11796	4 G 25	25,7	1140,0	1911,0	4
11797	5 G 25	28,5	1380,0	2414,0	4
11798	3 G 35	26,4	1240,0	1914,0	2
11799	4 G 35	29,2	1576,0	2542,0	2
11800	5 G 35	32,5	1930,0	3180,0	2
11801	3 G 50	31,7	1675,0	3080,0	1
11802	4 G 50	35,0	2155,0	3550,0	1
11803	5 G 50	39,1	2794,0	4753,0	1
11804	3 G 70	37,3	2288,0	3840,0	2/0
11805	4 G 70	41,1	3120,0	4939,0	2/0
11806	5 G 70	46,1	3705,0	6572,0	2/0
11807	3 G 95	42,2	3010,0	5651,0	3/0
11808	4 G 95	46,9	4043,0	6690,0	3/0
11809	5 G 95	51,8	5026,0	8370,0	3/0
11810	3 G 120	47,3	3812,0	6342,0	4/0
11811	4 G 120	52,5	5069,0	8453,0	4/0
11813	4 G 185	65,5	8040,0	10800,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RA03)

MEGAFLEX® 500-C halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, screened, EMC-preferred types, meter marking



Technical data

- Halogen-free flexible control cable, core-structure adapted to DIN VDE 0281 part 14, to UL-Style 20939, UL-Std. 758
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
flexing approx. 10x cable ø
fixed installation approx. 4x cable ø
- **Flexible**
Alternate bending test according to DIN VDE 0281-2
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free special polymer
- Black cores with white continuous numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layer with optimal lay-length
- Separating foil
- Tinned copper braided screening, coverage approx. 85%
- Outer sheath, halogen-free special polymer
- Outer jacket colour grey (RAL 7001)
- with meter marking, change-over in 2011
- The materials used in manufacture are cadmium-free and contain no silicone and are free from substances harmful to the wetting properties of lacquers
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free
- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Flexible, abrasion- and wear-resistant
- Ozone-resistant
- Recyclable

Tests

- Flame test to VDE 0482-332-3 / BS 4066 part 3/
DIN EN 60332-3/IEC 60332-3 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN/IEC 60332-1 (previously DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to NF X 10-702
Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN 60811-2-1
- Hydrolysis-resistant to DIN EN 61234-1
- Ozone-resistant to DIN EN 60811-2-1 / DIN VDE 0281-2



Approved to UL/CSA
see section N, page N 56

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **unscreened analogue type:**
MEGAFLEX® 500, see page A 64, N 54

Application

For fixed installation or flexible application, with free movements without forcing which do not constantly recur and without tensile stress, for high mechanical strain. An interference-free transmission of signals and pulse is assured by the high degree of screening. As a measuring and control cable primarily in machinery and plant construction, in building and air-conditioning systems, in warehousing and conveying systems, in ship-building and for regenerative types of energy such as in the construction of wind power stations. Especially well-suited for use in public buildings, such as airports and train stations, where personal injuries and subsequent damage must be prevented in the event of a fire.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13500	2 x 0,5	5,7	35,0	46,0	20
13501	3 G 0,5	6,0	42,0	56,0	20
13502	3 x 0,5	6,0	42,0	56,0	20
13504	4 x 0,5	6,5	47,0	62,0	20
13503	4 G 0,5	6,5	47,0	62,0	20
13505	5 G 0,5	7,0	56,0	75,0	20
13506	5 x 0,5	7,0	56,0	75,0	20
13507	7 G 0,5	7,9	69,0	98,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13508	8 G 0,5	8,5	80,0	116,0	20
13509	10 G 0,5	9,3	94,0	135,0	20
13510	12 G 0,5	9,6	108,0	158,0	20
13511	16 G 0,5	10,7	129,0	210,0	20
13512	18 G 0,5	11,2	145,0	216,0	20
13514	20 G 0,5	11,9	172,0	240,0	20
13515	25 G 0,5	13,4	240,0	315,0	20

Continuation ►

MEGAFLEX® 500-C halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, screened, EMC-preferred types, meter marking



A

Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13516	2 x 0,75	6,1	40,0	60,0	18
13517	3 G 0,75	6,4	52,0	68,0	18
13518	3 x 0,75	6,4	52,0	68,0	18
13519	4 G 0,75	6,9	60,0	78,0	18
13520	4 x 0,75	6,9	60,0	78,0	18
13521	5 G 0,75	7,4	71,0	95,0	18
13522	5 x 0,75	7,4	71,0	95,0	18
13523	7 G 0,75	8,6	91,0	130,0	18
13524	7 x 0,75	8,6	91,0	130,0	18
13525	8 G 0,75	9,4	110,0	145,0	18
13526	10 G 0,75	10,2	137,0	180,0	18
13527	12 G 0,75	10,4	142,0	203,0	18
13528	16 G 0,75	11,6	200,0	275,0	18
13529	18 G 0,75	12,4	212,0	290,0	18
13530	20 G 0,75	12,9	238,0	320,0	18
13531	25 G 0,75	14,8	281,0	413,0	18
13532	2 x 1	6,4	50,0	66,0	17
13533	3 G 1	6,7	60,0	80,0	17
13534	3 x 1	6,7	60,0	80,0	17
13535	4 G 1	7,3	71,0	100,0	17
13536	4 x 1	7,3	71,0	100,0	17
13537	5 G 1	7,8	88,0	130,0	17
13538	7 G 1	9,1	111,0	160,0	17
13539	8 G 1	9,9	127,0	197,0	17
13540	10 G 1	10,8	150,0	232,0	17
13541	12 G 1	11,2	184,0	260,0	17
13542	16 G 1	12,3	209,0	346,0	17
13543	18 G 1	13,2	260,0	382,0	17
13544	20 G 1	13,8	317,0	440,0	17
13545	25 G 1	15,8	349,0	540,0	17
13546	2 x 1,5	6,6	63,0	88,0	16
13547	3 G 1,5	6,9	80,0	100,0	16
13548	3 x 1,5	6,9	80,0	100,0	16
13549	4 G 1,5	7,5	97,0	125,0	16
13550	5 G 1,5	8,4	119,0	158,0	16
13552	7 G 1,5	10,0	147,0	210,0	16
13554	8 G 1,5	10,7	170,0	244,0	16
13556	10 G 1,5	11,8	193,0	315,0	16
13557	12 G 1,5	12,1	267,0	340,0	16
13558	16 G 1,5	13,6	315,0	424,0	16
13559	18 G 1,5	14,6	374,0	480,0	16
13560	20 G 1,5	15,3	396,0	545,0	16
13561	25 G 1,5	17,9	526,0	702,0	16

Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13562	2 x 2,5	8,3	96,0	132,0	14
13563	3 G 2,5	9,0	144,0	168,0	14
13565	4 G 2,5	9,8	148,0	195,0	14
13566	5 G 2,5	10,9	181,0	256,0	14
13567	7 G 2,5	12,9	255,0	345,0	14
13568	8 G 2,5	13,8	285,0	390,0	17
13569	10 G 2,5	15,8	340,0	482,0	14
13570	12 G 2,5	15,9	441,0	572,0	14
13571	2 x 4	9,8	120,0	220,0	12
13572	3 G 4	10,6	174,0	251,0	12
13573	4 G 4	11,5	230,0	305,0	12
13574	5 G 4	12,7	273,0	388,0	12
13575	7 G 4	13,9	316,0	504,0	12
13576	2 x 6	11,5	173,0	270,0	10
13577	3 G 6	12,4	240,0	351,0	10
13578	4 G 6	13,8	305,0	464,0	10
13579	5 G 6	15,7	439,0	546,0	10
13580	7 G 6	16,6	505,0	670,0	10
13581	2 x 10	14,9	255,0	461,0	8
13582	3 G 10	15,9	350,0	574,0	8
13583	4 G 10	17,8	535,0	785,0	8
13584	5 G 10	19,6	592,0	914,0	8
13585	7 G 10	21,6	810,0	1308,0	8
13586	2 x 16	17,3	422,0	670,0	6
13587	3 G 16	18,5	585,0	911,0	6
13588	4 G 16	20,8	740,0	1105,0	6
13589	5 G 16	22,9	895,0	1293,0	6
13590	7 G 16	25,0	1282,0	2149,0	6
13591	4 G 25	26,2	1140,0	1911,0	4
13592	4 x 35	30,4	1576,0	2542,0	2
13593	4 G 50	34,6	2155,0	3550,0	1
13594	4 G 70	41,3	3120,0	4939,0	2/0
13595	4 G 95	46,2	4043,0	6690,0	3/0
13596	4 G 120	51,0	5069,0	8453,0	4/0
13597	4 G 150	59,0	5792,0	9104,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RA03)

JZ-600 HMH-C flexible control cable, halogen-free, extremely fire resistant, oil resistant¹⁾, 0,6/1kV, screened, EMC-preferred type, meter marking



Technical data

- Halogen-free, flexible control cable, core construction adapted to DIN VDE 0281 Part 14 and DIN VDE 0281 Part 13
- **Temperature range**
flexing -15 °C to +70 °C
fixed -40 °C to +70 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
for permanent bending
approx. 15x cable \varnothing
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100×10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and/or IEC 60228 cl. 5
- Halogen-free polymer core insulation, T16 acc. to E DIN VDE 0281 Part 14
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Inner sheath
- Tinned copper braided screening, coverage approx. 85%
- Free-free polymer sheath, TM7 acc. to E DIN VDE 0281 Part 14
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Properties

- ¹⁾ For critical applications recommend you request a consultation

Tests

- Flame test acc. to VDE 0482-332-3 BS 4066 Part 3/
DIN EN EN 60332-3/IEC 60332-3 (as per DIN VDE 0472 Part 804 Test Method C)
- Self-extinguishing and flame-resistant acc. to DIN VDE 0482 Part 265-2-1/
EN 50265-2-1/ IEC 60332-1 (as per DIN VDE 0472 Part 804 Test Method B)
- Corrosiveness of corrosive gases acc. to VDE 0482, Part 267/ DIN EN 50267-2-2/ IEC 607542 (as per DIN VDE 0472, Part 813)
- Halogen-free acc. to VDE 0482, Part 267/ DIN EN 50267-2-1/ IEC 60754-1 (as per DIN VDE 0472, Part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- **unscreened analogue type:**
JZ-600 HMH, see page A 66

Application

Halogen-free, flame retardant cables are used as measuring and control cable in machine tools, conveyor belts, production lines as well as in plant installations, in heating and air-conditioning systems and steel production works. For fixed installation or flexible application, directed without forcing by casual, constantly recurring free movements and without tensile stress, for medium mechanical strain. This cable is suitable for the application in dry, damp and wet environments and outdoors (fixed installation) and for laying on, in and under plaster as well as in concrete and masonry excluding in direct laying in vibration, compacted or compressed concrete. The dense screening assures interference-free transmission of all signals and impulses.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12850	3 G 0,5	8,8	45,0	150,0	20
12851	4 G 0,5	9,6	54,0	170,0	20
12852	5 G 0,5	10,2	66,0	199,0	20
12853	7 G 0,5	11,1	79,0	235,0	20
12854	12 G 0,5	14,0	137,0	320,0	20
12855	18 G 0,5	16,2	156,0	428,0	20
12856	25 G 0,5	19,1	250,0	503,0	20
12857	3 G 0,75	9,3	57,0	155,0	18
12858	4 G 0,75	9,9	63,0	190,0	18
12859	5 G 0,75	10,8	76,0	228,0	18
12860	7 G 0,75	11,5	100,0	323,0	18
12861	12 G 0,75	14,8	175,0	410,0	18
12862	18 G 0,75	17,1	240,0	560,0	18
12863	25 G 0,75	20,2	306,0	730,0	18

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12864	3 G 1	9,8	64,0	163,0	17
12865	4 G 1	10,6	76,0	200,0	17
12866	5 G 1	11,4	89,0	239,0	17
12867	7 G 1	12,5	114,0	289,0	17
12868	12 G 1	15,7	186,0	464,0	17
12869	18 G 1	18,4	284,0	628,0	17
12870	25 G 1	21,6	387,0	855,0	17
12871	3 G 1,5	11,1	82,0	187,0	16
12872	4 G 1,5	11,8	99,0	240,0	16
12873	5 G 1,5	13,1	123,0	289,0	16
12874	7 G 1,5	14,2	148,0	383,0	16
12875	12 G 1,5	18,1	274,0	592,0	16
12876	18 G 1,5	21,4	386,0	806,0	16
12877	25 G 1,5	24,9	531,0	1241,0	16

Continuation ▶

JZ-600 HMH-C flexible control cable, halogen-free, extremely fire resistant, oil resistant¹⁾, 0,6/1kV, screened, EMC-preferred type, meter marking



A

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12878	3 G 2,5	12,7	148,0	298,0	14
12879	4 G 2,5	13,8	169,0	345,0	14
12880	5 G 2,5	15,1	220,0	427,0	14
12881	7 G 2,5	16,6	284,0	561,0	14
12882	12 G 2,5	21,3	470,0	857,0	14
12883	18 G 2,5	25,4	572,0	1355,0	14
12884	25 G 2,5	29,6	740,0	1995,0	14
12885	3 G 4	14,4	178,0	391,0	12
12886	4 G 4	15,7	234,0	527,0	12
12887	5 G 4	17,3	284,0	700,0	12
12888	3 G 6	15,9	245,0	629,0	10
12889	4 G 6	17,3	316,0	731,0	10
12890	5 G 6	19,2	442,0	1105,0	10
12891	3 G 10	19,7	367,0	1125,0	8
12892	4 G 10	21,5	549,0	1345,0	8
12893	5 G 10	23,7	604,0	1655,0	8

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
12894	4 G 16	26,1	807,0	1395,0	6
12895	5 G 16	29,0	940,0	1870,0	6
12896	7 G 16	31,8	1345,0	2720,0	6
12897	3 G 25	28,7	920,0	2465,0	4
12898	4 G 25	31,7	1169,0	2750,0	4
12899	5 G 25	35,0	1420,0	3490,0	4
12900	3 G 35	31,2	1250,0	3230,0	2
12901	4 G 35	34,5	1680,0	4100,0	2
12902	5 G 35	38,1	2020,0	4950,0	2
12903	4 G 50	40,7	2370,0	5780,0	1
12904	4 G 70	46,0	3257,0	7480,0	2/0
12905	4 G 95	51,3	4060,0	10220,0	3/0
12906	4 G 120	56,4	5231,0	13750,0	4/0
12907	4 G 150	64,3	6794,0	15900,0	4/0

Dimensions and specifications may be changed without prior notice. (RA03)

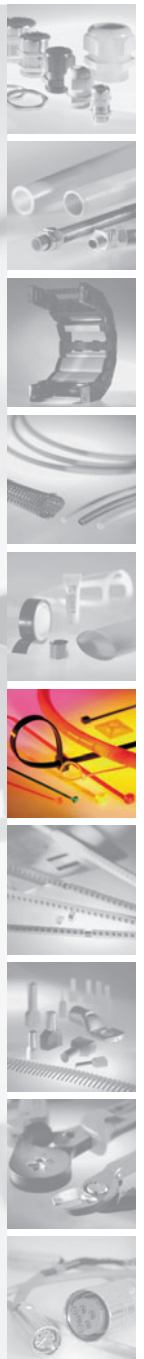
Bundling, binding, fastening

Plastic helix

Cable tie

Hook and loop cable tie

Mounting block



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JB-750 HMM-C flexible control cable, coloured core, halogen-free, screened, extremely fire resistant, oil resistant¹⁾, EMC-preferred type, meter marking



Technical data

- Halogen-free core flexible control cable, adapted to E DIN VDE 0281 part 14 and DIN VDE 0281 part 13
- **Temperature range**
flexing -15 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U₀/U 450/750 V
- **Test voltage** 3000 V
- **Minimum bending radius**
flexing approx. 12,5x cable ø
fixed installation approx. 4x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free compound TI6, to E DIN VDE 0281 part 14
- Colour coded to DIN VDE 0293-308
- Green-yellow earth core in the outer layer
- Cores laid up in layers with optimal lay-length
- Separating layer
- Screen braid of tinned copper wires, coverage approx. 85%
- Halogen-free sheath compound TM7, to E DIN VDE 0281 part 14
- Jacket colour grey (RAL 7001)
- with meter marking, change-over in 2011
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- ¹⁾ For the critical applications we advise for consultation
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test to DIN VDE 0482-332-3 BS 4066 part 3/ DIN EN 60332-3/IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to DIN VDE 0482 part 267/ EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- G = with green-yellow earth core
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **unscreened analogue type:**
JB-750 HMM, see page A 68

Application

Halogen-free, flame retardant control cables are used for instrumentation and control cables in tooling machinery, conveyor and transportation belts, production lines, in plant construction, air-conditioning systems as well as in iron and steel works. For fixed installation or for flexing applications, for casual, not constantly recurring free movement without forced motion and without tensile stress for medium mechanical loads. The cable is suitable for use in dry, damp and wet environments for installation above, on, in and beneath plaster as well as in masonry and concrete walls except for direct embedding in vibrated, compacted or tamped concrete, not suitable for imbedding in solidified or compressed concrete.

An interference-free transmission of signals and pulse is assured by the high degree of screening.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11942	3 G 1,5	7,4	80,0	125,0	16
11943	4 G 1,5	8,1	97,0	160,0	16
11944	5 G 1,5	9,0	119,0	193,0	16
11945	3 G 2,5	8,8	144,0	198,0	14
11946	4 G 2,5	9,8	148,0	240,0	14
11947	5 G 2,5	10,8	181,0	280,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11948	3 G 4	10,4	174,0	251,0	12
11949	4 G 4	11,6	230,0	315,0	12
11950	5 G 4	12,9	273,0	396,0	12
11951	4 G 6	13,8	305,0	430,0	10
11952	5 G 6	15,3	439,0	524,0	10

Continuation ►

JB-750 HMH-C flexible control cable, coloured core, halogen-free, screened, extremely fire resistant, oil resistant¹⁾, EMC-preferred type, meter marking



A

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11953	4 G 10	17,1	535,0	804,0	8
11954	5 G 10	19,1	592,0	942,0	8
11955	4 G 16	20,8	740,0	1190,0	6
11956	5 G 16	23,4	895,0	1370,0	6
11957	4 G 25	25,7	1140,0	1968,0	4
11958	5 G 25	28,5	1380,0	2514,0	4

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
11959	4 G 35	29,2	1576,0	2540,0	2
11960	5 G 35	32,5	1930,0	3260,0	2
11961	4 G 50	34,6	2155,0	3668,0	1
11962	4 G 70	41,1	3120,0	5076,0	2/0
11963	4 G 95	46,9	4043,0	6807,0	3/0
11964	4 G 120	52,5	5069,0	8612,0	4/0

Dimensions and specifications may be changed without prior notice. (RA03)

Marking

Marking rings
Cable marker
Indian pen



You can find marking in our catalogue Cable Accessories.
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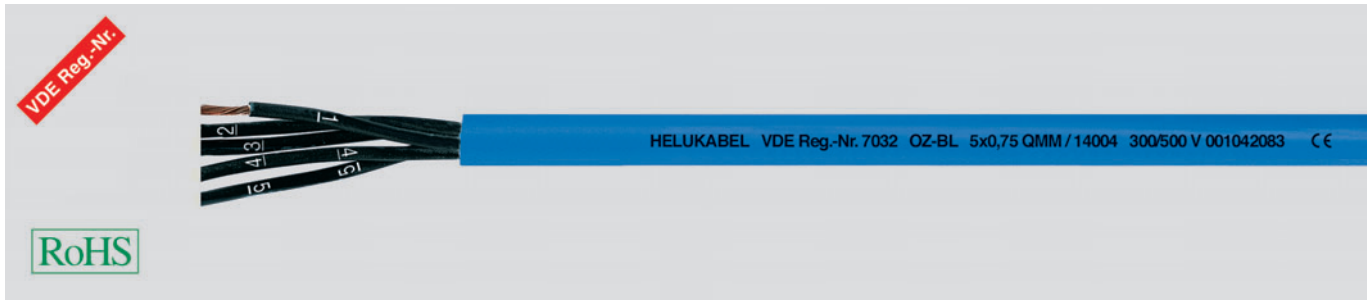
Photo: ©iStockphoto.com/Michael Utech

PVC Control Cables for Intrinsically Safe Circuits

Electrical cables for intrinsically safe circuits (separate power circuit of hazard type-i-) have to be specially marked with a blue outer sheath (RAL 5015) according to DIN VDE. HELUKABEL® manufactures these cables according to DIN VDE 0165 and in addition, screened types according to DIN VDE 0165, part 1, EN 60079-14 and IEC 60079-14 section 12.2.2.6.

As these cables are installed with separate power circuit, the application of green-yellow protective conductor is not allowed.

The installation of these cables outside of intrinsically safe circuits is not permitted. The installation can be done in dry and damp environments, but not in underground and in open air. The special PVC outer sheath material is resistant to oil and petrol as well as being flame resistant. HELUKABEL® can deliver almost all the cables as per typelists on the following pages, predominantly available in stock. Special cables can be manufactured in a short time.



Technical data

- Control cable, special PVC with blue outer jacket for hazardous areas to hazard type -i- (=intrinsically safe)
- For intrinsically safe installation according to DIN EN 60079-14 and IEC 60079-14 section 12.2.2 (VDE 0165 part 1)
- **Temperature range**
flexing -15 °C¹⁾ to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Mutual capacitance**
core/core approx. 120 nF/km
- **Inductance** approx. 0,68 mH/km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- ¹⁾ cold bending test, impact resistance test at low temperatures, elongation test at low temperatures. Tested according VDE 0473 Teil 811-1-4, EN 60811-1-4

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with white continuous figure imprint to DIN VDE 0293 without earth core
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1 and HD 21.1
- Colour blue (RAL 5015)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations.
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- For underground laying use NYY with blue outer sheath.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Instrumentation cable RE-2Y(St)Yv with blue outer jacket see catalog part B.

Application

For hazardous areas the cables with special marking (blue) (hazard type-i-) used as flexible control and measuring cables to meet the requirements for the installation of electrical apparatus. These installations are not earthed and require a separate power circuit. Those cables are not suitable for underground laying.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
14001	2 x 0,75	5,3	14,4	46,0	18	14019	2 x 1,5	6,4	29,0	70,0	16
14002	3 x 0,75	5,6	21,6	54,0	18	14020	3 x 1,5	6,8	43,0	90,0	16
14003	4 x 0,75	6,3	29,0	66,0	18	14021	4 x 1,5	7,4	58,0	109,0	16
14004	5 x 0,75	6,9	36,0	80,0	18	14022	5 x 1,5	8,3	72,0	131,0	16
14075	7 x 0,75	7,5	52,0	110,0	18	14023	7 x 1,5	9,2	101,0	184,0	16
14005	8 x 0,75	8,2	58,0	130,0	18	14024	12 x 1,5	12,0	173,0	309,0	16
14076	12 x 0,75	9,8	88,0	179,0	18	14025	18 x 1,5	14,6	259,0	440,0	16
14006	18 x 0,75	12,2	130,0	257,0	18	14026	25 x 1,5	17,4	360,0	620,0	16
14007	25 x 0,75	14,3	180,0	365,0	18	14027	30 x 1,5	18,6	440,0	842,0	16
14008	30 x 0,75	15,3	215,0	448,0	18	14100	3 x 2,5	8,3	72,0	148,0	14
14009	34 x 0,75	16,7	245,0	510,0	18	14101	4 x 2,5	9,2	96,0	178,0	14
14010	41 x 0,75	18,0	298,0	607,0	18	14102	5 x 2,5	10,1	120,0	221,0	14
14011	2 x 1	5,6	19,0	60,0	17						
14012	3 x 1	5,9	29,0	72,0	17						
14013	4 x 1	6,6	38,0	86,0	17						
14014	5 x 1	7,3	48,0	104,0	17						
14015	7 x 1	8,1	67,0	141,0	17						
14016	12 x 1	10,4	115,0	230,0	17						
14017	18 x 1	12,9	173,0	343,0	17						
14018	25 x 1	15,4	240,0	485,0	17						

Dimensions and specifications may be changed without prior notice. (RA04)



Technical data

- Control cable, special PVC with blue outer jacket for hazardous areas to hazard type -i- (=intrinsically safe)
- For intrinsically safe installation according to DIN EN 60079-14 and IEC 60079-14 section 12.2.2. (VDE 0165 part 1)
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Mutual capacitance**
core/core approx. 140 nF/km
core/screen approx. 187 nF/km
- **Inductance** approx. 0,68 mH/km
- **Coupling resistance**
max. 250 Ωm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of special PVC Z 7225
- Black cores with white continuous figure imprint to DIN VDE 0293 without earth core
- Cores stranded in layers with optimal lay-length
- Core wrapping of plastic foil
- Braiding, tinned copper wire screening, approx. 85% coverage
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1 and HD 21.1
- Colour blue (RAL 5015)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations.
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- For underground laying use NYY with blue outer sheath.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Instrumentation cable RE-2Y(St)Yv with blue outer jacket see catalog part B.

Application

For hazardous areas the cables with special marking (blue) (hazard type-i-) used as flexible control and measuring cables to meet the requirements for the installation of electrical apparatus. These installations are not earthed and require a separate power circuit. Those cables are not suitable for underground laying.

The copper braided screening ensures the transmission of data signals and free from interference.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
14028	2 x 0,75	6,1	40,0	59,0	18
14029	3 x 0,75	6,3	52,0	66,0	18
14030	4 x 0,75	6,8	60,0	77,0	18
14031	5 x 0,75	7,4	71,0	93,0	18
14088	7 x 0,75	8,2	91,0	130,0	18
14032	8 x 0,75	9,6	110,0	145,0	18
14033	10 x 0,75	10,3	137,0	180,0	18
14034	12 x 0,75	10,5	142,0	202,0	18
14035	18 x 0,75	12,7	212,0	292,0	18
14036	20 x 0,75	13,3	238,0	362,0	18
14037	25 x 0,75	15,0	281,0	415,0	18
14038	30 x 0,75	15,8	320,0	486,0	18
14039	34 x 0,75	17,2	345,0	525,0	18
14040	41 x 0,75	18,6	400,0	680,0	18
14041	2 x 1	6,4	50,0	65,0	17
14042	3 x 1	6,7	60,0	81,0	17
14043	4 x 1	7,2	71,0	98,0	17
14044	5 x 1	8,0	88,0	127,0	17
14045	7 x 1	8,7	111,0	158,0	17
14046	12 x 1	11,4	184,0	260,0	17
14047	18 x 1	13,5	260,0	380,0	17
14048	25 x 1	16,2	349,0	534,0	17
14049	34 x 1	18,5	486,0	741,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
14050	2 x 1,5	7,0	65,0	88,0	16
14051	3 x 1,5	7,5	80,0	100,0	16
14052	4 x 1,5	8,1	97,0	126,0	16
14053	5 x 1,5	9,0	119,0	160,0	16
14054	7 x 1,5	9,8	147,0	208,0	16
14055	12 x 1,5	12,8	267,0	338,0	16
14056	18 x 1,5	15,4	374,0	479,0	16
14057	25 x 1,5	18,4	526,0	705,0	16
14058	30 x 1,5	19,1	555,0	830,0	16
14059	34 x 1,5	20,8	629,0	900,0	16

Dimensions and specifications may be changed without prior notice. (RA04)

OB-BL-PAAR-CY outer jacket blue, intrinsic safety, EMC-preferred type, meter marking



A



HELUKABEL OB-BL-PAAR-CY 4x2x0.5 QMM / 14079 900 V 001042085 CE



Technical data

- Special PVC control cable with blue outer jacket for hazardous areas to hazard type -i- for intrinsically safe installation according to DIN EN 60079-14 and IEC 60079-14 section 12.2.2. (VDE 0165 part 1)
- **Conductor resistance**
at 0,5 mm² ≤37,8 Ohm/km
at 0,75 mm² ≤25,3 Ohm/km
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** 900 V
(not for power installation)
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Breakdown voltage** min. 4000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Mutual capacitance**
core/core approx. 105 nF/km
core/screen approx. 145 nF/km
- **Inductance**
approx. 0,68 mH/km
- **Characteristic impedance**
approx. 80 Ohm
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation Y12, to DIN VDE 0207 part 4
- Cores colour coded according to DIN 47100
- Cores twisted in pairs
- Pairs stranded in layers with optimal lay-length
- Foil taped
- Tinned copper braided screening, approx. 80% coverage
- Special PVC outer sheath YM2, to DIN VDE 0207 part 5
- Colour blue RAL 5015
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Instrumentation cable RE-2Y(St)Yv with blue outer jacket see catalog part B.

Application

For hazardous areas this flexible control cable has been constructed for closed circuit systems in accordance with VDE 0165 part 1, part 12.2.2.6, which covers the requirements for the special marking (blue) of this type (hazard type -i-).

The paired construction and the copper screening afford a good protection against electrical interference and ensure the transmission of data signals.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
14077	2 x 2 x 0,5	7,8	47,0	89,0	20	14089	2 x 2 x 0,75	8,4	60,0	105,0	18
14078	3 x 2 x 0,5	8,2	67,0	104,0	20	14090	3 x 2 x 0,75	9,0	80,0	128,0	18
14079	4 x 2 x 0,5	9,0	80,0	126,0	20	14091	4 x 2 x 0,75	9,8	110,0	156,0	18
14080	6 x 2 x 0,5	10,6	108,0	171,0	20	14092	6 x 2 x 0,75	12,1	142,0	216,0	18
14081	8 x 2 x 0,5	12,3	129,0	251,0	20	14093	8 x 2 x 0,75	13,4	200,0	309,0	18
14082	10 x 2 x 0,5	13,5	172,0	282,0	20	14094	10 x 2 x 0,75	15,1	238,0	355,0	18
14083	12 x 2 x 0,5	14,4	235,0	261,0	20	14095	12 x 2 x 0,75	15,8	270,0	405,0	18
14084	16 x 2 x 0,5	16,3	301,0	445,0	20	14096	16 x 2 x 0,75	18,0	342,0	560,0	18
14085	20 x 2 x 0,5	17,7	343,0	525,0	20	14097	20 x 2 x 0,75	19,2	369,0	671,0	18
14086	24 x 2 x 0,5	19,3	394,0	590,0	20	14098	24 x 2 x 0,75	21,3	451,0	795,0	18
14087	25 x 2 x 0,5	19,7	406,0	622,0	20	14099	25 x 2 x 0,75	21,8	461,0	803,0	18

Dimensions and specifications may be changed without prior notice. (RA04)



BIOFLEX-500®-JZ
BIOFLEX-500®-JZ-C
KOMPOFLEX® JZ-500
KOMPOFLEX® JZ-500-C

Photo: FUCHS DEA SCHMIERSTOFFE GMBH & Co. KG

Bio-Oil and microbial resistant Cables

We have joined forces with large scale farmers and operators of biofuel plants to develop a tailor-made product – the new BIOFLEX-500®.

HELUKABEL® has accordingly matched and extended the range of products from its plant in Windsbach. Special control cables and wires have been developed which are not only friendly on the environment, abrasion-resistant and can be recycled, they are also resistant to bio-oils. These are the special BIOFLEX-500®-control cables and

wires from HELUKABEL®. Specially modified polymers are used here for the core insulation and the jacket materials.

In the laboratory, these special compounds have been subjected to extreme testing according to VDMA requirements and VDE specifications. The suitability of these compounds has been assessed by endurance testing to demonstrate the long-term resistance to bio-oils.

BIOFLEX-500®-JZ Bio-fuel resistant, abrasion resistant, recyclable environment friendly, bio-oil resistant¹⁾, meter marking

A



Technical data

- Bio-oil resistant, abrasion resistant special control cable in adapted to DIN VDE 0281
- **Temperature range**
flexing -20 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 15x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special polymer core insulation
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special outer sheath, polymer compound
- Colour dark green
- with meter marking, change-over in 2011

Properties

- **Resistant to**
Bio-fuel (diesel and petrol), highly resistant to biologically decomposable oils, Oxygene, Ozone, Hydrolysis and Microbes
- Low adhesion

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
BIOFLEX-500®-JZ-C, see page A 85

Application

HELUKABEL® BIOFLEX-500-JZ is an extremely robust control cable with high abrasion and tear resistant properties. Due to its high resistance to Bio-fuel, Bio-oil and coolant emulsions. It is especially suited for use in the machine, tool making and plant industries as well as in the steel industry for difficult and problem areas. The high flexibility of this cable type makes it quick and easy to install. Suitable for outdoor lying.

¹⁾ For the critical applications we advise for consultation.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25620	2 x 0,5	5,4	9,6	45,0	20	25654	2 x 1,5	7,2	29,0	68,0	16
25621	3 G 0,5	5,9	14,4	55,0	20	25655	3 G 1,5	7,6	43,0	87,0	16
25622	4 G 0,5	6,3	19,0	65,0	20	25656	4 G 1,5	8,2	58,0	106,0	16
25623	5 G 0,5	6,9	24,0	75,0	20	25657	5 G 1,5	9,0	72,0	131,0	16
25624	7 G 0,5	7,8	33,6	90,0	20	25658	7 G 1,5	10,7	101,0	173,0	16
25625	10 G 0,5	9,6	48,0	120,0	20	25659	10 G 1,5	13,0	144,0	245,0	16
25626	12 G 0,5	10,0	58,0	135,0	20	25660	12 G 1,5	13,4	173,0	293,0	16
25627	14 G 0,5	10,3	67,0	170,0	20	25661	14 G 1,5	14,5	202,0	347,0	16
25628	18 G 0,5	11,5	86,0	205,0	20	25662	18 G 1,5	16,0	259,0	454,0	16
25629	25 G 0,5	13,6	120,0	270,0	20	25663	25 G 1,5	19,5	360,0	641,0	16
25630	2 x 0,75	5,4	14,4	44,0	18	25664	42 G 1,5	23,8	605,0	1100,0	16
25631	3 G 0,75	6,2	21,6	53,0	18	25665	2 x 2,5	8,6	48,0	110,0	14
25632	4 G 0,75	6,7	29,0	64,0	18	25666	3 G 2,5	9,3	72,0	146,0	14
25633	5 G 0,75	7,3	36,0	76,0	18	25667	4 G 2,5	10,3	96,0	183,0	14
25634	7 G 0,75	8,8	50,0	96,0	18	25668	5 G 2,5	11,5	120,0	222,0	14
25635	10 G 0,75	10,5	72,0	140,0	18	25669	7 G 2,5	13,4	168,0	293,0	14
25636	12 G 0,75	11,0	86,0	170,0	18	25670	12 G 2,5	17,0	288,0	512,0	14
25637	14 G 0,75	11,4	101,0	202,0	18	25671	18 G 2,5	20,0	432,0	740,0	14
25638	18 G 0,75	12,6	130,0	260,0	18	25672	25 G 2,5	24,1	600,0	940,0	14
25639	25 G 0,75	15,2	180,0	282,0	18	25673	2 x 4	10,4	77,0	147,0	12
25640	41 G 0,75	18,0	296,0	600,0	18	25674	3 G 4	11,2	115,0	228,0	12
25641	42 G 0,75	18,5	310,0	620,0	18	25675	4 G 4	12,5	154,0	291,0	12
25642	2 x 1	6,6	19,0	53,0	17	25676	5 G 4	13,8	192,0	355,0	12
25643	3 G 1	7,0	29,0	63,0	17	25677	3 G 6	13,0	173,0	362,0	10
25644	4 G 1	7,6	38,0	75,0	17	25678	4 G 6	14,7	230,0	468,0	10
25645	5 G 1	8,2	48,0	89,0	17	25679	5 G 6	16,0	288,0	570,0	10
25646	7 G 1	9,6	67,0	115,0	17	25680	3 G 10	16,7	288,0	555,0	8
25647	10 G 1	11,6	96,0	166,0	17	25681	4 G 10	18,3	384,0	720,0	8
25648	12 G 1	12,0	115,0	201,0	17	25682	5 G 10	20,5	480,0	894,0	8
25649	14 G 1	13,2	134,0	230,0	17	25683	4 G 16	21,1	614,0	1063,0	6
25650	18 G 1	14,5	173,0	289,0	17	25684	5 G 16	23,6	768,0	1400,0	6
25651	25 G 1	17,6	240,0	380,0	17	25685	4 G 25	29,4	960,0	1590,0	4
25652	41 G 1	21,1	394,0	720,0	17	25686	4 G 35	32,8	1344,0	2200,0	2
25653	42 G 1	21,5	403,0	740,0	17	25687	4 G 50	38,9	1920,0	2400,0	1
						25688	4 G 70	44,7	2688,0	4400,0	2/0
						25689	4 G 95	59,6	3648,0	6000,0	3/0
						25690	4 G 120	64,5	4608,0	7400,0	4/0

Dimensions and specifications may be changed without prior notice. (RA05)

BIOFLEX-500®-JZ-C **Bio-fuel resistant, abrasion resistant, recyclable environment friendly, bio-oil resistant¹⁾, Cu-screened, EMC-preferred type, meter marking**



Technical data

- Bio-oil resistant, abrasion resistant special control cable in adapted to DIN VDE 0281
- **Temperature range**
flexing -20 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 20x cable ø
fixed installation 6x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶CJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special polymer core insulation
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special inner sheath
- Screen of Cu braid, tinned coverage approx. 85%
- Fleece separator, ensure good dismantling ability
- Special outer sheath, polymer compound
- Colour dark green
- with meter marking, change-over in 2011

Properties

- **Resistant to**
Bio-fuel (diesel and petrol), highly resistant to biologically decomposable oils, Oxygene, Ozone, Hydrolysis and Microbes
- Low adhesion

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
BIOFLEX-500®-JZ, see page A 84

Application

HELUKABEL® BIOFLEX-500-JZ-C is an extremely robust control cable with high abrasion and tear resistant properties. Due to its high resistance to Bio-fuel, Bio-oil and coolant emulsions. It is especially suited for use in the machine, tool making and plant industries as well as in the steel industry for difficult and problem areas. The inner sheaths of those cables raise the mechanical stress. The high flexibility of this cable type makes it quick and easy to install. Suitable for outdoor lying. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications (electromagnetic compatibility). ¹⁾ For the critical applications we advise for consultation.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25691	2 x 0,5	6,6	41,0	68,0	20	25713	2 x 1	8,1	54,0	98,0	17
25692	3 G 0,5	7,1	45,0	84,0	20	25714	3 G 1	8,5	64,0	102,0	17
25693	4 G 0,5	7,6	54,0	95,0	20	25715	4 G 1	9,0	76,0	145,0	17
25694	5 G 0,5	8,2	66,0	107,0	20	25716	5 G 1	9,9	89,0	170,0	17
25695	7 G 0,5	9,4	79,0	135,0	20	25717	7 G 1	11,6	114,0	220,0	17
25696	10 G 0,5	11,2	107,0	170,0	20	25718	10 G 1	14,0	156,0	330,0	17
25697	12 G 0,5	11,3	137,0	195,0	20	25719	12 G 1	14,4	186,0	350,0	17
25698	14 G 0,5	11,9	142,0	222,0	20	25720	14 G 1	15,0	198,0	402,0	17
25699	18 G 0,5	12,9	156,0	278,0	20	25721	18 G 1	17,0	284,0	515,0	17
25700	25 G 0,5	15,9	250,0	406,0	20	25722	25 G 1	20,6	387,0	690,0	17
25701	2 x 0,75	7,2	46,0	88,0	18	25723	41 G 1	25,0	578,0	1070,0	17
25702	3 G 0,75	7,7	57,0	98,0	18	25724	42 G 1	25,5	590,0	1096,0	17
25703	4 G 0,75	8,2	65,0	112,0	18	25725	2 x 1,5	8,5	64,0	130,0	16
25704	5 G 0,75	8,8	76,0	130,0	18	25726	3 G 1,5	8,9	82,0	152,0	16
25705	7 G 0,75	10,1	100,0	185,0	18	25727	4 G 1,5	9,7	99,0	167,0	16
25706	10 G 0,75	12,2	140,0	270,0	18	25728	5 G 1,5	10,8	123,0	203,0	16
25707	12 G 0,75	12,3	175,0	294,0	18	25729	7 G 1,5	12,5	148,0	305,0	16
25708	14 G 0,75	13,0	190,0	317,0	18	25730	10 G 1,5	15,1	198,0	422,0	16
25709	18 G 0,75	14,6	240,0	357,0	18	25731	12 G 1,5	15,5	274,0	435,0	16
25710	25 G 0,75	17,8	306,0	510,0	18	25732	14 G 1,5	16,1	294,0	480,0	16
25711	41 G 0,75	21,5	403,0	951,0	18	25733	18 G 1,5	18,6	386,0	642,0	16
25712	42 G 0,75	22,0	410,0	975,0	18	25734	25 G 1,5	22,1	531,0	803,0	16

Continuation ►

BIOFLEX-500®-JZ-C

Bio-fuel resistant, abrasion resistant, recyclable
environment friendly, bio-oil resistant¹⁾, Cu-screened, EMC-preferred type, meter marking

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Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25735	41 G 1,5	27,2	840,0	1360,0	16
25736	42 G 1,5	27,5	890,0	1375,0	16
25737	2 x 2,5	10,6	110,0	180,0	14
25738	3 G 2,5	11,1	148,0	215,0	14
25739	4 G 2,5	12,1	169,0	268,0	14
25740	5 G 2,5	13,2	220,0	349,0	14
25741	7 G 2,5	15,9	284,0	406,0	14
25742	12 G 2,5	19,5	470,0	720,0	14
25743	2 x 4	12,6	124,0	300,0	12
25744	3 G 4	13,4	178,0	340,0	12
25745	4 G 4	15,0	234,0	408,0	12
25746	5 G 4	16,4	284,0	504,0	12
25747	3 G 6	15,2	245,0	453,0	10

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25748	4 G 6	17,0	316,0	560,0	10
25749	5 G 6	18,6	442,0	700,0	10
25750	3 G 10	19,5	367,0	750,0	8
25751	4 G 10	21,5	549,0	1023,0	8
25752	5 G 10	23,9	604,0	1114,0	8
25753	4 G 16	24,6	807,0	1385,0	6
25754	5 G 16	27,3	940,0	1550,0	6
25755	4 G 25	30,6	1169,0	1894,0	4
25756	4 G 35	36,9	1680,0	2395,0	2
25757	4 G 50	41,3	2370,0	3312,0	1
25758	4 G 70	48,8	3257,0	4605,0	2/0
25759	4 G 95	61,8	4060,0	6055,0	3/0
25760	4 G 120	65,7	5231,0	7318,0	4/0

Dimensions and specifications may be changed without prior notice. (RA05)

Tools

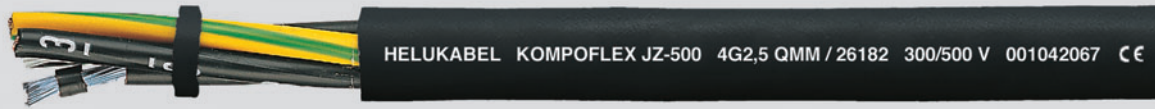
- Cable shears
- Box spanners
- Strippers
- Crimping tools
- Pliers
- Skinning knife



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KOMPOFLEX® JZ-500 halogen-free, microbes resistant, low adhesion, meter marking



Technical data

- Microbes resistant, halogen-free special control cable in adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -30 °C to + 90 °C
fixed installation -40 °C to +100 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special thermoplastic polymer-core insulation
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Outer sheath, special thermoplastic polymer
- Colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-radiation, Oxygene, Ozone, Microbes, Hydrofluoric acid, Hydrochloric acid and diluted sulfuric acid
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Low adhesion

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
KOMPOFLEX® JZ-500-C, see page A 88

Application

Extremely robust universal cable. This cable is specially installed in rubbish, sewage-treatment plants, composting works, animal stalls and greenhouses. Suitable for installation for flexible use for medium mechanical, stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26125	2 x 0,5	4,8	9,6	41,0	20
26126	3 G 0,5	5,1	14,4	50,0	20
26127	4 G 0,5	5,7	19,0	61,0	20
26128	5 G 0,5	6,2	24,0	72,0	20
26129	7 G 0,5	7,4	33,6	86,0	20
26130	12 G 0,5	9,1	58,0	130,0	20
26131	18 G 0,5	10,7	86,0	198,0	20
26132	20 G 0,5	11,2	96,0	211,0	20
26133	25 G 0,5	13,0	120,0	260,0	20
26135	34 G 0,5	14,5	163,0	361,0	20
26136	42 G 0,5	15,8	202,0	405,0	20
26137	50 G 0,5	17,3	240,0	541,0	20
26138	61 G 0,5	19,4	293,0	670,0	20
26139	2 x 0,75	5,2	14,4	42,0	18
26140	3 G 0,75	5,5	21,6	49,0	18
26141	4 G 0,75	6,2	29,0	60,0	18
26142	5 G 0,75	6,8	36,0	71,0	18
26143	7 G 0,75	8,1	50,0	88,0	18
26144	12 G 0,75	9,9	86,0	161,0	18
26145	18 G 0,75	11,9	130,0	250,0	18
26146	20 G 0,75	12,6	144,0	266,0	18
26147	25 G 0,75	14,5	180,0	273,0	18
26149	34 G 0,75	16,4	245,0	501,0	18
26150	42 G 0,75	17,6	302,0	591,0	18
26151	50 G 0,75	19,8	360,0	712,0	18
26152	61 G 0,75	20,9	439,0	820,0	18
26153	2 x 1	5,5	19,0	48,0	17
26154	3 G 1	6,0	29,0	56,0	17
26155	4 G 1	6,6	38,0	70,0	17
26156	5 G 1	7,2	48,0	81,0	17
26157	7 G 1	8,6	67,0	109,0	17
26158	12 G 1	10,7	115,0	191,0	17
26159	18 G 1	12,7	173,0	274,0	17
26160	20 G 1	13,5	192,0	314,0	17
26162	30 G 1	16,0	288,0	492,0	17
26163	34 G 1	17,4	326,0	640,0	17
26164	42 G 1	18,9	403,0	804,0	17
26165	50 G 1	21,0	480,0	932,0	17
26166	61 G 1	22,2	586,0	1102,0	17
26167	2 x 1,5	6,3	29,0	60,0	16

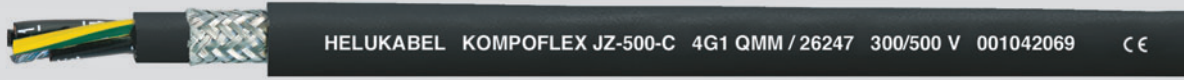
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26168	3 G 1,5	6,7	43,0	79,0	16
26169	4 G 1,5	7,3	58,0	98,0	16
26170	5 G 1,5	8,2	72,0	112,0	16
26171	7 G 1,5	9,8	101,0	159,0	16
26172	12 G 1,5	12,1	173,0	280,0	16
26173	18 G 1,5	14,5	259,0	420,0	16
26174	20 G 1,5	15,2	288,0	480,0	16
26175	25 G 1,5	17,8	360,0	604,0	16
26176	34 G 1,5	19,8	490,0	812,0	16
26177	42 G 1,5	21,4	605,0	1002,0	16
26178	50 G 1,5	23,7	720,0	1240,0	16
26179	61 G 1,5	25,3	878,0	1421,0	16
26180	2 x 2,5	7,6	48,0	99,0	14
26181	3 G 2,5	8,3	72,0	136,0	14
26182	4 G 2,5	9,1	96,0	170,0	14
26183	5 G 2,5	10,2	120,0	204,0	14
26184	7 G 2,5	12,1	168,0	281,0	14
26185	12 G 2,5	15,2	288,0	487,0	14
26186	18 G 2,5	18,1	432,0	704,0	14
26187	25 G 2,5	22,2	600,0	909,0	14
26189	3 G 4	9,9	115,0	224,0	12
26190	4 G 4	11,0	154,0	289,0	12
26191	5 G 4	12,1	192,0	357,0	12
26192	7 G 4	13,3	269,0	451,0	12
26193	12 G 4	18,3	461,0	782,0	12
26195	3 G 6	11,7	173,0	345,0	10
26196	4 G 6	13,0	230,0	417,0	10
26197	5 G 6	14,5	288,0	521,0	10
26198	7 G 6	16,0	403,0	622,0	10
26199	3 G 10	15,0	288,0	537,0	8
26200	4 G 10	16,8	384,0	699,0	8
26201	5 G 10	18,7	480,0	851,0	8
26202	7 G 10	20,6	672,0	1102,0	8
26204	4 G 16	19,7	614,0	1028,0	6
26206	7 G 16	24,4	1075,0	1772,0	6
26208	4 G 25	25,2	960,0	1577,0	4
26212	4 G 35	29,0	1344,0	2097,0	2
26215	4 G 50	33,4	1920,0	2914,0	1
26216	5 G 50	37,2	2400,0	3919,0	1

Dimensions and specifications may be changed without prior notice. (RA05)

KOMPOFLEX® JZ-500-C halogen-free, microbes resistant, Cu-screened, EMC-preferred type, meter marking



A



Technical data

- Screened microbes resistant, halogen-free special control cable in adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -30 °C to +90 °C
fixed installation -40 °C to +100 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage**
core/core 4000 V
core/screen 2000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special thermoplastic polymer core insulation
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Inner-sheath to special thermoplastic polymer
- Screen of tinned cu braid, coverage approx. 85%
- Outer sheath, special thermoplastic polymer
- Colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-radiation, Oxygene, Ozone, Microbes, Hydrofluoric acid, Hydrochloric acid and diluted sulfuric acid
- Low adhesion
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
KOMPOFLEX® JZ-500, see page A 87

Application

Extremely robust universal cable.

This cable is specially installed in rubbish, sewage-treatment plants, composting works, animal stalls and greenhouses. The inner sheaths of those cables raise the mechanical stress. Suitable for installation for flexible use for medium mechanical, stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside. The high flexibility of this cable type makes it quick and easy to install.

This screened cable is ideal for use in data signal transmission free from interferences for measurement and control engineering technology.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26217	2 x 0,5	6,9	41,0	68,0	20	26245	2 x 1	7,9	54,0	98,0	17
26218	3 G 0,5	7,2	45,0	84,0	20	26246	3 G 1	8,2	64,0	102,0	17
26219	4 G 0,5	7,8	54,0	95,0	20	26247	4 G 1	8,9	76,0	145,0	17
26220	5 G 0,5	8,3	66,0	107,0	20	26248	5 G 1	9,5	89,0	171,0	17
26221	7 G 0,5	9,5	79,0	135,0	20	26249	7 G 1	11,0	114,0	210,0	17
26222	12 G 0,5	11,3	137,0	195,0	20	26250	12 G 1	13,1	186,0	330,0	17
26223	18 G 0,5	13,1	156,0	278,0	20	26251	18 G 1	15,4	284,0	488,0	17
26224	20 G 0,5	13,8	173,0	310,0	20	26252	20 G 1	16,0	325,0	545,0	17
26225	25 G 0,5	15,7	250,0	406,0	20	26253	25 G 1	18,3	387,0	690,0	17
26226	30 G 0,5	16,0	297,0	520,0	20	26254	30 G 1	18,8	457,0	770,0	17
26227	34 G 0,5	17,4	316,0	571,0	20	26255	34 G 1	20,3	500,0	811,0	17
26228	42 G 0,5	18,9	360,0	651,0	20	26256	42 G 1	21,8	590,0	996,0	17
26229	50 G 0,5	20,9	407,0	760,0	20	26257	50 G 1	24,0	681,0	1320,0	17
26230	61 G 0,5	22,9	520,0	911,0	20	26258	61 G 1	26,2	710,0	1480,0	17
26231	2 x 0,75	7,6	46,0	88,0	18	26259	2 x 1,5	8,4	64,0	130,0	16
26232	3 G 0,75	7,8	57,0	98,0	18	26260	3 G 1,5	9,0	82,0	154,0	16
26233	4 G 0,75	8,3	63,0	112,0	18	26261	4 G 1,5	9,6	99,0	165,0	16
26234	5 G 0,75	9,1	76,0	130,0	18	26262	5 G 1,5	10,5	123,0	197,0	16
26235	7 G 0,75	10,4	100,0	185,0	18	26263	7 G 1,5	12,1	148,0	305,0	16
26236	12 G 0,75	12,5	175,0	294,0	18	26264	12 G 1,5	14,9	274,0	435,0	16
26237	18 G 0,75	14,3	240,0	357,0	18	26265	18 G 1,5	17,1	386,0	642,0	16
26238	20 G 0,75	15,2	262,0	404,0	18	26266	20 G 1,5	18,0	401,0	718,0	16
26239	25 G 0,75	17,6	306,0	510,0	18	26267	25 G 1,5	20,7	531,0	803,0	16
26240	30 G 0,75	18,1	340,0	561,0	18	26268	30 G 1,5	21,1	598,0	961,0	16
26241	34 G 0,75	19,5	346,0	670,0	18	26269	34 G 1,5	22,7	671,0	1060,0	16
26242	42 G 0,75	20,9	410,0	960,0	18	26270	42 G 1,5	24,4	890,0	1300,0	16
26243	50 G 0,75	23,2	470,0	1104,0	18	26271	50 G 1,5	26,8	997,0	1677,0	16
26244	61 G 0,75	25,0	550,0	1270,0	18	26272	61 G 1,5	29,6	1120,0	1971,0	16

Continuation ▶

KOMPOFLEX® JZ-500-C halogen-free, microbes resistant, Cu-screened, EMC-preferred type, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26273	2 x 2,5	10,0	110,0	180,0	14
26274	3 G 2,5	10,7	148,0	215,0	14
26275	4 G 2,5	11,4	169,0	268,0	14
26276	5 G 2,5	12,5	220,0	349,0	14
26277	7 G 2,5	15,0	284,0	404,0	14
26278	12 G 2,5	18,0	470,0	710,0	14
26279	18 G 2,5	21,2	572,0	891,0	14
26280	25 G 2,5	25,5	740,0	1104,0	14
26281	2 x 4	11,6	124,0	300,0	12
26282	3 G 4	12,3	178,0	340,0	12
26283	4 G 4	13,4	234,0	408,0	12
26284	5 G 4	14,8	284,0	504,0	12
26285	7 G 4	16,2	321,0	640,0	12
26286	12 G 4	21,8	581,0	894,0	12
26287	2 x 6	13,5	176,0	391,0	10
26288	3 G 6	14,2	245,0	453,0	10
26289	4 G 6	15,6	316,0	560,0	10
26290	5 G 6	17,0	442,0	680,0	10
26291	7 G 6	18,7	530,0	891,0	10

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26292	3 G 10	17,8	367,0	730,0	8
26293	4 G 10	19,7	549,0	1004,0	8
26294	5 G 10	21,6	604,0	1170,0	8
26295	7 G 10	24,0	820,0	1405,0	8
26296	3 G 16	20,7	653,0	894,0	6
26297	4 G 16	22,6	807,0	1311,0	6
26298	5 G 16	25,2	940,0	1550,0	6
26299	7 G 16	27,6	1345,0	1820,0	6
26300	3 G 25	26,0	920,0	1430,0	4
26301	4 G 25	28,9	1169,0	1894,0	4
26302	5 G 25	31,8	1420,0	2272,0	4
26303	4 G 35	33,4	1680,0	2310,0	2
26304	5 G 35	37,2	2020,0	2740,0	2
26305	4 G 50	38,2	2370,0	3270,0	1
26306	5 G 50	43,0	2880,0	4080,0	1

Dimensions and specifications may be changed without prior notice. (RA05)

Signal and power circular connectors

Series A, B, C, D, F and S

Tools

Accessories

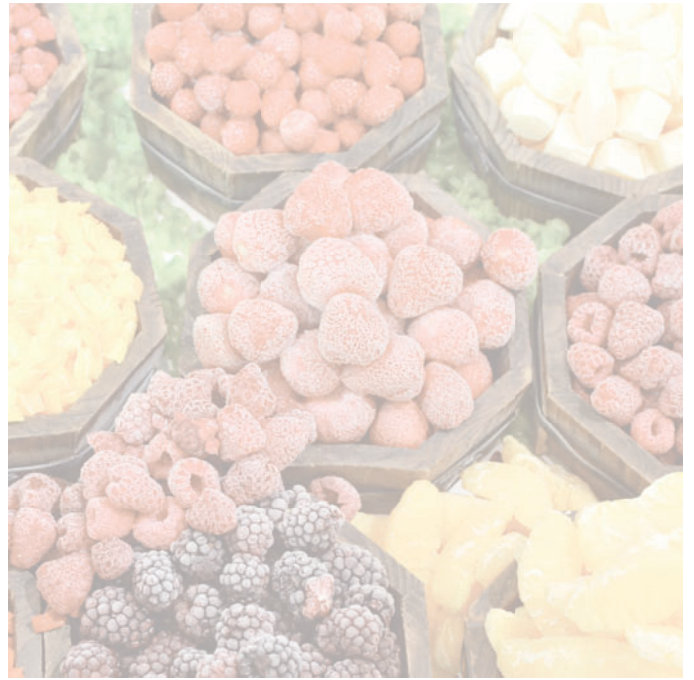
Online configurator

Pre-assembled cables



You can find signal and power circular connectors in our catalogue **Cable Accessories**.
Request it now at www.helukabel.de





NANOFLEX® HC 500
NANOFLEX® HC 500-C
NANOFLEX® HC TRONIC
NANOFLEX® HC TRONIC-C

Photos: fotolia.com

Hygienic Cable

In the food and beverage processing industry that is one of the most highly regulated industries, hygiene is crucial. To achieve complete hygiene security and to produce high-quality products all operational parameters have to be monitored continuously. For these special environments we are now able to offer cables with an antimicrobial outer sheath. The specially formulated insulation material helps to prevent contamination from impurities and the growth of micro-organisms on the outer

sheaths. The cable is resistant to all standard detergents and offers good cleaning properties.

A FCN (Food Contact Notification) has been issued for the antimicrobial material used.

A test certificate issued by the federal agency of material testing which approves the antimicrobial properties is available.

NANOFLEX® HC*500 cut-resistant, meter marking



HELUKABEL NANOFLEX® HC 500 3G1,5QMM/27071 300/500V 001091204 CE



Technical data

- Special polyurethane sheathed cable according to DIN VDE 0245, 0281
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage**
min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper conductor, fine wire stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 or IEC 60228 cl. 5
- Special PVC core insulation TI2 according to DIN VDE 0281 Part 1
- Black cores with sequential white numbering in accordance with DIN VDE 0293
- Green-yellow earth core in the outer layer, 3 cores and more
- Cores stranded in layers with optimal lay-lengths
- Outer sheath from special **fullpolyurethane** TPU according to DIN EN 50363-10-2
- Sheath colour - light grey (RAL 7035)
- With meter marking

Properties

- Resistant to UV radiation, oxygen, ozone, hydrolysis, microbes
- Self-extinguishing and flame retardant in accordance to VDE 0482-332-1-2, DIN EN 60332-1/ IEC 60332-1 (conforms to DIN VDE 0472 Part 804 Test method B)
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- Good cleaning properties
- Resistant to all standard detergents

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **screened analogue type:**
NANOFLEX®HC 500-C, see page A 92
- *Hygienic Cable

Application

Special PUR cable for the food and beverage industry; outer sheath with antimicrobial properties increases process reliability in all applications in which food and beverages are processed unpacked and unsealed, e.g. processing of dairy products, meat, fish; production of convenience foods, brewery and beverage industry

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27031	2 x 0,5	4,8	10,0	45,0	20
27032	3 G 0,5	5,1	14,0	55,0	20
27033	3 x 0,5	5,1	14,0	55,0	20
27034	4 G 0,5	5,7	19,0	65,0	20
27035	4 x 0,5	5,7	19,0	65,0	20
27036	5 G 0,5	6,2	24,0	75,0	20
27037	5 x 0,5	6,2	24,0	75,0	20
27038	7 G 0,5	7,2	34,0	90,0	20
27039	7 x 0,5	7,2	34,0	90,0	20
27040	10 G 0,5	8,8	48,0	120,0	20
27041	12 G 0,5	9,1	58,0	135,0	20
27042	18 G 0,5	10,7	86,0	205,0	20
27043	25 G 0,5	13,2	120,0	270,0	20
27044	2 G 0,75	5,4	14,0	44,0	18
27045	3 G 0,75	5,7	22,0	53,0	18
27046	3 G 0,75	5,7	22,0	53,0	18
27047	4 G 0,75	6,2	29,0	64,0	18
27048	4 x 0,75	6,2	29,0	64,0	18
27049	5 G 0,75	6,8	36,0	76,0	18
27050	5 x 0,75	6,8	36,0	76,0	18
27051	7 G 0,75	8,1	50,0	96,0	18
27052	7 x 0,75	8,1	50,0	96,0	18
27053	10 G 0,75	9,6	72,0	140,0	18
27054	12 G 0,75	9,6	86,0	170,0	18
27055	18 G 0,75	11,9	130,0	260,0	18
27056	25 G 0,75	14,5	180,0	282,0	18
27057	2 x 1	5,7	19,0	53,0	17
27058	3 G 1	6,0	29,0	63,0	17
27059	3 G 1	6,0	29,0	63,0	17
27060	4 G 1	6,6	38,0	75,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27061	4 x 1	6,6	38,0	75,0	17
27062	5 G 1	7,1	48,0	89,0	17
27063	5 x 1	7,1	48,0	89,0	17
27064	7 G 1	8,6	67,0	115,0	17
27065	7 x 1	8,6	67,0	115,0	17
27066	10 G 1	10,2	96,0	166,0	17
27067	12 G 1	10,7	115,0	201,0	17
27068	18 G 1	12,9	173,0	289,0	17
27069	25 G 1	14,9	240,0	380,0	17
27070	2 x 1,5	6,2	29,0	68,0	16
27071	3 G 1,5	6,6	43,0	87,0	16
27072	3 x 1,5	6,6	43,0	87,0	16
27073	4 G 1,5	7,2	58,0	106,0	16
27074	4 x 1,5	7,2	58,0	106,0	16
27075	5 G 1,5	8,2	72,0	131,0	16
27076	5 x 1,5	8,2	72,0	131,0	16
27077	7 G 1,5	9,8	101,0	173,0	16
27078	7 x 1,5	9,8	101,0	173,0	16
27079	12 G 1,5	12,0	173,0	293,0	16
27080	18 G 1,5	14,5	259,0	454,0	16
27081	25 G 1,5	17,8	360,0	641,0	16
27082	2 x 2,5	7,8	48,0	110,0	14
27083	3 G 2,5	8,3	72,0	146,0	14
27084	4 G 2,5	9,2	96,0	183,0	14
27085	5 G 2,5	10,1	120,0	222,0	14
27086	7 G 2,5	12,3	168,0	293,0	14
27087	12 G 2,5	15,3	288,0	512,0	14
27088	4 G 4	11,0	154,0	291,0	12
27089	5 G 4	12,7	192,0	355,0	12

Dimensions and specifications may be changed without prior notice. (RA02)

NANOFLEX® HC*500-C EMC preferred type, cut-resistant, screened, no inner sheath, meter marking

A

new



HELUKABEL NANOFLEX® HC 500-C 3G,075QMM/27120 300/500V 001091104 C€



Technical data

- Special polyurethane sheathed cable according to DIN VDE 0245 part 201 to 1,5 mm², according to DIN VDE 0245 part 102 from 2,5 mm²
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage**
min. 6000 V
- **Insulation resistance**
Min. 20 MOhm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ CJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper conductor, fine wire stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 or IEC 60228 cl. 5
- Special PVC core insulation TI2 according to DIN VDE 0281 Part 1
- Black cores with sequential white numbering in accordance with DIN VDE 0293
- Green-yellow earth core in the outer layer, 3 cores and more
- Cores stranded in layers with optimal lay-lengths
- Separating foil
- Braided screening of tinned copper wires, coverage approx. 85%
- Outer sheath from special **fullpolyurethane** TPU according to DIN EN 50363-10-2
- Sheath colour - light grey (RAL 7035)
- With meter marking

Properties

- Resistant to UV radiation, oxygen, ozone, hydrolysis, microbes
- Self-extinguishing and flame retardant in accordance to VDE 0482-332-1-2, DIN EN 60332-1/ IEC 60332-1 (conforms to DIN VDE 0472 Part 804 Test method B)
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- Good cleaning properties
- Resistant to all standard detergents

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ)
- **Unscreened analogue type:**
NANOFLEX® HC 500, see page A 91
- *Hygienic Cable

Application

Screened special PUR cable for the food and beverage industry; outer sheath with antimicrobial properties increases process reliability in all applications in which food and beverages are processed unpacked and unsealed, e.g. processing of dairy products, meat, fish; production of convenience foods, brewery and beverage industry

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C€ = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27105	2 x 0,5	5,3	35,0	47,0	20
27106	3 x 0,5	5,6	42,0	57,0	20
27107	3 x 0,5	5,6	42,0	57,0	20
27108	4 G 0,5	6,2	47,0	60,0	20
27109	4 x 0,5	6,2	47,0	60,0	20
27110	5 x 0,5	6,5	56,0	75,0	20
27111	5 G 0,5	6,5	56,0	75,0	20
27112	7 G 0,5	7,5	69,0	97,0	20
27113	7 x 0,5	7,5	69,0	97,0	20
27114	10 G 0,5	9,0	94,0	133,0	20
27115	12 G 0,5	9,2	108,0	158,0	20
27116	18 G 0,5	10,9	145,0	218,0	20
27117	25 G 0,5	13,3	240,0	315,0	20
27118	2 x 0,75	5,8	40,0	60,0	18
27119	3 x 0,75	6,1	52,0	67,0	18
27120	3 G 0,75	6,1	52,0	67,0	18
27121	4 G 0,75	6,5	60,0	76,0	18
27122	4 x 0,75	6,5	60,0	76,0	18
27123	5 x 0,75	7,1	71,0	92,0	18
27124	5 G 0,75	7,1	71,0	92,0	18
27125	7 G 0,75	8,3	91,0	131,0	18
27126	7 x 0,75	8,3	91,0	131,0	18
27127	10 G 0,75	10,1	137,0	180,0	18
27128	12 G 0,75	10,3	142,0	204,0	18
27129	18 G 0,75	12,1	212,0	290,0	18
27130	25 G 0,75	14,9	281,0	413,0	18
27131	2 x 1	6,1	50,0	66,0	17
27132	3 G 1	6,3	60,0	82,0	17
27133	3 x 1	6,3	60,0	82,0	17
27134	4 x 1	6,9	71,0	100,0	17

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27135	4 G 1	6,9	71,0	100,0	17
27136	5 x 1	7,5	88,0	128,0	17
27137	5 G 1	7,5	88,0	128,0	17
27138	7 x 1	8,9	111,0	157,0	17
27139	7 G 1	8,9	111,0	157,0	17
27140	10 G 1	10,7	150,0	230,0	17
27141	12 G 1	10,9	184,0	262,0	17
27142	18 G 1	13,0	260,0	381,0	17
27143	25 G 1	15,9	349,0	535,0	17
27144	2 x 1,5	6,6	63,0	87,0	16
27145	3 x 1,5	6,9	80,0	102,0	16
27146	3 G 1,5	6,9	80,0	102,0	16
27147	4 x 1,5	7,5	97,0	127,0	16
27148	4 G 1,5	7,5	97,0	127,0	16
27149	5 x 1,5	8,4	119,0	159,0	16
27150	5 G 1,5	8,4	119,0	159,0	16
27151	7 x 1,5	10,0	147,0	207,0	16
27152	7 G 1,5	10,0	147,0	207,0	16
27153	12 G 1,5	12,1	267,0	340,0	16
27154	18 G 1,5	14,6	374,0	480,0	16
27155	25 G 1,5	17,9	526,0	704,0	16
27156	2 x 2,5	8,2	96,0	131,0	14
27157	3 x 2,5	8,6	144,0	168,0	14
27158	4 G 2,5	9,6	148,0	194,0	14
27159	5 G 2,5	10,6	181,0	222,0	14
27160	7 G 2,5	12,6	255,0	345,0	14
27161	12 G 2,5	15,5	441,0	570,0	14
27162	4 G 4	11,0	230,0	310,0	12
27163	5 G 4	12,3	273,0	386,0	12

Dimensions and specifications may be changed without prior notice. (RA02)

NANOFLEX® HC*TRONIC flexible, colour code to DIN 47100, meter marking

new



HELUKABEL NANOFLEX® HC TRONIC 7x0,34QMMM/27202 001091147

CE



Technical data

- Special polyurethane data cable according to DIN VDE 0245, 0812
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Peak operating voltage**
(not for purposes of high current and power installation)
0,14 mm² = 350 V
>=0,25 mm² = 500 V
- **Test voltage**
to 0,25 mm² 1200 V
from 0,34 mm² 2000 V
- **Breakdown voltage**
to 0,25 mm² 2400 V
from 0,34 mm² 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Operating capacity**
(approx. value) at 800 Hz
0,14 mm² 120 pF/m
>=0,25 mm² 150 pF/m
- **Inductance** approx. 0,65 mH/km
- **Impedance** approx. 78 Ωm
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductor, fine wire stranded according to DIN VDE 0295 cl.5 or 0245 or IEC 60228
- Wire make-up for:
0,14 mm² = 18x0,1 mm
0,25 mm² = 14x0,15 mm
0,34 mm² = 7x0,25 mm
- Special PVC core insulation T12, to DIN VDE 0281 part 1
- Core identification in accordance with DIN 47100, but without colour repetition
- Cores stranded in layers with optimal lay-lengths
- Outer sheath from special **full polyurethane** TPU according to DIN EN 50363-10-2
- Colour light grey (RAL 7035)
- with meter marking

Properties

- Resistant to UV radiation, oxygen, ozone, hydrolysis, microbes
- Self-extinguishing and flame retardant in accordance to VDE 0482-332-1-2, DIN EN 60332-1/ IEC 60332-1 (conforms to DIN VDE 0472 Part 804 Test method B)
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- Good cleaning properties
- Resistant to all standard detergents

Note

- **Screened analogue type:**
NANOFLEX®HC TRONIC-C, see page A 95
- *Hygienic Cable

Application

Special PUR data cable for the food and beverage industry; outer sheath with antimicrobial properties increases process reliability in all applications in which food and beverages are processed unpacked and unsealed, e.g. processing of dairy products, meat, fish; production of convenience foods, brewery and beverage industry

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27164	2 x 0,14	3,3	3,0	13,0	26
27165	3 x 0,14	3,5	4,0	16,0	26
27166	4 x 0,14	3,7	5,0	19,0	26
27167	5 x 0,14	4,0	7,0	22,0	26
27168	6 x 0,14	4,3	8,0	25,0	26
27169	7 x 0,14	4,3	9,0	28,0	26
27170	8 x 0,14	5,1	11,0	35,0	26
27171	10 x 0,14	5,6	13,0	41,0	26
27172	12 x 0,14	5,7	16,0	48,0	26
27173	14 x 0,14	6,0	19,0	53,0	26
27174	16 x 0,14	6,5	22,0	59,0	26
27175	18 x 0,14	6,8	24,0	65,0	26
27176	20 x 0,14	7,1	27,0	70,0	26
27177	21 x 0,14	7,1	28,0	77,0	26
27178	24 x 0,14	7,5	32,0	87,0	26
27179	25 x 0,14	7,7	34,0	91,0	26

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27180	2 x 0,25	3,8	5,0	18,0	24
27181	3 x 0,25	3,9	7,0	22,0	24
27182	4 x 0,25	4,3	10,0	26,0	24
27183	5 x 0,25	4,7	12,0	30,0	24
27184	6 x 0,25	5,3	14,0	36,0	24
27185	7 x 0,25	5,3	17,0	42,0	24
27186	8 x 0,25	5,7	19,0	49,0	24
27187	10 x 0,25	6,6	24,0	57,0	24
27188	12 x 0,25	6,8	29,0	66,0	24
27189	14 x 0,25	7,2	34,0	75,0	24
27190	16 x 0,25	7,6	38,0	84,0	24
27191	18 x 0,25	8,1	43,0	92,0	24
27192	19 x 0,25	8,1	46,0	98,0	24
27193	20 x 0,25	8,6	48,0	101,0	24
27194	21 x 0,25	8,6	50,0	107,0	24
27195	24 x 0,25	9,4	60,0	120,0	24
27196	25 x 0,25	9,5	61,0	132,0	24

Continuation ▶

NANOFLEX® HC*TRONIC flexible, colour code to DIN 47100, meter marking

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27197	2 x 0,34	4,2	7,0	22,0	22	27218	7 x 0,5	6,4	34,0	81,0	20
27198	3 x 0,34	4,4	10,0	30,0	22	27219	8 x 0,5	7,2	38,0	97,0	20
27199	4 x 0,34	4,8	13,0	43,0	22	27220	10 x 0,5	8,4	48,0	116,0	20
27200	5 x 0,34	5,4	16,0	54,0	22	27221	12 x 0,5	8,4	58,0	135,0	20
27201	6 x 0,34	5,9	20,0	58,0	22	27222	16 x 0,5	10,0	77,0	168,0	20
27202	7 x 0,34	5,9	23,0	61,0	22	27223	20 x 0,5	11,2	96,0	213,0	20
27203	8 x 0,34	7,0	26,0	73,0	22	27224	24 x 0,5	11,8	116,0	241,0	20
27204	10 x 0,34	7,6	33,0	82,0	22	27225	2 x 0,75	5,2	14,0	47,0	18
27205	12 x 0,34	7,7	39,0	102,0	22	27226	3 x 0,75	5,4	22,0	54,0	18
27206	14 x 0,34	8,4	46,0	108,0	22	27227	4 x 0,75	5,9	29,0	66,0	18
27207	16 x 0,34	8,8	52,0	126,0	22	27228	5 x 0,75	6,7	36,0	80,0	18
27208	18 x 0,34	9,3	59,0	143,0	22	27229	7 x 0,75	7,3	50,0	110,0	18
27209	20 x 0,34	9,9	65,0	160,0	22	27230	8 x 0,75	8,6	58,0	125,0	18
27210	21 x 0,34	9,9	69,0	166,0	22	27231	10 x 0,75	9,6	72,0	148,0	18
27211	24 x 0,34	10,5	78,0	186,0	22	27232	12 x 0,75	9,7	86,0	176,0	18
27212	25 x 0,34	10,7	82,0	192,0	22	27233	16 x 0,75	11,6	115,0	220,0	18
27213	2 x 0,5	4,6	10,0	40,0	20	27234	20 x 0,75	12,4	144,0	276,0	18
27214	3 x 0,5	4,8	14,0	46,0	20						
27215	4 x 0,5	5,4	19,0	55,0	20						
27216	5 x 0,5	5,9	24,0	64,0	20						
27217	6 x 0,5	6,4	29,0	73,0	20						

Dimensions and specifications may be changed without prior notice. (RA02)



NANOFLEX HC*TRONIC-C EMC preferred type, flexible, colour code to DIN 47100, screened, meter marking



new

Technical data

- Special polyurethane data cables for electronic control according to DIN VDE 0245, 0812
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Peak operating voltage**
(not for purposes of high current and power installation)
0,14 mm² = 350 V
≥0,25 mm² = 500 V
- **Test voltage**
core/core 1200 V
core/screen 800 V
- **Breakdown voltage**
min. 2400 V
- **Insulation resistance**
min. 200 MΩm x km
- **Operating capacity**
(approx. -value) at 800 Hz
core/core at 0,14 mm² = 120 pF/m
core/core ≥0,25 mm² = 150 pF/m
core/screen at 0,14 mm² = 240 pF/m
core/screen ≥0,25 mm² = 270 pF/m
- **Inductance** approx. 0,65 mH/km
- **Impedance** approx. 78 Ωm
- **Coupling resistance** max. 250 Ωm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper conductor, fine wire stranded from 0,5 mm² according to DIN VDE 0295 cl.5 or 0245 or IEC 60228
- Wire make-up for:
0,14 mm² = 18x0,1 mm
0,25 mm² = 14x0,15 mm
0,34 mm² = 7x0,25 mm
- Special PVC core insulation T12, according to DIN VDE 0281 part 1
- Core identification according to DIN 47100, but without colour repetition
- Cores stranded in layers with optimal lay-lengths
- Foil wrapping
- Drain stranded wire, tinned copper
- Tinned copper braided screening, coverage approx. 85%
- Outer sheath from special full polyurethane TMPU according to DIN EN 50363-10-2
- Sheath colour - light grey (RAL 7035)
- With meter marking

Properties

- Resistant to UV radiation, oxygen, ozone, hydrolysis, microbes
- Self-extinguishing and flame retardant in accordance to VDE 0482-332-1-2, DIN EN 60332-1/ IEC 60332-1 (conforms to DIN VDE 0472 Part 804 Test method B)
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- Good cleaning properties
- Resistant to all standard detergents

Note

- **unscreened analogue type:**
NANOFLEX®HC TRONIC, see page A 93
- *Hygienic Cable

Application

Special PUR cable for the food and beverage industry; outer sheath with antimicrobial properties increases process reliability in all applications in which food and beverages are processed unpacked and unsealed, e.g. processing of dairy products, meat, fish; production of convenience foods, brewery and beverage industry

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C€ = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27235	1 x 0,14	2,5	6,0	16,0	26	27252	1 x 0,25	2,9	7,0	27,0	24
27236	2 x 0,14	3,7	12,0	20,0	26	27253	2 x 0,25	4,2	16,0	31,0	24
27237	3 x 0,14	3,9	13,0	27,0	26	27254	3 x 0,25	4,3	19,0	36,0	24
27238	4 x 0,14	4,1	15,0	32,0	26	27255	4 x 0,25	4,7	22,0	40,0	24
27239	5 x 0,14	4,4	16,0	37,0	26	27256	5 x 0,25	5,3	27,0	51,0	24
27240	6 x 0,14	4,9	18,0	42,0	26	27257	6 x 0,25	5,7	32,0	58,0	24
27241	7 x 0,14	4,9	19,0	48,0	26	27258	7 x 0,25	5,7	35,0	64,0	24
27242	8 x 0,14	5,2	21,0	55,0	26	27259	8 x 0,25	6,6	42,0	82,0	24
27243	10 x 0,14	6,2	29,0	65,0	26	27260	10 x 0,25	7,2	50,0	85,0	24
27244	12 x 0,14	6,2	31,0	77,0	26	27261	12 x 0,25	7,3	58,0	90,0	24
27245	14 x 0,14	6,6	32,0	79,0	26	27262	14 x 0,25	7,9	62,0	144,0	24
27246	16 x 0,14	6,9	43,0	89,0	26	27263	16 x 0,25	8,3	67,0	110,0	24
27247	18 x 0,14	7,2	51,0	103,0	26	27264	18 x 0,25	8,9	78,0	142,0	24
27248	20 x 0,14	7,7	55,0	116,0	26	27265	19 x 0,25	9,1	79,0	146,0	24
27249	21 x 0,14	7,9	56,0	120,0	26	27266	20 x 0,25	9,4	152,0	88,0	24
27250	24 x 0,14	8,3	62,0	131,0	26	27267	21 x 0,25	9,4	91,0	150,0	24
27251	25 x 0,14	8,5	61,0	136,0	26	27268	24 x 0,25	10,0	96,0	163,0	24

Continuation ▶

NANOFLEX HC*TRONIC-C EMC preferred type, flexible, colour code to DIN 47100, screened, meter marking

A

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27269	25 x 0,25	10,1	99,0	169,0	24
27270	1 x 0,34	3,2	13,0	24,0	22
27271	2 x 0,34	4,8	18,0	30,0	22
27272	3 x 0,34	5,2	22,0	37,0	22
27273	4 x 0,34	5,5	28,0	48,0	22
27274	5 x 0,34	6,0	31,0	54,0	22
27275	6 x 0,34	6,7	45,0	61,0	22
27276	7 x 0,34	6,7	51,0	67,0	22
27277	8 x 0,34	7,8	54,0	81,0	22
27278	10 x 0,34	8,4	65,0	103,0	22
27279	12 x 0,34	8,5	70,0	110,0	22
27280	14 x 0,34	9,0	81,0	153,0	22
27281	16 x 0,34	9,4	88,0	159,0	22
27282	18 x 0,34	9,8	103,0	172,0	22
27283	19 x 0,34	10,1	106,0	181,0	22
27284	20 x 0,34	10,1	112,0	191,0	22
27285	21 x 0,34	10,7	116,0	199,0	22
27286	24 x 0,34	10,7	129,0	229,0	22
27287	25 x 0,34	12,0	120,0	241,0	22
27288	1 x 0,5	3,4	15,0	40,0	20
27289	2 x 0,5	5,3	29,0	45,0	20
27290	3 x 0,5	5,6	39,0	55,0	20
27291	4 x 0,5	6,0	46,0	61,0	20
27292	5 x 0,5	6,7	52,0	76,0	20
27293	6 x 0,5	7,3	66,0	89,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27294	7 x 0,5	7,3	68,0	98,0	20
27295	8 x 0,5	8,5	80,0	117,0	20
27296	10 x 0,5	9,2	93,0	135,0	20
27297	12 x 0,5	9,5	117,0	157,0	20
27298	14 x 0,5	10,0	122,0	190,0	20
27299	16 x 0,5	10,6	129,0	210,0	20
27300	18 x 0,5	10,7	152,0	217,0	20
27301	19 x 0,5	11,2	156,0	246,0	20
27302	20 x 0,5	11,9	173,0	275,0	20
27303	24 x 0,5	12,6	256,0	337,0	20
27304	25 x 0,5	12,7	250,0	351,0	20
27305	1 x 0,75	3,8	19,0	41,0	18
27306	2 x 0,75	6,0	38,0	59,0	18
27307	3 x 0,75	6,2	50,0	66,0	18
27308	4 x 0,75	6,7	57,0	77,0	18
27309	5 x 0,75	7,3	70,0	93,0	18
27310	6 x 0,75	8,1	87,0	113,0	18
27311	7 x 0,75	8,2	96,0	130,0	18
27312	8 x 0,75	9,0	110,0	145,0	18
27313	10 x 0,75	10,3	140,0	180,0	18
27314	12 x 0,75	10,4	151,0	202,0	18
27315	14 x 0,75	11,2	167,0	225,0	18
27316	16 x 0,75	11,8	183,0	275,0	18
27317	18 x 0,75	12,6	207,0	292,0	18
27318	19 x 0,75	12,6	221,0	322,0	18
27319	20 x 0,75	13,1	238,0	362,0	18
27320	24 x 0,75	14,1	270,0	435,0	18
27321	25 x 0,75	14,3	278,0	415,0	18

Dimensions and specifications may be changed without prior notice. (RA02)



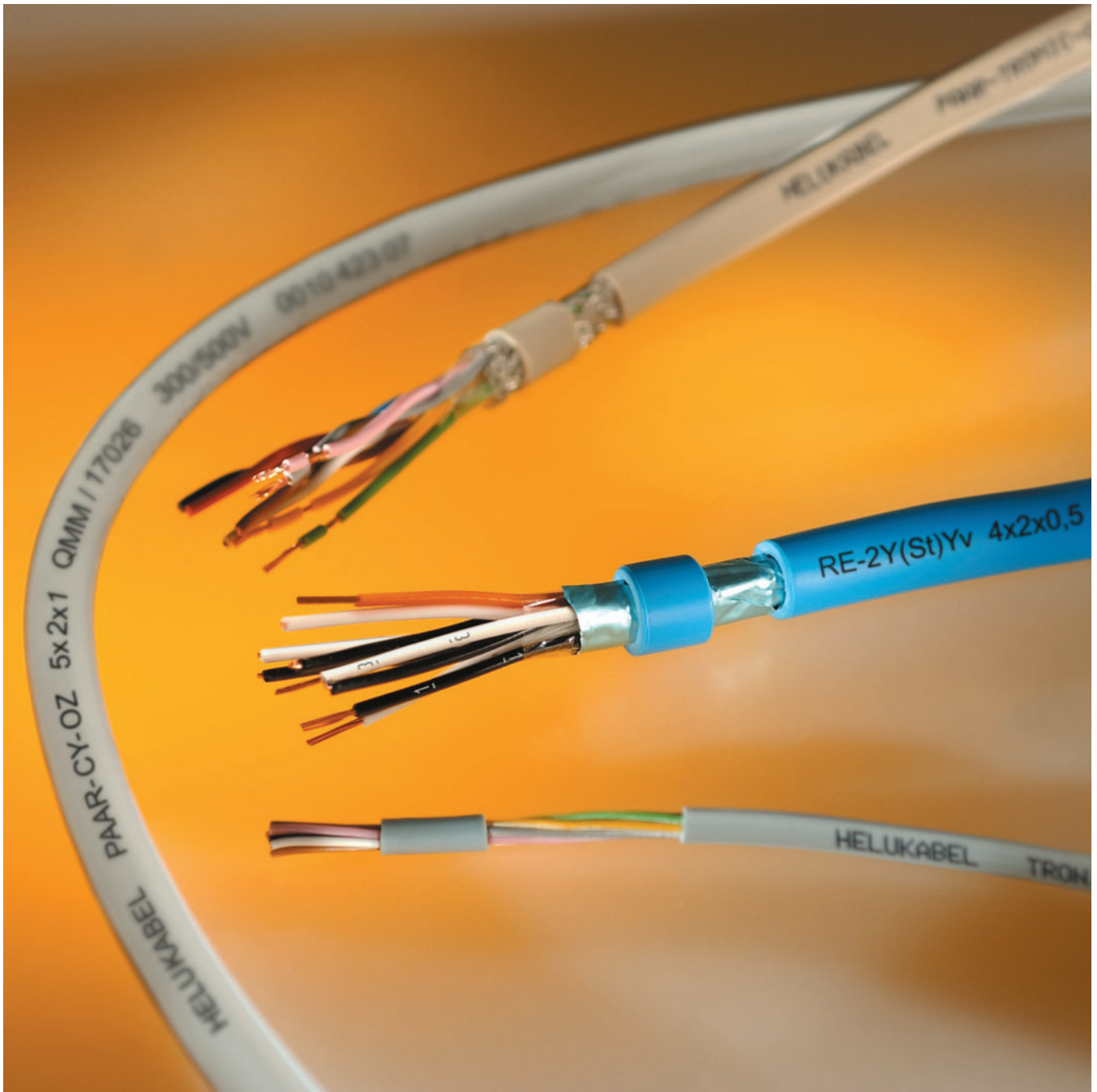


Photo: HELUKABEL®

Data and Computer Cables

Data and Computer Cables

Due to the increasing data transfer between machines and equipment the higher standards in data and computer applications are necessary.











Besides standard processes the requirement of precise data transfer must be the first and foremost.

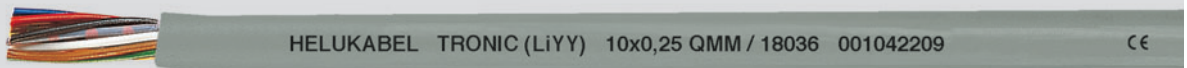
Depending on the requirement, the HELUKABEL® customer can choose the data or computer cable from an extensive stock, where almost all cable constructions are ex stock.

Depending on the required application, solid, flexible or highly flexible constructions with corresponding screening may be necessary. In this case our technical advisors are ready to inform you.

We can also manufacture cables according to your specific requirements with a minimum order quantity. For special enquiries please fill-in our attached enquiry form.

Contents

Description	Page
TRONIC (LiYY), flexible, colour coded to DIN 47100, meter marking 	B 4
PAAR-TRONIC, flexible, colour coded to DIN 47100, meter marking 	B 6
DATAFLAMM, halogen-free, meter marking	B 8
TRONIC-CY (LiY-CY), flexible, Cu-screened, colour coded to DIN 47100, EMC-preferred type, meter marking 	B 9
PAAR-TRONIC-CY, flexible, Cu-screened, colour coded to DIN 47100, EMC-preferred type, meter marking 	B 11
PAAR-CY-OZ, flexible, Cu-screened, EMC-preferred type, meter marking 	B 13
PAAR-TRONIC-CY-CY (LiYCY-CY), EMC-preferred type, meter marking	B 14
PAAR-TRONIC-Li-2YCYV, PE-insulated, low capacitance, Termi-Point®, EMC-preferred type, meter marking	B 16
PAAR-TRONIC-Li-2YCY, PE-insulated, low capacitance, Termi-Point®, EMC-preferred type, meter marking	B 17
LiFYCY, high flexible, paired, screened, EMC-preferred type, meter marking	B 18
TRONIC 1-CY, each core individually screened, EMC-preferred type, meter marking	B 19
TRONIC 2-CY, 2 cores screened, meter marking	B 20
LiY-TPC-Y, pairs screened, EMC-preferred type, meter marking	B 21
DATAPUR-C, EMC-preferred type, Cu-screened, PUR-outer jacket, meter marking	B 22
DATAFLAMM-C, EMC-preferred type, halogen-free, screened, meter marking	B 23
DATAFLAMM-C-PAAR, EMC-preferred type, halogen-free, screened, meter marking	B 24
EDV-PiMF-CY, PE-insulated, low capacitance, EMC-preferred type, meter marking	B 25
RD-Y(St)Y, Instrumentation Cable suitable for Maxi-Term-Point®-connection, meter marking	B 26
RD-Y(St)YV / RD-Y(St)YY, reinforced (double) outer jacket, instrumentation cable, Maxi-Termi-Point®, meter marking	B 27
RE-2Y(St)YV, instrumentation cable, reinforced outer jacket, meter marking 	B 28
RE-2Y(St)YV PiMF, instrumentation cable, pairs screened, reinforced outer jacket, meter marking 	B 29
J-2Y(St)Y, St III Bd 16 Mbits/s (Kat. 3) ISDN/EDV (Z = 100 Ohm), meter marking	B 30
JE-Y(St)Y, Bd Si Industry-Elektronik Cable according to DIN VDE 0815 	B 31
JE-LiYCY, Bd Si Industry-Elektronik Cable according to DIN VDE 0815 	B 32
JE-LiHCH, Bd industry electronic cable, halogen-free, according to VDE 0815 	B 33
RD-H(ST)H, Bd instrumentation cable, halogen-free	B 34



B

Technical data

- Special PVC data cables, adapted to DIN VDE 0812
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
(not for purposes of high current and power installation)
0,14 mm² = 350 V
≥0,25 mm² = 500 V
- **Test voltage**
up to 0,25 mm² 1200 V
from 0,34 mm² 2000 V
- **Breakdown voltage**
up to 0,25 mm² 2400 V
from 0,34 mm² 4000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Capacitance** (approx.-value) at 800 Hz
0,14 mm² 120 pF/m
≥0,25 mm² 150 pF/m
- **Inductance** approx. 0,65 mH/km
- **Impedance** approx. 78 Ohm
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5 and IEC 60228 cl. 5
- Conductor make-up for
0,14 mm² = 18x0,1 mm
0,25 mm² = 14x0,15 mm
0,34 mm² = 7x0,25 mm
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Colour coded to DIN 47100, but without colour repetition
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extremely oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- HELUKABEL®-TRONIC is also available in paired version (e.g. HELUKABEL®-PAAR-TRONIC 20x2x0,14 mm²).
- **screened analogue type: TRONIC-CY (LiY-CY)**, see page B 9

Application

These cables are used for flexible use with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, wherever the construction requirements call for a minimum outer diameter, TRONIC is the suitable cable to use. This applies especially to such areas as tool making and machine industries as well as electronic, computer, measurement and control sectors. **CE** The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
18001	2 x 0,14	3,3	2,7	13,0	26
18002	3 x 0,14	3,5	4,0	16,0	26
18003	4 x 0,14	3,7	5,4	19,0	26
18004	5 x 0,14	4,0	6,7	22,0	26
18005	6 x 0,14	4,3	8,1	25,0	26
18006	7 x 0,14	4,3	9,4	28,0	26
18007	8 x 0,14	5,1	10,7	35,0	26
18008	10 x 0,14	5,6	13,4	41,0	26
18009	12 x 0,14	5,7	16,1	48,0	26
18010	14 x 0,14	6,0	18,8	53,0	26
18011	16 x 0,14	6,5	21,5	59,0	26
18012	18 x 0,14	6,8	24,2	65,0	26
18013	20 x 0,14	7,1	26,9	70,0	26
18014	21 x 0,14	7,1	28,2	77,0	26
18015	24 x 0,14	7,5	32,3	87,0	26
18117	25 x 0,14	7,7	33,6	91,0	26
18016	27 x 0,14	7,7	36,3	97,0	26
18017	30 x 0,14	8,5	40,3	108,0	26
18018	32 x 0,14	8,8	43,0	114,0	26
18019	36 x 0,14	9,3	48,4	126,0	26
18020	40 x 0,14	9,6	54,0	139,0	26
18021	42 x 0,14	9,9	56,0	146,0	26
18022	44 x 0,14	10,4	59,0	153,0	26
18023	48 x 0,14	10,5	65,0	164,0	26
18024	52 x 0,14	11,0	70,0	173,0	26
18025	56 x 0,14	11,3	75,0	187,0	26
18026	61 x 0,14	11,6	82,0	204,0	26
18027	80 x 0,14	13,0	108,0	280,0	26
18028	100 x 0,14	14,7	135,0	370,0	26

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
18029	2 x 0,25	3,8	4,8	18,0	24
18030	3 x 0,25	3,9	7,2	22,0	24
18031	4 x 0,25	4,3	9,6	26,0	24
18032	5 x 0,25	4,7	12,0	30,0	24
18033	6 x 0,25	5,3	14,4	36,0	24
18034	7 x 0,25	5,3	16,8	42,0	24
18035	8 x 0,25	5,7	19,2	49,0	24
18036	10 x 0,25	6,6	24,0	57,0	24
18037	12 x 0,25	6,8	28,8	66,0	24
18038	14 x 0,25	7,2	33,6	75,0	24
18039	16 x 0,25	7,6	38,4	84,0	24
18040	18 x 0,25	8,1	43,2	92,0	24
18114	19 x 0,25	8,1	46,0	84,0	24
18041	20 x 0,25	8,6	48,0	101,0	24
18042	21 x 0,25	8,6	50,0	107,0	24
18043	24 x 0,25	9,4	60,0	120,0	24
18118	25 x 0,25	9,5	61,0	132,0	24
18044	27 x 0,25	9,5	65,0	140,0	24
18045	30 x 0,25	10,3	72,0	156,0	24
18046	32 x 0,25	10,9	77,0	164,0	24
18047	36 x 0,25	11,3	86,0	182,0	24
18115	37 x 0,25	11,3	89,0	190,0	24
18048	40 x 0,25	11,6	96,0	200,0	24
18049	42 x 0,25	12,0	101,0	211,0	24
18050	44 x 0,25	12,6	106,0	225,0	24
18051	48 x 0,25	12,7	115,0	245,0	24
18052	52 x 0,25	13,3	125,0	263,0	24
18053	56 x 0,25	13,9	134,0	280,0	24
18054	61 x 0,25	14,3	146,0	305,0	24

Continuation ▶

TRONIC (LiYY) flexible, colour coded to DIN 47100, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
18055	80 x 0,25	16,5	192,0	450,0	24
18056	100 x 0,25	18,2	240,0	590,0	24
18057	2 x 0,34	4,2	6,5	22,0	22
18058	3 x 0,34	4,4	9,8	30,0	22
18059	4 x 0,34	4,8	13,1	43,0	22
18060	5 x 0,34	5,4	16,3	54,0	22
18061	6 x 0,34	5,9	19,6	58,0	22
18062	7 x 0,34	5,9	22,8	61,0	22
18063	8 x 0,34	7,0	26,1	73,0	22
18064	10 x 0,34	7,6	32,6	82,0	22
18065	12 x 0,34	7,7	39,2	102,0	22
18066	14 x 0,34	8,4	45,7	108,0	22
18067	16 x 0,34	8,8	52,0	126,0	22
18068	18 x 0,34	9,3	59,0	143,0	22
18069	20 x 0,34	9,9	65,0	160,0	22
18070	21 x 0,34	9,9	69,0	166,0	22
18071	24 x 0,34	10,5	78,0	186,0	22
18096	25 x 0,34	10,7	82,0	192,0	22
18072	27 x 0,34	10,7	88,0	206,0	22
18073	30 x 0,34	11,8	98,0	226,0	22
18074	32 x 0,34	11,8	104,0	245,0	22
18075	36 x 0,34	12,9	118,0	285,0	22
18116	37 x 0,34	12,9	121,0	292,0	22
18076	40 x 0,34	13,3	131,0	318,0	22
18077	42 x 0,34	14,0	137,0	330,0	22
18078	44 x 0,34	14,0	144,0	370,0	22
18079	48 x 0,34	14,7	157,0	405,0	22
18080	52 x 0,34	15,4	170,0	430,0	22
18081	53 x 0,34	15,4	183,0	440,0	22
18082	61 x 0,34	16,3	199,0	610,0	22
18083	80 x 0,34	18,8	264,0	880,0	22
18084	100 x 0,34	21,0	327,0	1050,0	22

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
18085	2 x 0,5	4,6	9,6	40,0	20
18086	3 x 0,5	4,8	14,4	46,0	20
18087	4 x 0,5	5,4	19,2	55,0	20
18088	5 x 0,5	5,9	24,0	64,0	20
18089	6 x 0,5	6,4	28,8	73,0	20
18090	7 x 0,5	6,4	33,6	81,0	20
18091	8 x 0,5	7,2	38,4	97,0	20
18092	10 x 0,5	8,4	48,0	116,0	20
18093	12 x 0,5	8,4	58,0	135,0	20
18103	16 x 0,5	10,0	77,0	168,0	20
18101	20 x 0,5	11,2	96,0	213,0	20
18094	24 x 0,5	11,8	116,0	241,0	20
18102	30 x 0,5	13,2	144,0	303,0	20
18095	40 x 0,5	15,2	192,0	391,0	20
18104	2 x 0,75	5,2	14,4	47,0	18
18097	3 x 0,75	5,4	21,6	54,0	18
18098	4 x 0,75	5,9	29,0	66,0	18
18099	5 x 0,75	6,7	36,0	80,0	18
18100	7 x 0,75	7,3	50,0	110,0	18
18105	8 x 0,75	8,6	58,0	125,0	18
18106	10 x 0,75	9,6	72,0	148,0	18
18107	12 x 0,75	9,7	86,0	176,0	18
18108	16 x 0,75	11,1	115,0	220,0	18
18109	20 x 0,75	12,4	144,0	276,0	18
18110	2 x 1	5,5	19,2	56,0	17
18111	3 x 1	5,8	29,0	71,0	17
18112	2 x 1,5	6,2	29,0	75,0	16
18113	3 x 1,5	6,7	43,0	90,0	16

Dimensions and specifications may be changed without prior notice. (RB01)



Standardised process control and visualisation of an extrusion system at our Windsbach factory.



B

Technical data

- Special PVC data cables, adapted to DIN VDE 0812, 0814
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** 250 V
- **Test voltage** 1200 V
- **Breakdown voltage** min. 2400 V
- **Insulation resistance**
min. 20 MΩm x km
- **Capacitance** (approx.-value) at 800 Hz
core/core 0,14 mm² = 120 pF/m
core/core 0,25 mm² = 150 pF/m
- **Load** 0,14 mm² = 1,5 A
0,25 mm² = 2,5 A
- **Inductance** approx. 0,65 mH/km
- **Impedance** approx. 78 Ωm
- **K₁-coupling** approx. 300 pF/100 m
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation Y12, to DIN VDE 0207 part 4
- Colour coded to DIN 47100
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Core wrapping with foil
- Special PVC outer sheath YM2, to DIN VDE 0207 part 5
- Sheath colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
PAAR-TRONIC-CY, see page B 11

Application

These data control cables are used for flexible use with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air. PAAR-TRONIC is the perfect cable for use in areas where a small diameter is essential to complete wiring. E. g. as a control and signal cable in measuring instruments, computers, signal transfer etc. This cable is suitable only for low load application. **CE** The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19001	1 x 2 x 0,14	3,5	2,7	20,0	26
19002	2 x 2 x 0,14	5,1	5,4	25,0	26
19003	3 x 2 x 0,14	5,2	8,0	31,0	26
19004	4 x 2 x 0,14	5,6	10,7	38,0	26
19005	5 x 2 x 0,14	6,6	13,4	45,0	26
19006	6 x 2 x 0,14	6,9	16,1	50,0	26
19007	7 x 2 x 0,14	6,9	18,8	57,0	26
19008	8 x 2 x 0,14	7,5	21,5	64,0	26
19009	10 x 2 x 0,14	8,6	26,9	78,0	26
19010	11 x 2 x 0,14	8,7	29,5	86,0	26
19011	12 x 2 x 0,14	8,9	32,3	94,0	26
19012	14 x 2 x 0,14	9,6	37,6	105,0	26
19013	15 x 2 x 0,14	9,8	40,3	108,0	26
19014	16 x 2 x 0,14	10,1	43,0	110,0	26
19015	18 x 2 x 0,14	10,4	48,4	119,0	26
19016	20 x 2 x 0,14	10,8	54,0	130,0	26
19017	22 x 2 x 0,14	11,6	59,0	150,0	26
19018	24 x 2 x 0,14	12,4	65,0	170,0	26
19019	25 x 2 x 0,14	12,5	67,0	180,0	26
19020	26 x 2 x 0,14	12,5	70,0	184,0	26
19021	27 x 2 x 0,14	12,7	73,0	188,0	26
19022	28 x 2 x 0,14	12,8	75,0	192,0	26
19023	30 x 2 x 0,14	13,1	81,0	200,0	26
19024	32 x 2 x 0,14	13,5	86,0	224,0	26
19025	34 x 2 x 0,14	14,0	91,0	247,0	26
19026	36 x 2 x 0,14	14,2	97,0	260,0	26
19027	38 x 2 x 0,14	14,3	102,0	272,0	26
19028	40 x 2 x 0,14	15,0	108,0	294,0	26
19029	44 x 2 x 0,14	15,9	118,0	334,0	26
19030	45 x 2 x 0,14	15,9	121,0	342,0	26
19031	50 x 2 x 0,14	16,5	134,0	387,0	26
19032	52 x 2 x 0,14	16,9	140,0	403,0	26
19033	55 x 2 x 0,14	17,5	148,0	427,0	26

Continuation ▶

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19034	1 x 2 x 0,25	4,0	5,0	32,0	24
19035	2 x 2 x 0,25	6,0	10,0	37,0	24
19036	3 x 2 x 0,25	6,3	15,0	47,0	24
19037	4 x 2 x 0,25	6,8	20,0	58,0	24
19038	5 x 2 x 0,25	7,8	25,0	70,0	24
19039	6 x 2 x 0,25	8,3	30,0	80,0	24
19040	7 x 2 x 0,25	8,3	35,0	89,0	24
19041	8 x 2 x 0,25	9,3	40,0	99,0	24
19042	10 x 2 x 0,25	10,5	50,0	114,0	24
19043	11 x 2 x 0,25	10,6	55,0	126,0	24
19044	12 x 2 x 0,25	10,8	60,0	137,0	24
19045	14 x 2 x 0,25	11,6	70,0	161,0	24
19046	15 x 2 x 0,25	12,0	75,0	174,0	24
19047	16 x 2 x 0,25	12,5	80,0	187,0	24
19048	18 x 2 x 0,25	12,8	90,0	212,0	24
19049	20 x 2 x 0,25	13,3	100,0	234,0	24
19050	22 x 2 x 0,25	14,0	110,0	250,0	24
19051	24 x 2 x 0,25	15,0	120,0	280,0	24
19052	25 x 2 x 0,25	15,3	125,0	300,0	24
19053	26 x 2 x 0,25	15,3	130,0	320,0	24
19054	27 x 2 x 0,25	15,5	135,0	330,0	24
19055	28 x 2 x 0,25	15,7	140,0	345,0	24
19056	30 x 2 x 0,25	16,1	150,0	370,0	24

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19057	32 x 2 x 0,25	16,5	160,0	410,0	24
19058	34 x 2 x 0,25	17,2	170,0	425,0	24
19059	36 x 2 x 0,25	17,3	180,0	440,0	24
19060	38 x 2 x 0,25	17,6	190,0	480,0	24
19061	40 x 2 x 0,25	18,3	200,0	530,0	24
19062	44 x 2 x 0,25	19,7	220,0	580,0	24
19063	45 x 2 x 0,25	19,7	225,0	600,0	24
19064	50 x 2 x 0,25	20,4	250,0	650,0	24
19065	52 x 2 x 0,25	20,8	260,0	670,0	24
19066	55 x 2 x 0,25	21,5	275,0	790,0	24
19067	1 x 2 x 0,34	4,4	6,5	36,0	22
19068	2 x 2 x 0,34	6,9	13,1	42,0	22
19069	3 x 2 x 0,34	7,0	19,6	50,0	22
19070	4 x 2 x 0,34	7,8	26,1	61,0	22
19071	1 x 2 x 0,5	4,6	9,6	42,0	20
19072	2 x 2 x 0,5	7,6	19,2	51,0	20
19073	3 x 2 x 0,5	7,7	28,8	62,0	20
19074	4 x 2 x 0,5	8,6	38,4	73,0	20
19075	1 x 2 x 0,75	5,2	14,4	47,0	18
19076	2 x 2 x 0,75	8,5	28,8	59,0	18
19077	3 x 2 x 0,75	8,6	43,2	74,0	18
19078	4 x 2 x 0,75	9,6	57,6	93,0	18

Dimensions and specifications may be changed without prior notice. (RB01)

Drag Chain Systems

- Open chains
- Closed chains
- Accessories
- Installation instructions
- Selection tables



You can find drag chain systems in our catalogue Cable Accessories.
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DATAFLAMM halogen-free, meter marking



HELUKABEL DATAFLAMM 8x0,14 QMM / 52306 350 V halogen-free 001042620



B

Technical data

- Special data cable
- **Temperature range**
flexing +5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage**
0,14 mm² = 350 V
>0,14 mm² = 500 V
- **Test voltage**
0,14 mm² = 800 V
>0,14 mm² = 1200 V
- **Insulation resistance**
min. 2 GOhm x km
- **Capacitance**
core/core <70 nF/km
- **Minimum bending radius**
approx. 7,5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors to DIN VDE 0812, conductor make-up for 0,34 mm² - 7x0,25 mm
- PE-insulation, compound type 2YJ1 to DIN VDE 0207 part 2
- Cores colour coded to DIN 47100
- Cores twisted in layers with optimal lay-length
- Halogen-free outer sheath, to DIN VDE 0207 part 24, compound type HM2
- Sheath colour grey, RAL 7005
- with meter marking, change-over in 2011

Properties

- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free sheath compound, self-extinguishing and flame retardant according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- **screened analogue type:**
DATAFLAMM-C, see page B 23

Application

DATAFLAMM halogen-free data cables are used as connecting cable for signal, measuring, control, call-announcing and two-way intercom speaking systems, clock installations, electronic weighing equipment and electrical apparatus for office requirements. The cables are suitable for installation in dry, damp and wet environments as well as in masonry and concrete.

PE-insulated-cores, compared with the conventional PVC-insulated cores, assure a remarkable and more favourable capacitance values. These cables are generally installed in telecommunication apparatus and data transmission systems in public buildings, laboratories, trading centres where the freedom from halogen in case of fire and the flame propagation must be avoided.

The halogen-free thermoplastic sheath produce neither corrosive nor toxic gases.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52300	2 x 0,14	3,3	2,6	14,0	26
52301	3 x 0,14	3,5	4,0	17,0	26
52302	4 x 0,14	3,7	5,3	19,0	26
52303	5 x 0,14	4,0	6,6	23,0	26
52304	6 x 0,14	4,3	7,9	25,0	26
52305	7 x 0,14	4,3	9,2	27,0	26
52306	8 x 0,14	4,6	10,3	30,0	26
52307	10 x 0,14	5,4	13,2	38,0	26
52308	12 x 0,14	5,7	16,0	45,0	26
52309	15 x 0,14	6,2	20,1	57,0	26
52310	18 x 0,14	6,7	23,7	65,0	26
52311	21 x 0,14	7,3	27,9	76,0	26
52312	25 x 0,14	7,9	33,4	88,0	26
52313	30 x 0,14	8,1	39,3	98,0	26
52314	34 x 0,14	8,9	45,5	111,0	26
52315	40 x 0,14	9,5	53,6	139,0	26
52316	50 x 0,14	10,5	64,9	174,0	26
52317	2 x 0,25	3,7	4,7	18,0	24
52318	3 x 0,25	3,9	7,1	21,0	24
52319	4 x 0,25	4,2	9,5	26,0	24
52320	5 x 0,25	4,6	12,0	31,0	24
52321	7 x 0,25	5,1	16,6	40,0	24
52322	10 x 0,25	6,4	24,0	56,0	24
52323	12 x 0,25	6,5	28,6	64,0	24
52324	15 x 0,25	7,3	36,0	80,0	24
52430	18 x 0,25	7,8	43,2	90,0	24
52431	21 x 0,25	8,3	50,4	105,0	24
52325	25 x 0,25	9,3	59,8	121,0	24
52326	34 x 0,25	10,8	81,3	168,0	24
52327	40 x 0,25	11,7	96,0	196,0	24
52328	2 x 0,34	4,3	6,4	25,0	22
52329	3 x 0,34	4,5	9,7	30,0	22

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52330	4 x 0,34	4,9	13,0	35,0	22
52331	5 x 0,34	5,4	16,4	43,0	22
52332	7 x 0,34	5,9	22,7	58,0	22
52333	10 x 0,34	7,8	32,4	80,0	22
52334	12 x 0,34	8,0	39,1	91,0	22
52335	15 x 0,34	9,0	49,1	115,0	22
52336	18 x 0,34	9,6	59,1	135,0	22
52337	21 x 0,34	10,1	68,3	154,0	22
52338	25 x 0,34	11,9	81,4	180,0	22
52339	34 x 0,34	13,3	111,1	233,0	22
52340	40 x 0,34	14,4	130,5	272,0	22
52341	2 x 0,5	4,6	9,5	30,0	20
52342	3 x 0,5	4,9	14,2	36,0	20
52343	4 x 0,5	5,3	19,2	43,0	20
52344	5 x 0,5	5,9	24,0	56,0	20
52345	7 x 0,5	6,4	33,7	70,0	20
52346	10 x 0,5	8,4	48,0	101,0	20
52347	12 x 0,5	8,6	57,4	117,0	20
52348	15 x 0,5	9,8	72,0	145,0	20
52349	18 x 0,5	10,5	86,4	171,0	20
52350	21 x 0,5	11,1	101,0	197,0	20
52351	25 x 0,5	12,6	120,0	230,0	20
52352	30 x 0,5	13,3	142,6	269,0	20
52353	34 x 0,5	14,5	163,1	301,0	20
52354	40 x 0,5	15,8	192,0	365,0	20
52355	2 x 0,75	5,2	14,3	40,0	18
52356	3 x 0,75	5,5	21,5	51,0	18
52357	4 x 0,75	6,0	28,6	61,0	18
52358	5 x 0,75	6,7	36,1	76,0	18
52359	7 x 0,75	7,3	50,3	97,0	18
52360	10 x 0,75	9,8	72,0	137,0	18
52361	12 x 0,75	10,0	86,2	167,0	18

Dimensions and specifications may be changed without prior notice. (RB01)

TRONIC-CY (LiY-CY) flexible, Cu-screened, colour coded to DIN 47100, EMC-preferred type, meter marking



Technical data

- Special PVC data screened cables, adapted to DIN VDE 0812
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
0,14 mm² = 350 V
≥ 0,25 mm² = 500 V
- **Test voltage**
core/core 1200 V
core/screen 800 V
- **Breakdown voltage** min. 2400 V
- **Insulation resistance**
min. 200 MOhm x km
- **Capacitance** (approx. -value) at 800 Hz
core/core at 0,14 mm² = 120 pF/m
core/core ≥ 0,25 mm² = 150 pF/m
core/screen at 0,14 mm² = 240 pF/m
core/screen ≥ 0,25 mm² = 270 pF/m
- **Load** (A) According to different cross-sections, see table Technical Information
- **Inductance** approx. 0,65 mH/km
- **Impedance** approx. 78 Ohm
- **Coupling resistance** max. 250 Ohm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors for 0,5 mm² to DIN VDE 0295 cl. 5 and IEC 60228 cl. 5
- Conductor make-up for
0,14 mm² = 18x0,1 mm
0,25 mm² = 14x0,15 mm
0,34 mm² = 7x0,25 mm
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Cores stranded in layers with optimal lay-length
- Colour coded to DIN 47100, but without colour repetition
- Core wrapping with foil
- Drain-wire, tinned
- Tinned, copper braided screen, approx. 85% coverage
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- HELUKABEL®-TRONIC-CY is also available in paired version (e.g. HELUKABEL®-PAAR-TRONIC-CY 16x2x0,14 mm²).
- For 1 core cable screen of helically wound.
- **unscreened analogue type: TRONIC (LiYY)**, see page B 4

Application

These screened cables are used for flexible use with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air, wherever the construction requirements call for a minimum outer diameter, TRONIC is the suitable cable to use. This applies especially to such areas as tool making and machine industries as well as electronic, computer, measurement and control sectors.

The extremely small outer diameter make suitable for miniature plugs etc.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20139	1 x 0,14	2,5	6,1	16,0	26
20001	2 x 0,14	3,7	12,0	20,0	26
20002	3 x 0,14	3,9	13,0	27,0	26
20003	4 x 0,14	4,1	14,5	32,0	26
20004	5 x 0,14	4,4	15,5	37,0	26
20005	6 x 0,14	4,9	18,2	42,0	26
20006	7 x 0,14	4,9	19,0	48,0	26
20007	8 x 0,14	5,2	21,3	55,0	26
20008	10 x 0,14	6,2	28,7	65,0	26
20009	12 x 0,14	6,2	30,5	77,0	26
20010	14 x 0,14	6,6	32,0	79,0	26
20011	16 x 0,14	6,9	43,2	89,0	26
20012	18 x 0,14	7,2	51,0	103,0	26
20013	20 x 0,14	7,7	55,0	116,0	26
20014	21 x 0,14	7,9	56,0	120,0	26

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20015	24 x 0,14	8,3	62,0	131,0	26
20091	25 x 0,14	8,5	61,0	136,0	26
20016	27 x 0,14	8,5	65,0	142,0	26
20017	30 x 0,14	9,3	69,0	157,0	26
20018	32 x 0,14	9,6	76,0	163,0	26
20019	36 x 0,14	9,9	83,0	182,0	26
20020	40 x 0,14	10,2	88,0	209,0	26
20021	42 x 0,14	10,5	94,0	217,0	26
20022	44 x 0,14	11,2	110,0	226,0	26
20023	48 x 0,14	11,3	115,0	240,0	26
20024	52 x 0,14	11,8	124,0	270,0	26
20025	56 x 0,14	12,1	132,0	320,0	26
20026	61 x 0,14	12,4	146,0	370,0	26
20027	80 x 0,14	14,1	226,0	510,0	26
20028	100 x 0,14	15,6	267,0	580,0	26

Continuation ▶

TRONIC-CY (LiY-CY) flexible, Cu-screened, colour coded to DIN 47100, EMC-preferred type, meter marking



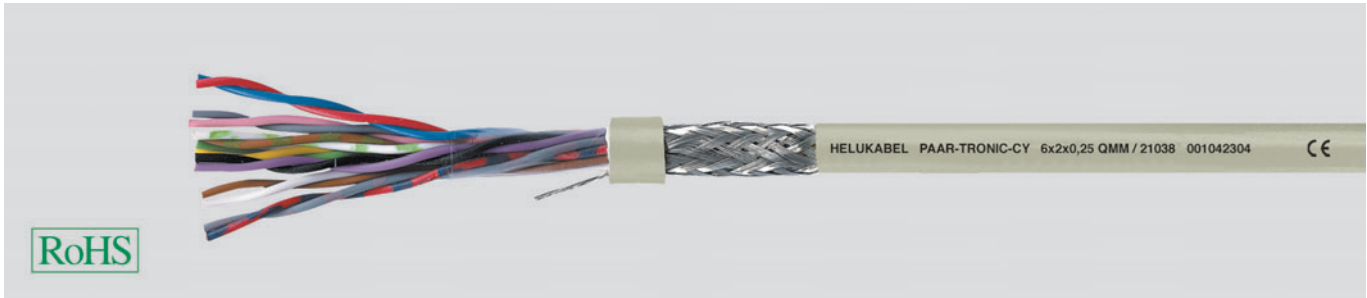
B

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20084	1 x 0,25	2,9	7,2	27,0	24
20029	2 x 0,25	4,2	15,8	31,0	24
20030	3 x 0,25	4,3	18,6	36,0	24
20031	4 x 0,25	4,7	22,0	40,0	24
20032	5 x 0,25	5,3	26,5	51,0	24
20083	6 x 0,25	5,7	32,4	58,0	24
20033	7 x 0,25	5,7	35,0	64,0	24
20034	8 x 0,25	6,3	42,1	82,0	24
20035	10 x 0,25	7,2	49,9	85,0	24
20036	12 x 0,25	7,3	58,0	90,0	24
20037	14 x 0,25	7,9	62,0	144,0	24
20038	16 x 0,25	8,3	67,0	110,0	24
20039	18 x 0,25	9,1	78,0	142,0	24
20086	19 x 0,25	9,1	79,0	146,0	24
20040	20 x 0,25	9,4	88,0	152,0	24
20041	21 x 0,25	9,4	91,0	150,0	24
20042	24 x 0,25	10,0	96,0	163,0	24
20092	25 x 0,25	10,1	99,0	169,0	24
20043	27 x 0,25	10,1	122,0	176,0	24
20044	30 x 0,25	11,1	132,0	189,0	24
20045	32 x 0,25	11,5	138,0	204,0	24
20046	36 x 0,25	11,9	146,0	219,0	24
20087	37 x 0,25	11,9	152,0	230,0	24
20047	40 x 0,25	12,4	157,0	247,0	24
20048	42 x 0,25	12,8	160,0	269,0	24
20049	44 x 0,25	13,6	164,0	292,0	24
20050	48 x 0,25	13,7	164,0	317,0	24
20051	52 x 0,25	14,1	175,0	330,0	24
20052	56 x 0,25	14,5	189,0	343,0	24
20053	61 x 0,25	15,1	204,0	365,0	24
20054	80 x 0,25	17,1	387,0	480,0	24
20055	100 x 0,25	19,1	505,0	605,0	24
20088	1 x 0,34	3,2	13,5	24,0	22
20056	2 x 0,34	5,0	18,0	30,0	22
20057	3 x 0,34	5,2	22,0	37,0	22
20058	4 x 0,34	5,6	28,0	48,0	22
20059	5 x 0,34	6,0	31,0	54,0	22
20085	6 x 0,34	6,7	45,0	61,0	22
20060	7 x 0,34	6,7	51,0	67,0	22
20061	8 x 0,34	7,2	54,0	81,0	22
20062	10 x 0,34	8,4	65,0	103,0	22
20063	12 x 0,34	8,5	70,0	110,0	22
20064	14 x 0,34	9,0	81,0	153,0	22
20065	16 x 0,34	9,6	88,0	159,0	22
20066	18 x 0,34	10,1	103,0	172,0	22
20089	19 x 0,34	10,1	106,0	181,0	22
20067	20 x 0,34	10,7	112,0	191,0	22
20068	21 x 0,34	10,7	116,0	199,0	22
20069	24 x 0,34	11,3	129,0	229,0	22
20093	25 x 0,34	11,5	120,0	241,0	22
20070	27 x 0,34	11,5	138,0	258,0	22
20071	30 x 0,34	12,6	158,0	290,0	22
20072	32 x 0,34	13,0	163,0	305,0	22
20073	36 x 0,34	13,7	178,0	330,0	22
20090	37 x 0,34	13,7	192,0	348,0	22
20074	40 x 0,34	14,2	198,0	364,0	22
20075	42 x 0,34	14,8	203,0	389,0	22
20076	44 x 0,34	15,4	214,0	414,0	22
20077	48 x 0,34	15,6	227,0	420,0	22
20078	52 x 0,34	16,2	242,0	450,0	22
20079	56 x 0,34	16,6	267,0	480,0	22
20080	61 x 0,34	17,1	295,0	520,0	22
20081	80 x 0,34	19,4	524,0	580,0	22
20082	100 x 0,34	21,7	620,0	694,0	22
16001	1 x 0,5	3,6	15,0	40,0	20
16002	2 x 0,5	5,5	29,0	45,0	20
16003	3 x 0,5	5,7	39,0	55,0	20
16004	4 x 0,5	6,3	46,0	61,0	20
16005	5 x 0,5	6,8	52,0	76,0	20
16006	6 x 0,5	7,3	66,0	89,0	20
16007	7 x 0,5	7,3	68,0	98,0	20
16008	8 x 0,5	8,0	80,0	117,0	20
16009	10 x 0,5	9,4	93,0	135,0	20
16010	12 x 0,5	9,6	117,0	157,0	20
16011	14 x 0,5	10,1	122,0	190,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
16012	16 x 0,5	10,6	129,0	210,0	20
16013	18 x 0,5	10,7	152,0	217,0	20
16526	19 x 0,5	11,2	156,0	246,0	20
16014	20 x 0,5	11,7	173,0	275,0	20
16015	24 x 0,5	12,6	236,0	337,0	20
16016	25 x 0,5	12,7	250,0	351,0	20
16527	27 x 0,5	12,7	265,0	373,0	20
16017	30 x 0,5	14,1	297,0	396,0	20
16018	32 x 0,5	14,6	301,0	431,0	20
16164	34 x 0,5	15,3	312,0	440,0	20
16019	36 x 0,5	15,3	320,0	445,0	20
16528	37 x 0,5	15,3	325,0	458,0	20
16020	40 x 0,5	15,8	345,0	470,0	20
16021	50 x 0,5	18,1	407,0	570,0	20
16022	61 x 0,5	19,1	508,0	650,0	20
16023	80 x 0,5	21,9	690,0	780,0	20
16024	100 x 0,5	24,3	814,0	990,0	20
16025	1 x 0,75	3,8	19,0	41,0	18
16026	2 x 0,75	5,8	38,0	59,0	18
16027	3 x 0,75	6,3	50,0	66,0	18
16028	4 x 0,75	6,8	57,0	77,0	18
16029	5 x 0,75	7,3	70,0	93,0	18
16030	6 x 0,75	8,1	87,0	113,0	18
16031	7 x 0,75	8,2	96,0	130,0	18
16032	8 x 0,75	9,0	110,0	145,0	18
16033	10 x 0,75	10,3	140,0	180,0	18
16034	12 x 0,75	10,5	151,0	202,0	18
16035	14 x 0,75	11,3	167,0	225,0	18
16036	16 x 0,75	11,8	183,0	275,0	18
16037	18 x 0,75	12,6	207,0	292,0	18
16529	19 x 0,75	12,6	221,0	322,0	18
16038	20 x 0,75	13,4	238,0	362,0	18
16039	24 x 0,75	14,1	270,0	435,0	18
16040	25 x 0,75	14,3	278,0	415,0	18
16041	27 x 0,75	14,3	287,0	467,0	18
16042	30 x 0,75	15,8	315,0	486,0	18
16043	32 x 0,75	16,3	330,0	530,0	18
16163	34 x 0,75	17,1	350,0	570,0	18
16044	36 x 0,75	17,1	370,0	600,0	18
16530	37 x 0,75	17,9	386,0	640,0	18
16045	40 x 0,75	17,9	395,0	680,0	18
16120	42 x 0,75	18,4	408,0	714,0	18
16047	61 x 0,75	21,5	555,0	900,0	18
16048	80 x 0,75	24,6	715,0	1200,0	18
16049	100 x 0,75	27,2	910,0	1440,0	18
16475	2 x 1	6,4	46,0	65,0	17
16476	3 x 1	6,7	56,0	80,0	17
16477	4 x 1	7,2	69,0	98,0	17
16478	5 x 1	8,0	89,0	127,0	17
16479	6 x 1	8,6	105,0	144,0	17
16480	7 x 1	8,6	111,0	158,0	17
16481	8 x 1	9,4	130,0	197,0	17
16482	10 x 1	11,2	140,0	232,0	17
16483	12 x 1	11,4	168,0	260,0	17
16484	14 x 1	12,0	198,0	302,0	17
16485	16 x 1	12,8	218,0	346,0	17
16486	19 x 1	13,6	268,0	412,0	17
16487	24 x 1	15,2	320,0	493,0	17
16488	27 x 1	15,4	360,0	562,0	17
16489	37 x 1	18,3	485,0	790,0	17
16500	2 x 1,5	7,3	63,0	88,0	16
16501	3 x 1,5	7,6	76,0	100,0	16
16502	4 x 1,5	8,3	98,0	126,0	16
16503	5 x 1,5	9,2	116,0	160,0	16
16504	6 x 1,5	9,9	140,0	192,0	16
16505	7 x 1,5	9,9	152,0	208,0	16
16506	8 x 1,5	10,8	172,0	244,0	16
16507	10 x 1,5	13,0	193,0	315,0	16
16508	12 x 1,5	13,0	254,0	338,0	16
16509	14 x 1,5	13,9	272,0	383,0	16
16510	16 x 1,5	14,9	285,0	424,0	16
16511	19 x 1,5	15,6	387,0	506,0	16
16512	24 x 1,5	17,7	448,0	690,0	16
16513	27 x 1,5	17,9	506,0	781,0	16
16514	37 x 1,5	21,2	682,0	941,0	16

Dimensions and specifications may be changed without prior notice. (RB01)

PAAR-TRONIC-CY flexible, Cu-screened, colour coded to DIN 47100, EMC-preferred type, meter marking



Technical data

- Special PVC data cables, adapted to DIN VDE 0812, 0814
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Operating voltage** 350 V
(not for purposes of high current and power installation)
- **Test voltage**
core/core 1200 V
core/screen 800 V
- **Breakdown voltage** min. 2400 V
- **Insulation resistance**
min. 20 MOhm x km
- **Conductor resistance**
at 0,14 mm² ≤ 138 Ohm/km
at 0,25 mm² ≤ 75,5 Ohm/km
at 0,34 mm² ≤ 57,5 Ohm/km
at 0,50 mm² ≤ 39 Ohm/km
at 0,75 mm² ≤ 26 Ohm/km
- **Capacitance** (approx. -value) at 800 Hz
core/core 0,14 mm² = 120 pF/m
core/core ≥ 0,25 mm² = 150 pF/m
core/screen 0,14 mm² = 240 pF/m
core/screen ≥ 0,25 mm² = 270 pF/m
- **Load**
at 0,14 mm² = 1,5 A
at 0,25 mm² = 2,5 A
at 0,34 mm² = 4,5 A
at 0,50 mm² = 6 A
at 0,75 mm² = 9 A
- **Inductance** approx. 0,65 mH/km
- **Impedance** approx. 78 Ohm
- **K₁-coupling** approx. 300 pF/100 m
- **Coupling resistance**
max. 250 Ohm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, 0245 and IEC 60228 cl. 5
- Conductor make-up for
0,14 mm² = 18x0,1 mm
0,25 mm² = 14x0,15 mm
0,34 mm² = 7x0,25 mm
- Special PVC core insulation Y12, to DIN VDE 0207 part 4
- Colours coded to DIN 47100 with colour repetition
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Core wrapping with foil
- Tinned copper braided screening, coverage approx. 85%
- Special PVC outer sheath YM2, to DIN VDE 0207 part 5
- Sheath colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Also available in other sheath colours.
- **unscreened analogue type:**
PAAR-TRONIC, see page B 6

Application

These data control cables are used for flexible use with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air.

PAAR-TRONIC-CY is well suited for use in areas subject to signal interference. The high level of screening reduces substantially the effects of electrical disturbances from parallel running wiring etc. The copper screening is also often used as an "earth".

The twisted pairs conform favourable cross-talk attenuation values. These cables are suitable for dry and wet rooms, yet not for open air.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21001	1 x 2 x 0,14	4,1	15,6	34,0	26
21002	2 x 2 x 0,14	5,6	18,5	40,0	26
21003	3 x 2 x 0,14	5,6	23,0	49,0	26
21004	4 x 2 x 0,14	6,0	26,6	55,0	26
21005	5 x 2 x 0,14	6,7	30,7	66,0	26

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21006	6 x 2 x 0,14	7,2	48,5	86,0	26
21007	7 x 2 x 0,14	7,2	51,1	91,0	26
21008	8 x 2 x 0,14	8,4	53,7	97,0	26
21009	10 x 2 x 0,14	9,1	59,0	109,0	26
21010	12 x 2 x 0,14	9,2	66,0	141,0	26

Continuation ▶

PAAR-TRONIC-CY flexible, Cu-screened, colour coded to DIN 47100, EMC-preferred type, meter marking



Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21011	14 x 2 x 0,14	9,9	74,0	148,0	26
21012	15 x 2 x 0,14	10,4	76,0	152,0	26
21013	16 x 2 x 0,14	10,4	79,0	155,0	26
21014	18 x 2 x 0,14	11,0	83,0	171,0	26
21015	20 x 2 x 0,14	11,5	97,0	183,0	26
21016	22 x 2 x 0,14	12,3	103,0	205,0	26
21017	24 x 2 x 0,14	12,3	111,0	228,0	26
21018	25 x 2 x 0,14	12,5	113,0	239,0	26
21019	26 x 2 x 0,14	12,5	122,0	245,0	26
21020	27 x 2 x 0,14	12,5	125,0	251,0	26
21021	28 x 2 x 0,14	13,7	128,0	258,0	26
21022	30 x 2 x 0,14	13,7	140,0	270,0	26
21023	32 x 2 x 0,14	14,2	145,0	284,0	26
21024	34 x 2 x 0,14	14,7	150,0	300,0	26
21025	36 x 2 x 0,14	14,9	156,0	316,0	26
21026	38 x 2 x 0,14	15,6	162,0	350,0	26
21027	40 x 2 x 0,14	16,1	177,0	370,0	26
21028	44 x 2 x 0,14	16,8	181,0	390,0	26
21029	46 x 2 x 0,14	17,0	195,0	430,0	26
21030	50 x 2 x 0,14	17,7	202,0	440,0	26
21031	52 x 2 x 0,14	17,7	206,0	460,0	26
21032	55 x 2 x 0,14	18,2	210,0	480,0	26
21033	1 x 2 x 0,25	4,6	15,0	45,0	24
21034	2 x 2 x 0,25	6,3	28,0	53,0	24
21035	3 x 2 x 0,25	6,6	32,0	65,0	24
21036	4 x 2 x 0,25	7,0	38,0	80,0	24
21037	5 x 2 x 0,25	7,8	55,0	98,0	24
21038	6 x 2 x 0,25	8,6	65,0	114,0	24
21039	7 x 2 x 0,25	8,6	70,0	121,0	24
21040	8 x 2 x 0,25	9,8	75,0	129,0	24
21041	10 x 2 x 0,25	11,0	110,0	157,0	24
21042	12 x 2 x 0,25	11,2	117,0	189,0	24
21043	14 x 2 x 0,25	12,2	122,0	213,0	24
21044	15 x 2 x 0,25	12,8	134,0	225,0	24
21045	16 x 2 x 0,25	12,8	143,0	237,0	24
21046	18 x 2 x 0,25	13,5	148,0	248,0	24
21047	20 x 2 x 0,25	14,1	162,0	275,0	24
21048	22 x 2 x 0,25	14,9	172,0	303,0	24
21049	24 x 2 x 0,25	15,3	223,0	330,0	24
21050	25 x 2 x 0,25	15,5	233,0	343,0	24
21051	26 x 2 x 0,25	15,5	238,0	345,0	24
21052	27 x 2 x 0,25	15,5	244,0	350,0	24
21053	28 x 2 x 0,25	17,0	249,0	360,0	24
21054	30 x 2 x 0,25	17,0	254,0	375,0	24
21055	32 x 2 x 0,25	17,6	290,0	400,0	24
21056	34 x 2 x 0,25	18,2	312,0	410,0	24
21057	36 x 2 x 0,25	18,2	322,0	420,0	24
21058	38 x 2 x 0,25	19,0	339,0	450,0	24
21059	40 x 2 x 0,25	19,7	349,0	485,0	24
21060	44 x 2 x 0,25	20,5	359,0	500,0	24
21061	46 x 2 x 0,25	20,7	398,0	540,0	24
21062	50 x 2 x 0,25	21,5	405,0	550,0	24
21063	52 x 2 x 0,25	21,5	435,0	580,0	24
21064	55 x 2 x 0,25	22,1	464,0	630,0	24
19970	1 x 2 x 0,34	5,2	16,0	58,0	22
19971	2 x 2 x 0,34	7,0	36,9	65,0	22

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19972	3 x 2 x 0,34	7,3	44,9	78,0	22
19973	4 x 2 x 0,34	8,1	54,2	90,0	22
19974	5 x 2 x 0,34	8,8	63,5	110,0	22
19975	6 x 2 x 0,34	9,8	73,1	130,0	22
19976	7 x 2 x 0,34	9,8	79,5	145,0	22
19977	8 x 2 x 0,34	11,2	88,4	150,0	22
19978	9 x 2 x 0,34	12,6	99,3	170,0	22
19979	10 x 2 x 0,34	12,6	106,9	190,0	22
19980	12 x 2 x 0,34	12,8	122,1	220,0	22
19981	14 x 2 x 0,34	13,3	138,2	245,0	22
19982	16 x 2 x 0,34	14,3	154,2	250,0	22
19983	18 x 2 x 0,34	15,2	197,9	275,0	22
19984	21 x 2 x 0,34	15,9	214,4	300,0	22
19985	25 x 2 x 0,34	17,5	238,5	400,0	22
19986	27 x 2 x 0,34	17,5	262,5	410,0	22
19987	30 x 2 x 0,34	19,1	286,6	440,0	22
19988	34 x 2 x 0,34	20,8	310,1	510,0	22
19989	37 x 2 x 0,34	21,5	368,7	550,0	22
19990	40 x 2 x 0,34	22,4	392,6	590,0	22
19991	44 x 2 x 0,34	23,6	424,3	600,0	22
19992	50 x 2 x 0,34	24,8	455,9	650,0	22
19993	52 x 2 x 0,34	24,8	487,6	680,0	22
19994	56 x 2 x 0,34	25,4	518,5	750,0	22
19995	61 x 2 x 0,34	26,2	557,2	840,0	22
17047	1 x 2 x 0,5	5,6	24,0	60,0	20
17001	2 x 2 x 0,5	7,8	54,0	89,0	20
17002	3 x 2 x 0,5	8,2	70,0	104,0	20
17003	4 x 2 x 0,5	9,1	91,0	126,0	20
17004	5 x 2 x 0,5	9,9	105,0	148,0	20
17005	6 x 2 x 0,5	10,7	120,0	171,0	20
17006	8 x 2 x 0,5	12,8	144,0	290,0	20
17007	10 x 2 x 0,5	14,0	178,0	320,0	20
17008	12 x 2 x 0,5	14,3	199,0	361,0	20
17009	16 x 2 x 0,5	16,1	254,0	421,0	20
17010	20 x 2 x 0,5	17,2	302,0	580,0	20
17011	25 x 2 x 0,5	19,7	344,0	740,0	20
17048	1 x 2 x 0,75	6,0	28,0	71,0	19
17012	2 x 2 x 0,75	8,4	58,0	105,0	19
17013	3 x 2 x 0,75	8,9	84,0	128,0	19
17014	4 x 2 x 0,75	9,8	108,0	156,0	19
17015	5 x 2 x 0,75	10,8	126,0	189,0	19
17016	6 x 2 x 0,75	12,1	146,0	216,0	19
17017	8 x 2 x 0,75	13,4	180,0	309,0	19
17018	10 x 2 x 0,75	15,5	220,0	355,0	19
17019	12 x 2 x 0,75	15,8	261,0	405,0	19
17020	16 x 2 x 0,75	18,0	328,0	565,0	19
17021	20 x 2 x 0,75	19,2	392,0	700,0	19
17022	25 x 2 x 0,75	21,8	470,0	950,0	19
17049	1 x 2 x 1	6,3	46,0	75,0	18
17050	2 x 2 x 1	8,9	82,0	116,0	18
17051	3 x 2 x 1	9,4	103,0	140,0	18
17052	4 x 2 x 1	10,4	132,0	191,0	18
17053	1 x 2 x 1,5	7,2	63,0	84,0	16
17054	2 x 2 x 1,5	10,2	111,0	122,0	16
17055	3 x 2 x 1,5	10,8	136,0	194,0	16
17056	4 x 2 x 1,5	12,0	172,0	240,0	16

Dimensions and specifications may be changed without prior notice. (RB01)



Technical data

- Special PVC data cables, screened, adapted to DIN VDE 0812, 0814
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage**
core/core 1200 V
core/screen 800 V
- **Breakdown voltage** min. 2400 V
- **Insulation resistance**
min. 20 MΩm x km
- **Mutual capacitance** according to different cross-sections
0,5 mm² to 1,5 mm²:
core/core approx. 150 nF/km
core/screen approx. 270 nF/km
- **Inductance** approx. 0,67 mH/km
- **Coupling resistance**
max. 250 Ωm/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Black cores with continuous numbering in white according to DIN VDE 0293
- Cores laid up in pairs
- Pairs stranded in layers with optimal lay-length
- Foil wrap
- Tinned copper screened braiding, approx. 85% coverage
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- We deliver other dimensions and other colours of outer jackets on request.

Application

PAAR-CY is ideal for use as a connecting cable for all areas involving measuring, control, regulation and signal transfer as well as for use in all fields of data and impulse transmission.

Especially suited for all areas of high electromagnetic activity, e. g. disturbances through parallel circuits.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C€ = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
17023	2 x 2 x 1	9,5	82,0	135,0	17
17024	3 x 2 x 1	10,0	103,0	160,0	17
17025	4 x 2 x 1	11,0	132,0	197,0	17
17026	5 x 2 x 1	12,3	161,0	253,0	17
17027	6 x 2 x 1	13,4	188,0	295,0	17
17028	8 x 2 x 1	14,7	240,0	410,0	17
17029	10 x 2 x 1	16,4	282,0	518,0	17
17030	12 x 2 x 1	18,2	324,0	601,0	17
17031	16 x 2 x 1	19,0	412,0	990,0	17
17032	20 x 2 x 1	19,8	505,0	1400,0	17
17033	25 x 2 x 1	23,5	610,0	1600,0	17

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
17034	2 x 2 x 1,5	11,3	112,0	168,0	16
17035	3 x 2 x 1,5	12,2	139,0	221,0	16
17036	4 x 2 x 1,5	13,5	176,0	269,0	16
17037	5 x 2 x 1,5	14,5	212,0	314,0	16
17038	6 x 2 x 1,5	17,2	255,0	550,0	16
17039	8 x 2 x 1,5	18,2	322,0	650,0	16
17040	10 x 2 x 1,5	20,1	380,0	900,0	16
17041	12 x 2 x 1,5	21,8	442,0	950,0	16
17042	16 x 2 x 1,5	25,0	572,0	1100,0	16
17043	20 x 2 x 1,5	27,0	705,0	1700,0	16
17044	25 x 2 x 1,5	29,5	862,0	1900,0	16

Dimensions and specifications may be changed without prior notice. (RB01)

PAAR-TRONIC-CY-CY (LiYCY-CY) EMC-preferred type, meter marking



HELUKABEL PAAR-TRONIC-CY-CY 6x2x0,34 QMM / 21094 001042319 CE



B

Technical data

- Special PVC data transmission cable adapted to DIN VDE 0812 and 0814
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Conductor resistance**
0,14 mm² = max. 138 Ohm/km
0,25 mm² = max. 77,8 Ohm/km
- **Nominal voltage**
0,14 mm² = max. 350 V
0,25 mm² = max. 500 V
- **Test voltage**
0,14 mm² = 1200 V
0,25 mm² = 2000 V
- **Breakdown voltage**
0,14 mm² = 2400 V
0,25 mm² = 4000 V
- **Mutual capacitance**
core/core
0,14 mm² = 147 pF/m
0,25 mm² = 152,5 pF/m
core/screen
0,14 mm² = 147 pF/m
0,25 mm² = 263 pF/m
- **Impedance**
0,14 mm² = 536 Ohm/1 kHz/20 °C
0,25 mm² = 396 Ohm/1 kHz/20 °C
- **Coupling** 250 pF/100 m/1 kHz
- **Screen resistance**
0,14 mm² = 36 Ohm/km
0,25 mm² = 18 Ohm/km
- **Attenuation**
0,14 mm² = 3,6 dB/1 kHz/km
0,25 mm² = 2,2 dB/1 kHz/km
- **Minimum bending radius**
flexing 12x cable ø
fixed installation 6x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (bis 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0812
- Strand make-up
0,14 mm² = 18x0,10 mm
0,25 mm² = 14x0,15 mm
0,34 mm² = 7x0,25 mm
- Special PVC core insulation Y12, to DIN VDE 0207 part 4
- Core colours to DIN 47100 with colour repetition
- Cores stranded in pairs with optimal lay-length
- Pairs screened individually, tinned copper, coverage approx. 85%
- Special PVC coating over individual screened pairs
- All pairs-CY stranded together
- Core wrapping with polyester foil, overlapped
- Overall braid-screening, tinned copper coverage approx. 85%
- Special PVC outer sheath YM2, to DIN VDE 0207 part 5
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- As of 0,75 mm² cross-sec. see type L-EDV-PiMF-CY.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This cable type offers total interference-free data transfer and is ideal for use as a signal and control cable in combination with computers and external units. The screening properties also make this cable type well suited for use as a connecting cable in sound studio equipment, measuring and control sectors as well as proving a highly reliable cable for process-control and security systems. The copper screening assures a disturbance-free data and signal transmission for measuring and control systems.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21065	2 x 2 x 0,14	7,4	31,0	95,0	26	21071	8 x 2 x 0,14	13,2	97,0	245,0	26
21066	3 x 2 x 0,14	8,5	34,0	105,0	26	21072	9 x 2 x 0,14	14,1	101,0	280,0	26
21067	4 x 2 x 0,14	10,0	45,0	140,0	26	21073	10 x 2 x 0,14	15,1	108,0	325,0	26
21068	5 x 2 x 0,14	10,5	58,0	160,0	26	21074	12 x 2 x 0,14	15,3	134,0	380,0	26
21069	6 x 2 x 0,14	11,6	67,0	185,0	26	21075	16 x 2 x 0,14	17,0	179,0	440,0	26
21070	7 x 2 x 0,14	12,1	78,0	230,0	26	21076	20 x 2 x 0,14	17,8	225,0	520,0	26

Continuation ▶

PAAR-TRONIC-CY-CY (LiYCY-CY) EMC-preferred type, meter marking

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21077	2 x 2 x 0,25	8,1	62,0	125,0	24
21078	3 x 2 x 0,25	9,5	78,2	140,0	24
21079	4 x 2 x 0,25	10,5	124,1	205,0	24
21080	5 x 2 x 0,25	11,9	137,6	230,0	24
21081	6 x 2 x 0,25	12,6	148,1	275,0	24
21082	7 x 2 x 0,25	13,9	159,1	295,0	24
21083	8 x 2 x 0,25	14,2	178,7	330,0	24
21084	10 x 2 x 0,25	15,2	213,9	420,0	24
21085	12 x 2 x 0,25	17,5	238,3	465,0	24
21086	16 x 2 x 0,25	22,0	291,4	590,0	24
21087	20 x 2 x 0,25	22,6	325,0	620,0	24
21088	24 x 2 x 0,25	27,5	367,5	690,0	24
21089	32 x 2 x 0,25	29,8	588,0	785,0	24
21090	48 x 2 x 0,25	34,5	840,5	970,0	24
21091	2 x 2 x 0,34	9,5	73,1	139,0	22
21092	3 x 2 x 0,34	11,6	88,1	157,0	22
21093	4 x 2 x 0,34	12,4	137,2	213,0	22
21094	6 x 2 x 0,34	15,0	174,8	308,0	22
21095	8 x 2 x 0,34	16,5	247,2	385,0	22
21096	10 x 2 x 0,34	19,0	288,7	433,0	22
21097	12 x 2 x 0,34	19,5	321,0	495,0	22
21098	14 x 2 x 0,34	20,7	388,4	600,0	22
21099	16 x 2 x 0,34	22,5	425,5	637,0	22
21100	24 x 2 x 0,34	28,0	577,1	781,0	22

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21101	2 x 2 x 0,5	10,4	83,1	143,0	20
21102	3 x 2 x 0,5	11,6	106,4	179,0	20
21103	4 x 2 x 0,5	13,0	158,0	241,0	20
21104	6 x 2 x 0,5	15,6	201,4	319,0	20
21105	8 x 2 x 0,5	18,0	311,5	441,0	20
21106	10 x 2 x 0,5	20,8	334,5	464,0	20
21107	12 x 2 x 0,5	21,5	394,1	529,0	20
21108	14 x 2 x 0,5	21,6	446,0	641,0	20
21109	16 x 2 x 0,5	23,8	501,2	694,0	20
21110	24 x 2 x 0,5	28,4	712,4	930,0	20

Dimensions and specifications may be changed without prior notice. (RB01)

Insulating, shrinking, braided and temperature protection tubes

- Braided hoses**
- High temperature protection**
- Insulation tubes**
- Heat-shrink tubes**
- End caps**



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PAAR-TRONIC-LI-2YCYV PE-insulated, low capacitance, Termi-Point®, EMC-preferred type, meter marking

B



Technical data

- PE-insulated data cable
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Conductor resistance** (loop) at 20 °C
0,22 mm² max. 186 Ohm/km
0,34 mm² max. 115 Ohm/km
0,5 mm² max. 78,5 Ohm/km
1,0 mm² max. 39,2 Ohm/km
- **Operating top level voltage**
max. 250 V (not for purposes of high current and power installation)
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance** min. 5 GOhm x km
- **Mutual capacitance** at 800 Hz
>4 pairs max. 60 nF/km
≤4 pairs values extended by 20%
- **Impedance** 100 Ohm ±15
- **Line attenuation** (approx. value)
0,22 mm² at 100 kHz 9,0 dB/km
0,34 mm² at 100 kHz 6,6 dB/km
0,50 mm² at 100 kHz 6,0 dB/km
0,22 mm² at 1 MHz 25,0 dB/km
0,34 mm² at 1 MHz 20,0 dB/km
0,50 mm² at 1 MHz 18,0 dB/km
- **Inductance** approx. 0,66 mH/km
- **Cross-talk attenuation**
up 1 MHz min. 50 dB
up 10 MHz min. 40 dB
- **Minimum bending radius**
flexing 12x cable ø
fixed installation 7,5x cable ø

Cable structure

- Bare copper stranded wires, 7-wires, adapted to DIN VDE 0881, suitable for Termi-Point® and solder-free connection technique
- Conductor make-up
0,22 mm² = 7x0,20 mm
0,34 mm² = 7x0,25 mm
0,5 mm² = 7x0,30 mm
- Core insulation of PE, compound type2Y11 to DIN VDE 0207 part 2
- Core colours to DIN 47100 with colour repetition
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Core wrapping with foil
- Tinned copper braided screening, coverage approx. 85%
- Special PVC outer sheath YM2 black, to DIN VDE 0207 part 5
- Type . . . Yv with reinforced outer sheath
- with meter marking, change-over in 2011

Properties

- PVC outer sheath self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- These cables make enormous advantages possible for fast and cost-effective contact-making using the Termi-Point® connection technique. With this solder-free connection technique, the stranded conductor is crimped together with a sleeve onto a contact pin without prior stripping of the insulation material
- The twisted-pair lay-up prevents electrical unbalances within the cable and this thus effectively suppresses cross-talking effects
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- At 0,22 mm² is designed for applications with Sub-D connectors.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Termi-Point® registered trade mark AMP.
- To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

Application

These PE-insulated data cables with twisted pairs are used in particular for the interference-free transmission of data and signals over longer distances. The high transmission rates are particularly suitable for RS 422 and RS 485 interfaces. These cables are suitable for fixed installations as well as for flexing applications, for free movement without forced motion and without tensile stress, in dry and moist environments. Yv black with reinforced outer sheath, is suitable for installation in the ground and in open air.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21129	2 x 2 x 0,22	8,0	26,0	60,0	24	21141	2 x 2 x 0,5	10,0	49,0	90,0	20
21130	3 x 2 x 0,22	8,3	31,0	79,0	24	21142	3 x 2 x 0,5	10,4	60,0	126,0	20
21131	4 x 2 x 0,22	8,9	38,0	96,0	24	21143	4 x 2 x 0,5	11,2	73,0	146,0	20
21132	8 x 2 x 0,22	10,6	62,0	140,0	24	21144	8 x 2 x 0,5	13,9	124,0	246,0	20
21133	10 x 2 x 0,22	12,1	79,0	184,0	24	21145	10 x 2 x 0,5	16,0	155,0	292,0	20
21135	2 x 2 x 0,34	9,2	35,0	83,0	22	21146	2 x 2 x 1	10,8	81,0	141,0	17
21136	3 x 2 x 0,34	9,6	44,0	92,0	22	21147	3 x 2 x 1	11,5	102,0	170,0	17
21137	4 x 2 x 0,34	10,2	53,0	112,0	22	21148	4 x 2 x 1	12,0	130,0	203,0	17
21138	8 x 2 x 0,34	12,8	86,0	179,0	22	21149	8 x 2 x 1	14,9	240,0	261,0	17
21139	10 x 2 x 0,34	14,1	104,0	219,0	22	21150	10 x 2 x 1	17,2	282,0	287,0	17

Dimensions and specifications may be changed without prior notice.

PAAR-TRONIC-LI-2YCY PE-insulated, low capacitance, Termi-Point®, EMC-preferred type, meter marking



Technical data

- PE-insulated data cable
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Conductor resistance** (loop) at 20 °C
0,22 mm² max. 186 Ohm/km
0,34 mm² max. 115 Ohm/km
0,5 mm² max. 78,5 Ohm/km
- **Operating top level voltage**
max. 250 V (not for purposes of high current and power installation)
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance** min. 5 GOhm x km
- **Mutual capacitance** at 800 Hz
>4 pairs max. 60 nF/km
≤4 pairs values extended by 20%
- **Impedance** 100 Ohm ±15
- **Line attenuation** (approx. value)
0,22 mm² at 100 kHz 9,0 dB/km
0,34 mm² at 100 kHz 6,6 dB/km
0,50 mm² at 100 kHz 6,0 dB/km
0,22 mm² at 1 MHz 25,0 dB/km
0,34 mm² at 1 MHz 20,0 dB/km
0,50 mm² at 1 MHz 18,0 dB/km
- **Inductance** approx. 0,66 mH/km
- **Cross-talk attenuation**
up 1 MHz min. 50 dB
up 10 MHz min. 40 dB
- **Minimum bending radius**
flexing 12x cable ø
fixed installation 7,5x cable ø

Cable structure

- Bare copper stranded wires, 7-wires, adapted to DIN VDE 0881, suitable for Termi-Point® and solder-free connection technique
- Conductor make-up
0,22 mm² = 7x0,20 mm
0,34 mm² = 7x0,25 mm
0,5 mm² = 7x0,30 mm
- Core insulation of PE, compound type2Y11 to DIN VDE 0207 part 2
- Core colours to DIN 47100 with colour repetition
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Core wrapping with foil
- Tinned copper braided screening, coverage approx. 85%
- Special PVC outer sheath YM2 grey, to DIN VDE 0207 part 5
- with meter marking, change-over in 2011

Properties

- PVC outer sheath self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- These cables make enormous advantages possible for fast and cost-effective contact-making using the Termi-Point® connection technique. With this solder-free connection technique, the stranded conductor is crimped together with a sleeve onto a contact pin without prior stripping of the insulation material
- The twisted-pair lay-up prevents electrical unbalances within the cable and this thus effectively suppresses cross-talking effects
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- At 0,22 mm² is designed for applications with Sub-D connectors.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Termi-Point® registered trade mark AMP.
- To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

Application

These PE-insulated data cables with twisted pairs are used in particular for the interference-free transmission of data and signals over longer distances. The high transmission rates are particularly suitable for RS 422 and RS 485 interfaces. These cables are suitable for fixed installations as well as for flexing applications, for free movement without forced motion and without tensile stress, in dry and moist environments but not in open air (Type grey).

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21111	2 x 2 x 0,22	6,4	26,0	48,0	24
21112	3 x 2 x 0,22	6,7	31,0	66,0	24
21113	4 x 2 x 0,22	7,3	38,0	82,0	24
21114	8 x 2 x 0,22	9,0	62,0	123,0	24
21115	10 x 2 x 0,22	10,5	79,0	165,0	24
21117	2 x 2 x 0,34	7,6	35,0	68,0	22
21118	3 x 2 x 0,34	8,0	44,0	77,0	22
21119	4 x 2 x 0,34	8,6	53,0	95,0	22
21120	8 x 2 x 0,34	11,2	86,0	158,0	22
21121	10 x 2 x 0,34	12,5	104,0	195,0	22
21123	2 x 2 x 0,5	8,4	49,0	74,0	20
21124	3 x 2 x 0,5	8,8	60,0	109,0	20
21125	4 x 2 x 0,5	9,6	73,0	128,0	20
21126	8 x 2 x 0,5	12,3	124,0	223,0	20
21127	10 x 2 x 0,5	14,5	155,0	265,0	20

Dimensions and specifications may be changed without prior notice. (RB01)

LifYCY high flexible, paired, screened, EMC-preferred type, meter marking

B



Technical data

- Special PVC connecting cable, adapted to DIN VDE 0812, 0814
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** 350 V
- **Test voltage** 1200 V
- **Breakdown voltage** min. 2400 V
- **Insulation resistance**
min. 10 MOhm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, extra fine conductors(102x0,05 = 0,2 mm²)
- Special PVC core insulation Y12, to DIN VDE 0207 part 4
- Core identification to DIN 47100
- Cores twisted in pairs, pairs twisted in layers
- Core wrapping with polyester tape
- Tinned copper, screened braiding, approx. 85% coverage
- Special PVC outer sheath YM2, to DIN VDE 0207 part 5
- Colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

These screened cables are used as connecting cable for signal, measuring, control and speaking purposes for example in Intercom systems, weighing instruments, equipment for office works, computers and telecommunication equipment etc. The cable offers a flexible handling and installation. Due to pair-twisting, the electrical unbalances of the cable itself can be reduced and cross-talk effects are avoided.

The tinned copper screened braiding serves as protection against outer high frequency influences (capacitance unbalance). The drain wire ensure an exact connection to the earth clamp.

The cables are suitable for fixed installation and flexible application, free-moving without tensile stress and without forced guiding operation in dry, damp and wet places for medium mechanical stress.

EMC = Electromagnetic compatibility

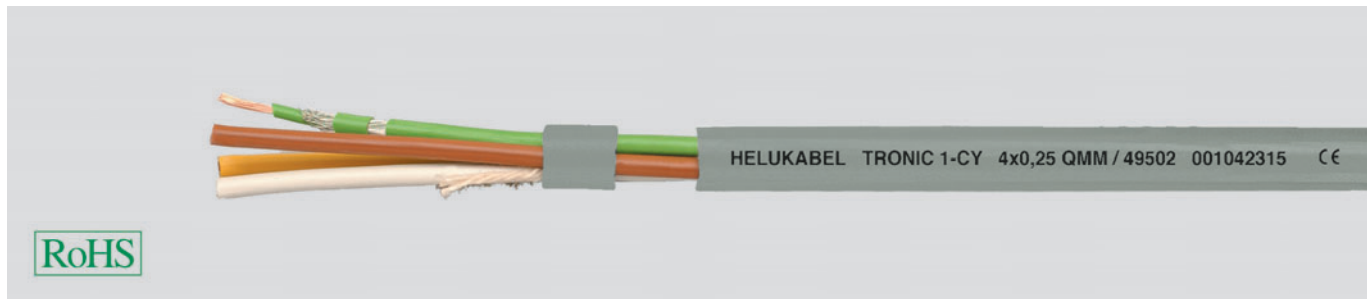
To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15987	2 x 2 x 0,2	5,9	24,0	60,0	-	15994	10 x 2 x 0,2	9,9	108,0	150,0	-
15988	3 x 2 x 0,2	6,1	35,0	70,0	-	15995	12 x 2 x 0,2	10,9	125,0	180,0	-
15989	4 x 2 x 0,2	6,6	45,0	80,0	-	15996	16 x 2 x 0,2	12,5	144,0	210,0	-
15990	5 x 2 x 0,2	7,9	54,0	90,0	-	15997	18 x 2 x 0,2	13,1	155,0	230,0	-
15991	6 x 2 x 0,2	8,6	56,0	100,0	-	15998	20 x 2 x 0,2	13,9	216,0	250,0	-
15992	7 x 2 x 0,2	8,9	68,0	120,0	-	15999	24 x 2 x 0,2	13,2	228,0	330,0	-
15993	8 x 2 x 0,2	9,4	72,0	130,0	-	16000	32 x 2 x 0,2	16,6	269,0	400,0	-

Dimensions and specifications may be changed without prior notice. (RB01)

TRONIC 1-CY each core individually screened, EMC-preferred type, meter marking



Technical data

- Special PVC core insulation, adapted to DIN VDE 0812
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
0,25 mm² 250 V
0,50 mm² 350 V
- **Test voltage** (core/screen)
0,25 mm² 800 V
0,50 mm² 1200 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 (for 0,5 mm²/0,25 mm² to DIN VDE 0812)
- Strand make-up
0,25 mm² 14x0,15 mm
0,50 mm² 16x0,20 mm
- Special PVC core insulation Y12, to DIN VDE 0207 part 4
- Colour coded to DIN 47100
- Each core individually copper spirally screened, approx. 85% coverage
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath YM2, to DIN VDE 0207 part 5
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

The individually screened, flexible cable is ideal for use in data and impulse transfer in computers, communication systems and external units and offers interference-free data flow for all measuring and command functions. This cable type is widely used in the machine and steel producing industries as well as for traffic signals and data processing areas.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

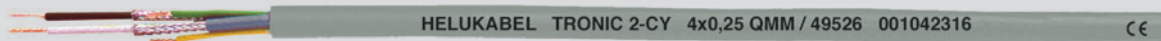
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49501	3 x 0,25	6,5	18,0	40,0	24
49502	4 x 0,25	7,2	24,0	45,0	24
49503	5 x 0,25	8,0	30,0	56,0	24
49504	7 x 0,25	8,8	42,0	70,0	24
49505	8 x 0,25	10,0	48,0	87,0	24
49506	10 x 0,25	11,3	60,0	90,0	24
49507	12 x 0,25	12,0	72,0	95,0	24
49508	16 x 0,25	13,1	96,0	115,0	24
49509	24 x 0,25	16,0	144,0	170,0	24
49510	32 x 0,25	18,5	192,0	210,0	24
49511	48 x 0,25	23,5	288,0	320,0	24

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49512	3 x 0,5	7,3	28,8	71,0	20
49513	4 x 0,5	8,2	38,5	81,0	20
49514	5 x 0,5	9,2	48,0	95,0	20
49515	7 x 0,5	10,0	67,0	115,0	20
49516	8 x 0,5	11,0	77,0	145,0	20
49517	10 x 0,5	13,2	96,0	169,0	20
49518	12 x 0,5	14,0	114,6	185,0	20
49519	16 x 0,5	15,5	154,0	225,0	20
49520	32 x 0,5	21,5	308,0	440,0	20

Dimensions and specifications may be changed without prior notice. (RB01)

TRONIC 2-CY 2 cores screened, meter marking



B

Technical data

- Special PVC core insulation adapted to DIN VDE 0812
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Conductor resistance**
0,14 mm² = max. 138 Ohm/km
0,25 mm² = max. 77,8 Ohm/km
0,50 mm² = max. 37,8 Ohm/km
- **Nominal voltage** (50 Hz)
0,14 mm² = max. 350 V
0,25 mm² = max. 500 V
0,50 mm² = max. 500 V
- **Test voltage** (50 Hz eff)
0,14 mm² = 800 V
0,25 mm² = 800 V
0,50 mm² = 1200 V
- **Breakdown voltage**
0,14 mm² = 1600 V
0,25 mm² = 1600 V
0,50 mm² = 2400 V
- **Insulation resistance**
min. 200 MOhm x km
- **Mutual capacitance** (approx.-value)
core/core
0,14 mm² = 70 pF/m
0,25 mm² = 80 pF/m
0,50 mm² = 80 pF/m
core/screen
0,14 mm² = 270 pF/m
0,25 mm² = 350 pF/m
0,50 mm² = 400 pF/m
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (bis 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 (for 0,5 mm²) 0,14 and 0,25 mm² to DIN VDE 0812
- Strand make-up
0,14 mm² 18x0,10 mm
0,25 mm² 14x0,15 mm
0,50 mm² 16x0,20 mm
- Special PVC core insulation Y12, to DIN VDE 0207 part 4
- White and brown cores each individually screened
- Colour coded to DIN 47100
- Cores stranded in layers with optimal lay-length
- Copper screened braiding, approx. 85% coverage
- Special PVC outer sheath YM2, to DIN VDE 0207 part 5
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

TRONIC 2-CY is used in all areas of measuring and control technology requiring only 2 impulse transfer cores. This cable type is used mainly in the machinery and industrial equipment fields as well as in the steel industry and in electronics.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49521	4 x 0,14	6,2	14,6	40,0	26	49531	4 x 0,5	7,6	34,0	100,0	20
49522	8 x 0,14	7,2	20,3	50,0	26	49532	8 x 0,5	11,6	53,2	150,0	20
49523	12 x 0,14	8,4	26,8	70,0	26	49533	12 x 0,5	11,9	72,4	190,0	20
49524	16 x 0,14	8,6	32,0	80,0	26	49534	16 x 0,5	12,5	91,6	240,0	20
49525	24 x 0,14	9,0	43,4	110,0	26	49535	24 x 0,5	15,3	130,0	310,0	20
49526	4 x 0,25	6,5	21,3	60,0	24						
49527	8 x 0,25	8,0	31,0	90,0	24						
49528	12 x 0,25	9,2	40,5	120,0	24						
49529	16 x 0,25	9,6	50,1	140,0	24						
49530	24 x 0,25	12,0	69,3	200,0	24						

Dimensions and specifications may be changed without prior notice. (RB01)

LiY-TPC-Y pairs screened, EMC-preferred type, meter marking



Technical data

- Pair screened special PVC data transmission cable adapted to DIN VDE 0812 and 0814
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +70 °C
- **Operating top level voltage**
500 V (not for purposes of high current and power installation)
- **Test voltage** 1200 V
- **Breakdown voltage** min. 2400 V
- **Insulation resistance**
min. 20 MΩm x km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 228 cl. 5 (for ≥0,5 mm²)
0,25 and 0,34 mm² to DIN VDE 0812
- Strand make up
0,25 mm² = 14x0,15 mm
0,34 mm² = 7x0,25 mm
- Special PVC core insulation Y12, to DIN VDE 0207 part 4
- Core colours to DIN 47100
- Cores stranded in pairs with optimal lay-length
- Each pair with foil wrapping
- Pairs individually screened, tinned copper coverage approx. 85%
- All pairs-C stranded in layers with optimal lay-length
- Foil separator Special PVC outer sheath YM2, to DIN VDE 0207 part 5
- Colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This pair screened table type offers total interference-free data transfer and is ideal for use as a signal and control cable in combination with computers and external units. The screening properties also make this cable type well suited for use as a connecting cable in sound studio equipment, measuring and control sectors as well as proving a highly reliable cable for process-control and security systems. The copper screening assures a disturbance-free data and signal transmission for measuring and control systems.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

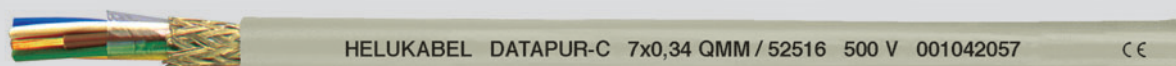
Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21323	2 x 2 x 0,25	6,2	32,0	60,0	24
21324	3 x 2 x 0,25	6,8	48,0	80,0	24
21325	4 x 2 x 0,25	8,1	64,0	112,0	24
21326	5 x 2 x 0,25	9,1	80,0	142,0	24
21327	6 x 2 x 0,25	9,0	96,0	159,0	24
21328	7 x 2 x 0,25	9,6	112,0	177,0	24
21329	10 x 2 x 0,25	11,7	160,0	250,0	24
21340	2 x 2 x 0,34	7,1	42,0	78,0	22
21341	3 x 2 x 0,34	7,9	63,0	104,0	22
21342	4 x 2 x 0,34	9,6	84,0	153,0	22
21343	5 x 2 x 0,34	10,6	105,0	189,0	22
21344	7 x 2 x 0,34	11,3	147,0	238,0	22
21345	10 x 2 x 0,34	13,4	210,0	322,0	22

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
21355	2 x 2 x 0,5	8,3	58,0	96,0	20
21356	3 x 2 x 0,5	8,8	87,0	136,0	20
21357	4 x 2 x 0,5	10,2	116,0	187,0	20
21370	2 x 2 x 0,75	8,9	76,0	132,0	18
21371	3 x 2 x 0,75	9,8	114,0	178,0	18
21372	4 x 2 x 0,75	11,2	152,0	243,0	18
21373	5 x 2 x 0,75	12,7	190,0	312,0	18
21385	2 x 2 x 1	9,3	86,0	142,0	17
21386	3 x 2 x 1	10,1	130,0	189,0	17
21387	4 x 2 x 1	11,9	149,0	275,0	17

Dimensions and specifications may be changed without prior notice. (RB01)

DATAPUR-C EMC-preferred type, Cu-screened, PUR-outer jacket, meter marking

B



Technical data

- Special PVC/PUR control cable, adapted to DIN VDE 0281
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Operating top level voltage**
(not for purposes of high current and power installation)
0,14 mm² 350 V
as of 0,25 mm² 500 V
- **Test voltage**
0,14 mm² 800 V
as of 0,25 mm² 1200 V
- **Insulation resistance**
min. 20 MOhm x km
- **Mutual capacitance** core/core:
up to 0,34 mm² approx. 120 nF/km
as of 0,5 mm² approx. 160 nF/km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- structure of conductors bei 0,35 mm² = 7 x 0,25 mm²
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Cores colour coded to DIN 47100
- Cores stranded in layers with optimal lay-length
- Foil taped
- Tinned copper braided screen, approx. 85% coverage
- PUR outer sheath TPU to DIN VDE 0282 part 1, appendix A
- Sheath colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- Chemical resistance: good against acids, lyes, hydraulic liquids
- High flexibility at low temperature
- High abrasion resistance
- **Resistant to**
Oils and fats
Non-alcoholic fuels and kerosene
Atmospheric influences
UV-radiation
Oxygen and ozone
Microbes and rotting
Sea and waste water
Vibrations
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

The specific construction of DATAPUR-C makes this cable type ideal for use in all types of computer systems, office machinery, signal and control units.

DATAPUR-C has uses that go beyond this for example in the field of acoustics, e.g. in telephone systems, intercoms as well as in all areas involving accurate control of weights and measurements. This cable type is noted for its excellent mechanical performance in humid to wet conditions. External high frequency interference is screened out by the tinned copper braiding. These cables are extremely tear and abrasive resistant.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52490	2 x 0,14	4,0	12,3	21,0	26	52512	2 x 0,34	5,0	17,0	33,0	22
52491	3 x 0,14	4,1	14,0	25,0	26	52513	3 x 0,34	5,2	20,7	42,0	22
52492	4 x 0,14	4,4	15,7	29,0	26	52514	4 x 0,34	5,6	24,7	48,0	22
52493	5 x 0,14	4,8	19,5	35,0	26	52515	5 x 0,34	6,2	30,1	57,0	22
52494	7 x 0,14	5,1	23,4	41,0	26	52516	7 x 0,34	6,7	38,2	77,0	22
52495	10 x 0,14	6,2	28,5	54,0	26	52517	10 x 0,34	8,4	63,1	111,0	22
52496	12 x 0,14	6,5	34,3	64,0	26	52518	12 x 0,34	8,9	74,2	128,0	22
52497	14 x 0,14	6,8	39,9	74,0	26	52519	14 x 0,34	9,3	85,3	144,0	22
52498	18 x 0,14	7,7	51,5	93,0	26	52520	18 x 0,34	10,2	107,4	175,0	22
52499	21 x 0,14	8,0	60,1	108,0	26	52521	21 x 0,34	10,9	124,1	200,0	22
52500	25 x 0,14	8,8	71,9	128,0	26	52522	25 x 0,34	11,9	147,0	233,0	22
52501	2 x 0,25	4,5	14,7	26,0	24	52523	2 x 0,5	5,4	23,2	38,0	20
52502	3 x 0,25	4,7	17,1	33,0	24	52524	3 x 0,5	5,6	30,1	51,0	20
52503	4 x 0,25	5,0	20,6	38,0	24	52525	4 x 0,5	6,2	35,4	58,0	20
52504	5 x 0,25	5,4	24,8	44,0	24	52526	5 x 0,5	6,7	52,6	77,0	20
52505	7 x 0,25	5,8	31,1	53,0	24	52527	7 x 0,5	7,2	65,3	93,0	20
52506	10 x 0,25	7,2	42,0	79,0	24	52528	10 x 0,5	9,3	88,8	134,0	20
52507	12 x 0,25	7,7	51,0	92,0	24	52529	12 x 0,5	9,7	101,9	155,0	20
52508	14 x 0,25	8,1	60,1	105,0	24	52530	14 x 0,5	10,2	115,1	175,0	20
52509	18 x 0,25	9,0	77,9	128,0	24	52531	18 x 0,5	11,4	141,2	214,0	20
52510	21 x 0,25	9,6	91,4	148,0	24	52532	21 x 0,5	11,9	161,1	245,0	20
52511	25 x 0,25	10,7	110,8	175,0	24	52533	25 x 0,5	13,1	187,9	285,0	20

Dimensions and specifications may be changed without prior notice. (RB01)

DATAFLAMM-C EMC-preferred type, halogen-free, screened, meter marking



Technical data

- Special data cable
- **Temperature range**
flexing +5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Operating top level voltage**
(not for purposes of high current and power installation)
0,14 mm² = 350 V
>0,14 mm² = 500 V
- **Test voltage**
0,14 mm² = 800 V
>0,14 mm² = 1200 V
- **Insulation resistance**
min. 2 GOhm x km
- **Capacitance**
core/core <70 nF/km
- **Minimum bending radius**
approx. 7,5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors to DIN VDE 0812, conductor make-up for 0,34 mm² - 7x0,25 mm
- PE-insulation, compound type 2YJ1 to DIN VDE 0207 part 2
- Cores colour coded to DIN 47100
- Cores twisted in layers with optimal lay-length
- Core wrapping with polyester (PETP) foil
- Tinned copper screened braiding, approx. 85% coverage
- Halogen-free outer sheath, to DIN VDE 0207 part 24, compound type HM2
- Sheath colour grey (RAL 7005)
- with meter marking, change-over in 2011

Properties

- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free sheath compound, self-extinguishing and flame retardant according to VDE 0482 part 265-2-1/ DIN EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- PE-insulated cores, compared with the conventional PVC-insulated cores, assure a remarkable and more favourable capacitance values
- The halogen-free thermoplastic sheath produce neither corrosive nor toxic gases

Note

- **unscreened analogue type:**
DATAFLAMM see page B 8

Application

Are used as connecting cable for signal, measuring, control, call-announcing and two-way intercom speaking systems, clock installations, electronic weighing equipment and electrical apparatus for office requirements. The cables are suitable for installation in dry, damp and wet environments as well as in masonry and concrete. These cables are generally installed in telecommunication apparatus and data transmission systems in public buildings, laboratories, trading centres where the freedom from halogen in case of fire and the flame propagation must be avoided. With screened braiding offers interference-free signal transfer.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52365	2 x 0,14	3,7	12,4	21,0	26
52366	3 x 0,14	3,9	14,0	25,0	26
52367	4 x 0,14	4,1	15,8	26,0	26
52368	5 x 0,14	4,4	19,5	32,0	26
52369	7 x 0,14	4,7	23,4	39,0	26
52370	10 x 0,14	5,9	28,4	54,0	26
52371	12 x 0,14	6,0	31,4	69,0	26
52372	14 x 0,14	6,4	37,5	76,0	26
52373	16 x 0,14	6,7	43,4	82,0	26
52374	18 x 0,14	7,0	51,4	90,0	26
52375	21 x 0,14	7,8	61,8	102,0	26
52376	25 x 0,14	8,4	76,0	121,0	26
52377	30 x 0,14	8,6	92,7	146,0	26
52378	34 x 0,14	9,4	121,0	167,0	26
52379	40 x 0,14	10,2	126,1	170,0	26
52380	2 x 0,25	4,2	14,6	23,0	24
52381	3 x 0,25	4,4	17,0	28,0	24
52382	4 x 0,25	4,7	20,6	34,0	24
52384	5 x 0,25	5,1	24,7	42,0	24
52385	7 x 0,25	5,6	31,2	49,0	24
52386	10 x 0,25	7,1	42,1	81,0	24
52387	12 x 0,25	7,3	47,5	88,0	24
52388	14 x 0,25	7,7	52,7	100,0	24
52389	16 x 0,25	8,1	58,1	113,0	24
52390	18 x 0,25	8,9	78,0	126,0	24
52391	21 x 0,25	9,2	94,3	144,0	24
52392	25 x 0,25	10,3	116,5	164,0	24
52393	30 x 0,25	10,8	132,2	191,0	24
52394	34 x 0,25	11,6	144,6	214,0	24
52395	40 x 0,25	12,5	163,3	245,0	24
52396	2 x 0,34	4,8	16,9	31,0	22
52397	3 x 0,34	5,1	20,6	38,0	22

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52398	4 x 0,34	5,5	24,5	47,0	22
52399	5 x 0,34	6,0	30,0	58,0	22
52400	7 x 0,34	6,5	38,2	76,0	22
52401	10 x 0,34	8,4	62,2	110,0	22
52402	12 x 0,34	8,7	69,4	123,0	22
52403	14 x 0,34	9,0	82,1	140,0	22
52404	16 x 0,34	9,7	95,0	157,0	22
52405	18 x 0,34	10,4	107,3	172,0	22
52406	21 x 0,34	10,8	122,4	195,0	22
52407	25 x 0,34	12,4	142,2	226,0	22
52408	30 x 0,34	12,9	162,6	261,0	22
52409	34 x 0,34	13,8	178,9	285,0	22
52410	40 x 0,34	15,1	203,3	330,0	22
52411	2 x 0,5	5,1	23,0	37,0	20
52412	3 x 0,5	5,5	30,0	46,0	20
52413	4 x 0,5	5,9	35,3	57,0	20
52414	5 x 0,5	6,6	52,5	77,0	20
52415	7 x 0,5	7,1	65,3	92,0	20
52416	10 x 0,5	9,3	88,7	135,0	20
52417	12 x 0,5	9,4	98,7	148,0	20
52418	18 x 0,5	11,1	141,2	210,0	20
52419	21 x 0,5	12,3	161,0	242,0	20
52420	25 x 0,5	13,4	187,2	285,0	20
52421	30 x 0,5	14,1	223,2	340,0	20
52422	40 x 0,5	16,4	294,9	445,0	20
52423	2 x 0,75	5,9	30,6	45,0	18
52424	3 x 0,75	6,2	38,1	60,0	18
52425	4 x 0,75	6,9	58,0	80,0	18
52426	5 x 0,75	7,5	68,4	97,0	18
52427	7 x 0,75	8,1	88,4	127,0	18
52428	10 x 0,75	10,6	122,5	175,0	18
52429	12 x 0,75	10,9	137,2	196,0	18

Dimensions and specifications may be changed without prior notice. (RB01)

DATAFLAMM-C-PAAR EMC-preferred type, halogen-free, screened, meter marking



B

Technical data

- Special data cable
- **Temperature range**
flexing +5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Operating top level voltage**
(not for purposes of high current and power installation)
0,14 mm² = 350 V
>0,14 mm² = 500 V
- **Test voltage**
0,14 mm² = 800 V
>0,14 mm² = 1200 V
- **Insulation resistance**
min. 2 GOhm x km
- **Capacitance**
core/core <70 nF/km
- **Minimum bending radius**
approx. 7,5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors to DIN VDE 0812, conductor make-up for 0,34 mm² - 7x0,25 mm
- PE-insulation, compound type 2YJ1 to DIN VDE 0207 part 2
- Cores colour coded to DIN 47100
- Cores twisted in layers
- Core wrapping with polyester (PETP) foil
- Tinned copper screened braiding, approx. 85% coverage
- Halogen-free outer sheath, to DIN VDE 0207 part 24, compound type HM2
- Sheath colour grey (RAL 7005)
- with meter marking, change-over in 2011

Properties

- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free sheath compound, self-extinguishing and flame retardant according to VDE 0482 part 265-2-1/ DIN EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Are used as connecting cable for signal, measuring, control, call-announcing and two-way intercom speaking systems, clock installations, electronic weighing equipment and electrical apparatus for office requirements. The cables are suitable for installation in dry, damp and wet environments as well as in masonry and concrete. PE-insulated cores, compared with the conventional PVC-insulated cores, assure a remarkable and more favourable capacitance values. These cables are generally installed in telecommunication apparatus and data transmission systems in public buildings, laboratories, trading centres where the freedom from halogen in case of fire and the flame propagation must be avoided. With screened braiding offers interference-free signal transfer. The halogen-free thermoplastic sheath produce neither corrosive nor toxic gases.

EMC = Electromagnetic compatibility

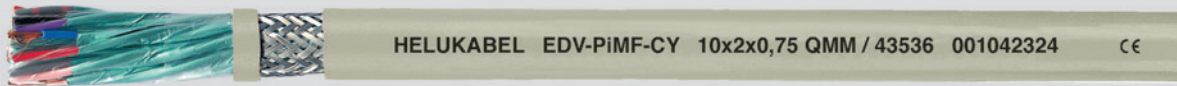
To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52435	2 x 2 x 0,14	5,1	22,5	37,0	26	52460	7 x 2 x 0,34	10,4	89,8	154,0	22
52436	3 x 2 x 0,14	6,1	25,6	47,0	26	52461	10 x 2 x 0,34	11,5	119,8	209,0	22
52437	4 x 2 x 0,14	6,3	39,1	66,0	26	52462	12 x 2 x 0,34	12,6	139,4	245,0	22
52438	5 x 2 x 0,14	7,4	45,3	76,0	26	52463	15 x 2 x 0,34	14,3	160,0	279,0	22
52439	6 x 2 x 0,14	8,0	51,4	87,0	26	52464	18 x 2 x 0,34	15,5	207,2	363,0	22
52440	7 x 2 x 0,14	8,2	54,2	94,0	26	52465	2 x 2 x 0,5	7,6	50,2	76,0	20
52441	10 x 2 x 0,14	8,6	68,7	119,0	26	52466	3 x 2 x 0,5	9,1	64,5	107,0	20
52442	12 x 2 x 0,14	9,6	78,3	135,0	26	52467	4 x 2 x 0,5	9,8	77,2	134,0	20
52443	15 x 2 x 0,14	10,0	79,9	157,0	26	52468	5 x 2 x 0,5	11,0	96,2	150,0	20
52444	18 x 2 x 0,14	10,4	99,2	190,0	26	52469	6 x 2 x 0,5	11,5	107,4	176,0	20
52445	2 x 2 x 0,25	5,8	27,1	44,0	24	52470	7 x 2 x 0,5	11,8	117,3	185,0	20
52446	3 x 2 x 0,25	7,0	42,4	66,0	24	52471	10 x 2 x 0,5	13,4	158,2	275,0	20
52447	4 x 2 x 0,25	7,6	54,5	81,0	24	52472	12 x 2 x 0,5	14,8	177,8	330,0	20
52448	5 x 2 x 0,25	8,3	59,8	98,0	24	52473	15 x 2 x 0,5	16,1	236,4	380,0	20
52449	6 x 2 x 0,25	9,2	64,6	116,0	24	52474	18 x 2 x 0,5	17,4	265,4	450,0	20
52450	7 x 2 x 0,25	9,4	71,3	120,0	24	52475	2 x 2 x 0,75	9,0	64,6	105,0	18
52451	10 x 2 x 0,25	10,7	93,3	153,0	24	52476	3 x 2 x 0,75	10,2	81,7	137,0	18
52452	12 x 2 x 0,25	11,2	108,0	175,0	24	52477	4 x 2 x 0,75	11,2	107,6	166,0	18
52453	15 x 2 x 0,25	11,7	123,4	213,0	24	52478	5 x 2 x 0,75	12,2	126,1	200,0	18
52454	18 x 2 x 0,25	12,9	139,7	248,0	24	52479	6 x 2 x 0,75	13,1	138,6	236,0	18
52455	2 x 2 x 0,34	6,8	43,3	68,0	22	52480	7 x 2 x 0,75	13,5	153,7	255,0	18
52456	3 x 2 x 0,34	7,7	55,0	92,0	22	52481	10 x 2 x 0,75	15,0	220,0	363,0	18
52457	4 x 2 x 0,34	8,4	64,0	110,0	22	52482	12 x 2 x 0,75	17,0	265,5	434,0	18
52458	5 x 2 x 0,34	9,4	74,5	128,0	22	52483	15 x 2 x 0,75	18,3	327,6	500,0	18
52459	6 x 2 x 0,34	10,1	85,0	147,0	22	52484	18 x 2 x 0,75	19,6	374,6	580,0	18

Dimensions and specifications may be changed without prior notice. (RB01)

EDV-PiMF-CY PE-insulated, low capacitance, EMC-preferred type, meter marking



Technical data

- Special PE data cable for computer application
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -20 °C to +80 °C
- **Operating top level voltage**
max. 300 V
(not for purposes of high current and power installation)
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance**
approx. 5 GOhm x km
- **Mutual capacitance**
core/core approx. 75pF/m
- **Inductance** approx. 0,4 mH/km
- **Cross-talk attenuation**
min. 60 dB at 100 kHz
- **Impedance** (approx. value)
at 1 kHz approx. 360 Ohm
at 10 kHz approx. 125 Ohm
at 100 kHz approx. 87 Ohm
at 1000 kHz approx. 70 Ohm
- **Line attenuation** (approx. value)
at 1 kHz approx. 1,1 dB
at 10 kHz approx. 2,7 dB
at 100 kHz approx. 6,8 dB
at 1000 kHz approx. 35 dB
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 6x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- PE core insulation
- Colour code as per DIN 47100
- PiMF: (pair in metal foil)
cores twisted in pairs; foil wrapped, plastic coated aluminium foil and copper drain-wire tinned, 100% coverage
- PiMFs are stranded in layer
- Core wrapping with plastic tapes
- Overall copper screened braiding, 85% coverage
- Outer jacket, TM2 in adapted to VDE 0281 part 1
- Colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- PVC outer sheath self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Absolute disturbance-free data transfer both for installed terminals in all areas of medicine and data technology. Also suitable for use in machine tool and steel producing industries, traffic signal systems, assembly lines and food processing.

EMC = Electromagnetic compatibility

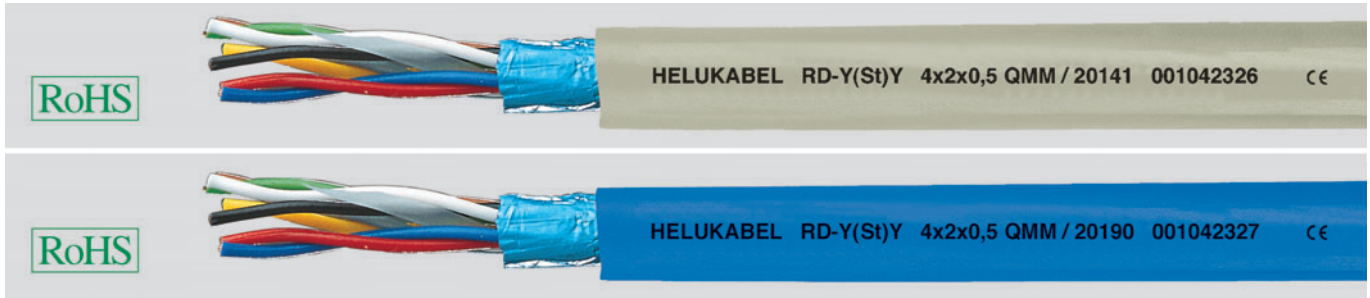
To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
43553	2 x 2 x 0,5	9,5	50,0	101,0	20	43539	30 x 2 x 0,75	30,9	765,0	1210,0	18
43554	3 x 2 x 0,5	10,0	66,0	120,0	20	43559	2 x 2 x 1	12,0	72,0	130,0	17
43524	4 x 2 x 0,5	11,0	108,0	196,0	20	43560	3 x 2 x 1	12,3	104,0	161,0	17
43555	5 x 2 x 0,5	11,5	120,0	201,0	20	43540	4 x 2 x 1	14,4	186,0	360,0	17
43525	6 x 2 x 0,5	13,2	148,0	260,0	20	43561	5 x 2 x 1	17,4	231,0	412,0	17
43526	8 x 2 x 0,5	13,9	180,0	310,0	20	43541	6 x 2 x 1	17,1	260,0	472,0	17
43527	10 x 2 x 0,5	15,5	236,0	398,0	20	43542	8 x 2 x 1	19,2	322,0	540,0	17
43528	16 x 2 x 0,5	21,2	358,0	515,0	20	43543	10 x 2 x 1	19,8	382,0	670,0	17
43529	20 x 2 x 0,5	22,9	394,0	688,0	20	43544	16 x 2 x 1	23,5	578,0	982,0	17
43530	30 x 2 x 0,5	27,9	577,0	980,0	20	43545	20 x 2 x 1	29,4	710,0	1240,0	17
43531	40 x 2 x 0,5	38,3	684,0	1390,0	20	43546	30 x 2 x 1	35,4	1050,0	1720,0	17
43532	50 x 2 x 0,5	43,2	834,0	1860,0	20	43562	2 x 2 x 1,5	14,0	81,0	164,0	16
43556	2 x 2 x 0,75	10,6	61,0	117,0	18	43563	3 x 2 x 1,5	14,7	141,0	197,0	16
43557	3 x 2 x 0,75	11,7	97,0	142,0	18	43547	4 x 2 x 1,5	16,1	261,0	480,0	16
43533	4 x 2 x 0,75	13,5	141,0	240,0	18	43564	5 x 2 x 1,5	18,4	284,0	516,0	16
43558	5 x 2 x 0,75	13,6	163,0	304,0	18	43548	6 x 2 x 1,5	19,5	355,0	590,0	16
43534	6 x 2 x 0,75	15,5	198,0	352,0	18	43549	8 x 2 x 1,5	20,7	448,0	696,0	16
43535	8 x 2 x 0,75	16,4	246,0	415,0	18	43550	10 x 2 x 1,5	23,9	551,0	874,0	16
43536	10 x 2 x 0,75	19,8	305,0	505,0	18	43551	16 x 2 x 1,5	29,7	838,0	1340,0	16
43537	16 x 2 x 0,75	22,7	446,0	732,0	18	43552	20 x 2 x 1,5	31,7	1030,0	1620,0	16
43538	20 x 2 x 0,75	23,9	530,0	860,0	18						

Dimensions and specifications may be changed without prior notice. (RB01)

RD-Y(St)Y Instrumentation Cable suitable for Maxi-Term-Point®-connection, meter marking



Technical data

- Special PVC data transmission cable adapted to DIN VDE 0815
- **Conductor resistance** (loop) max. 73,6 Ohm/km
- **Temperature range** flexing -5 °C to +50 °C fixed installation -40 °C to +70 °C
- **Operating top level voltage** max. 600 V (not for purposes of power installation)
- **Test voltage** core/core 2000 V core/screen 2000 V
- **Insulation resistance** core/core min. 100 MΩm x km core/screen min. 100 MΩm x km
- **Mutual capacitance** at 800 Hz max. 100 nF/km (this value may be exceeded by 20% with a make-up to 4 pairs)
- **Impedance** at 1 kHz approx. 370 Ohm at 10 kHz approx. 130 Ohm
- **Capacity unbalance** at 800 Hz max. 200 pF/100 m (20% of the values, but one value up to 400 pF is allowed)
- **Line attenuation** at 1 kHz approx. 1,2 dB/km at 10 kHz approx. 3,0 dB/km
- **Cross-talk attenuation** at 10 kHz and cable length of 500 m min. 60 dB
- **Minimum bending radius** approx. 7,5x cable ø

Application

The data transmission cables RD-Y(St)Y are used in measurement and control technology such as in control rooms of industrial plants and power stations. The cables serve for transmission of analog and digital signals up to frequencies of approx. 10 kHz. These cables offer considerable advantages by using the quick and economical connecting possibilities in Maxi-Termi-Point® technique. This solderless connecting technique is defined by a compression termination that employs a spring-clip for the connection of the cable to a square rigid post without pre-stripping. For this technique it is necessary to have an exact 7-core stranded conductor and a Semi-Rigid-PVC. Suitable for fixed installation only inside of buildings. Cable with a blue outer jacket is used for intrinsic safe installation.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cable structure

- Bare copper stranded wires 0,5 mm² (7x0,3 mm)
- PVC core insulation
- Cores colour coded
- Cores twisted in pairs (approx. 20 pitch/m ±50 mm) 4 pairs stranded to a unit
- Units stranded in concentric layers
- Electrostatic screen of plastic coated aluminium foil and drain-wire tinned, 0,5 mm² (7x0,3 mm)
- PVC outer jacket
- Colour grey (RAL 7032) or blue (RAL 5015)
- with meter marking, change-over in 2011
Core colours:
pair-no.1, a-core=blue, b-core=red
pair-no.2, a-core=grey, b-core=yellow
pair-no.3, a-core=green, b-core=brown
pair-no.4, a-core=white, b-core=black
(4 pairs = 1 unit)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The pairs are twisted with short pitches and different lay-lengths which lead to good crosstalk attenuation values in a unit
- The static screen protects the transmission circuits against outer electrical interferences
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cop.weight including drain-wire.
- Also available halogen-free type RD-H(St)H on request.
- Maxi-Termi-Point® = registered trade mark AMP.

Part no.	No.pairs x cross-sec. mm ²	Jacket colour	Core Ø approx. mm	No. units	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20140	2 x 2 x 0,5	grey	1,5	-	6,0	25,0	61,0	20
20141	4 x 2 x 0,5	grey	1,5	1	8,0	45,0	96,0	20
20142	8 x 2 x 0,5	grey	1,5	2	11,5	85,0	160,0	20
20143	12 x 2 x 0,5	grey	1,5	3	12,0	125,0	210,0	20
20144	16 x 2 x 0,5	grey	1,5	4	13,7	165,0	282,0	20
20145	24 x 2 x 0,5	grey	1,5	6	16,3	245,0	330,0	20
20146	32 x 2 x 0,5	grey	1,5	8	21,0	325,0	530,0	20
20147	48 x 2 x 0,5	grey	1,5	12	23,0	485,0	730,0	20
20148	96 x 2 x 0,5	grey	1,5	24	30,5	965,0	1400,0	20
20189	2 x 2 x 0,5	blue	1,5	-	6,0	25,0	61,0	20
20190	4 x 2 x 0,5	blue	1,5	1	8,0	45,0	96,0	20
20191	8 x 2 x 0,5	blue	1,5	2	11,5	85,0	160,0	20
20192	12 x 2 x 0,5	blue	1,5	3	12,0	125,0	210,0	20
20193	16 x 2 x 0,5	blue	1,5	4	13,7	165,0	282,0	20
20194	24 x 2 x 0,5	blue	1,5	6	16,3	245,0	330,0	20
20195	32 x 2 x 0,5	blue	1,5	8	21,0	325,0	530,0	20
20196	48 x 2 x 0,5	blue	1,5	12	23,0	485,0	730,0	20
20197	96 x 2 x 0,5	blue	1,5	24	30,5	965,0	1400,0	20

Dimensions and specifications may be changed without prior notice. (RB01)

RD-Y(St)Yv / RD-Y(St)YY reinforced (double) outer jacket, instrumentation cable, Maxi-Termi-Point®, meter marking



Technical data

- Special PVC data transmission cable adapted to DIN VDE 0815 and 0816
- **Conductor resistance** (loop) max. 73,6 Ohm/km
- **Temperature range** flexing -5 °C to +50 °C fixed installation -40 °C to +70 °C
- **Operating top level voltage** max. 600 V (not for purposes of high current and power installation)
- **Test voltage** core/core 2000 V core/screen 2000 V
- **Insulation resistance** core/core min. 100 MOhm x km core/screen min. 100 MOhm x km
- **Mutual capacitance** at 800 Hz max. 100 nF/km (this value may be exceeded by 20% with a make-up to 4 pairs)
- **Impedance** at 1 kHz approx. 370 Ohm at 10 kHz approx. 130 Ohm
- **Capacity unbalance** at 800 Hz max. 200 pF/100 m (20% of the values, but one value up to 400 pF is allowed)
- **Line attenuation** at 1 kHz approx. 1,2 dB/km at 10 kHz approx. 3,0 dB/km
- **Cross-talk attenuation** at 10 kHz and cable length of 500 m min. 60 dB
- **Minimum bending radius** approx. 7,5x cable ø

Cable structure

- Bare copper stranded wires 0,5 mm² (7x0,3 mm)
 - PVC core insulation
 - Cores colour coded
 - Cores twisted in pairs (approx. 20 pitch/m ± 50 mm)
 - 4 pairs stranded to a unit, units stranded in concentric layers
 - Static screen (St) of plastic coated metal foil with stranded tinned drain wire, 0,5 mm² (7x0,3 mm)
 - PVC outer jacket
 - Colour grey (RAL 7032)
 - with meter marking, change-over in 2011
- Core colours:
 pair-no.1, a-core=blue, b-core=red
 pair-no.2, a-core=grey, b-core=yellow
 pair-no.3, a-core=green, b-core=brown
 pair-no.4, a-core=white, b-core=black
 (4 pairs = 1 unit)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The static screen protects the transmission circuits against outer electrical interferences
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cop.Weight including drain-wire.
- Maxi-Termi-Point® = registered trade mark AMP.

Application

The data transmission cables RD-Y(St)Yv are used in measurement and control technology such as in control rooms of industrial plants and power stations. The pairs are twisted with short pitches and different lay-lengths which lead to good crosstalk attenuation values in a unit. The cables serve for transmission of analog and digital signals up to frequencies of approx. 10 kHz. These cables offer considerable advantages by using the quick and economical connecting possibilities in Maxi-Termi-Point® technique. This solderless connecting technique is defined by a compression termination that employs a spring-clip for the connection of the cable to a square rigid post without pre-stripping. For this technique it is necessary to have an exact 7-core stranded conductor and a Semi-Rigid-PVC. Suitable for fixed installation only inside of buildings. With the reinforced PVC(-Yv) outer jacket these cables are suitable for fixed installation in inside buildings and also in open air and in underground.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

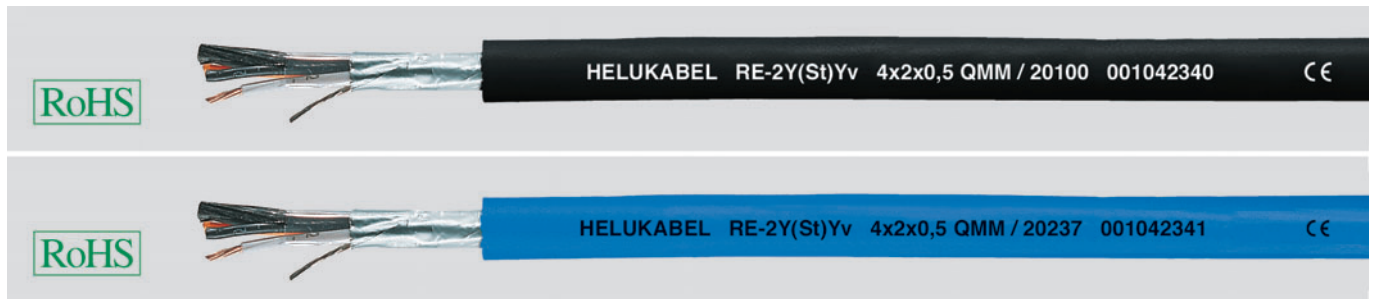
RD-Y(St)Yv

Part no.	No.pairs x cross-sec. mm ²	Core Ø approx. mm	No. units	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20160	2 x 2 x 0,5	2	-	7,0	25,0	80,0	20
20161	4 x 2 x 0,5	2	1	9,0	45,0	125,0	20
20162	8 x 2 x 0,5	2	2	12,5	85,0	200,0	20
20163	12 x 2 x 0,5	2	3	13,0	125,0	255,0	20
20164	16 x 2 x 0,5	2	4	14,7	165,0	315,0	20
20165	24 x 2 x 0,5	2	6	16,3	245,0	370,0	20
20166	32 x 2 x 0,5	2	8	21,0	325,0	555,0	20
20167	48 x 2 x 0,5	2	12	23,0	485,0	170,0	20
20168	96 x 2 x 0,5	2	24	35,5	965,0	1300,0	20

RD-Y(St)YY

Part no.	No.pairs x cross-sec. mm ²	Core Ø approx. mm	No. units	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20180	2 x 2 x 0,5	2	-	7,5	25,0	90,0	20
20181	4 x 2 x 0,5	2	1	9,5	45,0	140,0	20
20182	8 x 2 x 0,5	2	2	13,0	85,0	220,0	20
20183	12 x 2 x 0,5	2	3	14,0	125,0	275,0	20
20184	16 x 2 x 0,5	2	4	15,7	165,0	350,0	20
20185	24 x 2 x 0,5	2	6	17,3	245,0	470,0	20
20186	32 x 2 x 0,5	2	8	28,0	325,0	620,0	20
20187	48 x 2 x 0,5	2	12	24,0	485,0	850,0	20
20188	96 x 2 x 0,5	2	24	36,5	965,0	1450,0	20

Dimensions and specifications may be changed without prior notice. (RB01)



B

Technical data

- Special core insulation of PE
- **Conductor resistance**
0,5 mm²: max. 39,2 Ohm/km
0,75 mm²: max. 24,6 Ohm/km
1,3 mm²: max. 14,2 Ohm/km
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -40 °C to +70 °C
- **Operating top level voltage**
max. 300 V (not for purposes of high current and power installation)
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance**
min. 5 GOhm x km
- **Mutual capacitance** at 800 Hz
core/core 0,5 mm²: 60 nF/km
for 1 and 2 pairs: 75 nF/km
core/core 0,75 mm²: 65 nF/km
for 1 and 2 pairs: 110 nF/km
core/core 1,3 mm²: 75 nF/km
for 1 and 2 pairs: 100 nF/km
- **Inductance** max. 0,75 mH/km
- **Cross-talk attenuation**
min. 0,88 dB/km at 60 kHz
- **Minimum bending radius**
approx. 7,5x cable ø

Cable structure

- Bare copper stranded wires
0,5 mm² (7x0,3 mm)
0,75 mm² (7x0,37 mm)
1,3 mm² (7x0,49 mm)
- Core insulation of PE
- Cores colours with numbering pair: a-core black, b-core white triple:a-core black, b-core white, c-core red with number print 1/1, 2/2, etc.
- Cores twisted to pairs with optimum pitch
- Pairs stranded in layer + 1 communication core 0,5 mm², PE-insulated, orange (communication core for multicore version)
- Core wrapping with foil
- Electrostatic screen (St) of plastics-coated metal foil and tinned drain-wire 0,5 mm² (7x0,3 mm)
- PVC outer jacket, reinforced
- Colour black (RAL 9005) or blue (RAL 5015)
- with blue outer jacket for hazardous areas to hazard type -i- for intrinsically safe installation according to DIN EN 60079-14 and IEC 60079-14 section 12.2.2 (VDE 0165 part 1)
- with meter marking, change-over in 2011
- Wall-thickness to DIN VDE 0816 part 1, table 7, col. 1

Properties

- Self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The electrostatic screen protect the screened pairs against outer electrostatic interference fields
- Low level of line attenuations and low mutual capacitances enable long transmission distances and fast pulse acceleration
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cop.Weight including communication core and drain-wire.
- Control cable with blue outer jacket, see catalog part A.

Application

Instrumentation cables are used in data processing and process control.

Instrumentation cables are suitable for fixed installations in damp locations, in open spaces and for underground laying.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20099	1 x 2 x 0,5	black	8,2	15,0	74,0	20	20235	1 x 2 x 0,5	blue	8,2	15,0	74,0	20
20100	2 x 2 x 0,5	black	10,2	30,0	117,0	20	20236	2 x 2 x 0,5	blue	10,2	30,0	117,0	20
20101	4 x 2 x 0,5	black	11,5	50,0	140,0	20	20237	4 x 2 x 0,5	blue	11,5	50,0	140,0	20
20233	6 x 2 x 0,5	black	12,6	70,0	190,0	20	20238	6 x 2 x 0,5	blue	12,6	70,0	190,0	20
20102	8 x 2 x 0,5	black	13,8	90,0	215,0	20	20239	8 x 2 x 0,5	blue	13,8	90,0	215,0	20
20103	10 x 2 x 0,5	black	14,9	110,0	220,0	20	20240	10 x 2 x 0,5	blue	14,9	110,0	220,0	20
20104	12 x 2 x 0,5	black	15,7	130,0	280,0	20	20241	12 x 2 x 0,5	blue	15,7	130,0	280,0	20
20105	16 x 2 x 0,5	black	17,5	170,0	352,0	20	20242	16 x 2 x 0,5	blue	17,5	170,0	352,0	20
20106	20 x 2 x 0,5	black	18,8	210,0	385,0	20	20243	20 x 2 x 0,5	blue	18,8	210,0	385,0	20
20107	24 x 2 x 0,5	black	20,2	250,0	468,0	20	20244	24 x 2 x 0,5	blue	20,2	250,0	468,0	20
20108	36 x 2 x 0,5	black	24,1	370,0	656,0	20	20245	36 x 2 x 0,5	blue	24,1	370,0	656,0	20
20109	48 x 2 x 0,5	black	27,5	490,0	854,0	20	20246	48 x 2 x 0,5	blue	27,5	490,0	854,0	20
20149	1 x 2 x 0,75	black	7,9	20,0	74,0	18	20169	1 x 2 x 0,75	blue	7,9	20,0	74,0	18
20150	2 x 2 x 0,75	black	10,6	35,0	123,0	18	20170	2 x 2 x 0,75	blue	10,6	35,0	123,0	18
20151	4 x 2 x 0,75	black	11,8	65,0	164,0	18	20171	4 x 2 x 0,75	blue	11,8	65,0	164,0	18
20152	8 x 2 x 0,75	black	14,6	125,0	258,0	18	20172	8 x 2 x 0,75	blue	14,6	125,0	258,0	18
20153	10 x 2 x 0,75	black	16,1	154,0	305,0	18	20173	10 x 2 x 0,75	blue	16,1	154,0	305,0	18
20154	12 x 2 x 0,75	black	17,0	185,0	350,0	18	20174	12 x 2 x 0,75	blue	17,0	185,0	350,0	18
20155	16 x 2 x 0,75	black	19,0	245,0	445,0	18	20175	16 x 2 x 0,75	blue	19,0	245,0	445,0	18
20156	20 x 2 x 0,75	black	21,5	298,0	520,0	18	20176	20 x 2 x 0,75	blue	21,5	298,0	520,0	18
20157	24 x 2 x 0,75	black	23,2	365,0	620,0	18	20177	24 x 2 x 0,75	blue	23,2	365,0	620,0	18
20158	36 x 2 x 0,75	black	28,2	532,0	940,0	18	20178	36 x 2 x 0,75	blue	28,2	532,0	940,0	18
20159	48 x 2 x 0,75	black	32,0	708,0	1250,0	18	20179	48 x 2 x 0,75	blue	32,0	708,0	1250,0	18
20125	1 x 2 x 1,3	black	9,4	31,0	102,0	-	20247	1 x 2 x 1,3	blue	9,4	31,0	102,0	-
20132	1 x 3 x 1,3	black	9,7	44,0	116,0	-	20255	1 x 3 x 1,3	blue	9,7	44,0	116,0	-
20126	2 x 2 x 1,3	black	11,7	62,0	161,0	-	20248	2 x 2 x 1,3	blue	11,7	62,0	161,0	-
20127	4 x 2 x 1,3	black	13,5	114,0	230,0	-	20249	4 x 2 x 1,3	blue	13,5	114,0	230,0	-
20234	6 x 2 x 1,3	black	16,0	168,0	310,0	-	20250	6 x 2 x 1,3	blue	16,0	168,0	310,0	-
20128	8 x 2 x 1,3	black	17,1	218,0	377,0	-	20251	8 x 2 x 1,3	blue	17,1	218,0	377,0	-
20129	12 x 2 x 1,3	black	19,3	322,0	515,0	-	20252	12 x 2 x 1,3	blue	19,3	322,0	515,0	-
20130	16 x 2 x 1,3	black	22,0	426,0	656,0	-	20253	16 x 2 x 1,3	blue	22,0	426,0	656,0	-
20131	24 x 2 x 1,3	black	26,5	684,0	952,0	-	20254	24 x 2 x 1,3	blue	26,5	684,0	952,0	-

Dimensions and specifications may be changed without prior notice. (RB01)

RE-2Y(St)Yv PiMF Instrumentation cable, pairs screened, reinforced outer jacket, meter marking



Technical data

- Special core insulation of PE
- **Conductor resistance**
0,5 mm²: max. 39,2 Ohm/km
1,3 mm²: max. 14,2 Ohm/km
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -40 °C to +70 °C
- **Operating top level voltage**
max. 300 V (not for purposes of high current and power installation)
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance**
min. 5 GOhm x km
- **Mutual capacitance**
(nominal value at 800 Hz)
core/core 0,5 mm²: 75 nF/km
core/core 1,3 mm²: 100 nF/km
- **Inductance** max. 0,75 mH/km
- **Cross-talk attenuation**
min. 1,02 dB/km at 60 kHz
- **Minimum bending radius**
approx. 7,5x cable ø

Cable structure

- Bare copper stranded wires
0,5 mm² (7x0,3 mm)
1,3 mm² (7x0,49 mm)
- Core insulation of PE
- Cores colours with numbering
a-core black
b-core white
with number print 1/1, 2/2, etc.
- Cores twisted in pairs with optimum pitch
- PiMF (pair in metal foil):
foil taping, drain-wire
- Cu-bare 0,6 mm ø, plastic coated alu-foil and plastic foil
- PiMFe stranded in layer,
1 communication core 0,5 mm²,
- PE-insulated orange (communication core for multicore version)
- Electrostatic screen (St) of plastics-coated metal foil and tinned drain-wire 0,5 mm² (7x0,3 mm)
- PVC outer jacket, reinforced, black (RAL 9005) or blue (RAL 5015)
- with meter marking, change-over in 2011
- Wall-thickness to DIN VDE 0816 part 1, table 7, col. 1
- with blue outer jacket for hazardous areas to hazard type -i- for intrinsically safe installation according to DIN EN 60079-14 and IEC 60079-14 section 12.2.2 (VDE 0165 part 1)

Properties

- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cop. weight including communication core and drain-wire.
- Control cable with blue outer jacket, see catalog part A.

Application

Instrumentation cables are used in data processing and process control. The individual screening of the pairs guarantee high cross-talk attenuation. The electrostatic screen protect the screened pairs against outer electrostatic interference fields. Low level of line attenuations and low mutual capacitances enable long transmission distances and fast pulse acceleration. Instrumentation cables are suitable for fixed installations in damp locations, in open spaces and for underground laying.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20115	2 x 2 x 0,5	black	12,0	35,0	128,0	20	21537	2 x 2 x 0,5	blue	12,0	35,0	128,0	20
20116	4 x 2 x 0,5	black	13,2	60,0	170,0	20	21538	4 x 2 x 0,5	blue	13,2	60,0	170,0	20
21535	6 x 2 x 0,5	black	14,0	82,0	215,0	20	21539	6 x 2 x 0,5	blue	14,0	82,0	215,0	20
20117	8 x 2 x 0,5	black	14,9	121,0	246,0	20	21540	8 x 2 x 0,5	blue	14,9	121,0	246,0	20
20118	10 x 2 x 0,5	black	16,7	136,0	261,0	20	21541	10 x 2 x 0,5	blue	16,7	136,0	261,0	20
20119	12 x 2 x 0,5	black	17,6	161,0	351,0	20	21542	12 x 2 x 0,5	blue	17,6	161,0	351,0	20
20120	16 x 2 x 0,5	black	19,8	212,0	430,0	20	21543	16 x 2 x 0,5	blue	19,8	212,0	430,0	20
20121	20 x 2 x 0,5	black	21,5	262,0	496,0	20	21544	20 x 2 x 0,5	blue	21,5	262,0	496,0	20
20122	24 x 2 x 0,5	black	23,6	313,0	604,0	20	21545	24 x 2 x 0,5	blue	23,6	313,0	604,0	20
20123	36 x 2 x 0,5	black	27,0	465,0	850,0	20	21546	36 x 2 x 0,5	blue	27,0	465,0	850,0	20
20124	48 x 2 x 0,5	black	32,3	616,0	1115,0	20	21547	48 x 2 x 0,5	blue	32,3	616,0	1115,0	20
20133	2 x 2 x 1,3	black	12,7	68,0	184,0	-	21548	2 x 2 x 1,3	blue	12,7	68,0	184,0	-
20134	4 x 2 x 1,3	black	15,2	124,0	269,0	-	21549	4 x 2 x 1,3	blue	15,2	124,0	269,0	-
21536	6 x 2 x 1,3	black	16,7	178,0	370,0	-	21550	6 x 2 x 1,3	blue	16,7	178,0	370,0	-
20135	8 x 2 x 1,3	black	19,1	239,0	442,0	-	21551	8 x 2 x 1,3	blue	19,1	239,0	442,0	-
20136	12 x 2 x 1,3	black	21,4	353,0	593,0	-	21552	12 x 2 x 1,3	blue	21,4	353,0	593,0	-
20137	16 x 2 x 1,3	black	24,7	468,0	789,0	-	21553	16 x 2 x 1,3	blue	24,7	468,0	789,0	-
20138	24 x 2 x 1,3	black	29,4	697,0	1104,0	-	21554	24 x 2 x 1,3	blue	29,4	697,0	1104,0	-

Dimensions and specifications may be changed without prior notice. (RB01)

J-2Y(st)Y St III Bd 16 Mbits/s (Kat. 3) ISDN/EDV (Z = 100 Ohm), meter marking



B

Technical data

- Special core insulation of PE Adapted to DIN VDE 0815 and 0816
- **Conductor loop-resistance** max. 130 Ohm/km
- **Temperature range** flexing -5 °C to +70 °C fixed installation -40 °C to +70 °C
- **Operating peak voltage** 300 V (not for purposes of high current and power installation)
- **Test voltage** 800 V
- **Insulation resistance** min. 5 GOhm x km
- **Mutual capacitance** 48 nF/km
- **Characteristic impedance (Z)** at 4-16 MHz: 100 Ohm 15%
- **Capacitance unbalance** K₁ max. 400 pF/300 m K₉-K₁₂ max. 100 pF/300 m
- **Rel. velocity ratio** approx. 0,66
- **Attenuation** at
1 MHz: 28 dB/km
4 MHz: 47 dB/km
5 MHz: 51 dB/km
10 MHz: 65 dB/km
15 MHz: 76 dB/km
16 MHz: 78 dB/km
20 MHz: 89 dB/km
- **Cross-talk attenuation** from 4 MHz up to 16 MHz for 2 pairs: min. 40 dB 4 pairs and above: min. 25 dB
- **Minimum bending radius** stationary approx. 10x cable ø

Cable structure

- Bare, solid copper conductor 0,6 mm ø
- Core insulation of PE Colour coding to DIN VDE 0815
- Conductors twisted to quads
- 5 quads twisted to units
- Static screen of plastics coated alu foil with drain wire 0,6 mm ø
- PVC outer sheath, to DIN VDE 0207 part 5
- Colour grey (RAL 7032)
- with meter marking, change-over in 2011

Properties

- PVC sheath: self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Application

Used as data transmission and connection cable suitable for fixed installation in and under plaster, for data transmission applications, for periphery instrument data processing computers.

Suitable for transmission of analog- and digital signals up to 16 Mbit/s. High cross-talk attenuation values.

Suitable as connecting cable for periphery equipment, data processing systems, monitors, Printers and cash register systems.

The static screen (St) screen assures a disturbance-free data and signal transmission for measuring and control systems.

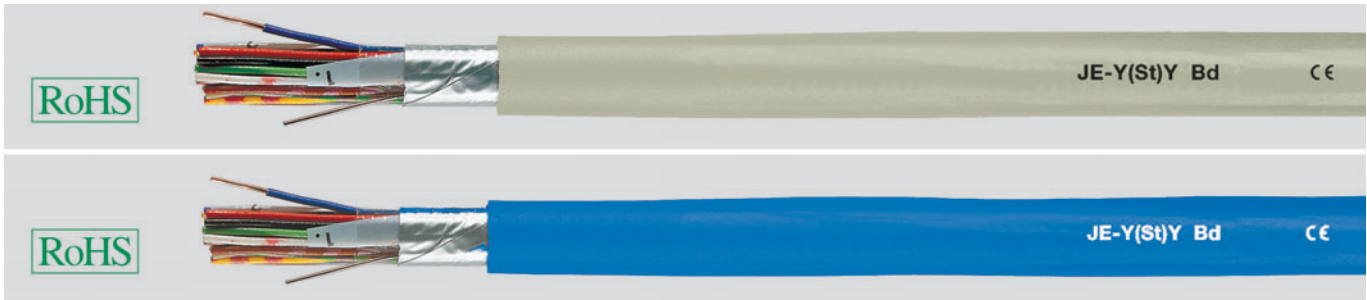
These cables are not allowed for purposes of high current and power installation.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
33200	2 x 2 x 0,6	6,1	13,0	44,0
33201	4 x 2 x 0,6	7,5	24,0	80,0
33202	6 x 2 x 0,6	7,7	35,0	86,0
33203	8 x 2 x 0,6	8,8	46,0	105,0
33204	10 x 2 x 0,6	8,9	58,0	112,0
33205	20 x 2 x 0,6	12,7	116,0	218,0

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
33206	30 x 2 x 0,6	14,0	172,0	302,0
33207	40 x 2 x 0,6	16,8	229,0	376,0
33208	50 x 2 x 0,6	17,5	266,0	480,0
33209	60 x 2 x 0,6	17,9	342,0	560,0
33210	80 x 2 x 0,6	24,4	455,0	748,0
33211	100 x 2 x 0,6	26,0	588,0	940,0

Dimensions and specifications may be changed without prior notice. (RB01)



Technical data

- Special core insulation to DIN VDE 0815/DIN 57815
- **Conductor resistance** at 20 °C 36,6 Ohm/km
- **Temperature range** flexing -5 °C to +50 °C fixed installation -30 °C to +70 °C
- **Nominal voltage** 225 V (not for purposes of high current and power installation)
- **Test voltage** core/core 500 V core/screen 2000 V
- **Insulation resistance** min. 100 MOhm x km
- **Mutual capacitance** max. 100 pF/m (the value can exceed of 20% by cables up to 4 pairs)
- **Capacitance unbalance** max. 200 pF/100 m
- **Inductance** approx. 0,70 mH/km
- **Attenuation** at 800 Hz approx. 1,1 dB/km
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Minimum bending radius** stationary approx. 6x cable ø
- **Caloric load values** see table Technical Informations

Cable structure

- Solid plain copper conductor wire 0,8 mm ø
- Special PVC core insulation Y13, to DIN VDE 0207 part 4
- Simatic colour coded to DIN VDE 0815
- Cores stranded in pairs with optimal lay-length
- 4 pairs stranded to a unit
- Units stranded in layer
- Polyester foil wrap
- PVC coated aluminium foil screen
- Copper drain-wire, bare
- Special PVC outer sheath YM1, to DIN VDE 0207 part 5
- Colour grey (RAL 7032) or blue (RAL 5015)
- with blue outer jacket for hazardous areas to hazard type -i- for intrinsically safe installation according to DIN EN 60079-14 and IEC 60079-14 section 12.2.2 (VDE 0165 part 1)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Also available in a halogen-free version. (see also content "Halogen-free Security Cables and Wires".)
- Control cable with blue outer jacket, see catalog part A.

Application

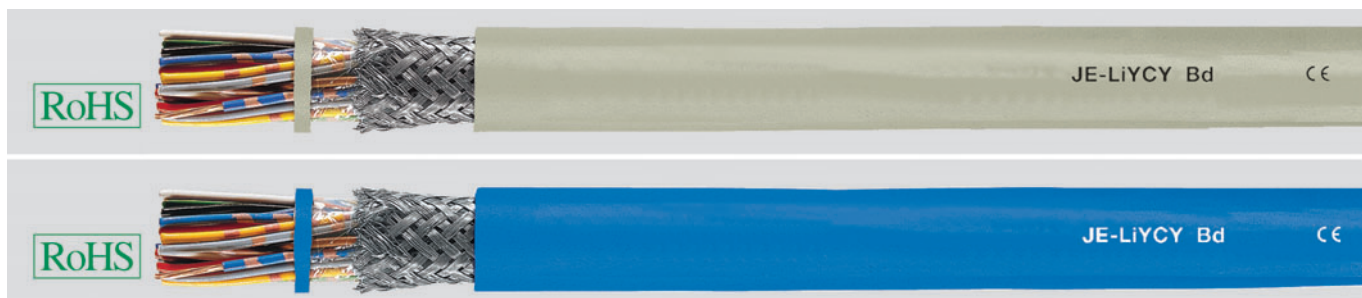
This cable type is especially suited for transmission of signals and measurements in the fields of electronics and for data transmission in computers. Suitable for fixed installation in and under plaster, in dry and moist environments as well as in the open. These cables are not allowed for purposes of high current and power installation.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Jacket colour	Outer ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
48500	1 x 2 x 0,8	grey	5,2	20,0	43,0
48501	2 x 2 x 0,8	grey	5,8	25,0	60,0
48502	4 x 2 x 0,8	grey	7,7	45,0	95,0
48503	8 x 2 x 0,8	grey	10,5	85,0	157,0
48504	12 x 2 x 0,8	grey	11,5	126,0	224,0
48505	16 x 2 x 0,8	grey	12,4	166,0	290,0
48506	20 x 2 x 0,8	grey	14,3	206,0	350,0
48507	32 x 2 x 0,8	grey	18,0	327,0	545,0
48508	40 x 2 x 0,8	grey	19,5	407,0	660,0
48509	80 x 2 x 0,8	grey	28,1	809,0	1160,0

Part no.	No.pairs x cross-sec. mm	Jacket colour	Outer ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
48519	1 x 2 x 0,8	blue	5,2	20,0	43,0
48520	2 x 2 x 0,8	blue	5,8	25,0	60,0
48521	4 x 2 x 0,8	blue	7,7	45,0	95,0
48522	8 x 2 x 0,8	blue	10,5	85,0	157,0
48523	12 x 2 x 0,8	blue	11,5	126,0	224,0
48524	16 x 2 x 0,8	blue	12,4	166,0	290,0
48525	20 x 2 x 0,8	blue	14,3	206,0	350,0
48526	32 x 2 x 0,8	blue	18,0	327,0	545,0
48527	40 x 2 x 0,8	blue	20,3	407,0	660,0
48528	80 x 2 x 0,8	blue	28,1	809,0	1160,0

Dimensions and specifications may be changed without prior notice. (RB01)



B

Technical data

- Special PVC core insulation to DIN VDE 0815/DIN 57815
- **Conductor resistance** at 20 °C 39,2 Ohm/km
- **Temperature range** flexing -5 °C to +50 °C fixed installation -30 °C to +70 °C
- **Nominal voltage** 225 V
- **Test voltage** core/core 500 V core/screen 2000 V
- **Insulation resistance** min. 100 MOhm x km
- **Mutual capacitance** max. 100 pF/m (the value can exceed of 20% by cables up to 4 pairs)
- **Capacitance unbalance** max. 200 pF/100 m
- **Inductance** approx. 0,70 mH/km
- **Attenuation** at 800 Hz approx. 1,1 dB/km
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Minimum bending radius** stationary approx. 5xcable ø

Cable structure

- Bare copper strands 7x0,30 mm
- Special PVC core insulation Y13, to DIN VDE 0207 part 4
- Simatic colour coded to DIN VDE 0815
- Cores stranded in pairs with optimal lay-length
- 4 pairs laid up to a unit
- Units stranded in layer
- Polyester foil wrap
- Bare or tinned copper wire braided, 0,2 mm ø screening, approx. 85% coverage
- Special PVC outer sheath YM1, to DIN VDE 0207 part 5
- Colour grey (RAL 7032) or blue (RAL 5015)
- with blue outer jacket for hazardous areas to hazard type -i- for intrinsically safe installation according to DIN EN 60079-14 and IEC 60079-14 section 12.2.2 (VDE 0165 part 1)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Features Suitable for cut-clamp technics
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Also available in a halogen-free version. (see also content "Halogen-free Security Cables and Wires")
- Control cable with blue outer jacket, see catalog part A.

Application

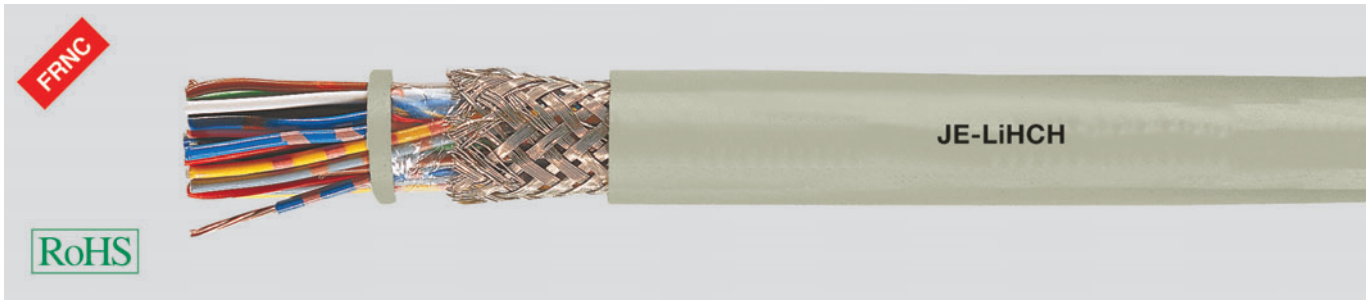
This cable type is especially suited for transmission of signals and measurements in the fields of electronics and for data transmission in computers. Suitable for flexing and fixed installation in dry and moist environments in and under plaster as well as in the open for fixed installation on outer walls of buildings.

These cables are not allowed for purposes of high current and power installation.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
48510	2 x 2 x 0,5	grey	6,9	51,0	94,0	20	48529	2 x 2 x 0,5	blue	6,9	51,0	94,0	20
48511	4 x 2 x 0,5	grey	9,2	87,0	154,0	20	48530	4 x 2 x 0,5	blue	9,2	87,0	154,0	20
48512	8 x 2 x 0,5	grey	13,8	144,0	259,0	20	48531	8 x 2 x 0,5	blue	13,8	144,0	259,0	20
48513	12 x 2 x 0,5	grey	14,6	196,0	340,0	20	48532	12 x 2 x 0,5	blue	14,6	196,0	340,0	20
48514	16 x 2 x 0,5	grey	15,9	249,0	431,0	20	48533	16 x 2 x 0,5	blue	15,9	249,0	431,0	20
48515	20 x 2 x 0,5	grey	17,4	299,0	494,0	20	48534	20 x 2 x 0,5	blue	17,4	299,0	494,0	20
48516	24 x 2 x 0,5	grey	19,4	348,0	604,0	20	48535	24 x 2 x 0,5	blue	19,4	348,0	604,0	20
48517	32 x 2 x 0,5	grey	24,9	444,0	737,0	20	48536	32 x 2 x 0,5	blue	24,9	444,0	737,0	20
48518	40 x 2 x 0,5	grey	25,2	537,0	844,0	20	48537	40 x 2 x 0,5	blue	25,2	537,0	844,0	20

Dimensions and specifications may be changed without prior notice. (RB01)



Technical data

- Industry-Electronic cable according to DIN VDE 0815
- **Loop resistance** at 20 °C
39,2 Ohm/km
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -30 °C to +70 °C
- **Operating top level voltage**
225 V (not for purposes of high current and power installation)
- **Test voltage** U eff.
core/core 500 V
core/screen 2000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance**
max. 120 nF/km at 800 Hz (this values may be extended at 20% with a make-up up to 4 pairs)
- **Capacitance unbalance**
max. 200 pF/100 m (20% of the values, but one value up to 400 pF is allowed)
- **Minimum bending radius**
approx. 7,5x cabel ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper, 7x0,3 mm ±0,5 mm²
- Halogen-free core insulation, compound type HI1 or HI2 to DIN VDE 0207 part 23, insulation wall thickness 0,3 mm
- Core identification to DIN VDE 0815 (with ring colours and ring groups)
- 2 cores twisted in pair, 4 pairs to a unit and several units stranded in layers (for 2 pairs cable, 4 cores stranded to a quad)
- Core wrapping with plastic tape
- Copper braided screening, wire 0,2 mm, approx. 85% coverage
- Outer jacket halogen-free, grey RAL 7032, compound type HM1 or HM2 to DIN VDE 0207 part 24
- Jacket wall-thickness to DIN VDE 0815

Properties

- Not for purposes of high current and power installation as well as underground laying

Tests

- Flame test to VDE 0482-332-3 ,BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **LSOH** = Low Smoke Zero Halogen-free.

Application

Halogen-free installation cables with improved characteristics in the case of fire are used for telephone transmission, measuring and signal purposes.

The copper screened design (C) protects the transmission circuits against electrical interferences.

A fire propagation is prevented through high oxygen index of the insulation material and produce no corrosive gases in case of fire. Those are preferably used for telecommunication indoor installations and in special cases the outdoor installation is permitted under protection against sunlight.

These cables are suitable for fixed installation in areas with danger of fire, in dry and damp environments as well as on and under plaster.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Core Ø approx. mm	No. units	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.pairs x cross-sec. mm ²	Core Ø approx. mm	No. units	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
34350	2 x 2 x 0,5	1,6	-	7,6	44,0	102,0	20	34354	20 x 2 x 0,5	1,6	5	17,0	288,0	555,0	20
34351	4 x 2 x 0,5	1,6	1	10,0	80,0	168,0	20	34355	32 x 2 x 0,5	1,6	8	18,0	439,0	852,0	20
34352	8 x 2 x 0,5	1,6	2	11,8	152,0	297,0	20	34356	40 x 2 x 0,5	1,6	10	21,7	531,0	1005,0	20
34353	12 x 2 x 0,5	1,6	3	13,5	192,0	357,0	20								

Dimensions and specifications may be changed without prior notice. (RB01)

RD-H(ST)H Bd instrumentation cable, halogen-free



Technical data

- Halogen-free data transmission cable adapted to DIN VDE 0815
- **Conductor resistance**
max. 73,6 Ohm/km (0,5 mm²)
max. 36,8 Ohm/km (1,0 mm²)
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation to +70 °C
- **Operating top level voltage**
(not for purposes of high current and power installation)
max. 225 V
- **Test voltage**
core/core 500 V
core/screen 2000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance**
at 800 Hz max. 100 nF/km
(this value may be exceeded by 20% with a make-up up to 4 pairs)
- **Impedance** at 1 kHz (nominal values)
450 Ohm (0,5 mm²)
320 Ohm (1,0 mm²)
- **Capacity unbalance**
at 800 Hz max. 200 pF/100 m
(20% of the values, but one value up to 200 pF is allowed)
- **Cross-talk attenuation**
at min. 10 kHz, 60 dB/500 m
- **Line attenuation** at 1 kHz (nominal values)
1,2 dB/km (0,5 mm²)
0,9 dB/km (1,0 mm²)
- **Bending radius**
approx. 7,5x cable ø

Application

The halogen-free data transmission cable RD-H(ST)H are used for measurement and control technology for transmission of analog and digital signals up to frequencies of approx. 10 kHz. The twisted pairs with short pitches (<50 mm for 0,5 mm²) and different lay-lengths which lead good cross-talk attenuation values in a unit.

These cables are used in inside buildings (in special cases in open air, but with sufficient protection against sunlight is necessary).

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cable structure

- Bare copper stranded wires 0,5 mm² (7x0,3) or 1,0 mm² (7x0,43)
- Core insulation, halogen-free polymer compound
- Cores twisted in pairs, with short lay-length (approx. 20 pitch/m ±50 mm)
- 4 pairs stranded to a unit
- Holding tape units with number coding
- Units stranded in concentric layers
- Core wrapping
- Electrostatic screen of plastic coated aluminium foil and drain wire tinned, 0,5 mm²
- Outer jacket, halogen-free, polymer compound, flame resistant
- Colour grey (RAL 7032)
- Core colours
pair no./a-core/b-core
1/blue/red
2/grey/yellow
3/green/brown
4/white/black
(4 pairs 1 unit)

Properties

- The static screen protects the transmission circuits against outer electrical interferences
- The halogen-free cables prevent the fire propagation and compared to PVC cables exist only a low smoke density under flame influence
- This results no decomposition products which destroy equipments, machines and buildings by corrosion

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Smoke density according to VDE 0482 part 1034-1+2, IEC 61034-1+2/ DIN EN 61034-1+2 BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20200	2 x 2 x 0,5	7,0	26,0	70,0	20
20201	4 x 2 x 0,5	9,0	46,0	110,0	20
20202	8 x 2 x 0,5	11,6	86,0	190,0	20
20203	12 x 2 x 0,5	13,5	127,0	240,0	20
20204	16 x 2 x 0,5	14,0	167,0	300,0	20
20205	20 x 2 x 0,5	16,0	209,0	360,0	20
20206	24 x 2 x 0,5	17,5	250,0	420,0	20
20207	28 x 2 x 0,5	19,0	290,0	480,0	20
20208	32 x 2 x 0,5	21,0	331,0	570,0	20
20209	36 x 2 x 0,5	21,5	372,0	614,0	20
20210	40 x 2 x 0,5	22,5	412,0	680,0	20
20211	44 x 2 x 0,5	23,5	453,0	700,0	20
20212	48 x 2 x 0,5	24,0	494,0	790,0	20
20213	64 x 2 x 0,5	30,0	658,0	1040,0	20
20214	80 x 2 x 0,5	33,0	821,0	1300,0	20
20215	96 x 2 x 0,5	36,0	986,0	1510,0	20

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
20216	2 x 2 x 1	9,0	47,0	110,0	17
20217	4 x 2 x 1	12,0	89,0	190,0	17
20218	8 x 2 x 1	16,5	172,0	320,0	17
20219	12 x 2 x 1	17,5	255,0	435,0	17
20220	16 x 2 x 1	19,5	338,0	560,0	17
20221	20 x 2 x 1	21,0	423,0	680,0	17
20222	24 x 2 x 1	23,0	507,0	800,0	17
20223	28 x 2 x 1	27,0	590,0	905,0	17
20225	32 x 2 x 1	29,0	674,0	1080,0	17
20226	36 x 2 x 1	30,0	757,0	1260,0	17
20227	40 x 2 x 1	31,0	841,0	1330,0	17
20228	44 x 2 x 1	34,0	924,0	1410,0	17
20229	48 x 2 x 1	32,5	1008,0	1550,0	17
20230	64 x 2 x 1	39,0	1342,0	2000,0	17
20231	80 x 2 x 1	43,0	1676,0	2470,0	17
20232	96 x 2 x 1	47,0	2016,0	2970,0	17

Dimensions and specifications may be changed without prior notice. (RB01)



Photo: HELUKABEL®

Cables for Drag Chains

Cables for Drag Chains

C









































HELUKABEL® delivers flexible control cables with different insulations and outer jacket materials, screened and unscreened with an optimum of price-earning ratio.

Control cables can be used in machinery production and production lines as direct line or connection cable for measuring, signal and control features, for computer systems, for control devices of tool making machines, conveyor belts and conveyor systems.

It goes without saying that we also demand a high quality standard for our control cable as well as for all other cables.

We hold an extensive stock of cables.

Contents

Description	Page
PVC Cables for Drag Chains	
JZ-HF, flexible, number coded, control cable for drag chains, oil resistant, meter marking    	C 5
MULTISPEED® 500-PVC, high flexible, safety against high bending in drag chain systems, oil resistant, low torsion, meter marking 	C 7
JZ-HF-CY, high flexible, screened control cable for drag chains, oil resistant, EMC-preferred type, meter marking    	C 8
MULTISPEED® 500-C-PVC, high flexible, safety against high bending in drag chain systems, oil resistant, low torsion, screened, EMC-preferred type, meter marking 	C 10
PUR Cables for Drag Chains	
PURÖ-JZ-HF, high flexible, cable for drag chains, abrasion and coolant resistant, meter marking  	C 12
MULTIFLEX 512®-PUR, special cable for drag chains, halogen-free, meter marking   	C 14
MULTISPEED® 500-PUR, safety against high bending in drag chain systems, low torsion, halogen-free, meter marking 	C 16
PURÖ-JZ-HF-YCP, EMC-preferred type, cable for drag chains, screened, PUR-outer sheath, meter marking  	C 17
MULTIFLEX 512®-C-PUR, special cable for drag chains, halogen-free, screened, EMC-preferred type, meter marking   	C 19
MULTISPEED® 500-C-PUR, safety against high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, halogen-free, meter marking 	C 21
MULTISPEED® 500-TPE, high flexible, safety against high bending in drag chain systems, low torsion, halogen-free, meter marking  	C 22
MULTISPEED® 500-C-TPE, safety against high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking  	C 24
Bio-Oil and microbial resistant Cables for Drag Chains	
BIOFLEX-500®-JZ-HF, Bio-fuel resistant, abrasion resistant, recyclable environment friendly, bio-oil resistant ¹⁾ , cable for drag chains, meter marking 	C 26
BIOFLEX-500®-JZ-HF-C, Biofuel-resistant, abrasion-resistant, recyclable, environmentally friendly, drag-chain cable, bio-oil resistant ¹⁾ , meter marking 	C 27
KOMPOSPEED® JZ-HF-500, halogen-free, microbes resistant, cable for drag chains, meter marking 	C 29
KOMPOSPEED® JZ-HF-500-C, halogen-free, microbes resistant, Cu-screened, EMC-preferred type, cable for drag chains, meter marking 	C 30
SUPERTRONIC®-PVC, special cable for drag chains, meter marking  	C 31
SUPERTRONIC®-C-PVC, special cable for drag chains, EMC-preferred type, meter marking  	C 32
SUPERTRONIC®-PURÖ, special cable for drag chains, meter marking  	C 33
SUPERTRONIC®-C-PURÖ, special cable for drag chains, halogen-free, EMC-preferred type, meter marking  	C 34
SUPER-PAAR-TRONIC-C-PUR, cable for drag chains, halogen-free, EMC-preferred type, meter marking  	C 35



**JZ-HF
MULTISPEED® 500-PVC
JZ-HF-CY
MULTISPEED® 500-C-PVC**

Photo: Fotolia.com

PVC Cables for Drag Chains

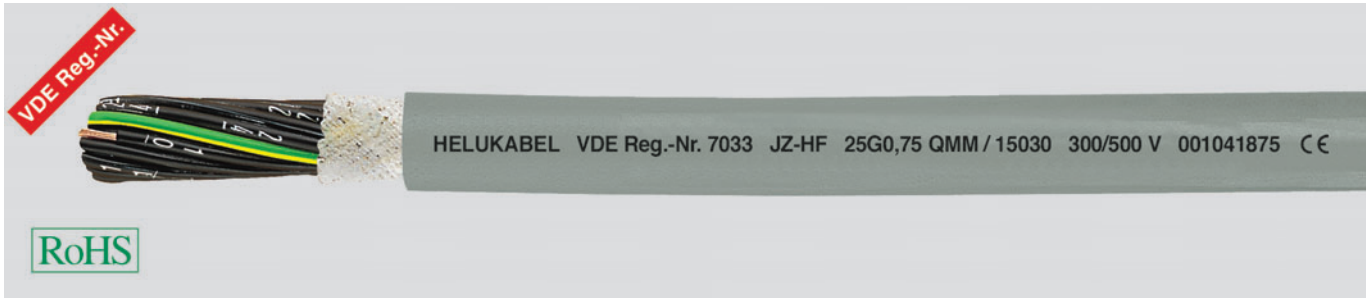
HELUKABEL® delivers flexible control cables with different insulations and outer jacket materials, screened and unscreened with an optimum of price-earning ratio.

Control cables can be used in machinery production and production lines as direct line or connection cable for measuring, signal and control features, for computer systems, for control devices of tool making machines, conveyor belts and conveyor systems.

It goes without saying that we also demand a high quality standard for our control cable as well as for all other cables.

We hold an extensive stock of cables.

JZ-HF flexible, number coded, control cable for drag chains, oil resistant, meter marking



Technical data

- Special PVC control cable, extreme flexibility due to special construction
- Requirements adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable \varnothing
fixed installation 4x cable \varnothing
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6 col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Core insulation of special PVC Z 7225
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece
- Special PVC outer sheath, TM5 to DIN VDE 0281 part 1 and HD 21.1,
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Oil resistant to DIN/EN 60811-2-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **screened analogue type:**
JZ-HF-CY see page C 8

Application

JZ-HF cables are ideal for use in the machine tool industry, in robotics and machine production and anywhere where high flexibility is essential. These cables have shown excellent performance in combination with standard cable trays. These cables are suitable for flexible use for medium mechanical stresses with free movements.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15001	2 x 0,5	5,0	9,6	46,0	20
15002	3 G 0,5	5,3	14,0	57,0	20
15003	4 G 0,5	5,7	19,0	70,0	20
15004	5 G 0,5	6,4	24,0	93,0	20
15005	7 G 0,5	7,5	34,0	127,0	20
15090	7 x 0,5	7,5	34,0	127,0	20
15006	10 G 0,5	9,1	48,0	161,0	20
15007	12 G 0,5	9,2	58,0	177,0	20
15008	14 G 0,5	9,8	67,0	213,0	20
15009	16 G 0,5	10,3	77,0	260,0	20
15010	18 G 0,5	11,1	86,0	284,0	20
15011	20 G 0,5	11,6	96,0	318,0	20
15012	25 G 0,5	13,4	120,0	363,0	20
15013	30 G 0,5	13,7	144,0	432,0	20
15014	34 G 0,5	15,0	163,0	487,0	20
15015	36 G 0,5	15,0	173,0	518,0	20
15016	42 G 0,5	16,1	202,0	575,0	20
15017	50 G 0,5	17,9	240,0	675,0	20
15018	61 G 0,5	19,6	290,0	829,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15019	2 x 0,75	5,4	14,4	58,0	18
15020	3 G 0,75	5,7	22,0	73,0	18
15021	4 G 0,75	6,4	29,0	77,0	18
15022	5 G 0,75	7,0	36,0	119,0	18
15023	7 G 0,75	8,3	50,0	165,0	18
15024	10 G 0,75	10,1	72,0	216,0	18
15025	12 G 0,75	10,2	86,0	247,0	18
15026	14 G 0,75	10,9	101,0	284,0	18
15027	16 G 0,75	11,5	115,0	320,0	18
15028	18 G 0,75	12,1	130,0	356,0	18
15029	20 G 0,75	12,8	144,0	453,0	18
15030	25 G 0,75	14,9	180,0	498,0	18
15031	30 G 0,75	15,2	216,0	510,0	18
15032	34 G 0,75	16,6	245,0	550,0	18
15033	36 G 0,75	16,6	259,0	570,0	18
15034	42 G 0,75	18,1	302,0	600,0	18
15035	50 G 0,75	20,0	360,0	700,0	18
15036	61 G 0,75	22,1	432,0	820,0	18
15091	65 G 0,75	22,7	439,0	841,0	18

Continuation ►

JZ-HF flexible, number coded, control cable for drag chains, oil resistant, meter marking



Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15037	2 x 1	5,7	19,0	65,0	17
15038	3 G 1	6,0	29,0	84,0	17
15039	4 G 1	6,8	38,0	113,0	17
15040	5 G 1	7,4	48,0	137,0	17
15041	7 G 1	8,8	67,0	192,0	17
15042	10 G 1	10,7	96,0	251,0	17
15043	12 G 1	10,8	115,0	295,0	17
15044	14 G 1	11,6	134,0	337,0	17
15045	16 G 1	12,2	154,0	379,0	17
15046	18 G 1	13,0	173,0	420,0	17
15047	20 G 1	13,6	192,0	480,0	17
15048	25 G 1	15,8	240,0	600,0	17
15049	30 G 1	16,4	288,0	695,0	17
15050	34 G 1	17,8	326,0	777,0	17
15051	36 G 1	17,8	346,0	825,0	17
15052	41 G 1	19,3	403,0	926,0	17
15214	42 G 1	19,3	403,0	948,0	17
15053	50 G 1	21,2	480,0	1092,0	17
15092	61 G 1	23,7	586,0	1204,0	17
15054	65 G 1	24,4	624,0	1400,0	17
15055	2 x 1,5	6,4	29,0	91,0	16
15056	3 G 1,5	6,8	43,0	117,0	16
15057	4 G 1,5	7,4	58,0	147,0	16
15058	5 G 1,5	8,3	72,0	181,0	16
15059	7 G 1,5	9,9	101,0	273,0	16
15060	10 G 1,5	11,9	144,0	344,0	16
15061	12 G 1,5	12,1	173,0	391,0	16
15062	14 G 1,5	12,9	202,0	457,0	16
15063	16 G 1,5	13,6	230,0	523,0	16
15064	18 G 1,5	14,5	259,0	590,0	16
15065	20 G 1,5	15,2	288,0	650,0	16
15066	25 G 1,5	17,8	360,0	801,0	16
15067	30 G 1,5	18,2	432,0	958,0	16
15068	34 G 1,5	19,7	490,0	1084,0	16
15069	36 G 1,5	19,7	518,0	1135,0	16
15070	42 G 1,5	21,5	605,0	1290,0	16
15071	50 G 1,5	23,7	720,0	1521,0	16
15072	60 G 1,5	25,3	864,0	1885,0	16
15215	61 G 1,5	26,2	878,0	1916,0	16
15216	65 G 1,5	27,2	936,0	1994,0	16

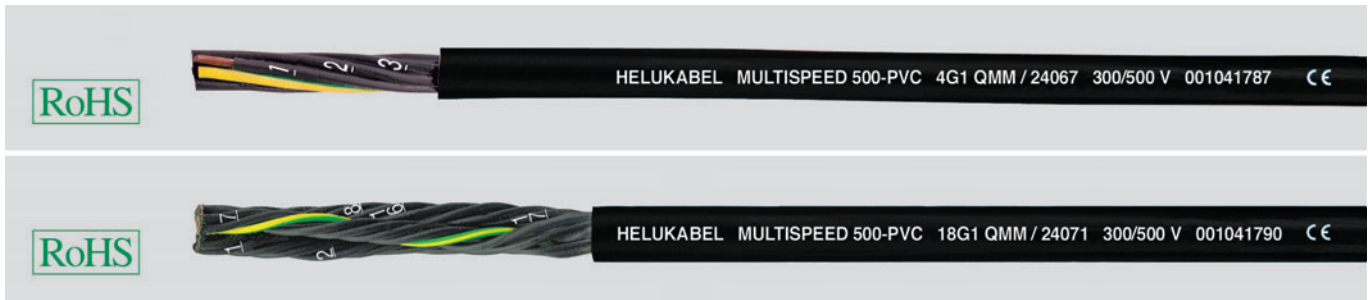
Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15073	2 x 2,5	7,7	43,0	130,0	14
15074	3 G 2,5	8,4	72,0	160,0	14
15075	4 G 2,5	9,1	96,0	200,0	14
15076	5 G 2,5	10,2	120,0	268,0	14
15077	7 G 2,5	12,2	168,0	357,0	14
15078	10 G 2,5	15,0	240,0	486,0	14
15079	12 G 2,5	15,2	288,0	572,0	14
15080	14 G 2,5	16,1	336,0	612,0	14
15081	16 G 2,5	17,2	384,0	702,0	14
15082	18 G 2,5	18,1	432,0	800,0	14
15083	20 G 2,5	19,2	480,0	920,0	14
15084	25 G 2,5	22,5	600,0	1100,0	14
15085	30 G 2,5	23,5	720,0	1400,0	14
15086	34 G 2,5	25,2	816,0	1500,0	14
15087	36 G 2,5	25,2	864,0	1600,0	14
15088	42 G 2,5	27,4	1008,0	1800,0	14
15089	50 G 2,5	30,0	1200,0	2100,0	14
15142	3 G 4	10,4	115,0	221,0	12
15143	4 G 4	11,4	154,0	260,0	12
15144	5 G 4	12,7	192,0	318,0	12
15145	4 G 6	13,3	230,0	392,0	10
15146	5 G 6	14,5	288,0	481,0	10
15147	4 G 10	17,7	384,0	642,0	8
15148	5 G 10	19,7	480,0	780,0	8
15149	4 G 16	20,8	614,0	926,0	6
15150	5 G 16	23,3	768,0	1155,0	6

Dimensions and specifications may be changed without prior notice. (RC01)

To be able to provide information on the service life and in line with our certification to DIN EN ISO 9001:2000, we document the realistic testing of our cables suitable for use in drag chains.

HELUKABEL GMBH						
Schleppketten-Testergebnis						
Type:	JZ-HF / -CY					
Art. Nr	Aderzahl x Nennquerschnitt mm	Außendurchmesser mm	geschirmt	Mindestbiegeradius	Mindestabstand	Mindestabstand
15023	7G0,75	8,30	nein	7,5sd	240	1.980,00
15005	7G0,5	7,50	nein	7,5sd	240	1.980,00
15041	7G1	8,80	nein	7,5sd	240	1.980,00
15058	5G1,5	9,10	nein	7,5sd	240	1.980,00
15006	10G0,5	9,10	nein	7,5sd	240	1.980,00
15075	4G2,5	15,40	ja	10sd	240	1.980,00
15967	18G1	13,10	ja	10sd	240	1.980,00
15967	14G0,75	13,10	ja	10sd	240	1.980,00
15986	12G1	14,40	ja	10sd	240	1.980,00
15966	7G2,5	12,70	ja	10sd	240	1.980,00
15928	5G2,5	14,50	ja	7,5sd	240	1.980,00

MULTISPEED® 500-PVC high flexible, safety against high bending in drag chain systems, oil resistant, low torsion, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-PVC outer sheath, especially resistant against fatigue strength, extruded as filler with pressure
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low adhesion
- ozon- and uv-resistant
- High property of alternating bending strength
- High resistant to mechanical strain
- Long life durabilities due to low friction-resistancen
- Better chemical resistance
- Oil resistance to DIN/ EN 60811-2-1
- High stability
- Higher economical solution
- Reduced ø, results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
MULTISPEED® 500-C-PVC see page C 10

Application

HELUKABEL® MULTISPEED 500-PVC are installed there, where the extreme requirements for the cables are necessary. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and low speed of movements.

These high flexible PVC control cables are suitable for shift- and bending stresses in machines and machine tool constructions. These are installed in dry, moist rooms and in open air with free movement without tensile stress or forced movements.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24050	2 x 0,5	4,3	9,6	40,0	20	24068	5 G 1	6,7	48,0	101,0	17
24051	3 G 0,5	4,6	14,4	45,0	20	24069	7 G 1	11,1	67,0	140,0	17
24052	4 G 0,5	5,0	19,0	57,0	20	24070	12 G 1	12,0	115,0	227,0	17
24053	5 G 0,5	5,4	24,0	66,0	20	24071	18 G 1	14,8	173,0	351,0	17
24054	7 G 0,5	8,9	33,6	81,0	20	24072	25 G 1	17,2	240,0	489,0	17
24055	12 G 0,5	9,7	58,0	133,0	20	24073	3 G 1,5	6,4	43,0	88,0	16
24056	18 G 0,5	11,8	86,0	194,0	20	24074	4 G 1,5	7,0	58,0	110,0	16
24057	25 G 0,5	13,9	120,0	274,0	20	24075	5 G 1,5	7,8	72,0	130,0	16
24058	4 G 0,75	5,6	29,0	63,0	18	24076	7 G 1,5	13,0	101,0	182,0	16
24059	5 G 0,75	6,3	36,0	79,0	18	24077	12 G 1,5	14,2	173,0	319,0	16
24060	7 G 0,75	10,3	50,0	107,0	18	24078	18 G 1,5	17,5	259,0	420,0	16
24061	12 G 0,75	11,0	86,0	169,0	18	24079	25 G 1,5	20,1	360,0	604,0	16
24062	18 G 0,75	13,9	130,0	247,0	18	24080	4 G 2,5	8,8	96,0	172,0	14
24063	25 G 0,75	15,9	180,0	366,0	18	24081	5 G 2,5	9,8	120,0	219,0	14
24064	36 G 0,75	19,6	259,0	540,0	18	24082	7 G 2,5	16,1	168,0	303,0	14
24065	42 G 0,75	21,5	302,0	630,0	18	24083	12 G 2,5	17,8	288,0	504,0	14
24066	3 G 1	5,4	29,0	69,0	17	24084	18 G 2,5	21,8	432,0	754,0	14
24067	4 G 1	5,9	38,4	86,0	17	24085	25 G 2,5	24,4	600,0	940,0	14

Dimensions and specifications may be changed without prior notice. (RC01)

JZ-HF-CY high flexible, screened control cable for drag chains, oil resistant, EMC-preferred type, meter marking



Technical data

- Special PVC control cable, extreme flexibility due to special construction
- Requirements adapted to DIN VDE 0281 part 13
- **Temperature range** flexing -5 °C to +80 °C fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 10x cable ø fixed installation 5x cable ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6 col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Core insulation of special PVC Z 7225
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece PVC-inner sheath
- One layer of tinned copper wire screening¹⁾, interwoven with synthetic cross-helix to improve the bending behaviour
- Minimum coverage 80%
- Special PVC outer sheath, TM5 to DIN VDE 0281 part 1 and HD 21.1
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- oil resistant to DIN/ EN 60811-2-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please note the cleanroom qualification when ordering.
- ¹⁾Change-over up to construction with Cu-screening, tinned, approx. 85% for coverage optimisation of the useful properties are in preparation.
- **unscreened analogue type:**
JZ-HF see page C 5

Application

JZ-HF cables are ideal for use in the machine tool industry, in robotics and machine production and anywhere where high flexibility is essential. These cables have shown excellent performance in combination with standard cable trays.

These cables are suitable for flexible use for medium mechanical stresses with free movements.

The dense screening assures disturbance-free transmission of all signals and impulses. An ideal disturbance-free control cable for the above application.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15930	2 x 0,5	7,2	30,0	90,0	20
15931	3 G 0,5	7,5	38,0	115,0	20
15932	4 G 0,5	8,1	48,0	140,0	20
15933	5 G 0,5	8,6	64,0	168,0	20
15934	7 G 0,5	9,9	70,0	217,0	20
15935	12 G 0,5	11,6	100,0	274,0	20
15876	14 G 0,5	12,2	135,0	332,0	20
15877	16 G 0,5	13,0	145,0	388,0	20
15936	18 G 0,5	13,8	154,0	445,0	20
15937	20 G 0,5	14,3	160,0	497,0	20
15878	21 G 0,5	14,8	175,0	500,0	20
15938	25 G 0,5	16,1	240,0	505,0	20
15879	30 G 0,5	16,6	280,0	515,0	20
15880	34 G 0,5	17,7	290,0	530,0	20
15881	36 G 0,5	17,7	300,0	572,0	20
15882	42 G 0,5	19,2	330,0	605,0	20
15883	50 G 0,5	21,2	393,0	742,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15945	2 x 0,75	7,6	39,0	105,0	18
15946	3 G 0,75	8,1	49,0	128,0	18
15947	4 G 0,75	8,6	60,0	184,0	18
15948	5 G 0,75	9,4	70,0	200,0	18
15949	7 G 0,75	10,5	95,0	269,0	18
15885	10 G 0,75	12,6	110,0	327,0	18
15950	12 G 0,75	12,9	140,0	366,0	18
15886	14 G 0,75	13,4	163,0	426,0	18
15887	16 G 0,75	14,2	187,0	487,0	18
15951	18 G 0,75	14,8	211,0	547,0	18
15888	20 G 0,75	15,5	216,0	551,0	18
15889	21 G 0,75	16,2	272,0	590,0	18
15952	25 G 0,75	17,7	322,0	600,0	18
15890	30 G 0,75	18,2	414,0	650,0	18
15891	34 G 0,75	19,8	473,0	685,0	18
15892	36 G 0,75	19,8	500,0	720,0	18
15893	42 G 0,75	21,0	583,0	800,0	18
15894	50 G 0,75	23,1	695,0	954,0	18

Continuation ►

JZ-HF-CY high flexible, screened control cable for drag chains, oil resistant, EMC-preferred type, meter marking



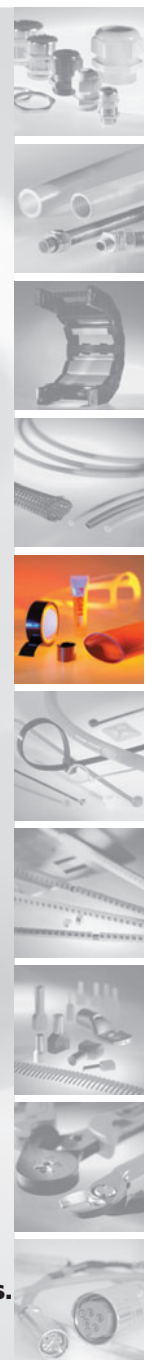
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15961	2 x 1	8,1	50,0	115,0	17
15962	3 G 1	8,4	60,0	142,0	17
15963	4 G 1	9,0	73,0	196,0	17
15964	5 G 1	9,8	81,0	271,0	17
15965	7 G 1	11,2	114,0	307,0	17
15966	12 G 1	13,4	186,0	474,0	17
15967	18 G 1	15,7	254,0	622,0	17
15968	25 G 1	19,0	365,0	828,0	17
15969	34 G 1	21,0	500,0	1049,0	17
15970	41 G 1	22,7	576,0	1257,0	17
15971	50 G 1	24,5	681,0	1437,0	17
15972	65 G 1	27,7	932,0	1825,0	17
15976	2 x 1,5	8,6	64,0	170,0	16
15977	3 G 1,5	9,0	84,0	203,0	16
15978	4 G 1,5	9,8	99,0	243,0	16
15979	5 G 1,5	10,5	120,0	288,0	16
15980	7 G 1,5	12,5	148,0	403,0	16
15981	12 G 1,5	14,8	274,0	592,0	16
15982	18 G 1,5	17,3	386,0	844,0	16
15983	25 G 1,5	21,0	584,0	1155,0	16
15152	41 G 1,5	24,8	867,0	1227,0	16
15153	50 G 1,5	27,3	970,0	1445,0	16
15154	61 G 1,5	29,8	1028,0	1724,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15925	3 G 2,5	10,8	140,0	215,0	14
15926	4 G 2,5	11,5	159,0	264,0	14
15927	5 G 2,5	12,9	194,0	344,0	14
15928	7 G 2,5	15,1	234,0	410,0	14
15929	12 G 2,5	18,4	390,0	721,0	14
15155	3 G 4	13,0	178,0	292,0	12
15156	4 G 4	14,2	222,0	372,0	12
15157	5 G 4	15,6	328,0	448,0	12
15158	4 G 6	16,0	305,0	526,0	10
15159	5 G 6	17,5	441,0	632,0	10
15160	4 G 10	21,2	485,0	838,0	8
15161	5 G 10	23,2	610,0	998,0	8
15162	4 G 16	24,1	840,0	1225,0	6
15163	5 G 16	27,0	1050,0	1560,0	6

Dimensions and specifications may be changed without prior notice. (RC01)

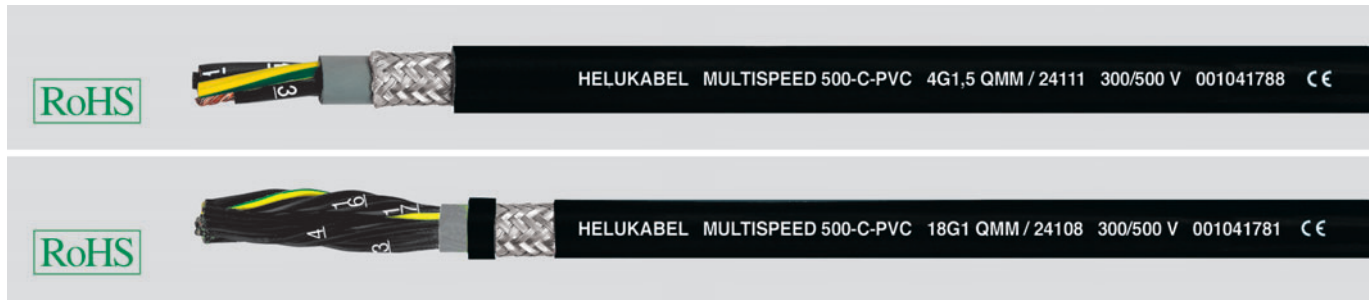
Terminations and straight-through joints

Telephone cables
Low voltage
Medium voltage
Accessories



You can find terminations and straight-through joints in our catalogue Cable Accessories. Request it now at www.helukabel.de

MULTISPEED® 500-C-PVC high flexible, safety against high bending in drag chain systems, oil resistant, low torsion, screened, EMC-preferred type, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable \varnothing
fixed installation 4x cable \varnothing
- **Coupling resistance**
max. 250 Ohm x km
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
 ≥ 7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-PVC inner sheath YM2 extruded as filler with pressure grey (RAL 7001)
- Tinned copper braided screen, coverage 85% max., with optimal bunch
- Fleece separator, ensure good dismantling ability
- Special-PVC outer sheath, especially resistant against fatigue strength
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low adhesion
- ozon- and uv- resistant
- High property of alternating bending strength
- Long life durability due to low friction-resistance
- Better chemical resistance
- Oil resistance to DIN/ EN 60811-2-1
- High stability
- Higher economical solution
- Reduced \varnothing , results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
MULTISPEED® 500-PVC see page C 7

Application

HELUKABEL® MULTISPEED 500-C-PVC are installed there, where the extreme requirements for the cables are necessary. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and low speed of movements.

These high flexible PVC control cables are suitable for shift- and bending stresses in machines and machine tool constructions. These are installed in dry, moist rooms and in open air with free movement without tensile stress or forced movements.

These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24086	2 x 0,5	6,2	30,0	88,0	20
24087	3 G 0,5	6,7	36,0	101,0	20
24088	4 G 0,5	7,2	42,0	116,0	20
24089	5 G 0,5	7,6	48,0	146,0	20
24090	7 G 0,5	11,4	64,0	181,0	20
24091	9 G 0,5	11,4	80,0	219,0	20
24092	12 G 0,5	12,4	105,0	271,0	20
24093	18 G 0,5	14,7	137,0	374,0	20
24094	25 G 0,5	17,1	210,0	542,0	20
24095	2 x 0,75	6,8	40,0	96,0	18
24096	3 G 0,75	7,3	48,0	111,0	18
24097	4 G 0,75	7,8	55,0	140,0	18
24098	5 G 0,75	8,3	66,0	161,0	18
24099	7 G 0,75	12,7	85,0	227,0	18
24100	12 G 0,75	13,7	135,0	317,0	18
24101	18 G 0,75	17,1	190,0	486,0	18
24102	25 G 0,75	19,5	275,0	651,0	18

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24103	3 G 1	7,6	59,0	131,0	17
24104	4 G 1	8,1	70,0	164,0	17
24105	5 G 1	8,9	84,0	198,0	17
24106	7 G 1	13,6	106,0	252,0	17
24107	12 G 1	14,6	174,0	410,0	17
24108	18 G 1	18,4	240,0	550,0	17
24109	25 G 1	21,0	332,0	756,0	17
24110	3 G 1,5	8,4	75,0	166,0	16
24111	4 G 1,5	9,1	90,0	199,0	16
24112	5 G 1,5	10,2	108,0	229,0	16
24113	7 G 1,5	15,7	157,0	304,0	16
24114	12 G 1,5	17,4	240,0	502,0	16
24115	18 G 1,5	21,3	355,0	709,0	16
24116	25 G 1,5	24,3	448,0	939,0	16
24117	4 G 2,5	11,2	134,0	270,0	14
24118	5 G 2,5	12,2	175,0	335,0	14

Dimensions and specifications may be changed without prior notice. (RC01)



Photo: Hüller Hille GmbH

PUR Cables for Drag Chains

The machinery and plant industries but especially the tool making industries are working particularly with mineral oils, alkalis and aggressive coolant emulsions and under difficult working environmental conditions.

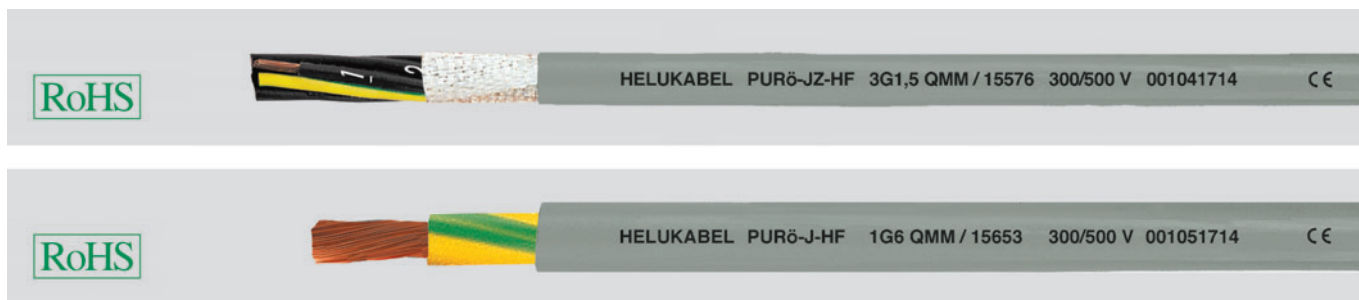
Due to these conditions the electrical control cables, data cables as well as cables for trailing chains have to perform to exceptionally high standards. Flexibility, abrasion and oil resistance have to be guaranteed.

HELUKABEL® in co-operation with the leading machine and plant industries have developed suitable and application orientated cables.

PUR cables are tested among the others, mineral and synthetic oils, cutting oils, coolant emulsions, etc. For the operation in power trailing chains, these cables are tested to multimillion alternating bending cycles.

Consequently we believe that we can deliver the right cable for your application needs.

PURÖ-JZ-HF high flexible, cable for drag chains, abrasion and coolant resistant, meter marking



Technical data

- Special polyurethane control cable adapted to DIN VDE 0281, 0282
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- **Oil resistant** PVC core insulation TI2, in adapted to DIN VDE 0281 part 1, for better sliding abilities
- Black cores with continuous white numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece
- Special **full-polyurethane** outer jacket TMPU, to DIN VDE 0282 part 10, appendix A
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Suitable for outdoor lying and resistant to UV-radiation, oxygen, ozone and hydrolysis. Conditionally resistant to microbes
- Adhesion-low
- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Cross-linked types also available on request.
- **screened analogue type:**
PURÖ-JZ-HF-YCP see page C 17

Application

PURÖ-JZ-HF is an extremely robust cable noted for its good tear and abrasion resistance. Due to its good performance with mineral oils and especially in connection with coolants, this cable is well suited for use in the machinery, tool making and steel industries in critical areas. Its high abrasion resistance and good flexing ability make it quick and easy to install and, with its low bending radius, ideal for use with cable trays.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15520	2 x 0,5	5,5	9,6	45,0	20	15556	2 x 1	6,3	19,2	64,0	17
15521	3 G 0,5	6,0	14,4	56,0	20	15557	3 G 1	6,6	29,0	83,0	17
15522	4 G 0,5	6,4	19,1	69,0	20	15558	4 G 1	7,1	38,5	113,0	17
15523	5 G 0,5	6,9	24,0	92,0	20	15559	5 G 1	7,8	48,0	137,0	17
15524	7 G 0,5	7,9	33,6	126,0	20	15560	7 G 1	9,0	67,0	191,0	17
16161	7 x 0,5	7,8	33,6	126,0	20	15561	8 G 1	9,9	77,0	218,0	17
15525	8 G 0,5	8,6	38,0	136,0	20	15562	10 G 1	11,1	96,0	251,0	17
15526	10 G 0,5	9,7	48,0	158,0	20	15563	12 G 1	11,1	115,0	294,0	17
15527	12 G 0,5	9,9	58,0	176,0	20	15564	14 G 1	12,1	134,0	337,0	17
15528	14 G 0,5	10,4	67,0	212,0	20	15565	18 G 1	13,6	173,0	420,0	17
15529	18 G 0,5	11,4	86,4	283,0	20	15566	21 G 1	14,2	196,0	504,0	17
15530	21 G 0,5	12,1	96,0	310,0	20	15567	25 G 1	16,1	240,0	600,0	17
15531	25 G 0,5	13,5	120,0	330,0	20	15568	32 G 1	17,6	308,0	732,0	17
15532	30 G 0,5	14,2	144,0	390,0	20	15569	34 G 1	18,4	326,0	776,0	17
15533	34 G 0,5	15,2	163,0	420,0	20	15570	41 G 1	19,7	394,0	925,0	17
15534	42 G 0,5	16,2	202,0	500,0	20	15571	42 G 1	19,7	403,0	949,0	17
15535	50 G 0,5	18,0	240,0	580,0	20	15572	50 G 1	21,7	480,0	1092,0	17
15538	2 x 0,75	6,0	14,4	57,0	18	15573	65 G 1	30,9	624,0	1400,0	17
15539	3 G 0,75	6,3	21,6	72,0	18	15575	2 x 1,5	6,8	29,0	90,0	16
15540	4 G 0,75	6,8	29,0	97,0	18	15576	3 G 1,5	7,2	43,0	117,0	16
15541	5 G 0,75	7,4	36,0	119,0	18	15577	4 G 1,5	7,7	58,0	147,0	16
15542	7 G 0,75	8,7	50,0	165,0	18	15578	5 G 1,5	8,6	72,0	181,0	16
15543	8 G 0,75	9,5	58,0	189,0	18	15579	7 G 1,5	10,3	101,0	274,0	16
15544	10 G 0,75	10,7	72,0	214,0	18	15580	8 G 1,5	11,0	115,0	313,0	16
15545	12 G 0,75	10,9	86,0	247,0	18	15581	10 G 1,5	12,7	144,0	344,0	16
15546	14 G 0,75	11,5	101,0	283,0	18	15582	12 G 1,5	12,7	173,0	391,0	16
15547	18 G 0,75	12,7	130,0	356,0	18	15583	14 G 1,5	13,4	202,0	457,0	16
15548	21 G 0,75	13,4	151,0	502,0	18	15584	18 G 1,5	15,1	259,0	589,0	16
15549	25 G 0,75	15,0	180,0	698,0	18	15585	21 G 1,5	16,2	302,0	680,0	16
15550	30 G 0,75	15,8	216,0	720,0	18	15586	25 G 1,5	18,0	360,0	801,0	16
15551	34 G 0,75	17,2	245,0	770,0	18	15587	30 G 1,5	18,7	410,0	938,0	16
15552	42 G 0,75	18,5	302,0	840,0	18	15588	34 G 1,5	20,6	490,0	1048,0	16
15553	50 G 0,75	20,1	360,0	990,0	18	15589	42 G 1,5	22,4	605,0	1290,0	16

Continuation ▶

PURÖ-JZ-HF high flexible, cable for drag chains, abrasion and coolant resistant, meter marking



Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15590	50 G 1,5	24,2	720,0	1520,0	16
15591	61 G 1,5	32,4	889,0	1850,0	16
15592	65 G 1,5	33,6	940,0	1970,0	16
15620	2 x 2,5	8,5	48,0	128,0	14
15621	3 G 2,5	9,0	72,0	160,0	14
15622	4 G 2,5	9,9	96,0	200,0	14
15623	5 G 2,5	11,0	120,0	268,0	14
15624	7 G 2,5	12,8	168,0	357,0	14
15625	12 G 2,5	16,2	288,0	571,0	14
15626	14 G 2,5	17,1	336,0	612,0	14
15627	18 G 2,5	19,1	432,0	800,0	14
15628	25 G 2,5	22,8	600,0	1100,0	14
15630	2 x 4	10,1	77,0	190,0	12
15631	3 G 4	10,9	115,0	250,0	12
15632	4 G 4	12,0	154,0	320,0	12
15633	5 G 4	13,4	192,0	400,0	12
15634	7 G 4	16,0	269,0	550,0	12
15653	1 G 6	7,3	58,0	81,0	10
15636	3 G 6	12,8	173,0	350,0	10

Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15637	4 G 6	13,9	230,0	500,0	10
15638	5 G 6	15,4	288,0	580,0	10
15639	7 G 6	18,0	403,0	800,0	10
15654	1 G 10	8,9	96,0	152,0	8
15641	3 G 10	16,2	288,0	660,0	8
15642	4 G 10	18,1	384,0	750,0	8
15643	5 G 10	20,3	480,0	990,0	8
15644	7 G 10	24,3	672,0	1300,0	8
15655	1 G 16	10,0	154,0	215,0	6
15645	4 G 16	21,1	614,0	1200,0	6
15646	5 G 16	23,5	768,0	1500,0	6
15647	7 G 16	28,7	1075,0	1900,0	6
15656	1 G 25	11,1	240,0	320,0	4
15648	4 G 25	34,0	960,0	1700,0	4
15649	4 G 35	37,0	1344,0	2300,0	2
15650	4 G 50	44,0	1920,0	2500,0	1
15651	4 G 70	53,0	2688,0	4600,0	2/0
15652	4 G 95	59,0	3648,0	6400,0	3/0

Dimensions and specifications may be changed without prior notice. (RC02)

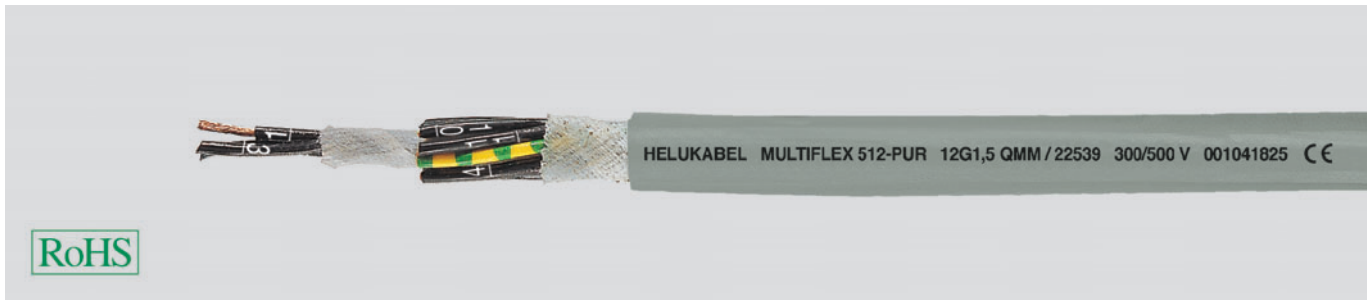
Bundling, binding, fastening

- Plastic helix
- Cable tie
- Hook and loop cable tie
- Mounting block



You can find bundling, binding, fastening in our catalogue Cable Accessories. Request it now at www.helukabel.de

MULTIFLEX 512[®]-PUR special cable for drag chains, halogen-free, meter marking



C

Technical data

- Special drag chain cables for high mechanical stress, adapted to DIN VDE 0282 part 1 and part 10
- **Temperature range**
flexing -40 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage**
3000 V
- **Insulation resistance**
min. 100 MΩm x km
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Alternating bending cycles**
approx. **10 million**
- **Radiation resistance**
up to 50x10⁶ cJ/kg (up to 50 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special core insulation, modified TPE
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Special core wrapping over each layer (up to 4 mm² without core wrapping over the outer layer)
- Special **full-polyurethane** outer jacket TMPU, to DIN VDE 0282 part 10
- Colour grey (RAL 7001) outer surface mat
- with meter marking, change-over in 2011

Properties

- Very good oil resistant
- Guaranteed permanent application in multi-shift operation under extreme high bending stress
- Adhesion-low
- High resistant to mechanical strain
- High property of alternating bending strength
- Long life durabilities through low friction-resistance by using the TPE insulation
- High tensile strength-, abrasion- and impact resistant at low temperature
- Resistant to Weather, Ozone and UV-radiation, Solvents, acids and alkalis, Hydraulic liquidity and Hydrolysis
- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **screened analogue type:**
MULTIFLEX 512[®]-C-PUR see page C 19

Application

The special cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts and multi-shift operation. Those cables are developed according to the newest state of technology improvement. These high flexible control cables with sliding abilities guaranteed an optimum service life durabilities and also very economic by using the TPE-core insulation and the PUR-outer jacket. The PUR material is adhesion-low and cut-resistant.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22501	2 x 0,5	5,5	9,6	38,0	20	22512	2 x 0,75	6,2	14,4	47,0	18
22502	3 G 0,5	5,8	14,4	46,0	20	22513	3 G 0,75	6,5	21,6	58,0	18
22503	4 G 0,5	6,4	19,0	59,0	20	22514	4 G 0,75	7,0	29,0	69,0	18
22504	5 G 0,5	7,0	24,0	68,0	20	22515	5 G 0,75	7,8	36,0	85,0	18
22505	7 G 0,5	8,1	33,6	88,0	20	22516	7 G 0,75	9,0	50,0	118,0	18
22506	12 G 0,5	9,9	58,0	131,0	20	22517	12 G 0,75	11,0	86,0	183,0	18
22507	18 G 0,5	11,5	86,0	197,0	20	22518	18 G 0,75	13,0	130,0	270,0	18
22508	20 G 0,5	12,0	96,0	260,0	20	22519	20 G 0,75	13,5	144,0	290,0	18
22509	25 G 0,5	13,7	120,0	282,0	20	22520	25 G 0,75	15,4	180,0	374,0	18
22510	30 G 0,5	14,3	144,0	315,0	20	22521	30 G 0,75	16,2	216,0	420,0	18
22511	36 G 0,5	15,3	172,0	374,0	20	22522	36 G 0,75	17,6	259,0	498,0	18

Continuation ▶

MULTIFLEX 512®-PUR special cable for drag chains,

halogen-free, meter marking



Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22523	2 x 1	6,9	19,2	55,0	17
22524	3 G 1	7,4	29,0	70,0	17
22525	4 G 1	8,0	38,0	86,0	17
22526	5 G 1	8,7	48,0	102,0	17
22527	7 G 1	10,2	67,0	143,0	17
22528	12 G 1	12,6	115,0	225,0	17
22529	18 G 1	14,8	173,0	334,0	17
22530	20 G 1	15,8	192,0	370,0	17
22531	25 G 1	18,1	240,0	460,0	17
22532	30 G 1	18,5	288,0	530,0	17
22533	36 G 1	20,1	346,0	625,0	17
22878	41 G 1	22,0	410,0	779,0	17
22879	50 G 1	24,0	498,0	953,0	17
22880	65 G 1	27,2	650,0	1205,0	17
22534	2 x 1,5	7,6	29,0	70,0	16
22535	3 G 1,5	8,1	43,0	90,0	16
22536	4 G 1,5	8,7	58,0	106,0	16
22537	5 G 1,5	9,7	72,0	145,0	16
22538	7 G 1,5	11,3	101,0	205,0	16
22539	12 G 1,5	13,8	173,0	320,0	16
22540	18 G 1,5	16,3	259,0	465,0	16
22541	20 G 1,5	17,3	288,0	510,0	16
22542	25 G 1,5	19,8	360,0	650,0	16
22543	30 G 1,5	20,3	432,0	750,0	16
22544	36 G 1,5	22,2	518,0	880,0	16
22881	42 G 1,5	24,0	628,0	1209,0	16
22882	50 G 1,5	26,2	749,0	1449,0	16
22883	61 G 1,5	28,9	912,0	1712,0	16

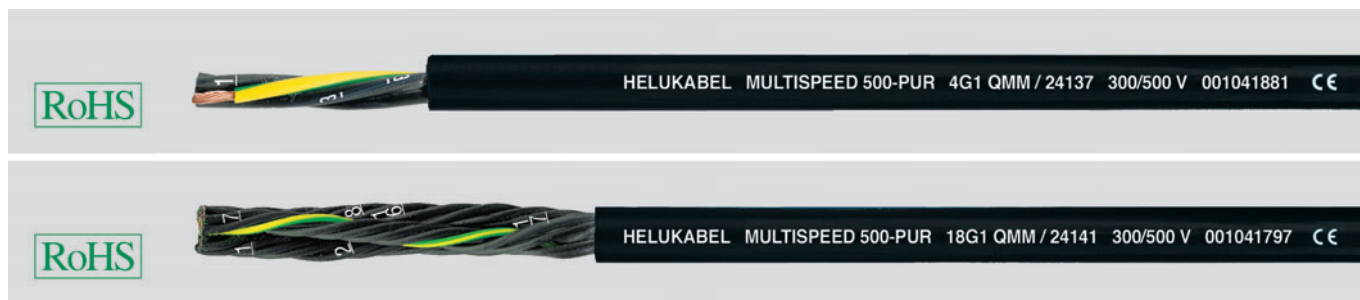
Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22545	2 x 2,5	9,2	48,0	115,0	14
22546	3 G 2,5	9,7	72,0	162,0	14
22547	4 G 2,5	10,5	96,0	196,0	14
22548	5 G 2,5	11,6	120,0	230,0	14
22549	7 G 2,5	13,8	168,0	312,0	14
22550	12 G 2,5	16,9	288,0	532,0	14
22551	18 G 2,5	20,0	432,0	762,0	14
22552	20 G 2,5	21,2	480,0	858,0	14
22553	25 G 2,5	24,4	600,0	998,0	14
22554	4 G 4	13,2	154,0	283,0	12
22555	5 G 4	14,6	192,0	349,0	12
22556	7 G 4	17,6	269,0	498,0	12
22557	4 G 6	14,4	230,0	432,0	10
22558	5 G 6	15,9	288,0	529,0	10
22559	7 G 6	19,2	403,0	782,0	10
22560	4 G 10	18,4	384,0	685,0	8
22561	5 G 10	20,7	480,0	817,0	8
22562	7 G 10	24,7	672,0	1023,0	8
22563	4 G 16	21,3	614,0	1042,0	6
22564	5 G 16	23,8	768,0	1292,0	6
22565	7 G 16	28,6	1075,0	1709,0	6

Dimensions and specifications may be changed without prior notice. (RC02)

Art. Nr.	Aderzahl x Nennquerschnitt mm	Außendurchmesser mm	geschmit	Mindestbiegeradius	FA-Nr.	Zykluszahl	Lebensdauer
22516	7G0,5	8,10	nein	5rd	9027	1.366.712	10
22519	20G,75	13,50	nein	5rd	2878	1.366.712	10
22507	18G0,5	11,50	nein	5rd	2742	1.366.712	10
22527	7G1	10,20	nein	5rd	3782	1.366.712	10
22518	18G70,5	12,90	nein	5rd	2444	1.366.712	10
22550	12G2,5	16,90	nein	5rd	4171	1.366.712	10
22565	7G16	28,60	nein	5rd	2273	1.366.712	10
22559	7G6	19,20	nein	5rd	4431	1.366.712	10
22579	25G0,5	17,00	ja	7,5rd	2817	1.366.712	10
22568	18G0,75	16,30	ja	7,5rd	4056	1.366.712	10
22578	20G0,5	15,40	ja	7,5rd	2877	1.366.712	10
22579	4G0,5	9,00	ja	7,5rd	2189	1.366.712	10
22577	4G0,5	9,30	ja	7,5rd	3672	1.443.248	10

To be able to provide information on the service life and in line with our certification to DIN EN ISO 9001:2000, we document the realistic testing of our cables suitable for use in drag chains.

MULTISPEED® 500-PUR safety against high bending in drag chain systems, low torsion, halogen-free, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13, DIN VDE 0282 part 10
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-PUR outer sheath, especially resistant against fatigue strength, extruded as filler with pressure
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low adhesion
- Halogen-free
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced ø, results low weight of moving materials
- High property of alternating bending strength
- High resistant to mechanical strain
- Long life durability due to low friction-resistance
- High tensile strength, abrasion- and impact resistance at low temperature
- Tear resistance and high stability
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (0Z).
- **screened analogue type:**
MULTISPEED® 500-C-PUR
see page C 21

Application

For permanent application in drag chains for long distances, high and low speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary.

For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. **CE** – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24119	2 x 0,5	4,3	9,6	41,0	20	24138	5 G 1	6,7	48,0	84,0	17
24120	3 G 0,5	4,6	14,4	48,0	20	24139	7 G 1	11,1	67,0	111,0	17
24121	4 G 0,5	5,0	19,0	62,0	20	24140	12 G 1	12,0	115,0	200,0	17
24122	5 G 0,5	5,4	24,0	70,0	20	24141	18 G 1	14,8	173,0	286,0	17
24123	7 G 0,5	8,9	33,6	88,0	20	24142	25 G 1	17,2	240,0	370,0	17
24124	12 G 0,5	9,7	58,0	131,0	20	24143	3 G 1,5	6,4	43,0	81,0	16
24125	18 G 0,5	11,8	86,0	204,0	20	24144	4 G 1,5	7,0	58,0	102,0	16
24126	25 G 0,5	13,9	120,0	266,0	20	24145	5 G 1,5	7,8	72,0	121,0	16
24127	3 G 0,75	5,2	21,6	51,0	18	24146	7 G 1,5	13,0	101,0	164,0	16
24128	4 G 0,75	5,6	29,0	68,0	18	24147	12 G 1,5	14,2	173,0	293,0	16
24129	5 G 0,75	6,3	36,0	73,0	18	24148	18 G 1,5	17,5	259,0	450,0	16
24130	7 G 0,75	10,3	50,0	92,0	18	24149	25 G 1,5	20,1	360,0	631,0	16
24131	12 G 0,75	11,0	86,0	170,0	18	24150	4 G 2,5	8,8	86,0	173,0	14
24132	18 G 0,75	13,9	130,0	257,0	18	24151	5 G 2,5	9,8	120,0	220,0	14
24133	25 G 0,75	15,9	180,0	280,0	18	24152	7 G 2,5	16,1	168,0	290,0	14
24134	36 G 0,75	19,6	260,0	411,0	18	24153	12 G 2,5	17,8	288,0	504,0	14
24135	42 G 0,75	21,5	302,0	608,0	18	24154	18 G 2,5	21,8	432,0	719,0	14
24136	3 G 1	5,4	29,0	59,0	17	24155	25 G 2,5	24,4	600,0	940,0	14
24137	4 G 1	5,9	38,0	71,0	17						

Dimensions and specifications may be changed without prior notice. (RC02)

PURÖ-JZ-HF-YCP EMC-preferred type, cable for drag chains, screened, PUR-outer sheath, meter marking



HELUKABEL PURÖ-JZ-HF-YCP 7G1,5 QMM / 22456 300/500 V 001041815 CE



Technical data

- Special polyurethane control cable adapted to DIN VDE 0281, 0282
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- **Oil resistant** PVC core insulation TI2, in adapted to DIN VDE 0281 part 1, for better sliding abilities
- Black cores with continuous white numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Fleece separator
- **Oil resistant** PVC inner jacket
- One layer of tinned copper wire screening, approx. 85% coverage
- Special **full-polyurethane** outer jacket, to DIN VDE 0282 part 10, appendix A
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Suitable for outdoor lying and resistant to UV-radiation, oxygen, ozone and hydrolysis. Conditionally resistant to microbes
- Adhesion-low
- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
PURÖ-JZ-HF see page C 12

Application

PURÖ-JZ-YCP is a highly robust and tare and abrasion resistant cable with excellent resistance properties to mineral oils and cooling fluids, thus making it an ideal choice for installation in most types of industrial machinery as well as in steel works and rolling mills, etc. in fact, wherever you may need a cable to cope with especially critical situations. Easy to install, thanks to its high degree of flexibility. Its high abrasion resistance and good flexing ability make it quick and easy to install and, with its low bending radius, ideal for use with cable trays. This screened cable is ideal for use in data signal transmission free from interferences for measurement and control engineering technology. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22400	2 x 0,5	7,5	30,0	90,0	20
22401	3 G 0,5	7,8	38,0	104,0	20
22402	4 G 0,5	7,8	48,0	123,0	20
22403	5 G 0,5	8,5	65,0	131,0	20
22404	7 G 0,5	9,5	70,0	172,0	20
22405	8 G 0,5	10,4	81,0	195,0	20
22406	10 G 0,5	11,4	94,0	230,0	20
22407	12 G 0,5	11,6	110,0	250,0	20
22408	14 G 0,5	12,0	135,0	280,0	20
22409	18 G 0,5	13,4	157,0	321,0	20
22410	21 G 0,5	14,8	175,0	380,0	20
22411	25 G 0,5	16,1	240,0	445,0	20
22412	30 G 0,5	16,4	275,0	509,0	20
22413	34 G 0,5	17,8	305,0	560,0	20
22414	42 G 0,5	19,1	330,0	780,0	20
22415	50 G 0,5	20,6	393,0	960,0	20
22416	61 G 0,5	23,0	541,0	1050,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22417	2 x 0,75	7,5	39,0	106,0	18
22418	3 G 0,75	7,8	49,0	120,0	18
22419	4 G 0,75	8,5	60,0	150,0	18
22420	5 G 0,75	9,1	70,0	158,0	18
22421	7 G 0,75	10,9	95,0	205,0	18
22422	8 G 0,75	11,5	104,0	272,0	18
22423	10 G 0,75	13,0	110,0	290,0	18
22424	12 G 0,75	13,2	141,0	304,0	18
22425	14 G 0,75	13,7	163,0	380,0	18
22426	18 G 0,75	15,2	211,0	418,0	18
22427	21 G 0,75	16,4	274,0	485,0	18
22428	25 G 0,75	18,2	322,0	578,0	18
22429	30 G 0,75	18,6	414,0	630,0	18
22430	34 G 0,75	20,0	473,0	720,0	18
22431	42 G 0,75	21,5	583,0	780,0	18
22432	50 G 0,75	23,7	626,0	954,0	18
22433	61 G 0,75	25,9	763,0	1085,0	18

Continuation ►

PURÖ-JZ-HF-YCP EMC-preferred type, cable for drag chains, screened, PUR-outer sheath, meter marking



Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22434	2 x 1	8,5	50,0	116,0	17
22435	3 G 1	8,8	60,0	135,0	17
22436	4 G 1	9,4	73,0	178,0	17
22437	5 G 1	10,7	81,0	188,0	17
22438	7 G 1	12,1	114,0	235,0	17
22439	8 G 1	13,2	130,0	270,0	17
22440	10 G 1	14,6	178,0	340,0	17
22441	12 G 1	14,8	186,0	358,0	17
22442	14 G 1	15,6	231,0	415,0	17
22443	18 G 1	17,0	254,0	500,0	17
22444	21 G 1	19,0	328,0	525,0	17
22445	25 G 1	20,9	378,0	678,0	17
22446	32 G 1	22,6	450,0	777,0	17
22447	34 G 1	23,3	478,0	825,0	17
22448	41 G 1	25,1	576,0	980,0	17
22449	42 G 1	25,3	590,0	998,0	17
22450	50 G 1	27,6	702,0	1160,0	17
22451	65 G 1	30,7	913,0	1670,0	17
22452	2 x 1,5	9,0	64,0	141,0	16
22453	3 G 1,5	9,4	84,0	164,0	16
22454	4 G 1,5	10,6	99,0	220,0	16
22455	5 G 1,5	11,4	120,0	233,0	16
22456	7 G 1,5	13,3	148,0	323,0	16
22457	8 G 1,5	14,5	191,0	369,0	16
22458	10 G 1,5	15,9	240,0	461,0	16
22459	12 G 1,5	16,1	274,0	481,0	16
22460	14 G 1,5	16,7	340,0	561,0	16
22461	18 G 1,5	18,4	395,0	672,0	16
22462	21 G 1,5	20,6	461,0	780,0	16
22463	25 G 1,5	22,8	533,0	927,0	16
22464	30 G 1,5	23,5	608,0	1030,0	16
22465	34 G 1,5	26,1	702,0	1180,0	16
22466	42 G 1,5	27,8	867,0	1458,0	16
22467	50 G 1,5	30,3	1033,0	1857,0	16
22468	61 G 1,5	32,7	1233,0	2250,0	16
22469	65 G 1,5	33,5	1315,0	2401,0	16

Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22470	2 x 2,5	10,9	96,0	185,0	14
22471	3 G 2,5	11,4	150,0	278,0	14
22472	4 G 2,5	12,2	159,0	370,0	14
22473	5 G 2,5	13,5	195,0	412,0	14
22474	7 G 2,5	16,0	240,0	470,0	14
22475	12 G 2,5	19,4	390,0	738,0	14
22476	14 G 2,5	20,4	480,0	870,0	14
22477	18 G 2,5	23,0	620,0	1100,0	14
22478	25 G 2,5	27,7	821,0	1512,0	14
22479	2 G 4	13,1	135,0	235,0	12
22480	3 G 4	13,7	178,0	350,0	12
22481	4 G 4	15,6	222,0	460,0	12
22482	5 G 4	16,7	328,0	550,0	12
22483	7 G 4	19,7	360,0	700,0	12
22484	3 G 6	16,0	250,0	525,0	10
22485	4 G 6	17,2	305,0	700,0	10
22486	5 G 6	19,3	441,0	800,0	10
22487	7 G 6	21,6	505,0	1100,0	10
22488	3 G 10	20,4	370,0	855,0	8
22489	4 G 10	23,0	485,0	1140,0	8
22490	5 G 10	25,3	610,0	1310,0	8
22491	7 G 10	28,0	820,0	1630,0	8
22492	4 G 16	26,2	840,0	1391,0	6
22493	5 G 16	28,6	1050,0	1810,0	6
22494	7 G 16	31,5	1510,0	2166,0	6

Dimensions and specifications may be changed without prior notice. (RC02)

MULTIFLEX 512®-C-PUR special cable for drag chains, halogen-free, screened, EMC-preferred type, meter marking



Technical data

- Special drag chain cables for extreme mechanical stresses in accordance to DIN VDE 0282 part 1 and part 10
- **Temperature range**
flexing -40 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage**
3000 V
- **Insulation resistance**
min. 100 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Test of alternating bending cycles**
approx. **10 million**
- **Radiation resistance**
up to 50x10⁶ cJ/kg (up to 50 Mrad)
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special core insulation, modified TPE
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Special core wrapping over each layers and an additional fleece over outer layer
- **TPE-inner sheath**, halogen-free
- Wrapping with special tapes
- Tinned copper braided screening, approx. 85% coverage
- Special core wrapping of fleece (up to 4 mm² without core wrapping over the outer layer
- Special **full-polyurethane** outer jacket TPU, to DIN VDE 0282 part 10, appendix A
- Jacket colour grey, (RAL 7001), with a matte surface
- with meter marking, change-over in 2011

Properties

- Very good oil resistant
- Guaranteed permanent application in multi-shift operation under extreme high bending stress
- Adhesion-low
- High resistant to mechanical strain
- High property of alternating bending strength/Long life durabilities through low friction-resistance by using the TPE insulation
- High tensile strength-, abrasion- and impact resistant at low temperature
- Resistant to Weather, Ozone and UV-radiation, Solvents, acids and alkalis, Hydraulic liquidity and Hydrolysis
- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Please note the cleanroom qualification when ordering.
For more information see introduction
- **unscreened analogue type:**
MULTIFLEX 512®-PUR see page C 14

Application

The special screened cables for drag chains are mainly applied for impulse transmission to prevent external interference effects and used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts and multi-shift operation. Those cables are developed according to the newest state of technology improvement. These high flexible control cables with sliding abilities guaranteed an optimum service life durabilities and also very economic by using the TPE-core insulation and the PUR-outer jacket which is adhesive-free and cut-resistant.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22571	2 x 0,5	8,3	30,0	90,0	20
22572	3 G 0,5	8,5	38,0	105,0	20
22573	4 G 0,5	9,0	50,0	124,0	20
22574	5 G 0,5	9,7	65,0	132,0	20
22575	7 G 0,5	11,1	70,0	175,0	20
22576	12 G 0,5	12,7	100,0	250,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22577	18 G 0,5	14,7	157,0	325,0	20
22578	20 G 0,5	15,4	167,0	350,0	20
22579	25 G 0,5	17,1	240,0	450,0	20
22580	30 G 0,5	17,9	273,0	510,0	20
22581	36 G 0,5	19,2	306,0	580,0	20

Continuation ▶

MULTIFLEX 512[®]-C-PUR special cable for drag chains, halogen-free, screened, EMC-preferred type, meter marking

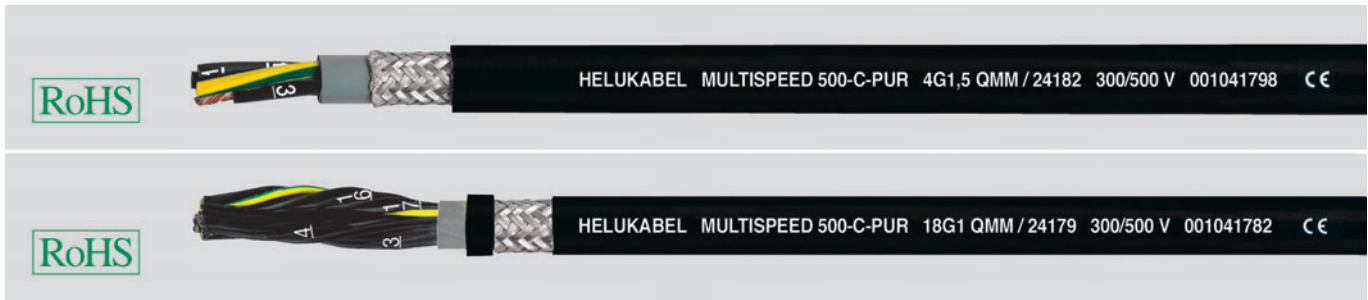


Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22582	2 x 0,75	8,8	39,0	110,0	18	22609	12 G 1,5	17,4	279,0	481,0	16
22583	3 G 0,75	9,3	49,0	120,0	18	22610	18 G 1,5	19,9	393,0	675,0	16
22584	4 G 0,75	9,7	60,0	148,0	18	22611	25 G 1,5	23,7	584,0	927,0	16
22585	5 G 0,75	10,5	70,0	160,0	18	22612	30 G 1,5	24,6	607,0	1025,0	16
22586	7 G 0,75	11,9	95,0	205,0	18	22613	36 G 1,5	26,4	702,0	1210,0	16
22587	12 G 0,75	14,2	140,0	308,0	18	22887	42 G 1,5	28,4	829,0	1441,0	16
22588	18 G 0,75	16,3	220,0	420,0	18	22888	50 G 1,5	31,2	1025,0	1709,0	16
22589	20 G 0,75	16,9	249,0	450,0	18	22889	61 G 1,5	34,2	1190,0	2025,0	16
22590	25 G 0,75	19,2	313,0	579,0	18	22614	2 x 2,5	11,9	104,0	198,0	14
22591	30 G 0,75	19,7	470,0	630,0	18	22615	3 G 2,5	12,6	140,0	284,0	14
22592	36 G 0,75	21,2	500,0	745,0	18	22616	4 G 2,5	13,6	164,0	378,0	14
22593	2 x 1	9,7	50,0	120,0	17	22617	5 G 2,5	14,7	190,0	423,0	14
22594	3 G 1	10,0	60,0	135,0	17	22618	7 G 2,5	17,4	236,0	486,0	14
22595	4 G 1	10,8	73,0	173,0	17	22619	12 G 2,5	20,9	390,0	756,0	14
22596	5 G 1	11,7	81,0	187,0	17	22620	18 G 2,5	24,2	607,0	1127,0	14
22597	7 G 1	13,4	114,0	240,0	17	22621	20 G 2,5	25,6	661,0	1210,0	14
22598	12 G 1	16,0	186,0	360,0	17	22622	25 G 2,5	29,1	796,0	1530,0	14
22599	18 G 1	18,5	254,0	498,0	17	22623	4 G 4	16,8	222,0	448,0	12
22600	20 G 1	19,4	322,0	568,0	17	22624	5 G 4	18,4	328,0	533,0	12
22601	25 G 1	21,7	377,0	670,0	17	22625	7 G 4	21,6	360,0	678,0	12
22602	30 G 1	22,5	429,0	774,0	17	22626	4 G 6	18,1	305,0	636,0	10
22603	36 G 1	24,3	516,0	895,0	17	22627	5 G 6	19,6	441,0	772,0	10
22884	41 G 1	26,1	610,0	1032,0	17	22628	7 G 6	23,2	505,0	1028,0	10
22885	50 G 1	28,4	690,0	1160,0	17	22629	4 G 10	22,5	485,0	1052,0	8
22886	65 G 1	32,2	852,0	1660,0	17	22630	5 G 10	24,7	610,0	1096,0	8
22604	2 x 1,5	10,2	64,0	145,0	16	22631	7 G 10	29,3	820,0	1530,0	8
22605	3 G 1,5	11,0	84,0	168,0	16	22632	4 G 16	25,7	840,0	1386,0	6
22606	4 G 1,5	11,6	99,0	217,0	16	22633	5 G 16	28,2	1050,0	1759,0	6
22607	5 G 1,5	12,6	129,0	235,0	16	22634	7 G 16	33,6	1510,0	2087,0	6
22608	7 G 1,5	14,5	148,0	325,0	16						

Dimensions and specifications may be changed without prior notice. (RC02)

C

MULTISPEED® 500-C-PUR safety against high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, halogen-free, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 3, DIN VDE 0282 part 10 and DIN VDE 0245
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Coupling resistant**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE inner sheath, extruded as filler with pressure, grey RAL 7001
- Tinned copper braided screen, coverage 85% max., with optimal pitch
- Fleece separator, ensure good dismantling ability
- Special-PUR outer sheath
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low adhesion
- High property of alternating bending strength
- High resistant to mechanical strain
- Long life durability due to low friction-resistance
- High tensile strength, abrasion- and impact resistance at low temperature
- Tear resistance
- High stability and oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced ø, results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **unscreened analogue type:**
MULTISPEED® 500-PUR see page C 16

Application

For permanent application in drag chains for long distances, high and low speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24156	2 x 0,5	6,4	30,0	90,0	20	24173	2 x 1	7,1	50,0	120,0	17
24157	3 G 0,5	6,7	36,0	104,0	20	24174	3 G 1	7,6	59,0	140,0	17
24158	4 G 0,5	7,2	42,0	118,0	20	24175	4 G 1	8,1	70,0	167,0	17
24159	5 G 0,5	7,6	48,0	148,0	20	24176	5 G 1	8,9	84,0	201,0	17
24160	7 G 0,5	11,4	64,0	184,0	20	24177	7 G 1	13,6	106,0	256,0	17
24161	9 G 0,5	11,4	80,0	219,0	20	24178	12 G 1	14,6	174,0	417,0	17
24162	12 G 0,5	12,4	105,0	276,0	20	24179	18 G 1	18,4	240,0	557,0	17
24163	18 G 0,5	14,7	137,0	378,0	20	24180	25 G 1	21,0	332,0	766,0	17
24164	25 G 0,5	17,1	210,0	547,0	20	24181	3 G 1,5	8,4	75,0	170,0	16
24165	2 x 0,75	6,8	40,0	100,0	18	24182	4 G 1,5	9,1	90,0	204,0	16
24166	3 G 0,75	7,3	48,0	117,0	18	24183	5 G 1,5	10,2	108,0	236,0	16
24167	4 G 0,75	7,8	55,0	143,0	18	24184	7 G 1,5	15,7	157,0	309,0	16
24168	5 G 0,75	8,3	66,0	167,0	18	24185	12 G 1,5	17,4	240,0	509,0	16
24169	7 G 0,75	12,7	85,0	229,0	18	24186	18 G 1,5	21,3	355,0	718,0	16
24170	12 G 0,75	13,7	135,0	319,0	18	24187	25 G 1,5	24,3	448,0	944,0	16
24171	18 G 0,75	17,1	190,0	492,0	18	24188	4 G 2,5	11,2	134,0	280,0	14
24172	25 G 0,75	19,5	275,0	659,0	18	24189	5 G 2,5	12,2	175,0	346,0	14
						24190	7 G 2,5	14,0	229,0	410,0	14

Dimensions and specifications may be changed without prior notice. (RC02)

MULTISPEED® 500-TPE high flexible, safety against high bending in drag chain systems, low torsion, halogen-free, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13 and DIN VDE 0245
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 5x cable \varnothing
fixed installation 3x cable \varnothing
- **Radiation resistance**
up to 100×10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, fine wire conductors, Unilay with short pitch length Special TPE core insulation Black cores with continuous white numbering Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE-O outer sheath, extruded as filler with pressure
- Sheath colour ocean blue (RAL 5020)
- with meter marking, change-over in 2011
- **TPE:** The selected tinned copper wire conductor permits the installation in aggressive environments as well as hydrogen sulfide, ammonia and sulfur dioxide

Properties

- Microbe-resistance - TPE
- Halogen-free
- Low adhesion
- High property of alternating bending strength
- High resistant to mechanical strain
- Long life durability due to low friction-resistance
- High tensile strength, abrasion- and impact resistance at low temperature
- Use in multi-shift operations under extremely high continuous bending loads
- Abrasion resistance
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced \varnothing , results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **screened analogue type:**
MULTISPEED® 500-C-TPE see page C 24

Application

For permanent application in drag chains for long distances, high and low speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24191	2 x 0,5	4,3	9,6	42,0	20
24192	3 G 0,5	4,6	14,4	49,0	20
24193	4 G 0,5	5,0	19,0	63,0	20
24194	5 G 0,5	5,4	24,0	70,0	20
24195	7 G 0,5	8,9	33,6	90,0	20
24196	12 G 0,5	9,7	58,0	134,0	20
24197	18 G 0,5	11,8	86,0	209,0	20
24198	25 G 0,5	13,9	120,0	270,0	20

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24199	2 x 0,75	5,0	14,4	47,0	18
24200	3 G 0,75	5,2	21,6	55,0	18
24201	4 G 0,75	5,6	29,0	70,0	18
24202	5 G 0,75	6,3	36,0	74,0	18
24203	7 G 0,75	10,3	50,0	95,0	18
24204	12 G 0,75	11,0	86,0	174,0	18
24205	18 G 0,75	13,9	130,0	261,0	18
24206	25 G 0,75	15,9	180,0	290,0	18
24207	36 G 0,75	19,6	260,0	419,0	18
24208	42 G 0,75	21,5	302,0	614,0	18

Continuation ▶

MULTISPEED® 500-TPE high flexible, safety against high bending in drag chain systems, low torsion, halogen-free, meter marking



Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24209	2 x 1	5,2	19,2	50,0	17
24210	3 G 1	5,4	29,0	60,0	17
24211	4 G 1	5,9	38,0	74,0	17
24212	5 G 1	6,7	48,0	86,0	17
24213	7 G 1	11,1	67,0	114,0	17
24214	12 G 1	12,0	115,0	210,0	17
24215	18 G 1	14,8	173,0	291,0	17
24216	25 G 1	17,2	240,0	380,0	17
24043	41 G 1	22,0	394,0	510,0	17
24217	3 G 1,5	6,4	43,0	84,0	16
24218	4 G 1,5	7,0	58,0	108,0	16
24219	5 G 1,5	7,8	72,0	126,0	16
24220	7 G 1,5	13,0	101,0	169,0	16
24221	12 G 1,5	14,2	173,0	299,0	16
24222	18 G 1,5	17,5	259,0	460,0	16
24223	25 G 1,5	20,1	360,0	640,0	16

Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24224	4 G 2,5	8,8	96,0	179,0	14
24225	5 G 2,5	9,8	120,0	230,0	14
24226	7 G 2,5	16,1	168,0	294,0	14
24227	12 G 2,5	17,8	288,0	510,0	14
24228	18 G 2,5	21,8	432,0	722,0	14
24229	25 G 2,5	24,4	600,0	950,0	14
24230	4 G 4	10,3	154,0	197,0	12
24231	4 G 6	11,9	231,0	320,0	10
24232	5 G 6	13,4	289,0	394,0	10
24233	4 G 10	14,7	387,0	520,0	8
24234	4 G 16	20,0	517,0	784,0	6
24235	4 G 35	24,9	1344,0	1711,0	2

Dimensions and specifications may be changed without prior notice. (RC02)

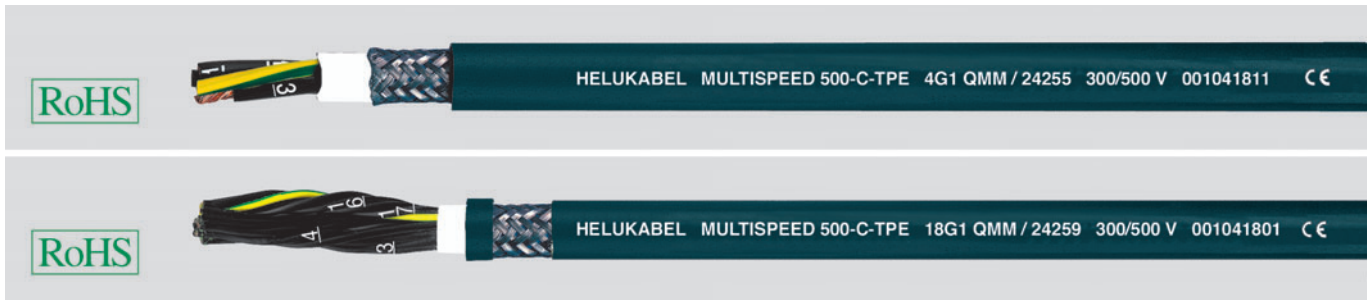
Marking

Marking rings
Cable marker
Indian pen



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Request it now at www.helukabel.de

MULTISPEED® 500-C-TPE safety against high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13 and E DIN VDE 0245
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Coupling resistance**
max. 250 Ohm x km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE inner sheath, extruded as filler with pressure, natural colour
- Screen of Cu braid tinned, coverage 85% max., with optimal pitch
- Fleece separator, ensure good dismantling ability
- Special-TPE-O outer sheath, extruded as filler with pressure
- Sheath colour ocean blue (RAL 5020)
- with meter marking, change-over in 2011
- **TPE:** The selected tinned copper wire conductor and tinned copper wire braid permit the installation in aggressive environments as well as hydrogen sulfide, ammonia and sulfur dioxide.

Properties

- Microbe-resistance - TPE
- High property of alternating bending strength
- Long life durability due to low friction-resistance
- High tensile strength, abrasion- and impact resistance at low temperature
- Low adhesion, oil resistance
- Tear resistance
- Better chemical resistance
- UV and ozone resistance
- Reduced ø, results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- Please note the cleanroom qualification when ordering.
- For more information, see introduction
- **unscreened analogue type:** **MULTISPEED® 500-TPE** see page C 22

Application

For permanent application in drag chains for long distances, high and low speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24236	2 x 0,5	6,5	30,0	85,0	20	24255	4 G 1	8,1	70,0	160,0	17
24237	3 G 0,5	6,7	36,0	99,0	20	24256	5 G 1	8,9	84,0	195,0	17
24238	4 G 0,5	7,2	42,0	107,0	20	24257	7 G 1	13,6	106,0	247,0	17
24239	5 G 0,5	7,6	48,0	140,0	20	24258	12 G 1	14,8	174,0	411,0	17
24240	7 G 0,5	11,4	64,0	176,0	20	24259	18 G 1	18,4	240,0	547,0	17
24241	10 G 0,5	11,4	80,0	204,0	20	24260	25 G 1	21,0	332,0	754,0	17
24242	12 G 0,5	12,4	105,0	261,0	20	24261	3 G 1,5	8,4	75,0	160,0	16
24243	18 G 0,5	14,7	137,0	360,0	20	24262	4 G 1,5	9,2	90,0	194,0	16
24244	25 G 0,5	17,1	320,0	530,0	20	24263	5 G 1,5	10,2	108,0	220,0	16
24245	2 x 0,75	7,0	40,0	97,0	18	24264	7 G 1,5	15,7	157,0	294,0	16
24246	3 G 0,75	7,3	48,0	110,0	18	24265	12 G 1,5	17,4	240,0	490,0	16
24247	4 G 0,75	7,8	55,0	139,0	18	24266	18 G 1,5	21,3	355,0	704,0	16
24248	5 G 0,75	8,3	66,0	160,0	18	24267	25 G 1,5	24,3	448,0	930,0	16
24249	7 G 0,75	12,7	85,0	219,0	18	24268	4 G 2,5	11,2	134,0	260,0	14
24250	12 G 0,75	13,7	135,0	307,0	18	24269	5 G 2,5	12,2	175,0	330,0	14
24251	18 G 0,75	17,1	190,0	490,0	18	24270	7 G 2,5	19,5	229,0	406,0	14
24252	25 G 0,75	19,5	275,0	640,0	18	24271	12 G 2,5	21,7	390,0	990,0	14
24253	2 x 1	7,3	50,0	115,0	17	24272	4 G 4	13,6	194,0	355,0	12
24254	3 G 1	7,6	59,0	131,0	17						

Dimensions and specifications may be changed without prior notice. (RC02)



BIOFLEX-500®-JZ-HF
BIOFLEX-500®-JZ-HF-C
KOMPOSPEED® JZ-HF-500
KOMPOSPEED® JZ-HF-500-C
SUPERTRONIC-PVC
SUPERTRONIC-C-PVC
SUPERTRONIC-PURÖ
SUPERTRONIC-C-PURÖ
SUPER-PAAR-TRONIC-C-PUR

Photo: FUCHS DEA SCHMIERSTOFFE GMBH & Co. KG

Bio-Oil and microbial resistant Cables for Drag Chains

We have joined forces with large scale farmers and operators of biofuel plants to develop a tailor-made product – the new BIOFLEX-500®.

HELUKABEL® has accordingly matched and extended the range of products from its plant in Windsbach. Special control cables and wires have been developed which are not only friendly on the environment, abrasion-resistant and can be recycled, they are also resistant to bio-oils. These are the special BIOFLEX-500®-control cables and

wires from HELUKABEL®. Specially modified polymers are used here for the core insulation and the jacket materials.

In the laboratory, these special compounds have been subjected to extreme testing according to VDMA requirements and VDE specifications. The suitability of these compounds has been assessed by endurance testing to demonstrate the long-term resistance to bio-oils.

BIOFLEX-500®-JZ-HF Bio-fuel resistant, abrasion resistant, recyclable environment friendly, bio-oil resistant¹⁾, cable for drag chains, meter marking



Technical data

- Bio-oil resistant, abrasion resistant special high flexible control cable in adapted to DIN VDE 0245, 0281
- **Temperature range**
flexing -20 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special polymer core insulation, for better sliding abilities
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece
- Special outer sheath, polymer compound
- Colour dark green
- with meter marking, change-over in 2011

Properties

- **Resistant to**
Bio-fuel (diesel and petrol), highly resistant to biologically decomposable oils, Oxygene, Ozone, Hydrolysis and Microbes
- Low adhesion

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
BIOFLEX-500®-JZ-HF-C see page C 27

Application

HELUKABEL® BIOFLEX-HF-500 is an extremely robust and high flexible control cable with high abrasion and tear resistant properties. Due to its high resistance to Bio-fuel, Bio-oil and coolant emulsions. It is especially suited for use in the machine, tool making and plant industries as well as in the steel industry for difficult and problem areas. Suitable in combination with cable trays in dry, moist and wet rooms and outdoor installation. The high flexibility of this cable type makes it quick and easy to install. Suitable for outdoor lying. ¹⁾ For the critical applications we advise for consultation. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text. **CE** – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25761	2 x 0,5	5,4	9,6	45,0	20
25762	3 G 0,5	5,9	14,4	56,0	20
25763	4 G 0,5	6,3	19,1	69,0	20
25764	5 G 0,5	6,9	24,0	92,0	20
25765	7 G 0,5	7,8	33,6	126,0	20
25766	10 G 0,5	9,6	48,0	158,0	20
25767	12 G 0,5	10,3	58,0	176,0	20
25768	14 G 0,5	10,3	67,0	212,0	20
25769	18 G 0,5	11,5	86,4	283,0	20
25770	25 G 0,5	13,6	120,0	330,0	20
25771	2 x 0,75	5,9	14,4	57,0	18
25772	3 G 0,75	6,2	21,6	72,0	18
25773	4 G 0,75	6,7	29,0	97,0	18
25774	5 G 0,75	7,3	36,0	119,0	18
25775	7 G 0,75	8,7	50,0	165,0	18
25776	10 G 0,75	10,5	72,0	214,0	18
25777	12 G 0,75	11,0	86,0	247,0	18
25778	14 G 0,75	11,4	101,0	283,0	18
25779	18 G 0,75	12,6	130,0	356,0	18
25780	25 G 0,75	15,2	180,0	698,0	18
25781	2 x 1	6,6	19,0	64,0	17
25782	3 G 1	7,0	29,0	83,0	17
25783	4 G 1	7,6	38,5	113,0	17
25784	5 G 1	8,2	48,0	137,0	17
25785	7 G 1	9,6	67,0	191,0	17
25786	10 G 1	11,6	96,0	251,0	17
25787	12 G 1	12,0	115,0	294,0	17
25788	14 G 1	13,0	134,0	337,0	17
25789	18 G 1	14,5	173,0	420,0	17
25790	25 G 1	17,6	240,0	600,0	17
25791	2 x 1,5	7,1	29,0	90,0	16
25792	3 G 1,5	7,5	43,0	117,0	16
25793	4 G 1,5	8,2	58,0	147,0	16
25794	5 G 1,5	9,0	72,0	181,0	16
25795	7 G 1,5	10,8	101,0	274,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25796	10 G 1,5	13,4	144,0	344,0	16
25797	12 G 1,5	13,4	173,0	391,0	16
25798	14 G 1,5	14,3	202,0	457,0	16
25799	18 G 1,5	16,0	259,0	589,0	16
25800	25 G 1,5	19,5	360,0	801,0	16
25801	2 x 2,5	8,6	48,0	128,0	14
25802	3 G 2,5	9,3	72,0	160,0	14
25803	4 G 2,5	10,3	96,0	200,0	14
25804	5 G 2,5	11,5	120,0	268,0	14
25805	7 G 2,5	13,4	168,0	357,0	14
25806	12 G 2,5	17,0	288,0	571,0	14
25807	14 G 2,5	18,5	336,0	612,0	14
25808	18 G 2,5	20,0	432,0	800,0	14
25809	25 G 2,5	29,6	600,0	1100,0	14
25810	2 x 4	10,4	77,0	190,0	12
25811	3 G 4	11,2	115,0	250,0	12
25812	4 G 4	12,5	154,0	320,0	12
25813	5 G 4	13,8	192,0	400,0	12
25814	3 G 6	13,0	173,0	350,0	10
25815	4 G 6	14,7	230,0	500,0	10
25816	5 G 6	16,0	288,0	580,0	10
25817	3 G 10	17,4	288,0	660,0	8
25818	4 G 10	19,0	384,0	750,0	8
25819	5 G 10	21,3	480,0	990,0	8
25820	4 G 16	23,2	614,0	1200,0	6
25821	4 G 25	34,0	960,0	1700,0	4
25822	4 G 35	37,0	1344,0	2300,0	2
25823	4 G 50	44,0	1920,0	2500,0	1
25824	4 G 70	53,0	2688,0	4600,0	2/0
25825	4 G 95	59,0	3648,0	6400,0	3/0

Dimensions and specifications may be changed without prior notice. (RC03)

BIOFLEX-500®-JZ-HF-C Biofuel-resistant, abrasion-resistant, recyclable, environmentally friendly, drag-chain cable, bio-oil resistant ¹⁾, meter marking



Technical data

- Bio-oil resistant, abrasion resistant special high flexible control cable in adapted to DIN VDE 0245, 0281
- **Temperature range**
flexing -20 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 15x cable ø
fixed installation 4x cable ø
- **Coupling resistance**
max. 250 Ωm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special polymer core insulation, for better sliding abilities
- Black cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece
- Special inner sheath
- Copper braided screening approx. 85% coverage
- Fleece separator, ensure good dismantling ability
- Special outer sheath polymer compound
- Colour dark green
- with meter marking, change-over in 2011

Properties

- **Resistant to**
Bio-fuel (diesel and petrol), highly resistant to biologically decomposable oils, Oxygene, Ozone, Hydrolysis and Microbes
- Low adhesion

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
BIOFLEX-500®-JZ-HF see page C 26

Application

HELUKABEL® BIOFLEX-HF-500-C is an extremely robust and high flexible control cable with high abrasion and tear resistant properties. Due to its high resistance to Bio-fuel, Bio-oil and coolant emulsions. It is especially suited for use in the machine, tool making and plant industries as well as in the steel industry for difficult and problem areas. Suitable in combination with cable trays in dry, moist and wet rooms and outdoor installation. The high flexibility of this cable type makes it quick and easy to install. Suitable for outdoor lying. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications (electromagnetic compatibility). For the critical applications we advise for consultation. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25826	2 x 0,5	7,5	47,0	90,0	20
25827	3 G 0,5	7,8	52,0	104,0	20
25828	4 G 0,5	8,2	55,0	123,0	20
25829	5 G 0,5	9,9	65,0	131,0	20
25830	7 G 0,5	10,0	84,0	172,0	20
25831	10 G 0,5	11,3	115,0	230,0	20
25832	12 G 0,5	12,5	117,0	250,0	20
25833	14 G 0,5	13,2	148,0	280,0	20
25834	18 G 0,5	14,5	157,0	321,0	20
25835	25 G 0,5	16,8	227,0	445,0	20
25836	2 x 0,75	8,3	53,0	106,0	18
25837	3 G 0,75	8,5	62,0	120,0	18
25838	4 G 0,75	9,5	77,0	150,0	18
25839	5 G 0,75	10,8	86,0	158,0	18
25840	7 G 0,75	11,5	107,0	205,0	18
25841	10 G 0,75	13,1	148,0	290,0	18
25842	12 G 0,75	14,0	156,0	304,0	18
25843	14 G 0,75	15,3	214,0	380,0	18
25844	18 G 0,75	17,3	235,0	418,0	18
25845	25 G 0,75	18,7	313,0	578,0	18
25846	2 x 1	10,0	60,0	116,0	17
25847	3 G 1	10,2	70,0	135,0	17
25848	4 G 1	11,0	86,0	178,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25849	5 G 1	11,8	99,0	188,0	17
25850	7 G 1	12,7	125,0	235,0	17
25851	10 G 1	14,6	178,0	340,0	17
25852	12 G 1	15,5	186,0	358,0	17
25853	14 G 1	16,7	250,0	415,0	17
25854	18 G 1	18,0	280,0	500,0	17
25855	25 G 1	21,0	378,0	678,0	17
25856	2 x 1,5	10,5	79,0	141,0	16
25857	3 G 1,5	10,8	94,0	164,0	16
25858	4 G 1,5	11,5	113,0	220,0	16
25859	5 G 1,5	12,5	129,0	233,0	16
25860	7 G 1,5	13,2	170,0	323,0	16
25861	8 G 1,5	14,4	226,0	369,0	16
25862	10 G 1,5	14,9	258,0	461,0	16
25863	12 G 1,5	16,2	280,0	481,0	16
25864	14 G 1,5	18,1	340,0	561,0	16
25865	18 G 1,5	20,3	395,0	672,0	16
25866	21 G 1,5	21,7	461,0	780,0	16
25867	25 G 1,5	23,1	533,0	927,0	16
25868	2 x 2,5	11,8	96,0	185,0	14
25869	3 G 2,5	13,0	150,0	278,0	14
25870	4 G 2,5	14,0	174,0	370,0	14
25871	5 G 2,5	15,1	200,0	412,0	14

Continuation ▶

BIOFLEX-500®-JZ-HF-C Biofuel-resistant, abrasion-resistant, recyclable, environmentally friendly, drag-chain cable, bio-oil resistant ¹⁾, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25872	7 G 2,5	16,2	240,0	470,0	14	25881	3 G 6	19,5	250,0	525,0	10
25873	12 G 2,5	21,0	410,0	738,0	14	25882	4 G 6	21,0	305,0	700,0	10
25874	14 G 2,5	23,4	480,0	870,0	14	25883	5 G 6	23,0	441,0	800,0	10
25875	18 G 2,5	25,7	620,0	1100,0	14	25884	3 G 10	18,8	370,0	855,0	8
25876	25 G 2,5	31,0	821,0	1512,0	14	25885	4 G 10	25,0	485,0	1140,0	8
25877	2 x 4	13,4	135,0	235,0	12	25886	5 G 10	26,4	610,0	1310,0	8
25878	3 G 4	15,8	178,0	350,0	12	25887	4 G 16	28,0	840,0	1391,0	6
25879	4 G 4	17,3	222,0	460,0	12						
25880	5 G 4	19,0	328,0	550,0	12						

Dimensions and specifications may be changed without prior notice. (RC03)

C

Core end sleeves and cable lugs

- Core end sleeves
- Solderless terminals
- Tubular cable lugs
- Compression joints



You can find core end sleeves and cable lugs in our catalogue Cable Accessories. Request it now at www.helukabel.de

KOMPOSPEED® JZ-HF-500 halogen-free, microbes resistant, cable for drag chains, meter marking



HELUKABEL KOMPOSPEED JZ-HF-500 4G2,5 QMM / 26341 300/500 V 001042079 CE



Technical data

- Microbes resistant, halogen-free special control cable in adapted to DIN VDE 0281 part 13 and DIN VDE 0245
- **Temperature range**
flexing -30 °C to +90 °C
fixed installation -40 °C to +100 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable Ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special thermoplastic polymer core insulation for better sliding abilities
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece thermoplastic polymer
- Outer sheath, special thermoplastic polymer
- Colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-radiation
Oxygene
Ozone
Microbes
Hydrofluoric acid
Hydrochloric acid
and diluted sulfuric acid
- Low adhesion
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

HELUKABEL® KOMPOSPEED JZ-HF-500 control cable is significant due to its resistance against microbes. This cable is specially installed in rubbish, sewage-treatment plants, composting works, animal stalls and greenhouses. Suitable for installation for flexible use for medium mechanical, stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside. The high flexibility of this cable type makes it quick and easy to install. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text. CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26307	2 x 0,5	5,0	9,6	42,0	20
26308	3 G 0,5	5,3	14,4	51,0	20
26309	4 G 0,5	5,7	19,1	62,0	20
26310	5 G 0,5	6,4	24,0	88,0	20
26311	7 G 0,5	7,5	33,6	119,0	20
26312	12 G 0,5	9,2	58,0	166,0	20
26313	18 G 0,5	11,1	86,4	273,0	20
26314	25 G 0,5	13,4	120,0	330,0	20
26315	2 x 0,75	5,4	14,4	53,0	18
26316	3 G 0,75	5,7	21,6	70,0	18
26317	4 G 0,75	6,4	29,0	92,0	18
26318	5 G 0,75	7,0	36,0	116,0	18
26319	7 G 0,75	8,3	50,0	159,0	18
26320	12 G 0,75	10,2	86,0	241,0	18
26321	18 G 0,75	12,1	130,0	346,0	18
26322	25 G 0,75	14,9	180,0	681,0	18
26323	2 x 1	5,7	19,2	60,0	17
26324	3 G 1	6,0	29,0	79,0	17
26325	4 G 1	6,8	38,5	107,0	17
26326	5 G 1	7,4	48,0	127,0	17
26327	7 G 1	8,8	67,0	181,0	17
26328	12 G 1	10,8	115,0	284,0	17
26329	18 G 1	13,0	173,0	397,0	17
26330	25 G 1	15,8	240,0	491,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26331	2 x 1,5	6,4	29,0	88,0	16
26332	3 G 1,5	6,8	43,0	104,0	16
26333	4 G 1,5	7,4	58,0	137,0	16
26334	5 G 1,5	8,3	72,0	171,0	16
26335	7 G 1,5	9,9	101,0	264,0	16
26336	12 G 1,5	12,1	173,0	381,0	16
26337	18 G 1,5	14,5	259,0	579,0	16
26338	25 G 1,5	17,8	360,0	789,0	16
26339	2 x 2,5	7,7	48,0	118,0	14
26340	3 G 2,5	8,4	72,0	172,0	14
26341	4 G 2,5	9,1	96,0	197,0	14
26342	5 G 2,5	10,2	120,0	258,0	14
26343	7 G 2,5	12,2	168,0	347,0	14
26344	12 G 2,5	15,2	288,0	561,0	14
26345	18 G 2,5	18,1	432,0	791,0	14
26346	25 G 2,5	22,5	600,0	1090,0	14

Dimensions and specifications may be changed without prior notice. (RC03)

KOMPOSPEED® JZ-HF-500-C halogen-free, microbes resistant, Cu-screened, EMC-preferred type, cable for drag chains, meter marking



C

Technical data

- Screened microbes resistant, halogen-free special control cable in adapted to DIN VDE 0281 part 13 and DIN VDE 0245
- **Temperature range**
flexing -30 °C to +90 °C
fixed installation -40 °C to +100 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage**
core/core 4000 V
core/screen 2000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special thermoplastic polymer core insulation, for better sliding abilities
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece
- Inner-sheath to special thermoplastic polymer
- Screen of tinned cu braid, coverage approx. 85%
- Fleece separator, ensure good dismantling ability
- Outer sheath, special thermoplastic polymer
- Colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- **Resistant to**
UV-radiation
Oxygene
Ozone
Microbes
Hydrofluoric acid
Hydrochloric acid
and diluted sulfuric acid
- Low adhesion
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (0Z).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

HELUKABEL® KOMPOSPEED JZ-HF-500-C control cable is significant due to its resistance against microbes. This cable is specially installed in rubbish, sewage-treatment plants, composting works, animal stalls and greenhouses. The inner sheaths of those cables raise the mechanical stress. For medium mechanical, stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside. This screened cable is ideal for use in data signal transmission free from interferences for measurement and control engineering technology.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C € = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26347	2 x 0,5	6,9	47,0	90,0	20
26348	3 G 0,5	7,2	52,0	101,0	20
26349	4 G 0,5	7,8	55,0	119,0	20
26350	5 G 0,5	8,3	65,0	121,0	20
26351	6 G 0,5	9,1	70,0	144,0	20
26352	7 G 0,5	9,6	84,0	169,0	20
26353	12 G 0,5	11,3	117,0	250,0	20
26354	18 G 0,5	13,5	157,0	321,0	20
26355	25 G 0,5	15,8	227,0	445,0	20
26356	2 x 0,75	7,3	53,0	106,0	18
26357	3 G 0,75	7,8	62,0	116,0	18
26358	4 G 0,75	8,3	77,0	140,0	18
26359	5 G 0,75	9,1	86,0	148,0	18
26360	7 G 0,75	10,2	107,0	198,0	18
26361	12 G 0,75	12,6	156,0	294,0	18
26362	18 G 0,75	14,5	235,0	391,0	18
26363	25 G 0,75	17,3	313,0	562,0	18
26364	2 x 1	7,8	60,0	110,0	17
26365	3 G 1	8,1	70,0	131,0	17
26366	4 G 1	8,7	86,0	171,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26367	5 G 1	9,5	99,0	179,0	17
26368	7 G 1	10,9	125,0	229,0	17
26369	12 G 1	13,1	186,0	348,0	17
26370	18 G 1	15,4	280,0	498,0	17
26371	25 G 1	18,6	378,0	669,0	17
26372	2 x 1,5	8,3	79,0	141,0	16
26373	3 G 1,5	8,7	94,0	162,0	16
26374	4 G 1,5	9,5	113,0	210,0	16
26375	5 G 1,5	10,2	129,0	233,0	16
26376	7 G 1,5	12,2	170,0	317,0	16
26377	12 G 1,5	14,5	280,0	471,0	16
26378	18 G 1,5	16,9	395,0	664,0	16
26379	25 G 1,5	20,6	533,0	914,0	16
26380	2 x 2,5	9,8	96,0	182,0	14
26381	3 G 2,5	10,5	150,0	264,0	14
26382	4 G 2,5	11,2	174,0	350,0	14
26383	5 G 2,5	12,6	200,0	394,0	14
26384	7 G 2,5	14,8	240,0	450,0	14
26385	12 G 2,5	18,0	410,0	712,0	14

Dimensions and specifications may be changed without prior notice. (RC03)



HELUKABEL SUPERTRONIC-PVC 4x0,25 QMM / 49563 350 V 001041714

CE



Technical data

- Special PVC cable for drag chains, adapted to DIN VDE 0245, 0281
- Very high flexible due to special construction
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
(short time +105 °C)
- **Nominal voltage** 350 V
- **Test voltage** 1500 V
- **Breakdown voltage** min. 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6 col. 4 and 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Cores colour coded to DIN 47100, see Technical Informations
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with textile tape
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant
- Chemical Resistance - see table Technical Informations
- Adhesion-free
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

The ideal cable for use in cable trays. This high flexible cable is ideal for all areas requiring a high and fast flexing cable including the machine industries, robotics and all areas of highly mobile machine parts. The long working life offers a secure performance as well as economy. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49550	2 x 0,14	3,5	2,8	23,0	26
49551	3 x 0,14	3,7	4,1	25,0	26
49552	4 x 0,14	3,9	5,6	30,0	26
49553	5 x 0,14	4,2	7,0	35,0	26
49554	7 x 0,14	4,8	9,8	49,0	26
49555	10 x 0,14	6,2	14,0	64,0	26
49556	12 x 0,14	6,3	16,8	71,0	26
49557	14 x 0,14	6,6	19,6	77,0	26
49558	18 x 0,14	7,2	25,2	90,0	26
49559	24 x 0,14	8,5	33,6	119,0	26
49560	25 x 0,14	8,6	35,0	124,0	26
49561	2 x 0,25	4,2	5,0	28,0	24
49562	3 x 0,25	4,4	7,5	33,0	24
49563	4 x 0,25	4,7	10,0	39,0	24
49564	5 x 0,25	5,6	12,5	50,0	24
49565	7 x 0,25	6,1	17,5	63,0	24
49566	10 x 0,25	7,2	25,0	83,0	24

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49567	12 x 0,25	7,5	30,1	95,0	24
49568	14 x 0,25	7,9	35,0	107,0	24
49569	18 x 0,25	8,9	45,0	130,0	24
49570	24 x 0,25	10,4	60,0	170,0	24
49571	25 x 0,25	10,5	62,5	177,0	24
49572	2 x 0,34	4,6	6,8	33,0	22
49573	3 x 0,34	4,8	10,2	42,0	22
49574	4 x 0,34	5,2	13,6	56,0	22
49575	5 x 0,34	6,1	17,0	64,0	22
49576	7 x 0,34	7,0	23,8	84,0	22
49577	10 x 0,34	8,4	34,0	116,0	22
49578	12 x 0,34	8,5	40,8	133,0	22
49579	14 x 0,34	9,0	47,6	150,0	22
49580	18 x 0,34	10,1	61,2	182,0	22
49581	24 x 0,34	12,0	81,5	240,0	22
49582	25 x 0,34	12,2	85,0	250,0	22

Dimensions and specifications may be changed without prior notice. (RC03)

SUPERTRONIC®-C-PVC special cable for drag chains, EMC-preferred

type, meter marking



Technical data

- Special PVC cable for drag chains, adapted to DIN VDE 0245, 0281
- Very high flexible due to special construction
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
(short time +105 °C)
- **Nominal voltage** 350 V
- **Test voltage** 1500 V
- **Breakdown voltage** min. 3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6 col. 4 and 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1
- Cores colour coded to DIN 47100, see Technical Informations
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with textile tape
- Tinned copper braided screen, approx. 85% coverage
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant
- Chemical Resistance - see table Technical Informations
- Adhesion-free
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

The ideal cable for use in cable trays. This high flexible cable is ideal for all areas requiring a high and fast flexing cable including the machine industries, robotics and all areas of highly mobile machine parts. The long working life offers a secure performance as well as economy. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C E = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49620	2 x 0,14	4,0	11,2	33,0	26
49621	3 x 0,14	4,2	14,1	36,0	26
49622	4 x 0,14	4,4	15,5	41,0	26
49623	5 x 0,14	4,7	18,3	46,0	26
49624	7 x 0,14	5,3	27,6	70,0	26
49625	10 x 0,14	6,7	39,3	88,0	26
49626	12 x 0,14	6,8	41,1	97,0	26
49627	14 x 0,14	7,1	45,3	105,0	26
49628	18 x 0,14	7,7	54,1	122,0	26
49629	24 x 0,14	9,0	66,3	156,0	26
49630	25 x 0,14	9,1	68,4	162,0	26
49631	2 x 0,25	4,7	14,9	39,0	24
49632	3 x 0,25	4,9	18,8	45,0	24
49633	4 x 0,25	5,2	21,3	52,0	24
49634	5 x 0,25	5,6	31,0	70,0	24
49635	7 x 0,25	6,7	39,6	88,0	24
49636	10 x 0,25	7,8	53,9	114,0	24
49637	12 x 0,25	8,1	59,1	128,0	24

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49638	14 x 0,25	8,5	64,2	140,0	24
49639	18 x 0,25	9,5	78,4	166,0	24
49640	24 x 0,25	11,0	89,9	210,0	24
49641	25 x 0,25	11,1	101,0	220,0	24
49642	2 x 0,34	5,2	16,1	46,0	22
49643	3 x 0,34	5,4	28,7	62,0	22
49644	4 x 0,34	5,8	35,7	80,0	22
49645	5 x 0,34	6,7	39,1	88,0	22
49646	7 x 0,34	7,6	52,7	116,0	22
49647	10 x 0,34	9,0	67,4	156,0	22
49648	12 x 0,34	9,1	76,4	167,0	22
49649	14 x 0,34	9,6	85,3	195,0	22
49650	18 x 0,34	10,7	99,7	225,0	22
49651	24 x 0,34	12,6	147,1	312,0	22
49652	25 x 0,34	12,8	155,0	325,0	22

Dimensions and specifications may be changed without prior notice. (RC03)



HELUKABEL SUPERTRONIC-PURÖ 4x0,25 QMM / 49596 350 V 001042052

CE



Technical data

- Special PUR drag chain cables adapted to DIN VDE 0281 part 13
- Very high flexible due to special construction
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** 350 V
- **Test voltage** 1500 V
- **Breakdown voltage** min. 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6, col. 4 and 5, cl. 6 and IEC 60228 cl. 6
- **Oil resistant** PVC core insulation TI2, in adapted to DIN VDE 0281 part 1, for better sliding abilities
- Cores are stranded in layer with short lay-length
- Cores colour coded to DIN 47100
- Core wrapping with textile tape
- Special **full-polyurethane** outer jacket TPU to DIN VDE 0282 part 10, appendix A
- Outer jacket grey (RAL 7001), surface mat
- with meter marking, change-over in 2011

Properties

- **Features**
High flexibility at low temperature, high abrasion resistance, break and cut-resistant, tear resistant, flame retardant.
- **Resistant to** UV-radiation, Oxygen, Ozone, Hydrolyse, Oil.
- **Conditional resistant to** Microbes, Hydraulic liquidity, Alkalis, Lye.
- The PUR outer jacket is extremely robust with high tear, abrasion and oil-resistance. Adhesion-free.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Perfect for use with cable trays. This highly flexible and screened PUR control cable is ideal for use wherever frequent high flexing motion is required, e.g. in robotics or all moving parts. The long working life of this cable makes it both efficient and economic. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49583	2 x 0,14	3,5	2,8	22,0	26
49584	3 x 0,14	3,7	4,1	24,0	26
49585	4 x 0,14	3,9	5,6	29,0	26
49586	5 x 0,14	4,2	7,0	33,0	26
49587	7 x 0,14	4,9	9,8	47,0	26
49588	10 x 0,14	6,2	14,0	59,0	26
49589	12 x 0,14	6,4	16,8	67,0	26
49590	14 x 0,14	6,6	19,6	74,0	26
49591	18 x 0,14	7,3	25,2	86,0	26
49592	24 x 0,14	8,5	33,6	115,0	26
49593	25 x 0,14	8,6	35,0	120,0	26
49594	2 x 0,25	4,1	5,0	27,0	24
49595	3 x 0,25	4,3	7,5	33,0	24
49596	4 x 0,25	4,8	10,0	40,0	24
49597	5 x 0,25	5,2	12,5	48,0	24
49598	7 x 0,25	6,2	17,5	60,0	24
49599	10 x 0,25	7,4	25,0	79,0	24

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49600	12 x 0,25	7,6	30,1	91,0	24
49601	14 x 0,25	7,9	35,0	102,0	24
49602	18 x 0,25	8,9	45,0	125,0	24
49603	24 x 0,25	10,0	60,0	163,0	24
49604	25 x 0,25	10,6	62,5	170,0	24
49605	2 x 0,34	4,5	6,8	32,0	22
49606	3 x 0,34	4,9	10,2	40,0	22
49607	4 x 0,34	5,3	13,6	55,0	22
49608	5 x 0,34	5,8	17,0	60,0	22
49609	7 x 0,34	6,9	23,8	80,0	22
49610	10 x 0,34	8,4	34,0	112,0	22
49611	12 x 0,34	8,6	40,8	127,0	22
49612	14 x 0,34	9,0	47,6	142,0	22
49613	18 x 0,34	10,1	61,2	175,0	22
49614	24 x 0,34	12,0	81,5	229,0	22
49615	25 x 0,34	12,2	85,0	238,0	22

Dimensions and specifications may be changed without prior notice. (RC03)

SUPERTRONIC®-C-PURÖ special cable for drag chains, halogen-free, EMC-preferred type, meter marking



HELUKABEL SUPERTRONIC-C-PURÖ 4x0,25 QMM / 49666 500 V 001042077

CE

C



Technical data

- Special PUR drag chain cables, screened, in adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -40 °C to +70 °C
fixed installation -50 °C to +70 °C
- **Nominal voltage**
0,14 mm² 350 V
0,25 and 0,34 mm² 500 V
- **Test voltage**
0,14 mm² 800 V
0,25 and 0,34 mm² 1200 V
- **Capacitance** core/core <80 nF/km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10

Cable structure

- Plain copper conductors extra fine wire stranded to DIN VDE 0295 cl. 6, col. 4 and 5, IEC 60228 cl. 6
- **Oil resistant** TPE core insulation
- Cores are stranded in layer with short lay-length
- Cores colour coded to DIN 47100
- Core wrapping with textile tape
- Tinned copper screened braiding. Due to the technical facilities, the copper braiding can be mixed and webbed with a portion of synthetic fibres
- Special **full-polyurethane** outer jacket TMPU to DIN VDE 0282 part 10, appendix A
- Outer jacket grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- **Features**
High flexibility at low temperature, high abrasion resistance, break and cut-resistant, tear resistant, flame retardant.
- **Resistant to** UV-radiation, Oxygen, Ozone, Hydrolyse, Oil.
- **Conditional resistant to** Microbes, Hydraulic liquidity, Alkalis, Lye.
- The PUR outer jacket is extremely robust with high tear, abrasion and oil-resistance.
- Adhesion-free.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Used for installation in dry, moist and wet environments as well as for outdoors, for free movement without forced motion and for flexible routing without forced motion, for proven use as drag-chain cables. Suitable as a highly flexible control cable for fast hoisting and bending stresses in machinery and tooling construction, in robotics engineering and for continuously moving machinery parts.

The long working life of this cable makes it both efficient and economic. The copper braided screening offers effective protection from both internal and external interference.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

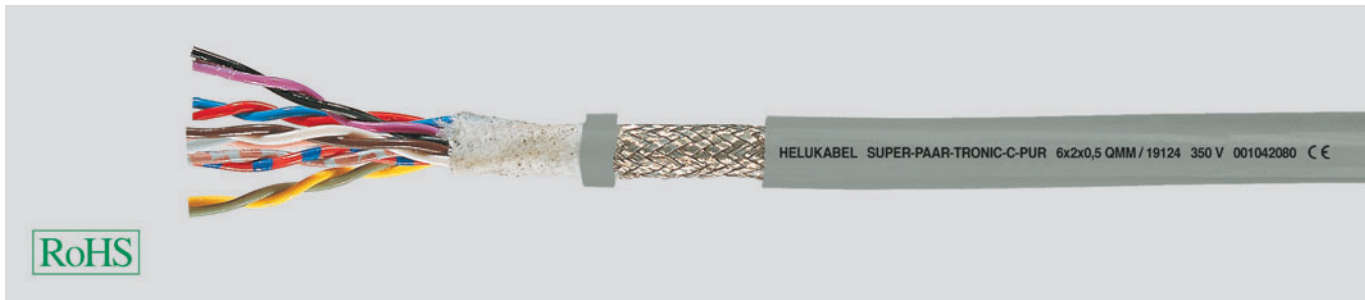
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
49653	2 x 0,14	4,1	11,2	32,0	26	49670	12 x 0,25	8,4	59,1	124,0	24
49654	3 x 0,14	4,3	14,1	35,0	26	49671	14 x 0,25	8,7	64,2	135,0	24
49655	4 x 0,14	4,5	15,5	40,0	26	49672	18 x 0,25	9,5	78,4	160,0	24
49656	5 x 0,14	4,8	18,3	45,0	26	49673	24 x 0,25	11,0	89,9	202,0	24
49657	7 x 0,14	5,7	27,8	66,0	26	49674	25 x 0,25	11,1	101,0	211,0	24
49658	10 x 0,14	6,7	39,3	86,0	26	49675	2 x 0,34	5,0	18,1	45,0	22
49659	12 x 0,14	6,9	42,1	94,0	26	49676	3 x 0,34	5,4	28,7	60,0	22
49660	14 x 0,14	7,1	45,3	102,0	26	49677	4 x 0,34	6,2	35,7	76,0	22
49661	18 x 0,14	7,8	54,1	118,0	26	49678	5 x 0,34	6,7	39,1	82,0	22
49662	24 x 0,14	9,0	66,3	149,0	26	49679	7 x 0,34	7,6	52,7	110,0	22
49663	25 x 0,14	9,1	68,4	156,0	26	49680	10 x 0,34	9,2	67,4	148,0	22
49664	2 x 0,25	4,6	14,9	38,0	24	49681	12 x 0,34	9,4	76,4	166,0	22
49665	3 x 0,25	4,8	18,8	44,0	24	49682	14 x 0,34	10,0	85,5	185,0	22
49666	4 x 0,25	5,3	21,3	51,0	24	49683	18 x 0,34	10,9	99,7	216,0	22
49667	5 x 0,25	5,7	31,0	68,0	24	49684	24 x 0,34	12,6	147,1	300,0	22
49668	7 x 0,25	6,7	39,6	82,0	24	49685	25 x 0,34	12,8	155,0	313,0	22
49669	10 x 0,25	8,2	53,9	110,0	24						

Dimensions and specifications may be changed without prior notice. (RC03)

SUPER-PAAR-TRONIC-C-PUR cable for drag chains,

halogen-free, EMC-preferred type, meter marking



Technical data

- Special PETP-PUR cable, twisted in pairs, adapted to DIN VDE 0245, 0812
- **Conductor and loop resistance** as per DIN VDE 0295, for 0,25 mm² see pages Technical-Informationen
- **Temperature range**
flexing -40 °C to +70 °C
fixed installation -50 °C to +70 °C
- **Nominal voltage** 350 V
- **Test voltage** 1500 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance**
approx. 135 nF/km
- **Minimum bending radius**
flexing at 0,25 mm²
approx. 7,5xcable ø
fixed installation at 0,25 mm²
approx. 4xcable ø
flexing at 0,5-1,0 mm²
approx. 10xcable ø
fixed installation at 0,5-1,0 mm²
approx. 5xcable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Plain copper conductors, extra fine wire stranded to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special core insulation of TPE
- Core identification as per DIN 47100
- Cores twisted in pairs, the pairs torsion-free stranded in layers
- Special fleece over outer layer
- Tinned copper screened braiding, approx. 85% coverage
- **Full-polyurethane** outer jacket TPU, to DIN VDE 0282 part 10, appendix A
- Outer jacket grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Very good oil resistant, test method according to DIN VDE 0472 part 803
- Resistant to weather, ozone and UV-radiation
- Chemical resistant to solvents, acids, lyes and hydraulic liquidity
- Flame retardant
- Guaranteed permanent application in multi-shift operation under extreme high bending stress
- High resistant to mechanical strain
- High property of alternating bending strength
- Long life durabilities through low friction-resistance by using the TPE-core insulation where the core are stranded in layers
- High tensile strength-, abrasion- and impact resistant at low temperature
- Adhesion-low
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

These pair stranded and overall screened special cables for drag chains offer the operational possibilities where the outer electrical influences at high frequency cause interference of impulse transmission, are applied for permanent flexible operations in machineries, machine tools, robot technics, for movable automated machinery parts and multi-shift-operation as a transmission-cable.

These high flexible data cables are developed according to the newest state of technology improvement and with its sliding abilities by using the PETP-core insulation and adhesion-low and cut-resistant PUR-outer jacket, guaranteed an optimum life durabilities and highly economic. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19101	1 x 2 x 0,25	4,7	14,0	28,0	24
19102	2 x 2 x 0,25	6,5	32,0	61,0	24
19103	3 x 2 x 0,25	6,6	38,4	73,0	24
19104	4 x 2 x 0,25	7,1	43,2	90,0	24
19105	5 x 2 x 0,25	8,2	51,5	105,0	24
19106	6 x 2 x 0,25	8,5	71,8	133,0	24
19107	8 x 2 x 0,25	9,2	74,4	156,0	24
19108	10 x 2 x 0,25	10,7	90,0	188,0	24
19109	14 x 2 x 0,25	11,5	111,2	220,0	24
19119	1 x 2 x 0,5	5,5	22,0	47,0	20
19120	2 x 2 x 0,5	7,9	50,0	100,0	20
19121	3 x 2 x 0,5	8,2	71,8	131,0	20
19122	4 x 2 x 0,5	8,9	74,4	149,0	20
19123	5 x 2 x 0,5	10,3	84,5	169,0	20
19124	6 x 2 x 0,5	10,7	99,6	196,0	20
19125	8 x 2 x 0,5	11,8	144,3	285,0	20
19126	10 x 2 x 0,5	13,5	176,0	344,0	20
19127	14 x 2 x 0,5	14,8	215,4	401,0	20

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19128	1 x 2 x 0,75	6,3	34,0	61,0	18
19129	2 x 2 x 0,75	9,0	60,0	113,0	18
19130	3 x 2 x 0,75	9,1	85,7	158,0	18
19131	4 x 2 x 0,75	9,9	93,6	173,0	18
19132	5 x 2 x 0,75	11,5	113,0	203,0	18
19133	6 x 2 x 0,75	11,9	130,4	231,0	18
19134	8 x 2 x 0,75	13,1	192,2	343,0	18
19135	10 x 2 x 0,75	15,0	258,0	467,0	18
19136	14 x 2 x 0,75	16,4	316,6	546,0	18
19137	1 x 2 x 1	6,9	42,0	71,0	17
19138	2 x 2 x 1	10,0	73,0	130,0	17
19139	3 x 2 x 1	10,2	93,6	170,0	17
19140	4 x 2 x 1	11,3	117,8	204,0	17
19141	5 x 2 x 1	13,1	139,0	238,0	17

Dimensions and specifications may be changed without prior notice. (RC03)

Research & Development

HELUKABEL® is responding to market demands with continuous new development of cable types

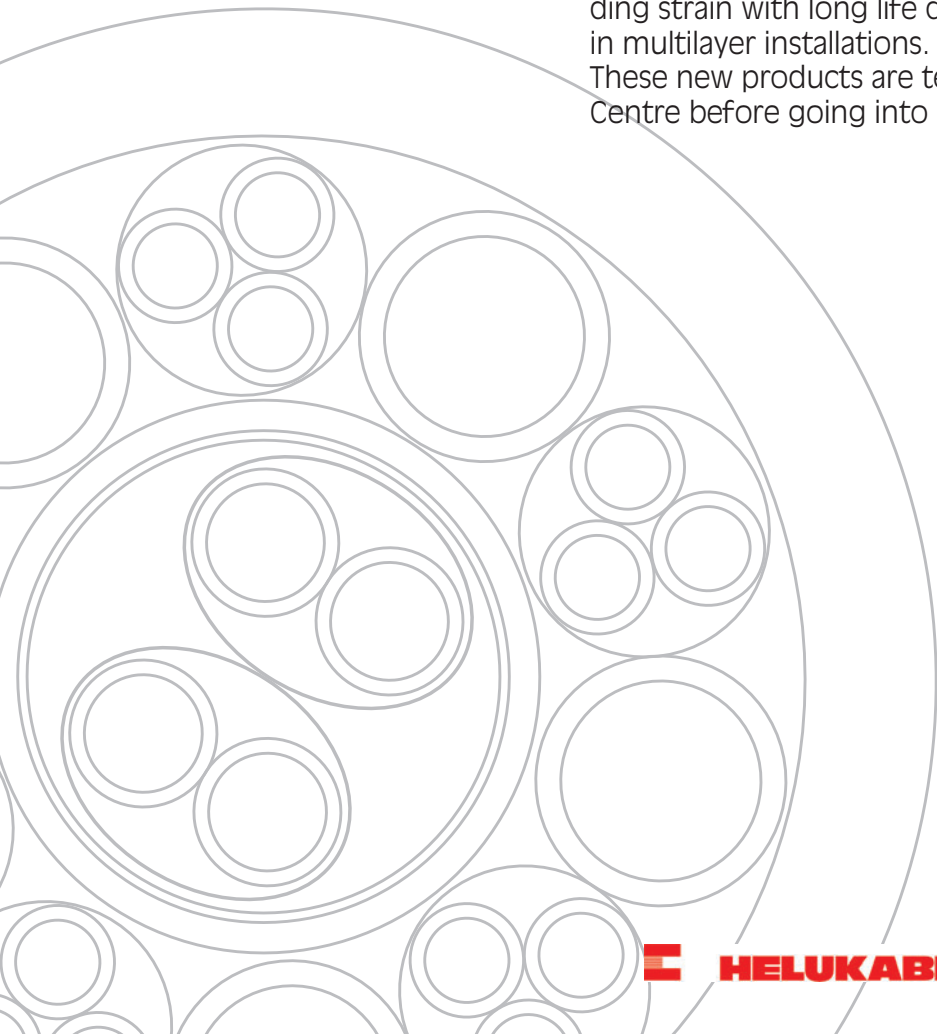
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Photos: Helukabel®

We continuously develop new connection types with special construction for extreme conditions in collaboration with our Customers, such as very small bending radius, or repeated bending strain with long life durabilities for extended operation in multilayer installations.

These new products are tested in our modern well-equipped Test Centre before going into production.



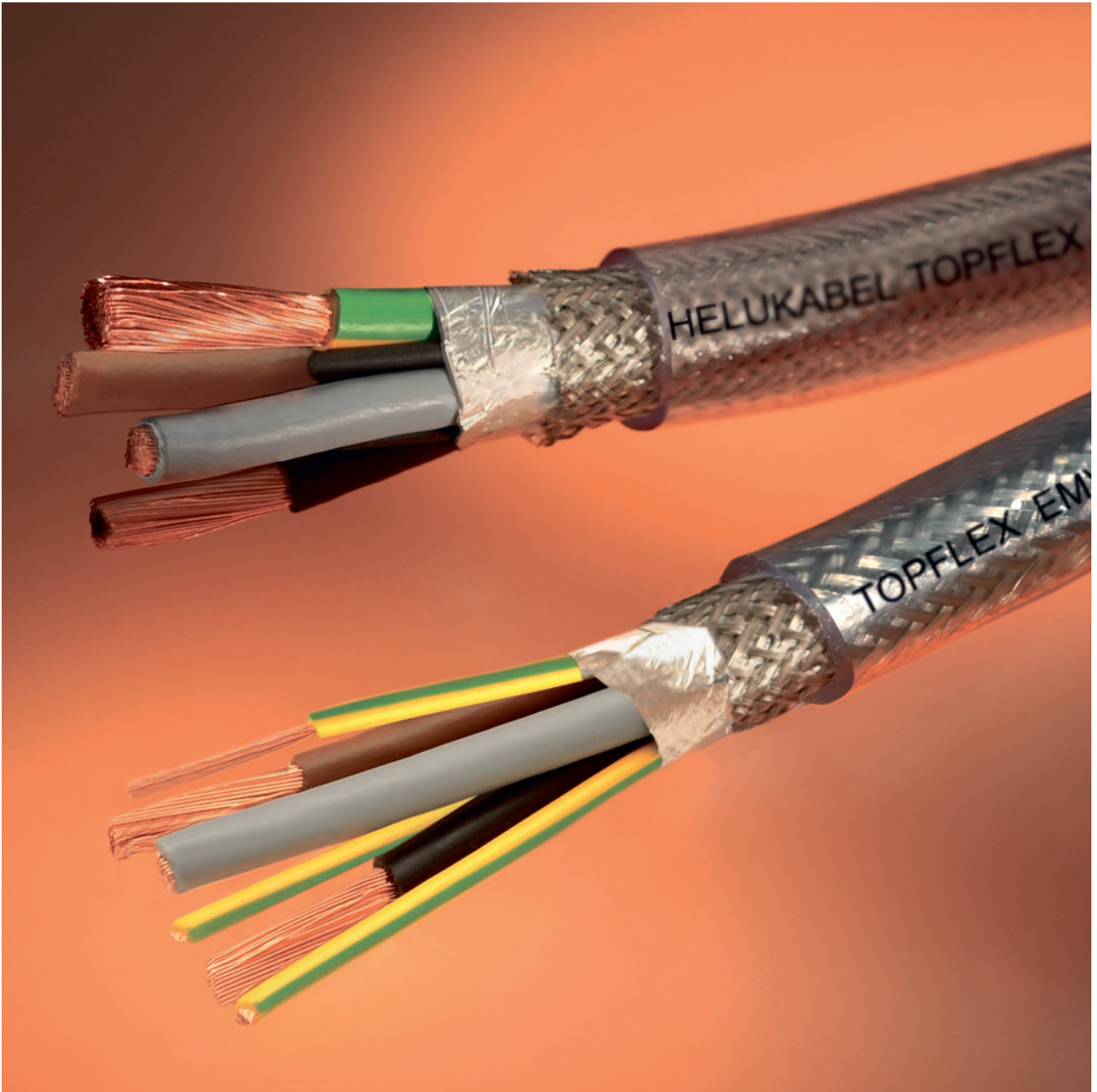


Photo: HELUKABEL®

Motor, Servo & Feedback Cables

Motor, Servo & Feedback Cables

D

A multitude of applications requires the construction of many special cables. Corresponding to the customers requirements, those cables may be constructed with different stranding elements and cross-sections of the cable. In this case we are speaking about combination or hybrid cables.

There could turn out to be technical reasons, specific to the application, for using different insulating materials or choosing special stranding types or a special screen, for example multiple or mixed screening.



Motor, Servo & Feedback Cables according to UL/CSA see in chapter N.

Contents

Description	Page
TOPFLEX® 600-PVC, for power supply connections 0,6/1kV, meter marking	D 4
TOPFLEX® 611-PUR, for power supply connections 0,6/1kV, meter marking	D 5
TOPFLEX® 600-C-PVC, Motor power supply cable 0,6/1kV, meter marking	D 6
TOPFLEX® 611-C-PUR, Motor power supply cable 0,6/1kV, halogen-free, meter marking	D 7
TOPSERV® 130, flexible servo cable 0,6/1kV, meter marking	D 8
TOPSERV® 110 / 120 / Feedback-Cable, drag chain cable, 0,6/1kV EMC-preferred type, servo/feedback cable, high flexible, meter marking	D 9
Tachofeedback-Cable-C-PVC, Incremental feedback-cable-C-PVC, EMC-preferred type, meter marking	D 10
Tachofeedback-Cable-C-PUR, Incremental feedback-cable-C-PUR, drag chain cable, EMC-preferred type, meter marking	D 11
TOPFLEX® 240-PVC / 240-PUR, special measuring and data cable, EMC-preferred type, meter marking	D 12
TOPFLEX®-PVC, feedback cable, EMC-preferred type, meter marking	D 13
TOPFLEX®-PUR, drag chain feedback cable, EMC-preferred type, halogen-free, meter marking	D 14
TOPFLEX®-PVC, feedback cable, EMC-preferred type, meter marking	D 15
TOPFLEX®-PUR, drag chain feedback cable, EMC-preferred type, halogen-free, meter marking	D 16
TOPFLEX® -EMV-2YSLCY-J, for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking	D 17
TOPFLEX® -EMV-UV-2YSLCYK-J, for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking	D 19
TOPFLEX®-EMV-3 PLUS 2YSLCY-J, for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking	D 21
TOPFLEX®-EMV-UV-3 PLUS 2YSLCYK-J, for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking	D 23
TOPFLEX® Motor 109, low capacitance power supply cable 0,6/1kV, increased ampacity, halogen-free, meter marking	D 25



D

Technical data

- Special PVC-insulated sheathed cable
- Based on DIN VDE 0293, 0295
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 600/1000 V
- **Test voltage** 4000 V
- **Breakdown voltage**
min. 8000V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing approx. 7,5x cable ø
fixed installation approx. 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (to 80 Mrad)

Cable structure

- Finely stranded, plain Cu wire conductor according to VDE 0295 cl. 5 and IEC 60228 cl. 5
- PVC core insulation
- Cores black with sequential numbering imprinted in white, according to DIN VDE 0293
- Earth core green-yellow
- Cores stranded in layers with optimal lay-length
- Special-PVC-insulated outer jacket
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PVC outer jacket: extensively oil resistant
Chemical Resistance - see table Technical Informations
- Flame retardant and self-extinguishing, test method B according to DIN VDE 0472 part 804 and IEC 60332-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- For use in drag chains, we recommend our versions TOPFLEX® 611-PUR and TOPFLEX® 611-C-PUR.
- **screened analogue type:**
TOPFLEX® 600-C-PVC, see page D 6

Application

As supply cable for electronically controlled servo-motors and connections to DNC motors. The cable is suitable for permanent and flexible installation for medium mechanical loads in dry, damp and wet environments.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22860	4 G 1,5	9,6	58,0	130,0	16	22866	4 G 25	27,4	960,0	1805,0	4
22861	4 G 2,5	11,2	95,0	220,0	14	22867	4 G 35	30,0	1344,0	2060,0	2
22862	4 G 4	13,0	154,0	350,0	12	22868	4 G 50	35,8	1920,0	2900,0	1
22863	4 G 6	14,5	231,0	445,0	10	22869	4 G 70	40,9	2640,0	4050,0	2/0
22864	4 G 10	18,2	384,0	660,0	8	22854	4 G 95	46,2	3648,0	5540,0	3/0
22865	4 G 16	22,3	615,0	1060,0	6	22855	4 G 120	51,6	4608,0	7000,0	4/0

Dimensions and specifications may be changed without prior notice. (RD01)

TOPFLEX® 611-PUR for power supply connections 0,6/1kV, meter marking



Technical data

- Special-PUR drag chain cable Based on DIN VDE 0293, 0295, 0250, 0281
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +90 °C
- **Nominal voltage** U₀/U 600/1000 V
- **Test voltage** 4000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Min. bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and/or IEC 60228 cl. 6
- TPE-core insulation
- Cores black with sequential numbering imprinted in white, according to DIN VDE 0293
- Green-yellow earth core
- Cores stranded together with optimal lay-length and stabilising filler
- Fleece wrapping facilitates sliding
- PUR-insulated outer jacket
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Adhesion-free, extremely abrasion resistant, halogen-free, flame retardant, resistant to hydrolysis and microbial attack
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- For extreme applications extending beyond standard solutions we recommend that you request our questionnaire, which has been especially designed for energy supply systems.
- Please observe applicable installation regulations for use in energy supply chains.
- **screened analogue type:**
TOPFLEX® 611-C-PUR, see page D 7

Application

As optimized supply cable for the supply to motors, in particular to DNC motors, servo-motors. These cables are specially designed for use in power drag chains, handling equipment, robotics, tooling machinery, processing and manufacturing machinery. Optimised insulation materials ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids as well as many alkalis and solvents. Favourable outer diameters, reduced weights and enhanced torsion characteristics assure the use in multi-layer operations with extremely high continuous bending loads. Suitable for outdoor use.

CE=The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22870	4 G 1,5	8,0	58,0	125,0	16
22871	4 G 2,5	10,8	95,0	215,0	14
22872	4 G 4	12,5	154,0	310,0	12
22873	4 G 6	14,8	231,0	470,0	10
22874	4 G 10	18,8	384,0	760,0	8
22875	4 G 16	22,8	615,0	1250,0	6

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22876	4 G 25	26,9	960,0	1510,0	4
22877	4 G 35	30,7	1344,0	2100,0	2
22978	4 G 50	36,5	1920,0	2950,0	1
22979	4 G 70	41,6	2640,0	4090,0	2/0
22980	4 G 95	48,2	3648,0	5580,0	3/0
22981	4 G 120	51,6	4608,0	7040,0	4/0

Dimensions and specifications may be changed without prior notice. (RD01)



D

Technical data

- Special PVC-insulated sheathed cable
- Based on DIN VDE 0293, 0295
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 600/1000 V
- **Test voltage** 4000 V
- **Breakdown voltage**
min. 8000V
- **Coupling resistance**
max. 250 Ohm/km
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing approx. 7,5x cable ø
fixed installation approx. 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (to 80 Mrad)

Cable structure

- Finely stranded, plain Cu wire conductor according to VDE 0295 cl. 5 and IEC 60228 cl. 5
- PVC core insulation
- Cores black with sequential numbering imprinted in white, according to DIN VDE 0293
- Earth core green-yellow
- Cores stranded in layers with optimal lay-length
- Special-PVC-insulated outer jacket
- PVC inner jacket
- Tinned copper braided screening, coverage approx. 85%
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PVC outer jacket: extensively oil resistant
Chemical Resistance - see table Technical Informations
- Flame retardant and self-extinguishing to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Applications as described above with additional compliance with electromagnetic compatibility (EMC compatibility) requirements on account of the 90% coverage by the braided screening

Note

- For use in drag chains, we recommend our versions TOPFLEX® 611-PUR and TOPFLEX® 611-C-PUR.
- **unscreened analogue type:**
TOPFLEX® 600-PVC, see page D 4

Application

As supply cable for electronically controlled servo-motors and connections to DNC motors. The cable is suitable for permanent and flexible installation for medium mechanical loads in dry, damp and wet environments.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22960	4 G 1,5	11,8	99,0	250,0	16
22961	4 G 2,5	13,8	169,0	360,0	14
22962	4 G 4	15,7	234,0	530,0	12
22963	4 G 6	17,3	316,0	620,0	10
22964	4 G 10	21,5	549,0	1050,0	8
22965	4 G 16	26,1	807,0	1465,0	6

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22966	4 G 25	31,7	1169,0	1920,0	4
22967	4 G 35	34,5	1680,0	2515,0	2
22856	4 G 50	40,7	2370,0	3315,0	1
22857	4 G 70	46,0	3257,0	4600,0	2/0
22858	4 G 95	51,3	4060,0	6060,0	3/0
22859	4 G 120	56,4	5231,0	7315,0	4/0

Dimensions and specifications may be changed without prior notice. (RD01)

TOPFLEX® 611-C-PUR Motor power supply cable 0,6/1kV, halogen-free, meter marking



Technical data

- Special-PUR drag chain cable Based on DIN VDE 0293, 0295, 0250, 0281
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +90 °C
- **Nominal voltage** U₀/U 600/1000 V
- **Test voltage** 4000 V
- **Coupling resistance**
max. 250 Ohm/km
- **Insulation resistance**
min. 20 MOhm x km
- **Min. bending radius**
flexing 10x cable ø
fixed installation 5x cable ø

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and/or IEC 60228 cl. 6
- TPE-core insulation
- Cores black with sequential numbering imprinted in white, according to DIN VDE 0293
- Green-yellow earth core
- Cores stranded together with optimal lay-length and stabilising filler
- Fleece wrapping facilitates sliding
- PUR-insulated outer jacket
- TPE inner jacket
- Tinned copper braided screening, coverage approx. 85%
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Adhesion-free, extremely abrasion resistant, halogen-free, flame retardant, resistant to hydrolysis and microbial attack
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- For extreme applications extending beyond standard solutions we recommend that you request our questionnaire, which has been especially designed for energy supply systems.
- Please observe applicable installation regulations for use in energy supply chains.
- **unscreened analogue type:**
TOPFLEX® 611-PUR, see page D 5

Application

As optimized supply cable for the supply to motors, in particular to DNC motors, servo-motors. These cables are specially designed for use in power drag chains, handling equipment, robotics, tooling machinery, processing and manufacturing machinery. Optimised insulation materials ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids as well as many alkalis and solvents. Favourable outer diameters, reduced weights and enhanced torsion characteristics assure the use in multi-layer operations with extremely high continuous bending loads. Suitable for outdoor use.

CE=The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22970	4 G 1,5	11,3	99,0	220,0	16
22971	4 G 2,5	13,5	169,0	340,0	14
22972	4 G 4	16,0	234,0	490,0	12
22973	4 G 6	17,8	316,0	680,0	10
22974	4 G 10	22,2	549,0	1035,0	8
22975	4 G 16	27,2	807,0	1460,0	6

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22976	4 G 25	31,2	1169,0	1990,0	4
22977	4 G 35	35,2	1680,0	2535,0	2
22982	4 G 50	42,5	2370,0	3360,0	1
22983	4 G 70	48,8	3257,0	4650,0	2/0
22984	4 G 95	54,6	4060,0	6090,0	3/0
22985	4 G 120	58,5	5231,0	7380,0	4/0

Dimensions and specifications may be changed without prior notice. (RD01)

TOPSERV® 130 flexible servo cable 0,6/1kV, meter marking



D

Technical data

- Special PVC drag chain cable acc. to DIN VDE 0281, 0245, 0250
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
power supply cores U_0/U 600/1000 V
control cores U_0/U 300/500 V
- **A.c. test voltage**, 50 Hz
power supply cores 4000 V
control cores 1000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Coupling resistance**
max. 250 Ωm/km
- **Minimum bending radius**
flexing approx. 10x cable \varnothing
fixed installation approx. 5x cable \varnothing

Cable structure

- Bare copper, fine wire conductors to DIN VDE 0295 cl. 5 and/or IEC 60228 cl. 5
- Special-PVC core insulation
- Core identification
-Power supply cores black with imprint white and earth core green-yellow
-Control cores:
0,34mm²: white/brown, green/yellow
from 0,5mm²: black with imprint white
- Screening of the control cores in pairs wrapped with plastic aluminium foil, copper drain-wire tinned and tinned copper braided screening, approx. coverage 85%
- Control cores stranded in pairs and laid up in layers together with the power supply cores with optimal lay length
- Polyester fleece wrapping
- Overall screening from tinned copper braid, optimal. coverage min. 85%
- Special-PVC outer sheath, grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- extensive oil-resistant
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Application

The supply conductors for these cables are ideally combined with the control conductors for the brake function and the thermal protection. Accurately working servomotors require high performance, reliable and durable cables. These requirements are fully met. The cables have an additional total shield for EMC compatibility. The production is based on the specifications of well known servo-drive and control system manufacturers as well as on several VDE standards.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C € = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59212	(4 x 0,75 + 2 x (1 G 0,34))	10,7	109,0	167,0	17
59213	(4 x 1,5 + 2 x (1 G 0,75))	12,7	154,0	241,0	17
59214	(4 x 2,5 + 2 G 0,75)	14,7	229,0	381,0	17
59215	(4 x 4 + 2 G 0,75 + 2 x 1,0)	16,5	317,0	480,0	17

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59216	(4 x 6 + 2 G 0,75 + 2 x 1,0)	17,6	420,0	604,0	17
59217	(4 x 10 + 2 G 0,75 + 2 x 1,0)	21,6	604,0	851,0	17
59218	(4 x 16 + 2 x (1 G 1,0))	24,4	891,0	1215,0	17
59219	(4 x 25 + 2 x (1 G 1,5))	30,0	1271,0	1647,0	17

Dimensions and specifications may be changed without prior notice. (RN07)

TOPSERV® 110 / 120 / Feedback-Cable drag

chain cable, 0,6/1kV EMC-preferred type, servo/feedback cable, high flexible, meter marking



Technical data

- Spezial-PUR drag chain cable based on DIN VDE 0295, 0250, 0281
- **Temperature range**
flexing -40 °C to +90 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage**
power supply cores U₀/U 600/1000 V
control cores U₀/U 300/500 V
- **Test voltage**
power supply cores 4000 V
control cores 1000 V
- **Power rating**
to DIN VDE 0298 part 4
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing approx. 7,5x cable Ø
fixed installation approx. 4x cable Ø
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Plain copper conductor, ultra-fine wire for TOPSERV® 110:
1 mm² = 19x0,25 mm
- TPE core insulation, halogen-free
- Core identification:
Power supply cores black with imprint U1, V2, W3 and earth core green-yellow, Control cores black with imprint BR1, BR2 or nos. 5-6 and 7-8 for the 2-pair-version
- Screening of the control cores in pairs with Al film, tinned drain wire and tinned Cu braid; single pair with tinned Cu braid only
- Control cores stranded in pairs and laid up in layers together with the power supply cores
- Fleece wrapping
- Overall screening of tinned cu braid, visible coverage min. 80%
- Fleece wrapping
- PUR-outer sheath, flame-resistant
- Colour petrol (RAL 5018)
- with meter marking, change-over in 2011

Properties

- PUR-outer sheath flame retardant, low adhesion, resistant to hydrolysis and microbial attack, halogen-free
- These highly flexible cables are fitted with an additional overall screen to assure EMC compatibility, i.e. the protection against electromagnetic interference
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- For extreme applications extending beyond standard solutions we recommend that you request our questionnaire, which has been especially designed for energy supply systems.
- Please observe applicable installation regulations for use in energy supply chains.

Application

The combination of feeder cores with the control cores for the braking function and the thermal protection in these cables is ideal. Precision servomotors, as used today in many areas of highly-automated manufacturing processes, call for high-quality, reliable and long-lasting cables. These requirements are met to a high degree as is the electromagnetic compatibility (EMC).

These cables can also be used as drag chain cables.

Manufacturing is based on specifications from renowned manufacturers of servo-actuators and servo-controls as well as in accordance with diverse VDE standards. Application for system SIMODRIVE.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

TOPSERV® 110

(1 pair screened and overall screening)

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
71491	(4 x 1,5 + (2 G 1,0))	11,5	139,0	211,0	16
71493	(4 x 2,5 + (2 G 1,0))	13,6	188,0	273,0	14
71705	(4 x 4 + (2 G 1,0))	14,6	260,0	352,0	12
71706	(4 x 6 + (2 G 1,0))	16,0	360,0	500,0	10
71707	(4 x 10 + (2 G 1,0))	20,2	590,0	753,0	8
71708	(4 x 16 + (2 G 1,0))	23,8	845,0	1061,0	6
71709	(4 x 25 + (2 G 1,0))	27,0	1320,0	1499,0	4
71710	(4 x 35 + (2 G 1,0))	31,9	1840,0	1992,0	2
71711	(4 x 50 + (2 G 1,0))	36,7	2530,0	2880,0	1

TOPSERV® 120

(2 pairs individually screened and overall screening)

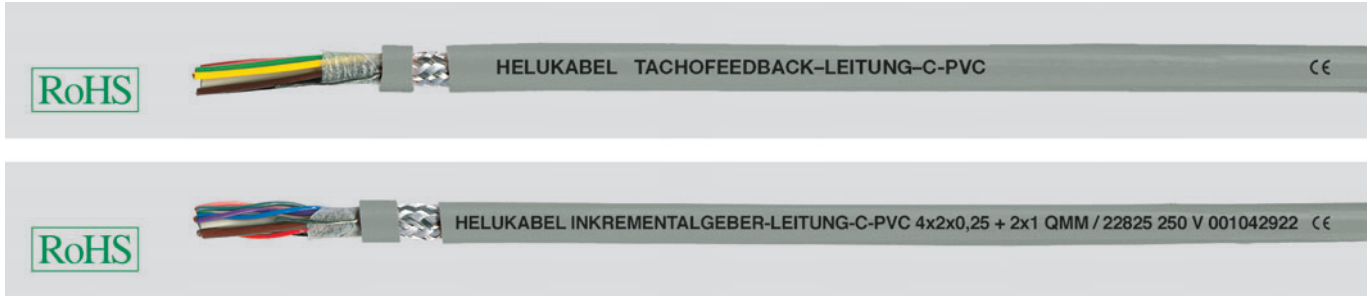
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
71990	(4 x 1,5 + 2 x (2 G 1,0))	12,6	186,0	242,0	16
71991	(4 x 2,5 + 2 x (2 G 1,0))	15,0	231,0	316,0	14
71992	(4 x 4 + 2 x (2 G 1,0))	16,0	308,0	415,0	12
71993	(4 x 6 + 2 x (2 G 1,0))	18,2	420,0	574,0	10
71994	(4 x 10 + 2 x (2 G 1,0))	22,8	647,0	805,0	8
71995	(4 x 16 + 2 x (2 G 1,0))	25,0	918,0	1122,0	6
71996	(4 x 25 + 2 x (2 G 1,0))	27,7	1400,0	1584,0	4
72106	(4 x 35 + 2 x (2 G 1,0))	32,0	1882,0	2185,0	2
71997	(4 x 50 + 2 x (2 G 1,0))	37,0	2574,0	2977,0	1

TOPSERV® Feedback-Cable (overall braid-screened)

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Cable structure (deviation from TOPSERV®)
72042	(12 x 0,25)	7,5	49,0	90,0	24	PVC-core insulation, Cores colour coded, Foil taped, PUR-jacket
71492	(3 x (2 x 0,14) + 4 x 0,14 + 4 x 0,25 + 2 x 0,5)	10,7	92,0	145,0	-	TPE-core insulation, Cores colour coded, Fleece wrapping, PUR-jacket
72043	(4 x 2 x 0,34 + 4 x 0,5)	9,5	77,0	144,0	22	PVC-core insulation, Cores colour coded, Foil taped, PUR-jacket

Dimensions and specifications may be changed without prior notice. (RD01)

Tachofeedback-Cable-C-PVC, Incremental feedback-cable-C-PVC EMC-preferred type, meter marking



Technical data

- Special core and sheath compound from PVC
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage**
Tachofeedback-cable-C-PVC
450 V
Increm. feedback-cable-C-PVC
250 V
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Breakdown voltage**
min. 4000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
10x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and/or IEC 60228 cl. 5
- Special PVC core insulation
- **Colour code**
Tachofeedback-cable:
blue, white, red, pink, green, yellow, brown, black, grey
Incremental feedback-cable:
brown, black/red, green/light-brown, white, pink/grey, violet/blue
- Single cores or pairs stranded in layer with optimal lay-length pairs part no. 22825)
- Core wrapping with film
- Drain wire
- Tinned copper braided screening, coverage approx. 85%
- Special PVC outer sheath
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, for oil-/ chemical Resistance see Techn. Information table
- PVC self-extinguishing and flame resistant to VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent to DIN VDE 0472 part 804 test type B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

Both cables fulfil differing tasks for the control of servo-motors.

The tachofeedback-cable or response cable serves the regulation of the motor speed and measurement of the actual values.

The incremental feedback-cable or position response cable transfers the control signals for positioning and engineering characteristics and is used as the flexible connecting cable for tachometer, brakes, pulse transmitter in system and mechanical engineering, in dry, damp and wet environments.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Tachofeedback-Cable

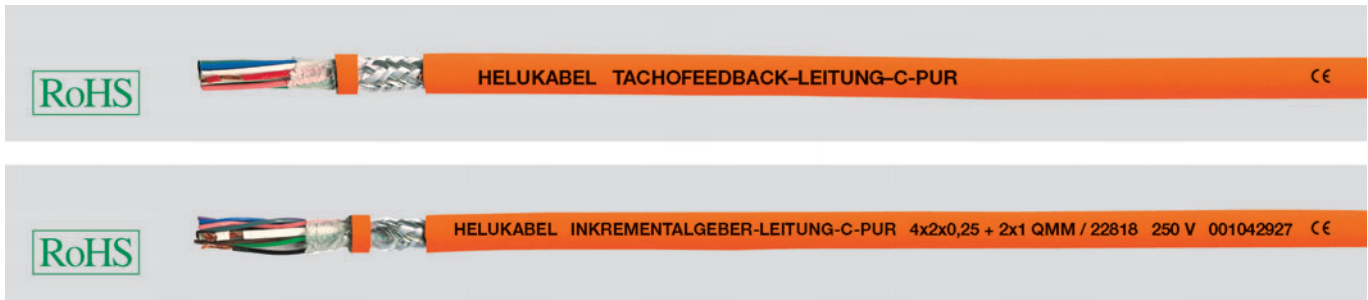
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22824	(9 x 0,5)	8,8	81,0	150,0	20

Incremental feedback-cable

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22825	(4 x 2 x 0,25 + 2 x 1,0)	8,8	66,0	110,0	24

Dimensions and specifications may be changed without prior notice. (RD01)

Tachofeedback-Cable-C-PUR, Incremental feedback-cable-C-PUR drag chain cable, EMC-preferred type, meter marking



Technical data

- Special core and sheath compound of TPE-E/PUR
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage**
Tachofeedback-cable-C-PUR = 450 V
Incremental feedback-cable-C-PUR = 250 V
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing approx. 10x cable \varnothing
fixed installation approx. 5x cable \varnothing
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and/or IEC 60228 cl. 6
- TPE-core insulation
- **Colour code**
Tachofeedback-cable:
blue, white, red, pink, green, yellow, brown, black, grey
Incremental feedback-cable:
brown (1mm²), black/red, green/light-brown (1mm²), white, pink/grey, violet/blue
- Single cores or pairs stranded in layer with optimal lay-length pairs part no. 22818)
- Fleece wrapping
- Drain wire
- Tinned copper braided screening, coverage approx. 85%
- Special PUR (polyurethane) outer sheath matt
- Sheath colour orange (RAL 2003)
- with meter marking, change-over in 2011

Properties

- Special PUR outer sheath low adhesion and flame retardant
- **Resistant to**
Oils and fats
Acids and alkalis
Hydraulic fluids
Oxygen and ozone
UV-radiation
Hydrolysis
Microbial attack
Water and weathering effects
- The high abrasion resistance and notch resistance meet the highest requirements
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- For extreme applications extending beyond standard solutions we recommend that you request our questionnaire, which has been especially designed for energy supply systems.
- Please observe applicable installation regulations for use in energy supply chains.

Application

Both cables fulfil differing tasks for the control of servo-motors.

The tachofeedback-cable or response cable serves the regulation of the motor speed and measurement of the actual values.

The incremental feedback-cable or position response cable transfers the control signals for positioning and engineering characteristics and is used as the flexible connecting cable for tachometer, brakes and pulse transmitter in case of high mechanical stress in plant, machine and control engineering in dry, moist and wet rooms. Particularly suitable for continuous operating in drag chains, industrial robotics and handling equipment as these cables enable an excellent transmission of data and signals. Additional cores for the power supply to individual components are available. The braided screen guarantees reliable signal transmission. Optimum functionality, long service life and an excellent cost-performance ratio are given for the mentioned applications by the special compounds used for insulation and sheath.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Tachofeedback-cable

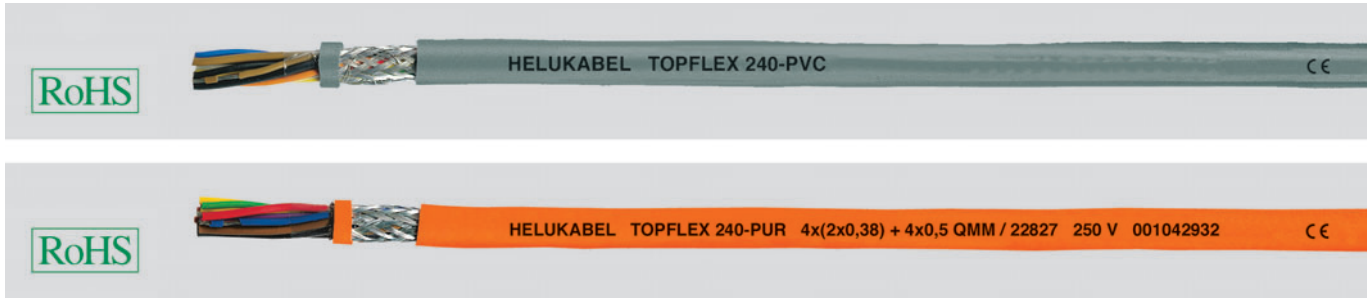
Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight approx. kg / km	Weight approx. kg / km	AWG-No.
22823	(9 x 0,5)	8,8	80,8	128,0	20

Incremental feedback cable

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight approx. kg / km	Weight approx. kg / km	AWG-No.
22818	(4 x 2 x 0,25 + 2 x 1,0)	8,8	65,2	105,0	24

Dimensions and specifications may be changed without prior notice. (RD01)

TOPFLEX® 240-PVC / 240-PUR special measuring and data cable, EMC-preferred type, meter marking



Technical data

- Special core and sheath compound from PVC
- **Core resistance** at 20 °C
0,38 mm² max. 47 Ohm/km
0,50 mm² max. 36 Ohm/km
- **Temperature range**
flexing -10 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** 500 V
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
approx. 10x cable \varnothing
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- TOPFLEX® 240-PVC**
- Tinned copper conductor
0,38 mm² 19x0,16 mm
0,50 mm² 28x0,15 mm
 - PVC core insulation
 - Cores stranded in pairs with optimal lay-length
 - Film wrap
 - Pairs stranded in layers with optimal lay-length
 - Tinned copper braided screening, coverage approx. 85%
 - PVC outer sheath
 - Sheath colour grey (RAL 7000)
 - with meter marking, change-over in 2011
- TOPFLEX®240-PUR**
- Highly-flexible copper wire stranding
 - PUR-outer sheath
 - Sheath colour orange (RAL 2003)
 - with meter marking, change-over in 2011

Properties

- **PVC-outer sheath** largely oil resistant, for oil-/ chemical Resistance see Technical Information table
- **PUR-outer sheath** particularly resistant to oil alkali as well as tear and abrasion proof
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- **Colour code No. 1 (Standard)**
0,38 mm²: orange/red violet/blue
brown/black yellow/green
0,50 mm²: brown/black yellow/red
- **Colour code No. 2 (alternative)**
0,38 mm²: orange/red violet/blue
brown/black yellow/grey
0,50 mm²: brown/black yellow/red
- **Colour-code No. 3 (to DIN 47100)**
0,38 mm²: white/brown green/yellow
grey/pink blue/red
0,50 mm²: black/violet grey-pink/red-blue

Application

TOPFLEX® 240-PVC

Used as a data and electronics cable in machines, plant installation, conveyor systems etc.

TOPFLEX® 240-PUR

This cable type is available in the following types for use under extreme conditions in machine and plant engineering.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

TOPFLEX® 240-PVC grey

Part no.	Col. code no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22801	1	4 x 2 x 0,38 + 4 x 0,5	10,5	77,0	125,0	21
22891	3	4 x 2 x 0,38 + 4 x 0,5	10,5	77,0	125,0	21
22890	2	4 x 2 x 0,38 + 4 x 0,5	10,5	77,0	125,0	21

TOPFLEX® 240-PUR orange

Part no.	Col. code no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22827	1	4 x 2 x 0,38 + 4 x 0,5	10,9	77,0	135,0	21
22892	2	4 x 2 x 0,38 + 4 x 0,5	10,9	77,0	135,0	21

Dimensions and specifications may be changed without prior notice. (RD01)

TOPFLEX®-PVC feedback cable, EMC-preferred type, meter marking



Technical data

- Special core and sheath compound from PVC
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** 350 V
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Breakdown voltage**
min. 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
10x cable ø
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Bare copper, fine and/or ultra-fine wire conductors acc. to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and/or IEC 60228
- PVC core insulation
- Cores colour coded according to DIN 47100
- Cores stranded in layers with optimal lay-length
- Core wrapping with film
- Tinned copper braided screening, coverage approx. 85%
- Special PVC outer sheath
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011
- **Colour code for cores**
Part no. / Core / colours
22845 / 10x0,14 / to DIN 47100
22845 / 2x0,5 / white, brown
22846 / 10x0,14 / to DIN 47100
22846 / 4x0,5 / white, brown, green, yellow
22820 / 15x0,14 / to DIN 47100
22820 / 4x0,5 / white, brown, green, yellow

Properties

- Largely oil-resistant, for oil-/ chemical Resistance see Technical Information table
- PVC self-extinguishing and flame resistant to VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent to DIN VDE 0472 part 804 test type B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

These feedback cables are used in machinery and control construction as well as in plant engineering as these enable an excellent transmission of data and signals. Additional cores for the power supply to individual components are available.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22845	(10 x 0,14 + 2 x 0,5)	8,0	46,2	70,0	26
22846	(10 x 0,14 + 4 x 0,5)	8,2	56,3	86,0	26

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22820	(15 x 0,14 + 4 x 0,5)	8,7	59,0	123,0	26

Dimensions and specifications may be changed without prior notice. (RD01)

TOPFLEX®-PUR drag chain feedback cable, EMC-preferred type, halogen-free, meter marking



D

Technical data

- Special core and sheath compound from PUR
- **Temperature range**
flexing -30 °C to +80 °C
- **Nominal voltage** 350 V
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing approx. 10x cable ø
fixed installation approx. 5x cable ø
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine and/or ultra-fine wire conductors acc. to DIN VDE 0295, BS 6360 and/or IEC 60228
- TPE-core insulation
- Cores colour coded according to DIN 47100
- Cores stranded in layers with optimal lay-length
- Common fleece wrapping
- Tinned copper braided screening, coverage approx. 85%
- Special PUR outer sheath
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PUR outer sheath, low adhesion, notch resistant
- The outer sheath on the basis of PUR is adhesion-free, flame retardant and resistant to hydrolysis and microbial attack
- The high abrasion resistance and notch resistance meet the highest requirements

Note

- For extreme applications extending beyond standard solutions we recommend that you request our questionnaire, which has been especially designed for energy supply systems.
- Please observe applicable installation regulations for use in energy supply chains.

Application

These feedback-cables are used in machinery and control construction as well as in plant engineering as these enable an excellent transmission of data and signals.

Particularly suitable in power drag chains, robotics and handling equipment. Additional cores for the power supply to individual components are available. The braided screen guarantees reliable signal transmission.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight approx. kg / km	Weight approx. kg / km	AWG-No.
22849	(10 x 0,14 + 2 x 0,5)	7,2	39,0	83,0	26
22848	(10 x 0,14 + 4 x 0,5)	7,7	54,3	96,0	26

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight approx. kg / km	Weight approx. kg / km	AWG-No.
22834	(15 x 0,14 + 4 x 0,5)	7,9	58,0	120,0	26

Dimensions and specifications may be changed without prior notice. (RD01)

TOPFLEX®-PVC feedback cable, EMC-preferred type, meter marking



Technical data

- Special core and sheath compound
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** 350 V
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Breakdown voltage**
min. 4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
10x cable ø
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Copper, fine and/or ultra-fine wire conductors acc. to DIN VDE 0295, BS 6360 and/or IEC 60228
- PVC core insulation
- Cores colour coded¹⁾ Cores or pairs stranded in layers with optimal lay-length
- Design includes
- Cu screen of single pairs or single cores and PVC-insulated sheath
- Common film wrapping
- Tinned copper braided screening, coverage approx. 85%
- Special PVC outer sheath
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011
- **Colour code for cores**
Part no./Core/colours
22800 / 0,14 / gn/ye, gy/pk, bu/rd
22802 / 0,14 / gn/ye, gy/pk, bu/rd
22803 / 0,14 / gn/gy, pk/rd, bn/bk
22806 / 0,14 / rd/bk, bn/gn, ye/vt,gy/pk
22800 / 0,5 / wh, bn
22802 / 0,5 / wh, bn
22803 / 0,5 / wh, bu, whgn, bngn
22806 / 0,5 / wh, bu, whgn, bngn

Properties

- Largely oil-resistant, for oil-/ chemical Resistance see Technical Information table
- PVC self-extinguishing and flame resistant to VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent to DIN VDE 0472 part 804 test type B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

These feedback-cables are used in machinery and control construction as well as in plant engineering as these enable an excellent transmission of data and signals. Additional cores for the power supply to individual components are available.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C€ = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22800	(3 x (2 x 0,14) + (2 x 0,5))	8,5	78,0	112,0	26
22802	(3 x (2 x 0,14) + (2 x 0,5))	8,5	72,0	108,0	26

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22803	(3 x 2 x 0,14 + 4 x 0,5)	8,5	66,0	98,0	26
22806	(4 x 2 x 0,14 + 4 x 0,5)	8,5	68,0	111,0	26

Dimensions and specifications may be changed without prior notice. (RD01)

TOPFLEX®-PUR drag chain feedback cable, EMC-preferred type, halogen-free, meter marking



D

Technical data

- Special core and sheath compound
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** 350 V
- **Test voltage**
core/core 2000 V
core/screen 1000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing approx. 10x cable ø
fixed installation approx. 5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation-resistance**
up to 50x10⁶ cJ/kg (up to 50 Mrad)

Cable structure

- Bare copper, ultra-fine wire conductor to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and/or IEC 60228 cl. 6
- TPE-core insulation
- Cores colour coded
- Adern adrig bzw. paarig mit optimalen Schlaglängen in Lagen verseilt
- Design includes Cu screen of single pairs or single cores and PETP (polyethylene terephthalate) sheath
- Fleece wrapping
- Tinned copper braided screening, coverage approx. 85%
- PUR outer sheath, matt
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011
- **Colour code for cores**
Part no./Core/colours
22847 / 0,14 / to DIN 47100 from green
22850 / 0,14 / to DIN 47100 from green
22851 / 0,14 / gn/ye, gy/pk, rd/bu
22852 / 0,14 / bn/gn, ye/vt, gy/pk,rt/bu
22853 / 0,25 / rd/bk, bn/gn, gy/pk,bu/vt
22847 / 0,5 / wh, bn
22850 / 0,5 / wh, bn
22851 / 0,5 / wh, bn
22852 / 0,5 / wh, bu, whgn, bngn
22853 / 0,5 / wh, bn

Properties

- PUR outer sheath is adhesion-free, flame retardant and resistant to hydrolysis and microbial attack.
- The high abrasion resistance and notch resistance meet the highest requirements
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- For extreme applications extending beyond standard solutions we recommend that you request our questionnaire, which has been especially designed for energy supply systems.
- Art.-No. 22847 diameter of conductor 0,5 mm² per core screened
- Please observe applicable installation regulations for use in energy supply chains.

Application

These feedback-cables are used in machinery and control construction as well as in plant engineering as these enable an excellent transmission of data and signals, e.g. in energy management chains, robotics and handling equipment. Additional cores for the power supply to individual components are available. The braided screen guarantees reliable signal transmission.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

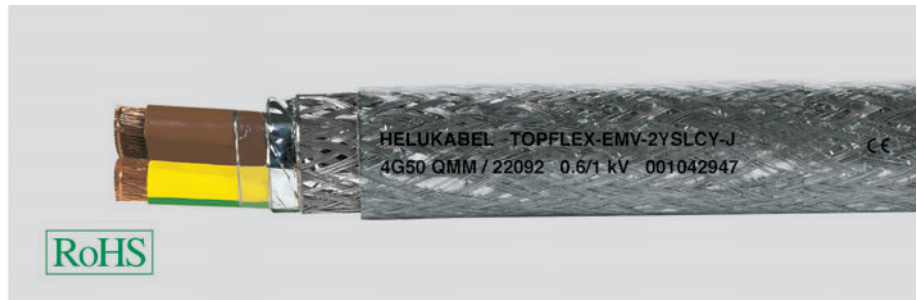
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight approx. kg / km	Weight approx. kg / km	AWG-No.
22847	(3 x (2 x 0,14) + 2 x (0,5))	8,3	78,0	103,0	26
22850	(3 x (2 x 0,14) + 2 x 0,5)	8,0	72,0	102,0	26
22851	(3 x (2 x 0,14) + 2 x 0,5)	8,4	72,0	105,0	26

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight approx. kg / km	Weight approx. kg / km	AWG-No.
22852	4 x 2 x 0,14 + 4 x 0,5	8,4	73,0	105,0	26
22853	4 x 2 x 0,25 + 2 x 0,5	8,6	77,0	125,0	24

Dimensions and specifications may be changed without prior notice. (RD01)

TOPFLEX® -EMV-2YSLCY-J for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking



Technical data

- Special motor power supply cable for frequency converters adapted to DIN VDE 0250
- **Temperature range**
flexing +5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U_0/U 600/1000 V
- **Max. operating voltage**
A.C. and 3-phase 700/1200 V
DC operation 900/1800 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 200 MOhm x km
- **Coupling resistance**
according to different cross-sections
max. 250 Ohm/km
- **Mutual capacitance**
according to different cross-sections
core/core 70 to 250 nF/km
core/screen 110 to 410 nF/km
- **Minimum bending radius**
fixed installation for outer \varnothing :
up to 12 mm: approx. 5x cable \varnothing
>12 to 20 mm: approx. 7,5x cable \varnothing
>20 mm: approx. 10x cable \varnothing
free-movement for outer \varnothing :
up to 12 mm: approx. 10x cable \varnothing
>12 to 20 mm: approx. 15x cable \varnothing
>20 mm: approx. 20x cable \varnothing
- **Radiation-resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Application

This TOPFLEX®-EMV-2YSLCY-J motor power supply cable for the frequency converters assures electromagnetic compatibility in plants and buildings, facilities with units and operating equipment where the fields of electromagnetic interference might cause adverse effects on the surroundings. As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments, not however for outdoor applications. Used in the automotive and food industries, environmental technology, packaging industry, machine tools.

Handling equipment, for SIMOVERT drives, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure lare-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 or IEC 60228 cl. 5
- Polyethylene (PE) core insulation
- Core colours: green-yellow, brown, black, grey
- Cores stranded in concentric layers
- 1. screening with special aluminum foil
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- Transparent special PVC outer sheath
- with meter marking, change-over in 2011

Note

- G = with green-yellow earth core.
- The current carrying capacity for permanent operation at ambient temperature of 30 °C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4

Properties

- Behavior in fire: Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low mutual capacitance, to DIN VDE 0472 part 504, test method B
- Features PE-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents
- Installation in hazardous areas
- Low mutual capacitance
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22084	4 G 1,5	10,3	70	110			18	95,0	230,0	16
22085	4 G 2,5	12,3	80	130	18	210	26	150,0	300,0	14
22086	4 G 4	13,9	90	150	11	210	34	235,0	485,0	12
22087	4 G 6	15,3	90	150	6	150	44	320,0	633,0	10

Continuation ►

TOPFLEX® -EMV-2YSLCY-J for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking



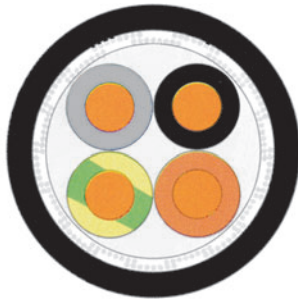
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22088	4 G 10	19,5	120	200	7	180	61	533,0	863,0	8
22089	4 G 16	23,3	140	230	9	190	82	789,0	1291,0	6
22090	4 G 25	27,4	120	210	4	95	108	1236,0	1862,0	4
22091	4 G 35	30,3	150	260	3	85	135	1662,0	2611,0	2
22092	4 G 50	35,5	190	320	2	40	168	2345,0	2955,0	1
22093	4 G 70	40,2	190	320	2	45	207	3196,0	3953,0	2/0
22094	4 G 95	44,5	250	410	1	50	250	4316,0	5304,0	3/0
22095	4 G 120	50,3					292	5435,0	6604,0	4/0
22096	4 G 150	56,1					335	6394,0	7043,0	300 kcmil
22097	4 G 185	58,0					382	7639,0	8384,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RD01)



Large cabling machine with backtwist at our Windsbach factory.

TOPFLEX® -EMV-UV-2YSLCYK-J for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking



Technical data

- Special motor power supply cable for frequency converters adapted to DIN VDE 0250
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U_0/U 600/1000 V
- **Max. operating voltage**
A.C. and 3-phase 700/1200 V
DC operation 900/1800 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 200 MOhm x km
- **Coupling resistance**
according to different cross-sections
max. 250 Ohm/km
- **Mutual capacitance**
according to different cross-sections
core/core 70 to 250 nF/km
core/screen 110 to 410 nF/km
- **Minimum bending radius**
fixed installation for outer \varnothing :
up to 12 mm: approx. 5x cable \varnothing
>12 to 20 mm: approx. 7,5x cable \varnothing
>20 mm: approx. 10x cable \varnothing
free-movement for outer \varnothing :
up to 12 mm: approx. 10x cable \varnothing
>12 to 20 mm: approx. 15x cable \varnothing
>20 mm: approx. 20x cable \varnothing
- **Radiation-resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 or IEC 60228 cl. 5
- Polyethylene (PE) core insulation
- Core colours: green-yellow, brown, black, grey
- Cores stranded in concentric layers
- 1. screening with special aluminium film
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- Special PVC outer sheath, black (RAL 9005)
- with meter marking, change-over in 2011

Note

The current carrying capacity for permanent operation at ambient temperature of 30 °C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4

Properties

- Behavior in fire: Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low mutual capacitance, to DIN VDE 0472 part 504, test method B
- Features PE-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents
- Low mutual capacitance
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- UV-resistant
- Outdoor application, possible for installation in underground at 4G16mm²
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

This TOPFLEX®-EMV-2YSLCYK-J motor power supply cable for the frequency converters assures electromagnetic compatibility in plants and buildings, facilities with units and operating equipment where the fields of electromagnetic interference might cause adverse effects on the surroundings. As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments and for outdoor applications, possible for installation in underground at 4G16 mm². Used in the automotive and food industries, environmental technology, packaging industry, machine tools. Handling equipment, for SIMOVERT drives, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications. Installation in hazardous areas.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure lare-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22234	4 G 1,5	10,3	70	110			18	95,0	230,0	16
22235	4 G 2,5	12,3	80	130	18	210	26	150,0	300,0	14
22236	4 G 4	13,9	90	150	11	210	34	235,0	485,0	12
22237	4 G 6	15,3	90	150	6	150	44	320,0	630,0	10
22238	4 G 10	19,5	120	200	7	180	61	533,0	860,0	8
22239	4 G 16	23,3	140	230	9	190	82	789,0	1290,0	6

Continuation ▶

TOPFLEX® -EMV-UV-2YSLCYK-J for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22240	4 G 25	27,4	120	210	4	95	108	1236,0	1860,0	4
22241	4 G 35	30,3	150	260	3	85	135	1662,0	2610,0	2
22242	4 G 50	35,5	190	320	2	40	168	2345,0	2950,0	1
22243	4 G 70	40,2	190	320	2	45	207	3196,0	3950,0	2/0
22244	4 G 95	44,5	250	410	1	50	250	4316,0	5300,0	3/0
22245	4 G 120	50,3					292	5435,0	6600,0	4/0
22246	4 G 150	56,1					335	6394,0	7040,0	300 kcmil
22247	4 G 185	58,0					382	7639,0	8380,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RD01)

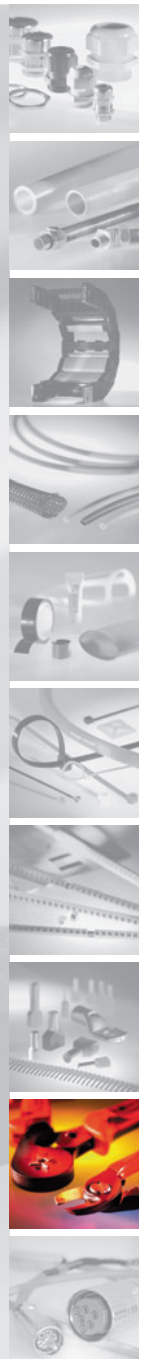
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Tools

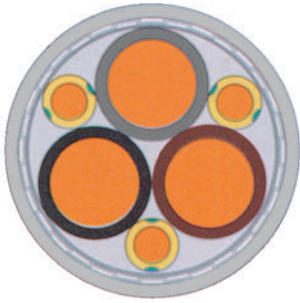
- Cable shears
- Box spanners
- Strippers
- Crimping tools
- Pliers
- Skinning knife



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TOPFLEX®-EMV-3 PLUS 2YSLCY-J for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking



Technical data

- Special motor power supply cable for frequency converters adapted to DIN VDE 0250
- **Temperature range**
flexing +5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** U_0/U 600/1000 V
- **Max. operating voltage**
A.C. and 3-phase 700/1200 V
DC operation 900/1800 V
- **Peak value** \hat{U} 1700 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 200 MΩm x km
- **Coupling resistance**
according to different cross-sections
max. 250 Ωm/km
- **Minimum bending radius**
fixed installation for outer \varnothing :
up to 12 mm: approx. 5x cable \varnothing
>12 to 20 mm: approx. 7,5x cable \varnothing
>20 mm: approx. 10x cable \varnothing
free-movement for outer \varnothing :
up to 12 mm: approx. 10x cable \varnothing
>12 to 20 mm: approx. 15x cable \varnothing
>20 mm: approx. 20x cable \varnothing
- **Radiation-resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Plain copper, fine wire conductor according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and/or IEC 60228 cl. 5
- Polyethylene (PE) core insulation
- Core colours: black, brown, grey, green-yellow (earth core divided into 3)
- 3+3-core structure
- Cores stranded in concentric layers
- 1. screening with special aluminium film
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- Transparent special PVC outer sheath
- with meter marking, change-over in 2011
- Pos.no. 22380 = capacitance
core/core 270 nF/km
core/screen 520 nF/km

Note

The current carrying capacity for permanent operation at ambient temperature of 30 °C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4

Properties

- Behavior in fire: Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- PE-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents
- Application in ex-area
- Low mutual capacitance
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- The screen must be connected at both ends and ensure lare-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011
- The minimum cross-section of 0,75² meets the requirements of DIN EN 60204 part 1

Application

As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments and for outdoor applications. Used in the automotive and food industries, environmental technology, packaging industry, machine tools. Handling equipment, for SIMOVERT drives, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications. Installation in hazardous areas

This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables.

Due to the optimal screening an interference-free operation of frequency converters is obtained.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure lare-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22368	3 x 1,5 + 3 G 0,25	9,9			18	86,0	140,0	16
22369	3 x 2,5 + 3 G 0,5	11,3	18	210	26	144,0	220,0	14
22370	3 x 4 + 3 G 0,75	13,0	11	210	34	224,0	323,0	12
22371	3 x 6 + 3 G 1,0	14,9	6	150	44	298,0	420,0	10
22372	3 x 10 + 3 G 1,5	18,4	7	180	61	491,0	615,0	8
22373	3 x 16 + 3 G 2,5	21,5	9	190	82	723,0	819,0	6
22374	3 x 25 + 3 G 4,0	25,3	4	95	108	1138,0	1325,0	4

Continuation ▶

TOPFLEX®-EMV-3 PLUS 2YSLCY-J for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking



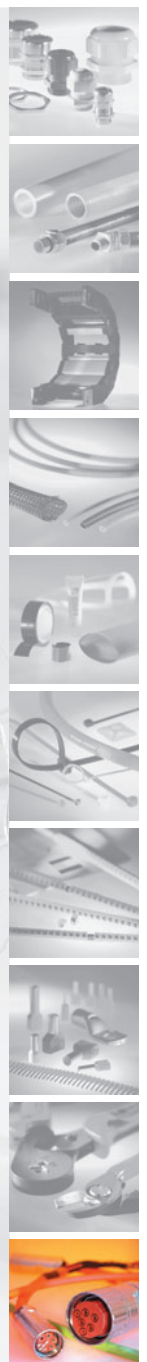
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22375	3 x 35 + 3 G 6,0	27,8	3	85	135	1535,0	1718,0	2
22376	3 x 50 + 3 G 10,0	31,9	2	40	168	2208,0	2399,0	1
22377	3 x 70 + 3 G 10,0	36,8	2	45	207	2871,0	3056,0	2/0
22378	3 x 95 + 3 G 16,0	40,6	1	50	250	3953,0	4162,0	3/0
22379	3 x 120 + 3 G 16,0	45,9			292	4836,0	5074,0	4/0
22380	3 x 150 + 3 G 25,0	51,7			335	5412,0	6128,0	300 kcmil
22381	3 x 185 + 3 G 35,0	53,8			382	6969,0	7189,0	350 kcmil
22382	3 x 240 + 3 G 42,5	61,7			453	8540,0	9540,0	500 kcmil

Dimensions and specifications may be changed without prior notice. (RD01)

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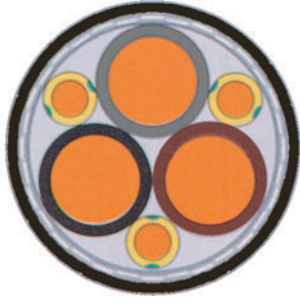
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TOPFLEX®-EMV-UV-3 PLUS 2YSLCYK-J for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking



Technical data

- Special motor power supply cable for frequency converters adapted to DIN VDE 0250
- **Temperature range**
flexing -5 °C bis +70 °C
fixed installation -40 °C bis +70 °C
- **Nominal voltage** U_0/U 600/1000 V
- **Operating voltage, max.**
A.C. and 3-phase 700/1200 V
DC operation 900/1800 V
- **Peak value** \hat{U} 1700 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 200 MΩm x km
- **Coupling resistance**
depending on the cross-section
max. 250 Ωm/km
- **Minimum bending radius**
fixed installation for outer \varnothing :
up to 12 mm: 5x cable \varnothing
>12 to 20 mm: 7,5x cable \varnothing
>20 mm: 10x cable \varnothing
free-movement for outer \varnothing :
up to 12 mm: 10x cable \varnothing
>12 to 20 mm: 15x cable \varnothing
>20 mm: 20x cable \varnothing
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Polyethylene (PE) core insulation
- Core colour: black, brown, grey, green-yellow (earth core divided into 3)
- Cores stranded in concentric layers
- **3+3 core design**
- 1. screening with special aluminum foil
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- Special PVC outer sheath, schwarz (RAL 9005)
- with meter marking, change-over in 2011
- Pos.no. 22685 = capacitance
core/core 270 nF/km
core/screen 520 nF/km

Note

The current carrying capacity for permanent operation at ambient temperature of 30 °C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4

Properties

- Behavior in fire: Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low mutual capacitance, test according to DIN VDE 0472 part 504, test method B
- PE-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents
- Low mutual capacitance
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- The 3 Plus-construction of motor power supply cables features a symmetrical 3-core design, improved in terms of EMC characteristics comparing favorably with a 4-core version. The protective conductor PE, divided into 3 is uniformly stranded in the interstices. This enables an extremely concentric structure
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- The minimum cross-section of 0,75² meets the requirements of DIN EN 60204 part 1
- UV-resistant
- Outdoor application
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables

Application

As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments and for outdoor applications, possible for installation in underground at $3 \times 16 + 3 \times 2,5$ mm². Used in the automobile industry, food industry, environmental engineering, packaging industry, toolmaking machinery, handling equipment, for SIMOVERT drivers, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications. Installation in hazardous areas.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure lare-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Continuation ►

TOPFLEX®-EMV-UV-3 PLUS 2YSLCYK-J for power supply connections to frequency converters, double screened, 0,6/1kV, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22673	3 x 1,5 + 3 G 0,25	9,9			18	86,0	140,0	16
22674	3 x 2,5 + 3 G 0,5	11,3	18	210	26	144,0	220,0	14
22675	3 x 4 + 3 G 0,75	13,0	11	210	34	224,0	323,0	12
22676	3 x 6 + 3 G 1,0	14,9	6	150	44	298,0	420,0	10
22677	3 x 10 + 3 G 1,5	18,4	7	180	61	491,0	615,0	8
22678	3 x 16 + 3 G 2,5	21,5	9	190	82	723,0	819,0	6
22679	3 x 25 + 3 G 4,0	25,3	4	95	108	1138,0	1325,0	4
22680	3 x 35 + 3 G 6,0	27,8	3	85	135	1535,0	1718,0	2
22681	3 x 50 + 3 G 10,0	31,9	2	40	168	2208,0	2399,0	1
22682	3 x 70 + 3 G 10,0	36,8	2	45	207	2871,0	3056,0	2/0
22683	3 x 95 + 3 G 16,0	40,6	1	50	250	3953,0	4162,0	3/0
22684	3 x 120 + 3 G 16,0	45,9			292	4836,0	5075,0	4/0
22685	3 x 150 + 3 G 25,0	51,7			335	5412,0	6128,0	300 kcmil
22686	3 x 185 + 3 G 35,0	53,8			382	6969,0	7189,0	350 kcmil
22687	3 x 240 + 3 G 42,5	61,7				8540,0	9540,0	500 kcmil

Dimensions and specifications may be changed without prior notice. (RD01)

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TOPFLEX® Motor 109 low capacitance power supply cable 0,6/1kV, increased ampacity, halogen-free, meter marking



Technical data

- Special motor power supply cable for frequency converters
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +80 °C
- **Permissible operating temperature**
at conductor +90 °C
- **Nominal voltage** U_0/U 600/1000 V
- **Max. operating voltage**
A.C. and 3-phase 700/1200 V
DC operation 900/1800 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 200 MOhm x km
- **Coupling resistance**
according to different cross-sections
max. 250 Ohm/km
- **Mutual capacitance**
according to different cross-sections
core/core 70 to 250 nF/km
core/screen 110 to 410 nF/km
- **Minimum bending radius**
fixed installation for outer \varnothing :
up to 12 mm: approx. 5x cable \varnothing
>12 to 20 mm: approx. 7,5x cable \varnothing
>20 mm: approx. 10x cable \varnothing
free-movement for outer \varnothing :
up to 12 mm: approx. 10x cable \varnothing
>12 to 20 mm: approx. 15x cable \varnothing
>20 mm: approx. 20x cable \varnothing
- **Radiation-resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 or IEC 60228 cl. 5
- Special-Polymer core insulation
- Cores coded to DIN VDE 0293-308
- Core colours:
above 5 cores color coded
7 cores black with numbering
- Green-yellow earth-core
- Cores stranded in concentric layers
- 1. screening with special aluminium film
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- Special PUR outer sheath, orange (RAL 2003)
- with meter marking, change-over in 2011

Properties

- PUR behavior in fire: Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low mutual capacitance, test according to DIN VDE 0472 part 504, test method B
- Special polymerinsulation ensures low dielectric losses, a dual voltage resistance, longer service life and low - interference shield, and increased current carrying capacity
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- UV-resistant
- Outdoor application
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- This screened motor supply cable with low mutual capacitance of the single cores because of the special Polymer core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- Design according to the requirements of VdS 3501:2006-04

Application

This motor power supply cable for the frequency converters assures electromagnetic compatibility in plants and buildings, facilities with units and operating equipment where the fields of electromagnetic interference might cause adverse effects on the surroundings. As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments and for outdoor applications. Used in the automotive and food industries, environmental technology, packaging industry, machine tools. Handling equipment, for SIMOVERT drives, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications.

Installation in hazardous areas.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure lare-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22724	3 G 1,5	9,4	72,0	200,0	16
22707	4 G 1,5	10,4	95,0	230,0	16
22708	5 G 1,5	11,2	117,0	258,0	16
22709	7 G 1,5	13,2	148,0	281,0	16
22710	3 G 2,5	11,2	137,0	270,0	16
22711	4 G 2,5	12,5	150,0	300,0	16

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22712	5 G 2,5	13,5	200,0	352,0	16
22713	7 G 2,5	16,0	230,0	473,0	16
22714	4 G 4	14,2	235,0	485,0	16
22715	5 G 4	15,4	321,0	567,0	16
22716	7 G 4	18,2	352,0	603,0	16
22717	4 G 6	15,2	320,0	633,0	16

Continuation ►

TOPFLEX® Motor 109 low capacitance power supply cable 0,6/1kV, increased ampacity, halogen-free, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22718	5 G 6	16,8	439,0	679,0	16
22719	7 G 6	20,0	501,0	771,0	16
22720	4 G 10	19,5	533,0	860,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22721	5 G 10	21,6	711,0	1029,0	16
22722	4 G 16	23,1	789,0	1290,0	16
22723	4 G 25	27,1	1236,0	1862,0	16

Dimensions and specifications may be changed without prior notice. (RD01)

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Drag Chain Systems

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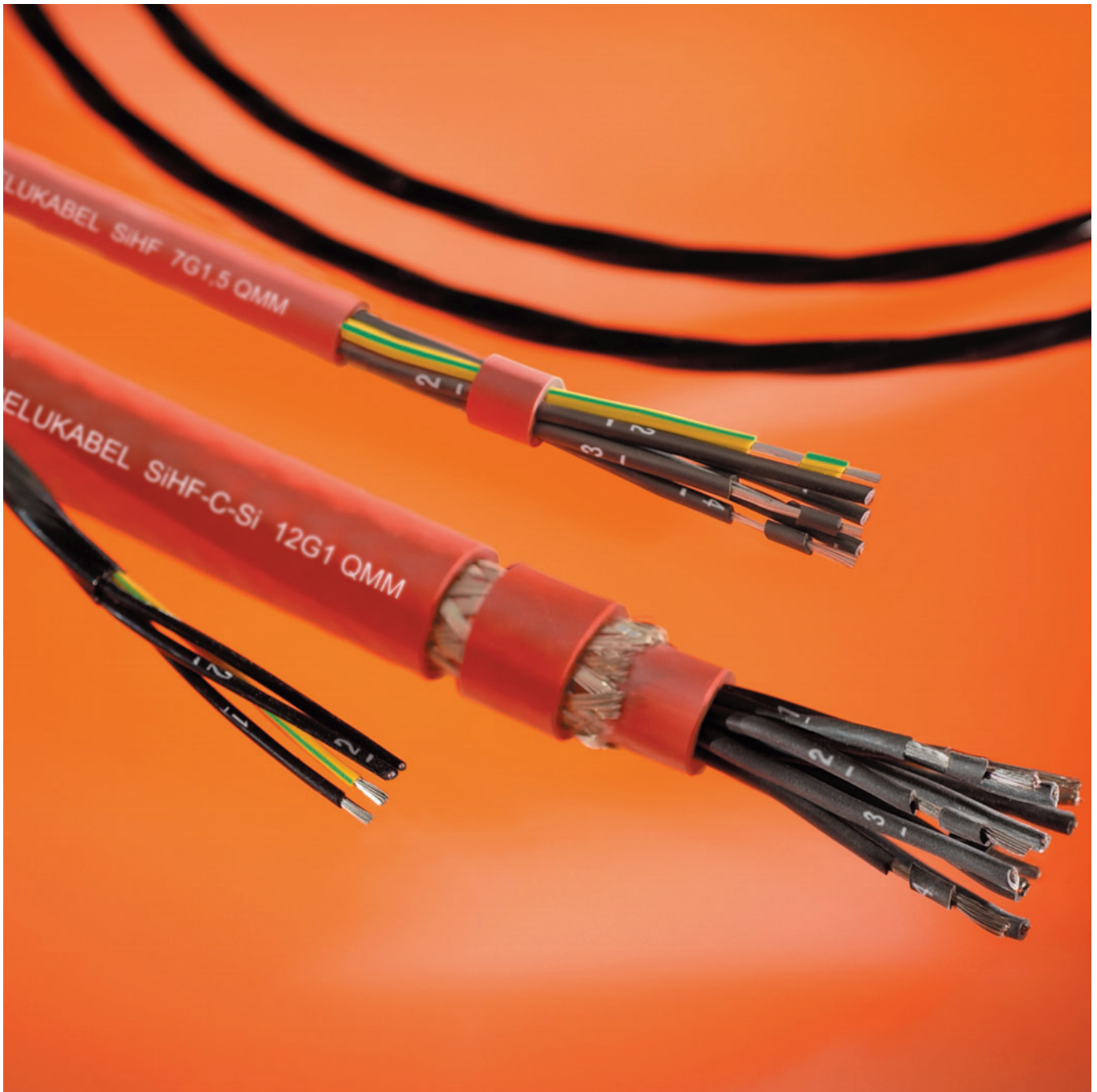


Photo: HELUKABEL®

Heat-resistant Cables

Heat-resistant Cables

High or low temperatures and permanent temperature changes demand cable types with special core and sheath insulation depending on the different applications.









HELUKABEL® supply these indispensable special cables which are used in power stations, iron works, steelworks and rolling mill, in foundries, cement, glass and ceramic factories. They are also used in aircraft construction and shipbuilding, in brickworks, kitchen appliances, measuring and heat appliances as well as in many other areas.

Depending on their individual temperature limits these cables are splitted in different resistant classes which cover temperature ranges from -190°C to $+1200^{\circ}\text{C}$.

The different insulant classes into which these cables are splitted, is effected as per VDE 0530 part 1 in the classes Y, A, E, B, F, H, C.

For detailed information please see technical information.

Contents

Description	Page
HELUTHERM® 120, flexible, heat-resistant (+105°C), meter marking 	E 4
HELUTHERM® 145 MULTI, flexible, cross-linked, halogen-free, meter marking 	E 5
SiHF, silicon multicores cable, flexible, halogen-free, meter marking 	E 7
THERMFLEX 180 EWKF, (H05SS-F) halogen-free, silicone multicores cable, meter marking	E 9
H05SS-F / H05SST-F, heat-resistant multicores cable  	E 10
HELUFLO®-FEP-6Y, multi core, fluorinated polymeric materials, -100°C up to +205°	E 11
MULTITHERM® 400, halogen-free	E 13
HELUTHERM® 145 MULTI-C, flexible, cross-linked, halogen-free, Cu-screened, EMC-preferred type, meter marking 	E 14
SiHF/GL-P, silicon multicores cable, steel braiding, halogen-free 	E 16
SiHF-C-Si, silicon multicores cable, halogen-free, Cu-screened, EMC-preferred type, meter marking 	E 17
THERMFLEX 180 EWKF-C, silicone multicores cable, Cu-screened, halogen-free, +180°C, EMC-preferred type, meter marking	E 19
MULTITHERM® 400 -ES, halogen-free, high-grade steel braiding	E 20



Technical data

- Special PVC cable with increased heat-resistance adapted to DIN VDE 0281 part 12 0,5-0,75 mm² according IEC 60227/56 1,0-2,5 mm² according IEC 60227/57
- **Temperature range** flexing -5 °C to 105 °C fixed installation -30 °C to +105 °C (up to +120 °C for short time)
- **Nominal voltage** 0,5-1 mm²: U₀/U 300/500 V 1,5 mm² and above: U₀/U 450/750 V
- **Spark-test** 6000 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 4000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable ø fixed installation 4x cable ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductors to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation, T13 to DIN VDE 0281 part 1
- Core identification to DIN VDE 0293-308
- Core colours: up to 5 cores one-coloured 6 and more cores, black with numbering
- 3 and above, with green-yellow earth core
- 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Special PVC outer jacket, heat-resistant TM3 to DIN VDE 0281 part 1
- Outer jacket black (RAL 9005), other colours on request
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- On request HELUTHERM® 120 H03V2V2-F HELUTHERM® 120 H05V2V2-F HELUTHERM® 120 (H)05V2V2-F

Application

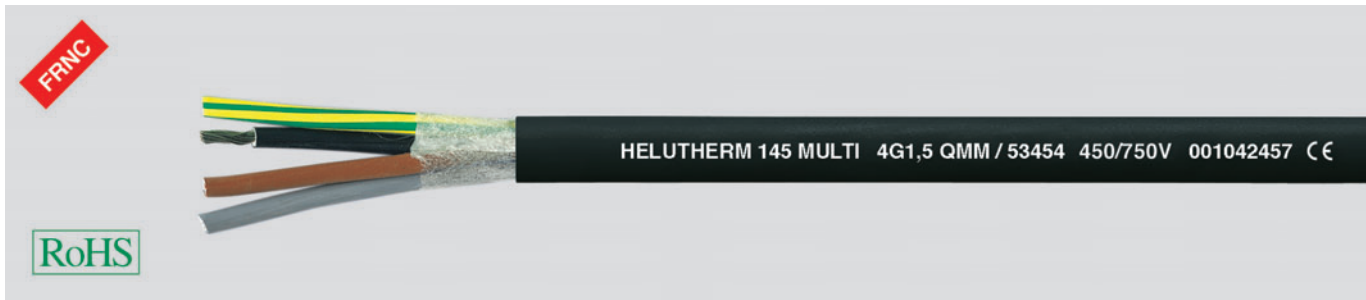
Therm cables are ideal for use in machines, appliances or motors which are subject to direct contact with high temperatures (e.g. varnishing machines and drying towers etc.).

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24002	2 x 0,5	5,0	9,6	40,0	20	24030	2 x 1,5	7,4	29,0	77,0	16
24003	3 G 0,5	5,3	14,4	50,0	20	24031	3 G 1,5	8,1	43,0	97,0	16
24004	4 G 0,5	5,8	19,2	60,0	20	24032	4 G 1,5	9,0	58,0	122,0	16
24005	5 G 0,5	6,7	24,0	70,0	20	24033	5 G 1,5	10,0	72,0	143,0	16
24006	7 G 0,5	8,8	33,6	90,0	20	24034	7 G 1,5	11,9	101,0	179,0	16
24007	12 G 0,5	11,1	58,0	140,0	20	24035	12 G 1,5	14,5	173,0	310,0	16
24008	18 G 0,5	12,9	86,0	170,0	20	24036	18 G 1,5	17,4	259,0	460,0	16
24009	25 G 0,5	15,8	101,0	250,0	20	24037	25 G 1,5	21,3	360,0	650,0	16
24011	2 x 0,75	6,2	14,4	52,0	18	24039	2 x 2,5	9,3	48,0	120,0	14
24012	3 G 0,75	6,6	21,6	61,0	18	24046	3 G 2,5	10,1	72,0	150,0	14
24013	4 G 0,75	7,1	29,0	75,0	18	24040	4 G 2,5	11,0	96,0	200,0	14
24014	5 G 0,75	8,0	36,0	94,0	18	24041	5 G 2,5	12,3	120,0	250,0	14
24015	7 G 0,75	9,5	50,0	112,0	18	24042	7 G 2,5	14,6	168,0	310,0	14
24016	12 G 0,75	11,6	86,0	180,0	18	24044	2 x 4	10,6	77,0	180,0	12
24017	18 G 0,75	13,9	130,0	270,0	18	24291	3 G 4	11,5	115,0	220,0	12
24018	25 G 0,75	16,9	180,0	380,0	18	24045	4 G 4	12,5	154,0	300,0	12
24019	1 x 1	6,0	9,6	50,0	17	24292	5 G 4	15,1	192,0	360,0	12
24020	2 x 1	6,5	19,2	60,0	17						
24021	3 G 1	6,9	29,0	75,0	17						
24022	4 G 1	7,7	38,0	88,0	17						
24023	5 G 1	8,4	48,0	110,0	17						
24024	6 G 1	9,3	58,0	121,0	17						
24025	7 G 1	10,0	67,0	130,0	17						
24026	12 G 1	12,5	115,0	225,0	17						
24027	18 G 1	14,7	173,0	350,0	17						
24028	25 G 1	17,8	240,0	485,0	17						

Dimensions and specifications may be changed without prior notice. (RE01)

HELUTHERM® 145 MULTI flexible, cross-linked, halogen-free, meter marking



Technical data

- Halogen-free control and connecting cable with increased heat resistance
- **Temperature range**
flexing -35 °C to +120 °C
fixed installation -55 °C to +145 °C
in short-circuit +250 °C
- **Nominal voltage**
U₀/U 300/500 V up to 1,0 mm²
U₀/U 450/750 V at 1,5 mm²
with protected fixed installation
U₀/U 600/1000 V at 1,5 mm²
- **Test voltage** 3500 V
- **Minimum bending radius**
for fixed installation 4x cable ø
in operation to -30 °C 12x cable ø
in operation to +60 °C 8x cable ø
- **Caloric load values**
see Technical Informations
- **Power ratings table**
see Technical Informations
- **Approval**
Germanischer Lloyd

Cable structure

- Tinned Cu wires, according to DIN VDE 0295 class 5, BS 6360 cl. 5 and IEC 60228 class 5
- Core insulation of polyolefin-copolymer, cross-linked and halogen-free
- Colour coded to DIN VDE 0293-308 and as of 6 cores number coded
- For two cores: brown, blue
- Green-yellow earth core as of 3 cores
- Cores stranded in layers with optimal lay-length
- Taping/Mica-Tape
- Polyolefin-Copolymer, cross-linked and halogen-free outer sheath
- Colour black
- with meter marking, change-over in 2011
- Different insulation- and outer sheath in other colours available on request.

Properties

- Reduced flame propagation
- Good abrasion and notch resistance
- Good resistance to oils and weathering
- Resistant to UV radiation and ozone
- Resistant to soldering temperatures
- Thermal class B
- Are resistant to melting, even when in contact with a temperatures of between 300 °C and 380 °C, because of the cross-linking for the insulation material
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test (unit flame test) to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3-22, IEC 60332-3-22 (equivalent DIN VDE 0472 part 804 test method C)
- Flame test (cable) to VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1-2 (equivalent DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density to VDE 0482 part 268-1 and 2, test method C, IEC 61034-1/61034-2, HD 606 and BS 7622 part 1 and 2 (DIN VDE 0472 part 816)

Note

- G = with green-yellow earth core
x = without green-yellow earth core
- **screened analogue type:**
HELUTHERM® 145 MULTI-C
see page E 14

Application

These halogen-free, cross-linked and temperature resistant wiring and control cables with enhanced fire-behaviour properties are used for wiring up the lighting fixtures, heaters, electric machines (temperature class B), switching systems and distribution switchboards. A very long service life is also given on account of their excellent high-temperature stability.

These cables exhibit good resistance to weathering as well as being very stable to temperature, moisture, ozone and UV radiation. These cables are therefore mainly used for traffic control systems and diverse outdoor applications. The development of smoke is low and no corrosive gases are liberated during combustion of these halogen-free cables in case of fire. The risk of toxic fumes is considerably less in the event of fire because the caloric load values is lower. Precious time can thus be won for a disciplined evacuation, and unnecessary loss of life can be prevented. The extent of the damage to costly control and monitoring systems and the concrete and steel structures of buildings and plant due to fire is reduced by this. Injuries to persons and damage to materials can be prevented. A lower conductor cross-section is possible in certain circumstances because of the high thermal load and thus savings in the space and weight required can be made. These wiring and control cables provide a significant contribution in safety engineering and environmental protection.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53376	1 x 0,25	2,9	2,4	11,4	24
53377	2 x 0,25	4,6	4,8	28,7	24
53378	3 G 0,25	4,9	7,2	33,7	24

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53379	4 G 0,25	5,5	9,6	41,8	24
53380	5 G 0,25	5,8	12,0	47,0	24
53381	6 G 0,25	6,5	14,4	58,0	24

Continuation ▶

HELUTHERM® 145 MULTI flexible, cross-linked, halogen-free, meter

marking



Part no.	No.cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53382	7 G 0,25	6,9	16,8	64,0	24
53383	8 G 0,25	7,3	19,2	71,0	24
53384	10 G 0,25	8,1	24,0	84,0	24
53385	12 G 0,25	8,1	28,8	90,0	24
53386	14 G 0,25	8,6	33,6	102,0	24
53387	16 G 0,25	8,9	38,4	114,0	24
53388	19 G 0,25	10,1	45,6	132,0	24
53389	21 G 0,25	10,5	50,4	145,0	24
53391	1 x 0,5	3,2	4,8	15,7	20
53392	2 x 0,5	5,1	9,6	39,6	20
53393	3 G 0,5	5,5	14,4	48,1	20
53394	4 G 0,5	5,9	19,2	51,0	20
53395	5 G 0,5	6,7	24,0	64,0	20
53396	6 G 0,5	7,1	28,8	74,0	20
53397	7 G 0,5	7,8	33,6	88,0	20
53398	8 G 0,5	8,6	38,4	102,0	20
53399	10 G 0,5	9,4	48,0	123,0	20
53400	12 G 0,5	9,4	57,6	135,0	20
53401	14 G 0,5	10,0	67,2	153,0	20
53402	16 G 0,5	10,7	76,8	176,0	20
53403	19 G 0,5	12,4	91,2	213,0	20
53404	21 G 0,5	13,0	100,8	234,0	20
53405	24 G 0,5	14,0	115,2	263,0	20
53406	25 G 0,5	14,0	120,0	269,0	20
53407	27 G 0,5	14,0	129,6	280,0	20
53408	30 G 0,5	15,0	144,0	311,0	20
53409	33 G 0,5	15,0	158,4	343,0	20
53410	37 G 0,5	17,0	177,6	392,0	20
53411	1 x 0,75	3,5	7,2	19,8	18
53412	2 x 0,75	5,9	14,4	40,0	18
53413	3 G 0,75	6,2	21,6	53,0	18
53414	4 G 0,75	6,9	28,8	69,0	18
53415	5 G 0,75	7,7	36,0	86,0	18
53416	6 G 0,75	8,3	43,2	101,0	18
53417	7 G 0,75	9,1	50,4	117,0	18
53418	8 G 0,75	10,2	57,6	140,0	18
53419	10 G 0,75	11,1	72,0	167,0	18
53420	12 G 0,75	11,1	86,4	183,0	18
53421	14 G 0,75	11,7	100,8	212,0	18
53422	16 G 0,75	12,5	115,2	239,0	18
53423	19 G 0,75	14,0	136,8	290,0	18
53424	21 G 0,75	15,0	151,2	323,0	18
53425	24 G 0,75	16,0	172,8	364,0	18
53426	25 G 0,75	16,0	180,0	371,0	18
53427	27 G 0,75	16,0	194,4	387,0	18
53428	30 G 0,75	17,0	216,0	429,0	18
53429	33 G 0,75	18,0	237,6	468,0	18
53430	37 G 0,75	19,0	266,4	550,0	18
53431	1 x 1	3,9	9,6	25,2	17
53432	2 x 1	6,3	19,2	50,0	17
53433	3 G 1	6,8	28,8	66,0	17
53434	4 G 1	7,4	38,4	86,0	17
53435	5 G 1	8,3	48,0	106,0	17
53436	6 G 1	8,9	57,6	127,0	17
53437	7 G 1	9,9	67,2	155,0	17
53438	8 G 1	11,0	76,8	187,0	17
53439	10 G 1	12,1	96,0	214,0	17
53440	12 G 1	12,1	115,2	230,0	17
53441	14 G 1	12,7	134,4	266,0	17
53442	16 G 1	13,6	153,6	301,0	17
53443	19 G 1	15,1	182,4	377,0	17
53444	21 G 1	16,0	201,6	419,0	17
53445	24 G 1	17,1	230,4	464,0	17
53446	25 G 1	17,1	240,0	472,0	17
53447	27 G 1	17,1	259,2	488,0	17
53448	30 G 1	17,7	288,0	536,0	17
53449	33 G 1	18,9	316,8	605,0	17
53450	37 G 1	20,3	355,2	690,0	17
53451	1 x 1,5	4,3	14,4	32,3	16
53452	2 x 1,5	7,6	28,8	69,0	16
53453	3 G 1,5	8,1	43,2	93,0	16
53454	4 G 1,5	8,8	57,6	120,0	16
53455	5 G 1,5	9,8	72,0	152,0	16
53456	6 G 1,5	10,9	86,4	187,0	16
53457	7 G 1,5	12,0	100,8	222,0	16
53458	8 G 1,5	14,0	115,2	263,0	16
53459	10 G 1,5	14,6	144,0	308,0	16
53460	12 G 1,5	14,6	172,8	330,0	16
53461	14 G 1,5	15,4	201,6	383,0	16
53462	16 G 1,5	16,2	230,4	438,0	16
53463	19 G 1,5	18,3	273,6	554,0	16
53464	21 G 1,5	19,7	302,4	614,0	16

Part no.	No.cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53465	24 G 1,5	21,1	345,6	791,0	16
53466	25 G 1,5	21,1	360,0	701,0	16
53467	27 G 1,5	21,1	388,8	723,0	16
53468	30 G 1,5	21,8	432,0	796,0	16
53469	33 G 1,5	22,6	475,2	880,0	16
53470	37 G 1,5	24,8	532,8	1026,0	16
53471	1 x 2,5	5,0	24,0	46,9	14
53472	2 x 2,5	9,0	48,0	99,0	14
53473	3 G 2,5	9,8	72,0	140,0	14
53474	4 G 2,5	10,8	96,0	183,0	14
53475	5 G 2,5	12,0	120,0	231,0	14
53476	6 G 2,5	13,2	144,0	280,0	14
53477	7 G 2,5	14,6	168,0	336,0	14
53478	8 G 2,5	15,7	192,0	397,0	14
53479	10 G 2,5	17,7	240,0	460,0	14
53480	12 G 2,5	18,7	288,0	500,0	14
53481	14 G 2,5	19,0	336,0	593,0	14
53482	16 G 2,5	20,1	384,0	675,0	14
53483	19 G 2,5	20,7	456,0	835,0	14
53484	21 G 2,5	23,7	504,0	939,0	14
53485	24 G 2,5	25,8	576,0	1047,0	14
53486	25 G 2,5	25,8	600,0	1067,0	14
53487	27 G 2,5	25,8	648,0	1107,0	14
53488	30 G 2,5	26,7	720,0	1219,0	14
53489	33 G 2,5	28,0	792,0	1349,0	14
53490	37 G 2,5	30,6	888,0	1565,0	14
53491	1 x 4	5,6	38,4	96,0	12
53492	2 x 4	10,2	76,8	159,0	12
53493	3 G 4	10,9	115,2	197,0	12
53494	4 G 4	12,2	153,6	260,0	12
53495	5 G 4	13,5	192,0	329,0	12
53496	6 G 4	14,9	230,4	398,0	12
53497	7 G 4	16,4	268,8	478,0	12
53498	8 G 4	17,6	307,2	553,0	12
53499	10 G 4	20,1	384,0	663,0	12
53500	12 G 4	20,1	460,8	725,0	12
53501	14 G 4	21,5	537,6	797,0	12
53502	1 x 6	6,1	57,6	88,0	10
53503	2 x 6	11,6	115,2	216,0	10
53504	3 G 6	12,4	172,8	285,0	10
53505	4 G 6	13,8	230,4	375,0	10
53506	5 G 6	15,4	288,0	465,0	10
53507	6 G 6	16,7	345,6	544,0	10
53508	7 G 6	18,3	403,2	664,0	10
53509	1 x 10	7,7	96,0	144,0	8
53510	2 x 10	14,7	192,0	351,0	8
53511	3 G 10	15,7	288,0	475,0	8
53512	4 G 10	17,5	384,0	630,0	8
53513	5 G 10	19,6	480,0	782,0	8
53514	6 G 10	21,7	576,0	914,0	8
53515	7 G 10	23,7	672,0	1092,0	8
53516	1 x 16	9,1	153,6	205,0	6
53517	2 x 16	17,7	307,2	495,0	6
53518	3 G 16	19,3	460,8	691,0	6
53519	4 G 16	21,5	614,4	905,0	6
53520	5 G 16	23,9	768,0	1129,0	6
53521	6 G 16	26,2	921,6	1327,0	6
53522	7 G 16	28,9	1075,2	1590,0	6
53523	1 x 25	10,9	240,0	336,0	4
53524	2 x 25	21,3	480,0	833,0	4
53525	3 G 25	22,7	720,0	1139,0	4
53526	4 G 25	25,4	960,0	1489,0	4
53527	5 G 25	28,1	1200,0	1863,0	4
53528	6 G 25	31,1	1440,0	2275,0	4
53529	7 G 25	34,5	1680,0	2633,0	4
53530	1 x 35	12,1	336,0	454,0	2
53531	2 x 35	23,7	672,0	1104,0	2
53532	3 G 35	25,5	1008,0	1513,0	2
53533	4 G 35	28,4	1344,0	1992,0	2
53534	5 G 35	31,3	1680,0	2488,0	2
53535	1 x 50	14,9	480,0	638,0	1
53536	2 x 50	29,3	960,0	1573,0	1
53537	3 G 50	31,5	1440,0	2154,0	1
53538	4 G 50	35,3	1920,0	2819,0	1
53539	5 G 50	39,1	2400,0	3505,0	1
53540	1 x 70	17,1	672,0	875,0	2/0
53541	2 x 70	33,7	1344,0	2157,0	2/0
53542	3 G 70	36,4	2016,0	2946,0	2/0
53543	4 G 70	40,3	2688,0	3888,0	2/0
53544	5 G 70	44,5	3360,0	4864,0	2/0
53545	1 x 95	19,2	912,0	1149,0	3/0
53546	2 x 95	37,5	1824,0	2763,0	3/0
53547	3 G 95	40,0	2736,0	3835,0	3/0
53548	4 G 95	45,3	3648,0	5052,0	3/0
53549	5 G 95	50,7	4560,0	6307,0	3/0

Dimensions and specifications may be changed without prior notice. (RE01)



Technical data

- Special silicone multicore cable with higher heat-resistance range adapted to DIN VDE 0250 part 1 and part 816
- **Temperature range**
-60 °C to +180 °C
(up to +220 °C for short time)
- **Temperature limit at the conductor**
in operation +180 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
min. 200 MΩm x km
- **Power rating**
at ambient temperature up to +145 °C
to DIN VDE 0100 for higher temperatures valid:
150 °C - load value 100%
155 °C - load value 91%
160 °C - load value 82%
165 °C - load value 71%
170 °C - load value 58%
175 °C - load value 41%
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

- Tinned fine wire copper conductors to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Silicone core insulation
- Core colours according to DIN VDE 0293-308
- Core colour
 - up to 5 cores one-coloured
 - up 6 and more cores, black with white numbering
 - 3 and above, with green-yellow earth core
 - 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Outer jacket of silicone
- Jacket colour preferably redbrown
- with meter marking, change-over in 2011

Properties

- **Advantages**
Hardly changes of dielectric strength and the insulation resistance also at high temperatures, high ignition or flash point, in case of fire, forms an insulating layer of SiO₂
- **Resistant to**
High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen and UV
- **Halogen-free**
according to VDE 0482 part 267/
DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- **Behaviour in fire**
no flame propagation
test according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90 °C.

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OB).
- **screened analogue type:**
SIHF-C-SI see page E 17

Application

Silicone cables were evolved for use wherever insulation is subjected to extreme temperature changes. They are heat-resistant for permanent temperature up to +180 °C, for short time operation up to +220 °C. The good performance of the environmental resistant properties means that silicone cables can be used at temperatures down to -60 °C. Silicone cables are halogen-free cables and are especially suited for installation in power stations. They have also found their uses in the steel producing industries, aviation industry, ship building as well as in ceramic, glass and cement factories.

Due to elastical characteristic of core insulations, these are used as flexible connection cable.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22989	2 x 0,5	5,6	9,6	42,0	20
22990	3 G 0,5	5,9	14,5	44,0	20
22940	3 x 0,5	5,9	14,5	44,0	20
22991	4 G 0,5	6,4	19,3	58,0	20
22941	4 x 0,5	6,4	19,3	58,0	20
22992	5 G 0,5	7,3	24,0	62,0	20
22942	5 x 0,5	7,3	24,0	62,0	20
22993	6 G 0,5	8,3	28,9	79,0	20
22994	7 G 0,5	8,1	33,7	85,0	20
22995	8 G 0,5	8,9	38,4	99,0	20
22996	10 G 0,5	10,0	48,1	124,0	20
22997	12 G 0,5	10,6	57,6	141,0	20
22998	16 G 0,5	12,1	76,7	186,0	20
22999	18 G 0,5	12,7	86,5	211,0	20
23000	25 G 0,5	15,2	120,0	271,0	20
23001	2 x 0,75	6,4	14,4	53,0	18

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23002	3 G 0,75	6,8	21,6	63,0	18
23104	3 x 0,75	6,8	21,6	63,0	18
23003	4 G 0,75	7,6	29,0	83,0	18
23105	4 x 0,75	7,6	29,0	83,0	18
23004	5 G 0,75	8,5	36,0	101,0	18
22943	5 x 0,75	8,5	36,0	101,0	18
23005	6 G 0,75	9,2	43,0	115,0	18
23006	7 G 0,75	9,2	50,0	124,0	18
23127	8 G 0,75	9,9	57,7	138,0	18
23128	10 G 0,75	11,1	72,1	156,0	18
23129	12 G 0,75	12,2	86,5	185,0	18
23130	16 G 0,75	13,7	115,2	218,0	18
23131	18 G 0,75	14,6	129,7	260,0	18
23132	25 G 0,75	17,2	180,0	370,0	18
23007	2 x 1	6,6	19,0	59,0	17
23008	3 G 1	7,0	29,0	77,0	17

Continuation ▶

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22944	3 x 1	7,0	29,0	77,0	17
23009	4 G 1	7,8	38,0	94,0	17
22945	4 x 1	7,8	38,0	94,0	17
23010	5 G 1	8,8	48,0	115,0	17
22946	5 x 1	8,8	48,0	115,0	17
23011	6 G 1	9,5	58,0	134,0	17
23012	7 G 1	9,5	67,0	144,0	17
23133	8 G 1	10,3	76,7	175,0	17
23134	10 G 1	11,5	96,1	216,0	17
23135	12 G 1	12,5	115,2	231,0	17
23136	16 G 1	14,2	153,5	302,0	17
23137	18 G 1	15,1	172,9	340,0	17
23138	25 G 1	18,0	240,0	431,0	17
23013	2 x 1,5	7,6	29,0	81,0	16
23014	3 G 1,5	8,0	43,0	98,0	16
22947	3 x 1,5	8,0	43,0	98,0	16
23015	4 G 1,5	8,7	58,0	122,0	16
22948	4 x 1,5	8,7	58,0	122,0	16
23016	5 G 1,5	9,6	72,0	147,0	16
22949	5 x 1,5	9,6	72,0	147,0	16
23017	6 G 1,5	10,4	86,0	173,0	16
23018	7 G 1,5	10,4	101,0	187,0	16
23019	8 G 1,5	11,2	114,0	213,0	16
23020	10 G 1,5	13,0	116,0	263,0	16
23021	12 G 1,5	13,9	173,0	314,0	16
23022	14 G 1,5	14,7	202,0	379,0	16
23023	16 G 1,5	16,2	231,0	445,0	16
23024	18 G 1,5	17,0	260,0	506,0	16
23025	20 G 1,5	17,5	288,0	566,0	16
23026	24 G 1,5	20,4	346,0	722,0	16
23027	2 x 2,5	8,8	48,0	134,0	14
23028	3 G 2,5	9,7	72,0	152,0	14
23029	4 G 2,5	10,6	96,0	188,0	14
23030	5 G 2,5	11,6	120,0	228,0	14
23139	6 G 2,5	12,6	144,0	304,0	14
23032	7 G 2,5	12,6	168,0	320,0	14
23140	8 G 2,5	13,6	192,2	373,0	14
23141	10 G 2,5	15,5	240,1	450,0	14

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23033	12 G 2,5	17,1	288,0	502,0	14
23142	16 G 2,5	19,6	384,0	659,0	14
23143	18 G 2,5	20,6	432,2	761,0	14
23144	25 G 2,5	24,4	600,0	1007,0	14
23034	2 x 4	10,8	77,0	180,0	12
23035	3 G 4	11,4	115,0	224,0	12
23036	4 G 4	12,5	154,0	295,0	12
23037	5 G 4	13,9	192,0	359,0	12
23039	7 G 4	15,6	269,0	479,0	12
23040	2 x 6	12,4	115,0	210,0	10
23041	3 G 6	13,2	173,0	270,0	10
23042	4 G 6	14,8	230,0	341,0	10
23043	5 G 6	16,5	288,0	432,0	10
23045	7 G 6	18,0	403,0	552,0	10
23046	2 x 10	16,2	192,0	400,0	8
23047	3 G 10	17,2	288,0	507,0	8
23048	4 G 10	19,4	384,0	644,0	8
23049	5 G 10	21,4	480,0	788,0	8
23145	7 G 10	23,4	672,2	1151,0	8
23050	2 x 16	18,0	308,0	591,0	6
23051	3 G 16	19,3	462,0	749,0	6
23052	4 G 16	21,4	616,0	950,0	6
23053	5 G 16	24,0	770,0	1204,0	6
23146	7 G 16	26,4	1075,3	1682,0	6
23054	2 x 25	22,0	480,0	700,0	4
23055	3 G 25	23,4	720,0	1100,0	4
23056	4 G 25	26,3	960,0	1500,0	4
23057	2 x 35	24,6	672,0	1100,0	2
23058	3 G 35	26,3	1008,0	1500,0	2
23059	4 G 35	29,1	1344,0	2100,0	2

Dimensions and specifications may be changed without prior notice. (RE01)

E

THERMFLEX 180 EWKF (H05SS-F) halogen-free, silicone multicore cable, meter marking



Technical data

- Heat-resistant silicone-insulated flexible cable in adapted to DIN VDE 0250 part 816
- **Temperature range**
flexing -25 °C to +180 °C
fixed installation -60 °C to +180 °C (short time operation +220 °C)
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 2000 V
- **Insulation resistance**
min. 200 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 20x10⁶ cJ/kg (up to 20 Mrad)
- **Insulation integrity** continuance of insulation effects under fire condition according to IEC 60331 and DIN VDE 0472 part 814
- **Freedom from halogen** (corrosiveness of combustion gases) according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- **Behaviour in fire** no flame propagation, test according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Cable structure

- Tinned copper conductor, stranded to DIN VDE 0295, cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special silicone core insulation, EI2 to DIN VDE 0207 part 20
- Core identification to DIN VDE 0293-308 up to 5 cores one-coloured, 6 and more cores black with white numbering
- Green-yellow earth core (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Silicone outer jacket, 2GM1 to DIN VDE 0207 part 21
- Jacket colour black (RAL 9005)
- with meter marking, change-over in 2011
- Different dimensions also approved by Germanischer Lloyd on request.

Properties

- **Smoke density** - low
- Due to the special abrasive and notch resistance outer jacket, these cables are suitable for heavy loading of mechanical stresses than the usual standard silicone cables
- Hardly changes of dielectric strength and the insulation resistance also at high temperatures
- High ignition or flash point
- In case of fire, forms an insulating layer of
- **Resistant to**
High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen, ozone

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- **EWKF** = Improved values to **E**=tearing resistance, **W**=breaking strength propagation, **K**=notch strength, **F**=flexibility
- **screened analogue type:**
THERMFLEX 180 EWKF-C
see page E 19

Application

These cables are ideal for use everywhere, where increased mechanical stresses for the installation and operation are required. Silicone-rubber-insulated cables are used for all applications where the cable insulation is subjected to high temperature fluctuations. Suitable for installation at high temperature influence in dry, damp and in the open air. As flexible connecting cable for low mechanical stress i.e. sauna, solar installations, foundries and steel plants. This cable can be used for fixed installation only in open and ventilated cable tubes and cable ducts.

FRNC = Flame Retardant Non Corrosive

All silicon cables are available also in FRNC versions. The jacket designed with special-compound conform flame test method C to DIN VDE 0472 part 804 and IEC 60332-3 as well as HD 405.3. This special compound is self-extinguishing. Because of that these cables can be installed as security cable with functionality as for example in communal buildings, power stations, hotels, airports etc.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
74992	2 x 0,75	6,4	15,0	53,0	18
74993	3 G 0,75	7,0	22,0	64,0	18
74994	4 G 0,75	7,6	29,0	84,0	18
74995	5 G 0,75	8,5	36,0	101,0	18
74996	2 x 1	6,8	20,0	60,0	17
74997	3 G 1	7,2	29,0	78,0	17
74998	4 G 1	7,8	39,0	95,0	17
74999	5 G 1	8,8	48,0	116,0	17
75000	2 x 1,5	8,8	29,0	82,0	16
75001	3 G 1,5	8,9	43,0	98,0	16
75002	4 G 1,5	9,9	58,0	122,0	16
75003	5 G 1,5	10,8	72,0	148,0	16
75004	7 G 1,5	12,0	101,0	187,0	16
75005	12 G 1,5	16,1	173,0	315,0	16
75006	16 G 1,5	18,2	231,0	446,0	16
75007	20 G 1,5	19,4	288,0	566,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75008	2 G 2,5	9,8	48,0	135,0	14
75009	3 G 2,5	10,4	72,0	152,0	14
75010	4 G 2,5	11,5	96,0	189,0	14
75011	5 G 2,5	12,9	120,0	229,0	14
75012	2 x 4	11,6	77,0	180,0	12
75013	3 G 4	12,3	115,0	230,0	12
75014	4 G 4	13,6	154,0	300,0	12
75015	5 G 4	15,2	192,0	380,0	12
75016	2 x 6	13,2	115,0	321,0	10
75017	3 G 6	14,0	173,0	330,0	10
75018	4 G 6	15,5	230,0	430,0	10
75019	5 G 6	17,2	288,0	550,0	10

Dimensions and specifications may be changed without prior notice. (RE01)

H05SS-F / H05SST-F heat-resistant multicore cable



Technical data

- Heat-resistant multicore cable to DIN VDE 0282 part 15, HD 22.15 S1
- **Temperature range**
fixed installation -60 °C to +180 °C (250 °C for short time)
- **Temperature limit**
at conductor in operation +180 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Specific volume resistivity**
min. 200 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable \varnothing
fixed installation 4x cable \varnothing
- **Radiation resistance**
up to 20×10^6 cJ/kg (up to 20 Mrad)

Cable structure

- Tinned or bare(1) copper conductor, stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 cl. 5 and IEC 60228
- SIR core insulation, crosslinked (rubber compound) E I2 to DIN VDE 0207 part 20
- Core identification to DIN VDE 0293-308
- Green-yellow earth core, 3 cores and above
- Cores stranded in layers with optimal lay-length
- Outer jacket of crosslinked EM9 (rubber compound) to HD 22.3 S3 : 1994 / A1 : 1999
- Jacket colour black (RAL 9005)
- Also available in other sheath colours

Cable structure H05SST-F

- As per H05SS-F
- Polyester braiding

Properties

- **Behavior in fire:**
Test of vertical flame-propagation to DIN VDE 0482 part 265-2-1 and DIN EN 50265-2-1, not valid for the cables with polyesterbraiding (Type H05SST-F)
- Advantages Hardly changes of dielectric strength and the insulation resistance also at high temperatures
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90 °C. These cables may be damaged by pulling over sharp-edges or by abrasion during the installation and application. To avoid this, it should be treated with great care during the installation and application of the cable.

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Multicore cables insulated and sheathed with heat resistant silicone rubber without strain relieving elements are used in high temperatures or with contact to hot-surfaces. These cables are installed for fixed installation, mechanical protected, for internal wiring of lighting fixtures in industrial application. It is recommended for the application of the apparatus which are moving during the operation with less mechanical stress.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

H05SS-F

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22290	2 x 0,75	5,7 - 7,4	14,4	59,0	18
22291	3 G 0,75	6,2 - 8,1	21,6	71,0	18
22292	4 G 0,75	6,8 - 8,8	28,8	93,0	18
22293	5 G 0,75	7,6 - 9,9	36,0	113,0	18
22294	2 x 1	6,1 - 8,0	19,2	67,0	17
22295	3 G 1	6,5 - 8,5	29,0	86,0	17
22296	4 G 1	7,1 - 9,3	38,4	105,0	17
22297	5 G 1	8,0 - 10,3	48,0	129,0	17
22298	2 x 1,5	7,6 - 9,8	29,0	91,0	16
22299	3 G 1,5	8,0 - 10,4	43,0	110,0	16
22300	4 G 1,5	9,0 - 11,6	58,0	137,0	16
22301	5 G 1,5	9,8 - 12,7	72,0	165,0	16
22302	2 x 2,5	9,0 - 11,6	48,0	150,0	14
22303	3 G 2,5	9,6 - 12,4	72,0	170,0	14
22304	4 G 2,5	10,7 - 13,8	96,0	211,0	14
22305	5 G 2,5	11,9 - 15,3	120,0	255,0	14
22306	3 G 4	11,3 - 14,5	115,0	251,0	12
22307	4 G 4	12,7 - 16,2	154,0	330,0	12
22308	3 G 6	12,8 - 16,3	173,0	379,0	10
22309	4 G 6	14,2 - 18,1	230,0	494,0	10

H05SST-F

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22343	2 x 0,75	6,7 - 8,4	14,4	63,0	18
22344	3 G 0,75	7,2 - 9,1	21,6	75,0	18
22345	4 G 0,75	7,8 - 9,8	28,8	99,0	18
22346	5 G 0,75	8,6 - 10,9	36,0	120,0	18
22347	2 x 1	7,1 - 9,0	19,2	71,0	17
22348	3 G 1	7,5 - 9,5	29,0	91,0	17
22349	4 G 1	8,1 - 10,3	38,4	111,0	17
22350	5 G 1	9,0 - 11,3	48,0	137,0	17
22351	2 x 1,5	8,6 - 10,8	29,0	97,0	16
22352	3 G 1,5	9,0 - 11,4	43,0	117,0	16
22353	4 G 1,5	10,0 - 12,6	58,0	145,0	16
22354	5 G 1,5	10,8 - 13,7	72,0	175,0	16
22355	2 x 2,5	10,0 - 12,6	48,0	159,0	14
22356	3 G 2,5	10,6 - 13,4	72,0	180,0	14
22357	4 G 2,5	11,7 - 14,8	96,0	224,0	14
22358	5 G 2,5	12,9 - 16,3	120,0	270,0	14
22359	3 G 4	12,3 - 15,5	115,0	266,0	12
22360	4 G 4	13,7 - 17,2	154,0	350,0	12
22361	3 G 6	13,8 - 17,3	173,0	402,0	10
22362	4 G 6	15,2 - 19,1	230,0	524,0	10

Dimensions and specifications may be changed without prior notice. (RE01)

HELUFLO[®]-FEP-6Y multi core, fluorinated polymeric materials,

-100°C up to +205°



Technical data

- Fluorinated polymeric insulation FEP (Fluorethylenpropylene)
- **Temperature range**
-100 °C to +205 °C
(up to +230 °C for short time)
- **Nominal voltage** 600 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 2 GOhm x km
- **Minimum bending radius**
flexing 15x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 1x10⁶ cJ/kg (up to 1 Mrad)
- **Conductor temperature range**
plain copper +130 °C
tinned copper +180 °C
silver pl. copper +200 °C

Cable structure

- Stranded copper wire, bare, tinned, silver
- Make-up fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation FEP-HELUFLO[®]
- Green-yellow earth core
- 0,25 mm² colour code to DIN VDE 0293-308
- 0,5 mm² and above black cores with white imprints
- Outer jacket FEP-HELUFLO[®]
- Colour black (RAL 9005)

Properties

- Higher insulation resistance
- Low dielectric loss
- Not flammable
- Resistant to micro-cultures
- Do not permit any fungus-formation
- Absolute ozone resistant
- Absolute weather resistant
- Water absorption <0,01%
- Minimal water vapour permeability (approx. 0,18 mgr/cm² in 24 hours)
- Self-extinguishing and flame retardant according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This cables are predominantly used for installing in control cabinets subjected to high thermal effects as well as in brickworks, heaters, kitchen fitments and measuring appliances as well as in the chemical industry. These cables are non-flammable and resistant to acids, alkalis, solvents, oil and petrol.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

copper wire, tinned

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24547	2 x 0,25	2,7	5,0	17,0	24
24548	3 G 0,25	2,9	7,5	22,0	24
24549	4 G 0,25	3,2	10,0	27,0	24
24550	5 G 0,25	3,5	12,5	34,0	24
24551	7 G 0,25	3,9	17,5	46,0	24
24552	2 x 0,5	3,3	9,8	21,0	20
24553	3 G 0,5	3,5	14,7	32,0	20
24554	4 G 0,5	3,9	19,6	44,0	20
24555	5 G 0,5	4,3	24,5	55,0	20
24556	7 G 0,5	4,8	34,3	70,0	20
24557	2 x 0,75	3,6	14,4	31,0	18
24558	3 G 0,75	3,9	21,6	46,0	18
24559	4 G 0,75	4,3	29,0	58,0	18
24560	5 G 0,75	4,7	36,0	69,0	18
24561	7 G 0,75	4,8	50,0	92,0	18
24562	2 x 1	4,1	19,0	41,0	17
24563	3 G 1	4,4	29,0	55,0	17
24564	4 G 1	4,9	38,0	71,0	17
24565	5 G 1	5,5	48,0	88,0	17

copper wire, tinned

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
24566	7 G 1	6,0	67,0	113,0	17
24273	12 G 1	8,0	115,2	220,0	17
24274	18 G 1	9,5	173,0	321,0	17
24275	25 G 1	11,2	240,0	458,0	17
24501	2 x 1,5	4,9	29,0	45,0	16
24502	3 G 1,5	5,3	43,0	70,0	16
24503	4 G 1,5	5,8	58,0	98,0	16
24504	5 G 1,5	6,5	72,0	117,0	16
24505	7 G 1,5	7,2	101,0	184,0	16
24276	12 G 1,5	10,2	173,0	326,0	16
24277	18 G 1,5	12,3	260,0	504,0	16
24278	25 G 1,5	14,0	360,0	682,0	16
24279	3 G 2,5	6,4	72,0	121,0	14
24280	4 G 2,5	7,0	96,0	182,0	14
24281	5 G 2,5	7,9	120,0	240,0	14
24282	7 G 2,5	8,7	168,0	316,0	14
24283	3 G 4	7,5	115,0	212,0	12
24284	4 G 4	8,3	154,0	304,0	12
24285	5 G 4	9,2	192,0	386,0	12

Continuation ▶

HELUFLO[®]-FEP-6Y multi core, fluorinated polymeric materials,

-100°C up to +205°

copper wire, bare

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25914	2 x 0,25	2,7	5,0	17,0	24
25915	3 G 0,25	2,9	7,5	22,0	24
25916	4 G 0,25	3,2	10,0	27,0	24
25917	5 G 0,25	3,5	12,5	34,0	24
25918	7 G 0,25	3,9	17,5	46,0	24
25919	2 x 0,5	3,3	9,8	21,0	20
25920	3 G 0,5	3,5	14,7	32,0	20
25921	4 G 0,5	3,9	19,6	44,0	20
25922	5 G 0,5	4,3	24,5	55,0	20
25923	7 G 0,5	4,8	34,3	70,0	20
25924	2 x 0,75	3,6	14,4	31,0	18
25925	3 G 0,75	3,9	21,6	46,0	18
25926	4 G 0,75	4,3	29,0	58,0	18
25927	5 G 0,75	4,7	36,0	69,0	18
25928	7 G 0,75	5,4	50,0	92,0	18
25929	2 x 1	4,1	19,0	41,0	17
25930	3 G 1	4,4	29,0	55,0	17
25931	4 G 1	4,9	38,0	71,0	17
25932	5 G 1	5,5	48,0	88,0	17
25933	7 G 1	6,0	67,0	113,0	17
25934	12 G 1	8,0	115,2	220,0	17
25935	18 G 1	9,5	173,0	321,0	17
25936	25 G 1	11,2	240,0	458,0	17
25937	2 x 1,5	4,9	29,0	45,0	16
25938	3 G 1,5	5,3	43,0	70,0	16
25939	4 G 1,5	5,8	58,0	98,0	16
25940	5 G 1,5	6,5	72,0	117,0	16
25941	7 G 1,5	7,2	101,0	184,0	16
25942	12 G 1,5	10,2	173,0	326,0	16
25943	18 G 1,5	12,3	260,0	504,0	16
25944	25 G 1,5	14,0	360,0	682,0	16
25945	3 G 2,5	6,4	72,0	121,0	14
25946	4 G 2,5	7,0	96,0	182,0	14
25947	5 G 2,5	7,9	120,0	240,0	14
25948	7 G 2,5	8,7	168,0	316,0	14
25949	3 G 4	7,5	115,0	212,0	12
25950	4 G 4	8,3	154,0	304,0	12
25951	5 G 4	9,2	192,0	386,0	12

copper wire, silvered

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25952	2 x 0,25	2,7	5,0	17,0	24
25953	3 G 0,25	2,9	7,5	22,0	24
25954	4 G 0,25	3,2	10,0	27,0	24
25955	5 G 0,25	3,5	12,5	34,0	24
25956	7 G 0,25	3,9	17,5	46,0	24
25957	2 x 0,5	3,3	9,8	21,0	20
25958	3 G 0,5	3,5	14,7	32,0	20
25959	4 G 0,5	3,9	19,6	44,0	20
25960	5 G 0,5	4,3	24,5	55,0	20
25961	7 G 0,5	4,8	34,3	70,0	20
25962	2 x 0,75	3,6	14,4	31,0	18
25963	3 G 0,75	3,9	21,6	46,0	18
25964	4 G 0,75	4,3	29,0	58,0	18
25965	5 G 0,75	4,7	36,0	69,0	18
25966	7 G 0,75	5,4	50,0	92,0	18
25967	2 x 1	4,1	19,0	41,0	17
25968	3 G 1	4,4	29,0	55,0	17
25969	4 G 1	4,9	38,0	71,0	17
25970	5 G 1	5,5	48,0	88,0	17
25971	7 G 1	6,0	67,0	113,0	17
25972	12 G 1	8,0	115,2	220,0	17
25973	18 G 1	9,5	173,0	321,0	17
25974	25 G 1	11,2	240,0	458,0	17
25975	2 x 1,5	4,9	29,0	45,0	16
25976	3 G 1,5	5,3	43,0	70,0	16
25977	4 G 1,5	5,8	58,0	98,0	16
25978	5 G 1,5	6,5	72,0	117,0	16
25979	7 G 1,5	7,2	101,0	184,0	16
25980	12 G 1,5	10,2	173,0	326,0	16
25981	18 G 1,5	12,3	260,0	504,0	16
25982	25 G 1,5	14,0	360,0	682,0	16
25983	3 G 2,5	6,4	72,0	121,0	14
25984	4 G 2,5	7,0	96,0	182,0	14
25985	5 G 2,5	7,9	120,0	240,0	14
25986	7 G 2,5	8,7	168,0	316,0	14
25987	3 G 4	7,5	115,0	212,0	12
25988	4 G 4	8,3	154,0	304,0	12
25989	5 G 4	9,2	192,0	386,0	12

Dimensions and specifications may be changed without prior notice. (RE01)

E



Technical data

- Special Cu-nickel silicone-insulated cable with enhanced heat resistance
- **Temperature range**
-60 °C to +400 °C
(up to +500 °C for short time)
- **Nominal voltage** 500 V
- **Test voltage** 2500 V
- **Minimum bending radius**
approx. 5x cable ø

Cable structure

- Cu wires, finely stranded, nickel plated (ASTM B 355)
- Core insulation of braided glass-fibre impregnated with silicone
- Second core insulation of glass-fibre braiding impregnated with silicone
- Overall lay up of cores
- Core identification according to colour coding listed below
- Common outer sheath of glass-fibre braiding impregnated with silicone
- Sheath colour grey

Properties

- **Asbestos** and **cadmium-free**

Colour code

- No. of cores **with** protective earth conductor
 - 3 = gn-ye/bl/bn
 - 4 = gn-ye/bk/bl/bn
 - 5 = gn-ye/bk/bl/bn/wh
 - 6 = gn-ye/bk/bl/bn/wh/rd
 - 7 = gn-ye/bk/bl/bn/wh/rd/gy
- No. of cores **without** protective earth conductor
 - 2 = bl/bn
 - 3 = bk/bl/bn
 - 4 = bk/bl/bn/wh
 - 5 = bk/bl/bn/wh/rd
 - 6 = bk/bl/bn/wh/rd/gy
 - 7 = bk/bl/bn/wh/rd/gy/gn

Note

- Enquire for further configurations and core cross sections for your requirements.
- We supply customised cables for temperature ranges up to approx. 1600 °C. Please enquire for minimum ordering quantities and delivery times.
- **screened analogue type:**
MULTITHERM® 400 -ES
see page E 20

Application

MULTITHERM 400 cables are used for applications where extremely high connecting and ambient temperatures can arise, e.g. in iron and steel works, rolling mills, foundries, glass and ceramic factories, in furnace and power plant construction, during thermoplastic moulding processes etc. The special construction of the cable is designed for a recommended maximum temperature in damp environments of 220 °C and for dry environments above this temperature.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
51741	2 x 0,5	6,2	10,0	47,0	20
51742	3 x 0,5	6,4	15,0	50,0	20
51743	4 x 0,5	7,5	19,0	70,0	20
51744	5 x 0,5	8,0	25,0	81,0	20
51745	6 x 0,5	8,6	30,0	97,0	20
51746	7 x 0,5	8,7	34,0	105,0	20
51747	2 x 0,75	6,7	14,4	55,0	18
51748	3 x 0,75	7,0	21,6	66,0	18
51749	4 x 0,75	8,0	29,0	86,0	18
51750	5 x 0,75	8,8	36,0	103,0	18
51751	6 x 0,75	9,5	43,0	119,0	18
51752	7 x 0,75	9,7	50,0	130,0	18
51753	2 x 1	6,9	19,0	63,0	17
51754	3 x 1	7,8	29,0	82,0	17
51755	4 x 1	8,3	38,0	98,0	17
51756	5 x 1	9,1	48,0	119,0	17
51757	6 x 1	9,8	58,0	138,0	17
51758	7 x 1	10,0	67,0	150,0	17
51759	2 x 1,5	8,0	29,0	87,0	16
51760	3 x 1,5	8,3	43,0	103,0	16
51761	4 x 1,5	9,1	58,0	128,0	16
51762	5 x 1,5	10,0	72,0	150,0	16
51763	6 x 1,5	10,7	88,0	175,0	16
51764	7 x 1,5	11,0	101,0	190,0	16
51765	2 x 2,5	9,2	48,0	135,0	14
51766	3 x 2,5	9,7	72,0	153,0	14
51767	4 x 2,5	10,6	96,0	190,0	14
50060	5 x 2,5	11,8	120,0	230,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
50061	6 x 2,5	12,8	144,0	270,0	14
50062	7 x 2,5	13,0	168,0	295,0	14
50063	2 x 4	11,0	77,0	191,0	12
50064	3 x 4	11,4	115,0	224,0	12
50065	4 x 4	13,0	154,0	285,0	12
50066	5 x 4	14,5	192,0	360,0	12
50067	7 x 4	16,5	270,0	485,0	12
50068	3 x 6	14,2	173,0	340,0	10
50069	4 x 6	16,2	230,0	442,0	10
50070	5 x 6	17,7	288,0	535,0	10
50071	4 x 10	20,0	384,0	710,0	8
50072	4 x 16	24,5	615,0	990,0	6

Dimensions and specifications may be changed without prior notice. (RE01)

HELUTHERM® 145 MULTI-C flexible, cross-linked, halogen-free,

Cu-screened, EMC-preferred type, meter marking



Technical data

- Halogen-free control and connecting cable with increased heat resistance
- **Temperature range**
flexing -35 °C to +120 °C
fixed installation -55 °C to +145 °C
in short-circuit +250 °C
- **Nominal voltage**
U₀/U 300/500 V up to 1,0 mm²
U₀/U 450/750 V at 1,5 mm²
with protected fixed installation
U₀/U 600/1000 V at 1,5 mm²
- **Test voltage** 3500 V
- **Minimum bending radius**
for fixed installation 4x cable ø
in operation to -30 °C 12x cable ø
in operation to +60 °C 8x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Caloric load values**
see Technical Informations
- **Power ratings table**
see Technical Informations
- **Approval**
Germanischer Lloyd

Cable structure

- Tinned copper conductor, fine wire stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of polyolefin-copolymer, cross-linked and halogen-free
- Black cores with continuous white numbering
- Cores stranded in layers with optimal lay-length
- Braided screen of tinned Cu wires, coverage approx. 85%
- Polyolefin-Copolymer, cross-linked and halogen-free outer sheath
- Colour black
- with meter marking, change-over in 2011
- Different insulation- and outer sheath in other colours available on request

Note

- **unscreened analogue type:**
HELUTHERM® 145 MULTI see page E 5

Properties

- Lower propagation of fire
- Low development of smoke and fumes
- Good abrasion and notch resistance
- Good resistance to oils and weathering
- Resistant to UV radiation and ozone
- Resistant to soldering temperatures
- Thermal class B
- These control cables are resistant to melting, even when in contact with a soldering iron at temperatures of between 300 °C and 380 °C, because of the cross-linking for the insulation material
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- **Flame test** (unit flame test) to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3-22, IEC 60332-3-22 (equivalent DIN VDE 0472 part 804 test method C)
- **Flame test** (cable) to VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1-2 (equivalent DIN VDE 0472 part 804 test method B)
- **Corrosiveness of combustion gases** according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- **Halogen-free** according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- **Smoke density** to VDE 0482 part 268-1 and 2, test method C, IEC 61034-1/61034-2, HD 606 and BS 7622 part 1 and 2 (DIN VDE 0472 part 816)

Application

These halogen-free, cross-linked and temperature resistant wiring and control cables with enhanced fire-behaviour properties are used for wiring up the lighting fixtures, heaters, electric machines (temperature class B), switching systems and distribution switchboards. A very long service life is also given on account of their excellent high-temperature stability.

These cables exhibit good resistance to weathering as well as being very stable to temperature, moisture, ozone and UV radiation. These cables are therefore mainly used for traffic control systems and diverse outdoor applications. The development of smoke is low and no corrosive gases are liberated during combustion of these halogen-free cables in case of fire. The risk of toxic fumes is considerably less in the event of fire because the caloric load values is lower. Precious time can thus be won for a disciplined evacuation, and unnecessary loss of life can be prevented. The extent of the damage to costly control and monitoring systems and the concrete and steel structures of buildings and plant due to fire is reduced by this. Injuries to persons and damage to materials can be prevented. A lower conductor cross-section is possible in certain circumstances because of the high thermal load and thus savings in the space and weight required can be made. These wiring and control cables provide a significant contribution in safety engineering and environmental protection.

EMC = Electromagnetic compatibility

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52194	2 x 0,25	5,0	16,0	36,0	24

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52195	3 x 0,25	5,5	21,0	44,0	24

Continuation ▶

HELUTHERM® 145 MULTI-C flexible, cross-linked, halogen-free,



Cu-screened, EMC-preferred type, meter marking

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52196	5 x 0,25	6,4	29,0	68,0	24
52197	7 x 0,25	7,5	37,0	95,0	24
52198	1 x 0,5	3,7	15,0	24,0	20
52199	2 x 0,5	5,6	29,0	55,0	20
52200	3 x 0,5	6,1	38,0	64,0	20
52201	4 x 0,5	6,7	45,0	78,0	20
52202	5 x 0,5	7,3	51,0	95,0	20
52203	6 x 0,5	7,9	66,0	106,0	20
52204	7 x 0,5	8,4	68,0	122,0	20
52205	8 x 0,5	9,0	80,0	138,0	20
52206	10 x 0,5	10,0	93,0	161,0	20
52207	12 x 0,5	10,0	107,0	170,0	20
52208	14 x 0,5	11,0	122,0	193,0	20
52209	16 x 0,5	11,7	129,0	216,0	20
52210	19 x 0,5	12,8	158,0	253,0	20
52211	21 x 0,5	13,5	167,0	281,0	20
52212	1 x 0,75	4,0	18,0	29,0	18
52213	2 x 0,75	6,6	38,0	71,0	18
52214	3 x 0,75	6,9	50,0	82,0	18
52215	4 x 0,75	7,6	58,0	100,0	18
52216	5 x 0,75	8,3	70,0	117,0	18
52217	6 x 0,75	8,9	85,0	135,0	18
52218	7 x 0,75	9,9	90,0	158,0	18
52219	8 x 0,75	10,6	110,0	178,0	18
52220	10 x 0,75	11,5	140,0	207,0	18
52221	12 x 0,75	11,5	148,0	220,0	18
52222	14 x 0,75	12,2	167,0	250,0	18
52223	16 x 0,75	12,9	183,0	282,0	18
52224	19 x 0,75	14,5	212,0	335,0	18
52225	21 x 0,75	15,3	230,0	370,0	18
52226	1 x 1	4,2	20,0	33,0	17
52227	2 x 1	7,0	31,0	78,0	17
52228	3 x 1	7,4	56,0	92,0	17
52229	4 x 1	8,1	66,0	112,0	17
52230	5 x 1	8,9	95,0	134,0	17
52231	6 x 1	9,5	105,0	164,0	17
52232	7 x 1	10,5	109,0	192,0	17
52233	8 x 1	11,4	130,0	219,0	17
52234	10 x 1	12,5	138,0	254,0	17
52235	12 x 1	12,5	164,0	270,0	17
52236	14 x 1	13,5	198,0	308,0	17
52237	16 x 1	14,3	203,0	350,0	17
52238	19 x 1	16,2	235,0	447,0	17
52239	21 x 1	17,0	257,0	492,0	17
52240	1 x 1,5	4,8	22,0	42,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52241	2 x 1,5	8,2	58,0	105,0	16
52242	3 x 1,5	8,7	71,0	121,0	16
52243	4 x 1,5	9,4	86,0	156,0	16
52244	5 x 1,5	10,5	104,0	188,0	16
52245	6 x 1,5	11,5	118,0	225,0	16
52246	7 x 1,5	12,6	136,0	264,0	16
52247	8 x 1,5	13,7	172,0	308,0	16
52248	10 x 1,5	15,0	193,0	361,0	16
52249	12 x 1,5	15,0	222,0	383,0	16
52250	14 x 1,5	16,0	272,0	458,0	16
52251	16 x 1,5	17,0	285,0	515,0	16
52252	19 x 1,5	19,3	331,0	639,0	16
52253	21 x 1,5	20,3	367,0	705,0	16
52254	1 x 2,5	5,6	28,0	59,0	14
52255	2 x 2,5	9,8	96,0	148,0	14
52256	3 x 2,5	10,4	146,0	183,0	14
52257	4 x 2,5	11,5	150,0	221,0	14
52258	5 x 2,5	12,6	200,0	273,0	14
52259	6 x 2,5	13,8	227,0	326,0	14
52260	7 x 2,5	15,3	235,0	397,0	14
52261	8 x 2,5	16,5	265,0	475,0	14
52262	10 x 2,5	18,3	326,0	542,0	14
52263	12 x 2,5	18,3	376,0	582,0	14
52264	14 x 2,5	19,6	428,0	681,0	14
52265	16 x 2,5	20,7	480,0	778,0	14
52266	19 x 2,5	23,5	557,0	948,0	14
52267	21 x 2,5	24,4	606,0	1042,0	14
52268	1 x 4	6,3	56,0	86,0	12
52269	2 x 4	10,9	135,0	196,0	12
52270	3 x 4	11,5	178,0	248,0	12
52271	4 x 4	12,8	220,0	316,0	12
52272	5 x 4	14,3	259,0	376,0	12
52273	6 x 4	15,6	302,0	452,0	12
52274	7 x 4	17,0	355,0	555,0	12
52275	8 x 4	18,3	392,0	655,0	12
52276	10 x 4	20,7	480,0	767,0	12
52277	12 x 4	20,7	557,0	829,0	12
52278	14 x 4	22,1	636,0	948,0	12
52279	1 x 6	6,9	81,0	108,0	10
52280	2 x 6	12,1	175,0	255,0	10
52281	3 x 6	12,8	240,0	330,0	10
52282	4 x 6	14,3	305,0	429,0	10
52283	5 x 6	16,0	441,0	536,0	10
52284	6 x 6	17,4	473,0	624,0	10
52285	7 x 6	19,3	505,0	751,0	10
52286	1 x 10	8,4	124,0	170,0	8
52287	2 x 10	15,1	265,0	409,0	8
52288	3 x 10	16,4	370,0	550,0	8
52289	4 x 10	18,1	485,0	715,0	8
52290	5 x 10	20,2	610,0	882,0	8
52291	6 x 10	22,3	715,0	1026,0	8
52292	7 x 10	24,3	820,0	1195,0	8

Dimensions and specifications may be changed without prior notice. (RE01)



Technical data

- Special silicone multicores cable with higher heat-resistance range adapted to DIN VDE 0250 part 1 and part 816
- **Temperature range**
-60 °C to +180 °C
(up to +220 °C for short time)
- **Temperature limit at the conductor**
in operation +180 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
min. 200 MOhm x km
- **Power rating**
at ambient temperature up to +145 °C to DIN VDE 0100 for higher temperatures valid:
150 °C - load value 100%
155 °C - load value 91%
160 °C - load value 82%
165 °C - load value 71%
170 °C - load value 58%
175 °C - load value 41%
- **Minimum bending radius**
flexing 10x cable \varnothing
fixed installation 5x cable \varnothing
- **Radiation resistance**
up to 20×10^6 cJ/kg (up to 20 Mrad)

Cable structure

- Tinned copper conductors fine wire to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Silicone core insulation
- Core colours according DIN VDE 0293-308
- Core colour
- up to 5 cores one-coloured
- up 6 and more cores, black with white numbering
- 3 and above, with green-yellow earth core
- 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Outer jacket of silicone
- Jacket colour preferably redbrown
- Glass fibre tape over the jacket
- Galvanized steel wire outer braiding

Properties

- **Advantages**
Hardly changes of dielectric strength and the insulation resistance also at high temperatures, high ignition or flash point, in case of fire, forms an insulating layer of SiO_2
- **Resistant to**
High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen
- **Corrosivity of combustion gases (Halogen-free)**
according to VDE 0482 part 267/
DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- **Behaviour in fire**
no flame propagation
test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90 °C

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.

Application

Silicone cables screened with steel braiding were evolved for use wherever insulation is subjected to extreme temperature changes. They are heat-resistant for permanent temperature up to +180 °C, for short time operation up to +220 °C. The good performance of the environmental resistant properties means that silicone cables can be used at temperatures down to -60 °C. Silicone cables are halogen-free cables and are especially suited for installation in power stations. They have also found their uses in the steel producing industries, aviation industry, ship building as well as in ceramic, glass and cement factories.

The screened steel braiding ensures a disturbance-free transmission of signals and impulses.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23062	2 x 0,75	7,9	14,4	90,0	18	23084	24 G 1,5	21,5	346,0	600,0	16
23063	3 G 0,75	8,3	21,6	101,0	18	23085	2 x 2,5	10,7	48,0	187,0	14
23064	4 G 0,75	9,3	29,0	129,0	18	23086	3 G 2,5	11,2	72,0	205,0	14
23065	5 G 0,75	10,0	36,0	157,0	18	23087	4 G 2,5	12,1	96,0	278,0	14
23067	7 G 0,75	10,7	50,0	177,0	18	23088	5 G 2,5	13,3	120,0	322,0	14
23068	2 x 1	8,0	19,0	97,0	17	23089	6 G 2,5	14,3	144,0	351,0	14
23069	3 G 1	8,9	29,0	122,0	17	23090	7 G 2,5	14,4	168,0	380,0	14
23070	4 G 1	9,4	38,0	141,0	17	23091	2 x 4	12,5	77,0	240,0	12
23071	5 G 1	10,4	48,0	166,0	17	23092	3 G 4	13,0	115,0	311,0	12
23073	7 G 1	11,1	67,0	197,0	17	23093	4 G 4	15,0	154,0	384,0	12
23074	2 x 1,5	9,0	29,0	127,0	16	23094	5 G 4	16,0	192,0	454,0	12
23075	3 G 1,5	9,5	43,0	145,0	16	23095	7 G 4	17,5	269,0	633,0	12
23076	4 G 1,5	10,3	58,0	173,0	16	23096	2 x 6	15,1	115,0	321,0	10
23077	5 G 1,5	11,0	72,0	202,0	16	23097	3 G 6	15,9	173,0	432,0	10
23078	6 G 1,5	12,0	86,0	240,0	16	23098	4 G 6	18,0	230,0	544,0	10
23079	7 G 1,5	12,0	101,0	244,0	16	23099	5 G 6	19,4	288,0	656,0	10
23080	8 G 1,5	13,0	115,0	261,0	16	23100	7 G 6	20,7	403,0	768,0	10
23081	12 G 1,5	15,5	173,0	327,0	16	23101	4 G 10	22,1	384,0	925,0	8
23082	14 G 1,5	16,2	202,0	382,0	16	23102	4 G 16	26,1	614,0	1235,0	6
23083	18 G 1,5	18,7	259,0	440,0	16	23103	4 G 25	30,4	960,0	1700,0	4

Dimensions and specifications may be changed without prior notice. (RE01)

SiHF-C-Si silicon multicore cable, halogen-free, Cu-screened, EMC-preferred type, meter marking



Technical data

- Special silicone-insulated cable with higher heat-resistance adapted to DIN VDE 0250 part 1 and part 816
- **Temperature range**
-60 °C to +180 °C
(+220 °C for short time)
- **Temperature limit at the conductor**
in operation +180 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
min. 200 MΩm x km
- **Power rating**
at ambient temperatures up to +145 °C according to DIN VDE 0100
150 °C - load value 100%
155 °C - load value 91%
160 °C - load value 82%
165 °C - load value 71%
170 °C - load value 58%
175 °C - load value 41%
- **Minimum bending radius**
flexing 10x cable \varnothing
fixed installation 5x cable \varnothing
- **Coupling resistance**
max. 250 Ωm/km
- **Radiation resistance**
up to 20×10^6 cJ/kg (up to 20 Mrad)

Cable structure

- Tinned copper conductor fine wire according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of silicone
- Core colours according DIN VDE 0293-308
Core colour
- up to 5 cores one-coloured
- up 6 and more cores, black with white numbering
- 3 and above, with green-yellow earth core
- 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Inner sheath of silicone
- Braid of tinned Cu wires, coverage approx. 85%
- Silicone-rubber-insulated common outer jacket
- Jacket preferentially redbrown colour
- with meter marking, change-over in 2011

Properties

- **Resistant to**
High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen and UV
- **Halogen-free**
according to VDE 0482 part 267/
DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- **Burning behaviour**
no propagation of fire
testing according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90 °C.

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analoguetype:**
SiHF see page E 7

Application

Silicone-rubber-insulated cables are used for all applications where the cable insulation is subjected to high temperature fluctuations. These cables are heat-resistant for continuous use at temperatures up to +180 °C, as well as for short periods of time at +220 °C. Silicone-rubber-insulated cables can also be used at low temperatures down to -60 °C because of the excellent weathering resistance of the material. These cables are halogen-free and hence are particularly suitable for applications in iron and steel works, rolling mills, foundries, in aircraft construction and ship building, as well as in cement, glass and ceramic plants. Silicone-rubber-insulated cables have demonstrated proven applications in projector and high-power lighting fixtures as well as all types of heating equipment. An interference-free transmission of signals and pulse is assured by the high screening density. The ideal interference-protected silicone multicore flexible cable for such applications as given above.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23151	2 x 0,5	8,0	55,5	101,0	20
23152	3 G 0,5	8,3	60,8	118,0	20
23153	4 G 0,5	9,1	66,5	131,0	20
23154	5 G 0,5	9,9	81,6	153,0	20
23155	7 G 0,5	10,9	92,2	173,0	20
23156	10 G 0,5	12,8	124,0	242,0	20
23157	12 G 0,5	13,5	134,4	263,0	20
23158	16 G 0,5	15,1	170,2	326,0	20
23159	18 G 0,5	15,9	181,0	351,0	20
23291	25 G 0,5	18,5	230,1	348,0	20

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23160	2 x 0,75	9,0	61,4	124,0	18
23161	3 G 0,75	9,4	69,1	136,0	18
23162	4 G 0,75	10,4	86,7	159,0	18
23163	5 G 0,75	11,3	95,2	180,0	18
23164	7 G 0,75	12,0	113,3	212,0	18
23165	10 G 0,75	13,9	165,2	306,0	18
23166	12 G 0,75	15,2	180,3	333,0	18
23167	16 G 0,75	16,9	212,2	418,0	18
23168	18 G 0,75	18,0	282,1	453,0	18
23292	25 G 0,75	20,8	297,4	468,0	18

Continuation ▶

SiHF-C-Si silicon multicore cable, halogen-free, Cu-screened, EMC-preferred type, meter marking



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23169	2 x 1	9,4	66,7	132,0	17
23170	3 G 1	9,8	86,2	153,0	17
23171	4 G 1	11,1	96,8	173,0	17
23172	5 G 1	12,0	108,3	202,0	17
23173	7 G 1	12,7	141,2	243,0	17
23174	10 G 1	14,7	190,0	238,0	17
23175	12 G 1	15,8	209,8	371,0	17
23176	16 G 1	17,4	251,8	468,0	17
23177	18 G 1	18,5	297,4	526,0	17
23293	25 G 1	21,8	329,0	559,0	17
23178	2 x 1,5	10,8	87,7	172,0	16
23179	3 G 1,5	11,2	103,5	198,0	16
23180	4 G 1,5	12,0	131,7	235,0	16
23181	5 G 1,5	12,8	148,5	281,0	16
23182	7 G 1,5	13,6	193,4	345,0	16
23183	10 G 1,5	14,7	268,5	482,0	16
23184	12 G 1,5	15,8	298,4	531,0	16
23185	16 G 1,5	17,4	362,3	662,0	16
23186	18 G 1,5	20,6	394,0	720,0	16
23294	25 G 1,5	24,2	488,2	791,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23187	2 x 2,5	12,0	122,3	230,0	14
23188	3 G 2,5	12,9	147,7	275,0	14
23189	4 G 2,5	13,8	188,6	340,0	14
23190	5 G 2,5	14,8	214,9	394,0	14
23191	7 G 2,5	15,8	265,7	488,0	14
23192	4 G 4	16,0	294,0	520,0	12
23193	5 G 4	17,4	374,0	653,0	12
23150	2 x 6	15,8	171,0	350,0	20
23194	4 G 6	18,1	449,0	781,0	10
23195	5 G 6	20,0	563,0	982,0	10
23196	4 G 10	23,2	759,0	1294,0	8
23197	4 G 16	25,2	1180,0	1988,0	6
23198	4 G 25	31,0	1810,0	2995,0	4

Dimensions and specifications may be changed without prior notice. (RE01)

Conduits

Corrugated tubes

- for standard applications
- for larger sizes
- scissile corrugated tubes
- conduit glands

High flexible conduits

- plastic conduits with spiral spring
- metal conduits
- conduits glands

Conduit for heavy mechanical duty

- metal conduits with plastic sheat
- plastic conduits
- conduits glands for metal conduits

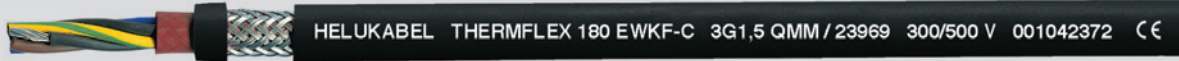


You can find conduits in our catalogue Cable Accessories.
Request it now at www.helukabel.de



E

THERMFLEX 180 EWKF-C silicone multicore cable, Cu-screened, halogen-free, +180°C, EMC-preferred type, meter marking



Technical data

- in adapted to DIN VDE 0250 part 816
- **Temperature range**
flexing -25 °C to +180 °C
fixed installation -60 °C to +180 °C
(short time operation +220 °C)
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Insulation resistance**
min. 200 MΩm x km
- **Minimum bending radius**
flexing 10x cable \varnothing
fixed installation 5x cable \varnothing
- **Coupling resistance**
max. 250 Ωm/km
- **Radiation resistance**
up to 20×10^6 cJ/kg (up to 20 Mrad)
- **Insulation integrity** continuance of insulation effects under fire condition according to IEC 60331 and DIN VDE 0472 part 814
- **Halogen-free**
according to VDE 0482 part 267/
DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- **Behaviour in fire** no flame propagation, test according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Application

These cables are ideal for use everywhere, where increased mechanical stresses for the installation and operation are required. Silicone-rubber-insulated cables are used for all applications where the cable insulation is subjected to high temperature fluctuations. Suitable for installation at high temperature influence in dry, damp and in the open air. As flexible connecting cable for low mechanical stress i.e. sauna, solar installations, foundries and steel plants. This cable can be used for fixed installation only in open and ventilated cable tubes and cable ducts. An interference-free transmission of signals and pulse is assured by the high screening density. The ideal interference-protected silicone multicore flexible cable for such applications as given above.

EMC = Electromagnetic compatibility

FRNC = **F**lame **R**etardant **N**on **C**orrosive

All silicon cables are available also in FRNC versions. The jacket designed with special-compound conform flame test method C to DIN VDE 0472 part 804 and IEC 60332-3 as well as HD 405.3. This special compound is self-extinguishing. Because of that these cables can be installed as security cable with functionality as for example in communal buildings, power stations, hotels, airports etc.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cable structure

- Tinned copper conductor, stranded to DIN VDE 0295, cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Silicone core insulation, EI2 to DIN VDE 0207 part 20
- Core identification to DIN VDE 0293-308 up to 5 cores one-coloured, 6 and more cores black with white numbering
- Green-yellow earth core (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special silicone inner sheath
- Tinned copper braided screening, covering approx. 85%
- Silicone outer jacket, 2GM1 to DIN VDE 0207 part 21
- Jacket colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- **Smoke density** - low
- Due to the special abrasive and notch resistance outer jacket, these cables are suitable for heavy loading of mechanical stresses than the usual standard silicone cables
- Hardly changes of dielectric strength and the insulation resistance also at high temperatures
- High ignition or flash point
- In case of fire, forms an insulating layer of SiO₂
- **Resistant to**
High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen, ozone

Note

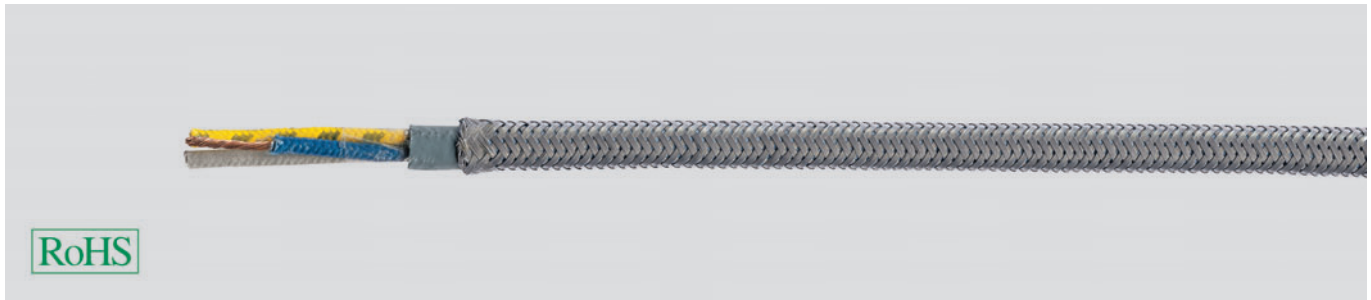
- G = with green-yellow earth core; x = without green-yellow earth core.
- **EWKF** = Improved values to **E**=tearing resistance, **W**=breaking strength propagation, **K**=notch strength, **F**=flexibility
- **unscreened analogue type: THERMFLEX 180 EWKF**
see page E 9

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
79804	2 x 0,75	9,0	61,4	124,0	18
79805	3 G 0,75	9,4	69,1	136,0	18
79806	4 G 0,75	10,4	86,7	160,0	18
79807	5 G 0,75	11,2	95,2	180,0	18
79808	2 x 1	9,4	66,7	132,0	17
79809	3 G 1	9,8	86,2	154,0	17
79810	4 G 1	10,7	96,8	176,0	17
79811	5 G 1	11,6	108,3	207,0	17
79812	2 x 1,5	10,8	87,7	170,0	16
79813	3 G 1,5	11,2	103,5	190,0	16
79814	4 G 1,5	12,0	131,7	231,0	16
79815	5 G 1,5	12,8	148,5	282,0	16
79816	7 G 1,5	13,6	193,4	342,0	16
701219	12 G 1,5	17,2	298,4	531,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
79817	16 G 1,5	20,0	362,3	660,0	16
79818	20 G 1,5	21,3	405,1	766,0	16
79819	2 x 2,5	12,0	122,3	230,0	14
79820	3 G 2,5	12,9	147,7	275,0	14
79821	4 G 2,5	13,9	188,6	340,0	14
79822	5 G 2,5	14,8	214,9	395,0	14
79823	2 x 4	14,2	137,0	308,0	12
79824	3 G 4	14,9	178,1	364,0	12
79825	4 G 4	16,0	294,0	511,0	12
79826	5 G 4	17,4	374,0	630,0	12
79827	2 x 6	15,8	185,0	418,0	10
79828	3 G 6	16,6	241,1	612,0	10
79829	4 G 6	18,1	449,0	781,0	10
79830	5 G 6	20,0	563,0	980,0	10

Dimensions and specifications may be changed without prior notice. (RE01)

MULTITHERM® 400 -ES halogen-free, high-grade steel braiding



Technical data

- Special core insulation for high temperatures
- **Temperature range**
-60 °C to +400 °C
- **Permissible temperature**
+200 °C to +400 °C
(up to +500 °C for short time)
- **Nominal voltage** 500 V
- **Test voltage** 2500 V
- **Minimum bending radius**
approx. 5x cable ø

Cable structure

- Cu wires, finely stranded, nickel plated (ASTM B 355)
- Core insulation of braided glass-fibre impregnated with silicone
- Second core insulation of glass-fibre braiding impregnated with silicone
- Overall lay up of cores
- Core identification according to colour coding listed below
- Common outer sheath of glass-fibre braiding impregnated with silicone
- Sheath colour grey
- Overall colour of braided high-grade steel, coverage approx. 80%

Properties

- **Asbestos and cadmium-free**
- **Colour code**
- No. of cores **with** protective earth conductor
 - 3 = gn-ye/bl/bn
 - 4 = gn-ye/bk/bl/bn
 - 5 = gn-ye/bk/bl/bn/wh
 - 6 = gn-ye/bk/bl/bn/wh/rd
 - 7 = gn-ye/bk/bl/bn/wh/rd/gy
- No. of cores **without** protective earth conductor
 - 2 = bk/bn
 - 3 = bk/bl/bn
 - 4 = bk/bl/bn/wh
 - 5 = bk/bl/bn/wh/rd
 - 6 = bk/bl/bn/wh/rd/gy
 - 7 = bk/bl/bn/wh/rd/gy/gn

Note

- Please enquire for further configurations and core cross sections for your requirements.
- **unscreened analogue type:**
MULTITHERM® 400
see page E 13

Application

Where extremely high connecting and ambient temperatures occur, e.g. in iron and steel works, rolling mills, foundries, glass and ceramic plants, in power plant construction, in the chemical industry, nuclear technology, crude oil engineering, in technical applications in medicine, as well as for wiring resistances in electrical heating equipment, furnaces and machinery in thermoplastic forming. Due to the special construction of the cable, a maximum temperature of approx. 220 °C is recommended for use in damp environments. Applications at temperatures above this should be used in dry environments only. The robust braiding of high-grade steel protects the cable from aggressive atmospheres and mechanical stresses. The braided screen can also be used for earthing purposes.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Max. perm. current carrying capacity at +340°C (A)	Weight approx. kg / km	AWG-No.
52018	2 x 0,5	7,1	10,0	3,3	84,0	20
52019	3 x 0,5	7,3	15,0	3,1	89,0	20
52020	4 x 0,5	8,4	19,0	3	111,0	20
52021	5 x 0,5	8,9	25,0	2,9	126,0	20
52022	6 x 0,5	9,5	30,0	2,8	146,0	20
52023	7 x 0,5	9,6	34,0	2,7	158,0	20
52024	2 x 0,75	7,6	14,4	5,1	95,0	18
52025	3 x 0,75	7,9	21,6	5,1	109,0	18
52026	4 x 0,75	8,9	29,0	4,9	131,0	18
52027	5 x 0,75	9,7	36,0	4,7	157,0	18
52028	6 x 0,75	10,4	43,0	4,5	177,0	18
52029	7 x 0,75	10,6	50,0	4,4	190,0	18
52030	2 x 1	7,8	19,0	7	105,0	17
52031	3 x 1	8,7	29,0	6,7	126,0	17
52032	4 x 1	9,2	38,0	6,4	148,0	17
52033	5 x 1	10,0	48,0	6,2	174,0	17
52034	6 x 1	10,7	58,0	6	198,0	17
52035	7 x 1	10,9	67,0	5,8	212,0	17
52036	2 x 1,5	8,9	29,0	9,4	132,0	16
52037	3 x 1,5	9,2	43,0	9	153,0	16
52038	4 x 1,5	10,0	58,0	8,6	183,0	16
52039	5 x 1,5	10,9	72,0	8,3	212,0	16
52040	6 x 1,5	11,6	88,0	8	241,0	16
52041	7 x 1,5	11,9	101,0	7,8	259,0	16
52042	2 x 2,5	10,1	48,0	12,2	191,0	14
52043	3 x 2,5	10,6	72,0	11,6	213,0	14
52044	4 x 2,5	11,5	96,0	11,2	256,0	14
52045	5 x 2,5	12,7	120,0	10,8	307,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Max. perm. current carrying capacity at +340°C (A)	Weight approx. kg / km	AWG-No.
52046	6 x 2,5	14,9	144,0	10,4	359,0	14
52047	7 x 2,5	15,1	168,0	10,1	388,0	14
52048	2 x 4	11,9	77,0	16	260,0	12
52049	3 x 4	12,3	115,0	15,3	303,0	12
52050	4 x 4	15,1	154,0	14,6	378,0	12
52051	5 x 4	15,6	192,0	14,1	458,0	12
52052	7 x 4	16,6	270,0	13,3	593,0	12
52053	3 x 6	16,3	173,0	20	442,0	10
52054	4 x 6	18,3	230,0	19	567,0	10
52055	5 x 6	19,8	288,0	18	671,0	10
52056	4 x 10	22,1	384,0	26	866,0	8
52057	4 x 16	26,6	615,0	34	1203,0	6

Dimensions and specifications may be changed without prior notice. (RE01)



Photo: HELUKABEL®

Allweather and Rubber Cables

Allweather and Rubber Cables

HELUKABEL® supply mainly from stock light, middle and heavy rubber cables, drum cables with polyurethane or neoprene outer jacket, elevator control cables with central or external support cores, connecting cables for submersible pumps and other special cables.










One of the biggest stocks of special cables in Germany makes this possible with a fast delivery time.

Our well trained sales team with long term experience and the latest technology know how to solve your cable problems.

Because of the permanent developments and tests it is possible for HELUKABEL® to manufacture cables with the newest and proven materials. We would like to construct and manufacture "your" cable.

F

Contents

Description	Page
YELLOWFLEX, cold flexible, robust, meter marking	F 4
H05 RR-F / H05 RN-F, rubber-sheathed cable  	F 5
H07 RN-F, rubber-sheathed cable, harmonized type   	F 6
A07 RN-F, rubber-sheathed cable, authorised national type  	F 8
NEOPREN Command Cable, flexible, colour or number coded with support organ	F 9
LIFT-TRAGO-30 / -60, lift hoist control cable, pendal length 30m resp. 60m	F 10
TRAGO / Lift-2S, Lift and Hoist Control Cables 300/500V	F 11
H07 ZZ-F, control cable, cross linked, halogen-free 	F 12
NSSHÖU, heavy duty rubber cable for mining working, 0,6/1kV 	F 14

YELLOWFLEX cold flexible, robust, meter marking



Technical data

- Rubber sheathed cable acc. to DIN VDE 0282 Part 4, HD 22.4 S4
- **Temperature range**
flexing -25 °C to +60 °C
fixed installation -30 °C to +60 °C
- Permissible **operating temperature** at conductor +60 °C
- **Nominal voltage** U_0/U 450/750 V with protected fixed installation U_0/U 600/1000 V
- Highest permissible **operating voltage** in three-phase and one-phase a.c. systems U_0/U 476/825 V in d.c. systems U_0/U 619/1238 V
- **Test voltage** 2500 V
- **Minimum bending radius**
for fixed installation 4x cable \varnothing
for guiding over roller 7,5x cable \varnothing
during winding on drums 5-7x cable \varnothing

Cable structure

- Bare copper conductor, fine wire to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and/or HD 383
- Rubber core insulation, EI4 to DIN VDE 0282 part 1
- Core colours according DIN VDE 0293-308
Core colour
- up to 5 cores one-coloured
- up 6 and more cores, black with white numbering
- 3 and above, with green-yellow earth core
- 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Special outer sheath, EM2 to DIN VDE 0282 part 1
- Sheath colour Yellow (RAL 1021)
- with meter marking, change-over in 2011
- **Individual printing:**
• **Article numbers** for individual printing:
Art.No. 37359 for 3G1,5 mm²
Art.No. 37360 for 3G2,5 mm²
Art.No. 37361 for 5G1,5 mm²
Art.No. 37362 for 5G2,5 mm²
- **Usual length:**
500m or 1000m drum
- **Minimum quantity**
500m drum
- price for 500m drum 102,25 Euro
price for 1000m drum 153,40 Euro

Properties

- **Tests**
Flame-retardant acc. to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Increased stability
- Tear-resistant
- **Resistant to**
Atmospheric influences
Hydrolysis
UV-radiation
- **Largely resistant to**
Oils and fats
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- individual marking

Application

These robust rubber sheathed cables can be used where high demands are placed flexibility and mechanical stress. For application on construction sites, in steel works and rolling mills in heating and air-conditioning systems, in the bottling industry, in machinery and plant construction, in the chemical industry and painting systems, as well as for the professional and the hobby enthusiast. The choice of yellow as the sheath colour ensures additional safety. Can be used in potentially explosive areas acc. to DIN VDE 0165.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

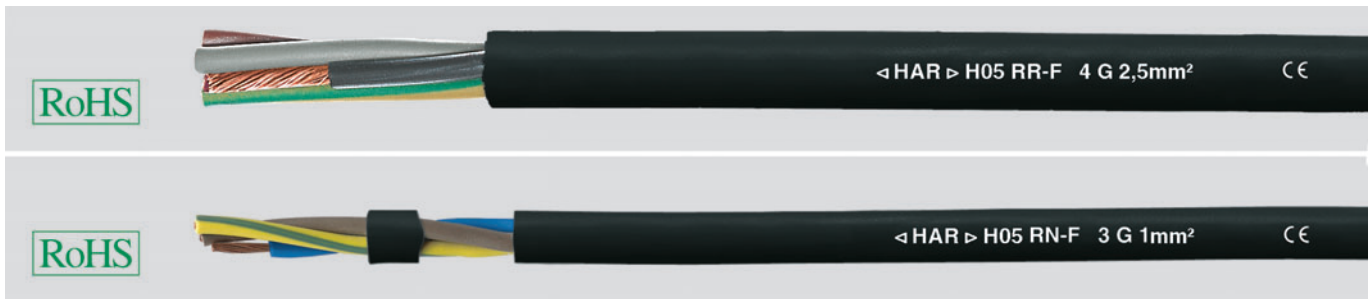
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37259	2 x 1	8,4	19,0	98,0	17
37260	3 G 1	9,2	29,0	131,0	17
37261	4 G 1	9,7	38,0	150,0	17
37262	5 G 1	11,0	48,0	220,0	17
37263	2 x 1,5	9,2	29,0	135,0	16
37264	3 G 1,5	9,8	43,0	165,0	16
37265	4 G 1,5	11,5	58,0	200,0	16
37266	5 G 1,5	12,0	72,0	241,0	16
37267	7 G 1,5	16,5	101,0	375,0	16
37268	12 G 1,5	18,3	175,0	460,0	16
37269	2 x 2,5	11,0	48,0	194,0	14
37270	3 G 2,5	11,8	72,0	235,0	14
37271	4 G 2,5	12,7	96,0	290,0	14
37272	5 G 2,5	14,1	120,0	347,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37273	2 x 4	13,0	77,0	282,0	12
37274	3 G 4	14,1	115,0	322,0	12
37275	4 G 4	15,8	154,0	397,0	12
37276	5 G 4	17,1	192,0	486,0	12
37277	4 G 6	18,2	230,0	541,0	10
37278	5 G 6	19,1	288,0	652,0	10
37279	4 G 10	23,0	384,0	952,0	8
37280	5 G 10	25,8	480,0	1203,0	8
37281	4 G 16	26,3	614,0	1260,0	6
37282	5 G 16	29,1	768,0	1550,0	6
37283	4 G 25	31,7	960,0	1860,0	4
37284	5 G 25	35,2	1200,0	2250,0	4
37285	4 G 35	36,8	1344,0	2374,0	2
37286	5 G 35	40,6	1680,0	2752,0	2

Dimensions and specifications may be changed without prior notice. (RF01)



Also available as pre-assembled cable - see page U 52.



Technical data

- To DIN VDE 0282 part 4, HD 22.4 S4 Δ IEC 60245-4
- H05 RR-F zusätzlich nach BS 6500
- **Temperature range**
-30 °C to +60 °C
- Permissible **operating temperature** at conductor +60 °C
- **Nominal voltage** U_0/U 300/500 V
- **Max. operating voltage** three-phase and one-phase a.c. U_0/U 318/550 V for direct current U_0/U 413/825 V
- **Test voltage** 2000 V
- **Minimum bending radius** approx. 7,5x cable \varnothing

Cable structure

- Bare copper conductors, fine stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and HD 383
- Rubber core insulation EI4 to DIN VDE 0282 part 1
- Cores laid up
- Cores colour coded to DIN VDE 0293-308
- Outer jacket black:
RR-F = Rubber, EM 3 to DIN VDE 0282 part 1
RN-F = EM 2 to DIN VDE 0282 part 1

Properties

- Oils and fats are allowed to come in touch
- **Tests**
Behaviour on fire according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- H05 RR-F is replaced the former type NLH and NMH up to 2,5 mm².
- H05 RN-F is replaced to former type NMHÖU up to 1 mm². at 1,5 mm² - not in VDE; adapted to VDE (H)05 RN-F
Art.no. 36008 = national type: A-05 RN-F
Art.no. 36007 = (A)05 RN-F, outer jacket colour grey, for window shades manufacturer

Application

H05 RR-F

These cables are suitable for connecting electrical appliances, for example vacuum cleaner, flat irons, soldering irons, kitchen appliances, toaster, stoves etc. They were also used for medium mechanical stress in households and offices. These cables are suitable for fixed installation in partition walls, furniture, decoration covering and in hollow spaces of prefabricated building parts.

They are not suitable for use in open air, in industries (also permitted to tailor workshops and of that kind) or in agriculture plants and for connecting commercial electrical tools.

H05 RN-F

These cables are suitable for connecting electrical equipment with low mechanical stress in dry, damp and wet places as well in open air, for example as connection cable for horticulture tools. These cables can be used in contact with fats and oils (for example deep fryer).

They are also suitable for fixed installation, for example in furniture, decoration covering, partition walls and in hollow spaces of prefabricated building parts. The installation in hazardous areas is allowed.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

H05 RR-F

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
35001	2 x 0,75	5,7 - 7,4	14,4	60,0	18
35005	3 G 0,75	6,2 - 8,1	21,6	74,0	18
35009	4 G 0,75	6,8 - 8,8	29,0	78,0	18
35019	5 G 0,75	7,6 - 9,9	36,0	99,0	18
35002	2 x 1	6,1 - 8,0	19,0	72,0	17
35006	3 G 1	6,5 - 8,5	29,0	85,0	17
35010	4 G 1	7,1 - 9,3	38,0	98,0	17
35020	5 G 1	8,0 - 10,3	48,0	134,0	17
35003	2 x 1,5	7,6 - 9,8	29,0	98,0	16
35007	3 G 1,5	8,0 - 10,4	43,0	120,0	16
35011	4 G 1,5	9,0 - 11,6	58,0	150,0	16
35013	5 G 1,5	9,8 - 12,7	72,0	180,0	16
35004	2 x 2,5	9,0 - 11,6	48,0	145,0	14
35008	3 G 2,5	9,6 - 12,4	72,0	170,0	14
35012	4 G 2,5	10,7 - 13,8	96,0	220,0	14
35014	5 G 2,5	11,9 - 15,3	120,0	270,0	14
35015	3 G 4	11,3 - 14,5	115,0	260,0	12
35017	4 G 4	12,7 - 16,2	154,0	340,0	12
35016	3 G 6	12,8 - 16,3	173,0	361,0	10
35018	4 G 6	14,2 - 18,1	230,0	462,0	10

H05 RN-F

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
36001	2 x 0,75	5,7 - 7,4	14,4	78,0	18
36003	3 G 0,75	6,2 - 8,1	21,6	94,0	18
36007	4 G 0,75	6,8 - 8,8	29,0	90,0	18
36008	4 G 0,75	6,8 - 8,8	29,0	90,0	18
36002	2 x 1	6,1 - 8,0	19,0	94,0	17
36004	3 G 1	6,5 - 8,5	29,0	114,0	17
36005	3 G 1,5	8,6 - 11,0	43,0	157,0	16
36006	5 G 1,5	10,5 - 13,5	72,0	228,0	16

Dimensions and specifications may be changed without prior notice. (RF01)



Technical data

- Rubber sheathed cable H07 RN-F to DIN VDE 0282 part 4, HD 22.4 S4, BS7919 Δ IEC 60245-4
- **Temperature range**
-30 °C to +60 °C
- Permissible **operating temperature** at conductor +60 °C
- **Nominal voltage** U_0/U 450/750 V in case of protected and fixed installation U_0/U 600/1000 V
- Max. permissible **operating voltage** in three phase and one phase a.c. system U_0/U 476/825 V direct current-system U_0/U 619/1238 V
- **Test voltage** 2500 V
- **Permanent tensile load**
max. 15 N/mm²
- **Minimum bending radius**
for fixed installation 4x cable \varnothing
for guiding over roller 7,5x cable \varnothing
during winding on drums 5-7x cable \varnothing

Cable structure

- Copper conductor fine wire stranded, bare to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and HD 383
- Rubber core insulation EI4 to DIN VDE 0282 part 1
- Insulation thickness to DIN VDE 0282 part 4
- Core identification to DIN VDE 0293-308
- Core colours
- up to 5 cores one-coloured
- 6 and more cores, black with numbering
- 3 and above, with green-yellow earth core
- 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Outer jacket of rubber black, rubber compound to DIN VDE 0282 part 1
- Sheath thickness to DIN VDE 0282 part 4

Properties

- **Resistant to**
Weather
- **Test**
Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Ozone resistant of the insulation to DIN VDE 0472 part 805, test method A or part 805 A1, test method C
- Oil resistant
Test according to EN 60811-2-1

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Further dimensions and cross-sections available on request.
- H07 RN-F = harmonized rubber-sheathed cable, working voltage 750 V, fine stranded.
- The core identification of a single core jacketed, of an insulated wire is black. For application as a protective core, the ends are to be identified with green-yellow and the middle conductor with light blue

Application

Heavy duty rubber-sheathed flexible cables are suited for use for medium mechanical stress in dry, damp and wet areas as well as in open air and in agriculture plants.

They are used for equipment in industry works such as boilers, heating plates, hand lamps, electric tools such as drills, circular saws and homework tools as well as for transportable motors or machines at site.

These cables are also suitable for fixed installation on plaster, in temporary buildings and residential barracks. They are suitable for direct laying on components and mechanical parts of machines, for example lifts and cranes.

They can be used in case of protected and fixed installation in tubes or in equipment as well as rotor connecting cable of motors with a working voltage up to 1000 V alternating voltage or a direct voltage up to 750 V against ground. The operating direct voltage is permitted up to 900 V against ground when they are used in rail-coaches. Installation in hazardous areas according to DIN VDE 0165 is allowed.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37001	1 x 1,5	5,7 - 7,1	14,4	58,0	16
37002	1 x 2,5	6,3 - 7,9	24,0	71,0	14
37003	1 x 4	7,2 - 9,0	38,0	100,0	12
37004	1 x 6	7,9 - 9,8	58,0	130,0	10
37005	1 x 10	9,5 - 11,9	96,0	230,0	8
37006	1 x 16	10,8 - 13,4	154,0	290,0	6
37007	1 x 25	12,7 - 15,8	240,0	420,0	4
37008	1 x 35	14,3 - 17,9	336,0	530,0	2
37009	1 x 50	16,5 - 20,6	480,0	750,0	1
37010	1 x 70	18,6 - 23,3	672,0	960,0	2/0
37011	1 x 95	20,8 - 26,0	912,0	1250,0	3/0
37012	1 x 120	22,8 - 28,6	1152,0	1560,0	4/0
37013	1 x 150	25,2 - 31,4	1440,0	1900,0	300 kcmil
37014	1 x 185	27,6 - 34,4	1776,0	2300,0	350 kcmil
37015	1 x 240	30,6 - 38,3	2304,0	2950,0	500 kcmil
37016	1 x 300	33,5 - 41,9	2880,0	3600,0	600 kcmil
37017	1 x 400	37,4 - 46,8	3840,0	4600,0	750 kcmil
37018	1 x 500	41,3 - 52,0	4800,0	6000,0	1000 kcmil
37019	2 x 1	7,7 - 10,0	19,0	98,0	17
37020	2 x 1,5	8,5 - 11,0	29,0	135,0	16

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37021	2 x 2,5	10,2 - 13,1	48,0	193,0	14
37022	2 x 4	11,8 - 15,1	77,0	280,0	12
37023	2 x 6	13,1 - 16,8	115,0	330,0	10
37024	2 x 10	17,7 - 22,6	192,0	586,0	8
37025	2 x 16	20,2 - 25,7	307,0	810,0	6
37026	2 x 25	24,3 - 30,7	480,0	1160,0	4
37027	3 G 1	8,3 - 10,7	29,0	130,0	17
37028	3 G 1,5	9,2 - 11,9	43,0	165,0	16

Continuation ▶

H07 RN-F rubber-sheathed cable, harmonized type



Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37029	3 G 2,5	10,9 - 14,0	72,0	235,0	14	37056	4 G 120	53,0 - 66,0	4608,0	6830,0	4/0
37030	3 G 4	12,7 - 16,2	115,0	320,0	12	37057	4 G 150	58,0 - 73,0	5760,0	8520,0	300 kcmil
37031	3 G 6	14,1 - 18,0	173,0	420,0	10	37058	4 G 185	64,0 - 80,0	7104,0	9800,0	350 kcmil
37032	3 G 10	19,1 - 24,2	288,0	810,0	8	37059	4 G 240	72,0 - 91,0	9216,0	12100,0	500 kcmil
37033	3 G 16	21,8 - 27,6	461,0	1050,0	6	37060	4 G 300	80,0 - 101,0	11520,0	15200,0	600 kcmil
37034	3 G 25	26,1 - 33,0	720,0	1250,0	4	37061	5 G 1,5	11,2 - 14,4	72,0	240,0	16
37035	3 G 35	29,3 - 37,1	1008,0	1900,0	2	37062	5 G 2,5	13,3 - 17,0	120,0	345,0	14
37036	3 G 50	34,1 - 42,9	1440,0	2600,0	1	37063	5 G 4	15,6 - 19,9	192,0	485,0	12
37037	3 G 70	38,4 - 48,3	2016,0	3400,0	2/0	37064	5 G 6	17,5 - 22,2	288,0	650,0	10
37038	3 G 95	43,3 - 54,0	2736,0	4450,0	3/0	37065	5 G 10	22,9 - 29,1	480,0	1200,0	8
37039	3 G 120	47,4 - 60,0	3456,0	5180,0	4/0	37066	5 G 16	26,4 - 33,3	768,0	1550,0	6
37040	3 G 150	52,0 - 66,0	4320,0	6500,0	300 kcmil	37067	5 G 25	32,0 - 40,4	1200,0	2250,0	4
37041	3 G 185	57,0 - 72,0	5328,0	7860,0	350 kcmil	37068	5 G 35	36,8 - 45,8	1680,0	2750,0	2
37042	3 G 240	65,0 - 82,0	6192,0	10224,0	500 kcmil	37091	5 G 50	40,0 - 50,8	2400,0	3950,0	1
37043	3 G 300	72,0 - 90,0	8640,0	12620,0	600 kcmil	37154	5 G 70	43,8 - 54,0	3360,0	4740,0	1
37044	4 G 1	9,2 - 11,9	38,0	150,0	17	34090	5 G 95	51,7 - 60,7	4560,0	6600,0	14
37045	4 G 1,5	10,2 - 13,1	58,0	200,0	16	34349	5 G 120	59,6 - 68,6	5760,0	8180,0	14
37046	4 G 2,5	12,1 - 15,5	96,0	290,0	14	37092	7 G 1,5	14,5 - 17,5	101,0	375,0	16
37047	4 G 4	14,0 - 17,9	154,0	395,0	12	37079	7 G 2,5	16,5 - 20,0	168,0	520,0	14
37048	4 G 6	15,7 - 20,0	230,0	540,0	10	37093	12 G 1,5	17,6 - 22,4	175,0	460,0	16
37049	4 G 10	20,9 - 26,5	384,0	950,0	8	37096	12 G 2,5	20,6 - 26,2	288,0	760,0	14
37050	4 G 16	23,8 - 30,1	614,0	1260,0	6	37097	18 G 2,5	24,4 - 30,9	432,0	850,0	14
37051	4 G 25	28,9 - 36,6	960,0	1860,0	4	37094	19 G 1,5	20,7 - 26,3	274,0	810,0	16
37052	4 G 35	32,5 - 41,1	1344,0	2380,0	2	37098	19 G 2,5	25,5 - 31,0	456,0	1075,0	14
37053	4 G 50	37,7 - 47,5	1920,0	3190,0	1	37095	24 G 1,5	24,3 - 30,7	346,0	1015,0	16
37054	4 G 70	42,7 - 54,0	2688,0	4260,0	2/0	37099	24 G 2,5	28,8 - 36,4	576,0	1390,0	14
37055	4 G 95	48,4 - 61,0	3648,0	5600,0	3/0						

Dimensions and specifications may be changed without prior notice. (RF01)

Current ratings for H07 RN F for current supply in industrial application

Operating temperature at conductor 60°C; Ambient temperature 30°C (Air)

Number of cores	1-core		2-cores	3-cores	3-cores	4-cores	5-cores
	2 cores loaded	3 cores loaded	2 cores loaded	2 cores loaded	3 cores loaded	3 cores loaded	3 cores loaded
Cross-section, mm ²	Current ratings in Ampere (A)						
4	34	30	34	35	29	30	30
6	43	38	43	44	36	37	38
10	60	53	60	62	51	52	54
16	79	71	79	82	67	69	71
25	104	94	105	109	89	92	94
35	129	117	-	135	110	114	-
50	162	148	-	169	138	143	-
70	202	185	-	211	172	178	-
95	240	222	-	250	204	210	-
120	280	260	-	292	238	246	-
150	321	300	-	335	273	282	-
185	363	341	-	378	309	319	-
240	433	407	-	447	365	377	-
300	497	468	-	509	415	430	-
400	586	553	-	-	-	-	-
500	670	634	-	-	-	-	-
630	784	742	-	-	-	-	-

Note

For the method of installation

- Single core cables are bunched (unit-form)
- 2 cores cables laid parallel with contact
- 3 cores cables are in triangle-form

Conversion factors for deviating ambient temperature

Ambient temperature at air °C	30	35	40	45	50	55
Factor	1,0	0,91	0,82	0,71	0,58	0,41



Technical data

- Rubber sheathed cable A07 RN-F to DIN VDE 0282 part 4
- **Temperature range**
-30 °C to +60 °C
- Permissible **operating temperature** at conductor +60 °C
- **Nominal voltage** U_0/U 450/750 V in case of protected and fixed installation U_0/U 600/1000 V
- max. permissible **operating voltage** in three phase and one phase a.c. system U_0/U 476/825 V direct current-system U_0/U 619/1238 V
- **Test voltage** 2500 V
- **Permanent tensile load**
max. 15 N/mm² under consideration of total copper cross-sections
- **Minimum bending radius**
for fixed installation 4x cable \varnothing
for guiding over roller 7,5x cable \varnothing
during winding on drums 5-7x cable \varnothing

Cable structure

- Copper conductor fine wire stranded, bare to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Rubber core insulation EI4 to DIN VDE 0281 part 1
- Insulation thickness to DIN VDE 0282 part 4
- Core identification to DIN VDE 0293-308
- Core colours:
6 and more cores green-yellow and the other cores black with numbering
- Cores stranded in layers in optimal lay-length
- Outer jacket of rubber black, rubber compound to DIN VDE 0281 part 1
- Sheath thickness to DIN VDE 0282 part 4

Properties

- **Resistant to**
Weather
- **Test**
Behaviour in fire to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Ozone resistant of the insulation to DIN VDE 0472 part 805, test method A or part 805 A1, test method C

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- A07 RN-F = Authorized national rubber-sheathed cable, nominal voltage 750 V, fine wire stranded.
- Valid for design with central core + 7 cores.
- The core identification of a single core jacketed, of an insulated wire is black. For application as a protective core, the ends are to be identified with green-yellow and the middle conductor with light blue.

Application

Heavy duty rubber-sheathed flexible cables are suited for use for medium mechanical stress in dry, damp and wet areas as well as in open air and in agriculture plants.

They are used for equipment in industry works such as boilers, heating plates, hand lamps, electric tools such as drills, circular saws and homework tools as well as for transportable motors or machines at site.

These cables are also suitable for fixed installation on plaster, in temporary buildings and residential barracks. They are suitable for direct laying on components and mechanical parts of machines, for example lifts and cranes.

They can be used in case of protected and fixed installation in tubes or in equipment as well as rotor connecting cable of motors with a working voltage up to 1000 V alternating voltage or a direct voltage up to 750 V against ground. The operating direct voltage is permitted up to 900 V against ground when they are used in rail-coaches. Installation in hazardous areas according to DIN VDE 0165 is allowed.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

A07 RN-F (with green-yellow protective conductor)

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37069	7 G 1,5	14,0 - 17,5	101,0	370,0	16
37070	7 G 2,5	16,5 - 20,0	168,0	500,0	14
37071	12 G 1,5	17,6 - 22,4	173,0	520,0	16
37072	12 G 2,5	20,6 - 26,2	288,0	720,0	14
37078	19 G 1,5	25,0 - 29,5	274,0	1100,0	14
37073	19 G 2,5	21,5 - 25,5	456,0	800,0	16
37074	24 G 2,5	28,8 - 36,4	576,0	1350,0	14
37075	27 G 1,5	25,5 - 31,5	385,0	1100,0	16
37076	27 G 2,5	30,0 - 37,0	640,0	1521,0	14
37077	37 G 2,5	34,0 - 37,5	720,0	1940,0	14

A07 RN-F (without green-yellow protective conductor)

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37080	3 x 1,5	9,2 - 11,9	43,0	165,0	16
37081	3 x 2,5	10,9 - 14,0	72,0	235,0	14
37082	3 x 4	12,7 - 16,2	115,0	320,0	12
37083	3 x 6	14,1 - 18,0	173,0	495,0	10
37084	3 x 10	19,1 - 24,2	288,0	880,0	8
37085	3 x 16	21,8 - 27,6	461,0	1095,0	6
37086	3 x 25	26,1 - 33,0	720,0	1450,0	4
37087	3 x 35	29,3 - 37,1	1008,0	1900,0	2
37088	3 x 50	34,1 - 42,9	1440,0	2600,0	1
37089	4 x 10	20,9 - 26,5	384,0	1065,0	8
37090	4 x 25	28,9 - 36,6	960,0	1995,0	4

Dimensions and specifications may be changed without prior notice. (RF01)

NEOPREN Command Cable flexible, colour or number coded with support organ



Technical data

- Special neoprene cable adapted to DIN VDE 0250 part 807 and DIN VDE 0282 part 807 and 808
- With strain bearing support strand
- **Temperature range**
flexing -25 °C to +60 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
for continuous bending without forced guiding operation 12,5x cable ø
for flexing with forced guiding operation 20x cable ø

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295, cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228
- Core insulation of rubber
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Support organ (hemp or sisal-string etc.), and/or taping with load carrying thread as construction permits
- Neoprene outer jacket, colour black
- A further selection of sizes and dimensions is available on request.

Properties

- Generally oil, flat and alkali resistant

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- Not suitable for a winding up and an unwinding on spring or motor cable reels.
- Break resistance must be taken into consideration.
- By the assembly the cables must be installed without torsion. The mobility of the stranded core is not be affected by using of clamps.
- The occurring pulling forces are to be carried by the support organ.

Application

As robust and weather resistant cable for machines, equipment and appliances, which are constantly exposed to the outdoor weather conditions (e.g. building machinery, conveyor and hoist systems, dry docks etc.). They are ideal for use as control cable in trailing cables. They are also suitable in dry, damp and wet areas for wall- and push-button panels and as power cable.

The core insulation is ozone resistant and the outer jacket made of chloroprene is hardly flammable and abrasion resistant.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Tensile strength of susp. strand in N	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25001	2 x 1	7,5	300	19,0	90,0	17
25002	3 G 1	8,5	150	29,0	111,0	17
25003	4 G 1	9,7	300	38,0	141,0	17
25004	5 G 1	11,5	300	48,0	170,0	17
25005	6 G 1	13,4	-	58,0	187,0	17
25006	7 G 1	13,8	2290	67,0	204,0	17
25007	9 G 1	15,8	2890	86,0	274,0	17
25008	12 G 1	17,5	6740	115,0	389,0	17
25009	16 G 1	19,2	570	154,0	432,0	17
25010	18 G 1	21,5	960	173,0	471,0	17
25011	19 G 1	22,0	-	182,0	565,0	17
25012	20 G 1	22,4	600	192,0	590,0	17
25013	24 G 1	25,6	2890	230,0	650,0	17
25074	30 G 1	24,6	-	290,0	785,0	17
25014	36 G 1	29,0	960	346,0	910,0	17
25015	37 G 1	30,5	-	355,0	956,0	17
25016	48 G 1	31,4	1440	461,0	1244,0	17
25017	50 G 1	32,6	-	480,0	1296,0	17
25018	54 G 1	32,9	2500	518,0	1399,0	17
25019	61 G 1	37,2	2290	586,0	1495,0	17
25020	2 x 1,5	8,5	300	29,0	95,0	16
25021	3 G 1,5	9,3	150	43,0	113,0	16
25022	4 G 1,5	10,5	570	58,0	150,0	16
25023	5 G 1,5	12,5	870	72,0	180,0	16
25024	6 G 1,5	14,3	-	86,0	245,0	16
25025	7 G 1,5	14,8	2600	101,0	309,0	16
25026	8 G 1,5	15,8	3460	115,0	333,0	16
25027	9 G 1,5	17,7	3850	130,0	360,0	16
25028	10 G 1,5	18,5	450	144,0	405,0	16
25029	11 G 1,5	20,1	-	158,0	458,0	16
25030	12 G 1,5	21,6	7710	173,0	516,0	16
25031	13 G 1,5	22,1	-	187,0	571,0	16
25032	15 G 1,5	22,8	680	216,0	590,0	16
25033	18 G 1,5	23,6	960	259,0	620,0	16
25034	19 G 1,5	24,1	860	274,0	670,0	16
25035	24 G 1,5	27,0	3850	346,0	817,0	16
25036	37 G 1,5	31,0	-	533,0	1220,0	16
25037	42 G 1,5	33,0	3460	605,0	1380,0	16
25038	48 G 1,5	34,9	-	691,0	1510,0	16
25039	50 G 1,5	36,7	-	720,0	1642,0	16
25040	61 G 1,5	41,8	-	878,0	1950,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Tensile strength of susp. strand in N	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25041	2 x 2,5	10,0	300	48,0	142,0	14
25042	3 G 2,5	10,5	300	72,0	172,0	14
25043	4 G 2,5	11,6	570	96,0	210,0	14
25044	5 G 2,5	12,9	380	120,0	255,0	14
25045	6 G 2,5	14,5	-	144,0	318,0	14
25046	7 G 2,5	16,2	3460	168,0	383,0	14
25075	8 G 2,5	16,8	3850	192,0	450,0	14
25047	9 G 2,5	21,5	680	216,0	541,0	14
25048	11 G 2,5	23,3	-	264,0	638,0	14
25049	12 G 2,5	25,4	6060	288,0	690,0	14
25050	16 G 2,5	24,4	-	383,0	813,0	14
25051	18 G 2,5	26,3	2290	432,0	891,0	14
25052	19 G 2,5	27,5	-	456,0	946,0	14
25053	24 G 2,5	30,5	6060	576,0	1221,0	14
25054	36 G 2,5	33,3	-	864,0	1737,0	14
25055	37 G 2,5	40,8	2500	888,0	1784,0	14
25056	48 G 2,5	41,9	-	1152,0	2500,0	14
25057	50 G 2,5	43,3	-	1200,0	2630,0	14
25058	61 G 2,5	49,3	-	1464,0	8100,0	14
25059	3 G 4	13,6	-	115,0	372,0	12
25060	4 G 4	15,0	1000	154,0	407,0	12
25061	5 G 4	17,1	600	192,0	432,0	12
25062	7 G 4	21,5	-	269,0	495,0	12
25063	3 G 6	13,9	-	173,0	380,0	10
25064	4 G 6	15,2	1000	230,0	445,0	10
25065	5 G 6	19,2	900	288,0	569,0	10
25066	7 G 6	21,1	-	403,0	702,0	10
25067	3 G 10	18,1	-	288,0	530,0	8
25068	4 G 10	20,6	1200	384,0	724,0	8
25069	5 G 10	22,6	1500	480,0	923,0	8
25070	7 G 10	27,4	-	672,0	1288,0	8
25071	3 G 16	21,3	-	461,0	865,0	6
25072	4 G 16	25,2	1920	614,0	1028,0	6
25073	5 G 16	26,5	2400	768,0	1260,0	6

Dimensions and specifications may be changed without prior notice. (RF01)

LIFT-TRAGO-30 / -60 lift hoist control cable, pendal length 30m resp. 60m



Technical data

- Lift hoist control cables with strain bearing element to IEC 60227-6 edition 2001-06 and adapted to DIN VDE 0281 part 13
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -40 °C to +70 °C
- **Max. conductor temperature**
under load +70 °C
circuit conditions +150 °C
- **Nominal voltage**
U₀/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage**
min. 6000 V
- **Minimum bending radius**
approx. 20x cable Ø
- **Insulation resistance**
min. 20 MOhm x km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation, TI2 to DIN VDE 0281 part 1
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer
- Cores stranded with optimal lay-length according to the number of cores in one or two layers, over a central suspension strand of textile.
- LIFT-TRAGO-30 - Fleece wrapping LIFT-TRAGO-60 - Support braiding of textile suspension strands
- Outer sheath of special PVC, TM2 to DIN VDE 0281 part 1
- Colour black (RAL 9005)

Properties

- Extensively oil resistant
Chemical Resistance - see table Technical Informations
- The PVC-outer sheath is oil resistant according to DIN VDE 0281 part 1
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cable for pendal length 60 m and above available on request.

Application

These cables are used as control or feeder cables in lifts and hoists.

- 30 m pendal length - LIFT-TRAGO-30
- 60 m pendal length - LIFT-TRAGO-60

Suspension height for medium mechanical stresses in dry and moist rooms.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

LIFT-TRAGO-30

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Support core	Pendal length app. m	AWG-No.
25259	7 G 1	11,5	67,0	170,0	Textile	30	17
25260	12 G 1	15,7	115,0	325,0	Textile	30	17
25261	18 G 1	16,1	173,0	390,0	Textile	30	17
25262	24 G 1	19,2	230,0	530,0	Textile	30	17

LIFT-TRAGO-60

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Support core	Pendal length app. m	AWG-No.
25263	7 G 1	12,3	67,0	185,0	Textile	60	17
25264	12 G 1	16,2	115,0	335,0	Textile	60	17
25265	18 G 1	16,7	173,0	400,0	Textile	60	17
25266	24 G 1	19,8	230,0	540,0	Textile	60	17
25267	30 G 1	22,5	288,0	690,0	Textile	60	17
25268	36 G 1	28,2	346,0	930,0	Steel	60	17

Dimensions and specifications may be changed without prior notice. (RF01)

TRAGO / Lift-2S Lift and Hoist Control Cables 300/500V



Technical data

- Lift hoist control cables with strain bearing element
- Special PVC-compound for core and jacket, adapted to DIN VDE 0250
- **Temperature range**
flexing -15 °C to +40 °C
fixed installation -40 °C to +70 °C
- **Max. conductor temperature**
under load +70 °C
circuit conditions +150 °C
- **Nominal voltage**
U₀/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Free suspension height** max. 50 m
- **Minimum bending radius**
approx. 20x cable Ø

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special PVC core insulation, YI3 to DIN VDE 0207 part 4
- Core coding to DIN VDE 0293
- Green-yellow earth core
- Special hemp support braid for **Trago** type with central support core of hemp
for **Lift-2S** type with 2 outer steel support wires
- Cores stranded in layers with optimal lay-length
- Multi-layer wrapping functioning as a support braid
- Special PVC outer jacket YM2 to DIN VDE 0207 part 5
- Colour black (RAL 9005)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Art.no. 25090 - C = 2 cores 0,5 mm² with copper braiding.
- Art.no. 25101 = 7G1 + 17x0,75 mm².
- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

These cables are used as control or feeder cables in lifts and hoists. The special attention given to both production and material quality for these cables has made them ideal even for use under extreme conditions.

HELUKABEL®-Lift-2S has also proven itself to be ideally suited for installation in conveyor systems and manual control units.

The external steel support wires can be dismantled without damaging the cable insulation.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

TRAGO with central support

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Support core	Pendal length app. m	AWG-No.
25080	7 G 0,75	15,4	50,0	290,0	Hemp	250	18
25081	12 G 0,75	19,2	86,0	360,0	Hemp	220	18
25082	18 G 0,75	21,0	130,0	455,0	Hemp	110	18
25083	24 G 0,75	23,0	173,0	535,0	Hemp	90	18
25101	7 G 1	21,5	190,0	595,0	Hemp	90	17
25084	7 G 1	14,9	67,0	222,0	Hemp	80	17
25085	12 G 1	20,0	115,0	415,0	Hemp	80	17
25086	18 G 1	21,4	173,0	450,0	Hemp	70	17
25087	20 G 1	21,6	192,0	490,0	Hemp	70	17
25088	24 G 1	23,2	230,0	605,0	Hemp	60	17
25090	28 G 1	26,0	293,0	760,0	Hemp	90	17
25089	36 G 1	26,1	346,0	950,0	Hemp	90	17

Lift-2S with 2 external support cores

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Support core	Pendal length app. m	AWG-No.
25091	12 G 1	13,5	115,2	446,0	Steel	-	17
25092	18 G 1	16,2	172,8	528,0	Steel	-	17
25093	25 G 1	19,0	240,0	660,0	Steel	-	17
25094	30 G 1	21,9	288,0	760,0	Steel	-	17
25095	8 G 1,5	14,7	115,0	425,0	Steel	-	16
25096	12 G 1,5	16,0	172,8	505,0	Steel	-	16
25097	15 G 1,5	19,5	230,0	575,0	Steel	-	16
25098	18 G 1,5	19,3	259,0	640,0	Steel	-	16
25099	20 G 1,5	19,5	288,0	715,0	Steel	-	16
25100	24 G 1,5	22,5	346,0	820,0	Steel	-	16

Dimensions and specifications may be changed without prior notice. (RF01)



Technical data

- halogen-free cross-linked control cable to DIN VDE 0282 part 13, HD 22.13 S1+A1
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -20 °C to +70 °C
- Permissible **operating temperature** at conductor +70C
- **Nominal voltage**
fixed installation U_0/U 06/1 kV
flexing U_0/U 450/750 V
- **Test voltage** 2500 V
- **Permanent tensile load**
max. 15 N/mm² under consideration of total copper cross-sections
- **Minimum bending radius**
for fixed installation 4x cable \varnothing
flexing 10x cable \varnothing

Cable structure

- Bare copper, fine wire stranded conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5, and IEC 60228 cl. 5 and HD 383
- Core insulation cross-linked, halogen-free, EI8 to DIN VDE 0282 part 1 (HD 22.1 S3)
- Core colours to DIN VDE 0293-308
- Cores stranded in layers with optimal lay-length
- Outer jacket, cross-linked halogen-free EM8 to DIN VDE 0282 part 1 (HD 22.1 S3)
- Sheath colour black

Properties

- **Test**
Behaviour in fire to EN 50265-2-1 (VDE 0472 part 804) and HD 405.3 cat. C
- Corrosiveness of combustion gases to EN 50267-2-2
Smoke density to HD 606
- Ozone resistant of single corethe insulation to EN 60811-2-1, HD 22.2

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Single and multicore sheathed cable, with low smoke and corrosive gas production in case of fire for interior use. Not suitable for continuous outside use. In this case, cable with a special tested covering should be used. Skin contact should be avoided when the cable is used in high temperatures.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No.cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37176	1 x 1,5	5,7 - 7,1	14,4	58,0	16	37202	3 G 1	8,3 - 10,7	29,0	115,0	17
37177	1 x 2,5	6,3 - 7,9	24,0	71,0	14	37203	3 G 1,5	9,2 - 11,9	43,0	144,0	16
37178	1 x 4	7,2 - 9,0	38,0	100,0	12	37204	3 G 2,5	10,9 - 14,0	72,0	211,0	14
37179	1 x 6	7,9 - 9,8	58,0	130,0	10	37205	3 G 4	12,7 - 16,2	115,0	290,0	12
37180	1 x 10	9,5 - 11,9	96,0	230,0	8	37206	3 G 6	14,1 - 18,0	173,0	391,0	10
37181	1 x 16	10,8 - 13,4	154,0	290,0	6	37207	3 G 10	19,1 - 24,2	288,0	706,0	8
37182	1 x 25	12,7 - 15,8	240,0	420,0	4	37208	3 G 16	21,8 - 27,6	461,0	961,0	6
37183	1 x 35	14,3 - 17,9	336,0	530,0	2	37209	3 G 25	26,1 - 33,0	720,0	1438,0	4
37184	1 x 50	16,5 - 20,6	480,0	750,0	1	37210	3 G 35	29,3 - 37,1	1008,0	1814,0	2
37185	1 x 70	18,6 - 23,3	672,0	960,0	2/0	37211	3 G 50	34,1 - 42,9	1440,0	2550,0	1
37186	1 x 95	20,8 - 26,0	912,0	1250,0	3/0	37212	3 G 70	38,4 - 48,3	2016,0	3210,0	2/0
37187	1 x 120	22,8 - 28,6	1152,0	1560,0	4/0	37213	3 G 95	43,3 - 54,0	2736,0	4423,0	3/0
37188	1 x 150	25,2 - 31,4	1440,0	1900,0	300 kcmil	37214	3 G 120	47,4 - 60,0	3456,0	5405,0	4/0
37189	1 x 185	27,6 - 34,4	1776,0	2300,0	350 kcmil	37215	3 G 150	52,0 - 66,0	4320,0	6725,0	300 kcmil
37190	1 x 240	30,6 - 38,3	2304,0	2950,0	500 kcmil	37216	3 G 185	57,0 - 72,0	5328,0	8222,0	350 kcmil
37191	1 x 300	33,5 - 41,9	2880,0	3600,0	600 kcmil	37217	3 G 240	65,0 - 82,0	6192,0	10224,0	500 kcmil
37192	1 x 400	37,4 - 46,8	3840,0	4600,0	750 kcmil	37218	3 G 300	72,0 - 90,0	8640,0	12620,0	600 kcmil
37193	1 x 500	41,3 - 52,0	4800,0	6000,0	1000 kcmil						
37194	2 x 1	7,7 - 10,0	19,0	95,0	17						
37195	2 x 1,5	8,5 - 11,0	29,0	119,0	16						
37196	2 x 2,5	10,2 - 13,1	48,0	172,0	14						
37197	2 x 4	11,8 - 15,1	77,0	239,0	12						
37198	2 x 6	13,1 - 16,8	115,0	319,0	10						
37199	2 x 10	17,7 - 22,6	192,0	572,0	8						
37200	2 x 16	20,2 - 25,7	307,0	767,0	6						
37201	2 x 25	24,3 - 30,7	480,0	1154,0	4						

Continuation ▶

H07 ZZ-F control cable, cross linked, halogen-free



Part no.	No.cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37219	4 G 1	9,2 - 11,9	38,0	141,0	17
37220	4 G 1,5	10,2 - 13,1	58,0	176,0	16
37221	4 G 2,5	12,1 - 15,5	96,0	235,0	14
37222	4 G 4	14,0 - 17,9	154,0	365,0	12
37223	4 G 6	15,7 - 20,0	230,0	501,0	10
37224	4 G 10	20,9 - 26,5	384,0	872,0	8
37225	4 G 16	23,8 - 30,1	614,0	1194,0	6
37226	4 G 25	28,9 - 36,6	960,0	1822,0	4
37227	4 G 35	32,5 - 41,1	1344,0	2307,0	2
37228	4 G 50	37,7 - 47,5	1920,0	3253,0	1
37229	4 G 70	42,7 - 54,0	2688,0	4130,0	2/0
37230	4 G 95	48,4 - 61,0	3648,0	5720,0	3/0
37231	4 G 120	53,0 - 66,0	4608,0	6965,0	4/0
37232	4 G 150	58,0 - 73,0	5760,0	8644,0	300 kcmil
37233	4 G 185	64,0 - 80,0	7104,0	10598,0	350 kcmil
37234	4 G 240	72,0 - 91,0	9216,0	12100,0	500 kcmil
37235	4 G 300	80,0 - 101,0	11520,0	15200,0	600 kcmil
37236	5 G 1	10,2 - 13,1	48,0	170,0	17
37237	5 G 1,5	11,2 - 14,4	72,0	214,0	16
37238	5 G 2,5	13,3 - 17,0	120,0	316,0	14
37239	5 G 4	15,6 - 19,9	192,0	448,0	12
37240	5 G 6	17,5 - 22,2	288,0	607,0	10
37241	5 G 10	22,9 - 29,1	480,0	1075,0	8
37242	5 G 16	26,4 - 33,3	768,0	1480,0	6
37243	5 G 25	32,0 - 40,4	1200,0	2255,0	4

Part no.	No.cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37244	6 G 1,5	13,4 - 17,2	84,0	287,0	16
37245	6 G 2,5	15,7 - 20,0	144,0	420,0	14
37246	6 G 4	18,2 - 23,2	230,0	583,0	12
37247	7 G 1,5	11,4 - 14,4	101,0	303,0	16
37248	7 G 2,5	13,4 - 17,0	168,0	448,0	14
37249	12 G 1,5	17,6 - 22,4	173,0	496,0	16
37250	12 G 2,5	20,6 - 26,2	288,0	724,0	14
37251	12 G 4	24,4 - 30,9	461,0	1042,0	12
37252	18 G 1,5	20,7 - 26,3	259,0	702,0	16
37253	18 G 2,5	24,4 - 30,9	432,0	1045,0	14
37254	18 G 4	28,8 - 36,4	691,0	1430,0	12
37255	24 G 1,5	24,3 - 30,7	346,0	935,0	16
37256	24 G 2,5	28,8 - 36,4	576,0	1325,0	14
37257	36 G 1,5	27,8 - 35,2	518,0	1297,0	16
37258	36 G 2,5	33,2 - 41,8	864,0	1949,0	14

Dimensions and specifications may be changed without prior notice. (RF01)



Technical data

- Rubber sheath cable to DIN VDE 0250 part 812
- **Temperature range**
flexing -25 °C to +80 °C
fixed installation -40 °C to +80 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U₀/U 0,6/1 kV
- **Operating voltage**
three-phase and one-phase a.c.
U₀/U 0,7/1,2 kV
direct current system
U₀/U 0,9/1,8 kV
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Tensile strength**
statical load:
total cross-section x15 N/mm²
- **Minimum bending radius**
fixed installation 4x cable ø
flexing 10x cable ø
without forced operation 15x cable ø

Cable structure

- Tinned copper conductor, fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Rubber insulation 3GI3 (EPR), to DIN VDE 0207 part 20
- Green-yellow earth-core for 3-cores and above
- Core identification: one green-yellow earth core and others black cores with continuous white numbering to DIN VDE 0293-308. The basic-line prohibits confusion to recognise the individual cores.
- Cores stranded (multi cores)
- Rubber inner sheath, GM1b, rubber-compound to DIN VDE 0207 part 21
- Outer jacket, rubber-compound 5GM5 to DIN VDE 0207 part 21
- Colour yellow

Properties

- Ozone resistance
- High insulation resistance
- Resistant against hot penetration
- Low abrasion
- High notch resistant
- **Resistant against** oils, fats and chemicals
- **Test of oil resistant** to DIN VDE 0472 part 803, test method A
- **Behaviour in fire** according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The code identification of a single core jacketed of an insulated wire is black. For application as a protective core, the ends are to be identified with green-yellow and the middle conductor with light blue.

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Are suited as a connecting cable for very high mechanical stress in underground mining and tools for use in industries and outdoor use. They are also used for mining industry, surface mining, stone-pits, on building sites, outdoors as well as indoors. Suitable for fixed installation on plaster in dry, damp and wet areas. A long duration of life is guaranteed under extreme operating conditions. Not suitable for drumming and use in all types of machinery, such as robots, handling units and energy transfer units, where constant mobility is essential. The insulation of a plastic-rubber compound on EPR basis improves the resistance to ozone in order to avoid the formation of cracks due to ozone and insulation damages in switch-boards.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
38001	1 x 16	11,5	154,0	336,0	6	38023	4 G 35	42,5	1344,0	2777,0	2
38002	1 x 25	14,5	240,0	473,0	4	38024	4 G 50	49,0	1920,0	3817,0	1
38003	1 x 35	15,5	336,0	635,0	2	38025	4 G 70	53,5	2688,0	5071,0	2/0
38004	1 x 50	18,0	480,0	866,0	1	38026	4 G 95	61,5	3648,0	6636,0	3/0
38005	1 x 70	20,5	672,0	1145,0	2/0	38027	4 G 120	68,0	4608,0	7000,0	4/0
38006	1 x 95	23,0	912,0	1475,0	3/0	38028	5 G 1,5	17,0	72,0	252,0	16
38007	1 x 120	25,0	1152,0	1832,0	4/0	38029	5 G 2,5	20,0	120,0	362,0	14
38008	1 x 150	28,0	1440,0	2000,0	300 kcmil	38030	5 G 4	23,0	192,0	509,0	12
38009	1 x 185	30,0	1776,0	2450,0	350 kcmil	38031	5 G 6	26,5	288,0	798,0	10
38010	1 x 240	33,0	2304,0	3190,0	500 kcmil	38035	5 G 10	30,0	480,0	1120,0	8
38011	2 x 2,5	13,2	48,0	205,0	14	38036	5 G 16	34,0	768,0	1680,0	6
38012	3 G 1,5	12,5	43,0	173,0	16	38037	5 G 25	42,0	1200,0	2430,0	4
38013	3 G 2,5	14,0	72,0	247,0	14	38038	7 G 1,5	19,5	101,0	470,0	16
38014	3 G 4	16,8	115,0	336,0	12	38032	7 G 2,5	21,5	168,0	546,0	14
38015	3 G 6	18,1	173,0	520,0	10	38039	10 G 1,5	19,8	144,0	560,0	16
38016	4 G 1,5	16,0	58,0	210,0	16	38033	12 G 2,5	28,0	288,0	851,0	14
38017	4 G 2,5	19,0	96,0	305,0	14	38040	18 G 2,5	33,0	432,0	1230,0	14
38018	4 G 4	21,5	154,0	415,0	12	38034	19 G 2,5	29,2	466,0	1260,0	14
38019	4 G 6	23,0	230,0	641,0	10						
38020	4 G 10	27,5	384,0	1113,0	8						
38021	4 G 16	37,0	614,0	1412,0	6						
38022	4 G 25	39,0	960,0	2095,0	4						

Dimensions and specifications may be changed without prior notice. (RF01)



Photo: HELUKABEL®

Trailing Cables



Trailing Cables

Trailing cables are used for high mechanical stress, especially for applications with frequent winding and unwinding with simultaneous tensile and torsional stress.

Trailing cables are frequently used in building machinery, conveyors and lifting systems, and cranes.

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Contents

Description	Page
TROMM-PUR-H, trailing, halogen-free 	G 4
TROMM-PUR, PUR trailing and control cable, halogen-free	G 5
NSHTÖU, drum cable, VDE approved 	G 6
(N)SHTÖU-V, Trailing-Cable	G 7
HELUSPREADER YSLTÖ-J, spreader cable for vertical basket enterprise	G 8
(N)TSCGEWÖU, extremely torsionally stiff	G 9



Technical data

- Trailing cable acc. to UL AWM Style 20235 CSA/AWM
- **Temperature range**
flexing -40 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage**
acc. to VDE 600/1000 V
acc. to UL 1000 V
- **A.c. test voltage**, 50 Hz
core/core 4000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Tensile strength** s. table
- **Speed of motion**
up to 250 m/min
- **Minimum bending radius**
approx. 6x cable ø

Cable structure

- Bare copper, extra fine wire conductor to VDE 0295 cl. 6 and IEC 60228 cl. 6
- TPE core insulation
- Core colours up to 5 cores acc. to DIN VDE 0293, 6 or more cores black with white numbers + gnye
- Cores stranded around support element
- Polyester fleece wrapping
- High-tensile PUR double sheath with integrated support braiding
- Sheath colour yellow

Properties

- PUR outer sheath, low adhesion, abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- PUR sheath: self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Due to the PUR outer jacket, the cable is resistant against ozone and radiation, as well as oils, greases and petrol

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Application

Significantly smaller external diameters, smaller bending radii and reduced weights compared to NSHTÖU cables enable the use of smaller drive motors and drums, thus providing significant cost savings.

> Trailing cables are used for high mechanical stress, especially for applications with frequent winding and unwinding with simultaneous tensile and torsional stress, for building machinery, conveyors and lifting systems, and cranes. They are used as robust and all-weather resistant cables in the harshest operating environments in mining and in flexible handling equipment and railway motors. The cables are suitable for installation in dry, damp and wet environments, as well as outdoors.

Notes

- During installation and operation the tensile stress on the cable must not exceed 15 N/mm²
- Acceleration must not exceed 0,4 m/sec²
- 1 to 2 turns should remain on the drum during operation

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
77144	4 G 1,5	10,2	58,0	157,0
77145	5 G 1,5	10,8	72,0	176,0
77146	7 G 1,5	12,9	101,0	245,0
77147	12 G 1,5	18,4	173,0	337,0
77148	18 G 1,5	18,6	259,0	526,0
77149	24 G 1,5	21,3	345,6	662,0
77150	30 G 1,5	24,6	432,0	901,0
77151	42 G 1,5	26,5	604,8	1056,0
77152	4 G 2,5	11,7	96,0	208,0
77153	5 G 2,5	12,7	120,0	263,0
77154	7 G 2,5	14,8	168,0	327,0
77155	12 G 2,5	20,4	288,0	533,0
77156	18 G 2,5	21,1	432,0	725,0
77157	24 G 2,5	24,8	576,0	988,0
77158	30 G 2,5	27,6	720,0	1242,0
77159	40 G 2,5	30,0	960,0	1500,0
77160	50 G 2,5	34,3	1200,0	1800,0

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
77161	4 G 4	12,5	154,0	270,0
77172	5 G 4	14,3	192,0	362,0
77162	4 G 6	16,9	230,0	409,0
77173	5 G 6	17,8	288,0	511,0
77163	4 G 10	19,6	384,0	633,0
77174	5 G 10	20,9	480,0	766,0
77164	4 G 16	23,8	614,0	936,0
77175	5 G 16	25,3	768,0	1170,0
77165	4 G 25	27,7	960,0	1485,0
77166	4 G 35	30,1	1344,0	2115,0
77167	4 G 50	35,2	1920,0	2600,0
77168	4 G 70	40,3	2688,0	3700,0
77169	4 G 95	50,6	3648,0	4800,0
77170	4 G 120	53,0	4608,0	5900,0
77171	4 G 150	56,0	5760,0	7100,0

Dimensions and specifications may be changed without prior notice.

TROMM-PUR PUR trailing and control cable, halogen-free



HELUKABEL TROMM-PUR 12G1 QMM / 26036 300/500 V 001042788 CE



Technical data

- Special PUR insulation and jacket
- Adapted to DIN VDE 0250
- Strain bearing support strand
- **Temperature range**
-40 °C to +80 °C
(up to +100 °C for short periods)
- **Nominal voltage**
up to 1 mm² U₀/U 300/500 V
as of 1,5 mm² U₀/U 450/750 V
- **Test voltage**
up to 1 mm² = 2000 V
as of 1,5 mm² = 2500 V
- **Breakdown voltage**
up to 1 mm² = 4000 V
as of 1,5 mm² = 5000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
approx. 10x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special core insulation, PUR
- Support core
- Core coding to DIN VDE 0293 (flexible cables)
- Cores stranded in layers with optimal lay-length
- Core wrapping with fleece
- Support braiding of synthetic fibres
- Halogen-free outer jacket PUR
- colour orange

Properties

- High flexibility at low temperatures
- Usable for foodstuffs
- Abrasion and tear resistant
- Loadable under torsional stress

Resistant to

- Oils and fats
- Non-alcoholic fuels and kerosene
- Atmospheric influences
- UV-radiation
- Oxygen and ozone
- Microbes and rotting
- Sea and waste water
- Vibrations

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

TROMM-PUR has taken the development of the neoprene type cables one step further. It is a robust, all-weather cable, halogen-free, tear and abrasion resistant and suitable for use in drag-chains, in ship docks, on building sites, for conveyor systems, in mining, for tunnels and roadbuilding.

For the connecting the ski lift terminal positions to the control unit, surveillance of the joining rods in ski lift cables, as feeder cables for very high currents as for example in pump engineering, mining, locomotive and rail-carriage construction, for oil rig platforms, emergency power generators etc.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Breaking strain ca. kp	AWG-No.
26035	14 G 0,75	16,5	154,0	320,0	250	18
26036	12 G 1	17,5	115,0	300,0	500	17
26037	18 G 1	23,0	173,0	480,0	500	17
26038	3 G 1,5	9,5	43,0	110,0	200	16
26039	5 G 1,5	12,5	72,0	220,0	200	16
26040	7 G 1,5	15,5	101,0	270,0	250	16
26041	12 G 1,5	21,0	173,0	450,0	750	16
26042	18 G 1,5	27,0	259,0	620,0	750	16
26043	24 G 1,5	30,0	346,0	850,0	750	16
26044	30 G 1,5	34,0	533,0	1100,0	750	16
26045	42 G 1,5	40,0	605,0	1600,0	750	16
26046	4 G 2,5	14,0	96,0	250,0	200	14
26047	5 G 2,5	15,0	120,0	280,0	250	14
26048	7 G 2,5	18,0	168,0	360,0	300	14
26049	12 G 2,5	25,0	288,0	740,0	750	14
26050	24 G 2,5	36,0	576,0	1400,0	750	14
26051	30 G 2,5	40,0	864,0	1740,0	750	14
26052	36 G 2,5	44,0	998,0	2050,0	750	14
26053	7 G 4	22,0	269,0	600,0	500	12
26054	4 G 10	22,0	384,0	650,0	500	8
26055	4 G 16	27,0	614,0	1100,0	500	6
26059	5 G 16	34,0	768,0	1600,0	750	6
26056	4 G 25	30,0	960,0	1600,0	500	4
26057	4 G 35	36,0	1344,0	2050,0	1000	2
26058	4 G 50	42,0	1920,0	2800,0	1000	1

Dimensions and specifications may be changed without prior notice. (RG01)



Technical data

- Special-crane-drum cable to DIN VDE 0250 part 814
- **Temperature range**
flexing -35 °C to +70 °C
fixed installation -40 °C to +70 °C
- Max. **conductor temperature**
under load +60 °C
circuit conditions +200 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- Max. **permissible nominal voltages**
for three phase and one phase a.c.
current installation U_0/U 0,7/1,2 kV
for direct current U_0/U 0,9/1,8 kV
- **Test voltage** 2500 V
- **Insulation resistance**
min. 10 MΩm x km
- **Minimum bending radius**
7,5x cable ø
- **Radiation resistance**
up to 20×10^6 cJ/kg (up to 20 Mrad)

Cable structure

- Tinned copper fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Rubber core insulation GI1 to DIN VDE 0207 part 20
- Core identification to DIN VDE 0293, 6 cores and above with numbering
- Cores stranded (without elongated central core) with max. lay-length of $8x\phi$ over the stranding layers
- Textile tape
- Textile braiding as protection against torsion, embedded in inner filling sheath
- Neoprene outer jacket, type 5GM2 to DIN VDE 0207 part 21
- Jacket colour black

Properties

- Designed and developed for horizontal drum-operation
- Permissible running speed up to 120 m/min max.
- Polychloroprene-rubber (neoprene)-jacket, extremely cold resistant
- **Behaviour in fire**
Test according to 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- **Oil resistant**
Test according to VDE 0472 part 803, test method A
- Due to the neoprene outer jacket, the cables **is resistant** against ozone and radiation, oils, acids, fats, gasoline, solvents and chemicals
- During the installation and operation the tensile stress on conductor may not increase 15 N/mm^2
- Acceleration not more than $0,4 \text{ m/sec}^2$
- During operation, 1-2 convolutions should remain on the operating drum
- In case of high mechanical stress, especially of high dynamic tensile stress result high acceleration, the permissible stress must be defined in each case

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm^2 .

Application

Trailing cables are used for high mechanical stress, especially for applications with frequent winding and unwinding with simultaneous tensile and torsional stress, for building machinery, conveyors, shifts and cranes.

They are used as robust and all weather resistant cables of roughest operations in mining and in flexible handling equipment and railway motors. The cables are suitable for outdoor installation in dry, damp and wet places as well in open air.

For applications which go beyond standard solutions we recommend that you fill out our especially developed questionnaire for reeling cables. Please read the installation instructions.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26001	3 G 1,5	13,6	47,0	236,0	16
26029	4 G 1,5	14,0	58,0	274,0	16
26002	5 G 1,5	14,5	81,0	316,0	16
26003	7 G 1,5	18,8	115,0	440,0	16
26004	12 G 1,5	21,0	196,0	606,0	16
26005	16 G 1,5	24,5	259,0	696,0	16
26006	18 G 1,5	25,5	271,0	750,0	16
26007	24 G 1,5	27,5	390,0	1150,0	16
26008	30 G 1,5	29,5	452,0	1325,0	16
26009	3 G 2,5	15,3	74,0	305,0	14
26010	4 G 2,5	16,5	98,0	350,0	14
26011	5 G 2,5	17,5	124,0	465,0	14
26012	7 G 2,5	20,0	168,0	576,0	14
26013	12 G 2,5	23,5	308,0	850,0	14
26014	18 G 2,5	28,0	451,0	1181,0	14
26015	24 G 2,5	32,5	615,0	1550,0	14
26016	30 G 2,5	34,0	770,0	1810,0	14
26017	40 G 2,5	42,5	1080,0	3110,0	14
26018	50 G 2,5	46,5	1200,0	3200,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26019	4 G 4	18,5	158,0	510,0	12
26030	5 G 4	21,5	220,0	635,0	12
26020	4 G 6	21,0	241,0	650,0	10
26031	5 G 6	23,5	317,0	800,0	10
26021	4 G 10	26,0	404,0	1010,0	8
26022	5 G 10	28,0	508,0	1200,0	8
26023	4 G 16	29,0	642,0	1300,0	6
26032	5 G 16	31,5	768,0	1700,0	6
26024	4 G 25	35,0	1005,0	2000,0	4
26025	4 G 35	37,5	1344,0	2610,0	2
26026	4 G 50	44,5	2010,0	3500,0	1
26027	4 G 70	49,0	2688,0	4600,0	2/0
26028	4 G 95	56,0	3648,0	6100,0	3/0

Dimensions and specifications may be changed without prior notice. (RG01)

(N)SHTÖU-V Trailing-Cable



Technical data

- Special trailing cable according to DIN VDE 0250, Part 814
- **Temperature range**
Flexing -25 °C to +80 °C
- **Max. temperature at the conductor**
during operation +90 °C
on short-circuit +250 °C
- **Nominal voltage**
U₀/U 0,6/1 kV
- **Maximum permitted operating voltages**
in three-phase and one-phase alternating
current installations
U₀/U 0,7/1,2 kV
Direct current installations
U₀/U 0,9/1,8 kV
- **Test voltage** 4 kV
- **Insulation resistance**
min. 10 MΩm x km
- **Minimum bending radius**
7,5x cable ø

Cable structure

- Tinned copper conductor, fine wire
stranded according to DIN VDE 0295 cl. 5,
BS 6360 cl. 5 or IEC 60228 cl. 5
- Insulating sleeve from special rubber
compound 3GI3 in accordance with DIN
VDE 207 Part 20
- Core identification in accordance with DIN
VDE 0293 Part 308 (HD 308 S2)
- Cores stranded (without elongated central
core) with max. lay-length of 8 x ø over the
stranded layers)
- Depending on dimension/structure with
Kevlar fillers
- Inner sheath: Special rubber,
compound-type 5GM5
- Torsion protection between inner and
outer sheath
- Outer sheath from special rubber
compound, compound type 5GM5
according to DIN VDE 0207 Part 21
- Sheath colour - yellow

Properties

- Permitted running speed up 180 m/min
- **Fire behaviour**
Test in accordance with 0482-332-1-2, DIN
EN 60332-1-2/ IEC 60332-1 (conforms to
DIN VDE 0472 Part 804 Test method B)
- **Oil resistant**
Test in accordance with DIN EN 60811-2-1
IEC 60811-2-1
- Highly resistant to acids, fats, gasoline,
solvents and chemicals
- During installation and operation, the
tensile stress must not exceed 30 N/mm²

Application

For vertical drum operation under extreme mechanical stress and on moving cable carriers. Used as a rugged feeder to construction machines, conveyor, transport and crane systems in dry, damp, wet environments and outdoors. For applications that go beyond standard solutions we recommend you to our specially developed questionnaire for reeling cables. Please note installation instructions.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Power supply Cable

Part no.	No. cores x cross-sec. mm ²	Outer ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	Tensile strain max. N	AWG-No.
31040	3 G 1,5	10,9 - 13,6	45,0	191,0	130	-
31041	3 G 2,5	12,3 - 14,8	74,0	240,0	220	-
31042	3 G 4	14,9 - 17,6	115,0	362,0	360	-
31043	3 G 6	16,2 - 18,9	173,0	450,0	540	-
31044	3 G 10	19,6 - 22,6	288,0	682,0	900	-
31045	3 G 16	21,8 - 24,9	461,0	890,0	1440	-
31046	3 G 25	27,5 - 30,8	720,0	1200,0	2250	-
31047	3 x 50 + 3 G 25	36,9 - 40,6	1685,0	2810,0	4500	-
31048	3 x 70 + 3 G 35	40,4 - 44,4	2355,0	3760,0	6300	-
31049	3 x 95 + 3 G 50	46,6 - 50,8	3215,0	4700,0	8550	-
31050	3 x 120 + 3 G 70	50,8 - 55,2	4130,0	5950,0	10800	-
31051	3 x 150 + 3 G 90	55,4 - 60,0	4990,0	7050,0	13500	-
31052	3 x 185 + 3 G 95	60,8 - 65,7	6250,0	8800,0	16650	-
31053	3 x 240 + 3 G 120	68,8 - 74,0	8065,0	11700,0	21600	-
31054	4 G 1,5	11,8 - 14,5	58,0	220,0	180	-
31055	4 G 2,5	14,4 - 17,1	99,0	330,0	300	-
31056	4 G 4	16,2 - 18,8	158,0	440,0	480	-
31057	4 G 6	17,4 - 20,2	241,0	530,0	720	-
31058	4 G 10	24,4 - 21,3	404,0	835,0	1200	-
31059	4 G 16	24,7 - 27,9	642,0	1175,0	1920	-
31060	4 G 25	31,4 - 34,9	1005,0	1850,0	3000	-
31061	4 G 35	37,5 - 33,9	1344,0	2250,0	4200	-
31062	4 G 50	40,3 - 44,2	2010,0	3210,0	6000	-
31063	4 G 70	44,5 - 48,6	2687,0	4210,0	8400	-
31064	4 G 95	51,1 - 55,5	3646,0	5550,0	11400	-
31065	4 G 120	57,4 - 62,0	4605,0	7010,0	14400	-
31066	4 G 150	62,6 - 67,6	5765,0	8450,0	18000	-
31067	4 G 185	68,1 - 73,2	7110,0	10000,0	22200	-
31068	5 G 1,5	12,8 - 15,5	73,0	258,0	220	-
31069	5 G 2,5	15,5 - 18,2	124,0	389,0	370	-
31070	5 G 4	17,4 - 20,2	220,0	511,0	600	-
31071	5 G 6	19,6 - 22,7	317,0	688,0	900	-
31072	5 G 10	23,2 - 26,3	508,0	1002,0	1500	-
31073	5 G 16	26,7 - 30,2	768,0	1395,0	2400	-
31074	5 G 25	34,1 - 37,7	1005,0	2205,0	3750	-
31075	5 G 35	38,3 - 42,2	1344,0	2960,0	5250	-
31076	5 G 50	43,8 - 47,8	2010,0	3950,0	7500	-
31077	5 G 70	50,2 - 54,6	2688,0	5455,0	10500	-

Control Cable (Kevlar fillers)

Part no.	No. cores x cross-sec. mm ²	Outer ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	Tensile strain max. N	AWG-No.
31078	49 G 1	31,0 - 34,5	470,0	1420,0	3450	-
31079	7 G 1,5	14,6 - 16,9	115,0	320,0	2318	-
31080	12 G 1,5	20,6 - 23,4	196,0	620,0	2540	-
31081	18 G 1,5	20,3 - 22,9	271,0	650,0	2810	-
31082	24 G 1,5	24,2 - 27,4	390,0	930,0	3080	-
31083	30 G 1,5	27,7 - 31,1	432,0	1190,0	3350	-
31084	36 G 1,5	27,9 - 31,3	518,0	1240,0	3620	-
31085	44 G 1,5	31,2 - 34,8	634,0	1530,0	3980	-
31086	48 G 1,5	31,8 - 35,4	691,0	1610,0	4160	-
31087	56 G 1,5	35,9 - 39,7	807,0	2020,0	4520	-
31088	7 G 2,5	17,5 - 19,8	168,0	480,0	2520	-
31089	12 G 2,5	23,8 - 26,7	308,0	915,0	2900	-
31090	18 G 2,5	23,4 - 26,2	451,0	945,0	3350	-
31091	24 G 2,5	28,2 - 31,1	615,0	1330,0	3800	-
31092	30 G 2,5	31,1 - 34,4	770,0	1615,0	4250	-
31093	36 G 2,5	31,3 - 34,7	866,0	1710,0	4680	-
31094	44 G 2,5	36,2 - 40,2	1057,0	2240,0	5250	-
31095	48 G 2,5	37,2 - 41,0	1153,0	2410,0	5550	-
31096	56 G 2,5	41,6 - 46,0	1344,0	2930,0	6150	-

Dimensions and specifications may be changed without prior notice. (RG01)

HELUSPREADER YSLTÖ-J spreader cable for vertical basket enterprise



HELUSPREADER YSLTÖ-J CE



new

Technical data

- Special cable line to DIN VDE 0250
- **Temperature range**
flexing -20 °C to +60 °C
fixed installation -20 °C to +60 °C
- Max. **operating temperature**
at the conductor +90 °C
- max. **Short circuit temperature**
at the conductor +150 °C
- **Nominal voltage**
U₀/U 300/500 V
- max. **Tensile load** 2000 N
- **Minimum bending radius**
15x cable ø
- **Current carrying capacity**
to DIN VDE 0298 part 4

Cable structure

- Bare copper, fine or extra fine wire conductor to DIN VDE 0295 cl. 5 and 6, BS 6360 cl. 5 and 6, IEC 60228 cl. 5 and 6
- Special EPR-core insulation
- Black cores with continuous white numbering to DIN VDE 0293
- Green yellow earth-core
- Cores laid-up in lay of length, stranding with optimal length of twists around a Kevlar element
- Special polychloropren outer jacket
- Jacket colour black (RAL 9005)

Properties

- weather resistant
- UV-resistant
- high abrasion resistance

Note

- G = with green-yellow earth core. Delivery on request:
- also as -K model, temperature range -40 °C to +80 °C
- further dimensions and special designs

G

Application

As Spreader cable with high mechanical stresses in vertical basket operation in dry, moist, wet environment and in open air. Please note that at the installation the cable must be placed counterwise and free of twist into the basket.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	Tensile strain max. N	AWG-No.
40160	36 G 2,5	38,1 - 41,0	864,0	2500,0	2000	14
40161	42 G 2,5	40,8 - 43,8	1008,0	3000,0	2000	14
40162	48 G 2,5	45,7 - 48,7	1152,0	3650,0	2000	14
40163	54 G 2,5	47,0 - 51,0	1296,0	4100,0	2000	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	Tensile strain max. N	AWG-No.
40164	36 G 3,3	42,4 - 45,5	1140,0	3200,0	2000	12
40165	42 G 3,3	46,6 - 49,6	1330,0	3750,0	2000	16
40166	48 G 3,3	52,0 - 55,0	1521,0	4450,0	2000	16
40167	54 G 3,3	56,6 - 60,0	1711,0	5000,0	2000	16

Dimensions and specifications may be changed without prior notice. (RG01)

(N)TSCGEWÖU extremely torsionally stiff

new



Technical data

- Medium voltage power cable according to VDE 0250 part 813
- **Temperature range**
flexing -20 °C to +60 °C
fixed installation -20 °C to +80 °C
- **Nominal voltages**
U₀/U 3,6/6kV, 6/10 kV, 8,7/15kV, 12/20 kV
- **Operating voltages, max**
3,6/6 kV = 4,2/7,2 kV
6/10 kV = 6,9/12 kV
8,7/15 kV = 10,4/18 kV
12/20 kV = 13,9/24 kV
- **Test voltages**
3,6/6 kV = 11 kV
6/10 kV = 17 kV
8,7/15 kV = 24 kV
12/20 kV = 29 kV
- **Minimum bending radius**
15x outer diameter

Cable structure

- Tinned copper conductor, fine wire stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Inner semi-conducting layer
- HEPR-insulation
- Outer semi-conducting layer
- Ground conductor with semi-conductive layer
- Cores concentrically stranded
- Inner jacket, jacket colour red
- Antitorsional protection
- Outer sheath: chloroprene rubber, compound 5GM3
- Jacket colour, red

Properties

- maximum permissible speed 200 m/min is allowed when operating drums in one direction
- extremely torsion resistant
- resistant against oils and fats, atmospheric exposure and UV-radiation

Note

- Further dimensions and special designs on request

Application

Reeling medium voltage supply train for use in high mechanical stresses, such as in container cranes or large mobile equipment as well as excavators in the mining industry for days, in dry, damp, wet areas and outdoors.

3,6/6kV

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Permanent load N	Tensile strain max. N	Cop. weight kg / km	Weight approx. kg / km
38533	3 x 25 + 3 x 10	37,0 - 40,0	1500	2200	1008,0	2280,0
38534	3 x 35 + 3 x 10	40,0 - 43,0	2000	3100	1292,0	2750,0
38535	3 x 50 + 3 x 10	44,0 - 47,0	3000	4300	1728,0	3400,0
38536	3 x 70 + 3 x 16	47,0 - 50,0	4100	5100	2477,0	4100,0
38537	3 x 95 + 3 x 16	52,0 - 56,0	5600	7000	3197,0	5450,0
38538	3 x 120 + 3 x 25	56,0 - 60,0	7100	8500	4176,0	6650,0

6/10kV

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Permanent load N	Tensile strain max. N	Cop. weight kg / km	Weight approx. kg / km
38539	3 x 25 + 3 x 10	39,0 - 42,0	1500	2200	1008,0	2400,0
38540	3 x 35 + 3 x 10	42,0 - 45,0	2000	3100	1292,0	2900,0
38541	3 x 50 + 3 x 10	45,0 - 48,0	3000	4300	1728,0	3450,0
38542	3 x 70 + 3 x 16	50,0 - 54,0	4100	5100	2477,0	4600,0
38543	3 x 95 + 3 x 16	54,0 - 58,0	5600	7000	3197,0	5770,0
38544	3 x 120 + 3 x 25	58,0 - 62,0	7100	8500	4176,0	6900,0

8,7/15kV

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Permanent load N	Tensile strain max. N	Cop. weight kg / km	Weight approx. kg / km
38545	3 x 25 + 3 x 10	43,0 - 46,0	1500	2200	1008,0	2750,0
38546	3 x 35 + 3 x 10	46,0 - 48,0	2000	3100	1292,0	3210,0
38547	3 x 50 + 3 x 10	49,0 - 52,0	3000	4300	1728,0	3950,0
39040	3 x 70 + 3 x 16	53,0 - 57,0	4100	5100	2477,0	5000,0
39041	3 x 95 + 3 x 16	58,0 - 62,0	5600	7000	3197,0	6150,0
39042	3 x 120 + 3 x 25	63,0 - 67,0	7100	8500	4176,0	7700,0

12/20kV

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Permanent load N	Tensile strain max. N	Cop. weight kg / km	Weight approx. kg / km
39043	3 x 25 + 3 x 10	46,0 - 49,0	1500	2200	1008,0	3040,0
39044	3 x 35 + 3 x 10	49,0 - 52,0	2000	3100	1292,0	3510,0
39045	3 x 50 + 3 x 10	53,0 - 57,0	3000	4300	1728,0	4410,0
39046	3 x 70 + 3 x 16	57,0 - 61,0	4100	5100	2477,0	5420,0
39047	3 x 95 + 3 x 16	62,0 - 66,0	5600	7000	3197,0	6750,0
39048	1 x 120 + 3 x 25	67,0 - 70,0	7100	8500	4176,0	8050,0

Dimensions and specifications may be changed without prior notice. (RQ03)

Cable Accessories

The expansion of our cable program rounds our wide product range out



Photo: Helukabel®

As a significant addition to the extensive catalogue of cables and connectors, HELUKABEL® has set up a Cable Accessories Program according to the latest guidelines and standards.

This applies to the following themes:

- Cable fixing
- Cable protective sleeving
- Drag and guidance chains
- Isolation and Heatshrink sleeving
- Termination & Connecting sleeves
- Bundling, binding and fixing
- Identification and Marking
- Terminals & cable lugs
- Tools
- Circular Connectors



Photo: HELUKABEL®

Robotic Cables




Robotic Cables

With over 30 years of experience with cables and lines, we also have the right solutions for the demands placed on the components to be installed by the applications of the robot.

Our specialists work with you to select the correct cables, wires, supplemental systems and also construct the pre-assembled cable protection system to suit your particular application.

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Contents

Description	Page
ROBOFLEX recycle 	H 4
ROBOFLEX 2001 / 2001-C, Robot cables, meter marking 	H 6
ROBOFLEX 150,...151,...152,...153, PUR, flame retardant, halogen-free, for torsional stress, meter marking 	H 7
ROBOFLEX 156-flat, PUR, flame retardant, halogen-free, for torsional stress	H 9
ROBOFLEX sewer robot, trailing	H 10



Technical data

- **Approval:**
UL/cUL approved, UL-Style 20233
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +105 °C
flexible -30 °C to +105 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

Assembly (3-pin)

- Bare copper litz wire
- Core insulation TPE
- Cores stranded in layers
- -D-screen: screened version for robot application
- -C-screen: in drag chain systems
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing according (to DIN VDE 0472 part 804 test method B, IEC 60332-1)
- Sheath colour: see below

Properties

- very good resistance to oil as per DIN EN 60811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant

Application

The cables with this new sheath material cover all requirements for very large mechanical stresses for abrasion, tear resistance, torsion, flexing, flexibility and oil resistance. Using for automation technology, plant and machine construction, fixture construction for handling devices, welding devices and welding tongs, assembly and handling devices, machining production, welding robots and tool machines, blast furnaces and rolling mills.

The completely new feature of this cable is the weld splatter resistance without the otherwise usual and required cross-linking process.

- Our newly developed non-cross-linked thermoplastic elastomer is fully recyclable.
- In contrast to this, the usual, cross-linked, thermoplastic elastomers cannot be recycled and put a not insignificant stress on our environment.
- This must be particularly interesting for customers who have an environment management system according to DIN EN ISO14001 and thus place a great deal of importance on the use of recyclable materials.
- A significantly longer service life than that of existing cables on the market, because it can be used in highly flexible applications, for example on robots (torsion) and in drag chains (dynamic load).

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

ROBOFLEX recycle

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Core colours	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	
701889	Black RAL 9005	3 x 0,25	brown, blue, black	X	4,4	7,2	22,0	-
701891	Yellow RAL 1021	3 x 0,25	brown, blue, black	X	4,4	7,2	22,0	-
701890	Grey RAL 7001	3 x 0,25	brown, blue, black	X	4,4	7,2	22,0	-
701894	Yellow RAL 1021	4 x 0,25	brown, blue, black, white	X	4,7	9,6	26,0	-
701892	Black RAL 9005	4 x 0,25	brown, blue, black, white	X	4,7	9,6	26,0	-
701893	Grey RAL 7001	4 x 0,25	brown, blue, black, white	X	4,7	9,6	26,0	-
701897	Yellow RAL 1021	5 x 0,25	brown, blue, black, white, grey	X	4,8	12,0	30,0	-
701895	Black RAL 9005	5 x 0,25	brown, blue, black, white, grey	X	4,8	12,0	30,0	-
701896	Grey RAL 7001	5 x 0,25	brown, blue, black, white, grey	X	4,8	12,0	30,0	-
702805	Yellow RAL 1021	8 x 0,25	DIN 47100	X	6,0	19,2	55,0	-
702803	Black RAL 9005	8 x 0,25	DIN 47100	X	6,0	19,2	55,0	-
702804	Grey RAL 7001	8 x 0,25	DIN 47100	X	6,0	19,2	55,0	-
701900	Yellow RAL 1021	3 x 0,34	brown, blue, black	X	4,9	9,8	30,0	-
701898	Black RAL 9005	3 x 0,34	brown, blue, black	X	4,9	9,8	30,0	-
701899	Grey RAL 7001	3 x 0,34	brown, blue, black	X	4,9	9,8	30,0	-

Continuation ▶

ROBOFLEX recycle



ROBOFLEX recycle

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Core colours	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
701903	Yellow RAL 1021	4 x 0,34	brown, blue, black, white	X	5,2	13,1	43,0
701901	Black RAL 9005	4 x 0,34	brown, blue, black, white	X	5,2	13,1	43,0
701902	Grey RAL 7001	4 x 0,34	brown, blue, black, white	X	5,2	13,1	43,0
701906	Yellow RAL 1021	5 x 0,34	brown, blue, black, white, grey	X	5,9	16,4	54,0
701904	Black RAL 9005	5 x 0,34	brown, blue, black, white, grey	X	5,9	16,4	54,0
701905	Grey RAL 7001	5 x 0,34	brown, blue, black, white, grey	X	5,9	16,4	54,0
702808	Yellow RAL 1021	8 x 0,34	DIN 47100	X	6,8	26,1	78,0
702806	Black RAL 9005	8 x 0,34	DIN 47100	X	6,8	26,1	78,0
702807	Grey RAL 7001	8 x 0,34	DIN 47100	X	6,8	26,1	78,0
701910	Yellow RAL 1021	5 G 0,5	JZ, black with numbering + greenyellow	X	6,0	24,0	65,0
701908	Black RAL 9005	5 G 0,5	JZ, black with numbering + greenyellow	X	6,0	24,0	65,0
701909	Grey RAL 7001	5 G 0,5	JZ, black with numbering + greenyellow	X	6,0	24,0	65,0
701913	Yellow RAL 1021	5 G 0,75	JZ, black with numbering + greenyellow	X	7,0	36,0	80,0
701911	Black RAL 9005	5 G 0,75	JZ, black with numbering + greenyellow	X	7,0	36,0	80,0
701912	Grey RAL 7001	5 G 0,75	JZ, black with numbering + greenyellow	X	7,0	36,0	80,0

ROBOFLEX recycle screened, D-screen

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Core colours	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
703843	Black RAL 9005	3 x 0,25	brown, blue, black	X	5,0	17,0	44,6
703845	Yellow RAL 1021	3 x 0,25	brown, blue, black	X	5,0	17,0	44,6
703844	Grey RAL 7001	3 x 0,25	brown, blue, black	X	5,0	17,0	44,6
703848	Yellow RAL 1021	4 x 0,25	brown, blue, black, white	X	5,2	19,4	46,3
703846	Black RAL 9005	4 x 0,25	brown, blue, black, white	X	5,2	19,4	46,3
703847	Grey RAL 7001	4 x 0,25	brown, blue, black, white	X	5,2	19,4	46,3
703851	Yellow RAL 1021	5 x 0,25	brown, blue, black, white, grey	X	5,3	22,5	50,0
703849	Black RAL 9005	5 x 0,25	brown, blue, black, white, grey	X	5,3	22,5	50,0
703850	Grey RAL 7001	5 x 0,25	brown, blue, black, white, grey	X	5,3	22,5	50,0
703869	Yellow RAL 1021	8 x 0,25	DIN 47100	X	6,8	34,1	53,5
703867	Black RAL 9005	8 x 0,25	DIN 47100	X	6,8	34,1	53,5
703868	Grey RAL 7001	8 x 0,25	DIN 47100	X	6,8	34,1	53,5
703854	Yellow RAL 1021	3 x 0,34	brown, blue, black	X	5,2	19,6	48,2
703852	Black RAL 9005	3 x 0,34	brown, blue, black	X	5,2	19,6	48,2
703853	Grey RAL 7001	3 x 0,34	brown, blue, black	X	5,2	19,6	48,2
703857	Yellow RAL 1021	4 x 0,34	brown, blue, black, white	X	5,4	23,7	53,0
703855	Black RAL 9005	4 x 0,34	brown, blue, black, white	X	5,4	23,7	53,0
703856	Grey RAL 7001	4 x 0,34	brown, blue, black, white	X	5,4	23,7	53,0
703860	Yellow RAL 1021	5 x 0,34	brown, blue, black, white, grey	X	5,8	28,7	61,9
703858	Black RAL 9005	5 x 0,34	brown, blue, black, white, grey	X	5,8	28,7	61,9
703859	Grey RAL 7001	5 x 0,34	brown, blue, black, white, grey	X	5,8	28,7	61,9
703872	Yellow RAL 1021	8 x 0,34	DIN 47100	X	7,3	58,0	85,0
703870	Black RAL 9005	8 x 0,34	DIN 47100	X	7,3	58,0	85,0
703871	Grey RAL 7001	8 x 0,34	DIN 47100	X	7,3	58,0	85,0
703863	Yellow RAL 1021	5 G 0,5	JZ, black with numbering + greenyellow	X	7,0	52,0	76,0
703861	Black RAL 9005	5 G 0,5	JZ, black with numbering + greenyellow	X	7,0	52,0	76,0
703866	Yellow RAL 1021	5 G 0,75	JZ, black with numbering + greenyellow	X	7,6	70,0	93,0
703864	Black RAL 9005	5 G 0,75	JZ, black with numbering + greenyellow	X	7,6	70,0	93,0
703865	Grey RAL 7001	5 G 0,75	JZ, black with numbering + greenyellow	X	7,6	70,0	93,0

ROBOFLEX recycle screened, C-screen

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Core colours	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
703873	Black RAL 9005	3 x 0,25	brown, blue, black	X	5,0	17,0	44,6
703875	Yellow RAL 1021	3 x 0,25	brown, blue, black	X	5,0	17,0	44,6
703874	Grey RAL 7001	3 x 0,25	brown, blue, black	X	5,0	17,0	44,6
703878	Yellow RAL 1021	4 x 0,25	brown, blue, black, white	X	5,2	19,4	46,3
703876	Black RAL 9005	4 x 0,25	brown, blue, black, white	X	5,2	19,4	46,3
703877	Grey RAL 7001	4 x 0,25	brown, blue, black, white	X	5,2	19,4	46,3
703881	Yellow RAL 1021	5 x 0,25	brown, blue, black, white, grey	X	5,3	22,5	50,0
703879	Black RAL 9005	5 x 0,25	brown, blue, black, white, grey	X	5,3	22,5	50,0
703880	Grey RAL 7001	5 x 0,25	brown, blue, black, white, grey	X	5,3	22,5	50,0
703899	Yellow RAL 1021	8 x 0,25	DIN 47100	X	6,8	34,1	53,5
703897	Black RAL 9005	8 x 0,25	DIN 47100	X	6,8	34,1	53,5
703898	Grey RAL 7001	8 x 0,25	DIN 47100	X	6,8	34,1	53,5
703884	Yellow RAL 1021	3 x 0,34	brown, blue, black	X	5,2	19,6	48,2
703882	Black RAL 9005	3 x 0,34	brown, blue, black	X	5,2	19,6	48,2
703883	Grey RAL 7001	3 x 0,34	brown, blue, black	X	5,2	19,6	48,2
703887	Yellow RAL 1021	4 x 0,34	brown, blue, black, white	X	5,4	23,7	53,0
703885	Black RAL 9005	4 x 0,34	brown, blue, black, white	X	5,4	23,7	53,0
703886	Grey RAL 7001	4 x 0,34	brown, blue, black, white	X	5,4	23,7	53,0
703890	Yellow RAL 1021	5 x 0,34	brown, blue, black, white, grey	X	5,8	28,7	61,9
703888	Black RAL 9005	5 x 0,34	brown, blue, black, white, grey	X	5,8	28,7	61,9
703889	Grey RAL 7001	5 x 0,34	brown, blue, black, white, grey	X	5,8	28,7	61,9
703902	Yellow RAL 1021	8 x 0,34	DIN 47100	X	7,3	58,0	85,0
703900	Black RAL 9005	8 x 0,34	DIN 47100	X	7,3	58,0	85,0
703901	Grey RAL 7001	8 x 0,34	DIN 47100	X	7,3	58,0	85,0
703893	Yellow RAL 1021	5 G 0,5	JZ, black with numbering + greenyellow	X	7,0	52,0	76,0
703891	Black RAL 9005	5 G 0,5	JZ, black with numbering + greenyellow	X	7,0	52,0	76,0
703892	Grey RAL 7001	5 G 0,5	JZ, black with numbering + greenyellow	X	7,0	52,0	76,0
703896	Yellow RAL 1021	5 G 0,75	JZ, black with numbering + greenyellow	X	7,6	70,0	93,0
703894	Black RAL 9005	5 G 0,75	JZ, black with numbering + greenyellow	X	7,6	70,0	93,0
703895	Grey RAL 7001	5 G 0,75	JZ, black with numbering + greenyellow	X	7,6	70,0	93,0

Dimensions and specifications may be changed without prior notice.



Technical data

- Special TPE-E/PUR adapted to DIN VDE 0245, 0250, 0282
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
up to 0,34 mm² 350 V (operating peak voltage)
above 0,5 mm² U₀/U 300/500 V
- **Test voltage**
up to 0,34 mm² 1,5 kV, 5 minutes
above 0,5 mm² 3,0 kV, 5 minutes
- **Mutual capacitance**
core/core approx. 100 nF/km
core/screen approx. 120 nF/km
- **Inductance approx.**
0,69 mH/km
- **Minimum bending radius**
7,5x cabel ø

Cable structure

- Bare copper, stranded to DIN VDE 0295 and IEC 60228, fine or extra fine wires, cl. 5 or cl. 6, BS 6360 cl. 5 or 6, up to 0,34 mm² cl. 5, above 0,5 mm² cl. 6
- Special core insulation, TPE
- Cores coded up to 0,34 mm² according DIN 47100
above 0,5 mm² black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special separating foil
- Cable structure C-type, cu-screen of helically wound, approx. 85-95% coverage
- Outer sheath, special polyurethane
- Colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- High flexibility at low temperatures
- High abrasion resistance
- Loadable under torsion stress ±360 °/meter
- Low adhesion
- **Resistant to**
Microbes and rotting
Oxygene and ozone
Vibrations
UV-radiation
Oil and fats resistant
- PUR-jacket flame retardant according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Application

These special robotic control and signal cables specially designed for torsion and bending stresses in robots and connecting handling tools. **EMC** = Electromagnetic compatibility. To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

ROBOFLEX 2001

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25459	7 G 0,25	5,8	16,8	48,0	24
25439	12 G 0,25	7,6	28,8	71,0	24
25460	25 G 0,25	10,6	60,0	143,0	24
25461	2 G 0,34	4,0	6,6	28,0	22
25462	3 G 0,34	4,0	9,8	34,0	22
25440	7 G 0,34	5,7	22,8	51,0	22
25449	12 G 0,34	8,3	39,2	69,0	22
25463	12 G 0,5	10,4	57,8	90,0	20
25519	16 G 0,5	11,6	76,8	277,0	20
25464	18 G 0,5	12,7	86,4	121,0	20
25465	25 G 0,5	14,2	120,0	256,0	20
25466	4 G 0,75	6,0	28,8	63,0	18
25450	7 G 0,75	7,9	50,4	96,0	18
25467	12 G 0,75	11,5	84,4	171,0	18
25468	14 G 0,75	12,8	100,8	200,0	18
25469	2 G 1	5,5	19,2	48,0	17
25470	3 G 1	6,0	29,0	60,0	17
25471	4 G 1	6,3	38,4	78,0	17
25472	7 G 1	8,5	67,2	131,0	17
25473	12 G 1	12,5	115,2	216,0	17
25474	18 G 1	15,4	172,8	306,0	17
25475	25 G 1	17,4	240,0	432,0	17
25476	34 G 1	21,3	326,4	569,0	17
25477	41 G 1	23,2	393,6	694,0	17
25520	3 G 1,5	6,9	43,2	94,0	16
25529	4 G 1,5	7,9	57,6	107,0	16
25559	5 G 1,5	8,6	72,0	121,0	18
25509	8 G 1,5	11,1	115,2	292,0	16
25478	12 G 1,5	15,5	172,8	356,0	16
25479	18 G 1,5	19,3	259,2	445,0	16
25480	25 G 1,5	21,8	360,0	636,0	16
25481	3 G 2,5	8,4	72,0	136,0	14
25482	4 G 2,5	9,1	96,0	170,0	14
25483	3 G 4	10,3	116,0	227,0	12
25530	4 G 4	11,2	153,6	261,0	12
25510	4 G 6	14,1	230,4	341,0	10
25484	3 G 10	15,6	288,0	518,0	8
25485	3 G 16	18,2	460,8	722,0	6
25486	3 G 25	22,9	720,0	1180,0	4
25487	3 G 35	26,5	1008,0	1600,0	2

ROBOFLEX 2001-C

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25539	10 G 0,14	7,8	34,2	62,0	26
25488	12 G 0,14	7,8	42,1	95,0	26
25489	18 G 0,14	9,7	54,5	120,0	26
25490	25 G 0,14	10,9	69,0	158,0	26
25491	12 G 0,25	8,3	59,5	126,0	24
25492	18 G 0,25	10,1	80,0	164,0	24
25493	25 G 0,25	11,1	103,0	215,0	24
25494	12 G 0,34	8,8	78,0	160,0	22
25495	18 G 0,34	10,8	101,0	210,0	22
25496	25 G 0,34	12,0	158,0	305,0	22
25497	12 G 0,5	11,2	117,0	175,0	20
25498	18 G 0,5	13,6	160,0	231,0	20
25499	25 G 0,5	14,8	255,0	347,0	20
25500	12 G 0,75	11,8	155,0	220,0	18
25501	18 G 0,75	15,0	210,0	305,0	18
25502	25 G 0,75	16,6	275,0	415,0	18
705462	3 G 1	6,3	76,0	90,0	22
25503	12 G 1	13,0	190,0	265,0	17
25504	18 G 1	16,1	245,0	390,0	17
25505	25 G 1	18,1	345,0	540,0	17
25506	12 G 1,5	16,2	260,0	345,0	16
25507	18 G 1,5	20,3	370,0	485,0	16
25508	25 G 1,5	22,5	498,0	710,0	16

Dimensions and specifications may be changed without prior notice. (RH01)

ROBOFLEX 150,...151,...152,...153 PUR, flame retardant, halogen-free, for torsional stress, meter marking



Technical data

- Special TPE-E/PUR robot cable
- Based on DIN VDE 0245, 0250, 0281, 0282
- **Temperature range**
flexing -40 °C to +80 °C
- **Nominal voltage**
up to 0,34 mm² 350 V
0.5 mm² and greater U₀/U 300/500 V
- **Test voltage**
up to 0,34 mm² 1500 V
0.5 mm² and greater 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- Max. **torsion angle**
±360 °/metre
- **Mutual capacitance**
core/core approx. 100 nF/km
core/screen approx. 120 nF/km
- **Minimum bending radius**
approx. 15x cable ø

Cable structure

- Special bare copper, extra-fine wire acc. to DIN VDE 0295 cl. 6 + IEC 60228 cl. 6
- TPE-E core insulation
- Black cores continuous white numbering according to DIN VDE 0293 + gnye
- Special optimised stranding
- High-grade slide wrapping
- with meter marking, change-over in 2011
- Tinned copper twist screen
- PUR outer sheath
- Sheath colour: grey (RAL 7001) or black
- Part. nos. 77261-77263, 76158, 70561, 77267, 77268, 76165, 76166, 77424**
- Core colours DIN 47100
- Part nos. 71820, 74658, 77264, 75253, 76167**
- Construction as above, but 0,5 (1,5) mm² cores screened with aluminium-coated polyester foil
- Part no. 72214**
- Construction as above, but 0,5 mm² pair screened with tinned twist screen
- Part nos. 77265, 77266, 77269, 77270**
- Construction as above, but 1,0 mm² pair only, screened with tinned twist screen
- Part no. 77469**
- Construction as above, but
- 6 cores, 1,5 mm², screened with tinned twist screen
- 4 pairs, 0,25 mm², screened with tinned twist screen
- Sheath colour: orange (RAL 2003)
- with meter marking, change-over in 2011

Properties

- PUR outer sheath, low adhesion, abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- PUR sheath, self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The smooth, high-grade core insulation, together with special stranding configuration and slide wrapping ensure long service life under combined bending and torsional stresses

Application

These cables are specially designed for combined torsional and bending stresses. They are employed both for power supply and for the transmission of control and monitoring signals. Roboflex cables are used in assembly and welding robots, in handling and automation centres, in transport and conveyor equipment, and on turntables and swivel tables. In other words, anywhere where there is no defined cable routing with only alternating bending cycles on a single plane such as in drag chains.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Continuation ▶

ROBOFLEX 150,...151,...152,...153 PUR, flame retardant, halogen-free, for torsional stress, meter marking



ROBOFLEX 150 (screened), Sheath colour grey

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
77261	(12 x 0,25)	8,3	59,5	126,0	24
77266	(23 x 1 + 2 x 1,0)	17,4	262,0	473,0	-
71789	(4 x 1,5)	8,9	81,7	150,0	16
75251	(4 x 2,5)	11,2	134,0	280,0	14
75252	(4 x 4)	13,1	200,0	400,0	12
76157	(4 x 6)	15,4	286,0	550,0	10
77262	(3 x 2 x 0,14)	5,8	17,0	43,0	26
77263	(4 x 2 x 0,14)	6,9	37,0	75,0	26
76158	(5 x 2 x 0,34)	9,2	65,0	116,0	22
70561	(8 x 2 x 0,34)	10,2	90,0	150,0	22
71820	(4 x 1,5 + (2 x 0,62))	10,5	106,8	195,0	16
74658	(4 x 1,5 + (2 x 0,5))	10,7	95,0	180,0	16
77264	(4 x 1,5 + (2 x 1,0))	11,1	128,0	220,0	16
75253	(4 x 2,5 + (2 x 0,5))	12,5	180,0	270,0	14
72214	(4 x 4 + (2 x 0,5))	13,5	260,0	340,0	12
76159	(4 x 4 + (2 x 1,0))	14,0	237,0	350,0	12
76160	(4 x 6 + (2 x 1,0))	16,0	341,0	500,0	10
77265	(16 x 1 + (2 x 1,0))	16,7	197,0	380,0	17

ROBOFLEX 151, Sheath colour grey

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
70116	12 G 0,5	8,3	57,6	131,0	20
76168	4 G 1,5	8,5	57,6	106,0	16
76169	4 G 2,5	10,8	96,0	196,0	14
76170	4 G 4	12,7	153,6	283,0	12
76171	4 G 6	15,0	230,4	432,0	10

ROBOFLEX 152 (screened), Sheath colour black

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76161	(4 x 1,5)	8,9	81,7	150,0	16
76162	(4 x 2,5)	11,2	164,0	280,0	14
76163	(4 x 4)	13,1	222,0	400,0	12
76164	(4 x 6)	15,4	305,0	550,0	10
77267	(3 x 2 x 0,14)	5,8	23,0	43,0	26
77268	(4 x 2 x 0,14)	6,9	26,6	55,0	26
77424	(3 x 2 x 0,25)	7,3	32,0	65,0	24
76165	(5 x 2 x 0,34)	9,2	65,0	116,0	22
76166	(8 x 2 x 0,34)	10,2	90,0	150,0	22
75415	(4 x 1,5 + (2 x 0,5))	10,7	95,0	170,0	16
75416	(4 x 2,5 + (2 x 0,5))	11,8	115,0	220,0	14
75940	(4 x 2,5 + (2 x 1,0))	12,3	147,0	250,0	14
75167	(4 x 4 + (2 x 0,5))	13,5	260,0	340,0	12
75417	(4 x 4 + (2 x 1,0))	14,0	237,0	350,0	12
75418	(4 x 6 + (2 x 1,0))	16,0	316,0	500,0	10
77269	(16 x 1 + (2 x 1,0))	16,7	176,0	380,0	17
77270	(23 x 1 + (2 x 1,0))	17,4	262,0	473,0	17
77469	(5 x 2,5 + (6 x 1,5) + 4 x (2 x 0,25))	16,7	320,0	460,0	14

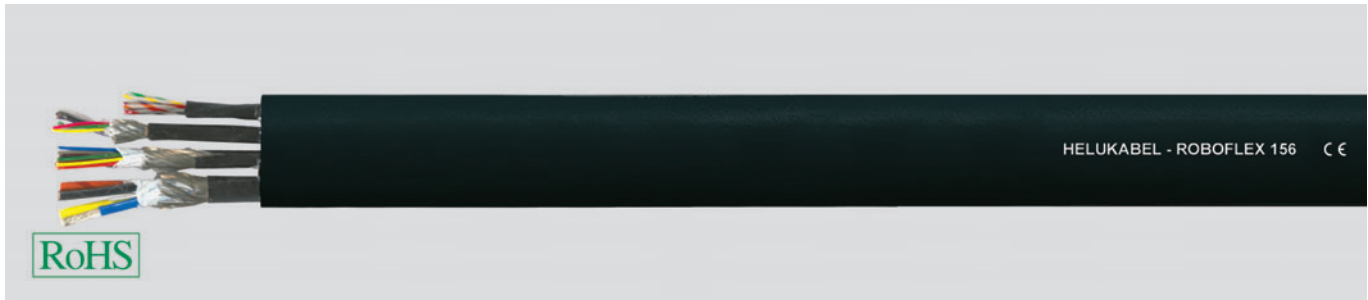
ROBOFLEX 153, Sheath colour black

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76172	4 G 1,5	8,5	57,6	106,0	16
76174	4 G 4	12,7	153,6	283,0	12
76175	4 G 6	15,0	230,4	432,0	10

Dimensions and specifications may be changed without prior notice.

H

ROBOFLEX 156-flat PUR, flame retardant, halogen-free, for torsional stress



Technical data

- Special TPE-E/PUR robot cable adapted to DIN VDE 0245, 0250, 0281, 0282
- **Temperature range**
flexing -40 °C to +80 °C
- **Nominal voltage**
up to 0,34 mm² 350 V
0,5 mm² and greater 300/500 V
- **Test voltage**
up to 0,5 mm² 1500 V
0,5 mm² and greater 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- Max. **torsion angle**
±360 °/metre
- **Mutual capacitance** (signal cores)
core/core approx. 100 nF/km
core/screen approx. 120 nF/km
- **Minimum bending radius**
approx. 15x cable ø

Cable structure

- Tinned copper conductor, 19x0,32/1,5 mm², 19x0,102/0,15 mm²
- 4 stranded cores 1,5 mm²
Screen of tinned copper braid
TPE-E sheath, black
- 12 cores 0,15 mm² stranded together
Screen of tinned copper braid
TPE-E sheath, black
- 6 cores 0,15 mm² stranded in paired
Screen of tinned copper braid
TPE-E sheath, black
- 10 stranded cores 0,15 mm²
Screen of tinned copper braid
Black TPE-E sheath
- Over the 4 elements in parallel PUR sheath
- Outer sheath colour black

Properties

- The smooth, very high quality core insulation, together with the special threading lay and the sliding wrapper ensure a long service life under combined bending and torsional stress
- PUR sheath, matt, low adhesion, flame retardant

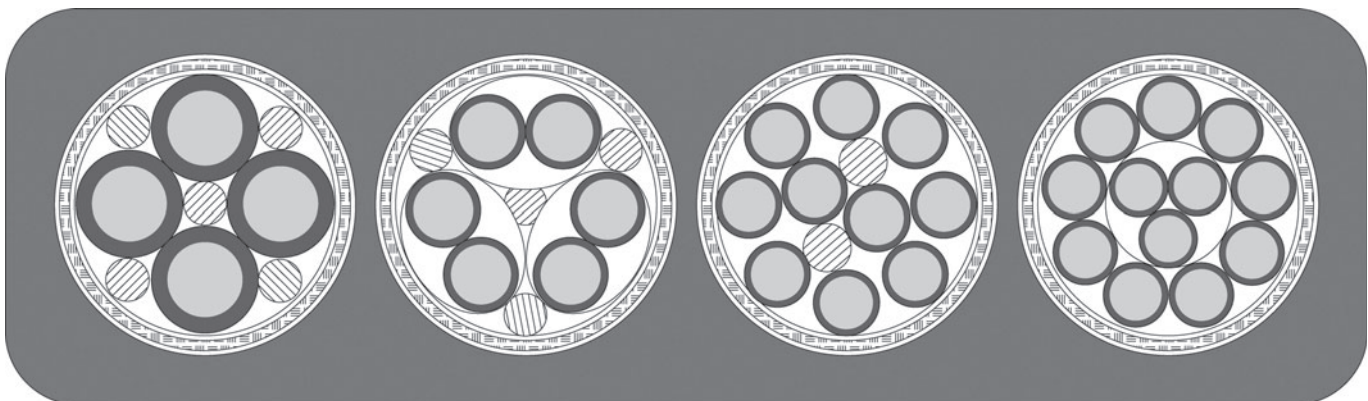
Application

These cables are specially designed for combined torsional and bending stresses. They are employed both for power supply and for the transmission of control and monitoring signals. Roboflex cables are used in assembly and welding robots, in handling and automation centres, in transport and conveyor equipment, and on turntables and swivel tables. In other words, anywhere where there is no defined cable routing with only alternating bending cycles in one plane, such as in energy supply chains, for example.

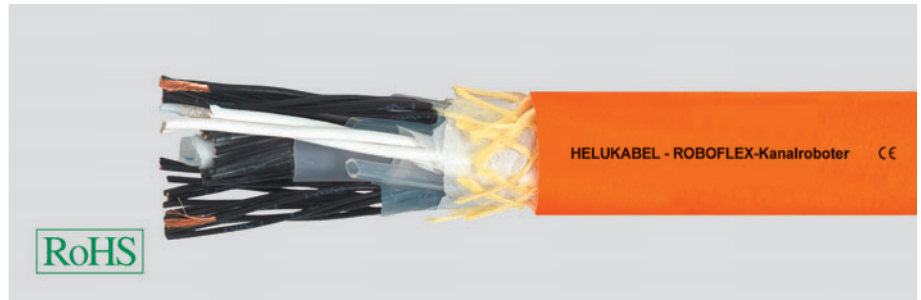
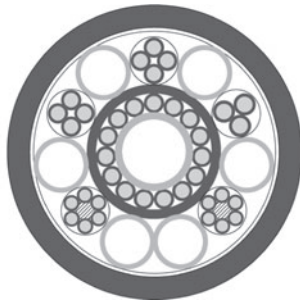
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
78499	(4 x 2 + 12 x 0,15 + 3 x 2 x 0,15 + 10 x 0,15)	7,2	128,6	200,0	16

Dimensions and specifications may be changed without prior notice. (RH01)



ROBOFLEX sewer robot trailing



Technical data

- **Temperature range**
flexing -40 °C to +80 °C
- **Nominal voltage**
300/500 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MOhm x km

Cable structure

Part No. 74540

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6 and/or IEC 60228 cl. 6
- Core insulation TPE-E, black with numbering
- 3 COAX 187/U stranded
- Cores and COAX elements and PVC sleeves, special stranded
- PUR outer sheath with embedded high-tensile and high-torsion resistant Kevlar braid
- Sheath colour orange (RAL 2003)

Part No. 70581

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6 or IEC 60228 cl. 6
- PVC core insulation, colour code DIN 47100
- Cores stranded with COAX
- Overall screening with tinned copper braid, coverage approx. 85%
- Special PVC sheath
- Sheath colour grey (RAL 7001)

Part No. 76397 (trailing cable for video cameras)

- Tinned copper conductor, fine wire stranded
- Core insulation of cell polypropylene
- Screen of aluminium-coated polyester foil and tinned copper braiding
- PUR outer jacket
- Sheath colour blue (RAL 5015)

Properties

- To enhance reliability and tensile strength, a high-tensile and high-torsion resistant Kevlar braid is incorporated into the extremely robust PUR sheath

Part No. 74540+76397

- PUR sheath: low adhesion, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack

Part No. 70581

- Special PVC sheath, largely oil resistant, self-extinguishing and flame retardant, test method B acc. to DIN VDE 0472 part 804 and IEC 60332-1, chemical resistant (see table Technical Information)

Application

These cables are designed for use with autonomous sewer robots.

These robots are used to inspect municipal sewer networks and if necessary to locate leaks or blockages. Some of these robots are even able to seal such leaks after detecting them. Besides cores for power supply, they also contain data cables, hoses for various drives, and coaxial cables for the video camera mounted on the robot.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part No.	No cores x cross-sec mm ²	Outer ø ca. mm	Cop. weight kg/km	Weight ca. kg/km
74540	22x0,5+6x0,75+3x1+4x1,5+3xCOAX +PVC sleeves	26,8	206,0	450
700766	4x0,14+12x1+3x2,5+1xCOAX +4xPA sleeves	33,5	394,2	1080

Part No.	No cores x cross-sec mm ²	Outer ø ca. mm	Cop. weight kg/km	Weight ca. kg/km
70581	12 x 0,25+1 x COAX	8,0	73,0	108
76397	1 x 1,22	6,5	24,0	50

Dimensions and specifications may be changed without prior notice. (RH01)



Photo: HELUKABEL®

Water resistant Cables

Water resistant Cables

For constant use in water for general use, waste water and drinking water*, up to a depth of immersion of 500 m to connect electrical operating materials such as submersible motor pumps, for medium mechanical stresses.

*on request



Contents

Description	Page
Tauchflex-R, 750V, blue, submersible-pump cable	14
Tauchflex-FL, 750 V, blue, submersible pump cable	15
H07 RN8-F, waterproof rubber-sheathed cable, harmonized type	16

Tauchflex-R 750V, blue, submersible-pump cable



Technical data

- Special cables corresponding to DIN VDE 0250 and 0282 part 810
- **Temperature range** -40 °C to +80 °C (max. temperature for the outer surface)
- Permissible **operating temperature** at conductor +90C
- **Nominal voltage** U_0/U 450/750 V
- **Operating voltage** for alternating and three-phase currents U_0/U 413/825 V, for direct currents U_0/U 619/1238 V
- **Current rating** to DIN 57100 part 523/ VDE 0100 part 523
- **Test voltage** 15 min 2,5 kV
- Max. permitted **tensile stress** per mm² conductor 15 N

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Foil as separator
- EPR core insulation, compound type 3GI3 to DIN VDE 0207 part 20
- Colour code according to DIN VDE 0293
- Cores stranded in layers with optimal lay-length
- EPR outer sheath, blue, compound type 5GM3 adapted to DIN VDE 0207 part 21
- **Minimum bending radius flexing** up to 8 mm cond. \emptyset min. 3x cond. \emptyset above 8 mm to 12 mm cond. \emptyset min. 4x cond. \emptyset above 12 mm cond. \emptyset min. 5x cond. \emptyset
- **fixed installation** up to 12 mm cond. \emptyset min. 3x cond. \emptyset above 12 mm cond. \emptyset min. 4x cond. \emptyset
- **Temperature limit in water:** max. +40 °C, max. +60 °C with limited duration of life
- **in air:** flexible -50 °C to +80 °C stationary -30 °C to +80 °C

Properties

- Good insulation properties when submerged in water
- Minimal weight gain under water
- The mechanical stability of the insulation materials remains constant even when submerged
- **Not suitable for drinking water.**
- Cables for use in drinking water with BAM-certificate on request (BAM Bundesanstalt für Materialprüfung/Federal Institute for Materials Testing).
- Installation adaptability for machinery material of protection class II
- As rotor-connection cable for motors up to 1000 V with protected fixed installation in tubes.

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **Please note:** halogen-free types available on request.

Application

Tauchflex-R is a special cable for use as a connecting and control cable for submersible motor pumps, underwater floodlights, floating switch and has proven its worth for constant use in waste water or water for general use up to the depth of immersion of 500 m (50 bar) and under temperatures of up to 70 °C.

Tauchflex-R can also be installed for use in dry, damp and humid areas as well as in the open air.

Not suitable for the installation in hazardous areas.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37100	1 x 1,5	7,2	14,0	54,0	16	37127	3 x 10	19,0	288,0	750,0	8
37101	1 x 2,5	8,0	24,0	76,0	14	37128	3 x 16	23,5	461,0	1110,0	6
37102	1 x 4	7,2	38,0	105,0	12	37129	3 x 25	28,5	720,0	1450,0	4
37103	1 x 6	7,9	58,0	135,0	10	37130	3 x 35	32,0	1008,0	2150,0	2
37104	1 x 10	9,5	96,0	200,0	8	37131	3 x 50	37,0	1440,0	2800,0	1
37105	1 x 16	11,5	154,0	290,0	6	37132	3 x 70	42,0	2016,0	3750,0	2/0
37106	1 x 25	13,5	240,0	400,0	4	37133	3 x 95	43,3	2736,0	4590,0	3/0
37107	1 x 35	15,0	336,0	560,0	2	37134	3 x 120	59,0	3456,0	5400,0	4/0
37108	1 x 50	17,5	480,0	730,0	1	37135	4 G 1,5	13,4	58,0	190,0	16
37109	1 x 70	20,0	672,0	1000,0	2/0	37136	4 G 2,5	15,4	96,0	270,0	14
37110	1 x 95	22,5	912,0	1250,0	3/0	37137	4 G 4	14,0	154,0	380,0	12
37111	1 x 120	24,0	1152,0	1650,0	4/0	37138	4 G 6	15,5	230,0	520,0	10
37112	1 x 150	25,2	1440,0	2000,0	300 kcmil	37139	4 G 10	21,0	384,0	955,0	8
37113	1 x 185	27,6	1776,0	2460,0	350 kcmil	37140	4 G 16	25,5	614,0	1400,0	6
37114	1 x 240	30,6	2304,0	3050,0	500 kcmil	37141	4 G 25	31,0	960,0	1950,0	4
37115	1 x 300	33,5	2880,0	3700,0	600 kcmil	37142	4 G 35	35,0	1344,0	2650,0	2
37116	2 x 1,5	8,5	29,0	130,0	16	37143	4 G 50	41,0	1920,0	3600,0	1
37117	2 x 2,5	10,2	48,0	190,0	14	37144	4 G 70	46,5	2688,0	4890,0	2/0
37118	2 x 4	11,8	77,0	260,0	12	37145	4 G 95	51,6	3648,0	6180,0	3/0
37119	2 x 6	13,1	115,0	350,0	10	37146	4 G 120	56,1	4608,0	7200,0	4/0
37120	2 x 10	17,7	192,0	550,0	8	37147	5 G 1,5	11,2	72,0	225,0	16
37121	2 x 16	20,2	307,0	900,0	6	37148	5 G 2,5	13,3	120,0	335,0	14
37122	2 x 25	24,3	480,0	1300,0	4	37149	5 G 4	15,6	192,0	470,0	12
37123	3 x 1,5	9,5	43,0	150,0	16	37150	5 G 6	17,5	288,0	645,0	10
37124	3 x 2,5	11,0	72,0	205,0	14	37151	5 G 10	22,9	480,0	1150,0	8
37125	3 x 4	13,0	115,0	330,0	12	37152	5 G 16	26,4	768,0	1690,0	6
37126	3 x 6	14,5	173,0	470,0	10	37153	5 G 25	32,0	1200,0	2400,0	4

Dimensions and specifications may be changed without prior notice. (RI01)

Tauchflex-FL 750 V, blue, submersible pump cable



Technical data

- Special cables corresponding to DIN VDE 0250 and 0282 part 810
- **Temperature range**
-40 °C to +80 °C (max. temperature for the outer surface)
- Permissible **operating temperature** at conductor +90C
- **Nominal voltage** U₀/U 450/750 V
- **Operating voltage** for alternating and three-phase currents U₀/U 413/825 V, for direct currents U₀/U 619/1238 V
- **Current rating** to DIN 57100 part 523/ VDE 0100 part 523
- **Test voltage** 15 min 2,5 kV
- Max. permitted **tensile stress** per mm² conductor 15 N
- **Minimum bending radius flexing**
up to 8 mm cond. ø min. 3x cond. ø
above 8 mm to 12 mm cond. ø min. 4x cond. ø
above 12 mm cond. ø min. 5x cond. ø
- **fixed installation**
up to 12 mm cond. ø min. 3x cond. ø
above 12 mm cond. ø min. 4x cond. ø
- **Temperature limit**
in water: max. +40 °C, max. +60 °C with limited duration of life
in air:
flexible -50 °C to +80 °C
stationary -30 °C to +80 °C

Cable structure

- Bare copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Foil as separator
- EPR core insulation, compound type 3GI3 to DIN VDE 0207 part 20
- Colour code according to DIN VDE 0293
- Cores laying parallel
- EPR outer sheath, blue, compound type 5GM3 adapted to DIN VDE 0207 part 21

Properties

- Good insulation properties when submerged in water
- Minimal weight gain under water
- The mechanical stability of the insulation materials remains constant even when submerged
- **Not suitable for drinking water.**
- Cables for use in drinking water with BAM-certificate on request (BAM Bundesanstalt für Materialprüfung/Federal Institute for Materials Testing).
- Installation adaptability for machinery material of protection class II
- As rotor-connection cable for motors up to 1000 V with protected fixed installation in tubes.

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **Please note:** halogen-free types available on request.

Application

Tauchflex-FL is a special cable for use as a connecting and control cable for submersible motor pumps, underwater floodlights, floating switch and has proven its worth for constant use in waste water or water for general use up to the depth of immersion of 500 m (50 bar) and under temperatures of up to 70 °C.

Tauchflex-FL can also be installed for use in dry, damp and humid areas as well as in the open air.

Not suitable for the installation in hazardous areas.

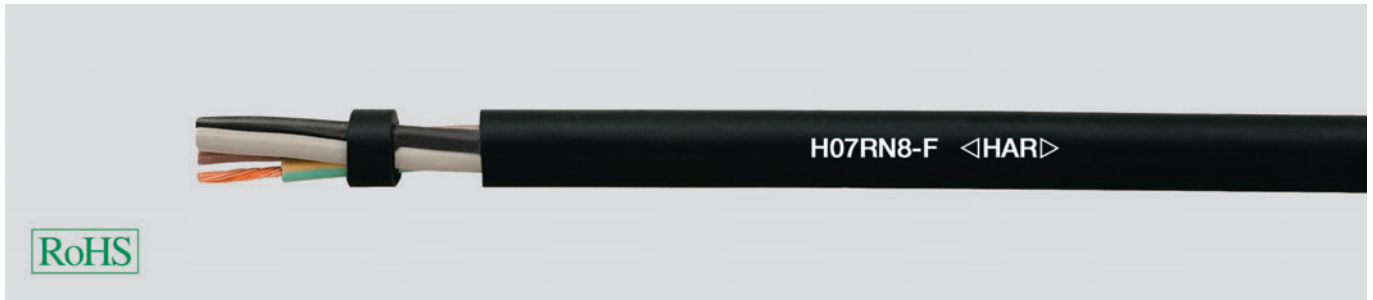
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37155	3 x 1,5	7,0 - 13,0	43,0	125,0	16
37156	3 x 2,5	8,0 - 16,0	72,0	185,0	14
37157	3 x 4	9,0 - 19,0	115,0	290,0	12
37158	3 x 6	10,0 - 23,0	173,0	400,0	10
37159	3 x 10	12,0 - 28,0	288,0	615,0	8
37160	3 x 16	14,0 - 31,0	461,0	890,0	6
37161	3 x 25	17,0 - 37,0	720,0	1155,0	4
37162	3 x 35	17,0 - 38,0	1008,0	1540,0	2
37163	3 x 50	20,0 - 45,0	1440,0	2190,0	1
37164	3 x 70	22,0 - 52,0	2016,0	2890,0	2/0
37165	3 x 95	25,0 - 58,0	2736,0	3800,0	3/0
37166	3 x 120	27,0 - 64,0	3456,0	4700,0	4/0

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37167	4 G 1,5	7,0 - 17,0	58,0	160,0	16
37168	4 G 2,5	8,0 - 20,0	96,0	245,0	14
37169	4 G 4	9,0 - 24,0	154,0	330,0	12
37170	4 G 6	10,0 - 26,0	230,0	450,0	10
37171	4 G 10	11,0 - 31,0	384,0	850,0	8
37172	4 G 16	13,0 - 36,0	614,0	1200,0	6
37173	4 G 25	15,0 - 45,0	960,0	1590,0	4
37174	4 G 35	17,0 - 48,0	1344,0	2085,0	2
37175	4 G 50	20,0 - 59,0	1920,0	2890,0	1

Dimensions and specifications may be changed without prior notice. (RI01)

H07 RN8-F waterproof rubber-sheathed cable, harmonized type



Technical data

- Water resistant heavy hose pipe to DIN VDE 0282 part 16, HD 22.16 S1
- **Temperature range**
flexing -25 °C
fixed installation -40 °C
in water max. +40 °C
- Permissible **operating temperature**
at conductor +60 °C
- **Nominal voltage** U₀/U 450/750 V
in case of protected and fixed installation
U₀/U 600/1000 V
- **Test voltage** 2500 V
- **Permanent tensile load**
max. 15 N/mm²
- **Minimum bending radius**
flexing 6 x cable ø
fixed installation 4x cable ø

Cable structure

- Copper conductor fine wire stranded, bare to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and HD 383
- Rubber core insulation EI4 to DIN VDE 0282 part 1
- Core identification to DIN VDE 0293-308 and HD 186
- Core colours
up to 5 cores one-coloured
6 and more cores, black with numbering
3 and above, with green-yellow earth core
2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Special polychloroprene rubber outer jacket
- Outer jacket black

Properties

- **Resistant to**
Ozone
Weather
- **Oil resistant**
Test according to EN 60811-2-1
- **Test of behaviour compared to environmental influences**
Test according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The core identification of a single core jacketed, of an insulated wire is black. For application as a protective core, the ends are to be identified with green-yellow and the middle conductor with light blue

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Water resistant heavy hose pipe for connection of submersible pumps and similar applications, at a recommended water depth to 10 m and a maximum water temperature of +40 °C. Can be used in dry, damp and wet areas as well as in open air.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37287	1 x 1,5	5,7 - 7,1	14,4	58,0	16
37288	1 x 2,5	6,3 - 7,9	24,0	71,0	14
37289	1 x 4	7,2 - 9,0	38,0	100,0	12
37290	1 x 6	7,9 - 9,8	58,0	130,0	10
37291	1 x 10	9,5 - 11,9	96,0	230,0	8
37292	1 x 16	10,8 - 13,4	154,0	290,0	6
37293	1 x 25	12,7 - 15,8	240,0	420,0	4
37294	1 x 35	14,3 - 17,9	336,0	530,0	2
37295	1 x 50	16,5 - 20,6	480,0	750,0	1
37296	1 x 70	18,6 - 23,3	672,0	960,0	2/0
37297	1 x 95	20,8 - 26,0	912,0	1250,0	3/0
37298	1 x 120	22,8 - 28,6	1152,0	1560,0	4/0
37299	1 x 150	25,2 - 31,4	1440,0	1900,0	300 kcmil
37300	1 x 185	27,6 - 34,4	1776,0	2300,0	350 kcmil
37301	1 x 240	30,6 - 38,3	2304,0	2950,0	500 kcmil
37302	1 x 300	33,5 - 41,9	2880,0	3600,0	600 kcmil
37303	1 x 400	37,4 - 46,8	3840,0	4600,0	750 kcmil
37304	1 x 500	41,3 - 52,0	4800,0	6000,0	1000 kcmil
37305	2 x 1	7,7 - 10,0	19,0	98,0	17
37306	2 x 1,5	8,5 - 11,0	29,0	135,0	16
37307	2 x 2,5	10,2 - 13,1	48,0	193,0	14
37308	2 x 4	11,8 - 15,1	77,0	280,0	12
37309	2 x 6	13,1 - 16,8	115,0	330,0	10
37310	2 x 10	17,7 - 22,6	192,0	586,0	8
37311	2 x 16	20,2 - 25,7	307,0	810,0	6
37312	2 x 25	24,3 - 30,7	480,0	1160,0	4
37313	3 G 1	8,3 - 10,7	29,0	130,0	17
37314	3 G 1,5	9,2 - 11,9	43,0	165,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37315	3 G 2,5	10,9 - 14,0	72,0	235,0	14
37316	3 G 4	12,7 - 16,2	115,0	320,0	12
37317	3 G 6	14,1 - 18,0	173,0	420,0	10
37318	3 G 10	19,1 - 24,2	288,0	810,0	8
37319	3 G 16	21,8 - 27,6	461,0	1050,0	6
37320	3 G 25	26,1 - 33,0	720,0	1250,0	4
37321	3 G 35	29,3 - 37,1	1008,0	1900,0	2
37322	3 G 50	34,1 - 42,9	1440,0	2600,0	1
37323	3 G 70	38,4 - 48,3	2016,0	3400,0	2/0
37324	3 G 95	43,3 - 54,0	2736,0	4450,0	3/0
37325	3 G 120	47,4 - 60,0	3456,0	5180,0	4/0
37326	3 G 150	52,0 - 66,0	4320,0	6500,0	300 kcmil
37327	3 G 185	57,0 - 72,0	5328,0	7860,0	350 kcmil
37328	3 G 240	65,0 - 82,0	6192,0	10224,0	500 kcmil
37329	3 G 300	72,0 - 90,0	8640,0	12620,0	600 kcmil
37330	4 G 1	9,2 - 11,9	38,0	150,0	17
37331	4 G 1,5	10,2 - 13,1	58,0	200,0	16
37332	4 G 2,5	12,1 - 15,5	96,0	290,0	14

Continuation ▶

H07 RN8-F waterproof rubber-sheathed cable, harmonized type



Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37333	4 G 4	14,0 - 17,9	154,0	395,0	12
37334	4 G 6	15,7 - 20,0	230,0	540,0	10
37335	4 G 10	20,9 - 26,5	384,0	950,0	8
37336	4 G 16	23,8 - 30,1	614,0	1260,0	6
37337	4 G 25	28,9 - 36,6	960,0	1860,0	4
37338	4 G 35	32,5 - 41,1	1344,0	2380,0	2
37339	4 G 50	37,7 - 47,5	1920,0	3190,0	1
37340	4 G 70	42,7 - 54,0	2688,0	4260,0	2/0
37341	4 G 95	48,4 - 61,0	3648,0	5600,0	3/0
37342	4 G 120	53,0 - 66,0	4608,0	6830,0	4/0
37343	4 G 150	58,0 - 73,0	5760,0	8320,0	300 kcmil
37344	4 G 185	64,0 - 80,0	7104,0	9800,0	350 kcmil
37345	4 G 240	72,0 - 91,0	9216,0	12100,0	500 kcmil
37346	4 G 300	80,0 - 101,0	11520,0	15200,0	600 kcmil
37354	5 G 1	10,2 - 13,1	48,0	175,0	4
37347	5 G 1,5	11,2 - 14,4	72,0	240,0	16
37348	5 G 2,5	13,3 - 17,0	120,0	345,0	14
37349	5 G 4	15,6 - 19,9	192,0	485,0	12

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
37350	5 G 6	17,5 - 22,2	288,0	650,0	10
37351	5 G 10	22,9 - 29,1	480,0	1200,0	8
37352	5 G 16	26,4 - 33,3	768,0	1550,0	6
37353	5 G 25	32,0 - 40,4	1200,0	2250,0	4
37355	6 G 1,5	13,4 - 17,2	87,0	171,0	4
37356	6 G 2,5	15,7 - 20,0	144,0	279,0	4
37357	12 G 1,5	17,6 - 22,4	173,0	340,0	4
37358	12 G 2,5	20,6 - 26,2	288,0	571,0	4

Dimensions and specifications may be changed without prior notice. (RI01)

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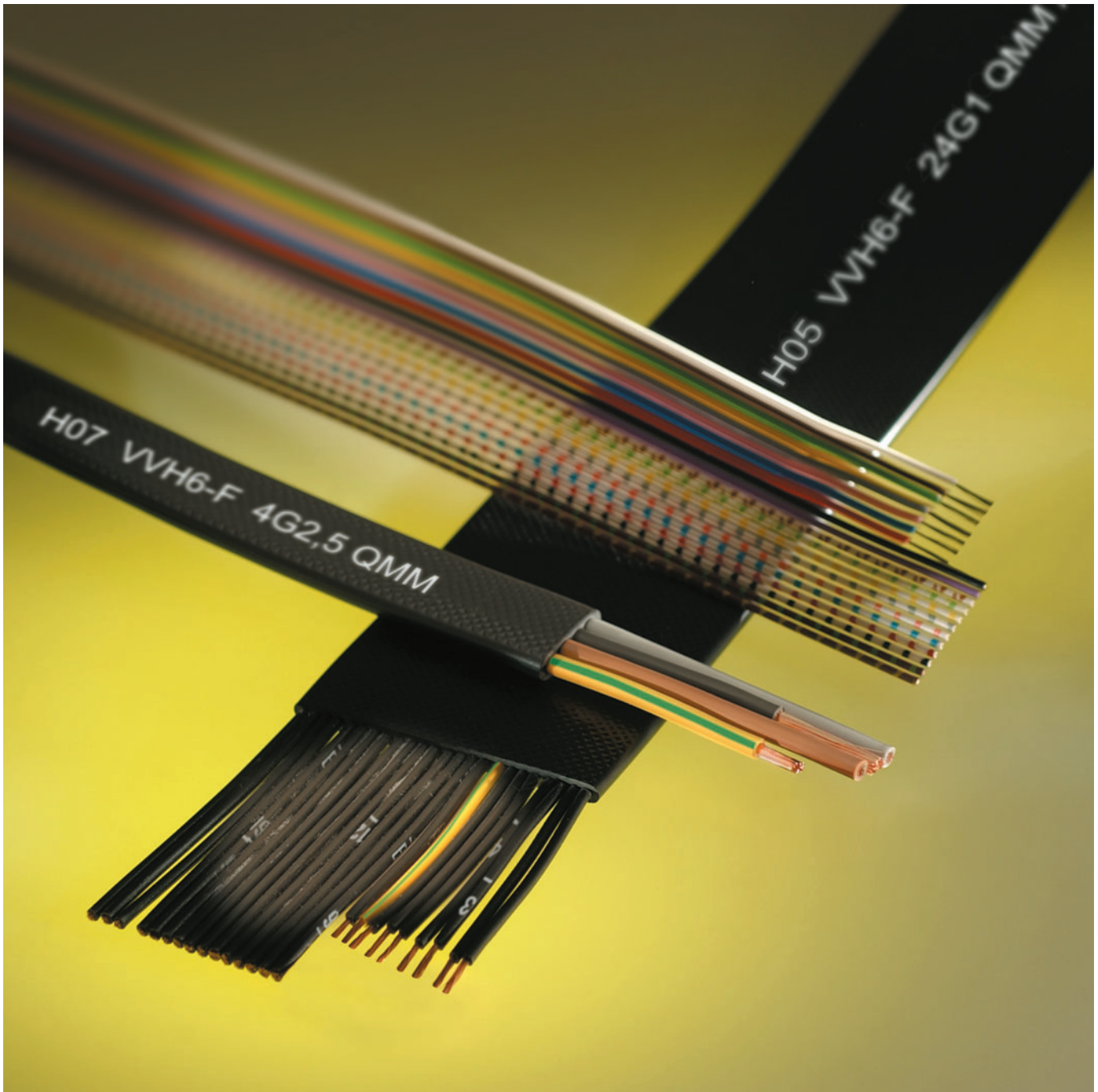


Photo: HELUKABEL®

Flat and Ribbon Cables

Flat and Ribbon Cables

Flat cables in PVC and neoprene design are used as trailing cables for cranes, open field conveyors and shelve service devices.

Flat cables offer the following advantages:

- Extremely small bending radius
- High flexibility
- Minimum wastage of space
- Packeting possibilities

An expert and proper installation is important to ensure perfect functioning. Please follow the corresponding fitting instructions.

Flat cables according to UL-standard are available on request.

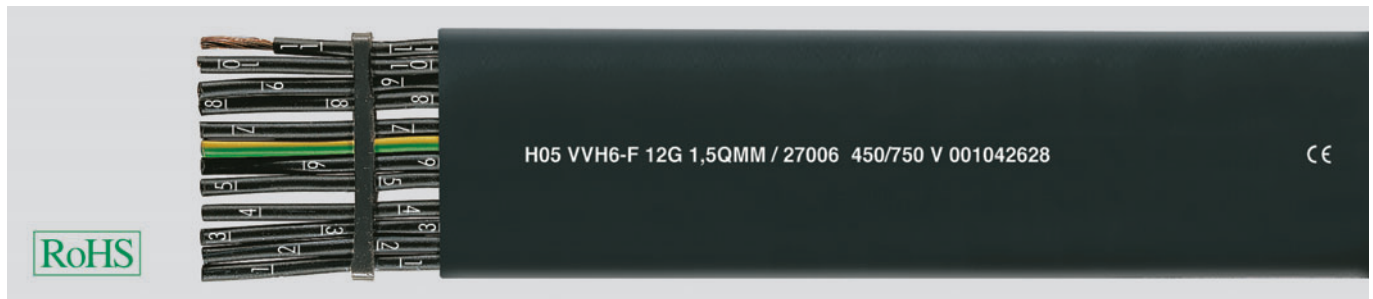
Ribbon cables are ideal for use because of the excellent flexibility as connecting cable in electronics and in control engineering.

J

Contents

Description	Page
PVC-flat (H05 VVH6-F/H07 VVH6-F), 300/500V and 450/750V	J 4
NEO-Flat, (NIGFLGÖU)	J 5
PVC-flat-CY, screened, EMC-preferred type	J 6
NEO-Flat-C, (MCHÖU) screened, EMC-preferred type	J 7
Ribbon Cables, Type L, Type L AWG 28, Type D	J 8
TUBEFLEX-Y, roundshaped flat ribbon cable for IDC-technique, pitch 1,27 mm	J 9
TUBEFLEX-(St)-CY, roundshaped flat ribbon cable, screened, for IDC-technique, pitch 1,27mm, EMC-preferred type	J 10

PVC-flat (H05 VVH6-F/H07 VVH6-F) 300/500V and 450/750V



Technical data

- Special PVC-flat cable, H05 VVH6-F to EN 50214 H07 VVH6-F to HD 359 S2 (25 mm² and above in adapted)
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
H05 VVH6-F = up to 1 mm²
U₀/U 300/500V
H07 VVH6-F = 1,5 mm² U₀/U 450/750 V
- **Test voltage**
H05 VVH6-F = up to 1 mm² 2000 V
H07 VVH6-F = 1,5 mm² 2500 V
- **Minimum bending radius**
10x cable thickness
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2 to DIN VDE 0281 part 1
- Cores laying parallel
- Core identification up to 5 cores to colour code DIN VDE 0293
7 cores and above with number printing
- Green-yellow earth core
- Special PVC outer jacket TM2 to DIN VDE 0281 part 1
- Colour black (RAL 9005)

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- Extremely small bending radius
- High flexibility
- Minimum waste of space
- Packeting possibility
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Art.No. 27012 (6x4).
- G = with green-yellow earth core

Application

PVC type of flat cables are used mainly as trailing cable for crane installations, floor conveyer systems and shelf control units.

Installation notes: See NEO flat at page J5.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	Outer dimension approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
26980	4 G 0,75	4,3 x 12,6	28,8	90,0	18
26981	5 G 0,75	4,3 x 16,1	36,0	115,0	18
26982	6 G 0,75	4,3 x 19,4	43,2	141,0	18
26983	9 G 0,75	4,3 x 26,4	64,8	198,0	18
26984	10 G 0,75	4,3 x 30,1	72,0	224,0	18
26985	12 G 0,75	4,3 x 33,8	84,4	258,0	18
26986	16 G 0,75	4,3 x 44,4	115,2	340,0	18
26987	18 G 0,75	4,3 x 49,2	129,6	380,0	18
26988	20 G 0,75	4,3 x 55,0	144,0	424,0	18
26989	24 G 0,75	4,3 x 65,6	172,8	509,0	18
26990	3 G 1	4,5 x 10,8	28,8	80,0	17
26991	4 G 1	4,5 x 13,4	38,4	104,0	17
26992	5 G 1	4,5 x 16,0	48,0	134,0	17
26993	6 G 1	4,5 x 20,6	57,6	161,0	17
26994	9 G 1	4,5 x 28,4	86,4	230,0	17
26995	10 G 1	4,5 x 30,0	96,0	256,0	17
26996	12 G 1	4,5 x 36,2	115,2	298,0	17
26997	16 G 1	4,5 x 47,6	153,6	395,0	17
26998	18 G 1	4,5 x 52,8	172,8	441,0	17
26999	20 G 1	4,5 x 59,0	192,0	495,0	17
27000	24 G 1	4,5 x 70,4	230,4	590,0	17
27001	4 G 1,5	4,5 x 13,7	58,0	133,0	16
27002	5 G 1,5	4,5 x 17,9	72,0	169,0	16
27003	7 G 1,5	4,5 x 23,5	101,0	235,0	16
27004	8 G 1,5	4,5 x 26,8	115,0	265,0	16
27005	10 G 1,5	4,5 x 33,5	144,0	332,0	16
27006	12 G 1,5	4,5 x 38,9	173,0	421,0	16
27028	16 G 1,5	4,5 x 51,5	230,4	555,0	16
27030	24 G 1,5	4,5 x 83,0	346,0	820,0	16
27007	4 G 2,5	5,5 x 17,0	96,0	205,0	14
27008	5 G 2,5	5,5 x 21,5	120,0	256,0	14

Part no.	No.cores x cross-sec. mm ²	Outer dimension approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27009	7 G 2,5	5,5 x 30,3	168,0	344,0	14
27010	8 G 2,5	5,5 x 31,9	192,0	389,0	14
27011	12 G 2,5	5,8 x 47,1	288,0	580,0	14
27029	16 G 2,5	5,8 x 55,1	384,0	674,0	14
27012	24 G 2,5	15,0 x 63,0	604,0	950,0	14
27027	24 G 2,5	5,8 x 120,0	604,0	950,0	14
27013	4 G 4	7,0 x 21,8	154,0	344,0	12
27014	5 G 4	7,0 x 27,4	192,0	428,0	12
27015	7 G 4	7,9 x 36,6	269,0	590,0	12
27016	4 G 6	8,2 x 24,8	230,0	424,0	10
27017	5 G 6	8,2 x 31,8	288,0	530,0	10
27018	7 G 6	8,2 x 42,6	403,0	760,0	10
27019	4 G 10	10,0 x 29,6	384,0	710,0	8
27020	4 G 16	11,2 x 34,4	614,0	1014,0	6
27025	5 G 16	13,0 x 46,6	768,0	1370,0	6
27021	4 G 25	13,7 x 42,6	960,0	1365,0	4
27026	5 G 25	15,5 x 55,5	1200,0	2000,0	4
27022	4 G 35	15,4 x 47,6	1344,0	2100,0	2
27023	4 G 50	18,2 x 57,0	1920,0	2940,0	1
27024	4 G 70	20,0 x 64,2	2688,0	4090,0	2/0

Dimensions and specifications may be changed without prior notice. (RJ01)

NEO-Flat (N)GFLGÖU



Technical data

- Special Neoprene-flat cable adapted to DIN VDE 0250 part 809
- **Temperature range**
flexing -25 °C to +60 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U0/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
10x cable thickness
- **Radiation resistance**
up to 50x10⁶ cJ/kg (up to 50 Mrad)

Cable structure

- Bare or tinned copper, stranded to DIN VDE 0295, BS 6360 cl. 5 and IEC 60228, fine or extra fine wire stranded according to different cross-sections
1 to 25 mm² - class 6, col. 4
35 to 95 mm² - class 5
- Special rubber core insulation GI1, to DIN VDE 0207 part 20
- Core identification up to 5 cores, colour code to DIN VDE 0293
7 cores and above with number printing
- Cores laying parallel
- Art.No. 28007 and 28013 cable structure 6x4
- Green-yellow earth core
- Special rubber outer sheath 5GM2, to DIN VDE 0207 part 21
- Colour black

Properties

- Special rubber outer sheath, cold-resistant
- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- Extremely small bending radius
- High flexibility
- Minimum waste of space
- Packeting possibility
- Behaviour in fire:
Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Neoprene type of flat cables are used mainly as trailing cable for crane installations, floor conveyer systems and shelf control units. These cables are also available for export with UL-approval on request.

Installation notes

Cables reels with flat cables must be transported in standing position on the flange. A bending flexibility can be achieved on a plane surface. For this purpose, the corresponding fitting instructions should be followed.

- Put the cable trolley on the guiding rail or upon carrier beam and push them together at the starting point. The distance between the bedding surface of two cable trolleys must be wider than the double thickness of a cable-packet.
- During the packeting performance, it must be started with the smaller cross-section which lays on the bedding surface and will be builded successively so that the biggest cross-section is laying on the top.
- Further, be careful of a symmetrical load distribution.
- In case of multicore flat cables with small cross-section, smaller than 2,5 mm², is very critical due to its low tensile stress. In such case, you should add 10% reserve wire for calculation.

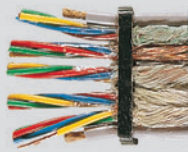
CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer dimension approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
28001	4 G 1,5	5,9 x 16,2	58,0	234,0	16
28002	5 G 1,5	5,9 x 23,7	72,0	304,0	16
28003	7 G 1,5	5,9 x 30,5	101,0	391,0	16
28004	8 G 1,5	5,9 x 34,0	115,0	441,0	16
28005	10 G 1,5	5,9 x 43,5	144,0	460,0	16
28006	12 G 1,5	6,5 x 50,4	173,0	646,0	16
28007	24 G 1,5 (6 x 4)	13,0 x 56,0	346,0	1290,0	16
28008	4 G 2,5	7,2 x 19,6	96,0	316,0	14
28009	5 G 2,5	7,2 x 27,8	120,0	391,0	14
28010	7 G 2,5	7,2 x 36,1	168,0	533,0	14
28011	8 G 2,5	7,2 x 40,2	192,0	602,0	14
28012	12 G 2,5	7,8 x 59,4	288,0	890,0	14
28013	24 G 2,5 (6 x 4)	15,5 x 66,8	576,0	1480,0	14
28014	4 G 4	8,8 x 24,2	154,0	506,0	12
28015	5 G 4	8,8 x 33,4	192,0	621,0	12
28016	7 G 4	8,8 x 42,5	269,0	851,0	12
28017	4 G 6	9,6 x 27,4	230,0	661,0	10
28018	5 G 6	9,6 x 37,4	288,0	740,0	10
28019	7 G 6	9,6 x 47,2	403,0	1004,0	10
28020	4 G 10	10,4 x 30,8	384,0	1027,0	8
28021	5 G 10	10,4 x 41,6	480,0	1171,0	8

Part no.	No. cores x cross-sec. mm ²	Outer dimension approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
28022	4 G 16	11,6 x 35,6	614,0	1430,0	6
28023	5 G 16	12,2 x 48,2	768,0	1590,0	6
28024	4 G 25	14,1 x 45,8	960,0	1890,0	4
28025	5 G 25	14,7 x 58,3	1200,0	2215,0	4
28026	7 G 25	15,3 x 78,7	1680,0	3000,0	4
28027	4 G 35	15,8 x 50,8	1344,0	2460,0	2
28028	5 G 35	16,4 x 64,4	1680,0	2880,0	2
28029	7 G 35	16,4 x 86,4	2352,0	4100,0	2
28030	4 G 50	18,6 x 60,2	1920,0	3385,0	1
28031	4 G 70	21,0 x 68,0	2688,0	4480,0	2/0
28032	4 G 95	24,1 x 78,6	3648,0	5990,0	3/0
28033	4 G 120	25,5 x 84,2	4608,0	7240,0	4/0

Dimensions and specifications may be changed without prior notice. (RJ01)

PVC-flat-CY screened, EMC-preferred type



HELUKABEL PVC-flach-CY 5x4x0,5 QMM / 27101 300/500 V 001042630



Technical data

- Special PVC-flat cable, screened, adapted to DIN VDE 0283 part 2
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Breakdown voltage**
min. 6000 V
- **Minimum bending radius**
15x cable thickness
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors according to DIN VDE 0295 and IEC 60228 cl. 5, BS 6360 cl. 5
- Special PVC insulation
- Core identification see below
- Cores screened individually or in bunches
- Cores laying parallel
- Copper screened braiding, approx. 85% coverage
- Special PVC outer jacket black (RAL 9005)

Properties

- Extensively oil resistant
- Extremely small bending radius
- High flexibility
- Minimum waste of space
- Packeting possibility
- The high degree of screening density assures disturbance-free transmission of all signal and impulses
- PVC self-extinguishing and flameretardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

PVC screened flat cables are used mainly as trailing cable for crane installations, floor conveyer systems and shelf control units.

Installation notes

Cables reels with flat cables must be transported in standing position on the flange. A bending flexibility can be achieved on a plane surface. For this purpose, the corresponding fitting instructions should be followed.

- Put the cable trolley on the guiding rail or upon carrier beam and push them together at the starting point. The distance between the bedding surface of two cable trolleys must be wider than the double thickness of a cable-packet.
- During the packeting performance, it must be started with the smaller cross-section which lays on the bedding surface and will be builded successively so that the biggest cross-section is laying on the top.
- Further, be careful of a symmetrical load distribution.
- In case of multicore flat cables with small cross-section, smaller than 2,5 mm², is very critical due to its low tensile stress. In such case, you should add 10% reserve wire for calculation.

EMC = Electromagnetic compatibillity

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Core marking	Outer dimension approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
27100	5 G 0,5	Colour coded, DIN VDE 0293	21,0 x 3,4	64,0	140,0	20
27101	5 x 4 x 0,5	Colour coded	37,4 x 7,2	175,0	280,0	20
27102	8 x 7 x 0,5	Cont. white numbering, DIN VDE 0293	68,6 x 11,7	480,0	1180,0	20
27090	4 G 0,75	Colour coded, DIN VDE 0293	15,0 x 5,0	70,0	147,0	18
27103	4 x 4 G 1	Cont. white numbering	33,5 x 11,0	310,0	625,0	17
27091	4 G 1,5	Colour coded, DIN VDE 0293	18,7 x 5,9	116,0	210,0	16
27092	8 G 1,5	Cont. white numbering	35,6 x 5,9	217,0	400,0	16
27093	12 G 1,5	Cont. white numbering	52,1 x 5,9	266,0	610,0	16
27094	4 G 2,5	Colour coded, DIN VDE 0293	21,0 x 6,9	170,0	270,0	14
27104	6 G 2,5	Cont. white numbering, DIN VDE 0293	37,4 x 7,2	240,0	320,0	14
27095	4 G 4	Colour coded, DIN VDE 0293	24,5 x 7,7	225,0	400,0	12
27096	4 G 6	Colour coded, DIN VDE 0293	30,1 x 9,2	328,0	520,0	10
27097	4 G 10	Colour coded, DIN VDE 0293	35,8 x 10,5	525,0	840,0	8
27098	4 G 16	Colour coded, DIN VDE 0293	41,3 x 12,6	788,0	1280,0	6
27099	4 G 25	Colour coded, DIN VDE 0293	48,4 x 14,4	1170,0	1800,0	4

Dimensions and specifications may be changed without prior notice. (RJ01)

NEO-Flat-C (MCHÖU) screened, EMC-preferred type



Technical data

- Special-Neoprene-flat cable, screened, adapted to DIN VDE 0250 part 809
- **Temperature range**
flexing -25 °C to +60 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
approx. 15x cable thickness
- **Radiation resistance**
up to 50x10⁶ cJ/kg (up to 50 Mrad)

Cable structure

- Bare or tinned copper, extra fine wire conductors according to DIN VDE 0295 Kl. 6 and IEC 60228 cl. 6, BS 6360 cl. 6
- Special rubber core insulation
- Core identification
up to 5 cores to colour code DIN VDE 0293
- Cores screened individually
- Cores laying parallel
- Copper screened braiding, approx. 85% coverage
- Special Neoprene outer jacket black (RAL 9005)

Properties

- Outer jacket cold resistant
- Extensively oil resistant
- Extremely small bending radius
- High flexibility
- Minimum waste of space
- Packeting possibility
- The high degree of screening density assures disturbance-free transmission of all signal and impulses
- Behaviour in fire
Test according to VDE 0482-332-1-2, DIN EN 60332-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Neoprene screened flat cables are used mainly as trailing cable for crane installations, floor conveyer systems and shelf control units. These cables are also available for export with UL-approval on request.

Installation notes

Cables reels with flat cables must be transported in standing position on the flange. A bending flexibility can be achieved on a plane surface. For this purpose, the corresponding fitting instructions should be followed.

- Put the cable trolley on the guiding rail or upon carrier beam and push them together at the starting point. The distance between the bedding surface of two cable trolleys must be wider than the double thickness of a cable-packet.
- During the packeting performance, it must be started with the smaller cross-section which lays on the bedding surface and will be builded successively so that the biggest cross-section is laying on the top.
- Further, be careful of a symmetrical load distribution.
- In case of multicore flat cables with small cross-section, smaller than 2,5 mm², is very critical due to its low tensile stress. In such case, you should add 10% reserve wire for calculation.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer dimension approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
28100	8 G 1,5	7,9 x 42,0	231,0	520,0	16
28101	12 G 1,5	7,9 x 61,0	346,0	790,0	16
28102	4 G 2,5	8,5 x 25,5	164,0	420,0	14

Part no.	No. cores x cross-sec. mm ²	Outer dimension approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
28103	6 G 2,5	8,5 x 34,5	247,0	540,0	14
28104	12 G 2,5	8,9 x 68,0	494,0	1000,0	14
28302	4 G 25	16,0 x 51,0	1116,0	1650,0	14

Dimensions and specifications may be changed without prior notice. (RJ01)

Ribbon Cables Type L, Type L AWG 28, Type D



Technical data

Type L (stranded wire)

- Pitch 2,54 mm
- **Nominal voltage**
0,14 mm² = 350 V
0,25 to 0,75 mm² = 600 V
- **Test voltage**
0,14 mm² = 1200 V
0,25 to 0,75 mm² = 2000 V

Type L AWG 28 (stranded wire)

- Pitch 1,27 mm
- **Heat-resistance** up to 105 °C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V

Type D (solid)

- Pitch 2,5 mm
- **Nominal voltage** 500 V
- **Test voltage** 1500 V

Cable structure

Type L (stranded wire)

- Tinned copper, fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5
- PVC core insulation, flame retardant
- Cores colour coded

Type L AWG 28 (stranded wire)

- Tinned copper 7x0,127
- PVC core insulation, flame retardant
- Cores moulded, can be separated easily
- Cores single coloured, edge marking on one side

Type D (solid)

- Cu-solid, tinned 0,5 mm ø
- PVC core insulation
- Cores moulded, can be separated easily
- Cores colour coded

Properties

Type L AWG 28 (stranded wire)

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Application

Ribbon cables are used as connecting and control cables wherever there is a need to install quickly and with a minimum waste of space. These cables offer an excellent degree of flexibility.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Type L (colour coded)

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
44001	2 x 0,14	3,9 x 1,4	2,7	7,0	26
44002	3 x 0,14	6,4 x 1,4	4,0	11,0	26
44003	4 x 0,14	8,9 x 1,4	5,4	14,0	26
44004	5 x 0,14	11,3 x 1,4	6,7	18,0	26
44005	6 x 0,14	13,9 x 1,4	8,1	21,0	26
44006	7 x 0,14	16,4 x 1,4	9,4	25,0	26
44007	8 x 0,14	18,9 x 1,4	10,7	28,0	26
44008	9 x 0,14	21,4 x 1,4	13,4	32,0	26
44009	10 x 0,14	23,9 x 1,4	14,4	35,0	26
44010	11 x 0,14	26,4 x 1,4	15,3	39,0	26
44011	12 x 0,14	28,9 x 1,4	16,1	42,0	26
44012	16 x 0,14	38,9 x 1,4	21,5	56,0	26
44013	20 x 0,14	48,9 x 1,4	27,0	70,0	26
44014	4 x 0,25	9,1 x 1,6	9,6	21,0	24
44015	5 x 0,25	11,6 x 1,6	12,0	26,0	24
44016	6 x 0,25	14,1 x 1,6	14,4	31,0	24
44017	7 x 0,25	16,6 x 1,6	16,8	36,0	24
44018	8 x 0,25	19,1 x 1,6	19,2	42,0	24
44019	10 x 0,25	24,1 x 1,6	24,0	52,0	24
44020	12 x 0,25	29,1 x 1,6	28,8	62,0	24
44021	16 x 0,25	39,1 x 1,6	38,4	83,0	24
44022	20 x 0,25	49,1 x 1,6	48,0	104,0	24
44023	4 x 0,5	9,0 x 2,0	19,2	38,0	20
44024	5 x 0,5	12,0 x 2,0	24,0	48,0	20
44025	6 x 0,5	15,0 x 2,0	28,8	57,0	20
44026	7 x 0,5	17,0 x 2,0	33,6	66,0	20
44027	8 x 0,5	20,0 x 2,0	38,4	76,0	20
44028	10 x 0,5	23,0 x 2,0	48,0	95,0	20
44029	12 x 0,5	30,0 x 2,0	58,0	114,0	20
44030	16 x 0,5	40,0 x 2,0	77,0	151,0	20
44031	20 x 0,5	50,0 x 2,0	101,0	190,0	20
44032	4 x 0,75	10,6 x 2,5	29,0	52,0	18
44033	5 x 0,75	13,3 x 2,5	36,0	64,0	18
44034	6 x 0,75	16,0 x 2,5	43,2	77,0	18
44035	7 x 0,75	18,7 x 2,5	50,0	90,0	18
44036	8 x 0,75	21,4 x 2,5	58,0	103,0	18
44037	10 x 0,75	26,8 x 2,5	72,0	130,0	18
44038	12 x 0,75	32,2 x 2,5	86,0	155,0	18
44039	16 x 0,75	43,0 x 2,5	112,0	206,0	18
44040	20 x 0,75	53,4 x 2,5	151,0	260,0	18

Type L AWG 28 (single coloured, edge marking on one side)

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
44041	10 x 0,08	12,7 x 0,9	13,4	30,0	28
44042	14 x 0,08	17,8 x 0,9	18,0	50,0	28
44043	16 x 0,08	20,3 x 0,9	20,0	53,0	28
44044	20 x 0,08	25,4 x 0,9	25,0	65,0	28
44045	26 x 0,08	33,0 x 0,9	32,0	75,0	28
44046	34 x 0,08	43,2 x 0,9	43,0	90,0	28
44047	40 x 0,08	50,8 x 0,9	48,0	125,0	28
44048	48 x 0,08	61,0 x 0,9	59,0	145,0	28

Type D (colour coded)

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
44049	2 x 0,5	3,9 x 1,4	10,0	10,0	20
44050	3 x 0,5	6,4 x 1,4	14,0	14,0	20
44051	4 x 0,5	8,9 x 1,4	19,0	17,0	20
44052	5 x 0,5	11,4 x 1,4	24,0	21,0	20
44053	6 x 0,5	13,9 x 1,4	29,0	25,0	20
44054	7 x 0,5	16,4 x 1,4	34,0	29,0	20
44055	8 x 0,5	18,9 x 1,4	38,0	33,0	20
44056	9 x 0,5	21,4 x 1,4	42,0	37,0	20
44057	10 x 0,5	23,9 x 1,4	48,0	41,0	20
44058	11 x 0,5	26,4 x 1,4	56,0	47,0	20

Standard colour-code (not to DIN 47100)

1	white	12	white-green	23	brown-blue
2	brown	13	white-yellow	24	brown-red
3	green	14	white-grey	25	brown-black
4	yellow	15	white-pink	26	green-grey
5	grey	16	white-blue	27	green-pink
6	pink	17	white-red	28	green-blue
7	blue	18	white-black	29	green-red
8	red	19	brown-green	30	green-black
9	black	20	brown-yellow	31	yellow-grey
10	violet	21	brown-grey	32	yellow-pink
11	white-brown	22	brown-pink	33	yellow-blue

Dimensions and specifications may be changed without prior notice. (RJ01)

TUBEFLEX-Y roundshaped flat ribbon cable for IDC-technique, pitch 1,27 mm



Technical data

- Roundshaped special Flat Ribbon Cable
- **Conductor resistance** at 20 °C
max. 230 Ohm/km
- **Temperature range**
-20 °C up to +80 °C
- **Voltage rating** max. 300 V
- **Test voltage**
core/core 2000 V
- **Dielectric strength, Spark-test**
3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Capacitance** (side cores)
ca. 75 pF/m
- **Impedance** 115 Ohm
- **Minimum bending radius**
15x cable \varnothing
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Stranded tinned copper conductor, size AWG 28
 $7 \times 0,127 \text{ mm} = 0,09 \text{ mm}^2$
- Special PVC core insulation, adapted to DIN VDE 0207 part 4
- Cores colour grey, edge marking on one side
- Cores laying parallel and adjacent, alternately spliced or separated and periodically slotted
- Roundshaped flat ribbon cable, folded
- Taping
- Special PVC outer sheath, adapted to DIN VDE 0207 part 5
- Colour grey

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Very interesting for cable pre-assemblers!**

Application

TUBEFLEX-Y Flat ribbon cable, due to its roundshape offers considerable advantages compared with other flat ribbon cables during the installation and assembly. This roundshaped cable bids enormous profits by using the quick and economical possibilities under continuance with the efficient connection in IDC-technique. All conductors can be contacted at one working procedure without stripping the insulation. The accurate to size pitch-image of the ribbon cable is obtained due to an adapted backshaping before the plug installation.

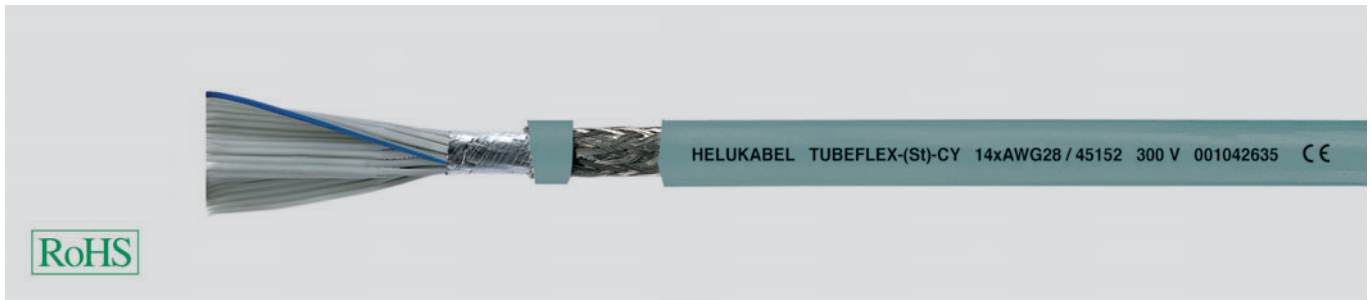
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x AWG-no.	Flat ribbon dimension Width mm	Outer jacket nominal wall-thickness mm	Outer \varnothing approx. mm	Cop. weight approx. kg / km	Weight approx. kg / km
45130	9 x 28	11,43	0,8	6,1	8,7	35,0
45131	10 x 28	12,70	0,8	6,2	9,7	36,0
45132	14 x 28	17,78	0,8	7,2	13,6	48,0
45133	16 x 28	20,30	0,8	7,2	15,5	51,0
45134	20 x 28	25,40	0,8	7,3	19,4	57,0
45135	24 x 28	30,48	0,8	8,6	23,2	66,0
45136	25 x 28	31,75	0,8	8,6	24,2	69,0
45137	26 x 28	33,02	0,8	8,6	25,2	70,0

Part no.	No.cores x AWG-no.	Flat ribbon dimension Width mm	Outer jacket nominal wall-thickness mm	Outer \varnothing approx. mm	Cop. weight approx. kg / km	Weight approx. kg / km
45138	30 x 28	38,10	0,8	9,0	29,0	81,0
45139	34 x 28	43,20	0,8	10,0	32,9	87,0
45140	36 x 28	45,72	0,8	10,2	34,9	91,0
45141	37 x 28	47,00	1,0	10,3	35,8	93,0
45142	40 x 28	50,80	1,0	10,7	38,7	101,0
45143	50 x 28	63,50	1,0	11,1	48,4	118,0
45144	60 x 28	76,20	1,0	12,5	58,1	135,0
45145	64 x 28	81,30	1,0	13,0	62,0	147,0

Dimensions and specifications may be changed without prior notice. (RJ01)

TUBEFLEX-(St)-CY roundshaped flat ribbon cable, screened, for IDC-technique, pitch 1,27mm, EMC-preferred type



Technical data

- Roundshaped special Flat Ribbon Cable, screened
- **Conductor resistance** at 20 °C max. 230 Ohm/km
- **Temperature range** -20 °C up to +80 °C
- **Voltage rating** max. 300 V
- **Test voltage** core/core 2000 V core/screen 2000 V
- **Dielectric strength, Spark-test** 3000 V
- **Insulation resistance** min. 20 MOhm x km
- **Capacitance** (side cores) ca. 75 pF/m
- **Impedance** 115 Ohm
- **Minimum bending radius** 15x cable ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Stranded tinned copper conductor, size AWG 28 7x0,127 mm = 0,09 mm²
- Special PVC core insulation, adapted to DIN VDE 0207 part 4
- Cores colour grey, edge marking on one side
- Cores laying parallel and adjacent, alternately spliced or separated and periodically slotted
- Roundshaped flat ribbon cable, folded
- Dual shielding: (St) - plastic coated Alu-foil and C - tinned copper wire braiding with optimal surface coverage
- Special PVC outer sheath, adapted to DIN VDE 0207 part 5
- Colour grey

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Very interesting for cable pre-assemblers!**
- The dual shielding with plastic coated aluminium foil (St) and the additional tinned copper wire braiding (C) protects against high frequency interference and ensures disturbance-free signal and impuls transfer.

Application

TUBEFLEX-(St)-CY Flat ribbon cable, due to its roundshape offers considerable advantages compared with other flat ribbon cables during the installation and assembly.

This roundshaped cable bids enormous profits by using the quick and economical possibilities under continuance with the efficient connection in IDC-technique. All conductors can be contacted at one working procedure without stripping the insulation. The accurate to size pitch-image of the ribbon cable is obtained due to an adapted backshaping before the plug installation.

EMC = Electromagnetic compatibillity

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x AWG-no.	Flat ribbon dimension Width mm	Outer jacket nominal wall-thickness mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
45150	9 x 28	11,43	0,8	6,3	30,9	56,0
45151	10 x 28	12,70	0,8	6,4	31,9	57,0
45152	14 x 28	17,78	0,8	7,2	35,6	70,0
45153	16 x 28	20,30	0,8	7,4	42,0	75,0
45154	20 x 28	25,40	0,8	7,8	45,8	83,0
45155	24 x 28	30,48	0,8	9,0	54,3	97,0
45156	25 x 28	31,75	0,8	9,0	55,2	100,0
45157	26 x 28	33,02	0,8	9,0	60,0	101,0
45158	30 x 28	38,10	0,8	9,2	60,4	113,0
45159	34 x 28	43,20	0,8	10,2	68,1	122,0
45160	36 x 28	45,72	0,8	10,4	70,1	126,0

Part no.	No. cores x AWG-no.	Flat ribbon dimension Width mm	Outer jacket nominal wall-thickness mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
45161	37 x 28	47,00	1,0	10,5	71,1	128,0
45162	40 x 28	50,80	1,0	11,3	74,1	135,0
45163	50 x 28	63,50	1,0	11,6	88,3	160,0
45164	60 x 28	76,20	1,0	12,9	98,7	172,0
45165	64 x 28	81,30	1,0	13,3	107,2	192,0

Dimensions and specifications may be changed without prior notice. (RJ01)



Photo: HELUKABEL®

Single Conductors

Single Conductors

Single cores are necessary for efficient use in switch cabinets wiring or cable assemblies. Whether PVC, Silicone, Fluorinated polymeric or Rubber insulated, with plain or tinned copper conductors, HELUKABEL® has an extended stock with nearly all popular colour combinations.

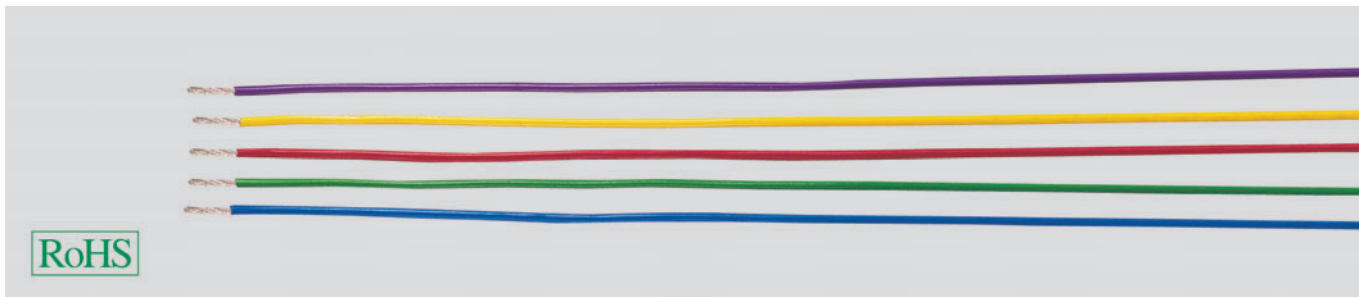
We produce special colour combinations upon request. For all two or three coloured combinations please take our program for vehicle cables (pages K 41 - K 44).

These products are dispatched in cardboard boxes, coils, non-returnable reels or in cardboard barrels. Several sizes of reels or barrels are available.

K

Contents

Description	Page
LiYV, PVC-Single Cores, fine wire stranded, tinned	K 4
H05 V-K, PVC-Single Cores, fine wire stranded	K 6
H07 V-K / (H)07 V-K, PVC-Single Cores, fine wire stranded	K 8
H05 V-U / (H)05 V-U / (H)07 V-U, PVC-single cores, fine wire stranded, VDE 0281 approved	K 10
H07 V-R / H05 V-K / (H)07 V-K**, PVC-single cores, fine wire stranded, VDE 0281 approved	K 11
LiFY Single Core, extra fine wires with highest flexibility	K 14
PUR Single Core, cold resistant, halogen-free	K 15
H05Z-K / H07Z-K, rubber insulated single core, halogen-free	K 16
H05G-U / -K / H07G-U / -R / -K	K 18
LiYW / H05 V2-K, PVC-Single Cores, 90°C, heat-resistant	K 19
HELUTHERM® 125-J/-O, extra flexible, halogen-free, temperature resistant, meter marking	K 20
H07 V2-K, PVC single core, 90°C, heat resistant	K 21
HELUTHERM® 145, flexible, cross-linked, halogen-free	K 22
SIF / SIFF, silicon single cores, halogen-free	K 24
SIF/GL, SiD, SiD/GL, silicon single cores, halogen-free	K 25
FZ-LSi / FZ-LS / Neon Light Cables	K 26
HELUFロン®-FEP-6Y, fluorinated polymeric materials, single core, -100°C to +205°C	K 27
HELUFロン®-PTFE-5Y, fluorinated polymeric materials, single core, 600V / 1000V	K 28
HELUTHERM® 400, Insulation class C	K 29
HELUTHERM® 600 / 600-ES, halogen-free / high-grade steel braiding	K 30
HELUTHERM® 800 / 800-ES, halogen-free / high-grade steel braiding	K 31
HELUTHERM® 1200 / 1200-ES, halogen-free / high-grade steel braiding	K 32
Earth Conductors ESUY and ESY	K 33
H01N2-D / -E, 100 V, VDE approved, welding cable	K 34
NSGAFÖU 3kV, Special Rubber-Insulated Cable, VDE approved, short-circuit up to 1000V	K 35
NSHXAFÖ 3kV, halogen-free Special Rubber-Insulated Cable, VDE approved, short-circuit up to 1000V	K 36
KOMPOSPEED® 600 / 600-C, 0,6/1kV double-insulated, halogen-free, special single cores for drag chains, EMC-preferred type	K 37
HELUTRAIN® 3GKW, Train-Cable, robust special single core, halogen-free, 0,6/1kV, meter marking	K 39
HELUTRAIN® 4GKW-AXplus, Train-Cable, robust special single core, halogen-free, 1,8/3kV, meter marking	K 40
Vehicle Cable FLY, one colour / two colour (old type FLK), according to DIN ISO 6722	K 41
Vehicle Cable FLY, one colour / two colour (old type FLK), according to DIN ISO 6722	K 42
Vehicle Cable FLY, one colour / two colour (old type FLK), according to DIN ISO 6722	K 43
Vehicle Cable FLRY, FLRY-Type A (FLK-R) / -Type B (FLK-D)	K 44



Technical data

- PVC single cores to DIN VDE 0812 LiYv (tinned)
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Operating peak voltage**
LiYv (tinned)
0,14 mm² 500 V
0,25-1,50 mm² 900 V
- **Test voltage**
LiY (tinned)
0,14 mm² 1200 V
0,25-1,50 mm² 2500 V
- **Insulation resistance**
min. 10 MΩm x km
- **Minimum bending radius**
12,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Tinned copper fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 and IEC 60228 cl. 5
- PVC core insulation, compound Y13 to DIN VDE 0812
- Core colours see below

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- For two-coloured combinations ring marking.

Application

PVC insulated flexible hook-up wires are used for the connection for low voltage applications, communication apparatus, electronic assemblies and equipment, racks, switchboards etc. correspondingly of VDE 0800 part 1 for the temperature range up to +70 °C. Those stranded hook-up wires are not permitted to install for heavy current application outside of the equipment.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

LiYv / mm²

Cross-section mm ²	Outer Ø mm	Cop. weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	ye	pink	green	trans	dk-bu	og	o.col.	2-col.
approx. RAL			9005	-	5015	8003	3000	9003	7000	4005	1021	3015	6018	-	5010	2003	-	-



Packing

Spool (standard 100m capacity)

LiY	Part no.	Outer Ø	Cop. weight	black	gn-ye	blue	brown	red	white	grey	vio	ye	pink	green	trans	dk-bu	og	o.col.	2-col.
0,14	1,1	1,4	26405	26406	26407	26408	26409	26410	26411	26412	26413	26414	26415	26416	26417	26418	26419	26420	
0,25	1,3	2,4	26421	26422	26423	26424	26425	26426	26427	26428	26429	26430	26431	26432	26433	26434	26435	26436	
0,5	1,8	4,8	26437	26438	26439	26440	26441	26442	26443	26444	26445	26446	26447	26448	26449	26450	26451	26452	
0,75	2,0	7,2	26453	26454	26455	26456	26457	26458	26459	26460	26461	26462	26463	26464	26465	26466	26467	26468	
1	2,1	9,6	26469	26470	26471	26472	26473	26474	26475	26476	26477	26478	26479	26480	26481	26482	26483	26484	
1,5	2,6	14,4	26485	26486	26487	26488	26489	26490	26491	26492	26493	26494	26495	26496	26497	26498	26499	26500	

Continuation ▶

LiYv PVC-Single Cores, fine wire stranded, tinned



LiYv / mm²

Cross-section mm ²	Outer Ø mm	Cop. weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	ye	pink	green	trans	dk-bu	og	o.col.	2-col.
approx. RAL			9005	-	5015	8003	3000	9003	7000	4005	1021	3015	6018	-	5010	2003	-	-



Packing

Barrel (with various capacity)

LiY	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
0,25	1,4	2,4	26505	26506	26507	26508	26509	26510	26511	26512	26513	26514	26515	26516	26517	26518	26519	26520
0,5	1,95	4,8	26521	26522	26523	26524	26525	26526	26527	26528	26529	26530	26531	26532	26533	26534	26535	26536
0,75	2,15	7,2	26537	26538	26539	26540	26541	26542	26543	26544	26545	26546	26547	26548	26549	26550	26551	26552
1	2,25	9,6	26553	26554	26555	26556	26557	26558	26559	26560	26561	26562	26563	26564	26565	26566	26567	26568
1,5	2,75	14,4	26569	26570	26571	26572	26573	26574	26575	26576	26577	26578	26579	26580	26581	26582	26583	26584

Dimensions and specifications may be changed without prior notice.

Conduits

Corrugated tubes

- for standard applications
- for lager sizes
- scissile corrugated tubes
- conduit glands

High flexible conduits

- plastic conduits with spiral spring
- metal conduits
- conduits glands

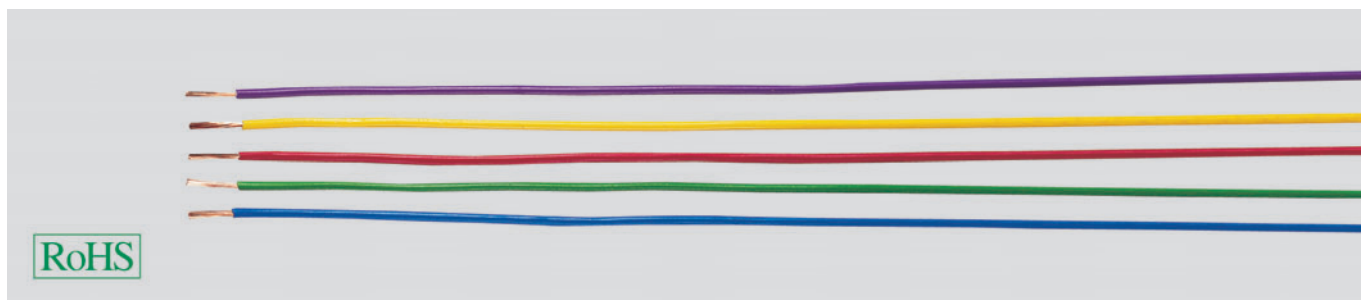
Conduit for heavy mechanical duty

- metal conduits with plastic sheat
- plastic conduits
- conduits glands for metal conduits



You can find conduits in our catalogue Cable Accessories.
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Technical data

- PVC single cores to DIN VDE 0281-3 H05 V-K/H05 V-U to DIN VDE 0281 part 3, HD 21.3 S3 and IEC 60227-3
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** H05 V-K 2000 V
- **Insulation resistance**
min. 10 MOhm x km
- **Minimum bending radius**
12,5x cable \varnothing
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 and IEC 60228 cl. 5
- PVC core insulation, compound T11 to DIN VDE 00281 part 3, HD 21.3 S3 and IEC 60227-3
- **Core identification as per DIN VDE 0293**
- The following colours are recommended: black, white, blue, grey, brown, red, orange, turquoise, violet and pink. Exceptions are the colours green and yellow; these are only permitted if the safety regulations allows. Green is permitted for the identification of luminous decorative chains. All two-coloured combinations of the above single colours are allowed

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

d-bl = dark blue (RAL approx. 5010)
u-bl = ultramarine blue (RAL approx. 5002)

Application

These insulated wires are determined for the installation to the inside of apparatus as well as for the protective laying to the lightings, in dry rooms, in production facilities, switch and distributor boards, in tubes, under and surface mounting of plasters.

☑ The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

H05 V-K/mm²

Cross-section mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	ye	pink	green	trans	dk-bu	og	o.col.	2-col.	u-blue
approx. RAL			9005	-	5015	8003	3000	9003	7001	4005	1021	3015	6018	-	5010	2003	-	-	5002



Coil in cardboard (100m)

Packing

H05 V-K

Part no.	29081	29082	29083	29084	29085	29086	29087	29088	29089	29090	29091	29092	29093	29094	29095	29096	26386		
0,5	2,1 - 2,5	4,8	29097	29098	29099	29100	29101	29102	29103	29104	29105	29106	29107	29108	29109	29110	29111	29112	26387
0,75	2,2 - 2,7	7,2	29113	29114	29115	29116	29117	29118	29119	29120	29121	29122	29123	29124	29125	29126	29127	29128	26388
1	2,4 - 2,8	9,6																	



Spool (with various capacity)

Packing

H05 V-

Part no.	26590	26591	26592	26593	26594	26595	26596	26597	26598	26599	26600	26601	26602	26603	26604	26605	26389		
0,5	2,1 - 2,5	4,8	26606	26607	26608	26609	26610	26611	26612	26613	26614	26615	26616	26617	26618	26619	26620	26621	26390
0,75	2,2 - 2,7	7,2	26622	26623	26624	26625	26626	26627	26628	26629	26630	26631	26632	26633	26634	26635	26636	26637	26391
1	2,4 - 2,8	9,6																	

Continuation ▶

H05 V-K PVC-Single Cores, fine wire stranded



H05 V-K/mm²

Cross-section mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	ye	pink	green	trans	dk-bu	og	o.col.	2-col.	u-blue
approx. RAL			9005	-	5015	8003	3000	9003	7001	4005	1021	3015	6018	-	5010	2003	-	-	-



Packing

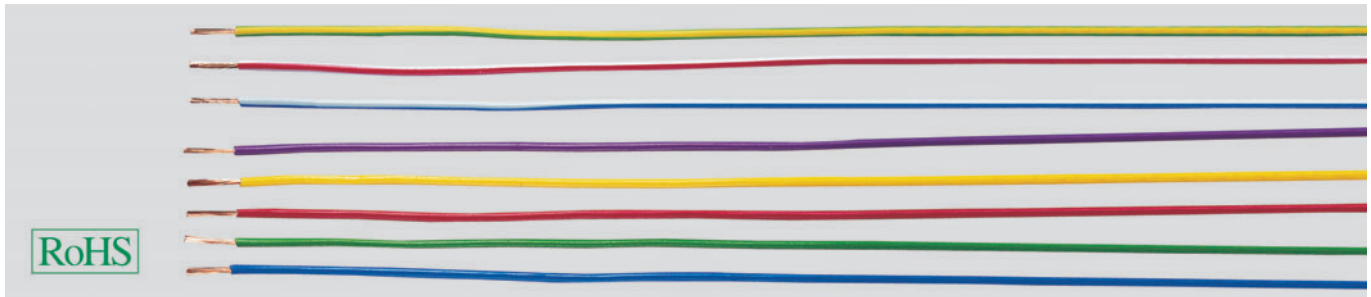
Barrel (with various capacity)

H05 V-K Part no.	Outer Ø	Cop. weight	26640	26641	26642	26643	26644	26645	26646	26647	26648	26649	26650	26651	26652	26653	26654	26655	26392	
0,5	2,1 - 2,5	4,8																		
0,75	2,2 - 2,7	7,2	26656	26657	26658	26659	26660	26661	26662	26663	26664	26665	26666	26667	26668	26669	26670	26671	26393	
1	2,4 - 2,8	9,6	26672	26673	26674	26675	26676	26677	26678	26679	26680	26681	26682	26683	26684	26685	26686	26687	26394	

Dimensions and specifications may be changed without prior notice. (RK01)



Photo: Robert Bürkle GmbH



Technical data

- PVC single cores to DIN VDE 0281 part 3, HD 21.3 S3 and IEC 60227-3
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** U₀/U 450/750 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 10 MΩm x km
- **Minimum bending radius**
12,5 to 15x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 and IEC 60228 cl. 5
- PVC core insulation, compound T11 to DIN VDE 0281 part 3, HD 21.3 S3 and IEC 60227-3
- Core colours see below
- **Core Identification with nominal voltage U₀/U 450/750 V**
- The following colours are recommended (only single colour): black, white, blue, grey, brown, red, orange, turquoise, violet and pink. Two-coloured combinations are not allowed, with exceptions of green-yellow.
- **Colour code Single core cables H07 see Technical Informations**

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Colours yellow, green, transparent only in (H)07 V-K available.
- Two-coloured combination is only permitted for (H)07 V-K.

Application

These insulated wires are suitable for laying in tubes, under and surface mounting of plasters and also in closed installation conduits. These are not allowed to install for direct laying on cable trays, channels or tanks. These types are permitted for the inner wiring of equipment, distributor and switchboards and also for protective laying to the lightings with a nominal voltage up to 1000 V alternating current or up to 750 V direct current against earth.

☑ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

H07 V-K, (H)07 V-K/mm²

Cross-section mm ² approx. RAL	Outer Ø min. - max. mm	Cop. weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	ye	pink	green	trans	dk-bu	og	2-col.	u-blue
			9005	-	5015	8003	3000	9003	7001	4005	1021	3015	6018	-	5010	2003	-	5002



Packing

Coil in cardboard (100m)

H07 V-K	Part no.	2,8 - 3,4	3,4 - 4,1	4,4 - 5,3	14,4	24,0	38,0	58,0	29129	29130	29131	29132	29133	29134	29135	29136	29137	29138	29139	29140	29141	29142	29144**	26395
1,5	Part no.								29145	29146	29147	29148	29149	29150	29151	29152	29153	29154	29155	29156	29157	29158	29160	26396
2,5	Part no.								29161	29162	29163	29164	29165	29166	29167	29168	29169	29170	29171	29172	29173	29174	29176	26397
4	Part no.								29177	29178	29179	29180	29181	29182	29183	29184	29185	29186	29187	29188	29189	29190	29192	26398
6	Part no.																							



Packing

Spool (with various capacity)

H07 V-K	Part no.	2,8 - 3,4	3,4 - 4,1	4,4 - 5,3	14,4	24,0	38,0	58,0	26690	26691	26692	26693	26694	26695	26696	26697	26698	26699	26700	26701	26702	26703	26705**	26399
1,5	Part no.								26706	26707	26708	26709	26710	26711	26712	26713	26714	26715	26716	26717	26718	26719	26721	26400
2,5	Part no.								26722	26723	26724	26725	26726	26727	26728	26729	26730	26731	26732	26733	26734	26735	26737	26401
4	Part no.								26738	26739	26740	26741	26742	26743	26744	26745	26746	26747	26748	26749	26750	26751	26753	26402
6	Part no.																							

Continuation ▶

H07 V-K / (H)07 V-K PVC-Single Cores, fine wire stranded



H07 V-K, (H)07 V-K/mm²

Cross-section mm ² approx. RAL	Outer Ø min. - max. mm	Cop. weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	ye	pink	green	trans	dk-bu	og	2-col.	u-blue
			9005	-	5015	8003	3000	9003	7001	4005	1021	3015	6018	-	5010	2003	-	-



Packing

Barrel (with various capacity)

H07 V-K																		
Part no. 1,5	2,8 - 3,4	14,4	26755	26756	26757	26758	26759	26760	26761	26762	26763	26764	26765	26766	26767	26768	26770	26403
Part no. 2,5	3,4 - 4,1	24,0	26771	26772	26773	26774	26775	26776	26777	26778	26779	26780	26781	26782	26783	26784	26786	26404
Part no. 4	3,9 - 4,8	38,0	26787	26788	26789	26790	26791	26792	26793	26794	26795	26796	26797	26798	26799	26800	26802	26819
Part no. 6	4,4 - 5,3	58,0	26803	26804	26805	26806	26807	26808	26809	26810	26811	26812	26813	26814	26815	26816	26818	26820



Packing

Coil in foil (100m)

H07 V-K																		
Part no. 1,5	2,8 - 3,4	14,4	26060	26061	26062	26063	26064	26065	26066	26067	26068	26069	26092	26099	26108	26109	26111	26821
Part no. 2,5	3,4 - 4,1	24,0	26112	26113	26114	26115	26116	26117	26118	26119	29855	29856	29857	29858	29859	29890	29892	26822
Part no. 4	3,9 - 4,8	38,0	29893	29894	29895	29896	29897	29898	29899	29905	29906	29907	29908	29909	29910	29911	29913	26823
Part no. 6	4,4 - 5,3	58,0	29914	29915	29916	29917	29918	29919	29921	29922	29923	29924	29925	29926	29927	29928	29933	26824
Part no. 10	5,7 - 6,8	96,0	29193	29194	29195	29196	29197	29198	29199	29200	29201	29202	29203	29204	29205	29206	29208	-
Part no. 16	6,7 - 8,1	154,0	29209	29210	29211	29212	29213	29214	29215	29216	29217	29218	29219	29220	29221	29222	29224	-
Part no. 25	8,4 - 10,2	240,0	29225	29226	29227	29228	29229	29230	29231	29232	29233	29234	29235	29236	29237	29238	29240	-
Part no. 35	9,7 - 11,7	336,0	29241	29242	29243	29244	29245	29246	29247	29248	29249	29250	29251	29252	29253	29254	29256	-
Part no. 50	11,5 - 13,9	480,0	29257	29258	29259	29260	29261	29262	29263	29264	29265	29266	29267	29268	29269	29270	29272	-
Part no. 70	13,2 - 16,0	672,0	29273	29274	29275	29276	29277	29278	29279	29280	29281	29282	29283	29284	29285	29286	29288	-
Part no. 95	15,1 - 18,2	912,0	29289	29290	29291	29292	29293	29294	29295	29296	29297	29298	29299	29300	29301	29302	29304	-
Part no. 120	16,7 - 20,2	1152,0	29418	29419	29420	29421	29422	29423	29424	29425	29426	29427	29428	29429	29430	29431	29433	-
Part no. 150	18,6 - 22,5	1440,0	29434	29435	29436	29437	29438	29439	29440	29441	29442	29443	29444	29445	29446	29447	29449	-
Part no. 185	20,6 - 24,9	1776,0	29494	29495	29496	29497	29498	29499	29590	29591	29592	29593	29594	29595	29596	29597	29599	-
Part no. 240	23,5 - 28,4	2304,0	29813	29814	29815	29816	29817	29818	29819	29840	29841	29842	29843	29844	29845	29846	29848	-



Packing

Drum

H07 V-K																		
Part no. 10	5,7 - 6,8	96,0	26825	26826	26827	26828	26829	26830	26831	26832	26833	26834	26835	26836	26837	26838	26840	-
Part no. 16	6,7 - 8,1	154,0	26841	26842	26843	26844	26845	26846	26847	26848	26849	26850	26851	26852	26853	26854	26856	-
Part no. 25	8,4 - 10,2	240,0	26857	26858	26859	26860	26861	26862	26863	26864	26865	26866	26867	26868	26869	26870	26872	-
Part no. 35	9,7 - 11,7	336,0	26873	26874	26875	26876	26877	26878	26879	26880	26881	26882	26883	26884	26885	26886	26888	-
Part no. 50	11,5 - 13,9	480,0	26889	26890	26891	26892	26893	26894	26895	26896	26897	26898	26899	26900	26901	26902	26904	-
Part no. 70	13,2 - 16,0	672,0	26905	26906	26907	26908	26909	26910	26911	26912	26913	26914	26915	26916	26917	26918	26920	-
Part no. 95	15,1 - 18,2	912,0	26921	26922	26923	26924	26925	26926	26927	26928	26929	26930	26931	26932	26933	26934	26936	-
Part no. 120	16,7 - 20,2	1152,0	29305	29306	29307	29308	29309	29310	29311	29312	29313	29314	29315	29316	29317	29318	29320	-
Part no. 150	18,6 - 22,5	1440,0	29321	29322	29323	29324	29325	29326	29327	29328	29329	29330	29331	29332	29333	29334	29336	-
Part no. 185	20,6 - 24,9	1776,0	29337	29338	29339	29340	29341	29342	29343	29344	29345	29346	29347	29348	29349	29350	29352	-
Part no. 240	23,5 - 28,4	2304,0	29353	29354	29355	29356	29357	29358	29359	29360	29361	29362	29363	29364	29365	29366	29368	-

Dimensions and specifications may be changed without prior notice. (RK01)

H05 V-U / (H)05 V-U / (H)07 V-U PVC-single cores, fine wire stranded, VDE 0281 approved



H05 V-U, (H)05 V-U/mm²

Cross-section mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	o.col.	o.col.	o.col.	o.col.	o.col.	o.col.	o.col.
approx. RAL			9005	-	5015	8003	3000	9003	7001	4005	-	-	-	-	-	-	-



Packing

Coil in cardboard (100m)

H05 V-U			28761	28762	28763	28764	28765	28766	28767	28768	-	-	-	-	-	-	-
Part no.																	
0,5	1,9 - 2,3	4,8															
Part no.			28769	28770	28771	28772	28773	28774	28775	28776	-	-	-	-	-	-	-
0,75	2,1 - 2,5	7,2															
Part no.			28777	28778	28779	28780	28781	28782	28783	28784	-	-	-	-	-	-	-
1	2,2 - 2,7	9,6															



Packing

Spool (with various capacity)

H05 V-U			26937	26938	26939	26940	26941	26942	26943	26944	-	-	-	-	-	-	-
Part no.																	
0,5	1,9 - 2,3	4,8															
Part no.			26945	26946	26947	26948	26949	26950	26951	26952	-	-	-	-	-	-	-
0,75	2,1 - 2,5	7,2															
Part no.			26953	26954	26955	26956	26957	26958	26959	26960	-	-	-	-	-	-	-
1	2,2 - 2,7	9,6															



Packing

Coil in cardboard (100m)

H07 V-U			28785	28786	28787	28788	28789	28790	28791	28792	-	-	-	-	-	-	-
Part no.																	
1,5	2,6 - 3,2	14,4															
Part no.			28793	28794	28795	28796	28797	28798	28799	28800	-	-	-	-	-	-	-
2,5	3,2 - 3,9	24,0															
Part no.			28801	28802	28803	28804	28805	28806	28807	28808	-	-	-	-	-	-	-
4	3,6 - 4,4	38,0															
Part no.			28809	28810	28811	28812	28813	28814	28815	28816	-	-	-	-	-	-	-
6	4,1 - 5,0	58,0															
Part no.			28817	28818	28819	28820	28821	28822	28823	28824	-	-	-	-	-	-	-
10	5,3 - 6,4	96,0															



Packing

Drum

H07 V-U			28145	28146	28147	28148	28149	28150	28151	28152	-	-	-	-	-	-	-
Part no.																	
1,5	2,6 - 3,2	14,4															
Part no.			28153	28154	28155	28156	28157	28158	28159	28160	-	-	-	-	-	-	-
2,5	3,2 - 3,9	24,0															
Part no.			28161	28162	28163	28164	28165	28166	28167	28168	-	-	-	-	-	-	-
4	3,6 - 4,4	38,0															
Part no.			28169	28170	28171	28172	28173	28174	28175	28176	-	-	-	-	-	-	-
6	4,1 - 5,0	58,0															
Part no.			28177	28178	28179	28180	28181	28182	28183	28184	-	-	-	-	-	-	-
10	5,3 - 6,4	96,0															

Dimensions and specifications may be changed without prior notice. (RK01)

K

H07 V-R / H05 V-K / (H)07 V-K** PVC-single cores, fine wire stranded, VDE 0281 approved



H07 V-R/mm²

Cross-section mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	o.col.	o.col.	o.col.	o.col.	o.col.	o.col.	o.col.
approx. RAL			9005	-	5015	8003	3000	9003	7001	4005	-	-	-	-	-	-	-



Coil in foil

Packing

H07 V-R			28825	28826	28827	28828	28829	28830	28831	28832	-	-	-	-	-	-	-
Part no. 16	6,4 - 7,8	154,0															
Part no. 25	8,1 - 9,7	240,0	28833	28834	28835	28836	28837	-	-	-	-	-	-	-	-	-	-
Part no. 35	9,0 - 10,9	336,0	28838	28839	28840	28841	28842	-	-	-	-	-	-	-	-	-	-
Part no. 50	10,6 - 12,8	480,0	28843	28844	28845	28846	28847	-	-	-	-	-	-	-	-	-	-
Part no. 70	12,1 - 14,6	672,0	28848	28849	28850	28851	28852	-	-	-	-	-	-	-	-	-	-
Part no. 95	14,1 - 17,1	912,0	28853	28854	28855	28856	28857	-	-	-	-	-	-	-	-	-	-
Part no. 120	15,6 - 18,8	1152,0	28858	28859	28860	28861	28862	-	-	-	-	-	-	-	-	-	-
Part no. 150	17,3 - 20,9	1440,0	28863	28864	28865	28866	28867	-	-	-	-	-	-	-	-	-	-
Part no. 185	19,3 - 23,3	1776,0	28868	28869	28870	28871	28872	-	-	-	-	-	-	-	-	-	-
Part no. 240	22,0 - 26,6	2304,0	28873	28874	28875	28876	28877	-	-	-	-	-	-	-	-	-	-



Drum

Packing

H07 V-R			28185	28186	28187	28188	28189	28190	28191	28192	-	-	-	-	-	-	-
Part no. 16	6,4 - 7,8	154,0															
Part no. 25	8,1 - 9,7	240,0	28193	28194	28195	28196	28197	-	-	-	-	-	-	-	-	-	-
Part no. 35	9,0 - 10,9	336,0	28198	28199	28200	28201	28202	-	-	-	-	-	-	-	-	-	-
Part no. 50	10,6 - 12,8	480,0	28203	28204	28205	28206	28207	-	-	-	-	-	-	-	-	-	-
Part no. 70	12,1 - 14,6	672,0	28208	28209	28210	28211	28212	-	-	-	-	-	-	-	-	-	-
Part no. 95	14,1 - 17,1	912,0	28213	28214	28215	28216	28217	-	-	-	-	-	-	-	-	-	-
Part no. 120	15,6 - 18,8	1152,0	28218	28219	28220	28221	28222	-	-	-	-	-	-	-	-	-	-
Part no. 150	17,3 - 20,9	1440,0	28223	28224	28225	28226	28227	-	-	-	-	-	-	-	-	-	-
Part no. 185	19,3 - 23,3	1776,0	28228	28229	28230	28231	28232	-	-	-	-	-	-	-	-	-	-
Part no. 240	22,0 - 26,6	2304,0	28233	28234	28235	28236	28237	-	-	-	-	-	-	-	-	-	-

Dimensions and specifications may be changed without prior notice. (RK01)

H05 V-K / (H)07 V-K**

PVC-single cores, fine wire stranded, VDE 0281 approved



Twin tone PVC-Single Cores in Coils

Type	min. – max. ø	Cop. weight	red-white	blue-white	brown-white	dark blue-white
Part No.	mm	kg/km				
Cross sec. mm ²						
H05 V-K/mm²						
Part No. 0,5	2,1 – 2,5	4,8	29370	29375	29380	29394
Part No. 0,75	2,2 – 2,7	7,2	29371	29376	29381	29395
Part No. 1	2,4 – 2,8	9,6	29372	29377	29382	29396
(H)07 V-K**/mm²						
Part No. 1,5	2,8 – 3,4	14,4	29373	29378	29383	29397
Part No. 2,5	3,4 – 4,1	24,0	29374	29379	29384	29398
Part No. 4	3,9 – 4,8	38,0	29385	29386	29387	29399
Part No. 6	4,4 – 5,3	58,0	29388	29389	29390	29527
Part No. 10	5,7 – 6,8	96,0	29391	29392	29393	29528

Twin tone PVC-Single Cores in Spool

Type	min. – max. ø	Cop. weight	red-white	blue-white	brown-white	dark blue-white
Part No.	mm	kg/km				
Cross sec. mm ²						
H05 V-K/mm²						
Part No. 0,5	2,1 – 2,5	4,8	29745	29746	29747	29748
Part No. 0,75	2,2 – 2,7	7,2	29749	29750	29751	29752
Part No. 1	2,4 – 2,8	9,6	29753	29754	29755	29756
(H)07 V-K**/mm²						
Part No. 1,5	2,8 – 3,4	14,4	29757	29758	29759	29760
Part No. 2,5	3,4 – 4,1	24,0	29761	29762	29763	29764
Part No. 4	3,9 – 4,8	38,0	29765	29766	29767	29768
Part No. 6	4,4 – 5,3	58,0	29769	29770	29771	29772
Part No. 10	5,7 – 6,8	96,0	29773	29774	29775	29776



Twin tone PVC-Single Cores in Barrels

Type	min. – max. ø	Cop. weight	red-white	blue-white	brown-white	dark blue-white
Part No.	mm	kg/km				
Cross sec. mm ²						
H05 V-K/mm²						
Part No. 0,5	2,1 – 2,5	4,8	28948	28949	28950	28951
Part No. 0,75	2,2 – 2,7	7,2	28952	28953	28954	28955
Part No. 1	2,4 – 2,8	9,6	28956	28957	28958	28959
(H)07 V-K**/mm²						
Part No. 1,5	2,8 – 3,4	14,4	28960	28961	28962	28963
Part No. 2,5	3,4 – 4,1	24,0	28964	28965	28966	28967
Part No. 4	3,9 – 4,8	38,0	28968	28969	28970	28971
Part No. 6	4,4 – 5,3	58,0	28972	28973	28974	28975
Part No. 10	5,7 – 6,8	96,0	28976	28977	28978	28979

* Please note: The colours yellow, green and transparent are only available in (H)05 V-U resp. (H)07 V-U.

** Two-coloured combination is only permitted for (H)07 V.

U = Solid conductor; R = Stranded conductor; K = Fine stranded conductor

Heat resistant versions see types HELUTHERM®. Colours available on request.

PVC cables will be changed to lead free PVC successively.

K

H05 V-K, H07 V-K

PVC-Single Cores to VDE 0281



CE = The product is conformed with the EC Low-Voltage Directive 73/23/EWG and 93/68/EWG.

Barrels, one-way barrels or barrels on hire

Type cross section mm ²	one-way cardboard 8-on guar dimension in mm	ca. contents in m
LIY		
0,25	500 x 500 x 420	10000
0,50	500 x 500 x 420	7000
0,75	500 x 500 x 420	5000
1,00	500 x 500 x 420	4000
1,50	500 x 500 x 420	3000

Type cross section mm ²	one-way barrels 8-on guar dimension in mm	ca. contents in m
H05 V-K		
H07 V-K		
0,50	400 x 400 x 500	4000
0,75	400 x 400 x 500	3500
1,00	400 x 400 x 500	3000
1,50	400 x 400 x 500	2000
2,50	400 x 400 x 500	1200
4,00	400 x 400 x 500	900
6,00	400 x 400 x 500	800

Type cross section mm ²	one-way barrels 8-on guar dimension in mm	ca. contents in m
H05 V-K		
H07 V-K		
0,50	400 x 400 x 800	7000
0,75	400 x 400 x 800	6000
1,00	400 x 400 x 800	5200
1,50	400 x 400 x 800	3500
2,50	400 x 400 x 800	2000



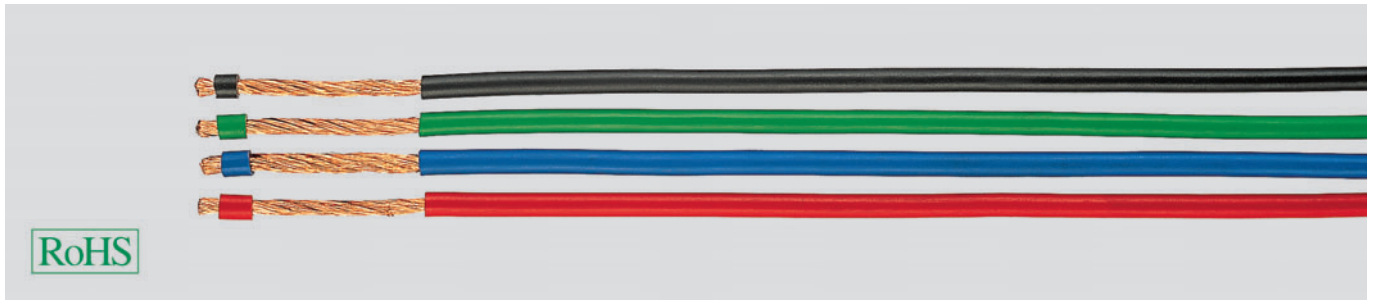
Delivery for one-way barrel

Works photo: HELUKABEL®

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- PVC self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

K = Fine stranded conductor

LifY Single Core extra fine wires with highest flexibility



Technical data

- Special PVC insulated extra fine stranded wire
- Extreme flexible by special design
- Adapted to DIN VDE 0250, 0281, 0295
- **Temperature range**
flexing -15 °C to +80 °C
- **Operating voltage**
up to 0,25 mm² 300 V
(not for purposes of high current and power installation)
- **Nominal voltage**
0,5 mm² up to 1 mm² U₀/U 300/500 V
from 1,5 mm² U₀/U 450/750 V
- **Test voltage**
up to 0,25 mm² = 2 kV
0,5 - 1 mm² = 2,5 kV
from 1,5 mm² = 3 kV
- **Bending radius**, flexing
approx. 8x cable Ø

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded, see table below
- PVC-core insulation with plasticized and elastic PVC

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please complete the part number for these cables by adding the suffix for the colour required as per the list:
00 = green, 01 = black, 02 = red,
03 = blue, 04 = brown, 05 = white,
06 = grey, 07 = violet, 08 = yellow,
09 = orange, 10 = transparent,
11 = pink, 12 = beige, 13 = twin colour

Application

The LifY single cores are used as super flexible insulated strand wires for switch cabinets, as measuring cable for testing, laboratories, research etc.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	Core colour	Cross-section mm ²	Cond. make-up (nom. val.) n x wire Ø	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
151xx	-	0,1	51 x 0,05	1,0	1,2	2,1	-
152xx	-	0,14	72 x 0,05	1,0	1,4	2,6	26
153xx	-	0,25	65 x 0,07	1,0	2,5	4,2	24
154xx	-	0,5	132 x 0,07	2,0	5,5	8,0	20
155xx	-	0,75	195 x 0,07	2,2	8,0	12,0	18
156xx	-	1	260 x 0,07	2,5	10,8	18,0	17
157xx	-	1,5	192 x 0,1	3,5	15,0	22,0	16
158xx	-	2,5	320 x 0,1	3,8	25,0	37,0	14
159xx	-	4	512 x 0,1	4,9	40,0	50,0	12
15093	black	6	768 x 0,1	6,0	60,0	71,0	10
15135	gn-ye	6	768 x 0,1	6,0	60,0	71,0	10
15115	blue	6	768 x 0,1	6,0	60,0	71,0	10
15116	brown	6	768 x 0,1	6,0	60,0	71,0	10
15114	red	6	768 x 0,1	6,0	60,0	71,0	10
15094	black	10	1280 x 0,1	7,3	100,0	130,0	8
15136	gn-ye	10	1280 x 0,1	7,3	100,0	130,0	8
15118	blue	10	1280 x 0,1	7,3	100,0	130,0	8
15119	brown	10	1280 x 0,1	7,3	100,0	130,0	8
15117	red	10	1280 x 0,1	7,3	100,0	130,0	8
15095	black	16	2048 x 0,1	8,8	160,0	187,0	6
15137	gn-ye	16	2048 x 0,1	8,8	160,0	187,0	6
15121	blue	16	2048 x 0,1	8,8	160,0	187,0	6
15122	brown	16	2048 x 0,1	8,8	160,0	187,0	6
15120	red	16	2048 x 0,1	8,8	160,0	187,0	6
15096	black	25	3234 x 0,1	10,5	240,0	294,0	4
15138	gn-ye	25	3234 x 0,1	10,5	240,0	294,0	4
15124	blue	25	3234 x 0,1	10,5	240,0	294,0	4
15125	brown	25	3234 x 0,1	10,5	240,0	294,0	4
15123	red	25	3234 x 0,1	10,5	240,0	294,0	4

Dimensions and specifications may be changed without prior notice. (RK01)

Part no.	Core colour	Cross-section mm ²	Cond. make-up (nom. val.) n x wire Ø	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15097	black	35	4508 x 0,1	11,7	336,0	380,0	2
15139	gn-ye	35	4508 x 0,1	11,7	336,0	380,0	2
15127	blue	35	4508 x 0,1	11,7	336,0	380,0	2
15128	brown	35	4508 x 0,1	11,7	336,0	380,0	2
15126	red	35	4508 x 0,1	11,7	336,0	380,0	2
15098	black	50	6468 x 0,1	14,7	480,0	521,0	1
15140	gn-ye	50	6468 x 0,1	14,7	480,0	521,0	1
15130	blue	50	6468 x 0,1	14,7	480,0	521,0	1
15131	brown	50	6468 x 0,1	14,7	480,0	521,0	1
15129	red	50	6468 x 0,1	14,7	480,0	521,0	1
15099	black	70	8967 x 0,1	15,5	672,0	740,0	2/0
15141	gn-ye	70	8967 x 0,1	15,5	672,0	740,0	2/0
15133	blue	70	8967 x 0,1	15,5	672,0	740,0	2/0
15134	brown	70	8967 x 0,1	15,5	672,0	740,0	2/0
15132	red	70	8967 x 0,1	15,5	672,0	740,0	2/0

PUR Single Core cold resistant, halogen-free



Technical data

- PUR-single cores, halogen-free
- **Temperature range**
-40 °C to +80 °C
(up to +100 °C for short time)
- **Operating voltage** 1000 V
- **Test voltage**
3500 V, 15 minutes
- **Minimum bending radius**
occasionally moved 10x core ø
without movement 5x core ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Plain copper conductors fine stranded to
DIN VDE 0295 cl. 5, BS 6360 cl. 5 and
IEC 60228 cl. 5
- Special PUR core insulation

Properties

- **Halogen-free**
- Flexible at low temperatures up to -40 °C
- Resistant against pressure
- Overroll steady
- Cut and scratchproof
- **Resistant to**
 - Oil
 - Petrol
 - See and waste water
 - Acids
 - Lye
 - UV-radiation

Application

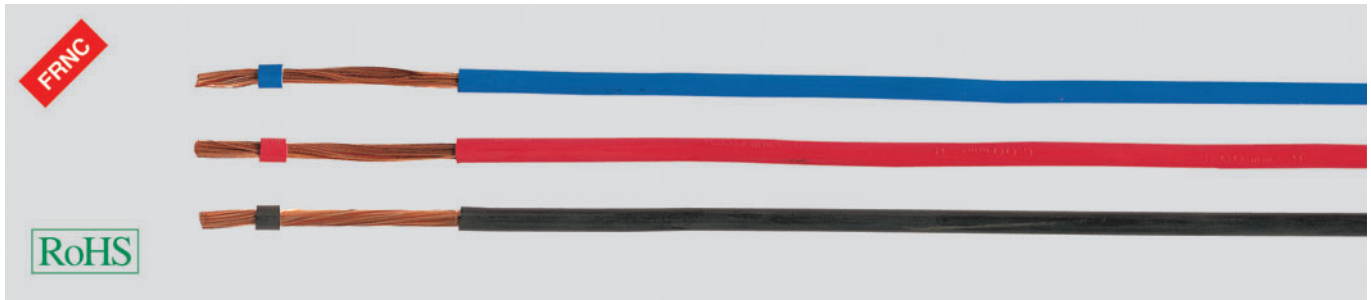
PUR-single cores are suited for installation in switch cabinets, cable assemblies and electronic equipment. Inductive loops in the road surface for controlling of light signalling equipment.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cross-section mm ²	Outer Ø approx. mm	Cop. weight kg / km	green 6018	black 9005	blue 5015	brown 8003	red 3000	white 1013	grey 7000	vio 4005	ye 1021	og 2003	trans -	pink 3015	dk-bu 5010	beige 1001	2-col. -
Part no. 0,5	2,2	4,8	50650	50651	50652	50653	50654	50655	50656	50657	50658	50659	50660	50661	50662	50663	50664
Part no. 0,75	2,4	7,2	50665	50666	50667	50668	50669	50670	50671	50672	50673	50674	50675	50676	50677	50678	50679
Part no. 1	2,5	9,6	50680	50681	50682	50683	50684	50685	50686	50687	50688	50689	50690	50691	50692	50693	50694
Part no. 1,5	3,0	14,4	50695	50696	50697	50698	50699	50700	50701	50702	50703	50704	50705	50706	50707	50708	50709
Part no. 2,5	3,7	24,0	50710	50711	50712	50713	50714	50715	50716	50717	50718	50719	50720	50721	50722	50723	50724
Part no. 4	4,3	38,0	50725	50726	50727	50728	50729	50730	50731	50732	50733	50734	50735	50736	50737	50738	50739
Part no. 6	5,1	58,0	50740	50741	50742	50743	50744	50745	50746	50747	50748	50749	50750	50751	50752	50753	50754
Part no. 10	6,8	96,0	50755	50756	50757	50758	50759	50760	50761	50762	50763	50764	50765	50766	50767	50768	50769
Part no. 16	7,8	154,0	50770	50771	50772	50773	50774	50775	50776	50777	50778	50779	50780	50781	50782	50783	50784
Part no. 25	10,0	240,0	50785	50786	50787	50788	50789	50790	50791	50792	50793	50794	50795	50796	50797	50798	50799
Part no. 35	11,4	336,0	50800	50801	50802	50803	50804	50805	50806	50807	50808	50809	50810	50811	50812	50813	50814
Part no. 50	13,2	480,0	50815	50816	50817	50818	50819	50820	50821	50822	50823	50824	50825	50826	50827	50828	50829
Part no. 70	15,4	672,0	50830	50831	50832	50833	50834	50835	50836	50837	50838	50839	50840	50841	50842	50843	50844
Part no. 95	17,7	912,0	50845	50846	50847	50848	50849	50850	50851	50852	50853	50854	50855	50856	50857	50858	50859
Part no. 120	19,2	1152,0	50860	50861	50862	50863	50864	50865	50866	50867	50868	50869	50870	50871	50872	50873	50874
Part no. 150	22,0	1440,0	50875	50876	50877	50878	50879	50880	50881	50882	50883	50884	50885	50886	50887	50888	50889

Dimensions and specifications may be changed without prior notice. (RK01)

H05Z-K / H07Z-K rubber insulated single core, halogen-free



Technical data

- Rubber-insulated single core cables for low emission of smoke and corrosive gases in case of fire to VDE 0282 part 9 and HD 22.9 S2
- **Conductor resistance** according to DIN VDE 0295 cl. 5
- **Temperature range** -40 °C to +90 °C
- Permissible **working temperature** at the conductor +90 °C
- **Nominal voltage**
H05Z-K U₀/U 300/500 V
H07Z-K U₀/U 450/750 V
- **Test voltage** 2500 V
- **Minimum bending radius** approx. 8x core ø
- **Radiation resistance** up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

- Bare copper conductor, finewire stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228, HD 383
- Core identification according to DIN VDE 0293
- Separator over conductor permitted
- Core insulation of cross-linked polyolefin, compound type EI5 to DIN VDE 0282 part 1
- Core colors see table below, dark blue and orange on request
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Ozone resistant according to EN 60811-2-1 / HD 505.2.1
- Smoke density according to VDE 0482 part 1034-1+2, DIN EN 61034-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Halogen-free single-core wires are used for installation in dry environments for wiring up lighting fixtures and units where valuable assets are to be protected from further damage resulting from fire. These cables may be installed on, in and beneath plaster, as well as in closed installation ducts. The direct operating voltage is permitted up to 900 V against ground when they are used in rail-coaches. For the inner wiring of switch boards and distributors are to be used with an alternating nominal voltage up to 1000 V or a direct voltage up to 750 V against ground.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

H05Z-K

Cross-section mm ²	Core Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	blue	brown	red	white	grey	vio	dk-bu	ye	og	u-blue
Part no.				52872	52873	52874	52875	52876	52877	52878	52879	52945	52880	52946	53071
0,5	2,1 - 2,6	4,8	9,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				52881	52882	52883	52884	52885	52886	52887	52888	52947	52889	52948	53072
0,75	2,2 - 2,8	7,2	12,4	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				52890	52891	52892	52893	52894	52895	52896	52897	52949	52898	52950	53073
1	2,4 - 2,9	9,6	15,0	-	-	-	-	-	-	-	-	-	-	-	-

H07Z-K

Cross-section mm ²	Core Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	blue	brown	red	white	grey	vio	dk-bu	ye	og	u-blue
Part no.				51768	51769	51770	51771	51772	51773	51774	51775	52951	51776	52952	53074
1,5	2,8 - 3,5	14,4	24,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				51777	51778	51779	51780	51781	51782	51783	51784	52953	51785	52954	53075
2,5	3,4 - 4,3	24,0	35,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				51786	51787	51788	51789	51790	51791	51792	51793	52955	51794	52956	53076
4	3,9 - 4,9	38,0	51,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				51795	51796	51797	51798	51799	51800	51801	51802	52957	51803	52958	53077
6	4,4 - 5,5	58,0	71,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				51804	51805	51806	51807	51808	51809	51810	51811	52959	51812	52960	53078
10	5,7 - 7,1	96,0	118,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				51813	51814	51815	51816	51817	51818	51819	51820	52961	51821	52962	53079
16	6,7 - 8,4	154,0	180,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				51822	51823	51824	51825	51826	51827	51828	51829	52963	51830	52964	53080
25	8,4 - 10,6	240,0	278,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				51831	51832	51833	51834	51835	51836	51837	51838	52965	51839	52966	53081
35	9,7 - 12,1	336,0	375,0	-	-	-	-	-	-	-	-	-	-	-	-
Part no.				51840	51841	51842	51843	51844	51845	51846	51847	52967	51848	52968	53082
50	11,5 - 14,4	480,0	560,0	-	-	-	-	-	-	-	-	-	-	-	-

Continuation ▶

H05Z-K / H07Z-K rubber insulated single core, halogen-free

H07Z-K

Cross-section mm ²	Core Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	blue	brown	red	white	grey	vio	dk-bu	ye	og	u-blue
Part no. 70	13,2 - 16,6	672,0	780,0	51849	51850	51851	51852	51853	51854	51855	51856	52969	51857	52970	53083
Part no. 95	15,1 - 18,8	912,0	952,0	51858	51859	51860	51861	51862	51863	51864	51865	52971	51866	52972	53084
Part no. 120	16,7 - 20,9	1152,0	1200,0	51867	51868	51869	51870	51871	51872	51873	51874	52973	51875	52974	53085
Part no. 150	18,6 - 23,3	1440,0	1505,0	51876	51877	51878	51879	51880	51881	51882	51883	52975	51884	52976	53086
Part no. 185	20,6 - 25,8	1776,0	1845,0	51885	51886	51887	51888	51889	51890	51891	51892	52977	51893	52978	53087
Part no. 240	23,5 - 29,4	2304,0	2400,0	51894	51895	51896	51897	51898	51899	51900	51901	52979	51902	52980	53088



H05Z-K

Packing

Barrel (with various capacity)

Cross-section mm ²	Core Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	blue	brown	red	white	grey	vio	dk-bu	ye	og	u-blue
Part no. 0,5	2,1 - 2,6	4,8	9,0	52809	52810	52811	52812	52813	52814	52815	52816	52817	-	52819	-
Part no. 0,75	2,2 - 2,8	7,2	12,4	52821	52822	52823	52824	52825	52826	52827	52828	52829	-	52831	-
Part no. 1	2,4 - 2,9	9,6	15,0	52833	52834	52835	52836	52837	52838	52839	52840	52841	-	52843	-



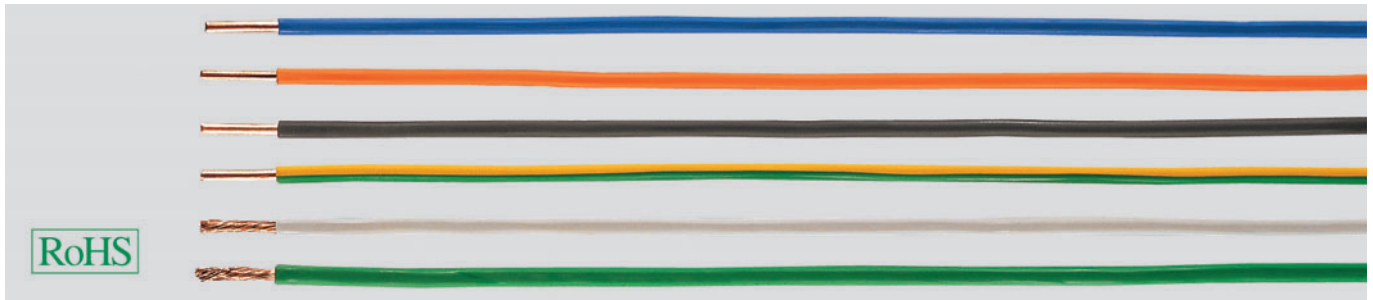
H07Z-K

Packing

Barrel (with various capacity)

Cross-section mm ²	Core Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	blue	brown	red	white	grey	vio	dk-bu	ye	og	u-blue
Part no. 1,5	2,8 - 3,5	14,4	24,0	52845	52846	52847	52848	52849	52850	52851	52852	52853	-	52855	-
Part no. 2,5	3,4 - 4,3	24,0	35,0	52857	52858	52859	52860	52861	52862	52863	52864	52865	-	52867	-

Dimensions and specifications may be changed without prior notice. (RK01)



Technical data

- Heat-resistant (+120 °C) rubber-insulated cable to DIN VDE 0282 part 7 and HD 22.7 S2
- Max. permissible **operating temperature** at conductor +110 °C
- **Lowest ambient temperatures** flexing up to -25 °C fixed installation up to -40 °C
- **Nominal voltage**
H05G U₀/U 300/500 V
H07G U₀/U 450/750 V
- **Test voltage**
H05G 2000 V
H05G 2500 V
- **Minimum bending radius**
approx. 7x cable ø

Cable structure

- Tinned copper conductor to DIN VDE 0295 and IEC 60228, BS 6360 and HD 383
single wire, solid: class 1
multi stranded wires: class 2
fine wires: class 5
- Rubber core insulation, compound type EI3 (EVA) to DIN VDE 0282 part 7 (ΔDIN VDE 0207 part 20)
- Separating layer over tinned conductor is optional
- Core identification to DIN VDE 0293
- Standard colour black

Properties

- Single core colours green and yellow can only be applied where the safety regulations are allowed
- The identification for the lighting chain cable is green permitted

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please quote the individual part-no. in your order with the codes for core colours of the key-positions.
00 = green
01 = black
02 = blue
03 = brown
04 = grey
05 = orange
06 = pink
07 = turquoise
08 = white
09 = violet
10 = yellow
11 = green-yellow
- bare conductor on request

Application

For inside wiring of switch boards and distributors as well as of operating parts such as in or on lights, for the connection of electric heaters with a nominal voltage up to 1000 V alternating voltage or up to 750 V direct voltage against ground. The cables are all allowed for laying in tubes, on and under the plaster.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

H05G-U (single wire)

Part no.	Cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
541__	0,5	1,9 - 2,4	4,8	10,0	20
542__	0,75	2,1 - 2,6	7,2	15,0	18
543__	1	2,2 - 2,8	9,6	16,0	17

H05G-K (fine wire)

Part no.	Cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
550__	0,5	2,1 - 2,6	4,8	13,0	20
551__	0,75	2,2 - 2,8	7,2	16,0	18
552__	1	2,4 - 2,9	9,6	22,0	17

H07G-U (single wire)

Part no.	Cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
544__	1,5	2,8 - 3,5	14,4	24,0	16
545__	2,5	3,4 - 4,3	24,0	35,0	14
546__	4	4,0 - 5,0	38,0	53,0	12

H07G-K (fine wire)

Part no.	Cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
553__	1,5	3,0 - 3,7	14,4	24,0	16
554__	2,5	3,6 - 4,5	24,0	42,0	14
555__	4	4,3 - 5,4	38,0	61,0	12
556__	6	4,8 - 6,0	58,0	78,0	10
557__	10	6,0 - 7,6	96,0	130,0	8
558__	16	7,1 - 8,9	154,0	212,0	6
559__	25	8,8 - 11,0	240,0	323,0	4
560__	35	10,1 - 12,6	336,0	422,0	2
561__	50	11,9 - 14,9	480,0	527,0	1
562__	70	13,6 - 17,0	672,0	726,0	2/0
563__	95	15,5 - 19,3	912,0	937,0	3/0
564__	120	17,1 - 21,4	1152,0	1192,0	4/0

H07G-R (multi wire)

Part no.	Cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
547__	6	4,7 - 5,9	58,0	72,0	10
548__	10	6,0 - 7,4	96,0	123,0	8
549__	16	6,8 - 8,5	154,0	184,0	6

Dimensions and specifications may be changed without prior notice. (RK01)

LiYW / H05 V2-K PVC-Single Cores, 90°C, heat-resistant



Technical data

- Special PVC single core with increased heat-resistance LiYW up to 105 °C adapted to DIN VDE 0281 H05 V2-K to 90 °C according to DIN VDE 0281 part 7 and HD 21.7 S2
- **Temperature range**
LiYW
flexing +5 °C to +105 °C
fixed installation -10 °C to +105 °C
H05 V2-K
flexing +5 °C to + 90 °C
- **Nominal voltage**
LiYW: U₀/U 300/500 V
H05 V2-K: U₀/U 300/500 V
- **Test voltage** 2000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
approx. 10-15x core ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Plain copper conductors to DIN VDE 0295, cl. 5, IEC 60228 cl. 5, BS 6360 cl. 5 and HD 383 (0,5 mm² and above)
for 0,14 mm² = 18x0,1 mm
0,25 mm² = 14x0,15 mm
- Special heat-resistant core insulation LiYW up to +105 °C adapted to DIN VDE 0207
H05 V2-K up to +90 °C, core insulation heat-resistant T13 to DIN VDE 0281 part 7
- Cores colour coded or on request numbered according to DIN VDE 0293

Properties

- Heat-resistant special PVC compound of selected stabilizer and plasticizer
- All requirements and test methods conform DIN VDE 0281 part 7, deviates however the maximal permissible operating temperature up to +105 °C for LiYW
- Not to be used in contact with objects higher than 85 °C
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Therm insulated wires are ideal for use in power current installation, switch cabinets, motors and transformers which are subject to direct contact with high temperatures (e.g. varnishing machines and drying towers etc.). These are also suitable for inside wiring of electrical equipments such as lighting and heating apparatus.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

LiYW 105°C

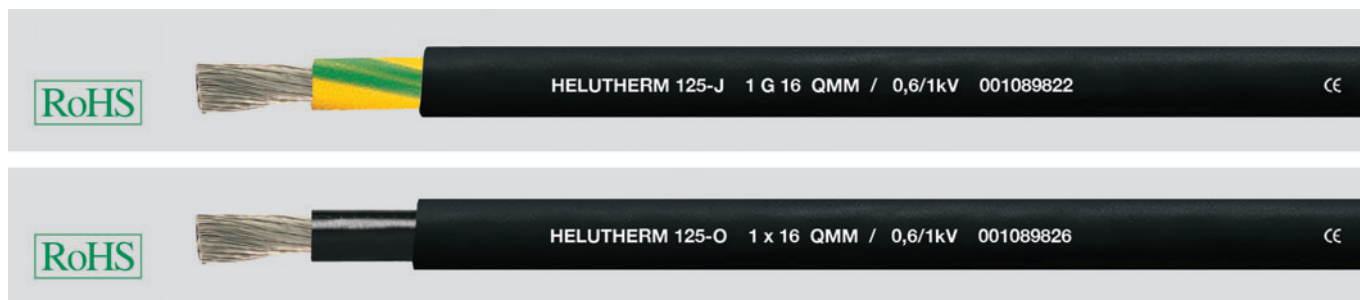
Cross-sec. mm ²	Core Ø mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	blue	brown	red	white	grey	vio	dk-bu
Part no. 0,14	22,0	1,4	3,2	29500	29501	29502	29503	29504	29505	29506	29507	29508
Part no. 0,25	16,0	2,4	4,3	29509	29510	29511	29512	29513	29514	29515	29516	29517
Part no. 0,5	19,0	4,8	7,2	29518	29519	29520	29521	29522	29523	29524	29525	29526

H05 V2-K 90°C

Cross-sec. mm ²	Core Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No. black	AWG-No. gn-ye	AWG-No. blue	AWG-No. brown	AWG-No. red	AWG-No. white	AWG-No. grey	AWG-No. vio	AWG-No. dk-bu
Part no. 0,5	2,1 - 2,5	4,8	8,7	29942	29943	29944	29945	29946	29947	29948	29949	29950
Part no. 0,75	2,2 - 2,7	7,2	11,9	29951	29952	29953	29954	29955	29956	29957	29958	29959
Part no. 1	2,4 - 2,8	9,6	14,0	29960	29961	29962	29963	29964	29965	29966	29967	29968

Dimensions and specifications may be changed without prior notice. (RK01)

HELUTHERM® 125-J/-O extra flexible, halogen-free, temperature resistant, meter marking



Technical data

- flexible and heat-resistant single core
- **Temperature range**
Flexing -50 °C to 125 °C
- **Nominal voltage**
U_n/U 600/1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**
flexing approx. 7,5x cable ø
fixed installation approx. 3x cable ø

Cable structure

- Tinned copper, fine wire conductor, to DIN VDE 0295 Kl.5, BS6360 cl.5 and/or IEC60228 cl.5.
- 1st core insulation from special compound elastomer based, cross-linked, colour: black or green/yellow
- 2nd core insulation from compound elastomer based, cross-linked, colour: black
- meter marking

Properties

- Halogen-free
- uv-resistant
- Abrasion resistant
- Flexible at heat and low temperature
- The materials used in manufacture are silicon and cadmium-free and contain no substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).

Application

These halogen-free and temperature resistant single core are used for wiring up the heaters, electric machines (temperature class B), switching systems and distribution switchboards, production lines and machinery production. The excellence temperature resistant is the guarantee of a very long life cycle.

CE= roduct is conformed with the EC Low-Voltage Directive 2006/95/EG

HELUTHERM® 125-J

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
65300	1 G 0,5	3,6	4,8	13,0	20
65301	1 G 0,75	3,8	7,2	16,0	18
65302	1 G 1	4,1	9,6	20,0	17
65303	1 G 1,5	4,6	14,4	27,0	16
65304	1 G 2,5	5,2	24,0	37,0	14
65305	1 G 4	5,7	38,0	52,0	12
65306	1 G 6	6,7	58,0	76,0	10
65307	1 G 10	8,1	96,0	121,0	8
65308	1 G 16	9,5	154,0	182,0	6
65309	1 G 25	11,2	240,0	267,0	4
65310	1 G 35	12,4	336,0	363,0	2
65311	1 G 50	14,2	480,0	526,0	1
65312	1 G 70	16,9	672,0	700,0	2/0
65313	1 G 95	18,6	912,0	1014,0	3/0

HELUTHERM® 125-O

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
65286	1 x 0,5	3,6	4,8	13,0	20
65287	1 x 0,75	3,8	7,2	16,0	18
65288	1 x 1	4,1	9,6	20,0	17
65289	1 x 1,5	4,6	14,4	27,0	16
65290	1 x 2,5	5,2	24,0	37,0	14
65291	1 x 4	5,7	38,0	52,0	12
65292	1 x 6	6,7	58,0	76,0	10
65293	1 x 10	8,1	96,0	121,0	8
65294	1 x 16	9,5	154,0	182,0	6
65295	1 x 25	11,2	240,0	267,0	4
65296	1 x 35	12,4	336,0	363,0	2
65297	1 x 50	14,2	480,0	526,0	1
65298	1 x 70	16,9	672,0	700,0	2/0
65299	1 x 95	18,6	912,0	1014,0	3/0

Dimensions and specifications may be changed without prior notice. (RN06)

K

H07 V2-K PVC single core, 90°C, heat resistant



Technical data

- Special PVC single core with increased heat-resistance up to 90 °C according to DIN VDE 0281 part 7 and HD 21.7 S2
- **Temperature range**
flexing +5 °C to +90 °C
- **Nominal voltage** U₀/U 450/750 V
- **Test voltage** 2000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
approx. 10-15x core ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Plain copper, fine wire, acc. to DIN VDE 0295, cl. 5, IEC 60228 cl. 5, BS 6360 cl. 5 and HD 383
- Special heat-resistant core insulation T13 to DIN VDE 0281 part 7
- Cores colour coded or on request numbered according to DIN VDE 0293

Properties

- Heat-resistant special PVC compound of selected stabilizer and plasticizer
- All requirements and test methods conform DIN VDE 0281 part 7
- Not to be used in contact with objects higher than 85 °C
- Only suitable for fixed protected installation in, or on, lighting or controlgear for voltages up to 1000 V a.c. or, up to 750 V d.c. to earth
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

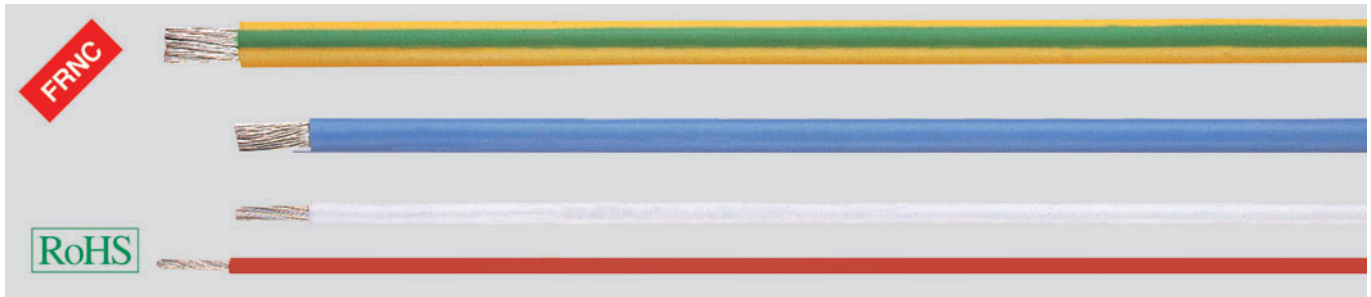
Application

Therm insulated wires are ideal for use in power current installation, switch cabinets, motors and transformers which are subject to direct contact with high temperatures (e.g. varnishing machines and drying towers etc.). These are also suitable for inside wiring of electrical equipments such as lighting and heating apparatus.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cross-sec. mm ²	Core Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	blue	brown	red	white	grey	vio	dk-bu
Part no. 1,5	2,8 - 3,4	14,4	20,0	29970	29971	29972	29973	29974	29975	29976	29977	29978
Part no. 2,5	3,4 - 4,1	24,0	33,3	29979	29980	29981	29982	29983	29984	29985	29986	29987
Part no. 4	3,9 - 4,8	38,0	48,3	29988	29989	29990	29991	29992	29993	29994	29995	29996
Part no. 6	4,4 - 5,3	58,0	68,5	29997	29998	29999	30000	30001	30002	30003	30004	30005
Part no. 10	5,7 - 6,8	96,0	115,0	30006	30007	30008	30009	30010	30011	30012	30013	30014
Part no. 16	6,7 - 8,1	154,0	170,0	30015	30016	30017	30018	30019	30020	30021	30022	30023
Part no. 25	8,4 - 10,2	240,0	270,0	30024	30025	30026	30027	30028	30029	30030	30031	30032
Part no. 35	9,7 - 11,7	336,0	367,0	30033	30034	30035	30036	30037	30038	30039	30040	30041
Part no. 50	11,5 - 13,9	480,0	520,0	30042	30043	30044	30045	30046	30047	30048	30049	30050
Part no. 70	13,2 - 16,0	672,0	729,0	30051	30052	30053	30054	30055	30056	30057	30058	30059
Part no. 95	15,1 - 18,2	912,0	962,0	30060	30061	30062	30063	30064	30065	30066	30067	30068
Part no. 120	16,7 - 20,2	1115,0	1235,0	30069	30070	30071	30072	30073	30074	30075	30076	30077
Part no. 150	18,6 - 22,5	1440,0	1523,0	30078	30079	30080	30081	30082	30083	30084	30085	30086
Part no. 185	20,6 - 24,9	1776,0	1850,0	30087	30088	30089	30090	30091	30092	30093	30094	30095
Part no. 240	23,5 - 28,4	2304,0	2430,0	30096	30097	30098	30099	30100	30101	30102	30103	30104

Dimensions and specifications may be changed without prior notice. (RK01)



Technical data

- Halogen-free single cores with increased heat resistance
- **Temperature range**
flexing -35 °C to +120 °C
fixed installation -55 °C to +145 °C
- **Nominal voltage**
U₀/U 300/500 V up to 1 mm²
U₀/U 450/ 750 V from 1,5 mm²
for fixed and protected installation
U₀/U 600/1000 V from 1,5 mm²
- **Test voltage** 3500 V
- **Minimum bending radius**
flexing 12,5x cable ø
fixed installation 4x cable ø
- **Caloric load values**
see Technical Informations
- **Power ratings table**
see Technical Informations
- **Approval**
Germanischer Lloyd

Cable structure

- Tinned Cu wires, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of polyolefin-copolymer, cross-linked
- Core colours see table

Tests

- **Flame test (unit flame test)** to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3-22, IEC 60332-3-22 (equivalent DIN VDE 0472 part 804 test method C)
- **Flame test (cable)** to VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1-2 (equivalent DIN VDE 0472 part 804 test method B)
- **Corrosiveness of combustion gases** according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- **Halogen-free** according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- **Smoke density** to VDE 0482 part 268-1 and 2, test method C, IEC 61034-1/61034-2, HD 606 and BS 7622 part 1 and 2 (DIN VDE 0472 part 816)

Properties

- Lower propagation of fire
- Low development of smoke and fumes
- Good abrasion and notch resistance
- Good resistance to oils and weathering
- Resistant to UV radiation and ozone
- Resistant to soldering temperatures
- Thermal class B
- These single-core cables are resistant to melting, even when in contact with a soldering iron at temperatures of between 300 °C and 380 °C, because of the cross-linking for the insulation material
- Due to the high temperature profile the cross-section of conductor can under certain circumstances be reduced, hereby enabling a saving in space requirement and weight
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

These temperature resistant single-core cables are used for the internal wiring of lighting fixtures, heaters, electrical machinery, switching systems and distributors in equipment and plant and machinery, suitable for installation on, in and beneath plaster, in closed installation ducts, as well as for traffic systems and outdoor applications. These cables are not approved for direct routing on racks, gutters or tanks. For a protected installation, these cables may be used at a nominal voltage of up to 1000 V alternating current or a direct current up to 750 V when earthed. The maximum operating d.c. voltage used in rail vehicles shall not exceed 900 V when earthed. These halogen-free single core cables are characterised by their amazingly high long-time resistance to temperature and feature among the leading halogen-free, flame resistant products in the world. These single core cables significantly contribute to safety and the environment.

☑ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cross-section mm ² approx. RAL	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	brown	red	white	grey	vio	dk-bu	ye	Beige	lt-bu	og	green	2-col.
Part no. 0,25	1,4 - 1,8	2,4	4,0	50999	50998	51071	51072	51073	51074	51075	51079	51076	51164	51070	51077	51078	51165
Part no. 0,33	1,5 - 1,9	3,2	5,0	51167	51166	51169	51170	51171	51172	51173	51177	51174	51178	51168	51175	51176	51179
Part no. 0,5	1,7 - 2,1	4,8	7,0	51281	51280	51283	51284	51285	51286	51287	51291	51288	51292	51282	51289	51290	51293
Part no. 0,75	2,0 - 2,4	7,2	11,0	51295	51294	51297	51298	51299	51300	51301	51305	51302	51306	51296	51303	51304	51307
Part no. 1	2,3 - 2,7	9,6	14,0	51309	51308	51311	51312	51313	51314	51315	51319	51316	51320	51310	51317	51318	51321
Part no. 1,5	2,7 - 3,1	14,4	20,0	51323	51322	51325	51326	51327	51328	51329	51333	51330	51334	51324	51331	51332	51335
Part no. 2,5	3,3 - 3,7	24,0	30,0	51337	51336	51339	51340	51341	51342	51343	51347	51344	51348	51338	51345	51346	51349
Part no. 4	4,1 - 4,5	38,0	47,0	51351	51350	51353	51354	51355	51356	51357	51361	51358	51362	51352	51359	51360	51363
Part no. 6	4,75 - 5,25	58,0	72,0	51365	51364	51367	51368	51369	51370	51371	51375	51372	51376	51366	51373	51374	51377
Part no. 10	6,0 - 6,6	96,0	120,0	51379	51378	51381	51382	51383	51384	51385	51389	51386	51390	51380	51387	51388	51391

Continuation ▶

HELUTHERM® 145 flexible, cross-linked, halogen-free

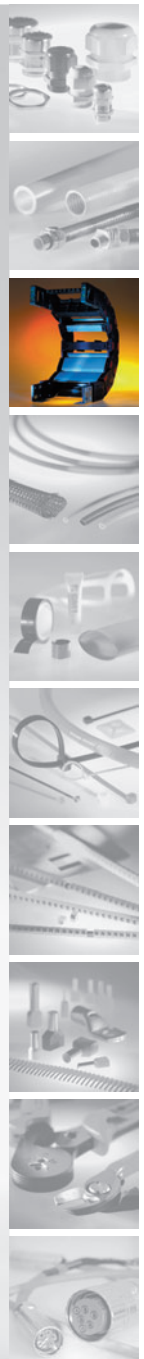


Cross-section mm² approx. RAL	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	brown	red	white	grey	vio	dk-bu	ye	Beige	lt-bu	og	green	2-col.
Part no. 16	7,25 - 7,75	154,0	182,0	51420	51419	51422	51423	51424	51425	51426	51430	51427	51431	51421	51428	51429	51432
Part no. 25	9,35 - 9,85	240,0	272,0	51434	51433	51436	51437	51438	51439	51440	51444	51441	51445	51435	51442	51443	51446
Part no. 35	10,3 - 11,1	336,0	371,0	51448	51447	51450	51451	51452	51453	51454	51458	51455	51459	51449	51456	51457	51460
Part no. 50	12,6 - 13,4	480,0	530,0	51462	51461	51464	51465	51466	51467	51468	51472	51469	51473	51463	51470	51471	51474
Part no. 70	14,7 - 15,4	672,0	730,0	51476	51475	51478	51479	51480	51481	51482	51486	51483	51487	51477	51484	51485	51488
Part no. 95	16,9 - 17,7	912,0	964,0	51490	51489	51492	51493	51494	51495	51496	51500	51497	51501	51491	51498	51499	51502
Part no. 120	18,2 - 19,2	1152,0	1235,0	51504	51503	51506	51507	51508	51509	51510	51514	51511	51515	51505	51512	51513	51516
Part no. 150	20,8 - 22,0	1440,0	1523,0	51518	51517	51520	51521	51522	51523	51524	51528	51525	51529	51519	51526	51527	51530
Part no. 185	23,0 - 24,2	1776,0	1850,0	51532	51531	51534	51535	51536	51537	51538	51542	51539	51543	51533	51540	51541	51544
Part no. 240	26,1 - 27,3	2304,0	2432,0	51546	51545	51548	51549	51550	51551	51552	51556	51553	51557	51547	51554	51555	51558

Dimensions and specifications may be changed without prior notice. (RK01)

Drag Chain Systems

- Open chains
- Closed chains
- Accessories
- Installation instructions
- Selection tables



You can find drag chain systems in our catalogue Cable Accessories.
Request it now at www.helukabel.de



Technical data

- Spezial-silicon single core with higher heat-resistance range adapted to DIN VDE 0250 Teil 1 and part 502
- **Temperature range**
-60 °C to +180 °C
(up to +220 °C for short time)
- **Temperature limit at the conductor**
in operation +180 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Minimum bending radius**
6x cable \varnothing
- **Radiation resistance**
up to 20×10^6 cJ/kg (up to 20 Mrad)

Cable structure

Type SiF

- Tinned copper conductors
0,5 mm² to DIN VDE 0295 Kl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
for 0,25 mm² = 14x0,15 mm
- Silicone core insulation

Type SiFF

- as SiF but with high flexible copper strands (see content technical information)
- Strand make-up
0,25 to 1,0 mm² - cl. 6 col. 7 (single wire \varnothing 0,05 mm)
1,5 to 10 mm² - cl. 6 col. 6 (single wire \varnothing 0,07 mm)

Properties

• Advantages

- High ignition or flash point

• Resistant to

- High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen

• Halogen-free

- according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)

• Behaviour in fire

- no flame propagation
test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90 °C.

Note

- Please complete the part number for these cables by adding the suffix for the colour required as per the list:
00 = green, 01 = black, 02 = red,
03 = blue, 04 = brown, 05 = white,
06 = grey, 07 = violet, 08 = yellow,
09 = orange, 10 = transparent,
11 = pink, 12 = beige, 13 = twin colour

Application

Special cables for use in high, resp. low temperature areas. They are used mainly in the steel producing industries, in aviation industries as well as in ship building, cement, glas and ceramic factories. As this cables are halogen-free, especially suited for use in power stations.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

SiF

Part no.	Cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
232xx	0,25	1,9	2,4	5,5	24
233xx	0,5	2,1	4,8	8,6	20
234xx	0,75	2,4	7,2	11,8	18
235xx	1	2,5	9,6	13,5	17
236xx	1,5	2,8	14,4	18,5	16
237xx	2,5	3,4	24,0	30,0	14
238xx	4	4,2	38,0	47,3	12
239xx	6	5,0	58,0	71,1	10
246xx	10	6,6	96,0	119,4	8
247xx	16	7,4	154,0	187,7	6
248xx	25	9,2	240,0	289,6	4

SiFF

Part no.	Cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
451xx	0,25	1,9	2,4	6,0	24
452xx	0,5	2,2	4,8	10,0	20
453xx	0,75	2,5	7,2	13,0	18
454xx	1	2,6	9,6	15,0	17
455xx	1,5	2,9	14,4	19,0	16
456xx	2,5	3,5	24,0	32,0	14
457xx	4	4,4	38,0	50,0	12
458xx	6	5,2	58,0	73,0	10
459xx	10	6,8	96,0	125,0	8

SiF (wire colour black)

Part no.	Cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23953	35	10,3	336,0	398,3	2
23954	50	12,2	480,0	559,7	1
23955	70	14,2	672,0	765,8	2/0
23956	95	16,6	912,0	1031,5	3/0
23957	120	18,0	1152,0	1284,6	4/0
23958	150	20,0	1440,0	1563,4	300 kcmil
23959	185	22,5	1776,0	1858,2	350 kcmil

Dimensions and specifications may be changed without prior notice. (RK01)



Technical data

- Spezial-silicon single core with higher heat-resistance range adapted to DIN VDE 0250 Teil 1 and part 502
- **Temperature range**
-60 °C to +180 °C
(up to +220 °C for short time)
- **Temperature limit at the conductor**
in operation +180 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Minimum bending radius**
15x cable \varnothing
(SiD only for permanent installation)
- **Radiation resistance**
up to 20×10^6 cJ/kg (up to 20 Mrad)

Cable structure

Type SiF/GL

- Tinned copper conductors
0,5 mm² to DIN VDE 0295 Kl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
for 0,25 mm² = 14x0,15 mm
- Silicone core insulation
- Glass-fibre braiding

Type SiD

- solid tinned copper conductor silicone insulated

Type SiD/GL

- as SiD but with an additional glass-fibre braiding

Properties

• Resistant to

High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen

• Corrosivity of combustion gases

(Halogen-free)

according to VDE 0482 part 267/
DIN EN 50267-2-2/ IEC 60754-2 (equivalent
DIN VDE 0472 part 813)

• Behaviour in fire

no flame propagation, test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

• High flash points

- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90 °C.

Note

- Please complete the part number for these cables by adding the suffix for the colour required as per the list:

00 = green, 01 = black, 02 = red,
03 = blue, 04 = brown, 05 = white,
06 = grey, 07 = violet, 08 = yellow,
09 = orange, 10 = transparent,
11 = pink, 12 = beige, 13 = twin colour

Application

Special cables for use in high, resp. low temperature areas. They are used mainly in the steel producing industries, in aviation industries as well as in ship building, cement, glass and ceramic factories. As this cables are halogen-free, especially suited for use in power stations.

€= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

SiF/GL

Part no.	Cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
47001	0,25	2,4	2,4	7,7	24
47002	0,5	2,5	4,8	12,4	20
47003	0,75	2,8	7,2	16,2	18
47004	1	2,9	9,6	18,2	17
47005	1,5	3,2	14,4	23,4	16
47006	2,5	3,8	24,0	35,2	14
47007	4	4,6	38,0	53,5	12
47008	6	5,4	58,0	77,4	10
47009	10	7,6	96,0	129,2	8
47010	16	8,4	154,0	198,4	6
47011	25	10,2	240,0	303,0	4
47012	35	11,3	336,0	413,2	2
47013	50	13,4	480,0	577,8	1

SiD

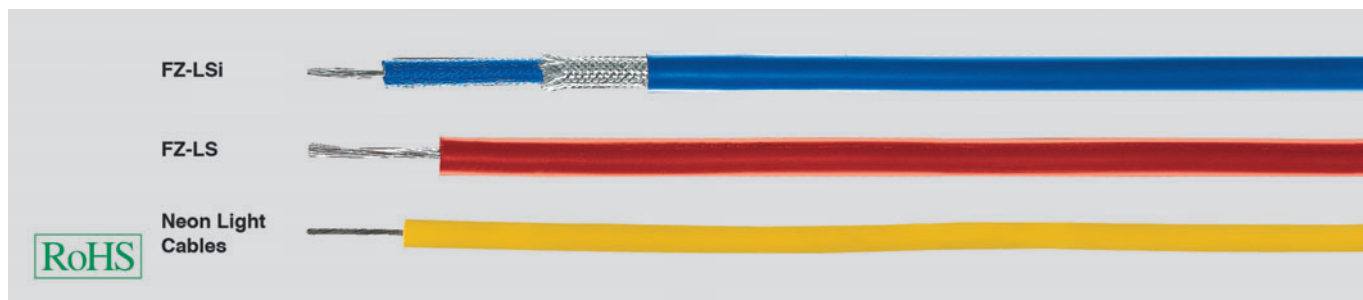
Part no.	Cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
461xx	0,2	1,7	1,9	4,2	-
462xx	0,28	1,8	2,7	5,1	-
463xx	0,5	2,0	4,8	7,5	20
464xx	0,75	2,1	7,2	10,2	18
465xx	1	2,3	9,6	12,6	17
466xx	1,5	2,5	14,4	18,1	16
467xx	2,5	3,2	24,0	28,7	14
468xx	4	3,9	38,0	45,2	12
469xx	6	4,4	58,0	64,3	10

SiD/GL

Part no.	Cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
47014	0,5	2,4	4,8	10,0	20
47015	0,75	2,6	7,2	15,0	18
47016	1	2,7	9,6	19,0	17
47017	1,5	3,0	14,4	28,0	16
47018	2,5	3,6	24,0	40,0	14
47019	4	4,3	36,0	55,0	12
47020	6	5,0	58,0	80,0	10

Dimensions and specifications may be changed without prior notice. (RK01)

FZ-LSi / FZ-LS / Neon Light Cables



Technical data

FZ-LSi, blue

- **Test voltage** 20 kV
- **Breakdown voltage** min. 30 kV
- **Ignition voltage** (kV eff.)
0,5 mm² = 6 kV
1,0 mm² = 8 kV
1,5 mm² = 10 kV

FZ-LS, red

- **Test voltage**
for 5 mm \varnothing = 15 kV
for 7 mm \varnothing = 20 kV
- **Breakdown voltage**
for 5 mm \varnothing : min. 25 kV
for 7 mm \varnothing : min. 35 kV

Neon-light-Cable, yellow

- **Nominal voltage**
3,5 kV, 4,0 kV bzw. 7,5 kV
- **Test voltage** 10 kV
- **Specific volume resistivity**
min. 10¹² Ohm x cm
- **Minimum bending radius**
approx. 7,5x cable \varnothing
- **Radiation resistance**
up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

FZ-LSi, blue

- Tinned copper stranded conductor, strand make-up see table below
- Silicone core insulation 2G11 to DIN VDE 0207 part 20
- Glass-fibre braiding
- Outer-jacket silicone 2GM1 to DIN VDE 0207 part 21
- Jacket colour blue

FZ-LS, red

- Tinned copper conductor, 19x0,25 mm \varnothing
- Silicone core insulation 2G11 to DIN VDE 0207 part 20
- Jacket colour redbrown

Neon-light-cable, yellow

- in adapted to DIN VDE 0250 part 1 and part 5
- Tinned copper stranded conductor 30x0,25 mm \varnothing
- Silicon core insulation 2G11 to DIN VDE 0207 part 20
- Jacket colour yellow

Properties

Neon-light-cable, yellow

- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- No flame propagation according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- No formation of corrosive gases
- Low smoke density
- Very good weather resistance

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

FZ-LSi, blue

This ignition cable is suitable for use at high and extremely alternating ambient temperatures up to +180 °C. Applications include engine manufacturing, valve manufacturing and heating technology. As protection against mechanical damages a glass fibre braiding and a silicone sheath covers the core insulation.

FZ-LS, red

This ignition cable is suitable for use at high and extremely alternating ambient temperatures up to +180 °C. Applications include the lamp and lighting industry and cooling and airconditioning technology.

Neon-light-cable, yellow

This cable is primarily suitable for use at high and extremely alternating ambient temperatures such as in the lamp and lighting industry. Protected installation is required.

FZ-LSi ignition cable

Part no.	Core colour	Cross-section mm ²	Cond. make-up (nom. val.) n x wire \varnothing	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23110	blue	0,5	7 x 0,3	5,0	4,8	36,0	20
23106	blue	1	19 x 0,25	7,5	9,5	65,0	17
23107	blue	1,5	28 x 0,26	8,5	14,4	88,0	16

FZ-LS high-voltage ignition cable 15 and 20kV

Part no.	Core colour	Cross-section mm ²	Cond. make-up (nom. val.) n x wire \varnothing	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23109	red-brown	1	19 x 0,25	5,0	9,6	34,0	17
23108	red-brown	1	19 x 0,25	7,0	9,6	60,0	17

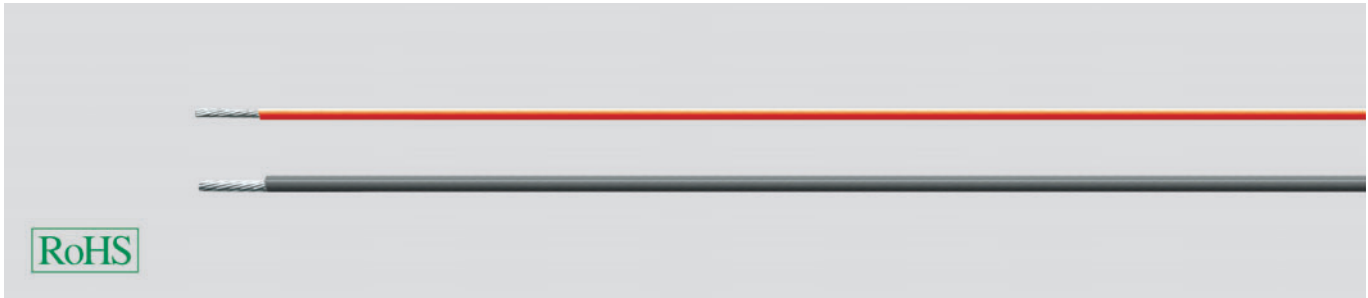
neon light cables (neon cable) 3,5kV, 4,0kV and 7,5kV

Part no.	Core colour	Cross-section mm ²	Cond. make-up (nom. val.) n x wire \varnothing	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
23147	ye	1,5	30 x 0,25	4,4	14,4	32,0	16
23148	ye	1,5	30 x 0,25	6,6	14,4	59,0	16
23149	ye	1,5	30 x 0,25	7,6	14,4	75,0	16

Dimensions and specifications may be changed without prior notice. (RK01)

HELUFLO[®]-FEP-6Y fluorinated polymeric materials, single core,

-100°C to +205°C



Technical data

- Fluorinated polymeric insulation FEP (Fluorethylenpropylene)
- **Temperature range**
-100 °C to +205 °C
(up to +230 °C for short time)
- **Nominal voltage** 600 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 2 GOhm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 1x10⁶ cJ/kg (up to 1 Mrad)
- **Conductor temperature range**
plain copper +130 °C
tinned copper +180 °C
silver pl. copper +200 °C

Cable structure

- Stranded copper wire, bare, tinned, silver
- Make-up fine wire stranded to
DIN VDE 0295 cl. 5, BS 6360 cl. 5 and
IEC 60228 cl. 5
- Core insulation FEP-HELUFLO[®]

Properties

- Higher insulation resistance
- Low dielectric loss
- Not flammable
- Min. 20 kV dielectric strength
- Resistant to micro-cultures
- Do not permit any fungus-formation
- Absolute ozone resistant
- Absolute weather resistant
- Water absorption <0,01%
- Minimal water vapour permeability (approx. 0,18 mgr/cm² in 24 hours)
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please complete the above part-no. for the colour required using the following table:
1 = black, 2 = red, 3 = blue,
4 = brown, 5 = white, 6 = transparent,
7 = twintone, 8 = other colours

Application

Teflon cables are predominantly used for installing in control cabinets subjected to high thermal effects as well as in brickworks, heaters, kitchen fitments and measuring appliances as well as in the chemical industry. These cables are non-flammable and resistant to acids, alkalis, solvents, oil and petrol.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Copper wire, tinned

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
2551x	1 x 0,14	1,0	1,35	2,6	26
2552x	1 x 0,25	1,16	2,4	4,1	24
2553x	1 x 0,5	1,42	4,8	8,0	20
2554x	1 x 0,75	1,62	7,2	9,7	18
2555x	1 x 1	1,9	9,6	12,7	17
2556x	1 x 1,5	2,2	14,4	17,9	16
2557x	1 x 2,5	2,65	24,0	26,4	14
2558x	1 x 4	3,2	38,0	43,1	12
2559x	1 x 6	4,4	58,0	65,9	10
2560x	1 x 10	5,3	96,0	115,0	8
2561x	1 x 16	8,0	154,0	175,0	6

Copper wire, bare

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
2490_	1 x 0,14	1,0	1,35	2,6	26
2491_	1 x 0,25	1,16	2,4	4,1	24
2492_	1 x 0,5	1,42	4,8	8,0	20
2493_	1 x 0,75	1,62	7,2	9,7	18
2494_	1 x 1	1,9	9,6	12,7	17
2495_	1 x 1,5	2,2	14,4	17,9	16

Copper wire, bare

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
2496_	1 x 2,5	2,65	24,0	26,4	14
2497_	1 x 4	3,2	38,0	43,1	12
2498_	1 x 6	4,4	58,0	65,9	10
2499_	1 x 10	5,3	96,0	115,0	8
2037_	1 x 16	8,0	154,0	175,0	6

copper wires, silvered

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
2026_	1 x 0,14	1,0	1,35	2,6	26
2027_	1 x 0,25	1,16	2,4	4,1	24
2028_	1 x 0,5	1,42	4,8	8,0	20
2029_	1 x 0,75	1,62	7,2	9,7	18
2030_	1 x 1	1,9	9,6	12,7	17
2031_	1 x 1,5	2,2	14,4	17,9	16
2032_	1 x 2,5	2,65	24,0	26,4	14
2033_	1 x 4	3,2	38,0	43,1	12
2034_	1 x 6	4,4	58,0	65,9	10
2035_	1 x 10	5,3	96,0	115,0	8
2036_	1 x 16	8,0	154,0	175,0	6

Dimensions and specifications may be changed without prior notice. (RK01)

HELUFLO[®]-PTFE-5Y fluorinated polymeric materials, single core, 600V / 1000V

RoHS

RoHS

Technical data

- Fluorinated polymeric insulation PTFE (Polytetrafluorethylene)
- Design to DIN VDE 0881 an IEC 60673
- **Temperature range**
-190 °C to +260 °C
(up to +300 °C for short time)
- **Nominal voltage**
type E = 600 V
type EE = 1000 V
- **Test voltage**
type E = 3,4 kV
type EE = 5 kV
- **Insulation resistance**
min. 1 GOhm x km
- **Minimum bending radius**
10x cable ø
- **Radiation resistance**
up to 1x10⁵ cJ/kg (up to 1 Mrad)
- **Conductor temperature range**
plain copper +130 °C
tinned copper +180 °C
silver pl. copper +200 °C
nickel pl. copper +300 °C

Cable structure

- Stranded copper wire, silver. Bare, tinned or nickel-plated on request
- Core insulation PTFE-HELUFLO[®] to DIN VDE 207 part 6
- Cores colour coded
- Outer jacket PTFE-HELUFLO[®]
- PTFE as per MIL-W 16878

Properties

- Higher insulation resistance
- Low dielectric loss
- Not flammable
- Resistant to micro-cultures
- Do not permit any fungus-formation
- Absolute ozone resistant
- Absolute weather resistant
- Water absorption <0,01%
- Minimal water vapour permeability (approx. 0,18 mgr/cm² in 24 hours)
- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please complete the above part-no. for the colour required using the following table:
1 = black, 2 = red, 3 = blue,
4 = brown, 5 = white, 6 = transparent,
7 = twintone, 8 = other colour
- Conductor bare, tinned or nickel plated on request

Application

Teflon cables are predominantly used for installing in control cabinets subjected to high thermal effects as well as in brickworks, heaters, kitchen fitments and measuring appliances as well as in the chemical industry. These cables are non-flammable and resistant to acids, alkalis, solvents, oil and petrol.

☑ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

600V

Part no.	AWG-No.	Cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Silv. weight kg / km	Weight approx. kg / km
2511x	32	0,03	0,74	0,4	0,03	0,38
2512x	30	0,06	0,81	0,6	0,04	0,59
2513x	28	0,09	0,89	0,9	0,06	0,93
2514x	26	0,14	0,99	1,4	0,07	1,47
2515x	26	0,14	0,99	1,4	0,09	1,58
2516x	24	0,21	1,12	2,3	0,07	2,31
2517x	24	0,24	1,12	2,3	0,13	2,52
2518x	22	0,35	1,27	3,5	0,10	3,68
2519x	22	0,38	1,27	3,5	0,17	3,99
2520x	20	0,57	1,47	5,6	0,12	6,0
2521x	20	0,57	1,47	6,1	0,18	6,4
2522x	18	0,90	1,74	9,6	0,22	9,45
2523x	18	0,95	1,74	9,6	0,27	10,2
2524x	16	1,23	2,04	13,5	0,29	12,9
2525x	14	1,94	2,40	18,0	0,38	20,3

1000V

Part no.	AWG-No.	Cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Silv. weight kg / km	Weight approx. kg / km
2531x	32	0,03	1,00	0,4	0,03	0,42
2532x	30	0,06	1,07	0,6	0,04	0,65
2533x	28	0,09	1,14	0,9	0,06	1,0
2534x	26	0,14	1,24	1,4	0,07	1,56
2535x	26	0,14	1,24	1,4	0,09	1,68
2536x	24	0,21	1,37	2,3	0,07	2,4
2537x	24	0,24	1,37	2,3	0,13	2,65
2538x	22	0,35	1,52	3,5	0,10	3,85
2539x	21	0,38	1,52	3,5	0,17	4,2
2540x	20	0,57	1,72	5,6	0,12	6,3
2541x	20	0,57	1,72	6,1	0,18	6,9
2542x	18	0,90	2,00	9,6	0,22	10,65
2543x	18	0,95	2,00	9,6	0,27	13,65
2544x	16	1,23	2,26	13,5	0,29	21,38
2545x	14	1,94	2,76	18,0	0,38	33,95

Dimensions and specifications may be changed without prior notice. (RK01)

HELUTHERM® 400 Insulation class C



Technical data

- Special core insulation
- Mono or multi coloured
- **Temperature range**
-60 °C to +400 °C
operating temperature
(up to +450 °C for short time)
- **Nominal voltage** 500 V
- **Test voltage** 2000 V
- **Minimum bending radius**
approx. 15x cable ø
- **Radiation resistance**
up to 1x10¹⁰ cJ/kg (up to 1x10⁴ Mrad)

Cable structure

- Stranded nickel conductor
- Overlapping with special heat-resistant impregnation

Properties

- These cables have very good electronic, chemical and radiation resistant properties

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Also available with additional Kapton film at extra cost.

Application

The wide temperature range offered by this cable type makes it especially suited for use in the aviation and aerospace industries, for atomic power stations and in the steel making and chemical industries.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cross-section mm ²	Conductor construction	Outer Ø approx. mm	Nickel weight kg / km	black	gn-ye	blue	brown	red	white	grey	vio	ye	Beige	pink	og	2-col.	trans
Part no. 0,5	16 x 0,2	2,2	4,8	50901	50900	50902	50903	50904	50905	50906	50907	50908	50912	50911	50909	50913	50910
Part no. 0,75	24 x 0,2	2,4	7,2	50915	50914	50916	50917	50918	50919	50920	50921	50922	50926	50925	50923	50927	50924
Part no. 1	32 x 0,2	2,7	9,6	50929	50928	50930	50931	50932	50933	50934	50935	50936	50940	50939	50937	50941	50938
Part no. 1,5	30 x 0,25	2,8	14,4	50943	50942	50944	50945	50946	50947	50948	50949	50950	50954	50953	50951	50955	50952
Part no. 2,5	50 x 0,25	3,4	24,0	50957	50956	50958	50959	50960	50961	50962	50963	50964	50968	50967	50965	50969	50966
Part no. 4	56 x 0,3	4,5	38,0	50971	50970	50972	50973	50974	50975	50976	50977	50978	50982	50981	50979	50983	50980
Part no. 6	84 x 0,3	4,9	58,0	50985	50984	50986	50987	50988	50989	50990	50991	50992	50996	50995	50993	50997	50994
Part no. 10	141 x 0,3	5,8	96,0	50890	50209	50891	50892	50893	50894	50895	50896	50897	51561	51560	50898	51562	51559
Part no. 16	226 x 0,3	7,4	154,0	51564	51563	51565	51566	51567	51568	51569	51570	51571	51575	51574	51572	51576	51573
Part no. 25	196 x 0,4	9,6	240,0	51578	51577	51579	51580	51581	51582	51583	51584	51585	51589	51588	51586	51590	51587
Part no. 35	276 x 0,4	11,5	336,0	51592	51591	51593	51594	51595	51596	51597	51598	51599	51603	51602	51600	51604	51601
Part no. 50	396 x 0,4	12,7	480,0	51606	51605	51607	51608	51609	51610	51611	51612	51613	51617	51616	51614	51618	51615
Part no. 70	360 x 0,5	16,0	672,0	51620	51619	51621	51622	51623	51624	51625	51626	51627	51631	51630	51628	51632	51629
Part no. 95	485 x 0,5	18,0	912,0	51634	51633	51635	51636	51637	51638	51639	51640	51641	51645	51644	51642	51646	51643
Part no. 120	608 x 0,5	19,0	1152,0	51648	51647	51649	51650	51651	51652	51653	51654	51655	51659	51658	51656	51660	51657
Part no. 150	756 x 0,5	22,0	1440,0	51662	51661	51663	51664	51665	51666	51667	51668	51669	51673	51672	51670	51674	51671
Part no. 185	944 x 0,5	24,0	1776,0	51676	51675	51677	51678	51679	51680	51681	51682	51683	51687	51686	51684	51688	51685
Part no. 240	1222 x 0,5	27,0	2304,0	51690	51689	51691	51692	51693	51694	51695	51696	51697	51701	51700	51698	51702	51699

Dimensions and specifications may be changed without prior notice. (RK01)

HELUTHERM® 600 / 600-ES halogen-free / high-grade steel braiding



Technical data

- Special core insulation for high temperatures
- **Temperature range** -60 °C to +600 °C
- **Permissible temperature** +400 °C to +600 °C (up to +600 °C for short time)
- **Nominal voltage** 500 V
- **Test voltage** 2500 V
- **Minimum bending radius** approx. 5x cable ø

Cable structure

- HELUTHERM® 600**
- Stranded nickel conductor (ASTM B 355)
 - Double-insulated glass-fibre braiding, impregnated with silicone
 - Braiding of special mineral fibres and additional impregnation with silicone
- HELUTHERM® 600-ES**
- As per above
 - Additional braided high-grade steel, coverage approx. 80%

Properties

- Asbestos and cadmium-free

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

HELUTHERM® 600 cables are used in applications where extremely high connecting and ambient temperatures occur, e.g. in iron and steel works, rolling mills, foundries, glass and ceramic plants, in power construction as well as for wiring resistances in electrical heating equipment, furnaces and in thermoplastic forming. Good characteristics in the presence of moisture and chemical effects.

HELUTHERM® 600-ES

The robust braiding of high-grade steel protects the cable from aggressive atmospheres and mechanical stresses. The high-grade braiding also gives this cable an attractive appearance. The braided screen can also be used for earthing purposes.

☑ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

HELUTHERM® 600

Part no.	No. cores x cross-sec. mm ²	Conductor construction	Outer Ø approx. mm	Linear resistance at 20°C Ohm / km	Max. perm. current carrying capacity at +400°C (A)	Nickel weight kg / km	Weight approx. kg / km	AWG-No.
51703	1 x 0,25	4 x 0,3	2,0	346	1,5	2,4	9,5	24
51704	1 x 0,5	7 x 0,3	2,3	175	2,5	4,8	11,5	20
51705	1 x 0,75	11 x 0,3	2,6	115	4,5	7,2	15,0	18
51706	1 x 1	14 x 0,3	2,8	88	5,5	9,6	17,8	17
51707	1 x 1,5	21 x 0,3	3,2	59	7	14,4	24,0	16
51708	1 x 2,5	35 x 0,3	3,7	35	10	24,0	36,0	14
51709	1 x 4	56 x 0,3	4,5	22	13,5	38,0	54,5	12
51710	1 x 6	84 x 0,3	6,0	14,6	16	58,0	77,0	10
51711	1 x 10	140 x 0,3	8,0	8,8	21	96,0	150,0	8
51712	1 x 16	228 x 0,3	9,1	5,5	28	154,0	225,0	6
51713	1 x 25	354 x 0,3	10,8	3,5	36	240,0	340,0	4
51714	1 x 35	495 x 0,3	13,0	2,5	58	336,0	440,0	2
51715	1 x 50	707 x 0,3	13,5	1,5	70	480,0	600,0	1

HELUTHERM® 600-ES

Part no.	No. cores x cross-sec. mm ²	Conductor construction	Outer Ø approx. mm	Linear resistance at 20°C Ohm / km	Max. perm. current carrying capacity at +400°C (A)	Nickel weight kg / km	Weight approx. kg / km	AWG-No.
50475	1 x 0,5	7 x 0,3	3,2	175	2,5	4,8	21,0	20
50476	1 x 0,75	11 x 0,3	3,5	115	4,5	7,2	29,0	18
50477	1 x 1	14 x 0,3	3,7	88	5,5	9,6	38,0	17
50478	1 x 1,5	21 x 0,3	4,1	59	7	14,4	44,0	16
50479	1 x 2,5	35 x 0,3	4,6	35	10	24,0	56,0	14
50480	1 x 4	56 x 0,3	5,4	22	13,5	38,0	78,0	12
50481	1 x 6	84 x 0,3	6,9	14,6	16	58,0	112,0	10
50482	1 x 10	140 x 0,3	8,9	8,8	21	96,0	198,0	8
50483	1 x 16	228 x 0,3	10,0	5,5	28	154,0	281,0	6
50484	1 x 25	354 x 0,3	11,7	3,5	36	240,0	410,0	4
50485	1 x 35	495 x 0,3	15,1	2,5	58	336,0	536,0	2
50486	1 x 50	707 x 0,3	15,6	1,5	70	480,0	697,0	1

Dimensions and specifications may be changed without prior notice. (RK01)

HELUTHERM® 800 / 800-ES halogen-free / high-grade steel braiding



Technical data

- Special core insulation for high temperatures
- **Temperature range**
-120 °C to +750 °C
- **Permissible temperature**
+600 °C to +800 °C
(up to +1200 °C for short time)
- **Nominal voltage** 500 V
- **Test voltage** 2000 V
- **Minimum bending radius**
approx. 5x cable ø

Cable structure

- HELUTHERM® 800**
- Stranded nickel conductor
 - Double-insulated glass-fibre braiding, impregnated with silicone
 - Braiding of special mineral fibres and additional impregnation with silicone
- HELUTHERM® 800-ES**
- As per above
 - Additional braided high-grade steel, coverage approx. 80%

Properties

- Asbestos and cadmium-free

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

HELUTHERM® 800 cables are used in applications where extremely high connecting and ambient temperatures occur, e.g. in iron and steel works, rolling mills, foundries, glass and ceramic plants, in power construction as well as for wiring resistances in electrical heating equipment, furnaces and in thermoplastic forming. Good characteristics in the presence of moisture and chemical effects.

HELUTHERM® 800-ES

The robust braiding of high-grade steel protects the cable from aggressive atmospheres and mechanical stresses. The high-grade braiding also gives this cable an attractive appearance. The braided screen can also be used for earthing purposes.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

HELUTHERM® 800

Part no.	No. cores x cross-sec. mm ²	Conductor construction	Outer Ø approx. mm	Linear resistance at 20°C Ohm / km	Max. perm. current carrying capacity at +700°C (A)	Nickel weight kg / km	Weight approx. kg / km	AWG-No.
51716	1 x 0,25	4 x 0,3	2,2	346	1	2,4	10,2	24
51717	1 x 0,5	7 x 0,3	2,3	175	2	4,8	12,0	20
51718	1 x 0,75	11 x 0,3	2,9	115	3	7,2	16,0	18
51719	1 x 1	14 x 0,3	3,2	88	4	9,6	19,0	17
51720	1 x 1,5	21 x 0,3	3,2	59	5	14,4	26,5	16
51721	1 x 2,5	35 x 0,3	3,7	35	7	24,0	38,8	14
51722	1 x 4	56 x 0,3	4,5	22	9	38,0	57,0	12
51723	1 x 6	84 x 0,3	5,9	14,6	12	58,0	81,0	10
51724	1 x 10	140 x 0,3	8,0	8,8	14	96,0	156,0	8
51725	1 x 16	228 x 0,3	9,0	5,5	20	154,0	240,0	6
51726	1 x 25	354 x 0,3	10,6	3,5	24	240,0	370,0	4
51727	1 x 35	495 x 0,3	13,4	2,5	40	336,0	490,0	2
51728	1 x 50	707 x 0,3	14,0	1,5	48	480,0	645,0	1

HELUTHERM® 800-ES

Part no.	No. cores x cross-sec. mm ²	Conductor construction	Outer Ø approx. mm	Linear resistance at 20°C Ohm / km	Max. perm. current carrying capacity at +700°C (A)	Nickel weight kg / km	Weight approx. kg / km	AWG-No.
50488	1 x 0,5	7 x 0,3	3,5	175	2	4,8	23,0	20
50489	1 x 0,75	11 x 0,3	3,8	115	3	7,2	31,0	18
50490	1 x 1	14 x 0,3	4,1	88	4	9,6	40,0	17
50491	1 x 1,5	21 x 0,3	4,5	59	5	14,4	47,0	16
50492	1 x 2,5	35 x 0,3	4,9	35	7	24,0	59,0	14
50493	1 x 4	56 x 0,3	5,8	22	9	38,0	82,0	12
50494	1 x 6	84 x 0,3	7,3	14,6	12	58,0	118,0	10
50495	1 x 10	140 x 0,3	9,4	8,8	14	96,0	209,0	8
50496	1 x 16	228 x 0,3	10,5	5,5	20	154,0	298,0	6
50497	1 x 25	354 x 0,3	12,2	3,5	24	240,0	452,0	4
50498	1 x 35	495 x 0,3	15,5	2,5	40	336,0	592,0	2
50499	1 x 50	707 x 0,3	16,1	1,5	48	480,0	650,0	1

Dimensions and specifications may be changed without prior notice. (RK01)

HELUTHERM® 1200 / 1200-ES halogen-free / high-grade steel braiding



Technical data

- Special core insulation for high temperatures
- **Temperature range**
-170 °C to +1000 °C
- **Permissible temperature**
+800 °C to +1100 °C
(up to +1400 °C for short time)
- **Nominal voltage** 500 V
- **Test voltage** 2000 V
- **Minimum bending radius**
approx. 5x cable ø

Cable structure

HELUTHERM® 1200

- Stranded nickel conductor
- Double-insulated glass-fibre braiding, impregnated with silicone
- Braiding of special mineral fibres and additional impregnation with silicone

HELUTHERM® 1200-ES

- As per above
- Additional braided high-grade steel, coverage approx. 80%

Properties

- Asbestos and cadmium-free

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

HELUTHERM® 1200 cables are used in applications, where extremely high connecting and ambient temperatures occur, e.g. in iron and steel works, rolling mills, foundries, glass and ceramic plants, in furnace and power plant construction as well for wiring resistances in electrical heating equipment, furnaces and in thermoplastic forming. Good characteristics in the presence of moisture and chemical effects.

HELUTHERM® 1200-ES

The robust braiding of high-grade steel protects the cable from aggressive atmospheres and mechanical stresses. The high-grade braiding also gives this cable an attractive appearance. The braided screen can also be used for earthing purposes.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

HELUTHERM® 1200

Part no.	No. cores x cross-sec. mm ²	Conductor construction	Outer Ø approx. mm	Linear resistance at 20°C Ohm / km	Max. permitt. current carrying capacity at +700°C (A)	Nickel weight kg / km	Weight approx. kg / km	AWG-No.
51729	1 x 0,5	7 x 0,3	2,3	175	2	4,8	12,3	20
51730	1 x 0,75	11 x 0,3	2,6	115	3	7,2	16,1	18
51731	1 x 1	14 x 0,3	2,8	88	4	9,6	19,8	17
51732	1 x 1,5	21 x 0,3	3,2	59	5	14,4	27,5	16
51733	1 x 2,5	35 x 0,3	3,7	35	7	24,0	39,8	14
51734	1 x 4	56 x 0,3	4,5	22	9	38,0	58,0	12
51735	1 x 6	84 x 0,3	5,9	14,6	12	58,0	83,0	10
51736	1 x 10	140 x 0,3	8,0	8,8	14	96,0	160,0	8
51737	1 x 16	228 x 0,3	9,0	5,5	20	154,0	244,0	6
51738	1 x 25	354 x 0,3	10,6	3,5	24	240,0	376,0	4
51739	1 x 35	495 x 0,3	13,6	2,5	40	336,0	495,0	2
51740	1 x 50	707 x 0,3	14,5	1,5	48	480,0	654,0	1

HELUTHERM® 1200-ES

Part no.	No. cores x cross-sec. mm ²	Conductor construction	Outer Ø approx. mm	Linear resistance at 20°C Ohm / km	Max. permitt. current carrying capacity at +700°C (A)	Nickel weight kg / km	Weight approx. kg / km	AWG-No.
50635	1 x 0,5	7 x 0,3	3,6	175	2	4,8	26,0	20
50636	1 x 0,75	11 x 0,3	3,8	115	3	7,2	34,0	18
50637	1 x 1	14 x 0,3	4,2	88	4	9,6	42,0	17
50638	1 x 1,5	21 x 0,3	4,7	59	5	14,4	53,0	16
50639	1 x 2,5	35 x 0,3	5,0	35	7	24,0	64,0	14
50640	1 x 4	56 x 0,3	6,0	22	9	38,0	87,0	12
50641	1 x 6	84 x 0,3	7,5	14,6	12	58,0	120,0	10
50642	1 x 10	140 x 0,3	9,7	8,8	14	96,0	218,0	8
50643	1 x 16	228 x 0,3	10,9	5,5	20	154,0	314,0	6
50644	1 x 25	354 x 0,3	12,9	3,5	24	240,0	453,0	4
50645	1 x 35	495 x 0,3	15,7	2,5	40	336,0	593,0	2
50646	1 x 50	707 x 0,3	16,7	1,5	48	480,0	760,0	1

Dimensions and specifications may be changed without prior notice. (RK01)

Earth Conductors ESUY and ESY



Technical data

ESUY (H00V-D)

- Earthing cable of braid wires over core strands in adapted to DIN VDE 0283 part 3, and EN 61138
- **Conductor resistance** at 20 °C according DIN VDE 0283 part 3
- **Temperature range** -5 °C to +70 °C
- **Test voltage** 2000 V
- **Spark test** (during winding)
16 mm² to 35 mm² - 5000 V
50 mm² to 70 mm² - 6000 V
95 mm² to 240 mm² - 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimal bending radius**
approx. 12x cable ø

ESY

- Earthing cable in adapted to DIN VDE 0283 part 3 and EN 61138
- for further technical datas from conductor resistance - see above ESUY (H00V-D)

Application

ESUY (H00V-D)

ESY

These high flexible earth conductors are used for earthing of portable equipment and short-circuiting. These cables specially perform a protective function in repair live working of high voltage power supply company as EVU, in railway systems, failing current equipment, alternating current systems and in networks of transmission and distribution. Because of that these are designated as safety cables. These earthing cables offer special characteristics with low weights, high flexibility to a wide temperature range and the behavior in high temperature. The protective sheath over conductor assures the essential function for protection against the mechanical and chemical stresses.

Type ESUY (H00V-D), high flexible

Part no.	Cross-sec. mm ²	Cond. make-up n x wire Ø	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
28930	16	4200 x 0,07	8,3	194,0	230,0	6
28931	25	3192 x 0,1	9,5	280,0	335,0	4
28932	35	4480 x 0,1	11,2	415,0	475,0	2
28933	50	6383 x 0,1	13,2	585,0	670,0	1
28934	70	8918 x 0,1	15,6	820,0	905,0	2/0
28935	95	12100 x 0,1	17,4	1090,0	1220,0	3/0
28936	120	15300 x 0,1	19,8	1360,0	1505,0	4/0
28937	150	19152 x 0,1	23,4	1650,0	1940,0	300 kcmil
28938	185	23580 x 0,1	26,6	2150,0	2390,0	350 kcmil
28939	240	30600 x 0,1	30,2	2750,0	3090,0	500 kcmil

Type ESY, flexible

Part no.	Cross-sec. mm ²	Cond. make-up n x wire Ø	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
28940	16	525 x 0,2	8,4	155,0	185,0	6
28941	25	798 x 0,2	9,8	240,0	270,0	4
28942	35	1120 x 0,2	11,4	336,0	390,0	2
28943	50	1617 x 0,2	13,8	480,0	575,0	1
28944	70	2254 x 0,2	16,4	672,0	810,0	2/0
28945	95	3087 x 0,2	18,2	912,0	1080,0	3/0
28946	120	3822 x 0,2	20,1	1152,0	1320,0	4/0
28947	150	4802 x 0,2	23,0	1440,0	1680,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RK01)

Cable structure

ESUY (H00V-D)

- Bare copper, extra fine wire conductors, high flexible
- Braiding of bare copper wires over the stranded copper conductor
- PVC-jacket, transparent (glass clear), compound type TM2 according DIN VDE 0281 part 1

ESY

- Bare copper, fine wire conductors
- Copper conductors of stranded wires
- PVC-jacket, transparent (glass clear), compound type TM2 according DIN VDE 0281 part 1

Properties

- For these cable types no nominal voltages are mentioned, as these are: only used for earthing performances
- For further requirements see European Norm EN 61230 and DIN VDE 0683 part 100: Live working - Portable equipment for earthing and earthing

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².



Technical data

- Harmonized welding cable with rubber jacket, according to DIN VDE 0282 part 6 or HD 22.6 S2
- **Conductor resistance** according to HD 383 cl. 6
- **Conductor resistance factor** at 20 °C - see Technical Informations
- **Temperature range** flexing -25 °C to +80 °C fixed installation -40 °C to +80 °C
- **Admissible working temperature** at conductor +85 °C
- **Nominal voltage** U₀/U 100/100 V
- **Test voltage** 1000 V

Cable structure

- Plain copper conductors (on request tinned conductor available), extra fine stranded to DIN VDE 0295, BS 6360, IEC 60228 and HD 383
- Separator over conductor
- Neoprene outer jacket, chlorinated rubber compound EM5
- Outer sheath black
- Without green-yellow marking

Properties

- Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Oil resistant to DIN EN 60811-2-1
- The cable also maintains its high flexibility under the effect of ozone, light, oxygen, inert gas, oil or petrol

Note

- No. wires = Gauiding value, the number of individual wires are without obligation.

Application

For use between the welding generator and the hand-electrode and the workpiece. For use in the automobile industry, in shipbuilding, in transport and conveyor systems, tool making machinery, welding robots etc. These cables retain their high flexibility even under influence of ozone, light, oxygen, protective gases, oil and petrol. The robust construction makes these cables resistant to both to cold and the heat as well as to flames. They are suitable for use in open spaces and in dry and damp conditions.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

H01N2-D: Cables with standard flexibility, bending radius: approx. 12 x CableØ

Part no.	No. cores x cross-sec. mm ²	No. wires x single wire Ø mm	Sheat Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
31001	1 x 10	320 x 0,2	2	7,7 - 9,7	96,0	135,0	8
31002	1 x 16	512 x 0,2	2	8,8 - 11,0	154,0	205,0	6
31003	1 x 25	800 x 0,2	2	10,1 - 12,7	240,0	302,0	4
31004	1 x 35	1120 x 0,2	2	11,4 - 14,2	336,0	420,0	2
31005	1 x 50	1600 x 0,2	2,2	13,2 - 16,5	480,0	586,0	1
31006	1 x 70	2240 x 0,2	2,4	15,3 - 19,2	672,0	798,0	2/0
31007	1 x 95	3024 x 0,2	2,6	17,1 - 21,4	912,0	1015,0	3/0
31008	1 x 120	614 x 0,5	2,8	19,2 - 24,0	1152,0	1310,0	4/0
31030	1 x 150	765 x 0,5	3	21,2 - 26,4	1440,0	1620,0	300 kcmil
31031	1 x 185	944 x 0,5	3,2	23,1 - 28,9	1776,0	1916,0	350 kcmil
31009	1 x 240	1225 x 0,5	3,4	25,0 - 29,5	2304,0	2540,0	500 kcmil

H01N2-E: Cables with extreme high flexibility, bending radius: approx. 10 x CableØ

Part no.	No. cores x cross-sec. mm ²	No. wires x single wire Ø mm	Sheat Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
31032	1 x 10	566 x 0,15	1,2	6,2 - 7,8	96,0	119,0	8
31033	1 x 16	903 x 0,15	1,2	7,3 - 9,1	154,0	181,0	6
31034	1 x 25	1407 x 0,15	1,2	8,6 - 10,8	240,0	270,0	4
31035	1 x 35	1974 x 0,15	1,2	9,8 - 12,3	336,0	363,0	2
31036	1 x 50	2830 x 0,15	1,5	11,9 - 14,8	480,0	528,0	1
31037	1 x 70	3952 x 0,15	1,5	13,6 - 17,0	672,0	716,0	2/0
31038	1 x 95	5370 x 0,15	1,8	15,6 - 19,5	912,0	1012,0	3/0
31039	1 x 120	3819 x 0,2	1,8	17,2 - 21,6	1152,0	1190,0	4/0
31019	1 x 150	4788 x 0,2	1,8	18,8 - 23,5	1440,0	1305,0	300 kcmil
31020	1 x 185	5852 x 0,2	1,8	20,4 - 25,5	1776,0	1511,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RK01)

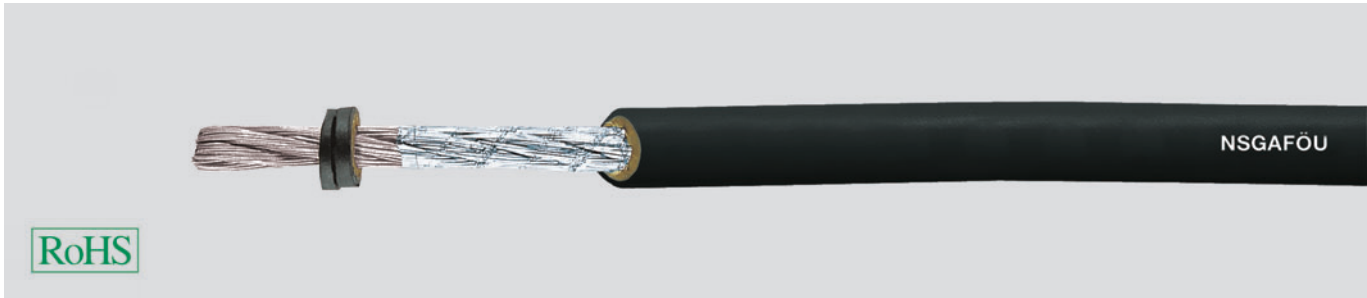
Repeat cycle operation based on a 5-minute repeat period

Cross-section mm ²	Permanent operation ED 100% A	Intermitted operation				
		ED 85% A	ED 60% A	ED 35% A	ED 20% A	ED 8% A
10	96	97	102	114	137	198
16	130	132	142	166	204	301
25	173	179	196	234	293	442
35	216	226	250	304	384	584
50	274	287	323	398	508	779
70	341	360	409	510	655	1011
95	413	438	502	632	816	1266
120	480	511	588	745	966	1502
150	557	594	687	875	1137	1771
185	638	683	793	1012	1319	2059

Repeat cycle operation based on a 10-min. repeat period

Cross-section mm ²	Permanent operation ED 100% A	Intermitted operation				
		ED 85% A	ED 60% A	ED 35% A	ED 20% A	ED 8% A
10	96	96	97	102	113	152
16	130	131	133	144	167	233
25	173	175	182	204	244	351
35	216	220	233	268	324	477
50	274	281	303	356	439	654
70	341	352	387	463	578	872
95	413	430	478	582	734	1117
120	480	503	564	692	880	1348
150	557	586	661	819	1046	1609
185	638	674	765	955	1226	1892

NSGAFÖU 3kV Special Rubber-Insulated Cable, VDE approved, short-circuit up to 1000V



Technical data

- Special rubber-insulated single core cables to DIN VDE 0250 part 602
- **Temperature range**
flexing -25 °C to +80 °C
fixed installation -40 °C to +80 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 1,8/3 kV
- Max. permissible **operating voltage** for three and one-phase alternating current operation U_0/U 2,1/3,6 kV, for direct current operation U_0/U 2,7/5,4 kV
- **Test voltage** 6 kV
- **Minimum bending radius**
5x cable \varnothing

Cable structure

- Tinned copper, fine wire conductors, bunch stranded to DIN VDE 0295 cl. 5 and IEC 60228 cl. 5
- EPR-insulation, compound type 3GI3 to DIN VDE 0207 part 20
- Polychloroprene outer jacket oil resistant, abrasion resistance
- Colour black or red

Properties

- **Oil resistant**
Test to DIN VDE 0473 part 811-2-1
- **Behaviour in fire**
Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Considered as being short-circuit safe and inherently earth-fault-proof are those operating materials and conducting assemblies where because of suitable measures and/or means applied, neither a short circuit nor a short to ground is to be expected under operating conditions which are in accordance with those specified for the intended application.

Note

- Version in 6 kV available on request.

Application

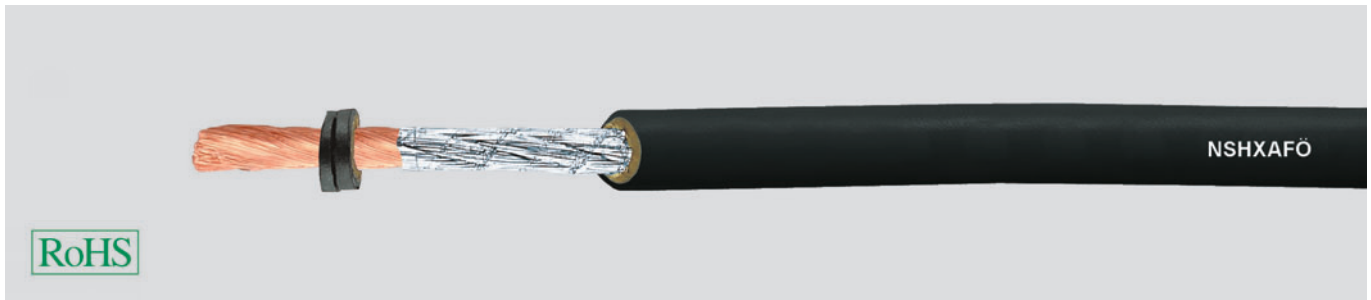
Particularly suitable for protection against short circuits in laying and for inherently earth-fault-proof routing in rail vehicles and omnibuses. Also suitable for laying in dry environments.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
38501	1 x 1,5	7,0	14,4	62,0	16
38502	1 x 2,5	7,5	24,0	76,0	14
38503	1 x 4	9,0	38,0	95,0	12
38504	1 x 6	9,5	58,0	140,0	10
38505	1 x 10	11,0	96,0	190,0	8
38506	1 x 16	13,0	154,0	270,0	6
38507	1 x 25	15,0	240,0	410,0	4
38508	1 x 35	16,5	336,0	490,0	2

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
38509	1 x 50	18,0	480,0	650,0	1
38510	1 x 70	20,5	672,0	900,0	2/0
38511	1 x 95	24,0	912,0	1200,0	3/0
38513	1 x 120	28,0	1152,0	1450,0	4/0
38514	1 x 150	31,0	1440,0	1800,0	300 kcmil
38512	1 x 185	26,0	1776,0	2200,0	350 kcmil
38515	1 x 240	34,5	2304,0	2650,0	500 kcmil
38516	1 x 300	38,0	2880,0	3250,0	600 kcmil

Dimensions and specifications may be changed without prior notice. (RK01)

NSHXAFÖ 3kV halogen-free Special Rubber-Insulated Cable, VDE approved, short-circuit up to 1000V



Technical data

- Special rubber core cable acc. to E DIN VDE 0250 Teil 606
- **Temperature range**
flexing -25 °C to +70 °C
fixed installation -40 °C to +90 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 1,8/3 kV
- Highest permissible **operating voltage** in three-phase and one-phase a.c. systems U_0/U 2,1/3,6 kV in d.c. systems U_0/U 2,7/5,4 kV
- **Test voltage** 6 kV
- **Minimum bending radius**
flexing 10x cable \varnothing
fixed 6x cable \varnothing

Cable structure

- Bare or tinned copper conductor, fine wire to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and/or IEC 60228 cl. 5
- EPR-insulation, 3GI3 acc. to DIN VDE 0207 part 20
- Halogen-free, polymer sheath GM3 acc. to DIN VDE 0207 part 24
- Colour black

Properties

Tests

- Corrosiveness of corrosive gases acc. to VDE 0482, part 267/ DIN EN 50267-2-2/ IEC 607542 (as per DIN VDE 0472, part 813)
- Smoke density acc. to DIN VDE 0482, part 268 HD 606, EN 50268-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (as per DIN VDE 0472, part 816)
- Oil resistant acc. to DIN VDE 0473 part 811-2-1
- Behaviour in fire: Test acc. to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Application

Particularly suitable for protection against short circuits in laying and for inherently earth-fault-proof routing in rail vehicles and omnibuses. Also suitable for laying in dry environments. In switching units and distributors, they are considered to be short circuit and inherently earth proof to 1000 V. Note: Considered as being short-circuit safe and inherently earth-fault-proof are those operating materials and conducting assemblies where because of suitable measures and/or means applied, neither a short circuit nor a short to ground is to be expected under operating conditions which are in accordance with those specified for the intended application.

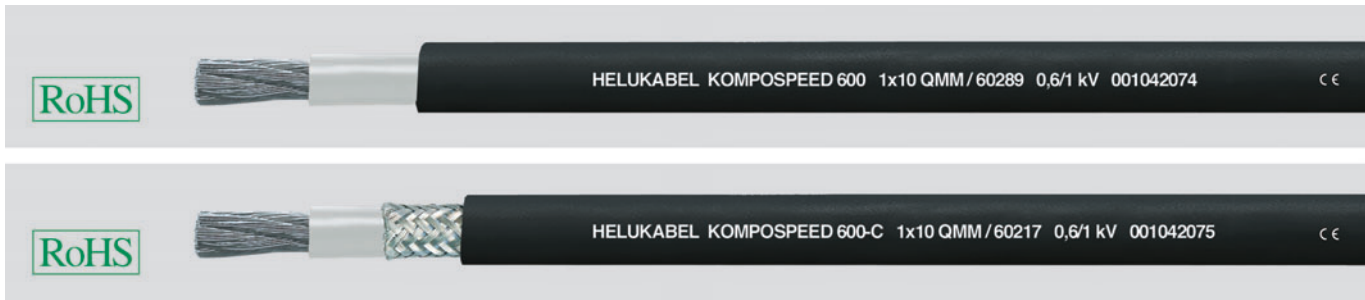
Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
38517	1 x 1,5	5,9	14,4	62,0	16
38518	1 x 2,5	6,2	24,0	76,0	14
38519	1 x 4	6,8	38,0	95,0	12
38520	1 x 6	7,4	58,0	140,0	10
38521	1 x 10	8,7	96,0	190,0	8
38522	1 x 16	9,5	154,0	270,0	6
38523	1 x 25	11,9	240,0	410,0	4
38524	1 x 35	13,1	336,0	490,0	2

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
38525	1 x 50	14,5	480,0	650,0	1
38526	1 x 70	16,3	672,0	900,0	4
38527	1 x 95	19,2	912,0	1200,0	3/0
38528	1 x 120	21,0	1152,0	1450,0	4/0
38529	1 x 150	22,8	1440,0	1800,0	300 kcmil
38530	1 x 185	24,8	1776,0	2200,0	350 kcmil
38531	1 x 240	27,1	2304,0	2650,0	500 kcmil
38532	1 x 300	30,3	2880,0	3250,0	600 kcmil

Dimensions and specifications may be changed without prior notice. (RK01)

K

KOMPOSPEED® 600 / 600-C 0,6/1kV double-insulated, halogen-free, special single cores for drag chains, EMC-preferred type



Technical data

- Special drag chain single cores for high mechanical stress, adapted to DIN VDE 0281 part 3
- **Temperature range**
flexing -30 °C to +90 °C
fixed installation -40 °C to +100 °C
- **zulässige Betriebstemperatur am Leiter** +90 °C
- **Nominal voltage** U₀/U 600/1000 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
KOMPOSPEED 600
flexing installation 5x cores ø
fixed installation 3x cores ø
KOMPOSPEED 600-C
flexing installation 7,5x cores ø
fixed installation 4x cores ø

Cable structure

KOMPOSPEED® 600

- Tinned copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- 1. Core insulation of special thermoplastic polymer, natural coloured
- 2. Core insulation of special polyolefine, black (RAL 9005)

KOMPOSPEED® 600-C

- Structure as above up to 1. core insulation
- Screen of tinned cu-braid, coverage approx. 85%
- 2. core-insulation of special polyolefine, black (RAL 9005)

Properties

- Very good oil resistant
- Halogen free
- Abrasion resistant
- **Resistant to**
Hydrofluoric acid
Hydrochloric acid
Diluted sulfuric acid
Coolants
Microbes
UV-radiation
Weather
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

The special single cores are used for permanent flexible applications in machineries, machine tools, composting appliances and sewage-treatment plants, animal stalls and greenhouses and used for permanent flexible application for movable automated machinery parts and multi-shift operation as well as in open air. These cables are installed for flexible use with free movements without tensile stress or forced movements and suitable for application in drag chains. The selected tinned copper wire conductor and tinned copper wire braid permit the installation in aggressive environments as well as hydrogen sulfide, ammonia and sulfur dioxide.

KOMPOSPEED® 600-C These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications (electromagnetic compatibility).

EMC = Electromagnetic compatibility.

For application as a protective core, the ends are to be identified with green-yellow shrink-on tubes.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

KOMPOSPEED® 600

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
60288	1 x 6	6,5	58,0	83,0	10
60289	1 x 10	8,4	96,0	132,0	8
60290	1 x 16	9,5	154,0	188,0	6
60291	1 x 25	11,2	240,0	281,0	4
60292	1 x 35	13,0	336,0	404,0	2
60293	1 x 50	15,4	480,0	531,0	1
60294	1 x 70	17,2	672,0	729,0	2/0
60295	1 x 95	20,0	912,0	1049,0	3/0
60296	1 x 120	21,0	1152,0	1220,0	4/0
60297	1 x 150	23,8	1440,0	1510,0	300 kcmil
60298	1 x 185	26,2	1776,0	1932,0	350 kcmil

KOMPOSPEED® 600-C

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
60216	1 x 6	7,3	71,0	101,0	10
60217	1 x 10	9,1	122,0	168,0	8
60218	1 x 16	10,1	180,0	217,0	6
60219	1 x 25	12,2	282,0	342,0	4
60220	1 x 35	14,2	386,0	468,0	2
60221	1 x 50	17,0	535,0	584,0	1
60222	1 x 70	19,2	750,0	822,0	2/0
60223	1 x 95	21,8	1004,0	1190,0	3/0
60224	1 x 120	23,8	1260,0	1400,0	4/0
60225	1 x 150	26,0	1570,0	1710,0	300 kcmil
60226	1 x 185	28,8	1911,0	2021,0	350 kcmil
62500	1 x 240	34,0	2470,0	2850,0	6

Dimensions and specifications may be changed without prior notice. (RK01)



K

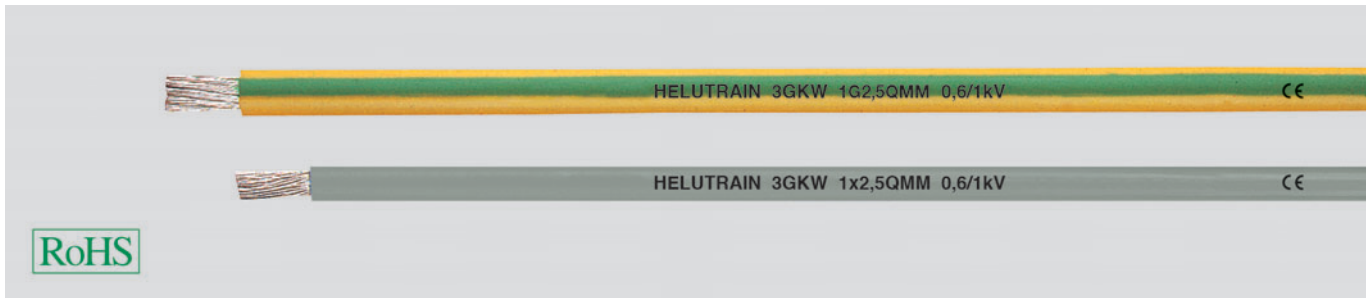
HELUTRAIN 3GKW
HELUTRAIN 4GKW

Photo: fotolia.com

Train Cable

HELUTRAIN® 3GKW Train-Cable, robust special single core, halogen-free, 0,6/1kV, meter marking

new



Technical data

- Temperature resistant special-insulated wire
- **Temperature range**
flexing -35 °C to +90 °C
fixed installation -45 °C to +120 °C
- **Short-circuit temperature**
+250 °C
- **Nominal voltage**
U₀/U 0,6/1 kV (AC)
U₀/U 0,9/1,8 kV (DC)
- **Test voltage**
3,5 kV
- **Minimum bending radius**
fixed installation for cable ø
to 10 mm 3 x cable ø
> 10 mm 4 x cable ø
flexing for cable ø
to 10 mm 5 x cable ø
> 10 mm 6 x cable ø

Cable structure

- Tinned copper, fine wire conductors, conform to DIN VDE 0295 cl. 5 and IEC 60228 cl. 5
- Core insulation from Polyolefin Copolymer, cross-linked
- Colour grey or green-yellow

Properties

Tests

- **Flame test** to VDE 0482 part 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (conforms to DIN VDE 0472 Teil 804 test method C)
- **Flame retardant** to DIN VDE 0482-331-1-2, DIN EN 60332-1-2, IEC 60332-1
- **Corrosiveness of combustion gases** to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (conforms to DIN VDE 0472 part 813)
- **Halogen-free** to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- **Smoke density** to VDE 0482 part 268-1 u. 2, test method C, IEC 61034-1/61034-2, HD 606 and BS 7622 part 1 and 2 (conforms to DIN VDE 0472 part 816)
- **Oil- and gasoline resistant** to EN 50305
- **Ozon resistant** to EN 50305
- **Low fire load** (DIN 51900)
- **No fluor** (EN 60684-2)
- Resistant to mechanical influences in rough environmental conditions
- Good chemical durability with simultaneous high fire safety
- Reduction of toxic combustion gases and the spread of the fire source in case of fire increases protection against personal injury and property damage
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

HELUTRAIN® 3 GKW train cable are Halogen-free and suitable for fixed and protected installation in rough environmental conditions inside and outside of rail vehicles. For connecting fixed and moving parts. Due to the flexibility and the small outer diameter suitable for fixed installation in small bending radii.

=The product conforms to the EG Low-Voltage Directive 2006/95/EG.

Core colour grey

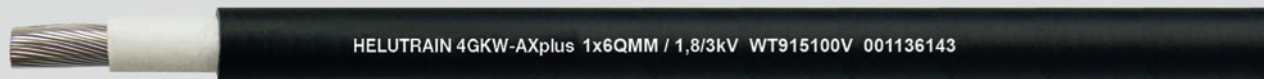
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59114	1 x 0,5	2,0	4,8	9,0	-
59115	1 x 0,75	2,2	7,2	12,0	-
59116	1 x 1	2,4	9,6	14,0	-
59117	1 x 1,5	2,7	14,4	21,0	-
59118	1 x 2,5	3,4	24,0	31,0	-
59119	1 x 4	3,9	38,4	46,0	-
59126	1 x 6	4,6	57,6	68,0	-
59127	1 x 10	5,5	96,0	111,0	-
59128	1 x 16	7,1	154,0	166,0	-
59129	1 x 25	8,6	240,0	250,0	-
59130	1 x 35	9,8	336,0	350,0	-
59131	1 x 50	12,0	480,0	500,0	-
59132	1 x 70	14,2	672,0	690,0	-
59133	1 x 95	15,6	912,0	940,0	-
59134	1 x 120	17,6	1152,0	1180,0	-
59135	1 x 150	20,3	1440,0	1460,0	-

Core colour green-yellow

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53762	1 x 0,5	2,0	4,8	9,0	-
53763	1 x 0,75	2,2	7,2	12,0	-
53764	1 x 1	2,4	9,6	14,0	-
53765	1 x 1,5	2,7	14,4	21,0	-
53766	1 x 2,5	3,4	24,0	31,0	-
53767	1 x 4	3,9	38,4	46,0	-
53768	1 x 6	4,6	57,6	68,0	-
53769	1 x 10	5,5	96,0	111,0	-
53770	1 x 16	7,1	154,0	166,0	-
53771	1 x 25	8,6	240,0	250,0	-
53772	1 x 35	9,8	336,0	350,0	-
53773	1 x 50	12,0	480,0	500,0	-
53774	1 x 70	14,2	672,0	690,0	-
53775	1 x 95	15,6	912,0	940,0	-
53776	1 x 120	17,6	1152,0	1180,0	-
53777	1 x 150	20,3	1440,0	1460,0	-

Dimensions and specifications may be changed without prior notice. (RK01)

HELUTRAIN® 4GKW-AXplus Train-Cable, robust special single core, halogen-free, 1,8/3kV, meter marking



HELUTRAIN 4GKW-AXplus 1x6QMM / 1,8/3kV WT915100V 001136143

new



Technical data

- **Temperature range**
Fixed installation: -60 °C to +120 °C
Flexing: -35 °C to +90 °C
Short circuit: +200 °C
- **Nominal voltage**
U₀/U AC 1,8/3 kV
U₀/U DC 2,7 kV
- **Test voltage**
6,5 kV AC
- **Minimum bending radius**
< 10 mm fixed installation > 5 x D
flexing > 7 x D
> 10 mm fixed installation > 6 x D
flexing > 8 x D

Cable structure

- Tinned copper conductor, fine wire stranded according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 or IEC 60228 cl. 5
- Core insulation of crosslinked polyolefin copolymer
- Outer jacket cross linked Elastomer
- Jacket colour: black

Properties

Tests

- **Flame test** to VDE 0482 part 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (conforms to DIN VDE 0472 Teil 804 test method C)
- **Flame retardant** to DIN VDE 0482-331-1-2, DIN EN 60332-1-2, IEC 60332-1
- **Corrosiveness of combustion gases** to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (conforms to DIN VDE 0472 part 813)
- **Halogen-free** to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- **Smoke density** to VDE 0482 part 268-1 u. 2, test method C, IEC 61034-1/61034-2, HD 606 and BS 7622 part 1 and 2 (conforms to DIN VDE 0472 part 816)
- **No toxic gases** (EN 50305)
- **Oil- and gasoline resistant** to EN 50305
- **Ozon resistant** to EN 50305
- **Low fire load** (DIN 51900)
- **No fluor** (EN 60684-2)
- High voltage resistance and mechanical influences in rough environmental conditions
- Resistant to mechanical influences in rough environmental conditions
- Good chemical durability with simultaneous high fire safety
- Reduction of toxic combustion gases and the spread of the fire source in case of fire increases protection against personal injury and property damage
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

K

Application

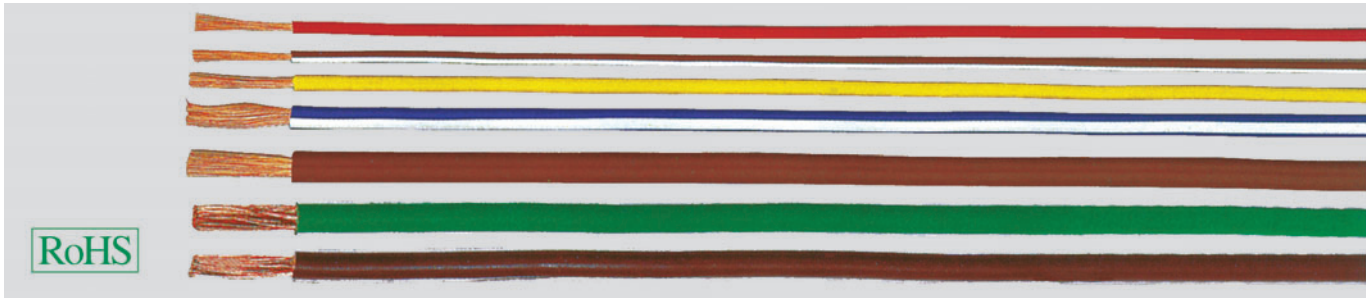
For fixed installation inside and outside of unprotected rail cars and buses. For connecting fixed and moving parts. Suitable for wiring of switchboards, distribution boards, power converters, electrical panels and blocks, resistor and brake blocks.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59262	1 x 1,5	3,6	14,4	24,0	-
59263	1 x 2,5	4,0	24,0	34,0	-
59264	1 x 4	4,9	38,4	53,0	-
59265	1 x 6	5,5	57,6	74,0	-
59266	1 x 10	6,5	96,0	118,0	-
59267	1 x 16	8,7	153,6	182,0	-
59268	1 x 25	10,2	240,0	274,0	-
59269	1 x 35	11,5	336,0	379,0	-

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59312	1 x 50	13,6	480,0	536,0	-
59313	1 x 70	16,0	672,0	729,0	-
59314	1 x 95	17,5	912,0	960,0	-
59315	1 x 120	20,0	1152,0	1203,0	-
59316	1 x 150	22,0	1440,0	1464,0	-
59317	1 x 185	24,1	1776,0	1802,0	-
59318	1 x 240	26,8	2304,0	2348,0	-

Dimensions and specifications may be changed without prior notice. (RK01)

Vehicle Cable FLY one colour / two colour (old type FLK), according to DIN ISO 6722



Technical data

- Special PVC core insulation
- **Temperature stability**
(3000 h) -25 °C to +90 °C
- **Nominal voltage** up to 24 V
- **Test voltage** 1 kV (effective value)
- **Breakdown voltage**
5 kV (effective value)
- **Specific volume resistance**
min. 10^9 Ohm x mm

Cable structure

- Bare copper conductor, soft annealed electrolytic copper E-Cu58 F21 according to DIN 40500 part 4 (the mechanical requirements valid for unprocessing single wires)
- Copper conductor fine wire stranded as per DIN ISO 6722 part 3
- PVC core insulation
- For three-colour combinations we produce only on request

Properties

- Oil and fuel resistant as per DIN ISO 6722 part 2

Note

- **Minimum quantities**
Per cross-section and colour combination:
2-colour
0,5 to 2,5 mm² = 3 km
4,0 to 25 mm² = 1 km
3-colour
0,5 to 2,5 mm² = 5 km
4,0 to 25 mm² = 3 km
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

PVC insulated single core cables are used for vehicle constructions.

one colour

Cross-section mm ²	Outer Ø min. - max.	Cop. weight kg / km	Weight approx. kg / km	black	white	blue	og	brown	green	vio	red	pink	ye	grey
Part no. 0,5	2,0 - 2,3	4,8	9,0	29800	40204	40217	40230	40243	40256	40269	40282	40295	40308	40321
Part no. 0,75	2,2 - 2,5	7,2	12,0	29801	40205	40218	40231	40244	40257	40270	40283	40296	40309	40322
Part no. 1	2,4 - 2,7	9,6	15,0	29802	40206	40219	40232	40245	40258	40271	40284	40297	40310	40323
Part no. 1,5	2,7 - 3,0	14,4	20,0	29803	40207	40220	40233	40246	40259	40272	40285	40298	40311	40324
Part no. 2,5	3,3 - 3,6	24,0	32,0	29804	40208	40221	40234	40247	40260	40273	40286	40299	40312	40325
Part no. 4	4,0 - 4,4	38,4	48,0	29805	40209	40222	40235	40248	40261	40274	40287	40300	40313	40326
Part no. 6	4,6 - 5,0	57,6	68,0	29806	40210	40223	40236	40249	40262	40275	40288	40301	40314	40327
Part no. 10	6,0 - 6,5	96,0	117,0	29807	40211	40224	40237	40250	40263	40276	40289	40302	40315	40328
Part no. 16	7,0 - 8,3	154,0	189,0	29808	40212	40225	40238	40251	40264	40277	40290	40303	40316	40329
Part no. 25	9,4 - 10,4	240,0	288,0	29809	40213	40226	40239	40252	40265	40278	40291	40304	40317	40330
Part no. 35	10,8 - 11,6	336,0	382,0	29810	40214	40227	40240	40253	40266	40279	40292	40305	40318	40331
Part no. 50	12,5 - 13,5	480,0	540,0	29811	40215	40228	40241	40254	40267	40280	40293	40306	40319	40332
Part no. 70	14,5 - 15,5	672,0	744,0	29812	40216	40229	40242	40255	40268	40281	40294	40307	40320	40333

Dimensions and specifications may be changed without prior notice. (RK01)

Vehicle Cable FLY one colour / two colour (old type FLK),

according to DIN ISO 6722

two colour

Cross-section mm ²	Outer Ø min. - max.	Cop. weight kg / km	Weight approx. kg / km	wh/gy	wh/rd	wh/bn	wh/bu	wh/bk	ye/gy	ye/rd	ye/bn	ye/bu	yellow/back
Part no. 0,5	2,0 - 2,3	4,8	9,0	40334	40347	40360	40373	40386	40399	40412	40425	40438	40451
Part no. 0,75	2,2 - 2,5	7,2	12,0	40335	40348	40361	40374	40387	40400	40413	40426	40439	40452
Part no. 1	2,4 - 2,7	9,6	15,0	40336	40349	40362	40375	40388	40401	40414	40427	40440	40453
Part no. 1,5	2,7 - 3,0	14,4	20,0	40337	40350	40363	40376	40389	40402	40415	40428	40441	40454
Part no. 2,5	3,3 - 3,6	24,0	32,0	40338	40351	40364	40377	40390	40403	40416	40429	40442	40455
Part no. 4	4,0 - 4,4	38,4	48,0	40339	40352	40365	40378	40391	40404	40417	40430	40443	40456
Part no. 6	4,6 - 5,0	57,6	68,0	40340	40353	40366	40379	40392	40405	40418	40431	40444	40457
Part no. 10	6,0 - 6,5	96,0	117,0	40341	40354	40367	40380	40393	40406	40419	40432	40445	40458
Part no. 16	7,0 - 8,3	154,0	189,0	40342	40355	40368	40381	40394	40407	40420	40433	40446	40459
Part no. 25	9,4 - 10,4	240,0	288,0	40343	40356	40369	40382	40395	40408	40421	40434	40447	40460
Part no. 35	10,8 - 11,6	336,0	382,0	40344	40357	40370	40383	40396	40409	40422	40435	40448	40461
Part no. 50	12,5 - 13,5	480,0	540,0	40345	40358	40371	40384	40397	40410	40423	40436	40449	40462
Part no. 70	14,5 - 15,5	672,0	744,0	40346	40359	40372	40385	40398	40411	40424	40437	40450	40463

two colour

Cross-section mm ²	Outer Ø min. - max.	Cop. weight kg / km	Weight approx. kg / km	gy/gn	gy/rd	gy/bn	gy/bk	gn/wh	gn/gy	gn/bn	gn/bu	green/black
Part no. 0,5	2,0 - 2,3	4,8	9,0	40464	40477	40490	40802	40503	40516	40529	40542	40555
Part no. 0,75	2,2 - 2,5	7,2	12,0	40465	40478	40491	40803	40504	40517	40530	40543	40556
Part no. 1	2,4 - 2,7	9,6	15,0	40466	40479	40492	40804	40505	40518	40531	40544	40557
Part no. 1,5	2,7 - 3,0	14,4	20,0	40467	40480	40493	40805	40506	40519	40532	40545	40558
Part no. 2,5	3,3 - 3,6	24,0	32,0	40468	40481	40494	40806	40507	40520	40533	40546	40559
Part no. 4	4,0 - 4,4	38,4	48,0	40469	40482	40495	40807	40508	40521	40534	40547	40560
Part no. 6	4,6 - 5,0	57,6	68,0	40470	40483	40496	40808	40509	40522	40535	40548	40561
Part no. 10	6,0 - 6,5	96,0	117,0	40471	40484	40497	40809	40510	40523	40536	40549	40562
Part no. 16	7,0 - 8,3	154,0	189,0	40472	40485	40498	40810	40511	40524	40537	40550	40563
Part no. 25	9,4 - 10,4	240,0	288,0	40473	40486	40499	40811	40512	40525	40538	40551	40564
Part no. 35	10,8 - 11,6	336,0	382,0	40474	40487	40500	40812	40513	40526	40539	40552	40565
Part no. 50	12,5 - 13,5	480,0	540,0	40475	40488	40501	40813	40514	40527	40540	40553	40566
Part no. 70	14,5 - 15,5	672,0	744,0	40476	40489	40502	40814	40515	40528	40541	40554	40567

Dimensions and specifications may be changed without prior notice.

K

Vehicle Cable FLY one colour / two colour (old type FLK),

according to DIN ISO 6722

two colour

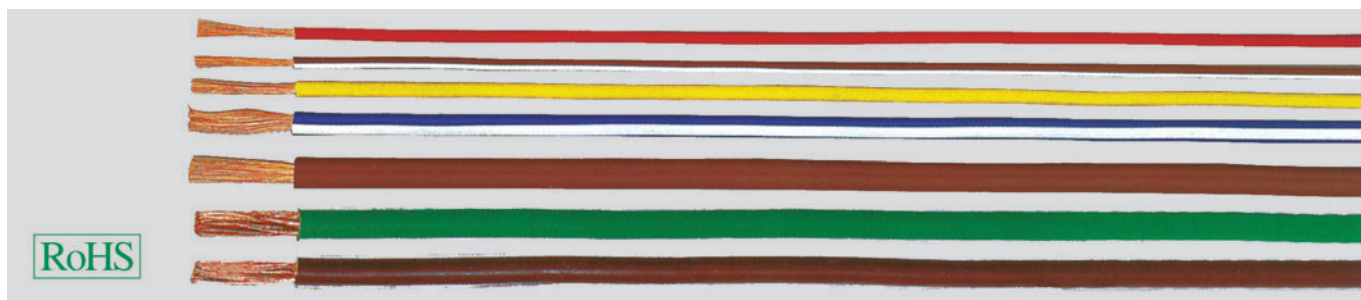
Cross-section mm ²	Outer Ø min. - max.	Cop. weight kg / km	Weight approx. kg / km	rd/wh	rd/ye	rd/gy	rd/gn	rd/bu	rd/bk	bn/wh	bn/ye	bn/gn	bn/bk
Part no. 0,5	2,0 - 2,3	4,8	9,0	40568	40581	40594	40607	40620	40633	40646	40659	40672	40685
Part no. 0,75	2,2 - 2,5	7,2	12,0	40569	40582	40595	40608	40621	40634	40647	40660	40673	40686
Part no. 1	2,4 - 2,7	9,6	15,0	40570	40583	40596	40609	40622	40635	40648	40661	40674	40687
Part no. 1,5	2,7 - 3,0	14,4	20,0	40571	40584	40597	40610	40623	40636	40649	40662	40675	40688
Part no. 2,5	3,3 - 3,6	24,0	32,0	40572	40585	40598	40611	40624	40637	40650	40663	40676	40689
Part no. 4	4,0 - 4,4	38,4	48,0	40573	40586	40599	40612	40625	40638	40651	40664	40677	40690
Part no. 6	4,6 - 5,0	57,6	68,0	40574	40587	40600	40613	40626	40639	40652	40665	40678	40691
Part no. 10	6,0 - 6,5	96,0	117,0	40575	40588	40601	40614	40627	40640	40653	40666	40679	40692
Part no. 16	7,0 - 8,3	154,0	189,0	40576	40589	40602	40615	40628	40641	40654	40667	40680	40693
Part no. 25	9,4 - 10,4	240,0	288,0	40577	40590	40603	40616	40629	40642	40655	40668	40681	40694
Part no. 35	10,8 - 11,6	336,0	382,0	40578	40591	40604	40617	40630	40643	40656	40669	40682	40695
Part no. 50	12,5 - 13,5	480,0	540,0	40579	40592	40605	40618	40631	40644	40657	40670	40683	40696
Part no. 70	14,5 - 15,5	672,0	744,0	40580	40593	40606	40619	40632	40645	40658	40671	40684	40697

two colour

Cross-section mm ²	Outer Ø min. - max.	Cop. weight kg / km	Weight approx. kg / km	bu/wh	bu/ye	bu/gn	bu/rd	bk/wh	bk/ye	bk/gn	bk/rd
Part no. 0,5	2,0 - 2,3	4,8	9,0	40698	40711	40724	40737	40750	40763	40776	40789
Part no. 0,75	2,2 - 2,5	7,2	12,0	40699	40712	40725	40738	40751	40764	40777	40790
Part no. 1	2,4 - 2,7	9,6	15,0	40700	40713	40726	40739	40752	40765	40778	40791
Part no. 1,5	2,7 - 3,0	14,4	20,0	40701	40714	40727	40740	40753	40766	40779	40792
Part no. 2,5	3,3 - 3,6	24,0	32,0	40702	40715	40728	40741	40754	40767	40780	40793
Part no. 4	4,0 - 4,4	38,4	48,0	40703	40716	40729	40742	40755	40768	40781	40794
Part no. 6	4,6 - 5,0	57,6	68,0	40704	40717	40730	40743	40756	40769	40782	40795
Part no. 10	6,0 - 6,5	96,0	117,0	40705	40718	40731	40744	40757	40770	40783	40796
Part no. 16	7,0 - 8,3	154,0	189,0	40706	40719	40732	40745	40758	40771	40784	40797
Part no. 25	9,4 - 10,4	240,0	288,0	40707	40720	40733	40746	40759	40772	40785	40798
Part no. 35	10,8 - 11,6	336,0	382,0	40708	40721	40734	40747	40760	40773	40786	40799
Part no. 50	12,5 - 13,5	480,0	540,0	40709	40722	40735	40748	40761	40774	40787	40800
Part no. 70	14,5 - 15,5	672,0	744,0	40710	40723	40736	40749	40762	40775	40788	40801

Dimensions and specifications may be changed without prior notice.

Vehicle Cable FLRY FLRY-Type A (FLK-R) / -Type B (FLK-D)



Technical data

- Special PVC core insulation
- **Temperature stability**
(3000 h) -40°C to +105°C
- **Nominal voltage** up to 24 V
- **Test voltage**
1 kV (effective value)
- **Breakdown voltage**
5 kV (effective value)
- **Specific volume resistance**
min. 10⁹ Ohm x mm
- **Type A** = Conductor make-up symmetrical (1+6+12), number of single wires are odd number; a single wire laying at the centre of the cross-section.

Cable structure

- Bare copper conductor, soft annealed electrolytic copper E-Cu58 F21 according to DIN 40500 part 4 (the mechanical requirements valid for unprocessing single wires)
- Stranded copper conductor bare, conductor make-up as per DIN 72551
Type A: Conductor make-up symmetrical
Type B: Conductor make-up unsymmetrical
- Special PVC core insulation

Properties

- Oil and fuel resistant as per DIN ISO 6722 part 2
- **Special characteristics**
Place and weight saving by using the reduced insulation wall thickness.
- **Requirements and tests**
As per DIN 72551 part 5

Note

- **Indication for order**
Please mention the core colour and colour combination **clearly** to your order, because a re-acceptance of false ordered articles is impossible.
- **Minimum quantities**
Per cross-section and colour combination:
2-colour
0,5 to 2,5 mm² = 3 km
4,0 to 25 mm² = 1 km
3-colour
0,5 to 2,5 mm² = 5 km
4,0 to 25 mm² = 3 km
- For three-colour combinations we produce **only** on request.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

PVC insulated single core cables are used for vehicle constructions.

FLRY - Type A (FLK-R)

Cross-section mm ²	Outer Ø min. - max.	Cop. weight kg / km	Weight approx. kg / km	AWG-No. black	AWG-No. white	AWG-No. blue	AWG-No. og	AWG-No. brown	AWG-No. green	AWG-No. vio	AWG-No. red	AWG-No. pink	AWG-No. ye	AWG-No. grey
Part no. 0,35	1,2 - 1,3	3,4	4,5	28484	28485	28486	28487	28488	28489	28490	28491	28492	28493	28494
Part no. 0,5	1,4 - 1,6	4,8	6,6	28495	28496	28497	28498	28499	28500	28501	28502	28503	28504	28505

FLRY - Type B (FLK-D)

Cross-section mm ²	Outer Ø min. - max.	Cop. weight kg / km	Weight approx. kg / km	AWG-No. black	AWG-No. white	AWG-No. blue	AWG-No. og	AWG-No. brown	AWG-No. green	AWG-No. vio	AWG-No. red	AWG-No. pink	AWG-No. ye	AWG-No. grey
Part no. 0,75	1,7 - 1,9	7,2	9,0	28506	28507	28508	28509	28510	28511	28512	28513	28514	28515	28516
Part no. 1	1,9 - 2,1	9,6	11,0	28517	28518	28519	28520	28521	28522	28523	28524	28525	28526	28527
Part no. 1,5	2,2 - 2,4	14,4	16,0	28528	28529	28530	28531	28532	28533	28534	28535	28536	28537	28538
Part no. 2,5	2,7 - 3,0	24,0	26,0	28539	28540	28541	28542	28543	28544	28545	28546	28547	28548	28549
Part no. 4	3,4 - 3,7	38,0	42,0	28550	28551	28552	28553	28554	28555	28556	28557	28558	28559	28560
Part no. 6	4,0 - 4,3	58,0	61,0	28561	28562	28563	28564	28565	28566	28567	28568 5/0	28569	28570	28571

Further types of Vehicle Cables on request

FLYW	FLSY	FL6G	FLYZ	FLYDY	FL4G11Y
FLX	FLYY	FL4C	FLYYF	FLRYDY	FL4CYW
FLYK	FLYTL	FL7Y	FZLY	FLRYBDY	
FLRY		FL6Y			

Dimensions and specifications may be changed without prior notice. (RK01)

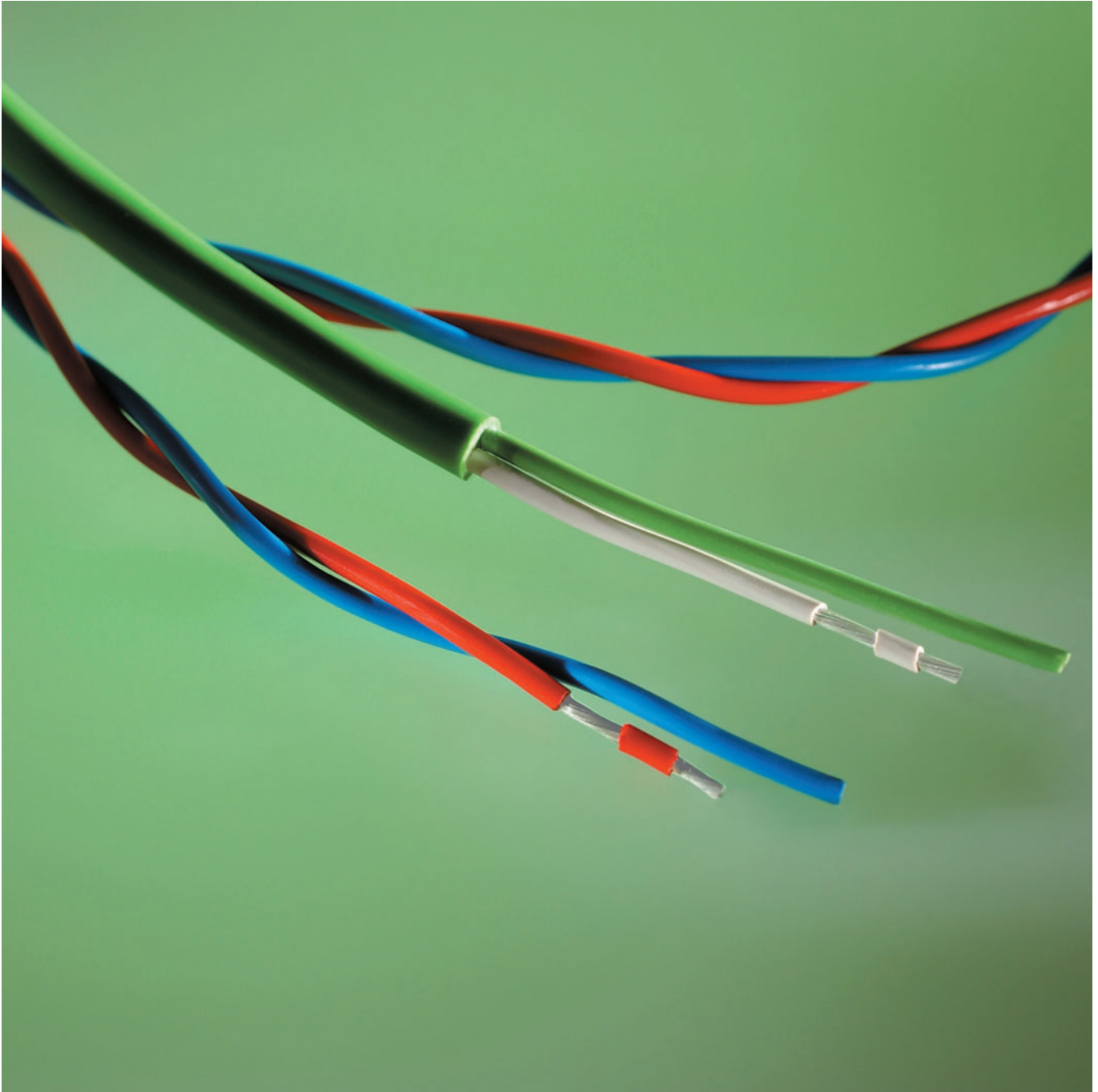
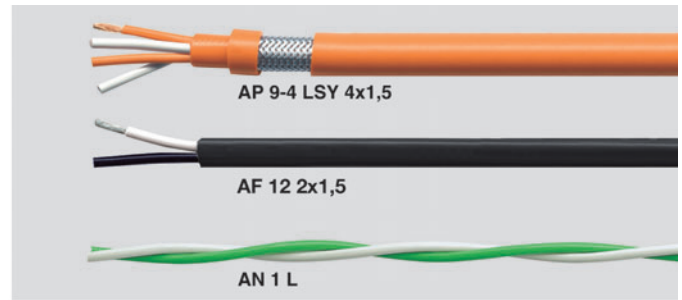
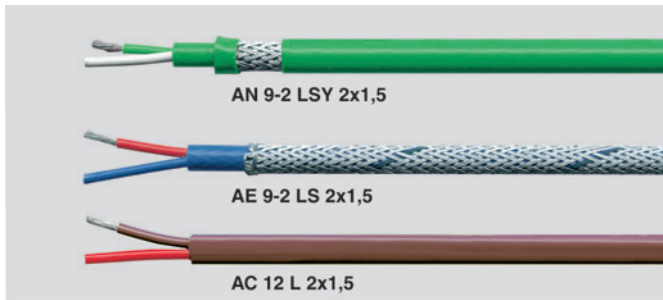


Photo: HELUKABEL®

Compensating Cables



Technical data

– Special insulation as per requirement of PVC, Silicone, Fluorinated polymeric or Glassfilament

– Conductor resistance

according DIN 43713

Fe: 0,080 Ohm/m

CuNi: 0,327 Ohm/m

NiCr: 0,07 Ohm/m

Ni: 0,3 Ohm/m

PtRh: 0,023 Ohm/m

Pt: 0,041 Ohm/m

– Test voltage

for PVC-, Fluorinated polymeric- and Silicone cables

core/core 500 V

core/screen 500 V

screen/screen 500 V

– Test voltage

Cables with Glassfilament

core/core 500 V

– Insulation resistance

for PVC, Silicone and Fluorinated polymeric

min. 10 MOhm·km

– Capacitance

(approx. value) – nF/km

	Stranded wire 1,5 mm ²	Solid wire 1,5 mm ²	Stranded wire 0,22mm ²
• PVC			
core	135	138	115
pair			
screened	240	245	180
• FEP			
core	60	60	45
pair			
screened	120	120	70
• Silicone			
core	80	70	45

– Induction (guiding value)

for PVC, Fluorinated polymeric and Silicon cables < 1 mH/km

– Corrosiveness of combustion gases (free from halogen)

• Silicone + Glassfilament

Test method to VDE 0472 part 813 and IEC 60754-1

• no evolution of corrosive gases

– Behaviour in fire

PVC sheath self-extinguishing and flame retardant acc. to VDE 0482-322-1-2, DIN EN 60332-1-2/IEC 60332-1 (equals to DIN VDE 0472 part 804 test method B)

Cable structure

- Conductors of stranded wires or solid, insulated with special material
- Conductors: Fe/CuNi, Ni/Cr Ni or Pt Rh/Pt
- Insulations: PVC, Silicone, Fluorinated polymeric or Glassfilament
- Core identification:
 - colour coded, single colour (see also colour-identification table)
- Colour code for pairs from 2 pairs and above the individual pairs number coded
- Jacketing materials are of PVC, Silicone, Fluorinated polymeric or Glassfilament-braiding
- Screened braiding of galvanized steel wire (type SY) or galvanized copper wire braided screen.

Measuring

For temperature measuring the temperature dependent upon the characteristics of materials are taken into consideration, for example the expansion thermometer of the thermocouples etc.

Temperature measuring appliances with a thermocouple as transmitter of the measured value consists generally of the thermocouple, the connection between the junction and a reference part, a comparative part where the temperature is known under a voltage measuring device. The fitted connection line between the thermocouple and the comparative part must have the same thermoelectrical characteristics as the thermocouple. The difference of temperature is measured between the measuring point and the comparative part of the cable. Tolerance of the meter resistance $\pm 10\%$.

For hazardous areas

The compensating cables for thermoelements with plastic insulation are permitted to imprint colour longitudinal stripe of the same belonging thermoelement types, and as:

Cu/Cu-Ni = brown, Fe/Cu-Ni = dark blue, NiCr/Ni = green, Pt-Rh/Pt = white

The compensating cables for thermoelements with mineral insulation or with metal braiding must be identified with a light blue coloured tape of sufficient width for intrinsic safe, which can be webed in the braiding.

- Flame test to DIN VDE 0482 part 266-2/ HD 405.3, BS 4066 part 3/EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)

Application

Compensating cables are an essential part of exact and precise measuring capabilities. They are used as extension leads from the thermocoupling elements to the measure gauge.

Compensating cables are made up of a positive and a negative core which, at a thermocoupler temperature of up to +200°C, retain the same properties as a Thermopair according to DIN 43710.

Materials

(Compensating wires and strands) We distinguish between original raw materials and substitutes.

- Compensating wires and strands of **original raw materials** are made of the same material as the corresponding thermocouple and they are called Thermocable or Thermocouplecable.
- Compensating wires and strands of **substitute materials**, which consist of alloys and which are not identical with the corresponding thermocouple are called Compensating Cable.

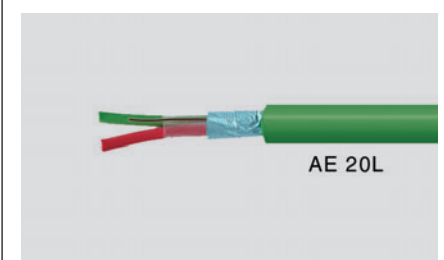
- **Substitute materials** are used for the thermopairs Type **K** and Type **N**.
- **Precious metal thermopairs** Type **R**, Type **S**, Type **B** consist of thermomaterials.

Thermocouple cables





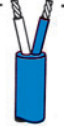






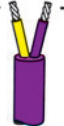






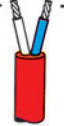
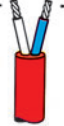






Thermocouple cables consist of the same element material as the thermocouple and are tested to the same temperatures. These cables are manufactured to customers request.

Note

Thermomaterials consist of very expensive materials while the substitutes are much cheaper.






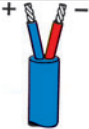




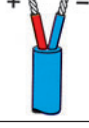
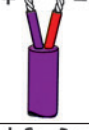
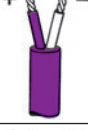
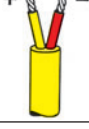
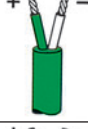






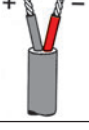
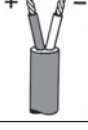
Colour identification and temperature ranges

Identification letter of Thermo-pairs	Material combination		 NF C 42-324		 BS 4937	
	+	-	THL	AGL	THL	AGL
T	Cu	Cu Ni	TX -25°C to +100°C 	TC -25°C to +100°C 	TX 0°C to +100°C 	
U	Cu	Cu Ni				
J	Fe	Cu Ni	JX -25°C to +200°C 	JC -25°C to +250°C 	JX 0°C to +200°C 	
L	Fe	Cu Ni				
E	Ni Cr	Cu Ni	EX -25°C to +200°C 	EC -25°C to +250°C 	EX 0°C to +200°C 	
K	Ni Cr	Ni	KX -25°C to +200°C 	KC -25°C to +200°C 	KX 0°C to +200°C 	
	Ni Cr	Ni		WC 0°C to +150°C 		
	Ni Cr	Ni		VC 0°C to +100°C - 		VX 0°C to +100°C 
N	Ni Cr Si	Ni Si				
R S	PtRh 13 PtRh 10	Pt Pt		SC 0°C to +200°C 		SX 0°C to +200°C 
B	PtRh 30	PtRh 6		BC 0°C to +100°C 		

The highest application temperature of the insulating materials or the application temperature range of the conductor material is limited for the application temperature range of the cable. Valid with the corresponding lower value.

For intrinsically safe installation generally provides with a blue coloured jacket and an element with the associated identification stripe.

for Thermo- and Compensating Cables

 ANSI MC 96.1		 DIN IEC 584		 DIN 43710*	
THL	AGL	THL	AGL	THL	AGL
TX 0°C to +100°C 		TX -25°C to +100°C 			
				UX 0°C to +200°C 	
JX 0°C to +200°C 		JX -25°C to +200°C 			
				LX 0°C to +200°C 	
EX 0°C to +200°C 		EX -25°C to +200°C 			
KX 0°C to +200°C 		KX -25°C to +200°C 			
				KCA 0°C to +150°C 	
				KCB 0°C to +100°C 	
		NX -25°C to +200°C 		NC 0°C to +150°C 	
 SX 0°C to +200°C				RCA/SCA 0°C to +100°C RCB/SCB 0°C to +200°C 	
 BX 0°C to +100°C		(adapted to DIN 43710/85)  BC 0°C to +100°C			

Other Colour code on request.
THL = Thermocouple wire
AGL = Compensating cable

Examples: KX Thermocouple wire KX (plus) \triangle positive core for THL KX
 KX (minus) \triangle negative core for THL KX
 KCA Compensating cable KCA (plus) \triangle positive core for AGL KC
 KCA (minus) \triangle negative core for AGL KC

L

Compensating Cables

Materials for compensating cables

Standards	Art of thermocouple elements			Materials of compensating cables		
	Type	Plus-Pol (+)	Minus-Pol (-)	Code	Plus-Pol (+)	Minus-Pol (-)
DIN 43710	U	Cu	CuNi	UX	Cu	CuNi
	L	Fe	CuNi	LX	Fe	CuNi
DIN IEC 584	T	Cu	CuNi	TX	Cu	CuNi
	E	NiCr	CuNi	EX	NiCr	CuNi
	J	Fe	CuNi	JX	Fe	CuNi
	K	NiCr	Ni	KX	NiCr	Ni
	K	NiCr	Ni	KC 1	Fe	CuNi
	K	NiCr	Ni	KC 2	Cu	CuNi
	R/S	Pt 13/10 Rh	Pt	RC A/SC A	Cu	CuNi
	R/S	Pt 13/10 Rh	Pt	RC B/SC B	Cu	CuNi
NF	T	Cu	CuNi	TX	Cu	CuNi
	E	NiCr	CuNi	EX	NiCr	CuNi
	J	Fe	CuNi	JX	Fe	CuNi
	K	NiCr	Ni	KX	NiCr	Ni
	K	NiCr	Ni	VC	Cu	CuNi
	K	NiCr	Ni	WC	Fe	CuNi
	R/S	Pt 13/10 Rh	Pt	RC/SC	Cu	CuNi
	B	Pt 30 Rh	Pt 6 Rh	BC	Cu-Leg.	Cu
ANSI	T	Cu	CuNi	TX	Cu	CuNi
	E	NiCr	CuNi	EX	NiCr	CuNi
	J	Fe	CuNi	JX	Fe	CuNi
	K	NiCr	Ni	KX	NiCr	Ni
	R/S	Pt 13/10 Rh	Pt	RX/SX	Cu	CuNi
	B	Pt 30 Rh	Pt 6 Rh	BX	Cu	Cu

Characteristics of the conductors for thermo-pairs and compensating cables

Materials	Main components approx. %				Density at 20°C $\frac{g}{cm^3}$	Specific resistance at 20°C $\mu Ohm \cdot cm$	Resistance value (nominal value) Ohm/m	
	Cu	Ni	Mn	Others			mm \varnothing 0,20	mm \varnothing 1,38
CuNi	55	44	1	-	8,85	49	15,60	0,328
SoNi	51	45	2	Fe2	8,85	51	16,26	0,341
NiCr	-	Rest	-	Cr 10	8,7	72	22,90	0,481
Ni	-	95	MnAlSi	5	8,55	27	8,59	0,180
SoPt	95	3	2	-	8,9	12	3,82	0,0802
ECu	according to DIN 46 431				8,9	1,7	0,54	0,011
Fe	-	-	-	-	7,85	12	3,82	0,08
BPX	97	-	3	-	8,9	12,5	3,98	0,084

Compensating Cables

Part No.	Thermo-pair materials to DIN 43713	Thermo-pair type	Type	Core insulation	Jacket/Armouring/Jacket	Outer ø ca. mm	Form	Temperature range of insulation °C	Temperature range at installation °C	Min. bending radius ..x cable ø	Weight ca. kg/km
Single pair: 2 x 1,5 mm² (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48001	FE-CuNi (Ko)	L	AE 1 L stranded	PVC	-	5,4	round			7,5	40
48002	SoNiCr-SoNi	K	AN 1 L stranded	PVC	-	5,4	round			7,5	40
48003	SoPtRh-SoPt	S	AP 1 L stranded	PVC	-	5,4	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	40
48230	Cu-CuNi (Ko)	U	AC 1 L stranded	PVC	-	5,4	round			7,5	40
48478	Fe-CuNi	J	AF 1 L stranded	PVC	-	5,4	round			7,5	40
48004	Fe-CuNi (Ko)	L	AE 1 M stranded	PVC	-	5,4	round			10	40
48005	SoNiCr-SoNi	K	AN 1 M stranded	PVC	-	5,4	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	10	40
48006	SoPtRh-SoPt	S	AP 1 M stranded	PVC	-	5,4	round			10	40
48231	Cu-CuNi (Ko)	U	AC 1 M stranded	PVC	-	5,4	round			10	40
48007	Fe-CuNi (Ko)	L	AE 1 L-SIL stranded	Silicone	-	5,4	round			7,5	40
48008	SoNiCr-SoNi	K	AN 1 L-SIL stranded	Silicone	-	5,4	round	-60°C to +180°C	stationary: -25°C to +180°C flexing: -25°C to +180°C	7,5	40
48009	SoPtRh-SoPt	S	AP 1 L-SIL stranded	Silicone	-	5,4	round			7,5	40
48232	Cu-CuNi (Ko)	U	AC 1 L-SIL stranded	Silicone	-	5,4	round	+180°C	stationary: -25°C to +180°C (short time +200°C) flexing: -25°C to +180°C	7,5	40
48233	Fe-CuNi (Ko)	L	AE 2 M-SIL stranded	Silicone	textile tape/lead sheath/ tin. steel wire braiding	7,8	round			15	248
48234	SoNiCr-SoNi	K	AN 2 M-SIL stranded	Silicone		7,8	round	-60°C to +180°C	stationary: -25°C to +180°C flexing: -25°C to +180°C	15	248
48235	SoPtRh-SoPt	S	AP 2 M-SIL stranded	Silicone		7,8	round			15	248
48236	Cu-CuNi (Ko)	U	AC 2 M-SIL stranded	Silicone		7,8	round	+180°C	stationary: -25°C to +180°C (short time +200°C) flexing: -25°C to +180°C	15	248
48010	Fe-CuNi (Ko)	L	AE 3 L parallel	glass filam.	glass filam. braid.	5,0x7,2	oval			7,5	64
48011	SoNiCr-SoNi	K	AN 3 L parallel	glass filam.	glass filam. braid.	5,0x7,2	oval	-60°C to +200°C	stationary: -25°C to +200°C flexing: -25°C to +200°C	7,5	64
48012	SoPtRh-SoPt	S	AP 3 L parallel	glass filam.	glass filam. braid.	5,0x7,2	oval			7,5	64
48237	Cu-CuNi (Ko)	U	AC 3 L parallel	glass filam.	glass filam. braid.	5,0x7,2	oval			7,5	64
48238	Fe-CuNi (Ko)	L	AE 3 Ln-SIL parallel	Silicone	Silicone	5,2x7,4	oval			7,5	62
48239	SoNiCr-SoNi	K	AN 3 Ln-SIL parallel	Silicone	Silicone	5,2x7,4	oval	-60°C to +180°C	stationary: -25°C to +180°C flexing: -25°C to +180°C	7,5	62
48240	SoPtRh-SoPt	S	AP 3 Ln-SIL parallel	Silicone	Silicone	5,2x7,4	oval			7,5	62
48241	Cu-CuNi (Ko)	U	AC 3 Ln-SIL parallel	Silicone	Silicone	5,2x7,4	oval	+180°C	stationary: -25°C to +180°C (short time +200°C) flexing: -25°C to +180°C	7,5	62
48013	Fe-CuNi (Ko)	L	AE 4 L parallel	glass filam.	glass filam.	5,8x8,0	oval			7,5	87
48014	SoNiCr-SoNi	K	AN 4 L parallel	glass filam.	glass filam. braid./ galv. steel wire-braiding	5,8x8,0	oval	-60°C to +200°C	stationary: -25°C to +200°C flexing: -25°C to +200°C	7,5	87
48015	SoPtRh-SoPt	S	AP 4 L parallel	glass filam.	glass filam.	5,8x8,0	oval			7,5	87
48242	Cu-CuNi (Ko)	U	AC 4 L parallel	glass filam.	glass filam.	5,8x8,0	oval	+200°C	stationary: -25°C to +200°C flexing: -25°C to +200°C	7,5	87
48016	Fe-CuNi (Ko)	L	AE 4 Ln-SIL	Silicone	Silicone/ galv. steel wire-braiding	6,0x8,2	oval			7,5	85
48017	SoNiCr-SoNi	K	AN 4 Ln-SIL	Silicone	Silicone	6,0x8,2	oval	-60°C to +180°C	stationary: -25°C to +180°C flexing: -25°C to +180°C	7,5	85
48018	SoPtRh-SoPt	S	AP 4 Ln-SIL	Silicone	Silicone	6,0x8,2	oval			7,5	85
48243	Cu-CuNi (Ko)	U	AC 4 Ln-SIL	Silicone	Silicone	6,0x8,2	oval	+180°C	stationary: -25°C to +180°C (short time +200°C) flexing: -25°C to +180°C	7,5	85
48244	Fe-CuNi (Ko)	L	AE 5 L	PVC	PETP-tape/ Cu-solid wire	8,1	round			7,5	93
48245	SoNiCr-SoNi	K	AN 5 L	PVC	PVC	8,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	93
48246	SoPtRh-SoPt	S	AP 5 L	PVC	braiding/ tinned/PVC-jacket	8,1	round			7,5	93
48247	Cu-CuNi (Ko)	U	AC 5 L	PVC	PVC	8,1	round			7,5	93
48248	Fe-CuNi (Ko)	L	AE 6 L-SIL	Silicone	PETP-tape/ Cu-ground wire	8,0	round			7,5	94
48249	SoNiCr-SoNi	K	AN 6 L-SIL	Silicone	Silicone	8,0	round	-60°C to +180°C	stationary: -25°C to +180°C flexing: -25°C to +180°C	7,5	94
48250	SoPtRh-SoPt	S	AP 6 L-SIL	Silicone	0,5 mm ø / Alu-tape/Silicone	8,0	round			7,5	94
48251	Cu-CuNi (Ko)	U	AC 6 L-SIL	Silicone	Silicone	8,0	round	+180°C	stationary: -25°C to +180°C (short time +200°C) flexing: -25°C to +180°C	7,5	94
48252	Fe-CuNi (Ko)	L	AE 6 M-SIL	Silicone	PETP-tape/ Cu-ground wire	7,8	round			12	92
48253	SoNiCr-SoNi	K	AN 6 M-SIL	Silicone	Silicone	7,8	round	-60°C to +180°C	stationary: -25°C to +180°C flexing: -25°C to +180°C	12	92
48254	SoPtRh-SoPt	S	AP 6 M-SIL	Silicone	0,5 mm ø / Alu-tape/Silicone	7,8	round			12	92
48255	Cu-CuNi (Ko)	U	AC 6 M-SIL	Silicone	Silicone	7,8	round	+180°C	stationary: -25°C to +180°C (short time +200°C) flexing: -25°C to +180°C	12	92
48019	Fe-CuNi (Ko)	L	AE 7 L parallel	PVC	glass filament	5,5x8,2	oval			7,5	60
48020	SoNiCr-SoNi	K	AN 7 L parallel	PVC	glass filament	5,5x8,2	oval	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	60
48021	SoPtRh-SoPt	S	AP 7 L parallel	PVC	glass filament	5,5x8,2	oval			7,5	60
48256	Cu-CuNi (Ko)	U	AC 7 L parallel	PVC	glass filament	5,5x8,2	oval			7,5	60
48022	Fe-CuNi (Ko)	L	AE 8 L	PVC	glass filament/ galv. steel wire braiding	6,3x9,0	oval			7,5	82
48023	SoNiCr-SoNi	K	AN 8 L	PVC	PVC	6,3x9,0	oval	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	82
48024	SoPtRh-SoPt	S	AP 8 L	PVC	PVC	6,3x9,0	oval			7,5	82
48257	Cu-CuNi (Ko)	U	AC 8 L	PVC	PVC	6,3x9,0	oval			7,5	82
48025	Fe-CuNi (Ko)	L	AE 9 L	PVC	PVC	7,0	round			7,5	79
48026	SoNiCr-SoNi	K	AN 9 L	PVC	PVC	7,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	79
48027	SoPtRh-SoPt	S	AP 9 L	PVC	PVC	7,0	round			7,5	79
48258	Cu-CuNi (Ko)	U	AC 9 L	PVC	PVC	7,0	round			7,5	79
48479	Fe-CuNi	J	AF 9 L	PVC	PVC	7,0	round			7,5	79
48028	Fe-CuNi (Ko)	L	AE 9-2 LS	PVC	PVC/galv. steel wire braiding	7,8	round			7,5	108
48029	SoNiCr-SoNi	K	AN 9-2 LS	PVC	PVC	7,8	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	108
48030	SoPtRh-SoPt	S	AP 9-2 LS	PVC	PVC	7,8	round			7,5	108
48259	Cu-CuNi (Ko)	U	AC 9-2 LS	PVC	PVC	7,8	round			7,5	108
48480	Fe-CuNi	J	AF 9-2 LS	PVC	PVC	7,8	round			7,5	108
48031	Fe-CuNi (Ko)	L	AE 9-2 LSY	PVC	PVC/galv. steel wire braiding/ PVC	9,8	round			7,5	147
48032	SoNiCr-SoNi	K	AN 9-2 LSY	PVC	PVC	9,8	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	147
48069	SoPtRh-SoPt	S	AP 9-2 LSY	PVC	PVC	9,8	round			7,5	147
48260	Cu-CuNi (Ko)	U	AC 9-2 LSY	PVC	PVC	9,8	round			7,5	147

L = conductor of stranded wires
M = solid conductor
tin. = tinned
galv. = galvanized

Continuation ▶

Compensating Cables

Part No.	Thermo-pair materials to DIN 43713	Thermo-pair Type	Type	Core insulation	Jacket/ Armouring/ Jacket	Outer ø ca. mm	Form	Temperature range of insulation °C	Temperature range at installation °C	Min. bending radius .x cable ø	Weight ca. kg/km
Single pair: 2 x 1,5 mm² (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48033	Fe-CuNi (Ko)	L	AE 9 M	PVC	PVC	7,0	round		stationary:	12	79
48034	SoNiCr-SoNi	K	AN 9 M	PVC	PVC	7,0	round	-10°C to +80°C	-25°C to +70°C	12	79
48035	SoPtRh-SoPt	S	AP 9 M	PVC	PVC	7,0	round		flexing:	12	79
48261	Cu-CuNi (Ko)	U	AC 9 M	PVC	PVC	7,0	round		-5°C to +70°C	12	79
48262	Fe-CuNi (Ko)	L	AE 9-2 MSY	PVC		9,6	round		stationary:	12	144
48263	SoNiCr-SoNi	K	AN 9-2 MSY	PVC	PVC/galv. steel wire braiding/	9,6	round	-10°C to +80°C	-25°C to +70°C	12	144
48264	SoPtRh-SoPt	S	AP 9-2 MSY	PVC	PVC	9,6	round		flexing:	12	144
48265	Cu-CuNi (Ko)	U	AC 9-2 MSY	PVC		9,6	round		-5°C to +70°C	12	144
48036	Fe-CuNi (Ko)	L	AE 10 L-SIL parallel	Silicone	glass filament	5,5x8,2	oval		stationary:	7,5	59
48037	SoNiCr-SoNi	K	AN 10 L-SIL parallel	Silicone	glass filament	5,5x8,2	oval	-60°C to +180°C	-25°C to +180°C	7,5	59
48038	SoPtRh-SoPt	S	AP 10 L-SIL parallel	Silicone	glass filament	5,5x8,2	oval		flexing:	7,5	59
48266	Cu-CuNi (Ko)	U	AC 10 L-SIL parallel	Silicone	glass filament	5,5x8,2	oval		(short time +200°C)	7,5	59
48039	Fe-CuNi (Ko)	L	AE 11 L	Silicone		6,3x9,0	oval		stationary:	7,5	82
48040	SoNiCr-SoNi	K	AN 11 L	Silicone	glass filament/ galv. steel wire braiding	6,3x9,0	oval	-60°C to +180°C	-25°C to +180°C	7,5	82
48041	SoPtRh-SoPt	S	AP 11 L	Silicone		6,3x9,0	oval		flexing:	7,5	82
48267	Cu-CuNi (Ko)	U	AC 11 L	Silicone		6,3x9,0	oval		(short time +200°C)	7,5	82
48042	Fe-CuNi (Ko)	L	AE 11 Lr	Silicone		6,7	round		stationary:	7,5	83
48043	SoNiCr-SoNi	K	AN 11 Lr	Silicone	glass filament/ galv. steel wire braiding	6,7	round	-60°C to +180°C	-25°C to +180°C	7,5	83
48044	SoPtRh-SoPt	S	AP 11 Lr	Silicone		6,7	round		flexing:	7,5	83
48268	Cu-CuNi (Ko)	U	AC 11 Lr	Silicone		6,7	round		(short time +200°C)	7,5	83
48045	Fe-CuNi (Ko)	L	AE 11 Mr	Silicone		6,5	round		stationary:	12	83
48046	SoNiCr-SoNi	K	AN 11 Mr	Silicone	glass filament/ galv. steel wire braiding	6,5	round	-60°C to +180°C	-25°C to +180°C	12	83
48047	SoPtRh-SoPt	S	AP 11 Mr	Silicone		6,5	round		flexing:	12	83
48269	Cu-CuNi (Ko)	U	AC 11 Mr	Silicone		6,5	round		(short time +200°C)	12	83
48048	Fe-CuNi (Ko)	L	AE 12 L parallel	PVC	PVC	4,3x7,0	oval		stationary:	7,5	69
48049	SoNiCr-SoNi	K	AN 12 L parallel	PVC	PVC	4,3x7,0	oval	-10°C to +80°C	-25°C to +70°C	7,5	69
48050	SoPtRh-SoPt	S	AP 12 L parallel	PVC	PVC	4,3x7,0	oval		flexing:	7,5	69
48270	Cu-CuNi (Ko)	U	AC 12 L parallel	PVC	PVC	4,3x7,0	oval		-5°C to +70°C	7,5	69
48481	Fe-CuNi	J	AF 12 L parallel	PVC	PVC	4,3x7,0	oval			7,5	69
48051	Fe-CuNi (Ko)	L	AE 12 M parallel	PVC	PVC	4,2x6,8	oval		stationary:	12	61
48052	SoNiCr-SoNi	K	AN 12 M parallel	PVC	PVC	4,2x6,8	oval	-10°C to +80°C	-25°C to +70°C	12	61
48053	SoPtRh-SoPt	S	AP 12 M parallel	PVC	PVC	4,2x6,8	oval		flexing:	12	61
48271	Cu-CuNi (Ko)	U	AC 12 M parallel	PVC	PVC	4,2x6,8	oval		-5°C to +70°C	12	61
48054	Fe-CuNi (Ko)	L	AE 13 L parallel	Silicone	glass filament	3,2x5,9	oval		stationary:	7,5	45
48055	SoNiCr-SoNi	K	AN 13 L parallel	Silicone	glass filament	3,2x5,9	oval	-60°C to +180°C	-25°C to +180°C	7,5	45
48056	SoPtRh-SoPt	S	AP 13 L parallel	Silicone	glass filament	3,2x5,9	oval		flexing:	7,5	45
48272	Cu-CuNi (Ko)	U	AC 13 L parallel	Silicone	glass filament	3,2x5,9	oval		(short time +200°C)	7,5	45
48057	Fe-CuNi (Ko)	L	AE 13 M	Silicone	glass filament	3,5x6,0	oval		stationary:	12	45
48058	SoNiCr-SoNi	K	AN 13 M	Silicone	glass filament	3,5x6,0	oval	-60°C to +180°C	-25°C to +180°C	12	45
48059	SoPtRh-SoPt	S	AP 13 M	Silicone	glass filament	3,5x6,0	oval		flexing:	12	45
48273	Cu-CuNi (Ko)	U	AC 13 M	Silicone	glass filament	3,5x6,0	oval		(short time +200°C)	12	45
48060	Fe-CuNi (Ko)	L	AE 14 L	Silicone		11,7	round		stationary:	7,5	196
48061	SoNiCr-SoNi	K	AN 14 L	Silicone	special Silicone compound, foamed/ galv. steel tubing	11,7	round	-60°C to +180°C	-25°C to +180°C	7,5	196
48062	SoPtRh-SoPt	S	AP 14 L	Silicone		11,7	round		flexing:	7,5	196
48274	Cu-CuNi (Ko)	U	AC 14 L	Silicone		11,7	round		(short time +200°C)	7,5	196
48063	Fe-CuNi (Ko)	L	AE 15 L	Silicone	Silicone	7,7	round		stationary:	7,5	76
48064	SoNiCr-SoNi	K	AN 15 L	Silicone	Silicone	7,7	round	-60°C to +180°C	-25°C to +180°C	7,5	76
48065	SoPtRh-SoPt	S	AP 15 L	Silicone	Silicone	7,7	round		flexing:	7,5	76
48275	Cu-CuNi (Ko)	U	AC 15 L	Silicone	Silicone	7,7	round		(short time +200°C)	7,5	76
48482	Fe-CuNi	J	AF 15 L	Silicone	Silicone	7,7	round			7,5	76
48066	Fe-CuNi (Ko)	L	AE 15 LS	Silicone		7,8	round		stationary:	7,5	105
48067	SoNiCr-SoNi	K	AN 15 LS	Silicone	Silicone/ galv. steel wire braiding	7,8	round	-10°C to +180°C	-25°C to +180°C	7,5	105
48068	SoPtRh-SoPt	S	AP 15 LS	Silicone		7,8	round		flexing:	7,5	105
48276	Cu-CuNi (Ko)	U	AC 15 LS	Silicone		7,8	round		(short time +200°C)	7,5	105
48277	Fe-CuNi (Ko)	L	AE 16 L-SIL parallel	Silicone	-	2,8x5,6	oval		stationary:	7,5	38
48278	SoNiCr-SoNi	K	AN 16 L-SIL parallel	Silicone	-	2,8x5,6	oval	-10°C to +180°C	-25°C to +180°C	7,5	38
48279	SoPtRh-SoPt	S	AP 16 L-SIL parallel	Silicone	-	2,8x5,6	oval		flexing:	7,5	38
48280	Cu-CuNi (Ko)	U	AC 16 L-SIL parallel	Silicone	-	2,8x5,6	oval		(short time +200°C)	7,5	38
48281	Fe-CuNi (Ko)	L	AE 18 L	HELUFLO [®] -FEP	HELUFLO [®] -FEP	4,4	round		stationary:	7,5	37
48282	SoNiCr-SoNi	K	AN 18 L	HELUFLO [®] -FEP	HELUFLO [®] -FEP	4,4	round	-100°C to +200°C	-25°C to +205°C	7,5	37
48283	SoPtRh-SoPt	S	AP 18 L	HELUFLO [®] -FEP	HELUFLO [®] -FEP	4,4	round		flexing:	7,5	37
48284	Cu-CuNi (Ko)	U	AC 18 L	HELUFLO [®] -FEP	HELUFLO [®] -FEP	4,4	round		(short time +200°C)	7,5	37
48285	Fe-CuNi (Ko)	L	AE 19 L	HELUFLO [®] -FEP		5,6	round		stationary:	7,5	60
48286	SoNiCr-SoNi	K	AN 19 L	HELUFLO [®] -FEP	PETP-tape/ Cu-solid wire	5,6	round	-100°C to +200°C	-25°C to +205°C	7,5	60
48287	SoPtRh-SoPt	S	AP 19 L	HELUFLO [®] -FEP	braiding	5,6	round		flexing:	7,5	60
48288	Cu-CuNi (Ko)	U	AC 19 L	HELUFLO [®] -FEP	HELUFLO [®] -FEP	5,6	round		(short time +200°C)	7,5	60

L = conductor of stranded wires
M = solid conductor
tin. = tinned
galv. = galvanized

Continuation ▶

Compensating Cables

Part No.	Thermo-pair materials to DIN 43713	Thermo-pair Type	Type	Core insulation	Jacket/Armouring/Jacket	Outer \varnothing ca. mm	Form	Temperature range of insulation °C	Temperature range at installation °C	Min. bending radius .x cable \varnothing	Weight ca. kg/km
Single pair: 2 x 1,5 mm² (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48289	Fe-CuNi (Ko)	L	AE 20 L	PVC	PETP-tape/	8,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	75
48290	SoNiCr-SoNi	K	AN 20 L	PVC	Cu-ground wire	8,0	round			7,5	75
48291	SoPtRh-SoPt	S	AP 20 L	PVC	bare 0,5 mm \varnothing /	8,0	round			7,5	75
48292	Cu-CuNi (Ko)	U	AC 20 L	PVC	Alu-tape/PVC	8,0	round			7,5	75
48293	Fe-CuNi (Ko)	L	AE 20 M	PVC	PETP-tape/	8,2	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	82
48294	SoNiCr-SoNi	K	AN 20 M	PVC	Cu-ground wire	8,2	round			12	82
48295	SoPtRh-SoPt	S	AP 20 M	PVC	bare 0,5 mm \varnothing /	8,2	round			12	82
48296	Cu-CuNi (Ko)	U	AC 20 M	PVC	Alu-tape/PVC	8,2	round			12	82
Multi-paired: 2 pairs (4 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48100	Fe-CuNi (Ko)	L	AE 9-4 L	PVC	PVC	8,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	125
48101	SoNiCr-SoNi	K	AN 9-4 L	PVC	PVC	8,3	round			7,5	125
48102	SoPtRh-SoPt	S	AP 9-4 L	PVC	PVC	8,3	round			7,5	125
48297	Cu-CuNi (Ko)	U	AC 9-4 L	PVC	PVC	8,3	round			7,5	125
48483	Fe-CuNi	J	AF 9-4 L	PVC	PVC	8,3	round			7,5	125
48298	Fe-CuNi (Ko)	L	AE 9-4 LS	PVC	PVC/galv. steel wire braiding	8,9	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	155
48299	SoNiCr-SoNi	K	AN 9-4 LS	PVC		8,9	round			7,5	155
48300	SoPtRh-SoPt	S	AP 9-4 LS	PVC		8,9	round			7,5	155
48301	Cu-CuNi (Ko)	U	AC 9-4 LS	PVC		8,9	round			7,5	155
48137	Fe-CuNi (Ko)	L	AE 9-4 LSY	PVC	PVC/galv. steel wire braiding/ PVC	11,4	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	220
48138	SoNiCr-SoNi	K	AN 9-4 LSY	PVC		11,4	round			7,5	220
48139	SoPtRh-SoPt	S	AP 9-4 LSY	PVC		11,4	round			7,5	220
48302	Cu-CuNi (Ko)	U	AC 9-4 LSY	PVC		11,4	round			7,5	220
48303	Fe-CuNi (Ko)	L	AE 9-4 MSY	PVC	PVC/galv. steel wire braiding/ PVC	11,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	210
48304	SoNiCr-SoNi	K	AN 9-4 MSY	PVC		11,0	round			12	210
48305	SoPtRh-SoPt	S	AP 9-4 MSY	PVC		11,0	round			12	210
48306	Cu-CuNi (Ko)	U	AC 9-4 MSY	PVC		11,0	round			12	210
48307	Fe-CuNi (Ko)	L	AE 20-4 M	PVC	PETP-tape/	10,8	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	137
48308	SoNiCr-SoNi	K	AN 20-4 M	PVC	Cu-ground wire	10,8	round			12	137
48309	SoPtRh-SoPt	S	AP 20-4 M	PVC	bare 0,5 mm \varnothing /	10,8	round			12	137
48310	Cu-CuNi (Ko)	U	AC 20-4 M	PVC	Alu-tape/PVC	10,8	round			12	137
Multi-paired: 3 pairs (6 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48103	Fe-CuNi (Ko)	L	AE 9-6 L	PVC	PVC	10,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	190
48104	SoNiCr-SoNi	K	AN 9-6 L	PVC	PVC	10,3	round			7,5	190
48105	SoPtRh-SoPt	S	AP 9-6 L	PVC	PVC	10,3	round			7,5	190
48311	Cu-CuNi (Ko)	U	AC 9-6 L	PVC	PVC	10,3	round			7,5	190
48484	Fe-CuNi	J	AF 9-6 L	PVC	PVC	10,3	round			7,5	190
48312	Fe-CuNi (Ko)	L	AE 9-6 LS	PVC	PVC/galv. steel wire braiding	10,9	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	226
48313	SoNiCr-SoNi	K	AN 9-6 LS	PVC		10,9	round			7,5	226
48314	SoPtRh-SoPt	S	AP 9-6 LS	PVC		10,9	round			7,5	226
48315	Cu-CuNi (Ko)	U	AC 9-6 LS	PVC		10,9	round			7,5	226
48140	Fe-CuNi (Ko)	L	AE 9-6 LSY	PVC	PVC/galv. steel wire braiding/ PVC	13,4	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	292
48141	SoNiCr-SoNi	K	AN 9-6 LSY	PVC		13,4	round			7,5	292
48142	SoPtRh-SoPt	S	AP 9-6 LSY	PVC		13,4	round			7,5	292
48316	Cu-CuNi (Ko)	U	AC 9-6 LSY	PVC		13,4	round			7,5	292
48317	Fe-CuNi (Ko)	L	AE 9-6 MSY	PVC	PVC/galv. steel wire braiding/ PVC	12,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	272
48318	SoNiCr-SoNi	K	AN 9-6 MSY	PVC		12,5	round			12	272
48319	SoPtRh-SoPt	S	AP 9-6 MSY	PVC		12,5	round			12	272
48320	Cu-CuNi (Ko)	U	AC 9-6 MSY	PVC		12,5	round			12	272
48321	Fe-CuNi (Ko)	L	AE 20-6 M	PVC	PETP-tape/	12,4	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	186
48322	SoNiCr-SoNi	K	AN 20-6 M	PVC	Cu-ground wire	12,4	round			12	186
48323	SoPtRh-SoPt	S	AP 20-6 M	PVC	bare 0,5 mm \varnothing /	12,4	round			12	186
48324	Cu-CuNi (Ko)	U	AC 20-6 M	PVC	Alu-tape/PVC	12,4	round			12	186
Multi-paired: 4 pairs (8 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm)											
48106	Fe-CuNi (Ko)	L	AE 9-8 L	PVC	PVC	11,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	238
48107	SoNiCr-SoNi	K	AN 9-8 L	PVC	PVC	11,0	round			7,5	238
48108	SoPtRh-SoPt	S	AP 9-8 L	PVC	PVC	11,0	round			7,5	238
48325	Cu-CuNi (Ko)	U	AC 9-8 L	PVC	PVC	11,0	round			7,5	238
48485	Fe-CuNi	J	AF 9-8 L	PVC	PVC	11,0	round			7,5	238
48143	Fe-CuNi (Ko)	L	AE 9-8 LSY	PVC	PVC/galv. steel wire braiding/ PVC	14,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	410
48144	SoNiCr-SoNi	K	AN 9-8 LSY	PVC		14,0	round			7,5	410
48145	SoPtRh-SoPt	S	AP 9-8 LSY	PVC		14,0	round			7,5	410
48326	Cu-CuNi (Ko)	U	AC 9-8 LSY	PVC		14,0	round			7,5	410

Continuation ▶

L = conductor of stranded wires
M = solid conductor
tin. = tinned
galv. = galvanized

Compensating Cables

Part No.	Thermo-pair materials to DIN 43713	Thermo-pair Type	Type	Core insulation	Jacket/ Armouring/ Jacket	Outer ø ca. mm	Form	Temperature range of insulation °C	Temperature range at installation °C	Min. bending radius ..x cable ø	Weight ca. kg/km
Multi-paired: 5 pairs (10 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm)											
48109	Fe-CuNi (Ko)	L	AE 9-10 L	PVC	PVC	13,0	round			7,5	284
48110	SoNiCr-SoNi	K	AN 9-10 L	PVC	PVC	13,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	284
48111	SoPtRh-SoPt	S	AP 9-10 L	PVC	PVC	13,0	round			7,5	284
48327	Cu-CuNi (Ko)	U	AC 9-10 L	PVC	PVC	13,0	round			7,5	284
48486	Fe-CuNi	J	AF 9-10 L	PVC	PVC	13,0	round			7,5	284
48146	Fe-CuNi (Ko)	L	AE 9-10 LSY	PVC		16,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	475
48147	SoNiCr-SoNi	K	AN 9-10 LSY	PVC	PVC/galv. steel wire braiding/ PVC	16,5	round			7,5	475
48148	SoPtRh-SoPt	S	AP 9-10 LSY	PVC		16,5	round			7,5	475
48328	Cu-CuNi (Ko)	U	AC 9-10 LSY	PVC		16,5	round			7,5	475
Multi-paired: 6 pairs (12 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48112	Fe-CuNi (Ko)	L	AE 9-12 L	PVC	PVC	13,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	320
48113	SoNiCr-SoNi	K	AN 9-12 L	PVC	PVC	13,5	round			7,5	320
48114	SoPtRh-SoPt	S	AP 9-12 L	PVC	PVC	13,5	round			7,5	320
48329	Cu-CuNi (Ko)	U	AC 9-12 L	PVC	PVC	13,5	round			7,5	320
48487	Fe-CuNi	J	AF 9-12 L	PVC	PVC	13,5	round			7,5	320
48330	Fe-CuNi (Ko)	L	AE 9-12 LS	PVC		14,2	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	384
48331	SoNiCr-SoNi	K	AN 9-12 LS	PVC	PVC/galv. steel wire braiding	14,2	round			7,5	384
48332	SoPtRh-SoPt	S	AP 9-12 LS	PVC		14,2	round			7,5	384
48333	Cu-CuNi (Ko)	U	AC 9-12 LS	PVC		14,2	round			7,5	384
48149	Fe-CuNi (Ko)	L	AE 9-12 LSY	PVC		17,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	483
48150	SoNiCr-SoNi	K	AN 9-12 LSY	PVC	PVC/galv. steel wire braiding/ PVC	17,5	round			7,5	483
48151	SoPtRh-SoPt	S	AP 9-12 LSY	PVC		17,5	round			7,5	483
48334	Cu-CuNi (Ko)	U	AC 9-12 LSY	PVC		17,5	round			7,5	483
48335	Fe-CuNi (Ko)	L	AE 9-12 MSY	PVC		16,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	478
48336	SoNiCr-SoNi	K	AN 9-12 MSY	PVC	PVC/galv. steel wire braiding/ PVC	16,5	round			12	478
48337	SoPtRh-SoPt	S	AP 9-12 MSY	PVC		16,5	round			12	478
48338	Cu-CuNi (Ko)	U	AC 9-12 MSY	PVC		16,5	round			12	478
48339	Fe-CuNi (Ko)	L	AE 20-12 M	PVC	PETP-tape/ Cu-ground wire	16,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	362
48340	SoNiCr-SoNi	K	AN 20-12 M	PVC	bare 0,5 mm ø/ Alu-tape/ PVC	16,3	round			12	362
48341	SoPtRh-SoPt	S	AP 20-12 M	PVC		16,3	round			12	362
48342	Cu-CuNi (Ko)	U	AC 20-12 M	PVC		16,3	round			12	362
Multi-paired: 7 pairs (14 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm)											
48115	Fe-CuNi (Ko)	L	AE 9-14 L	PVC	PVC	14,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	396
48116	SoNiCr-SoNi	K	AN 9-14 L	PVC	PVC	14,5	round			7,5	396
48117	SoPtRh-SoPt	S	AP 9-14 L	PVC	PVC	14,5	round			7,5	396
48343	Cu-CuNi (Ko)	U	AC 9-14 L	PVC	PVC	14,5	round			7,5	396
48488	Fe-CuNi	J	AF 9-14 L	PVC	PVC	14,5	round			7,5	396
48152	Fe-CuNi (Ko)	L	AE 9-14 LSY	PVC		18,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	640
48153	SoNiCr-SoNi	K	AN 9-14 LSY	PVC	PVC/galv. steel wire braiding/ PVC	18,5	round			7,5	640
48154	SoPtRh-SoPt	S	AP 9-14 LSY	PVC		18,5	round			7,5	640
48344	Cu-CuNi (Ko)	U	AC 9-14 LSY	PVC		18,5	round			7,5	640
Multi-paired: 8 pairs (16 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48118	Fe-CuNi (Ko)	L	AE 9-16 L	PVC	PVC	15,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	419
48119	SoNiCr-SoNi	K	AN 9-16 L	PVC	PVC	15,1	round			7,5	419
48120	SoPtRh-SoPt	S	AP 9-16 L	PVC	PVC	15,1	round			7,5	419
48345	Cu-CuNi (Ko)	U	AC 9-16 L	PVC	PVC	15,1	round			7,5	419
48489	Fe-CuNi	J	AF 9-16 L	PVC	PVC	15,1	round			7,5	419
48346	Fe-CuNi (Ko)	L	AE 9-16 LS	PVC		16,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	495
48347	SoNiCr-SoNi	K	AN 9-16 LS	PVC	PVC/galv. steel wire braiding	16,1	round			7,5	495
48348	SoPtRh-SoPt	S	AP 9-16 LS	PVC		16,1	round			7,5	495
48349	Cu-CuNi (Ko)	U	AC 9-16 LS	PVC		16,1	round			7,5	495
48155	Fe-CuNi (Ko)	L	AE 9-16 LSY	PVC		19,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	623
48156	SoNiCr-SoNi	K	AN 9-16 LSY	PVC	PVC/galv. steel wire braiding/ PVC	19,3	round			7,5	623
48157	SoPtRh-SoPt	S	AP 9-16 LSY	PVC		19,3	round			7,5	623
48350	Cu-CuNi (Ko)	U	AC 9-16 LSY	PVC		19,3	round			7,5	623
48351	Fe-CuNi (Ko)	L	AE 9-16 MSY	PVC		18,7	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	616
48352	SoNiCr-SoNi	K	AN 9-16 MSY	PVC	PVC/galv. steel wire braiding/ PVC	18,7	round			12	616
48353	SoPtRh-SoPt	S	AP 9-16 MSY	PVC		18,7	round			12	616
48354	Cu-CuNi (Ko)	U	AC 9-16 MSY	PVC		18,7	round			12	616
48355	Fe-CuNi (Ko)	L	AE 20-16 M	PVC	PETP-tape/ Cu-ground wire	16,8	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	423
48356	SoNiCr-SoNi	K	AN 20-16 M	PVC	bare 0,5 mm ø/ Alu-tape/ PVC	16,8	round			12	423
48357	SoPtRh-SoPt	S	AP 20-16 M	PVC		16,8	round			12	423
48358	Cu-CuNi (Ko)	U	AC 20-16 M	PVC		16,8	round			12	423

Continuation ▶

L = conductor of stranded wires
M = solid conductor
tin. = tinned
galv. = galvanized

Compensating Cables

Part No.	Thermo-pair materials to DIN 43713	Thermo-pair type	Type	Core insulation	Jacket/Armouring/Jacket	Outer ø ca. mm	Form	Temperature range of insulation °C	Temperature range at installation °C	Min. bending radius ..x cable ø	Weight ca. kg/km
Multi-paired: 9 pairs (18 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm)											
48121	Fe-CuNi (Ko)	L	AE 9-18 L	PVC	PVC	16,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	480
48122	SoNiCr-SoNi	K	AN 9-18 L	PVC	PVC	16,5	round			7,5	480
48123	SoPtRh-SoPt	S	AP 9-18 L	PVC	PVC	16,5	round			7,5	480
48359	Cu-CuNi (Ko)	U	AC 9-18 L	PVC	PVC	16,5	round			7,5	480
48490	Fe-CuNi	J	AF 9-18 L	PVC	PVC	16,5	round			7,5	480
48158	Fe-CuNi (Ko)	L	AE 9-18 LSY	PVC	PVC/galv. steel wire braiding/ PVC	20,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	758
48159	SoNiCr-SoNi	K	AN 9-18 LSY	PVC		20,5	round			7,5	758
48160	SoPtRh-SoPt	S	AP 9-18 LSY	PVC		20,5	round			7,5	758
48360	Cu-CuNi (Ko)	U	AC 9-18 LSY	PVC		20,5	round			7,5	758
Multi-paired: 10 pairs (20 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48124	Fe-CuNi (Ko)	L	AE 9-20 L	PVC	PVC	16,7	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	520
48125	SoNiCr-SoNi	K	AN 9-20 L	PVC	PVC	16,7	round			7,5	520
48126	SoPtRh-SoPt	S	AP 9-20 L	PVC	PVC	16,7	round			7,5	520
48361	Cu-CuNi (Ko)	U	AC 9-20 L	PVC	PVC	16,7	round			7,5	520
48491	Fe-CuNi	J	AF 9-20 L	PVC	PVC	16,7	round			7,5	520
48362	Fe-CuNi (Ko)	L	AE 9-20 LS	PVC	PVC/galv. steel wire braiding	17,7	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	613
48363	SoNiCr-SoNi	K	AN 9-20 LS	PVC		17,7	round			7,5	613
48364	SoPtRh-SoPt	S	AP 9-20 LS	PVC		17,7	round			7,5	613
48365	Cu-CuNi (Ko)	U	AC 9-20 LS	PVC		17,7	round			7,5	613
48161	Fe-CuNi (Ko)	L	AE 9-20 LSY	PVC	PVC/galv. steel wire braiding/ PVC	20,9	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	752
48162	SoNiCr-SoNi	K	AN 9-20 LSY	PVC		20,9	round			7,5	752
48163	SoPtRh-SoPt	S	AP 9-20 LSY	PVC		20,9	round			7,5	752
48366	Cu-CuNi (Ko)	U	AC 9-20 LSY	PVC		20,9	round			7,5	752
48367	Fe-CuNi (Ko)	L	AE 9-20 MSY	PVC	PVC/galv. steel wire braiding/ PVC	20,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	744
48368	SoNiCr-SoNi	K	AN 9-20 MSY	PVC		20,3	round			12	744
48369	SoPtRh-SoPt	S	AP 9-20 MSY	PVC		20,3	round			12	744
48370	Cu-CuNi (Ko)	U	AC 9-20 MSY	PVC		20,3	round			12	744
48371	Fe-CuNi (Ko)	L	AE 20-20 M	PVC	PETP-tape/ Cu-ground wire bare 0,5 mm ø/ Alu-tape/ PVC	20,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	542
48372	SoNiCr-SoNi	K	AN 20-20 M	PVC		20,3	round			12	542
48373	SoPtRh-SoPt	S	AP 20-20 M	PVC		20,3	round			12	542
48374	Cu-CuNi (Ko)	U	AC 20-20 M	PVC		20,3	round			12	542
Multi-paired: 12 pairs (24 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48127	Fe-CuNi (Ko)	L	AE 9-24 L	PVC	PVC	19,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	614
48128	SoNiCr-SoNi	K	AN 9-24 L	PVC	PVC	19,0	round			7,5	614
48129	SoPtRh-SoPt	S	AP 9-24 L	PVC	PVC	19,0	round			7,5	614
48375	Cu-CuNi (Ko)	U	AC 9-24 L	PVC	PVC	19,0	round			7,5	614
48492	Fe-CuNi	J	AF 9-24 L	PVC	PVC	19,0	round			7,5	614
48376	Fe-CuNi (Ko)	L	AE 9-24 LS	PVC	PVC/galv. steel wire braiding	20,2	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	738
48377	SoNiCr-SoNi	K	AN 9-24 LS	PVC		20,2	round			7,5	738
48378	SoPtRh-SoPt	S	AP 9-24 LS	PVC		20,2	round			7,5	738
48379	Cu-CuNi (Ko)	U	AC 9-24 LS	PVC		20,2	round			7,5	738
48164	Fe-CuNi (Ko)	L	AE 9-24 LSY	PVC	PVC/galv. steel wire braiding/ PVC	24,2	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	938
48165	SoNiCr-SoNi	K	AN 9-24 LSY	PVC		24,2	round			7,5	938
48166	SoPtRh-SoPt	S	AP 9-24 LSY	PVC		24,2	round			7,5	938
48380	Cu-CuNi (Ko)	U	AC 9-24 LSY	PVC		24,2	round			7,5	938
48381	Fe-CuNi (Ko)	L	AE 9-24 MSY	PVC	PVC/galv. steel wire braiding/ PVC	23,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	907
48382	SoNiCr-SoNi	K	AN 9-24 MSY	PVC		23,1	round			12	907
48383	SoPtRh-SoPt	S	AP 9-24 MSY	PVC		23,1	round			12	907
48384	Cu-CuNi (Ko)	U	AC 9-24 MSY	PVC		23,1	round			12	907
48385	Fe-CuNi (Ko)	L	AE 20-24 M	PVC	PETP-tape/ Cu-ground wire bare 0,5 mm ø/ Alu-tape/ PVC	22,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	638
48386	SoNiCr-SoNi	K	AN 20-24 M	PVC		22,5	round			12	638
48387	SoPtRh-SoPt	S	AP 20-24 M	PVC		22,5	round			12	638
48388	Cu-CuNi (Ko)	U	AC 20-24 M	PVC		22,5	round			12	638
Multi-paired: 16 pairs (32 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48389	Fe-CuNi (Ko)	L	AE 9-32 L	PVC	PVC	20,9	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	793
48390	SoNiCr-SoNi	K	AN 9-32 L	PVC	PVC	20,9	round			7,5	793
48391	SoPtRh-SoPt	S	AP 9-32 L	PVC	PVC	20,9	round			7,5	793
48392	Cu-CuNi (Ko)	U	AC 9-32 L	PVC	PVC	20,9	round			7,5	793
48493	Fe-CuNi	J	AF 9-32 L	PVC	PVC	20,9	round			7,5	793
48393	Fe-CuNi (Ko)	L	AE 9-32 LS	PVC	PVC/galv. steel wire braiding	22,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	923
48394	SoNiCr-SoNi	K	AN 9-32 LS	PVC		22,1	round			7,5	923
48395	SoPtRh-SoPt	S	AP 9-32 LS	PVC		22,1	round			7,5	923
48396	Cu-CuNi (Ko)	U	AC 9-32 LS	PVC		22,1	round			7,5	923

Continuation ►

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Compensating Cables

Part No.	Thermo-pair materials to DIN 43713	Thermo-pair Type	Type	Core insulation	Jacket/ Armouring/ Jacket	Outer ø ca. mm	Form	Temperature range of insulation °C	Temperature range at installation °C	Min. bending radius ..x cable ø	Weight ca. kg/km
Multi-paired: 16 pairs (32 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48397	Fe-CuNi (Ko)	L	AE 9-32 LSY	PVC		26,1	round			7,5	1141
48398	SoNiCr-SoNi	K	AN 9-32 LSY	PVC	PVC/galv. steel wire braiding/ PVC	26,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	1141
48399	SoPtRh-SoPt	S	AP 9-32 LSY	PVC		26,1	round			7,5	1141
48400	Cu-CuNi (Ko)	U	AC 9-32 LSY	PVC		26,1	round			7,5	1141
48401	Fe-CuNi (Ko)	L	AE 9-32 MSY	PVC		25,3	round			12	1130
48402	SoNiCr-SoNi	K	AN 9-32 MSY	PVC	PVC/galv. steel wire braiding/ PVC	25,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	1130
48403	SoPtRh-SoPt	S	AP 9-32 MSY	PVC		25,3	round			12	1130
48404	Cu-CuNi (Ko)	U	AC 9-32 MSY	PVC		25,3	round			12	1130
48405	Fe-CuNi (Ko)	L	AE 20-32 M	PVC	PETP-tape/ Cu-ground wire bare 0,5 mm ø/ Alu-tape/ PVC	25,1	round			12	847
48406	SoNiCr-SoNi	K	AN 20-32 M	PVC		25,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	847
48407	SoPtRh-SoPt	S	AP 20-32 M	PVC		25,1	round			12	847
48408	Cu-CuNi (Ko)	U	AC 20-32 M	PVC		25,1	round			12	847
Multi-paired: 18 pairs (36 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48130	FE-CuNi (Ko)	L	AE 9-36 L	PVC	PVC	22,1	round			7,5	904
48132	SoNiCr-SoNi	K	AN 9-36 L	PVC	PVC	22,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	904
48133	SoPtRh-SoPt	S	AP 9-36 L	PVC	PVC	22,1	round			7,5	904
48409	Cu-CuNi (Ko)	U	AC 9-36 L	PVC	PVC	22,1	round			7,5	904
48494	Fe-CuNi	J	AF 9-36 L	PVC	PVC	22,1	round			7,5	904
48410	Fe-CuNi (Ko)	L	AE 9-36 LS	PVC		23,3	round			7,5	1040
48411	SoNiCr-SoNi	K	AN 9-36 LS	PVC	PVC/galv. steel wire braiding	23,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	1040
48412	SoPtRh-SoPt	S	AP 9-36 LS	PVC		23,3	round			7,5	1040
48413	Cu-CuNi (Ko)	U	AC 9-36 LS	PVC		23,3	round			7,5	1040
48167	Fe-CuNi (Ko)	L	AE 9-36 LSY	PVC		27,3	round			7,5	1268
48169	SoNiCr-SoNi	K	AN 9-36 LSY	PVC	PVC/galv. steel wire braiding/ PVC	27,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	1268
48170	SoPtRh-SoPt	S	AP 9-36 LSY	PVC		27,3	round			7,5	1268
48414	Cu-CuNi (Ko)	U	AC 9-36 LSY	PVC		27,3	round			7,5	1268
48415	Fe-CuNi (Ko)	L	AE 9-36 MSY	PVC		26,1	round			12	1232
48416	SoNiCr-SoNi	K	AN 9-36 MSY	PVC	PVC/galv. steel wire braiding/ PVC	26,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	1232
48417	SoPtRh-SoPt	S	AP 9-36 MSY	PVC		26,1	round			12	1232
48418	Cu-CuNi (Ko)	U	AC 9-36 MSY	PVC		26,1	round			12	1232
48419	Fe-CuNi (Ko)	L	AE 20-36 M	PVC	PETP-tape/ Cu-ground wire bare 0,5 mm ø/ Alu-tape/ PVC	26,0	round			12	944
48420	SoNiCr-SoNi	K	AN 20-36 M	PVC		26,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	944
48421	SoPtRh-SoPt	S	AP 20-36 M	PVC		26,0	round			12	944
48422	Cu-CuNi (Ko)	U	AC 20-36 M	PVC		26,0	round			12	944
Multi-paired: 19 pairs (38 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm)											
48134	Fe-CuNi (Ko)	L	AE 9-38 L	PVC	PVC	22,5	round			7,5	937
48135	SoNiCr-SoNi	K	AN 9-38 L	PVC	PVC	22,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	937
48136	SoPtRh-SoPt	S	AP 9-38 L	PVC	PVC	22,5	round			7,5	937
48423	Cu-CuNi (Ko)	U	AC 9-38 L	PVC	PVC	22,5	round			7,5	937
48171	Fe-CuNi (Ko)	L	AE 9-38 LSY	PVC		26,5	round			7,5	1340
48172	SoNiCr-SoNi	K	AN 9-38 LSY	PVC	PVC/galv. steel wire braiding/ PVC	26,5	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	1340
48173	SoPtRh-SoPt	S	AP 9-38 LSY	PVC		26,5	round			7,5	1340
48424	Cu-CuNi (Ko)	U	AC 9-38 LSY	PVC		26,5	round			7,5	1340
Multi-paired: 20 pairs (40 x 1,5 mm²) (L = stranded wires, conductor make-up 48 x 0,20 mm; M = solid conductor, diameter 1,38 mm)											
48425	Fe-CuNi (Ko)	L	AE 9-40 L	PVC	PVC	24,1	round			7,5	1032
48426	SoNiCr-SoNi	K	AN 9-40 L	PVC	PVC	24,1	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	1032
48427	SoPtRh-SoPt	S	AP 9-40 L	PVC	PVC	24,1	round			7,5	1032
48428	Cu-CuNi (Ko)	U	AC 9-40 L	PVC	PVC	24,1	round			7,5	1032
48429	Fe-CuNi (Ko)	L	AE 9-40 LS	PVC		25,3	round			7,5	1200
48430	SoNiCr-SoNi	K	AN 9-40 LS	PVC	PVC/galv. steel wire braiding	25,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	1200
48431	SoPtRh-SoPt	S	AP 9-40 LS	PVC		25,3	round			7,5	1200
48432	Cu-CuNi (Ko)	U	AC 9-40 LS	PVC		25,3	round			7,5	1200
48433	Fe-CuNi (Ko)	L	AE 9-40 LSY	PVC		29,3	round			7,5	1446
48434	SoNiCr-SoNi	K	AN 9-40 LSY	PVC	PVC/galv. steel wire braiding/ PVC	29,3	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	7,5	1446
48435	SoPtRh-SoPt	S	AP 9-40 LSY	PVC		29,3	round			7,5	1446
48436	Cu-CuNi (Ko)	U	AC 9-40 LSY	PVC		29,3	round			7,5	1446
48437	Fe-CuNi (Ko)	L	AE 9-40 MSY	PVC		28,0	round			12	1381
48438	SoNiCr-SoNi	K	AN 9-40 MSY	PVC	PVC/galv. steel wire braiding/ PVC	28,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	1381
48439	SoPtRh-SoPt	S	AP 9-40 MSY	PVC		28,0	round			12	1381
48440	Cu-CuNi (Ko)	U	AC 9-40 MSY	PVC		28,0	round			12	1381
48441	Fe-CuNi (Ko)	L	AE 20-40 M	PVC	PETP-tape/ Cu-ground wire bare 0,5 mm ø/ Alu-tape/ PVC	26,0	round			12	1001
48442	SoNiCr-SoNi	K	AN 20-40 M	PVC		26,0	round	-10°C to +80°C	stationary: -25°C to +70°C flexing: -5°C to +70°C	12	1001
48443	SoPtRh-SoPt	S	AP 20-40 M	PVC		26,0	round			12	1001
48444	Cu-CuNi (Ko)	U	AC 20-40 M	PVC		26,0	round			12	1001

Continuation ▶

L = conductor of stranded wires
M = solid conductor
tin. = tinned
galv. = galvanized

Compensating Cables

Part No.	Thermo-pair materials to DIN 43713	Thermo-pair Type	Type	Core insulation	Jacket/ Armouring/ Jacket	Outer ø ca. mm	Form	Temperature range of insulation °C	Temperature range at installation °C	Min. bending radius .x cable ø	Weight ca. kg/km
Single pair: 2 x 0,22 mm² (stranded wires, conductor make-up 7 x 0,20 mm)											
48200	FE-CuNi (Ko)	L	AE 1 L	PVC		1,0	round			7,5	10
48201	SoNiCr-SoNi	K	AN 1 L	PVC		1,0	round	-10°C to +80°C	stationary: -25°C to +70°C	7,5	10
48202	SoPtRh-SoPt	S	AP 1 L	PVC		1,0	round		flexing: -5°C to +70°C	7,5	10
48460	Cu-CuNi (Ko)	U	AC 1 L	PVC		1,0	round			7,5	10
Single pair: 2 x 0,22 mm² (stranded wires, conductor make-up 7 x 0,20 mm)											
48203	Fe-CuNi (Ko)	L	AE 9-022	PVC	PVC	4,0	round			7,5	22
48204	SoNiCr-SoNi	K	AN 9-022	PVC	PVC	4,0	round	-10°C to +80°C	stationary: -25°C to +70°C	7,5	22
48205	SoPtRh-SoPt	S	AP 9-022	PVC	PVC	4,0	round		flexing: -5°C to +70°C	7,5	22
48461	Cu-CuNi (Ko)	U	AC 9-022	PVC	PVC	4,0	round			7,5	22
48206	Fe-CuNi (Ko)	L	AE 5-022	PVC		4,9	round			7,5	31
48207	SoNiCr-SoNi	K	AN 5-022	PVC	PETP-tape/ Cu-solid wire braid.	4,9	round	-10°C to +80°C	stationary: -25°C to +70°C	7,5	31
48208	SoPtRh-SoPt	S	AP 5-022	PVC	tinned/ PVC	4,9	round		flexing: -5°C to +70°C	7,5	31
48462	Cu-CuNi (Ko)	U	AC 5-022	PVC		4,9	round			7,5	31
48463	Fe-CuNi (Ko)	L	AE 15-022	glass filam.	Silicone	3,4	round	-40°C to +200°C	stationary: -25°C to +180°C	7,5	16
48464	SoNiCr-SoNi	K	AN 15-022	glass filam.	Silicone	3,4	round		flexing: -25°C to +180°C	7,5	16
48465	SoPtRh-SoPt	S	AP 15-022	glass filam.	Silicone	3,4	round		flexing: -25°C to +180°C (short time +200°C)	7,5	16
48466	Cu-CuNi (Ko)	U	AC 15-022	glass filam.	Silicone	3,4	round			7,5	16
48209	Fe-CuNi (Ko)	L	AE 15-G 022	glass filam.		3,9	round			7,5	22
48210	SoNiCr-SoNi	K	AN 15-G 022	glass filam.	Silicone/ glass filam.	3,9	round	-40°C to +200°C	stationary: -25°C to +180°C	7,5	22
48211	SoPtRh-SoPt	S	AP 15-G 022	glass filam.		3,9	round		flexing: -25°C to +180°C	7,5	22
48467	Cu-CuNi (Ko)	U	AC 15-G 022	glass filam.		3,9	round		flexing: -25°C to +180°C (short time +200°C)	7,5	22
48212	Fe-CuNi (Ko)	L	AE (GI-SIL-GI-S)	glass filam.	Silicone/ glass filament/ galv. steel wire braiding	5,0	round	-40°C to +200°C	stationary: -25°C to +180°C	7,5	25
48213	SoNiCr-SoNi	K	AN (GI-SIL-GI-S)	glass filam.		5,0	round		flexing: -25°C to +180°C	7,5	25
48214	SoPtRh-SoPt	S	AP (GI-SIL-GI-S)	glass filam.		5,0	round		flexing: -25°C to +180°C (short time +200°C)	7,5	25
48468	Cu-CuNi (Ko)	U	AC (GI-SIL-GI-S)	glass filam.		5,0	round			7,5	25
Single pair: 2 x 0,5 mm² (stranded wires, conductor make-up 16 x 0,20 mm)											
48215	Fe-CuNi (Ko)	L	AE (GI-SIL)	glass filam.	Silicone	4,6	round			7,5	18
48216	SoNiCr-SoNi	K	AN (GI-SIL)	glass filam.	Silicone	4,6	round	-40°C to +200°C	stationary: -25°C to +200°C	7,5	18
48217	SoPtRh-SoPt	S	AP (GI-SIL)	glass filam.	Silicone	4,6	round		flexing: -25°C to +200°C	7,5	18
48469	Cu-CuNi (Ko)	U	AC (GI-SIL)	glass filam.	Silicone	4,6	round			7,5	18
Single pair: 2 x 0,75 mm² (stranded wires, conductor make-up 24 x 0,20 mm)											
48218	Fe-CuNi (Ko)	L	AE (PVC-PVC)	PVC	PVC	6,0	round			7,5	25
48219	SoNiCr-SoNi	K	AN (PVC-PVC)	PVC	PVC	6,0	round	-10°C to +80°C	stationary: -25°C to +70°C	7,5	25
48220	SoPtRh-SoPt	S	AP (PVC-PVC)	PVC	PVC	6,0	round		flexing: -5°C to +70°C	7,5	25
48470	Cu-CuNi (Ko)	U	AC (PVC-PVC)	PVC	PVC	6,0	round			7,5	25
Multi-paired: 4 x 0,22 mm² (stranded wires, conductor make-up 7 x 0,20 mm)											
48221	Fe-CuNi (Ko)	L	AE (PVC-PVC)	PVC	PVC	6,0	round			7,5	33
48222	SoNiCr-SoNi	K	AN (PVC-PVC)	PVC	PVC	6,0	round	-10°C to +80°C	stationary: -20°C to +80°C	7,5	33
48223	SoPtRh-SoPt	S	AP (PVC-PVC)	PVC	PVC	6,0	round		flexing: -5°C to +80°C	7,5	33
48471	Cu-CuNi (Ko)	U	AC (PVC-PVC)	PVC	PVC	6,0	round			7,5	33
48224	Fe-CuNi (Ko)	L	AE (PVC-C-PVC)	PVC		6,0	round			7,5	37
48225	SoNiCr-SoNi	K	AN (PVC-C-PVC)	PVC	galv. Cu-braiding/ PVC-jacket	6,0	round	-10°C to +80°C	stationary: -20°C to +80°C	7,5	37
48226	SoPtRh-SoPt	S	AP (PVC-C-PVC)	PVC		6,0	round		flexing: -5°C to +80°C	7,5	37
48472	Cu-CuNi (Ko)	U	AC (PVC-C-PVC)	PVC		6,0	round			7,5	37
48227	Fe-CuNi (Ko)	L	AE (GI-SIL)	glass filam.	Silicone	6,0	round			7,5	35
48228	SoNiCr-SoNi	K	AN (GI-SIL)	glass filam.	Silicone	6,0	round	-40°C to +200°C	stationary: -25°C to +180°C	7,5	35
48229	SoPtRh-SoPt	S	AP (GI-SIL)	glass filam.	Silicone	6,0	round		flexing: -25°C to +180°C	7,5	35
48473	Cu-CuNi (Ko)	U	AC (GI-SIL)	glass filam.	Silicone	6,0	round			7,5	35
Multi-paired: 4 x 1,5 mm² (stranded wires, conductor make-up 48 x 0,20 mm)											
48474	Fe-CuNi (Ko)	L	AE 11-4 Lr	Silicone		7,8	round			7,5	11,8
48475	SoNiCr-SoNi	K	AN 11-4 Lr	Silicone	glass filament/ galv. steel wire braiding	7,8	round	-60°C to +180°C	stationary: -25°C to +180°C	7,5	11,8
48476	SoPtRh-SoPt	S	AP 11-4 Lr	Silicone		7,8	round		flexing: -25°C to +180°C	7,5	11,8
48477	Cu-CuNi (Ko)	U	AC 11-4 Lr	Silicone		7,8	round		flexing: -25°C to +180°C (short time +200°C)	7,5	11,8

L = conductor of stranded wires
M = solid conductor
tin. = tinned
galv. = galvanized

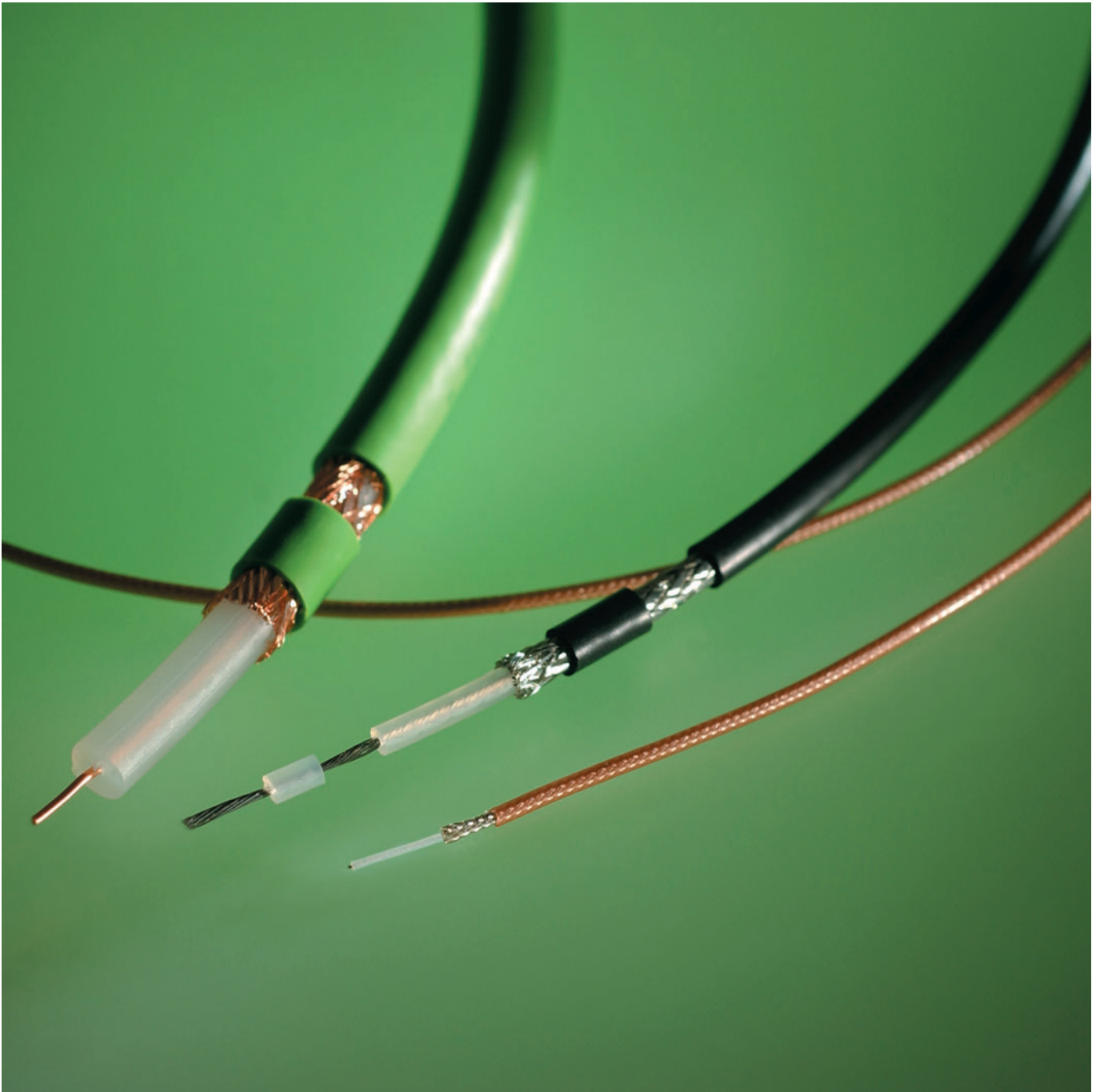


Photo: HELUKABEL®

Coaxial Cables

Coaxial Cables

Coaxial cables are used in all areas of the high frequency transmission technology, for example in medicine, military or in communication sectors. Because of the wide spectrum of coaxial and video or TV cables, which HELUKABEL® has in stock, most requirements are covered. Naturally we also offer special constructions for you.

HELUKABEL® supply RG-coaxial cables or RG-multi coaxial cables according to the american military standard MIL-C-17.

The coaxial cables for satellite receivers and TV aerials as well as video cables are designed according to the respective specified standards.

M

Contents

Description	Page
RG-Coaxial Cables	M 4
RG-Coaxial Cables	M 5
RG-Coaxial Cables	M 6
Halogen-Free RG-Coaxial Cables	M 7
CATV-Cables, with alu- or copper foil and braiding	M 8
SAT-Coaxial Cables, up to 2150 MHz, for satellite-receivers, double screened	M 9
Multimedia-Coaxial Cables, SAT 1,0/4,6GH, up to 2400MHz, for digital-tv, double screened, screening efficiency >90dB	M 10
SAT-Coaxial Cables, for digital-tv, screening efficiency >90dB / >95dB, for satellite-receivers, double screened	M 11
RGB-COAX-CY / RGB-COAX-(St)Y, transmission cables for colour monitor	M 12

RG-Coaxial Cables



Type RG.../U	6	8	11	58	59	62
Part no.	40001	40013	40002	40003	40004	40005

Cable structure

Inner conductor diameter mm	1 x 0,72	7 x 0,72	7 x 0,4	19 x 0,18	1 x 0,6	1 x 0,65
	Steel/copper, bare	Copper, bare	Tinned copper	Tinned copper	Steel/copper, bare	Steel/copper, bare
Insulation Ø mm	4,7 PE	6,4 PE	7,3 PE	2,95 PE	3,7 PE	3,7 PE, hollow
Outer conductor	2 braids Silvered copper Copper, bare	Braid Copper, bare	Braid Copper, bare	Braid Tinned copper	Braid Copper, bare	Braid Copper, bare
Outer jacket	PVC	PVC	PVC	PVC	PVC	PVC
Min. bending radius approx. mm	40	50	50	25	30	30
Temperature range °C	-35 to +80	-35 to +80	-35 to +80	-35 to +80	-35 to +80	-35 to +80
Copper weight kg/km	67,0	62,0	58,0	21,0	26,0	26,0
Outer Ø approx. mm	8,4	9,5	10,3	4,95	6,2	6,15
Weight approx. kg / km	115	128	140	38	57	52

Electrical characteristics

Impedance (Ohm)	75 ± 3	50 ± 2	75 ± 3	50 ± 2	75 ± 3	95 ± 5
Frequency range						
f (max.) GHz	3	3	3	3	3	3
Propagation velocity v/c	0,66	0,66	0,66	0,66	0,66	0,83
Attenuation at 20 °C (dB/100m)						
100 MHz	8,8	8	7,5	17	11,5	10,5
200 MHz	13,5	10,8	11	24	16,5	15
500 MHz	21	17	18,5	39	27	24,5
800 MHz	27,5	25	24	51	35	32,5
1000 MHz	-	26,5	30	56	41	35
1350 MHz	-	30,6	-	-	-	-
1750 MHz	-	35	-	-	-	-
Capacitance pF/m	67	101	67	101	67	42,5
Rel. velocity of propagation %	67	66	67	67	67	83
Insulation resistance MOhm x km min.	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵
Loop resistance max. (Ohm/km)	110	11	23	53	171	155
Nominal peak voltage kVs	2,8	5,1	5,2	2,5	3,5	1,1
Dielectric strength 50 Hz kVeff	7	9,5	10	5	7	3

Dimensions and specifications may be changed without prior notice. (RM01)

Note

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.
- RG-Coaxial types are in accordance with US-Military specifications MIL-C-17.
- RG/U: R=Radio, G=Guide, U=Utility

Application

Coaxial cables are used in high frequency transmission, especially for transmitters and receivers, computers, radio and TV transmissions. The varied mechanical, thermal and electronic properties of Coaxial cables mean that they can be used up into the GHz levels, as per cable type.

RG-Coaxial Cables



Type RG.../U	71	174	178	179	180	187	213
Part no.	40006	40197	40007	40008	40009	40010	40012
Cable structure							
Inner conductor diameter mm	1 x 0,65 Steel/copper, bare	7 x 0,16 Steel/copper, bare	7 x 0,1 Steel/copper, silvered	7 x 0,1 Steel/copper, silvered	7 x 0,1 Steel/copper, silvered	7 x 0,1 Steel/copper, silvered	7 x 0,75 Copper, bare
Insulation Ø mm	3,7 PE, hollow	1,52 PE	0,86 PTFE	1,6 PTFE	2,6 PTFE	1,6 PTFE	7,24 PE
Outer conductor	2 braids Copper, bare Tinned copper	Braid Tinned copper	Braid Silvered copper	Braid Silvered copper	Braid Silvered copper	Braid Silvered copper	Braid Copper, bare
Outer jacket	PE	PVC	FEP	FEP	FEP	PFA	PVC
Min. bending radius approx. mm	30	15	10	15	25	15	50
Temperature range °C	-50 to +70	-35 to +80	-55 to +200	-55 to +200	-55 to +200	-55 to +260	-35 to +80
Copper weight kg/km	48,0	7,0	6,4	7,3	11,0	8,5	79,0
Outer Ø approx. mm	6,2	2,8	1,8	2,54	3,7	2,65	10,3
Weight approx. kg / km	62	11	8	16	28	17	159

Electrical characteristics

Impedance (Ohm)	95 ± 3	50 ± 2	50 ± 2	75 ± 3	95 ± 5	75 ± 3	50 ± 2
Frequency range							
f (max.) GHz	3	1	3	3	3	3	3
Propagation velocity v/c	0,83	0,66	0,7	0,7	0,7	0,7	0,66
Attenuation at 20°C (dB/100m)							
100 MHz	10,5	30	43	28	20	28	7
200 MHz	15	45	62	41	33	41	10,2
500 MHz	24,5	73	102	69	-	69	17
800 MHz	32,5	93	134	92	-	92	23
Capacitance pF/m	42,5	101	93	63	50	64	101
Rel. velocity of propagation %	83	70	70	70	70	70	100
Insulation resistance							
MOhm x km min.	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵
Loop resistance max. (Ohm/km)	136	360	860	840	840	840	10
Nominal peak voltage kVs	1,5	1,1	1,1	1,3	1,6	1,3	5,2
Dielectric strength							
50 Hz kVeff	3	2	2	2	2	2	10

Dimensions and specifications may be changed without prior notice. (RM01)

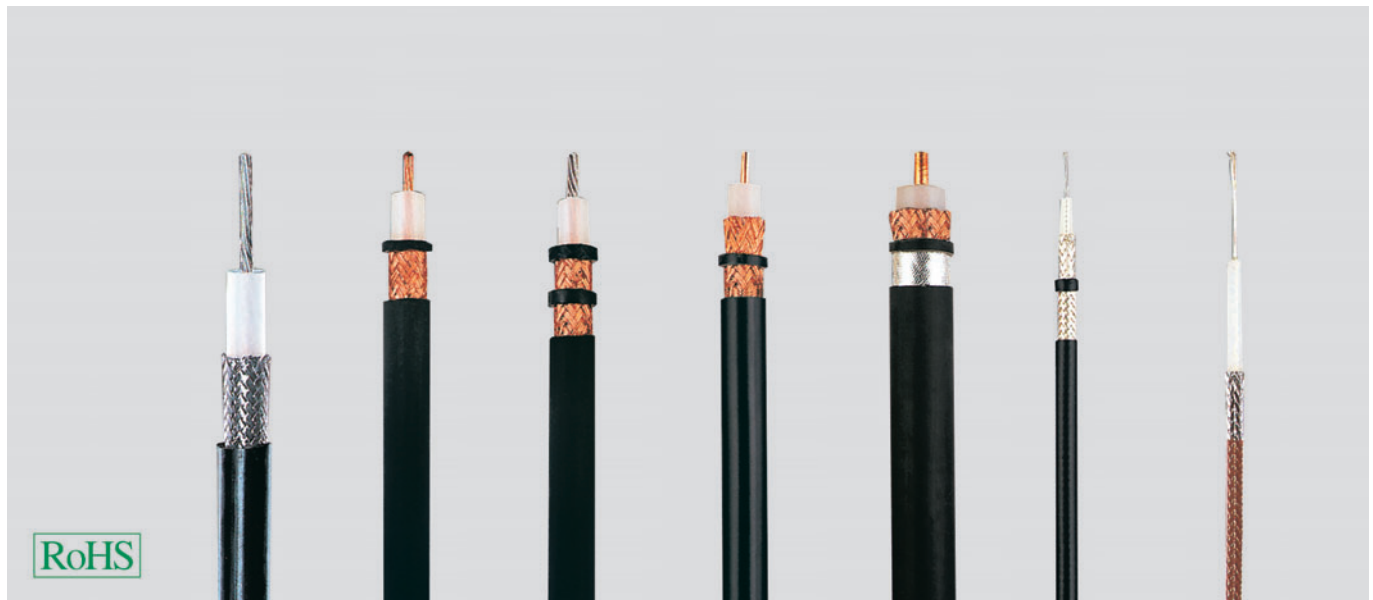
Note

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.
- The colour at FEP and PFA outer jacket is black or transparent as per production outlet.
- RG-Coaxial types are in accordance with US-Military specifications MIL-C-17.
- RG/U: R=Radio, G=Guide, U=Utility

Application

Coaxial cables are used in high frequency transmission, especially for transmitters and receivers, computers, radio and TV transmissions. The varied mechanical, thermal and electronic properties of Coaxial cables mean that they can be used up into the GHz levels, as per cable type.

RG-Coaxial Cables



Type RG.../U	214	215	216	217	218	223	316
Part no.	40011	40198	40199	40200	40201	40202	40203
Cable structure							
Inner conductor diameter mm	7 x 0,75	7 x 0,75	7 x 0,4	1 x 2,7	1 x 4,95	1 x 0,9	7 x 0,17
	Silvered copper	Copper, bare	Tinned copper	Copper, bare	Copper, bare	Silvered copper	Steel/copper, silvered
Insulation Ø mm	7,24 PE	7,24 PE	7,24 PE	9,4 PE	17,3 PE	2,95 PE	1,52 PTFE
Outer conductor	2 braids 2x silvered copper	Braid Copper, bare	2 braids Copper, bare	2 braids Copper, bare	Braid Copper, bare	2 braids 2x silvered copper	Braid Silvered copper
Outer jacket	PVC	PVC	PVC	PVC	PVC	PVC	PTFE/ alt. FEP
Min. bending radius approx. mm	50	70	50	70	110	25	15
Temperature range °C	-35 to +80	-35 to +80	-35 to +80	-35 to +80	-35 to +80	-35 to +80	-55 to +200
Copper weight kg/km	119,0	148,0	107,0	187,0	348,0	42,0	8,5
Outer Ø approx. mm	10,8	10,3	10,8	13,84	22,1	5,38	2,5
Weight approx. kg / km	198	300	176	300	710	60	15
Electrical characteristics							
Impedance (Ohm)	50 ± 2	50 ± 2	75 ± 3	50 ± 2	50 ± 2	50 ± 2	50 ± 2
Frequency range							
f (max.) GHz	11	3	3	3	3	3	3
Propagation velocity v/c	0,66	0,66	0,66	0,66	0,66	0,66	0,66
Attenuation at 20°C (dB/100m)							
100 MHz	7	7	7,5	4,8	2,9	17	28
200 MHz	10,2	10,2	11	7,1	4,5	23	40
500 MHz	17	17	18,5	12,3	8,1	38	68
800 MHz	23	23	24	16,8	11,2	50	90
Capacitance pF/m	101	101	67	101	101	101	95
Rel. velocity of propagation %	67	100	100	100	100	67	70
Insulation resistance							
MOhm x km min.	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵
Loop resistance							
max. (Ohm/km)	10	10	21	5	2	36	310
Nominal peak voltage kVs	5,2	5	5	7	11	1,9	1,2
Dielectric strength							
50 Hz kVeff	10	10	10	10	15	5	2

Dimensions and specifications may be changed without prior notice. (RM01)

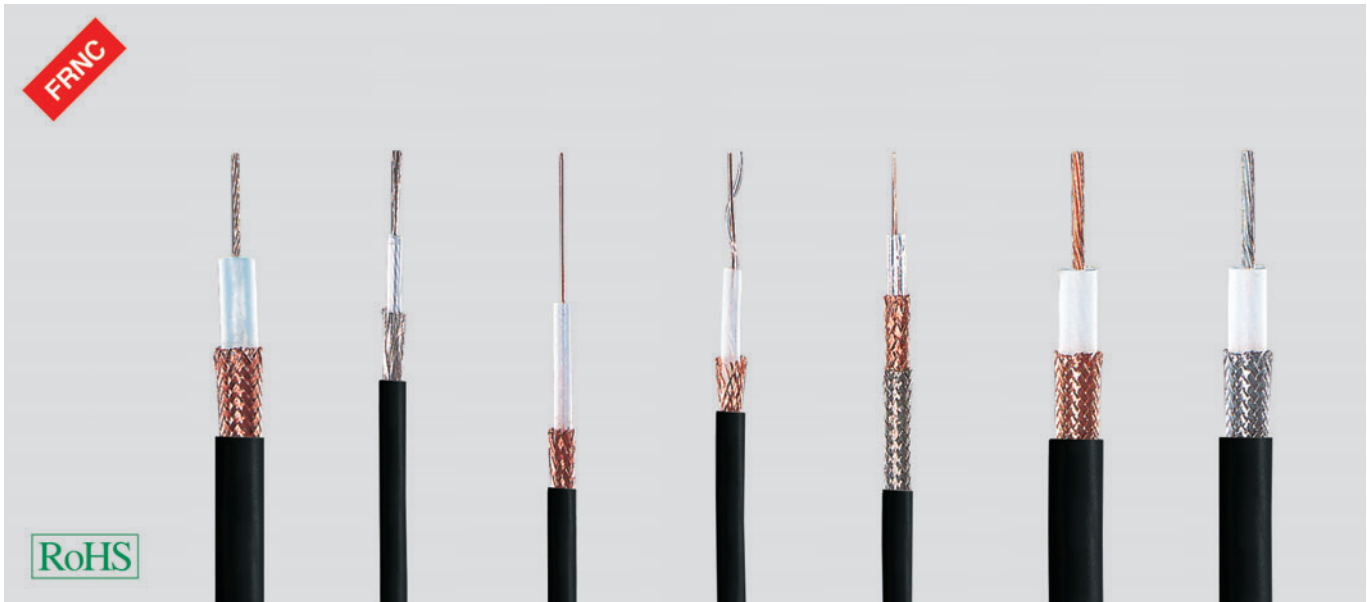
Note

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.
- The colour outer jacket at PTFE is black or transparent as per production outlet.
- RG-Coaxial types are in accordance with US-Military specifications MIL-C-17.
- RG/U: R=Radio, G=Guide, U=Utility

Application

Coaxial cables are used in high frequency transmission, especially for transmitters and receivers, computers, radio and TV transmissions. The varied mechanical, thermal and electronic properties of Coaxial cables mean that they can be used up into the GHz levels, as per cable type.

Halogen-Free RG-Coaxial Cables



Type RG.../U	11	58	59	62	71	213	214
Part no.	40190	40191	40192	40193	40194	40195	40196
Cable structure							
Inner conductor diameter mm	7 x 0,4	19 x 0,18	1 x 0,6	1 x 0,65	1 x 0,65	7 x 0,75	7 x 0,75
Insulation Ø mm	Tinned copper	Tinned copper	Steel/copper, bare	Steel/copper, bare	Steel/copper, bare	Copper, bare	Silvered copper
Outer conductor	7,3 PE	2,95 PE	3,7 PE	3,7 PE, hollow	3,7 PE, hollow	7,24 PE	7,24 PE
Outer jacket	Braid	Braid	Braid	Braid	2 braids	Braid	2 braids
Min. bending radius approx. mm	Copper, bare	Tinned copper	Copper, bare	Copper, bare	Copper, bare	Copper, bare	2x silvered copper
Temperature range °C	-	-	-	-	Tinned copper	-	-
Copper weight kg/km	HM2	HM2	HM2	HM2	HM2	HM2	HM2
Outer Ø approx. mm	50	25	30	30	30	50	50
Weight approx. kg / km	-35 to +80	-35 to +80	-35 to +80	-35 to +80	-50 to +70	-35 to +80	-35 to +80
	58,0	21,0	26,0	26,0	48,0	79,0	119,0
	10,3	5,4	6,4	6,4	6,9	10,3	10,8
	144	38	57	54	64	155	203

Electrical characteristics	11	58	59	62	71	213	214
Impedance (Ohm)	75 ± 3	50 ± 2	75 ± 3	93 ± 5	93 ± 3	50 ± 2	50 ± 2
Frequency range							
f (max.) GHz	3	3	3	3	3	3	11
Propagation velocity v/c	0,66	0,66	0,66	0,85	0,85	0,66	0,66
Attenuation at 20°C (dB/100m)							
3 MHz	1,3	2,9	2	2	2	1,2	1,2
10 MHz	2,4	5,3	3,8	3,7	3,7	2,3	2,3
100 MHz	7,8	17	12,2	12	12,5	7,5	7,5
200 MHz	11,3	24,4	17,6	17,3	17,3	10,9	10,9
500 MHz	18,7	39,2	27,2	24,7	24,7	17,2	17,2
800 MHz	23,4	47,8	35,2	34,6	34,6	22,6	22,6
Capacitance pF/m	68	0	68	42,5	42,5	101	101
Rel. velocity of propagation %	67	67	67	43	43	101	101
Insulation resistance							
MOhm x km min.	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵
Loop resistance							
max. (Ohm/km)	23	53	171	155	136	10	10
Nominal peak voltage kVs	5	1,9	2,3	0,75	0,75	5	5
Dielectric strength							
50 Hz kV eff.	10	5	7	3	3	10	10

Dimensions and specifications may be changed without prior notice. (RM01)

Note

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.
- H-outer jacket = halogen-free material (HM2)
- RG-Coaxial types are in accordance with US-Military specifications MIL-C-17.
- RG/U: R=Radio, G=Guide, U=Utility
- FRNC = Flame Retardant Non-Corrosive

Application

Coaxial cables are used in high frequency transmission, especially for transmitters and receivers, computers, radio and TV transmissions where no flame propagation under behaviour in fire is permitted. The varied mechanical, thermal and electronic properties of Coaxial cables mean that they can be used up into the GHz levels, as per cable type.

CATV-Cables with alu- or copper foil and braiding



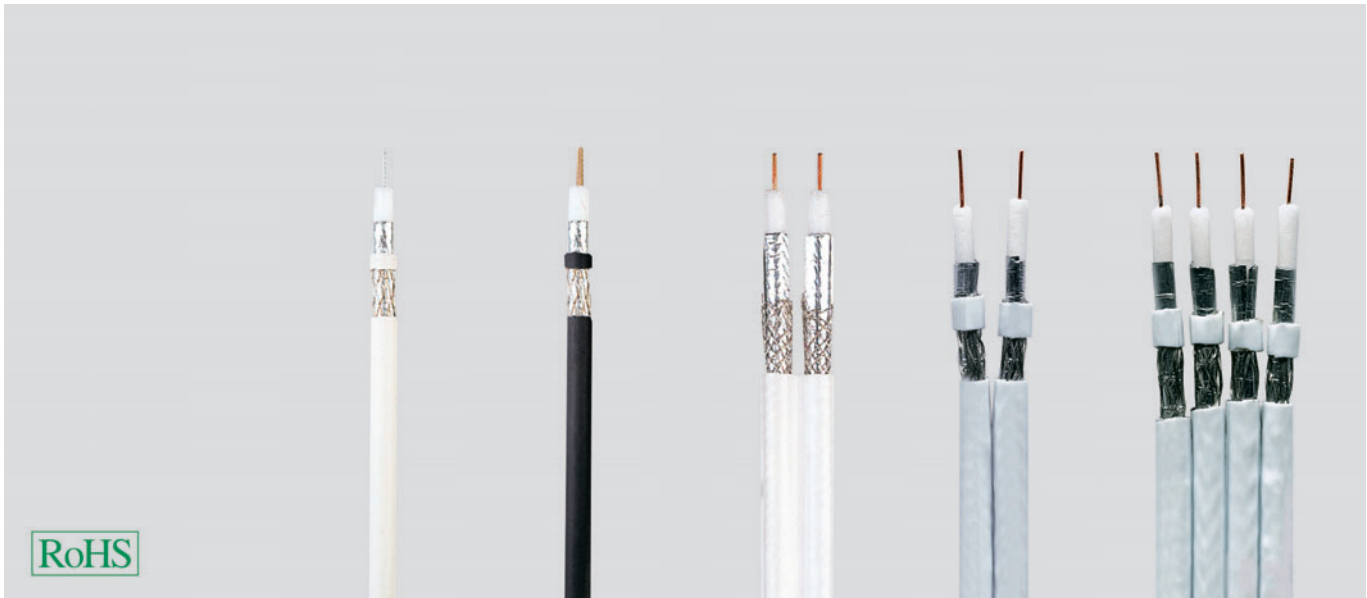
used as Type	0.7/4.4 ALG	Underground 1.1/7.3 ALG	Outdoor span 1.1/7.3 ALG-T	Underground 1.8/11.5 FG	Underground A-2YK2Y1 IKx 1.1/7.3	Underground A-2YOK2Y1 nKx 2.2/8.8	Underground A-2YOK2Y1 qKx 3.3/13.5	Underground A-2YOK2Y1 sKx 4.9/19.4
Part no.	40135	40139	40140	40141	40142	40143	40144	40179
Cable structure								
Inner conductor diameter mm	0,7 Copper, bare	1,1 Copper, bare	1,1 Copper, bare	1,8 Copper, bare	1,1 Copper, bare	2,2 Copper, bare	3,3 Copper, bare	4,9 Copper, bare
Insulation Ø mm	4,4 PE	7,3 PE	7,3 PE	11,5 PE	7,3 PE	8,8 PE, hollow	13,5 PE, hollow	19,4 PE, hollow
Outer conductor	Polyester foil coated with aluminium on both sides	Polyester foil coated with aluminium on both sides	Polyester foil coated with aluminium on both sides	Copper tape	Copper tube, welded	Copper tube, welded	Copper tube, welded	Copper tube, welded
Braid	-	Braid	Braid	Braid	-	-	-	-
Outer jacket	PVC	PE	PE	PE	PE	PE	PE	PE
Jacket colour	white	black	black	black	black	black	black	black
Outer Ø approx. mm	6,6	10,5	2,8	15,0	11,0	12,5	17,0	24,4
Min. bending radius approx. mm	35	100	150	150	160	200	300	400
Strain/suspending wire N	-	-	5500	-	-	-	-	-
Weight approx. kg / km	44	98	177	218	142	183	347	500
Electrical characteristics								
Impedance (Ohm)	75 ± 3	75 ± 3	75 ± 3	75 ± 3	75 ± 2	75 ± 2	75 ± 1	75 ± 1
Capacitance pF/m	67	67	67	67	65	51	51	50
Propagation velocity v/c	0,66	0,66	0,66	0,66	0,66	0,88	0,88	0,89
Attenuation at 20°C (dB/100m)								
100 MHz	9	5,2	5,2	3,5	5,4	2,8	1,9	1,3
200 MHz	12	7,3	7,3	5,2	7,9	4	2,7	1,9
500 MHz	21,2	12,6	12,6	9	12,9	6,6	4,4	3,1
800 MHz	27,5	16,8	16,8	12	17,3	8,4	5,7	4,1
950 MHz	30,5	18,8	18,8	13	18,9	9,3	6,3	4,4
1350 MHz	37	23	23	-	-	-	-	-
1750 MHz	43	27,7	27,7	-	-	-	-	-
2050 MHz	47,5	30,2	30,2	-	-	-	-	-
Structural return loss min. (dB) between								
30 and 300 MHz	30	32	32	30	26	26	28	28
300 and 600 MHz	30	32	32	30	23	23	25	25
600 and 960 MHz	25	30	30	28	21	21	23	23
960 and 1750 MHz	23	27	27	25	-	-	-	-
DC resistance at 20°C								
Inner conductor max. Ohm/km	47	18,5	18,5	7,3	22	5,6	2,5	1
Outer conductor max. Ohm/km	23	11	11	6,5	3,1	3	2	1
Screening efficiency (dB)								
50 and 100 MHz ≥	75	80	80	80	110	110	110	110
100 and 500 MHz ≥	75	85	85	85	110	110	110	110
500 and 1000 MHz ≥	75	85	85	85	110	110	110	110
1000 and 2050 MHz ≥	75	78	78	80	110	110	110	110
Post office approved	G670009A	G670011A	G622015B	G622010B	-	-	-	-

Dimensions and specifications may be changed without prior notice. (RM01)

Note

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.
- AL**=Aluminium, **ALPR**=Polyesterfoil coated with Aluminium on both sides
BK-cable=bandwidth communication cable, **Cu**=Copper, **CuR**=Cu-tube welded, **CuW**=Copperweld, **F**=Foil, **G**=Braid, **PE**=Polyethylene, **PEH**=Polyethylene air-space insulation, **PVC**=Polyvinylchloride

SAT-Coaxial Cables up to 2150 MHz, for satellite-receivers, double screened



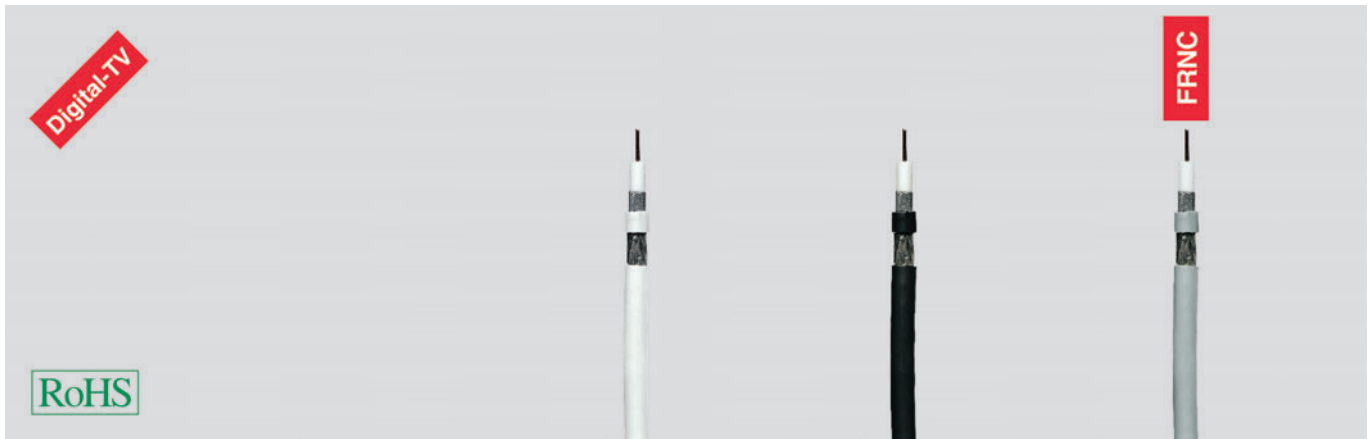
Type	1.1/5.0 ALG	1.65/7.2 ALG	SAT-MINI 1	DUO 2x0.7/2.9	QUADRO 4x0.7/2.9
Part no.	40150	40151	40159	40168	40169
Cable structure					
Inner conductor diameter mm	1,1 Tinned copper	1,6 Copper, bare	0,8 Copper, bare	0,65 Copper, bare	0,65 Copper, bare
Insulation Ø mm	5 Cell PE	7,2 Cell PE	3,5 Cell PE	3 Cell PE	3 Cell PE
Core colours	-	-	-	-	-
Outer conductor	Polyester foil coated with aluminium on both sides	Polyester foil coated with aluminium on both sides	Polyester foil coated with aluminium on both sides	Polyester foil coated with aluminium on both sides	Polyester foil coated with aluminium on both sides
	Braid	Braid	Braid	Braid	Braid
Outer jacket	PVC	PE	PVC	PVC	PVC
Jacket colour	white	black	white	white	white
Outer Ø approx. mm	6,8	10,1	5,4 x 10,8	8,6 x 4,3	20,0 x 4,3
Min. bending radius approx. mm	40	60	40	35	80
Weight approx. kg / km	49	81	62	40	82
Electrical characteristics					
Impedance (Ohm)	75 ± 3	75 ± 3	75 ± 3	75 ± 3	75 ± 3
Capacitance pF/m	55	55	55	55	55
Propagation velocity v/c	0,82	0,82	0,82	0,8	0,8
Attenuation at 20°C (dB/100m)					
100 MHz	5	3,7	8	8,9	8,9
200 MHz	7,3	5,1	11,5	13,5	13,5
500 MHz	13	9	18,5	22	22
800 MHz	17,2	11,8	23,5	28	28
950 MHz	19,5	13,6	25,5	31,5	31,5
1350 MHz	23,5	16,8	31	37	37
1750 MHz	27,6	19,7	35,5	42,3	42,3
2050 MHz	30	22	39,5	45,9	45,9
2150 MHz	31	22,5	43	50,4	50,4
Structural return loss min. (dB) between					
30 and 300 MHz	28	31	27	20	20
300 and 600 MHz	28	30	25	17	18
600 and 960 MHz	26	30	20	17	15
960 and 2050 MHz	24	28	20	-	-
DC resistance at 20°C					
Inner conductor max. Ohm/km	18	9	36	110	52
Outer conductor max. Ohm/km	20	12	28	22	26
Max. nominal voltage (V)	-	-	-	-	-
Screening efficiency (dB)					
50 and 100 MHz ≥	75	80	78	75	75
100 and 500 MHz ≥	75	85	78	75	75
500 and 1000 MHz ≥	75	85	75	75	75
1000 and 2050 MHz ≥	75	78	75	75	75
Post office approved					
	G670010A	G622016B	-	-	-
Copper weight kg/km	10,0	35,0	30,0	16,0	32,0

Dimensions and specifications may be changed without prior notice. (RM01)

Note

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.
- AL**=Aluminium, **ALPR**=Polyesterfoil coated with Aluminium on both sides
Cu=Copper, **CuW**=Copperweld, **F**=Foil, **G**=Braid, **PE**=Polyethylene, **PEH**=Polyethylene air-space insulation, **PVC**=Polyvinylchloride, **vz**=tinned

Multimedia-Coaxial Cables SAT 1,0/4,6GH, up to 2400MHz, for digital-tv, double screened, screening efficiency >90dB



used as Type	inner/outer 1.0/4.6 GH-Y	Underground 1.0/4.6 GH-2Y	Safety zones 1.0/4.6 GH-FRNC
Part no.	40176	40177	40178
Cable structure			
Inner conductor diameter mm	1 Copper with skin	1 Copper with skin	1 Copper with skin
Insulation Ø mm	4,6 Cell polyethylene with skin and PIB coating	4,6 Cell polyethylene with skin and PIB coating	4,6 Cell polyethylene with skin and PIB coating
Outer conductor	Polyester foil coated with aluminium on both sides	Polyester foil coated with aluminium on both sides	Polyester foil coated with aluminium on both sides
Outer jacket	PVC	PE	FRNC
Jacket colour	white	black	grey
Outer Ø approx. mm	6,6	6,6	6,6
Approv. bending radius approx. mm	45	45	45
Weight approx. kg / km	40	40	40
Electrical characteristics			
Impedance (Ohm)	75 ± 1	75 ± 1	75 ± 1
Capacitance pF/m	55	55	55
Propagation velocity v/c	0,8	0,85	0,85
Attenuation at 20°C (dB/100m)			
100 MHz	5,8	5,8	5,8
200 MHz	7,8	7,8	7,8
450 MHz	12,5	12,5	12,5
600 MHz	14,7	14,7	14,7
800 MHz	17,2	17,2	17,2
1000 MHz	19,1	19,1	19,1
1750 MHz	26,2	26,2	26,2
2050 MHz	28,5	28,5	28,5
2400 MHz	31,3	31,3	31,3
Structural return loss min. (dB) between			
30 and 300 MHz	30	30	30
300 and 600 MHz	32	32	32
600 and 960 MHz	31	31	31
960 and 1750 MHz	26	26	26
1750 and 2400 MHz	30	30	30
DC resistance at 20°C			
Inner conductor max. Ohm/km	18	18	18
Outer conductor max. Ohm/km	20	20	20
Max. nominal voltage (V)	-	-	-
Screening efficiency (dB) ≥	90	90	90
Copper weight kg/km	22,0	22,0	22,0

Dimensions and specifications may be changed without prior notice. (RM01)

Application

• Copper inner-conductor 1,02 with skin-effect

Protection against humidity and corrosion / Solid compound of dielectric. No change of position during installation in narrow bending radius.

• Dielectric 4,6 mm Ø : - special PE-compound, foaming by GAS-INJEKTION

Important improvement of propagation velocity values / Very high transmission speed of individual signals (presumption for Multimedia) / Improvement for the resistance to ageing / Reduction of attenuation-loss

• The over surface of dielectric consists too a skin-coating (smooth over surface)

Protection against humidity and other chemical influences / Minimum impedance tolerance ±2 Ohm / This coaxial cable is crimpable / Installation in narrow bending radius, no kinking risk / The transmission-loss of signals are hardly measurable to the advance in years / Additionally to the skin-effect, the dielectric contains a gel-coating (special PIB-compound) / We therefore offer a **15 years guarantee for attenuation-loss** by installation at 20 °C room-temperature

• Screening

a) AL/PR-foil, polyesterfoil coated with aluminium on both sides or b) Copper braiding of tinned wires, **screening efficiency >90 dB**

• Outer sheath

Alternatives - PVC white for indoor and outdoor installation / - PE black for underground laying or - FRNC grey as a safety coaxial cable in hospitals, airports and for medical equipment etc. (other sheath colours on request)

SAT-Coaxial Cables for digital-tv, screening efficiency >90dB / >95dB, for satellite-receivers, double screened



used as Type	inner 0,7/2,9	inner/outer 0,7/4,5	inner/outer 0,8/3,5	inner 1,1/5,0	Underground 1.6/7,0	inner 1,1/5,0 FRNC	inner/outer 1,1/5,0 FRNC	inner 1.6/7.0 FRNC
Part no.	40015	40016	40085	40017	40018	40019	40021	40020
Cable structure								
Inner conductor diameter mm	0,65	0,75	0,8	1,13	1,63	1,13	1,13	1,63
	Copper, bare	Tinned copper	Copper, bare	Copper, bare	Copper, bare	Copper, bare	Copper, bare	Copper, bare
Insulation Ø mm	3	4,5	3,5	4,8	7,1	4,8	4,8	7,1
	Polyethylene, foamed	Polyethylene, foamed	Polyethylene, foamed	Polyethylene, foamed	Polyethylene, foamed	Cell PE, foamed	Cell PE, foamed	Polyethylene, foamed
Outer conductor	ALPR-FG	ALPR-FG	ALPR-FG	ALPR-FG	ALPR-FG	ALPR-FG	ALPR-FG	ALPR-FG
	-	-	-	-	-	-	-	-
1st Screen - ALPR	foil	foil	foil	foil	foil	foil	foil	foil
2nd Screen - Cu-Braid	Braid	Braid	Braid	Braid	Braid	Braid	Braid	Braid
Outer jacket	PVC	PVC	PVC	PVC	PE	FRNC	FRNC	FRNC
Jacket colour	white	white	white	white	black	white	black	white
Outer Ø approx. mm	4,3	6,6	5,0	6,9	10,3	6,8	6,8	10,0
Min. bending radius approx. mm	43	35	50	45	60	48	48	60
Weight approx. kg / km	20	40	32	47	110	47	47	110
Electrical characteristics								
Impedance (Ohm)	75 ± 3	75 ± 3	75 ± 3	75 ± 2	75 ± 2	75 ± 2	75 ± 2	75 ± 2
Capacitance pF/m	55	67	53	55	55	53	55	53
Propagation velocity v/c	0,8	0,66	0,8	0,8	0,85	0,85	0,8	0,85
Attenuation at 20°C (dB/100m)								
100 MHz	8,1	7,1	6,3	4,9	3	4,7	4,9	3,8
200 MHz	13,3	10,4	11,5	7,7	6,1	7	7,2	5,5
450 MHz	20,9	16,8	17,1	11,6	9	11,5	11,6	8,6
800 MHz	-	25	-	-	-	17	-	12,1
1000 MHz	31,5	27,4	26,5	18,9	14,3	18,1	18,9	13,2
1750 MHz	42,2	37,4	36,4	26,6	20,1	25	26,6	17,5
2050 MHz	45,8	40,5	39,7	28,2	22,5	27,3	28,2	19
2250 MHz	49,9	44,3	43,1	29,5	24	28	29,5	19,9
2400 MHz	55,5	45	-	31,9	-	29,3	31,9	22,5
Structural return loss min. (dB) between								
30 and 300 MHz	20	20	35	25	40	25	40	25
300 and 600 MHz	18	18	35	18	35	18	40	18
600 and 960 MHz	16	18	30	17	35	17	35	17
960 and 1750 MHz	-	-	30	15	30	15	30	15
DC resistance at 20°C								
Inner conductor max. Ohm/km	52	110	36	18	9	18	18	9
Outer conductor max. Ohm/km	29	22	28	14	21	14	14	21
Max. nominal voltage (V)	-	-	-	-	-	-	-	-
Screening efficiency (dB)								
50 and 100 MHz ≥	95	90	90	95	90	90	95	90
100 and 500 MHz ≥	95	90	90	95	90	90	95	90
500 and 1000 MHz ≥	95	90	90	95	90	90	95	90
1000 and 2050 MHz ≥	95	90	90	95	90	90	95	90
Copper weight kg/km	8,0	9,0	9,0	15,0	32,0	15,0	15,0	15,0

Dimensions and specifications may be changed without prior notice. (RM01)

RGB-COAX-CY / RGB-COAX-(St)Y transmission cables for colour monitor



Technical data

- **Base cable 0,37/1,5 bzw. 0,6/3,7**

- **Temperature range**

fixed installation -10 °C to +80 °C
flexing -5 °C to +50 °C

- **Mutual capacitance** 67 nF/km

- **Impedance** 75 Ohm

- **Attenuation**

RGB-Coax 0,37/1,5

1 MHz = 2,0 dB/100m

2 MHz = 2,8 dB/100m

5 MHz = 4,0 dB/100m

10 MHz = 5,8 dB/100m

20 MHz = 8,4 dB/100m

50 MHz = 13,9 dB/100m

100 MHz = 19,8 dB/100m

200 MHz = 28,5 dB/100m

RGB-Coax 0,6/3,7

1 MHz = 1,1 dB/100m

2 MHz = 1,5 dB/100m

5 MHz = 2,5 dB/100m

10 MHz = 3,5 dB/100m

20 MHz = 4,5 dB/100m

50 MHz = 7,2 dB/100m

100 MHz = 10,4 dB/100m

200 MHz = 15,1 dB/100m

- **Minimum bending radius**

15x cable ø

Cable structure

RGB-COAX-CY ... x0,37/1,5

- Inner conductor bare copper, solid, conductor ø 0,37 mm
- Dielectric (insulation) of cell-Polyethylene
- Outer conductor of tinned copper wire braiding
- PVC-jacket in colour
red, green, blue for 3xRGB COAX
red, green, blue, white, black for 5xRGB COAX
- 3 or 5 Coax twisted with optimal lay-length
- Foil taping
- Overall braid-screening, tinned copper with optimal surface coverage and drain-wire
- PVC-outer jacket, black

RGB-COAX-CY 3x0,37/1,5 + 3x0,25

- Cable structure as per above, but with additional control cores (3x0,25) in the interstices
- Colour brown, green, white

RGB-COAX-(St)Y ... x0,6/3,7 (deviation)

- Inner conductor, bare copper, solid, conductor ø 0,6 mm
- Outer conductor of tinned or bare copper wire braiding
- Foil taping
- Plastic coated aluminium foil and drain wire
- PVC-outer jacket, green or black

Properties

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Application

RGB cables are suitable for the transmission of both analogue and digital video signals.

They are used particularly as connecting cables for data systems, engineering applications (CAD, high-definition graphics) and in television studios. The three main signals (red, green, blue) are transmitted separately. Depending on the application, it is possible to supply the base cable with further coaxial cables or with symmetrical signal cores for the intensity and horizontal or vertical synchronisation.

RGB-COAX-CY ... 0,37/1,5

Part no.	No. RGB-Coax n x mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
40145	3 x 0,37/1,5	7,2	25,0	59,0
40147	3 x 0,37/1,5 + 3 x 0,25	8,2	39,0	89,0
40146	5 x 0,37/1,5	9,0	36,0	89,0

RGB-COAX-(St)Y ... 0,6/3,7

Part no.	No. RGB-Coax n x mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
40148	3 x 0,6/3,7	16,0	66,0	278,0
40149	5 x 0,6/3,7	19,0	102,0	397,0

Dimensions and specifications may be changed without prior notice. (RM01)



Photo: HELUKABEL®

Cables according to International Approvals

Cables according to International Approvals

The installation of cables and wires according to overseas standards is getting more and more important for the machine and plant industries.

HELUKABEL® knows this problem from his customers and has for a long time delivered single core and multicore cables according to the following standards. Due to our extensive stock capacity, we are in a position to cover your requirements quickly and correctly.

Please enquire to our sales department.

UL	Underwriters Laboratories Inc.
AWM	Appliance Wiring Material
MTW	Machine Tool Wire
CEI	Comitato Elettrotecnico Italiano
CSA	Canadian Standard Association
SEV	Schweizerischer Elektrotechnischer Verein
USASI	USA Standard Institute
CNOMO	Comité De Normalisation Des Moyens De Production
GOST	GOST-R Certification
CCC	China Compulsory Certification
BS	British Standard

N

Contents

Description	Page
UL/CSA Control Cables	
JZ-602, two approvals control cable, 90°C, 600V, oil resistant, meter marking	N 7
JZ-603, Multi approvals control cable, oil resistant, meter marking	N 9
JZ-600 UL/CSA, flexible, number coded, 0,6/1kV, meter marking	N 10
H05VV-F/SJT, 300V, according to DIN VDE 0281 and UL 62	N 12
H05VV-F/SJT, 300V, according to DIN VDE 0281 and UL 62	N 13
H05VV-F/UL, 500 V, according to DIN VDE 0281 and UL-Style 20195	N 14
FROR CEI 20-22 II	N 15
C.N.O.M.O., Type N05VV5-F according to NFC 32-207	N 16
JZ-602-CY, EMC-preferred type, 90°C 600V, screened two approvals control cable, oil resistant, meter marking	N 17
JZ-603-CY, Multi approvals control cable, Cu-screened, EMC-preferred, oil resistant, meter marking	N 19
JZ-600-Y-CY UL/CSA, flexible, number coded, 0,6/1kV, EMC-preferred type, meter marking	N 20
JZ 604 TC TRAY CABLE, PVC power cable, exposed run, 90°C, 600V, meter marking	N 25
TRAYCONTROL 500, flexible, oil-resistant, open installation TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2007	N 27
TRAYCONTROL 530, flexible TC-ER control cable with coloured cores	N 29
TRAYCONTROL 600, flexible, oil-resistant, open installation (TC-ER), NFPA 79 Edition 2007	N 30
TRAYCONTROL 670 HDP / 670-C HDP, flexible, oil-resistant, open installation (TC-ER), NFPA 79 Edition 2007	N 32
JZ 604-FCY TC TRAY CABLE, PVC power cable, exposed run, screened, NFPA 79 Edition 2007, 90°C, 600V, EMC-preferred type, meter marking	N 33
JZ 604-YCY TC TRAY CABLE, PVC power cable, exposed run, screened, NFPA 79 Edition 2007, 90°C, 600V, EMC-preferred type, meter marking	N 34
TRAYCONTROL 500-C, flexible, oil-resistant, screened, EMC-preferred type, open installation TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2007	N 35
TRAYCONTROL 600-C, flexible, oil-resistant, screened, EMC-preferred type, open installation (TC-ER), NFPA 79 Edition 2007	N 37
TRAYCONTROL 300, flexible, oil-resistant, NFPA 79 Edition 2007	N 38
TRAYCONTROL 300-C, flexible, oil-resistant, screened, EMC-preferred type, NFPA 79 Edition 2007	N 40
TRAYCONTROL 300 TP, stranded pair, flexible, oil-resistant, NFPA 79 Edition 2007	N 42
TRAYCONTROL 300-C TP, stranded pair, flexible, screened, oil-resistant, EMC-preferred type, NFPA 79 Edition 2007	N 44
JZ-602-PUR, 80°C, 600V, two approvals control cable, meter marking	N 46
JZ-602-PUR DC/AC, 80°C, 600V, two approvals control cable, meter marking	N 48
JZ-600 PUR, tear and coolant resistant, 0,6/1kV, meter marking	N 49
JZ-602-C-PUR, screened two approvals control cable, 80°C, 600V, EMC-preferred type, meter marking	N 51
JZ-600-YC-PUR, tear and coolant resistant, 0,6/1kV, Cu-screened, EMC-preferred type, meter marking	N 52
MEGAFLEX® 500, halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking	N 54
MEGAFLEX® 500-C, halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, screened, EMC-preferred types, meter marking	N 56
MEGAFLEX® 600, halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking	N 58
MEGAFLEX® 600-C, halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking	N 60
MULTIFLEX 600, highly flexible, oil-resistant, open installation TC-ER, PLTC-ER, NFPA 79 Edition 2007	N 62
MULTIFLEX 600-C, highly-flexible, oil-resistant, screened, EMC-preferred type, control cable for open installation TC-ER, PLTC-ER, NFPA 79 Edition 2007	N 63
UL/CSA Data Cables	
Command Cable UL (LiYY), style 2464/300 V, (80°C)	N 65
Command Cable UL (LiYY), 600V, style 2516/600 V, (105°C)	N 66
Command Cable UL (LiYY-TP), style 2464/300V, 80°C	N 67
Command Cable UL (LiYCY), style 2464, 300V, 80°C, EMC-preferred type	N 69
Command Cable UL (LiYCY), style 2516/600 V, 105°C, EMC-preferred type	N 71
Command Cable UL (LiYCY-TP), style 2464/300 V, 80°C, EMC-preferred type	N 72
UL/CSA Heat resistant Cables	
SiHF UL/CSA, halogen-free, 150°C/ 600 V, two-approvals silicon multicore cable	N 75
SiHF-C-Si UL/CSA, halogen-free, 150°C/ 600 V, two-approvals silicon multicore cable, Cu-screened, EMC-preferred type	N 77

Contents

Description	Page
UL/CSA Rubber Cables	
Rubber / Neoprene Control Cable, Typen SJO und SO	N 79
H07RN-F/S00W, rubber-sheathed cable, harmonized type	N 80
UL/CSA Cables for Drag Chains	
MULTISPEED® 500-PVC UL/CSA, high flexible, safety against high bending in drag chain systems, oil-resistant, low torsion, meter marking	N 82
JZ-602 RC*, cable for drag chains, 90°C, 600V, two approvals control cable, meter marking	N 83
MULTISPEED® 500-C-PVC UL/CSA, oil resistant, high flexible, safety against high bending in drag chain systems, low torsion, screened, EMC-preferred type, meter marking	N 84
JZ-602 RC*-CY, special cable for drag chains, 90°C, 600V, two approvals control cable, EMC-preferred type, meter marking	N 85
JZ-602 RC*-PUR, special cable for drag chains, 80°C, 600V, two approvals control cable, meter marking	N 86
MULTIFLEX 512®-PUR UL/CSA, special cable for drag chains, 80°C, 600V, two approvals control cable, halogen-free	N 87
MULTISPEED® 500-PUR UL/CSA, safety against high bending in drag chain systems, low torsion, halogen-free, meter marking	N 89
JZ-602 RC*-C-PUR, special cable for drag chains, 80°C, 600V, two approvals control cable, EMC-preferred type, meter marking	N 91
MULTIFLEX 512®-C-PUR UL/CSA, special cable for drag chains, 80°C, 600V, two approvals control cable, EMC-preferred type, halogen-free, meter marking	N 92
MULTISPEED® 500-C-PUR UL/CSA, safety against high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking	N 94
MULTISPEED® 500-TPE UL/CSA, high flexible, safety against high bending in drag chain systems, low torsion, halogen-free, meter marking	N 96
MULTISPEED® 500-C-TPE UL/CSA, safety against high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking	N 98
SUPERTRONIC-310-PVC, special cable for drag chains, meter marking	N 100
SUPERTRONIC-310-C-PVC, special cable for drag chains, EMC-preferred type, meter marking	N 101
SUPERTRONIC-330 PURÖ, cable for drag chains, halogen-free, meter marking	N 102
SUPERTRONIC-330 C-PURÖ, cable for drag chains, halogen-free, EMC-preferred type, meter marking	N 103
SUPER-PAAR-TRONIC 340-C-PUR, cable for drag chains, halogen-free, EMC-preferred type, meter marking	N 104
MULTISPEED®-TRONIC-PUR, safety against high bending in drag chain systems, halogen-free, meter marking	N 105
MULTISPEED®-TRONIC-C-PUR, safety against high bending in drag chain systems, high flexible, halogen-free, screened, EMC-preferred type, meter marking	N 106
UL/CSA Single Conductors	
UL-Style 1007, CSA TR 64, PVC single cores, 80°C, 300V	N 108
UL-Style 1569, CSA TR 64, PVC single cores, 105°C, 300V	N 109
UL-Style 1015, PVC single core, 600V	N 110
THREENORM, PVC single core, UL-Style 1013 and CSA 600V	N 111
FIVENORM, HAR-UL-CSA-AWM-MTW, PVC single core, UL-Style 10269/UL-Standard 1063, 600V, 105°C	N 113
THHN/THWN, 90°C, 600V, UL listed, PVC + nylon single core	N 115
PVC single cores, According to CEI-20-22 II	N 116
HELUTHERM® 145, 300V, flexible single core, cross-linked, halogen-free	N 117
HELUTHERM® 145, 600V, flexible single core, cross-linked, halogen-free	N 118
UL-Style 3135, silicone single cores cable, 600V / 200°C, halogen-free	N 119
Single 600-J/-O, special single core cable, 0,6/1kV, meter marking	N 120
Single 600-CY -J/-O, special single core cable, Cu-screened, EMC-preferred type, meter marking	N 121
Single 602-RC* -J/O, special single core cable for drag chains, 90°C, 600V, meter marking	N 122
Single 602-RC* -CY -J/O, special single core cable for drag chains, 90°C, 600V, EMC-preferred type, meter marking	N 123
MULTISPEED® 600-PUR -J/-O, special single cores for drag chains, halogen-free, meter marking	N 124
MULTISPEED® 600-C-PUR -J/-O, special cable for drag chains, screened, halogen-free, EMC-preferred type, meter marking	N 125

N

Contents

Description	Page
UL/CSA Servo, Feedback & Motor Cables	
TOPSERV® 108 PVC, Motor cable without pair according to Siemens Standard 6FX5008 with PVC-outer sheath for fixed or not constantly movements 0,6/1kV	N 127
TOPSERV® 112 PVC, Servo cable with 1 signal pair according to Siemens Standard 6FX5008 and Lenze Standard with PVC-sheath for fixed or not constantly movements 0,6/1kV	N 128
TOPSERV® 119 PVC, Servo cable with 2 signal pairs analogue Indramat Standard with PVC-sheath for fixed or not constantly movements 0,6/1kV	N 129
TOPGEBER® 511 PVC, Feedback cables according to Siemens-, Lenze- or Indramat Standard with PVC-sheath for fixed or not constantly movements	N 130
TOPSERV® 109 PUR, PUR, high flexible motor cable for drag chain without pairs according to Siemens Standard 6FX8008-plus 0,6/1kV	N 131
TOPSERV® 113 PUR, PUR, high flexible servo cable for drag chain with 1 signal pair according to Siemens Standard 6FX8008-plus and Lenze 0,6/1kV	N 132
TOPSERV® 121 PUR, PUR, high flexible servo cable for drag chain with 2 Signal pairs according to Indramat-Standard INK	N 134
TOPGEBER® 512 PUR, PUR, high flexible Feedback cable for drag chain according to Siemens, Indramat, Lenze and other Standards	N 135
TOPFLEX® 600 VFD, EMC-preferred type, flexible motor power supply cable, oil-resistant, NFPA 79 Edition 2007	N 137
TOPFLEX® 650 VFD, EMC-preferred type, flexible motor power supply cable with control cores, oil-resistant, NFPA 79 Edition 2007	N 138
TOPSERV® 600 VFD, EMC-preferred type, flexible motor power supply cable, oil-resistant, NFPA 79 Edition 2007	N 139
TOPSERV® 650 VFD, EMC-preferred type, flexible motor power supply cable with control cores, oil-resistant, NFPA 79 Edition 2007	N 140
TOPFLEX®-EMV-UV-2YSLCYK-J UL/CSA, Motor supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.	N 141
TOPFLEX®-EMV-UV 2YSLCYK-J UL/CSA, Motor supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.	N 143
TOPFLEX®-EMV-UV 2YSLC11Y-J UL/CSA, Motor supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.	N 145
TOPFLEX® MOTOR EMV 1/1, triple-screened, low capacitance, 80°C 600V high flexible motor supply cable, meter marking	N 147
TOPFLEX®-MOTOR-EMV 3/3, triple-screened, low capacitance, 80°C, 600V, PUR flexible motor supply cable, meter marking	N 148
TOPFLEX®-MOTOR-EMV 103, low capacitance power supply cable 0,6/1kV, increased ampacity, meter marking	N 150
VERTEILERFLEX two-approvals, sensor actuator and distributor cables PVC, PUR, PVC/PUR	N 151
Cables to British Standard	
HELUKABEL BS 5308 Part 1, Instruments cable, core insulation PE or XLPE	N 154
HELUKABEL BS 5308 Part 2, Instruments cable, core insulation PVC	N 155
HELUKABEL BS 5467, High voltage cable 0,6/1kV, armoured, sheath PVC	N 156
HELUKABEL BS 6724, High voltage cable 0,6/1kV, armoured, halogen-free	N 157

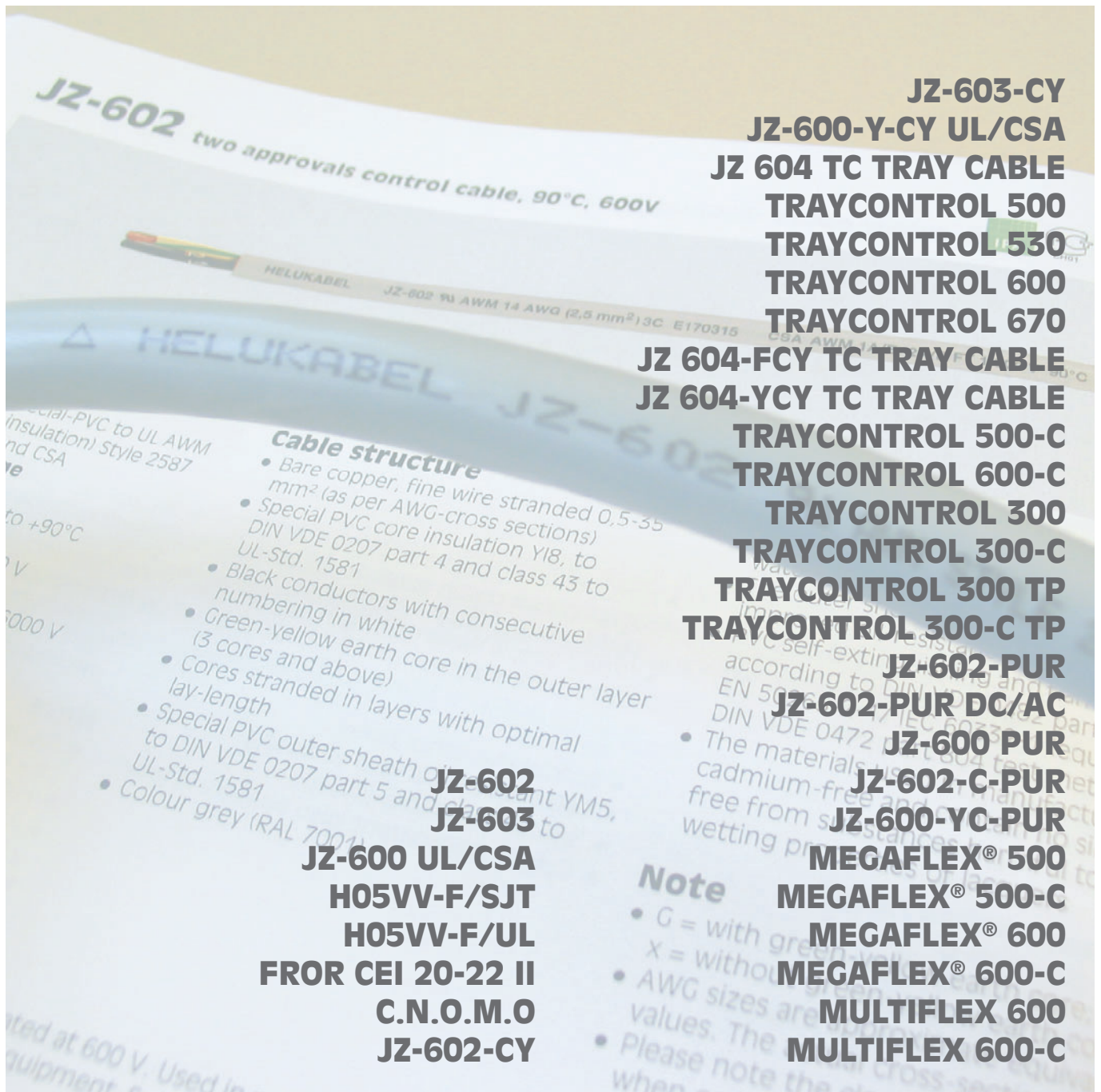
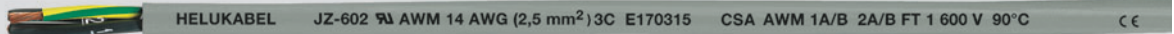


Photo: HELUKABEL®

UL/CSA Control Cables

JZ-602 two approvals control cable, 90°C, 600V, oil resistant, meter marking



Technical data

- Control cable of special-PVC to UL CSA AWM I/II A/B Style 2587 (jacket insulation) and CSA
- Temperature range**
flexing -5 °C to +90 °C
fixed installation -40 °C to +90 °C
- Nominal voltage**
according to UL + CSA 600 V
- Test voltage** 3000 V
- Breakdown voltage** min. 6000 V
- Insulation resistance**
min 20 MOhm x km
- Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI3, to DIN VDE 0281 part 1 and class 43 to UL-Std. 1581
- Black conductors with consecutive numbering in white
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath YM5, to DIN VDE 0207 part 5 and class 43 to UL-Std. 1581
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Resistant to mineral oils, synthetic oils and water based coolants
- The outer sheath is approved with an improved oil-resistance-test
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Please note the cleanroom qualification when ordering.
- screened analogue type:**
JZ-602-CY, see page N 17

Application

UL-approved and CSA certified flexible control cable rated at 600 V. Used in machine tools, control systems, connection between control panels and machines, assembly lines and other industrial equipment. Suitable for installation in dry, moist or wet environment and moderate flexing applications.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83090	2 x 0,5	20	5,8	9,6	49,0
83091	3 G 0,5	20	6,2	14,0	58,0
83092	4 G 0,5	20	6,6	19,0	69,0
83093	5 G 0,5	20	7,2	24,0	84,0
83094	7 G 0,5	20	7,8	34,0	123,0
83100	8 G 0,5	20	8,4	38,4	140,0
83101	9 G 0,5	20	10,3	43,2	177,0
83095	12 G 0,5	20	10,8	58,0	192,0
83096	18 G 0,5	20	12,8	86,0	256,0
83097	25 G 0,5	20	15,4	120,0	358,0
83098	34 G 0,5	20	17,6	163,0	487,0
83099	41 G 0,5	20	19,7	197,0	580,0
83080	2 x 1	18	6,2	19,2	53,0
83081	3 G 1	18	6,6	27,0	61,0
83565	3 x 1	18	6,6	27,0	61,0
83082	4 G 1	18	7,2	38,4	74,0
83083	5 G 1	18	7,8	48,0	90,0
83084	7 G 1	18	8,4	67,0	130,0
83102	8 G 1	18	9,4	76,8	144,0
83103	9 G 1	18	11,0	86,4	180,0
83085	12 G 1	18	11,7	115,2	198,0
83086	18 G 1	18	14,0	173,0	274,0
83087	25 G 1	18	17,0	240,0	384,0
83088	34 G 1	18	19,2	326,0	494,0
83089	41 G 1	18	21,0	394,0	508,0
83070	2 x 1,5	16	6,8	28,8	73,0
83071	3 G 1,5	16	7,4	44,0	94,0
83072	4 G 1,5	16	8,0	58,0	117,0
83073	5 G 1,5	16	8,6	72,0	140,0
83074	7 G 1,5	16	9,7	101,0	186,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83104	9 G 1,5	16	12,7	129,7	244,0
83075	12 G 1,5	16	13,3	173,0	319,0
83076	18 G 1,5	16	15,7	260,0	451,0
83077	25 G 1,5	16	18,8	360,0	625,0
83078	34 G 1,5	16	22,0	490,0	840,0
83079	41 G 1,5	16	23,6	590,0	1032,0
83060	2 x 2,5	14	8,1	48,0	115,0
83061	3 G 2,5	14	8,6	72,0	143,0
83062	4 G 2,5	14	10,0	96,0	185,0
83063	5 G 2,5	14	10,8	120,0	221,0
83064	7 G 2,5	14	12,0	168,0	293,0
83065	9 G 2,5	14	15,5	216,0	429,0
83066	12 G 2,5	14	16,6	288,0	563,0
83067	18 G 2,5	14	19,5	432,0	854,0
83068	19 G 2,5	14	19,5	456,0	914,0
83069	25 G 2,5	14	23,8	600,0	1188,0
83051	3 G 4	12	11,1	115,0	232,0
83052	4 G 4	12	12,4	154,0	298,0
83053	5 G 4	12	13,7	192,0	358,0
83054	7 G 4	12	15,0	269,0	460,0
83041	3 G 6	10	12,8	173,0	360,0
83042	4 G 6	10	14,1	231,0	402,0
83043	5 G 6	10	15,7	288,0	484,0
83044	7 G 6	10	17,7	403,0	630,0
83031	3 G 10	8	16,8	288,0	535,0
83032	4 G 10	8	18,3	384,0	653,0
83033	5 G 10	8	20,1	480,0	786,0
83034	7 G 10	8	22,4	672,0	1100,0

Continuation ▶

JZ-602 two approvals control cable, 90°C, 600V, oil resistant, meter marking



Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83020	2 x 16	6	20,0	307,0	640,0
83021	3 G 16	6	21,3	461,0	810,0
83022	4 G 16	6	23,8	615,0	1045,0
83023	5 G 16	6	26,6	768,0	1260,0
83024	7 G 16	6	29,4	1075,0	1760,0
83011	3 G 25	4	24,7	720,0	1180,0
83012	4 G 25	4	27,8	960,0	1507,0
83013	5 G 25	4	30,5	1200,0	1858,0
83014	7 G 25	4	35,5	1680,0	2830,0
83001	3 G 35	2	29,4	1008,0	1590,0
83002	4 G 35	2	32,6	1344,0	2123,0
83003	5 G 35	2	36,3	1680,0	2612,0
83004	3 G 50	1	31,2	1440,0	2652,0
83005	4 G 50	1	36,8	1920,0	3058,0
83006	5 G 50	1	38,7	2400,0	4093,0

Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83007	3 G 70	2/0	39,2	2016,0	3307,0
83008	4 G 70	2/0	42,6	2688,0	4254,0
83009	5 G 70	2/0	48,4	3360,0	5661,0
83010	3 G 95	3/0	42,1	2736,0	4867,0
83015	4 G 95	3/0	47,5	3648,0	5762,0
83016	5 G 95	3/0	51,2	4560,0	7208,0
83017	3 G 120	4/0	47,8	3456,0	5580,0
83018	4 G 120	4/0	54,6	4608,0	7280,0
83019	5 G 120	4/0	59,0	5760,0	8692,0

Dimensions and specifications may be changed without prior notice. (RN01)

N



Carrying out a flame test according to the American standard UL 1581 at our Windsbach factory.



JZ-603 (VDE) (HAR) H05VV5-F 4 G 0,5 OMM AWM STYLE 2587 20AWG 4C VW-1 LL113926 CSA
AWM I/II A/B 90°C 600V FT1 CCC A014024 HELUKABEL GMBH 60227IEC75(RVVY) 300/500V GOST-R / 83651



Technical data

- Special PVC control cable with oil resistant outer sheath to DIN VDE 0281 part 13, HD 21.13 S1 and to UL-Style 2587
- **Temperature range**
flexing
-5 °C to +70 °C (HAR)
-5 °C to +90 °C (UL+CSA)
fixed installation
-40 °C to +70 °C (HAR)
-40 °C to +90 °C (UL+CSA)
- **Nominal voltage**
U₀/U 300/500 V (HAR)
U 600 V (UL+CSA)
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation T11, to DIN VDE 0281 part 1, HD 21.1S2 and class 43 to UL-Std. 1581
- Black cores with white continuous numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath TM5 oil resistant, to DIN VDE 0281 part 1, HD 21.1 S4 and class 43 to UL-Std. 1581
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Oil resistant as per HD/EN 60811-2-1, UL 1581 part 50.182
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B), UL-VW1.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- The following amendments in the cable designation result from the new DIN VDE 0281 part 13 / harmonised in accordance with HD 21.13S1: NYSLYÖ-J (new: H05VV5-F) and NYSLYCYÖ-J (new: H05VVC4V5-K). SEV-approval is no longer applicable as a result of the harmonisation.
- **screened analogue type:**
JZ-603-CY, see page N 19

Application

UL-CSA-HAR approved cables offer any company exporting anywhere in the world, primarily designed for exporters, used in machine tools, control systems, assembly lines and other industrial equipment. These cables are suitable for flexible use for medium mechanical stresses with free movements in dry, moist and wet rooms but not for open air.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83704	2 x 0,5	20	5,8	9,6	52,0
83650	3 G 0,5	20	6,1	14,0	63,0
83651	4 G 0,5	20	6,7	19,0	69,0
83652	5 G 0,5	20	7,3	24,0	87,0
83653	7 G 0,5	20	8,8	34,0	119,0
83654	12 G 0,5	20	11,1	58,0	198,0
83655	18 G 0,5	20	12,9	86,0	266,0
83656	25 G 0,5	20	16,0	120,0	380,0
83657	34 G 0,5	20	17,7	163,0	508,0
83658	41 G 0,5	20	19,5	197,0	594,0
83659	50 G 0,5	20	21,3	240,0	715,0
83660	61 G 0,5	20	23,8	293,0	840,0
83705	2 x 0,75	19	6,1	14,4	66,0
83661	3 G 0,75	19	6,5	22,0	76,0
83662	4 G 0,75	19	7,1	29,0	85,0
83663	5 G 0,75	19	7,9	36,0	113,0
83664	7 G 0,75	19	9,5	50,0	144,0
83665	12 G 0,75	19	11,6	86,0	245,0
83666	18 G 0,75	19	13,9	130,0	327,0
83667	25 G 0,75	19	17,1	180,0	466,0
83668	34 G 0,75	19	19,1	245,0	626,0
83669	41 G 0,75	19	20,9	296,0	747,0
83670	50 G 0,75	19	23,0	360,0	896,0
83671	61 G 0,75	19	25,3	439,0	1070,0
83706	2 x 1	18	6,4	19,2	70,0
83672	3 G 1	18	6,8	29,0	88,0
83673	4 G 1	18	7,5	39,0	99,0
83674	5 G 1	18	8,4	48,0	132,0
83675	7 G 1	18	10,0	67,0	170,0
83676	12 G 1	18	12,5	115,0	285,0
83677	18 G 1	18	14,7	173,0	405,0
83678	25 G 1	18	18,0	240,0	570,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83679	34 G 1	18	20,3	326,0	742,0
83680	41 G 1	18	22,4	394,0	885,0
83681	50 G 1	18	24,3	480,0	1071,0
83682	61 G 1	18	26,8	586,0	1265,0
83707	2 x 1,5	16	7,4	28,8	91,0
83683	3 G 1,5	16	8,0	43,0	110,0
83684	4 G 1,5	16	8,7	58,0	141,0
83685	5 G 1,5	16	9,8	72,0	167,0
83686	7 G 1,5	16	11,9	101,0	225,0
83687	12 G 1,5	16	14,5	173,0	361,0
83688	18 G 1,5	16	17,4	259,0	518,0
83689	25 G 1,5	16	21,3	360,0	730,0
83690	34 G 1,5	16	24,1	490,0	945,0
83691	41 G 1,5	16	26,2	591,0	1135,0
83692	50 G 1,5	16	28,8	720,0	1381,0
83693	61 G 1,5	16	31,5	878,0	1640,0
83708	2 x 2,5	14	9,1	48,0	125,0
83694	3 G 2,5	14	9,9	72,0	169,0
83695	4 G 2,5	14	11,0	96,0	209,0
83696	5 G 2,5	14	12,0	120,0	256,0
83697	7 G 2,5	14	14,6	168,0	340,0
83698	12 G 2,5	14	18,1	288,0	579,0
83699	18 G 2,5	14	22,1	432,0	851,0
83700	25 G 2,5	14	26,5	600,0	1175,0
83701	34 G 2,5	14	29,9	816,0	1529,0
83702	50 G 2,5	14	35,2	1200,0	2290,0
83703	61 G 2,5	14	38,4	1464,0	2724,0

Dimensions and specifications may be changed without prior notice. (RN01)

JZ-600 UL/CSA flexible, number coded, 0,6/1kV, meter marking



Technical data

- Special PVC control cables Adapted to DIN VDE 0276 part 627, DIN VDE 0281 part 13, with insulation thickness for 1 kV type and UL-Std. 758 Style 21179
- **Temperature range** flexing -5 °C to +80 °C fixed installation -40 °C to +80 °C
- **Nominal voltage** 1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Power rating** as per DIN VDE 0298
- **Minimum bending radius** flexing 7,5x cable ø fixed installation 4x cable ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, as per DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1, class 43 UL-Std. 1581
- Black cores with white figure imprints to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Separating foil Special PVC outer sheath TM2, to DIN VDE 0281 part 1, class 43 UL-Std. 1581
- Colour black (RAL 9005) or grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- Resistant to ultra violet rays (building with black jacket)
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) VW1, FT1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
JZ-600-Y-CY UL/CSA, see page N 20

Application

Wiring cable for measuring and controlling purposes in tool machinery, conveyor belts and production lines, for plant installations, air conditioning and in steel production plants and rolling mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation, building with black jacket). Is not suitable to be used as direct burial- or as underwater cable. The cores have been numbered in such a way that the numbers are easily identifiable, even if the cable has only been stripped back a few cm. The core numbers have been underlined to avoid confusion. The earth core is located in the outer layer. The black, special PVC outer sheath is resistant to the ultra violet radiation. Mainly used in South-European, Eastern and Arabian countries.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
11815	2 x 0,5	20	6,4	9,6	56,0
11816	3 G 0,5	20	6,8	14,4	68,0
11817	4 G 0,5	20	7,6	19,0	100,0
11818	5 G 0,5	20	8,2	24,0	117,0
11819	7 G 0,5	20	9,8	33,6	138,0
11820	12 G 0,5	20	12,2	58,0	200,0
11821	18 G 0,5	20	14,4	86,0	276,0
11822	25 G 0,5	20	17,2	120,0	335,0
11823	2 x 0,75	19	6,8	14,4	66,0
11824	3 G 0,75	19	7,2	21,6	74,0
11825	4 G 0,75	19	8,0	29,0	126,0
11826	5 G 0,75	19	8,8	36,0	140,0
11827	7 G 0,75	19	10,7	50,0	190,0
11828	12 G 0,75	19	13,1	86,0	257,0
11829	18 G 0,75	19	15,6	130,0	362,0
11830	25 G 0,75	19	18,9	180,0	486,0
11831	2 x 1	18	7,4	19,2	80,0
11832	3 G 1	18	8,0	29,2	96,0
11833	4 G 1	18	8,8	38,4	100,0
11834	5 G 1	18	9,8	48,0	130,0
11835	7 G 1	18	11,7	67,0	170,0
11836	12 G 1	18	14,5	115,0	290,0
11837	18 G 1	18	17,3	173,0	405,0
11838	25 G 1	18	21,1	240,0	570,0
11839	2 x 1,5	16	8,4	29,0	95,0
11840	3 G 1,5	16	9,1	43,0	112,0
11841	4 G 1,5	16	9,9	58,0	139,0
11842	5 G 1,5	16	11,0	72,0	170,0
11843	7 G 1,5	16	13,3	101,0	225,0
11844	12 G 1,5	16	16,6	173,0	370,0
11845	18 G 1,5	16	19,7	259,0	520,0
11846	25 G 1,5	16	23,9	360,0	730,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
11880	2 x 0,5	20	6,4	9,6	56,0
11881	3 G 0,5	20	6,8	14,4	68,0
11882	4 G 0,5	20	7,6	19,0	100,0
11883	5 G 0,5	20	8,2	24,0	117,0
11884	7 G 0,5	20	9,8	33,6	138,0
11885	12 G 0,5	20	12,2	58,0	200,0
11886	18 G 0,5	20	14,4	86,0	276,0
11887	25 G 0,5	20	17,2	120,0	335,0
11888	2 x 0,75	18	6,8	14,4	66,0
11889	3 G 0,75	18	7,2	21,6	74,0
11890	4 G 0,75	18	8,0	29,0	126,0
11891	5 G 0,75	18	8,8	36,0	140,0
11892	7 G 0,75	18	10,7	50,0	190,0
11893	12 G 0,75	18	13,1	86,0	257,0
11894	18 G 0,75	18	15,6	130,0	362,0
11895	25 G 0,75	18	18,9	180,0	486,0
11896	2 x 1	17	7,4	19,2	80,0
11897	3 G 1	17	8,0	29,2	96,0
11898	4 G 1	17	8,8	38,4	100,0
11899	5 G 1	17	9,8	48,0	130,0
11900	7 G 1	17	11,7	67,0	170,0
11901	12 G 1	17	14,5	115,0	290,0
11902	18 G 1	17	17,3	173,0	405,0
11903	25 G 1	17	21,1	240,0	570,0
11904	2 x 1,5	16	8,4	29,0	95,0
11905	3 G 1,5	16	9,1	43,0	112,0
11906	4 G 1,5	16	9,9	58,0	139,0
11907	5 G 1,5	16	11,0	72,0	170,0
11908	7 G 1,5	16	13,3	101,0	225,0
11909	12 G 1,5	16	16,6	173,0	370,0
11910	18 G 1,5	16	19,7	259,0	520,0
11911	25 G 1,5	16	23,9	360,0	730,0

Continuation ▶

JZ-600 UL/CSA flexible, number coded, 0,6/1kV, meter marking



Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
11847	2 x 2,5	14	9,4	48,0	160,0
11848	3 G 2,5	14	9,9	72,0	175,0
11849	4 G 2,5	14	11,1	96,0	203,0
11850	5 G 2,5	14	12,4	120,0	251,0
11851	7 G 2,5	14	15,0	168,0	330,0
11852	12 G 2,5	14	18,4	288,0	553,0
11853	18 G 2,5	14	22,0	432,0	795,0
11854	25 G 2,5	14	26,9	600,0	1110,0
11855	2 x 4	12	11,4	77,0	180,0
11856	3 G 4	12	12,3	115,0	230,0
11857	4 G 4	12	13,8	154,0	310,0
11858	5 G 4	12	15,3	192,0	410,0
11859	7 G 4	12	16,8	269,0	540,0
11860	12 G 4	12	22,9	461,0	860,0
11861	3 G 6	10	14,1	173,0	370,0
11862	4 G 6	10	15,6	230,0	430,0
11863	5 G 6	10	17,3	288,0	650,0
11864	7 G 6	10	19,3	403,0	860,0
11865	3 G 10	8	16,5	288,0	660,0
11866	4 G 10	8	18,1	384,0	790,0
11867	5 G 10	8	20,5	480,0	960,0
11868	7 G 10	8	22,5	672,0	1300,0
11869	3 G 16	6	19,6	461,0	760,0
11870	4 G 16	6	21,7	614,0	1100,0
11871	5 G 16	6	24,2	768,0	1600,0
11872	7 G 16	6	25,7	1075,0	1890,0
11873	3 G 25	4	24,0	720,0	1450,0
11874	4 G 25	4	26,9	960,0	1600,0
11875	5 G 25	4	29,4	1200,0	2050,0
11876	7 G 25	4	32,8	1680,0	2900,0

Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
11912	2 x 2,5	14	9,4	48,0	160,0
11913	3 G 2,5	14	9,9	72,0	175,0
11914	4 G 2,5	14	11,1	96,0	203,0
11915	5 G 2,5	14	12,4	120,0	251,0
11916	7 G 2,5	14	15,0	168,0	330,0
11917	12 G 2,5	14	18,4	288,0	553,0
11918	18 G 2,5	14	22,0	432,0	795,0
11919	25 G 2,5	14	26,9	600,0	1110,0
11920	2 x 4	12	11,4	77,0	180,0
11921	3 G 4	12	12,3	115,0	230,0
11922	4 G 4	12	13,8	154,0	310,0
11923	5 G 4	12	15,3	192,0	410,0
11924	7 G 4	12	16,8	269,0	540,0
11925	12 G 4	12	22,9	461,0	860,0
11926	3 G 6	10	14,1	173,0	370,0
11927	4 G 6	10	15,6	230,0	430,0
11928	5 G 6	10	17,3	288,0	650,0
11929	7 G 6	10	19,3	403,0	860,0
11930	3 G 10	8	16,5	288,0	660,0
11931	4 G 10	8	18,4	384,0	790,0
11932	5 G 10	8	20,5	480,0	960,0
11933	7 G 10	8	22,5	672,0	1300,0
11934	3 G 16	6	19,6	461,0	760,0
11935	4 G 16	6	21,7	614,0	1100,0
11936	5 G 16	6	24,2	768,0	1600,0
11937	7 G 16	6	25,7	1075,0	1890,0
11938	3 G 25	4	24,0	720,0	1450,0
11939	4 G 25	4	26,9	960,0	1600,0
11940	5 G 25	4	29,3	1200,0	2050,0
11941	7 G 25	4	32,6	1680,0	2900,0

Dimensions and specifications may be changed without prior notice. (RN01)



Technical data

- PVC control cable to DIN VDE 0281 part 5 and part 2, IEC 60227-5, HD 21.5 S3 and UL-Std. 62 and CSA 22.2 No. 49
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage**
DIN VDE 0281 = U₀/U 300/500 V
UL 62 = U 300 V
CSA = U 300 V
- **Test voltage** 2500 V, 5 min.
- **Breakdown voltage** min. 5000 V
- **Spark-Test** 6000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
approx. 7,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire stranded conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5, HD 383 and UL-Std. 62
- PVC insulation TI2 to DIN VDE 0281 part 1 and class 43 to UL-Std. 62 (Table 50.182, UL-Std. 1581) according to CSA-Std. C 22.2 No 49 Type SJT
- Core identification according to colour code DIN VDE 0293-308, one coloured
- Green-yellow earth core, 3 cores and above
- Core stranded with optimal lay-length
- PVC outer jacket TM2 to DIN VDE 0281 part 1 and class 43 to UL-Std. 62 (Table 50.182, UL-Std. 1581) according to CSA-Std. C 22.2 No 49 Type SJT
- Jacket colour black, white or grey

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.

Application

These flexible PVC control cables, VDE-HAR-UL-CSA approved, are designed for the export and also for the export-orientated-equipment. These cables are especially suited to use for the appliance with medium mechanical stresses with free movement without tensile stress in households, kitchens and offices, also for household appliances in damp and wet areas, e.g. refrigerators, washing machines, spin-driver etc., as far as this cable is admitted to the relevant specifications of the equipment.

These cables are suited to be used for cooking and heating apparatus under the condition that cable does not come in direct contact with hot parts of the apparatus and no other influences or heat.

The cables are suitable for fixed installation in furnitures, partition walls, decoration covering and in hollow spaces of prefabricated building parts.

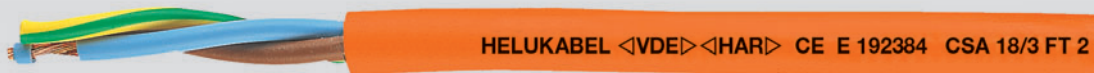
They are not suitable for use in open air, in industries (also permitted to tailor workshops and of that kind) and in agriculture plants and for connecting commercial electrical tools.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
28034	2 x 1	black	7,3	19,2	56,0	17
28066	2 x 1	grey	7,3	19,2	56,0	17
28050	2 x 1	white	7,3	19,2	56,0	17
28035	3 G 1	black	7,8	28,8	73,0	17
28067	3 G 1	grey	7,8	28,8	73,0	17
28051	3 G 1	white	7,8	28,8	73,0	17
28036	4 G 1	black	8,6	38,4	86,0	17
28068	4 G 1	grey	8,6	38,4	86,0	17
28052	4 G 1	white	8,6	38,4	86,0	17
28037	5 G 1	black	9,4	48,0	105,0	17
28069	5 G 1	grey	9,4	48,0	105,0	17
28053	5 G 1	white	9,4	48,0	105,0	17
28038	2 x 1,5	black	7,9	28,8	82,0	16
28070	2 x 1,5	grey	7,9	28,8	82,0	16
28054	2 x 1,5	white	7,9	28,8	82,0	16
28039	3 G 1,5	black	8,4	44,0	96,0	16
28071	3 G 1,5	grey	8,4	44,0	96,0	16
28055	3 G 1,5	white	8,4	44,0	96,0	16
28040	4 G 1,5	black	9,3	58,0	117,0	16
28072	4 G 1,5	grey	9,3	58,0	117,0	16
28056	4 G 1,5	white	9,3	58,0	117,0	16
28041	5 G 1,5	black	10,4	72,0	144,0	16
28073	5 G 1,5	grey	10,4	72,0	144,0	16
28057	5 G 1,5	white	10,4	72,0	144,0	16

Part no.	No. cores x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
28042	2 x 2,5	black	9,2	48,0	118,0	14
28074	2 x 2,5	grey	9,2	48,0	118,0	14
28058	2 x 2,5	white	9,2	48,0	118,0	14
28043	3 G 2,5	black	10,0	72,0	152,0	14
28075	3 G 2,5	grey	10,0	72,0	152,0	14
28059	3 G 2,5	white	10,0	72,0	152,0	14
28044	4 G 2,5	black	10,9	96,0	192,0	14
28076	4 G 2,5	grey	10,9	96,0	192,0	14
28060	4 G 2,5	white	10,9	96,0	192,0	14
28045	5 G 2,5	black	12,2	120,0	243,0	14
28077	5 G 2,5	grey	12,2	120,0	243,0	14
28061	5 G 2,5	white	12,2	120,0	243,0	14
28046	2 x 4	black	10,6	76,8	195,0	12
28078	2 x 4	grey	10,6	76,8	195,0	12
28062	2 x 4	white	10,6	76,8	195,0	12
28047	3 G 4	black	11,5	115,0	235,0	12
28079	3 G 4	grey	11,5	115,0	235,0	12
28063	3 G 4	white	11,5	115,0	235,0	12
28048	4 G 4	black	12,4	154,0	300,0	12
28080	4 G 4	grey	12,4	154,0	300,0	12
28064	4 G 4	white	12,4	154,0	300,0	12
28049	5 G 4	black	14,1	192,0	361,0	12
28081	5 G 4	grey	14,1	192,0	361,0	12
28065	5 G 4	white	14,1	192,0	361,0	12

Dimensions and specifications may be changed without prior notice. (RN01)



Technical data

- PVC control cable to DIN VDE 0281 part 5 and part 2, IEC 60227-5, HD 21.5 S3 and UL-Std. 62 and CSA 22.2 No. 49
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage**
DIN VDE 0281 = U₀/U 300/500 V
UL 62 = U 300 V
CSA = U 300 V
- **Test voltage** 2500 V, 5 min.
- **Breakdown voltage** min. 5000 V
- **Spark-Test** 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
approx. 7,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire stranded conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5, HD 383 and UL-Std. 62
- PVC insulation TI2 to DIN VDE 0281 part 1 and class 43 to UL-Std. 62 (Table 50.182, UL-Std. 1581) according to CSA-Std. C 22.2 No 49 Type SJT
- Core identification according to colour code DIN VDE 0293-308, one coloured
- Green-yellow earth core, 3 cores and above
- Core stranded with optimal lay-length
- PVC outer jacket TM2 to DIN VDE 0281 part 1 and class 43 to UL-Std. 62 (Table 50.182, UL-Std. 1581) according to CSA-Std. C 22.2 No 49 Type SJT
- Jacket colour by request

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- Colour code:
0 = RAL 5015, blue
1 = RAL 6018, green
2 = RAL 8003, brown
3 = RAL 1021, yellow
4 = RAL 3000, red
5 = RAL 2003, orange
6 = RAL 4005, violet
7 = gold
8 = dusky gold
- Please add the individual part no. for order with the identification colour code. Further colours on request.

Application

These flexible PVC control cables, VDE-HAR-UL-CSA approved, are designed for the export and also for the export-orientated-equipment. These cables are especially suited to use for the appliance with medium mechanical stresses with free movement without tensile stress in households, kitchens and offices, also for household appliances in damp and wet areas, e.g. refrigerators, washing machines, spin-driver etc., as far as this cable is admitted to the relevant specifications of the equipment. These cables are suited to be used for cooking and heating apparatus under the condition that cable does not come in direct contact with hot parts of the apparatus and no other influences or heat. The cables are suitable for fixed installation in furnitures, partition walls, decoration covering and in hollow spaces of prefabricated building parts. They are not suitable for use in open air, in industries (also permitted to tailor workshops and of that kind) and in agriculture plants and for connecting commercial electrical tools.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3110_	2 x 1	7,3	19,2	56,0	17
3111_	3 G 1	7,8	28,8	73,0	17
3112_	4 G 1	8,6	38,4	86,0	17
3113_	5 G 1	9,4	48,0	105,0	17
3114_	2 x 1,5	7,9	28,8	82,0	16
3115_	3 G 1,5	8,4	44,0	96,0	16
3116_	4 G 1,5	9,3	58,0	117,0	16
3117_	5 G 1,5	10,4	72,0	144,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3118_	2 x 2,5	9,2	48,0	118,0	14
3119_	3 G 2,5	10,0	72,0	152,0	14
3120_	4 G 2,5	10,9	96,0	192,0	14
3121_	5 G 2,5	12,2	120,0	243,0	14
3122_	2 x 4	10,6	76,8	195,0	12
3123_	3 G 4	11,5	115,0	235,0	12
3124_	4 G 4	12,4	154,0	300,0	12
3125_	5 G 4	14,1	192,0	361,0	12

Dimensions and specifications may be changed without prior notice. (RN01)



Technical data

- PVC control cable to DIN VDE 0281 part 5 and part 2, IEC 60227-5, HD 21.5 S3 and UL-Subj. 758 AWM-Style 20195
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage**
DIN VDE 0281 = U_0/U 300/500 V
UL-Style 20195 = U_0/U 300/500 V
- **Test voltage** 2500 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
approx. 7,5x cable ø
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors bunch stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5, HD 383 and to UL-Std. 62
- PVC core insulation TI2 to DIN VDE 0281 part 1
- Cores colour coded to DIN VDE 0293-308
- Green-yellow earth core, 3 cores and above
- Core stranded in layers with optimal lay-length
- PVC outer jacket, colour by request
- PVC outer jacket TM2 to DIN VDE 0281 part 1

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Colour code:
0 = RAL 9005, black
1 = RAL 9003, white
2 = RAL 5015, blue
3 = RAL 6018, green
4 = RAL 8003, brown
5 = RAL 1021, yellow
6 = RAL 3000, red
7 = RAL 2003, orange
8 = RAL 4005, violet
9 = RAL 7001/7032, grey
- Please add the individual part no. for order with the identification colour code. Further colours on request.

Application

These flexible PVC control cables, VDE-HAR-AWM approved, are designed for the export and also for the export-orientated-equipment. These cables are especially suited to use for the appliance with medium mechanical stresses with free movement without tensile stress in households, kitchens and offices, also for household appliances in damp and wet areas, e.g. refrigerators, washing machines, spin-driver etc., as far as this cable is admitted to the relevant specifications of the equipment. These cables are suited to be used for cooking and heating apparatus under the condition that cable does not come in direct contact with hot parts of the apparatus and no other influences or heat. The cables are suitable for fixed installation in furnitures, partition walls, decoration covering and in hollow spaces of prefabricated building parts. They are not suitable for use in open air, in industries (also permitted to tailor workshops and of that kind) and in agriculture plants and for connecting commercial electrical tools.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3269_	2 x 0,75	6,4	14,4	50,0	18
3270_	3 G 0,75	6,8	21,6	60,0	18
3271_	4 G 0,75	7,4	29,0	73,0	18
3272_	5 G 0,75	8,3	36,0	88,0	18
3273_	2 x 1	7,3	19,0	57,0	17
3274_	3 G 1	7,8	29,0	73,0	17
3275_	4 G 1	8,6	38,0	85,0	17
3276_	5 G 1	9,4	48,0	105,0	17
3277_	2 x 1,5	7,9	29,0	82,0	16
3278_	3 G 1,5	8,4	43,0	95,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
3279_	4 G 1,5	9,3	58,0	117,0	16
3280_	5 G 1,5	10,4	72,0	144,0	16
3281_	3 G 2,5	10,0	72,0	152,0	14
3282_	4 G 2,5	10,9	96,0	192,0	14
3283_	5 G 2,5	12,2	120,0	243,0	14

Dimensions and specifications may be changed without prior notice. (RN01)



CEI 20-22 II FROR 450/750 V 4 G 2,5 MM2

CE



Technical data

- Special PVC-sheath flexible cord as per Italian standard CEI 20-22
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -35 °C to +70 °C
- **Nominal voltage**
to 5 cores U₀/U 450/750 V
at 7 cores U₀/U 300/500 V
- **Test voltage** 2000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (80 Mrad)
- **Minimum bending radius**
approx. 10x cable ø

Cable structure

- Bare copper conductor, fine wire stranded to CEI 20-29 cl. 5
- Special PVC compound Mi R 2
- Colour coded up and to 4 cores to HELUKABEL®-JB colour code see Technical Informations
- As of 5 cores black with continuous white number printing
- Green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath
- Sheath colour grey, similar to RAL 7035, with printing CEI 20-22 II

Properties

- Oil- and petrol resistant as per CEI 20-22 II
- **Conditionally resistant to**
Oil
Solvents
Acids
Lyes
- PVC self-extinguishing and flame retardant, test methods analog to IEC 60332-3
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Well known companies (FIAT, COMAU, etc.) use this cable for measurement and control purposes on machine tools and conveyors, as well as on production lines in equipment production and for special mechanical engineering. These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air. Due to special conductor insulation- and sheath compound, this cable is flame resistant in case of fire and self-extinguishing. The good oil- and petrol resistance allows the usage of this cable also in problem areas.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
60250	3 G 1	8,5	29,0	85,0	17
60251	4 G 1	9,5	39,0	100,0	17
60252	5 G 1	10,5	48,0	123,0	17
60253	7 G 1	10,8	67,0	160,0	17
60254	12 G 1	13,8	115,0	270,0	17
60255	18 G 1	16,5	173,0	380,0	17
60256	25 G 1	19,5	240,0	500,0	17
60284	27 G 1	20,0	259,0	560,0	17
60285	33 G 1	20,8	317,0	700,0	17
60257	34 G 1	21,0	326,0	720,0	17
60258	42 G 1	23,3	405,0	800,0	17
60259	50 G 1	25,0	480,0	1050,0	17
60260	3 G 1,5	9,6	43,0	105,0	16
60261	4 G 1,5	11,0	58,0	150,0	16
60262	5 G 1,5	12,0	72,0	190,0	16
60263	7 G 1,5	12,5	101,0	220,0	16
60264	12 G 1,5	16,0	173,0	350,0	16
60265	18 G 1,5	18,8	259,0	515,0	16
60266	25 G 1,5	23,0	360,0	705,0	16
60267	34 G 1,5	26,0	490,0	990,0	16
60286	37 G 1,5	26,5	533,0	1005,0	16
60268	42 G 1,5	29,5	605,0	1080,0	16
60269	50 G 1,5	30,5	720,0	1330,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
60287	3 G 2,5	11,3	72,0	190,0	14
60270	4 G 2,5	12,3	96,0	215,0	14
60271	5 G 2,5	12,6	120,0	270,0	14
60272	7 G 2,5	14,5	168,0	350,0	14
60273	12 G 2,5	18,0	288,0	550,0	14
60274	4 G 4	14,0	154,0	300,0	12
60275	7 G 4	16,0	269,0	500,0	12
60276	4 G 6	16,0	230,0	430,0	10
60277	4 G 10	19,0	384,0	700,0	8
60278	4 G 16	23,0	614,0	1000,0	6
60279	4 G 25	28,0	960,0	1550,0	4
60280	4 G 35	31,0	1344,0	2070,0	2
60281	4 G 50	37,0	1920,0	2850,0	1
60282	4 G 70	43,0	2688,0	4000,0	2/0
60283	4 G 95	50,0	3648,0	5400,0	3/0

Dimensions and specifications may be changed without prior notice. (RN01)



Technical data

- Special PVC based core insulation
- As per to the french motor industry standard for tool machines 04-24-22
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** 500 V
- **Test voltage** 2000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (80 Mrad)
- **Minimum bending radius**
15x cable ø

Cable structure

- Plain copper conductors
- Special core insulation
- Cores laid up
- Cores available in either red or black with white figure imprint
- Green-yellow earth core
- PVC outer jacket grey

Properties

- PVC self-extinguishing and flame retardant, text method B and IEC 60332-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Resistant to**
Oil
Petrol
Cutting oil according to C.N.O.M.O. recommendation E 03.40.150N

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Further types and sizes available on request.

Application

These cables are constructed specially for the french automobile industries and used for the installation in tool making machines, production lines, industrial plants, air conditioning as well as for use in steel production. These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

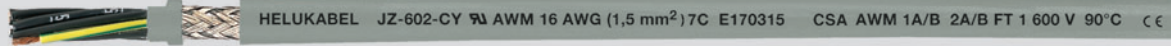
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
60000	2 x 0,75	6,2	14,4	50,0	18
60001	3 G 0,75	6,6	21,6	59,0	18
60002	4 G 0,75	7,2	29,0	72,0	18
60003	5 G 0,75	8,0	36,0	87,0	18
60004	6 G 0,75	8,9	50,0	105,0	18
60005	12 G 0,75	11,6	86,0	175,0	18
60006	18 G 0,75	13,9	144,0	267,0	18
60007	27 G 0,75	17,2	230,0	404,0	18
60008	36 G 0,75	19,7	288,0	503,0	18
60009	48 G 0,75	22,8	360,0	670,0	18
60010	60 G 0,75	24,9	439,0	805,0	18
60011	2 x 1	6,5	19,0	56,0	17
60012	3 G 1	6,9	29,0	72,0	17
60013	4 G 1	7,7	38,0	84,0	17
60014	5 G 1	8,5	48,0	104,0	17
60015	6 G 1	9,2	67,0	124,0	17
60016	12 G 1	12,4	115,0	219,0	17
60017	18 G 1	15,2	192,0	314,0	17
60018	27 G 1	18,7	308,0	485,0	17
60019	36 G 1	21,1	384,0	620,0	17
60020	48 G 1	24,3	480,0	809,0	17
60021	60 G 1	26,4	586,0	1000,0	17
60022	2 x 1,5	7,5	29,0	76,0	16
60023	3 G 1,5	8,1	43,0	94,0	16
60024	4 G 1,5	9,1	58,0	116,0	16
60025	5 G 1,5	10,1	72,0	143,0	16
60026	6 G 1,5	11,0	101,0	173,0	16
60027	12 G 1,5	15,1	173,0	307,0	16
60028	18 G 1,5	17,9	263,0	464,0	16
60029	24 G 1,5	21,0	341,0	629,0	16
60030	27 G 1,5	21,8	372,0	708,0	16
60031	36 G 1,5	24,5	498,0	985,0	16
60032	48 G 1,5	28,4	641,0	1175,0	16
60033	60 G 1,5	31,3	878,0	1415,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
60034	2 x 2,5	10,5	48,0	122,0	14
60035	3 G 2,5	11,0	72,0	151,0	14
60036	4 G 2,5	12,0	96,0	191,0	14
60037	5 G 2,5	13,1	120,0	244,0	14
60038	6 G 2,5	15,0	168,0	292,0	14
60039	12 G 2,5	18,0	288,0	524,0	14
60040	2 x 4	10,4	77,0	178,0	12
60041	3 G 4	11,3	115,0	230,0	12
60042	4 G 4	12,8	154,0	300,0	12
60043	5 G 4	14,2	192,0	362,0	12
60044	2 x 6	11,6	115,0	218,0	10
60045	3 G 6	12,7	173,0	325,0	10
60046	4 G 6	14,2	230,0	481,0	10
60047	5 G 6	15,7	288,0	584,0	10
60048	2 x 10	15,0	194,0	505,0	8
60049	3 G 10	16,6	288,0	610,0	8
60050	4 G 10	18,4	384,0	736,0	8
60051	5 G 10	20,9	480,0	913,0	8

Dimensions and specifications may be changed without prior notice. (RN01)

JZ-602-CY EMC-preferred type, 90°C 600V, screened two approvals

control cable, oil resistant, meter marking



Technical data

- Special PVC-insulated sheathed cable according to UL AWM Style 10012 (core insulation) Style 2587 and CSA
- **Temperature range**
flexing -5 °C to +90 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage** according to UL+CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 10x cable Ø
fixed installation 5x cable Ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI3, to DIN VDE 0281 part 1 and class 43 to UL-Std. 1581
- Cores black with sequential numbering imprinted in white
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- PVC-insulated inner sheath YM5 to DIN VDE 0207 part 5
- Braided screen of tinned Cu wires approx. 85% coverage
- Special PVC outer sheath YM5, to DIN VDE 0207 part 5 and class 43 to UL-Std. 1581
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Resistant to mineral oils, synthetic oils and refrigerants. The outer sheath is approved with an improved oil-resistance-test.
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **unscreened analogue type:**
JZ-602, see page N 7

Application

UL and CSA approved flexible control cables up to 600 V, for all machinery in tooling and plant construction, suitable for installation in dry, moist or wet environments for medium mechanical loads. Designed for the export-orientated machinery manufacturer, specifically for USA and Canada. The thick braiding screen ensures compliance with electromagnetic requirements.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
82990	2 x 0,5	20	7,7	35,0	93,0
82991	3 G 0,5	20	8,0	42,0	124,0
82992	4 G 0,5	20	8,6	47,0	133,0
82993	5 G 0,5	20	9,2	56,0	153,0
82994	7 G 0,5	20	10,0	69,0	191,0
82995	9 G 0,5	20	11,8	87,0	243,0
82996	12 G 0,5	20	13,0	108,0	322,0
82997	18 G 0,5	20	15,2	145,0	374,0
82998	25 G 0,5	20	18,2	240,0	436,0
82999	34 G 0,5	20	20,1	312,0	560,0
83000	41 G 0,5	20	22,4	348,0	663,0
82979	2 x 1	18	8,1	50,0	107,0
82980	3 G 1	18	8,4	60,0	130,0
82981	4 G 1	18	9,3	71,0	155,0
82982	5 G 1	18	10,0	88,0	181,0
82983	7 G 1	18	10,7	111,0	209,0
82984	9 G 1	18	12,7	139,0	321,0
82985	12 G 1	18	14,0	184,0	341,0
82986	18 G 1	18	16,4	260,0	473,0
82987	25 G 1	18	19,7	349,0	650,0
82988	34 G 1	18	22,1	486,0	781,0
82989	41 G 1	18	24,5	531,0	892,0
82968	2 x 1,5	16	8,7	63,0	136,0
82969	3 G 1,5	16	9,4	80,0	165,0
82970	4 G 1,5	16	10,2	97,0	192,0
82971	5 G 1,5	16	11,0	119,0	224,0
82972	7 G 1,5	16	12,0	147,0	273,0
82973	9 G 1,5	16	14,2	182,0	340,0
82974	12 G 1,5	16	15,6	267,0	461,0
82975	18 G 1,5	16	18,7	374,0	674,0
82976	25 G 1,5	16	22,6	526,0	950,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
82977	34 G 1,5	16	25,5	629,0	1203,0
82978	41 G 1,5	16	27,4	801,0	1588,0
82959	2 x 2,5	14	10,3	96,0	173,0
82960	3 G 2,5	14	10,8	144,0	220,0
82961	4 G 2,5	14	11,7	148,0	270,0
82962	5 G 2,5	14	13,0	181,0	329,0
82963	7 G 2,5	14	14,2	255,0	428,0
82964	9 G 2,5	14	15,8	309,0	580,0
82965	12 G 2,5	14	17,1	441,0	761,0
82966	18 G 2,5	14	18,9	570,0	1140,0
82967	25 G 2,5	14	27,8	738,0	1551,0
82954	2 x 4	12	12,5	120,0	209,0
82955	3 G 4	12	13,1	174,0	310,0
82956	4 G 4	12	14,4	230,0	456,0
82957	5 G 4	12	15,8	273,0	532,0
82958	7 x 4	12	17,6	316,0	737,0
82949	2 G 6	10	14,2	173,0	318,0
82950	3 G 6	10	15,1	240,0	411,0
82951	4 G 6	10	16,5	305,0	572,0
82952	5 G 6	10	18,3	439,0	732,0
82953	7 G 6	10	20,9	505,0	961,0
82945	3 G 10	8	19,1	350,0	741,0
82946	4 G 10	8	21,1	535,0	988,0
82947	5 G 10	8	23,6	592,0	1202,0
82948	7 G 10	8	26,4	810,0	1743,0
82941	3 G 16	6	24,3	585,0	1088,0
82942	4 G 16	6	27,5	740,0	1662,0

Continuation ▶

JZ-602-CY EMC-preferred type, 90°C 600V, screened two approvals control cable, oil resistant, meter marking



Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
82943	5 G 16	6	31,2	895,0	2021,0
82944	7 G 16	6	34,1	1282,0	2720,0
82937	3 G 25	4	29,9	1070,0	1947,0
82938	4 G 25	4	32,9	1140,0	2591,0
82939	5 G 25	4	36,4	1380,0	3197,0
82940	7 G 25	4	39,0	1870,0	4550,0
82934	3 G 35	2	32,8	1240,0	2701,0
82935	4 G 35	2	36,3	1576,0	3277,0
82936	5 G 35	2	39,9	1930,0	4530,0
82488	3 G 50	1	35,0	1675,0	2870,0
82780	4 G 50	1	41,0	2155,0	3960,0
82781	5 G 50	1	44,4	2794,0	4371,0
82782	3 G 70	2/0	41,4	2288,0	3647,0
82783	4 G 70	2/0	46,7	3120,0	4882,0
82914	5 G 70	2/0	50,6	3705,0	5876,0
82915	3 G 95	3/0	46,2	3010,0	4751,0
82916	4 G 95	3/0	51,2	4043,0	6368,0
82917	5 G 95	3/0	56,1	5026,0	7843,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
82918	3 G 120	4/0	52,0	3812,0	5899,0
82919	4 G 120	4/0	58,7	5069,0	8010,0
82920	5 G 120	4/0	62,7	5877,0	9205,0

Dimensions and specifications may be changed without prior notice. (RN01)

Insulating, shrinking, braided and temperature protection tubes

- Braided hoses
- High temperature protection
- Insulation tubes
- Heat-shrink tubes
- End caps



N



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JZ-603-CY Multi approvals control cable, Cu-screened, EMC-preferred, oil resistant, meter marking



Technical data

- Special PVC control cable with oil resistant outer sheath to DIN VDE 0281 part 13, HD 21.13 S1 and to UL-Style 2587
- **Temperature range**
flexing -5 °C to +70 °C (HAR)
-5 °C to +90 °C (UL+CSA)
fixed installation -40 °C to +70 °C (HAR)
-40 °C to +90 °C (UL+CSA)
- **Nominal voltage**
U₀/U 300/500 V (HAR)
U 600 V (UL+CSA)
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20MΩm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation T11, to DIN VDE 0281 part 1, HD 21.1S2 and class 43 to UL-Std. 1581
- Black cores with white continuous numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer
- Cores stranded in layers with optimal lay-length
- PVC based inner sheath
- Tinned copper braiding screening, 85% coverage
- Special PVC outer sheath TM5, oil resistant to DIN VDE 0281 part 1, HD 21.1 S4 and class 43 to UL-Std. 1581
- Colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Oil resistant as per DIN EN 60811-2-1, UL 1581 part 50.182
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) UL VW-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- The following amendments in the cable designation result from the new DIN VDE 0281 part 13 / harmonised in accordance with HD 21.13S1: NYSLYÖ-J (new: H05VV5-F) and NYSLYCYÖ-J (new: H05VV4V5-K). SEV-approval is no longer applicable as a result of the harmonisation.
- **unscreened analogue type:**
JZ-603, see page N 9

Application

UL-CSA-HAR approved cables offer any company exporting anywhere in the world, primarily designed for exporters, used in machine tools, control systems, assembly lines and other industrial equipment. These cables are suitable for flexible use for medium mechanical stresses with free movements in dry, moist and wet rooms but not for open air.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83709	2 x 0,5	20	8,0	41,0	90,0
83720	3 G 0,5	20	8,3	45,0	105,0
83721	4 G 0,5	20	8,9	54,0	123,0
83722	5 G 0,5	20	9,7	66,0	147,0
83723	7 G 0,5	20	11,2	79,0	195,0
83724	12 G 0,5	20	13,6	137,0	276,0
83725	18 G 0,5	20	15,4	156,0	418,0
83726	25 G 0,5	20	18,6	250,0	504,0
83727	34 G 0,5	20	20,8	316,0	632,0
83728	41 G 0,5	20	22,6	348,0	750,0
83729	50 G 0,5	20	24,8	407,0	968,0
83730	61 G 0,5	20	26,0	520,0	1068,0
83710	2 x 0,75	19	8,3	46,0	101,0
83731	3 G 0,75	19	8,6	57,0	127,0
83732	4 G 0,75	19	9,4	63,0	155,0
83733	5 G 0,75	19	10,1	76,0	180,0
83734	7 G 0,75	19	11,9	100,0	225,0
83735	12 G 0,75	19	14,2	175,0	326,0
83736	18 G 0,75	19	16,6	240,0	457,0
83737	25 G 0,75	19	20,0	306,0	635,0
83738	34 G 0,75	19	22,4	346,0	805,0
83739	41 G 0,75	19	24,0	403,0	908,0
83740	50 G 0,75	19	26,2	470,0	1155,0
83741	61 G 0,75	19	30,0	550,0	1400,0
83711	2 x 1	18	8,6	54,0	113,0
83742	3 G 1	18	9,2	64,0	144,0
83743	4 G 1	18	9,8	76,0	178,0
83744	5 G 1	18	10,7	89,0	205,0
83745	7 G 1	18	12,5	114,0	263,0
83746	12 G 1	18	15,1	186,0	424,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83747	18 G 1	18	17,3	284,0	560,0
83748	25 G 1	18	21,1	387,0	760,0
83749	34 G 1	18	23,5	500,0	945,0
83750	41 G 1	18	25,5	578,0	1151,0
83751	50 G 1	18	27,6	681,0	1300,0
83752	61 G 1	18	32,4	710,0	1500,0
83712	2 x 1,5	16	9,6	64,0	144,0
83753	3 G 1,5	16	10,1	82,0	160,0
83754	4 G 1,5	16	11,0	99,0	210,0
83755	5 G 1,5	16	12,3	123,0	240,0
83756	7 G 1,5	16	14,2	148,0	305,0
83757	12 G 1,5	16	17,1	274,0	482,0
83758	18 G 1,5	16	20,0	386,0	611,0
83759	25 G 1,5	16	24,0	531,0	950,0
83760	34 G 1,5	16	27,1	671,0	1200,0
83761	41 G 1,5	16	29,7	840,0	1400,0
83762	50 G 1,5	16	31,8	997,0	1665,0
83763	61 G 1,5	16	34,6	1120,0	1852,0
83713	2 x 2,5	14	11,4	110,0	189,0
83764	3 G 2,5	14	12,0	148,0	244,0
83765	4 G 2,5	14	13,4	169,0	296,0
83766	5 G 2,5	14	14,6	220,0	367,0
83767	7 G 2,5	14	17,2	284,0	478,0
83768	12 G 2,5	14	21,2	470,0	622,0
83769	18 G 2,5	14	24,8	572,0	1010,0
83770	25 G 2,5	14	29,8	740,0	1375,0
83771	34 G 2,5	14	33,4	1179,0	1893,0
83772	50 G 2,5	14	39,0	1660,0	2666,0
83773	61 G 2,5	14	41,0	1992,0	3077,0

Dimensions and specifications may be changed without prior notice. (RN01)

JZ-600-Y-CY UL/CSA flexible, number coded, 0,6/1kV, EMC-preferred



type, meter marking



Technical data

- Special PVC control cables
- Adapted to DIN VDE 0276 part 627, DIN VDE 0281 part 13, with insulation thickness for 1 kV type and UL-Std. 758 Style 21179
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage** U 1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Power rating**
according to DIN VDE 0298
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1, class 43 UL-Std. 1581
- Black cores with sequential numbering imprinted in white, according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- PVC-insulated inner sheath TM2, to DIN VDE 0281 part 1, class 43 UL-Std. 1581
- Braided screen of tinned Cu wires, coverage approx. 85%
- Special PVC outer sheath TM2, to DIN VDE 0281 part 1 class 43 UL-Std. 1581
- Colour black (RAL 9005) or grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- UV-resistant (building with black jacket)
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) VW-1, FT1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (0Z).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
JZ-600 UL/CSA, see page N 10

Application

Wiring cable for measuring and controlling purposes in tool machinery, conveyor belts and production lines, for plant installations, air conditioning and in steel production plants and rolling mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation, building with black jacket). Is not suitable to be used as direct burial- or as underwater cable. Interference-free transmission of signals and pulses is assured by the high degree of screening.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
Jacket colour black						Jacket colour grey					
12345	2 x 0,5	20	8,3	41,0	129,0	12410	2 x 0,5	20	8,3	30,0	129,0
12346	3 G 0,5	20	8,6	45,0	150,0	12411	3 G 0,5	20	8,6	39,0	150,0
12347	4 G 0,5	20	9,4	54,0	170,0	12412	4 G 0,5	20	9,4	52,0	170,0
12348	5 G 0,5	20	10,1	66,0	199,0	12413	5 G 0,5	20	10,1	61,0	199,0
12349	7 G 0,5	20	12,1	79,0	235,0	12414	7 G 0,5	20	12,1	75,0	235,0
12350	12 G 0,5	20	14,7	137,0	320,0	12415	12 G 0,5	20	14,7	130,0	320,0
12351	18 G 0,5	20	17,3	156,0	428,0	12416	18 G 0,5	20	17,3	170,0	428,0
12352	25 G 0,5	20	20,6	250,0	503,0	12417	25 G 0,5	20	20,6	230,0	503,0
12353	2 x 0,75	19	8,7	46,0	143,0	12418	2 x 0,75	18	8,7	39,0	143,0
12354	3 G 0,75	19	9,0	57,0	155,0	12419	3 G 0,75	18	9,0	57,0	155,0
12355	4 G 0,75	19	9,9	63,0	190,0	12420	4 G 0,75	18	9,9	68,0	190,0
12356	5 G 0,75	19	10,8	76,0	228,0	12421	5 G 0,75	18	10,8	79,0	228,0
12357	7 G 0,75	19	13,0	100,0	323,0	12422	7 G 0,75	18	13,0	96,0	323,0
12358	12 G 0,75	19	15,8	175,0	410,0	12423	12 G 0,75	18	15,8	169,0	410,0
12359	18 G 0,75	19	17,9	240,0	560,0	12424	18 G 0,75	18	17,9	224,0	560,0
12360	25 G 0,75	19	22,8	306,0	730,0	12425	25 G 0,75	18	22,8	292,0	730,0
12361	2 x 1	18	9,4	54,0	150,0	12426	2 x 1	17	9,4	52,0	150,0
12362	3 G 1	18	9,8	64,0	163,0	12427	3 G 1	17	9,8	67,0	163,0
12363	4 G 1	18	10,8	76,0	200,0	12428	4 G 1	17	10,8	78,0	200,0
12364	5 G 1	18	12,1	89,0	239,0	12429	5 G 1	17	12,1	94,0	239,0
12365	7 G 1	18	14,5	114,0	289,0	12430	7 G 1	17	14,5	122,0	289,0
12366	12 G 1	18	17,4	186,0	464,0	12431	12 G 1	17	17,4	201,0	464,0
12367	18 G 1	18	20,7	284,0	628,0	12432	18 G 1	17	20,7	275,0	628,0
12368	25 G 1	18	24,8	387,0	855,0	12433	25 G 1	17	24,8	364,0	855,0
12369	2 x 1,5	16	10,2	64,0	162,0	12434	2 x 1,5	16	10,2	68,0	162,0
12370	3 G 1,5	16	10,9	82,0	187,0	12435	3 G 1,5	16	10,9	84,0	187,0
12371	4 G 1,5	16	12,2	99,0	240,0	12436	4 G 1,5	16	12,2	104,0	240,0

Continuation ▶

JZ-600-Y-CY UL/CSA flexible, number coded, 0,6/1kV, EMC-preferred

type, meter marking



Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12372	5 G 1,5	16	13,3	123,0	289,0
12373	7 G 1,5	16	16,0	148,0	383,0
12374	12 G 1,5	16	19,6	274,0	592,0
12375	18 G 1,5	16	23,4	386,0	806,0
12376	25 G 1,5	16	28,2	531,0	1241,0
12377	2 x 2,5	14	11,5	110,0	272,0
12378	3 G 2,5	14	12,2	148,0	298,0
12379	4 G 2,5	14	13,4	169,0	345,0
12380	5 G 2,5	14	14,9	220,0	427,0
12381	7 G 2,5	14	17,9	284,0	561,0
12382	12 G 2,5	14	21,9	470,0	857,0
12383	18 G 2,5	14	26,1	572,0	1355,0
12384	25 G 2,5	14	31,9	740,0	1995,0
12385	2 x 4	12	14,3	124,0	306,0
12386	3 G 4	12	15,1	178,0	391,0
12387	4 G 4	12	16,7	234,0	527,0
12388	5 G 4	12	18,6	284,0	700,0
12389	7 G 4	12	20,0	321,0	920,0
12390	3 G 6	10	17,0	245,0	629,0
12391	4 G 6	10	18,7	316,0	751,0
12392	5 G 6	10	20,7	442,0	1105,0
12393	7 G 6	10	23,0	530,0	1465,0
12394	3 G 10	8	19,6	367,0	1125,0
12395	4 G 10	8	21,9	549,0	1345,0
12396	5 G 10	8	24,1	604,0	1635,0
12397	7 G 10	8	26,8	820,0	2210,0
12398	3 G 16	6	23,5	653,0	1395,0
12399	4 G 16	6	26,4	807,0	1870,0
12400	5 G 16	6	28,8	940,0	2720,0
12401	7 G 16	6	31,9	1345,0	3213,0
12402	3 G 25	4	28,0	920,0	2465,0
12403	4 G 25	4	32,5	1169,0	2750,0
12404	5 G 25	4	35,7	1420,0	3490,0
12405	7 G 25	4	39,0	1921,0	4980,0

Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12437	5 G 1,5	16	13,3	123,0	289,0
12438	7 G 1,5	16	16,0	180,0	383,0
12439	12 G 1,5	16	19,6	284,0	592,0
12440	18 G 1,5	16	23,4	390,0	806,0
12441	25 G 1,5	16	28,2	521,0	1241,0
12442	2 x 2,5	14	11,5	99,0	272,0
12443	3 G 2,5	14	12,2	124,0	298,0
12444	4 G 2,5	14	13,4	170,0	345,0
12445	5 G 2,5	14	14,9	202,0	427,0
12446	7 G 2,5	14	17,9	268,0	561,0
12447	12 G 2,5	14	21,9	423,0	857,0
12448	18 G 2,5	14	26,1	572,0	1355,0
12449	25 G 2,5	14	31,9	740,0	1995,0
12450	2 x 4	12	14,3	156,0	306,0
12451	3 G 4	12	15,1	191,0	391,0
12452	4 G 4	12	16,7	236,0	527,0
12453	5 G 4	12	18,6	303,0	700,0
12454	7 G 4	12	20,0	394,0	920,0
12455	3 G 6	10	17,0	251,0	629,0
12456	4 G 6	10	18,7	319,0	751,0
12457	5 G 6	10	20,7	421,0	1105,0
12458	7 G 6	10	23,0	561,0	1465,0
12459	3 G 10	8	19,6	371,0	1125,0
12460	4 G 10	8	21,9	576,0	1345,0
12461	5 G 10	8	24,1	620,0	1635,0
12462	7 G 10	8	26,8	842,0	2210,0
12463	3 G 16	6	23,5	540,0	1395,0
12464	4 G 16	6	26,4	807,0	1870,0
12465	5 G 16	6	28,8	1394,0	2720,0
12466	7 G 16	6	31,9	1605,0	3213,0
12467	3 G 25	4	28,0	820,0	2465,0
12468	4 G 25	4	32,5	1169,0	2750,0
12469	5 G 25	4	35,7	1850,0	3490,0
12470	7 G 25	4	39,0	2140,0	4980,0

Dimensions and specifications may be changed without prior notice. (RN01)



Photo: HELUKABEL®

NFPA 79 Edition 2007 Challenges and solutions

NFPA 79 Edition 2012 – Challenges and solutions



The first edition of the Electrical Code (NEC), also referred to as NFPA 70, was published in 1897. The NEC is the only code for electrical installations that enjoys national recognition in the USA. It addresses the causes of electricity-induced fire. The code is updated every three years, that means in 2011 appeared the edition of 2012. In Article 670 "Industrial Machinery" the NEC refers to the NFPA 79 (Electrical Standard for Industrial Machinery).

This standard specifies the safety requirements for electrical equipment of industrial machinery or industrial manufacturing systems. Manufacturers and operators of plant and machinery have to comply with this and other standards in order to fulfil their product liability and satisfy insurance requirements.

Machines commissioned in the USA are always subject to approval, which can be obtained in two different ways. One is through a testing institute accredited in the USA, alternatively the machine concerned is subjected to an acceptance procedure in Germany, for example. The final decision on whether a machine is to be commissioned is always taken by a local inspector, who does not necessarily have to be an expert in electrical systems. If the inspector is in any doubt as to whether the machine complies with the relevant US standards, he may order a temporary stoppage.

The NFPA 79: 2007 allowed for the use of AWM wires in chapter 12.2.7.3 „When part of a listed assembly suitable for the intended application, type AWM shall be permissible“.

However, there are applications for which there had up to now not been any NFPA 79-relevant wires. This applies to wires used for power track chains or wires with special-purpose bodies. There were objections and protests from the industry in this regard. The NFPA responded accordingly and appointed an expert commission. As a result, the NFPA 79: Edition 2012 once again allows for the use of AWM wires under certain conditions. As before, usage is not unrestricted. Rather, responsibility for their usage now lies with the manufacturer or builder of the system.

Article 12.2.7.of Edition 2007 was deleted entirely. The new article 12.9 summarizes all recommendations.

The complete original text:

- 12.9 Special Cables and Conductors
- 12.9.1 Other listed cables and conductors shall be permitted where identified as suitable for the identified use.
- 12.9.2 Appliance Wiring Material (AWM) shall be permitted under 12.9.2.1 through 12.9.2.3
- 12.9.2.1 Where part of an assembly that has been identified for intended use
- 12.9.2.2 Where specified for use with approved equipment and used in accordance with the equipment manufacturers instructions.
- 12.9.2.3 Where its construction meets all applicable requirements of sections 12.2 – 12.6 with modifications as follows:
 - (1) Stranded conductors with wire sizes smaller than those listed in 12.2.2 shall have a minimum of 7 strands.
 - (2) Conductor insulation and cable jacket materials not specified in 12.3.1 have flame resistant properties in compliance with applicable standards for intended use such as FT2 (horizontal wire) flame test or VW-1 (Vertical Wire) flame test in ANSI/UL 1581-2001, Reference Standard for Electrical Wires, Cables and Flexible Cords.
 - (3) Minimum insulation thickness for single conductor AWM shall be as specified in 12.3.2. Minimum insulation thickness for conductors that are part of a multi conductor jacketed AWM cable shall be as specified by the AWM Style number and by the marked voltage rating of the cable.
 - (4) AWM shall be marked in accordance with 12.4.1, 12.4.3 and 12.4.4. The legend shall include manufacturer's name or trademark, AWM style number, voltage rating (unless marking is prohibited by 12.4.2), wire gauge(s), temperature rating and flame resistance. Additional markings for properties such as oil, water, UV and chemical resistance identifiers shall be permitted where in compliance with applicable standards for intended use. Where markings alone are insufficient to identify for the intended application, suitable information shall be included with the technical machine documentation.

Summary

- Plant and machinery with certification (e.g. from UL) can continue to be repaired, modified or upgraded in accordance with existing rules.
- Newly certified plant and machinery can continue to be constructed in accordance with existing rules. The certification is recognised.
- In certain sectors, new plant and machinery without certification may need to satisfy tougher requirements for certain cables (e.g. UL Listing). In this case, consultation is required with the certifying body concerned.

HELUKABEL recommends in many cases still the use of UL-listed cables.

The following pages present a broad range of cables that already meet the requirements of the 2007 Edition of NFPA 79.

If you have any further questions, please contact our cable experts on +49 (0)7150 9209 -0.

NFPA 79 Edition 2012 – Challenges and solutions



Flexible Control Cables

TRAYCONTROL 500 & TRAYCONTROL 500-C **NEW**

Flexible, extremely oil-resistant control cables for open installation (ER)
UL: TC-ER, PLTC-ER, ITC-ER, MTW, DP-1, WTTTC 1000V, OIL RES I & II
CSA: CIC-TC FT4, AWM I/II A/B FT4
See page N 27 - N 28 and N 35 - N 36

TRAYCONTROL 600 & TRAYCONTROL 600-C **NEW**

Flexible, oil-resistant TRAY CABLE for open installation (ER)
UL: TC-ER, PLTC-ER, ITC-ER, MTW, DP-1, WTTTC 1000V, OIL RES I & II
CSA: CIC-TC FT4, AWM I/II A/B FT4
See page N 30 - N 31 and N 37

JZ 604 TC & JZ 604-FCY/YCY TC

Flexible, oil-resistant TRAY CABLE for open installation (ER)
UL: TC-ER
See page N 25 - N 26 and N 33 - N 34

Hochflexible Steuerleitungen

MULTIFLEX 600 & MULTIFLEX 600-C **NEW**

Highly-flexible, extremely oil-resistant cables for open installation (ER)
UL: TC-ER, PLTC-ER, ITC-ER, MTW, DP-1, WTTTC 1000V, OIL RES I & II
CSA: CIC-TC FT4, AWM I/II A/B FT4
See page N 62 - N 63

Data Cables

TRAYCONTROL 300 & TRAYCONTROL 300-C **NEW**

Flexible, extremely oil-resistant data and control cables for open installation (ER)*
UL: PLTC-ER, ITC-ER, CM, OIL RES I & II;
CSA: CIC-TC FT4, CMG
See page N 38 - N 41

TRAYCONTROL 300 TP & TRAYCONTROL 300-C TP **NEW**

Flexible, extremely oil-resistant data and control cables for open installation (ER)*
UL: PLTC-ER, ITC-ER, CM, OIL RES I & II;
CSA: CIC-TC FT4, CMG
See page N 42 - N 45

Single Conductors

FIVENORM

The jumper wire that meets five different standards
HAR: H05 V2-K/H07 V2-K;
UL: MTW, AWM Style 10269;
CSA: TEW bzw. AWM I/A/B
See page N 113 - N 114

* AWG 22 - AWG 16

THHN/THWM

Flexible jumper wire
UL: MTW, THHN, THWN, GASOLINE, OIL RES II,
AWM W-51554
See page N 115

Servo and Motor Cables

TOPFLEX® 600 VFD **NEW**

Flexible, extremely oil-resistant motor connection cables for open installation (ER)
UL: TC-ER, PLTC-ER, ITC-ER, MTW, WTTTC 1000V, OIL RES I & II
CSA: CIC-TC FT4, AWM I/II A/B FT4
See page N 137

TOPFLEX® 650 VFD **NEW**

Flexible, extremely oil-resistant motor connection cables with control pair for open installation (ER)
UL: TC-ER, PLTC-ER, ITC-ER, MTW, WTTTC 1000V, OIL RES I & II
CSA: CIC-TC FT4, AWM I/II A/B FT4
See page N 138

TOPSERV® 600 VFD **NEW**

Highly-flexible, extremely oil-resistant motor connection cables for open installation (ER)
UL: TC-ER, PLTC-ER, ITC-ER, MTW, WTTTC 1000V, OIL RES I & II
CSA: CIC-TC FT4, AWM I/II A/B FT4
See page N 139

TOPSERV® 650 VFD **NEW**

Highly-flexible, extremely oil-resistant motor connection cables for open installation (ER)
UL: TC-ER, PLTC-ER, ITC-ER, MTW, WTTTC 1000V, OIL RES I & II
CSA: CIC-TC FT4, AWM I/II A/B FT4
See page N 140

HELUKAT® Copper Data Cables

HELUKAT® 155 UTP 4x2xAWG24/1 UL CMX 444
HELUKAT® 200 FTP FLEX 4x2xAWG26/7 UL CMX 444
HELUKAT® 300 UTP 4x2xAWG24/1 UL CMX 444
HELUKAT® 300 U-STP 4x2xAWG26/7 UL CMX 444
See page R 51 et seq.

Bus Cables

PROFINet Typ A UL CMG or PLTC, CSA FT4
PROFINet Typ B UL CMG or PLTC
PROFINet Typ B SHIPLINE UL CMG or PLTC, CSA FT4
PROFINet Typ C UL CMG
Profibus L2 Torsion UL CMX
Profibus L2 Festoon UL CMX, CSA FT4
Profibus SK inside UL CMG, CSA FT4
Profibus SK FRNC UL CM
Profibus SK drag chain UL CMX
DeviceNet™PVC small UL CMG FT4
DeviceNet™PVC thick UL CMG FT4
See Chapter R

N

JZ 604 TC TRAY CABLE

PVC power cable, exposed run, 90°C,
600V, meter marking



HELUKABEL JZ-604 TC-ER MTW UL 1277 18AWG / 1 QMM 7C 600V 90C DRY 75C WET SUN RES
DIR BUR FT4 OR AWN STYLE 2587 CSA AWM I/II A/B 90C FT4 600V LL113926 CE



Technical data

- PVC power cable to UL-standard 1277 TRAY CABLE
- **Multinorm**
The TRAY CABLE also conforms to the following standards:
AWM-Style 2587 to UL-Std. 758 and CSA C22.2 No 210.2 I/II A/B 90C 600 V
- **Temperature range**
dry environment
flexing -5 °C to +90 °C
fixed installation -25 °C to +90 °C
wet environment
flexing -5 °C to +75 °C
fixed installation -25 °C to +75 °C
- **Nominal voltage** to UL 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩ x km
- **Minimum bending radius**
7,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation class 12 B to table 50.155 UL-standard 1581, type TFF to UL-Std. 66 (AWG 20-AWG 16), type THHW to UL-Std. 83 (≥ AWG 14)
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special PVC outer sheath, to UL-Std. 1277 table 11.2
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Material self-extinguishing and flame retardant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
JZ 604-FCY TC TRAY CABLE,
see page N 33
JZ 604-YCY TC TRAY CABLE,
see page N 34

Application

USA NFPA79, edition 2007 conformant flexible power cables up to 600 V, for all machinery in tool and plant construction, suitable for installation in dry, humid and damp environments, in the open and in pipes. For underground installation and for open, unprotected installation from the cable rack to machines and industrial plants.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69661	2 x 1	18	8,0	19,2	72,0
69662	3 G 1	18	8,4	29,0	84,0
69663	4 G 1	18	9,1	39,0	96,0
69664	5 G 1	18	10,0	48,0	114,0
69665	7 G 1	18	11,7	67,0	147,0
69666	9 G 1	18	12,6	84,0	172,0
69667	10 G 1	18	14,3	96,0	206,0
69668	12 G 1	18	14,7	115,0	256,0
69669	18 G 1	18	17,1	173,0	367,0
69670	25 G 1	18	20,3	240,0	477,0
69671	34 G 1	18	23,7	326,0	551,0
69672	50 G 1	18	26,1	480,0	959,0
69673	2 x 1,5	16	8,4	28,8	88,0
69674	3 G 1,5	16	8,8	43,0	102,0
69675	4 G 1,5	16	9,6	58,0	119,0
69676	5 G 1,5	16	10,5	72,0	144,0
69677	7 G 1,5	16	12,3	101,0	192,0
69678	8 G 1,5	16	13,5	115,0	213,0
69679	9 G 1,5	16	13,3	130,0	261,0
69680	10 G 1,5	16	15,1	144,0	294,0
69681	12 G 1,5	16	15,6	173,0	328,0
69682	16 G 1,5	16	17,1	230,0	402,0
69683	18 G 1,5	16	18,2	259,0	427,0
69684	25 G 1,5	16	22,7	360,0	594,0
69685	34 G 1,5	16	25,3	489,0	714,0
69686	41 G 1,5	16	27,0	590,0	803,0
69687	50 G 1,5	16	27,3	720,0	1021,0
69688	61 G 1,5	16	29,4	878,0	1258,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69689	2 x 2,5	14	9,4	48,0	108,0
69690	3 G 2,5	14	9,9	72,0	137,0
69691	4 G 2,5	14	10,8	96,0	157,0
69692	5 G 2,5	14	11,8	120,0	190,0
69693	7 G 2,5	14	14,7	168,0	253,0
69694	8 G 2,5	14	16,0	192,0	339,0
69695	9 G 2,5	14	16,0	216,0	341,0
69696	10 G 2,5	14	17,1	240,0	392,0
69697	12 G 2,5	14	17,7	288,0	470,0
69698	18 G 2,5	14	20,8	432,0	682,0
69699	25 G 2,5	14	25,8	600,0	891,0
69700	3 G 4	12	11,0	115,0	187,0
69701	4 G 4	12	12,0	154,0	226,0
69702	5 G 4	12	13,2	192,0	280,0
69703	7 G 4	12	16,5	269,0	390,0
69704	9 G 4	12	17,8	346,0	480,0
69705	12 G 4	12	19,9	461,0	841,0
69706	18 G 4	12	24,2	691,0	981,0
69707	3 G 6	10	12,5	173,0	290,0
69708	4 G 6	10	14,5	230,0	381,0
69709	5 G 6	10	15,8	288,0	465,0
69710	7 G 6	10	17,3	403,0	654,0
69711	3 G 10	8	16,9	288,0	511,0
69712	4 G 10	8	18,6	384,0	584,0
69713	5 G 10	8	20,4	480,0	781,0
69714	7 G 10	8	23,5	672,0	970,0

Continuation ▶

JZ 604 TC TRAY CABLE PVC power cable, exposed run, 90°C, 600V, meter marking



Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69715	3 G 16	6	21,0	461,0	651,0
69716	4 G 16	6	23,9	614,0	866,0
69717	5 G 16	6	26,3	768,0	1117,0
69718	7 G 16	6	28,8	1075,0	1364,0
69719	3 G 25	4	24,9	720,0	1090,0
69720	4 G 25	4	27,2	960,0	1421,0
69721	5 G 25	4	30,3	1200,0	1611,0
69722	7 G 25	4	33,1	1680,0	1943,0
69723	3 G 35	2	27,1	1008,0	1734,0
69724	4 G 35	2	29,8	1344,0	2011,0
69725	5 G 35	2	33,0	1680,0	2347,0
69726	3 G 50	1	33,2	1440,0	2041,0
69727	4 G 50	1	36,7	1920,0	2539,0
69728	5 G 50	1	41,5	2400,0	2894,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69729	3 G 70	2/0	37,6	2016,0	2831,0
69730	4 G 70	2/0	42,0	2688,0	3494,0
69731	5 G 70	2/0	47,6	3360,0	4260,0
69732	3 G 95	3/0	41,8	2736,0	5010,0
69733	4 G 95	3/0	47,0	3648,0	6104,0
69734	5 G 95	3/0	52,5	4560,0	7891,0
69735	3 G 120	4/0	46,0	3456,0	5940,0
69736	4 G 120	4/0	51,5	4608,0	7604,0
69737	5 G 120	4/0	56,5	5760,0	8751,0

Dimensions and specifications may be changed without prior notice. (RN01)

Terminations and straight-through joints

Telephone cables
Low voltage
Medium voltage
Accessories



N

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TRAYCONTROL 500 flexible, oil-resistant, open installation TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2007



HELUKABEL TRAYCONTROL 500 P/N 63111 12AWG 2,5QMM 4C (UL) TC-ER 90°C DRY 75°C WET 600 V SUN RES DIR BUR OIL RES I/II E330430 OR MTW "FLEXING" OR WTTC 1000 V OR c(UL)CIC TC FT4 LL41103 CSA AWM I/II 90°C 600 V FT4 CE ROHS



Technical data

- PVC control cable according to UL Standard 1277
- **Temperature range**
Flexing -5 °C to +90 °C
Fixed installation -40 °C to +90 °C
- **Nominal voltage**
TC 600 V
AWM 1000 V
TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**
Flexing 4x cable ø
- **Insulation resistance**
Min. 20 MOhm x km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire stranded
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer, 3 cores and more
- Cores stranded in layers with optimal lay-lengths
- Separator
- Special PVC outer jacket
- Sheath colour - grey (RAL 7001)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- **Tests**
UL: TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2007, WTTC 1000V, DP-1, OIL RES I & II, 90 °C dry / 75 °C wet, Class 1 Div. 2 per NEC Art 336, 392, 501, crush impact test in accordance with UL 1277
CSA: c(UL) CIC-TC FT4, CSA AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, easy to install

Available on request

- with blue cores (DC)
- with red cores (AC)
- Black or TPE outer sheath

Application

HELUKABEL® TRAYCONTROL 500 is a flexible, oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for industrial plant and machinery in accordance with NFPA 79 Edition 2007. Approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (OIL RES I & II) guarantees a long service life for industrial applications in dry, damp and wet environments. Recommended applications: production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, automotive industry.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
63079	2 x 0,5	20	6,4	10,0	58,0
63080	3 G 0,5	20	6,7	14,0	61,0
63081	4 G 0,5	20	7,2	19,0	76,0
63082	5 G 0,5	20	7,8	24,0	89,0
63083	7 G 0,5	20	8,4	34,0	120,0
63084	9 G 0,5	20	9,6	43,0	201,0
63085	12 G 0,5	20	10,7	58,0	250,0
63086	18 G 0,5	20	12,4	86,0	295,0
63087	25 G 0,5	20	14,9	120,0	362,0
63088	2 x 1	18	7,0	19,0	68,0
63089	3 G 1	18	7,1	29,0	88,0
63090	4 G 1	18	8,0	38,0	98,0
63091	5 G 1	18	8,6	48,0	116,0
63092	7 G 1	18	9,5	67,0	149,0
63093	9 G 1	18	10,7	86,0	186,0
63094	10 G 1	18	11,6	96,0	199,0
63095	12 G 1	18	11,9	115,0	245,0
63096	15 G 1	18	13,2	144,0	292,0
63097	16 G 1	18	13,5	154,0	306,0
63098	18 G 1	18	366,0	14,6	173,0
63099	19 G 1	18	14,7	182,0	384,0
63100	25 G 1	18	17,0	240,0	451,0
63101	27 G 1	18	17,4	259,0	521,0
63102	34 G 1	18	19,5	326,0	625,0
63103	37 G 1	18	19,8	355,0	684,0
63104	41 G 1	18	20,7	394,0	744,0
63105	50 G 1	18	23,5	480,0	933,0
63106	61 G 1	18	24,9	586,0	1095,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
63107	2 x 1,5	16	7,7	29,0	80,0
63108	3 G 1,5	16	8,1	43,0	86,0
63109	4 G 1,5	16	8,8	58,0	115,0
63110	5 G 1,5	16	9,5	72,0	126,0
63111	4 G 2,5	14	9,8	96,0	141,0
63112	6 G 1,5	16	10,0	86,0	164,0
63113	7 G 1,5	16	10,3	101,0	171,0
63114	8 G 1,5	16	10,9	115,0	201,0
63115	9 G 1,5	16	11,9	130,0	237,0
63116	10 G 1,5	16	12,9	144,0	259,0
63117	12 G 1,5	16	14,2	173,0	301,0
63118	14 G 1,5	16	14,5	202,0	365,0
63119	15 G 1,5	16	15,2	216,0	379,0
63120	16 G 1,5	16	15,9	14,0	61,0
63121	18 G 1,5	16	16,4	259,0	443,0
63122	19 G 1,5	16	16,5	274,0	458,0
63123	20 G 1,5	16	17,0	288,0	491,0
63124	25 G 1,5	16	18,6	360,0	564,0
63125	27 G 1,5	16	19,0	389,0	629,0
63126	30 G 1,5	16	19,6	432,0	701,0
63127	34 G 1,5	16	20,5	490,0	775,0
63128	40 G 1,5	16	22,9	576,0	946,0
63129	41 G 1,5	16	23,4	590,0	967,0
63130	50 G 1,5	16	25,1	720,0	1137,0
63131	61 G 0,5	16	27,2	878,0	1345,0
63132	2 x 2,5	14	8,6	48,0	100,0
63133	3 G 2,5	14	8,9	72,0	112,0
63164	5 G 2,5	14	10,6	120,0	152,0

Continuation ►

TRAYCONTROL 500 flexible, oil-resistant, open installation TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2007



Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
63165	6 G 2,5	14	11,2	144,0	205,0
63166	7 G 2,5	14	11,6	168,0	216,0
63167	9 G 2,5	14	14,3	216,0	312,0
63168	10 G 2,5	14	15,5	240,0	378,0
63169	12 G 2,5	14	15,9	288,0	434,0
63170	16 G 2,5	14	17,6	384,0	550,0
63171	18 G 2,5	14	18,4	432,0	616,0
63172	19 G 2,5	14	18,6	456,0	634,0
63173	25 G 2,5	14	22,2	600,0	817,0
63174	2 x 4	14	9,5	76,8	132,0
63175	3 G 4	14	10,6	115,0	177,0
63176	4 G 4	14	11,5	154,0	201,0
63177	5 G 4	14	12,6	192,0	274,0
63178	6 G 4	12	14,1	230,0	315,0
63179	7 G 4	12	14,6	269,0	353,0
63180	9 G 4	12	16,9	346,0	476,0
63181	12 G 4	12	18,9	461,0	613,0
63182	16 G 4	12	19,8	614,0	783,0
63183	19 G 4	12	23,1	768,0	918,0
63184	20 G 4	12	24,3	768,0	961,0
63185	25 G 4	12	26,3	960,0	1236,0
63186	2 x 6	10	11,9	115,0	213,0
63187	3 G 6	10	12,6	173,0	283,0

Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
63188	4 G 6	10	14,7	230,0	387,0
63189	5 G 6	10	16,0	288,0	473,0
63190	7 G 6	10	17,4	403,0	607,0
63191	9 G 6	10	20,4	518,0	771,0
63192	12 G 6	10	23,9	691,0	1061,0
63193	19 G 6	10	27,9	1094,0	1528,0
63194	3 G 10	8	17,0	288,0	420,0
63195	4 G 10	8	19,7	384,0	662,0
63196	5 G 10	8	21,7	480,0	784,0
63197	3 G 16	6	19,5	461,0	701,0
63198	4 G 16	6	21,9	614,0	908,0
63199	5 G 16	6	24,0	768,0	1149,0
62802	3 G 25	4	24,3	720,0	1061,0
62803	4 G 25	4	27,1	960,0	1366,0
62804	5 G 25	4	29,3	1200,0	1631,0
62805	3 G 35	2	27,9	1008,0	1480,0
62806	4 G 35	2	31,4	1344,0	1922,0
62807	5 G 35	2	34,0	1680,0	2363,0
62808	4 G 42,3	1	34,8	1624,0	2397,0
62809	4 G 52,9	1/0	37,9	2031,0	2938,0
62810	4 G 67,3	2/0	41,3	2584,0	3559,0
62811	4 G 84,4	3/0	48,6	3256,0	4181,0
62812	4 G 106,7	4/0	51,2	4097,0	5747,0

Dimensions and specifications may be changed without prior notice. (RN01)

TRAYCONTROL 530 flexible TC-ER control cable with coloured cores



HELUKABEL TRAYCONTROL 530 TC-ER 90°C 600V FT4

CE



Technical data

- Flexible PVC tray cable to UL Standard 1277
- **Temperature range**
flexing -5 °C to +90 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage**
TC 600 V
AWM 1000 V
TC Wind Turbine (WTTC) 1000 V
- **Test voltage**
3000 V
- **Minimum bending radius**
Approx. 5x cable ø

Cable structure

- Bare copper conductor, fine wire stranded with AWG dimensions
- Special PVC core insulation with clear nylon jacket
- Blue cores with continuous numbering plus green/yellow ground, 3 cores and more> second core is blue-white
- Conductor cabled with non-wicking fillers
- Separator
- Sheath colour - grey (RAL 7001)

Properties

- Material self-extinguishing and flame retardant to UL-Standard in accordance CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Tests**
UL: TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2007, WTTC 1000V, DP-1, OIL RES I & II, 90°C dry / 75°C wet, Class 1 Div. 2 per NEC Art 336, 392, 501, crush impact test in accordance with UL 1277
CSA:
c(UL) CIC-TC FT4
CSA AWM I/II
A/B FT4

Note

Available on request

- with red, black, yellow or orange cores
- Black or TPE outer sheath

Application

TRAYCONTROL 530 is a flexible, oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for AC, DC or control wiring in accordance with NFPA 79 Edition 2007. Approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (OIL RES I & II) guarantees a long service life for industrial applications in dry, damp and wet environments.

Recommended Applications: automotive industry, machine tool, production lines

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

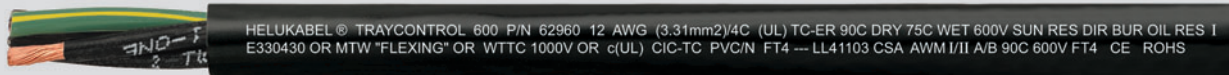
Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
66840	2 x 1	18	7,0	19,0	68,0
66841	3 G 1	18	7,1	29,0	88,0
66842	4 G 1	18	8,0	38,0	98,0
66843	5 G 1	18	8,6	48,0	116,0
66844	7 G 1	18	9,3	67,0	149,0
66845	9 G 1	18	10,7	86,0	186,0
66846	10 G 1	18	11,6	96,0	199,0
66847	12 G 1	18	11,9	115,0	245,0
66848	15 G 1	18	13,2	144,0	292,0
66849	16 G 1	18	13,3	154,0	306,0
66850	18 G 1	18	14,6	173,0	366,0
66851	19 G 1	18	14,7	182,0	384,0
66852	25 G 1	18	17,0	240,0	451,0
66853	27 G 1	18	17,4	259,0	521,0
66854	33 G 1	18	18,7	317,0	590,0
66855	34 G 1	18	19,3	326,0	625,0
66856	41 G 1	18	20,7	394,0	744,0
66857	42 G 1	18	20,8	403,0	758,0
66858	49 G 1	18	23,0	470,0	917,0
66859	50 G 1	18	23,5	480,0	933,0
66860	61 G 1	18	24,9	624,0	1095,0
66861	65 G 1	18	25,6	624,0	1125,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
66862	2 x 1,32	16	7,5	25,0	80,0
66863	3 G 1,32	16	7,8	38,0	86,0
66864	4 G 1,32	16	8,5	51,0	115,0
66865	5 G 1,32	16	9,3	63,0	126,0
66866	7 G 1,32	16	10,1	89,0	171,0
66867	9 G 1,32	16	11,7	114,0	237,0
66868	10 G 1,32	16	12,4	127,0	259,0
66869	12 G 1,32	16	12,9	152,0	301,0
66870	15 G 1,32	16	15,0	190,0	379,0
66871	16 G 1,32	16	15,2	203,0	405,0
66872	18 G 1,32	16	15,9	228,0	443,0
66873	19 G 1,32	16	16,0	241,0	458,0
66874	25 G 1,32	16	18,6	317,0	564,0
66875	27 G 1,32	16	19,0	342,0	629,0
66876	33 G 1,32	16	20,4	418,0	758,0
66877	34 G 1,32	16	20,5	431,0	775,0
66878	41 G 1,32	16	23,4	520,0	967,0
66879	42 G 1,32	16	24,1	532,0	972,0
66880	49 G 1,32	16	25,5	621,0	1132,0
66881	50 G 1,32	16	25,6	634,0	1137,0
66882	61 G 1,32	16	27,2	773,0	1345,0
66883	65 G 1,32	16	28,5	824,0	1376,0

Dimensions and specifications may be changed without prior notice. (RN01)

TRAYCONTROL 600 flexible, oil-resistant, open installation (TC-ER),

NFPA 79 Edition 2007



new

Technical data

- PVC-power cable according to UL Standard 1277
- **Temperature range**
UL / CSA TC -40 °C to +90 °C
UL / AWM -40 °C to +90 °C
- **Nominal voltage**
TC 600 V
AWM 1000 V
WTTC 1000 V
- **Test voltage**
3000 V
- **Minimum bending radius**
Approx. 5x cable ø
- **Insulation resistance**
Min. 20 MOhm x km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire stranded with AWG dimensions
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer, 3 cores and more
- Cores stranded in layers with optimal lay-lengths
- Separator
- Special PVC outer jacket
- Sheath colour - black (RAL 9005)
- With length marking in feet

Properties

- Material self-extinguishing and flame retardant to UL-Standard in accordance CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant
- **Tests**
UL: TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), UL 1277, UL Type WTTC, UL Type MTW, NFPA 79 2007, Oil Res I (Oil Res II also available), 90° C dry / 75° C wet
CSA: c(UL) CIC-TC FT4
CSA AWM I/II A/B FT4

Note

- G = with green-yellow earth core
x = without earth core (OZ)

Advantages

- TC-ER, Tray Cable Exposed Run
- simple installation
- outstanding flexibility

Application

USA NFPA79, edition 2007 conformant flexible power cables up to 600 V (WTTC 1000 V), for all machinery in tool and plant construction, suitable for installation in dry, humid and damp environments, in the open and in pipes. For underground installation and for open, unprotected installation from the cable rack to machines and industrial plants.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62902	2 x 1	18	7,0	19,0	68,0
62903	3 G 1	18	7,1	29,0	88,0
62904	4 G 1	18	8,0	39,0	97,0
62905	5 G 1	18	8,6	48,0	116,0
62906	7 G 1	18	9,3	67,0	147,0
62907	9 G 1	18	10,7	86,0	186,0
62908	10 G 1	18	11,6	96,0	199,0
62909	12 G 1	18	11,9	115,0	250,0
62910	15 G 1	18	13,2	144,0	292,0
62911	16 G 1	18	13,3	154,0	306,0
62912	18 G 1	18	14,6	173,0	365,0
62913	19 G 1	18	14,7	182,0	384,0
62914	25 G 1	18	17,0	240,0	480,0
62915	27 G 1	18	17,4	259,0	521,0
62916	34 G 1	18	19,3	326,0	625,0
62940	34 G 1	16	20,5	431,0	775,0
62917	37 G 1	18	19,8	355,0	684,0
62941	40 G 1	16	22,9	507,0	946,0
62918	41 G 1	18	20,7	394,0	744,0
62942	41 G 1	16	23,4	519,0	967,0
62919	50 G 1	18	23,5	480,0	933,0
62920	61 G 1	18	24,9	586,0	1095,0
62970	2 x 6	10	11,9	115,0	213,0
62971	3 G 6	10	12,6	173,0	283,0
62972	4 G 6	10	14,7	230,0	387,0
62973	5 G 6	10	16,0	288,0	473,0
62974	7 G 6	10	17,4	403,0	607,0
62975	9 G 6	10	20,4	518,0	771,0
62976	12 G 6	10	23,9	691,0	1061,0
62977	19 G 6	10	27,9	1094,0	1528,0

Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62978	4 G 10	8	19,7	384,0	615,0
62979	5 G 10	8	21,7	480,0	768,0
62980	3 G 16	6	19,5	461,0	700,0
62981	4 G 16	6	21,9	614,0	907,0
62982	5 G 16	6	24,0	768,0	1100,0
62983	3 G 25	4	24,3	720,0	1061,0
62984	4 G 25	4	27,1	960,0	1366,0
62985	5 G 25	4	29,3	1200,0	1631,0
62986	3 G 35	2	27,9	1008,0	1480,0
62987	4 G 35	2	31,4	1344,0	1922,0
62988	5 G 35	2	34,0	1680,0	2360,0
62921	2 x 1,32	16	7,5	25,0	80,0
62922	3 G 1,32	16	7,8	38,0	86,0
62923	4 G 1,32	16	8,5	51,0	120,0
62924	5 G 1,32	16	9,3	63,0	130,0
62925	6 G 1,32	16	10,0	76,0	164,0
62926	7 G 1,32	16	10,1	89,0	188,0
62927	8 G 1,32	16	10,9	101,0	201,0
62928	9 G 1,32	16	11,7	114,0	238,0
62929	10 G 1,32	16	12,4	127,0	259,0
62930	12 G 1,32	16	12,9	152,0	301,0
62931	14 G 1,32	16	14,5	177,0	356,0
62932	15 G 1,32	16	15,0	190,0	379,0
62933	16 G 1,32	16	15,2	203,0	405,0
62934	18 G 1,32	16	15,9	228,0	430,0
62935	19 G 1,32	16	16,0	241,0	450,0
62936	20 G 1,32	16	16,5	253,0	481,0
62937	25 G 1,32	16	18,6	317,0	564,0
62938	27 G 1,32	16	19,0	342,0	629,0
62939	30 G 1,32	16	19,6	380,0	701,0

Continuation ▶

TRAYCONTROL 600 flexible, oil-resistant, open installation (TC-ER),

NFPA 79 Edition 2007



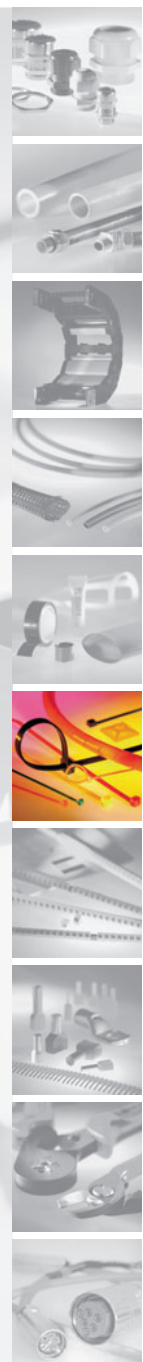
Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62943	50 G 1,32	16	25,1	634,0	1137,0
62944	61 G 1,32	16	27,2	773,0	1345,0
62945	2 x 2,08	14	8,6	40,0	100,0
62946	3 G 2,08	14	8,9	60,0	117,0
62947	4 G 2,08	14	9,8	80,0	141,0
62948	5 G 2,08	14	10,6	100,0	152,0
62949	6 G 2,08	14	11,6	120,0	216,0
62950	7 G 2,08	14	11,9	140,0	255,0
62951	9 G 2,08	14	13,5	180,0	312,0
62952	10 G 2,08	14	15,5	200,0	378,0
62953	12 G 2,08	14	15,9	240,0	434,0
62954	16 G 2,08	14	17,6	319,0	550,0
62955	18 G 2,08	14	18,3	359,0	616,0
62956	19 G 2,08	14	18,5	380,0	634,0
62957	25 G 2,08	14	21,6	500,0	817,0
62958	2 x 3,31	12	9,5	63,0	132,0
62959	3 G 3,31	12	10,0	95,0	177,0
62960	4 G 3,31	12	10,9	127,0	201,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62961	5 G 3,31	12	11,9	159,0	274,0
62962	6 G 3,31	12	13,0	191,0	315,0
62963	7 G 3,31	12	13,1	222,0	353,0
62964	9 G 3,31	12	15,9	286,0	476,0
62965	12 G 3,31	12	17,8	381,0	613,0
62966	16 G 3,31	12	19,8	508,0	785,0
62967	19 G 3,31	12	20,8	604,0	918,0
62968	20 G 3,31	12	21,9	636,0	916,0
62969	25 G 3,31	12	25,3	794,0	1286,0
62989	4 G 42,3	1	34,8	1624,0	2397,0
62990	4 G 52,9	1/0	37,9	2031,0	2938,0
62991	4 G 67,3	2/0	41,3	2584,0	3569,0
62992	4 G 84,4	3/0	48,6	3256,0	4181,0
62993	4 G 106,7	4/0	51,2	4097,0	5747,0
62994	4 G 128,4	250 kcmil	55,0	4931,0	7591,0
62995	4 G 181,9	350 kcmil	63,5	6985,0	8299,0
62996	4 G 257,6	500 kcmil	73,7	9892,0	11549,0

Dimensions and specifications may be changed without prior notice. (RN01)

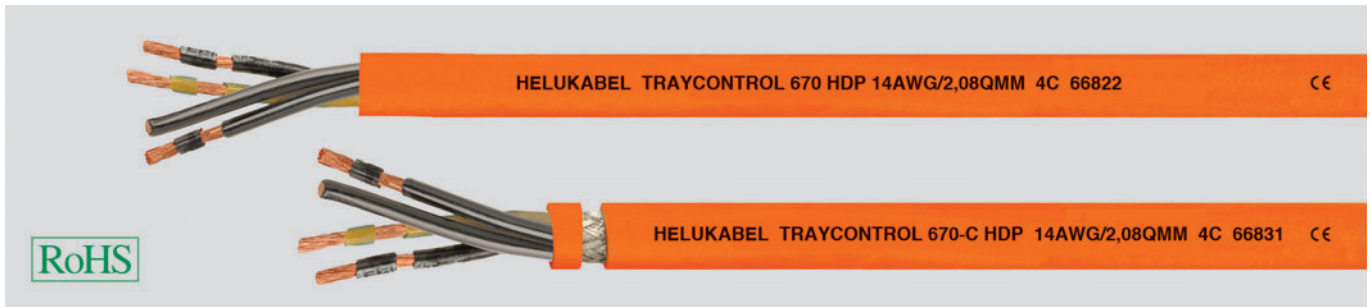
Bundling, binding, fastening

- Plastic helix
- Cable tie
- Hook and loop cable tie
- Mounting block



You can find bundling, binding, fastening in our catalogue Cable Accessories.
Request it now at www.helukabel.de

TRAYCONTROL 670 HDP / 670-C HDP flexible, oil-resistant, open installation (TC-ER), NFPA 79 Edition 2007



new

Technical data

- TPE motor supply cable according to UL 1277
- **Temperature range**
Flexing -40°C bis +105°C
- **Nominal voltage**
TC 600 V
AWM 1000 V
TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**
7,5 cable ø
- **Coupling resistance (-C-type)**
Max. 250 Ohm/km

Cable structure

- Tinned copper conductor, fine wire stranded with AWG measures
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer
- Cores stranded in layers with optimal lay-lengths
- Separator
- Special TPE outer jacket
- Sheath colour orange (RAL 2003)
- With length marking in feet
- **C-Type**
Screening with braid of tinned copper wires, optimal coverage, approx. 85%

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting

Tests

UL:

TC-ER, WTTC, MTW, NFPA 79 2007, UL 1277, UL AWM 105°C, OIL RES I & II, 75° C wet Bus Drop Cable Class I Div 2 per NEC Art. 336, 318, 501

CSA:

c (UL) CIC-TC FT4,
AWM I/II A/B FT4

Note

- HDP = Heavy Duty Power

Application

HELUKABEL TRAYCONTROL 670 HDP / 670-C-HDP are multi-conductor severe duty motor supply cables with Bus Drop, UL TC-ER and CSA CIC/TC approval. Superior oil performance for long cable life and permitted to be used in hazardous (classified) locations Class I Div 2 per NEC 336, 318 and 501. Special extruded jacket and fine copper stranding approved for exposed run, pipes and burial installation. Excellent flexibility and easier to pull than standard tray cables. Suitable for installation in dry, humid and damp environments, in the open unprotected installation from the cable tray to machines.

Recommended Applications: Motor connections in industrial and automation environments, machine tool, automotive and renewable energies

CE = The product conforms to EC Low-Voltage Directive 2006/95/EG

TRAYCONTROL 670 HDP

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
66820	4 x 1	18	8,4	39,0	103,0
66821	4 G 1,32	16	9,2	51,0	133,0
66822	4 G 2,08	14	10,0	80,0	170,0
66823	4 G 3,31	12	11,2	127,0	229,0
66824	4 G 6	10	15,2	230,0	393,0
66825	4 G 10	8	19,3	384,0	626,0
66826	4 G 16	6	22,4	614,0	885,0
66827	4 G 25	4	26,7	960,0	1301,0
66828	4 G 35	2	31,5	1344,0	1983,0

TRAYCONTROL 670-C HDP

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
66829	4 x 1	18	9,8	52,0	133,0
66830	4 G 1,32	16	10,5	72,0	159,0
66831	4 G 2,08	14	11,7	115,0	222,0
66832	4 G 3,31	12	12,8	179,0	283,0
66833	4 G 6	10	16,9	256,0	460,0
66834	4 G 10	8	22,1	426,0	741,0
66835	4 G 16	6	26,2	657,0	1059,0
66836	4 G 25	4	30,8	1026,0	1497,0
66837	4 G 35	2	35,0	1412,0	2058,0

Dimensions and specifications may be changed without prior notice. (RN01)

N

JZ 604-FCY TC TRAY CABLE

PVC power cable, exposed run, screened, NFPA 79 Edition 2007, 90°C, 600V, EMC-preferred type, meter marking



HELUKABEL JZ-604 FCY TC-ER MTW UL 1277 18AWG / 1 QMM 7C 600V 90C DRY 75C WET SUN RES
DIR BUR FT4 OR AWN STYLE 2587 CSA AWM III A/B 90C FT4 600V LL113926 CE



Technical data

- PVC power cable, screened toUL-standard 1277 TRAY CABLE
- **Multinorm**
AWM-Style 2587 to UL-Std. 758 and CSA C22.2 No 210.2 I/II A/B 90 °C 600 V
- **Temperature range**
dry environment
flexing -5 °C to +90 °C
fixed installation -25 °C to +90 °C
wet environment
flexing -5 °C to +75 °C
fixed installation -25 °C to +75 °C
- **Nominal voltage** to UL 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
10x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Spezial PVC core insulation class 12 B to table 50.155 UL-standard 1581, type TFF to UL-Std. 66 (AWG 20-AWG 16), type THHW to UL-Std. 83 (≥AWG 14)
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Special separation foil
- Tinned copper braided screening, approx. 85% coverage
- Special PVC outer sheath, to UL-Std. 1277 table 11.2
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Material self-extinguishing and flame retardant to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.
- **unscreened analogue type:**
JZ 604 TC TRAY CABLE, see page N 25

Application

USA NFPA79, edition 2007 conformant flexible power cables up to 600 V, for all machinery in tool and plant construction, suitable for installation in dry, humid and damp environments, in the open and in pipes. For underground installation and for open, unprotected installation from the cable rack to machines and industrial plants.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

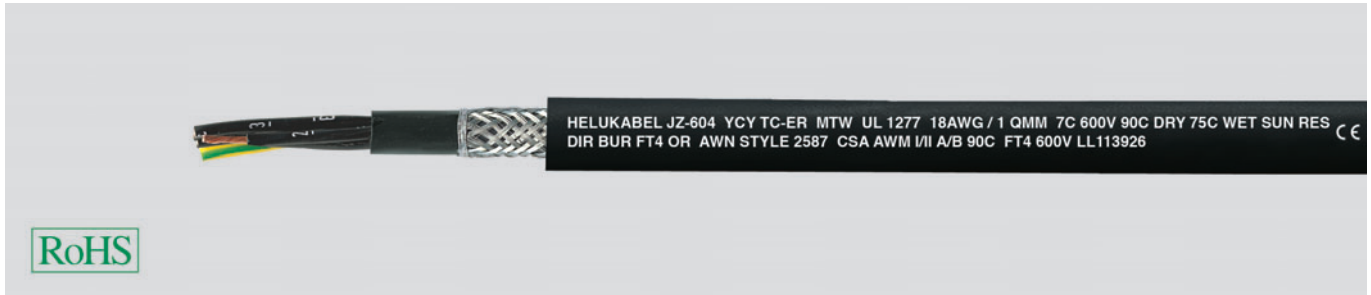
Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69750	2 x 1	18	8,6	50,0	151,0
69751	3 G 1	18	9,0	60,0	164,0
69752	4 G 1	18	9,7	71,0	200,0
69753	5 G 1	18	10,5	88,0	229,0
69754	7 G 1	18	12,2	111,0	306,0
69755	9 G 1	18	13,2	139,0	371,0
69756	10 G 1	18	15,0	150,0	411,0
69757	12 G 1	18	15,4	184,0	460,0
69758	18 G 1	18	17,8	260,0	624,0
69759	25 G 1	18	21,9	349,0	845,0
69760	34 G 1	18	24,5	486,0	984,0
69761	50 G 1	18	26,2	625,0	1096,0
69762	2 x 1,5	16	9,0	63,0	161,0
69763	3 G 1,5	16	9,4	80,0	181,0
69764	4 G 1,5	16	10,2	97,0	240,0
69765	5 G 1,5	16	11,1	119,0	274,0
69766	7 G 1,5	16	12,9	147,0	367,0
69767	8 G 1,5	16	14,5	170,0	431,0
69768	9 G 1,5	16	14,5	182,0	437,0
69769	10 G 1,5	16	15,8	193,0	511,0
69770	12 G 1,5	16	16,2	267,0	598,0
69771	16 G 1,5	16	17,9	315,0	630,0
69772	18 G 1,5	16	18,9	374,0	787,0
69773	25 G 1,5	16	22,3	526,0	1240,0
69774	34 G 1,5	16	24,9	629,0	1401,0
69775	41 G 1,5	16	26,7	801,0	2671,0
69776	50 G 1,5	16	33,7	885,0	3614,0
69777	61 G 1,5	16	36,0	1100,0	4089,0
69778	2 x 2,5	14	10,0	96,0	269,0
69779	3 G 2,5	14	10,5	144,0	294,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69780	4 G 2,5	14	11,4	148,0	341,0
69781	5 G 2,5	14	12,4	181,0	420,0
69782	7 G 2,5	14	15,3	255,0	551,0
69783	8 G 2,5	14	16,5	285,0	583,0
69784	9 G 2,5	14	16,5	309,0	593,0
69785	10 G 2,5	14	17,9	340,0	631,0
69786	12 G 2,5	14	18,4	441,0	847,0
69787	18 G 2,5	14	22,4	570,0	1336,0
69788	25 G 2,5	14	26,5	738,0	1921,0
69789	3 G 4	12	11,6	174,0	381,0
69790	4 G 4	12	12,6	230,0	504,0
69791	5 G 4	12	14,5	273,0	692,0
69792	7 G 4	12	17,1	316,0	908,0
69793	9 G 4	12	18,4	402,0	1104,0
69794	12 G 4	12	20,5	507,0	1497,0
69795	18 G 4	12	25,0	751,0	2104,0
69796	3 G 6	10	13,8	240,0	623,0
69797	4 G 6	10	15,1	305,0	729,0
69798	5 G 6	10	16,4	439,0	1082,0
69799	7 G 6	10	18,0	505,0	1414,0
69800	3 G 10	8	17,6	350,0	1108,0
69801	4 G 10	8	19,3	535,0	1324,0
69802	5 G 10	8	22,1	592,0	1596,0
69803	7 G 10	8	24,2	810,0	2186,0

Dimensions and specifications may be changed without prior notice. (RN01)

JZ 604-YCY TC TRAY CABLE PVC power cable, exposed

run, screened, NFPA 79 Edition 2007, 90°C, 600V, EMC-preferred type, meter marking



Technical data

- PVC power cable, screened to UL-standard 1277 TRAY CABLE
- **Multinorm**
also conforms to the following standards:
AWM-Style 2587 to UL-Std. 758 (cUL) and CSA type TC FT4 to C22.2 no 230, CSA C22.2 No 210.2 I/II A/B 90 °C 600 V FT4
- **Temperature range**
dry environment
flexing -5 °C to +90 °C
fixed installation -25 °C to +90 °C
wet environment
flexing -5 °C to +75 °C
fixed installation -25 °C to +75 °C
- **Nominal voltage** to UL 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
10x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Spezial PVC core insulation class 12 B to table 50.155 UL-standard 1581, type TFF to UL-Std. 66 (AWG 20-AWG 16), type THHW to UL-Std. 83 (≥AWG 14)
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- PVC-inner sheath, to UL-Std. 1277 table 11.2
- Tinned copper braided screening, approx. 85% coverage
- Special PVC outer sheath, to UL-Std. 1277 table 11.2,
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Material self-extinguishing and flame retardant to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
JZ 604 TC TRAY CABLE, see page N 25

Application

UL-approved, flexible high current cables for use up to 600 V, for all machines, tools and installation work. Suitable for use in dry, damp and wet areas, outside, in cable ducts, open cable trays. Also in pipes, in the ground and for open installation in machinery and industrial areas.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69804	3 G 16	6	25,2	653,0	1385,0
69805	4 G 16	6	27,8	807,0	1861,0
69806	5 G 16	6	31,2	940,0	2614,0
69807	7 G 16	6	34,5	1345,0	3211,0
69808	3 G 25	4	29,0	920,0	2455,0
69809	4 G 25	4	32,4	1169,0	2721,0
69810	5 G 25	4	34,2	1420,0	3490,0
69811	7 G 25	4	40,3	1921,0	4960,0
69812	3 G 35	2	32,4	1250,0	3130,0
69813	4 G 35	2	36,2	1680,0	4100,0
69814	5 G 35	2	40,5	2020,0	4921,0
69815	3 G 50	1	40,4	1887,0	4560,0
69816	4 G 50	1	45,5	2370,0	5761,0
69817	5 G 50	1	50,0	2880,0	7186,0
69818	3 G 70	2/0	47,1	2516,0	5580,0
69819	4 G 70	2/0	51,1	3257,0	7387,0
69820	5 G 70	2/0	56,0	4032,0	9290,0
69821	3 G 95	3/0	50,1	3086,0	8520,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69822	4 G 95	3/0	55,0	4060,0	10200,0
69823	5 G 95	3/0	60,5	5244,0	13800,0
69824	3 G 120	4/0	54,0	4176,0	11090,0
69825	4 G 120	4/0	59,5	5231,0	13620,0
69826	5 G 120	4/0	64,5	6624,0	15420,0

Dimensions and specifications may be changed without prior notice. (RN01)

TRAYCONTROL 500-C flexible, oil-resistant, screened, EMC-preferred type, open installation TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2007



new



HELUKABEL TRAYCONTROL 500-C P/N 62855 12AWG 3,31QMM 4C (UL) TC-ER 90°C DRY 75°C WET 600 V SUN RES DIR BUR OIL RES I/II E330430 OR MTW "FLEXING" OR WTTC 1000 V OR c(UL)CIC TC FT4 LL41103 CSA AWM I/II 90°C 600 V FT4 CE ROHS



Technical data

- PVC control cable according to UL Standard 1277
- **Temperature range**
Flexing -5 °C to +90 °C
Fixed installation -40 °C to +90 °C
- **Nominal voltage**
TC 600 V
AWM 1000 V
TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 3000 V
- **Coupling resistance**
max. 250 Ohm/km
- **Minimum bending radius**
Flexing 6x cable ø
- **Insulation resistance**
Min. 20 MOhm x km
- **Radiation resistance**
up to 80x106 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire stranded
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer, 3 cores and more
- Cores stranded in layers with optimal lay-lengths
- Separating foil
- Braided screening of tinned copper wires, coverage approx. 85%
- Separator
- Special PVC outer jacket
- Sheath colour - grey (RAL 7001)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting

Tests

UL: TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2007, WTTC 1000V, DP-1, OIL RES I & II, 90°C dry / 75 °C wet, Class 1 Div. 2 per NEC Art 336, 392, 501, crush impact test in accordance with UL 1277

CSA: c(UL) CIC-TC FT4, CSA AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, easy to install

Available on request

- with blue cores (DC)
- with red cores (AC)
- Black or TPE outer sheath

Application

HELUKABEL TRAYCONTROL 500-C is a flexible, screened and oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for industrial plant and machinery in accordance with NFPA 79 2007. Approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (OIL RES I & II) guarantees a long service life for industrial applications in dry, damp and wet environments. Recommended applications: production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, automotive industry.

EMC = Electromagnetic compatibility. To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62813	2 x 0,5	20	7,0	35,0	95,0
62814	3 G 0,5	20	7,6	42,0	115,0
62815	7 G 0,5	20	9,4	69,0	164,0
62816	12 G 0,5	20	11,0	108,0	266,0
62817	25 G 0,5	20	16,1	240,0	435,0
62818	2 x 1	18	8,1	50,0	110,0
62819	3 G 1	18	8,2	60,0	118,0
62820	4 G 1	18	8,8	71,0	136,0
62821	5 G 1	18	9,4	88,0	148,0
62822	7 G 1	18	10,1	111,0	192,0
62823	9 G 1	18	11,4	140,0	244,0
62824	10 G 1	18	11,6	150,0	283,0
62825	12 G 1	18	12,9	184,0	329,0
62826	15 G 1	18	14,8	207,0	377,0
62827	18 G 1	18	15,7	260,0	435,0
62828	19 G 1	18	15,7	280,0	443,0
62829	25 G 1	18	17,7	349,0	571,0
62830	3 G 1,5	16	8,9	74,0	144,0
62831	4 G 1,5	16	9,6	90,0	172,0
62832	5 G 1,5	16	10,3	104,0	188,0
62833	6 G 1,5	16	10,5	120,0	203,0
62834	7 G 1,5	16	11,3	134,0	244,0
62835	9 G 1,5	16	12,6	165,0	308,0
62836	10 G 1,5	16	12,9	180,0	346,0
62837	12 G 1,5	16	15,1	244,0	423,0
62838	15 G 1,5	16	16,4	270,0	441,0
62839	18 G 1,5	16	17,3	319,0	512,0
62840	19 G 1,5	16	17,6	327,0	503,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62841	20 G 1,5	16	17,5	340,0	524,0
62842	25 G 1,5	16	19,6	434,0	704,0
62843	3 G 2,08	14	9,8	112,0	179,0
62844	4 G 2,08	14	10,7	121,0	222,0
62845	5 G 2,08	14	11,6	150,0	266,0
62846	7 G 0,5	14	12,5	200,0	326,0
62847	9 G 2,08	14	15,0	240,0	435,0
62848	10 G 2,08	14	16,3	264,0	427,0
62849	12 G 2,08	14	16,9	350,0	592,0
62850	15 G 2,08	14	18,3	409,0	635,0
62851	18 G 2,08	14	19,5	471,0	780,0
62852	19 G 2,08	14	19,7	505,0	799,0
62853	25 G 2,08	14	23,3	652,0	1042,0
62854	3 G 3,31	12	11,4	137,0	237,0
62855	4 G 3,31	12	12,5	169,0	314,0
62856	5 G 3,31	12	14,4	201,0	386,0
62857	6 G 3,31	12	14,6	236,0	425,0
62858	7 G 3,31	12	15,5	262,0	496,0
62859	9 G 3,31	12	17,7	334,0	740,0
62860	12 G 3,31	12	19,7	434,0	887,0
62861	15 G 3,31	12	21,0	531,0	903,0
62862	19 G 3,31	12	23,1	720,0	1123,0
62863	20 G 3,31	12	25,0	764,0	1490,0
62864	25 G 3,31	12	27,1	914,0	1865,0
62865	3 G 6	10	14,1	240,0	389,0
62866	4 G 6	10	15,5	305,0	549,0
62867	5 G 6	10	16,8	399,0	610,0
62868	7 G 6	10	18,2	505,0	851,0

Continuation ▶

TRAYCONTROL 500-C flexible, oil-resistant, screened, EMC-preferred type, open installation TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2007



Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62869	9 G 6	10	20,9	704,0	1132,0
62870	12 G 6	10	24,4	940,0	1523,0
62871	19 G 6	10	27,5	1210,0	1952,0
62872	4 G 10	8	18,7	535,0	852,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62873	4 G 16	6	23,3	740,0	1202,0
62874	4 G 25	4	28,6	1140,0	1971,0
62875	4 G 35	2	33,2	1576,0	2887,0

Dimensions and specifications may be changed without prior notice. (RN01)

Marking

Marking rings
Cable marker
Indian pen



You can find marking in our catalogue Cable Accessories.
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TRAYCONTROL 600-C flexible, oil-resistant, screened, EMC-preferred type, open installation (TC-ER), NFPA 79 Edition 2007



Technical data

- PVC power cable according to UL 1277
- **Temperature range**
UL / CSA TC -40 °C to +90 °C
UL / AWM -40 °C to +90 °C
- **Nominal voltage**
TC 600 V
AWM 1000 V
WTTC 1000 V
- **Test voltage**
3000 V
- **Coupling resistance**
max. 250 Ohm/km
- **Minimum bending radius**
approx. 6x cable ø
- **Insulation resistance**
Min. 20 MOhm x km
- **Radiation resistance**
Up to 80x106 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire stranded with AWG dimensions
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer, 3 cores and more
- Cores stranded in layers with optimal lay-lengths
- Separating foil
- Braided screening of tinned copper wires, coverage approx. 85%
- Separator
- Special PVC outer jacket
- Sheath colour - black (RAL 9005)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant material in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- UV-resistant
- **Tests**
UL:
TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), UL 1277, UL Type WTTC, UL Type MTW
NFPA 79 2007, Oil Res I (Oil Res II also available), 90 °C dry / 75 °C wet
CSA:
c (UL) CIC-TC FT4,
CSA AWM I/II A/B FT4

Note

- G = with green-yellow earth core
X = without earth core (OZ)

Advantages

- TC-ER, Tray Cable Exposed Run
- Simple installation
- Outstanding flexibility

Application

USA NFPA 79, Edition 2007 compliant, screened, flexible power cable to 600 V (WTTC 1000 V), for all tool and plant construction machinery, suitable for installation in dry, damp and wet environments, outdoors and in pipes. For underground installation and for open, unprotected installation from the cable tray to the machine and industrial plants.

EMC = Electromagnetic compatibility. To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE = The product conforms to the EC Low-Voltage Directive 2006/95/EC.

Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
63049	3 G 1	18	8,2	31,0	118,0
63050	4 G 1	18	8,8	52,0	136,0
63051	5 G 1	18	9,4	62,0	149,0
63052	7 G 1	18	10,1	83,0	193,0
63053	12 G 1	18	12,9	143,0	328,0
63054	18 G 1	18	15,7	207,0	431,0
63055	25 G 1	18	17,7	284,0	569,0
62997	3 G 1,32	16	8,9	57,0	144,0
63056	4 G 1,32	16	9,6	72,0	172,0
63057	5 G 1,32	16	10,3	84,0	186,0
63058	7 G 1,32	16	11,3	124,0	243,0
63059	12 G 1,32	16	15,1	199,0	421,0
63060	18 G 1,32	16	17,3	290,0	510,0
63061	25 G 1,32	16	19,6	384,0	704,0
63062	3 G 2,08	14	9,8	85,0	178,0
63063	4 G 2,08	14	10,7	115,0	220,0

Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
63064	5 G 2,08	14	11,6	139,0	264,0
63065	7 G 2,08	14	12,5	185,0	325,0
63066	12 G 2,08	14	16,9	309,0	591,0
63067	18 G 2,08	14	19,5	448,0	780,0
63068	25 G 2,08	14	23,3	632,0	1041,0
63069	4 G 3,31	12	12,5	179,0	313,0
63070	5 G 3,31	12	14,4	223,0	384,0
63071	7 G 3,31	12	15,5	298,0	492,0
63072	4 G 6	10	15,5	256,0	547,0
63073	5 G 6	10	16,8	312,0	608,0
63074	7 G 6	10	18,2	430,0	850,0
63075	4 G 10	8	18,7	426,0	851,0
63076	4 G 16	6	23,3	657,0	1197,0
63077	4 G 25	4	28,6	1026,0	1970,0
63078	4 G 35	2	33,2	1412,0	2874,0

Dimensions and specifications may be changed without prior notice. (RN01)



HELUKABEL TRAYCONTROL 300 24AWG/0,25QMM 6C/62652

CE



new

Technical data

- Flexible PVC data and control cable
- **Temperature range**
-25 °C to +105 °C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Minimum bending radius**
Flexing 4x cable \varnothing

Cable structure

- Tinned copper conductor, fine wire stranded, with AWG measures
- Special PVC core insulation (AWG 22 - AWG 16 with transparent nylon skin)
Core identification according to international colour code
- Cores stranded in layers with optimal lay-lengths
- Separator
- Special PVC outer sheath
- Sheath colour - grey (RAL 7001)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- **Tests**
UL (AWG 22 - AWG 16): PLTC-ER, ITC-ER, Type CM, NFPA 79 2007, OIL RES I & II, Class I Div. 2, NEC Art. 501, 725, 760 & 800, AWM 2464
UL (AWG 24 - AWG 28): CM, AWM 2464, rated OIL RES I & II, NEC Art. 725, 760 & 800, NFPA 79 2007
CSA: CSA CMG FT4, AWM I/II A/B

Note

Advantages

- highly-flexible easy to install
- Oil-resistant to OIL RES I & II

Available on request

- PUR or TPE outer sheath
- Sheath colour to suit customer requirements

Application

HELUKABEL®TRAYCONTROL 300 is a multi-core PVC data and control cable. Cross-sections with PLTC-ER and ITC-ER approval suitable for open, unprotected installation in cable trays to the machine; their outstanding oil resistance (OIL RES I & II) makes them ideally suited as connecting and joining cables and also for control, signal and measuring systems in industrial plants. The flexible cable structure facilitates installation inside and outside of machines and switch cabinets.

Applications: tool machines, control panels, control and instrumentation technology, production automation, cable ducts, renewable energies.

CE – The product conforms to the EG Low-Voltage Directive 2006/95/EG

Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62625	2 x 0,08	28	3,7	1,6	12,0
62626	3 x 0,08	28	4,0	2,0	18,0
62627	4 x 0,08	28	4,2	3,0	21,0
62628	6 x 0,08	28	4,7	5,0	27,0
62629	8 x 0,08	28	5,0	6,0	30,0
62630	10 x 0,08	28	5,6	8,0	30,0
62631	15 x 0,08	28	6,2	12,0	43,0
62632	20 x 0,08	28	6,8	15,0	54,0
62633	25 x 0,08	28	7,8	19,0	63,0
62634	30 x 0,08	28	8,2	23,0	73,0
62635	40 x 0,08	28	8,9	31,0	89,0
62636	50 x 0,08	28	9,9	38,0	109,0
62637	2 x 0,14	26	4,0	3,0	18,0
62638	3 x 0,14	26	4,1	4,0	21,0
62639	4 x 0,14	26	4,3	5,0	24,0
62640	6 x 0,14	26	5,0	8,0	30,0
62641	8 x 0,14	26	5,3	11,0	34,0
62642	10 x 0,14	26	6,0	13,0	42,0
62643	15 x 0,14	26	6,6	20,0	52,0
62644	20 x 0,14	26	7,5	27,0	67,0
62645	25 x 0,14	26	8,3	34,0	80,0
62646	30 x 0,14	26	8,6	40,0	92,0
62647	40 x 0,14	26	9,4	54,0	116,0
62648	50 x 0,14	26	10,6	67,0	145,0
62649	2 x 0,25	24	4,2	5,0	19,0
62650	3 x 0,25	24	4,4	7,0	22,0
62651	4 x 0,25	24	4,7	10,0	27,0
62652	6 x 0,25	24	5,4	14,0	33,0
62653	8 x 0,25	24	5,7	19,0	42,0
62654	10 x 0,25	24	6,4	24,0	49,0

Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62655	15 x 0,25	24	7,2	36,0	69,0
62656	20 x 0,25	24	8,2	48,0	86,0
62657	25 x 0,25	24	9,1	60,0	103,0
62658	30 x 0,25	24	9,4	72,0	131,0
62659	40 x 0,25	24	11,0	96,0	173,0
62660	50 x 0,25	24	12,2	120,0	219,0
62661	2 x 0,34	22	4,6	7,0	22,0
62662	3 x 0,34	22	4,8	10,0	28,0
62663	4 x 0,34	22	5,1	13,0	32,0
62664	6 x 0,34	22	5,8	20,0	46,0
62665	8 x 0,34	22	6,2	26,0	54,0
62666	10 x 0,34	22	7,3	33,0	66,0
62667	15 x 0,34	22	8,3	49,0	90,0
62668	20 x 0,34	22	9,1	65,0	115,0
62669	25 x 0,34	22	10,5	82,0	141,0
62670	30 x 0,34	22	10,9	98,0	176,0
62671	40 x 0,34	22	12,1	131,0	234,0
62672	50 x 0,34	22	13,5	163,0	293,0
62673	2 x 0,75	20	5,7	14,0	57,0
62674	3 x 0,75	20	6,0	22,0	60,0
62675	4 x 0,75	20	6,5	29,0	73,0
62676	6 x 0,75	20	7,8	43,0	97,0
62677	8 x 0,75	20	8,4	58,0	133,0
62678	10 x 0,75	20	9,6	72,0	143,0
62679	15 x 0,75	20	11,4	108,0	177,0
62680	20 x 0,75	20	12,7	144,0	261,0
62681	25 x 0,75	20	14,1	180,0	353,0
62682	30 x 0,75	20	14,7	216,0	419,0
62683	40 x 0,75	20	16,9	288,0	562,0
62684	50 x 0,75	20	18,9	360,0	699,0

Continuation ▶

TRAYCONTROL 300 flexible, oil-resistant, NFPA 79 Edition 2007



Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62685	2 x 1	18	6,2	19,0	61,0
62686	3 x 1	18	6,5	29,0	64,0
62687	4 x 1	18	7,3	38,0	77,0
62688	6 x 1	18	8,5	58,0	101,0
62700	6 x 1	16	9,3	86,0	162,0
62689	8 x 1	18	9,1	77,0	142,0
62702	8 x 1	16	10,6	115,0	243,0
62690	10 x 1	18	11,1	96,0	195,0
62691	15 x 1	18	12,6	144,0	247,0
62692	20 x 1	18	13,9	192,0	328,0
62693	25 x 1	18	16,6	240,0	407,0
62694	30 x 1	18	16,7	288,0	539,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62695	40 x 1	18	18,5	384,0	717,0
62696	50 x 1	18	20,8	480,0	894,0
62697	2 x 1,5	16	6,7	28,0	83,0
62698	3 x 1,5	16	7,4	43,0	91,0
62699	4 x 1,5	16	8,0	58,0	109,0
62705	10 x 1,5	16	12,2	144,0	267,0
62704	15 x 1,5	16	13,9	216,0	364,0
62705	20 x 1,5	16	15,3	288,0	493,0
62706	25 x 1,5	16	17,7	360,0	608,0
62707	30 x 1,5	16	18,4	432,0	729,0
62708	40 x 1,5	16	20,5	576,0	967,0
62709	50 x 1,5	16	23,1	720,0	1214,0

Dimensions and specifications may be changed without prior notice. (RN02)

Core end sleeves and cable lugs

- Core end sleeves
- Solderless terminals
- Tubular cable lugs
- Compression joints



You can find core end sleeves and cable lugs in our catalogue Cable Accessories. Request it now at www.helukabel.de

TRAYCONTROL 300-C flexible, oil-resistant, screened, EMC-preferred

type, NFPA 79 Edition 2007



new

Technical data

- Flexible screened PVC data and control cable
- **Temperature range**
-25 °C to +105 °C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Minimum bending radius**
Flexing 6x cable ø
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Tinned copper conductor, fine wire stranded, with AWG measures
- Special PVC core insulation (AWG 22 - AWG 16 with transparent nylon skin)
- Core identification according to international colour code
- Cores stranded in layers with optimal lay-lengths
- 1. Screening with special aluminium foil
- 2. Screening with braid of tinned copper wires, optimal coverage, approx. 85%
- Separator
- Special PVC outer sheath
- Sheath colour - grey (RAL 7001)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- **Tests**
UL (AWG 22 - AWG 16): PLTC-ER, ITC-ER, Type CM, NFPA 79 2007, OIL RES I & II, Class I Div. 2, NEC Art. 501, 725, 760 & 800, AWM 2464
UL (AWG 24 - AWG 28): CM, AWM 2464, rated OIL RES I & II, NEC Art. 725, 760 & 800, NFPA 79 2007
CSA: CSA CMG FT4, AWM I/II A/B

Note

Advantages

- Highly-flexible, easy to install
- Oil-resistant to OIL RES I & II

Available on request

- PUR or TPE outer sheath
- Sheath colour to suit customer requirement

Application

HELUKABEL® TRAYCONTROL 300 is a screened, multi-core PVC data and control cable. Cross-sections with PLTC-ER and ITC-ER approval suitable for open, unprotected installation in cable trays to the machine; their outstanding oil resistance (OIL RES I & II) makes them ideally suited as connecting and joining cables and also for control, signal and measuring systems in industrial plants. The flexible cable structure facilitates installation inside and outside of machines and switch cabinets. The double-screening with aluminium foil (100% coverage) and copper braid (approx. 85% coverage) guarantee superior EMC protection.

Applications: tool machines, control panels, measuring devices, production automation, cable ducts, renewable energies.

EMC = Electromagnetic compatibility.

To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE = The product conforms to the EG Low-Voltage Directive 2006/95/EG

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62710	2 x 0,08	28	4,4	6,0	16,0
62711	3 x 0,08	28	4,6	7,0	22,0
62712	4 x 0,08	28	4,9	9,0	27,0
62713	6 x 0,08	28	5,4	12,0	34,0
62714	8 x 0,08	28	5,7	15,0	37,0
62715	10 x 0,08	28	6,3	18,0	43,0
62716	15 x 0,08	28	6,9	24,0	52,0
62717	20 x 0,08	28	7,5	30,0	67,0
62718	25 x 0,08	28	8,5	37,0	79,0
62719	30 x 0,08	28	8,8	43,0	88,0
62720	40 x 0,08	28	9,6	54,0	112,0
62721	50 x 0,08	28	11,3	67,0	131,0
62722	2 x 0,14	26	4,6	9,0	24,0
62723	3 x 0,14	26	4,8	10,0	27,0
62724	4 x 0,14	26	5,0	12,0	31,0
62725	6 x 0,14	26	5,6	16,0	39,0
62726	8 x 0,14	26	5,9	19,0	43,0
62727	10 x 0,14	26	6,6	24,0	51,0
62728	15 x 0,14	26	7,3	31,0	66,0
62729	20 x 0,14	26	8,1	40,0	79,0
62730	25 x 0,14	26	9,0	49,0	92,0
62731	30 x 0,14	26	9,3	57,0	110,0
62732	40 x 0,14	26	10,2	72,0	136,0
62733	50 x 0,14	26	11,9	88,0	165,0
62734	2 x 0,25	24	4,9	15,0	30,0
62735	3 x 0,25	24	5,1	16,0	33,0
62736	4 x 0,25	24	5,3	19,0	37,0
62737	6 x 0,25	24	6,0	27,0	48,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62738	8 x 0,25	24	6,3	31,0	57,0
62739	10 x 0,25	24	7,1	39,0	67,0
62740	15 x 0,25	24	8,2	51,0	85,0
62741	20 x 0,25	24	8,9	64,0	106,0
62742	25 x 0,25	24	9,8	77,0	128,0
62743	30 x 0,25	24	10,1	92,0	155,0
62744	40 x 0,25	24	11,2	118,0	206,0
62745	50 x 0,25	24	13,0	148,0	249,0
62746	2 x 0,34	22	5,3	19,0	34,0
62747	3 x 0,34	22	5,5	22,0	40,0
62748	4 x 0,34	22	5,8	27,0	46,0
62749	6 x 0,34	22	6,5	34,0	60,0
62750	8 x 0,34	22	6,9	45,0	72,0
62751	10 x 0,34	22	8,1	69,0	85,0
62752	15 x 0,34	22	9,0	77,0	115,0
62753	20 x 0,34	22	9,7	92,0	140,0
62754	25 x 0,34	22	11,4	121,0	176,0
62755	30 x 0,34	22	11,8	139,0	210,0
62756	40 x 0,34	22	12,9	177,0	273,0
62757	50 x 0,34	22	14,3	215,0	331,0
62758	2 x 0,75	20	6,4	28,0	75,0
62759	3 x 0,75	20	6,7	34,0	77,0
62760	4 x 0,75	20	7,2	40,0	91,0
62761	6 x 0,75	20	8,6	54,0	118,0
62762	8 x 0,75	20	9,1	70,0	158,0
62763	10 x 0,75	20	10,4	85,0	175,0
62764	15 x 0,75	20	12,3	119,0	218,0
62765	20 x 0,75	20	13,6	150,0	298,0

Continuation ▶

TRAYCONTROL 300-C flexible, oil-resistant, screened, EMC-preferred type, NFPA 79 Edition 2007



Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62766	25 x 0,75	20	15,0	186,0	401,0
62767	30 x 0,75	20	15,5	224,0	477,0
62768	40 x 0,75	20	17,7	288,0	623,0
62769	50 x 0,75	20	19,7	337,0	752,0
62770	2 x 1	18	6,9	37,0	80,0
62771	3 x 1	18	7,2	49,0	86,0
62772	4 x 1	18	8,0	58,0	101,0
62773	6 x 1	18	9,2	82,0	130,0
62774	8 x 1	18	9,8	100,0	168,0
62775	10 x 1	18	12,0	124,0	226,0
62776	15 x 1	18	13,5	180,0	295,0
62777	20 x 1	18	14,7	234,0	386,0
62778	25 x 1	18	16,9	277,0	462,0
62779	30 x 1	18	17,6	323,0	590,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62780	40 x 1	18	19,4	416,0	773,0
62781	50 x 1	18	21,6	508,0	958,0
62782	2 x 1,5	16	7,4	51,0	110,0
62783	3 x 1,5	16	8,1	63,0	116,0
62784	4 x 1,5	16	8,7	76,0	139,0
62785	6 x 1,5	16	10,0	104,0	195,0
62786	8 x 1,5	16	11,2	134,0	283,0
62787	10 x 1,5	16	13,1	168,0	316,0
62788	15 x 1,5	16	14,7	234,0	410,0
62789	20 x 1,5	16	16,2	301,0	551,0
62790	25 x 1,5	16	18,6	367,0	675,0
62791	30 x 1,5	16	19,3	428,0	794,0
62792	40 x 1,5	16	21,5	550,0	1033,0
62793	50 x 1,5	16	24,3	669,0	1274,0

Dimensions and specifications may be changed without prior notice. (RN02)

Tools

- Cable shears
- Box spanners
- Strippers
- Crimping tools
- Pliers
- Skinning knife



You can find tools in our catalogue Cable Accessories.
Request it now at www.helukabel.de

TRAYCONTROL 300 TP stranded pair, flexible, oil-resistant,

NFPA 79 Edition 2007



new

Technical data

- Flexible PVC data and control cable
- **Temperature range**
-25 °C to +105 °C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Minimum bending radius**
Flexing 6x cable ø

Cable structure

- Tinned copper conductor, fine wire stranded, with AWG measures
- Special PVC core insulation (AWG 22 - AWG 18 with transparent nylon skin)
- Pair identification according to international colour code
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Separator
- Special PVC outer sheath
- Sheath colour - grey (RAL 7001)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting

Tests

UL (AWG 22 - AWG 18): PLTC-ER, ITC-ER, Type CM, NFPA 79 2007, OIL RES I & II, Class I Div. 2, NEC Art. 501, 725, 760 & 800, AWM 2464

UL (AWG 24 - AWG 26): CM, AWM 2464, rated OIL RES I & II,

NEC Art. 725, 760 & 800, NFPA 79 2007

CSA: CSA CMG FT4, AWM I/II A/B

Note

Advantages

- Highly-flexible, easy to install
- Oil-resistant to OIL RES I & II

Available on request

- PUR or TPE outer sheath
- Sheath colour to suit customer requirement

Application

HELUKABEL®TRAYCONTROL 300 TP is a stranded pair data and control cable. Cross-sections with PLTC-ER and ITC-ER approval for open, unprotected installation in cable trays to the machine; their outstanding oil resistance (OIL RES I & II) makes them ideally suited as connecting and joining cables and also for control, signal and measuring systems in industrial plants. The flexible cable structure facilitates installation inside and outside of machines and switch cabinets.

Applications: tool machines, control panels, measuring devices, production automation, cable ducts, renewable energies.

CE= The product conforms to the EG Low-Voltage Directive 2006/95/EG

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62794	1 x 2 x 0,14	26	3,6	3,0	20,0
62795	2 x 2 x 0,14	26	5,1	5,0	24,0
62796	3 x 2 x 0,14	26	5,3	8,0	30,0
62797	4 x 2 x 0,14	26	5,8	11,0	38,0
62798	5 x 2 x 0,14	26	6,2	14,0	44,0
62799	6 x 2 x 0,14	26	6,8	16,0	51,0
62800	7 x 2 x 0,14	26	6,9	19,0	57,0
61928	8 x 2 x 0,14	26	7,3	22,0	64,0
61929	10 x 2 x 0,14	26	7,4	27,0	76,0
61930	12 x 2 x 0,14	26	9,1	33,0	93,0
61931	14 x 2 x 0,14	26	9,8	38,0	103,0
61932	15 x 2 x 0,14	26	10,6	41,0	109,0
61933	16 x 2 x 0,14	26	10,7	43,0	112,0
61934	18 x 2 x 0,14	26	11,1	49,0	119,0
61935	20 x 2 x 0,14	26	11,9	54,0	130,0
61936	22 x 2 x 0,14	26	12,4	59,0	150,0
61937	24 x 2 x 0,14	26	13,1	65,0	169,0
61938	25 x 2 x 0,14	26	13,4	67,0	178,0
61939	1 x 2 x 0,25	24	3,9	5,0	32,0
61940	2 x 2 x 0,25	24	5,9	10,0	36,0
61941	3 x 2 x 0,25	24	6,2	15,0	48,0
61942	4 x 2 x 0,25	24	6,5	20,0	56,0
61943	5 x 2 x 0,25	24	7,2	25,0	71,0
61944	6 x 2 x 0,25	24	8,1	29,0	80,0
61945	7 x 2 x 0,25	24	8,2	34,0	89,0
61946	8 x 2 x 0,25	24	8,9	39,0	98,0
61947	10 x 2 x 0,25	24	10,5	49,0	111,0
61948	12 x 2 x 0,25	26	11,0	59,0	135,0
61949	14 x 2 x 0,25	24	11,6	69,0	160,0
61950	15 x 2 x 0,25	24	12,0	74,0	171,0

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
61951	16 x 2 x 0,25	24	12,1	79,0	185,0
61952	18 x 2 x 0,25	24	13,5	89,0	209,0
61953	20 x 2 x 0,25	24	14,4	98,0	230,0
61954	22 x 2 x 0,25	24	15,3	109,0	248,0
61955	24 x 2 x 0,25	24	16,1	118,0	279,0
61956	25 x 2 x 0,25	24	16,7	124,0	292,0
61957	1 x 2 x 0,34	22	4,2	7,0	38,0
61958	2 x 2 x 0,34	22	6,4	13,0	44,0
61959	3 x 2 x 0,34	22	6,8	20,0	60,0
61960	4 x 2 x 0,34	22	7,9	7,6	26,0
61961	5 x 2 x 0,34	22	8,2	33,0	92,0
61962	6 x 2 x 0,34	22	8,9	39,0	119,0
61963	7 x 2 x 0,34	22	9,0	46,0	128,0
61964	8 x 2 x 0,34	22	9,9	52,0	139,0
61965	10 x 2 x 0,34	22	11,7	65,0	171,0
61966	12 x 2 x 0,34	22	12,4	78,0	194,0
61967	14 x 2 x 0,34	22	13,0	92,0	222,0
61968	15 x 2 x 0,34	22	13,2	98,0	231,0
61969	16 x 2 x 0,34	22	13,3	105,0	240,0
61970	18 x 2 x 0,34	22	14,2	118,0	264,0
61971	20 x 2 x 0,34	22	15,1	131,0	291,0
61972	22 x 2 x 0,34	22	15,8	144,0	300,0
61973	24 x 2 x 0,34	22	17,0	157,0	359,0
61974	25 x 2 x 0,34	22	17,5	163,0	381,0
61975	1 x 2 x 0,75	20	5,2	11,0	60,0
61976	2 x 2 x 0,75	20	8,8	22,0	80,0
61977	3 x 2 x 0,75	20	9,3	32,0	94,0
61978	4 x 2 x 0,75	20	10,2	43,0	104,0
61979	5 x 2 x 0,75	20	11,3	54,0	130,0
61980	6 x 2 x 0,75	20	12,5	65,0	151,0

Continuation ▶

TRAYCONTROL 300 TP stranded pair, flexible, oil-resistant,

NFPA 79 Edition 2007



Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
61981	7 x 2 x 0,75	20	12,6	75,0	174,0
61982	8 x 2 x 0,75	20	15,9	86,0	262,0
61983	10 x 2 x 0,75	20	16,4	108,0	298,0
61984	12 x 2 x 0,75	20	17,2	129,0	302,0
61985	14 x 2 x 0,75	20	18,1	151,0	327,0
61986	15 x 2 x 0,75	20	18,5	161,0	370,0
61987	16 x 2 x 0,75	20	18,6	172,0	402,0
61988	18 x 2 x 0,75	20	19,9	194,0	480,0
61989	20 x 2 x 0,75	20	21,1	215,0	551,0

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
61990	22 x 2 x 0,75	20	21,8	237,0	621,0
61991	24 x 2 x 0,75	20	23,5	258,0	703,0
61992	25 x 2 x 0,75	20	24,3	269,0	721,0
61993	1 x 2 x 1	18	5,6	18,0	61,0
61994	1 x 2 x 1	18	9,6	36,0	77,0
61995	3 x 2 x 1	18	10,6	54,0	103,0
61996	6 x 2 x 1	18	13,7	107,0	216,0
61997	9 x 2 x 1	18	16,4	162,0	328,0
61998	15 x 2 x 1	18	20,4	271,0	542,0

Dimensions and specifications may be changed without prior notice. (RN02)

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TRAYCONTROL 300-C TP stranded pair, flexible, screened, oil-resistant, EMC-preferred type, NFPA 79 Edition 2007



new



Technical data

- Flexible screened PVC data and control cable
- **Temperature range**
-25 °C to +105 °C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Minimum bending radius**
Flexing 6x cable ø
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Tinned copper conductor, fine wire stranded, with AWG measures
- Special PVC core insulation (AWG 22 - AWG 18 with transparent nylon skin)
- Pair identification according to international colour code
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- 1. Screening with special aluminium foil
2. Screening with braid of tinned copper wires, optimal coverage, approx. 85%
- Separator
- Special PVC outer sheath
- Sheath colour - grey (RAL 7001)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting

Tests

UL (AWG 22 - AWG 18): PLTC-ER, ITC-ER, CM, NFPA 79 2007, OIL RES I & II, Class I Div. 2, NEC Art. 501, 725, 760 & 800, AWM 2464

UL (AWG 24 - AWG 26): CM, AWM 2464, rated OIL RES I & II, NEC Art. 725, 760 & 800, NFPA 79 2007

CSA: CSA CMG FT4, AWM I/II A/B

Note

Advantages

- Highly-flexible, easy to install
- Oil-resistant to OIL RES I & II

Available on request

- PUR or TPE outer sheath
- Sheath colour to suit customer requirement

Application

HELUKABEL® TRAYCONTROL 300 is a screened, stranded pair data and control cable. Cross-sections with PLTC-ER and ITC-ER approval suitable for open, unprotected installation in cable trays to the machine; their outstanding oil resistance (OIL RES I & II) makes them ideally suited as connecting and joining cables and also for control, signal and measuring systems in industrial plants. The flexible cable structure facilitates installation inside and outside of machines and switch cabinets. The double-screening with aluminium foil (100% coverage) and copper braid (approx. 85% coverage) guarantee superior EMC protection.

Applications: tool machines, control panels, measuring devices, production automation, cable ducts, renewable energies.

EMC = Electromagnetic compatibility.

To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE = The product conforms to the EG Low-Voltage Directive 2006/95/EG

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
61999	1 x 2 x 0,14	26	4,0	16,0	32,0
59760	2 x 2 x 0,14	26	5,6	20,0	39,0
59761	3 x 2 x 0,14	26	5,8	24,0	47,0
59762	4 x 2 x 0,14	26	6,3	27,0	55,0
59763	5 x 2 x 0,14	26	6,7	31,0	68,0
59764	6 x 2 x 0,14	26	7,3	50,0	86,0
59765	7 x 2 x 0,14	26	7,4	52,0	92,0
59766	8 x 2 x 0,14	26	7,8	54,0	97,0
59767	10 x 2 x 0,14	26	9,1	60,0	111,0
59768	12 x 2 x 0,14	26	9,8	67,0	141,0
59769	14 x 2 x 0,14	26	10,5	75,0	150,0
59770	15 x 2 x 0,14	26	11,1	77,0	154,0
59771	16 x 2 x 0,14	26	11,2	80,0	155,0
59772	18 x 2 x 0,14	26	11,8	84,0	170,0
59773	20 x 2 x 0,14	26	12,4	98,0	183,0
59774	22 x 2 x 0,14	26	13,1	104,0	207,0
59775	24 x 2 x 0,14	26	13,6	112,0	228,0
59776	25 x 2 x 0,14	26	15,1	114,0	239,0
59777	1 x 2 x 0,25	24	4,6	16,0	46,0
59778	2 x 2 x 0,25	24	6,6	27,0	53,0
59779	3 x 2 x 0,25	24	6,9	32,0	65,0
59780	4 x 2 x 0,25	26	7,5	37,0	79,0
59781	5 x 2 x 0,25	24	8,0	55,0	98,0
59782	6 x 2 x 0,25	24	8,8	66,0	114,0
59783	7 x 2 x 0,25	24	8,9	60,0	121,0
59784	8 x 2 x 0,25	24	9,7	74,0	129,0

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
59785	10 x 2 x 0,25	24	11,4	109,0	152,0
59786	12 x 2 x 0,25	24	11,8	116,0	189,0
59787	14 x 2 x 0,25	24	12,6	121,0	213,0
59788	15 x 2 x 0,25	24	12,8	132,0	225,0
59789	16 x 2 x 0,25	24	12,9	142,0	227,0
59790	18 x 2 x 0,25	24	13,8	147,0	238,0
59791	20 x 2 x 0,25	24	14,4	161,0	270,0
59792	22 x 2 x 0,25	24	15,3	171,0	300,0
59793	24 x 2 x 0,25	24	16,4	230,0	321,0
59794	25 x 2 x 0,25	24	16,7	231,0	340,0
59795	1 x 2 x 0,34	22	4,9	17,0	58,0
59796	2 x 2 x 0,34	22	7,1	37,0	65,0
59797	3 x 2 x 0,34	22	7,7	45,0	79,0
59798	4 x 2 x 0,34	22	8,4	54,0	88,0
59799	5 x 2 x 0,34	22	9,0	63,0	110,0
59800	6 x 2 x 0,34	22	9,6	73,0	126,0
59801	7 x 2 x 0,34	22	9,7	79,0	140,0
59802	8 x 2 x 0,34	22	10,7	88,0	148,0
59803	10 x 2 x 0,34	22	12,7	107,0	184,0
59804	12 x 2 x 0,34	22	13,2	122,0	210,0
59805	14 x 2 x 0,34	22	13,9	138,0	241,0
59806	15 x 2 x 0,34	22	14,1	154,0	245,0
59807	16 x 2 x 0,34	22	14,2	161,0	251,0
59808	18 x 2 x 0,34	22	15,3	198,0	275,0
59809	20 x 2 x 0,34	22	15,9	211,0	300,0
59810	22 x 2 x 0,34	22	16,8	218,0	320,0

Continuation ▶

TRAYCONTROL 300-C TP stranded pair, flexible, screened, oil-resistant, EMC-preferred type, NFPA 79 Edition 2007



Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
59811	24 x 2 x 0,34	22	18,0	230,0	371,0
59812	25 x 2 x 0,34	22	18,3	239,0	402,0
59813	1 x 2 x 0,75	20	5,9	26,0	70,0
59814	2 x 2 x 0,75	20	9,4	56,0	89,0
59815	3 x 2 x 0,75	20	10,5	72,0	102,0
59816	4 x 2 x 0,75	20	11,5	92,0	119,0
59817	5 x 2 x 0,75	20	12,6	107,0	140,0
59818	6 x 2 x 0,75	20	13,3	122,0	162,0
59819	7 x 2 x 0,75	20	13,4	132,0	198,0
59820	8 x 2 x 0,75	20	16,8	144,0	272,0
59821	10 x 2 x 0,75	20	17,5	180,0	307,0
59822	12 x 2 x 0,75	20	18,0	202,0	318,0
59823	14 x 2 x 0,75	20	19,1	221,0	342,0

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
59824	15 x 2 x 0,75	20	19,4	232,0	381,0
59825	16 x 2 x 0,75	20	19,5	257,0	417,0
59826	18 x 2 x 0,75	20	20,5	282,0	494,0
59827	20 x 2 x 0,75	20	21,5	307,0	570,0
59828	22 x 2 x 0,75	20	22,6	322,0	645,0
59829	24 x 2 x 0,75	20	24,4	342,0	724,0
59830	25 x 2 x 0,75	20	24,9	361,0	740,0
59831	1 x 2 x 1	18	6,3	28,0	104,0
59832	2 x 2 x 1	18	10,2	57,0	121,0
59833	3 x 2 x 1	18	11,5	75,0	150,0
59834	6 x 2 x 1	18	14,6	139,0	328,0
59835	9 x 2 x 1	18	17,2	212,0	490,0
59836	15 x 2 x 1	18	21,3	358,0	811,0

Dimensions and specifications may be changed without prior notice. (RN02)

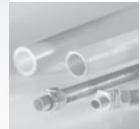
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HELUKABEL JZ-602-PUR AWM 14 AWG/2,5 QMM 4C E170315 CSA AWM I/II A/B 80°C 600V FT 1 CE



Technical data

- Control cable of special-PUR to UL CSA AWM I/II A/B Style 20939 (jacket insulation) and CSA
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** according to UL + CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI3, to DIN VDE 0281 part 1 and UL-Style 10012
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- **Full-polyurethane**
outer jacket grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Resistant to mineral oils, synthetic oils, water based coolants, UV-radiation, oxygene, ozon and hydrolysis. Conditionally resistant to microbes.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (0Z).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
JZ-602-C-PUR, see page N 51

Application

UL and CSA approved flexible control cable rated at 600 V, primarily designed for exporters to the US or Canadian market. Used in machine tools, control systems, connection between control panels and machines, assembly lines and other industrial equipment. Suitable for installation in dry, moist, wet and outdoor environment and moderate flexing applications.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12471	2 x 0,5	20	5,8	9,6	52,0
12472	3 G 0,5	20	6,2	14,0	64,0
12473	4 G 0,5	20	6,6	19,0	72,0
12474	5 G 0,5	20	7,2	24,0	88,0
12475	7 G 0,5	20	8,4	34,0	130,0
12476	8 G 0,5	20	9,5	38,4	145,0
12477	9 G 0,5	20	10,3	43,2	180,0
12478	12 G 0,5	20	10,8	58,0	196,0
12479	18 G 0,5	20	12,8	86,0	260,0
12480	25 G 0,5	20	15,4	120,0	368,0
12481	34 G 0,5	20	17,6	165,0	502,0
12482	41 G 0,5	20	19,7	197,0	594,0
12483	2 x 1	18	6,2	19,2	57,0
12484	3 G 1	18	6,6	27,0	68,0
12485	4 G 1	18	7,2	38,4	79,0
12486	5 G 1	18	7,8	48,0	97,0
12487	7 G 1	18	9,1	67,0	141,0
12488	8 G 1	18	9,9	76,8	152,0
12489	9 G 1	18	11,0	86,4	190,0
12490	12 G 1	18	11,7	115,2	211,0
12491	18 G 1	18	14,0	175,0	284,0
12492	25 G 1	18	17,0	240,0	394,0
12493	34 G 1	18	19,2	326,0	521,0
12494	41 G 1	18	21,0	394,0	609,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12495	2 x 1,5	16	6,8	28,8	75,0
12496	3 G 1,5	16	7,4	44,0	96,0
12497	4 G 1,5	16	8,0	58,0	117,0
12498	5 G 1,5	16	8,6	72,0	140,0
12499	7 G 1,5	16	10,5	101,0	186,0
12500	9 G 1,5	16	12,7	129,7	244,0
12501	12 G 1,5	16	13,3	173,0	319,0
12502	18 G 1,5	16	15,7	260,0	451,0
12503	25 G 1,5	16	18,8	360,0	625,0
12504	34 G 1,5	16	22,0	490,0	850,0
12505	41 G 1,5	16	25,6	590,0	1041,0
12506	2 x 2,5	14	8,1	48,0	115,0
12507	3 G 2,5	14	8,6	72,0	143,0
12508	4 G 2,5	14	10,0	96,0	185,0
12509	5 G 2,5	14	10,8	120,0	221,0
12510	7 G 2,5	14	13,0	168,0	293,0
12511	9 G 2,5	14	15,5	216,0	429,0
12512	12 G 2,5	14	16,6	288,0	563,0
12513	18 G 2,5	14	19,5	432,0	854,0
12514	19 G 2,5	14	19,5	456,0	914,0
12515	25 G 2,5	14	23,8	600,0	1188,0
12516	3 G 4	12	11,1	115,0	232,0
12517	4 G 4	12	12,4	154,0	298,0

Continuation ▶

N

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12518	5 G 4	12	13,7	192,0	358,0
12519	7 G 4	12	16,2	269,0	460,0
12520	3 G 6	10	12,8	173,0	360,0
12521	4 G 6	10	14,1	231,0	402,0
12522	5 G 6	10	15,7	288,0	484,0
12523	7 G 6	10	19,2	403,0	630,0
12524	3 G 10	8	16,8	288,0	535,0
12525	4 G 10	8	18,3	384,0	653,0
12526	5 G 10	8	20,1	480,0	786,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12527	7 G 10	8	22,4	672,0	1100,0
12528	2 x 16	6	19,2	307,0	640,0
12529	3 G 16	6	20,5	461,0	810,0
12530	4 G 16	6	23,0	615,0	1045,0
12531	5 G 16	6	25,5	768,0	1260,0
12532	7 G 16	6	28,2	1075,0	1760,0
12533	3 G 25	4	25,0	720,0	1180,0
12534	4 G 25	4	28,1	960,0	1507,0
12535	5 G 25	4	30,9	1200,0	1858,0
12536	7 G 25	4	35,5	1680,0	2830,0
12537	3 G 35	2	28,6	1008,0	1590,0
12538	4 G 35	2	31,7	1344,0	2123,0
12539	5 G 35	2	35,5	1680,0	2612,0
12540	4 G 50	1	35,8	1920,0	3058,0
12541	4 G 70	2/0	41,6	2688,0	4254,0
12542	4 G 95	3/0	46,0	3648,0	5762,0
12543	4 G 120	4/0	52,8	4608,0	7280,0

Dimensions and specifications may be changed without prior notice. (RN01)

Conduits

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High flexible conduits

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- metal conduits
- conduits glands

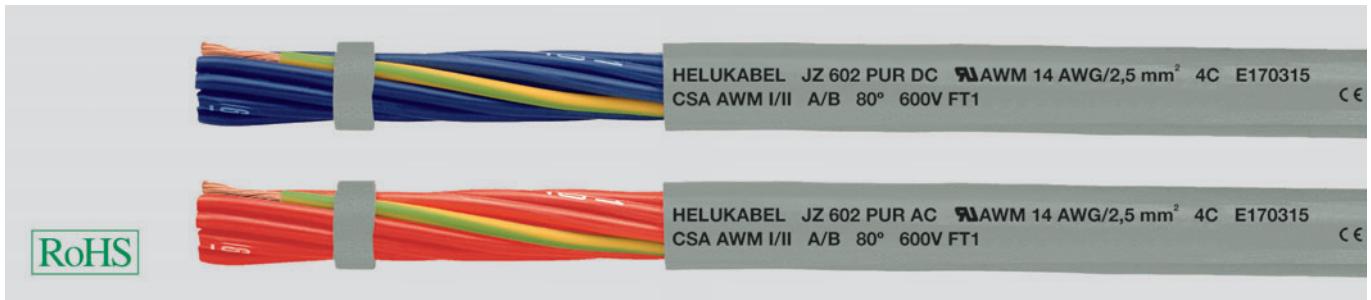
Conduit for heavy mechanical duty

- metal conduits with plastic sheat
- plastic conduits
- conduits glands for metal conduits



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JZ-602-PUR DC/AC 80°C, 600V, two approvals control cable, meter marking



Technical data

- Control cable of special-PUR to UL CSA AWM I/II A/B Style 20939 (jacket insulation) and CSA
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** according to UL + CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI3, to DIN VDE 0281 part 1 and UL-Style 10012
- Blue (DC) or red (AC) cores with continuous white numbering
- Green-yellow earth core
- Cores stranded in layers with optimal lay-length
- **Full-polyurethane**
outer jacket grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Resistant to mineral oils, synthetic oils, water based coolants, UV-radiation, oxygene, ozon and hydrolysis. Conditionally resistant to microbes.
- High abrasion resistance
- Tear and cut resistant
- The materials used in manufacturing are cadmium-free and do not contain no silicone any silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
- DC = blue cores;
- AC = red cores;
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For use on conveyor belts, tooling machines, conveyor system, production lines and automotive production plants. Also for medium mechanical stress in flexible applications with free movement and without tensile stress. UL and CSA approved control cables especially for U.S. and Canadian markets.

CE=The product conforms to the EC Low Voltage Directive 2006/95/EG

JZ-602 PUR DC (blue core)

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12805	3 G 1	18	6,6	27,0	68,0
12806	4 G 1	18	7,2	38,0	79,0
12807	5 G 1	18	7,8	48,0	97,0
12808	7 G 1	18	9,1	67,0	141,0
12809	12 G 1	18	11,7	115,0	211,0
12810	18 G 1	18	14,0	173,0	284,0
12811	25 G 1	18	17,0	240,0	394,0
12812	3 G 1,5	16	7,4	44,0	96,0
12813	4 G 1,5	16	8,0	58,0	117,0
12814	5 G 1,5	16	8,6	72,0	140,0
12815	7 G 1,5	16	10,5	101,0	186,0
12816	12 G 1,5	16	13,3	173,0	319,0
12817	18 G 1,5	16	15,7	260,0	451,0
12818	25 G 1,5	16	18,8	360,0	625,0
12819	3 G 2,5	14	8,6	72,0	143,0
12820	4 G 2,5	14	10,0	96,0	185,0
12821	5 G 2,5	14	10,8	120,0	221,0
12822	7 G 2,5	14	13,0	168,0	293,0
12823	12 G 2,5	14	16,6	288,0	563,0
12824	18 G 2,5	14	19,5	432,0	854,0
12825	25 G 2,5	14	23,8	600,0	1188,0

JZ-602 PUR AC (red core)

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12826	3 G 1	18	6,6	27,0	68,0
12827	4 G 1	18	7,2	38,0	79,0
12828	5 G 1	18	7,8	48,0	97,0
12829	7 G 1	18	9,1	67,0	141,0
12830	12 G 1	18	11,7	115,0	211,0
12831	18 G 1	18	14,0	173,0	284,0
12832	25 G 1	18	17,0	240,0	394,0
12833	3 G 1,5	16	7,4	44,0	96,0
12834	4 G 1,5	16	8,0	58,0	117,0
12835	5 G 1,5	16	8,6	72,0	140,0
12836	7 G 1,5	16	10,5	101,0	186,0
12837	12 G 1,5	16	13,3	173,0	319,0
12838	18 G 1,5	16	15,7	260,0	451,0
12839	25 G 1,5	16	18,8	360,0	625,0
12840	3 G 2,5	14	8,6	72,0	143,0
12841	4 G 2,5	14	10,0	96,0	185,0
12842	5 G 2,5	14	10,8	120,0	221,0
12843	7 G 2,5	14	13,0	168,0	293,0
12844	12 G 2,5	14	16,6	288,0	563,0
12845	18 G 2,5	14	19,5	432,0	854,0
12846	25 G 2,5	14	23,8	600,0	1188,0

Dimensions and specifications may be changed without prior notice. (RN01)



Technical data

- Special PUR control cables Adapted to DIN VDE 0276 part 627, DIN VDE 0281 part 13, with insulation thickness for 1 kV type and UL-Std. 758 Style 20234
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Power rating**
as per DIN VDE 0298
- **Minimum bending radius**
flexing 7,5x cable \varnothing
fixed installation 4x cable \varnothing
- **Radiation resistance**
up to 100×10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, as per DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1, class 43
UL-Std. 1581UL-Style 10012
- Black cores with white figure imprints to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Outer jacket, special full-polyurethane adapted to DIN VDE 0282 part 10, appendix A, flame retardant to UL-Std. 758
- Colour black (RAL 9005) or grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- High abrasion resistance
- High flexibility
- Resistant to ultra violet rays
- Wear resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
JZ-600-YC-PUR, see page N 52

Application

Extremely robust, control cable resistant to mineral oils and to coolant emulsions. In tool machinery, conveyor belts and production lines, for plant installations, air conditioning and in steel production plants and rolling mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside. Interesting for the export-oriented machinery plants.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x Jacket colour	cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
28240	2 x 0,5	20	6,9	9,6	60,0	
28241	3 G 0,5	20	7,3	14,4	70,0	
28242	4 G 0,5	20	7,9	19,0	104,0	
28243	5 G 0,5	20	8,5	24,0	120,0	
28244	7 G 0,5	20	9,9	33,6	141,0	
28245	12 G 0,5	20	12,2	58,0	208,0	
28246	18 G 0,5	20	14,4	86,0	289,0	
28247	25 G 0,5	20	17,2	120,0	342,0	
28248	2 x 0,75	19	7,3	14,4	70,0	
28249	3 G 0,75	19	7,7	21,6	78,0	
28250	4 G 0,75	19	8,3	29,0	134,0	
28251	5 G 0,75	19	9,1	36,0	149,0	
28252	7 G 0,75	19	10,7	50,0	201,0	
28253	12 G 0,75	19	13,1	86,0	269,0	
28254	18 G 0,75	19	15,6	130,0	378,0	
28255	25 G 0,75	19	18,9	180,0	498,0	
28256	2 x 1	18	7,9	19,2	86,0	
28257	3 G 1	18	8,3	29,0	100,0	
28258	4 G 1	18	9,1	38,4	107,0	
28259	5 G 1	18	9,9	48,0	130,0	
28260	7 G 1	18	11,7	67,0	174,0	
28261	12 G 1	18	14,5	115,0	290,0	
28262	18 G 1	18	17,3	173,0	405,0	
28263	25 G 1	18	21,1	240,0	570,0	
28264	2 x 1,5	16	8,7	29,0	97,0	
28265	3 G 1,5	16	9,2	43,0	118,0	
28266	4 G 1,5	16	10,0	58,0	141,0	
28267	5 G 1,5	16	11,0	72,0	181,0	
28268	7 G 1,5	16	13,3	101,0	234,0	
28269	12 G 1,5	16	16,6	173,0	370,0	
28270	18 G 1,5	16	19,7	259,0	520,0	
28271	25 G 1,5	16	23,9	360,0	730,0	

Part no.	No. cores x Jacket colour	cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
28305	2 x 0,5	20	6,9	9,6	60,0	
28306	3 G 0,5	20	7,3	14,4	70,0	
28307	4 G 0,5	20	7,9	19,0	104,0	
28308	5 G 0,5	20	8,5	24,0	120,0	
28309	7 G 0,5	20	9,9	33,6	141,0	
28310	12 G 0,5	20	12,2	58,0	208,0	
28311	18 G 0,5	20	14,4	86,0	289,0	
28312	25 G 0,5	20	17,2	120,0	342,0	
28313	2 x 0,75	18	7,3	14,4	70,0	
28314	3 G 0,75	18	7,7	21,6	78,0	
28315	4 G 0,75	18	8,3	29,0	134,0	
28316	5 G 0,75	18	9,1	36,0	149,0	
28317	7 G 0,75	18	10,7	50,0	201,0	
28318	12 G 0,75	18	13,1	86,0	269,0	
28319	18 G 0,75	18	15,6	130,0	378,0	
28320	25 G 0,75	18	18,9	180,0	498,0	
28321	2 x 1	17	7,9	19,2	86,0	
28322	3 G 1	17	8,3	29,0	100,0	
28323	4 G 1	17	9,1	38,4	107,0	
28324	5 G 1	17	9,9	48,0	130,0	
28325	7 G 1	17	11,7	67,0	174,0	
28326	12 G 1	17	14,5	115,0	290,0	
28327	18 G 1	17	17,3	173,0	405,0	
28328	25 G 1	17	21,1	240,0	570,0	
28329	2 x 1,5	16	8,7	29,0	97,0	
28330	3 G 1,5	16	9,2	43,0	118,0	
28331	4 G 1,5	16	10,0	58,0	141,0	
28332	5 G 1,5	16	11,0	72,0	181,0	
28333	7 G 1,5	16	13,3	101,0	234,0	
28334	12 G 1,5	16	16,6	173,0	370,0	
28335	18 G 1,5	16	19,7	259,0	520,0	
28336	25 G 1,5	16	23,9	360,0	730,0	

Continuation ▶

JZ-600 PUR tear and coolant resistant, 0,6/1kV, meter marking

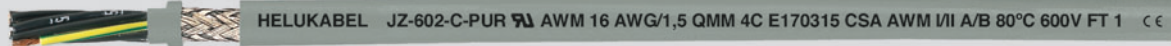


Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
28272	2 x 2,5	14	9,5	48,0	170,0
28273	3 G 2,5	14	10,0	72,0	181,0
28274	4 G 2,5	14	11,1	96,0	203,0
28275	5 G 2,5	14	12,4	120,0	251,0
28276	7 G 2,5	14	15,0	168,0	330,0
28277	12 G 2,5	14	18,4	288,0	553,0
28278	18 G 2,5	14	22,0	432,0	795,0
28279	25 G 2,5	14	26,9	600,0	1110,0
28280	2 x 4	12	11,4	77,0	190,0
28281	3 G 4	12	12,3	115,0	235,0
28282	4 G 4	12	13,8	154,0	310,0
28283	5 G 4	12	15,3	192,0	410,0
28284	7 G 4	12	16,8	269,0	540,0
28285	12 G 4	12	22,9	461,0	860,0
28286	3 G 6	10	14,1	173,0	370,0
28287	4 G 6	10	15,6	230,0	430,0
28288	5 G 6	10	17,3	288,0	650,0
28289	7 G 6	10	19,3	403,0	860,0
28290	3 G 10	8	16,5	288,0	660,0
28291	4 G 10	8	18,4	384,0	790,0
28292	5 G 10	8	20,5	480,0	960,0
28293	7 G 10	8	22,5	672,0	1300,0
28294	3 G 16	6	19,6	461,0	709,0
28295	4 G 16	6	21,7	614,0	1114,0
28296	5 G 16	6	24,2	768,0	1620,0
28297	7 G 16	6	25,7	1075,0	1900,0
28298	3 G 25	4	24,0	720,0	1450,0
28299	4 G 25	4	26,9	960,0	1600,0
28300	5 G 25	4	29,3	1200,0	2050,0
28301	7 G 25	4	32,6	1680,0	2900,0

Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
28337	2 x 2,5	14	9,5	48,0	170,0
28338	3 G 2,5	14	10,0	72,0	181,0
28339	4 G 2,5	14	11,1	96,0	203,0
28340	5 G 2,5	14	12,4	120,0	251,0
28341	7 G 2,5	14	15,0	168,0	330,0
28342	12 G 2,5	14	18,4	288,0	553,0
28343	18 G 2,5	14	22,0	432,0	795,0
28344	25 G 2,5	14	26,9	600,0	1110,0
28345	2 x 4	12	11,4	77,0	190,0
28346	3 G 4	12	12,3	115,0	235,0
28347	4 G 4	12	13,8	154,0	310,0
28348	5 G 4	12	15,3	192,0	410,0
28349	7 G 4	12	16,8	269,0	540,0
28350	12 G 4	12	22,9	461,0	860,0
28351	3 G 6	10	14,1	173,0	370,0
28352	4 G 6	10	15,6	230,0	430,0
28353	5 G 6	10	17,3	288,0	650,0
28354	7 G 6	10	19,3	403,0	860,0
28355	3 G 10	8	16,5	288,0	660,0
28356	4 G 10	8	18,4	384,0	790,0
28357	5 G 10	8	20,5	480,0	960,0
28358	7 G 10	8	22,5	672,0	1300,0
28359	3 G 16	6	19,6	461,0	709,0
28360	4 G 16	6	21,7	614,0	1114,0
28361	5 G 16	6	24,2	768,0	1620,0
28362	7 G 16	6	25,8	1075,0	1900,0
28363	3 G 25	4	24,0	720,0	1450,0
28364	4 G 25	4	26,9	960,0	1600,0
28365	5 G 25	4	29,3	1200,0	2050,0
28366	7 G 25	4	32,6	1680,0	2900,0

Dimensions and specifications may be changed without prior notice. (RN01)

JZ-602-C-PUR screened two approvals control cable, 80°C, 600V, EMC-preferred type, meter marking



Technical data

- Special PUR-insulated to UL CSA AWM I/II A/B Style 20939 (jacket insulation) and CSA
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
according to UL+CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI3, to DIN VDE 0281 part 1 and UL-Style 10012
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- PVC-insulated inner sheath YM5 to DIN VDE 0207 part 5
- Braided screen of tinned Cu wires approx. 85% coverage
- **Full-polyurethane**
outer jacket grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Resistant to mineral oils, synthetic oils and refrigerants, UV-radiation, osygene, ozon and hydrolysis. Conditionally resistant to microbes.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
JZ-602 PUR, see page N 46

Application

UL and CSA approved flexible control cables up to 600 V, for all machinery in tooling and plant construction, suitable for installation in dry, moist, wet and outdoor environments for medium mechanical loads. Designed for the export-orientated machinery manufacturer, specifically for USA and Canada.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12550	2 x 0,5	20	7,7	41,0	93,0
12551	3 G 0,5	20	8,0	45,0	124,0
12552	4 G 0,5	20	8,6	54,0	133,0
12553	5 G 0,5	20	9,2	66,0	153,0
12554	7 G 0,5	20	10,5	79,0	191,0
12555	9 G 0,5	20	12,3	94,0	243,0
12556	12 G 0,5	20	13,0	137,0	322,0
12557	18 G 0,5	20	15,6	156,0	374,0
12558	25 G 0,5	20	18,2	250,0	436,0
12559	34 G 0,5	20	20,1	316,0	560,0
12560	41 G 0,5	20	22,4	348,0	663,0
12561	2 x 1	18	8,1	54,0	107,0
12562	3 G 1	18	8,4	64,0	130,0
12563	4 G 1	18	9,1	76,0	155,0
12564	5 G 1	18	10,0	89,0	181,0
12565	7 G 1	18	11,3	114,0	209,0
12566	9 G 1	18	13,3	144,0	321,0
12567	12 G 1	18	13,8	186,0	341,0
12568	18 G 1	18	16,2	284,0	473,0
12569	25 G 1	18	19,5	387,0	650,0
12570	34 G 1	18	22,5	500,0	781,0
12571	41 G 1	18	24,2	578,0	892,0
12572	2 x 1,5	16	8,7	64,0	136,0
12573	3 G 1,5	16	9,2	82,0	165,0
12574	4 G 1,5	16	10,0	99,0	192,0
12575	5 G 1,5	16	10,8	123,0	224,0
12576	7 G 1,5	16	12,9	148,0	273,0
12577	9 G 1,5	16	14,8	187,0	340,0
12578	12 G 1,5	16	15,6	274,0	461,0
12579	18 G 1,5	16	18,5	386,0	674,0
12580	25 G 1,5	16	22,5	531,0	950,0
12581	34 G 1,5	16	25,1	671,0	1203,0
12582	41 G 1,5	16	27,3	840,0	1588,0
12583	2 x 2,5	14	10,3	110,0	173,0
12584	3 G 2,5	14	10,8	148,0	220,0
12585	4 G 2,5	14	11,8	169,0	270,0
12586	5 G 2,5	14	13,2	220,0	329,0
12587	7 G 2,5	14	15,6	284,0	428,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12588	9 G 2,5	14	18,1	349,0	580,0
12589	12 G 2,5	14	19,2	470,0	761,0
12590	18 G 2,5	14	23,0	572,0	1140,0
12591	25 G 2,5	14	28,3	740,0	1551,0
12592	2 x 4	12	12,5	124,0	209,0
12593	3 G 4	12	13,1	178,0	310,0
12594	4 G 4	12	14,5	234,0	456,0
12595	5 G 4	12	15,8	284,0	532,0
12596	7 G 4	12	19,0	321,0	737,0
12597	2 x 6	10	14,2	176,0	318,0
12598	3 G 6	10	15,2	245,0	411,0
12599	4 G 6	10	16,6	316,0	572,0
12600	5 G 6	10	18,4	442,0	732,0
12601	7 G 6	10	22,2	530,0	961,0
12602	3 G 10	8	19,1	367,0	741,0
12603	4 G 10	8	21,1	549,0	988,0
12604	5 G 10	8	23,7	604,0	1202,0
12605	7 G 10	8	26,5	820,0	1743,0
12606	3 G 16	6	24,2	653,0	1088,0
12607	4 G 16	6	27,2	807,0	1662,0
12608	5 G 16	6	30,6	940,0	2021,0
12609	7 G 16	6	33,6	1345,0	2720,0
12610	3 G 25	4	30,2	920,0	1947,0
12611	4 G 25	4	33,3	1169,0	2591,0
12612	5 G 25	4	36,8	1420,0	3197,0
12613	7 G 25	4	40,6	1921,0	4530,0
12614	3 G 35	2	33,8	1250,0	2701,0
12615	4 G 35	2	37,7	1680,0	3277,0
12616	5 G 35	2	41,5	2020,0	4530,0
12617	4 G 50	1	40,5	2370,0	3370,0
12618	4 G 70	2/0	46,1	3257,0	4630,0
12619	4 G 95	3/0	50,7	4060,0	6114,0
12620	4 G 120	4/0	57,0	5231,0	7417,0

Dimensions and specifications may be changed without prior notice. (RN01)

JZ-600-YC-PUR tear and coolant resistant, 0,6/1kV, Cu-screened, EMC-preferred type, meter marking



Technical data

- Special PUR control cables Adapted to DIN VDE 0276 part 627, DIN VDE 0281 part 13, with insulation thickness for 1 kV type and UL-Std. 758 Style 20234
- **Temperature range** flexing -5 °C to +80 °C fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Power rating** as per DIN VDE 0298
- **Minimum bending radius** flexing 10x cable \varnothing fixed installation 5x cable \varnothing
- **Radiation resistance** up to 100×10^6 cJ/kg (up to 100 Mrad)
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, as per DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation TI2, to DIN VDE 0281 part 1, class 43 UL-Std. 1581 UL-Style 10012
- Black cores with white figure imprints to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal lay-length
- Oil resistant PVC inner jacket, TM5 to DIN VDE 0281 part 1 and class 43 gem. UL-Std. 1581
- Tinned copper braided screening, approx. 85% coverage
- Outer jacket, special full-polyurethane adapted to DIN VDE 0282 part 10, appendix A, flame retardant to UL-Std. 758
- Colour black (RAL 9005) or grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- High abrasion resistance
- High flexibility
- Resistant to ultra violet rays
- Wear resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type: JZ-600 PUR**, see page N 49

Application

Extremely robust, control cable resistant to mineral oils and to coolant emulsions. In tool machinery, conveyor belts and production lines, for plant installations, air conditioning and in steel production plants and rolling mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside. Interesting for the export-oriented machinery plants.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km
28370	2 x 0,5	20	9,0	41,0	131,0	28430	2 x 0,5	20	9,0	30,0	131,0
28371	3 G 0,5	20	9,3	45,0	154,0	28431	3 G 0,5	20	9,3	39,0	154,0
28372	4 G 0,5	20	9,9	54,0	176,0	28432	4 G 0,5	20	9,9	52,0	176,0
28373	5 G 0,5	20	10,6	66,0	204,0	28433	5 G 0,5	20	10,6	61,0	204,0
28374	7 G 0,5	20	12,2	79,0	237,0	28434	7 G 0,5	20	12,2	75,0	237,0
28375	12 G 0,5	20	14,7	137,0	323,0	28435	12 G 0,5	20	14,7	130,0	323,0
28376	18 G 0,5	20	17,3	156,0	431,0	28436	18 G 0,5	20	17,3	170,0	431,0
28377	25 G 0,5	20	20,6	250,0	507,0	28437	25 G 0,5	20	20,6	230,0	507,0
28378	2 x 0,75	19	9,4	46,0	143,0	28438	2 x 0,75	18	9,4	39,0	143,0
28379	3 G 0,75	19	9,8	57,0	158,0	28439	3 G 0,75	18	9,8	57,0	158,0
28380	4 G 0,75	19	10,4	63,0	193,0	28440	4 G 0,75	18	10,4	68,0	193,0
28381	5 G 0,75	19	11,1	76,0	231,0	28441	5 G 0,75	18	11,1	79,0	231,0
28382	7 G 0,75	19	13,0	100,0	337,0	28442	7 G 0,75	18	13,0	96,0	337,0
28383	12 G 0,75	19	15,8	175,0	424,0	28443	12 G 0,75	18	15,8	169,0	424,0
28384	18 G 0,75	19	17,9	240,0	568,0	28444	18 G 0,75	18	17,9	224,0	568,0
28385	25 G 0,75	19	22,8	306,0	741,0	28445	25 G 0,75	18	22,8	292,0	741,0
28386	2 x 1	18	9,9	54,0	158,0	28446	2 x 1	17	9,9	51,8	158,0
28387	3 G 1	18	10,3	64,0	169,0	28447	3 G 1	17	10,3	67,0	169,0
28388	4 G 1	18	11,1	76,0	207,0	28448	4 G 1	17	11,1	78,0	207,0
28389	5 G 1	18	12,2	89,0	244,0	28449	5 G 1	17	12,2	94,0	244,0
28390	7 G 1	18	14,5	114,0	292,0	28450	7 G 1	17	14,5	122,0	292,0
28391	12 G 1	18	17,4	186,0	472,0	28451	12 G 1	17	17,4	201,0	472,0
28392	18 G 1	18	20,7	284,0	634,0	28452	18 G 1	17	20,7	275,0	634,0
28393	25 G 1	18	24,8	387,0	861,0	28453	25 G 1	17	24,8	364,0	861,0
28394	2 x 1,5	16	10,7	64,0	166,0	28454	2 x 1,5	16	10,7	68,0	166,0
28395	3 G 1,5	16	11,2	82,0	192,0	28455	3 G 1,5	16	11,2	84,0	192,0
28396	4 G 1,5	16	12,3	99,0	246,0	28456	4 G 1,5	16	12,3	104,0	246,0

Continuation ▶

JZ-600-YC-PUR tear and coolant resistant, 0,6/1kV, Cu-screened, EMC-preferred type, meter marking

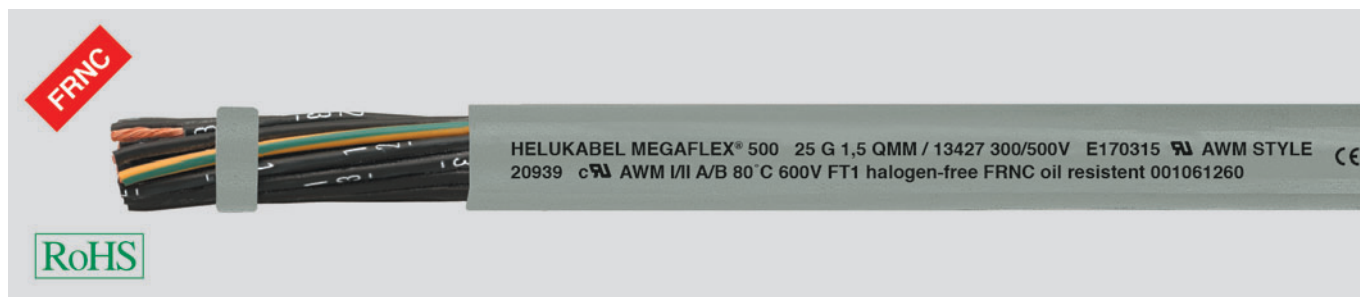


Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
28397	5 G 1,5	16	13,3	123,0	294,0
28398	7 G 1,5	16	16,0	148,0	392,0
28399	12 G 1,5	16	19,6	274,0	599,0
28400	18 G 1,5	16	23,4	386,0	817,0
28401	25 G 1,5	16	28,2	531,0	1261,0
28402	2 x 2,5	14	11,8	110,0	280,0
28403	3 G 2,5	14	12,3	148,0	301,0
28404	4 G 2,5	14	13,4	169,0	352,0
28405	5 G 2,5	14	14,9	220,0	433,0
28406	7 G 2,5	14	17,9	284,0	569,0
28407	12 G 2,5	14	21,9	470,0	864,0
28408	18 G 2,5	14	26,1	572,0	1365,0
28409	25 G 2,5	14	31,9	740,0	1997,0
28410	2 x 4	12	14,3	124,0	310,0
28411	3 G 4	12	15,1	178,0	396,0
28412	4 G 4	12	16,7	234,0	531,0
28413	5 G 4	12	18,6	284,0	704,0
28414	7 G 4	12	20,0	321,0	932,0
28415	3 G 6	10	17,0	245,0	633,0
28416	4 G 6	10	18,7	316,0	742,0
28417	5 G 6	10	20,7	442,0	1117,0
28418	3 G 10	8	19,6	367,0	1131,0
28419	4 G 10	8	21,9	549,0	1357,0
28420	5 G 10	8	24,1	604,0	1646,0
28421	3 G 16	6	23,5	653,0	1397,0
28422	4 G 16	6	26,4	807,0	1880,0
28423	5 G 16	6	28,8	940,0	2721,0

Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
28457	5 G 1,5	16	13,3	123,0	294,0
28458	7 G 1,5	16	16,0	180,0	392,0
28459	12 G 1,5	16	19,6	284,0	599,0
28460	18 G 1,5	16	23,4	390,0	817,0
28461	25 G 1,5	16	28,2	521,0	1261,0
28462	2 x 2,5	14	11,8	99,0	280,0
28463	3 G 2,5	14	12,3	124,0	301,0
28464	4 G 2,5	14	13,4	170,0	352,0
28465	5 G 2,5	14	14,9	202,0	433,0
28466	7 G 2,5	14	17,9	268,0	569,0
28467	12 G 2,5	14	21,9	423,0	864,0
28468	18 G 2,5	14	26,1	572,0	1365,0
28469	25 G 2,5	14	31,9	740,0	1997,0
28470	2 x 4	12	14,3	156,0	310,0
28471	3 G 4	12	15,1	191,0	396,0
28472	4 G 4	12	16,7	236,0	531,0
28473	5 G 4	12	18,6	303,0	704,0
28474	7 G 4	12	20,0	394,0	932,0
28475	3 G 6	10	17,0	251,0	633,0
28476	4 G 6	10	18,7	319,0	742,0
28477	5 G 6	10	20,7	421,0	1117,0
28478	3 G 10	8	19,6	371,0	1131,0
28479	4 G 10	8	21,9	576,0	1357,0
28480	5 G 10	8	24,1	620,0	1646,0
28481	3 G 16	6	23,5	540,0	1397,0
28482	4 G 16	6	26,4	807,0	1880,0
28483	5 G 16	6	28,8	1394,0	2721,0

Dimensions and specifications may be changed without prior notice. (RN01)

MEGAFLEX® 500 halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking



Technical data

- Halogen-free flexible control cable, core-structure adapted to DIN VDE 0281 part 14, to UL-Style 20939, UL-Std. 758
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
flexing approx. 10x cable \varnothing
fixed installation approx. 4x cable \varnothing
- **Flexible**
Alternate bending test according to DIN VDE 0281-2

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free special polymer
- Black cores with white continuous numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layer with optimal lay-length
- Outer sheath, halogen-free special polymer
- Outer jacket colour grey (RAL 7001)
- with meter marking, change-over in 2011
- The materials used in manufacture are cadmium-free and contain no silicone and are free from substances harmful to the wetting properties of lacquers
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free
- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Hydrolysis resistant
- Flexible, abrasion- and wear-resistant
- Ozone-resistant
- Recyclable

Tests

- Flame test to VDE 0482-332-3/ BS 4066 part 3/
DIN EN 60332-3/ IEC 60332-3-24 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN/IEC 60332-1 (previously DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to NF X 10-702
- Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN EN 60811-2-1
- Hydrolysis-resistant to DIN EN 61234-1
- Ozone-resistant to DIN EN 60811-2-1 / DIN VDE 0281-2

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Also available as a 0,6/1 kV cable under consideration of economical minimum quantities. MEGAFLEX® 600
- **screened analogue type:**
MEGAFLEX® 500-C, see page N 56

Application

For fixed installation or flexible application, with free movements without forcing which do not constantly recur and without tensile stress, for high mechanical strain. As a measuring and control cable primarily in machinery and plant construction, in building and air-conditioning systems, in warehousing and conveying systems, in ship-building and for regenerative types of energy such as in the construction of wind power stations. Especially well-suited for use in public buildings, such as airports and train stations, where personal injuries and subsequent damage must be prevented in the event of a fire. The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13344	2 x 0,5	4,8	9,6	43,0	20
13345	3 G 0,5	5,1	14,4	50,0	20
13346	3 x 0,5	5,1	14,4	50,0	20
13347	4 G 0,5	5,7	19,0	60,0	20
13348	4 x 0,5	5,7	19,0	60,0	20
13349	5 G 0,5	6,2	24,0	71,0	20
13350	5 x 0,5	6,2	24,0	71,0	20
13351	7 G 0,5	7,4	33,6	84,0	20

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13352	8 G 0,5	8,0	38,0	101,0	20
13353	10 G 0,5	8,8	48,0	121,0	20
13354	12 G 0,5	9,1	58,0	142,0	20
13355	16 G 0,5	10,0	76,0	183,0	20
13356	18 G 0,5	10,7	86,0	204,0	20
13357	20 G 0,5	11,2	96,0	227,0	20
13359	25 G 0,5	12,7	120,0	283,0	20
13360	30 G 0,5	13,5	144,0	324,0	20

Continuation ▶

MEGAFLEX® 500 halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking



Part no.	No.cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13361	34 G 0,5	14,5	163,0	367,0	20
13362	37 G 0,5	15,0	178,0	381,0	20
13363	41 G 0,5	15,8	197,0	417,0	20
13364	42 G 0,5	15,8	202,0	454,0	20
13365	50 G 0,5	17,3	240,0	519,0	20
13366	61 G 0,5	19,4	293,0	635,0	20
13367	65 G 0,5	19,4	312,0	694,0	20
13368	2 x 0,75	5,2	14,4	47,0	19
13369	3 G 0,75	5,5	21,6	56,0	19
13370	3 x 0,75	5,5	21,6	56,0	19
13371	4 G 0,75	6,2	29,0	69,0	19
13372	4 x 0,75	6,2	29,0	69,0	19
13373	5 G 0,75	6,8	36,0	83,0	19
13374	5 x 0,75	6,8	36,0	83,0	19
13375	7 G 0,75	8,1	50,0	114,0	19
13376	7 x 0,75	8,1	50,0	114,0	19
13377	8 G 0,75	8,9	58,0	136,0	19
13378	10 G 0,75	9,6	72,0	172,0	19
13379	12 G 0,75	9,9	86,0	183,0	19
13380	16 G 0,75	11,2	115,0	241,0	19
13381	18 G 0,75	11,9	130,0	266,0	19
13382	20 G 0,75	12,6	144,0	291,0	19
13383	25 G 0,75	14,1	180,0	374,0	19
13384	30 G 0,75	15,4	216,0	450,0	19
13385	34 G 0,75	16,4	245,0	517,0	19
13386	37 G 0,75	17,2	260,0	541,0	19
13387	41 G 0,75	17,6	296,0	611,0	19
13388	42 G 0,75	17,6	302,0	621,0	19
13389	50 G 0,75	19,8	360,0	742,0	19
13390	61 G 0,75	20,9	439,0	853,0	19
13392	65 G 0,75	21,5	468,0	909,0	19
13393	2 x 1	5,5	19,2	63,0	18
13394	3 G 1	6,0	29,0	74,0	18
13395	3 x 1	6,0	29,0	74,0	18
13396	4 G 1	6,6	38,4	90,0	18
13397	4 x 1	6,6	38,4	90,0	18
13398	5 G 1	7,2	48,0	109,0	18
13399	7 G 1	8,6	67,0	151,0	18
13400	8 G 1	9,4	77,0	184,0	18
13401	10 G 1	10,4	96,0	224,0	18
13402	12 G 1	10,7	115,0	243,0	18
13403	16 G 1	12,0	154,0	314,0	18
13404	18 G 1	12,7	173,0	361,0	18
13405	20 G 1	13,5	192,0	387,0	18
13406	25 G 1	15,2	240,0	496,0	18
13407	34 G 1	17,4	326,0	670,0	18
13408	37 G 1	18,4	355,0	713,0	18
13409	41 G 1	18,9	394,0	784,0	18
13410	42 G 1	18,9	403,0	824,0	18
13411	50 G 1	21,0	480,0	952,0	18
13412	61 G 1	22,2	586,0	1140,0	18
13413	65 G 1	22,8	628,0	1201,0	18
13414	2 x 1,5	6,1	29,0	70,0	16
13415	3 G 1,5	6,5	43,0	94,0	16
13416	3 x 1,5	6,5	43,0	94,0	16
13417	4 G 1,5	7,2	58,0	112,0	16
13418	5 G 1,5	7,9	72,0	141,0	16
13419	7 G 1,5	9,5	101,0	191,0	16
13420	8 G 1,5	10,4	115,0	224,0	16
13421	10 G 1,5	11,3	144,0	282,0	16
13422	12 G 1,5	11,7	173,0	311,0	16
13423	16 G 1,5	13,3	230,0	392,0	16
13425	18 G 1,5	14,0	259,0	450,0	16
13426	20 G 1,5	14,9	288,0	497,0	16
13427	25 G 1,5	16,8	360,0	630,0	16
13428	34 G 1,5	19,4	490,0	842,0	16
13429	37 G 1,5	20,2	533,0	897,0	16
13430	50 G 1,5	23,4	720,0	1277,0	16
13431	61 G 1,5	24,8	878,0	1460,0	16
13432	65 G 1,5	26,0	936,0	1612,0	16
13433	2 x 2,5	7,6	48,0	118,0	14
13434	3 G 2,5	8,3	72,0	151,0	14
13435	4 G 2,5	9,1	96,0	181,0	14
13436	5 G 2,5	10,2	120,0	224,0	14

Part no.	No.cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13437	7 G 2,5	12,1	168,0	316,0	14
13438	8 G 2,5	13,2	192,0	370,0	14
13439	10 G 2,5	14,6	240,0	451,0	14
13440	12 G 2,5	15,2	288,0	499,0	14
13441	16 G 2,5	16,8	384,0	720,0	14
13442	18 G 2,5	18,1	432,0	769,0	14
13443	20 G 2,5	19,0	480,0	911,0	14
13444	25 G 2,5	22,2	600,0	1047,0	14
13445	30 G 2,5	22,9	720,0	1280,0	14
13446	2 x 4	9,2	77,0	199,0	12
13447	3 G 4	9,9	115,0	247,0	12
13448	4 G 4	11,0	154,0	299,0	12
13449	5 G 4	12,1	192,0	369,0	12
13450	7 G 4	13,3	269,0	463,0	12
13451	8 G 4	15,9	307,0	601,0	12
13452	10 G 4	17,3	384,0	698,0	12
13453	12 G 4	18,3	461,0	790,0	12
13454	16 G 4	20,2	614,0	1130,0	12
13455	18 G 4	21,8	691,0	1280,0	12
13456	2 x 6	10,8	115,0	266,0	10
13457	3 G 6	11,7	173,0	360,0	10
13458	4 G 6	13,0	230,0	429,0	10
13459	5 G 6	14,5	288,0	529,0	10
13460	7 G 6	16,0	403,0	631,0	10
13461	2 x 10	14,0	192,0	440,0	8
13462	3 G 10	15,0	288,0	550,0	8
13463	4 G 10	16,8	384,0	708,0	8
13464	5 G 10	18,7	480,0	862,0	8
13465	7 G 10	20,6	672,0	1124,0	8
13466	2 x 16	16,5	307,0	642,0	6
13467	3 G 16	17,6	461,0	830,0	6
13468	4 G 16	19,7	641,0	1060,0	6
13469	5 G 16	21,9	768,0	1270,0	6
13470	7 G 16	24,4	1075,0	1794,0	6
13471	3 G 25	22,5	720,0	1190,0	4
13472	4 G 25	25,2	960,0	1594,0	4
13473	5 G 25	27,9	1200,0	2014,0	4
13474	3 G 35	26,3	1008,0	1590,0	2
13475	4 G 35	29,2	1344,0	2200,0	2
13476	5 G 35	32,7	1680,0	2693,0	2
13477	3 G 50	31,5	1440,0	2571,0	1
13478	4 G 50	35,0	1920,0	3087,0	1
13479	5 G 50	38,7	2400,0	3980,0	1
13480	3 G 70	37,2	2016,0	3207,0	2/0
13481	4 G 70	42,2	2688,0	4077,0	2/0
13482	5 G 70	47,4	3360,0	5501,0	2/0
13483	3 G 95	42,1	2736,0	4708,0	3/0
13484	4 G 95	47,0	3648,0	5590,0	3/0
13485	5 G 95	52,3	4560,0	6972,0	3/0
13486	3 G 120	46,6	3456,0	5515,0	4/0
13487	4 G 120	51,4	4608,0	7100,0	4/0
13488	3 G 150	53,0	4320,0	6279,0	300 kcmil
13489	4 G 150	59,0	5760,0	7781,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RA03)

MEGAFLEX® 500-C halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, screened, EMC-preferred types, meter marking



Technical data

- Halogen-free flexible control cable, core-structure adapted to DIN VDE 0281 part 14, to UL-Style 20939, UL-Std. 758
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
flexing approx. 10x cable \varnothing
fixed installation approx. 4x cable \varnothing
- **Flexible**
Alternate bending test according to DIN VDE 0281-2
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free special polymer
- Black cores with white continuous numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layer with optimal lay-length
- Separating foil
- Tinned copper braided screening, coverage approx. 85%
- Outer sheath, halogen-free special polymer
- Outer jacket colour grey (RAL 7001)
- with meter marking, change-over in 2011
- The materials used in manufacture are cadmium-free and contain no silicone and are free from substances harmful to the wetting properties of lacquers
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free
- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Flexible, abrasion- and wear-resistant
- Ozone-resistant
- Recycleable

Tests

- Flame test to VDE 0482-332-3 / BS 4066 part 3/
DIN EN 60332-3/IEC 60332-3 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN/IEC 60332-1 (previously DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to NF X 10-702
Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2/
IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN 60811-2-1
- hydrolysebeständig nach DIN EN 61234-1
- Ozone-resistant to DIN EN 60811-2-1 / DIN VDE 0281-2

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **unscreened analogue type:**
MEGAFLEX® 500, see page N 54

Application

For fixed installation or flexible application, with free movements without forcing which do not constantly recur and without tensile stress, for high mechanical strain. An interference-free transmission of signals and pulse is assured by the high degree of screening. As a measuring and control cable primarily in machinery and plant construction, in building and air-conditioning systems, in warehousing and conveying systems, in ship-building and for regenerative types of energy such as in the construction of wind power stations. Especially well-suited for use in public buildings, such as airports and train stations, where personal injuries and subsequent damage must be prevented in the event of a fire.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13500	2 x 0,5	5,7	35,0	46,0	20
13501	3 G 0,5	6,0	42,0	56,0	20
13502	3 x 0,5	6,0	42,0	56,0	20
13504	4 x 0,5	6,5	47,0	62,0	20
13503	4 G 0,5	6,5	47,0	62,0	20
13505	5 G 0,5	7,0	56,0	75,0	20
13506	5 x 0,5	7,0	56,0	75,0	20
13507	7 G 0,5	7,9	69,0	98,0	20

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13508	8 G 0,5	8,5	80,0	116,0	20
13509	10 G 0,5	9,3	94,0	135,0	20
13510	12 G 0,5	9,6	108,0	158,0	20
13511	16 G 0,5	10,7	129,0	210,0	20
13512	18 G 0,5	11,2	145,0	216,0	20
13514	20 G 0,5	11,9	172,0	240,0	20
13515	25 G 0,5	13,4	240,0	315,0	20

Continuation ▶

MEGAFLEX® 500-C halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, screened, EMC-preferred types, meter marking

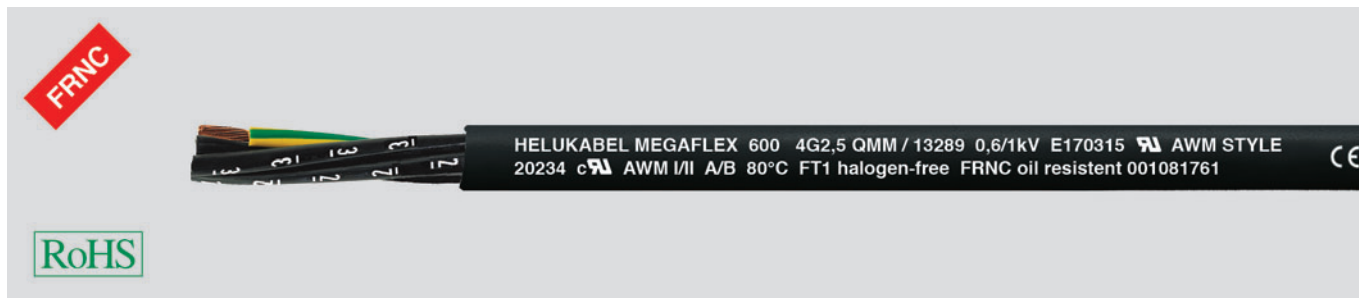


Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13516	2 x 0,75	6,1	40,0	60,0	18
13517	3 G 0,75	6,4	52,0	68,0	18
13518	3 x 0,75	6,4	52,0	68,0	18
13519	4 G 0,75	6,9	60,0	78,0	18
13520	4 x 0,75	6,9	60,0	78,0	18
13521	5 G 0,75	7,4	71,0	95,0	18
13522	5 x 0,75	7,4	71,0	95,0	18
13523	7 G 0,75	8,6	91,0	130,0	18
13524	7 x 0,75	8,6	91,0	130,0	18
13525	8 G 0,75	9,4	110,0	145,0	18
13526	10 G 0,75	10,2	137,0	180,0	18
13527	12 G 0,75	10,4	142,0	205,0	18
13528	16 G 0,75	11,6	200,0	275,0	18
13529	18 G 0,75	12,4	212,0	290,0	18
13530	20 G 0,75	12,9	238,0	320,0	18
13531	25 G 0,75	14,8	281,0	413,0	18
13532	2 x 1	6,4	50,0	66,0	17
13533	3 G 1	6,7	60,0	80,0	17
13534	3 x 1	6,7	60,0	80,0	17
13535	4 G 1	7,3	71,0	100,0	17
13536	4 x 1	7,3	71,0	100,0	17
13537	5 G 1	7,8	88,0	130,0	17
13538	7 G 1	9,1	111,0	160,0	17
13539	8 G 1	9,9	127,0	197,0	17
13540	10 G 1	10,8	150,0	232,0	17
13541	12 G 1	11,2	184,0	260,0	17
13542	16 G 1	12,3	209,0	346,0	17
13543	18 G 1	13,2	260,0	382,0	17
13544	20 G 1	13,8	317,0	440,0	17
13545	25 G 1	15,8	349,0	540,0	17
13546	2 x 1,5	6,6	65,0	88,0	16
13547	3 G 1,5	6,9	80,0	100,0	16
13548	3 x 1,5	6,9	80,0	100,0	16
13549	4 G 1,5	7,5	97,0	125,0	16
13550	5 G 1,5	8,4	119,0	158,0	16
13552	7 G 1,5	10,0	147,0	210,0	16
13554	8 G 1,5	10,7	170,0	244,0	16
13556	10 G 1,5	11,8	193,0	315,0	16
13557	12 G 1,5	12,1	267,0	340,0	16
13558	16 G 1,5	13,6	315,0	424,0	16
13559	18 G 1,5	14,6	374,0	480,0	16
13560	20 G 1,5	15,3	396,0	545,0	16
13561	25 G 1,5	17,9	526,0	702,0	16
13562	2 x 2,5	8,3	96,0	132,0	14
13563	3 G 2,5	9,0	144,0	168,0	14
13565	4 G 2,5	9,8	148,0	195,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13566	5 G 2,5	10,9	181,0	256,0	14
13567	7 G 2,5	12,9	255,0	345,0	14
13568	8 G 2,5	13,8	285,0	390,0	17
13569	10 G 2,5	15,8	340,0	482,0	14
13570	12 G 2,5	15,9	441,0	572,0	14
13571	2 x 4	9,8	120,0	220,0	12
13572	3 G 4	10,6	174,0	251,0	12
13573	4 G 4	11,5	230,0	305,0	12
13574	5 G 4	12,7	273,0	388,0	12
13575	7 G 4	13,9	316,0	504,0	12
13576	2 x 6	11,5	173,0	270,0	10
13577	3 G 6	12,4	240,0	351,0	10
13578	4 G 6	13,8	305,0	464,0	10
13579	5 G 6	15,7	439,0	546,0	10
13580	7 G 6	16,6	505,0	670,0	10
13581	2 x 10	14,9	255,0	461,0	8
13582	3 G 10	15,9	350,0	574,0	8
13583	4 G 10	17,8	535,0	785,0	8
13584	5 G 10	19,6	592,0	914,0	8
13585	7 G 10	21,6	810,0	1308,0	8
13586	2 x 16	17,3	422,0	670,0	6
13587	3 G 16	18,5	585,0	911,0	6
13588	4 G 16	20,8	740,0	1105,0	6
13589	5 G 16	22,9	895,0	1293,0	6
13590	7 G 16	25,0	1282,0	2149,0	6
13591	4 G 25	26,2	1140,0	1911,0	4
13592	4 x 35	30,4	1576,0	2542,0	2
13593	4 G 50	34,6	2155,0	3550,0	1
13594	4 G 70	41,3	3120,0	4939,0	2/0
13595	4 G 95	46,2	4043,0	6690,0	3/0
13596	4 G 120	51,0	5069,0	8453,0	4/0
13597	4 G 150	59,0	5792,0	9104,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RA03)

MEGAFLEX® 600 halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking



Technical data

- Halogen-free flexible control cable to UL-Style 20234, UL-Std. 758
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
flexing approx. 10x cable \varnothing
fixed installation approx. 4x cable \varnothing
- **Flexible**
Alternate bending test according to DIN VDE 0281-2

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free special polymer
- Black cores with white continuous numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layer with optimal lay-length
- Outer sheath, halogen-free special polymer
- Outer jacket colour black (RAL 9005)
- The materials used in manufacture are cadmium-free and contain no silicone and are free from substances harmful to the wetting properties of lacquers
- with meter marking, change-over in 2011

Properties

- Halogen-free
 - Highly flame-retardant
 - Resistant to oils and greases
 - Resistant to UV and weathering
 - Hydrolysis resistant
 - Flexible, abrasion- and wear-resistant
 - Ozone-resistant
 - Recyclable
- Tests**
- Flame test to VDE 0482-332-3/BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3-24 (previously DIN VDE 0472 part 804 test method C)
 - Self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN/IEC 60332-1 (previously DIN VDE 0472 part 804 test method B)
 - Corrosiveness of combustion gases according to NF X 10-702
 - Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
 - Smoke density according to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
 - Oil-resistant to DIN EN 60811-2-1
 - Hydrolysis-resistant to DIN EN 61234-1
 - Ozone-resistant to DIN EN 60811-2-1 / DIN VDE 0281-2

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- **screened analogue type:**
MEGAFLEX® 600-C, see page N 60

Application

For fixed installation or flexible application, with free movements without forcing which do not constantly recur and without tensile stress, for high mechanical strain. As a measuring and control cable primarily in machinery and plant construction, in building and air-conditioning systems, in warehousing and conveying systems, in ship-building and for regenerative types of energy such as in the construction of wind power stations.

Especially well-suited for use in public buildings, such as airports and train stations, where personal injuries and subsequent damage must be prevented in the event of a fire.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13200	2 x 0,5	6,4	9,6	56,0	20
13202	3 x 0,5	6,8	14,4	68,0	20
13201	3 G 0,5	6,8	14,4	68,0	20
13203	4 G 0,5	7,6	19,0	100,0	20
13204	4 x 0,5	7,6	19,0	100,0	20
13205	5 G 0,5	8,2	24,0	117,0	20
13206	5 x 0,5	8,2	24,0	117,0	20
13207	7 G 0,5	9,8	33,6	138,0	20

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13208	8 G 0,5	10,7	38,0	150,0	20
13209	10 G 0,5	11,6	48,0	176,0	20
13210	12 G 0,5	12,2	58,0	200,0	20
13211	16 G 0,5	13,7	76,0	250,0	20
13212	18 G 0,5	14,4	86,0	276,0	20
13213	20 G 0,5	15,3	96,0	293,0	20
13214	25 G 0,5	17,2	120,0	335,0	20
13215	30 G 0,5	18,0	144,0	348,0	20

Continuation ▶

MEGAFLEX® 600 halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking



Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13216	34 G 0,5	19,8	163,0	520,0	20
13217	37 G 0,5	15,0	178,0	561,0	20
13218	41 G 0,5	21,3	197,0	590,0	20
13219	42 G 0,5	21,2	202,0	595,0	20
13220	50 G 0,5	23,4	240,0	715,0	20
13221	61 G 0,5	26,0	293,0	840,0	20
13222	65 G 0,5	26,8	312,0	880,0	20
13223	2 x 0,75	6,8	14,4	66,0	19
13224	3 G 0,75	7,2	21,6	74,0	19
13225	3 x 0,75	7,2	21,6	74,0	19
13226	4 G 0,75	8,0	29,0	126,0	19
13227	4 x 0,75	8,0	29,0	126,0	19
13228	5 G 0,75	8,8	36,0	140,0	19
13229	5 x 0,75	8,8	36,0	140,0	19
13230	7 G 0,75	10,7	50,0	190,0	19
13231	7 x 0,75	10,7	50,0	190,0	19
13232	8 G 0,75	11,5	58,0	212,0	19
13233	10 G 0,75	12,7	72,0	238,0	19
13234	12 G 0,75	13,1	86,0	257,0	19
13235	16 G 0,75	14,6	115,0	304,0	19
13236	18 G 0,75	15,6	130,0	362,0	19
13237	20 G 0,75	16,6	144,0	394,0	19
13238	25 G 0,75	18,9	180,0	486,0	19
13239	30 G 0,75	15,4	216,0	450,0	19
13241	34 G 0,75	21,5	245,0	638,0	19
13242	37 G 0,75	21,5	260,0	696,0	19
13243	41 G 0,75	23,2	296,0	750,0	19
13244	42 G 0,75	23,2	302,0	770,0	19
13245	50 G 0,75	25,6	360,0	895,0	19
13246	61 G 0,75	28,2	439,0	1070,0	19
13247	65 G 0,75	29,0	468,0	1110,0	19
13248	2 x 1	7,4	19,2	80,0	18
13249	3 G 1	8,0	29,0	96,0	18
13250	3 x 1	8,0	29,0	96,0	18
13251	4 G 1	8,8	38,4	100,0	18
13252	4 x 1	8,8	38,4	100,0	18
13253	5 G 1	9,8	48,0	130,0	18
13254	7 G 1	11,7	67,0	170,0	18
13255	8 G 1	12,8	77,0	230,0	18
13256	10 G 1	14,3	96,0	270,0	18
13257	12 G 1	14,5	115,0	290,0	18
13258	16 G 1	16,5	154,0	360,0	18
13259	18 G 1	17,3	173,0	405,0	18
13260	20 G 1	18,4	192,0	450,0	18
13261	25 G 1	21,1	240,0	570,0	18
13262	34 G 1	24,0	326,0	750,0	18
13263	37 G 1	24,3	355,0	790,0	18
13264	41 G 1	25,9	394,0	890,0	18
13265	42 G 1	25,9	403,0	900,0	18
13266	50 G 1	28,5	480,0	1100,0	18
13267	61 G 1	31,4	586,0	1266,0	18
13268	65 G 1	32,5	628,0	1560,0	18
13269	2 x 1,5	8,4	29,0	95,0	16
13270	3 G 1,5	9,1	43,0	112,0	16
13271	3 x 1,5	9,1	43,0	112,0	16
13272	4 G 1,5	9,9	58,0	139,0	16
13273	5 G 1,5	11,0	72,0	170,0	16
13274	7 G 1,5	13,3	101,0	225,0	16
13275	8 G 1,5	14,5	115,0	250,0	16
13276	10 G 1,5	16,1	144,0	300,0	16
13277	12 G 1,5	16,6	173,0	370,0	16
13278	16 G 1,5	18,5	230,0	450,0	16
13279	18 G 1,5	19,7	259,0	520,0	16
13280	20 G 1,5	20,9	288,0	600,0	16

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
13281	25 G 1,5	23,9	360,0	730,0	16
13282	34 G 1,5	27,2	490,0	950,0	16
13283	37 G 1,5	29,4	533,0	1094,0	16
13284	50 G 1,5	32,5	720,0	1400,0	16
13285	61 G 1,5	35,7	878,0	1700,0	16
13286	65 G 1,5	36,8	936,0	1900,0	16
13287	2 x 2,5	9,4	48,0	160,0	14
13288	3 G 2,5	9,9	72,0	175,0	14
13289	4 G 2,5	11,1	96,0	203,0	14
13290	5 G 2,5	12,4	120,0	251,0	14
13291	7 G 2,5	15,0	168,0	330,0	14
13292	8 G 2,5	16,1	192,0	400,0	14
13293	10 G 2,5	17,0	240,0	461,0	14
13294	12 G 2,5	18,4	288,0	553,0	14
13295	16 G 2,5	19,4	384,0	742,0	14
13296	18 G 2,5	22,0	432,0	795,0	14
13297	20 G 2,5	32,2	480,0	924,0	14
13298	25 G 2,5	26,9	600,0	1110,0	14
13299	30 G 2,5	28,1	720,0	1370,0	14
13300	2 x 4	11,4	77,0	180,0	12
13301	3 G 4	12,3	115,0	230,0	12
13302	4 G 4	13,8	154,0	310,0	12
13303	5 G 4	15,3	192,0	410,0	12
13304	7 G 4	16,8	269,0	540,0	12
13305	8 G 4	20,0	307,0	710,0	12
13306	10 G 4	21,6	384,0	760,0	12
13307	12 G 4	22,9	461,0	860,0	12
13308	16 G 4	23,6	614,0	910,0	12
13309	18 G 4	24,2	691,0	980,0	12
13310	2 x 6	13,1	115,0	205,0	10
13311	3 G 6	14,1	173,0	370,0	10
13312	4 G 6	15,6	230,0	430,0	10
13313	5 G 6	17,3	288,0	650,0	10
13314	7 G 6	19,3	403,0	860,0	10
13315	2 x 10	15,4	192,0	330,0	8
13316	3 G 10	16,5	288,0	660,0	8
13317	4 G 10	18,1	384,0	790,0	8
13318	5 G 10	20,5	480,0	960,0	8
13319	7 G 10	22,5	672,0	1300,0	8
13320	2 x 16	18,3	307,0	580,0	6
13321	3 G 16	19,6	461,0	700,0	6
13322	4 G 16	21,7	641,0	1100,0	6
13323	5 G 16	24,2	768,0	1600,0	6
13324	7 G 16	25,7	1075,0	1890,0	6
13325	3 G 25	24,0	720,0	1450,0	4
13326	4 G 25	26,9	960,0	1600,0	4
13327	5 G 25	29,4	1200,0	2050,0	4
13328	3 G 35	26,2	1008,0	1900,0	2
13329	4 G 35	29,4	1344,0	2400,0	2
13330	5 G 35	32,8	1680,0	2900,0	2
13331	3 G 50	31,6	1440,0	2700,0	1
13332	4 G 50	35,5	1920,0	3400,0	1
13333	5 G 50	40,0	2400,0	4361,0	1
13334	3 G 70	36,7	2016,0	3300,0	2/0
13335	4 G 70	40,7	2688,0	4400,0	2/0
13336	5 G 70	45,7	3360,0	5807,0	2/0
13337	3 G 95	41,2	2736,0	5050,0	3/0
13338	4 G 95	46,2	3648,0	6010,0	3/0
13339	5 G 95	50,7	4560,0	7752,0	3/0
13340	3 G 120	45,9	3456,0	5620,0	4/0
13341	4 G 120	50,3	4608,0	7500,0	4/0
13342	3 G 150	52,7	4320,0	6390,0	300 kcmil
13343	4 G 150	58,8	5760,0	6840,0	300 kcmil

Dimensions and specifications may be changed without prior notice. (RA03)

MEGAFLEX® 600-C halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking



Technical data

- Halogen-free flexible control cable to UL-Style 20234, UL-Std. 758
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
flexing approx. 10x cable \varnothing
fixed installation approx. 4x cable \varnothing
- **Flexible**
Alternate bending test according to DIN VDE 0281-2
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of halogen-free special polymer
- Black cores with white continuous numbering to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layer with optimal lay-length
- Separating foil
- Tinned copper braided screening, coverage approx. 85%
- Outer sheath, halogen-free special polymer
- Outer jacket colour black (RAL 9005)
- The materials used in manufacture are cadmium-free and contain no silicone and are free from substances harmful to the wetting properties of lacquers
- with meter marking, change-over in 2011

Properties

- Halogen-free
- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Flexible, abrasion- and wear-resistant
- Ozone-resistant
- Recycleable

Tests

- Flame test to VDE 0482-332-3/ BS 4066 part 3/ DIN EN 60332-3/IEC 60332-3-24 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN/IEC 60332-1 (previously DIN VDE 0472 part 804 test method B)
- Corrosiveness of combustion gases according to NF X 10-702
Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN EN 60811-2-1
- hydrolysebeständig nach DIN EN 61234-1
- Ozone-resistant to DIN EN 60811-2-1 / DIN VDE 0281-2

Note

- G = with green-yellow earth core; x = without green-yellow earth core.
- **unscreened analogue type:**
MEGAFLEX® 600, see page N 58

Application

For fixed installation or flexible application, with free movements without forcing which do not constantly recur and without tensile stress, for high mechanical strain. An interference-free transmission of signals and pulse is assured by the high degree of screening. As a measuring and control cable primarily in machinery and plant construction, in building and air-conditioning systems, in warehousing and conveying systems, in ship-building and for regenerative types of energy such as in the construction of wind power stations. Especially well-suited for use in public buildings, such as airports and train stations, where personal injuries and subsequent damage must be prevented in the event of a fire.

EMC = Electromagnetic compatibility

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15217	2 x 0,5	6,9	35,0	46,0	20
15218	3 G 0,5	7,3	42,0	56,0	20
15219	3 x 0,5	7,3	42,0	56,0	20
15220	4 G 0,5	8,1	47,0	62,0	20
15221	4 x 0,5	8,1	47,0	62,0	20
15222	5 G 0,5	8,7	56,0	75,0	20
15223	5 x 0,5	8,7	56,0	75,0	20
15224	7 G 0,5	10,3	69,0	98,0	20

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15225	10 G 0,5	12,1	94,0	135,0	20
15226	12 G 0,5	12,7	108,0	158,0	20
15227	18 G 0,5	14,9	145,0	216,0	20
15228	20 G 0,5	15,8	172,0	240,0	20
15229	25 G 0,5	17,7	240,0	315,0	20
15230	2 x 0,75	7,3	40,0	60,0	18
15231	3 G 0,75	7,7	52,0	68,0	18
15232	3 x 0,75	7,7	52,0	68,0	18

Continuation ▶

MEGAFLEX® 600-C

halogen-free, flame retardant, oil-resistant,
UV-resistant, flexible, meter marking



Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15233	4 G 0,75	8,5	60,0	78,0	18
15234	4 x 0,75	8,5	60,0	78,0	18
15235	5 G 0,75	9,3	71,0	95,0	18
15236	5 x 0,75	9,3	71,0	95,0	18
15237	7 G 0,75	10,7	91,0	130,0	18
15238	7 x 0,75	10,7	91,0	130,0	18
15239	12 G 0,75	13,1	142,0	203,0	18
15240	18 G 0,75	16,2	212,0	290,0	18
15241	20 G 0,75	17,2	238,0	320,0	18
15242	25 G 0,75	19,5	281,0	413,0	18
15243	2 x 1	8,0	50,0	66,0	17
15244	3 G 1	8,6	60,0	80,0	17
15245	3 x 1	8,6	60,0	80,0	17
15247	4 G 1	9,4	71,0	100,0	17
15246	4 G 1	9,4	71,0	100,0	17
15248	5 G 1	10,4	88,0	130,0	17
15249	10 G 1	14,9	150,0	232,0	17
15250	12 G 1	14,5	184,0	260,0	17
15251	18 G 1	17,9	260,0	382,0	17
15252	20 G 1	19,0	317,0	440,0	17
15253	25 G 1	21,7	349,0	540,0	17
15254	2 x 1,5	9,0	63,0	88,0	16
15255	3 G 1,5	9,7	80,0	100,0	16
15256	3 x 1,5	9,7	80,0	100,0	16
15257	4 G 1,5	10,5	97,0	125,0	16
15258	5 G 1,5	11,6	119,0	158,0	16

Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
15259	7 G 1,5	13,9	147,0	210,0	16
15260	10 G 1,5	16,7	193,0	315,0	16
15261	12 G 1,5	17,2	267,0	340,0	16
15262	18 G 1,5	20,5	374,0	480,0	16
15263	20 G 1,5	21,7	396,0	545,0	16
15264	25 G 1,5	24,7	526,0	702,0	16
15265	2 x 2,5	10,2	96,0	132,0	14
15266	3 G 2,5	10,7	144,0	168,0	14
15267	4 G 2,5	11,9	148,0	195,0	14
15268	5 x 2,5	13,2	181,0	256,0	14
15269	7 G 2,5	15,8	255,0	345,0	14
15270	10 G 2,5	17,0	340,0	482,0	14
15271	12 G 2,5	19,2	441,0	572,0	14
15272	3 G 4	13,1	174,0	251,0	12
15273	4 G 4	14,6	230,0	305,0	12
15274	5 G 4	16,1	273,0	388,0	12
15275	7 G 4	17,6	316,0	504,0	12
15276	3 G 6	14,9	240,0	351,0	10
15277	4 G 6	16,4	305,0	464,0	10
15278	5 G 6	18,1	439,0	546,0	10
15279	7 G 6	20,1	505,0	670,0	10
15280	3 G 10	16,6	350,0	574,0	8
15281	4 G 10	18,1	535,0	785,0	8
15282	5 G 10	20,6	592,0	914,0	8
15283	7 G 10	22,6	810,0	1308,0	8

Dimensions and specifications may be changed without prior notice. (RA03)

MULTIFLEX 600 highly flexible, oil-resistant, open installation

TC-ER, PLTC-ER, NFPA 79 Edition 2007



HELUKABEL MULTIFLEX 600 P/N 63136 14AWG 2,5QMM 4C (UL) TC-ER 90°C DRY 75°C WET 600 V SUN RES DIR BUR OIL RES I/II E330430 OR MTW "HIGH FLEXIBLE" OR WTTC 1000 V OR c(UL)CIC TC FT4 LL41103 CSA AWM I/II 90°C 600 V FT4 CE ROHS



new

Technical data

- Highly-flexible PVC control cable according to UL Standard 1277
- **Temperature range**
Flexing -5 °C to +90 °C
Fixed installation -40 °C to +90 °C
- **Nominal voltage**
TC 600 V
TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**
Permanently flexing
7,5x cable ø
- **Insulation resistance**
Min. 20 MOhm x km
- **Radiation resistance**
Up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, extra-fine wire stranded, with AWG measures
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer (3 cores and more)
- Cores stranded in layers with optimal lay-lengths
- Separator
- Special PVC outer sheath
- Sheath colour - black (RAL 9005)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant
- **Tests**
UL:
TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2007.
WTTC 1000 V, DP-1, OIL RES I&II, 90 °C dry / 75 °C wet, Class 1 Div. 2 per NEC Art 336, 392, 501, crush impact test in accordance with UL 1277
CSA:
c(UL) CIC-TC FT4, CSA AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, simple installation
- **Available on request**
- with blue cores (DC)
- with red cores (AC)
- Grey or TPE outer sheath

Application

HELUKABEL®MULTIFLEX 600 is a highly-flexible, oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for industrial plant and machinery in accordance with NFPA 79 2007. Approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (OIL RES I & II) guarantees a long service life; for industrial applications in dry, damp and wet environments. Recommended applications: production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, automotive industry.

Please observe applicable installation regulations for use in energy supply chains.

☞ The product conforms to the EG Low-Voltage Directive 2006/95/EG

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62502	2 x 0,5	20	6,9	10,0	53,0	62529	25 G 1,5	16	20,8	360,0	665,0
62503	3 G 0,5	20	7,3	14,0	61,0	62530	34 G 1,5	16	23,0	490,0	1084,0
62504	4 G 0,5	20	8,0	19,0	72,0	62531	41 G 1,5	16	25,1	590,0	1260,0
62505	5 G 0,5	20	8,6	24,0	85,0	62532	50 G 1,5	16	27,7	720,0	1521,0
62506	7 G 0,5	20	9,9	34,0	110,0	62533	60 G 1,5	16	29,5	864,0	1885,0
62507	12 G 0,5	20	11,4	58,0	158,0	62534	3 G 2,5	14	9,8	72,0	160,0
62508	18 G 0,5	20	14,2	86,0	241,0	63136	4 G 2,5	14	10,6	96,0	173,0
62509	25 G 0,5	20	17,0	120,0	316,0	62535	5 G 2,5	14	11,9	120,0	268,0
62510	34 G 0,5	20	18,9	163,0	439,0	62536	7 G 2,5	14	13,6	168,0	307,0
62511	3 G 0,75	18	7,8	22,0	75,0	62537	9 G 2,5	14	16,1	216,0	437,0
62512	4 G 0,75	18	8,6	29,0	91,0	62538	12 G 2,5	14	16,9	288,0	572,0
62513	5 G 0,75	18	9,3	36,0	103,0	62539	18 G 2,5	14	20,1	432,0	800,0
62514	7 G 0,75	18	10,8	50,0	136,0	62540	25 G 2,5	14	25,1	600,0	1100,0
62515	12 G 0,75	18	12,4	86,0	228,0	62541	3 G 4	12	11,3	115,0	221,0
62516	15 G 0,75	18	13,8	108,0	273,0	62542	4 G 4	12	12,4	154,0	247,0
62517	18 G 0,75	18	15,4	130,0	311,0	62543	5 G 4	12	13,8	192,0	318,0
62518	25 G 0,75	18	18,5	180,0	498,0	62544	7 G 4	12	16,9	269,0	438,0
62519	34 G 0,75	18	20,5	245,0	550,0	62545	4 G 6	10	15,3	230,0	383,0
62520	36 G 0,75	18	20,6	259,0	570,0	62546	5 G 6	10	16,6	288,0	481,0
62521	42 G 0,75	18	22,3	302,0	600,0	62547	7 G 6	10	18,2	403,0	800,0
62522	3 G 1,5	16	8,6	43,0	100,0	62548	4 G 10	8	19,7	384,0	671,0
62523	4 G 1,5	16	9,5	58,0	122,0	62549	5 G 10	8	22,0	480,0	990,0
62524	5 G 1,5	16	10,3	72,0	148,0	62550	4 G 16	6	23,7	614,0	951,0
62525	7 G 1,5	16	12,0	101,0	197,0	62551	5 G 16	6	26,1	768,0	1500,0
62526	9 G 1,5	16	14,2	130,0	244,0	62552	4 G 25	4	34,0	960,0	1700,0
62527	12 G 1,5	16	14,7	173,0	328,0	62554	4 G 35	2	37,0	1344,0	2300,0
62528	18 G 1,5	16	17,2	259,0	459,0						

Dimensions and specifications may be changed without prior notice. (RN01)

MULTIFLEX 600-C highly-flexible, oil-resistant, screened,

EMC-preferred type, control cable for open installation TC-ER, PLTC-ER, NFPA 79 Edition 2007



new



Technical data

- Highly-flexible PVC control cable according to UL Standard 1277
- **Temperature range**
Flexing -5 °C to +90 °C
Fixed installation -40 °C to +90 °C
- **Nominal voltage**
TC 600 V
TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 3000 V
- **Coupling resistance**
max. 250 Ohm/km
- **Minimum bending radius**
Permanently flexing
10x cable ø
- **Insulation resistance**
Min. 20 MOhm x km
- **Radiation resistance**
Up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, extra-fine wire stranded, with AWG measures
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer (3 cores and more)
- Cores stranded in layers with optimal lay-lengths
- Separating foil
- Braided screening of tinned copper wires, coverage approx. 85%
- Separator
- Special PVC outer sheath
- Sheath colour - black (RAL 9005)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- UV-resistant
- **Tests**
UL:
TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2007.
WTTC 1000 V, DP-1, OIL RES I&II, 90 °C dry / 75 °C wet, Class 1 Div. 2 per NEC Art 336, 392, 501, crush impact test in accordance with UL 1277
- **CSA:**
c(UL) CIC-TC FT4, CSA AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, simple installation
- **Available on request**
- with blue cores (DC)
- with red cores (AC)
- Grey or TPE outer sheath

Application

HELUKABEL® MULTIFLEX 600-C is a highly-flexible, screened, oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for industrial plant and machinery in accordance with NFPA 79 2007. Approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (OIL RES I & II) guarantees a long service life; for industrial applications in dry, damp and wet environments. Recommended applications: Production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, automotive industry.

Please observe applicable installation regulations for use in energy supply chains.

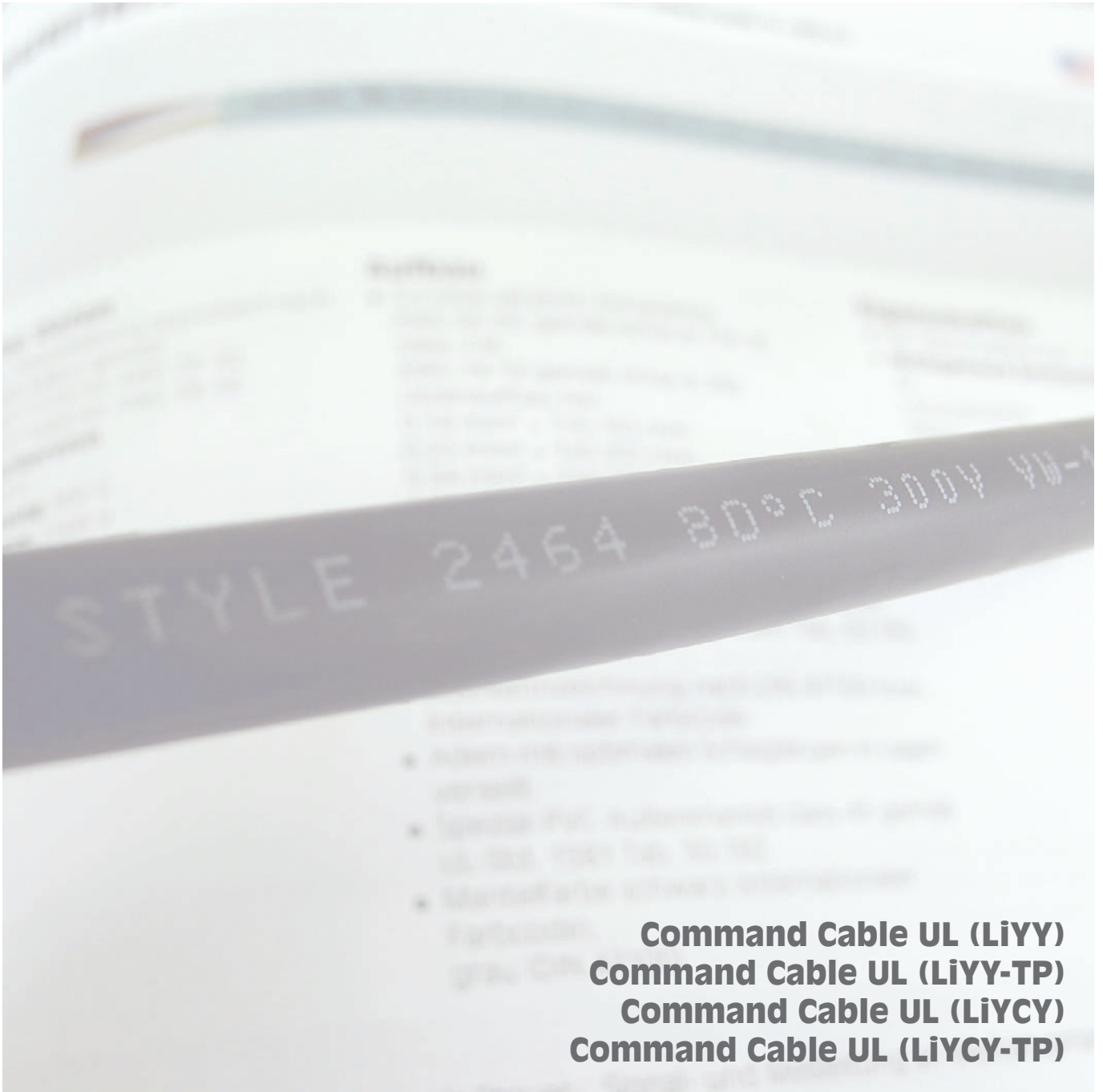
EMC = Electromagnetic compatibility. To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62556	2 x 0,5	20	7,7	30,0	80,0
62557	3 G 0,5	20	8,0	37,0	85,0
62558	4 G 0,5	20	8,7	46,0	100,0
62559	5 G 0,5	20	9,3	54,0	113,0
62560	7 G 0,5	20	10,7	70,0	152,0
62561	12 G 0,5	20	12,5	112,0	210,0
62562	18 G 0,5	20	15,1	153,0	304,0
62563	25 G 0,5	20	18,1	225,0	408,0
62564	34 G 0,5	20	19,8	267,0	530,0
62565	3 G 0,75	18	8,5	55,0	101,0
62566	4 G 0,75	18	9,3	69,0	127,0
62567	5 G 0,75	18	10,0	82,0	148,0
62568	7 G 0,75	18	11,6	119,0	186,0
62569	12 G 0,75	18	14,1	178,0	286,0
62570	15 G 0,75	18	15,2	175,0	455,0
62571	18 G 0,75	18	16,5	252,0	383,0
62572	25 G 0,75	18	19,6	362,0	514,0
62573	34 G 0,75	18	21,9	473,0	685,0
62574	3 G 1,5	16	9,3	75,0	131,0
62575	4 G 1,5	16	10,2	93,0	165,0
62576	5 G 1,5	16	11,0	113,0	195,0
62577	7 G 1,5	16	12,9	162,0	250,0
62578	9 G 1,5	16	15,2	193,0	340,0
62579	12 G 1,5	16	15,6	249,0	393,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
62580	18 G 1,5	16	18,4	376,0	559,0
62581	25 G 1,5	16	23,1	510,0	788,0
62582	34 G 1,5	16	25,8	674,0	1203,0
62583	3 G 2,5	14	10,3	141,0	218,0
62584	4 G 2,5	14	11,5	149,0	222,0
62585	5 G 2,5	14	12,4	195,0	350,0
62586	7 G 2,5	14	15,4	243,0	373,0
62587	9 G 2,5	14	16,8	312,0	479,0
62588	12 G 2,5	14	18,5	368,0	730,0
62589	18 G 2,5	14	22,4	639,0	1140,0
62590	25 G 2,5	14	25,5	796,0	1530,0
62591	3 G 4	12	11,7	180,0	296,0
62592	4 G 4	12	13,3	221,0	305,0
62593	5 G 4	12	14,7	330,0	450,0
62594	7 G 4	12	17,8	363,0	536,0
62595	4 G 6	10	16,1	314,0	469,0
62596	5 G 6	10	17,5	441,0	772,0
62597	7 G 6	10	20,6	505,0	1028,0
62598	4 G 10	8	21,9	526,0	790,0
62599	5 G 10	8	24,1	610,0	1096,0
62600	4 G 16	6	24,8	730,0	1621,0
62602	5 G 16	6	27,2	1050,0	1759,0
62603	4 G 25	4	33,1	1450,0	2100,0
62605	4 G 35	2	37,8	37,0	2550,0

Dimensions and specifications may be changed without prior notice. (RN01)



N

**Command Cable UL (LiYY)
Command Cable UL (LiYY-TP)
Command Cable UL (LiYCY)
Command Cable UL (LiYCY-TP)**

Photo: HELUKABEL®

UL/CSA Data Cables

Command Cable UL (LiYY) style 2464/300 V, (80°C)



Technical data

- Special PVC command cable, approved to UL-Style 2464, cores according AWG 26-20 to UL-Style 1061/1729 AWG 18-16 to UL-Style 1007/1569
- **Temperature range**
flexing -10 °C to +80 °C
fixed installation -20 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage**
min. 3000 V
- **Minimum bending radius**
fixed approx. 7,5x cable Ø
flexing approx. 15 cable Ø

Cable structure

- Tinned copper, fine wire conductors AWG 26-20, gemäß ASTM-B 174-95 class J-M,
AWG 18-16 gemäß ASTM-B 286
Conductor make-up to:
0,14 mm² = 7x0,162 mm
0,23 mm² = 7x0,202 mm
0,34 mm² = 7x0,254 mm
0,56 mm² = 7x0,32 mm
0,82 mm² = 19x0,235 mm
1,30 mm² = 19x0,31 mm
- Special PVC core insulation class 43, semirigid to UL-Std. 1581 table 50.182 and 50.183
- Colour coded to DIN 47100 or international colour code
- Cores stranded in layers with optimal lay-length
- Special PVC outer jacket class 43 to UL-Std. 1581 table 50.182
- Outer jacket colour
black (international colour code)
grey (DIN 47100 / preferred type for stock)

Properties

- PVC flame retardant according to UL VW-1/CSA FT1
- **Conditionally resistant to**
Oil
Solvents
Acids
Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type: Command Cable UL (LIYCY)**, see page N 69

Application

Suitable for use as a command, measuring and control cable in tool making machinery conveyor system and production lines, in industrial plants and in air conditioning as well as in the steel producing industries.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	Part no.	No. cores x	AWG-No.	Outer Ø	Cop.	Weight
Jacket colour	Jacket colour	cross-sec.		approx.	approx.	approx.
grey	black	mm ²		mm	kg / km	kg / km
83137	83045	2 x 0,14	26	3,6	3,6	13,0
83138	83046	3 x 0,14	26	3,8	4,0	15,0
83139	83047	4 x 0,14	26	4,0	5,4	18,0
83140	83048	6 x 0,14	26	4,6	8,1	25,0
83141	83049	10 x 0,14	26	5,6	13,4	38,0
83142	83050	12 x 0,14	26	5,8	16,2	46,0
83143	83055	16 x 0,14	26	6,3	21,5	56,0
83144	83056	18 x 0,14	26	6,6	34,4	62,0
83145	83057	24 x 0,14	26	7,5	32,4	82,0
83146	83058	27 x 0,14	26	7,6	36,3	97,0
83147	83059	30 x 0,14	26	8,0	40,4	110,0
83153	83130	2 x 0,23	24	3,8	4,6	16,0
83154	83131	3 x 0,23	24	4,0	7,1	19,0
83155	83132	4 x 0,23	24	4,3	9,4	23,0
83156	83133	6 x 0,23	24	4,9	14,2	32,0
83157	83134	10 x 0,23	24	6,0	23,8	55,0
83158	83135	12 x 0,23	24	6,2	28,5	60,0
83159	83136	16 x 0,23	24	6,8	38,1	75,0
83160	83371	18 x 0,23	24	7,1	43,1	82,0
83161	83372	24 x 0,23	24	8,1	59,7	116,0
83162	83373	27 x 0,23	24	8,4	64,7	140,0
83163	83374	30 x 0,23	24	8,9	71,9	150,0
83169	83375	2 x 0,34	22	4,1	6,5	25,0
83170	83376	3 x 0,34	22	4,3	9,8	30,0
83171	83377	4 x 0,34	22	4,6	13,0	45,0
83172	83378	6 x 0,34	22	5,4	19,6	60,0
83173	83379	10 x 0,34	22	6,6	32,5	80,0
83174	83380	12 x 0,34	22	6,8	39,1	105,0
83175	83381	16 x 0,34	22	7,5	52,0	130,0
83176	83382	18 x 0,34	22	8,1	59,0	140,0
83177	83383	24 x 0,34	22	9,4	79,0	190,0
83178	83384	27 x 0,34	22	9,7	88,0	207,0
83179	83385	30 x 0,34	22	10,2	97,8	225,0
83185	83386	2 x 0,56	20	4,6	9,8	30,0
83186	83387	3 x 0,56	20	4,8	14,6	33,0
83187	83388	4 x 0,56	20	5,2	19,4	41,0

Part no.	Part no.	No. cores x	AWG-No.	Outer Ø	Cop.	Weight
Jacket colour	Jacket colour	cross-sec.		approx.	approx.	approx.
grey	black	mm ²		mm	kg / km	kg / km
83188	83389	6 x 0,56	20	6,1	29,0	65,0
83189	83390	10 x 0,56	20	7,6	48,2	102,0
83190	83391	12 x 0,56	20	7,8	58,2	120,0
83191	83392	16 x 0,56	20	8,7	77,3	152,0
83192	83393	18 x 0,56	20	9,3	87,0	168,0
83193	83394	24 x 0,56	20	10,9	116,3	224,0
83194	83395	27 x 0,56	20	11,2	129,8	260,0
83195	83396	30 x 0,56	20	11,8	144,6	300,0
83201	83397	2 x 0,82	18	6,1	15,2	50,0
83202	83398	3 x 0,82	18	6,4	23,2	62,0
83203	83399	4 x 0,82	18	6,9	31,3	72,0
83204	83474	6 x 0,82	18	8,1	47,0	100,0
83205	83475	10 x 0,82	18	10,4	78,2	180,0
83206	83476	12 x 0,82	18	10,9	94,0	182,0
83207	83477	16 x 0,82	18	12,2	125,1	240,0
83208	83478	18 x 0,82	18	13,0	141,1	270,0
83209	83479	24 x 0,82	18	15,2	188,2	370,0
83210	83480	27 x 0,82	18	15,8	212,0	400,0
83211	83481	30 x 0,82	18	16,3	235,6	470,0
83217	83482	2 x 1,3	16	6,6	24,4	70,0
83218	83483	3 x 1,3	16	7,0	37,1	90,0
83219	83484	4 x 1,3	16	7,6	49,4	110,0
83220	83491	6 x 1,3	16	9,2	74,2	160,0
83221	83492	10 x 1,3	16	11,8	124,0	250,0
83222	83493	12 x 1,3	16	12,2	149,0	300,0
83223	83494	16 x 1,3	16	13,7	198,7	400,0
83224	83495	18 x 1,3	16	14,6	224,0	450,0
83225	83496	24 x 1,3	16	17,0	298,4	650,0
83226	83497	27 x 1,3	16	17,6	336,0	680,0
83227	83498	30 x 1,3	16	18,6	373,6	750,0

Dimensions and specifications may be changed without prior notice. (RN02)

Command Cable UL (LiYY) 600V, Style 2516/600 V, (105°C)



Technical data

- Special PVC command cable, approved to UL-Style 2516
- **Temperature range**
flexing -10 °C to +105 °C
fixed installation -20 °C to +105 °C
- **Nominal voltage** 600 V
- **Test voltage** 2000 V
- **Breakdown voltage**
min. 4000 V
- **Minimum bending radius**
fixed approx. 7,5 cable ø
flexing approx. 15 cable ø

Cable structure

- Tinned copper, fine wire conductors to ASTM-B 174, class J-K
Conductor make-up to:
2,08 mm² = 41x0,254 mm
3,20 mm² = 65x0,254 mm
- Special PVC core insulation class 43 to UL-Std. 1581 table 50.182 (105 °C)
- Colour coded to DIN 47100 or international colour code
- Cores stranded in layers with optimal lay-length
- Special PVC outer jacket class 43 to UL-Std. 1581 table 50.182 (105 °C)
- Outer jacket colour
black (international colour code)
grey (DIN 47100 / preferred type from stock)

Properties

- PVC flame retardant according to UL VW-1/CSA FT1
- **Conditionally resistant to**
Oil
Solvents
Acids
Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
Command Cable UL (LIYCY), see page N 69

Application

Suitable for use as a command, measuring and control cable in tool making machinery conveyor system and production lines, in industrial plants and in air conditioning as well as in the steel producing industries.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no. Jacket colour grey	Part no. Jacket colour black	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83233	83624	2 x 2,08	14	8,4	39,6	120,0
83234	83625	3 x 2,08	14	8,9	59,6	150,0
83235	83626	4 x 2,08	14	9,6	79,2	190,0
83236	83627	6 x 2,08	14	11,4	119,0	300,0
83237	83628	10 x 2,08	14	15,1	198,4	450,0
83238	83629	12 x 2,08	14	15,6	238,7	500,0
83239	83630	16 x 2,08	14	17,2	319,0	700,0
83240	83631	18 x 2,08	14	18,3	358,4	750,0
83241	83632	24 x 2,08	14	21,5	478,4	900,0
83242	83633	27 x 2,08	14	22,7	538,1	1100,0
83243	83634	30 x 2,08	14	23,5	598,4	1150,0
83244	83635	36 x 2,08	14	25,4	717,2	1800,0

Dimensions and specifications may be changed without prior notice. (RN02)

Part no. Jacket colour grey	Part no. Jacket colour black	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83245	83636	2 x 3,2	12	9,3	61,0	150,0
83246	83637	3 x 3,2	12	9,8	91,4	210,0
83247	83638	4 x 3,2	12	10,8	121,6	300,0
83248	83639	6 x 3,2	12	12,8	183,7	450,0
83249	83640	10 x 3,2	12	17,0	305,9	500,0
83250	83641	12 x 3,2	12	17,5	367,6	700,0
83251	83642	16 x 3,2	12	19,8	490,9	810,0
83252	83643	18 x 3,2	12	21,0	551,7	970,0
83253	83644	24 x 3,2	12	24,8	736,4	1200,0

N

Command Cable UL (LiYY-TP) style 2464/300V, 80°C



Technical data

- Special PVC command cable, approved to UL-Style 2464, cores according, UL-Style 1061/1729
- **Temperature range**
flexing -10 °C to +80 °C
fixed installation -20 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage**
min. 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
fixed approx. 7,5 cable ø
flexing approx. 15 cable ø

Cable structure

- Tinned copper, fine wire conductors to ASTM-B 174-95 class J-M conductor make-up to
0,14 mm² = 7x0,162 mm
0,23 mm² = 7x0,202 mm
0,34 mm² = 7x0,254 mm
0,56 mm² = 7x0,32 mm
- Special PVC core insulation class 43, semirigid to UL-Std. 1581 table 50.182 and 50183
- Colour coded to DIN 47100 with colour repetition from pair no. 23 and above or international colour code
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Separator-foil
- Special PVC outer jacket class 43 to UL-Std. 1581 table 50.182
- Outer jacket colour
black (international colour code)
grey (DIN 47100 / preferred type)

Properties

- PVC flame retardant according to UL VW-1/CSA FT1
- **Conditionally resistant to**
Oil
Solvents
Acids
Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
Command Cable UL (LiYCY-TP), see page N 72

Application

Twisted pair control cable for use in tool making machinery conveyor system and production lines, in industrial plants and in air conditioning as well as in the steel producing industries.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no. Jacket colour	No.pairs x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
grey					
83904	1 x 2 x 0,14	26	3,6	2,7	20,0
83905	2 x 2 x 0,14	26	5,1	5,4	24,0
83906	3 x 2 x 0,14	26	5,3	8,1	30,0
83907	4 x 2 x 0,14	26	5,8	10,8	38,0
83908	5 x 2 x 0,14	26	6,2	13,6	44,0
83909	6 x 2 x 0,14	26	6,8	16,2	51,0
83910	7 x 2 x 0,14	26	6,8	19,0	57,0
83911	8 x 2 x 0,14	26	7,3	21,7	64,0
83912	10 x 2 x 0,14	26	7,4	26,7	76,0
83913	12 x 2 x 0,14	26	9,1	32,6	93,0
83914	14 x 2 x 0,14	26	9,8	37,4	105,0
83915	15 x 2 x 0,14	26	10,6	40,7	109,0
83916	16 x 2 x 0,14	26	10,6	43,4	112,0
83917	18 x 2 x 0,14	26	11,1	48,5	119,0
83918	20 x 2 x 0,14	26	11,9	54,2	130,0
83919	22 x 2 x 0,14	26	12,4	59,3	150,0
83920	24 x 2 x 0,14	26	13,1	64,7	169,0
83921	25 x 2 x 0,14	26	13,4	67,2	178,0
83922	1 x 2 x 0,23	24	3,8	4,8	32,0
83923	2 x 2 x 0,23	24	5,4	9,7	36,0
83924	3 x 2 x 0,23	24	5,7	14,7	48,0
83925	4 x 2 x 0,23	24	6,2	19,6	56,0
83926	5 x 2 x 0,23	24	6,6	24,6	71,0
83927	6 x 2 x 0,23	24	7,2	29,3	80,0
83928	7 x 2 x 0,23	24	7,2	34,1	89,0
83929	8 x 2 x 0,23	24	7,8	39,1	98,0
83930	10 x 2 x 0,23	24	9,2	48,9	111,0
83931	12 x 2 x 0,23	24	9,7	59,4	135,0
83932	14 x 2 x 0,23	24	10,2	68,7	160,0

Part no. Jacket colour	No.pairs x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
black					
65214	1 x 2 x 0,14	26	3,6	2,7	20,0
65215	2 x 2 x 0,14	26	5,1	5,4	24,0
65216	3 x 2 x 0,14	26	5,3	8,1	30,0
65217	4 x 2 x 0,14	26	5,8	10,8	38,0
65218	5 x 2 x 0,14	26	6,2	13,6	44,0
65219	6 x 2 x 0,14	26	6,8	16,2	51,0
65220	7 x 2 x 0,14	26	6,8	19,0	57,0
65221	8 x 2 x 0,14	26	7,3	21,7	64,0
65222	10 x 2 x 0,14	26	7,4	26,7	76,0
65223	12 x 2 x 0,14	26	9,1	32,6	93,0
65224	14 x 2 x 0,14	26	9,8	37,4	105,0
65225	15 x 2 x 0,14	26	10,6	40,7	109,0
65226	16 x 2 x 0,14	26	10,6	43,4	112,0
65227	18 x 2 x 0,14	26	11,1	48,5	119,0
65228	20 x 2 x 0,14	26	11,9	54,2	130,0
65229	22 x 2 x 0,14	26	12,4	59,3	150,0
65230	24 x 2 x 0,14	26	13,1	64,7	169,0
65231	25 x 2 x 0,14	26	13,4	67,2	178,0
65232	1 x 2 x 0,22	24	3,8	4,8	32,0
65233	2 x 2 x 0,22	24	4,0	9,7	36,0
65234	3 x 2 x 0,22	24	5,7	14,7	48,0
65235	4 x 2 x 0,22	24	2,0	19,6	56,0
65236	5 x 2 x 0,22	24	6,0	24,6	56,0
65237	6 x 2 x 0,22	24	7,2	29,3	80,0
65238	7 x 2 x 0,22	24	7,2	34,1	89,0
65239	8 x 2 x 0,22	24	7,8	39,1	98,0
65240	10 x 2 x 0,22	24	9,2	48,9	111,0
65241	12 x 2 x 0,22	24	9,7	59,4	135,0
65242	14 x 2 x 0,22	24	10,2	68,7	160,0

Continuation ▶

Command Cable UL (LiYY-TP) style 2464/300V, 80°C



Part no. Jacket colour	No.pairs x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
grey					
83933	15 x 2 x 0,23	24	10,9	73,7	171,0
83934	16 x 2 x 0,23	24	10,9	79,1	185,0
83935	18 x 2 x 0,23	24	11,5	88,9	209,0
83936	20 x 2 x 0,23	24	12,2	98,4	230,0
83937	22 x 2 x 0,23	24	13,0	108,6	248,0
83938	24 x 2 x 0,23	24	13,7	117,9	279,0
83939	25 x 2 x 0,23	24	14,2	123,5	292,0
83940	1 x 2 x 0,34	22	4,2	6,5	38,0
83941	2 x 2 x 0,34	22	5,9	13,0	44,0
83942	3 x 2 x 0,34	22	6,3	19,5	60,0
83943	4 x 2 x 0,34	22	7,0	26,1	79,0
83944	5 x 2 x 0,34	22	7,6	32,6	92,0
83945	6 x 2 x 0,34	22	8,2	39,2	119,0
83946	7 x 2 x 0,34	22	8,2	45,7	128,0
83947	8 x 2 x 0,34	22	9,0	52,3	139,0
83948	10 x 2 x 0,34	22	10,7	65,3	171,0
83949	12 x 2 x 0,34	22	11,3	78,4	194,0
83950	14 x 2 x 0,34	22	12,1	91,5	222,0
83951	15 x 2 x 0,34	22	12,7	97,8	231,0
83952	16 x 2 x 0,34	22	12,7	104,6	240,0
83953	18 x 2 x 0,34	22	13,6	117,8	264,0
83954	20 x 2 x 0,34	22	14,4	130,7	291,0
83955	22 x 2 x 0,34	22	15,1	143,6	300,0
83956	24 x 2 x 0,34	22	16,2	156,8	359,0
83957	25 x 2 x 0,34	22	16,7	163,3	381,0
83958	1 x 2 x 0,56	20	4,6	10,8	60,0
83959	2 x 2 x 0,56	20	6,5	21,5	80,0
83960	3 x 2 x 0,56	20	7,1	32,3	94,0
83961	4 x 2 x 0,56	20	7,8	43,1	104,0
83962	5 x 2 x 0,56	20	8,6	53,8	130,0
83963	6 x 2 x 0,56	20	9,6	64,6	151,0
83964	7 x 2 x 0,56	20	9,6	75,3	174,0
83965	8 x 2 x 0,56	20	12,2	86,1	262,0
83966	10 x 2 x 0,56	20	12,5	107,7	298,0
83967	12 x 2 x 0,56	20	13,1	129,1	302,0
83968	14 x 2 x 0,56	20	13,8	150,6	327,0
83969	15 x 2 x 0,56	20	14,7	161,3	370,0
83970	16 x 2 x 0,56	20	14,7	172,1	402,0
83971	18 x 2 x 0,56	20	15,7	193,6	480,0
83972	20 x 2 x 0,56	20	16,7	215,1	551,0
83973	22 x 2 x 0,56	20	17,2	236,6	621,0
83974	24 x 2 x 0,56	20	18,6	258,0	703,0
83975	25 x 2 x 0,56	20	19,2	268,9	721,0

Part no. Jacket colour	No.pairs x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
black					
65243	15 x 2 x 0,22	24	10,9	73,7	171,0
65244	16 x 2 x 0,22	24	10,9	79,1	185,0
65245	18 x 2 x 0,22	24	11,5	88,9	209,0
65246	20 x 2 x 0,22	24	12,2	98,4	230,0
65247	22 x 2 x 0,22	24	13,0	108,6	248,0
65248	24 x 2 x 0,22	24	13,7	117,9	279,0
65249	25 x 2 x 0,22	24	14,2	123,5	292,0
65250	1 x 2 x 0,34	22	4,2	6,5	38,0
65251	2 x 2 x 0,34	22	5,9	13,0	44,0
65252	3 x 2 x 0,34	22	6,3	19,5	60,0
65253	4 x 2 x 0,34	22	7,0	26,1	79,0
65254	5 x 2 x 0,34	22	7,6	32,6	92,0
65255	6 x 2 x 0,34	22	8,2	39,2	119,0
65256	7 x 2 x 0,34	22	8,2	45,7	128,0
65257	8 x 2 x 0,34	22	9,0	52,3	139,0
65258	10 x 2 x 0,34	22	10,7	65,3	171,0
65259	12 x 2 x 0,34	22	11,3	78,4	194,0
65260	14 x 2 x 0,34	22	12,1	91,5	222,0
65261	15 x 2 x 0,34	22	12,7	97,8	231,0
65262	16 x 2 x 0,34	22	12,7	104,6	240,0
65263	18 x 2 x 0,34	22	13,6	117,8	264,0
65264	20 x 2 x 0,34	22	14,4	130,7	291,0
65265	22 x 2 x 0,34	22	15,1	143,6	300,0
65266	24 x 2 x 0,34	22	16,2	156,8	359,0
65267	25 x 2 x 0,34	22	16,7	163,3	381,0
65268	1 x 2 x 0,56	20	4,6	10,8	60,0
65269	2 x 2 x 0,56	20	6,5	21,5	80,0
65270	3 x 2 x 0,56	20	7,1	32,3	94,0
65271	4 x 2 x 0,56	20	7,8	43,1	104,0
65272	5 x 2 x 0,56	20	8,6	53,8	130,0
65273	6 x 2 x 0,56	20	9,6	64,6	151,0
65274	7 x 2 x 0,56	20	9,6	75,3	174,0
65275	8 x 2 x 0,56	20	12,1	86,1	262,0
65276	10 x 2 x 0,56	20	12,5	107,7	298,0
65277	12 x 2 x 0,56	20	13,1	129,1	302,0
65278	14 x 2 x 0,56	20	13,8	150,6	327,0
65279	15 x 2 x 0,56	20	14,7	161,3	370,0
65280	16 x 2 x 0,56	20	14,7	172,1	402,0
65281	18 x 2 x 0,56	20	15,7	193,6	480,0
65282	20 x 2 x 0,56	20	16,7	215,1	551,0
65283	22 x 2 x 0,56	20	17,2	236,6	621,0
65284	24 x 2 x 0,56	20	18,6	258,0	703,0
65285	25 x 2 x 0,56	20	19,2	268,9	721,0

Dimensions and specifications may be changed without prior notice. (RN02)

Command Cable UL (LiYCY) style 2464, 300V, 80°C,

EMC-preferred type



Technical data

- Special PVC command cable, approved to UL-Style 2464, cores according AWG 26-20 to UL-Style 1061/1729 AWG 18-16 to UL-Style 1007/1569
- **Temperature range**
flexing -10 °C to +80 °C
fixed installation -20 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage**
min. 3000 V
- **Minimum bending radius**
fixed approx. 7,5 cable ø
flexing approx. 15 cable ø
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Tinned copper, fine wire conductors
AWG 26-20 gem. ASTM-B 174-95 class J-M,
AWG 18-16 gem. ASTM-B 286
conductor make-up to
0,14 mm² = 7x0,162 mm
0,23 mm² = 7x0,202 mm
0,34 mm² = 7x0,254 mm
0,56 mm² = 7x0,32 mm
0,82 mm² = 19x0,235 mm
1,30 mm² = 19x0,31 mm
- Special PVC core insulation class 43, semirigid to UL-Std. 1581 table 50.182 and 50.183
- Colour coded to DIN 47100 or international colour code
- Cores stranded in layers with optimal lay-length
- Separator-foil
- Drain wire
- Tinned copper wire braiding, approx. 85% coverage
- Special PVC outer jacket class 43 to UL-Std. 1581 table 50.182
- Outer jacket colour
black (international colour code)
grey (DIN 47100 / preferred type from stock)

Properties

- PVC flame retardant according to UL VW-1/CSA FT1
- **Conditionally resistant to**
Oil
Solvents
Acids
Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **non-screened analogue types: Command Cable UL (LiYY),** see page N 65

Application

This cable type is suitable for use as a flexible connector cable in the fields of electronics, control and command technology as well as for measuring, signal and impulse transfer. Quick and cost favourable connections through cutting and clamping technics.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no. Jacket colour	Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø mm	Cop. approx. weight kg / km	Weight approx. kg / km
grey	black					
83254	83976	2 x 0,14	26	3,9	12,6	20,0
83255	83977	3 x 0,14	26	4,2	13,7	25,0
83256	83978	4 x 0,14	26	4,4	14,9	28,0
83257	83979	6 x 0,14	26	5,0	18,9	30,0
83258	83980	10 x 0,14	26	6,1	29,5	50,0
83259	83981	12 x 0,14	26	6,3	31,4	53,0
83260	83982	16 x 0,14	26	6,8	43,9	60,0
83261	83983	18 x 0,14	26	7,1	52,1	70,0
83262	83984	24 x 0,14	26	8,0	62,8	100,0
83263	83985	27 x 0,14	26	8,4	66,3	105,0
83264	83986	30 x 0,14	26	8,6	70,4	110,0

Part no. Jacket colour	Part no. Jacket colour	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø mm	Cop. approx. weight kg / km	Weight approx. kg / km
grey	black					
83270	83987	2 x 0,23	24	4,3	16,1	20,0
83271	83988	3 x 0,23	24	4,5	18,9	25,0
83272	83989	4 x 0,23	24	4,8	23,0	30,0
83273	83990	6 x 0,23	24	5,4	32,8	40,0
83274	83991	10 x 0,23	24	6,5	50,9	60,0
83275	83992	12 x 0,23	24	6,7	59,1	70,0
83276	83993	16 x 0,23	24	7,4	68,4	90,0
83277	83994	18 x 0,23	24	7,7	79,5	123,0
83278	83995	24 x 0,23	24	8,8	97,3	131,0
83279	83996	27 x 0,23	24	9,0	122,0	160,0
83280	83997	30 x 0,23	24	9,3	132,0	170,0

Continuation ▶

Command Cable UL (LiYCY) style 2464, 300V, 80°C,

EMC-preferred type



Part no. Jacket colour grey	Part no. Jacket colour black	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83286	65044	2 x 0,34	22	4,6	18,1	40,0
83287	65045	3 x 0,34	22	4,8	22,2	50,0
83288	65046	4 x 0,34	22	5,1	28,7	60,0
83289	65047	6 x 0,34	22	6,0	45,4	80,0
83290	65048	10 x 0,34	22	7,3	66,1	130,0
83291	65049	12 x 0,34	22	7,5	70,8	140,0
83292	65050	16 x 0,34	22	8,2	88,4	160,0
83293	65051	18 x 0,34	22	8,7	104,1	170,0
83294	65052	24 x 0,34	22	9,9	129,0	220,0
83295	65053	27 x 0,34	22	10,4	138,4	250,0
83296	65054	30 x 0,34	22	10,9	159,0	280,0
83302	65055	2 x 0,56	20	5,1	29,4	50,0
83303	65056	3 x 0,56	20	5,3	39,7	55,0
83304	65057	4 x 0,56	20	5,6	46,1	61,0
83305	65058	6 x 0,56	20	6,6	66,8	90,0
83306	65059	10 x 0,56	20	8,1	93,1	133,0
83307	65060	12 x 0,56	20	8,4	117,4	151,0
83308	65061	16 x 0,56	20	9,5	130,4	190,0
83309	65062	18 x 0,56	20	9,9	151,4	216,0
83310	65063	24 x 0,56	20	11,5	237,0	339,0
83311	65064	27 x 0,56	20	12,0	257,4	374,0
83312	65065	30 x 0,56	20	12,4	297,0	397,0
83318	65066	2 x 0,82	18	6,5	39,1	60,0
83319	65067	3 x 0,82	18	6,8	50,0	75,0
83320	65068	4 x 0,82	18	7,4	59,1	90,0
83321	65069	6 x 0,82	18	8,8	89,1	125,0
83322	65070	10 x 0,82	18	10,9	141,4	180,0
83323	65071	12 x 0,82	18	11,2	152,8	220,0
83324	65072	16 x 0,82	18	12,9	184,1	290,0
83325	65073	18 x 0,82	18	13,5	207,2	300,0
83326	65074	24 x 0,82	18	15,6	272,6	450,0
83327	65075	27 x 0,82	18	15,9	289,1	470,0
83328	65076	30 x 0,82	18	16,6	317,4	490,0
83334	65077	2 x 1,3	16	6,9	59,1	90,0
83335	65078	3 x 1,3	16	7,3	74,1	160,0
83336	65079	4 x 1,3	16	7,9	96,4	200,0
83337	65080	6 x 1,3	16	9,6	137,4	290,0
83338	65081	10 x 1,3	16	12,4	191,7	450,0
83339	65082	12 x 1,3	16	12,8	251,7	600,0
83340	65083	16 x 1,3	16	12,8	276,1	650,0
83341	65084	18 x 1,3	16	15,5	364,1	680,0
83342	65085	24 x 1,3	16	18,1	442,4	900,0
83343	65086	27 x 1,3	16	18,7	494,7	990,0
83344	65087	30 x 1,3	16	19,5	521,4	1050,0

Dimensions and specifications may be changed without prior notice. (RN02)

Command Cable UL (LiYCY) style 2516/600 V, 105°C,

EMC-preferred type



Technical data

- Special PVC command cable, approved to UL-Style 2516 cores according UL-Style 10012
- **Temperature range**
flexing -10 °C to +105 °C
fixed installation -20 °C to +105 °C
- **Nominal voltage** 600 V
- **Test voltage** 2000 V
- **Breakdown voltage**
min. 4000 V
- **Minimum bending radius**
fixed approx. 7,5 cable ø
flexing approx. 15 cable ø
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Tinned copper, fine wire conductors to ASTM-B 174, class J-K conductor make-up to 2,08 mm² = 41x0,254 mm
3,20 mm² = 65x0,254 mm
- Special PVC core insulation class 43 to UL-Std. 1581 table 50.182 (105 °C)
- Colour coded to DIN 47100 or international colour code
- Cores stranded in layers with optimal lay-length
- Separator-foil
- Drain wire
- Tinned copper wire braiding, approx. 85% coverage
- Special PVC outer jacket class 43 to UL-Std. 1581 table 50.182 (105 °C)
- Outer jacket colour
black (international colour code)
grey (DIN 47100 / preferred type from stock)

Properties

- PVC flame retardant according to UL VW-1/CSA FT1
- **Conditionally resistant to**
Oil
Solvents
Acids
Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **non-screened analogue types: Command Cable UL (LiYY),** see page N 65

Application

This cable type is suitable for use as a flexible connector cable in the fields of electronics, control and command technology as well as for measuring, signal and impulse transfer. Quick and cost favourable connections through cutting and clamping technics.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

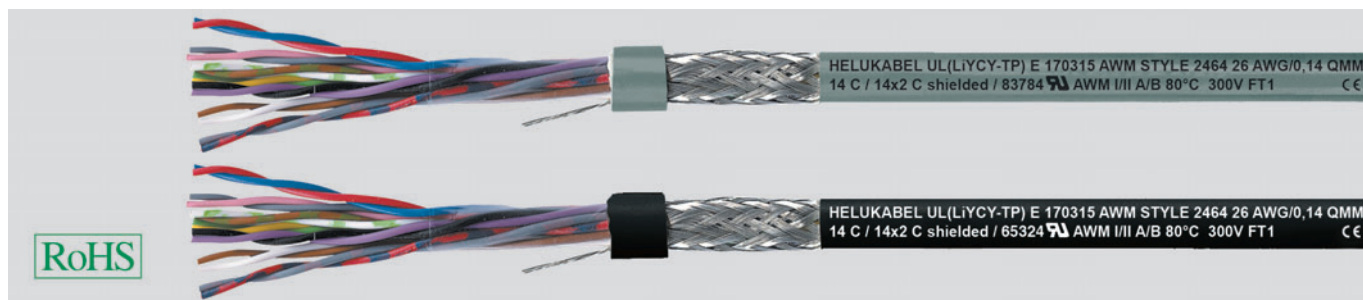
Part no.	Part no.	No. cores x	AWG-No.	Outer Ø	Cop.	Weight
Jacket colour	Jacket colour	cross-sec.		approx.	approx.	approx.
grey	black	mm ²		mm	kg / km	kg / km
83350	65114	2 x 2,08	14	9,1	92,1	180,0
83351	65115	3 x 2,08	14	9,6	140,6	220,0
83352	65116	4 x 2,08	14	10,4	162,4	270,0
83353	65117	6 x 2,08	14	12,1	200,0	380,0
83354	65118	10 x 2,08	14	16,0	313,1	600,0
83355	65119	12 x 2,08	14	16,5	417,6	770,0
83356	65120	16 x 2,08	14	18,1	510,3	870,0
83357	65121	18 x 2,08	14	19,4	540,4	990,0
83358	65122	24 x 2,08	14	23,4	580,6	1300,0
83359	65123	27 x 2,08	14	23,9	604,2	1400,0
83360	65124	30 x 2,08	14	24,6	660,1	1610,0

Part no.	Part no.	No. cores x	AWG-No.	Outer Ø	Cop.	Weight
Jacket colour	Jacket colour	cross-sec.		approx.	approx.	approx.
grey	black	mm ²		mm	kg / km	kg / km
83362	65125	2 x 3,2	12	10,0	131,4	200,0
83363	65126	3 x 3,2	12	10,6	162,6	240,0
83364	65127	4 x 3,2	12	11,4	221,7	300,0
83365	65128	6 x 3,2	12	14,4	328,1	400,0
83366	65129	10 x 3,2	12	17,8	401,8	580,0
83367	65130	12 x 3,2	12	18,4	460,2	800,0
83368	65131	16 x 3,2	12	20,6	532,3	900,0
83369	65132	18 x 3,2	12	22,7	573,4	1000,0
83370	65133	24 x 3,2	12	26,1	626,8	1300,0

Dimensions and specifications may be changed without prior notice. (RN02)

Command Cable UL (LiYCY-TP) style 2464/300 V, 80°C,

EMC-preferred type



Technical data

- Special PVC command cable, approved to UL-Style 2464, cores according, UL-Style 1061/1729
- **Temperature range**
flexing -10 °C to +80 °C
fixed installation -20 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage**
min. 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
fixed approx. 7,5 cable ø
flexing approx. 15 cable ø
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Tinned copper, fine wire conductors to ASTM-B 174-95 class J-M
Conductor make-up to
0,14 mm² = 7x0,162 mm
0,23 mm² = 7x0,202 mm
0,34 mm² = 7x0,254 mm
0,56 mm² = 7x0,32 mm
- Special PVC core insulation class 43, semirigid to UL-Std. 1581 table 50.182 and 50183
- Colour coded to DIN 47100 with colour repetition from pair no. 22 and above or international colour code
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Separator-foil
- Drain wire
- Tinned copper wire braiding, approx. 85% coverage
- Special PVC outer jacket class 43 to UL-Std. 1581 table 50.182
- Outer jacket colour
black (international colour code)
grey (DIN 47100 / preferred type from stock)

Properties

- PVC flame retardant according to UL VW-1/CSA FT1
- **Conditionally resistant to**
Oil
Solvents
Acids
Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **non-screened analogue type: Command Cable UL (LiYY-TP),** see page N 67

Application

Twisted pair control cable for use in tool making machinery conveyor system and production lines, in industrial plants and in air conditioning as well as in the steel producing industries.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	Jacket colour	Jacket colour	No.pairs x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Part no.	Jacket colour	Jacket colour	No.pairs x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83774	grey	black	1 x 2 x 0,14	26	4,0	15,7	32,0	83792	grey	black	1 x 2 x 0,23	24	4,2	16,4	46,0
83775	65314	65315	2 x 2 x 0,14	26	5,6	19,5	39,0	83793	65332	65333	2 x 2 x 0,23	24	5,9	27,4	53,0
83776	65316	65317	3 x 2 x 0,14	26	5,8	23,7	47,0	83794	65334	65335	3 x 2 x 0,23	24	6,2	31,7	65,0
83777	65317	65318	4 x 2 x 0,14	26	6,3	26,9	55,0	83795	65336	65337	4 x 2 x 0,23	24	6,7	37,4	79,0
83778	65318	65319	5 x 2 x 0,14	26	6,7	31,2	68,0	83796	65338	65339	5 x 2 x 0,23	24	7,2	54,7	98,0
83779	65319	65320	6 x 2 x 0,14	26	7,3	49,7	86,0	83797	65340	65341	6 x 2 x 0,23	24	7,7	65,6	114,0
83780	65320	65321	7 x 2 x 0,14	26	7,3	52,0	92,0	83798	65342	65343	7 x 2 x 0,23	24	7,7	60,2	121,0
83781	65321	65322	8 x 2 x 0,14	26	7,8	53,9	97,0	83799	65344	65345	8 x 2 x 0,23	24	8,4	74,1	129,0
83782	65322	65323	10 x 2 x 0,14	26	9,1	59,6	111,0	83800	65346	65347	10 x 2 x 0,23	24	9,9	109,3	152,0
83783	65323	65324	12 x 2 x 0,14	26	9,8	67,1	141,0	83801	65348	65349	12 x 2 x 0,23	24	10,2	115,8	189,0
83784	65324	65325	14 x 2 x 0,14	26	10,5	75,2	150,0	83802	65342	65343	14 x 2 x 0,23	24	10,9	120,7	213,0
83785	65325	65326	15 x 2 x 0,14	26	11,1	77,3	154,0	83803	65344	65345	15 x 2 x 0,23	24	11,4	132,4	225,0
83786	65326	65327	16 x 2 x 0,14	26	11,1	80,4	155,0	83804	65346	65347	16 x 2 x 0,23	24	11,4	141,6	227,0
83787	65327	65328	18 x 2 x 0,14	26	11,8	84,2	170,0	83805	65348	65349	18 x 2 x 0,23	24	12,2	146,6	238,0
83788	65328	65329	20 x 2 x 0,14	26	12,4	98,2	183,0	83806	65342	65343	20 x 2 x 0,23	24	12,7	160,6	270,0
83789	65329	65330	22 x 2 x 0,14	26	13,1	104,1	207,0	83807	65344	65345	22 x 2 x 0,23	24	13,5	170,8	300,0
83790	65330	65331	24 x 2 x 0,14	26	13,6	112,0	228,0	83808	65346	65347	24 x 2 x 0,23	24	14,5	229,7	321,0
83791	65331		25 x 2 x 0,14	26	15,1	114,4	239,0	83809	65348	65349	25 x 2 x 0,23	24	14,8	251,4	340,0

Continuation ▶

Command Cable UL (LiYCY-TP) style 2464/300 V, 80°C,

EMC-preferred type



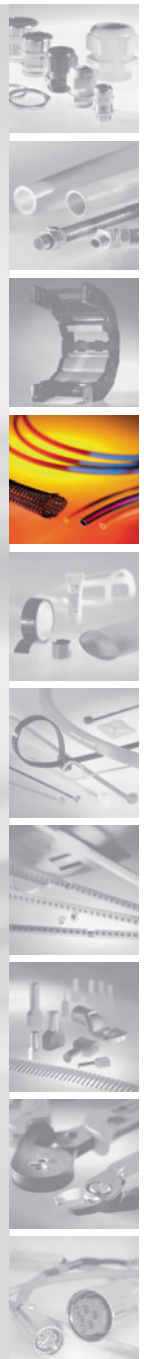
Part no. Jacket colour grey	Jacket colour black	No.pairs x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83810	65350	1 x 2 x 0,34	22	4,6	17,0	58,0
83811	65351	2 x 2 x 0,34	22	6,4	36,7	65,0
83812	65352	3 x 2 x 0,34	22	6,9	44,6	78,0
83813	65353	4 x 2 x 0,34	22	7,5	54,1	88,0
83814	65354	5 x 2 x 0,34	22	8,1	63,4	110,0
83815	65355	6 x 2 x 0,34	22	8,8	73,4	126,0
83816	65356	7 x 2 x 0,34	22	8,8	79,4	140,0
83817	65357	8 x 2 x 0,34	22	9,7	88,4	148,0
83818	65358	10 x 2 x 0,34	22	11,5	107,0	184,0
83819	65359	12 x 2 x 0,34	22	12,0	122,4	210,0
83820	65360	14 x 2 x 0,34	22	12,6	138,2	241,0
83821	65361	15 x 2 x 0,34	22	13,4	154,3	245,0
83822	65362	16 x 2 x 0,34	22	13,4	161,4	251,0
83823	65363	18 x 2 x 0,34	22	14,4	197,9	275,0
83824	65364	20 x 2 x 0,34	22	15,0	211,4	300,0
83825	65365	22 x 2 x 0,34	22	15,9	217,6	320,0
83826	65366	24 x 2 x 0,34	22	17,0	230,4	371,0
83827	65367	25 x 2 x 0,34	22	17,3	138,5	402,0

Part no. Jacket colour grey	Jacket colour black	No.pairs x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
83828	65368	1 x 2 x 0,56	20	5,0	26,0	70,0
83829	65369	2 x 2 x 0,56	20	7,0	56,1	89,0
83830	65370	3 x 2 x 0,56	20	7,6	71,7	102,0
83831	65371	4 x 2 x 0,56	20	8,3	92,4	119,0
83832	65372	5 x 2 x 0,56	20	9,1	107,4	140,0
83833	65373	6 x 2 x 0,56	20	10,1	122,4	162,0
83834	65374	7 x 2 x 0,56	20	10,1	131,7	198,0
83835	65375	8 x 2 x 0,56	20	12,7	144,3	272,0
83836	65376	10 x 2 x 0,56	20	13,2	179,6	307,0
83837	65377	12 x 2 x 0,56	20	13,6	201,7	318,0
83838	65378	14 x 2 x 0,56	20	14,4	221,4	342,0
83839	65379	15 x 2 x 0,56	20	15,5	231,6	381,0
83840	65380	16 x 2 x 0,56	20	15,5	257,1	417,0
83841	65381	18 x 2 x 0,56	20	16,3	282,4	494,0
83842	65382	20 x 2 x 0,56	20	17,1	306,7	570,0
83843	65383	22 x 2 x 0,56	20	18,0	321,8	643,0
83844	65384	24 x 2 x 0,56	20	19,4	342,4	724,0
83845	65385	25 x 2 x 0,56	20	19,8	361,2	740,0

Dimensions and specifications may be changed without prior notice. (RN02)

Insulating, shrinking, braided and temperature protection tubes

- Braided hoses
- High temperature protection
- Insulation tubes
- Heat-shrink tubes
- End caps



You can find insulating, shrinking, braided and temperature protection tubes in our catalogue **Cable Accessories**. Request it now at www.helukabel.de

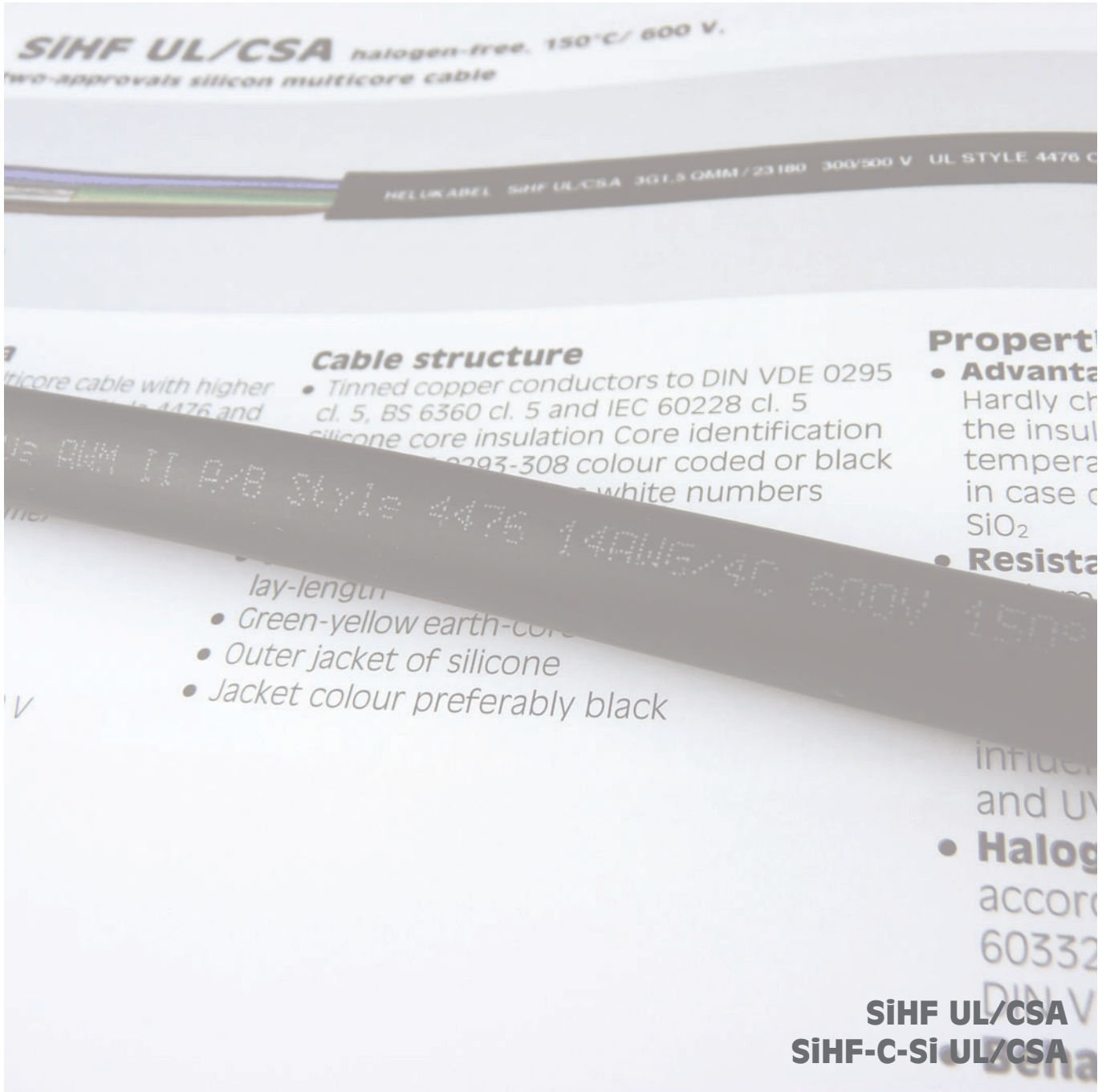


Photo: HELUKABEL®

UL/CSA Heat resistant Cables

SiHF UL/CSA halogen-free, 150°C/ 600 V, two-approvals silicon multicore cable



Technical data

- Special silicone multicore cable with higher heat-resistance range to UL Style 4476 and CSA AWM II A/B
- **Temperature range**
VDE -60 °C to +180 °C
(up to +220 °C for short time)
UL/CSA -50 °C to +150 °C
- **Nominal voltage**
VDE U₀/U 300/500 V
UL/CSA U 600 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
min. 200 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

- Tinned copper conductors to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Silicone core insulation Core identification to DIN VDE 0293-308 colour coded or black cores with continuous white numbers
- For 2-cores brown, blue
- Cores stranded in layers with optimal lay-length
- Green-yellow earth-core (3 cores and above)
- Outer jacket of silicone
- Jacket colour preferably black

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- screened analogue type:
SiHF-C-Si UL/CSA
- **screened analogue type:**
SiHF-C-Si UL/CSA, see page N 77

Properties

- **Advantages**
Hardly changes of dielectric strength and the insulation resistance also at high temperatures, high ignition or flash point, in case of fire, forms an insulating layer of SiO₂
- **Resistant to**
High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen and UV
- **Halogen-free**
according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- **Behaviour in fire**
no flame propagation
test according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90 °C.

Application

UL-CSA approved Silicone cables were evolved for use wherever insulation is subjected to extreme temperature changes. They are heat-resistant for permanent temperature up to +180 °C, for short time operation up to +220 °C. The good performance of the environmental resistant properties means that silicone cables can be used at temperatures down to -60 °C. Silicone cables are halogen-free cables and are especially suited for installation in power stations. They have also found their uses in the steel producing industries, aviation industry, ship building as well as in ceramic, glass and cement factories.

Due to elastical characteristic of core insulations, these are used as flexible connection cable.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
23214	2 x 0,5	20	7,7	9,6	73,0
23215	3 G 0,5	20	8,1	14,4	82,0
23216	4 G 0,5	20	8,8	19,2	98,0
23217	5 G 0,5	20	9,4	24,0	120,0
23218	6 G 0,5	20	10,4	28,8	131,0
23219	7 G 0,5	20	10,4	33,6	140,0
23220	8 G 0,5	20	10,8	38,4	183,0
23221	10 G 0,5	20	12,8	48,0	201,0
23222	12 G 0,5	20	13,4	57,6	241,0
23223	16 G 0,5	20	13,9	76,8	269,0
23224	18 G 0,5	20	14,4	86,4	311,0
23225	25 G 0,5	20	16,8	120,0	401,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
23226	2 x 1	17	8,2	19,2	88,0
23227	3 G 1	17	9,0	28,2	111,0
23228	4 G 1	17	10,0	38,4	130,0
23229	5 G 1	17	10,6	48,0	161,0
23230	6 G 1	17	11,4	57,6	182,0
23231	7 G 1	17	11,4	67,2	198,0
23232	8 G 1	17	12,4	76,8	251,0
23233	10 G 1	17	13,2	96,0	304,0
23234	12 G 1	17	14,4	115,2	343,0
23235	16 G 1	17	15,7	153,6	441,0
23236	18 G 1	17	16,6	172,8	492,0
23237	25 G 1	17	19,1	240,0	617,0

Continuation ►

SiHF UL/CSA halogen-free, 150°C/ 600 V, two-approvals silicon multicore cable

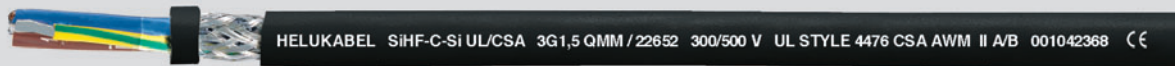


Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
23238	2 x 1,5	16	9,1	28,8	117,0
23239	3 G 1,5	16	9,6	43,2	131,0
23240	4 G 1,5	16	10,6	57,6	166,0
23241	5 G 1,5	16	11,4	72,0	198,0
23242	6 G 1,5	16	12,4	86,4	240,0
23243	7 G 1,5	16	12,4	100,8	261,0
23244	8 G 1,5	16	13,9	115,2	298,0
23245	10 G 1,5	16	16,1	144,0	359,0
23246	12 G 1,5	16	16,6	172,6	431,0
23247	14 G 1,5	16	18,0	201,6	520,0
23248	16 G 1,5	16	20,0	230,4	569,0
23249	18 G 1,5	16	20,9	259,2	652,0
23250	20 G 1,5	16	21,8	288,0	724,0
23251	25 G 1,5	16	24,0	345,6	925,0
23252	41 G 1,5	16	29,2	590,4	1440,0
23253	2 x 2,5	14	9,8	48,0	141,0
23254	3 G 2,5	14	10,4	72,0	174,0
23255	4 G 2,5	14	11,6	96,0	217,0
23256	5 G 2,5	14	12,4	120,0	271,0
23257	6 G 2,5	14	13,6	144,0	314,0
23258	7 G 2,5	14	13,6	168,0	331,0
23259	8 G 2,5	14	14,9	192,0	404,0
23260	10 G 2,5	14	17,2	240,0	495,0
23261	12 G 2,5	14	21,0	288,0	554,0
23262	16 G 2,5	14	22,6	384,0	725,0
23263	18 G 2,5	14	24,0	432,0	838,0
23264	25 G 2,5	14	28,8	600,0	1108,0
23265	2 x 4	12	10,9	76,8	190,0
23266	3 G 4	12	11,8	115,2	241,0
23267	4 G 4	12	12,9	153,6	304,0
23268	5 G 4	12	14,5	192,0	384,0
23269	7 G 4	12	17,8	268,8	527,0

Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
23270	2 x 6	10	14,4	115,2	284,0
23271	3 G 6	10	15,1	172,8	392,0
23272	4 G 6	10	16,4	230,4	492,0
23273	5 G 6	10	18,2	288,0	610,0
23274	7 G 6	10	21,1	403,2	681,0
23275	2 x 10	8	18,0	192,0	405,0
23276	3 G 10	8	18,9	288,0	620,0
23277	4 G 10	8	20,0	384,0	741,0
23278	5 G 10	8	22,1	480,0	914,0
23279	7 G 10	8	24,9	672,0	1164,0
23280	2 x 16	6	20,9	307,2	441,0
23281	3 G 16	6	22,8	460,8	501,0
23282	4 G 16	6	24,9	614,4	623,0
23283	5 G 16	6	26,9	768,0	971,0
23284	7 G 16	6	28,1	1075,3	1690,0
23285	2 x 25	4	25,1	480,0	711,0
23286	3 G 25	4	27,0	720,0	1210,0
23287	4 G 25	4	32,1	960,0	1524,0
23288	2 x 35	2	28,7	672,0	1140,0
23289	3 G 35	2	30,6	1008,0	1523,0
23290	4 G 35	2	32,9	1344,0	2217,0

Dimensions and specifications may be changed without prior notice. (RN03)

SiHF-C-Si UL/CSA halogen-free, 150°C/ 600 V, two-approvals silicon multicore cable, Cu-screened, EMC-preferred type



Technical data

- Special silicone multicore cable with higher heat-resistance range to UL Style 4476 and CSA AWM II A/B
- **Temperature range**
VDE -60 °C to +180 °C
(up to +220 °C for short time)
UL/CSA -50 °C to +150 °C
- **Nominal voltage**
VDE: U₀/U 300/500 V
UL/CSA: U 600 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
min. 200 MΩm x km
- **Minimum bending radius**
flexing 10x cable ø
fixed installation 5x cable ø
- **Coupling resistance**
max. 250 Ωm/km
- **Radiation resistance**
up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

- Tinned copper conductors to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Silicone core insulation
- Core identification to DIN VDE 0293-308 colour coded or black cores with continuous white numbers
- For 2-cores brown, blue
- Cores stranded in layers with optimal lay-length
- Green-yellow earth-core (3 cores and above)
- Foil separator
- Tinned copper braided screening, approx. 85% coverage
- Outer jacket of silicone
- Jacket colour preferably black
- **Halogen-free**
according to VDE 0482 part 267/
DIN EN 50267-2-1/ IEC 60754-1 (equivalent
DIN VDE 0472 part 815)
- **Behaviour in fire**
no flame propagation
test according to VDE 0482-332-1-2, DIN
EN 60332-1-2/ IEC 60332-1 (equivalent
DIN VDE 0472 part 804 test method B)

Properties

- **Advantages**
Hardly changes of dielectric strength and the insulation resistance also at high temperatures
High ignition or flash point
In case of fire, forms an insulating layer of SiO₂
- **Resistant to**
High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen and UV
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90 °C.

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- **non-screened analogue type:**
SiHF UL/CSA, see page N 75
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

UL-CSA approved Silicone cables were evolved for use wherever insulation is subjected to extreme temperature changes. The good performance of the environmental resistant properties means that silicone cables can be used at temperatures down to -60 °C. Silicone cables are halogen-free cables and are especially suited for installation in power stations. They have also found their uses in the steel producing industries, aviation industry, ship building as well as in ceramic, glass and cement factories. Due to elastical characteristic of core insulations, these are used as flexible connection cable.

An interference-free transmission of signals and pulse is assured by the high screening density. The ideal interference-protected silicone multicore flexible cable for such applications as given above.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
22637	2 x 0,5	20	9,0	55,5	94,0
22638	3 G 0,5	20	9,3	60,8	104,0
22639	4 G 0,5	20	9,7	66,5	125,0
22640	5 G 0,5	20	10,1	81,6	149,0
22641	7 G 0,5	20	10,5	92,2	168,0
22642	10 G 0,5	20	13,2	124,0	237,0
22643	12 G 0,5	20	13,4	134,4	260,0
22644	2 x 1	17	9,5	66,7	130,0
22645	3 G 1	17	9,6	86,2	151,0
22646	4 G 1	17	10,6	96,8	169,0
22647	5 G 1	17	11,6	108,3	198,0
22648	7 G 1	17	12,1	141,2	256,0
22649	10 G 1	17	14,7	190,0	248,0
22650	12 G 1	17	15,1	209,8	364,0
22651	2 x 1,5	16	10,6	87,7	169,0
22652	3 G 1,5	16	11,0	103,5	191,0
22653	4 G 1,5	16	11,6	131,7	250,0
22654	5 G 1,5	16	13,1	148,5	272,0
22655	7 G 1,5	16	14,1	193,4	341,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
22656	10 G 1,5	16	17,3	268,5	478,0
22657	12 G 1,5	16	17,9	298,4	521,0
22658	2 x 2,5	14	12,0	122,3	226,0
22659	3 G 2,5	14	12,7	147,7	271,0
22660	4 G 2,5	14	14,0	188,6	332,0
22661	5 G 2,5	14	15,1	214,9	384,0
22662	7 G 2,5	14	16,9	265,7	478,0
22663	4 G 4	12	17,0	294,0	516,0
22664	5 G 4	12	19,1	374,0	641,0
22665	4 G 6	10	18,6	449,0	773,0
22666	5 G 6	10	21,3	563,0	980,0
22667	4 G 10	8	25,5	759,0	1284,0

Dimensions and specifications may be changed without prior notice. (RN03)



**Rubber-/Neoprene Control Cable
N07RN-F/S00W**

Photo: HELUKABEL®

UL/CSA Rubber Cables

Rubber / Neoprene Control Cable Typen SJO und SO



Technical data

- UL+CSA approved rubber/neoprene flexible cables
- **Temperature range**
SJO and SO -40 °C to +90 °C
- **Nominal voltage**
300 V for **SJO**
600 V for **SO**
- **Approvals**
UL Subject 62
CSA-C22.2-49

Cable structure

- Plain copper conductors to ASTM B-174
- Core insulation of synthetic rubber, EPDM
- Cores colour coded
- Cores stranded in layers with optimal lay-length
- Hemp or cotton tape
- Outer jacket neoprene (oil resistant)
- Jacket colour black

Properties

- **Resistant**
Oil
Wetness
UV-radiation
- **Colour code**
2 cores black, white
3 cores black, white, green
4 cores black, white, green, red

Note

- **Note: SJO-18/2**
18 = AWG 18
2 = No. of cores
- Supply lengths are on original reels of 76 m or 152 m or on drums of 305 m lengths.
- Further Types also available: PVC control cables SJT, SJTO, ST, STO.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For use as a feeder cable under rough conditions in motors and machine construction, at shipyards, in steel production and in farming.
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Nominal voltage 300 Volt, type SJO (90°C)

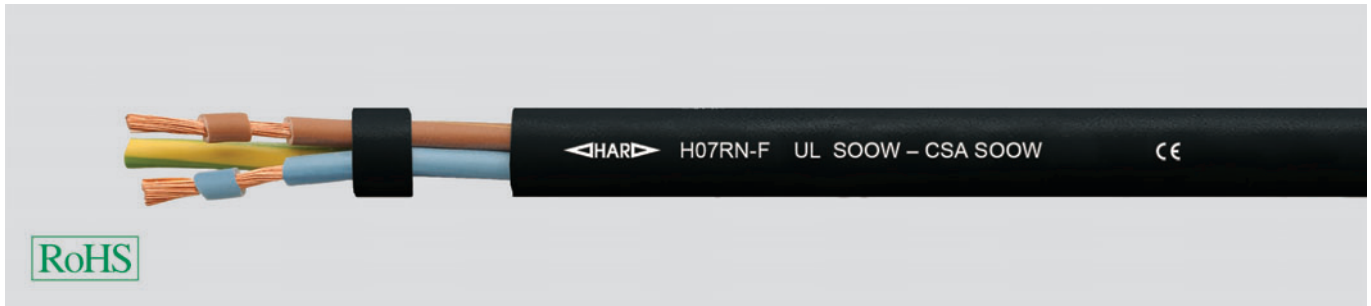
Part no.	No. cores x AWG-no.	Current carrying capacity in Amp.	Cond. make-up n x wire Ø	Outer Ø approx. mm	Weight approx. kg / km
63010	2 x 18	7	16 x 0,3	7,8	65,0
63011	3 x 18	7	16 x 0,3	8,4	80,0
63012	4 x 18	7	16 x 0,3	9,2	95,0
63013	2 x 16	10	26 x 0,3	8,3	130,0
63014	3 x 16	10	26 x 0,3	9,0	148,0
63015	4 x 16	10	26 x 0,3	10,0	180,0
63016	2 x 14	15	41 x 0,3	9,4	195,0
63017	3 x 14	15	41 x 0,3	10,0	225,0
63018	4 x 14	15	41 x 0,3	10,7	288,0

Nominal voltage 600 Volt, type SO (90°C)

Part no.	No. cores x AWG-no.	Current carrying capacity in Amp.	Cond. make-up n x wire Ø	Outer Ø approx. mm	Weight approx. kg / km
63034	2 x 18	7	16 x 0,3	10,0	70,0
63035	3 x 18	7	16 x 0,3	10,4	86,0
63036	4 x 18	7	16 x 0,3	11,0	110,0
63037	2 x 16	10	26 x 0,3	10,4	140,0
63038	3 x 16	10	26 x 0,3	11,0	155,0
63039	4 x 16	10	26 x 0,3	12,3	200,0
63040	2 x 14	15	41 x 0,3	13,5	200,0
63041	3 x 14	15	41 x 0,3	14,3	235,0
63042	4 x 14	15	41 x 0,3	15,3	300,0
63043	2 x 12	20	65 x 0,3	15,3	280,0
63044	3 x 12	20	65 x 0,3	16,2	310,0
63045	4 x 12	20	65 x 0,3	18,9	330,0
63046	2 x 10	25	105 x 0,3	16,4	305,0
63047	3 x 10	25	105 x 0,3	17,5	325,0
63048	4 x 10	25	105 x 0,3	19,0	365,0

Dimensions and specifications may be changed without prior notice. (RN04)

H07RN-F/SOOW rubber-sheathed cable, harmonized type



new

Technical data

- Rubber-sheathed cable H07RN-F according to VDE 0282 Part 4, HD 22.4 S4
- UL - SOOW
CSA - SOOW
- **Temperature range**
- HAR -25 °C to +60 °C
- UL/CSA -40 °C to +90 °C
- Permissible **operating temperature** at the conductor +60 °C
- **Nominal voltage**
HAR 450/750 V
UL/CSA 600 V
- **Test voltage** 2500 V
- **Minimum bending radius**
Flexing 10x cable ø
Fixed installation 7,5 cable ø

Cable structure

- Bare copper conductor, fine wire stranded according to
DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 or
HD 383
- Rubber core insulation (EPR)
- Core identification
3 cores: blue, brown, green-yellow
4 cores: brown, black, grey, green-yellow
5 cores: blue, brown, black, grey, green-yellow
- Cores stranded in layers with optimal lay-lengths
- Rubber outer sheath (CPE)
- Sheath colour - black

Properties

- Ozone-resistant
- Weather and UV-resistant
- Resistant to oils and greases

Note

- G - with green-yellow earth core

Application

Highly-standardised, heavy-duty rubber-sheathed cable for use in practically all machines destined for export markets, in dry, damp, wet environments and outdoors. As a feeder to transportable motors or machines, cranes, hoists, hand lamps and drilling machines.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
39025	3 G 1	9,6	29,0	130,0	18
39026	3 G 1,5	10,2	43,0	165,0	16
39027	4 G 1,5	11,4	58,0	200,0	16
39028	5 G 1,5	13,1	72,0	240,0	16
39029	3 G 2,5	14,0	72,0	235,0	14
39030	4 G 2,5	15,1	96,0	290,0	14
39031	5 G 2,5	16,9	120,0	345,0	14
39032	3 G 4	16,0	115,0	320,0	12

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
39033	4 G 4	17,3	154,0	395,0	12
39034	5 G 4	18,7	192,0	485,0	12
39035	3 G 6	17,1	173,0	420,0	10
39036	4 G 6	18,4	230,0	540,0	10
39037	5 G 6	20,1	288,0	650,0	10
39038	3 G 10	22,9	288,0	810,0	8
39039	4 G 10	25,0	384,0	950,0	8

Dimensions and specifications may be changed without prior notice. (RF01)

N

MULTISPEED® 500-PVC UL/CSA

JZ-602 RC*

MULTISPEED® 500-C-PVC UL/CSA

JZ-602 RC*-CY

JZ-602 RC*-PUR

MULTIFLEX 512® PUR UL/CSA

MULTISPEED® 500-PUR UL/CSA

JZ-602 RC*-C-PUR

MULTIFLEX 512® C-PUR UL/CSA

MULTISPEED® 500-C-PUR UL/CSA

MULTISPEED® 500-TPE UL/CSA

MULTISPEED® 500-C-TPE UL/CSA

SUPERTRONIC-310-PVC

SUPERTRONIC-310-C-PVC

SUPERTRONIC-330 PURö

SUPERTRONIC 330 C-PURö

SUPER-PAAR-TRONIC 340-C-PUR

MULTISPEED® TRONIC-PUR

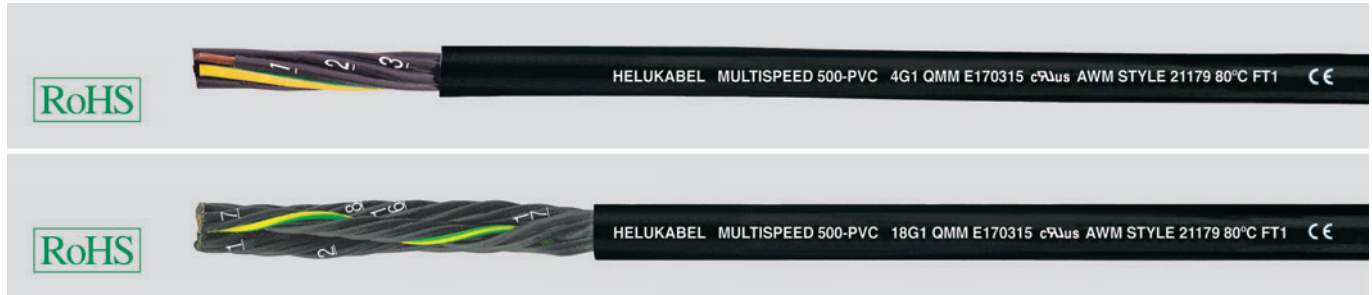
MULTISPEED® TRONIC-C-PUR

Photo: HELUKABEL®

UL/CSA Cables for Drag Chains

MULTISPEED® 500-PVC UL/CSA high flexible, safety

against high bending in drag chain systems, oil-resistant, low torsion, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13 and E DIN VDE 0245 and UL-Std. 758 AWM Style 21179
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage**
VDE U₀/U 300/500 V
UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-PVC outer sheath, especially resistant against fatigue strength, extruded as filler with pressure
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) VW-1, FT1
- Low-adhesion
- Ozon and UV resistant
- High property of alternating bending strength
- Long life durabilities due to low friction-resistance
- Better chemical resistance
- Oil resistance to DIN EN 60811-2-1
- High stability
- Higher economical solution
- Reduced ø, results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
MULTISPEED® 500-C-PVC UL/CSA, see page N 84

Application

UL/CSA approved HELUKABEL® MULTISPEED 500-PVC are installed there, where the extreme requirements for the cables are necessary. Designed for the export-orientated machinery manufacturer, specifically for USA and Canada. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and slow speed of movements. These high flexible PVC control cables are suitable for shift- and bending stresses in machines and machine tool constructions. These are installed in dry, open air and moist rooms with free movement without tensile stress or forced movements.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24295	2 x 0,5	20	4,8	9,6	40,0
24296	3 G 0,5	20	5,1	14,4	45,0
24297	4 G 0,5	20	5,5	19,0	57,0
24298	5 G 0,5	20	6,0	24,0	66,0
24299	7 G 0,5	20	9,1	33,6	81,0
24300	12 G 0,5	20	10,0	58,0	133,0
24301	18 G 0,5	20	12,2	86,0	194,0
24302	25 G 0,5	20	14,3	120,0	274,0
24303	4 G 0,75	19	6,1	29,0	63,0
24304	5 G 0,75	19	6,6	36,0	79,0
24305	7 G 0,75	19	10,5	50,0	107,0
24306	12 G 0,75	19	11,4	86,0	169,0
24307	18 G 0,75	19	14,2	130,0	247,0
24308	25 G 0,75	19	16,3	180,0	366,0
24309	36 G 0,75	19	20,1	259,0	540,0
24310	42 G 0,75	19	22,2	302,0	630,0
24311	3 G 1	18	5,9	29,0	69,0
24312	4 G 1	18	6,4	38,4	86,0
24313	5 G 1	18	7,0	48,0	101,0
24314	7 G 1	18	11,2	67,0	140,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24315	12 G 1	18	12,3	115,0	227,0
24316	18 G 1	18	15,1	173,0	351,0
24317	25 G 1	18	17,6	240,0	489,0
24318	3 G 1,5	16	6,7	43,0	88,0
24319	4 G 1,5	16	7,3	58,0	110,0
24320	5 G 1,5	16	8,0	72,0	130,0
24321	7 G 1,5	16	13,2	101,0	182,0
24322	12 G 1,5	16	14,4	173,0	319,0
24323	18 G 1,5	16	17,7	259,0	420,0
24324	25 G 1,5	16	20,5	360,0	604,0
24325	4 G 2,5	14	8,9	96,0	172,0
24326	5 G 2,5	14	9,9	120,0	219,0
24327	7 G 2,5	14	16,1	168,0	303,0
24328	12 G 2,5	14	17,8	288,0	504,0
24329	18 G 2,5	14	21,8	432,0	754,0
24330	25 G 2,5	14	24,4	600,0	940,0

Dimensions and specifications may be changed without prior notice. (RN05)

JZ-602 RC* cable for drag chains, 90°C, 600V, two approvals control cable, meter marking



Technical data

- Control cable of special-PVC to UL AWM Style 10012 (core insulation) Style 2587 (jacket insulation) and CSA
- **Temperature range**
flexing -5 °C to +90 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage** according to UL + CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable Ø
fixed installation 4x cable Ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6 col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special PVC core insulation, Y18 to DIN VDE 0207 part 4 and class 43 to UL-Std. 1581
- Red cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece over each layer
- Special PVC outer jacket YM5 to DIN VDE 0207 part 5, UL-Style 2587 and CSA C22.2 No 210
- Outer jacket black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
JZ-602 RC* -CY, see page N 85

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms. These special cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. These cables have shown excellent performance in combination with standard cable trays.

Interesting for the export-oriented machines and machinery plants.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

RC = Robotics Cable

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

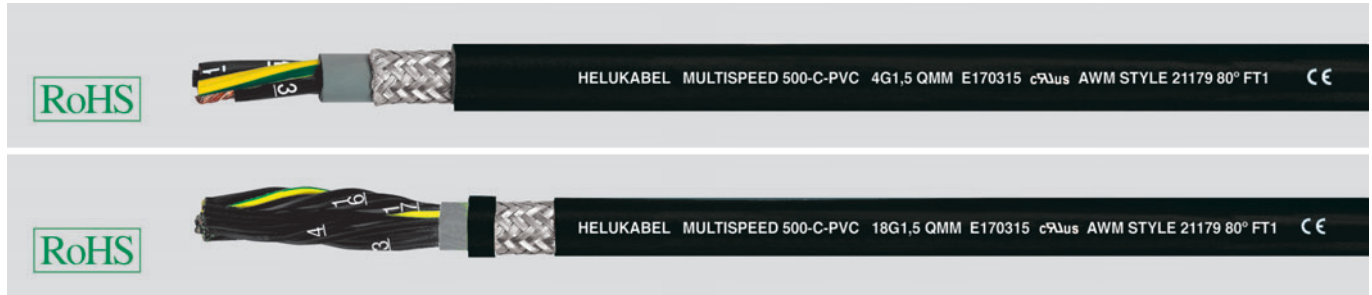
Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
89900	3 G 0,5	20	6,0	14,0	58,0
89901	4 G 0,5	20	6,5	19,0	69,0
89902	5 G 0,5	20	7,1	24,0	84,0
89903	7 G 0,5	20	8,2	34,0	123,0
89904	9 G 0,5	20	10,0	43,2	177,0
89905	12 G 0,5	20	10,5	58,2	192,0
89906	18 G 0,5	20	12,5	86,0	256,0
89907	25 G 0,5	20	15,2	120,0	358,0
89908	34 G 0,5	20	17,1	163,0	487,0
89909	3 G 0,75	18	6,6	23,8	88,0
89910	4 G 0,75	18	7,1	31,7	101,0
89911	5 G 0,75	18	7,8	39,6	126,0
89912	7 G 0,75	18	9,2	55,4	145,0
89913	9 G 0,75	18	11,0	71,2	168,0
89914	12 G 0,75	18	11,5	95,0	260,0
89915	15 G 0,75	18	13,2	119,0	300,0
89916	18 G 0,75	18	14,0	142,4	360,0
89917	25 G 0,75	18	17,2	197,8	640,0
89918	34 G 0,75	18	19,1	269,0	730,0
89919	3 G 1,5	16	7,4	44,0	94,0
89920	4 G 1,5	16	8,0	58,0	117,0
89921	5 G 2,5	16	8,8	72,0	140,0
89922	7 G 1,5	16	10,8	101,0	186,0
89923	9 G 1,5	16	12,8	129,7	244,0
89924	12 G 1,5	16	13,5	173,0	319,0
89925	18 G 1,5	16	16,0	260,0	451,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
89926	25 G 1,5	16	19,8	360,0	625,0
89927	34 G 1,5	16	22,4	490,0	840,0
89932	3 G 2,5	14	8,9	72,0	150,0
89928	4 G 2,5	14	10,1	96,0	185,0
89933	5 G 2,5	14	11,3	120,0	242,0
89929	7 G 2,5	14	13,6	168,0	293,0
89934	12 G 2,5	14	16,8	288,0	498,0
89935	3 G 4	12	10,9	115,0	231,0
89930	4 G 4	12	12,4	154,0	298,0
89936	5 G 4	12	13,8	192,0	370,0
89931	7 G 4	12	16,6	269,0	460,0
89937	4 G 6	10	14,6	231,0	430,0
89938	4 G 10	8	18,2	384,0	720,0
89939	4 G 16	6	22,6	615,0	1060,0
89940	4 G 25	4	26,5	960,0	1590,0
89941	4 G 35	2	30,8	1344,0	2105,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTISPEED® 500-C-PVC UL/CSA oil resistant,

high flexible, safety against high bending in drag chain systems, low torsion, screened, EMC-preferred type, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13 and E DIN VDE 0245 and UL-Std. 758 AWM Style 21179
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage**
VDE U₀/U 300/500 V
UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Coupling resistance**
max. 250 Ohm x km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-PVC inner sheath YM2 extruded as filler with pressure grey (RAL 7001)
- Tinned copper braided screen, coverage 85% max., with optimal bunch
- Special-PVC outer sheath, especially resistant against fatigue strength
- sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) VW-1, FT1
- Low adhesion
- Ozon and UV resistant
- High property of alternating bending strength
- Long life durability due to low friction-resistance
- Better chemical resistance
- Oil resistance to DIN EN 6081-2-1
- High stability
- Higher economical solution
- Reduced ø, results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
MULTISPEED® 500-PVC UL/CSA, see page N 82

Application

For permanent application in drag chains for long distances, high and slow speed of movements.

These high flexible PVC control cables are suitable for shift- and bending stresses in machines and machine tool constructions. These are installed in dry, moist rooms and in open air with free movement without tensile stress or forced movements. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications.

For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24335	2 x 0,5	20	6,6	30,0	88,0
24336	3 G 0,5	20	6,9	36,0	101,0
24337	4 G 0,5	20	7,3	42,0	116,0
24338	5 G 0,5	20	7,8	48,0	146,0
24339	7 G 0,5	20	11,3	64,0	181,0
24340	9 G 0,5	20	11,4	80,0	219,0
24341	12 G 0,5	20	12,6	105,0	271,0
24342	18 G 0,5	20	15,0	137,0	374,0
24343	25 G 0,5	20	17,1	210,0	542,0
24344	2 x 0,75	19	6,8	40,0	96,0
24345	3 G 0,75	19	7,4	48,0	111,0
24346	4 G 0,75	19	8,0	55,0	140,0
24347	5 G 0,75	19	8,5	66,0	161,0
24348	7 G 0,75	19	12,9	85,0	227,0
24349	12 G 0,75	19	14,4	135,0	317,0
24350	18 G 0,75	19	17,5	190,0	486,0
24351	25 G 0,75	19	19,9	275,0	651,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24352	3 G 1	18	7,7	59,0	131,0
24353	4 G 1	18	8,3	70,0	164,0
24354	5 G 1	18	9,1	84,0	198,0
24355	7 G 1	18	14,0	106,0	252,0
24356	12 G 1	18	15,0	174,0	410,0
24357	18 G 1	18	18,7	240,0	550,0
24358	25 G 1	18	21,2	332,0	756,0
24359	3 G 1,5	16	8,6	75,0	166,0
24360	4 G 1,5	16	9,4	90,0	199,0
24361	5 G 1,5	16	10,4	108,0	229,0
24362	7 G 1,5	16	16,0	157,0	304,0
24363	12 G 1,5	16	17,6	240,0	502,0
24364	18 G 1,5	16	21,3	355,0	709,0
24365	25 G 1,5	16	24,8	448,0	939,0
24366	4 G 2,5	14	11,3	134,0	270,0
24367	5 G 2,5	14	12,3	175,0	335,0

Dimensions and specifications may be changed without prior notice. (RN05)

JZ-602 RC*-CY special cable for drag chains, 90°C, 600V, two approvals control cable, EMC-preferred type, meter marking



Technical data

- Control cable of special-PVC to UL AWM Style 10012 (core insulation) Style 2587 (jacket insulation) and CSA
- Temperature range**
flexing -5 °C to +90 °C
fixed installation -40 °C to +90 °C
- Nominal voltage**
according to UL + CSA 600 V
- Test voltage** 4000 V
- Breakdown voltage** min. 8000 V
- Insulation resistance**
min 20 MOhm x km
- Minimum bending radius**
flexing 10x cable \varnothing
fixed installation 5x cable \varnothing
- Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6 col. 4, BS 6360 cl. 5 and IEC 60228 cl. 6
- Special PVC core insulation, Y18 to DIN VDE 0207 part 4 and class 43 to UL-Std. 1581
- Red cores with continuous white figure imprint to DIN VDE 0293
- Green-yellow earth core in the outer layer
- Cores with optimal selected lay-length
- Core wrapping with fleece over each layer
- PVC-inner sheath
- Screening: braid coverage ca. 85%
up to 17 mm \varnothing - layer of tinned copper wires
>17 mm \varnothing - tinned copper wire
- Special PVC outer jacket YM5 to DIN VDE 0207 part 5, UL-Style 2587 and CSA C22.2 No 210
- Outer jacket black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type:**
JZ-602 RC*, see page N 83

Application

These cable are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms. These special cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. These cables have shown excellent performance in combination with standard cable trays. The dense screening assures disturbance-free transmission of all signals and impulses. An ideal disturbance-free control cable for the above applications. Interesting for the export-oriented machines and machinery plants. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

RC = Robotics Cable.

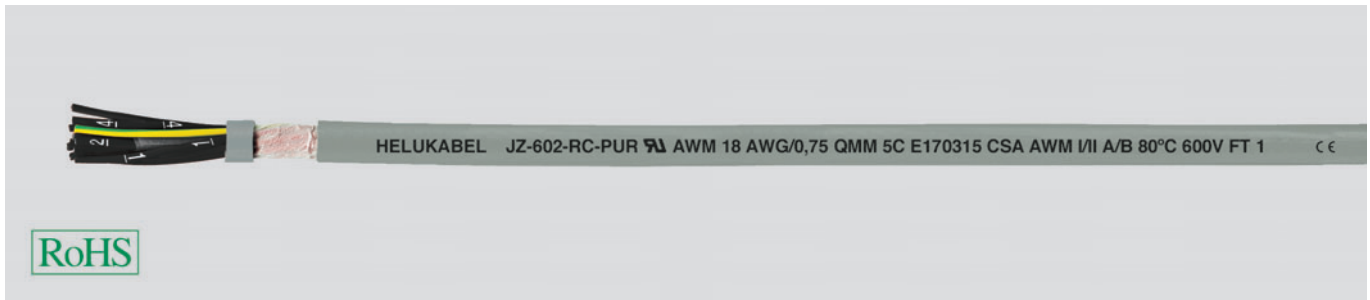
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km
89950	3 G 0,5	20	8,5	45,0	124,0
89951	4 G 0,5	20	9,0	52,0	135,0
89952	5 G 0,5	20	9,7	68,0	153,0
89953	7 G 0,5	20	11,0	93,0	191,0
89954	9 G 0,5	20	12,4	134,0	243,0
89955	12 G 0,5	20	13,5	163,0	322,0
89956	15 G 0,5	20	14,8	174,0	350,0
89957	18 G 0,5	20	16,0	191,0	374,0
89958	25 G 0,5	20	19,0	223,0	436,0
89959	3 G 0,75	18	8,9	56,0	130,0
89960	4 G 0,75	18	9,7	81,0	155,0
89961	5 G 0,75	18	10,4	90,0	181,0
89962	7 G 0,75	18	12,0	106,0	208,0
89963	9 G 0,75	18	14,1	161,0	321,0
89964	12 G 0,75	18	15,2	175,0	341,0
89965	15 G 0,75	18	16,7	204,0	396,0
89966	18 G 0,75	18	17,6	241,0	473,0
89967	25 G 0,75	18	20,7	342,0	650,0
89968	34 G 0,75	18	24,3	434,0	781,0
89969	3 G 1,5	16	10,2	89,0	165,0
89970	4 G 1,5	16	11,0	97,0	192,0
89971	5 G 1,5	16	11,8	111,0	224,0
89972	7 G 1,5	16	14,0	147,0	274,0
89973	9 G 1,5	16	16,4	193,0	340,0
89974	12 G 1,5	16	17,1	256,0	461,0
89975	18 G 1,5	16	20,2	360,0	674,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km
89976	25 G 1,5	16	25,2	544,0	950,0
89977	34 G 1,5	16	28,1	674,0	1203,0
89984	3 G 2,5	14	11,8	141,0	220,0
89978	4 G 2,5	14	13,2	170,0	270,0
89985	5 G 2,5	14	14,2	195,0	350,0
89979	7 G 2,5	14	17,4	251,0	428,0
89986	12 G 2,5	14	21,0	368,0	730,0
89980	18 G 2,5	14	25,4	639,0	1140,0
89987	3 G 4	12	14,0	180,0	296,0
89981	4 G 4	12	15,9	232,0	456,0
89988	5 G 4	12	17,7	330,0	450,0
89982	7 G 4	12	20,9	395,0	737,0
89983	4 G 6	10	18,3	316,0	572,0
89989	4 G 10	8	23,2	490,0	1012,0
89990	4 G 16	6	27,6	850,0	1400,0
89991	4 G 25	4	33,1	1450,0	2100,0
89992	4 G 35	2	37,8	1890,0	2550,0

Dimensions and specifications may be changed without prior notice. (RN05)

JZ-602 RC*-PUR special cable for drag chains, 80°C, 600V, two approvals control cable, meter marking



Technical data

- Control cable of special-PUR to UL CSA AWM I/II A/B Style 20939 (jacket insulation) and CSA
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
according to UL + CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special PVC core insulation, Y18 to DIN VDE 0207 part 4 and class 43 to UL-Std. 1581
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Core wrapping with fleece over each layer
- **Full-polyurethane**
outer jacket grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Resistant to mineral oils, synthetic oils and refrigerants, UV-radiation, oxygene, ozon and hydrolysis. Conditionally resistant to microbes.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
JZ-602 RC* -C-PUR, see page N 91

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist, wet rooms and outdoor. These special cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

RC = Robotics Cable.

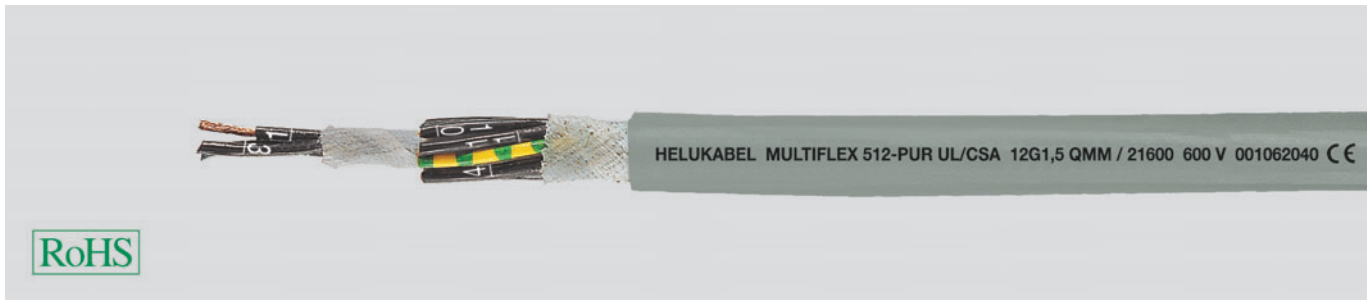
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12630	3 G 0,5	20	6,0	14,0	58,0
12631	4 G 0,5	20	6,5	19,0	69,0
12632	5 G 0,5	20	7,1	24,0	84,0
12633	7 G 0,5	20	8,2	34,0	123,0
12634	9 G 0,5	20	10,0	43,2	177,0
12635	12 G 0,5	20	10,5	58,2	192,0
12636	18 G 0,5	20	12,5	86,0	256,0
12637	25 G 0,5	20	15,2	120,0	358,0
12638	34 G 0,5	20	17,1	163,0	487,0
12639	3 G 0,75	18	6,6	23,8	88,0
12640	4 G 0,75	18	7,1	31,7	101,0
12641	5 G 0,75	18	7,8	39,6	126,0
12642	7 G 0,75	18	9,2	55,4	145,0
12643	9 G 0,75	18	11,0	86,4	168,0
12644	12 G 0,75	18	11,5	95,0	260,0
12645	15 G 0,75	18	13,2	119,0	300,0
12646	18 G 0,75	18	14,0	142,4	360,0
12647	25 G 0,75	18	17,2	197,8	640,0
12648	34 G 0,75	18	19,1	269,0	730,0
12649	3 G 1,5	16	7,4	44,0	94,0
12650	4 G 1,5	16	8,0	58,0	117,0
12651	5 G 1,5	16	8,8	72,0	140,0
12652	7 G 1,5	16	10,8	101,0	186,0
12653	9 G 1,5	16	12,8	129,7	244,0
12654	12 G 1,5	16	13,5	173,0	319,0
12655	18 G 1,5	16	16,0	260,0	451,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
12656	25 G 1,5	16	19,8	360,0	625,0
12657	34 G 1,5	16	22,4	490,0	840,0
12658	3 G 2,5	14	8,9	72,0	150,0
12659	4 G 2,5	14	10,1	96,0	185,0
12660	5 G 2,5	14	11,3	120,0	242,0
12661	7 G 2,5	14	13,6	168,0	293,0
12662	12 G 2,5	14	16,8	288,0	498,0
12663	3 G 4	12	10,9	115,0	231,0
12664	4 G 4	12	12,4	154,0	298,0
12665	5 G 4	12	13,8	192,0	370,0
12666	7 G 4	12	16,6	269,0	460,0
12667	4 G 6	10	14,6	231,0	430,0
12668	4 G 10	8	18,2	384,0	720,0
12669	4 G 16	6	22,6	615,0	1060,0
12670	4 G 25	4	26,5	960,0	1590,0
12671	4 G 35	2	30,8	1344,0	2105,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTIFLEX 512®-PUR UL/CSA special cable for drag chains, 80°C, 600V, two approvals control cable, halogen-free



Technical data

- Special drag chain cables for high mechanical stress, according to UL -Style 20939
- **Temperature range**
flexing -40 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage**
3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Alternating bending cycles**
approx. **10 million**
- **Radiation resistance**
up to 50x10⁶ cJ/kg (up to 50 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special core insulation, modified TPE
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Special core wrapping over each layer (up to 4 mm² without core wrapping over the outer layer)
- Special **full-polyurethane** outer jacket TPU, to DIN VDE 0282 part 10
- Colour grey (RAL 7001) outer surface mat
- with meter marking, change-over in 2011

Properties

- Very good oil resistant
- Guaranteed permanent application in multi-shift operation under extreme high bending stress
- Adhesion-low
- High resistant to mechanical strain
- High property of alternating bending strength
- Long life durabilities through low friction-resistance by using the TPE insulation
- High tensile strength-, abrasion- and impact resistant at low temperature
- Resistant to Weather, Ozone and UV-radiation, Solvents, acids and alkalis, and Hydrolysis
- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **screened analogue type:**
MULTIFLEX 512® -C-PUR UL/CSA,
see page N 92

Application

These special UL/CSA cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts and multi-shift operation. Those cables are developed according to the newest state of technology improvement. These high flexible control cables with sliding abilities guaranteed an optimum service life durabilities and also very economic by using the TPE-core insulation and the PUR-outer jacket. The PUR material is adhesion-low and cut-resistant.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
21559	2 x 0,5	20	5,5	9,6	38,0
21560	3 G 0,5	20	5,8	14,4	46,0
21561	4 G 0,5	20	6,4	19,0	59,0
21562	5 G 0,5	20	7,0	24,0	68,0
21563	7 G 0,5	20	8,1	33,6	88,0
21564	12 G 0,5	20	9,9	58,0	131,0
21565	18 G 0,5	20	11,5	86,0	197,0
21566	20 G 0,5	20	12,0	96,0	260,0
21567	25 G 0,5	20	13,7	120,0	282,0
21568	30 G 0,5	20	14,3	144,0	315,0
21569	36 G 0,5	20	15,3	172,0	374,0
21570	2 x 0,75	18	6,2	14,4	47,0

Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
21571	3 G 0,75	18	6,5	21,6	58,0
21572	4 G 0,75	18	7,0	29,0	69,0
21573	5 G 0,75	18	7,8	36,0	85,0
21574	7 G 0,75	18	9,0	50,0	118,0
21575	12 G 0,75	18	11,0	86,0	183,0
21576	18 G 0,75	18	13,0	130,0	270,0
21577	20 G 0,75	18	13,5	144,0	290,0
21578	25 G 0,75	18	15,4	180,0	374,0
21579	30 G 0,75	18	16,2	216,0	420,0
21580	36 G 0,75	18	17,6	259,0	498,0

Continuation ▶

MULTIFLEX 512®-PUR UL/CSA special cable for drag chains, 80°C, 600V, two approvals control cable, halogen-free

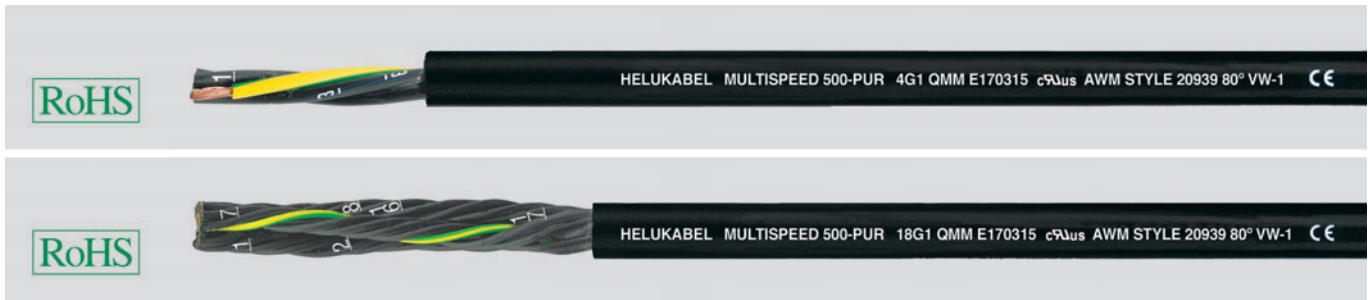


Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
21581	2 x 1	17	6,9	19,2	55,0
21582	3 G 1	17	7,4	29,0	70,0
21583	4 G 1	17	8,0	38,0	86,0
21584	5 G 1	17	8,7	48,0	102,0
21585	7 G 1	17	10,2	67,0	143,0
21586	12 G 1	17	12,6	115,0	225,0
21587	18 G 1	17	14,8	173,0	334,0
21588	20 G 1	17	15,8	192,0	370,0
21589	25 G 1	17	18,1	240,0	460,0
21590	30 G 1	17	18,5	288,0	530,0
21591	36 G 1	17	20,1	346,0	625,0
21592	41 G 1	17	22,0	410,0	779,0
21593	50 G 1	17	24,0	498,0	953,0
21594	65 G 1	17	27,2	650,0	1205,0
21595	2 x 1,5	16	7,6	29,0	70,0
21596	3 G 1,5	16	8,1	43,0	90,0
21597	4 G 1,5	16	8,7	58,0	106,0
21598	5 G 1,5	16	9,7	72,0	145,0
21599	7 G 1,5	16	11,3	101,0	205,0
21600	12 G 1,5	16	13,8	173,0	320,0
21601	18 G 1,5	16	16,3	259,0	465,0
21602	20 G 1,5	16	17,3	288,0	510,0
21603	25 G 1,5	16	19,8	360,0	650,0
21604	30 G 1,5	16	20,3	432,0	750,0
21605	36 G 1,5	16	22,2	518,0	880,0
21606	42 G 1,5	16	24,0	628,0	1209,0
21607	50 G 1,5	16	26,2	749,0	1449,0
21608	61 G 1,5	16	28,9	912,0	1712,0

Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
21609	2 x 2,5	14	9,2	48,0	115,0
21610	3 G 2,5	14	9,7	72,0	162,0
21611	4 G 2,5	14	10,5	96,0	196,0
21612	5 G 2,5	14	11,6	120,0	230,0
21613	7 G 2,5	14	13,8	168,0	312,0
21614	12 G 2,5	14	16,9	288,0	532,0
21615	18 G 2,5	14	20,0	432,0	762,0
21616	20 G 2,5	14	21,2	480,0	858,0
21617	25 G 2,5	14	24,4	600,0	998,0
21618	4 G 4	12	13,2	154,0	283,0
21619	5 G 4	12	14,6	192,0	349,0
21620	7 G 4	12	17,6	79,0	498,0
21621	4 G 6	10	14,4	230,0	432,0
21622	5 G 6	10	15,9	288,0	529,0
21623	7 G 6	10	19,2	403,0	782,0
21624	4 G 10	8	18,4	384,0	685,0
21625	5 G 10	8	20,7	480,0	817,0
21626	7 G 10	8	24,7	672,0	1023,0
21627	4 G 16	6	21,3	614,0	1042,0
21628	5 G 16	6	23,8	768,0	1292,0
21629	7 G 16	6	28,6	1075,0	1709,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTISPEED® 500-PUR UL/CSA safety against high bending in drag chain systems, low torsion, halogen-free, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13, DIN VDE 0282 part 10 and E DIN VDE 0245 and UL-Std. 758 AWM Style 20233 and 20939
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage**
VDE U₀/U 300/500 V
UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-PUR outer sheath, especially resistant against fatigue strength, extruded as filler with pressure
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B), VW-1, FT1
- low adhesion
- halogen-free
- Higher economical solution
- Reduced ø, results low weight of moving materials
- Halogen-free
- High resistant to mechanical strain
- Long life durability due to low friction-resistance
- High tensile strength, abrasion- and impact resistance at low temperature
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
MULTISPEED® 500-C-PUR UL/CSA,
see page N 94

Application

UL/CSA approved HELUKABEL® MULTISPEED 500-PUR are installed there, where the extreme requirements for the cables are necessary. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high an slow speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24370	2 x 0,5	20	4,8	9,6	41,0
24371	3 G 0,5	20	5,1	14,4	48,0
24372	4 G 0,5	20	5,5	19,0	62,0
24373	5 G 0,5	20	6,0	24,0	70,0
24374	7 G 0,5	20	9,1	33,6	88,0
24375	12 G 0,5	20	10,0	58,0	131,0
24376	18 G 0,5	20	12,2	86,0	204,0
24377	25 G 0,5	20	14,3	120,0	266,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24378	3 G 0,75	19	5,2	21,6	51,0
24379	4 G 0,75	19	6,1	29,0	68,0
24380	5 G 0,75	19	6,6	36,0	73,0
24381	7 G 0,75	19	10,5	50,0	92,0
24382	12 G 0,75	19	11,4	86,0	170,0
24383	18 G 0,75	19	14,2	130,0	257,0
24384	25 G 0,75	19	16,3	180,0	280,0
24385	36 G 0,75	19	20,1	260,0	411,0
24386	42 G 0,75	19	22,2	302,0	608,0

Continuation ▶

MULTISPEED® 500-PUR UL/CSA safety against high bending in drag chain systems, low torsion, halogen-free, meter marking



Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24387	3 G 1	18	5,9	29,0	59,0
24388	4 G 1	18	6,4	38,0	71,0
24389	5 G 1	18	7,0	48,0	84,0
24390	7 G 1	18	11,2	67,0	111,0
24391	12 G 1	18	12,3	115,0	200,0
24392	18 G 1	18	15,1	173,0	286,0
24393	25 G 1	18	17,6	240,0	370,0
24331	36 G 1	18	21,6	346,0	485,0
24394	3 G 1,5	16	6,7	43,0	81,0
24395	4 G 1,5	16	7,3	58,0	102,0
24396	5 G 1,5	16	8,0	72,0	121,0
24397	7 G 1,5	16	13,2	101,0	164,0
24398	12 G 1,5	16	14,4	173,0	293,0
24399	18 G 1,5	16	17,7	259,0	450,0
24400	25 G 1,5	16	20,5	360,0	631,0
24332	36 G 1,5	16	25,6	518,0	779,0

Part no.	No. cores x cross-sec. mm²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24401	4 G 2,5	14	8,9	86,0	173,0
24402	5 G 2,5	14	9,8	120,0	220,0
24403	7 G 2,5	14	16,1	168,0	290,0
24404	12 G 2,5	14	17,8	288,0	504,0
24405	18 G 2,5	14	21,8	432,0	719,0
24406	25 G 2,5	14	24,4	600,0	940,0

Dimensions and specifications may be changed without prior notice. (RN05)

Terminations and straight-through joints

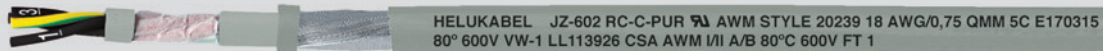
Telephone cables
Low voltage
Medium voltage
Accessories



N

You can find terminations and straight-through joints in our catalogue Cable Accessories. Request it now at www.helukabel.de

JZ-602 RC*-C-PUR special cable for drag chains, 80°C, 600V, two approvals control cable, EMC-preferred type, meter marking



Technical data

- Control cable of special-PUR to UL CSA AWM I/II A/B Style 20939 (jacket insulation) and CSA
- Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- Nominal voltage**
according to UL+CSA 600 V
- Test voltage** 4000 V
- Breakdown voltage** min. 8000 V
- Insulation resistance**
min 20 MOhm x km
- Minimum bending radius**
flexing 10x cable \varnothing
fixed installation 5x cable \varnothing
- Radiation resistance**
up 100x10⁶ cJ/kg (up to 100 Mrad)
- Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special PVC core insulation, Y18 to DIN VDE 0207 part 4 and class 43 to UL-Std. 1581
- Black cores with continuous white numbering according to DIN VDE 0293
- Green-yellow earth core in the outer layer
- Cores with optimal selected lay-length
- Core wrapping with fleece over each layer
- PVC-inner sheath
- Screening:
up to 17 mm \varnothing - layer of tinned copper wires
>17 mm \varnothing - tinned copper wire braid coverage ca. 85%
- Full-polyurethane**
outer jacket grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Resistant to mineral oils, synthetic oils and refrigerants, UV-radiation, oxygene, ozon and hydrolysis. Conditionally resistant to microbes.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Note

- G = with green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type:**
JZ-602 RC* PUR, see page N 86

Application

These cable are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist, wet rooms and outdoor. These special cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. The dense screening assures disturbance-free transmission of all signals and impulses. An ideal disturbance-free control cable for the above applications. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

RC = Robotics Cable.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km
12680	3 G 0,5	20	8,5	45,0	124,0
12681	4 G 0,5	20	9,0	52,0	135,0
12682	5 G 0,5	20	9,7	68,0	153,0
12683	7 G 0,5	20	11,0	93,0	191,0
12684	9 G 0,5	20	12,4	134,0	243,0
12685	12 G 0,5	20	13,5	163,0	322,0
12686	15 G 0,5	20	14,8	174,0	350,0
12687	18 G 0,5	20	16,0	191,0	374,0
12688	25 G 0,5	20	19,0	223,0	436,0
12689	3 G 0,75	18	8,9	56,0	130,0
12690	4 G 0,75	18	9,7	81,0	155,0
12691	5 G 0,75	18	10,4	90,0	181,0
12692	7 G 0,75	18	12,0	106,0	208,0
12693	9 G 0,75	18	14,1	161,0	321,0
12694	12 G 0,75	18	15,2	175,0	341,0
12695	15 G 0,75	18	16,7	204,0	396,0
12696	18 G 0,75	18	17,6	241,0	473,0
12697	25 G 0,75	18	20,7	342,0	650,0
12698	34 G 0,75	18	24,3	434,0	781,0
12699	3 G 1,5	16	10,2	89,0	165,0
12700	4 G 1,5	16	11,0	97,0	192,0
12701	5 G 1,5	16	11,8	111,0	224,0
12702	7 G 1,5	16	14,0	147,0	274,0
12703	9 G 1,5	16	16,4	193,0	340,0
12704	12 G 1,5	16	17,1	256,0	461,0
12705	18 G 1,5	16	20,2	360,0	674,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km
12706	25 G 1,5	16	25,2	544,0	950,0
12707	34 G 1,5	16	28,1	674,0	1203,0
12708	3 G 2,5	14	11,8	141,0	220,0
12709	4 G 2,5	14	13,2	170,0	270,0
12710	5 G 2,5	14	14,2	195,0	350,0
12711	7 G 2,5	14	17,4	251,0	428,0
12712	12 G 2,5	14	21,0	368,0	730,0
12713	18 G 2,5	14	25,4	639,0	1140,0
12714	3 G 4	12	14,0	180,0	296,0
12715	4 G 4	12	15,9	232,0	456,0
12716	5 G 4	12	17,7	330,0	450,0
12717	7 G 4	12	20,9	395,0	737,0
12718	4 G 6	10	18,3	316,0	572,0
12719	4 G 10	8	23,2	490,0	1012,0
12720	4 G 16	6	27,6	850,0	1400,0
12721	4 G 25	4	33,1	1450,0	2100,0
12722	4 G 35	2	37,8	1890,0	2550,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTIFLEX 512®-C-PUR UL/CSA special cable for

drag chains, 80°C, 600V, two approvals control cable, EMC-preferred type, halogen-free, meter marking



Technical data

- Special cables for drag chains with high degree of resistance to mechanical stress according to UL -Style -20939
- **Temperature range**
flexing -40 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage**
3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Test of alternating bending cycles**
approx. **10 million**
- **Radiation resistance**
up to 50x10⁶ cJ/kg (up to 50 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special core insulation, modified TPE
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Special core wrapping over each layers and an additional fleece over outer layer
- **TPE-inner sheath**, halogen-free
- Wrapping with special tapes
- Tinned copper braided screening, approx. 85% coverage
- Special core wrapping of fleece (up to 4 mm² without core wrapping over the outer layer)
- Special **full-polyurethane** outer jacket TMPU, to DIN VDE 0282 part 10, appendix A
- Colour grey (RAL 7001) outer surface mat
- with meter marking, change-over in 2011

Properties

- Very good oil resistant, test method according to DIN VDE 0472 part 803
- Guaranteed permanent application in multi-shift operation under extreme high bending stress
- Adhesion-low
- High resistant to mechanical strain
- High property of alternating bending strength
- Long life durabilities through low friction-resistance by using the TPE insulation
- High tensile strength-, abrasion- and impact resistant at low temperature
- Resistant to Weather, Ozone and UV-radiation, Solvents, acids and alkalis, Hydraulic liquidity and Hydrolysis
- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please note the cleanroom qualification when ordering.
- **unscreened analogue type:**
MULTIFLEX 512® PUR UL/CSA, see page N 87

Application

The special screened UL/CSA cables for drag chains are mainly applied for impulse transmission to prevent external interference effects and used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts and multi-shift operation. Those cables are developed according to the newest state of technology improvement. These high flexible control cables with sliding abilities guaranteed an optimum service life durabilities and also very economic by using the TPE-core insulation and the PUR-outer jacket which is adhesive-free and cut-resistant.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
21630	2 x 0,5	20	8,3	30,0	90,0
21631	3 G 0,5	20	8,5	38,0	105,0
21632	4 G 0,5	20	9,0	50,0	124,0
21633	5 G 0,5	20	9,7	65,0	132,0
21634	7 G 0,5	20	11,1	70,0	175,0
21635	12 G 0,5	20	12,7	100,0	250,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
21636	18 G 0,5	20	14,7	157,0	325,0
21637	20 G 0,5	20	15,4	167,0	350,0
21638	25 G 0,5	20	17,1	240,0	450,0
21639	30 G 0,5	20	17,9	273,0	510,0
21640	36 G 0,5	20	19,2	306,0	580,0

Continuation ▶

MULTIFLEX 512®-C-PUR UL/CSA special cable for

drag chains, 80°C, 600V, two approvals control cable, EMC-preferred type, halogen-free, meter marking



Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
21641	2 x 0,75	18	8,8	39,0	110,0
21642	3 G 0,75	18	9,3	49,0	120,0
21643	4 G 0,75	18	9,7	60,0	148,0
21644	5 G 0,75	18	10,5	70,0	160,0
21645	7 G 0,75	18	11,9	95,0	205,0
21646	12 G 0,75	18	14,2	140,0	308,0
21647	18 G 0,75	18	16,3	220,0	420,0
21648	20 G 0,75	18	16,9	249,0	450,0
21649	25 G 0,75	18	19,2	313,0	579,0
21650	30 G 0,75	18	19,7	470,0	630,0
21651	36 G 0,75	18	21,2	500,0	745,0
21652	2 x 1	17	9,7	50,0	120,0
21653	3 G 1	17	10,0	60,0	135,0
21654	4 G 1	17	10,8	73,0	173,0
21655	5 G 1	17	11,7	81,0	187,0
21656	7 G 1	17	13,4	114,0	240,0
21657	12 G 1	17	16,0	186,0	360,0
21658	18 G 1	17	18,5	254,0	498,0
21659	20 G 1	17	19,4	322,0	568,0
21660	25 G 1	17	21,7	377,0	670,0
21661	30 G 1	17	22,5	429,0	774,0
21662	36 G 1	17	24,3	516,0	895,0
21663	41 G 1	17	26,1	610,0	1032,0
21664	50 G 1	17	28,4	690,0	1160,0
21665	65 G 1	17	32,2	852,0	1660,0
21666	2 x 1,5	16	10,2	64,0	145,0
21667	3 G 1,5	16	11,0	84,0	168,0
21668	4 G 1,5	16	11,6	99,0	217,0
21669	5 G 1,5	16	12,6	129,0	235,0
21670	7 G 1,5	16	14,5	148,0	325,0
21671	12 G 1,5	16	17,4	279,0	481,0
21672	18 G 1,5	16	19,9	393,0	675,0
21673	25 G 1,5	16	23,7	584,0	927,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
21674	30 G 1,5	16	24,6	607,0	1025,0
21675	36 G 1,5	16	26,4	702,0	1210,0
21676	42 G 1,5	16	28,4	829,0	1441,0
21677	50 G 1,5	16	31,2	1025,0	1709,0
21678	61 G 1,5	16	34,2	1190,0	2025,0
21679	2 x 2,5	14	11,9	104,0	198,0
21680	3 G 2,5	14	12,6	140,0	284,0
21681	4 G 2,5	14	13,6	164,0	378,0
21682	5 G 2,5	14	14,7	190,0	423,0
21683	7 G 2,5	14	17,4	236,0	486,0
21684	12 G 2,5	14	20,9	390,0	756,0
21685	18 G 2,5	14	24,2	607,0	1127,0
21686	20 G 2,5	14	25,6	661,0	1210,0
21687	25 G 2,5	14	29,1	796,0	1530,0
21688	4 G 4	12	16,8	222,0	448,0
21689	5 G 4	12	18,4	328,0	533,0
21690	7 G 4	12	21,6	360,0	678,0
21691	4 G 6	10	18,1	305,0	636,0
21692	5 G 6	10	19,6	441,0	772,0
21693	7 G 6	10	23,2	505,0	1028,0
21694	4 G 10	8	22,5	485,0	1052,0
21695	5 G 10	8	24,7	610,0	1096,0
21696	7 G 10	8	29,3	820,0	1530,0
21697	4 G 16	6	25,7	840,0	1386,0
21698	5 G 16	6	28,2	1050,0	1759,0
21699	7 G 16	6	33,6	1510,0	2087,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTISPEED® 500-C-PUR UL/CSA safety against

high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13, DIN VDE 0282 part 10 and E DIN VDE 0245 and UL-Std. 758 AWM Style 20939
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage**
VDE U₀/U 300/500 V
UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Coupling resistant**
max. 250 Ωm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE-O inner sheath, extruded as filler with pressure, grey RAL 7001
- Tinned copper braided screen, coverage 85% max., with optimal pitch
- Special-PUR outer sheath
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PUR-jacket flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B), VW-1, FT1
- Low adhesion
- High resistant to mechanical strain
- Long life durability due to low friction-resistance
- High tensile strength, abrasion- and impact resistance at low temperature
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced ø, results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **unscreened analogue type:**
MULTISPEED® 500-PUR UL/CSA,
see page N 89

Application

UL/CSA approved HELUKABEL® MULTISPEED 500-C-PUR are installed there, where the extreme requirements for the cables are necessary. Designed for the export-orientated machinery manufacturer, specifically for USA and Canada. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and slow speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary.

These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24410	2 x 0,5	20	6,6	30,0	90,0
24411	3 G 0,5	20	6,9	36,0	104,0
24412	4 G 0,5	20	7,3	42,0	118,0
24413	5 G 0,5	20	7,8	48,0	148,0
24414	7 G 0,5	20	11,3	64,0	184,0
24415	9 G 0,5	20	11,4	80,0	219,0
24416	12 G 0,5	20	12,6	105,0	276,0
24417	18 G 0,5	20	15,0	137,0	378,0
24418	25 G 0,5	20	17,5	210,0	547,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24419	2 x 0,75	19	6,8	40,0	100,0
24420	3 G 0,75	19	7,4	48,0	117,0
24421	4 G 0,75	19	8,0	55,0	143,0
24422	5 G 0,75	19	8,5	66,0	167,0
24423	7 G 0,75	19	12,9	85,0	229,0
24424	12 G 0,75	19	14,4	135,0	319,0
24425	18 G 0,75	19	17,5	190,0	492,0
24426	25 G 0,75	19	19,9	275,0	659,0

Continuation ▶

MULTISPEED® 500-C-PUR UL/CSA safety against high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking



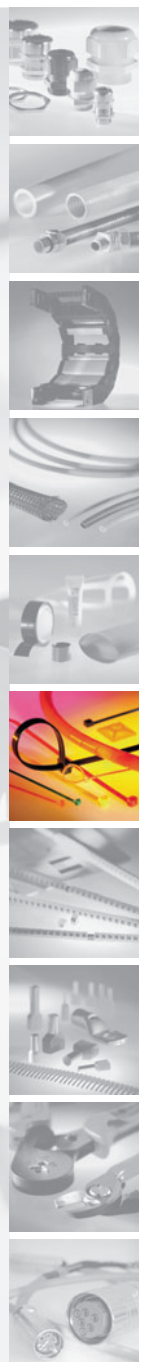
Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24427	2 x 1	18	7,1	50,0	120,0
24428	3 G 1	18	7,7	59,0	140,0
24429	4 G 1	18	8,3	70,0	167,0
24430	5 G 1	18	9,1	84,0	201,0
24431	7 G 1	18	14,0	106,0	256,0
24432	12 G 1	18	15,0	174,0	417,0
24433	18 G 1	18	18,7	240,0	557,0
24434	25 G 1	18	21,4	332,0	766,0
24333	36 G 1	18	26,1	436,0	840,0
24435	3 G 1,5	16	8,6	75,0	170,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24436	4 G 1,5	16	9,4	90,0	204,0
24437	5 G 1,5	16	10,4	108,0	236,0
24438	7 G 1,5	16	16,0	157,0	309,0
24439	12 G 1,5	16	17,6	240,0	509,0
24440	18 G 1,5	16	21,3	355,0	718,0
24441	25 G 1,5	16	24,8	448,0	944,0
24334	36 G 1,5	16	30,3	592,0	1070,0
24442	4 G 2,5	14	11,3	134,0	280,0
24443	5 G 2,5	14	12,3	175,0	346,0
24444	7 G 2,5	14	19,9	229,0	410,0

Dimensions and specifications may be changed without prior notice. (RN05)

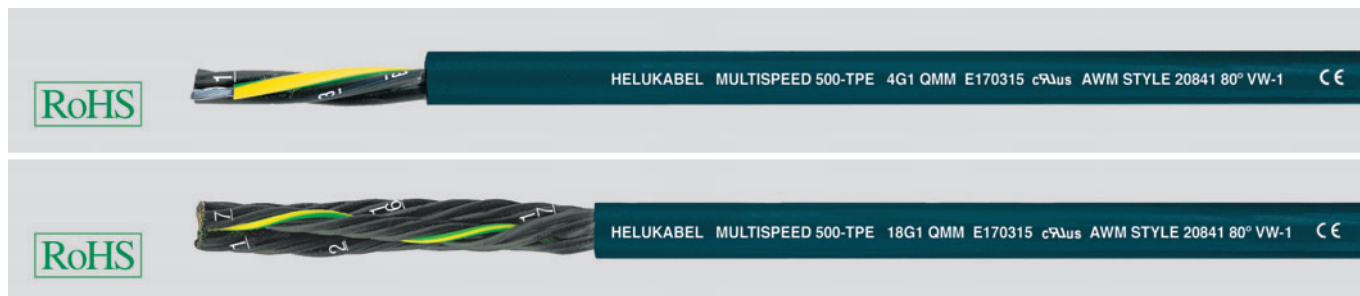
Bundling, binding, fastening

- Plastic helix
- Cable tie
- Hook and loop cable tie
- Mounting block



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MULTISPEED® 500-TPE UL/CSA high flexible, safety against high bending in drag chain systems, low torsion, halogen-free, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13 and E DIN VDE 0245 and UL-Std. 758 AWM Style 20841 and 21184
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage**
VDE U₀/U 300/500 V
UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MΩm x km
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE-O outer sheath, extruded as filler with pressure
- Sheath colour ocean blue (RAL 5020)
- with meter marking, change-over in 2011
- **TPE:** The selected tinned copper wire conductor permits the installation in aggressive environments as well as hydrogen sulfide, ammonia and sulfur dioxide

Properties

- Microbe-resistance - TPE
- Low adhesion
- High property of alternating bending strength
- High resistant to mechanical strain
- Long life durability due to low friction-resistance
- High tensile strength, abrasion- and impact resistance at low temperature
- Extremely high continuous bending loads
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced ø, results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- **screened analogue type:**
MULTISPEED® 500-C-TPE UL/CSA,
see page N 98

Application

The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and slow speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text. **CE** = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24450	2 x 0,5	20	4,7	9,6	42,0
24451	3 G 0,5	20	5,0	14,4	49,0
24452	4 G 0,5	20	5,4	19,0	63,0
24453	5 G 0,5	20	5,8	24,0	70,0
24454	7 G 0,5	20	8,9	33,6	90,0
24455	12 G 0,5	20	9,8	58,0	134,0
24456	18 G 0,5	20	11,9	86,0	209,0
24457	25 G 0,5	20	13,9	120,0	270,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24458	2 x 0,75	19	5,0	14,4	47,0
24459	3 G 0,75	19	5,2	21,6	55,0
24460	4 G 0,75	19	6,1	29,0	70,0
24461	5 G 0,75	19	6,6	36,0	74,0
24462	7 G 0,75	19	10,5	50,0	95,0
24463	12 G 0,75	19	11,4	86,0	174,0
24464	18 G 0,75	19	14,2	130,0	261,0
24465	25 G 0,75	19	16,3	180,0	290,0
24466	36 G 0,75	19	19,5	260,0	419,0
24467	42 G 0,75	19	21,3	302,0	614,0

Continuation ▶

MULTISPEED® 500-TPE UL/CSA high flexible, safety against high bending in drag chain systems, low torsion, halogen-free, meter marking



Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24468	2 x 1	18	5,2	19,2	50,0
24469	3 G 1	18	5,9	29,0	60,0
24470	4 G 1	18	6,4	38,0	74,0
24471	5 G 1	18	7,0	48,0	86,0
24472	7 G 1	18	11,2	67,0	114,0
24473	12 G 1	18	12,3	115,0	210,0
24474	18 G 1	18	15,1	173,0	291,0
24475	25 G 1	18	17,6	240,0	380,0
24476	3 G 1,5	16	6,7	43,0	84,0
24477	4 G 1,5	16	7,3	58,0	108,0
24478	5 G 1,5	16	8,0	72,0	126,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24479	7 G 1,5	16	13,2	101,0	169,0
24480	12 G 1,5	16	14,4	173,0	299,0
24481	18 G 1,5	16	17,7	259,0	460,0
24482	25 G 1,5	16	19,8	360,0	640,0
24483	4 G 2,5	14	8,9	96,0	179,0
24484	5 G 2,5	14	9,8	120,0	230,0
24485	7 G 2,5	14	16,1	168,0	294,0
24486	12 G 2,5	14	17,8	288,0	510,0
24487	18 G 2,5	14	21,8	432,0	722,0
24488	25 G 2,5	14	24,4	600,0	950,0

Dimensions and specifications may be changed without prior notice. (RN05)

Marking

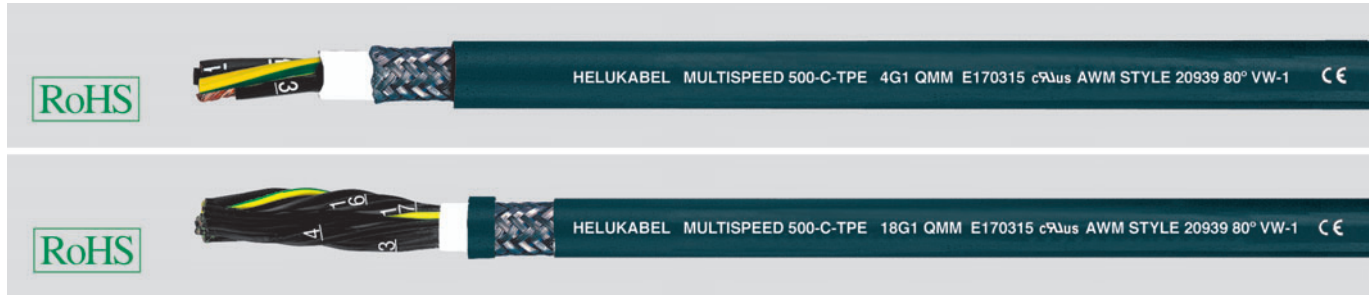
Marking rings
Cable marker
Indian pen



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MULTISPEED® 500-C-TPE UL/CSA safety

against high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13 and E DIN VDE 0245 and UL-Std. 758 AWM Style 21184
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U₀/U 300/500 V
UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Coupling resistance**
max. 250 Ohm x km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Black cores with continuous white numbering
- Green-yellow earth core (3 cores and above)
- Stranding:
 - <7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
 - ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE-O inner sheath, extruded as filler with pressure, natural colour
- Screen of Cu braid tinned, coverage 85% max., with optimal pitch
- Special-TPE-O outer sheath, extruded as filler with pressure
- Sheath colour ocean blue (RAL 5020)
- with meter marking, change-over in 2011
- **TPE:** The selected tinned copper wire conductor and tinned copper wire braid permit the installation in aggressive environments as well as hydrogen sulfide, ammonia and sulfur dioxide.

Properties

- Microbe-resistance - TPE
- High property of alternating bending strength
- High resistant to mechanical strain
- Long life durability due to low friction-resistance
- High tensile strength, abrasion- and impact resistance at low temperature
- Extremely high continuous bending loads
- Low adhesion
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced ø, results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.

Note

- G = with green-yellow earth core; x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please note the cleanroom qualification when ordering.
- **unscreened analogue type:**
MULTISPEED® 500-TPE UL/CSA,
see page N 96

Application

The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and slow speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
23914	2 x 0,5	20	6,4	30,0	85,0
23915	3 G 0,5	20	6,7	36,0	99,0
23916	4 G 0,5	20	7,3	42,0	107,0
23917	5 G 0,5	20	7,7	48,0	140,0
23918	7 G 0,5	20	11,3	64,0	176,0
23919	10 G 0,5	20	10,1	80,0	204,0
23920	12 G 0,5	20	12,4	105,0	261,0
23921	18 G 0,5	20	14,7	137,0	360,0
23922	25 G 0,5	20	17,1	320,0	530,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
23923	2 x 0,75	19	7,0	40,0	97,0
23924	3 G 0,75	19	7,4	48,0	110,0
23925	4 G 0,75	19	8,0	55,0	139,0
23926	5 G 0,75	19	8,5	66,0	160,0
23927	7 G 0,75	19	12,9	85,0	219,0
23928	12 G 0,75	19	14,4	135,0	307,0
23929	18 G 0,75	19	17,2	190,0	490,0
23930	25 G 0,75	19	19,9	275,0	640,0

Continuation ▶

MULTISPEED® 500-C-TPE UL/CSA safety

against high bending in drag chain systems, low torsion, halogen-free,
EMC-preferred type, meter marking



Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
23931	2 x 1	18	7,4	50,0	115,0
23932	3 G 1	18	7,7	59,0	131,0
23933	4 G 1	18	8,3	70,0	160,0
23934	5 G 1	18	9,1	84,0	195,0
23935	7 G 1	18	14,0	106,0	247,0
23936	12 G 1	18	15,0	174,0	411,0
23937	18 G 1	18	18,5	240,0	547,0
23938	25 G 1	18	21,4	332,0	754,0
23939	3 G 1,5	16	8,6	75,0	160,0
23940	4 G 1,5	16	9,4	90,0	194,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
23941	5 G 1,5	16	10,4	108,0	220,0
23942	7 G 1,5	16	16,0	157,0	294,0
23943	12 G 1,5	16	17,6	240,0	490,0
23944	18 G 1,5	16	21,3	355,0	704,0
23945	25 G 1,5	16	24,8	448,0	930,0
23946	4 G 2,5	14	11,3	134,0	260,0
23947	5 G 2,5	14	12,3	175,0	330,0
23948	7 G 2,5	14	14,8	229,0	406,0
23949	12 G 2,5	14	21,5	390,0	990,0

Dimensions and specifications may be changed without prior notice. (RN05)

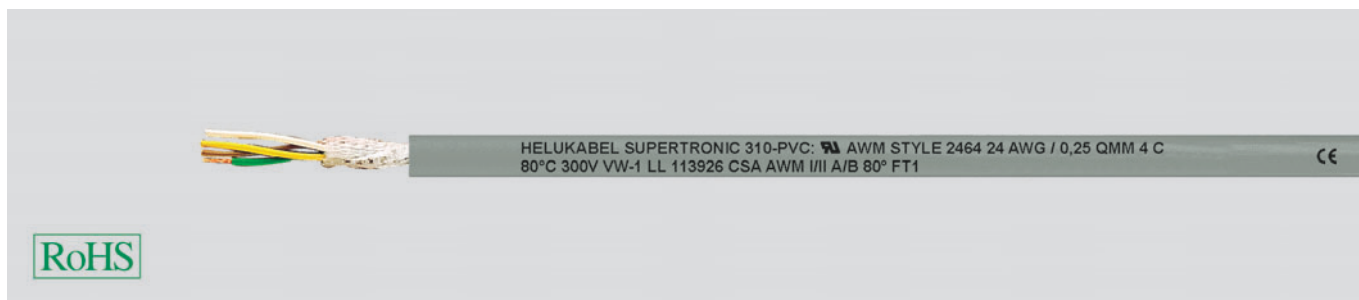
Core end sleeves and cable lugs

- Core end sleeves
- Solderless terminals
- Tubular cable lugs
- Compression joints



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SUPERTRONIC-310-PVC special cable for drag chains, meter marking



Technical data

- Special PVC drag chain cable approved to UL-Style 2464
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage**
min. 3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 5x cable ø
fixed installation 3x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire
Unilay with short lay-lengths
- PVC core insulation, class 43 acc. to UL std. 1581
- Colour coded to DIN 47100
- Cores stranded in layers with optimal lay-length
- Core wrapping from fleece between the layers of stranding
- PVC outer jacket, oil resistant. TM5 acc. to DIN VDE 0281 Part 1 or class 43 acc. to UL std. 1581
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Low-adhesion
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Please observe applicable installation regulations for use in energy supply chains.

Application

A highly-flexible PVC control cable suitable for frequent and fast lifting and bending stresses in machines and tool building, robot systems and on constantly moving machine components. Long service lives guarantee reliable function and good cost efficiency. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text. Designed for machines intended for export, specifically USA and Canada.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49885	2 x 0,14	26	3,7	2,8	24,0
49886	3 x 0,14	26	3,9	4,1	26,0
49887	4 x 0,14	26	4,1	5,6	31,0
49888	5 x 0,14	26	4,5	7,0	36,0
49889	7 x 0,14	26	5,1	9,8	50,0
49890	10 x 0,14	26	5,8	14,0	65,0
49891	12 x 0,14	26	6,0	16,8	72,0
49892	14 x 0,14	26	6,2	19,6	78,0
49893	18 x 0,14	26	6,9	25,2	91,0
49894	24 x 0,14	26	7,8	33,6	120,0
49895	25 x 0,14	26	8,3	35,0	125,0
49896	2 x 0,25	24	4,0	5,0	29,0
49897	3 x 0,25	24	4,2	7,5	34,0
49898	4 x 0,25	24	4,5	10,0	40,0
49899	5 x 0,25	24	4,9	12,5	51,0
49900	7 x 0,25	24	5,6	17,5	65,0
49901	10 x 0,25	24	6,4	25,0	85,0
49902	12 x 0,25	24	6,6	30,1	97,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49903	14 x 0,25	24	6,9	35,0	109,0
49904	18 x 0,25	24	7,6	45,0	132,0
49905	24 x 0,25	24	8,8	60,0	171,0
49906	25 x 0,25	24	9,4	62,5	178,0
49907	2 x 0,34	22	4,2	6,8	34,0
49908	3 x 0,34	22	4,4	10,2	43,0
49909	4 x 0,34	22	4,8	13,6	58,0
49910	5 x 0,34	22	5,1	17,0	65,0
49911	7 x 0,34	22	5,9	23,8	85,0
49912	10 x 0,34	22	6,8	34,0	117,0
49913	12 x 0,34	22	7,0	40,8	134,0
49914	14 x 0,34	22	7,4	47,6	152,0
49915	18 x 0,34	22	8,1	61,2	184,0
49916	24 x 0,34	22	9,6	81,5	242,0
49917	25 x 0,34	22	10,0	85,0	252,0

Dimensions and specifications may be changed without prior notice. (RN05)

SUPERTRONIC-310-C-PVC special cable for drag chains,

EMC-preferred type, meter marking



HELUKABEL SUPERTRONIC 310-C-PVC AWM STYLE 2464 22 AWG /
0,34 QMM 5 C SHIELDED 80°C 300V VW-1 CE LL 113926 CSA AWM IIII A/B 80°C FT1



Technical data

- Special PVC drag chain cable approved to UL-Style 2464
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage**
core/core 1500 V
core/screen 1000 V
- **Breakdown voltage**
min. 3000 V
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Insulation resistance**
min. 20 MΩm x km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

- Bare copper conductor, fine wire
Unilay with short lay-lengths
- PVC core insulation, class 43 acc. to UL std. 1581
- Colour coded to DIN 47100
- Cores stranded in layers with optimal lay-length
- Core wrapping from fleece between the layers of stranding
- Core wrapping over the outer layer
- Braided screen of tinned Cu wires, coverage approx. 85%
- Core wrapping with fleece
- PVC outer jacket, oil resistant, TM5 acc. to DIN VDE 0281 Part 1 or class 43 acc. to UL std. 1581
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Low-adhesion
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Please observe applicable installation regulations for use in energy supply chains.

Application

A highly-flexible PVC control cable suitable for frequent and fast lifting and bending stresses in machines and tool building, robot systems and on constantly moving machine components. Long service lives guarantee reliable function and good cost efficiency. The copper screen effectively protects against internal and external interference. Designed for machines intended for export, specifically USA and Canada. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49920	2 x 0,14	26	4,3	11,3	33,0
49921	3 x 0,14	26	4,5	14,2	36,0
49922	4 x 0,14	26	4,7	15,5	41,0
49923	5 x 0,14	26	5,0	18,4	46,0
49924	7 x 0,14	26	5,7	27,9	70,0
49925	10 x 0,14	26	6,4	39,1	88,0
49926	12 x 0,14	26	6,7	42,2	97,0
49927	14 x 0,14	26	6,9	45,4	105,0
49928	18 x 0,14	26	7,6	54,2	116,0
49929	24 x 0,14	26	8,6	66,5	150,0
49930	25 x 0,14	26	9,0	68,5	157,0
49931	2 x 0,25	24	4,6	14,8	39,0
49932	3 x 0,25	24	4,8	18,9	45,0
49933	4 x 0,25	24	5,1	21,4	52,0
49934	5 x 0,25	24	5,5	31,2	70,0
49935	7 x 0,25	24	6,2	39,8	80,0
49936	10 x 0,25	24	7,1	53,9	114,0
49937	12 x 0,25	24	7,3	59,2	123,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49938	14 x 0,25	24	7,6	64,3	138,0
49939	18 x 0,25	24	8,3	78,6	165,0
49940	24 x 0,25	24	9,7	89,8	200,0
49941	25 x 0,25	24	10,1	101,2	204,0
49942	2 x 0,34	22	4,8	18,2	44,0
49943	3 x 0,34	22	5,0	28,8	60,0
49944	4 x 0,34	22	5,4	35,8	76,0
49945	5 x 0,34	22	5,7	39,2	80,0
49946	7 x 0,34	22	6,6	52,8	104,0
49947	10 x 0,34	22	7,5	67,5	150,0
49948	12 x 0,34	22	7,7	76,5	160,0
49949	14 x 0,34	22	8,1	85,9	180,0
49950	18 x 0,34	22	8,9	99,9	211,0
49951	24 x 0,34	22	10,3	147,0	290,0
49952	25 x 0,34	22	10,9	155,0	304,0

Dimensions and specifications may be changed without prior notice. (RN05)

SUPERTRONIC-330 PURö cable for drag chains,

halogen-free, meter marking



HELUKABEL SUPERTRONIC 330 PURö 4x0,34 QMM E 170515 AWM STYLE
20233 22 AWG 4C WV-1c AWM I/II A/B 80°C 300V FT1/ 49788 001070789



Technical data

- Special PUR sheathed cable
- **Temperature range**
flexing -40 °C to +80 °C
fixed -50 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage**
core/core 1500 V
- **Insulation resistance**
min. 100 MΩm x km
- **Capacitance**
core/core 60 nF/km
- **Minimum bending radius**
flexing 5 x cable ø
fixed 3 x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine-wire to
DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6
- Polyolefine core insulation
- Cores stranded in layers with optimally
adjusted lay-lengths
- Cores colour coded to DIN 47100
- Foil wrapping over the outer layer
- Special **full-polyurethane** outer sheath
TMPU to DIN VDE 0282 Part 10, Annex A
and acc. to UL std. 1581 Tab. 50227 80 °C
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- PUR flame retardant according to VDE
0482-332-1-2, DIN EN 60332-1-2/
IEC 60332-1 (equivalent DIN VDE 0472
part 804 test method B)
- Low adhesion
- High flexibility at low temperatures
- High abrasion resistance
- Tear and cut-resistant
- Notch resistant
- **Resistant to**
UV-radiation, Oxygen, Ozone, Hydrolysis,
Oil
- **Partially resistant to**
Microbial attack, Hydraulic fluids, Coolant
emulsion, Alkalis
- The materials used in manufacture are
silicon and cadmium-free and contain no
substances harmful to the wetting
properties of lacquers

Application

For installation in dry, moist and wet rooms and outdoors with free movement without tensile stress or forced movements, impressively proven in drag chain application.

A highly flexible PUR control cable, suitable for frequent and quick lifting and bending stresses in machine engineering and construction, in robot technology and on permanently moving machine components. Long service life guarantees reliable function and high cost-efficiency. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

Attractive for export-oriented mechanical engineering.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49764	2 x 0,14	26	3,9	2,8	22,0
49765	3 x 0,14	26	4,0	4,1	24,0
49766	4 x 0,14	26	4,3	5,6	29,0
49767	5 x 0,14	26	4,7	7,0	35,0
49768	7 x 0,14	26	5,3	9,8	47,0
49769	10 x 0,14	26	6,1	14,0	57,0
49770	12 x 0,14	26	6,2	16,8	63,0
49771	14 x 0,14	26	6,5	19,6	72,0
49772	18 x 0,14	26	7,2	25,2	80,0
49773	24 x 0,14	26	8,2	33,6	110,0
49774	25 x 0,14	26	8,6	35,0	115,0
49775	2 x 0,25	24	4,3	5,0	26,0
49776	3 x 0,25	24	4,5	7,5	30,0
49777	4 x 0,25	24	4,8	10,0	39,0
49778	5 x 0,25	24	5,2	12,5	44,0
49779	7 x 0,25	24	6,0	17,5	52,0
49780	10 x 0,25	24	6,9	25,0	70,0
49781	12 x 0,25	24	7,1	30,1	84,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49782	14 x 0,25	24	7,4	35,0	97,0
49783	18 x 0,25	24	8,2	45,0	114,0
49784	24 x 0,25	24	9,6	60,0	157,0
49785	25 x 0,25	24	10,1	62,5	160,0
49786	2 x 0,34	22	4,6	6,8	31,0
49787	3 x 0,34	22	4,8	10,2	38,0
49788	4 x 0,34	22	5,2	13,6	51,0
49789	5 x 0,34	22	5,6	17,0	54,0
49790	7 x 0,34	22	6,5	23,8	77,0
49791	10 x 0,34	22	7,5	34,0	104,0
49792	12 x 0,34	22	7,7	40,8	122,0
49793	14 x 0,34	22	8,1	47,6	140,0
49794	18 x 0,34	22	9,2	61,2	162,0
49795	24 x 0,34	22	10,7	81,5	204,0
49796	25 x 0,34	22	11,2	85,0	229,0

Dimensions and specifications may be changed without prior notice. (RN05)

SUPERTRONIC-330 C-PURÖ cable for drag chains, halogen-free, EMC-preferred type, meter marking



Technical data

- Special PUR sheathed cable, screened
- **Temperature range**
flexing -40 °C to +80 °C
fixed -50 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage**
core/core 1500 V
core/screen 1000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Capacitance**
core/core 60 nF/km
- **Minimum bending radius**
flexing 7,5 x cable ø
fixed 4 x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
max. 250 Ohm/km

Cable structure

- Bare copper conductor, extra fine wire to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6
- Polyolefine core insulation
- Colour coded to DIN 47100
- Cores stranded in layers with optimal lay-length
- Wrapping over the outer layer
- Braided screen of tinned Cu wires, coverage approx. 85%
- Core wrapping with fleece
- Special **full polyurethane** outer sheath TPU acc. to DIN VDE 0281 Part 10, Annex A and acc. to UL std. 1581 Tab. 50227 80 °C
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low-adhesion
- High flexibility at low temperatures
- High abrasion resistance
- Tear and cut-resistant
- Notch resistant
- **Resistant to**
UV-radiation, Oxygen, Ozone, Hydrolysis, Oil
- **Partially resistant to**
Microbial attack, Hydraulic fluid, Coolant emulsion, Alkalis
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

Especially suited for drag chain installation in dry, moist and wet environments and outdoors with flexible movement and without tensile stress or forced movements. A highly-flexible PVC control cable suitable for frequent and fast lifting and bending stresses in machines and tool building, robot systems and on constantly moving machine components. Long service lives guarantee reliable function and good cost efficiency. The dense screening assures interference-free transmission of all signals and impulses. An ideal interference-free control cable for the above applications.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC characteristics we recommend a large area of contact of the copper braiding around the entire circumference on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49797	2 x 0,14	26	4,4	11,2	32,0
49798	3 x 0,14	26	4,5	14,1	35,0
49799	4 x 0,14	26	4,8	15,5	40,0
49800	5 x 0,14	26	5,0	18,3	45,0
49801	7 x 0,14	26	5,8	27,8	66,0
49802	10 x 0,14	26	6,7	39,3	86,0
49803	12 x 0,14	26	6,8	42,1	94,0
49804	14 x 0,14	26	7,1	45,3	102,0
49805	18 x 0,14	26	7,8	54,1	118,0
49806	24 x 0,14	26	8,8	66,3	149,0
49807	25 x 0,14	26	9,2	68,4	156,0
49808	2 x 0,25	24	4,8	14,9	38,0
49809	3 x 0,25	24	5,0	18,8	44,0
49810	4 x 0,25	24	5,3	21,3	51,0
49811	5 x 0,25	24	5,7	31,0	68,0
49812	7 x 0,25	24	6,6	39,6	82,0
49813	10 x 0,25	24	7,5	53,9	110,0
49814	12 x 0,25	24	7,7	59,1	124,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49815	14 x 0,25	24	8,0	64,2	135,0
49816	18 x 0,25	24	8,8	78,4	150,0
49817	24 x 0,25	24	10,2	89,9	194,0
49818	25 x 0,25	24	10,7	101,0	204,0
49819	2 x 0,34	22	5,1	18,1	45,0
49820	3 x 0,34	22	5,3	28,7	60,0
49821	4 x 0,34	22	5,7	35,7	76,0
49822	5 x 0,34	22	6,1	39,1	82,0
49823	7 x 0,34	22	7,1	52,7	110,0
49824	10 x 0,34	22	8,1	67,4	148,0
49825	12 x 0,34	22	8,3	76,4	166,0
49826	14 x 0,34	22	8,7	85,5	185,0
49827	18 x 0,34	22	9,8	99,7	216,0
49828	24 x 0,34	22	11,3	147,1	291,0
49829	25 x 0,34	22	11,8	155,0	305,0

Dimensions and specifications may be changed without prior notice. (RN05)

SUPER-PAAR-TRONIC 340-C-PUR cable for drag

chains, halogen-free, EMC-preferred type, meter marking



HELUKABEL SUPER-PAAR-TRONIC 340-C-PUR 8x2x0,5 QMM E 170315 AWM STYLE
20233 20 AWG 16C VW-1 AWM I/II A/B 80°C 300V FT1/49854 001070044



Technical data

- Special drag chain cable, stranded in pairs
- **Temperature range**
flexing -20 °C to +80 °C
fixed -40 °C to +80 °C
- **Nominal voltage** 300 V
- **Test voltage**
core/core 1500 V
core/screen 1000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance**
core/core approx. 60 nF/km
- **Minimum bending radius**
for permanent bending
at 0,25 mm²
flexing 7,5x cable ø
fixed 4x cable ø
at 0,5-1,0 mm²
flexing 10x cable ø
fixed 5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper conductor, fine or extra fine wire to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6
- **Polyolefin** core insulation
- Colour coded to DIN 47100
- Cores stranded in pairs, pairs stranded torsion-free in layers with optimal lay-length
- Core wrapping between the layers of stranding
- Braided screen of tinned Cu wires, coverage approx. 85%
- Core wrapping with fleece
- **Full polyurethane** outer sheath TMPU acc. to DIN VDE 0281 Part 10, Annex A and acc. to UL std. 1581 Tab. 50227 80 °C
- Sheath colour grey (RAL 7001)
- with meter marking, change-over in 2011

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Oil resistance according to IEC 60092-350
- Halogen free
- Weather, ozone and UV-resistant
- Chemical resistance to solvents, acids, alkalis and hydraulic fluids
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Advantages

- Very high resistance to mechanical stresses
- Very good alternating bending strength
- High tear, abrasion and impact resistance, even at low temperatures

Application

Stranded in pairs, these fully-screened special drag chain cables can also be used where external, high-frequency interference influences pulse transfer. They are used for permanently flexible stresses in machine and tool building, in robot technology, on constantly moving machine components and for extended use in multi-shift operations.

Developed to state-of-the-art technology, these highly-flexible data cable, with a cut resistant and low-adhesion PUR outer sheath guaranteeing optimal service life and extremely good cost efficiency. This two-approvals single-core cable is preferred for use in export-oriented mechanical engineering, in machine tools, production lines and systems engineering. Guaranteed extended use in multi-shift operations with extremely high bending stresses.

EMC = Electromagnetic compatibility

To optimise the EMC characteristics we recommend a large area of contact of the copper braiding around the entire circumference on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

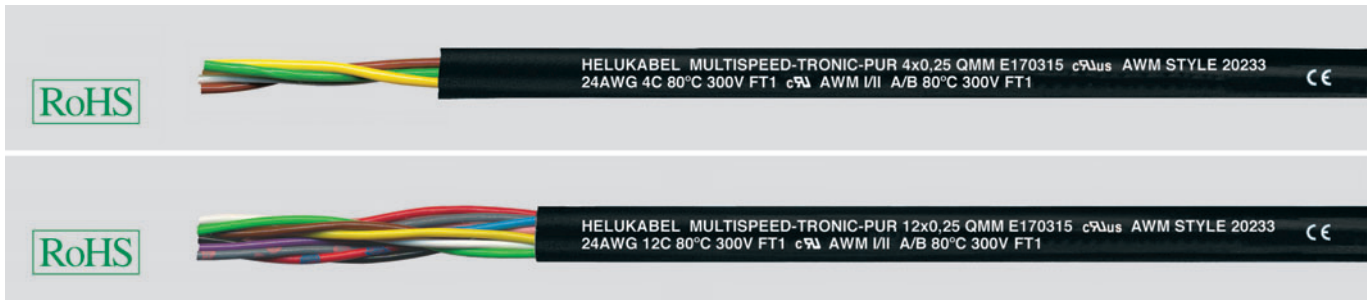
Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49830	1 x 2 x 0,25	24	4,8	14,0	26,0
49831	2 x 2 x 0,25	24	6,7	32,0	61,0
49832	3 x 2 x 0,25	24	7,1	38,4	70,0
49833	4 x 2 x 0,25	24	7,6	43,2	82,0
49834	5 x 2 x 0,25	24	8,3	51,5	99,0
49835	6 x 2 x 0,25	24	9,0	71,8	126,0
49836	8 x 2 x 0,25	24	10,5	74,4	147,0
49837	10 x 2 x 0,25	24	11,9	90,0	179,0
49838	14 x 2 x 0,25	24	12,7	111,2	210,0
49839	1 x 2 x 0,34	22	5,1	20,0	35,0
49840	2 x 2 x 0,34	22	7,2	41,0	80,0
49841	3 x 2 x 0,34	22	7,6	52,2	100,0
49842	4 x 2 x 0,34	22	8,3	59,1	118,0
49843	5 x 2 x 0,34	22	9,0	67,0	134,0
49844	6 x 2 x 0,34	22	9,9	86,4	162,0
49845	8 x 2 x 0,34	22	11,9	107,5	214,0
49846	10 x 2 x 0,34	22	13,9	131,0	270,0
49847	14 x 2 x 0,34	22	14,1	150,0	304,0
49848	1 x 2 x 0,5	20	5,8	22,5	47,0
49849	2 x 2 x 0,5	20	8,4	53,0	100,0
49850	3 x 2 x 0,5	20	9,0	72,8	131,0
49851	4 x 2 x 0,5	20	10,0	75,6	149,0
49852	5 x 2 x 0,5	20	11,0	85,7	169,0

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
49853	6 x 2 x 0,5	20	11,8	103,0	181,0
49854	8 x 2 x 0,5	20	14,2	148,4	274,0
49855	10 x 2 x 0,5	20	16,5	180,0	332,0
49856	14 x 2 x 0,5	20	16,9	218,3	390,0
49857	1 x 2 x 0,75	19	6,2	35,2	56,0
49858	2 x 2 x 0,75	19	9,2	61,4	102,0
49859	3 x 2 x 0,75	19	9,8	87,1	144,0
49860	4 x 2 x 0,75	19	11,2	95,2	160,0
49861	5 x 2 x 0,75	19	12,2	115,0	193,0
49862	6 x 2 x 0,75	19	13,2	137,1	216,0
49863	8 x 2 x 0,75	19	15,6	184,4	327,0
49864	10 x 2 x 0,75	19	18,4	259,8	451,0
49865	14 x 2 x 0,75	19	18,9	318,4	521,0
49866	1 x 2 x 1	18	6,7	42,0	64,0
49867	2 x 2 x 1	18	10,0	73,0	120,0
49868	3 x 2 x 1	18	10,8	93,6	160,0
49869	4 x 2 x 1	18	11,7	117,8	184,0
49870	5 x 2 x 1	18	13,2	139,0	217,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTISPEED®-TRONIC-PUR safety against high bending

in drag chain systems, halogen-free, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13, DIN VDE 0282 part 10 and E DIN VDE 0245 and UL-Std. 758 AWM Style 20233 and 20939.
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U_0/U 300/300 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable \varnothing
fixed installation 4x cable \varnothing
- **Radiation resistance**
up to 100×10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Colour coded to DIN 47100
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-PUR outer sheath, especially resistant against fatigue strength, extruded as filler with pressure, sheath
- Colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PUR flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B), VW-1, FT1
- Low-adhesion
- Halogen-free
- High property of alternating bending strength
- High tensile strength, abrasion- and impact resistance at low temperature
- Use in multi-shift operations under extremely high continuous bending loads
- Abrasion resistance
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced diameter, therefore lower moving masses
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- **screened analogue type:**
MULTISPEED® TRONIC-C-PUR,
see page N 106

Application

Application HELUKABEL® MULTISPEED-TRONIC-PUR installed there, where the extreme requirements for the cables are necessary. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and low speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e.g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

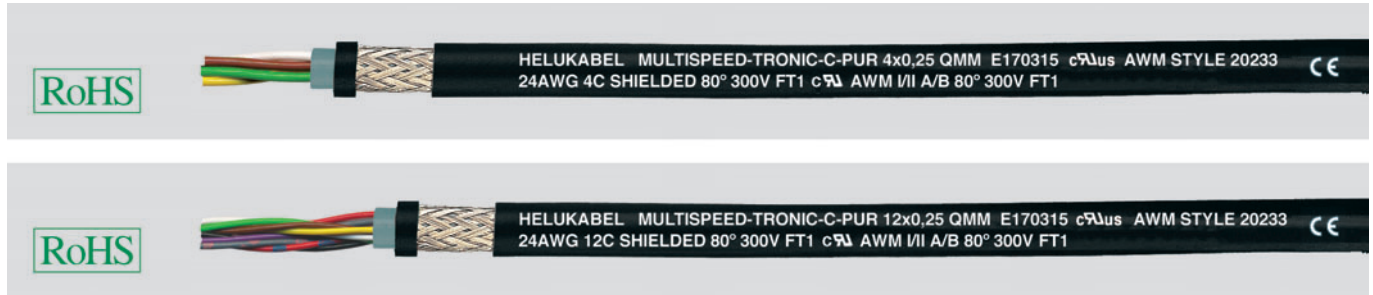
Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24567	2 x 0,25	24	3,9	5,0	27,0
24568	3 x 0,25	24	4,1	7,5	33,0
24569	4 x 0,25	24	4,4	10,0	40,0
24570	5 x 0,25	24	4,7	12,5	48,0
24571	7 x 0,25	24	6,9	17,5	60,0
24572	12 x 0,25	24	7,4	30,1	91,0
24573	18 x 0,25	24	8,9	45,0	125,0
24574	25 x 0,25	24	10,2	62,5	170,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
24575	2 x 0,34	22	4,1	6,8	32,0
24576	3 x 0,34	22	4,3	10,2	40,0
24577	4 x 0,34	22	4,6	13,6	55,0
24578	5 x 0,34	22	5,0	17,0	60,0
24579	7 x 0,34	22	7,3	23,8	80,0
24580	12 x 0,34	22	7,9	40,8	127,0
24581	18 x 0,34	22	9,7	61,2	175,0
24582	25 x 0,34	22	10,0	85,0	238,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTISPEED®-TRONIC-C-PUR safety against high

bending in drag chain systems, high flexible, halogen-free, screened, EMC-preferred type, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0281 part 13, DIN VDE 0282 part 10 and E DIN VDE 0245 and UL-Std. 758 AWM Style 20233 and 20939.
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Nominal voltage** U_0/U 300/300 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable \varnothing
fixed installation 4x cable \varnothing
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Special TPE core insulation
- Colour coded to DIN 47100
- Stranding:
<7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE inner sheath, extruded as filler with pressure, grey (RAL 7001)
- Screen of Cu braid bare, coverage 85% max., with optimal pitch
- Special-PUR outer sheath
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) VW-1, FT1
- Low-Adhesion
- Halogen-free
- High property of alternating bending strength
- High tensile strength, abrasion- and impact resistance at low temperature
- Use in multi-shift operations under extremely high continuous bending loads
- Abrasion resistance
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced \varnothing , results low weight of moving materials
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- **non screened analogue type:**
MULTISPEED® TRONIC-PUR,
see page N 105

Application

For permanent application in drag chains for long distances, high and low speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications.

For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km
24614	2 x 0,25	24	5,4	74,0	39,0	24622	2 x 0,34	22	5,6	18,0	45,0
24615	3 x 0,25	24	5,6	19,0	45,0	24623	3 x 0,34	22	5,8	22,0	60,0
24616	4 x 0,25	24	5,9	22,0	51,0	24624	4 x 0,34	22	6,1	28,0	76,0
24617	5 x 0,25	24	6,2	26,0	68,0	24625	5 x 0,34	22	6,8	31,0	82,0
24618	7 x 0,25	24	8,7	35,0	83,0	24626	7 x 0,34	22	9,3	51,0	110,0
24619	12 x 0,25	24	9,4	58,0	122,0	24627	12 x 0,34	22	9,9	70,0	166,0
24620	18 x 0,25	24	11,5	79,0	160,0	24628	18 x 0,34	22	12,3	103,0	216,0
24621	25 x 0,25	24	13,0	99,0	210,0	24629	25 x 0,34	22	13,6	130,0	312,0

Dimensions and specifications may be changed without prior notice. (RN05)



UL-Style 1007, CSA TR 65
UL-Style 1569, CSA TR 64
UL-Style 1015
DREINORM
FÜNFNORM
THHN/THWN
PVC-Single Cores
HELUTHERM® 145
UL-Style 3135
Single 600-J/-O
Single 600-CY -J/-O
Single 602-RC* -J/O
Single 602-RC*-CY -J/O
MULTISPEED® 600-PUR -J/-O
MULTISPEED® 600-C-PUR -J/-O

Photo: HELUKABEL®

UL/CSA Single Conductors

UL-Style 1007, CSA TR 64 PVC single cores, 80°C, 300V



Technical data

- PVC-single core to UL-Style and CSA-AWM
 - UL-Style 1007
 - CSA-AWM I A/B or TR 64
- **Temperature range**
flexible -5 °C bis +80 °C
fixed installation -30 °C bis +80 °C
CSA-AWM I A/B or TR 64 +90 °C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Test voltage (Spark test)**
AWG 26-20 = 4 kV
AWG 10-18 = 5 kV
- **Bending radius**
once approx. 5x core ø
multiple approx. 10x core ø

Cable structure

- Stranded copper conductor, tinned to UL-Std. 785 section G
- PVC-core insulation according to UL-Std. 1581 class 43 Tab. 50.182, heat and damp resistant

Properties

- **Conditionally resistant to**
Oils
Solvents
Acids
Lyes
- PVC self-extinguishing and flame retardant, test method to UL VW-1/CSA FT1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Please complete the above part number for the colour required, using the following table:
00 = green
01 = black
02 = blue
03 = brown
04 = red
05 = white
06 = grey
07 = violet
08 = yellow
09 = orange
10 = transparent
11 = pink
12 = beige
13 = green-yellow
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Due to design the constructional alternations may be possible.

Application

For the internal wiring of switchboards, electrical equipment, e. g. households, radio or televisions and control desks. Connecting wires in machines laid in protective tubes and flexible pipes and also for motors and transformers.

AWM = Appliance Wiring Material

For internal wirings for electrical equipment and control apparatus e.g. electronic assembly components.

UL = Underwriters Laboratories Inc. (USA)

CSA = Canadian Standards Association (Canada)

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
635xx	1 x 0,13	26	1,4	1,6	3,2
620xx	1 x 0,21	24	1,5	2,3	4,3
621xx	1 x 0,33	22	1,6	3,4	6,0
622xx	1 x 0,52	20	1,8	5,3	8,5
623xx	1 x 0,82	18	2,1	8,2	12,5

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
624xx	1 x 1,32	16	2,4	13,0	18,5
636xx	1 x 2,08	14	3,0	20,0	29,0
637xx	1 x 3,31	12	3,9	33,0	40,0
638xx	1 x 5,26	10	4,1	51,6	61,0

Dimensions and specifications may be changed without prior notice. (RN06)



Technical data

- PVC-single core to UL-Style and CSA-AWM UL-Style 1569
CSA-AWM I A/B or TR 64
- **Temperature range**
flexible -5 °C bis +105 °C
fixed installation -30 °C bis +105 °C
CSA-AWM I A/B or TR 64 +90 °C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Test voltage (Spark test)**
AWG 26-20 = 4 kV
AWG 10-18 = 5 kV
- **Bending radius**
once approx. 5x core ø
multiple approx. 10x core ø

Cable structure

- Stranded copper conductor, tinned to UL-Std. 785
- PVC-core insulation according to UL-Std. 1581 class 43 Tab. 50.182, heat and damp resistant

Properties

- **Conditionally resistant to**
Oils
Solvents
Acids
Lyes
- PVC self-extinguishing and flame retardant, test method to UL VW-1/CSA FT1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Please complete the above part number for the colour required, using the following table:
00 = green
01 = black
02 = blue
03 = brown
04 = red
05 = white
06 = grey
07 = violet
08 = yellow
09 = orange
10 = transparent
11 = pink
12 = beige
13 = green-yellow
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Due to design the constructional alternations may be possible.

Application

For the internal wiring of switchboards, electrical equipment, e. g. households, radio or televisions and control desks. Connecting wires in machines laid in protective tubes and flexible pipes and also for motors and transformers.

AWM = Appliance Wiring Material

For internal wirings for electrical equipment and control apparatus e.g. electronic assembly components.

UL = Underwriters Laboratories Inc. (USA)

CSA = Canadian Standards Association (Canada)

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
660xx	1 x 0,13	26	1,4	1,6	3,2
661xx	1 x 0,21	24	1,5	2,3	4,3
662xx	1 x 0,33	22	1,6	3,4	6,0
663xx	1 x 0,52	20	1,8	5,3	8,5
664xx	1 x 0,82	18	2,1	8,2	12,5

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
665xx	1 x 1,32	16	2,4	13,0	18,5
666xx	1 x 2,08	14	2,9	20,0	29,0
667xx	1 x 3,31	12	3,6	33,0	40,0
668xx	1 x 5,26	10	4,3	51,6	61,0

Dimensions and specifications may be changed without prior notice. (RN06)



Technical data

- PVC-single core as per UL AWM Style 1015/MTW and CSA-AWM/TEW as per UL-Style 1015 and CSA-TEW
- **Temperature range**
flexible -5 °C to +105 °C
fixed installation -30 °C to +105 °C
- **Temperature at conductor**
max. UL and CSA: +105 °C
- **Nominal voltage** 600 V
- **Test voltage (Spark test)**
AWG 24: 4 kV
AWG 22 and 20: 5 kV
AWG 18 to 10: 6 kV
AWG 8: 7,5 kV
- UL-type **AWM + MTW** 105 °C 600 V
- CSA-type **AWM + TEW** 105 °C 600 V
- **Bending radius**
once approx. 5x core ø
multiple approx. 10x core ø

Cable structure

- Stranded copper conductor, tinned or plain
AWG-sizes as per table below
- PVC-core insulation according to UL-Standard 1581, class 43 and CSA-C22.2 No. 210 UL VW-1 and CSA FT1, heat and damp resistant
- For structural reasons, constructive changes are possible

Properties

- **Conditionally resistant to**
Oils
Solvents
Acids
Lyes
- PVC self-extinguishing and flame retardant, test method to UL VW-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Please complete the above part number for the colour required, using the following table:
00 = green / 01 = black /
02 = blue / 03 = brown /
04 = red / 05 = white /
06 = grey / 07 = violet /
08 = yellow / 09 = orange /
10 = transparent / 11 = pink /
12 = beige / 13 = green-yellow /
14 = blue/white / 15 = dark blue/white
27 = white/blue
(supply up to AWG 8)

Application

For the internal wiring of switchboards, electrical equipment, e. g. households, radio or televisions and control desks. Connecting wires in machines laid in preductive tubes and flexible pipes and also for motors and transformers.

UL bzw. CSA:

AWM = Appliance Wiring Material

For internal wirings for electrical equipment and control apparatus e. g. electronic assembly components. UL-MTW: Machine Tool-Wires
CSA-TEW: Equipment/Lead Wires

MTW = Machine Tool Wire

For the electrical installation of machine tools and the relative control

UL = Underwriters Laboratories Inc. (USA)

CSA = Canadian Standards Association (Kanada)

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
601xx	1 x 0,21	24	2,2	2,3	8,0
602xx	1 x 0,33	22	2,4	3,2	10,0
603xx	1 x 0,52	20	2,5	5,0	12,0
604xx	1 x 0,81	18	2,8	7,9	16,0
605xx	1 x 1,31	16	3,1	12,6	22,0
606xx	1 x 2,08	14	3,5	20,7	31,0
607xx	1 x 3,32	12	4,0	33,0	45,0
608xx	1 x 5,26	10	4,6	51,6	65,0
609xx	1 x 8,35	8	6,5	80,6	110,0
610xx	1 x 13,29	6	8,0	125,0	175,0
611xx	1 x 21,14	4	9,5	201,0	260,0
612xx	1 x 26,65	3	10,4	253,0	340,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
613xx	1 x 33,61	2	11,3	317,0	380,0
614xx	1 x 42,38	1	13,3	399,0	500,0
615xx	1 x 53,47	1/0	13,6	500,0	615,0
616xx	1 x 67,4	2/0	15,5	631,0	750,0
617xx	1 x 84,97	3/0	17,5	792,0	900,0
618xx	1 x 107,17	4/0	19,0	996,0	1070,0
62501	1 x 127	250 kcmil	21,2	1178,0	1280,0
62601	1 x 152	300 kcmil	22,4	1410,0	1518,0
62701	1 x 178	350 kcmil	25,3	1645,0	1756,0
62801	1 x 203	400 kcmil	26,0	1902,0	2002,0
62901	1 x 254	500 kcmil	28,0	2345,0	2475,0

Dimensions and specifications may be changed without prior notice. (RN06)



Technical data

- PVC-single cores according to DIN VDE 0281 part 3 and HD 21.3 S3 UL-Style 1013 and CSA, CSA-AWM I/A/B
- **Temperature range**
H05 V-K/H07 V-K
flexing +5 °C to +70 °C
fixed installation -10 °C to +70 °C
UL/CSA +90 °C
- **Nominal voltage**
H05 V-K U₀/U 300/500 V (≤1 mm²)
H07 V-K U₀/U 450/750 V (1,5 mm²)
UL/CSA 600 V AC
- **Test voltage**
H05 V-K/H07 V-K 2000 V
- **Spark Test**
AWG 20: 5 kV
>AWG 20: 6 kV
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
for permanent bending
ca. 10-15 core ø

Cable structure

- Bare copper fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 and IEC 60228 cl. 5
- UL-Subject 758 Section G resp. ASTM B 174
- PVC core insulation T1 to DIN VDE 0281 part 1 and UL-Std. 1581, class 43, CSA-C 22.2 No. 210 Tab. 12 class H
- Core colours to DIN VDE 0293

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) UL-VW-1 CSA FT1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Tinned conductor on request.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- The cross-sections 0,5 mm², 0,75 mm² and 1,0 mm² are according to H05 V-K, the cross-sections 1,5 up to 120 mm² according to H07 V-K.

Application

Three norms approved connecting jumper wire primarily designed for exportes, used in machine tools. This wire is used for internal wiring of switchboards and electrical equipment. The approbation of HAR-UL-CSA AWM make possible an economical storekeeping and simplification of parts list.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

H05 V-K/mm²

Cross-sec. mm ² / AWG-no.	Outer Ø approx. mm	Cop. weight kg / km	black	blue	brown	red	white	grey	vio	pink	og	green	ye	gn-ye	2-col.	dk-bu	trans	o.col.
approx. RAL			9005	5015	8003	3000	1013	7000	4005	3015	2003	6018	1021	-	-	5010	-	-
Part no. 0,5 / 20	2,5	4,8	63815	63817	63818	63819	63820	63821	63822	63824	63828	63825	63823	63816	63830	63827	63826	63829
Part no. 0,75 / 19	2,65	7,2	63831	63833	63834	63835	63836	63837	63838	63840	63844	63841	63839	63832	63846	63843	63842	63845
Part no. 1 / 18	2,8	9,6	63847	63849	63850	63851	63852	63853	63854	63856	63860	63857	63855	63848	63862	63859	63858	63861

Continuation ▶

THREENORM PVC single core, UL-Style 1013 and CSA 600V



H07 V-K/mm²

Cross-sec. mm ² / AWG-no. approx. RAL	Outer Ø approx. mm	Cop. weight kg / km	black	blue	brown	red	white	grey	vio	pink	og	green	ye	gn-ye	2-col.	dk-bu	trans	o.col.
Part no. 1,5 / 16	3,05	14,4	63863	63865	63866	63867	63868	63869	63870	63872	63876	63873	63871	63864	63878	63875	63874	63877
Part no. 2,5 / 14	3,6	24,0	63879	63881	63882	63883	63884	63885	63886	63888	63892	63889	63887	63880	63894	63891	63890	63893
Part no. 4 / 12	4,1	38,0	63895	63897	63898	63899	63900	63901	63902	63904	63908	63905	63903	63896	63910	63907	63906	63909
Part no. 6 / 10	4,8	58,0	63911	63913	63914	63915	63916	63917	63918	63920	63924	63921	63919	63912	63926	63923	63922	63925
Part no. 10 / 8	6,4	96,0	63927	63929	63930	63931	63932	63933	63934	63936	63940	63937	63935	63928	63942	63939	63938	63941
Part no. 16 / 6	8,1	154,0	63943	63945	63946	63947	63948	63949	63950	63952	63956	63953	63951	63944	63958	63955	63954	63957
Part no. 25 / 4	9,6	240,0	63959	63961	63962	63963	63964	63965	63966	63968	63972	63969	63967	63960	63974	63971	63970	63973
Part no. 35 / 2	10,8	336,0	63975	63977	63978	63979	63980	63981	63982	63984	63988	63985	63983	63976	63990	63987	63986	63989
Part no. 50 / 1	13,6	480,0	63991	63993	63994	63995	63996	63997	63998	64000	64004	64001	63999	63992	64006	64003	64002	64005
Part no. 70 / 2/0	15,2	672,0	64007	64009	64010	64011	64012	64013	64014	64016	64020	64017	64015	64008	64022	64019	64018	64021
Part no. 95 / 3/0	16,8	912,0	64023	64025	64026	64027	64028	64029	64030	64032	64036	64033	64031	64024	64038	64035	64034	64037
Part no. 120 / 4/0	19,5	1152,0	64039	64041	64042	64043	64044	64045	64046	64048	64052	64049	64047	64040	64054	64051	64050	64053
Part no. 150 / 300 kcmil	22,2	1440,0	64055	64057	64058	64059	64060	64061	64062	64064	64068	64065	64063	64056	64070	64067	64066	64069

Dimensions and specifications may be changed without prior notice. (RN06)

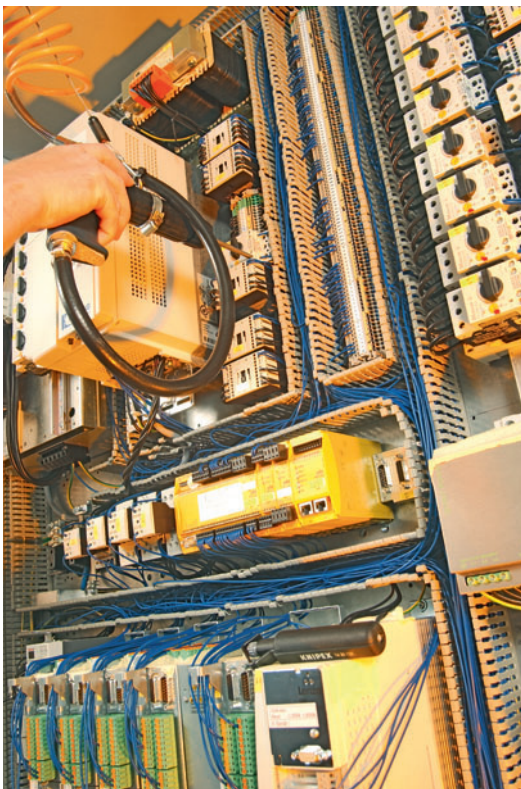


Photo: HOMAG Holzbearbeitungssysteme AG

FIVENORM HAR-UL-CSA-AWM-MTW, PVC single core, UL-Style

10269/UL-Standard 1063, 600V, 105°C



Technical data

- PVC-single cores according to DIN VDE 0281 part 7 and HD 21.7 S2, UL-Std. 1063, UL-Style 10269 and CSA-TEW and CSA-AWM I/A/B
- **Temperature range**
H05 V2-K/H07 V2-K
flexing +5 °C to +90 °C
fixed installation -40 °C to +90 °C
UL (AWM) -40 °C to +105 °C
UL (MTW) -40 °C to +90 °C
CSA (TEW) -40 °C to +105 °C
- **Nominal voltage**
H05 V2-K: U₀/U 300/500 V (up to 1 mm²)
H07 V2-K: U₀/U 450/750 V (1,5 mm²)
UL (AWM) U 1000 V
UL (MTW) U 600 V
CSA (TEW) U 600 V
- **Test voltage**
H05 V2-K/H07 V2-K 2000 V
- **Spark Test**
AWG 20: 5 kV
>AWG 20: 6 kV
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
for permanent bending
ca. 10-15 core ø

Cable structure

- Bare copper fine wire stranded to DIN VDE 0295 cl. 5, BS 6360 cl. 5, HD 383 and IEC 60228 cl. 5 and UL-Subject 758 Section G
- PVC core insulation TI3 to DIN VDE 0281 part 1 and UL-Std. 1581, class 43, CSA-C 22.2 No. 210 Tab. 12 class H
- Core colours to DIN VDE 0293
- 2-colour combination - Part No. on request

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B), UL VW-1, CSA FT1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Tinned conductor on request.
- The cross-sections 0,5 mm², 0,75 mm² and 1,0 mm² are according to H05 V2-K, the cross-sections 1,5 up to 35 mm² according to H07 V2-K, the cross-sections >35 mm² are identified as H07 V-K.
- Cross-sections up to 35 mm² is according to DIN VDE 0281 part 7. Due to this cross-section >35 mm² is the type but with an increased heat-resistant PVC-compound.
- **Type H05 V:**
approved one-colour mark: black, blue, brown, grey, orange, pink, red, turquoise, violet, white, green and yellow.
Two-coloured mark in any combination of the above individual colours.
- **Type H07 V:**
approved mark: black, blue, brown, grey, orange, pink, red, turquoise, violet, white and green-yellow.
Other marks are available as (H).

Application

Five norms approved connecting jumper wire primarily designed for exportes, used in machine tools. The approbation of HAR, UL-AWM, UL-MTW, CSA-AWM, CSA-Equipment-wire make possible an economical storekeeping and simplification of parts list.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

H05 V2-K/mm²

Cross-sec. mm ² / AWG-no.	Outer Ø approx. mm	Cop. weight kg / km	black	blue	brown	red	white	grey	vio	pink	og	green	ye	gn-ye	2-col.	dk-bu	trans	o.col.
approx. RAL			9005	5015	8003	3000	1013	7000	4005	3015	2003	6018	1021	-	-	5010	-	-
Part no. 0,5 / 20	2,5	5,2	64075	64077	64078	64079	64080	64081	64082	64084	64088	64085	64083	64076	64090	64087	64086	64089
Part no. 0,75 / 19	2,65	7,2	64091	64093	64094	64095	64096	64097	64098	64100	64104	64101	64099	64092	64106	64103	64102	64105
Part no. 1 / 18	2,8	9,6	64107	64109	64110	64111	64112	64113	64114	64116	64120	64117	64115	64108	64122	64119	64118	64121

Continuation ►

FIVENORM HAR-UL-CSA-AWM-MTW, PVC single core, UL-Style

10269/UL-Standard 1063, 600V, 105°C



H07 V2-K/mm²

Cross-sec. mm ² / AWC-no.	Outer Ø approx. mm	Cop. weight kg / km	black	blue	brown	red	white	grey	vio	pink	og	green	ye	gn-ye	2-col.	dk-bu	trans	o.col.
approx. RAL			9005	5015	8003	3000	1013	7000	4005	3015	2003	6018	1021	-	-	5010	-	-
Part no. 1,5 / 16	3,05	14,4	64123	64125	64126	64127	64128	64129	64130	64132	64136	64133	64131	64124	64138	64135	64134	64137
Part no. 2,5 / 14	3,6	24,0	64139	64141	64142	64143	64144	64145	64146	64148	64152	64149	64147	64140	64154	64151	64150	64153
Part no. 4 / 12	4,1	38,0	64155	64157	64158	64159	64160	64161	64162	64164	64168	64165	64163	64156	64170	64167	64166	64169
Part no. 6 / 10	4,8	58,0	64171	64173	64174	64175	64176	64177	64178	64180	64184	64181	64179	64172	64186	64183	64182	64185
Part no. 10 / 8	6,4	96,0	64187	64189	64190	64191	64192	64193	64194	64196	64200	64197	64195	64188	64202	64199	64198	64201
Part no. 16 / 6	8,1	154,0	64203	64205	64206	64207	64208	64209	64210	64212	64216	64213	64211	64204	64218	64215	64214	64217
Part no. 25 / 4	9,6	240,0	64219	64221	64222	64223	64224	64225	64226	64228	64232	64229	64227	64220	64234	64231	64230	64233
Part no. 35 / 2	10,8	336,0	64235	64237	64238	64239	64240	64241	64242	64244	64248	64245	64243	64236	64250	64247	64246	64249
Part no. 50 / 1	13,6	480,0	64251	64253	64254	64255	64256	64257	64258	64260	64264	64261	64259	64252	64266	64263	64262	64265
Part no. 70 / 2/0	15,2	672,0	64267	64269	64270	64271	64272	64273	64274	64276	64280	64277	64275	64268	64282	64279	64278	64281
Part no. 95 / 3/0	16,8	912,0	64283	64285	64286	64287	64288	64289	64290	64292	64296	64293	64291	64284	64298	64295	64294	64297
Part no. 120 / 4/0	19,5	1152,0	64299	64301	64302	64303	64304	64305	64306	64308	64312	64309	64307	64300	64314	64311	64310	64313
Part no. 150 / 300 kcmil	22,2	1440,0	64315	64317	64318	64319	64320	64321	64322	64324	64328	64325	64323	64316	64330	64327	64326	64329

Dimensions and specifications may be changed without prior notice. (RN06)





Technical data

- PVC + Nylon insulated single cores as per UL-Styles und NEC standard
- **Temperature range as per Styles**
THHN: 90 °C dry - NEC standard
THWN: 75 °C wet - NEC standard
AWM: UL-Styles 1316 to 1321
 105 °C dry
 80 °C in oil
AWM: UL-Styles 1452, 1453
 90 °C dry
 80 °C in oil 1000 V
MTW: UL-Styles 1408 to 1414
 90 °C dry
 80 °C in oil 600 V
- **Nominal voltage** 600 V
- **Minimum bending radius**
8x core ø
- **Test voltage (Spark test)**
 AWG 14 to AWG 10 = 7,5 kV
 AWG 8 to AWG 2/0 = 10 kV
 AWG 3/0 to AWG 4/0 = 12,5 kV
 kcmil 250 to kcmil 500 = 15 kV
 kcmil 600 to kcmil 1000 = 17,5 kV

Cable structure

- Bare copper conductor, AWG-sizes as per given table below and ASTM B-3 and ASTM B-8
- Core insulation of PVC+Nylon-outer-sheath
- Cores colour coded, colour identification see below
- Surface of jacket printed with markings:
 14 to 1000 MCM THHN (stranded) - (size)
 AWG Type MTW OR THHN OR THWN 600 V
 OR GASOLINE AND OIL RESISTANT II (UL) OR
 AWM W-51554
 14 to 10 AWG THHN (solid) - (size)
 AWG TYPE THHN OR THWN 600 V OR
 GASOLINE AND OIL RESISTANT II (UL) OR AWM

Properties

- **Resistant against**
 Oils
 Gasoline
 Water
 Acids
 Ozone
 Lyes
 Sunlight
 Abrasion

Note

- 1 kcmil = 1000 circ mils = 0,5067 mm².
- Please complete the above part number for the colour required, using the following code:
 0 = green
 1 = black
 2 = blue
 3 = brown
 4 = red
 5 = white
 6 = grey
 7 = yellow
 8 = orange
 9 = pink

Application

As flexible connecting cable in machines, switch and distribution cabinets, cable assemblies and for fixed indoor installation, in tubes and in cable conduits.

AWM = **A**ppliance **W**iring **M**aterial / For internal wirings for electrical equipment and control apparatus e.g. radio and televisions, electronic assembly component.

MTW = **M**achine **T**ool **W**ire / For the electronic installation of machine tools and the relative control.

THW = **T**hermoplastic PVC-insulated building wire, **H**eat resistant 75 °C, for **W**et and dry locations, flame retardant.

THHN = **T**hermoplastic PVC-insulated building wire, **N**ylon jacketed, 90 °C 600 V, for dry and damp locations.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	Cross-sec. mm ²	AWG-No.	AWG size	Cond. make-up n x wire Ø	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
6320x	2,08	14	0,0147	19 x 0,38	3,0	20,7	25,0
6321x	3,32	12	0,0185	19 x 0,48	3,4	33,0	37,0
6322x	5,26	10	0,0234	19 x 0,6	4,3	51,6	60,0
6323x	8,35	8	0,0295	19 x 0,75	5,5	80,6	95,0
6324x	13,39	6	0,0378	19 x 0,96	6,6	125,0	143,0
6325x	21,14	4	0,0469	19 x 1,19	8,4	201,0	229,0
6326x	26,65	3	0,053	19 x 1,336	9,1	253,0	282,0
6327x	33,61	2	0,0591	19 x 1,5	10,0	317,0	349,0
6328x	42,38	1	0,0664	19 x 1,686	11,4	399,0	449,0
6329x	53,47	1/0	0,0745	19 x 1,89	12,4	500,0	557,0
6330x	67,4	2/0	0,0837	19 x 2,126	13,7	631,0	691,0
6331x	84,97	3/0	0,094	19 x 2,387	15,0	792,0	861,0
6332x	107,17	4/0	0,1055	19 x 2,68	16,5	996,0	1069,0

Part no.	Cross-sec. mm ²	AWG-No.	AWG size	Cond. make-up n x wire Ø	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
63331	127	250 kcmil	0,0822	37 x 2,088	18,29	1178,0	1277,0
63341	152	300 kcmil	0,09	37 x 2,286	19,56	1410,0	1515,0
63351	178	350 kcmil	0,0973	37 x 2,47	21,08	1645,0	1753,0
63361	203	400 kcmil	0,104	37 x 2,7	22,35	1902,0	1998,0
63371	254	500 kcmil	0,1162	37 x 2,95	24,13	2345,0	2466,0
63381	304	600 kcmil	0,0992	61 x 2,52	26,75	2920,0	3000,0
63391	380	750 kcmil	0,1109	61 x 2,82	29,36	3658,0	3713,0
63401	507	1000 kcmil	0,128	61 x 3,25	33,27	4858,0	4796,0

Dimensions and specifications may be changed without prior notice. (RN06)

PVC single cores According to CEI-20-22 II



Technical data

- PVC-Single Cores as per Italian standard CEI 20-22 II
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage**
U₀/U 450/750 V = 1 mm² and above
U₀/U 300/500 V = 0,5 and 0,75 mm²
U₀/U 300/300 V = 0,35 mm²
- **Test voltage** 2500 V
- **Minimum bending radius**
4-6x core ø

Cable structure

- Bare fine wire stranded copper conductor to CEI 20-29 cl. 5
- PVC-core insulation R 2 up to CEI 20 II, cap. VI cl. 3

Properties

- Low smoke
- **Resistant to**
Oil
Solvents
Acids
Lyes
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

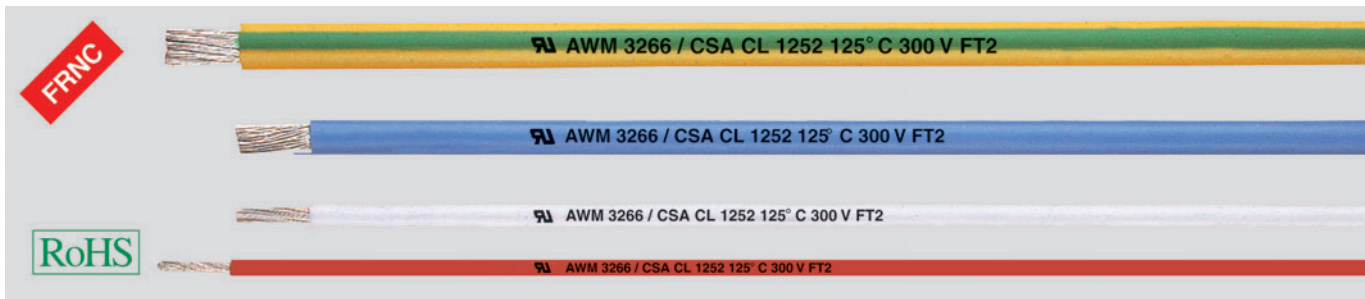
Application

As hook up wire, control cabinet building, in cable assembly manufacturing as well as in electronic applications.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	black	gn-ye	blue	brown	red	white	dk-bu	o.col.
approx. RAL				9005	-	5015	8003	3000	1013	5010	-
Part no.				29600	29601	29602	29603	29604	29605	29606	29607
0,35	1,5	2,5	3,6	-	-	-	-	-	-	-	-
Part no.				29608	29609	29610	29611	29612	29613	29614	29615
0,5	2,6	4,8	6,0	20	20	20	20	20	20	20	20
Part no.				29616	29617	29618	29619	29620	29621	29622	29623
0,75	2,8	7,2	10,0	18	18	18	18	18	18	18	18
Part no.				29624	29625	29626	29627	29628	29629	29630	29631
1	3,2	9,6	16,0	17	17	17	17	17	17	17	17
Part no.				29632	29633	29634	29635	29636	29637	29638	29639
1,5	3,5	14,4	21,0	16	16	16	16	16	16	16	16
Part no.				29640	29641	29642	29643	29644	29645	29646	29647
2,5	4,2	24,0	32,0	14	14	14	14	14	14	14	14
Part no.				29648	29649	29650	29651	29652	29653	29654	29655
4	4,6	38,0	48,0	12	12	12	12	12	12	12	12
Part no.				29656	29657	29658	29659	29660	29661	29662	29663
6	6,3	58,0	69,0	10	10	10	10	10	10	10	10
Part no.				29664	29665	29666	29667	29668	29669	29670	29671
10	7,6	96,0	117,0	8	8	8	8	8	8	8	8
Part no.				29672	29673	29674	29675	29676	29677	29678	29679
16	8,8	154,0	180,0	6	6	6	6	6	6	6	6
Part no.				29680	29681	29682	29683	29684	29685	29686	29687
25	11,0	240,0	266,0	4	4	4	4	4	4	4	4
Part no.				29688	29689	29690	29691	29692	29693	29694	29695
35	12,5	336,0	366,0	2	2	2	2	2	2	2	2
Part no.				29696	29697	29698	29699	29700	29701	29702	29703
50	14,5	480,0	515,0	1	1	1	1	1	1	1	1
Part no.				29704	29705	29706	29707	29708	29709	29710	29711
70	16,5	672,0	741,0	2/0	2/0	2/0	2/0	2/0	2/0	2/0	2/0
Part no.				29712	29713	29714	29715	29716	29717	29718	29719
95	18,5	912,0	950,0	3/0	3/0	3/0	3/0	3/0	3/0	3/0	3/0
Part no.				29720	29721	29722	29723	29724	29725	29726	29727
120	21,0	1152,0	1230,0	4/0	4/0	4/0	4/0	4/0	4/0	4/0	4/0
Part no.				29728	29729	29730	29731	29732	29733	29734	29735
150	23,0	1440,0	1500,0	300 kcmil	300 kcmil	300 kcmil	300 kcmil	300 kcmil	300 kcmil	300 kcmil	300 kcmil

Dimensions and specifications may be changed without prior notice. (RN06)



Technical data

- Halogen-free single cores with increased heat resistance according to **UL Style 3266** **CSA CL 1252**
- **Temperature range fixed**
flexing -35 °C to +120 °C
fixed installation -55 °C to +125 °C
in short circuit +280 °C
- **Nominal voltage** U₀/U 300/300 V
- **Test voltage** 2000 V
- **Minimum bending radius**
flexing approx. 12,5x core ø
fixed installation approx. 4x core ø
- **Caloric load values**
see Technical Informations
- **Power ratings table**
see Technical Informations

Cable structure

- Tinned Cu wires, according to AWG-sizes
Conductor make-up:
AWG 24 to AWG 14 = 19-wires
AWG 12 = 65-wires
AWG 10 = 105-wires
- Core insulation of polyolefin-copolymer, cross-linked, flame retardant, halogen-free
- Core colours see table below
- **Tests**
Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
Smoke density to VDE 0482 part 1034-1+2/ IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Properties

- Halogen-free
- Lower propagation of fire
- Low development of smoke and fumes
- Good abrasion and notch resistance
- Good resistance to oils and weathering
- Resistant to UV radiation and ozone
- Resistant to soldering temperatures
- Thermal class B
- These single-core cables are resistant to melting, even when in contact with a soldering iron at temperatures of between 300 °C and 380 °C, because of the electron-beam cross-linking for the insulation material
- Due to the high temperature profile the cross-section of conductor can under certain circumstances be reduced, hereby enabling a saving in space requirement and weight
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

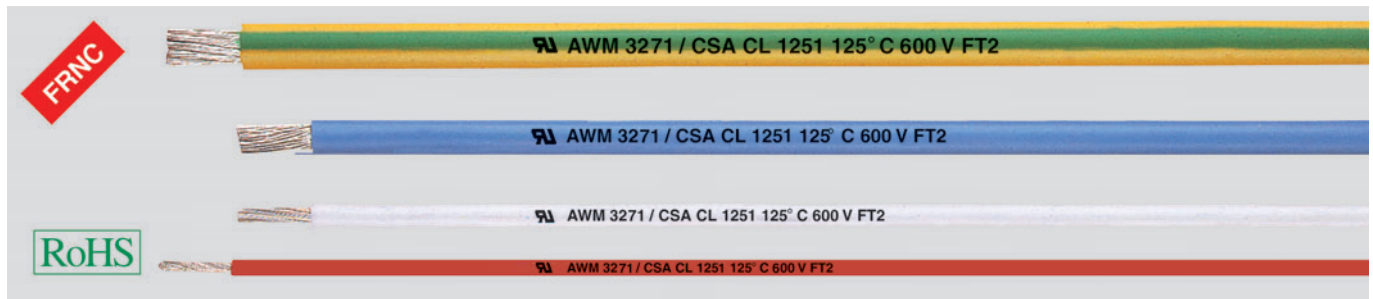
Application

These temperature resistant single-core cables are used for the internal wiring of lighting fixtures, heaters, electrical machinery, switching systems and distributors in equipment and plant and machinery, suitable for installation on, in and beneath plaster, in closed installation ducts, as well as for traffic systems and outdoor applications. These cables are not approved for direct routing on racks, gutters or tanks. For a protected installation, these cables may be used at a nominal voltage of up to 1000 V alternating current or a direct current up to 750 V when earthed. The maximum operating d.c. voltage used in rail vehicles shall not exceed 900 V when earthed. These halogen-free single core cables are characterised by their amazingly high long-time resistance to temperature and feature among the leading halogen-free. Flame resistant products in the world.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	black	brown	red	white	grey	vio	green	Beige	pink	lt-bu	og	ye	gn-ye	2-col.
approx. RAL				9005	8003	3000	1013	7000	4005	6018	1001	3015	5015	2003	1021	6018	-
Part no. 24	1,5	2,3	4,0	61817	61819	61820	61821	61822	61823	61826	61828	61827	61818	61825	61824	61816	61829
Part no. 22	1,6	3,2	6,0	61831	61833	61834	61835	61836	61837	61840	61842	61841	61832	61839	61838	61830	61843
Part no. 20	1,9	5,0	9,0	61845	61847	61848	61849	61850	61851	61854	61856	61855	61846	61853	61852	61844	61857
Part no. 18	2,1	7,9	12,0	61859	61861	61862	61863	61864	61865	61868	61870	61869	61860	61867	61866	61858	61871
Part no. 16	2,4	12,6	16,0	61873	61875	61876	61877	61878	61879	61882	61884	61883	61874	61881	61880	61872	61885
Part no. 14	2,9	20,7	27,0	61887	61889	61890	61891	61892	61893	61896	61898	61897	61888	61895	61894	61886	61899
Part no. 12	3,3	33,0	36,0	61901	61903	61904	61905	61906	61907	61910	61912	61911	61902	61909	61908	61900	61913
Part no. 10	4,1	51,6	58,0	61915	61917	61918	61919	61920	61921	61924	61926	61925	61916	61923	61922	61914	61927

Dimensions and specifications may be changed without prior notice. (RN06)



Technical data

- Halogen-free single cores with increased heat resistance according to **UL Style 3271 CSA CL 1251**
- **Temperature range**
flexing -35 °C to +120 °C
fixed installation -55 °C to +125 °C
in short circuit +280 °C
- **Nominal voltage** U 600 V
- **Test voltage** 3500 V
- **Minimum bending radius**
flexing approx. 12,5x core ø
fixed installation approx. 4x core ø
- **Caloric load values**
see Technical Informations
- **Power ratings table**
see Technical Informations

Cable structure

- Tinned Cu wires, according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Core insulation of polyolefin-copolymer, cross-linked, flame retardant, halogen-free
- Core colours see table below
- **Tests**
Flame test to VDE 0482 Teil 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
Smoke density to VDE 0482 part 1034-1+2/ IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Properties

- Halogen-free
- Lower propagation of fire
- Low development of smoke and fumes
- Good abrasion and notch resistance
- Good resistance to oils and weathering
- Resistant to UV radiation and ozone
- Resistant to soldering temperatures
- Resistant to melting, even when in contact with a soldering iron at temperatures of between 300 °C and 380 °C, because of the cross-linking for the insulation material
- Due to the high temperature profile the cross-section of conductor can under certain circumstances be reduced, hereby enabling a saving in space requirement and weight
- The materials in manufacture are cadmium-free +contain no silicone +free from substances harmful to the wetting properties of lacquers

Application

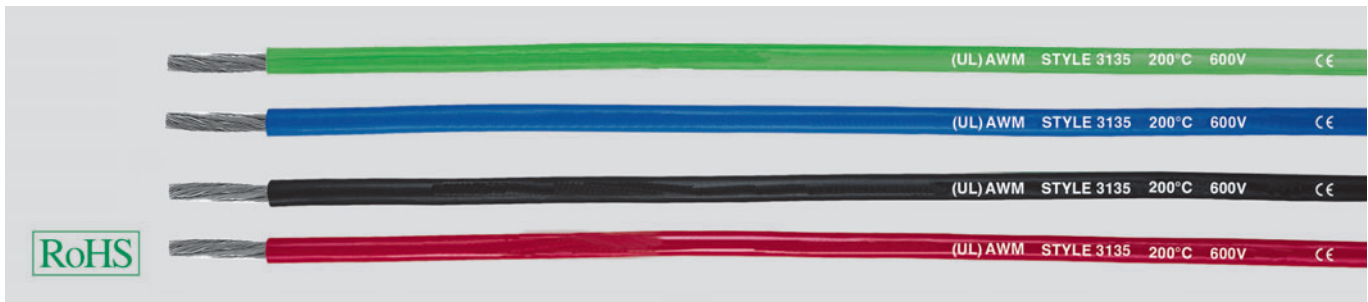
These temperature resistant single-core cables are used for the internal wiring of lighting fixtures, heaters, electrical machinery, switching systems and distributors in equipment and plant and machinery, suitable for installation on, in and beneath plaster, in closed installation ducts, as well as for traffic systems and outdoor applications. These cables are not approved for direct routing on racks, gutters or tanks. For a protected installation, these cables may be used at a nominal voltage of up to 1000 V alternating current or a direct current up to 750 V when earthed. The maximum operating d.c. voltage used in rail vehicles shall not exceed 900 V when earthed.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cross-section mm²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	black	brown	red	white	grey	vio	green	Beige	pink	lt-bu	og	ye	gn-ye	2-col.
approx. RAL				9005	8003	3000	1013	7000	4005	6018	1001	3015	5015	2003	1021	6018	-
Part no.				59473	59475	59476	59477	59478	59479	59482	59484	59483	59474	59481	59480	59472	59485
0,25	2,3	2,4	7,0														
Part no.				59487	59489	59490	59491	59492	59493	59496	59498	59497	59488	59495	59494	59486	59499
0,5	2,6	4,8	11,0														
Part no.				59501	59503	59504	59505	59506	59507	59510	59512	59511	59502	59509	59508	59500	59513
0,75	2,8	7,2	14,0														
Part no.				59515	59517	59518	59519	59520	59521	59524	59526	59525	59516	59523	59522	59514	59527
1	2,9	9,6	17,0														
Part no.				59529	59531	59532	59533	59534	59535	59538	59540	59539	59530	59537	59536	59528	59541
1,5	3,2	14,4	22,0														
Part no.				59543	59545	59546	59547	59548	59549	59552	59554	59553	59544	59551	59550	59542	59555
2,5	3,7	24,0	33,0														
Part no.				59557	59559	59560	59561	59562	59563	59566	59568	59567	59558	59565	59564	59556	59569
4	4,2	38,4	53,0														
Part no.				59571	59573	59574	59575	59576	59577	59580	59582	59581	59572	59579	59578	59570	59583
6	4,8	57,6	78,0														
Part no.				59585	59587	59588	59589	59590	59591	59594	59596	59595	59586	59593	59592	59584	59597
10	6,7	96,0	136,0														
Part no.				59599	59601	59602	59603	59604	59605	59608	59610	59609	59600	59607	59606	59598	59611
16	8,5	154,0	203,0														
Part no.				59613	59615	59616	59617	59618	59619	59622	59624	59623	59614	59621	59620	59612	59625
25	10,4	240,0	300,0														
Part no.				59627	59629	59630	59631	59632	59633	59636	59638	59637	59628	59635	59634	59626	59639
35	11,5	336,0	405,0														
Part no.				59641	59643	59644	59645	59646	59647	59650	59652	59651	59642	59649	59648	59640	59653
50	14,4	480,0	580,0														

Dimensions and specifications may be changed without prior notice. (RN06)

UL-Style 3135 silicone single cores cable, 600V / 200°C, halogen-free



Technical data

- Silicon single cores according UL subj. 758 style 3135
- **Temperature range** -60 °C to +200 °C
- **Nominal voltage** 600 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Minimum bending radius** 15x cable ø

Cable structure

- Tinned copper conductors
- Stranded see table below
- Silicon core insulation
- Core colours see below

Properties

- **Halogen-free** according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- **Resistant to** High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen

Note

- Additional sizes on request.

Application

UL-approved single cores for use in high, temperature areas. They are used mainly in the steel producing industries, in aviation industries as well as in ship building, cement, glas and ceramic factories.

AWM = Appliance Wiring Material

For internal wirings for electrical equipment and control apparatus e.g. electronic assembly components

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

AWG-No.	Conductor construction	Core Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	black	blue	brown	red	white	grey	vio	green
Part no. 24	1 x 0,5	2,1	1,9	6,3	47021	47022	47023	47024	47025	47026	47027	47076
					o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.
Part no. 22	3 x 0,4	2,4	3,6	9,2	47028	47029	47030	47031	47032	47033	47034	47071
					o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.
Part no. 20	5 x 0,4	2,6	6,0	12,3	47035	47036	47037	47038	47039	47040	47041	47072
					o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.
Part no. 18	7 x 0,4	2,8	8,6	15,5	47042	47043	47044	47045	47046	47047	47048	47073
					o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.
Part no. 16	11 x 0,4	3,0	13,3	21,0	47049	47050	47051	47052	47053	47054	47055	47074
					o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.
Part no. 14	17 x 0,4	3,4	20,5	29,7	47056	47057	47058	47059	47060	47061	47062	47075
					o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.
Part no. 12	27 x 0,4	3,8	32,6	43,2	47063	47064	47065	47066	47067	47068	47069	47070
					o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.	o. r.

Dimensions and specifications may be changed without prior notice. (RN06)

Single 600-J/-O special single core cable, 0,6/1kV, meter marking



Technical data

- Special PVC control cable according to UL-Style 10107 and CSA AWM I/II A/B, adapted to DIN VDE 0281 part 3, DIN VDE 0281 part 13, to UL-Std. 758
- **Temperature**
range flexing -5 °C bis +90 °C
fixed installation -40 °C bis +90 °C
- **Permissible operating temperature**
max. 90 °C at conductor
- **Nominal voltage** U_0/U 06/1 kV
nach UL+CSA 600V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable \varnothing
fixed installation 4x cable \varnothing
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- 1. Core insulation of special PVC, Tl2 to DIN VDE 0281 part 1 and UL-Std. 1581 class 43, colour black or green-yellow
- 2. Core insulation (jacket) of special PVC, TM2 to DIN VDE 0821 part 1 and UL Std. 1581 class 43, colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Chemical Resistance - see table Technical informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B), UL VW-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Resistant to ultra violet rays

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **screened analogue type:**
Single 600-CY -J/-O, see page N 121
- also as 1000 V Style 10678 deliverable

Application

PVC Single cores suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation). Is not suitable to be used as direct burial- or as underwater cable.

These two norms approved single cores designed for exportorientated machinery manufacturer for machine tools, conveyor belts and production lines.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Core colour	Outer Ø approx. mm	Cop. approx. weight kg / km	Weight approx. kg / km
10881	1 G 6	10	green-yellow	7,8	58,0	118,0
10882	1 x 6	10	black	7,8	58,0	118,0
10883	1 G 10	8	green-yellow	9,0	96,0	180,0
10884	1 x 10	8	black	9,0	96,0	180,0
10885	1 G 16	6	green-yellow	10,0	154,0	250,0
10886	1 x 16	6	black	10,0	154,0	250,0
10887	1 G 25	4	green-yellow	11,5	240,0	370,0
10888	1 x 25	4	black	11,5	240,0	370,0
10889	1 G 35	2	green-yellow	13,0	336,0	490,0
10890	1 x 35	2	black	13,0	336,0	490,0
10891	1 G 50	1	green-yellow	15,6	480,0	665,0
10892	1 x 50	1	black	15,6	480,0	665,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Core colour	Outer Ø approx. mm	Cop. approx. weight kg / km	Weight approx. kg / km
10893	1 G 70	2/0	green-yellow	17,9	672,0	910,0
10894	1 x 70	2/0	black	17,9	672,0	910,0
10895	1 G 95	3/0	green-yellow	19,5	912,0	1195,0
10896	1 x 95	3/0	black	19,5	912,0	1195,0
10897	1 G 120	4/0	green-yellow	22,3	1152,0	1545,0
10898	1 x 120	4/0	black	22,3	1152,0	1545,0
10899	1 G 150	300 kcmil	green-yellow	25,0	1440,0	1750,0
10900	1 x 150	300 kcmil	black	25,0	1440,0	1750,0
10901	1 G 185	350 kcmil	green-yellow	28,6	1776,0	2320,0
10902	1 x 185	350 kcmil	black	28,6	1776,0	2320,0
10903	1 G 240	500 kcmil	green-yellow	31,4	2304,0	2960,0
10904	1 x 240	500 kcmil	black	31,4	2304,0	2960,0

Dimensions and specifications may be changed without prior notice. (RN06)

Single 600-CY -J/-O special single core cable, Cu-screened, EMC-preferred type, meter marking



Technical data

- Special PVC control cable according to UL-Style 10107 and CSA AWM I/II A/B, adapted to DIN 0281 part 3, DIN VDE 0281 part 13, to UL-Std. 758
- **Temperature range**
flexing -5 °C bis +90 °C
fixed installation -40 °C bis +90 °C
- **Permissible operating temperature**
max. 90 °C at conductor
- **Nominal voltage** U_0/U 06/1 kV
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 4x cable ø
- **Coupling resistance**
max. 250 Ωm/km
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- 1. Core insulation of special PVC, TI2 to DIN VDE 0281 part 1 and UL-Std. 1581 class 43, colour black or green-yellow
- Tinned copper braided screening, coverage approx. 85%
- 2. Core insulation of special PVC, TM2 to DIN VDE 0281 part 1 and UL-Std. 1581 class 43, colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) UL VW-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Resistant to ultra violet rays

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- **unscreened analogue type:**
Single 600-J/-O, siehe Seite N 120
- also as 1000 V Style 10678 deliverable

Application

PVC Single cores suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation). Is not suitable to be used as direct burial-or as underwater cable.

These two norms approved single cores designed for exportorientated machinery manufacturer for machine tools, conveyor belts and production lines. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications (electromagnetic compatibility).

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Core colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
10910	1 G 6	10	green-yellow	7,6	72,0	140,0
10911	1 x 6	10	black	7,6	72,0	140,0
10912	1 G 10	8	green-yellow	9,4	130,0	230,0
10913	1 x 10	8	black	9,4	130,0	230,0
10914	1 G 16	6	green-yellow	10,4	190,0	300,0
10915	1 x 16	6	black	10,4	190,0	300,0
10916	1 G 25	4	green-yellow	12,0	260,0	420,0
10917	1 x 25	4	black	12,0	260,0	420,0
10918	1 G 35	2	green-yellow	14,4	405,0	615,0
10919	1 x 35	2	black	14,4	405,0	615,0
10920	1 G 50	1	green-yellow	16,4	560,0	825,0
10921	1 x 50	1	black	16,4	560,0	825,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Core colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
10922	1 G 70	2/0	green-yellow	17,4	780,0	1090,0
10923	1 x 70	2/0	black	17,4	780,0	1090,0
10924	1 G 95	3/0	green-yellow	20,1	1030,0	1395,0
10925	1 x 95	3/0	black	20,1	1030,0	1395,0
10926	1 G 120	4/0	green-yellow	23,0	1285,0	1770,0
10927	1 x 120	4/0	black	23,0	1285,0	1770,0
10928	1 G 150	300 kcmil	green-yellow	26,1	1570,0	1930,0
10929	1 x 150	300 kcmil	black	26,1	1570,0	1930,0
10930	1 G 185	350 kcmil	green-yellow	29,3	1940,0	2635,0
10931	1 x 185	350 kcmil	black	29,3	1940,0	2635,0
10932	1 G 240	500 kcmil	green-yellow	32,2	2530,0	3380,0
10933	1 x 240	500 kcmil	black	32,2	2530,0	3380,0

Dimensions and specifications may be changed without prior notice. (RN06)

Single 602-RC* -J/O special single core cable for drag chains, 90°C, 600V, meter marking



Technical data

- Special PVC control cable according to UL-Style 10107 and CSA AWM I/II AB, core according to DIN VDE 0281 part 3 (except 300 mm²)
- **Temperature range**
flexing -5 °C to +90 °C
fixed installation -40 °C to +90 °C
- **Permissible operating temperature**
max. +90 °C at conductor
- **Nominal voltage**
according to UL+CSA 600 V
U₀/U 600/1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 3x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6, however by 185 mm² up to 300 mm² with reduced single wire-ø, max. 0,30 mm
- 1. Core insulation of special PVC, TI3 to DIN VDE 0281 part 1 and UL-Std. 1581 class 43 90 °C, wall-thickness to UL-Style 10107 and DIN VDE 0281 part 3, colour black or green-yellow
- 2. Core insulation (jacket) of special PVC, YM5 to DIN VDE 0207 part 5 and UL-Std. 1581 class 43 90 °C, wall-thickness to UL-Style 10107, colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Chemical Resistance - see table Technical Informations
- Resistant to mineral oils, synthetic oils and lubricating coolants.
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B) UL VW-1
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Tests**
According to UL-Style 10107/ UL-Std. 1581, CSA C22.2 No 2-10
Core according to DIN VDE 0281 part 3 and part 1 (HD 21.3)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- 300 mm² in adaption to DIN VDE 0281
- **screened analogue type:**
Single 602-RC*-CY -J/O, see page N 123

Application

High flexible special single core cables for drag chains are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms. These two-norm cables primarily designed for exportorientated machinery manufacturer for flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts.

For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems.

Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

RC = Robotics Cable

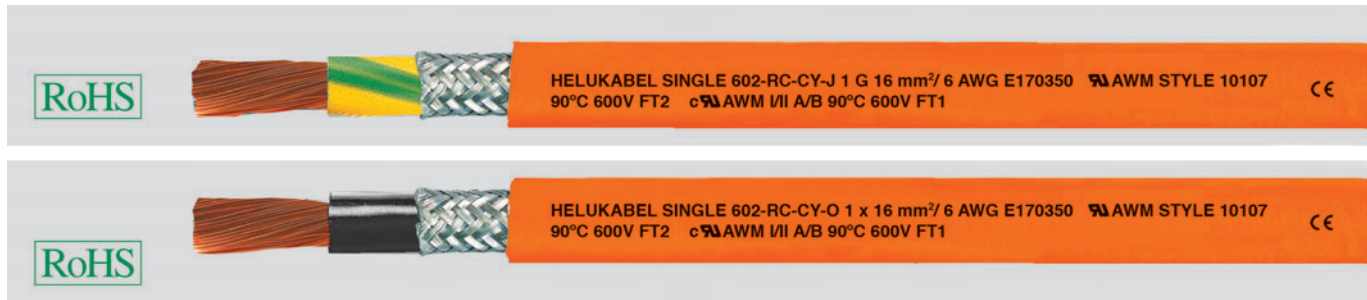
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Core colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69601	1 G 10	8	green-yellow	9,4	96,0	180,0
69602	1 x 10	8	black	9,4	96,0	180,0
69603	1 G 16	6	green-yellow	10,5	154,0	250,0
69604	1 x 16	6	black	10,5	154,0	250,0
69605	1 G 25	4	green-yellow	11,6	240,0	370,0
69606	1 x 25	4	black	11,6	240,0	370,0
69607	1 G 35	2	green-yellow	14,5	336,0	490,0
69608	1 x 35	2	black	14,5	336,0	490,0
69609	1 G 50	1	green-yellow	16,6	480,0	665,0
69610	1 x 50	1	black	16,6	480,0	665,0
69611	1 G 70	2/0	green-yellow	18,4	672,0	910,0
69612	1 x 70	2/0	black	18,4	672,0	910,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Core colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69613	1 G 95	3/0	green-yellow	20,5	912,0	1195,0
69614	1 x 95	3/0	black	20,5	912,0	1195,0
69615	1 G 120	4/0	green-yellow	23,0	1152,0	1545,0
69616	1 x 120	4/0	black	23,0	1152,0	1545,0
69617	1 G 150	300 kcmil	green-yellow	25,2	1440,0	1750,0
69618	1 x 150	300 kcmil	black	25,2	1440,0	1750,0
69619	1 G 185	350 kcmil	green-yellow	29,0	1776,0	2320,0
69620	1 x 185	350 kcmil	black	29,0	1776,0	2320,0
69621	1 G 240	500 kcmil	green-yellow	32,5	2304,0	2960,0
69622	1 x 240	500 kcmil	black	32,5	2304,0	2960,0
69623	1 G 300	600 kcmil	green-yellow	35,4	2880,0	3550,0
69624	1 x 300	600 kcmil	black	35,4	2880,0	3550,0

Dimensions and specifications may be changed without prior notice. (RN06)

Single 602-RC* -CY -J/O special single core cable for drag chains, 90°C, 600V, EMC-preferred type, meter marking



Technical data

- Special PVC control cable according to UL-Style 10107 and CSA AWM I/II A/B, core according to DIN VDE 0281 part 3 (except 300 mm²)
- **Temperature range**
flexing -5 °C to +90 °C
fixed installation -40 °C to +90 °C
- **Permissible operating temperature**
max. +90 °C at conductor
- **Nominal voltage**
according to UL+CSA 600 V
U₀/U 600/1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
flexing 7,5x cable ø
fixed installation 3x cable ø
- **Coupling resistance**
max. 250 Ωm/km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl. 6, col. 4, BS 6360 cl. 6 and IEC 60228 cl. 6, however by 185 mm² up to 300 mm² with reduced single wire-ø, max. 0,30 mm
- 1. Core insulation of special PVC, TI3 to DIN VDE 0281 part 1 and UL Std. 1581 class 43 90 °C, wall-thickness to UL-Style 10107 and DIN VDE 0281 part 3, colour black or green-yellow
- Tinned copper braided screening, coverage approx. 80%
- 2. Core insulation (jacket) of special PVC, YM5 to DIN VDE 0207 part 5 and UL-Std. 1581 class 43 90 °C, wall-thickness to UL-Style 10107, colour orange (RAL 2003)
- with meter marking, change-over in 2011

Properties

- Chemical Resistance - see table Technical Informations
- Resistant to mineral oils, synthetic oils and lubricating coolants.
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B), UL VW-1
- The materials used are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Tests**
According to UL-Style 10107/ UL Std 1581, CSA C22.2 No 210
Core according to DIN VDE 0281 part 3 and part 1 (HD 21.3)

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- 300 mm² in adaption to DIN VDE 0281.
- **non screened analogue type:**
Single 602-RC* -J/O, see page N 122

Application

High flexible special single core screened cables for drag chains are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms. These two-norm cables primarily designed for exportorientated machinery manufacturer for flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications (electromagnetic compatibility). For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

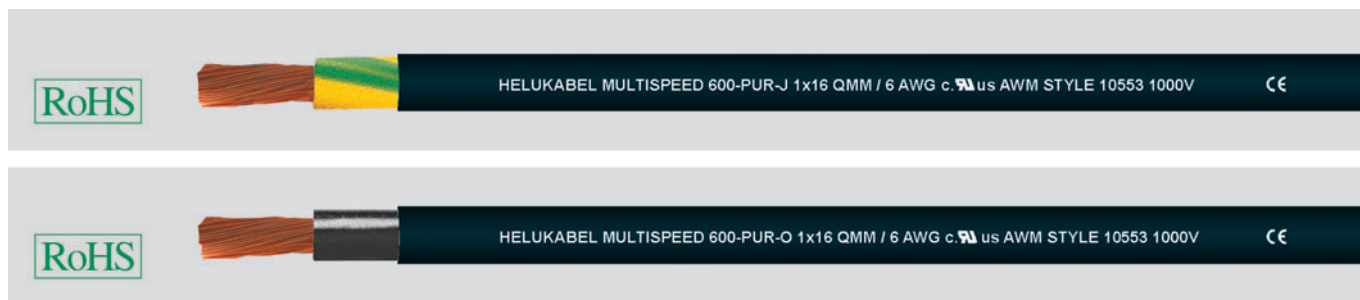
RC = Robotics Cable

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69631	1 G 10	8	10,0	130,0	230,0
69632	1 x 10	8	10,0	130,0	230,0
69633	1 G 16	6	11,1	190,0	300,0
69634	1 x 16	6	11,1	190,0	300,0
69635	1 G 25	4	12,3	260,0	420,0
69636	1 x 25	4	12,3	260,0	420,0
69637	1 G 35	2	15,1	405,0	615,0
69638	1 x 35	2	15,1	405,0	615,0
69639	1 G 50	1	17,2	560,0	825,0
69640	1 x 50	1	17,2	560,0	825,0
69641	1 G 70	2/0	19,0	780,0	1090,0
69642	1 x 70	2/0	19,0	780,0	1090,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
69643	1 G 95	3/0	22,0	1030,0	1395,0
69644	1 x 95	3/0	22,0	1030,0	1395,0
69645	1 G 120	4/0	23,6	1285,0	1770,0
69646	1 x 120	4/0	23,6	1285,0	1770,0
69647	1 G 150	300 kcmil	25,8	1570,0	1930,0
69648	1 x 150	300 kcmil	25,8	1570,0	1930,0
69649	1 G 185	350 kcmil	29,8	1940,0	2635,0
69650	1 x 185	350 kcmil	29,8	1940,0	2635,0
69651	1 G 240	500 kcmil	33,5	2530,0	3380,0
69652	1 x 240	500 kcmil	33,5	2530,0	3380,0
69653	1 G 300	600 kcmil	36,2	3140,0	4120,0
69654	1 x 300	600 kcmil	36,2	3140,0	4120,0

Dimensions and specifications may be changed without prior notice. (RN06)

MULTISPEED® 600-PUR -J/-O special single cores for drag chains, halogen-free, meter marking



Technical data

- Special drag chain core line for extreme mechanical stresses adapted to DIN VDE 0281 Part 3 and UL style 10553
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage** U_0/U 600/1000 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 5 x core \varnothing
fixed installation 3 x core \varnothing

Cable structure

- Bare copper conductor, ultra-fine wire to DIN VDE 0295 cl. 6, column 4, BS 6360 cl. 6 and/or IEC 60228 cl. 6
- 1st core insulation from thermoplastic polymer in either black or green/yellow
- 2nd core insulation from special polyurethane, TMPU adapted to DIN VDE 0282, Part 10, low-adhesion
- Sheath colour: black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Flame retardant, FT1, VW-1
- Halogen-free
- Abrasion resistant
- Very good oil resistance
- Very good alternating bending strength
- Very high resistance to mechanical stresses
- Higher notch resistance
- Ozone and UV-resistant
- Coolant resistant
- The materials used in manufacture are silicon and cadmium-free and contain no substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- **screened analogue type:**
MULTISPEED® 600-C-PUR -J/-O,
see page N 125

Application

These special drag chain core cables permit extended use with extreme requirements, with free movement, without tensile stresses or forced movements.

Suitable for installation in long traverse paths and high speeds in dry, high temperature influence in dry, moist and wet environments and in the open air. These cables can be used for all applications demanding the highest requirements in flexibility, abrasion resistance, ozone and chemical resistance.

For applications extending beyond standard solutions (e.g. composting plants or high-lift conveyor systems working at extremely low speeds), we recommend that you request our questionnaire, which has been especially designed for energy supply systems. Before installation in cable trays please read the instructions.

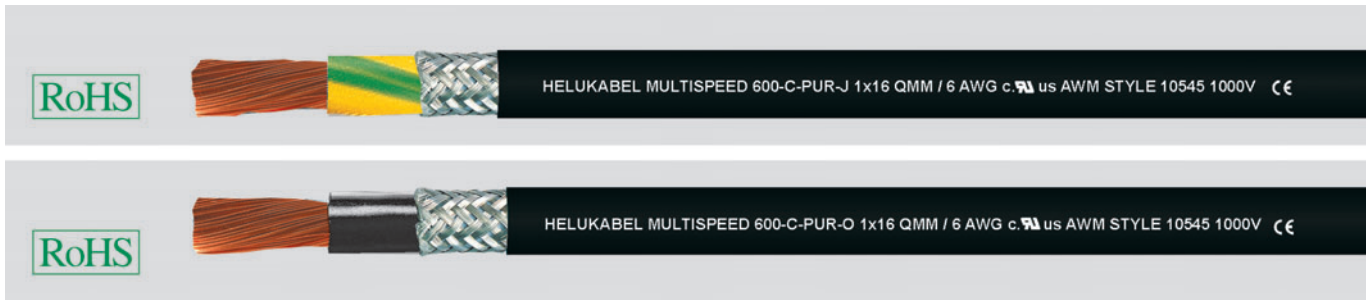
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25888	1 G 6	7,2	58,0	80,0	10
25269	1 x 6	7,2	58,0	80,0	10
25889	1 G 10	8,4	96,0	130,0	8
25270	1 x 10	8,4	96,0	130,0	8
25890	1 G 16	9,5	154,0	181,0	6
25271	1 x 16	9,5	154,0	181,0	6
25891	1 G 25	11,0	240,0	274,0	4
25272	1 x 25	11,0	240,0	274,0	4
25892	1 G 35	13,0	336,0	398,0	2
25273	1 x 35	13,0	336,0	398,0	2
25893	1 G 50	15,4	480,0	529,0	1
25274	1 x 50	15,4	480,0	529,0	1
25894	1 G 70	17,2	672,0	717,0	2/0
25275	1 x 70	17,2	672,0	717,0	2/0

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25895	1 G 95	20,0	912,0	1050,0	3/0
25276	1 x 95	20,0	912,0	1050,0	3/0
25896	1 G 120	21,0	1152,0	1240,0	4/0
25277	1 x 120	21,0	1152,0	1240,0	4/0
25897	1 G 150	23,8	1440,0	1524,0	300 kcmil
25278	1 x 150	23,8	1440,0	1524,0	300 kcmil
25898	1 G 185	26,2	1776,0	1932,0	350 kcmil
25279	1 x 185	26,2	1776,0	1932,0	350 kcmil
25899	1 G 240	29,8	2304,0	2467,0	500 kcmil
25280	1 x 240	29,8	2304,0	2467,0	500 kcmil
25900	1 G 300	33,1	2880,0	3140,0	600 kcmil
25281	1 x 300	33,1	2880,0	3140,0	600 kcmil

Dimensions and specifications may be changed without prior notice. (RN06)

MULTISPEED® 600-C-PUR -J/-O special cable for drag chains, screened, halogen-free, EMC-preferred type, meter marking



Technical data

- Special drag chain core cable for mechanical stresses adapted to DIN VDE 0281 Part 3 and UL-Style 10553
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage** U₀/U 600/1000 V
- **Test voltage** 3000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
flexing 5 x core ø
fixed installation 3 x core ø

Cable structure

- Bare copper conductor, ultra-fine wire to DIN VDE 0295 cl. 6, column 4, BS 6360 cl. 6 and/or IEC 60228 cl. 6
- 1st core insulation from thermoplastic polymer in either black or green/yellow
- Braided screen of tinned Cu wires, coverage approx. 85%
- Core wrapping with fleece
- 2nd insulation from special polyurethane, TPU adapted to DIN VDE 0282, Part 10, low-adhesion
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Flame retardant, FT1, VW-1
- Halogen-free
- Abrasion resistant
- Very good oil resistance
- Very good alternating bending strength
- Very high resistance to mechanical stresses
- Improved notch resistance
- Ozone and UV-resistant
- Coolant-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- Please observe applicable installation regulations for use in energy supply chains.
- **unscreened analogue type:**
MULTISPEED® 600-PUR -J/-O,
see page N 124

Application

These special drag chain core cables permit extended use with extreme requirements, with free movement, without tensile stresses or forced movements. Suitable for installation in long traverse paths and high speeds in dry, high temperature influence in dry, moist and wet environments and in the open air.

These cables can be used for all applications demanding the highest requirements in flexibility, abrasion resistance, ozone and chemical resistance. The copper screening assures a disturbance-free data and signal transmission for measuring and control systems. For applications extending beyond standard solutions (e.g. composting plants or high-lift conveyor systems working at extremely low speeds), we recommend that you request our questionnaire, which has been especially designed for energy supply systems. Before installation in cable trays please read the instructions.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

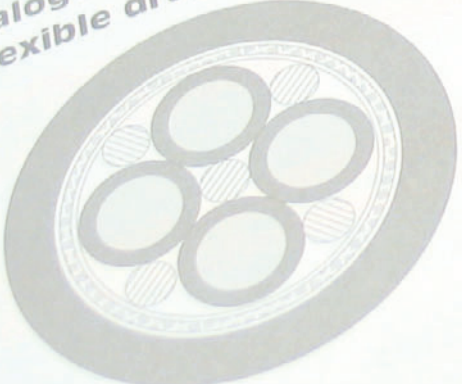
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25901	1 G 6	7,8	71,0	101,0	10
25282	1 x 6	7,8	71,0	101,0	10
25902	1 G 10	9,7	122,0	168,0	8
25283	1 x 10	9,7	122,0	168,0	8
25903	1 G 16	11,7	180,0	217,0	6
25284	1 x 16	11,7	180,0	217,0	6
25904	1 G 25	13,2	282,0	342,0	4
25285	1 x 25	13,2	282,0	342,0	4
25905	1 G 35	15,2	386,0	468,0	2
25286	1 x 35	15,2	386,0	468,0	2
25906	1 G 50	18,7	535,0	584,0	1
25287	1 x 50	18,7	535,0	584,0	1
25907	1 G 70	21,2	750,0	822,0	2/0
25288	1 x 70	21,2	750,0	822,0	2/0

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
25908	1 G 95	23,4	1004,0	1190,0	3/0
25289	1 x 95	23,4	1004,0	1190,0	3/0
25909	1 G 120	24,5	1260,0	1400,0	4/0
25290	1 x 120	24,5	1260,0	1400,0	4/0
25910	1 G 150	27,8	1570,0	1710,0	300 kcmil
25291	1 x 150	27,8	1570,0	1710,0	300 kcmil
25911	1 G 185	29,4	1911,0	2021,0	350 kcmil
25292	1 x 185	29,4	1911,0	2021,0	350 kcmil
25912	1 G 240	34,2	2451,0	2601,0	500 kcmil
25293	1 x 240	34,2	2451,0	2601,0	500 kcmil
25913	1 G 300	37,4	2997,0	3257,0	600 kcmil
25294	1 x 300	37,4	2997,0	3257,0	600 kcmil

Dimensions and specifications may be changed without prior notice. (RN06)

TOPSERV® 109 PVC according to Siemens Standard 6
 PUR, halogen-free, VDE-Reg.No..
 high flexible drag chain motor supply cable 0.6/1kV



... for static installation
 TOPSERV® 108 PVC
 TOPSERV® 112 PVC
 TOPSERV® 119 PVC
 TOPGEBER® 511 PVC

... for dynamic installation
 TOPSERV® 109 PUR
 TOPSERV® 113 PUR
 TOPSERV® 121 PUR
 TOPGEBER® 512 PUR
 TOPFLEX® 600 VFD
 TOPFLEX® 650 VFD
 TOPSERV® 600 VFD
 TOPSERV® 650 VFD
 TOPFLEX®-EMV-UV-2YSLCYK-J
 TOPFLEX®-EMV-UV-3 PLUS 2YSLCYK-J
 TOPFLEX® EMV UV 2YSLC11Y-J
 TOPFLEX® MOTOR EMV 1/1
 TOPFLEX® MOTOR EMV 3/3
 TOPFLEX® MOTOR 103
 VERTEILERFLEX Zwei-Norm

Technical data
 • Special PUR drag chain cable acc. to
 UL AWM Style 20235 CSA AWM
 • **Temperature range**
 flexing -40°C to +80°C
 fixed installation -50°C to +90°C
 • **Nominal voltage**
 acc. to UL/CSA 1000 V
 VDE U/U 600/1000 V
 range, 50 Hz

N

Photo: HELUKABEL®

UL/CSA Motor, Servo & Feedback Cables

TOPSERV® 108 PVC Motor cable without pair according to Siemens Standard 6FX5008 with PVC-outer sheath for fixed or not constantly movements 0,6/1kV



new

Technical data

- Special PVC Motorcable acc. to UL AWM Style 2570 and CSA AWM
- **Temperature range**
flexing -0 °C to +60 °C
fixed installation -20 °C to +80 °C
- **Nominal voltage**
acc. to UL/CSA 1000 V
acc. to VDE $U_0/U = 600/1000$ V
- **A.c. test voltage**, 50 Hz
power supply cores 4000 V
- **Minimum bending radius**
flexing approx. 15x cable \varnothing
fixed installation approx. 5x cable \varnothing
- max. 100.000 cycles

Cable structure

- Bare copper, fine wire conductors acc. to DIN EN 60228 cl. 5
- core insulation Polypropylen until 6mm²; PVC from 10mm²
- Black power supply cores with white imprint
- Green-yellow earth core
- power supply cores laid up with optimal lay length and stabilising filler
- Overall screening from tinned copper braid, optimal. coverage approx. 85%
- PVC outer sheath
- Sheath colour orange (RAL 2003) according to DESINA®
- with meter marking, change-over in 2011

Properties

- low capacitance until 6mm²(included)
- oilresistant PVC outer sheath
- PVC sheath flame retardant according to VDE 0482-332-1-1 to -1-3
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA®-standard
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- the corresponding Encoder cables mit PVC Jacket can be found under heading TOPGEBER® 511 PVC
- the Motorcables for application in drag chain with PUR Jacket can be found under heading TOPSERV® 109 PUR
- Brackets () indicate screen.
- Desina®: Explanation: see introduction.
- SIEMENS product designations 6FX 5008- are registered trademarks of Siemens AG, and are to be used only for purposes of comparison.

Application

low cost alternativ to Motorcables with PUR Jacket for fix instalation.The cables have an overall screen to ensure EMC compatibility, i.e. for protection against electromagnetic interference. Production is based on the specifications of established manufacturers of servo-drives and controls, as well as on various VDE, UL and CSA standards. Applications include machine, plant and robot construction, automation, drive, control and production engineering.

Attractive for export-oriented mechanical and system engineering.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C€= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
707250	(4 G 1,5)	Siemens	6FX5008-1BB11	Orange RAL 2003	8,0	78,0	118,0	16
707251	(4 G 2,5)	Siemens	6FX5008-1BB21	Orange RAL 2003	9,6	130,0	179,0	14
707252	(4 G 4)	Siemens	6FX5008-1BB31	Orange RAL 2003	11,0	198,0	260,0	12
707253	(4 G 6)	Siemens	6FX5008-1BB41	Orange RAL 2003	13,1	288,0	638,0	10
707254	(4 G 10)	Siemens	6FX5008-1BB51	Orange RAL 2003	19,3	463,0	705,0	8
707255	(4 G 16)	Siemens	6FX5008-1BB61	Orange RAL 2003	23,3	701,0	1055,0	6
707256	(4 G 25)	Siemens	6FX5008-1BB25	Orange RAL 2003	26,9	1068,0	1509,0	4
707257	(4 G 35)	Siemens	6FX5008-1BB35	Orange RAL 2003	30,3	1449,0	1976,0	2
707258	(4 G 50)	Siemens	6FX5008-1BB50	Orange RAL 2003	34,5	2096,0	2781,0	1

Dimensions and specifications may be changed without prior notice. (RN07)

TOPSERV® 112 PVC Servo cable with 1 signal pair according to Siemens Standard 6FX5008 and Lenze Standard with PVC-sheath for fixed or not constantly movements 0,6/1kV



new

Technical data

- Special PVC Motorcable acc. to UL AWM Style 2570 and 21179 CSA AWM
- **Temperature range**
flexing -0 °C to +60 °C
fixed installation -20 °C to +80 °C
- **Nominal voltage**
acc. to UL/CSA 1000 V
acc. to VDE
power supply cores U₀/U 600/1000 V
control cores U₀/U 300/500 V
- **A.c. test voltage, 50 Hz**
power supply cores 4000 V
control cores 1000V
- **Minimum bending radius**
flexing approx. 15x cable ø
fixed installation approx. 5x cable ø
- max. 100.000 cycles

Cable structure

- Bare copper, fine wire conductors acc. to DIN EN 60228 cl. 5
- core insulation Polypropylen until 6mm²; PVC from 10mm²
- Black power supply cores with white imprint
- Green-yellow earth core
- Black control cores with white imprint
- Screening of the control cores in pairs wrapped with plastic foil and tinned copper braided screening, approx. coverage 85%
- Control cores stranded in pairs and laid up in layers together with the power supply cores with optimal lay length and stabilising filler
- Overall screening from tinned copper braid, optimal. coverage approx. 85%
- PVC outer sheath
- Sheath colour orange (RAL 2003) according to DESINA®
- with meter marking

Properties

- low capacitance until 6mm²(included)
- oilresistant PVC outer sheath
- PVC sheath flame retardant according to VDE 0482-332-1-1 to -1-3
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA®-standard
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- the corresponding Encoder cables mit PVC Jacket can be found under heading TOPGEBER® 511 PVC
- the Motorcables for application in drag chain with PUR Jacket can be found under heading TOPSERV® 113 PUR
- Brackets () indicate screen.
- Desina®: Explanation: see introduction.
- SIEMENS product designations 6FX 5008- are registered trademarks of Siemens AG, and are to be used only for purposes of comparison.
- LENZE product designations are registered trademarks of LENZE AG, and are to be used only for purposes of comparison.

Application

Low cost alternativ to supply cables with PUR Jacket for fix instalation or occasional moving applications. The combination of feeder cores with the control cores for the braking function in these cables is ideal.

The cables have an overall screen to ensure EMC compatibility, i.e. for protection against electromagnetic interference. Production is based on the specifications of established manufacturers of servo-drives and controls, as well as on various VDE, UL and CSA standards. Applications include machine, plant and robot construction, automation, drive, control and production engineering.

Attractive for export-oriented mechanical and system engineering.

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
707221	(4 G 1 + (2 x 0,5))	Lenze	-	Orange RAL 2003	9,5	88,0	136,0	17
707222	(4 G 1,5 + (2 x 0,5))	Lenze	-	Orange RAL 2003	11,0	106,0	178,0	16
707223	(4 G 2,5 + (2 x 0,5))	Lenze	-	Orange RAL 2003	12,3	152,0	274,0	14
707224	(4 G 4 + (2 x 1,0))	Lenze	-	Orange RAL 2003	14,6	229,0	365,0	12
707225	(4 G 6 + (2 x 1,0))	Lenze	-	Orange RAL 2003	16,7	312,0	515,0	10

Part no.	No.cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
707280	(4 G 1,5 + (2 x 1,5))	Siemens	6FX5008-1BA11	Orange RAL 2003	10,4	140,0	190,0	16
707281	(4 G 2,5 + (2 x 1,5))	Siemens	6FX5008-1BA21	Orange RAL 2003	12,0	185,0	256,0	14
707282	(4 G 4 + (2 x 1,5))	Siemens	6FX5008-1BA31	Orange RAL 2003	13,6	257,0	341,0	12
707283	(4 G 6 + (2 x 1,5))	Siemens	6FX5008-1BA41	Orange RAL 2003	15,6	348,0	454,0	10
707284	(4 G 10 + (2 x 1,5))	Siemens	6FX5008-1BA51	Orange RAL 2003	21,0	416,0	794,0	8
707285	(4 G 16 + (2 x 1,5))	Siemens	6FX5008-1BA61	Orange RAL 2003	24,1	476,0	1125,0	6
707286	(4 G 25 + (2 x 1,5))	Siemens	6FX5008-1BA25	Orange RAL 2003	28,3	555,0	1576,0	4
707287	(4 G 35 + (2 x 1,5))	Siemens	6FX5008-1BA35	Orange RAL 2003	31,4	611,0	2049,0	2
707288	(4 G 50 + (2 x 1,5))	Siemens	6FX5008-1BA50	Orange RAL 2003	34,5	710,0	2818,0	1

Dimensions and specifications may be changed without prior notice. (RN07)

TOPSERV® 119 PVC Servo cable with 2 signal pairs analogue

Indramat Standard with PVC-sheath for fixed or not constantly movements 0,6/1kV



new

Technical data

- Special PVC Motorcable acc. to UL AWM Style 2570 CSA AWM
- **Temperature range**
flexing -0 °C to +60 °C
fixed installation -20 °C to +80 °C
- **Nominal voltage**
acc. to UL/CSA 1000 V
acc. to VDE
power supply cores U₀/U 600/1000 V
control cores U₀/U 300/500 V
- **A.c. test voltage**, 50 Hz
power supply cores 4000 V
control cores 1000V
- **Minimum bending radius**
flexing approx. 15x cable ø
fixed installation approx. 5x cable ø
- max. 100.000 cycles

Cable structure

- Bare copper, fine wire conductors acc. to DIN EN 60228 cl. 5
- core insulation Polypropylen until 6mm²; PVC from 10mm²
- Black power supply cores with white imprint
- Green-yellow earth core
- Black control cores with white imprint
- Screening of the control cores in pairs wrapped with plastic foil and tinned copper braided screening, approx. coverage 85%
- Control cores stranded in pairs and laid up in layers together with the power supply cores with optimal lay length and stabilising filler
- Overall screening from tinned copper braid, optimal. coverage approx. 85%
- PVC outer sheath
- Sheath colour orange (RAL 2003) according to DESINA®
- with meter marking

Properties

- low capacitance until 6mm²(included)
- oilresistant PVC outer sheath
- PVC sheath flame retardant according to VDE 0482-332-1-1 to -1-3
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA®-standard
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- the corresponding Encoder cables mit PVC Jacket can be found under heading TOPGEBER® 511 PVC
- the Motorcables for application in drag chain with PUR Jacket can be found under heading TOPSERV® 121 PUR
- Brackets () indicate screen.
Desina®: Explanation: see introduction.
- INDRAMAT product designations INK- are registered trademarks of Bosch Rexroth AG and are to be used only for purposes of comparison.

Application

The combination of supply cores with the control cores for the braking function and the thermal protection in these cables is ideal. Precision servomotors, as used today in many areas of highly-automated manufacturing processes, call for high-quality, reliable and long-lasting cables. These requirements are met to a high degree by these cables. The cables have an additional overall screen to ensure EMC compatibility, i.e. for protection against electromagnetic interference. Production is based on the specifications of established manufacturers of servo-drives and controls, as well as on various VDE, UL and CSA standards. Applications include machine, plant and robot construction, automation, drive, control and production engineering.

Attractive for export-oriented mechanical and system engineering.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

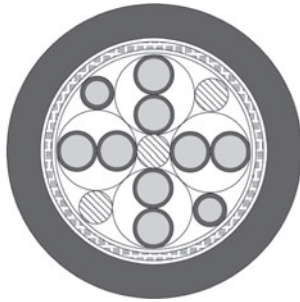
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
707290	(4 G 1 + 2 x (2 x 0,75))	Indramat	INK-0653	Orange RAL 2003	12,0	130,0	218,0	-
707291	(4 G 1,5 + 2 x (2 x 0,75))	Indramat	INK-0650	Orange RAL 2003	12,4	155,0	256,0	-
707292	(4 G 2,5 + 2 x (2 x 1,0))	Indramat	INK-0602	Orange RAL 2003	14,6	216,0	346,0	-
707293	(4 G 4 + (2 x 1,0) + (2 x 1,5))	Indramat	INK-0603	Orange RAL 2003	16,0	297,0	443,0	-
707294	(4 G 6 + (2 x 1,0) + (2 x 1,5))	Indramat	INK-0604	Orange RAL 2003	18,8	374,0	596,0	-
707295	(4 G 10 + (2 x 1,0) + (2 x 1,5))	Indramat	INK-0605	Orange RAL 2003	22,4	545,0	825,0	-
707296	(4 G 16 + 2 x (2 x 1,5))	Indramat	INK-0606	Orange RAL 2003	26,9	804,0	1217,0	-

Dimensions and specifications may be changed without prior notice. (RN07)

TOPGEBER® 511 PVC Feedback cables according to Siemens-,

Lenze- or Indramat Standard with PVC-sheath for fixed or not constantly movements



new

Technical data

- Special PVC feedback cable acc. to UL AWM style 20233 and CSA
- **Temperature range**
flexing -0 °C to +60 °C
fixed installation -20 °C to +80 °C
- **Nominal voltage**
acc. to UL 300 V
0,14-0,34 mm²: 350 V
0,5-1,0 mm²: 500 V
- **A.c. test voltage**, 50 Hz
core/core 2000 V
core/screen 1000 V
- **Minimum bending radius**
flexing approx. 12x cable ø
fixed installation approx. 6x cable ø
- max. 100.000 cycles

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6
- Core insulation of special polypropylene
- Core colours on request
- Overall screening of tinned copper wire braid with tinned drain wire, coverage approx. 85%
- Polyester foil
- PVC outer sheath
- Sheath colour green (RAL 6018) acc. to DESINA® or orange
- with meter marking, change-over in 2009
- **Colour code:**
- **Part No. 78081**
0,5 mm² whrd, whye, whbk, whbu
- **Part No. 79613**
0,5 mm² wh, bn

Properties

- low capacitance
- oilresistant PVC outer sheath
- PVC sheath flame retardant according to VDE 0482-332-1-1 to -1-3
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA®-standard
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- the corresponding Motor- and Servocables with PVC Jacket can be found under heading TOPSERV® 112 PVC
- the Encodercables for application in drag chain with PUR Jacket can be found under heading TOPGEBER® 512 PUR
- Brackets () indicate screen.
- SIEMENS product designations 6FX 5008-... are registered trademarks of Siemens AG, and are to be used only for purposes of comparison.
- INDRAMAT product designations INK- are registered trademarks of Bosch-Rexroth AG, and are to be used only for purposes of comparison.
- LENZE product designations are registered trademarks of LENZE AG, and are to be used only for purposes of comparison.
- Desina®: Explanation: see introduction.

Application

Low cost alternativ to Motorcables with PUR Jacket for fix instalation or occasional moving applications. These low-capacitance incremental encoder cables or position feedback cables transmit the control pulses for positioning and operating characteristics of servomotors. These cables are used as connecting cables for tachos, brakes and pulse generators in industrial equipment, machine tools, control and automation equipment.

EMC = Electromagnetic compatibillity

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

C€= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
707417	(4 x 2 x 0,38 + 4 x 0,5)	Siemens	6FX 5008-1BD21	Green	8,9	70,3	117,8	-
707389	(3 x (2 x 0,14) + 4 x 0,14 + 2 x 0,5)	Siemens	6FX 5008-1BD41	Green	8,8	58,0	118,9	-
707390	(3 x (2 x 0,14) + 4 x 0,14 + 4 x 0,25 + 2 x 0,5)	Siemens	6FX 5008-1BD51	Green	9,6	70,7	137,7	-
803672	(2 x 2 x 0,22 + 1 x 2 x 0,34)	Siemens	6FX 8008-2DC00	Green	6,9	38,0	61,0	-
802471	(2 x 2 x 0,22)	Siemens	6FX 8008-1DC00	Green	6,9	35,0	71,0	-
705461	(4 x 2 x 0,25 + 2 x 0,5)	Indramat	INK-0448	Orange	8,4	50,0	99,0	-
707392	(4 x 2 x 0,25 + 2 x 1,0)	Indramat	INK-0209	Orange	8,8	64,0	119,0	-
707394	(4 x 2 x 0,14 + 4 x 1,0 + (4 x 0,14))	Indramat	INK-0532	Orange	9,7	86,0	149,0	-
707077	3 x (2 x 0,14) + (2 x 0,5)	Lenze	-	Green	9,3	46,0	95,0	-
707397	4 x (2 x 0,14) + (2 x 1,0)	Lenze	-	Green	11,0	70,0	145,0	-
707398	3 x (2 x 0,14) + (3 x 0,14)	Lenze	-	Green	9,2	41,0	102,0	-

Dimensions and specifications may be changed without prior notice. (RN07)

N

TOPSERV® 109 PUR PUR, high flexible motor cable

for drag chain without pairs according to Siemens Standard
6FX8008-plus 0,6/1kV



new

Technical data

- Special PUR drag chain cable acc. to UL AWM Style 21223 CSA AWM
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage**
acc. to UL/CSA 1000 V
acc. to VDE U₀/U 600/1000 V
- **A.c. test voltage**, 50 Hz
4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Coupling resistance**
max. 250 Ωm/km
- **Minimum bending radius**
flexing approx. 7,5x cable ø
fixed installation approx. 4x cable ø

Cable structure

- Bare copper, ultra-fine wire acc. to DIN VDE 0295 cl. 6 and/or IEC 60228 cl. 6
- core insulation Polypropylen, halogen-free
- Black cores with sequential numbering imprinted in white
- Green-yellow earth core
- Cores stranded together with optimal lay-length and stabilising filler
- Fleece wrapping facilitates sliding
- Tinned copper braided screening, coverage approx. 85%
- PUR outer sheath
- Sheath colour orange (RAL 2003) according to DESINA®
- with meter marking, change-over in 2011

Properties

- Low adhesion, flame retardant, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack PUR sheath
- PUR sheath self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Optimized insulation materials ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids as well as many alkalis and solvents.
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA® standard.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- the corresponding Encoder cables can be found under TOPGEBER® 512 PUR
- the Motorcables for static application or application with occasional movement with PVC Jacket can be found under TOPSERV® 109 PVC
- SIEMENS product designations 6FX 8008-plus... are registered trademarks of Siemens AG, and are to be used only for purposes of comparison.
- For extreme applications extending beyond standard solutions we recommend that you request our questionnaire, which has been especially designed for energy supply systems.
- Please observe applicable installation regulations for use in energy supply chains.
- Desina®: Explanation: see introduction.

Application

Supply cable optimised especially for the supply of DNC motors. These cables are specially designed for use in power drag chains, handling equipment, robotics, tooling machinery, processing and manufacturing machinery.

The optimised outside diameter, reduced weight and excellent torsion characteristics facilitate use in multi-shift operation with extreme alternating bending stress cycles.

Particularly recommended as a supply cable between frequency converters and servomotors.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

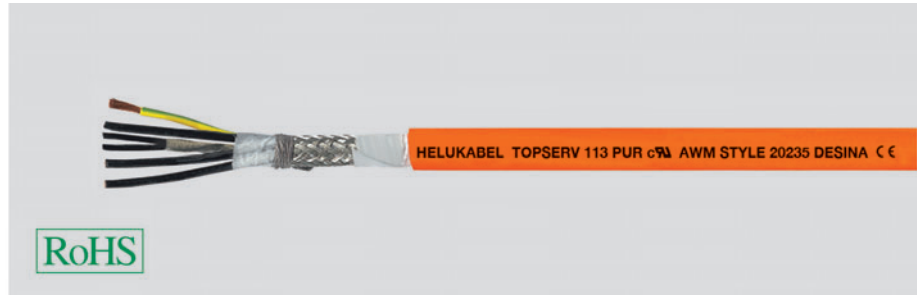
C€ = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75943	(4 G 1,5)	Siemens	6FX8008-1BB11	Orange RAL 2003	9,1	90,0	159,0	16
75944	(4 G 2,5)	Siemens	6FX8008-1BB21	Orange RAL 2003	10,6	132,0	235,0	14
75945	(4 G 4)	Siemens	6FX8008-1BB31	Orange RAL 2003	11,9	204,0	323,0	12
75946	(4 G 6)	Siemens	6FX8008-1BB41	Orange RAL 2003	14,5	315,0	464,0	10
75947	(4 G 10)	Siemens	6FX8008-1BB51	Orange RAL 2003	17,5	488,0	672,0	8
75948	(4 G 16)	Siemens	6FX8008-1BB61	Orange RAL 2003	21,6	769,0	1089,0	6
75949	(4 G 25)	Siemens	6FX8008-1BB25	Orange RAL 2003	25,4	1100,0	1523,0	4
75950	(4 G 35)	Siemens	6FX8008-1BB35	Orange RAL 2003	28,6	1510,0	2080,0	2
75951	(4 G 50)	Siemens	6FX8008-1BB50	Orange RAL 2003	33,4	2133,0	2710,0	1
700437	(4 G 70)	Siemens	6FX8008-1BB70	Orange RAL 2003	42,5	3029,0	4123,0	2/0
700897	(4 G 95)	Siemens	-	Orange RAL 2003	49,5	4606,0	0,0	3/0

Dimensions and specifications may be changed without prior notice. (RN07)

TOPSERV® 113 PUR PUR, high flexible servo cable

for drag chain with 1 signal pair according to Siemens Standard 6FX8008-plus and Lenze 0,6/1kV



new

Technical data

- Special PUR drag chain cable acc. to UL AWM Style 21223, 20234 and CSA AWM VDE-registered
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
acc. to UL/CSA 1000 V
acc. to VDE
power supply cores U_0/U 600/1000 V
control cores U_0/U 300/500 V
- **A.c. test voltage, 50 Hz**
power supply cores 4000 V
control cores 1000 V
- **Insulation resistance**
min. 20 Ohm x km
- **Coupling resistance**
max. 250 Ohm/km
- **Minimum bending radius**
flexing approx. 7,5x cable \varnothing
fixed installation approx. 4x cable

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6 and/or IEC 60228 cl. 6
- Polypropylene core insulation, halogen-free
- Black power supply cores with white imprint
- Green-yellow earth core
- Black control cores with white imprint
- Screening of the control cores in pairs wrapped with plastic aluminium foil, copper drain-wire tinned and tinned copper braided screening, approx. coverage 85%
- Control cores stranded in pairs and laid up in layers together with the power supply cores with optimal lay length and stabilising filler
- Fleece wrapping facilitates sliding
Overall screening from tinned copper braid, optimal. coverage approx. 85%
- PUR outer sheath
- Sheath colour orange (RAL 2003) according to DESINA®
- with meter marking, change-over in 2011

Properties

- low capacitance
- PUR outer sheath: low adhesion, extremely abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack
- PUR sheath: self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Optimized insulation materials ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids as well as many alkalis and solvents.
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA®-standard
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- the corresponding encoder cables with PUR jacket can be found under TOPGEBER® 512 PUR
- the Servocables for static application oder occasional movements can be found under TOPSERV® 112 PVC
- Brackets () indicate screen.
- Desina®: Explanation: see introduction.
- SIEMENS product designations 6FX 8008- are registered trademarks of Siemens AG, and are to be used only for purposes of comparison.
- LENZE product designations are registered trademarks of LENZE AG, and are to be used only for purposes of comparison.

Application

The combination of supply cores with the control cores for the braking function in these cables is ideal. Precision servomotors, as used today in many areas of highly-automated manufacturing processes, call for high-quality, reliable and long-lasting cables. These requirements are met to a high degree by these cables. The cables have an additional overall screen to ensure EMC compatibility, i.e. for protection against electromagnetic interference. Production is based on the specifications of established manufacturers of servo-drives and controls, as well as on various VDE, UL and CSA standards. Applications include machine, plant and robot construction, automation, drive, control and production engineering.

Attractive for export-oriented mechanical and system engineering.

Please observe applicable installation regulations for use in energy supply chains.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Continuation ▶

N

TOPSERV® 113 PUR PUR, high flexible servo cable

for drag chain with 1 signal pair according to Siemens Standard
6FX8008-plus and Lenze 0,6/1kV



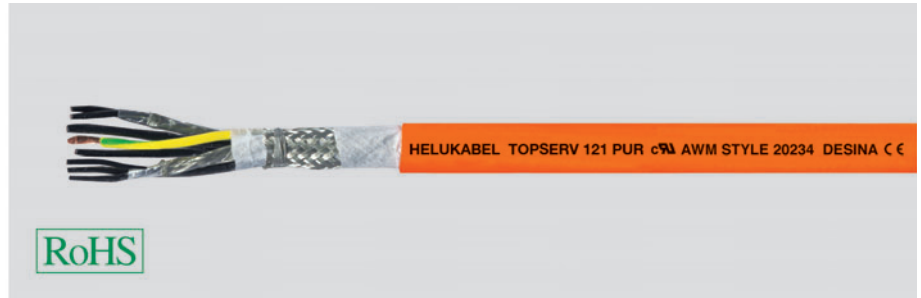
Part no.	No. cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
707228	(4 G 1 + (2 x 0,5))	Lenze	-	Orange RAL 2003	10,5	88,0	161,0	16
707229	(4 G 1,5 + (2 x 0,5))	Lenze	-	Orange RAL 2003	11,5	106,0	186,0	16
707230	(4 G 2,5 + (2 x 0,5))	Lenze	-	Orange RAL 2003	13,2	152,0	263,0	14
707231	(4 G 4 + (2 x 1,0))	Lenze	-	Orange RAL 2003	14,6	229,0	337,0	12
707232	(4 G 6 + (2 x 1,0))	Lenze	-	Orange RAL 2003	16,8	312,0	488,0	10
707746	(4 G 10 + (2 x 1,0))	Lenze	-	Orange RAL 2003	20,1	508,0	688,0	8
707747	(4 G 16 + (2 x 1,0))	Lenze	-	Orange RAL 2003	23,8	751,0	1046,0	6

Part no.	No. cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
78948	(4 G 1,5 + (2 x 1,5))	Siemens	6FX8008-1BA11	Orange RAL 2003	11,6	148,0	228,0	16
78949	(4 G 2,5 + (2 x 1,5))	Siemens	6FX8008-1BA21	Orange RAL 2003	13,4	187,0	346,0	14
78950	(4 G 4 + (2 x 1,5))	Siemens	6FX8008-1BA31	Orange RAL 2003	14,8	268,0	393,0	12
78951	(4 G 6 + (2 x 1,5))	Siemens	6FX8008-1BA41	Orange RAL 2003	16,8	358,0	519,0	10
78952	(4 G 10 + (2 x 1,5))	Siemens	6FX8008-1BA51	Orange RAL 2003	19,4	584,0	849,0	8
75956	(4 G 16 + (2 x 1,5))	Siemens	6FX8008-1BA61	Orange RAL 2003	23,1	825,0	1260,0	6
75957	(4 G 25 + (2 x 1,5))	Siemens	6FX8008-1BA25	Orange RAL 2003	26,6	1283,0	1620,0	4
75958	(4 G 35 + (2 x 1,5))	Siemens	6FX8008-1BA35	Orange RAL 2003	30,9	1850,0	2166,0	2
75959	(4 G 50 + (2 x 1,5))	Siemens	6FX8008-1BA50	Orange RAL 2003	34,0	2540,0	3039,0	1

Part no.	No. cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
77376	(4 G 1 + (2 x 0,75))	-	-	Orange RAL 2003	11,5	134,0	250,0	17
700199	(4 G 1,5 + (2 x 0,5))	-	-	Orange RAL 2003	11,5	127,0	240,0	16
74506	(4 G 1,5 + (2 x 1,0))	-	-	Orange RAL 2003	11,5	138,0	254,0	16
74507	(4 G 2,5 + (2 x 1,0))	-	-	Orange RAL 2003	13,6	177,0	328,0	14
74508	(4 G 4 + (2 x 1,0))	-	-	Orange RAL 2003	15,0	258,0	462,0	12
74514	(4 G 6 + (2 x 1,0))	-	-	Orange RAL 2003	16,1	348,0	596,0	10
74509	(4 G 10 + (2 x 1,0))	-	-	Orange RAL 2003	20,2	574,0	912,0	8
74510	(4 G 16 + (2 x 1,0))	-	-	Orange RAL 2003	23,8	815,0	1194,0	6
74511	(4 G 25 + (2 x 1,0))	-	-	Orange RAL 2003	27,0	1273,0	1499,0	4
74512	(4 G 35 + (2 x 1,0))	-	-	Orange RAL 2003	31,9	1840,0	1992,0	2
74513	(4 G 50 + (2 x 1,0))	-	-	Orange RAL 2003	36,7	2530,0	2880,0	1

Dimensions and specifications may be changed without prior notice.

TOPSERV® 121 PUR PUR, high flexible servo cable for drag chain with 2 Signal pairs according to Indramat-Standard INK



new

Technical data

- Special PUR drag chain cable acc. to UL AWM Style 20234 and CSA AWM
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
acc. to UL/CSA 1000 V
acc. to VDE
power supply cores U₀/U 600/1000 V
control cores U₀/U 300/500 V
- **A.c. test voltage**, 50 Hz
power supply cores 4000 V
control cores 1000 V
- **Insulation resistance**
min. 20 Ohm x km
- **Coupling resistance**
max. 250 Ohm/km
- **Minimum bending radius**
flexing approx. 7,5x cable ø
fixed installation approx. 4x cable ø

Cable structure

- Bare copper, ultrafine wire conductors acc. to DIN VDE 0295 Kl. 6 bzw. IEC 60228 cl. 6
- core insulation Polypropylen until 6mm²
- Black power supply cores with white imprint
- Green-yellow earth core
- Black control cores with white imprint
- Screening of the control cores in pairs wrapped with plastic aluminium foil, copper drain-wire tinned and tinned copper braided screening, approx. coverage 85%
- Control cores stranded in pairs and laid up in layers together with the power supply cores with optimal lay length and stabilising filler
- Overall screening from tinned copper braid, optimal. coverage approx. 85%
- PUR outer sheath
- Sheath colour orange (RAL 2003) according to DESINA®
- with meter marking, change-over in 2011

Properties

- low capacitance
- PUR outer sheath: low adhesion, extremely abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack
- PUR sheath: self-extinguishing and flame retardant, test method B acc. to DIN VDE 0472 part 804 and IEC 60332-1
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA®-standard
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- the corresponding Encoder cables can be found under TOPGEBER® 512 PUR
- the Servocables for stativ application oder occasional movements can be found under TOPSERV® 119 PVC
- Indramat Artikelbezeichnungen INK sind eingetragene Warenzeichen der Bosch Rexroth AG und dienen nur zu Vergleichszwecken

Application

The combination of supply cores with the control cores for the braking function and the thermal protection in these cables is ideal. Precision servomotors, as used today in many areas of highly-automated manufacturing processes, call for high-quality, reliable and long-lasting cables. These requirements are met to a high degree by these cables. The cables have an additional overall screen to ensure EMC compatibility, i.e. for protection against electromagnetic interference. Production is based on the specifications of established manufacturers of servo-drives and controls, as well as on various VDE, UL and CSA standards. Applications include machine, plant and robot construction, automation, drive, control and production engineering.

Attractive for export-oriented mechanical and system engineering.

Please observe applicable installation regulations for use in energy supply chains.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

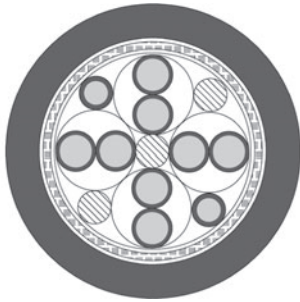
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
706003	(4 G 0,75 + (2 x 0,5))	Indramat	INK-0670	Orange RAL 2003	10,0	77,0	166,0	17
73774	(4 G 1 + 2 x (2 x 0,75))	Indramat	INK-0653	Orange RAL 2003	11,5	148,0	254,0	17
76103	(4 G 1,5 + 2 x (2 x 0,5))	-	-	Orange RAL 2003	12,4	145,0	250,0	17
73579	(4 G 1,5 + 2 x (2 x 1,0))	-	-	Orange RAL 2003	12,6	182,0	262,0	16
700561	(4 G 1,5 + 2 x (2 x 0,75))	Indramat	INK-0650	Orange RAL 2003	12,2	170,0	290,0	16
73580	(4 G 2,5 + 2 x (2 x 1,0))	Indramat	INK-0602	Orange RAL 2003	14,6	229,0	336,0	14
78955	(4 G 2,5 + 2 x (2 x 1,5))	-	-	Orange RAL 2003	15,6	241,0	350,0	14
74094	(4 G 4 + 2 x (2 x 1,0))	-	-	Orange RAL 2003	16,2	312,0	475,0	12
700562	(4 G 4 + (2 x 1,0) + (2 x 1,5))	Indramat	INK-0603	Orange RAL 2003	16,0	318,0	485,0	12
78956	(4 G 4 + 2 x (2 x 1,5))	-	-	Orange RAL 2003	16,7	324,0	490,0	12
74095	(4 G 6 + 2 x (2 x 1,0))	-	-	Orange RAL 2003	18,2	437,0	606,0	10
700563	(4 G 6 + (2 x 1,0) + (2 x 1,5))	Indramat	INK-0604	Orange RAL 2003	18,8	445,0	615,0	10
78957	(4 G 6 + 2 x (2 x 1,5))	-	-	Orange RAL 2003	19,0	450,0	621,0	10
74096	(4 G 10 + 2 x (2 x 1,0))	-	-	Orange RAL 2003	21,5	609,0	905,0	8
700564	(4 G 10 + (2 x 1,0) + (2 x 1,5))	Indramat	INK-0605	Orange RAL 2003	22,4	610,0	915,0	8
78958	(4 G 10 + 2 x (2 x 1,5))	-	-	Orange RAL 2003	22,4	625,0	925,0	8
75978	(4 G 16 + 2 x (2 x 1,5))	Indramat	INK-0606	Orange RAL 2003	26,9	904,0	1226,0	6
75979	(4 G 25 + 2 x (2 x 1,5))	Indramat	INK-0607	Orange RAL 2003	28,0	1323,0	1595,0	4
75980	(4 G 35 + 2 x (2 x 1,5))	Indramat	INK-0667	Orange RAL 2003	32,5	1621,0	2196,0	2
700565	(4 G 50 + 2 x (2 x 2,5))	Indramat	INK-0668	Orange RAL 2003	37,0	2600,0	3000,0	1

Dimensions and specifications may be changed without prior notice. (RN07)

TOPGEBER® 512 PUR PUR, high flexible Feedback

cable for drag chain according to Siemens, Indramat, Lenze and other Standards



new

Technical data

- Special PUR drag chain feedback cable acc. to UL AWM style 20233 and 20236 and CSA
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
acc. to UL 300 V
0,14-0,34 mm²: 350 V
0,5-1,0 mm²: 500 V
- **A.c. test voltage**, 50 Hz
core/core 2000 V
core/screen 1000 V
- **Mutual capacitance** at 800 Hz
core/core approx. 70 nF/km
core/screen approx. 110 nF/km
- **Insulation resistance**
min. 20 MΩm x km
- **Coupling resistance**
max. 250 Ωm
- **Minimum bending radius**
flexing approx. 10x cable ø
fixed installation approx. 6x cable ø

Cable structure

- tinned copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6
- Core insulation of special polypropylene
- Core colours on demand
- Fleece wrapping facilitates sliding
- Overall screening of tinned copper wire braid with tinned drain wire, coverage approx. 85%
- Polyester foil
- PUR outer sheath
- Sheath colour green (RAL 6018) acc. to DESINA® or orange
- with meter marking, change-over in 2011

Properties

- PUR outer sheath: low adhesion, extremely abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack
- Special feature: These cables are produced to high quality specifications and conform to the DESINA®-standard
- Due to the high grade special core insulation, the PUR sheath and the highly flexible conductor, these cables are ideally suitable for use in drag chains and provide high functional reliability
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- Particularly attractive for export-oriented markets due to UL/CSA approval
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- the corresponding Motor- and Servocables can be found under TOPSERV® 109 respectively 113 PUR
- Encoder cables for static application with PVC Jacket can be found under TOPGEBER® 511 PVC
- Brackets () indicate screen.
- SIEMENS product designations 6FX 8008-... are registered trademarks of Siemens AG, and are to be used only for purposes of comparison.
- INDRAMAT product designations INK- are registered trademarks of Bosch-Rexroth AG, and are to be used only for purposes of comparison.
- Desina®: Explanation: see introduction.

Application

These low-capacitance incremental encoder cables or position feedback cables transmit the control pulses for positioning and operating characteristics of servomotors. These cables are used as connecting cables for tachos, brakes and pulse generators in applications subjected to heavy mechanical stresses in industrial equipment, machine tools, control and automation equipment. Please observe applicable installation regulations for use in energy supply chains.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Continuation ▶

TOPGEBER® 512 PUR PUR, high flexible Feedback

cable for drag chain according to Siemens, Indramat, Lenze and other Standards



Part no.	No. cores x cross-sec. mm ²	for system	OEM Part no.	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
700655	(8 x 2 x 0,18)	Siemens	6FX 8008-1BD11	Green	7,8	54,0	79,0	24
78081	(4 x 2 x 0,38 + 4 x 0,5)	Siemens	6FX 8008-1BD21	Green	9,8	83,0	135,0	21
707400	(3 x (2 x 0,14) + 2 x 0,5)	Siemens	6FX 8008-1BD31	Green	9,0	74,0	119,0	21
700657	(3 x (2 x 0,14) + 4 x 0,14 + 2 x 0,5)	Siemens	6FX 8008-1BD41	Green	8,9	66,0	120,0	26
700540	(3 x (2 x 0,14) + 4 x 0,14 + 4 x 0,25 + 2 x 0,5)	Siemens	6FX 8008-1BD51	Green	9,6	75,0	138,0	-
700654	(4 x 2 x 0,18)	Siemens	6FX 8008-1BD61	Green	6,4	35,0	57,0	-
700653	(2 x 2 x 0,18)	Siemens	6FX 8008-1BD71	Green	5,0	24,0	42,0	-
78079	(12 x 0,25)	Siemens	6FX 8008-1BD81	Green	7,5	65,0	74,0	24
802473	(2 x 2 x 0,15 + 2 x 0,38)	Siemens	6FX 8008-2DC00	Green	7,0	41,0	72,0	-
706333	(5 x 2 x 0,25 + 2 x 0,5)	Berger Lahr	-	Green	8,8	69,0	127,0	24
705413	(3 x 2 x 0,25 + 2 x 0,5)	Elau	-	Green	7,4	43,0	82,0	24
707403	(3 x 2 x 0,25)	B+R	-	Green	6,5	31,0	60,0	24
707404	(5 x 2 x 0,14 + 2 x 0,5)	B+R	-	Green	8,7	48,0	98,0	24
707405	3 x (2 x 0,14) + (2 x 0,5)	Lenze	-	Green	9,8	42,0	98,0	24
707406	4 x (2 x 0,14) + (2 x 1,0)	Lenze	-	Green	11,3	66,0	144,0	24
707407	3 x (2 x 0,14) + (3 x 0,14)	Lenze	-	Green	10,3	41,0	127,0	24
702050	(4 x 2 x 0,25 + 2 x 1,0)	Indramat	INK-0209 grün	Green	8,8	64,0	99,0	24
78080	(4 x 2 x 0,25 + 2 x 0,5)	Indramat	INK-0448 grün	Green	8,5	51,0	106,0	24
77741	(9 x 0,5)	Indramat	INK-0208 grün	Green	8,8	69,0	124,0	20
707738	(4 x 2 x 0,25 + 2 x 1,0)	Indramat	INK-0209	Orange	8,8	64,0	99,0	20
707739	(4 x 2 x 0,25 + 2 x 0,5)	Indramat	INK-0448	Orange	8,5	51,0	106,0	20
707740	(9 x 0,5)	Indramat	INK-0208	Orange	8,8	69,0	124,0	20
707408	(4 x 2 x 0,14 + 4 x 1,0 + (4 x 0,14))	Indramat	INK-0532	Orange	9,7	81,0	142,0	20
707418	(3 x (2 x 0,25) + 3 x 0,25 + 2 x 1,0)	Indramat	INK-0280	Orange	9,0	84,0	134,7	20
707409	(2 x 2 x 0,25 + 2 x 0,5)	Indramat	INK-0750	Orange	7,2	38,0	79,0	20
77743	(3 x (2 x 0,14) + 2 x (1 x 0,5))	Heidenhain	-	Green	8,4	54,0	109,0	-
79513	(4 x 2 x 0,14 + 4 x 0,5)	Heidenhain	-	Green	8,5	52,0	100,0	26
707410	(3 x 2 x 0,14 + 2 x 1,0)	Heidenhain	-	Green	9,1	72,0	132,0	26
700560	(4 x 2 x 0,14 + (4 x 0,14) + 4 x 0,5)	Heidenhain	-	Green	8,3	81,0	104,0	-
77753	(10 x 0,14 + 2 x 0,5)	Heidenhain	-	Green	7,2	43,0	83,0	26
78963	(5 x 2 x 0,14 + 2 x 0,5)	Baumüller	-	Green	9,0	72,0	98,0	26
78828	(3 x 2 x 0,25)	-	-	Green	7,2	55,0	83,0	24
79613	(5 x 2 x 0,38 + 2 x 0,5)	-	-	Green	8,6	69,0	130,0	21
77744	(3 x (2 x 0,14) + 2 x 1,0)	-	-	Green	8,2	71,0	107,0	26
78372	(3 x 2 x 0,14 + 2 x 0,5)	-	-	Green	7,2	35,0	67,0	26
77750	(4 x (2 x 0,25) + 2 x 1,0)	-	-	Green	10,5	93,0	175,0	24
705221	(4 x 2 x 0,25)	-	-	Green	7,5	39,0	88,0	24

Dimensions and specifications may be changed without prior notice. (RN07)

TOPFLEX® 600 VFD EMC-preferred type, flexible motor power supply cable, oil-resistant, NFPA 79 Edition 2007



new



Technical data

- PVC motor supply cable according to UL 1277
- **Temperature range**
-25°C to +90°C
- **Nominal voltage**
TC 600 V
WTTC 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**
Flexing 6x cable ø
- **Coupling resistance**
Max. 250 Ohm/km

Cable structure

- Tinned copper conductor, fine wire stranded with AWG measures
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer
- Cores stranded in layers with optimal lay-lengths
- Fleece
- 1. Screening with special aluminium foil
- 2. Screening with braid of tinned copper wires, optimal coverage, approx. 85%
- Separator
- Special PVC outer jacket
- Sheath colour - black (RAL 9005) or orange (RAL 2003)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- UV-resistant
- **Tests**
UL:
TC-ER, WTTC 1000 V, MTW, NFPA 79 2007, UL 1277, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12) OIL RES I & II, 90° C dry / 75° C wet, Cold Bend Test -40°C Class 1 Div. 2 per NEC Art. 336, 392, 501
CSA:
c (UL) CIC-TC FT4, AWM I/II A/B FT4

Note

- VFD = Variable Frequency Drive

Application

Flexible, extremely oil-resistant motor supply cable for modern servomotors; the double-screening with special aluminium foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbance and the resultant failures. Approved to NFPA 79 2007 for open, unprotected installation on cable trays and from cable trays to the machine. The special PVC sheath is extremely resistant to oil, coolants and solvents and hence the perfect solution for industrial applications with open installation, installation in pipes and in the earth.

EMC = Electromagnetic compatibility

To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE = The product conforms to the EG Low-Voltage Directive 2006/95/EG

Sheath colour black

Part No.	Number of cores	Outer Ø approx. mm	Cop.Weight kg / km	Weight approx. kg / km
18 AWG / 1 mm ² (19/30)				
63139	4	9,9	52,0	164,0
16 AWG / 1,50 mm ² (26/30)				
63140	4	11,4	72,0	183,0
14 AWG / 2,50 mm ² (41/30)				
63137	4	12,5	118,0	197,0
12 AWG / 4 mm ² (65/30)				
63141	4	14,0	182,0	267,0
10 AWG / 6 mm ² (105/30)				
63142	4	17,1	256,0	402,0
8 AWG / 10 mm ² (168/30)				
63143	4	22,3	417,0	668,0
6 AWG / 16 mm ² (266/30)				
63144	4	25,4	651,0	918,0
4 AWG / 25 mm ² (413/30)				
63145	4	30,1	910,0	1363,0
2 AWG / 35 mm ² (665/30)				
63146	4	35,3	1411,0	1994,0

Sheath colour orange, Desina

Part No.	Number of cores	Outer Ø approx. mm	Cop.Weight kg / km	Weight approx. kg / km
18 AWG / 1 mm ² (19/30)				
63147	4	9,9	52,0	164,0
16 AWG / 1,50 mm ² (26/30)				
63148	4	11,4	72,0	183,0
14 AWG / 2,50 mm ² (41/30)				
63149	4	12,5	118,0	197,0
12 AWG / 4 mm ² (65/30)				
63150	4	14,0	182,0	267,0
10 AWG / 6 mm ² (105/30)				
63151	4	17,1	256,0	402,0
8 AWG / 10 mm ² (168/30)				
63152	4	22,3	417,0	668,0
6 AWG / 16 mm ² (266/30)				
63153	4	25,4	651,0	918,0
4 AWG / 25 mm ² (413/30)				
63154	4	30,1	910,0	1363,0
2 AWG / 35 mm ² (665/30)				
63155	4	35,3	1411,0	1994,0

Dimensions and specifications may be changed without prior notice. (RN01)

TOPFLEX® 650 VFD EMC-preferred type, flexible motor power supply cable with control cores, oil-resistant, NFPA 79 Edition 2007



new



Technical data

- TPE motor supply cable according to UL 1277
- **Temperature range**
Flexing -25°C to +105°C
- **Nominal voltage**
TC 600 V
WTTC 1000 V
- **Test voltage**
Power supply cores 4000 V
Control cores 2000 V
- **Minimum bending radius**
Flexing 6x cable ø
- **Coupling resistance**
Max. 250 Ohm/km

Cable structure

- Tinned copper conductor, fine wire stranded, with AWG measures
- Special PVC core insulation with transparent nylon skin
- Black supply cores with continuous white numbering
- Green-yellow earth core in the outer layer
- 2 black control cores with marking 5 and 6
- Control cores screened in pairs with plastic-coated aluminium foil, tinned drain wire
- Control cores stranded in pairs and laid up in layers with optimal lay-length with the power supply cores
- 1. Screening with plastic-coated aluminium foil
- 2. Screening from tinned Cu-braid, optimal coverage approx. 85%
- Separator
- Special TPE outer jacket
- Sheath colour - black (RAL 9005) or orange (RAL 2003)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- UV-resistant
- **Tests**
UL:
TC-ER, WTTC 1000 V, MTW, NFPA 79 2007, UL 1277, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12) OIL RES I & II, 90° C dry / 75° C wet
Class 1 Div. 2 per NEC Art. 336, 392, 501
Cold Bend Test -40°C
CSA:
c (UL) CIC-TC FT4
AWM I/II A/B FT4

Note

- VFD = Variable Frequency Drive

Application

Flexible, extremely oil-resistant motor supply cable for modern servomotors; the double-screening with special aluminium foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbance and the resultant failures. Approved to NFPA 79 2007 for open, unprotected installation on cable trays and from cable trays to the machine. The special PVC sheath is extremely resistant to oil, coolants and solvents and hence the perfect solution for industrial applications with open installation, installation in pipes and in the earth.

EMC = Electromagnetic compatibility

To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Sheath colour black

Part No.	Number of cores	Outer Ø approx. mm	Cop.Weight kg / km	Weight approx. kg / km
16 AWG / 1,50 mm ² (26/30)				
63156	4c/16 + 2c/18	13,0	88,0	259,0
14 AWG / 2,50 mm ² (41/30)				
63157	4c/14 + 2c/18	14,0	133,0	370,0
63138	4c/14 + 2c/14	14,6	159,0	399,0
12 AWG / 4 mm ² (65/30)				
63158	4c/12 + 2c/18	15,3	197,0	435,0
63159	4c/12 + 2c/14	15,7	224,0	466,0
10 AWG / 6 mm ² (105/30)				
63160	4c/10 + 2c/14	18,2	301,0	703,0
8 AWG / 10 mm ² (168/30)				
63161	4c/8 + 2c/14	24,1	457,0	901,0
6 AWG / 16 mm ² (266/30)				
63162	4c/6 + 2c/14	27,4	615,0	1275,0
4 AWG / 25 mm ² (413/30)				
63163	4c/4 + 2c/14	33,4	1450,0	1861,0

Sheath colour orange, Desina

Part No.	Number of cores	Outer Ø approx. mm	Cop.Weight kg / km	Weight approx. kg / km
16 AWG / 1,50 mm ² (26/30)				
62876	4c/16 + 2c/18	13,0	88,0	259,0
14 AWG / 2,50 mm ² (41/30)				
62877	4c/14 + 2c/18	14,0	133,0	370,0
62878	4c/14 + 2c/14	14,6	159,0	399,0
12 AWG / 4 mm ² (65/30)				
62879	4c/12 + 2c/18	15,3	197,0	435,0
62880	4c/12 + 2c/14	15,7	224,0	466,0
10 AWG / 6 mm ² (105/30)				
62881	4c/10 + 2c/14	18,2	301,0	703,0
8 AWG / 10 mm ² (168/30)				
62882	4c/8 + 2c/14	24,1	457,0	901,0
6 AWG / 16 mm ² (266/30)				
62883	4c/6 + 2c/14	27,4	615,0	1275,0
4 AWG / 25 mm ² (413/30)				
62884	4c/4 + 2c/14	33,4	1450,0	1861,0

Dimensions and specifications may be changed without prior notice. (RN01)

TOPSERV® 600 VFD EMC-preferred type, flexible motor power supply cable, oil-resistant, NFPA 79 Edition 2007



new



Technical data

- PVC motor supply cable according to UL 1277
- **Temperature range**
-25°C to +90°C
- **Nominal voltage**
TC 600 V
WTTC 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**
Flexing 5x cable ø
Permanently flexing 7,5 cable ø
- **Coupling resistance**
Max. 250 Ohm/km

Cable structure

- Tinned copper conductor, extra fine wire stranded with AWG measures
- Special PVC core insulation with transparent nylon skin
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer
- Cores stranded in layers with optimal lay-lengths
- Fleece
- 1. Screening with special aluminium foil
- 2. Screening with braid of tinned copper wires, optimal coverage, approx. 85%
- Separator
- Special PVC outer jacket
- Sheath colour - black (RAL 9005) or orange (RAL 2003)
- With length marking in feet

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- UV-resistant

Tests

UL:

TC-ER, WTTC 1000 V, MTW, NFPA 79 2007, UL 1277, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12) OIL RES I & II, 90° C dry / 75° C wet, Cold Bend Test -40°C

CSA:

c (UL) CIC-TC FT4,
AWM I/II A/B FT4

Note

- VFD = Variable Frequency Drive

Application

Flexible, extremely oil-resistant motor supply cable for modern servomotors; the double-screening with special aluminium foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbance and the resultant failures. Approved to NFPA 79 2007 for open, unprotected installation on cable trays and from cable trays to the machine. The special TPE sheath is extremely resistant to oil, coolants and solvents and hence the perfect solution for industrial applications with open installation, installation in pipes and in the earth.

EMC = Electromagnetic compatibility

To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE = The product conforms to the EG Low-Voltage Directive 2006/95/EG

Sheath colour black

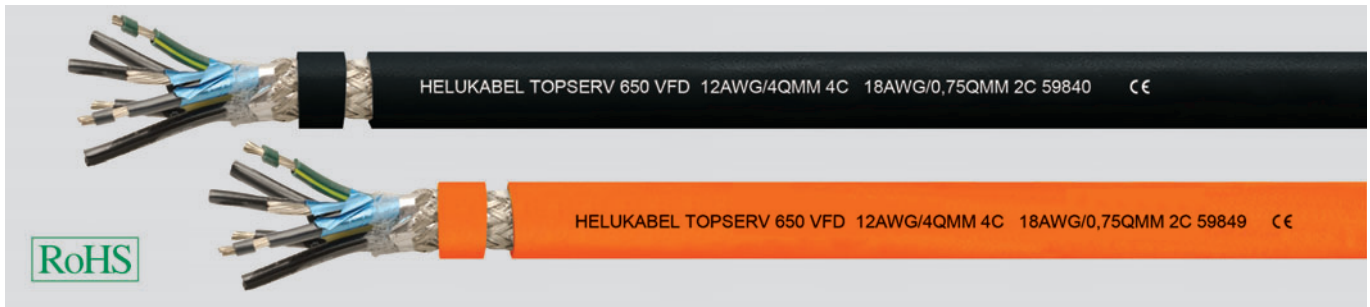
Part No.	Number of cores	Outer Ø approx. mm	Cop. Weight kg / km	Weight approx. kg / km
18 AWG / 1 mm ² (41/34)				
62607	4	9,9	38,0	163,0
5116 AWG / 1,50 mm ² (65/34)				
62608	4	11,4	51,0	184,0
14 AWG / 2,50 mm ² (105/34)				
62609	4	12,5	80,0	197,0
12 AWG / 4 mm ² (168/34)				
62610	4	14,0	127,0	266,0
10 AWG / 6 mm ² (259/34)				
62611	4	17,1	230,0	401,0
8 AWG / 10 mm ² (413/34)				
62612	4	22,3	384,0	669,0
6 AWG / 16 mm ² (665/34)				
62613	4	25,4	614,0	917,0
4 AWG / 25 mm ² (1064/34)				
62614	4	30,1	960,0	1364,0
2 AWG / 35 mm ² (1666/34)				
62615	4	35,3	1344,0	1990,0

Sheath colour orange, Desina

Part No.	Number of cores	Outer Ø approx. mm	Cop. Weight kg / km	Weight approx. kg / km
18 AWG / 1 mm ² (41/34)				
62616	4	9,9	38,0	163,0
5116 AWG / 1,50 mm ² (65/34)				
62617	4	11,4	51,0	184,0
14 AWG / 2,50 mm ² (105/34)				
62618	4	12,5	80,0	197,0
12 AWG / 4 mm ² (168/34)				
62619	4	14,0	127,0	266,0
10 AWG / 6 mm ² (259/34)				
62620	4	17,1	230,0	401,0
8 AWG / 10 mm ² (413/34)				
62621	4	22,3	384,0	669,0
6 AWG / 16 mm ² (665/34)				
62622	4	25,4	614,0	917,0
4 AWG / 25 mm ² (1064/34)				
62623	4	30,1	960,0	1364,0
2 AWG / 35 mm ² (1666/34)				
62624	4	35,3	1344,0	1990,0

Dimensions and specifications may be changed without prior notice. (RN01)

TOPSERV® 650 VFD EMC-preferred type, flexible motor power supply cable with control cores, oil-resistant, NFPA 79 Edition 2007



new

Technical data

- TPE motor supply cable according to UL 1277
- **Temperature range**
Flexing -25°C to +105°C
- **Nominal voltage**
TC 600 V
WTTC 1000 V
- **Test voltage**
Power supply cores 4000 V
Control cores 2000 V
- **Minimum bending radius**
Flexing 5x cable ø
Permanently flexing 7,5 cable ø
- **Coupling resistance**
Max. 250 Ohm/km

Cable structure

- Tinned copper conductor, fine wire stranded, with AWG measures
- Special PVC core insulation with transparent nylon skin
- Black supply cores with continuous white numbering
- Green-yellow earth core in the outer layer
- 2 black control cores with marking 5 and 6
- Control cores screened in pairs with plastic-coated aluminium foil, tinned drain wire
- Control cores stranded in pairs and laid up in layers with optimal lay-length with the power supply cores
- 1. Screening with plastic-coated aluminium foil
- 2. Screening from tinned Cu-braid, optimal coverage approx. 85%
- Separator
- Special TPE outer jacket
- Sheath colour - black (RAL 9005) or orange (RAL 2003)

Properties

- Self-extinguishing and flame retardant in accordance with CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- UV-resistant

Tests

UL:

TC-ER, WTTC 1000 V, MTW, NFPA 79 2007, UL 1277, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12) OIL RES I & II, 90° C dry / 75° C wet
Class 1 Div. 2 per NEC Art. 336, 392, 501
Cold Bend Test -40°C

CSA:

c (UL) CIC-TC FT4
AWM I/II A/B FT4

Note

- VFD = Variable Frequency Drive
- with meter marking in feet

Application

Highly-flexible, extremely oil-resistant motor supply cable for modern servomotors; the double-screening with special aluminium foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbance and the resultant failures. Approved to NFPA 79 2007 for open, unprotected installation on cable trays and from cable trays to the machine. The special TPE sheath is extremely resistant to oil, coolants and solvents and hence the perfect solution for industrial applications with open installation, installation in pipes and in the earth.

EMC = Electromagnetic compatibility

To optimise EMC characteristics, we recommend a large contact area for the copper braiding around the entire circumference on both ends.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Sheath colour black

Part No.	Number of cores	Outer Ø approx. mm	Cop.Weight kg / km	Weight approx. kg / km
59837	4c/16 + 2c/18	13,0	88,0	259,0
59838	4c/14 + 2c/18	14,0	133,0	370,0
59839	4c/14 + 2c/14	14,6	159,0	399,0
59840	4c/12 + 2c/18	15,3	197,0	435,0
59841	4c/12 + 2c/14	15,7	224,0	466,0
59842	4c/10 + 2c/14	18,2	301,0	703,0
59843	4c/8 + 2c/14	24,1	457,0	901,0
59844	4c/6 + 2c/14	27,4	615,0	1275,0
59845	4c/4 + 2c/14	33,4	1450,0	1861,0

Sheath colour orange, Desina

Part No.	Number of cores	Outer Ø approx. mm	Cop.Weight kg / km	Weight approx. kg / km
59846	4c/16 + 2c/18	13,0	88,0	259,0
59847	4c/14 + 2c/18	14,0	133,0	370,0
59848	4c/14 + 2c/14	14,6	159,0	399,0
59849	4c/12 + 2c/18	15,3	197,0	435,0
59850	4c/12 + 2c/14	15,7	224,0	466,0
59851	4c/10 + 2c/14	18,2	301,0	703,0
59852	4c/8 + 2c/14	24,1	457,0	901,0
59853	4c/6 + 2c/14	27,4	615,0	1275,0
59854	4c/4 + 2c/14	33,4	1450,0	1861,0

Dimensions and specifications may be changed without prior notice. (RN01)

TOPFLEX®-EMV-UV-2YSLCYK-J UL/CSA Motor

supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.



Technical data

- Special motor power supply cable for frequency converters to Style 2570
- **Temperature range**
flexing -5 °C bis +70 °C
fixed installation -40 °C bis +70 °C
- **Nominal voltage**
VDE - U₀/U 0,6/1 kV
UL - U 1000 V
- **Operating voltage, max.**
A.C. and 3-phase 700/1200 V
DC operation 900/1800 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 200 MOhm x km
- **Coupling resistance**
depending on the cross-section
max. 250 Ohm/km
- **Mutual capacitance**
depending on the cross-section
core/core - 70 up to 250 nF/km
core/screen - 110 up to 410 nF/km
- **Minimum bending radius**
fixed installation for outer ø:
up to 12 mm: 5x cable ø
>12 to 20 mm: 7,5x cable ø
>20 mm: 10x cable ø
free-movement for outer ø:
up to 12 mm: 10x cable ø
>12 to 20 mm: 15x cable ø
>20 mm: 20x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to style 2570
- Polyethylene (PE) core insulation
- Core colour: green-yellow, brown, black and grey
- Cores stranded in concentric layers
- 1. screening with special aluminum foil
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- Special PVC outer sheath, schwarz (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Behavior in fire: Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low mutual capacitance
- PE-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents
- Low coupling resistance for high electromagnetic compatibility
- Resistant to ultra violet rays
- This enables an extremely concentric structure
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained

Application

This TOPFLEX®-EMV-UV-2YSLCYK-J UL/CSA motor connection cable for the frequency converters secures the EMC in systems and buildings, equipment with devices and machineries, which can emit electromagnetic interference fields that can impact the environment in an illegal manner. It is used as a connection and connecting cable under average mechanical stress for fixed installations and sometimes for free movement in dry, moist and wet rooms and outside. It is used in the automotive industry, food processing industry, transfer streets, packaging industry, machine tools, handling equipment, in the industry it is used for pumps, fans, transport belts, etc.

Used in explosion proof areas.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure large-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22320	4 G 1,5	10,4					18	95,0	140,0	16
22321	4 G 2,5	12,5	80	130	18	210	26	150,0	300,0	14
22322	4 G 4	14,2	90	150	11	210	34	235,0	485,0	12
22323	4 G 6	15,2	90	150	6	150	44	320,0	630,0	10
22324	4 G 10	19,5	120	200	7	180	61	533,0	860,0	8
22325	4 G 16	22,9	140	230	9	190	82	789,0	1290,0	6
22326	4 G 25	27,1	120	210	4	95	108	1236,0	1860,0	4
22327	4 G 35	29,6	150	260	3	85	135	1662,0	2610,0	2

Continuation ▶

TOPFLEX®-EMV-UV-2YSLCYK-J UL/CSA Motor

supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22328	4 G 50	35,2	190	320	2	40	168	2345,0	2950,0	1
22329	4 G 70	41,4	190	320	2	45	207	3196,0	3950,0	2/0
22330	4 G 95	46,0	250	410	1	50	250	4316,0	5300,0	3/0
22331	4 G 120	50,8					292	5435,0	6600,0	4/0
22332	4 G 150	58,3					335	6394,0	7040,0	300 kcmil
22333	4 G 185	65,5					382	7639,0	8380,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RD01)

Tools

- Cable shears
- Box spanners
- Strippers
- Crimping tools
- Pliers
- Skinning knife



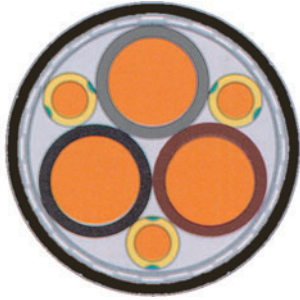
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TOPFLEX®-EMV-UV 2YSLCYK-J UL/CSA Motor

supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.



Technical data

- Special motor power supply cable for frequency converters to Style 2570
- **Temperature range**
flexing -5 °C bis +70 °C
fixed installation -40 °C bis +70 °C
- **Nominal voltage**
VDE - U₀/U 0,6/1 kV
UL - U 1000 V
- **Operating voltage, max.**
A.C. and 3-phase 700/1200 V
DC operation 900/1800 V
- **Peak value** \hat{U} 1700 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 200 MΩm x km
- **Coupling resistance**
depending on the cross-section
max. 250 Ωm/km
- **Minimum bending radius**
fixed installation for outer \varnothing :
up to 12 mm: 5x cable \varnothing
>12 to 20 mm: 7,5x cable \varnothing
>20 mm: 10x cable \varnothing
free-movement for outer \varnothing :
up to 12 mm: 10x cable \varnothing
>12 to 20 mm: 15x cable \varnothing
>20 mm: 20x cable \varnothing
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- Polyethylene (PE) core insulation
- Core colour: black, brown, grey, green-yellow (earth core divided into 3)
- Cores stranded in concentric layers
- **3+3 core design**
- 1. screening with special aluminum foil
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- Special PVC outer sheath, schwarz (RAL 9005)
- with meter marking, change-over in 2011

Properties

- Behavior in fire: Test according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- PE-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents
- Low mutual capacitance
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- The 3 Plus-construction of motor power supply cables features a symmetrical 3-core design, improved in terms of EMC characteristics comparing favorably with a 4-core version
- The protective conductor PE, divided into 3 is uniformly stranded in the interstices
- This enables an extremely concentric structure
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- The minimum cross-section of 0,75² meets the requirements of DIN EN 60204 part 1
- Resistant to ultra violet rays
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables.

Application

It is used as a connection and connecting cable under average mechanical stress for fixed installation and sometimes for free movement in dry, moist and wet rooms and outside. It is used in the automotive industry, food processing industry, transfer streets, packaging industry, machine tools, handling equipment, in the industry it is used for pumps, fans, transport belts and in air condition systems, etc. Used in explosion proof areas.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure large-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Continuation ►

TOPFLEX®-EMV-UV 2YSLCYK-J UL/CSA Motor

supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22193	(3 x 1,5 + 3 G 0,25)	10,0			18	86,0	140,0	16
22194	(3 x 2,5 + 3 G 0,5)	11,4	18	210	26	144,0	220,0	14
22195	(3 x 4 + 3 G 0,75)	13,0	11	210	34	224,0	323,0	12
22196	(3 x 6 + 3 G 1,0)	15,0	6	150	44	298,0	420,0	10
22197	(3 x 10 + 3 G 1,5)	18,4	7	180	61	491,0	615,0	8
22198	(3 x 16 + 3 G 2,5)	21,0	9	190	82	723,0	819,0	6
22199	(3 x 25 + 3 G 4,0)	25,3	4	95	108	1138,0	1325,0	4
22223	(3 x 35 + 3 G 6,0)	27,8	3	85	135	1535,0	1718,0	2
22224	(3 x 50 + 3 G 10,0)	32,6	2	40	168	2208,0	2399,0	1
22225	(3 x 70 + 3 G 10,0)	38,1	2	45	207	2871,0	3056,0	2/0
22226	(3 x 95 + 3 G 16,0)	41,0	1	50	250	3953,0	4162,0	3/0
22227	(3 x 120 + 3 G 16,0)	46,4			292	4836,0	5075,0	4/0
22228	(3 x 150 + 3 G 25,0)	53,5			335	5412,0	6128,0	300 kcmil
22229	(3 x 185 + 3 G 35,0)	59,5			382	6969,0	7189,0	350 kcmil
22230	(3 x 240 + 3 G 42,5)	65,1				8540,0	9540,0	500 kcmil

Dimensions and specifications may be changed without prior notice. (RD01)

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TOPFLEX®-EMV-UV 2YSLC11Y-J UL/CSA Motor

supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.



new

Technical data

- Special PUR motor power supply cable for frequency converters to UL AWM style 20234 and CSA AWM adapted to DIN VDE 0250
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage**
to UL 1000 V
to VDE U₀/U 0,6/1 kV
- **A.c. test voltage**, 50 Hz
3000 V
- **Mutual capacitance** at 4 kHz,
according to different cross-sections
core/core 70 to 250 nF/km
core/screen 110 to 410 nF/km
- **Insulation resistance**
min. 200 MOhm x km
- **Minimum bending radius**
fixed installation for outer ø:
up to 12 mm: approx. 5x cable ø
>12 to 20 mm: approx. 7,5x cable ø
>20 mm: approx. 10x cable ø
free-movement for outer ø:
up to 12 mm: approx. 10x cable ø
>12 to 20 mm: approx. 15x cable ø
>20 mm: approx. 20x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation-resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 or IEC 60228 cl. 5
- Polyethylen (PE) core insulation
- Core colours: black, brown, grey, green-yellow
- Cores stranded in concentric layers
- 1. screening with special aluminium film
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- PUR-outer sheath
- Sheath colour black (RAL 9005)
- with meter marking, change-over in 2011

Properties

- PUR outer sheath: low adhesion, flame retardant, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- PUR sheath: self-extinguishing and flame retardant, to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Low mutual capacitance, to DIN VDE 0472 part 504, test method B
- Features PE-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents
- Low mutual capacitance
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- UV-resistant
- Outdoor application
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained

Application

This TOPFLEX®-EMV-UV-2YSLC11Y-J UL/CSA motor power supply cable with PUR outer sheath for the frequency converters assures electromagnetic compatibility in plants and buildings, facilities with units and operating equipment where the fields of electromagnetic interference might cause adverse effects on the surroundings. As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments and for outdoor applications. Used in the automotive and food industries, environmental technology, packaging industry, machine tools. Handling equipment, for SIMOVERT drives, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications.

Installation in hazardous areas.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure large-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22389	4 G 1,5	10,3	70	110			21	95,0	230,0	16
22390	4 G 2,5	12,3	80	130	18	210	31	150,0	300,0	14
22391	4 G 4	13,9	90	150	11	210	40	235,0	485,0	14
22392	4 G 6	15,3	90	150	6	150	52	320,0	630,0	14
22393	4 G 10	19,5	120	200	7	180	72	533,0	860,0	14

Continuation ▶

TOPFLEX®-EMV-UV 2YSLC11Y-J UL/CSA Motor

supply cable 0,6/1kV, for power supply connections to frequency converters, double screened, meter marking.



Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
22394	4 G 16	23,3	140	230	9	190	96	789,0	1290,0	14
22395	4 G 25	27,4	120	211	4	95	127	1180,0	1800,0	14
22396	4 G 35	30,3	150	260	3	85	158	1662,0	2610,0	14
22397	4 G 50	35,5	190	320	2	40	192	2345,0	2950,0	14
22398	4 G 70	40,2	190	320	2	45	246	3196,0	3950,0	14
22399	4 G 95	44,5	250	410	1	50	295	4316,0	5300,0	14
22566	4 G 120	50,3					344	5435,0	6600,0	14
22567	4 G 150	56,1					395	6394,0	7040,0	14
22568	4 G 185	58,0					450	7639,0	8380,0	14

Dimensions and specifications may be changed without prior notice. (RD01)

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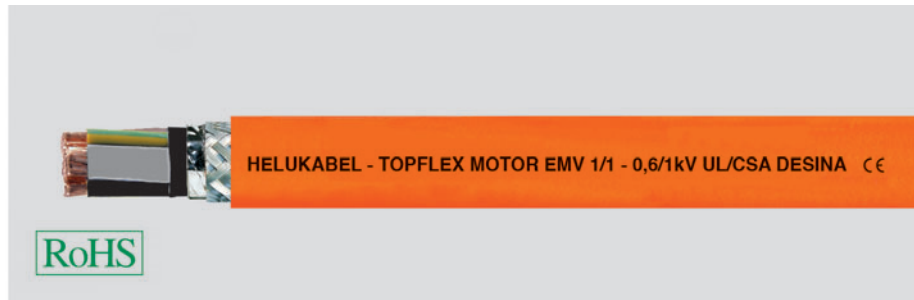
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TOPFLEX® MOTOR EMV 1/1 triple-screened, low capacitance, 80°C 600V high flexible motor supply cable, meter marking



Technical data

- Special PUR motor power supply cable for frequency converter to UL AWM Style 20234 and CSA AWM based on DIN VDE 0250
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
acc. to UL 1000 V
acc. to VDE U₀/U 0,6/1 kV
- **A.c. test voltage**, 50 Hz
3000 V
- **Mutual capacitance** at 4 kHz,
depending on conductor cross-section
core/core 70-250 nF/km
core/screen 110-410 nF/km
- **Insulation resistance**
min. 200 MΩm x km
- **Minimum bending radius**
fixed installation,
for outside Ø to 12 mm = 5x cable Ø
12 to 20 mm = 7,5x cable Ø
> 20 mm = 10x cable Ø
free-movement,
for outside Ø to 12 mm = 10x cable Ø
12 to 20 mm = 15x cable Ø
> 20 mm = 20x cable Ø
- **Coupling resistance**
max. 250 Ωm/km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire in acc. with DIN VDE 0295 cl. 5 and IEC 60228 cl. 5
- Special polyethylene (PE) core insulation
- Core colours black, brown, grey
- Green-yellow earth core
- Cores stranded in layers
- Screen of semi-conductive fleece, aluminium-coated polyester film and tinned copper braiding, coverage approx. 85%
- PUR outer sheath
- Sheath colour orange (RAL 2003) according to DESINA®
- with meter marking, change-over in 2011

Properties

- PUR outer sheath: low adhesion, flame retardant, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- PUR sheath: self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- This screened motor power supply cable, with low mutual capacitance because of the special PE core insulation, enables low-loss transmission of power compared to PVC-sheathed power supply cables
- The optimal triple screening enables interference-free operation of frequency converters
- Optimum compliance with requirements for electromagnetic compatibility (EMC) due to the triple screening
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Low mutual capacitance: tested acc. to DIN VDE 0472 part 504, test method B

Application

This TOPFLEX® MOTOR EMV 1/1 two-approvals, triple-screened motor power supply cable for frequency converters provides outstanding EMC in machines and systems.

Suitable as a supply and connecting cable for high mechanical stresses, in fixed installations and occasional free movements in dry, moist and wet environments, as well as outdoors.

Areas of application include machine tools, processing and manufacturing machinery, machining centres, industrial robots, transfer lines, handling equipment, etc.

EMC = Electromagnetic compatibility

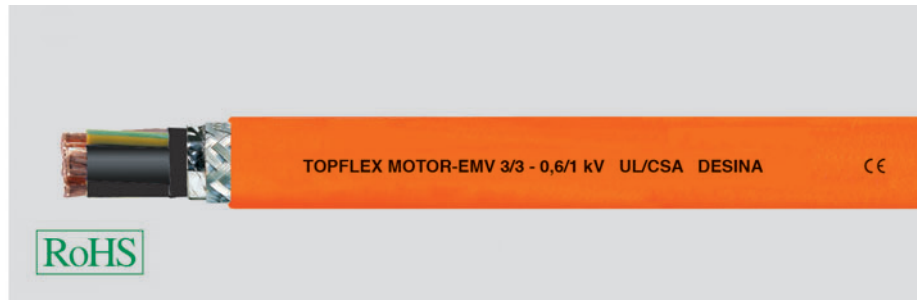
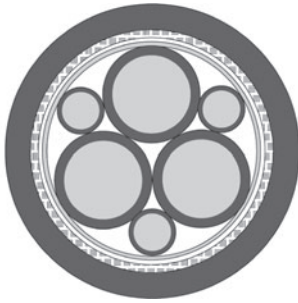
To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Mutual capacitance		Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			Core / Core approx. nF / km	Core / Screen approx. nF / km	at 1 MHz Ohm/km	at 30 MHz Ohm/km				
78377	4 G 1,5	11,5	70	110			18	95,0	230,0	16
78378	4 G 2,5	13,5	80	130	18	210	26	150,0	300,0	14
78379	4 G 4	15,8	90	150	11	210	34	235,0	485,0	12
78380	4 G 6	17,8	90	150	6	150	44	320,0	630,0	10
78381	4 G 10	21,6	120	200	7	180	61	533,0	860,0	8
78382	4 G 16	25,4	120	210	9	190	82	789,0	1290,0	6
701308	4 G 25	31,0	140	230	4	95	108	1180,0	1800,0	4
78383	4 G 35	33,0	150	260	3	85	135	1662,0	2610,0	2
78384	4 G 50	39,0	190	320	2	40	168	2345,0	2950,0	1
78385	4 G 70	45,0	190	320	2	45	207	3196,0	3950,0	2/0
78386	4 G 95	50,1	250	410	1	50	250	4316,0	5300,0	3/0
78387	4 G 120	54,2					292	5435,0	6600,0	4/0
78388	4 G 150	61,3					335	6394,0	7040,0	300 kcmil
78479	4 G 185	64,2					382	7639,0	8380,0	350 kcmil

Dimensions and specifications may be changed without prior notice.

TOPFLEX®-MOTOR-EMV 3/3 triple-screened, low capacitance, 80°C, 600V, PUR flexible motor supply cable, meter marking



Technical data

- Special PUR motor power supply cable for frequency converter to UL AWM Style 20234 and CSA AWM based on DIN VDE 0250
- **Temperature range**
flexing -30 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
acc. to UL 1000 V
acc. to VDE U₀/U 0,6/1 kV
- **A.c. test voltage**, 50 Hz
3000 V
- **Mutual capacitance** at 4 kHz,
depending on conductor cross-section
core/core 70-250 nF/km
core/screen 110-410 nF/km
- **Insulation resistance**
min. 200 MOhm x km
- **Minimum bending radius**
fixed installation,
for outside \varnothing to 12 mm = 5x cable \varnothing
>12 to 20 mm = 7,5x cable \varnothing
>20 mm = 10x cable \varnothing
free-movement,
for outside \varnothing to 12 mm = 10x cable \varnothing
>12 to 20 mm = 15x cable \varnothing
>20 mm = 20x cable \varnothing
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire in acc. with DIN VDE 0295 cl. 5 and IEC 60228 cl. 5
- Special polyethylene (PE) core insulation
- Core colours black with imprint U1, V2, W3
- Green-yellow earth core
- Cores stranded in layers
- Screen of semi-conductive fleece, aluminium-coated polyester film and tinned copper braiding, coverage approx. 85%
- PVC outer sheath
- Sheath colour orange (RAL 2003) according to DESINA®
- with meter marking, change-over in 2011

Properties

- PUR outer sheath: low adhesion, flame retardant, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- PUR sheath: self-extinguishing and flame retardant, test method B acc. to DIN VDE 0472 part 804 and IEC 60332-1
- This screened motor power supply cable, with low mutual capacitance because of the special PE core insulation, enables low-loss transmission of power compared to PVC-sheathed power supply cables
- The optimal triple screening enables interference-free operation of frequency converters
- Optimum compliance with requirements for electromagnetic compatibility (EMC) due to the triple screening
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Low mutual capacitance: tested acc. to DIN VDE 0472 part 504, test method B

Special features:

Here the earth core cross-section is divided into thirds, which lie in the interstices between the power supply cores. Due to this symmetrical construction, the PE insulation and the triple screening, very low capacitance and inductance are achieved. EMC compatibility is considerably enhanced.

Note

- All cables are also available in JB with coloured cores according to VDE 0295.

Application

This TOPFLEX® MOTOR EMV 3/3 two-approvals, triple-screened motor power supply cable for frequency converters provides outstanding EMC in machines and systems. Suitable as a supply and connecting cable for high mechanical stresses, in fixed installations and occasional free movements in dry, moist and wet environments, as well as outdoors.

Areas of application include machine tools, processing and manufacturing machinery, machining centres, industrial robots, transfer lines, handling equipment, etc.

By dividing the earth core into thirds and dividing it evenly in the interstices between the power supply cores, a symmetrical structure has been achieved. This results in improved EMC, capacitance and inductance compared to the 4-core version.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Continuation ▶

TOPFLEX®-MOTOR-EMV 3/3 triple-screened, low capacitance, 80°C, 600V, PUR flexible motor supply cable, meter marking



Part no.	No. cores x cross-sec. mm²	Outer Ø approx. mm	Coupling resistance		Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
			at 1 MHz Ohm/km	at 30 MHz Ohm/km				
78614	3 x 1,5 + 3 G 0,25	10,4			18	100,0	150,0	16
78615	3 x 2,5 + 3 G 0,5	12,1	18	210	26	160,0	240,0	14
78616	3 x 4 + 3 G 0,75	13,9	11	210	34	245,0	345,0	12
78617	3 x 6 + 3 G 1,0	15,5	6	150	44	335,0	460,0	10
78618	3 x 10 + 3 G 1,5	19,5	7	180	61	750,0	840,0	8
78619	3 x 16 + 3 G 2,5	22,5	9	190	82	820,0	930,0	6
78620	3 x 25 + 3 G 4,0	28,6	4	95	108	1180,0	1425,0	4
78621	3 x 35 + 3 G 6,0	29,6	3	85	135	1700,0	1900,0	2
78622	3 x 50 + 3 G 16,0	35,7	2	40	168	2400,0	2650,0	1
78623	3 x 70 + 3 G 10,0	43,0	2	45	207	3300,0	4400,0	2/0
78624	3 x 95 + 3 G 16,0	47,0	1	50	250	4500,0	5300,0	3/0
78625	3 x 120 + 3 G 16,0	52,0			292	5500,0	6300,0	4/0
78626	3 x 150 + 3 G 25,0	58,0			335	6260,0	7200,0	300 kcmil

Dimensions and specifications may be changed without prior notice.

Conduits

Corrugated tubes

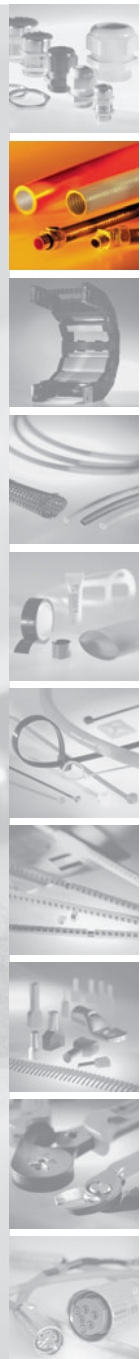
- for standard applications
- for larger sizes
- scissile corrugated tubes
- conduit glands

High flexible conduits

- plastic conduits with spiral spring
- metal conduits
- conduits glands

Conduit for heavy mechanical duty

- metal conduits with plastic sheat
- plastic conduits
- conduits glands for metal conduits



You can find conduits in our catalogue Cable Accessories.
Request it now at www.helukabel.de

TOPFLEX®-MOTOR-EMV 103 low capacitance power supply cable 0,6/1kV, increased ampacity, meter marking



Technical data

- Special motor power supply cable for frequency converters according to UL-AWM style 21179
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -40 °C to +80 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 600/1000 V
- **Max. operating voltage**
A.C. and 3-phase 700/1200 V
DC operation 900/1800 V
- **Test voltage** 2500 V
- **Insulation resistance**
min. 200 MOhm x km
- **Coupling resistance**
according to different cross-sections
max. 250 Ohm/km
- **Mutual capacitance**
according to different cross-sections
core/core 70 to 250 nF/km
core/screen 110 to 410 nF/km
- **Minimum bending radius**
fixed installation for outer \varnothing :
up to 12 mm: approx. 5x cable \varnothing
>12 to 20 mm: approx. 7,5x cable \varnothing
>20 mm: approx. 10x cable \varnothing
free-movement for outer \varnothing :
up to 12 mm: approx. 10x cable \varnothing
>12 to 20 mm: approx. 15x cable \varnothing
>20 mm: approx. 20x cable \varnothing
- **Radiation-resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5, BS 6360 cl. 5 or IEC 60228 cl. 5
- Special-Polymer core insulation
- Cores coded to DIN VDE 0293-308
- Core colours:
above 5 cores color coded
7 cores black with numbering
- Green-yellow earth-core
- Cores stranded in concentric layers
- 1. screening with special aluminium film
- 2. screening with copper braiding, tinned copper, coverage approx. 80%
- Special PVC outer sheath, orange (RAL 2003)
- with meter marking, change-over in 2011

Properties

- Behavior in fire: Test according to DIN VDE 0482 / IEC 60332-1 (equivalent to DIN VDE 0472 part 804) test type B)
- Low mutual capacitance, to DIN VDE 0472 part 504, test method B
- Features Special-Polymer-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents to include increased current carrying capacity
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- This screened motor supply cable with low mutual capacitance of the single cores because of the special Polymer core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- Design according to the requirements of VdS 3501:2006-04
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

This UL/CSA motor power supply cable for the frequency converters assures electromagnetic compatibility in plants and buildings, facilities with units and operating equipment where the fields of electromagnetic interference might cause adverse effects on the surroundings. As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments. Used in the automotive and food industries, environmental technology, packaging industry, machine tools. Handling equipment, for SIMOVERT drives, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications.

Installation in hazardous areas.

EMC = Electromagnetic compatibility

The screen must be connected at both ends and ensure lare-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

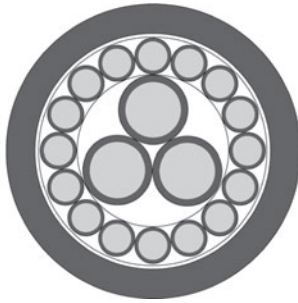
Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22689	3 G 1,5	9,4	72,0	200,0	16
22690	4 G 1,5	10,4	95,0	230,0	16
22691	5 G 1,5	11,2	117,0	258,0	16
22692	7 G 1,5	13,2	148,0	281,0	16
22693	3 G 2,5	11,2	137,0	270,0	16
22694	4 G 2,5	12,5	150,0	300,0	16
22695	5 G 2,5	13,5	200,0	352,0	16
22696	7 G 2,5	16,0	230,0	473,0	16
22697	4 G 4	14,2	235,0	485,0	16

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
22698	5 G 4	15,4	321,0	567,0	16
22699	7 G 4	18,2	352,0	603,0	16
22700	4 G 6	15,2	320,0	633,0	16
22701	5 G 6	16,8	439,0	679,0	16
22702	7 G 6	20,0	501,0	771,0	16
22703	4 G 10	19,5	533,0	860,0	16
22704	5 G 10	21,6	711,0	1029,0	16
22705	4 G 16	23,1	789,0	1290,0	16
22706	4 G 25	27,1	1236,0	1862,0	16

Dimensions and specifications may be changed without prior notice. (RN07)

VERTEILERFLEX two-approvals sensor actuator and

distributor cables PVC, PUR, PVC/PUR



Technical data

- Special PVC or PUR sheath acc. to UL Style 2464 for PVC, or UL Style 20233 for PUR
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** 300/500 V
- **A.c. test voltage**, 50 Hz
to 0,25 mm² 1200 V
from 0,34 mm² 2000 V
- **Minimum bending radius**
Sensorflex Two approvals PVC
approx. 7,5x cable ø
Sensorflex Two approvals PUR
approx. 15x cable ø

Cable structure

PVC cables

- Bare copper, fine wire in acc. with DIN VDE 0295 cl. 5 or IEC 60228 cl. 5
- PVC core insulation, core colours see below
- Special PVC

PUR cables

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6 and/or IEC 60228 cl. 6
- PVC core insulation
- Core colours see below
- PUR sheath
- **Part Nos. 79907, 75642, 79850**
- Construction like SENSORFLEX two-approvals, except
- with polypropylene core insulation

Properties

PVC cables

- Extensively oil resistant.
Chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

PUR cables

- Low adhesion, extremely abrasion resistant, resistant to hydrolysis and microbial attack

Special feature

- The cables with the highly flexible stranded conductor, cl. 6, are suitable for drag chain applications
- The types with PVC/PUR sheath material have a PVC inner sheath, with a PUR sheath applied over it by means of coextrusion

Note

- All additional cross-sections, also with UL/CSA approval, are available on request.

Application

For decentralised installation and control technology.

These cables are used in connector systems for sensors and actuators.

In combination with injected circular connectors and installed actuator-sensor boxes, they constitute an important connecting element between the periphery and the PLC in production systems.

The assembled cables offer attractive opportunities for reducing costs, not only in the field of automation technology, but also in the entire manufacturing industry.

While previously it was necessary to carry out time-consuming wiring of switchgear cabinets and machines, now field bus technology has made it possible to move the periphery interfaces from the switchgear cabinets to the machines and systems.

Moving the I/O points to the system periphery enables significant reductions in installation costs.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

SENSORFLEX 2-APPROVALS

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
78284	Grey RAL 7001	3 x 0,25	PUR	brown, blue, black		X	4,4	7,2	18,0	24
79907	Grey RAL 7001	4 x 0,25	PUR	brown, blue, black, white		X	4,7	9,6	18,0	24
78286	Grey RAL 7001	6 x 0,25	PVC	brown, blue, black, white, grey, pink	X		5,2	14,4	36,0	24
76345	Grey RAL 7001	3 x 0,34	PVC	brown, blue, black		X	4,9	9,8	30,0	22
76347	Grey RAL 7001	4 x 0,34	PVC	brown, blue, black, white		X	5,2	13,1	43,0	22
76348	Grey RAL 7001	5 G 0,34	PVC/PUR	brown, blue, black, white, green-yellow	X		5,9	16,4	54,0	22
76349	Grey RAL 7001	5 G 0,34	PVC/PUR	brown, blue, black, white, green-yellow		X	5,9	16,4	54,0	22
79850	Grey RAL 7001	5 G 0,34	PUR	brown, blue, black, white, green-yellow		X	5,9	16,4	54,0	22
78287	Grey RAL 7001	5 G 0,34	PVC/PUR	JZ, black with numbering + greenyellow		X	5,9	16,4	54,0	22
78288	Grey RAL 7001	3 G 0,75	PUR	JZ, black with numbering + greenyellow		X	5,9	21,6	58,0	18
76351	Grey RAL 7001	3 G 0,75	PVC	brown, blue, green-yellow	X		6,7	28,8	88,0	18
73571	Grey RAL 7001	3 G 0,75	PVC	JZ, black with numbering + greenyellow	X		6,7	21,6	58,0	18
75642	Black RAL 9005	3 G 0,75	PUR	JZ, black with numbering + greenyellow		X	5,9	21,6	58,0	18

Continuation ►

VERTEILERFLEX two-approvals sensor actuator and distributor cables PVC, PUR, PVC/PUR



SENSORFLEX 2-APPROVALS

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
74551	Grey RAL 7001	4 G 0,75	PUR	JZ, black with numbering + greenyellow		X	6,9	29,0	66,0	18
78289	Grey RAL 7001	4 G 0,75	PVC/PUR	JZ, black with numbering + greenyellow	X		7,0	29,0	66,0	18
78290	Grey RAL 7001	2 x 1	PVC	black with number 1-2	X		7,2	19,2	56,0	17
77352	Black RAL 9005	2 x 1	PVC	black with number 1-2	X		7,2	19,2	56,0	17
76350	Grey RAL 7001	11 G 1	PVC/PUR	black with number 1-8, bn, bu, gn, ye	X		12,0	105,6	225,0	17
78291	Grey RAL 7001	2 x 1,5	PVC	brown, blue	X		6,8	29,0	75,0	16
73587	Grey RAL 7001	3 G 1,5	PVC	brown, blue, green-yellow	X		6,9	44,0	94,0	16

Verteilerflex 2-APPROVALS

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76352	Grey RAL 7001	4 G 0,34	PVC/PUR	brown, blue, green-yellow, white, green, yellow, grey		X	8,7	35,0	82,0	22
76353	Grey RAL 7001	6 G 0,34	PVC/PUR	brown, blue, green-yellow, white, green, yellow, grey, pink, red		X	9,1	42,0	106,0	22
75614	Grey RAL 7001	8 G 0,34	PUR	white, red-blue, green, wh-green, yellow, brown-green, gy-pink, brown, blue, green-yellow	X		10,0	65,0	143,0	22
76354	Grey RAL 7001	8 G 0,34	PVC/PUR	brown, blue, green-yellow, white, green, yellow, grey, pink, red, black, violet		X	9,1	48,0	110,0	22
76355	Grey RAL 7001	12 G 0,34	PVC/PUR	brown, blue, gnye, gnwh, white, rdbu, green, whgn, yellow, bngn, grey, whye, pink, yebr, red		X	10,3	61,0	138,0	22
76356	Grey RAL 7001	16 G 0,34	PVC/PUR	bn, bu, gnye, gnwh, wh, rdbu, gn, whgn, ye, bngn, gy, whye, pk, yebr, rd, whgy, bk, gybn, vt		X	10,5	74,0	170,0	22

Dimensions and specifications may be changed without prior notice.



HELUKABEL BS 5308-1
HELUKABEL BS 5308-2
HELUKABEL BS 5467
HELUKABEL BS 6724

Photo: HELUKABEL®

Cables to British Standard

HELUKABEL BS 5308 Part 1 Instruments cable, core insulation PE or XLPE



Technical data

- Instrument cable acc. to British Standard 5308 Part 1
- **Temperature range**
fixed installation -20 °C to +65 °C
- **Nominal voltage**
U_o/U 300/500V
- **Minimum bending radius**
fixed installation
5x external ø (Type 1)
6x external ø (Types 2+3)

Cable structure

- Copper conductor, single-, multiple-, or fine-wire acc. to BS 6360
- Conductor cross-sections from 0,5 mm² to 1,5 mm²
- Core insulation
 - Polyethylene acc. to BS 6234 Type 03 or
 - XLPE (cross-linked polyethylene for LSZH cable)
- Cores stranded in pairs with optimal lay-length,
Lay-length smaller than 100 mm
- Number of pairs: 1,2,5,10,15,20,30,50
- Pairs individually not screened or screened
- Pairs stranded in layers
- Wrapping with aluminium/polyester foil, on request
- **Type 1**
Flame retardant PVC outer sheath or LSZH
- **Type 2**
Extruded polyethylene inner sheath, steel wire armouring Flame retardant PVC outer sheath or LSZH
- **Type 3**
PVC inner sheath, steel wire armouring, PVC outer sheath
- Sheath colour black or blue

Note

As a result of a wide range of cables and wires according to British Standard, you can find following only a small selection of types. For request about British Standard cables please contact us under
Ph. 0049 7150 9209-786
Fax 0049 7150 9209-148

Application

As measurement and control cables in power plants and industrial plants, and in the petrochemical industry.

Example

BS 5308 P1 T1 CU / PE / CAM / PVC = Overall screening, jacket PVC

BS 5308 P1 T2 CU / XLPE / IAM / CAM / LSZH / SWA / LSZH = Pair screened, Overall screening, galvanic round steel wire, halogen free

Dimensions and specifications may be changed without prior notice.

N

HELUKABEL BS 5308 Part 2 Instruments cable, core insulation

PVC



Technical data

- Instrument cable acc. to British Standard 5308 Part 2
- **Temperature range**
fixed installation -20 °C to +65 °C
- **Nominal voltage**
U₀/U 300/500V
- **Minimum bending radius**
fixed installation
5x external \varnothing (Type 1)
6x external \varnothing (Types 2)

Cable structure

- Copper conductor, single-, multiple-, or fine-wire acc. to BS 6360
- Conductor cross-sections from 0,5 mm² to 1,5 mm²
- Core insulation
- PVC acc. to BS 6746
- Cores stranded in pairs with optimal lay-length,
Lay-length smaller than 100mm
- Number of pairs: 1,2,5,10,20,30,50
- Pairs individually not screened or screened
- Pairs stranded in layers
- Wrapping with aluminium/polyester foil, on request
- **Type 1**
Flame retardant PVC outer sheath
- **Type 2**
Extruded PVC inner sheath, steel wire armouring
Flame retardant PVC outer sheath
- Sheath colour black or blue

Note

As a result of a wide range of cables and wires according to British Standard, you can find following only a small selection of types. For request about British Standard cables please contact us under
Ph. 0049 7150 9209-786
Fax 0049 7150 9209-148

Application

As measurement and control cables in power plants and industrial plants, and in the petrochemical industry.

Example

BS 5308 P2 T2 CU / PVC / CAM / PVC / SWA / PVC = Overall screening, steel wire armouring

Dimensions and specifications may be changed without prior notice.

HELUKABEL BS 5467 High voltage cable 0,6/1kV, armoured, sheath PVC



Technical data

- Special power cable acc. to British Standard 5467
- **Temperature range**
flexing 0 °C to +90 °C
fixed installation -15 °C to +90 °C
- **Nominal voltage**
 U_0/U 0,6/1 kV
- **Minimum bending radius**
fixed installation 6x external \varnothing

Cable structure

- Bare copper conductor acc. to BS 6360 cl.2
- Core insulation of cross-linked polyethylene
- Core identification
 - 1-core - brown
 - 2-core - brown, blue
 - 3-core - brown, blue, grey
 - 4-core - brown, black, grey, blue
 - 5-core and up with numbering
- Cores stranded layers
- PVC-Inner sheath
- Armouring of galvanized steel wire
- PVC-Outer sheath
- Sheath colour black

Properties

- Reaction to fire tested acc. to IEC 60332-1, BS 4066-1

Note

As a result of a wide range of cables and wires according to British Standard, you can find following only a small selection of types. For request about British Standard cables please contact us under
Ph. 0049 7150 9209-786
Fax 0049 7150 9209-148

Application

As a control and power cable in industrial environments. Thanks to the armouring of galvanized steel wire, can be used anywhere that a high level of mechanical protection is required. Suitable for use outdoors and in the earth.

Example

BS 5467 CU / XLPE / PVC / AWA / PVC = Singlecore
BS 5467 CU / XLPE / PVC / SWA / PVC = Multicore

Dimensions and specifications may be changed without prior notice.

HELUKABEL BS 6724 High voltage cable 0,6/1kV, armoured, halogen-free



Technical data

- Special power cable acc. to British Standard 6724
- **Temperature range**
flexing 0 °C to +90 °C
fixed installation -20 °C to +90 °C
- Permissible **operating temperature**
at conductor +90 °C
- **Nominal voltage**
U₀/U 0,6/1 kV
- **Minimum bending radius**
fixed installation 6x external \varnothing

Cable structure

- Bare copper conductor acc. to BS 6360 cl.2
- Core insulation of cross-linked polyethylene
- Core identification
 - 1-core - brown
 - 2-core - brown, blue
 - 3-core - brown, black, grey
 - 4-core - brown, black, grey, blue
 - 5-core and up with numbering
- Cores stranded layers
- Inner sheath LSHF mix
- Armouring of galvanized steel wire
- Outer sheath LSHF mix
- Sheath colour black

Properties

- Reaction to fire tested acc. to IEC 60332-3, BS 4066-1

Note

As a result of a wide range of cables and wires according to British Standard, you can find following only a small selection of types. For request about British Standard cables please contact us under
Ph. 0049 7150 9209-786
Fax 0049 7150 9209-148

Application

Unlike power cables acc. to BS 5467, these are LSHF (Low Smoke Halogen Free). Used anywhere where in case of fire damage to human life and material assets must be prevented, e.g. in industrial plants, airports, underground railways and tunnels.

Example

BS 5467 CU / XLPE / LSZH / AWA / LSZH = Singelcore
BS 5467 CU / XLPE / LSZH / SWA / LSZH = Multicore

Dimensions and specifications may be changed without prior notice.



Infrastructure Cables and Wires

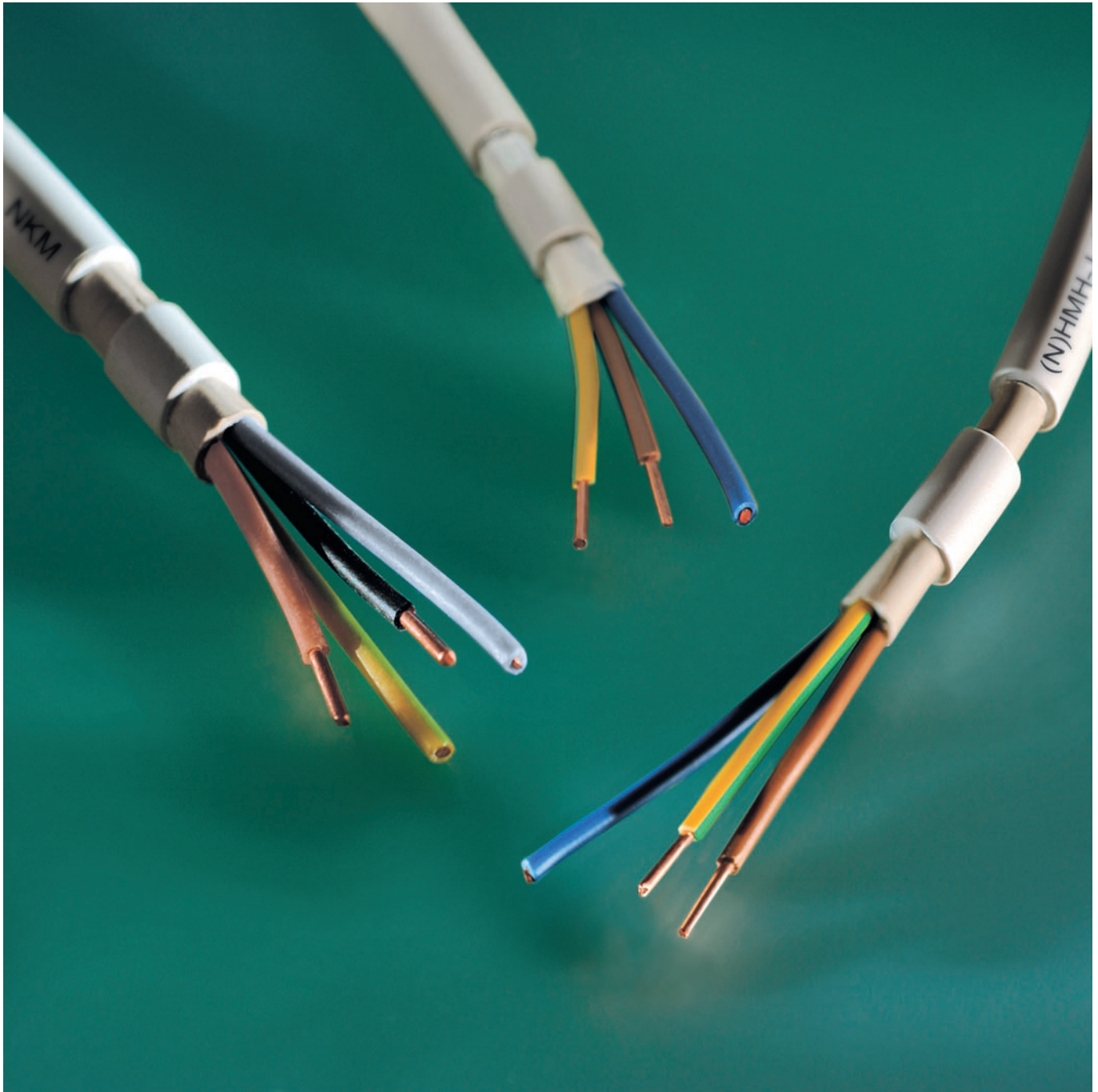


Photo: HELUKABEL®

Installation Cables





Installation Cables

The most important cable for today's electricians are NYM, (N)YM(St)Y, NHXMH etc. It is reassuring that HELUKABEL® takes care that cables are always available at the right price, in the required quantity and that cable can be supplied ex stock from all 4 HELUKABEL® stocks.

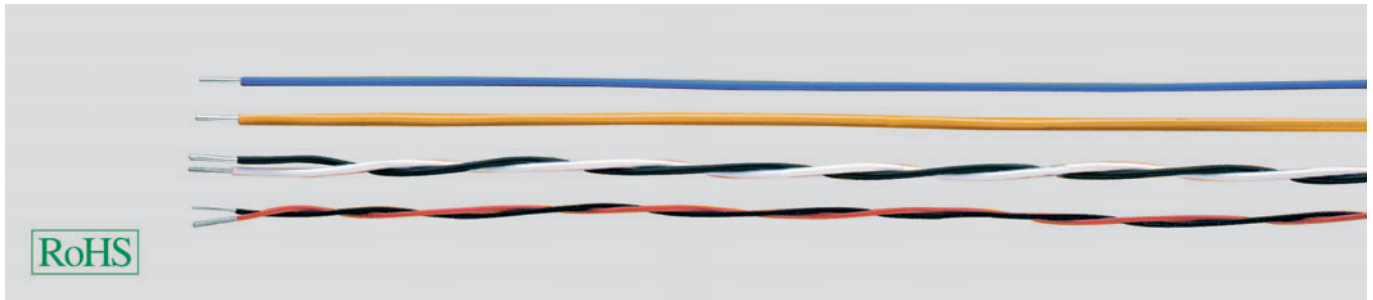
Consequently there are no delays in delivery to the building-site and no extra expense are incurred by utilizing alternative sizes. Our own transports deliver the required coils and drums immediately to the customer. The environmentally friendly packaging poses no waste disposal problems.

Maybe you can complete your next cable order with corresponding accessories which you can find in our latest accessories catalogue. We supply glands, identification materials, nylon binders, etc. ex stock. You can find our complete accessories program in our latest accessories catalogue.

Contents

Description	Page
YV-Equipment Wires / YR-Bell Sheathed Cables, according to VDE 0812 	0 4
NYM-J/-O PVC-Sheathed Cable, VDE approved  	0 5
(N)YM(St)-J PVC-sheathed cable, screened	0 6
(N)HMH-O, halogen-free for fixed installation, emission-free, 300/500V	0 7
(N)HMH-J, halogen-free for fixed installation, emission-free, 300/500V	0 8
NHXMH-O/-J, halogen-free plastic sheathed cable 300/500 V, VDE approved 	0 9

YV-Equipment Wires / YR-Bell Sheathed Cables according to VDE 0812



Technical data

YR-Bell Sheathed Cables

- Adapted to DIN VDE 0812
- **Minimum bending radius**
15x cable Ø

YV-Equipment Wires

- Equipment wires with PVC core insulation to DIN VDE 0812
- Temperature range
flexing -5°C to +70°C
fixed installation -30°C to +70°C
- **Electrical characteristics**

Cable structure

YV-Equipment Wires

- Solid, tinned copper conductor
0,3 to 1,8 mm Ø
- PVC core insulation, Y13 to DIN VDE 0207 part 4
- Mono or twin colour wires, twin colour wires have a base colour with the second colour superimposed in ring form
- Colour code to DIN 47002

YR-Bell Sheathed Cables

- Bare copper conductor, solid 0,8 mm
- Cores stranded in layer
- Colour identification code see Technical Informations
- PVC-Outer jacket, white

Properties

YV-Equipment Wires

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Installation notes

The equipment wires are to be so uncoiled from drums or coils so that no kinks or twisting torsional stress can be occurred. Those are allowed to install as self-supporting shaped wires independently ensuring the free-movements so as to gain a compensating bending. These are used without any mechanical stress, pull, pressure, abrasion and notch. Several equipment wires are used together in form of a bunch. The insulating coverings are not be cut through the binding materials. The binding materials must be nonconductive and not allowed to swell or shrink in humidity. During the soldering process without jointing clamp, the soldering period is to be shortened so that the insulating covering should not be shrunk or injured.

Application

YV-Equipment Wires

Single core cables for use in small apparatus, switching and intercom system and for data transmission. These cables are not allowed for the installation of heavy current operation. Equipment wire are used for wiring to the switchboards, amplifiers and dial intercommunicating systems, measuring instruments, telephone exchange, clock centrals and data processing apparatus etc.

These wires are not permitted to apply outside of equipment for high power ratings.

YR-Bell Sheathed Cables

For different applications up to max. 100 V operating voltage, for fixed installation above and beneath plaster.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

YV-Equipment Wires

Part no.	No. cores x cond. Ø / core Ø mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
28900	1 x 0,3 / 0,7	0,7	0,7	1,2
28901	2 x 0,3 / 0,7	1,4	1,4	2,4
28902	3 x 0,3 / 0,7	1,6	2,1	3,6
28903	1 x 0,4 / 0,8	0,8	1,3	1,8
28904	2 x 0,4 / 0,8	1,6	2,5	3,6
28905	3 x 0,4 / 0,8	1,8	3,8	5,4
28906	1 x 0,5 / 0,9	0,9	2,0	2,5
28907	2 x 0,5 / 0,9	1,8	3,9	5,0
28908	3 x 0,5 / 0,9	2,0	5,9	7,5
28909	4 x 0,5 / 0,9	2,2	7,9	10,0
28910	1 x 0,8 / 1,4	1,4	5,0	6,0
28911	2 x 0,8 / 1,4	2,8	10,0	12,0
28912	3 x 0,8 / 1,4	3,0	15,0	18,0
28913	4 x 0,8 / 1,4	3,4	20,0	24,0
28914	1 x 1 / 1,8	1,8	7,9	10,0
28915	2 x 1 / 1,8	3,6	16,0	20,0
28916	3 x 1 / 1,8	4,0	24,0	30,0
28917	1 x 1,4 / 2,2	2,2	15,0	17,0
28918	1 x 1,8 / 2,8	2,8	25,0	27,5

YR-Bell Sheathed Cables

Part no.	No. cores x cond. Ø / core Ø mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
28919	2 x 0,8 / 1,4	4,0	9,6	27,0
28920	3 x 0,8 / 1,4	4,4	14,4	33,0
28921	4 x 0,8 / 1,4	4,9	19,2	41,0
28922	5 x 0,8 / 1,4	5,3	24,0	48,0
28923	6 x 0,8 / 1,4	5,8	28,8	56,0
28924	8 x 0,8 / 1,4	6,5	38,0	70,0
28925	10 x 0,8 / 1,4	7,6	48,0	84,0
28926	12 x 0,8 / 1,4	7,7	58,0	98,0
28927	16 x 0,8 / 1,4	8,6	77,0	124,0
28928	24 x 0,8 / 1,4	10,5	115,0	188,0

Dimensions and specifications may be changed without prior notice. (R001)



Technical data

- PVC-sheathed cable to DIN VDE 0250 part 204
- **Temperature range**
flexing +5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage**
 U_0/U 300/500 V
- **Test voltage** 2000 V
- **Minimum bending radius**
fixed installation 4x cable ϕ
- **Radiation resistance**
up to 80×10^6 cJ/kg (up to 80 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Solid or stranded, plain copper conductor to DIN VDE 0295 cl. 1 or cl. 2, BS 6360 cl. 1 or cl. 2 and IEC 60228 cl. 1 or cl. 2
- PVC core insulation, T11 to DIN VDE 0281 part 1
- Colour coded to DIN VDE 0293-308
- Cores stranded in layer
- Special PVC outer sheath TM1, to DIN VDE 0281 part 1
- Jacket colour grey (RAL 7035)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- re = round conductor, single-wire;
rm = round conductor, multiple-wire.
- G = with green-yellow earth core;
x = without green-yellow earth core (OZ).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm^2 .

Application

For industrial- and wiring purposes.

Usable in the open, in dry, damp and wet environments in the open and concealed, as well as in masonry and in beton, not suitable for imbedding in solidified- or compressed-concrete. Outdoor usage is only possible, as long as the cable is protected against direct sunlight.

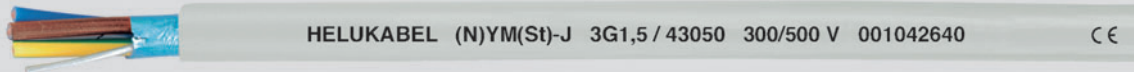
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm^2	Outer ϕ approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
39050	1 G 1,5 re	5,4	14,4	40,0	16
39001	1 x 1,5 re	5,4	14,4	40,0	16
39006	2 x 1,5 re	8,7	29,0	170,0	16
39056	3 G 1,5 re	9,1	43,0	135,0	16
39007	3 x 1,5 re	9,1	43,0	135,0	16
39058	4 G 1,5 re	9,8	58,0	160,0	16
39009	4 x 1,5 re	9,8	58,0	160,0	16
39066	5 G 1,5 re	10,3	72,0	190,0	16
39017	5 x 1,5 re	10,3	72,0	190,0	16
39072	7 G 1,5 re	11,5	101,0	235,0	16
39023	7 x 1,5 re	11,5	101,0	235,0	16
39076	10 G 1,5 re	13,8	144,0	330,0	16
39077	12 G 1,5 re	14,4	173,0	405,0	16
39055	1 G 2,5 re	6,0	24,0	70,0	14
39024	1 x 2,5 re	6,0	24,0	70,0	14
39057	3 G 2,5 re	10,4	72,0	190,0	14
39008	3 x 2,5 re	10,4	72,0	190,0	14
39059	4 G 2,5 re	11,3	96,0	230,0	14
39010	4 x 2,5 re	11,3	96,0	230,0	14
39067	5 G 2,5 re	12,0	120,0	270,0	14
39018	5 x 2,5 re	12,0	120,0	270,0	14
39075	7 G 2,5 re	13,2	168,0	342,0	14
39051	1 G 4 re	6,6	38,0	80,0	12
39002	1 x 4 re	6,6	38,0	80,0	12
39074	3 G 4 re	12,0	115,0	258,0	12
39060	4 G 4 re	13,0	154,0	330,0	12
39011	4 x 4 re	13,0	154,0	330,0	12
39068	5 G 4 re	14,5	192,0	410,0	12
39019	5 x 4 re	14,5	192,0	410,0	12
39052	1 G 6 re	7,2	58,0	105,0	10
39003	1 x 6 re	7,2	58,0	105,0	10
39078	3 G 6 re	13,0	173,0	320,0	10

Part no.	No.cores x cross-sec. mm^2	Outer ϕ approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
39061	4 G 6 re	15,1	230,0	460,0	10
39012	4 x 6 re	15,1	230,0	460,0	10
39069	5 G 6 re	16,1	288,0	540,0	10
39020	5 x 6 re	16,1	288,0	540,0	10
39053	1 G 10 re	8,4	96,0	155,0	8
39004	1 x 10 re	8,4	96,0	155,0	8
39062	4 G 10 re	17,6	384,0	680,0	8
39013	4 x 10 re	17,6	384,0	680,0	8
39070	5 G 10 re	19,2	480,0	850,0	8
39021	5 x 10 re	19,2	480,0	850,0	8
39054	1 G 16 rm	9,9	154,0	230,0	6
39005	1 x 16 rm	9,9	154,0	230,0	6
39063	4 G 16 rm	21,3	614,0	1048,0	6
39014	4 x 16 rm	21,3	614,0	1048,0	6
39071	5 G 16 rm	23,4	768,0	1280,0	6
39022	5 x 16 rm	23,4	768,0	1280,0	6
39079	1 G 25 rm	12,0	240,0	325,0	4
39064	4 G 25 rm	25,8	960,0	1649,0	4
39015	4 x 25 rm	25,8	960,0	1649,0	4
39073	5 G 25 rm	28,7	1200,0	1970,0	4
39065	4 G 35 rm	28,5	1344,0	2000,0	2
39016	4 x 35 rm	28,5	1344,0	2000,0	2

Dimensions and specifications may be changed without prior notice. (R001)

(N)YM(St)-J PVC-sheathed cable screened



Technical data

- Screened PVC-sheathed cable
- Adapted to DIN VDE 0250 part 204/209
- VDE production accessment available
- **Direct current resistance** to DIN VDE 0295
- **Temperature range** flexing +5 °C to +70 °C fixed installation -40 °C to +70 °C
- Permissible **working temperature** at the conductor +70 °C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage** 2000 V
- **Power rating according** to VDE 0100
- **Minimum bending radius** fixed installation 4x cable \varnothing
- **Radiation resistance** up to 80×10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Solid plain copper conductor to DIN VDE 0295 cl. 1, BS 6360 cl. 1 and IEC 60228 cl. 1
- Special PVC core insulation TI1, to DIN VDE 0281 part 1 colour code to DIN VDE 0293-308
- Cores stranded in layer
- Plastic filled inner sheath
- Coated aluminium foil screening
- Solid copper drain-wire, tinned
- Special PVC outer sheath TM1, to DIN VDE 0281 part 1
- Jacket colour grey (RAL 7035)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- re = round solid core;
- rm = stranded core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

These installation cables are made for an effective range of electromagnetic interference alternating fields by a static screen. This screening is specially used for the installation in computer sector, hospitals or industry measuring observation points with measuring instruments which are sensitive to interferences.

These cables are also ideal for installations in the living rooms of those peoples who are extreme sensitive to radiation. The cable is suitable for laying on, in and under plaster in dry and damp places as well as in concrete and masonry (a direct laying in shaken or stamped concrete is excluded).

Outdoor laying only is possible if the cable is not exposed to direct sunlight or if the cable is laid in cable conduits. Use in dangerous areas is not allowed.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Drain-wire mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
43050	3 G 1,5	1,5	10,5	51,0	154,0	16
43051	4 G 1,5	1,5	11,5	65,0	184,0	16
43052	5 G 1,5	1,5	12,0	80,0	208,0	16
43053	7 G 1,5	1,5	13,0	106,0	250,0	16
43054	3 G 2,5	1,5	12,0	80,0	217,0	14
43055	4 G 2,5	1,5	13,0	104,0	256,0	14
43056	5 G 2,5	1,5	13,5	128,0	280,0	14
43057	3 G 4	1,5	13,5	123,0	228,0	12
43058	4 G 4	1,5	14,5	159,0	359,0	12
43059	5 G 4	1,5	16,5	200,0	440,0	12
43060	3 G 6	1,5	15,0	187,0	378,0	10
43061	4 G 6	1,5	16,5	235,0	477,0	10
43062	5 G 6	1,5	17,5	293,0	565,0	10

Part no.	No. cores x cross-sec. mm ²	Drain-wire mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
43063	5 G 10	1,5	21,5	485,0	840,0	8
43064	5 G 16	rm	2,5	26,0	773,0	6
43065	5 G 25	rm	2,5	31,5	1205,0	4

Dimensions and specifications may be changed without prior notice. (R001)

(N)HMH-O halogen-free for fixed installation, emission-free, 300/500V



HELUKABEL (N)HMH-O 3x1,5 / 51981 300/500 V 001042644

CE



Technical data

- Plastic-sheathed cable, halogen-free, for fixed installation
- To DIN VDE 0250 part 215
- Permissible **working temperature** at the conductor +70 °C
- **Nominal voltage** U_0/U 300/500 V
- Max. **voltage** for equipment U_m 550 V
- **Power rating**
- in accordance with DIN VDE 0298 part 4, tables 3 and 4, analogous for NYM, taking the type of installation and the appropriate factors for differing ambient temperatures and build-up of cables
- rated short-circuit current of density acc. to DIN VDE 0298 part 4 table 15
- fuse rating according to DIN VDE 0100 part 430
- **Caloric load values**
see Technical Informations

Cable structure

- Bare Cu conductor, solid or stranded on the basis of DIN VDE 0250 part 204 with the following modifications:
- Core insulation of halogen-free thermoplastic polymer compound with optimum wall thickness
- Colour coded to DIN VDE 0293-308
- for 1 core cable
core colour black
- Cores stranded in layer
- Extruded core insulation, halogen-free
- Outer jacket of non-cross-linked, halogen-free thermoplastic polymer compound
- Jacket colour light-grey (RAL 7035)

Properties

- **Corrosive nature of combustion gases (halogen-free verification)**
testing acc. to VDE 0482 part 267, DIN EN 50267-2-2, IEC 60754-2, HD 602 (equivalent DIN VDE 0472 part 813)
- **Behaviour in case of fire**
self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- **Low smoke**
testing acc. to DIN VDE 0472 part 818

Note

- re = round conductor, single-wire;
- rm = round conductor, multiple-wire;
- x = without green-yellow earth core.
- O-version: single-core conductor with black core insulation. Cables between two and seven cores are without green-yellow core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This plastic-sheathed cable of defined behaviour in case of fire is used for installations in residential dwellings, public buildings as well as in industrial constructions.

Suitable for applications in dry, damp or wet environments for installation above, on, in and beneath plaster, as well as in masonry and concrete walls, not however for embedding in vibration, compacted or tamped concrete.

The cable is also approved for outdoor applications provided these are not exposed to direct sunlight radiation. Installation of this cable in earth or in water is not permitted.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
51970	1 x 1,5 re	8,3	14,4	39,0	16
51976	2 x 1,5 re	8,9	29,0	82,0	16
51981	3 x 1,5 re	9,2	43,0	92,0	16
51983	4 x 1,5 re	9,9	58,0	115,0	16
51991	7 x 1,5 re	11,5	101,0	167,0	16
51971	1 x 2,5 re	9,0	24,0	47,0	14
51977	2 x 2,5 re	10,0	48,0	110,0	14
51982	3 x 2,5 re	10,6	72,0	128,0	14
51984	4 x 2,5 re	11,0	96,0	152,0	14
51972	1 x 4 re	9,5	38,0	62,0	12
51978	2 x 4 re	11,5	77,0	160,0	12
51985	4 x 4 re	13,4	154,0	244,0	12
51973	1 x 6 re	10,0	58,0	83,0	10
51979	2 x 6 re	12,4	115,0	208,0	10
51986	4 x 6 re	15,9	230,0	345,0	10

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
51974	1 x 10 re	11,5	96,0	125,0	8
51980	2 x 10 re	14,9	192,0	340,0	8
51987	4 x 10 re	17,5	384,0	522,0	8
51975	1 x 16 rm	12,9	154,0	188,0	6
51988	4 x 16 rm	19,9	614,0	815,0	6
51989	4 x 25 rm	27,4	960,0	1305,0	4
51990	4 x 35 rm	30,4	1344,0	1750,0	2

Dimensions and specifications may be changed without prior notice. (R001)

(N)HMH-J halogen-free for fixed installation, emission-free, 300/500V



HELUKABEL (N)HMH-J 3G1,5 / 51996 300/500 V 001042645



Technical data

- Plastic-sheathed cable, halogen-free, for fixed installation
- To DIN VDE 0250 part 215
- Permissible **working temperature** at the conductor +70 °C
- **Nominal voltage**
U₀/U 300/500 V
- Max. **voltage** for equipment
U_m 550 V
- **Power rating**
- in accordance with DIN VDE 0298 part 4, tables 3 and 4, analogous for NYM, taking the type of installation and the appropriate factors for differing ambient temperatures and build-up of cables
- rated short-circuit current of density acc. to DIN VDE 0298 part 4 table 15
- fuse rating according to DIN VDE 0100 part 430
- **Caloric load values**
see Technical Informations

Cable structure

- Bare Cu conductor, solid or stranded on the basis of DIN VDE 0250 part 204 with the following modifications:
- Core insulation of halogen-free thermoplastic polymer compound with optimum wall thickness
- Colour coded to DIN VDE 0293-308
- Green-yellow earth core, 3 cores and above
- for 1 core cable
core colour green-yellow
- Cores stranded in layer
- Extruded core insulation, halogen-free
- Outer jacket of non-cross-linked, halogen-free thermoplastic polymer compound
- Jacket colour light-grey (RAL 7035)

Properties

- **Corrosive nature of combustion gases (halogen-free verification)**
testing acc. to VDE 0482 part 267, DIN EN 50267-2-2, IEC 60754-2, HD 602 (equivalent DIN VDE 0472 part 813)
- **Behaviour in case of fire**
self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- **Low smoke**
testing acc. to DIN VDE 0472 part 818

Note

- re = round conductor, single-wire;
rm = round conductor, multiple-wire.
- G = with green-yellow earth core.
- O-version: single core conductor with black core insulation. Cables with between two and seven cores are without green-yellow core.
- J-version: with green-yellow core insulation.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This plastic-sheathed cable of defined behaviour in case of fire is used for installations in residential dwellings, public buildings as well as in industrial constructions.

Suitable for applications in dry, damp or wet environments for installation above, on, in and beneath plaster, as well as in masonry and concrete walls, not however for embedding in vibration, compacted or tamped concrete.

The cable is also approved for outdoor applications provided these are not exposed to direct sunlight radiation. Installation of this cable in earth or in water is not permitted.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
51996	3 G 1,5 re	9,4	43,0	92,0	16
52001	4 G 1,5 re	10,2	58,0	115,0	16
52009	5 G 1,5 re	10,8	72,0	133,0	16
52016	7 G 1,5 re	11,4	101,0	168,0	16
51997	3 G 2,5 re	10,4	72,0	128,0	14
52002	4 G 2,5 re	11,3	96,0	152,0	14
52010	5 G 2,5 re	11,9	120,0	182,0	14
52017	7 G 2,5 re	13,5	158,0	250,0	14
51992	1 G 4 re	8,6	38,0	62,0	12
51998	3 G 4 re	11,8	115,0	192,0	12
52003	4 G 4 re	13,3	154,0	244,0	12
52011	5 G 4 re	14,8	192,0	300,0	12
51993	1 G 6 re	9,9	58,0	83,0	10
51999	3 G 6 re	13,4	173,0	267,0	10
52004	4 G 6 re	14,8	230,0	345,0	10
52012	5 G 6 re	16,0	288,0	400,0	10
51994	1 G 10 re	11,2	96,0	125,0	8
52000	3 G 10 re	16,0	288,0	628,0	8
52005	4 G 10 re	17,4	384,0	522,0	8
52013	5 G 10 re	18,9	480,0	620,0	8
51995	1 G 16 rm	11,9	154,0	188,0	6
52006	4 G 16 rm	21,6	614,0	815,0	6

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52014	5 G 16 rm	23,8	768,0	995,0	6
52007	4 G 25 rm	27,0	960,0	1305,0	4
52015	5 G 25 rm	29,0	1200,0	1580,0	4
52008	4 G 35 rm	29,9	1344,0	1750,0	2

Dimensions and specifications may be changed without prior notice. (R001)



Technical data

- Halogen-free plastic-sheathed cable with enhanced characteristics in case of fire, according to DIN VDE 0250 part 214
- **Conductor resistance** (at 20 °C) according to DIN VDE 0295 and IEC 60228
- **Max. temperature at the conductor** during operation +70 °C in case of short circuit +250 °C
- **Temperature range** during installation -5 °C to +50 °C fixed installation -30 °C to +70 °C
- **Nominal voltage** U₀/U 300/500 V
- **Test voltage** 2000 V
- **Minimum bending radius** single-core approx. 15x cable ø multi-core approx. 10x cable ø
- **Caloric load values** see Technical Informations

Cable structure

- Plain copper conductor, single core up to 10 mm² multi-core from 16-35 mm² according to DIN VDE 0295 cl. 1 or 2, BS 6360 cl. 1 or 2 and IEC 60228 cl. 1 or 2
- Core insulation of cross-linked polymer compound 2X11 to DIN VDE 0207 part 22
- Colour code according to DIN VDE 0293-308
- for 1 core cable core colour black or green-yellow
- Cores stranded in layer
- Overall core jacket of halogen-free filling compound (not for single-core cables)
- Outer jacket, flame-retardant polymer compound HM2 according to DIN VDE 0207 part 24, halogen-free
- Jacket colour grey (RAL 7035)
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Flame-retardant
- Halogen-free, no liberation of corrosive or toxic gases
- Limited propagation of fire
- Low smoke development, Ozone resistant

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to DIN VDE 0482 part 268, HD 606, EN 50268-12/ IEC 61034-12, BS 7622 part 12 (equivalent DIN VDE 0472 part 816)
- Ozone resistance according to DIN VDE 0472 part 805
- Also deliverable in screened (St) version

Note

- re = round conductor, single-wire; rm = round conductor, multiple-wire.

Application

Halogen-free plastic-sheathed cables with enhanced characteristics in case of fire are used for applications where harm to human life and damage to property must be prevented in the event of fire, e.g. in industrial installations, communal establishments, hotels, airports, underground stations, railway stations, hospitals, departmental stores, banks, schools, theatres, multi-storey buildings, process control centres etc. Suitable for installation in dry, damp or wet environments, for installation above, on, in and beneath plaster as well as in masonry walls and in concrete, not however for direct embedding in vibration, compacted or tamped concrete. These cables are also suitable for outdoor applications. The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

NHXMH-O

Part no.	No. cores x cross-sec. mm ²		Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53300	1 x 1,5	re	5,0 - 8,4	15,0	49,0	16
53306	2 x 1,5	re	7,6 - 9,2	29,0	110,0	16
53301	1 x 2,5	re	5,4 - 8,8	24,0	60,0	14
53307	2 x 2,5	re	8,4 - 10,1	48,0	136,0	14
53302	1 x 4	re	6,0 - 9,5	39,0	80,0	12
53308	2 x 4	re	9,6 - 11,6	77,0	202,0	12
53303	1 x 6	re	6,4 - 10,0	58,0	111,0	10
53304	1 x 10	re	7,4 - 11,3	96,0	160,0	8
53305	1 x 16	rm	8,5 - 12,4	154,0	232,0	6

NHXMH-J

Part no.	No. cores x cross-sec. mm ²		Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53350	3 G 1,5	re	8,0 - 9,6	43,0	130,0	16
53358	4 G 1,5	re	8,5 - 10,3	58,0	151,0	16
53366	5 G 1,5	re	9,1 - 11,0	72,0	177,0	16
53374	7 G 1,5	re	9,9 - 11,9	101,0	209,0	16
53351	3 G 2,5	re	8,7 - 10,6	72,0	163,0	14
53359	4 G 2,5	re	9,5 - 11,5	96,0	200,0	14
53367	5 G 2,5	re	10,4 - 12,3	120,0	238,0	14
53375	7 G 2,5	re	11,4 - 13,8	168,0	300,0	14
53352	3 G 4	re	10,1 - 12,2	115,0	235,0	12
53360	4 G 4	re	11,3 - 13,7	154,0	300,0	12
53368	5 G 4	re	12,5 - 15,1	192,0	345,0	12
53353	3 G 6	re	11,5 - 13,9	173,0	323,0	10
53361	4 G 6	re	12,7 - 15,3	230,0	400,0	10
53369	5 G 6	re	13,7 - 16,6	288,0	475,0	10
53354	3 G 10	re	13,8 - 16,7	288,0	485,0	8
53362	4 G 10	re	15,1 - 18,2	384,0	603,0	8
53370	5 G 10	re	16,3 - 19,7	480,0	720,0	8
53355	3 G 16	rm	16,5 - 20,0	461,0	850,0	6
53363	4 G 16	rm	18,0 - 21,8	615,0	940,0	6
53371	5 G 16	rm	19,7 - 23,8	768,0	1142,0	6
53356	3 G 25	rm	20,4 - 24,6	720,0	1152,0	4
53364	4 G 25	rm	22,6 - 27,3	960,0	1432,0	4
53372	5 G 25	rm	24,7 - 29,8	1200,0	1800,0	4
53357	3 G 35	rm	22,7 - 27,4	1008,0	1503,0	2
53365	4 G 35	rm	24,9 - 30,0	1344,0	1930,0	2
53373	5 G 35	rm	27,5 - 33,2	1680,0	2490,0	2

Dimensions and specifications may be changed without prior notice. (R001)

Data, Network & Bus Technology

The complete program, from delivery advice to installation

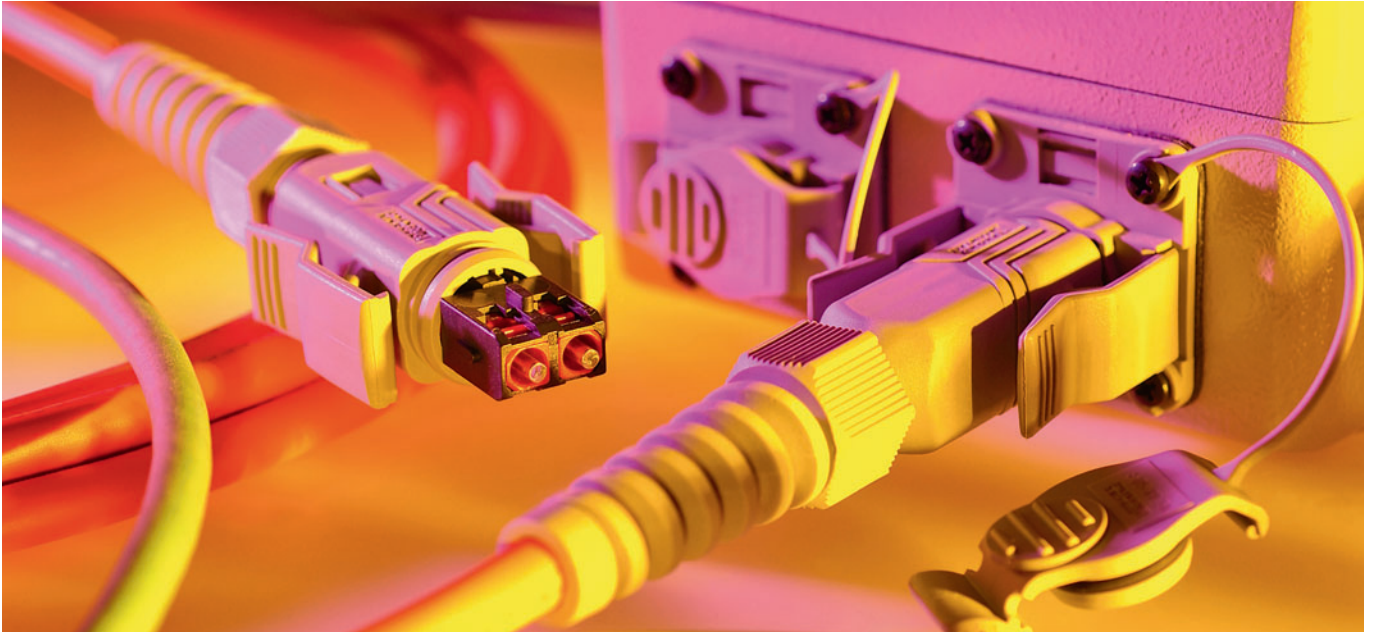


Photo: Helukabel®

LAN and WAN Networks have steadily increased in importance in the last few years, and have become the backbone of company communication.

HELUKABEL® can offer an extensive range of equipment for networking heterogeneous systems using Fibre Optic and Copper techniques. Products developed by us for passive applications, and active components from well-known manufacturers form the basis of our portfolio.

Our activities can be recognized by the tradenames HELUCOM®, HELUKAT®, HELUCOM CONNECTING SYSTEMS and HELUKAT CONNECTING SYSTEMS.

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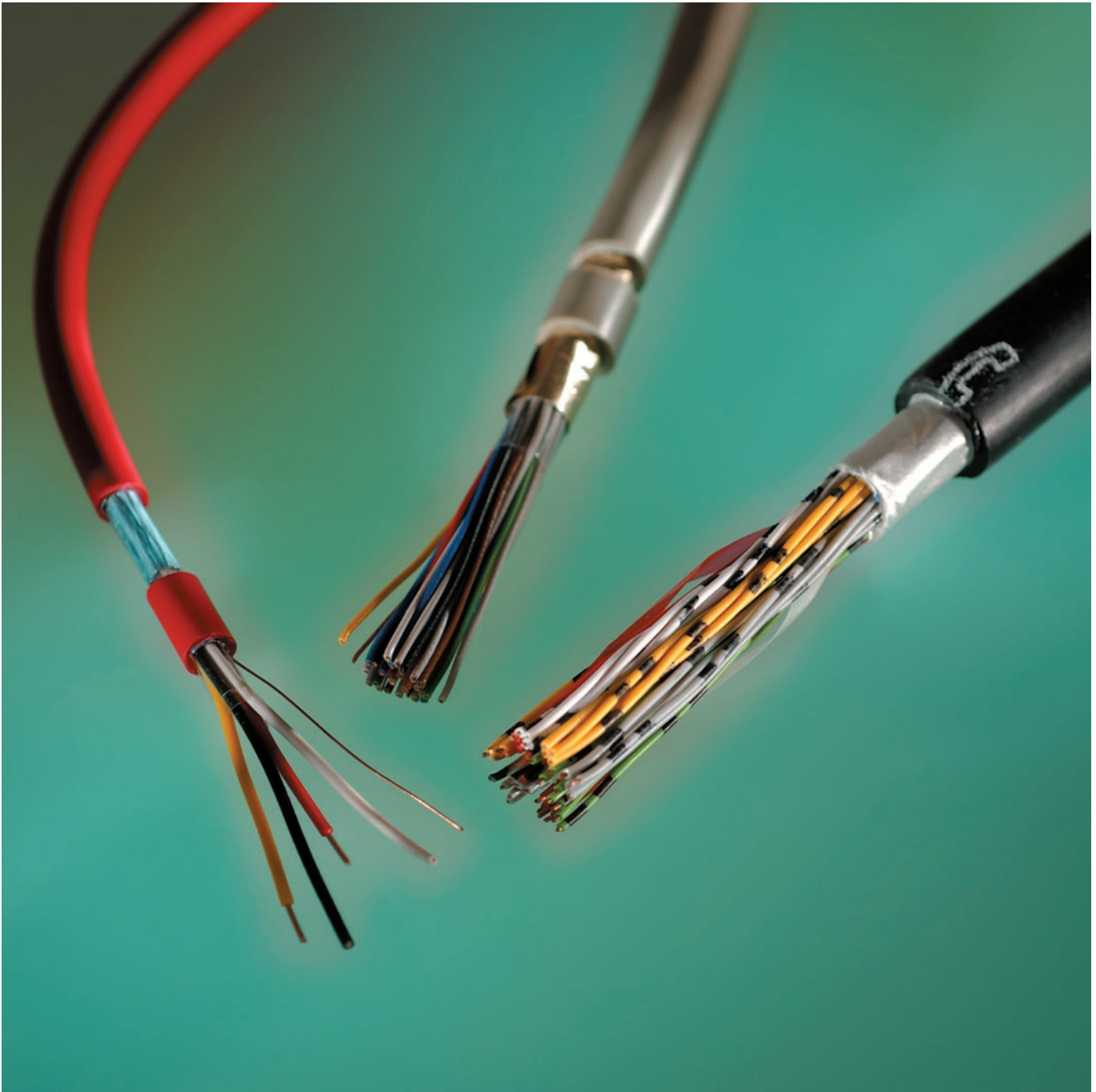


Photo: HELUKABEL®

Telephone and Fire Warning Cables

Telephone and Fire Warning Cables

As a supplier of underground cables such as telephone cables to be laid in- and outdoors as well as fire warning cables, HELUKABEL® can provide a short term delivery-readiness. Modern and powerful cutting machines ensure that even the demands for fixed lengths can be processed within a short time.

Due to our proximity to our customers (stock in Hemmingen/Stuttgart, Neuenhagen/Berlin, Pleiße/Chemnitz and Windsbach/Nuremberg) we can also deliver in a short time „on the spot“ to the **customer's construction site**.

On request we also deliver vehicles with lifting platform for easier loading and unloading.

Contents

Description	Page
A-2Y(L)2Y, Bd telephone-outdoor cable, according to VDE 0816, laminated sheath, unfilled	P 4
A-2YF(L)2Y, Bd telephone-outdoor cable, according to VDE 0816, laminated sheath, filled cable core, longitudinally water-proof	P 5
J-YY Bd, telephone installation cable, according to VDE 0815	P 6
J-Y(St)Y Lg, telephone installation cable, according to VDE 0815	P 7
J-Y(St)Y Lg, fire warning installation cable	P 8
S-YY Lg, switchboard cable according to VDE 0813	P 9
J-H(St)H, Bd installation cable, halogen-free, according to VDE 0815	P 10
J-H(St)H, Bd fire warning installation cable, halogen-free	P 11
J-2Y(St)H, St III Bd 16 Mbits/s (Kat.3) ISDN/EDV (Z = 100 Ohm), halogen-free	P 12

A-2Y(L)2Y Bd telephone-outdoor cable, according to VDE 0816, laminated sheath, unfilled



Technical data

- According to DIN VDE 0816
- **Temperature range**
flexible -20 °C to +50 °C
fixed installation to +70 °C
- **Loop resistance** at 20 °C
0,6 mm = max. 130 Ohm/km
0,8 mm = max. 73,2 Ohm/km
- **Operating voltage** (peak voltage)
max. 225 V
- **Test voltage**
core/core U eff. 500²⁾
core/screen U eff. 2000 V
- **Insulation resistance**
min. 5 GOhm x km
- **Line attenuation**
of side circuits at 800 Hz
0,6 mm = 1,04 dB/km
0,8 mm = 0,78 dB/km
- **Impedance**
of side circuits at 800 Hz
0,6 mm = 720 Ohm
0,8 mm = 520 Ohm
- **Minimum bending radius**
approx. 10x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid, 0,6 and 0,8 mm ø
- PE (2Y) core insulation, wall-thickness as per DIN VDE 0816 table 4
- Core identification of quads marked with black rings
- 4 cores twisted to a star quad
- 5 star quads stranded to sub units, each 5 or 10 sub units stranded to main units and the sub or main units stranded to cable core
- Core wrapping with several plastic tapes
- Outer sheath, as laminated sheath (L)2Y, PE-coated aluminium tape spliced with PE (2Y) sheath
- PE-outer sheath colour black
- Sheath marking continuously with telephone-receiver, meter marking in white colour

Properties

- These are not allowed for the power installation
- For fire and hazardous areas, this cable type with PE-sheath, the installation is not permitted without enough protective precaution

Mutual capacitance at 800 Hz

of all values 100%
0,6 mm - max. 52 nF/km
0,8 mm - max. 55 nF/km
of all values 95%
0,6 mm - max. 50³⁾ nF/km
0,8 mm - max. 53³⁾ nF/km
of all values 80%
0,6 mm - max. 48 nF/km
0,8 mm - max. 50 nF/km

Capacitance unbalances at 800 Hz
of all values k₁ 100% - max. 800¹⁾ pF/300 m
of all values k₁ 98% - max. 400 pF/300 m
of all values k₉₋₁₂ 100% - max. 300¹⁾ pF/300 m
of all values k₉₋₁₂ 98% - max. 100 pF/300 m

Note

- ¹⁾ But at least for 2 quads.
- ²⁾ Local cables with more than 100 pairs the test conductor/conductor is emitted.
- ³⁾ For cables up to 10 double cores is the 100 % value valid
- Conductor ø 0,4 mm on request.

Application

These external subscriber telephone cables are installed as telecommunication connection cable for connecting the telephone extension to the telephone exchange or central offices and as well as for industrial plants.

These subscriber connecting cables are suitable for laying in under ground, in cable ducts and cable conduits - and also for indoor-laying. Both sides of PE-copolymere coated aluminium type (L), which is spliced with the outer PE-sheath ensures a **barrier against water vapour** and diagonally water-proof.

Black coloured PE-sheath is **UV-resistant**.

The Polyethelene material (PE 2Y) is **halogen-free**.

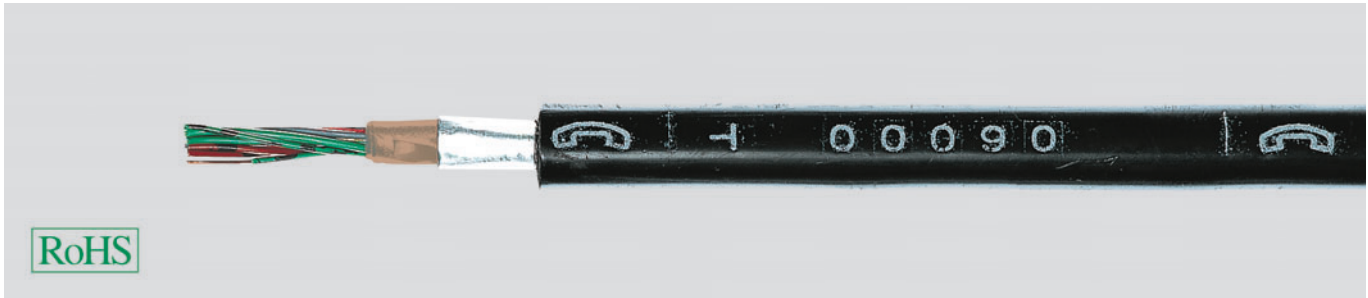
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34100	2 x 2 x 0,6	8,0	11,0	82,0
34101	4 x 2 x 0,6	10,0	23,0	127,0
34102	6 x 2 x 0,6	11,5	34,0	132,0
34103	10 x 2 x 0,6	12,5	57,0	171,0
34104	20 x 2 x 0,6	15,5	113,0	268,0
34105	30 x 2 x 0,6	17,5	170,0	358,0
34106	40 x 2 x 0,6	19,5	226,0	438,0
34107	50 x 2 x 0,6	21,0	283,0	531,0
34108	70 x 2 x 0,6	24,5	396,0	712,0
34109	100 x 2 x 0,6	28,0	565,0	950,0
34110	150 x 2 x 0,6	33,0	848,0	1348,0
34111	200 x 2 x 0,6	37,0	1131,0	1758,0
34112	250 x 2 x 0,6	40,5	1414,0	2137,0
34113	300 x 2 x 0,6	44,0	1696,0	2533,0
34114	350 x 2 x 0,6	47,5	1979,0	2954,0
34115	400 x 2 x 0,6	50,0	2262,0	3342,0

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34130	2 x 2 x 0,8	11,0	20,0	102,0
34131	4 x 2 x 0,8	12,0	40,0	158,0
34132	6 x 2 x 0,8	13,0	60,0	179,0
34133	10 x 2 x 0,8	14,5	101,0	241,0
34134	20 x 2 x 0,8	18,0	201,0	393,0
34135	30 x 2 x 0,8	21,0	302,0	540,0
34136	40 x 2 x 0,8	23,0	402,0	675,0
34137	50 x 2 x 0,8	25,5	503,0	842,0
34138	70 x 2 x 0,8	29,0	704,0	1105,0
34139	100 x 2 x 0,8	34,0	1005,0	1524,0
34140	150 x 2 x 0,8	40,0	1508,0	2208,0
34141	200 x 2 x 0,8	46,5	2011,0	2915,0
34142	250 x 2 x 0,8	51,0	2514,0	3575,0
34143	300 x 2 x 0,8	53,0	3016,0	4232,0
34144	350 x 2 x 0,8	56,5	3519,0	4940,0
34145	400 x 2 x 0,8	60,0	4022,0	5565,0
34146	500 x 2 x 0,8	68,0	5027,0	6955,0
34147	600 x 2 x 0,8	73,0	6032,0	8240,0

Dimensions and specifications may be changed without prior notice. (RP01)

A-2YF(L)2Y Bd telephone-outdoor cable, according to VDE 0816, laminated sheath, filled cable core, longitudinally water-proof



Technical data

- According to DIN VDE 0816
- **Temperature range**
flexible -20 °C to +50 °C
fixed installation to +70 °C
- **Loop resistance** at 20 °C
0,6 mm = max. 130 Ohm/km
0,8 mm = max. 73,2 Ohm/km
- **Operating voltage** (peak voltage)
max. 225 V
- **Test voltage**
core/core U eff. 500 V²⁾
core/screen U eff. 2000 V
- **Insulation resistance**
min. 1,5 GOhm x km
- **Line attenuation**
of side circuits at 800 Hz
0,6 mm = 1,04 dB/km
0,8 mm = 0,78 dB/km
- **Impedance** of side circuits
at 800 Hz
0,6 mm = 720 Ohm
0,8 mm = 520 Ohm
- **Minimum bending radius**
approx. 10x cable ø
- **Radiation resistance**
up to 80x106 cJ/kg (up to 80 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid, 0,6 and 0,8 mm ø
- PE (2Y) core insulation, wall-thickness as per DIN VDE 0816 table 4
- Core identification of quads marked with black rings
- 4 cores twisted to a star quad
- 5 star quads stranded to sub units, each 5 or 10 sub units stranded to main units and the sub or main units stranded to cable core
- Core cavities continuously filled with petrol-jelly
- Core wrapping with paper tape
- Outer sheath, as laminated sheath (L)2Y, PE-coated aluminium tape spliced with PE (2Y) sheath
- PE-outer sheath colour black
- Sheath marking continuously with telephone-receiver, meter marking in white colour

Properties

- These cables are not allowed for purposes of high current and power installation. These cables with outer PE-jacket are also not permitted for fire and explosive areas without any protective measure.
- **Mutual capacitance** at 800 Hz
of all values 100%
0,6 mm - max. 52 nF/km
0,8 mm - max. 55 nF/km
of all values 95%
0,6 mm - max. 50³⁾ nF/km
0,8 mm - max. 53³⁾ nF/km
of all values 80%
0,6 mm - max. 48 nF/km
0,8 mm - max. 50 nF/km
- **Capacitance unbalances** at 800 Hz
of all values k₁ 100% - max. 800¹⁾ pF/300 m
of all values k₁ 98% - max. 400 pF/300 m
of all values k₉₋₁₂ 100% - max. 300¹⁾ pF/300 m
of all values k₉₋₁₂ 98% - max. 100 pF/300 m

Note

- ¹⁾ But at least for 2 quads.
- ²⁾ Local cables with more than 100 pairs the test conductor/conductor is emitted.
- ³⁾ For cables up to 10 double cores is the 100 % value valid
- Conductor ø 0,4 mm on request.

Application

These external subscriber telephone cables are installed as telecommunication connection cable for connecting the telephone extension to the telephone exchange for transmitting signals.

These subscriber connecting cables are suitable for laying in under ground, in cable ducts and cable conduits.

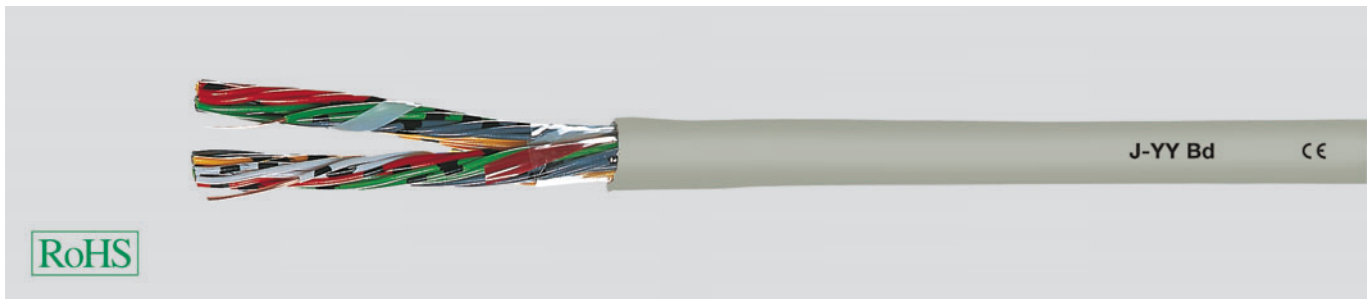
According to DIN VDE 0800 part 1, these cables are allowed in all types of installation plants. The cavities of the cable core, filled continuously with viscous compound (F). Both sides of PE-copolymere coated aluminium type (L), which is spliced with the outer PE-sheath, ensures a barrier against water vapour and **crosswise and longitudinal water tightness**. Black coloured PE-sheath is **UV-resistant**. The Polyethelene material (PE 2Y) is **halogen-free**.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34007	2 x 2 x 0,6	7,5	11,0	80,0
34008	4 x 2 x 0,6	9,0	23,0	140,0
34009	6 x 2 x 0,6	12,0	34,0	150,0
34010	10 x 2 x 0,6	13,5	57,0	190,0
34011	20 x 2 x 0,6	16,0	113,0	310,0
34012	30 x 2 x 0,6	19,0	170,0	430,0
34013	40 x 2 x 0,6	20,5	226,0	545,0
34014	50 x 2 x 0,6	23,0	283,0	660,0
34015	70 x 2 x 0,6	26,0	396,0	895,0
34016	100 x 2 x 0,6	31,5	565,0	1230,0
34017	150 x 2 x 0,6	37,5	848,0	1780,0
34018	200 x 2 x 0,6	42,5	1131,0	2320,0
34036	250 x 2 x 0,6	47,5	1414,0	2910,0
34037	300 x 2 x 0,6	51,5	1696,0	3490,0
34038	350 x 2 x 0,6	55,0	1979,0	3970,0
34039	400 x 2 x 0,6	60,5	2262,0	4480,0
34040	500 x 2 x 0,6	66,0	2827,0	5460,0

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34029	2 x 2 x 0,8	8,5	20,0	100,0
34030	4 x 2 x 0,8	10,0	40,0	180,0
34019	6 x 2 x 0,8	12,5	60,0	190,0
34020	10 x 2 x 0,8	15,0	101,0	280,0
34021	20 x 2 x 0,8	19,0	201,0	480,0
34022	30 x 2 x 0,8	23,0	302,0	670,0
34023	40 x 2 x 0,8	26,0	402,0	860,0
34024	50 x 2 x 0,8	29,0	503,0	1060,0
34025	70 x 2 x 0,8	33,0	704,0	1420,0
34026	100 x 2 x 0,8	39,0	1005,0	1980,0
34027	150 x 2 x 0,8	47,0	1508,0	2940,0
34028	200 x 2 x 0,8	51,0	2011,0	3780,0
34031	250 x 2 x 0,8	58,0	2514,0	4660,0
34032	300 x 2 x 0,8	62,5	3016,0	5570,0
34033	350 x 2 x 0,8	68,0	3519,0	6750,0
34034	400 x 2 x 0,8	73,0	4022,0	7630,0
34035	500 x 2 x 0,8	81,5	5027,0	9540,0

Dimensions and specifications may be changed without prior notice. (RP01)



Technical data

- Installation cable according to DIN VDE 0815
- **Temperature range** during operation -5 °C to +50 °C before and after installation -30 °C to +70 °C
- **Loop resistance** at 20 °C max. 130 Ohm/km
- **Nominal voltage** (peak voltage) 300 V
- **Test voltage** (50 Hz) core/core U eff. 800 V
- **Insulation resistance** min. 100 MOhm x km
- **Mutual capacitance** at 800 Hz max. 100¹⁾ nF/km
- **Capacitance unbalances** at 800 Hz k₁ max. 300²⁾ pF/100 m k_{9...k₁₂} 100³⁾ pF/100 m
- **Line attenuation** at 800 Hz 1,48 dB/km
- **Minimum bending radius** to DIN VDE 0891 part 5 during delivery 7,5x cable ø single bending without tension 2,5x cable ø repeated bending under tension 7,5x cable ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Caloric load values** see Technical Informations

Cable structure

- Bare copper conductor, solid, 0,6 mm ø
- PVC core insulation, compound type Y11 to DIN VDE 0207, insulation wall-thickness 0,2 mm to table 7
- Core and star quad identification to DIN VDE 0815
- The cores to a quad and each 5 quads to a unit and several units are stranded in layer
- Core wrapping with plastic tape
- PVC outer jacket grey, flame retardant, compound type YM1 to DIN VDE 0207 part 5, jacket wall-thickness to DIN VDE 0815 table 19

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- ¹⁾ This value may be extended by 20% with a make-up to 4 pairs.
- ²⁾ 20% of the values, but one value up to 500 pF is allowed.
- ³⁾ 10% of the values, but four values (relationship) up to 300 pF are allowed.

Application

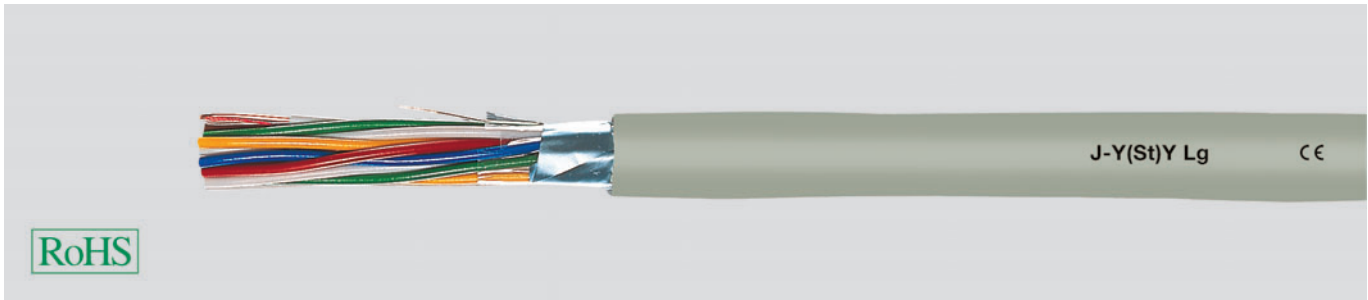
J-YY installation cables are preferably used as telephone cables in telephone stations and sub-extensions, suitable for installation in dry and damp environments in, on and under plaster as well as in the open air for fixed installation on outer walls of buildings.

Telephone-Installation cables are not allowed for purposes of high current and power installation.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Part no.	No. pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
33100	2 x 2 x 0,6	4,5	11,0	34,0	33107	30 x 2 x 0,6	13,0	170,0	284,0
33101	4 x 2 x 0,6	6,5	23,0	59,0	33108	40 x 2 x 0,6	15,0	226,0	364,0
33102	6 x 2 x 0,6	7,0	34,0	74,0	33109	50 x 2 x 0,6	16,5	283,0	451,0
33103	10 x 2 x 0,6	8,5	57,0	111,0	33110	60 x 2 x 0,6	17,5	339,0	529,0
33104	16 x 2 x 0,6	10,0	90,0	160,0	33111	80 x 2 x 0,6	20,3	452,0	700,0
33105	20 x 2 x 0,6	11,0	113,0	200,0	33112	100 x 2 x 0,6	22,3	565,0	850,0
33106	24 x 2 x 0,6	11,5	136,0	224,0					

Dimensions and specifications may be changed without prior notice. (RP01)



Technical data

- Installation cable according to DIN VDE 0815
- **Temperature range**
during operation -5 °C to +50 °C
before and after installation
-30 °C to +70 °C
- **Loop resistance** at 20 °C
0,6 mm - max. 130 Ohm/km
0,8 mm - max. 73,2 Ohm/km
- **Nominal voltage** (peak voltage)
(not for purposes of high current and power installation)
0,6 mm - 300 V
0,8 mm - 300³⁾ V
- **Test voltage**
core/core U eff. 800 V
core/screen 800 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance** at 800 Hz
max. 100¹⁾ nF/km
- **Capacitance unbalances** at 800 Hz
k- max. 300²⁾ pF/100 m
- **Line attenuation** at 800 Hz
0,6 mm - 1,7 dB/km
0,8 mm - 1,1 dB/km
- **Minimum bending radius**
to DIN VDE 0891 part 5
during delivery 7,5x cable ø
single bending without tension
2,5x cable ø
repeated bending under tension
7,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- As per J-YY, but laid up in pairs and with electrostatic screen (St)
- Bare copper conductor, solid, 0,6 and 0,8 mm ø
- PVC core insulation, compound type YI1, to DIN VDE 0207, insulation wall-thickness 0,2 mm and 0,4 mm to table 7
- Core and pair identification to DIN VDE 0815
- Cores twisted to pairs and the pairs are stranded in layers
- Core wrapping with plastic tape
- Electrostatic screen (St) of plastic coated aluminium foil and drain wire
- PVC outer jacket grey, flame retardant, compound type YM1 to DIN VDE 0207 part 5, jacket wall-thickness to DIN VDE 0815 table 19

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- ¹⁾ This value may be extended by 20% with a make-up to 4 pairs.
- ²⁾ 20% of the values, but one value up to 500 pF is allowed.
- ³⁾ Short time operation (6 s/min) up to 600 V permitted.

Application

This cable type with electrostatic screening (St) protects the transmission circuits against external electrical interferences. Installation cables laid up in pairs are preferably used for indoor telecommunication installation in dry and damp places, in, on and under plaster but also in the open air for fixed installation on outer walls of buildings. These cables are suitable for telephone stations and sub-extensions, for signal and data transmission. Telephone-Installation cables are not allowed for purposes of high current and power installation.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
33001	2 x 2 x 0,6	5,0	13,0	40,0
33002	3 x 2 x 0,6	6,3	18,0	50,0
33003	4 x 2 x 0,6	6,5	24,0	60,0
33004	5 x 2 x 0,6	7,2	30,0	70,0
33005	6 x 2 x 0,6	7,5	35,0	80,0
33006	8 x 2 x 0,6	8,0	46,0	90,0
33007	10 x 2 x 0,6	10,0	58,0	110,0
33008	12 x 2 x 0,6	10,2	71,0	130,0
33009	16 x 2 x 0,6	11,0	93,0	160,0
33010	20 x 2 x 0,6	12,0	116,0	190,0
33011	24 x 2 x 0,6	13,0	139,0	220,0
33012	30 x 2 x 0,6	14,0	172,0	280,0
33013	40 x 2 x 0,6	15,0	220,0	350,0
33014	50 x 2 x 0,6	17,0	286,0	430,0
33015	60 x 2 x 0,6	19,0	342,0	500,0
33016	80 x 2 x 0,6	21,0	455,0	640,0
33017	100 x 2 x 0,6	24,0	568,0	850,0

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
33018	2 x 2 x 0,8	7,0	21,0	60,0
33019	3 x 2 x 0,8	8,5	31,0	80,0
33020	4 x 2 x 0,8	9,0	41,0	100,0
33021	5 x 2 x 0,8	9,5	52,0	120,0
33022	6 x 2 x 0,8	11,0	62,0	140,0
33023	8 x 2 x 0,8	11,5	82,0	170,0
33024	10 x 2 x 0,8	13,2	102,0	220,0
33025	12 x 2 x 0,8	14,2	123,0	250,0
33026	16 x 2 x 0,8	16,0	164,0	320,0
33027	20 x 2 x 0,8	17,0	204,0	380,0
33028	24 x 2 x 0,8	19,0	244,0	460,0
33029	30 x 2 x 0,8	20,8	304,0	560,0
33030	40 x 2 x 0,8	23,0	405,0	710,0
33031	50 x 2 x 0,8	26,0	505,0	900,0
33032	60 x 2 x 0,8	28,0	606,0	1050,0
33033	80 x 2 x 0,8	31,5	807,0	1400,0
33034	100 x 2 x 0,8	33,0	1008,0	1750,0

Dimensions and specifications may be changed without prior notice. (RP01)

J-Y(St)Y Lg fire warning installation cable



Technical data

- Installation cable adapted to DIN VDE 0815
- **Temperature range**
during operation -5 °C to +50 °C
before and after installation
-30 °C to +70 °C
- **Loop resistance**
at 20 °C max. 73,2 Ohm/km
- **Nominal voltage**
(peak voltage) 300³⁾ V
(not for purposes of high current and power installation)
- **Test voltage** (50 Hz)
core/core U eff. 800 V
core/screen 800 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance**
at 800 Hz max. 100¹⁾ nF/km
- **Capacitance unbalances**
at 800 Hz k - max. 300²⁾ pF/100 m
- **Line attenuation**
at 800 Hz 1,1 dB/km
- **Minimum bending radius**
to DIN VDE 0891 part 5
during delivery 7,5x cable ø
single bending without tension
2,5x cable ø
repeated bending under tension
7,5x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Solid plain copper wire 0,8 mm ø
- PVC core insulation Y11, to DIN VDE 0207 part 4
- Cores twisted in pairs Pairs stranded in layer
- Plastic coated aluminium foil static screening (St)
- Tinned copper drain wire PVC outer sheath YM1, to DIN VDE 0207 part 5
- Red PVC outer jacket with imprint "Brandmeldekabel"

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- ¹⁾ This value may be extended by 20% with a make-up to 4 pairs.
- ²⁾ 20% of the values, but one value up to 500 pF is allowed.
- ³⁾ Short time operation (6 s/min) up to 600 V permitted.

Application

This cable type with electrostatic screening (St) protects the transmission circuits against external electrical interferences. Installation cables laid up in pairs are preferably used for indoor telecommunication installation in dry and damp places, in, on and under plaster but also in the open air for fixed installation on outer walls of buildings.

These cables are suitable for telephone stations and sub-extensions, for signal and data transmission. Telephone-Installation cables are not allowed for purposes of high current and power installation.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	Part no.	No. pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
33035	1 x 2 x 0,8	4,5	11,0	38,0	33045	16 x 2 x 0,8	16,0	164,0	320,0
33036	2 x 2 x 0,8	7,0	21,0	60,0	33046	20 x 2 x 0,8	17,0	204,0	380,0
33037	3 x 2 x 0,8	8,5	31,0	80,0	33047	24 x 2 x 0,8	19,0	244,0	460,0
33038	4 x 2 x 0,8	9,0	41,0	100,0	33048	30 x 2 x 0,8	20,8	304,0	560,0
33039	5 x 2 x 0,8	9,5	52,0	120,0	33049	40 x 2 x 0,8	23,0	405,0	710,0
33040	6 x 2 x 0,8	11,0	62,0	140,0	33050	50 x 2 x 0,8	26,0	505,0	900,0
33041	8 x 2 x 0,8	11,5	82,0	170,0	33051	60 x 2 x 0,8	28,0	606,0	1050,0
33042	10 x 2 x 0,8	13,2	102,0	220,0	33052	80 x 2 x 0,8	31,5	807,0	1400,0
33043	12 x 2 x 0,8	14,2	123,0	250,0	33053	100 x 2 x 0,8	33,0	1008,0	1750,0
33044	14 x 2 x 0,8	14,6	145,0	280,0					

Dimensions and specifications may be changed without prior notice. (RP01)



Technical data

- Switchboard cable according to DIN VDE 0813
- **Temperature range** during operation
-5 °C to +50 °C
before and after installation
-30 °C to +70 °C
- **Electrical characteristics** according to VDE 0813 at 20 °C
- **Conductor resistance**
0,5 mm - max. 96 Ohm/km
0,6 mm - max. 65 Ohm/km
1,0 mm - max. 23,4 Ohm/km
- **Nominal voltage**
0,5 mm - max. 375 V
0,6 mm - max. 375 V
1,0 mm - max. 400 V
- **Test voltage** core/core
0,5 mm - 2000 V
0,6 mm - 2500 V
1,0 mm - 2500 V
- **Insulation resistance**
min. 100 MOhm x km
- Min. permissible **bending radius** according to DIN VDE 0891 part 3 during operation max. 7,5x cable ø

Cable structure

- Bare copper conductor, solid PVC core insulation, Y11 to DIN VDE 0207 part 4
- Core identification to DIN VDE 0813
- Cores stranded in layers
- Core wrapping with plastic tape
- PVC outer jacket, YM1 to DIN VDE 0207 part 5
- Jacket colour grey (RAL 7032)

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

In DIN VDE 0800 the operational areas are defined, where the application of switchboard cables permit. These are preferred for the transmission of data signals of telecommunication and control processings i. e. in interlocking installations, to connect the outdoor cables with relay groups as well as for fixed installation to interconnect the racks and distributor frames. This type is not allowed for the installation of heavy current operation.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cond. Ø mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34300	30 x 1 x 0,5	9,6	59,0	128,0
34301	60 x 1 x 0,5	11,9	118,0	233,0
34302	10 x 1 x 0,6	7,9	28,0	98,0
34303	20 x 1 x 0,6	9,6	57,0	132,0
34304	30 x 1 x 0,6	11,1	85,0	183,0
34305	60 x 1 x 0,6	15,4	170,0	344,0
34306	80 x 1 x 0,6	18,3	226,0	445,0
34307	20 x 1 x 1	14,5	157,0	292,0
34308	24 x 1 x 1	15,2	188,0	328,0
34309	32 x 1 x 1	16,3	251,0	430,0
34310	40 x 1 x 1	17,8	314,0	515,0
34311	60 x 1 x 1	22,2	471,0	710,0

Dimensions and specifications may be changed without prior notice. (RP01)



Technical data

- Flame retardant, halogen-free installation cable to DIN VDE 0815
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -30 °C to +70 °C
- **Loop resistance** at 20 °C
max. 130 Ohm/km at 0,6 mm²
max. 73,2 Ohm/km at 0,8 mm²
- **Operating top level voltage**
300 V (not for purposes of high current and power installation)
- **Test voltage**
core/core U eff. 800 V
core/screen 800 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance** at 800 Hz
max. 120¹⁾ nF/km
- **Capacitance unbalances** at 800 Hz
K₁ max. 300²⁾ pF/100 m
K₉-K₁₂ max. 100³⁾ pF/100 m
- **Line attenuation** at 800 Hz
approx. 1,5 dB/km
- **Minimum bending radius**
during delivery 7,5x cable ø
single bending without tension
= 2,5x cable ø
repeated bending under tension
= 7,5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Caloric load values**
see technical informations

Cable structure

- Bare copper conductor, solid, 0,6 mm ø and 0,8 mm ø
- Core insulation of halogen-free compound type HI2, to DIN VDE 0207 part 23 insulation wall thickness 0,3 or 0,4 mm
- Core and star-quad identification to DIN VDE 0815
- Cores twisted in quads
- The cores to quads and the quads are stranded to units
- Core wrapping with plastic tape
- Drain wire solid
- Electrostatic screen (St) of plastic coated aluminium foil
- Halogen-free outer jacket type HM2 to DIN VDE 0207 part 24
- Jacket colour grey
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Not for purposes of high current and power installation as well as underground laying.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- ¹⁾ This value may be extended by 20% with make-up up to 4 pairs.
- ²⁾ 20% of the values, but one value up to 500 pF is allowed.
- ³⁾ 10% of the values, but four values (relationship) up to 300 pF are allowed.

Application

The halogen-free installation cables with improved characteristics in the case of fire are used for the telephone transmission, measurement and control technology.

The static screen protects the transmission circuits against outer electrical interferences. A fire propagation is prevented through high oxygen index of the insulation material and produce no corrosive gases in case of fire. Those cables are preferably used for telecommunication indoor installations and in special cases the outdoor installation is permitted under protection against sunlight. These cables are suitable for fixed installation in areas with danger of fire, in dry and damp environments as well as on, in and under plaster.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34050	2 x 2 x 0,6	5,8	14,0	50,0
34051	4 x 2 x 0,6	8,6	25,0	91,0
34052	6 x 2 x 0,6	9,0	37,0	100,0
34053	10 x 2 x 0,6	10,3	59,0	147,0
34054	20 x 2 x 0,6	15,5	116,0	308,0
34055	30 x 2 x 0,6	16,5	172,0	350,0
34056	40 x 2 x 0,6	18,6	229,0	465,0
34057	50 x 2 x 0,6	20,7	286,0	571,0
34058	60 x 2 x 0,6	22,8	342,0	662,0
34059	80 x 2 x 0,6	26,6	455,0	877,0
34060	100 x 2 x 0,6	28,2	568,0	1055,0

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34061	2 x 2 x 0,8	6,8	25,0	70,0
34062	4 x 2 x 0,8	10,5	45,0	135,0
34063	6 x 2 x 0,8	10,9	65,0	151,0
34064	10 x 2 x 0,8	13,1	106,0	230,0
34065	20 x 2 x 0,8	20,4	206,0	507,0
34066	30 x 2 x 0,8	21,5	307,0	600,0
34067	40 x 2 x 0,8	24,5	407,0	788,0
34068	50 x 2 x 0,8	27,1	508,0	972,0
34069	60 x 2 x 0,8	29,4	608,0	1120,0
34070	80 x 2 x 0,8	33,2	809,0	1475,0
34071	100 x 2 x 0,8	37,2	1010,0	1804,0

Dimensions and specifications may be changed without prior notice. (RP01)

J-H(St)H Bd fire warning installation cable, halogen-free



Technical data

- Flame retardant, halogen-free installation cable adapted to DIN VDE 0815
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -30 °C to +70 °C
- **Loop resistance** at 20 °C
max. 73,2 Ohm/km
- **Operating voltage** (peak value)
300 V
(not for purposes of high current and power installation)
- **Test voltage**
core/core U eff. 800 V
core/screen 800 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance** at 800 Hz
max. 120¹⁾ nF/km
- **Capacitance unbalances** at 800 Hz
K₁ max. 300²⁾ pF/100 m
K₉-K₁₂ max. 100³⁾ pF/100 m
- **Line attenuation** at 800 Hz
approx. 1,5 dB/km
- **Minimum bending radius**
during delivery = 7,5x cable ø
single bending without tension
= 2,5x cable ø
repeated bending under tension
= 7,5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid, 0,8 mm ø
- Core insulation of halogen-free compound type HI2, to DIN VDE 0207 part 23 insulation wall thickness 0,3 or 0,4 mm
- Core and star-quad identification to DIN VDE 0815
- Cores twisted in quads
- The cores to quads and the quads are stranded to units
- Core wrapping with plastic tape
- Drain wire solid
- Electrostatic screen (St) of plastic coated aluminium foil and drain wire
- Halogen-free outer jacket type HM2 to DIN VDE 0207 part 24
- Jacket colour red with imprint "BRANDMELDEKABEL"
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Not for purposes of high current and power installation as well as underground laying
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test to DIN VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to DIN VDE 0482 part 267/ EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- ¹⁾ This value may be extended by 20% with make-up up to 4 pairs.
- ²⁾ 20% of the values, but one value up to 500 pF is allowed.
- ³⁾ 10% of the values, but four values (relationship) up to 300 pF are allowed.

Application

The halogen-free installation cables with improved characteristics in the case of fire are used for the telephone transmission, measurement and control technology.

The static screen protects the transmission circuits against outer electrical interferences. A fire propagation is prevented through high oxygen index of the insulation material and produce no corrosive gases in case of fire. Those cables are preferably used for telecommunication indoor installations and in special cases the outdoor installation is permitted under protection against sunlight.

These cables are suitable for fixed installation in areas with danger of fire, in dry and damp environments as well as on, in and under plaster.

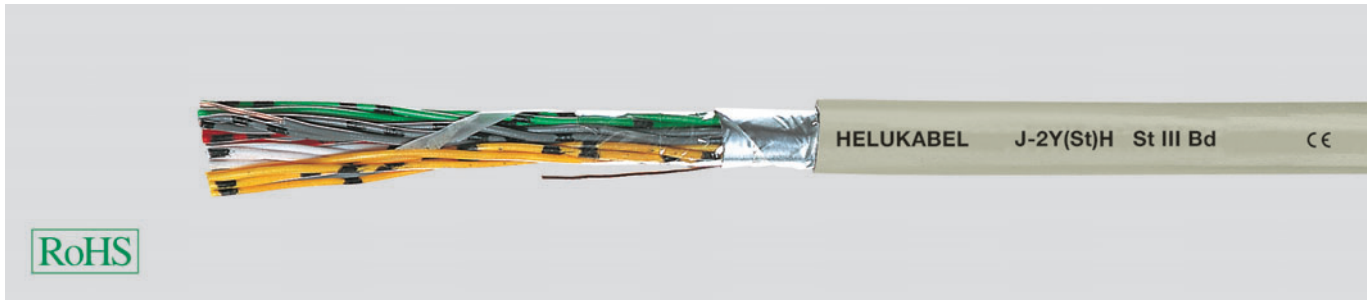
☑= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34116	2 x 2 x 0,8	6,8	25,0	70,0
34117	4 x 2 x 0,8	10,5	45,0	135,0
34118	6 x 2 x 0,8	10,9	65,0	151,0
34119	10 x 2 x 0,8	13,1	106,0	230,0
34120	20 x 2 x 0,8	20,4	206,0	507,0
34121	30 x 2 x 0,8	21,5	307,0	600,0

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34122	40 x 2 x 0,8	24,5	407,0	788,0
34123	50 x 2 x 0,8	27,1	508,0	972,0
34124	60 x 2 x 0,8	29,4	608,0	1120,0
34125	80 x 2 x 0,8	33,2	809,0	1475,0
34126	100 x 2 x 0,8	37,2	1010,0	1804,0

Dimensions and specifications may be changed without prior notice. (RP01)

J-2Y(St)H St III Bd 16 Mbits/s (Kat.3) ISDN/EDV (Z = 100 Ohm), halogen-free



Technical data

- Special core insulation of PE
- Adapted to DIN VDE 0815 and 0816
- **Conductor loop-resistance** max. 130 Ohm/km
- **Temperature range** flexing -5 °C to +70 °C fixed installation -30 °C to +70 °C
- **Operating peak voltage** 300 V (not for purposes of high current and power installation)
- **Test voltage** 800 V
- **Insulation resistance** min. 5 GOhm x km
- **Mutual capacitance** 48 nF/km
- **Characteristic impedance (Z)** at 4-16 MHz: 100 Ohm ±15%
- **Capacitance unbalance** K₁ max. 400 pF/300 m K₉-K₁₂ max. 100 pF/300 m
- **Rel. velocity ratio** approx. 0,66
- **Attenuation** at
1 MHz: 28 dB/km
4 MHz: 47 dB/km
5 MHz: 51 dB/km
10 MHz: 65 dB/km
15 MHz: 76 dB/km
16 MHz: 78 dB/km
20 MHz: 89 dB/km
- **Cross-talk attenuation** from 4 MHz up to 16 MHz for 2 pairs: min. 40 dB 4 pairs and above: min. 25 dB
- **Minimum bending radius** stationary approx. 10x cable ø

Cable structure

- Bare, solid copper conductor 0,6 mm ø
- Core insulation of PE (2Y)
- Colour coding to DIN VDE 0815
- Conductors twisted to quads
- 5 quads twisted to units
- Static screen of plastics coated alu foil with drain wire 0,6 mm ø
- Outer jacket flame retardant, halogen-free polymer-compound
- Jacket colour grey

Properties

- Outer jacket
Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- These cables are not allowed for purposes of high current and power installation
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

Used as data transmission and connection cable suitable for fixed installation in and under plaster, for data transmission applications, for periphery instrument data processing computers.

Suitable for transmission of analog- and digital signals up to 16 Mbit/s. High cross-talk attenuation values.

Suitable as connecting cable for periphery equipment, data processing systems, monitors, Printers and cash register systems.

The static screen (St) screen assures a disturbance-free data and signal transmission for measuring and control systems.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34166	2 x 2 x 0,6	5,8	13,0	44,0
34167	4 x 2 x 0,6	9,2	24,0	80,0
34168	6 x 2 x 0,6	9,3	35,0	86,0
34169	8 x 2 x 0,6	9,5	46,0	105,0
34170	10 x 2 x 0,6	9,8	58,0	112,0
34171	20 x 2 x 0,6	12,7	116,0	218,0

Part no.	No.pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34172	30 x 2 x 0,6	15,0	172,0	302,0
34173	40 x 2 x 0,6	16,8	229,0	376,0
34174	50 x 2 x 0,6	18,5	266,0	480,0
34175	60 x 2 x 0,6	20,2	342,0	560,0
34176	80 x 2 x 0,6	23,0	455,0	748,0
34177	100 x 2 x 0,6	25,2	588,0	940,0

Dimensions and specifications may be changed without prior notice. (RP01)

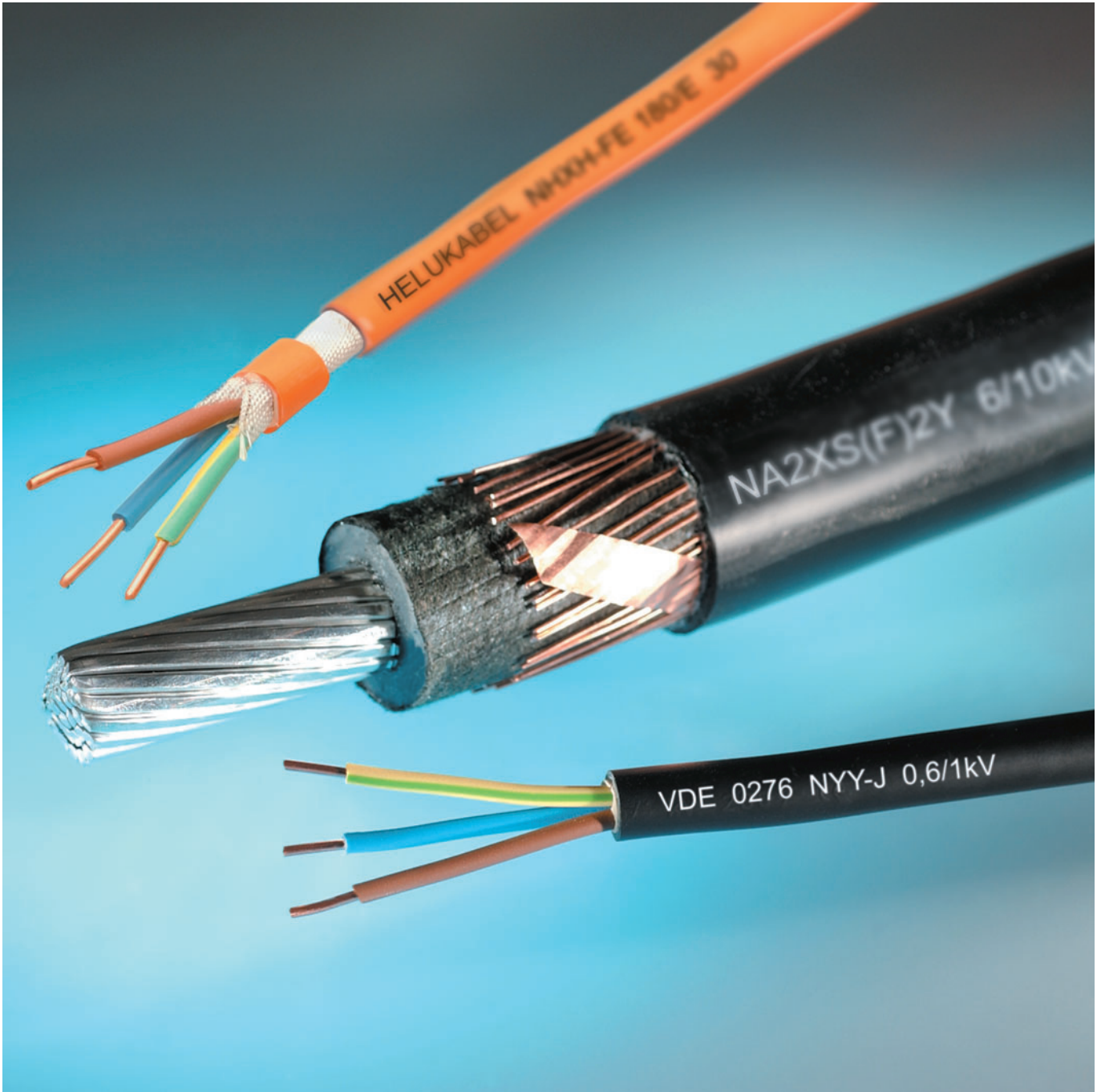


Photo: HELUKABEL®

Power Cables, Security Cables and Medium Voltage Cables

Power Cables, Security Cables and Medium Voltage Cables

Medium Voltage Power Cables up to 30 kV with XLPE-insulation

The XLPE-insulation possesses very good electrical, mechanical and thermal characteristics in medium voltage networks. This type of insulation is outstandingly chemically resistant and also resistant to cold. Due to various advantages, the XLPE-insulated type has vastly displaced the traditional classical paper insulated types in many sectors.

The XLPE-insulated medium voltage cables are designed to be longitudinally water-proof. In comparison to PVC and paper-insulated cables, the advantage of XLPE-insulated medium voltage power cables is that they possess a low dielectric factor.

The good properties of XLPE-insulated cables remain constant through a wide temperature range. These cables can be laid in earth, in air or in tubes.

Further information for laying, bending radius ambient temperatures, permissible tensile strength with pulling head test voltages can be found in the following pages.

Due to our proximity to our customers (stock in Hemmingen/Stuttgart, Neuenhagen/Berlin, Pleiße/Chemnitz and Windsbach/Nuremberg) we can also deliver in a short time „on the spot“ to the **customer's construction site**.

Q

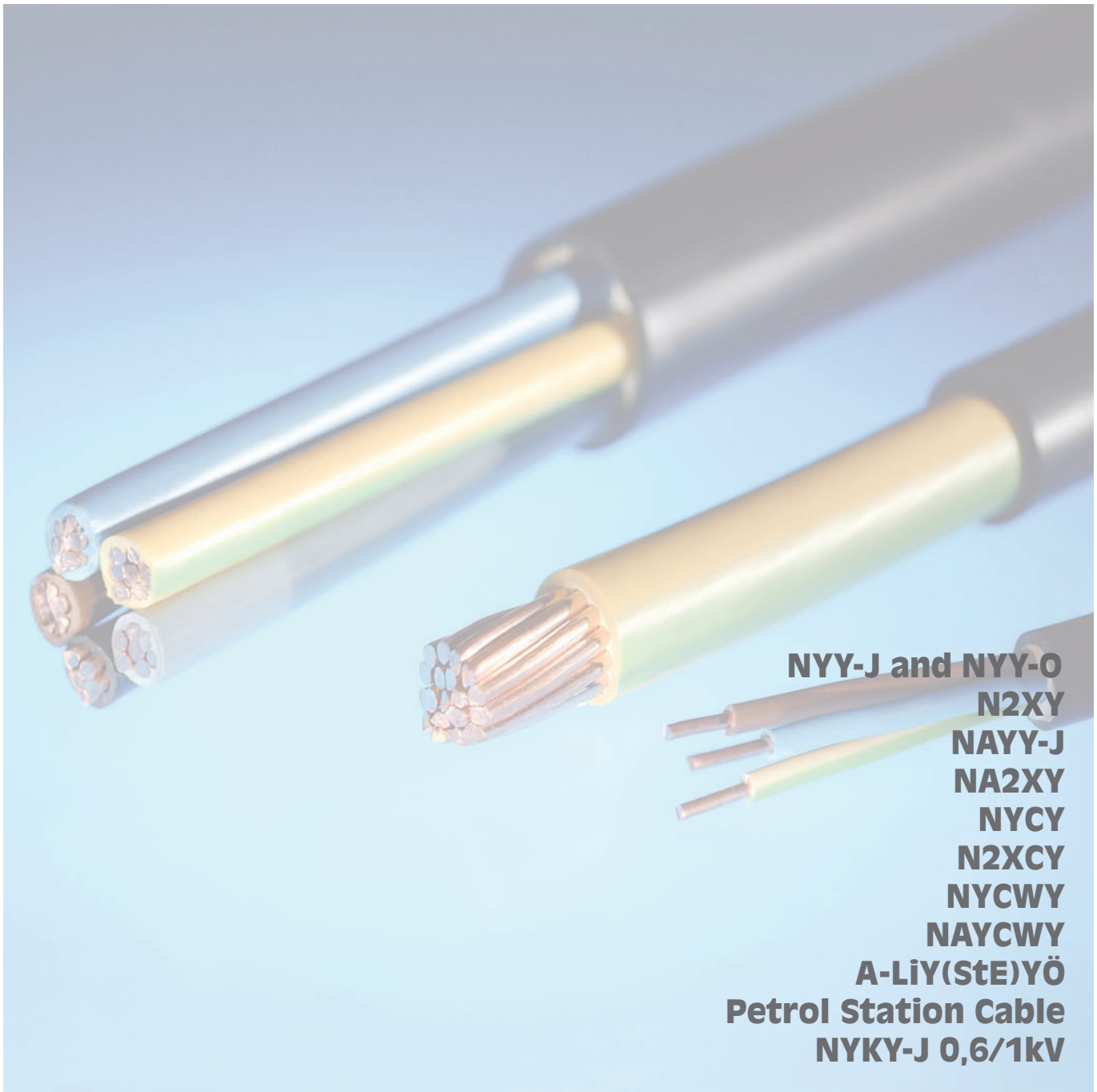
Contents

Description	Page
Power Cables	
NYJ / NY-O, power cable, 0,6/1kV, VDE approved	Q 6
N2XY, power cable, 0,6/1 kV, VDE approved, higher current carrying capacity	Q 8
NAYY, power cable, 0,6/1 kV, VDE approved	Q 9
NA2XY, power cable, 0,6/1 kV, VDE approved, higher current carrying capacity	Q 11
NYCY, power cable, 0,6/1kV, VDE approved, with concentric copper conductor	Q 12
N2XCY, power cable, 0,6/1 kV, VDE approved, higher current carrying capacity	Q 14
NYCWY, power cable, 0,6/1kV, with concentric copper conductor, VDE approved	Q 16
NAYCWY, power cable, 0,6/1kV, with concentric copper conductor, VDE approved	Q 18
A-LiY(StE)YÖ, Data transmission cables for petrol stations and refineries with BAM*-test report	Q 19
Petrol Station Cables, (NYÖ-J 0,6/1 kV, with BAM-test report	Q 20
NYK-J 0,6/1kV, with lead sheath, VDE approved	Q 21
Security Cables	
N2XH, power cable, 0,6/1 kV, halogen-free, without functionality	Q 24
N2XCH, power cable, 0,6/1kV, halogen-free, with concentric conductor, without functionality	Q 26
JE-H(St)H, Bd FE 180/E 30 bis E 90 (orange), halogen-free	Q 28
JE-H(St)H, Bd fire warning cable, FE 180/E 30 to E 90 (red), halogen-free	Q 29
JE-H(St)HRH, Bd fire warning cable, FE 180/E 30 to E 90, halogen-free	Q 30
N2XH-FE 180/E 30, security cable, halogen-free, 0,6/1 kV, with improved fire characteristics	Q 31
N2XCH-FE 180/E 30, security cable, halogen-free, 0,6/1 kV, with improved fire characteristics	Q 33
NHXH-FE 180/E 30, security cable, halogen-free, 0,6/1 kV, with improved fire characteristics	Q 35
NHXCH-FE 180/E 30, security cable, halogen-free, 0,6/1 kV, with improved fire characteristics	Q 37
N2XH-FE 180/E 90, security cable, halogen-free, 0,6/1 kV, with improved fire characteristics	Q 39
N2XCH-FE 180/E 90, security cable, halogen-free, 0,6/1 kV, with improved fire characteristics	Q 41
NHXH-FE 180/E 90, security cable, halogen-free, 0,6/1 kV, with improved fire characteristics	Q 43
NHXCH-FE 180/E 90, security cable, halogen-free, 0,6/1 kV, with improved fire characteristics	Q 45
Medium Voltage Power Cables	
N2XS 6/10kV, 12/20kV, 18/30kV, XLPE-insulated, Cu-conductor, single core, screened, PVC-jacket	Q 50
NA2XS 6/10kV, 12/20kV, 18/30kV, XLPE-insulated, alu-conductor, single core, screened, PVC-jacket	Q 52
N2XS2Y 6/10kV, 12/20kV, 18/30kV, XLPE-insulated, Cu-conductor, single core, screened, PE-jacket	Q 54
NA2XS2Y 6/10kV, 12/20kV, 18/30kV, XLPE-insulated, Cu-conductor, single core, screened, PE-jacket	Q 56
N2XS(F)2Y 6/10kV, 12/20kV, 18/30kV, XLPE-insulated, Cu-conductor, single core, longitudinally water-tight, screened, PE-jacket	Q 58
NA2XS(F)2Y 6/10kV, 12/20kV, 18/30kV, XLPE-insulated, alu-conductor, single core, longitudinally water-tight, screened, PE-jacket	Q 60
N2XSEY 3 x ... 6/10kV, XLPE-insulated, Cu-conductor, PVC-jacket	Q 62

Code-designation for power cables with PVC or XLPE insulation

Design	Identification of design	Explanations
Core	N	According to VDE standard (no abbreviation for copper conductor)
	A	Aluminium conductors
	Y	Insulation of thermoplastic Polyvinylchloride (PVC)
	2X	Insulation cross-linked Polyethylene (XLPE)
Concentric conductor, screen	C	Concentric conductors of copper wires and copper tape, helically wounded
	CW	Concentric conductor of copper wires in waveconal formation and copper tape, helically wounded
	CE	Concentric conductor of copper wires and copper tape over each individual core, helically wounded
Screen	S	Screen of copper wires and copper tape, helically wounded
	SE	Screen of copper wires and copper tape over each individual core, helically wounded
	(F)	Longitudinally water-proof screen
Armour	B	Armour of steel tape
	F	Armour of galvanized flat steel wires
	G	Counter helix of galvanized steel tape
Sheath	K	Lead sheath
Outer jacket	Y	PVC jacket
	2Y	PE jacket
Cable for U_0/U 0,6/1 kV are additionally designated with		
	-J	Cables with green-yellow (green-natural) core are marked with protective conductor
	-O	able without green-yellow (green-natural) core are marked without protective conductor

Q



NYJ and NY-O
N2XY
NAYJ
NA2XY
NYCY
N2XCY
NYCWY
NAYCWY
A-LiY(StE)YÖ
Petrol Station Cable
NYKY-J 0,6/1kV

Photo: HELUKABEL®

Power Cables



Technical data

- Power and control cable to DIN VDE 0276 part 603 S1, HD 603.1 and IEC 60502, 7 core and above to DIN VDE 0276 part 627, HD 627 S1 and IEC 60502
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -40 °C to +70 °C
- Permissible **operating temperature** at conductor +70 °C
- Permissible **short circuit temperature** +160 °C (short circuit duration 5 sec.)
- **Nominal voltage** U₀/U 0,6/1 kV
- **Test voltage** 4 kV
- Max. permissible **tensile stress** with cable grip for Cu-conductor = 50 N/mm²
- **Minimum bending radius**
for single core approx. 15x cable ø
for multi core approx. 12x cable ø
- **Power ratings table**
see Technical Informations
- **Caloric load values**
see Technical Informations

Cable structure

- Plain copper conductor, to DIN VDE 0295 cl. 1 or cl. 2 solid or stranded type, BS 6360 cl. 1 or cl. 2, IEC 60228 and HD 383
- PVC core insulation, DIV4 to HD 603.1
- Cores stranded concentrically
- Colour coded to DIN VDE 0293-308, 0276 part 603 or HD 186
- Core colour for 3+½ conductor
J-type: gnye (½), bn, bk, gy
O-type: bu (½), bn, bk, gy
- PVC outer jacket, DMV5 to HD 603.1
- Sheath colour black

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Highest permissible voltage**
- Direct current systems 1,8 kV
- Alternating current systems, single-phase systems 1,4 kV
Both conductors insulated, single-phase systems 0,7 kV
One conductor earthed, three-phase systems 1,2 kV
With concentric conductor and a cross-section of 240 mm² and above 3,6 kV

Note

- re = round conductor, single-wire;
rm = round conductor, multiple-wire;
sm = stranded, sectional core.
- Also available in NYFGBY, NYBY versions etc.
- 2 cores = adapted to DIN VDE.
- **In respect to 3+½ conductors**
Whereby only one conductor is allowed to contain a smaller cross-section (as per DIN VDE 0276 part 603 table 5) and permitted to place as insulated core (gree-yellow and blue as ½-conductor), stranded in layer.

Application

Power cables for energy supply are installed in open air, in underground, in water, indoors, in cable ducts, power stations, for industry and distribution boards as well as in subscriber networks, where mechanical damages are not to be expected.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

No. cores x cross-sec. mm ²		Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	J type Part no.	AWG-No.	O type Part no.	AWG-No.
1 x 4	re	9,0	38,0	115,0	32001	12	32089	12
1 x 6	re	9,5	58,0	135,0	32002	10	32090	10
1 x 10	re	10,0	96,0	179,0	32003	8	32091	8
1 x 16	re	11,0	154,0	245,0	32004	6	32092	6
1 x 25	rm	12,0	240,0	360,0	32005	4	32093	4
1 x 35	rm	13,0	336,0	470,0	32006	2	32094	2
1 x 50	rm	15,0	480,0	620,0	32007	1	32095	1
1 x 70	rm	16,5	672,0	810,0	32008	2/0	32096	2/0
1 x 95	rm	19,0	912,0	1110,0	32009	3/0	32097	3/0
1 x 120	rm	20,5	1152,0	1360,0	32010	4/0	32098	4/0
1 x 150	rm	22,5	1440,0	1670,0	32011	300 kcmil	32099	300 kcmil
1 x 185	rm	25,0	1776,0	2050,0	32012	350 kcmil	32100	350 kcmil
1 x 240	rm	28,0	2304,0	2630,0	32013	500 kcmil	32101	500 kcmil
1 x 300	rm	30,0	2880,0	3200,0	32014	600 kcmil	32102	600 kcmil
1 x 400	rm	34,0	3840,0	4150,0	32015	750 kcmil	32103	750 kcmil
1 x 500	rm	38,0	4800,0	5200,0	32556	1000 kcmil	32558	1000 kcmil
1 x 630	rm	43,0	6048,0	6650,0	32557	-	32559	-

Continuation ▶

NYY-J / NYY-O power cable, 0,6/1kV, VDE approved



No. cores x cross-sec. mm²		Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	J type Part no.	AWG-No.	O type Part no.	AWG-No.
2 x 1,5	re	11,0	29,0	175,0	32016	16	32104	16
2 x 2,5	re	12,0	48,0	215,0	32017	14	32105	14
2 x 4	re	14,0	77,0	295,0	32018	12	32106	12
2 x 6	re	15,0	115,0	370,0	32019	10	32107	10
2 x 10	re	16,5	192,0	495,0	32020	8	32108	8
2 x 16	re	18,5	307,0	670,0	32021	6	32109	6
2 x 25	rm	23,5	480,0	960,0	32022	4	32110	4
3 x 1,5	re	11,5	43,0	195,0	32023	16	32111	16
3 x 2,5	re	12,5	72,0	250,0	32024	14	32112	14
3 x 4	re	14,0	115,0	340,0	32025	12	32113	12
3 x 6	re	15,0	173,0	430,0	32026	10	32114	10
3 x 10	re	17,0	288,0	590,0	32027	8	32115	8
3 x 16	re	19,0	461,0	820,0	32028	6	32116	6
3 x 25	rm	24,0	720,0	1520,0	32029	4	32117	4
3 x 35	sm	25,0	1008,0	1450,0	32030	2	32118	2
3 x 50	sm	26,5	1440,0	1850,0	32031	1	32119	1
3 x 70	sm	30,0	2016,0	2450,0	32032	2/0	32120	2/0
3 x 95	sm	34,5	2736,0	3500,0	32033	3/0	32121	3/0
3 x 120	sm	37,0	3456,0	4100,0	32034	4/0	32122	4/0
3 x 150	sm	40,0	4320,0	4900,0	32293	300 kcmil	32296	300 kcmil
3 x 185	sm	46,0	5328,0	6500,0	32294	350 kcmil	32297	350 kcmil
3 x 240	sm	51,0	6912,0	8500,0	32295	500 kcmil	32298	500 kcmil
4 x 1,5	re	12,0	58,0	230,0	32044	16	32132	16
4 x 2,5	re	13,5	96,0	300,0	32045	14	32133	14
4 x 4	re	15,0	154,0	410,0	32046	12	32134	12
4 x 6	re	16,5	230,0	520,0	32047	10	32135	10
4 x 10	re	18,5	384,0	730,0	32048	8	32136	8
4 x 16	re	21,5	614,0	1045,0	32049	6	32137	6
4 x 25	rm	26,0	960,0	1640,0	32050	4	32138	4
4 x 35	sm	27,5	1344,0	1760,0	32051	2	32139	2
4 x 50	sm	30,0	1920,0	2350,0	32052	1	32140	1
4 x 70	sm	34,0	2688,0	3100,0	32053	2/0	32141	2/0
4 x 95	sm	39,0	3648,0	4250,0	32054	3/0	32142	3/0
4 x 120	sm	42,5	4608,0	5300,0	32055	4/0	32143	4/0
4 x 150	sm	47,5	5760,0	6400,0	32056	300 kcmil	32144	300 kcmil
4 x 185	sm	52,0	7104,0	8500,0	32057	350 kcmil	32145	350 kcmil
4 x 240	sm	58,0	9216,0	11000,0	32058	500 kcmil	32146	500 kcmil
5 x 1,5	re	13,0	72,0	270,0	32059	16	32147	16
5 x 2,5	re	14,5	120,0	360,0	32060	14	32148	14
5 x 4	re	16,5	192,0	490,0	32061	12	32149	12
5 x 6	re	18,0	288,0	600,0	32062	10	32150	10
5 x 10	re	20,0	480,0	890,0	32063	8	32151	8
5 x 16	re	22,5	768,0	1255,0	32064	6	32152	6
5 x 25	rm	28,0	1200,0	1960,0	32065	4		
5 x 35	rm	34,0	1680,0	2400,0	32300	2		
5 x 50	rm	40,0	2400,0	3500,0	32257	1		
7 x 1,5	re	15,5	101,0	310,0	32066	16	32153	16
7 x 2,5	re	16,5	168,0	450,0	32076	14	32163	10
7 x 4	re	18,5	269,0	640,0	32086	12		
7 x 6	re	20,0	403,0	850,0	32087	10	32174	10
7 x 10	re	23,5	672,0	1200,0	32088	8	32175	8
10 x 1,5	re	18,0	144,0	380,0	32067	16	32154	16
10 x 2,5	re	19,5	240,0	520,0	32077	14	32164	10
12 x 1,5	re	19,0	173,0	420,0	32068	16	32155	16
12 x 2,5	re	20,5	288,0	600,0	32078	14		
14 x 1,5	re	20,0	202,0	470,0	32069	16	32156	16
14 x 2,5	re	21,0	336,0	680,0	32079	14		
16 x 1,5	re	21,0	230,0	520,0	32070	16	32157	16
16 x 2,5	re	22,0	384,0	750,0	32080	14		
19 x 1,5	re	22,0	274,0	570,0	32071	16	32158	16
19 x 2,5	re	23,0	456,0	850,0	32081	14	32168	10
21 x 1,5	re	23,0	302,0	650,0	32072	16	32159	16
21 x 2,5	re	24,5	504,0	980,0	32082	14		
24 x 1,5	re	25,0	346,0	750,0	32073	16	32160	16
24 x 2,5	re	27,0	576,0	1100,0	32083	14		
30 x 1,5	re	26,0	432,0	860,0	32074	16	32161	16
30 x 2,5	re	28,0	720,0	1280,0	32084	14		
40 x 1,5	re	29,0	576,0	1070,0	32075	16	32162	16
40 x 2,5	re	31,5	960,0	1700,0	32085	14		
52 x 2,5	re	35,0	1248,0	2150,0	32169	14		
61 x 1,5	re	34,0	878,0	1680,0	32176	16		

3+1/2-conductors

No. cores x cross-sec. mm²		Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	J type Part no.	AWG-No.	O type Part no.	AWG-No.
3 x 25 / 16	rm/re	24,5	874,0	1530,0	32035	4	32123	4
3 x 35 / 16	sm/re	26,0	1162,0	1750,0	32036	2	32124	2
3 x 50 / 25	sm	29,0	1680,0	2350,0	32037	1	32125	1
3 x 70 / 35	sm/rm	32,0	2352,0	2850,0	32038	2/0	32126	2/0
3 x 95 / 50	sm	38,0	3216,0	3850,0	32039	3/0	32127	3/0
3 x 120 / 70	sm	41,0	4128,0	4780,0	32040	4/0	32128	4/0
3 x 150 / 70	sm	46,0	4992,0	5800,0	32041	300 kcmil	32129	300 kcmil
3 x 185 / 95	sm	51,0	6240,0	7600,0	32042	350 kcmil	32130	350 kcmil
3 x 240 / 120	sm	58,0	8064,0	9800,0	32043	500 kcmil	32131	500 kcmil
3 x 300 / 150	sm	64,0	10080,0	11500,0	32256	600 kcmil		

Dimensions and specifications may be changed without prior notice. (RQ01)



Technical data

- Power and control cable according to DIN VDE 0276 part 603 S1 or HD 603 and IEC 60502
- **Temperature range**
Flexing -5 °C to +50 °C
Fixed installation -40 °C to +70 °C
- Permissible **operating temperature** at the conductor +90 °C
- Permissible **short circuit temperature** +250 °C (short circuit duration 5 sec.)
- **Nominal voltage**
U₀/U 0,6/1 kV
- **Test voltage** 4 kV
Max. permissible **tensile load** with cable grip = 50 N/mm²
- **Minimum bending radius**
Single-core approx. 15x cable ø
Multi-core approx. 12x cable ø

Cable structure

- Bare copper conductor according to DIN VDE 0295 cl. 1 or cl. 2, single-wire or multi-wire, BS 6360 cl. 1 or cl. 2, IEC 60228 cl. 1 or cl. 2 or HD 383
- Core insulation from cross-linked polyethylene compound, DIX3 according to HD 603.1
- Cores stranded in concentric layers
- Core colours in accordance with DIN VDE 0293-308, 0276 Part 603 or HD 186 PVC outer sheath, DMV6/DMP2 according to HD 603.1
- Sheath colour - black

Properties

- Self-extinguishing and flame retardant in accordance with VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (conforms to DIN VDE 0472 part 804 Test method B)
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- **Highest permissible voltage**
- Direct current systems 1,8 kV
- Three-phase systems
Single-phase systems:
Both outer conductors insulated 1,4 kV
Single-phase systems:
One conductor earthed 0,7 kV
- Three-phase systems 1,2 kV

Note

- re = round conductor, single-wire;
rm = round conductor, multi-wire
sm = sector-shaped conductor, multi-wire

Application

Power distribution cables for use in underground, in water, outdoors, in concrete, indoors, in cable ducts, for power stations, industrial applications and switching systems, as well as in local networks if no mechanical damage is expected. Respecting the permissible operating temperature at the conductor of +90 °C permits a higher current carrying capacity than PVC insulated power distribution cables.

☞ The product conforms to the EC Low-Voltage Directive 2006/95/EG.

No. cores x cross-sec. mm ²		Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	J type Part no.	AWG-No.	O type Part no.	AWG-No.
1 x 16	re	11,5	154,0	242,0	32850	6	32862	6
1 x 25	rm	12,5	240,0	362,0	32851	4	32863	4
1 x 35	rm	13,5	336,0	470,0	32852	2	32864	2
1 x 50	rm	15,5	480,0	620,0	32853	1	32865	1
1 x 70	rm	17,0	672,0	805,0	32854	2/0	32866	2/0
1 x 95	rm	19,0	912,0	1108,0	32855	3/0	32867	3/0
1 x 120	rm	20,5	1152,0	1360,0	32856	4/0	32868	4/0
1 x 150	rm	23,0	1440,0	1670,0	32857	300 kcmil	32869	300 kcmil
1 x 185	rm	25,5	1776,0	2050,0	32858	350 kcmil	32870	350 kcmil
1 x 240	rm	28,5	2304,0	2635,0	32859	500 kcmil	32871	500 kcmil
1 x 300	rm	30,0	2880,0	3200,0	32860	600 kcmil	32872	600 kcmil
1 x 400	rm	34,0	3840,0	4150,0	32861	750 kcmil	32873	750 kcmil
4 x 16	rm	21,5	614,0	1042,0	32874	6	32884	6
4 x 25	rm	26,0	960,0	1640,0	32875	4	32885	4
4 x 35	rm	27,5	1344,0	1760,0	32876	2	32886	2
4 x 50	sm	30,0	1920,0	2350,0	32877	1	32887	1
4 x 70	sm	34,0	2688,0	3100,0	32878	2/0	32888	2/0
4 x 95	sm	39,0	3648,0	4250,0	32879	3/0	32889	3/0
4 x 120	sm	42,5	4608,0	5300,0	32880	4/0	32890	4/0
4 x 150	sm	47,5	5760,0	6400,0	32881	300 kcmil	32891	300 kcmil
4 x 185	sm	52,0	7104,0	8500,0	32882	350 kcmil	32892	350 kcmil
4 x 240	sm	58,0	9216,0	11000,0	32883	500 kcmil	32893	500 kcmil

Dimensions and specifications may be changed without prior notice. (RQ01)



Technical data

- Power and control cable to DIN VDE 0276 part 603, HD 603 S1 and IEC 60502
- Insulation and jacket-compound of thermoplastic PVC
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -40 °C to +70 °C
Permissible **operating temperature** at conductor +70 °C
- Permissible **short circuit temperature** +160 °C (short circuit duration 5 sec.)
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4 kV
- Max. permissible **tensile stress** with cable grip for Alu-conductor = 30 N/mm²
- **Current carrying capacity** as per DIN VDE 0276 part 603, in normal operation table 14 and 15, under short circuit conditions table 17
- **Minimum bending radius** for multi core approx. 12x cable \varnothing for single core approx. 15x cable \varnothing
- **Current carrying capacity** see Technical Informations
- **Caloric load values** see Technical Informations

Cable structure

- Solid aluminium conductor, as per VDE 0295 cl. 1 or cl. 2 (round and sector shaped), BS 6360 cl. 1 or cl. 2, IEC 60228 and HD 383
- PVC core insulation, DIV4 to HD 603.1
- Conductor colours: green-yellow, brown, black, grey
- Cores stranded in layers
- Inner covering
- PVC outer jacket black, DMV5 to HD 603.1
- Sheath colour black

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Highest permissible voltage

- Direct current systems 1,8 kV
- Alternating current systems, single-phase systems
Both conductors insulated 1,4 kV
single-phase systems
One conductor earthed 0,7 kV
- three-phase systems 1,2 kV

Note

- re = round solid core;
- se = sectional core;
- rm = stranded core.

Application

Power cables for energy supply are installed in open air, in underground, in water, indoors, in cable ducts, power stations, for industry and distribution boards as well as in subscriber networks, where mechanical damages are not be expected.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

No. cores x cross-sec. mm ²		Outer \varnothing approx. mm	Alu weight approx. kg / km	Weight approx. kg / km	J type Part no.	AWG-No.	O type Part no.	AWG-No.
4 x 16	re	23,0	186,0	750,0	32301	6	32184	6
4 x 25	re	26,0	290,0	950,0	32302	4	32185	4
4 x 35	re	28,5	406,0	1120,0	32303	2	32186	2
4 x 50	se	30,0	580,0	1151,0	32304	1	32187	1
4 x 70	se	35,0	812,0	1549,0	32305	2/0	32188	2/0
4 x 95	se	39,5	1102,0	2030,0	32306	3/0	32189	3/0
4 x 95	sm	39,5	1102,0	2030,0	32177	3/0	32190	3/0
4 x 120	se	44,0	1392,0	2400,0	32307	4/0	32191	4/0
4 x 120	sm	44,0	1392,0	2400,0	32178	4/0	32192	4/0
4 x 150	se	46,0	1740,0	3030,0	32308	300 kcmil	32193	300 kcmil
4 x 150	sm	46,0	1740,0	3030,0	32179	300 kcmil	32194	300 kcmil
4 x 185	se	51,0	2146,0	3650,0	32309	350 kcmil	32195	350 kcmil
4 x 185	sm	51,0	2146,0	3650,0	32180	350 kcmil	32196	350 kcmil
4 x 240	se	56,0	2784,0	4800,0	32310	500 kcmil	32197	500 kcmil
4 x 240	sm	56,0	2784,0	4800,0	32181	500 kcmil	32198	500 kcmil
4 x 300	se	64,0	3480,0	5596,0	32182	600 kcmil	32199	600 kcmil
4 x 300	sm	64,0	3480,0	5596,0	32183	600 kcmil	32258	600 kcmil

Continuation ►

NAYY power cable, 0,6/1 kV, VDE approved



No. cores x cross-sec. mm ²		Outer Ø approx. mm	Alu weight approx. kg / km	Weight approx. kg / km	J type Part no.	AWG-No.	O type Part no.	AWG-No.
5 x 10	re	22,0	145,0	637,0	33275	8	33283	8
5 x 16	re	25,0	232,0	832,0	33276	6	33284	6
5 x 25	re	28,0	363,0	1175,0	33277	4	33285	4
5 x 35	re	31,0	508,0	1399,0	33278	2	33286	2
5 x 50	sm	35,0	725,0	1855,0	33279	1	33287	1
5 x 70	sm	40,0	1015,0	2351,0	33280	2/0	33288	2/0
5 x 95	sm	45,0	1378,0	3071,0	33281	3/0	33289	3/0
5 x 120	sm	49,0	1740,0	3631,0	33282	4/0	33290	4/0

No. cores x cross-sec. mm ²		Outer Ø approx. mm	Alu weight approx. kg / km	Weight approx. kg / km	J type Part no.	AWG-No.	O type Part no.	AWG-No.
1 x 35	re	13,0	102,0	240,0	32328	2	32311	2
1 x 50	rm	15,0	145,0	360,0	32329	1	32312	1
1 x 70	rm	16,5	203,0	410,0	32390	2/0	32313	2/0
1 x 95	rm	19,0	276,0	570,0	32391	3/0	32314	3/0
1 x 120	rm	20,5	348,0	691,0	32392	4/0	32315	4/0
1 x 150	rm	22,5	435,0	804,0	32393	300 kcmil	32321	300 kcmil
1 x 185	rm	25,0	537,0	979,0	32394	350 kcmil	32322	350 kcmil
1 x 240	rm	28,0	696,0	1253,0	32395	500 kcmil	32323	500 kcmil
1 x 300	rm	30,0	870,0	1395,0	32396	600 kcmil	32324	600 kcmil
1 x 400	rm	34,0	1160,0	1890,0	32397	750 kcmil	32325	750 kcmil
1 x 500	rm	38,0	1450,0	2600,0	32398	1000 kcmil	32326	1000 kcmil
1 x 650	rm	43,0	1827,0	2780,0	32399	-	32327	-

Dimensions and specifications may be changed without prior notice. (RQ01)



Technical data

- Power and control cable according to DIN VDE 0276 Part 603 S1 or HD 603.1 and IEC 60502
- **Temperature range**
Flexing -5 °C to +50 °C
Fixed installation -40 °C to +70 °C
- Permissible **operating temperature** at the conductor +90 °C
- Permissible **short circuit temperature** +250 °C (short circuit duration 5 sec.)
- **Nominal voltage**
U₀/U 0,6/1 kV
- **Test voltage** 4 kV
- **Max. permissible tensile load** with cable grip for Alu-conductor = 30 N/mm²
- **Minimum bending radius**
Single-core approx. 15x cable ø
Multi-core approx. 12x cable ø

Cable structure

- Aluminium conductor, according to DIN VDE 0295 cl. 1 or cl. 2 single-wire or multi-wire, BS 6360 cl. 1 or cl. 2, IEC 60228 cl. 1 or cl.2 or HD 383
- Core insulation from cross-linked polyethylen compound, DIX3 in accordance with HD 603.1
- Cores stranded in concentric layers
- Core colours according to DIN VDE 0293-308, 0276 part 603 or HD 186
- PVC outer sheath, DMV6/DMP2 according to HD 603.1
- Sheath colour - black
- PVC outer sheath, DMV6/DMP2 to HD 603.1
- Sheath colour black

Properties

- Self-extinguishing and flame retardant in accordance with VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (conforms to DIN VDE 0472 part 804 Test method B)
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- **Highest permissible voltage**
- Direct current systems 1,8 kV
- Three-phase systems
Single-phase systems:
Both outer conductors insulated 1,4 kV
Single-phase systems:
One outer conductor earthed 0,7 kV
- Three-phase systems 1,2 kV

Note

- re = round conductor, single-wire;
se = round conductor, multi-wire
sm = sector-shaped conductor, multi-wire

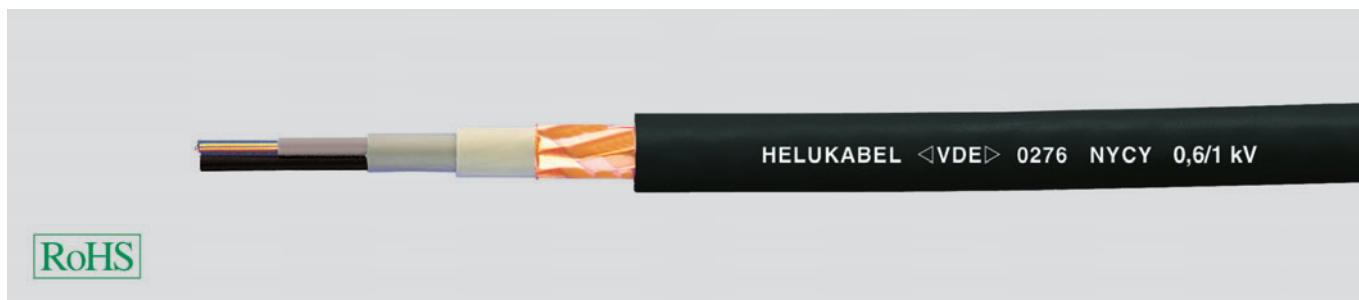
Application

Power distribution cables for use in underground, in water, outdoors, in concrete, indoors, in cable ducts, for power stations, industrial applications and switching systems, as well as in local networks if no mechanical damage is expected. Respecting the permissible operating temperature at the conductor of +90 °C permits a higher current carrying capacity than PVC insulated power distribution cables.

CE= The product conforms to the EC Low-Voltage Directive 2006/95/EG.

No. cores x cross-sec. mm ²		Outer Ø approx. mm	Alu weight kg / km	Weight approx. kg / km	J type Part no.	AWG-No.	O type Part no.	AWG-No.
1 x 16	re	11,5	47,0	98,0	33113	6	33125	6
1 x 25	rm	12,5	73,0	150,0	33114	4	33126	4
1 x 35	rm	13,5	102,0	241,0	33115	2	33127	2
1 x 50	rm	15,5	145,0	357,0	33116	1	33128	1
1 x 70	rm	17,0	203,0	409,0	33117	2/0	33129	2/0
1 x 95	rm	19,0	276,0	570,0	33118	3/0	33130	3/0
1 x 120	rm	20,5	348,0	590,0	33119	4/0	33131	4/0
1 x 150	rm	23,0	435,0	804,0	33120	300 kcmil	33132	300 kcmil
1 x 150	rm	25,5	537,0	978,0	33121	350 kcmil	33133	350 kcmil
1 x 240	rm	28,5	696,0	1253,0	33122	500 kcmil	33134	500 kcmil
1 x 300	rm	30,0	870,0	1394,0	33123	600 kcmil	33135	600 kcmil
1 x 400	rm	34,0	1160,0	1890,0	33124	750 kcmil	33136	750 kcmil
4 x 16	rm	21,5	186,0	750,0	33137	6	33147	6
4 x 25	rm	26,0	290,0	950,0	33138	4	33148	4
4 x 35	rm	27,5	406,0	1120,0	33139	2	33149	2
4 x 50	sm	30,0	580,0	1251,0	33140	1	33150	1
4 x 70	sm	34,0	812,0	1548,0	33141	2/0	33151	2/0
4 x 95	sm	39,0	1102,0	2030,0	33142	3/0	33152	3/0
4 x 120	sm	42,5	1392,0	2400,0	33143	4/0	33153	4/0
4 x 150	sm	47,5	1740,0	3030,0	33144	300 kcmil	33154	300 kcmil
4 x 185	sm	52,0	2146,0	3650,0	33145	350 kcmil	33155	350 kcmil
4 x 240	sm	58,0	2784,0	4800,0	33146	500 kcmil	33156	500 kcmil

Dimensions and specifications may be changed without prior notice. (RQ01)



Technical data

- Power and control cable to DIN VDE 0276 part 603, HD 603 S1 and IEC 60502 7 cores and above to DIN VDE 0276 part 627, HD 627 S1 and IEC 60502
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -40 °C to +70 °C
- Permissible **operating temperature** at conductor +70 °C
- Permissible **short circuit temperature** +160 °C (short circuit duration 5 sec.)
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4 kV
- Max. permissible **tensile stress** with cable grip for Cu-conductor = 50 N/mm²
- **Minimum bending radius**
for single core approx. 15x cable ø
for multi core approx. 12x cable ø
- **Power ratings table**
see Technical Informations
- **Caloric load values**
see Technical Informations

Cable structure

- Plain copper solid conductor as per VDE 0295 cl. 1, BS 6360 cl. 1, IEC 60228 and HD 383
- PVC core insulation, DIV4 to HD 603.1
- Colour coded to VDE 0293-308 and HD 186
- Cores stranded concentrically
- Filling compound
- Concentric conductor in inner layer of round copper wires, outer layer with copper tape
- PVC outer sheath, DMV5 to HD 603.1
- Sheath colour black

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Highest permissible voltage**
- Direct current systems 1,8 kV
- Alternating current systems, single-phase systems 1,4 kV
Both conductors insulated, single-phase systems 0,7 kV
- One conductor earthed, three-phase systems 1,2 kV
- With concentric conductor and a cross-section of 240 mm² and above 3,6 kV

Note

- re = round solid core.
- Available with outer sheath in alternative colours on request.

Application

Power cables for energy supply are used for industry and distribution boards, power stations, house connecting boxes and street lighting as well as control cable for the transmission of control impulses and test datas. Overall, where increased electrical and also mechanical protection are required. Those cables are installed in open air, in underground, in water, indoors and in cable ducts. The concentric conductor (C) is allowed to use as PE-, PEN-conductor or as screen.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32200	1 x 10 re / 10	11,0	216,0	280,0	8
32201	1 x 16 re / 16	12,0	336,0	440,0	6
32202	2 x 1,5 re / 1,5	13,0	52,0	205,0	16
32203	2 x 2,5 re / 2,5	13,5	80,0	270,0	14
32204	2 x 4 re / 4	15,5	123,0	360,0	12
32205	2 x 6 re / 6	17,0	182,0	435,0	10
32206	2 x 10 re / 10	19,5	312,0	590,0	8
32207	2 x 16 re / 16	20,5	489,0	820,0	6
32208	3 x 1,5 re / 1,5	13,5	66,0	225,0	16
32209	3 x 2,5 re / 2,5	14,5	104,0	290,0	14
32210	3 x 4 re / 4	16,5	161,0	400,0	12
32211	3 x 6 re / 6	17,5	240,0	510,0	10
32212	3 x 10 re / 10	20,0	408,0	850,0	8
32213	3 x 16 re / 16	23,0	643,0	1080,0	6
32214	4 x 1,5 re / 1,5	14,5	81,0	260,0	16
32215	4 x 2,5 re / 2,5	15,5	128,0	350,0	14
32216	4 x 4 re / 4	17,0	200,0	470,0	12
32217	4 x 6 re / 6	18,5	297,0	590,0	10
32218	4 x 10 re / 10	21,0	504,0	900,0	8
32219	4 x 16 re / 16	23,0	796,0	1250,0	6
32220	5 x 1,5 re / 1,5	15,0	95,0	330,0	16
32221	5 x 2,5 re / 2,5	16,0	152,0	400,0	14
32222	5 x 4 re / 4	19,0	238,0	560,0	12
32223	5 x 6 re / 6	21,0	355,0	710,0	10

Continuation ▶

NYCY power cable, 0,6/1kV, VDE approved, with concentric copper conductor



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32224	5 x 10 re / 10	23,0	600,0	1000,0	8
32227	7 x 1,5 re / 2,5	16,0	133,0	350,0	16
32226	7 x 1,5 re / 1,5	16,0	124,0	320,0	16
32241	7 x 2,5 re / 2,5	17,5	200,0	450,0	14
32225	7 x 4 re / 4	21,0	315,0	670,0	12
32255	7 x 6 re / 6	24,0	470,0	790,0	10
32228	8 x 1,5 re / 1,5	17,0	138,0	380,0	16
32229	8 x 1,5 re / 2,5	17,0	147,0	400,0	16
32242	8 x 2,5 re / 2,5	18,0	224,0	510,0	14
32230	10 x 1,5 re / 2,5	19,0	176,0	440,0	16
32243	10 x 2,5 re / 4	20,5	286,0	600,0	14
32231	12 x 1,5 re / 2,5	20,0	205,0	500,0	16
32244	12 x 2,5 re / 4	21,0	334,0	660,0	14
32232	14 x 1,5 re / 2,5	20,5	234,0	540,0	16
32246	14 x 2,5 re / 6	22,5	403,0	800,0	14
32245	14 x 2,5 re / 4	22,0	382,0	760,0	14
32233	16 x 1,5 re / 4	22,0	276,0	600,0	16
32247	16 x 2,5 re / 6	23,0	451,0	910,0	14
32234	19 x 1,5 re / 4	23,0	320,0	690,0	16
32248	19 x 2,5 re / 6	23,5	523,0	950,0	14
32235	21 x 1,5 re / 6	24,0	369,0	810,0	16
32249	21 x 2,5 re / 10	26,0	571,0	1100,0	14
32236	24 x 1,5 re / 6	26,0	413,0	860,0	16
32250	24 x 2,5 re / 10	28,0	696,0	1300,0	14
32237	30 x 1,5 re / 6	27,0	499,0	1230,0	16
32251	30 x 2,5 re / 10	30,0	840,0	1610,0	14
32238	40 x 1,5 re / 10	30,0	696,0	1590,0	16
32252	40 x 2,5 re / 10	35,0	1080,0	2100,0	14
32239	52 x 1,5 re / 10	32,0	869,0	1820,0	16
32253	52 x 2,5 re / 10	38,0	1368,0	2500,0	14
32240	61 x 1,5 re / 10	33,0	998,0	2000,0	16
32254	61 x 2,5 re / 10	40,0	1584,0	2850,0	14

Dimensions and specifications may be changed without prior notice. (RQ01)



Technical data

- Power and control cable according to DIN VDE 0276 Part 603 or HD 603 S1 and IEC 60502
- 7 cores and above in accordance with DIN 0276 Part 627 or HD 627 S1 and IEC 60502
- **Temperature range**
Flexing -5 °C to +50 °C
Fixed installation -40 °C to +70 °C
- Permissible **operating temperature** at conductor +90 °C
- Permissible **short circuit temperature** +250 °C (short circuit duration 5 sec.)
- **Nominal voltage**
U₀/U 0,6/1 kV
- **Test voltage** 4 kV
- Max. permissible **tensile load** with cable grip = 50 N/mm²
- **Minimum bending radius**
Single-core approx. 15x cable ø
Multi-core approx. 12x cable ø

Cable structure

- Bare copper conductor, single-wire according to DIN VDE 0295 cl. 1, BS 6360 cl. 1, IEC 60228 or HD 383
- Core insulation from cross-linked polyethylene compound, DIX3 according to HD 603.1
- Cores stranded in concentric layers
- Filling compound
- Concentric conductor, inner layer of round bare copper wires, outer layer of copper tape as counter helix
- PVC outer sheath, DMV6 to HD 603.1
- Sheath colour black

Properties

- Self-extinguishing and flame retardant in accordance with VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (conforms to DIN VDE 0472 part 804 Test method B)
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting
- **Highest permissible voltage**
- Direct current systems 1,8 kV
- Three-phase systems
Single-phase systems
Both outer conductors insulated 1,4 kV
Single-phase systems
One outer conductor earthed 0,7 kV
- Three-phase systems 1,2 kV

Note

- re = round conductor, single-wire
- rm = round conductor, multi-wire
- sm = sector-shaped conductor, multi-wire

Application

Power distribution cables for industrial applications and switching systems, power stations, residential connections and street lighting, as well as control cables for transmitting control pulses and measurements. Wherever increased electrical and mechanical protection are required. For installation in underground, in water, outdoors, in concrete and cable ducts. Respecting the permissible operating temperature at the conductor of +90 °C permits a higher current carrying capacity than PVC insulated power distribution cables. The concentric conductor (C) can be used as a PE or PEN-conductor or as a screen.

☞ The product conforms to the EG Low-Voltage Directive 2006/95/EG

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
33212	2 x 1,5 re / 1,5	13,0	53,0	205,0	16
33213	2 x 2,5 re / 2,5	13,5	80,0	270,0	14
33214	2 x 4 re / 4	15,5	125,0	360,0	12
33215	2 x 6 re / 6	17,0	182,0	435,0	10
33216	2 x 10 re / 10	19,5	312,0	590,0	8
33217	2 x 16 re / 16	20,5	489,0	820,0	6
33218	3 x 1,5 re / 1,5	13,5	66,0	225,0	16
33219	3 x 2,5 re / 2,5	14,5	104,0	290,0	14
33220	3 x 4 re / 16	16,5	161,0	400,0	12
33221	3 x 6 re / 6	17,5	240,0	510,0	10
33222	3 x 10 re / 10	20,0	408,0	850,0	8
33223	3 x 16 re / 16	23,0	643,0	1080,0	6
33224	3 x 25 rm / 16	25,1	902,0	1295,0	4
33225	3 x 25 rm / 25	25,0	1003,0	1375,0	4
33226	3 x 35 sm / 16	25,1	1190,0	1441,0	2
33227	3 x 35 sm / 35	25,4	1402,0	1619,0	2
33228	3 x 50 sm / 25	27,3	1723,0	1902,0	1
33229	3 x 50 sm / 50	27,7	2000,0	2107,0	1
33230	3 x 70 sm / 35	32,2	2410,0	2700,0	2/0
33231	3 x 70 sm / 70	32,7	2796,0	3005,0	2/0
33232	3 x 95 sm / 50	35,3	3296,0	3588,0	3/0
33233	3 x 95 sm / 95	35,8	3791,0	4017,0	3/0
33234	3 x 120 sm / 120	38,9	4786,0	4998,0	4/0
33235	3 x 120 sm / 70	38,9	4236,0	4534,0	4/0
33236	3 x 150 sm / 120	43,4	5970,0	5937,0	300 kcmil
33237	3 x 150 sm / 70	43,4	5100,0	5473,0	300 kcmil
33238	3 x 185 sm / 95	47,4	6383,0	6831,0	350 kcmil
33239	3 x 240 sm / 120	52,5	8242,0	8809,0	500 kcmil

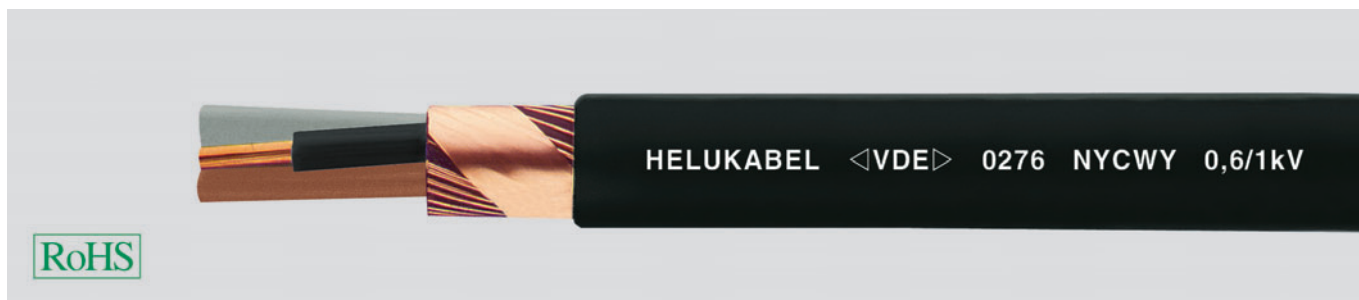
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N2XCY power cable, 0,6/1 kV, VDE approved, higher current carrying capacity



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
33240	4 x 1,5 re / 1,5	14,5	81,0	260,0	16
33241	4 x 2,5 re / 2,5	15,5	128,0	350,0	14
33242	4 x 4 re / 4	17,0	200,0	470,0	12
33243	4 x 6 re / 6	18,5	297,0	590,0	10
33244	4 x 10 re / 10	21,0	504,0	900,0	8
33245	4 x 16 re / 16	23,0	796,0	1250,0	6
33246	4 x 25 re / 16	27,2	1142,0	1559,0	4
33247	4 x 35 sm / 16	27,2	1526,0	1812,0	2
33248	4 x 50 sm / 25	30,6	2203,0	2413,0	1
33249	4 x 70 sm / 35	35,9	3082,0	3420,0	2/0
33250	4 x 95 sm / 50	39,5	4208,0	4561,0	3/0
33251	4 x 120 sm / 16	44,5	5388,0	5819,0	4/0
33252	4 x 150 sm / 70	48,6	6540,0	6972,0	300 kcmil
33253	5 x 1,5 re / 1,5	15,0	95,0	330,0	16
33254	5 x 2,5 re / 2,5	16,0	152,0	400,0	14
33255	5 x 4 re / 4	19,0	238,0	560,0	12
33256	5 x 6 re / 6	21,0	355,0	710,0	10
33257	5 x 10 re / 10	23,0	600,0	1000,0	8
33258	5 x 16 re / 16	24,3	931,0	1233,0	6
33259	7 x 1,5 re / 1,5	16,0	133,0	350,0	16
33260	7 x 2,5 re / 2,5	17,5	200,0	450,0	14
33261	7 x 4 re / 4	21,0	315,0	670,0	12
33262	7 x 6 re / 6	24,0	470,0	790,0	10
33263	10 x 1,5 re / 2,5	19,0	176,0	440,0	16
33264	10 x 2,5 re / 4	20,5	286,0	600,0	14
33265	12 x 1,5 re / 2,5	20,0	205,0	500,0	16
33266	12 x 2,5 re / 4	21,0	334,0	660,0	14
33267	14 x 1,5 re / 2,5	20,5	234,0	540,0	16
33268	14 x 2,5 re / 6	22,5	403,0	800,0	14
33269	19 x 1,5 re / 2,5	23,0	320,0	690,0	16
33270	19 x 2,5 re / 6	23,5	523,0	950,0	14
33271	30 x 1,5 re / 2,5	27,0	499,0	1230,0	16
33272	30 x 2,5 re / 10	30,0	840,0	1610,0	14
33273	40 x 1,5 re / 2,5	30,0	696,0	1590,0	16
33274	40 x 2,5 re / 10	35,0	1080,0	2100,0	14

Dimensions and specifications may be changed without prior notice. (RQ01)



Technical data

- Power and control cable to DIN VDE 0276 part 603, HD 603 S1 and IEC 60502
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -40 °C to +70 °C
- Permissible **operating temperature** at conductor +70 °C
- Permissible **short circuit temperature** +160 °C (short circuit duration 5 sec.)
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4 kV
- Max. permissible **tensile stress** with cable grip for Cu-conductor = 50 N/mm²
- **Minimum bending radius**
for single core approx. 15x cable ø
for multi core approx. 12x cable ø
- **Power ratings table**
see Technical Informations
- **Caloric load values**
see Technical Informations

Cable structure

- Plain copper conductors, as per VDE 0295 cl. 1 od. cl. 2, IEC 60228, BS 6360 cl. 1 and HD 383, solid or stranded versions, conductor types
10-16 mm² round, solid cores (re) alt.
10-25 mm², stranded conductor (rm),
35-240 mm², sector shaped conductor, stranded (sm)
- PVC core insulation, DIV4 to HD 603.1
- Colour coded to DIN VDE 0293-308 and HD 186
- Cores stranded concentrically
- Filling compound
- Concentric conductor (Ceander), inner layer of corrugated copper wires, outer layer with copper tape
- PVC outer sheath, DMV5 to HD 603.1
- Sheath colour black

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Highest permissible voltage**
- Direct current systems 1,8 kV
- Alternating current systems, single-phase systems 1,4 kV
Both conductors insulated, single-phase systems 0,7 kV
One conductor earthed, three-phase systems 1,2 kV
With concentric conductor and a cross-section of 240 mm² and above 3,6 kV

Note

- At 25 mm² = round cables are more compact thus smaller ø.
- Available with outer sheath in alternative colours on request.
- re = round solid core;
rm = stranded core;
sm = sectional core.

Application

Power cables for energy supply are used for industry and distribution boards, power stations, house connecting boxes and street lighting as well as control cable for the transmission of control impulses and test datas. Overall, where increased electrical and also mechanical protection are required. Those cables are installed in open air, in underground, in water, indoors and in cable ducts. The concentric conductor (C) is allowed to use as PE-, PEN-conductor or as screen.

☞ The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWC-No.
32260	2 x 10 re / 10	19,0	312,0	650,0	8
32261	2 x 16 re / 16	21,0	489,0	850,0	6
32262	2 x 25 rm / 25	24,0	763,0	1210,0	4
32263	3 x 10 re / 10	19,5	408,0	730,0	8
32264	3 x 16 re / 16	22,0	643,0	1000,0	6
32265	3 x 25 rm / 16	26,0	902,0	1550,0	4
32274	3 x 25 rm / 25	26,0	1003,0	1600,0	4
32275	3 x 35 sm / 35	27,5	1402,0	1850,0	2
32266	3 x 35 sm / 16	27,0	1190,0	1750,0	2
32267	3 x 50 sm / 25	29,5	1723,0	2250,0	1
32276	3 x 50 sm / 50	29,5	2000,0	2450,0	1
32268	3 x 70 sm / 35	33,0	2410,0	2950,0	2/0
32277	3 x 70 sm / 70	34,0	2796,0	3350,0	2/0
32269	3 x 95 sm / 50	38,0	3296,0	4100,0	3/0
32278	3 x 95 sm / 95	38,5	3791,0	4550,0	3/0
32270	3 x 120 sm / 70	41,0	4236,0	5050,0	4/0
32279	3 x 120 sm / 120	42,0	4786,0	5550,0	4/0
32271	3 x 150 sm / 70	45,0	5100,0	6000,0	300 kcmil
32280	3 x 150 sm / 150	46,0	5970,0	6900,0	300 kcmil
32272	3 x 185 sm / 95	50,0	6383,0	7550,0	350 kcmil
32281	3 x 185 sm / 185	51,0	7363,0	8500,0	350 kcmil
32273	3 x 240 sm / 120	57,0	8242,0	9950,0	500 kcmil
32282	4 x 10 re / 10	20,5	504,0	890,0	8
32283	4 x 16 re / 16	23,5	796,0	1250,0	6

Continuation ▶

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32284	4 x 25 rm / 16	28,0	1142,0	1800,0	4
32285	4 x 35 sm / 16	29,0	1526,0	2050,0	2
32286	4 x 50 sm / 25	33,0	2203,0	2700,0	1
32287	4 x 70 sm / 35	37,0	3082,0	3750,0	2/0
32288	4 x 95 sm / 50	43,5	4208,0	5000,0	3/0
32289	4 x 120 sm / 70	47,0	5388,0	6350,0	4/0
32290	4 x 150 sm / 70	51,0	6540,0	7650,0	300 kcmil
32291	4 x 185 sm / 95	56,0	8159,0	9350,0	350 kcmil
32292	4 x 240 sm / 120	62,5	10546,0	11600,0	500 kcmil

Dimensions and specifications may be changed without prior notice. (RQ01)

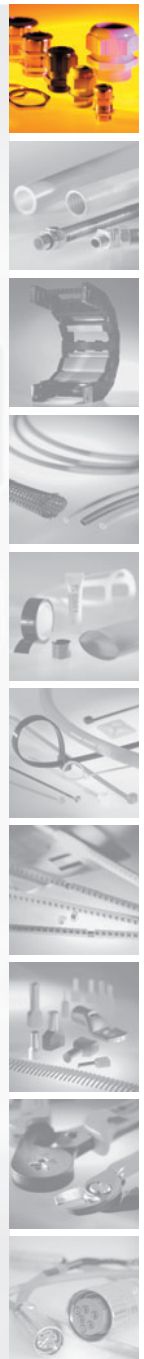
Cable Glands

Cable glands for standard applications

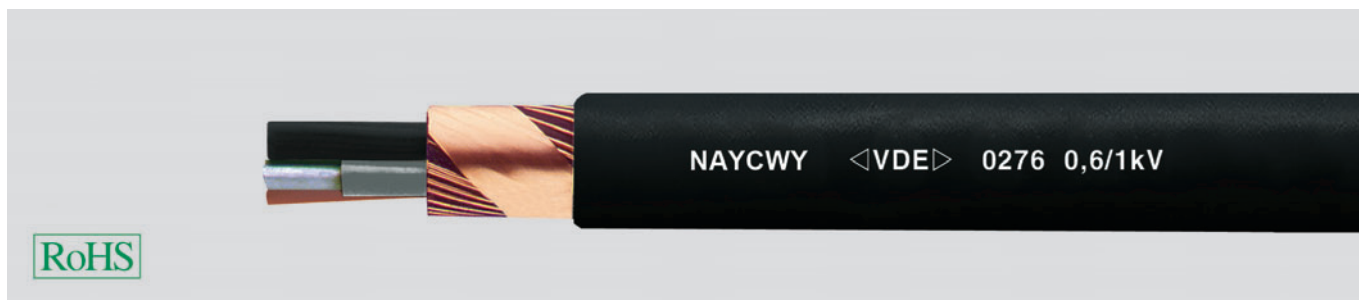
- Plastic Glands
- Cable Glands of Brass
- Accessories

Cable glands for special application conditions

- for electromagnetic compatibility EMC
- for rugged applications and special chemical resistance
- for high temperature use
- for explosive areas
- for special mounting conditions
- for special pressure conditions



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Technical data

- Power and control cable to DIN VDE 0276 part 603, HD 603 S1 and IEC 60502
- **Temperature range**
Flexing -5 °C to +50 °C
Fixed installation -40 °C to +70 °C
- **Permissible operating temperature**
At conductor +70 °C
- **Permissible short circuit temperature**
+160 °C (short circuit duration 5 sec.)
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4 kV
- Max. permissible tensile load with cable grip = 30 N/mm²
- **Minimum bending radius**
Approx. 12x cable \varnothing

Cable structure

- Aluminium conductor according to DIN VDE 0295 cl. 1, IEC 60228, BS 6360 cl. 1 or HD 383
- 16-25 mm² round conductor
- single wire (re) or 35-240 mm²
- sector shaped conductor, multi-wire (sm)
- PVC core insulation, DIV4 to HD 603.1
- Colour coded to DIN VDE 0293-308 and HD 186
- Cores stranded concentrically
- Filling compound
- Concentric conductor (Ceander), inner layer of corrugated copper wires, outer layer with copper tape
- PVC outer sheath, DMV5 to HD 603.1
- Sheath colour black

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Highest permissible voltage**
 - Direct current systems 1,8 kV
 - Alternating current systems
 - single-phase systems
 - Both conductors insulated 1,4 kV
 - single-phase systems
 - One conductor earthed 0,7 kV
 - Three-phase systems 1,2 kV
 - With concentric conductor and a cross-section from 240 mm² 3,6 kV

Note

- re = round conductor, single-wire;
sm = sector-shaped conductor, multi-wire.

Application

Power distribution cables, preferably used for underground installation, primarily in local networks, for industrial applications and switching systems, power stations. Wherever increased electrical and mechanical protection are required. Installation in water, outdoors, in concrete, indoors and in cable ducts. The concentric conductor (C) can be used as a PE or PEN conductor or as a screen. The corrugated design (Ceander) of the concentric conductor permits any number of cable junctions during assembly, without any conductors having to be cut. This guarantees optimised reliability.

☞ The product conforms to the EG Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Alu weight kg / km	Weight approx. kg / km	AWG-No.
32840	4 x 16 re / 16	21,5	182,0	186,0	1250,0	6
32841	4 x 25 re / 16	25,5	182,0	290,0	1800,0	4
32842	4 x 35 sm / 16	27,1	182,0	406,0	2050,0	2
32843	4 x 50 sm / 25	28,2	285,0	580,0	2700,0	1
32844	4 x 70 sm / 35	32,3	394,0	814,0	3750,0	2/0
32845	4 x 95 sm / 50	35,8	560,0	1102,0	5000,0	3/0
32846	4 x 120 sm / 70	39,2	780,0	1392,0	6350,0	4/0
32847	4 x 150 sm / 70	43,2	780,0	1740,0	7650,0	300 kcmil
32848	4 x 185 sm / 95	48,4	1056,0	2146,0	9350,0	350 kcmil
32849	4 x 240 sm / 120	56,0	1130,0	2784,0	11600,0	500 kcmil

Dimensions and specifications may be changed without prior notice. (RQ01)

A-LiY(StE)YÖ Data transmission cables for petrol stations and refineries with BAM-test report



Technical data

- Oil- and fuel-resistant data transmission cables
- **Temperature range**
flexing -5 °C to +70 °C
fixed installation -30 °C to +70 °C
- **Nominal voltage** 200 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
approx. 12x cable ø
- **Radiation resistance**
up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Tinned copper conductor, 7 strands
- Core insulation of special PVC, according to DIN VDE 0207
- Black cores with continuous white numbering
- Each single core screened with aluminium/polyester foil, metal layer at outside
- Screened cores in layers with optimal lay-length screenings of each core make contact mutually
- Drain wire, tinned copper 0,75 mm²
- 7 strands
- Overall core-filler
- Special PVC-outer sheath, oil- and fuel resistant
- Sheath colour black

Properties

Tests

- Compound characteristic according to DIN VDE 0207
- Oil- and fuel resistance of sheath: according to BAM-Specification
- Oil-resistance of sheath: DIN ISO 6722 part 1, 4.11, DIN VDE 0472 part 803 test method B
- Fuel-resistance of sheath: DIN ISO 6722 part 1, 4.12
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **BAM** = Federal Institute for Materials Testing

Application

These data transmission cables, oil- and fuel-resistant, are used for internal and external wiring applications at petrol pumps, for data transmission from the pumps to the cash desk and in the installation of video surveillance systems. These cables are also installed directly in the ground and are resistant to UV radiation.

Special screens over individual cores guarantee good overall screening and ensure an interference-free transmission of control pulses.

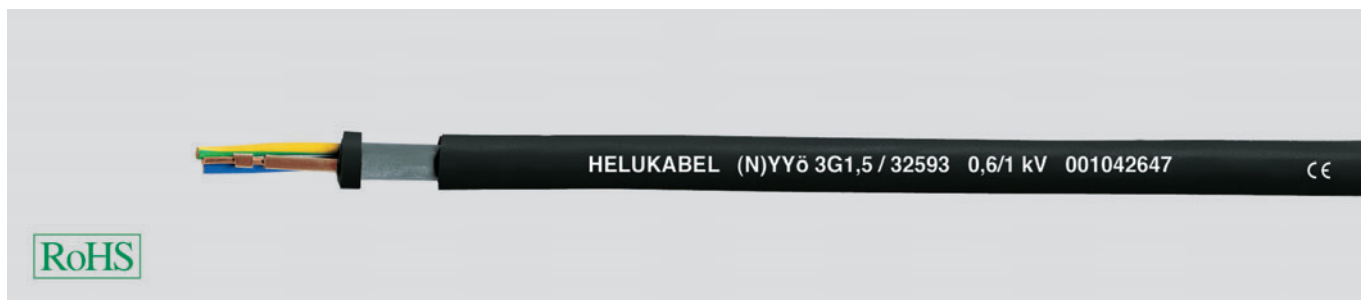
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32597	4 x 0,75	9,0	38,0	105,0	18
32633	7 x 0,75	10,3	60,0	150,0	18

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32599	8 x 0,75	11,0	68,0	169,0	18
32634	12 x 0,75	12,9	99,0	223,0	18

Dimensions and specifications may be changed without prior notice. (RQ01)

Petrol Station Cables (N)YYÖ-J 0,6/1 kV, with BAM-test report



Technical data

- Power and data transmission cable based on DIN VDE 0271
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -30 °C to +70 °C
- Permissible **operating temperature** at conductor +70 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4 kV
- Max. permissible **tensile stress** by cable grip for Cu-conductor = 50 N/mm²
- **Minimum bending radius**
approx. 12x cable ø

Cable structure

- Bare copper conductor, solid according to DIN VDE 0295 cl. 1, BS 6360 cl. 1 and IEC 60228 cl. 1
- Core insulation of PVC, compound Y13 according to DIN VDE 0207 part 4
- Concentric lay-up of cores
- Core identification according to DIN VDE 0293-308
- PVC outer jacket black¹⁾ according to DIN VDE 0207 part 5

Properties

- Oil and fuel-resistant according to DIN ISO 6722
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- VDE 0298 part 1 shall be observed.

Note

- **BAM** = Federal Institute for Materials Testing
- ¹⁾ Version with blue outer jacket available upon request.

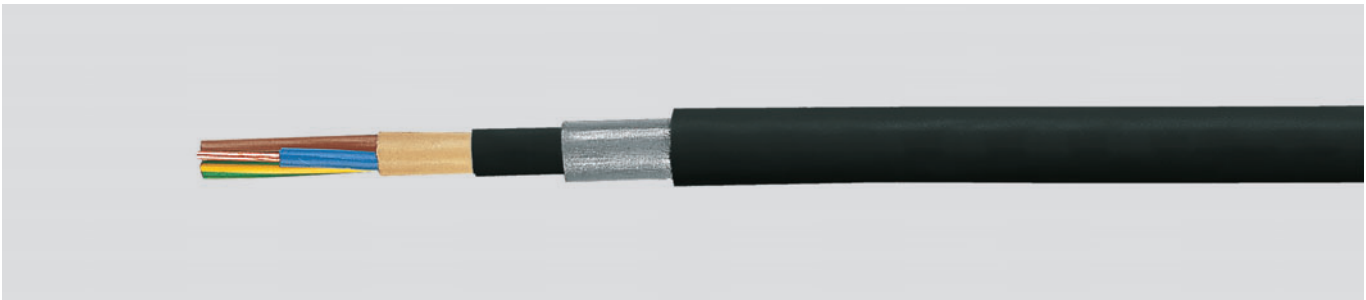
Application

Power and data transmission cables are used for outdoor and underground applications, in water and in concrete provided mechanical damage can be ruled out. These cables are installed for applications such as petrol stations and oil refineries where resistance to oils and fuels is required.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32592	2 x 1,5	11,0	29,0	180,0	16	32595	5 x 1,5	13,0	72,0	280,0	16
32593	3 x 1,5	11,5	43,0	225,0	16	32596	7 x 1,5	15,5	101,0	370,0	16
32594	4 x 1,5	12,0	58,0	260,0	16						

Dimensions and specifications may be changed without prior notice. (RQ01)



Technical data

- Power and control cable, PVC insulation and lead inner-sheath to DIN VDE 0265
- **Temperature range flexing** -5 °C to +50 °C
fixed installation -30 °C to +70 °C
- Permissible **operating temperature** at conductor +70 °C
- Permissible **short circuit temperature** +160 °C (short circuit duration 5 sec.)
- **Short circuit temperature** +160 °C (short circuit duration 5 sec.)
- **Nominal voltage** U_0/U 0,6/1 kV
nominal voltage U
for three-phase system 1,0 kV
for one-phase system 1,2 kV (outer conductor insulated)
for one phase system 0,6 kV (one outer conductor earthed)
nominal voltage
 U_0 = between conductor and lead sheath
 U = voltage between the outer conductors, e. g. U_0/U for cables:
For three-phase system $U/\sqrt{3}$
For one-phased.c. system, $U_0 = U/2$ (both outer conductor insulated)
For one-phase andd.c. system $U_0 = U$ (one outer conductor earthed)
- **operating voltage**
the voltage between the conductors of a current-circuit (or between conductor and earth) in a given time during undisturbed operation under specified condition
- **Test voltage** (5 min.) 6,0 kV
- Min. permissible **bending radius**
approx. 12x cable \varnothing
- **Power ratings table**
see Technical Informations

Application

These cables of PVC insulation and lead inner-sheath are installed everywhere, where the danger of chemical reaction of solvents, energy fuels, oils, gasolines or of that kind in filling stations particularly in petrol pump areas for carburetor propellants, in refining plants and in chemical industries are to be caused. Suitable for installation under ground, in water, indoor areas and cable conduits.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cable structure

- Bare copper conductor to DIN VDE 0295, BS 6360, IEC 60228 and HD 383
- Core insulation of PVC, compound type DIV4 to VDE 0276 part 603
- Core identification to DIN VDE 0293-308 up to 5 cores coloured
7 cores black with numbering
- Green-yellow earth core
- Cores stranded concentrically
- Overall jacket of soft plastics material, if exists, permits also as extrusion or taping or a combination of both
- Lead inner-sheath, jointless and enclosed
- PVC outer jacket black, DMV5 to DIN VDE 0276 part 603
- Sheath colour black

Properties

- **Advantage**
Good coupling resistance due to enclosed lead sheath is suitable for special **EMC-requirements** (Electromagnetic Compatibility)
- **Resistant to**
Turpentine substitute
Xylol
Fuels
Trichlor
Oils
Petroleum
Toluene
Hydrocarbon
- The lead sheath is **not** permitted to use as neutral-conductor (N)
- If drain-wire exists, only for use as earthing of lead sheath in a grounding system e.g. in hazardous areas to DIN VDE 0165. This drain-wire is **not** allowed to install as protective, neutral or earth conductor

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- re = round solid core;
sm = sectional core.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Lead weight kg / km	Weight approx. kg / km	AWG-No.
32640	3 x 1,5 re	13,5	43,0	427,0	598,0	16
32686	3 x 1,5 re / 1,5	14,5	57,0	427,0	610,0	16
32641	3 x 2,5 re	14,8	72,0	487,0	690,0	14
32642	3 x 4 re	16,2	115,0	555,0	840,0	12
32643	3 x 6 re	17,3	173,0	610,0	990,0	10
32644	3 x 25 rm / 16	27,8	874,0	1290,0	2550,0	4
32645	3 x 35 sm / 16	29,2	1162,0	1340,0	3080,0	2
32646	3 x 50 sm / 25	32,7	1680,0	1670,0	3850,0	1
32647	3 x 70 sm / 35	35,8	2352,0	2020,0	5360,0	2/0
32648	3 x 95 sm / 50	40,3	3216,0	2440,0	6950,0	3/0
32649	3 x 120 sm / 70	43,2	4128,0	2770,0	8235,0	4/0
32650	3 x 150 sm / 70	48,8	4992,0	3530,0	9620,0	300 kcmil
32651	3 x 185 sm / 95	53,4	6240,0	4230,0	11940,0	350 kcmil
32652	3 x 240 sm / 120	59,8	8064,0	5230,0	15380,0	500 kcmil

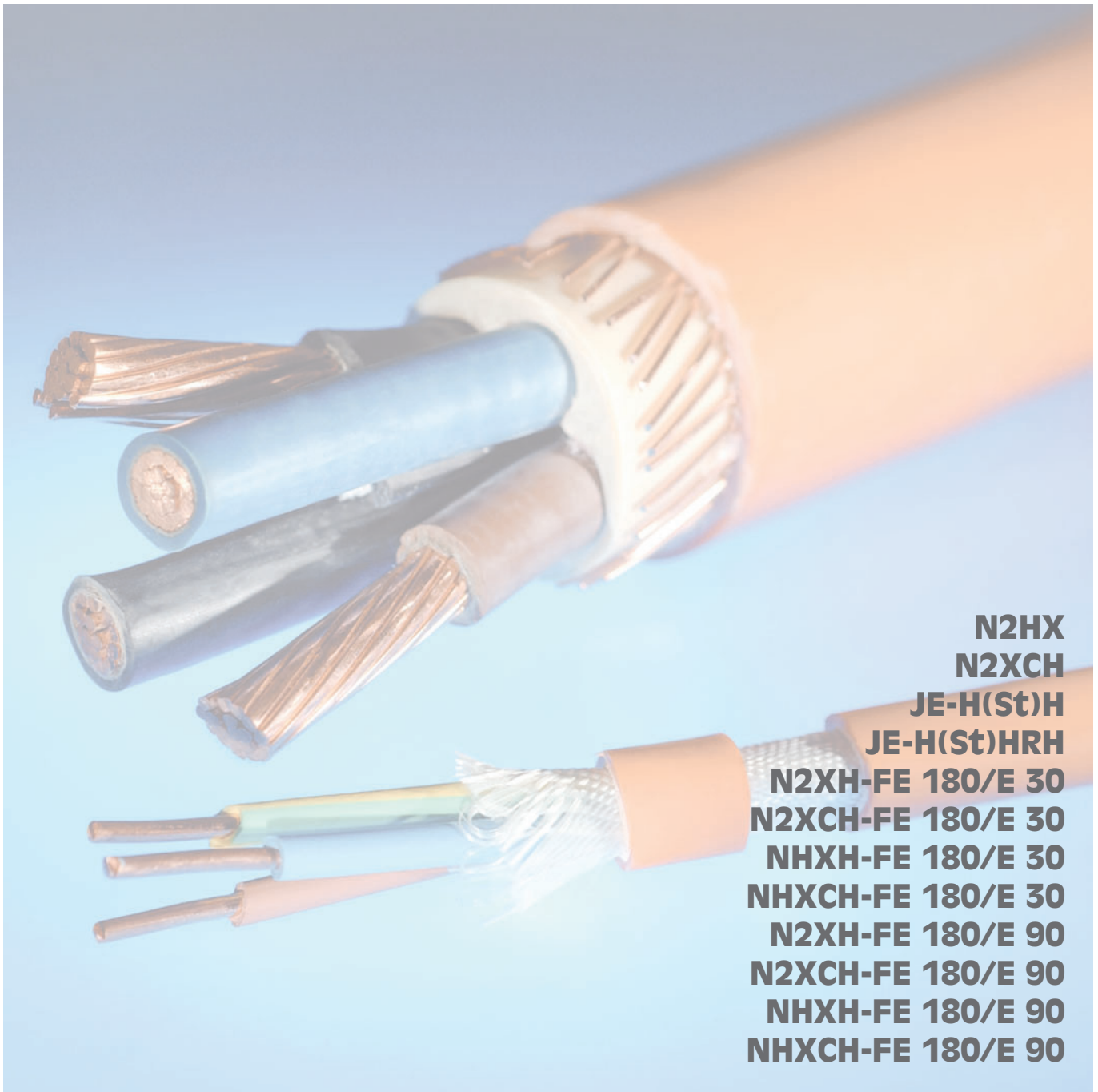
Continuation ►

NYKY-J 0,6/1kV with lead sheath, VDE approved



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Lead weight kg / km	Weight approx. kg / km	AWG-No.
32653	4 x 1,5 re	14,5	58,0	464,0	650,0	16
32687	4 x 1,5 re / 1,5	15,3	72,0	464,0	650,0	16
32654	4 x 2,5 re	15,5	96,0	530,0	760,0	14
32655	4 x 4 re	17,5	154,0	605,0	960,0	12
32656	4 x 6 re	18,5	230,0	665,0	1100,0	10
32657	4 x 10 re	21,3	384,0	750,0	1400,0	8
32658	4 x 16 re	24,2	614,0	975,0	1910,0	6
32659	4 x 25 rm	28,5	960,0	1290,0	2750,0	4
32660	4 x 35 rm	30,5	1344,0	1340,0	3630,0	2
32661	4 x 50 sm	33,3	1920,0	1680,0	4580,0	1
32662	4 x 70 sm	37,5	2688,0	2020,0	5340,0	2/0
32663	4 x 95 sm	42,3	3648,0	2440,0	7120,0	3/0
32664	5 x 1,5 re	15,3	72,0	505,0	710,0	16
32688	5 x 1,5 re / 1,5	16,4	86,0	505,0	780,0	16
32665	5 x 2,5 re	17,2	120,0	580,0	910,0	14
32666	5 x 4 re	19,4	192,0	665,0	1090,0	12
32667	5 x 6 re	20,2	288,0	730,0	1270,0	10
32668	5 x 10 re	22,8	480,0	930,0	1700,0	8
32669	5 x 16 re	26,4	768,0	1070,0	2231,0	6
32670	7 x 1,5 re	17,2	101,0	545,0	810,0	16
32689	7 x 1,5 re / 1,5	17,2	115,0	545,0	970,0	16
32678	7 x 2,5 re	18,0	168,0	625,0	1070,0	14
32671	10 x 1,5 re	21,3	144,0	680,0	918,0	16
32679	10 x 2,5 re	22,4	240,0	865,0	1330,0	14
32672	12 x 1,5 re	21,3	173,0	710,0	988,0	16
32680	12 x 2,5 re	23,2	288,0	940,0	1440,0	14
32673	14 x 1,5 re	21,3	202,0	735,0	1100,0	16
32681	14 x 2,5 re	24,5	336,0	980,0	1530,0	14
32674	19 x 1,5 re	23,0	274,0	900,0	1440,0	16
32682	19 x 2,5 re	26,0	456,0	1170,0	1680,0	14
32675	24 x 1,5 re	27,3	346,0	1170,0	1610,0	16
32683	24 x 2,5 re	31,0	576,0	1370,0	2160,0	14
32676	30 x 1,5 re	28,2	432,0	1240,0	1830,0	16
32684	30 x 2,5 re	32,3	720,0	1550,0	2530,0	14
32677	40 x 1,5 re	31,4	576,0	1390,0	2300,0	16
32685	40 x 2,5 re	36,4	960,0	1770,0	3310,0	14

Dimensions and specifications may be changed without prior notice. (RQ01)



N2HX
N2XCH
JE-H(St)H
JE-H(St)HRH
N2XH-FE 180/E 30
N2XCH-FE 180/E 30
NHXH-FE 180/E 30
NHXCH-FE 180/E 30
N2XH-FE 180/E 90
N2XCH-FE 180/E 90
NHXH-FE 180/E 90
NHXCH-FE 180/E 90

Photo: HELUKABEL®

Security Cables



Technical data

- Power and control cable according to DIN VDE 0276 part 604, HD 604 S1 part 1 and part 5G
- **Conductor resistance** (at 20 °C) according to VDE 0295 cl. 1 or 2 and IEC 60228 cl. 1 or 2 and HD 383 cl. 1 and cl. 2
- **Temperature range** during installation -5 °C to +50 °C fixed installation -30 °C to +90 °C
- Permissible **operating temperature** at conductor 90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4 kV
- **Minimum bending radius** single-core approx. 15x cable \varnothing multi-core approx. 12x cable \varnothing
- **Radiation resistance** up to 100×10^6 cJ/kg (up to 100 Mrad)
- **Caloric load values** see Technical Informations

Cable structure

- Bare copper conductor, single or multiple-wire, according to DIN VDE 0295 cl. 1 or 2, BS 6360 cl. 1 or 2 and IEC 60228 cl. 1 or 2, HD 383
- Halogen-free core insulation, cross-linked polyethylene compound 2X11, to HD 604 S1
- Colour coding of cores according to DIN VDE 0293-308 and HD 186
- Green-yellow earth-core, 3 cores and above
- Cores stranded in layers (for multi-core cables)
- Overall filled inner sheath
- covered by filling compound or wrapped tape
- Outer sheath of thermoplastic polyolefine compound HM4, to HD 604 S1
- Sheath colour black
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free, no separation of corrosive or toxic gases
- Limited propagation of fire
- Low smoke development
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to DIN VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2/ IEC 61034-1+2/ DIN EN 61034-1+2/ BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)

Note

- rm = round conductor, multiple-wire; re = round conductor, single-wire.

Application

Halogen-free power cables with enhanced characteristics in case of fire are used for applications where harm to human life and damage to property must be prevented in the event of fire, e.g. in industrial installations, communal establishments, hotels, airports, underground stations, railway stations, hospitals department stores, banks, schools theaters, multi-storey buildings, process control centres etc. Suitable for fixed installation in dry, damp or wet environments, in, above, on and beneath plaster as well as in masonry walls and in concrete. These cables are suitable for outdoor applications and in underground by using in conduits or tubes.

For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no. J type	O type	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53100	53248	1 x 4 re	8,0	39,0	68,0	12
53101	53249	1 x 6 re	9,0	58,0	90,0	10
53102	53250	1 x 10 re	9,0	96,0	140,0	8
53103	53251	1 x 16 re	10,0	154,0	190,0	6
53104	53252	1 x 25 rm	11,0	240,0	290,0	4
53105	53253	1 x 35 rm	12,0	336,0	390,0	2
53106	53254	1 x 50 rm	15,0	480,0	510,0	1
53107	53255	1 x 70 rm	17,0	672,0	710,0	2/0
53108	53256	1 x 95 rm	19,0	912,0	960,0	3/0
53109	53257	1 x 120 rm	21,0	1152,0	1200,0	4/0
53110	53258	1 x 150 rm	23,0	1440,0	1480,0	300 kcmil
53111	53259	1 x 185 rm	25,0	1776,0	1910,0	350 kcmil
53112	53260	1 x 240 rm	28,0	2304,0	2370,0	500 kcmil
53113	53261	1 x 300 rm	30,0	2880,0	2970,0	600 kcmil
53114	53262	2 x 1,5 re	12,0	29,0	185,0	16
53115	53263	2 x 2,5 re	12,2	48,0	220,0	14
53116	53264	2 x 4 re	13,2	77,0	275,0	12
53117	53265	2 x 6 re	14,1	115,0	355,0	10
53118	53266	2 x 10 re	16,2	192,0	450,0	8
53119	53267	2 x 16 re	17,8	307,0	620,0	6
53120	53268	2 x 25 rm	21,0	480,0	930,0	4
53121	53269	3 x 1,5 re	13,0	43,0	220,0	16
53122	53270	3 x 2,5 re	14,0	72,0	280,0	14

Part no. J type	O type	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53123	53271	3 x 4 re	15,0	115,0	350,0	12
53124	53272	3 x 6 re	16,0	173,0	420,0	10
53125	53273	3 x 10 re	18,0	288,0	600,0	8
53126	53274	3 x 16 re	20,0	461,0	770,0	6
53127	53275	3 x 25 rm	21,8	720,0	1120,0	4
53128	53276	3 x 35 sm	24,9	1008,0	1550,0	2
53129	53277	3 x 50 sm	25,2	1440,0	1750,0	1
53130	53278	3 x 70 sm	29,2	2016,0	2450,0	2/0
53131	53279	3 x 95 sm	32,0	2736,0	3250,0	3/0
53132	53280	3 x 120 sm	34,9	3456,0	4000,0	4/0
53133	53281	3 x 150 sm	39,2	4320,0	5000,0	300 kcmil
53134	53282	3 x 185 sm	44,1	5328,0	6150,0	350 kcmil
53135	53283	3 x 240 sm	49,2	6912,0	8000,0	500 kcmil
53143	53284	4 x 1,5 re	13,0	58,0	235,0	16
53144	53285	4 x 2,5 re	14,0	96,0	290,0	14
53145	53286	4 x 4 re	15,0	154,0	370,0	12
53146	53287	4 x 6 re	16,0	230,0	470,0	10
53147	53288	4 x 10 re	18,0	384,0	670,0	8
53148	53289	4 x 16 re	20,0	614,0	930,0	6
53149	53290	4 x 25 rm	25,0	960,0	1440,0	4
53150	53291	4 x 35 sm	27,0	1344,0	1890,0	2
53151	53292	4 x 50 sm	28,0	1920,0	2300,0	1

Continuation ▶

N2XH power cable, 0,6/1 kV, halogen-free, without functionality

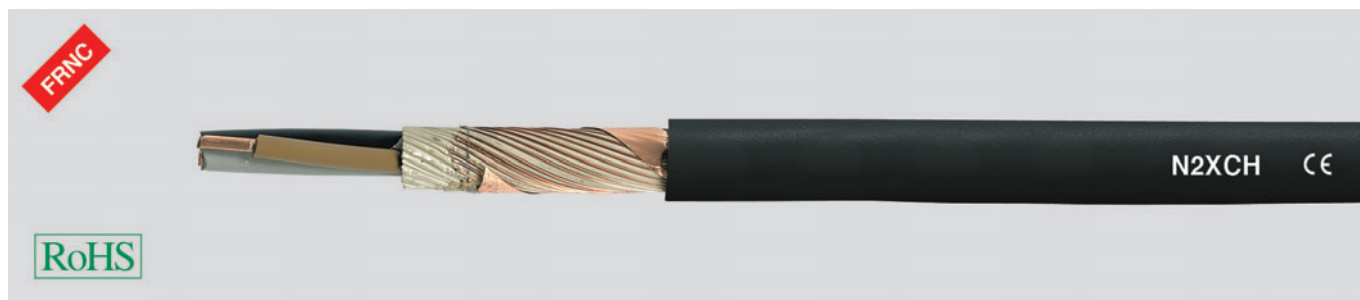


Part no. J type	O type	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53152	53293	4 x 70 sm	32,0	2668,0	3200,0	2/0
53153	53294	4 x 95 sm	36,0	3648,0	4250,0	3/0
53154	53295	4 x 120 sm	40,2	4608,0	5350,0	4/0
53155	53296	4 x 150 sm	45,8	5760,0	6550,0	300 kcmil
53156	53297	4 x 185 sm	49,5	7104,0	8100,0	350 kcmil
53157	53298	4 x 240 sm	56,0	9216,0	10550,0	500 kcmil
53158	53299	5 x 1,5 re	14,5	72,0	280,0	16
53159	53309	5 x 2,5 re	16,0	120,0	350,0	14
53160	53310	5 x 4 re	17,0	192,0	450,0	12
53161	53311	5 x 6 re	18,5	288,0	600,0	10
53162	53312	5 x 10 re	21,0	480,0	850,0	8
53163	53313	5 x 16 re	24,0	768,0	1200,0	6
53164	53314	7 x 1,5 re	15,5	101,0	350,0	16
53171	53315	7 x 2,5 re	17,0	168,0	370,0	14
53178	53316	7 x 4 re	17,2	269,0	530,0	12
53165	53317	10 x 1,5 re	18,5	144,0	480,0	16
53172	53318	10 x 2,5 re	20,0	240,0	500,0	14
53166	53319	12 x 1,5 re	19,0	173,0	520,0	16
53173	53320	12 x 2,5 re	21,0	288,0	560,0	14
53179	53321	12 x 4 re	21,2	461,0	800,0	12
53167	53322	14 x 1,5 re	20,0	202,0	550,0	16
53174	53323	14 x 2,5 re	22,0	336,0	630,0	14
53168	53324	19 x 1,5 re	22,0	274,0	700,0	16
53175	53325	19 x 2,5 re	24,0	456,0	800,0	14
53169	53326	24 x 1,5 re	25,0	346,0	850,0	16
53176	53327	24 x 2,5 re	27,0	576,0	990,0	14
53170	53328	30 x 1,5 re	26,0	432,0	950,0	16
53177	53329	30 x 2,5 re	28,0	720,0	1180,0	14

Part no. J type	O type	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53136	53330	3 x 50 / 25 sm	28,5	1680,0	2100,0	1
53137	53331	3 x 70 / 35 sm	31,4	2352,0	2800,0	2/0
53138	53332	3 x 95 / 50 sm	34,9	3216,0	3750,0	3/0
53139	53333	3 x 120 / 70 sm	38,0	4128,0	4750,0	4/0
53140	53334	3 x 150 / 70 sm	43,3	4992,0	5750,0	300 kcmil
53141	53335	3 x 185 / 95 sm	47,2	6240,0	7200,0	350 kcmil
53142	53336	3 x 240 / 120 sm	53,4	8064,0	9500,0	500 kcmil

Dimensions and specifications may be changed without prior notice. (RQ02)

N2XCH power cable, 0,6/1kV, halogen-free, with concentric conductor, without functionality



Technical data

- Power and control cable according to DIN VDE 0276 part 604, HD 604 S1 part 1 and part 5G
- **Conductor resistance** (at 20 °C) according to VDE 0295 cl. 1 or 2 and IEC 60228 cl. 1 or 2 and HD 383 cl. 1 and cl. 2
- **Temperature range** during installation -5 °C to +50 °C for fixed installation -30 °C to +90 °C
- Permissible **operating temperature** at conductor 90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4 kV
- **Minimum bending radius** approx. 12x cable \varnothing
- **Radiation resistance** up to 100×10^6 cJ/kg (up to 100 Mrad)
- **Caloric load values** see Technical Informations

Cable structure

- Plain Cu wire conductor, single or multiple-wire, according to DIN VDE 0295 cl. 1 or 2, BS 6360 cl. 1 or 2 and IEC 60228 cl. 1 or 2, HD 383
- Halogen-free core insulation, cross-linked polyethylene compound 2X1, to HD 604 S1
- Colour coding of cores according to DIN VDE 0293-308 and HD 186
- Cores stranded in layers (for multi-core cables)
- Overall filled inner sheath
- covered by filling compound
- or wrapped tape
- Concentric conductor of plain Cu wires
- Outer sheath of thermoplastic polyolefine compound HM4, to HD 604 S1
- Sheath colour black
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free, no liberation of corrosive or toxic gases
- Limited propagation of fire
- Low smoke development
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)

Note

- rm = round conductor, multiple-wire; re = round conductor, single-wire.

Application

The concentric conductor can be used as PE- PEN conductor or as screen. Suitable for fixed installation in dry, damp or wet environments, in, above, on and beneath plaster as well as in masonry walls and in concrete. These cables are suitable for outdoor applications and in underground by using in conduits or tubes.

For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53200	2 x 1,5 / 1,5 re	14,0	53,0	250,0	16
53201	2 x 2,5 / 2,5 re	15,0	81,0	280,0	14
53202	2 x 4 / 4 re	14,0	122,0	320,0	12
53203	2 x 6 / 6 re	15,0	183,0	400,0	10
53204	2 x 10 / 10 re	16,0	311,0	560,0	8
53205	2 x 16 / 16 re	19,1	490,0	780,0	6
53206	3 x 1,5 / 1,5 re	14,5	67,0	250,0	16
53207	3 x 2,5 / 2,5 re	15,5	104,0	320,0	14
53208	3 x 4 / 4 re	16,5	161,0	400,0	12
53209	3 x 6 / 6 re	18,0	242,0	500,0	10
53210	3 x 10 / 10 re	20,0	408,0	750,0	8
53211	3 x 16 / 16 re	22,5	643,0	1000,0	6
53212	3 x 25 / 16 rm	27,0	1001,0	1600,0	4
53213	3 x 35 / 16 rm	27,5	1190,0	1900,0	2
53214	3 x 50 / 25 rm	32,3	2003,0	2400,0	1
53215	3 x 70 / 35 sm	35,6	2794,0	3060,0	2/0
53216	3 x 95 / 50 sm	39,0	3790,0	4200,0	3/0
53217	3 x 120 / 70 sm	42,0	4785,0	5207,0	4/0
53218	3 x 150 / 70 sm	43,5	5100,0	5700,0	300 kcmil
53219	3 x 185 / 95 sm	47,4	6381,0	7150,0	350 kcmil
53220	3 x 240 / 120 sm	53,5	8240,0	9250,0	500 kcmil
53221	4 x 1,5 / 1,5 re	15,5	81,0	300,0	16
53222	4 x 2,5 / 2,5 re	16,5	129,0	380,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53223	4 x 4 / 4 re	17,5	202,0	480,0	12
53224	4 x 6 / 6 re	19,0	297,0	600,0	10
53225	4 x 10 / 10 re	21,5	504,0	850,0	8
53226	4 x 16 / 16 re	24,5	797,0	1200,0	6
53227	4 x 25 / 16 rm	29,0	1142,0	1800,0	4
53228	4 x 35 / 16 rm	29,5	1528,0	2100,0	2
53229	4 x 50 / 25 rm	32,5	2203,0	2800,0	1
53230	4 x 70 / 35 sm	38,0	3082,0	3800,0	2/0
53231	4 x 95 / 50 sm	43,5	4208,0	5100,0	3/0
53758	4 x 120 / 70 sm	50,5	5388,0	6556,0	4/0
53759	4 x 150 / 70 sm	52,1	6540,0	7600,0	300 kcmil
53760	4 x 185 / 95 sm	57,2	8159,0	9370,0	350 kcmil
53761	4 x 240 / 120 sm	62,6	10546,0	11611,0	500 kcmil
53232	7 x 1,5 / 2,5 re	14,5	132,0	320,0	16
53239	7 x 2,5 / 2,5 re	15,1	200,0	400,0	14
53246	7 x 4 / 4 re	18,1	316,0	580,0	12
53233	10 x 1,5 / 2,5 re	17,2	177,0	420,0	16
53240	10 x 2,5 / 4 re	18,9	287,0	550,0	14
53234	12 x 1,5 / 2,5 re	18,4	204,0	460,0	16
53241	12 x 2,5 / 4 re	19,2	335,0	610,0	14
53247	12 x 4 / 6 re	22,6	528,0	910,0	12
53235	16 x 1,5 / 4 re	20,0	275,0	686,0	16
53242	16 x 2,5 / 6 re	20,9	450,0	805,0	14

Continuation ▶

N2XCH power cable, 0,6/1kV, halogen-free, with concentric conductor, without functionality



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53236	21 x 1,5 / 6 re	22,6	370,0	766,0	16
53243	21 x 2,5 / 6 re	25,2	572,0	1015,0	14
53237	24 x 1,5 / 6 re	23,2	412,0	800,0	16
53244	24 x 2,5 / 10 re	26,1	695,0	1100,0	14
53238	30 x 1,5 / 6 re	24,3	500,0	930,0	16
53245	30 x 2,5 / 10 re	28,0	842,0	1290,0	14

Dimensions and specifications may be changed without prior notice. (RQ02)

Conduits

Corrugated tubes

- for standard applications
- for larger sizes
- scissile corrugated tubes
- conduit glands

High flexible conduits

- plastic conduits with spiral spring
- metal conduits
- conduits glands

Conduit for heavy mechanical duty

- metal conduits with plastic sheat
- plastic conduits
- conduits glands for metal conduits



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JE-H(St)H Bd FE 180/E 30 bis E 90 (orange), halogen-free



Technical data

- Flame retardant, halogen-free installation cable, adapted to DIN VDE 0815
- **Insulation integrity** 180 min tested to DIN VDE 0472 part 814 and IEC 60331
- **Functionality** E 30 to E 90 min (dependant on corresponding installation technique)
- **Loop resistance** max. 73,2 Ohm/km
- **Temperature range**
flexing -5 °C to +50 °C
fixed installation -30 °C to +70 °C
- **Operating top level voltage**
225 V (not for purposes of high current and power installation)
- **Test voltage**
core/core 500 V
core/screen 2000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance**
max. 120 nF/km at 800 Hz
(this values may be extended at 20% with a make-up up to 4 pairs)
- **Capacitance unbalance**
max. 200 pF/100 m (20% of the values, but one value up to 400 pF is allowed)
- **Minimum bending radius**
approx. 6x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid, 0,8 mm ø
- Special core insulation halogen-free, cross-linked polymer to DIN VDE 0207 part 23, HI1 flame retardant (E90 with special foil wrapping over conductor)
- Core identification with colour rings and ring-groups to DIN VDE 0815
- Cores twisted to pairs, 4 pairs consist to unit, several units stranded to layers
- Units identified by numbered tape
- Core wrapping with special polyester and glass-fibre tape
- Screening with alu-laminated polyester tape and solid tinned copper drain wire 0,8 mm ø
- Halogen-free outer jacket, flame retardant to DIN VDE 0207 part 24 HM2
- Jacket colour orange

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Smoke testing according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- No fire propagation
- Low smoke density
- **FE 180: Insulation integrity** for 180 minutes.
Tests to DIN VDE 0472 part 814 IEC 60331. **Insulation integrity** under direct flame propagation for the test period of 180 minutes.
- **E 30: Functionality** of electrical cable systems for minimum 30 minutes. Test to DIN 4102 part 12.
The **functionality** for 30 minutes assures when persons and animals are to be saved from a burning building. 30 minutes secures the functional performance of the fire warning and alarm systems, safety and spare lighting, passenger lifts with evacuation circuits, except the cables which are installed within the ladder shafts and engine rooms.
- **E 90: Functionality** of electrical cable systems for minimum 90 minutes. Test method to DIN 4102 part 12.
The **functionality** for 90 minutes assures the functional performance of water-pressure-rising stations for the supply to avoid smoke and heat in safety-stairs and inner rooms, ladder shafts and engine rooms for fire brigade lifts, emergency lifts for sickbeds in hospitals and the fire brigade lifts.

Note

- **E 30 to E 90**
Functionality (burning behaviour) is dependant on corresponding installation technique.
- Not for purposes of high current and power installation as well as underground laying.

Application

Flame resistant, halogen-free, static screened installation cables for telecommunication purpose. The static screen prevents strong interference impulse. Suitable for fixed installation everywhere, where in case of fire human life and material assets are to be protected and a safety consciousness take a special significance, e.g. in industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Functionality E 30 to E 90

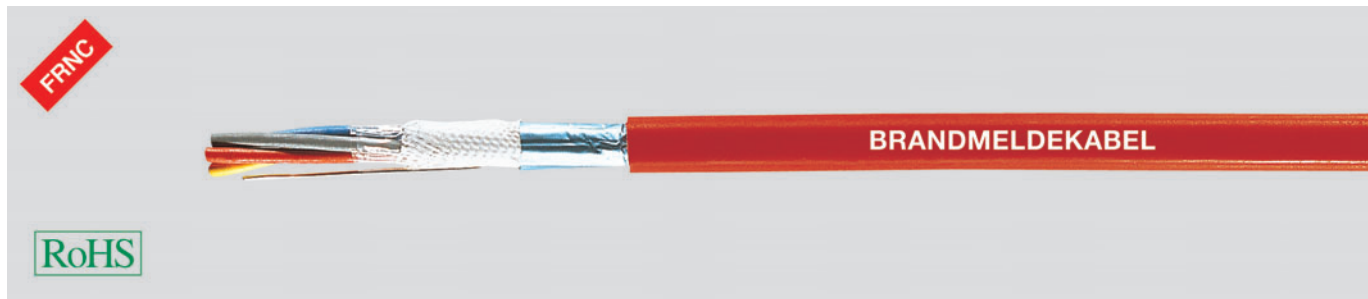
Part no.	No. pairs x cross-sec. mm	outer ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34081	2 x 2 x 0,8	7,4	25,0	74,0
34082	4 x 2 x 0,8	10,8	45,0	127,0
34083	8 x 2 x 0,8	16,9	85,0	300,0
34084	12 x 2 x 0,8	18,5	126,0	336,0
34085	16 x 2 x 0,8	20,1	166,0	426,0
34086	20 x 2 x 0,8	22,2	206,0	529,0
34087	32 x 2 x 0,8	29,1	326,0	859,0
34088	40 x 2 x 0,8	34,2	407,0	1094,0
34089	52 x 2 x 0,8	37,3	529,0	1280,0

Functionality E 30

Part no.	No. pairs x cross-sec. mm	Outer ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34148	2 x 2 x 0,8	7,5	25,0	74,0
34149	4 x 2 x 0,8	9,3	45,0	127,0
34150	8 x 2 x 0,8	11,4	85,0	300,0
34151	12 x 2 x 0,8	13,0	126,0	336,0
34152	16 x 2 x 0,8	15,7	166,0	426,0
34153	20 x 2 x 0,8	16,5	206,0	529,0
34154	32 x 2 x 0,8	20,3	326,0	859,0
34155	40 x 2 x 0,8	25,4	407,0	1094,0
34156	52 x 2 x 0,8	25,2	529,0	1280,0

Dimensions and specifications may be changed without prior notice. (RQ02)

JE-H(St)H Bd fire warning cable, FE 180/E 30 to E 90 (red), halogen-free



Technical data

- Flame retardant, halogen-free installation cable, adapted to DIN VDE 0815
- **Insulation integrity** 180 min, tested to DIN VDE 0472 part 814 and IEC 60331
- **Functionality** (burning behaviour) E 30 to E 90 min (dependant on corresponding installation technique)
- **Loop resistance** max. 73,2 Ohm/km
- **Temperature range** flexing -5 °C to +50 °C fixed installation -30 °C to +70 °C
- **Operating voltage** (peak voltage) 225 V (not for purposes of high current and power installation)
- **Test voltage** core/core 500 V core/screen 2000 V
- **Insulation resistance** min. 100 MOhm x km
- **Mutual capacitance** max. 120 nF/km at 800 Hz (this values may be extended at 20% with a make-up up to 4 pairs)
- **Capacitance unbalance** max. 200 pF/100 m (20% of the values, but one value up to 400 pF is allowed)
- **Minimum bending radius** approx. 6x cable ø
- **Radiation resistance** up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Caloric load values** see Technical Informations

Cable structure

- Bare copper conductor, solid, 0,8 mm ø
- Special core insulation halogen-free, cross-linked polymer to DIN VDE 0207 part 23, HI1, flame retardant (E90 with special foil wrapping over conductor)
- Core identification with colour rings and ring-groups to DIN VDE 0815
- Cores twisted to pairs, each 4 pairs consist to unit, several units stranded to layers
- Units identified with numbered tape
- Core wrapping with special polyester and glass-fibre tape
- Screening with alu-laminated polyester tape and solid copper drain wire 0,8 mm ø
- Halogen-free outer jacket, flame retardant to DIN VDE 0207 part 24, HM2
- Jacket colour red, RAL 3000 with imprint "BRANDMELDEKABEL"

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- No fire propagation
- Low smoke density
- Not for purposes of high current and power installation as well as underground laying
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331. **Insulation integrity** under direct flame propagation for the test period of 180 minutes.
- **E 30: Functionality** of electrical cable systems for minimum 30 minutes. Test to DIN 4102 part 12. The **functionality** for 30 minutes assures when persons and animals are to be saved from a burning building. 30 minutes secures the functional performance of the fire warning and alarm systems, safety and spare lighting, passenger lifts with evacuation circuits, except the cables which are installed within the ladder shafts and engine rooms.
- **E 90: Functionality** of electrical cable systems for minimum 90 minutes. Test method to DIN 4102 part 12. The **functionality** for 90 minutes assures the functional performance of water-pressure-rising stations for the supply to avoid smoke and heat in safety-stairs and inner rooms, ladder shafts and engine rooms for fire brigade lifts, emergency lifts for sickbeds in hospitals and the fire brigade lifts.

Note

- **E 30 to E 90** Functionality (burning behaviour) is dependant on corresponding installation technique.

Application

Flame resistant, halogen-free, static screened installation cables for telecommunication purpose. The static screen prevents strong interference impulse. Suitable for fixed installation everywhere, where in case of fire human life and material assets are to be protected and a safety consciousness take a special significance, e.g. in industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34091	2 x 2 x 0,8	7,4	25,0	74,0
34092	4 x 2 x 0,8	10,8	45,0	127,0
34093	8 x 2 x 0,8	16,9	85,0	300,0
34094	12 x 2 x 0,8	18,5	126,0	336,0
34095	16 x 2 x 0,8	20,1	166,0	426,0
34096	20 x 2 x 0,8	22,2	206,0	529,0
34097	32 x 2 x 0,8	29,1	326,0	859,0
34098	40 x 2 x 0,8	34,2	407,0	1094,0
34099	52 x 2 x 0,8	37,3	529,0	1280,0

Functionality E30

Part no.	No. pairs x cross-sec. mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
34157	2 x 2 x 0,8	7,5	25,0	67,0
34158	4 x 2 x 0,8	9,3	45,0	103,0
34159	8 x 2 x 0,8	11,4	85,0	168,0
34160	12 x 2 x 0,8	13,0	126,0	237,0
34161	16 x 2 x 0,8	15,7	166,0	303,0
34162	20 x 2 x 0,8	16,5	206,0	361,0
34163	32 x 2 x 0,8	20,3	326,0	553,0
34164	40 x 2 x 0,8	23,4	407,0	699,0
34165	52 x 2 x 0,8	25,2	529,0	865,0

Dimensions and specifications may be changed without prior notice. (RQ02)



Technical data

- Special insulation for cores and outer jacket according to DIN VDE 0815. Compound to DIN VDE 0207 part 23 HI 1, flame resistant
- **Insulation integrity** 180 min tested to DIN VDE 0472 part 814 and IEC 60331
- **Functionality** E 90 min
- **Loop resistance** max. 73 Ohm/km
- **Operating voltage** (peak voltage) max. 225 V (not for purposes of high current and power installation)
- **Test voltage**
core/core 500 V
core/screen 2000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Mutual capacitance**
max. 120 nF/km at 800 Hz
- **Minimum bending radius**
approx. 6x cable \varnothing
- **Caloric load values**
see Technical Informations

Cable structure

- Bare solid copper conductor, 0,8 mm \varnothing
- Special core insulation halogen-free, cross-linked polymer to DIN VDE 0207 part 23, HI1, flame retardant (E90 with special foil wrapping over conductor)
- 2 cores twisted to pair and each 4 pairs layed up in bunches, the bunches stranded in layers
- Glass-fibre taped
- Screening with alu-laminated polyester tape and solid copper drain wire 0,8 mm \varnothing
- Inner sheath, flame retardant polyolefin compound to DIN VDE 0207 part 24 HM3
- Galvanized steel wire braided screen
- Special outer jacket HM2 to DIN VDE 0207 part 24, flame resistant
- Outer jacket red (RAL 3000) with imprint "BRANDMELDEKABEL"

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- No fire propagation
- Low smoke density
- Not for purposes of high current and power installation as well as underground laying
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331.
Insulation integrity under direct flame propagation for the test period of 180 minutes.
- **E 30: Functionality** of electrical cable systems for minimum 30 minutes. Test to DIN 4102 part 12.
The **functionality** for 30 minutes assures when persons and animals are to be saved from a burning building. 30 minutes secures the functional performance of the fire warning and alarm systems, safety and spare lighting, passenger lifts with evacuation circuits, except the cables which are installed within the ladder shafts and engine rooms.
- **E 90: Functionality** of electrical cable systems for minimum 90 minutes. Test method to DIN 4102 part 12.
The **functionality** for 90 minutes assures the functional performance of water-pressure-rising stations for the supply to avoid smoke and heat in safety-stairs and inner rooms, ladder shafts and engine rooms for fire brigade lifts, emergency lifts for sickbeds in hospitals and the fire brigade lifts.

Note

- **E 30 to E 90**
Functionality is dependant on installation technique.

Application

Flame resistant, halogen-free, static screened installation cables for telecommunication purpose. The static screen prevents strong interference impulse.

Suitable for fixed installation everywhere, where in case of fire human life and material assets are to be protected and a safety consciousness take a special significance, e.g. in industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals.

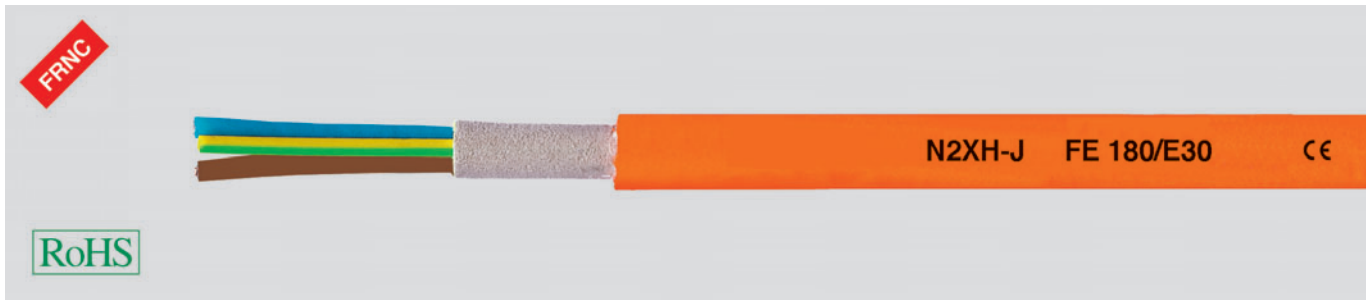
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x cross-sec. mm	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km
34075	2 x 2 x 0,8	10,5	25,0	150,0
34076	4 x 2 x 0,8	14,8	45,0	275,0
34077	8 x 2 x 0,8	21,1	85,0	545,0
34078	12 x 2 x 0,8	22,7	126,0	602,0
34079	16 x 2 x 0,8	25,0	166,0	734,0

Part no.	No.pairs x cross-sec. mm	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km
34080	20 x 2 x 0,8	26,9	206,0	870,0
34072	32 x 2 x 0,8	35,0	326,0	1360,0
34073	40 x 2 x 0,8	41,0	407,0	1800,0
34074	52 x 2 x 0,8	44,0	529,0	2038,0

Dimensions and specifications may be changed without prior notice. (RQ02)

N2XH-FE 180/E 30 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Technical data

- Halogen-free security cable with improved characteristics in the case of fire to DIN VDE 0266
- **Insulation integrity**
180 minutes to DIN VDE 0472 part 814
- **Functionality**
30 minutes to DIN VDE 4102 part 12
- **Temperature range**
-30 °C to +70 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
approx. 15x cable \varnothing
- **Radiation resistance**
up to 200×10^6 cJ/kg (up to 200 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid or stranded, to DIN VDE 0295 cl. 1 or cl. 2, BS 6360 cl. 1 or 2, IEC 60228 cl. 1/2, HD 383
- Core with double insulation: Flame retardant MICA-tapeover conductor Core insulation with cross-linked polyethylene, compound type 2X11 to DIN VDE 0276 part 604
- Cores colour coding to DIN VDE 0293-308 and 0276 part 604
- Green-yellow earth-core, 3 cores and above
- Cores stranded in layers Overall core covering, halogen-free filling compound, pressed
- Outer jacket of thermoplastic halogen-free polyolefine, compound type HM4 to DIN VDE 0276 part 604, flame retardant, colour orange

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to DIN VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Insulation integrity under flame propagation to VDE 0472 part 814 IEC 60331, Burning behaviour in fire (functionality) of the complete cable system to DIN 4102 part 12 (30 minutes)
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free; no evolution of corrosive and toxic gases
- Flame retardant
- Hardly flammable
- Self-extinguished and fire resistant
- No flame propagation, therefore security from fire
- Low smoke density, no darkening of emergency exits without hindering the fire extinguishing works
- Toxicological harmless
- No self-ignition
- Maintenance of functionality during the increased current load
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331.

Insulation integrity under direct flame propagation for the test period of 180 minutes.

- **E 30: Functionality** of electrical cable systems for minimum 30 minutes. Test to DIN 4102 part 12. This fulfils the demands of technical guide lines for fire protection (supplement 1 to DIN VDE 0108 part 1). The **functionality** for 30 minutes assures when persons and animals are to be saved from a burning building. 30 minutes secures the functional performance of the fire warning and alarm systems, safety and spare lighting, passenger lifts with evacuation circuits, except the cables which are installed within the ladder shafts and engine rooms.

Note

- rm = round conductor, multiple-wire;
re = round conductor, single-wire.

Application

Security cables are ideal for use everywhere, where in case of fire human life and material assets are to be protected and safety consciousness take a special significance, e.g. in industrial complexes, power stations, communal establishment, hotels, airports, underground railway networks, hospitals and outpatients clinic (DIN VDE 0107), department stores, data processing centres, theaters, cinemas, in multi-storey buildings, public gatherings, schools etc. (DIN VDE 0108), mining works, offshore plants, leading centres, traffic communication, emergency power supply and alarm systems. The cables are suitable for fixed installation in dry and moist rooms, in, above, on and beneath plaster as well as in masonry walls and in concrete.

For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52058	1 x 4 re	8,0	38,0	155,0	12
52059	1 x 6 re	9,0	58,0	190,0	10
52060	1 x 10 re	10,0	96,0	215,0	8
52061	1 x 16 re	10,5	154,0	240,0	6
52062	1 x 25 rm	13,0	240,0	380,0	4

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52063	1 x 35 rm	14,0	336,0	460,0	2
52064	1 x 50 rm	15,5	480,0	590,0	1
52065	1 x 70 rm	17,5	672,0	820,0	2/0
52066	1 x 95 rm	19,5	912,0	1090,0	3/0
52067	1 x 120 rm	21,0	1152,0	1350,0	4/0

Continuation ▶

N2XH-FE 180/E 30 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52068	1 x 150 rm	23,0	1440,0	1650,0	300 kcmil
52069	1 x 185 rm	25,0	1776,0	2030,0	350 kcmil
52070	1 x 240 rm	29,0	2304,0	2590,0	500 kcmil
52071	2 x 1,5 re	11,5	29,0	170,0	16
52072	2 x 2,5 re	12,0	48,0	190,0	14
52073	2 x 4 re	13,0	77,0	260,0	12
52074	2 x 6 re	14,0	115,0	310,0	10
52075	2 x 10 re	15,5	192,0	430,0	8
52076	2 x 16 re	17,5	307,0	600,0	6
52077	2 x 25 rm	22,0	480,0	930,0	4
52078	3 G 1,5 re	12,0	43,0	170,0	16
52079	3 G 2,5 re	12,5	72,0	220,0	14
52080	3 G 4 re	13,5	115,0	290,0	12
52081	3 G 6 re	14,5	173,0	370,0	10
52082	3 G 10 re	16,5	288,0	530,0	8
52083	3 G 16 re	18,5	461,0	760,0	6
52084	3 G 25 rm	23,5	720,0	1160,0	4
52088	3 G 25 / 16 rm	22,5	874,0	1430,0	4
52085	3 G 35 rm	26,0	1080,0	1560,0	2
52089	3 G 35 / 16 rm	28,0	1162,0	1810,0	2
52086	3 G 50 rm	29,0	1440,0	2030,0	1
52090	3 G 50 / 25 rm	32,0	1680,0	2340,0	1
52087	3 G 70 rm	34,0	2016,0	2890,0	2/0
52091	3 G 70 / 35 rm	35,0	2352,0	3190,0	2/0
52092	3 G 95 / 50 rm	40,0	3216,0	4350,0	3/0

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52093	3 G 120 / 70 rm	45,0	4128,0	5550,0	4/0
52094	3 G 150 / 70 rm	48,5	4992,0	6560,0	300 kcmil
52095	3 G 185 / 95 rm	54,0	6240,0	8240,0	350 kcmil
52096	4 G 1,5 re	12,5	58,0	210,0	16
52097	4 G 2,5 re	13,0	96,0	260,0	14
52614	4 G 4 re	13,0	154,0	310,0	12
52615	4 G 6 re	14,5	230,0	410,0	10
52616	4 G 10 re	16,0	384,0	620,0	8
52617	4 G 16 re	18,0	614,0	900,0	6
52628	4 x 25 rm	23,6	960,0	1600,0	4
52629	4 x 35 rm	26,4	1344,0	2050,0	2
52383	4 x 50 rm	29,5	1920,0	2761,0	1
52432	4 x 70 rm	34,6	2688,0	3785,0	2/0
52433	4 x 95 rm	39,0	3648,0	5010,0	3/0
52434	4 x 120 re	43,5	4608,0	6135,0	4/0
52618	5 G 1,5 re	12,0	72,0	210,0	16
52619	5 G 2,5 re	13,0	120,0	280,0	14
52620	5 G 4 re	14,5	192,0	380,0	12
52621	5 G 6 re	15,5	288,0	510,0	10
52622	5 G 10 re	18,0	480,0	760,0	8
52623	5 G 16 re	20,0	768,0	1120,0	6
52626	5 x 25 rm	24,5	1200,0	1840,0	4
52627	5 x 35 rm	33,5	1680,0	2510,0	2
52624	7 G 1,5 re	13,0	101,0	250,0	16
52625	12 G 1,5 re	16,5	173,0	390,0	16

Dimensions and specifications may be changed without prior notice. (RQ02)

N2XCH-FE 180/E 30 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Technical data

- Halogen-free security cable with improved characteristics in the case of fire to DIN VDE 0266
- Insulation integrity
180 minutes to DIN VDE 0472 part 814
- Functionality
30 minutes to DIN VDE 4102 part 12
- **Temperature range**
-30 °C to +70 °C
- Permissible **operating temperature**
at conductor +90 °C
- **Nominal voltage** U0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
approx. 15x cable Ø
- **Radiation resistance**
up to 200x106 cJ/kg (up to 200 Mrad)
- **Caloric load values**
see Technical Informations

Tests

- Flame test to VDE 0482 part 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2/ IEC 61034-1+2/ DIN EN 61034-1+2/ BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Insulation integrity under flame propagation to VDE 0472 part 814 ± IEC 60331 Funktionserhalt von Kabelanlagen nach DIN 4102 part 12 (30 min)

Cable structure

- Bare copper conductor, solid or stranded, to DIN VDE 0295 cl. 1 or cl. 2, BS 6360 cl. 1 or 2, IEC 60228 cl. 1 or 2, HD 383
- Core with double insulation:
Flame retardant MICA-tape over conductor
Core insulation with cross-linked polyethylene, compound type 2X11 to DIN VDE 0276 part 604
- Cores colour coding to DIN VDE 0293-308 and 0276 part 604
- Cores stranded in layers
- Overall core covering, halogen-free filling compound, pressed
- Concentric conductor of Cu-bare wires with helix of copper tape
- Outer jacket of thermoplastic halogen-free polyolefine, compound type HM4 to DIN VDE 0276 part 604, flame retardant, colour orange
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free; no evolution of corrosive and toxic gases
- Flame retardant
- Hardly flammable
- Self-extinguished and fire resistant
- No flame propagation, therefore security from fire
- Low smoke density, no darkening of emergency exits without hindering the fire extinguishing works
- Toxicological harmless
- No self-ignition
- Maintenance of functionality during the increased current load
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331.

Insulation integrity under direct flame propagation for the test period of 180 minutes.

- **E 30: Functionality** of electrical cable systems for minimum 30 minutes. Test method to DIN 4102 part 12. This fulfils the demands of technical guide lines for fire protection (supplement 1 to DIN VDE 0108 part 1).

The **functionality** for 30 minutes assures when persons and animals are to be saved from a burning building. 30 minutes secures the functional performance of the fire warning and alarm systems, safety and spare lighting, passenger lifts with evacuation circuits, except the cables which are installed within the ladder shafts and engine rooms.

Note

- rm = round conductor, multiple-wire;
re = round conductor, single-wire.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Everywhere, where in case of fire human life and material assets are to be protected and safety consciousness take a special significance, e.g. in industrial complexes, power stations, communal establishment, hotels, airports, underground railway networks, hospitals and outpatients clinic (DIN VDE 0107), department stores, data processing centres, theaters, cinemas, in multi-storey buildings, public gatherings, schools etc. (DIN VDE 0108), mining works, offshore plants, leading centres, traffic communication, emergency power supply and alarm systems. Suitable for fixed installation in dry and moist rooms, in, above, on and beneath plaster as well as in masonry walls and in concrete. These cables are suitable for outdoor applications and in underground by using in conduits or tubes. Additionally valid also DIN VDE 0298 part 1 and 2.

For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52098	2 x 1,5 / 1,5 re	13,0	52,0	200,0	16
52099	2 x 2,5 / 2,5 re	14,0	80,0	250,0	14
52100	2 x 4 / 4 re	15,0	123,0	310,0	12

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52101	2 x 6 / 6 re	16,0	182,0	400,0	10
52102	2 x 10 / 10 re	17,5	312,0	570,0	8
52103	3 x 1,5 / 1,5 re	13,0	66,0	220,0	16

Continuation ▶

N2XCH-FE 180/E 30 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52104	3 x 2,5 / 2,5 re	14,0	104,0	270,0	14
52105	3 x 4 / 4 re	15,5	161,0	360,0	12
52106	3 x 6 / 6 re	16,5	240,0	470,0	10
52107	3 x 10 / 10 re	18,5	408,0	680,0	8
52108	3 x 16 / 16 re	21,0	643,0	960,0	6
52109	3 x 25 / 16 rm	25,5	902,0	1390,0	4
52110	3 x 35 / 16 rm	29,0	1190,0	1720,0	2
52111	3 x 50 / 25 rm	31,5	1723,0	2320,0	1
52112	3 x 70 / 35 rm	36,5	2410,0	3260,0	2/0
52113	3 x 95 / 50 rm	40,0	3296,0	4310,0	3/0
52114	3 x 120 / 70 rm	46,0	4236,0	5520,0	4/0
52115	3 x 150 / 70 rm	50,5	5100,0	6620,0	300 kcmil
52116	3 x 185 / 95 rm	55,0	6383,0	8180,0	350 kcmil
52117	3 x 240 / 120 rm	61,5	8242,0	10620,0	500 kcmil
52118	4 x 1,5 / 1,5 re	15,0	81,0	260,0	16
52119	4 x 2,5 / 2,5 re	16,0	128,0	310,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52120	4 x 4 / 4 re	17,0	200,0	420,0	12
52121	4 x 6 / 6 re	18,0	297,0	540,0	10
52122	4 x 10 / 10 re	20,0	504,0	800,0	8
52123	4 x 16 / 16 re	22,5	796,0	1150,0	6
52124	4 x 25 / 16 rm	28,0	1142,0	1670,0	4
52125	4 x 35 / 16 rm	30,5	1526,0	2160,0	2
52126	4 x 50 / 25 rm	32,0	2203,0	2860,0	1
52127	4 x 70 / 35 rm	39,5	3082,0	3980,0	2/0
52128	4 x 95 / 50 rm	43,5	4208,0	5300,0	3/0
52129	4 x 120 / 70 rm	49,5	5388,0	6740,0	4/0
52130	4 x 150 / 70 rm	55,5	6558,0	8210,0	300 kcmil
52131	4 x 185 / 95 rm	60,0	8159,0	10200,0	350 kcmil
52132	4 x 240 / 120 rm	68,0	10546,0	12900,0	500 kcmil
52133	7 x 1,5 / 2,5 re	16,5	133,0	360,0	16
52134	30 x 1,5 / 6 re	29,0	499,0	1070,0	16

Dimensions and specifications may be changed without prior notice. (RQ02)

Drag Chain Systems

- Open chains
- Closed chains
- Accessories
- Installation instructions
- Selection tables



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NHXX-FE 180/E 30 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Technical data

- Halogen-free security cable with improved characteristics in the case of fire to DIN VDE 0266
- **Insulation integrity**
180 minutes to DIN VDE 0472 part 814
- **Functionality**
30 minutes to DIN VDE 4102 part 12
- **Temperature range**
-30 °C to +70 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
approx. 15xcable \varnothing
- **Radiation resistance**
up to 200×10^6 cJ/kg (up to 200 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid or stranded, to DIN VDE 0295 cl. 1 or cl. 2
- Double core insulation of mica tape and cross-linked polymer HI1, to DIN VDE 0207 part 23
- Colour coding of cores according to DIN VDE 0293-308
- Green-yellow earth-core, 3 cores and above
- Cores stranded in layer
- Core wrapping with glass-fibre tape as flame-protection
- Outer jacket orange, polymer-compound DIN VDE 0207 part 24, flame retardant

Tests

- Flame test to VDE 0482-332-3, BS 4066 part 3/ DIN EN 60332-3/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Insulation integrity under flame propagation to VDE 0472 part 814 Δ IEC 60331
Burning behaviour in fire(functionality) of the complete cable system to DIN 4102 part 12 (30 minutes)
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free; no evolution of corrosive and toxic gases
- Flame retardant
- Hardly flammable
- Self-extinguished and fire resistant
- No flame propagation, therefore security from fire
- Low smoke density, no darkening of emergency exits without hindering the fire extinguishing works
- Toxicological harmless
- No self-ignition
- Maintenance of functionality during the increased current load
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331.
- **Insulation integrity** under direct flame propagation for the test period of 180 minutes.
- **E 30: Functionality** of electrical cable systems for minimum 30 minutes. Test to DIN 4102 part 12. This fulfils the demands of technical guide lines for fire protection (supplement 1 to DIN VDE 0108 part 1). The **functionality** for 30 minutes assures when persons and animals are to be saved from a burning building. 30 minutes secures the functional performance of the fire warning and alarm systems, safety and spare lighting, passenger lifts with evacuation circuits, except the cables which are installed within the ladder shafts and engine rooms.

Note

- rm = round conductor, multiple-wire;
re = round conductor, single-wire.

Application

Security cables are ideal for use everywhere, where in case of fire human life and material assets are to be protected and safety consciousness take a special significance, e.g. in industrial complexes, power stations, communal establishment, hotels, airports, underground railway networks, hospitals and outpatients clinic (DIN VDE 0107), department stores, data processing centres, theaters, cinemas, in multi-storey buildings, public gatherings, schools etc. (DIN VDE 0108), mining works, offshore plants, leading centres, traffic communication, emergency power supply and alarm systems. The cables are suitable for fixed installation in dry and moist rooms, in, above, on and beneath plaster as well as in masonry walls and in concrete. These cables are suitable for outdoor applications and in underground by using in conduits or tubes. Additionally valid also DIN VDE 0298 part 1 and 2.

For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52700	1 x 4 re	7,0	38,0	98,0	12
52701	1 x 6 re	7,5	58,0	125,0	10
52702	1 x 10 re	8,0	96,0	165,0	8
52703	1 x 16 rm	9,0	154,0	230,0	6
52704	1 x 25 rm	10,5	240,0	345,0	4
52705	1 x 35 rm	11,5	336,0	450,0	2
52706	1 x 50 rm	12,0	480,0	590,0	1

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52707	1 x 70 rm	15,0	672,0	800,0	2/0
52708	1 x 95 rm	16,5	912,0	1100,0	3/0
52709	1 x 120 rm	18,5	1152,0	1350,0	4/0
52710	1 x 150 rm	20,5	1440,0	1650,0	300 kcmil
52711	1 x 185 rm	23,0	1776,0	2000,0	350 kcmil
52712	1 x 240 rm	25,5	2304,0	2650,0	500 kcmil
52713	1 x 300 rm	31,8	2880,0	3200,0	600 kcmil
52714	2 x 2,5 re	12,5	48,0	290,0	14

Continuation ►

NHXH-FE 180/E 30 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics

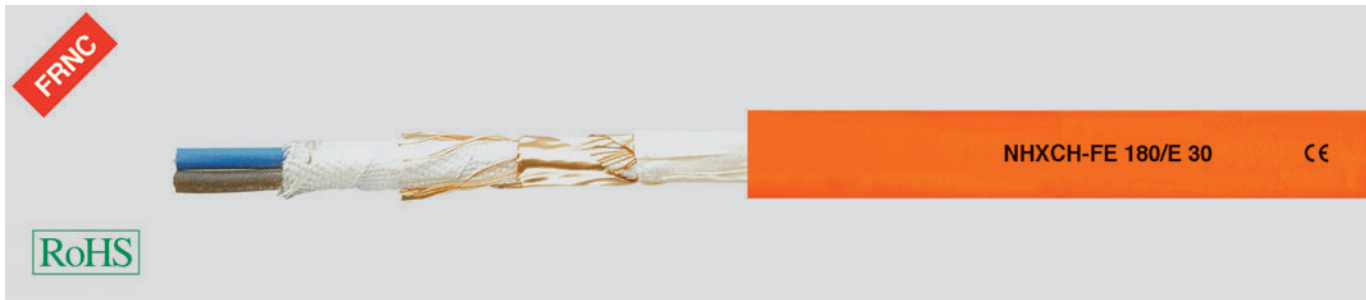


Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52715	2 x 4 re	13,5	77,0	345,0	12
52716	2 x 6 re	14,5	115,0	410,0	10
52717	2 x 10 re	16,0	192,0	540,0	8
52718	2 x 16 rm	18,0	307,0	720,0	6
52719	2 x 25 rm	21,0	480,0	1100,0	4
52720	2 x 35 rm	24,0	672,0	1120,0	2
52721	3 x 1,5 re	12,5	43,0	280,0	16
52722	3 x 2,5 re	13,5	72,0	330,0	14
52723	3 x 4 re	14,5	115,0	400,0	12
52724	3 x 6 re	15,5	173,0	480,0	10
52725	3 x 10 re	17,0	288,0	650,0	8
52726	3 x 16 rm	19,0	461,0	850,0	6
52727	3 x 25 rm	22,5	720,0	1300,0	4
52728	3 x 35 rm	24,5	1080,0	1700,0	2
52729	3 x 50 rm	27,5	1440,0	2200,0	1
52730	3 x 70 rm	32,0	2016,0	3000,0	2/0
52731	3 x 95 rm	35,5	2736,0	4000,0	3/0
52732	3 x 120 rm	39,5	3456,0	4850,0	4/0
52733	3 x 150 rm	44,0	4320,0	5950,0	300 kcmil
52734	3 x 185 rm	49,5	5328,0	7450,0	350 kcmil
52735	3 x 240 rm	60,0	6910,0	8600,0	500 kcmil
52736	4 x 1,5 re	13,5	58,0	325,0	16
52737	4 x 2,5 re	14,0	96,0	385,0	14
52738	4 x 4 re	15,5	154,0	470,0	12
52739	4 x 6 re	16,5	230,0	580,0	10
52740	4 x 10 re	18,5	384,0	790,0	8
52741	4 x 16 rm	20,5	614,0	1100,0	6
52742	4 x 25 rm	24,5	960,0	1650,0	4
52743	4 x 35 rm	27,0	1344,0	2150,0	2
52744	4 x 50 rm	30,0	1920,0	2800,0	1
52745	4 x 70 rm	35,0	2688,0	3800,0	2/0
52746	4 x 95 rm	39,5	3648,0	5050,0	3/0
52747	4 x 120 rm	43,5	4608,0	6150,0	4/0
52748	4 x 150 rm	49,0	5760,0	7650,0	300 kcmil

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52749	5 x 1,5 re	14,0	72,0	375,0	16
52750	5 x 2,5 re	15,0	120,0	445,0	14
52751	5 x 4 re	16,5	192,0	560,0	12
52752	5 x 6 re	18,0	288,0	690,0	10
52753	5 x 10 re	20,0	480,0	950,0	8
52754	5 x 16 rm	22,5	768,0	1300,0	6
52755	5 x 25 rm	26,5	1200,0	1980,0	4
52756	5 x 35 rm	36,0	1680,0	2600,0	2
52757	7 x 1,5 re	15,0	101,0	365,0	16
52758	7 x 2,5 re	16,5	168,0	540,0	14
52759	10 x 1,5 re	18,0	144,0	580,0	16
52760	10 x 2,5 re	20,0	240,0	710,0	14
52761	12 x 1,5 re	19,0	173,0	640,0	16
52762	12 x 2,5 re	20,5	288,0	790,0	14
52763	14 x 1,5 re	20,0	202,0	740,0	16
52764	14 x 2,5 re	21,5	336,0	880,0	14
52765	19 x 1,5 re	21,5	274,0	880,0	16
52766	19 x 2,5 re	23,5	456,0	1150,0	14
52767	24 x 1,5 re	25,0	346,0	1100,0	16
52768	24 x 2,5 re	27,0	576,0	1400,0	14
52769	30 x 1,5 re	26,0	432,0	1300,0	16
52770	30 x 2,5 re	28,5	720,0	1650,0	14

Dimensions and specifications may be changed without prior notice. (RQ02)

NHXCH-FE 180/E 30 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Technical data

- Halogen-free security cable with improved characteristics in the case of fire to DIN VDE 0266
- **Insulation integrity**
180 minutes to DIN VDE 0472 part 814
- **Functionality**
30 minutes to DIN VDE 4102 part 12
- Permissible **operating temperature**
at conductor +90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
approx. 15xcable \varnothing
- **Radiation resistance**
up to 200x10⁶ cJ/kg (up to 200 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid or stranded, to DIN VDE 0295 cl. 1 or cl. 2, BS 6360 cl. 1 or 2, IEC 60228 cl. 1 or cl. 2, HD 383
- Special core insulation of mica tape and cross-linked polymer HI1 to DIN VDE 0207 part 23
- Colour coding of cores according to DIN VDE 0293-308
- Core stranded in layer
- Core wrapping with glass-fibre tape
- Copper wire screening with helix of copper tape
- Separator of special tape
- Outer jacket orange, polymer-compound HM4, to DIN VDE 0207 part 24, flame retardant

Tests

- Flame test to VDE 0482 part 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Insulation integrity under flame propagation to VDE 0472 part 814 Δ IEC 60331
- Burning behaviour in fire (functionality) of the complete cable system to DIN 4102 part 12 (30 minutes)
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free; no evolution of corrosive and toxic gases
- Flame retardant and hardly flammable
- Self-extinguished and fire resistant
- No flame propagation, therefore security from fire
- Low smoke density, no darkening
- Toxicological harmless
- No self-ignition
- Maintenance of functionality during the increased current load
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 Δ IEC 60331.
Insulation integrity under direct flame propagation for the test period of 180 minutes.
- **E 30: Functionality** of electrical cable systems for minimum 30 minutes. Test method to DIN 4102 part 12. This fulfils the demands of technical guide lines for fire protection (supplement 1 to DIN VDE 0108 part 1).
The **functionality** for 30 minutes assures when persons and animals are to be saved from a burning building. 30 minutes secures the functional performance of the fire warning and alarm systems, safety and spare lighting, passenger lifts with evacuation circuits, except the cables which are installed within the ladder shafts and engine rooms.

Note

- re = round solid core;
rm = stranded core.

Application

Everywhere, where in case of fire human life and material assets are to be protected and safety consciousness take a special significance, e.g. in industrial complexes, power stations, communal establishment, hotels, airports, underground railway networks, hospitals and outpatients clinic (DIN VDE 0107), department stores, data processing centres, theaters, cinemas, in multi-storey buildings, public gatherings, schools etc. (DIN VDE 0108), mining works, offshore plants, leading centres, traffic communication, emergency power supply and alarm systems. Suitable for fixed installation in dry and moist rooms, in, above, on and beneath plaster as well as in masonry walls and in concrete. These cables are suitable for outdoor applications and in underground by using in conduits or tubes. Additionally valid also DIN VDE 0298 part 1 and 2. For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52900	2 x 1,5 / 1,5 re	15,0	52,0	220,0	16
52901	2 x 2,5 / 2,5 re	13,5	80,0	385,0	14
52902	2 x 4 / 4 re	14,5	123,0	470,0	10
52903	2 x 6 / 6 re	16,0	182,0	550,0	10
52904	2 x 10 / 10 re	18,0	312,0	730,0	8
52905	3 x 1,5 / 1,5 re	13,5	66,0	380,0	16
52906	3 x 2,5 / 2,5 re	14,5	104,0	430,0	14

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52907	3 x 4 / 4 re	15,5	161,0	530,0	12
52908	3 x 6 / 6 re	16,5	240,0	630,0	10
52909	3 x 10 / 10 re	18,5	408,0	850,0	8
52910	3 x 16 / 16 rm	20,5	643,0	1150,0	6
52911	3 x 25 / 16 rm	24,0	902,0	1700,0	4
52912	3 x 35 / 16 rm	26,5	1190,0	2150,0	2
52913	3 x 50 / 25 rm	29,5	1723,0	2800,0	1

Continuation ▶

NHXCH-FE 180/E 30 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52914	3 x 70 / 35 rm	33,0	2410,0	3800,0	2/0
52915	3 x 95 / 50 rm	37,5	3296,0	5100,0	3/0
52916	3 x 120 / 70 rm	42,5	4236,0	6250,0	4/0
52917	3 x 150 / 70 rm	47,0	5100,0	6900,0	300 kcmil
52918	3 x 185 / 95 rm	52,5	6383,0	8550,0	350 kcmil
52919	3 x 240 / 120 rm	58,5	8242,0	11150,0	500 kcmil
52920	4 x 1,5 / 1,5 re	14,5	81,0	435,0	16
52921	4 x 2,5 / 2,5 re	15,5	128,0	500,0	14
52922	4 x 4 / 4 re	16,5	200,0	610,0	12
52923	4 x 6 / 6 re	17,5	297,0	740,0	10
52924	4 x 10 / 10 re	20,0	504,0	1050,0	8
52925	4 x 16 / 16 re	22,0	796,0	1350,0	6
52926	4 x 25 / 16 rm	26,0	1142,0	1950,0	4
52927	4 x 35 / 16 rm	28,5	1526,0	2400,0	2
52928	4 x 50 / 25 rm	32,0	2203,0	3200,0	1
52929	4 x 70 / 35 rm	37,0	3082,0	4500,0	2/0

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52930	4 x 95 / 50 rm	41,5	4208,0	5750,0	3/0
52931	4 x 120 / 70 rm	47,0	5388,0	7100,0	4/0
52932	4 x 150 / 70 rm	52,0	6558,0	8550,0	300 kcmil
52933	4 x 185 / 95 rm	58,0	8159,0	10700,0	350 kcmil
52934	4 x 240 / 120 rm	64,0	10546,0	13930,0	500 kcmil
52935	7 x 1,5 / 2,5 re	16,5	133,0	635,0	16
52936	7 x 2,5 / 2,5 re	17,5	200,0	680,0	14
52937	10 x 1,5 / 2,5 re	19,5	176,0	870,0	16
52938	10 x 2,5 / 4 re	21,0	286,0	980,0	14
52939	12 x 1,5 / 2,5 re	20,0	205,0	1050,0	16
52940	12 x 2,5 / 4 re	21,5	334,0	1050,0	14
52941	24 x 1,5 / 6 re	26,0	413,0	1900,0	16
52942	24 x 2,5 / 10 re	28,5	696,0	1900,0	14
52943	30 x 1,5 / 6 re	27,0	499,0	2200,0	16
52944	30 x 2,5 / 10 re	30,0	840,0	2200,0	14

Dimensions and specifications may be changed without prior notice. (RQ02)

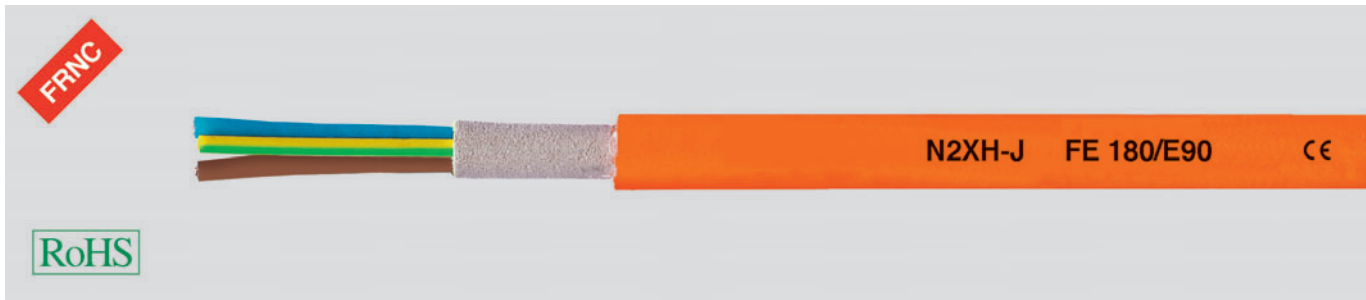
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N2XH-FE 180/E 90 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Technical data

- Halogen-free security cable with improved characteristics in the case of fire to DIN VDE 0266
- **Insulation integrity**
180 minutes to DIN VDE 0472 part 814
- **Functionality**
90 minutes to DIN VDE 4102 part 12
- **Temperature range**
-30 °C to +70 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
approx. 12x cable \varnothing
- **Radiation resistance**
up to 200×10^6 cJ/kg (up to 200 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid or stranded, to DIN VDE 0295 cl. 1 or cl. 2, BS 6360 cl. 1 or 2, IEC 60228 cl. 1 or cl. 2, HD 383
- Core with double insulation: Flame retardant MICA-tapeover conductor
- Core insulation with cross-linked polyethylene, compound type 2X11 to DIN VDE 0276 part 604
- Cores colour coding to DIN VDE 0293-308 and 0276 part 604
- Green-yellow earth-core, 3 cores and above
- Cores stranded in layers
- Overall core covering, halogen-free filling compound, pressed
- Outer jacket of thermoplastic halogen-free polyolefine, compound type HM4 to DIN VDE 0276 part 604, flame retardant, colour orange

Tests

- Flame test to VDE 0482 part 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2/ IEC 61034-1+2/ DIN EN 61034-1+2/ BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Insulation integrity under flame propagation to VDE 0472 part 814 Δ IEC 60331
- Functionality of the complete cable system to DIN 4102 part 12 (90 minutes)
- **LSOH** = Low Smoke Zero Halogen-free.

Properties

- Halogen-free; no evolution of corrosive and toxic gases
- Flame retardant
- Hardly flammable
- Self-extinguished and fire resistant
- No flame propagation, therefore security from fire
- Low smoke density, no darkening of emergency exits without hindering the fire extinguishing works
- Toxicological harmless
- No self-ignition
- Maintenance of functionality during the increased current load
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331.
- **Insulation integrity** under direct flame propagation for the test period of 180 minutes.
- **E 90: Functionality** of electrical cable systems for minimum 90 minutes. Test method to DIN 4102 part 12. This fulfils the demands of technical guide lines for fire protection (supplement 1 to DIN VDE 0108 part 1).
The **functionality** for 90 minutes assures the functional performance of water-pressure-rising stations for the supply to avoid smoke and heat in safety-stairs and inner rooms, ladder shafts and engine rooms for fire brigade lifts, emergency lifts for sickbeds in hospitals and the fire brigade lifts.

Note

- rm = round conductor, multiple-wire;
- re = round conductor, single-wire.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Everywhere, where in case of fire human life and material assets are to be protected and safety consciousness take a special significance, e.g. in industrial complexes, power stations, communal establishment, hotels, airports, underground railway networks, hospitals and outpatients clinic (DIN VDE 0107), department stores, data processing centres, theaters, cinemas, in multi-storey buildings, public gatherings, schools etc. (DIN VDE 0108), mining works, offshore plants, leading centres, traffic communication, emergency power supply and alarm systems. Suitable for fixed installation in dry and moist rooms, in, above, on and beneath plaster as well as in masonry walls and in concrete. These cables are suitable for outdoor applications and in underground by using in conduits or tubes.

Additionally valid also DIN VDE 0298 part 1 and 2.

For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52534	1 x 16 rm	11,5	154,0	250,0	6
52535	1 x 25 rm	13,0	240,0	360,0	4
52536	1 x 35 rm	14,0	336,0	460,0	2
52537	1 x 50 rm	15,5	480,0	610,0	1

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52538	1 x 70 rm	17,5	672,0	840,0	2/0
52539	1 x 95 rm	19,5	912,0	1120,0	3/0
52540	1 x 120 rm	21,5	1152,0	1390,0	4/0
52541	1 x 150 rm	23,5	1440,0	1690,0	300 kcmil

Continuation ▶

N2XH-FE 180/E 90 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52542	1 x 185 rm	25,5	1776,0	2090,0	350 kcmil
52899	1 x 240 rm	28,5	2304,0	2660,0	500 kcmil
52543	1 x 300 rm	31,0	2880,0	3350,0	600 kcmil
52544	1 x 400 rm	34,5	3840,0	4230,0	750 kcmil
52545	2 x 1,5 re	14,5	29,0	270,0	16
52546	2 x 2,5 re	15,5	48,0	310,0	14
52547	2 x 4 re	16,5	77,0	370,0	12
52548	2 x 6 re	17,5	115,0	440,0	10
52549	2 x 10 rm	19,5	192,0	600,0	8
52550	2 x 16 rm	21,0	307,0	780,0	6
52551	2 x 25 rm	23,5	480,0	1100,0	4
52552	2 x 35 rm	26,5	672,0	1400,0	2
52553	2 x 50 rm	30,0	960,0	1830,0	1
52554	2 x 70 rm	33,0	1344,0	2420,0	2/0
52555	2 x 95 rm	37,5	1824,0	3240,0	3/0
52556	2 x 120 rm	41,0	2304,0	3940,0	4/0
52557	3 x 1,5 re	15,0	43,0	260,0	16
52558	3 x 2,5 re	16,0	72,0	350,0	14
52559	3 x 4 re	17,0	115,0	420,0	12
52560	3 x 6 re	18,0	173,0	520,0	10
52561	3 x 10 rm	20,5	288,0	710,0	8
52562	3 x 16 rm	22,5	461,0	950,0	6
52563	3 x 25 rm	26,0	720,0	1370,0	4
52572	3 x 35 / 16 rm	29,5	1162,0	1950,0	2
52564	3 x 35 rm	28,0	1008,0	1750,0	2
52565	3 x 50 rm	32,0	1440,0	2310,0	1
52573	3 x 50 / 25 rm	33,5	1680,0	2640,0	1
52566	3 x 70 rm	35,5	2016,0	3100,0	2/0
52574	3 x 70 / 35 rm	37,0	2352,0	3520,0	2/0
52567	3 x 95 rm	40,5	2736,0	4180,0	3/0
52575	3 x 95 / 50 rm	42,0	3216,0	4710,0	3/0
52576	3 x 120 / 70 rm	46,5	4128,0	5910,0	4/0
52568	3 x 120 rm	44,0	3456,0	5130,0	4/0
52577	3 x 150 / 70 rm	50,0	4992,0	6970,0	300 kcmil
52569	3 x 150 rm	48,5	4320,0	6260,0	300 kcmil
52578	3 x 185 / 95 rm	55,5	6240,0	8750,0	350 kcmil
52570	3 x 185 rm	53,0	5328,0	7720,0	350 kcmil
52579	3 x 240 / 120 rm	61,5	8064,0	11180,0	500 kcmil
52571	3 x 240 rm	59,5	6912,0	9990,0	500 kcmil
52580	4 x 1,5 re	16,5	58,0	350,0	16
52581	4 x 2,5 re	17,5	96,0	420,0	14
52582	4 x 4 re	18,5	154,0	510,0	12

Part no.	No.cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52583	4 x 6 re	19,5	230,0	630,0	10
52584	4 x 10 rm	22,5	384,0	880,0	8
52585	4 x 16 rm	24,5	614,0	1180,0	6
52586	4 x 25 rm	28,5	960,0	1730,0	4
52587	4 x 35 rm	31,0	1344,0	2220,0	2
52588	4 x 50 rm	35,0	1920,0	2940,0	1
52589	4 x 70 rm	39,0	2688,0	3960,0	2/0
52590	4 x 95 rm	45,0	3648,0	5360,0	3/0
52591	4 x 120 rm	48,5	4608,0	6550,0	4/0
52592	4 x 150 rm	54,0	5760,0	8070,0	300 kcmil
52593	4 x 185 rm	59,0	7104,0	9970,0	350 kcmil
52594	4 x 240 rm	66,0	9216,0	12830,0	500 kcmil
52595	5 x 1,5 re	18,0	72,0	420,0	16
52596	5 x 2,5 re	19,0	120,0	500,0	14
52597	5 x 4 re	20,0	192,0	610,0	12
52598	5 x 6 re	21,5	288,0	760,0	10
52599	5 x 10 rm	24,5	480,0	1070,0	8
52600	5 x 16 rm	27,0	768,0	1450,0	6
52601	5 x 25 rm	31,0	1200,0	2120,0	4
52602	5 x 35 rm	34,0	1680,0	2730,0	2
52603	5 x 50 rm	38,5	2400,0	3620,0	1
52604	5 x 70 rm	43,5	3360,0	4940,0	2/0
52605	7 x 1,5 re	19,5	101,0	480,0	16
52606	7 x 2,5 re	20,5	168,0	580,0	14
52607	7 x 4 re	22,0	269,0	730,0	12
52608	10 x 1,5 re	24,0	144,0	650,0	16
52609	10 x 2,5 re	25,5	240,0	790,0	14
52610	12 x 1,5 re	24,5	173,0	720,0	16
52611	12 x 2,5 re	26,0	288,0	890,0	14
52612	24 x 1,5 re	33,0	346,0	1270,0	16

Dimensions and specifications may be changed without prior notice. (RQ02)

N2XCH-FE 180/E 90 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Technical data

- Halogen-free security cable with improved characteristics in the case of fire to DIN VDE 0266
- **Insulation integrity**
180 minutes to DIN VDE 0472 part 814
- **Functionality**
90 minutes to DIN VDE 4102 part 12
- **Temperature range**
-30 °C to +70 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
approx. 12x cable \varnothing
- **Radiation resistance**
up to 200×10^6 cJ/kg (up to 200 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid or stranded, to DIN VDE 0295 cl. 1 and cl. 2, BS 6360 cl. 1 or 2, IEC 60228 cl. 1 or 2, HD 383
- Core with double insulation:
Flame retardant MICA-tapeover conductor
Core insulation with cross-linked polyethylene, compound type 2X11 to DIN VDE 0276 part 604
- Cores colour coding to DIN VDE 0293-308 and 0276 part 604
- Cores stranded in layers
- Overall core covering, halogen-free filling compound, pressed
- Concentric conductor of Cu-bare wires with helix of copper tape
- Outer jacket of thermoplastic halogen-free polyolefine, compound type HM4 to DIN VDE 0276 part 604, flame retardant
- Colour orange

Tests

- Flame test to VDE 0482 part 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2/ IEC 61034-1+2/ DIN EN 61034-1+2/ BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Insulation integrity under flame propagation to VDE 0472 part 814 IEC 60331
- Functionality of the complete cable system to DIN 4102 part 12 (90 minutes)

Properties

- Halogen-free; no evolution of corrosive and toxic gases
 - Flame retardant
 - Hardly flammable
 - Self-extinguished and fire resistant
 - No flame propagation, therefore security from fire
 - Low smoke density, no darkening of emergency exits without hindering the fire extinguishing works
 - Toxicological harmless
 - No self-ignition
 - Maintenance of functionality during the increased current load
 - **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331.
 - **Insulation integrity** under direct flame propagation for the test period of 180 minutes.
 - **E 90: Functionality** of electrical cable systems for minimum 90 minutes. Test method to DIN 4102 part 12. This fulfils the demands of technical guide lines for fire protection (supplement 1 to DIN VDE 0108 part 1).
- The **functionality** for 90 minutes assures the functional performance of water-pressure-rising stations for the supply to avoid smoke and heat in safety-stairs and inner rooms, ladder shafts and engine rooms for fire brigade lifts, emergency lifts for sickbeds in hospitals and the fire brigade lifts.

Note

- re = round solid core;
- rm = stranded core.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Everywhere, where in case of fire human life and material assets are to be protected and safety consciousness take a special significance, e.g. in industrial complexes, power stations, communal establishment, hotels, airports, underground railway networks, hospitals and outpatients clinic (DIN VDE 0107), department stores, data processing centres, theaters, cinemas, in multi-storey buildings, public gatherings, schools etc. (DIN VDE 0108), mining works, offshore plants, leading centres, traffic communication, emergency power supply and alarm systems. Suitable for fixed installation in dry and moist rooms, in, above, on and beneath plaster as well as in masonry walls and in concrete. These cables are suitable for outdoor applications and in underground by using in conduits or tubes. Additionally valid also DIN VDE 0298 part 1 and 2. For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.
= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52771	3 x 1,5 / 1,5 re	16,5	66,0	330,0	16
52772	3 x 2,5 / 2,5 re	17,5	104,0	400,0	14
52773	3 x 4 / 4 re	18,5	161,0	480,0	12
52774	3 x 6 / 6 re	20,0	240,0	600,0	10
52775	3 x 10 / 10 rm	22,0	408,0	840,0	8

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52776	3 x 16 / 16 rm	24,5	645,0	1130,0	6
52777	3 x 25 / 16 rm	28,0	902,0	1560,0	4
52778	3 x 35 / 16 rm	30,5	1190,0	1960,0	2
52779	3 x 50 / 25 rm	34,0	1723,0	2610,0	1
52780	3 x 70 / 35 rm	37,5	2410,0	3500,0	2/0

Continuation ▶

N2XCH-FE 180/E 90 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
52781	3 x 95 / 50 rm	43,0	3296,0	4700,0	3/0	52795	4 x 70 / 35 rm	41,5	3082,0	4360,0	2/0
52782	3 x 120 / 70 rm	48,0	4236,0	5880,0	4/0	52796	4 x 95 / 50 rm	47,5	4208,0	5900,0	3/0
52783	3 x 150 / 70 rm	52,0	4992,0	7300,0	300 kcmil	52797	4 x 120 / 70 rm	52,5	5388,0	7340,0	4/0
52784	3 x 185 / 95 rm	57,5	6383,0	8760,0	350 kcmil	52798	4 x 150 / 70 rm	57,5	6540,0	8840,0	300 kcmil
52785	3 x 240 / 120 rm	63,5	8242,0	11280,0	500 kcmil	52799	4 x 185 / 95 rm	63,5	8159,0	11020,0	350 kcmil
52786	4 x 1,5 / 1,5 re	17,5	81,0	390,0	16	52800	4 x 240 / 120 rm	70,0	10546,0	14140,0	500 kcmil
52787	4 x 2,5 / 2,5 re	19,0	128,0	470,0	14	52801	7 x 1,5 / 2,5 re	20,5	133,0	520,0	16
52788	4 x 4 / 4 re	20,0	200,0	570,0	12	52805	7 x 2,5 / 2,5 re	22,0	200,0	630,0	14
52789	4 x 6 / 6 re	21,5	297,0	720,0	10	52802	12 x 1,5 / 2,5 re	26,0	205,0	770,0	16
52790	4 x 10 / 10 rm	24,0	504,0	1010,0	8	52806	12 x 2,5 / 4 re	28,0	334,0	950,0	14
52791	4 x 16 / 16 rm	26,5	796,0	1370,0	6	52803	24 x 1,5 / 6 re	35,0	413,0	1380,0	16
52792	4 x 25 / 16 rm	30,5	1142,0	1940,0	4	52807	24 x 2,5 / 10 re	37,5	696,0	1750,0	14
52793	4 x 35 / 16 rm	33,0	1526,0	2420,0	2	52804	30 x 1,5 / 6 re	37,0	499,0	1630,0	16
52794	4 x 50 / 25 rm	37,5	2203,0	3240,0	1	52808	30 x 2,5 / 10 re	39,5	840,0	2080,0	14

Dimensions and specifications may be changed without prior notice. (RQ02)

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NHXH-FE 180/E 90 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Technical data

- Halogen-free security cable with improved characteristics in the case of fire to DIN VDE 0266
- **Insulation integrity**
180 minutes to DIN VDE 0472 part 814
- **Functionality**
90 minutes to DIN VDE 4102 part 12
- **Temperature range**
-30 °C to +70 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
approx. 12x cable \varnothing
- **Radiation resistance**
up to 200×10^6 cJ/kg (up to 200 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid or stranded, to DIN VDE 0295 cl. 1 or cl. 2, BS 6360 cl. 1 or 2, IEC 60228 cl. 1 or cl. 2, HD 383
- Double core insulation of mica tape and cross-linked polymer HI1, to DIN VDE 0207 part 23
- Colour coding of cores according to DIN VDE 0293-308
- Each single core covering with flame resistant glass-fibre tape
- Cores stranded in layer
- Core wrapping with glass-fibre tape as flame-protection
- Outer jacket orange, polyolefin compound HM4, to DIN VDE 0207 part 24 HM4

Tests

- Flame test to VDE 0482 part 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density according to VDE 0482 part 1034-1+2/ IEC 61034-1+2/ DIN EN 61034-1+2/ BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Insulation integrity under flame propagation to VDE 0472 part 814 Δ IEC 60331
- Functionality of the complete cable system to DIN 4102 part 12 (90 minutes)

Properties

- Halogen-free; no evolution of corrosive and toxic gases
- Flame retardant
- Hardly flammable
- Self-extinguished and fire resistant
- No flame propagation, therefore security from fire
- Low smoke density, no darkening of emergency exits without hindering the fire extinguishing works
- Toxicological harmless
- No self-ignition
- Maintenance of functionality during the increased current load
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331.
- **Insulation integrity** under direct flame propagation for the test period of 180 minutes.
- **E 90: Functionality** of electrical cable systems for minimum 90 minutes. Test method to DIN 4102 part 12. This fulfils the demands of technical guide lines for fire protection (supplement 1 to DIN VDE 0108 part 1).
The **functionality** for 90 minutes assures the functional performance of water-pressure-rising stations for the supply to avoid smoke and heat in safety-stairs and inner rooms, ladder shafts and engine rooms for fire brigade lifts, emergency lifts for sickbeds in hospitals and the fire brigade lifts.

Note

- re = round solid core;
- rm = stranded core.

Application

Everywhere, where in case of fire human life and material assets are to be protected and safety consciousness take a special significance, e.g. in industrial complexes, power stations, communal establishment, hotels, airports, underground railway networks, hospitals and outpatients clinic (DIN VDE 0107), department stores, data processing centres, theaters, cinemas, in multi-storey buildings, public gatherings, schools etc. (DIN VDE 0108), mining works, offshore plants, leading centres, traffic communication, emergency power supply and alarm systems. Suitable for fixed installation in dry and moist rooms, in, above, on and beneath plaster as well as in masonry walls and in concrete. These cables are suitable for outdoor applications and in underground by using in conduits or tubes. Additionally valid also DIN VDE 0298 part 1 and 2. For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53180	1 x 16 rm	11,0	154,0	255,0	6
53181	1 x 25 rm	12,5	240,0	375,0	4
53182	1 x 35 rm	13,5	336,0	475,0	2
53183	1 x 50 rm	15,0	480,0	625,0	1
53184	1 x 70 rm	16,5	672,0	855,0	2/0
53185	1 x 95 rm	18,0	912,0	1140,0	3/0
53186	1 x 120 rm	20,5	1152,0	1410,0	4/0
53187	1 x 150 rm	22,5	1440,0	1730,0	300 kcmil

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53188	1 x 185 rm	24,5	1776,0	2140,0	350 kcmil
53189	1 x 240 rm	27,0	2304,0	2700,0	500 kcmil
53190	1 x 300 rm	30,0	2880,0	3420,0	600 kcmil
53191	1 x 400 rm	33,5	3840,0	4310,0	750 kcmil
53000	3 x 1,5 re	14,0	43,0	280,0	16
53001	3 x 2,5 re	15,0	72,0	330,0	14
53002	3 x 4 re	16,0	115,0	400,0	12
53003	3 x 6 re	17,0	173,0	480,0	10

Continuation ►

NHXH-FE 180/E 90 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53004	3 x 10 re	19,0	288,0	650,0	8
53005	3 x 16 re	21,0	461,0	850,0	6
52990	3 x 25 rm	25,0	720,0	1300,0	4
52992	3 x 35 / 16 rm	28,0	1162,0	1850,0	2
52991	3 x 35 rm	28,0	1008,0	1700,0	2
52993	3 x 50 / 25 rm	32,0	1680,0	2500,0	1
52994	3 x 70 / 35 rm	36,0	2352,0	3350,0	2/0
52995	3 x 95 / 50 rm	42,0	3216,0	4500,0	3/0
52996	3 x 120 / 70 rm	45,0	4128,0	5600,0	4/0
52997	3 x 150 / 70 rm	49,0	4992,0	6700,0	300 kcmil
52998	3 x 185 / 95 rm	55,0	6240,0	8350,0	350 kcmil
52999	3 x 240 / 120 rm	63,0	8064,0	10000,0	500 kcmil
53006	4 x 1,5 re	15,0	58,0	325,0	16
53007	4 x 2,5 re	16,0	96,0	385,0	14
53008	4 x 4 re	17,0	154,0	470,0	12
53009	4 x 6 re	18,0	230,0	580,0	10
53010	4 x 10 re	20,0	384,0	790,0	8
53011	4 x 16 re	22,0	614,0	1100,0	6
53012	4 x 25 rm	27,0	960,0	1650,0	4
53013	4 x 35 rm	30,0	1344,0	2150,0	2
53014	4 x 50 rm	34,0	1920,0	2800,0	1
53030	4 x 70 rm	39,0	2688,0	3800,0	2/0
53031	4 x 95 rm	44,0	3648,0	5050,0	3/0

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53070	4 x 120 rm	47,0	4608,0	6150,0	4/0
53390	4 x 150 rm	51,2	5760,0	7662,0	4/0
53015	5 x 1,5 re	16,0	72,0	375,0	16
53016	5 x 2,5 re	17,0	120,0	445,0	14
53017	5 x 4 re	18,0	192,0	560,0	12
53018	5 x 6 re	20,0	288,0	690,0	10
53019	5 x 10 re	22,0	480,0	950,0	8
53020	5 x 16 rm	24,0	768,0	1300,0	6
53021	5 x 25 rm	29,0	1200,0	1980,0	4
53028	5 x 35 rm	33,0	1680,0	2350,0	2
53029	5 x 50 rm	38,0	2500,0	3100,0	1
53022	7 x 1,5 re	19,0	101,0	560,0	16
53027	7 x 2,5 re	21,0	168,0	650,0	14
53025	10 x 1,5 re	23,0	144,0	750,0	16
53026	10 x 2,5 re	25,0	240,0	910,0	14
53023	12 x 1,5 re	25,0	173,0	850,0	16
53024	12 x 2,5 re	26,0	288,0	1000,0	14

Dimensions and specifications may be changed without prior notice. (RQ02)

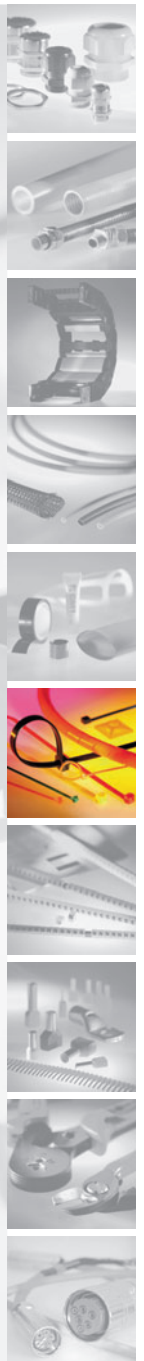
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NHXCH-FE 180/E 90 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Technical data

- Halogen-free security cable with improved characteristics in the case of fire to DIN VDE 0266
- **Insulation integrity**
180 minutes to DIN VDE 0472 part 814
- **Functionality**
90 minutes to DIN VDE 4102 part 12
- **Temperature range**
-30 °C to +70 °C
- Permissible **operating temperature** at conductor +90 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Test voltage** 4000 V
- **Minimum bending radius**
approx. 12x cable \varnothing
- **Radiation resistance**
up to 200×10^6 cJ/kg (up to 200 Mrad)
- **Caloric load values**
see Technical Informations

Cable structure

- Bare copper conductor, solid or stranded, to DIN VDE 0295 cl. 1 and cl. 2, BS 6360 cl. 1 or 2, IEC 60228 cl. 1 or cl. 2, HD 383
- Double core insulation of mica tape and cross-linked polymer HI1, to DIN VDE 0207 part 23
- Each single core covering with flame resistant glass-fibre tape
- Colour coding of cores according to DIN VDE 0293-308
- Cores stranded in layer
- Core wire screening with helix of copper tape
- Bare copper wire screening with helix of copper tape
- Outer jacket orange, polyolefin compound HM4, to DIN VDE 0207 part 24

Tests

- Flame test to VDE 0482 part 266-2, BS 4066 part 3/ DIN EN 50266-2/ IEC 60332-3 (equivalent DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases according to VDE 0482 part 267/ DIN EN 50267-2-2/ IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free according to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
Smoke density according to VDE 0482 part 1034-1+2/ IEC 61034-1+2/ DIN EN 61034-1+2/ BS 7622 part 1+2 (equivalent DIN VDE 0472 part 816)
- Insulation integrity under flame propagation to VDE 0472 part 814 \pm IEC 60331
- Functionality of the complete cable system to DIN 4102 part 12 (90 minutes)

Properties

- Halogen-free; no evolution of corrosive and toxic gases
- Flame retardant
- Hardly flammable
- Self-extinguished and fire resistant
- No flame propagation, therefore security from fire
- Low smoke density, no darkening of emergency exits without hindering the fire extinguishing works
- Toxicological harmless
- No self-ignition
- Maintenance of functionality during the increased current load
- **FE 180: Insulation integrity** for 180 minutes. Tests to DIN VDE 0472 part 814 IEC 60331.
- **Insulation integrity** under direct flame propagation for the test period of 180 minutes.
- **E 90: Functionality** of electrical cable systems for minimum 90 minutes. Test method to DIN 4102 part 12. This fulfils the demands of technical guide lines for fire protection (supplement 1 to DIN VDE 0108 part 1).
The **functionality** for 90 minutes assures the functional performance of water-pressure-rising stations for the supply to avoid smoke and heat in safety-stairs and inner rooms, ladder shafts and engine rooms for fire brigade lifts, emergency lifts for sickbeds in hospitals and the fire brigade lifts.

Note

- re = round solid core;
rm = stranded core.

Application

Everywhere, where in case of fire human life and material assets are to be protected and safety consciousness take a special significance, e.g. in industrial complexes, power stations, communal establishment, hotels, airports, underground railway networks, hospitals and outpatients clinic (DIN VDE 0107), department stores, data processing centres, theaters, cinemas, in multi-storey buildings, public gatherings, schools etc. (DIN VDE 0108), mining works, offshore plants, leading centres, traffic communication, emergency power supply and alarm systems. Suitable for fixed installation in dry and moist rooms, in, above, on and beneath plaster as well as in masonry walls and in concrete. For the installation in conduit all precautions must be taken that no accumulation of water can occur in the pipes.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53032	3 x 1,5 / 1,5 re	16,9	66,0	380,0	16
53033	3 x 2,5 / 2,5 re	18,0	104,0	430,0	14
53034	3 x 4 / 4 re	19,0	161,0	530,0	12
53035	3 x 6 / 6 re	20,1	240,0	640,0	10
53036	3 x 10 / 10 re	22,0	408,0	850,0	8
53037	3 x 16 / 16 re	24,0	643,0	1150,0	6
53038	3 x 25 / 16 rm	28,0	902,0	1700,0	4
53039	3 x 35 / 16 rm	30,0	1190,0	2150,0	2
53040	3 x 50 / 25 rm	34,0	1723,0	2800,0	1
53041	3 x 70 / 35 rm	38,0	2410,0	3800,0	2/0

Part no.	No. cores x cross-sec. mm ²	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53042	3 x 95 / 50 rm	44,0	3296,0	5100,0	3/0
53043	3 x 120 / 70 rm	47,0	4236,0	6250,0	4/0
53044	3 x 150 / 70 rm	51,0	4992,0	6900,0	300 kcmil
53045	3 x 185 / 95 rm	56,0	6383,0	8550,0	350 kcmil
53046	3 x 240 / 120 rm	65,0	8242,0	11150,0	500 kcmil
53047	4 x 1,5 / 1,5 re	18,0	81,0	435,0	16

Continuation ▶

NHXCH-FE 180/E 90 security cable, halogen-free, 0,6/1 kV, with improved fire characteristics



Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53048	4 x 2,5 / 2,5 re	18,9	128,0	500,0	14
53049	4 x 4 / 4 re	20,0	200,0	610,0	12
53050	4 x 6 / 6 re	21,0	297,0	740,0	10
53051	4 x 10 / 10 re	23,0	504,0	1050,0	8
53052	4 x 16 / 16 rm	25,0	796,0	1350,0	6
53053	4 x 25 / 16 rm	30,0	1142,0	1950,0	4
53054	4 x 35 / 16 rm	33,0	1526,0	2400,0	2
53055	4 x 50 / 25 rm	37,0	2203,0	3200,0	1
53056	4 x 70 / 35 rm	42,0	3082,0	4300,0	2/0
53057	4 x 95 / 50 rm	47,0	4208,0	5750,0	3/0
53058	4 x 120 / 70 rm	51,0	5388,0	7100,0	4/0
53059	4 x 150 / 70 rm	56,0	6540,0	8550,0	300 kcmil
53060	4 x 185 / 95 rm	68,0	8159,0	10700,0	350 kcmil
53061	4 x 240 / 120 rm	70,0	10546,0	13930,0	500 kcmil
53062	7 x 1,5 / 2,5 re	21,0	133,0	680,0	16
53066	7 x 2,5 / 2,5 re	21,0	200,0	680,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
53063	12 x 1,5 / 2,5 re	27,0	205,0	1050,0	16
53067	12 x 2,5 / 4 re	28,0	334,0	1050,0	14
53064	24 x 1,5 / 6 re	37,0	413,0	1900,0	16
53068	24 x 2,5 / 10 re	37,5	696,0	1900,0	14
53065	30 x 1,5 / 6 re	39,0	499,0	2200,0	16
53069	30 x 2,5 / 10 re	39,5	840,0	2200,0	14

Dimensions and specifications may be changed without prior notice. (RQ02)

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N2XSY 6/10kV, 12/20kV, 18/30kV
NA2XSY 6/10kV, 12/20kV, 18/30kV
N2XS2Y 6/10kV, 12/20kV, 18/30kV
NA2XS2Y 6/10kV, 12/20kV, 18/30kV
N2XS(F)2Y 6/10kV, 12/20kV, 18/30kV
NA2XS(F)2Y 6/10kV, 12/20kV, 18/30kV
N2XSEY 3 x ... 6/10kV

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Medium Voltage Power Cables

Medium Voltage Power Cables XLPE-insulated

6/10 kV, 12/20 kV, 18/30 kV

Since about 1970 the cross-linked polyethylene (XLPE)-insulated power cables have been used in Germany. The XLPE-insulation possesses very good electrical, mechanical and thermal characteristics in medium voltage networks. This type of insulation is very chemically resistant and also resistant to cold. Due to various advantages, the XLPE-insulated type has vastly displaced the traditional classical paper-insulated types in many sectors.

In order to prevent the penetration of moisture and also to extend the duration of life, the XLPE-insulated medium voltage cables are designed with longitudinally water-proof screen including an additional swell tape and a PE outer sheath.

The manufacture of this sheath is based on high density polyethylene (HDPE), in which an additive organic peroxide is mixed. Due to the heating and pressure the molecule chains are joined to each other, assuring the transition from thermoplastic to elastic condition.

In comparison to PVC and paper-insulated cables, the advantage of XLPE-insulated medium voltage power cables is that they possess a low dielectric factor, such as it is 100 times smaller than of PVC-insulated cables.

Moreover, a better dielectric constant value has an effect on the low mutual capacitance, the short-circuit to ground and the charging current of XLPE-insulated cables.

The good properties of XLPE-insulated cables remain constant through a wide temperature range.

Characteristics of XLPE

- permissible operating temperature
 - For permanent (normal) operation + 90°C
 - In short circuit +250°C
 - In overload operation and damage by sea up to +130°C
- Specific heat resistance 3,5 K · m/W
- Dielectric constant 2,4
- Specific resistance (20°C) min. 10^{16} Ohm · cm
- Loss factor (tan δ) (20°C) max. $0,5 \cdot 10^{-3}$
- Density 0,92 g/cm³
- Breaking strength min. 200%
- Tensile strength min. 12,5 N/mm²

Conductor

– Copper or aluminium, round, multiwire stranded and compact, according to VDE 0295 and HD 383.

Inner semi-conducting layer

– Semi-conducting compound, cross-linked, mini-mum wall-thickness 0,3 mm.

Insulation

- Cross-linked polyethylene (XLPE), compound type 2X11 according to DIN VDE 0207 part 22 and HD 620.1.
- Insulation nominal wall-thickness
 - for 6/10 kV = 3,4 mm
 - 12/20 kV = 5,5 mm
 - 18/30 kV = 8,0 mm

Outer semi-conducting layer

- Outer semi-conducting layer is extruded together with the inner semi-conducting layer and the insulation in one working process and are spliced with each other.
- Semi-conducting compound, cross-linked, wall-thickness 0,3 to 0,6 mm.

Concentricity of conductor

- The difference between the maximum and mini-mum value of 0,5 mm should not be exceeded.

Semi-conducting type

- Over the outer semi-conducting layer, a semi-conducting tape must be used.

Screen

- Screening of copper wires must have a minimum diameter of 0,5 mm and over that a copper tape applied helically with a minimum thickness of 0,1 mm.
- Copper cross-section according to DIN VDE 0273 and 0276 to the corresponded table 2.

Separator

- Over the screen as well as under outer jacket, a separating layer must be used (e. g. taping).

Outer jacket

- PE compound DMP2 according to HD 620.1 and 2YM3 to DIN VDE 0276 part 3, black or
- PVC compound DMV6 according to HD 620.1 and YM5 to DIN VDE 0207 part 5, red
- Wall-thickness = 2,5 mm, for 1x 500 mm² /30 kV = 2,6 mm

Q

Continuation ►

Medium Voltage Power Cables XLPE-insulated

6/10 kV, 12/20 kV, 18/30 kV

Laying of Cable

In order to avoid any damage, the XLPE-insulated medium voltage cables should carefully laid and installed. It must be ensured that the cables should not be pulled over the hard or sharp edges. The cable ends must be water-tight-sealed. After cutting the length both ends must be sealed immediately.

A laying depth of 60 to 80 cm is recommended. Single conductor cables are normally arranged in a trefoil touching or triangular shape. For laying in conduits, the influence of thermal insulation of air space between the cable and the inner wall of conduit should be specially considered. The inner diameter of the conduit should be at least 1,5 times that of the diameter of the cable.

Bending radius

During the laying of XLPE cables, the bending radius should not be below of the following values:

- Cable without metal sheath = 15 x cable \varnothing
- Cable with Alu-laminated sheath = 30 x cable \varnothing

Temperature range

During the installation, the temperature should not be below the following values:

- for XLPE-insulation + PVC jacket = -5°C
- for XLPE-insulation + PE jacket = -20°C

Max. permissible tensile strength

By pulling the conductors with a pulling head (not for armoured cables)

$P = \text{No. of cores} \times \text{conductor cross-section} \times \delta$
 $\delta = \text{permissible pulling tension N/mm}^2$
 – For Cu-conductor: 50 N/mm²
 – For Alu-conductor: 30 N/mm²

Current carrying capacity

according to VDE 0276 part 620, – 5C or HD 620 S1

Laying in earth (ground)

- Laying depth 0,7 – 0,8 m
- Earth temperature in the laying depth 20°C
- Specific heat resistance 1,0 K · m/W
- Load factor 0,7 (EVU-Load)

Laying in air

- Air temperature 30°C
- Load factor (permanent load) 1,0

Laying in conduits

Cables for conduit systems laying in earth, a reduction of the current carrying capacity with a factor of 0,85 is recommended.

Test voltages

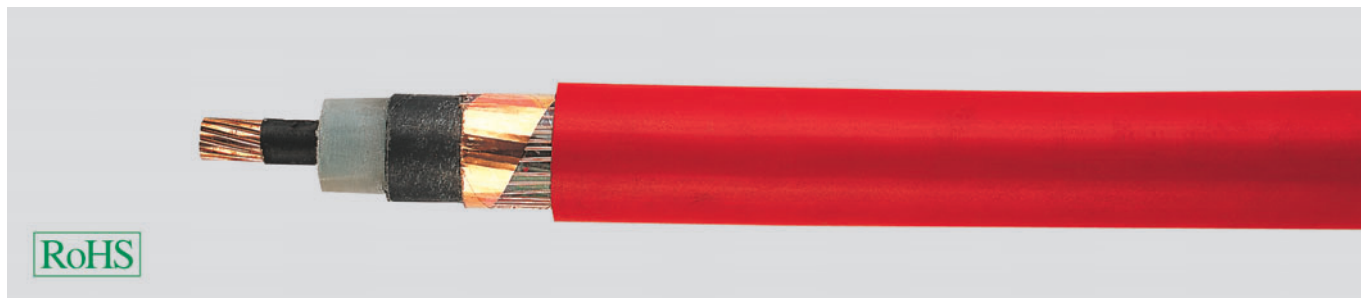
Kind of voltage test	Voltage test in kV		
	$U_0/U = 6/10$ kV	$U_0/U = 12/20$ kV	$U_0/U = 18/30$ kV
Voltage test a. c. in kV	15	30	45
Voltage test d. c. in kV	48	96	144
Voltage test a. c. (voltage test = 1000 h)	18	36	54

Voltage test to cable system

During the operation or after laying the medium voltage power cables, the dielectric can be tested with alternating or direct current. The test duration continues 30 minutes.

Kind of voltage test	$U_0/U = 6/10$ kV	$U_0/U = 12/20$ kV	$U_0/U = 18/30$ kV
Voltage test a. c. in kV	12	24	36
Voltage test d. c. in kV	34 up to 48	67 up to 96	76 up to 108

N2XSY 6/10kV, 12/20kV, 18/30kV XLPE-insulated, Cu-conductor, single core, screened, PVC-jacket



Technical data

- XLPE-insulated power cables to DIN VDE 0276 part 620, HD 620 S1 and IEC 60502
- **Temperature range** during installation up to -5 °C
- **Operating temperature** max. 90 °C
- **Short circuit temperature** 250 °C (short circuit duration up to 5 sec.)
- **Nominal voltages** U₀/U 6/10 kV, 12/20 kV, 18/30 kV
- **Operating voltages** for 6/10 kV = max. 12 kV
12/20 kV = max. 24 kV
18/30 kV = max. 36 kV
- **Test voltages** for 6/10 kV = 15 kV
12/20 kV = 30 kV
18/30 kV = 45 kV
- **Minimum bending radius** during installation max. 15x cable ø
- **Power ratings table** see Technical Informations

Cable structure

- Circular bare Cu-conductor of stranded wires to HD 383
- Inner semi-conducting coating
- Core insulation of cross-linked Polyethylene (XLPE), PE-compound DIX8 to HD 620.1
- Outer extrusion of semi-conducting coating spliced with the insulation
- Wrapping of conductive material
- Screen: Braiding of copper wires with one or two tape(s) applied helically
- Wrapping
- PVC outer jacket, compound DMV6 to HD 620.1
- Jacket colour red

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Installation notes**
To guarantee an optimum on operating reliability the extruded semi-conductive layer is spliced with the insulation for long duration. For this reason we recommend a peeling tool for installation.

Note

- Further dimensions available on request.

Application

Suitable for installation mostly for power supply stations, in indoors and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switch-boards and power stations. Due to the good laying characteristic, this can also be laid easily in difficult line guideways.

The inner conducting layer between the conductor and the XLPE insulation and the firmly bonded outer conducting layer on the XLPE insulation assures a construction free of partial discharges with high operational reliability.

Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Jacket thickness Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32400	1 x 35 rm / 16	12	6 / 10	3,4	2,5	23,0 - 28,0	518,0	905,0	2
32401	1 x 50 rm / 16	12	6 / 10	3,4	2,5	24,0 - 29,0	662,0	1080,0	1
32402	1 x 70 rm / 16	12	6 / 10	3,4	2,5	26,0 - 31,0	854,0	1310,0	2/0
32403	1 x 95 rm / 16	12	6 / 10	3,4	2,5	26,0 - 32,0	1094,0	1580,0	3/0
32404	1 x 120 rm / 16	12	6 / 10	3,4	2,5	28,0 - 34,0	1334,0	1860,0	4/0
32406	1 x 150 rm / 25	12	6 / 10	3,4	2,5	29,0 - 35,0	1723,0	2210,0	300 kcmil
32405	1 x 150 rm / 16	12	6 / 10	3,4	2,5	29,0 - 35,0	1622,0	2040,0	300 kcmil
32408	1 x 185 rm / 25	12	6 / 10	3,4	2,5	31,0 - 37,0	2059,0	2580,0	350 kcmil
32407	1 x 185 rm / 16	12	6 / 10	3,4	2,5	31,0 - 37,0	1958,0	2450,0	350 kcmil
32409	1 x 240 rm / 16	12	6 / 10	3,4	2,5	33,0 - 39,0	2486,0	3000,0	500 kcmil
32410	1 x 240 rm / 25	12	6 / 10	3,4	2,5	33,0 - 39,0	2587,0	3130,0	500 kcmil
32411	1 x 300 rm / 25	12	6 / 10	3,4	2,5	36,0 - 41,0	3163,0	3780,0	600 kcmil
32412	1 x 400 rm / 35	12	6 / 10	3,4	2,5	40,0 - 45,0	4234,0	4670,0	750 kcmil
32413	1 x 500 rm / 35	12	6 / 10	3,4	2,5	43,0 - 48,0	5194,0	5750,0	1000 kcmil
32414	1 x 35 rm / 16	24	12 / 20	5,5	2,5	27,0 - 32,0	518,0	1110,0	2
32415	1 x 50 rm / 16	24	12 / 20	5,5	2,5	28,0 - 33,0	662,0	1250,0	1
32416	1 x 70 rm / 16	24	12 / 20	5,5	2,5	30,0 - 35,0	854,0	1510,0	2/0
32417	1 x 95 rm / 16	24	12 / 20	5,5	2,5	31,0 - 36,0	1094,0	1780,0	3/0
32418	1 x 120 rm / 16	24	12 / 20	5,5	2,5	32,0 - 38,0	1334,0	2070,0	4/0
32419	1 x 150 rm / 16	24	12 / 20	5,5	2,5	33,0 - 39,0	1622,0	2310,0	300 kcmil
32420	1 x 150 rm / 25	24	12 / 20	5,5	2,5	33,0 - 39,0	1723,0	2420,0	300 kcmil
32422	1 x 185 rm / 25	24	12 / 20	5,5	2,5	35,0 - 41,0	2059,0	2810,0	350 kcmil
32421	1 x 185 rm / 16	24	12 / 20	5,5	2,5	35,0 - 41,0	1958,0	2650,0	350 kcmil
32424	1 x 240 rm / 25	24	12 / 20	5,5	2,5	38,0 - 44,0	2587,0	3360,0	500 kcmil
32423	1 x 240 rm / 16	24	12 / 20	5,5	2,5	38,0 - 44,0	2486,0	3260,0	500 kcmil
32425	1 x 300 rm / 25	24	12 / 20	5,5	2,5	40,0 - 46,0	3163,0	4020,0	600 kcmil
32426	1 x 400 rm / 35	24	12 / 20	5,5	2,5	43,0 - 49,0	4234,0	4930,0	750 kcmil
32427	1 x 500 rm / 35	24	12 / 20	5,5	2,5	46,0 - 52,0	5194,0	6050,0	1000 kcmil
32428	1 x 50 rm / 16	36	18 / 30	8	2,5	32,0 - 38,0	662,0	1480,0	1
32429	1 x 70 rm / 16	36	18 / 30	8	2,5	34,0 - 40,0	854,0	1730,0	2/0

Continuation ▶

N2XSY 6/10kV, 12/20kV, 18/30kV XLPE-insulated, Cu-conductor, single core, screened, PVC-jacket



Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Jacket thickness Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32430	1 x 95 rm / 16	36	18 / 30	8	2,5	35,0 - 41,0	1094,0	2060,0	3/0
32431	1 x 120 rm / 16	36	18 / 30	8	2,5	37,0 - 43,0	1334,0	2330,0	4/0
32432	1 x 150 rm / 25	36	18 / 30	8	2,5	38,0 - 44,0	1723,0	2720,0	300 kcmil
32433	1 x 185 rm / 25	36	18 / 30	8	2,5	40,0 - 46,0	2059,0	3100,0	350 kcmil
32434	1 x 240 rm / 25	36	18 / 30	8	2,5	42,0 - 48,0	2587,0	3730,0	500 kcmil
32435	1 x 300 rm / 25	36	18 / 30	8	2,5	45,0 - 51,0	3163,0	4000,0	600 kcmil
32436	1 x 400 rm / 35	36	18 / 30	8	2,5	48,0 - 54,0	4234,0	5330,0	750 kcmil
32437	1 x 500 rm / 35	36	18 / 30	8	2,5	51,0 - 57,0	5194,0	6480,0	1000 kcmil

Dimensions and specifications may be changed without prior notice. (RQ03)

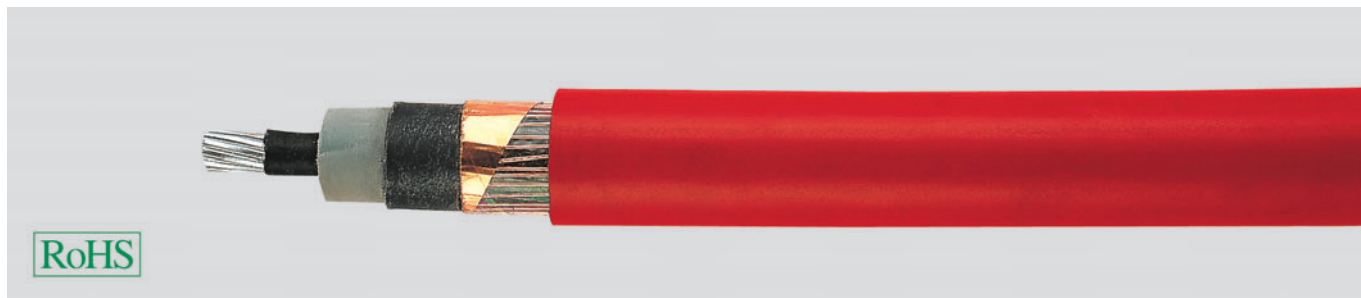
Core end sleeves and cable lugs

- Core end sleeves
- Solderless terminals
- Tubular cable lugs
- Compression joints



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NA2XS_Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, alu-conductor, single core, screened, PVC-jacket



Technical data

- XLPE-insulated power cables to DIN VDE 0276 part 620, HD 620 S1 and IEC 60502
- **Temperature range** during installation up to -5 °C
- **Operating temperature** max. 90 °C
- **Short circuit temperature** 250 °C (short circuit duration up to 5 sec.)
- **Nominal voltages** U₀/U 6/10 kV, 12/20 kV, 18/30 kV
- **Operating voltages** for 6/10 kV = max. 12 kV
12/20 kV = max. 24 kV
18/30 kV = max. 36 kV
- **Test voltages** for 6/10 kV = 15 kV
12/20 kV = 30 kV
18/30 kV = 45 kV
- **Minimum bending radius** during installation max. 15x cable ø
- **Power ratings** see Technical Informations

Cable structure

- Circular bare alu-conductor of stranded wires to HD 383
- Inner semi-conducting coating
- Core insulation of cross-linked Polyethylene (XLPE), PE-compound DIX8 to HD 620.1
- Outer extrusion of semi-conducting coating spliced with the insulation
- Wrapping of conductive material
- Screen: Braiding of copper wires with one or two tapes applied helically
- Wrapping
- PVC outer jacket, compound DMV6 to HD 620.1
- Jacket colour red

Properties

- self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Installation notes**
To guarantee an optimum on operating reliability the extruded semi-conductive layer is spliced with the insulation for long duration. For this reason we recommend a peeling tool for installation

Note

- Further dimensions available on request.

Application

Suitable for installation mostly for power supply stations, in indoors and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switch-boards and power stations. Due to the good laying characteristic, this can also be laid easily in difficult line guideways.

The inner conducting layer between the conductor and the XLPE insulation and the firmly bonded outer conducting layer on the XLPE insulation assures a construction free of partial discharges with high operational reliability.

Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Jacket thickness Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Alu weight kg / km	Weight approx. kg / km	AWG-No.
32440	1 x 50 rm / 16	12	6 / 10	3,4	2,5	24,0 - 29,0	182,0	145,0	780,0	1
32441	1 x 70 rm / 16	12	6 / 10	3,4	2,5	26,0 - 31,0	182,0	203,0	875,0	2/0
32442	1 x 95 rm / 16	12	6 / 10	3,4	2,5	26,0 - 32,0	182,0	276,0	990,0	3/0
32443	1 x 120 rm / 16	12	6 / 10	3,4	2,5	28,0 - 34,0	182,0	348,0	1110,0	4/0
32445	1 x 150 rm / 25	12	6 / 10	3,4	2,5	29,0 - 35,0	283,0	435,0	1310,0	300 kcmil
32444	1 x 150 rm / 16	12	6 / 10	3,4	2,5	29,0 - 35,0	182,0	435,0	1240,0	300 kcmil
32447	1 x 185 rm / 25	12	6 / 10	3,4	2,5	31,0 - 37,0	283,0	537,0	1460,0	350 kcmil
32446	1 x 185 rm / 16	12	6 / 10	3,4	2,5	31,0 - 37,0	182,0	537,0	1405,0	350 kcmil
32449	1 x 240 rm / 25	12	6 / 10	3,4	2,5	33,0 - 39,0	283,0	696,0	1660,0	500 kcmil
32448	1 x 240 rm / 16	12	6 / 10	3,4	2,5	33,0 - 39,0	182,0	696,0	1615,0	500 kcmil
32450	1 x 300 rm / 25	12	6 / 10	3,4	2,5	36,0 - 41,0	283,0	870,0	1910,0	600 kcmil
32451	1 x 400 rm / 35	12	6 / 10	3,4	2,5	40,0 - 45,0	394,0	1160,0	2315,0	750 kcmil
32452	1 x 500 rm / 35	12	6 / 10	3,4	2,5	43,0 - 48,0	394,0	1450,0	2750,0	1000 kcmil
32453	1 x 50 rm / 16	24	12 / 20	5,5	2,5	28,0 - 33,0	182,0	145,0	950,0	1
32454	1 x 70 rm / 16	24	12 / 20	5,5	2,5	30,0 - 35,0	182,0	203,0	1110,0	2/0
32455	1 x 95 rm / 16	24	12 / 20	5,5	2,5	31,0 - 36,0	182,0	276,0	1220,0	3/0
32456	1 x 120 rm / 16	24	12 / 20	5,5	2,5	32,0 - 38,0	182,0	348,0	1310,0	4/0
32457	1 x 150 rm / 16	24	12 / 20	5,5	2,5	33,0 - 39,0	182,0	435,0	1460,0	300 kcmil
32458	1 x 150 rm / 25	24	12 / 20	5,5	2,5	33,0 - 39,0	283,0	435,0	1520,0	300 kcmil
32459	1 x 185 rm / 16	24	12 / 20	5,5	2,5	35,0 - 41,0	182,0	537,0	1660,0	350 kcmil
32460	1 x 185 rm / 25	24	12 / 20	5,5	2,5	35,0 - 41,0	283,0	537,0	1720,0	350 kcmil
32462	1 x 240 rm / 25	24	12 / 20	5,5	2,5	38,0 - 44,0	283,0	696,0	1910,0	500 kcmil
32461	1 x 240 rm / 16	24	12 / 20	5,5	2,5	38,0 - 44,0	182,0	696,0	1860,0	500 kcmil
32463	1 x 300 rm / 25	24	12 / 20	5,5	2,5	40,0 - 46,0	283,0	870,0	2220,0	600 kcmil
32464	1 x 400 rm / 35	24	12 / 20	5,5	2,5	43,0 - 49,0	394,0	1160,0	2620,0	750 kcmil
32465	1 x 500 rm / 35	24	12 / 20	5,5	2,5	46,0 - 52,0	394,0	1450,0	3030,0	1000 kcmil
32466	1 x 50 rm / 16	36	18 / 30	8	2,5	32,0 - 38,0	182,0	145,0	1260,0	1
32467	1 x 70 rm / 16	36	18 / 30	8	2,5	34,0 - 40,0	182,0	203,0	1360,0	2/0

Continuation ▶

NA2XS_Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, alu-conductor, single core, screened, PVC-jacket



Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Jacket thickness Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Alu weight kg / km	Weight approx. kg / km	AWG-No.
32468	1 x 95 rm / 16	36	18 / 30	8	2,5	35,0 - 41,0	182,0	276,0	1510,0	3/0
32469	1 x 120 rm / 16	36	18 / 30	8	2,5	37,0 - 43,0	182,0	348,0	1610,0	4/0
32470	1 x 150 rm / 16	36	18 / 30	8	2,5	38,0 - 44,0	182,0	435,0	1760,0	300 kcmil
32471	1 x 150 rm / 25	36	18 / 30	8	2,5	38,0 - 44,0	283,0	435,0	1810,0	300 kcmil
32472	1 x 185 rm / 16	36	18 / 30	8	2,5	40,0 - 46,0	182,0	537,0	1960,0	350 kcmil
32473	1 x 185 rm / 25	36	18 / 30	8	2,5	40,0 - 46,0	283,0	537,0	2020,0	350 kcmil
32475	1 x 240 rm / 25	36	18 / 30	8	2,5	42,0 - 48,0	283,0	696,0	2260,0	500 kcmil
32474	1 x 240 rm / 16	36	18 / 30	8	2,5	42,0 - 48,0	182,0	696,0	2210,0	500 kcmil
32476	1 x 300 rm / 25	36	18 / 30	8	2,5	45,0 - 51,0	283,0	870,0	2560,0	600 kcmil
32477	1 x 400 rm / 35	36	18 / 30	8	2,5	48,0 - 54,0	394,0	1160,0	2960,0	750 kcmil
32478	1 x 500 rm / 35	36	18 / 30	8	2,6	51,0 - 57,0	394,0	1450,0	3460,0	1000 kcmil

Dimensions and specifications may be changed without prior notice. (RQ03)

Tools

- Cable shears**
- Box spanners**
- Strippers**
- Crimping tools**
- Pliers**
- Skinning knife**



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N2XS2Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated,

Cu-conductor, single core, screened, PE-jacket



Technical data

- XLPE-insulated power cables to IEC 60502, DIN VDE 0276 part 620, HD 620 S1
- **Temperature range**
during installation up to -20 °C
- **Operating temperature**
max. 90 °C
- **Short circuit temperature**
250 °C (short circuit duration up to 5 sec.)
- **Nominal voltages**
U₀/U 6/10 kV, 12/20 kV, 18/30 kV
- **Operating voltages** for
6/10 kV = max. 12 kV
12/20 kV = max. 24 kV
18/30 kV = max. 36 kV
- **Test voltages** for
6/10 kV = 15 kV
12/20 kV = 30 kV
18/30 kV = 45 kV
- **Minimum bending radius**
during installation max. 15x cable ø
- **Power ratings**
table see Technical Informations

Cable structure

- Circular bare cu-conductor of stranded wires to HD 383
- Inner semi-conducting coating
- Core insulation of cross-linked Polyethylene (XLPE), PE-compound DIX8 to HD 620.1
- Outer extrusion of semi-conducting coating spliced with the insulation
- Wrapping of conductive material
- Screen: Braiding of copper wires with one or two tapes applied helically
- Wrapping
- PE-outer jacket black, compound DMP2 to HD 620.1
- Jacket colour black

Properties

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Installation notes**
To guarantee an optimum on operating reliability the extruded semi-conductive layer is spliced with the insulation for long duration. For this reason we recommend a peeling tool for installation.

Note

- Further dimensions available on request.

Application

Suitable for indoor installation and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switch-boards and power stations. The PE-outer jacket is resistant to high mechanical stress for laying the cables. This PE-jacket is not flame-resistant (does not conform the test method B, as per VDE 0472 part 804).

The inner conducting layer between the conductor and the XLPE insulation and the firmly bonded outer conducting layer on the XLPE insulation assures a construction free of partial discharges with high operational reliability.

Part no.	No.cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Jacket thickness Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32480	1 x 35 rm / 16	12	6 / 10	3,4	2,5	23,0 - 28,0	518,0	910,0	2
32481	1 x 50 rm / 16	12	6 / 10	3,4	2,5	24,0 - 29,0	662,0	990,0	1
32482	1 x 70 rm / 16	12	6 / 10	3,4	2,5	26,0 - 31,0	854,0	1205,0	2/0
32483	1 x 95 rm / 16	12	6 / 10	3,4	2,5	26,0 - 32,0	1098,0	1520,0	3/0
32484	1 x 120 rm / 16	12	6 / 10	3,4	2,5	28,0 - 34,0	1334,0	1760,0	4/0
32485	1 x 150 rm / 16	12	6 / 10	3,4	2,5	29,0 - 35,0	1622,0	2020,0	300 kcmil
32486	1 x 150 rm / 25	12	6 / 10	3,4	2,5	29,0 - 35,0	1725,0	2130,0	300 kcmil
32488	1 x 185 rm / 25	12	6 / 10	3,4	2,5	31,0 - 37,0	2059,0	2470,0	350 kcmil
32487	1 x 185 rm / 16	12	6 / 10	3,4	2,5	31,0 - 37,0	1958,0	2360,0	350 kcmil
32489	1 x 240 rm / 16	12	6 / 10	3,4	2,5	33,0 - 39,0	2486,0	2960,0	500 kcmil
32490	1 x 240 rm / 25	12	6 / 10	3,4	2,5	33,0 - 39,0	2587,0	3020,0	500 kcmil
32491	1 x 300 rm / 25	12	6 / 10	3,4	2,5	36,0 - 41,0	3163,0	3630,0	600 kcmil
32492	1 x 400 rm / 35	12	6 / 10	3,4	2,5	40,0 - 45,0	4234,0	4560,0	750 kcmil
32493	1 x 500 rm / 35	12	6 / 10	3,4	2,5	43,0 - 48,0	5194,0	5580,0	1000 kcmil
32494	1 x 35 rm / 16	24	12 / 20	5,5	2,5	27,0 - 32,0	518,0	960,0	2
32495	1 x 50 rm / 16	24	12 / 20	5,5	2,5	28,0 - 33,0	662,0	1160,0	1
32496	1 x 70 rm / 16	24	12 / 20	5,5	2,5	30,0 - 35,0	854,0	1410,0	2/0
32497	1 x 95 rm / 16	24	12 / 20	5,5	2,5	31,0 - 36,0	1094,0	1670,0	3/0
32498	1 x 120 rm / 16	24	12 / 20	5,5	2,5	33,0 - 38,0	1334,0	1960,0	4/0
32500	1 x 150 rm / 25	24	12 / 20	5,5	2,5	34,0 - 39,0	1723,0	2310,0	300 kcmil
32499	1 x 150 rm / 16	24	12 / 20	5,5	2,5	34,0 - 39,0	1622,0	2220,0	300 kcmil
32502	1 x 185 rm / 25	24	12 / 20	5,5	2,5	36,0 - 41,0	2059,0	2670,0	350 kcmil
32501	1 x 185 rm / 16	24	12 / 20	5,5	2,5	36,0 - 41,0	1958,0	2620,0	350 kcmil
32503	1 x 240 rm / 16	24	12 / 20	5,5	2,5	39,0 - 44,0	2486,0	3160,0	500 kcmil
32504	1 x 240 rm / 25	24	12 / 20	5,5	2,5	39,0 - 44,0	2587,0	3270,0	500 kcmil
32505	1 x 300 rm / 25	24	12 / 20	5,5	2,5	41,0 - 46,0	3163,0	3880,0	600 kcmil
32506	1 x 400 rm / 35	24	12 / 20	5,5	2,5	44,0 - 49,0	4234,0	4820,0	750 kcmil
32507	1 x 500 rm / 35	24	12 / 20	5,5	2,5	47,0 - 52,0	5194,0	5860,0	1000 kcmil
32508	1 x 50 rm / 16	36	18 / 30	8	2,5	32,0 - 38,0	662,0	1410,0	1
32509	1 x 70 rm / 16	36	18 / 30	8	2,5	34,0 - 40,0	854,0	1660,0	2/0

Continuation ▶

N2XS2Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, Cu-conductor, single core, screened, PE-jacket



Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Jacket thickness Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32510	1 x 95 rm / 16	36	18 / 30	8	2,5	35,0 - 41,0	1094,0	1970,0	3/0
32511	1 x 120 rm / 16	36	18 / 30	8	2,5	37,0 - 43,0	1334,0	2220,0	4/0
32512	1 x 150 rm / 25	36	18 / 30	8	2,5	38,0 - 44,0	1723,0	2650,0	300 kcmil
32513	1 x 185 rm / 25	36	18 / 30	8	2,5	40,0 - 46,0	2059,0	2980,0	350 kcmil
32514	1 x 240 rm / 25	36	18 / 30	8	2,5	42,0 - 48,0	2587,0	3570,0	500 kcmil
32515	1 x 300 rm / 25	36	18 / 30	8	2,5	45,0 - 51,0	3163,0	4220,0	600 kcmil
32516	1 x 400 rm / 35	36	18 / 30	8	2,5	48,0 - 54,0	4234,0	5170,0	750 kcmil
32517	1 x 500 rm / 35	36	18 / 30	8	2,5	51,0 - 57,0	5194,0	6260,0	1000 kcmil

Dimensions and specifications may be changed without prior notice. (RQ03)

Signal and power circular connectors

Series A, B, C, D, F and S

Tools

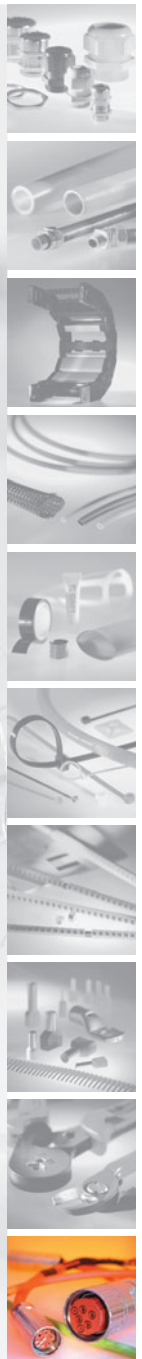
Accessories

Online configurator

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NA2XS2Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, Cu-conductor, single core, screened, PE-jacket



Technical data

- XLPE-insulated power cables to DIN VDE 0276 part 620, HD 620 S1 and IEC 60502
- **Temperature range**
during installation up to -20 °C
- **Operating temperature**
max. 90 °C
- **Short circuit temperature**
250 °C (short circuit duration up to 5 sec.)
- **Nominal voltages**
U₀/U 6/10 kV, 12/20 kV, 18/30 kV
- **Operating voltages** for
6/10 kV = max. 12 kV
12/20 kV = max. 24 kV
18/30 kV = max. 36 kV
- **Test voltages** for
6/10 kV = 15 kV
12/20 kV = 30 kV
18/30 kV = 45 kV
- **Minimum bending radius**
during installation max. 15x cable ø
- **Power ratings**
table see Technical Informations

Cable structure

- Circular bare alu-conductor of stranded wires to HD 383
- Inner semi-conducting coating
- Core insulation of cross-linked Polyethylene (XLPE), PE-compound DIX8 to HD 620.1
- Outer extrusion of semi-conducting coating spliced with the insulation
- Wrapping of conductive material
- Screen: Braiding of copper wires with one or two tapes applied helically
- Wrapping
- PE-outer jacket black, compound DMP2 to HD 620.1
- Jacket colour black

Properties

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Installation notes**
To guarantee an optimum on operating reliability the extruded semi-conductive layer is spliced with the insulation for long duration. For this reason we recommend a peeling tool for installation.

Note

- Further dimensions available on request.

Application

Suitable for indoor installation and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switch-boards and power stations. The PE-outer jacket is resistant to high mechanical stress for laying the cables. This PE-jacket is not flame-resistant (does not conform the test method B, as per VDE 0472 part 804).

The inner conducting layer between the conductor and the XLPE insulation and the firmly bonded outer conducting layer on the XLPE insulation assures a construction free of partial discharges with high operational reliability.

Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Jacket thickness Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Alu weight kg / km	Weight approx. kg / km	AWG-No.
32520	1 x 50 rm / 16	12	6 / 10	3,4	2,5	24,0 - 29,0	182,0	145,0	710,0	1
32521	1 x 70 rm / 16	12	6 / 10	3,4	2,5	26,0 - 31,0	182,0	203,0	790,0	2/0
32522	1 x 95 rm / 16	12	6 / 10	3,4	2,5	26,0 - 32,0	182,0	276,0	920,0	3/0
32523	1 x 120 rm / 16	12	6 / 10	3,4	2,5	28,0 - 34,0	182,0	348,0	990,0	4/0
32524	1 x 150 rm / 16	12	6 / 10	3,4	2,5	29,0 - 35,0	182,0	435,0	1110,0	300 kcmil
32525	1 x 150 rm / 25	12	6 / 10	3,4	2,5	29,0 - 35,0	283,0	435,0	1220,0	300 kcmil
32527	1 x 185 rm / 25	12	6 / 10	3,4	2,5	33,0 - 39,0	283,0	537,0	1370,0	350 kcmil
32526	1 x 185 rm / 16	12	6 / 10	3,4	2,5	31,0 - 37,0	182,0	537,0	1260,0	350 kcmil
32528	1 x 240 rm / 16	12	6 / 10	3,4	2,5	33,0 - 39,0	182,0	696,0	1480,0	500 kcmil
32529	1 x 240 rm / 25	12	6 / 10	3,4	2,5	33,0 - 39,0	283,0	696,0	1530,0	500 kcmil
32530	1 x 300 rm / 25	12	6 / 10	3,4	2,5	36,0 - 41,0	283,0	870,0	1820,0	600 kcmil
32531	1 x 400 rm / 35	12	6 / 10	3,4	2,5	40,0 - 45,0	394,0	1160,0	2220,0	750 kcmil
32532	1 x 500 rm / 35	12	6 / 10	3,4	2,5	43,0 - 48,0	394,0	1450,0	2570,0	1000 kcmil
32533	1 x 50 rm / 16	24	12 / 20	5,5	2,5	28,0 - 33,0	182,0	145,0	890,0	1
32534	1 x 70 rm / 16	24	12 / 20	5,5	2,5	30,0 - 35,0	182,0	203,0	970,0	2/0
32535	1 x 95 rm / 16	24	12 / 20	5,5	2,5	31,0 - 36,0	182,0	276,0	1120,0	3/0
32536	1 x 120 rm / 16	24	12 / 20	5,5	2,5	32,0 - 38,0	182,0	348,0	1210,0	4/0
32538	1 x 150 rm / 25	24	12 / 20	5,5	2,5	33,0 - 39,0	283,0	435,0	1420,0	300 kcmil
32537	1 x 150 rm / 16	24	12 / 20	5,5	2,5	33,0 - 39,0	182,0	435,0	1370,0	300 kcmil
32540	1 x 185 rm / 25	24	12 / 20	5,5	2,5	35,0 - 41,0	283,0	537,0	1570,0	350 kcmil
32539	1 x 185 rm / 16	24	12 / 20	5,5	2,5	35,0 - 41,0	182,0	537,0	1530,0	350 kcmil
32542	1 x 240 rm / 25	24	12 / 20	5,5	2,5	38,0 - 44,0	283,0	696,0	1830,0	500 kcmil
32541	1 x 240 rm / 16	24	12 / 20	5,5	2,5	38,0 - 44,0	182,0	696,0	1720,0	500 kcmil
32543	1 x 300 rm / 25	24	12 / 20	5,5	2,5	40,0 - 46,0	283,0	870,0	2070,0	600 kcmil
32544	1 x 400 rm / 35	24	12 / 20	5,5	2,5	43,0 - 49,0	394,0	1160,0	2460,0	750 kcmil
32545	1 x 500 rm / 35	24	12 / 20	5,5	2,5	46,0 - 52,0	394,0	1450,0	2890,0	1000 kcmil
32546	1 x 50 rm / 16	36	18 / 30	8	2,5	32,0 - 38,0	182,0	145,0	1120,0	1
32547	1 x 70 rm / 16	36	18 / 30	8	2,5	34,0 - 40,0	182,0	203,0	1270,0	2/0

Continuation ▶

NA2XS2Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, Cu-conductor, single core, screened, PE-jacket



Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Jacket thickness Nominal value mm	Outer Ø min. - max. mm	Cop. weight kg / km	Alu weight kg / km	Weight approx. kg / km	AWG-No.
32548	1 x 95 rm / 16	36	18 / 30	8	2,5	35,0 - 41,0	182,0	276,0	1380,0	3/0
32549	1 x 120 rm / 16	36	18 / 30	8	2,5	37,0 - 43,0	182,0	348,0	1530,0	4/0
32550	1 x 150 rm / 25	36	18 / 30	8	2,5	38,0 - 44,0	283,0	435,0	1720,0	300 kcmil
32551	1 x 185 rm / 25	36	18 / 30	8	2,5	40,0 - 46,0	283,0	537,0	1860,0	350 kcmil
32552	1 x 240 rm / 25	36	18 / 30	8	2,5	42,0 - 48,0	283,0	696,0	2110,0	500 kcmil
32553	1 x 300 rm / 25	36	18 / 30	8	2,5	45,0 - 51,0	283,0	870,0	2370,0	600 kcmil
32554	1 x 400 rm / 35	36	18 / 30	8	2,5	48,0 - 54,0	394,0	1160,0	2820,0	750 kcmil
32555	1 x 500 rm / 35	36	18 / 30	8	2,5	51,0 - 57,0	394,0	1450,0	3280,0	1000 kcmil

Dimensions and specifications may be changed without prior notice. (RQ03)

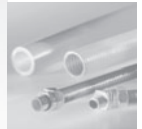
Cable Glands

Cable glands for standard applications

- Plastic Glands
- Cable Glands of Brass
- Accessories

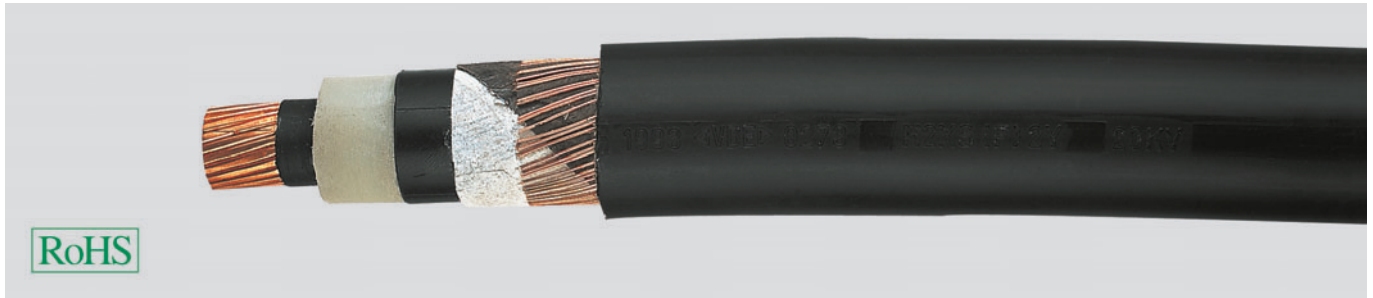
Cable glands for special application conditions

- for electromagnetic compatibility EMC
- for rugged applications and special chemical resistance
- for high temperature use
- for explosive areas
- for special mounting conditions
- for special pressure conditions



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N2XS(F)2Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, Cu-conductor, single core, longitudinally water-tight, screened, PE-jacket



Technical data

- XLPE-insulated power cables to DIN VDE 0276 part 620, HD 620 S1 and IEC 60502
- **Temperature range**
during installation up to -20 °C
- **Operating temperature**
max. 90 °C
- **Short circuit temperature**
250 °C (short circuit duration up to 5 sec.)
- **Nominal voltages**
U₀/U 6/10 kV, 12/20 kV, 18/30 kV
- **Operating voltages for**
6/10 kV = max. 12 kV
12/20 kV = max. 24 kV
18/30 kV = max. 36 kV
- **Test voltages for**
6/10 kV = 15 kV
12/20 kV = 30 kV
18/30 kV = 45 kV
- **Minimum bending radius**
during installation max. 15x cable ø
- **Power ratings**
table see Technical Informations

Cable structure

- Circular bare Cu-conductor of stranded wires to DIN VDE 0295 cl. 2 bzw. IEC 60228 cl. 2
- Inner semi-conducting coating
- Core insulation of cross-linked Polyethylene (XLPE), PE-compound DIX8 to HD 620.1
- Outer extrusion of semi-conducting coating spliced with the XLPE-insulation
- Longitudinally water-tight, conductive wrapping
- Screen: Braiding of copper wires with one or two tapes applied helically
- Longitudinally water-tight wrapping
- PE-outer jacket, compound DMP2 to HD 620.1
- Jacket colour black

Properties

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Installation notes**
To guarantee an optimum on operating reliability the extruded semi-conductive layer is spliced with the insulation for long duration. For this reason we recommend a peeling tool for installation

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- For longitudinally and crosswise water-tight cable type N2XS(FL)2Y with PE-copolymere coated aluminium.
- Further types and dimensions on request.

Application

Suitable for indoor installation and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switch-boards and power stations. The PE-outer jacket is resistant to high mechanical stress for laying the cables. This PE-jacket is not flame-resistant (does not conform the test method B, as per VDE 0472 part 804).

The inner conducting layer between the conductor and the XLPE insulation and the firmly bonded outer conducting layer on the XLPE insulation assures a construction free of partial discharges with high operational reliability.

Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Screen cross-sec. mm ²	Jacket thickness Nominal value mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32560	1 x 35 rm / 16	12	6 / 10	3,4	16	2,5	26,0	518,0	1050,0	2
32561	1 x 50 rm / 16	12	6 / 10	3,4	16	2,5	28,0	662,0	1150,0	1
32562	1 x 70 rm / 16	12	6 / 10	3,4	16	2,5	30,0	854,0	1460,0	2/0
32563	1 x 95 rm / 16	12	6 / 10	3,4	16	2,5	31,0	1094,0	1700,0	3/0
32564	1 x 120 rm / 16	12	6 / 10	3,4	16	2,5	32,0	1334,0	2030,0	4/0
32565	1 x 150 rm / 25	12	6 / 10	3,4	25	2,5	34,0	1723,0	2350,0	300 kcmil
32566	1 x 185 rm / 25	12	6 / 10	3,4	25	2,5	36,0	2059,0	2700,0	350 kcmil
32567	1 x 240 rm / 25	12	6 / 10	3,4	25	2,5	38,0	2587,0	3300,0	500 kcmil
32568	1 x 300 rm / 25	12	6 / 10	3,4	25	2,5	40,0	3163,0	3900,0	600 kcmil
32569	1 x 400 rm / 35	12	6 / 10	3,4	35	2,5	44,0	4234,0	4850,0	750 kcmil
32570	1 x 500 rm / 35	12	6 / 10	3,4	35	2,5	47,0	5194,0	6000,0	1000 kcmil
32571	1 x 35 rm / 16	24	12 / 20	5,5	16	2,5	31,0	518,0	1210,0	2
32572	1 x 50 rm / 16	24	12 / 20	5,5	16	2,5	33,0	662,0	1400,0	1
32573	1 x 70 rm / 16	24	12 / 20	5,5	16	2,5	34,0	854,0	1550,0	2/0
32574	1 x 95 rm / 16	24	12 / 20	5,5	16	2,5	36,0	1094,0	1800,0	3/0
32575	1 x 120 rm / 16	24	12 / 20	5,5	16	2,5	37,0	1334,0	2150,0	4/0
32576	1 x 150 rm / 25	24	12 / 20	5,5	25	2,5	39,0	1723,0	2400,0	300 kcmil
32577	1 x 185 rm / 25	24	12 / 20	5,5	25	2,5	41,0	2059,0	2850,0	350 kcmil
32578	1 x 240 rm / 25	24	12 / 20	5,5	25	2,5	43,0	2587,0	3250,0	500 kcmil
32579	1 x 300 rm / 25	24	12 / 20	5,5	25	2,5	45,0	3163,0	3850,0	600 kcmil
32580	1 x 400 rm / 35	24	12 / 20	5,5	35	2,5	48,0	4234,0	4900,0	750 kcmil
32581	1 x 500 rm / 35	24	12 / 20	5,5	35	2,5	52,0	5194,0	6100,0	1000 kcmil
32582	1 x 50 rm / 16	36	18 / 30	8	16	2,5	37,0	662,0	1700,0	1
32583	1 x 70 rm / 16	36	18 / 30	8	16	2,5	38,0	854,0	1950,0	2/0

Continuation ▶

N2XS(F)2Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, Cu-conductor, single core, longitudinally water-tight, screened, PE-jacket



Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Screen cross-sec. mm ²	Jacket thickness Nominal value mm	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
32584	1 x 95 rm / 16	36	18 / 30	8	16	2,5	40,0	1094,0	2300,0	3/0
32585	1 x 120 rm / 16	36	18 / 30	8	16	2,5	42,0	1334,0	2600,0	4/0
32586	1 x 150 rm / 25	36	18 / 30	8	25	2,5	43,0	1723,0	3000,0	300 kcmil
32587	1 x 185 rm / 25	36	18 / 30	8	25	2,5	45,0	2059,0	3350,0	350 kcmil
32588	1 x 240 rm / 25	36	18 / 30	8	25	2,5	47,0	2587,0	4100,0	500 kcmil
32589	1 x 300 rm / 25	36	18 / 30	8	25	2,5	50,0	3163,0	4800,0	600 kcmil
32590	1 x 400 rm / 35	36	18 / 30	8	35	2,5	53,0	4234,0	5750,0	750 kcmil
32591	1 x 500 rm / 35	36	18 / 30	8	35	2,5	56,0	5194,0	6700,0	1000 kcmil

Dimensions and specifications may be changed without prior notice. (RQ03)

Conduits

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- scissile corrugated tubes
- conduit glands

High flexible conduits

- plastic conduits with spiral spring
- metal conduits
- conduits glands

Conduit for heavy mechanical duty

- metal conduits with plastic sheat
- plastic conduits
- conduits glands for metal conduits



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NA2XS(F)2Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, alu-conductor, single core, longitudinally water-tight, screened, PE-jacket



Technical data

- XLPE-insulated power cables to DIN VDE 0276 part 620, HD 620 S1 and IEC 60502
- **Temperature range**
during installation up to -20°C
- **Operating temperature**
max. 90°C
- **Short circuit temperature**
250°C (short circuit duration up to 5 sec.)
- **Nominal voltages**
U₀/U 6/10 kV, 12/20 kV, 18/30 kV
- **Operating voltages for**
6/10 kV = max. 12 kV
12/20 kV = max. 24 kV
18/30 kV = max. 36 kV
- **Test voltages for**
6/10 kV = 15 kV
12/20 kV = 30 kV
18/30 kV = 45 kV
- **Minimum bending radius**
during installation max. 15x cable Ø
- **Power ratings**
table see Technical Informations

Cable structure

- Circular bare alu-conductor of stranded wires to DIN VDE 0295 cl. 2 and IEC 60228 cl. 2
- Inner semi-conducting coating
- Core insulation of cross-linked Polyethylene (XLPE), PE-compound DIX8 to HD 620.1
- Outer extrusion of semi-conducting coating spliced with the XLPE-insulation
- Longitudinally water-tight, conductive wrapping
- Screen: Braiding of copper wires with one or two tapes applied helically
- Longitudinally water-tight wrapping
- PE-outer jacket, compound DMP2 to HD 620.1
- Jacket colour black
- Jacket thickness voltage 2,5 mm

Properties

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Installation notes**
To guarantee an optimum on operating reliability the extruded semi-conductive layer is spliced with the insulation for long duration. For this reason we recommend a peeling tool for installation.

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- For longitudinally and crosswise water-tight cable type NA2XS(F)2Y with PE-copolymere coated aluminium.
- Further types and dimensions on request.

Application

Suitable for indoor installation and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switch-boards and power stations. The PE-outer jacket is resistant to high mechanical stress for laying the cables. This PE-jacket is not flame-resistant (does not conform the test method B, as per VDE 0472 part 804).

The inner conducting layer between the conductor and the XLPE insulation and the firmly bonded outer conducting layer on the XLPE insulation assures a construction free of partial discharges with high operational reliability.

Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Screen cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Alu weight kg / km	Weight approx. kg / km	AWG-No.
32600	1 x 35 rm / 16	12	6 / 10	3,4	16	26,0	182,0	102,0	780,0	2
32601	1 x 50 rm / 16	12	6 / 10	3,4	16	28,0	182,0	145,0	850,0	1
32602	1 x 70 rm / 16	12	6 / 10	3,4	16	30,0	182,0	203,0	980,0	2/0
32603	1 x 95 rm / 16	12	6 / 10	3,4	16	31,0	182,0	276,0	1080,0	3/0
32604	1 x 120 rm / 16	12	6 / 10	3,4	16	32,0	182,0	348,0	1150,0	4/0
32605	1 x 150 rm / 25	12	6 / 10	3,4	25	34,0	283,0	435,0	1280,0	300 kcmil
32606	1 x 185 rm / 25	12	6 / 10	3,4	25	36,0	283,0	537,0	1420,0	350 kcmil
32607	1 x 240 rm / 25	12	6 / 10	3,4	25	38,0	283,0	696,0	1630,0	500 kcmil
32608	1 x 300 rm / 25	12	6 / 10	3,4	25	40,0	283,0	870,0	1950,0	600 kcmil
32609	1 x 400 rm / 35	12	6 / 10	3,4	35	44,0	394,0	1160,0	2350,0	750 kcmil
32610	1 x 500 rm / 35	12	6 / 10	3,4	35	47,0	394,0	1450,0	2780,0	1000 kcmil
32611	1 x 50 rm / 16	24	12 / 20	5,5	16	33,0	182,0	145,0	920,0	1
32612	1 x 70 rm / 16	24	12 / 20	5,5	16	34,0	182,0	203,0	1030,0	2/0
32613	1 x 95 rm / 16	24	12 / 20	5,5	16	36,0	182,0	276,0	1140,0	3/0
32614	1 x 120 rm / 16	24	12 / 20	5,5	16	37,0	182,0	348,0	1250,0	4/0
32615	1 x 150 rm / 25	24	12 / 20	5,5	25	39,0	283,0	435,0	1320,0	300 kcmil
32616	1 x 185 rm / 25	24	12 / 20	5,5	25	41,0	283,0	537,0	1570,0	350 kcmil
32617	1 x 240 rm / 25	24	12 / 20	5,5	25	43,0	283,0	696,0	1780,0	500 kcmil
32618	1 x 300 rm / 25	24	12 / 20	5,5	25	45,0	283,0	870,0	2100,0	600 kcmil
32619	1 x 400 rm / 35	24	12 / 20	5,5	35	48,0	394,0	1160,0	2480,0	750 kcmil
32620	1 x 500 rm / 35	24	12 / 20	5,5	35	52,0	394,0	1450,0	2900,0	1000 kcmil
32621	1 x 50 rm / 16	36	18 / 30	8	16	37,0	182,0	145,0	1250,0	1
32622	1 x 70 rm / 16	36	18 / 30	8	16	38,0	182,0	203,0	1500,0	2/0

Continuation ▶

NA2XS(F)2Y 6/10kV, 12/20kV, 18/30kV XLPE-insulated, alu-conductor, single core, longitudinally water-tight, screened, PE-jacket



Part no.	No. cores x cross-sec. mm ²	Operation voltage max.	Nominal voltage kV	Insulation thickness mm	Screen cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Alu weight kg / km	Weight approx. kg / km	AWG-No.
32623	1 x 95 rm / 16	36	18 / 30	8	16	40,0	182,0	276,0	1700,0	3/0
32624	1 x 120 rm / 16	36	18 / 30	8	16	42,0	182,0	348,0	1800,0	4/0
32625	1 x 150 rm / 25	36	18 / 30	8	25	43,0	283,0	435,0	2050,0	300 kcmil
32626	1 x 185 rm / 25	36	18 / 30	8	25	45,0	283,0	537,0	2150,0	350 kcmil
32627	1 x 240 rm / 25	36	18 / 30	8	25	47,0	283,0	696,0	2400,0	500 kcmil
32628	1 x 300 rm / 25	36	18 / 30	8	25	50,0	283,0	870,0	2700,0	600 kcmil
32629	1 x 400 rm / 35	36	18 / 30	8	35	53,0	394,0	1160,0	3200,0	750 kcmil
32630	1 x 500 rm / 35	36	18 / 30	8	35	56,0	394,0	1450,0	3555,0	1000 kcmil

Dimensions and specifications may be changed without prior notice. (RQ03)

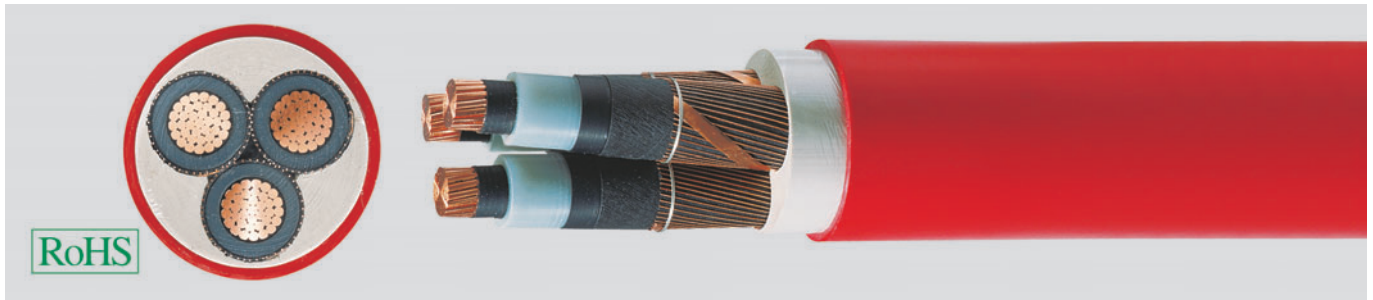
Drag Chain Systems

- Open chains
- Closed chains
- Accessories
- Installation instructions
- Selection tables



You can find drag chain systems in our catalogue Cable Accessories.
Request it now at www.helukabel.de

N2XSEY 3 x ... 6/10kV XLPE-insulated, Cu-conductor, PVC-jacket



RoHS

Technical data

- Three core XLPE-insulated power cables to VDE 0276 and IEC 60502
- **Temperature range** during installation up to -5 °C
- **Operating temperature** max. 90 °C
- **Short circuit temperature** core 250 °C screen 350 °C (duration) (short circuit duration up to 5 sec.)
- **Nominal voltages** U_0/U 6/10 kV
- **Operating voltages** max. 12 kV
- **Test voltages** 15 kV
- **Test voltages d.c.** 48 kV
- **Power rating** to DIN VDE 0298 part 2
- **Minimum bending radius** during installation 15x cable \varnothing
- **Tests** according to DIN VDE 0276 und IEC 60502

Cable structure

- Circular bare Cu-conductor of stranded wires to DIN VDE 0295 cl. 2 and IEC 60228 cl. 2
- Inner semi-conducting coating
- Core insulation of cross-linked Polyethylene (XLPE), PE-compound DIX8 to HD 620.1
- Outer extrusion of semi-conducting coating spliced with the XLPE-insulation
- Conductive wrapping
- Screen: Braiding of copper wires with one or two tapes applied helically
- 3 cores stranded
- Extruded sheath over three cores
- PVC outer jacket, compound DMV6 to HD 405.1 and HD 620/1
- Jacket colour red

Properties

- self-extinguishing and flame retardant according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **Installation notes**
To guarantee an optimum on operating reliability the extruded semi-conductive layer is spliced with the insulation for long duration. For this reason we recommend a peeling tool for installation.

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- **For laying in earth:** For ground thermal resistivity of 1 K m/W, laying depth 0,7 m, ground temperature 20 °C, EVU load grade 0,7.
- **For laying in air:** Air temperature 30 °C, EVU load grade 1,0.
- Conversion factors for laying in earth especially for laying in bundle form and other requirements are noted din DIN VDE 0298 part 2 and 0276 part 1000.
- Conversion factors for laying in air
Air temperature/Conversion factor
15 °C/1,12; 20 °C/1,08; 25 °C/1,04; 30 °C/1,0; 35 °C/0,96; 35 °C/0,96; 40 °C/0,91; 45 °C/0,87; 50 °C/0,82;

Power rating and electrical characteristics

Cross-sec. mm ²	Power ratings		Conductor resistance 20° C Ohm / km	Operating capacity μ F / km	Effective resistance 90° C Ohm / km	Inductance per core mH / km
	laying in earth ¹⁾	laying in air ²⁾				
3 x 25 rm/16	151	147	0,727	0,203	0,928	0,399
3 x 35 rm/16	181	178	0,524	0,225	0,669	0,378
3 x 50 rm/16	213	213	0,387	0,249	0,494	0,359
3 x 70 rm/16	261	265	0,268	0,283	0,343	0,338
3 x 95 rm/16	312	322	0,193	0,315	0,247	0,323
3 x 120 rm/16	355	370	0,153	0,345	0,197	0,311
3 x 150 rm/25	399	420	0,124	0,374	0,160	0,302
3 x 185 rm/25	451	481	0,0991	0,406	0,129	0,293
3 x 240 rm/25	523	566	0,0754	0,456	0,0991	0,282
3 x 300 rm/25	590	648	0,0601	0,495	0,0803	0,274

Application

Suitable for installation in indoors and in cable ducts, outdoors as well as for laying on racks for industrial and switching systems and power plants. Limited use when buried in the earth if the PVC outer jacket could be damaged by high mechanical stress. The inner conducting layer between the conductor and the XLPE insulation and the firmly bonded outer conducting layer on the XLPE insulation assures a construction free of partial discharges with high operational reliability.

Part no.	No. cores x cross-sec. mm ²	Insulation thickness mm	Screen cross-sec. mm ²	Jacket thickness Nominal value mm	Outer \varnothing approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
34339	3 x 25 rm / 16	3,4	16	2,5	43,0	1046,0	2850,0	4
34340	3 x 35 rm / 16	3,4	16	2,5	48,0	1210,0	3300,0	2
34341	3 x 50 rm / 16	3,4	16	2,5	50,0	1670,0	3750,0	1
34342	3 x 70 rm / 16	3,4	16	2,6	54,0	2250,0	4650,0	2/0
34343	3 x 95 rm / 16	3,4	16	2,8	58,0	2995,0	5700,0	3/0
34344	3 x 120 rm / 16	3,4	16	2,9	61,0	3715,0	6700,0	4/0
34345	3 x 150 rm / 25	3,4	25	3	65,0	4635,0	7900,0	300 kcmil
34346	3 x 185 rm / 25	3,4	25	3,1	68,0	5645,0	9200,0	350 kcmil
34347	3 x 240 rm / 25	3,4	25	3,3	74,0	7274,0	11450,0	500 kcmil
34348	3 x 300 rm / 25	3,4	25	3,5	79,0	9160,0	14450,0	600 kcmil

Dimensions and specifications may be changed without prior notice. (RQ03)



Large cabling machine with backtwist at our Windsbach factory

Photo: Helukabel®



Data, Network and Bus Technology



Photo: HELUKABEL®

Data, Network and Bus Technology

Data, Network and Bus Technology

The importance of information technology in our communications-orientated world has increased considerably in recent years. This can best be seen the way distances between continents have diminished because of the rapid processing of information within media networks. Last but not least, the high speed availability of information is of major significance for industrial and commercial operations, the economic success of these going hand in hand with the availability of data. Well developed paths for communications and infrastructures mean decisive advantages in competition. Prerequisites for such an exchange of information are the physical links between the systems.

These are the cables for data and network engineering. HELUKABEL® supplies the cables for infrastructures in local and wide-area networks. A whole range of cables is available for standardised LAN's of the differing topologies, like Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, Token Ring, FDDI and ATM.

Besides the basic level within such communication, we also supply additional components such as the cabinet systems, connection techniques for copper and optical-fibre cables, as well as other active components. The bus technology is becoming ever more important in all fields of industrial applications. The enormous pressures of competitiveness and costs in all areas of process control emphasise the need for even more rationalisation and greater efficiency. The traditional method of parallel wiring for the equipment and machines does not have the flexibility and thus constitutes a major factors in costs and time. The use of bus systems opens up a very high potential for cost-saving. HELUKABEL® supplies the appropriate cables for all common bus systems like ASI, CAN, DeviceNet, EIB, INTERBUS, KH, PROFIBUS etc.

R

Contents and Index

Description	Page
-------------	------

R HELUCOM® Fibre optic cables

Fibre optic indoor cables.....	R 6 – R 9
Fibre optic cables.....	R 10 – R 14
Fibre optic cable with functional integrity	R 15 – R 16
Fibre optic outdoor cables.....	R 17 – R 33
Fibre optic flexible cables.....	R 34 – R 37
Fibre optic outdoor cables, divisible.....	R 38
Fibre optic industrial cables	R 39 – R 45
POF-Plastic fibre cables	R 46 – R 47

R HELUKAT® Copper data cables

HELUKAT® LAN cables.....	R 54 – R 80
Multimedia cables.....	R 81 – R 82
IBM-cabling	R 83 – R 85

R HELUKABEL® Bus-Cables

Industrial Ethernet.....	R 89 – R 106
Profibus.....	R 107 – R 121
Foundation™ Fieldbus.....	R 122 – R 125
HMCB.....	R 126 – R 129
USB	R 130 – R 131
CAN-Bus	R 132 – R 141
Interbus.....	R 142 – R 144
Multibus	R 145 – R 146
A-Bus.....	R 147 – R 150
A-Bus, electrical cabinet.....	R 151
Sensor actuator	R 152
Device-Net™.....	R 153 – R 156
CC-Link	R 157
Safety-Bus.....	R 158
LON-Bus.....	R 159
EIB-Bus	R 160 – R 162
KH-Bus.....	R 163



Photo: HELUKABEL®

Fiber Optic Cables HELUCOM®

The future reliability of any installation depends on the correct choice of cable used in the network technique. It is only by careful selection of the components that compliance with the continually increasing requirements placed upon the quality of the network is possible. Infrastructures based on copper are continually nearing their physical limits because of the rapidly growing demands from multimedia developments, and hence an alternative to copper must be provided for installations in the future.

The benefits of optical fibre technology are obvious: High transmission rates, low attenuation, no electromagnetic problems, small dimensions and low weight. Modern designs for optical fibre cables of the HELUCOM® series exhibit the same robustness as a copper cable. The cable constructions are selected for optimum protection of the optical fibres in each application.

Within the HELUCOM® series, optical fibre cables are available with the common fibre types of 50/125µm, 62,5/125µm, 9/125µm, 200/230µm and 980/1000µm. The HELUCOM® optical fibre cables are manufactured in accordance with the standards and regulations of DIN VDE 0888.

Contents Fiber Optic Cables

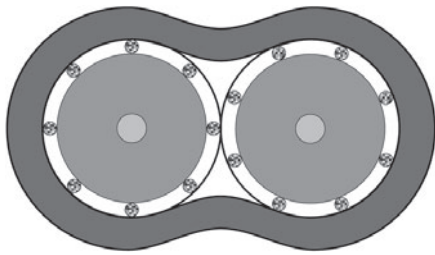
Description	Page
Fibre Optic Indoor Cable – Composite buffered	I-VH, I-V11Y, I-VHH, I-V11Y11Y R 6
Fibre Optic Breakout-Cable – Composite buffered	I-V(ZN)HH R 7
Fibre Optic Minibreakout Cable – Tight buffer	I-V(ZN)H R 8
Fibre Optic Indoor Cable – Loose tube	I-D(ZN)H R 9
Fibre Optic Indoor/Outdoor Cable – Tight buffer.....	A/I-VQ(ZN)BH R 10
Fibre Optic Indoor/Outdoor Cable HELUCOM® pact – Loose tube.....	A/I-DQ(ZN)BH R 11
Fibre Optic Indoor/Outdoor Cable HELUCOM® pact – Loose tube.....	A/I-DQ(ZN)BH OM3 R 12
Fibre Optic Indoor/Outdoor Cable – Loose tube.....	A/I-DQ(ZN)BH, central R 13
Fibre Optic Indoor/Outdoor Cable – Loose tube.....	A/I-DQ(ZN)BH, stranded R 14
Fibre Optic Cable with Functionality FS 30 with reference to DIN 4102-12 – Loose tube.....	A-DQ(ZN)BH R 15
Fibre Optic Cable with Functionality FS 90 with reference to IEC 60331-25 – Loose tube.....	A/I-D(ZN)BH(SR)H R 16
Fibre Optic Outdoor Cable – Loose tube	A-DQ(ZN)2Y, central R 17
Fibre Optic Outdoor Cable – Loose tube	A-DQ(ZN)2Y, stranded R 18
Fibre Optic Outdoor Cable HELUCOM® pact – Loose tube.....	A-DQ(ZN)B2Y, central R 19
Fibre Optic Outdoor Cable – Loose tube	A-DQ(ZN)B2Y, central R 20
Fibre Optic Outdoor Cable – Loose tube	A-DQ(ZN)B2Y, stranded R 21
Fibre Optic Outdoor Cable HELUCOM® pact – Loose tube.....	A-DQ(ZN)B2Y Faserkombi, stranded R 22
Fibre Optic Outdoor Cable – Loose tube	A-DQ(ZN)B2Y Faserkombi, stranded R 23
Fibre Optic Outdoor Cable – Loose tube	A-DF(ZN)2Y R 24
Fibre Optic Outdoor Cable – Loose tube	A-DF(ZN)B2Y R 25
Fibre Optic Outdoor Cable – Loose tube	A-DF(ZN)2Y4Y R 26
Fibre Optic Outdoor Cable Microduct – Loose tube.....	A-DQ2Y, central R 27
Fibre Optic Outdoor Cable Microduct – Loose tube.....	A-DQ2Y, stranded R 28
Fibre Optic Outdoor Cable steel armoured – Loose tube	A-DQ(ZN)(SR)2Y R 29
Fibre Optic Outdoor Cable acc. ARCOR Standard – Loose tube	A-DF(ZN)2Y(SR)2Y R 30
Fibre Optic Outdoor Cable Hybrid – Loose tube.....	A-DSQ(ZN)B2Y R 31
Fibre Optic Outdoor Cable Hybrid – Loose tube.....	A-DSF(L)(ZN)2Y R 32
Aerial Fibre Optic Cable metal free – Loose tube	ADSS R 33
Fibre Optic Cable flexible, WK-mobile – Tight buffer	A-V(ZN)11Y R 34
Fibre Optic Cable flexible, WK-UL/CSA – Tight buffer	A-V(ZN)Y R 35
Fibre Optic Cable flexible, WK robust PUR + PVC (UL/CSA) – Composite buffered ..	AT-V(ZN)H(ZN)11Y, AT-V(ZN)Y(ZN)Y R 36
Fibre Optic Cable flexible, WK – Composite buffered	AT-V(ZN)YY R 37
Fibre Optic Breakout Cable, outdoor – Composite buffered.....	AT-V(ZN)HH(BN)2Y R 38
Fibre Optic Cable robust, multimode – Tight buffer.....	AT-VYY R 39
Fibre Optic Cable flexible, HCS – Composite buffered	I-VH, I-VHH R 40
Fibre Optic Breakout Cable robust, flexible, HCS – Composite buffered	I-V(ZN)Y11Y R 41
Fibre Optic Breakout Cable robust, HCS – Composite buffered.....	AT-VQH(ZN)B2Y R 42
Fibre Optic Breakout Cable flexible, HCS – Composite buffered	AT-V(ZN)HH R 43
Fibre Optic Breakout Cable robust, flexible, HCS UL/CSA – Composite buffered	I-V(ZN)YY R 44
Fibre-optic Universal Cable, HCS – Loose tube	A/I-DQ(ZN)BH R 45
Plastic-fibre cable industry, POF/PE – POF 980/1000.....	I-V2Y, I-V2Y(ZN)11Y R 46
Plastic-fibre cable industry, POF/PA – POF 980/1000.....	I-V4Y(ZN)11Y R 47

Fibre Optic Indoor Cable

acc. DIN VDE 0888

HELUCOM®

I-VH, I-V11Y, I-VHH, I-V11Y11Y



Cable structure

Core type: Composite buffered
Strain relief elements: Aramide
Outer sheath material: FRNC
Outer sheath colour: Yellow

Temperature range

Laying, min.: 0°C
Laying, max.: +50°C
Operating, min.: 0°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1
Smoke density acc. to IEC 61034

Designation	Number of fibres	Fibre type	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
I-VH	1	Multimode G50/125	2,6	300	40	0,17	10	8,7	80783
I-VH	1	Multimode G62.5/125	2,6	300	40	0,17	10	8,7	80782
I-VH	1	Single-mode E9/125	2,6	300	40	0,17	10	8,7	80784
I-VH	2	Multimode G50/125	2,6 x 5,6	400	40	0,24	10	17,5	80316
I-VH	2	Multimode G62.5/125	2,6 x 5,6	400	40	0,24	10	17,5	80699
I-VH	2	Single-mode E9/125	2,6 x 5,6	400	40	0,24	10	17,5	80785
I-V11Y	2	Multimode G50/125	2,6 x 5,6	400	40	2,80	20	14,0	82408
I-V11Y	2	Multimode G62.5/125	2,6 x 5,6	400	40	2,80	20	14,0	82410
I-V11Y	2	Single-mode E9/125	2,6 x 5,6	400	40	2,80	20	14,0	82411
I-VHH	2	Multimode G50/125	3,6 x 6,2	600	50	0,57	20	20,0	80789
I-VHH	2	Multimode G62.5/125	3,6 x 6,2	600	50	0,57	20	20,0	80790
I-VHH	2	Single-mode E9/125	3,6 x 6,2	600	50	0,57	20	20,0	80791
I-V11Y11Y	2	Multimode G50/125	3,6 x 6,2	600	60	4,20	20	16,0	82409
I-V11Y11Y	2	Multimode G62.5/125	3,6 x 6,2	600	60	4,20	20	16,0	81900
I-V11Y11Y	2	Single-mode E9/125	3,6 x 6,2	600	60	4,20	20	16,0	82412

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® one-fibre and two-fibre (duplex) cables are used for fixed indoor installation, such as in cable ducts. These cables are also used as ready-made cables (pigtailed) that are spliced to fixed cables or as connection cables (jumper cable) as well as for switch frames. The small diameter and the high flexibility make these cables ideal for the application in switch frames as well as for the connection of terminals.

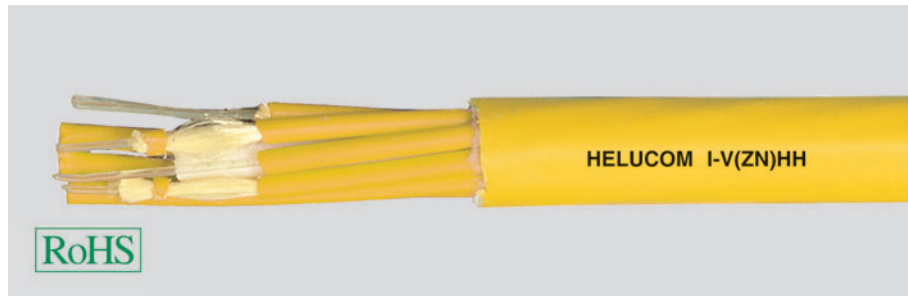
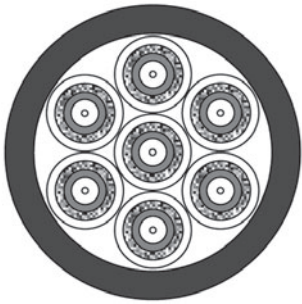
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Fibre Optic Breakout-Cable

acc. DIN VDE 0888

HELUCOM®

I-V(ZN)HH



Cable structure

Core type: Composite buffered
Strain relief elements: Aramide
Outer sheath material: FRNC
Outer sheath colour: Yellow

Temperature range

Laying, min.: 0°C
Laying, max.: +50°C
Operating, min.: 0°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1 and IEC 60332-3
Smoke density acc. to IEC 61034

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
I-V(ZN)HH	2	Multimode G50/125	1	7,1	1000	270,0	1,00	300	40,0	80743
I-V(ZN)HH	2	Multimode G62.5/125	1	7,1	1000	270,0	1,00	300	40,0	80799
I-V(ZN)HH	2	Single-mode E9/125	1	7,1	1000	270,0	1,00	300	40,0	80813
I-V(ZN)HH	4	Multimode G50/125	1	7,1	1000	270,0	1,00	300	45,0	80753
I-V(ZN)HH	4	Multimode G62.5/125	1	7,1	1000	270,0	1,00	300	45,0	80800
I-V(ZN)HH	4	Single-mode E9/125	1	7,1	1000	270,0	1,00	300	45,0	80814
I-V(ZN)HH	6	Multimode G50/125	1	8,4	1350	270,0	1,25	300	70,0	80754
I-V(ZN)HH	6	Multimode G62.5/125	1	8,4	1350	270,0	1,25	300	70,0	80769
I-V(ZN)HH	6	Single-mode E9/125	1	8,4	1350	270,0	1,25	300	70,0	80815
I-V(ZN)HH	8	Multimode G50/125	1	9,3	1500	270,0	1,50	300	100,0	80688
I-V(ZN)HH	8	Multimode G62.5/125	1	9,3	1500	270,0	1,50	300	100,0	80801
I-V(ZN)HH	8	Single-mode E9/125	1	9,3	1500	270,0	1,50	300	100,0	80816
I-V(ZN)HH	12	Multimode G50/125	1	9,6	2350	270,0	1,85	300	165,0	80795
I-V(ZN)HH	12	Multimode G62.5/125	1	9,6	2350	270,0	1,85	300	165,0	80803
I-V(ZN)HH	12	Single-mode E9/125	1	9,6	2350	270,0	1,85	300	165,0	80818
I-V(ZN)HH	16	Multimode G50/125	1	15,0	2400	270,0	2,40	300	170,0	80796
I-V(ZN)HH	16	Multimode G62.5/125	1	15,0	2400	270,0	2,40	300	170,0	80804
I-V(ZN)HH	16	Single-mode E9/125	1	15,0	2400	270,0	2,40	300	170,0	80819
I-V(ZN)HH	24	Multimode G50/125	1	17,5	2400	330,0	3,20	300	220,0	80798
I-V(ZN)HH	24	Multimode G62.5/125	1	17,5	2400	330,0	3,20	300	220,0	80806
I-V(ZN)HH	24	Single-mode E9/125	1	17,5	2400	320,0	3,20	300	220,0	80821

Dimensions and specifications may be changed without prior notice.

Application

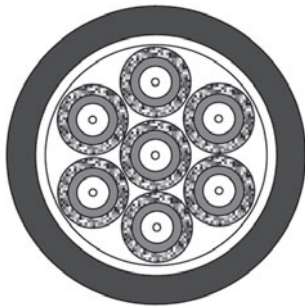
HELUCOM® breakout cables are designed to replace splicing on-site. They are mainly used in indoor applications for small and medium transmission lines. The fibre-optic connectors are mounted directly to the individual cables. Therefore no splicing and no splice boxes are necessary. Pre-assembled cables only need to be laid on site and are immediately functional.

Fibre Optic Minibreakout Cable

acc. DIN VDE 0888

HELUCOM®

I-V(ZN)H



Cable structure

Core type: Tight buffer
Strain relief elements: Aramide
Outer sheath material: FRNC
Outer sheath colour: Orange

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -10°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1
Smoke density acc. to IEC 61034

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
I-V(ZN)H	2	Multimode G50/125	1	4,0	400	60,0	0,24	40	15,0	80435
I-V(ZN)H	2	Multimode G62.5/125	1	4,0	400	60,0	0,24	40	15,0	80434
I-V(ZN)H	2	Single-mode E9/125	1	4,0	400	60,0	0,24	40	15,0	80433
I-V(ZN)H	4	Multimode G50/125	1	4,8	400	70,0	0,31	40	19,0	80432
I-V(ZN)H	4	Multimode G62.5/125	1	4,8	400	70,0	0,31	40	19,0	80431
I-V(ZN)H	4	Single-mode E9/125	1	4,8	400	70,0	0,31	40	19,0	80430
I-V(ZN)H	6	Multimode G50/125	1	5,3	400	80,0	0,35	40	23,0	80429
I-V(ZN)H	6	Multimode G62.5/125	1	5,3	400	80,0	0,35	40	23,0	80428
I-V(ZN)H	6	Single-mode E9/125	1	5,3	400	80,0	0,35	40	23,0	80427
I-V(ZN)H	8	Multimode G50/125	1	5,3	500	80,0	0,40	40	25,0	80426
I-V(ZN)H	8	Multimode G62.5/125	1	5,3	500	80,0	0,40	40	25,0	80425
I-V(ZN)H	8	Single-mode E9/125	1	5,3	500	80,0	0,40	40	25,0	80424
I-V(ZN)H	10	Multimode G50/125	1	6,0	600	90,0	0,53	40	32,0	80423
I-V(ZN)H	10	Multimode G62.5/125	1	6,0	600	90,0	0,53	40	32,0	80422
I-V(ZN)H	10	Single-mode E9/125	1	6,0	600	90,0	0,53	40	32,0	80421
I-V(ZN)H	12	Multimode G50/125	1	7,0	800	110,0	0,61	40	40,0	80420
I-V(ZN)H	12	Multimode G62.5/125	1	7,0	800	110,0	0,61	40	40,0	80419
I-V(ZN)H	12	Single-mode E9/125	1	7,0	800	110,0	0,61	40	40,0	80418

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® fibre-optic cables are used for the data network cabling in indoor applications. A big advantage of this cable type is its space-saving construction. Similar to the breakout cable, the connector is directly mounted at the tight buffer.

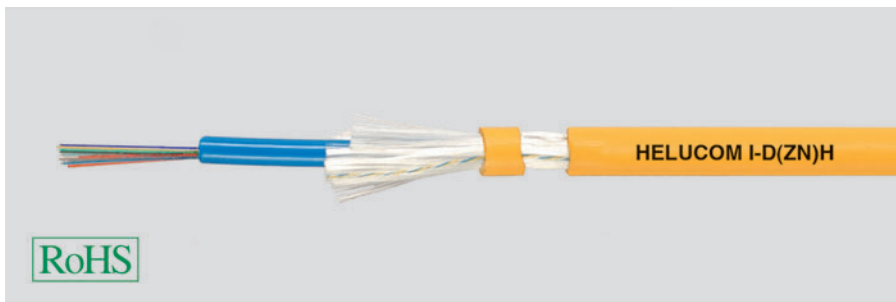
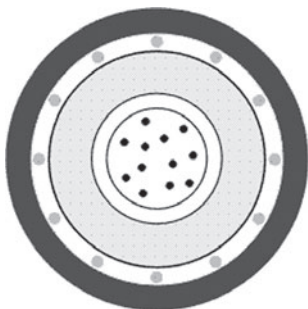
R

Fibre Optic Indoor Cable

acc. DIN VDE 0888

HELUCOM®

I-D(ZN)H



Cable structure

Core type: Loose tube
Strain relief elements: Aramide
Outer sheath material: FRNC
Outer sheath colour: Yellow

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1
Smoke density acc. to IEC 61034

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
I-D(ZN)H	4	Multimode G50/125	4	8,0	1200	120,0	1,50	150	65,0	80631
I-D(ZN)H	4	Multimode G62.5/125	4	8,0	1200	120,0	1,50	150	65,0	80882
I-D(ZN)H	4	Single-mode E9/125	4	8,0	1200	120,0	1,50	150	65,0	80896
I-D(ZN)H	6	Multimode G50/125	6	8,0	1200	120,0	1,50	150	65,0	80868
I-D(ZN)H	6	Multimode G62.5/125	6	8,0	1200	120,0	1,50	150	65,0	80883
I-D(ZN)H	6	Single-mode E9/125	6	8,0	1200	120,0	1,50	150	65,0	80897
I-D(ZN)H	8	Multimode G50/125	8	8,0	1200	120,0	1,50	150	65,0	80869
I-D(ZN)H	8	Multimode G62.5/125	8	8,0	1200	120,0	1,50	150	65,0	80884
I-D(ZN)H	8	Single-mode E9/125	8	8,0	1200	120,0	1,50	150	65,0	80898
I-D(ZN)H	10	Multimode G50/125	10	8,0	1200	120,0	1,50	150	65,0	80793
I-D(ZN)H	10	Multimode G62.5/125	10	8,0	1200	120,0	1,50	150	65,0	80885
I-D(ZN)H	10	Single-mode E9/125	10	8,0	1200	120,0	1,50	150	65,0	80899
I-D(ZN)H	12	Multimode G50/125	12	8,0	1200	120,0	1,50	150	65,0	80045
I-D(ZN)H	12	Multimode G62.5/125	12	8,0	1200	120,0	1,50	150	65,0	80879
I-D(ZN)H	12	Single-mode E9/125	12	8,0	1200	120,0	1,50	150	65,0	80880
I-D(ZN)H	16	Multimode G50/125	16	8,0	1200	120,0	1,50	150	135,0	80870
I-D(ZN)H	16	Multimode G62.5/125	16	8,0	1200	120,0	1,50	150	135,0	80886
I-D(ZN)H	16	Single-mode E9/125	16	8,0	1200	120,0	1,50	150	135,0	80900
I-D(ZN)H	24	Multimode G50/125	12	12,5	3000	190,0	2,20	200	150,0	80872
I-D(ZN)H	24	Multimode G50/125	24	9,0	1600	140,0	1,50	150	135,0	80871
I-D(ZN)H	24	Multimode G62.5/125	12	12,5	3000	190,0	2,20	200	150,0	80888
I-D(ZN)H	24	Multimode G62.5/125	24	9,0	1600	140,0	1,50	150	135,0	81246
I-D(ZN)H	24	Single-mode E9/125	12	12,5	3000	190,0	2,20	200	150,0	80902
I-D(ZN)H	24	Single-mode E9/125	24	9,0	1600	140,0	1,50	150	135,0	80901
I-D(ZN)H	36	Multimode G50/125	12	13,5	3000	200,0	2,20	200	160,0	80875
I-D(ZN)H	36	Multimode G62.5/125	12	13,5	3000	200,0	2,20	200	160,0	80891
I-D(ZN)H	36	Single-mode E9/125	12	13,5	3000	200,0	2,20	200	160,0	80905
I-D(ZN)H	48	Multimode G50/125	12	13,5	3000	200,0	2,20	200	160,0	80877
I-D(ZN)H	48	Multimode G62.5/125	12	13,5	3000	200,0	2,20	200	160,0	80893
I-D(ZN)H	48	Single-mode E9/125	12	13,5	3000	200,0	2,20	200	160,0	80907
I-D(ZN)H	60	Multimode G50/125	12	13,5	3000	200,0	2,20	200	170,0	80878
I-D(ZN)H	60	Multimode G62.5/125	12	13,5	3000	200,0	2,20	200	170,0	80894
I-D(ZN)H	60	Single-mode E9/125	12	13,5	3000	200,0	2,20	200	170,0	80908

Dimensions and specifications may be changed without prior notice.

Application

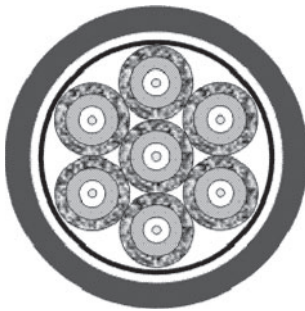
These HELUCOM® fibre-optic cables are available either as central bundle core cable or as stranded versions. They are suitable for indoor cabling of buildings and facilities. The halogen-free version is especially suitable for the application in skyscrapers, hospitals and stores as well as in facilities with high concentration of capital goods, such as power plants, computing centers, and at locations with high security requirements, such as underground and control stations.

Fibre Optic Indoor/Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A/I-VQ(ZN)BH



Cable structure

Core type: Tight buffer
 Strain relief elements: Aramide
 Type of armouring: Glass yarns
 Outer sheath material: FRNC
 Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -20°C
 Operating, max.: +55°C

Other data

Corrosiveness acc. to EN50267-2-3
 Halogen-free acc. to 60754-2
 Flame-resistance acc. to IEC 60332-1
 Smoke density acc. to IEC 61034
 UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A/I-VQ(ZN)BH	4	Multimode G50/125	1	6,1	2000	90,0	0,35	40	40,0	82804
A/I-VQ(ZN)BH	4	Multimode G62.5/125	1	6,1	2000	90,0	0,35	40	40,0	82809
A/I-VQ(ZN)BH	4	Single-mode E9/125	1	6,1	2000	90,0	0,35	40	40,0	82814
A/I-VQ(ZN)BH	6	Multimode G50/125	1	6,6	2000	100,0	0,41	40	47,0	82805
A/I-VQ(ZN)BH	6	Multimode G62.5/125	1	6,6	2000	100,0	0,41	40	47,0	82810
A/I-VQ(ZN)BH	6	Single-mode E9/125	1	6,6	2000	100,0	0,41	40	47,0	82815
A/I-VQ(ZN)BH	8	Multimode G50/125	1	6,6	2000	100,0	0,43	40	51,0	82806
A/I-VQ(ZN)BH	8	Multimode G62.5/125	1	6,6	2000	100,0	0,43	40	51,0	82811
A/I-VQ(ZN)BH	8	Single-mode E9/125	1	6,6	2000	100,0	0,43	40	51,0	82816
A/I-VQ(ZN)BH	10	Multimode G50/125	1	8,0	2000	120,0	0,61	40	65,0	82807
A/I-VQ(ZN)BH	10	Multimode G62.5/125	1	8,0	2000	120,0	0,61	40	65,0	82812
A/I-VQ(ZN)BH	10	Single-mode E9/125	1	8,0	2000	120,0	0,61	40	65,0	82817
A/I-VQ(ZN)BH	12	Multimode G50/125	1	8,3	3000	125,0	0,71	40	70,0	82808
A/I-VQ(ZN)BH	12	Multimode G62.5/125	1	8,3	3000	125,0	0,71	40	70,0	82813
A/I-VQ(ZN)BH	12	Single-mode E9/125	1	8,3	3000	125,0	0,71	40	70,0	82818

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® fibre-optic cables are used for the data network cabling in indoor and outdoor applications. With their black UV-resistant outer sheath and the non-metallic rodent protection, they are perfectly suited for outdoor use. A big advantage of this cable type is its space-saving construction. Similar to the breakout cable, the connector is directly mounted at the tight buffer.

R

Fibre Optic Indoor/Outdoor Cable

acc. DIN VDE 0888

HELUCOM[®] pact

A/I-DQ(ZN)BH



Cable structure

Core type: Loose tube
Strain relief elements: Glass yarns
Type of armouring: Glass yarns
Outer sheath material: FRNC
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1
Smoke density acc. to IEC 61034
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A/I-DQ(ZN)BH	4	Multimode G50/125	4	7,5	1500	150,0	1,10	200	55,0	82792
A/I-DQ(ZN)BH	4	Multimode G62.5/125	4	7,5	1500	150,0	1,10	200	55,0	82796
A/I-DQ(ZN)BH	4	Single-mode E9/125	4	7,5	1500	150,0	1,10	200	55,0	82800
A/I-DQ(ZN)BH	6	Multimode G50/125	6	7,5	1500	150,0	1,10	200	55,0	82793
A/I-DQ(ZN)BH	6	Multimode G62.5/125	6	7,5	1500	150,0	1,10	200	55,0	82797
A/I-DQ(ZN)BH	6	Single-mode E9/125	6	7,5	1500	150,0	1,10	200	55,0	82801
A/I-DQ(ZN)BH	8	Multimode G50/125	8	7,5	1500	150,0	1,10	200	55,0	82794
A/I-DQ(ZN)BH	8	Multimode G62.5/125	8	7,5	1500	150,0	1,10	200	55,0	82798
A/I-DQ(ZN)BH	8	Single-mode E9/125	8	7,5	1500	150,0	1,10	200	55,0	82802
A/I-DQ(ZN)BH	12	Multimode G50/125	12	7,5	1500	150,0	1,10	200	55,0	82795
A/I-DQ(ZN)BH	12	Multimode G62.5/125	12	7,5	1500	150,0	1,10	200	55,0	82799
A/I-DQ(ZN)BH	12	Single-mode E9/125	12	7,5	1500	150,0	1,10	200	55,0	82803
A/I-DQ(ZN)BH	24	Multimode G50/125	24	8,5	1500	170,0	1,40	200	75,0	802143
A/I-DQ(ZN)BH	24	Multimode G62.5/125	24	8,5	1500	170,0	1,40	200	75,0	802144
A/I-DQ(ZN)BH	24	Single-mode E9/125	24	8,5	1500	170,0	1,40	200	75,0	802145

Dimensions and specifications may be changed without prior notice.

Application

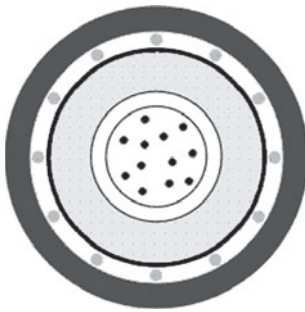
These HELUCOM[®] pact fibre-optic cables have a small but robust construction. They are suitable for indoor and outdoor cabling of buildings and facilities when space is an important argument. They are used in particular if the installation is to be done in one piece from the inside to the outside without additional use of couplings. With their black UV-resistant outer sheath and the non-metallic rodent protection, they are perfectly suited for outdoor use. The halogen-free outer sheath makes installation inhouse possible without any problems.

Fibre Optic Indoor/Outdoor Cable

acc. DIN VDE 0888

HELUCOM[®] pact

A/I-DQ(ZN)BH OM3



Cable structure

Core type: Loose tube
 Strain relief elements: Glass yarns
 Type of armouring: Glass yarns
 Outer sheath material: FRNC
 Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -20°C
 Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
 Halogen-free acc. to 60754-2
 Flame-resistance acc. to IEC 60332-1
 Smoke density acc. to IEC 61034
 Longitudinally water-tight acc. to IEC 60794-1-2-F5
 UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A/I-DQ(ZN)BH	4	Multimode G50/125	4	7,5	1500	150,0	1,10	200	55,0	802247
A/I-DQ(ZN)BH	6	Multimode G50/125	6	7,5	1500	150,0	1,10	200	55,0	802277
A/I-DQ(ZN)BH	8	Multimode G50/125	8	7,5	1500	150,0	1,10	200	55,0	802278
A/I-DQ(ZN)BH	12	Multimode G50/125	12	7,5	1500	150,0	1,10	200	55,0	802248
A/I-DQ(ZN)BH	24	Multimode G50/125	24	8,5	1500	170,0	1,40	200	75,0	802249

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM[®] pact fibre-optic cables have a small but robust construction. They are suitable for indoor and outdoor cabling of buildings and facilities when space is an important argument. They are used in particular if the installation is to be done in one piece from the inside to the outside without additional use of couplings. With their black UV-resistant outer sheath and the non-metallic rodent protection, they are perfectly suited for outdoor use. The halogen-free outer sheath makes installation inhouse possible without any problems.

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Fibre Optic Indoor/Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A/I-DQ(ZN)BH, central



Cable structure

Core type: Loose tube
Strain relief elements: Glass yarns
Type of armouring: Glass yarns
Outer sheath material: FRNC
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1
Smoke density acc. to IEC 61034
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A/I-DQ(ZN)BH	4	Multimode G50/125	4	10,0	2500	150,0	1,50	300	125,0	80270
A/I-DQ(ZN)BH	4	Multimode G62.5/125	4	10,0	2500	150,0	1,50	300	125,0	80276
A/I-DQ(ZN)BH	4	Single-mode E9/125	4	10,0	2500	150,0	1,50	300	125,0	80264
A/I-DQ(ZN)BH	6	Multimode G50/125	6	10,0	2500	150,0	1,50	300	125,0	80271
A/I-DQ(ZN)BH	6	Multimode G62.5/125	6	10,0	2500	150,0	1,50	300	125,0	80265
A/I-DQ(ZN)BH	6	Single-mode E9/125	6	10,0	2500	150,0	1,50	300	125,0	80272
A/I-DQ(ZN)BH	8	Multimode G50/125	8	10,0	2500	150,0	1,50	300	125,0	80273
A/I-DQ(ZN)BH	8	Multimode G62.5/125	8	10,0	2500	150,0	1,50	300	125,0	80274
A/I-DQ(ZN)BH	8	Single-mode E9/125	8	10,0	2500	150,0	1,50	300	125,0	80275
A/I-DQ(ZN)BH	12	Multimode G50/125	12	10,0	2500	150,0	1,50	300	125,0	80681
A/I-DQ(ZN)BH	12	Multimode G62.5/125	12	10,0	2500	150,0	1,50	300	125,0	80278
A/I-DQ(ZN)BH	12	Single-mode E9/125	12	10,0	2500	150,0	1,50	300	125,0	80279
A/I-DQ(ZN)BH	16	Multimode G50/125	16	10,0	2500	150,0	1,50	300	145,0	80280
A/I-DQ(ZN)BH	16	Multimode G62.5/125	16	10,0	2500	150,0	1,50	300	145,0	80281
A/I-DQ(ZN)BH	16	Single-mode E9/125	16	10,0	2500	150,0	1,50	300	145,0	80851
A/I-DQ(ZN)BH	24	Multimode G50/125	24	10,0	2500	150,0	1,50	300	145,0	80725
A/I-DQ(ZN)BH	24	Multimode G62.5/125	24	10,0	2500	150,0	1,50	300	145,0	82431

Dimensions and specifications may be changed without prior notice.

Application

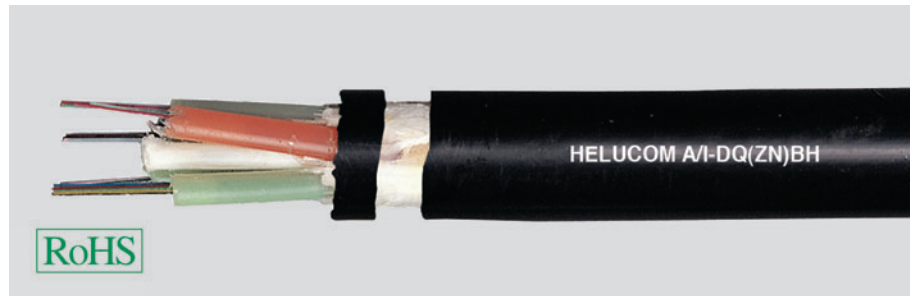
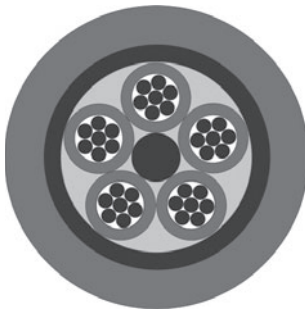
These HELUCOM® fibre-optic cables are available either as central bundle core cable or as stranded versions. They are suitable for indoor and outdoor cabling of buildings and facilities. They are used in particular if the installation is to be done in one piece from the inside to the outside without additional use of couplings. With their black UV-resistant outer sheath and the non-metallic rodent protection, they are perfectly suited for outdoor use. The halogen-free outer sheath makes installation inhouse possible without any problems.

Fibre Optic Indoor/Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A/I-DQ(ZN)BH, stranded



Cable structure

Core type: Loose tube
GRP support element
Strain relief elements: Glass yarns
Type of armouring: Glass yarns
Outer sheath material: FRNC
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1
Smoke density acc. to IEC 61034
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A/I-DQ(ZN)BH	24	Multimode G50/125	12	11,0	2700	165,0	2,00	600	90,0	81495
A/I-DQ(ZN)BH	24	Multimode G62.5/125	12	11,0	2700	165,0	2,00	600	90,0	802263
A/I-DQ(ZN)BH	24	Single-mode E9/125	12	11,0	2700	165,0	2,00	600	90,0	80846
A/I-DQ(ZN)BH	48	Multimode G50/125	12	11,0	2700	165,0	2,00	600	90,0	802261
A/I-DQ(ZN)BH	48	Multimode G62.5/125	12	11,0	2700	165,0	2,00	600	90,0	802264
A/I-DQ(ZN)BH	48	Single-mode E9/125	12	11,0	2700	165,0	2,00	600	90,0	802266
A/I-DQ(ZN)BH	48	Single-mode E9/125	12	11,0	2700	165,0	2,00	600	90,0	802281
A/I-DQ(ZN)BH	60	Multimode G50/125	12	11,0	2700	165,0	2,00	600	90,0	802262
A/I-DQ(ZN)BH	60	Multimode G62.5/125	12	11,0	2700	165,0	2,00	600	90,0	802265
A/I-DQ(ZN)BH	60	Single-mode E9/125	12	11,0	2700	165,0	2,00	600	90,0	802267
A/I-DQ(ZN)BH	72	Multimode G50/125	12	11,5	2700	175,0	2,10	600	100,0	802268
A/I-DQ(ZN)BH	72	Multimode G62.5/125	12	11,5	2700	175,0	2,10	600	100,0	802271
A/I-DQ(ZN)BH	72	Single-mode E9/125	12	11,5	2700	175,0	2,10	600	100,0	802274
A/I-DQ(ZN)BH	84	Multimode G50/125	12	12,5	3000	190,0	2,40	600	130,0	802269
A/I-DQ(ZN)BH	84	Multimode G62.5/125	12	12,5	3000	190,0	2,40	600	130,0	802272
A/I-DQ(ZN)BH	84	Single-mode E9/125	12	12,5	3000	190,0	2,40	600	130,0	802275
A/I-DQ(ZN)BH	96	Multimode G50/125	12	12,5	3000	190,0	2,80	600	130,0	802270
A/I-DQ(ZN)BH	96	Multimode G62.5/125	12	12,5	3000	190,0	2,80	600	130,0	802273
A/I-DQ(ZN)BH	96	Single-mode E9/125	12	12,5	3000	190,0	2,80	600	130,0	802276

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® fibre-optic cables are available either as central bundle core cable or as stranded versions. They are suitable for indoor and outdoor cabling of buildings and facilities. They are used in particular if the installation is to be done in one piece from the inside to the outside without additional use of couplings. With their black UV-resistant outer sheath and the non-metallic rodent protection, they are perfectly suited for outdoor use. The halogen-free outer sheath makes installation inhouse possible without any problems.

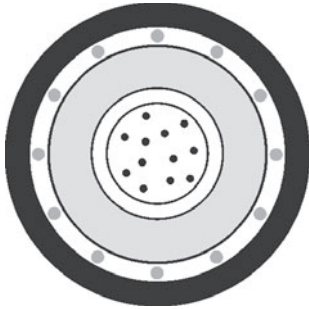
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Fibre Optic Cable with Functionality

with reference to DIN 4102-12

HELUCOM® FS30

A-DQ(ZN)BH



Cable structure

Core type: Loose tube
Strain relief elements: Aramide
Type of armoring: Glass yarns
Outer sheath material: FR/LSOH
Outer sheath colour: Red

Temperature range

Laying, min.: -10°C
Laying, max.: +50°C
Operating, min.: -25°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1
Smoke density acc. to IEC 61034
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant
Functional integrity: E30

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A/I-DQ(ZN)BH	4	Multimode G50/125	4	7,8	1000	80,0	1,08	200	102,0	801217
A/I-DQ(ZN)BH	4	Multimode G62.5/125	4	7,8	1000	80,0	1,08	200	102,0	801218
A/I-DQ(ZN)BH	4	Single-mode E9/125	4	7,8	1000	80,0	1,08	200	102,0	801219
A/I-DQ(ZN)BH	12	Multimode G50/125	12	7,8	1000	80,0	1,08	200	102,0	801220
A/I-DQ(ZN)BH	12	Multimode G62.5/125	12	7,8	1000	80,0	1,08	200	102,0	801221
A/I-DQ(ZN)BH	12	Single-mode E9/125	12	7,8	1000	80,0	1,08	200	102,0	801190

Dimensions and specifications may be changed without prior notice.

Application

With the serie HELUCOM® E30 we have realized, based on a special construction and high quality raw materials, a functional Integrity according to DIN 4102-12 E30 (30 minutes). Together with the planned accessories the cables realize the full function of the communication in areas like tunnels or buildings for the defined period of time. On request we also can deliver cables with more than 12 fibres as stranded construction.

Fibre Optic Cable with Functionality

with reference to IEC 60331-25

HELUCOM® FS90

A/I-D(ZN)BH(SR)H



new

Cable structure

Core type: Loose tube
Strain relief elements: Glass yarns
Inner sheath material: FRNC
Type of armouring: steel tape
Outer sheath material: FR/LSOH
Outer sheath colour: Yellow

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +70°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1 and -3
Smoke density acc. to IEC 61034
Longitudinally water-tight acc. to IEC 60794-1-2-F5
Cable, laterally water-tight
Functional integrity: IEC 60794/ IEC 60331-25

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A/I-D(ZN)BH(SR)H	4	Multimode G50/125	4	12,7	700	180,0	6,20	300	216,0	803917
A/I-D(ZN)BH(SR)H	4	Single-mode E9/125	4	12,7	700	180,0	6,20	300	216,0	803919
A/I-D(ZN)BH(SR)H	12	Multimode G50/125	12	12,7	700	180,0	6,20	300	216,0	803918
A/I-D(ZN)BH(SR)H	12	Single-mode E9/125	12	12,7	700	180,0	6,20	300	216,0	803920

Dimensions and specifications may be changed without prior notice.

Application

With the serie HELUCOM® FS90 we have realized, based on a special construction and high quality raw materials, a functional Integrity according to IEC 60331-25 within 90, minutes (up to 750 °C). Together with the planned accessories the cables realize the full function of the communication in areas like tunnels or buildings for the defined period of time. On request we also can deliver cables with more than 12 fibres as stranded construction.

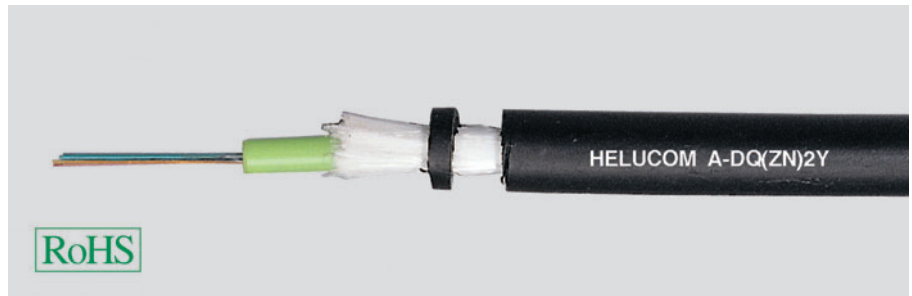
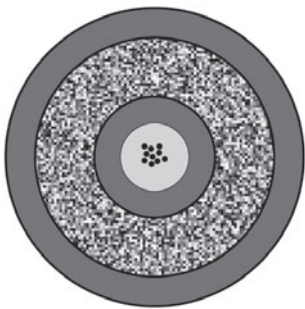
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Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A-DQ(ZN)2Y, central



Cable structure

Core type: Loose tube
Strain relief elements: Glass yarns
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ(ZN)2Y	2	Multimode G50/125	2	8,8	1500	130,0	1,60	250	40,0	80148
A-DQ(ZN)2Y	2	Multimode G62.5/125	2	8,8	1500	130,0	1,60	250	40,0	80164
A-DQ(ZN)2Y	2	Single-mode E9/125	2	8,8	1500	130,0	1,60	250	40,0	80131
A-DQ(ZN)2Y	4	Multimode G50/125	4	8,8	1500	130,0	1,60	250	40,0	80149
A-DQ(ZN)2Y	4	Multimode G62.5/125	4	8,8	1500	130,0	1,60	250	40,0	80165
A-DQ(ZN)2Y	4	Single-mode E9/125	4	8,8	1500	130,0	1,60	250	40,0	80132
A-DQ(ZN)2Y	6	Multimode G50/125	6	8,8	1500	130,0	1,60	250	40,0	80150
A-DQ(ZN)2Y	6	Multimode G62.5/125	6	8,8	1500	130,0	1,60	250	40,0	80166
A-DQ(ZN)2Y	6	Single-mode E9/125	6	8,8	1500	130,0	1,60	250	40,0	80133
A-DQ(ZN)2Y	8	Multimode G50/125	8	8,8	1500	130,0	1,60	250	40,0	80151
A-DQ(ZN)2Y	8	Multimode G62.5/125	8	8,8	1500	130,0	1,60	250	40,0	80167
A-DQ(ZN)2Y	8	Single-mode E9/125	8	8,8	1500	130,0	1,60	250	40,0	80134
A-DQ(ZN)2Y	12	Multimode G50/125	12	8,8	1500	130,0	1,60	250	40,0	80153
A-DQ(ZN)2Y	12	Multimode G62.5/125	12	8,8	1500	130,0	1,60	250	40,0	80169
A-DQ(ZN)2Y	12	Single-mode E9/125	12	8,8	1500	130,0	1,60	250	40,0	80136
A-DQ(ZN)2Y	16	Multimode G50/125	16	8,8	1500	130,0	1,80	250	70,0	80154
A-DQ(ZN)2Y	16	Multimode G62.5/125	16	8,8	1500	130,0	1,80	250	70,0	80170
A-DQ(ZN)2Y	16	Single-mode E9/125	16	8,8	1500	130,0	1,80	250	70,0	80137
A-DQ(ZN)2Y	24	Multimode G50/125	24	8,8	1500	130,0	1,80	250	70,0	80155
A-DQ(ZN)2Y	24	Multimode G62.5/125	24	8,8	1500	130,0	1,80	250	70,0	80171
A-DQ(ZN)2Y	24	Single-mode E9/125	24	8,8	1500	130,0	1,80	250	70,0	80138

Dimensions and specifications may be changed without prior notice.

Application

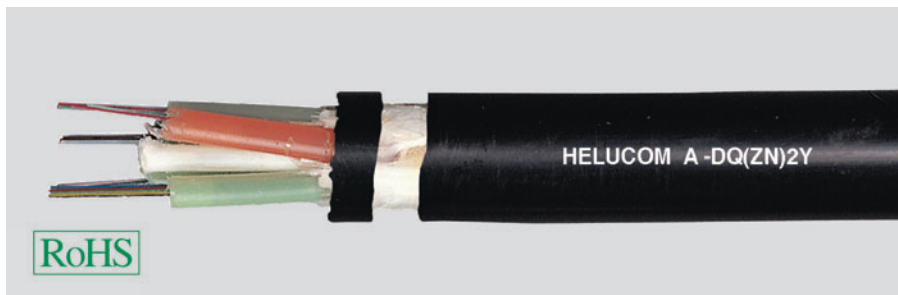
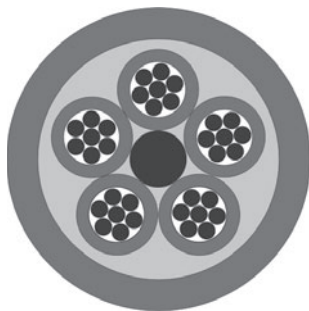
These HELUCOM® fibre-optic cables are characterized by a design that is particularly easy to mount. Around a central grooved cable, there is a composite of glass yarns and swelling fleece with characteristics that ensure the actual strain relief and waterproofing in longitudinal direction of the cable. In addition, these cables are designed grease-free. Wiping the jelly off is therefore unnecessary. This construction is particularly used in underground, tubes and channel areas, where rodent infestation is not to be expected.

Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A-DQ(ZN)2Y, stranded



Cable structure

Core type: Loose tube
GRP support element
Strain relief elements: Glass yarns
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ(ZN)2Y	24	Multimode G50/125	12	10,0	2500	200,0	2,50	400	70,0	80156
A-DQ(ZN)2Y	24	Multimode G62.5/125	12	10,0	2500	200,0	2,50	400	70,0	80172
A-DQ(ZN)2Y	24	Single-mode E9/125	12	10,0	2500	200,0	2,50	400	70,0	80139
A-DQ(ZN)2Y	36	Multimode G50/125	12	10,0	2500	200,0	2,50	400	70,0	80448
A-DQ(ZN)2Y	36	Multimode G62.5/125	12	10,0	2500	200,0	2,50	400	70,0	80449
A-DQ(ZN)2Y	36	Single-mode E9/125	12	10,0	2500	200,0	2,50	400	70,0	80450
A-DQ(ZN)2Y	48	Multimode G50/125	12	10,0	2500	200,0	2,50	400	70,0	80447
A-DQ(ZN)2Y	48	Multimode G62.5/125	12	10,0	2500	200,0	2,50	400	70,0	80446
A-DQ(ZN)2Y	48	Single-mode E9/125	12	10,0	2500	200,0	2,50	400	70,0	80445
A-DQ(ZN)2Y	60	Multimode G50/125	12	10,0	2500	200,0	2,50	400	70,0	80159
A-DQ(ZN)2Y	60	Multimode G62.5/125	12	10,0	2500	200,0	2,50	400	70,0	80175
A-DQ(ZN)2Y	60	Single-mode E9/125	12	10,0	2500	200,0	2,50	400	70,0	80142
A-DQ(ZN)2Y	72	Multimode G50/125	12	10,5	2500	210,0	2,60	400	75,0	80444
A-DQ(ZN)2Y	72	Multimode G62.5/125	12	10,5	2500	210,0	2,60	400	75,0	80443
A-DQ(ZN)2Y	72	Single-mode E9/125	12	10,5	2500	210,0	2,60	400	75,0	80442
A-DQ(ZN)2Y	84	Multimode G50/125	12	11,5	2700	230,0	3,30	400	110,0	80160
A-DQ(ZN)2Y	84	Multimode G62.5/125	12	11,5	2700	230,0	3,30	400	110,0	80176
A-DQ(ZN)2Y	84	Single-mode E9/125	12	11,5	2700	230,0	3,30	400	110,0	80143
A-DQ(ZN)2Y	96	Multimode G50/125	12	11,5	2700	230,0	3,30	400	110,0	80441
A-DQ(ZN)2Y	96	Multimode G62.5/125	12	11,5	2700	230,0	3,30	400	110,0	80440
A-DQ(ZN)2Y	96	Single-mode E9/125	12	11,5	2700	230,0	3,30	400	110,0	80439
A-DQ(ZN)2Y	108	Multimode G50/125	12	13,0	2700	260,0	4,00	400	130,0	80161
A-DQ(ZN)2Y	108	Multimode G62.5/125	12	13,0	2700	260,0	4,00	400	130,0	80177
A-DQ(ZN)2Y	108	Single-mode E9/125	12	13,0	2700	260,0	4,00	400	130,0	80144
A-DQ(ZN)2Y	120	Multimode G50/125	12	13,0	2700	260,0	4,00	400	130,0	80162
A-DQ(ZN)2Y	120	Multimode G62.5/125	12	13,0	2700	260,0	4,00	400	130,0	80178
A-DQ(ZN)2Y	120	Single-mode E9/125	12	13,0	2700	260,0	4,00	400	130,0	80146
A-DQ(ZN)2Y	144	Multimode G50/125	12	14,0	2700	280,0	5,00	400	150,0	80438
A-DQ(ZN)2Y	144	Multimode G62.5/125	12	14,0	2700	280,0	5,00	400	150,0	80437
A-DQ(ZN)2Y	144	Single-mode E9/125	12	14,0	2700	280,0	5,00	400	150,0	80436

Dimensions and specifications may be changed without prior notice.

Application

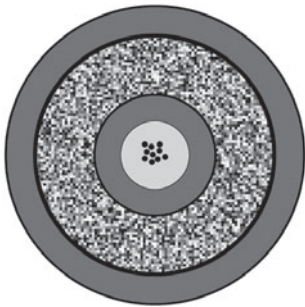
These HELUCOM® fibre-optic cables are characterized by a design that is particularly easy to mount and extremely tension-resistant. Around a stranded grooved cable and filler elements, there is a swelling fleece with characteristics that ensure strain relief and waterproofing in longitudinal direction of the cable. In addition, these cables are designed grease-free. Wiping the jelly off is therefore unnecessary. This construction is particularly used in underground, tubes and channel areas, where above-average tensile stresses and/or transverse compressions occur, but rodent infestation is not to be expected.

Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM[®] pact

A-DQ(ZN)B2Y, central



Cable structure

Core type: Loose tube
Strain relief elements: Glass yarns
Type of armouring: Glass yarns
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ(ZN)B2Y	2	Multimode G50/125	2	7,5	1500	150,0	1,60	300	40,0	800754
A-DQ(ZN)B2Y	2	Multimode G62.5/125	2	7,5	1500	150,0	1,60	300	40,0	802131
A-DQ(ZN)B2Y	2	Single-mode E9/125	2	7,5	1500	150,0	1,60	300	40,0	802137
A-DQ(ZN)B2Y	4	Multimode G50/125	4	7,5	1500	150,0	1,60	300	40,0	800755
A-DQ(ZN)B2Y	4	Multimode G62.5/125	4	7,5	1500	150,0	1,60	300	40,0	802132
A-DQ(ZN)B2Y	4	Single-mode E9/125	4	7,5	1500	150,0	1,60	300	40,0	802138
A-DQ(ZN)B2Y	6	Multimode G50/125	6	7,5	1500	150,0	1,60	300	40,0	800756
A-DQ(ZN)B2Y	6	Multimode G62.5/125	6	7,5	1500	150,0	1,60	300	40,0	802133
A-DQ(ZN)B2Y	6	Single-mode E9/125	6	7,5	1500	150,0	1,60	300	40,0	802139
A-DQ(ZN)B2Y	8	Multimode G50/125	8	7,5	1500	150,0	1,60	300	40,0	800757
A-DQ(ZN)B2Y	8	Multimode G62.5/125	8	7,5	1500	150,0	1,60	300	40,0	802134
A-DQ(ZN)B2Y	8	Single-mode E9/125	8	7,5	1500	150,0	1,60	300	40,0	802140
A-DQ(ZN)B2Y	12	Multimode G50/125	12	7,5	1500	150,0	1,60	300	40,0	800759
A-DQ(ZN)B2Y	12	Multimode G62.5/125	12	7,5	1500	150,0	1,60	300	40,0	802135
A-DQ(ZN)B2Y	12	Single-mode E9/125	12	7,5	1500	150,0	1,60	300	40,0	802141
A-DQ(ZN)B2Y	24	Single-mode E9/125	24	8,5	1500	170,0	1,90	300	60,0	802142
A-DQ(ZN)B2Y	24	Multimode G50/125	24	8,5	1500	170,0	1,90	300	60,0	800762
A-DQ(ZN)B2Y	24	Multimode G62.5/125	24	8,5	1500	170,0	1,90	300	60,0	802136

Dimensions and specifications may be changed without prior notice.

Application

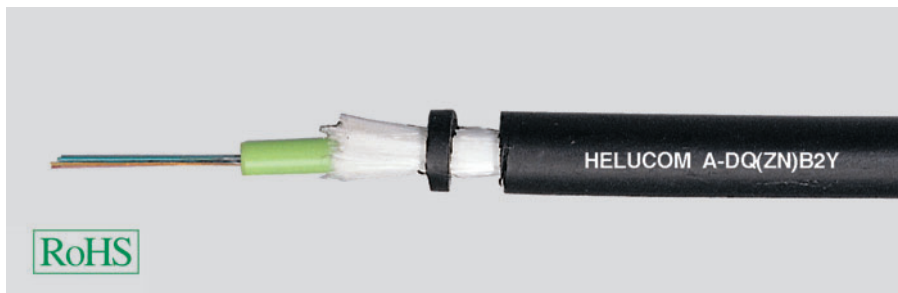
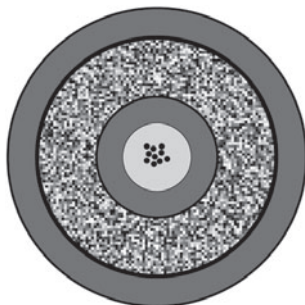
These HELUCOM[®] pact fibre-optic cables are characterized by a design that is particularly easy to mount and is rodent-protected. Around a central grooved cable, there is a composite of glass yarns and swelling fleece with characteristics that ensure rodent protection, strain relief, and waterproofing in longitudinal direction of the cable. In addition, these cables are designed grease-free. Wiping the jelly off is therefore unnecessary. This construction is particularly used in underground, tubes and channel areas, where normal tensile stresses and/or transverse compressions occur and rodent infestation is to be expected.

Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A-DQ(ZN)B2Y, central



Cable structure

Core type: Loose tube
 Strain relief elements: Glass yarns
 Type of armouring: Glass yarns
 Outer sheath material: PE
 Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -20°C
 Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
 Halogen-free acc. to 60754-2
 Longitudinally water-tight acc. to IEC 60794-1-2-F5
 UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ(ZN)B2Y	2	Multimode G50/125	2	10,0	2500	160,0	1,60	300	100,0	80196
A-DQ(ZN)B2Y	2	Multimode G62.5/125	2	10,0	2500	160,0	1,60	300	100,0	80212
A-DQ(ZN)B2Y	2	Single-mode E9/125	2	10,0	2500	160,0	1,60	300	100,0	80180
A-DQ(ZN)B2Y	4	Multimode G50/125	4	10,0	2500	160,0	1,60	300	100,0	80197
A-DQ(ZN)B2Y	4	Multimode G62.5/125	4	10,0	2500	160,0	1,60	300	100,0	80213
A-DQ(ZN)B2Y	4	Single-mode E9/125	4	10,0	2500	160,0	1,60	300	100,0	80181
A-DQ(ZN)B2Y	6	Multimode G50/125	6	10,0	2500	160,0	1,60	300	100,0	80198
A-DQ(ZN)B2Y	6	Multimode G62.5/125	6	10,0	2500	160,0	1,60	300	100,0	80214
A-DQ(ZN)B2Y	6	Single-mode E9/125	6	10,0	2500	160,0	1,60	300	100,0	80182
A-DQ(ZN)B2Y	8	Multimode G50/125	8	10,0	2500	160,0	1,60	300	100,0	80199
A-DQ(ZN)B2Y	8	Multimode G62.5/125	8	10,0	2500	160,0	1,60	300	100,0	80215
A-DQ(ZN)B2Y	8	Single-mode E9/125	8	10,0	2500	160,0	1,60	300	100,0	80183
A-DQ(ZN)B2Y	12	Multimode G50/125	12	10,0	2500	160,0	1,60	300	100,0	80201
A-DQ(ZN)B2Y	12	Multimode G62.5/125	12	10,0	2500	160,0	1,60	300	100,0	80217
A-DQ(ZN)B2Y	12	Single-mode E9/125	12	10,0	2500	160,0	1,60	300	100,0	80185
A-DQ(ZN)B2Y	16	Multimode G50/125	16	10,0	2500	180,0	1,80	300	130,0	80202
A-DQ(ZN)B2Y	16	Multimode G62.5/125	16	10,0	2500	180,0	1,80	300	130,0	80218
A-DQ(ZN)B2Y	16	Single-mode E9/125	16	10,0	2500	180,0	1,80	300	130,0	80186
A-DQ(ZN)B2Y	24	Multimode G50/125	24	10,0	2500	180,0	1,80	300	130,0	80204
A-DQ(ZN)B2Y	24	Multimode G62.5/125	24	10,0	2500	180,0	1,80	300	130,0	80220
A-DQ(ZN)B2Y	24	Single-mode E9/125	24	10,0	2500	180,0	1,80	300	130,0	80187

Dimensions and specifications may be changed without prior notice.

Application

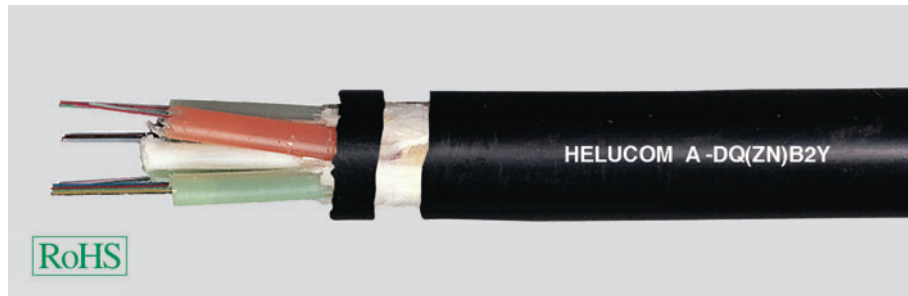
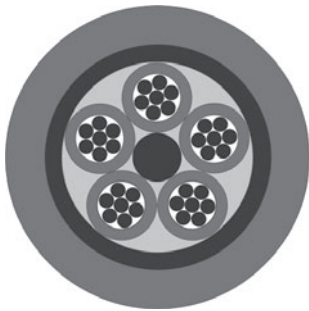
These HELUCOM® fibre-optic cables are characterized by a design that is particularly easy to mount and is rodent-protected. Around a central grooved cable, there is a composite of glass yarns and swelling fleece with characteristics that ensure rodent protection, strain relief, and waterproofing in longitudinal direction of the cable. In addition, these cables are designed grease-free. Wiping the jelly off is therefore unnecessary. This construction is particularly used in underground, tubes and channel areas, where normal tensile stresses and/or transverse compressions occur and rodent infestation is to be expected.

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Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM®
A-DQ(ZN)B2Y, stranded



Cable structure

Core type: Loose tube
GRP support element
Strain relief elements: Glass yarns
Type of armouring: Glass yarns
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ(ZN)B2Y	24	Multimode G50/125	12	10,5	2700	210,0	2,70	600	95,0	81382
A-DQ(ZN)B2Y	24	Multimode G62.5/125	12	10,5	2700	210,0	2,70	600	95,0	80219
A-DQ(ZN)B2Y	24	Single-mode E9/125	12	10,5	2700	210,0	2,70	600	95,0	80188
A-DQ(ZN)B2Y	36	Multimode G50/125	12	10,5	2700	210,0	2,70	600	95,0	81108
A-DQ(ZN)B2Y	36	Multimode G62.5/125	12	10,5	2700	210,0	2,70	600	95,0	81109
A-DQ(ZN)B2Y	36	Single-mode E9/125	12	10,5	2700	210,0	2,70	600	95,0	81110
A-DQ(ZN)B2Y	48	Multimode G50/125	12	10,5	2700	210,0	2,70	600	95,0	82648
A-DQ(ZN)B2Y	48	Multimode G62.5/125	12	10,5	2700	210,0	2,70	600	95,0	81112
A-DQ(ZN)B2Y	48	Single-mode E9/125	12	10,5	2700	210,0	2,70	600	95,0	81113
A-DQ(ZN)B2Y	60	Multimode G50/125	12	10,5	2700	210,0	2,70	600	95,0	80207
A-DQ(ZN)B2Y	60	Multimode G62.5/125	12	10,5	2700	210,0	2,70	600	95,0	80223
A-DQ(ZN)B2Y	60	Single-mode E9/125	12	10,5	2700	210,0	2,70	600	95,0	80191
A-DQ(ZN)B2Y	72	Multimode G50/125	12	11,0	2700	220,0	2,90	600	100,0	81133
A-DQ(ZN)B2Y	72	Multimode G62.5/125	12	11,0	2700	220,0	2,90	600	100,0	81134
A-DQ(ZN)B2Y	72	Single-mode E9/125	12	11,0	2700	220,0	2,90	600	100,0	81120
A-DQ(ZN)B2Y	84	Multimode G50/125	12	12,0	3000	240,0	3,60	600	140,0	80208
A-DQ(ZN)B2Y	84	Multimode G62.5/125	12	12,0	3000	240,0	3,60	600	140,0	80224
A-DQ(ZN)B2Y	84	Single-mode E9/125	12	12,0	3000	240,0	3,60	600	140,0	80192
A-DQ(ZN)B2Y	96	Multimode G50/125	12	12,0	3000	240,0	3,60	600	140,0	81135
A-DQ(ZN)B2Y	96	Multimode G62.5/125	12	12,0	3000	240,0	3,60	600	140,0	81136
A-DQ(ZN)B2Y	96	Single-mode E9/125	12	12,0	3000	240,0	3,60	600	140,0	81121
A-DQ(ZN)B2Y	108	Multimode G50/125	12	13,5	3000	270,0	4,30	600	155,0	80209
A-DQ(ZN)B2Y	108	Multimode G62.5/125	12	13,5	3000	270,0	4,30	600	155,0	80225
A-DQ(ZN)B2Y	108	Single-mode E9/125	12	13,5	3000	270,0	4,30	600	155,0	80193
A-DQ(ZN)B2Y	120	Multimode G50/125	12	13,5	3000	270,0	4,30	600	155,0	80210
A-DQ(ZN)B2Y	120	Multimode G62.5/125	12	13,5	3000	270,0	4,30	600	155,0	80226
A-DQ(ZN)B2Y	120	Single-mode E9/125	12	13,5	3000	270,0	4,30	600	155,0	80194
A-DQ(ZN)B2Y	144	Multimode G50/125	12	14,5	3000	290,0	5,40	600	200,0	80211
A-DQ(ZN)B2Y	144	Multimode G62.5/125	12	14,5	3000	290,0	5,40	600	200,0	80227
A-DQ(ZN)B2Y	144	Single-mode E9/125	12	14,5	3000	290,0	5,40	600	200,0	80195

Dimensions and specifications may be changed without prior notice.

Application

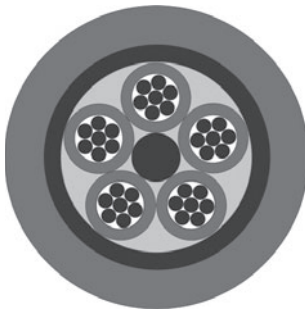
These HELUCOM® fibre-optic cables are characterized by a design that is particularly easy to mount, extremely tension-resistant and rodent-proof. Around a stranded grooved cable and filler elements, there is a composite of glass yarns and swelling fleece with characteristics that ensure rodent protection, strain relief, and waterproofing in longitudinal direction of the cable. In addition, these cables are designed grease-free. Wiping the jelly off is therefore unnecessary. This construction is particularly used in underground, tubes and channel areas, where above-average tensile stresses and/or transverse compressions occur and rodent infestation is to be expected.

Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM[®] pact

A-DQ(ZN)B2Y fibre combi, stranded



new

Cable structure

Core type: Loose tube
 GRP support element
 Strain relief elements: Glass yarns
 Type of armouring: Glass yarns
 Outer sheath material: PE
 Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -20°C
 Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
 Longitudinally water-tight acc. to IEC
 60794-1-2-F5
 UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ(ZN)B2Y	24	Single- and multimode G50/125	12	9,5	2500	200,0	2,50	400	90,0	803037
A-DQ(ZN)B2Y	24	Single- und Multimode G50/125 OM3	12	9,5	2500	200,0	2,50	400	90,0	803923
A-DQ(ZN)B2Y	48	Single- and multimode G50/125	12	9,5	2500	200,0	2,50	400	90,0	803038
A-DQ(ZN)B2Y	48	Single- und Multimode G50/125 OM3	12	9,5	2500	200,0	2,50	400	90,0	803924

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM[®] pact fibre-optic cables are characterized by a design that is particularly easy to mount, tension-resistant and rodent-proof. Around a stranded grooved cable and filler elements, there is a composite of glass yarns and swelling fleece with characteristics that ensure rodent protection, strain relief and waterproofing in longitudinal direction of the cable. In addition, these cables are designed grease-free. Wiping the jelly off is therefore unnecessary. This construction is particularly used in underground, tubes and channel areas, where packing density also plays a role.

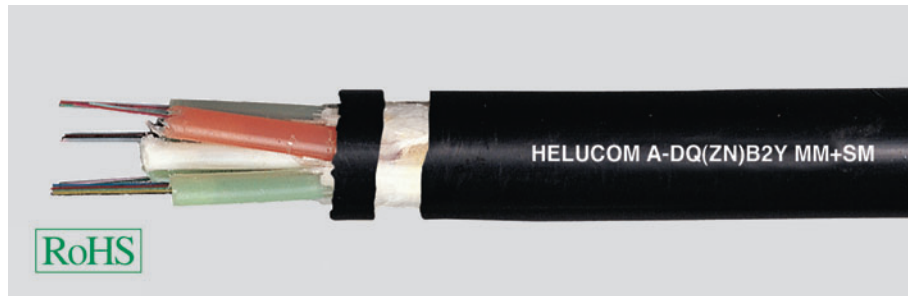
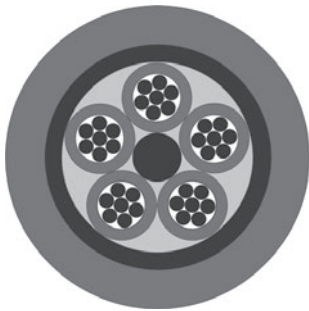
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Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A-DQ(ZN)B2Y fibre combi, stranded



Cable structure

Core type: Loose tube
 GRP support element
 Strain relief elements: Glass yarns
 Type of armouring: Glass yarns
 Outer sheath material: PE
 Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -20°C
 Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
 Halogen-free acc. to 60754-2
 Longitudinally water-tight acc. to IEC 60794-1-2-F5
 UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ(ZN)B2Y	24	Single- and multimode G50/125	12	10,5	2700	200,0	2,70	600	95,0	81478
A-DQ(ZN)B2Y	48	Single- and multimode G50/125	12	10,5	2700	200,0	2,70	600	95,0	801183

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® fibre-optic cables are characterized by a design that is particularly easy to mount, extremely tension-resistant and rodent-proof. Around a stranded grooved cable and filler elements, there is a composite of glass yarns and swelling fleece with characteristics that ensure rodent protection, strain relief and waterproofing in longitudinal direction of the cable. In addition, these cables are designed grease-free. Wiping the jelly off is therefore unnecessary. This construction is particularly used in underground, tubes and channel areas, where above-average tensile stresses and/or transverse compressions occur and rodent infestation is to be expected.

Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A-DF(ZN)2Y



Cable structure

Core type: Loose tube
GRP support element
Strain relief elements: Aramide
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DF(ZN)2Y	2	Multimode G50/125	2	9,5	2500	95,0	4,20	400	85,0	80016
A-DF(ZN)2Y	2	Multimode G62.5/125	2	9,5	2500	95,0	4,20	400	85,0	80033
A-DF(ZN)2Y	2	Single-mode E9/125	2	9,5	2500	95,0	4,20	400	85,0	80000
A-DF(ZN)2Y	4	Multimode G50/125	4	9,5	2500	95,0	4,20	400	85,0	80017
A-DF(ZN)2Y	4	Multimode G62.5/125	4	9,5	2500	95,0	4,20	400	85,0	80034
A-DF(ZN)2Y	4	Single-mode E9/125	4	9,5	2500	95,0	4,20	400	85,0	80001
A-DF(ZN)2Y	8	Multimode G50/125	8	9,5	2500	95,0	4,20	400	85,0	80019
A-DF(ZN)2Y	8	Multimode G62.5/125	8	9,5	2500	95,0	4,20	400	85,0	80036
A-DF(ZN)2Y	8	Single-mode E9/125	8	9,5	2500	95,0	4,20	400	85,0	80003
A-DF(ZN)2Y	12	Multimode G50/125	12	9,5	2500	95,0	4,20	400	85,0	80021
A-DF(ZN)2Y	12	Multimode G62.5/125	12	9,5	2500	95,0	4,20	400	85,0	80038
A-DF(ZN)2Y	12	Single-mode E9/125	12	9,5	2500	95,0	4,20	400	85,0	80005
A-DF(ZN)2Y	24	Multimode G50/125	12	9,5	2700	95,0	4,00	400	85,0	80024
A-DF(ZN)2Y	24	Multimode G62.5/125	12	9,5	2700	95,0	4,00	400	85,0	80041
A-DF(ZN)2Y	24	Single-mode E9/125	12	9,5	2700	95,0	4,00	400	85,0	80008
A-DF(ZN)2Y	36	Multimode G50/125	12	9,5	2700	95,0	4,00	400	85,0	80912
A-DF(ZN)2Y	36	Multimode G62.5/125	12	9,5	2700	95,0	4,00	400	85,0	80913
A-DF(ZN)2Y	36	Single-mode E9/125	12	9,5	2700	95,0	4,00	400	85,0	80914
A-DF(ZN)2Y	48	Multimode G50/125	12	9,5	2700	95,0	4,00	400	85,0	80026
A-DF(ZN)2Y	48	Multimode G62.5/125	12	9,5	2700	95,0	4,00	400	85,0	80046
A-DF(ZN)2Y	48	Single-mode E9/125	12	9,5	2700	95,0	4,00	400	85,0	80010
A-DF(ZN)2Y	60	Multimode G50/125	12	9,5	2700	95,0	4,00	400	85,0	80027
A-DF(ZN)2Y	60	Multimode G62.5/125	12	9,5	2700	95,0	4,00	400	85,0	80047
A-DF(ZN)2Y	60	Single-mode E9/125	12	9,5	2700	95,0	4,00	400	85,0	80011
A-DF(ZN)2Y	72	Multimode G50/125	12	10,0	2700	100,0	3,80	400	90,0	80473
A-DF(ZN)2Y	72	Multimode G62.5/125	12	10,0	2700	100,0	3,80	400	90,0	80474
A-DF(ZN)2Y	72	Single-mode E9/125	12	10,0	2700	100,0	3,80	400	90,0	80475
A-DF(ZN)2Y	84	Multimode G50/125	12	10,7	3000	107,0	4,30	400	120,0	80028
A-DF(ZN)2Y	84	Multimode G62.5/125	12	10,7	3000	107,0	4,30	400	120,0	80048
A-DF(ZN)2Y	84	Single-mode E9/125	12	10,7	3000	107,0	4,30	400	120,0	80012
A-DF(ZN)2Y	96	Multimode G50/125	12	11,5	3000	115,0	5,00	400	135,0	80777
A-DF(ZN)2Y	96	Multimode G62.5/125	12	11,5	3000	115,0	5,00	400	135,0	80774
A-DF(ZN)2Y	96	Single-mode E9/125	12	11,5	3000	115,0	5,00	400	135,0	80764
A-DF(ZN)2Y	144	Multimode G50/125	12	14,5	3000	145,0	7,70	400	175,0	80032
A-DF(ZN)2Y	144	Multimode G62.5/125	12	14,5	3000	145,0	7,70	400	175,0	80051
A-DF(ZN)2Y	144	Single-mode E9/125	12	14,5	3000	145,0	7,70	400	175,0	80015

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® fibre-optic cables are characterized by a stranded construction with jelly filling. They are made waterproof in longitudinal direction by filling a jelly mass into the stranding cavities. Non-metallic tension elements ensure above average strain relief. This construction is particularly used in the area of telecommunication and long distance, but also in regular channels and tubes.

Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A-DF(ZN)B2Y



Cable structure

Core type: Loose tube
GRP support element
Strain relief elements: Aramide
Type of armouring: Glass yarns
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DF(ZN)B2Y	2	Multimode G50/125	2	10,5	2500	105,0	4,40	400	90,0	80100
A-DF(ZN)B2Y	2	Multimode G62.5/125	2	10,5	2700	105,0	4,40	400	90,0	80115
A-DF(ZN)B2Y	2	Single-mode E9/125	2	10,5	2700	105,0	4,40	400	90,0	80084
A-DF(ZN)B2Y	4	Multimode G50/125	4	10,5	2700	105,0	4,40	400	90,0	80101
A-DF(ZN)B2Y	4	Multimode G62.5/125	4	10,5	2700	105,0	4,40	400	90,0	80116
A-DF(ZN)B2Y	4	Single-mode E9/125	4	10,5	2700	105,0	4,40	400	90,0	80085
A-DF(ZN)B2Y	8	Multimode G50/125	8	10,5	2700	105,0	4,40	400	90,0	80031
A-DF(ZN)B2Y	8	Multimode G62.5/125	8	10,5	2700	105,0	4,40	400	90,0	80771
A-DF(ZN)B2Y	8	Single-mode E9/125	8	10,5	2700	105,0	4,40	400	90,0	80087
A-DF(ZN)B2Y	12	Multimode G50/125	12	10,5	2700	105,0	4,40	400	90,0	80104
A-DF(ZN)B2Y	12	Multimode G62.5/125	12	10,5	2700	105,0	4,40	400	90,0	80120
A-DF(ZN)B2Y	12	Single-mode E9/125	12	10,5	2700	105,0	4,40	400	90,0	80089
A-DF(ZN)B2Y	24	Multimode G50/125	12	10,5	2700	105,0	4,40	400	90,0	80059
A-DF(ZN)B2Y	24	Multimode G62.5/125	12	10,5	2700	105,0	4,40	400	90,0	80123
A-DF(ZN)B2Y	24	Single-mode E9/125	12	10,5	2700	105,0	4,40	400	90,0	80092
A-DF(ZN)B2Y	36	Multimode G50/125	12	10,5	2700	105,0	4,30	400	90,0	81137
A-DF(ZN)B2Y	36	Multimode G62.5/125	12	10,5	2700	105,0	4,30	400	90,0	81138
A-DF(ZN)B2Y	36	Single-mode E9/125	12	10,5	2700	105,0	4,30	400	90,0	81139
A-DF(ZN)B2Y	48	Multimode G50/125	12	10,5	2700	105,0	4,20	400	90,0	80109
A-DF(ZN)B2Y	48	Multimode G62.5/125	12	10,5	2700	105,0	4,20	400	90,0	80125
A-DF(ZN)B2Y	48	Single-mode E9/125	12	10,5	2700	105,0	4,20	400	90,0	80094
A-DF(ZN)B2Y	60	Multimode G50/125	12	10,5	2700	105,0	4,20	400	90,0	80110
A-DF(ZN)B2Y	60	Multimode G62.5/125	12	10,5	2700	105,0	4,20	400	90,0	80126
A-DF(ZN)B2Y	60	Single-mode E9/125	12	10,5	2700	105,0	4,20	400	90,0	80095
A-DF(ZN)B2Y	72	Multimode G50/125	12	11,0	2700	110,0	4,10	400	95,0	81143
A-DF(ZN)B2Y	72	Multimode G62.5/125	12	11,0	2700	110,0	4,10	400	95,0	81144
A-DF(ZN)B2Y	72	Single-mode E9/125	12	11,0	2700	110,0	4,10	400	95,0	81145
A-DF(ZN)B2Y	84	Multimode G50/125	12	11,5	3000	115,0	4,60	400	136,0	80111
A-DF(ZN)B2Y	84	Multimode G62.5/125	12	11,5	3000	115,0	4,60	400	136,0	80127
A-DF(ZN)B2Y	84	Single-mode E9/125	12	11,5	3000	115,0	4,60	400	136,0	80096
A-DF(ZN)B2Y	96	Multimode G50/125	12	12,0	3000	120,0	5,30	400	155,0	81147
A-DF(ZN)B2Y	96	Multimode G62.5/125	12	12,0	3000	120,0	5,30	400	155,0	81148
A-DF(ZN)B2Y	96	Single-mode E9/125	12	12,0	3000	120,0	5,30	400	155,0	81149
A-DF(ZN)B2Y	144	Multimode G50/125	12	14,5	3000	145,0	8,00	400	228,0	80114
A-DF(ZN)B2Y	144	Multimode G62.5/125	12	14,5	3000	145,0	8,00	400	228,0	80130
A-DF(ZN)B2Y	144	Single-mode E9/125	12	14,5	3000	145,0	8,00	400	228,0	80099

Dimensions and specifications may be changed without prior notice.

Application

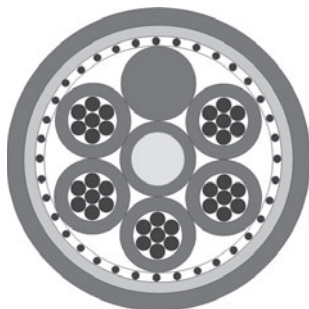
These HELUCOM® fibre-optic cables are characterized by a stranded construction with jelly filling. They are made waterproof in longitudinal direction by filling a jelly mass into the stranding cavities. Non-metallic tension elements and glass yarns ensure above average strain relief and rodent protection. This construction is particularly used in the area of telecommunication and long distance, but also in regular channels and tubes where rodent infestation is possible.

Fibre Optic Outdoor Cable

acc. DIN VDE 0888

HELUCOM®

A-DF(ZN)2Y4Y



Cable structure

Core type: Loose tube
GRP support element
Strain relief elements: Aramide
Inner sheath material: PE
Type of armouring: PA sheath
Outer sheath material: PA
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
Cable, laterally water-tight
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DF(ZN)2Y4Y	2	Multimode G50/125	2	10,0	2500	100,0	6,10	400	90,0	80915
A-DF(ZN)2Y4Y	2	Multimode G62.5/125	2	10,0	2700	100,0	6,10	400	90,0	80927
A-DF(ZN)2Y4Y	2	Single-mode E9/125	2	10,0	2700	100,0	6,10	400	90,0	80945
A-DF(ZN)2Y4Y	4	Multimode G50/125	4	10,0	2700	100,0	6,10	400	90,0	80735
A-DF(ZN)2Y4Y	4	Multimode G62.5/125	4	10,0	2700	100,0	6,10	400	90,0	80928
A-DF(ZN)2Y4Y	4	Single-mode E9/125	4	10,0	2700	100,0	6,10	400	90,0	80895
A-DF(ZN)2Y4Y	8	Multimode G50/125	8	10,0	2700	100,0	6,10	400	90,0	80691
A-DF(ZN)2Y4Y	8	Multimode G62.5/125	8	10,0	2700	100,0	6,10	400	90,0	80809
A-DF(ZN)2Y4Y	8	Single-mode E9/125	8	10,0	2700	100,0	6,10	400	90,0	80118
A-DF(ZN)2Y4Y	12	Multimode G50/125	12	10,0	2700	100,0	6,10	400	90,0	80627
A-DF(ZN)2Y4Y	12	Multimode G62.5/125	12	10,0	2700	100,0	6,10	400	90,0	80931
A-DF(ZN)2Y4Y	12	Single-mode E9/125	12	10,0	2700	100,0	6,10	400	90,0	80947
A-DF(ZN)2Y4Y	24	Multimode G50/125	12	10,0	2700	100,0	6,10	400	90,0	80578
A-DF(ZN)2Y4Y	24	Multimode G62.5/125	12	10,0	2700	100,0	6,10	400	90,0	80576
A-DF(ZN)2Y4Y	24	Single-mode E9/125	12	10,0	2700	100,0	6,10	400	90,0	80577
A-DF(ZN)2Y4Y	36	Multimode G50/125	12	10,0	2700	100,0	6,00	400	90,0	80672
A-DF(ZN)2Y4Y	36	Multimode G62.5/125	12	10,0	2700	100,0	6,00	400	90,0	80935
A-DF(ZN)2Y4Y	36	Single-mode E9/125	12	10,0	2700	100,0	6,00	400	90,0	80950
A-DF(ZN)2Y4Y	48	Multimode G50/125	12	10,0	2700	100,0	6,00	400	90,0	80732
A-DF(ZN)2Y4Y	48	Multimode G62.5/125	12	10,0	2700	100,0	6,00	400	90,0	80936
A-DF(ZN)2Y4Y	48	Single-mode E9/125	12	10,0	2700	100,0	6,00	400	90,0	80951
A-DF(ZN)2Y4Y	60	Multimode G50/125	12	10,0	2700	100,0	5,80	400	90,0	80920
A-DF(ZN)2Y4Y	60	Multimode G62.5/125	12	10,0	2700	100,0	5,80	400	90,0	80938
A-DF(ZN)2Y4Y	72	Multimode G50/125	12	10,5	2700	105,0	5,80	400	95,0	80921
A-DF(ZN)2Y4Y	72	Multimode G62.5/125	12	10,5	2700	105,0	5,80	400	95,0	80939
A-DF(ZN)2Y4Y	72	Single-mode E9/125	12	10,5	2700	105,0	5,80	400	95,0	80954
A-DF(ZN)2Y4Y	84	Multimode G50/125	12	11,0	3000	110,0	8,40	400	110,0	80922
A-DF(ZN)2Y4Y	84	Multimode G62.5/125	12	11,0	3000	110,0	8,40	400	110,0	80940
A-DF(ZN)2Y4Y	84	Single-mode E9/125	12	11,0	3000	110,0	8,40	400	110,0	80955
A-DF(ZN)2Y4Y	96	Multimode G50/125	12	11,5	3000	115,0	7,20	400	120,0	80923
A-DF(ZN)2Y4Y	96	Multimode G62.5/125	12	11,5	3000	115,0	7,20	400	120,0	80941
A-DF(ZN)2Y4Y	96	Single-mode E9/125	12	11,5	3000	115,0	7,20	400	120,0	80956
A-DF(ZN)2Y4Y	144	Multimode G50/125	12	14,5	3000	145,0	10,40	400	180,0	80926
A-DF(ZN)2Y4Y	144	Multimode G62.5/125	12	14,5	3000	145,0	10,40	400	180,0	80944
A-DF(ZN)2Y4Y	144	Single-mode E9/125	12	14,5	3000	145,0	10,40	400	180,0	80959

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® fibre-optic cables are characterized by a stranded construction with jelly filling. They are made waterproof in longitudinal direction by filling a jelly mass into the stranding cavities. Non-metallic tension elements and a second outer sheath made of polyamide (PA) ensure above average strain relief and rodent protection. This construction is particularly used in the area of telecommunication and long distance, but also in regular channels and tubes where rodent infestation is possible.

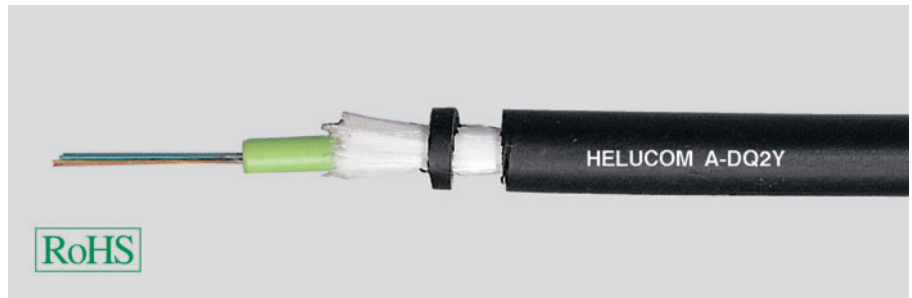
Fibre Optic Outdoor Cable

Microduct

HELUCOM®

A-DQ2Y, central

new



Cable structure

Core type: Loose tube
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -20°C
Laying, max.: +60°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ2Y central	4	Single-mode E9/125	4	2,5	180	25,0	1,40	200	6,0	803664
A-DQ2Y central	12	Single-mode E9/125	12	2,5	180	25,0	1,40	200	6,0	803929

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® micro fibre-optic cables are characterized by a design that is slim but robust. Around a central tube, there is a composite of swelling fleece with characteristics that ensure the strain relief, and waterproofing in longitudinal direction of the cable. This construction is particularly used in tubes and channels. These cables can be blowing into microducts.

Fibre Optic Outdoor Cable

Microduct

HELUCOM®

A-DQ2Y, stranded



new

Cable structure

Core type: Loose tube
GRP support element
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -30°C
Laying, max.: +60°C
Operating, min.: -30°C
Operating, max.: +70°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ2Y stranded	4	Single-mode E9/125	4	6,0	700	60,0	0,87	100	28,0	803931
A-DQ2Y stranded	12	Single-mode E9/125	12	6,0	700	60,0	0,87	100	28,0	803932
A-DQ2Y stranded	24	Single-mode E9/125	12	6,0	700	60,0	0,00	100	28,0	803930
A-DQ2Y stranded	48	Single-mode E9/125	12	6,0	700	60,0	0,867	100	28,0	803658
A-DQ2Y stranded	72	Single-mode E9/125	12	6,0	700	60,0	0,867	100	28,0	803659
A-DQ2Y stranded	96	Single-mode E9/125	12	7,2	1000	72,0	1,245	100	44,0	803660
A-DQ2Y stranded	144	Single-mode E9/125	12	9,7	1200	97,0	2,189	100	77,0	803661
A-DQ2Y stranded	288	Single-mode E9/125	12	11,2	1500	115,0	2,97	100	90,0	803668

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® micro fibre-optic cables are characterized by a design that is slim but robust. Around stranded tubes, there is a composite of swelling fleece with characteristics that ensure the strain relief, and waterproofing in longitudinal direction of the cable. This construction is particularly used in tubes and channels. These cables can be blowing into microducts.

R

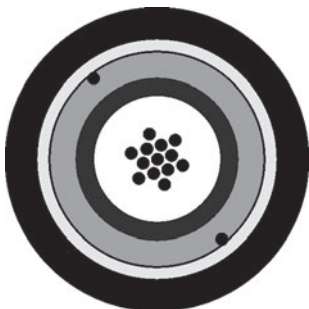
Fibre Optic Outdoor Cable

steel armoured

HELUCOM®

A-DQ(ZN)(SR)2Y

new



Cable structure

Core type: Loose tube
Strain relief elements: Glass yarns
Type of armouring: Steel rib
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +70°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
Cable, laterally water-tight
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DQ(ZN)(SR)2Y	4	Multimode G50/125	4	9,5	1500	95,0	2,00	500	115,0	802917
A-DQ(ZN)(SR)2Y	4	Multimode G62.5/125	4	9,5	1500	95,0	2,00	500	115,0	803925
A-DQ(ZN)(SR)2Y	4	Single-mode E9/125	4	9,5	1500	95,0	2,00	500	105,0	803927
A-DQ(ZN)(SR)2Y	12	Multimode G50/125	12	9,5	1500	95,0	2,00	500	115,0	802918
A-DQ(ZN)(SR)2Y	12	Multimode G62.5/125	12	9,5	1500	95,0	2,00	500	115,0	803926
A-DQ(ZN)(SR)2Y	12	Single-mode E9/125	12	9,5	1500	95,0	2,00	500	115,0	803928

Dimensions and specifications may be changed without prior notice.

Application

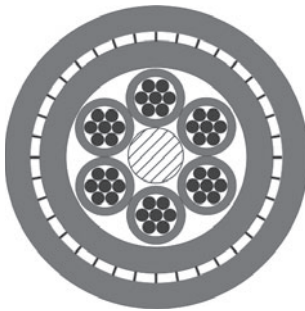
These HELUCOM® fibre-optic cables are characterized by a compact construction with a swelling fleece. Above-average rodent protection is achieved with the metallic rodent protection (steel groove) and an outer sheath made of PE. This construction is particularly used in the area of telecommunication and long distance, but also in regular channels and tubes where rodent infestation is possible.

Fibre Optic Outdoor Cable

acc. ARCOR Standard

HELUCOM®

A-DF(ZN)2Y(SR)2Y



Cable structure

Core type: Loose tube
 GRP support element
 Strain relief elements: Aramide
 Inner sheath material: PE
 Type of armouring: Steel rib
 Outer sheath material: PE
 Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -25°C
 Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
 Halogen-free acc. to 60754-2
 Longitudinally water-tight acc. to IEC 60794-1-2-F5
 Cable, laterally water-tight
 UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DF(ZN)2Y(SR)2Y	12	Single-mode E9/125	2	13,0	2700	130,0	800	180	82190
A-DF(ZN)2Y(SR)2Y	24	Single-mode E9/125	4	13,0	2700	130,0	800	180	800708
A-DF(ZN)2Y(SR)2Y	48	Single-mode E9/125	12	13,0	2700	130,0	800	180	800709
A-DF(ZN)2Y(SR)2Y	60	Single-mode E9/125	12	13,0	2700	130,0	800	180	800710

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® fibre-optic cables are characterized by a stranded construction with jelly filling. They are made waterproof in longitudinal direction by filling a jelly mass into the stranding cavities. Above-average rodent protection is achieved with the metallic rodent protection (steel groove) and the second outer sheath made of PE. This construction is particularly used in the area of telecommunication and long distance where ARCOR standards must be followed, but also in regular channels and tubes where rodent infestation is possible.

R

Fibre Optic Outdoor Cable Hybrid

acc. DIN VDE 0888

HELUCOM®

A-DSQ(ZN)B2Y



Cable structure

Core type: Loose tube
 GRP support element
 Number of fibres per core: 4
 Strain relief elements: Glass yarns
 Type of armouring: Glass yarns
 Outer sheath material: PE
 Outer sheath colour: Black

Temperature range

Laying, min.: -10°C
 Laying, max.: +60°C
 Operating, min.: -25°C
 Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
 Longitudinally water-tight acc. to IEC 60794-1-2-F5
 UV-resistant

Designation	No. of fibres	Fibre type	No. of copper cores	Dimensions of copper cores mm	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DSQ(ZN)B2Y	4	Multimode G50/125	2	1,2	12,0	2100	300	4,80	200	140,0	81209
A-DSQ(ZN)B2Y	4	Multimode G62.5/125	2	1,2	12,0	2100	300	4,80	200	140,0	81255
A-DSQ(ZN)B2Y	4	Single-mode E9/125	2	1,2	12,0	2100	300	4,80	200	140,0	81256
A-DSQ(ZN)B2Y	4	Multimode G50/125	2	1,5	12,5	2300	320	4,80	200	160,0	82561
A-DSQ(ZN)B2Y	4	Multimode G62.5/125	2	1,5	12,5	2300	320	4,80	200	160,0	81257
A-DSQ(ZN)B2Y	4	Single-mode E9/125	2	1,5	12,5	2300	320	4,80	200	160,0	81258
A-DSQ(ZN)B2Y	4	Multimode G50/125	4	1,5	17,0	2600	430	5,80	200	250,0	82786
A-DSQ(ZN)B2Y	4	Multimode G62.5/125	4	1,5	17,0	2600	430	5,80	200	250,0	81259
A-DSQ(ZN)B2Y	4	Single-mode E9/125	4	1,5	17,0	2600	430	5,80	200	250,0	81260

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® fibre-optic cables are designed especially for use in fibre-optical temperature measurements, such as monitoring of dams. The extreme mechanical requirements in these areas are fulfilled by the specially designed cable construction. These lines are hybrid glass fibre lines with copper cores and a special PE outer sheath.

Typical application within a coffer-dam

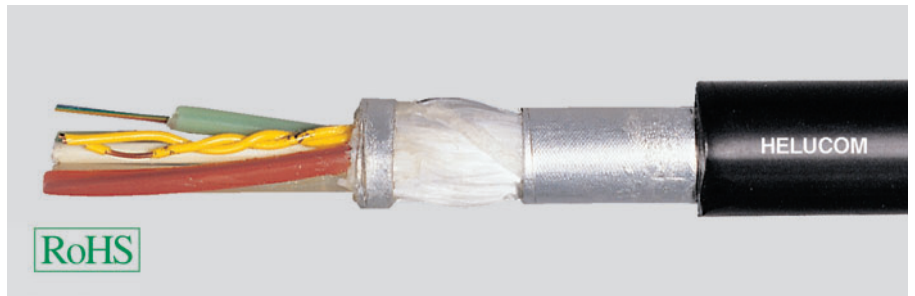
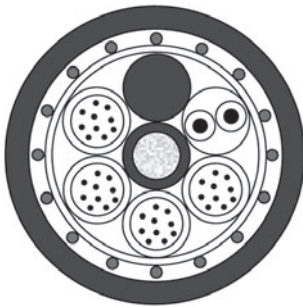


Fibre Optic Outdoor Cable Hybrid

acc. DIN VDE 0888

HELUCOM®

A-DSF(L)(Z)N)2Y



Cable structure

Core type: Loose tube
GRP support element
Number of fibres per core: 2
Strain relief elements: Aramide
Aluminium laminated sheath
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -25°C
Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
Cable, laterally water-tight
UV-resistant

Designation	No. of fibres	Fibre type	No. of copper cores	Dimensions of copper cores mm	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A-DSF(L)(Z)N)2Y	12	Single-mode E9/125	2	0,6	12,0	2500	200	4,80	250	135,0	80495
A-DSF(L)(Z)N)2Y	12	Single-mode E9/125	4	0,6	12,0	2500	200	4,80	250	140,0	80497
A-DSF(L)(Z)N)2Y	24	Single-mode E9/125	2	0,6	13,1	2500	200	4,80	250	139,0	800753
A-DSF(L)(Z)N)2Y	24	Single-mode E9/125	4	0,6	13,1	2500	200	4,80	250	144,0	801182
A-DSF(L)(Z)N)2Y	48	Single-mode E9/125	2	0,6	13,1	2500	200	4,80	250	141,0	80501
A-DSF(L)(Z)N)2Y	48	Single-mode E9/125	4	0,6	13,1	2500	200	4,80	250	146,0	80503
A-DSF(L)(Z)N)2Y	60	Single-mode E9/125	2	0,6	14,1	2500	230	4,80	250	166,0	80504
A-DSF(L)(Z)N)2Y	60	Single-mode E9/125	4	0,6	14,1	2500	230	4,80	250	171,0	80506
A-DSF(L)(Z)N)2Y	72	Single-mode E9/125	2	0,6	14,8	2500	240	5,10	250	179,0	80507
A-DSF(L)(Z)N)2Y	72	Single-mode E9/125	4	0,6	14,8	2500	240	5,10	250	184,0	80509
A-DSF(L)(Z)N)2Y	96	Single-mode E9/125	2	0,6	16,6	3000	280	6,30	250	276,0	80510
A-DSF(L)(Z)N)2Y	96	Single-mode E9/125	4	0,6	16,6	3000	280	6,30	250	281,0	80512
A-DSF(L)(Z)N)2Y	120	Single-mode E9/125	2	0,6	18,4	3000	290	8,50	250	280,0	80513
A-DSF(L)(Z)N)2Y	120	Single-mode E9/125	4	0,6	18,4	3000	290	8,50	250	285,0	80515
A-DSF(L)(Z)N)2Y	144	Single-mode E9/125	2	0,6	20,3	3500	310	10,00	250	331,0	80516
A-DSF(L)(Z)N)2Y	144	Single-mode E9/125	4	0,6	20,3	3500	310	10,00	250	336,0	80518

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® outdoor cables are designed for use under extreme environmental conditions. With the double jelly filling and the Al/PE laminated sheath, they are water proof in longitudinal and transverse direction. The welded Al tape acts as an additional vapour barrier. These cables can be layed directly in the ground, in tubes and in ducts. They are mainly used in local and long-distance networks.

R

Aerial Fibre Optic Cable

metall free

HELUCOM®

ADSS



Cable structure

Core type: Loose tube
GRP support element
Strain relief elements: Aramide
Inner sheath material: PE
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -10°C
Laying, max.: +60°C
Operating, min.: -25°C
Operating, max.: +70°C

Other data

Sag at 25 °C ADSS 9: 2,0 m
Sag at 25 °C ADSS 16: 4,5 m
Sag at 25 °C ADSS 35: 9,5 m
Halogen-free acc. to 60754-2
Longitudinally water-tight acc. to IEC 60794-1-2-F5
Cable, laterally water-tight
UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Span width m	Max. tensile force N	Additional load daN / m	Min. stat. bending radius mm	Outer Ø approx. mm	Weight kg / km	Part no.
ADSS 9	12	Single-mode E9/125	4	150	9	0,5	410	13,6	135	82390
ADSS 9	24	Single-mode E9/125	4	150	9	0,5	410	13,6	137	82391
ADSS 9	36	Single-mode E9/125	6	150	9	0,5	470	15,6	177	82392
ADSS 9	48	Single-mode E9/125	8	150	9	0,5	470	15,6	178	82393
ADSS 9	60	Single-mode E9/125	12	150	9	0,5	450	15,0	161	82394
ADSS 9	144	Single-mode E9/125	12	150	9	0,5	630	20,8	316	82395
ADSS 16	12	Single-mode E9/125	4	350	16	0,3	430	14,4	162	82396
ADSS 16	24	Single-mode E9/125	4	350	16	0,3	430	14,4	165	82397
ADSS 16	36	Single-mode E9/125	6	350	16	0,3	500	16,4	200	82398
ADSS 16	48	Single-mode E9/125	8	350	16	0,3	500	16,4	201	82399
ADSS 16	60	Single-mode E9/125	12	350	16	0,3	480	15,8	184	82400
ADSS 16	144	Single-mode E9/125	12	350	16	0,3	650	21,6	333	82401
ADSS 35	12	Single-mode E9/125	4	700	35	0,35	520	17,2	198	82402
ADSS 35	24	Single-mode E9/125	4	700	35	0,35	520	17,2	200	82403
ADSS 35	36	Single-mode E9/125	6	700	35	0,35	580	19,2	240	82404
ADSS 35	48	Single-mode E9/125	8	700	35	0,35	580	19,2	241	82405
ADSS 35	60	Single-mode E9/125	12	700	35	0,35	560	18,6	227	82406
ADSS 35	144	Single-mode E9/125	12	700	35	0,35	730	24,4	381	82407

Dimensions and specifications may be changed without prior notice.

Application

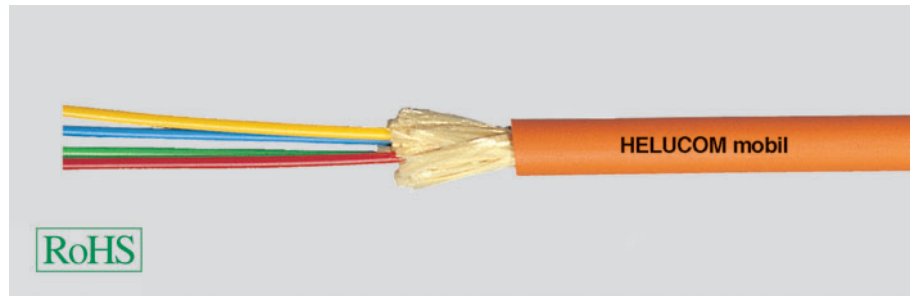
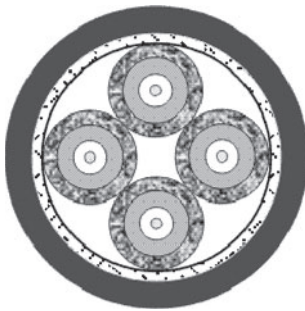
These HELUCOM® outdoor cables designed as aerial cables for freely suspended installations on posts and masts. The construction is waterproof in longitudinal direction thanks to the use of jelly-filled bundle cores and swelling tape. The outer jacket is UV-resistant and at the same time provides protection against environmental influences, such as snow, ice, sun insolation and wind.

Fibre Optic Cable flexible

WK - mobile

HELUCOM®

A-V(ZN)11Y



Cable structure

Core type: Tight buffer
Strain relief elements: Kevlar
Outer sheath colour: Orange

Temperature range

Laying, min.: +5°C
Laying, max.: +50°C
Operating, min.: -30°C
Operating, max.: +70°C

Other data

Max. tensile force: 650 N
Max. transverse pressure: 40 N / cm
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant
Resistant to hammer impact acc. to IEC 60794-1-2-E6
Bending cycles acc. to IEC 60794-1-2-E6: 500.000
Oil-resistant

Designation	Number of Fibre type fibres		Outer Ø approx. mm	Outer sheath material	Inner sheath material	Min. stat. bending radius mm	Flame proof	halogen-free	UL	Weight kg / km	Part no.
Fibre-optic cable	2	Multimode G50/125	5,0	PUR	-	75	yes	yes	no	20	80382
Fibre-optic cable	2	Multimode G62.5/125	5,0	PUR	-	75	yes	yes	no	20	80363
Fibre-optic cable	4	Multimode G50/125	5,8	PUR	-	90	yes	yes	no	31	80534
Fibre-optic cable	4	Multimode G62.5/125	5,8	PUR	-	90	yes	yes	no	31	81036
Fibre-optic cable	4	Single-mode E9/125	5,8	PUR	-	90	yes	yes	no	31	801727
Fibre-optic cable	8	Multimode G50/125	7,0	PUR	-	105	yes	yes	no	47	81037
Fibre-optic cable	8	Multimode G62.5/125	7,0	PUR	-	105	yes	yes	no	47	81038

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® cables were designed as mobile field cables. They are easily wound up on a drum and are very tension-proof. As the outer sheath is tightly anchored on the aramid braiding, it is especially suitable for mobile use. The advantage of these cables is evident especially where mobile fibre-optic lines are to be installed, such as for drag chains, TV transmission, supervision of protected areas, etc.

R

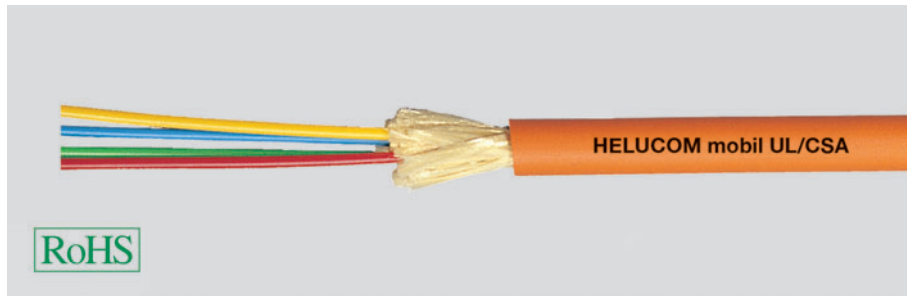
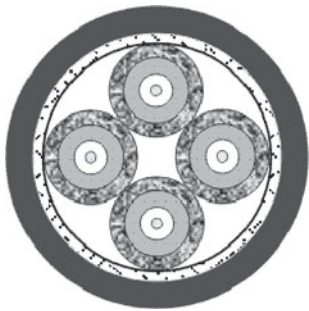
Fibre Optic Cable flexible

WK - UL/CSA

HELUCOM® WK

A-V(ZN)Y

new



Cable structure

Core type: Tight buffer
Strain relief elements: Aramide
Outer sheath colour: Orange

Temperature range

Laying, min.: 0°C
Laying, max.: +50°C
Operating, min.: -30°C
Operating, max.: +80°C

Other data

Max. tensile force: 1200 N
Max. transverse pressure: 44 N / cm
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant
Bending cycles acc. to IEC 60794-1-2-E6: 9.000
Oil-resistant

Designation	Number of Fibre type fibres		Outer Ø approx. mm	Outer sheath material	Inner sheath material	Min. stat. bending radius mm	Flame proof	halogen-free	UL	Weight kg / km	Part no.
Fibre-optic cable	4	Multimode G50/125	7,0	PVC	-	75	yes	no	yes	50	802792
Fibre-optic cable	4	Multimode G62.5/125	7,0	PVC	-	75	yes	no	yes	50	803934
Fibre-optic cable	4	Single-mode E9/125	7,0	PVC	-	75	yes	no	yes	50	803935

Dimensions and specifications may be changed without prior notice.

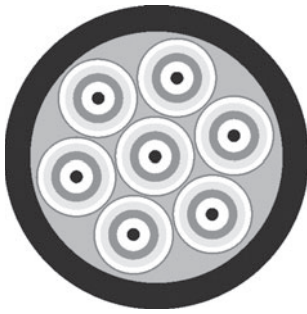
Application

These HELUCOM® cables were designed as mobile field cables. They are easily wound up on a drum and are very tension-proof. As the outer sheath is tightly anchored on the aramid braiding, it is especially suitable for mobile use. The advantage of these cables is evident especially where mobile fibre-optic lines are to be installed, such as windturbine projects, TV transmission, supervision of protected areas, etc.. This series with PVC jacket is certified according to the UL/CSA standard OFNG/ FT4.

Fibre Optic Cable flexible

WK robust PUR + PVC (UL/CSA)

HELUCOM® WK
AT-V(ZN)H(ZN)11Y, AT-V(ZN)Y(ZN)Y



new

Cable structure

Core type: Composite buffered
Strain relief elements: Aramide
Outer sheath colour: Black

Temperature range

Laying, min.: -10°C
Laying, max.: +50°C
Operating, min.: -40°C
Operating, max.: +90°C

Other data

Max. tensile force: 4800 N
Max. transverse pressure: 200 N / cm
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant
Resistant to hammer impact acc. to IEC 60794-1-2-E6
Bending cycles acc. to IEC 60794-1-2-E6: 9.000
Oil-resistant

Designation	Number of Fibre type fibres		Outer Ø approx. mm	Outer sheath material	Inner sheath material	Min. stat. bending radius mm	Flame proof	halogen-free	UL	Weight kg / km	Part no.
AT-V(ZN)H(ZN)11Y	4	Multimode G50/125	8,5	PUR	ULSZH	100	yes	yes	no	125	803346
AT-V(ZN)Y(ZN)Y	4	Multimode G50/125	8,5	PVC	PVC	130	yes	no	yes	125	803348
AT-V(ZN)H(ZN)11Y	12	Multimode G50/125	12,4	PUR	ULSZH	190	yes	yes	no	320	803347
AT-V(ZN)Y(ZN)Y	12	Multimode G50/125	12,4	PVC	PVC	190	yes	no	yes	320	803349

Dimensions and specifications may be changed without prior notice.

Application

The HELUCOM® WK range is set apart by its extreme rugged yet highly-flexible design. It is used wherever demanding environmental conditions and extreme movements occur. The tight buffer structure enables the cable to be pre-assembled in-situ with ease. Applications are for example Windturbines, TV transmissions, mobile field applications, etc..

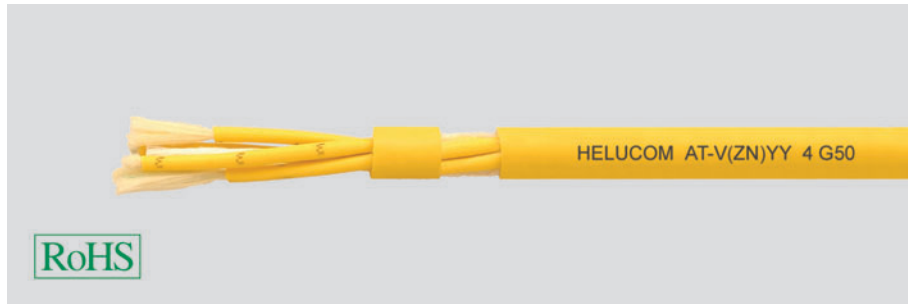
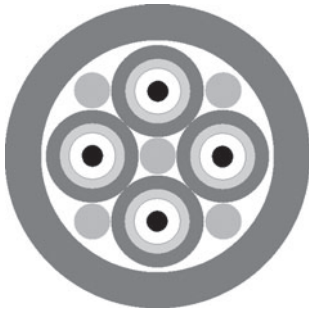
R

Fibre Optic Cable flexible

HELUCOM® WK

AT-V(ZN)YY

new



Cable structure

Core type: Composite buffered
Strain relief elements: Aramide
Outer sheath colour: Yellow

Temperature range

Laying, min.: -10°C
Laying, max.: +50°C
Operating, min.: -40°C
Operating, max.: +90°C

Other data

Max. tensile force: 1200 N
Max. transverse pressure: 100 N / cm
UV-resistant
Resistant to hammer impact acc. to IEC 60794-1-2-E6
Bending cycles acc. to IEC 60794-1-2-E6: 15
Oil-resistant

Designation	Number of Fibre type fibres		Outer Ø approx. mm	Outer sheath material	Inner sheath material	Min. stat. bending radius mm	Flame proof	halogen-free	UL	Weight kg / km	Part no.
Fibre-optic cable	4	Multimode G50/125	7,4	PVC	PVC	90	yes	no	no	65	803364

Dimensions and specifications may be changed without prior notice.

Application

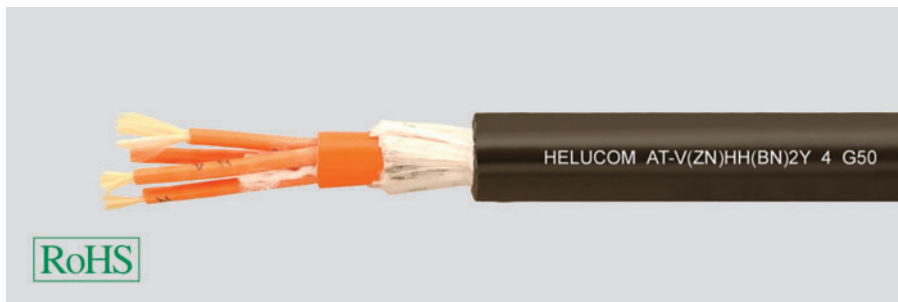
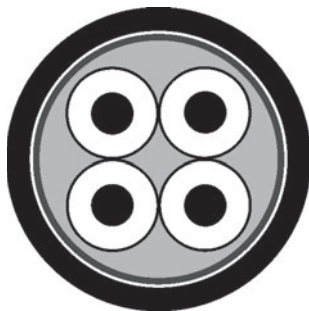
The HELUCOM® range is set apart by its extreme rugged yet flexible design. It is used wherever demanding environmental conditions and movements occur. The tight buffer structure enables the cable to be pre-assembled in-situ with ease. Applications are for example industry applications, TV transmissions, etc..

Fibre Optic Breakout Cable

outdoor

HELUCOM®

AT-V(ZN)HH(BN)2Y



new

Cable structure

Core type: Composite buffered
GRP support element
Strain relief elements: Aramide
Inner sheath material: ULSZH
Outer sheath material: PE
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Longitudinally water-tight acc. to IEC
60794-1-2-F5
UV-resistant
Oil-resistant

Designation	Number of fibres	Fibre type	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Max. transverse pressure N / cm	Caloric load approx. MJ / m	Weight kg / km	Part no.
AT-V(ZN)HH(BN)2Y	4	Multimode G50/125	13,5	1200	340	300	2,95	140	801352

Dimensions and specifications may be changed without prior notice.

Application

The HELUCOM® range is set apart by its extreme rugged rodent protected design. It is used wherever demanding environmental conditions while fixed installations occur. The tight buffer structure enables the cable to be pre-assembled in-situ with ease. Applications are for example industry applications, etc..

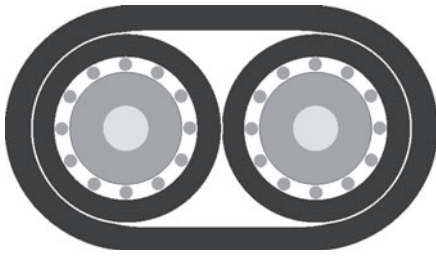
R

Fibre Optic Cable robust

multimode

HELUCOM®

AT-VYY



Cable structure

Core type: Tight buffer
Strain relief elements: Aramide
Outer sheath material: PVC
Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +60°C

Other data

Flame-resistance acc. to IEC 60332-1
Longitudinally water-tight acc. to IEC 60794-1-2-F5
UV-resistant
Oil-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
AT-VYY	2	Multimode G62.5/125	1	6,8 x 10,2	400	110,0	1,10	300	76,0	800126

Dimensions and specifications may be changed without prior notice.

Application

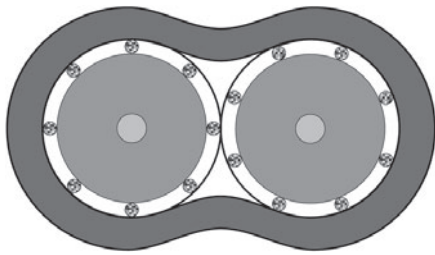
This HELUCOM® fibre-optic cable is suited for fixed installations in pits and channels, but also for flexible applications as jumper cable. Because of the robust construction with Single- and Overall-jacket you also can use it in industrial areas. With the core-construction, direct plug manufacturing, even on site, poses no problems.

Fibre Optic Cable flexible

HCS

HELUCOM®

I-VH, I-VHH



Cable structure

Core type: Composite buffered
 Strain relief elements: Aramide
 Outer sheath material: FRNC
 Outer sheath colour: Orange

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -10°C
 Operating, max.: +60°C

Other data

Corrosiveness acc. to EN50267-2-3
 Halogen-free acc. to 60754-2
 Flame-resistance acc. to IEC 60332-1
 Smoke density acc. to IEC 61034

Designation	Number of fibres	Fibre type	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
I-VH	1	HCS 200/230	2,8	300	40	0,26	10	2,8	800579
I-VHH	2	HCS 200/230	3,8 x 6,6	600	50	0,52	10	30,0	81238

Dimensions and specifications may be changed without prior notice.

Application

These HELUCOM® HCS fibre lines are suitable for stationary installation indoors. For heavy-duty mechanical requirements, such as application in industrial environments, a version with PUR outer sheath is available on request. With a HCS fibre transmission lengths of up to 300m can be achieved. With the tight buffer construction, direct plug manufacturing, even on site, poses no problems.

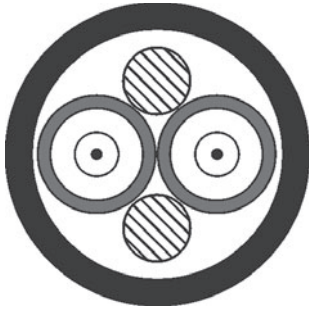
R

Fibre Optic Breakout Cable robust flexible

HCS

HELUCOM®

I-V(ZN)Y11Y



RoHS

Cable structure

Core type: Composite buffered
Strain relief elements: Aramide
Outer sheath material: PUR
Outer sheath colour: Red

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +70°C

Other data

Oil-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
I-V(ZN)Y11Y	2	HCS 200/230	1	7,0	800	50,0	1,014	150	43,0	800980

Dimensions and specifications may be changed without prior notice.

Application

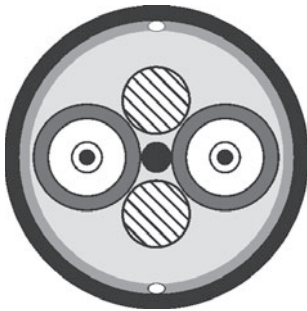
This HELUCOM® HCS fibre cable is suitable for fixed installation. Possible applications are normal and heavy-duty mechanical requirements for example in industrial environments. With the tight buffer construction, direct plug manufacturing, even on site, poses no problems. With a HCS fibre transmission lengths of up to 300m can be achieved.

Fibre Optic Breakout Cable robust

HCS

HELUCOM®

AT-VQH(ZN)B2Y



Cable structure

Core type: Composite buffered
 GRP support element
 Strain relief elements: Aramide
 Type of armouring: Glass yarns
 Outer sheath material: PE
 Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -25°C
 Operating, max.: +70°C

Other data

Corrosiveness acc. to EN50267-2-3
 Halogen-free acc. to 60754-2
 Longitudinally water-tight acc. to IEC 60794-1-2-F5
 UV-resistant
 Oil-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
AT-VQH(ZN)B2Y	2	HCS 200/230	1	11,0	1500	200,0	2,10	500	90,0	801196

Dimensions and specifications may be changed without prior notice.

Application

This HELUCOM® HCS fibre cable is suitable for fixed installation outdoors. Possible applications are normal and heavy-duty mechanical requirements for example in industrial environments. This is the reason we also equipped the cable with a non-metallic rodent-protection. With the tight buffer construction, direct plug manufacturing, even on site, poses no problems. With a HCS fibre transmission lengths of up to 300m can be achieved.

R

Fibre Optic Breakout Cable flexible

HCS

HELUCOM®

AT-V(ZN)HH



Cable structure

Core type: Composite buffered
GRP support element
Strain relief elements: Aramide
Outer sheath material: FRNC
Outer sheath colour: Black

Temperature range

Laying, min.: -20°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +70°C

Other data

Corrosiveness acc. to EN50267-2-3
Halogen-free acc. to 60754-2
Flame-resistance acc. to IEC 60332-1
Smoke density acc. to IEC 61034
UV-resistant
Oil-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
AT-V(ZN)HH	4	HCS 200/230	1	9,0	800	225,0	1,60	100	76,0	802260

Dimensions and specifications may be changed without prior notice.

Application

This HELUCOM® HCS fibre cable is suitable for fixed and normal flexible installation. Possible applications are normal requirements and also limited industrial environments. With the tight buffer construction, direct plug manufacturing, even on site, poses no problems. With a HCS fibre transmission lengths of up to 300m can be achieved.

Fibre Optic Breakout Cable robust, flexible

HCS UL/CSA

HELUCOM®
I-V(ZN)YY



Cable structure

Core type: Composite buffered
Strain relief elements: Aramide
Outer sheath material: PVC
Outer sheath colour: Black

Temperature range

Laying, min.: -20°C
Laying, max.: +75°C
Operating, min.: -30°C
Operating, max.: +85°C

Other data

Flame-resistance acc. to IEC 60332-1 and IEC 60332-3
UV-resistant
Oil-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
I-V(ZN)YY	2	HCS 200/230	1	7,5	800	100,0	1,40	300	68,0	801733

Dimensions and specifications may be changed without prior notice.

Application

This HELUCOM® HCS fibre cable is suitable for fixed and normal flexible installations. Possible applications are normal and heavy-duty mechanical requirements for example in industrial environments. Because of a special PVC jacket this construction is certified by UL (FT1 and FT4). With the tight buffer construction, direct plug manufacturing, even on site, poses no problems. With a HCS fibre transmission lengths of up to 300m can be achieved.

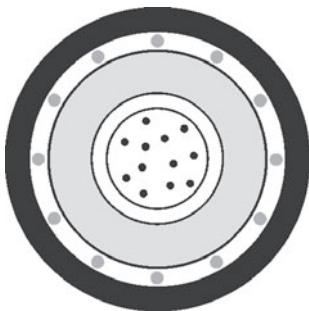
R

Fibre-optic Universal Cable

HCS

HELUCOM®

A/I-DQ(ZN)BH



Cable structure

Core type: Loose tube
 Strain relief elements: Glass yarns
 Type of armouring: Glass yarns
 Outer sheath material: FR/LSOH
 Outer sheath colour: Black

Temperature range

Laying, min.: -5°C
 Laying, max.: +50°C
 Operating, min.: -20°C
 Operating, max.: +70°C

Other data

Corrosiveness acc. to EN50267-2-3
 Halogen-free acc. to 60754-2
 Flame-resistance acc. to IEC 60332-1
 Smoke density acc. to IEC 61034
 Longitudinally water-tight acc. to IEC 60794-1-2-F5
 UV-resistant

Designation	Number of fibres	Fibre type	Number of fibres per core	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Caloric load approx. MJ / m	Max. transverse pressure N / cm	Weight kg / km	Part no.
A/I-DQ(ZN)BH	4	HCS 200/230	4	8,5	1500	130,0	2,00	150	76,0	801198
A/I-DQ(ZN)BH	8	HCS 200/230	8	8,5	1500	130,0	2,00	150	79,0	802001
A/I-DQ(ZN)BH	12	HCS 200/230	12	8,5	1500	130,0	2,00	150	82,0	802002
A/I-DQ(ZN)BH	24	HCS 200/230	8	17,7	6000	265,0	3,20	300	280,0	802003
A/I-DQ(ZN)BH	48	HCS 200/230	8	18,9	6000	285,0	3,20	300	355,0	802004

Dimensions and specifications may be changed without prior notice.

Application

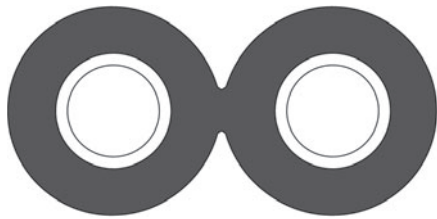
These HELUCOM® fibre-optic cables are available either as central bundle core cable or as stranded versions. They are suitable for fixed indoor and outdoor cabling of buildings and industry facilities. They are used in particular if the installation is to be done in one piece from the inside to the outside without additional use of couplings. With their black UV-resistant outer sheath and the non-metallic rodent protection, they are perfectly suited for outdoor use. The halogen-free outer sheath makes installation inhouse possible without any problems.

Plastic-fibre cable industry

POF/PE

HELUCOM®

I-V2Y, I-V2Y(ZN)11Y



Cable structure

Fibre type: POF 980/1000
Fibre cladding: PE

Optical characteristic

Refractive index core: 1,492
Refractive index cladding: 1,419
Numerical aperture: 0,5
Attenuation see table

Temperature range

Laying, min.: -20°C
Laying, max.: +80°C
Operating, min.: -20°C
Operating, max.: +80°C

Designation	Outer sheath material	Jacket colour	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Fibre attenuation	Oil-resistant	Acc. to DESINA	Weight kg / km	Part no.
I-V2Y 1P 980/1000	PE	Black	2,2	70	25,0	160A1	no	no	4,0	80532
I-V2Y 2P 980/1000	PE	Black	2,2 x 4,4	140	25,0	160A1	no	no	8,0	80388
I-V2Y(ZN)11Y 1P 980/1000	PUR	Violet	5,8	400	30,0	230A1	yes	yes	30,0	81611
I-V2Y(ZN)11Y 2P 980/1000	PUR	Violet	6,0	400	31,0	230A1	yes	yes	36,0	80629
I-V2Y(ZN)11Y 2P 980/1000	PUR	Violet	6,0	400	31,0	230A1	yes	yes	36,0	81882
I-V2Y(ZN)11Y 4P 980/1000	PUR	Violet	7,1	400	45,0	230A1	yes	yes	65,0	80630
I-V2Y(ZN)11Y 2P 980/1000 + 2x1mm ² Cu	PUR	Red	7,8	200	70,0	230A1	yes	no	60,0	82032
I-V2Y(ZN)11Y 2P 980/1000 + 3x1,5mm ² Cu	PUR	Red	11,0	200	70,0	230A1	yes	no	132,0	82033

Dimensions and specifications may be changed without prior notice.

Application

HELUCOM® plastic-fibre cables are used in mechanical engineering, both in mobile and fixed applications. With different constructions, such as PUR outer sheaths, special strain relief components, hybrid construction with copper cores for power supply or only raw fibre cables, any possible fields of application are covered. Due to their solidity and their simple adjustability on site, the plastic-fibres (PMMA) are particularly suitable for applications where trouble-free data transmission is necessary under heavy-duty conditions.

R

Plastic Fibre Cable Industry

POF/PA

HELUCOM®

I-V4Y(ZN)11Y



Cable structure

Fibre type: POF 980/1000
Fibre cladding: PA

Optical characteristic

Refractive index core: 1,492
Refractive index cladding: 1,419
Numerical aperture: 0,5
Attenuation see table

Temperature range

Laying, min.: -5°C
Laying, max.: +50°C
Operating, min.: -20°C
Operating, max.: +70°C

Designation	Outer sheath material	Jacket colour	Outer Ø approx. mm	Max. tensile force N	Min. stat. bending radius mm	Fibre attenuation	Oil-resistant	Acc. to DESINA	Weight kg / km	Part no.
I-V4Y(ZN)11Y 2P980/1000 RUGGED	PUR	Red	8,0	100	50,0	160A1	yes	no	42,0	801200
I-V4Y(ZN)11Y 2P980/1000 FLEX RUGGED	PUR	Red	8,0	100	50,0	250A1	yes	no	51,0	801201
I-V4Y(ZN)11Y 2P980/1000 HEAVY	PUR	Red	6,0	100	30,0	160A1	yes	no	28,0	801202

Dimensions and specifications may be changed without prior notice.

Application

Signal lines as plastic optical fibre. The use of these transmission systems significantly reduces the number of different cables in a planned bus installation in machine tools operations. Furthermore, possible EMC problems are prevented by the metal-free construction. The main application of these cables are in machine construction and automobile industry (PA version).

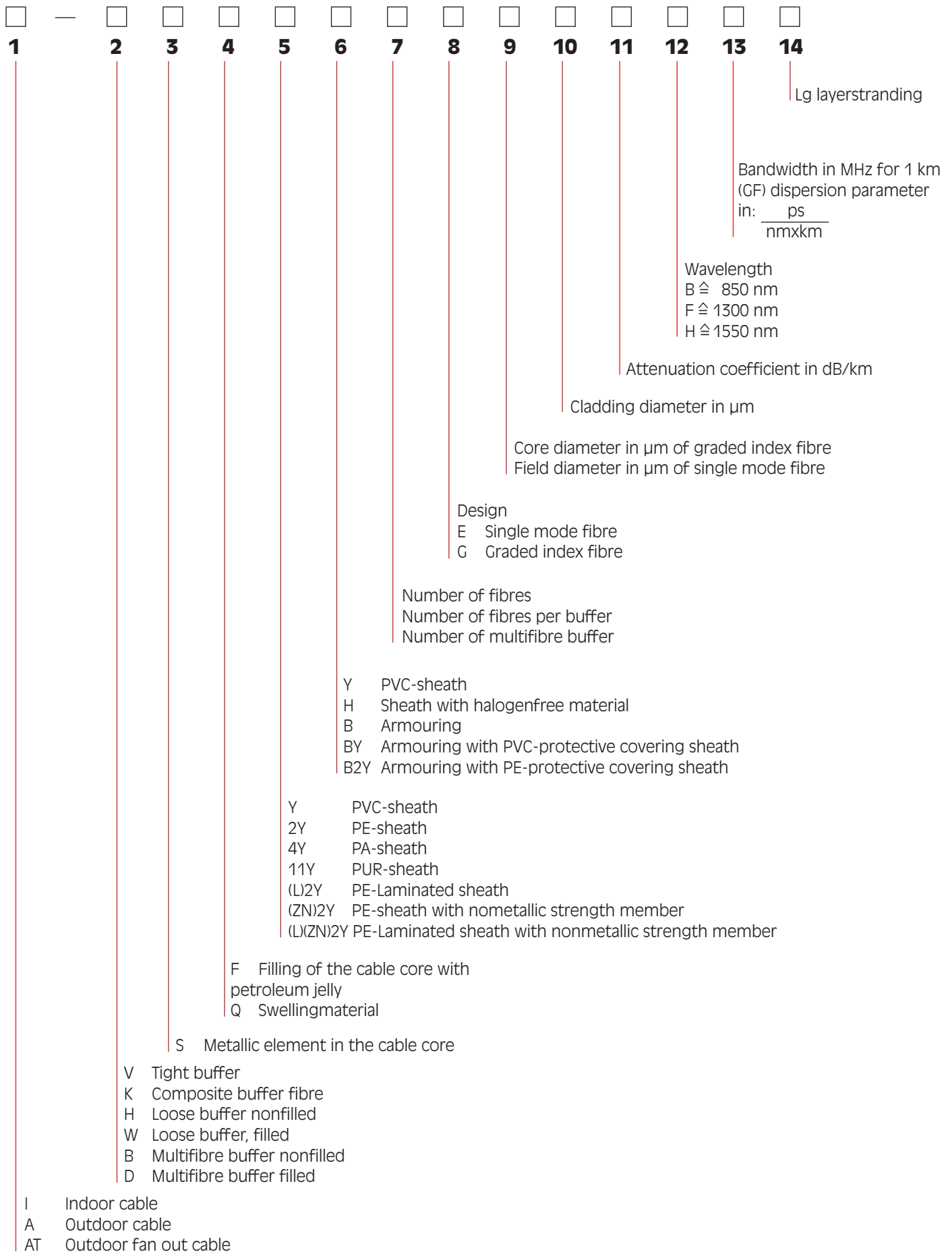
Graded index fibres (multimode)			
Specification		Fibre type G 50/125	Fibre type G 62,5/125
Fibre categorie		OM2 Standardfibre	OM1 Standardfibre
Core diameter		50 ± 3 µm	62,5 ± 3 µm
Numerical aperture		0,200 ± 0,015	0,275 ± 0,015
Typ. attenuation	850 nm	2,8 dB/km	3,0 dB/km
	1300 nm	0,7 dB/km	1,0 dB/km
Min. bandwidth	850 nm	500 MHz x km	200 MHz x km
	1300 nm	800 MHz x km	500 MHz x km
Cladding diameter		125 ± 1 µm	
Primary coating diameter		245 ± 10 µm	
Core noncircularity		< 5 %	
Cladding concentricity error		< 3,0 µm	
Cladding noncircularity		< 2,0 %	

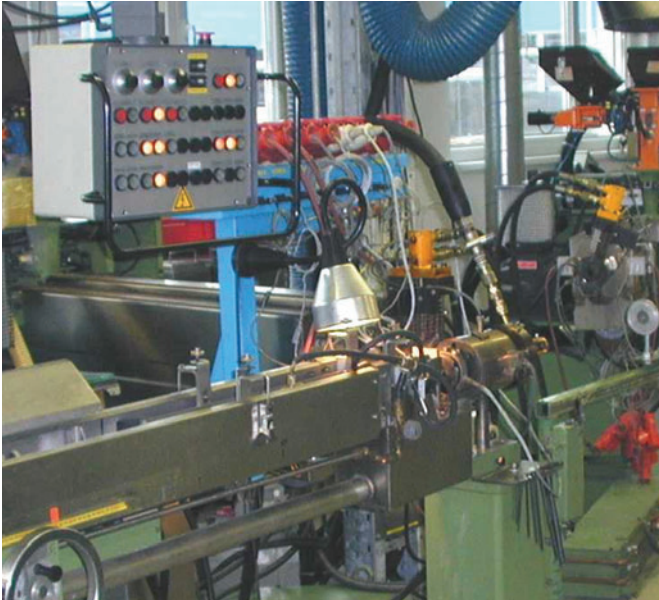
Specification		Fibre type G 50/125	
Fibre categorie		OM3 Standardfibre	OM4 Standardfibre
Core diameter		50 ± 3 µm	50 ± 3 µm
Numerical aperture		0,200 ± 0,015	0,200 ± 0,015
Typ. attenuation	850 nm	2,5 dB/km	3,0 dB/km
	1300 nm	0,5 dB/km	1,0 dB/km
Min. bandwidth	850 nm	1500 MHz x km	3500 MHz x km
	1300 nm	500 MHz x km	500 MHz x km
Cladding diameter		125 ± 1 µm	125 ± 1 µm
Primary coating diameter		245 ± 10 µm	245 ± 10 µm
Core noncircularity		< 5 %	< 5 %
Cladding concentricity error		< 3,0 µm	< 6,0 µm
Cladding noncircularity		< 2,0 %	< 2,0 %

Single-Mode-Fibre			
Specification		Fibre type E9...10/125 (single mode)	
Fibre categorie		ITU-T G. 652.d	
Attenuation	1300 nm	0,36 dB/km	
	1550 nm	0,22 dB/km	
Dispersion	1285 - 1330 nm	< 3,5 ps/(nm x km)	
	1550 nm	< 19 ps/(nm x km)	
Wave length		1312 nm	
Mode field diameter at 1310 nm		9,3 ± 0,5 µm	
Cladding diameter		125 ± 1 µm	
Primary coating diameter		245 ± 10 µm	
Cut-off wavelength		< 1250 nm	
Cladding concentricity error		≤ 0,8 µm	
Cladding noncircularity		< 1,0 %	

POF and HCS-Fibre			
Specification		Fibre type POF P980/1000	Fibre type HCS K200/230
Core diameter		980 µm	200 µm
Numerical aperture		0,5	0,37
Typ. attenuation	650 nm	160 dB/km	10 db/km
	850 nm	-	8 dB/km
Min. Bandwidth	650 nm	10 MHz x 100 m	17 MHz x km
	850 nm	-	20 MHz x km
Wallthickness		1000 µm	230 µm

Fibres with other parameteres on request





We manufacture optical fibre cables to meet your specific requests and engineering requirements. A variety of applications requires the use of very special cable constructions. Hence we produce, for example, optical fibre cables for earth buried or duct cables comprising differing fibre types, e. g. a combination of graded index fibres and single mode fibres, or hybrid data cables where different technologies are brought together within one cable, optical fibre cables with copper data cables. Hybrid cables are used in buildings where optical fibre and copper cables shall be installed in parallel so as to minimise the pulling required. These are also used for projects where the optical fibre cable is planned to serve a purpose for future applications. Metal-free optical fibre cables can be used as aerial cable, having a similar structure as cables for outdoor applications, whereby the strain relief must be strengthened accordingly. These aerial cables are used by electricity and railway companies.

R

Contact us for your special requirements.

Inquiry – fibre optic special cable **HELUCOM®**

To:

HELUKABEL® GmbH
Data-, Network- and Bus Technology
Dieselstraße 8-12
71282 Hemmingen
Germany

Phone: +49 7150 9209-181
Fax: +49 7150 970819

Sender/Stamp

Responsible: _____

Phone.: _____ Fax: _____

Inquiry: **No.:** _____ **Date :** _____

Quantity: _____ km Ohne Step Continuous Yearly Quantity: approx. _____ km

Needed delivery date: _____

Dimensions: _____

Cable type: _____

Using: a) indoor outdoor indoor/outdoor b) fixed installation mobil use
c.) ambient temperature _____ °C constant load _____ °C shorttime _____ °C

Fibre type: G 50/125 G 62,5/125 E 9/125 S 200/230 980/1000 POF

Fibre spec.: attenuation: _____ specification: _____
bandwidth: _____

Cable structure: a) Tight buffer Loose tube filled Bundle core filled
 Compact fiber Loose tube unfilled Bundle core unfilled
b) Metal element yes no
c) Centrale bundle core Stranded bundle core
d) Filler: _____ e) Armouring: _____
f) Outer jacket: PVC PE PA PUR FRNC
g) Laminated jacket: yes no

Min. bending radius: _____ **Max. tensile load:** _____ **Max. transverse pressure:** _____ **Caloric load:** _____

Fibre colour: acc. DIN acc. your demands (see notice) **Tube colour:** acc. DIN acc. your demands (see notice)

Jacket printing: _____

Remarks: _____

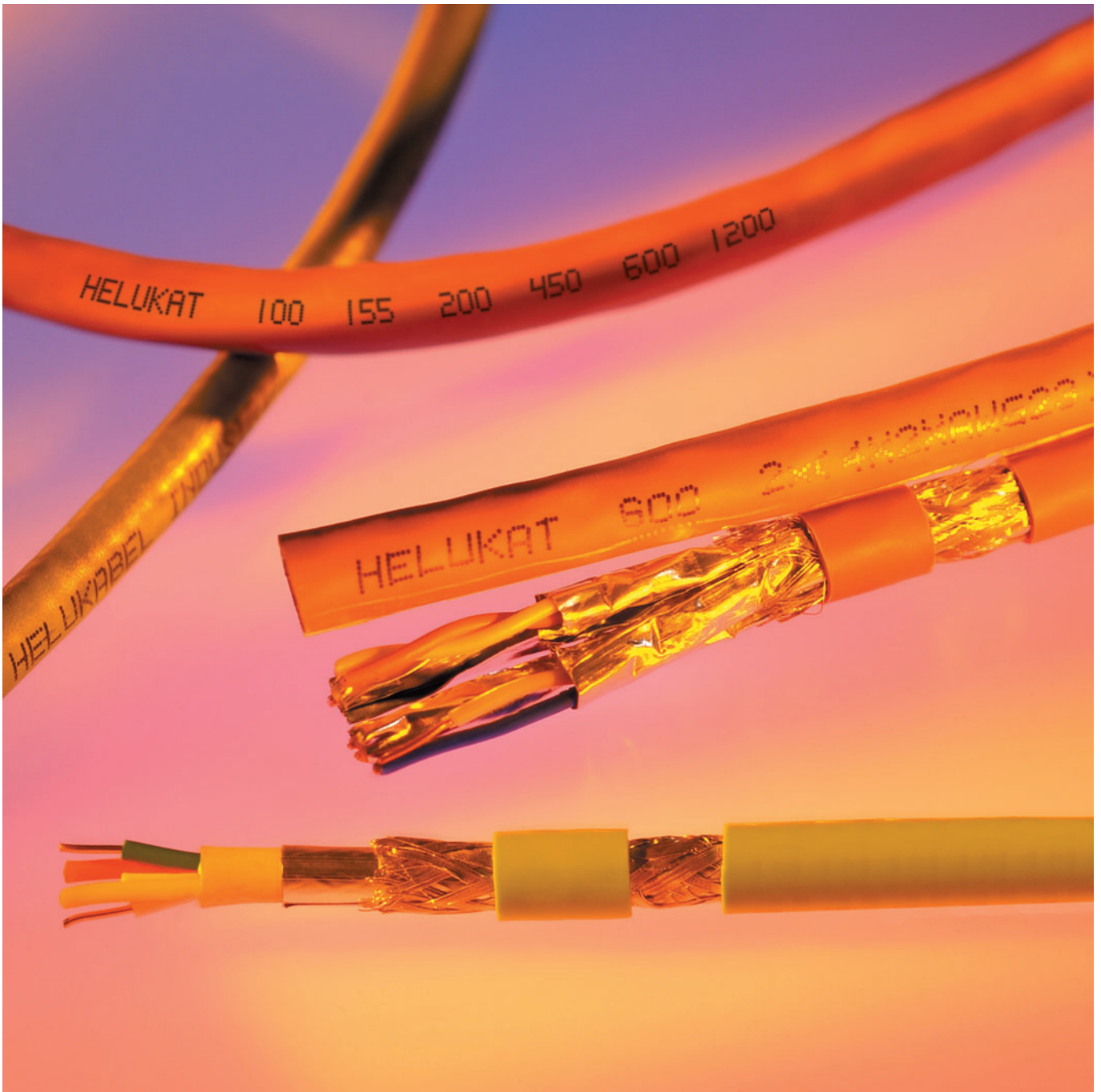


Photo: HELUKABEL®

Copper Data Cables HELUKAT®

All HELUKAT® data cables and wires comply with the latest standardisation recommendations and are designed for use in high-speed networks with transmission rates of 100Mbit/s and higher (e.g. CCDI, TPDDI, ATM, SDH/SONET). All HELUKAT® types of cables and wires meet the requirements of category 5 according to EIA/TIA TSB-36 ISO/IEC DIS 11801, CENELEC pr EN 50173, as well as category 6/7 according to DIN 44312-5/ EN 50288. Cables for Ethernet applications, as well as coax/twinaxial cables for IBM's IVS system complete the product range from HELUKABEL®.

The excellent transmission characteristics of HELUKAT® data cables and wires constitute enormous challenges for production equipment and the measurement laboratories. HELUKAT® data cables and wires are manufactured using the latest machinery technologies. These have been designed for producing cables and wires of the categories 5/6/7/8 in accordance with the latest standardisation recommendations. A special laboratory for high-frequency testing such high transmission rates has been installed complete with network analyser and computer-controlled equipment for HF cables.

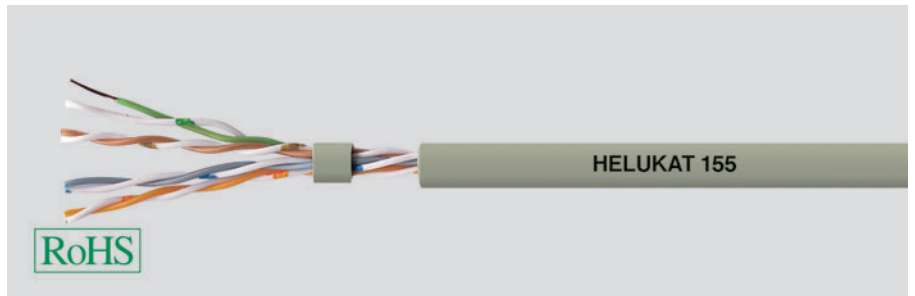
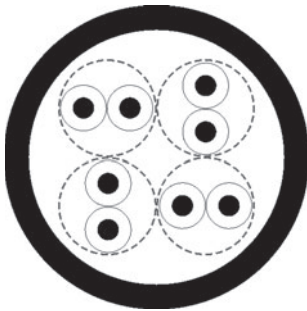
Contents Copper Data Cables

Description	Page
HELUKAT® 155 UTP	R 54
HELUKAT® 155 UTP UL	R 55
HELUKAT® 300 UTP UL	R 56
HELUKAT® 100 UTP flex	R 57
HELUKAT® 155 FTP	R 58
HELUKAT® 100 FTP flex	R 59
HELUKAT® 100 FTP FE60	R 60
HELUKAT® 200 FTP flex, UL	R 61
HELUKAT® 200 S-FTP	R 62
HELUKAT® 200 S-FTP duplex	R 63
HELUKAT® 200 S-FTP flex	R 64
HELUKAT® 300 U-STP, UL	R 65
HELUKAT® 450 S-STP	R 66
HELUKAT® 450 S-STP duplex	R 67
HELUKAT® 500 F-STP	R 68
HELUKAT® 500 F-FTP duplex	R 69
HELUKAT® 500 F-FTP, flex	R 70
HELUKAT® 600 S-STP	R 71
HELUKAT® 600 S-STP duplex	R 72
HELUKAT® 600 S-STP flex	R 73
HELUKAT® 600A S-STP PVC/PVC	R 74
HELUKAT® 600E S-STP PVC	R 75
HELUKAT® 600AE S-STP FRNC/PE	R 76
HELUKAT® 1200 S-STP	R 77
HELUKAT® 1200 S-STP duplex	R 78
HELUKAT® 1200 S-STP	R 79
HELUKAT® 1200 S-STP duplex	R 80
HELUKAT® 1500 S-STP, Multimedia	R 81
HELUKAT® 1500 S-STP duplex, Multimedia	R 82
TWINAX LAN-Cable IBM P/N 7 362 211	R 83
IVS LAN-Cable IBM type 1A, type 1A mini, Typ 6A	R 84
Cheapernet Cable, Yellow Cable, Transceiver Cable	R 85

LAN Cable

Category 5e

HELUKAT® 155
UTP



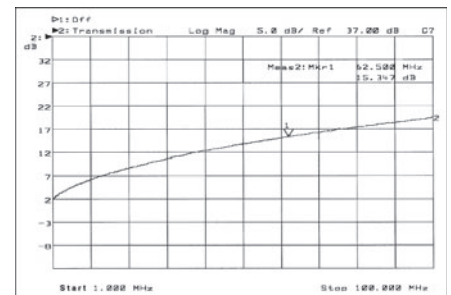
Cable structure

Inner conductor diameter: 0,51 mm
 Conductor material: Copper, bare
 Core insulation: PE
 Core colours: whbu/bu, whog/og, whgn/gn, whbn/bn
 Shielding 1: -
 Screen over stranding element: -
 Screen 1 over stranding: -
 Screen 2 over stranding: -
 Outer sheath material: PVC
 Outer diameter: approx. 4,9 mm
 Outer sheath colour: Grey

UTP 4x2xAWG 24/1 PVC

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
 Loop resistance: 190 Ohm/km max.
 Mutual capacitance: 50 nF/km nom.
 Rel. propagation velocity: 66 %

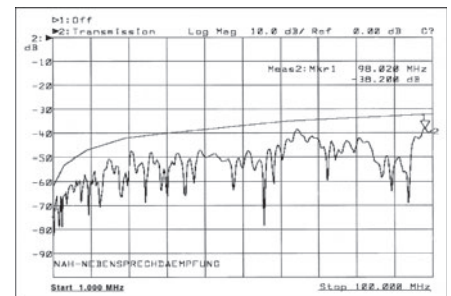


Typical values

Frequency (MHz)	10	16	62,5	100	155
Attenuation (dB/100m)	6,3	8,0	16,5	21,3	26,8
Next (db)	50,3	47,3	38,4	35,3	33,0
ACR (db)	44,0	39,3	21,9	14,0	6,2

Technical data

Weight: approx. 26 kg/km
 Min. bending radius for laying: 40 mm
 Operating temperature range min.: -20°C
 Operating temperature range max.: +60°C
 Caloric load, approx. value: 0,40 MJ/m
 Copper weight: 17,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e

Application

HELUKAT®155 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

80053, UTP 4x2xAWG24/1 PVC (U/UTP)

Dimensions and specifications may be changed without prior notice.

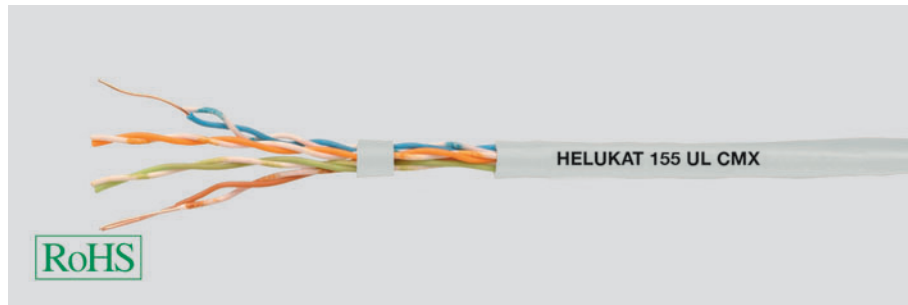
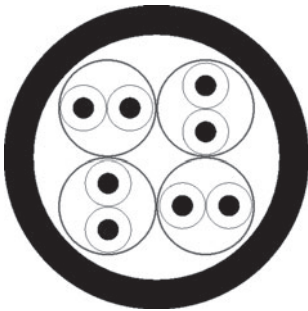
R

LAN Cable

Category 5e

HELUKAT® 155

UTP UL



Cable structure

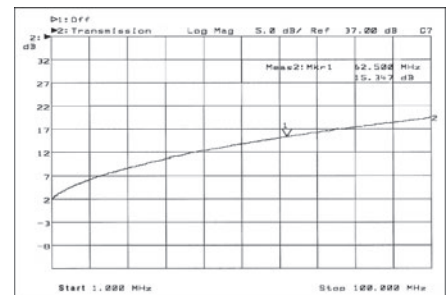
Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

UTP 4x2xAWG 24/1 PVC, UL

0,53 mm
Copper, bare
PE
whbu/bu, whog/og, whgn/gn, whbn/bn
-
-
-
PVC
approx. 5,2 mm
Grey

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Loop resistance: 190 Ohm/km max.
Mutual capacitance: 50 nF/km nom.
Rel. propagation velocity: 66 %

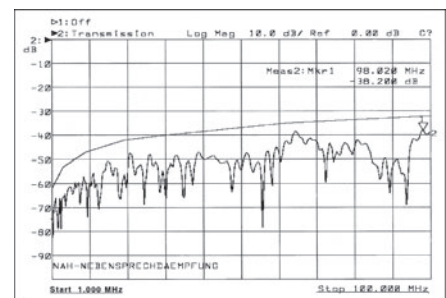


Typical values

Frequency (MHz)	10	16	62,5	100	155
Attenuation (db/100m)	6,1	7,7	15,2	19,9	22,7
Next (db)	65,0	63,0	53,0	40,0	37,0
ACR (db)	58,9	55,3	37,8	20,1	14,3

Technical data

Weight: approx. 35 kg/km
Min. bending radius for laying: 42 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,43 MJ/m
Copper weight: 17,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e,
Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, CMX 444

Application

HELUKAT®155 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction. This type is certified according to UL because of the special PVC jacket.

Part no.

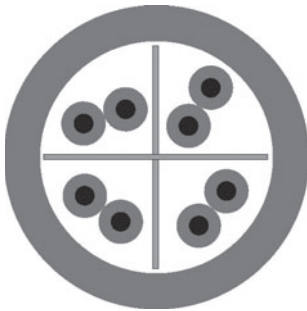
802171, UTP 4x2xAWG24/1 PVC UL (U/UTP)

Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 6

HELUKAT® 300
UTP UL

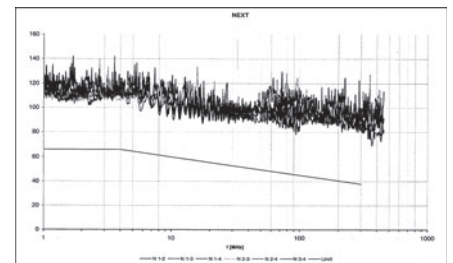


Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

UTP 4x2xAWG 24/1 PVC, UL

0,55 mm
Copper, bare
PE
whbu/bu, whog/og, whgn/gn, whbn/bn
-
-
-
PVC
approx. 6,8 mm
Grey



Electrical data

Characteristic impedance:
Loop resistance:
Mutual capacitance:
Rel. propagation velocity:

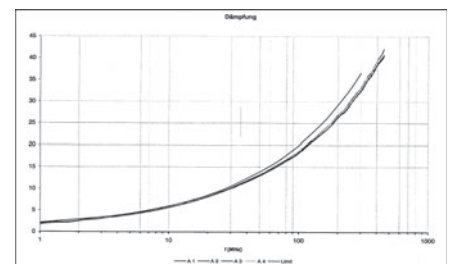
100 Ohm \pm 20 ohm at 101 to 155 MHz
190 Ohm/km max.
50 nF/km nom.
67 %

Typical values

Frequency (MHz)	10	16	62,5	100	155	200	300
Attenuation (db/100m)	5,6	7,0	14,3	18,2	22,9	26,0	32,5
Next (db)	72,0	70,0	65,0	63,0	60,0	57,0	55,0
ACR (db)	66,4	63,0	50,7	44,8	37,1	31,0	22,5

Technical data

Weight: approx. 46 kg/km
Min. bending radius for laying: 55 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,68 MJ/m
Copper weight: 20,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, CMX 444

Application

HELUKAT®300 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction. This type is certified according UL because of the special PVC jacket.

Part no.

802172, UTP 4x2xAWG24/1 PVC UL (U/UTP)

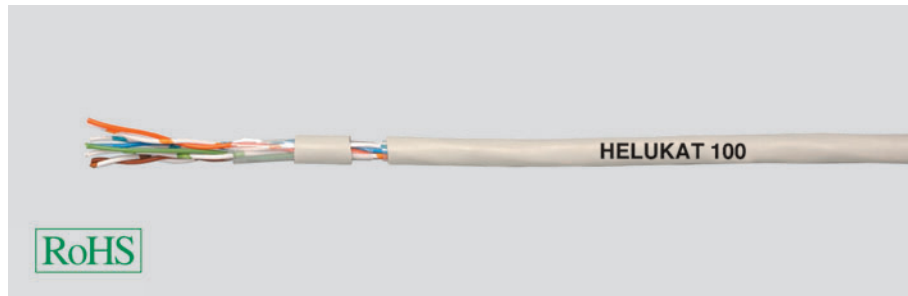
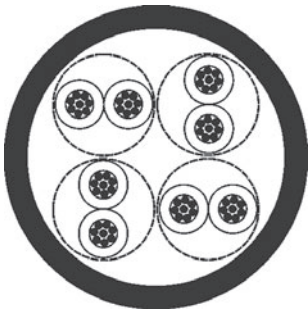
Dimensions and specifications may be changed without prior notice.

LAN-Cable

Category 5

HELUKAT® 100

UTP flex



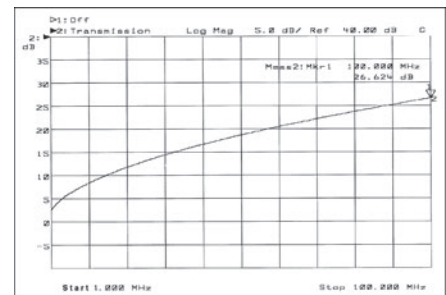
Cable structure

Inner conductor diameter: 0,48 mm
 Conductor material: Copper, bare
 Core insulation: PO
 Core colours: whbu/bu, whog/og, whgn/gn, whbn/bn
 Shielding 1: -
 Screen over stranding element: -
 Screen 1 over stranding: -
 Screen 2 over stranding: -
 Outer sheath material: PVC
 Outer diameter: approx. 4,5 mm
 Outer sheath colour: Grey similar to RAL 7035

UTP 4x2xAWG 26/7 PVC

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
 Loop resistance: 290 Ohm/km max.
 Mutual capacitance: 50 nF/km nom.
 Rel. propagation velocity: 74 %

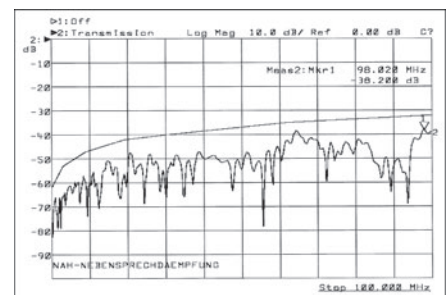


Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/10m)	0,9	1,2	2,4	3,1
Next (db)	53,0	50,0	41,0	38,0
ACR (db)	52,1	48,8	38,6	34,9

Technical data

Weight: approx. 17 kg/km
 Min. bending radius for laying: 35 mm
 Operating temperature range min.: -20°C
 Operating temperature range max.: +60°C
 Caloric load, approx. value: 0,527 MJ/m
 Copper weight: 11,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5

Application

HELUKAT®100 data cables are used in the tertiary level of a network as patch cables and connection cables. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. With its optimized construction, the HELUKAT®100 series can be manufactured quickly and easily with all common RJ45 plugs.

Part no.

80055, UTP 4x2xAWG 26/7 PVC (U/UTP)

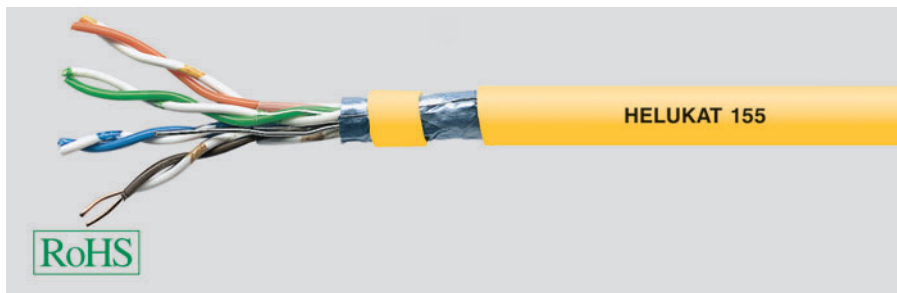
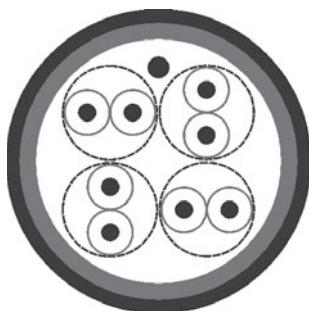
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 5e

HELUKAT® 155

FTP



Cable structure

Inner conductor diameter:

Conductor material:

Core insulation:

Core colours:

Shielding 1:

Screen over stranding element:

Screen 1 over stranding:

Screen 2 over stranding:

Outer sheath material:

Outer diameter:

Outer sheath colour:

FTP 4x2xAWG 24/1 PVC

0,51 mm

Copper, bare

PE

whbu/bu, whog/og, whgn/gn, whbn/bn

Polyester foil over stranded bundle

-

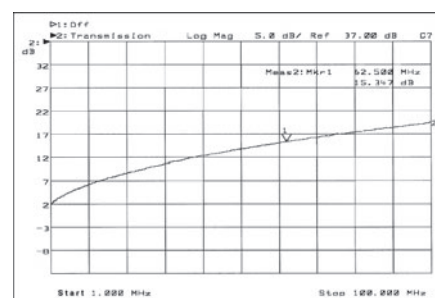
Polyester foil, aluminium-lined

-

PVC

approx. 5,9 mm

Yellow similar to RAL 1021



Electrical data

Characteristic impedance:

Loop resistance:

Mutual capacitance:

Rel. propagation velocity:

100 Ohm ± 15 ohm at 1 to 100 MHz

170 Ohm/km max.

50 nF/km nom.

69 %

Typical values

Frequency (MHz)	10	16	62,5	100	155
Attenuation (dB/100m)	5,9	7,6	15,7	20,3	22,0
Next (db)	59,0	53,0	44,0	40,0	40,0
ACR (db)	53,1	45,4	28,3	19,7	18,0

Technical data

Weight:

Min. bending radius for laying:

Operating temperature range min.:

Operating temperature range max.:

Caloric load, approx. value:

Copper weight:

approx. 40 kg/km

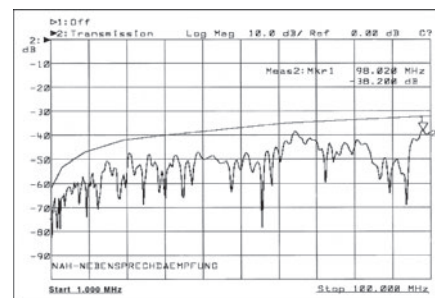
48 mm

-20°C

+60°C

0,40 MJ/m

18,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e

Application

HELUKAT®155 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

80043, FTP 4x2xAWG24/1 PVC (F/UTP)

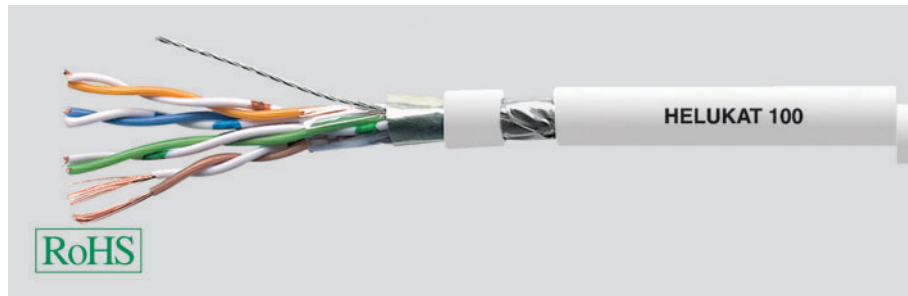
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 5

HELUKAT® 100

FTP flex



Cable structure

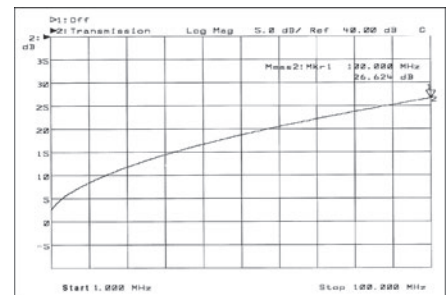
Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

FTP 4x2xAWG 26/7 FRNC

0,48 mm
Copper, bare
PO
whbu/bu, whog/og, whgn/gn, whbn/bn
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
-
FRNC
approx. 5,7 mm
Grey similar to RAL 7035

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Loop resistance: 290 Ohm/km max.
Mutual capacitance: 50 nF/km nom.
Rel. propagation velocity: 74 %

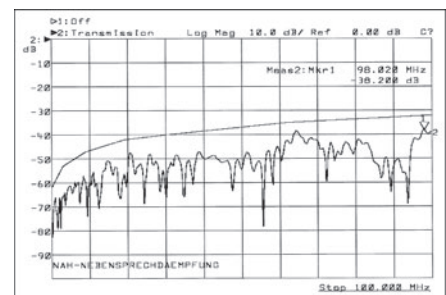


Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/10m)	0,9	1,2	2,4	2,9
Next (db)	58,0	56,0	45,0	43,0
ACR (db)	57,1	54,8	42,6	40,1

Technical data

Weight: approx. 31 kg/km
Min. bending radius for laying: 40 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,527 MJ/m
Copper weight: 14,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®100 data cables are used in the tertiary level of a network as patch cables and connection cables. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. With its optimized construction, the HELUKAT®100 series can be manufactured quickly and easily with all common RJ45 plugs.

Part no.

81278, FTP 4x2xAWG 26/7 FRNC (F/UTP)

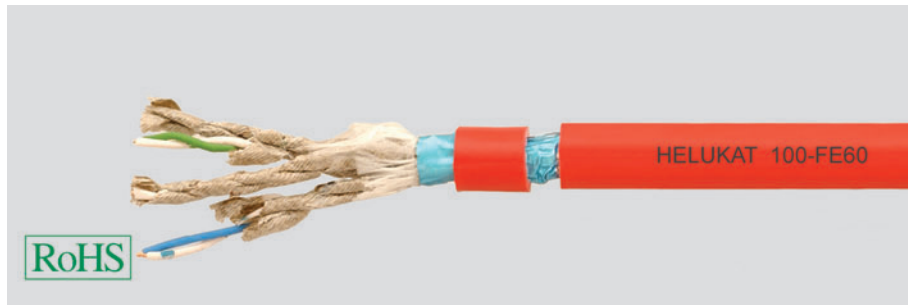
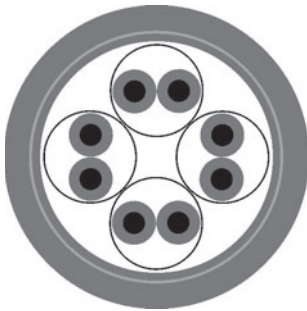
Dimensions and specifications may be changed without prior notice.

LAN Cables

Category 5

HELUKAT® 100

FTP FE60



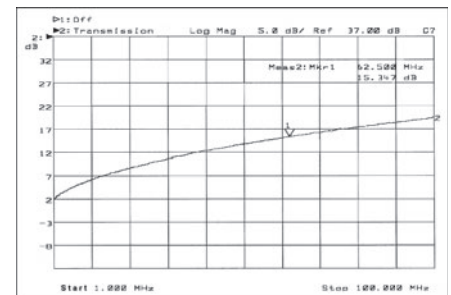
new

Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

F-FTP 4x2xAWG 24/1 FR-OH

0,51 mm
Copper, bare
PE + flame resistant tape
whbu/bu, whog/og, whgn/gn, whbn/bn
Polyester foil over stranded bundle
-
-
Polyester foil, aluminium-lined
LSZH
approx. 8,3 mm
Red



Electrical data

Characteristic impedance:
Loop resistance:
Mutual capacitance:
Rel. propagation velocity:

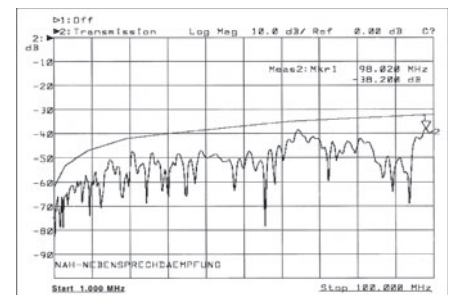
100 Ohm ± 15 ohm at 1 to 100 MHz
182 Ohm/km max.
53 nF/km nom.
67 %

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	5,7	7,3	14,9	19,3
Next (db)	56,0	53,0	42,0	38,0
ACR (db)	50,3	45,7	27,1	18,7

Technical data

Weight: approx. 90 kg/km
Min. bending radius for laying: 130 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 0,91 MJ/m
Copper weight: 24,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5, Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®100-FE60 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. Likewise, the thermal characteristics are perfectly suited to realize an isolation integrity according EN50200-FE60 due to their optimized construction.

Part no.

804045, F-FTP 4x2xAWG 24/1 FR-OH

Dimensions and specifications may be changed without prior notice.

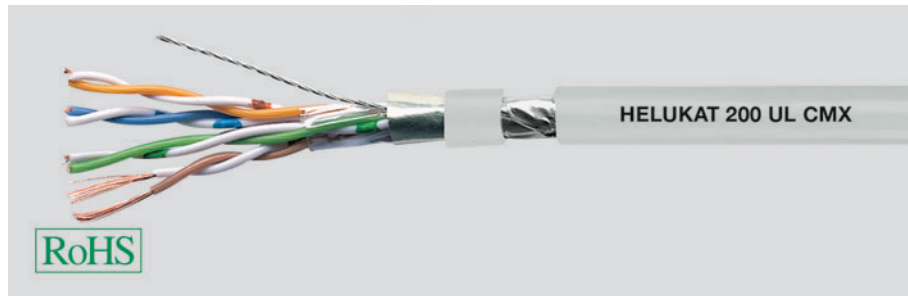
R

LAN Cables

Category 5e

HELUKAT® 200

FTP Flex, UL



Cable structure

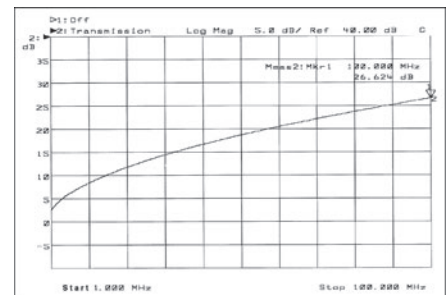
Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

FTP 4x2xAWG 26/7 PVC, UL

0,48 mm
Copper, bare
PE
whbu/bu, whog/og, whgn/gn, whbn/bn
-
Polyester foil, aluminium-lined
-
PVC
approx. 5,4 mm
Grey similar to RAL 7035

Electrical data

Characteristic impedance: 100 Ohm ± 20 ohm at 101 to 155 MHz
Loop resistance: 290 Ohm/km max.
Mutual capacitance: 50 nF/km nom.
Rel. propagation velocity: 67 %

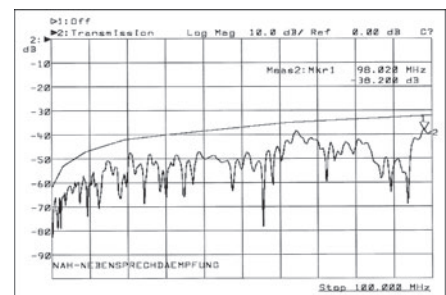


Typical values

Frequency (MHz)	10	16	62,5	100	200
Attenuation (db/10m)	0,9	1,2	2,4	3,1	3,9
Next (db)	62,0	60,0	50,0	48,0	45,0
ACR (db)	61,1	58,8	47,6	44,9	41,1

Technical data

Weight: approx. 30 kg/km
Min. bending radius for laying: 44 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,40 MJ/m
Copper weight: 15,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e,
Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, CMX 444

Application

HELUKAT®200 data cables are used in the tertiary level of a network as patch cables and connection cables. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. With its optimized construction, the HELUKAT®200 series can be manufactured quickly and easily with all common RJ45 plugs. This type is certified according UL because of the special PVC jacket.

Part no.

802173, FTP 4x2xAWG26/7 PVC UL (F/UTP)

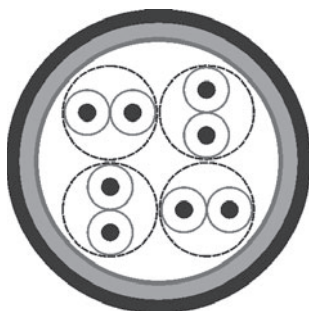
Dimensions and specifications may be changed without prior notice.

LAN-Cable

Category 5e

HELUKAT® 200

S-FTP



Cable structure

Inner conductor diameter:

Conductor material:

Core insulation:

Core colours:

Shielding 1:

Screen over stranding element:

Screen 1 over stranding:

Screen 2 over stranding:

Outer sheath material:

Outer diameter:

Outer sheath colour:

S-FTP 4x2xAWG 24/1 PVC or FRNC

0,51 mm

Copper, bare

Foam-skin-PE

whbu/bu, whog/og, whgn/gn, whbn/bn

Polyester foil over stranded bundle

-

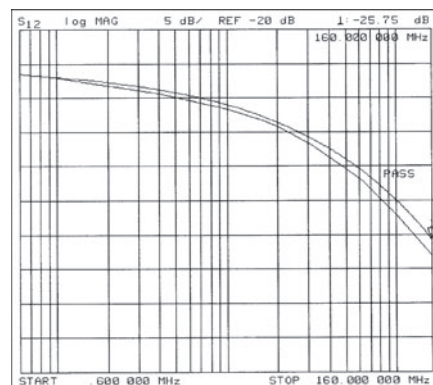
Polyester foil, aluminium-lined

Cu braid

PVC / FRNC

approx. 6,0 mm / approx. 6,0 mm

Grey similar to RAL 7035



Electrical data

Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz

Loop resistance:

185 Ohm/km max.

Mutual capacitance:

48 nF/km nom.

Rel. propagation velocity:

74 %

Typical values

Frequency (MHz)	10	16	62,5	100	200
Attenuation (dB/100m)	5,6	7,2	14,4	18,2	25,9
Next (db)	62,0	59,0	50,0	46,0	40,0
ACR (db)	56,4	51,8	35,6	27,8	14,6

Technical data

Weight:

approx. 50 kg/km

Min. bending radius for laying:

52 mm

Operating temperature range min.:

-20°C

Operating temperature range max.:

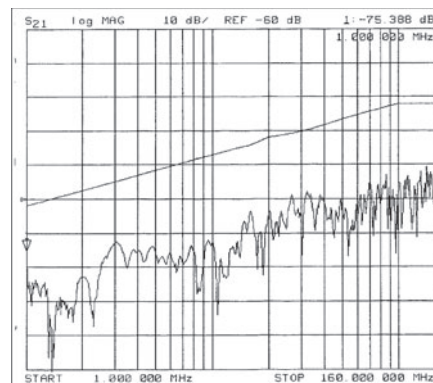
+60°C

Caloric load, approx. value:

0,60 MJ/m / 0,48 MJ/m

Copper weight:

27,00 kg/km



Norms

81610:

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e

81609:

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e, Flame-retardant:

acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2,

Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®200 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

81610, S-FTP 4x2xAWG 24/1 PVC (SF/UTP)

81609, S-FTP 4x2xAWG 24/1 FRNC (SF/UTP)

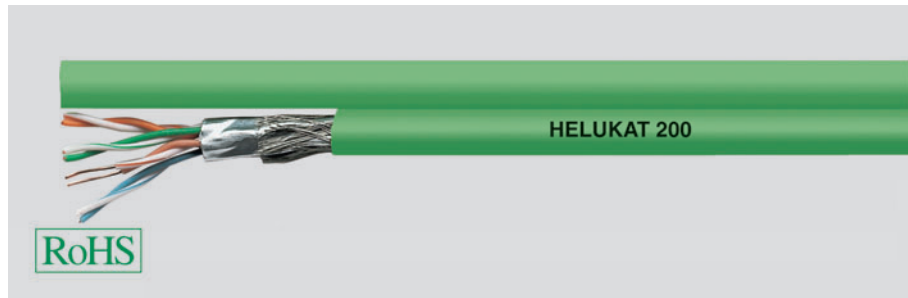
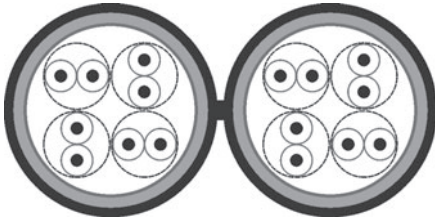
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 5e

HELUKAT® 200

S-FTP duplex



Cable structure

Inner conductor diameter:

Conductor material:

Core insulation:

Core colours:

Shielding 1:

Screen over stranding element:

Screen 1 over stranding:

Screen 2 over stranding:

Outer sheath material:

Cable dimensions:

Outer sheath colour:

S-FTP 2x(4x2xAWG 24/1) FRNC

0,51 mm

Copper, bare

Foam-skin-PE

whbu/bu, whog/og, whgn/gn, whbn/bn

Polyester foil over stranded bundle

-

Polyester foil, aluminium-lined

Cu braid

FRNC

approx. 6,0 mm x 12,5 mm

Green similar to RAL 6018

Electrical data

Characteristic impedance:

Loop resistance:

Mutual capacitance:

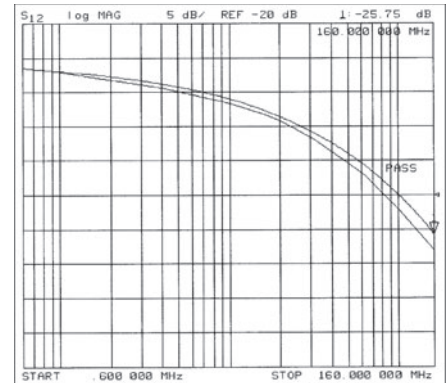
Rel. propagation velocity:

100 Ohm ± 15 ohm at 1 to 100 MHz

185 Ohm/km max.

48 nF/km nom.

74 %



Typical values

Frequency (MHz)	10	16	62,5	100	200
Attenuation (dB/100m)	5,6	7,2	14,4	18,2	25,9
Next (db)	62,0	59,0	50,0	46,0	40,0
ACR (db)	56,4	51,8	35,6	27,8	14,6

Technical data

Weight:

Min. bending radius for laying:

Operating temperature range min.:

Operating temperature range max.:

Caloric load, approx. value:

Copper weight:

approx. 100 kg/km

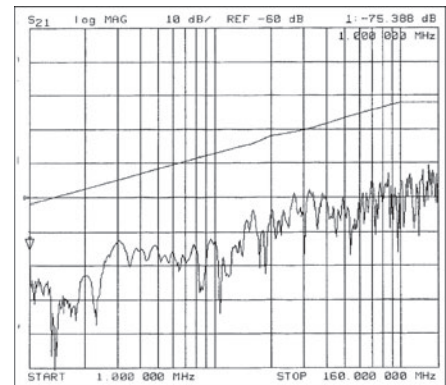
52 mm

-20°C

+60°C

0,96 MJ/m

54,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e,

Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®200 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

81123, S-FTP 2x(4x2xAWG 24/1) FRNC (SF/UTP)

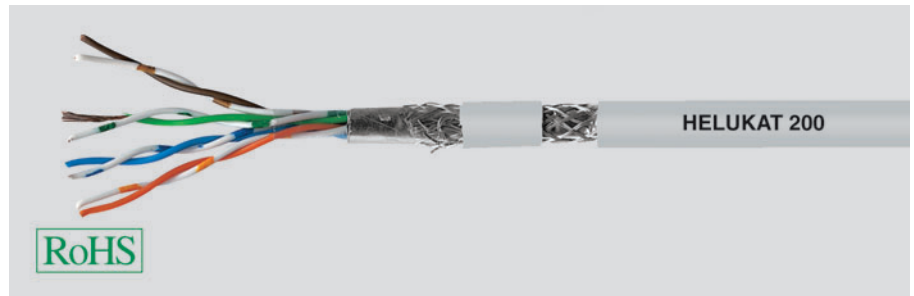
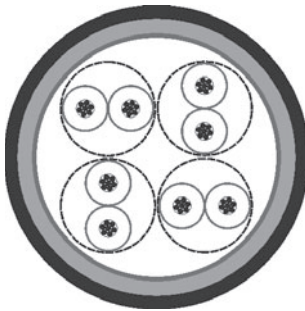
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 5e

HELUKAT® 200

S-FTP flex



Cable structure

Inner conductor diameter:
 Conductor material:
 Core insulation:
 Core colours:
 Shielding 1:
 Screen over stranding element:
 Screen 1 over stranding:
 Screen 2 over stranding:
 Outer sheath material:
 Outer diameter:
 Outer sheath colour:

S-FTP 4x2xAWG 26/7 FRNC

0,48 mm
 Copper, bare
 PO
 whbu/bu, whog/og, whgn/gn, whbn/bn
 Polyester foil over stranded bundle
 -
 Polyester foil, aluminium-lined
 Cu braid
 FRNC
 approx. 5,3 mm
 Grey similar to RAL 7035

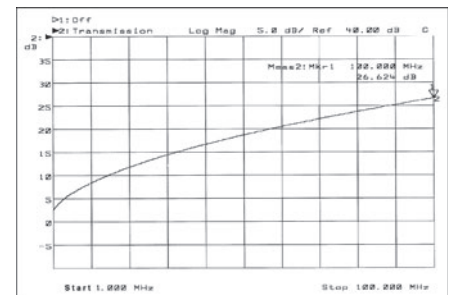
Electrical data

Characteristic impedance:
 Loop resistance:
 Mutual capacitance:
 Rel. propagation velocity:

100 Ohm ± 15 ohm at 1 to 100 MHz
 260 Ohm/km max.
 47 nF/km nom.
 69 %

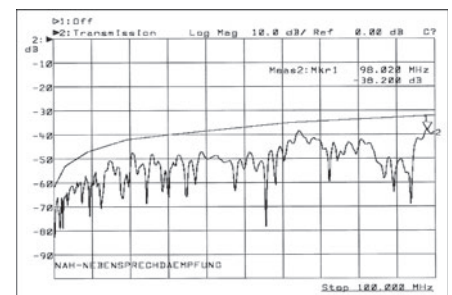
Typical values

Frequency (MHz)	10	16	62,5	100	200
Attenuation (dB/10m)	0,8	1,1	2,4	2,9	4,3
Next (db)	58,0	56,0	45,0	43,0	37,0
ACR (db)	57,2	54,9	42,6	40,1	32,7



Technical data

Weight: approx. 35 kg/km
 Min. bending radius for laying: 46 mm
 Operating temperature range min.: -20°C
 Operating temperature range max.: +60°C
 Caloric load, approx. value: 0,543 MJ/m
 Copper weight: 24,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e,
 Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®200 data cables are used in the tertiary level of a network as patch cables and connection cables. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. With its optimized construction, the HELUKAT®200 series can be manufactured quickly and easily with all common RJ45 plugs.

Part no.

81254, S-FTP 4x2xAWG 26/7 FRNC (SF/UTP)

Dimensions and specifications may be changed without prior notice.

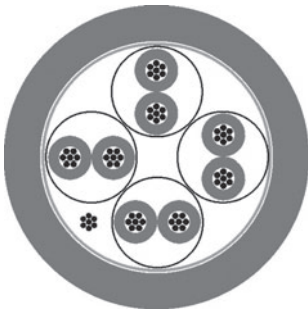
R

LAN Cable

Category 6

HELUKAT® 300

U-STP, UL



Cable structure

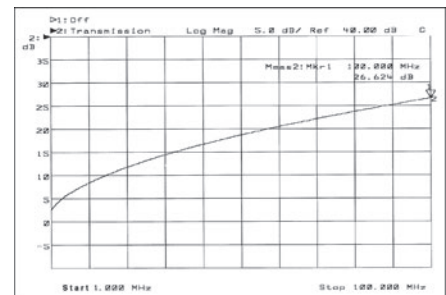
Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

S-UTP 4x2xAWG 26/7 PVC, UL

0,48 mm
Copper, tinned
Foam-skin-PE
whbu/bu, whog/og, whgn/gn, whbn/bn
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
-
-
PVC
approx. 5,9 mm
Grey similar to RAL 7035

Electrical data

Characteristic impedance: 100 Ohm ± 20 ohm at 101 to 155 MHz
Loop resistance: 290 Ohm/km max.
Mutual capacitance: 45 nF/km nom.
Rel. propagation velocity: 77 %



Typical values

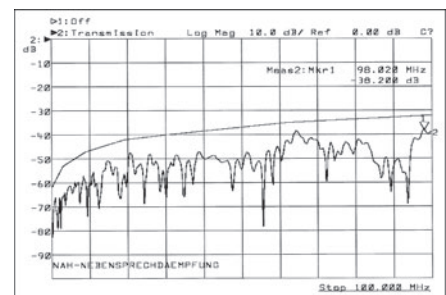
Frequency (MHz)	10	16	62,5	100	200	300
Attenuation (db/10m)	0,9	1,1	2,2	2,7	3,9	4,7
Next (db)	90,0	88,0	83,0	80,0	76,0	73,0
ACR (db)	89,1	86,9	80,8	77,3	72,1	68,3

Technical data

Weight: approx. 37 kg/km
Min. bending radius for laying: 48 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,41 MJ/m
Copper weight: 20,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, CMX 444



Application

HELUKAT®300 data cables are used in the tertiary level of a network as patch cables and connection cables. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. With its optimized construction, the HELUKAT®300 series can be manufactured quickly and easily with all common RJ45 plugs. This type is certified according UL because of the special PVC jacket.

Part no.

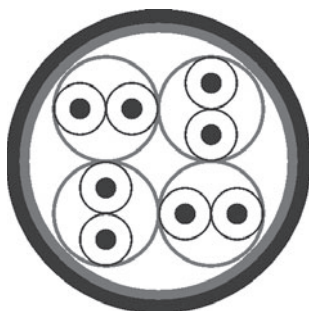
802174, U-STP 4x2xAWG 26/7 PVC

Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 6

HELUKAT® 450
S-STP

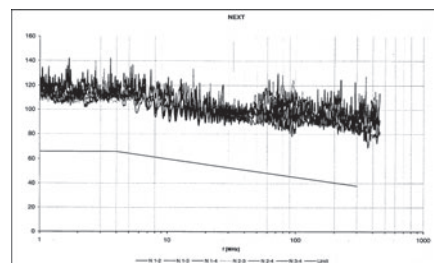


Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

S-STP 4x2xAWG 24/1 FRNC

0,52 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Polyester foil, aluminium-lined
-
FRNC
approx. 7,4 mm
Green similar to RAL 6018



Electrical data

Characteristic impedance:
Loop resistance:
Mutual capacitance:
Rel. propagation velocity:

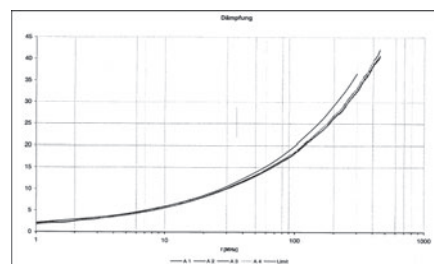
100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 450 MHz
146 Ohm/km max.
43 nF/km nom.
79 %

Typical values

Frequency (MHz)	10	16	62,5	100	200	300	450
Attenuation (dB/100m)	5,4	7,0	13,8	17,6	26,0	34,0	38,5
Next (db)	100,0	100,0	95,8	94,5	91,0	87,0	84,3
ACR (db)	94,6	93,0	82,0	76,9	65,0	53,0	45,8

Technical data

Weight: approx. 50 kg/km
Min. bending radius for laying: 59 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,57 MJ/m
Copper weight: 24,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6, Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®450 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

82501, S-STP 4x2xAWG 24/1 FRNC (S/FTP)

Dimensions and specifications may be changed without prior notice.

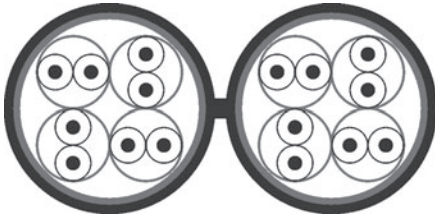
R

LAN Cable

Category 6

HELUKAT® 450

S-STP duplex



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Cable dimensions:
Outer sheath colour:

S-STP 2x(4x2xAWG 24/1) FRNC

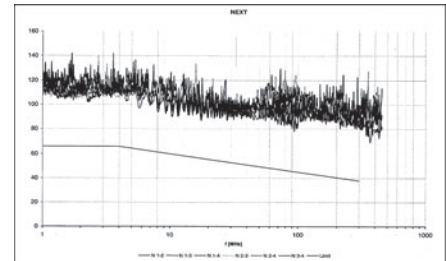
0,52 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Polyester foil, aluminium-lined
-
FRNC
approx. 7,4 mm x 15,0 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance:

Loop resistance:
Mutual capacitance:
Rel. propagation velocity:

100 Ohm \pm 15 ohm at 1 to 100 MHz
100 Ohm \pm 20 ohm at 101 to 450 MHz
146 Ohm/km max.
43 nF/km nom.
79 %

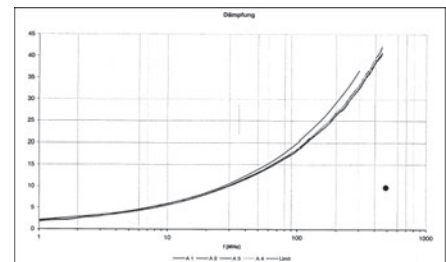


Typical values

Frequency (MHz)	10	16	62,5	100	200	300	450
Attenuation (dB/100m)	5,4	7,0	13,8	17,6	26,0	34,0	38,5
Next (db)	100,0	100,0	95,8	94,5	91,0	87,0	84,3
ACR (db)	94,6	93,0	82,0	76,9	65,0	53,0	45,8

Technical data

Weight: approx. 100 kg/km
Min. bending radius for laying: 59 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 1,14 MJ/m
Copper weight: 48,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6, Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®450 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

82502, S-STP 2x(4x2xAWG 24/1) FRNC (S/FTP)

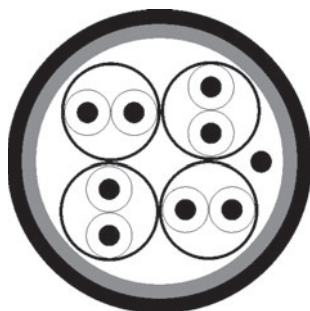
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 6A

HELUKAT® 500

F-FTP

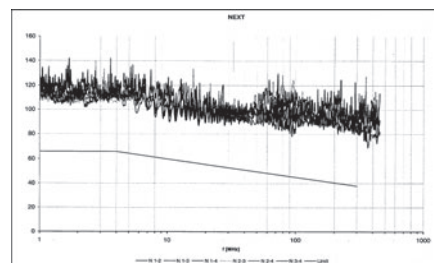


Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

F/FTP 4x2xAWG 23/1 LSZH

0,57 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Polyester foil, aluminium-lined
-
LSZH
approx. 7,5 mm
Blue Lilac similar to RAL 4005



Electrical data

Characteristic impedance:

Loop resistance:
Mutual capacitance:
Rel. propagation velocity:

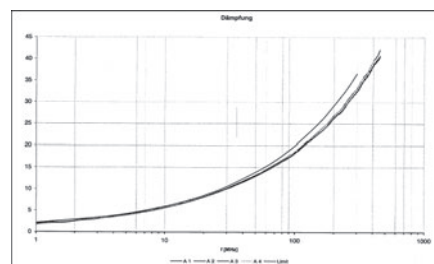
100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 500 MHz
160 Ohm/km max.
45 nF/km nom.
80 %

Typical values

Frequency (MHz)	10	16	62,5	100	200	250	300	500
Attenuation (db/100m)	5,7	7,2	14,2	18,1	25,8	29,0	31,9	41,8
Next (db)	100,0	100,0	100,0	97,4	92,9	91,4	90,2	86,9
ACR (db)	94,3	92,8	85,8	79,3	67,1	62,4	58,3	45,1

Technical data

Weight: approx. 50 kg/km
Min. bending radius for laying: 100 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,55 MJ/m
Copper weight: 28,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6A,
Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT® 500 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as 10Gigabit Ethernet, Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

803378, F-FTP 4x2xAWG 23/1 LSZH

Dimensions and specifications may be changed without prior notice.

new

R

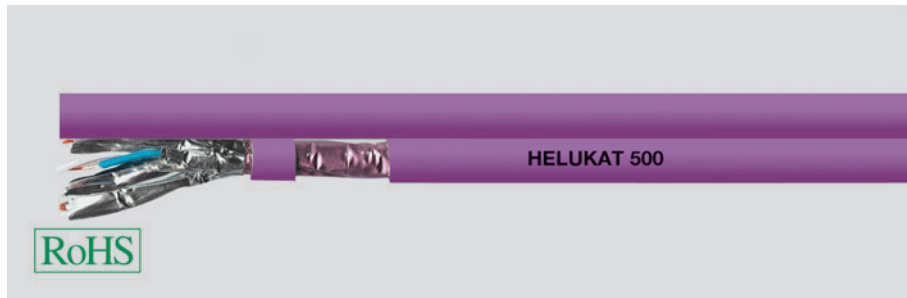
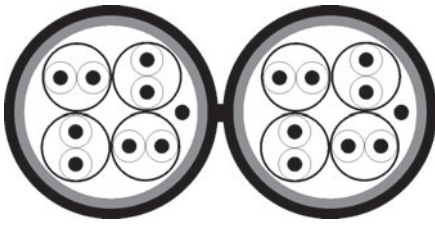
LAN Cable

Kategorie 6A

HELUKAT® 500

F-FTP duplex

new

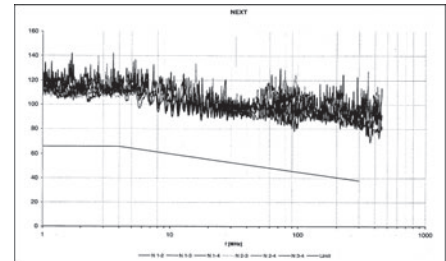


Cable structure

Inner conductor diameter:
 Conductor material:
 Core insulation:
 Core colours:
 Shielding 1:
 Screen over stranding element:
 Screen 1 over stranding:
 Screen 2 over stranding:
 Outer sheath material:
 Cable dimensions:
 Outer sheath colour:

F/FTP 2x(4x2xAWG 23/1) LSZH

0,57 mm
 Copper, bare
 Foam-skin-PE
 wh/bu, wh/og, wh/gn, wh/bn
 -
 Polyester foil, aluminium-lined
 Polyester foil, aluminium-lined
 -
 LSZH
 approx. 7,8 mm x 15,9 mm
 Blue Lilac similar to RAL 4005



Electrical data

Characteristic impedance:
 Loop resistance:
 Mutual capacitance:
 Rel. propagation velocity:

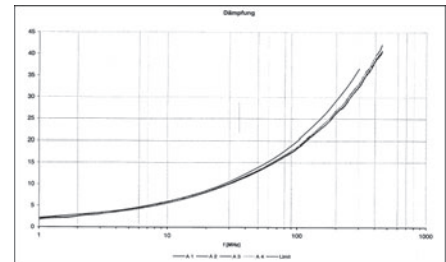
100 Ohm ± 15 ohm at 1 to 100 MHz
 100 Ohm ± 20 ohm at 101 to 500 MHz
 160 Ohm/km max.
 45 nF/km nom.
 80 %

Typical values

Frequency (MHz)	10	16	62,5	100	200	250	300	500
Attenuation (db/100m)	5,7	7,2	14,2	18,1	25,8	29,0	31,9	41,8
Next (db)	100,0	100,0	100,0	97,4	92,9	91,4	90,2	86,9
ACR (db)	94,3	92,8	85,8	79,3	67,1	62,4	58,3	45,1

Technical data

Weight: approx. 100 kg/km
 Min. bending radius for laying: 100 mm
 Operating temperature range min.: -20°C
 Operating temperature range max.: +60°C
 Caloric load, approx. value: 1,13 MJ/m
 Copper weight: 56,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6A,
 Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT® 500 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as 10Gigabit Ethernet, Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

803379, F/FTP 2x(4x2xAWG 23/1) LSZH

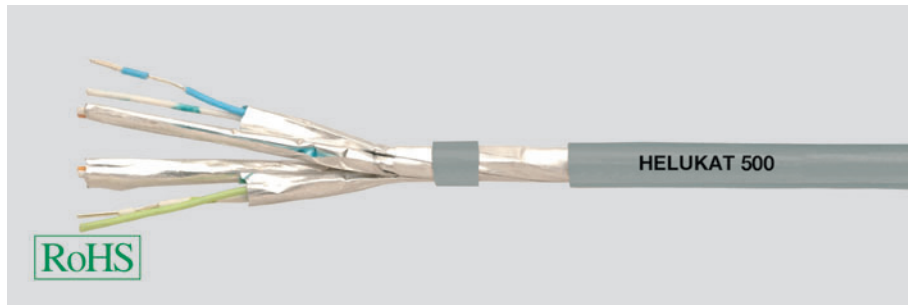
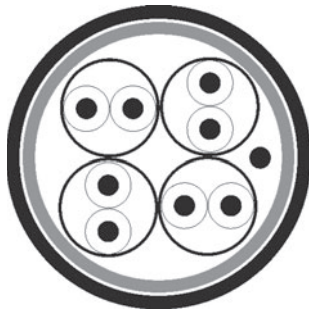
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 6A

HELUKAT® 500

F-FTP, flex



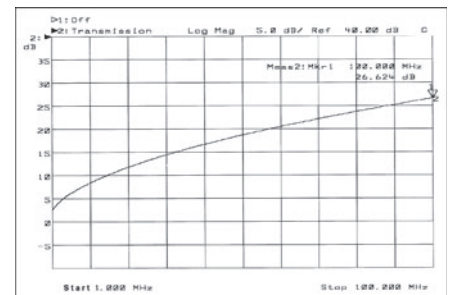
Cable structure

Inner conductor diameter: 0,48 mm
 Conductor material: Copper, bare
 Core insulation: Foam-skin-PE
 Core colours: wh/bu, wh/og, wh/gn, wh/bn
 Shielding 1: -
 Screen over stranding element: Polyester foil, aluminium-lined
 Screen 1 over stranding: -
 Screen 2 over stranding: -
 Outer sheath material: LSZH
 Outer diameter: approx. 5,8 mm
 Outer sheath colour: Grey similar to RAL 7035

U/FTP 4x2xAWG 26/7 (stranded) LSZH

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
 100 Ohm ± 20 ohm at 101 to 500 MHz
 Loop resistance: 165 Ohm/km max.
 Mutual capacitance: 54 nF/km nom.
 Rel. propagation velocity: 78 %

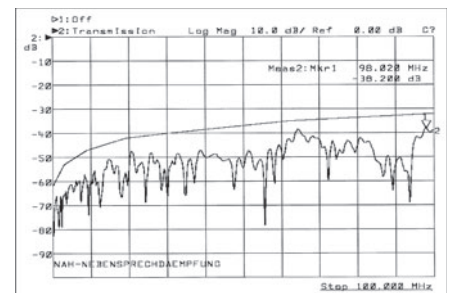


Typical values

Frequency (MHz)	10	16	62,5	100	200	250	500
Attenuation (dB/10m)	0,8	1,1	2,1	2,7	3,9	4,4	6,3
Next (db)	100,0	100,0	100,0	97,0	92,0	91,0	86,0
ACR (db)	99,2	98,9	97,9	94,3	88,1	86,6	79,7

Technical data

Weight: approx. 35 kg/km
 Min. bending radius for laying: 49 mm
 Operating temperature range min.: -20°C
 Operating temperature range max.: +60°C
 Caloric load, approx. value: 0,39 MJ/m
 Copper weight: 15,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6A,
 Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT® 500 data cables are used in the tertiary level of a network as patch cables and connection cables. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as 10Gigabit Ethernet, Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. With its optimized construction, the HELUKAT®500 series can be manufactured quickly and easily with many common RJ45 plugs.

Part no.

804043, U/FTP 4x2xAWG 26/7 LSZH

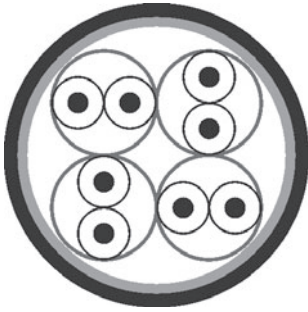
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 7e

HELUKAT® 600

S-STP



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

S-STP 4x2xAWG 23/1 FRNC

0,57 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Cu braid
-
FRNC
approx. 7,5 mm
Blue Lilac similar to RAL 4005

Electrical data

Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 1000 MHz
130 Ohm/km max.

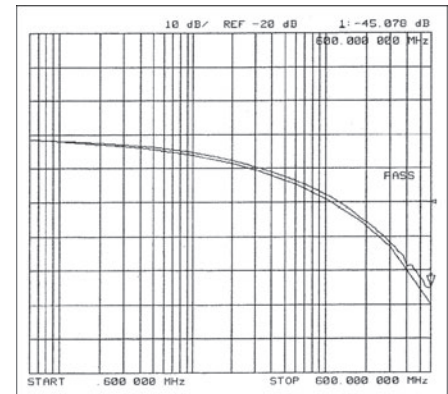
Loop resistance:

43 nF/km nom.

Mutual capacitance:

Rel. propagation velocity:

79 %

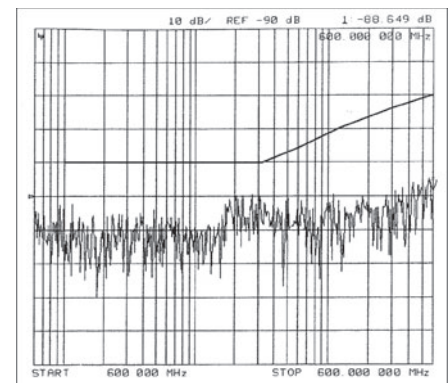


Typical values

Frequency (MHz)	10	16	62,5	100	200	300	600	900	1000
Attenuation (dB/100m)	5,6	7,1	13,9	17,5	25,2	32,1	44,9	55,0	58,0
Next (db)	100,0	100,0	96,0	94,0	88,0	84,0	73,0	71,0	69,0
ACR (db)	94,4	92,9	82,1	76,5	62,8	51,9	28,1	16,0	9,0

Technical data

Weight: approx. 60 kg/km
Min. bending radius for laying: 60 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,60 MJ/m
Copper weight: 30,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7e,
Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®600 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

80810, S-STP 4x2xAWG 23/1 FRNC (S/FTP)

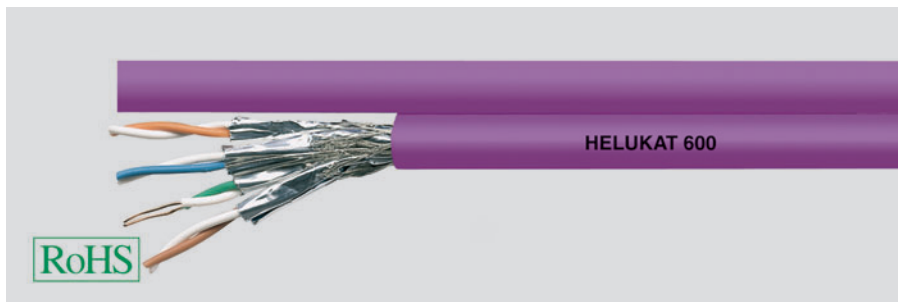
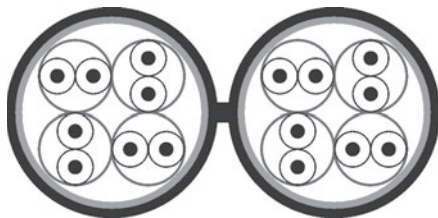
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 7e

HELUKAT® 600

S-STP duplex



Cable structure

Inner conductor diameter:

Conductor material:

Core insulation:

Core colours:

Shielding 1:

Screen over stranding element:

Screen 1 over stranding:

Screen 2 over stranding:

Outer sheath material:

Cable dimensions:

Outer sheath colour:

S-STP 2x(4x2xAWG 23/1) FRNC

0,57 mm

Copper, bare

Foam-skin-PE

wh/bu, wh/og, wh/gn, wh/bn

-

Polyester foil, aluminium-lined

Cu braid

-

FRNC

approx. 7,5 mm x 16,0 mm

Blue Lilac similar to RAL 4005

Electrical data

Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz

Loop resistance:

100 Ohm ± 20 ohm at 101 to 1000 MHz

Mutual capacitance:

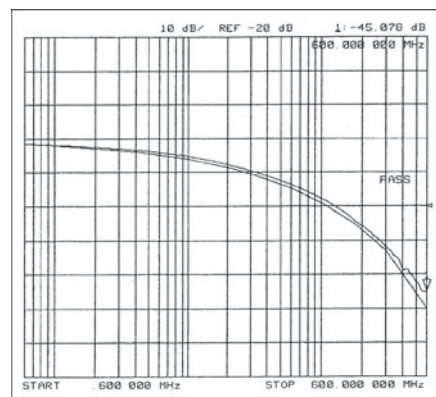
130 Ohm/km max.

Rel. propagation velocity:

79 %

Typical values

Frequency (MHz)	10	16	62,5	100	200	300	600	900	1000
Attenuation (dB/100m)	5,6	7,1	13,9	17,5	25,2	32,1	44,9	55,0	58,0
Next (db)	100,0	100,0	96,0	94,0	88,0	84,0	73,0	71,0	69,0
ACR (db)	94,4	92,9	82,1	76,5	62,8	51,9	28,1	16,0	9,0



Technical data

Weight:

approx. 120 kg/km

Min. bending radius for laying:

60 mm

Operating temperature range min.:

-20°C

Operating temperature range max.:

+60°C

Copper load, approx. value:

1,20 MJ/m

Copper weight:

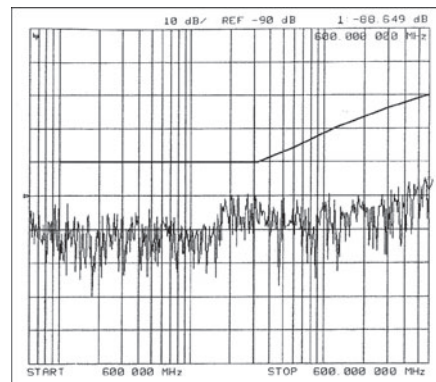
60,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7e,

Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to

60754-2, Corrosiveness acc. to EN50267-2-3



Application

HELUKAT®600 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

81446, S-STP 2x(4x2xAWG 23/1) FRNC (S/FTP)

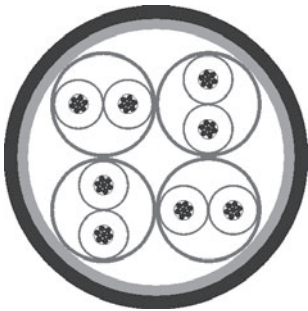
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 7

HELUKAT® 600

S-STP flex



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

S-STP 4x2xAWG 26/7 FRNC

0,48 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Cu braid
-
FRNC
approx. 5,9 mm
Grey similar to RAL 7035

Electrical data

Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 600 MHz

Loop resistance:

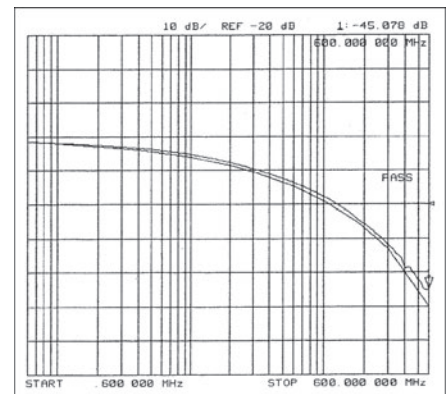
264 Ohm/km max.

Mutual capacitance:

45 nF/km nom.

Rel. propagation velocity:

77 %

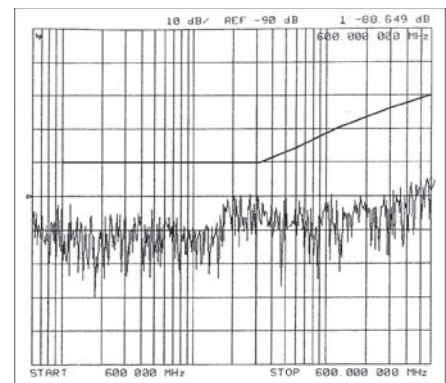


Typical values

Frequency (MHz)	10	16	62,5	100	200	300	600
Attenuation (dB/10m)	0,8	1,0	2,0	2,6	4,0	4,9	6,3
Next (db)	96,0	96,0	95,0	94,0	88,0	86,0	80,0
ACR (db)	95,2	95,0	93,0	91,4	84,0	81,1	73,7

Technical data

Weight: approx. 42 kg/km
Min. bending radius for laying: 55 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,47 MJ/m
Copper weight: 22,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®600 data cables are used in the tertiary level of a network as patch cables and connection cables. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. With its optimized construction, the HELUKAT®600 series can be manufactured quickly and easily with all common RJ45 plugs.

Part no.

80294, S-STP 4x2xAWG 26/7 FRNC (S/FTP)

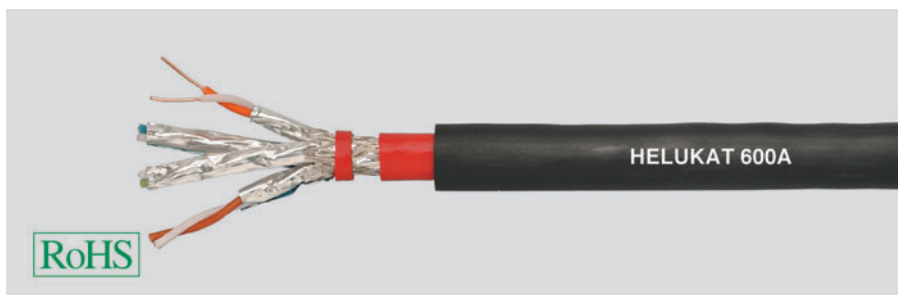
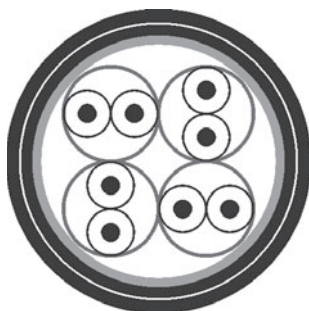
Dimensions and specifications may be changed without prior notice.

LAN Cable Outdoor

Category 7

HELUKAT® 600A

S-STP PVC/PVC



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Inner sheath material:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

S-STP 4x2xAWG 23/1 PVC/PVC

0,58 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
PVC
Polyester foil, aluminium-lined
Cu braid
-
PVC
approx. 11,6 mm
Black similar to RAL 9005

Electrical data

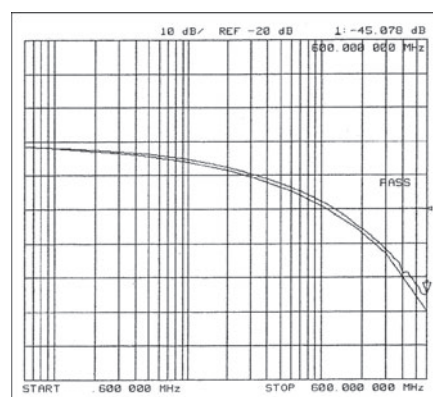
Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 600 MHz
160 Ohm/km max.
43 nF/km nom.
79 %

Loop resistance:

Mutual capacitance:

Rel. propagation velocity:



Typical values

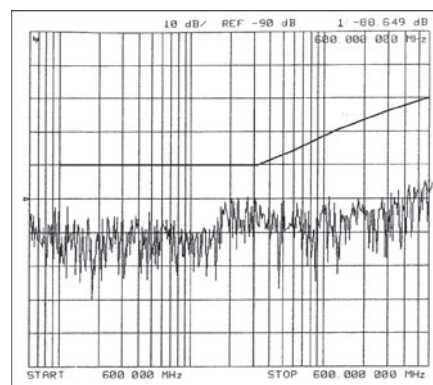
Frequency (MHz)	10	16	62,5	100	200	300	600
Attenuation (dB/100m)	5,8	7,4	14,6	18,4	26,2	32,1	49,0
Next (db)	85,0	85,0	85,0	85,0	83,0	80,0	80,0
ACR (db)	79,2	77,6	70,4	66,6	56,8	47,9	31,0

Technical data

Weight: approx. 153 kg/km
Min. bending radius for laying: 95 mm
Operating temperature range min.: -30°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 2,62 MJ/m
Copper weight: 32,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034



Application

HELUKAT® 600 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. The serie of HELUKAT® 600A with a double PVC jacket is constructed especially for outdoor applications like laying at house walls or in cable lines.

Part no.

801147, S-STP 4x2xAWG 23/1 PVC/PVC (S/FTP)

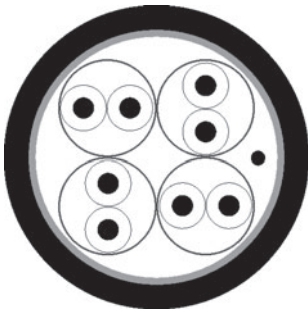
Dimensions and specifications may be changed without prior notice.

LAN Cable Direct Burial

Category 7

HELUKAT® 600E

S-STP PVC



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

S-STP 4x2xAWG 23/1 direct burial

0,58 mm
Copper, bare
PO
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Cu braid
-
PVC
approx. 9,8 mm
Black

Electrical data

Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 600 MHz
150 Ohm/km max.

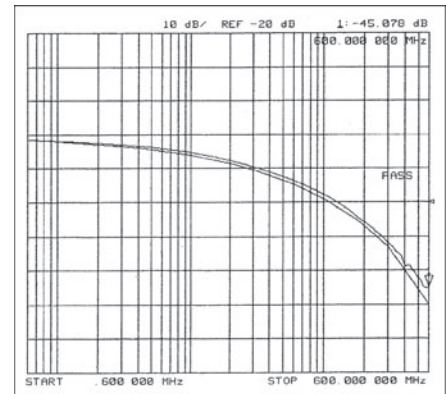
Loop resistance:

42 nF/km nom.

Mutual capacitance:

Rel. propagation velocity:

79 %

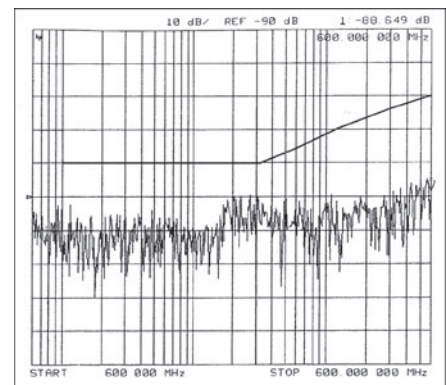


Typical values

Frequency (MHz)	10	16	62,5	100	200	300	600
Attenuation (dB/100m)	5,8	7,4	14,6	18,4	26,2	32,1	49,0
Next (db)	85,0	85,0	85,0	85,0	83,0	80,0	80,0
ACR (db)	79,2	77,6	70,4	66,6	56,8	47,9	31,0

Technical data

Weight: approx. 102 kg/km
Min. bending radius for laying: 100 mm
Operating temperature range min.: -45°C
Operating temperature range max.: +65°C
Caloric load, approx. value: 1,40 MJ/m
Copper weight: 32,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, UL 1581 VW-1

Application

HELUKAT® 600 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. The serie of HELUKAT® 600E with a cold resistant PVC jacket is constructed especially for outdoor applications like laying at house walls or direct burial.

Part no.

802167, S-STP 4x2xAWG23/1 PVC (S/FTP)

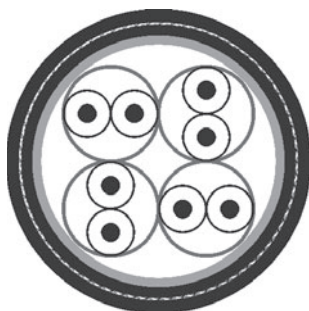
Dimensions and specifications may be changed without prior notice.

LAN Cable / armoured

Category 7

HELUKAT® 600AE

S-STP FRNC/PE



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Inner sheath material:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
:
Outer sheath material:
Outer diameter:
Outer sheath colour:

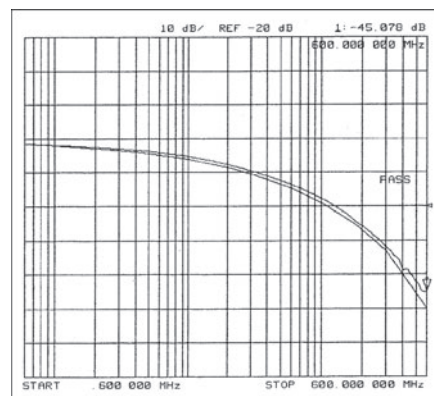
S-STP 4x2xAWG 23/1 FRNC/PE

0,58 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
FRNC
Polyester foil, aluminium-lined
Cu braid
-
Steel shaft
PE
approx. 12,2 mm
Black

Electrical data

Characteristic impedance:
Loop resistance:
Mutual capacitance:
Rel. propagation velocity:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 600 MHz
150 Ohm/km max.
43 nF/km nom.
79 %



Typical values

Frequency (MHz)	10	16	62,5	100	200	300	600
Attenuation (dB/100m)	5,8	7,4	14,6	18,4	26,2	32,1	49,0
Next (db)	85,0	85,0	85,0	85,0	83,0	80,0	80,0
ACR (db)	79,2	77,6	70,4	66,6	56,8	47,9	31,0

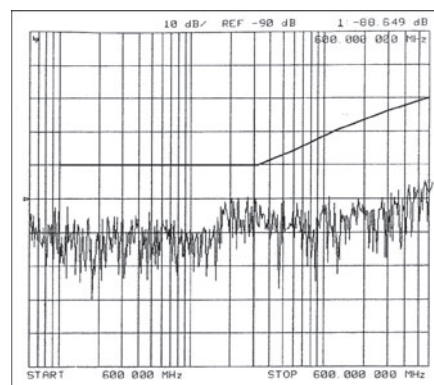
Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 155 kg/km
330 mm
-45°C
+70°C
2,30 MJ/m
32,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7



Application

HELUKAT® 600 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. The serie of HELUKAT® 600AE with a FRNC/PE double jacket and the rodent protection is constructed especially for outdoor and direct burial applications.

Part no.

802168, S-STP 4x2xAWG 23/1 FRNC/PE

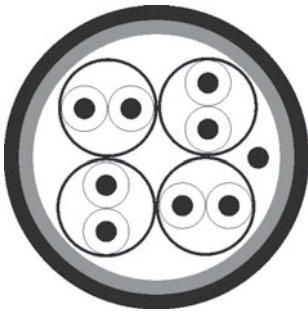
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 7_A

HELUKAT® 1200
S-STP

new



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

S/FTP 4x2xAWG 23/1 LSZH

0,57 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Cu braid
-
LSZH
approx. 7,9 mm
Blue Lilac similar to RAL 4005

Electrical data

Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 1200 MHz
160 Ohm/km max.

Loop resistance:

45 nF/km nom.

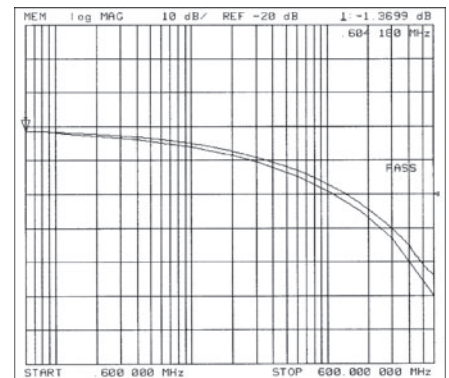
Mutual capacitance:

Rel. propagation velocity:

80 %

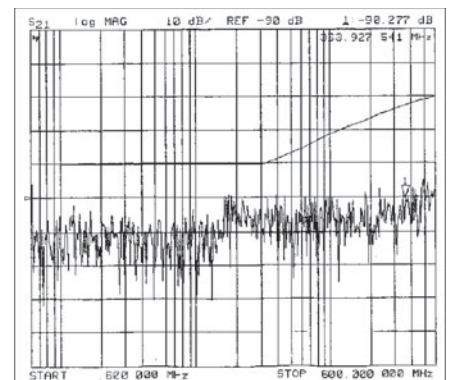
Typical values

Frequency (MHz)	10	16	62,5	100	200	300	600	900	1000	1200
Attenuation (db/100m)	5,4	6,8	13,3	16,9	24,2	29,8	42,9	53,2	56,3	62,1
Next (db)	105,0	105,0	105,0	100,0	95,0	93,0	88,0	85,0	84,0	82,0
ACR (db)	99,6	98,2	91,7	83,1	70,8	63,2	45,1	31,8	27,7	19,9



Technical data

Weight: approx. 60 kg/km
Min. bending radius for laying: 60 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,56 MJ/m
Copper weight: 35,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7_A,
Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®1200-7A data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as 10Gigabit Ethernet, Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

803380, S-STP 4x2xAWG 23/1 LSZH (S/FTP)

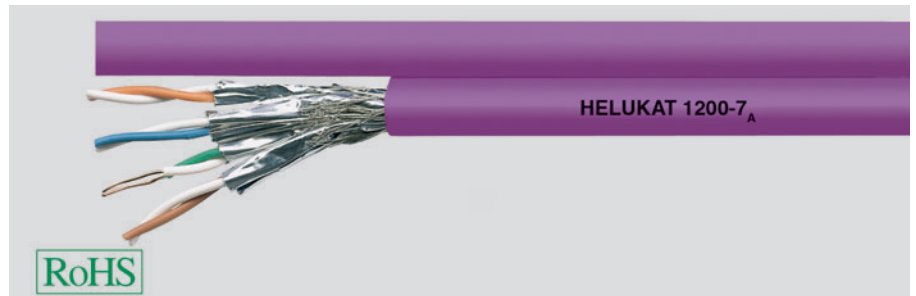
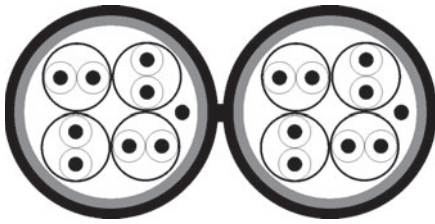
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 7_A

HELUKAT® 1200

S-STP duplex

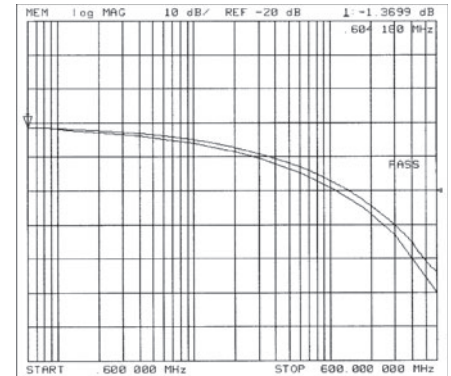


new

Cable structure

Inner conductor diameter: 0,57 mm
 Conductor material: Copper, bare
 Core insulation: Foam-skin-PE
 Core colours: wh/bu, wh/og, wh/gn, wh/bn
 Shielding 1: -
 Screen over stranding element: Polyester foil, aluminium-lined
 Screen 1 over stranding: Cu braid
 Screen 2 over stranding: -
 Outer sheath material: LSZH
 Cable dimensions: approx. 16,8 mm x 7,9 mm
 Outer sheath colour: Blue Lilac similar to RAL 4005

S/FTP 4x2xAWG 23/1 LSZH



Electrical data

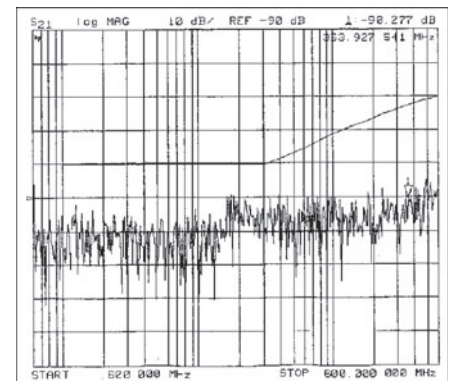
Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
 100 Ohm ± 20 ohm at 101 to 1200 MHz
 Loop resistance: 160 Ohm/km max.
 Mutual capacitance: 56 nF/km nom.
 Rel. propagation velocity: 80 %

Typical values

Frequency (MHz)	10	16	62,5	100	200	300	600	900	1000	1200
Attenuation (db/100m)	5,4	6,8	13,3	16,9	24,2	29,8	42,9	53,2	56,3	62,1
Next (db)	105,0	105,0	105,0	100,0	95,0	93,0	88,0	85,0	84,0	82,0
ACR (db)	99,6	98,2	91,7	83,1	70,8	63,2	45,1	31,8	27,7	19,9

Technical data

Weight: approx. 120 kg/km
 Min. bending radius for laying: 60 mm
 Operating temperature range min.: -20°C
 Operating temperature range max.: +60°C
 Caloric load, approx. value: 1,15 MJ/m
 Copper weight: 70,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7_A,
 Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

Application

HELUKAT®1200-7A data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as 10Gigabit Ethernet, Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

803381, S-STP 4x2xAWG 23/1 LSZH (S/FTP)

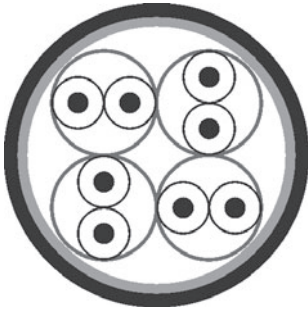
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 7e

HELUKAT® 1200

S-STP



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:

S-STP 4x2xAWG 22/1 FRNC

0,64 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Cu braid
-
FRNC
approx. 7,7 mm

Electrical data

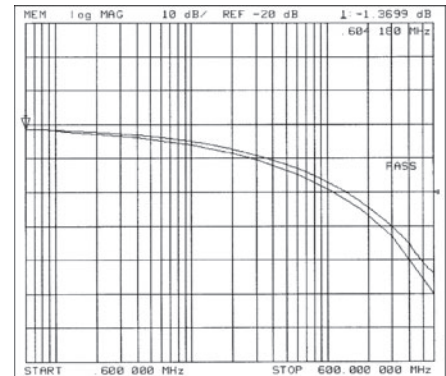
Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 1200 MHz
120 Ohm/km max.
43 nF/km nom.
79 %

Loop resistance:

Mutual capacitance:

Rel. propagation velocity:



Typical values

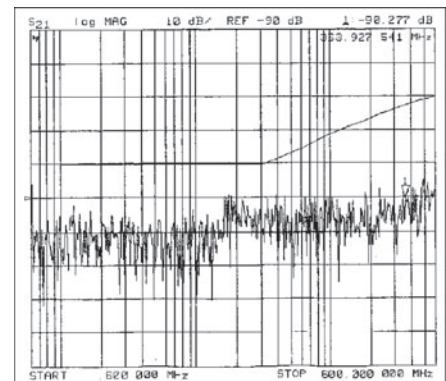
Frequency (MHz)	10	16	62,5	100	200	300	600	1000	1200
Attenuation (dB/100m)	4,9	6,3	12,7	16,3	23,5	29,4	42,8	53,0	59,0
Next (db)	100,0	100,0	95,0	93,0	90,0	87,0	81,0	78,0	77,0
ACR (db)	95,1	93,7	82,3	76,7	66,5	57,6	38,2	25,0	18,0

Technical data

Weight: approx. 66 kg/km
Min. bending radius for laying: 72 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,70 MJ/m
Copper weight: 40,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7e,
Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3



Application

HELUKAT®1200 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

81699, S-STP 4x2xAWG 22/1 FRNC (S/FTP)

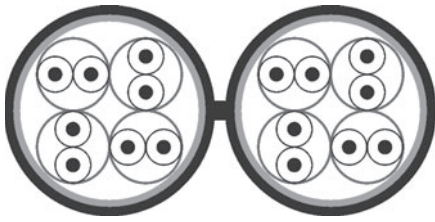
Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 7e

HELUKAT® 1200

S-STP duplex



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Cable dimensions:

S-STP 2x(4x2xAWG 22/1) FRNC

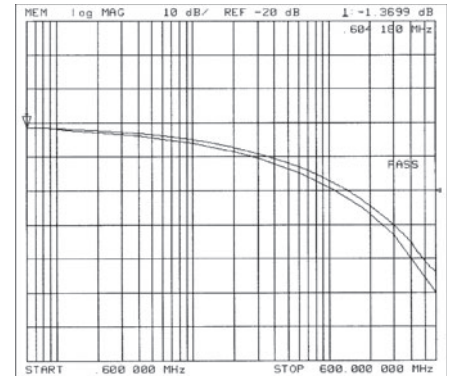
0,64 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Cu braid
-
FRNC
approx. 7,7 mm x 16,5 mm

Electrical data

Characteristic impedance:

Loop resistance:
Mutual capacitance:
Rel. propagation velocity:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 1200 MHz
120 Ohm/km max.
43 nF/km nom.
79 %



Typical values

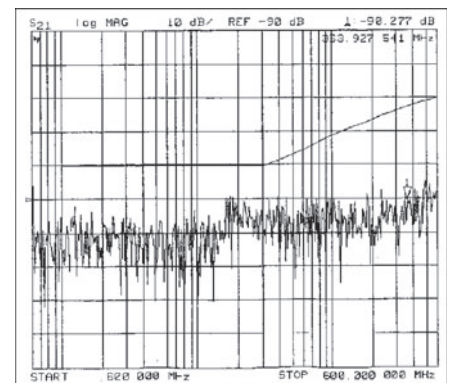
Frequency (MHz)	10	16	62,5	100	200	300	600	1000	1200
Attenuation (dB/100m)	4,9	6,3	12,7	16,3	23,5	29,4	42,8	53,0	59,0
Next (db)	100,0	100,0	95,0	93,0	90,0	87,0	81,0	78,0	77,0
ACR (db)	95,1	93,7	82,3	76,7	66,5	57,6	38,2	25,0	18,0

Technical data

Weight: approx. 133 kg/km
Min. bending radius for laying: 72 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 1,50 MJ/m
Copper weight: 80,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7e,
Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3



Application

HELUKAT®1200 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

800647, S-STP 2x(4x2xAWG 22/1) FRNC (S/FTP)

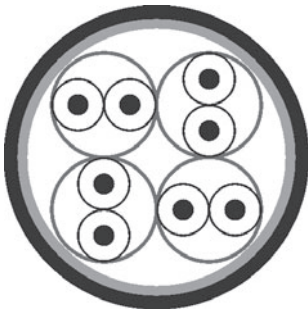
Dimensions and specifications may be changed without prior notice.

Multimedia Cable

Category 7e

HELUKAT® 1500

S-STP



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Screen over stranding element:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Outer diameter:

S-STP 4x2xAWG 22/1 FRNC

0,64 mm
Copper, bare
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
-
Polyester foil, aluminium-lined
Cu braid
-
FRNC
approx. 8,6 mm

Electrical data

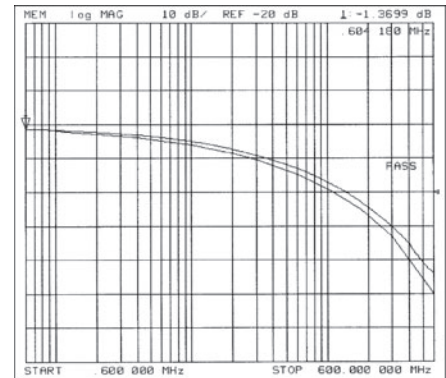
Characteristic impedance:

100 Ohm ± 15 ohm at 1 to 100 MHz
100 Ohm ± 20 ohm at 101 to 1200 MHz
120 Ohm/km max.
42 nF/km nom.
80 %

Loop resistance:

Mutual capacitance:

Rel. propagation velocity:



Typical values

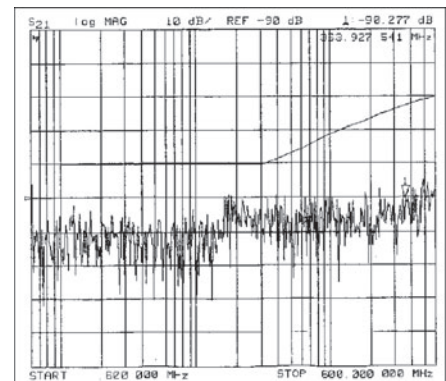
Frequenz (MHz)	10	16	62,5	100	200	300	600	1000	1200	1500
Dämpfung (db/100m)	4,2	6,3	12,7	14,4	21,5	27,5	37,7	49,0	54,9	62,0
Next (db)	110,0	110,0	110,0	110,0	110,0	105,0	100,0	92,0	88,0	73,0
ACR (db)	106,0	103,7	97,3	95,6	88,5	77,5	62,3	43,0	33,1	11,0

Technical data

Weight: approx. 80 kg/km
Min. bending radius for laying: 68 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,74 MJ/m
Copper weight: 53,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7e,
Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3



Application

HELUKAT® 1500 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as 10Gigabit Ethernet, Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. That means applications such as multimedia (TV, Video, Data, Speech) are no problem for this series. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

802169, S-STP 4x2xAWG 22/1 FRNC (S/FTP)

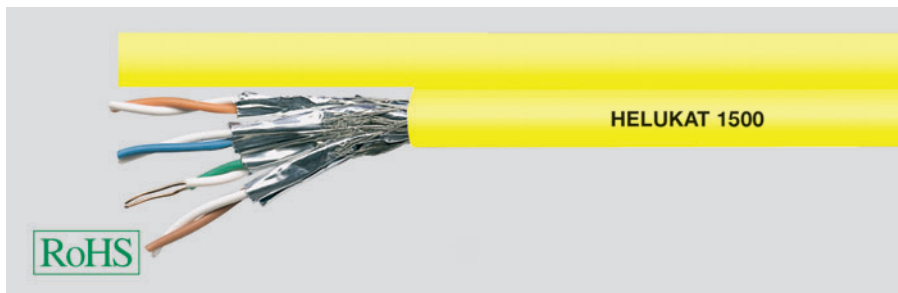
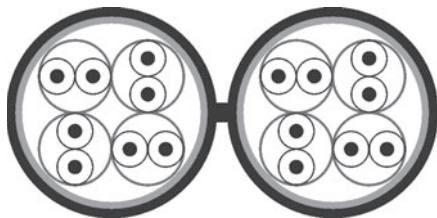
Dimensions and specifications may be changed without prior notice.

Multimedia Cable

Category 7e

HELUKAT® 1500

S-STP duplex



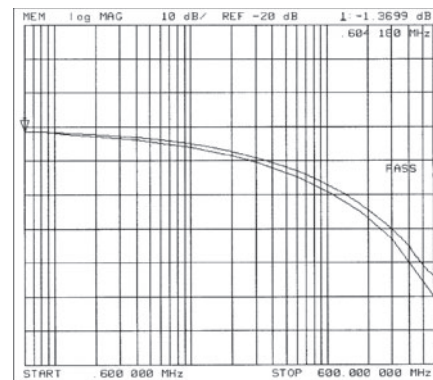
Cable structure

Inner conductor diameter:	0,64 mm
Conductor material:	Copper, bare
Core insulation:	Foam-skin-PE
Core colours:	wh/bu, wh/og, wh/gn, wh/bn
Shielding 1:	-
Screen over stranding element:	Polyester foil, aluminium-lined
Screen 1 over stranding:	Cu braid
Screen 2 over stranding:	-
Outer sheath material:	FRNC
Cable dimensions:	approx. 8,6 mm x 18,2 mm

S-STP 2x(4x2xAWG 22/1) FRNC

Electrical data

Characteristic impedance:	100 Ohm ± 15 ohm at 1 to 100 MHz 100 Ohm ± 20 ohm at 101 to 1200 MHz
Loop resistance:	120 Ohm/km max.
Mutual capacitance:	42 nF/km nom.
Rel. propagation velocity:	80 %

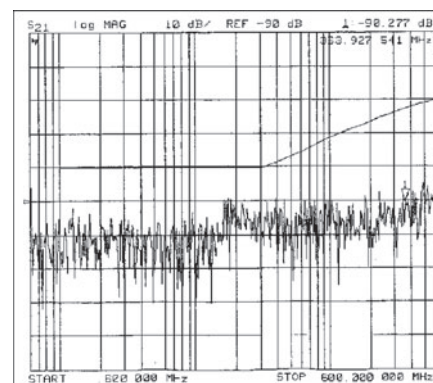


Typical values

Frequency (MHz)	10	16	62,5	100	200	300	600	1000	1200	1500
Attenuation (db/100m)	4,2	6,3	12,7	14,4	21,5	27,5	37,7	49,0	54,9	62,0
Next (db)	110,0	110,0	110,0	110,0	110,0	105,0	100,0	92,0	88,0	73,0
ACR (db)	106,0	103,7	97,3	95,6	88,5	77,5	62,3	43,0	33,1	11,0

Technical data

Weight:	approx. 160 kg/km
Min. bending radius for laying:	68 mm
Operating temperature range min.:	-20°C
Operating temperature range max.:	+60°C
Caloric load, approx. value:	1,50 MJ/m
Copper weight:	106,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7e, Flame-retardant acc. to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3

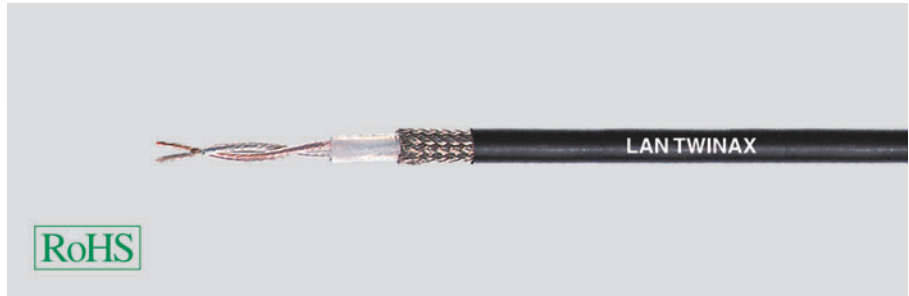
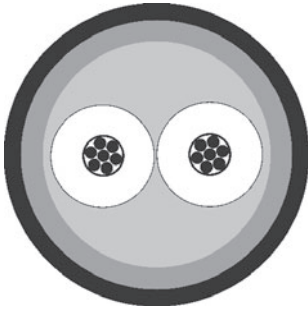
Application

HELUKAT®1500 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as 10Gigabit Ethernet, Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. That means applications such as multimedia (TV, Video, Data, Speech) are no problem for this series. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

802170, S-STP 2x(4x2xAWG 22/1) FRNC (S/FTP)

Dimensions and specifications may be changed without prior notice.



Cable structure

Inner conductor diameter:	1 x AWG 20, Copper, bare + 1 x AWG 20, Copper, tinned
Conductor material:	Copper, bare
Core insulation:	PE
Core colours:	Transparent
Screen over stranding element:	Solid PE dielectric
Screen over stranding 1:	-
Screen over stranding 2:	Cu braid, tinned
Outer sheath material:	PVC / PE
Outer diameter:	approx. 8,3 mm / approx. 9,3 mm
Outer sheath colour:	Black

Electrical data

Characteristic impedance:	105 Ohm
Mutual capacitance:	53 nF/km nom.
Rel. propagation velocity:	66 %

Typical values

Frequency (MHz)	100
Attenuation (dB/100m)	14,0

Technical data

Weight:	approx. 88 kg/km
Min. bending radius for laying:	125 mm
Operating temperature range min.:	-10°C
Operating temperature range max.:	+80°C
Copper weight:	51,00 kg/km

Application

HELUKABEL® TWINAX cables are used in the area of the IBM computer systems S/36, S/38 and AS400. By using a special PE sheath, an outdoor version was developed as well.

Part no.

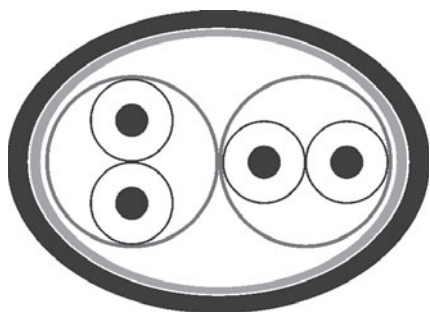
80072, IBM P/N 7362211 Twinax indoor

80073, IBM P/N 7362211 Twinax outdoor

Dimensions and specifications may be changed without prior notice.

LAN Cable

IBM P/N 33G2772, IBM P/N 33G8224, IBM P/N 33G2775



Cable structure

Inner conductor diameter:
 Conductor material:
 Core insulation:
 Number of cores:
 Core colours:
 Screen over stranding element:

Screen over stranding 1:
 Screen over stranding 2:
 Outer sheath material:
 Cable dimensions:
 Outer sheath colour:

Electrical data

Characteristic impedance:

Direct current resistance:
 Rel. propagation velocity:

Typical values

Frequency (MHz)	20	100	20	100	20	100
Attenuation (dB/100m)	7,4	18,7	4,9	12,3	7,4	18,7
Next (db)	80,0	60,0	50,0	39,0	60,0	49,0

Technical data

Weight:	approx. 85 kg/km	approx. 70 kg/km	approx. 60 kg/km
Min. bending radius for laying:	110 mm	117 mm	84 mm
Operating temperature range min.:	-10°C	-10°C	-10°C
Operating temperature range max.:	+70°C	+70°C	+70°C
Caloric load, approx. value:	1,70 MJ/m	0,78 MJ/m	0,68 MJ/m
Copper weight:	38,00 kg/km	25,00 kg/km	21,00 kg/km

Application

HELUKABEL® IVS types are used in the area of the IVS system, developed by IBM. They correspond to the wiring guidelines set by IBM.

Part no.

80068, IBM P/N 33G2772
type 1A

80071, IBM P/N 33G2775
type 6A

80070, IBM P/N 33G8224
type 1A mini

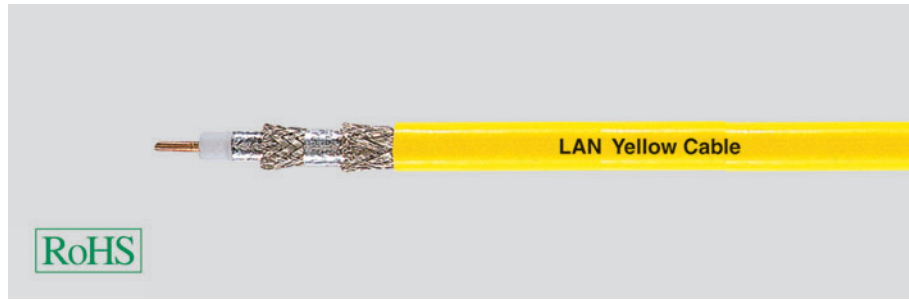
Dimensions and specifications may be changed without prior notice.



LAN Cable



Ethernet Cheapernet Cable, Yellow Cable, Transceiver Cable



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Number of cores:
Core colours:
Screen over stranding element:

Screen over stranding 1:

Screen over stranding 2:

Outer sheath material:
Outer diameter:
Outer sheath colour:

Electrical data

Characteristic impedance:
Mutual capacitance:
Direct current resistance:
Rel. propagation velocity:

Typical values

Frequency (MHz)	4	10	4	10	4	10
Attenuation (dB/100m)	1,2	1,8	3,3	4,6	4,2	6,0

Technical data

Weight:	approx. 32 kg/km	approx. 176 kg/km	approx. 142 kg/km
Min. bending radius for laying:	69 mm	117 mm	159 mm
Operating temperature range min.:	-10°C	-10°C	-10°C
Operating temperature range max.:	+80°C	+70°C	+60°C
Caloric load, approx. value:	0,36 MJ/m	-	-
Copper weight:	21,00 kg/km	128,00 kg/km	95,00 kg/km

Application

HELUKABEL® ETHERNET types are used as baselines (Yellow + Cheapernet) and cable connections (Transceiver or AUI) within the Ethernet wiring structure.

Part no.

80044, Cheapernet cable

80074, Yellow cable

80076, Transceiver cable

Dimensions and specifications may be changed without prior notice.



Photo: HELUKABEL®

Bus Cables HELUKABEL®

Bus technology is being used in an increasing number of industrial applications. This technology can be applied in every branch in industry where process-control techniques are used. The enormous pressures of competitiveness and costs in all areas of process control emphasise the need for even more rationalisation and greater efficiency. The traditional method of parallel wiring for the equipment and machines does not have the flexibility and thus constitutes a major factor in costs and time. The potential for saving costs from internetworking the machinery by bus systems is very high. So as to keep the amount of cabling low, the information from the master controller is sent over a bus network and is potentially available to all components in the system. Only those components specifically addressed by the information can respond and process these signals. All types of cables and wires used in all common bus systems are available from HELUKABEL®.

R

Contents Bus Cables

Description	Page
Industrial Ethernet HELUKAT 600IND S-STP, ROBUST.....	R 89
Industrial Ethernet HELUKAT 600IND S-STP, SHIPLINE	R 90
Industrial Ethernet HELUKAT 600IND S-STP, ROBUSTFLEX.....	R 91
Industrial Ethernet HELUKAT 500IND S-STP, 10GIG	R 92
Industrial Ethernet HELUKAT 250S S-FTP, Drag Chain	R 93
Industrial Ethernet HELUKAT 200IND S-FTP, ROBUSTFLEX.....	R 94
Industrial Ethernet S-FTP, WK Industrial 105°C	R 95
Industrial Ethernet HELUKAT 100S ECO S-FTP 4-core, Drag Chain	R 96
Industrial Ethernet HELUKAT 100S ECO S-FTP 4-pair, Drag Chain.....	R 97
Industrial Ethernet HELUKAT 200S S-FTP 4-core, Drag Chain.....	R 98
Industrial Ethernet HELUKAT 200S S-FTP 4-pair, Drag Chain	R 99
Industrial Ethernet HELUKAT 100T S-FTP Tordierflex	R 100
Industrial Ethernet PROFINet Type A, fixed installed + robust.....	R 101
Industrial Ethernet PROFINet Type A, radiation resistant + armoured	R 102
Industrial Ethernet PROFINet Type B, hybrid	R 103
Industrial Ethernet PROFINet Type B, SHIPLINE + FESTOON.....	R 104
Industrial Ethernet PROFINet Type B and C, flexible + high flexible	R 105
Industrial Ethernet PROFINet Type C, Torsion	R 106
Profibus L2, fixed installation, indoor	R 107
Profibus L2, fixed installation, outdoor or Industrial Area	R 108
Profibus L2, Direct Burial without + with Armouring.....	R 109
Profibus L2, 7-wire.....	R 110
Profibus L2, Drag Chain	R 111
Profibus, ET200X + ECOFAST	R 112
Profibus, SHIPLINE and High Temperature	R 113
Profibus DESINA®-HYBRID-BUS	R 114
Profibus L2, TORSION + FESTOON	R 115
Profibus PA	R 116
Profibus PA, armoured.....	R 117
Profibus PA, Long Distance	R 118
Profibus SK, Indoor + Outdoor.....	R 119
Profibus SK, FRNC + Industry	R 120
Profibus SK, Drag Chain.....	R 121
FOUNDATION™ Fieldbus Basic.....	R 122
FOUNDATION™ Fieldbus Type A + gnge	R 123
FOUNDATION™ Fieldbus Type A, armoured.....	R 124
FOUNDATION™ Fieldbus Type A	R 125
BUS Cables HMxCB200, fixed installed	R 126
BUS Cables HMxCB500, Drag Chain.....	R 127
BUS Cables HMxCB500S, Drag Chain	R 128
BUS Cables HMxCB800, Drag Chain.....	R 129
BUS Cables USB S	R 130
BUS Cables USB L.....	R 131
CAN-Bus 0,22 mm ² , fixed installed	R 132
CAN-Bus 0,22 mm ² , fixed installed	R 133
CAN-Bus, fixed installed, 105°C.....	R 134
CAN-Bus 0,34 mm ² , fixed installed	R 135
CAN-Bus 0,34 mm ² , fixed installed	R 136

Contents Bus Cables

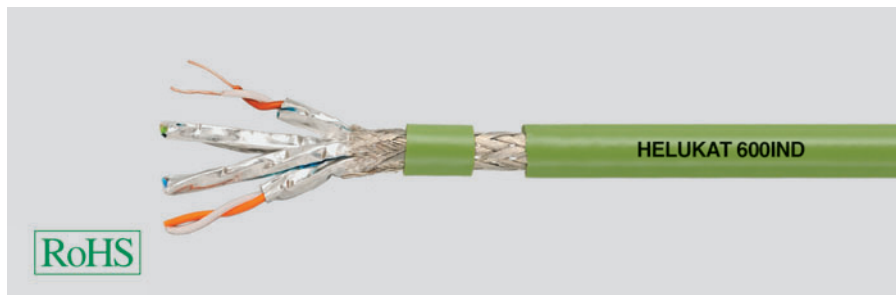
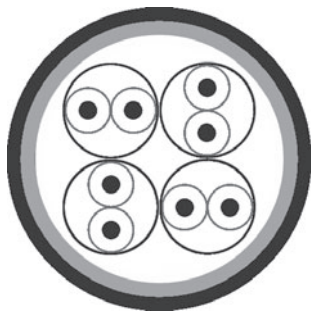
Description	Page
CAN-Bus 0,50 mm ² , fixed installed	R 137
CAN-Bus 0,50 mm ² , fixed installed	R 138
CAN-Bus 0,75 mm ² , fixed installed	R 139
CAN-Bus 0,25 mm ² , Drag Chain	R 140
CAN-Bus 0,34 mm ² Drag Chain, UL	R 141
Interbus, fixed installed	R 142
Interbus, fixed installed, halogen-free	R 143
Interbus Drag Chain	R 144
Multibus I, high flexible	R 145
Multibus II, high flexible	R 146
ASI-Bus, EPDM	R 147
ASI-Bus, PUR, UL/CSA	R 148
ASI-Bus, TPE	R 149
ASI-Bus, TPE, UL/CSA	R 150
AS-Interface Electrical Cabinet FLIH	R 151
Sensor-Aktor TPM	R 152
DeviceNet™ PVC	R 153
DeviceNet™ FRNC	R 154
DeviceNet™ CPE	R 155
DeviceNet™ PUR, flexible	R 156
CC-Link-Bus PVC	R 157
SafetyBUS®, FRNC + PUR	R 158
LON BUS, H122 + Y116	R 159
EIB-Bus, 2-pairs PVC	R 160
EIB-Bus, FRNC + PVC	R 161
EIB-Bus ERD, PE	R 162
KH-Bus, PVC + FRNC	R 163

Industrial Ethernet

ROBUST

HELUKAT® 600IND

S-STP, Category 7



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Industrial Area

S-STP 4x2xAWG 23/1 PUR

Copper, bare (AWG 23/1)
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
Double core
-
Polyester foil, aluminium-lined
Cu braid
-
PUR
approx. 8,2 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance:

Loop resistance:
Mutual capacitance:

100 Ohm \pm 15 ohm at 1 to 100 MHz
100 Ohm \pm 20 ohm at 101 to 600 MHz
148 Ohm/km max.
43 nF/km nom.

Typical values

Frequency (MHz)		10	16	62,5	100	200	300	600
Attenuation (dB/100m)		5,6	7,1	13,9	17,5	25,2	32,1	44,9
Next (db)		100,0	100,0	96,0	94,0	88,0	84,0	73,0
ACR (db)		94,4	92,9	82,1	76,5	62,8	51,9	28,1

Technical data

Weight: approx. 62 kg/km
Min. bending radius for laying: 85 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +80°C
Caloric load, approx. value: 0,74 MJ/m
Copper weight: 34,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7, Flame-retardant acc. to IEC 60332-1, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3, Oil-resistant

Application

HELUKAT® 600IND data cables are used for harsh industrial applications. Mechanical characteristics are the steady against mineral oils, fats and cooling lubricants. Also they are microben resistant and hydrolysis resistant. Electrically they are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. The cables thus exceed the requirements for EN55022 Class B emission and EN55024 immunity. So this series has a superior electromagnetic compatibility qualification.

Part no.

801197, S-STP 4x2xAWG 23/1 PUR (S/FTP)

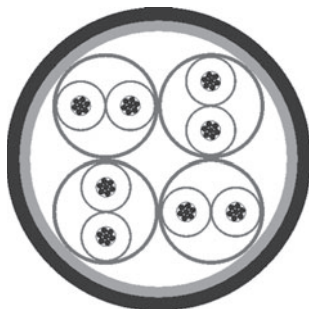
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

SHIPLINE

HELUKAT® 600IND

S-STP, Category 7



new

Cable structure

Inner conductor diameter:

Conductor material:

Core insulation:

Core colours:

Shielding 1:

Screen over stranding element:

Screen 1 over stranding:

Screen 2 over stranding:

Outer sheath material:

Outer diameter:

Outer sheath colour:

S-STP 4x2xAWG 24/7 (stranded) FRNC

0,61 mm

Copper, bare

Foam-skin-PE

wh/bu, wh/og, wh/gn, wh/bn

-

Polyester foil, aluminium-lined

Cu braid

-

FRNC

approx. 9,1 mm

Grey similar to RAL 7035

Electrical data

Characteristic impedance:

100 Ohm \pm 15 ohm at 1 to 100 MHz

100 Ohm \pm 20 ohm at 101 to 600 MHz

Loop resistance:

164 Ohm/km max.

Mutual capacitance:

43 nF/km nom.

Rel. propagation velocity:

72 %

Typical values

Frequency (MHz)	10	16	62,5	100	200	600
Attenuation (dB/10m)	0,7	0,8	1,6	2,1	3,1	5,2
Next (db)	90,0	90,0	85,0	81,0	76,0	68,0
ACR (db)	89,3	89,2	83,4	78,9	72,9	62,8

Technical data

Weight:

approx. 85 kg/km

Min. bending radius for laying:

85 mm

Operating temperature range min.:

-20°C

Operating temperature range max.:

+75°C

Caloric load, approx. value:

0,80 MJ/m

Copper weight:

36,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7, Flame-retardant acc.

to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness

acc. to EN50267-2-3, Oil-resistant

Application

This copper data cable, designed specifically for extreme industrial applications, is the ideal solution for Ethernet applications. Superior transmission properties, suitable for use even under the most demanding conditions, certified by Germanischer Lloyd, that means suitable for flexible marine and offshore applications.

Part no.

803382, S-STP 4x2xAWG 24/7 FRNC (S/FTP)

Dimensions and specifications may be changed without prior notice.

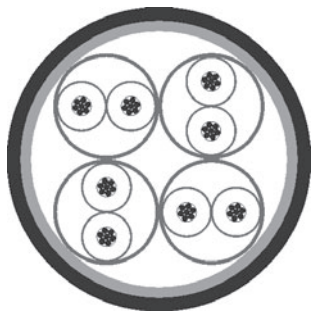
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Industrial Ethernet

ROBUSTFLEX

HELUKAT® 600IND

S-STP, Category 7



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Industrial Patch Cables

S-STP 4x2xAWG 26/7 PUR

Copper, bare (AWG 26/7)
Foam-skin-PE
wh/bu, wh/og, wh/gn, wh/bn
Double core
-
Polyester foil, aluminium-lined
Cu braid
-
PUR
approx. 6,4 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance:

100 Ohm \pm 15 ohm at 1 to 100 MHz
100 Ohm \pm 20 ohm at 101 to 600 MHz
290 Ohm/km max.
42 nF/km nom.

Loop resistance:

Mutual capacitance:

Typical values

Frequency	(MHz)	10	16	62,5	100	200	600
Attenuation	(db/10m)	0,8	1,1	2,2	2,8	4,0	7,4
Next	(db)	80,0	80,0	75,0	72,0	68,0	61,0
ACR	(db)	79,2	78,9	72,8	69,2	64,0	53,6

Technical data

Weight: approx. 48 kg/km
Min. bending radius for laying: 64 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +80°C
Caloric load, approx. value: 0,45 MJ/m
Copper weight: 28,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3, Oil-resistant, AWM 20963 (80°C/30V)

Application

HELUKAT®600 industry data cables were designed for high requirements in the industry (industrial ethernet) and other heavy-duty environments. They are characterized by large performance reserves and outstanding performance. Mechanically they are also perfectly suited for rough industrial environments due to their halogen-free PUR outer sheath. These line are manufacturable with common RJ45 plugs (industry and office version), and also with some Sub-D and M12 plugs.

Part no.

802184, S-STP 4x2xAWG 26/7 PUR (S/FTP)

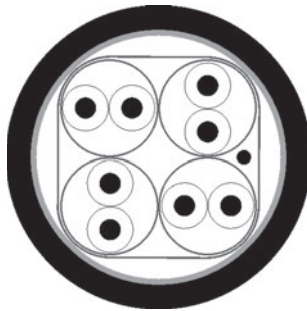
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

10GIG

HELUKAT® 500IND

S-STP, Category 6A



new

Cable structure

Inner conductor diameter:	0,65 mm
Conductor material:	Copper, bare
Core insulation:	Foam-skin-PE
Core colours:	whbu/bu, whog/og, whgn/gn, whbn/bn
Shielding 1:	Polyester foil over stranded bundle
Inner sheath material:	PVC
Screen over stranding element:	Polyester foil, aluminium-lined
Total shielding:	Foil + braid
Outer sheath material:	PVC
Outer diameter:	approx. 9,6 mm
Outer sheath colour:	Green similar to RAL 6018

Electrical data

Characteristic impedance:	100 Ohm ± 15 ohm at 1 to 100 MHz 100 Ohm ± 20 Ohm at 101 to 500 MHz
Conductor resistance, max.:	59 Ohm/km
Insulation resistance, min.:	0,5 GOhm x km
Loop resistance:	118 Ohm/km max.
Mutual capacitance:	72 nF/km nom.
Test voltage:	0,7 kV
Rel. propagation velocity:	62 %

Typical values

Frequency (MHz)	10	16	62,5	100	250	500
Attenuation (db/100m)	5,9	7,5	15,0	19,1	31,1	45,3
Next (dB)	60,3	57,2	48,4	45,3	39,3	34,3
PSNext (dB)	57,3	54,2	45,4	42,3	36,3	31,8

Technical data

Weight:	approx. 115 kg/km
Min. bending radius for laying:	80 mm
Operating temperature range min.:	-40°C
Operating temperature range max.:	+70°C
Caloric load, approx. value:	1,69 MJ/m
Copper weight:	44,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6A,
Flame-retardant acc. to IEC 60332-3, CM 75°C or PLTC

Application

Part no.

803693, INDUSTRIAL ETHERNET CAT.6A 10GIG

Dimensions and specifications may be changed without prior notice.

R

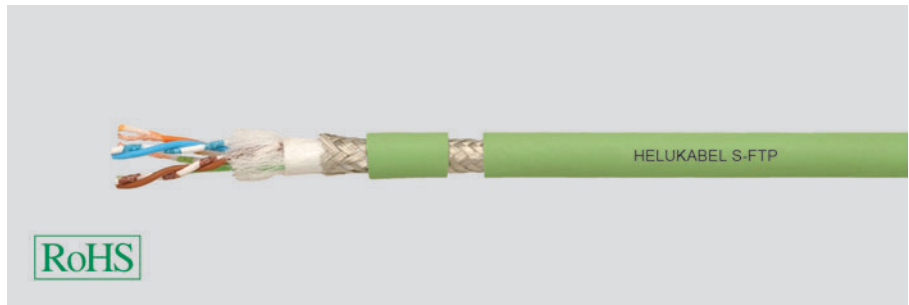
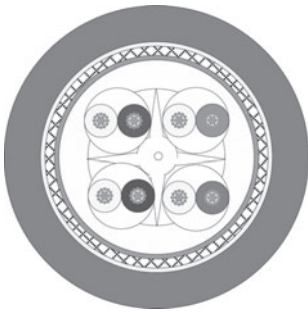
Industrial Ethernet

Drag Chain

HELUKAT® 250S

S-FTP, Category 6

new



Cable structure

Inner conductor diameter:	0,55 mm
Conductor material:	Copper, tinned
Core insulation:	PP
Core colours:	whbu/bu, whog/og, whgn/gn, whbn/bn
Shielding 1:	-
Inner sheath material:	FRNC
Screen over stranding element:	-
Total shielding:	Foil + braid
Outer sheath material:	PUR
Outer diameter:	approx. 7,8 mm
Outer sheath colour:	Green similar to RAL 6018

4x2x0.15 mm² (stranded)

Electrical data

Characteristic impedance:	100 Ohm ± 15 ohm at 1 to 100 MHz 100 Ohm ± 20 Ohm bei 101 bis 250 MHz
Conductor resistance, max.:	140 Ohm/km
Insulation resistance, min.:	0,5 GOhm x km
Loop resistance:	280 Ohm/km max.
Mutual capacitance:	52 nF/km nom.
Test voltage:	0,7 kV

Typical values

Frequency (MHz)	10	16	62,5	100	250
Attenuation (db/10m)	0,9	1,2	2,4	2,9	4,9
Next (db)	59,3	56,2	47,4	44,3	38,3
ACR (db)	58,4	55,0	45,0	41,4	33,4

Technical data

Weight:	approx. 63 kg/km
Min. bending radius for laying:	60 mm
Operating temperature range min.:	-30°C
Operating temperature range max.:	+70°C
Caloric load, approx. value:	1,35 MJ/m
Copper weight:	34,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6, Flame-retardant acc. to IEC 60332-1, UL 1581, Sec. 1080 (VW-1) and Sec. 1060 (FT-1)

Application

This copper data cable, designed specifically for extreme industrial applications, is the ideal solution for Ethernet Category 6 applications. Superior transmission properties, suitable for use even under the most demanding conditions, designed for use in drag chains, fire-proof and oil-resistant according to UL/CSA, the cable can also be used in the USA and Canada.

Part no.

803387, INDUSTRIAL ETHERNET CAT.6

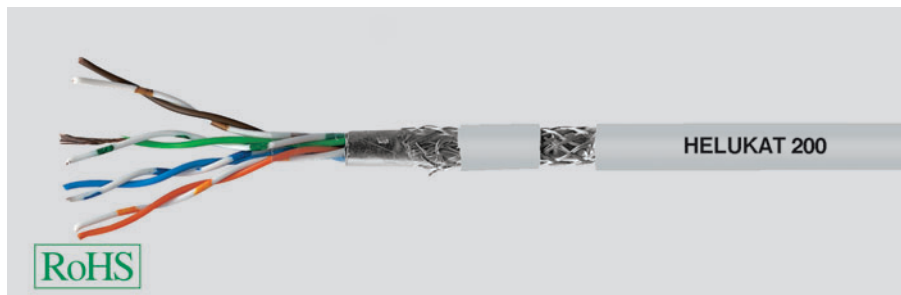
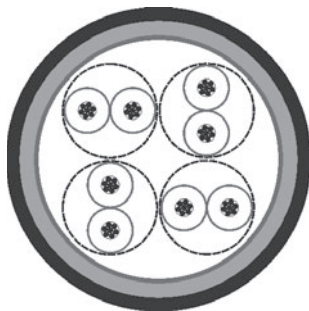
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

ROBUSTFLEX

HELUKAT® 200IND

S-FTP, Category 5e



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Industrial Patch Cables

S-FTP 4x2xAWG 26/7 PUR

Copper, bare (AWG 26/7)
PO
whbu/bu, whog/og, whgn/gn, whbn/bn
Double core
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
Cu braid
PUR
approx. 5,7 mm
Grey similar to RAL 7035

Electrical data

Characteristic impedance:
Loop resistance:
Mutual capacitance:

100 Ohm \pm 15 ohm at 1 to 100 MHz
260 Ohm/km max.
47 nF/km nom.

Typical values

Frequency (MHz)	10	16	62,5	100	200
Attenuation (dB/10m)	0,8	1,1	2,4	2,9	4,3
Next (db)	58,0	56,0	45,0	43,0	37,0
ACR (db)	57,2	54,9	42,6	40,1	32,7

Technical data

Weight: approx. 44 kg/km
Min. bending radius for laying: 46 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +80°C
Caloric load, approx. value: 0,54 MJ/m
Copper weight: 24,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Oil-resistant

Application

HELUKAT®200 industry data cables were designed for high requirements in the industry (industrial ethernet) and other heavy-duty environments. They are characterized by large performance reserves and outstanding performance. Mechanically they are also perfectly suited for rough industrial environments due to their halogen-free PUR outer sheath. These lines are manufacturable with all common RJ45 plugs (industry and office version), and also with some Sub-D and M12 plugs.

Part no.

800068, S-FTP 4x2xAWG 26/7 PUR (SF/UTP)

Dimensions and specifications may be changed without prior notice.

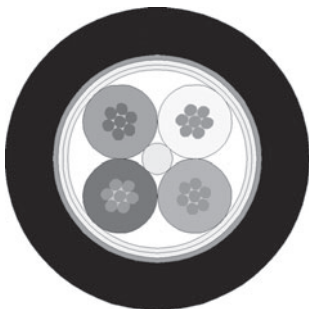
Industrial Ethernet

WK Industrial 105°C

HELUKABEL®

S-FTP, Category 5e

new



Cable structure

Inner conductor diameter:
Conductor material:
Core insulation:
Core colours:
Shielding 1:
Inner sheath material:
Screen over stranding element:
Total shielding:
Outer sheath material:
Outer diameter:
Outer sheath colour:

2x2x0,75 mm (stranded)

0,75 mm
Copper, tinned
XLPE ray cross-linking
wh, ye, bu, og
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
Cu braid, tinned
X-FRNC
approx. 6,5 mm
Black similar to RAL 9005

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Conductor resistance, max.: 60 Ohm/km
Insulation resistance, min.: 0,5 GOhm x km
Loop resistance: 120 Ohm/km max.
Mutual capacitance: 52 nF/km nom.
Test voltage: 2 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	6,3	8,0	16,5	21,3
Next (db)	70,0	65,0	55,0	50,0
ACR (db)	63,7	57,0	38,5	28,7

Technical data

Weight: approx. 64 kg/km
Min. bending radius for laying: 46 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +105°C *
Caloric load, approx. value: 0,89 MJ/m
Copper weight: 34,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Category 5e, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3, UL-Syle 21281 80°C/300V

Application

This copper data cable, designed specifically for extreme industrial applications, is the ideal solution for Ethernet applications. It guarantees superior transmission properties. Cable with oil-resistant FRNC sheath and increased temperature resistance for use in the wind turbine and similar sectors. Certified to UL, the cable can also be used in the USA and Canada.

* = with limited service life

Part no.

802293, INDUSTRIAL ETHERNET CAT.5e

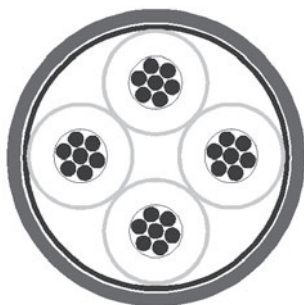
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

DRAG CHAIN ECO

HELUKAT® 100S

S-FTP 4-Core, Category 5e



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications

4x1x0.15 mm² (stranded)

Copper, bare (AWG 26/19)
PP
whbl, bl, whor, or
Star quad
Polyester foil over stranded bundle
PETP fleece
Foil + braid
PUR
approx. 4,8 mm ± 0,3 mm
Green

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Insulation resistance, min.: 0,15 GOhm x km
Loop resistance: 250 Ohm/km max.
Mutual capacitance: 51 nF/km nom.
Test voltage: 0,7 kV

Typical values

Frequency	(MHz)	10	16	62,5	100	155
Attenuation	(db/100m)	9,9	12,3	25,6	33,0	41,0
Next	(db)	47,0	44,0	35,0	32,0	30,0

Technical data

Weight: approx. 30 kg/km
Min. bending radius for laying: 72 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +80°C
Caloric load, approx. value: 0,37 MJ/m
Copper weight: 17,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e, Flame-retardant acc. to IEC 60332-1, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3, AWM 20963 (80°C/30V)

Application

This copper data cable, designed especially for heavy-duty industrial applications (Industrial Ethernet), is very well suited for manufacturing of RJ45 and 15 or 9-Pin Sub-D plugs. With its PUR sheath, it is also suitable for the application in drag chains.

Part no.

82838, INDUSTRIAL ETHERNET CAT.5e

Dimensions and specifications may be changed without prior notice.

R

Industrial Ethernet

Drag chain ECO

HELUKAT® 100S

S-FTP 4-pair, Category 5e



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications

4x2x0.15 mm² (stranded)

Copper, bare (AWG 26/19)
PP
whbu/bu, whog/og, whgn/gn, whbn/bn
Double core
Polyester foil over stranded bundle
PETP fleece
Foil + braid
PUR
approx. 6,6 mm ± 0,2 mm
Green

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Insulation resistance, min.: 0,15 GOhm x km
Loop resistance: 250 Ohm/km max.
Mutual capacitance: 48 nF/km nom.
Test voltage: 0,7 kV

Typical values

Frequency (MHz)	10	16	62,5	100	155
Attenuation (db/100m)	9,9	12,3	25,6	33,0	41,0
Next (db)	47,0	44,0	35,0	32,0	30,0

Technical data

Weight: approx. 56 kg/km
Min. bending radius for laying: 102 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +80°C
Caloric load, approx. value: 0,64 MJ/m
Copper weight: 31,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e, Flame-retardant acc. to IEC 60332-1, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3, AWM 20963 (80°C/30V)

Application

This copper data cable, designed especially for heavy-duty industrial applications (Industrial Ethernet), is very well suited for manufacturing of RJ45 and 15 or 9-Pin Sub-D plugs. With its PUR sheath, it is also suitable for the application in drag chains.

Part no.

82839, INDUSTRIAL ETHERNET CAT.5e

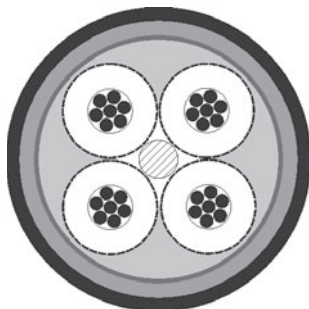
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

DRAG CHAIN

HELUKAT® 200S

S-FTP 4-Core, Category 5



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag Chain Patch Cables

S-FTP 4x1xAWG 24/19 PUR

Copper, bare (AWG 24/19)
PP
wh/bn, gn/ye
Quad
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
Cu braid
PUR
approx. 6,2 mm ± 0,2 mm
Green similar to RAL 6026

Electrical data

Characteristic impedance:
Loop resistance:
Mutual capacitance:

100 Ohm ± 15 ohm at 1 to 100 MHz
156 Ohm/km max.
51 nF/km nom.

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/10m)	1,0	1,2	2,6	3,3
Next (db)	47,0	44,0	35,0	32,0
ACR (db)	46,0	42,8	32,4	28,7

Technical data

Weight: approx. 54 kg/km
Min. bending radius for laying: 80 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 0,944 MJ/m
Copper weight: 30,00 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5, Flame-retardant acc. to IEC 60332-1, Halogen-free acc. to 60754-2, Oil-resistant

Application

HELUKAT®200T industry data cables were designed for the most extreme requirements in the industry (industrial ethernet) and other heavy-duty environments. They are characterized by large performance reserves and outstanding performance, even under the most extreme conditions. In addition, the thought-out mechanical construction even ensures applications in drag chains with high packing density. These lines are manufacturable with conventional Sub-D plugs or with various RJ45 plugs.

Part no.

800088, S-FTP 4x1xAWG 24/19 PUR (SF/UTP)

Dimensions and specifications may be changed without prior notice.

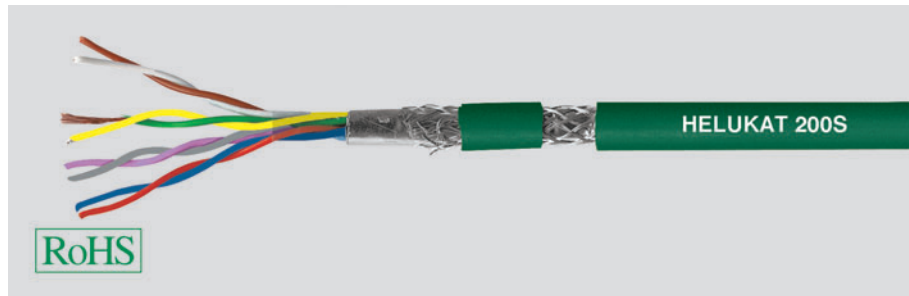
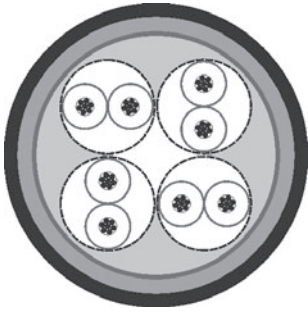
R

Industrial Ethernet

DRAG CHAIN

HELUKAT® 200S

S-FTP 4-Paar, Category 5



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag Chain Patch Cables

S-FTP 4x2xAWG 24/19 PUR

Copper, bare (AWG 24/19)
PE
wh/bn, gn/ye, gy/pk, bu/rd
Double core
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
Cu braid
PUR
approx. 9,5 mm ± 0,2 mm
Green similar to RAL 6026

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Loop resistance: 156 Ohm/km max.
Mutual capacitance: 51 nF/km nom.

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/10m)	1,0	1,2	2,6	3,3
Next (db)	47,0	44,0	35,0	32,0
ACR (db)	46,0	42,8	32,4	28,7

Technical data

Weight: approx. 110 kg/km
Min. bending radius for laying: 115 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 2,08 MJ/m
Copper weight: 54,30 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5, Flame-retardant acc. to IEC 60332-1, Halogen-free acc. to 60754-2, Oil-resistant

Application

HELUKAT®200T industry data cables were designed for the most extreme requirements in the industry (industrial ethernet) and other heavy-duty environments. They are characterized by large performance reserves and outstanding performance, even under the most extreme conditions. In addition, the thought-out mechanical construction even ensures applications in drag chains with high packing density. These lines are manufacturable with conventional Sub-D plugs or with various RJ45 plugs.

Part no.

81155, S-FTP 4x2xAWG 24/19 PUR (SF/UTP)

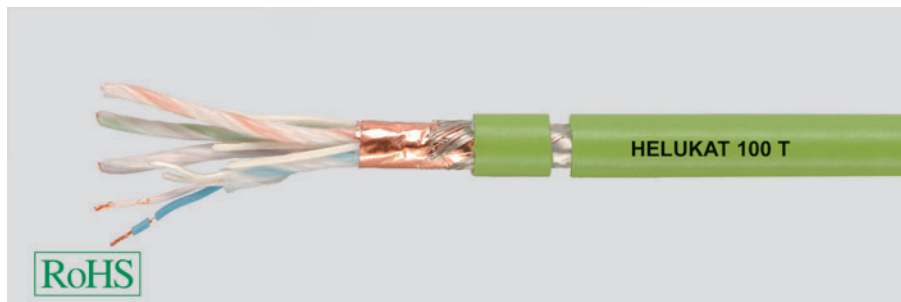
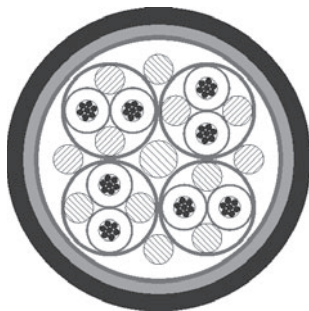
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

TORDIERFLEX

HELUKAT® 100T

S-FTP, Category 5



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Screen 1 over stranding:
Screen 2 over stranding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Torsion Patch Cables

S-FTP 4x2xAWG 26/19 PUR

Copper, bare (AWG 26/19)
PO
wh/bu, wh/og, wh/gn, wh/bn
Double core
Polyester foil over stranded bundle
-
Polyester foil copper, bare
Cu braid
PUR
approx. 7,5 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance:
Loop resistance:
Mutual capacitance:

100 Ohm \pm 15 ohm at 1 to 100 MHz
260 Ohm/km max.
50 nF/km nom.

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/10m)	1,3	1,6	3,2	4,0
Next (db)	47,0	44,0	35,0	32,0
ACR (db)	45,7	42,4	31,8	28,0

Technical data

Weight: approx. 63 kg/km
Min. bending radius for laying: 80 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +80°C
Caloric load, approx. value: 1,234 MJ/m
Copper weight: 29,50 kg/km

Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5, Flame-retardant acc. to IEC 60332-1, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Oil-resistant, AWM 20963 (80°C/30V)

Application

HELUKAT®100T TORDIERFLEX data cables were designed for the most extreme requirements in the industry and other heavy-duty environments in torsion applications. They are characterized by large performance reserves and outstanding performance, even under extreme conditions. Long mechanical service life is also ensured due to a thought-out design. These lines are manufacturable with conventional Sub-D plugs or with various RJ45 plugs.

Part no.

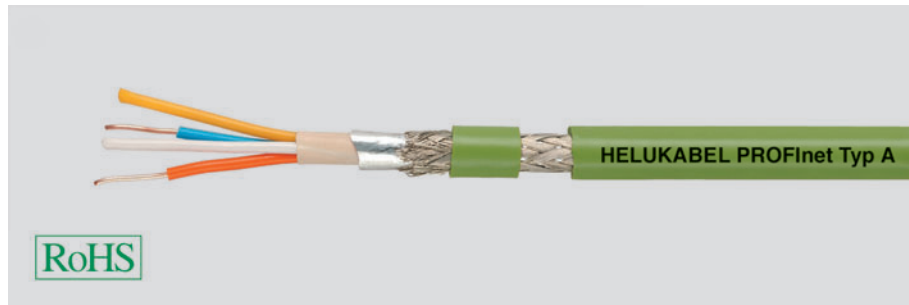
800067, S-FTP 4x2xAWG 26/19 PUR (SF/UTP)

Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

PROFInet Type A

HELUKABEL®
fixed installed + robust



Type Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 2x2x0.64 mm

Copper, bare (AWG 22/1)
PE
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 6,5 mm ± 0,2 mm
Green similar to RAL 6018

Industrial Area 2x2x0.64 mm

Copper, bare (AWG 22/1)
PE
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 6,5 mm ± 0,2 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Conductor resistance, max.: 62 Ohm/km
Insulation resistance, min.: 0,5 GOhm x km
Loop resistance: 124 Ohm/km max.
Mutual capacitance: 50 nF/km nom.
Test voltage: 2 kV

100 Ohm ± 15 ohm at 1 to 100 MHz
62 Ohm/km
0,5 GOhm x km
124 Ohm/km max.
50 nF/km nom.
2 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	5,2	6,9	15,0	19,5
Next (db)	70,0	65,0	55,0	50,0
ACR (db)	64,8	58,1	40,0	30,5

Technical data

Weight: approx. 67 kg/km (indoor) / approx. 64 kg/km (industrial area)
Min. bending radius for laying: 100 mm / 46 mm
Operating temperature range min.: -40°C / -40°C
Operating temperature range max.: +80°C / +70°C
Caloric load, approx. value: 0,34 MJ/m / 0,91 MJ/m
Copper weight: 32,00 kg/km / 32,00 kg/km

Norms

Applicable standards: PROFInet Guideline / PROFInet Guideline
UL Style: CMG 75°C PLTC FT4 / -
CSA standard: CSA FT 4 / -

Application

These copper data cables, designed especially for heavy-duty industrial applications, are very well suited for Ethernet applications. They ensure superior transmission properties and can be used even under most severe conditions. The line specified here correspond to the PROFInet type A it is designed for normal (PVC) and robust (PUR) fixed installation applications.

Part no.

800653, PROFInet type A (SK)

801194, PROFInet type A (SK)

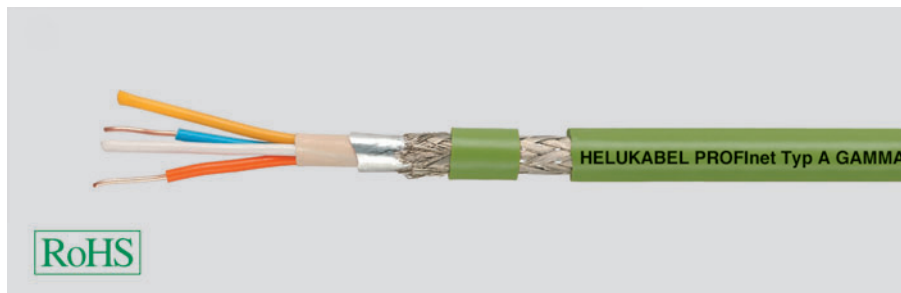
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

PROFINet Type A

HELUKABEL®

radiation resistant + armoured



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Armouring:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

ray loaded areas

2x2x0.64 mm

Copper, bare (AWG 22/1)
XLPE ray cross-linking
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
TPR ray cross-linking
Polyester foil, aluminium-lined
Cu braid, tinned
-
PUR
approx. 6,5 mm ± 0,2 mm
Green similar to RAL 6018

Fixed installation, outdoor

2x2x0.64 mm

Copper, bare (AWG 22/1)
PE
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
Steel rib
PE
approx. 9,3 mm ± 0,5 mm
Black

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:

100 Ohm ± 15 ohm at 1 to 100 MHz
62 Ohm/km
0,5 GOhm x km
124 Ohm/km max.
50 nF/km nom.
2 kV

100 Ohm ± 15 ohm at 1 to 100 MHz
62 Ohm/km
0,5 GOhm x km
124 Ohm/km max.
50 nF/km nom.
2 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	5,2	6,9	15,0	19,5
Next (db)	70,0	65,0	55,0	50,0
ACR (db)	64,8	58,1	40,0	30,5

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 63 kg/km
46 mm
-40°C
+80°C
0,29 MJ/m
32,00 kg/km

approx. 124 kg/km
93 mm
-40°C
+70°C
2,14 MJ/m
31,00 kg/km

Norms

Applicable standards:

PROFINet Guideline

PROFINet Guideline

Application

These copper data cables, designed especially for heavy-duty industrial applications are very well suited for Ethernet applications. They ensure superior transmission properties and can be used even under most severe conditions. The line specified here correspond to the PROFINet type A and because of the special construction with cross-linked inner-jacket and PUR outer-jacket it is suitable for fixed installation applications inside radiated areas and with the PVC inner-jacket/PE outer-jacket it is suitable for areas with rodent problems.

Part no.

801195, PROFINet type A (SK)

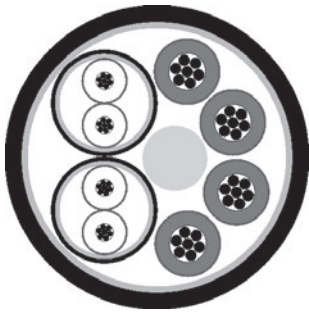
801650, PROFINet type A (SK)

Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

PROFINet Type B

HELUKABEL[®]
hybrid



Type

Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Mobile use

2x2x0,75 mm (stranded)+ 4x1,5 mm²

Copper, bare (AWG 22/7)
Copper, bare (AWG 16/84)
Foam-skin-PE
Foam-skin-PE
wh, ye, bu, og
Black
Double core
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Polyester foil
FRNC
approx. 10,3 mm ± 0,3 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Conductor resistance, max.: 60 Ohm/km
Insulation resistance, min.: 0,5 GOhm x km
Loop resistance: 120 Ohm/km max.
Mutual capacitance: 52 nF/km nom.
Test voltage: 2 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	6,3	8,0	16,5	21,3
Next (db)	50,0	47,0	38,0	35,0
ACR (db)	43,7	39,0	21,5	13,7

Technical data

Weight: approx. 153 kg/km
Min. bending radius for laying: 103 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 1,50 MJ/m
Copper weight: 94,00 kg/km

Norms

Applicable standards: PROFINet Guideline
UL Style: UL Style 21282

Application

This copper data cable, designed especially for heavy-duty industrial applications is very well suited for Ethernet applications. It ensures superior transmission properties and can be used even under most severe conditions. The line specified here corresponds the PROFINet type, i.e. it is designed for flexible applications with integrated energoe cores.

Part no.

801651, PROFINet type B (SK)

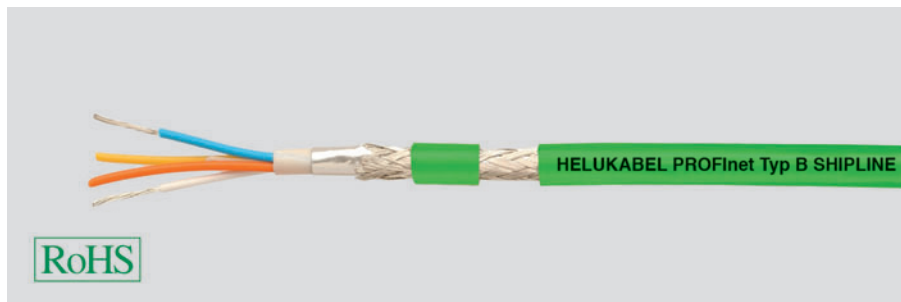
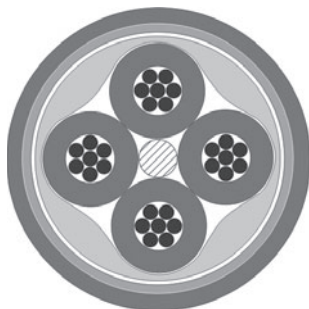
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

PROFInet Typ B

HELUKABEL[®]

SHIPLINE + FESTOON



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Marine and Offshore 2x2x0,75 mm (stranded)

Copper, tinned (AWG 22/7)
PP
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
FRNC
Polyester foil, aluminium-lined
Cu braid, tinned
FRNC
approx. 6,5 mm ± 0,4 mm
Green similar to RAL 6018

FESTOON 2x2x0.75 mm (stranded)

Copper, tinned (AWG 22/7)
PE
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 6,5 mm ± 0,2 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:

100 Ohm ± 15 ohm at 1 to 100 MHz
60 Ohm/km
0,5 GOhm x km
120 Ohm/km max.
52 nF/km nom.
2 kV

100 Ohm ± 5 %
60 Ohm/km
0,5 GOhm x km
120 Ohm/km max.
52 nF/km nom.
0,7 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	6,0	7,6	16,0	21,0
Next (db)	70,0	65,0	55,0	50,0
ACR (db)	64,0	57,4	39,0	29,0

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 68 kg/km
46 mm
-40°C
+70°C
0,45 MJ/m
32,00 kg/km

approx. 68 kg/km
50 mm
-10°C
+80°C
1,20 MJ/m
32,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

PROFInet Guideline
CMG 75°C PLTC FT4
CSA FT 4

PROFInet Guideline
CMG 75°C or PLTC or AWM 21694 600V
CSA FT 4

Application

This copper data cable, designed especially for heavy-duty industrial applications is very well suited for Ethernet applications. It ensures superior transmission properties and can be used even under most severe conditions. The lines specified here corresponds the PROFInet type B and are certified by the Germanische Lloyd (SHIPLINE), i.e. designed for flexible marine and offshore applications and Festoon applications.

Part no.

802185, PROFInet type B (SK)

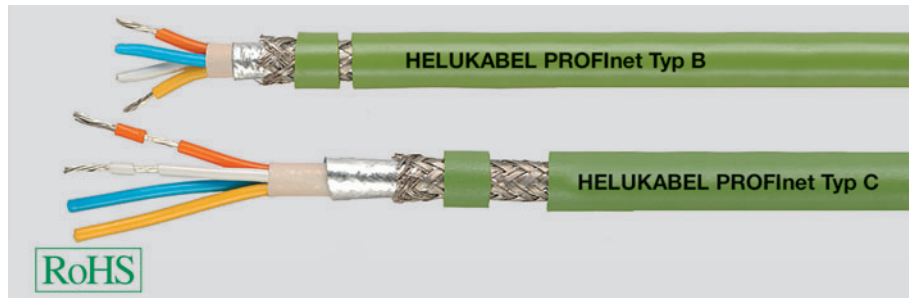
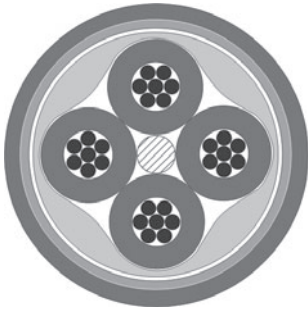
803295, PROFInet type B (SK)

Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

PROFInet Type B + C

HELUKABEL®
flexible + high flexible



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Mobile use

2x2x0,75 mm (stranded)

Copper, tinned (AWG 22/7)
PE
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 6,5 mm ± 0,2 mm
Green similar to RAL 6018

Drag chain applications

2x2x0.75 mm (stranded)

Copper, tinned (AWG 22/7)
PE
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
FRNC
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 6,5 mm ± 0,2 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:

100 Ohm ± 15 ohm at 1 to 100 MHz
62 Ohm/km
0,5 GOhm x km
124 Ohm/km max.
52 nF/km nom.
2 kV

100 Ohm ± 15 ohm at 1 to 100 MHz
60 Ohm/km
0,5 GOhm x km
120 Ohm/km max.
52 nF/km nom.
0,7 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	6,0	7,6	16,0	21,0
Next (db)	70,0	65,0	55,0	50,0
ACR (db)	64,0	57,4	39,0	29,0

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 67 kg/km
46 mm
-40°C
+70°C
0,32 MJ/m
32,00 kg/km

approx. 61 kg/km
50 mm
-40°C
+70°C
0,85 MJ/m
32,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

PROFInet Guideline
CMG 60°C or PLTC or AWM 20201
CSA FT 4

PROFInet Guideline
CMX 75°C (shielded)
-

Application

This copper data cable, designed especially for heavy-duty industrial applications is very well suited for Ethernet applications. It ensures superior transmission properties and can be used even under most severe conditions. The lines specified here corresponds the PROFInet types B and C, i.e. they are designed for flexible and highly flexible applications, such as drag chains.

Part no.

800654, PROFInet type B (SK)

800655, PROFInet type C (SK)

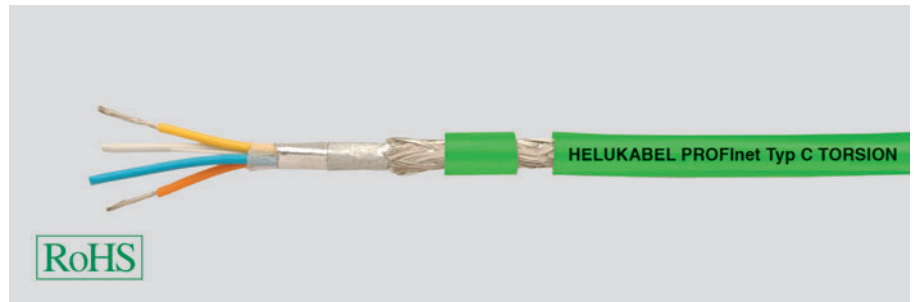
Dimensions and specifications may be changed without prior notice.

Industrial Ethernet

PROFINet Type C

HELUKABEL®

Torsion



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Torsional applications

2x2x0,75 mm (stranded)

Copper, tinned (AWG 22/19)
Foam-skin-PE
wh, ye, bu, og
Star quad
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 6,5 mm ± 0,2 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Conductor resistance, max.: 60 Ohm/km
Insulation resistance, min.: 0,5 GOhm x km
Loop resistance: 120 Ohm/km max.
Mutual capacitance: 52 nF/km nom.
Test voltage: 0,7 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (db/100m)	7,6	10,0	26,5	41,0
ELFEXT (db)	43,8	39,7	24,0	20,0

Technical data

Weight: approx. 54 kg/km
Min. bending radius for laying: 46 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +80°C
Caloric load, approx. value: 0,45 MJ/m
Copper weight: 32,00 kg/km

Norms

Applicable standards: PROFINet Guideline
UL Style: AWM Style 21161 80°C

Application

This copper data cable, designed especially for heavy-duty industrial applications is very well suited for Ethernet applications. It ensures superior transmission properties and can be used even under most severe conditions. The lines specified here corresponds the PROFINet types C, i.e. they are designed for torsion applications, such as roboter arms.

Part no.

802186, PROFINet type C (SK)

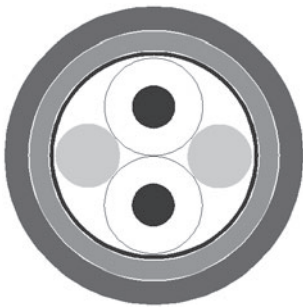
Dimensions and specifications may be changed without prior notice.

BUS Cables

Profibus L2



Indoor



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 7,8 mm ± 0,2 mm
Grey similar to RAL 7001

Fixed installation, indoor 1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 7,8 mm ± 0,2 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
110 Ohm/km max.
30 nF/km nom.
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
110 Ohm/km max.
30 nF/km nom.
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 69 kg/km
120 mm
-40°C
+70°C
0,99 MJ/m
24,00 kg/km

approx. 69 kg/km
120 mm
-40°C
+70°C
0,99 MJ/m
24,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

Profibus acc. to DIN 19245 T3 and EN50170
CMX 75°C (shielded)
CSA FT1

Profibus acc. to DIN 19245 T3 and EN50170
CMX 75°C (shielded)
CSA FT1

Application

This system cable is used to interconnect L2-BUS components. This cable is an economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The types mentioned here are suitable for indoor laying and are equipped with a special PVC sheath.

Part no.

80384, Profibus L2

81448, Profibus L2

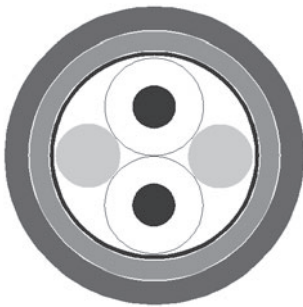
Dimensions and specifications may be changed without prior notice.

BUS Cables

PROFIBUS L2 Outdoor + Industry

HELUKABEL[®]

Outdoor + Industry



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, outdoor

1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PE
approx. 8,0 mm ± 0,4 mm
Black similar to RAL 9005

Industrial Area

1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 8,0 mm ± 0,4 mm
Petrol similar to RAL 5018

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
110 Ohm/km max.
30 nF/km nom.
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
110 Ohm/km max.
30 nF/km nom.
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 64 kg/km
120 mm
-40°C
+70°C
2,26 MJ/m
24,00 kg/km

approx. 67 kg/km
120 mm
-40°C
+70°C
1,52 MJ/m
24,00 kg/km

Norms

Applicable standards:

Profibus acc. to DIN 19245 T3 and EN50170

Profibus acc. to DIN 19245 T3 and EN50170

Application

This system cable is used to interconnect L2-BUS components. This cable is an economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The types mentioned here are suitable for outdoor laying (PE sheath) and industry laying (PUR sheath).

Part no.

80792, Profibus L2

81186, Profibus L2

Dimensions and specifications may be changed without prior notice.

BUS Cables

Profibus L2 Direct Burial



without + with Armouring



Type Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Armouring:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Underground laying 1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
-
PE
approx. 10,0 mm ± 0,2 mm
Black similar to RAL 9005

Underground laying 1x2x0.64 mm

Copper, bare (AWG 22/1)
Cell PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
PE
Polyester foil, aluminium-lined
Cu braid, tinned
Steel band
PE
approx. 10,6 mm ± 0,3 mm
Black similar to RAL 9005

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:
Attenuation:

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
114 Ohm/km max.
30 nF/km nom.
-
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
3 MHz < 22,0 dB/km
20 MHz < 42,0 dB/km

150 Ohm ± 10 %
55 Ohm/km
5 GOhm x km
110 Ohm/km max.
30 nF/km nom.
250 V
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 92 kg/km
180 mm
-40°C
+70°C
2,657 MJ/m
24,00 kg/km

approx. 132 kg/km
190 mm
-40°C
+70°C
2,40 MJ/m
24,00 kg/km

Norms

Applicable standards:

Profibus acc. to DIN 19245 T3 and EN50170

Profibus acc. to DIN 19245 T3 and EN50170

Application

This system cable is used to interconnect L2-BUS components. This cable is an economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The above mentioned type is suitable for underground installation and is equipped with a special PVC/PE sheath.

Part no.

82824, Profibus ERD

802177, Profibus L2

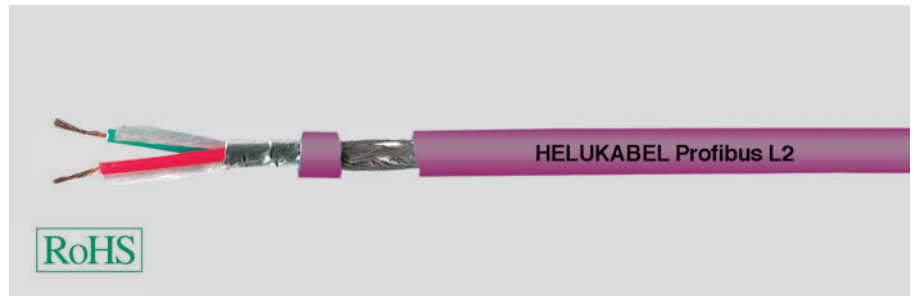
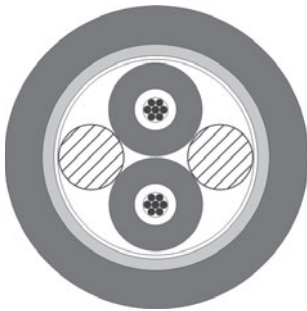
Dimensions and specifications may be changed without prior notice.

BUS Cables

Profibus L2



7-wire



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Mobile use

1x2x0.64 mm (stranded)

Copper, bare (AWG 24/7)
Foam-skin-PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 7,8 mm ± 0,2 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance: 150 Ohm ± 10 %
Conductor resistance, max.: 86,7 Ohm/km
Insulation resistance, min.: 1 GOhm x km
Loop resistance: 110 Ohm/km max.
Mutual capacitance: 30 nF/km nom.
Test voltage: 1,5 kV
Attenuation:
9,6 kHz < 3,0 dB/km
38,4 kHz < 5,0 dB/km
4 MHz < 26,0 dB/km
16 MHz < 55,0 dB/km

Technical data

Weight: approx. 75 kg/km
Min. bending radius for laying: 120 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 1,20 MJ/m
Copper weight: 24,00 kg/km

Norms

Applicable standards: Profibus acc. to DIN 19245 T3 and EN50170
UL Style: UL Style 2571

Application

This system cable is used to interconnect L2-BUS components. This cable is an economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. With his cord design, the type mentioned here is suitable for laying in regular mobile applications and is equipped with a special PVC sheath.

Part no.

800648, Profibus L2

Dimensions and specifications may be changed without prior notice.

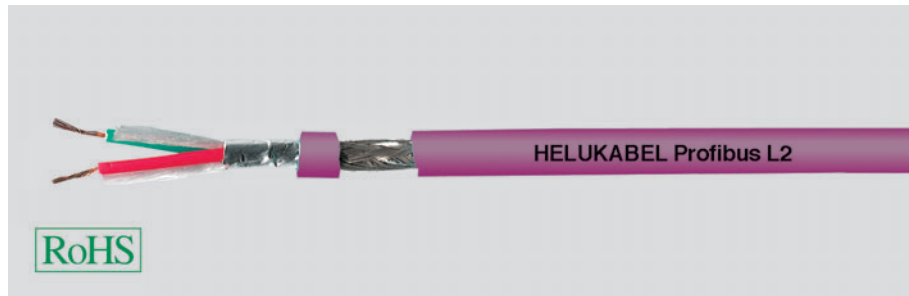
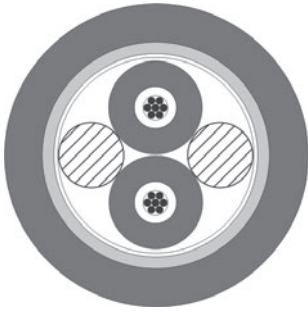
R

BUS Cables

Profibus L2



Drag Chain



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications 1x2x0.64 mm (stranded)

Copper, bare (AWG 24/19)
Foam-skin-PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 8,0 mm ± 0,4 mm
Petrol similar to RAL 5018

Drag chain applications 1x2x0.64 mm (stranded)

Copper, bare (AWG 24/19)
Foam-skin-PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 8,0 mm ± 0,4 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

150 Ohm ± 10 %
82 Ohm/km
1 GOhm x km
164 Ohm/km max.
30 nF/km nom.
1,5 kV
9,6 kHz < 3,0 dB/km
38,4 kHz < 5,0 dB/km
4 MHz < 25,0 dB/km
16 MHz < 52,0 dB/km

150 Ohm ± 10 %
82 Ohm/km
1 GOhm x km
164 Ohm/km max.
30 nF/km nom.
1,5 kV
9,6 kHz < 3,0 dB/km
38,4 kHz < 5,0 dB/km
4 MHz < 25,0 dB/km
16 MHz < 52,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 65 kg/km
60 mm
-20°C
+60°C
1,52 MJ/m
25,00 kg/km

approx. 65 kg/km
60 mm
-20°C
+60°C
1,52 MJ/m
25,00 kg/km

Norms

Applicable standards:

Profibus acc. to DIN 19245 T3 and EN50170

Profibus acc. to DIN 19245 T3 and EN50170

Application

This system cable is used to interconnect L2-BUS components. This cable is an economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The above mentioned types are suitable for drag chains (stranded).

Part no.

81003, Profibus L2

80267, Profibus L2

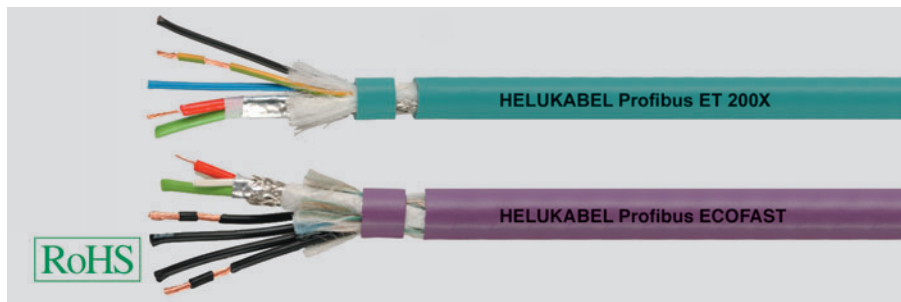
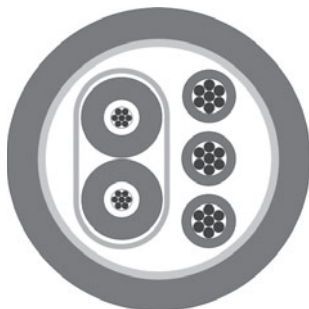
Dimensions and specifications may be changed without prior notice.

BUS Cables

Profibus

HELUKABEL®

ET200X + ECOFAST



Type Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications 1x2x0.65 mm + 3x1x0.75 mm² (stranded)

Copper, bare (AWG 22/19)
Copper, bare (AWG 18/24)
Foam-skin-PE
PVC
rd, gn
bk, bu, gnye
Double core
Polyester foil over stranded bundle
Foil + braid
Polyester foil
PUR
approx. 9,5 mm ± 0,5 mm
Petrol similar to RAL 5018

Drag chain applications 1x2x0.65 mm + 4x1x1.5 mm² (stranded)

Copper, bare (AWG 24/19)
Copper, bare (AWG 18/84)
Foam-skin-PE
TPM
rd, gn
bk, bk, bk, bk
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Foil + braid
-
TPU
approx. 11,0 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

150 Ohm ± 10 %
84 Ohm/km
1 GOhm x km
168 Ohm/km max.
30 nF/km nom.
1,5 kV
9,6 kHz < 3,0 dB/Km
38,4 kHz < 5,0 dB/Km
4 MHz < 25,0 dB/Km
16 MHz < 52,0 dB/Km

150 Ohm ± 15 %
89,9 Ohm/km
1 GOhm x km
179 Ohm/km max.
30 nF/km nom.
1,5 kV
9,6 kHz ≤ 3,0 dB/km
38,4 kHz ≤ 5,0 dB/km
4 MHz ≤ 30,0 dB/km
16 MHz ≤ 60,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 105 kg/km
140 mm
-5°C
+60°C
1,973 MJ/m
46,00 kg/km

approx. 159 kg/km
165 mm
-20°C
+60°C
2,835 MJ/m
90,00 kg/km

Norms

Applicable standards:
UL Style:

Profibus acc. to DIN 19245 T3 and EN50170
AWM Style 20351

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 20233

Application

The Profibus-ET200X and Profibus ECOFAST lines used in the area of process automation. These BUS systems are a very economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The series ET200X and DESINA® hybrid are characterized by a special construction with data and power supply in one cable. These types are suited for the application in drag chains and similar mobile applications.

Part no.

82913, Profibus L2

800044, Profibus L2

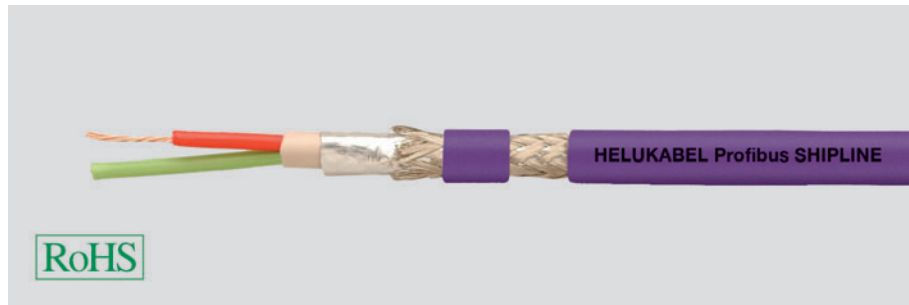
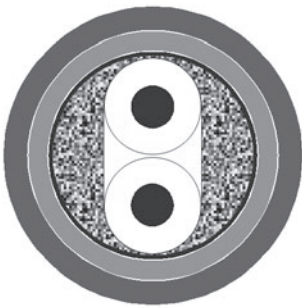
Dimensions and specifications may be changed without prior notice.

Bus Cables

Profibus

HELUKABEL®

SHIPLINE and High Temperature



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Marine and Offshore 1x2x0.75 mm (stranded)

Copper, bare (AWG 22/7)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
FRNC
Polyester foil, aluminium-lined
Cu braid, tinned
X-FRNC
approx. 8,0 mm ± 0,4 mm
Violet similar to RAL 4001

High temperature areas 1x2x0.64 mm

Copper, bare (AWG 22/1)
XLPE ray cross-linking
rd, gn
2 cores + 2 fillers stranded together
-
Polyester foil, aluminium-lined
Cu braid, tinned
FEP
approx. 7,2 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:
Attenuation:

150 Ohm ± 10 %
55 Ohm/km
1,6 GOhm x km
110 Ohm/km max.
29 nF/km nom.
60 V
1 kV
9,6 kHz < 2,5 dB/Km
38,4 kHz < 4,0 dB/Km
4 MHz < 22,0 dB/Km
16 MHz < 42,0 dB/Km

150 Ohm ± 10 %
55 Ohm/km
1,6 GOhm x km
110 Ohm/km max.
28 nF/km nom.
250 V
3,6 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 84 kg/km
80 mm
-25°C
+80°C
1,26 MJ/m
35,00 kg/km

approx. 64 kg/km
52 mm
-50°C
+180°C
0,30 MJ/m
24,00 kg/km

Norms

Applicable standards:

Profibus acc. to DIN 19245 T3 and EN50170

Profibus acc. to DIN 19245 T3 and EN50170

Application

The series SHIPLINE and HIGH TEMPERATURE are used to interconnect Profibus components. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The lines described here are designed for Marine and Offshore applications or the use in extreme temperature ranges.

Part no.

802178, Profibus SHIPLINE

802179, Profibus high temperature

Dimensions and specifications may be changed without prior notice.

BUS Cables

DESINA-HYBRID-BUS



HELUKABEL®



Type Cable structure

Conductor material
Core insulation:
Polymer optical fibre:
Core colours:
Core identification:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Hybrid Bus Cable 4x1.5 mm² + 2xPOF

Copper, bare, KL.6 = extra fine wire
TPM
4x POF 980/1000
Black
Numbers
PETP fleece
TPU
approx. 8,8 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Conductor resistance, max.: 13,7 Ohm/km
Insulation resistance, min.: 0,5 GOhm x km
Test voltage: 3 kV

Optical characteristic

Fibre attenuation: 230 dB/km max. at 650 nm

Technical data

Weight: approx. 120 kg/km
Min. bending radius for laying: 130 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +80°C
Copper weight: 60,00 kg/km

Norms

Applicable standards: Detail specification for DESINA

Application

The DESINA® Cu/POF hybrid field bus cables combines signal lines made of plastic fibre-optic conductors and copper cables. The use of these transmission systems significantly reduces the number of different cables in a planned bus installation in machine tools operations. The main applications of these cables are in mobile applications in machine construction.

Part no.

81713, DESINA HYBRID BUS

Dimensions and specifications may be changed without prior notice.

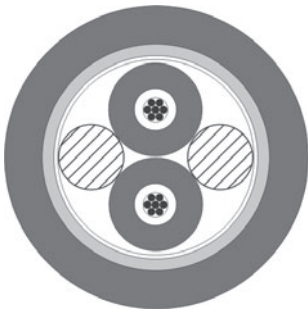
R

BUS Cables

Profibus L2



TORSION + FESTOON



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Torsional applications

1x2x0.80 mm (stranded)

Copper, bare (AWG 22/19)
Foam-skin-PE
rd, gn
2 cores + filler
-
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 8,0 mm ± 0,4 mm
Violet similar to RAL 4001

Mobile use

1x2x0.65 mm (stranded)

Copper, bare (AWG 24/19)
Cell PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 8,0 mm ± 0,3 mm
Petrol similar to RAL 5018

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

150 Ohm ± 10 %
49 Ohm/km
1 GOhm x km
98 Ohm/km max.
29 nF/km nom.
3,6 kV
9,6 kHz < 3,0 dB/km
38,4 kHz < 5,0 dB/km
4 MHz < 25,0 dB/km
16 MHz < 51,0 dB/km

150 Ohm ± 10 %
66,5 Ohm/km
1,6 GOhm x km
133 Ohm/km max.
28 nF/km nom.
2 kV
9,6 kHz ≤ 3,0 dB/km
38,4 kHz ≤ 4,0 dB/km
4 MHz ≤ 25,0 dB/km
16 MHz ≤ 49,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 66 kg/km
100 mm
-25°C
+75°C
0,89 MJ/m
32,00 kg/km

approx. 64 kg/km
40 mm
-40°C
+60°C
1,09 MJ/m
23,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

Profibus acc. to DIN 19245 T3 and EN50170
CMX 75°C (shielded)
-

Profibus acc. to DIN 19245 T3 and EN50170
CMG 75°C or CL2 or AWM 20201 600V
CSA FT 4

Application

The series TORSION and FESTOON are used to interconnect Profibus BUS components. This BUS system is a very economical solution for the field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The lines described here are designed torsionable or hanging movable construction. Areas such as robot applications and/or garland suspension are easily realized.

Part no.

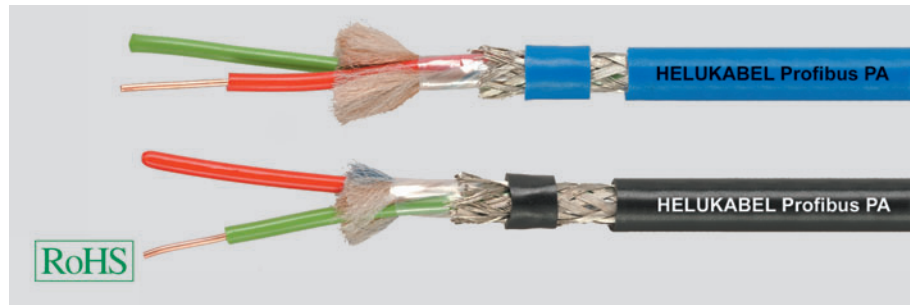
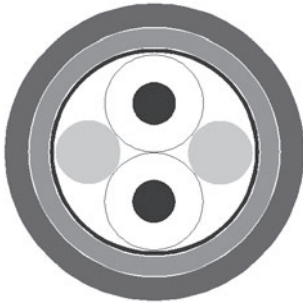
800109, Profibus L2

800649, Profibus L2

Dimensions and specifications may be changed without prior notice.

BUS Cables

Profibus PA



Type Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Hazardous areas 1x2x1.0/2.55 mm

Copper, bare (AWG 18/1)
PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 7,6 mm ± 0,2 mm
Blue

Non-hazardous areas 1x2x1.0/2.55 mm

Copper, bare (AWG 18/1)
PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 7,6 mm ± 0,2 mm
Black

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:
Attenuation:

100 Ohm ± 20 %
22 Ohm/km
1 GOhm x km
44 Ohm/km max.
55 nF/km nom.
300 V
2,5 kV
39 kHz ≤ 3,0 dB/km

100 Ohm ± 20 %
22 Ohm/km
1 GOhm x km
44 Ohm/km max.
55 nF/km nom.
300 V
2,5 kV
39 kHz ≤ 3,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 76 kg/km
140 mm
-20°C
+70°C
0,95 MJ/m
44,00 kg/km

approx. 76 kg/km
140 mm
-20°C
+70°C
0,95 MJ/m
44,00 kg/km

Norms

Applicable standards:
UL Style:

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Application

This Profibus PA line is used in the area of process automation, among other things in the chemical industry. This cable is an economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The above mentioned types are suitable for ex (and ATEX/ Class II, EX-i/ EN 60079-14) and not-ex installation and are equipped with a special PVC-sheath.

Part no.

82835, Profibus PA

82836, Profibus PA

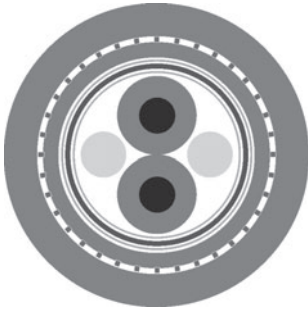
Dimensions and specifications may be changed without prior notice.

R

Bus Cables

Profibus PA

HELUKABEL®
armoured



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Armouring:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Hazardous areas 1x2x1.0/2.55 mm

Copper, bare (AWG 18/1)
PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
Steel band
PVC
approx. 10,2 mm ± 0,2 mm
Blue

Non-hazardous areas 1x2x1.0/2.55 mm

Copper, bare (AWG 18/1)
PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
Steel band
PVC
approx. 10,2 mm ± 0,2 mm
Black

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:
Attenuation:

100 Ohm ± 15 %
22 Ohm/km
1 GOhm x km
44 Ohm/km max.
55 nF/km nom.
300 V
2,5 kV
39 kHz ≤ 3,0 dB/km

100 Ohm ± 15 %
22 Ohm/km
1 GOhm x km
44 Ohm/km max.
55 nF/km nom.
300 V
2,5 kV
39 kHz ≤ 3,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 170 kg/km
200 mm
-20°C
+70°C
1,95 MJ/m
45,00 kg/km

approx. 170 kg/km
200 mm
-20°C
+70°C
1,95 MJ/m
45,00 kg/km

Norms

Applicable standards:

Profibus acc. to DIN 19245 T3 and EN50170

Profibus acc. to DIN 19245 T3 and EN50170

Application

This Profibus PA line is used in the area of process automation, among other things in the chemical industry. This cable is an economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The above mentioned types are suitable for ex and not-ex installation where rodent infestation is to be expected and therefore equipped with a metal armouring and a double PVC-sheath.

Part no.

802180, Profibus PA

802181, Profibus PA

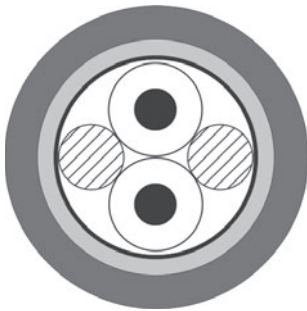
Dimensions and specifications may be changed without prior notice.

BUS Cables

Profibus PA

HELUKABEL®

Long Distance



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Hazardous areas

1x2x1.6/3.2 mm

Copper, bare (AWG 16/7)
PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 9,5 mm ± 0,5 mm
Blue

Non-hazardous areas

1x2x1.6/3.2 mm

Copper, bare (AWG 16/7)
PE
rd, gn
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 9,5 mm ± 0,5 mm
Black

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:
Attenuation:

100 Ohm ± 20 %
24 Ohm/km
1 GOhm x km
48 Ohm/km max.
60 nF/km nom.
300 V
1 kV
39 kHz ≤ 2,7 dB/km

100 Ohm ± 20 %
24 Ohm/km
1 GOhm x km
48 Ohm/km max.
60 nF/km nom.
300 V
1 kV
39 kHz ≤ 2,7 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 110 kg/km
75 mm
-40°C
+70°C
1,57 MJ/m
62,00 kg/km

approx. 110 kg/km
75 mm
-40°C
+70°C
1,57 MJ/m
62,00 kg/km

Norms

Applicable standards:
UL Style:

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Application

This Profibus PA line is used in the area of process automation, among other things in the chemical industry. This cable is an economical solution for the cell and field area. For the information exchange between different automation systems as well as for communication with the connected decentralized field units, serial field bus systems are used. The types mentioned here are suitable for ex and not-ex installation and are equipped with a special PVC-sheath.

Part no.

800650, Profibus PA

800715, Profibus PA

Dimensions and specifications may be changed without prior notice.

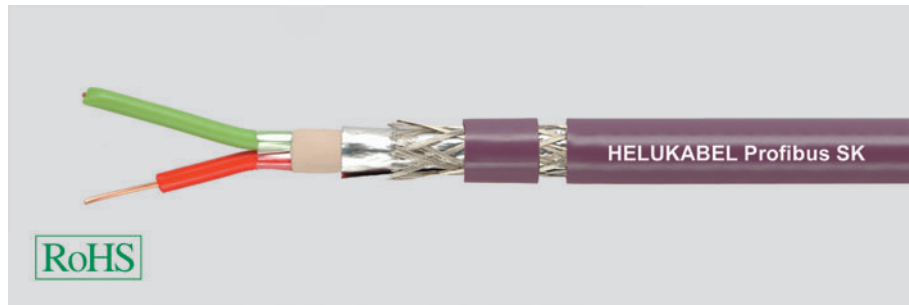
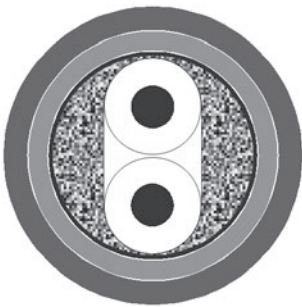
R

BUS Cables

Profibus SK

HELUKABEL®

Indoor + Outdoor



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor

1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 8,0 mm ± 0,4 mm
Violet similar to RAL 4001

Fixed installation, outdoor

1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
PE
Polyester foil, aluminium-lined
Cu braid, tinned
PE
approx. 8,0 mm ± 0,4 mm
Black similar to RAL 9005

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
110 Ohm/km max.
35 nF/km nom.
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4,0 MHz < 22,0 dB/km
16,0 MHz < 42,0 dB/km

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
110 Ohm/km max.
35 nF/km nom.
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 79 kg/km
120 mm
-40°C
+80°C
1,068 MJ/m
24,00 kg/km

approx. 65 kg/km
120 mm
-20°C
+70°C
1,451 MJ/m
24,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

Profibus acc. to DIN 19245 T3 and EN50170
CMG 75°C or CL3 or AWM 21694 600V
CSA FT 4

Profibus acc. to DIN 19245 T3 and EN50170
-
-

Application

The application of these Profibus SK cables are in the cell and field area, just as for conventional types. The great advantage of this new system is the quick connection of the cable to the respective plugs. This type of processing also avoids errors. The above mentioned types are suitable for indoor- or outdoor installation and are equipped with a special PVC or PE sheath.

Part no.

81903, Profibus SK

81904, Profibus SK

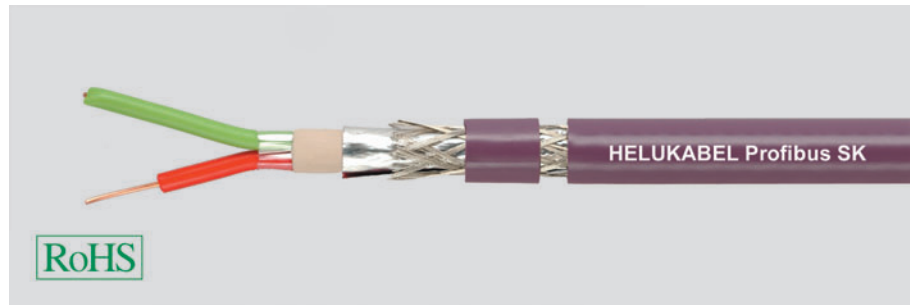
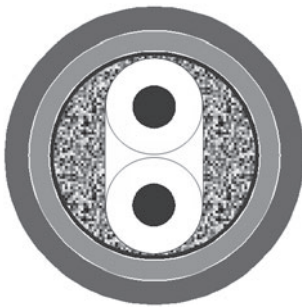
Dimensions and specifications may be changed without prior notice.

BUS Cables

Profibus SK

HELUKABEL[®]

FRNC + Industry



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor

1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
FRNC
Polyester foil, aluminium-lined
Cu braid, tinned
FRNC
approx. 8,0 mm ± 0,4 mm
Violet similar to RAL 4001

Industrial Area

1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
PE
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 8,0 mm ± 0,4 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
110 Ohm/km max.
35 nF/km nom.
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

150 Ohm ± 10 %
55 Ohm/km
1 GOhm x km
110 Ohm/km max.
35 nF/km nom.
1,5 kV
9,6 kHz < 2,5 dB/km
38,4 kHz < 4,0 dB/km
4 MHz < 22,0 dB/km
16 MHz < 42,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 73 kg/km
160 mm
-25°C
+70°C
1,203 MJ/m
24,00 kg/km

approx. 71 kg/km
120 mm
-40°C
+70°C
1,574 MJ/m
24,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

Profibus acc. to DIN 19245 T3 and EN50170
CM 750C (shielded)

Profibus acc. to DIN 19245 T3 and EN50170
AWM Style 20236 AWM I/II A/B 80°C 30V FT1
CSA FT1

Application

The application of these Profibus SK cables are in the cell and field area, just as for conventional types. The great advantage of this new system is the quick connection of the cable to the respective plugs. This type of processing also avoids errors. The types mentioned here are suitable for indoor laying (special FRNC sheath) and heavy industry laying (PUR sheath).

Part no.

81501, Profibus SK

81905, Profibus SK

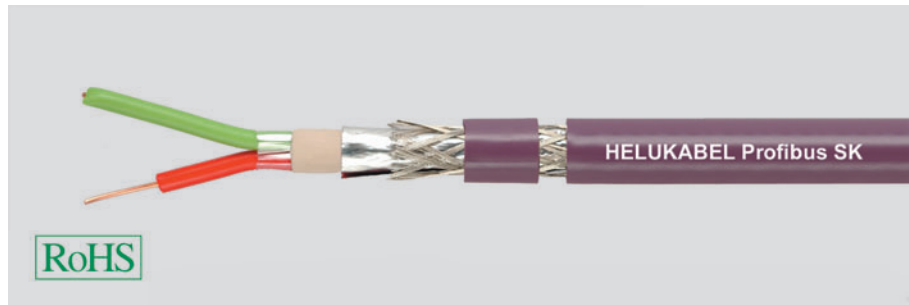
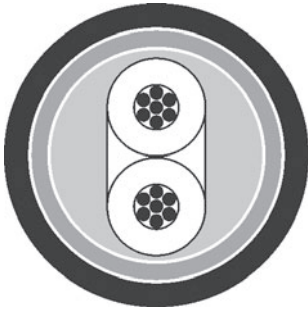
Dimensions and specifications may be changed without prior notice.

BUS Cables

Profibus SK

 **HELUKABEL®**

Drag Chain



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Inner sheath material:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications 1x2x0.64 mm (stranded)

Copper, bare (AWG 24/19)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 8,0 mm ± 0,4 mm
Petrol similar to RAL 5018

Drag chain applications 1x2x0.64 mm (stranded)

Copper, bare (AWG 24/19)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
PVC
Polyester foil, aluminium-lined
Cu braid, tinned
PUR
approx. 8,0 mm ± 0,4 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

150 Ohm ± 10 %
84 Ohm/km
1 GOhm x km
168 Ohm/km max.
35 nF/km nom.
1,5 kV
9,6 kHz < 3,0 dB/km
38,4 kHz < 5,0 dB/km
4 MHz < 25,0 dB/km
16 MHz < 52,0 dB/km

150 Ohm ± 10 %
84 Ohm/km
1 GOhm x km
168 Ohm/km max.
35 nF/km nom.
1,5 kV
9,6 kHz < 3,0 dB/km
38,4 kHz < 5,0 dB/km
4 MHz < 25,0 dB/km
16 MHz < 52,0 dB/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 70 kg/km
60 mm
-40°C
+70°C
1,53 MJ/m
25,00 kg/km

approx. 70 kg/km
60 mm
-40°C
+70°C
1,53 MJ/m
25,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

Profibus acc. to DIN 19245 T3 and EN50170
CMX 75°C (shielded)
CSA FT1

Profibus acc. to DIN 19245 T3 and EN50170
CMX 75°C (shielded)
CSA FT1

Application

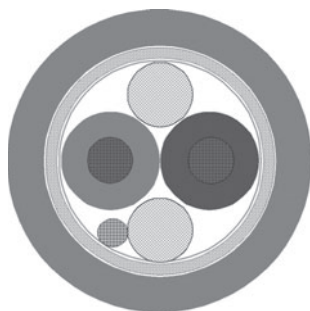
The application of these Profibus SK cables are in the cell and field area, just as for conventional types. The great advantage of this new system is the quick connection of the cable to the respective plugs. This type of processing also avoids errors. The above mentioned types are suitable for drag chains (stranded).

Part no.

81906, Profibus SK

801659, Profibus SK

Dimensions and specifications may be changed without prior notice.



new

Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

process automation

1x2x1.1/2,55-100 LI

Copper, bare (AWG 18/7)
PO
or, bl
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
yes
PVC
approx. 8,0 mm ± 0,3 mm
Orange

Electrical data

Characteristic impedance: 100 Ohm ± 20 Ohm
Conductor resistance, max.: 22 Ohm/km
Insulation resistance, min.: 5 GOhm x km
Loop resistance: 44 Ohm/km max.
Mutual capacitance: 60 nF/km nom.
Nominal voltage: 300 V
Test voltage: 1,5 kV
Attenuation: 39 kHz ≤ 3,4 dB/km

Technical data

Weight: approx. 85 kg/km
Min. bending radius for laying: 80 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +80°C
Caloric load, approx. value: 1,22 MJ/m
Copper weight: 45,00 kg/km

Norms

Applicable standards: Foundation Fieldbus Spec. FF-816-1.4
UL Style: CMG 75°C PLTC FT4
CSA standard: CSA FT 4

Application

The FOUNDATION™ Fieldbus is an open and neutral fieldbus standard which is primarily oriented on the requirements of process automation. It is a functionally complete fieldbus solution for areas like temperature transmitters, pressure transmitters or valve actuators. Today we distinguish between the specification H1 (31,25 kbit/s) and HSE (100Mbit/s). Branches like the petrochemical, chemical or the food- and beverage industry see the advantages and use the FOUNDATION™ fieldbus technology.

Part no.

803354, Foundation™ Fieldbus Basic

Dimensions and specifications may be changed without prior notice.

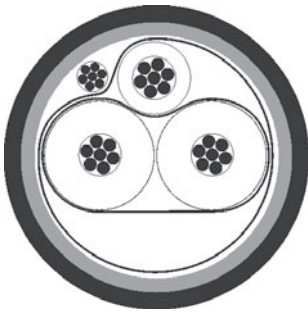
R

BUS Cables

FOUNDATION™ Fieldbus



Type A + gnye



Type

Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

process automation

1x2x1.1/2,85-100 LI + 1x0,8 gnye

Copper, bare (AWG 18/41)
Copper, bare (AWG 18/41)
XLPE ray cross-linking
PVC
bu, bn
gn/ye
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
PVC
approx. 7,9 mm ± 0,3 mm
Yellow

Electrical data

Characteristic impedance: 100 Ohm ± 20 Ohm
Conductor resistance, max.: 24 Ohm/km
Insulation resistance, min.: 2 GOhm x km
Loop resistance: 48 Ohm/km max.
Mutual capacitance: 65 nF/km nom.
Nominal voltage: 300 V
Test voltage: 1,5 kV
Attenuation: 39 kHz ≤ 3,4 dB/km

Technical data

Weight: approx. 84 kg/km
Min. bending radius for laying: 60 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +105°C
Caloric load, approx. value: 1,00 MJ/m
Copper weight: 49,00 kg/km

Norms

Applicable standards: Foundation Fieldbus Spec. FF-816-1.4
UL Style: CMG 105° or CL3 FT4
CSA standard: CSA FT 4

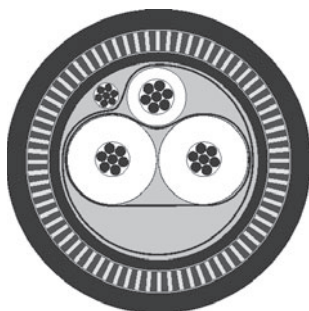
Application

The FOUNDATION™ Fieldbus is an open and neutral fieldbus standard which is primarily oriented on the requirements of process automation. It is a functionally complete fieldbus solution for areas like temperature transmitters, pressure transmitters or valve actuators. Today we distinguish between the specification H1 (31,25 kbit/s) and HSE (100Mbit/s). Branches like the petrochemical, chemical or the food- and beverage industry see the advantages and use the FOUNDATION™ fieldbus technology.

Part no.

801191 Foundation Fieldbus FF A

Dimensions and specifications may be changed without prior notice.



Type

Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Armouring:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

process automation

1x2x1.1/2,85-100 LI + 1x0,8 gnye, armoured

Copper, bare (AWG 18/41)
Copper, bare (AWG 18/41)
XLPE ray cross-linking
PVC
bu, bn
gn/ye
Double core
-
Polyester foil, aluminium-lined
Polyester foil, aluminium-lined
yes
Steel shaft
PVC
approx. 12,3 mm ± 0,3 mm
Yellow

Electrical data

Characteristic impedance: 100 Ohm ± 20 Ohm
Conductor resistance, max.: 24 Ohm/km
Insulation resistance, min.: 2 GOhm x km
Loop resistance: 48 Ohm/km max.
Mutual capacitance: 65 nF/km nom.
Nominal voltage: 300 V
Test voltage: 1,5 kV
Attenuation: 39 kHz ≤ 3,4 dB/km

Technical data

Weight: approx. 187 kg/km
Min. bending radius for laying: 130 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +105°C
Caloric load, approx. value: 1,65 MJ/m
Copper weight: 110,00 kg/km

Norms

Applicable standards: Foundation Fieldbus Spec. FF-816-1.4
UL Style: CMG 105°C or PLTC FT4 Sun Res
CSA standard: CSA FT 4

Application

The FOUNDATION™ Fieldbus is an open and neutral fieldbus standard which is primarily oriented on the requirements of process automation. It is a functionally complete fieldbus solution for areas like temperature transmitters, pressure transmitters or valve actuators. Today we distinguish between the specification H1 (31,25 kbit/s) and HSE (100Mbit/s). Branches like the petrochemical, chemical or the food- and beverage industry see the advantages and use the FOUNDATION™ fieldbus technology.

Part no.

801192, Foundation Fieldbus FF A

Dimensions and specifications may be changed without prior notice.

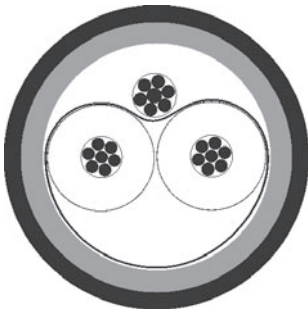
R

BUS Cables

FOUNDATION™ Fieldbus

 **HELUKABEL®**

Type A



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

process automation

1x2x1.1/2,85-100 LI

Copper, bare (AWG 18/41)
XLPE ray cross-linking
bu, bn
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
PVC
approx. 7,9 mm ± 0,3 mm
Yellow

Electrical data

Characteristic impedance: 100 Ohm ± 20 Ohm
Conductor resistance, max.: 24 Ohm/km
Insulation resistance, min.: 2 GOhm x km
Loop resistance: 48 Ohm/km max.
Mutual capacitance: 65 nF/km nom.
Nominal voltage: 300 V
Test voltage: 1,5 kV
Attenuation: 39 kHz ≤ 3,4 dB/km

Technical data

Weight: approx. 89 kg/km
Min. bending radius for laying: 60 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +105°C
Caloric load, approx. value: 1,05 MJ/m
Copper weight: 42,00 kg/km

Norms

Applicable standards: Foundation Fieldbus Spec. FF-816-1.4
UL Style: CMG 105° or CL3 FT4
CSA standard: CSA FT 4

Application

The FOUNDATION™ Fieldbus is an open and neutral fieldbus standard which is primarily oriented on the requirements of process automation. It is a functionally complete fieldbus solution for areas like temperature transmitters, pressure transmitters or valve actuators. Today we distinguish between the specification H1 (31,25 kbit/s) and HSE (100Mbit/s). Branches like the petrochemical, chemical or the food- and beverage industry see the advantages and use the FOUNDATION™ fieldbus technology.

Part no.

801193, Foundation Fieldbus FF A

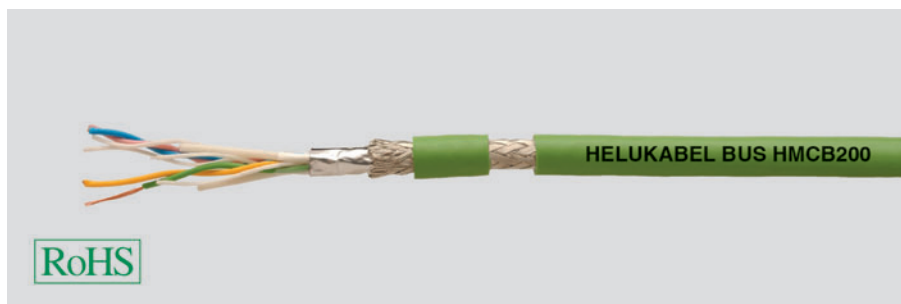
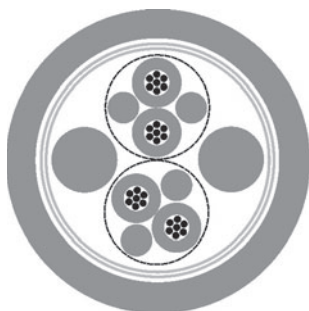
Dimensions and specifications may be changed without prior notice.

BUS Cables

HMCB200

HELUKABEL®

fixed installed



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor

2x2x0,22 mm²

Copper, bare (AWG 22/7)
Foam-skin-PE
gn, ye, pk, bu
Double core
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
PVC
approx. 6,8 mm ± 0,15 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Conductor resistance, max.: 87,6 Ohm/km
Insulation resistance, min.: 1 GOhm x km
Loop resistance: 175 Ohm/km max.
Mutual capacitance: 50 nF/km nom.
Test voltage: 0,5 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (db/100m)	8,0	10,0	20,0	27,0
Next (db)	47,0	44,0	35,0	32,0
ACR (db)	39,0	34,0	15,0	5,0

Technical data

Weight: approx. 71 kg/km
Min. bending radius for laying: 100 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 0,92 MJ/m
Copper weight: 35,00 kg/km

Norms

UL Style: AWM Style 2502 AWM I/II A/B 80°C 30V FT1

Application

These signal cables, designed specifically for use in heavy-duty industries, are the ideal solution for MOTION-CONNECT 200, 500 and 800 series applications. They guarantee superior transmission properties and can be used under the most severe conditions. The cable cited here conforms to HMCB200 for fixed installation.

Part no.

802471, HMCB200

Dimensions and specifications may be changed without prior notice.

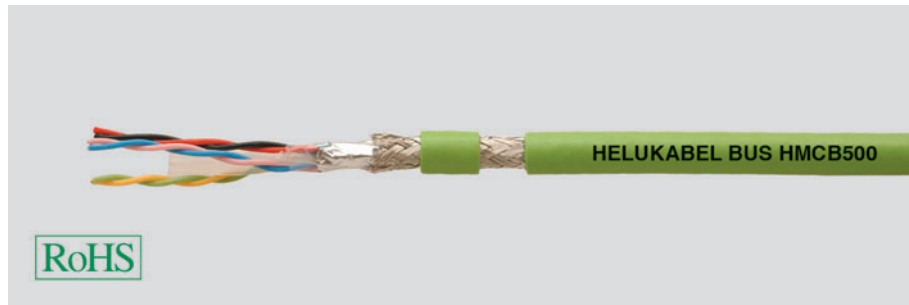
* Drive Cliq is registered trademark from Siemens AG.

BUS Cables

HMCB500

 **HELUKABEL®**

Drag Chain



Type

Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications

2x2xAWG26 + 1x2xAWG22

Copper, bare (AWG 26/7)
Copper, bare (AWG 22/7)
PO
PO
gn, ye, pk, bu
rd, bk
Double core
-
-
Foil + braid
PUR
approx. 6,9 mm ± 0,1 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Conductor resistance, max.: 135 Ohm/km
Insulation resistance, min.: 1 GOhm x km
Loop resistance: 270 Ohm/km max.
Mutual capacitance: 50 nF/km nom.
Test voltage: 0,5 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (db/100m)	13,0	16,0	32,0	40,0
Next (db)	47,0	44,0	35,0	32,0
ACR (db)	34,0	28,0	3,0	-8,0

Technical data

Weight: approx. 61 kg/km
Min. bending radius for laying: 70 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,97 MJ/m
Copper weight: 35,00 kg/km

Norms

UL Style: AWM Style 20236 AWM I/II A/B 80°C 30V FT1

Application

These signal cables, designed specifically for use in heavy-duty industries, are the ideal solution for MOTION-CONNECT 200, 500 and 800 series applications. They guarantee superior transmission properties and can be used under the most severe conditions. The cable cited here conforms to HMCB500 for highly-flexible applications inside motor drives.

Part no.

802472, HMCB500

Dimensions and specifications may be changed without prior notice.

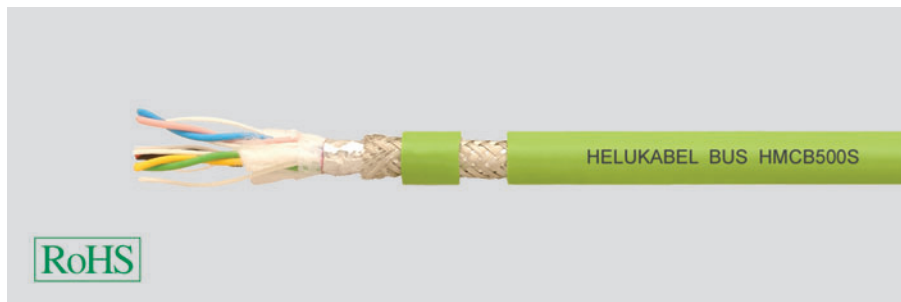
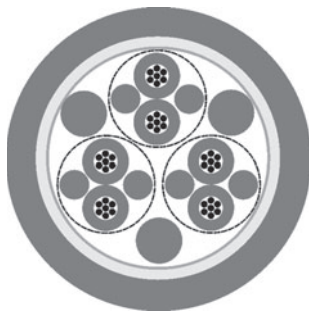
* Drive Cliq is registered trademark from Siemens AG.

BUS Cables

HMCB500S

HELUKABEL[®]

Drag Chain



new

Type

Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications

2x2xAWG24 + 1x2xAWG22

Copper, bare (AWG 24/7)
Copper, tinned (AWG 22/19)
Foam-skin-PE
PE
gn, ye, pk, bu
rd, bk
Double core
-
-
Foil + braid
PVC
approx. 7,0 mm ± 0,15 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:

100 Ohm ± 15 ohm at 1 to 100 MHz
90 Ohm/km
1 GOhm x km
180 Ohm/km max.
50 nF/km nom.
0,5 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (db/100m)	10,0	12,0	23,0	30,0
Next (db)	47,0	44,0	35,0	32,0
ACR (db)	37,0	36,0	12,0	2,0

Technical data

Weight: approx. 72 kg/km
Min. bending radius for laying: 125 mm
Operating temperature range min.: 0°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,00 MJ/m
Copper weight: 38,00 kg/km

Norms

UL Style: AWM Style 2502 AWM I/II A/B 80°C 30V FT1
CSA standard: CSA FT1

Application

These signal cables, designed specifically for use in heavy-duty industries, are the ideal solution for MOTION-CONNECT 200, 500 and 800 series applications. They guarantee superior transmission properties and can be used under the most severe conditions. The cable cited here conforms to HMCB500 for flexible applications inside motor drives for distances up to 100m.

Part no.

803672, HMCB500S

Dimensions and specifications may be changed without prior notice.

* Drive Cliq is registered trademark from Siemens AG.

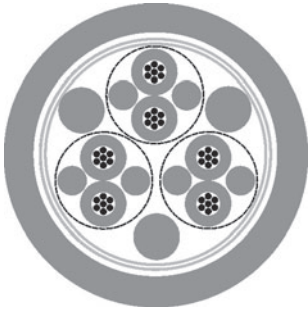
R

BUS Cables

HMCB800

 **HELUKABEL®**

Drag Chain



Type

Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications

2x2x0,15 mm² + 1x2x0,38 mm²

Copper, bare (AWG 26/19)
Copper, tinned (AWG 22/19)
PO
PO
gn, ye, pk, bu
rd, bk
Double core
Polyester foil over stranded bundle
-
Foil + braid
TPE
approx. 7,0 mm ± 0,15 mm
Green similar to RAL 6018

Electrical data

Characteristic impedance: 100 Ohm ± 15 ohm at 1 to 100 MHz
Conductor resistance, max.: 135 Ohm/km
Insulation resistance, min.: 1 GOhm x km
Loop resistance: 270 Ohm/km max.
Mutual capacitance: 50 nF/km nom.
Test voltage: 0,5 kV

Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (db/100m)	13,0	16,0	32,0	40,0
Next (db)	47,0	44,0	35,0	32,0
ACR (db)	34,0	28,0	3,0	-8,0

Technical data

Weight: approx. 72 kg/km
Min. bending radius for laying: 105 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,91 MJ/m
Copper weight: 42,00 kg/km

Norms

UL Style: AWM Style 20236 AWM I/II A/B 80°C 30V FT1

Application

These signal cables, designed specifically for use in heavy-duty industries, are the ideal solution for MOTION-CONNECT 200, 500 and 800 series applications. They guarantee superior transmission properties and can be used under the most severe conditions. The cable cited here conforms to HMCB800 for highly-flexible applications.

Part no.

802473, HMCB800

Dimensions and specifications may be changed without prior notice.

* Drive Cliq is registered trademark from Siemens AG.

BUS Cables

USB Bus S



Type

Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications

1x2xAWG28 + 1x2xAWG20

Cu VAG + steel core (AWG 28/19)
Copper, tinned (AWG 20/37)
FEP
PO
wh, gn
rd, bk
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
-
Foil + braid
PUR
approx. 5,0 mm ± 0,2 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance: 90 Ohm ± 15 %
Conductor resistance, max.: 232 Ohm/km
Insulation resistance, min.: 0,1 GOhm x km
Loop resistance: 464 Ohm/km max.
Mutual capacitance: 54 nF/km nom.
Test voltage: 0,5 kV

Typical values

Frequency (MHz)	10	16	62,5	100	200	300	400
Attenuation (db/100m)	12,1	15,4	31,0	39,7	60,2	76,2	99,7

Technical data

Weight: approx. 45 kg/km
Min. bending radius for laying: 50 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,49 MJ/m
Copper weight: 30,00 kg/km

Norms

Applicable standards: USB-Standard 2.0

Application

These USB cables, designed specifically for use in heavy-duty industries, are the ideal solution for highly-flexible applications such as drag chains and camera technology. They guarantee superior transmission properties. The cable cited here can be used up to a maximum cable length of 5m.

Part no.

802469, USB S

Dimensions and specifications may be changed without prior notice.

R

BUS Cables

USB Bus L



Type

Cable structure

Inner conductor diameter 1:	Copper, bare (AWG 24/19)
Inner conductor diameter 2:	Copper, tinned (AWG 20/37)
Core insulation 1:	PO
Core insulation 2:	PO
Core colours 1:	wh, gn
Core colours 2:	rd, bk
Stranding element 1:	2 cores + 2 fillers stranded together
Shielding 1:	Polyester foil over stranded bundle
Shielding 2:	-
Total shielding:	Foil + braid
Outer sheath material:	PUR
Cable external diameter:	approx. 5,8 mm ± 0,2 mm
Outer sheath colour:	Violet similar to RAL 4001

Electrical data

Characteristic impedance:	90 Ohm ± 15 %
Conductor resistance, max.:	140 Ohm/km
Insulation resistance, min.:	0,1 GOhm x km
Loop resistance:	280 Ohm/km max.
Mutual capacitance:	50 nF/km nom.
Test voltage:	0,5 kV

Typical values

Frequency (MHz)	10	16	62,5	100	200	300
Attenuation (db/100m)	8,5	10,2	21,3	27,3	41,5	53,3

Technical data

Weight:	approx. 56 kg/km
Min. bending radius for laying:	75 mm
Operating temperature range min.:	-35°C
Operating temperature range max.:	+70°C
Caloric load, approx. value:	0,57 MJ/m
Copper weight:	34,00 kg/km

Norms

Applicable standards:	USB-Standard 2.0
-----------------------	------------------

Application

These USB cables, designed specifically for use in heavy-duty industries, are the ideal solution for highly-flexible applications such as drag chains and camera technology. They guarantee superior transmission properties and can be used even under the most severe conditions. The cable cited here can be used up to a maximum cable length of 10m.

Part no.

802470, USB L

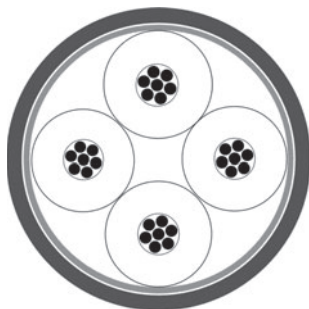
Dimensions and specifications may be changed without prior notice.

BUS Cables

CAN Bus

HELUKABEL®

fixed installed



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 1x2x0.22 mm² (stranded)

Copper, bare (AWG 24/7)
Cell PE
wh/bn
Double core
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 5,4 mm ± 0,2 mm
Violet similar to RAL 4001

Fixed installation, indoor 4x1x0.22 mm² (stranded)

Copper, bare (AWG 24/7)
Cell PE
wh, bn, gn, ye
Star quad
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 6,9 mm ± 0,2 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:

120 Ohm ± 10 %
87 Ohm/km
1 GOhm x km
174 Ohm/km max.
58 nF/km nom.
30 V
1,5 kV

120 Ohm ± 10 %
87 Ohm/km
1 GOhm x km
174 Ohm/km max.
58 nF/km nom.
30 V
1,5 kV

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 41 kg/km
81 mm
-40°C
+70°C
0,574 MJ/m
17,00 kg/km

approx. 60 kg/km
107 mm
-40°C
+70°C
1,234 MJ/m
21,00 kg/km

Norms

Applicable standards:
UL Style:

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The above mentioned types are suitable for fixed laying in indoor applications. This is also a very economical solution of a BUS system.

Part no.

81286, CAN BUS

81287, CAN BUS

Dimensions and specifications may be changed without prior notice.

R

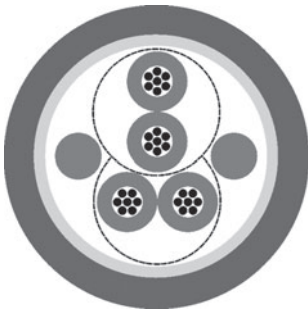
BUS Cables

CAN Bus

 **HELUKABEL®**

fixed installed

new



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 2x2x0.22 mm² (stranded)

Copper, bare (AWG 24/7)
Cell PE
wh/bn, gn/ye
2 cores + 2 fillers stranded together
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 7,5 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance: 120 Ohm ± 10 %
Conductor resistance, max.: 87,6 Ohm/km
Insulation resistance, min.: 5 GOhm x km
Loop resistance: 174 Ohm/km max.
Mutual capacitance: 40 nF/km nom.
Nominal voltage: 30 V
Test voltage: 1,5 kV

Technical data

Weight: approx. 60 kg/km
Min. bending radius for laying: 113 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 1,13 MJ/m
Copper weight: 32,00 kg/km

Norms

Applicable standards: Profibus acc. to DIN 19245 T3 and EN50170
UL Style: UL Style 2571
CSA standard: CSA FT1

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The above mentioned types are suitable for fixed laying in indoor applications. This is also a very economical solution of a BUS system.

Part no.

82509, CAN BUS

Dimensions and specifications may be changed without prior notice.

BUS Cables

CAN Bus

HELUKABEL®

fixed installed, 105°C



new

Type

Cable structure

Inner conductor diameter:

Core insulation:

Core colours:

Stranding element:

Shielding 1:

Shielding 2:

Total shielding:

Outer sheath material:

Cable external diameter:

Outer sheath colour:

Industrial Area

2x2xAWG 24/19 mm² (stranded)

Copper, bare (AWG 24/19)

XLPE ray cross-linking

wh/bn, gn/ye

Double core

Polyester foil over stranded bundle

-

Cu braid, tinned

PUR

approx. 8,4 mm ± 0,3 mm

Violet similar to RAL 4001

Electrical data

Characteristic impedance:

Conductor resistance, max.:

Insulation resistance, min.:

Loop resistance:

Mutual capacitance:

Nominal voltage:

Test voltage:

120 Ohm ± 10 %

87,2 Ohm/km

1 GOhm x km

84 Ohm/km max.

42 nF/km nom.

600 V

2,5 kV

Technical data

Weight:

Min. bending radius for laying:

Operating temperature range min.:

Operating temperature range max.:

Copper weight:

approx. 80 kg/km

126 mm

-40°C

+105°C *

40,00 kg/km

Norms

Applicable standards:

UL Style:

Profibus acc. to DIN 19245 T3 and EN50170

UL/CSA 21223 80°C, 600V

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The above mentioned types are suitable for fixed laying in indoor applications. This is also a very economical solution of a BUS system. Cable with oil-resistant FRNC sheath and increased temperature resistance for use in the wind turbine and similar sectors. Certified to UL, the cable can also be used in the USA and Canada.

* = with limited service life

Part no.

801982, CAN BUS

Dimensions and specifications may be changed without prior notice.

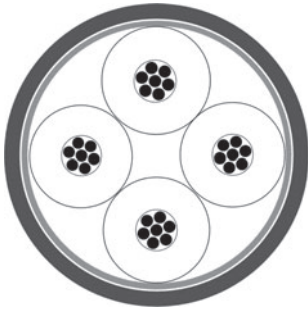
R

BUS Cables

CAN Bus

 **HELUKABEL®**

fixed installed



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 1x2x0.34 mm² (stranded)

Copper, bare (AWG 22/7)
Cell PE
wh/bn
Double core
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 6,5 mm ± 0,2 mm
Violet similar to RAL 4001

Fixed installation, indoor 4x1x0.34 mm² (stranded)

Copper, bare (AWG 22/7)
Cell PE
wh/bn, gn/ye
Star quad
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 8,0 mm ± 0,2 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:

120 Ohm ± 10 %
57,5 Ohm/km
5 GOhm x km
115 Ohm/km max.
40 nF/km nom.
30 V
2 kV

120 Ohm ± 10 %
57,5 Ohm/km
5 GOhm x km
115 Ohm/km max.
40 nF/km nom.
30 V
2 kV

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 54 kg/km
98 mm
-25°C
+70°C
1,109 MJ/m
23,00 kg/km

approx. 77 kg/km
120 mm
-25°C
+70°C
1,179 MJ/m
30,00 kg/km

Norms

Applicable standards:
UL Style:

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The above mentioned types are suitable for fixed laying in indoor applications. This is also a very economical solution of a BUS system.

Part no.

801572, CAN BUS

801573, CAN BUS

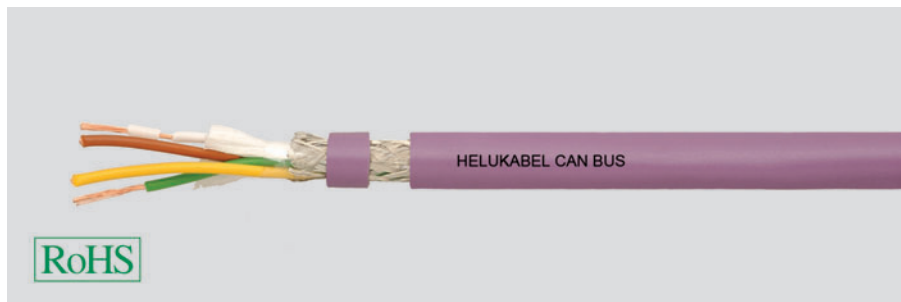
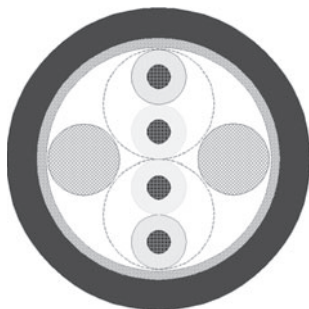
Dimensions and specifications may be changed without prior notice.

BUS Cables

CAN Bus

HELUKABEL®

fixed installed



new

Type

Cable structure

Inner conductor diameter:

Core insulation:

Core colours:

Stranding element:

Shielding 1:

Shielding 2:

Total shielding:

Outer sheath material:

Cable external diameter:

Outer sheath colour:

Fixed installation, indoor 2x2x0.34 mm² (stranded)

Copper, bare (AWG 22/7)

Foam-skin-PE

wh/bn, gn/ye

Double core

Polyester foil over stranded bundle

-

Cu braid, tinned

PVC

approx. 8,5 mm ± 0,2 mm

Violet similar to RAL 4001

Electrical data

Characteristic impedance:

Conductor resistance, max.:

Insulation resistance, min.:

Loop resistance:

Mutual capacitance:

Nominal voltage:

Test voltage:

120 Ohm ± 10 %

55,4 Ohm/km

5 GOhm x km

110 Ohm/km max.

40 nF/km nom.

250 V

1,5 kV

Technical data

Weight:

Min. bending radius for laying:

Operating temperature range min.:

Operating temperature range max.:

Caloric load, approx. value:

Copper weight:

approx. 85 kg/km

130 mm

-40°C

+70°C

1,32 MJ/m

46,00 kg/km

Norms

Applicable standards:

UL Style:

CSA standard:

Profibus acc. to DIN 19245 T3 and EN50170

CMX 75°C (shielded)

CSA FT1

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The above mentioned types are suitable for fixed laying in indoor applications. This is also a very economical solution of a BUS system.

Part no.

803344, CAN BUS

Dimensions and specifications may be changed without prior notice.

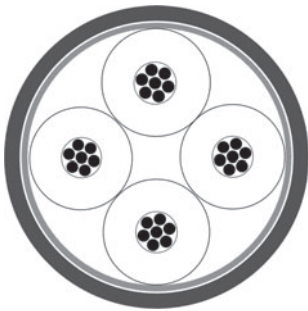
R

BUS Cables

CAN Bus

 **HELUKABEL®**

fixed installed



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 1x2x0.50 mm² (stranded)

Copper, bare (AWG 20/7)
Foam-skin-PE
wh/bn
Double core
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 7,0 mm ± 0,2 mm
Violet similar to RAL 4001

Fixed installation, indoor 4x1x0.50 mm² (stranded)

Copper, bare (AWG 20/7)
Foam-skin-PE
wh, bn, gn, ye
Star quad
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 8,5 mm ± 0,2 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:

120 Ohm ± 10 %
37 Ohm/km
1 GOhm x km
74 Ohm/km max.
50 nF/km nom.
1,5 kV

120 Ohm ± 10 %
37 Ohm/km
1 GOhm x km
74 Ohm/km max.
65 nF/km nom.
1,5 kV

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 69 kg/km
105 mm
-40°C
+70°C
1,09 MJ/m
30,00 kg/km

approx. 100 kg/km
128 mm
-40°C
+70°C
1,64 MJ/m
45,00 kg/km

Norms

Applicable standards:
UL Style:

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The above mentioned types are suitable for fixed laying in indoor applications. This is also a very economical solution of a BUS system.

Part no.

800571, CAN BUS

800685, CAN BUS

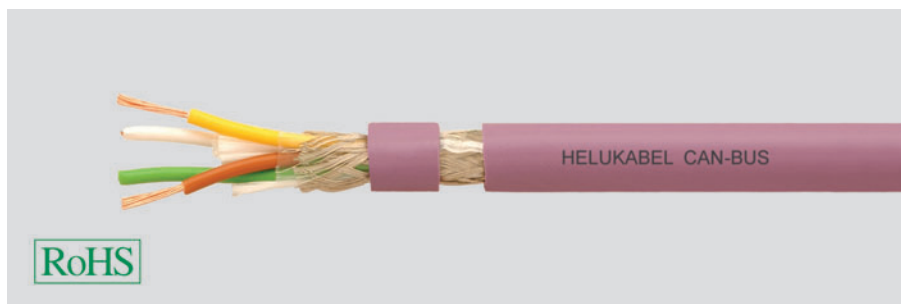
Dimensions and specifications may be changed without prior notice.

BUS Cables

CAN Bus

HELUKABEL®

fixed installed



new

Type

Cable structure

Inner conductor diameter:

Core insulation:

Core colours:

Stranding element:

Shielding 1:

Shielding 2:

Total shielding:

Outer sheath material:

Cable external diameter:

Outer sheath colour:

Fixed installation, indoor 2x2x0.50 mm² (stranded)

Copper, bare (AWG 20/7)

Foam-skin-PE

wh/bn, gn/ye

Double core

Polyester foil over stranded bundle

-

Cu braid, tinned

PVC

approx. 9,5 mm ± 0,2 mm

Violet similar to RAL 4001

Electrical data

Characteristic impedance:

Conductor resistance, max.:

Insulation resistance, min.:

Loop resistance:

Mutual capacitance:

Nominal voltage:

Test voltage:

120 Ohm ± 10 %

34,4 Ohm/km

5 GOhm x km

68 Ohm/km max.

40 nF/km nom.

250 V

1,5 kV

Technical data

Weight:

Min. bending radius for laying:

Operating temperature range min.:

Operating temperature range max.:

Caloric load, approx. value:

Copper weight:

approx. 116 kg/km

150 mm

-40°C

+70°C

1,62 MJ/m

60,00 kg/km

Norms

Applicable standards:

UL Style:

CSA standard:

Profibus acc. to DIN 19245 T3 and EN50170

CMX 75°C (shielded)

CSA FT1

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The above mentioned types are suitable for fixed laying in indoor applications. This is also a very economical solution of a BUS system.

Part no.

803722, CAN BUS

Dimensions and specifications may be changed without prior notice.

R

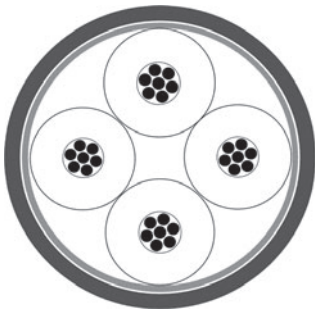
BUS Cables

CAN Bus

 **HELUKABEL®**

fixed installed

new



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 1x2x0.75 mm² (stranded)

Copper, bare (AWG 18/19)
Foam-skin-PE
wh/bn
Double core
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 8,7 mm ± 0,3 mm
Violet similar to RAL 4001

Fixed installation, indoor 4x1x0.75 mm² (stranded)

Copper, bare (AWG 18/19)
Foam-skin-PE
wh/bn, gn/ye
Star quad
Polyester foil over stranded bundle
-
Cu braid, tinned
PVC
approx. 8,8 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:

120 Ohm ± 15 %
27,5 Ohm/km
1 GOhm x km
55 Ohm/km max.
42 nF/km nom.
300 V
1,5 kV

120 Ohm ± 15 %
27,5 Ohm/km
1 GOhm x km
55 Ohm/km max.
42 nF/km nom.
300 V
1,5 kV

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 101 kg/km
110 mm
-40°C
+70°C
1,67 MJ/m
40,00 kg/km

approx. 112 kg/km
120 mm
-40°C
+70°C
1,76 MJ/m
58,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571
CSA FT1

Profibus acc. to DIN 19245 T3 and EN50170
UL Style 2571
CSA FT1

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The above mentioned types are suitable for fixed laying in indoor applications. This is also a very economical solution of a BUS system.

Part no.

803383, CAN BUS

803384, CAN BUS

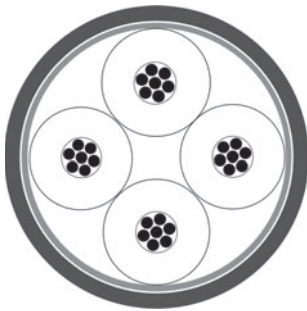
Dimensions and specifications may be changed without prior notice.

BUS Cables

CAN Bus

HELUKABEL[®]

Drag Chain



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications 1x2x0.25 mm² (stranded)

Copper, bare (AWG 24/19)
PE
wh/bn
Double core
Polyester foil over stranded bundle
-
Cu braid, tinned
PUR
approx. 6,2 mm ± 0,3 mm
Violet similar to RAL 4001

Drag chain applications 4x1x0.25 mm² (stranded)

Copper, bare (AWG 24/19)
PE
wh, bn, gn, ye
Star quad
Polyester foil over stranded bundle
-
Cu braid, tinned
PUR
approx. 6,5 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:

120 Ohm ± 10 %
85 Ohm/km
1 GOhm x km
170 Ohm/km max.
50 nF/km nom.
1,5 kV

120 Ohm ± 10 %
85 Ohm/km
1 GOhm x km
170 Ohm/km max.
50 nF/km nom.
1,5 kV

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 40 kg/km
90 mm
-20°C
+70°C
0,798 MJ/m
18,00 kg/km

approx. 45 kg/km
95 mm
-20°C
+70°C
0,943 MJ/m
25,00 kg/km

Norms

Applicable standards:

Profibus acc. to DIN 19245 T3 and EN50170

Profibus acc. to DIN 19245 T3 and EN50170

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The lines specified here are designed for highly flexible applications. This is also a very economical solution of a BUS system.

Part no.

81911, CAN BUS, highly flexible

81912, CAN BUS, highly flexible

Dimensions and specifications may be changed without prior notice.

R

Bus Cables

CAN Bus

 **HELUKABEL®**

Drag Chain, UL



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications 1x2x0.34 mm² (stranded)

Copper, bare (AWG 22/43)
Foam-skin-PE
wh/bn
2 cores + 2 fillers stranded together
-
-
Cu braid, tinned
PUR
approx. 6,9 mm ± 0,3 mm
Violet similar to RAL 4001

Drag chain applications 4x1x0.34 mm² (stranded)

Copper, bare (AWG 22/43)
Foam-skin-PE
wh/bn, gn/ye
Star quad
-
-
Cu braid, tinned
PUR
approx. 7,5 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:

120 Ohm ± 15 %
56 Ohm/km
5 GOhm x km
170 Ohm/km max.
40 nF/km nom.
250 V
1,5 kV

120 Ohm ± 15 %
56 Ohm/km
5 GOhm x km
170 Ohm/km max.
40 nF/km nom.
250 V
1,5 kV

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 54 kg/km
70 mm
-30°C
+70°C
1,20 MJ/m
30,00 kg/km

approx. 64 kg/km
75 mm
-30°C
+70°C
1,20 MJ/m
42,00 kg/km

Norms

Applicable standards:
UL Style:

Profibus acc. to DIN 19245 T3 and EN50170
CMX 444

Profibus acc. to DIN 19245 T3 and EN50170
CMX 444

Application

The CAN bus series (control area network) is a variable field bus system. In the area of automation technology, complex controllers and control units are networked. Industries, such as the textile or construction machine industry and the medical technology, use this series. The lines specified here are designed for highly flexible applications where also a UL Certificate is required.

Part no.

802182, CAN BUS, highly flexible

802339, CAN BUS, highly flexible

Dimensions and specifications may be changed without prior notice.

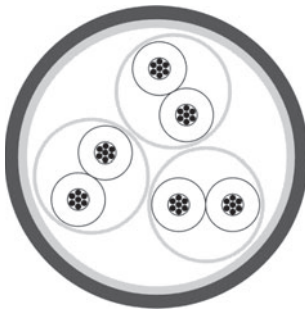
BUS Cables

I-BUS



HELUKABEL®

fixed installed



Type Cable structure

Inner conductor diameter:
Inner conductor diameter 2:
Core insulation:
Core insulation 2:
Core colours:
Core colours 2:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 3x2x0.22 mm²

Copper, bare (AWG 24/7)
-
PE
-
wh/bn, gn/rd, ye/gn
-
Double core
Polyester foil over stranded bundle
-
Cu braid, bare
PVC
approx. 7,0 mm ± 0,3 mm
Pastel turquoise similar to RAL 6034

Fixed installation, indoor 3x2x0.22 mm² + 3x1.0 mm²

Copper, bare (AWG 24/7)
Copper, bare (AWG 17/56)
PE
PE
wh/bn, gn/rd, ye/gn
bu, rd, gnye
Double core
Polyester foil over stranded bundle
-
Cu braid, bare
PVC
approx. 8,0 mm ± 0,3 mm
Pastel turquoise similar to RAL 6034

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

100 Ohm ± 15 Ohm
96 Ohm/km
1 GOhm x km
192 Ohm/km max.
60 nF/km nom.
1 kV
256 kHz < 1,5 dB/100m
772 kHz < 2,4 dB/100m
1 MHz < 2,7 dB/100m
4 MHz < 5,2 dB/100m
10 MHz < 8,4 dB/100m
16 MHz < 11,2 dB/100m
20 MHz < 11,9 dB/100m

100 Ohm ± 15 Ohm
96 Ohm/km
1 GOhm x km
192 Ohm/km max.
60 nF/km nom.
1 kV
256 kHz < 3,0 dB/100m
772 kHz < 4,8 dB/100m
1 MHz < 5,2 dB/100m
4 MHz < 10,4 dB/100m
10 MHz < 16,8 dB/100m
16 MHz < 22,4 dB/100m
20 MHz < 23,8 dB/100m

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 70 kg/km
110 mm
-40°C
+70°C
1,20 MJ/m
35,00 kg/km

approx. 96 kg/km
120 mm
-40°C
+70°C
1,31 MJ/m
68,00 kg/km

Norms

Applicable standards:
UL Style:

interbus specification 2.0, IEC61158
UL Style 2571

interbus specification 2.0, IEC61158
UL Style 2571

Application

Interbus-S is an inexpensive way to network sensors and actuators with all standard automation instruments. The twisted two-core conductor is used as a standard transfer medium. This bus system replaces the expensive parallel cabling for the different signal types in the lower levels of automation technique and combines the cables in a single bus cable. Interbus components are connected with this long-distance BUS cable.

Part no.

80778, I-BUS

81202, I-BUS

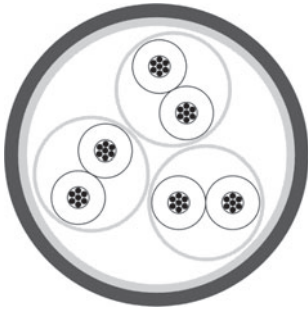
Dimensions and specifications may be changed without prior notice.

BUS Cables

I-BUS



fixed installed, halogenfree



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor

3x2x0.22 mm²

Copper, bare (AWG 24/7)
PE
wh/bn, gn/rd, ye/gn
Double core
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, bare
PE
approx. 7,0 mm ± 0,3 mm
Pastel turquoise similar to RAL 6034

Electrical data

Characteristic impedance: 100 Ohm ± 15 Ohm
Conductor resistance, max.: 96 Ohm/km
Insulation resistance, min.: 1 GOhm x km
Loop resistance: 192 Ohm/km max.
Mutual capacitance: 50 nF/km nom.
Test voltage: 1 kV
Attenuation:

256	kHz	< 1,5	dB/100m
772	kHz	< 2,4	dB/100m
1	MHz	< 2,7	dB/100m
4	MHz	< 5,2	dB/100m
10	MHz	< 8,4	dB/100m
16	MHz	< 11,2	dB/100m
20	MHz	< 11,9	dB/100m

Technical data

Weight: approx. 67 kg/km
Min. bending radius for laying: 110 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 1,10 MJ/m
Copper weight: 35,00 kg/km

Norms

Applicable standards: interbus specification 2.0, IEC61158

Application

Interbus-S is an inexpensive way to network sensors and actuators with all standard automation instruments. The twisted two-core conductor is used as a standard transfer medium. This bus system replaces the expensive parallel cabling for the different signal types in the lower levels of automation technique and combines the cables in a single bus cable. Interbus components are connected with this long-distance BUS cable. The cable with halogenfree jacket is used for outdoor applications and in the food-industry.

Part no.

81557, I-BUS

Dimensions and specifications may be changed without prior notice.

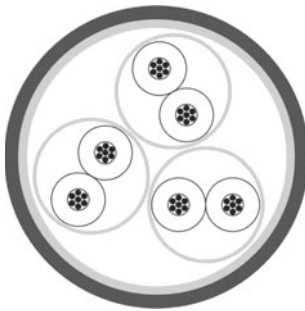
BUS Cables

I-BUS



HELUKABEL®

Drag Chain



Type Cable structure

Inner conductor diameter:
Inner conductor diameter 2:
Core insulation:
Core insulation 2:
Core colours:
Core colours 2:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

Norms

Applicable standards:

Application

Interbus-S is an inexpensive way to network sensors and actuators with all standard automation instruments. The twisted two-core conductor is used as a standard transfer medium. This bus system replaces the expensive parallel cabling for the different signal types in the lower levels of automation technique and combines the cables in a single bus cable. Interbus components are connected with this long-distance BUS cable. The above mentioned types are suitable for drag chain application.

Part no.

Dimensions and specifications may be changed without prior notice.

Drag chain applications 3x2x0.25 mm²

Copper, bare (AWG 24/19)
-
PE
-
wh/bn, gn/rd, ye/gn
-
Double core
Polyester foil over stranded bundle
-
Cu braid, bare
PUR
approx. 7,6 mm ± 0,3 mm
Pastel turquoise similar to RAL 6034

100 Ohm ± 15 Ohm
96 Ohm/km
1 GOhm x km
192 Ohm/km max.
60 nF/km nom.
1 kV
256 kHz < 1,5 dB/100m
772 kHz < 2,4 dB/100m
1 MHz < 2,7 dB/100m
4 MHz < 5,2 dB/100m
10 MHz < 8,4 dB/100m
16 MHz < 11,2 dB/100m
20 MHz < 11,9 dB/100m

approx. 63 kg/km
90 mm
-20°C
+70°C
0,937 MJ/m
36,00 kg/km

interbus specification 2.0, IEC61158

81203, I-BUS

Drag chain applications 3x2x0.25 mm² + 3x1.0 mm²

Copper, bare (AWG 24/19)
Copper, bare (AWG 17/65)
PE
PE
wh/bn, gn/rd, ye/gn
bu, rd, gnye
Double core
Polyester foil over stranded bundle
-
Cu braid, tinned
PUR
approx. 8,6 mm ± 0,3 mm
Violet similar to RAL 4001

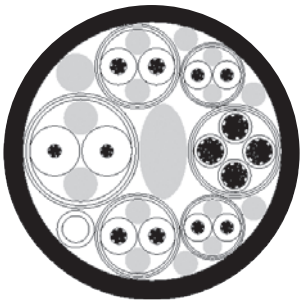
100 Ohm ± 15 Ohm
96 Ohm/km
1 GOhm x km
192 Ohm/km max.
60 nF/km nom.
1 kV
256 kHz < 3,0 dB/100m
772 kHz < 4,8 dB/100m
1 MHz < 5,2 dB/100m
4 MHz < 10,4 dB/100m
10 MHz < 16,8 dB/100m
16 MHz < 22,4 dB/100m
20 MHz < 23,8 dB/100m

approx. 92 kg/km
100 mm
-20°C
+70°C
1,227 MJ/m
70,00 kg/km

interbus specification 2.0, IEC61158

82696, I-BUS

R



Type Cable structure

Profibus:	1 x 2 x AWG 22 mm ² (Foam-Skin PO/rd/gn)
DeviceNet™:	2 x 2 x AWG 22 mm ² (Foam-Skin PO/wh/bn, ye/gn)
Interbus:	2 x 2 x 0,25 (Foam-Skin PO/ gn/pk, ye/gn)
Power cores:	4 x 1 x 1,0 mm ² (PO/rd, bl, bu, bn)
Protective earth core:	1,0 mm ² (PO/gnye)
Stranding:	Single cores totally stranded together and filled with plastic elements
Total shielding:	PP vlies
Outer sheath material:	PUR, halogenfree
Cable external diameter:	app. 14,7 mm
Outer sheath colour:	violet similar to RAL 4001

Electrical data

Characteristic impedance:	150 + -15 Ohm (Profibus) 120 + -12 Ohm (DeviceNet™) 100 + -15 Ohm (Interbus)
Conductor resistance:	<= 20 Ohm/km (power cores + protection core) <= 70 Ohm/km (Profibus) <= 70 Ohm/km (DeviceNet™) <= 80 Ohm/km (Interbus)
Insulation resistance:	>= 500 Mohm x km (at 20° C)
Mutual capacitance:	30 pF/m nominal (Profibus) 40 pF/m nominal (DeviceNet™) 50 pF/m nominal (Interbus)
Testvoltage:	2500 V (core/ core) 1500 V (core/ screen)

Mechanical data

Bending radius single:	<= 70 mm
Bending radius repeated:	<= 110 mm
Tensile strength static:	300 N
Tensile strength dynamic:	140 N
Oil resistance:	Diesel, Biodiesel, ASTM-Öl 1, ASTM-Öl 2, Vitam EHF, Biohydran
Flame resistance:	HD 405.1, IEC 60332-1, VW1/ FT1 acc. C-UL
FCKW free:	yes
Self extinguishable:	yes
Other attributes:	PVC free, free of lacquer wetting disturbing substances, siliconfree, resistant against PVC flexibiliser and cable fat RB1

Thermal attributes

Operating temperature range:	- 40° C to + 80° C
Laying temperature range:	- 30° C to + 80° C

Norms

Profibus standard, DeviceNet™ standard, Interbus standard

UL-Style

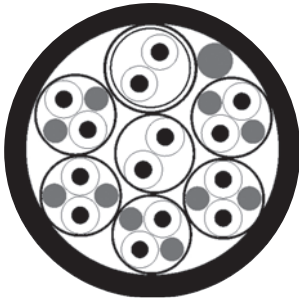
VW1/ FT1 acc. C-UL

Application

Drag chains, torsion applications (according HELU specification)

Part no.

801652, Multibus I, 15 cores



new

Type Cable structure

Profibus:
DeviceNet™:
Power cores 1:
Power cores 2:
Protective earth core:
Stranding:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Multibus II, 15 cores high flexible

1 x 2 x 0,34 mm² (Foam-Skin PO/rd/gn)
4 x 2 x 0,34 mm² (Foam-Skin PE/ye, or, wh, bu-ye, or, wh, bu)
2 x 1,0 mm² (PO/rd, bl)
2 x 1,5 mm² (PO/bu, bn)
1,5 mm² (PO/gnye)
Single cores totally stranded together and filled with plastic elements
PP vlies
PUR, halogenfree
app. 15,0 mm
violet similar to RAL 4001

Electrical data

Characteristic impedance:

Conductor resistance:

Insulation resistance:
Mutual capacitance:

Testvoltage:

150 + -15 Ohm (Profibus)
100 + -15 Ohm (PROFINet)
<= 20 Ohm/km (power cores + protection core)
<= 70 Ohm/km (Profibus)
<= 62 Ohm/km (PROFINet)
>= 500 Mohm x km (at 20° C)
30 pF/m nominal (Profibus)
40 pF/m nominal (PROFINet)
2500 V (core/ core)
1500 V (core/ screen)

Mechanical data

Bending radius single:
Bending radius repeated:
Tensile strength static:
Tensile strength dynamic:
Oil resistance:
Flame resistance:
FCKW free:
Self extinguishable:
Other attributes:

<= 70 mm
<= 110 mm
300 N
140 N
Diesel, Biodiesel, ASTM-Öl 1, ASTM-Öl 2, Vitam EHF, Biohydran
HD 405.1, IEC 60332-1, VW1/ FT1 acc. C-UL
yes
yes
PVC free, free of lacquer wetting disturbing substances, siliconfree,
resistant against PVC flexibiliser and cable fat RB1

Thermal attributes

Operating temperature range:
Laying temperature range:

- 40° C to + 80° C
- 20° C to + 80° C

Norms UL-Style Application Part no.

Profibus standard, PROFINet standard
VW1/ FT1 acc. C-UL
Drag chains, torsion applications (according HELU specification)
804115, Multibus II, 15 cores

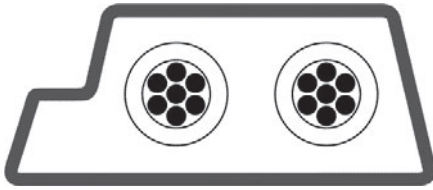
R

BUS Cables

A-BUS

 **HELUKABEL®**

EPDM



Type Cable structure

Inner conductor:
Core insulation:
Core colours:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Outer sheath colour:

Actuator Sensor Interface 2x1.5 mm²

Copper, tinned
Rubber compound
bu, bn
-
-
-
EPDM
Yellow similar to RAL 1023

Actuator Sensor Interface 2x1.5 mm²

Copper, tinned
Rubber compound
bu, bn
-
-
-
EPDM
Black similar to RAL 9005

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Nominal voltage:
Test voltage:

13,7 Ohm/km
1 GOhm x km
27 Ohm/km max.
32 V
1 kV at 15 min.

13,7 Ohm/km
1 GOhm x km
27 Ohm/km max.
48 V
1 kV at 15 min.

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 70 kg/km
30 mm
-40°C
+85°C
0,975 MJ/m
31,00 kg/km

approx. 70 kg/km
30 mm
-40°C
+85°C
0,975 MJ/m
31,00 kg/km

Norms

Applicable standards: ASI standard

ASI standard

Application

AS components are interconnected with this special system cable. With the AS interface, the cable assembly from the control system to the sensor/actuator is not needed. The AS interface is the field bus system that transmits both data and power in one single cable. With fast contacting in penetration technique, the possibility of errors in cabling is largely reduced. The special outer jacket provides protection against bio-oil, grease, and refrigerant lubricants, and the cable is therefore even suitable for applications in wet surroundings, in machinery and plant construction, as well as in the machine tool and automotive industry.

Part no.

80824, A-BUS EPDM

80825, A-BUS EPDM

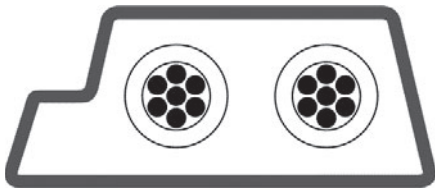
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BUS Cables

A-BUS

HELUKABEL®

PUR, UL/CSA



Type Cable structure

Inner conductor:
Core insulation:
Core colours:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Outer sheath colour:

Actuator Sensor Interface 2x1.5 mm²

Copper, tinned
PO
bu, bn
-
-
-
PUR
Yellow similar to RAL 1023

Actuator Sensor Interface 2x1.5 mm²

Copper, tinned
PO
bu, bn
-
-
-
PUR
Black similar to RAL 9005

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Nominal voltage:
Test voltage:

13,7 Ohm/km
1 GOhm x km
27 Ohm/km max.
32 V
1 kV at 15 min.

13,7 Ohm/km
1 GOhm x km
27 Ohm/km max.
48 V
1 kV at 15 min.

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 64 kg/km
30 mm
-40°C
+80°C
0,965 MJ/m
31,00 kg/km

approx. 64 kg/km
30 mm
-40°C
+80°C
0,965 MJ/m
31,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

ASI standard
AWM Style 20549/10493
CSA FT2

ASI standard
AWM Style 20549/10493
CSA FT2

Application

AS components are interconnected with this special system cable. With the AS interface, the cable assembly from the control system to the sensor/actuator is not needed. The AS interface is the field bus system that transmits both data and power in one single cable. With fast contacting in penetration technique, the possibility of errors in cabling is largely reduced. The special outer jacket provides protection against oil, grease, and refrigerant lubricants, and the cable is therefore even suitable for applications in wet surroundings, in machinery and plant construction, as well as in the machine tool and automotive industry. The PUR variant is suitable for heavy-duty industrial environments. These types are certified for the American market (UL 1581, FT2) through the use of special materials.

Part no.

82434, A-BUS PUR

82822, A-BUS PUR

Dimensions and specifications may be changed without prior notice.

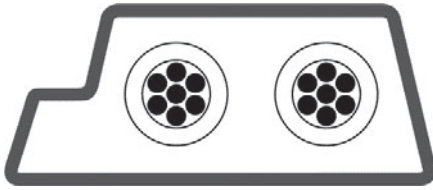
R

BUS Cables

A-BUS

 **HELUKABEL®**

TPE



Type Cable structure

Inner conductor:
Core insulation:
Core colours:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Outer sheath colour:

Actuator Sensor Interface 2x1.5 mm²

Copper, tinned
TPE
bu, bn
-
-
-
TPE
Yellow

Mobile use 2x1.5 mm²

Copper, tinned
TPE
bu, bn
-
-
-
TPE
Black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Nominal voltage:
Test voltage:

13,7 Ohm/km
1 GOhm x km
27 Ohm/km max.
32 V
1,5 kV at 15 min.

13,7 Ohm/km
1 GOhm x km
27 Ohm/km max.
32 V
1,5 kV at 15 min.

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 70 kg/km
24 mm
-40°C
+105°C
1,10 MJ/m
31,00 kg/km

approx. 70 kg/km
24 mm
-40°C
+105°C
1,10 MJ/m
31,00 kg/km

Norms

Applicable standards: ASI standard

ASI standard

Application

AS components are interconnected with this special system cable. With the AS interface, the cable assembly from the control system to the sensor/actuator is not needed. The AS interface is the field bus system that transmits both data and power in one single cable. With fast contacting in penetration technique, the possibility of errors in cabling is largely reduced. The special outer jacket provides protection against many oils, grease, and refrigerant lubricants, and the cable is therefore even suitable for applications in wet surroundings, in machinery and plant construction, as well as in the machine tool and automotive industry.

Part no.

801846, A-BUS TPE

801847, A-BUS TPE

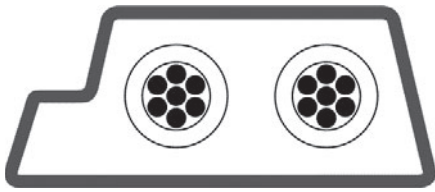
Dimensions and specifications may be changed without prior notice.

BUS Cables

A-BUS

HELUKABEL®

TPE, UL/CSA



Type Cable structure

Inner conductor:
Core insulation:
Core colours:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Outer sheath colour:

Actuator Sensor Interface 2x1.5 mm²

Copper, tinned
TPE
bu, bn
-
-
-
TPE
Yellow

Mobile use 2x1.5 mm²

Copper, tinned
TPE
bu, bn
-
-
-
TPE
Black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Nominal voltage:
Test voltage:

13,7 Ohm/km
1 GOhm x km
27 Ohm/km max.
32 V
1,5 kV at 15 min.

13,7 Ohm/km
1 GOhm x km
27 Ohm/km max.
48 V
1,5 kV at 15 min.

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 70 kg/km
24 mm
-40°C
+105°C
1,10 MJ/m
31,00 kg/km

approx. 70 kg/km
24 mm
-40°C
+105°C
1,10 MJ/m
31,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

ASI standard
21439 nach UL 758
CSA FT2

ASI standard
21439 nach UL 758
CSA FT2

Application

AS components are interconnected with this special system cable. With the AS interface, the cable assembly from the control system to the sensor/actuator is not needed. The AS interface is the field bus system that transmits both data and power in one single cable. With fast contacting in penetration technique, the possibility of errors in cabling is largely reduced. The special outer jacket provides protection against many oils, grease, and refrigerant lubricants, and the cable is therefore even suitable for applications in wet surroundings, in machinery and plant construction, as well as in the machine tool and automotive industry. These variations are certified for the American market (UL 1581, FT2) through the use of special materials.

Part no.

801954, A-BUS UL

801955, A-BUS UL

Dimensions and specifications may be changed without prior notice.

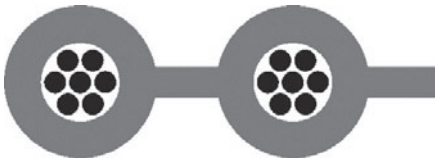
R

BUS Cables

AS-Interface



Electrical Cabinet FLIH



Type Cable structure

Inner conductor:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Outer sheath colour:

Fixed installation, indoor 2x0,86/ 2,5

Copper, tinned
-
-
-
FRNC
Yellow

Electrical data

Characteristic impedance: 105 Ohm \pm 35 Ohm
Conductor resistance, max.: 23 Ohm/km
Insulation resistance, min.: 0,01 GOhm x km
Loop resistance: 46 Ohm/km max.
Nominal voltage: 300 V
Test voltage: 2 kV at 15 min.

Technical data

Weight: approx. 24 kg/km
Min. bending radius for laying: 15 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 0,30 MJ/m
Copper weight: 20,00 kg/km

Norms

Applicable standards: ASI standard
UL Style: UL-Style 2440 (80°C/300V)

Application

AS components are interconnected with this special system cable. With the AS interface, the cable assembly from the control system to the sensor/actuator is not needed. The AS interface is the field bus system that transmits both data and power in one single cable. With fast contacting in penetration technique, the possibility of errors in cabling is largely reduced. This type is especially constructed for cabling inside electrical cabinets.

Part no.

802183, AS-Interface FLIH

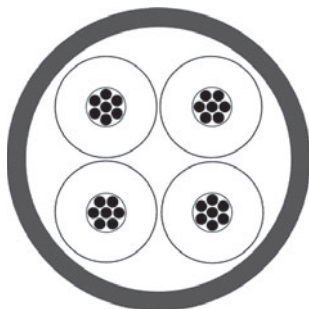
Dimensions and specifications may be changed without prior notice.

BUS Cables

SENSOR-AKTOR

 **HELUKABEL®**

TPM



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Sensor Actuator Cable

4x0.34 mm²

Copper, bare (AWG 22/43)
PP
wh, bu, bk, bn
Star quad
-
PETP fleece
-
TPM
approx. 4,7 mm ± 0,2 mm
Black

Electrical data

Conductor resistance, max.: 60 Ohm/km
Insulation resistance, min.: 1 GOhm x km
Loop resistance: 120 Ohm/km max.
Test voltage: 1,5 kV

Technical data

Weight: approx. 29 kg/km
Min. bending radius for laying: 75 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +60°C
Caloric load, approx. value: 0,505 MJ/m
Copper weight: 15,00 kg/km

Norms

UL Style: AWM Style 21198/ 1049

Application

All Sensors and actuators (such as proximity switches, magnet valves) in a field are installed with these special cables, whereby particular attention is paid to the corrosive environmental conditions. Due to the decentralisation of control and electro-technical function groups, connected directly to the components in the field, significant savings potentials are realized. The main applications of these cables are in machine construction.

Part no.

81712, sensor actuator

Dimensions and specifications may be changed without prior notice.

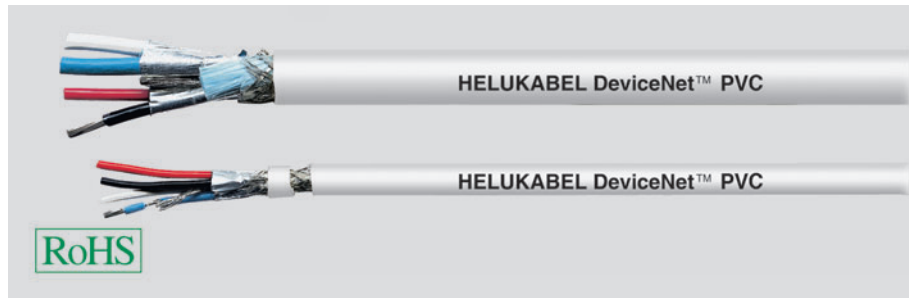
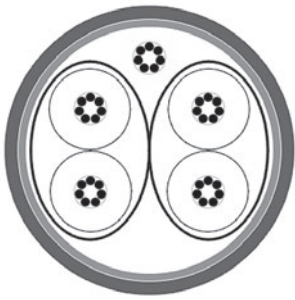
R

BUS Cables

DeviceNet™

HELUKABEL®

PVC



Type Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 1x2xAWG18 + 1x2xAWG15

Copper, tinned (AWG 18/19)
Copper, tinned (AWG 15/19)
Foam-skin-PE
PVC
light bu, wh
rd, bk
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
PVC
approx. 12,2 mm ± 0,3 mm
Grey

Fixed installation, indoor 1x2xAWG24 + 1x2xAWG22

Copper, tinned (AWG 24/19)
Copper, tinned (AWG 22/19)
Foam-skin-PE
PVC
light bu, wh
rd, bk
Double core
-
Polyester foil, aluminium-lined
Copper shifting, tinned
yes
PVC
approx. 6,9 mm ± 0,3 mm
Grey

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

120 Ohm ± 10 %
22,6 Ohm/km
0,2 GOhm x km
45 Ohm/km max.
39,8 nF/km nom.
2 kV
125 kHz < 0,42 dB/100m
500 kHz < 0,81 dB/100m

120 Ohm ± 10 %
90 Ohm/km
0,2 GOhm x km
180 Ohm/km max.
39,8 nF/km nom.
2 kV
125 kHz < 0,95 dB/100m
500 kHz < 1,64 dB/100m

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 192 kg/km
190 mm
-20°C
+80°C
2,92 MJ/m
85,00 kg/km

approx. 67 kg/km
110 mm
-20°C
+80°C
0,91 MJ/m
35,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

ODVA DeviceNet
CMG 75°C PLTC FT4
CEC: CMG FT4

ODVA DeviceNet
CMG 75°C PLTC FT4
CSA FT 4

Application

DeviceNet™ is a bus system developed by Allen Bradley (Rockwell Automation). These cables are used to interconnect various industrial devices, such as SPS controls or limit switches. The special characteristic of this bus system is that a data pair and a power supply pair are integrated in one cable. These cables with PVC sheath are designed for fixed installation.

Part no.

800683, DeviceNet PVC

800684, DeviceNet PVC

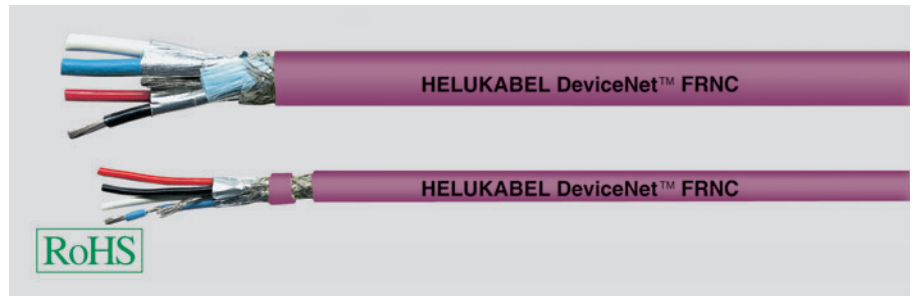
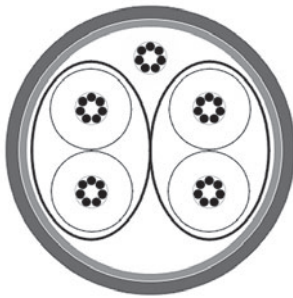
Dimensions and specifications may be changed without prior notice.

BUS Cables

DeviceNet™

HELUKABEL®

FRNC



Type Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor

1x2xAWG18 + 1x2xAWG15

Copper, tinned (AWG 18/19)
Copper, tinned (AWG 15/19)
Cell PE
Cell PE
light bu, wh
rd, bk
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
FRNC
approx. 12,2 mm ± 0,3 mm
Violet similar to RAL 4001

Fixed installation, indoor

1x2xAWG24 + 1x2xAWG22

Copper, tinned (AWG 24/19)
Copper, tinned (AWG 22/19)
Cell PE
Cell PE
light bu, wh
rd, bk
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
FRNC
approx. 6,9 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

120 Ohm ± 10 %
22,6 Ohm/km
0,2 GOhm x km
45 Ohm/km max.
39 nF/km nom.
2 kV
125 kHz < 0.42 dB/100m
500 kHz < 0.81 dB/100m

120 Ohm ± 10 %
90 Ohm/km
0,2 GOhm x km
180 Ohm/km max.
39,8 nF/km nom.
2 kV
125 kHz < 0.95 dB/100m
500 kHz < 1.64 dB/100m

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 195 kg/km
190 mm
-25°C
+80°C
2,73 MJ/m
85,00 kg/km

approx. 70 kg/km
110 mm
-25°C
+80°C
0,82 MJ/m
34,00 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

ODVA DeviceNet
CL2 CMG
CEC: CMG FT4

ODVA DeviceNet
CL2 CMG
CEC: CMG FT4

Application

DeviceNet™ is a bus system developed by Allen Bradley (Rockwell Automation). These cables are used to interconnect various industrial devices, such as SPS controls or limit switches. The special characteristic of this bus system is that a data pair and a power supply pair are integrated in one cable. These cables with FRNC sheath are designed for fixed installation.

Part no.

800681, DeviceNet FRNC

800682, DeviceNet FRNC

Dimensions and specifications may be changed without prior notice.

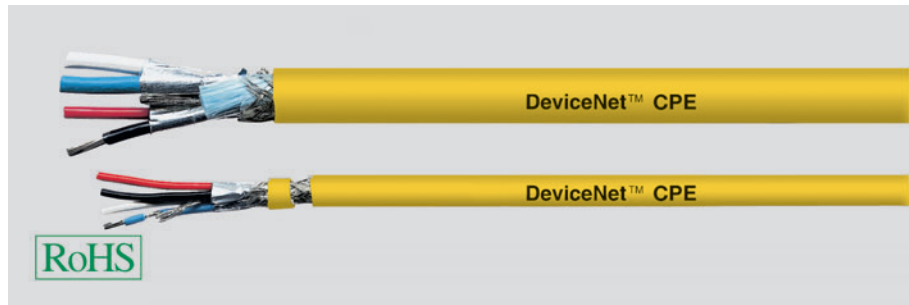
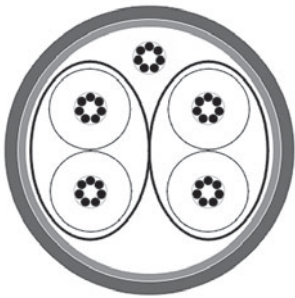
R

BUS Cables

DeviceNet™

HELUKABEL®

CPE



Type Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 1x2xAWG18 + 1x2xAWG15

Copper, tinned (AWG 18/19)
Copper, tinned (AWG 15/19)
PE
PE
light bu, wh
rd, bk
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
CPE
approx. 12,0 mm ± 0,3 mm
Yellow

Fixed installation, indoor 1x2xAWG24 + 1x2xAWG22

Copper, tinned (AWG 24/19)
Copper, tinned (AWG 22/19)
PE
PVC
light bu, wh
rd, bk
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
CPE
approx. 7,0 mm ± 0,3 mm
Yellow

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

120 Ohm ± 10 %
22,6 Ohm/km
0,2 GOhm x km
45 Ohm/km max.
39 nF/km nom.
2 kV
125 kHz < 0,43 dB/100m
500 kHz < 0,82 dB/100m

120 Ohm ± 10 %
90 Ohm/km
0,2 GOhm x km
180 Ohm/km max.
39 nF/km nom.
2 kV
125 kHz < 0,95 dB/100m
500 kHz < 1,64 dB/100m

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 195 kg/km
190 mm
-20°C
+60°C
2,73 MJ/m
71,20 kg/km

approx. 70 kg/km
110 mm
-20°C
+60°C
0,82 MJ/m
28,10 kg/km

Norms

Applicable standards:
UL Style:
CSA standard:

ODVA DeviceNet
CMG PLTC
CEC: CMG FT4

ODVA DeviceNet
CL2 CMG
CEC: CMG FT4

Application

DeviceNet™ is a bus system developed by Allen Bradley (Rockwell Automation). These cables are used to interconnect various industrial devices, such as SPS controls or limit switches. The special characteristic of this bus system is that a data pair and a power supply pair are integrated in one cable. These cables are designed for fixed installation.

Part no.

81907, DeviceNet CPE

81908, DeviceNet CPE

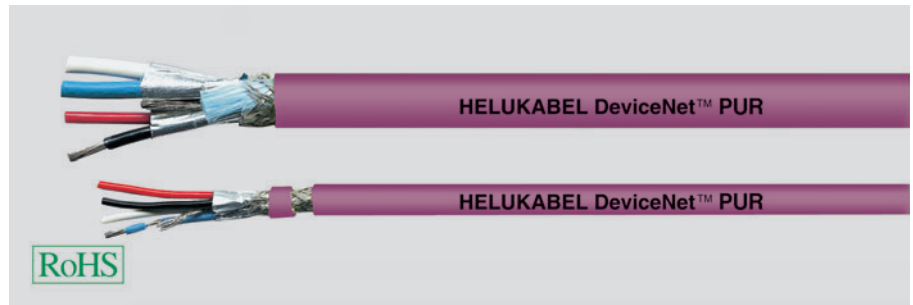
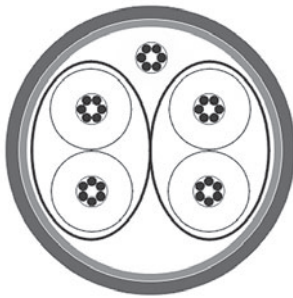
Dimensions and specifications may be changed without prior notice.

BUS Cables

DeviceNet™

HELUKABEL®

PUR, flexible



Type Cable structure

Inner conductor diameter 1:
Inner conductor diameter 2:
Core insulation 1:
Core insulation 2:
Core colours 1:
Core colours 2:
Stranding element 1:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Drag chain applications

1x2xAWG18 + 1x2xAWG15

Copper, tinned (AWG 18/40)
Copper, tinned (AWG 15/84)
Cell PE
Cell PE
light bu, wh
rd, bk
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
PUR
approx. 12,0 mm ± 0,3 mm
Violet similar to RAL 4001

Drag chain applications

1x2xAWG24 + 1x2xAWG22

Copper, tinned (AWG 24/19)
Copper, tinned (AWG 22/19)
Cell PE
Cell PE
light bu, wh
rd, bk
Double core
-
Polyester foil, aluminium-lined
Cu braid, tinned
yes
PUR
approx. 7,0 mm ± 0,3 mm
Violet similar to RAL 4001

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Test voltage:
Attenuation:

120 Ohm ± 10 %
22,6 Ohm/km
0,2 GOhm x km
45 Ohm/km max.
39,8 nF/km nom.
2 kV
125 kHz < 0,41 dB/100m
500 kHz < 0,82 dB/100m

120 Ohm ± 10 %
90 Ohm/km
0,2 GOhm x km
45 Ohm/km max.
39,8 nF/km nom.
2 kV
125 kHz < 0,95 dB/100m
500 kHz < 1,64 dB/100m

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 185 kg/km
61 mm
-40°C
+80°C
2,54 MJ/m
90,00 kg/km

approx. 68 kg/km
35 mm
-40°C
+80°C
0,76 MJ/m
35,00 kg/km

Norms

Applicable standards:
UL Style:

ODVA DeviceNet
CMX 75°C CL2X

ODVA DeviceNet
CMX 75°C CL2X

Application

DeviceNet™ is a bus system developed by Allen Bradley (Rockwell Automation). These cables are used to interconnect various industrial devices, such as SPS controls or limit switches. The special characteristic of this bus system is that a data pair and a power supply pair are integrated in one cable. These cables with PUR sheath are designed for highly flexible applications.

Part no.

81909, DeviceNet PUR

81910, DeviceNet PUR

Dimensions and specifications may be changed without prior notice.

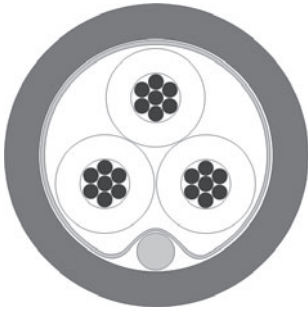
R

BUS Cables

CC-Link BUS

 **HELUKABEL®**

PVC



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor

3x0.5 mm²

Copper, bare (AWG 20/7)
Cell PE
wh, bu, ye
Triple core
Polyester foil over stranded bundle
Polyester foil, aluminium-lined
Cu braid, tinned
yes
PVC
approx. 7,7 mm ± 0,3 mm
Red

Electrical data

Characteristic impedance: 110 Ohm ± 15 Ohm
Conductor resistance, max.: 37,8 Ohm/km
Insulation resistance, min.: 10 GOhm x km
Loop resistance: 75 Ohm/km max.
Mutual capacitance: 60 nF/km nom.
Test voltage: 2 kV
Attenuation:
1 MHz < 16,0 dB/100m
5 MHz < 35,0 dB/100m

Technical data

Weight: approx. 77 kg/km
Min. bending radius for laying: 120 mm
Operating temperature range min.: -40°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 1,10 MJ/m
Copper weight: 40,00 kg/km

Norms

Applicable standards: CC-Link Specification 1.10
UL Style: CM 75°C or PLTC

Application

The CC link (control and communication link) is a field bus system that is used in the area of testing, sensors and actuators. The main target market is Asia, but the USA and Great Britain also rely more and more on CC link. As an option, a version with power supply cores is available. It is used particularly in channels.

Part no.

800497, CC-Link communications cable

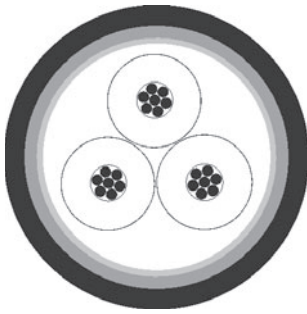
Dimensions and specifications may be changed without prior notice.

BUS Cables

SafetyBUS

HELUKABEL[®]

FRNC + PUR



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 3x0,75 mm² (stranded)

Copper, bare (AWG 18/24)
PP
wh, bn, gn
Triple core
Polyester foil over stranded bundle
-
Cu braid, tinned
FRNC
approx. 7,5 mm ± 0,3 mm
Yellow similar to RAL 1003

Drag chain applications 3x0,75 mm² (stranded)

Copper, bare (AWG 18/24)
PP
wh, bn, gn
Triple core
Polyester foil over stranded bundle
-
Cu braid, tinned
PUR
approx. 7,5 mm ± 0,3 mm
Yellow similar to RAL 1003

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:
Attenuation:

110 Ohm ± 10 Ohm
26 Ohm/km
0,2 GOhm x km
52 Ohm/km max.
45 nF/km nom.
250 V
3 kV
1 MHz < 1,6 dB/Km
5 MHz < 3,4 dB/Km
10 MHz < 5,6 dB/Km
16 MHz < 7,5 dB/Km

110 Ohm ± 10 Ohm
26 Ohm/km
0,2 GOhm x km
52 Ohm/km max.
45 nF/km nom.
250 V
3 kV
1 MHz < 1,6 dB/Km
5 MHz < 3,4 dB/Km
10 MHz < 5,6 dB/Km
16 MHz < 7,5 dB/Km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 68 kg/km
60 mm
-25°C
+80°C
0,72 MJ/m
50,00 kg/km

approx. 65 kg/km
60 mm
-40°C
+80°C
0,76 MJ/m
50,00 kg/km

Norms

Applicable standards:

abuttet at SafetyBUS p technical guidelines
copper wires 1.0

abuttet at SafetyBUS p technical guidelines
copper wires 1.0

Application

SafetyBUS p is an open bus system for the serial transfer of safety-related data. It is based on the CAN (Controller Area Network) protocol. From this technology benefit the users in several areas like the automotive industry or the process automation. The above mentioned types are suitable for fixed installations and as well as for drag chains (PUR).

Part no.

800651, SafetyBus p

800652, SafetyBus p

Dimensions and specifications may be changed without prior notice.

BUS Cables

LON BUS

 **HELUKABEL®**

H112 + Y116



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor

1x2xAWG 22/1

Copper, bare (AWG 22/1)
PE
wh, bu
Double core
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
yes
FRNC
approx. 4,4 mm ± 0,3 mm
White

Mobile use

1x2xAWG 16/19

Copper, bare (AWG 16/19)
PVC
wh, bk
Double core
Polyester foil over stranded bundle
-
-
-
PVC
approx. 7,0 mm ± 0,4 mm
Grey

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:
Nominal voltage:
Test voltage:

100 Ohm ± 10 %
57 Ohm/km
5 GOhm x km
114 Ohm/km max.
45 nF/km nom.
125 V
0,7 kV

85 Ohm ± 15 %
15,8 Ohm/km
0,02 GOhm x km
31 Ohm/km max.
10 nF/km nom.
300 V
2 kV

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 24 kg/km
35 mm
-20°C
+75°C
0,337 MJ/m
11,00 kg/km

approx. 71 kg/km
85 mm
-20°C
+80°C
1,25 MJ/m
30,00 kg/km

Application

The LON bus (Local Operating Network) is a system used in building automation systems. It has the great advantage that it allows usage of different transmission media. It is used in the interior as hard wiring (H122) and as patch cable (Y116) and must be made in accordance with DIN EN 50090-2-2 (VDE 0892 Part 2-2:1997-06).

Part no.

802187, LON H122

802188, LON Y116

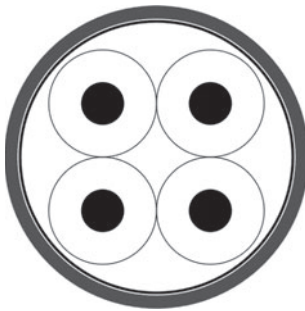
Dimensions and specifications may be changed without prior notice.

BUS Cables

E-BUS

HELUKABEL®

PVC



Type Cable structure

Inner conductor:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

2-pairs 2x2x0.8 mm

Copper, bare
PVC
wh, ye, rd, bk
Star quad
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
yes
PVC
approx. 6,6 mm ± 0,3 mm
Blue Lilac similar to RAL 4005

2-pairs 2x2x0.8 mm

Copper, bare
PVC
wh, ye, rd, bk
Star quad
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
yes
PVC
approx. 6,6 mm ± 0,3 mm
Green similar to RAL 6010

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:

100 Ohm
73,2 Ohm/km
0,1 GOhm x km
146 Ohm/km max.
100 nF/km nom.

100 Ohm
73,2 Ohm/km
0,1 GOhm x km
146 Ohm/km max.
100 nF/km nom.

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 54 kg/km
95 mm
-30°C
+70°C
0,90 MJ/m
25,00 kg/km

approx. 54 kg/km
95 mm
-30°C
+70°C
0,90 MJ/m
25,00 kg/km

Norms

Applicable standards:

EIB standard

EIB standard

Application

The E-bus cable is used for the transmission of bus signals for intelligent systems in buildings. The cables ensure perfect communication in accordance with EIB regulations (European installation bus). They can be layed over, in, or below the plaster, in pipes and pipe ducts, in dry, moist, and wet areas, as well as outside, provided they are protected against direct exposure to the sun. Wiring together with high-power supply cables is possible without limitation. The EIB bus can be used to control lighting, blinds, heating, ventilation, indicator boards, etc.

Part no.

81081, E-BUS

81663, E-BUS

Dimensions and specifications may be changed without prior notice.

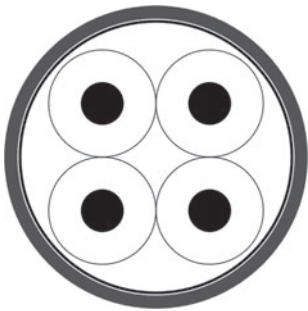
R

BUS Cables

E-BUS

HELUKABEL®

FRNC + PVC



Type

Cable structure

Inner conductor:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

2-pairs 2x2x0.8 mm

Copper, bare
PE
wh, ye, rd, bk
Star quad
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
yes
FRNC
approx. 6,6 mm ± 0,3 mm
Blue Lilac similar to RAL 4005

4-pairs

4x2x0.8 mm

Copper, bare
PVC
wh, ye, rd, gn, bu, bn, wh, wh
Double core
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
yes
PVC
approx. 8,2 mm ± 0,4 mm
Blue Lilac similar to RAL 4005

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:
Loop resistance:
Mutual capacitance:

100 Ohm
73,2 Ohm/km
0,1 GOhm x km
146 Ohm/km max.
100 nF/km nom.

100 Ohm
73,2 Ohm/km
0,1 GOhm x km
146 Ohm/km max.
100 nF/km nom.

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 54 kg/km
95 mm
-30°C
+70°C
0,58 MJ/m
25,00 kg/km

approx. 92 kg/km
120 mm
-30°C
+70°C
1,37 MJ/m
41,00 kg/km

Norms

Applicable standards: EIB standard

EIB standard

Application

The E-bus cable is used for the transmission of bus signals for intelligent systems in buildings. The cables ensure perfect communication in accordance with EIB regulations (European installation bus). They can be laid over, in, or below the plaster, in pipes and pipe ducts, in dry, moist, and wet areas, as well as outside, provided they are protected against direct exposure to the sun. Wiring together with high-power supply cables is possible without limitation. The EIB bus can be used to control lighting, blinds, heating, ventilation, indicator boards, etc.

Part no.

80826, E-BUS

81077, E-BUS

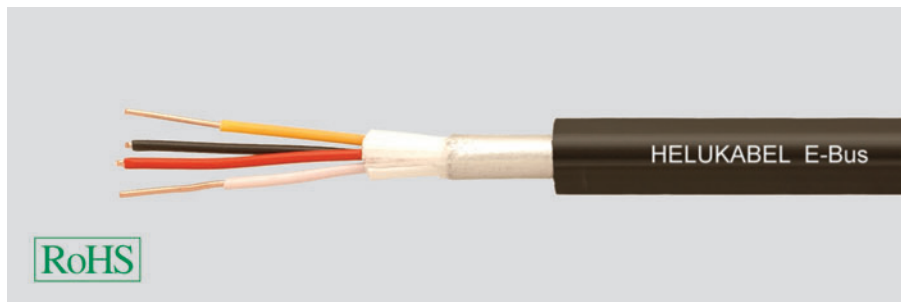
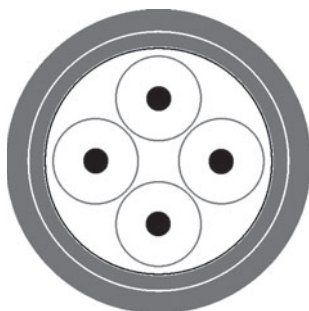
Dimensions and specifications may be changed without prior notice.

BUS Cables

E-BUS DIRECT BURIAL

HELUKABEL®

PE, ERD



new

Type

Cable structure

Inner conductor:
Core insulation:
Core colours:
Stranding element:
Shielding 1:
Shielding 2:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Underground laying

2x2x0.8 mm

Copper, bare
PE
wh, ye, rd, bk
Star quad
Polyester foil over stranded bundle
-
Polyester foil, aluminium-lined
PE
approx. 8,8 mm ± 0,3 mm
Black similar to RAL 9005

Electrical data

Characteristic impedance: 100 Ohm
Conductor resistance, max.: 73,2 Ohm/km
Insulation resistance, min.: 5 GOhm x km
Loop resistance: 146 Ohm/km max.
Mutual capacitance: 55 nF/km nom.
Test voltage: 0,8 kV

Technical data

Weight: approx. 75 kg/km
Min. bending radius for laying: 130 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +70°C
Caloric load, approx. value: 2,00 MJ/m
Copper weight: 25,00 kg/km

Norms

Applicable standards: EIB standard

Application

The E-bus cable is used for the transmission of bus signals for intelligent systems in buildings. The cables ensure perfect communication in accordance with EIB regulations (European installation bus). They can be layed over, in, or below the plaster, in pipes and pipe ducts, in dry, moist, and wet areas, as well as outside, provided they are protected against direct exposure to the sun. Wiring together with high-power supply cables is possible without limitation. The EIB bus can be used to control lighting, blinds, heating, ventilation, indicator boards, etc.

Part no.

802800, E-BUS BURIAL

Dimensions and specifications may be changed without prior notice.

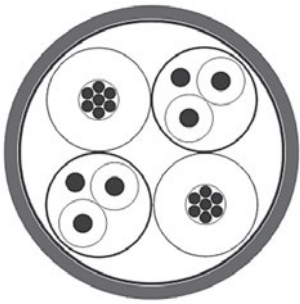
R

BUS Cables

KH-BUS

 **HELUKABEL®**

PVC + FRNC



Type Cable structure

Inner conductor, power core:
Inner conductor, data core:
Core insulation, power core:
Core insulation, data core:
Core colours, power core:
Core colours, data core:
Stranding element, data core:
Shielding, data pair:
Drain wire:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Hospital-Bus 2x1.5mm² (stranded) + 2x2x0.60 mm (solid)

Copper, bare
Copper, tinned
PVC
PE
rd, bu
gn/ye, gy/pk
Double core
PP foil + aluminium-lined foil + PP foil
yes
PVC
approx. 8,0 mm ± 0,3 mm
Green similar to RAL 6001

Hospital-Bus 2x1.5mm² (stranded) + 2x2x0.60 mm (solid)

Copper, bare
Copper, tinned
PVC
PE
rd, bu
gn/ye, gy/pk
Double core
PP foil + aluminium-lined foil + PP foil
yes
FRNC
approx. 8,0 mm ± 0,3 mm
Green similar to RAL 6001

Electrical data

Insulation resistance, min.:
Mutual capacitance:
Test voltage:

0,02 GOhm x km
70 nF/km nom.
2 kV

0,02 GOhm x km
70 nF/km nom.
2 kV

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Caloric load, approx. value:
Copper weight:

approx. 90 kg/km
120 mm
-30°C
+80°C
1,01 MJ/m
53,00 kg/km

approx. 93 kg/km
120 mm
-30°C
+80°C
0,86 MJ/m
53,00 kg/km

Application

For computer-based patient calling systems, easy and quick installation is an important factor. Therefore a 6-core bus cable is used to connect the components of the calling system. This cable is used for the transmission of power, data, and voice.

Part no.

81085, KH-BUS

81447, KH-BUS

Dimensions and specifications may be changed without prior notice.



Media Technology



Photo: HELUKABEL®

Media Technology

The product range for media equipment encompasses cables for both indoor and outdoor use. It guarantees high transmission quality for fixed installations or for mobile use. The diverse range of products in detail comprises HELUSOUND®

audio cables for analogue and digital transmission, HELULIGHT® for the DMX light controller, video cables, Triax camera cables and special cables as per your requirements.

Contents

Description	Page
Audio, Audio cables with braided shielding	S 3
Audio, Audio cables, multicore, with braided shielding	S 4
Audio, Audio cables with foil shielding, single pair	S 5
Audio, Audio cables, multipaired, pairs with foil shielding	S 6
Audio, Audio cables, multipaired, spirally screened pairs and overall braided shielding	S 7
Audio, AES/EBU digital audio cables, single pair, with spiral screen	S 8
Audio, AES/EBU digital audio cables, single pair, foil/braided shielding	S 9
Audio, AES/EBU digital audio cables, multipaired, pairs with foil shielding and overall foil shielding	S 10
Audio, AES/EBU digital audio cables, multipaired, spirally screened pairs and overall foil shielding	S 11
Audio & Light, AES/EBU & DMX patch cable	S 12
Audio & Light, AES/EBU & DMX cables	S 13
Audio & Light, AES/EBU TP DMX 512	S 14
Audio & Light, DMX cables, multicore with spiral screen	S 15
Light+Power, DMX-POWER	S 16
HELUSOUND® DMX+POWER	S 17
Audio, Instrument cables with spiral screen	S 18
Audio, Microphone cables with spiral screen, paired	S 19
Audio, Microphone cables with braided shielding	S 20
Audio, Microphone cables with braided shielding, star quads	S 21
Loudspeaker Cables	S 22
HELUSOUND® 400 PVC, Speaker cables, round	S 23
Audio, Speaker cable, round	S 24
HELUSOUND® 500 PUR	S 25
HELUSOUND® 600 FRNC, halogen-free	S 26
Audio, Speaker cables, coaxial	S 27
Loadcable 300/500V + 600/1000V	S 28
Video Cables	S 29
Video, Video cables, multicore	S 30
Video, Camera cables	S 31

Audio

Audio cables with braided shielding

HELUSOUND[®]



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Drain wire:
Sheath material:
Cable external diameter:
Sheath colour:

HELUSOUND audio cable analog

2x0,25 + 0,25

Copper, bare
PVC
rd, wh
2 cores with 1 filler and 1 earth conductor stranded
yes
PVC
approx. 3,4 mm
black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:

75 Ohm/km
5 MOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 20 kg/km
35 mm
-25°C
+70°C
13,5 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.	Cable structure	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400000	2x0,25 + 0,25	< 75,0	3,4	13,5	20,0
400001	2x0,33+0,33	< 60,0	4,0	16,3	26,0
400002	2x0,5+0,33	< 36,8	5,6	26,1	49,0

Dimensions and specifications may be changed without prior notice.

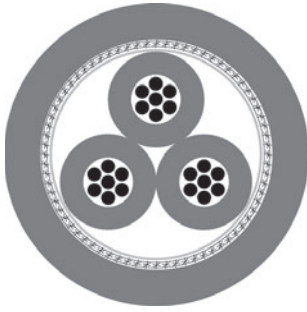
Application

The HELUSOUND[®] audio cable is a 2-core, shielded multipurpose cable with earth conductor. It is particularly suitable for use in microphone, radio, studio and transmission systems.

Audio

Audio cables, multicore, with braided shielding

HELUSOUND[®]



Type

Cable structure

Conductor material:
Core insulation:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

HELUSOUND audio cable analog

2x0,26

Copper, bare
PE
pairs stranded
PVC
approx. 5,2 mm
black

Electrical data

Conductor resistance, max.: 73,9 Ohm/km
Insulation resistance, min.: 1 GOhm x km

Technical data

Weight: approx. 37 kg/km
Min. bending radius for laying: 52 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Copper weight: 16,8 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.	Cable structure	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400003	2x0,26	< 73,9	5,2	16,8	37,0
400004	2x0,33	< 61,6	5,3	18,2	38,0
400005	4x0,33	< 61,6	5,9	27,2	52,0
400006	2x0,50	< 39,0	5,7	22,0	46,0
400007	2x0,75	< 26,0	7,2	30,0	70,0
400008	3x0,75	< 26,0	7,7	50,0	90,0
400009	4x0,75	< 26,0	8,3	60,0	102,0
400010	5x0,75	< 26,0	8,9	72,0	120,0

Dimensions and specifications may be changed without prior notice.

Application

The 2-5-core shielded HELUSOUND[®] audio cable with a common PE core insulation, braided shielding and PVC outer sheath is especially well suited for use in microphone, loudspeaker, radio and transmission systems.

S

Audio

Audio cables with foil shielding, single pair

HELUSOUND[®]



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Analog audio cables

2x0,22

Copper, tinned
PE
rd, bu
pairs stranded
PVC
approx. 3,4 mm
black

Electrical data

Conductor resistance, max.: 86 Ohm/km
Insulation resistance, min.: 1 GOhm x km

Technical data

Weight: approx. 17 kg/km
Min. bending radius for laying: 35 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Copper weight: 6,6 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.

400011

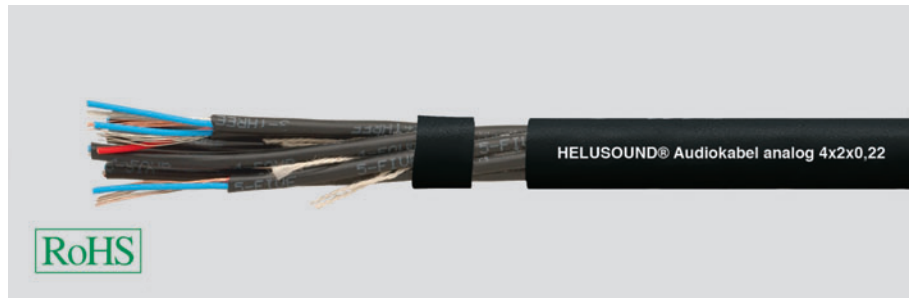
Dimensions and specifications may be changed without prior notice.

Application

The 2-core HELUSOUND[®] audio cable is a foil shielded cable with earth conductor. This symmetrical cable is suitable for use in racks and for studio cabling.

Audio

Audio cables, multipaired, pairs with foil shielding



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Drain wire:
Sheath material:
Cable external diameter:
Sheath colour:

Analog audio cables 2x2x0,22

Copper, bare
PE
rd, bu
pairs stranded
yes
PVC
approx. 7,6 mm
black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:

86 Ohm/km
1 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 72 kg/km
76 mm
-25°C
+70°C
13,2 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.	Cable structure	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400012	2x2x0,22	7,6	13,2	72,0
400013	4x2x0,22	9,2	26,0	100,0
400014	8x2x0,22	12,2	53,0	179,0
400015	12x2x0,22	14,2	79,0	248,0
400016	16x2x0,22	16,4	106,0	337,0
400017	20x2x0,22	18,4	132,0	421,0
400018	24x2x0,22	20,4	158,0	493,0
400019	32x2x0,22	22,4	211,0	620,0
400020	40x2x0,22	24,6	264,0	759,0

Dimensions and specifications may be changed without prior notice.

Application

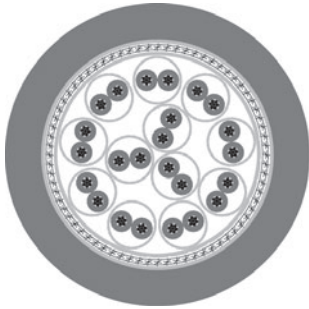
The HELUSOUND® audio cable is an insulated, multi-core audio cable which is screened symmetrically and in pairs. The cable is particularly suitable for permanent laying in public buildings, such as, e.g. theatres or music stages and for permanent studio installation.



Audio

Audio cables, multipaired, spirally screened pairs and overall braided shielding

HELUSOUND®



Type Cable structure

Conductor material:
Core insulation:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Analog audio cables 12x2x0,14

Copper, tinned
TPE
pairs stranded
PUR
approx. 12,7 mm
black

Analog audio cables 16x2x0,14

Copper, tinned
TPE
pairs stranded
PUR
approx. 14,1 mm
black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:

150 Ohm/km
100 MOhm x km

150 Ohm/km
100 MOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 190 kg/km
127 mm
-25°C
+70°C
118,0 kg/km

approx. 247 kg/km
142 mm
-25°C
+70°C
165,0 kg/km

Norms

Halogen-free acc. to 60754-2

Halogen-free acc. to 60754-2

Part no.

400042

400043

Dimensions and specifications may be changed without prior notice.

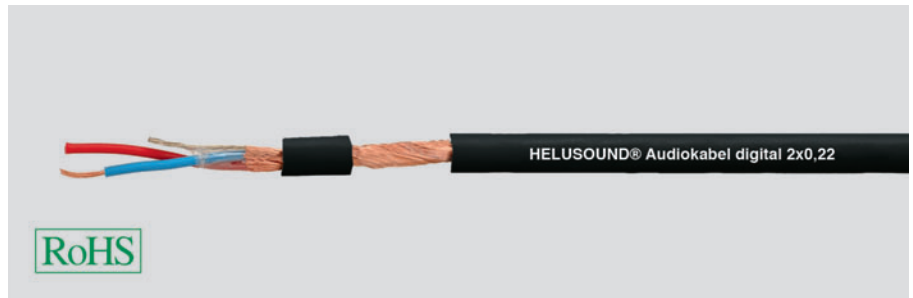
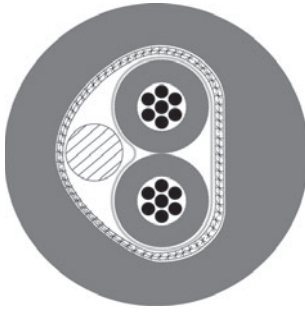
Application

The multipaired HELUSOUND® special sound audio cable has individually shielded pairs and is protected by an additional braided shielding and ribbed PUR sheath. This cable is particularly suitable for use in mobile radio and transmission systems.

Audio

AES/EBU digital audio cables, single pair, with spiral screen

HELUSOUND[®]



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Drain wire:
Sheath material:
Cable external diameter:
Sheath colour:

Digital audio cables

2x0,22

Copper, bare
PE
rd, bu
2 cores with 1 earth conductor
yes
PVC
approx. 5,0 mm
black

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:

110 Ohm
86 Ohm/km
1 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 35 kg/km
50 mm
-25°C
+70°C
14,7 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.

400021

Dimensions and specifications may be changed without prior notice.

Application

The HELUSOUND[®] AES/EBU audio cable is a 2-core, symmetrical and shielded digital sound cable with flexible spiral screen and PVC outer sheath. The cable is suitable for the transmission of digital audio signals and can therefore, for example, be used for connecting audio amplifiers, digital mixers, DAT recorders etc.

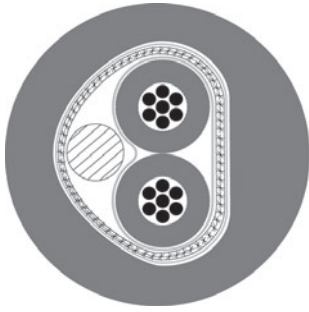
The cable is also available with PUR outer sheath.

S

Audio

AES/EBU digital audio cables, single pair, foil/braided shielding

HELUSOUND[®]



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Digital audio cables

2x0,22

Copper, tinned
Cell PE
rd, bu
2 cores with 1 earth conductor
PVC
approx. 6,0 mm
black

Electrical data

Characteristic impedance: 110 Ohm
Conductor resistance, max.: 86 Ohm/km
Insulation resistance, min.: 1 GOhm x km

Technical data

Weight: approx. 43 kg/km
Min. bending radius for laying: 60 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Copper weight: 15,7 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.	Cable structure	Screen	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400022	2x0,22	Foil + braid	< 86,0	6,0	15,7	43,0
400023	2x0,22	Foil + braid	< 86,0	4,5	15,7	25,0
400024	2x0,22	Foil	< 86,0	4,2	7,3	18,0

Dimensions and specifications may be changed without prior notice.

Application

The HELUSOUND[®] AES/EBU audio cable is a 2-core, symmetrical and shielded digital sound cable. The cable is available in three different versions. The standard version is characterised by double shielding; the patch variant has reduced outside diameter and the foil shielded variant is suitable for the permanent wiring of digital devices. All three versions are suitable for the transmission of digital audio signals.

Audio

AES/EBU digital audio cables, multipaired, pairs with foil shielding and overall foil shielding

HELUSOUND®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Drain wire:
Sheath material:
Cable external diameter:
Sheath colour:

Digital audio cables

2x2x0,22

Copper, tinned
Cell PE
rd, bu
2 cores with 1 earth conductor
yes
PVC
approx. 9,9 mm
black

Electrical data

Characteristic impedance: 110 Ohm
Conductor resistance, max.: 86 Ohm/km
Insulation resistance, min.: 1 GOhm x km

Technical data

Weight: approx. 85 kg/km
Min. bending radius for laying: 100 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Copper weight: 15,4 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.	Cable structure	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400025	2x2x0,22	9,9	15,4	85,0
400026	4x2x0,22	11,8	29,0	119,0
400027	6x2x0,22	14,9	42,0	195,0
400028	8x2x0,22	16,1	55,0	232,0
400029	12x2x0,22	19,1	81,0	330,0

Dimensions and specifications may be changed without prior notice.

Application

The multipaired, digital HELUSOUND® AES/EBU audio cable is characterised by its shielding in pairs, its element sheaths and by the additional overall sheath. This cable is suitable for the transmission of digital audio signals.

S

Audio

AES/EBU digital audio cables, multipaired, spirally screened pairs and overall foil shielding

HELUSOUND®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Digital audio cables

12x2x0,22

Copper, bare
Cell PE
rd, bu
2 cores with 1 earth conductor
PVC
approx. 17,0 mm
black

Electrical data

Characteristic impedance: 110 Ohm
Conductor resistance, max.: 86 Ohm/km
Insulation resistance, min.: 1 GOhm x km

Technical data

Weight: approx. 320 kg/km
Min. bending radius for laying: 170 mm
Operating temperature range min.: -20°C
Operating temperature range max.: +70°C
Copper weight: 171,0 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.

400030

Dimensions and specifications may be changed without prior notice.

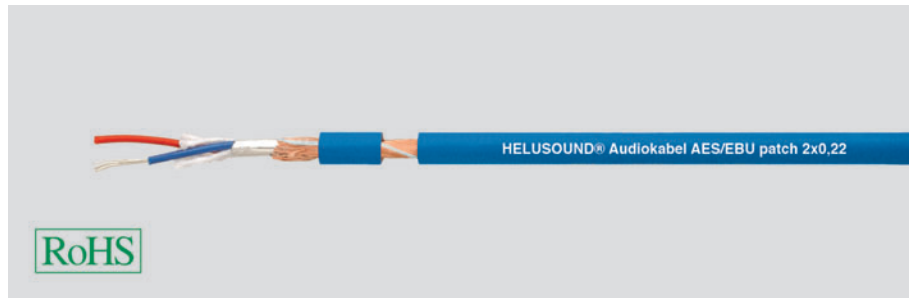
Application

The multipaired, digital HELUSOUND® AES/EBU audio cable is characterised by its shielding in pairs, its element sheaths and by the additional overall sheath. This cable is suitable for the transmission of digital audio signals.

Audio & Light

AES/EBU & DMX patch cable

HELULIGHT®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Drain wire:
Sheath material:
Cable external diameter:
Sheath colour:

DMX cables

2x0,22

Copper, tinned
Cell PE
rd, bu
2 cores with textile filler stranded
yes
PVC
approx. 5,0 mm
blue

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:

110 Ohm
80 Ohm/km
5 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 33 kg/km
50 mm
-30°C
+70°C
14,0 kg/km

Part no.

400031

Dimensions and specifications may be changed without prior notice.

Application

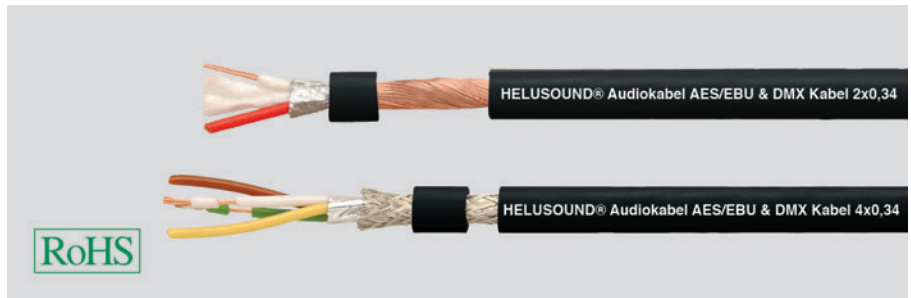
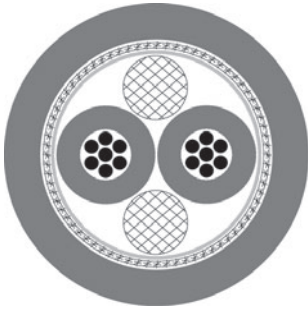
The 2-core HELUSOUND® AES/EBU & DMX patch cable is foil shielded and optimally protected against external interference by its copper spiral screen. This cable is suitable for indoor use for permanent laying for the control of lighting systems or for patching in studio technology.

S

Audio & Light

AES/EBU & DMX cables

HELULIGHT®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

DMX cables

2x0,34

Copper, bare
Cell PE
rd, wh
2 cores with textile filler stranded
PVC
approx. 6,4 mm
black

DMX cables

4x0,34

Copper, bare
PE
wh,gn,bn,ye
Star quad
PVC
approx. 7,0 mm
black

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:

110 Ohm
53 Ohm/km
10 GOhm x km

110 Ohm
53 Ohm/km
5 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 50 kg/km
64 mm
-30°C
+70°C
18,0 kg/km

approx. 65 kg/km
70 mm
-30°C
+70°C
29,0 kg/km

Part no.

400032

400033

Dimensions and specifications may be changed without prior notice.

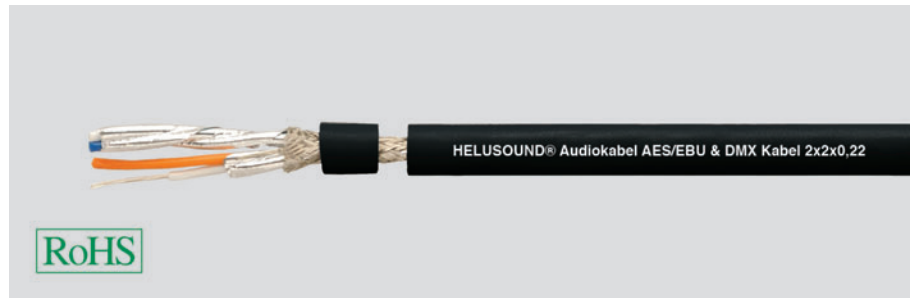
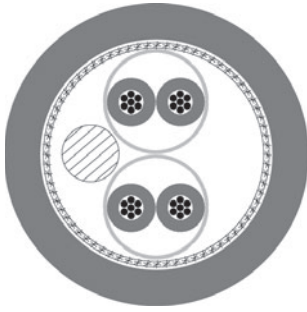
Application

The 2-core HELUSOUND® AES/EBU & DMX patch cable is protected against external interference by its copper spiral screen. This cable is suitable for permanent laying for the control of lighting systems or for connecting digital audio amplifiers. It can be installed indoors and outdoors.

Audio & Light

AES/EBU TP DMX 512

HELULIGHT®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Drain wire:
Sheath material:
Cable external diameter:
Sheath colour:

DMX cables

2x2x0,22

Copper, tinned
Cell PE
or/wh, bu/wh
pairs stranded
yes
PVC
approx. 8,0 mm
black

Electrical data

Characteristic impedance:
Conductor resistance, max.:
Insulation resistance, min.:

110 Ohm
85 Ohm/km
100 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 76 kg/km
80 mm
-25°C
+70°C
38,0 kg/km

Part no.

400034

Dimensions and specifications may be changed without prior notice.

Application

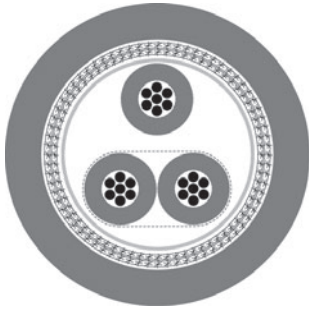
The 4-core HELUSOUND® AES/EBU & DMX cable is protected against external interference by its AL/PT foil, its copper spiral screen and its PVC outer sheath. This cable is suitable for controlling all types of digital equipment.

S

Audio & Light

DMX cables, multicore with spiral screen

HELULIGHT®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

DMX cables

2x0,22+0,22

Copper, tinned
PE spumed
wh,bu+rd
pair and core stranded together
PVC
approx. 6,4 mm
black

Electrical data

Characteristic impedance: 110 Ohm
Conductor resistance, max.: 86 Ohm/km
Insulation resistance, min.: 1 MOhm x km

Technical data

Weight: approx. 79 kg/km
Min. bending radius for laying: 64 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Copper weight: 66,0 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.

400035

Dimensions and specifications may be changed without prior notice.

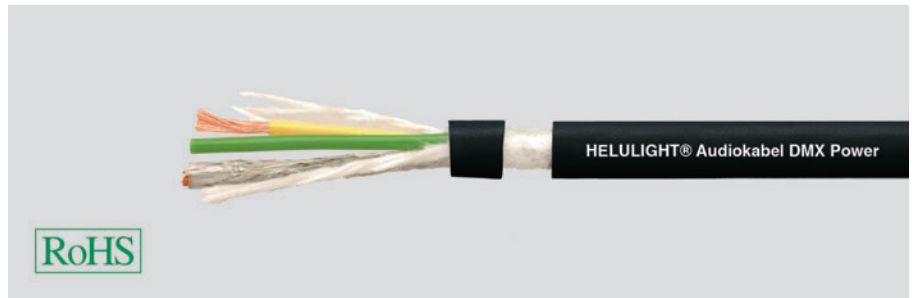
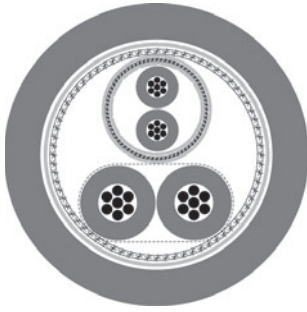
Application

The 3-core, shielded HELUSOUND® digital sound cable consists of a symmetrical pair and an additional third core. A double spiral screen and the PVC outer sheath protect the cable against electrical interference. This AES/EBU and DMX compliant (110 Ohm) special cable is suitable for the transmission of digital audio signals and can therefore, for example, be used for connecting digital mixers, audio amplifiers, DAT recorders, light and scanner systems etc.

Light+Power

DMX-POWER

HELULIGHT®



Type

Cable structure

Conductor material:
Core insulation:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

DMX cables

(1x2x0,24)+2x1,0

Copper, bare
Foam-skin-PE
Double core
PVC
approx. 7,4 mm
black

Electrical data

Characteristic impedance: 110 Ohm

Technical data

Weight: approx. 74 kg/km
Copper weight: 35,0 kg/km

Part no.

400081

Dimensions and specifications may be changed without prior notice.

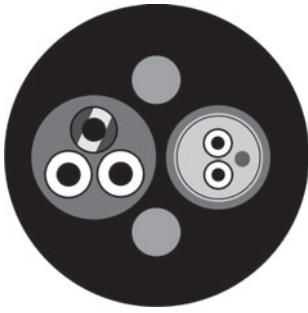
Application

The hybrid DMX Power cable is used in the professional DMX light controller. It transmits power for the light and control signals for the movement. The cable is compact, flexible and easy to process.

S

HELUSOUND® DMX+POWER

new



Type

Cable structure

Conductor material:
Core insulation:
Core insulation 2:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

DMX cables

Copper, bare
Foam-Skin-PE (DMX), PVC (Power)
PVC
red, white (DMX); brown, blue, green/yellow (Power)
DMX-Element together with Power-Element and filler stranded
PVC flexible at low temperatures
approx. 13,2 mm
black

Electrical data

Characteristic impedance: 110 Ohm
Conductor resistance, max.: 53 Ohm/km
Insulation resistance, min.: 10 GOhm x km

Technical data

Weight: approx. 50 kg/km
Min. bending radius for laying: 64 mm
Operating temperature range min.: -30°C
Operating temperature range max.: +70°C
Copper weight: 60,5 kg/km

Part no.

400151

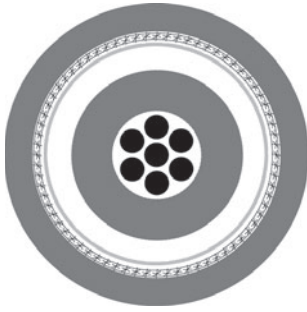
Dimensions and specifications may be changed without prior notice.

Application

The HELUSOUND® DMX+POWER hybrid cable combines a shielded light control wire and the power supply wire. The DMX-cable, which is shielded by a tin-coated copper braiding is perfectly suited for the control of light systems and mixing boards (110 Ohm characteristic intrinsic impedance). It highlights a soft PVC insulation and it is qualified for the use at indoor and outdoor installations. The DMX cable can also be used for the transmission of audio signals such as a microphone wire or as a power supply wire for active loudspeaker systems.

Audio

Instrument cables with spiral screen



Type

Cable structure

Conductor material:
Core insulation:
Drain wire:
Sheath material:
Cable external diameter:
Sheath colour:

Instrument cables

1x0,22

Copper, bare
Foam-skin-PE
-
PVC
approx. 5,9 mm
black

Instrument cables

1x0,38

Copper, bare
Cell PE
yes
PVC
approx. 7,0 mm
black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:

86 Ohm/km
1 GOhm x km

55 Ohm/km
1 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 44 kg/km
60 mm
-25°C
+70°C
7,9 kg/km

approx. 55 kg/km
70 mm
-25°C
+70°C
29,0 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Halogen-free acc. to EN 50267-2-3

Part no.

400036

400037

Dimensions and specifications may be changed without prior notice.

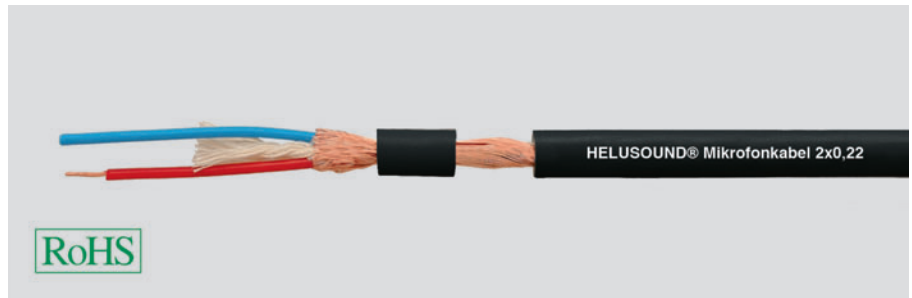
Application

The HELUSOUND® instrument cable with spiral screen is a non-symmetrical, double shielded cable. This cable is specially suitable for connecting high ohmic components such as synthesizers, keyboards or guitars in professional stage and studio operation. The high-quality 1x0.38 special cable has an increased cross-section, a semi-conductor layer and a double spiral screen, which makes it suitable for the most stringent requirements of professional stages and studios.

Audio

Microphone cables with spiral screen, paired

HELUSOUND[®]



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Microphone cable 2x0,22

Copper, bare
PE
rd, bu
pairs stranded
PVC
approx. 6,0 mm
black

Microphone cable 2x0,15

Copper, bare
PVC
rd, wh
pairs stranded
PVC
approx. 4,2 mm
black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:

86 Ohm/km
1 GOhm x km

120 Ohm/km
1 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 55 kg/km
60 mm
-25°C
+70°C
12,1 kg/km

approx. 27 kg/km
42 mm
-25°C
+70°C
14,0 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Halogen-free acc. to EN 50267-2-3

Part no.

400038

400039

Dimensions and specifications may be changed without prior notice.

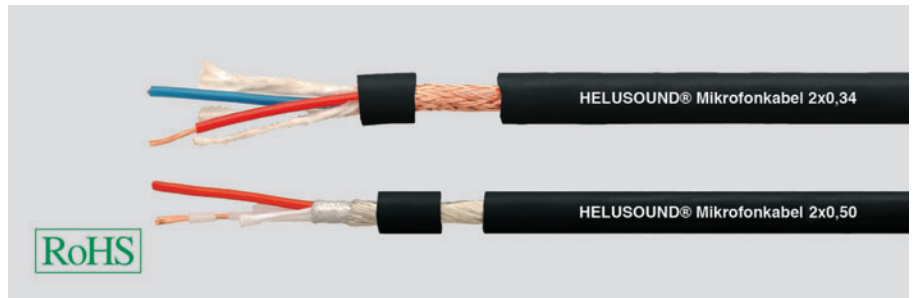
Application

The 2-core HELUSOUND[®] microphone cable with spiral screen is suitable for use in professional stage and studio operation. The microphone cable 2x0.15 has a double spiral screen made of bare copper wires.

Audio

Microphone cables with braided shielding

HELUSOUND®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Microphone cable

2x0,34

Copper, bare
PE
rd, bu
2 cores with textile filler stranded
PVC
approx. 6,5 mm
black

Microphone cable

2x0,50

Copper, bare
PE
rd, wh
2 cores with textile filler stranded
PVC
approx. 6,7 mm
black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:

53 Ohm/km
1 GOhm x km

37 Ohm/km
1 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 30 kg/km
65 mm
-30°C
+70°C
15,2 kg/km

approx. 59 kg/km
67 mm
-30°C
+70°C
37,0 kg/km

Part no.

400040

400080

Dimensions and specifications may be changed without prior notice.

Application

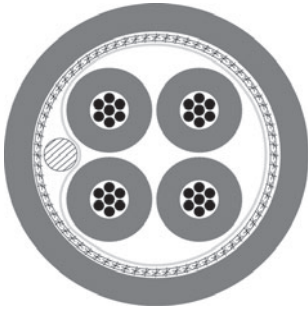
The 2-core HELUSOUND® microphone cable with copper braided shield is suitable for use in professional stage and studio operation and for permanent installation. The cable is distinguished by its very flexible PVC sheath.

S

Audio

Microphone cables with braided shielding, star quads

HELUSOUND[®]



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Drain wire:
Inner sheath material:
Sheath material:
Cable external diameter:
Sheath colour:

Microphone cable 4x0,22

Copper, bare
PE
rd,bu,gn,bk
Star quad
AWG 26/7, Kupfer verzinkt
PE
PVC
approx. 6,1 mm
black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:

86 Ohm/km
1 GOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 50 kg/km
62 mm
-25°C
+70°C
25,0 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.

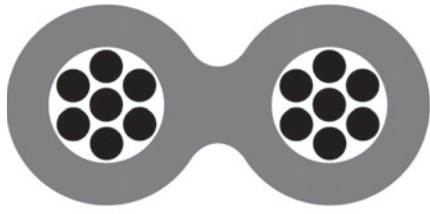
400041

Dimensions and specifications may be changed without prior notice.

Application

The 4-core HELUSOUND[®] microphone cable is stranded in star quads and suitable for special application due to its earth conductor and braided shielding. Among other things, it is used as a stereo cable in the area of professional studio and microphone technology.

Loudspeaker Cables



Cross section (mm ²)	2 x 0,5	2 x 0,5	2 x 0,75	2 x 0,75	2 x 1,5	2 x 1,5	2 x 2,5	2 x 2,5	2 x 4	2 x 4
Part no.	40180	40023	40181	40024	40182	40025	40183	40026	40184	40027

Cable structure

Conductor material: Copper litz wire, bare

Identification: Grooves

Cond. make-up	16 x 0,20	16 x 0,20	24 x 0,20	24 x 0,20	28 x 0,25	28 x 0,25	48 x 0,25	48 x 0,25	55 x 0,30	55 x 0,30
Insulation h x w mm	2,1 x 4,7	2,1 x 4,7	2,2 x 4,9	2,2 x 4,9	2,6 x 5,5	2,6 x 5,5	3,3 x 7,0	3,3 x 7,0	4,3 x 8,2	4,3 x 8,2
Jacket material	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Jacket colour	transparent	black/red	transparent	black/red	transparent	black/red	transparent	black/red	transparent	black/red
Weight approx. kg / km	15	15	20	20	37	37	63	63	80	80

Electrical characteristics

Loop resistance

max. (Ohm/km)	70	70	47	47	23	23	14	14	9	9
Capacitance pF/m	47	47	60	60	67	67	67	67	64	64
Inductance µH/m at										
1 kHz	0,67	0,67	0,61	0,61	0,54	0,54	0,54	0,54	0,58	0,58
10 kHz	0,79	0,79	0,73	0,73	0,59	0,59	0,62	0,62	0,65	0,65
100 kHz	0,85	0,85	0,73	0,73	0,59	0,59	0,62	0,62	0,65	0,65
1000 kHz	0,8	0,8	0,67	0,67	0,52	0,52	0,56	0,56	0,59	0,59
Copper weight kg/km	9,6	9,6	14,4	14,4	28,8	28,8	48,0	48,0	76,8	76,8

Cross section (mm ²)	2 x 1,5	2 x 2,5	2 x 4	2 x 6	2 x 10
Part no.	40185	40186	40187	40188	40189

Cable structure

Conductor material: Bare copper litz wire, highly flexible

Identification: Stripes

Cond. make-up	189 x 0,10	322 x 0,10	511 x 0,10	777 x 0,10	1273 x 0,10
Insulation h x w mm	3,1 x 6,5	3,6 x 7,5	5 x 10,2	6,1 x 12,5	7,0 x 15,0
Jacket material	PVC	PVC	PVC	PVC	PVC
Jacket colour	transparent	transparent	transparent	transparent	transparent
Weight approx. kg / km	41	60	79	136	254

Electrical characteristics

Loop resistance

max. (Ohm/km)	23	14	9	6	3
Capacitance pF/m	67	53	50	54	59
Inductance µH/m at					
1 kHz	0,54	0,48	0,49	0,46	0,45
10 kHz	0,61	0,55	0,56	0,54	0,53
100 kHz	0,62	0,59	0,6	0,56	0,56
1000 kHz	0,55	0,54	0,56	0,53	0,52
Copper weight kg/km	28,8	48,0	76,8	115,2	192,0

Dimensions and specifications may be changed without prior notice. (RM01)

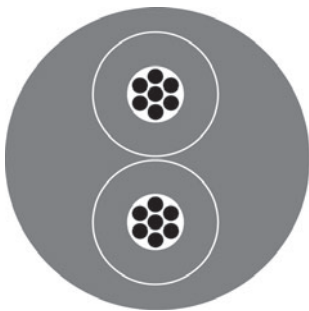
Note

- The materials used in manufacture are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers.

HELUSOUND® 400 PVC

Speaker cables, round

HELUSOUND®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Sheath material:
Cable external diameter:
Sheath colour:

Speaker cable HELUSOUND® 400 2x1,5

Copper, bare
PVC
rd, bk
PVC
approx. 6,6 mm
Black

Electrical data

Conductor resistance, max.: 12,7 Ohm/km

Technical data

Weight: approx. 73,4 kg/km
Min. bending radius for laying: 33 mm
Operating temperature range min.: -10°C
Operating temperature range max.: +70°C
Copper weight: 28,8 kg/km

Part no.	Cable structure	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400089	2x1,5	< 12,7	6,6	28,8	73,4
400090	2x2,5	< 7,9	7,5	48,0	106,9
400091	2x4,0	< 4,9	9,4	76,8	163,7
400092	4x2,5	< 7,9	8,8	96,0	169,3
400093	4x4,0	< 4,9	11,6	153,6	272,4
400060	8x2,5	< 7,9	13,5	192,0	349,0
400094	8x4,0	< 4,9	16,8	307,2	541,6

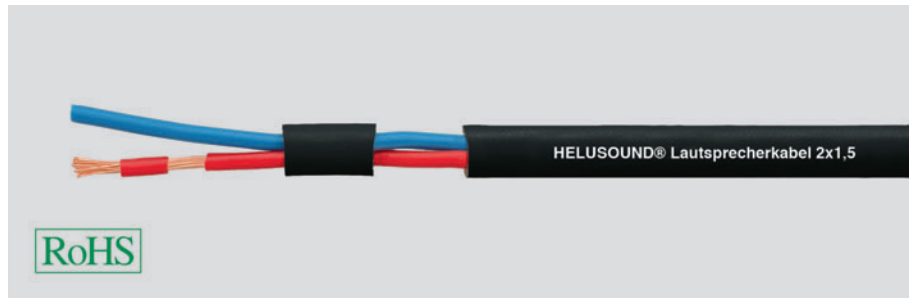
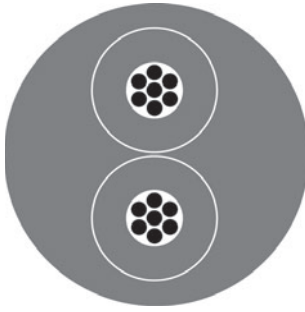
Dimensions and specifications may be changed without prior notice.

Application

All products of the HELUSOUND® 400 LOUDSPEAKER series impress with their extremely high flexibility. 0.15 strands and a very soft PVC outer sheath make this possible. These cables are particularly used in mobile applications, in studios and in conference technology.

Audio

Speaker cable, round



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Speaker cable

2x1,5

Copper, bare
PVC
rd, bu
pairs stranded
PVC
approx. 7,0 mm
Black

Electrical data

Conductor resistance, max.: 13,3 Ohm/km
Insulation resistance, min.: 5 MOhm x km

Technical data

Weight: approx. 74 kg/km
Min. bending radius for laying: 70 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +70°C
Copper weight: 30,0 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.	Cable structure	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400056	2x1,5	< 13,3	7,0	30,0	74,0
400057	2x2,5	< 7,98	7,6	50,0	97,0
400058	2x4,0	< 4,95	11,0	80,0	187,0
400059	4x2,5	< 7,98	10,0	100,0	176,0

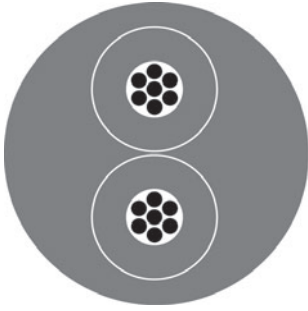
Dimensions and specifications may be changed without prior notice.

Application

The HELUSOUND® loudspeaker cable suits for outdoor application as well as fixed installation. Due to its robustness and reeling characteristic, it is in use in all kind of acoustic irradiation systems, also in stage and building control systems.

HELUSOUND® 500 PUR

new



Type Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Speaker cable HELUSOUND® 500 PUR 2x1,5

Copper, bare
PVC
rd, bk
Double core
PUR
approx. 6,6 mm
Black

Electrical data

Conductor resistance, max.: 12,7 Ohm/km

Technical data

Weight: approx. 66,9 kg/km
Min. bending radius for laying: 33 mm
Operating temperature range min.: -25°C
Operating temperature range max.: +80°C
Copper weight: 28,8 kg/km

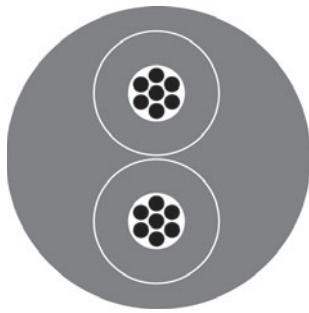
Part no.	Cable structure	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400109	2x1,5	< 12,7	6,6	28,8	66,9
400110	2x2,5	< 7,9	7,5	48,0	98,5
400111	2x4,0	< 4,9	9,4	76,8	150,2
400112	4x2,5	< 7,9	8,8	96,0	159,1
400113	4x4,0	< 4,9	11,6	153,6	253,0
400114	8x2,5	< 7,9	13,5	192,0	332,1
400115	8x4,0	< 4,9	16,8	307,2	499,5

Dimensions and specifications may be changed without prior notice.

Application

All products of the HELUSOUND® 400 LOUDSPEAKER series impress with their extremely high flexibility. 0.15 strands and a very soft PVC outer sheath make this possible. These cables are particularly used in mobile applications, in studios and in conference technology.

HELUSOUND® 600 FRNC, halogen-free



new

Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Stranding element:
Sheath material:
Cable external diameter:
Sheath colour:

Speaker cable HELUSOUND® 600 FRNC

2x1,5

Copper, bare
FRNC
rd, bk
Double core
FRNC
approx. 6,6 mm
Black

Electrical data

Conductor resistance, max.: 12,7 Ohm/km

Technical data

Weight: approx. 77 kg/km
Min. bending radius for laying: 33 mm
Operating temperature range min.: -5°C
Operating temperature range max.: +70°C
Copper weight: 28,8 kg/km

Part no.	Cable structure	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400116	2x1,5	< 12,7	6,6	28,8	77,0
400117	2x2,5	< 7,9	7,5	48,0	105,6
400118	2x4,0	< 4,9	9,4	76,8	166,9
400119	4x2,5	< 7,9	8,8	96,0	161,5
400120	4x4,0	< 4,9	11,6	153,6	271,6
400121	8x2,5	< 7,9	13,5	192,0	338,6
400122	8x4,0	< 4,9	16,8	307,2	531,5

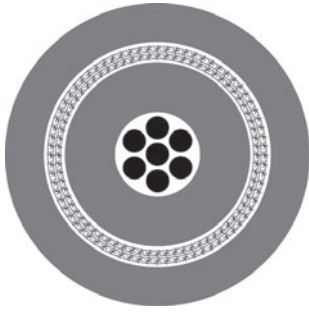
Dimensions and specifications may be changed without prior notice.

S

Audio

Speaker cables, coaxial

HELUSOUND®



Type

Cable structure

Conductor material:
Core insulation:
Core colours:
Sheath material:
Cable external diameter:
Sheath colour:

Speaker cable

1x2,5

Copper, bare
PVC
Black
PVC
approx. 6,8 mm
Black

Speaker cable

1x4,0

Copper, bare
PVC
Black
PVC
approx. 7,9 mm
Black

Electrical data

Conductor resistance, max.:
Insulation resistance, min.:

7,98 Ohm/km
5 MOhm x km

4,95 Ohm/km
5 MOhm x km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 84 kg/km
68 mm
-25°C
+70°C
52,0 kg/km

approx. 129 kg/km
80 mm
-25°C
+70°C
87,0 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Halogen-free acc. to EN 50267-2-3

Part no.

400061

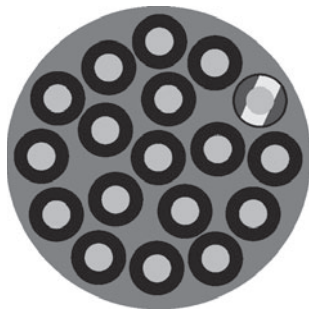
400062

Dimensions and specifications may be changed without prior notice.

Application

The coaxial HELUSOUND® speaker cable is protected by dual spiral screens in opposite directions and outer sheath. As well as robustness and good winding capability its design is particularly distinguished by high flexibility and small dimensions.

Loadcable 300/500V + 600/1000V



new

Type

Cable structure

Conductor material:	Copper, bare
Core insulation:	PVC flexible at low temperatures
Core colours:	black number coded + gn/ye
Stranding element:	14 cores stranded
Sheath material:	PVC flexible at low temperatures
Cable external diameter:	approx. 13,4 mm
Sheath colour:	black

Electrical data

Conductor resistance, max.:	13,3 Ohm/km
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Technical data

Weight:	approx. 322 kg/km
Min. bending radius for laying:	53,6 mm
Operating temperature range min.:	-40°C
Operating temperature range max.:	+80°C
Copper weight:	201,6 kg/km

Loadcable 300/500V

Part no.	Cable structure	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400143	14 G 1,5	< 13,3	13,4	201,6	322,0
400144	18 G 1,5	< 13,3	15,2	259,2	422,0
400145	14 G 2,5	< 7,98	16,6	336,0	487,0
400146	18 G 2,5	< 7,98	19,0	432,0	634,0

Loadcable 600/1000V

Part no.	Cable structure	Conductor resistance Ohm / km	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400147	14 G 1,5	< 13,3	17,7	201,6	430,0
400148	18 G 1,5	< 13,3	20,2	259,2	560,0
400149	14 G 2,5	< 7,98	20,0	336,0	604,0
400150	18 G 2,5	< 7,98	22,6	432,0	778,0

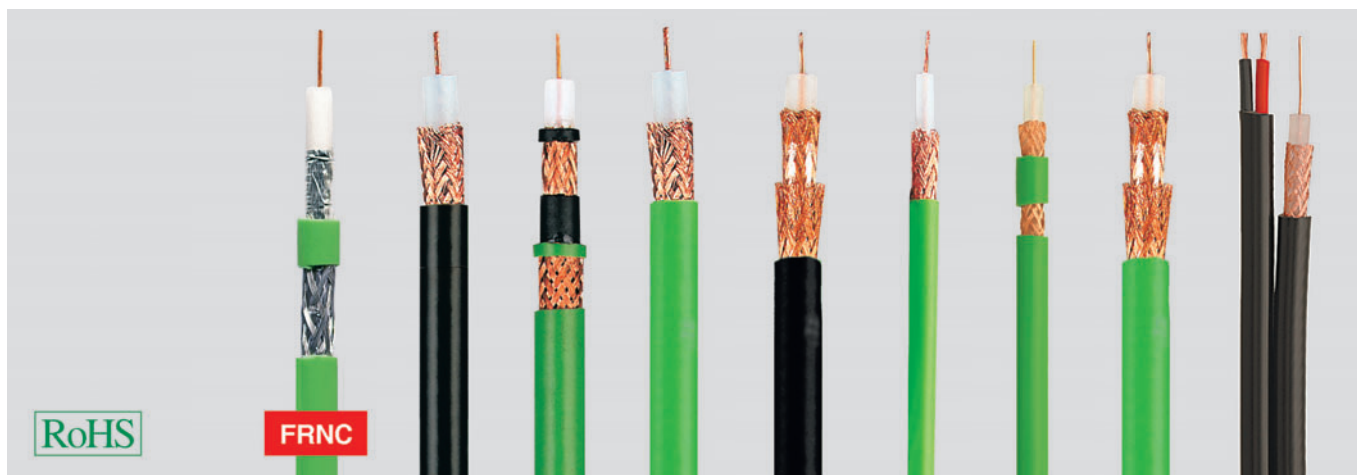
Dimensions and specifications may be changed without prior notice.

Application

The extremely flexible load cables U_0/U 300/500V and load cables U_0/U 600/1000V are used for common mechanical demands for professional stage light systems and other electrical load circuits from 500V to 1000V. The flexibility is achieved by very fine wire stranding design with 0.15mm flexible strands. The core and sheath insulation are made of cold-flexible PVC; this is also available as a customized product.

S

Video Cables



used as	Indoors	Indoors, underground	Indoors	Indoors	Indoors, underground	Indoors	Indoors	Indoors	Indoors, outdoors
Type	0,6/2,8	1,0/6,6	1,0/6,6 2YD	1,0/6,6	1,0/6,6D	0,6L/3,7	0,6/3,7	1,0/6,6D	0,6L/3,7+2x0,75
Part no.	40022	40056	40175	40173	40073	40170	40171	40174	40028

Cable structure

Inner conductor diameter mm	0,6	1	1	1	1	0,2	0,6	1	0,6
Insulation Ø mm	2,8 Cell PE	6,4 PE	6,4 PE	6,4 PE	6,4 PE	3,7 PE	3,7 PE	6,4 PE	3,7 PE
1st Outer conductor	Polyester foil coated with aluminium on both sides	Bare copper braid	Bare copper braid	Bare copper braid	Bare copper braid	Bare copper braid	Bare copper braid	Bare copper braid	Bare copper braid
Ø approx. mm	-	7	7	7	7	4,2	4,3	7	-
Inner sheath/Foil	-	-	PE	-	Foil	-	-	Foil	-
Ø approx. mm	-	-	8,5	-	-	-	-	-	-
2nd Outer conductor	Tinned copper braid	no	Bare copper braid	no	Bare copper braid	no	no	Bare copper braid	-
Ø approx. mm	-	-	9,1	-	7,6	-	-	7,6	-
Outer jacket	FRNC	PE	PVC	PVC	PE	PVC	PVC	PVC	PVC
Jacket colour	green	black	green	green	black	green	green	green	black
Outer Ø approx. mm	4,3	8,8	11,0	8,8	9,0	6,1	6,1	9,0	11,8
Min. bending radius approx. mm	25	45	55	45	50	30	30	50	50
Weight approx. kg / km	24	93	151	95	125	48	48	128	0

Electrical characteristics

Impedance (Ohm)	75 ± 2	75 ± 1	75 ± 1	75 ± 1	75 ± 1	75 ± 1	75 ± 1	75 ± 1	75 ± 3
Attenuation at 20°C (dB/100m)									
1 MHz	0,9	0,6	0,6	0,6	0,6	1,2	1,1	0,6	1,1
5 MHz	2,2	1,3	1,4	1,3	1,4	2,6	2,5	1,4	2,5
7 MHz	2,6	-	-	-	-	-	-	-	-
10 MHz	3,2	2	2	2	2	3,6	3,5	2	3,5
50 MHz	7,5	-	-	-	-	-	-	-	-
100 MHz	10,2	-	-	-	-	-	-	-	-
Propagation velocity v/c	0,8	0,66	0,66	0,66	0,66	0,66	0,66	0,66	0

DC resistance at 20°C

Inner conductor max. Ohm/km	63	22	24	22	24	83	63	24	63
Outer conductor max. Ohm/km	21	7,5	6,5	7,5	3,5	12,5	13	3,5	13
Capacitance pF/m	54	67	67	67	67	67	67	67	67
Test voltage (50 Hz, kV eff.)	3,5	7	7	7	7	4,2	4,2	7	4

Working voltage at (kV)

Pulse operation	-	6	6	6	6	3,6	3,6	6	-
HF-operation (peak value)	-	3	3	3	3	1,8	1,8	3	-
DC operation	-	14	14	14	14	8	8	14	-
Screening efficiency (dB)									
50 and 900 MHz ≥	90	-	-	-	-	-	-	-	-
Copper weight kg/km	11,0	32,0	78,0	32,0	78,0	22,0	22,0	78,0	38,0

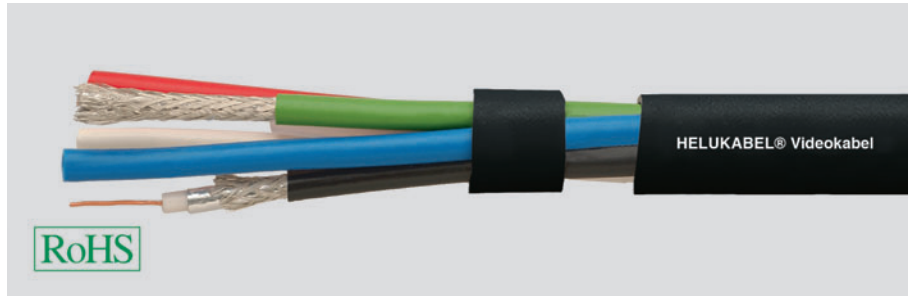
Dimensions and specifications may be changed without prior notice. (RM01)

Note

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers.
- ALPR**=Polyesterfoil coated with Aluminium on both sides
bl=Bare, **bk**=Black, **Cu**=Copper, **D**=2xbraiding, **FRNC**=Flame Retardant Non-Corrosive, **G**=Braid, **gn**=Green, **PE**=Polyethylene, **PEE**=Cell-PE, **PVC**=Polyvinylchloride

Video

Video cables, multicore



Type

Cable structure

Conductor material:
Core insulation:
Sheath material:
Cable external diameter:
Sheath colour:

Video Cables

3x(0,6/2,8)

Copper, bare
Cell PE
PVC
approx. 12,9 mm
Black

Electrical data

Characteristic impedance:
Inner conductor resistance, max.:

75 Ohm
65 Ohm/km

Technical data

Weight:
Min. bending radius for laying:
Operating temperature range min.:
Operating temperature range max.:
Copper weight:

approx. 178 kg/km
130 mm
-25°C
+70°C
49,0 kg/km

Norms

Halogen-free acc. to EN 50267-2-3

Part no.	Cable structure	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400068	3x(0,6/2,8)	12,9	49,0	178,0
400069	4x(0,6/2,8)	14,1	65,0	214,0
400070	5x(0,6/2,8)	15,3	81,0	259,0
400071	6x(0,6/2,8)	16,7	97,0	295,0
400072	7x(0,6/2,8)	16,7	113,0	310,0

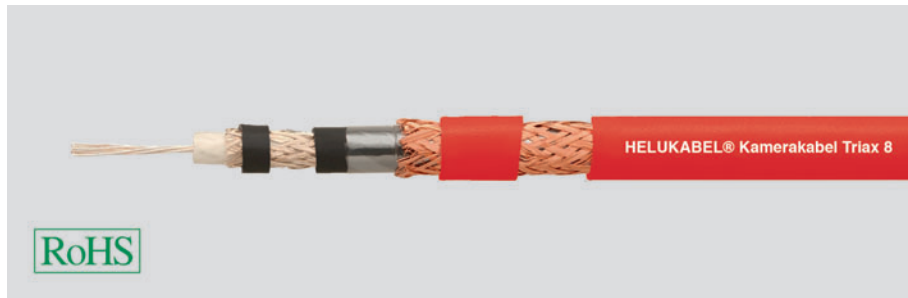
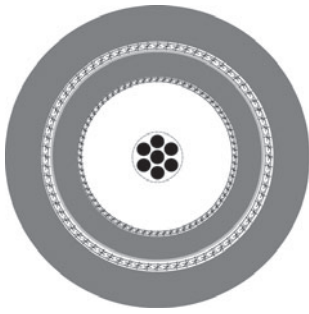
Dimensions and specifications may be changed without prior notice.

Application

The multi-core, coaxial HELUKABEL® video cable is distinguished by 75 Ohm, cell PE insulation, AL foil and braided shielding, PVC element sheath and outer sheath. Alternative we also offer a halogen-free and flame-resistant version. As example it is suitable for the parallel transmission of signals (e.g. RGB).

Video

Camera cables



Type Cable structure

Conductor material:
Core insulation:
Sheath material:
Cable external diameter:
Sheath colour:

Camera Cables Triax 8

Copper, silvered
PE
PUR
approx. 8,5 mm
Red

Electrical data

Characteristic impedance: 75 Ohm

Technical data

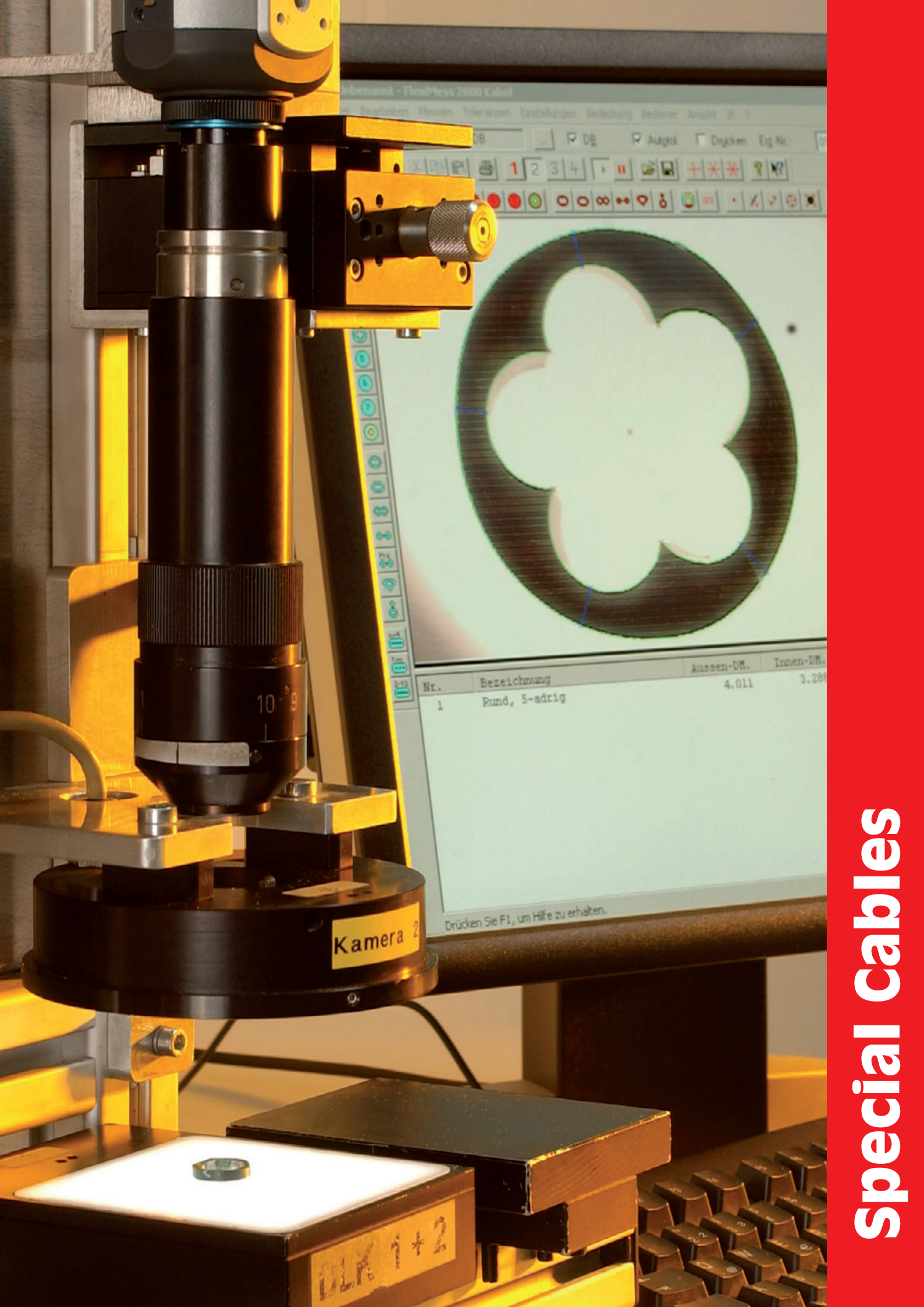
Weight: approx. 95 kg/km
Min. bending radius for laying: 80 mm
Operating temperature range min.: -30°C
Operating temperature range max.: +80°C
Copper weight: 55,0 kg/km

Part no.	Cable structure	Conductor insulation mm	Outer diameter approx. mm	Cop. weight kg / km	Weight approx. kg / km
400073	Triax 8	4,5	8,5	55,0	95,0
400074	Triax 11	6,5	11,0	80,0	150,0
400075	Triax 14	9,7	14,4	128,0	235,0
400076	Triax 8 flex	4,5	8,5	55,0	105,0
400077	Triax 11 flex	6,1	11,2	80,0	160,0
400078	Triax 14 flex	9,7	14,4	133,0	250,0

Dimensions and specifications may be changed without prior notice.

Application

The HELUKABEL® Triax cable ensures the optimal transmission of image signals. This is possible because of the low attenuation values, thick cross-braided shielding and an especially rugged outer sheath. For the Flex variant, the PVC inner and outer sheath are replaced by TPE to guarantee greater flexibility. The Triax cables are primarily used to connect video cameras and image transmission systems and are suitable for mobile use.



Special Cables

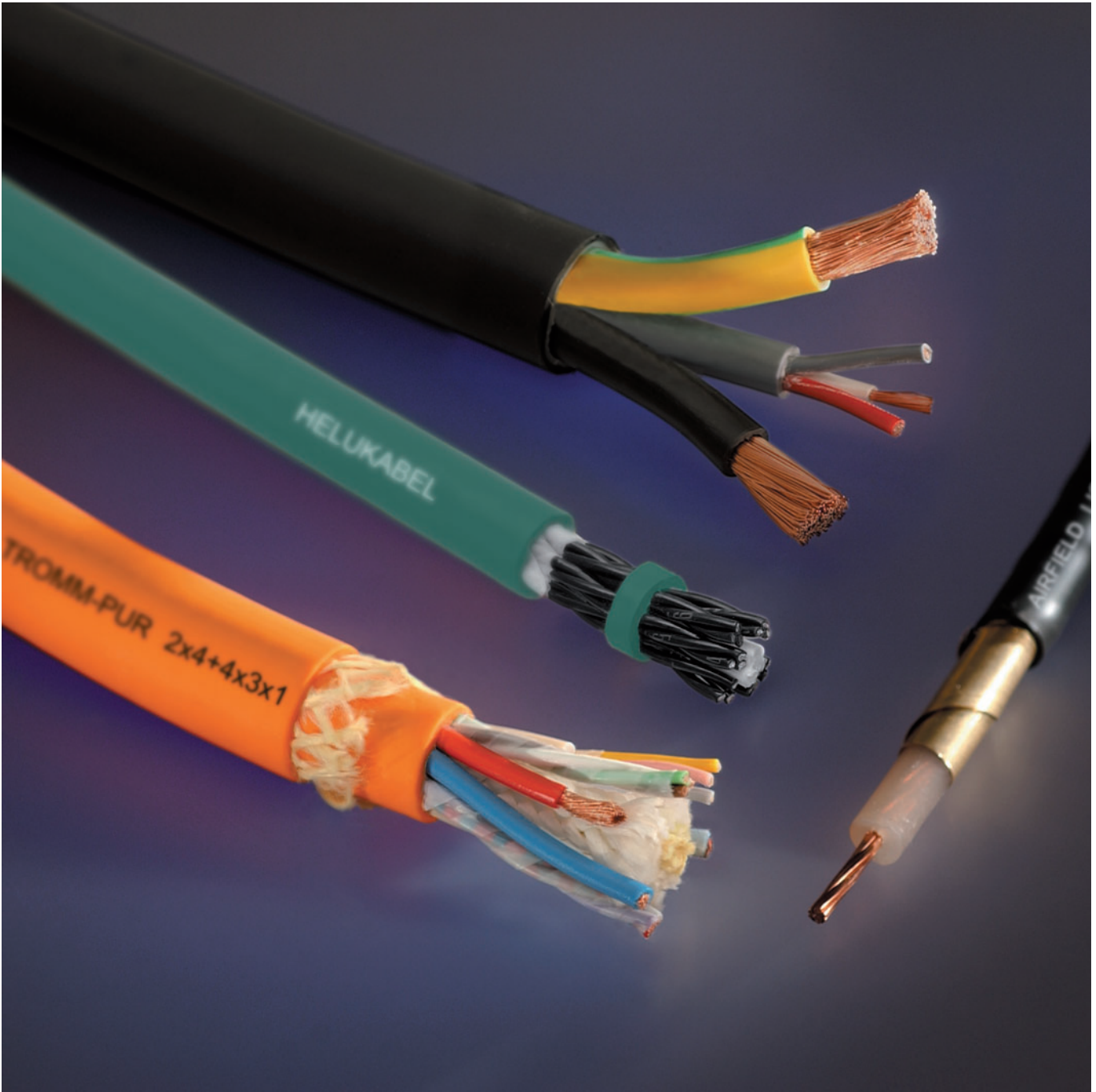


Photo: HELUKABEL®

Special Cables

Special Cables

The name HELUKABEL® stands for standard cables and lines, cables for data technology, pre-assembled cables, cable accessories and also special cables such as system cables and all types of customised special solutions. And we've been doing it for 30 years.

We design, construct, and produce insulation and sheath materials for standard to high tech applications, including PVC, PE, PP, TPE-E, TPE-O, PUR, silicon, fluoro-plastics, halogen-free polymers, to name just a few. Our cables meet requirements in terms of reelability, suitability for drag chains, increasingly high speed and acceleration, as well as extreme alternating bending cycles for a minimum bending radius, and resistance to rough environmental conditions regarding high and low temperatures, humidity, oils, petrol and other chemicals.

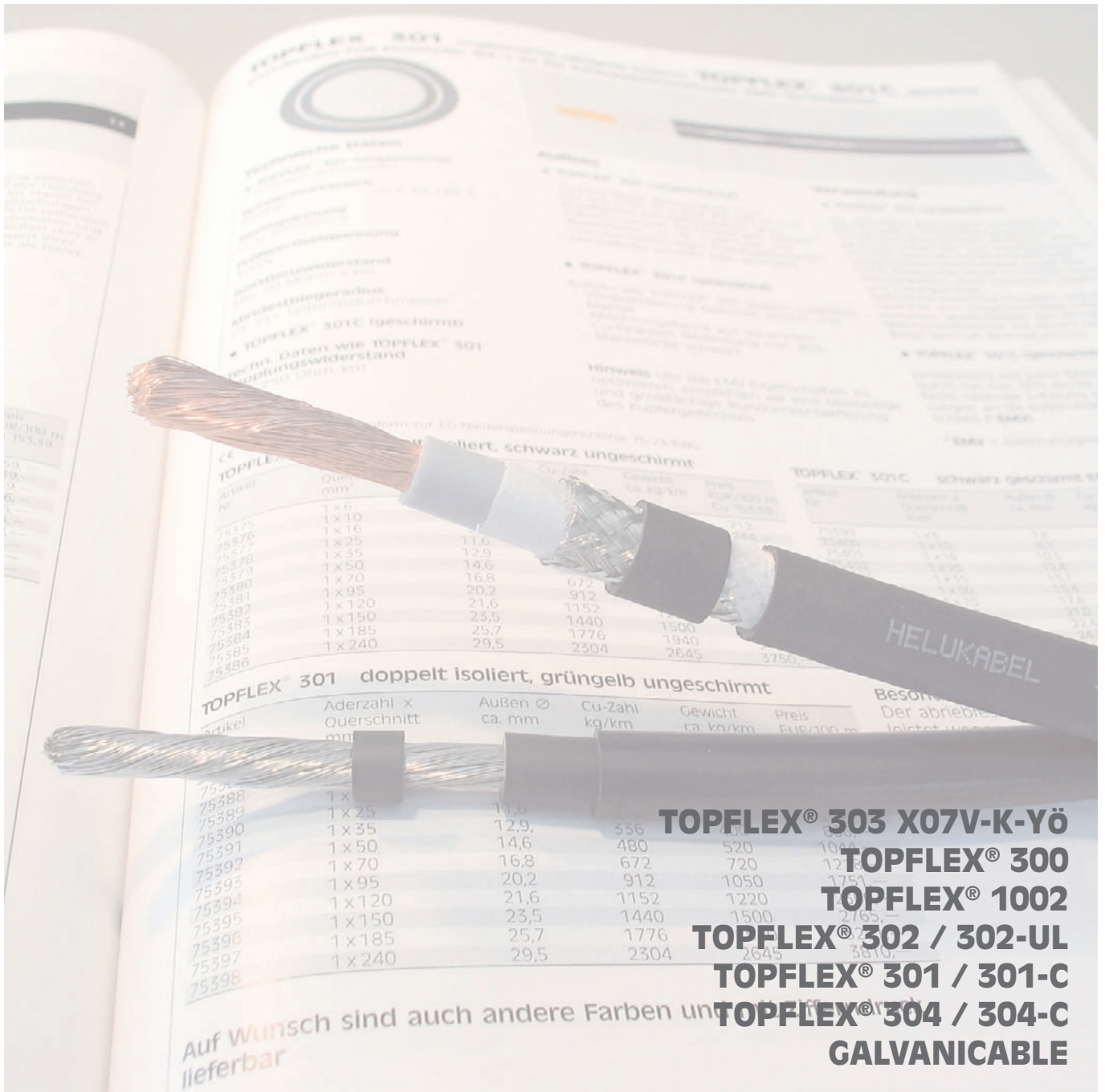
Our qualified staff in the Special Cables department would be happy to advise you on an individual basis and develop and design your leads. We set great store by providing the right line for the right purpose. Depending on the type of cable, we can deliver in as fast as 4 – 6 weeks for a minimum quantity of 100 m.

Just ask us. Our tailor-made range of products will win you over.

T

Contents

Description	Page
Single Conductors	
TOPFLEX® 303 X07V-K-YÖ, double insulation 0,6/1kV flexible PVC single core, oil resistant	T 5
TOPFLEX® 300, high flexible PVC single core, 0,6/1kV for drag chain and free move application	T 6
TOPFLEX® 1002, flexible double insulated single core 1000V	T 7
TOPFLEX® 302 / 302-UL, very high flexible PVC single core double insulated 0,6/1kV	T 8
TOPFLEX® 301 / 301-C, unscreened (double insulated)/ screened high flexible PUR single core 0,6/1kV for drag chain application	T 9
TOPFLEX® 304 / 304-C, unscreened (double insulated)/ screened high flexible PVC single core 0,6/1kV for drag chain application	T 10
GALVANICABLE®, high-current cable, high flexible and halogen-free	T 11
Trailing Cables	
Flugzeugheber-T, trailing, PUR	T 13
BAULIFTKABEL B101 / B102 / B103, to be used at plant elevators	T 14
Cables for Photovoltaic Installations	
SOLARFLEX®-X PV1-F	T 18
SOLARFLEX®-X PV1-F TWIN	T 19
Cables for Wind Power Stations	
HELUWIND® WK 103w-T, WK 103w EMC D-T, UV-resistant, UL/CSA-Style 10678/21179 Single-/Multicore	T 27
HELUWIND® WK 103k-T, WK 103k EMC D-T, UV-resistant, UL/CSA-Style 10269/2570 Single-/Multicore, screened/unscreened,	T 28
HELUWIND® WK 135-T, WK 135 D-EMC T, UV-resistant, UL/CSA-Style** 10553 / 20234, Single-/Multicore 90°C (80°C acc. to UL), suitable for offshore	T 29
HELUWIND® WK 137-T / WK 137 EMV D-T _{FT4} , UV-resistant, suitable for offshore, UL/CSA-Style 10553/20234, Single-/Multicore, 90°C, (80°C according to UL)	T 30
HELUWIND® WK 300w-Torsion 1,8/3kV, UV-resistant	T 31
HELUWIND® WK 305-Torsion 1,8/3kV, UV-resistant, suitable for offshore	T 32
HELUWIND® WK H07BN4-F WIND-Torsion, Torsion +/- 150°/1m, UV-resistant, 750V/90°C	T 33
HELUWIND® WK 101 H, 0,6/1kV halogen-free	T 34
HELUWIND® WK Fire Alarm Cable-Torsion, halogen-free, FT1, 24V	T 35
HELUWIND® WK-NTSCGEWOEU-Torsion, 3,6 / 6kV	T 36
HELUWIND® WK DLO 2kV, FT4, UV-resistant, UL44 1kV, 90°C, VW-1, LS, MSHA	T 37
HELUWIND® WK Powerline ALU 105°C robust, 0,6/1kV or 1,8/3kV	T 38
HELUWIND® WK THERMFLEX 145, halogen-free, +145°C	T 39
HELUWIND® WK (N)A2XH, 0,6/1kV, halogen-free	T 40
Sensor actuator and distributor Cables	
SENSORFLEX, sensor actuator cable, PVC, PUR, PVC/PUR	T 42
VERTEILERFLEX two-approvals, sensor actuator and distributor cables PVC, PUR, PVC/PUR	T 43
VERTEILERFLEX, for sensor actuator distributor boxes, PVC, PUR or PVC/PUR	T 45
SENSORFLEX-H, sensor actuator cables, halogen-free, high flexible drag chain cable, PUR, mantle EVA +125°C	T 46
Cables for airport 400 Hz	
AIRPORT 400 HZ, trailing, PUR, halogen-free, flame retardant	T 49
AIRPORT 400 HZ, trailing, PUR, halogen-free, flame retardant	T 50
Truck Cables	
HELUTRUCK® 270, with ADR-approval, PVC low voltage cable for commercial vehicles	T 52
HELUTRUCK® 271, with ADR-approval, PUR low voltage cable for commercial vehicles	T 53
HELUTRUCK® 272 / 273, Flat cable for the sideways lighting with GCVS-authorization, Battery cable, battery charging cable	T 54



TOPFLEX® 303 X07V-K-Yö
TOPFLEX® 300
TOPFLEX® 1002
TOPFLEX® 302 / 302-UL
TOPFLEX® 301 / 301-C
TOPFLEX® 304 / 304-C
GALVANICABLE

Photo: HELUKABEL®

Single Conductors

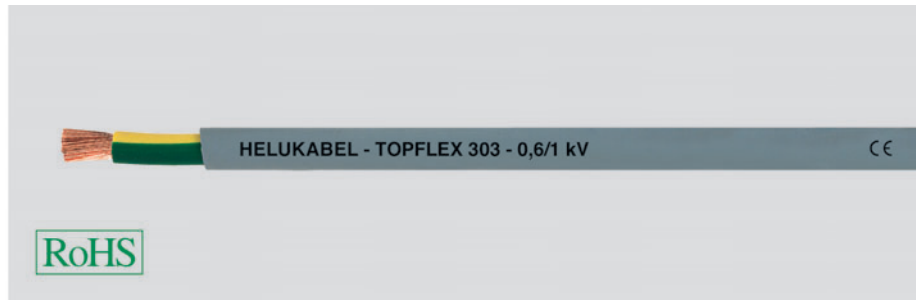
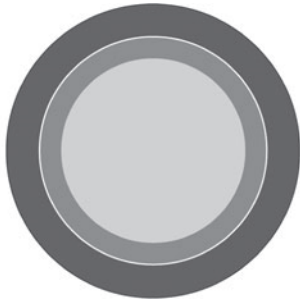
These lines are specially designed for use as connecting cables in energy supply chains, handling equipment, robots, machine tools, and manufacturing and processing machines, and in almost all areas of flexible use with free movement.

Optimised insulation materials ensure resistance to oil, greases, coolants, hydraulic liquids, as well as countless alkalis and solvents. Optimised exterior diameters, reduced weights, and outstanding torsion characteristics are the standout features of many of the single cores listed here.



TOPFLEX® 303 X07V-K-YÖ double insulation 0,6/1kV flexible PVC

single core, oil resistant



Technical data

- Special PVC single-core cable with double insulation and oil-resistant sheath
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
U₀/U 600/1000 V
- **A.C. test voltage**, 50 Hz
3000 V
- **Insulation resistance**
min. 20 MΩm/km
- **Minimum bending radius**
for flexible installation
approx. 12 cable ø

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl. 5 and IEC 60228 cl. 5
- Special PVC core insulation, cold-resistant colour black / green-yellow
- Special PVC sheath, TM5 acc. to HD 21.1S2/A16
- Sheath colour grey

Properties

- These cables have been tested according to VDE 207 and VDE 0473 and found to be totally oil resistant
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Improved mechanical protection due the double insulation

Application

This cable is used for conditions of increased mechanical stress. For flexible use with free movement without tensile stress or forced movements in dry, moist and wet environments, but not suitable for use outdoors. The cable may be laid in trays, troughs and channels.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

core-/sheath-color black/grey

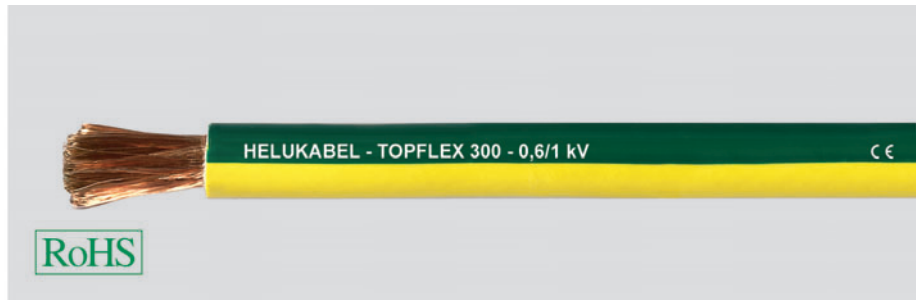
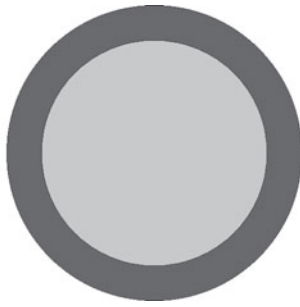
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75460	1 x 6	8,5	58,0	94,0	10
75461	1 x 10	9,5	96,0	143,0	8
75462	1 x 16	11,5	154,0	209,0	6
75463	1 x 25	14,0	240,0	308,0	4
75464	1 x 35	15,0	336,0	440,0	2
75465	1 x 50	17,5	480,0	572,0	1
75466	1 x 70	20,0	672,0	792,0	2/0
75467	1 x 95	22,0	912,0	1155,0	3/0
72184	1 x 120	23,5	1152,0	1267,0	4/0
72185	1 x 150	26,5	1440,0	1650,0	300 kcmil
75468	1 x 185	29,0	1776,0	2134,0	350 kcmil
74221	1 x 240	31,0	2304,0	2943,0	500 kcmil
72082	1 x 300	35,0	2880,0	3600,0	600 kcmil

core-/sheath-color green-yellow/grey

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75449	1 G 6	8,5	57,6	94,0	10
75469	1 G 10	9,5	96,0	143,0	8
73859	1 G 16	11,5	154,0	209,0	6
75470	1 G 25	14,0	240,0	308,0	4
75471	1 G 35	15,0	336,0	440,0	2
75472	1 G 50	17,5	480,0	572,0	1
75473	1 G 70	20,0	672,0	792,0	2/0
75474	1 G 95	22,0	912,0	1155,0	3/0
75475	1 G 120	23,5	1152,0	1267,0	4/0
75476	1 G 150	26,5	1440,0	1650,0	300 kcmil
75477	1 G 185	29,0	1776,0	2134,0	350 kcmil
75478	1 G 240	31,0	2304,0	2943,0	500 kcmil
75479	1 G 300	35,0	2280,0	3600,0	600 kcmil

Dimensions and specifications may be changed without prior notice.

TOPFLEX® 300 high flexible PVC single core, 0,6/1kV for drag chain and free move application



Technical data

- Special PVC single-core cable with oil-resistant insulation based on DIN VDE 0281 part 13 and in accordance with HD 21.13 S1
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage**
U₀/U 600/1000 V
- **A.C. test voltage**, 50 Hz
3000 V
- **Insulation resistance**
min. 20 MΩm/km
- **Minimum bending radius**
for flexible installation
approx. 7,5 cable ø

Cable structure

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl. 6 and IEC 60228 cl. 6
- Oil-resistant special PVC insulation
- Colour see table, or as desired
- If this cable is to be double-insulated, then its external diameter and weight must be adapted.
- Caution with existing cables.

Properties

- PVC self-extinguishing and flame retardant, test method B according to VDE 0472 part 804 and IEC 60332-1
- Chemical resistance see table Technical Information

Application

Thanks to their outstanding alternating bending stress characteristics, these cables are ideally suited for use in drag chains, and also for use in handling devices, robots, and nearly any area requiring flexible used and free motion. Due to its resistance to mineral oils these cables are well suited for use in mechanical engineering, tool making, and systems engineering, and in steel mills and rolling mills in particularly critical areas.

Suitable for installation in dry, damp and wet environments. With the black sheath, can also be used outdoors.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

TOPFLEX® 300 black

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
79623	1 x 2,5	4,2	24,0	42,0	14
79624	1 x 4	5,1	38,4	58,0	12
79625	1 x 6	6,0	57,6	85,0	10
79626	1 x 10	7,4	96,0	130,0	8
75431	1 x 16	8,8	154,0	210,0	6
75432	1 x 25	10,7	240,0	300,0	4
75433	1 x 35	12,1	336,0	420,0	2
70519	1 x 50	14,0	480,0	580,0	1
75434	1 x 70	16,3	672,0	780,0	2/0
73714	1 x 95	18,3	912,0	1010,0	3/0
75435	1 x 120	20,0	1152,0	1200,0	4/0
75436	1 x 150	23,0	1440,0	1600,0	300 kcmil
72872	1 x 185	24,8	1776,0	2030,0	350 kcmil
75437	1 x 240	28,7	2304,0	2600,0	500 kcmil

TOPFLEX® 300 green-yellow

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
79627	1 G 2,5	4,2	24,0	42,0	14
79628	1 G 4	5,1	38,4	58,0	12
79629	1 G 6	6,0	57,6	85,0	10
79630	1 G 10	7,4	96,0	130,0	8
75438	1 G 16	8,8	154,0	210,0	6
75439	1 G 25	10,7	240,0	300,0	4
75440	1 G 35	12,1	336,0	420,0	2
70536	1 G 50	14,0	480,0	580,0	1
75441	1 G 70	16,3	672,0	780,0	2/0
75442	1 G 95	18,3	912,0	1010,0	3/0
73885	1 G 120	20,0	1152,0	1200,0	4/0
75443	1 G 150	23,0	1440,0	1600,0	300 kcmil
75444	1 G 185	24,8	1776,0	2030,0	350 kcmil
75445	1 G 240	28,7	2304,0	2600,0	500 kcmil

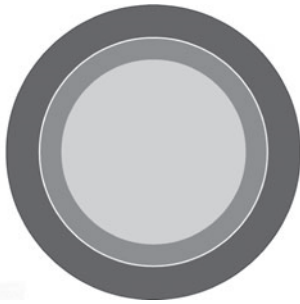
TOPFLEX® 300 red

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
79631	1 x 2,5	4,2	24,0	42,0	14
79632	1 x 4	5,1	38,4	58,0	12
79633	1 x 6	6,0	57,6	85,0	10
79634	1 x 10	7,4	96,0	130,0	8
78106	1 x 16	8,8	154,0	210,0	6
78107	1 x 25	10,7	240,0	300,0	4
78108	1 x 35	12,1	336,0	420,0	2
70518	1 x 50	14,0	480,0	580,0	1
78109	1 x 70	16,3	672,0	780,0	2/0
78110	1 x 95	18,3	912,0	1010,0	3/0
78111	1 x 120	20,0	1152,0	1200,0	4/0

TOPFLEX® 300 blue

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
79635	1 x 2,5	4,2	24,0	42,0	14
79636	1 x 4	5,1	38,4	58,0	12
79637	1 x 6	6,0	57,6	85,0	10
79638	1 x 10	7,4	96,0	130,0	8
78112	1 x 16	8,8	154,0	210,0	6
78113	1 x 25	10,7	240,0	300,0	4
78114	1 x 35	12,1	336,0	420,0	2
78115	1 x 50	14,0	480,0	580,0	1
78116	1 x 70	16,3	672,0	780,0	2/0
78117	1 x 95	18,3	912,0	1010,0	3/0
73884	1 x 120	20,0	1152,0	1200,0	4/0

Dimensions and specifications may be changed without prior notice.



Technical data

- Special PVC single-core cable with double insulation approved to UL AWM Style 1032
- **Temperature range**
flexing -5 °C to +90 °C
fixed installation -40 °C to +90 °C
- **Nominal voltage**
acc. to VDE U₀/U 600/1000 V
acc. to UL 1000 V
- **A.C. test voltage**, 50 Hz
4000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
for flexible installation
approx. 7,5x cable ø
for fixed installation
approx. 3x cable ø

Cable structure

- Bare copper conductor, fine wire stranded
- 1st insulation: special PVC, black colour
- 2nd insulation: special PVC
- Sheath colour black

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Application

PVC single-core cable suitable for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms, and in open air (fixed installation).

Must not be installed directly in the ground or water.

This two-approvals single-core cable is preferred for use in export-oriented mechanical engineering, in machine tools, production lines and systems engineering.

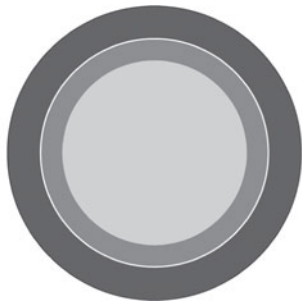
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
701377	1 x 1,5	16	4,5	14,4	30,0
701378	1 x 2,5	14	5,0	24,0	49,0
701379	1 x 4	12	6,1	38,4	75,0
700160	1 x 6	10	7,2	57,6	118,0
701380	1 x 10	8	9,0	96,0	180,0
700159	1 x 16	6	10,2	154,0	250,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
701381	1 x 25	4	11,6	240,0	370,0
701382	1 x 35	2	13,0	336,0	490,0
701383	1 x 50	1	16,0	480,0	665,0
701384	1 x 70	2/0	17,1	672,0	910,0
701387	1 x 95	3/0	19,5	912,0	1195,0
701388	1 x 120	4/0	22,3	1152,0	1545,0

Dimensions and specifications may be changed without prior notice.

TOPFLEX® 302 / 302-UL very high flexible PVC single core double insulated 0,6/1kV



Technical data

TOPFLEX® 302

- Special PVC single-core cable with double insulation flexible at low temperatures
- **Temperature range**
flexing -15 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 600/1000 V
- **A.C. test voltage**, 50 Hz
3000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
for flexible installation
approx. 5x cable diameters

TOPFLEX® 302-UL

- Technical data as above, but
- with additional UL Approval Style 10107
- **Nominal voltage** UL 1000 V

Application

These cables are specially designed for use as connecting cables on sliding contacts for current collectors, and also for use in energy supply chains, automatic handling devices, robots, machine tools, machining and processing equipment, and nearly any area requiring flexible used and free motion.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cable structure

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl. 6 and IEC 60228 cl. 6
- PVC insulation flexible at low temperatures, natural colour
- PVC sheath compound TM2 flexible at low temperatures
- Sheath colour black, UV-resistant

Properties

- Sheath UV-resistant
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Chemical resistance see table Technical Information
- The cable is permissible for overvoltage category II

TOPFLEX® 302 without UL-approval

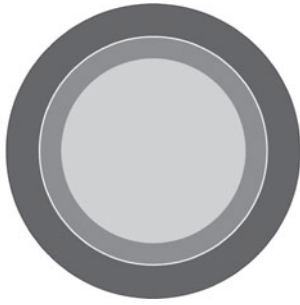
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
72946	1 x 1,5	4,0	14,4	25,0	16
73924	1 x 2,5	4,5	24,0	42,0	14
72950	1 x 4	5,6	38,4	58,0	12
72945	1 x 6	6,1	57,6	85,0	10
75450	1 x 10	8,0	96,0	130,0	8
72947	1 x 16	9,8	153,6	190,0	6
75451	1 x 25	11,8	240,0	280,0	4
75452	1 x 35	12,9	336,0	400,0	2
75453	1 x 50	14,6	480,0	520,0	1
72944	1 x 70	17,5	672,0	720,0	2/0
75454	1 x 95	20,2	912,0	1050,0	3/0
75455	1 x 120	21,6	1152,0	1220,0	4/0
75456	1 x 150	23,5	1440,0	1500,0	300 kcmil
75457	1 x 185	25,7	1776,0	1940,0	350 kcmil
75458	1 x 240	29,5	2304,0	2675,0	500 kcmil

TOPFLEX® 302 with UL-approval

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
700231	1 x 1,5	16	5,2	14,4	25,0
700232	1 x 2,5	14	6,4	24,0	42,0
700233	1 x 4	12	7,0	38,4	58,0
700234	1 x 6	10	7,5	57,6	85,0
701351	1 x 10	8	9,1	96,0	130,0
700114	1 x 16	6	10,8	153,6	190,0
701352	1 x 25	4	13,1	240,0	280,0
701353	1 x 35	2	14,1	336,0	400,0
701354	1 x 50	1	15,8	480,0	520,0
700235	1 x 70	2/0	19,0	672,0	720,0
701355	1 x 95	3/0	21,5	912,0	1050,0
701356	1 x 120	4/0	23,2	1152,0	1220,0
701357	1 x 150	300 kcmil	25,2	1440,0	1500,0
701358	1 x 185	350 kcmil	27,0	1776,0	1940,0
701359	1 x 240	500 kcmil	31,5	2304,0	2675,0

Dimensions and specifications may be changed without prior notice.

TOPFLEX® 301 / 301-C unscreened (double insulated)/ screened high flexible PUR single core 0,6/1kV for drag chain application



Technical data

TOPFLEX® 301 (unscreened)

- Special PUR single-core cable acc. to UL AWM Style 10553
- **Temperature range**
flexing -15 °C to +80 °C
- **Nominal voltage**
acc. to VDE U₀/U 600/1000 V
acc. to UL 1000 V
- **A.C. test voltage** 3000 V
- **Insulation resistance**
min. 20 MΩm x km
- **Minimum bending radius**
approx. 7,5 cable ø

TOPFLEX® 301C (screened)

- Tech. data as per TOPFLEX® 301
- **Coupling resistance**
max. 250 Ωm/km

Cable structure

TOPFLEX® 301 (unscreened)

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl. 6 and IEC 60228 cl. 6
- PVC core insulation flexible at low temperatures, grey
- PUR sheath
- Colour black or green-yellow

TOPFLEX® 301C (screened)

- Structure as per TOPFLEX 301, but additionally
- Fleece wrapping between screen and sheath
- Tinned copper braided screening, approx. 85% coverage
- Sheath colour black

Properties

- PUR outer sheath: low adhesion, flame retardant, extremely abrasion resistant, resistant to UV, oil, hydrolysis and microbial attack
- Optimised insulation materials ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids as well as many alkalis and solvents
- The optimised external diameter and the reduced weight facilitate use in multi-shift operation with extreme alternating bending stress cycles
- Thanks to its excellent mechanical characteristics, the wear-resistant, notch-resistant, flame-retardant PUR sheath provides high functional reliability over long periods

Application

TOPFLEX® 301 (unscreened)

These cables are specially designed for use in energy supply chains, automated handling equipment, robots, machine tools, processing and manufacturing machinery.

TOPFLEX® 301C (screened)

Applications as described above, additionally optimal compliance with electromagnetic compatibility (EMC) requirements on account of the approx. 85% coverage by the braided screening.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

TOPFLEX® 301 double insulated, black unscreened

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75375	1 x 6	7,1	58,0	85,0	10
75376	1 x 10	8,8	96,0	130,0	8
75377	1 x 16	10,5	154,0	190,0	6
75378	1 x 25	11,2	240,0	280,0	4
75379	1 x 35	13,5	336,0	400,0	2
75380	1 x 50	15,8	480,0	520,0	1
75381	1 x 70	18,0	672,0	720,0	2/0
75382	1 x 95	20,4	912,0	1050,0	3/0
75383	1 x 120	22,2	1152,0	1220,0	4/0
75384	1 x 150	25,0	1440,0	1500,0	300 kcmil
75385	1 x 185	28,0	1776,0	1940,0	350 kcmil
75386	1 x 240	32,5	2304,0	2645,0	500 kcmil

TOPFLEX® 301C black screened EMC

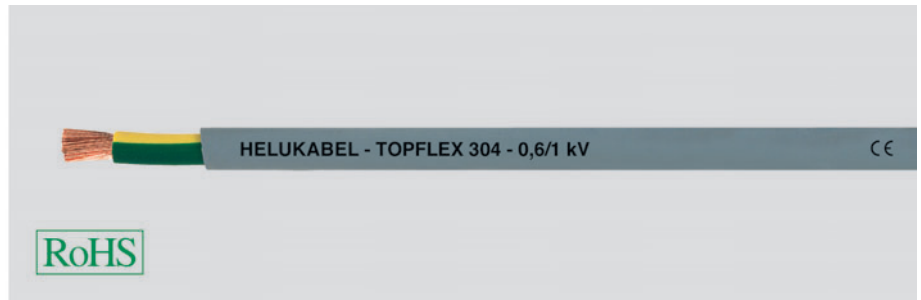
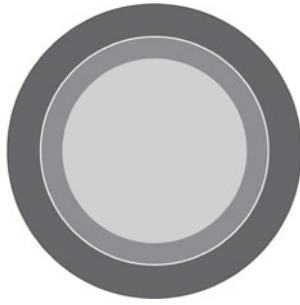
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75399	1 x 6	7,8	95,0	144,0	10
75400	1 x 10	9,5	124,0	170,0	8
75401	1 x 16	10,8	186,0	220,0	6
75402	1 x 25	12,2	278,0	340,0	4
75403	1 x 35	13,7	384,0	460,0	2
75404	1 x 50	15,4	530,0	580,0	1
75405	1 x 70	17,6	753,0	820,0	2/0
75406	1 x 95	21,7	1006,0	1200,0	3/0
75407	1 x 120	22,4	1257,0	1350,0	4/0
75408	1 x 150	24,3	1562,0	1680,0	300 kcmil
75409	1 x 185	26,5	1895,0	2100,0	350 kcmil
75410	1 x 240	30,3	2704,0	3100,0	500 kcmil

TOPFLEX® 301 double insulated, green-yellow unscreened

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75387	1 G 6	7,1	58,0	85,0	10
75388	1 G 10	8,8	96,0	130,0	8
75389	1 G 16	10,5	154,0	190,0	6
75390	1 G 25	11,2	240,0	280,0	4
75391	1 G 35	13,5	336,0	400,0	2
75392	1 G 50	15,8	480,0	520,0	1
75393	1 G 70	18,0	672,0	720,0	2/0
75394	1 G 95	20,4	912,0	1050,0	3/0
75395	1 G 120	22,2	1152,0	1220,0	4/0
75396	1 G 150	25,0	1440,0	1500,0	300 kcmil
75397	1 G 185	28,0	1776,0	1940,0	350 kcmil
75398	1 G 240	32,5	2304,0	2645,0	500 kcmil

Dimensions and specifications may be changed without prior notice.

TOPFLEX® 304 / 304-C unscreened (double insulated)/ screened high flexible PVC single core 0,6/1kV for drag chain application



Technical data

- Special PVC single-core cable
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -40 °C to +80 °C
- **Nominal voltage** U₀/U 600/1000 V
- **A.c. test voltage**, 50 Hz
3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
for flexible installation
approx. 5x cable Ø

Cable structure

TOPFLEX® 304

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl. 6 and IEC 60228 cl. 6
- PVC insulation, green-yellow
- PVC sheath compound TM2
- Sheath colour grey

TOPFLEX® 304C

- Construction as above, but
- Tinned copper braid, coverage approx. 85%

Properties

- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Chemical resistance see table Technical Information

Application

Thanks to their outstanding alternating bending stress characteristics, these cables are ideally suited for use in drag chains, and also for use in handling devices, robots, and nearly any area requiring flexible used and free motion.

TOPFLEX® 304C

Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

TOPFLEX® 304

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
79639	1 G 2,5	4,5	24,0	42,0	14
79640	1 G 4	5,6	38,4	58,0	12
79641	1 G 6	6,1	57,6	85,0	10
71544	1 G 10	8,0	96,0	130,0	8
79642	1 G 16	9,8	154,0	190,0	6
79643	1 G 25	11,8	240,0	280,0	4
79644	1 G 35	12,9	336,0	400,0	2
79645	1 G 50	14,6	480,0	520,0	1
79646	1 G 70	17,5	672,0	720,0	2/0
79647	1 G 95	20,0	912,0	1050,0	3/0
79648	1 G 120	21,6	1152,0	1220,0	4/0
79649	1 G 150	23,5	1440,0	1500,0	300 kcmil
79650	1 G 185	25,7	1776,0	1940,0	350 kcmil
79651	1 G 240	29,5	2304,0	2675,0	500 kcmil
79652	1 G 300	32,5	2880,0	3300,0	600 kcmil

TOPFLEX® 304C

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
79653	1 G 2,5	5,9	40,0	55,0	14
79654	1 G 4	6,5	50,0	75,0	12
79655	1 G 6	8,3	88,0	125,0	10
79656	1 G 10	8,7	124,0	170,0	8
79657	1 G 16	10,3	190,0	300,0	6
79658	1 G 25	12,4	260,0	420,0	4
79659	1 G 35	13,7	405,0	620,0	2
79660	1 G 50	15,4	560,0	825,0	1
79661	1 G 70	17,5	780,0	1090,0	2/0
79662	1 G 95	21,0	1030,0	1395,0	3/0
79685	1 G 120	22,4	1311,0	1770,0	4/0
79663	1 G 150	24,3	1527,0	1930,0	300 kcmil
79664	1 G 185	26,5	1940,0	2635,0	350 kcmil
79665	1 G 240	30,3	2530,0	3380,0	500 kcmil
79666	1 G 300	35,0	3050,0	3500,0	600 kcmil

Dimensions and specifications may be changed without prior notice.



GALVANICABLE® high-current cable, high flexible and halogen-free



Technical data

- **Temperature range**
flexing -40 °C to +80 °C
fixed installation -50 °C to +80 °C
- **Operating voltage**
U₀/U 600/1000 V
- **Test voltage**
3500 V
- **Insulation resistance**
min. 20 MΩ/km
- **Minimum bending radius**
approx. 15x cable ø

Application

This cable is employed as a highly-flexible high-current cathode cable for electroplating drum systems and as a wearing cable in the chemical industry.

Special feature:

Despite the extremely thick wearing sheath, the highly flexible conductor enables good contact when installing the pear push. Good flexibility is likewise ensured when the pear push comes into contact with the parts to be electroplated.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6 and IEC 60228 cl. 6
- Extremely thick PUR wearing sheath
- Natural colour, smooth, glossy

Properties

- PUR wearing sheath: extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- Chemical resistance:
PUR demonstrates significantly better chemical resistance when compared with other materials, e.g. rubber or PVC
- The extremely thick PUR sheath means longer service life

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
700768	1 x 35	17,2	336,0	548,0	2
75497	1 x 50	19,0	480,0	686,0	1
75498	1 x 70	21,5	672,0	950,0	2/0
75499	1 x 95	24,0	912,0	1386,0	3/0

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
74749	1 x 120	27,0	1152,0	1520,0	4/0
700769	1 x 150	28,0	1440,0	2002,0	300 kcmil
700770	1 x 185	30,5	1776,0	2610,0	350 kcmil
700771	1 x 240	36,0	2304,0	3820,0	500 kcmil

Dimensions and specifications may be changed without prior notice.



Photo: HELUKABEL®

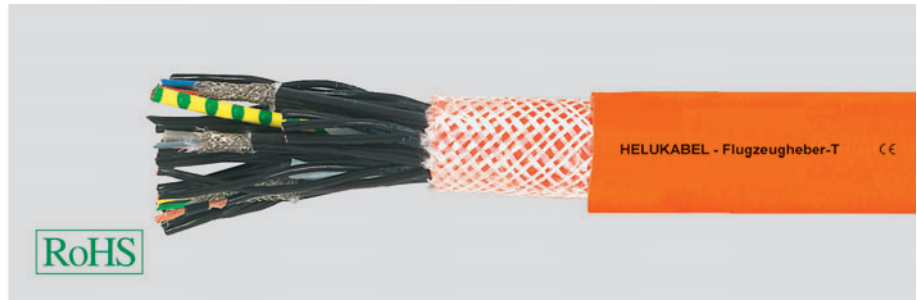
Trailing Cables

Trailing cables are used for high mechanical stress, especially for applications with frequent winding and unwinding with simultaneous tensile and torsional stress.

Trailing cables are frequently used in building machinery, conveyors and lifting systems, and cranes.

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Flugzeugheber-T trailing, PUR



RoHS

Technical data

- **Temperature range**
flexing -20 °C to +80 °C
- **Nominal voltage**
control cores 300/500 V
power supply cores 0,6/1 kV
- **A.C. test voltage**, 50 Hz
control cores 1500 V
power supply cores 4000 V
- **Minimum bending radius**
for flexible installation
approx. 15x cable ø

Cable structure

Part no. 70736

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl. 6 and IEC 60228 cl. 6
- Polyethylene core insulation DIN 47100/0.34 mm²
- Core insulation: special PVC, flexible at low temperatures, black with number 6-20/0,75 mm² and number 1-5/4 mm²
- 0,34 mm² cores stranded in pairs and screened with doubled copper braid
- Inner sheath of special PVC flexible at low temperatures
- Cores stranded with elements
- Inner sheath of special PVC flexible at low temperatures over cores
- PUR outer sheath with embedded support braiding
- Sheath colour grey RAL 7001

Part no. 77548

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl. 6 and IEC 60228 cl. 6
- Core insulation TPE-E, black with number +gnye/1 mm² and 2,5 mm²
- Polypropylene core insulation, colour code DIN 47100/0,34 mm²
- 0,34 mm² cores stranded in a pair
- Pairs screened with aluminium-coated polyester foil and tinned copper braiding
- Cores and pairs stranded
- PUR outer sheath with embedded support braiding
- Sheath colour orange RAL 2003

Properties

- PUR outer sheath: low adhesion, flame retardant, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- PUR-jacket flame retardant according to DIN VDE 0482 part 265-2-1/ EN 50265-2-1/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Application

This hybrid cable is designed for the aircraft industry, and contains cores for power supply, control cores, and cores for a positioning laser. The cable is used to control and position a support robot, which absorbs loads at specific points when loading extremely heavy items, for example during loading of aircraft assemblies in large transport aircraft of the Airbus industry. The cable is trailing, UV and weather-resistant, and is provided with an extremely wear-resistant and petrol-resistant special sheath.

Part no. 77548

is designed for similar applications, as a load-reducing lifter in aircraft assembly.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
70736	5 x 4 + 5 x 3 G 0,75 + 2 x 2 x 0,34	25,6	390,0	600,0	12

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
77548	5 x 2,5 + 18 G 1,0 + 4 x 2 x 0,34	27,0	461,0	750,0	14

Dimensions and specifications may be changed without prior notice.

BAULIFTKABEL B101 / B102 / B103 to be used at plant elevators



Technical data

- **Temperature range**
flexing -10 °C to +80 °C
- **Nominal voltage**
control cores 300/500 V
power supply cores 0,6/1 kV
- **A.c. test voltage**, 50 Hz
control cores 1500 V
power supply cores 3000 V
- **Minimum bending radius**
approx. 10x cable diameters

Cable structure

- Bare copper wire, highly flexible
- Core insulation of plastic, flexible at low temperatures, with number and gnye
- Sheath of special plastic, flexible at low temperatures, black
- Optional separate copper screening of the control cores

Properties

- Sheath UV-resistant
- In carriage version with special support braiding and with PUR sheath particularly resistant to wear, oil, hydrolysis and microbial attack

Application

These hybrid cables are used for power supply and control of vertical lifts in the construction industry. There are 3 cable versions.

B101: Here the cable is drawn vertically from a drum as a drag cable via the load platform. The load platform pulls the cable along as it moves up. During the downwards motion the cable returns to the drum automatically. Our special versions are used at heights of up to about 150 m.

B102: For greater heights, a so-called carriage version is employed, in which the cable is fed at the centre of the tower, i.e. half the way up.

B103: Here the cable is guided via a spring-loaded drum.

These vertical construction lifts are used during new construction and renovation work on high buildings. The rack lattice elements are fastened at intervals to the exterior facade.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

BAULIFTKABEL B101

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
73519	5 x 2,5 + 10 G 1,0	20,0	220,0	306,0	-
73913	5 x 2,5 + 11 G 1,0	20,0	225,6	320,0	14
70402	3 x 4 + 7 G 1,0	17,4	184,0	360,0	12
70931	4 x 6 + 9 G 1,0	20,5	330,0	555,0	10
70377	4 x 6 + 10 G 1,0	21,0	340,0	575,0	10
71901	4 x 6 + 15 G 1,0	22,0	388,0	625,0	10
71369	4 x 10 + 10 G 1,0	25,0	480,0	870,0	8
78123	4 x 16 + 6 G 1,0	26,1	700,0	1250,0	6
78124	4 x 16 + 10 G 1,0	29,0	710,0	1300,0	6
78125	4 x 16 + 15 G 1,0	31,5	760,0	1380,0	6
73726	4 x 16 + 1 G 2,5 + 4 x 1,0	28,5	830,0	1460,0	6

BAULIFTKABEL B102

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
74293	4 x 16 + 1 G 2,5 + 2 x 2 x 1,0	28,5	830,0	1080,0	6
74670	4 x 16 + 1 G 2,5 + 2 x 2 x 1,0	28,5	787,0	1080,0	6
74297	4 x 25 + 1 G 2,5 + 2 x 2 x 1,0	33,4	1176,0	1500,0	4
78122	4 x 35 + 4 G 2,5 + 2 x 2 x 1,0 + 1 x 1,0	38,0	1500,0	1850,0	2

BAULIFTKABEL B103

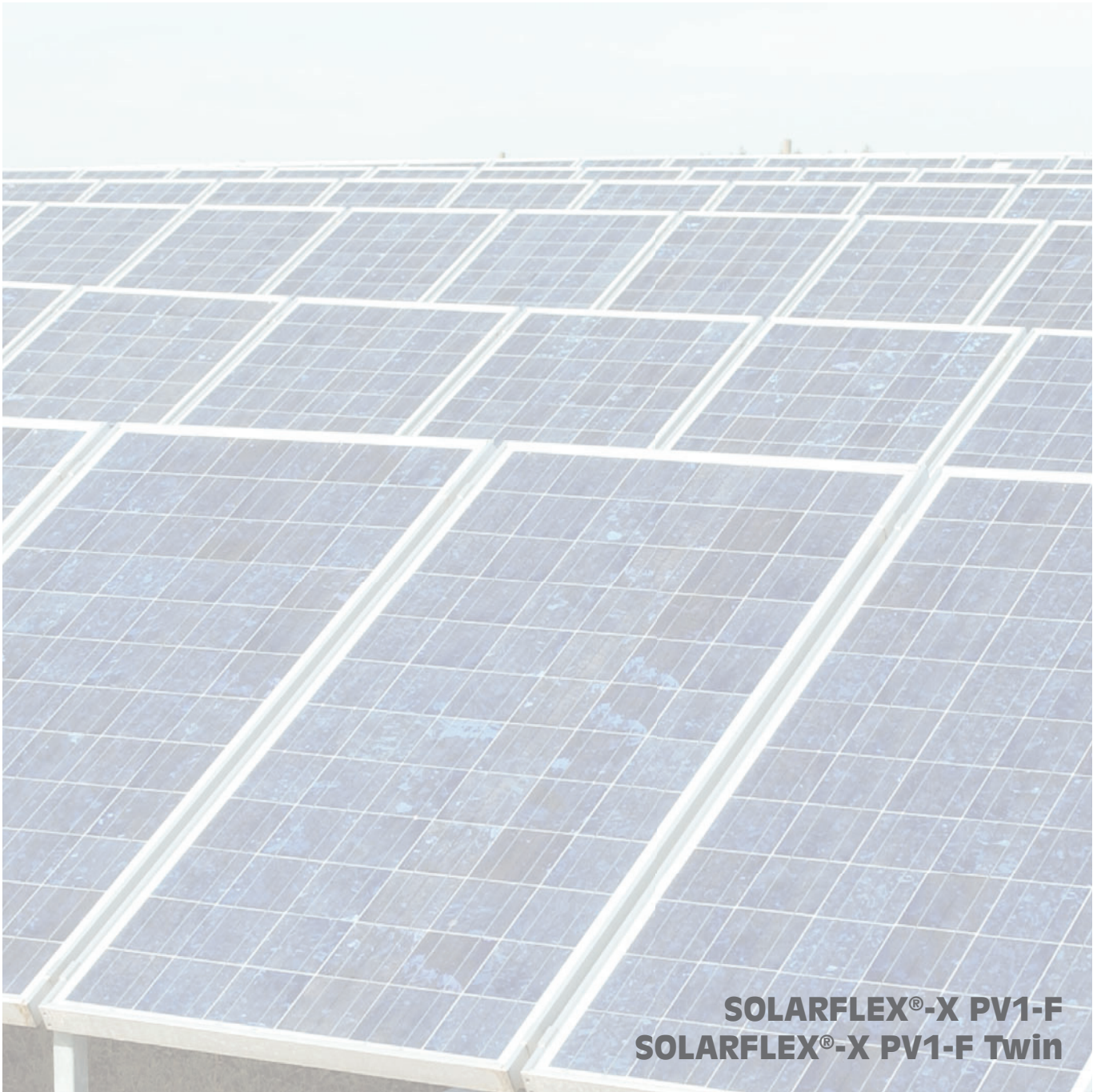
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
77532	4 x 2,5 + 3 G 1,0	13,0	125,0	230,0	14
77538	4 x 2,5 + 3 G 1,0	15,3	125,0	280,0	14

Dimensions and specifications may be changed without prior notice.



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GREEN LINE
**Cables & Wires for
Renewable Energies**







SOLARFLEX®-X PV1-F
SOLARFLEX®-X PV1-F Twin

Photo: HELUKABEL®

Cables for Photovoltaic Installations

T

Contents

Description	Page
SOLARFLEX®-X PV1-F.....  	T 18
SOLARFLEX®-X PV1-F TWIN  	T 19



Technical data

- **Temperature range**
-40 °C to +90 °C
Max.Temp. at conductor +120 °C
- **Nominal voltage**
According to VDE 600/1000 V AC
1800 V DC conductor/conductor
- **AC test voltage**
10000 V
- **Minimum bending radius**
fixed installation approx. 4 x outer diameters
flexing 10 x cable diameter

Cable structure

- Bare copper, tinned, finely stranded according to DIN VDE 0295 class 5 and IEC 60228 cl. 5
- Double-insulated
- Insulation cross-linked Polyolefin
- Outer sheath cross-linked Polyolefin
- Sheath colour black, red or blue

Approvals

- According to PV1-F requirement profile for PV cable DKE/VDE AK 411.2.3
- VDE (Reg. 8266)
- TÜV (2 PFG 1169/08.2007, R60025298)
- RoHS and CE compliant
- UL certification in progress (UL Subject 4703)

Properties

- Ozone resistant acc. to EN 50396
- Weather und UV resistant acc. to HD 605/A1
- Halogen-free acc. to EN 50267-2-1, EN 60684-2
- Resistant to acid and bases acc. to EN 60811-2-1
- Flame-resistant acc. to VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1
- Very robust and abrasion-resistant sheath acc. to DIN EN 53516
- Resistant to short-circuits up to 200 °C thanks to their double insulation; short-circuits temperature 200 °C / 5sec.
- Anticipated service life - 25 years
- Hydrolysis and ammoniac resistant

Note

- Not for direct installation in ground
- Version with rodent protection available: Solarflex-X PV1-F NTS (V2A braiding)
- All types with metre marking

Application

The SOLARFLEX®-X PV1-F is used for cabling solar modules.

Part no.	No.cores x cross-sec. mm ²	Jacket colour	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
704225	1 x 2,5	black	4,5	24,0	42,0	14
705892	1 x 2,5	blue	4,5	24,0	42,0	14
705891	1 x 2,5	red	4,5	24,0	42,0	14
704226	1 x 4	black	5,2	38,4	60,0	14
705776	1 x 4	blue	5,2	38,5	60,0	14
705775	1 x 4	red	5,2	38,4	60,0	14
704227	1 x 6	black	5,9	57,6	82,0	14
705778	1 x 6	blue	5,9	57,6	82,0	14
705777	1 x 6	red	5,9	57,6	82,0	14
704228	1 x 10	black	6,9	96,0	123,0	14
705894	1 x 10	blue	6,9	96,0	123,0	14
705893	1 x 10	red	6,9	96,0	123,0	14
704229	1 x 16	black	8,3	153,6	190,0	14
706840	1 x 16	blue	8,3	153,6	190,0	14
706839	1 x 16	red	8,3	153,6	190,0	14
704230	1 x 25	black	10,0	240,0	285,0	14
704231	1 x 35	black	11,0	336,0	376,0	14
704232	1 x 50	black	13,0	480,0	530,0	14
704233	1 x 70	black	15,3	672,0	745,0	14
704234	1 x 95	black	17,0	912,0	960,0	14
705738	1 x 120	black	19,1	1152,0	1220,0	14
705739	1 x 150	black	22,7	1440,0	1550,0	14
706288	1 x 185	black	25,5	1776,0	1930,0	14
706289	1 x 240	black	28,3	2304,0	2550,0	14

Dimensions and specifications may be changed without prior notice.

SOLARFLEX®-X PV1-F TWIN



new



Technical data

- **Temperature range**
-40 °C to +90 °C
Max. temp. at conductor +120 °C
- **Nominal voltage**
According to VDE U₀/U 600/1000 V AC
1800 V DC conductor/conductor
- **AC test voltage**
6500 V, 50 Hz, 15 kV DC
- **Minimum bending radius**
Single 1,5 cable diameters
Multiple 10 cable diameters

Cable structure

- Bare copper, Class 5, tinned, finely stranded according to DIN VDE 0295 class 5 and IEC 60228 cl. 5
- Double-insulated
- Insulation cross-linked special Polyolefin
- Outer sheath cross-linked special Polyolefin
- Sheath colour: black

Properties

- Approval: TÜV 2Pfg 1169/08.2007
- UV-, ozone-resistant, weather-resistant
- Halogen-free
- Abrasion and cut resistant
- Relatively flexible
- Easy to strip
- Flame-resistant according to VDE 0482 Part 332-1-2, IEC 60332-1-2
- Resistant to short circuits up to 200 °C thanks to double insulation, short circuit temperature 200 °C/5 sec.
- Anticipated service life 25 years

Note

- Cross-sections up to 2 x 16 mm² are available on request

Application

The SOLARFLEX®-X PV1-F TWIN is used for cabling solar modules.

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
707234	2 x 2,5	5,4 - 11,0	50,0	106,0	14
707235	2 x 4	5,8 - 11,8	80,0	142,0	12

Part no.	No. cores x cross-sec. mm ²	Outer Ø min. - max. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
705769	2 x 6	6,8 - 13,6	120,0	182,0	10
707236	2 x 10	7,8 - 15,8	200,0	254,0	8

Dimensions and specifications may be changed without prior notice.







HELWIND® WK 103w
HELWIND® WK 103k
HELWIND® WK 135-Torsion
HELWIND® WK 137-Torsion
HELWIND® WK 300w-Torsion
HELWIND® WK 305-Torsion
HELWIND® WK H07BN4N4-F WIND-Torison
HELWIND® WK 101 H
HELWIND® WK fire warning cable Torsion
HELWIND® WK-NTSCGEW0EU-Torsion
HELWIND® WK DLO 2kV
HELWIND® WK Powerline ALU
HELWIND® Thermflex 145
HELWIND® WK (N)A2XH

Photo: HELUKABEL®

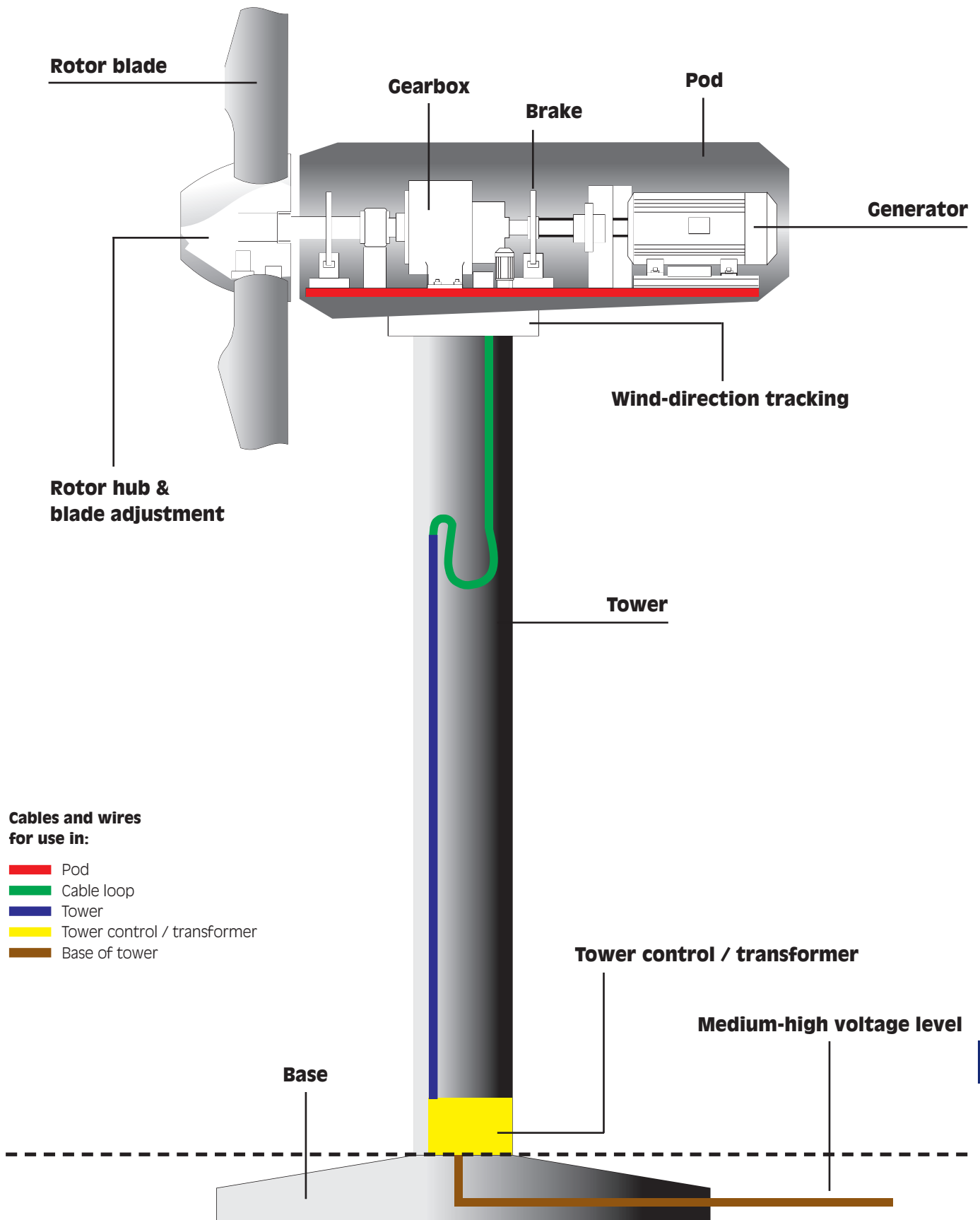
Cables for Wind Power Stations

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Contents

Description	Page
Functional view of Wind Power Station.....	T 22
Selection table Cables & Wires	T 23
HELWIND® WK 103w-T, WK 103w EMV D-T UV-resistant, UL/CSA-Style 10678/21179 Single-/Multicore..... 	T 27
HELWIND® WK 103k-T, WK 103k EMV D-T UV-resistant, UL/CSA-Style 10269/2570 Single-/Multicore, screened/unscreened 	T 28
HELWIND® WK 135-T, WK 135 D-EMV T UV-resistant, UL/CSA-Style** 10553 / 20234, Single-/Multicore 90°C (80°C nach UL), suitable for offshore.... 	T 29
HELWIND® WK 137-T / WK 137 EMV D-T FT4 UV-resistant, suitable for offshore, UL/CSA-Style 10553/20234, Single-/Multicore, 90°C (80°C according to UL) 	T 30
HELWIND® WK 300w-Torsion 1,8/3kV UV-resistant	T 31
HELWIND® WK 305-Torsion 1,8/3kV UV-resistant, suitable for offshore	T 32
HELWIND® WK H07BN4-F WIND-Torsion Torsion +/- 150°/1m, UV-resistant, 750V/ 90°C	T 33
HELWIND® WK 101 H 0,6/1kV halogen-free	T 34
HELWIND® WK Fire Alarm Cable-Torsion halogen-free, FT1, 24V	T 35
HELWIND® WK NTSCGEW0EU-Torsion 3,6 / 6kV	T 36
HELWIND® WK DLO 2kV FT4, UV-resistant, UL44 1kV, 90°C, VW-1, LS, MSHA.....	T 37
HELWIND® WK Powerline ALU 105°C robust 0,6/1kV oder 1,8/3kV.....	T 38
HELWIND® WK THERMFLEX 145 halogen-free, +145°C.....	T 39
HELWIND® WK (N)A2XH 0,6/1kV halogen-free.....	T 40

Functional view of Wind Power Station



Selection table Cables & Wires

Torsion Cables	Usage, see chart on page T 22																				
	UL-Style	CSA	CE	VDE*	fire tests FT4	fire tests FT1 (with FT2)	nominal voltage according to UL	nominal voltage according to VDE	halogen-free	oil resistant II**	oil resistant I	UV-resistant	offshore employment	temp. non-flexing from (in °C)	temp. non-flexing to (in °C)	temp. flexing from (in °C)	temp. flexing to (in °C)	twistable +/- 150° per meter	twistable +/- 140° per meter	twistable +/- 90° per meter	can be found on page
WK 103w-T	10678 21179	cRUus	X			X	1000V	0,6/ 1kV		X (*)	X	X		-40	+90	-35	+90		X		T 27
WK 103w EMV D-T	10678 21179	cRUus	X			X	1000V	0,6/ 1kV		X (*)	X	X		-40	+90	-35	+90			X	T 27
WK 103k-T	10269 2570	cRUus	X			X	1000V	0,6/ 1kV			X	X		-40	+80	-40	+80		X		T 28
WK 103k EMV D-T	10269 2570	cRUus	X			X	1000V	0,6/ 1kV			X	X		-40	+80	-40	+80			X	T 28
WK 135-T	10553 20234	cRUus	X	X	60332 -3		1000V	0,6/ 1kV	X	X		X	X	-40	+90	-40	+90	X			T 29
WK 135 EMV D-T	10553 20234	cRUus	X	X	60332 -3		1000V	0,6/ 1kV	X	X		X	X	-40	+90	-40	+90	X			T 29
WK 137-T FT4	10553 20234	cRUus	X	X	X ^①		1000V	0,6/ 1kV	X	X		X	X	-40	+90	-40	+90	X			T 30
WK 137 EMV D-T	10553 20234	cRUus	X	X	X ^①		1000V	0,6/ 1kV	X	X		X	X	-40	+90	-40	+90	X			T 30
WK 300w-T			X					1,8/ 3kV			X	X		-40	+90	-35	+90		X		T 31
WK 305-T			X		60332 -3			1,8/ 3kV	X	X		X		-40	+90	-40	+90	X			T 32
WK H07BN4-F WIND-T			X					450/ 750V				X		-45	+90	-35	+90	X			T 33
WK 101 H			X					0,6/ 1kV	X		X	X		-50	+100	-40	+90				T 34
WK Fire Alarm Cable-T			X			X		24V	X	X				-50	+90	-40	+80	+/- 215°			T 35
WK NTSCGEWOU-T			X					3,6/ 6kV			X	X		-40	+90	-40	+90		+/- 100°		T 36
WK DLO 2kV	UL 44	X			X	X	2000V					X		-40	+90						T 37
WK Powerline ALU					60332 -3			0,6/ 1kV			X	X	X	-40	+105	-20	+105				T 38
WK Thermflex 145			X					0,6/ 1kV	X			X		-55	+145	-20	+120				T 39
WK (N)A2XH			X		60332 -3			0,6/ 1kV	X			X		-30	+90	-5	+50				T 40

*in preparation

** in accordance with UL 1277, Table 11.2

① for multi-core types

Selection table Cables & Wires

Control Cables	Usage, see chart on page T 22		UL-Style	CSA	CE	HAR	with VDE Reg.-No.	FT1 equivalent to IEC 60332-1	nominal voltage according to UL	nominal voltage according to VDE	halogen-free	oil resistant II	UV-resistant	temp. non-flexing from (in °C)	temp. non-flexing to (in °C)	temp. flexing from (in °C)	temp. flexing to (in °C)	Cu-Shield	can be found on page
	UL-Style	CSA																	
JZ-500					X		X	X		300/500V	X			-40	+80	-15	+80		A 6
F-CY-JZ					X		X	X		300/500V	X			-40	+80	-40	+80		A 27
Y-CY-JZ					X		X	X		300/500V				-40	+80	-5	+80	X	A 32
JZ-500 HMH JZ-500 HMH-C					X			60332-3		300/500V		X		-40	+70	-15	+70	X	A 62 A 71
MEGAFLEX 500 MEGAFLEX 500-C	X	X	X					60332-3	300/600V	300/500V	X	X	X	-40	+80	-30	+90	X	A 64 A 73
JZ-600 JZ-600-Y-CY					X			X		0,6/1kV		X	X	-40	+80	-5	+80	X	A 16 A 36
Single 600-J/-O Single 600-CY -J/-O	X	X	X					X	600 V	0,6/1kV			X	-40	+90	-5	+90	X	N 120 N 121
JZ-600 HMH JZ-600 HMH-C					X			60332-3		0,6/1kV	X	X	X	-40	+70	-15 -5	+70	X	A 66 A 75
JZ-600-UL/CSA JZ-600-Y-CY-UL/CSA	X	X	X					X	1kV	0,6/1kV		X	black	-40	+80	-5	+80	X	N 10 N 20
JZ-602 JZ-602-CY	X	X	X					X	600V			X		-40	+90	-5	+90	X	N 7 N 17
JZ-603 JZ-603-CY	X	X	X	X				X	600V	300/500V		X		-40	+70	-5	+70	X	N 9 N 19
H07RN-F H07RN-F/SOOW	X	X	X	X					600V	450/750V			X	-40	+90				F 6 N 80
HELUTHERM 145 MULTI HELUTHERM 145 MULTI-C					X			60332-3		300/500V to 1,0 mm ² 450/750V from 1,5 mm ²	X	X	X	-55	+145	-35	+120	X	E 5 E 14

Selection table Cables & Wires

Data Cables	Usage, see chart on page T 22		UL-Style	CSA	CE	HAR	with VDE Reg.-No.	FT1 equivalent to IEC 60332-1	nominal voltage according to UL	nominal voltage according to VDE	halogen-free	oil resistant II	UV-resistant	temp. non-flexing from (in °C)	temp. non-flexing to (in °C)	temp. flexing from (in °C)	temp. flexing to (in °C)	Cu-Shield	can be found on page
TRONIC-CY PAAR-TRONIC-CY					X			X		350/ 500V		X		-40 -30	+80	-5	+80	X	B 9 B 11
DATAFLAMM DATAFLAMM-C					X			X		350/ 500V	X			-40	+70	-5	+70	X	B 8 B 23
DATAFLAMM-C-PAAR					X			X		350/ 500V	X			-40	+70	-5	+70	X	B 24
LIYY-UL LIYY-TP-UL	X	X	X						300V			X		-20	+80	-10	+80	X	N 65 N 67
SUPERTRONIC®-PURØ SUPERTRONIC®-C-PURØ					X					350V		X		-40	+70	-5	+70	X	C 33 C 34
SUPERTRONIC®-330 PURØ SUPERTRONIC®-330-C-PURØ	X	X	X				X	300V	300V		X	X		-50	+80	-40	+80	X	N 102 N 103
SUPER-PAAR-TRONIC-C-PUR® SUPER-PAAR-TRONIC 340-C-PUR®	X	X	X				X	300V	350V		X	X		-50	+70	-40	+70	X	C 35 N 104
Single Conductors																			
H07 V-K/(H)07 V-K H05Z-K/H07Z-K					X			X			X			-30 -40	+80 +90	-5	+70		K 8 K 16
FIVENORM	X	X	X				X				X			-40 -55	+90 +145	-5 -35	+90 +120		N 113
HELUTHERM 145 600V HELUTHERM 145 600V UL	X	X	X								X	X		-55	+125	-35	+120		K 22 N 118
TC TRAY CABLES UL/CSA																			
TRAYCONTROL 300	X	X	X				FT4	300				X		-25	+105	-25	+105		N 38
TRAYCONTROL 300-C	X	X	X				FT4	300				X		-25	+105	-25	+105	X	N 40
TRAYCONTROL 300-C TP	X	X	X				FT4	300				X		-25	+105	-25	+105	X	N 44
TRAYCONTROL 500	1277	X	X				FT4	1000				X		-40	+90	-5	+90		N 27
TRAYCONTROL 500-C	1277	X	X				FT4	1000				X		-40	+90	-5	+90	X	N 35
JZ-604 TC TRAY CABLE	1277	X	X				FT4	600				X	X	-25	+90	-5	+90		N 25
JZ-604-YCY TC TRAY CABLE	1277	X					FT4	600				X	X	-25	+90	-5	+90	X	N 34

Selection table Cables & Wires

TC TRAY CABLES UL/CSA	Usage, see chart on page T 22		UL-Style	CSA	CE	HAR	with VDE Reg.-No.	FT1 equivalent to IEC 60332-1	nominal voltage according to UL	nominal voltage according to VDE	halogen-free	oil resistant II	UV-resistant	temp. non-flexing from (in °C)	temp. non-flexing to (in °C)	temp. flexing from (in °C)	temp. flexing to (in °C)	Cu-Shield	can be found on page
	UL-Style	CSA																	
TRAYCONTROL 600			1277	X	X			FT4	1000			X	X	-40	+90	-5	+90		N 30
Communication Cables																			
Industrial Ethernet 105°C			X	X	X			60332-1	300V	100V	X	X	X	-40	+105	-40	+105	X	R 94
Industrial Ethernet S-FTP TORDIERFLEX			X	X	X			60332-1	300V	100V	X	X	X	-20	+80	-20	+80	X	R 99
BUS Cable HELUWIND WK CAN BUS 105°C			X	X	X			X	600V	100V	X	X	X	-40	+105	-20	+60	X	R 133
BUS Cable indoor Profibus SK outdoor			X -	X -	X X			X -	600V -	100V 100V	- X	- -	X X	-40 -40	+70 +70	-5 -5	+60 +60	X X	R 118
BUS Cable Torsion Profibus L2 industry			X -	CMX -	X X			X X	300V -	100V 100V	X X	X X	X X	-40 -40	+75 +70	-25 -5	+75 +60	X X	R 114
AT-V(ZN)Y(ZN)Y AT-V(ZN)H(ZN)11Y			submitted -	submitted -				FT4 submitted -				X X	X X	-40 -40	+90 +90	-40 -40	+90 +90		R 36
Fibre Optic Cable mobile, trailing A-V(ZN)11Y								60332-1			X	X	X	-30	+70	-20	+70		R 34
Fibre Optic Cable mobile A-V(ZN)Y			X	X				FT4				X	X	-30	+80	-20	+80		R 35
Fibre Optic Breakoutcable Industry HCS I-V(ZN)YY			X	X				FT4				X	X	-30	+85	-20	+85		R 44
LWL-Breakoutkabel Industrie HCS I-V(ZN)Y11Y											X	X		-20	+80	-20	+80		R 41
Plastic-fibre Optic cable industry POF/PE I-V2Y, I-V2Y(ZN)11Y								60332-1				X	X	-20	+80	-20	+80		R 46
Fibre Optic Indoor/Outdoor Cable A/I-DQ(ZN)BH								60332-1			X	X	X	-20	+60	-5	+50		R 14
Fibre Optic Outdoor Cable A-DQ(ZN)B2Y (central)												X		-20	+60	-5	+50		R 20
Fibre Optic Outdoor Cable A-DQ(ZN)B2Y (stranded)												X		-20	+60	-5	+50		R 22
Fibre Optic Outdoor Cable A-DQ(ZN)B2Y (stranded, Multi-fibre)												X		-20	+60	-5	+50		R 23

T

HELUWIND® WK 103w-T, WK 103w EMC D-T

UV-resistant, UL/CSA-Style 10678/21179 Single-/Multicore



Technical data

- **Temperature range**
flexing -35 °C up to +90 °C
fixed installation -40 °C up to +90 °C
installation -20 °C up to +90 °C
- **Operating temperature at conductor**
max. +90 °C
- **Nominal voltage**
acc. to VDE U₀/U 0,6/1kV
also for 1500V DC capable
acc. to UL 1000V
- **Test voltage 50 Hz**
3000 V
- **Min. bending radius**
flexing 10 x cable diameter
fixed installation 4 x cable diameter
- **Torsion application**
+/-140 ° per 1 m for unshielded types
+/- 90 ° per 1 m for shielded types
- **Approvals**
UL/CSA-Style 10678/21179
cRUus*, CE compliant
- **Flame test**
FT1

Cable structure

- Special stranded bare copper wires according to IEC 60228
- Special insulation heat-resistant
- Core identification black with numbers + gnye or colour code DIN 47100
- Multicore cores stranded
- Tinned copper wrapped at EMV-shielded types
- Sheath Special compound heat-resistant
- Sheath colour black

Properties

- UV-resistant
- multi-climate operation
- torsion tested
- flame-retardant
- oil-resistant
- recyclable
- easy to tailor

Note

Available cross sections, part no. and prices on request.
Please contact us with your individual requirements via
fax +49 7150 9209-5135.

Application

The HELUWIND® WK series was specifically designed for wind power applications.

We supply the leading wind turbine manufacturers with our cables. No reduction factor for ambient temperature up to +30 °C.

CE= The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

HELUWIND® WK 103k-T, WK 103k EMC D-T

UV-resistant, UL/CSA-Style 10269/2570 Single-/Multicore, screened/unscreened,



Technical data

- **Temperature range**
flexing -40 °C up to +80 °C
fixed installation -40 °C up to +80 °C
installation -40 °C up to +80 °C
- **Operating temperature at conductor**
max. +90 °C
- **Nominal voltage**
acc. to VDE U₀/U 0,6/1kV
also for 1500V DC capable
acc. to UL 1000V
- **Test voltage 50 Hz**
3000 V
- **Min. bending radius**
flexing 10 x cable diameter
fixed installation 4 x cable diameter
- **Torsion application**
+/-140 ° per 1 m for unshielded types
+/- 90 ° per 1 m for shielded types
- **Approvals**
UL-Style 10269/2570
cRUus*, CE compliant
- **Flame test**
FT1

Application

The HELUWIND® WK series was specifically designed for wind power applications.

We supply the leading wind turbine manufacturers with our cables. No reduction factor for ambient temperature up to +30 °C.

CE The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

Cable structure

- Special stranded bare copper wires according to IEC 60228
- Special insulation cold flexing
- Core identification black with numbers + gnye or colour code DIN 47100
- Multicore cores stranded
- Tinned copper wrapped at EMV-shielded types
- Sheath Special compound heat-resistant
- Sheath colour black

Properties

- UV-resistant
- multi-climate operation
- torsion tested
- flame-retardant
- oil-resistant
- recyclable
- easy to tailor

Note

Available cross sections, part no. and prices on request.
Please contact us with your individual requirements via
fax +49 7150 9209-5135.

HELUWIND® WK 135-T, WK 135 D-EMV T

UV-resistant, UL/CSA-Style** 10553 / 20234, Single-/Multicore 90°C (80°C acc. to UL), suitable for offshore



Technical data

- **Temperature range**
flexing -40 °C up to +90 °C
fixed installation -40 °C up to +90 °C
acc. UL up to +80 °C
- **Operating temperature at conductor**
max. +90 °C
- **Nominal voltage**
acc. to VDE U₀/U 0,6/1kV
also for 1500V DC capable
acc. to UL 1000V
- **Test voltage 50 Hz**
3000 V
- **Min. bending radius**
flexing 10 x cable diameter
fixed installation 4 x cable diameter
- **Torsion application**
+/-150 ° per 1m
- **Approvals**
UL-Style 10553/20234
cRUus, CE compliant
- **Flame test**
FT1
IEC 60332-3-24
- **Halogen free**
IEC 60754-1
- **Smoke density**
IEC 61034-1+2

Application

The HELUWIND® WK series was specifically designed for wind power applications.

We supply the leading wind turbine manufacturers with our cables. No reduction factor for ambient temperature up to +50 °C.

CE= The product conforms to the EC low-voltage directive 2006/95/EG.

Advantages of WK 135-T over H07BN4-F:

- Burning behavior as per FT1 and IEC 60332-3-24
- increased wear-resistance
- Recyclable

Dimensions and specifications may be changed without prior notice.

Cable structure

- Special stranded bare copper wires according to IEC 60228
- Special insulation
- Core identification black with numbers + gnye or colour code DIN 47100
- Multicore cores stranded
- Tinned copper wrapped at EMV-shielded types
- Sheath Special compound heat-resistant
- Sheath colour black

Properties

- halogen-free
- Extrem abrasion resistant
- high flame-retardant
- torsion tested
- suitable for Offshore
- extremely oil resistant
- UV resistant
- recyclable
- Multi climate operation
- CCV non-adhesive

Note

The listed part numbers show only a small list of our production range. All types can be produced as Single- or Multicore, screened or unscreened versions. Please contact us with your individual requirements via fax +49 7150 9209-5135.

HELUWIND® WK 137-T / WK 137 EMV D-T_{FT 4}

UV-resistant, suitable for offshore, UL/CSA-Style 10553/20234, Single-/Multicore, 90°C, (80°C according to UL)



new

Technical data

- **Temperature range**
flexing -40 °C up to +90 °C
fixed installation -40 °C up to +90 °C
acc. UL up to +80 °C
- **Operating temperature at conductor**
max. +90 °C
- **Nominal voltage**
acc. to VDE U₀/U 0,6/1kV
also for 1500V DC capable
acc. to UL 1000V
- **Test voltage 50 Hz**
3000 V
- **Min. bending radius**
flexing 10 x cable diameter
fixed installation 4 x cable diameter
- **Torsion application**
+/-150 ° per 1m
- **Approvals**
UL-Style 10553/20234
cRUus, CE compliant
- **Flame test**
FT4
IEC 60332-3-24
- **Halogen free**
IEC 60754-1
- **Smoke density**
IEC 61034-1+2

Application

The HELUWIND® WK series was specifically designed for wind power applications.

We supply the leading wind turbine manufacturers with our cables. No reduction factor for ambient temperature up to +30 °C.

CE The product conforms to the EC low-voltage directive 2006/95/EG.

Advantages of WK 137-T over H07BN4-F:

- Burning behavior CSA FT4 + IEC 60332-3-24
- increased wear-resistance
- Recyclable

Dimensions and specifications may be changed without prior notice.

Cable structure

- Special stranded bare copper wires according to IEC 60228
- Special insulation
- Core identification black with numbers + gnye or colour code DIN 47100
- Multicore cores stranded
- Tinned copper wrapped at EMV-shielded types
- Sheath Special compound heat-resistant
- Sheath colour black

Properties

- halogen-free
- Extrem abrasion resistant
- high flame-retardant
- torsion tested
- suitable for Offshore
- extremely oil resistant
- UV resistant
- recyclable
- Multi climate operation
- CCV non-adhesive

Note

Available cross sections, part no. and prices on request.

Please contact us with your individual requirements via fax +49 7150 9209-5135.

HELWIND® WK 300w-Torsion 1,8/3kV UV-resistant

new



Technical data

- **Temperatur range**
flexing -35 °C to +90 °C
fixed instal. -40 °C to +90 °C
assemgly -20 °C to +90 °C
- **Operating temperature**
max. +90 °C
- **Nominal voltage**
according VDE U₀/U 1,8/3kV
- **Test voltage** 50 Hz
9000 V
- **Min. bending radius**
flexing 10 x Leitungsdurchmesser
fixed instal. 5 x Leitungsdurchmesser
- **Torsion application**
+/-90 ° per 1m

Application

The HELWIND® WK series was specifically designed for wind power applications. We supply the leading wind turbine manufacturers with our cables. No reduction factor for ambient temperature up to +30 °C.

CE= The product conforms to the EC low-voltage directive 73/23EWG bzw. 93/68EWG.

Dimensions and specifications may be changed without prior notice.

Cable structure

- Special stranded bare copper wires according to IEC 60228
- Special insulation
- Core identification black
- Sheath Special compound
- Sheath colour black

Properties

- UV resistant
- Multi climate operation
- torsion tested
- flame retardant
- oil resistant
- recyclable
- easy to tailor

Note

Available cross sections, part no. and prices on request. Please contact us with your individual requirements via fax +49 7150 9209-5135.

HELUWIND® WK 305-Torsion 1,8/3kV UV-resistant, suitable for offshore



Technical data

- **Temperature range**
flexing -35 °C up to +90 °C
fixed installation -40 °C up to +90 °C
- **Operating temperature at conductor**
max. +90 °C
- **Nominal voltage**
U₀/U 1,8/3kV
- **Test voltage 50 Hz**
9000 V
- **Min. bending radius**
flexing 10 x cable diameter
fixed installation 5 x cable diameter
- **Flame retardant**
IEC 60332
- **Halogen free**
IEC 60754-1
- **Smoke density**
IEC 61034-1+2
- **Torsion application**
+/-150 ° per 1m

Cable structure

- Special stranded bare copper wires according to IEC 60228
- Special insulation
- Core identification black
- Sheath Special compound
- Sheath colour black

Properties

- halogen free
- extremely abrasion resistant
- Offshore suitable
- UV resistant
- Multi climate operation
- torsion tested
- flame retardant
- oil resistant
- recyclable
- easy to tailor

Note

Available cross sections, part no. and prices on request.
Please contact us with your individual requirements via
fax +49 7150 9209-5135.

Application

The HELUWIND® WK series was specifically designed for wind power applications. We supply the leading wind turbine manufacturers with our cables. No reduction factor for ambient temperature up to +50 °C.
CE= The product conforms to the EC low-voltage directive 73/23EWG bzw. 93/68EWG.

Dimensions and specifications may be changed without prior notice.

new

T

HELUWIND® WK H07BN4-F WIND-Torsion

Torsion +/- 150°/1m, UV-resistant, 750V/90°C



Technical data

- **Temperature range:**
Ambient temperature at least -45 °C
+90 °C at the conductor
- **Nominal voltage:**
450/750V
- **Test voltage:**
3000V
- **Min. bending radius:**
6 x cable diameter
- **Torsion application:**
+/-150 ° per 1m
- **Approvals:**
CE conformed

Application

The HELUWIND® WK series was specifically designed for wind power applications. We supply the leading wind turbine manufacturers with our cables.

CE= The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

Cable structure

- Special bare stranded copper wire, as IEC 60228
- Special EPR insulation black
- Special EPR Sheath compound
- Sheath colour black

Properties

- UV-resistant

Note

Available cross sections, part no. and prices on request.

Please contact us with your individual requirements via
fax +49 7150 9209-5135.

HELUWIND® WK 101 H 0,6/1kV halogen-free



new

Technical data

- **Temperature range:**
flexing -40 °C to +90 °C
fixed installation acc. to UL -40 °C to +90 °C
assembly -40 °C to +90 °C
- Operation temperature on conductor max. +90 °C
- **Nominal voltage:**
according to VDE U₀/U 0.6/1kV,
according to UL 1000V
- **Test voltage** 50 Hz:
3000 V
- **Min. bending radius:**
10 x cable diameter
- **Torsion application:**
WK135-Torsion up to +/-150 ° per 1m
- **Approvals:**
UL-style** 10553 singlecore types
UL-style** 20234 multicore types
cRUus, CE conformed
- **Flame test:**
FT4* in preparation

Application

The HELUWIND WK 125 and WK 135-Torsion series of cables were specifically designed for use in wind turbines. We supply the leading wind turbines manufacturers with our cables.

Advantages of WK 125 and 135-T over H07BN4-F:

Burning behavior as per FT4 and IEC 60332-3-24
increased wear-resistance. Recyclable

☞ The product conforms to the EC low-voltage directive 2006/95/EC

Dimensions and specifications may be changed without prior notice.

Cable structure

- Special bare stranded copper wire, as. per DIN VDE 0295
- Special conductor insulation
- Conductor colours, black with numbers + gnye
- Cores cabled together by multicore types
- (I) = Screened version optional (EMC)
- Special SSH jacket compound, non-adhesive
- colour: black

Properties

- UV-resistant
- oil-resistant in accordance with UL 1277, Table 11.2 oil resistant II
- non-adhesive
- high flame-retardant
- halogen-free
- Multi climate operation
- Torsion elastic (WK 135-T)
- Extrem abrasion-proof sheath
- Sea water resistant
- recyclable

Note

Available cross sections, part no. and prices on request.

Please contact us with your individual requirements via fax +49 7150 9209-5135.

HELUWIND® WK Fire Alarm Cable-Torsion

halogen-free, FT1, 24V



Technical data

- **Temperature range:**
flexing -40 °C to +80 °C
fixed installation -50 °C to +90 °C
- **Nominal voltage:**
24V
- **Test voltage:**
Conductor/conductor 1500V
conductor/shield 800V
- **Minimum bending radius:**
10 x cable diameter
- **Torsion application:**
3 x 360 ° on 5m
- **Approvals:**
IEC 60332-1, test type B acc. to VDE 0472
Part 804,
CE-conformed
- **Flame test:**
FT1

Application

The HELUWIND® WK series was specifically designed for wind power applications. We supply the leading wind turbine manufacturers with our cables.

CE = The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

Cable structure

- Special stranded bare copper wires according to IEC 60228 cl. 6
- Special Polyester insulation
- Core identification black with numbers 1
- cores stranded
- tinned copper helically wound for EMC screening
- Sheath PUR
- Sheath colour red RAL 3000

Properties

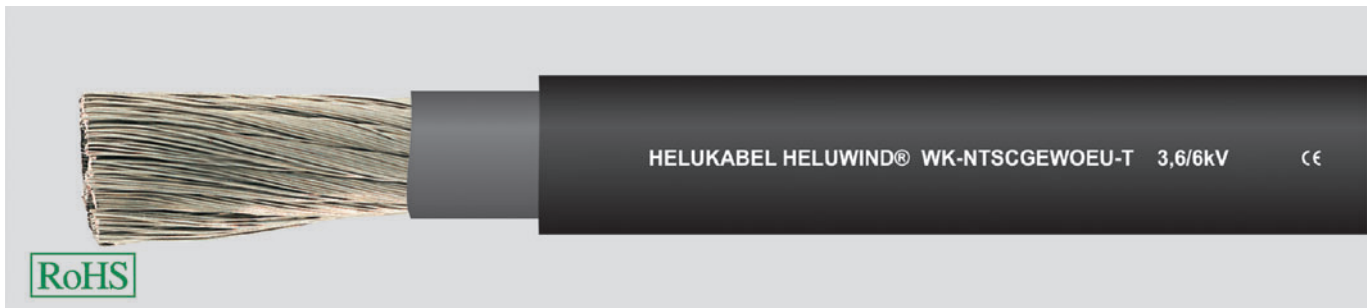
- very good oil and petrol-resistance acc. to DIN VDE 0250 and 0472
- very resistant to acids, alkali and solvents
- extremely abrasion resistant
- halogen free

Note

Available cross sections, part no. and prices on request.

Please contact us with your individual requirements via
fax +49 7150 9209-5135.

HELUWIND® WK-NTSCGEWOEU-Torsion 3,6 / 6kV



Technical data

- **Temperature range**
flexing min. -40 °C
+90 °C at conductor
- **Nominal voltage**
U₀/U 1,8/3kV
- **Test voltage**
10kV
- **Torsion application**
+/-100 ° per 1m free hanging
- **Approvals**
acc. to DIN VDE 0250-813
CE compliant
- **Minimum bending radius**
10x cable diameter

Application

The HELUWIND® WK series was specifically designed for wind power applications. We supply the leading wind turbine manufacturers with our cables.

CE= The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

Cable structure

- Special stranded tinned copper wires according to IEC 60228
- Special EPR insulation
- Core identification black
- conduction layer
- MC or CR Sheath
- Sheath colour black

Properties

- for torsion application
- UV resistant
- Ozon resistant
- Oil resistant

Note

Available cross sections, part no. and prices on request.

Please contact us with your individual requirements via
fax +49 7150 9209-5135.

HELWIND® WK DLO 2kV FT4, UV-resistant, UL44 1kV, 90°C, VW-1, LS, MSHA



Technical data

- **Temperature range:**
flexing -40 °C to +90 °C
- **Nominal voltage:**
DLO 2000V
- **Approvals:**
UL44, CSA, ICEA S-68-516/NEMA WC-8,
MSHA, VW-1, FOR CT USE. LS CERTIFIED
- **Flame test:**
FT4, FT1

Cable structure

- Special tinned stranded copper wire, acc.
to ASTM B-172, ASTM B-33
- Special wrapping
- Special EPR insulation
- Special CPE jacket compound, non-adhesive
- Jacket colour: black

Properties

- UV-resistant

Note

Available cross sections, part no. and prices on request.
Please contact us with your individual requirements via
fax +49 7150 9209-5135.

Application

The HELWIND® WK DLO was specifically designed for wind power applications for nominal voltage up to 2kV.
We supply the leading wind turbine manufacturers with our cables.

CE= The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

HELUWIND® WK Powerline ALU 105°C robust

0,6/1kV or 1,8/3kV



Technical data

- **Temperature range**
flexing -20 °C up to +105 °C
fixed installation -40 °C up to +105 °C
- **Nominal voltage**
acc. to VDE U0/U 0,6/1kV
or 1,8/3kV
- **Test voltage 50 Hz**
2500 V or 9kV
- **Min. bending radius**
flexing 10 x cable diameter
fixed installation 4 x cable diameter
- **Approvals**
in acc. to DIN VDE 0250-813
CE compliant
- **Flame test**
IEC 60332-1

Cable structure

- Special stranded bare copper wires
- Special insulation heat-resistant
- Core identification black
- Sheath Special compound heat-resistant
- Sheath colour black

Properties

- UV resistant
- flame retardant
- oil resistant
- rexcable
- easy to tailor

Note

Our WK Powerline robust with the special shielding is especially for flexing using or for heavy conditions. Please ask for more notes and informations about the properties and the assembly. Available cross sections, part no. and prices on request. Please contact us with your individual requirements via fax +49 7150 9209-5135.

Application

The HELUWIND® WK series was specifically designed for wind power applications. We supply the leading wind turbine manufacturers with our cables.

CE The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

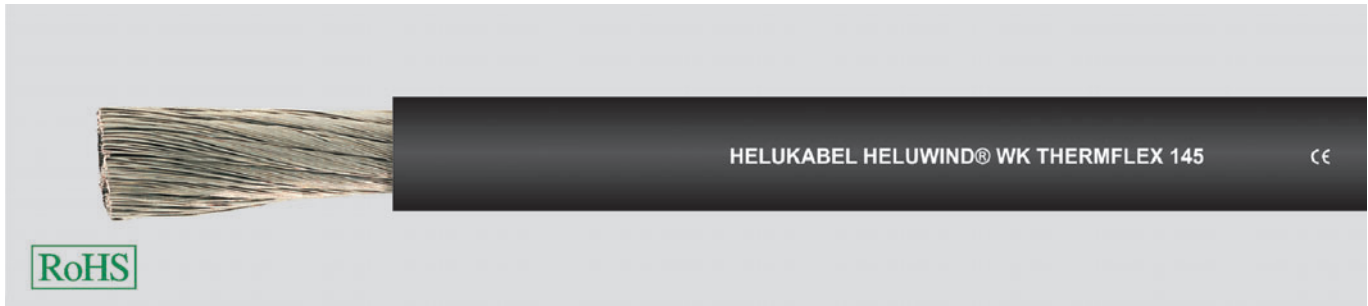
HELUWIND® WK Powerline ALU 0,6/1 kV
HELUWIND® WK Powerline ALU 1,8/3 kV
HELUWIND® WK Powerline ALU robust 0,6/1 kV
HELUWIND® WK Powerline ALU robust 1,8/3 kV
HELUWIND® WK Powerline ALU robust halogen free 0,6/1 kV

All options in burial design possible.

new

T

HELWIND® WK THERMFLEX 145 halogen-free, +145°C



Technical data

- **Temperature range**
flexing -20 °C to +120 °C
non-flexing -55 °C to +145 °C
- **Nominal voltage**
U₀/U 0,6/1 kV
- **Test voltage**
3000 V
- **Insulation resistance**
min. 100 MΩm x km
- **Minimum bending radius**
flexing 12,5-15x cable diameter
fixed installation 4x cable diameter
- **flame retardant**
IEC 60332-3-24 Cat. C

Cable structure

- Tinned stranded copper wire, acc. to IEC 60228 cl.5
- Special insulation, polyolefin-copolymer halogen-free, flame retardant
- Jacket colour black

Properties

- Halogen-free, no release of corrosive or toxic gases
- Reduced propagation of fire
- Minimal smoke generation
- Good abrasion-resistance
- Good oil and weathering resistance
- Resistant to UV radiation and ozone
- Thermal class B
- The materials used are silicone and cadmium-free and free of substances harmful to paint adhesion

Note

Available cross sections, part no. and prices on request.

Please contact us with your individual requirements via
fax +49 7150 9209-5135.

Application

This special cable is used for example as a generator connecting cable in wind-turbines installations.

Other installation uses:

- Connection cable for Heating Class B (130 °C) installations for motors, transformers, relays, coils, electro-magnets, etc.
- Aggregate connections in the automobile industry.
- Halogen-free wiring of switchgear and control cabinets
- Connections for heating equipment.
- Supplies for high power lighting for industry, sports centres and street lighting.

The HELWIND® WK series was specifically designed for wind power applications.

We supply the leading wind turbine manufacturers with our cables.

CE= The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

HELUWIND® WK (N)A2XH 0,6/1kV, halogen-free



Technical data

- **Temperature range**
fixed installation -40 °C to +90 °C
during assembly -5 °C to +50 °C
max. +90 °C at conductor
- **Nominal voltage**
U_o/U 0,6/1kV
also for 1500V DC capable
- **Test voltage 50 Hz**
4kV
- **Approvals**
acc. to VDE
CE compliant
- **Min. bending radius**
15 x cable diameter
- **Flame test**
acc. to DIN VDE 0482 part 266-2, BS 4066,
part 3 / EN 50266-2 /
IEC 60332-3-24 (acc. DIN VDE 0472
Teil 804 cat. C)
- **Smoke density**
acc. DIN VDE 0482 part 268, HD 606,
EN 50268-12 / IEC 61034-12,
BS 7622 Teil 12 (acc. DIN VDE 0472 Teil 816)
- **Corrosivity**
acc. VDE 0482 Teil 267 /
DIN EN 50267-2-2 / IEC 60754-2
(acc. DIN VDE 0472 part 813)
- **Halogen free**
acc. DIN VDE 0482 part 267 / EN 50267-2-1 /
IEC 60754-1
(acc. DIN VDE 0472 part 815)

Application

The HELUWIND® WK series was specifically designed for wind power applications. We supply the leading wind turbine manufacturers with our cables.

CE= The product conforms to the EC low-voltage directive 2006/95/EG.

Dimensions and specifications may be changed without prior notice.

Cable structure

- ALU Conductor acc. IEC 60228 cl. 2
- Special insulation VPE
- Core identification black
- Sheath Polymer compound
- Sheath colour black

Properties

- Halogen-free
- UV resistant

Note

Available cross sections, part no. and prices on request.

Please contact us with your individual requirements via
fax +49 7150 9209-5135.

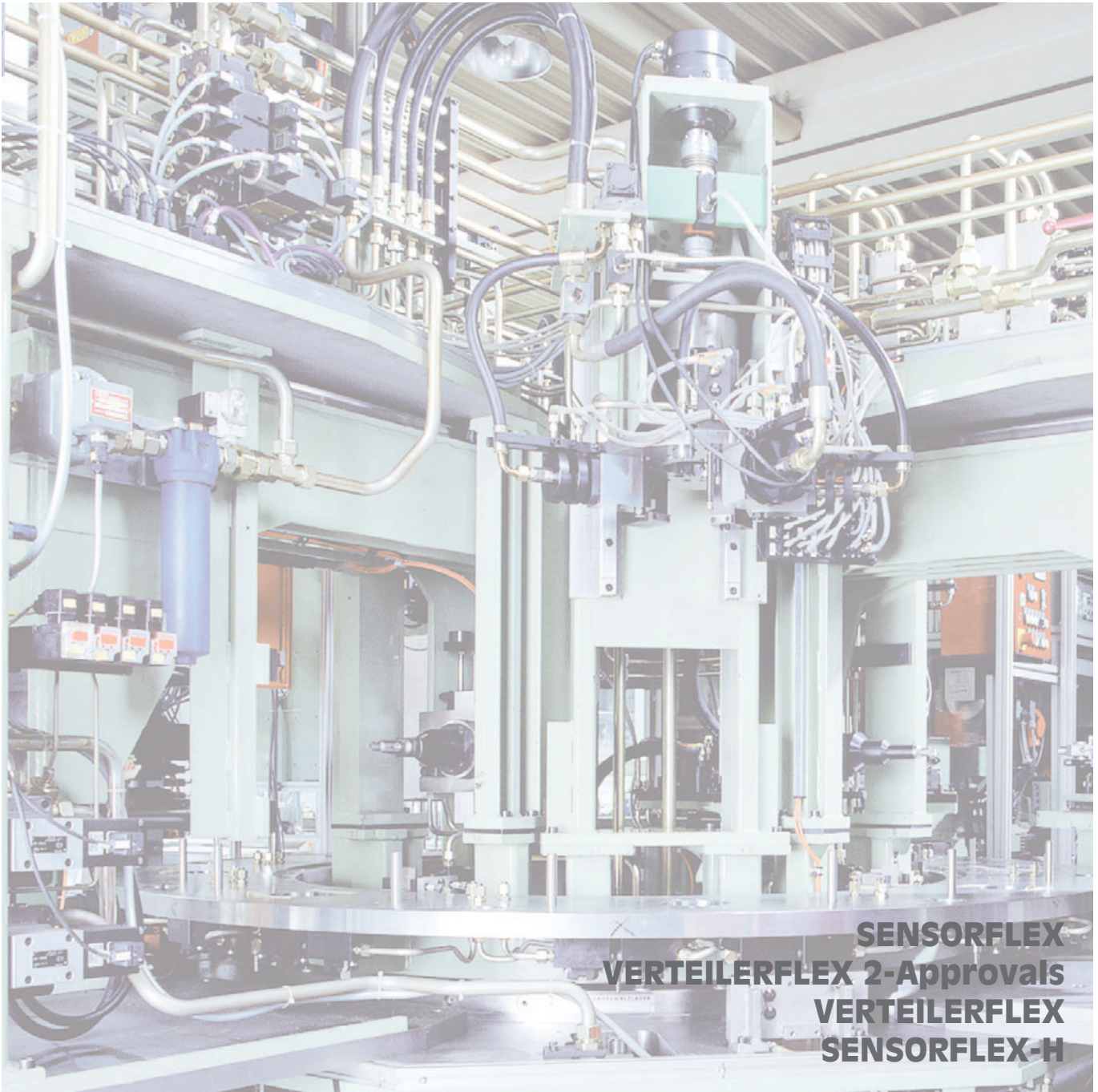


Photo: HELUKABEL®

Sensor actuator and distributor Cables

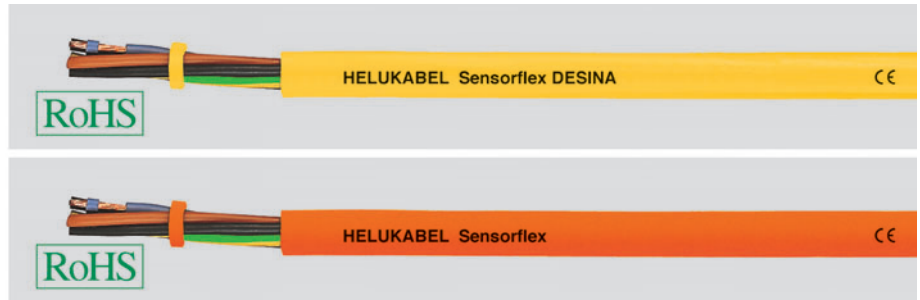
These cables for decentralised installation and control technology are used in plug systems, sensors and actuators.

They constitute an important connecting element between the periphery and the PLC in production systems.

While previously it was necessary to carry out timeconsuming wiring of switchgear cabinets

and machines, now field bus technology has made it possible to move the periphery interfaces from the switchgear cabinets to the machines and systems. The assembled cables offer attractive opportunities for reducing costs, not only in the field of automation technology, but also in the entire manufacturing industry.

SENSORFLEX sensor actuator cable, PVC, PUR, PVC/PUR



Technical data

- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Peak operating voltage**
to 0,25 mm² 350 V
from 0,34 mm² 500 V
- **A.c. test voltage**, 50 Hz
to 0,25 mm² 1200 V
from 0,34 mm² 2000 V
- **Minimum bending radius**
Sensorflex PUR
approx. 7,5x cable ø
Sensorflex PVC/PUR
approx. 7,5x cable ø
Sensorflex PVC
approx. 15x cable ø

Cable structure

- **Sensorflex PVC**
 - Bare copper, fine wire conductors in acc. with DIN VDE 0295 cl. 5 and/or cl. 6 and IEC 60228 cl. 5 and cl. 6
 - PVC core insulation, core colours see below
 - Special PVC sheath
- **Sensorflex PUR**
 - Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6 and/or IEC 60228 cl. 6
 - PVC core insulation, core colours see below
 - PUR sheath
- **Sensorflex PVC/PUR**
 - Construction as above, except
 - PVC inner sheath, with PUR sheath applied over it by means of coextrusion

Properties

- **Sensorflex PVC**
 - Extensively oil resistant.
 - Chemical Resistance - see table Technical Informations
 - PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
 - **Sensorflex PUR**
 - PUR sheath: low adhesion, extremely abrasion resistant, resistant to hydrolysis and microbial attack
 - **Sensorflex PVC/PUR**
 - The cables with the highly flexible stranded conductor, cl. 6, are suitable for drag chain applications
 - These cables are produced to high quality specifications and conform with a yellow sheath to the DESINA®-standard
- Sheath colour yellow (RAL 1021) according to DESINA®**

Note

- All cables can be delivered with UL/CSA approval and Cu shield.
- Desina®: Explanation: see introduction.

Application

For decentralised installation and control technology.

These cables are used in connector systems for sensors and actuators.

In combination with injected circular connectors and installed actuator-sensor boxes, they constitute an important connecting element between the periphery and the PLC in production systems. The assembled cables offer attractive opportunities for reducing costs, not only in the field of automation technology, but also in the entire manufacturing industry.

While previously it was necessary to carry out time-consuming wiring of switchgear cabinets and machines, now field bus technology has made it possible to move the periphery interfaces from the switchgear cabinets to the machines and systems.

Moving the I/O points to the system periphery enables significant reductions in installation costs.

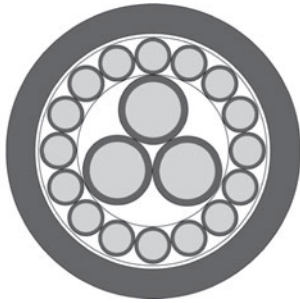
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no. yellow	orange	grey	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76061	76076	73473	3 x 0,25	PVC	brown, blue, black		X	4,4	7,2	22,0	24
76062	76077	73466	3 x 0,25	PUR	brown, blue, black		X	4,4	7,2	22,0	24
76063	76078	73474	4 x 0,25	PVC	brown, blue, black, white		X	4,7	9,6	26,0	24
76064	76079	73471	4 x 0,25	PUR	brown, blue, black, white		X	4,7	9,6	26,0	24
76065	76080	76094	5 G 0,25	PVC	brown, blue, black, white, green-yellow		X	4,8	12,0	30,0	24
76066	76081	76095	5 G 0,25	PVC/PUR	brown, blue, black, white, green-yellow		X	4,8	12,0	30,0	24
76071	76086	73472	3 G 0,34	PVC/PUR	brown, blue, green-yellow		X	4,9	9,8	30,0	22
76070	76085	76099	3 x 0,34	PVC	brown, blue, black		X	4,9	9,8	30,0	22
73485	76087	73568	4 x 0,34	PVC	brown, blue, black, white	X		5,2	13,1	43,0	22
73484	76088	72973	4 x 0,34	PVC/PUR	brown, blue, black, white		X	5,2	13,1	43,0	22
78240	78241	73728	5 x 0,34	PVC	brown, blue, black, white, grey	X		5,9	16,4	54,0	22
76072	76089	73657	5 G 0,34	PVC	brown, blue, black, white, green-yellow	X		5,9	16,4	54,0	22
73870	76090	73548	5 G 0,34	PVC/PUR	brown, blue, black, white, green-yellow		X	5,9	16,4	54,0	22

Dimensions and specifications may be changed without prior notice.

VERTEILERFLEX two-approvals sensor actuator and

distributor cables PVC, PUR, PVC/PUR



Technical data

- Special PVC or PUR sheath acc. to UL Style 2464 for PVC, or UL Style 20233 for PUR
- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Nominal voltage** 300/500 V
- **A.c. test voltage**, 50 Hz
to 0,25 mm² 1200 V
from 0,34 mm² 2000 V
- **Minimum bending radius**
Sensorflex Two approvals PVC approx. 7,5x cable ø
Sensorflex Two approvals PUR approx. 15x cable ø

Cable structure

PVC cables

- Bare copper, fine wire in acc. with DIN VDE 0295 cl. 5 or IEC 60228 cl. 5
- PVC core insulation, core colours see below
- Special PVC

PUR cables

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6 and/or IEC 60228 cl. 6
- PVC core insulation
- Core colours see below
- PUR sheath
- **Part Nos. 79907, 75642, 79850**
- Construction like SENSORFLEX two-approvals, except
- with polypropylene core insulation

Properties

PVC cables

- Extensively oil resistant.
Chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

PUR cables

- Low adhesion, extremely abrasion resistant, resistant to hydrolysis and microbial attack

Special feature

- The cables with the highly flexible stranded conductor, cl. 6, are suitable for drag chain applications
- The types with PVC/PUR sheath material have a PVC inner sheath, with a PUR sheath applied over it by means of coextrusion

Note

- All additional cross-sections, also with UL/CSA approval, are available on request.

Application

For decentralised installation and control technology.

These cables are used in connector systems for sensors and actuators.

In combination with injected circular connectors and installed actuator-sensor boxes, they constitute an important connecting element between the periphery and the PLC in production systems.

The assembled cables offer attractive opportunities for reducing costs, not only in the field of automation technology, but also in the entire manufacturing industry.

While previously it was necessary to carry out time-consuming wiring of switchgear cabinets and machines, now field bus technology has made it possible to move the periphery interfaces from the switchgear cabinets to the machines and systems.

Moving the I/O points to the system periphery enables significant reductions in installation costs.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

SENSORFLEX 2-APPROVALS

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
78284	Grey RAL 7001	3 x 0,25	PUR	brown, blue, black		X	4,4	7,2	18,0	24
79907	Grey RAL 7001	4 x 0,25	PUR	brown, blue, black, white		X	4,7	9,6	18,0	24
78286	Grey RAL 7001	6 x 0,25	PVC	brown, blue, black, white, grey, pink	X		5,2	14,4	36,0	24
76345	Grey RAL 7001	3 x 0,34	PVC	brown, blue, black		X	4,9	9,8	30,0	22
76347	Grey RAL 7001	4 x 0,34	PVC	brown, blue, black, white		X	5,2	13,1	43,0	22
76348	Grey RAL 7001	5 G 0,34	PVC/PUR	brown, blue, black, white, green-yellow	X		5,9	16,4	54,0	22
76349	Grey RAL 7001	5 G 0,34	PVC/PUR	brown, blue, black, white, green-yellow		X	5,9	16,4	54,0	22
79850	Grey RAL 7001	5 G 0,34	PUR	brown, blue, black, white, green-yellow		X	5,9	16,4	54,0	22
78287	Grey RAL 7001	5 G 0,34	PVC/PUR	JZ, black with numbering + greenyellow		X	5,9	16,4	54,0	22
78288	Grey RAL 7001	3 G 0,75	PUR	JZ, black with numbering + greenyellow		X	5,9	21,6	58,0	18
76351	Grey RAL 7001	3 G 0,75	PVC	brown, blue, green-yellow	X		6,7	28,8	88,0	18
73571	Grey RAL 7001	3 G 0,75	PVC	JZ, black with numbering + greenyellow	X		6,7	21,6	58,0	18
75642	Black RAL 9005	3 G 0,75	PUR	JZ, black with numbering + greenyellow		X	5,9	21,6	58,0	18

Continuation ►

VERTEILERFLEX two-approvals sensor actuator and distributor cables PVC, PUR, PVC/PUR



SENSORFLEX 2-APPROVALS

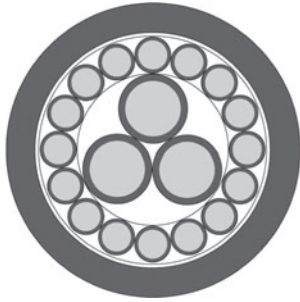
Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
74551	Grey RAL 7001	4 G 0,75	PUR	JZ, black with numbering + greenyellow		X	6,9	29,0	66,0	18
78289	Grey RAL 7001	4 G 0,75	PVC/PUR	JZ, black with numbering + greenyellow	X		7,0	29,0	66,0	18
78290	Grey RAL 7001	2 x 1	PVC	black with number 1-2	X		7,2	19,2	56,0	17
77352	Black RAL 9005	2 x 1	PVC	black with number 1-2	X		7,2	19,2	56,0	17
76350	Grey RAL 7001	11 G 1	PVC/PUR	black with number 1-8, bn, bu, gn, ye	X		12,0	105,6	225,0	17
78291	Grey RAL 7001	2 x 1,5	PVC	brown, blue	X		6,8	29,0	75,0	16
73587	Grey RAL 7001	3 G 1,5	PVC	brown, blue, green-yellow	X		6,9	44,0	94,0	16

Verteilerflex 2-APPROVALS

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76352	Grey RAL 7001	4 G 0,34	PVC/PUR	brown, blue, green-yellow, white, green, yellow, grey		X	8,7	35,0	82,0	22
76353	Grey RAL 7001	6 G 0,34	PVC/PUR	brown, blue, green-yellow, white, green, yellow, grey, pink, red		X	9,1	42,0	106,0	22
75614	Grey RAL 7001	8 G 0,34	PUR	white, red-blue, green, wh-green, yellow, brown-green, gy-pink, brown, blue, green-yellow	X		10,0	65,0	143,0	22
76354	Grey RAL 7001	8 G 0,34	PVC/PUR	brown, blue, green-yellow, white, green, yellow, grey, pink, red, black, violet		X	9,1	48,0	110,0	22
76355	Grey RAL 7001	12 G 0,34	PVC/PUR	brown, blue, gnye, gnwh, white, rdbu, green, whgn, yellow, bngn, grey, whye, pink, yebr, red		X	10,3	61,0	138,0	22
76356	Grey RAL 7001	16 G 0,34	PVC/PUR	bn, bu, gnye, gnwh, wh, rdbu, gn, whgn, ye, bngn, gy, whye, pk, yebr, rd, whgy, bk, gybn, vt		X	10,5	74,0	170,0	22

Dimensions and specifications may be changed without prior notice.

VERTEILERFLEX for sensor actuator distributor boxes, PVC, PUR or PVC/PUR



Technical data

- **Temperature range**
flexing -5 °C to +80 °C
fixed installation -30 °C to +80 °C
- **Operating voltage**
U₀/U 300/500 V
- **A.c. test voltage**, 50 Hz
2000 V
- **Minimum bending radius**
highly flexible approx. 7,5x cable ø
flexibel approx. 15x cable ø

Cable structure

PVC cables

- Bare copper, fine wire conductors in acc. with DIN VDE 0295 cl. 5 and/or cl. 6 and/or IEC 60228 cl. 5 and cl. 6
- PVC core insulation
- Core colours see below
- Special PVC sheath

PUR cables

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl. 6 and IEC 60228 cl. 6
- PVC core insulation
- Core colours see below
- PUR sheath

Properties

PVC cables

- Extensively oil resistant.
Chemical Resistance - see table Technical Informations
- PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

PUR cables

- Low adhesion, extremely abrasion resistant, resistant to hydrolysis and microbial attack

Special feature

- The cables with the highly flexible stranded conductor, cl. 6, are suitable for drag chain applications
- The types with PVC/PUR sheath material have a PVC inner sheath, with a PUR sheath applied over it by means of coextrusion

Note

- All cables can be delivered with UL/CSA approbation and Cu shield.
- Further core numbers, cross-sections and sheath colours available on request.

Application

These cables are used in connector systems for sensors and actuators.

In combination with injected circular connectors and installed actuator-sensor boxes, they constitute an important connecting element between the periphery and the PLC in production systems.

The assembled cables offer attractive opportunities for reducing costs, not only in the field of automation technology, but also in the entire manufacturing industry.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no. black	grey	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76105	76115	4 G 0,34	PVC	brown, blue, black, white, green-yellow	X		5,8	18,0	58,0	22
76639		4 G 0,34	PVC/PUR	yellow, white, green, grey, green-yellow, brown, blue		X	8,7	36,0	82,0	22
76107	73574	6 G 0,34	PVC/PUR	white, green, yellow, grey, pink, red, brown, blue, green-yellow		X	9,1	42,0	106,0	22
72961	73993	8 G 0,34	PVC/PUR	grey, pink, red, black, violet, white, green, yellow, brown, blue, green-yellow		X	9,1	48,0	110,0	22
76109	74729	8 x 0,34	PVC	white, green, yellow, grey, pink, red, black, violet, blue, brown	X		9,1	41,0	107,0	22
76110	72951	8 x 0,34	PUR	white, green, yellow, grey, pink, red, black, violet, blue, brown		X	9,1	41,0	107,0	22
76108	76117	8 x 0,34	PVC/PUR	white, green, yellow, grey, pink, red, black, violet, blue, brown		X	8,8	36,0	102,0	22
71254	76118	11 x 0,34	PVC	black with number 1-2+DIN 47100	X		10,0	65,0	143,0	22
76111	76119	12 x 0,34	PVC/PUR	pink, yebrn, red, gypk, white, rdbu, green, whgn, yellow, bngn, gy, whye		X	10,3	61,0	138,0	22
	77642	16 G 0,34	PVC/PUR	blue with no:1-2 + gnye, gypk, wh, rdbu, gn, whgy, ye, bngy, whye, pk, yebrn, rd, whgy, bk, gybn, vt		X	12,5	89,0	193,0	22
76112	76120	16 G 0,34	PVC/PUR	bn, gypk, rdbu, whgn, bngn, whye, yebrn, gybn, bu, wh, gn, ye, gy, pk, rd, bk, vt, gnye		X	10,5	74,0	170,0	22
76113	76121	8 G 0,5	PUR	brown, blue, green-yellow, grey-pink, red-blue, white-green, brown-green, white, green, yellow, grey		X	9,9	68,0	136,0	20
76114	76122	12 G 0,5	PUR	gypk, rdbu, whgn, bngn, whye, yebrn, white, green, yellow, grey, pink, red, brown, blue, gnye		X	10,4	87,0	160,0	20
	79921	14 x 0,5	PVC	Black, with printing BR1, BR2, BL1, BL, numbers 1-14	X		12,3	125,0	201,0	20
76640		16 G 0,5	PVC/PUR	gy, bngn, gn, rdbu, gypk, wh, whgn, whgy, bk, whye, pk, ye, rd, yebrn, vt, gybn, gnye, bn, bu		X	11,6	106,0	183,0	20
74034	76123	16 G 0,5	PUR	gypk, wh, rdbu, gn, whgn, ye, bngn, gy, whye, pk, yebrn, rd, whgn, bk, vt, bn, bu, gnye		X	11,6	106,0	183,0	20

Dimensions and specifications may be changed without prior notice.

SENSORFLEX-H sensor actuator cables, halogen-free, high flexible drag chain cable, PUR, mantle EVA +125°C



Technical data

- Temperature range**
 Li12Y11Y/Li9Y11Y
 flexing -30 °C to +80 °C
 fixed installation -40 °C to +80 °C
 Li4G4G
 flexing -25 °C to +125 °C
 fixed installation -40 °C to +125 °C
- Operating voltage**
 up to 0,25 mm² 350 V
 0,34 mm² and greater 500 V
- A.c. test voltage**, 50 Hz
 up to 0,25 mm² 1200 V
 0,34 mm² and greater 2000 V
- Minimum bending radius**
 Sensorflex-H Li12Y11Y
 Approx. 5x cable ø
 Sensorflex-H Li9Y11Y
 Approx. 7,5x cable ø
 Sensorflex-H Li4G4G
 Approx. 15x cable ø

Application

For decentralised installation and control technology.

These cables are used in connector systems for sensors and actuators.

In combination with injected circular connectors and installed actuator-sensor boxes, they constitute an important connecting element between the periphery and the PLC in production systems.

The assembled cables offer attractive opportunities for reducing costs, not only in the field of automation technology, but also in the entire manufacturing industry.

While previously it was necessary to carry out time-consuming wiring of switchgear cabinets and machines, now field bus technology has made it possible to move the periphery interfaces from the switchgear cabinets to the machines and systems.

Moving the I/O points to the system periphery enables significant reductions in installation costs.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

SENSORFLEX-H (Li12Y11Y) high flexible drag chain cable, PUR

Part no. black	grey	Cable structure No.cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76283	76299	2 x 0,25	PUR	brown, blue		X	4,4	4,8	22,0	24
76284	76300	3 x 0,25	PUR	brown, blue, black		X	4,4	7,2	22,0	24
76285	76301	4 x 0,25	PUR	brown, blue, black, white		X	4,7	9,6	26,0	24
76286	76302	5 x 0,25	PUR	brown, blue, black, white, grey		X	4,8	12,0	30,0	24
76287	76303	2 x 0,34	PUR	brown, blue		X	4,9	6,5	30,0	22
76288	76304	3 x 0,34	PUR	brown, blue, black		X	4,9	9,8	30,0	22
76289	76305	4 x 0,34	PUR	brown, blue, black, white		X	5,2	13,1	43,0	22
76290	76306	5 x 0,34	PUR	brown, blue, black, white, grey		X	5,9	16,4	54,0	22
78265	78266	5 G 0,34	PUR	brown, blue, black, white, green-yellow		X	5,9	16,4	54,0	22
76291	76307	2 x 0,5	PUR	brown, blue		X	5,0	9,6	40,0	20
78267	78268	3 G 0,5	PUR	JZ, black with numbering + greenyellow		X	5,7	14,4	43,0	20
76292	76308	3 x 0,5	PUR	brown, blue, black		X	5,0	14,4	40,0	20
76293	76309	4 x 0,5	PUR	brown, blue, black, white		X	5,5	19,2	47,0	20
76294	76310	5 x 0,5	PUR	brown, blue, black, white, grey		X	6,0	24,0	55,0	20

Continuation ▶

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SENSORFLEX-H sensor actuator cables, halogen-free, high flexible drag chain cable, PUR, mantle EVA +125°C



SENSORFLEX-H (Li12Y11Y) high flexible drag chain cable, PUR

Part no. black	grey	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76295	76311	2 x 0,75	PUR	brown, blue		X	5,7	14,4	47,0	18
78269	78270	3 G 0,75	PUR	brown, blue, green-yellow		X	5,9	21,6	54,0	18
76296	76312	3 x 0,75	PUR	brown, blue, black		X	5,9	21,6	54,0	18
78271	78272	4 G 0,75	PUR	brown, blue, black, green-yellow		X	6,2	28,8	67,0	18
76297	76313	4 x 0,75	PUR	brown, blue, black, white		X	6,0	28,8	66,0	18
78273	78274	5 G 0,75	PUR	JZ, black with numbering + greenyellow		X	7,0	36,0	80,0	18
76298	76314	5 x 0,75	PUR	brown, blue, black, white, grey		X	7,0	36,0	80,0	18

SENSORFLEX-H (Li9Y11Y) high flexible drag chain cable, PUR

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75801	Grey RAL 7001	3 x 0,25	PUR	brown, blue, black		X	4,5	7,2	22,0	24
77468	Grey RAL 7001	4 x 0,25	PUR	brown, blue, black, white		X	4,7	9,6	26,0	24
76705	Grey RAL 7001	8 x 0,25	PUR	DIN 47100		X	6,0	19,2	49,0	24
77427	Grey RAL 7001	4 x 0,34	PUR	brown, blue, black, white		X	4,9	13,1	43,0	22
77428	Grey RAL 7001	3 G 0,75	PUR	JZ, black with numbering + greenyellow		X	6,2	21,6	54,0	18
78275	Grey RAL 7001	3 x 0,75	PUR	JZ, black with numbering + greenyellow		X	6,2	21,6	54,0	18
77429	Grey RAL 7001	4 G 0,75	PUR	JZ, black with numbering + greenyellow		X	6,2	28,8	66,0	18

SENSORFLEX-H (Li4G4G) unqualified for drag chain cable, sheath EVA

Part no.	Jacket colour	Cable structure No. cores x cross-sec. mm ²	Jacket material	Core colours	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
78359	Red-brown RAL 8016	4 G 0,75	EVA	brown, blue, black, green-yellow	X		7,0	28,8	65,0	18
73575	Red-brown RAL 8016	3 G 1	EVA	brown, blue, green-yellow	X		7,0	29,0	60,0	17

Dimensions and specifications may be changed without prior notice.



AIRPORT 400 Hz

Photo: HELUKABEL®

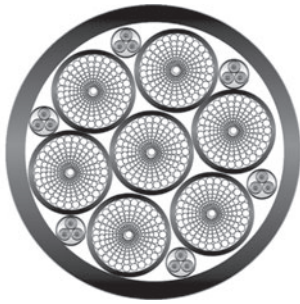
Cables for airport 400 Hz

Special cable for drum reeling purpose meeting the highest mechanical stresses. Mobile cable in flexible feeds in 400 Hz units, especially as aircraft feeder line on airports. The qualified employees of our special cable department will give individual advice and assistance to develop and construct your cable.

Your personal advice is important to us in order that we can offer you the right cable for your purpose. Depending on the cable type these special cables can be offered with a minimum length of 100 m, with short delivery periods.

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AIRPORT 400 Hz trailing, PUR, halogen-free, flame retardant



Technical data

- **Temperature range**
-40 °C to +90 °C
- **Nominal voltage**
115/200 V
- **Operating voltage**
U₀/U 0,6/1 kV
- **Test voltage**
4000 V
- **Bending radius**
flexing 7x cable ø
fixed installation 4x cable ø

Cable structure

- Fine copper wire in acc. with DIN VDE 0295 and IEC 60228
- Core insulation TPE, black with number 1-6 + blue/..., with number 7-30/1 mm²
- 4 cores each 1 mm² twisted to a quad
- Cores and 6 bundles laid-up together
- PUR inner sheath
- Support braiding
- PUR outer sheath, orange (RAL 2003)

Part No. 75992

- Bare copper conductor, 7 strands
- Core insulation cross-linked polyethylene, black with number 1-6 + grey
- Polyethylene inner sheath
- Concentric conductor of plain Cu wires, cross-section 35 mm²
- Black polyethylene outer sheath

Properties

- Low adhesion, abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack

Special feature:

The use of four-core cables to transmit large amounts of power in a 400 Hz grid results in voltage asymmetries and larger inductive voltage losses. These unfavourable cable characteristics can be improved through the employment of seven-core cables. In this case the central core is used as a protective or earth conductor (green/yellow or blue) and six cores with the same cross-section (black with imprint) stranded in a single layer around the central core. Each pair of two opposite cores is connected in parallel to a phase conductor.

Note

- Distribution only over authorised partner

Application

400 Hz cables are used to supply power to aircraft (on-board power), data processing systems, radar stations, radio stations, etc. For safety reasons, 400 Hz cables are used to connect data processing systems, radar systems and communications systems to uninterruptible power supplies. Such power supplies prevent a total failure of power and compensate for frequency and voltage fluctuations. Suitable for installation indoors, outdoors.

Applications:

Below floor level cable dispensers (drums), attached to jetways and retractable articulated cable carries.

☑= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
700573	7 x 25 + 6 x 4 x 1,0	41,0	1910,0	2140,0	4
770009	7 x 35 + 6 x 4 x 1,0	45,5	2625,0	2950,0	2
700574	7 x 50 + 6 x 4 x 1,0	51,0	3590,0	4030,0	1

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75992	7 G 35	35,8	2746,0	3050,0	2

Dimensions and specifications may be changed without prior notice.

AIRPORT 400 Hz trailing, PUR, halogen-free, flame retardant



Technical data

- **Temperature range**
-40 °C to +90 °C
- **Nominal voltage**
115/200 V
- **Operating voltage**
 U_0/U 0,6/1 kV
- **Test voltage**
4000 V
- **Bending radius**
approx. 6x cable ø

Cable structure

- Part Nos. 700566-700569**
- Fine copper wire in acc. with DIN VDE 0295 and IEC 60228
 - Special plastic core insulation
 - Sheath colour yellow (RAL 1021)
- Part Nos. 700570, 770001-770003**
- Fine copper wire in acc. with DIN VDE 0295 and IEC 60228
 - Core insulation TPE, grey with number 1-4/1 mm²
 - Core 1 mm² stranded with bundle conductor
 - Double-sheath TPE/PUR
 - Sheath colour yellow (RAL 1021)
- Part Nos. 700571, 770005, 770004, 700572**
- Each set of 4 parts, 700570, 770001-770003, is stranded

Properties

- Part Nos. 700570, 770001-770003**
- Low adhesion, abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack

Note

- Distribution only over authorised partner

Application

400 Hz cables are used to supply power to aircraft (on-board power), data processing systems, radar stations, radio stations, etc. For safety reasons, 400 Hz cables are used to connect data processing systems, radar systems and communications systems to uninterruptible power supplies. Such power supplies prevent a total failure of power and compensate for frequency and voltage fluctuations. Suitable for installation indoors, outdoors. Highly flexible, and can thus be plugged directly into the connector in the aircraft without an adapter, and without endangering the contacts.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
700566	1 x 35	11,5	336,0	430,0	2	700571	4 x 1 x 35 + 4 x 1,0	33,0	1498,0	2600,0	2
700570	1 x 35 + 4 x 1,0	14,0	375,0	490,0	2	770005	4 x 1 x 50 + 4 x 1,0	40,0	2074,0	3900,0	1
770001	1 x 50 + 4 x 1,0	17,0	519,0	600,0	1	770004	4 x 1 x 70 + 4 x 1,0	50,0	2844,0	4300,0	2/0
700567	1 x 50	12,6	480,0	665,0	1	700572	4 x 1 x 120 + 4 x 1,0	56,0	4765,0	7400,0	4/0
700568	1 x 70	14,0	672,0	910,0	2/0						
770002	1 x 70 + 4 x 1,0	18,7	711,0	800,0	2/0						
770003	1 x 120 + 4 x 1,0	25,0	1191,0	1400,0	4/0						
700569	1 x 120	23,0	1152,0	1545,0	4/0						

Dimensions and specifications may be changed without prior notice.



Photo: HELUKABEL®

Truck Cables

These low-voltage cables are designed for the wiring of electrical installations in the manufacture of commercial vehicles.

HELUTRUCK® 270 with ADR-approval, PVC low voltage cable for commercial vehicles



Technical data

- **Temperature range**
-40 °C to +85 °C
- **Test voltage**
2000 V min. 5 minutes
- **Capacitance**
max. 50 pF/m for the data pair
max. 100 pF/m between data pair cores and the other cores
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
approx. 12x cable ø

Cable structure

- Bare copper, fine wire in acc. with DIN VDE 0295 cl. 5 or IEC 60228 cl. 5
- Cold-resistant special PVC core insulation
- Core coding:
up to 9 cores by colour,
10 cores and above white with numbers (see below)
- Special PVC sheath
- Colour black

Properties

- Cold-resistant special PVC sheath, UV-resistant
 - Largely resistant to oil, weather, and chemicals;
Chemical resistance see table Technical Information
 - PVC self-extinguishing and flame retardant, test method B according to VDE 0472 part 804 and IEC 60332-1
 - **These cables conform to the national standard ISO 4141 and the international standard DIN/ISO 6722**
 - **Component codes Tü.EGG.073-03**
- Special feature:**
- Complies with GGVS regulations
 - Approved and tested by the TÜV technical inspectorate

Application

These low-voltage cables are designed for the wiring of electrical installations in the manufacture of commercial vehicles. Especially suitable for trailers and semitrailers.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
700016	2 x 0,5	4,8	9,6	40,0	20
700575	2 x 0,75 + 2 x 1,5	7,0	43,2	91,0	18
700582	7 x 0,75	7,3	50,4	101,0	18
75255	2 x 1	6,0	19,2	56,0	17
75254	2 x 1	6,0	19,2	56,0	17
75256	3 x 1	6,3	28,8	66,0	17
700578	3 x 1	6,6	28,8	66,0	17
75257	4 x 1	6,8	38,4	80,0	17
75260	5 x 1 + 1 x 2,5	9,0	72,0	132,0	17
75258	5 x 1	7,5	48,0	98,0	17
700580	5 x 1 + 1 x 2,5	9,0	72,0	132,0	17
75259	5 x 1 + 1 x 2,5	9,0	72,0	132,0	17
700581	5 x 1 + 1 x 2,5	9,0	72,0	132,0	17
700576	2 x 1,5	6,6	28,8	66,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
700577	2 x 1,5	6,6	28,8	66,0	16
700579	4 x 1,5	7,5	57,6	106,0	16
75262	6 x 1,5 + 1 x 2,5	10,3	110,5	187,0	16
700032	7 x 1,5	10,3	100,8	185,0	16
75261	7 x 1,5	8,9	100,2	165,0	16
75263	8 x 1,5 + 1 x 2,5	11,7	139,2	238,0	16
700583	8 x 1,5 + 5 x 2,5	14,8	235,2	360,0	16
75267	9 x 1,5 + 4 x 2,5	14,8	200,0	350,0	16
75265	10 x 1,5 + 3 x 2,5	14,4	215,0	366,0	16
75319	10 x 1,5 + 3 x 2,5 + 2 x 1,5	14,4	244,8	393,0	16
700017	10 x 1,5 + 3 x 2,5 + 2 x 1,5	14,3	244,8	391,0	16
75266	10 x 1,5 + 3 x 2,5	13,0	216,0	345,0	16
700018	11 x 1,5 + 3 x 2,5	13,5	230,4	365,0	16
700142	3 x 2,5 + 4 x 1,5	10,3	129,6	221,0	14

Dimensions and specifications may be changed without prior notice.

Part No.	Core colours	Part No.	Core colours
700016	white, black	75263	black, yellow, red, green, brown, blue, grey, violet/1,5 mm ² , white/2,5 mm ²
700575	white, brown/0,75 mm ² ; green, yellow/1,5 mm ²	700583	yellow, blue, green, brown, red, black, pink, white-blue/1,5 mm ² ; white, orange, grey, white-black, white-red/2,5 mm ²
75254	white, black	75267	white with black numbers, nos. 2, 4-8, 10-12/1,5 mm ² , nos. 1, 3, 9, 13/2,5 mm ²
75255	white, brown	75319	white with black numbers, nos. 1-3, 5-8, 10-12/1,5 mm ² , nos. 4, 9, 13/2,5 mm ² , data pair nos. 14-15/1,5 mm ²
700576	white, black	700017	white-blue, white-black, white-brown, white-green, yellow, green, blue, black, brown, red, violet, grey/1,5 mm ² , white, orange, white-red/2,5 mm ²
700577	white, brown	75265	white with black numbers, like part no. 75319 without data pair
700578	white, brown, blue	75266	white with black numbers, nos. 1, 2, 4-8, 10-12/1,5 mm ² ; nos. 3, 9, 13/2,5 mm ²
75256	black, blue, brown	700018	white-brown, white-green, orange, white-red, white-blue, white-black pink, blue, yellow, green, red/1,5 mm ² , white, brown, black/2,5 mm ²
75257	white, black, red, brown	700142	white-brown, grey, yellow, red/1,5 mm ² , wh.bn,bk/2,5 mm ²
700579	white, black, red, brown		
75258	white, brown, green, red, grey		
75259	green, brown, red, blue, violet/1,0 mm ² ; white/2,5 mm ²		
75260	yellow, black, red, blue, violet/1,0 mm ² ; white, 2,5 mm ²		
700580	brown, green, red, grey, violet/1,0 qmm; white/2,5 mm ²		
700581	brown, yellow, red, grey, violet/1,0 qmm; white/2,5 mm ²		
700582	white, black, yellow, red, green, brown, blue		
75261	white, black, yellow, red, green, brown, blue		
700032	pink, blue, orange, white-red, white-green, white-blue, white-black		
75262	black, yellow, red, green, brown, blue/1,5 mm ² , white/2,5 mm ²		

HELUTRUCK® 271 with ADR-approval, PUR low voltage cable for commercial vehicles



Technical data

- **Temperature range**
-40 °C to +85 °C
- **Test voltage**
2000 V min. 5 minutes
- **Capacitance**
max. 50 pF/m for the data pair
max. 100 pF/m between data pair cores and the other cores
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
approx. 12x cable ø

Cable structure

- Bare copper, fine wire in acc. with DIN VDE 0295 cl. 5 or IEC 60228 cl. 5
- Cold-resistant special PVC core insulation
- Core coding:
up to 9 cores by colour,
10 cores and above white with numbers (see below)
- Inner sheath from special PVC
- PUR outer sheath
- Colour black
- Also available with PVC sheath

Properties

- PUR outer sheath, low adhesion, abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack
- **These cables conform to the national standard ISO 4141 and the international standard DIN/ISO 6722**
- **Component codes Tü.EGG.074-03**
- **Special feature:**
 - Complies with GGVS regulations
 - Approved and tested by the TÜV technical inspectorate
 - PUR sheath provides high resistance to abrasion, UV and wear

Application

These low-voltage cables are designed for the wiring of electrical installations in the manufacture of commercial vehicles. Especially suitable for trailers and semitrailers manufactured for the transport of GGVS hazardous substances.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

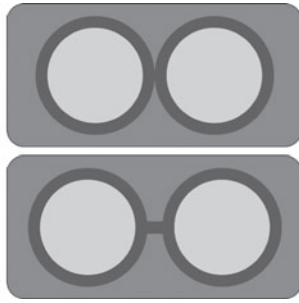
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75528	2 x 1	6,0	19,0	56,0	17
700585	2 x 0,75 + 2 x 1,5	7,0	43,2	91,0	18
75529	2 x 1	6,0	19,0	56,0	17
700586	2 x 1,5	6,6	28,8	67,0	16
700587	2 x 1,5	6,6	28,8	67,0	16
75932	2 x 4 + 3 x 1,5 + 2 x 1,5	12,0	148,8	230,0	12
75541	2 x 6 + 3 x 1,5 + 2 x 1,5	12,0	187,2	320,0	10
75540	2 x 6 + 3 x 1,5	12,0	158,6	270,0	10
75530	3 x 1	6,3	28,8	66,0	17
700588	3 x 1	6,3	28,8	66,0	17
75531	4 x 1	6,8	38,5	80,0	17
700589	4 x 1,5	7,5	57,6	105,0	16
75532	5 x 1	7,5	48,1	98,0	17

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
700591	5 x 1 + 1 x 0,25	9,0	72,0	132,0	17
75533	5 x 1 + 1 x 2,5	9,0	72,0	132,0	17
700590	5 x 1 + 1 x 2,5	9,0	72,0	132,0	17
75534	5 x 1 + 1 x 2,5	9,0	72,0	132,0	17
75536	6 x 1,5 + 1 x 2,5	10,3	110,4	187,0	16
700592	7 x 0,75	7,9	50,4	100,0	18
75535	7 x 1,5	8,9	100,8	165,0	16
75537	8 x 1,5 + 1 x 2,5	11,7	139,2	238,0	16
75539	10 x 1,5 + 3 x 2,5	14,4	214,0	366,0	16
700594	10 x 1,5 + 3 x 2,5	14,4	214,0	366,0	16
75538	10 x 1,5 + 3 x 2,5 + 2 x 1,5	14,4	244,8	393,0	16
700595	18 x 1,5	17,0	259,2	520,0	16
700596	25 x 1,5	19,9	360,0	730,0	16

Dimensions and specifications may be changed without prior notice.

Part No.	Core colours	Part No.	Core colours
75528	white, black	75536	black, yellow, red, green, brown, blue/1,5 mm ² , white/2,5 mm ²
75529	white, brown	75537	black, yellow, red, green, brown, blue, grey, violet/1,5 mm ² , white/2,5 mm ²
700585	white, brown/0,75 mm ² ; green yellow/1,5 mm ²	75538	white with black numbers, nos. 1-3, 5-8, 10-12/1,5 mm ² , nos. 4, 9, 13/2,5 mm ² , data pair nos. 14-15/1,5 mm ²
700586	white, black	75539	white with black numbers, like part no. 75319 except without data pair
700587	white, brown	700594	yellow, green, blue, black, brown, red, pink, grey, white-black, white-blue/1,5 mm ² ; white, orange, white-red/2,5 mm ²
700588	white, brown, blue	75540	red, brown/6 mm ² ; black, yellow, white/1,5 mm ²
75530	black, blue, brown	75541	red, brown/6 mm ² ; black, yellow, white/1,5 mm ² ; data pair white-grey/white brown/1,5 mm ²
75531	white, black, red, brown	75932	red, brown/4 mm ² ; black, yellow, white/1,5 mm ² ; data pair white-grey/white brown/1,5 mm ²
700589	white, black, red, brown	700595	white with black numbers
75532	white, brown, green, red, grey	700596	white with black numbers
75533	green, brown, red, blue, violet/1,0 mm ² ; white/2,5 mm ²		
75534	yellow, black, red, blue, violet/1,0 mm ² ; white/2,5 mm ²		
700590	brown, green, red, grey, violet/1,0 mm ² ; white/2,5 mm ²		
700591	brown, yellow, red, grey, violet/1,0 mm ² ; white/2,5 mm ²		
700592	white, black, yellow, red, green, brown, blue		
75535	white, black, yellow, red, green, brown, blue		

HELUTRUCK® 272 / 273 Flat cable for the sideways lighting with GGVS-authorization, Battery cable, battery charging cable



Technical data

HELUTRUCK® 272

- **Temperature range**
-40 °C to +85 °C
- **Test voltage**
2000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
fixed installation 5x cable ø

HELUTRUCK® 273

- **Temperature range**
-40 °C to +85 °C
- **Nominal voltage**
75 V DC
- **Test voltage**
3000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius**
fixed installation 15x cable ø

Cable structure

HELUTRUCK® 272

- Bare copper wire conductors in acc. with DIN VDE 0295 cl. 5 or IEC 60228 cl. 5
- Special PVC core insulation, cold-resistant
- Core colours white, brown (Part No. 76706), white, black (Part No. 78983, 700035)
- Cold-resistant special PVC sheath
- Colour black

HELUTRUCK® 273

- Bare copper, fine wire in acc. with DIN VDE 0295 cl. 5 or IEC 60228 cl. 5
- Special PVC core insulation, cold-resistant
- Core colours red and black
- Cold-resistant special PVC sheath
- Colour black

Also available with PUR sheath

Properties

- UV-resistant, largely resistant to oil, weather, and chemicals, self-extinguishing and flame retardant, test method B according to VDE 0472 part 804 and IEC 60332-1
 - Chemical resistance see table Technical Information
- ### HELUTRUCK® 272
- Polarity easy to determine by a white line on the sheath above the white core
- ### HELUTRUCK® 273
- Complies with GGVS regulations
 - Approved and tested by the TÜV technical inspectorate
 - The additional sheath means that the cable is very robust, and can be installed without a corrugated conduit
 - Installation time is shorter due to twin design
 - Polarity is easy to determine even without stripping thanks to an imprint with the type designation and on the sheath over the positive core. This helps prevent wrong connections
 - The special construction of the conductor enables optimal crimping
 - Easy mechanical separation of the sheath web

Application

HELUTRUCK® 272

This low-voltage cable is designed for the wiring of electrical installations in the manufacture of commercial vehicles. Especially suitable for trailers and semitrailers. This flat cable can be used for simple and quick contacting of sidelights by means of core penetration. Its flat construction and the special contacting method eliminate the need for time-consuming assembly of cables. This facilitates quick installation, making it possible to save a great deal of time.

HELUTRUCK® 273

This battery cable can be used between the battery and the ultimate consumer (e.g. DC motor of the tail-lift).

CE The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

HELUTRUCK® 272

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
76706	2 x 1,5	6,8	28,8	90,0	16
78983	2 x 1,5	6,8	28,8	90,0	16
700035	2 x 1,5	6,8	28,8	90,0	16

HELUTRUCK® 273

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
75507	2 x 2,5	9,4	48,0	87,0	14
75508	2 x 4	11,5	77,0	125,0	12
75509	2 x 6	15,2	116,0	175,0	10
75510	2 x 10	18,8	192,0	270,0	8
75511	2 x 16	21,0	308,0	390,0	6
75512	2 x 25	25,6	480,0	575,0	4
75513	2 x 35	28,0	672,0	820,0	2
75514	2 x 50	33,0	960,0	1065,0	1
75515	2 x 70	36,0	16,8	1475,0	2/0

Dimensions and specifications may be changed without prior notice.

Enquiry Special Cable

to

HELUKABEL® GmbH

Export Dept.
Dieselstraße 8 – 12
71282 Hemmingen
Germany

Ph. +49 7150 9209-0
Fax +49 7150 81786

www.helukabel.de

Sender _____
Contact _____
Phone _____ Fax _____

Enquiry No. _____
Date _____

Requirement _____ m once continuous
yearly requirement approx. _____ m

Delivery required _____

Make-up Coil _____ m
 Drum

Size _____

Type of Cable _____

Application a.) indoor outdoor
b.) stationary for flexing with reversed bending / torsion
 Drag chain: speed _____ m/s Acceleration _____ m/s² Tracing range _____ m
load cyclic non-cyclic
c.) Temperatures ambient _____ °C continuous _____ °C intermitted _____ °C for _____ Min/Std

Construction

1. Conductor
 Copper St-Cu solid Stranded wire (_____ Ø mm)
 bare tinned silvered nickel-plated _____
No. of cores x cross section _____ x _____ mm² No. of wires x diam. _____ x _____ mm
No. of cores x cross section _____ x _____ mm² No. of wires x diam. _____ x _____ mm
No. of cores x cross section _____ x _____ mm² No. of wires x diam. _____ x _____ mm

2. Insulation
 PVC PE Zell-PE PUR PETP Rubber Thermopl. rubber Silicone
 ETFE FEP PTFE _____

3. Colour-code
 black with white numbers with protected conductor green-yellow colours to DIN 47100 colours to VDE

4. Screening
 Single core Pairs which core/pair _____
 Cu-bare Cu-tinned Cu-silvered
as Braiding Serving Alu-Foil (St) Covering approx. _____ %
Drain wire bare/tinned _____ mm Ø Stranded drain wire bare/tinned _____ mm Ø
with/without protection against elec. shock, hazard under screen, with/without foil/insulation over screen

5. Support Element
 Hemp Polypropylen galv. Steel Kevlar _____
Tensile load _____ N

6. Centre _____ mm Ø PVC Polypropylen _____

7. Stranding
 Cores in layer stranding twisted in pair all _____

8. Inner sheath
 yes: PVC Rubber Silicone Fleece Foil _____

9. Overall Screen
 yes: Cu-bare Cu-tinned Cu-silvered
 braiding Serving Alu-Foil Covering _____ %
with/without drain wire/stranded drain wire _____ mm Ø/mm² bare/tinned

10. Armouring
 Steel wire galv.

11. Outer sheath
 PVC PUR PETP PE Rubber Thermopl. Rubber Neoprene
 Silicon ETFE FEP PTFE _____
Outer Ø _____ mm Colour _____
 Outerprinting /text) _____

Electrical Characters
Operating voltage _____ V Capacity Cond./Cond. _____ pF/m
Test Voltage _____ V Capacity Cond./shield. _____ pF/m

Additional details





Pre-assembled Cables

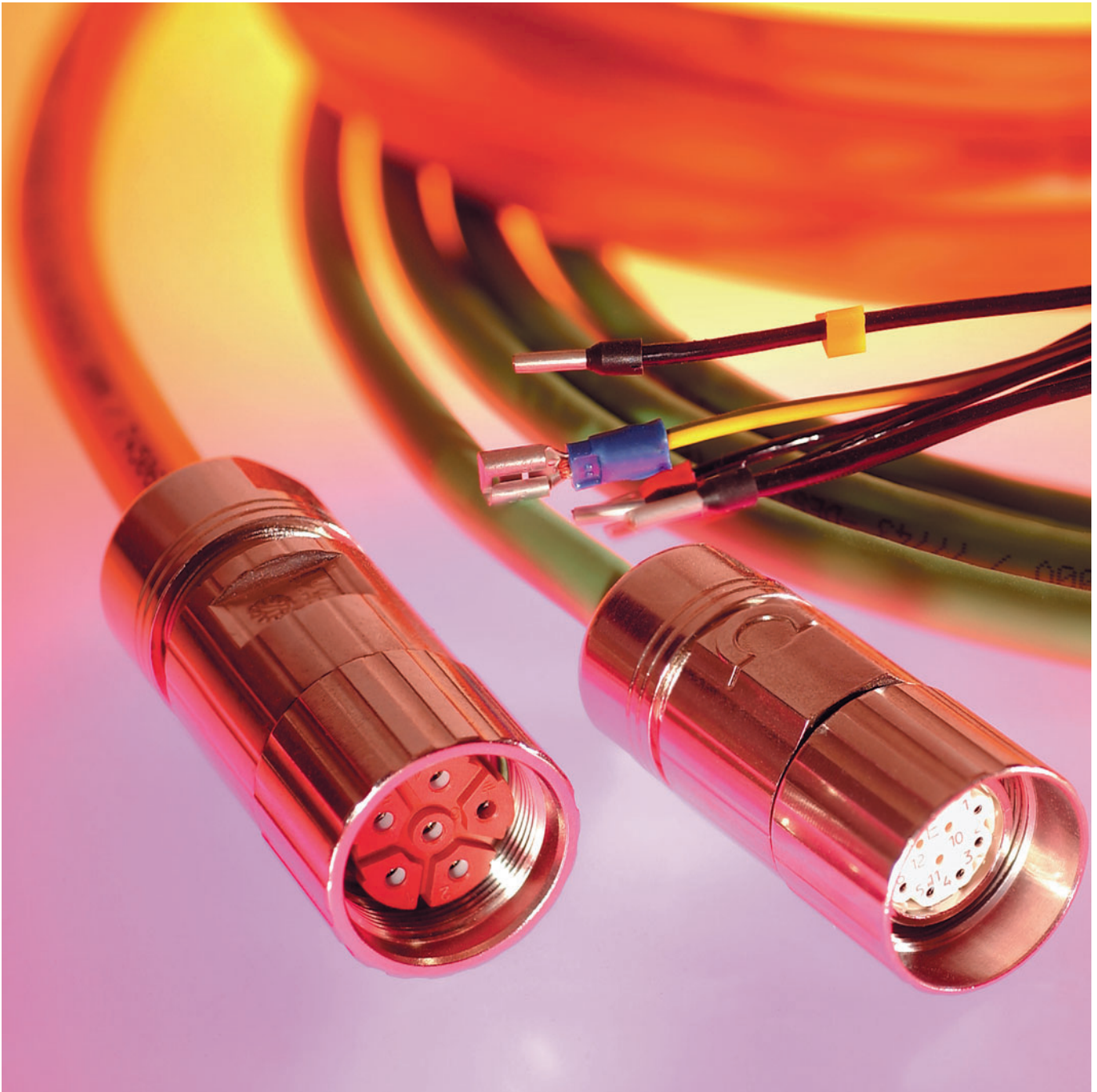


Photo: HELUKABEL®

Pre-assembled Cables

Pre-assembled Cables

Today, more and more users are installing pre-assembled and pre-mounted cables and wires. Many years ago HELUKABEL® recognised this trend and consequently we can offer a complete range of pre-assembled cables and wires. Other assembly variations according to your special requirements are available.

The versatility of possible uses and combinations of plugs and connection types which we can provide can offer an economical and easy solution to your problems. You will benefit from our wealth of experience and from the advantage of an easy and effective installation.

Questions to connection techniques?
HELUKABEL® has the answer.
Phone: +49 7150 9209-0


























Contents

Description

Page

Servo motor, feedback, and fan cables



































Base line for use on SIEMENS drive systems

Pre-assembled servo motor cables for fixed laying    	U 5
→ Extensions on request	
Pre-assembled servo motor cables for mobile use    	U 6
→ Extensions on request	
Pre-assembled feedback cables for fixed laying   	U 7
→ Extensions on request	
Pre-assembled feedback cables for mobile use   	U 8
→ Extensions on request	
Pre-assembled servo motor cables for fixed laying (Drive-Click)    	U 9
→ Extensions on request	
Pre-assembled servo motor cables for mobile use (Drive-Click)   	U 10
→ Extensions on request	
Pre-assembled feedback cables for fixed laying (Drive-Click)  	U 11
→ Extensions on request	
Pre-assembled feedback cables for mobile use (Drive-Click)  	U 12
→ Extensions on request	

Base line for use on REXROTH drive systems

Pre-assembled servo motor cables for mobile use (PVC)   	U 13
→ Links on request	
Pre-assembled servo motor cables for mobile use (PUR)   	U 14
→ Links on request	
Pre-assembled feedback cables for mobile use (PVC)  	U 16
→ Links on request	
Pre-assembled feedback cables for mobile use (PUR)  	U 17
→ Links on request	

Base line for use on LENZE drive systems

Pre-assembled servo motor cables for fixed laying (Global Drive)    	U 18
→ Extensions on request	
Pre-assembled servo motor cables for mobile use (Global Drive)   	U 19
→ Extensions on request	
Pre-assembled feedback cables for fixed laying (Global Drive)   	U 20
→ Extensions on request	
Pre-assembled feedback cables for mobile use (Global Drive)   	U 21
→ Extensions on request	
Pre-assembled fan cables for fixed laying (Global Drive)  	U 22
→ Extensions on request	
Pre-assembled fan cables for mobile use (Global Drive)  	U 23
→ Extensions on request	
Pre-assembled servo motor cables for fixed laying (L-Force)    	U 24
→ Extensions on request	
Pre-assembled servo motor cables for mobile use (L-Force)   	U 25
→ Extensions on request	
Pre-assembled feedback cables for fixed laying (L-Force)   	U 26
→ Extensions on request	
Pre-assembled feedback cables for mobile use (L-Force)   	U 27
→ Extensions on request	
Pre-assembled fan cables for fixed laying (L-Force)  	U 28
→ Extensions on request	
Pre-assembled fan cables for mobile use (L-Force)  	U 29
→ Extensions on request	







Contents

Description

Page

Servo motor, feedback, and fan cables

Base line for use on SEW drive systems

Pre-assembled servo motor cables for fixed laying		U 30
Pre-assembled servo motor cables for mobile use.....		U 31
Pre-assembled feedback cables for fixed laying		U 32
Pre-assembled feedback cables for mobile use		U 33
Pre-assembled servo motor cables for fixed laying		U 34
→ Extensions on request		
Pre-assembled servo motor cables for mobile use.....		U 35
→ Extensions on request		

For use on HEIDENHAIN measurement systems/hand wheels

Pre-assembled feedback cables	U 36
Pre-assembled adapter cables.....	U 37

Upon request we are able to offer you the appropriate changes and customized assemblies in all lengths.

Of course, you can also get our connectors and cables separately – please see HELUTEK configurator at www.helukabel.de

Robot cables

ROBOFLEX-recycle, M12 femal one end pre-assembled 3-, 4- and 5-pin	U 41
ROBOFLEX-recycle, M12 sensor cable 4-pin + PE one end pre-assembled	U 43
ROBOFLEX-recycle, M12 both ends pre-assembled	U 44
ROBOFLEX-recycle, M12 5-pin + PE both ends pre-assembled	U 46
ROBOFLEX-recycle, M12 plug straight or angled, pre-assembled on one end, 3-pin, 4-pin and 5-pin.....	U 47
ROBOFLEX-recycle, M8 femal one end pre-assembled	U 48
ROBOFLEX-recycle, M8 pre-assembled on both ends	U 49
ROBOFLEX-recycle, M8 plug, straight or angled, pre-assembled on one side, 3-pin and 4-pin.....	U 51
ROBOFLEX-recycle, M12 sensor cable screened one end pre-assembled	U 52
ROBOFLEX-recycle, M12 sensor cable screened both ends pre-assembled.....	U 54
ROBOFLEX-recycle, Twin cables M12 to M12	U 56
ROBOFLEX-recycle, Twin cables M12 to M12	U 57

Connecting cables

PVC connecting cables.....	U 58
Rubber connecting cables	U 59
YELLOWFLEX – connecting cable meter marking	U 60
PUR connecting cables, orange.....	U 61

Extensions / Supply cables

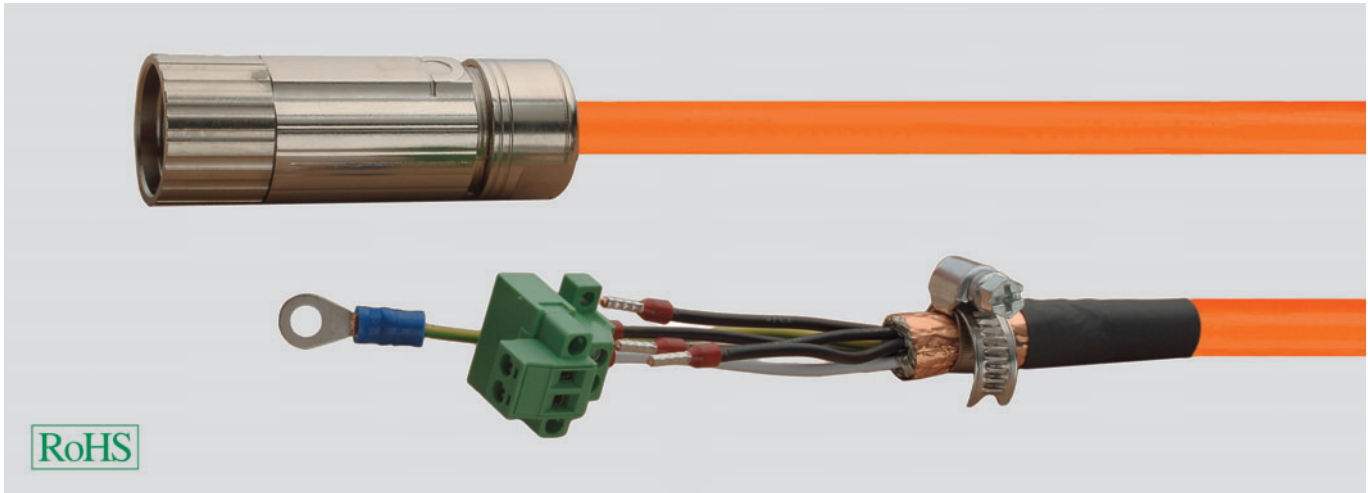
Extensions / Supply cables, CEE-Extensions / Cold equipment / PVC-Extensions	U 62
Front connecting cables for Simatic® S7.....	U 63

U

Pre-assembled servo motor cables

for fixed laying

Base line for use on SIEMENS drive systems



RoHS

Technical data

- **Temperature range**
moving 0 °C to +60 °C
not moving -20 °C to +80 °C
- **Bending radius**
moving 20 x cable diameter \varnothing
not moving 5 x cable diameter \varnothing
- **Max. acceleration**
2 m/s²
- **Bending cycles**
100,000 for $\geq 20x$ cable diameter \varnothing
- **Nominal voltage (UL/CSA)** 1000 V (power + signal)
- **Nominal voltage (VDE)** U₀/U 0.6/1kV (power)
24 V (signal)
- **Test voltage, power cores** 4 kV
- **Test voltage, signal cores** 2 kV
- **Insulation resistance** ≥ 20 MOhm x km

Approbations

Desina® (ISO 23570)
VDE
UL/CSA

Cable structure

Power supply cores

- Bare copper, according to IEC 60228 CL. 6
 - **PVC core insulation**
 - **Core identification** U/L1/C/L+
V/L2
W/L3/D/L-
 - **Earth core** green-yellow
- ### Signal cores
- Copper conductors, bare
 - **TPE-E core** insulation
 - **Core identification** black
white
 - Cores twisted in pairs
 - **Shield**, tin-plated copper braiding
 - **Complete shield** made of tin-plated copper braiding
 - **Coverage** approx. 80%
 - PVC outer jacket
 - **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX5002-5CA01	5CA01 DESINA PVC	660224	6FX5002-5DA21	5DA21 DESINA PVC	660247
6FX5002-5CA11	5CA11 DESINA PVC	660227	6FX5002-5DA31	5DA31 DESINA PVC	660250
6FX5002-5CA21	5CA21 DESINA PVC	660230	6FX5002-5DA41	5DA41 DESINA PVC	660254
6FX5002-5CA31	5CA31 DESINA PVC	660234	6FX5002-5DA51	5DA51 DESINA PVC	660257
6FX5002-5CA41	5CA41 DESINA PVC	660237	6FX5002-5DA61	5DA61 DESINA PVC	660259
6FX5002-5CA51	5CA51 DESINA PVC	660238	6FX5002-5DA13	5DA13 DESINA PVC	660666
6FX5002-5CA61	5CA61 DESINA PVC	660239	6FX5002-5DA23	5DA23 DESINA PVC	660249
6FX5002-5CA13	5CA13 DESINA PVC	660229	6FX5002-5DA33	5DA33 DESINA PVC	660252
6FX5002-5CA23	5CA23 DESINA PVC	660232	6FX5002-5DA43	5DA43 DESINA PVC	660255
6FX5002-5DA01	5DA01 DESINA PVC	660241	6FX5002-5DA53	5DA53 DESINA PVC	660667
6FX5002-5DA11	5DA11 DESINA PVC	660244			

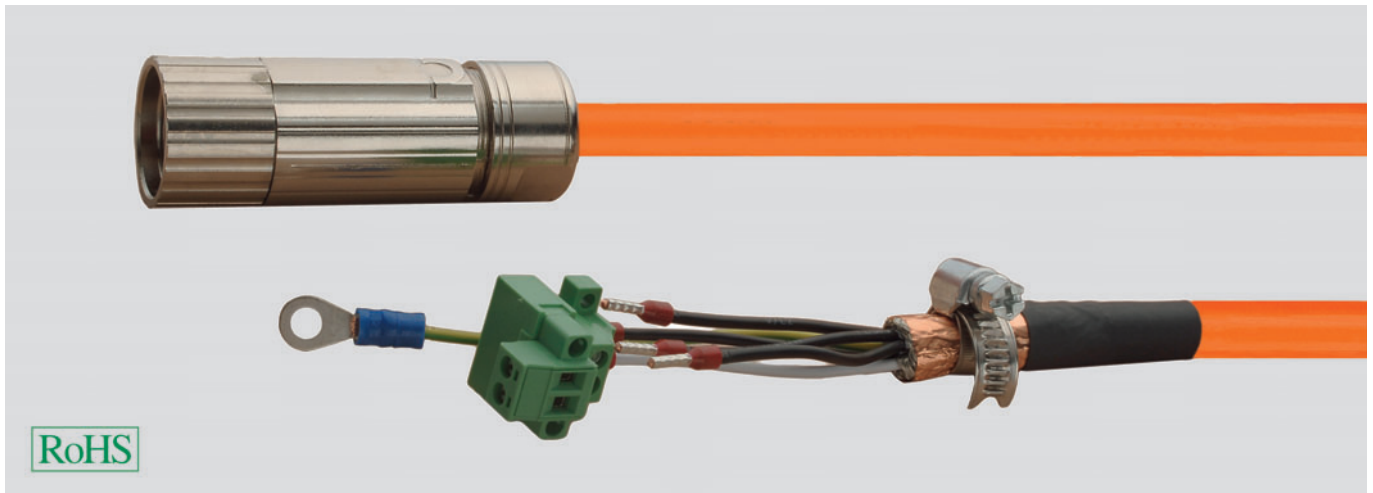
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for mobile use

Base line for use on SIEMENS drive systems



Technical data

- **Temperature range**
moving -20 °C to +60 °C
not moving -50 °C to +80 °C
- **Bending radius**
moving 10 x cable diameter \varnothing
not moving 7 x cable diameter \varnothing
- **Max. acceleration**
5 m/s²
- **Bending cycles**
10 million for $\geq 12x$ cable diameter \varnothing
- **Operating voltage** U₀/U 600/1000 V (VDE)
1000 V (UL)
- **Test voltage, power cores** 4 kV
- **Test voltage, control cores** 2 kV
- **Insulation resistance** ≥ 500 MOhm x km

Approbations

Desina® (ISO 23570)
VDE
UL/CSA

Cable structure

Power supply cores

- Bare copper, extra fine wire conductor according to DIN VDE 0295 CL. 6
- high quality PP core insulation
- **Core identification** U/L1/C/L+ V/L2 W/L3/D/L-

- **Earth core** green-yellow

Signal cores

- Copper conductors, bare
- **High quality PP** core insulation
- **Core identification** black white
- Cores twisted in pairs
- **Shielding** screened with tin-plated copper wires
- **Complete shield made of tin-plated copper braiding**
- **Coverage** approx. 80%
- PUR outer sheath
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX8002-5CA01	5CA01 DESINA PUR	660053	6FX8002-5DA21	5DA21 DESINA PUR	660076
6FX8002-5CA11	5CA11 DESINA PUR	660056	6FX8002-5DA31	5DA31 DESINA PUR	660080
6FX8002-5CA21	5CA21 DESINA PUR	660059	6FX8002-5DA41	5DA41 DESINA PUR	660084
6FX8002-5CA31	5CA31 DESINA PUR	660063	6FX8002-5DA51	5DA51 DESINA PUR	660088
6FX8002-5CA41	5CA41 DESINA PUR	660066	6FX8002-5DA61	5DA61 DESINA PUR	660089
6FX8002-5CA51	5CA51 DESINA PUR	660067	6FX8002-5DA13	5DA13 DESINA PUR	89800
6FX8002-5CA61	5CA61 DESINA PUR	660068	6FX8002-5DA23	5DA23 DESINA PUR	89802
6FX8002-5CA13	5CA13 DESINA PUR	660058	6FX8002-5DA33	5DA33 DESINA PUR	660082
6FX8002-5CA23	5CA23 DESINA PUR	660061	6FX8002-5DA43	5DA43 DESINA PUR	660085
6FX8002-5DA01	5DA01 DESINA PUR	660070	6FX8002-5DA53	5DA53 DESINA PUR	660668
6FX8002-5DA11	5DA11 DESINA PUR	660073			

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

for fixed laying

Base line for use on SIEMENS drive systems



Technical data

- **Temperature range**
-20 °C to +80 °C
- **Bending radius**
18 x cable diameter Ø
- **Max. acceleration**
2 m/s²
- **Bending cycles**
100,000
- **Max. operating voltage** 30 V AC
- **Test voltage** 500 V
- **Insulation resistance** ≥ 100 MOhm x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

- Tinned copper conductors
 - Polyolefin polymer core insulation
 - **Complete shield**, tin-plated copper braiding
 - **Coverage** approx. 80%
 - PVC outer jacket
 - **Sheath colour** green
- Structure(3x(2x0.14)+4x0.14+2x0.5)**
- 3 pairs with tin-plated copper wires, coverage approx. 90%
 - **Colour code**
Pair 1: yellow + green
Pair 2: black + brown
Pair 3: red + orange
Quad 1: grey + blue + white/yellow + black/white
Pair 4: brown/red + brown/blue
- Structure(3x(2x0.14)+4x0.14+4x0.22+2x0.5)**
- 3 pairs with tin-plated copper wires, coverage approx. 90%
 - **Colour code**
Pair 1: yellow + green
Pair 2: black + brown
Pair 3: red + orange
Quad 1: grey + blue + white/yellow + black/white
Quad 2: brown/yellow + brown/grey + green/black + red/green
Pair 4: brown/red + brown/blue
- Structure(3x2x0.34+4x0.5)**
- **Colour code**
Pair 1: brown + violet
Pair 2: brown + black
Pair 3: red + orange
Pair 4: yellow + green
Quad: yellow/white + red/white + blue/white + black/white

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX5002-2AD00	2AD00 DESINA PVC	660207	6FX5002-2CC11	2CC11 DESINA PVC	660670
6FX5002-2AH00	2AH00 DESINA PVC	660209	6FX5002-2CD01	2CD01 DESINA PVC	660671
6FX5002-2CA11	2CA11 DESINA PVC	660210	6FX5002-2CF02	2CF02 DESINA PVC	660219
6FX5002-2CA15	2CA15 DESINA PVC	660211	6FX5002-2CG00	2CG00 DESINA PVC	660672
6FX5002-2CA31	2CA31 DESINA PVC	660212	6FX5002-2CH00	2CH00 DESINA PVC	660220
6FX5002-2CA51	2CA51 DESINA PVC	660214	6FX5002-2EQ10	2EQ10 DESINA PVC	660222
6FX5002-2CA61	2CA61 DESINA PVC	660215	6FX5002-2CE02	2CE02 DESINA PVC	660673
6FX5002-2CA72	2CA72 DESINA PVC	660669	6FX5002-2CM00	2CM00 DESINA PVC	660674
6FX5002-2CB51	2CB51 DESINA PVC	660217	6FX5002-2CE07	2CE07 DESINA PVC	660675

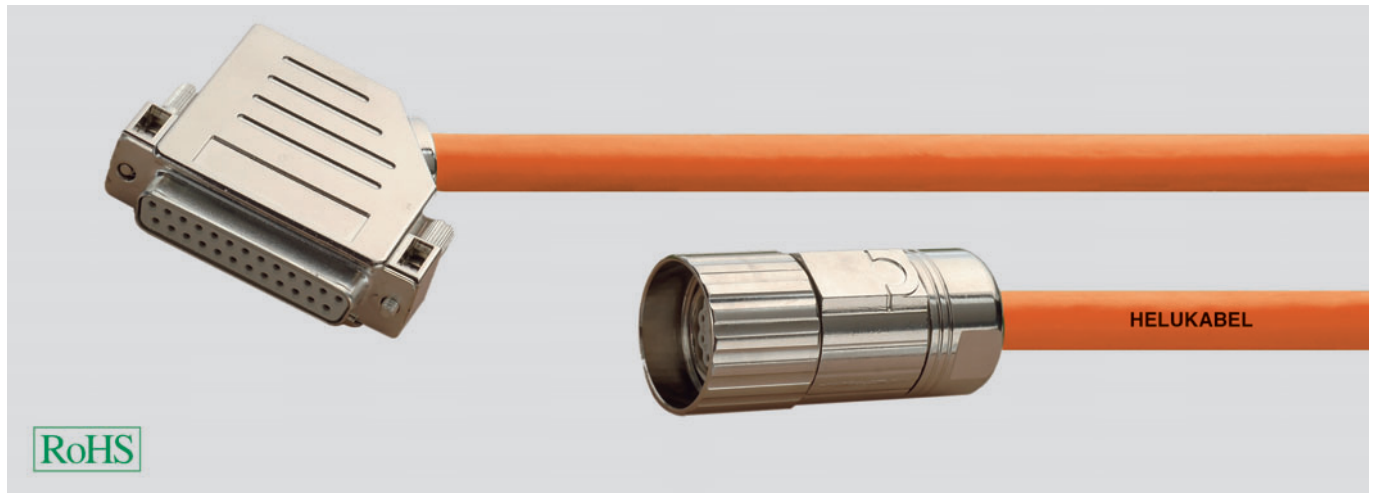
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

for mobile use

Base line for use on SIEMENS drive systems



Technical data

- **Temperature range**
moving -20 °C to +60 °C
not moving -50 °C to +80 °C
- **Bending radius**
moving 11 x cable diameter \varnothing
not moving 7 x cable diameter \varnothing
- **Max. acceleration**
5 m/s²
- **Bending cycles**
10 million for $\geq 12x$ cable diameter \varnothing
- **Operating voltage** 30 V
- **Test voltage** 500 V
- **Insulation resistance** ≥ 10 MOhm x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

- Tinned copper conductors
- high quality PP core insulation
- **Complete shield**, tin-plated copper braiding
- **Coverage** approx. 80%
- PUR outer sheath
- **Sheath colour** orange
- **Structure/colour code**
- **(2x2x0.18)** bl, bn, rd, or
- **(4x2x0.18)** bl+bn, rd+or, ye+gn, bu+vio
- **(8x2x0.18)** bl+bn, rd+or, ye+gn, bu+vio, gy+wh, wh/bl+wh/bn, wh/rd+wh/or, wh/ye+wh/gy
- **(12x0.22)** bl, bn, rd, or, ye, gn, bu, vio, gy, wh, wh/bl, wh/bn
- **(4x2x0.34+4x0.5)** rd+or, ye+gn, bu+vio, bl+bn, wh/rd, wh/ye, wh/bu, wh/bl
- **(3x(2x0.14)+2x(0.5))** rd+or, ye+gn, bl+bn, bl, rd
- **(3x(2x0.14)+2x0.5+4x0.14)** rd+or, ye+gn, bl+bn, bn/rd, bn/bu, gy, bu, wh/ye, wh/bl
- **(3x(2x0.14)+2x0.5+4x0.14+4x0.22)** rd+or, ye+gn, bl+bn, bn/rd, bn/bu, gy, bu, wh/ye, wh/bl, bn/ye, bn/gy/gn/bl, gn/rd

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX8002-2AD00	2AD00 DESINA PUR	660014	6FX8002-2CC11	2CC11 DESINA PUR	660032
6FX8002-2AH00	2AH00 DESINA PUR	87328	6FX8002-2CD01	2CD01 DESINA PUR	660033
6FX8002-2CA11	2CA11 DESINA PUR	660018	6FX8002-2CF02	2CF02 DESINA PUR	89293
6FX8002-2CA15	2CA15 DESINA PUR	660019	6FX8002-2CG00	2CG00 DESINA PUR	660034
6FX8002-2CA31	2CA31 DESINA PUR	660021	6FX8002-2CH00	2CH00 DESINA PUR	660035
6FX8002-2CA51	2CA51 DESINA PUR	660023	6FX8002-2EQ10	2EQ10 PUR DESINA	660038
6FX8002-2CA61	2CA61 DESINA PUR	660024	6FX8002-2CA21	2CA21 DESINA PUR	660020
6FX8002-2CA72	2CA72 DESINA PUR	660676	6FX8002-2CE02	2CE02 DESINA PUR	660677
6FX8002-2CB31	2CB31 DESINA PUR	650122	6FX8002-2CM00	2CM00 DESINA PUR	660678
6FX8002-2CB51	2CB51 DESINA PUR	660031	6FX8002-2CE07	2CE07 DESINA PUR	660679

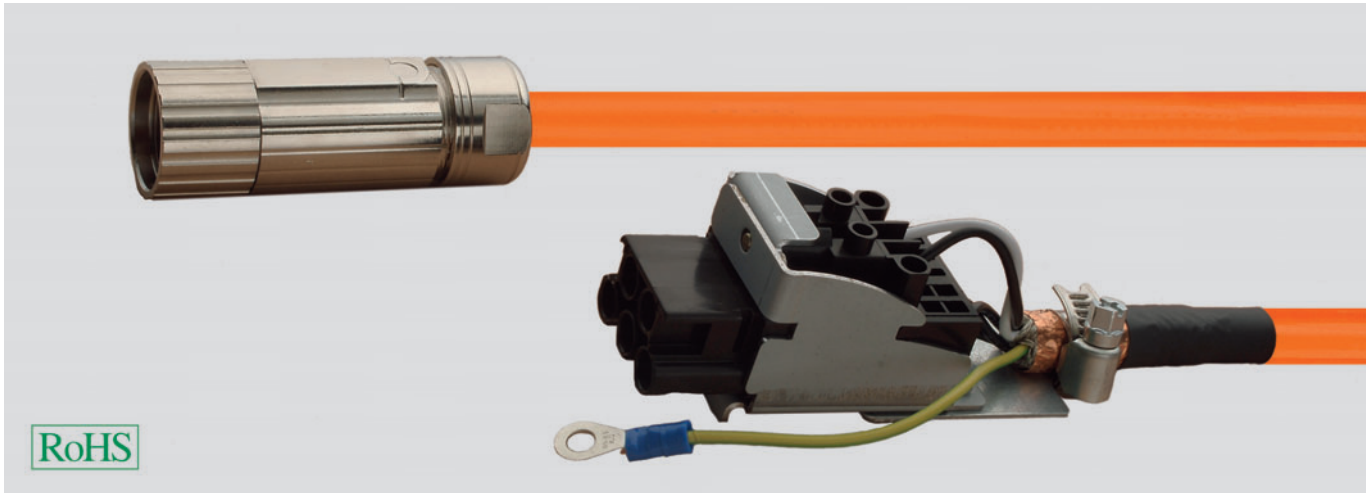
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for fixed laying

Base line for use on SIEMENS drive systems (Drive Cliq*)



Technical data

- **Temperature range**
moving 0 °C to +60 °C
not moving -20 °C to +80 °C
- **Bending radius**
moving 20 x cable diameter \varnothing
not moving 5 x cable diameter \varnothing
- **Max. acceleration**
2 m/s²
- **Bending cycles**
100,000 for $\geq 20x$ cable diameter \varnothing
- **Nominal voltage (UL/CSA)** 1000 V (power + signal)
- **Nominal voltage (VDE)** U_0/U 0.6/1kV (power)
24 V (signal)
- **Test voltage, power cores** 4 kV
- **Test voltage, signal cores** 1 kV
- **Insulation resistance** ≥ 20 M Ω m x km

Approbations

Desina® (ISO 23570)
VDE
UL/CSA

Cable structure

Power supply cores

- Bare copper, according to IEC 60228 CL. 6
 - **PVC core insulation**
 - **Core identification** U/L1/C/L+
V/L2
W/L3/D/L-
 - **Earth core** green-yellow
- ### Signal cores
- Copper conductors, bare
 - **TPE-E core** insulation
 - **Core identification** black
white
 - Cores twisted in pairs
 - **Shield**, tin-plated copper braiding
 - **Complete shield** made of tin-plated copper braiding
 - **Coverage** approx. 80%
 - PVC outer jacket
 - **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX5002-5CS01	5CS01 DESINA PVC	660855	6FX5002-5DS01	5DS01 DESINA PVC	660863
6FX5002-5CS11	5CS11 DESINA PVC	660856	6FX5002-5DS11	5DS11 DESINA PVC	660864
6FX5002-5CS21	5CS21 DESINA PVC	660857	6FX5002-5DS21	5DS21 DESINA PVC	660865
6FX5002-5CS31	5CS31 DESINA PVC	660858	6FX5002-5DS31	5DS31 DESINA PVC	660866
6FX5002-5CS41	5CS41 DESINA PVC	660859	6FX5002-5DS41	5DS41 DESINA PVC	660867
6FX5002-5CS51	5CS51 DESINA PVC	660860	6FX5002-5DS51	5DS51 DESINA PVC	660868
6FX5002-5CS61	5CS61 DESINA PVC	660861	6FX5002-5DS61	5DS61 DESINA PVC	660869
6FX5002-5CS13	5CS13 DESINA PVC	660862	6FX5002-5DS13	5DS13 DESINA PVC	660870

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

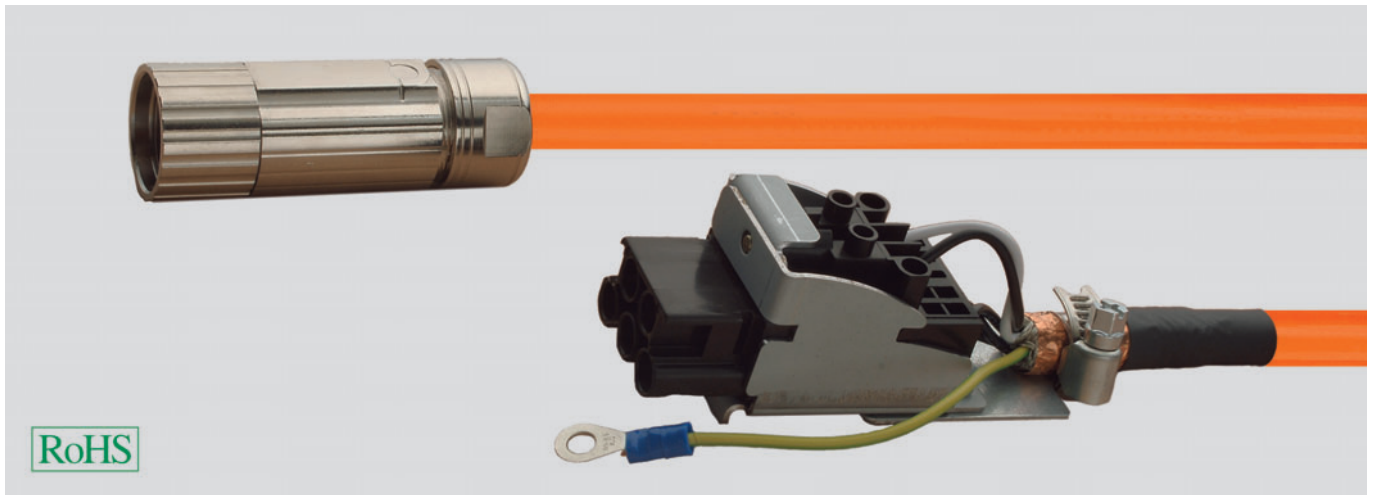
* Drive Cliq is registered trademark from Siemens AG.

Pre-assembled servo motor cables



for mobile use

Base line for use on SIEMENS drive systems (Drive Cliq*)



Technical data

- **Temperature range**
moving -20 °C to +60 °C
not moving -50 °C to +80 °C
- **Bending radius**
moving 10 x cable diameter \varnothing
not moving 7 x cable diameter \varnothing
- **Max. acceleration**
5 m/s²
- **Bending cycles**
10 million for $\geq 12x$ cable diameter \varnothing
- **Operating voltage** /U 600/1000 V (VDE)
1000V (UL)
- **Test voltage, power cores** 4 kV
- **Test voltage, signal cores** 2 kV
- **Insulation resistance** ≥ 500 MOhm x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Power supply cores

- Bare copper, extra fine wire conductor according to DIN VDE 0295 CL. 6
- **high quality PP core insulation**
- **Core identification** U/L1/C/L+ V/L2 W/L3/D/L-
- **Earth core** green-yellow

Signal cores

- Copper conductors, bare
- **High quality PP** core insulation
- **Core identification** black white
- Cores twisted in pairs
- **Shielding** screened with tin-plated copper wires
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 80%
- PUR outer sheath
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX8002-5CS01	5CS01 DESINA PUR	660871	6FX8002-5DS01	5DS01 DESINA PUR	660879
6FX8002-5CS11	5CS11 DESINA PUR	660872	6FX8002-5DS11	5DS11 DESINA PUR	660880
6FX8002-5CS21	5CS21 DESINA PUR	660873	6FX8002-5DS21	5DS21 DESINA PUR	660881
6FX8002-5CS31	5CS31 DESINA PUR	660874	6FX8002-5DS31	5DS31 DESINA PUR	660882
6FX8002-5CS41	5CS41 DESINA PUR	660875	6FX8002-5DS41	5DS41 DESINA PUR	660883
6FX8002-5CS51	5CS51 DESINA PUR	660876	6FX8002-5DS51	5DS51 DESINA PUR	660884
6FX8002-5CS61	5CS61 DESINA PUR	660877	6FX8002-5DS61	5DS61 DESINA PUR	660885
6FX8002-5CS13	5CS13 DESINA PUR	660878	6FX8002-5DS13	5DS13 DESINA PUR	660886

Dimensions and specifications may be changed without prior notice.

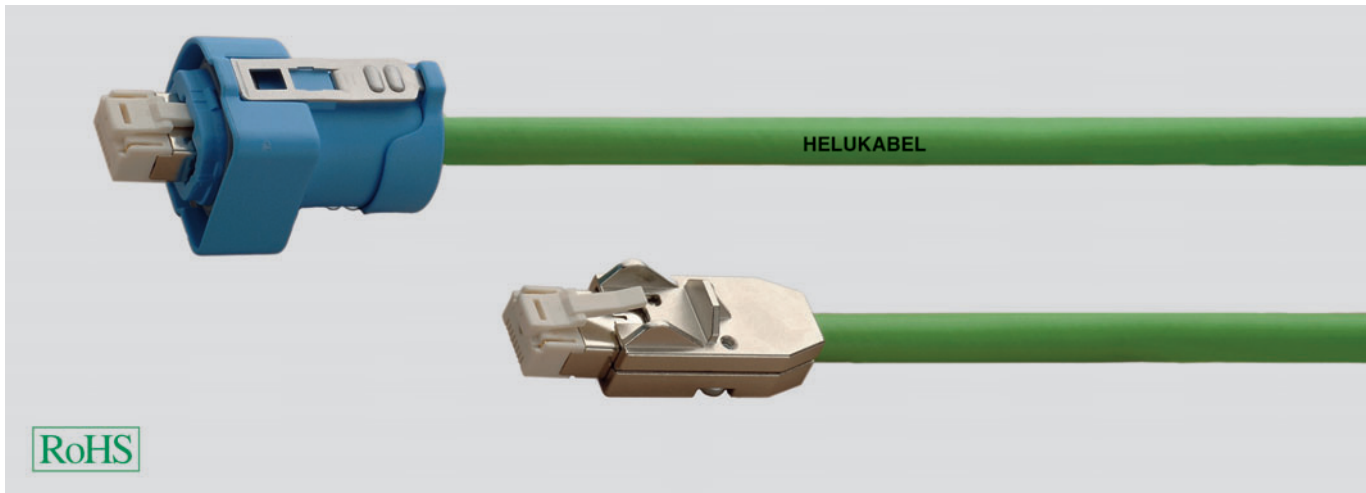
The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

* Drive Cliq is registered trademark from Siemens AG.

Pre-assembled feedback cables

for fixed laying

Base line for use on SIEMENS drive systems (Drive Cliq*)



Technical data

- **Temperature range**
moving -20 °C to +60 °C
not moving -20 °C to +80 °C
- **Bending radius**
moving 10 x cable diameter \varnothing
not moving 5 x cable diameter \varnothing
- **Max. acceleration**
2 m/s²
- **Bending cycles**
100000 for $\geq 10x$ cable diameter \varnothing
- **max. operating voltage** 30 V AC (UL)
- **Test voltage** 500 V / 50 Hz / 1min
- **Insulation resistance** ≥ 1 GOhm x km
- **Conductor resistance**
Core AWG26 ≤ 135 ohms/km
Core AWG22 ≤ 62 ohms/km
- **Characteristic impedance AWG26 pairs**
from 1 MHz to 100 MHz 100+/-150 hm
- **Operating capacitance AWG26 pairs**
for 800 Hz rated 50 nF/km

Approbations

UL/CSA

Cable structure

- Bare copper conductor, 7 strands
- Polyolefin core insulation
- **Complete shield** aluminium foil coated with plastic, braiding made of tin-plated copper wires
- **Coverage** approx. 85%
- PUR outer sheath
- **Sheath colour** green

Structure/colour code

- **(2xAWG22+2x2xAWG26)**
Colour code
Pair AWG22: red + black Pair 1 AWG26:
green + yellow Pair 2 AWG26: pink + blue

Connector data

RJ45 connector CAT5
Material: nickel-plated PBT/brass
Contacts 30u" Au/Ni
Rated voltage: 50 V DC/35 V AC
Operating temperature: -20 °C to + 120 °C
Mating cycles: 1000
Cover
zinc die-cast
zinc die-cast / PBT, blue
PBT blue
PBT black

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX5002-2DC00	2DC00 DESINA PUR	660887
6FX5002-2DC10	2DC10 DESINA PUR	660888

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX5002-2DC20	2DC20 DESINA PUR	660889

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

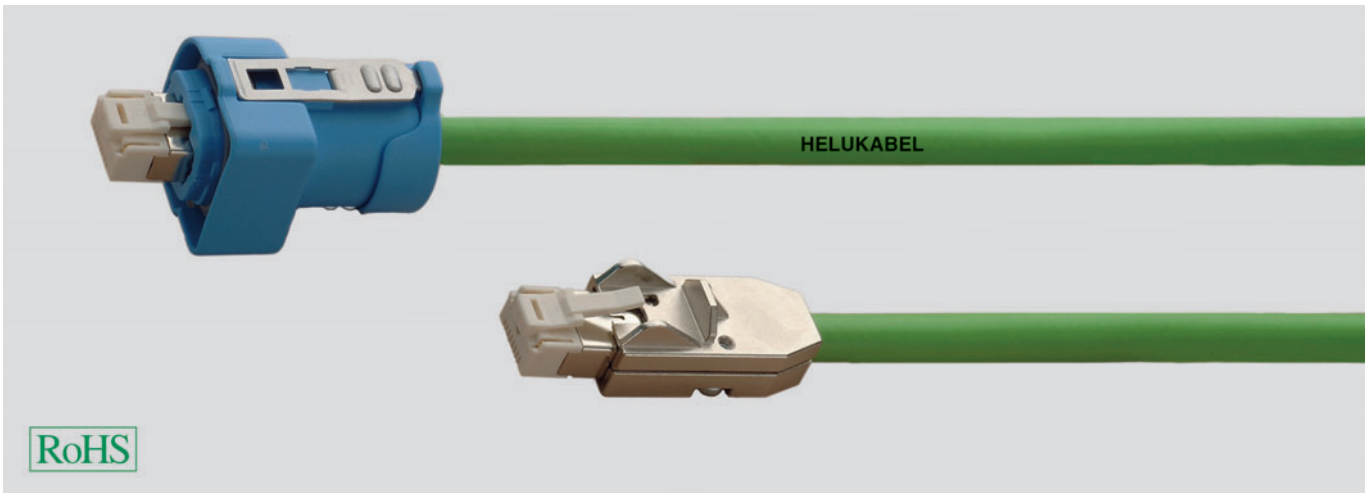
* Drive Cliq is registered trademark from Siemens AG.

Pre-assembled feedback cables



for mobile use

Base line for use on SIEMENS drive systems (Drive Cliq*)



Technical data

- **Temperature range**
moving -20 °C to +60 °C
not moving -20 °C to +80 °C
- **Bending radius**
moving 15 x cable diameter \varnothing
not moving 5 x cable diameter \varnothing
- **Max. acceleration**
5 m/s²
- **Bending cycles**
2 million for $\geq 15x$ cable diameter \varnothing
- **max. operating voltage** 30 V
- **Test voltage** 500 V / 50 Hz / 1min
- **Insulation resistance** ≥ 1 GOhm x km
- **Conductor resistance**
Core AWG26 ≤ 135 ohms/km
Core AWG22 ≤ 62 ohms/km
- **Characteristic impedance 0.15mm² pairs**
from 1 MHz to 100 MHz 100+/-150 hm
- **Operating capacitance 0.15mm² pairs**
for 800 Hz rated 50 nF/km

Approbations

UL/CSA

Cable structure

- 0.15 mm² Bare copper conductor, 19 strands
- 0.38 mm² Tin-plated copper conductor, 19 strands
- Polyolefin core insulation
- **Complete shield** aluminium foil coated with plastic, braiding made of tin-plated copper wires
- **Coverage** approx. 85%
- PUR outer sheath
- **Sheath colour** green

Structure/colour code

- **(2x0.38mm²)+2x(2x0.15mm²)**
Colour code
Pair 0.38mm²: red + black
Pair 0.15mm²: green + yellow
Pair 2 0.15mm²: pink + blue

Connector data

RJ45 connector CAT5
Material: nickel-plated PBT/brass
Contacts 30u" Au/Ni
Rated voltage: 50 V DC/35 V AC
Operating temperature: -20 °C to + 120 °C
Mating cycles: 1000
Cover
zinc die-cast
zinc die-cast / PBT, blue
PBT blue
PBT black

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
6FX8002-2DC00	2DC00 DESINA PUR	660890	6FX8002-2DC20	2DC20 DESINA PUR	660892
6FX8002-2DC10	2DC10 DESINA PUR	660891			

Dimensions and specifications may be changed without prior notice.

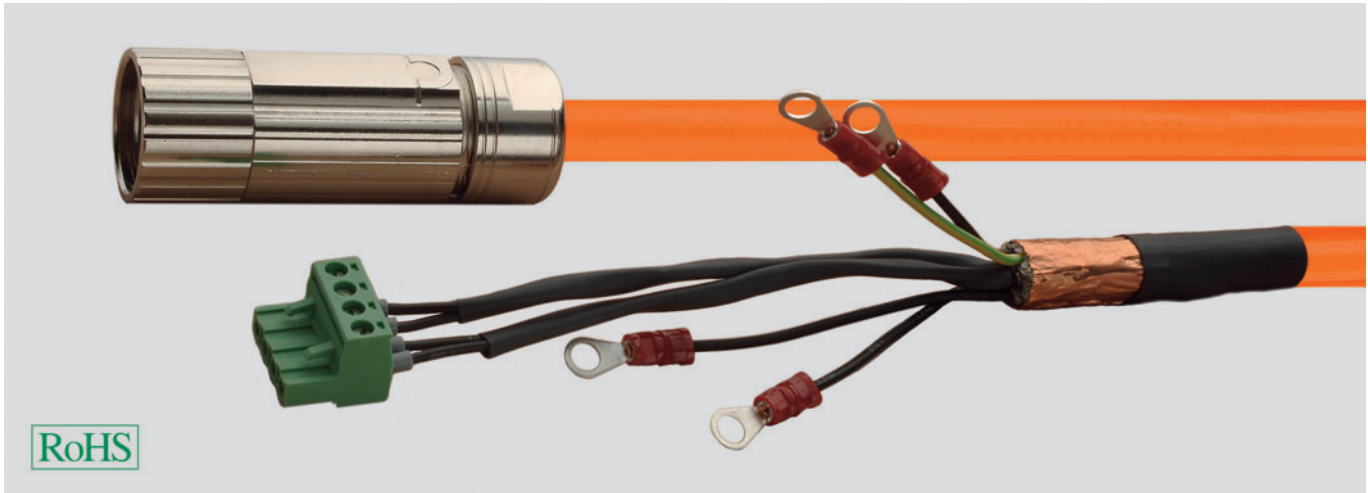
The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

* Drive Cliq is registered trademark from Siemens AG.

Pre-assembled servo motor cables

for mobile use (PVC)

Base line for use on REXROTH drive systems



RoHS

Technical data

- **Wire temperature range**
moving -30 °C to +80 °C
not moving -50 °C to +90 °C
- **Bending radius**
moving 10 x cable diameter \varnothing
not moving 7 x cable diameter \varnothing
- **Max. acceleration**
4 m/s²
- **Bending cycles**
5 million for $\geq 10x$ cable diameter \varnothing
- **Nominal voltage (UL/CSA)** 1000 V
- **Test voltage, power cores** 4 kV
- **Test voltage, signal cores** 2 kV
- **Insulation resistance** ≥ 20 MOhm x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Power supply cores

- Bare copper, extra fine wire conductor according to DIN VDE 0295 CL. 6
- **PETP core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow

Signal cores

- Bare copper, extra fine wire conductor according to DIN VDE 0295 CL. 6
- **Core insulation** PETP
- **Core identification**
Pair 1: 5.6
Pair 2: 7.8
- Cores twisted in pairs
- **Shielding** aluminium/polyester foil
Drain wire
tin-plated copper braiding
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 85%
- PVC outer jacket
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with high mechanical stress. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Particularly suitable for use with small bending radii and high acceleration. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel Designation	Helukabel Part no.	Helukabel Designation	Helukabel Part no.
motor cable 4009 PVC	660680	motor cable 4020 PVC	660685
motor cable 4017 PVC	660681	motor cable 4018 PVC	660686
motor cable 4039 PVC	660682	motor cable 4016 PVC	660687
motor cable 4060 PVC	660683	motor cable 4119 PVC	660688
motor cable 4055 PVC	660684		

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for mobile use (PUR)

Base line for use on REXROTH drive systems



RoHS

Technical data

- **Wire temperature range**
moving -20 °C to +60 °C
not moving -50 °C to +80 °C
- **Bending radius**
moving 10 x cable diameter \varnothing
not moving 7 x cable diameter \varnothing
- **Max. acceleration**
5 m/s²
- **Bending cycles**
5 million for $\geq 10x$ cable diameter \varnothing
- **Nominal voltage (UL/CSA)** 1000 V
- **Test voltage, power cores** 4 kV
- **Test voltage, signal cores** 2 kV
- **Insulation resistance** ≥ 10 M Ω m x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Power supply cores

- Bare copper, extra fine wire conductor according to DIN VDE 0295 CL. 6
- **PETP core insulation or high quality PP core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow

Signal cores

- Bare copper, extra fine wire conductor according to DIN VDE 0295 CL. 6
- **PETP or high quality PP** core insulation
- **Core identification**
Pair 1: 5,6
Pair 2: 7,8
- Cores twisted in pairs
- **Shielding** aluminium/polyester foil
Drain wire
tin-plated copper braiding
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 80%
- PUR outer sheath
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with high mechanical stress. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Particularly suitable for use with small bending radii and high acceleration. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
IKG4008	motor cable 4008 PUR	660090	IKG4130	motor cable 4130 PUR	660125
IKG4009	Motorleitung 4009 PUR	660091	IKG4127	motor cable 4127 PUR	660126
IKG4017	Motorleitung 4017 PUR	660092	IKG4143	motor cable 4143 PUR	660129
IKG4077	Motorleitung 4077 PUR	660093	IKG4150	motor cable 4150 PUR	660130
IKG4029	Motorleitung 4029 PUR	660095	IKG4147	motor cable 4147 PUR	660131
IKG4039	Motorleitung 4039 PUR	660096	IKG4163	motor cable 4163 PUR	660134
IKG4028	Motorleitung 4028 PUR	660097	IKG4170	motor cable 4170 PUR	660135
IKG4073	Motorleitung 4073 PUR	660099	IKG4167	motor cable 4167 PUR	660136
IKG4071	motor cable 4071 PUR	660100	IKG4183	motor cable 4183 PUR	660139
IKG4072	Motorleitung 4072 PUR	660101	IKG4200	motor cable 4200 PUR	660140
IKG4053	motor cable 4053 PUR	660103	IKG4186	Motorleitung 4186 PUR	660141
IKG4060	motor cable 4060 PUR	660104	IKG4203	motor cable 4203 PUR	660144
IKG4055	motor cable 4055 PUR	660105	IKG4210	motor cable 4210 PUR	660145
IKG4063	motor cable 4063 PUR	660108	IKG4204	motor cable 4204 PUR	660146
IKG4070	motor cable 4070 PUR	660109	IKG4223	motor cable 4223 PUR	660149
IKG4068	motor cable 4068 PUR	660110	IKG4224	motor cable 4224 PUR	660150
IKG4067	motor cable 4067 PUR	660111	IKG4013	motor cable 4013 PUR	660153
IKG4085	motor cable 4085 PUR	660114	IKG4020	motor cable 4020 PUR	660154
IKG4090	motor cable 4090 PUR	660115	IKG4018	motor cable 4018 PUR	660155
IKG4087	motor cable 4087 PUR	660116	IKG4016	motor cable 4016 PUR	660156
IKG4103	motor cable 4103 PUR	660119	IKG4033	motor cable 4033 PUR	660157
IKG4110	motor cable 4110 PUR	660120	IKG4050	motor cable 4050 PUR	660158
IKG4107	motor cable 4107 PUR	660121	IKG4035	motor cable 4035 PUR	660159
IKG4123	motor cable 4123 PUR	660124	IKG4037	motor cable 4037 PUR	660160

Continuation ▶

Pre-assembled servo motor cables

for mobile use (PUR)

Base line for use on REXROTH drive systems



Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
IKG4136	motor cable 4136 PUR	660689	RKL4313	motor cable 4313 PUR	660719
IKG4155	motor cable 4155 PUR	660690	RKL4314	motor cable 4314 PUR	660720
IKG4176	Motorleitung 4176	660691	RKL4315	motor cable 4315 PUR	660721
IKG4186	motor cable 4186	660692	RKL4317	motor cable 4317 PUR	660722
IKG4172	motor cable 4172	660693	RKL4318	motor cable 4318 PUR	660723
IKG4173	motor cable 4173 PUR	660694	RKL4401	motor cable 4401 PUR	660724
IKG4174	motor cable 4174	660695	RKL4421	motor cable 4421 PUR	660725
IKG4115	motor cable 4115	660696	RKL4431	motor cable 4431 PUR	660726
IKG4140	motor cable 4140	660697	RKL4441	motor cable 4441 PUR	660727
IKG4116	motor cable 4116 PUR	660698	RKL4421	motor cable 4421 PUR	660728
RKL4421	motor cable 4421 PUR	660699	RKL4421	motor cable 4421 PUR	660729
IKG4117	motor cable 4117 PUR	660700	RKL4421	motor cable 4421 PUR	660730
IKG4177	motor cable 4177 PUR	660701	RKL4421	motor cable 4421 PUR	660732
IKG4118	motor cable 4118 PUR	660702	RKL4421	motor cable 4421 PUR	660733
IKG4215	motor cable 4215 PUR	660703	RKL4421	motor cable 4421 PUR	660734
IKG4175	motor cable 4175 PUR	660704	RKL4421	motor cable 4421 PUR	660735
IKG4169	motor cable 4169 PUR	660705	RKL4421	motor cable 4421 PUR	660736
IKG4138	motor cable 4138 PUR	660706	RKL4421	motor cable 4421 PUR	660737
IKG4134	motor cable 4134 PUR	660707	RKL4421	motor cable 4421 PUR	660739
IKG4119	motor cable 4119 PUR	660708	RKL4421	motor cable 4421 PUR	660740
IKG4120	motor cable 4120 PUR	660709	RKL4421	motor cable 4421 PUR	660741
IKG4137	motor cable 4137 PUR	660710	RKL4421	motor cable 4421 PUR	660742
RKL4302	motor cable 4302 PUR	660627	RKL4421	motor cable 4421 PUR	660743
RKL4303	motor cable 4303 PUR	660711	RKL4421	motor cable 4421 PUR	660744
RKL4300	motor cable 4300 PUR	660712	RKL4421	motor cable 4421 PUR	660745
RKL4301	motor cable 4301 PUR	660713	RKL4421	motor cable 4421 PUR	660746
RKL4306	motor cable 4306 PUR	660714	RKL4421	motor cable 4421 PUR	660747
RKL4307	motor cable 4307 PUR	660715	RKL4421	motor cable 4421 PUR	660748
RKL4308	motor cable 4308 PUR	660716	RKL4421	motor cable 4421 PUR	660749
RKL4309	motor cable 4309 PUR	660717	RKL4421	motor cable 4421 PUR	660750
RKL4310	motor cable 4310 PUR	660718	RKL4421	motor cable 4421 PUR	660751

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables



for mobile use (PVC)

Base line for use on REXROTH drive systems



Technical data

- **Temperature range**
 - moving -10 °C to +80 °C
 - not moving -40 °C to +80 °C
- **Bending radius**
 - moving 12 x cable diameter \varnothing
 - not moving 8 x cable diameter \varnothing
- **Max. acceleration**
 - 4 m/s²
- **Bending cycles**
 - 5 million for $\geq 12x$ cable diameter \varnothing
- **Operating voltage** 30 V
- **Test voltage** 1500 V
- **Insulation resistance** ≥ 100 M Ω m x km

Cable structure

- Copper conductors
 - Polyolefin core insulation
 - **Complete shield**, tin-plated copper braiding
 - **Coverage** approx. 85%
 - PVC outer jacket
 - **Sheath colour** orange
- Structure/colour code**
- **(2x0.5+4x2x0.25)** wh, bn, bn+gn, rd+bl, bu+vio, gy+pk
 - **(2x1.0+4x2x0.25)** wh, bn, bn+gn, rd+bl, bu+vio, gy+pk

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with high mechanical stress. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Particularly suitable for use with small bending radii and high acceleration. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Approbations

UL/CSA

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel Designation	Helukabel Part no.	Helukabel Designation	Helukabel Part no.
feedback cables 4374 PVC	660752	feedback cables 4103 PVC	660755
feedback cables 4042 PVC	660753	feedback cables 4200 PVC	660756
feedback cables 4375 PVC	660754		

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

for mobile use (PUR)

Base line for use on REXROTH drive systems



RoHS

Technical data

- **Temperature range**
moving 0 °C to +60 °C
not moving -40 °C to +60 °C
- **Bending radius**
moving 10 x cable diameter \varnothing
not moving 8 x cable diameter \varnothing
- **Max. acceleration**
5 m/s²
- **Bending cycles**
10 million for $\geq 12x$ cable diameter \varnothing
- **Operating voltage**
300 V AC according to VDE
30 V according to UL/CSA
- **Test voltage** 1000 V (0.14 mm² 0.5 kV)
- **Insulation resistance** ≥ 100 MOhm x km

Approbations

UL/CSA

Cable structure

- Copper conductors
 - high quality PP core insulation / polyolefin core insulation
 - **Complete shield**, tin-plated copper braiding
 - **Coverage** approx. 80%
 - PUR outer sheath
 - **Sheath colour** orange
(for (2x0.5+4x2x0.25) green also possible)
- Structure/colour code**
- **(2x0.5+4x2x0.25)** wh, bn, bn+gn, rd+bl, bu+vio, gy+pk
 - **(2x1.0+4x2x0.25)** wh, bn, bn+gn, rd+bl, bu+vio, gy+pk
 - **(4x2x0.14+4x1.0+(4x0.14))** gy+pk, ye+vio, gn+bn, rd+bl, bu, wh/gn, bn/gn, wh, gn/bl, bu/bl, ye/bl, rd/bl

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with high mechanical stress. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Particularly suitable for use with small bending radii and high acceleration. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
IKS4374	feedback cables 4374 PUR	660260	IKS0205	feedback cables 0205 PUR	660275
IKS4042	feedback cables 4042 PUR	660757	IKS0204	feedback cables 0204 PUR	660276
IKS4375	feedback cables 4375 PUR	660263	IKS0206	feedback cables 0206 PUR	660277
IKS4040	feedback cables 4040 PUR	660758	IKS4142	feedback cables 4142 PUR	660283
IKS4041	feedback cables 4041 PUR	660759	IKS4038	feedback cables 4038 PUR	660761
IKS4020	feedback cables 4020 PUR	660266	IKS4001	feedback cables 4001 PUR	660313
IKS4043	feedback cables 4043 PUR	660760	IKS4019	feedback cables 4019 PUR	660314
IKS4103	feedback cables 4103 PUR	660272	RG4200	feedback cables 4200 PUR	660628

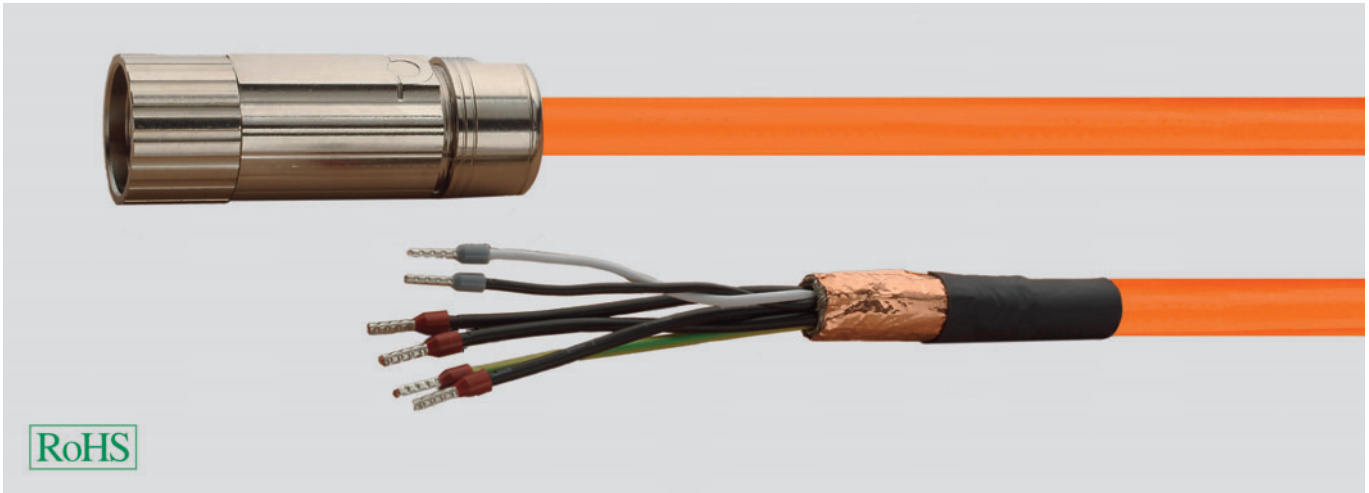
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for fixed laying

Base line for use on LENZE drive systems of the type Global Drive



Technical data

- **Temperature range**
moving -20 °C to +70 °C
not moving -20 °C to +80 °C
- **Bending radius**
moving 18 x cable diameter \varnothing
not moving 9 x cable diameter \varnothing
- **Max. acceleration**
5 m/s²
- **Bending cycles**
50,000 for $\geq 18x$ cable diameter \varnothing
- **Nominal voltage** U_0/U 0.6/1kV
- **Test voltage** 4 kV
- **Insulation resistance** ≥ 500 MOhm x km

Approbations

Desina® (ISO 23570)
VDE
UL/CSA

Cable structure

Power supply cores

- Copper conductors, bare
- **high quality PP core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow

Signal cores

- Copper conductors, bare
- **High quality PP** core insulation
- **Core identification** black white
- **Shielding** aluminium/polyester foil screened with tin-plated copper wires
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 80%
- PVC outer jacket
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EWLMxxxGM-015C	motor cable GM 015	660334	EWLMxxxGM-100	motor cable GM 100	660738
EWLMxxxGM-015C	motor cable GM 015	660482	EWLMxxxGM-040I	motor cable GM 040I	660762
EWLMxxxGM-040	motor cable GM 040	660350	-	motor cable GM 060I	660763
-	motor cable GM 060	660731	EWLMxxxGM-100I	motor cable GM 100I	660764

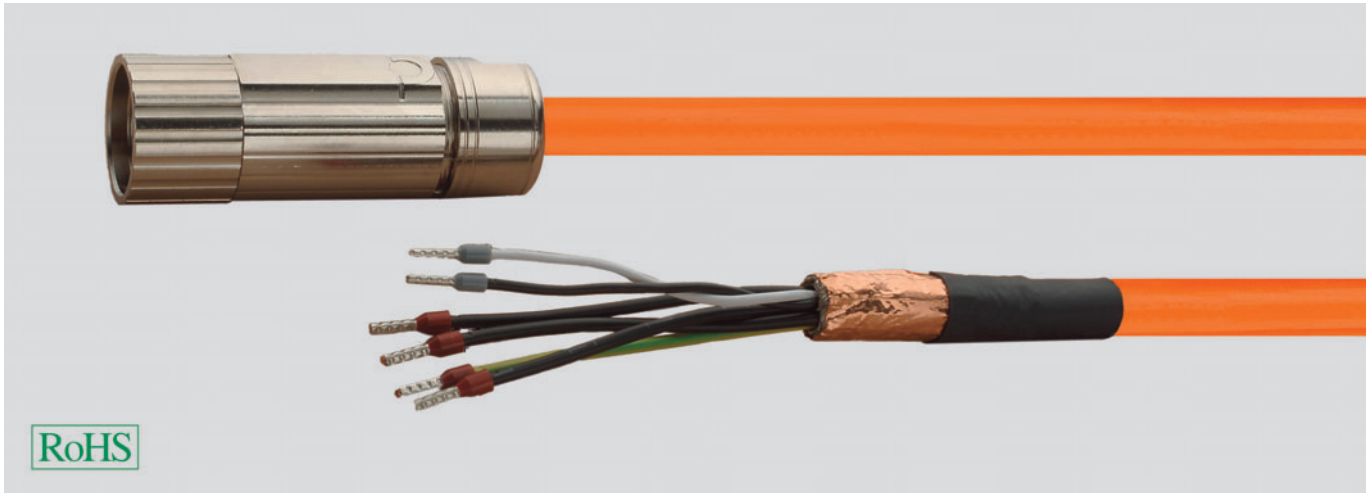
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for mobile use

Base line for use on LENZE drive systems of the type Global Drive



Technical data

- **Wire temperature range**
moving 0 °C to +60 °C
not moving -30 °C to +80 °C
- **Bending radius**
moving 12 x cable diameter \varnothing
not moving 7 x cable diameter \varnothing
- **Max. acceleration**
4 m/s²
- **Bending cycles**
10 million for $\geq 12x$ cable diameter \varnothing
- **Operating voltage** 1,000 V
- **Test voltage, power cores** 3 kV
- **Test voltage, control cores** 1.5 kV
- **Insulation resistance, power cores** ≥ 5000 MOhm x km
- **Insulation resistance, signal cores** ≥ 20 MOhm x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Power supply cores

- Bare copper conductor according to DIN VDE 0295 CL. 6
- **Polyolefin polymer core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow

Signal cores

- Copper conductors, bare
- **Polyolefin/polymer** core insulation
- **Core identification** black white
- Cores twisted in pairs
- **Shield**, tin-plated copper braiding
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 85%
- PUR outer sheath
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with high mechanical stress. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Particularly suitable for use with small bending radii and high acceleration. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
-	motor cable GMS 015	660500
EWLMxxxGMS-025	motor cable GMS 025	660648
EWLMxxxGMS-040	motor cable GMS 040	660766
-	motor cable GMS 060	660767

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
-	motor cable GMS 100	660768
-	motor cable GMS 040I	660769
-	motor cable GMS 060I	660770
-	motor cable GMS 100I	660771

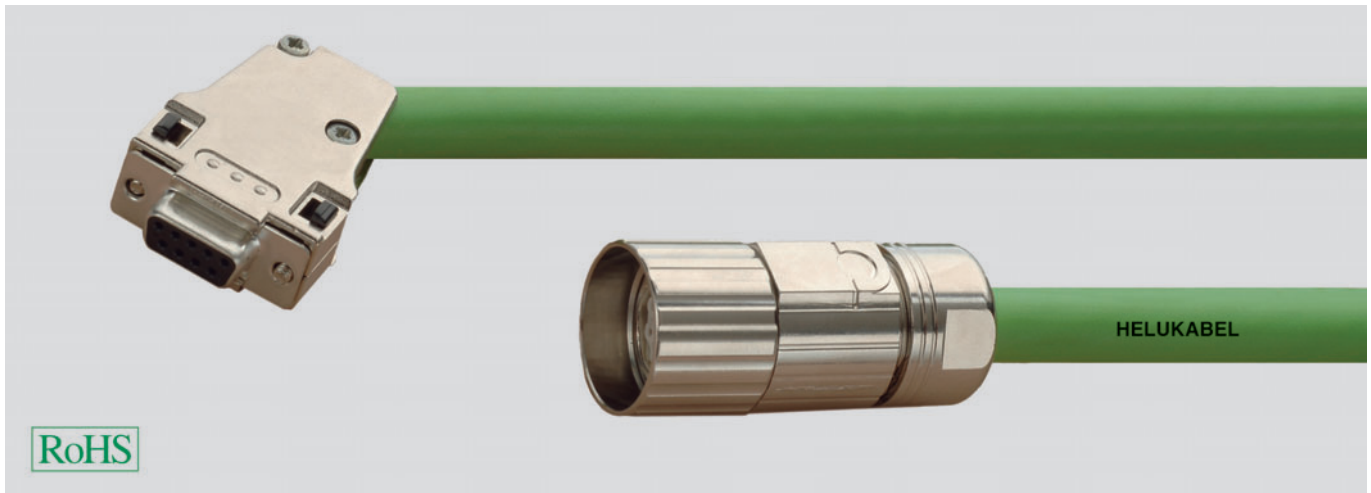
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

for fixed laying

Base line for use on LENZE drive systems of the type Global Drive



Technical data

- **Temperature range**
not moving -25 °C to +80 °C
- **Bending radius**
not moving 8 x outer \varnothing
- **Operating voltage** 30 V
- **Test voltage** 1000 V
- **Insulation resistance** $\geq 10 \text{ M}\Omega \times \text{km}$

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

- Tinned copper conductors
 - PVC or PE core insulation
 - **Shield**, tin-plated copper braiding
 - **Coverage** approx. 75%
 - PVC outer jacket
 - **Sheath colour** green
- Structure/colour code**
- **(3x(2x0.14)+2x(0.5))**
ye+bl, gn+bl, rd+bl, wh, bl
 - **(4x(2x0.14)+2x(1,0))**
ye+gn, pk+gy, rd+bu, bl+vio, wh, bn

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EWLRxxxGM-T	feedback cables GM-T	660335
EWLRxxxGM-T	encoder cables GM-T	660772

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EWLDxxxGGBS93	system cable GGBS 93	660773

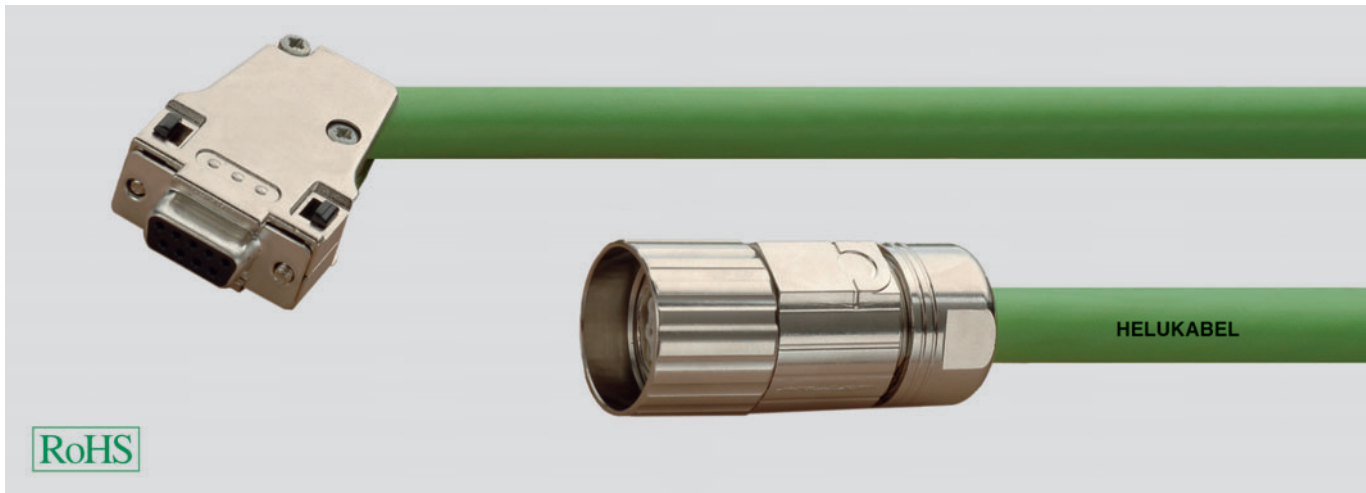
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

for mobile use

Base line for use on LENZE drive systems of the type Global Drive



Technical data

- **Temperature range**
moving -5 °C to +70 °C
not moving -40 °C to +80 °C
- **Bending radius**
moving 15 x cable diameter \varnothing
not moving 8 x cable diameter \varnothing
- **Max. acceleration**
3 m/s²
- **Bending cycles**
2 million for \geq 15x cable diameter \varnothing
- **Operating voltage** 30 V
- **Test voltage** 1000 V

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

- Tinned copper conductors
 - Polyester/polyolefin core insulation
 - **Shield**, tin-plated copper braiding
 - **Coverage** approx. 80%
 - PUR outer sheath
 - **Sheath colour** green
(0-000000-02866 orange)
- Structure/colour code**
- **(3x(2x0.14)+2x(0.5))**
ye+bl, gn+bl, rd+bl, wh, bl
 - **(3x(2x0.14)+2x(0.5))**
ye+gn, rd+gy, rd+bu, wh, bn
 - **(4x(2x0.14)+2x(1.0))**
ye+gn, pk+gy, rd+bu, bl+vio, wh, bn
 - **(4x(2x0.14)+2x(0.5))**
ye+gn, pk+gy, rd+bu, bl+vio, wh, bn

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

**Helukabel
Designation**
feedback cables GMS-T

**Helukabel
Part no.**
660445

**Helukabel
Designation**
encoder cables GMS-T

**Helukabel
Part no.**
660774

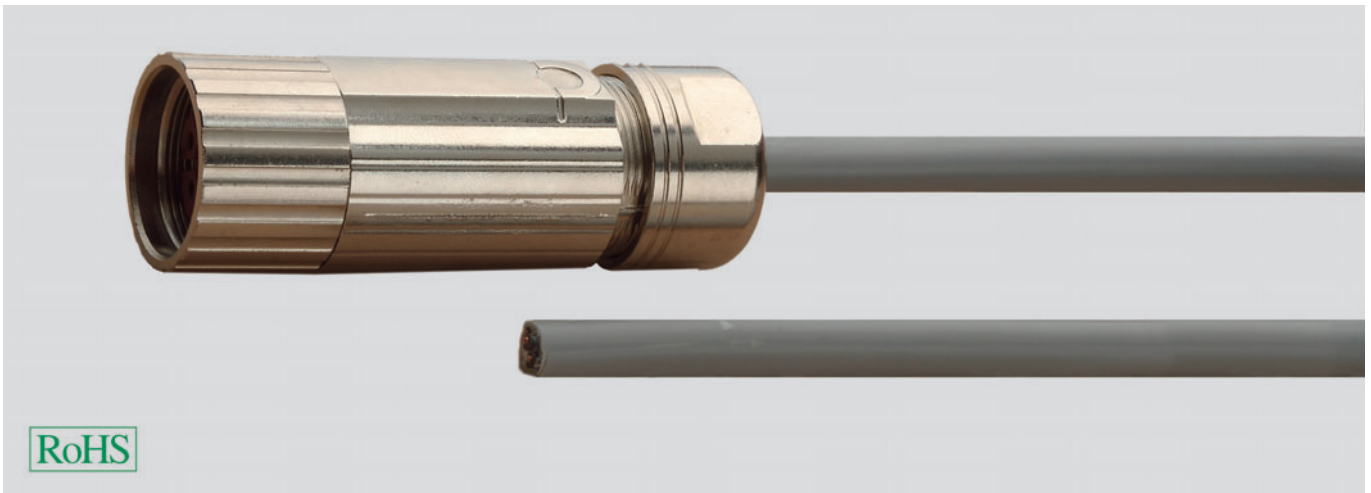
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled fan cables

for fixed laying

Base line for use on LENZE drive systems of the type Global Drive



Technical data

- **Wire temperature range**
moving -5 °C to +70 °C
not moving -40 °C to +70 °C
- **Bending radius**
moving 8 x outer \varnothing
not moving 4 x outer \varnothing
- **Nominal voltage (HAR)** U₀/U 300/500V
- **Nominal voltage (UL/CSA)** U 600V
- **Test voltage, power cores** 3 kV
- **Insulation resistance** ≥ 20 M Ω hm x km

Approbations

UL/CSA

Cable structure

- Bare copper conductor, fine wire stranded
- **PVC core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow
- PVC outer jacket
- **Sheath colour** grey

Application

This high quality pre-assembled fan cable is specially manufactured for applications with static installation. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EWLxxxGM	fan cables GM	660351

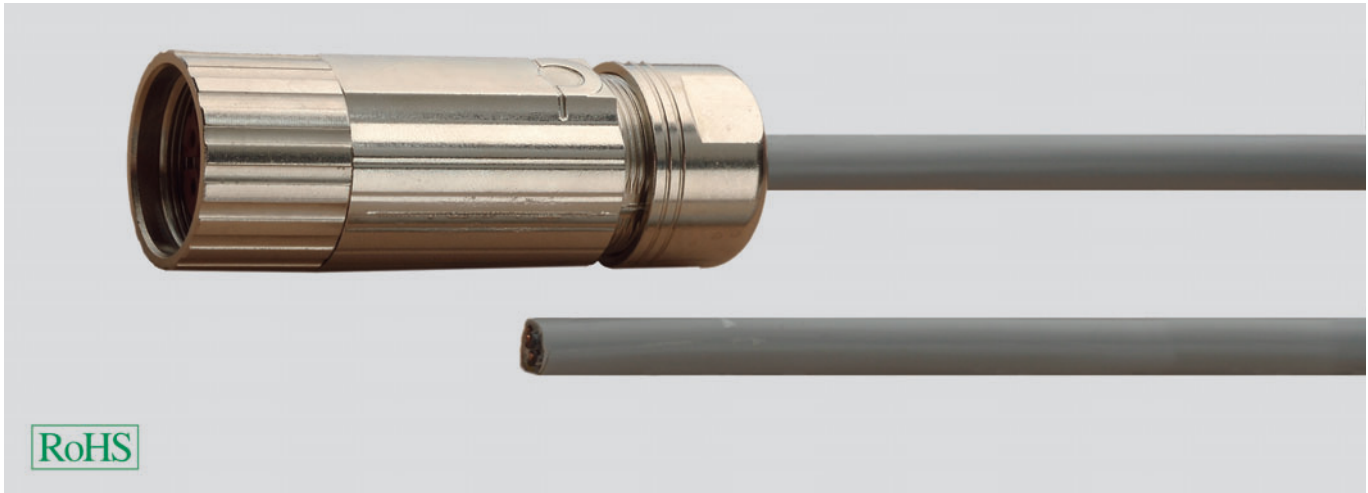
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled fan cables

for mobile use

Base line for use on LENZE drive systems of the type Global Drive



Technical data

- **Wire temperature range**
moving -5 °C to +80 °C
not moving -40 °C to +80 °C
- **Bending radius**
moving 8 x outer ø
not moving 4 x outer ø
- **Nominal voltage (UL/CSA)** U 600V
- **Test voltage, power cores** 4 kV
- **Insulation resistance** ≥ 20 MΩm x km

Approbations

UL/CSA

Cable structure

- Copper conductors, bare, fine wire stranded
- **PVC core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow
- PUR outer sheath
- **Sheath colour** grey

Application

This high quality pre-assembled fan cable is specially manufactured for applications with high mechanical stress. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Particularly suitable for use with small bending radii and high acceleration. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EWLxxxGMS	fan cables GMS	660850

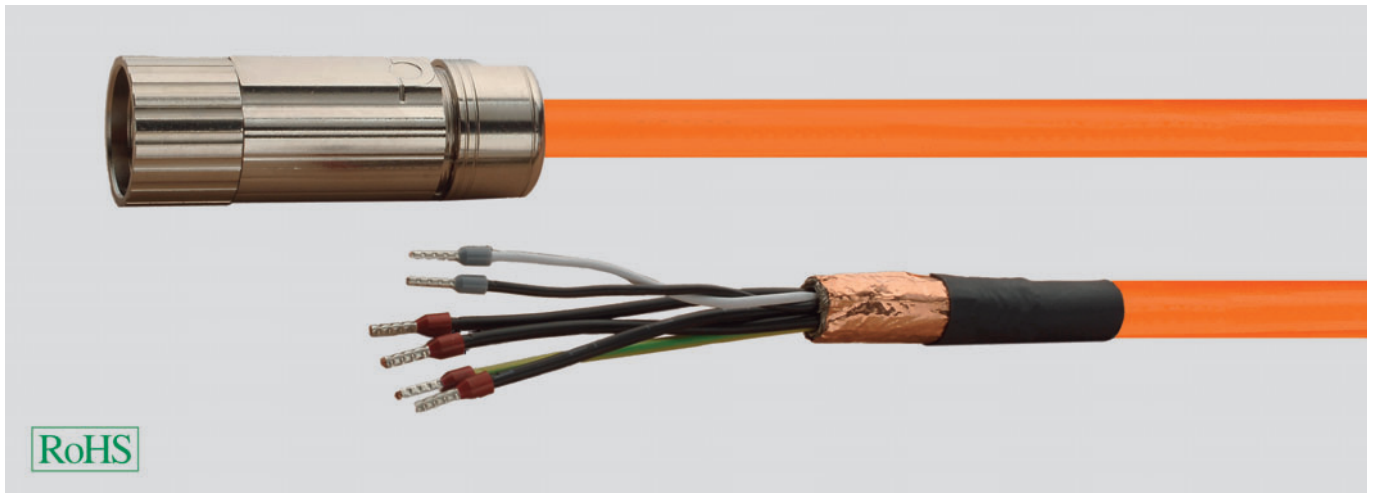
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for fixed laying

Base line for use on LENZE drive systems of the type L-force®



RoHS

Technical data

- **Wire temperature range**
moving -20 °C to +70 °C
not moving -20 °C to +80 °C
- **Bending radius**
moving 18 x cable diameter \varnothing
not moving 9 x cable diameter \varnothing
- **Max. acceleration**
5 m/s²
- **Bending cycles**
50,000 for $\geq 18x$ cable diameter \varnothing
- **Operating voltage (VDE)** U_0/U 0.6/1kV
- **Test voltage** 4 kV
- **Insulation resistance** ≥ 500 MOhm x km

Approbations

Desina® (ISO 23570)
VDE
UL/CSA

Cable structure

Power supply cores

- Copper conductors, bare
- **high quality PP core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow

Signal cores

- Copper conductors, bare
- **High quality PP** core insulation
- **Core identification** black white
- **Shielding** aluminium/polyester foil screened with tin-plated copper wires
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 80%
- PVC outer jacket
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EYP 0006 A xxxx C01 A00	motor cable 0006AC01A00 PVC	660776	EYP 0008 A xxxx M03 A00	motor cable 0008AM03A00 PVC	660781
EYP 0008 A xxxx C02 A00	motor cable 0008AC02A00 PVC	660777	EYP 0009 A xxxx M03 A00	motor cable 0009AM03A00 PVC	660782
EYP 0005 A xxxx M02 A00	motor cable 0005AM02A00 PVC	660778	EYP 0003 A xxxx M01 A00	motor cable 0003AM01A00 PVC	660783
EYP 0006 A xxxx M02 A00	motor cable 0006AM02A00 PVC	660779	EYP 0004 A xxxx M01 A00	motor cable 0004AM01A00 PVC	660784
EYP 0007 A xxxx M03 A00	motor cable 0007AM03A00 PVC	660780	EYP 0005 A xxxx M01 A00	motor cable 0005AM01A00 PVC	660785

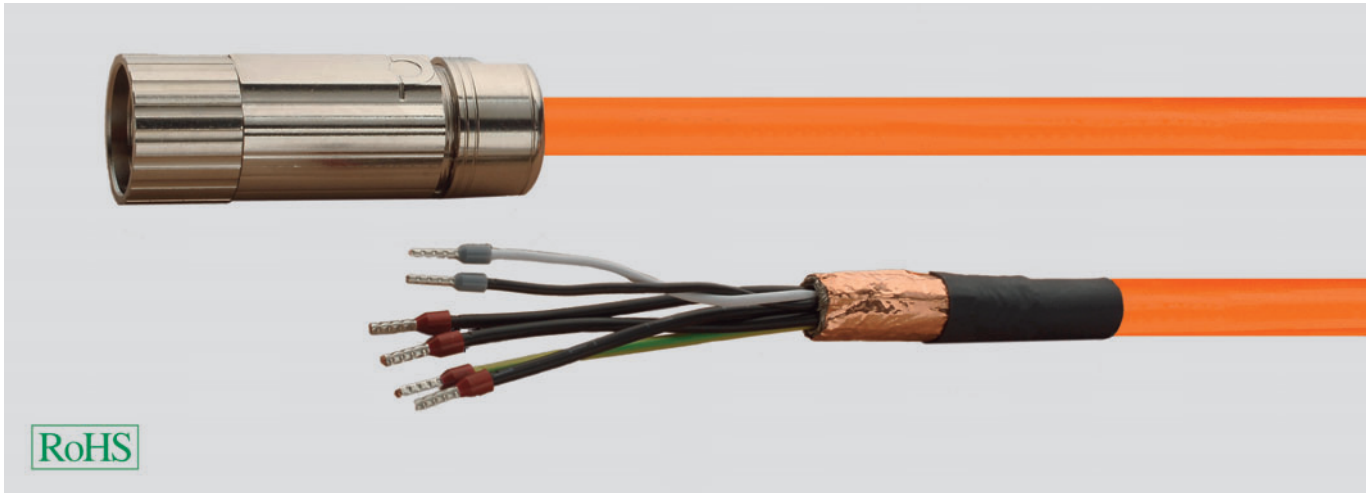
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for mobile use

Base line for use on LENZE drive systems of the type L-force®



RoHS

Technical data

- **Wire temperature range**
moving 0 °C to +60 °C
not moving -30 °C to +80 °C
- **Bending radius**
moving 12 x cable diameter \varnothing
not moving 7 x cable diameter \varnothing
- **Max. acceleration**
4 m/s²
- **Bending cycles**
10 million for $\geq 12x$ cable diameter \varnothing
- **Operating voltage** 1,000V
- **Test voltage, power cores** 3 kV
- **Test voltage, control cores** 1.5 kV
- **Insulation resistance, power cores**
 ≥ 5000 MOhm x km
- **Insulation resistance, signal cores**
 ≥ 20 MOhm x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Power supply cores

- Bare copper conductor according to DIN VDE 0295 CL. 6
- **Polyolefin polymer core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow

Signal cores

- Copper conductors, bare
- **Polyolefin/polymer** core insulation
- **Core identification** black white
- Cores twisted in pairs
- **Shielding** screened with tin-plated copper wires
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 85%
- PUR outer sheath
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with high mechanical stress. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Particularly suitable for use with small bending radii and high acceleration. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EYP 0013 A xxxx C01 A00	motor cable 0013AC01A00 PUR	660786
EYP 0015 A xxxx C02 A00	motor cable 0015AC02A00 PUR	660787
EYP 0012 A xxxx M02 A00	motor cable 0012AM02A00 PUR	660788
EYP 0013 A xxxx M02 A00	motor cable 0013AM02A00 PUR	660789
EYP 0014 A xxxx M03 A00	motor cable 0014AM03A00 PUR	660790

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EYP 0015 A xxxx M03 A00	motor cable 0015AM03A00 PUR	660791
EYP 0016 A xxxx M03 A00	motor cable 0016AM03A00 PUR	660792
EYP 0010 A xxxx M01 A00	motor cable 0010AM01A00 PUR	660793
EYP 0011 A xxxx M01 A00	motor cable 0011AM01A00 PUR	660510
EYP 0012 A xxxx M01 A00	motor cable 0012AM01A00 PUR	660794

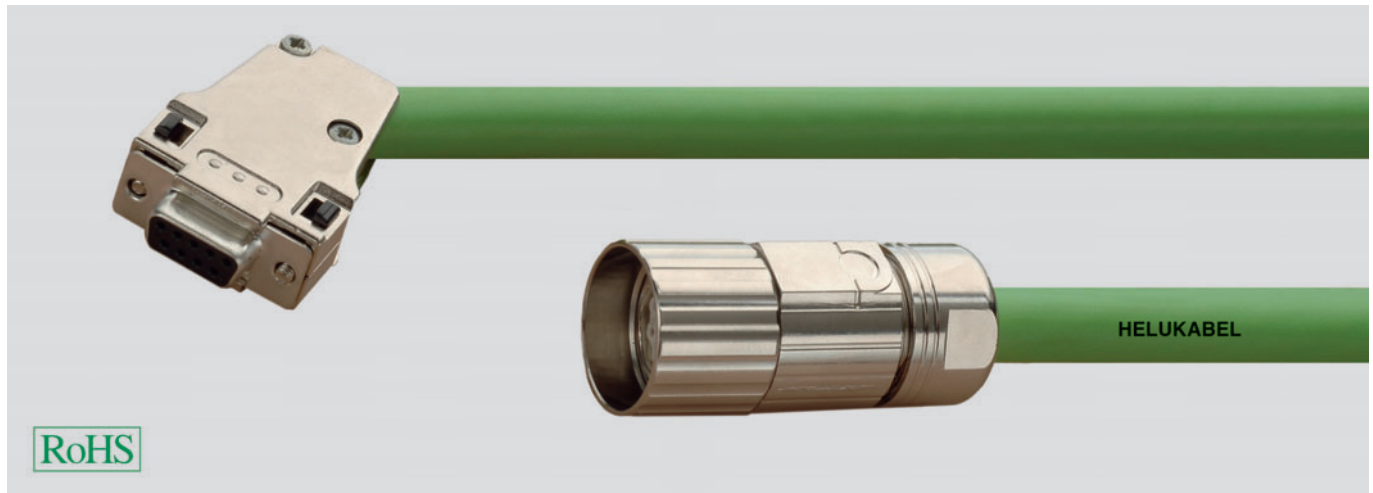
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

for fixed laying

Base line for use on LENZE drive systems of the type L-force®



Technical data

- **Temperature range**
not moving -25 °C to +80 °C
- **Bending radius**
not moving 8 x outer ø
- **Operating voltage** 30 V
- **Test voltage** 1000V
- **Insulation resistance** ≥ 10 MΩ x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

- Tinned copper conductors
 - PVC/polyolefin core insulation
 - **Shield**, tin-plated copper braiding
 - **Coverage** approx. 75%
 - PVC outer jacket
 - **Sheath colour** green
- Structure/colour code**
- **(3x(2x0.14)+2x(0.5))**
ye+bl, gn+bl, rd+bl, wh, bl
 - **(4x(2x0.14)+2x(1.0))**
ye+gn, pk+gy, rd+bu, bl+vio, wh, bn

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EYD 0017 A xxxx W01 S01	feedback cables 0017AW01S01 PVC	660795	EYF 0028 A xxxx A00 G02	feedback cables 0028AA00G02 PVC	660805
EYD 0017 A xxxx W01 S02	feedback cables 0017AW01S02 PVC	660796	EYF 0018 A xxxx A00 S03	feedback cables 0018AA00S03 PVC	660806
EYD 0017 A xxxx W01 W01	feedback cables 0017AW01W01 PVC	660797	EYF 0018 A xxxx A00 W02	feedback cables 0018AA00W02 PVC	660807
EYD 0017 A xxxx W03 S01	feedback cables 0017AW03S01 PVC	660798	EYF 0018 A xxxx F02 A00	feedback cables 0018AF02A00 PVC	660808
EYD 0017 A xxxx W03 S02	feedback cables 0017AW03S02 PVC	660799	EYF 0028 A xxxx F02 G02	feedback cables 0028AF02G02 PVC	660809
EYD 0017 A xxxx W03 W01	feedback cables 0017AW03W01 PVC	660800	EYF 0018 A xxxx F02 S03	feedback cables 0018AF02S03 PVC	660810
EYF 0017 A xxxx A00 S01	feedback cables 0017AA00S01 PVC	660801	EYF 0018 A xxxx F02 W02	feedback cables 0018AF02W02 PVC	660811
EYF 0017 A xxxx A00 S02	feedback cables 0017AA00S02 PVC	660802	EYF 0021 A xxxx A00 S03	feedback cables 0021AA00S03 PVC	660812
EYF 0017 A xxxx F01 A00	feedback cables 0017AF01A00 PVC	660803	EYF 0021 A xxxx F03 A00	feedback cables 0021AF03A00 PVC	660813
EYF 0017 A xxxx F01 S01	feedback cables 0017AF01S01 PVC	660630	EYF 0021 A xxxx F03 S03	feedback cables 0021AF03S03 PVC	660814
EYF 0017 A xxxx F01 S02	feedback cables 0017AF01S02 PVC	660804			

Dimensions and specifications may be changed without prior notice.

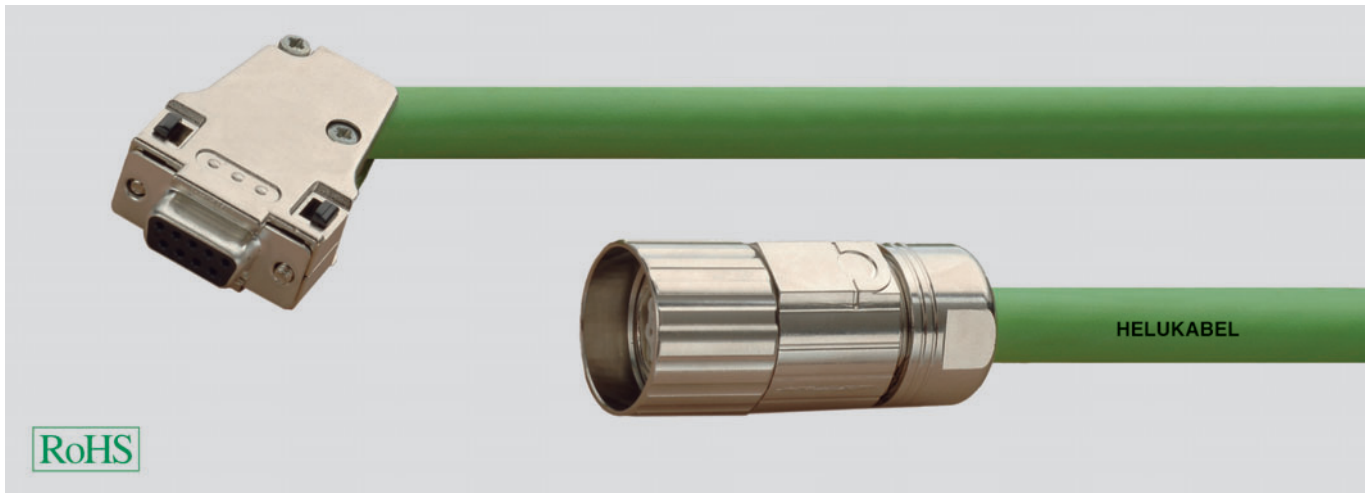
The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

U

Pre-assembled feedback cables

for mobile use

Base line for use on LENZE drive systems of the type L-force®



Technical data

- **Temperature range**
moving -5 °C to +70 °C
not moving -40 °C to +80 °C
- **Bending radius**
moving 15 x cable diameter \varnothing
not moving 8 x cable diameter \varnothing
- **Max. acceleration**
3 m/s²
- **Bending cycles**
2 million for \geq 15x cable diameter \varnothing
- **Operating voltage** 30 V
- **Test voltage** 1000 V

Approbations

Desina® (ISO 23570) (except 0-000000-02866)
UL/CSA

Cable structure

- Tinned copper conductors
- Polyester/polyolefin core insulation
- **Shield**, tin-plated copper braiding
- **Coverage** approx. 80%
- PUR outer sheath
- **Sheath colour** green
(0-000000-02866 orange)

Structure/colour code

- **(3x(2x0.14)+2x(0.5))**
ye+bl, gn+bl, rd+bl, wh, bl
- **(3x(2x0.14)+2x(0.5))**
ye+gn, rd+gy, rd+bu, wh, bn
- **(4x(2x0.14)+2x(1.0))**
ye+gn, pk+gy, rd+bu, bl+vio, wh, bn
- **(4x(2x0.14)+2x(0.5))**
ye+gn, pk+gy, rd+bu, bl+vio, wh, bn

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EYD 0019 A xxxx F02 A00	feedback cables 0019AF02A00 PUR	660815
EYD 0020 A xxxx A00 S04	feedback cables 0020AA00S04 PUR	660816
EYF 0020 A xxxx A00 S05	feedback cables 0020AA00S05 PUR	660817
EYF 0020 A xxxx F01 A00	feedback cables 0020AF01A00 PUR	660818

Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EYF 0020 A xxxx F01 S01	feedback cables 0020AF01S01 PUR	660819
EYF 0020 A xxxx F01 S02	feedback cables 0020AF01S02 PUR	660820
EYF 0022 A xxxx F03 A00	feedback cables 0022AF03A00 PUR	660821

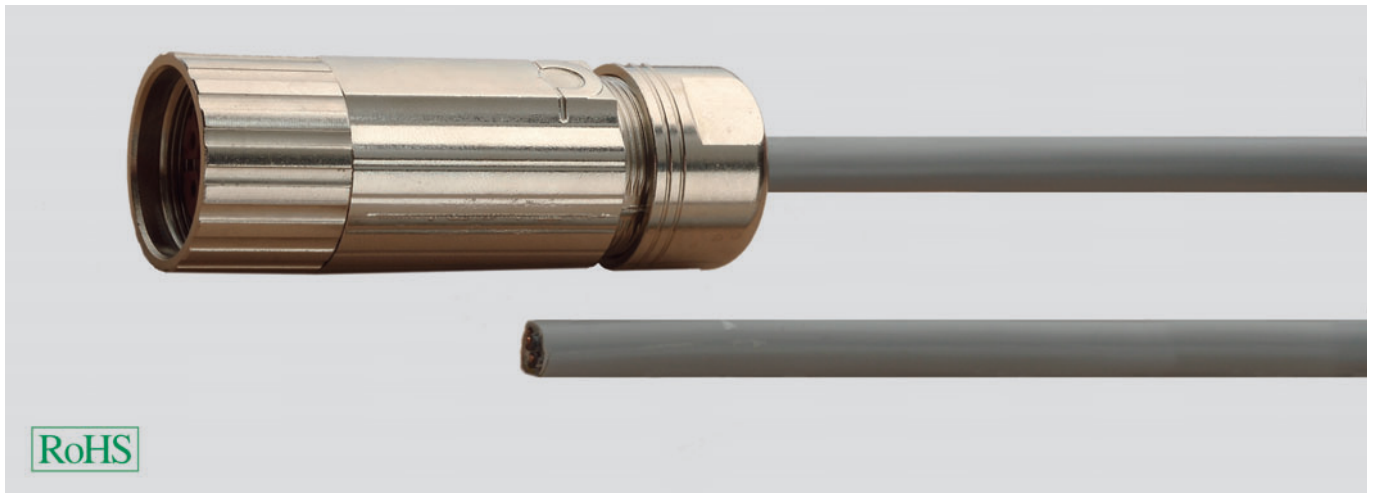
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled fan cables

for fixed laying

Base line for use on LENZE drive systems of the type L-force®



Technical data

- **Wire temperature range**
moving -5 °C to +70 °C
not moving -40 °C to +70 °C
- **Bending radius**
moving 8 x cable diameter \varnothing
not moving 4 x cable diameter \varnothing
- **Nominal voltage (HAR)** U₀/U 300/500 V
- **Nominal voltage (UL/CSA)** U 600 V
- **Test voltage, power cores** 3 kV
- **Insulation resistance** ≥ 20 M Ω m x km

Approbations

UL/CSA

Cable structure

Power supply cores

- Bare copper conductor, fine wire stranded
 - **PVC core insulation**
 - **Core identification** numbers
 - **Earth core** green-yellow
- PVC outer jacket
Sheath colour grey

Application

This high quality pre-assembled fan cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EYL 0001 A xxxx L01 A00	fan cables 0001AL01A00 PVC	660851	EYL 0001 A xxxx L02 A00	fan cables 0001AL02A00 PVC	660852

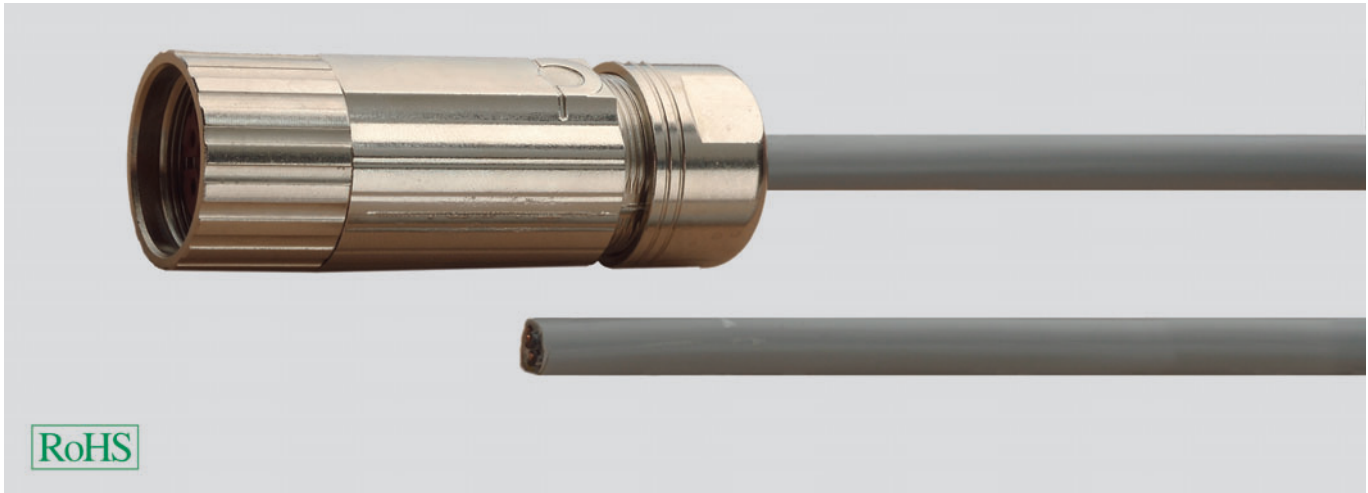
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled fan cables

for mobile use

Base line for use on LENZE drive systems of the type L-force®



Technical data

- **Wire temperature range**
moving -5 °C to +80 °C
not moving -40 °C to +80 °C
- **Bending radius**
moving 8 x outer ø
not moving 4 x outer ø
- **Nominal voltage (UL/CSA)** U 600V
- **Test voltage, power cores** 4 kV
- **Insulation resistance** ≥ 20 MΩm x km

Approbations

UL/CSA

Cable structure

- Copper conductors, bare, fine wire stranded
- **TPE/PVC core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow
- PUR outer sheath
- **Sheath colour** grey

Application

This high quality pre-assembled fan cable is specially manufactured for applications with high mechanical stress. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Particularly suitable for use with small bending radii and high acceleration. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Manufacturer Designation	Helukabel Designation	Helukabel Part no.	Manufacturer Designation	Helukabel Designation	Helukabel Part no.
EYL 0002 A xxxx L01 A00	fan cables 0001AL01A00 PVC	660853	EYL 0002 A xxxx L02 A00	fan cables 0002AL02A00 PVC	660854

Dimensions and specifications may be changed without prior notice.

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Pre-assembled servo motor cables

for fixed laying

Base line for use on SEW drive systems



RoHS

Technical data

- **Wire temperature range**
not moving -40 °C to +80 °C
- **Bending radius**
not moving 20 x cable diameter \varnothing
- **Nominal voltage (UL)** 1000 V
- **Nominal voltage (VDE)** 0.6/1kV
- **Test voltage** 4 kV
- **Insulation resistance** $\geq 20 \text{ MOhm} \times \text{km}$

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Power supply cores

- Copper conductors, bare
- **PP core insulation**
- **Core identification** U1, V2, W3
- **Earth core** green-yellow

Signal cores

- Copper conductors, bare
- **PP core insulation**
- **Core identification** 1, 2, 3
- Cores twisted to triple
- **Shielding** aluminium coated polyester foil with drain wire + copper screen
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 85%
- PVC outer jacket
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel Designation	Helukabel Part no.
motor cable 1991795 PVC 4x1,5	660822
motor cable 1991892 PVC 4x1,5+3x1	660823

Helukabel Designation	Helukabel Part no.
Motorleitung 1991914 PVC 4x2,5+3x1	660897

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for mobile use

Base line for use on SEW drive systems



RoHS

Technical data

- **Temperature range**
moving -20 °C to +60 °C
not moving -50 °C to +80 °C
- **Bending radius**
moving 10 x cable diameter \varnothing
not moving 3 x cable diameter \varnothing
- **Max. acceleration**
20 m/s² for 4 m horizontal traverse path
- **Bending cycles**
5 million for ≥ 10 x cable diameter \varnothing
- **Operating voltage** U₀/U 600/1000 V
power cores
- **Operating voltage** U 1000 V AC control
cores
- **Test voltage, power cores** 4 kV
- **Test voltage, control cores** 4 kV
- **Insulation resistance** ≥ 100 MOhm x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Power supply cores

- Bare copper, extra fine wire conductor according to DIN VDE 0295 CL. 6
- **high quality PP core insulation**
- **Core identification** U/L1/C/L+
V/L2
W/L3/D/L-

- **Earth core** green-yellow

Signal cores

- Copper conductors, bare, fine wire stranded
- **High quality PP** core insulation
- **Core identification** 1, 2, 3
- Cores twisted to triple
- **Shield**, tin-plated copper braiding
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 85%
- PUR outer sheath
- **Sheath colour** orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel Designation	Helukabel Part no.
motor cable 1991809 PUR 4x1,5	660824
motor cable 1991825 PUR 4x2,5	660825
motor cable 1991841 PUR 4x4	660826
motor cable 1991868 PUR 4x6	660827
motor cable 1991884 PUR 4x10	660828

Helukabel Designation	Helukabel Part no.
motor cable 1991906 PUR 4x1,5+3x1	660829
motor cable 1991922 PUR 4x2,5+3x1	660830
motor cable 1991949 PUR 4x4+3x1	660831
motor cable 1991965 PUR 4x6+3x1	660832
motor cable 1991981 PUR 4x10+3x1	660833

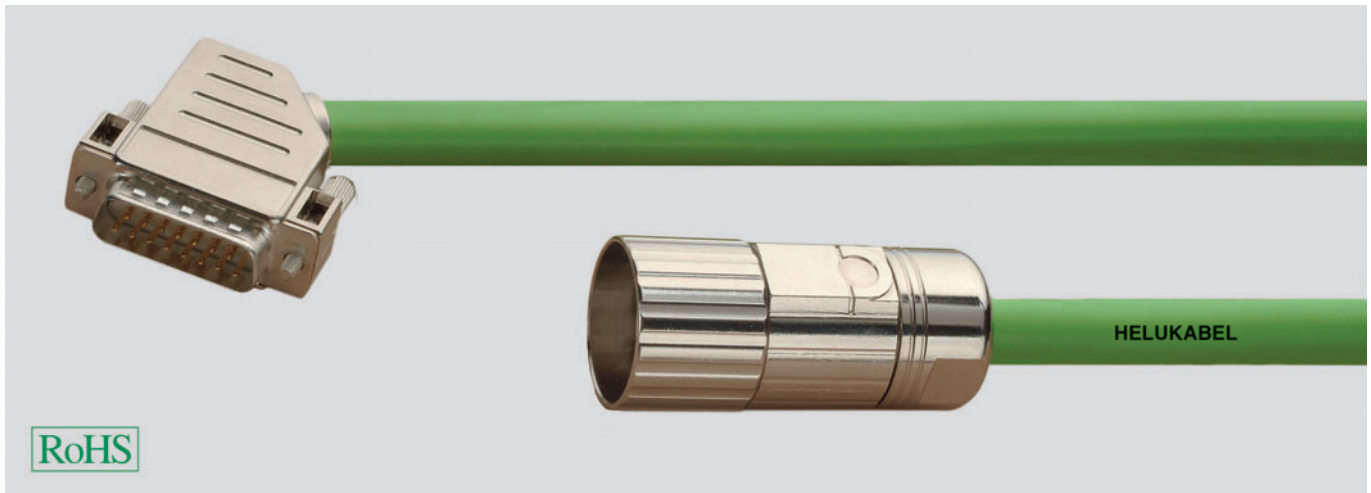
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

for fixed laying

Base line for use on SEW drive systems



Technical data

- **Temperature range**
not moving -40 °C to +80 °C
- **Bending radius**
not moving 20 x cable diameter \varnothing
- **Nominal voltage** max. 350 V, 300 V according to UL
- **Test voltage, core/core** 1.5 kV
- **Test voltage, core/shield** 1 kV

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Power supply cores

- Copper conductors, bare
- **PP core insulation**
- **Core identification** colours according to DIN 47100
- **Complete shield** made of tin-plated copper braiding with drain wire
- **Coverage** approx. 85%
- PVC outer jacket
- **Sheath colour** green

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel Designation	Helukabel Part no.	Helukabel Designation	Helukabel Part no.
feedback cables HF 13324535 PVC 6x2x0,25	660834	feedback cables 1994875 PVC 5x2x0,25	660836
feedback extension HF 1995391 PVC 6x2x0,25	660835	feedback extension 1995421 PVC 5x2x0,25	660837

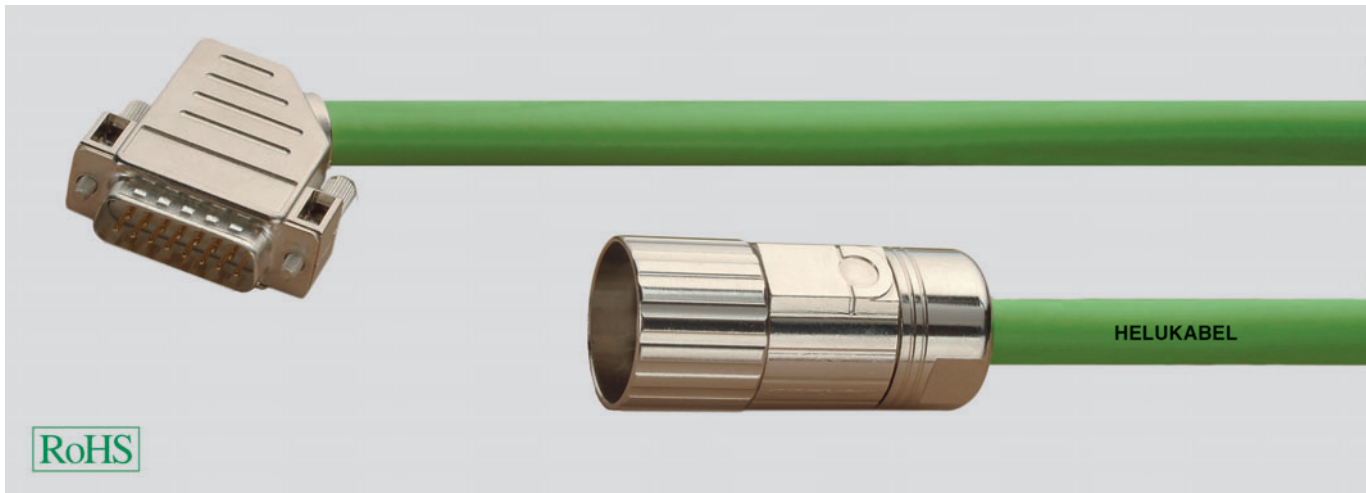
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

for mobile use

Base line for use on SEW drive systems



Technical data

- **Temperature range**
moving -20 °C to +60 °C
not moving -50 °C to +80 °C
- **Bending radius**
moving 10 x cable diameter \varnothing
not moving 5 x cable diameter \varnothing
- **Max. acceleration**
20 m/s²
- **Bending cycles**
10 million for $\geq 10x$ cable diameter \varnothing
- **Nominal voltage** 300 V
- **Test voltage** 1.5 kV

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

- Copper conductors, bare
- **PP core insulation**
- **TPE inner sheath**
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 80%
- PUR outer sheath
- **Sheath colour** green
- **Core identification** colours according to DIN 47100

Application

This high quality pre-assembled sensor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel Designation	Helukabel Part no.
feedback cables HF 13324551 PUR 6x2x0,25	660838
feedback extension HF 1995405 PUR 6x2x0,25	660839

Helukabel Designation	Helukabel Part no.
feedback cables 1994875 PVC 5x2x0,25	660840
feedback extension 1995421 PVC 5x2x0,25	660841

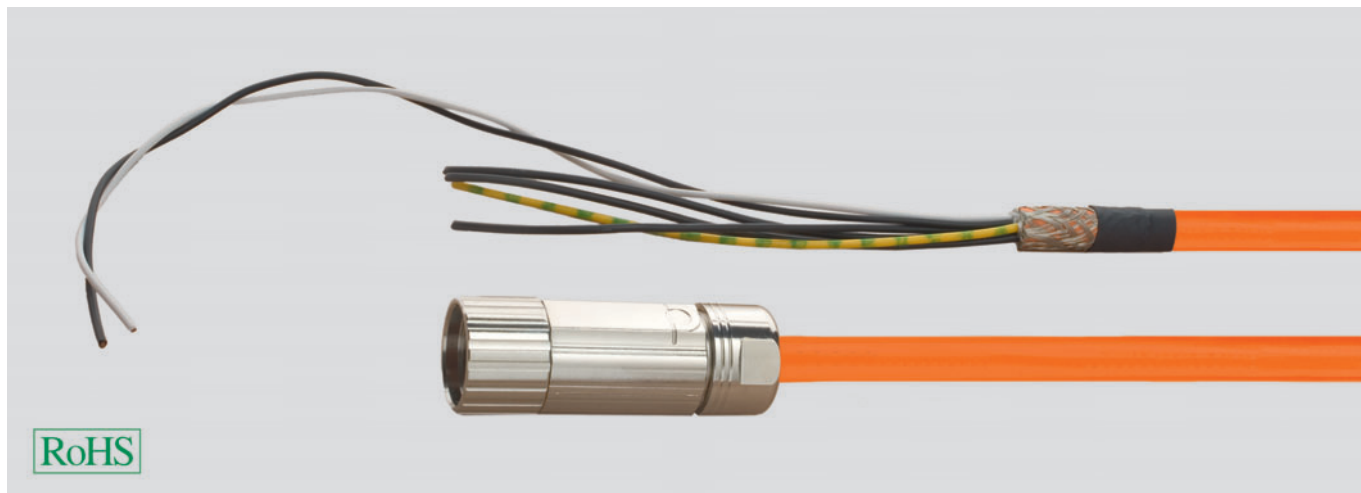
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for fixed laying

Base line for use on SEW drive systems



Technical data

- **Temperature range**
moving 0 °C to +60 °C
not moving -20 °C to +80 °C
- **Bending radius**
moving 20 x cable diameter \varnothing
not moving 9 x cable diameter \varnothing
- **Max. acceleration**
2 m/s²
- **Bending cycles**
50,000 for $\geq 20x$ cable diameter \varnothing
- **Operating voltage, power supply cores** 600/1000 V
- **Test voltage, power cores** 4 kV
- **Insulation resistance** ≥ 20 M Ω m x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

Brake motor cable Power supply cores

- Bare copper, extra fine wire conductor according to DIN VDE 0295 CL. 5
- **high quality PP core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow

Brake cores

- Copper conductors, bare
- **Core insulation** high quality PP
- **Core identification** black white
- **Shielding** aluminium/polyester foil, screened with tin-plated copper wires

Motor cable

Power supply cores

- Bare copper, according to IEC 60228 Cl. 6
- **Core insulation** PVC
- **Core identification** U/L1/C/L+
V/L2
W/L3/D/L-
- **Earth core** green-yellow
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 80%
- PVC outer jacket
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with static installation. The special PVC outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

Economical alternatives to the cable carrier compatible cable types which otherwise meet all requirements of the servo drive manufacturers. These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel Designation	Helukabel Part no.
motor cable 1995502 PVC 4x1,5	660842
motor cable 05904552 PVC 4x2,5	660845

Helukabel Designation	Helukabel Part no.
motor cable 13324853 PVC 4x1,5+2x1	660844
motor cable 13332139 PVC 4x2,5+2x1	660845

Helukabel Designation	Helukabel Part no.
motor cable 13324853 PVC 4x1,5+2x1	660844
motor cable 13332139 PVC 4x2,5+2x1	660845

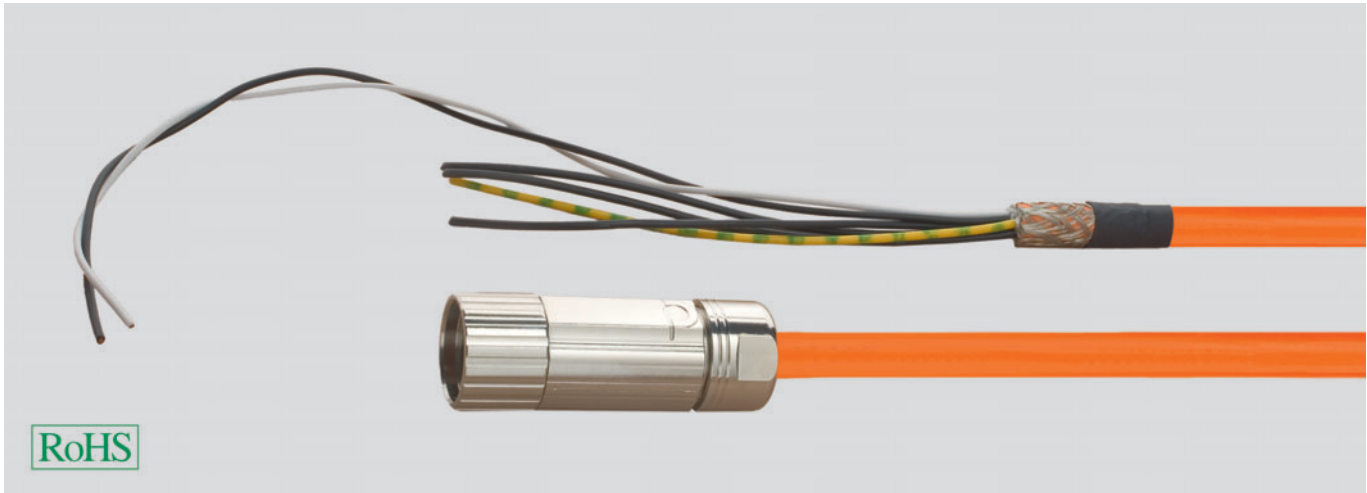
Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled servo motor cables

for mobile use

Base line for use on SEW drive systems



RoHS

Technical data

- **Temperature range**
moving 0 °C to +60 °C
not moving -30 °C to +80 °C
- **Bending radius**
moving 12 x cable diameter \varnothing
not moving 7 x cable diameter \varnothing
- **Max. acceleration**
4 m/s²
- **Bending cycles**
10 million for $\geq 12x$ cable diameter \varnothing
- **Operating voltage, power supply cores** 600/1000 V
- **Test voltage, power cores** 3 kV
- **Test voltage, control cores** 1.5 kV
- **Insulation resistance** ≥ 500 MOhm x km

Approbations

Desina® (ISO 23570)
UL/CSA

Cable structure

For brake motor cables Power supply cores

- Copper conductors, bare
- **Polyolefin polymer core insulation**
- **Core identification** 1, 2, 3
- **Earth core** green-yellow

Brake cores

- Copper conductors, bare, fine wire stranded
- **Core insulation** polyester
- **Core identification** black white
- **Shielding** screened with tin-plated copper wires

For motor cables

Power supply cores

- Copper conductors, bare, fine wire stranded
- **Core insulation** polyester
- **Core identification** U/L1/C/L+
V/L2
W/L3/D/L-
- **Earth core** green-yellow
- **Complete shield** made of tin-plated copper braiding
- **Coverage** approx. 80%
- PUR outer sheath
- **Sheath colour**, orange (RAL 2003)

Application

This high quality pre-assembled motor connection cable is specially manufactured for applications with mobile use. The special PUR outer jacket allows use in many industrial environments of general machine and plant construction.

Characteristic

These pre-assembled cables can be produced in any lengths and also with customer-specific modifications.

Note

Please observe the installation instructions for laying cables in cable carriers on Page 36 and the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel Designation	Helukabel Part no.
motor cable 05906245 PUR 4x1,5	660846
motor cable 05906253 PUR 4x2,5	660847

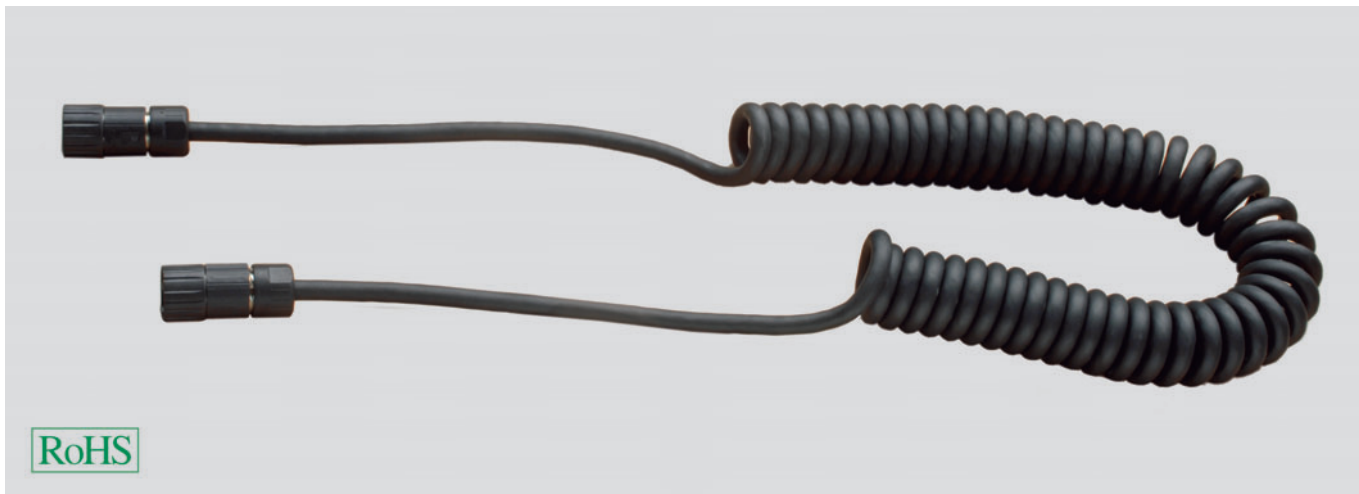
Helukabel Designation	Helukabel Part no.
motor cable 13331221 PUR 4x1,5+2x1	660848
motor cable 13332155 PUR 4x2,5+2x1	660849

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled feedback cables

For use on Heidenhain measurement systems



Technical data

- **Temperature range**
-20 °C to +70 °C
- **Max. operating voltage** 50 V

Cable structure

- Tinned copper conductor, fine wire stranded
- PVC/PP core insulation
- **Shielding**
Internal shield: tinned copper winding
External shield: tinned copper winding
- PUR outer sheath
- **Sheath colour** black
- **Structure/colour code**
• **((5x0.14)+4x0.25+2x0.25+1x0.5)** (wh, bn, gn, ye, gy) bu, bk, rd, rd/bu, wh/bu, wh/gn, bn/gn, gy/pk)

Application

This pre-assembled sensor cable is suitable for use on Heidenhain measurement systems (hand wheels).

Characteristic

These pre-assembled cables can be produced in any lengths and with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel
Designation
spiral cable 312879 PUR sw

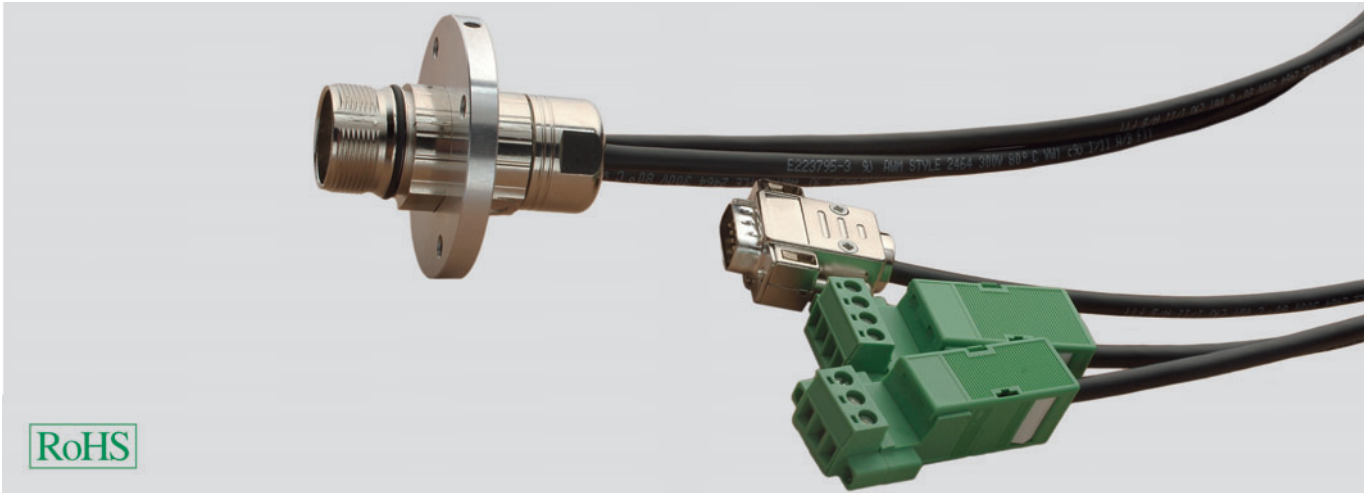
Helukabel
Part no.
660893

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Pre-assembled adapter cables

For use on Heidenhain measurement systems (hand wheels)



RoHS

Technical data

- **Temperature range**
moving -15 °C to +60 °C
not moving -30 °C to +80 °C
- **Bending radius**
moving 15 x cable diameter \varnothing
not moving 8 x cable diameter \varnothing
- **Max. operating voltage** 300 V
- **Test voltage** 1.5 kV
- **Insulation resistance** $\geq 100 \text{ MOhm} \times \text{km}$

Cable structure

- Tinned copper conductors
 - SR PVC core insulation
 - **Complete shield** made of tin-plated copper braiding
 - PVC outer jacket
 - **Sheath colour** black
- Structure/colour code**
- **internal code for UL/CSA cables** bl, bn, rd, or, ye, gn

Application

This pre-assembled sensor cable is suitable for use on Heidenhain measurement systems (hand wheels).

Characteristic

These pre-assembled cables can be produced in any lengths and with customer-specific modifications.

Note

Please observe the drive or controller manufacturer's information about maximum permitted cable length.

Helukabel
Designation
adapter cables 296466 PVC sw

Helukabel
Part no.
660894

Dimensions and specifications may be changed without prior notice.

The prefabricated cables listed here are not original parts, but accessories manufactured by the company HELUKABEL® GmbH. The data, standards and approvals relate solely to the bulk goods used.

Project planning sheet for pre-assembled cables

Description of the pre-assembled cable

Male connector description																																			
Connection diagram	Assignment				Connection diagram																														
	PIN	Core No./ colour	PIN	Core No./ colour																															
<input type="checkbox"/> Mating face view <input type="checkbox"/> Working side view					<input type="checkbox"/> Mating face view <input type="checkbox"/> Working side view																														
Cores not used <input type="checkbox"/> insulate <input type="checkbox"/> cut off					Cores not used <input type="checkbox"/> insulate <input type="checkbox"/> cut off																														
Cable outlet <input type="checkbox"/> straight <input type="checkbox"/> angled in PIN direction					Cable outlet <input type="checkbox"/> straight <input type="checkbox"/> angled in PIN direction																														
Coding setting <input type="checkbox"/> in direction					Coding setting <input type="checkbox"/> in direction																														
Screen machining <table border="0"> <tr> <td>outer</td> <td>inner</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>cut off</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>on case</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>on PIN</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>implement with core</td> </tr> </table> <input type="checkbox"/> insulate outer screen against inner screen <input type="checkbox"/> connect inner screens <input type="checkbox"/> insulate inner screens against each other <input type="checkbox"/> cut off outer screen, encase with sheath <input type="checkbox"/> screen window Width Position	outer	inner		<input type="checkbox"/>	<input type="checkbox"/>	cut off	<input type="checkbox"/>	<input type="checkbox"/>	on case	<input type="checkbox"/>	<input type="checkbox"/>	on PIN	<input type="checkbox"/>	<input type="checkbox"/>	implement with core					Screen machining <table border="0"> <tr> <td>outer</td> <td>inner</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>cut off</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>on case</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>on PIN</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>implement with core</td> </tr> </table> <input type="checkbox"/> insulate outer screen against inner screen <input type="checkbox"/> connect inner screens <input type="checkbox"/> insulate inner screens against each other <input type="checkbox"/> cut off outer screen, encase with sheath <input type="checkbox"/> screen window Width Position	outer	inner		<input type="checkbox"/>	<input type="checkbox"/>	cut off	<input type="checkbox"/>	<input type="checkbox"/>	on case	<input type="checkbox"/>	<input type="checkbox"/>	on PIN	<input type="checkbox"/>	<input type="checkbox"/>	implement with core
outer	inner																																		
<input type="checkbox"/>	<input type="checkbox"/>	cut off																																	
<input type="checkbox"/>	<input type="checkbox"/>	on case																																	
<input type="checkbox"/>	<input type="checkbox"/>	on PIN																																	
<input type="checkbox"/>	<input type="checkbox"/>	implement with core																																	
outer	inner																																		
<input type="checkbox"/>	<input type="checkbox"/>	cut off																																	
<input type="checkbox"/>	<input type="checkbox"/>	on case																																	
<input type="checkbox"/>	<input type="checkbox"/>	on PIN																																	
<input type="checkbox"/>	<input type="checkbox"/>	implement with core																																	
Special features 					Special features 																														

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Project planning sheet for pre-assembled cables

Customer data

Company name			
Address		Tel	
Post code, Town/City		Fax	
Contact		Email	

Data for the pre-assembled cable

Designation		Batch sizes/ scale quantities	
Annual requirement		Delivery time/ date	

Sold by the metre

Designation/ description/design		Usage conditions	
Sheath material		Lengths (n)	
Sheath colour		Supplier	
Approvals		Supplier article number	

Side A

Male connector

Designation/ Description	
Quality class	
Supplier	
Supplier article number	

Machined open end

Designation/ Description	
Stripping dimensions/ core lengths	
Contacts/ Male connector	
Supplier	
Supplier article number	

cut flush labelled not labelled

Lettering system	
Supplier	
Supplier article number	

Special test parameters	
Packaging	

Side B

Male connector

Designation/ Description	
Quality class	
Supplier	
Supplier article number	

Machined open end

Designation/ Description	
Stripping dimensions/ core lengths	
Contacts/ Male connector	
Supplier	
Supplier article number	

cut flush labelled not labelled

Lettering system	
Supplier	
Supplier article number	

Special test parameters	
Packaging	



Photo: HELUKABEL®

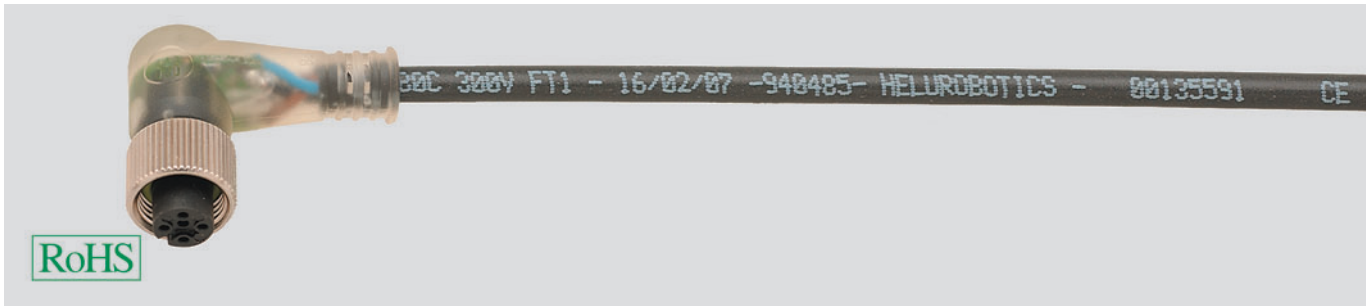
ROBOFLEX-recycle

The cables with this new sheath material cover all requirements for very large mechanical stresses for abrasion, tear resistance, torsion, flexing, flexibility and oil resistance. Using for automation technology, plant and machine construction, fixture construction for handling devices, welding devices and welding tongs, assembly and handling devices, machining production, welding robots and tool machines, blast furnaces and rolling mills. The completely new feature of this cable is the weld splatter resistance without the required cross-linking process.

- Our newly developed non-cross-linked thermoplastic elastomer is fully recyclable.
- In contrast to this, the usual, cross-linked, thermoplastic elastomers cannot be recycled and put a not insignificant stress on our environment.
- A significantly longer service life than that of existing cables on the market, because it can be used in highly flexible applications, for example on robots (torsion) and in drag chains (dynamic load).

U

ROBOFLEX-recycle M12 femal one end pre-assembled 3-, 4- and 5-pin



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

- Bare copper litz wire, 42 x 0.10 mm
 - Core insulation polyester, black, blue, brown
 - Cores stranded in layers
 - Sheath, special mix
 - weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
 - Sheath colour: black
- Assembly (3-pin)**
colour of cores brown, blue, black
AD 5,2 +/-0,2 mm
- Assembly (4-pin)**
colour of cores brown, blue, black, white
AD 5,5 +/-0,2 mm
- Assembly (5-pin)**
colour of cores brown, blue, black, white, grey
AD 6,0 +/-0,2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

* Design for the standard 2 LEDs in the colours: yellow, green.
3 LEDs in the colours: white, yellow, green - available upon request.
** Sensor cable ROBOFLEX-recycle M12 socket, angled, preassembled on one side, 5 pins. Available on request.
IP67
A-coded

socket with LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670742	ROBOFLEX-recycle 3 x 0,34	1,5	socket angled with 2 LED	14,7
670743	ROBOFLEX-recycle 3 x 0,34	3,0	socket angled with 2 LED	29,4
670744	ROBOFLEX-recycle 3 x 0,34	5,0	socket angled with 2 LED	49,0
670745	ROBOFLEX-recycle 3 x 0,34	10,0	socket angled with 2 LED	98,0
670746	ROBOFLEX-recycle 4 x 0,34	1,5	socket angled with 2 LED	19,7
670747	ROBOFLEX-recycle 4 x 0,34	3,0	socket angled with 2 LED	39,3
670748	ROBOFLEX-recycle 4 x 0,34	5,0	socket angled with 2 LED	65,5
670749	ROBOFLEX-recycle 4 x 0,34	10,0	socket angled with 2 LED	131,0
671543	ROBOFLEX-recycle 3 x 0,34	1,0	socket straight with LED	9,8
671544	ROBOFLEX-recycle 3 x 0,34	1,5	socket straight with LED	14,7
671546	ROBOFLEX-recycle 3 x 0,34	3,0	socket straight with LED	29,4
671547	ROBOFLEX-recycle 3 x 0,34	5,0	socket straight with LED	49,0
671548	ROBOFLEX-recycle 3 x 0,34	10,0	socket straight with LED	98,0
671557	ROBOFLEX-recycle 4 x 0,34	1,0	socket straight with LED	13,1
671550	ROBOFLEX-recycle 4 x 0,34	1,5	socket straight with LED	19,7
671551	ROBOFLEX-recycle 4 x 0,34	3,0	socket straight with LED	39,3
671552	ROBOFLEX-recycle 4 x 0,34	5,0	socket straight with LED	65,5
671553	ROBOFLEX-recycle 4 x 0,34	10,0	socket straight with LED	131,0
671473	ROBOFLEX-recycle 5 x 0,34	1,0	socket straight with LED	16,5
671474	ROBOFLEX-recycle 5 x 0,34	1,5	socket straight with LED	24,8
671476	ROBOFLEX-recycle 5 x 0,34	3,0	socket straight with LED	49,5
671477	ROBOFLEX-recycle 5 x 0,34	5,0	socket straight with LED	82,5
671478	ROBOFLEX-recycle 5 x 0,34	10,0	socket straight with LED	165,0

Continuation ►

ROBOFLEX-recycle M12 femal one end pre-assembled 3-, 4- and 5-pin

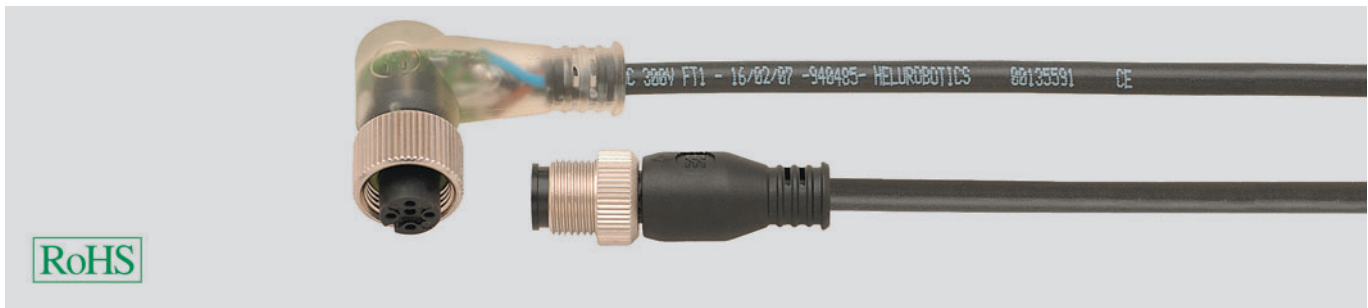
socket without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670722	ROBOFLEX-recycle 3 x 0,34	1,5	socket angled without LED	14,7
670723	ROBOFLEX-recycle 3 x 0,34	3,0	socket angled without LED	29,4
670724	ROBOFLEX-recycle 3 x 0,34	5,0	socket angled without LED	49,0
670725	ROBOFLEX-recycle 3 x 0,34	10,0	socket angled without LED	98,0
670738	ROBOFLEX-recycle 4 x 0,34	1,5	socket angled without LED	19,7
670739	ROBOFLEX-recycle 4 x 0,34	3,0	socket angled without LED	39,3
670740	ROBOFLEX-recycle 4 x 0,34	5,0	socket angled without LED	65,5
670741	ROBOFLEX-recycle 4 x 0,34	10,0	socket angled without LED	131,0
671438	ROBOFLEX-recycle 5 x 0,34	1,5	socket angled without LED	24,8
671439	ROBOFLEX-recycle 5 x 0,34	3,0	socket angled without LED	49,5
671440	ROBOFLEX-recycle 5 x 0,34	5,0	socket angled without LED	82,5
671441	ROBOFLEX-recycle 5 x 0,34	10,0	socket angled without LED	165,0
670718	ROBOFLEX-recycle 3 x 0,34	1,5	socket straight without LED	14,7
670719	ROBOFLEX-recycle 3 x 0,34	3,0	socket straight without LED	29,4
671720	ROBOFLEX-recycle 3 x 0,34	5,0	socket straight without LED	49,0
670721	ROBOFLEX-recycle 3 x 0,34	10,0	socket straight without LED	98,0
670734	ROBOFLEX-recycle 4 x 0,34	1,5	socket straight without LED	19,7
670735	ROBOFLEX-recycle 4 x 0,34	3,0	socket straight without LED	39,3
670736	ROBOFLEX-recycle 4 x 0,34	5,0	socket straight without LED	65,5
670737	ROBOFLEX-recycle 4 x 0,34	10,0	socket straight without LED	131,0
671434	ROBOFLEX-recycle 5 x 0,34	1,5	socket straight without LED	24,8
671435	ROBOFLEX-recycle 5 x 0,34	3,0	socket straight without LED	49,5
671436	ROBOFLEX-recycle 5 x 0,34	5,0	socket straight without LED	82,5
671437	ROBOFLEX-recycle 5 x 0,34	10,0	socket straight without LED	165,0

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle M12 sensor cable 4-pin + PE one end pre-assembled

new



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

- Bare copper litz wire, 42 x 0.10 mm
 - Core insulation polyester, black, blue, brown
 - Cores stranded in layers
 - Sheath, special mix
 - weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
 - Sheath colour: black
- Assembly (5-pin)**
colour of cores brown, blue, black, white, green/yellow
AD 6,0 +/-0,2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

IP67
A-coded

socket one end pre-assembled with LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
672393	ROBOFLEX-recycle 5 x 0,34	1,0	plug, straight	16,5
672394	ROBOFLEX-recycle 5 x 0,34	1,5	plug, straight	24,8
672396	ROBOFLEX-recycle 5 x 0,34	3,0	plug, straight	49,5
672397	ROBOFLEX-recycle 5 x 0,34	5,0	plug, straight	82,5
672399	ROBOFLEX-recycle 5 x 0,34	10,0	plug, straight	165,0
672403	ROBOFLEX-recycle 5 x 0,34	1,0	plug, angled	16,5
672404	ROBOFLEX-recycle 5 x 0,34	1,5	plug, angled	24,8
672406	ROBOFLEX-recycle 5 x 0,34	3,0	plug, angled	49,5
672407	ROBOFLEX-recycle 5 x 0,34	5,0	plug, angled	82,5
672409	ROBOFLEX-recycle 5 x 0,34	10,0	plug, angled	165,0
672343	ROBOFLEX-recycle 5 x 0,34	1,0	socket straight	16,5
672344	ROBOFLEX-recycle 5 x 0,34	1,5	socket straight	24,8
672346	ROBOFLEX-recycle 5 x 0,34	3,0	socket straight	49,5
672347	ROBOFLEX-recycle 5 x 0,34	5,0	socket straight	82,5
672349	ROBOFLEX-recycle 5 x 0,34	10,0	socket straight	165,0
672353	ROBOFLEX-recycle 5 x 0,34	1,0	socket angled	16,5
672354	ROBOFLEX-recycle 5 x 0,34	1,5	socket angled	24,8
672356	ROBOFLEX-recycle 5 x 0,34	3,0	socket angled	49,5
672357	ROBOFLEX-recycle 5 x 0,34	5,0	socket angled	82,5
672359	ROBOFLEX-recycle 5 x 0,34	10,0	socket angled	165,0

socket one end pre-assembled, 3 LED (gn, rd, ye)

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
672413	ROBOFLEX-recycle 5 x 0,34	1,0	socket straight with LED	16,5
672414	ROBOFLEX-recycle 5 x 0,34	1,5	socket straight with LED	24,8
672416	ROBOFLEX-recycle 5 x 0,34	3,0	socket straight with LED	49,5
672417	ROBOFLEX-recycle 5 x 0,34	5,0	socket straight with LED	82,5
672419	ROBOFLEX-recycle 5 x 0,34	10,0	socket straight with LED	165,0
672363	ROBOFLEX-recycle 5 x 0,34	1,0	socket angled with LED	16,5
672364	ROBOFLEX-recycle 5 x 0,34	1,5	socket angled with LED	24,8
672366	ROBOFLEX-recycle 5 x 0,34	3,0	socket angled with LED	49,5
672367	ROBOFLEX-recycle 5 x 0,34	5,0	socket angled with LED	82,5
672369	ROBOFLEX-recycle 5 x 0,34	10,0	socket angled with LED	165,0

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle M12 both ends pre-assembled



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

- Bare copper litz wire, 42 x 0.10 mm
 - Core insulation polyester, black, blue, brown
 - Cores stranded in layers
 - Sheath, special mix
 - weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
 - Sheath colour: black
- Assembly (3-pin)**
colour in cores brown, blue, black
AD 5,2 +/-0,2 mm
- Assembly (4-pin)**
colour of cores brown, blue, black, white
AD 5,5 +/-0,2 mm
- Assembly (5-pin)**
colour of cores brown, blue, black, white, grey
AD 6,0 +/-0,2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

*Design for the standard 2 LEDs in the colours: yellow, green.
3 LEDs in the colours: white, yellow, green - available upon request.
** Sensor cable ROBOFLEX-recycle M12 plug, straight and socket, angled, pre-assembled on both side, 5-pin. Available on request.
IP67
A-coded

plug straight / socket angled with LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670866	ROBOFLEX-recycle 3 x 0,34	1,0	plug straight / socket, angled with 2 LED	9,8
670802	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket, angled with 2 LED	14,7
670803	ROBOFLEX-recycle 3 x 0,34	3,0	plug straight / socket, angled with 2 LED	29,4
670804	ROBOFLEX-recycle 3 x 0,34	5,0	plug straight / socket, angled with 2 LED	49,0
670805	ROBOFLEX-recycle 3 x 0,34	10,0	plug straight / socket, angled with 2 LED	98,0
670867	ROBOFLEX-recycle 4 x 0,34	1,0	plug straight / socket, angled with 2 LED	13,1
670814	ROBOFLEX-recycle 4 x 0,34	1,5	plug straight / socket, angled with 2 LED	19,7
670815	ROBOFLEX-recycle 4 x 0,34	3,0	plug straight / socket, angled with 2 LED	39,3
670816	ROBOFLEX-recycle 4 x 0,34	5,0	plug straight / socket, angled with 2 LED	65,5
670817	ROBOFLEX-recycle 4 x 0,34	10,0	plug straight / socket, angled with 2 LED	131,0

plug straight / socket straight without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
671341	ROBOFLEX-recycle 3 x 0,34	1,0	plug straight / socket straight without LED	9,8
670750	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket straight without LED	14,7
670751	ROBOFLEX-recycle 3 x 0,34	3,0	plug straight / socket straight without LED	29,4
670752	ROBOFLEX-recycle 3 x 0,34	5,0	plug straight / socket straight without LED	49,0
670753	ROBOFLEX-recycle 3 x 0,34	10,0	plug straight / socket straight without LED	98,0
670771	ROBOFLEX-recycle 4 x 0,34	1,0	plug straight / socket straight without LED	13,1
670774	ROBOFLEX-recycle 4 x 0,34	1,5	plug straight / socket straight without LED	19,7
670775	ROBOFLEX-recycle 4 x 0,34	3,0	plug straight / socket straight without LED	39,3
670776	ROBOFLEX-recycle 4 x 0,34	5,0	plug straight / socket straight without LED	65,5
670777	ROBOFLEX-recycle 4 x 0,34	10,0	plug straight / socket straight without LED	131,0
671493	ROBOFLEX-recycle 5 x 0,34	1,0	plug straight / socket straight without LED	16,5
671494	ROBOFLEX-recycle 5 x 0,34	1,5	plug straight / socket straight without LED	24,8
671496	ROBOFLEX-recycle 5 x 0,34	3,0	plug straight / socket straight without LED	49,5
671497	ROBOFLEX-recycle 5 x 0,34	5,0	plug straight / socket straight without LED	82,5
671499	ROBOFLEX-recycle 5 x 0,34	10,0	plug straight / socket straight without LED	165,0

Continuation ▶

ROBOFLEX-recycle M12 both ends pre-assembled

plug straight / socket angled without LED

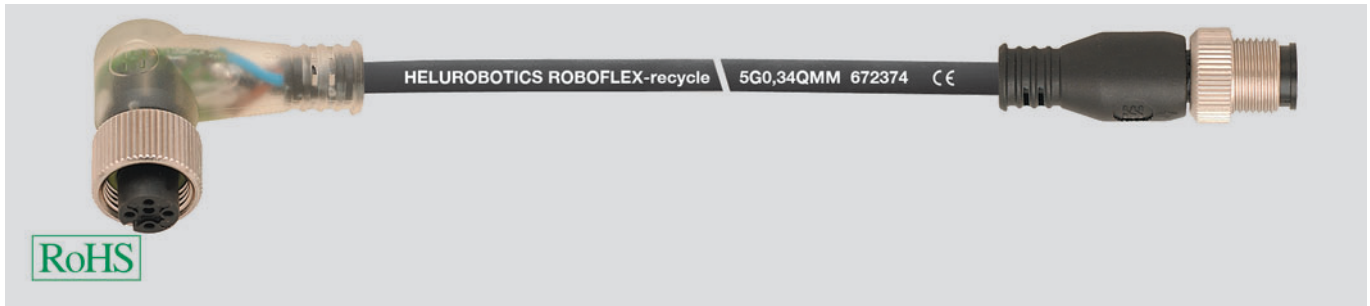
Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670757	ROBOFLEX-recycle 3 x 0,34	1,0	plug straight / socket angled without LED	9,8
670758	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket angled without LED	14,7
670759	ROBOFLEX-recycle 3 x 0,34	3,0	plug straight / socket angled without LED	29,4
670760	ROBOFLEX-recycle 3 x 0,34	5,0	plug straight / socket angled without LED	49,0
670761	ROBOFLEX-recycle 3 x 0,34	10,0	plug straight / socket angled without LED	98,0
670781	ROBOFLEX-recycle 4 x 0,34	1,0	plug straight / socket angled without LED	13,1
670782	ROBOFLEX-recycle 4 x 0,34	1,5	plug straight / socket angled without LED	19,7
670783	ROBOFLEX-recycle 4 x 0,34	3,0	plug straight / socket angled without LED	39,3
670784	ROBOFLEX-recycle 4 x 0,34	5,0	plug straight / socket angled without LED	65,5
670785	ROBOFLEX-recycle 4 x 0,34	10,0	plug straight / socket angled without LED	131,0
671483	ROBOFLEX-recycle 5 x 0,34	1,0	plug straight / socket angled without LED	16,5
671484	ROBOFLEX-recycle 5 x 0,34	1,5	plug straight / socket angled without LED	24,8
671486	ROBOFLEX-recycle 5 x 0,34	3,0	plug straight / socket angled without LED	49,5
671487	ROBOFLEX-recycle 5 x 0,34	5,0	plug straight / socket angled without LED	82,5
671489	ROBOFLEX-recycle 5 x 0,34	10,0	plug straight / socket angled without LED	165,0

plug angled / socket angled without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670766	ROBOFLEX-recycle 3 x 0,34	1,5	plug angled / socket angled without LED	14,7
670767	ROBOFLEX-recycle 3 x 0,34	3,0	plug angled / socket angled without LED	29,4
670768	ROBOFLEX-recycle 3 x 0,34	5,0	plug angled / socket angled without LED	49,0
670769	ROBOFLEX-recycle 3 x 0,34	10,0	plug angled / socket angled without LED	98,0
670790	ROBOFLEX-recycle 4 x 0,34	1,5	plug angled / socket angled without LED	19,7
670791	ROBOFLEX-recycle 4 x 0,34	3,0	plug angled / socket angled without LED	39,3
670792	ROBOFLEX-recycle 4 x 0,34	5,0	plug angled / socket angled without LED	65,5
670793	ROBOFLEX-recycle 4 x 0,34	10,0	plug angled / socket angled without LED	131,0
671533	ROBOFLEX-recycle 5 x 0,34	1,5	plug angled / socket angled without LED	24,8
671534	ROBOFLEX-recycle 5 x 0,34	3,0	plug angled / socket angled without LED	49,5
671536	ROBOFLEX-recycle 5 x 0,34	5,0	plug angled / socket angled without LED	82,5
671537	ROBOFLEX-recycle 5 x 0,34	10,0	plug angled / socket angled without LED	165,0

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle M12 5-pin + PE both ends pre-assembled



new

Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, blue, brown
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black

Assembly (5-pin)

colour of cores brown, blue, black, white, green/yellow
AD 6,0 +/-0,2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

IP67
A-codiert

both ends pre-assembled without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
672303	ROBOFLEX-recycle 5 x 0,34	1,0	plug straight / socket straight	16,5
672304	ROBOFLEX-recycle 5 x 0,34	1,5	plug straight / socket straight	24,8
672306	ROBOFLEX-recycle 5 x 0,34	3,0	plug straight / socket straight	49,5
672307	ROBOFLEX-recycle 5 x 0,34	5,0	plug straight / socket straight	82,5
672309	ROBOFLEX-recycle 5 x 0,34	10,0	plug straight / socket straight	165,0
672443	ROBOFLEX-recycle 5 x 0,34	1,0	plug angled / socket angled	16,5
672444	ROBOFLEX-recycle 5 x 0,34	1,5	plug angled / socket angled	24,8
672446	ROBOFLEX-recycle 5 x 0,34	3,0	plug angled / socket angled	49,5
672447	ROBOFLEX-recycle 5 x 0,34	5,0	plug angled / socket angled	82,5
672449	ROBOFLEX-recycle 5 x 0,34	10,0	plug angled / socket angled	165,0
672313	ROBOFLEX-recycle 5 x 0,34	1,0	plug straight / socket angled	16,5
672314	ROBOFLEX-recycle 5 x 0,34	1,5	plug straight / socket angled	24,8
672316	ROBOFLEX-recycle 5 x 0,34	3,0	plug straight / socket angled	49,5
672317	ROBOFLEX-recycle 5 x 0,34	5,0	plug straight / socket angled	82,5
672319	ROBOFLEX-recycle 5 x 0,34	10,0	plug straight / socket angled	165,0

both ends pre-assembled, 3 LED (gn, rd, ye)

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
672333	ROBOFLEX-recycle 5 x 0,34	1,0	plug straight / socket straight	16,5
672334	ROBOFLEX-recycle 5 x 0,34	1,5	plug straight / socket straight	24,8
672336	ROBOFLEX-recycle 5 x 0,34	3,0	plug straight / socket straight	49,5
672337	ROBOFLEX-recycle 5 x 0,34	5,0	plug straight / socket straight	82,5
672339	ROBOFLEX-recycle 5 x 0,34	10,0	plug straight / socket straight	165,0
672373	ROBOFLEX-recycle 5 x 0,34	1,0	socket angled / socket angled	16,5
672374	ROBOFLEX-recycle 5 x 0,34	1,5	socket angled / socket angled	24,8
672376	ROBOFLEX-recycle 5 x 0,34	3,0	socket angled / socket angled	49,5
672377	ROBOFLEX-recycle 5 x 0,34	5,0	socket angled / socket angled	82,5
672379	ROBOFLEX-recycle 5 x 0,34	10,0	socket angled / socket angled	165,0
672323	ROBOFLEX-recycle 5 x 0,34	1,0	plug straight / socket angled	16,5
672324	ROBOFLEX-recycle 5 x 0,34	1,5	plug straight / socket angled	24,8
672326	ROBOFLEX-recycle 5 x 0,34	3,0	plug straight / socket angled	49,5
672327	ROBOFLEX-recycle 5 x 0,34	5,0	plug straight / socket angled	82,5
672329	ROBOFLEX-recycle 5 x 0,34	10,0	plug straight / socket angled	165,0

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle M12 plug straight or angled, pre-assembled on one end, 3-pin, 4-pin and 5-pin



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

Assembly (3-pin)

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, blue, brown
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black
- Outer diameter 4.9 +/-0.2 mm

Assembly (4-pin)

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, brown, white, blue
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black
- Outer diameter 4.9 +/-0.2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

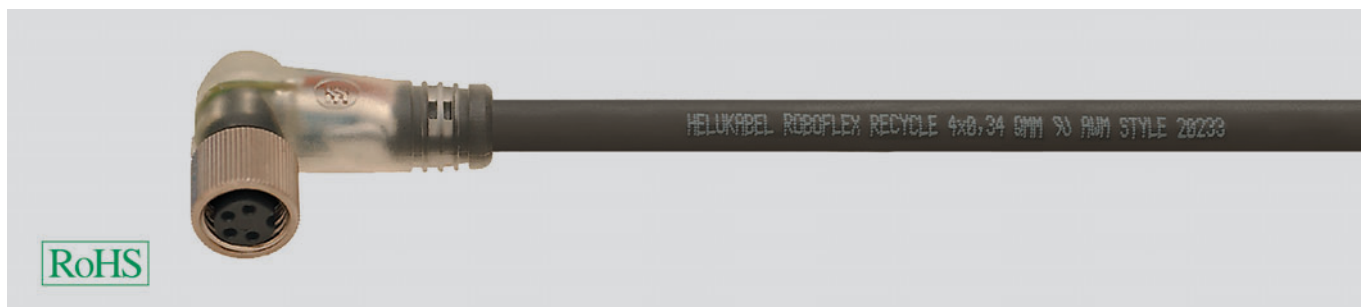
Note

IP67
A-coded

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670710	ROBOFLEX-recycle 3 x 0,34	1,5	plug, straight	14,7
670711	ROBOFLEX-recycle 3 x 0,34	3,0	plug, straight	29,4
670712	ROBOFLEX-recycle 3 x 0,34	5,0	plug, straight	49,0
670713	ROBOFLEX-recycle 3 x 0,34	10,0	plug, straight	98,0
670714	ROBOFLEX-recycle 3 x 0,34	1,5	plug, angled	14,7
670715	ROBOFLEX-recycle 3 x 0,34	3,0	plug, angled	29,4
670716	ROBOFLEX-recycle 3 x 0,34	5,0	plug, angled	49,0
670717	ROBOFLEX-recycle 3 x 0,34	10,0	plug, angled	98,0
670726	ROBOFLEX-recycle 4 x 0,34	1,5	plug, straight	19,7
670727	ROBOFLEX-recycle 4 x 0,34	3,0	plug, straight	39,3
670728	ROBOFLEX-recycle 4 x 0,34	5,0	plug, straight	65,5
670729	ROBOFLEX-recycle 4 x 0,34	10,0	plug, straight	131,0
670730	ROBOFLEX-recycle 4 x 0,34	1,5	plug, angled	19,7
670731	ROBOFLEX-recycle 4 x 0,34	3,0	plug, angled	39,3
670732	ROBOFLEX-recycle 4 x 0,34	5,0	plug, angled	65,5
670733	ROBOFLEX-recycle 4 x 0,34	10,0	plug, angled	131,0
671426	ROBOFLEX-recycle 5 x 0,34	1,5	plug, straight	24,8
671427	ROBOFLEX-recycle 5 x 0,34	3,0	plug, straight	49,5
671428	ROBOFLEX-recycle 5 x 0,34	5,0	plug, straight	82,5
671429	ROBOFLEX-recycle 5 x 0,34	10,0	plug, straight	165,0
671430	ROBOFLEX-recycle 5 x 0,34	1,5	plug, angled	24,8
671431	ROBOFLEX-recycle 5 x 0,34	3,0	plug, angled	49,5
671432	ROBOFLEX-recycle 5 x 0,34	5,0	plug, angled	82,5
671433	ROBOFLEX-recycle 5 x 0,34	10,0	plug, angled	165,0

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle M8 femal one end pre-assembled



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

- Bare copper litz wire, 42 x 0.10 mm
 - Core insulation polyester, black, blue, brown
 - Cores stranded in layers
 - Sheath, special mix
 - weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
 - Sheath colour: black
- Assembly (3-pin)**
colour of cores brown, blue, black
AD 5,2 +/-0,2 mm
- Assembly (4-pin)**
colour of cores brown, blue, black, white
AD 5,5 +/-0,2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

IP67
A-coded

socket angled with 2 LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670672	ROBOFLEX-recycle 3 x 0,34	1,5	socket angled with 2 LED	14,7
670673	ROBOFLEX-recycle 3 x 0,34	3,0	socket angled with 2 LED	29,4
670674	ROBOFLEX-recycle 3 x 0,34	5,0	socket angled with 2 LED	49,0
670675	ROBOFLEX-recycle 3 x 0,34	10,0	socket angled with 2 LED	98,0
670688	ROBOFLEX-recycle 4 x 0,34	1,5	socket angled with 2 LED	19,7
670689	ROBOFLEX-recycle 4 x 0,34	3,0	socket angled with 2 LED	39,3
670690	ROBOFLEX-recycle 4 x 0,34	5,0	socket angled with 2 LED	65,5
670691	ROBOFLEX-recycle 4 x 0,34	10,0	socket angled with 2 LED	131,0

socket straight without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670668	ROBOFLEX-recycle 3 x 0,34	1,5	socket straight without LED	14,7
670669	ROBOFLEX-recycle 3 x 0,34	3,0	socket straight without LED	29,4
670670	ROBOFLEX-recycle 3 x 0,34	5,0	socket straight without LED	49,0
670671	ROBOFLEX-recycle 3 x 0,34	10,0	socket straight without LED	98,0
670656	ROBOFLEX-recycle 3 x 0,34	1,5	socket angled without LED	14,7
670657	ROBOFLEX-recycle 3 x 0,34	3,0	socket angled without LED	29,4
670658	ROBOFLEX-recycle 3 x 0,34	5,0	socket angled without LED	49,0
670659	ROBOFLEX-recycle 3 x 0,34	10,0	socket angled without LED	98,0
670684	ROBOFLEX-recycle 4 x 0,34	1,5	socket straight without LED	19,7
670685	ROBOFLEX-recycle 4 x 0,34	3,0	socket straight without LED	39,3
670686	ROBOFLEX-recycle 4 x 0,34	5,0	socket straight without LED	65,5
670687	ROBOFLEX-recycle 4 x 0,34	10,0	socket straight without LED	131,0
670693	ROBOFLEX-recycle 4 x 0,34	1,5	socket angled without LED	19,7
670694	ROBOFLEX-recycle 4 x 0,34	3,0	socket angled without LED	39,3
670695	ROBOFLEX-recycle 4 x 0,34	5,0	socket angled without LED	65,5
670696	ROBOFLEX-recycle 4 x 0,34	10,0	socket angled without LED	131,0

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle M8 pre-assembled on both ends



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

Assembly (3-pin)

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, blue, brown
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black
- Outer diameter 4.9 +/-0.2 mm

Assembly (4-pin)

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, brown, white, blue
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black
- Outer diameter 4.9 +/-0.2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

* Design for the standard 2 LEDs in the colours: yellow, green.
IP67, A-coded

plug straight / socket angled with 2 LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670849	ROBOFLEX-recycle 3 x 0,34	1,0	plug straight / socket, angled with 2 LED	9,8
670850	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket, angled with 2 LED	14,7
670851	ROBOFLEX-recycle 3 x 0,34	3,0	plug straight / socket, angled with 2 LED	29,4
670852	ROBOFLEX-recycle 3 x 0,34	5,0	plug straight / socket, angled with 2 LED	49,0
670853	ROBOFLEX-recycle 3 x 0,34	10,0	plug straight / socket, angled with 2 LED	98,0
670861	ROBOFLEX-recycle 4 x 0,34	1,0	plug straight / socket, angled with 2 LED	13,1
670862	ROBOFLEX-recycle 4 x 0,34	1,5	plug straight / socket, angled with 2 LED	19,7
670863	ROBOFLEX-recycle 4 x 0,34	3,0	plug straight / socket, angled with 2 LED	39,3
670864	ROBOFLEX-recycle 4 x 0,34	5,0	plug straight / socket, angled with 2 LED	65,5
670865	ROBOFLEX-recycle 4 x 0,34	10,0	plug straight / socket, angled with 2 LED	131,0

plug straight / socket straight without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
671356	ROBOFLEX-recycle 3 x 0,34	1,0	plug straight / socket straight without LED	9,8
670822	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket straight without LED	14,7
670823	ROBOFLEX-recycle 3 x 0,34	3,0	plug straight / socket straight without LED	29,4
670824	ROBOFLEX-recycle 3 x 0,34	5,0	plug straight / socket straight without LED	49,0
670825	ROBOFLEX-recycle 3 x 0,34	10,0	plug straight / socket straight without LED	98,0
671351	ROBOFLEX-recycle 4 x 0,34	1,0	plug straight / socket straight without LED	13,1
670834	ROBOFLEX-recycle 4 x 0,34	1,5	plug straight / socket straight without LED	19,7
670835	ROBOFLEX-recycle 4 x 0,34	3,0	plug straight / socket straight without LED	39,3
670836	ROBOFLEX-recycle 4 x 0,34	5,0	plug straight / socket straight without LED	65,5
670837	ROBOFLEX-recycle 4 x 0,34	10,0	plug straight / socket straight without LED	131,0

Continuation ►

ROBOFLEX-recycle M8 pre-assembled on both ends

plug straight / socket angled without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
671332	ROBOFLEX-recycle 3 x 0,34	1,0	plug straight / socket angled without LED	9,8
670826	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket angled without LED	14,7
670827	ROBOFLEX-recycle 3 x 0,34	3,0	plug straight / socket angled without LED	29,4
670828	ROBOFLEX-recycle 3 x 0,34	5,0	plug straight / socket angled without LED	49,0
670829	ROBOFLEX-recycle 3 x 0,34	10,0	plug straight / socket angled without LED	98,0
671333	ROBOFLEX-recycle 4 x 0,34	1,0	plug straight / socket angled without LED	13,1
670838	ROBOFLEX-recycle 4 x 0,34	1,5	plug straight / socket angled without LED	19,7
670839	ROBOFLEX-recycle 4 x 0,34	3,0	plug straight / socket angled without LED	39,3
670840	ROBOFLEX-recycle 4 x 0,34	5,0	plug straight / socket angled without LED	65,5
670841	ROBOFLEX-recycle 4 x 0,34	10,0	plug straight / socket angled without LED	131,0

plug angled / socket angled without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
671334	ROBOFLEX-recycle 3 x 0,34	1,0	plug angled / socket angled without LED	9,8
670830	ROBOFLEX-recycle 3 x 0,34	1,5	plug angled / socket angled without LED	14,7
670831	ROBOFLEX-recycle 3 x 0,34	3,0	plug angled / socket angled without LED	29,4
670832	ROBOFLEX-recycle 3 x 0,34	5,0	plug angled / socket angled without LED	49,0
670833	ROBOFLEX-recycle 3 x 0,34	10,0	plug angled / socket angled without LED	98,0
671335	ROBOFLEX-recycle 4 x 0,34	1,0	plug angled / socket angled without LED	13,1
670842	ROBOFLEX-recycle 4 x 0,34	1,5	plug angled / socket angled without LED	19,7
670843	ROBOFLEX-recycle 4 x 0,34	3,0	plug angled / socket angled without LED	39,3
670844	ROBOFLEX-recycle 4 x 0,34	5,0	plug angled / socket angled without LED	65,5
670845	ROBOFLEX-recycle 4 x 0,34	10,0	plug angled / socket angled without LED	131,0

Dimensions and specifications may be changed without prior notice.

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- for special pressure conditions



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ROBOFLEX-recycle M8 plug, straight or angled, pre-assembled on one side, 3-pin and 4-pin



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

- Bare copper litz wire, 42 x 0.10 mm
 - Core insulation polyester, black, blue, brown
 - Cores stranded in layers
 - Sheath, special mix
 - weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
 - Sheath colour: black
- Assembly (3-pin)**
colour of cores brown, blue, black
AD 5,2 +/-0,2 mm
- Assembly (4-pin)**
colour of cores brown, blue, black, white
AD 5,5 +/-0,2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

IP67
A-coded

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
670660	ROBOFLEX-recycle 3 x 0,34	1,5	plug, straight	14,7
670661	ROBOFLEX-recycle 3 x 0,34	3,0	plug, straight	29,4
670662	ROBOFLEX-recycle 3 x 0,34	5,0	plug, straight	49,0
670663	ROBOFLEX-recycle 3 x 0,34	10,0	plug, straight	98,0
670664	ROBOFLEX-recycle 3 x 0,34	1,5	plug, angled	14,7
670665	ROBOFLEX-recycle 3 x 0,34	3,0	plug, angled	29,4
670666	ROBOFLEX-recycle 3 x 0,34	5,0	plug, angled	29,4
670667	ROBOFLEX-recycle 3 x 0,34	10,0	plug, angled	98,0
670676	ROBOFLEX-recycle 4 x 0,34	1,5	plug, straight	19,7
670677	ROBOFLEX-recycle 4 x 0,34	3,0	plug, straight	39,3
670678	ROBOFLEX-recycle 4 x 0,34	5,0	plug, straight	65,5
670679	ROBOFLEX-recycle 4 x 0,34	10,0	plug, straight	131,0
670680	ROBOFLEX-recycle 4 x 0,34	1,5	plug, angled	19,7
670681	ROBOFLEX-recycle 4 x 0,34	3,0	plug, angled	39,3
670682	ROBOFLEX-recycle 4 x 0,34	5,0	plug, angled	65,5
670683	ROBOFLEX-recycle 4 x 0,34	10,0	plug, angled	131,0

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle M12 sensor cable screened one end pre-assembled



new

Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

- Bare copper stranded wire, 42 x 0.10 mm
- Cores stranded in layers
- Polyester foil taping
- Screening of tinned copper braid, coverage approx. 85%, D-screen for robot applications
- Special compound sheath, weld-splatter resistant, recyclable, matt, low-adhesion, flame retardant and self-extinguishing (in accordance with VDE 0472 Part 804 Test Method B, IEC 60332-1)
- Sheath colour: black

Assembly (3-pin)

- Core insulation polyester, black, brown, blue, black
- Outer diameter 5,2 +/- 0.2 mm

Assembly (4-pin)

- Core insulation polyester, brown, blue, black, white
- Outer diameter 5.5 +/- 0.2 mm

Assembly (5-pin)

- Core insulation polyester, brown, blue, black, white, green
- Outer diameter 4.9 +/- 0.2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

IP67
A-coded

plug straight pre-assembled

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
671893	ROBOFLEX-recycle 3 x 0,34	1,0	plug, straight	19,6
671894	ROBOFLEX-recycle 3 x 0,34	1,5	plug, straight	29,4
671896	ROBOFLEX-recycle 3 x 0,34	3,0	plug, straight	58,8
671897	ROBOFLEX-recycle 3 x 0,34	5,0	plug, straight	98,0
671899	ROBOFLEX-recycle 3 x 0,34	10,0	plug, straight	196,0
671903	ROBOFLEX-recycle 3 x 0,34	1,0	plug, angled	19,6
671904	ROBOFLEX-recycle 3 x 0,34	1,5	plug, angled	29,4
671906	ROBOFLEX-recycle 3 x 0,34	3,0	plug, angled	58,8
671907	ROBOFLEX-recycle 3 x 0,34	5,0	plug, angled	98,0
671909	ROBOFLEX-recycle 3 x 0,34	10,0	plug, angled	196,0
671913	ROBOFLEX-recycle 4 x 0,34	1,0	plug, straight	24,2
671914	ROBOFLEX-recycle 4 x 0,34	1,5	plug, straight	36,3
671916	ROBOFLEX-recycle 4 x 0,34	3,0	plug, straight	72,6
671917	ROBOFLEX-recycle 4 x 0,34	5,0	plug, straight	121,0
671919	ROBOFLEX-recycle 4 x 0,34	10,0	plug, straight	242,0
671923	ROBOFLEX-recycle 4 x 0,34	1,0	plug, angled	24,2
671924	ROBOFLEX-recycle 4 x 0,34	1,5	plug, angled	36,3
671926	ROBOFLEX-recycle 4 x 0,34	3,0	plug, angled	72,6
671927	ROBOFLEX-recycle 4 x 0,34	5,0	plug, angled	121,0
671929	ROBOFLEX-recycle 4 x 0,34	10,0	plug, angled	242,0
671933	ROBOFLEX-recycle 5 x 0,34	1,0	plug, straight	30,0
671934	ROBOFLEX-recycle 5 x 0,34	1,5	plug, straight	45,0
671936	ROBOFLEX-recycle 5 x 0,34	3,0	plug, straight	90,0
671937	ROBOFLEX-recycle 5 x 0,34	5,0	plug, straight	150,0
671939	ROBOFLEX-recycle 5 x 0,34	10,0	plug, straight	300,0
671943	ROBOFLEX-recycle 5 x 0,34	1,0	plug, angled	30,0
671944	ROBOFLEX-recycle 5 x 0,34	1,5	plug, angled	45,0
671946	ROBOFLEX-recycle 5 x 0,34	3,0	plug, angled	90,0
671947	ROBOFLEX-recycle 5 x 0,34	5,0	plug, angled	150,0
671949	ROBOFLEX-recycle 5 x 0,34	10,0	plug, angled	300,0

Continuation ▶

U

ROBOFLEX-recycle M12 sensor cable screened one end pre-assembled

socket one end pre-assembled

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
671873	ROBOFLEX-recycle 3 x 0,34	1,0	socket straight	19,6
671874	ROBOFLEX-recycle 3 x 0,34	1,5	socket straight	29,4
671876	ROBOFLEX-recycle 3 x 0,34	3,0	socket straight	58,8
671877	ROBOFLEX-recycle 3 x 0,34	5,0	socket straight	98,0
671879	ROBOFLEX-recycle 3 x 0,34	10,0	socket straight	196,0
671883	ROBOFLEX-recycle 3 x 0,34	1,0	socket angled	19,6
671884	ROBOFLEX-recycle 3 x 0,34	1,5	socket angled	29,4
671886	ROBOFLEX-recycle 3 x 0,34	3,0	socket angled	58,8
671887	ROBOFLEX-recycle 3 x 0,34	5,0	socket angled	98,0
671889	ROBOFLEX-recycle 3 x 0,34	10,0	socket angled	196,0
671833	ROBOFLEX-recycle 4 x 0,34	1,0	socket straight	24,2
671834	ROBOFLEX-recycle 4 x 0,34	1,5	socket straight	36,3
671836	ROBOFLEX-recycle 4 x 0,34	3,0	socket straight	72,6
671837	ROBOFLEX-recycle 4 x 0,34	5,0	socket straight	121,0
671839	ROBOFLEX-recycle 4 x 0,34	10,0	socket straight	242,0
671843	ROBOFLEX-recycle 4 x 0,34	1,0	socket angled	24,2
671844	ROBOFLEX-recycle 4 x 0,34	1,5	socket angled	36,3
671846	ROBOFLEX-recycle 4 x 0,34	3,0	socket angled	72,6
671847	ROBOFLEX-recycle 4 x 0,34	5,0	socket angled	121,0
671849	ROBOFLEX-recycle 4 x 0,34	10,0	socket angled	242,0
671854	ROBOFLEX-recycle 5 x 0,34	1,0	socket straight	30,0
671850	ROBOFLEX-recycle 5 x 0,34	1,5	socket straight	45,0
671851	ROBOFLEX-recycle 5 x 0,34	3,0	socket straight	90,0
671852	ROBOFLEX-recycle 5 x 0,34	5,0	socket straight	150,0
671853	ROBOFLEX-recycle 5 x 0,34	10,0	socket straight	300,0
671859	ROBOFLEX-recycle 5 x 0,34	1,0	socket angled	30,0
671855	ROBOFLEX-recycle 5 x 0,34	1,5	socket angled	45,0
671856	ROBOFLEX-recycle 5 x 0,34	3,0	socket angled	90,0
671857	ROBOFLEX-recycle 5 x 0,34	5,0	socket angled	150,0
671858	ROBOFLEX-recycle 5 x 0,34	10,0	socket angled	300,0

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle M12 sensor cable screened both ends pre-assembled



new

Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

- Bare copper stranded wire, 42 x 0.10 mm
- Cores stranded in layers
- Polyester foil taping
- Screening of tinned copper braid, coverage approx. 85%, D-screen for robot applications
- Special compound sheath, weld-splatter resistant, recyclable, matt, low-adhesion, flame retardant and self-extinguishing (in accordance with VDE 0472 Part 804 Test Method B, IEC 60332-1)
- Sheath colour: black

Assembly (3-pin)

- Core insulation polyester, black, brown, blue, black
- Outer diameter 5,2 +/- 0.2 mm

Assembly (4-pin)

- Core insulation polyester, brown, blue, black, white
- Outer diameter 5.5 +/- 0.2 mm

Assembly (5-pin)

- Core insulation polyester, brown, blue, black, white, green
- Outer diameter 4.9 +/- 0.2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

IP67
A-coded

plug / socket without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
671953	ROBOFLEX-recycle 3 x 0,34	1,0	plug straight / socket straight without LED	19,6
671954	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket straight without LED	29,4
671956	ROBOFLEX-recycle 3 x 0,34	3,0	plug straight / socket straight without LED	58,8
671957	ROBOFLEX-recycle 3 x 0,34	5,0	plug straight / socket straight without LED	98,0
671759	ROBOFLEX-recycle 3 x 0,34	10,0	plug straight / socket straight without LED	196,0
671963	ROBOFLEX-recycle 4 x 0,34	1,0	plug straight / socket straight without LED	24,2
671964	ROBOFLEX-recycle 4 x 0,34	1,5	plug straight / socket straight without LED	36,3
671966	ROBOFLEX-recycle 4 x 0,34	3,0	plug straight / socket straight without LED	72,6
671967	ROBOFLEX-recycle 4 x 0,34	5,0	plug straight / socket straight without LED	121,0
671969	ROBOFLEX-recycle 4 x 0,34	10,0	plug straight / socket straight without LED	242,0
671973	ROBOFLEX-recycle 5 x 0,34	1,0	plug straight / socket straight without LED	30,0
671974	ROBOFLEX-recycle 5 x 0,34	1,5	plug straight / socket straight without LED	45,0
671976	ROBOFLEX-recycle 5 x 0,34	3,0	plug straight / socket straight without LED	90,0
671977	ROBOFLEX-recycle 5 x 0,34	5,0	plug straight / socket straight without LED	150,0
671979	ROBOFLEX-recycle 5 x 0,34	10,0	plug straight / socket straight without LED	300,0
671983	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket angled without LED	19,6
671984	ROBOFLEX-recycle 3 x 0,34	1,5	plug straight / socket angled without LED	29,4
671986	ROBOFLEX-recycle 3 x 0,34	3,0	plug straight / socket angled without LED	58,8
671988	ROBOFLEX-recycle 3 x 0,34	5,0	plug straight / socket angled without LED	98,0
671989	ROBOFLEX-recycle 3 x 0,34	10,0	plug straight / socket angled without LED	196,0
671993	ROBOFLEX-recycle 4 x 0,34	1,0	plug straight / socket angled without LED	24,2
671994	ROBOFLEX-recycle 4 x 0,34	1,5	plug straight / socket angled without LED	36,3
671996	ROBOFLEX-recycle 4 x 0,34	3,0	plug straight / socket angled without LED	72,6
671997	ROBOFLEX-recycle 4 x 0,34	5,0	plug straight / socket angled without LED	121,0
671999	ROBOFLEX-recycle 4 x 0,34	10,0	plug straight / socket angled without LED	242,0
672003	ROBOFLEX-recycle 5 x 0,34	1,0	plug straight / socket angled without LED	30,0
672004	ROBOFLEX-recycle 5 x 0,34	1,5	plug straight / socket angled without LED	45,0
672006	ROBOFLEX-recycle 5 x 0,34	3,0	plug straight / socket angled without LED	90,0
672007	ROBOFLEX-recycle 5 x 0,34	5,0	plug straight / socket angled without LED	150,0
672009	ROBOFLEX-recycle 5 x 0,34	10,0	plug straight / socket angled without LED	300,0
672013	ROBOFLEX-recycle 3 x 0,34	1,0	plug angled / socket angled without LED	19,6
672014	ROBOFLEX-recycle 3 x 0,34	1,5	plug angled / socket angled without LED	29,4
672016	ROBOFLEX-recycle 3 x 0,34	3,0	plug angled / socket angled without LED	58,8
672017	ROBOFLEX-recycle 3 x 0,34	5,0	plug angled / socket angled without LED	98,0
672019	ROBOFLEX-recycle 3 x 0,34	10,0	plug angled / socket angled without LED	196,0

Continuation ▶

U

ROBOFLEX-recycle M12 sensor cable screened both ends pre-assembled

plug / socket without LED

Part no.	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.
672023	ROBOFLEX-recycle 4 x 0,34	1,0	plug angled / socket angled without LED	24,2
672024	ROBOFLEX-recycle 4 x 0,34	1,5	plug angled / socket angled without LED	36,3
672026	ROBOFLEX-recycle 4 x 0,34	3,0	plug angled / socket angled without LED	72,6
672027	ROBOFLEX-recycle 4 x 0,34	5,0	plug angled / socket angled without LED	121,0
672029	ROBOFLEX-recycle 4 x 0,34	10,0	plug angled / socket angled without LED	242,0
672033	ROBOFLEX-recycle 5 x 0,34	1,0	plug angled / socket angled without LED	30,0
672034	ROBOFLEX-recycle 5 x 0,34	1,5	plug angled / socket angled without LED	45,0
672036	ROBOFLEX-recycle 5 x 0,34	3,0	plug angled / socket angled without LED	90,0
672037	ROBOFLEX-recycle 5 x 0,34	5,0	plug angled / socket angled without LED	150,0
672039	ROBOFLEX-recycle 5 x 0,34	10,0	plug angled / socket angled without LED	300,0

Dimensions and specifications may be changed without prior notice.

Conduits

Corrugated tubes

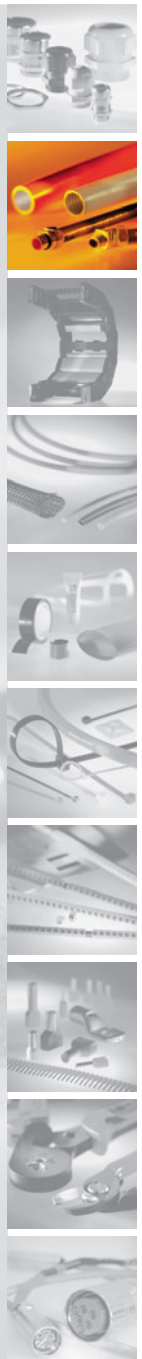
- for standard applications
- for larger sizes
- scissile corrugated tubes
- conduit glands

High flexible conduits

- plastic conduits with spiral spring
- metal conduits
- conduits glands

Conduit for heavy mechanical duty

- metal conduits with plastic sheat
- plastic conduits
- conduits glands for metal conduits



You can find conduits in our catalogue Cable Accessories.
Request it now at www.helukabel.de

ROBOFLEX-recycle Twin cables M12 to M12



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

Assembly (3-pin)

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, blue, brown
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black
- Outer diameter 4.9 +/-0.2 mm

Assembly (4-pin)

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, brown, white, blue
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black
- Outer diameter 4.9 +/-0.2 mm

Properties

- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

* Twin cables with sensor cable ROBOFLEX recycle M12 to M8 and other configurations and lengths - available on request.

Dimensions and specifications may be changed without prior notice.

ROBOFLEX-recycle Twin cables M12 to M12



Technical data

- **Approval:**
UL/cUL approved
- **Production**
in accordance with VDE standards
- **Temperature range:**
fixed installation -40 °C to +120 °C
flexible -30 °C to +120 °C
- **Nominal voltage:**
300 V
- **Test voltage:**
2000V
- **Minimum bending radius:**
approx. 7.5 x cable diameter (for flexible installation)
- **Traversing speed:**
max. 3.3 m/s for 5 m of horizontal traverse path length
- **Acceleration:**
max. 5 m/s²
- **Flexing and torsion cycles:**
min. 10 million.
- **Torsional stress:**
+/- 360 °/m

Cable structure

Assembly (3-pin)

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, blue, brown
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black
- Outer diameter 4.9 +/-0.2 mm

Assembly (4-pin)

- Bare copper litz wire, 42 x 0.10 mm
- Core insulation polyester, black, brown, white, blue
- Cores stranded in layers
- Sheath, special mix
- weld splatter resistant, dull, low adhesion, flame retardant and self-extinguishing (as per VDE 0472 Part 804 Test method B, IEC 60332-1)
- Sheath colour: black
- Outer diameter 4.9 +/-0.2 mm

Properties

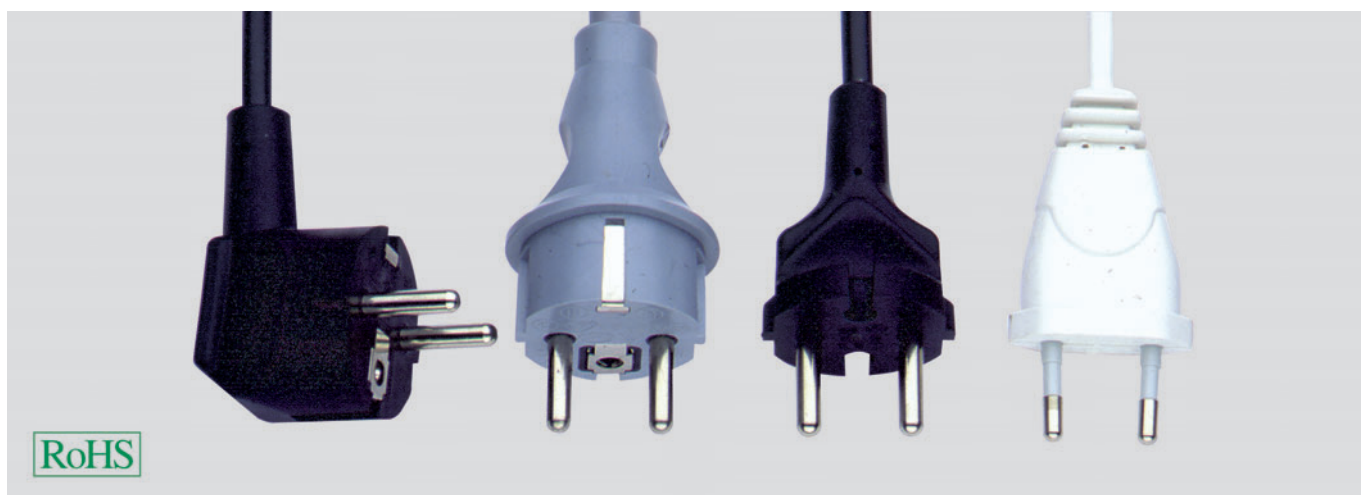
- very good resistance to oil
- as per VDE 0473 Part 811-2-1
- good resistance to acids, alkalis and solvents
- not cross-linked
- weld splatter resistant
- recyclable
- halogen-free
- Silicone and cadmium-free
- Free of substances harmful to paint adhesion Substances
- very high mechanical load capacity
- abrasion resistant
- wear-resistant
- Highly flexible
- UV-resistant
- ROHS conformant
- CE conformant

Note

* Design for the standard 2 LEDs in the colours: yellow, green; 3 LEDs in the colours: white, yellow, green - available upon request.
** Twin cables with sensor cable ROBOFLEX recycle M12 to M8 and other configurations and lengths - available on request.

Dimensions and specifications may be changed without prior notice.

PVC connecting cables



Technical data

- **Temperature range**
flexing -5 °C to +70 °C
- **Nominal voltage**
H03VV-F 300/700 V
H03VV-F 300/700 V
- **Test voltage** 2000 V
- **End 1:** Connector
- **End 2:** 25 respectively 30 mm stripped with wire end ferrule

Cable structure

- Plain copper conductor, fine wire stranded to DIN VDE 0295 cl. 5, IEC 60228 cl. 5 and HD 383
- PVC core insulation
- Core identification acc. to VDE colour code
- Cores stranded in layers
- Green/yellow earth core (3 or more cores)
- PVC outer sheath

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- On request also with international approval.

Application

H03VV-F

This cable is highly suitable as a hand tool connection for lightweight applications. It is often used as a connecting cable for household appliances.

H05VV-F

This cable is highly suitable as a hand tool connection for medium-weight applications. It can also be used in wet rooms. As a connecting cable: for machine installation.

Part no. black	white	grey	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.	AWG-No.
84412	84416		H03VVH2-F 2 x 0,75	2,0	Euro plug	28,8	18
84413	84417		H03VVH2-F 2 x 0,75	3,0	Euro plug	43,2	18
84420	84421		H03VVH2-F 2 x 0,75	5,0	Euro plug	72,0	18
84414	84418		H03VV-F 2 x 0,75	2,0	Euro plug	28,8	18
84415	84419		H03VV-F 2 x 0,75	3,0	Euro plug	43,2	18
84422	84425		H03VV-F 2 x 0,75	5,0	Euro plug	72,0	18
84424	84425	84428	H03VV-F 2 x 0,75	2,0	Central contour connector	28,8	18
84426	84427	84429	H03VV-F 2 x 0,75	3,0	Central contour connector	43,2	18
86870	84430	84431	H03VV-F 2 x 0,75	5,0	Central contour connector	72,0	18
87127	87128	84432	H05VV-F 2 x 1,0	2,0	Central contour connector	38,0	17
86765	87130	84433	H05VV-F 2 x 1,0	3,0	Central contour connector	57,0	17
86867	84434	84435	H05VV-F 2 x 1,0	5,0	Central contour connector	95,0	17
86764	87575	84436	H03VV-F 3 G 0,75	2,0	PROTECTED PLUG, straight	43,2	18
84437	84438	84439	H03VV-F 3 G 0,75	3,0	PROTECTED PLUG, straight	64,8	18
84440	84441	84442	H03VV-F 3 G 0,75	5,0	PROTECTED PLUG, straight	108,0	18
84400	84406	87725	H03VV-F 3 G 0,75	2,0	PROTECTED PLUG, angled	43,2	18
84401	84407	84446	H03VV-F 3 G 0,75	3,0	PROTECTED PLUG, angled	64,8	18
87748	84447	87277	H03VV-F 3 G 0,75	5,0	PROTECTED PLUG, angled	108,0	18
87137	87139	84451	H05VV-F 3 G 1,0	2,0	PROTECTED PLUG, straight	58,0	17
87138	87140	84452	H05VV-F 3 G 1,0	3,0	PROTECTED PLUG, straight	87,0	17
84453	84454	84455	H05VV-F 3 G 1,0	5,0	PROTECTED PLUG, straight	145,0	17
84402	84408	84459	H05VV-F 3 G 1,0	2,0	PROTECTED PLUG, angled	58,0	17
84403	84409	87410	H05VV-F 3 G 1,0	3,0	PROTECTED PLUG, angled	87,0	17
87074	87141	84460	H05VV-F 3 G 1,0	5,0	PROTECTED PLUG, angled	145,0	17
84464	84465	84466	H05VV-F 3 G 1,5	2,0	PROTECTED PLUG, straight	86,0	16
84467	84468	84469	H05VV-F 3 G 1,5	3,0	PROTECTED PLUG, straight	129,0	16
84470	84471	84472	H05VV-F 3 G 1,5	5,0	PROTECTED PLUG, straight	215,0	16
84404	84410	84475	H05VV-F 3 G 1,5	2,0	PROTECTED PLUG, angled	86,0	16
84405	84411	87503	H05VV-F 3 G 1,5	3,0	PROTECTED PLUG, angled	129,0	16
87142	87143	84476	H05VV-F 3 G 1,5	5,0	PROTECTED PLUG, angled	215,0	16

Dimensions and specifications may be changed without prior notice.

Rubber connecting cables



Technical data

- **Temperature range**
flexing -30 °C to +80 °C
- **Nominal voltage**
H05RR-F/H05RN-F 300/500 V
H07RN-F 450/750 V
- **Test voltage** 3000 V
- **End 1:** Connector
- **End 2:** 25 respectively 30 mm stripped with wire end ferrule

Cable structure

- Plain copper conductor, fine wire stranded to DIN VDE 0295 cl. 5, IEC 60228 cl. 5 and HD 383
- Rubber core insulation
- Core identification to VDE 0293 and HD 186
- Cores stranded in layers
- Rubber outer sheath

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.
- On request also with international approval.

Application

H05RR-F

Lightweight rubber-sheathed cable for use as a hand tool connection and lightweight workshop tools for light to medium-weight applications in dry and wet rooms.

H05RN-F

Medium-weight rubber-sheathed cable for use as a hand tool connection and lightweight workshop equipment for light to medium-weight applications in dry rooms, wet rooms outdoors and in industrial water.

H07RN-F

Heavyweight rubber-sheathed cable for use on heavy equipment and tools (agricultural, construction industry). For heavyweight applications in dry rooms, wet rooms, outdoors and in industrial water.

Part no. black	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.	AWG-No.
84481	H05RR-F 2 x 0,75	3,0	Central contour connector	43,2	18
84482	H05RR-F 2 x 0,75	5,0	Central contour connector	72,0	18
84483	H05RR-F 2 x 0,75	10,0	Central contour connector	144,0	18
87738	H05RR-F 2 x 1,0	3,0	Central contour connector	57,6	17
86961	H05RR-F 2 x 1,0	5,0	Central contour connector	96,0	17
84485	H05RR-F 2 x 1,0	10,0	Central contour connector	192,0	17
86960	H05RR-F 2 x 1,5	3,0	Central contour connector	86,4	16
87406	H05RR-F 2 x 1,5	5,0	Central contour connector	144,0	16
84487	H05RR-F 2 x 1,5	10,0	Central contour connector	288,0	16
87690	H05RR-F 3 G 0,75	3,0	PROTECTED PLUG, straight	64,8	18
84489	H05RR-F 3 G 0,75	5,0	PROTECTED PLUG, straight	108,0	18
84490	H05RR-F 3 G 0,75	10,0	PROTECTED PLUG, straight	216,0	18
84492	H05RR-F 3 G 0,75	3,0	PROTECTED PLUG, angled	64,8	18
84493	H05RR-F 3 G 0,75	5,0	PROTECTED PLUG, angled	108,0	18
84494	H05RR-F 3 G 0,75	10,0	PROTECTED PLUG, angled	216,0	18
86740	H07RN-F 3 G 1,0	3,0	PROTECTED PLUG, straight	86,4	17
87145	H07RN-F 3 G 1,0	5,0	PROTECTED PLUG, straight	144,0	17
87604	H07RN-F 3 G 1,0	10,0	PROTECTED PLUG, straight	288,0	17
84496	H07RN-F 3 G 1,0	3,0	PROTECTED PLUG, angled	86,4	17
84497	H07RN-F 3 G 1,0	5,0	PROTECTED PLUG, angled	144,0	17
84498	H07RN-F 3 G 1,0	10,0	PROTECTED PLUG, angled	288,0	17
86741	H07RN-F 3 G 1,5	3,0	PROTECTED PLUG, straight	129,6	16
87084	H07RN-F 3 G 1,5	5,0	PROTECTED PLUG, straight	216,0	16
84499	H07RN-F 3 G 1,5	10,0	PROTECTED PLUG, straight	432,0	16
84653	H07RN-F 3 G 1,5	3,0	PROTECTED PLUG, angled	129,6	16
84654	H07RN-F 3 G 1,5	5,0	PROTECTED PLUG, angled	216,0	16
84655	H07RN-F 3 G 1,5	10,0	PROTECTED PLUG, angled	432,0	16

Dimensions and specifications may be changed without prior notice.

YELLOWFLEX - connecting cable meter marking



Technical data

- Special rubber sheathed cable acc. to DIN VDE 0282 Part 4, HD 22.4 S4
- **Temperature range**
flexing -25 °C to +60 °C
fixed installation -50 °C to +60 °C
- Permissible **operating temperature** at conductor +60 °C
- **Nominal voltage** U_0/U 450/750 V with protected fixed installation U_0/U 600/1000 V
- Highest permissible **operating voltage** in three-phase and one-phase a.c. systems U_0/U 476/825 V in d.c. systems U_0/U 619/1238 V
- **Test voltage** 2500 V
- **Minimum bending radius**
flexible
up to 12 mm cable \varnothing : 3x cable \varnothing
greater than 12 mm cable \varnothing : 4 x 6 cable \varnothing
- **End 1:** Plug
- **End 2:** 30 mm stripped with wire end ferrule

Cable structure

- Bare copper conductor, fine wire to DIN VDE 0295 cl. 5, BS 6360 cl. 5, IEC 60228 cl. 5 and/or HD 383
- Rubber core insulation, EI4 to DIN VDE 0282 part 4
- Core colours according DIN VDE 0293-308
- Core colour:
 - up to 5 cores one-coloured
 - up 6 and more cores, black with white numbering
 - 3 and above, with green-yellow earth core
 - 2 cores without green-yellow earth core
- Cores stranded in layers with optimal lay-length
- Special outer sheath, EM2 to DIN VDE 0282 part 1
- Sheath colour Yellow (RAL 1021)
- with meter marking, change-over in 2011

Properties

- **Tests**
Flame-retardant acc. to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Increased stability
- Tear-resistant
- **Resistant to**
Atmospheric influences
Hydrolysis
UV-radiation
- **Largely resistant to**
Oils and fats
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow earth core;
x = without green-yellow earth core.

Application

These robust special rubber sheathed cables can be used where high demands are placed, flexibility and mechanical stress. For application on construction sites, in steel works and rolling mills in heating and air-conditioning systems, in the bottling industry, in machinery and plant construction, in the chemical industry and painting systems, as well as for the professional and the hobby enthusiast. The choice of yellow as the sheath colour ensures additional safety. Can be used in potentially explosive areas acc. to DIN VDE 0165.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no. orange	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.	AWG-No.
650950	YELLOWFLEX 2 x 1,0	2,0	Central contour connector	38,0	17
650951	YELLOWFLEX 2 x 1,0	3,0	Central contour connector	57,0	17
650952	YELLOWFLEX 2 x 1,0	5,0	Central contour connector	95,0	17
650953	YELLOWFLEX 2 x 1,0	10,0	Central contour connector	190,0	17
650958	YELLOWFLEX 2 x 1,5	2,0	Central contour connector	58,0	16
650959	YELLOWFLEX 2 x 1,5	3,0	Central contour connector	87,0	16
650960	YELLOWFLEX 2 x 1,5	5,0	Central contour connector	145,0	16
650961	YELLOWFLEX 2 G 1,5	10,0	Central contour connector	290,0	16
650954	YELLOWFLEX 3 G 1,0	2,0	PROTECTED PLUG, straight	58,0	17
650955	YELLOWFLEX 3 G 1,0	3,0	PROTECTED PLUG, straight	87,0	17
650956	YELLOWFLEX 3 G 1,0	5,0	PROTECTED PLUG, straight	145,0	17
650957	YELLOWFLEX 3 G 1,0	10,0	PROTECTED PLUG, straight	290,0	17
650962	YELLOWFLEX 3 G 1,5	2,0	PROTECTED PLUG, straight	86,0	16
650963	YELLOWFLEX 3 G 1,5	3,0	PROTECTED PLUG, straight	129,0	16
650964	YELLOWFLEX 3 G 1,5	5,0	PROTECTED PLUG, straight	215,0	16
650965	YELLOWFLEX 3 G 1,5	10,0	PROTECTED PLUG, straight	430,0	16

Dimensions and specifications may be changed without prior notice.

PUR connecting cables, orange



Technical data

- **Temperature range**
-40 °C to +90 °C
- **Nominal voltage**
H05BQ-F 300/500 V
H07BQ-F 450/750 V
- **Test voltage** 3000 V
- **End 1:** Plug
- **End 2:** 30 mm stripped with wire end ferrule

Cable structure

- Tinned copper conductor, fine wire stranded
- Rubber core insulation
- Cores stranded
- Cores colour coded to VDE 0293
- PUR outer sheath orange

Note

- G = with green-yellow earth core
x = without green-yellow earth core
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

These cables can be used for medium mechanical loads in dry, damp or wet environments, e.g. for connecting agricultural and commercial equipment and heaters provided there is no danger of contact with the hot parts or by radiation of heat. These robust and flexible cables are used for electrical tools such as drills and hand-held circular saws, as well as for portable motors and machinery in agriculture, at building sites, docks and refrigeration plants.

☑= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no. orange	Cable type / cross-sec. mm ²	Length m	Plug type	Cop. weight kg / 1000 pcs.	AWG-No.
84656	H05BQ-F 2 x 0,75	2,0	Central contour connector	28,8	18
87802	H05BQ-F 2 x 0,75	3,0	Central contour connector	43,2	18
84657	H05BQ-F 2 x 0,75	5,0	Central contour connector	72,0	18
84658	H05BQ-F 2 x 0,75	10,0	Central contour connector	144,0	18
84663	H05BQ-F 2 x 1,0	2,0	Central contour connector	38,4	17
84664	H05BQ-F 2 x 1,0	3,0	Central contour connector	57,6	17
84665	H05BQ-F 2 x 1,0	5,0	Central contour connector	96,0	17
84666	H05BQ-F 2 x 1,0	10,0	Central contour connector	192,0	17
84669	H07BQ-F 2 x 1,5	2,0	Central contour connector	58,0	16
84670	H07BQ-F 2 x 1,5	3,0	Central contour connector	87,0	16
86989	H07BQ-F 2 x 1,5	5,0	Central contour connector	145,0	16
84671	H07BQ-F 2 x 1,5	10,0	Central contour connector	290,0	16
84659	H05BQ-F 3 G 0,75	2,0	PROTECTED PLUG, straight	43,2	18
84660	H05BQ-F 3 G 0,75	3,0	PROTECTED PLUG, straight	64,8	18
84661	H05BQ-F 3 G 0,75	5,0	PROTECTED PLUG, straight	108,0	18
84662	H05BQ-F 3 G 0,75	10,0	PROTECTED PLUG, straight	216,0	18
84667	H05BQ-F 3 G 1,0	2,0	PROTECTED PLUG, straight	58,0	17
86775	H05BQ-F 3 G 1,0	3,0	PROTECTED PLUG, straight	87,0	17
86774	H05BQ-F 3 G 1,0	5,0	PROTECTED PLUG, straight	145,0	17
84668	H05BQ-F 3 G 1,0	10,0	PROTECTED PLUG, straight	290,0	17
84672	H07BQ-F 3 G 1,5	2,0	PROTECTED PLUG, straight	86,0	16
86782	H07BQ-F 3 G 1,5	3,0	PROTECTED PLUG, straight	129,0	16
87548	H07BQ-F 3 G 1,5	5,0	PROTECTED PLUG, straight	215,0	16
84673	H07BQ-F 3 G 1,5	10,0	PROTECTED PLUG, straight	430,0	16

Dimensions and specifications may be changed without prior notice.

Extensions / Supply cables CEE-Extensions / Cold equipment /

PVC-Extensions



CEE-Extensions

Part no.	Cable type / cross-sec. mm ²	Length m	Cable colour	Plug 1	Plug 2	AWG-No.
84688	H07RN-F 5 G 1,5	5,0	black	CEE connector 16A	CEE coupling 16A	16
84689	H07RN-F 5 G 1,5	10,0	black	CEE connector 16A	CEE coupling 16A	16
87164	H07RN-F 5 G 1,5	25,0	black	CEE connector 16A	CEE coupling 16A	16
84690	H07RN-F 5 G 2,5	5,0	black	CEE connector 32A	CEE coupling 32A	14
84691	H07RN-F 5 G 2,5	10,0	black	CEE connector 32A	CEE coupling 32A	14
87416	H07RN-F 5 G 2,5	25,0	black	CEE connector 32A	CEE coupling 32A	14



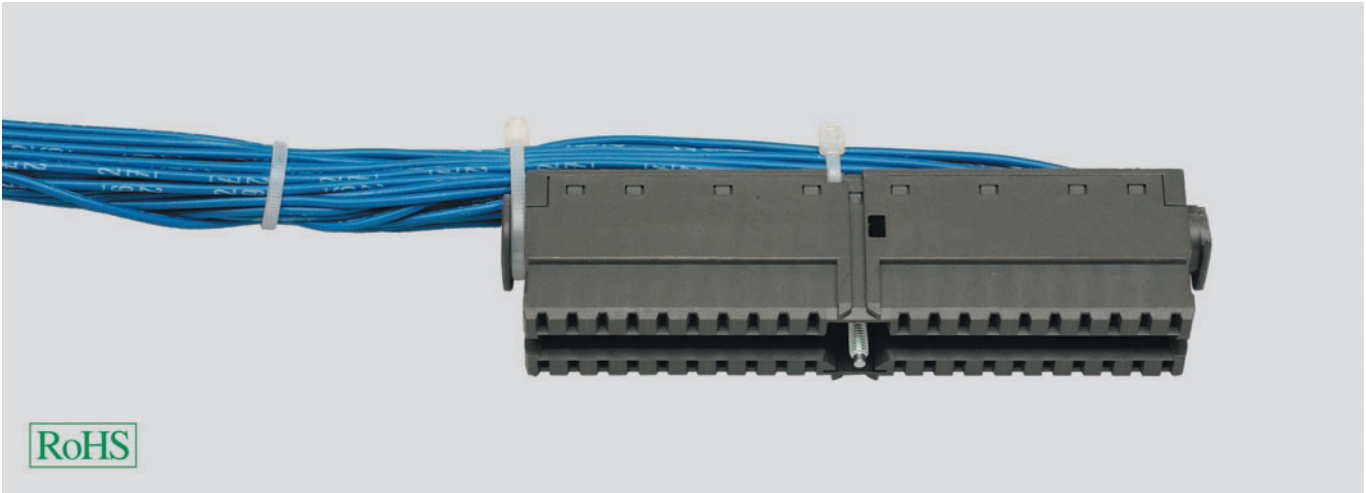
Cold equipments + PVC-Extensions

Part no.	Cable type / cross-sec. mm ²	Length m	Cable colour	Plug 1	Plug 2	AWG-No.
87476	H05VV-F 3 G 0,75	2,0	black	PROTECTED PLUG, angled	Cold device socket	18
86762	H05VV-F 3 G 0,75	2,0	grey	PROTECTED PLUG, angled	Cold device socket	18
84674	H05VV-F 3 G 0,75	3,0	black	PROTECTED PLUG, angled	Cold device socket	18
87845	H05VV-F 3 G 0,75	3,0	grey	PROTECTED PLUG, angled	Cold device socket	18
87196	H05VV-F 3 G 1,0	2,0	black	PROTECTED PLUG, angled	Cold device socket	17
84675	H05VV-F 3 G 1,0	2,0	grey	PROTECTED PLUG, angled	Cold device socket	17
87549	H05VV-F 3 G 1,0	3,0	black	PROTECTED PLUG, angled	Cold device socket	17
84676	H05VV-F 3 G 1,0	3,0	grey	PROTECTED PLUG, angled	Cold device socket	17

Part no.	Cable type / cross-sec. mm ²	Length m	Cable colour	Plug 1	Plug 2	AWG-No.
87445	H05VV-F 3 G 1,5	2,0	white	PROTECTED PLUG, straight	PROTECTED PLUG coupling	16
87919	H05VV-F 3 G 1,5	3,0	white	PROTECTED PLUG, straight	PROTECTED PLUG coupling	16
84178	H05VV-F 3 G 1,5	5,0	white	PROTECTED PLUG, straight	PROTECTED PLUG coupling	16

Dimensions and specifications may be changed without prior notice.

Front connecting cables for Simatic® S7



Cable structure

- Cable cores 0,75 mm² in dark blue (RAL 5010)
- Printed characters in white
- Numbers according to allocation in the plug
- Original front connector can be completely allocated
- Cores cut flush
- Customised pre-assembly possible

Properties

Advantages

- Tremendous time savings
- Quick wiring
- Considerably easier troubleshooting
- Customised pre-assembled cable

Note

- Other lengths, dimensions, colours and special conditions possible on request

Application

These pre-assembled cables with pre-wired front connectors are highly suitable for Simatic S7 programmable logic controllers (PLC). As opposed to past days when you had to cut to length, strip, crimp, screw in and mark, pre-wired front connectors offer the customer a host of advantages for the Simatic S7 system.

Part no.	Connection type	Length m	Cop. weight kg / 1000 pcs.	AWG-No.
Front connector, 20-pole				
650091	Screw fitting version	2,0	324,0	18
650200	Screw fitting version	3,0	468,0	18
650201	Screw fitting version	5,0	756,0	18
84867	Spring version	2,0	324,0	18
84868	Spring version	3,0	468,0	18
84869	Spring version	5,0	756,0	18
650202	Crimp version	2,0	324,0	18
650203	Crimp version	3,0	468,0	18
650088	Crimp version	5,0	756,0	18
Front connector, 40-pole				
650092	Screw fitting version	2,0	648,0	18
650204	Screw fitting version	3,0	936,0	18
650205	Screw fitting version	5,0	1512,0	18
84870	Spring version	2,0	648,0	18
84871	Spring version	3,0	936,0	18
84872	Spring version	5,0	1512,0	18
650206	Crimp version	2,0	648,0	18
650207	Crimp version	3,0	936,0	18
650086	Crimp version	5,0	1512,0	18
Front connector, 48-pole				
650208	Screw fitting version	2,0	746,0	18
650209	Screw fitting version	3,0	1077,0	18
650210	Screw fitting version	5,0	1739,0	18
650211	Spring version	2,0	746,0	18
650212	Spring version	3,0	1077,0	18
650213	Spring version	5,0	1739,0	18
84873	Crimp version	2,0	746,0	18
84874	Crimp version	3,0	1077,0	18
84875	Crimp version	5,0	1739,0	18

Dimensions and specifications may be changed without prior notice.



Spiral Cables



Photo: HELUKABEL®

Spiral Cables

Spiral Cables

The use of spiral cables is necessary in nearly all market segments.

Whether in the communications sector, medical engineering, the automotive industry, mechanical and plant engineering, etc. or as supply wires for the lamp industry - spiral cables are used everywhere.

Along with the electrical/mechanical uses, spiral cables are frequently also an excellent solution for designing the optical appearance.

When using PVC or PUR spiral cables, it is often possible to match the supply wire to the object. Copper-shielded spiral cables can also be supplied.

PVC spiral cable:

Low mechanical and chemical tolerance, medium recoil strength, appearance (various colors possible).

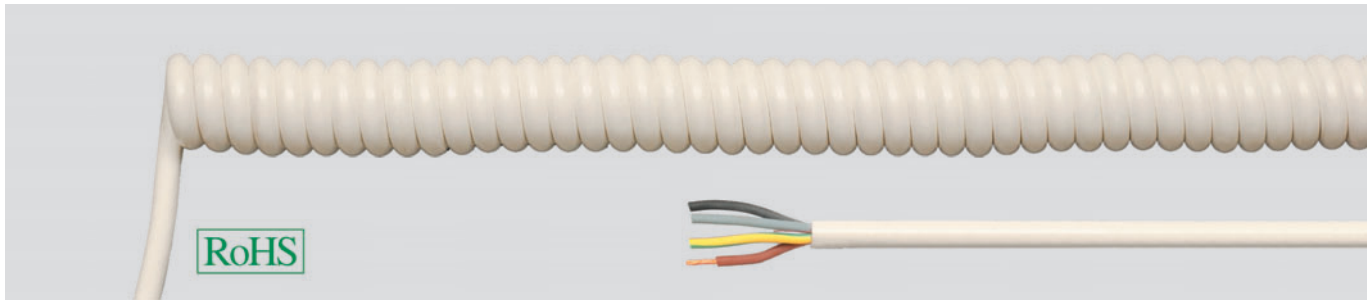
PUR spiral cable:

The ideal solution in most cases. Excellent chemically, mechanically, thermally and in appearance (various colors possible). Very good recoil strength.

Contents

Description	Page
PVC spiral cables	V 4
PUR spiral cables black	V 5
PUR spiral cables orange	V 7
PUR electronic spiral cables unshielded	V 9
PUR electronic spiral cables shielded	V 11

PVC spiral cables



Technical data

- **Temperature range**
-5 °C to +70 °C
- **Nominal voltage**
H03VV-F 300/300 V (up to 1mm²)
H05VV-F 300/500 V (from 1,5mm²)
- **Test voltage**
2000 V
- **Expansion ratio** 1:3
- **straight ends**
200/200 mm

Application

- Lighting industry
- Data installations
- Shops

Cable structure

- Bare copper, fine wire conductors to VDE 0295 cl. 5
- PVC core insulation
- Cores stranded
- Cores colour coded to VDE 0293
- PVC outer sheath

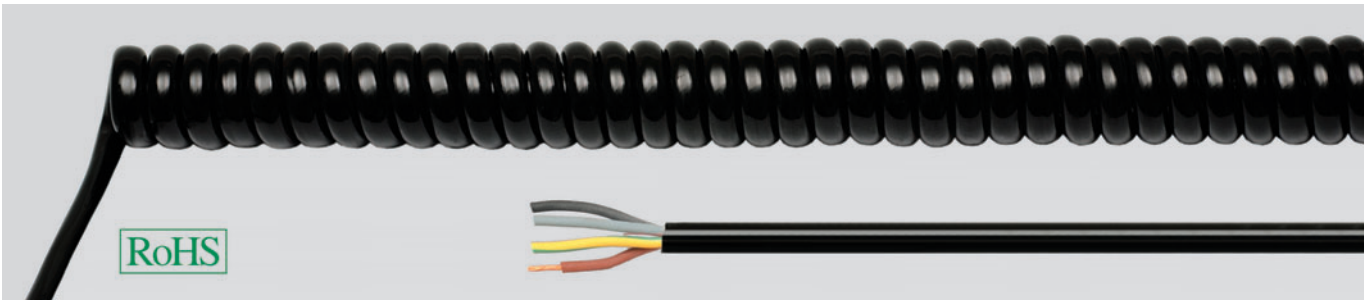
Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- As well in axial construction
- On request closed spiral lengths up to max. 5000 mm possible.

Part no. black	white	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral-outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
84500	84700	2 x 0,75	200	6,2	21,4	34,6	18
84502	84702	2 x 0,75	400	6,2	21,4	63,4	18
84504	84704	2 x 0,75	600	6,2	21,4	92,2	18
84506	84706	2 x 0,75	800	6,2	21,4	121,0	18
84508	84708	2 x 0,75	1000	6,2	21,4	149,8	18
84509	84709	2 x 0,75	1200	6,2	21,4	178,6	18
84510	84710	2 x 0,75	1400	6,2	21,4	207,4	18
84517	84717	3 G 0,75	200	6,6	22,2	51,9	18
84519	84719	3 G 0,75	400	6,6	22,2	95,1	18
84521	84721	3 G 0,75	600	6,6	22,2	138,3	18
84523	84723	3 G 0,75	800	6,6	22,2	181,5	18
84525	84725	3 G 0,75	1000	6,6	22,2	224,7	18
84526	84726	3 G 0,75	1200	6,6	22,2	267,8	18
84527	84727	3 G 0,75	1400	6,6	22,2	311,1	18
84534	84734	2 x 1,0	200	6,6	22,2	43,2	17
84536	84736	2 x 1,0	400	6,6	22,2	65,3	17
84538	84738	2 x 1,0	600	6,6	22,2	122,8	17
84540	84740	2 x 1,0	800	6,6	22,2	161,3	17
84542	84742	2 x 1,0	1000	6,6	22,2	199,7	17
84543	84743	2 x 1,0	1200	6,6	22,2	238,1	17
84544	84744	2 x 1,0	1400	6,6	22,2	276,5	17
84585	84785	2 x 1,5	200	7,7	26,4	69,6	16
84587	84787	2 x 1,5	400	7,7	26,4	127,0	16
84589	84789	2 x 1,5	600	7,7	26,4	185,6	16
84591	84791	2 x 1,5	800	7,7	26,4	243,6	16
84593	84793	2 x 1,5	1000	7,7	26,4	301,6	16
84594	84794	2 x 1,5	1200	7,7	26,4	359,6	16
84595	84795	2 x 1,5	1400	7,7	26,4	417,6	16
84602	84802	3 G 1,5	200	8,5	29,0	103,2	16
84604	84804	3 G 1,5	400	8,5	29,0	189,2	16
84606	84806	3 G 1,5	600	8,5	29,0	275,2	16
84608	84808	3 G 1,5	800	8,5	29,0	361,2	16
84610	84810	3 G 1,5	1000	8,5	29,0	447,2	16
84611	84811	3 G 1,5	1200	8,5	29,0	533,2	16
84612	84812	3 G 1,5	1400	8,5	29,0	619,2	16

Dimensions and specifications may be changed without prior notice.

PUR spiral cables black



Technical data

- **Temperature range**
-25 °C to +70 °C
- **Nominal voltage**
H05BQ-F 300/500 V (up to 1mm²)
H07BQ-F 450/750 V (from 1,5mm²)
- **Test voltage**
2000/2500 V
- **Expansion ratio** 1:4
- **straight ends**
200/200 mm

Application

- Machine Construction
- Electrical Tools
- Building Industry
- Handling Equipment
- Entertainment Equipment

Cable structure

- Plain copper conductor, fine wire stranded to DIN VDE 0295 cl. 5
- EPDM core insulation
- VDE-approved cable
- PUR outer sheath
- Colour black

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- As well in axial construction
- On request closed spiral lengths up to max. 5000 mm possible.

Part no. black	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral- outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
86303	2 x 0,75	500	6,5	23,0	77,8	18
86306	2 x 0,75	1000	6,5	23,0	149,8	18
86308	2 x 0,75	1400	6,5	23,0	207,4	18
86311	2 x 0,75	2000	6,5	23,0	295,8	18
86315	2 x 0,75	3000	6,5	23,0	437,8	18
86319	3 G 0,75	500	7,1	25,2	116,7	18
86322	3 G 0,75	1000	7,1	25,2	224,7	18
86324	3 G 0,75	1400	7,1	25,2	311,1	18
86327	3 G 0,75	2000	7,1	25,2	440,6	18
86331	3 G 0,75	3000	7,1	25,2	656,6	18
86335	4 G 0,75	500	7,9	28,8	156,6	18
86338	4 G 0,75	1000	7,9	28,8	301,6	18
86340	4 G 0,75	1400	7,9	28,8	417,6	18
86343	4 G 0,75	2000	7,9	28,8	591,6	18
86347	4 G 0,75	3000	7,9	28,8	881,6	18
86351	5 G 0,75	500	8,6	31,2	194,4	18
86354	5 G 0,75	1000	8,6	31,2	374,4	18
86356	5 G 0,75	1400	8,6	31,2	518,4	18
86359	5 G 0,75	2000	8,6	31,2	734,4	18
86363	5 G 0,75	3000	8,6	31,2	1094,4	18
86367	2 x 1,0	500	6,8	24,6	103,7	17
86370	2 x 1,0	1000	6,8	24,6	199,7	17
86372	2 x 1,0	1400	6,8	24,6	276,5	17
86375	2 x 1,0	2000	6,8	24,6	391,7	17
86379	2 x 1,0	3000	6,8	24,6	583,7	17
84903	3 G 1,0	500	7,2	26,4	156,6	17
84906	3 G 1,0	1000	7,2	26,4	301,6	17
84908	3 G 1,0	1400	7,2	26,4	417,6	17
84911	3 G 1,0	2000	7,2	26,4	591,6	17
84915	3 G 1,0	3000	7,2	26,4	881,6	17
86383	4 G 1,0	500	7,8	28,6	207,4	17
86386	4 G 1,0	1000	7,8	28,6	399,4	17
86388	4 G 1,0	1400	7,8	28,6	553,0	17
86391	4 G 1,0	2000	7,8	28,6	785,4	17
86395	4 G 1,0	3000	7,8	28,6	1167,4	17
86399	5 G 1,0	500	9,0	32,0	259,2	17
86402	5 G 1,0	1000	9,0	32,0	499,2	17
86404	5 G 1,0	1400	9,0	32,0	691,2	17
86407	5 G 1,0	2000	9,0	32,0	979,2	17
86411	5 G 1,0	3000	9,0	32,0	1459,2	17

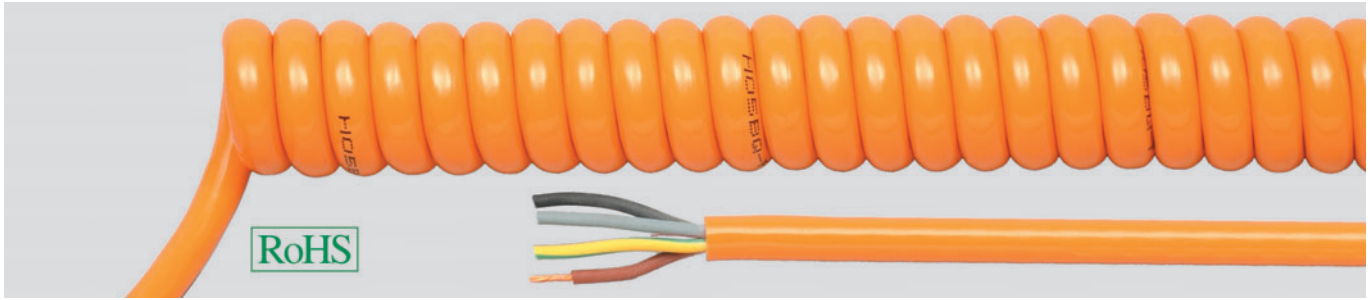
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PUR spiral cables black

Part no. black	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral- outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
86415	7 G 1,0	500	11,1	39,0	361,8	17
86418	7 G 1,0	1000	11,1	39,0	696,8	17
86420	7 G 1,0	1400	11,1	39,0	964,8	17
86423	7 G 1,0	2000	11,1	39,0	1366,8	17
86427	7 G 1,0	3000	11,1	39,0	2036,8	17
86463	2 x 1,5	500	8,5	30,0	156,6	16
86466	2 x 1,5	1000	8,5	30,0	301,6	16
86468	2 x 1,5	1400	8,5	30,0	417,6	16
86471	2 x 1,5	2000	8,5	30,0	591,6	16
86475	2 x 1,5	3000	8,5	30,0	881,6	16
84919	3 G 1,5	500	8,9	32,8	252,2	16
84922	3 G 1,5	1000	8,9	32,8	447,2	16
84924	3 G 1,5	1400	8,9	32,8	619,2	16
84927	3 G 1,5	2000	8,9	32,8	877,2	16
84931	3 G 1,5	3000	8,9	32,8	1307,2	16
84951	5 G 1,5	500	10,9	38,8	388,8	16
84954	5 G 1,5	1000	10,9	38,8	748,8	16
84956	5 G 1,5	1400	10,9	38,8	1036,8	16
84959	5 G 1,5	2000	10,9	38,8	1468,8	16
84963	5 G 1,5	3000	10,9	38,8	2188,8	16
84967	7 G 1,5	500	12,2	46,4	545,4	16
84970	7 G 1,5	1000	12,2	46,4	1050,4	16
84972	7 G 1,5	1400	12,2	46,4	1454,1	16
84975	7 G 1,5	2000	12,2	46,4	2060,4	16
84979	7 G 1,5	3000	12,2	46,4	3070,4	16
86479	3 G 2,5	500	10,6	38,2	388,8	14
86482	3 G 2,5	1000	10,6	38,2	748,8	14
86484	3 G 2,5	1400	10,6	38,2	1036,8	14
86487	3 G 2,5	2000	10,6	38,2	1468,8	14
86491	3 G 2,5	3000	10,6	38,2	2188,8	14

Dimensions and specifications may be changed without prior notice.

PUR spiral cables orange



Technical data

- **Temperature range**
-25 °C to +70 °C
- **Nominal voltage**
H05BQ-F 300/500 V (up to 1mm²)
H07BQ-F 450/750 V (from 1,5mm²)
- **Test voltage**
2000/2500 V
- **Expansion ratio** 1:4
- **straight ends**
200/200 mm

Cable structure

- Plain copper conductor, fine wire stranded
- EPDM core insulation
- VDE-approved cable
- PUR outer sheath
- Sheath colour orange

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- As well in axial construction
- On request closed spiral lengths up to max. 5000 mm possible.

Application

- Machine Construction
- Electrical Tools
- Building Industry
- Handling Equipment
- Entertainment Equipment

Part no. orange	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral- outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
85221	2 x 0,75	300	6,5	23,0	59,0	18
85223	2 x 0,75	500	6,5	23,0	77,8	18
85226	2 x 0,75	1000	6,5	23,0	149,8	18
85229	2 x 0,75	1500	6,5	23,0	221,8	18
85236	2 x 0,75	3000	6,5	23,0	437,8	18
85238	3 G 0,75	300	7,1	25,2	73,5	18
85240	3 G 0,75	500	7,1	25,2	116,7	18
85243	3 G 0,75	1000	7,1	25,2	224,7	18
85246	3 G 0,75	1500	7,1	25,2	332,6	18
85253	3 G 0,75	3000	7,1	25,2	656,6	18
85255	4 G 0,75	300	7,9	28,8	98,6	18
85257	4 G 0,75	500	7,9	28,8	156,6	18
85260	4 G 0,75	1000	7,9	28,8	301,6	18
85263	4 G 0,75	1500	7,9	28,8	446,6	18
85270	4 G 0,75	3000	7,9	28,8	881,6	18
85272	5 G 0,75	300	8,6	31,2	122,4	18
85274	5 G 0,75	500	8,6	31,2	194,4	18
85277	5 G 0,75	1000	8,6	31,2	374,4	18
85280	5 G 0,75	1500	8,6	31,2	554,4	18
85287	5 G 0,75	3000	8,6	31,2	1094,4	18
85289	2 x 1,0	300	6,8	24,6	65,3	17
85291	2 x 1,0	500	6,8	24,6	103,7	17
85294	2 x 1,0	1000	6,8	24,6	199,7	17
85297	2 x 1,0	1500	6,8	24,6	295,7	17
85304	2 x 1,0	3000	6,8	24,6	583,7	17
85306	3 G 1,0	300	7,2	26,4	98,6	17
85308	3 G 1,0	500	7,2	26,4	156,6	17
85311	3 G 1,0	1000	7,2	26,4	301,6	17
85314	3 G 1,0	1500	7,2	26,4	446,6	17
85321	3 G 1,0	3000	7,2	26,4	881,6	17
85323	4 G 1,0	300	7,8	28,6	130,6	17
85325	4 G 1,0	500	7,8	28,6	207,4	17
85328	4 G 1,0	1000	7,8	28,6	399,4	17
85331	4 G 1,0	1500	7,8	28,6	591,4	17
85338	4 G 1,0	3000	7,8	28,6	1167,4	17
85340	5 G 1,0	300	9,0	32,0	163,2	17
85342	5 G 1,0	500	9,0	32,0	259,2	17
85345	5 G 1,0	1000	9,0	32,0	499,2	17
85348	5 G 1,0	1500	9,0	32,0	739,2	17
85355	5 G 1,0	3000	9,0	32,0	1459,2	17

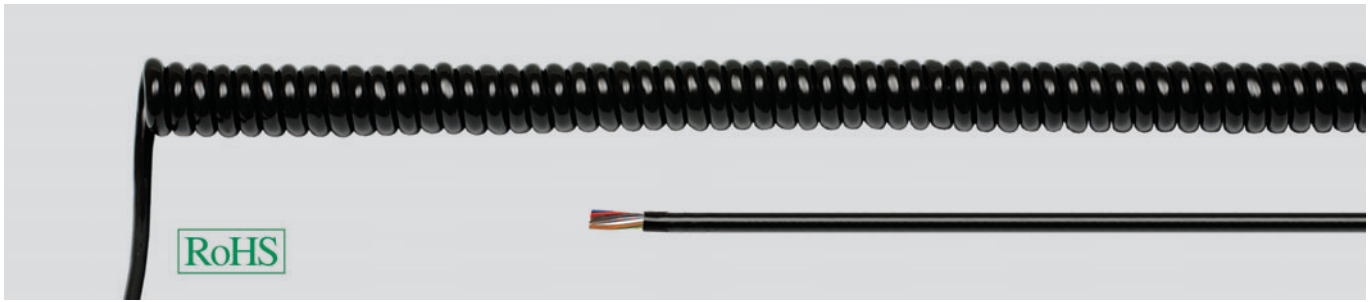
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PUR spiral cables orange

Part no. orange	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral- outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
85357	2 x 1,5	300	8,5	30,0	98,6	16
85359	2 x 1,5	500	8,5	30,0	156,6	16
85362	2 x 1,5	1000	8,5	30,0	301,6	16
85365	2 x 1,5	1500	8,5	30,0	446,6	16
85372	2 x 1,5	3000	8,5	30,0	881,6	16
85374	3 G 1,5	300	8,9	32,8	146,2	16
85376	3 G 1,5	500	8,9	32,8	232,2	16
85379	3 G 1,5	1000	8,9	32,8	447,2	16
85382	3 G 1,5	1500	8,9	32,8	662,2	16
85389	3 G 1,5	3000	8,9	32,8	1307,2	16
85408	5 G 1,5	300	10,9	38,8	244,8	16
85410	5 G 1,5	500	10,9	38,8	388,8	16
85413	5 G 1,5	1000	10,9	38,8	748,8	16
85416	5 G 1,5	1500	10,9	38,8	1108,8	16
85423	5 G 1,5	3000	10,9	38,8	2188,8	16
85425	7 G 1,5	300	12,6	46,4	343,4	16
85427	7 G 1,5	500	12,6	46,4	545,4	16
85430	7 G 1,5	1000	12,6	46,4	1050,4	16
85433	7 G 1,5	1500	12,6	46,4	1555,4	16
85440	7 G 1,5	3000	12,6	46,4	3070,4	16
85442	12 G 1,5	300	16,6	65,2	588,2	16
85444	12 G 1,5	500	16,6	65,2	934,2	16
85447	12 G 1,5	1000	16,6	65,2	1799,2	16
85450	12 G 1,5	1500	16,6	65,2	2664,2	16
85457	12 G 1,5	3000	16,6	65,2	5259,2	16
85459	3 G 2,5	300	10,6	38,2	244,8	14
85461	3 G 2,5	500	10,6	38,2	388,8	14
85464	3 G 2,5	1000	10,6	38,2	748,8	14
85467	3 G 2,5	1500	10,6	38,2	1108,8	14
85474	3 G 2,5	3000	10,6	38,2	2188,8	14
85493	5 G 2,5	300	13,2	48,4	408,0	14
85495	5 G 2,5	500	13,2	48,4	648,0	14
85498	5 G 2,5	1000	13,2	48,4	1248,0	14
85501	5 G 2,5	1500	13,2	48,4	1848,0	14
85508	5 G 2,5	3000	13,2	48,4	3648,0	14

Dimensions and specifications may be changed without prior notice.

PUR electronic spiral cables unscreened



Technical data

- **Temperature range**
-25 °C to +70 °C
- **Nominal voltage**
300 V (up to 0,14 mm²)
500 V (from 0,25 mm²)
- **Test voltage**
1000 V
- **Expansion ratio** 1:4
- **straight ends**
200/200 mm

Application

- Control technology use

Cable structure

- Bare copper, fine wire conductor to VDE 0295 cl. 6, IEC 60228 cl. 6
- TPE-E core insulation
- Core identification to DIN 47100
- Cores stranded in layers
- PUR outer sheath
- Colour black

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- As well in axial construction
- On request closed spiral lengths up to max. 5000 mm possible.

Part no. black	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral- outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
85550	2 x 0,14	300	3,5	13,0	9,2	26
85551	2 x 0,14	400	3,5	13,0	11,9	26
85552	2 x 0,14	500	3,5	13,0	15,6	26
85555	2 x 0,14	1000	3,5	13,0	28,1	26
85566	4 x 0,14	300	4,0	14,0	18,4	26
85567	4 x 0,14	400	4,0	14,0	23,8	26
85568	4 x 0,14	500	4,0	14,0	29,2	26
85571	4 x 0,14	1000	4,0	14,0	56,2	26
85574	5 x 0,14	300	4,4	15,8	22,8	26
85575	5 x 0,14	400	4,4	15,8	29,5	26
85576	5 x 0,14	500	4,4	15,8	36,2	26
85579	5 x 0,14	1000	4,4	15,8	69,7	26
85582	6 x 0,14	300	4,9	17,8	27,5	26
85583	6 x 0,14	400	4,9	17,8	36,7	26
85584	6 x 0,14	500	4,9	17,8	43,8	26
85587	6 x 0,14	1000	4,9	17,8	84,2	26
85590	7 x 0,14	300	5,2	18,4	32,0	26
85591	7 x 0,14	400	5,2	18,4	42,4	26
85592	7 x 0,14	500	5,2	18,4	50,8	26
85595	7 x 0,14	1000	5,2	18,4	97,8	26
85598	8 x 0,14	300	5,4	19,8	36,7	26
85599	8 x 0,14	400	5,4	19,8	47,5	26
85600	8 x 0,14	500	5,4	19,8	58,3	26
85603	8 x 0,14	1000	5,4	19,8	112,3	26
85638	2 x 0,25	300	3,9	13,8	16,3	24
85639	2 x 0,25	400	3,9	13,8	21,1	24
85640	2 x 0,25	500	3,9	13,8	25,9	24
85643	2 x 0,25	1000	3,9	13,8	49,9	24
85654	4 x 0,25	300	4,6	17,2	36,7	24
85655	4 x 0,25	400	4,6	17,2	42,2	24
85656	4 x 0,25	500	4,6	17,2	51,8	24
85659	4 x 0,25	1000	4,6	17,2	99,8	24
85662	5 x 0,25	300	5,4	19,8	40,8	24
85663	5 x 0,25	400	5,4	19,8	52,8	24
85664	5 x 0,25	500	5,4	19,8	64,8	24
85667	5 x 0,25	1000	5,4	19,8	124,8	24
85670	6 x 0,25	300	5,5	20,0	48,9	24
85671	6 x 0,25	400	5,5	20,0	63,4	24
85672	6 x 0,25	500	5,5	20,0	77,8	24
85675	6 x 0,25	1000	5,5	20,0	149,8	24

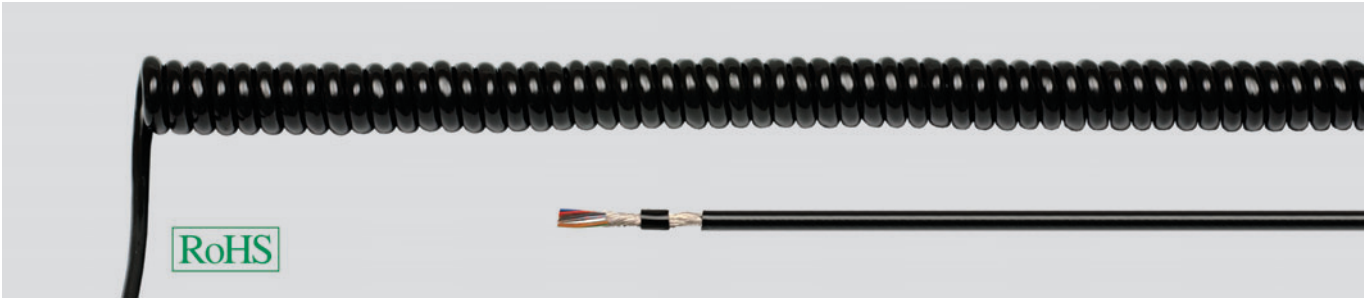
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PUR electronic spiral cables unscreened

Part no. black	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral- outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
85686	8 x 0,25	300	6,4	23,8	65,3	24
85687	8 x 0,25	400	6,4	23,8	84,5	24
85688	8 x 0,25	500	6,4	23,8	103,7	24
85691	8 x 0,25	1000	6,4	23,8	199,7	24
85702	12 x 0,25	300	6,9	24,8	97,9	24
85703	12 x 0,25	400	6,9	24,8	126,7	24
85704	12 x 0,25	500	6,9	24,8	155,5	24
85707	12 x 0,25	1000	6,9	24,8	299,5	24
85726	2 x 0,5	300	4,6	16,2	32,6	20
85727	2 x 0,5	400	4,6	16,2	42,3	20
85728	2 x 0,5	500	4,6	16,2	51,8	20
85731	2 x 0,5	1000	4,6	16,2	99,8	20
85742	4 x 0,5	300	5,0	18,0	65,3	20
85743	4 x 0,5	400	5,0	18,0	84,5	20
85744	4 x 0,5	500	5,0	18,0	103,7	20
85747	4 x 0,5	1000	5,0	18,0	201,8	20
85758	6 x 0,5	300	6,2	22,4	97,9	20
85759	6 x 0,5	400	6,2	22,4	126,7	20
85760	6 x 0,5	500	6,2	22,4	155,5	20
85763	6 x 0,5	1000	6,2	22,4	299,5	20
85774	8 x 0,5	300	7,4	26,8	130,6	20
85775	8 x 0,5	400	7,4	26,8	169,0	20
85776	8 x 0,5	500	7,4	26,8	207,4	20
85779	8 x 0,5	1000	7,4	26,8	399,4	20
85790	12 x 0,5	300	8,2	29,4	195,8	20
85791	12 x 0,5	400	8,2	29,4	254,3	20
85792	12 x 0,5	500	8,2	29,4	311,1	20
85795	12 x 0,5	1000	8,2	29,4	599,1	20

Dimensions and specifications may be changed without prior notice.

PUR electronic spiral cables screened



Technical data

- **Temperature range**
-25 °C to +70 °C
- **Nominal voltage**
300 V (up to 0,14 mm²)
500 V (from 0,25 mm²)
- **Test voltage**
2000 V
- **Expansion ratio** 1:4
- **straight ends**
200/200 mm

Application

- Control technology use

Cable structure

- Bare copper, fine wire conductor to VDE 0295 cl. 6 and IEC 60228 cl. 6
- TPE-E core insulation
- Core identification to DIN 47100
- Cores stranded in layers
- Overall screening
- PUR sheath
- Colour black

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- As well in axial construction
- On request closed spiral lengths up to max. 5000 mm possible.

Part no. black	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral- outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
85900	2 x 0,14	300	3,8	13,6	30,6	26
85901	2 x 0,14	400	3,8	13,6	39,6	26
85902	2 x 0,14	500	3,8	13,6	48,6	26
85905	2 x 0,14	1000	3,8	13,6	93,6	26
600154	3 x 0,14	300	4,1	15,2	44,2	26
600155	3 x 0,14	400	4,1	15,2	55,8	26
600156	3 x 0,14	500	4,1	15,2	67,5	26
600157	3 x 0,14	1000	4,1	15,2	135,0	26
85916	4 x 0,14	300	4,6	16,2	47,6	26
85917	4 x 0,14	400	4,6	16,2	61,6	26
85918	4 x 0,14	500	4,6	16,2	75,6	26
85921	4 x 0,14	1000	4,6	16,2	145,6	26
85924	5 x 0,14	300	4,6	17,2	54,4	26
85925	5 x 0,14	400	4,6	17,2	70,4	26
85926	5 x 0,14	500	4,6	17,2	86,4	26
85929	5 x 0,14	1000	4,6	17,2	166,4	26
85932	6 x 0,14	300	5,2	19,4	64,6	26
85933	6 x 0,14	400	5,2	19,4	83,6	26
85934	6 x 0,14	500	5,2	19,4	102,6	26
85937	6 x 0,14	1000	5,2	19,4	197,6	26
85940	7 x 0,14	300	5,5	20,0	68,0	26
85941	7 x 0,14	400	5,5	20,0	88,0	26
85942	7 x 0,14	500	5,5	20,0	108,0	26
85945	7 x 0,14	1000	5,5	20,0	208,0	26
85948	8 x 0,14	300	5,6	20,2	74,8	26
85949	8 x 0,14	400	5,6	20,2	96,8	26
85950	8 x 0,14	500	5,6	20,2	118,8	26
85953	8 x 0,14	1000	5,6	20,2	228,8	26
85980	2 x 0,25	300	4,5	16,0	51,0	24
85981	2 x 0,25	400	4,5	16,0	66,0	24
85982	2 x 0,25	500	4,5	16,0	81,0	24
85985	2 x 0,25	1000	4,5	16,0	156,0	24
85988	4 x 0,25	300	5,0	18,0	74,8	24
85989	4 x 0,25	400	5,0	18,0	96,8	24
85990	4 x 0,25	500	5,0	18,0	118,8	24
85993	4 x 0,25	1000	5,0	18,0	228,8	24
85996	5 x 0,25	300	5,4	19,8	85,0	24
85997	5 x 0,25	400	5,4	19,8	110,0	24
85998	5 x 0,25	500	5,4	19,8	135,0	24
86001	5 x 0,25	1000	5,4	19,8	260,0	24

Continuation ▶

PUR electronic spiral cables screened

Part no. black	Cross-section mm ²	Spiral length unexpanded (WL in mm)	Cable Ø approx. mm	Spiral- outer Ø approx. mm	Cop. weight kg / 1000 pcs.	AWG-No.
86004	6 x 0,25	300	5,7	20,4	102,0	24
86005	6 x 0,25	400	5,7	20,4	132,0	24
86006	6 x 0,25	500	5,7	20,4	162,0	24
86009	6 x 0,25	1000	5,7	20,4	312,0	24
86012	8 x 0,25	300	6,5	23,0	119,0	24
86013	8 x 0,25	400	6,5	23,0	154,0	24
86014	8 x 0,25	500	6,5	23,0	189,0	24
86017	8 x 0,25	1000	6,5	23,0	364,0	24
86020	12 x 0,25	300	7,1	26,2	170,0	24
86021	12 x 0,25	400	7,1	26,2	220,0	24
86022	12 x 0,25	500	7,1	26,2	270,0	24
86025	12 x 0,25	1000	7,1	26,2	520,0	24
86036	2 x 0,5	300	5,5	20,0	78,2	20
86037	2 x 0,5	400	5,5	20,0	101,2	20
86038	2 x 0,5	500	5,5	20,0	124,2	20
86041	2 x 0,5	1000	5,5	20,0	239,2	20
86044	4 x 0,5	300	5,8	21,6	153,0	20
86045	4 x 0,5	400	5,8	21,6	198,0	20
86046	4 x 0,5	500	5,8	21,6	243,0	20
86049	4 x 0,5	1000	5,8	21,6	648,0	20
86052	6 x 0,5	300	7,0	26,0	231,2	20
86053	6 x 0,5	400	7,0	26,0	299,2	20
86054	6 x 0,5	500	7,0	26,0	367,2	20
86057	6 x 0,5	1000	7,0	26,0	707,2	20
86060	8 x 0,5	300	8,0	29,0	289,0	20
86061	8 x 0,5	400	8,0	29,0	374,0	20
86062	8 x 0,5	500	8,0	29,0	459,0	20
86065	8 x 0,5	1000	8,0	29,0	884,0	20
86068	12 x 0,5	300	8,8	31,6	380,8	20
86069	12 x 0,5	400	8,8	31,6	492,8	20
86070	12 x 0,5	500	8,8	31,6	604,8	20
86073	12 x 0,5	1000	8,8	31,6	1164,8	20

Dimensions and specifications may be changed without prior notice.

Enquiry Spiral Cable

HELUKABEL® GmbH

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Dieselstraße 8-12
71282 Hemmingen
Germany

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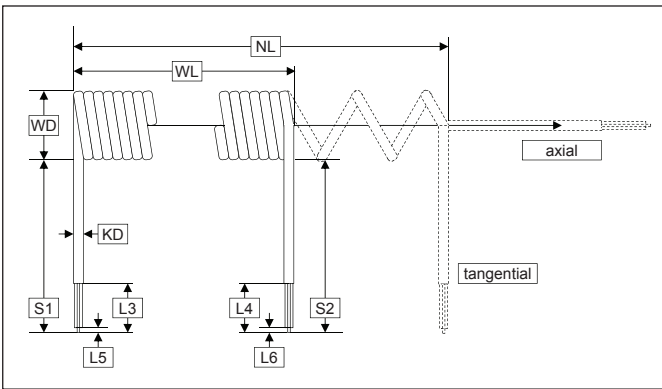
Sender (stamp)

Contact

Phone Fax

Enquiry No.
Date

Requirement pcs once continuous
yearly requirement approx. pcs



... also available with ready moulded or mounted plugs

If you should require a special design please enclose a sketch

- 1. Sheath type PVC PUR
 - 2. Outer sheath colour
 - 3. Type No. of cores x cross section x mm²
 - 4. Screen yes:
 - 5. Spiral length (WL closed)
 - 6. Max. elongation (extended spiral)
 - 7. Spiral outer diameter WD
 - 8. Internal diameter KD
 - 9. End lengths (axial or tangential)
- S1 mm² S2 mm²

Comments

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Characteristics PVC (Polyvinylchlorid)

PVC spiral cables offer a high degree of economy. They are suitable for installation wherever a light duty cable is required.

Characteristics PUR (Polyurethan)

Good resistance to chemicals and cold conditions. Good performance characteristics in all weather conditions, excellent mechanical properties such as tear and abrasion resistance, excellent oil resistance.





Shipwiring and Marine Cables

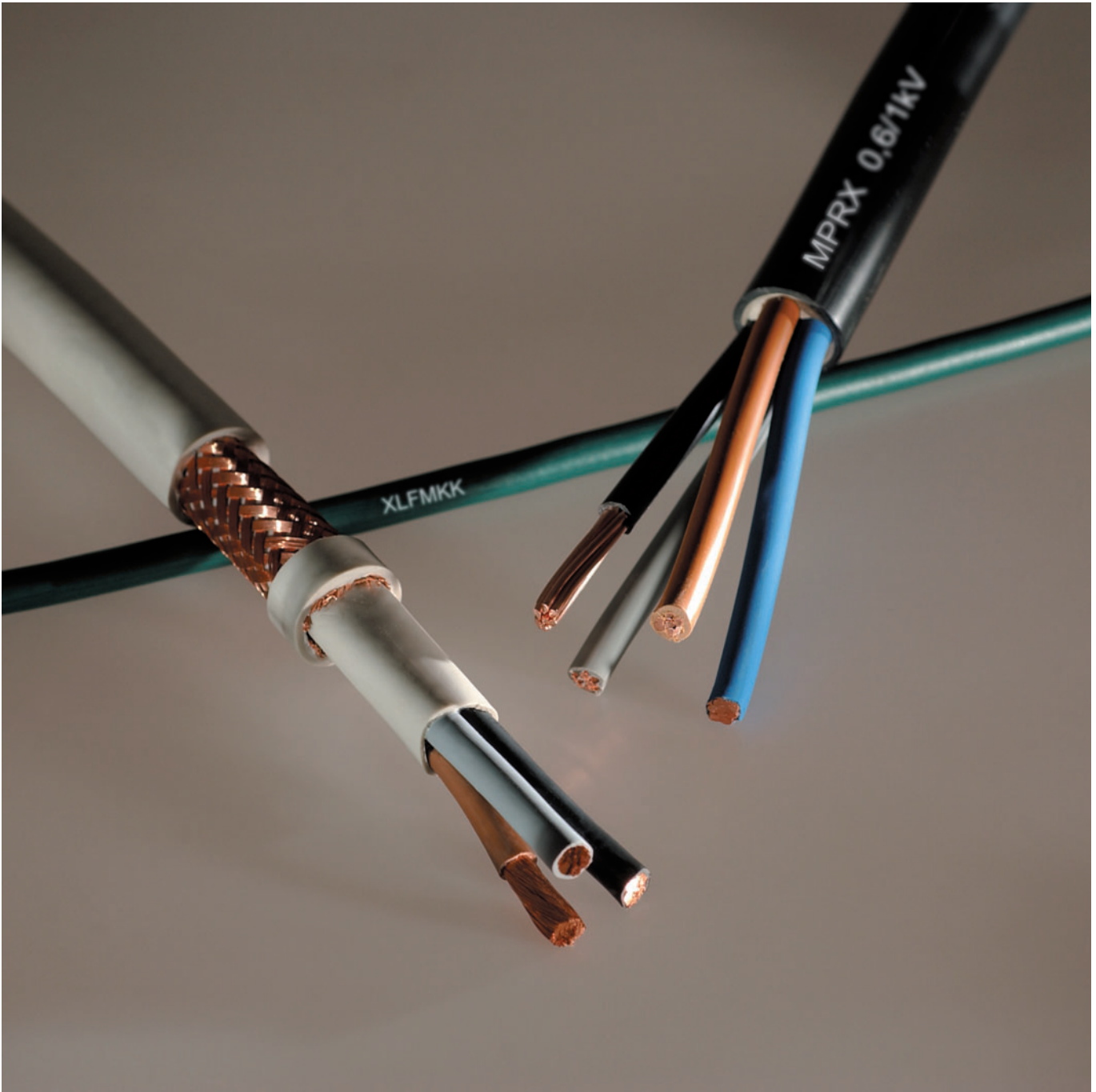


Photo: HELUKABEL®

Shipwiring and Marine Cables

Shipwiring and Marine Cables

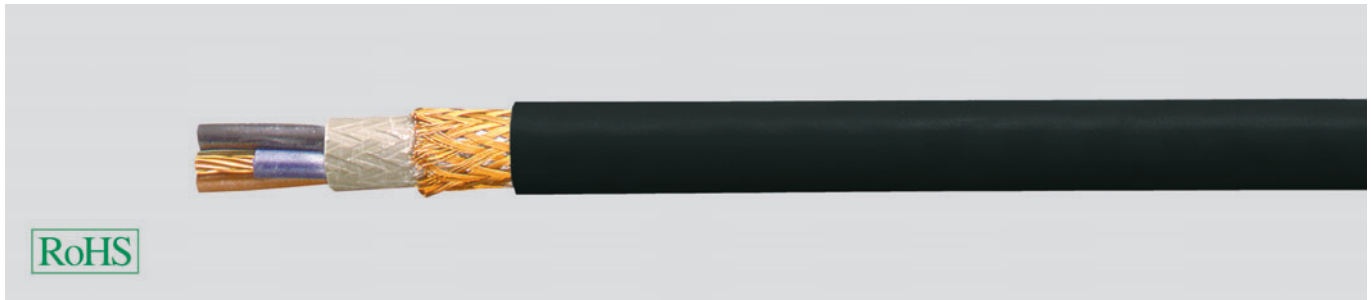
We offer shipwiring and marine cables with approvals of the Germanischer Lloyd, Lloyds Register of Shipping, American Bureau of Shipping, Det Norske Veritas, Bureau Veritas, USSR Register of Shipping and the Verband Deutscher Elektrotechniker.

Great parts of the programm are available within a short time from our stock. Cutting lengths are available for an additional charge. On request we send with each order a corresponding production or company certificate.

Contents

Description	Page
Ships Power Cables MGSGO, halogen-free, copper screened	W 4
Light Marine Power Cables XLFMCK, Cu-screened	W 5
Marine Power Cables LMGSGO, halogen-free, Cu-screened	W 6
Ships Telephone Cables FMGCH 250 V (FMGCG*), halogen-free according to DIN 89 159/99	W 7
Marine Telecommunication Cables FMGSGO, halogen-free, Cu-screened	W 8
Marine Telecommunication Cables FMGSGO 250 V, with a single screen, higher cross-talk attenuation, halogen-free	W 9
Light Marine Telecommunication Cables LFMGSSGO, halogen-free, 2x Cu-screened	W 10
Light Marine Telecommunication Cables LFMGSSGO, halogen-free, 2x Cu-screened	W 11
Ships Wiring Cables-SY single cores	W 12
Ships Wiring Cables-SY stranded type	W 13
Ships Power Cables MPRX 0,6/1kV, according to IEC 60092-353, halogen-free	W 14
Ships Power Cables MPRXCX 0,6/1kV, according to IEC 60092-353, halogen-free	W 15
SHIPFLEX 512, cable for drag chain, halogen-free, EMC preferred type, meter marking	W 17
SHIPFLEX 330, cable for drag chain, halogen-free, EMC preferred type, meter marking	W 18
SHIPFLEX 340, cable for drag chain, halogen-free, EMC preferred type, meter marking	W 19
SHIPFLEX 109, cable for drag chain, halogen-free, EMC preferred type (-C-Type), meter marking	W 20
SHIPFLEX 109, cable for drag chain, halogen-free, EMC preferred type, meter marking	W 21
SHIPFLEX 113, cable for drag chain, halogen-free, EMC preferred type, meter marking	W 22
SHIPFLEX 121, cable for drag chain, halogen-free, EMC preferred type, meter marking	W 23

Ships Power Cables MGSGO halogen-free, copper screened



Technical data

- According to VG 95218 part 60, screened. The core insulation continues to function during a fire without the need for extra flame-proof taping
- **Conductor operating temperature** max. +85 °C
- **Nominal voltage** U_0/U 0,6/1 kV
- **Minimum bending radius** approx. 5x cable \emptyset

Cable structure

- Stranded copper conductors
- Heat-resistant EPR-insulation 3GI3, to DIN VDE 0207 part 20
- Cores stranded in layers with optimal lay-length
- Filling compound covering all cores
- Foil screen
- Plain copper braided screen
- Polyester tape
- Chloroprene based outer sheath 5GM3, to DIN VDE 0207 part 21
- Jacket colour black

Properties

- halogen-free and flame retardant
- **Colour code**
 - 1 core: black
 - 2 cores: brown/blue
 - 3 cores: brown/black/grey
 - 4 cores: blue/brown/black/grey
- **Approved by** BWB (Bundesamt für Wehrtechnik und Beschaffung), i.e. German Federal Office for Defence and Procurement

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Halogen-free power cables for marine craft are used for permanent installation on ships in all rooms and open decks as control and power cables.

Part no.	No.cores x cross-sec. mm ²	Outer \emptyset approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59270	1 x 4	7,5	81,0	170,0	12
59271	1 x 6	8,4	104,0	200,0	10
59272	1 x 10	9,5	149,0	260,0	8
59273	1 x 16	10,0	214,0	340,0	6
59274	1 x 25	12,0	311,0	480,0	4
59275	1 x 35	13,0	416,0	590,0	2
59276	1 x 50	15,0	572,0	760,0	1
59277	1 x 70	17,0	779,0	980,0	2/0
59278	1 x 95	19,5	1034,0	1300,0	3/0
59279	1 x 120	21,0	1316,0	1550,0	4/0
59280	1 x 150	23,0	1615,0	1850,0	300 kcmil
59281	1 x 185	25,5	1968,0	2300,0	350 kcmil
59282	1 x 240	29,0	2506,0	2950,0	500 kcmil
59283	1 x 300	31,5	3345,0	3600,0	600 kcmil
59284	2 x 1,5	11,5	105,0	340,0	16
59285	2 x 2,5	12,4	132,0	400,0	14
59286	2 x 4	13,4	170,0	460,0	12
59287	2 x 6	14,7	217,0	570,0	10
59288	2 x 10	16,2	307,0	720,0	8
59289	2 x 16	19,0	471,0	940,0	6
59290	2 x 25	22,5	670,0	1300,0	4

Part no.	No.cores x cross-sec. mm ²	Outer \emptyset approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59291	3 x 1,5	12,0	125,0	380,0	16
59292	3 x 2,5	13,0	161,0	440,0	14
59293	3 x 4	14,0	215,0	520,0	12
59294	3 x 6	15,5	282,0	640,0	10
59295	3 x 10	17,6	417,0	840,0	8
59296	3 x 16	20,0	636,0	1110,0	6
59297	3 x 25	24,0	924,0	1610,0	4
59298	3 x 35	26,0	1233,0	2020,0	2
59299	3 x 50	30,0	1703,0	2610,0	1
59300	3 x 70	34,5	2413,0	3450,0	2/0
59301	3 x 95	39,7	3191,0	4710,0	3/0
59302	3 x 120	43,0	3975,0	5680,0	4/0
59303	4 x 4	15,2	284,0	620,0	12
59304	4 x 6	17,0	371,0	750,0	10
59305	4 x 10	19,4	545,0	1010,0	8
59306	4 x 16	22,0	796,0	1400,0	6
59307	4 x 25	26,4	1170,0	2000,0	4
59308	4 x 35	29,2	1578,0	2530,0	2
59309	4 x 50	33,5	2278,0	3280,0	1
59310	4 x 70	38,2	3090,0	4450,0	2/0
59311	4 x 95	44,2	4110,0	5930,0	3/0

Dimensions and specifications may be changed without prior notice. (RW01)

Light Marine Power Cables XLFMKK Cu-screened



Technical data

- According to VG 88778/66
- **Conductor operating temperature**
max. +85 °C
- **Min. installation temperature**
-10 °C
- **Nominal voltage** 250 V
- **Minimum bending radius**
approx. 5x cable ø

Cable structure

- Stranded copper conductors to
DIN VDE 0295 cl. 2, BS 6360 cl. 2 and
IEC 60228 cl. 2
- PVC core insulation with polyamid coating
- Cores laid up in pairs
- Pairs copper screened
- Separating foil
- PVC inner sheath
- Plain copper braided screen, waterproofed
- PVC outer sheath, colour green

Properties

- **Colour code**
All sizes are colour coded
- **Approved by**
German ministry of defense

Application

For fixed installation on marine craft above and below deck.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59336	2 x 2 x 0,75	16,0	160,0	370,0	18
59337	4 x 2 x 0,75	18,1	277,0	490,0	18

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59338	11 x 2 x 0,75	26,2	658,0	1080,0	18

Dimensions and specifications may be changed without prior notice. (RW01)

Marine Power Cables LMGSGO halogen-free, Cu-screened



Technical data

- According to VG 95281 part 61 screened. No loss of insulation if directly exposed to fire. No special fire-proofed layer necessary
- **Conductor operating temperature** max. +85 °C
- **Nominal voltage** 500 V
- **Minimum bending radius** approx. 5x cable ø

Cable structure

- Stranded copper conductor
- Heat resistant EPR-insulation 3GI3, to DIN VDE 0207 part 20
- Core stranded in layers with optimal lay-length
- Halogen-free inner filling sheath
- Copper braided screening
- Polyester foil taping
- Chloroprene based outer sheath
- Sheath colour black

Properties

- Halogen-free and flame retardant
- **Colour code**
2 cores: brown/blue
3 cores: brown/schwarz/grey
4 cores: blue/brown/black/grey
5 cores: blue/brown/black/grey/black
7-33 cores: all cores black, number coded, core 1 placed centrally.
- **Approved by**
BWB (Bundesamt für Wehrtechnik und Beschaffung), i.e. German Federal Office for Defence and Procurement

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For fixed installation on marine craft above and below deck.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59360	2 x 1,5	7,0	89,0	110,0	16
59361	3 x 1,5	7,2	105,0	140,0	16
59362	4 x 1,5	7,8	131,0	170,0	16
59363	5 x 1,5	8,3	146,0	180,0	16
59364	7 x 1,5	9,3	180,0	230,0	16
59365	10 x 1,5	10,8	244,0	310,0	16
59366	12 x 1,5	12,0	276,0	350,0	16
59367	14 x 1,5	12,7	310,0	400,0	16
59368	16 x 1,5	13,2	342,0	450,0	16
59369	19 x 1,5	13,9	401,0	510,0	16
59370	24 x 1,5	15,5	494,0	620,0	16
59371	27 x 1,5	16,6	539,0	680,0	16
59372	33 x 1,5	17,5	635,0	810,0	16

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59373	2 x 2,5	7,7	114,0	160,0	14
59374	3 x 2,5	8,0	144,0	190,0	14
59375	4 x 2,5	8,7	171,0	230,0	14
59376	6 x 2,5	10,3	242,0	300,0	14
59377	7 x 2,5	10,3	266,0	320,0	14

Dimensions and specifications may be changed without prior notice. (RW01)

Ships Telephone Cables FMGCH 250 V (FMGCC*)

halogen-free according to DIN 89 159/99



Technical data

- As per DIN 89159/ edition 1998 and IEC 60092-375
- **Temperature range**
max. +85 °C conductor temperature
- **Nominal voltage** 250 V
- **Insulation resistance**
1400 MΩm x km
- **Minimum bending radius**
approx. 5x cable ø

Cable structure

- Stranded, bare copper conductors to DIN VDE 0295 cl. 2, BS 6360 cl. 2 and IEC 60228 cl. 2
- HEPR core insulation (Hard grade EPR)
- Cores per pair, printed with numbers, starting in center with number 1
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Separator-foil
- Bare copper braided screen
- Separator-foil
- Outer sheath, Polyolefin basis-compound
- Sheath colour green

Properties

- Flame retardant according to SOLAS definition (according to IEC 60332-3 category A)
- **Approved by**
Association of German Electrical Engineers
Germanischer Lloyd, Lloyds Register of Shipping, American Bureau of Shipping, Det Norske Veritas, Bureau Veritas, Russian Maritime Register of Shipping and Registro Italiano Navale are in preparation

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For measurement, control, regulation, control and alarm systems; radio, positioning and messaging systems. For fixed installation on ships in rooms and on open decks.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59138	1 x 2 x 0,75	8,5	62,0	90,0	18
59139	2 x 2 x 0,75	9,0	87,0	130,0	18
59140	4 x 2 x 0,75	13,0	153,0	230,0	18
59141	7 x 2 x 0,75	15,5	230,0	340,0	18

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59142	10 x 2 x 0,75	18,5	319,0	470,0	18
59143	14 x 2 x 0,75	21,0	445,0	610,0	18
59144	19 x 2 x 0,75	24,0	525,0	770,0	18
59145	24 x 2 x 0,75	27,0	663,0	950,0	18

Dimensions and specifications may be changed without prior notice. (RW01)

Marine Telecommunication Cables FMGSGO

halogen-free, Cu-screened



Technical data

- According to VG 95218 part 62 with screen and sustaining natural isolation in the case of fire without a flame retardant barrier
- **Conductor operating temperature**
max. +85 °C
- **Nominal voltage** 250 V
- **Minimum bending radius**
approx. 5x cable ø

Cable structure

- Bare copper conductor, stranded
- Heat resistant EPR-insulation 3GI3, to DIN VDE 0207 part 20
- To four wires twisted
- Filling compound covering all cores, halogen-free
- Screening of copper braid
- Sheet of polyester
- Outer sheath of elastomer compound to olefin - based copolymer
- Sheath colour black

Properties

- Halogen-free and flame retardant
- **Colour code**
All sizes and dimensions are colour coded
- **Approved by**
BWB (Bundesamt für Wehrtechnik und Beschaffung), i.e. German Federal Office for Defence and Procurement

Application

For fixed installation on Navy ships in locations and on open decks.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59380	2 x 2 x 0,75	6,7	89,0	110,0	18
59381	4 x 2 x 0,75	9,6	142,0	190,0	18
59382	6 x 2 x 0,75	10,8	189,0	260,0	18
59383	8 x 2 x 0,75	11,9	225,0	310,0	18

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59384	10 x 2 x 0,75	13,7	272,0	380,0	18
59385	14 x 2 x 0,75	14,9	338,0	465,0	18
59386	16 x 2 x 0,75	16,1	373,0	520,0	18

Dimensions and specifications may be changed without prior notice. (RW01)

Marine Telecommunication Cables FMSGGO

250 V with a single screen, higher cross-talk attenuation, halogen-free



Technical data

- According to VG 95218 part 63
- **Conductor operating temperature**
max. +85 °C
- **Min. installation temperature**
-10 °C
- **Nominal voltage** 250 V
- **Minimum bending radius**
approx. 3-5x cable ø

Cable structure

- Bare copper conductor, stranded
- Cross-linked polyolefin-insulation
- Cores laid up in pairs
- Separation foil
- Each pair plain copper wire screened
- Each pair with separation foil
- Pairs laid up concentrically
- Separation foil
- Overall foil wrap
- Plain, copper wire, braided screen
- Separation foil
- Elastomere based outer sheath
- Sheath colour black

Properties

- Oil resistant and flame retardant
- **Colour code for cores**
Pair/counting pair: black/blue
Pair/counting direction pair: black/brown
Subsequent pairs: black/grey
- **Approved by**
BWB (Bundesamt für Wehrtechnik und Beschaffung), i.e. German Federal Office for Defence and Procurement

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For fixed installation on marine craft above and below deck.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59150	2 x 2 x 0,75	11,1	149,0	220,0	18
59151	4 x 2 x 0,75	12,9	277,0	340,0	18
59152	7 x 2 x 0,75	14,9	489,0	500,0	18
59153	11 x 2 x 0,75	19,6	658,0	780,0	18

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59154	14 x 2 x 0,75	20,8	731,0	950,0	18
59155	19 x 2 x 0,75	23,4	951,0	1300,0	18
59156	24 x 2 x 0,75	25,3	1181,0	1600,0	18

Dimensions and specifications may be changed without prior notice. (RW01)

Light Marine Telekommunikation Cables

LFMGSSGO halogen-free, 2x Cu-screened



Technical data

- According to VG 95218 part 64, 2x copper screening.
No loss of insulation if directly exposed to open flame.
No special flame proof layer necessary
- **Conductor operating temperature**
max. +85 °C
- **Min. installation temperature**
-10 °C
- **Nominal voltage** 250 V
- **Minimum bending radius**
approx. 6x cable ø

Cable structure

- Stranded (7) tinned copper conductor to DIN VDE 0295 cl. 2, BS 6360 cl. 2 and IEC 60228 cl. 2
- Cross-linked polyolefin-insulation
- Core stranded to pairs with optimal lay-length
- Overall halogen-free inner filling
- Tinned copper, braided double screening
- Polyester foil taping
- Elastomere based outer sheath
- Sheath colour black

Properties

- Oil resistant and flame retardant
- **Colour code for cores**
Pair/counting pair: black/blue
Pair/counting direction pair: black/brown
Subsequent pairs: black/grey
- **Approved by**
BWB (Bundesamt für Wehrtechnik und Beschaffung), i.e. German Federal Office for Defence and Procurement

Application

For fixed installation on marine craft above and below decks.

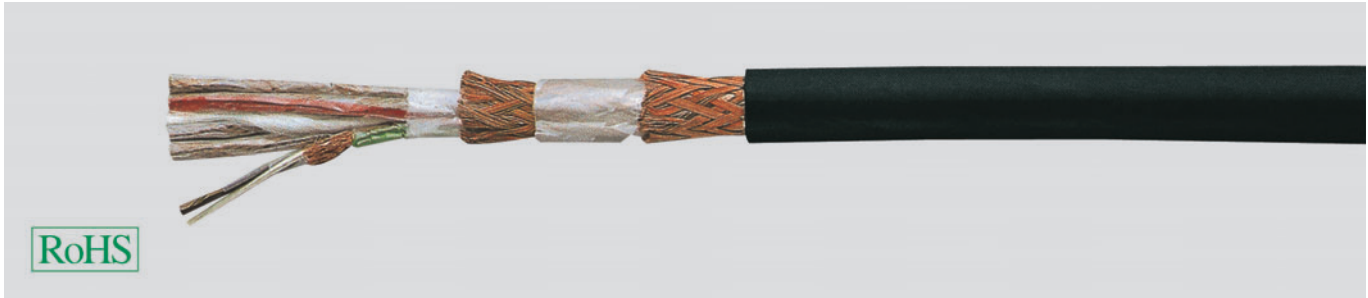
Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	
59390	2 x 2 x 0,4	8,0	60,0	95,0	-
59391	4 x 2 x 0,4	10,5	95,0	145,0	-
59392	7 x 2 x 0,4	12,5	146,0	220,0	-

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	
59393	12 x 2 x 0,4	15,5	235,0	320,0	-
59394	19 x 2 x 0,4	18,0	320,0	415,0	-
59395	27 x 2 x 0,4	20,0	414,0	540,0	-

Dimensions and specifications may be changed without prior notice. (RW01)

Light Marine Telecommunication Cables

LFMSGSSGO halogen-free, 2x Cu-screened



Technical data

- According to VG 95218 part 66, 2x copper screening with improved cross-talk protection. No loss of insulation if directly exposed to open flame. No special flame proof layer necessary
- **Conductor operating temperature** max. +85 °C
- **Min. installation temperature** -10 °C
- **Nominal voltage** 250 V
- **Minimum bending radius** approx. 6x cable ø

Cable structure

- Stranded (7) tinned copper conductor
- Cross-linked polyolefin-insulation
- Core stranded to pairs with optimal lay-length
- Tinned copper, braided screening over each pair
- Polyester foil separator
- Overall polyester taped inner covering
- Tinned copper, braided overall screen
- Halogen-free insulating layer
- Overall tinned copper, braided screen
- Polyester foil separator
- Elastomere based outer sheath
- Sheath colour black

Properties

- Oil resistant and flame retardant
- **Colour code**
All sizes and dimensions are colour coded
- **Approved by**
BWB (Bundesamt für Wehrtechnik und Beschaffung), i.e. German Federal Office for Defence and Procurement

Application

For fixed installation on marine craft above and below decks.

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	
59396	5 x 3 x 0,4	16,0	248,0	420,0	-

Part no.	No.pairs x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	
59397	12 x 3 x 0,4	23,0	500,0	740,0	-

Dimensions and specifications may be changed without prior notice. (RW01)

Ships Wiring Cables-SY single cores



Technical data

- Special PVC single cores according to DIN VDE 0250
- **Temperature range**
flexing +5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** 250 V
- **Test voltage** 1500 V
- **Minimum bending radius**
approx. 7,5x cable ø

Cable structure

- Fine wire stranded, plain copper conductors according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- PVC core insulation
- Tinned steel-wire braided screening
- PVC outer sheath (RAL 7001)
- Sheath colour black

Properties

- Flame resistant and self-extinguishing as per VDE 0472, part 804, test B and IEC 60332-1
- Oil resistant according DIN VDE 0250
- **Approved by**
Germanischer Lloyd

Application

A connection and a connection cable for measuring and control devices for communication systems , production lines , conveyor systems for fixed and variable connection in humid, wet and dry areas. These PVC single cores are also suitable for use in ship building.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59450	1 x 6	8,3	57,4	148,0	10
59451	1 x 10	10,3	95,8	221,0	8
59452	1 x 16	10,3	153,4	293,0	6
59453	1 x 25	13,7	239,5	447,0	4

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59454	1 x 35	15,2	335,0	565,0	2
59455	1 x 50	18,1	479,5	788,0	1
59456	1 x 70	21,1	671,0	1061,0	2/0
59457	1 x 95	22,8	910,0	1355,0	3/0

Dimensions and specifications may be changed without prior notice. (RW01)

Ships Wiring Cables-SY stranded type



Technical data

- Special PVC cables
- **Temperature range**
flexing +5 °C to +70 °C
fixed installation -40 °C to +70 °C
- **Nominal voltage** 250 V
- **Test voltage** 3000 V
- **Minimum bending radius**
approx. 7,5x cable ø

Cable structure

- Fine stranded, plain copper conductors according to DIN VDE 0295 cl. 5, BS 6360 cl. 5 and IEC 60228 cl. 5
- PVC-based core insulation Y12 according to DIN VDE 0207
- Cores colour coded to DIN VDE 0293 or black cores with continuous white numbering
- Core stranded in layers with optimal lay-length
- PVC inner sheath
- Galvanized steel-wire braided overall screening
- Outer sheath according to DIN VDE 0207 part 5
- Sheath colour grey (RAL 7001)

Properties

- Extensively oil resistant.
Chemical Resistance - see table Technical Informations
- Flame resistant and self-extinguishing as per VDE 0472, part 804, test B and IEC 60332-1
- **Approved by**
Germanischer Lloyd

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Ideally suited for fixed installation but also for the variable use of manufacturing lines, machine tools, conveyor systems and robotic assembly lines. A line that can also be used in shipbuilding. The galvanized steel braid protects against mechanical stress and simultaneously effective against electrical interference.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59460	2 x 1,5	9,7	28,7	146,0	16
59461	3 x 1,5	10,1	43,1	166,0	16
59462	4 x 1,5	10,8	57,5	198,0	16
59463	5 x 1,5	11,6	71,9	230,0	16
59464	7 x 1,5	13,3	100,6	299,0	16
59465	3 x 2,5	11,6	72,1	231,0	14

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59466	4 x 2,5	13,3	95,8	298,0	14
59467	5 x 2,5	14,3	120,0	355,0	14
59468	4 x 4	16,2	153,5	358,0	12
59469	5 x 4	17,5	193,0	535,0	12
59470	4 x 6	18,4	230,3	595,0	10
59471	5 x 6	19,7	288,0	714,0	10

Dimensions and specifications may be changed without prior notice. (RW01)

Ships Power Cables MPRX 0,6/1kV

according to IEC 60092-353, halogen-free



Technical data

- As per IEC 60092-353
- **Temperature range**
max. +85 °C conductor temperature
- **Min. installation temperature**
-10 °C
- **Nominal voltage**
U₀/U 0,6/1 kV
- **Minimum bending radius**
approx. 4x cable ø

Cable structure

- Stranded, bare copper conductors to DIN VDE 0295 cl. 2, BS 6360 cl. 2 and IEC 60228 cl. 2
- Core insulation of cross-linked polyethylene
- Cores stranded in layers with optimal lay-length
- Outer sheath, Polyolefin basis-compound
- Jacket colour black

Properties

- **Colour code**
1 core: black
2 cores: brown/blue
3 cores: brown/black/grey
4 cores: blue/brown/black/grey
5 to 24 core cable: all cores black coloured, printed with numbers, starting in center with number 1
- **Approved by**
Germanischer Lloyd, Lloyds Register of Shipping, American Bureau of Shipping, Det Norske Veritas, Bureau Veritas, Russian Maritime Register of Shipping and Registro Italiano Navale
- **Tests**
Flame-test to VDE 0472 part 804, test method C, IEC 60332-3 cat. A and IEEE 45-18.13
Smoke density to IEC 61034 Halogen-free to 60754-1
Corrosiveness of combustion gases to IEC 60754-2
- Flame retardant according to SOLAS definition (according to IEC 60332-3 category A and IEEE 45-18.13)

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For fixed installation on ships and offshore-units in all locations below the upper metallic deck. Particularly suitable for installation on passenger ships.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59654	1 x 4	27,5	38,0	70,0	12
59655	1 x 6	7,0	58,0	95,0	10
59656	1 x 10	8,0	96,0	140,0	8
59657	1 x 16	9,0	154,0	200,0	6
59658	1 x 25	10,0	240,0	320,0	4
59659	1 x 35	12,5	336,0	420,0	2
59660	1 x 50	14,5	480,0	560,0	1
59661	1 x 70	18,0	672,0	780,0	2/0
59662	1 x 95	8,0	912,0	1030,0	3/0
59663	1 x 120	9,0	1152,0	1290,0	4/0
59664	1 x 150	10,0	1440,0	1590,0	300 kcmil
59665	1 x 185	11,0	1776,0	1960,0	350 kcmil
59666	1 x 240	13,0	2304,0	2560,0	500 kcmil
59667	1 x 300	15,5	2880,0	3200,0	600 kcmil
59668	2 x 1,5	19,0	29,0	80,0	16
59669	2 x 2,5	20,5	48,0	105,0	14
59670	2 x 4	24,0	77,0	145,0	12
59671	2 x 6	26,5	115,0	190,0	10
59672	2 x 10	30,5	192,0	290,0	8
59673	2 x 16	33,5	307,0	430,0	6
59674	2 x 25	8,5	480,0	680,0	4
59675	3 x 1,5	10,0	43,0	100,0	16
59676	3 x 2,5	11,0	72,0	140,0	14
59677	3 x 4	12,0	115,0	190,0	12
59678	3 x 6	14,5	173,0	260,0	10
59679	3 x 10	17,0	288,0	410,0	8
59680	3 x 16	21,0	461,0	600,0	6

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59681	3 x 25	23,0	720,0	970,0	4
59682	3 x 35	27,0	1008,0	1290,0	2
59683	3 x 50	31,0	1440,0	1720,0	1
59684	3 x 70	35,5	2016,0	2450,0	2/0
59685	3 x 95	9,5	2736,0	3305,0	3/0
59686	3 x 120	10,5	3456,0	4140,0	4/0
59687	4 x 1,5	10,5	58,0	130,0	16
59688	4 x 2,5	13,5	96,0	180,0	14
59689	4 x 4	14,0	154,0	245,0	12
59690	4 x 6	14,5	230,0	345,0	10
59691	4 x 10	16,5	384,0	535,0	8
59692	4 x 16	16,5	614,0	795,0	6
59693	4 x 25	19,5	960,0	1300,0	4
59694	4 x 35	23,9	1344,0	1725,0	2
59695	4 x 50	27,8	1920,0	2310,0	1
59696	4 x 70	32,9	2688,0	3275,0	2/0
59697	4 x 95	36,1	3648,0	4445,0	3/0
59698	5 x 1,5	10,1	72,0	165,0	16
59699	5 x 2,5	11,2	120,0	225,0	14
59700	7 x 1,5	11,0	101,0	205,0	16
59701	10 x 1,5	14,1	144,0	290,0	16
59702	12 x 1,5	14,7	173,0	350,0	16
59703	14 x 1,5	15,5	202,0	375,0	16
59704	16 x 1,5	16,3	230,0	440,0	16
59705	19 x 1,5	17,4	274,0	500,0	16
59706	24 x 1,5	20,5	346,0	630,0	16

Dimensions and specifications may be changed without prior notice. (RW01)

Ships Power Cables MPRXCX 0,6/1kV

according to IEC 60092-353, halogen-free



Technical data

- As per IEC 60092-353
- **Temperature range**
max. +85 °C conductor temperature
- **Min. installation temperature**
-10 °C
- **Nominal voltage**
U₀/U 0,6/1 kV
- **Minimum bending radius**
approx. 4x cable ø
- **Tests**
Flame-test to VDE 0472 part 804, test method C, IEC 60332-3 cat. A and IEEE 45-18.13
Smoke density to IEC 61034
Halogen-free to 60754-1
Corrosiveness of combustion gases to IEC 60754-2

Cable structure

- Stranded, bare copper conductors to DIN VDE 0295 cl. 2, BS 6360 cl. 2 and IEC 60228 cl. 2
- Core insulation of cross-linked polyethylene
- Cores stranded in layers with optimal lay-length
- Cores wrapping with fail
- Copper screened braiding
- Outer sheath, Polyolefin basis-compound
- Jacket colour black

Properties

- **Colour code**
1 core: black
2 cores: brown/blue
3 cores: brown/black/grey
4 cores: blue/brown/black/grey
5- to 24 core cable: all cores black coloured, printed with numbers, starting in center with number 1
- **Approved by**
Germanischer Lloyd, Lloyds Register of Shipping, American Bureau of Shipping, Det Norske Veritas, Bureau Veritas, Russian Maritime Register of Shipping and Registro Italiano Navale
- Flame retardant according to SOLAS definition (according to IEC 60332-3 category A and IEEE 45-18.13)

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- 3-core cables with green-yellow marked core and/or as MPRXCX 331 (insulation integrity to IEC 60331) also available.

Application

For fixed installation on ships and offshore-units in all locations below the upper metallic deck. Particularly suitable for installation on passenger ships. The good screening qualities of the copper braid also reduce radio interferences and electrical influences to electronic installations.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.	Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
59707	1 x 4	7,3	81,0	105,0	12	59734	3 x 25	21,7	924,0	950,0	4
59708	1 x 6	7,8	104,0	130,0	10	59735	3 x 35	23,1	1233,0	1470,0	2
59709	1 x 10	8,9	149,0	180,0	8	59736	3 x 50	26,5	1703,0	1870,0	1
59710	1 x 16	9,8	214,0	250,0	6	59737	3 x 70	29,1	2413,0	2650,0	2/0
59711	1 x 25	11,7	311,0	380,0	4	59738	3 x 95	32,9	3192,0	3500,0	3/0
59712	1 x 35	12,7	416,0	480,0	2	59739	3 x 120	36,7	3975,0	4300,0	4/0
59713	1 x 50	14,8	572,0	660,0	1	59740	4 x 1,5	10,6	147,0	200,0	16
59714	1 x 70	16,9	779,0	900,0	2/0	59741	4 x 2,5	11,9	190,0	240,0	14
59715	1 x 95	18,7	1034,0	1170,0	3/0	59742	4 x 4	13,0	284,0	350,0	12
59716	1 x 120	20,6	1316,0	1410,0	4/0	59743	4 x 6	14,6	371,0	450,0	10
59717	1 x 150	22,7	1615,0	1750,0	300 kcmil	59744	4 x 10	17,3	545,0	670,0	8
59718	1 x 185	24,9	1968,0	2160,0	350 kcmil	59745	4 x 16	19,8	796,0	950,0	6
59719	1 x 240	27,2	2506,0	2770,0	500 kcmil	59746	4 x 25	23,9	1170,0	1470,0	4
59720	1 x 300	30,4	3345,0	3440,0	600 kcmil	59747	4 x 35	25,7	1578,0	1930,0	2
59721	2 x 1,5	3,9	105,0	130,0	16	59748	4 x 50	29,6	2278,0	2500,0	1
59722	2 x 2,5	10,2	132,0	160,0	14	59749	4 x 70	33,7	3090,0	3550,0	2/0
59723	2 x 4	11,4	170,0	205,0	12	59750	4 x 95	38,3	4110,0	4600,0	3/0
59724	2 x 6	12,6	217,0	290,0	10	59751	5 x 1,5	11,7	171,0	225,0	16
59725	2 x 10	14,8	400,0	307,0	8	59752	5 x 2,5	12,8	220,0	350,0	14
59726	2 x 16	16,9	471,0	560,0	6	59753	7 x 1,5	12,5	209,0	310,0	16
59727	2 x 25	20,4	670,0	840,0	4	59754	10 x 1,5	16,0	318,0	400,0	16
59728	3 x 1,5	9,9	125,0	160,0	16	59755	12 x 1,5	16,6	353,0	440,0	16
59729	3 x 2,5	10,8	161,0	200,0	14	59756	14 x 1,5	17,4	394,0	500,0	16
59730	3 x 4	12,0	215,0	250,0	12	59757	16 x 1,5	18,2	432,0	550,0	16
59731	3 x 6	13,2	282,0	360,0	10	59758	19 x 1,5	19,3	486,0	620,0	16
59732	3 x 10	15,7	417,0	520,0	8	59759	24 x 1,5	22,4	601,0	770,0	16
59733	3 x 16	18,0	636,0	750,0	6						

Dimensions and specifications may be changed without prior notice. (RW01)



Photo: fotolia.com

Lloyd's Register

W

SHIPFLEX 512 cable for drag chain, halogen-free, EMC preferred type, meter marking



new



Technical data

- Special screened drag chain cable
- UL-Style 20234
- **Temperature range**
flexing -40 °C to +80 °C
fixed -40 °C to +80 °C
- **Installation temperature**
minimum -25 °C
- **Nominal voltage**
UL 1000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius**
for permanent bending
7,5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6, BS 6360 cl. 6, IEC 60228 cl.6
- Special core insulation
- Black cores with continuous white numbering
- Green-yellow earth core in the outer layer (3 cores and above)
- Cores stranded in layers with optimal selected lay-length
- Braided screening of tinned copper wires, coverage approx. 85 %, optional aluminium foil under the braid
- **Full polyurethane** outer sheath to UL std. 1581 Tab. 50227
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Halogen free to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- Oil resistant to IEC 60092-350, appendix F
- Behaviour at low temperature at -40 °C to IEC 60092-350, appendix E
- Weather, ozon and UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

HELUKABEL® SHIPFLEX 512 is a new developed and successfully tested screened special drag chain cable which meets the requirements of the strict standards for application in offshore-areas. For this two - line standard there is a **Lloyd's Register approval**. The outer sheath insulation of non-adhesive Polyurethan allows the application in extremely oily and rough environmental conditions. For applications which go beyond standard solutions we recommend that you fill out our especially developed questionnaire for drag chains. Before installation in cable drag chains please read the installation instructions.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
19864	2 x 0,5	20	6,3	35,0	50,0
19865	3 G 0,5	20	6,5	42,0	60,0
19866	4 G 0,5	20	7,0	47,0	64,0
19867	5 G 0,5	20	7,5	56,0	79,0
19868	7 G 0,5	20	8,5	69,0	101,0
19869	12 G 0,5	20	10,0	108,0	164,0
19870	18 G 0,5	20	11,5	145,0	227,0
19871	25 G 0,5	20	13,5	240,0	331,0
19872	36 G 0,5	20	15,2	318,0	457,0
19873	2 x 0,75	19	7,0	40,0	65,0
19874	3 G 0,75	19	7,2	52,0	71,0
19875	4 G 0,75	19	7,8	60,0	82,0
19876	5 G 0,75	19	8,5	71,0	97,0
19877	7 G 0,75	19	9,6	91,0	141,0
19878	12 G 0,75	19	11,5	142,0	217,0
19879	18 G 0,75	19	13,0	212,0	304,0
19880	25 G 0,75	19	15,8	281,0	420,0
19881	36 G 0,75	19	17,5	350,0	535,0
19882	2 x 1	18	7,4	50,0	69,0
19883	3 G 1	18	7,7	60,0	84,0
19884	4 G 1	18	8,5	71,0	104,0
19885	5 G 1	18	9,0	88,0	130,0
19886	7 G 1	18	10,4	111,0	160,0
19887	12 G 1	18	12,4	184,0	270,0
19888	18 G 1	18	14,3	260,0	391,0
19889	25 G 1	18	17,0	349,0	547,0
19890	36 G 1	18	19,0	510,0	790,0
19891	2 x 1,5	16	8,0	63,0	90,0
19892	3 G 1,5	16	8,3	80,0	109,0
19893	4 G 1,5	16	9,2	97,0	132,0
19894	5 G 1,5	16	10,0	119,0	169,0
19895	7 G 1,5	16	11,6	147,0	219,0

Part no.	No.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
19896	12 G 1,5	16	13,8	267,0	363,0
19897	18 G 1,5	16	16,2	374,0	496,0
19898	25 G 1,5	16	19,0	526,0	724,0
19899	36 G 1,5	16	21,5	702,0	1190,0
19900	2 x 2,5	14	9,5	96,0	136,0
19901	3 G 2,5	14	10,3	144,0	179,0
19902	4 G 2,5	14	11,3	149,0	201,0
19903	5 G 2,5	14	12,4	181,0	232,0
19904	7 G 2,5	14	14,4	255,0	357,0
19905	12 G 2,5	14	17,5	441,0	586,0
19906	18 G 2,5	14	20,3	604,0	1064,0
19907	25 G 2,5	14	24,2	793,0	1411,0
19908	36 G 2,5	14	27,2	1034,0	1623,0
19909	3 G 4	12	11,5	174,0	257,0
19910	4 G 4	12	12,4	230,0	324,0
19911	5 G 4	12	13,5	274,0	401,0
19912	6 G 4	12	15,2	295,0	456,0
19913	7 G 4	12	16,3	316,0	511,0
19914	3 G 6	10	13,5	240,0	343,0
19915	4 G 6	10	15,2	305,0	427,0
19916	5 G 6	10	16,5	442,0	562,0
19917	6 G 6	10	17,8	471,0	628,0
19918	7 G 6	10	19,5	505,0	692,0
19919	3 G 10	8	17,1	367,0	731,0
19920	4 G 10	8	19,0	549,0	992,0
19921	5 G 10	8	20,7	607,0	1014,0
19922	6 G 10	8	22,0	711,0	1241,0
19923	7 G 10	8	24,0	820,0	1491,0
19924	3 G 16	6	19,8	692,0	1004,0
19925	4 G 16	6	21,8	840,0	1296,0
19926	5 G 16	6	24,0	1050,0	1658,0

Dimensions and specifications may be changed without prior notice. (RC02)

SHIPFLEX 330 cable for drag chain, halogen-free, EMC preferred type, meter marking



new

Technical data

- Special screened drag chain cable
- UL-Style 20233
- **Temperature range**
flexing -40 °C to +80 °C
fixed -40 °C to +80 °C
- **Installation temperature**
minimum -25 °C
- **Nominal voltage**
VDE U₀/U 300/500 V
UL 300 V
- **Insulation resistance**
min. 100 MΩm x km
- **Minimum bending radius**
for permanent bending 7,5x cable ø
- **Coupling resistance**
max. 250 Ωm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper conductor, extra fine wire to DIN VDE 0295 cl. 6, BS 6360 cl. 6 and IEC 60228 cl. 6
- Special core insulation
- Colored cores to DIN 47100
- Cores stranded in layers with optimal lay-length
- Core wrapping between the layers of stranding
- Braided screening of tinned copper wires, coverage approx. 85 % optional aluminium foil under the screen
- **Full polyurethane** outer sheath to UL std. 1581 Tab. 50227
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Halogen free to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- Oil resistant to IEC 60092-350, appendix F
- Behaviour at low temperature at -40 ° to IEC 60092-350, appendix E
- Weather, ozon and UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

HELUKABEL® SHIPFLEX 330 is a new developed and successfully tested special drag chain cable with overall screening which meets the requirements of the strict standards for application in offshore-areas. For this two-line standard there is a **Lloyd's Register approval**. The outer sheath insulation of non-adhesive Polyurethan allows the application in extremely oily and rough environmental conditions. For applications which go beyond standard solutions we recommend that you fill out our especially developed questionnaire for drag chains. Before installation in cable drag chains please read the installation instructions.

EMC=Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
19846	2 x 0,25	24	5,0	14,9	38,0
19847	3 x 0,25	24	5,2	18,8	44,0
19848	4 x 0,25	24	5,5	21,3	51,0
19849	5 x 0,25	24	5,8	31,0	68,0
19850	7 x 0,25	24	6,7	39,6	82,0
19851	12 x 0,25	24	8,0	59,1	124,0
19852	18 x 0,25	24	9,0	78,4	150,0
19853	25 x 0,25	24	10,8	101,0	204,0
19854	36 x 0,25	24	11,5	126,4	230,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
19855	2 x 0,34	22	5,2	18,1	45,0
19856	3 x 0,34	22	5,5	28,7	60,0
19857	4 x 0,34	22	5,8	35,7	76,0
19858	5 x 0,34	22	6,5	39,1	82,0
19859	7 x 0,34	22	7,2	52,7	110,0
19860	12 x 0,34	22	8,5	76,4	166,0
19861	18 x 0,34	22	10,0	99,7	216,0
19862	25 x 0,34	22	12,0	155,0	305,0
19863	36 x 0,34	22	13,0	188,0	340,0

Dimensions and specifications may be changed without prior notice. (RN05)

SHIPFLEX 340 cable for drag chain, halogen-free, EMC preferred type, meter marking



new



HELUKABEL SHIPFLEX 340

CE

RoHS

Technical data

- Special screened drag chain cable, stranded in pairs
- UL-Style 20233
- **Temperature range**
flexing -40 °C to +80 °C
fixed -40 °C to +80 °C
- **Installation temperature**
minimum -25 °C
- **Nominal voltage**
VDE U₀/U 300/500 V
UL 300 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius** for permanent bending
7,5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper conductor, extra fine wire to DIN VDE 0295 cl. 6, BS 6360 cl. 6, IEC 60228 cl. 6
- Special coreinsulation
- Colour coded to DIN 47100
- Cores stranded in pairs, pairs stranded torsion-free in layers with optimal lay-length
- Core wrapping between the layers of stranding
- Braided screening of tinned copper wires, coverage approx. 85 %
optional aluminium foil under the screen
- **Full polyurethane** outer sheath to UL std. 1581 Tab. 50227
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Halogen free to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- Oil resistant to IEC 60092-350, appendix F
- Behaviour at low temperature at -40 °C to IEC 60092-350, appendix E
- Weather, ozon and UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

HELUKABEL® SHIPFLEX 340 is a new developed and successfully tested special drag chain cable with overall screening which meets the requirements of the strict standards for application in offshore-areas.

For this two - line standard there is a **Lloyds Register approval**.

The outer sheath insulation of non-adhesive Polyurethan allows the application in extremely oily and rough environmental conditions.

For applications which go beyond standard solutions we recommend that you fill out our especially developed questionnaire for drag chains. Before installation in cable drag chains please read the installation instructions.

EMC=Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
19927	2 x 2 x 0,25	24	6,8	32,0	60,0
19928	3 x 2 x 0,25	24	7,1	38,0	70,0
19929	4 x 2 x 0,25	24	7,5	43,0	82,0
19930	5 x 2 x 0,25	24	8,0	51,0	99,0
19931	6 x 2 x 0,25	24	8,5	72,0	126,0
19932	7 x 2 x 0,25	24	9,2	75,0	135,0
19933	12 x 2 x 0,25	24	11,4	117,0	189,0
19934	18 x 2 x 0,25	24	13,5	148,0	248,0
19935	25 x 2 x 0,25	24	15,0	235,0	343,0
19936	2 x 2 x 0,34	22	7,4	41,0	81,0
19937	3 x 2 x 0,34	22	7,7	52,0	100,0
19938	4 x 2 x 0,34	22	8,4	59,0	119,0
19939	5 x 2 x 0,34	22	9,1	67,0	135,0
19940	6 x 2 x 0,34	22	10,0	86,0	163,0
19941	7 x 2 x 0,34	22	10,5	94,0	170,0
19942	12 x 2 x 0,34	22	12,2	122,0	220,0
19943	18 x 2 x 0,34	22	14,4	197,0	277,0
19944	25 x 2 x 0,34	22	16,5	238,0	400,0
19945	2 x 2 x 0,5	20	8,0	53,0	100,0
19946	3 x 2 x 0,5	20	8,4	73,0	131,0
19947	4 x 2 x 0,5	20	9,0	77,0	149,0

Part no.	No.pairs x no.cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
19948	5 x 2 x 0,5	20	9,7	86,0	160,0
19949	6 x 2 x 0,5	20	10,6	103,0	170,0
19950	7 x 2 x 0,5	20	11,5	117,0	191,0
19951	12 x 2 x 0,5	20	13,5	199,0	361,0
19952	18 x 2 x 0,5	20	15,7	265,0	427,0
19953	25 x 2 x 0,5	20	18,2	344,0	740,0
19954	2 x 2 x 0,75	19	9,0	61,0	102,0
19955	3 x 2 x 0,75	19	9,5	87,0	144,0
19956	4 x 2 x 0,75	19	10,3	95,0	160,0
19957	5 x 2 x 0,75	19	11,2	115,0	193,0
19958	6 x 2 x 0,75	19	12,1	137,0	218,0
19959	7 x 2 x 0,75	19	13,0	153,0	298,0
19960	12 x 2 x 0,75	19	16,0	261,0	406,0
19961	18 x 2 x 0,75	19	18,0	374,0	519,0
19962	2 x 2 x 1	18	10,0	73,0	120,0
19963	3 x 2 x 1	18	10,4	94,0	161,0
19964	4 x 2 x 1	18	11,8	118,0	184,0
19965	5 x 2 x 1	18	12,6	139,0	217,0
19966	6 x 2 x 1	18	13,6	188,0	295,0
19967	7 x 2 x 1	18	14,8	204,0	311,0
19968	12 x 2 x 1	18	18,0	324,0	602,0

Dimensions and specifications may be changed without prior notice. (RN05)

SHIPFLEX 109 cable for drag chain, halogen-free, EMC preferred type (-C-Type), meter marking



new

Technical data

- Special drag chain cable
- UL-Style 20234
- **Temperature range**
flexing -40 °C to +80 °C
fixed -40 °C to +80 °C
- **Installation temperature**
minimum -25 °C
- **Nominal voltage**
to VDE U₀/U 0,6/1 kV
UL 1000 V
- **Insulation resistance**
min. 100 MOhm x km
- **Minimum bending radius** for permanent bending
7,5x cable ø
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, ultra-fine wire acc. to DIN VDE 0295 cl. 6, BS 6360 cl. 6, IEC 60228 cl. 6
- Special core insulation
- Colour black or green-yellow
- **Full polyurethane** outer sheath to UL std. 1581 Tab. 50227
- Sheath colour orange (RAL 2003)
- **Screen Type**
screen off tinned Cu-braid, coverage approx. 85%
- with meter marking

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Halogen free to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- Oil resistant to IEC 60092-350, appendix F
- Behaviour at low temperature at -40 °C to IEC 60092-350, appendix E
- Weather, ozon and UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

HELUKABEL® SHIPFLEX 109 Single is a new developed and successfully tested non screened special drag chain cable which meets the requirements of the strict standards for application in offshore-areas. For this two - line standard there is a **Lloyds Register approval**. The outer sheath insulation of non-adhesive Polyurethane allows the application in extremely oily and rough environmental conditions. For applications which go beyond standard solutions we recommend that you fill out our especially developed questionnaire for drag chains. Before installation in cable drag chains please read the installation instructions.

CE – The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

SHIPFLEX 109 unscreened

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Core colour	Outer Ø mm	Cop. approx. weight kg / km	Weight approx. kg / km
21388	1 x 6	10	black	6,9	58,0	108,0
21374	1 G 6	10	Green-yellow	6,9	58,0	108,0
21389	1 x 10	8	black	8,3	96,0	170,0
21375	1 G 10	8	Green-yellow	8,3	96,0	170,0
21390	1 x 16	6	black	9,5	154,0	240,0
21376	1 G 16	6	Green-yellow	9,5	154,0	240,0
21391	1 x 25	4	black	11,3	240,0	370,0
21377	1 G 25	4	Green-yellow	11,3	240,0	370,0
21392	1 x 35	2	black	12,7	336,0	490,0
21378	1 G 35	2	Green-yellow	12,7	336,0	490,0
21393	1 x 50	1	black	15,0	480,0	665,0
21379	1 G 50	1	Green-yellow	15,0	480,0	665,0
21394	1 x 70	2/0	black	16,3	672,0	910,0
21380	1 G 70	2/0	Green-yellow	16,3	672,0	910,0
21395	1 x 95	3/0	black	18,8	912,0	1190,0
21381	1 G 95	3/0	Green-yellow	18,8	912,0	1190,0
21396	1 x 120	4/0	black	20,9	1152,0	1530,0
21382	1 G 120	4/0	Green-yellow	20,9	1152,0	1530,0
21397	1 x 150	300 kcmil	black	23,2	1440,0	1720,0
21383	1 G 150	300 kcmil	Green-yellow	23,2	1440,0	1720,0
21398	1 x 185	350 kcmil	black	25,7	1776,0	2280,0
21384	1 G 185	350 kcmil	Green-yellow	25,7	1776,0	2280,0
21399	1 x 240	500 kcmil	black	28,2	2304,0	2895,0
21404	1 G 240	500 kcmil	Green-yellow	28,2	2304,0	2895,0

SHIPFLEX 109 screened

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Core colour	Outer Ø mm	Cop. approx. weight kg / km	Weight approx. kg / km
19798	1 x 6	10	black	7,6	72,0	140,0
21330	1 G 6	10	Green-yellow	7,6	72,0	140,0
19799	1 x 10	8	black	9,1	130,0	225,0
21331	1 G 10	8	Green-yellow	9,1	130,0	225,0
19800	1 x 16	6	black	10,2	190,0	295,0
21332	1 G 16	6	Green-yellow	10,2	190,0	295,0
19801	1 x 25	4	black	12,1	260,0	415,0
21333	1 G 25	4	Green-yellow	12,1	260,0	415,0
19802	1 x 35	2	black	13,5	405,0	610,0
21334	1 G 35	2	Green-yellow	13,5	405,0	610,0
19803	1 x 50	1	black	15,9	560,0	817,0
21335	1 G 50	1	Green-yellow	15,9	560,0	817,0
19804	1 x 70	2/0	black	17,3	780,0	1065,0
21336	1 G 70	2/0	Green-yellow	17,3	780,0	1065,0
19805	1 x 95	3/0	black	19,5	1030,0	1340,0
21337	1 G 95	3/0	Green-yellow	19,5	1030,0	1340,0
19806	1 x 120	4/0	black	21,8	1285,0	1735,0
21338	1 G 120	4/0	Green-yellow	21,8	1285,0	1735,0
19807	1 x 150	300 kcmil	black	24,1	1430,0	1910,0
21339	1 G 150	300 kcmil	Green-yellow	24,1	1430,0	1910,0
19808	1 x 185	350 kcmil	black	26,5	1940,0	2610,0
21406	1 G 185	350 kcmil	Green-yellow	26,5	1940,0	2610,0
19809	1 x 240	500 kcmil	black	29,2	2530,0	3274,0
21410	1 G 240	500 kcmil	Green-yellow	29,2	2530,0	3274,0

Dimensions and specifications may be changed without prior notice. (RN07)

SHIPFLEX 109 cable for drag chain, halogen-free, EMC preferred type, meter marking



new



Technical data

- Special screened drag chain cable
- UL-Style 20234
- **Temperature range**
flexing -40 °C to +80 °C
fixed -40 °C to +80 °C
- **Installation temperature**
minimum -25 °C
- **Nominal voltage**
to VDE U₀/U 0,6/1 kV
UL 1000 V
- **Insulation resistance**
min. 200 MOhm x km
- **Minimum bending radius** for permanent bending
7,5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, ultra-fine wire acc. to DIN VDE 0295 cl. 6, BS 6360 cl. 6, IEC 60228 cl. 6
- Special core insulation
- Black cores imprinted with U1, V2, W3
- Green-yellow earth core depends on conductor cross-section may cut into thirds
- Cores stranded together with optimal lay-length
- Core wrapping between the layers of stranding
- Braided screening of tinned copper wires, coverage approx. 85%
- **Full polyurethane** outer sheath to UL std. 1581 Tab. 50227
- Sheath colour orange (RAL 2003)
- with meter marking

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Halogen free to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- Oil resistant to IEC 60092-350, appendix F
- Behaviour at low temperature at -40 °C to IEC 60092-350, appendix E
- Weather, ozon and UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

HELUKABEL® SHIPFLEX 109 is a new developed and successfully tested special drag chain cable with overall screening which meets the requirements of the strict standards for application in offshore-areas. For this two - line standard there is a **Lloyds Register approval**. The outer sheath insulation of non-adhesive Polyurethan allows the application in extremely oily and rough environmental conditions. For applications which go beyond standard solutions we recommend that you fill out our especially developed questionnaire for drag chains. Before installation in cable drag chains please read the installation instructions.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
19810	4 G 1	18	9,0	84,0	124,0
19811	4 G 1,5	16	10,5	105,0	175,0
19812	4 G 2,5	14	11,7	157,0	265,0
19813	4 G 4	12	13,4	231,0	390,0
19814	4 G 6	10	15,6	352,0	570,0
19815	4 G 10	8	19,2	527,0	804,0
19816	4 G 16	6	23,9	794,0	1450,0

Part no.	No. cores x cross-sec. mm ²	AWG-No.	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km
19817	4 G 25	4	27,6	1180,0	1660,0
19818	4 G 35	2	32,7	1600,0	2400,0
19819	4 G 50	1	37,0	2165,0	2600,0
19820	4 G 70	2/0	43,0	3196,0	4600,0
19969	3 G 95	3/0	41,0	3090,0	4480,0
19821	4 G 95	3/0	48,0	4606,0	5350,0

Dimensions and specifications may be changed without prior notice. (RN07)

SHIPFLEX 113 cable for drag chain, halogen-free, EMC preferred type, meter marking



new

Technical data

- Special screened drag chain cable
- UL-Style 20234
- **Temperature range**
flexing -40 °C to +80 °C
fixed -40 °C to +80 °C
- **Installation temperature**
minimum -25 °C
- **Nominal voltage**
to VDE U₀/U 0,6/1 kV
UL 1000 V
- **Insulation resistance**
min. 20 MOhm x km
- **Minimum bending radius** for permanent bending
7,5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6, BS 6360 cl. 6, IEC 60228 cl.6
- Special core insulation
- Black power supply cores with imprint U1, V2, W3
- Green-yellow earth core, depends of the diameter of the conductor
- Black control cores with white numbers 5,6
- Screening of the control cores in pairs wrapped with plastic aluminium foil, and tinned copper braided screening, approx. coverage 85%
- Control cores stranded in pairs and laid up in layers together with the power supply cores with optimal lay length and stabilising filler
- Core wrapping between the layers of stranding
- Braided screening of tinned copper wires, coverage approx. 85 %
- **Full polyurethane** outer sheat to UL std. 1581 Tab. 50227
- Sheath colour orange (RAL 2003)
- with meter marking

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Halogen free to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- Oil resistant to IEC 60092-350, appendix F
- Behaviour at low temperature at -40 °C to IEC 60092-350, appendix E
- Weather, ozon and UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

HELUKABEL® SHIPFLEX 113 is a new developed and successfully tested screened special drag chain cable which meets the requirements of the strict standards for application in offshore-areas. This kind of cable combines the feeding cores with the control cores. For this two-line standard there is a **Lloyds Register approval**.

The outer sheath insulation of non-adhesive Polyurethan allows the application in extremely oily and rough environmental conditions. For applications which go beyond standard solutions we recommend that you fill out our especially developed questionnaire for drag chains. Before installation in cable drag chains please read the installation instructions.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19822	(4 G 1,5 + (2 x 1,0))	11,5	138,0	254,0	-
19827	(4 G 1,5 + (2 x 1,5))	12,0	148,0	265,0	-
19823	(4 G 2,5 + (2 x 1,0))	13,0	176,0	328,0	-
19828	(4 G 2,5 + (2 x 1,5))	14,0	187,0	339,0	-
19824	(4 G 4 + (2 x 1,0))	14,5	258,0	460,0	-
19829	(4 G 4 + (2 x 1,5))	15,0	268,0	475,0	-
19825	(4 G 6 + (2 x 1,0))	17,0	348,0	596,0	-

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19830	(4 G 6 + (2 x 1,5))	17,0	358,0	607,0	-
19826	(4 G 10 + (2 x 1,0))	20,0	574,0	912,0	-
19831	(4 G 10 + (2 x 1,5))	20,5	584,0	924,0	-
19832	(4 G 16 + (2 x 1,5))	24,0	825,0	1205,0	-
19833	(4 G 25 + (2 x 1,5))	28,5	1283,0	1510,0	-
19834	(4 G 35 + (2 x 1,5))	32,0	1850,0	2005,0	-
19835	(4 G 50 + (2 x 1,5))	37,0	2540,0	2890,0	-

Dimensions and specifications may be changed without prior notice. (RN07)

SHIPFLEX 121 cable for drag chain, halogen-free, EMC preferred type, meter marking



new



Technical data

- Special screened drag chain cable
- UL-Style 20234
- **Temperature range**
flexing -40 °C to +80 °C
fixed -40 °C to +80 °C
- **Installation temperature**
minimum -25 °C
- **Nominal voltage**
to VDE U₀/U 0,6/1 kV
UL 1000 V
- **Insulation resistance**
min. 200 MOhm x km
- **Minimum bending radius** for permanent bending
7,5x cable ø
- **Coupling resistance**
max. 250 Ohm/km
- **Radiation resistance**
up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, ultra-fine wire conductors acc. to DIN VDE 0295 cl. 6, BS 6360 cl. 6, IEC 60228 cl.6
- Special core insulation
- Black power supply cores with imprint U1, V2, W3
- Green-yellow earth core, depends of the diameter of the conductor
- Black control cores with white numbers 5,6 and 7,8
- Screening of the control cores in pairs wrapped with plastic aluminium foil, and tinned copper braided screening, approx. coverage 85%
- Control cores stranded in pairs and laid up in layers together with the power supply cores with optimal lay length and stabilising filler
- Core wrapping between the layers of stranding
- Braided screening of tinned copper wires, coverage approx. 85 %
- **Full polyurethane** outer sheath to UL std. 1581 Tab. 50227
- Sheath colour orange (RAL 2003)
- with meter marking

Properties

- Flame retardant according to VDE 0482-332-1-2, DIN EN 60332-1-2/ IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Halogen free to VDE 0482 part 267/ DIN EN 50267-2-1/ IEC 60754-1 (conforms to DIN VDE 0472 part 815)
- Oil resistant to IEC 60092-350, appendix F
- Behaviour at low temperature at -40 °C to IEC 60092-350, appendix E
- Weather, ozon and UV-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

HELUKABEL® SHIPFLEX 121 is a new developed and successfully tested screened special drag chain cable which meets the requirements of the strict standards for application in offshore-areas. This kind of cable combines the feeding cores with the control cores. For this two - line standard there is a **Lloyds Register Approval**.

The outer sheath insulation of non-adhesive Polyurethan allows the application in extremely oily and rough environmental conditions. For applications which go beyond standard solutions we recommend that you fill out our especially developed questionnaire for drag chains. Before installation in cable drag chains please read the installation instructions.

EMC = Electromagnetic compatibility

To optimise the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EG.

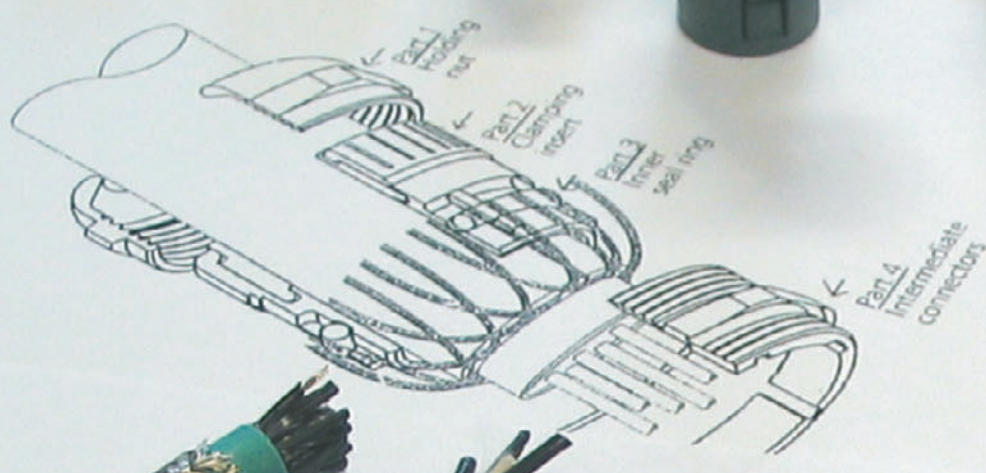
Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19836	(4 G 1 + 2 x (2 x 0,75))	12,5	148,0	254,0	-
19837	(4 G 1,5 + 2 x (2 x 0,75))	13,0	170,0	290,0	-
19838	(4 G 2,5 + 2 x (2 x 1,0))	15,0	229,0	336,0	-
19839	(4 G 4 + (2 x 1,5) + (2 x 1,0))	17,0	318,0	485,0	-
19840	(4 G 6 + (2 x 1,5) + (2 x 1,0))	18,5	445,0	615,0	-

Part no.	No. cores x cross-sec. mm ²	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG-No.
19841	(4 G 10 + (2 x 1,5) + (2 x 1,0))	22,0	610,0	915,0	-
19842	(4 G 16 + 2 x (2 x 1,5))	25,0	904,0	1226,0	-
19843	(4 G 25 + 2 x (2 x 1,5))	29,0	1323,0	1595,0	-
19844	(4 G 35 + 2 x (2 x 1,5))	33,0	1621,0	2196,0	-
19845	(4 G 50 + 2 x (2 x 1,5))	37,0	2585,0	2995,0	-

Dimensions and specifications may be changed without prior notice. (RN07)

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Cable Gland BSK-MS-E



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35mm² nach



Aufbau

1 - Cu-Litze blank, ferroschle...

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H05VV5-F 25G1,5 QMM

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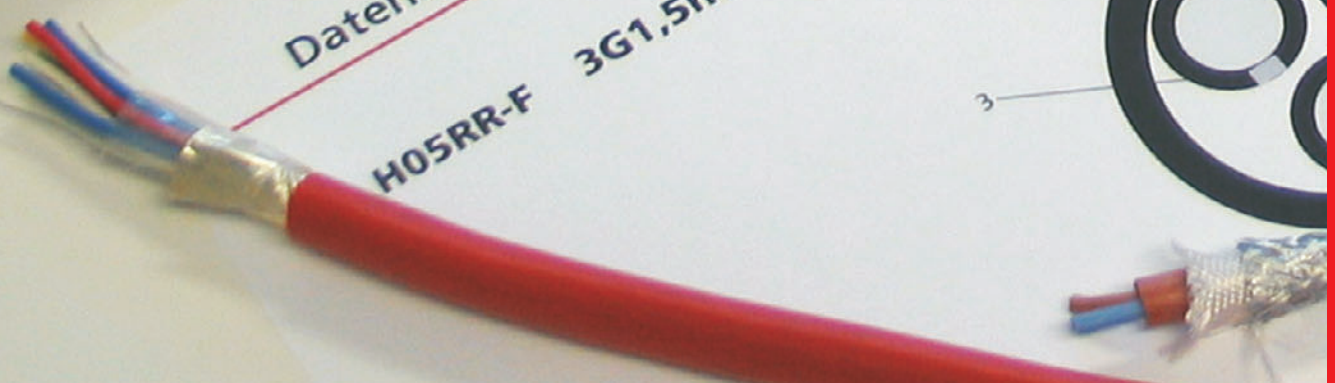
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HELUKABEL

Datenblatt

H05RR-F

3G1,5mm², nach DIN VDE 0282 Teil4 bzw. 1



Technical Information

Contents and Index

Subject	Page
X Technical Information	
AWG-Wires and AWG-stranded conductors, Conductor make-up, cross-section, resistance and weight	X 81 – X 82
Cable lengths (m) to KTG-Drums capacity of pool drums	X 110
Caloric load values of halogenated cables and insulated wires	X 76
Caloric load values of halogen-free and halogenated cables and insulated wires	X 77
Caloric load values of halogen-free Security Cables and insulated wires	X 73 – X 75 + X 78 – X 79
Caloric load values (heat of combustion)	X 72
Capacity of KTG-Pool drums	X 109
Characteristics of insulating and sheath materials	X 90 – X 91
Chemical Resistance Table	X 64 – X 65
Chemical Resistance of Fluorinated polymeric materials	X 66
Chemical Resistance of PUR (Polyurethane)	X 63
Chemical Resistance of Silicone	X 68
Code-designation for harmonized cables and flexible cords to DIN VDE 0292 and HD 361 S2/S3	X 9 – X 10
Code-designation-explanations for cables and insulated wire	X 14
Colour Abbreviations according to DIN VDE and IEC	X 60
Colour code according to DIN 47100 with/ without colour repetition from core no. 45. and above	X 49
Colour code according to DIN VDE 0293	X 47
Colour code according to DIN VDE 0813	X 57
Colour code according to DIN VDE 0815	X 58
Colour code according to DIN VDE 0816 and extended	X 59
Colour code according to E DIN VDE 0245 part 1	X 48
Colour code according to international standard	X 51 + X 52
Colour code for single wire vehicle cables	X 54
Colour code HELUKABEL®-JB	X 55
Colour code HELUKABEL®-OB	X 56
Comparison of harmonized cables with IEC, DIN VDE and HD	X 11
Conductor resistance (extracted from DIN VDE 0295, IEC 228 and HD 383)	X 16
Conductor-diameters according to DIN VDE 0295	X 15
Conversion factor for Medium Voltage Power Cables, 6 – 30 kV	X 46
Copper and Alu-Price Calculation	X 3 – X 4
Current carrying capacity and indications for calculation of Power Cables and Wires	X 19
Current carrying capacity for NYKY 0,6/1 kV	X 33
Current ratings Conversion factors for deviating ambient temperature	X 35
Current ratings Conversion factors for grouping of multicore cables or cables on troughs and trays	X 37
Current ratings Conversion factors for grouping of single core cables or cables on troughs and trays	X 36
Current ratings Conversion factors for grouping on the wall, on the floor, in insulation tubes or in conduit and under the ceiling	X 34
Current ratings (general) for flexible cables, for non-existing cable types in the previous tables	X 28
Current ratings for cables ≤0,6/1 kV, Special rubber-insulated single core cables, multicore rubber cables and trailing cables	X 27
Current ratings for cables and insulated wires up to 1000 V and heat resistant cables	X 26
Current ratings for HELUTHERM® 145	X 29
Current ratings for installation A1, A2, B1 and B2, Cables for fixed installation within buildings	X 22
Current ratings for installation conditions A1, A2, B1 and B2, Cables for fixed installation within buildings	X 24
Current ratings for installation conditions C, E, F and G, Cables for fixed installation within buildings	X 23
Current ratings for installation conditions C, E, F and G, Cables for fixed installation within buildings	X 25
Current ratings for NYY, NAYY, NYCY, NYCWY, NAYCWY 0,6/1 kV and N2XY, NA2XY, N2XCY, NA2XCY 0,6/1 kV	X 31 – X 32
Current ratings for silicone cables and wires	X 30
Current ratings for UL-CSA cables	X 84
Definitions: Classes of Stress (Duty) in Flexible Cables and Insulated Wires	X 92
Designation code for harmonized cables according to DIN VDE 0281/DIN VDE0282/DIN VDE 0292	X 8
Designation code for power cables according to DIN VDE0271/0276	X 12
Designation code for telephone cables, jumper wires and stranded hook-up wires	X 13
Electrical characteristics of XLPE-insulated Medium Voltage Power Cables, 6 – 30 kV	X 39 – X 43
European Directives WEEE, RoHS and ElektroG	X 113
Explanatory notes on CE marking	X 111 – X 112
Fluorinated polymeric materials: PTFE, FEP, PFA, ETFE	X 67
Formulas of electrotechnic and electronic, Formulas of power engineering	X 107 – X 108
Glossary of Terms: Cables and Wires	X 98 – X 105
Halogen-free Security Cables and Wires	X 69 – X 71
Harmonized Identification	X 7
Heat-resistance classes as per VDE 0530 part1	X 72
Identification of insulated wires by colours according to DIN 40705 and CEI/IEC 60446	X 61
Index British Standard	X 87 – X 88
Information and Installation Instructions for UL and CSA cables	X 80
Installation Methods and Operating Conditions – Power cables and insulated wires for fixed installation	X 20
International abbreviations	X 89
International Certification Marks and Testing Institute	X 106
Laying Conditions for Power Cables	X 21
List of UL-Styles (Multicore cables)	X 86
List of UL-Styles (Single core cables)	X 85
Nominal voltage and Operating voltage	X 18
Pair-Colour code according to DIN 47100 with colour repetition from pair no. 45 and above	X 50
Pair-Colour code according to international standard	X 51 + X 53
Permissible minimum bending radius according to DIN VDE specifications	X 62
Power ratings for XLPE-insulated Medium Voltage Power Cables 6/10 kV, 12/20 kV, 18/30 kV	X 38
Rating conversion factors for installation of Medium Voltage Cables, 6 – 30 kV	X 44 – X 45
Reference to DIN VDE Standards	X 5 – X 6
Resistance of substances against solvents, oils and fats	X 68
Safety Requirements in the Use of Cables and Insulated Wires	X 93 – X 97
Strand make-up according to DIN VDE 0295, IEC 60228 and HD 383	X 17
US-American and British units, Conversion of usual measuring units	X 83

Copper and Alu-Price Calculation

The material price for cables and wires is usually based on a copper price of 150,00 EUR/100 kg. For invoicing, as copper surcharge – the difference to the daily copper rate will be calculated.

The **Formula for calculating** the copper surcharge:

$$\text{Copper surcharge in EUR/km} = \text{Copper value (kg/km)} \times \frac{(\text{DEL} + 1\% \text{ delivery charge}) - \text{copper basis}}{100}$$

DEL

The DEL (German electrolytic copper for guiding purpose) is the Stock Exchange Quotation for 99,5% pure copper. The value is given per EUR/100 kg in the economic part of daily newspapers.

Example: DEL quotation = 194,29 i. e.,
100 kg copper cost 194,29 EUR and
1% delivery charge is added to the daily quotation for cables and wires.

Copper basis

In our catalogue, for almost all cables and wires, a certain portion of copper price is already included.

- Standard cables – copper basis = EUR 150,0/100 kg
- Telephone cables – copper basis = EUR 100,0/100 kg
- Power cables – copper basis = EUR 0, – /100 kg (copper base = 0)

Copper value

The copper value is stated in our catalogue. It is the copper weight of a cable or a wire.

Example: JZ-500 8 x 0,75 mm², Part-No. 10040
Copper value 58 kg/km

Calculation example: for

JZ-500 8 x 0,75 mm²

DEL 194,29 EUR/100 kg (assuming value)

Copper basis 150,0 EUR/100 kg

Copper value 58 kg/km

$$\begin{aligned} \text{Copper surcharge} &= \frac{(194,29 + 1,9429) - 150,0}{100} \times 58 \text{ kg/km} \quad (\text{calculated value } 1,9429 = 1\% \text{ of } 194,29) \\ &= 26,82 \text{ EUR/km} \end{aligned}$$

The net price including copper is calculated as follows:

Gross price
././ individual discount
+ Copper surcharge

Note: The copper surcharge is indicated separately in our invoices.

Copper and Alu-Price Calculation

Calculation examples:

- Assumption:
- DEL-Quotation 194,29 EUR/100 kg for copper
 - Daily rate 173,84 EUR/100 kg for aluminium
 - Individual discount, e. g. 20%

1. NYY-J 3 x 70/35 sm,

0,6/1 kV, Part no. 32038

Quantity ordered 1000 m

Copper base = 0	9300,00 EUR/km
minus 20% (discount)	<u>1860,00 EUR/km</u>
	7440,00 EUR/km

+ Copper surcharge:

$\frac{(194,29 + 1,9429) - 0}{100}$ x Copper value

equal, 1,962 EUR/kg x 2352 kg/km =

<u>4614,62 EUR/km</u>
12054,62 EUR/km

2. NYCWY 3 x 70/35 sm,

0,6/1 kV, Part No. 32268

Quantity ordered 1000 m

Copper base = 0	14780,00 EUR/km
minus 20% (discount)	<u>2956,00 EUR/km</u>
	11824,00 EUR/km

+ Copper surcharge (Conductor + screen):

$\frac{(194,29 + 1,9429) - 0}{100}$ x Copper value

equal, 1,962 EUR/kg x 2410 kg/km =

<u>4728,42 EUR/km</u>
16552,42 EUR/km

3. NA2XSJ 1 x 70 sm/16,

12/20 kV, Part No. 32454

Quantity ordered 1000 m

- Aluminium conductor
- Copper screen

Copper base = 0	9500,00 EUR/km
minus 20% (discount)	<u>1900,00 EUR/km</u>
	7600,00 EUR/km

+ Copper surcharge (screen):

$\frac{(194,29 + 1,9429) - 0}{100}$ x Copper value

equal, 1,962 EUR/kg x 182 kg/km =

357,08 EUR/km

+ Aluminium (Conductor):

Aluminium value x daily rate
203 kg/km x 1,74 EUR/kg

<u>353,22 EUR/km</u>
8310,30 EUR/km

Reference to DIN VDE Standards

Power Installations

- DIN VDE 0100
 - Erection of power installations with rated voltages below 1000
 - General requirements, scope
 - Protective measures and protection against electric shock
 - Protection of cables against overcurrent
 - Choice of protective measures, protection against fire
 - Selection and erection of equipment – cable, wires and wiring systems
 - Erection electrical equipment – switch- and controlgear
 - Luminaires and lighting equipment
 - Rooms containing a bath tub or shower basin
 - Roofed swimming pools (swimming baths) and open air swimming baths
 - Rooms containing electrical sauna-heaters – Installations site
 - Agricultural and horticultural premises
 - Fire-hazards locations
 - Lifting and hoisting devices
 - Laying of cables in hollow walls and in buildings made up mainly flammable building materials
 - Cable entries into buildings in public cable network
 - Humid and wet areas, outdoor installation
- DIN VDE 0100 part 100
- DIN VDE 0100 part 410
- DIN VDE 0100 part 430
- DIN VDE 0100 part 482
- DIN VDE 0100 part 520/part 530
- DIN VDE 0100 part 559
- DIN VDE 0100 part 701 to part 705
- DIN VDE 0100 part 720
- DIN VDE 0100 part 726 up to 0 part 737
- DIN VDE 0101
- DIN VDE 0105
- DIN VDE 0107
- DIN VDE 0108 part 1 up to part 100
- DIN VDE 0113
- DIN VDE 0118
- DIN VDE 0165
- DIN VDE 0166
- DIN VDE 0168
- DIN VDE 0170/0171
- DIN VDE 0185
- DIN VDE 0207 part 1 up to part 24
- DIN VDE 0245 part 1
 - Erection of power installations with rated voltages above 1 kV
 - Operation of power installations
 - Electrical installations in hospitals and locations for medical use outside hospitals
 - Power installations and safety power supply in comunal facilities, stores and shops and exhibition rooms, multi-storey buildings, Restaurants, closed car parks and working or business premises
 - Electrical equipment of industrial machines
 - Erection of electrical installations in mines
 - Installation of electrical apparatus in hazardous areas
 - Electrical installations and apparatus thereof for use in atmospheres potentially endangered by explosive material
 - Erection of electrical installation in open cast mines quarries and similar plants
 - Electrical apparaturs for potentially explosive atmospheres
 - Lightning protection system, protection of structures against lightning
- DIN VDE 0245 part 101 up to part 202
- DIN VDE 0245 part 1 up to part 819
- DIN VDE 0253
 - Insulating and sheathing compounds for cables and flexible cords
 - Cables and cords for electrical and electronic equipment in power installations
 - Flexible PVC-insulated control cable
 - Cables, wires and flexible cords for power installation
 - Heating – cables

Power guides

- DIN VDE 0262
 - XLPE (cross linked PE) insulated and PVC sheathed installationscable up to 0,6/1 kV
- DIN VDE 0265
 - Cables with plastic-insulated lead-sheat for power installation
- DIN VDE 0266 part 3 and part 4
 - Halogen-free cables with improved characteristics in the case of fire, with reduced fire propagation and continuance of isolation for use in the containment of nuclear power plants

Reference to DIN VDE Standards

Power guides

- DIN VDE 0271 – PVC-insulated cables and sheathed power cables for rated voltages up to and including 3,6/6 (7,2) kV
- DIN VDE 0276 part 603 – Distribution cables of nominal voltages U_0/U 0,6/1 kV
- DIN VDE 0276 part 604 – Power cables of nominal voltages U_0/U 0,6/1 kV with special fire performance for use in power stations
- DIN VDE 0276 part 604/605 – Additional test methods
- DIN VDE 0276 part 620 – Distribution cables of nominal voltages U_0/U 3,6 kV to 20,8/36 kV
- DIN VDE 0276 part 1000 – Current-carrying capacity, general; conversion factors
- DIN VDE 0276 part 1001 – Tests on cables laid with nominal voltages U_0/U 6/10 kV, 12/20 kV and 18/30 kV with PVC-insulation, VPE-insulation or paper insulation.
- DIN VDE 0277 – Primary cables for airport lighting
- DIN VDE 0281 part 1 to part 404 – PVC-cables, wires and flexible cords for power installation
- DIN VDE 0282 part 1 to part 808 – Rubber cables and flexible cords for power installation, heat-resistant silicon rubber insulated cable, halogen-free insulated cable arc welding cable, rubber insulated lift cable, rubber-sheathed flexible cables
- DIN VDE 0284 – Mineral insulated cables with a rated voltages not exceeding 750 V
- DIN VDE 0289 part 1 to part 101 – Definitions for cables, wires and flexible cords for power installation
- DIN VDE 0292 – Code designation for harmonized cables and flexible cords for power installations
- DIN VDE 0293 – Core identification for cables and flexible cords used in power installation
- DIN VDE 0295 – Conductors of cables, wires and flexible cords for power installation
- DIN VDE 0298 part 1 to part 300 – Application of cables and flexible cords in power installations

Testing, measurement

- DIN VDE 0472 part 1 to part 818 – Testing of cables, wires and flexible cords
- DIN VDE 0473 up to part 811 – Insulating and sheathing materials of electric cables; Common test methods
- DIN VDE 0482 up to part 268 – Measurement of smoke density of cables

Telecommunications, Switchboard and Installations-cable

- DIN VDE 0800 part 1 to part 10 – Telecommunications
- DIN VDE 0811 – Ribbon cables with round conductors, with a pitch of 1,27 mm
- DIN VDE 0812 – Equipment wires and stranded equipment wires of telecommunications system
- DIN VDE 0813 – Switchboard cables for telecommunications system
- DIN VDE 0814 – Cords for telecommunications system
- DIN VDE 0815 – Wiring cables for telecommunications system (indoor cable)
- DIN VDE 0816 part 1 to part 3 – Outdoor cables for telecommunications system
- DIN VDE 0817 – Cables with stranded conductors for increased mechanical stress for telecommunications system
- DIN VDE 0818 – Self-supporting telecommunication aerial cables on overhead power lines above 1 kV
- DIN VDE 0839 – Electromagnetic compatibility
- DIN VDE 0881 – Equipment wires and flexible equipment wires with extended temperature
- DIN VDE 0891 part 1 to part 10 – Special directions and guidings principles of cables and insulated wires
- DIN VDE 0899 part 1 up to part 5 – Special specification for optical fiber, single cores, indoor and outdoor cables

Harmonized Identification

The harmonized identifications for cables and wires come to an agreement with the CENELEC-structure (HAR-agreement) are determined by the certification institute. These identifications conform the harmonized standards.

The harmonized identification must be visible on the core or the sheath in form of an imprint or embossing, or contained with a three-coloured black-red-yellow protected identification thread of different colour lengths (dimension in cm).

Harmonized identification				Country	Certification institute Name	Designation
Kind of imprint or embossing	Colour of identification thread black red yellow (dimension in cm)					
CEBEC <HAR>	1	3	1	Belgium	Comite' Electrotechnique Belge	CEBEC
<VDE> <HAR>	3	1	1	Germany	Verband Deutscher Elektrotechniker e.V. VDE Prüf- und Zertifizierungsinstitut	VDE
USE <HAR>	3	3	1	France	Union Technique de l'Electricité	UTE
IEMMEQU <HAR>	1	3	5	Italy	Instituto Italiano de Marchio Qualità	IMQ
BASEC <HAR>	1	1	3	Great Britain and North Ireland	British Approvals Service for Cables	BASEC
KEMA-KEUR <HAR>	1	3	3	Netherlands	N.V. tot Keuring van Elektrotechnische Materialien	KEMA
SEMKO <HAR>	1	1	5	Sweden	Svenska Elektriska Materielkontrollanstalten	SEMKO
<ÖVE> <HAR>	3	1	5	Austria	Österreichischer Verband für Elektrotechnik	ÖVE
<DEMKO> <HAR>	3	1	3	Denmark	Danmarks Elektriske Materialkontroll	DEMKO
<NSAI> <HAR> <IIRS> <HAR>	3	3	5	Ireland	National Standards Authority of Ireland old: Institute for Industrial Research and Standards	NSAI (IIRS)
NEMKO <HAR>	1	1	7	Norway	Norges Elektriske Materiellkontroll	NEMKO
⊠UNE⊠ <HAR> (⊠UNE⊠)	3	1	7	Spain	up to 31. 12. 1992: Asociación Electrotécnica y Electrónica Española	AEE
AENOR <HAR>	3	1	9		from 01.01.1993: Asociación Española de Normalización y Certificación	AENOR
ELOT <HAR>	3	3	7	Greece	Hellenic Organization for Standardization	ELOT
<IPQ> <HAR>	1	1	9	Portugal	Instituto Português da Qualidade	IPQ
SEV <HAR>	1	3	9	Switzerland	Schweizerischer Elektrotechnischer Verein	SEV
FIMKO	1	3	7	Finnland	FIMKO LTD	FIMKO
MEEI <HAR>	3	3	9	Hungarian	Magyar Elektrotechnikai Ellenőrző Intézet	MEEI

Designation code for harmonized cables

according to DIN VDE 0281/DIN VDE 0282/DIN VDE 0292

Construction reference

H 05 V — V5 — F 25 G 0,75

Identifications of designation

- A** authorised national standards
H harmonized standards

Nominal voltage U

- 01** 100 V
03 300/300 V
05 300/500 V
07 450/750 V

Insulation material

- B** (EPR) Ethylene-propylene-rubber
G (EVA) Ethylene-Vinylacetat-Copolymer
N2 (CR) Chloroprene rubber for welding cables
R (NR a./o. SR) Natural a./o. synthetic rubber
S (SiR) Silicone rubber
V (PVC) Polyvinyl chloride
V2 (PVC) Polyvinyl chloride heat-resistant
V3 (PVC) Polyvinyl chloride low-temperature
V4 (PVC) Polyvinyl chloride cross-linked
Z (PE) Polyethylene cross-linked

Structural elements

- C4** Cooper-Screen braiding over laid-up cores
Q4 (PA) Additional polyimide core jacket
T Additional textile braiding over laid-up cores
T6 Additional textile braiding over individual cores

Sheath/jacket material

- B** (EPR) Ethylene-propylene rubber
J Glass fibre braid
N (CR) Chloroprene rubber
N2 (CR) Chloroprene rubber for welding cables
N4 (CR) Chloroprene rubber heat-resistant
O (PUR) Polyurethane
R (NR a./o. SR) Natural- a./o. synthetic rubber
T Textile braid
T2 Textile braid with flame retardant compound
V (PVC) Polyvinyl chloride
V2 (PVC) Polyvinyl chloride heat-resistant
V3 (PVC) Polyvinyl chloride low-temperature
V4 (PVC) Polyvinyl chloride cross-linked
V5 (PVC) Polyvinyl chloride oil resistant

Special structural features

- D3** Stress-relieving elements (support wire)
D5 Centre core (no supporting element)
FM Telecommunications cores integrated in power cables
H Flat, separable cable (twin cable)
H2 Flat, non-separable cable (two-core sheathed cable)
H6 Flat, non-separable cable (multi- and multiple sheathed cable)
H7 Two-layer insulating jacket
H8 Spiral cables

Conductor type

- D** Finely stranded, for welding cables
E (very) finely stranded, for welding cables
F Finely stranded, for cables for flexible installation
H (Very) finely stranded, for flexible cables
K Finely stranded, for cables for fixed installation
R Multiple-wire, round, class 2
U Single-wire, round, class 1
Y Tinsel wire, DIN 47104

Number of cores

Earth core

- G** With earth core
X Without earth core

Conductor nominal cross section in mm²

Examples:

H07V-U 2,5 black (according to DIN VDE 0281)
 Harmonized PVC-insulated single-core sheathed cable, 2,5 mm² single-core, nominal voltage 750 V

H07RN-F 3G 1,5 (according to DIN VDE 0282)

Harmonized rubber-sheathed-cable for medium tensile loads, three-core 1,5 mm², finely stranded, green-yellow earth core, nominal voltage 750 V

Code-designation for harmonized cables and flexible cords to DIN VDE 0292 and HD 361 S2/S3

This system of code-designation is prepared by CENELEC for harmonized cables as flexible cords for power installations and published in Harmonization Document 361 S3.

Kind of Standards

Code-designation	Classified to Standards
H	cables and wires to harmonized documents
A	authorised national standards

Conductor material

without designation	Copper
- A	Aluminium
- Z	Conductor of special material and/or special shape

Type and shape of conductor

- D	fine wire stranded conductor for welding cables
- E	extra fine wire stranded conductor for welding cables
- F	fine wire stranded conductor for flexible cables according to DIN VDE 0295, class 5
- H	extra fine wire stranded conductor for flexible cables according to DIN VDE 0295, class 6
- K	fine wire stranded conductor for fixed installation (if not specified, equivalent to DIN VDE 0295, classe 5)
- M	Milliken conductor
- R	conductor of multistranded wires
- S	sector-shaped conductor of multistranded wires
- U	round conductor of single wire
- W	sector-shaped conductor of single wire
- Y	tinsel conductor
- Z	conductor of special material and/or special shape

Core numbers and cross-section of conductor

Number	number of cores n
X	Multiplication sign without green-yellow core
G	Multiplication sign for green-yellow core
Y	tinsel conductor, whereby the cross-section is not specified

Insulation and sheath materials

B	Ethylene-propylene-rubber for Temp. of +90°C
B2	Ethylene-propylene rubber, hardend
B3	Butyl rubber (isobutylene-isoprene rubber)
E	Polyethelene
E2	Polyethelene, high density
E4	Polytetrafluorethylene
E5	Perfluor (Ethylene-propylene – copolymers)
E6	Ethylene-tetrafluorethylene – copolymers
E7	Polypropylene

Insulation and sheath materials

Code-designation	Materials
G	Ethylene-vinylacetate – copolymers
J	braiding of glass fibre
J2	wrapping of glass fibre
M	mineral insulation
N	chloroprene-rubber (or equivalent material)
N2	special compound of chloroprene-rubber
N4	Sulfonated chlor or chlorinated polyethelene
N5	Nitril-rubber
N6	Florinated rubber
N7	PVC-Nitril-rubber compound
N8	Special-polychloroprene-rubber, water resistant
P	Cables with impregnated paper insulation for multicore belted cable
Q	Polyurethane
Q2	Polyethyleneterephthalate
Q3	Polystyrole
Q4	Polyamide
Q5	Polyimide
Q6	Polyvinylidene fluoride
R	Ethylene-propylene rubber or equivalent synthetic elastomer for +60°C temperature of +60°C, for permanent temperature of +60°C
S	Silicon-rubber
T	textile braiding over twisted cores, impregnated/unimpregnated
T2	textile braiding with flamme retardant impregnated composition
T3	layer of textile as core wrapping or tape
T4	layer of textile as core wrapping or tape with flame retardant impregnated composition
T5	corrosion protection
T6	textile braiding over individual core or multicore cable, impregnated/unimpregnated
V	PVC soft
V2	PVC soft, resistant to increased temperature, +90°C
V3	PVC soft, for low temperatures
V4	PVC soft, cross-linked
V5	PVC soft, oil resistant
X	cross-linked polyethylene
Z	cross-linked compound to a basis of polyolefine, for low corrosiv gas and low smoke emission in case of fire
Z1	Thermoplastic compound to a basis of polyole-fine, for low corrosiv gas and low smoke emission in case of fire

Continuation ▶

X

Code-designation for harmonized cables and flexible cords to DIN VDE 0292 and HD 361 S2/S3

Metal sheath, concentric conductor and screens

Code-designation	Metal sheath
A2	Aluminium sheath, pressed or welded, smooth
A3	Aluminium sheath, pressed or welded, corrugated
A4	Aluminium sheath over individual core
A5	Aluminium sheath of Band
C2	Copper sheath
C3	Copper sheath, corrugated
F	Steel sheath
F3	Steel sheath, corrugated
K	Zinc sheath
L	Alloyed lead sheath for general use
L2	non-alloyed lead sheath, normal pure lead
L4	alloyed lead sheath over individual core
L5	non-alloyed lead sheath over individual core
L6	alloyed lead sheath, but other composition than above

Concentric conductors

A	concentric aluminium conductor
A6	concentric aluminium conductor, meander-shaped
C	concentric copper-conductor
C6	concentric copper-conductor, meander-shaped
C9	divided concentric copper conductor

Screens

A7	Aluminium screen
A8	Aluminium screen of individual core
C4	Copper screen as braid over the stranded cores
C5	Copper screen braiding over individual core
C7	Copper screen of tape, round or profile-wires over twisted cores
C8	Copper screen as C7, over individual core
D	screen of one or more thin steel tapes, laying direkt over twisted cores, in contact with a stranded plain conductor

Armouring

Code-designation	Armouring**
Z2	Armouring of round steel wires*, galvanized/ungalvanized
Z3	Armouring of flat steel wires*, galvanized/ungalvanized
Z4	Armouring of steel tape, galvanized/ungalvanized
Z5	Braiding of steel wires, galvanized, ungalvanized
Z6	Supporting braid of steel wires
Z7	Armouring of sectional steel wires
Y2	Armouring of round aluminium wires*
Y3	Armouring of flat aluminium wires*
Y5	Armouring of special materials
Y6	Armouring of steel wires and/or steel tape and copper wires

* counter helix, if specified
** see remarks DIN VDE 0292

Special constructive supporting elements

D2	Supporting elements of textile or steel wires over cable core
D3	Textil supporting elements of one or more elements, stranded in the core of circular cable or placed in a flat cable
D4	self-supporting cables and wires, where the conductor permits the strain-relieving function
D5	central core element (not as supporting element), used for lift cable
D7	as D3, the supporting element however is connected externally
D8	as D7, however a section horizontal to the axis of the cable forming the number "8"

Special versions

without designation	round cable construction
H	flat type as seperable cables with or without sheath
H2	flat type of cables unseperable
H3	building cable, flat webbed
H4	multicore flat cable with one plain conductor
H5	two or more single core stranded, non-sheathed cables
H6	flat cables according to HD 359 or EN 50214 with 3 or more cores
H7	Cable with two-sheathed extruded insulation
H8	Coiled conductor

Comparison of harmonized cables with IEC, DIN VDE and HD

PVC-insulated cables according to DIN VDE 0281 in comparison with IEC and HD

Designation	accord. to VDE part . . .	short designation new	short designation old VDE 0250	nominal cross-section (mm ²)	nominal voltage U ₀ /U (V)	according to HD	comparative design to IEC
PVC-wiring cables single wire fine wires	0281 part 3 0281 part 3	H 05V-U H 05V-K	NYFA, NYA NYFAF, NYAF	0,5 to 1,0	300/500	HD 21.3 S3	227 IEC 01 227 IEC 01
PVC-insulated cables single wire multi-stranded wires fine wires	0281 part 3 0281 part 3 0281 part 3	H 07V-U H 07V-R H 07V-K	NYA NYA NYAF	1,5 to 10 1,5 to 400 1,5 to 240	450/750	HD 21.3 S3	227 IEC 01 227 IEC 01 227 IEC 02
Light PVC-Twin cables	0281 part 5	H 03VH-Y	NLYZ	0,1	300/300	HD 21.5 S3	227 IEC 41
Twin cables	0281 part 5	H 03VH-H	NYZ	0,5+0,75	300/300	HD 21.5 S3	227 IEC 42
PVC-sheathed cables 03VV-F round flat	0281 part 5 0281 part 5	H 03VV-F H 03VVH2-F	NYLHY rund NYLHY flach	0,5+0,75 0,5+0,75	300/300	HD 21.5 S3	227 IEC 43 227 IEC 43
PVC-sheathed cables 05 VV-F round flat	0281 part 5 0281 part 5	H 05VV-F H 05VVH2-F	NYMHY rund NYMHY rund NYMHY flach	0,75 to 2,5 1 to 2,5 0,75	300/500 300/500	HD 21.5 S3	227 IEC 53 227 IEC 53
PVC-Flat-cable 05VV-H6 PVC-Flat-cable 07VV-H6	0281 part 403 0281 part 404	H 05VVH6-F H 07VVH6-F	NYFLY NYFLY	0,75 to 1 1,5 to 25	300/500 450/750	–	– –

Rubber insulated power cables according to DIN VDE 0282 in comparison with IEC and HD

Designation	according to VDE	short designation new	short designation old VDE 0250	nominal cross-section (mm ²)	nominal voltage U ₀ /U (V)	according to HD	comparative design to IEC
Heat-resistant rubberinsulated cable H 07G	0282 part 7 0282 part 7	H 07G-U H 07G-K	N4GA N4GAF	1,5+2,5 0,5 to 95	450/750	HD 22.7 S2	– –
Heat-resistant siliconerubber cable	0282 part 3	H 05SJ-K	N2GAFU	0,5 to 95	300/500	HD 22.3 S2	245 IEC 03
Braided flexible cord	0282 part 4	H 03RT-F	NSA	0,75 to 1,5	300/500	HD 22.4 S3	245 IEC 51
Rubber sheathed flexible cord 05RR	0282 part 4	H 05RR-F	NLH, NMH	0,75 to 2,5	300/500	HD 22.4 S3	245 IEC 53
Polychloroprene sheathed flexible cable 05RN	0282 part 4	H 05RN-F	NYMHöu NYMHöu NYMHöu	0,75+1 0,75+1 0,75	300/500	HD 22.4 S3	245 IEC 57 245 IEC 57 245 IEC 57
Polychloroprene sheathed flexible cable 07RN	0282 part 4	H 07RN-F	NMHöu NSHöu	1,5 to 500 1 to 25 1 to 300 1,5+2,5	450/750	HD 22.4 S3	245 IEC 65 245 IEC 66
Rubber insulated lift cable with textile braid 05RT2D5	0282 part 807	H 05RT2D5-F	NFLG	0,75	300/500	–	–
Rubber insulated lift cable with polychloroprene sheath 05RND5	0282 part 807	H 05RND5-F	NFLGC	0,75	300/500	–	–
Rubber insulated lift cable with textile braid 07RT2D5	0282 part 808	H 07RT2D5-F	NFLG	1	450/750	–	–
Rubber insulated lift cable with polychloroprene sheath 07RND5	0282 part 808	H 07RND5-F	NFLGC	1	450/750	–	–

IEC-definition

IEC 227: Polyvinylchloride insulated flexible cables and cords with circular conductors and a rated voltage not exceeding 750 V
IEC 245: Rubber insulated flexible cables and cords with circular conductors and a rated voltage not exceeding 750 V

Designation code for telephone cables, jumper wires and stranded hook-up wires

Construction reference

Basic cable type with additional information

A	outdoor cable	IE	installation cable for industrial electronic
AB	outdoor cable with lightning protection requirements	IE-H	installation cable for industrial electronic, halogen-free
AJ	outdoor cable with induction protection requirements	S	switchboard cable
G	mining cable	T	distribution cable
I	installation cable	YV/Li...	jumper wires/hook-up wires

Insulation

P	dry paper	3Y	Styroflex
Y	PVC (Polyvinylchloride)	5Y	PTFE
2Y	PE (Polyethylene)	6Y	FEP
02Y	foamed PE (cellular)	7Y	ETFE
02YS	foam-skin insulation		

Screening

C	screen of braided copper wires	(ms)	magnetic screen steel tape
D	copper screen, helically stranded	(St)	screen of plastic coated metallic foil
F	filling of cable core with petrol-jelly	(Z)	high tensile steel wire braiding
(K)	screen of copper tape with PE-inner sheath		
(L)	aluminium tape		

Sheath Material

L	smooth aluminium sheath	M	lead sheath
(L)2Y	copolymer coated aluminium	Mz	lead alloy sheath
	moisture barrier sheath	W	corrugated steel sheath
LD	corrugated aluminium sheath		

Protective coating

Y	PVC sheath	2Y	PE sheath
Yv	reinforced protective sheath of PVC	2Yv	reinforced protective PE sheath
Yw	PVC sheath heat-resistant	E	compound with embedded plastic tape
Yu	PVC flame resistant (non-flammable)	C	protective covering of jute and compound

Number of stranding elements

.. x1x	single core	.. x4x	quad
.. x2x	pair (double cores)	.. x5x	five-core
.. x3x	triple		

Conductor diameter in mm

Type of stranding components

F	star quad with phantom circuit in railway cables	St V	star quad for transmission of $f = 550$ kHz
S	signal core in railway signal cable	St VI	star quad for transmission of $f = 17$ MHz
St0	star quad general	DM	Dieselhorst-Martin quad
St	star quad with phantom circuit for long distance	TF	carrier frequency star quad
St I	star quad without phantom circuit	P	twisted pair
St II	star quad like St III, but with increased capacitance unbalances	PiMF	pair in metal foil
St III	star quad in local (Subscriber) cable	ViMF	quad in metal foil
St IV	star quad for transmission of $f = 120$ kHz	BdiMF	unit in metal foil
		Kx	coaxial cable

Stranding layout

Lg	layer stranding concentric
Bd	unit stranding

Armouring wire

A	layer of Al-wires for inductive protection	2B 0,5	2 layers steel tape, thickness 0,5 mm
b	armouring	D	layer of copper wires for inductive protection
B	armouring of steel band for inductive protection	(T)	strain bearing of steel wires for aerial cable
1B 0,3	1 layer steel tape, thickness 0,3 mm		

Code-designation-explanations for cables and insulated wire

A-	Outdoor cable	-OZ	cable without green-yellow earth core and cores with imprinted numbers
A	approved national design	ö	oil-resistant
AB	Outdoor cable with lightning protection	O2Y	Foam-PE, insulation (cellular PE)
AD	Outdoor cable with differential protection	Q	Steel wire braiding
AJ-	Outdoor cable with induction protection	(R...)	round wire, diameter in mm
ASLH	self-supporting communication cables for high voltage overhead lines	RAGL-	Compensating cable for thermocoupling
B	armouring	RD-	Rhenomatic cable
B	spinning of textile yarn	RE	Computer cable
b	armouring	RG-	Coaxial cable according MIL specification
(1B...)	one layer of steel tape... thickness of the steel tape in mm	re	round, single wire
(2B...)	two layers of steel tape... thickness of the steel tape in mm	rm	round, multiwire
BD	unit-type stranding	RS-	computer switchboard cable
BLK	bare copper-conductor without insulation	S	silk whipping
BZ	bronze conductor	S	signal cables for railways
C	screen of copper wire braiding	(S...)	nominal value of mutual capacitance (nF /km)
C	screen of copper wire spinning	-S	signal cable for German Railway
C	outer protection of jute and viscous compound	S-	Switchboard cable
Cu	copper wire	SL	flexible sheathed cable
(-Cu)	total cross-section of copper screens (mm ²)	2S	two layers of silk whipping
D	screen of copper wires	St	star quad for phantom circuits
(D)	screen of helically applied copper wires	St I	star quad in telephone cables for larger distance
DM	Dieselhorst-Martin quad	St III	star quad in local cables
Dreier	three cores in triple stranded	(St)	static screen
E	copper drain wire	Staku	copper clad steel wire
E(e)	protective covering of viscous compound with embedded layer of plastic tape	Staku-Li	copper clad steel stranded wires
e	single wire, solid	...t	termite protection
F	cable cores assembly with petrol-jelly	T	supporting element for overhead cable
F	foil wrapping	T-	fan out cable
F	flat cable	TF	carrier frequency of pairs or quads triple
F	star quad for railway cable	TiC	triple in copper wire braid
F	star quad for phantom circuits	TiMF	triple in metal foil
(F...)	flat wire armouring... thickness in mm	U	braiding of textile fibres
OF	jelly filled cable core, filling compound of hard substances	VGD	gold-plated
FR	flame retardant	VN	nickel-plated; VS silver-plated
f	flexible, fine wire stranding	VZK	galvanized; VZN tinned
ff	extra fine wire stranding	W	corrugated steel sheath
G	insulation or sheath material of rubber (NR) or (SBR)	W	high heat resistant
G-	Mining cable	W	corrugated steel sheath
GJ	Mining cable with induction protection	X	cross-linked polyvinylchlorid (X-PVC) or other materials
GS	glass fibre whipping or braiding	XPE	cross-linked polyethylene (X-PE)
2G	insulation or jacket of silicone rubber, (SIR)	2X	cross-linked polyethylene
3G	insulation or jacket of ethylene propylene rubber, (EPR)	7X	cross-linked Ethylentetrafluorethylen (X-ETFE)
4G	insulation or jacket of ethylene vinylacetate rubber (EVA)	10X	cross-linked Polyvinylidenfluorid (X-PVDF)
5G	insulation or jacket of chloroprene rubber (CR)	Y	PVC, polyvinylchloride
6G	insulation or jacket of chlorosulphonated polyethylene (CSM), Hypalon	Yu	PVC, polyvinylchloride, non-flammable, flame-retardant
7G	insulation or jacket of Fluoroelastomer (FKM)	Yv	PVC, polyvinylchloride, with reinforced sheath
8G	insulation or jacket of Nitrile rubber (NBR)	YV	Equipment wires with tinned conductor
9G	PE-C rubber (CM)	Yw	PVC, polyvinylchlorid, heat resistant upto 90°C
53G	CM, chlorinated Polyethylene	2Y	Polyethylene (PE)
H	insulation or jacket of halogen-free compound	2Yv	Polyethylene, reinforced sheath
H	Harmonized Documents	O2Y	Cellular polyethylene
(H...)	maximal value of mutual capacitance (nF /km)	O2YS	insulation of cellular polyethylene with outer PE-skin
(HS)	semi-conducting tape of layer	2YHO	insulation of air-spaced polyethylene
HX	cross-linked, halogen-free polymer compound	3Y	insulation polystyrene (PS), Styroflex
...IMF	individual stranding element (pairs or single cores etc.) in metal foil and drain wire	4Y	insulation or jacket of polyamide (PA)
IMF	several stranding elements in metalfoil and drain wire	5Y	insulation or jacket of polytetrafluorethylen (PTFE), HELUFLON®
-J	cable with green-yellow earth core	5YX	Perfluoralkoxy (PFA)
-JZ	cable with green-yellow earth core and cores with imprinted numbers	6Y	Perfluoroethylene-propylene (FEP), HELUFLON®
K	copper-tape	7Y	insulation or jacket of ethylentetrafluorethylen (ETFE)
(K)	inner sheath and longitudinally folded copper tape	8Y	insulation of polyimid (PI), Kapton®
LA	tinsel conductor (flat copper wire stranded over the thread of synthetic fibres)	9Y	polypropylen (PP)
LD	corrugated aluminium sheath	10Y	PVDF, Polyvinylidene fluoride
Lg	in layers stranding	11Y	polyurethan (PUR)
Li	stranded wires conductor	12Y	TPE-E, TPE
(LY)	laminated sheath Al-tape and PVC-jacket	13Y	TPE-EE, TPE on base of Polyester-Ester
(LY2)	laminated sheath Al-tape and PE-jacket	31Y	TPE-S, TPE on base of Polystyrol
2L	double enamel coating as insulation	41Y	TPE-A, TPE on base of Polyamide
M	plastic-sheath cable	51Y	PFA, Perfluor-Alkoxylalkane
M	lead sheath	71Y	ECTFE, Monochlorotrifluorethylen
Mz	alloyed lead sheath	91Y	TPE-O, TPE on base of Polyester-Ester
(mS)	magnetic shield	-Z	core imprinted with numbers
N	VDE standard	Z	twin cable
(N)	in adapted to VDE standard	(Z)	high-tensile braid of steel wires
NC	non-corrosiv, smoke-gase	(ZG)	high-tensile element of glass fibre yarn
NF	natural colour	(ZN)	high-tensile of non-metallic elements
-O	cable without green-yellow earth core		

Conductor-diameters according to VDE 0295 (DIN EN 60228)

The indicated values are stated in the following table containing the conductor diameters according to the dimension of cross-sections and conductor classes in VDE 0295 (DIN EN 60228).

Single-wire round (Cu und Alu) class 1			Multi stranded wires, round compacted (Cu) class 2	Fine and extra-fine copper wires class 5 and 6
Nominal-cross-section mm ²	min- \varnothing ³⁾ mm	max- \varnothing mm	max- \varnothing mm	max- \varnothing mm
0,5	–	0,9	1,1	1,1
0,75	–	1,0	1,2	1,3
1	–	1,2	1,4	1,5
1,5	–	1,5	1,7	1,8
2,5	–	1,9	2,2	2,4
4	–	2,4	2,7	3,0
6	–	2,9	3,3	3,9
10	–	3,7	4,2	5,1
16	–	4,6	5,3	6,3
25	5,2 ¹⁾	5,7 ²⁾	6,6	7,8
35	6,1 ¹⁾	6,7 ²⁾	7,9	9,2
50	7,2 ¹⁾	7,8 ²⁾	9,1	11,0
70	8,7 ¹⁾	9,4 ²⁾	11,0	13,1
95	10,3 ¹⁾	11,0 ²⁾	12,9	15,1
120	11,6 ¹⁾	12,4 ²⁾	14,5	17,0
150	12,9 ¹⁾	13,8 ²⁾	16,2	19,0
185	–	15,4	18,0	21,0
240	–	17,6	20,6	24,0
300	–	19,8	23,1	27,0
400	–	22,2	26,1	31,0
500	–	–	29,2	35,0
630	–	–	33,2	39,0
800	–	–	37,6	–
1000	–	–	42,2	–

¹⁾ only for Aluminium round conductor

²⁾ for mineral-insulated round conductor, only for copper

³⁾ min- \varnothing for round Cu-conductor are not scheduled

Conductor resistance (extracted from DIN VDE 0295, IEC 60228 and HD 383)

The values are extracted from DIN VDE 0295 (equivalent with the international standard IEC 60228 and HD 383), according to cross-sections and conductor classes, beginning with nominal cross-section of 0.5 mm². The diameters of the single wires of each bunched conductor are not permitted to exceed the maximum stated values (ref. DIN VDE 0295), which are required to conform the maximum resistance value of the bunched conductors at 20° C.

Nominal cross-section mm ²	Copper conductor plain wires (Ohm/km)		Copper conductor tinned wires (Ohm/km)		Aluminium conductor (Ohm/km) Class 1 and 2
	Class 1 and 2	Class 5 and 6	Class 1 and 2	Class 5 and 6	
0.05	–	~380	–	~392	–
0.08	–	~237	–	244	–
0.11	–	~170	–	~175	–
0.126	–	~150	–	~155	–
0.14	–	~134	–	~138	–
0.22	–	~ 96	–	~ 99	–
0.25	–	~ 76	–	~ 79	–
0.34	–	~ 53	–	~ 56	–
0.5	36.0	39.0	36.7	40.1	–
0.75	24.5	26.0	24.8	26.7	–
1.0	18.1	19.5	18.2	20.0	–
1.5	12.1	13.3	12.2	13.7	–
2.5	7.41	7.98	7.56	8.21	–
4.0	4.61	4.95	4.70	5.09	–
6.0	3.08	3.30	3.11	3.39	–
10.0	1.83	1.91	1.84	1.95	3.08
16.0	1.15	1.21	1.16	1.24	1.91
25.0	0.727*	0.780	0.734	0.795	1.20
35.0	0.524*	0.554	0.529	0.565	0.868
50.0	0.387*	0.386	0.391	0.393	0.641
70.0	0.268*	0.272	0.270	0.277	0.443
95.0	0.193*	0.206	0.195	0.210	0.320
120.0	0.153*	0.161	0.154	0.164	0.253
150.0	0.124*	0.129	0.126	0.132	0.206
185.0	0.0991	0.106	0.100	0.108	0.164
240.0	0.0754	0.0801	0.0762	0.0817	0.125
300.0	0.0601	0.0641	0.0607	0.0654	0.100
400.0	0.0470	0.0486	0.0475	0.0495	0.0778
500.0	0.0366	0.0384	0.0369	0.0391	0.0605
630.0	0.0283	0.0287	0.0286	0.0292	0.0469

class 1 = single core conductor for single and multi core cables
class 2 = multi core conductors for single and multi core cables
class 5 = fine wire copper conductors for single and multi core cables
class 6 = extra fine wire copper conductors for single and multi core cables
* for mineral-insulated cables (class 1 up to 150 mm²)

Strand make-up (acc. to DIN VDE 0295, IEC 60228 and HD 383)

The number of wires in columns 3-7 is not binding. According to DIN VDE 0295 is the maximum single wire diameter for the construction of the conductor cross section and the maximum conductor resistance value shall prevail.

cross section mm ²	stranded wires		multistranded wires		fine wires		extra-fine wires							
	class 2 DIN VDE 0295				class 5 DIN VDE 0295		class 6 DIN VDE 0295							
	column 1		column 2		column 3		column 4		column 5		column 6		column 7	
	Number ³⁾ of wires	single wire ø mm	Number of wires	single wire ø mm	Number ¹⁾ of wires	single ²⁾ wire ø mm	Number ¹⁾ of wires	single ²⁾ wire ø mm	Number ¹⁾ of wires	single wire ø mm	Number ¹⁾ of wires	single wire ø mm	Number ¹⁾ of wires	single wire ø mm
0,05											~14 x 0,07		~26 x 0,05	
0,08													~40 x 0,05	
0,09											~24 x 0,07*			
0,14						~18 x 0,1	~18 x 0,1	~18 x 0,1	~18 x 0,1	~18 x 0,1	~36 x 0,07		~72 x 0,05	
0,25						~14 x 0,15	~32 x 0,1	~32 x 0,1	~32 x 0,1	~32 x 0,1	~65 x 0,07		~128 x 0,05	
0,34				7 x 0,25		~19 x 0,15	~42 x 0,1	~42 x 0,1	~42 x 0,1	~42 x 0,1	~88 x 0,07		~174 x 0,05	
0,38				7 x 0,27		~12 x 0,2	~21 x 0,15	~48 x 0,1	~48 x 0,1	~48 x 0,1	~100 x 0,07		~194 x 0,05	
0,5	7 x 0,30		7 x 0,30			~16 x 0,2	~28 x 0,15	~64 x 0,1	~64 x 0,1	~64 x 0,1	~131 x 0,07		~256 x 0,05	
0,75	7 x 0,37		7 x 0,37			~24 x 0,2	~42 x 0,15	~96 x 0,1	~96 x 0,1	~96 x 0,1	~195 x 0,07		~384 x 0,05	
1,0	7 x 0,43		7 x 0,43			~32 x 0,2	~56 x 0,15	~128 x 0,1	~128 x 0,1	~128 x 0,1	~260 x 0,07		~512 x 0,05	
1,5	7 x 0,52		7 x 0,52			~30 x 0,25	~84 x 0,15	~192 x 0,1	~192 x 0,1	~192 x 0,1	~392 x 0,07		~768 x 0,05	
2,5	7 x 0,67		19 x 0,41			~50 x 0,25	~140 x 0,15	~320 x 0,1	~320 x 0,1	~320 x 0,1	~651 x 0,07		~1280 x 0,05	
4	7 x 0,85		19 x 0,52			~56 x 0,3	~224 x 0,15	~512 x 0,1	~512 x 0,1	~512 x 0,1	~1040 x 0,07			
6	7 x 1,05		19 x 0,64			~84 x 0,3	~192 x 0,2	~768 x 0,1	~768 x 0,1	~768 x 0,1	~1560 x 0,07			
10	7 x 1,35		49 x 0,51			~80 x 0,4	~320 x 0,2	~1280 x 0,1	~1280 x 0,1	~1280 x 0,1	~2600 x 0,07			
16	7 x 1,70		49 x 0,65			~128 x 0,4	~512 x 0,2	~2048 x 0,1	~2048 x 0,1	~2048 x 0,1				
25	7 x 2,13		84 x 0,62			~200 x 0,4	~800 x 0,2	~3200 x 0,1	~3200 x 0,1	~3200 x 0,1				
35	7 x 2,52		133 x 0,58			~280 x 0,4	~1120 x 0,2							
50	19 x 1,83		133 x 0,69			~400 x 0,4	~705 x 0,3							
70	19 x 2,17		189 x 0,69			~356 x 0,5	~990 x 0,3							
95	19 x 2,52		259 x 0,69			~485 x 0,5	~1340 x 0,3							
120	37 x 2,03		336 x 0,67			~614 x 0,5	~1690 x 0,3							
150	37 x 2,27		392 x 0,69			~765 x 0,5	~2123 x 0,3							
185	37 x 2,52		494 x 0,69			~944 x 0,5	~1470 x 0,4							
240	37 x 2,87		627 x 0,70			~1225 x 0,5	~1905 x 0,4							
300	61 x 2,50		790 x 0,70			~1530 x 0,5	~2385 x 0,4							
400	61 x 2,89					~2035 x 0,5								
500	61 x 3,23					~1768 x 0,6								
630	91 x 2,97					~2228 x 0,6								

* Alternative: 19x0,08

¹⁾ The number of individual wires are without obligation.

²⁾ The diameters of the single wires for each conductor are not allowed to exceed the values stated to DIN VDE 0295. The single wires of a stranded conductor must have all the same nominal diameters.

³⁾ Minimum-number of single wires of stranded conductor (up to 35 mm²). The single wires of a stranded conductor must have all the same nominal diameters.

²⁾ Note: permissible maximal diameter of single wires:

nominal value mm	maximal value mm
0,2	0,21
0,25	0,26
0,3	0,31
0,4	0,41
0,5	0,51
0,6	0,61

Conversion AWG to (mm²)

AWG	mm ²	AWG	mm ²	AWG	mm ²	kcmil	mm ²
30	0,05	18	0,75	6	16	300 kcmil	150
28	0,08	17	1,00	4	25	350 kcmil	185
26	0,14	16	1,50	2	35	500 kcmil	240
24	0,25	14	2,50	1	50	600 kcmil	300
22	0,34	12	4	2/0	70	750 kcmil	400
21	0,38	10	6	3/0	95	1000 kcmil	500
20	0,50	8	10	4/0	120		

This cross reference list shows equivalent nominal values. Actual cross sections may vary. The AWG values are approximate, if the cables are made to European Standards (mm²) and vice versa. In critical applications, where the current reaches upper limits. The deviating operation conditions for installation and laying according to standards are to be taken into consideration.

Nominal voltage and Operating voltage

Nominal voltage

Voltage of cables and wires, by which the construction and the tests in respect of electrical characteristics are to be referred.

According to DIN VDE 0298 and IEC 183 the cables are specified U_0/U , where

U_0 = cable nominal voltage between the conductor and the metal covering or earth and

U = cable nominal voltage between the phase conductors, for 3-phase $U = \sqrt{3} U_0$.

According to IEC regulations, the maximum permissible voltage U_m is given in brackets. The identification is: $U_0/U (U_m)$.

As the insulation of plastic insulated cables are measured with a nominal voltage $U_0/U = 0,6/1$ kV and all radial field cables for the voltage U_0 , these cables are suitable for installation:

- in single phase systems, in which the both phase conductors are insulated, with nominal voltage $U_N = 2 U_0$
- in single phase systems, in which one phase conductor is earthed, with the nominal voltage $U_N = U_0$

Operating voltage

Voltage between conductors of a power system or between a conductor and earth under specified condition in a given time during an undisturbed operation.

Coordination of cable-Nominal voltages

Nominal-voltages U_0/U kV	for 3-phase system kV	for 1-phase alternating current	
		both phase conductors insulated kV	one phase conductor earthed kV
0,6/1	1	1,2	0,6
3,6/6	6	7,2	3,6
6/10	10	12	6
12/20	20	24	12
18/30	30	36	18

Coordination of maximum permissible Operating voltages

Nominal voltages U_0/U kV	maximum voltage for 3-phase system kV	maximum voltage for 1-phase alternating current	
		both phase conductors insulated kV	one phase conductor earthed kV
0,6/1	1,2	1,4	0,7
3,6/6	7,2	8,3	4,1
6/10	12	14	7
12/20	24	28	14
18/30	36	42	21

Note:

Cable with $U_0/U 0,6/1$ kV is allowed for **Direct Current Systems**, of those the maximum operating voltage conductor/conductor 1,8 kV or conductor/earth 0,9 kV not to be exceeded.

Current carrying capacity and indications for calculation of Power Cables and Wires

The guidelines for current carrying capacities of copper and aluminium are valid DIN VDE 0298 part 4 as well as DIN VDE 0276 part 603 and for the conversion factors DIN VDE 0276 part 1000.

The current carrying capacity of a cable should be limited in such a degree that at all locations in a cable system which causes the generated heats under given proportions to lead safely in the environment. The heat flow depends on the inner heat-resistance between conductor and outer surface of the cable and as well as from the heat emission to the surroundings.

The following recommended values are the current carrying capacity of cables for laying in earth and in air at normal operating conditions. Hints for the deviated operating conditions, see DIN VDE 0298 table 4 and DIN VDE 0276 part 603 and part 1000.

Indications for Calculation

• For laying in earth

- Deviating operating conditions with both conversion factors are to be considered, as these depend on both of specific heat-resistance and the grade of load.
- EVU-load (load grade) is the maximum load factor of 0,7. The conversion factors for the load grades 0,5, 0,6, 0,85 and 1,0 are to be taken in tables DIN VDE 0276 part 603 and part 1000. Intermediate values can be interpolated (1,0 used for permanent load).
- Laying depth 0,7 m. The load capacity decreases with increasing of the laying depth. Usual depth of laying is 0,7 to 1,2 m.
- As normal value of the specific ground thermal resistivity in moist areas is selected with $1,0 \text{ K} \cdot \text{m/W}$. For dry areas the choiced value is $2,5 \text{ K} \cdot \text{m/W}$, under consideration of the applied usual bedding materials of sands.
- For favourable ground conditions or with thermal resisted bedding materials, lower value under well consolidation can be achieved. For individual case, the values and upon that the resulted current carrying loads are to be determined.

• For laying in air

- The values stated in the tables for outdoor laying in the air are defined for permanent operation.
- The arrangement of the cables is corresponded the presentation in table 3, DIN VDE 0276 part 1000.
- Conversion factors for other laying conditions and the heaping of cables are shown in table 10 and 11, DIN VDE 0276 part 1000.
- The current carrying capacities of multi-core cables can be calculated by using the current load value for 3-core cables according to table 13 with help of the conversion factors.
- By using the cable channels or cable board underlays etc. the air temperature will be increased. In this case the conversion factors according to table 12 for deviating air temperature should be used.
- For outdoor installation in air, the ambient temperature is based on 30°C .

- Radiation of heats and solar influence must be taken into consideration, where a good air circulation is needed.

- A sufficient large distance is to retain between the cables and the heating elements, because badly insulated heating elements often raise additionally the temperature of the cable.

- Distance between the cable from the wall, floor or ceiling = 2 cm

- Distance between the cables being laid one above the other = $2 \times D$

- Distance between the cable systems being laid one above the other = 20 cm

- Distance between the cables being laid side by side = $2 \times D$

• Specific ground thermal resistivity

- very moist area = $0,7 \text{ K} \cdot \text{m/W}$
- moist area = $1,0 \text{ K} \cdot \text{m/W}$
- dry area = $2,0 \text{ K} \cdot \text{m/W}$
- very dry area = $3,0 \text{ K} \cdot \text{m/W}$

Installation Methods and Operating Conditions

- Power cables and insulated wires for fixed installation -

Installation method type A1

- Single core cables in insulation tube in a thermally insulated wall.

Installation method A2

- Multicore cables or multicore plastic sheathed cables in the insulation tube in a thermally insulated wall, whereby the walls for the methods of installation employed comprise an outer weatherproof board, thermal insulation and an inner board of wood or materials similar to wood, having a temperature lag of $0,1 \text{ m}^2 \cdot \text{K/W}$. The plastic or metal insulation tube is mounted such that this is very close to the inner wall without actually being in contact with the wall.

Installation method B1

- Single core cables in insulation tube on a wooden wall.

Installation method B2

- Multicore cables or multicore plastic-sheathed cables in insulation tube on a wooden wall.

For both installation methods, the insulation tube must be secured such that the space between conduit and the wall surface is less than 0,3 times the diameter of the insulation tube. The plastic or metal insulation tube can be installed directly on the masonry construction or plastered surface, whereby the current carrying capacity of the cables or wires can then be higher.

This problem is still being investigated by CENELEC.

Installation method C

- Single core or multicore cables, or single core or multicore plastic-sheathed cables, on a wooden wall.

The cables or insulated wires shall be mounted such that the space from the wall surface is less than 0,3 times the outer diameter of the cable or insulated wire. The current carrying capacity can be increased when installed directly on or in the masonry construction as well as underneath the plaster.

This problem is still being investigated by CENELEC.

Installation methods E, F and G

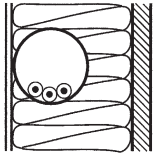
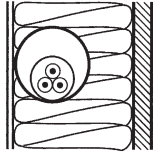

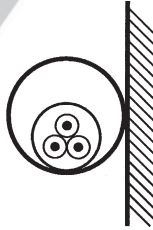
- Single core or multicore cables, or single core or multicore plastic-sheathed cables, installed in the open air.

The cable or insulated wire shall be installed such that the dissipation of heat is not impeded, whereby allowance shall be made for heating by other sources and for irradiation by sunshine. Natural convection shall not be obstructed. The space from the cable or insulated wire by each bordering surface shall be 0,3 times that of the outside diameter. A space equal to that of the outside diameter is sufficient for single core cables and plastic-sheathed wires in order to meet the current carrying requirements for an installation in the open-air.

Current ratings for installation A1, A2, B1 and B2

Cables for fixed installation within buildings

Operating temperature at conductor 70°C; Ambient temperature 30°C

Type Designation	H07V-U, -R, -K H07V3-U, -R, -K		NYM, NYMZ, NYMT NHYRUZY, NYBUY NYDY N05VV-U, N05VV-R NHXMH NYY, NYCY ¹⁾		H07V-U, -R, -K H07V3-U, -R, -K		NYM, NYMZ, NYMT NHYRUZY, NYBUY NYDY N05VV-U, N05VV-R NHXMH NYY, NYCY ¹⁾	
Installation: • in thermally insulated walls • in insulating tubes	Single core cables in insulating tubes, in a thermally insulated walls		Multicore sheathed cables in insulating tubes, in a thermally insulated walls		Single core cables in insulating tubes on a wall		Multicore cables or multicore sheathed cables in insulating tubes on a wall	
								
	Installation in thermally insulated walls				Installation in insulating tubes			
Installation method ²⁾	A1		A2		B1		B2	
Nuber of loaded cores	2	3	2	3	2	3	2	3
Cross-section, mm ²	Current ratings in Ampere (A)							
1,5	15,5 ³⁾	13,5	15,5 ³⁾	13,0	17,5	15,5	16,5	15,0
2,5	19,5	18,0	18,5	17,5	24	21	23	20
4	26	24	25	23	32	28	30	27
6	34	31	32	29	41	36	38	34
10	46	42	43	39	57	50	52	46
10	-	-	-	-	-	-	-	47,17 ⁴⁾
16	61	56	57	52	76	68	69	62
25	80	73	75	68	101	89	90	80
35	99	89	92	83	125	110	111	99
50	119	108	110	99	151	134	133	118
70	151	136	139	125	192	171	168	149
95	182	164	167	150	232	207	201	179
120	210	188	192	172	269	239	232	206
150	240	216	219	196	-	-	-	-
185	273	245	248	223	-	-	-	-
240	320	286	291	261	-	-	-	-
300	367	328	334	298	-	-	-	-

Conversion factors for deviating ambient temperature, grouping, installation under the ceiling, multicore cables and insulated wires – see DIN VDE 0298 part 4.

¹⁾ The current ratings are valid for cables with concentric conductor, only for multicore versions

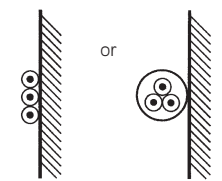
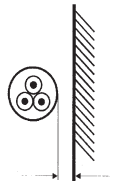
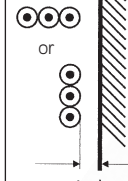
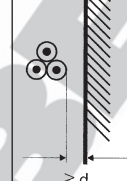
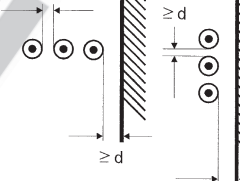
²⁾ for further installation methods – see DIN VDE 0298 part 4

³⁾ see DIN VDE 0298 part 4

⁴⁾ not permitted for the installation on a wooden wall and not for application of the conversion factors, see DIN VDE 0298 part 4

Current ratings for installation conditions C, E, F and G Cabel for fixed installation within buildings

Operating temperature at conductor 70°C; Ambient temperature 30°C

Type designation	NYM, NYMZ, NYMT, NYIF, NYIFY NHYRUZY, NYBUY, NYDY N05VV-U, N05VV-R NHXMH, NYY, NYCY ¹⁾				NYY				
Installation: • directly • in open air	Singlecore or multicore cables or single or multicore sheathed cables on a wall		Multicore cables or multicore sheathed cables with a space of minimum 0,3 x diameter d to wall		Single core cables or single core sheathed cables with a space of minimum 1 x diameter d to wall				
									
	direct installation		installation in open air						
installation method ²⁾	C		E		F			G	
Number of loaded cores	2	3	2	3	2	3			
Cross-section, mm ²	Current ratings in Ampere (A)								
1,5	19,5	17,5	22	18,5	-	-	-	-	-
2,5	27	24	30	25	-	-	-	-	-
4	36	32	40	34	-	-	-	-	-
4	-	33,02 ³⁾	-	-	-	-	-	-	-
6	46	41	51	43	-	-	-	-	-
10	63	57	70	60	-	-	-	-	-
10	-	59,43 ³⁾	-	-	-	-	-	-	-
16	85	76	94	80	-	-	-	-	-
25	112	96	119	101	131	114	110	146	130
35	138	119	148	126	162	143	137	181	162
50	168	144	180	153	196	174	167	219	197
70	213	184	232	196	251	225	216	281	254
95	258	223	282	238	304	275	264	341	311
120	299	259	328	276	352	321	308	396	362
150	344	299	379	319	406	372	356	456	419
185	392	341	434	364	463	427	409	521	480
240	461	403	514	430	546	507	485	615	569
300	530	464	593	497	629	587	561	709	659
400	-	-	-	-	754	689	656	852	795
500	-	-	-	-	868	789	749	982	920
630	-	-	-	-	1005	905	855	1138	1070

Conversion factors for deviating ambient temperature, grouping, installation under the ceiling, multicore cables and insulated wires see DIN VDE 0298 part 4.

¹⁾ The current ratings are valid for cables with concentric conductor, only for multicore versions

²⁾ for further installation methods – see DIN VDE 0298 part 4

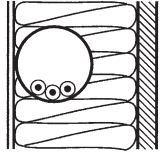
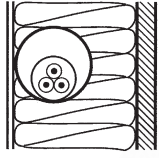
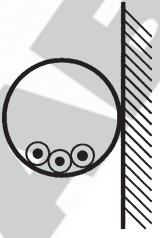
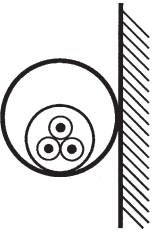
³⁾ see DIN VDE 0298 part 4

Current ratings for installation conditions

Cables for fixed installation within buildings

A1, A2, B1 and B2

Operating temperature at Conductor 90°C; Ambient temperature 30°C

Type designation	H07V2-U, -K NHXA, NHXAF H07Z-U, -R, -K	NI2XY, N2XY, N2X2Y N2XH, N2XCH NHXHX FE180 NHXCHX FE180 NHXH FE180 NHXCH FE180 NHXHX, NHXCHX	H07V2-U, -K NHXA, NHXAF H07Z-U, -R, -K	NI2XY, N2XY, N2X2Y N2XH, N2XCH NHXHX FE180 NHXCHX FE180 NHXH FE180 NHXCH FE180 NHXHX, NHXCHX				
Installation: • in thermally insulated walls • in insulating tubes	Single core cables in insulating tubes in a thermally insulated walls	Multicore sheathed cables in insulating tubes, in a thermally insulated walls	Single core cables in insulating tubes on a wall	Multicore cables or multicore sheathed cables in insulating tubes on a wall				
								
	Installation in thermally insulated walls		Installation in insulating tubes					
Installation method ¹⁾	A1		A2		B1		B2	
Number of loaded cores	2	3	2	3	2	3	2	3
Cross-section, mm ²	Current ratings in Ampere (A)							
1,5	19,0	17,0	18,5	16,5	23	20	22	19,5
2,5	26	23	25	22	31	28	30	26
4	35	31	33	30	42	37	40	35
6	45	40	42	38	54	48	51	44
10	61	54	57	51	75	66	69	60
16	81	73	76	68	100	88	91	80
25	106	95	99	89	133	117	119	105
35	131	117	121	109	164	144	146	128
50	158	141	145	130	198	175	175	154
70	200	179	183	164	253	222	221	194
95	241	216	220	197	306	269	265	233
120	278	249	253	227	354	312	305	268
150	318	285	290	259	–	–	–	–
185	362	324	329	295	–	–	–	–
240	424	380	386	346	–	–	–	–
300	486	435	442	396	–	–	–	–

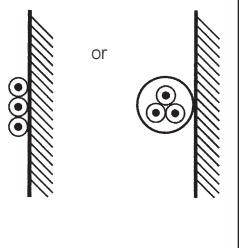
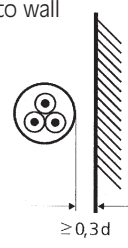
Conversion factors for deviating ambient temperature, grouping, installation under the ceiling, multicore cables and insulated wires – see DIN VDE 0298 part 4 .

¹⁾ for further installation conditions – see DIN VDE 0298 part 4

Current ratings for installation conditions

Cables for fixed installation within buildings C, E, F and G

Operating temperature at conductor 90°C; Ambient temperature 30°C

Type designation	Nl2XY, N2XY, N2X2Y N2XH, N2XCH ¹⁾ NHXH FE180, NHXCH FE180 ¹⁾ NHXH FE180, NHXCH FE180 ¹⁾ NHXH, NHXCH ¹⁾				Nl2XY, N2XY, N2X2Y N2XH NHXH FE180 NHXH FE180 NHXH				
Installation: ● directly ● in open air	Singlecore or multicore cables or single or multicore sheathed cables on a wall		Multicore cables or multicore sheathed cables with a space of minimum 0,3 x diameter d to wall		Single core cables or single core sheathed cables with a space of minimum 1 x diameter d to wall				
					with contact		with gap d		
	direct installation		installation in open air						
Installation method ²⁾	C		E		F		G		
Number of loaded cores	2	3	2	3	2	3			
Cross-section, mm ²	Current ratings in Ampere (A)								
1,5	24	22	26	23	–	–	–	–	–
2,5	33	30	36	32	–	–	–	–	–
4	45	40	49	42	–	–	–	–	–
6	58	52	63	54	–	–	–	–	–
10	80	71	86	75	–	–	–	–	–
16	107	96	115	100	–	–	–	–	–
25	138	119	149	127	161	141	135	182	161
35	171	147	185	158	200	176	169	226	201
50	209	179	225	192	242	216	207	275	246
70	269	229	289	246	310	279	268	353	318
95	328	278	352	298	377	342	328	430	389
120	382	322	410	346	437	400	383	500	454
150	441	371	473	399	504	464	444	577	527
185	506	424	542	456	575	533	510	661	605
240	599	500	641	538	679	634	607	781	719
300	693	576	741	621	783	736	703	902	833
400	–	–	–	–	940	868	823	1085	1008
500	–	–	–	–	1083	998	946	1253	1169
630	–	–	–	–	1254	1151	1088	1454	1362

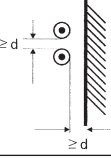
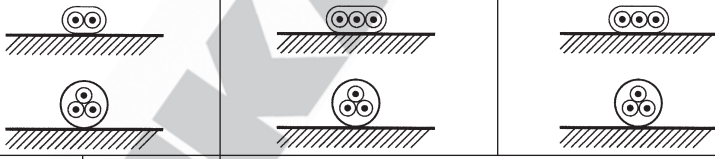
Conversion factors for deviating ambient temperature, grouping, installation under the ceiling, multicore cables and insulated wires see DIN VDE 0298 part 4.

¹⁾ The current ratings are valid for cables with concentric conductor, only for multicore versions

²⁾ for further installation methods – see DIN VDE 0298 part 4

Current ratings for cables and insulated wires up to 1000 V and heat resistant cables

Permissible operating temperature at conductor 40°C to 180°C as per type Ambient temperature 30°C to 150°C, as per type

Type designation	H05V-U, -K H07V-U, -R, -K H07V3-U, -R, -K N05XAFX, N07XAFX NFYW H05RN-F, H07RN-F H05V2-U, H05V2-K H07V2-U, H07V2-K H05Z-U H07Z-U, -R, -K NHXA, NHXAF H05G-U, H05G-K H07G-U, -R, -K N7YA, N7YAF N2GFA, N2GFAF H05S-U, H05S-K H05SJ-K, A05SJ-U, -K H07ZZ-F	H03RT-F, A03RT-F H05RR-F, A05RR-F, A05RRT-F H05RN-F, A05RN-F H05RNH2-F H07RN-F, A07RN-F H03VH-Y ¹⁾ , H03VH-H H03VV-F, A03VV-F, H03VVH2-F H05VV-F, A05VV-F, H05VVH2-F H03VVH8-F H03VVH2H8-F H05VVH8-F H05VVH2H8-F H07ZZ-F ²⁾	NPL, NMHCÖU, NYMHYV NSHCÖU, NGFLGÖU, NSHTÖU H05RTD5-F, H05RND5-F H05RTD3-F, H05RND3-F H07RTD5-F, H07RND5-F H07RTD3-F, H07RND3-F H07RN-F, A07RN-F NYMH11YÖ, NGMH11YÖ H05VVH6-F, H05VVD3H6-F H07VVH6-F, H07VVD3H6-F A07VVH6-F, A07VVD3H6-F NXMHX H05VV5-F, H05VVC4V5-K NYSLY, NYSLYCY NLSY, NLSCY NSY, NSCY NYPLYW, NYFAZW N2GSA, N2GMH2G	JZ-500, -JB, -OZ, -OB JZ-600, -CY, JZ-750 SY-JZ, -JB JZ-602, -CY, -RC, -RC-CY JZ-HF, -CY, PURö -JZ F-C-PURö-JZ, Yö-C-PURö-JZ PUR-750, PURö-JZ-HF, -CY MULTIFLEX 512 PUR, C-PUR PUR-ORANGE, YELLOW PUR-C-PUR TRONIC (≤ 0,5mm ²) TRONIC-CY (≤ 0,5mm ²) F-CY-JZ, -OZ, Y-CY-JZ THERM 120 JZ-500 HMH, -C BAUFLEX, MULTIFLEX-PLUS Lift-Hoist cable Lift-2S, PVC-Flat, -CY NEO-Flat, -CY TOPSERV®, TOPFLEX	
Installation: ● in open air ● upon or on surface	in open air 	upon or on surface 			
Number of loaded cores	1	2	3	2 or 3	
Cross-section, mm ²	Current ratings in Ampere (A)				
0,5	–	3	3	~9	9
0,75	15	6	6	12	12
1	19	10	10	15	15
1,5	24	16	16	18	18
2,5	32	25	20	26	26
4	42	32	25	34	34
6	54	40	–	44	44
10	73	63	–	61	61
16	98	–	–	82	82
25	129	–	–	108	108
35	158	–	–	135	135
50	198	–	–	168	168
70	245	–	–	207	207
95	292	–	–	250	250
120	344	–	–	292	292
150	391	–	–	335	335
185	448	–	–	382	382
240	528	–	–	453	453
300	608	–	–	523	523
400	726	–	–	–	–
500	830	–	–	–	–

Conversion factors for deviating ambient temperature, grouping, installation under the ceiling, multicore cables and insulated wires – see DIN VDE 0298 part 4.


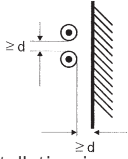
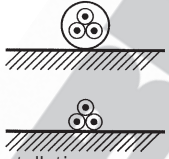
¹⁾ Nominal cross-sectional area 0,1 mm², loadable with 0,2 A, independent of the ambient temperature

²⁾ The current ratings are valid for the application of household equipment conductor cross-section ≤ 0,34 mm² – see table page X 28

Current ratings for cables $\leq 0,6/1\text{kV}$

Special rubber-insulated single core cables, multicore rubber cables and trailing cables

Operating temperature at conductor 90°C (80°C); Ambient temperature 30°C

Type designation	NSGAÖU, NSGAFÖU NSHXAÖ, NSHXAFÖ ¹⁾	NSGAÖU, NSGAFÖU NSGAFÖMÖU NSHXAÖ, NSHXAFÖ NSHXAFÖMÖ ¹⁾	NSSHÖU NT...	NT... 
Nominal voltage	0,6/1 kV and 1,8/3 kV	3,6/6 kV	up to 6/10 kV	$\geq 6/10$ kV
Permissible operating temperature at conductor	90°C		-	
Recommended operating temperature	-		80°C	
Installation: ● in open air ● upon or on surface	 Installation in open air		 Installation upon or on surface	
Number of loaded cores	1	1	3	3
Cross-section, mm ²	Current ratings in Ampere (A)			
1,5	30	32	-	-
2,5	41	43	30	-
4	55	56	41	-
6	70	71	53	-
10	98	99	74	-
16	132	133	99	105
25	176	174	131	139
35	218	215	162	172
50	276	270	202	215
70	347	338	250	265
95	416	403	301	319
120	488	473	352	371
150	566	546	404	428
185	644	622	461	488
240	775	-	540	-
300	898	-	-	-

Conversion factors for deviating ambient temperature, grouping, installation under the ceiling, multicore cables and insulated wires – see DIN VDE 0298 part 4.

¹⁾ – when a bunched installation with single cores or multi-cored cables are used on floor the conversion factors for the rating values should be considered – see table page X 34
 factor 0,76 for one-phase a.c. and direct current circuits or
 factor 0,67 for three-phase circuits, is to be multiplied.
 – when a bunched installation with single cores or multi-cored cables are used in open air, or cable trays, the conversion factors for the rating values should be considered – see table in page X 36
 factor 0,8 for one-phase a.c. and direct current circuits or
 factor 0,7 for three-phase circuits, is to be multiplied.
 – when a bunched installation with single cores or multi-cored cables are used in insulating tubes or conduits, the conversion factors for the rating values should be considered – see table page X 34
 factor 0,61 for one-phase a.c. and direct current circuits or
 factor 0,54 for three-phase circuits, is to be multiplied.

Current ratings (general) for flexible cables, for non-existing cable types in the previous tables

The indicated values stated in the following table considered as guiding values in an abbreviate form, extracted from DIN VDE 0298 part 4 and DIN VDE 0100 part 430. In critical situation the DIN VDE recommendations should be considered. For industrial machines the DIN VDE 0113, part 1 (EN 60204 part 1/IEC 204-1) is valid; for telephone and information systems DIN VDE 0891 part 1; for telephone aerial cables DIN VDE 0891 part 8 and for flat cables DIN VDE 0891 part 10. General terms and recommended values are contained in DIN VDE 0298 part 2 and part 4.

Power rating values for 1,5–120 mm² (group 3 up to 35 mm²) according to DIN VDE 0100 part 430 at an

Ambient temperature up to 30°C

Nominal cross-section mm ²	Group 1		Group 2		Group 3	
	power rating	protective fuse	power rating	protective fuse	power rating	protective fuse
	A	A	A	A	A	A
0,05	1	–	1	–	2	–
0,14	2	–	2	–	3,5	–
0,25	4	–	4,5	–	6	–
0,34	6	–	6	–	9	–
0,5	9	–	9	–	12	–
0,75	12	–	12	10	15	10
1	15	10	15	10	19	16
1,5	18	16	18	16	24	20
2,5	26	25	26	25	32	25
4	34	25	34	25	42	35
6	44	35	44	35	54	50
10	61	50	61	50	73	63
16	82	80	82	63	98	80
25	108	100	108	80	129	100
35	135	125	135	100	158	125
50	168	160	168	125	198	160
70	207	200	207	160	245	200
95	250	250	250	200	292	250
120	292	250	292	250	344	315
150	335	315	335	315	391	355
185	382	355	382	355	448	400
240	–	–	453	425	528	500
300	–	–	523	500	608	600
400	–	–	–	–	726	630

group 1 One or more single core cables and insulated wires laid in duct i. e. PVC-sheathed single cores H 03V. ./H 05V. ./H 07V. according to VDE 0281.

group 2 Multi core cables, i. e. light PVC-sheathed cables, flexible cables, metal-clad wiring cables in open or ventilated conduits.

group 3 Single core cables, laid open in air with a spacing at least equal to cable diameter, such as single core wirings for switch- and distribution cabinets and rail line distributors.

Conversion factors*) for deviating ambient temperatures:

Ambient temperature over 30°C

Ambient temperature °C	Conversion factors, applied to the above current ratings table	
	Rubber insulation Permissible operating temp. at conductor Conversion factors up to 60°C	PVC insulation Permissible operating temp. at conductor Conversion factors up to 70°C
over 30 bis 35	0,91	0,94
over 35 bis 40	0,82	0,87
over 40 bis 45	0,71	0,79
over 45 bis 50	0,58	0,71
over 50 bis 55	0,41	0,61
over 55 bis 60	–	0,50
over 60 bis 65	–	0,35

Ambient temperature over 50°C (heat-resistant)



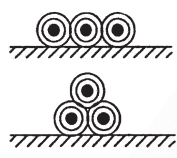

Permissible operating temperature at conductor Conversion factors up to 90°C	Conversion factors, applied to the above current ratings table		
	Permissible operating temperature at conductor Conversion factors up to 110°C	Permissible operating temperature at conductor Conversion factors up to 110°C	
over 50 bis 55	0,94	over 50 bis 55	1,00
over 55 bis 60	0,87	over 55 bis 60	1,00
over 60 bis 65	0,79	over 60 bis 65	1,00
over 65 bis 70	0,71	over 65 bis 70	1,00
over 70 bis 75	0,61	over 70 bis 75	1,00
over 75 bis 80	0,50	over 75 bis 80	1,00
over 80 bis 85	0,35	over 80 bis 85	0,91
over 85 bis 90	–	over 85 bis 90	0,82
		over 90 bis 95	0,71
		over 95 bis 100	0,58
		over 100 bis 105	0,41
		over 105 bis 110	–

* Further informations see page X 35.

Current ratings for HELUTHERM® 145

For permanent operating to the ambient temperature of 30° C. Conversion factors for the deviating site operation conditions – see tables below.

Sufficiently large or ventilated rooms in which the ambient temperature is not noticeably increased by the heat losses from the cables. Protection should be taken from the solar radiation etc.

Installation				
	in open air	on face without inter-contact	on surface with inter-contact	in tubes, conduites, cabinets
Conversion factors for grouping	–	to table 1	to table 2	to table 3
Cross-section, mm ²	Current ratings in Ampere (A) up to 30° C ambient temperature			
0,25	13	12	9	7
0,33	17	15	11	9
0,50	19	18	12	10
0,75	24	23	17	13
1,0	31	30	20	17
1,5	39	36	25	20
2,5	51	48	33	26
4	68	65	45	36
6	88	84	58	46
10	121	116	80	64
16	160	152	106	85
25	211	200	140	111
35	261	248	172	138
50	320	304	211	169
70	411	391	272	217
95	502	476	331	265
120	587	558	387	310
150	680	646	449	359
185	781	743	516	413
240	931	884	614	492

Conversion factors for grouping

Number of single core cables for 2-phase or 3-phase systems		1	2	3	4	5	6	7	8	9	10	12
Table 1	Factor	1,00	0,94	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90
Table 2	Factor	1,00	0,85	0,79	0,75	0,73	0,72	0,72	0,71	0,70	–	–
Table 3	Factor	1,00	0,80	0,70	0,65	0,60	0,57	0,54	0,52	0,50	0,48	0,45

Conversion factors for deviating ambient temperatures

Temperature in °C	20	30	40	50	60	70	80	90	95	100	105	110	115
Factor	1,05	1,00	0,94	0,88	0,82	0,75	0,67	0,58	0,53	0,47	0,41	0,35	0,24

Current ratings for silicone cables and wires

The indicated values stated in the following table are considered as guiding values. These are to be selected each particularly for the individual application.

Heat-resistance at an ambient **temperature up to 150°C**

Nominal-cross-section	Group 1		Group 2		Group 3	
	current-carrying capacity A	protective fuse A	current-carrying capacity A	protective fuse A	current-carrying capacity A	protective fuse A
0,25	2,8	–	–	–	5	–
0,5	6	–	7	–	10	–
0,75	9	6	12	6	15	10
1,0	12	10	15	10	19	20
1,5	16	16	18	16	24	25
2,5	21	20	26	25	32	35
4	28	25	34	35	42	50
6	36	35	44	50	54	63
10	49	50	61	63	73	80
16	65	63	82	80	98	100
25	85	83	108	100	129	125
35	105	100	135	–	158	160
50	140	125	168	–	198	200
70	175	160	207	–	245	250
95	210	200	250	–	292	300
120	250	250	292	–	344	335
150	–	–	335	–	391	–
185	–	–	382	–	448	–
240	–	–	453	–	528	–
300	–	–	523	–	608	–

Group 1: One or more single core cables laid in duct.

Group 2: Multicore cables, flexible cables laid in open or ventilated conduits.

Group 3: Single core cables laid in open air with a spacing at least equal to cable diameter.

Power ratings for











ambient temperature over 150°C

The following conversion factors are valid:

Temperature °C	current-carrying capacity values in %
up to 150	100
over 150 to 155	91
over 155 to 160	82
over 160 to 165	71
over 165 to 170	58
over 170 to 175	41











Current ratings for NYY, NAYY, NYCY, NYCWY, NAYCWY 0,6/1 kV

Current carrying capacity in Ampere (A), laying **in ground** (20°C) according to DIN VDE 0276 part 603, cyclic loading, load factor 0,7 ²⁾

Nominal Cross- section mm ²	Copper conductor					Aluminium conductor				
	NYY			NYCWY		NAYY			NAYCWY	
										
1,5	30	27	41	31	27	-	-	-	-	-
2,5	39	36	55	40	36	-	-	-	-	-
4	50	47	71	51	47	-	-	-	-	-
6	62	59	90	63	59	-	-	-	-	-
10	83	79	124	84	79	-	-	-	-	-
16	107	102	160	108	102	-	-	-	-	-
25	138	133	208	139	133	106	102	160	108	103
35	164	159	250	166	160	127	123	193	129	123
50	195	188	296	196	190	151	144	230	153	145
70	238	232	365	238	234	185	179	283	187	180
95	286	280	438	281	280	222	215	340	223	216
120	325	318	501	315	319	253	245	389	252	246
150	365	359	563	347	357	284	275	436	280	276
185	413	406	639	385	402	322	313	496	314	313
240	479	473	746	432	463	375	364	578	358	362
300	541	535	848	473	518	425	419	656	397	415
400	614	613	975	521	579	487	484	756	441	474
500	693	687	1125	574	624	558	553	873	489	528
630	777	-	1304	636	-	635	-	1011	539	-
800	859	-	1507	-	-	716	-	1166	-	-
1000	936	-	1715	-	-	796	-	1332	-	-

¹⁾ Rated current for direct current systems with a far-distanced return conductor

Current carrying capacity in Ampere (A), laying **in air** (30°C)

Nominal Cross- section, mm ²	Copper conductor					Aluminium conductor				
	NYY			NYCWY		NAYY			NAYCWY	
										
1,5	21	19,5	27	22	19,5	-	-	-	-	-
2,5	28	25	35	29	26	-	-	-	-	-
4	37	34	47	39	34	-	-	-	-	-
6	47	43	59	49	44	-	-	-	-	-
10	64	59	81	67	60	-	-	-	-	-
16	84	79	107	89	80	-	-	-	-	-
25	114	106	144	119	108	87	82	110	91	83
35	139	129	176	146	132	107	100	135	112	101
50	169	157	214	177	160	131	119	166	137	121
70	213	199	270	221	202	166	152	210	173	155
95	264	246	334	270	249	205	186	259	212	189
120	307	285	389	310	289	239	216	302	247	220
150	352	326	446	350	329	273	246	345	280	249
185	406	374	516	399	377	317	285	401	321	287
240	483	445	618	462	443	378	338	479	374	339
300	557	511	717	519	504	437	400	555	426	401
400	646	597	843	583	577	513	472	653	488	468
500	747	669	994	657	626	600	539	772	556	524
630	858	-	1180	744	-	701	-	915	628	-
800	971	-	1396	-	-	809	-	1080	-	-
1000	1078	-	1620	-	-	916	-	1258	-	-

¹⁾ Rated current for direct current systems with a far-distanced return conductor

²⁾ Definition of load factor s. DIN VDE 0276 part 603, table 16

Conversion factors for multicore cable (≥ 5 cores)












The conversion factors are to be used for laying the cables in ground or in air, to the values given in above tables.

Number of loaded cores n	laying in ground f	laying in air f
5	0,70	0,75
7	0,60	0,65
10	0,50	0,55
14	0,45	0,50
19	0,40	0,45
24	0,35	0,40
40	0,30	0,35
61	0,25	0,30

Note: valid for cross-section 1,5 to 10 mm²

Current ratings for N2XY, NA2XY, N2XCY, NA2XCY 0,6/1 kV












Current carrying capacity in Ampere (A), laying in **ground** (20°C), cyclical movement load factor 0,7.

Insulation material		VPE									
Permissible operating temperature		90 °C									
Nominal-Cross-section in mm ²	N2XY			N2XCY			NA2XY			NA2XCY	
											
	Copper conductor, rated current in A						Aluminium conductor, rated current in A				
1,5	33	31	48	33	31	-	-	-	-	-	
2,5	42	40	63	43	40	-	-	-	-	-	
4	54	52	82	55	52	-	-	-	-	-	
6	67	64	102	68	65	-	-	-	-	-	
10	89	86	136	91	87	-	-	-	-	-	
16	115	112	176	117	113	-	-	-	-	-	
25	148	145	229	150	146	114	112	177	116	113	
35	177	174	275	179	176	136	135	212	138	136	
50	209	206	326	211	208	162	158	252	164	159	
70	256	254	400	257	256	199	196	310	201	197	
95	307	305	480	304	307	238	234	372	240	236	
120	349	348	548	341	349	272	268	425	272	269	
150	393	392	616	377	391	305	300	476	303	302	
185	445	444	698	418	442	347	342	541	340	342	
240	517	517	815	469	509	404	398	631	387	397	
300	583	585	927	514	569	457	457	716	430	454	
400	663	671	1064	565	637	525	529	825	479	520	
500	749	758	1227	623	691	601	609	952	531	584	
630	843	-	1421	690	-	687	-	1102	587	-	
800	935	-	1638	-	-	776	-	1267	-	-	
1000	1023	-	1869	-	-	865	-	1448	-	-	

¹⁾ Rated current in direct current systems with remote return conductor

²⁾ Definition of load factor DIN VDE 0276 part 603.

Current carrying capacity in Ampere (A), laying in **air** (30°C)

Insulation material		VPE									
Permissible operating temperature		90 °C									
Nominal-Cross-section in mm ²	N2XY			N2XCY			NA2XY			NA2XCY	
											
	Copper conductor, rated current in A						Aluminium conductor, rated current in A				
1,5	26	25	33	27	25	-	-	-	-	-	
2,5	34	32	43	36	33	-	-	-	-	-	
4	44	42	57	47	43	-	-	-	-	-	
6	56	53	72	59	54	-	-	-	-	-	
10	77	74	99	81	75	-	-	-	-	-	
16	102	98	131	109	100	-	-	-	-	-	
25	138	133	177	146	136	106	102	136	112	104	
35	170	162	217	179	165	130	126	166	137	128	
50	207	197	265	218	201	161	149	205	169	152	
70	263	250	336	275	255	204	191	260	214	194	
95	325	308	415	336	314	252	234	321	263	239	
120	380	359	485	388	364	295	273	376	308	278	
150	437	412	557	438	416	339	311	431	349	316	
185	507	475	646	501	480	395	360	501	401	365	
240	604	564	774	580	565	472	427	600	469	430	
300	697	649	901	654	643	547	507	696	535	506	
400	811	761	1060	733	737	643	600	821	615	575	
500	940	866	1252	825	807	754	695	971	700	682	
630	1083	-	1486	934	-	882	-	1151	790	-	
800	1228	-	1751	-	-	1019	-	1355	-	-	
1000	1368	-	2039	-	-	1157	-	1580	-	-	

¹⁾ Rated current in direct current systems with remote return conductor

Current carrying capacity for NYKY 0,6/1 kV

The guidelines for current carrying capacities of copper and aluminium are valid DIN VDE 0265 and 0276 part 1000.

The current carrying capacity of a cable should be limited in such a degree that at all locations in a cable system which causes the generated heats under given proportions to lead safely in the environment. The heat flow depends on the inner heat-resistance between conductor and outer surface of the cable and as well as from the heat emission to the surroundings.

For cables laid in earth, the assumption for the calculation are chosen in a way that the given values for current loading at normal operation can be used in most of the cases **without conversion**.

For single cables laid directly in earth at EVU-Loading and a specific earth heat-resistance of 100 K · cm/W, mostly of the soil conditions are to be taken into consideration.

Calculation basis

EVU-load (current loading grade)	0,7 (1,0 for air)
Specific earth heat-resistance	100 K · cm/W
Specific heat-resistance of the insulation and sheath	600 K · cm/W
Bedding depth in earth	0,7 m
Earth temperature	20° C
Ambient temperature in the air	30° C

Current carrying capacity of 3-, 4- and multicore (5 cores and more) cables at ambient temperature of 20°C in earth, 30°C for the air.

Current carrying capacity in ampere (A):

cross-section mm ²	3- and 4-core cable		5- to 61-core cable	
	Earth A	Air A	Earth A	Air A
1,5	28	18,5	Number of loading cores and the conversion factors from 1,5 to 10 mm ² see the following table	
2,5	37	27		
4	48	36		
6	60	45		
10	80	62		
16	103	81		
25	134	110		
35	162	134		
50	192	163		
70	235	205		
95	283	253		
120	323	294		
150	363	334		
185	412	386		
240	478	457		
300	542	529		
400	615	610		

Current loading for multicore cables (5 cores and more)

The current loading of each core for cables with a conductor cross-section of 1,5 to 10 mm², depends on the number of cores and the number of loaded cores respectively and is calculated by means of the following conversion factors.

The conversion factors according to the number of loaded cores are to be multiplied with the loading values of the above table.

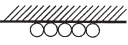
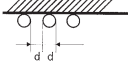
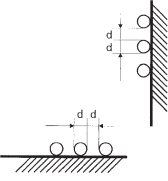
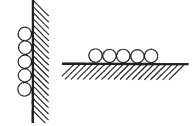
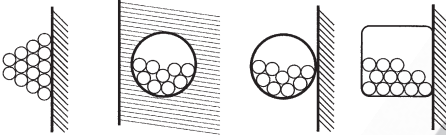
Number of loading conductors	Conversion factors for the value to 1,5 to 10 mm ² of the above table	
	Earth	Air
5	0,70	0,75
7	0,60	0,65
10	0,50	0,55
14	0,45	0,50
19	0,40	0,45
24	0,35	0,40
40	0,30	0,35
61	0,25	0,30

Note

During the installation in earth or in the air, for the operation and the laying performance occur any deviations or unfavourable relations (e. g. bundling of cables, in the wall, under plaster, on the wall or on trays, on cable troughs or on cable racks), the specified conversion factors to DIN VDE 0276 part 1000 table 12 and 13 must be taken into consideration.

Current ratings – Conversion factors

for grouping on the wall, on the floor, in insulation tubes or in conduit and under the ceiling

Number of multicore cables or number of a.c. or 3-phase circuits of single core cables	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20
Installation method	Conversion factors														
One layer under the ceiling with contact 	0,95	0,81	0,72	0,68	0,66	0,64	0,63	0,62	0,61	0,61	0,61	0,61	0,61	0,61	0,61
One layer under the ceiling, with a space equal to the outer diameter d 	0,95	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85
One layer on the wall or on the floor with a space equal to the outer diameter d 	1,00	0,94	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90	0,90
One layer on the wall or on the floor with contact 	1,00	0,85	0,79	0,75	0,73	0,72	0,72	0,71	0,70	0,70	0,70	0,70	0,70	0,70	0,70
Bunched directly on the wall, on the floor, in insulating tubes or trunking or in the wall 	1,00	0,80	0,70	0,65	0,60	0,57	0,54	0,52	0,50	0,48	0,45	0,43	0,41	0,39	0,38

○ Symbol for one single core or one multicore cable

*Conversion factors for multicore cables (≤ 5 cores), Conductor cross-section from 1,5 to 10 mm²

Number of loaded cores	Conversion factors for the values of 1,5 to 10 mm ² to the belonging table	
	Earth	Air
5	0,7	0,75
7	0,6	0,65
10	0,5	0,55
14	0,45	0,5
19	0,4	0,45
24	0,35	0,4
40	0,3	0,35
61	0,25	0,3

*For other conditions e.g. ground temperature, grouping, load factor, thermal resistance, the rating factors should be calculated according to DIN VDE 0276 part1000.

Notes:

- when these factors are to be applied for the calculation of power ratings, the same type of cables and with equal loaded cores in the same installation method shall correspond. At the same time the cross-section are permitted to differ maximum one grade of cross-section.
 - If the actual horizontal-space between the adjacent cables is more than double of the outer diameter, no reduction factor is necessary.
 - The same reduction factors are to be applied for grouping of two or three-core or multicore cables. For a system consisting of two or as well as three-core cables, firstly the total number of cables will be assumed as the number of circuits. For that the applicable factor is to be used either in the tables for two-cores loaded cables or the tables for three-cores loaded cables.
- If the grouping of single core cables consist of n loaded single core cables, the rating factor shall be determined for n/2 or n/3 circuits and applied to the current carrying capacity of two or three loaded cores.

Current ratings – Conversion factors for deviating ambient temperature

- Conversion factors for deviating ambient temperature

Permissible operating temperature	40°C	60°C	70°C	80°C	85°C	90°C
Ambient temperature °C	Conversion factors, used to the current ratings data in tables of the following pages					
10	1,73	1,29	1,22	1,18	1,17	1,15
15	1,58	1,22	1,17	1,14	1,13	1,12
20	1,41	1,15	1,12	1,10	1,09	1,08
25	1,22	1,08	1,06	1,05	1,04	1,04
30	1,00	1,00	1,00	1,00	1,00	1,00
35	0,71	0,91	0,94	0,95	0,95	0,96
40	–	0,82	0,87	0,89	0,90	0,91
45	–	0,71	0,79	0,84	0,85	0,87
50	–	0,58	0,71	0,77	–	0,82
55	–	0,41	0,61	0,71	–	0,76
60	–	–	0,50	0,63	–	0,71
65	–	–	0,35	0,55	–	0,65
70	–	–	–	0,45	–	0,58
75	–	–	–	0,32	–	0,50
80	–	–	–	–	–	0,41
85	–	–	–	–	–	0,29

- Conversion factors for multicore cables with cross-section up to 10 mm²

Number of loaded cores	Conversion factors
5	0,75
7	0,65
10	0,55
14	0,50
19	0,45
24	0,40
40	0,35
61	0,30

- Conversion factors for reeled cables

Number of layers on drums	1	2	3	4	5
Conversion factors	0,80	0,61	0,49	0,42	0,38

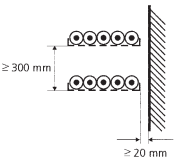
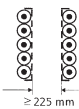
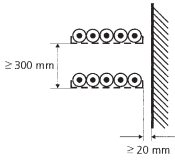
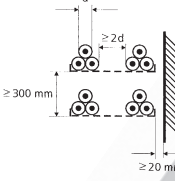
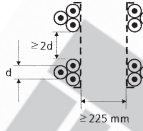
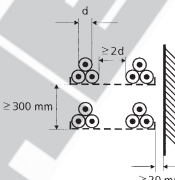
Note: For spiral-reeling the conversion factor 0,80.

- Conversion temperature for heat-resistant cables

Permissible operating temperature	80°C	90°C	110°C	135°C	180°C
Ambient temperature °C	Conversion factors, used to the current ratings data for heat-resistant cables in the tables of the following pages				
bis 50	1,00	1,00	1,00	1,00	1,00
55	0,91	0,94	1,00	1,00	1,00
60	0,82	0,87	1,00	1,00	1,00
65	0,71	0,79	1,00	1,00	1,00
70	0,58	0,71	1,00	1,00	1,00
75	0,41	0,61	1,00	1,00	1,00
80	–	0,50	1,00	1,00	1,00
85	–	0,35	0,91	1,00	1,00
90	–	–	0,82	1,00	1,00
95	–	–	0,71	1,00	1,00
100	–	–	0,58	0,94	1,00
105	–	–	0,41	0,87	1,00
110	–	–	–	0,79	1,00
115	–	–	–	0,71	1,00
120	–	–	–	0,61	1,00
125	–	–	–	0,50	1,00
130	–	–	–	0,35	1,00
135	–	–	–	–	1,00
140	–	–	–	–	1,00
145	–	–	–	–	1,00
150	–	–	–	–	1,00
155	–	–	–	–	0,91
160	–	–	–	–	0,82
165	–	–	–	–	0,71
170	–	–	–	–	0,58
175	–	–	–	–	0,41

Current ratings – Conversion factors

for grouping of single core cables or cables on troughs and trays

Number of three-phase systems with single core cables		Used as multiplier for the ratings value for	Number of troughs or trays	1	2	3
Installation method				Conversion factors		
Perforated cable troughs	with contact 	Three-cores cable in horizontal-surface arrangement	1	0,98	0,91	0,87
			2	0,96	0,87	0,81
			3	0,95	0,85	0,78
	with contact 	Three-cores cable vertical-surface arrangement	1	0,96	0,86	–
			2	0,95	0,84	–
Cable trays	with contact 	Three-cores cable in horizontal-surface arrangement	1	1,00	0,97	0,96
			2	0,98	0,93	0,89
			3	0,97	0,90	0,86
Perforated cable troughs			1	1,00	0,98	0,96
			2	0,97	0,93	0,89
			3	0,96	0,92	0,86
		Three-core cables in vertical-surface triangle arrangement	1	1,00	0,91	0,89
			2	1,00	0,90	0,86
Cable trays			1	1,00	1,00	1,00
			2	0,97	0,95	0,93
			3	0,96	0,94	0,90

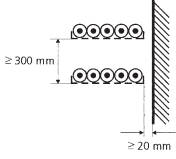
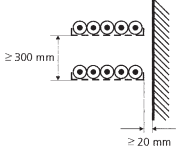
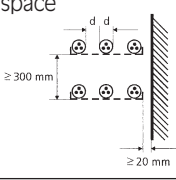
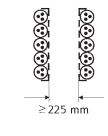
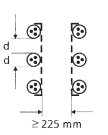
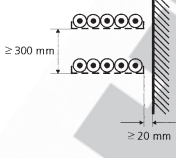
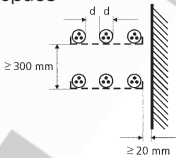
Note:

The conversion factors are used only for cables of one layer grouping arrangement. These are not valid when the cables are installed with contact one upon another or the given spaces between the cable troughs or cable trays are not followed. In such cases the conversion factors can be reduced.

To parallel current circuits each group of three conductors of the parallel circuit is regarded as single circuit.

Current ratings – Conversion factors

for grouping of multicore cables or cables on troughs and trays

Number of multicore cables			1	2	3	4	6	9	
Installation method		Number of troughs and trays	Conversion factors						
Non-perforated cable troughs	with contact 	1	0,97	0,84	0,78	0,75	0,71	0,68	
		2	0,97	0,83	0,76	0,72	0,68	0,63	
		3	0,97	0,82	0,75	0,71	0,66	0,61	
		6	0,97	0,81	0,73	0,69	0,63	0,58	
Perforated cable troughs	with contact 	1	1,00	0,88	0,82	0,79	0,76	0,73	
		2	1,00	0,87	0,80	0,77	0,73	0,68	
		3	1,00	0,86	0,79	0,76	0,71	0,66	
		6	1,00	0,84	0,77	0,73	0,68	0,64	
	with space 	1	1,00	1,00	0,98	0,95	0,91	–	
		2	1,00	0,99	0,96	0,92	0,87	–	
		3	1,00	0,98	0,95	0,91	0,85	–	
	with contact 	1	1,00	0,88	0,82	0,78	0,73	0,72	
		2	1,00	0,88	0,81	0,76	0,71	0,70	
		with space 	1	1,00	0,91	0,89	0,88	0,87	–
			2	1,00	0,91	0,88	0,87	0,85	–
	Cable trays	with contact 	1	1,00	0,87	0,82	0,80	0,79	0,78
2			1,00	0,86	0,81	0,78	0,76	0,73	
3			1,00	0,85	0,79	0,76	0,73	0,70	
6			1,00	0,83	0,76	0,73	0,69	0,66	
with space 		1	1,00	1,00	1,00	1,00	1,00	–	
		2	1,00	0,99	0,98	0,97	0,96	–	
		3	1,00	0,98	0,97	0,96	0,93	–	

Note:

The conversion factors are used for cables of one layer grouping arrangement. These are not valid when the cables are installed with contact one upon another or the given spaces between the cable troughs or cable trays can not meet. In such cases the conversion factor can be reduced.

Power ratings for XLPE-insulated Medium Voltage Power Cables single core 6/10 kV, 12/20 kV, 18/30 kV

N2XSY
NA2XSY

N2XS2Y
NA2XS2Y

N2XS(F)2Y
NA2XS(F)2Y

Current carrying capacity* in Amperes (A) in ground (20°C)

Conductor material	Copper conductor						Aluminium conductor					
Arrangement												
U ₀ /U	6/10 kV		12/20 kV		18/30 kV		6/10 kV		12/20 kV		18/30 kV	
cross section mm ²	Current ratings in Ampere (A)											
25	157	179	–	–	–	–	–	–	–	–	–	–
35	187	212	189	213	–	–	145	165	–	–	–	–
50	220	249	222	250	225	251	171	194	172	195	174	195
70	268	302	271	303	274	304	208	236	210	237	213	238
95	320	359	323	360	327	362	248	281	251	282	254	283
120	363	405	367	407	371	409	283	318	285	319	289	321
150	405	442	409	445	414	449	315	350	319	352	322	354
185	456	493	461	498	466	502	357	394	361	396	364	399
240	526	563	532	568	539	574	413	452	417	455	422	458
300	591	626	599	633	606	640	466	506	471	510	476	514
400	662	675	671	685	680	695	529	558	535	564	541	570
500	744	748	754	760	765	773	602	627	609	634	616	642

*This factors are also valid for longitudinally water-tight cable

Current carrying capacity* in Amperes (A) in air (30°C)

Conductor material	Copper conductor						Aluminium conductor					
Arrangement												
U ₀ /U	6/10 kV		12/20 kV		18/30 kV		6/10 kV		12/20 kV		18/30 kV	
cross section mm ²	Current ratings in Ampere (A)											
25	163	194	–	–	–	–	–	–	–	–	–	–
35	197	235	200	235	–	–	153	182	–	–	–	–
50	236	282	239	282	241	282	183	219	185	219	187	219
70	294	350	297	351	299	350	228	273	231	273	232	273
95	358	426	361	426	363	425	278	333	280	332	282	331
120	413	491	416	491	418	488	321	384	323	384	325	382
150	468	549	470	549	472	548	364	432	366	432	367	429
185	535	625	538	625	539	624	418	496	420	494	421	492
240	631	731	634	731	635	728	494	583	496	581	496	578
300	722	831	724	830	725	828	568	666	569	663	568	659
400	827	920	829	923	831	922	660	755	660	753	650	750
500	949	1043	953	1045	953	1045	767	868	766	866	764	861

*This factors are also valid for longitudinally water-tight cable

Electrical characteristics of XLPE-insulated Medium Voltage Power Cables, 6 – 30 kV

Conductor resistance 20°C

cross-section mm ²	maximum value	
	Cu-conductor Ohm/km	Alu-conductor Ohm/km
25	0,727	1,20
35	0,524	0,868
50	0,387	0,641
70	0,268	0,443
95	0,193	0,320
120	0,153	0,253
150	0,124	0,206
185	0,0991	0,164
240	0,0754	0,125
300	0,0601	0,100
400	0,0470	0,0778
500	0,0366	0,0605

Conversion factors for the conductor temperatures

Temperature at °C	60	65	70	80	90
Cu-conductor	1,157	1,177	1,196	1,236	1,275
Alu-conductor	1,161	1,181	1,202	1,242	1,282

Conversion formula:

$$R_{\delta} = R_{20} \cdot \frac{234,5 + \delta}{254,5} \quad \text{for Cu-conductor}$$







$$R_{\delta} = R_{20} \cdot \frac{228 + \delta}{248} \quad \text{for Alu-conductor}$$

Conductor temperature at °C = δ
 Conductor resistance at δ °C in Ohm/km = R_{δ}
 Conductor resistance at 20 °C in Ohm/km = R_{20}







Electrical characteristics of XLPE-insulated Medium Voltage Power Cables, 6 – 30 kV

Effective resistance at 50 Hz (Alternating-current resistance)







Copper conductor

Nominal voltage	6/10 kV		12/20 kV		18/30 kV	
Cross-section	approx Ohm/km					
mm ²						
35	0,671	0,673	0,671	0,672	–	–
50	0,497	0,498	0,496	0,498	0,496	0,497
70	0,345	0,346	0,345	0,346	0,344	0,346
95	0,249	0,251	0,249	0,250	0,249	0,250
120	0,198	0,200	0,198	0,200	0,198	0,199
150	0,163	0,165	0,163	0,165	0,162	0,164
185	0,132	0,134	0,131	0,133	0,131	0,133
240	0,102	0,104	0,101	0,103	0,101	0,103
300	0,082	0,085	0,082	0,084	0,082	0,084
400	0,068	0,071	0,067	0,070	0,067	0,069
500	0,055	0,058	0,055	0,058	0,054	0,057

Aluminium conductor

Nominal voltage	6/10 kV		12/20 kV		18/30 kV	
Cross-section	approx Ohm/km					
mm ²						
35	1,12	1,12	1,12	1,12	–	–
50	0,825	0,826	0,825	0,826	0,824	0,826
70	0,571	0,572	0,571	0,572	0,571	0,572
95	0,413	0,415	0,413	0,414	0,413	0,414
120	0,327	0,329	0,327	0,329	0,327	0,328
150	0,269	0,271	0,268	0,270	0,268	0,270
185	0,215	0,217	0,215	0,217	0,214	0,216
240	0,165	0,167	0,165	0,167	0,164	0,166
300	0,133	0,135	0,133	0,135	0,133	0,135
400	0,106	0,109	0,106	0,109	0,106	0,108
500	0,085	0,088	0,084	0,087	0,084	0,087

Inductive resistance at 50 Hz







Nominal voltage	6/10 kV		12/20 kV		18/30 kV	
Cross-section	Ohm/km					
mm ²						
35	0,144	0,158	0,153	0,168	–	–
50	0,136	0,150	0,145	0,159	0,154	0,169
70	0,129	0,143	0,138	0,152	0,147	0,161
95	0,123	0,137	0,131	0,145	0,139	0,154
120	0,118	0,132	0,126	0,140	0,134	0,148
150	0,114	0,128	0,121	0,135	0,129	0,143
185	0,110	0,124	0,117	0,131	0,125	0,139
240	0,105	0,120	0,112	0,126	0,120	0,134
300	0,102	0,116	0,108	0,123	0,115	0,130
400	0,097	0,111	0,103	0,117	0,110	0,124
500	0,094	0,108	0,100	0,114	0,106	0,120

Electrical characteristics of XLPE-insulated Medium Voltage Power Cables, 6 – 30 kV

Mutual capacitance

Nominal voltage	6/10 kV	12/20 kV	18/30 kV
Cross-section			
mm ²	μF/km	μF/km	μF/km
35	0,22	0,16	–
50	0,25	0,18	0,14
70	0,28	0,20	0,15
95	0,31	0,22	0,17
120	0,34	0,23	0,18
150	0,37	0,25	0,19
185	0,40	0,27	0,20
240	0,44	0,30	0,22
300	0,48	0,32	0,24
400	0,55	0,36	0,27
500	0,60	0,40	0,29

Inductance

Nominal voltage	6/10 kV		12/20 kV		18/30 kV	
Cross-section						
mm ²	mH/km	mH/km	mH/km	mH/km	mH/km	mH/km
35	0,45	0,76	0,48	0,76	–	–
50	0,42	0,73	0,45	0,74	0,48	0,75
70	0,39	0,70	0,43	0,70	0,45	0,71
95	0,38	0,67	0,41	0,68	0,43	0,68
120	0,36	0,65	0,39	0,65	0,42	0,66
150	0,35	0,63	0,38	0,63	0,41	0,64
185	0,34	0,61	0,36	0,62	0,39	0,63
240	0,32	0,59	0,35	0,59	0,37	0,60
300	0,31	0,57	0,33	0,58	0,36	0,59
400	0,30	0,55	0,33	0,55	0,34	0,56
500	0,29	0,53	0,31	0,53	0,33	0,54

Electrical characteristics of XLPE-insulated Medium Voltage Power Cables, 6 – 30 kV

Short-circuit current carrying capacity up to 30 kV

Conductor temperature: 90° C

Short-circuit temperature: 250° C

Cable with Cu-conductors

Cross-section mm ²	short-circuit time in s (seconds)														
	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,5	2,0	3,0	4,0	5,0
	permissible short-circuit in kA														
25	11,3	8,0	6,5	5,7	5,1	4,6	4,3	4,0	3,8	3,6	2,9	2,5	2,1	1,8	1,6
35	15,8	11,2	9,1	7,9	7,1	6,5	6,0	5,6	5,3	5,0	4,1	3,5	2,9	2,5	2,2
50	22,6	16,0	13,1	11,3	10,1	9,2	8,5	8,0	7,5	7,2	5,8	5,1	4,1	3,6	3,2
70	31,7	22,4	18,3	15,8	14,2	12,9	12,0	11,2	10,6	10,0	8,2	7,1	5,8	5,0	4,5
95	43,0	30,4	24,8	21,5	19,2	17,5	16,2	15,2	14,3	13,6	11,1	9,6	7,8	6,8	6,1
120	54,3	38,4	31,3	27,1	24,3	22,2	20,5	19,2	18,1	17,2	14,0	12,1	9,9	8,6	7,7
150	67,8	48,0	39,2	33,9	30,3	27,7	25,6	24,0	22,6	21,5	17,5	15,2	12,4	10,7	9,6
185	83,7	59,2	48,3	41,8	37,4	34,2	31,6	29,6	27,9	26,5	21,6	18,7	15,3	13,2	11,8
240	108,5	76,7	62,7	54,3	48,5	44,3	41,0	38,4	36,2	34,3	28,0	24,3	19,8	17,2	15,3
300	135,7	95,9	78,3	67,8	60,7	55,4	51,3	48,0	45,2	42,9	35,0	30,3	24,8	21,5	19,2
400	180,9	127,9	104,4	90,4	80,9	73,8	68,4	64,0	60,3	57,2	46,7	40,4	33,0	28,6	25,6
500	226,1	159,9	130,5	113,1	101,1	92,3	85,5	79,9	75,4	71,5	58,4	50,6	41,3	35,8	32,0

Cable with Alu-conductors

Cross-section mm ²	short-circuit time in s (seconds)														
	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,5	2,0	3,0	4,0	5,0
	permissible short-circuit in kA														
25	7,4	5,3	4,3	3,7	3,3	3,0	2,8	2,6	2,5	2,4	1,9	1,7	1,4	1,2	1,1
35	10,4	7,4	6,0	5,2	4,7	4,2	3,9	3,7	3,5	3,3	2,7	2,3	1,9	1,6	1,5
50	14,9	10,5	8,6	7,4	6,6	6,1	5,6	5,3	5,0	4,7	3,8	3,3	2,7	2,4	2,1
70	20,8	14,7	12,0	10,4	9,3	8,5	7,9	7,4	6,9	6,6	5,4	4,7	3,8	3,3	2,9
95	28,2	20,0	16,3	14,1	12,6	11,5	10,7	10,0	9,4	8,9	7,3	6,3	5,2	4,5	4,0
120	35,7	25,2	20,6	17,8	16,0	14,6	13,5	12,6	11,9	11,3	9,2	8,0	6,5	5,6	5,0
150	44,6	31,5	25,7	22,3	19,9	18,2	16,9	15,8	14,9	14,1	11,5	10,0	8,1	7,1	6,3
185	55,0	38,9	31,7	27,5	24,6	22,5	20,8	19,4	18,3	17,4	14,2	12,3	10,0	8,7	7,8
240	71,3	50,4	41,2	35,7	31,9	29,1	27,0	25,2	23,8	22,6	18,4	16,0	13,0	11,3	10,1
300	89,2	63,1	51,5	44,6	39,9	36,4	33,7	31,5	29,7	28,2	23,0	19,9	16,3	14,1	12,6
400	118,9	84,1	68,6	59,5	53,2	48,5	44,9	42,0	39,6	37,6	30,7	26,6	21,7	18,8	16,8
500	148,6	105,1	85,8	74,3	66,5	60,7	56,2	52,5	49,5	47,0	38,4	33,2	27,1	23,5	21,0

Electrical characteristics of XLPE-insulated Medium Voltage Power Cables, 6 – 30 kV

Short-circuit to ground

Nominal voltage	6/10 kV	12/20 kV	18/30 kV
cross-section mm ²	A/km	A/km	A/km
35	1,2	1,7	–
50	1,4	1,9	2,3
70	1,5	2,1	2,5
95	1,7	2,4	2,7
120	1,9	2,6	2,9
150	2,0	2,7	3,1
185	2,2	3,0	3,3
240	2,4	3,3	3,7
300	2,6	3,5	4,0
400	3,0	4,0	4,4
500	3,3	4,3	4,8

Short-circuit current carrying capacity of copper screens Short-circuit temperature: 350°C

short-circuit time in seconds	load of short-circuit current in kA		
	up to 16 mm ²	25 mm ²	35 mm ²
	kA	kA	kA
s			
0,1	9,7	15,1	21,2
0,2	6,9	10,7	15,1
0,3	5,7	8,9	12,5
0,4	5,0	7,7	10,9
0,5	4,5	7,0	9,8
0,6	4,2	6,4	9,0
0,7	3,9	6,0	8,4
0,8	3,5	5,6	7,9
0,9	3,4	5,3	7,5
1,0	3,3	5,1	7,2
1,5	2,7	4,2	5,9
2,0	2,3	3,6	5,1
3,0	1,9	2,9	4,2
4,0	1,7	2,6	3,6
5,0	1,5	2,3	3,2

Coordination of screen-cross-section

conductor cross-section mm ²	screen-cross-section mm ²
35 to 120	16
150 to 300	25
400 and 500	35

Rating conversion factors for installation of Medium Voltage Cables, 6 – 30 kV

Rating conversion factors for laying in air*) Single core cables in 3-phase systems

Arrangement of cables in laying condition	Number of cables in troughs or trays on top of each other	For laying on plain surface			For installation in grouping				
		Space = cable \varnothing d Distance from wall ≥ 2 cm			Space = 2 x cable \varnothing d Distance from wall ≥ 2 cm				
		Installation method	Number of systems			Installation method	Number of systems		
			1	2	3		1	2	3
on the ground			0,92	0,89	0,88		0,98	0,96	0,94
on non-perforated cable troughs (restricted air circulation)	1		0,92	0,89	0,88		0,98	0,96	0,94
	2		0,87	0,84	0,83		0,95	0,91	0,87
	3		0,84	0,82	0,81		0,94	0,90	0,85
	6		0,82	0,80	0,79		0,93	0,88	0,82
on perforated cable troughs	1		1,00	0,93	0,90		1,00	0,98	0,96
	2		0,97	0,89	0,85		0,97	0,93	0,89
	3		0,96	0,88	0,82		0,96	0,92	0,85
	6		0,94	0,84	0,80		0,95	0,90	0,83
on cable trays or on cable ladders (unrestricted air circulation)	1		1,00	0,97	0,96		1,00	1,00	1,00
	2		0,97	0,94	0,93		0,97	0,95	0,93
	3		0,96	0,93	0,92		0,96	0,94	0,90
	6		0,94	0,91	0,90		0,95	0,93	0,87
on platform or on the wall	1		0,94	0,91	0,89		1,00	0,91	0,89
	2		0,94	0,90	0,86		1,00	0,90	0,86
Arrangements, for which a reduction not necessary ¹⁾		For the installation on plain surface with greater distance, the mutual heating is lower, for this occur the additional sheath or screen-losses. Because of that no particulars can be made for reduction-free arrangements.							

*Conversion factors for deviating ambient temperature

Temperature °C	10	15	20	25	30	35	40	45	50
VPE-cable	1,15	1,12	1,08	1,04	1,0	0,96	0,91	0,87	0,82
PVC-cable	1,22	1,17	1,12	1,06	1,0	0,94	0,87	0,79	0,71

¹⁾ In narrow rooms or for bigger grouping, the air temperature is increased due to energy losses of cable, so the additional conversion factors for deviating air-temperatures are to be taken in the given table.

Conversion factor for Medium Voltage Power Cables, 6 – 30 kV

Load rating for cables laid in ground Load factor 0,7 and 1,0

Fundamental conditions*

Ground temperature 20° C
 Thermal resistivity 1,0 K · m/W
 Distance between cables or systems 7 cm
 Single core cables laid in trefoil touching arrangement

Load factor 0,7

Type of insulation	Cable design	Nominal voltage	Number of cables or systems				
			2	4	6	8	10
PVC	Multicore cables	0,6/1 to 3,6/6 kV	0,86	0,71	0,64	0,60	0,57
	Three-core cables	to 6/10 kV	0,87	0,71	0,63	0,59	0,54
	Single core cables	0,6/1 to 3,6/6 kV	0,85	0,70	0,63	0,59	0,56
	Single core cables	to 6/10 kV	0,83	0,66	0,57	0,53	0,49
VPE	Multicore cables	0,6/1 to 18/30 kV	0,85	0,70	0,63	0,59	0,56
	Three-core cables	0,6/1 to 18/30 kV	0,85	0,70	0,63	0,58	0,56

Load factor 1,0

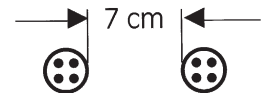
Type of insulation	Cable design	Nominal voltage	Number of cables or systems					
			1	2	4	6	8	10
PVC	Multicore cables	0,6/1 to 3,6/6 kV	0,81	0,66	0,52	0,46	0,43	0,40
	Three-core cables	to 6/10 kV	0,82	0,67	0,51	0,45	0,41	0,37
	Single core cables	0,6/1 to 3,6/6 kV	0,79	0,65	0,51	0,46	0,42	0,40
	Single core cables	to 6/10 kV	0,78	0,62	0,47	0,40	0,36	0,33
VPE	Multicore cables	0,6/1 to 18/30 kV	0,83	0,67	0,53	0,47	0,44	0,41
	Single core cables	0,6/1 to 18/30 kV	0,81	0,66	0,52	0,47	0,43	0,41

Build-up of systems:

- for single core cables



- for multicore cables



Colour code according to DIN VDE 0293¹⁾ (old)

Multicore flexible cables

Number of cores	Cores with green-yellow protective conductor (-J)	Cores without green-yellow protective conductor (-O)
2	-	brown/blue
3	green-yellow/brown/blue	black/blue/brown
4	green-yellow/black/blue/brown	black/blue/brown/black
5	green-yellow/black/blue/brown/black	black/blue/brown/black/black
6 and more	green-yellow/others black with white numbering	black with white numbering

Multicore cables for fixed installation

Number of cores	Cores with green-yellow protective conductor (-J)	Cores without green-yellow protective conductor (-O)	with protective conductor
2	green-yellow/black*	black/blue	black/blue
3	green-yellow/black/blue	black/blue/brown	black/blue/brown
4	green-yellow/black/blue/brown	black/blue/brown/black	black/blue/brown/black
5	green-yellow/black/blue/brown/black	black/blue/brown/black/black	-
6 and more	green-yellow/others black with white numbering	black with white numbering	black with white numbering

* This type is according to DIN VDE 0100 part 540, table 2 valid only for copper cross-section of 10 mm² and more or Alu 16 mm².

Colour code according to DIN VDE 0293-308²⁾ (new)

Number of cores	Cores with green-yellow protective conductor (-J)	Cores without green-yellow protective conductor (-O)
2	-	brown/blue
3	green-yellow/brown/blue	brown/black/grey
3 ³⁾	-	blue/brown/black
4	green-yellow/brown/black/grey	blue/brown/black/grey
4 ³⁾	green-yellow/blue/brown/black	-
5	green-yellow/blue/brown/black/grey	blue/brown/black/grey/black
6 and more	green-yellow/others black with white numbering	black with white numbering

¹⁾ Coding in accordance with VDE 0293: 1990-01 / transitional periods until 1 April 2006, beyond that only the coding for 6 or more conductors will continue to exist.

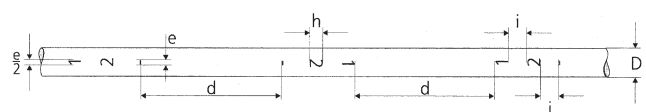
²⁾ Coding in accordance with VDE 0293-308 (valid as of 1 January 2003).

³⁾ Only for certain applications.

Core marking with numbering (in direction to longitudinal axis)

Height and gap of numbers

Core-nominal- \varnothing mm	e*) mm	h mm	i mm	d mm
$D \leq 2,4$	$\geq 0,6$	$\geq 2,3$	ca. 2	≤ 50
$2,4 < D \leq 5,0$	$\geq 1,2$	$\geq 3,2$	ca. 3	≤ 50
$5,0 < D$	$\geq 1,6$	$\geq 4,6$	ca. 4	≤ 50



e: breadth of number

h: height of number

i: gap between two successive numbers and between number and dash

d: gap between two successive numbers

*) when the number is only 1, the smallest breadth is half of the given dimension to this column.

Colour code according to E DIN VDE 0245 part 1

Application for types: NLSY NSY
NLSCY NSYCY

According to DIN-Norm 0245 series, the core identification is stated whether the code is to be marked with colours or with numberings.

Identification with colours

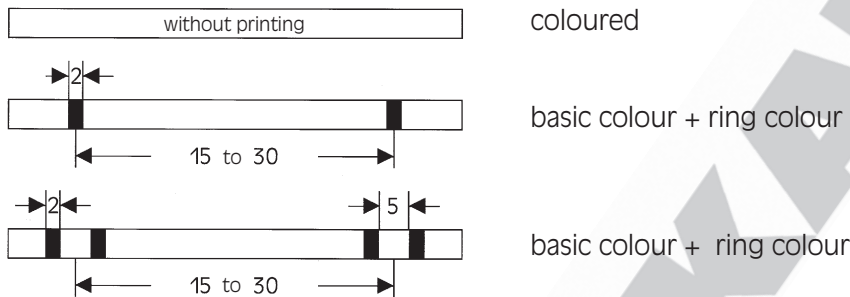
The core colour is given in basic colour and ring colour. For the identification of two or three colours, the first underlined colour is the basic colour.

The identification of the basic colours must be followed through colouring of the insulation or the oversurface of insulation cores.

The second and the third colour is printed over the basic colour as a form of ring.

Counting

The cores are to be counted continuously through all layers at the same direction, beginning with core 1 in inner layer towards outside. Measures of rings and distances are given in mm.



Core No.	Basic- and ring colour	Core No.	Basic- and ring colour	Core No.	Basic- and ring colour
1	white	22	<u>brown</u> blue	43	<u>blue</u> black
2	brown	23	<u>white</u> red	44	<u>red</u> black
3	green	24	<u>brown</u> red	45	<u>white</u> brownblack
4	yellow	25	<u>white</u> black	46	<u>yellow</u> greenblack
5	grey	26	<u>brown</u> black	47	<u>grey</u> pinkblack
6	pink	27	<u>grey</u> green	48	<u>red</u> blueblack
7	blue	28	<u>yellow</u> grey	49	<u>white</u> greenblack
8	red	29	<u>pink</u> green	50	<u>brown</u> greenblack
9	black	30	<u>yellow</u> pink	51	<u>white</u> yellowblack
10	violet	31	<u>green</u> blue	52	<u>yellow</u> brownblack
11	<u>grey</u> pink	32	<u>yellow</u> blue	53	<u>white</u> greyblack
12	<u>red</u> blue	33	<u>green</u> red	54	<u>grey</u> brownblack
13	<u>white</u> green	34	<u>yellow</u> red	55	<u>white</u> pinkblack
14	<u>brown</u> green	35	<u>green</u> black	56	<u>pink</u> brownblack
15	<u>white</u> yellow	36	<u>yellow</u> black	57	<u>white</u> blueblack
16	<u>yellow</u> brown	37	<u>grey</u> blue	58	<u>brown</u> blueblack
17	<u>white</u> grey	38	<u>pink</u> blue	59	<u>white</u> redblack
18	<u>grey</u> brown	39	<u>grey</u> red	60	<u>brown</u> redblack
19	<u>white</u> pink	40	<u>pink</u> red		
20	<u>pink</u> brown	41	<u>grey</u> black		
21	<u>white</u> blue	42	<u>pink</u> black		

Example: Core 21 whiteblue
 | |
 basic colour ring colour

The given colours are corresponded to DIN IEC 60304 and HD 402.S2.

Identification through numberings as per DIN VDE 0293.

Colour code according to DIN 47100

with colour repetition from core no. 45 and above

Electronic control and computer cable: **single cores** stranding

The insulation of the conductor gives the first basic colour. The codes of the multi-coloured identification are combined with a basic colour and colour rings. The second and third colour is printed on the basic colour as a form of ring.

The ring width is 2–3 mm. A less unsharpness on the edge of the identification colour and a minor plugging of both half-rings are permitted.

The cores are to be counted continuously through all layers at the same direction, beginning with the outer layer towards inside.

No. Basic-Ring-colours	No. Basic-Ring-colours	No. Basic-Ring-colours	No. Basic-Ring-colours
1 white	17 white-grey	33 green-red	45 white
2 brown	18 grey-brown	34 yellow-red	46 brown
3 green	19 white-pink	35 green-black	47 green
4 yellow	20 pink-brown	36 yellow-black	48 yellow
5 grey	21 white-blue	37 grey-blue	49 grey
6 pink	22 brown-blue	38 pink-blue	50 pink
7 blue	23 white-red	39 grey-red	51 blue
8 red	24 brown-red	40 pink-red	52 red
9 black	25 white-black	41 grey-black	53 black
10 violet	26 brown-black	42 pink-black	54 violet
11 grey-pink	27 grey-green	43 blue-black	55 grey-pink
12 red-blue	28 yellow-grey	44 red-black	56 red-blue
13 white-green	29 pink-green		57 white-green
14 brown-green	30 yellow-pink		58 brown-green
15 white-yellow	31 green-blue		59 white-yellow
16 yellow-brown	32 yellow-blue		60 yellow-brown
			61 white-grey

Colour code adapted* to DIN 47100

without colour repetition

No. Basic-Ring-colours	No. Basic-Ring-colours	No. Basic-Ring-colours	No. Basic-Ring-colours
1 white	17 white-grey	33 green-red	45 white-brown-black
2 brown	18 grey-brown	34 yellow-red	46 yellow-green-black
3 green	19 white-pink	35 green-black	47 grey-pink-black
4 yellow	20 pink-brown	36 yellow-black	48 red-blue-black
5 grey	21 white-blue	37 grey-blue	49 white-green-black
6 pink	22 brown-blue	38 pink-blue	50 brown-green-black
7 blue	23 white-red	39 grey-red	51 white-yellow-black
8 red	24 brown-red	40 pink-red	52 yellow-brown-black
9 black	25 white-black	41 grey-black	53 white-grey-black
10 violet	26 brown-black	42 pink-black	54 grey-brown-black
11 grey-pink	27 grey-green	43 blue-black	55 white-pink-black
12 red-blue	28 yellow-grey	44 red-black	56 pink-brown-black
13 white-green	29 pink-green		57 white-blue-black
14 brown-green	30 yellow-pink		58 brown-blue-black
15 white-yellow	31 green-blue		59 white-red-black
16 yellow-brown	32 yellow-blue		60 brown-red-black
			61 black-white

* deviation to DIN, without colour repetition, from core no. 45 and above

Pair-Colour code according to DIN 47100 with colour repetition

Electronic control and computer cable: **pair** stranding

The insulation of the conductor gives the first basic colour. The codes of the multi-coloured identification are combined with a basic colour and colour rings. The second colour is printed on the basic colour as a form of ring.

The ring width is 2–3 mm. A less unsharpness on the edge of the identification colour and a minor pledging of both half-rings are permitted.

The cores are to be counted continuously through all layers at the same direction, beginning with the outer layer towards inside.

Pair-stranding				colour
Pair-no.	core			
1	23	45	a	white
			b	brown
2	24	46	a	green
			b	yellow
3	25	47	a	grey
			b	pink
4	26	48	a	blue
			b	red
5	27	49	a	black
			b	violet
6	28	50	a	grey-pink
			b	red-blue
7	29	51	a	white-green
			b	brown-green
8	30	52	a	white-yellow
			b	yellow-brown
9	31	53	a	white-grey
			b	grey-brown
10	32	54	a	white-pink
			b	pink-brown
11	33	55	a	white-blue
			b	brown-blue

Pair-stranding				colour
Pair-no.	core			
12	34	56	a	white-red
			b	brown-red
13	35	57	a	white-black
			b	brown-black
14	36	58	a	grey-green
			b	yellow-grey
15	37	59	a	pink-green
			b	yellow-pink
16	38	60	a	green-blue
			b	yellow-blue
17	39	61	a	green-red
			b	yellow-red
18	40	62	a	green-black
			b	yellow-black
19	41	63	a	grey-blue
			b	pink-blue
20	42	64	a	grey-red
			b	pink-red
21	43	65	a	grey-black
			b	pink-black
22	44	66	a	blue-black
			b	red-black

Colour code as per DIN 47002

YV-Equipment wires
(for twin colour cables, the base colour is underlined>)

ws	white	br	brown
gn	green	ge	yellow
gr	grey	rs	pink
bl	blue	rt	red
sw	black	vi	violet
wsbr	<u>white</u> -brown	wsgn	white-green
wsge	<u>white</u> -yellow	wsbl	<u>white</u> -blue
wsrt	<u>white</u> -red	wssw	<u>white</u> -black
brgn	<u>brown</u> -green	brge	<u>brown</u> -yellow
brbl	<u>brown</u> -blue	brsw	<u>brown</u> -black
gnge	<u>green</u> -yellow	gnrt	<u>green</u> -red
gnsw	<u>green</u> -black	gebl	<u>yellow</u> -blue
gert	<u>yellow</u> -red	gesw	<u>yellow</u> -black
grrt	<u>grey</u> -red	grsw	<u>grey</u> -black
rssw	<u>pink</u> -black	rsvi	<u>pink</u> -violet
blrt	<u>blue</u> -red	rtsw	<u>red</u> -black
virt	<u>violet</u> -red		

Colour code for YR-Bell Sheathed Cables

2 x 0,8:	bk, bu
3 x 0,8:	bk, bu, bn
4 x 0,8:	bk, bu, bn, ye
5 x 0,8:	bk, bu, bn, ye, gn
6 x 0,8:	bk, bu, bn, ye, gn, vt
8 x 0,8:	bk, bu, bn, ye, gn, vt, wh, og
10 x 0,8:	bk, bu, bn, ye, gn, vt, wh, og, tr, gy
12 x 0,8:	bk, bu, bn, ye, gn, vt, wh, og, tr, gy, rd, lbu
14 x 0,8:	bk, bu, bn, ye, gn, vt, wh, og, tr, gy, rd, lbu, cog, lgn
16 x 0,8:	bk, bu, bn, ye, gn, vt, wh, og, tr, gy, rd, lbu, cog, lgn, lrd, lye

Colour code according to international standard

Electronic control UL-version: **single cores** stranding

The insulation of the conductor gives the first basic colour. The codes of the multi-coloured identification are combined with a basic colour and colour rings. The second colour is printed on the basic colour as a form of ring.

The ring width is 2–3 mm. A less unsharpness on the edge of the identification colour and a minor pledging of both half-rings are permitted.

The cores are to be counted continuously through all layers at the same direction, beginning with the inside layer towards outer.

No. Basic-Ring-colours	No. Basic-Ring-colours	No. Basic-Ring-colours	No. Basic-Ring-colours
1 black	16 white-green	31 green-red	46 grey-brown
2 brown	17 white-blue	32 green-orange	47 grey-red
3 red	18 white-violet	33 green-blue	48 grey-orange
4 orange	19 white-grey	34 green-violet	49 grey-yellow
5 yellow	20 brown-black	35 green-grey	50 grey-green
6 green	21 brown-red	36 green-white	51 grey-blue
7 blue	22 brown-orange	37 yellow-black	52 grey-violet
8 violet	23 brown-yellow	38 yellow-brown	53 grey-white
9 grey	24 brown-green	39 yellow-red	54 orange-black
10 white	25 brown-blue	40 yellow-orange	55 orange-brown
11 white-black	26 brown-violet	41 yellow-blue	56 orange-red
12 white-brown	27 brown-grey	42 yellow-violet	57 orange-yellow
13 white-red	28 brown-white	43 yellow-grey	58 orange-green
14 white-orange	29 green-black	44 yellow-white	59 orange-blue
15 white-yellow	30 green-brown	45 grey-black	60 orange-violet

Pair-colour code according to international standard

Electronic control UL-version: **pair** stranding

The insulation of the conductor gives the first basic colour. The codes of the multi-coloured identification are combined with a basic colour and colour rings. The second colour is printed on the basic colour as a form of ring.

The ring width is 2–3 mm. A less unsharpness on the edge of the identification colour and a minor pledging of both half-rings are permitted.

The cores are to be counted continuously through all layers at the same direction, beginning with the inside layer towards outer.

Pair-stranding			Pair-stranding			Pair-stranding		
Pair-no.	core	colour	Pair-no.	core	colour	Pair-no.	core	colour
1	a	black	9	a	black	17	a	brown
	b	brown		b	white		b	white
2	a	black	10	a	brown	18	a	red
	b	red		b	red		b	orange
3	a	black	11	a	brown	19	a	red
	b	orange		b	orange		b	yellowz
4	a	black	12	a	brown	20	a	red
	b	yellow		b	yellow		b	green
5	a	black	13	a	brown	21	a	red
	b	green		b	green		b	blue
6	a	black	14	a	brown	22	a	red
	b	blue		b	blue		b	violet
7	a	black	15	a	brown	23	a	red
	b	violet		b	violet		b	grey
8	a	black	16	a	brown	24	a	red
	b	grey		b	grey		b	white

Colour codes according to international standards

TRAYCONTROL 300 / TRAYCONTROL 300-C (AWG 28-22)

No.	Basic-ring-colour	No.	Basic-ring-colour	No.	Basic-ring-colour
1	black	18	white/violet	35	white/red/orange
2	brown	19	white/grey	36	white/red/yellow
3	red	20	white/black/brown	37	white/red/green
4	orange	21	white/black/red	38	white/red/blue
5	yellow	22	white/black/orange	39	white/red/violet
6	green	23	white/black/yellow	40	white/red/grey
7	blue	24	white/black/green	41	white/orange/yellow
8	violet	25	white/black/blue	42	white/orange/green
9	grey	26	white/black/violet	43	white/orange/blue
10	white	27	white/black/grey	44	white/orange/violet
11	white/black	28	white/brown/red	45	white/orange/grey
12	white/brown	29	white/brown/orange	46	white/yellow/green
13	white/red	30	white/brown/yellow	47	white/yellow/blue
14	white/orange	31	white/brown/green	48	white/yellow/violet
15	white/yellow	32	white/brown/blue	49	white/yellow/grey
16	white/green	33	white/brown/violet	50	white/green/blue
17	white/blue	34	white/brown/grey		

TRAYCONTROL 300 / TRAYCONTROL 300-C (AWG 20-16)

No.	Basic-ring-colour	No.	Basic-ring-colour	No.	Basic-ring-colour
1	black	18	white/green	35	white/red/red
2	red	19	white/yellow	36	white/red/green
3	white	20	white/blue	37	white/red/blue
4	green	21	white/brown	38	white/red/brown
5	orange	22	white/orange	39	white/red/violet
6	blue	23	white/grey	40	white/green/black
7	brown	24	white/violet	41	white/green/red
8	yellow	25	white/black/red	42	white/green/green
9	violet	26	white/black/green	43	white/green/blue
10	grey	27	white/black/yellow	44	white/green/brown
11	pink	28	white/black/blue	45	white/green/violet
12	hellbrown	29	white/black/brown	46	white/blue/black
13	red/green	30	white/black/orange	47	white/blue/red
14	red/yellow	31	white/black/grey	48	white/blue/green
15	red/black	32	white/black/violet	49	white/blue/blue
16	white/black	33	white/black/black	50	white/blue/brown
17	white/red	34	white/red/black		

Pair-colour codes according to international standards

TRAYCONTROL 300 TP / TRAYCONTROL 300 TP-C (AWG 26-22)

Pair-stranding			Pair-stranding			Pair-stranding		
Pair-no.	core	colour	Pair-no.	core	colour	Pair-no.	core	colour
1	a	black	10	a	red	19	a	white
	b	red		b	blue		b	blue
2	a	black	11	a	red	20	a	white
	b	white		b	yellow		b	brown
3	a	black	12	a	red	21	a	white
	b	green		b	brown		b	orange
4	a	black	13	a	red	22	a	white
	b	blue		b	orange		b	yellow
5	a	black	14	a	green	23	a	blue
	b	brown		b	blue		b	brown
6	a	black	15	a	green	24	a	blue
	b	yellow		b	white		b	orange
7	a	black	16	a	green	25	a	blue
	b	orange		b	brown		b	yellow
8	a	red	17	a	green			
	b	green		b	orange			
9	a	red	18	a	green			
	b	white		b	yellow			

TRAYCONTROL 300 TP / TRAYCONTROL 300 TP-C (AWG 20-18)

Pair-stranding			Pair-stranding			Pair-stranding		
Pair-no.	core	colour	Pair-no.	core	colour	Pair-no.	core	colour
1	a	white	10	a	black	19	a	brown
	b	black		b	brown		b	orange
2	a	white	11	a	black	20	a	brown
	b	brown		b	red		b	yellow
3	a	white	12	a	black	21	a	brown
	b	red		b	orange		b	green
4	a	white	13	a	black	22	a	brown
	b	orange		b	yellow		b	blue
5	a	white	14	a	black	23	a	brown
	b	yellow		b	green		b	violet
6	a	white	15	a	black	24	a	brown
	b	green		b	blue		b	grey
7	a	white	16	a	black	25	a	red
	b	blue		b	violet		b	orange
8	a	white	17	a	black			
	b	violet		b	grey			
9	a	white	18	a	brown			
	b	grey		b	red			

Colour code for single wire vehicle cables

one-colour

black, white, blue, orange, brown, green, violet, red, pink, yellow, grey

two-colours

● preferred colours

base colour	marking colour longitudinal stripe	base colour	marking colour longitudinal stripe
white	grey	red	white
white	red	red	yellow
white	brown	red	grey
white	blue	red	green
white	black	red	blue
		red	black
yellow	grey	brown	white
yellow	red	brown	yellow
yellow	brown	brown	yellow
yellow	blue	brown	green
yellow	black	brown	black
grey	green	blue	white
grey	red	blue	yellow
grey	brown	blue	yellow
		blue	red
green	white	black	white
green	grey	black	yellow
green	brown	black	yellow
green	blue	black	green
green	black	black	red

three-colours

● preferred colours

base colour	1. marking colour longitudinal stripe	2. marking colour longitudinal stripe
grey	green	yellow
grey	red	yellow
grey	brown	yellow
red	white	yellow
red	yellow	yellow
red	grey	yellow
red	green	yellow
red	blue	yellow
red	black	yellow
brown	white	yellow
brown	yellow	yellow
brown	green	yellow
brown	black	yellow
blue	white	yellow
blue	yellow	yellow
blue	green	yellow
blue	red	yellow
black	white	yellow
black	yellow	yellow
black	green	yellow
black	red	yellow

Minimum quantities for one or two-coloured combinations per cross-section and colour combination:

0,5 to 2,5 mm² = 3 km

4,0 to 25,0 mm² = 1 km. Remaining cross-sections on request

For three-coloured combination we manufacture **only** on request.

Minimum quantities per cross-sections and colour combinations:

0,5 to 2,5 mm² = 5 km

4,0 to 25,0 mm² = 3 km. Remaining cross-sections on request.



base colour

longitudinal stripe

ring marking

● further colour combinations

base colour	marking colour longitudinal stripe	base colour	marking colour longitudinal stripe
white	yellow	brown	grey
white	green	brown	violet
white	violet	brown	blue
yellow	white	blue	grey
yellow	green	blue	violet
yellow	violet	blue	brown
grey	white	black	grey
grey	yellow	black	violet
grey	violet	black	brown
green	yellow	orange	white
green	red	orange	yellow
green	violet	orange	grey
		orange	green
		orange	violet
		orange	blue
		orange	black
red	brown		
violet	white		
violet	yellow		
violet	grey		
violet	green		
violet	brown		
violet	blue		
violet	black		

● further colour combinations

base colour	1. marking colour longitudinal stripe	2. marking colour longitudinal stripe
grey	white	yellow
grey	yellow	yellow
grey	violet	yellow
red	brown	yellow
violet	white	yellow
violet	yellow	yellow
violet	grey	yellow
violet	green	yellow
violet	brown	yellow
violet	blue	yellow
violet	black	yellow
brown	grey	yellow
brown	violet	yellow
brown	blue	yellow
blue	grey	yellow
blue	violet	yellow
blue	brown	yellow
black	grey	yellow
black	violet	yellow
black	brown	yellow
orange	white	yellow
orange	yellow	yellow
orange	grey	yellow
orange	green	yellow
orange	violet	yellow
orange	blue	yellow
orange	black	yellow

Colour code HELUKABEL®-JB

Colour coded Control Cables **JB** and **SY-JB** with green-yellow protective conductor

The combination of colour identification up to 102 cores consists of 11 basic colours. For core-no. 12 and more, one or two additional colour rings or longitudinal stripes are printed on the basic colour. The ring width is approximately 2 mm.

3- to 5-core cables

Colour identification according to VDE 0293 for flexible cables

- 3 cores = green-yellow/brown/blue
- 4 cores = green-yellow/brown/black/grey
- 5 cores = green-yellow/blue/brown/black/grey

6- and more core cables

Colour identification as per following table.

The insulation of the conductor gives the first basic colour. The second and the third colour is printed on the basic colour as a form of ring or longitudinal stripe. The cores are to be counted continuously through all layers at the same direction, beginning with inner layer towards outside.

No. Basic-Ring-Colour

- 0 green-yellow
- 1 white
- 2 black
- 3 blue
- 4 brown
- 5 grey
- 6 red
- 7 violet
- 8 pink
- 9 orange
- 10 transparent
- 11 beige
- 12 black-white
- 13 blue-white
- 14 brown-white
- 15 grey-white
- 16 red-white
- 17 violet-white
- 18 pink-white
- 19 orange-white
- 20 transparent-white
- 21 beige-white
- 22 blue-black
- 23 brown-black
- 24 grey-black
- 25 red-black
- 26 violet-black
- 27 pink-black
- 28 orange-black
- 29 transparent-black
- 30 beige-schwarz
- 31 brown-blue
- 32 grey-blue
- 33 red-blue
- 34 pink-blue
- 35 orange-blue

No. Basic-Ring-Colour

- 36 transparent-blue
- 37 beige-blue
- 38 grey-brown
- 39 red-brown
- 40 violet-brown
- 41 pink-brown
- 42 orange-brown
- 43 transparent-brown
- 44 beige-brown
- 45 red-grey
- 46 violet-grey
- 47 pink-grey
- 48 orange-grey
- 49 transparent-grey
- 50 beige-grey
- 51 orange-red
- 52 transparent-red
- 53 beige-red
- 54 pink-violet
- 55 orange-violet
- 56 transparent-violet
- 57 beige-violet
- 58 transparent-pink
- 59 beige-pink
- 60 transparent-orange
- 61 beige-orange
- 62 blue-white-black
- 63 brown-white-black
- 64 grey-white-black
- 65 red-white-black
- 66 violet-white-black
- 67 pink-white-black
- 68 orange-white-black

No. Basic-Ring-Colour

- 69 transparent-white-black
- 70 beige-white-black
- 71 brown-white-blue
- 72 grey-white-blue
- 73 red-white-blue
- 74 violet-white-blue
- 75 pink-white-blue
- 76 orange-white-blue
- 77 transparent-white-blue
- 78 beige-white-blue
- 79 grey-white-brown
- 80 red-white-brown
- 81 violet-white-brown
- 82 pink-white-brown
- 83 orange-white-brown
- 84 transparent-white-brown
- 85 beige-white-brown
- 86 red-white-grey
- 87 violet-white-grey
- 88 pink-white-grey
- 89 orange-white-grey
- 90 transparent-white-grey
- 91 beige-white-grey
- 92 blue-white-red
- 93 brown-white-red
- 94 violet-white-red
- 95 pink-white-red
- 96 orange-white-red
- 97 brown-white-violet
- 98 orange-white-violet
- 99 brown-black-blue
- 100 grey-black-blue
- 101 red-black-blue

Colour code HELUKABEL®-OB

Colour coded Control Cables **OB** and **SY-OB** without green-yellow protective conductor

The combination of colour identification up to 101 cores consists of 11 basic colours. For core-no. 12 and more, one or two additional colour rings or longitudinal stripes are printed on the basic colour. The ring width is approximately 2 mm.

2- to 5-core cables

Colour identification according to VDE 0293 for flexible cables

- 2 cores = brown/blue
- 3 cores = brown/black/grey
- 4 cores = blue/brown/black/grey
- 5 cores = blue/brown/black/grey/black

6- and more core cables

Colour identification as per following table. The insulation of the conductor gives the first basic colour. The second and the third colour is printed on the basic colour as a form of ring or longitudinal stripe. The cores are to be counted continuously through all layers at the same direction, beginning with inner layer towards outside.

No. Basic-Ring-colour

- 1 white
- 2 black
- 3 blue
- 4 brown
- 5 grey
- 6 red
- 7 violet
- 8 pink
- 9 orange
- 10 transparent
- 11 beige
- 12 black-white
- 13 blue-white
- 14 brown-white
- 15 grey-white
- 16 red-white
- 17 violet-white
- 18 pink-white
- 19 orange-white
- 20 transparent-white
- 21 beige-white
- 22 blue-black
- 23 brown-black
- 24 grey-black
- 25 red-black
- 26 violet-black
- 27 pink-black
- 28 orange-black
- 29 transparent-black
- 30 beige-black
- 31 brown-blue
- 32 grey-blue
- 33 red-blue
- 34 pink-blue
- 35 orange-blue

No. Basic-Ring-colour

- 36 transparent-blue
- 37 beige-blue
- 38 grey-brown
- 39 red-brown
- 40 violet-brown
- 41 pink-brown
- 42 orange-brown
- 43 transparent-brown
- 44 beige-brown
- 45 red-grey
- 46 violet-grey
- 47 pink-grey
- 48 orange-grey
- 49 transparent-grey
- 50 beige-grey
- 51 orange-red
- 52 transparent-red
- 53 beige-red
- 54 pink-violet
- 55 orange-violet
- 56 transparent-violet
- 57 beige-violet
- 58 transparent-pink
- 59 beige-pink
- 60 transparent-orange
- 61 beige-orange
- 62 blue-white-black
- 63 brown-white-black
- 64 grey-white-black
- 65 red-white-black
- 66 violet-white-black
- 67 pink-white-black
- 68 orange-white-black

No. Basic-Ring-colour

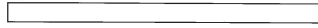
- 69 transparent-white-black
- 70 beige-white-black
- 71 brown-white-blue
- 72 grey-white-blue
- 73 red-white-blue
- 74 violet-white-blue
- 75 pink-white-blue
- 76 orange-white-blue
- 77 transparent-white-blue
- 78 beige-white-blue
- 79 grey-white-brown
- 80 red-white-brown
- 81 violet-white-brown
- 82 pink-white-brown
- 83 orange-white-brown
- 84 transparent-white-brown
- 85 beige-white-brown
- 86 red-white-grey
- 87 violet-white-grey
- 88 pink-white-grey
- 89 orange-white-grey
- 90 transparent-white-grey
- 91 beige-white-grey
- 92 blue-white-red
- 93 brown-white-red
- 94 violet-white-red
- 95 pink-white-red
- 96 orange-white-red
- 97 brown-white-violet
- 98 orange-white-violet
- 99 brown-black-blue
- 100 grey-black-blue
- 101 red-black-blue

Colour code according to DIN VDE 0813

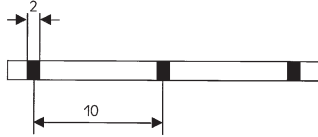
Switchboard cable S-YY Lg

Core identification

Dimensions in mm



single coloured
no ring marking



with ring marking,
ring width and ring
distance

The cores are identified in colour-groups with each 4, 5, 6, 10 different core colour combinations which is repeated continuously according to the following scheme:

No. of cores in each colour-group	Core colours
4	blue, red, grey, green
5	blue, red, grey, green, brown
6	blue, red, grey, green, brown, black
10	blue, red, grey, green, brown, black, yellow, white, pink, violet

Example

S-YY 30 (5 x6) x1x 0,6 Lg
= 5x colour-groups with 6 different core colours.

The colour-groups of same identification codes are only permitted to apply in a cable. In each layer, the blue core of the first completed colour-group is identified with red colour ring markings. The remaining cores of the previous colour-group are laying before the blue cores with red markings.

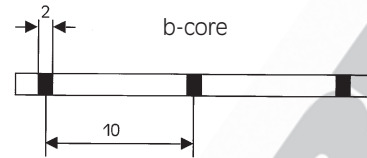
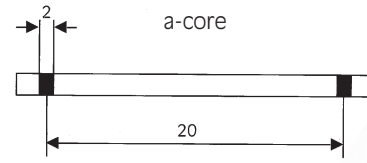
Counting: from outside towards inside.

The cores of the switchboard cable are stranded in layers. The cores are to be counted continuously through all layers at the same direction, beginning with outer layer towards inside.

Switchboard cable S-Y(St)Y Bd

Core identification

Dimensions in mm



The colour identifications of the a- and b-cores of switchboard cables are coded with a basic colour and colour rings.

Identification of ring- and basic colours

No. of Unit	Serial no. of twisted elements	Ring-colours a-core	Basic colour a- and b-core										
1	1 2 3 4 5	blue	white										
2	6 7 8 9 10	yellow											
3	11 12 13 14 15	green											
4	16 17 18 19 20	brown											
5	21 22 23 24 25	black											
6	26 27 28 29 30	blue	grey										
7	31 32 33 34 35	yellow											
8	36 37 38 39 40	green											
9	41 42 43 44 45	brown											
10	46 47 48 49 50	black											
		<table border="1"> <tr> <td>blue</td> <td>yellow</td> <td>green</td> <td>brown</td> <td>black</td> </tr> <tr> <td colspan="5">Ring-colours b-core</td> </tr> </table>	blue	yellow	green	brown	black	Ring-colours b-core					
blue	yellow	green	brown	black									
Ring-colours b-core													

all c-cores: red;
all d-cores: pink;
all e-cores: black

Cables with more than 50 twisted elements, the identifications code of 51 and above elements are to be counted again from serial no. 1.

The twisted elements are pairs, triples, five-core units

Pairs a- and b-cores

triple a-, b- and c-cores

five-core units a-, b-, c-, d- and e-cores

The cores of 5 twisted elements with same ring markings of a-cores are bunched to a unit.

Counting: from outside towards inside.

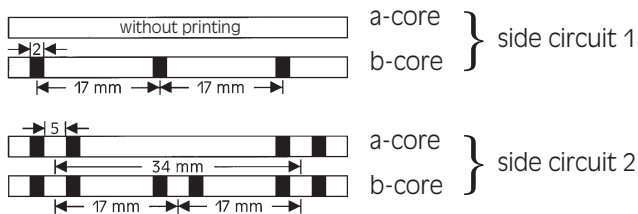
The units are to be counted continuously through all layers at the same direction with correct colour countings, beginning with outer layer towards inside.

Colour code according to DIN VDE 0815

Installation Cables

J-YY . . . Bd, J-HH . . . Bd, J-Y(St)Y . . . Bd,
J-H(St)H . . . Bd and J-2Y(St)Y . . . Bd

The Insulating coverings of single cores of a star quad are marked with black rings:



The cores of 5 star quads of a sub unit are counted according to the sequence of basic colours:

- Quad 1: basic colour of all cores red
- Quad 2: basic colour of all cores green
- Quad 3: basic colour of all cores grey
- Quad 4: basic colour of all cores yellow
- Quad 5: basic colour of all cores white

The marker of units are identified with a red helix, the others with white or uncoloured.

The quads of sub units are counted according to the sequence of basic colours. The units are counted continuously through all layers beginning in the inner layer.

Installation Cables

J-Y(St)Y . . . Lg

2-paired installation cables are stranded to a star quad.

- circuit 1 a-core red, b-core black
- circuit 2 a-core white, b-core yellow

3- and multi-paired installation cables

a-core of 1. pair in each layer is red
other pairs are white

- b-core blue, yellow, green, brown, black in continuous repeat

Counting: from outside to inside

Installation Cables

JE-Y(St)Y . . . Bd, JE-LiYCY . . . Bd, JE-H(St) . . . and JE-HCH...Bd

Pair-colour-identification

The insulating cores are identified with different basic colours which are repeated sequentially in each unit.

Basic colours of pairs

Pair	1	2	3	4
a-core	blue	grey	green	white
b-core	red	yellow	brown	black

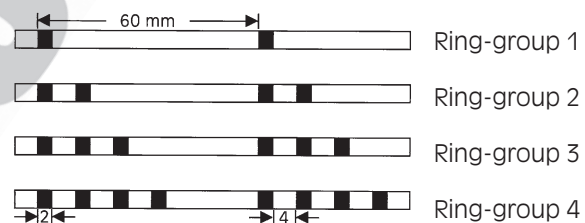
2-paired cables: the cores are stranded to a star quad:

- circuit 1: a-core blue b-core red
- circuit 2: a-core grey b-core yellow

Each unit is assigned to one group of ring. All cores in each unit are marked with coloured rings and ring-groups.

Counting direction in all units is from inside to outside.

Ring-colour and Ring-group



Unit-identification

Unit-No.	Ring-colour	Ring-group	Colour-identification tape
1		I	
2	pink	II	
3		III	-
4		IIII	
5			I
6	orange	II	
7		III	-
8		IIII	
9			I
10	violet	II	
11		III	-
12		IIII	
13			I
14	pink	II	
15		III	blue
16		IIII	
17			I
18	orange	II	
19		III	red
20		IIII	

Cables with more than 12 units contain coloured plastic helix in addition to ring code.

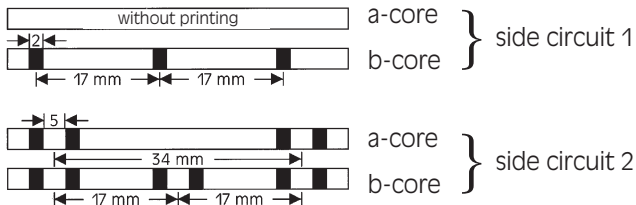
Colour code according to DIN VDE 0816 and extended

Outdoor Telephone Cables

A-2Y(L)2Y...Bd and A-2YF(L)2Y...Bd

A-02Y(L)2Y . . . Bd, A-02YSF(L)2Y . . Bd and A-2Y0F(L)2Y . . . Bd

The Insulating coverings of single cores of a quad are to be marked with black rings:



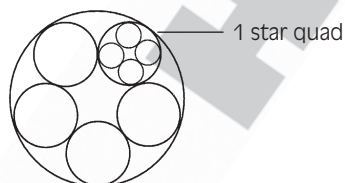
The insulating cores of five star quads of a sub-unit must have the following colours:

- Quad 1: basic colours of all conductors red
- Quad 2: basic colours of all conductors green
- Quad 3: basic colours of all conductors grey
- Quad 4: basic colours of all conductors yellow
- Quad 5: basic colours of all conductors white

The first sub- or main-unit in each layer is to be marked by an open helix of plastic tape of red (marker). All other sub- or main-units must be whipped with an open helix of white or uncoloured plastic tape. The quads of a sub-unit are to be counted according to the sequence of basic colours. In cables with more than 5 star quads, the sub- and main-units must be counted continuously beginning with maker-unit at inner layer towards outside.

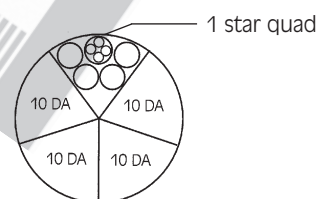
Design of a sub-unit:

Consist of 5 star quads = 10 pairs (DA)
(DA = double core or pair)



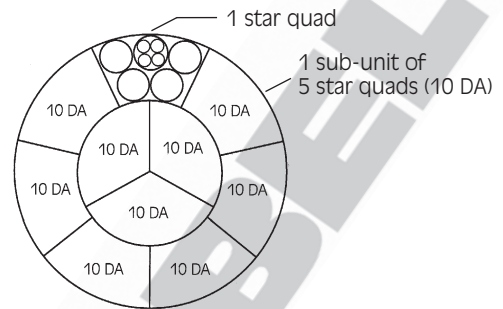
Design of a main-unit:

Consist of 5 sub-units = 50 pairs (DA)



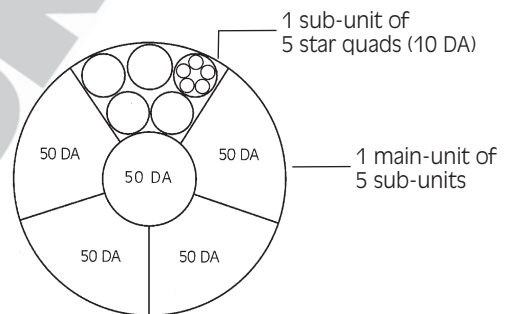
Desing of a main-unit:

Consist of 10 sub-units = 100 pairs (DA)



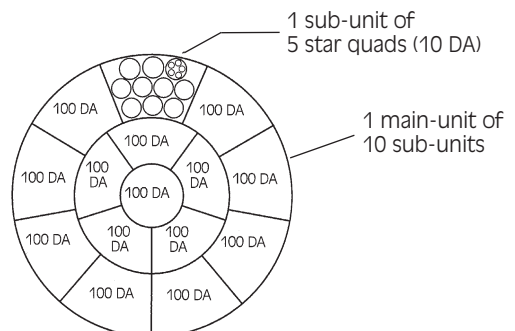
Design of a 300-pairs cable:

Consist of 6 main-units, each of 50 pairs (DA)



Design of a 1500-pairs cable:

Consist of 15 main-units, each of 100 pairs (DA)



Colour Abbreviations according to VDE and IEC

It is planned to use in future an uniform common colour abbreviations according to IEC 60757 (identical to CENELEC-harmonized document HD 457).

The following table shows the comparison of German and IEC colour abbreviations:

colour	German abbreviation		Abbreviation according to IEC 60757
	new	old	
black	SW	sw	BK
brown	BR	br	BN
red	RT	rt	RD
orange	OR	or	OG
yellow	GE	ge	YE
green	GN	gn	GN
blue	BL	bl	BU
violet	VI	vi	VT
grey	GR	gr	GY
white	WS	ws	WH
pink	RS	rs	PK
turquoise	TK	tk	TQ

IEC = International Electrotechnical Commission

Identification of the core according to DIN VDE 0293 and core colour to DIN 47002 and IEC 60304

• Wiring cable with a nominal voltage U_0/U 300/500 V

The following colours have been recommended: black, white, blue, grey, brown, red, orange, turquoise, violet and pink.

Exceptions are green and yellow which are only admitted to be used, if the safety regulations permit.

The colour green is allowed to use for illuminations and light decorations.

All two-colour combinations of the above single colours are allowed to be used.

• Single core cables with a nominal voltage U_0/U 450/750 V

The following single colours have been recommended (only of one colour)

black, white, blue, grey, brown, red, orange, turquoise, violet and pink.

Two-colour combinations are not allowed to be used, with the exception of green-yellow.

• Single core cables and single core sheathed cables

The colour is black or green-yellow.

The exception is for illumination and light decorations where the core colour brown is permitted.

Identification of the cores through colours

are allowed:

- through colouring the whole insulation compound or
- through colouring the outer surface or
- through coloured tapes, so far it is specified in the standards

By identification through colouring only on outer surface (item b) but not allowed to have any colour additives beneath the insulation with an exception by double colour coding.

By core identification with green-yellow, one of the colours have to cover not less than 30% and the other not more than 70% of the surface.

Identification through number coding

The printing of numberings on cores consists of repeating codes (with number and dashes), printed longitudinally on core (for coordination and dimensions see DIN VDE 0293)

Note

The following core identifications are valid for power cables with nominal voltage up to 1000 V. Scopes for valid DIN VDE prescription:

- DIN VDE 0250 – Insulated power cables
- DIN VDE 0255 – Cables with paper-insulation and metal sheath
- DIN VDE 0265 – Cables with PVC-insulation and lead sheath
- DIN VDE 0266 – Halogene-free cable with improved characteristics in case of fire
- DIN VDE 0271 – Cable with PVC-insulation and PVC outer jacket 0,6/1 kV
- DIN VDE 0272 – XLPE-insulated cable
- DIN VDE 0281 – PVC-insulated power cable
- DIN VDE 0282 – Rubber-insulated power cable




Identification of insulated wires by colours according to DIN 40705 and CEI/IEC 60446

Core identification

The core identification of different conductors such as **Phase conductor, Mid-point conductor, PEN-conductor and Predictive conductor** are distinguished by the indicating letters and colours of the core.

An universal international norm exists only for the green-yellow earthing (grounding) conductor.

For new installation it is not allowed to use the old core colours.

Conductor designation	Alphanumerical type		Colour identification		Symbol
	old	new	old	new	
Alternating current					
Phase conductor 1	R	L1	black	not defined (preferred colour black ¹)	
Phase conductor 2	S	L2	red	not defined (e. g. brown ¹)	
Phase conductor 3	T	L3	blue	not defined	
Mid-point conductor	MP	N	grey	light blue ²	
Direct current					
Positive	L +	+		not defined	
Negative	L -	-		not defined	
Mid-point conductor	M			light blue ²	
Protective conductor		PE		green-yellow ³	
Neutral conductor with protection		PEN		green-yellow ³	
Earth (ground)		E		not defined	
Earth for external voltage		TE		not defined	
Load-Connecting clamps		to L1 to L2 to L3 to N			U V W N

¹ Application of conductors by colours "black" or "brown" for internal wiring of single core cables

For the internal wiring of apparatus, distributor boards and equipment with the insulated single cores, only the "black"-colour is preferred. Application of other colours or combinations of two other colours are also provided, if these for the purpose of manufacturing or services are necessary.

If only an additional colour for the individual identification of separated conductor group is necessary, the colour "brown" is preferred.

² Application of the colour "light blue"

Where a circuit includes a neutral or mid-point conductor identified by colour, the colour used for this purpose shall be blue. In order to avoid confusion with other colours it is recommended to use an unsaturated colour blue, called here "light blue". Light blue shall not be used for identifying any other conductor where confusion is possible.

In the absence of a neutral or mid-point conductor, a conductor identified by light blue within the whole wiring system may also be used for any other purposes, except as a predictive conductor.

If identification by colour is used, bare conductors used as neutral or mid-wire conductors shall be either coloured by a light blue stripe, 15 mm to 100 mm wide in each unit or enclosure and each accessible position, or coloured light blue throughout their length.

³ Application of bi-colour combination "green-yellow"

The bi-colour combination green-and-yellow shall be used for identifying the predictive conductor and for no other purposes. Green-and-yellow is the only colour combination recognised for identifying the predictive conductor, according to DIN VDE 0293. The combination of the colours green-and-yellow shall be such that, on any 15 mm length of the conductor where colour coding is applied, one of these colours cover at least 30% and not more than 70% of the surface of the conductor, the other colour covering the remainder of that surface.

If bare conductors, used as predictive conductors, are provided with colouring they shall be coloured green-and-yellow, either throughout the whole length of each conductor or in each compartment or unit or at each accessible position. If adhesive tape is used, only bi-coloured tape shall be applied.

Permissible minimum bending radius according to DIN VDE specifications

The indicated values for bending radius stated in the following table are not permitted to fall below the value. For non-compliance of the values a short longevity is to be expected.

Permissible minimum bending radius for power cables according to DIN VDE 0298 – part 3 – Nominal voltage 0,6/1 kV

• Cables for fixed installation

method of laying	Outer Ø of cables or thickness of flat cable in mm (D)		
	up to 10 mm	> 10 to 25 mm	> 25 mm
– for permanent laying	4 x D	4 x D	4 x D
– to form out	1 x D	2 x D	3 x D

• for flexible cables

	Outer Ø of cables or thickness of flat cable in mm (D)			
	up to 8 mm	> 8 bis 12 mm	> 12 to 20 mm	> 20 mm
– for fixed installation	3 x D	3 x D	4 x D	4 x D
– for free movement	3 x D	4 x D	5 x D	5 x D
– to the inlet	3 x D	4 x D	5 x D	5 x D
– for forced guiding operation (such as trailing)	5 x D	5 x D	5 x D	6 x D
– operation for trolley cable	3 x D	4 x D	5 x D	5 x D
– operation in power drag chain	4 x D	4 x D	5 x D	5 x D
– operation for return sheave	7,5 x D	7,5 x D	7,5 x D	7,5 x D

D = outer Ø of cables or thickness of flat cable

Permissible minimum bending radius according to DIN VDE 0891 – part 5 for installation cable and wires according to DIN VDE 0815

Type	for transport	repeated bending under stress	bending for one time without stress
J-Y(St)Y . . . Lg	7,5 x D	7,5 x D	5 x D
JE-Y(St)Y . . . Bd			2,5 x D
JE-H(St)H . . . Bd			
JE-H(St)H . . . Bd FE			
JE-YCY . . . Bd			
JE-HCH . . . Bd			
JE-LiYCY . . . Bd			
JE-LiHCH . . . Bd			
JE-LiYY . . . Bd			
JE-LiHH . . . Bd			
J-YY . . . Bd			
J-HH . . . Bd			
J-Y(St)Y . . . Bd			
J-H(St)H . . . Bd			

D = outer Ø of cable

Note: For the individual application above the range of specification, the indications in respect of cable recommendations should be considered.

Chemical Resistance of PUR (Polyurethane)

Substance	Concentration (%)	Classification of requirement	Substance	Concentration (%)	Classification of requirement
Aceton		○	Magnesium chloride	30	●
Alums		○	Methanol	< 5	●
Aluminium chloride	10	●	Mythyl acetate		○
Formic acid	30	○	Mythyl chloride		○
Ammonia	10	●	Methylethylketon		●
Ammonium carbonate		○	Mythylglycol		○
Ammonium chloride		●	Mythylglycolacetate		○
Aniline		○	Lactic acid	10	○
ASTM-Oil I		●	Mineral oil		●*
ASTM-Oil II		●	Motor oil		○
ASTM-Oil III		●	Sodium chloride	10	●
ASTM-Fuel No. I		●	Sodium perchlorate solut.		●
ASTM-Fuel No. II		●	Soda lye	10	●
ASTM-Fuel No. III		●	Olive oil		●
Benzene		○	Ozone		●
Brake fluid ATE		○	Paraffin oil		●
Butanol		○	Perchlore ethylene		○
Butyl acetate		○	Petroleum ether		●
Calcium chloride	40	●	Petroleum		●
Chlorobenzene		○	Vegetable oils		●
Chloroform		○	Vegetable fats		●
Chloroprene		○	Phosphoric acid	50	○
Chromic acid		○	Nitric acid	30	○
Cyclohexan		●	Hydrochlorid acid, concen.		○
Cyclohexanon		○	Cutting oil		●*
Diethylether		●	Carbon disulfide		○
Diethylprestone		●	Sulfuric acid	30	●
Diesel oil		●	Sea water		●
Dimethylformamide		○	Silver salts	20	●
Ferric-III-chloride	10	●	Tetrachloroethylene		○
Acetic acid 20-80	10	●	Carbon tetrachloride	100	○
Ethanol	100	●	Tetrahydrofuran		○
Ethyl ether		●	Toluene		○
Ethylacetate		○	Trichlorethylene		○
Ethylencloride		●	Tataric acid	< 10	●
Freon 12		●	Xylon		○
Freon 22		●			
Hydraulic oil SAE 90		●*			
Glycerin		●			
Glycol		●			
Isopropanol		○			
Potash lye	10	●			
Bichromate of potash		●			
Potassium nitrate		●			
Potassium permanganate		○			
Kerosene		●			

resistant ●
 vastly resistant ●
 conditionally resistant ●
 not resistant ○
 *for individual case, please verify

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Chemical Resistance	Concentration (%)	Temperature up to +... °C	PVC										PE	PUR	H	Silicone	Neoprene Rubber	HELU-FLOX®
			JZ-500/600/750, JB, OZ-BL, JZ-HF PVC-Flach, TRONIC (LIVY), SUPERTRONIC-PVC	JZ-603, JZ-603-CY, LI-TPC-Y, PAAR-CY-OZ, N05W5-F, CEI 20-22	H05W5-F, H 05WC4V5-K	LifY, Trago, Lift-25, BAUFLEX BUS-cables-PVC, DAT-cables-PVC	JZ-602, JZ-602-CY, TORONIC-CY, LIVCY, JZ-602 RC, PAAR-TRONIC-CY, SY-JZ, SY-JB, JZ-602 RC-CY	F-CY-JZ, Y-CY-JZ, JZ-HF-CY, J-YISBY, J-YJ, JE-YISBY S-YJ, S-YISBY, TOPFLEX-PVC	ESUY, LIFY, PVC-Single cores, EDV-PIMF-CY ESY, LIFDY, TUBEFLEX-CY	H 05 V-K, H 07 V-K, H 03 W-F, H05 W-F	THERM 120, THERM 105, H05V2-K, H07V2-K	Coaxial-cable (PE) L2-BUS-cable (PE) A-2Y(L)Z1Y, A-2Y(L)Z2Y, HELUCOM® ... 2Y	PUR-JZ, PUR-JZ-HF, TOPEX-PUR, ROBOFLEX, SUPERTRONIC-PUR, MULTIFLEX-PUR, TOPSERV®	J-HISbH, Security Cable ... E 30/E 90, HELUCOM-H JZ-500-HMH/MX/MHX, N2XH, H072-K, RC-H	SIHF, SIHF/GI-P, SIF, SID, SIFF, SIF/GI, SID/GI, SIHF-C-SI, FZ-LS, FZ-LSI, N2GMH2C	Neoprene-Round/Flat, NSHTÖJ, AIRPORT 400 Hz H01N2-D/E, H 05/H 07, A 05/A 07 RN-F	FEP-6Y, PTFE-5Y, Compensating cables-FEP	
Substance																		
Inorganic chemicals																		
Alums	colts.	20	●	●	●	●	●	●	●	●	●	●	○	●	○	●	●	
Aluminium salts	each	20	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	
Ammonia, wat.	10	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Ammonium acetate, wat.	each	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Ammonium carbonate, wat.	each	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Ammonium chloride, wat.	each	20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Barium salts	each	20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Boric acid	100	20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Calcium chloride, wat.	colts.	20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Calcium chloride, wat.	10 – 40	20											●	○				
Calcium nitrate, wat.	colts.	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Chromium salts, wat.	colts.	20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Potassium carbonate, wat.		20	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	
Potassium chlorate, wat.	colts.	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Potassium chloride, wat.	colts.	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Potassium dicromate, wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Potassium iodide, wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Potassium nitrate, wat.	colts.	20	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	
Potassium permanganate, wat.		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Potassium sulphate, wat.		20	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	
Copper salts	colts.	20	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	
Megnesium salts	colts.	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Sodium bicarbonate (Natron), wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Sodium bisulphite (Soda), wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Sodium chloride (Cook salt), wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Sodium thiosulfat, wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Soda Lye	50	50	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Nickel salts, wat.	colts.	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Nitrobenzene	100	50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Phosphoric acid	50	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Mercury	100	20	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Mercury salts	colts.	20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Nitric acid	30	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Hydrochlorid acid	conc.	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Sulfur dioxide		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Carbon disulfide		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Sulfuric acid	50	50	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Hydrogen sulfide		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Sea water		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Silver salts, wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Cleaning fluid lye	2	100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Water (dest.)		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Hydrogen peroxide, wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Zinc salts, wat.		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	
Stannous chloride		20	●	●	●	●	●	●	●	●	●	●	○	○	●	●	●	

● resistant
 ○ conditionally resistant
 ○ not resistant
 * for individual case, please verify

each = each concentration
 colts. = cold saturated
 wat. = watery, liquid

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Chemical Resistance of Fluorinated polymeric materials

- The **Fluorinated polymeric** is resistant against following chemical materials

Abietin acid	Ethyl ether	Pentachloro benzamide
Acetone	Ethyl alcohol	Perchloro ethylene
Acetone phenon	Ethyl acetate	Permanganate
Acetic anhydride	Ethylene bromide	Petrol Phenol
Acetic acid	Ethylene glycol	Phosphorus pentachloride
Acryl hydride		Phosphoric acid
Allylic acetate	Ferric chloride	Phthalic acid
Allylic metacrylacid	Fluoride naphthalene	Pinene
Aluminium chloride	Fluoride nitrobenzene	Piperidine
Ammonia, liquid	Fomaldehyde	Potassium
Ammonium chloride	Formic acid	Potassium acetate
Aniline	Furan	Potassium hydroxide
		Polyacrylonitril
Benzene chloride	Hexane hydrazine	Pyridine
Benzonitrile	Hydrochlorid acid	
Benzyl alcohol	Hydrogen superoxide	Stannous chloride
Borax		Sodium hydroxide
Bromine	Iron phosphide	Sodium hydrochloride
Butyl acetate		Sodium peroxide
Butyl	Lead	Solvents
		Soaps
Calcium chloride	Magnesium chloride	Sulfur
Carbon bisulfide	Mercury	Sulfuric acid
Cetane	Metacryl acid	
Chlorine	Methanol	Tetra bromothane
Chloroform	Methyl ethyl keton	Tetrachlorethane
Chlorosulfonic acid	Methyl metacryl acid	Triethanolamine
Chromic acid		Trichloroacetic acid
Cyclohexan	Naphtalene	Trichloroethylene
Cyclohexanon	Naphthole	Tricresylic phosphate
	N-Butylamine	
Diethyl Carbonate	Nitric acid	Vinylmetracrylate
Dibutyl-Phthalide	Nitromethane	
Dibutyl-Sebacat	Nitrogen tetroxyde	Washing mediums
Di-isobutyl Adipt	not synthetic nitrobenze	Water
Dimethyl ether	N-octadecyl alcohol	
Dimethyl Formamide	2-Nitro butanol	Xylol
Dimethyl hydrazine	2-Nitro-Methyl propanol	
Dioxane		Zinc chloride
	Oils, from vegetables	
Esachloroethane	Oils, from animals	
Ethyl Exoate	Ozone	

- The following chemical substance attack no **Fluorinated polymeric**

Ethyl alcohol	Soda
Vapour	Crude petroleum
Hydrofluoric acid	Nitric acid concentr.
Aviation gasoline	Sea water
Hydraulic liquid-Skydrol	Sulfuric acid (30%)
Isopropyl alcohol	Transformer Oil
Carbon chlorid	Turbine fuel JP 4

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Fluorinated polymeric materials: PTFE, FEP, PFA, ETFE

The chemical resistance of polymers with a high fluorine content is exceptionally high. The electrical insulating and dielectric properties of these materials are also very good.

Fluoropolymere Werkstoffe sind: HELUFLON®-PTFE, HELUFLON®-FEP, HELUFLON®-PFA, HELUFLON®-ETFE

- HELUFLON®-PTFE – Polytetrafluoroethylene (5Y)
- HELUFLON®-FEP – Tetrafluoroethylene –perfluoropropylene –copolymer (6Y)
- HELUFLON®-PFA – Tetrafluoroethylene –perfluoroalkoxy –copolymer (51Y)
- HELUFLON®-ETFE – Ethylene–tetrafluoroethylene –copolymer (7Y)

Fluoropolymere is resistant against nearly all known chemical compounds.

Fluoropolymere has a smooth surface of extremely low surface tension which is why virtually nothing adheres to this material.

Fluoropolymere is moisture rejecting, doesn't swell and is not be damaged by welding.

Fluoropolymere is used, where conventional material wouldn't resist the environmental conditions.

Fluoropolymere is applied in the civil and military sector as well as in the aviation- and astronautics technology.

Fluorcarbonresins have following important characteristics::

- high heat-resistance during permanent operation
 - HELUFLON®-FEP up to 205 °C
 - HELUFLON®-PTFE up to 260 °C
- outstanding resistant against dielectric strength
- constant dielectric characteristics
- no moisture absorption
- resistant against nearly all chemical products
- insensitive to environmental influences, weatherproof and resistant to irradiation from the sun and temperature fluctuations
- good mechanical characteristics, no formation of cracks, wear-resistant
- low coefficient of friction
- no action of light (also uv)

Characteristics

Insulation material	Material initial code	Nominal temperature permanent (°C) approx. 25000 h	Nominal temperature temporary (°C) (hours)	Break-down temperature, melting point (°C)	Dielectric number at 60 Hz (20°C)	Density 10 ³ kg/ m ³ (20°C)	Specific resistance Ohm · cm (20°C)	Break-down resistance kV/ mm (20°C)	Tension MPa (20°C)	Breaking point % (20°C)	Porosity % (20°C)	Environmental resistance	Flammability	Resistance to chemicals	Radiation resistance ¹⁾ x10 ⁴ Gy
ETFE	7Y	-100 +150	+180	+270	2,6	1,70	10 ¹⁶	36	45	150 – 300	0,02	very good	n.e.f.	very good	200
FEP	6Y	-100 +205	+230	+290	2,1	2,15	10 ¹⁸	25	20 – 25	250 – 300	0,01	very good	n.e.f.	very good	0,02
PTFE	5Y	-190 +260	+300	+327	2,0	2,18	10 ¹⁸	20	35 – 45	350 – 400	0,01	very good	n.e.f.	very good	0,02
PFA	51Y	-190 +260	+280	+310	2,1	2,20	10 ¹⁶	25	30	300	0,01	very good	n.e.f.	very good	0,02

¹⁾ Values shown include high dosage and ca. 50% rest smoldering values n.e.f. = no flammable

Insulation and jacket type abbreviations

DIN/VDE	Material
7Y	ETFE
6Y	FEP
5Y	PTFE
51Y	PFA

Chemical Resistance of Silicone

Substance	Test period 7 days Temperature °C	Classification of requirement
Acetamide	150	●
Acetone	20	⦿
Aniline	100	●
Petrol	20	⦿
Brake fluid AT	100	●
Butanol	117	⦿
Butylacetate	20	⦿
Calcium hydroxide, (saturated)	20	●
Chlorbenzene	20	⦿
Cloroform	20	○
Clophene	150	●
Vapour up to 2,5 atü	138	●
Diphenyl	150	⦿
Diesel oil	20	⦿
Dinamo oil	150	⦿
Mineral oil	20	⦿
Acetic acid	20	○
Hydrofluor acid 5%	20	●
Gear oil DTE BB	150	●
Gear oil DTE HH	150	●
Gear oil DTE extra heavy	150	●
Gear oil Type SEA 90	150	●
Prestone	20	●
Glycerin	100	●
Hexa ethoxydisiloxane	20	⦿
High pressure compressor oil	150	●
Isopropyl alcohol	82	⦿
Potassium 20%	20	●
Potassium hydroxide 50%	20	●
Potassium permanganate solution	20	●
Carbolineum	20	●
Cooking salt solution 10%	20	●
Carbon tetrachloride	20	⦿
Compressor oil, light	150	●
Ball bearing fat	150	●
Linseed oil	100	●

- Iresistant
- ⦿ conditionally resistant
- not resistant

Substance	Test period 7 days Temperature °C	Classification of requirement
Methanol	65	⦿
Methylen chloride	20	○
Mineral oil ASTM No. 1	150	●
Mineral oil ASTM No. 3	150	⦿
Mineral oil SEA 10	150	●
Mineral oil SEA 20	150	●
Mineral oil SEA 30	150	●
Motor oil viscose static	150	●
Sodium 20%	20	●
Soda 50%	20	●
Nitrobenzene	20	●
Oleic acid	150	○
Olive oil	150	●
Perchlor	20	○
Petroleum ether	20	○
Petroleum	20	⦿
Phenol	60	●
Phosphoric acid 30%	20	●
Pyridine	20	⦿
Regulator oil	150	○
Castor oil	150	●
Hydrochlorid acid 10%	20	●
Nitric acid conc.	20	○
Nitric acid 10%	20	⦿
Sulfuric acid, conc.	20	○
Sulfuric acid, 10%	20	●
Shock absorber oil	20	●
Styrol	20	⦿
Turbentine oil	20	⦿
Toluene	20	⦿
Transformer oil	150	⦿
Tri	20	○
Tri glycol	20	●
Vaseline	150	●
Water	100	●

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Resistance of substances against solvents, oils and fats

Substance	PVC Y	PA 4 Y	PTFE 5 Y	FEP 6 Y	ETFE 7 Y
Alcohol, methylated spirit	○	⦿	●	●	●
Brake fluid for vehicles	○	⦿	●	●	●
Bromide chloridfluormethane	○	○	●	●	●
Jet gasoline IP4	○	⦿	●	●	●
de-icing and icing protective agent	○	⦿	●	●	●
Aircraft lubricating grease	⦿	⦿	●	●	⦿
Hydraulic oil on bas of mineral oil	⦿	●	●	●	⦿
Hydraulic liquid (chlor-free silicone liquid)	○	○	●	●	●
Hydraulic liquid (synthetic)	○	⦿	●	●	●
Methylethylketon	○	○	●	●	●
Otto-gasoline, diesel gasoline	○	⦿	●	●	●
Lubricating oil for recebrocating engine SAE 10 W	⦿	⦿	●	●	⦿
Lubricating oil for jet engine (synthetic)	⦿	⦿	●	●	⦿
Toluene-Isocotane (Toluene 30%, Isocotane 70%)	○	⦿	●	●	●
Trichlorethane	○	○	●	●	●
Urine	●	●	●	●	●

- Iresistant
- ⦿ conditionally resistant
- not resistant

PVC = Polyvinylchloride Y
PA = Polyamid 4 Y
PTFE = Polytetrafluorethylene 5 Y

FEP = Fluorethylenepropylene 6 Y
ETFE = Tetrafluorethylene 7 Y

Halogen-free Security Cables and Wires

What are halogens?

Halogens "formation of salt" are the elements as fluorine, chlorine, bromine and iodine. Fluorine and chlorine are important for cables and wires as atoms in the plastic molecules, for example fluorine plastics or PVC (polyvinyl chloride) are of significance; and bromine as component of flame protection additives.

When is a cable halogen-free ?

The burning behaviour of cables and wires is very important for the installation in buildings and also in control plants.

Thereby the following points are very important:

- Behaviour under flame influence i. e. the inflammability as well as the propagation of fire
- Subsequent damage by formation of corrosive and toxic gases
- Development of smoke density (darkening of emergency exits hindered the fire extinguishing works)

Cables produced of not halogen-free (halogenated) materials such as mainly the materials with chlorine in the molecule-chain: Polyvinyl chloride (PVC), chloroprene rubber (CR), chlorinated polyethylene (CM), chlorosulfonated polyethylene (CSM) and fluorhydrocarbons.

Polytetrafluorethylene (PTFE)
Fluorethylenpropylene (FEP)
Perfluoralkoxypolymeric (PFA)

These materials have a better behaviour in case of fire.

These are hardly combustible or not flammable and vastly self-extinguishing. Due to this effect and in case of fire the released molecules constituents chlorine and fluorine, which hinder the admittance of oxygen to the fire location and suffocate the flame.

The remarkable disadvantages of these materials are existing in the fact that the released chlorine and fluorine atoms composite themselves with hydrogen which is decomposed from plastic material as well as with hydraulic acid or hydrofluoric acid from the existing air.

These compositions are extremely corrosive and also toxic. In consequence the damages by corrosion are often higher than the actual damage caused by fire.

Halogen-free cables contain no halogens, i. e. the insulation and sheath materials of these cables are composed with polymers on the basis of pure

hydrocarbons. By burning such kind of materials, produce no corrosive and toxic gases but only water vapour and carbondioxide.

Polymers like polyethelene (PE) or polypropylene (PP) are halogen-free. These materials are easy flammable and not self-extinguishing.

Halogen-free cables for the security requirements must be hardly flammable and self-extinguishing. This happens by using the special polymer compounds, containing the considerable percentage of flame protective materials.

Such kind of protective materials consist for example, of an aluminium hydroxide which on one side cools the fire location by setting free of crystal water and on the other side the released water vapour hinders the admittance of oxygen and thereby this suffocates the flame. By using of additional supporting tapes and filling yarns of glass web, mica and similar materials the functionality for example of E 90 can be realised with the suitable cable accessories.

Application

The application of halogen-free security cables and wires are specified more and more with increasing numbers for the buildings where people gather or everywhere, where safety conciousness to protect the human life and valuable materials take a special significance. For example,

- Hospitals, airports, in multi-storey buildings, stores and shops, hotels, theaters, cinemas, schools etc.
- Fire warning plants, alarm systems, ventilation systems, escalators, lifts, safety lights, operation and intensive stations, maintenance equipment
- Underground railways and other railway plants
- Data processing installations
- Power stations and industrial plants with high valuable machines and materials or risky potentials
- Mining works
- Shipbuilding and offshore plants
- Emergency power supply works

HELUKABEL-Security Cables and Wires and the advantages

- Flame retardant and hardly combustibility so that no flame propagation in case of fire can be resulted
- Halogen-free; no evolution of corrosive gases
- In case of burning, the halogen-free cables emits low smoke

Halogen-free Security Cables and Wires

- The danger of toxic gases caused by fire is far inferior
- Low caloric load
- Remarkable longer electrical functionality and flame influence
- Insulation integrity for at least 30 minutes as well as 180 minutes at 800°C under fire condition
- Suitable for emergency service up to 180 minutes
- Radiation resistance up to 200×10^6 cJ/kg (up to 200 Mrad)

These characteristics are obtained by using of a flexible halogen-free basis material – aluminium hydroxide $\text{Al}(\text{OH})_3$.

Caloric load values (heat of combustion)

For designing a building the criterions of the caloric load values are very important. The caloric load values of the modern halogen-free cables are reduced by corresponding additives.

The specific heating values of the non-metallic raw materials for cables are specified to DIN 51900. The values of the caloric load or heat of combustion for electrical cables are given per running meter in the following tables.

Combustible cable insulations or open building materials of class B1 are regarded as harmless so far as the resulted caloric load is distributed as proportionale as possible and is valid ≤ 7 kWh/m²

The conversion of the values:

1 MJ/m ²	\triangleq 0,278 kWh/m ²
1 kWh/m ²	\triangleq 3,6 MJ/m ²

Regulations

According to DIN VDE 0108 supplement 1:

- The total caloric load of the cables are allowed up to 14 kWh per m² of the field areas if only halogen-free cables with improved characteristics in the case of fire are used.

If you use PVC cables the total caloric load is only up to 7 kWh per m²

Tests

The characteristics of the security cables are tested according to DIN VDE specifications:

Behaviour in fire

According to DIN VDE 0472 part 804, test method A, test method B and test method C.

• Test method A – test on single cable \triangleq IEC 60332-2

- Test sample of 600 mm cable length shall be in a position vertically hanging. A propane gas burner (\varnothing 8 mm) shall be at an angle of 45° to the axis and the flame of approx. 100 mm below the lower edge of the sample. Flame influence max. 20 s.
- The test is passed, if the sample has not burned or the flame extinguished by itselfs and the damage by fire doesnt reach the remotest upper side of the sample.

• PVC self-extinguishing and flame retardant according to VDE 0482-332-1-2 DIN EN 60332-1-2 7 / IEC 60332-1 (equivalent to DIN VDE 0472 Teil 804 test method B).

- Test sample of 600 mm cable length shall be in a position vertically hanging. A propane gas burner (\varnothing 8 mm) shall be at an angle of 45° to the axis and the flame of approx. 100 mm below the lower edge of the sample. Flame influence, depending on cable weight, 1 to 2 minutes.
- The test is passed, if the sample has not burned or the flame extinguished by itselfs and the damage by fire doesnt reach the remotest upper side of the sample.

• Test method C – test on bunched cables similar IEC 60332-3, HD 405.3, DIN EN 60332-3, VDE 0482-332-3

- Test samples of 360 cm cable length are laying parallel side-by-side attached to a test-ladder, which is hanging vertically with a distance of 150 mm to the furnace. The sample should be flamed with a flame length of 60 cm on the test sample at approx. temperature 800°C by a burner width of approx. 250 mm. The test duration should be 20 minutes.
- The test is passed, if the sample has not burned or the flame extinguished by itself and the damage by fire does not reach the remotest upper side of the sample.

Corrosivity of cumbustion gases

According to VDE 0482 part 267/DIN EN 50267-2-2 / IEC 60754-2 (is equivalent to DIN VDE 0472 part 813). For the performance of the test procedure the insulation and sheath materials are to be put in the moveable furnace, preheated to 750 to 800°C. The burning gas is conducted through two gas-washing bottles.

- The test shall be regarded as passed when the measured pH-value is $\geq 4,3$ and the electrical conductivity $\leq 100 \mu\text{S}\cdot\text{cm}^{-1}$.
- During this test all the not desired components of the materials are precipitated such as all halogens, sulphur and nitrogen.

Halogen-free Security Cables and Wires

Continuance of insulation effect under direct fire conditions

According to DIN VDE 0472 part I 814 IEC 60331

Test sample of 1200 mm cable length is fixed in a horizontal position, 75 mm over the gas burner. The rated voltage of 3 A fuse is fixed between the core groups. The burner flame is so to regulate that the temperature on cable should be $800 \pm 50^\circ\text{C}$. The measuring can be effected until the fuse is blown. Test voltage 400 V for power cables and wires
Test voltage 110 V for telecommunication cables

- The test shall be regarded as passed when no 3 A fuse has blown during the test period between 20 to 180 minutes.

Non-Halogen verification

According to VDE 0482 part 267/DIN EN 50267-2-1/IEC 60754-1 (is equivalent to DIN VDE 0472 part 815).

The corrosion test of gases caused by fire is carried out to the test materials, not of complete cable samples. The proof of halogen is effected by chemical analysis.

Materials with a content of:

$\leq 0,2\%$ chlorine and

$\leq 0,1\%$ fluorine

are regarded as halogen-free.

Smoke density

According to VDE 0482 part 1034-1+2 / IEC 61034-1+2 / DIN EN 61034-1+2 / BS 7622 Teil 1+2 (is equivalent to DIN VDE 0472 part 816).

The test of smoke density is effected to a single cable, laid in a horizontal position within a room of 3 meter cube. The photometrically measured absorption of light is a measuring unit (in %) of light transmittance for the smoke density.

The test is regarded as passed when the light absorption appears within 40 minutes and the following values shall be obtained for light transmission.

Cable Ø	Transmission of Light
> 3–5 mm	40%
> 5–10 mm	50%
> 10–20 mm	60%
> 20–40 mm	60%
> 40	70%

Functionality of electric cable systems

According to DIN 4102 part 12 (system test)
DIN 4102 part 12 describes the requirements and measurements necessary in achieving circuit integrity of a complete electric cable system in case of fire.

Cable systems

Regarded as cable systems are power cables, insulated power cables and wires, telecommunication installation cables for telephone and data transmission and rail-distributors including their corresponding connecting devices such as the necessary ducts and conduits, coatings and coverings, connecting elements, supporting devices, cable trays and clamps.

Functionality

According to DIN VDE 4102 part 12

The functionality is given, when during the test under fire no short circuit and no interruption of current flow occur in the tested electrical cable system.

According to this standard, the security cables are always to be tested together with the corresponding supporting devices, clamps, holder and mounting accessories.

Note: The above defined functionality has no relationship with the continuance of insulation effect under fire conditions according to DIN VDE 0472 part 814.

Test

During this test under fire a complete cable installation will be tested in a large combustion chamber, i. e. cables and wires including clamps, supporting devices, holders, dowels etc.

Test voltage for power cables:	380 V
Test voltage for telecommunication cables:	110 V
Current load:	3 A

The combustion chamber is to be heated up according to ETK (Standard temperature curve).

The test period is distinguished in 3 classes:

- E30 for the functionality ≥ 30 minutes
- E60 for the functionality ≥ 60 minutes
- E90 for the functionality ≥ 90 minutes

Raise of temperature in combustion chamber:

- For E30 to approx. 820°C
- For E60 to approx. 870°C
- For E90 to approx. 980°C

After passing the functionality test, this will be certified with the class identification as E30, E60 or E90.

Note: At the moment the class E60, which is specified in DIN-VDE standards, is not applied for economical and technical reasons.

Heat-resistance classes as per VDE 0530 part 1

Class	Insulating material	Impregnation material	max. continuous temperature	Cable type
Y	Cotton, Synthetic and natural silk, Polyamide fibres, Paper, Polyvinylchloride (PVC), Polyethylene (PE), Vulkanised rubber	–	90°C	HELUKABEL® PVC + Neoprene cables
A	Cotton, Synthetic and natural silk, Polyamide, Paper, heat-resistant impregnated textiles, Polyester resin	Bitumous varnish Synthetic resin varnish Insulating oil and synthetic dielectrical fluids	105°C	HELUTHERM® single cores, control cables UL + CSA-approved
(E)	Special wire enamel, Special synthetic foils, Compressed material with cellulose fillers, Paper and cotton tapes	Synthetic resin varnish and Polyester resin, both with a permissible continuous withstand temperature of > 120°C	105°C (short time operation 120°C)	HELUTHERM® 120
B	Glass fibre, Micaproducts, Special synthetic foils, Compressed materials with mineral fillers	As under E but with a permissible continuous withstand temperature of > 130°C	145°C	HELUTHERM® 145
F	Glass fibre, Micaproducts, Aromatic polyamides, Impregnated glass fibre braides	Resins with a permissible continuous withstand temperature of > 155°C	155°C	HELUTHERM® 145
H	Glass fibre, Micaproducts, Aromatic polyamides, Silicone rubber, Polyamide foils, PTFE	Silicone resins with a permissible continuous withstand temperature of > 180°C	180°C	Silicone + HELUFLON® tinned conductors
C	Mica, Porcelain, Glass, Quartz, and similar fire resistant materials	As under H but with a permissible continuous withstand temperature of > 225°C	> 180°C	HELUFLON® PTFE+FEP with tinned or nickel plated conductors, HELUTHERM® 400/600/800/1200

Caloric load values (heat of combustion)

For designing a building the criterions of the caloric load values are very important. The caloric load values of the modern halogen-free cables are reduced by corresponding additives. The specific heating values of the non-metallic raw materials for cables are specified to DIN 51900. The values of the caloric load or heat of combustion for electrical cables are given per running meter in the following tables. The tables are subdivided according to the different cable designs, with halogen-free or halogenated insulation, number of cores with different cross-sections. With these tables of the caloric load values of our cables we will give you the possibility to accomodate your calculations for the application of these cables.

Regulations:

According to DIN VDE 108 supplement 1:

- The total caloric load of the cables are allowed up to 14 kWh per m² of the field areas if only halogen-free cables with improved characteristics

in the case of fire are used. If you use PVC cables the total caloric load is only up to 7 kWh per m².

- Cables are according to
 - DIN VDE 0250 part 214 – halogen-free installation cable with improved fire behaviour.
 - DIN VDE 0266 – halogen-free cables with improved characteristics in the case of fire.
 - DIN VDE 0815 – wiring cables for telecommunication and data processing systems.
- The caloric load values – Hu (calculated value):

PVC-core insulation	Hu	6,3 kWh/kg
PVC-sheath material	Hu	5,7 kWh/kg
PVC (lower limit)	Hu	5,6 kWh/kg
H-core insulation	Hu	4,8 kWh/kg
H-sheath material	Hu	4,2 kWh/kg
PE in general	Hu	12,2 kWh/kg
PP in general	Hu	12,8 kWh/kg

The conversion of the values:

$$1 \text{ MJ/m}^2 \triangleq 0,278 \text{ kWh/m}^2, 1 \text{ kWh/m}^2 \triangleq 3,6 \text{ MJ/m}^2$$

Caloric load values of halogen-free Security Cables and insulated wires

Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m	
(N)HXH-E 30 orange	4 x 120 rm	7,26	(N)HXCH-E 30 orange	7 x 1,5/ 2,5 re	1,04	(N)HXCH-E 90 orange	3 x 1,5/re 1,5	0,86	
	4 x 150 rm	8,92		7 x 2,5/ 2,5 re	1,33		3 x 2,5/re	0,95	
	4 x 185 rm	10,38		7 x 4 / 4 re	1,49		3 x 4 /re 4	1,06	
	4 x 240 rm	11,76		10 x 1,5/ 2,5 re	1,55		3 x 6 /re	1,17	
	5 x 1,5 re	0,99		10 x 2,5/ 4 re	1,71		3 x 10 /re 10	1,36	
	5 x 2,5 re	1,09		10 x 4 / 6 re	1,92		3 x 16 /rm 16	1,68	
	5 x 4 re	1,25		12 x 1,5/ 2,5 re	1,72		3 x 25 /rm 16	2,18	
	5 x 6 re	1,43		12 x 2,5/ 4 re	1,90		3 x 35 /rm 16	2,53	
	5 x 10 re	1,72		12 x 4 / 6 re	2,14		3 x 50 /rm 25	3,19	
	5 x 16 rm	2,05		16 x 1,5/ 4 re	2,22		3 x 70 /rm 35	4,04	
	5 x 25 rm	3,05		16 x 2,5/ 6 re	2,41		3 x 95 /rm 50	4,73	
	7 x 1,5 re	1,16		21 x 1,5/ 6 re	2,58		3 x 120 /rm 70	5,69	
	7 x 2,5 re	1,29		21 x 2,5/ 6 re	2,74		3 x 150 /rm 70	6,80	
	10 x 1,5 re	1,47		24 x 1,5/ 6 re	2,80		3 x 185 /rm 95	8,44	
	10 x 2,5 re	1,63		24 x 2,5/10 re	3,19		3 x 240 /rm 120	10,04	
	12 x 1,5 re	1,84		30 x 1,5/ 6 re	3,26		4 x 1,5/ 1,5 re	0,99	
	12 x 2,5 re	2,05		30 x 2,5/10 re	3,69		4 x 2,5/ 2,5 re	1,08	
	14 x 1,5 re	2,09		40 x 1,5/10 re	4,17		4 x 4 / 4 re	1,22	
	14 x 2,5 re	2,42		40 x 2,5/10 re	4,68		4 x 6 / 6 re	1,36	
	19 x 1,5 re	2,52		(N)HXH-E 90 orange	3 x 1,5 re		0,55	4 x 10 / 10 re	1,58
	19 x 2,5 re	2,79			3 x 2,5 re		0,61	4 x 16 / 16 rm	1,96
	24 x 1,5 re	3,30	3 x 4 re		0,67	4 x 25 / 16 rm	2,60		
	24 x 2,5 re	3,66	3 x 6 re		0,85	4 x 35 / 16 rm	3,11		
	30 x 1,5 re	3,77	3 x 10 re		0,99	4 x 50 / 25 rm	3,81		
	30 x 2,5 re	4,19	3 x 16 rm		1,23	4 x 70 / 35 rm	4,92		
	(N)HXCH-E 30 orange	2 x 1,5/ 1,5 re	0,58		3 x 25 rm	1,60	4 x 95 / 50 rm	6,02	
		2 x 2,5/ 2,5 re	0,64		3 x 35 rm	1,83	4 x 120 / 70 rm	6,90	
		2 x 4 / 4 re	0,75		3 x 50 rm	2,30	4 x 150 / 70 rm	8,39	
		2 x 6 / 6 re	0,85		3 x 70 rm	3,03	4 x 185 / 95 rm	10,20	
		2 x 10 /10 re	1,00		3 x 95 rm	3,98	4 x 240 /120 rm	13,00	
		3 x 1,5/ 1,5 re	0,63		3 x 120 rm	4,70	7 x 1,5/1,5	1,29	
		3 x 2,5/ 2,5 re	0,71		3 x 150 rm	5,63	10 x 1,5/2,5	1,71	
		3 x 4 / 4 re	0,84		3 x 185 rm	6,95	12 x 1,5/2,5	1,86	
3 x 6 / 6 re		0,95	3 x 240 rm		8,44	16 x 1,5/4	2,26		
3 x 10 / 10 re		1,12	4 x 1,5 re		0,67	21 x 1,5/6	2,74		
3 x 16 / 16 re		1,35	4 x 2,5 re		0,73	24 x 1,5/6	3,42		
3 x 25 / 16 rm		2,09	4 x 4 re		0,82	NYSEY 6/10 kV	3 x 35/16	10,56	
3 x 35 / 16 rm	2,74	4 x 6 re	0,91	3 x 50/16	11,67				
3 x 50 / 25 rm	3,04	4 x 10 re	1,06	3 x 70/16	12,78				
3 x 70 / 35 rm	3,90	4 x 16 rm	1,49	3 x 95/16	14,72				
3 x 95 / 50 rm	4,62	4 x 25 rm	1,95	3 x 120/16	16,12				
3 x 120 / 70 rm	5,66	4 x 35 rm	2,30	NA2XSEY 6/10 kV	3 x 35/16		10,28		
3 x 150 / 70 rm	7,19	4 x 50 rm	2,88		3 x 50/16	11,67			
3 x 185 / 95 rm	8,71	4 x 70 rm	3,80		3 x 70/16	13,06			
3 x 240 /120 rm	10,57	4 x 95 rm	4,96		3 x 95/16	14,72			
4 x 1,5/ 1,5re	0,78	4 x 120 rm	5,74		3 x 120/16	16,68			
4 x 2,5/ 2,5re	0,82	4 x 150 rm	6,97						
4 x 4 / 4 re	0,96	4 x 185 rm	8,58						
4 x 6 / 6 re	1,09	5 x 1,5 re	0,79						
4 x 10 / 10 re	1,30	5 x 2,5 re	0,88						
4 x 16 / 16 rm	1,56	5 x 4 re	0,99						
4 x 25 / 16 rm	2,40	5 x 6 re	1,10						
4 x 35 / 16 rm	2,74	5 x 10 re	1,29						
4 x 50 / 25 rm	3,50	5 x 16 rm	1,59						
4 x 70 / 35 rm	4,49	5 x 25 rm	2,42						
4 x 95 / 50 rm	5,35	5 x 35 rm	2,84						
4 x 120 / 70 rm	6,51	7 x 1,5 re	0,92						
4 x 150 / 70 rm	8,35	10 x 1,5 re	1,25						
4 x 185 / 95 rm	10,13	12 x 1,5 re	1,40						
4 x 240 /120 rm	12,32	19 x 1,5 re	1,96						
		24 x 1,5 re	2,47						
		27 x 1,5 re	2,69						

Caloric load values of halogen-free Security Cables and insulated wires

Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m	
NHXHX black	1 x 2,5	0,22	NHXHX black	37 x 1,5	3,92	(N)HMH-O/J	5 x 1,5	0,45	
	1 x 4	0,28		37 x 2,5	4,69		5 x 2,5	0,52	
	1 x 6	0,28		37 x 4	5,53		5 x 4	0,77	
	1 x 10	0,28	NHXCHX black	3 x 1,5/ 1,5	0,78		5 x 6	0,89	
	1 x 16	0,39		3 x 4 / 4	1,00		5 x 10	1,15	
	1 x 25	0,53		3 x 6 / 6	1,11		5 x 16	1,67	
	1 x 35	0,58		3 x 10 / 10	1,33		5 x 25	2,40	
	1 x 50	0,69		3 x 16 / 10	1,58		7 x 1,5	0,55	
	1 x 70	0,81		3 x 16 / 16	1,58		7 x 2,5	0,68	
	1 x 95	1,03		3 x 25 / 16	2,31		HXSLHXOE	3 x 0,75	0,29
	1 x 120	1,14		3 x 25 / 25	2,31			3 x 1,0	0,30
	1 x 150	1,39		3 x 35 / 16	2,61			3 x 1,5	0,33
	2 x 1,5	0,69		3 x 35 / 35	2,61			3 x 2,5	0,47
	2 x 2,5	0,78		3 x 50 / 25	3,33	4 x 0,75		0,34	
	2 x 4	0,89		3 x 50 / 50	3,33	4 x 1,0		0,35	
	2 x 6	1,00		3 x 70 / 35	4,11	4 x 1,5		0,38	
	2 x 10	1,19		3 x 70 / 70	4,11	4 x 2,5		0,54	
	3 x 1,5	0,78		3 x 95 / 50	5,33	5 x 0,75		0,39	
	3 x 2,5	0,86		3 x 95 / 95	5,33	5 x 1,0		0,40	
	3 x 4	1,00		3 x 120 / 70	6,11	5 x 1,5	0,47		
	3 x 6	1,08	3 x 120 / 120	6,11	5 x 2,5	0,63			
	3 x 10	1,28	3 x 150 / 70	7,50	7 x 0,75	0,48			
	3 x 16	1,53	3 x 150 / 150	7,50	7 x 1,0	0,50			
	3 x 25	2,25	4 x 1,5/ 1,5	0,89	7 x 1,5	0,54			
	3 x 35	2,56	4 x 2,5/ 2,5	1,03	7 x 2,5	0,72			
	3 x 50	3,19	4 x 4 / 4	1,17	12 x 0,75	0,77			
	3 x 70	3,94	4 x 6 / 6	1,31	12 x 1,0	0,80			
	3 x 95	5,14	4 x 10 / 10	1,53	12 x 1,5	0,88			
	3 x 120	5,89	4 x 16 / 16	1,89	12 x 2,5	1,37			
	3 x 150	7,25	4 x 25 / 16	2,69	16 x 0,75	1,02			
	4 x 1,5	0,89	4 x 35 / 16	3,06	16 x 1,0	1,06			
	4 x 2,5	1,00	4 x 50 / 25	4,00	16 x 1,5	1,15			
	4 x 4	1,14	4 x 70 / 35	4,89	16 x 2,5	1,65			
4 x 6	1,28	4 x 95 / 50	6,44	19 x 0,75	1,26				
4 x 10	1,50	4 x 120 / 70	7,36	19 x 1,0	1,32				
4 x 16	1,86	4 x 150 / 70	8,97	19 x 1,5	1,43				
4 x 25	2,64	(N)HMH-O/J	1 x 1,5	0,16	19 x 2,5	2,02			
4 x 35	3,00		1 x 2,5	0,19	24 x 0,75	1,50			
4 x 50	3,92		1 x 4	0,23	24 x 1,0	1,57			
4 x 70	4,81		1 x 6	0,26	24 x 1,5	1,70			
4 x 95	6,25		1 x 10	0,33	24 x 2,5	2,42			
4 x 120	7,14		1 x 16	0,41					
4 x 150	7,14		2 x 1,5	0,30					
5 x 1,5	1,03		2 x 2,5	0,34					
5 x 2,5	1,14		2 x 4	0,43					
5 x 4	1,31		2 x 6	0,51					
5 x 6	1,47		2 x 10	0,74					
5 x 10	1,83	3 x 1,5	0,33						
5 x 16	2,17	3 x 2,5	0,40						
5 x 25	3,14	3 x 4	0,52						
7 x 1,5	1,17	3 x 6	0,64						
7 x 2,5	1,31	3 x 10	0,87						
7 x 4	1,50	4 x 1,5	0,41						
12 x 1,5	1,69	4 x 2,5	0,48						
12 x 2,5	2,00	4 x 4	0,67						
12 x 4	2,31	4 x 6	0,77						
19 x 1,5	2,36	4 x 10	1,02						
19 x 2,5	2,69	4 x 16	1,37						
19 x 4	3,14	4 x 25	1,98						
24 x 1,5	2,86	4 x 35	2,35						
24 x 2,5	3,28								
24 x 4	3,97								

Caloric load values of halogenated Cables and insulated wires

Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m
NYN	1 x 2,5	0,22	NYCY, NYCWY	3 x 1,5/ 1,5	0,78	NYM	1 x 1,5	0,17
	1 x 4	0,33		3 x 2,5/ 2,5	0,86		1 x 2,5	0,22
	1 x 6	0,33		3 x 4 / 4	1,11		1 x 4	0,25
	1 x 10	0,33		3 x 6 / 6	1,25		1 x 6	0,28
	1 x 16	0,42		3 x 10 / 10	1,47		1 x 10	0,36
	1 x 25	0,58		3 x 16 / 10	1,75		1 x 16	0,42
	1 x 35	0,67		3 x 16 / 16	1,75		1 x 25	0,58
	1 x 50	0,81		3 x 25 / 16	2,53			
	1 x 70	0,92		3 x 25 / 25	2,53		2 x 1,5	0,42
	1 x 95	1,17		3 x 35 / 16	2,22		2 x 2,5	0,53
	1 x 120	1,31		3 x 35 / 35	2,22		2 x 4	0,67
	1 x 150	1,58		3 x 50 / 25	2,78		2 x 6	0,75
				3 x 50 / 50	2,78		2 x 10	1,17
	2 x 1,5	0,69		3 x 70 / 35	3,28			
	2 x 2,5	0,78		3 x 70 / 70	3,28		3 x 1,5	0,44
	2 x 4	1,00		3 x 95 / 50	4,28		3 x 2,5	0,58
	2 x 6	1,11		3 x 95 / 95	4,28		3 x 4	0,72
	2 x 10	1,31		3 x 120 / 70	4,72		3 x 6	0,92
				3 x 120 /120	4,72		3 x 10	1,28
	3 x 1,5	0,75		3 x 150 / 70	5,72		3 x 16	1,53
	3 x 2,5	0,83		3 x 150 /150	5,72		3 x 25	2,39
	3 x 4	1,08					3 x 35	2,78
	3 x 6	1,22		4 x 1,5/ 1,5	0,86			
	3 x 10	1,42		4 x 2,5/ 2,5	0,97		4 x 1,5	0,53
	3 x 16	1,69		4 x 4 / 4	1,28		4 x 2,5	0,67
	3 x 25	2,14		4 x 6 / 6	1,44		4 x 4	0,92
	3 x 35	2,47		4 x 10 / 10	1,69		4 x 6	1,08
	3 x 50	2,60		4 x 16 / 16	2,08		4 x 10	1,50
	3 x 70	3,08		4 x 25 / 16	2,92		4 x 16	1,86
	3 x 95	4,06		4 x 35 / 16	2,67		4 x 25	2,89
	3 x 120	4,47		4 x 50 / 25	3,44		4 x 35	3,28
	3 x 150	5,42		4 x 70 / 35	4,17			
				4 x 95 / 50	5,33		5 x 1,5	0,58
	4 x 1,5	0,83		4 x 120 / 70	5,94		5 x 2,5	0,75
	4 x 2,5	0,94		4 x 150 / 70	7,22		5 x 4	1,11
	4 x 4	1,25					5 x 6	1,28
	4 x 6	1,42		A-2Y(L)2Y Bd	2 x 2 x 0,6		0,84	5 x 10
	4 x 10	1,67		4 x 2 x 0,6	1,17		5 x 16	2,31
	4 x 16	2,03		6 x 2 x 0,6	1,25		5 x 25	3,42
	4 x 25	2,89		10 x 2 x 0,6	1,38			
	4 x 35	2,61		20 x 2 x 0,6	1,92		6 x 1,5	0,67
	4 x 50	3,31		30 x 2 x 0,6	2,32			
	4 x 70	4,08		40 x 2 x 0,6	2,62		7x 1,5	0,67
	4 x 95	5,11		50 x 2 x 0,6	3,02			
	4 x 120	5,69		100 x 2 x 0,6	4,71			
	4 x 150	6,97		150 x 2 x 0,6	6,17			
				200 x 2 x 0,6	7,69			
5 x 1,5	0,94		250 x 2 x 0,6	8,88				
5 x 2,5	1,08		300 x 2 x 0,6	10,20				
5 x 4	1,44		350 x 2 x 0,6	11,88				
5 x 6	1,64		400 x 2 x 0,6	13,19				
5 x 10	2,00		500 x 2 x 0,6	15,45				
5 x 16	2,39		600 x 2 x 0,6	18,57				
5 x 25	3,42		700 x 2 x 0,6	20,82				
			800 x 2 x 0,6	24,18				
7x 1,5	1,08		1000 x 2 x 0,6	28,33				
7x 2,5	1,22							
7x 4	1,67							
12 x 1,5	1,56							
12 x 2,5	1,78							
12 x 4	2,53							
19 x 1,5	2,06							
19 x 2,5	2,44							
19 x 4	3,42							
24 x 1,5	2,56							
24 x 2,5	2,94							
24 x 4	4,33							
37 x 1,5	3,39							
37 x 2,5	4,00							
37 x 4	6,03							

Caloric load values of halogen-free and halogenated Cables and insulated wires

Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m
JE-H (St) H Bd	2 x 2 x 0,6	0,12	J-HH Bd	2 x 2 x 0,6	0,22	J-YY Bd	2 x 2 x 0,6	0,11
	4 x 2 x 0,6	0,18		4 x 2 x 0,6	0,33		4 x 2 x 0,6	0,17
	6 x 2 x 0,6	0,23		6 x 2 x 0,6	0,39		6 x 2 x 0,6	0,22
	10 x 2 x 0,6	0,33		10 x 2 x 0,6	0,53		10 x 2 x 0,6	0,28
	20 x 2 x 0,6	0,64		16 x 2 x 0,6	0,81		16 x 2 x 0,6	0,39
	30 x 2 x 0,6	0,81		20 x 2 x 0,6	0,97		20 x 2 x 0,6	0,44
	40 x 2 x 0,6	1,05		24 x 2 x 0,6	1,11		24 x 2 x 0,6	0,50
	50 x 2 x 0,6	1,34		30 x 2 x 0,6	1,36		30 x 2 x 0,6	0,67
	60 x 2 x 0,6	1,50		40 x 2 x 0,6	1,72		40 x 2 x 0,6	0,81
	80 x 2 x 0,6	2,01		50 x 2 x 0,6	2,00		50 x 2 x 0,6	0,94
	100 x 2 x 0,6	2,53		60 x 2 x 0,6	2,39		60 x 2 x 0,6	1,17
JE-H (St) H Bd	2 x 2 x 0,8	0,28	JE-LiHH Bd	4 x 1 x 0,5 mm ²	0,28	J-Y(St)Y, JE-Y(St)Y	1 x 2 x 0,6	0,15
	4 x 2 x 0,8	0,39		8 x 1 x 0,5 mm ²	0,45		2 x 2 x 0,6	0,17
	8 x 2 x 0,8	0,58		16 x 1 x 0,5 mm ²	0,78		3 x 2 x 0,6	0,20
	12 x 2 x 0,8	0,86		24 x 1 x 0,5 mm ²	1,08		4 x 2 x 0,6	0,23
	20 x 2 x 0,8	1,17		32 x 1 x 0,5 mm ²	1,36		5 x 2 x 0,6	0,26
	32 x 2 x 0,8	1,78		40 x 1 x 0,5 mm ²	1,64		6 x 2 x 0,6	0,28
J-H(St)H Bd	2 x 2 x 0,6	0,12	I-YY Bd	2 x 2 x 0,6	0,11		8 x 2 x 0,6	0,29
	4 x 2 x 0,6	0,18		4 x 2 x 0,6	0,17		10 x 2 x 0,6	0,33
	6 x 2 x 0,6	0,23		6 x 2 x 0,6	0,22		12 x 2 x 0,6	0,38
	10 x 2 x 0,6	0,33		10 x 2 x 0,6	0,28		14 x 2 x 0,6	0,40
	20 x 2 x 0,6	0,72		16 x 2 x 0,6	0,39		16 x 2 x 0,6	0,43
	30 x 2 x 0,6	0,81		20 x 2 x 0,6	0,44	20 x 2 x 0,6	0,47	
	40 x 2 x 0,6	1,05		24 x 2 x 0,6	0,50	24 x 2 x 0,6	0,52	
	50 x 2 x 0,6	1,34		30 x 2 x 0,6	0,67	30 x 2 x 0,6	0,69	
	60 x 2 x 0,6	1,50		40 x 2 x 0,6	0,81	40 x 2 x 0,6	0,77	
	80 x 2 x 0,6	2,01		50 x 2 x 0,6	0,94	50 x 2 x 0,6	0,92	
	100 x 2 x 0,6	2,53		60 x 2 x 0,6	1,17	60 x 2 x 0,6	1,20	
J-H (St) H Bd	2 x 2 x 0,8	0,16	80 x 2 x 0,6	1,42	80 x 2 x 0,6	1,41		
	4 x 2 x 0,8	0,29	100 x 2 x 0,6	1,69	100 x 2 x 0,6	1,83		
	6 x 2 x 0,8	0,35	JE-Y (St) Y Bd	2 x 2 x 0,8	0,19	J-Y(St)Y, JE-Y(St)Y	1 x 2 x 0,8	0,19
	10 x 2 x 0,8	0,55		4 x 2 x 0,8	0,28		2 x 2 x 0,8	0,25
	20 x 2 x 0,8	1,21		8 x 2 x 0,8	0,42		3 x 2 x 0,8	0,31
	30 x 2 x 0,8	1,36		12 x 2 x 0,8	0,58		4 x 2 x 0,8	0,38
	40 x 2 x 0,8	1,67		16 x 2 x 0,8	0,72		5 x 2 x 0,8	0,43
	50 x 2 x 0,8	2,19		20 x 2 x 0,8	0,83		6 x 2 x 0,8	0,50
	60 x 2 x 0,8	2,44		24 x 2 x 0,8	0,94		8 x 2 x 0,8	0,56
	80 x 2 x 0,8	3,18		28 x 2 x 0,8	1,17		10 x 2 x 0,8	0,75
	100 x 2 x 0,8	4,07		32 x 2 x 0,8	1,28		12 x 2 x 0,8	0,81
J-HLiHCH Bd	2 x 2 x 0,5 mm ²	1,0		36 x 2 x 0,8	1,39		14 x 2 x 0,8	0,87
	4 x 2 x 0,5 mm ²	1,4		40 x 2 x 0,8	1,50		16 x 2 x 0,8	1,00
	8 x 2 x 0,5 mm ²	2,1	44 x 2 x 0,8	1,61	20 x 2 x 0,8	1,13		
	12 x 2 x 0,5 mm ²	3,1	48 x 2 x 0,8	1,83	24 x 2 x 0,8	1,45		
	20 x 2 x 0,5 mm ²	4,2	52 x 2 x 0,8	1,94	30 x 2 x 0,8	1,70		
	32 x 2 x 0,5 mm ²	6,4	56 x 2 x 0,8	2,06	40 x 2 x 0,8	2,08		
	40 x 2 x 0,5 mm ²	7,5	60 x 2 x 0,8	2,14	50 x 2 x 0,8	2,65		
	J-H (St) H Bd E 30 bis E 90 red Fire warning installation cable	2 x 2 x 0,8	0,20	64 x 2 x 0,8	2,25	60 x 2 x 0,8	2,84	
		4 x 2 x 0,8	0,34	68 x 2 x 0,8	2,36	80 x 2 x 0,8	3,92	
		8 x 2 x 0,8	0,72	72 x 2 x 0,8	2,47	100 x 2 x 0,8	4,94	
		12 x 2 x 0,8	0,89	76 x 2 x 0,8	2,72			
16 x 2 x 0,8		1,08	80 x 2 x 0,8	2,83				
20 x 2 x 0,8		1,36						
32 x 2 x 0,8		2,03						
40 x 2 x 0,8		2,59						
52 x 2 x 0,8		3,06						
J-H (St) HRH Bd E 30 bis E 90 red Fire warning installation cable		2 x 2 x 0,8	0,39					
		4 x 2 x 0,8	0,66					
	8 x 2 x 0,8	1,27						
	12 x 2 x 0,8	1,56						
	16 x 2 x 0,8	1,81						
	20 x 2 x 0,8	2,26						
	32 x 2 x 0,8	3,23						
	40 x 2 x 0,8	4,15						
52 x 2 x 0,8	4,68							

Caloric load values of halogen-free Security Cables and insulated wires

Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m
HELUTHERM® 145	1 x 0,25	0,00884	HELUTHERM® MULTI 145	1 x 1	0,05	HELUTHERM® MULTI 145	1 x 4	0,10
	1 x 0,33	0,00973		2 x 1	0,11		2 x 4	0,29
	1 x 0,50	0,01231		3 x 1	0,13		3 x 4	0,27
	1 x 0,75	0,01600		4 x 1	0,16		4 x 4	0,35
	1 x 1,0	0,01958		5 x 1	0,19		5 x 4	0,45
	1 x 1,5	0,02931		6 x 1	0,23		6 x 4	0,54
	1 x 2,5	0,04157		7 x 1	0,29		7 x 4	0,68
	1 x 4	0,05014		8 x 1	0,34		8 x 4	0,80
	1 x 6	0,05952		10 x 1	0,38		10 x 4	0,90
	1 x 10	0,10655		12 x 1	0,35		12 x 4	0,81
	1 x 16	0,13120		14 x 1	0,40		14 x 4	0,94
	1 x 25	0,21506		16 x 1	0,44		1 x 6	0,16
	1 x 35	0,25086		19 x 1	0,59		2 x 6	0,46
	1 x 50	0,33443		21 x 1	0,66		3 x 6	0,52
	1 x 70	0,40502		24 x 1	0,70		4 x 6	0,57
	1 x 95	0,53553		25 x 1	0,69		5 x 6	0,71
	1 x 120	0,61629		27 x 1	0,66		6 x 6	0,88
	1 x 150	0,77025		30 x 1	0,70		7 x 6	1,02
	1 x 185	0,94133		33 x 1	0,83		1 x 10	0,15
	1 x 240	1,18313		37 x 1	1,03		2 x 10	0,53
HELUTHERM® MULTI 145	1 x 0,50	0,04	1 x 1,5	0,06	3 x 10	0,58		
	2 x 0,50	0,08	2 x 1,5	0,14	4 x 10	0,74		
	3 x 0,50	0,09	3 x 1,5	0,16	5 x 10	0,87		
	4 x 0,50	0,11	4 x 1,5	0,20	6 x 10	1,00		
	5 x 0,50	0,14	5 x 1,5	0,25	7 x 10	1,25		
	6 x 0,50	0,16	6 x 1,5	0,32	1 x 16	0,17		
	7 x 0,50	0,19	7 x 1,5	0,38	2 x 16	0,64		
	8 x 0,50	0,24	8 x 1,5	0,47	3 x 16	0,73		
	10 x 0,50	0,27	10 x 1,5	0,51	4 x 16	0,89		
	12 x 0,50	0,25	12 x 1,5	0,46	5 x 16	1,07		
	14 x 0,50	0,28	14 x 1,5	0,52	6 x 16	1,23		
	16 x 0,50	0,32	16 x 1,5	0,60	7 x 16	1,58		
	19 x 0,50	0,41	19 x 1,5	0,83	1 x 25	0,24		
	21 x 0,50	0,45	21 x 1,5	0,92	2 x 25	1,01		
	24 x 0,50	0,48	24 x 1,5	1,01	3 x 25	1,08		
	25 x 0,50	0,48	25 x 1,5	0,98	4 x 25	1,30		
	27 x 0,50	0,46	27 x 1,5	0,93	5 x 25	1,64		
	30 x 0,50	0,51	30 x 1,5	1,00	6 x 25	2,04		
	33 x 0,50	0,57	33 x 1,5	1,12	7 x 25	2,46		
	37 x 0,50	0,68	37 x 1,5	1,37	1 x 35	0,29		
1 x 0,75	0,05	1 x 2,5	0,07	2 x 35	1,28			
2 x 0,75	0,09	2 x 2,5	0,17	3 x 35	1,32			
3 x 0,75	0,11	3 x 2,5	0,21	4 x 35	1,64			
4 x 0,75	0,13	4 x 2,5	0,27	5 x 35	2,04			
5 x 0,75	0,17	5 x 2,5	0,34	1 x 50	0,36			
6 x 0,75	0,20	6 x 2,5	0,41	2 x 50	1,76			
7 x 0,75	0,22	7 x 2,5	0,51	3 x 50	1,81			
8 x 0,75	0,29	8 x 2,5	0,63	4 x 50	2,15			
10 x 0,75	0,32	10 x 2,5	0,65	5 x 50	2,53			
12 x 0,75	0,30	12 x 2,5	0,59	1 x 70	0,42			
14 x 0,75	0,34	14 x 2,5	0,72	2 x 70	2,28			
16 x 0,75	0,38	16 x 2,5	0,80	3 x 70	2,25			
19 x 0,75	0,48	19 x 2,5	1,04	4 x 70	2,77			
21 x 0,75	0,54	21 x 2,5	1,24	5 x 70	3,36			
24 x 0,75	0,59	24 x 2,5	1,32	1 x 95	0,55			
25 x 0,75	0,58	25 x 2,5	1,29	2 x 95	2,72			
27 x 0,75	0,55	27 x 2,5	1,22	3 x 95	2,81			
30 x 0,75	0,61	30 x 2,5	1,31	4 x 95	3,42			
33 x 0,75	0,66	33 x 2,5	1,47	5 x 95	4,11			
37 x 0,75	0,85	37 x 2,5	1,88					

Caloric load values of halogen-free Security Cables and insulated wires

Type	dimension n x mm ²	caloric load kWh/m	Type	dimension n x mm ²	caloric load kWh/m
HELUKABEL® MULTI-C 145	1 x 0,50	0,05	HELUKABEL® MULTI-C 145	1 x 2,5	0,11
	2 x 0,50	0,12		2 x 2,5	0,29
	3 x 0,50	0,12		3 x 2,5	0,32
	4 x 0,50	0,15		4 x 2,5	0,36
	5 x 0,50	0,18		5 x 2,5	0,45
	6 x 0,50	0,21		6 x 2,5	0,55
	7 x 0,50	0,24		7 x 2,5	0,69
	8 x 0,50	0,27		8 x 2,5	0,82
	10 x 0,50	0,31		10 x 2,5	0,87
	12 x 0,50	0,30		12 x 2,5	0,83
	14 x 0,50	0,35		14 x 2,5	1,01
	16 x 0,50	0,39		16 x 2,5	1,17
	19 x 0,50	0,48		19 x 2,5	1,47
	21 x 0,50	0,54		21 x 2,5	1,61
	1 x 0,75	0,05		1 x 4	0,13
	2 x 0,75	0,14		2 x 4	0,36
	3 x 0,75	0,15		3 x 4	0,39
	4 x 0,75	0,18		4 x 4	0,49
	5 x 0,75	0,21		5 x 4	0,56
	6 x 0,75	0,25		6 x 4	0,66
	7 x 0,75	0,31		7 x 4	0,84
8 x 0,75	0,35	8 x 4	1,04		
10 x 0,75	0,39	10 x 4	1,16		
12 x 0,75	0,38	12 x 4	1,10		
14 x 0,75	0,43	14 x 4	1,23		
16 x 0,75	0,49	16 x 4	1,42		
19 x 0,75	0,62	1 x 6	0,15		
21 x 0,75	0,69	2 x 6	0,43		
1 x 1	0,07	3 x 6	0,48		
2 x 1	0,16	4 x 6	0,60		
3 x 1	0,17	5 x 6	0,71		
4 x 1	0,20	6 x 6	0,82		
5 x 1	0,24	7 x 6	1,06		
6 x 1	0,30	1 x 10	0,22		
7 x 1	0,36	2 x 10	0,67		
8 x 1	0,41	3 x 10	0,77		
10 x 1	0,46	4 x 10	0,99		
12 x 1	0,44	5 x 10	1,21		
14 x 1	0,50	6 x 10	1,41		
16 x 1	0,57	7 x 10	1,68		
19 x 1	0,74	1 x 16	0,28		
21 x 1	0,82	1 x 25	0,35		
1 x 1,5	0,08				
2 x 1,5	0,22				
3 x 1,5	0,21				
4 x 1,5	0,28				
5 x 1,5	0,33				
6 x 1,5	0,41				
7 x 1,5	0,48				
8 x 1,5	0,58				
10 x 1,5	0,66				
12 x 1,5	0,63				
14 x 1,5	0,72				
16 x 1,5	0,80				
19 x 1,5	1,08				
21 x 1,5	1,19				
24 x 1,5	1,32				
25 x 1,5	1,30				
27 x 1,5	1,27				
30 x 1,5	1,37				
33 x 1,5	1,53				
36 x 1,5	1,71				
37 x 1,5	1,85				

Information and Installation Instructions

for UL and CSA cables

UL/CSA cables must be protected against mechanical, thermal and chemical damages.

Installation in switchboards and control boards

- Inside switchboards, flexible single core cables must be installed in cable channels of plastics
- As american cables are not so flexible, the minimum bending radius must be taken into consideration during flexible installation.

For connections on machinery and equipment

- Permissible tube and conduit \varnothing :
minimum- $\varnothing = 1/2"$ (inch)
maximum- $\varnothing = 4"$ (inch)
Minimum wall-thickness of the conduit = 1,9 mm
- Normal steel armoured tubes with transition socket PG-NPT is used. Further metal cable channels must also be used.
- The cables are permitted to be filled with only max. 50% cross-section of the cable channel.
- Flexible single cores must be installed in PVC tubes inside the conduits.
- If connectors are used, both the main and the control cables should be installed separately.

Delivery program:

- PVC tubes
- Metal tubes and glands
- Fixing material
- Steel armoured tubes.

Cable Channels

- Cable channels in switchboards must be made out of a flame resistant PVC and must have enough spare space.
- Cable channels on machineries and equipment must be made out of metal. They must also be closed and oil resistant.

Cable identification

- Cable identification is achieved through continuous numbers, letters or number/letter combination. The beginning and end of the cable have the same identification system.

Cable connections to apparatus

• Main and Control cables

It is depending on the type of connection to the apparatus if screw or press clamps are used.

- In USA, it is normal to install cables without using cable lugs or cable crushing socket. The connection is only possible with the UL-wires sizes. These sizes are not designed with fine wire stranding make-up.

Conductor cross-section

General rules

- | | minimum cross-section for |
|---------------------------|----------------------------------|
| • Motor Cables | AWG 14 |
| • Control Cables | |
| – in switchboards | AWG 18 |
| – in the installed system | AWG 16 |

This rule does not apply to electronic devices and systems.

In case, the electronic cables and other circuits are installed together, all cables must be set for maximum voltage.

Colour identification

• Black

For main circuits, control- and subcircuits, direct connected to main voltage.

• Blue

For direct voltage- (d. c.), control- and subcircuits, which are connected to the main circuit.

• Red

For alternating voltage (a. c.), control and subcircuits.

• Yellow or brown

For interlock circuits from an external power source.

• White or grey

For current conveying earthed conductors at main, control and subcircuits.

• Green or green-yellow

For insulated earth-connectors as protective conductor.

Motor-driving voltages

200 / 230 / 460 / 575 V, 60 Hz

Driving voltage

Normally the driving voltage is 120 V, 60 Hz or lower. Transformers must be operated with separate windings.

AWG-Wires and AWG-stranded conductors

Conductor make-up, cross-section, resistance and weight

AWG No.	AWG-make-up n x AWG	conductor make-up mm	cross- section mm ²	conductor outer-Ø mm	conductor resistance Ohm/km	conductor weight kg/km
36	solid	solid	0,013	0,127	1460,0	0,116
36	7/44	7 x 0,05	0,014	0,152	1271,0	0,125
34	solid	solid	0,020	0,160	918,0	0,178
34	7/42	7 x 0,064	0,022	0,192	777,0	0,196
32	solid	solid	0,032	0,203	571,0	0,284
32	7/40	7 x 0,078	0,034	0,203	538,0	0,302
32	19/44	19 x 0,05	0,037	0,229	448,0	0,329
30	solid	solid	0,051	0,254	365,0	0,45
30	7/38	7 x 0,102	0,057	0,305	339,0	0,507
30	19/42	19 x 0,064	0,061	0,305	286,7	0,543
28	solid	solid	0,080	0,330	232,0	0,71
28	7/36	7 x 0,127	0,087	0,381	213,0	0,774
28	19/40	19 x 0,078	0,091	0,406	186,0	0,81
27	7/35	7 x 0,142	0,111	0,457	179,0	0,988
26	solid	solid	0,128	0,409	143,0	1,14
26	10/36	10 x 0,127	0,127	0,533	137,0	1,13
26	19/38	19 x 0,102	0,155	0,508	113,0	1,38
26	7/34	7 x 0,160	0,141	0,483	122,0	1,25
24	solid	solid	0,205	0,511	89,4	1,82
24	7/32	7 x 0,203	0,227	0,610	76,4	2,02
24	10/34	10 x 0,160	0,201	0,582	85,6	1,79
24	19/36	19 x 0,127	0,241	0,610	69,2	2,14
24	41/40	41 x 0,078	0,196	0,582	84,0	1,74
22	solid	solid	0,324	0,643	55,3	2,88
22	7/30	7 x 0,254	0,355	0,762	48,4	3,16
22	19/34	19 x 0,160	0,382	0,787	45,1	3,4
22	26/36	26 x 0,127	0,330	0,762	52,3	2,94
20	solid	solid	0,519	0,813	34,6	4,61
20	7/28	7 x 0,320	0,562	0,965	33,8	5,0
20	10/30	10 x 0,254	0,507	0,889	33,9	4,51
20	19/32	19 x 0,203	0,615	0,940	28,3	5,47
20	26/34	26 x 0,160	0,523	0,914	33,0	4,65
20	41/36	41 x 0,127	0,520	0,914	32,9	4,63
18	solid	solid	0,823	1,020	21,8	7,32
18	7/26	7 x 0,404	0,897	1,219	19,2	7,98
18	16/30	16 x 0,254	0,811	1,194	21,3	7,22
18	19/30	19 x 0,254	0,963	1,245	17,9	8,57
18	41/34	41 x 0,160	0,824	1,194	20,9	7,33
18	65/36	65 x 0,127	0,823	1,194	21,0	7,32
16	solid	solid	1,310	1,290	13,7	11,66
16	7/24	7 x 0,511	1,440	1,524	12,0	12,81
16	65/34	65 x 0,160	1,310	1,499	13,2	11,65
16	26/30	26 x 0,254	1,317	1,499	13,1	11,72
16	19/29	19 x 0,287	1,229	1,473	14,0	10,94
16	105/36	105 x 0,127	1,330	1,499	13,1	11,84
14	solid	solid	2,080	1,630	8,6	18,51
14	7/22	7 x 0,643	2,238	1,854	7,6	19,92
14	19/27	19 x 0,361	1,945	1,854	8,9	17,31
14	41/30	41 x 0,254	2,078	1,854	8,3	18,49
14	105/34	105 x 0,160	2,111	1,854	8,2	18,79

Continuation ►

AWG-Wires and AWG-stranded conductors

Conductor make-up, cross-section, resistance and weight

AWG No.	AWG-make-up n x AWG	conductor make-up mm	cross- section mm ²	conductor outer-Ø mm	conductor resistance Ohm/km	conductor weight kg/km
12	solid	solid	3,31	2,05	5,4	29,46
12	7/20	7 x 0,813	3,63	2,438	4,8	32,30
12	19/25	19 x 0,455	3,09	2,369	5,6	27,50
12	65/30	65 x 0,254	3,292	2,413	5,7	29,29
12	165/34	165 x 0,160	3,316	2,413	5,2	29,51
10	solid	solid	5,26	2,59	3,4	46,81
10	37/26	37 x 0,404	4,74	2,921	3,6	42,18
10	49/27	49 x 0,363	5,068	2,946	3,6	45,10
10	105/30	105 x 0,254	5,317	2,946	3,2	47,32
8	49/25	49 x 0,455	7,963	3,734	2,2	70,87
8	133/29	133 x 0,287	8,604	3,734	2,0	76,57
8	655/36	655 x 0,127	8,297	3,734	2,0	73,84
6	133/27	133 x 0,363	13,764	4,676	1,5	122,49
6	259/30	259 x 0,254	13,123	4,674	1,3	116,79
6	1050/36	1050 x 0,127	13,316	4,674	1,3	118,51
4	133/25	133 x 0,455	21,625	5,898	0,80	192,46
4	259/27	259 x 0,363	26,804	5,898	0,66	238,55
4	1666/36	1666 x 0,127	21,104	5,898	0,82	187,82
2	133/23	133 x 0,574	34,416	7,417	0,50	306,30
2	259/26	259 x 0,404	33,201	7,417	0,52	295,49
2	665/30	665 x 0,254	33,696	7,417	0,52	299,89
2	2646/36	2646 x 0,127	33,518	7,417	0,52	298,31
1	133/22	133 x 0,643	43,187	8,331	0,40	384,37
1	259/25	259 x 0,455	42,112	8,331	0,41	374,80
1	817/30	817 x 0,254	41,397	8,331	0,42	368,43
1	2109/34	2109 x 0,160	42,403	8,331	0,41	377,39
1/0	133/21	133 x 0,724	54,75	9,347	0,31	487,28
1/0	259/24	259 x 0,511	53,116	9,347	0,32	472,73
2/0	133/20	133 x 0,813	69,043	10,516	0,25	614,48
2/0	259/23	259 x 0,574	67,021	10,516	0,25	596,49
3/0	259/22	259 x 0,643	84,102	11,786	0,20	748,51
3/0	427/24	427 x 0,511	87,570	11,786	0,19	779,37
4/0	259/21	259 x 0,724	106,626	13,259	0,16	948,97
4/0	427/23	427 x 0,574	110,494	13,259	0,15	983,39

AWG-Wires (Solid-conductor)

AWG No.	Wire-Ø mm
44	0,050
41	0,070
40	0,079
39	0,089
38	0,102
37	0,114
36	0,127
35	0,142
34	0,160
33	0,180
32	0,203
31	0,226
30	0,254
29	0,287

AWG No.	Wire-Ø mm
28	0,320
27	0,363
26	0,404
25	0,455
24	0,511
23	0,574
22	0,643
21	0,724
20	0,813
19	0,912
18	1,024
17	1,151
16	1,290
15	1,450

AWG No.	Wire-Ø mm
14	1,628
13	1,829
12	2,052
11	2,304
10	2,588
9	2,906
8	3,268
7	3,665
6	4,115
5	4,620
4	5,189
3	5,827
2	6,543
1	7,348

AWG No.	Wire-Ø mm
1/0	8,252
2/0	9,266
3/0	10,404
4/0	11,684

US-American and British units

Conversion of usual measuring units

Units for cables and wires

In the US the measurements are mainly used in AWG-numbers (AWG = American Wire Gauge).
The AWG-numbers conform the british B&S-numbers (B&S = Brown & Sharp)

AWG No.	Cross-section mm ²	Dia-meter mm	Conductor resistance Ohm/km	AWG No.	Cross-section mm ²	Dia-meter mm	Conductor resistance Ohm/km
1000 MCM*	507	25,4	0,035	14	2,08	1,63	8,79
750	380	22,0	0,047	15	1,65	1,45	11,20
600	304	19,7	0,059	16	1,31	1,29	14,70
500	254	20,7	0,07	17	1,04	1,15	17,80
400	203	18,9	0,09	18	0,8230	1,0240	23,0
350	178	17,3	0,10	19	0,6530	0,9120	28,3
300	152	16,0	0,12	20	0,5190	0,8120	34,5
250	127	14,6	0,14	21	0,4120	0,7230	44,0
4/0	107,20	11,68	0,18	22	0,3250	0,6440	54,8
3/0	85,00	10,40	0,23	23	0,2590	0,5730	70,1
2/0	67,50	9,27	0,29	24	0,2050	0,5110	89,2
0	53,40	8,25	0,37	25	0,1630	0,4550	111,0
1	42,40	7,35	0,47	26	0,1280	0,4050	146,0
2	33,60	6,54	0,57	27	0,1020	0,3610	176,0
3	26,70	5,83	0,71	28	0,0804	0,3210	232,0
4	21,20	5,19	0,91	29	0,0646	0,2860	282,0
5	16,80	4,62	1,12	30	0,0503	0,2550	350,0
6	13,30	4,11	1,44	31	0,0400	0,2270	446,0
7	10,60	3,67	1,78	32	0,0320	0,2020	578,0
8	8,366	3,26	2,36	33	0,0252	0,1800	710,0
9	6,63	2,91	2,77	34	0,0200	0,1600	899,0
10	5,26	2,59	3,64	35	0,0161	0,1430	1125,0
11	4,15	2,30	4,44	36	0,0123	0,1270	1426,0
12	3,30	2,05	5,41	37	0,0100	0,1130	1800,0
13	2,62	1,83	7,02	38	0,00795	0,1010	2255,0
				39	0,00632	0,0897	2860,0

4/0 is also stated: 0000; 1 mil = 0,001 inch = 0,0254 mm
* for bigger cross-section the sizes in MCM (circular mils)

1 CM = 1 Circ. mil. = 0,0005067 mm²
1 MCM = 1000 Circ. mils = 0,5067 mm²

General measuring units

Length

1 mil	= 0,0254 mm
1 in (inch)	= 25,4 mm
1 ft (foot)	= 0,3048 m
1 yd (yard)	= 0,9144 m
1 ch (chain)	= 20,1 m
1 mile (land mile)	= 1,609 km
	= 1760 yards
1 mile (nautic mile)	= 1,852 km
1 mm	= 0,039370 inches
1 m	= 39,370079 inches

Area

1 CM (circ. mil)	= 0,507 · 10 ⁻³ mm ²
1 MCM	= 0,5067 mm ²
1 sq. inch (sq. inch)	= 645,16 mm ²
1 sq. ft. (sq. foot)	= 0,0929 m ²
1 square yard	= 0,836 m ²
1 acre	= 4047 m ²
1 square mile	= 2,59 km ²

Density

1 cu. in. (cubic inch)	= 16,39 cm ³
1 cu. ft. (cubic foot)	= 0,0283 m ³
1 cu. yd. (cubic yard)	= 0,7646 m ³
1 gal. (US gallon)	= 3,785 l
1 gal. (brit gallon)	= 4,546 l
1 US pint	= 0,473 l
1 US quart	= 0,946 l
1 US barrel	= 158,8 l

Temperature

F (Fahrenheit)	= (1,8 · C) + 3°
C (Celsius)	= 0,5556 · (F-32°)

Weight

1 grain	= 64,8 mg
1 dram	= 1,77 g

1 oz (ounce)	= 28,35 g
1 lb (pound)	= 0,4536 Kp
1 stone	= 6,35 Kp
1 qu (quarter)	= 12,7 Kp
1 US-cwt (hundred-weight)	= 45,36 Kp
1 US ton (short ton)	= 0,907 t
1 brit. ton (long ton)	= 1,016 t

Force

1 lb	= 4,448 N
1 brit. ton	= 9954 N
1 pdl (Poundal)	= 0,1383 N
1 kp	= 9,81 N
1 N	= 0,102 kp

Velocity

1 mile/h	= 1,609 km/h
1 Knoten	= 1,852 km/h
1 ft/s	= 0,305 m/s
1 ft/min	= 5,08 · 10 ⁻³ m/s

Energy

1 lb/mile	= 0,282 kg/m
1 lb/yd	= 0,496 kg/m
1 lb/foot	= 1,488 kg/m

Radiation absorbed dose

1 Gray	= 1 J/kg
1 rad	= 10 ⁻² J/kg = 1 Centi Gy
	= 0,01 Gy
1 Centi	= 100 Joule
1 rad	= cJ/kg = 0,01Gy
1 Mrad	= 1 · 10 ⁶ cJ/kg

Pressure

1 psi (lb/sq.)	= 68,95 mbar
	= 6,895 · 10 ⁻³ Nmm ²

1 lb/sq. ft.	= 0,478 mbar
1 pdl/sq. ft.	= 1,489 N/m ²
1 in Hg	= 33,86 mbar
1 ft H ₂ O	= 29,89 mbar
1 in H ₂ O	= 2,491 mbar
1 N/mm ²	= 145 psi
	= 10 bar

1 kp/mm ²	= 1422 psi
1 at	= 736 Torr
	= 1 kp/cm ²
1 Torr	= 1 mm Hg
1 bar	= 0,1 H Pa
1 Pa	= 1 N/m ²

Density

1 lb/cu. ft.	= 16,02 kg/m ³
1 lb/cu. in.	= 27,68 t/m ³

Horse power

1 hp · h	= 1,0139 PS · h
	= 2,684 · 10 ⁶ Joule
	= 746 W · h
1 BTU (brit. therm. unit)	= 1055 Joule

Electrical units

1 ohm/1000 yd	= 1,0936 Ω/km
1 ohm/1000 ft	= 3,28 Ω/km
1 μF/mile	= 0,62 μF/km
1 megohm/mile	= 1,61 MΩ/km
1 μuf/foot	= 3,28 pF/m
1 decibel/mile	= 71,5 mN/m

Power rate

1 PS	= 0,736 kW
1 kW	= 1,36 PS
1 hp	= 0,7457 kW
1 kW	= 1,31 hp

Current ratings for UL-CSA cables

Ambient temperature 30 °C

Abstract of NEC Tabelle 310-17

Allowable ampacity (in Ampere) of **conductors**, rated 0 – 2000 Volts, in free air.

Conductor size	Temperature Rating of Conductor		
	60 °C (140 °F)	75 °C (167 °F)	90 °C (194 °F)
18	–	–	18
16	–	–	24
14	25	30	35
12	30	35	40
10	40	50	55
8	60	70	80
6	80	95	105
4	105	125	140
3	120	145	165
2	140	170	190
1	165	195	220
1/0	195	230	260
2/0	225	265	300
3/0	260	310	350
4/0	300	360	405
250	340	405	455
300	375	445	505
350	420	505	570
400	455	545	615
500	515	620	700
600	575	690	780

Abstract of NEC Tabelle 310-16

Allowable ampacity (in Ampere) of insulated conductors, rated 0 – 2000 Volts. NOT MORE THAN **three conductors** in **raceway** or cable ore Earth (direct burial).

Conductor size	Temperature Rating of Conductor		
	60 °C (140 °F)	75 °C (167 °F)	90 °C (194 °F)
18	–	–	14
16	–	–	18
14*	20	20	25
12*	25	25	30
10*	30	35	40
8	40	50	55
6	55	65	75
4	70	85	95
3	85	100	110
2	95	115	130
1	110	130	150
1/0	125	150	170
2/0	145	175	195
3/0	165	200	225
4/0	195	230	260
250	215	255	290
300	240	285	320
350	260	310	350
400	280	355	380
500	320	380	430
600	355	420	475

* **Note** Unless otherwise specifically permitted elsewhere in the NEC, the overcurrent protection for conductor types market with an * shall not exceed 15 amperes for AWG 14, 20 amperes for AWG 12 and 30 amperes for AWG 10, after any correction factors for ambient temperature and numbers of conductors have been applied.

Correction factors for ambient temperatures other than 30 °C				Correction factors for more than three current-carrying conductors in a raceway or cable.	
Ambient temperature in °C	60 °C (140 °F)	75 °C (167 °F)	90 °C (194 °F)	Number of current-carrying conductors	Correction factor
21 – 25	1,08	1,05	1,04	4 up to 6	0,80
26 – 30	1,00	1,00	1,00	7 up to 9	0,70
31 – 35	0,91	0,94	0,96	10 up to 20	0,50
36 – 40	0,82	0,88	0,91	21 up to 30	0,45
41 – 45	0,71	0,82	0,87	31 up to 40	0,40
46 – 50	0,58	0,75	0,82	41 and more	0,35
51 – 55	0,41	0,67	0,76		
56 – 60	–	0,58	0,71		
61 – 70	–	0,33	0,58		
71 – 80	–	–	0,41		

List of UL-Styles (single core cables)

UL-Style No.	Insulation Material	Voltage Volt	Temp. °C	Insulation thickness mm	AWG Size	UL-Style No.	Insulation Material	Voltage Volt	Temp. °C	Insulation thickness mm	AWG Size
1001	PVC/Nylon	300	80	0,23	30 – 16	1316	PVC/Nylon	600	105	0,38	26 – 12
1002	PVC	600	60	0,76	26 – 16	1317	PVC/Nylon	600	105	0,51	10
1003	PE, FRPE	300	60	0,76	26 – 16	1318	PVC/Nylon	600	105	0,76	8 – 6
1004	PVC/Nylon	–	80	0,20	30 – 16	1319	PVC/Nylon	600	105	1,02	4 – 2
1005	PVC/Nylon	–	90	0,20	26 – 16	1320	PVC/Nylon	600	105	1,27	1 – 4/10
1006	PVC/Nylon	–	105	0,20	26 – 16	1321	PVC/Nylon	600	105	1,78	250 – 1000
1007	PVC	300	80	0,38	32 – 16	1322	PVC	600	90	1,91	14 – 10
1011	PVC	600	80	0,76	28 – 9	1327	PVDF	–	105	0,25	30 – 16
1013	PVC	600	90	0,76	28 – 9	1329	PVC	600	105	1,91	14 – 10
1015	PVC	600	105	0,76	28 – 9	1330	FEP	600	200	variable	30 – 4/0
1017	PVC	600	80	1,14	22 – 8	1331	FEP	600	105	variable	30 – 4/0
1019	PVC	600	80	1,52	8 – 2	1332	FEP	300	200	0,38	30 – 10
1020	PVC	600	80	2,05	1 – 4/0	1333	FEP	300	150	0,38	30 – 10
1022	PVC	600	80	2,78	–	1335	PVC	600	90	0,76	22 – 10
1023	PVC	600	80	3,17	–	1336	PVC	600	90	1,14	8
1024	PVC	600	90	1,14	18 – 8	1337	PVC	600	90	1,52	6 – 2
1025	PVC/Nylon	600	90	1,14	8 – 6	1338	PVC	600	90	1,98	8 – 4/0
1026	PVC	600	90	1,52	8 – 6	1366	PVC/PVC	600	90	variable	26 – 9
1027	PVC	600	90	1,91	1 – 4/0	1394	PTFE	–	200	0,15	32 – 20
1028	PVC	600	105	1,14	22 – 8	1400	PVC	600	90	1,14	14 – 10
1029	PVC/Nylon	600	105	1,14	8 – 6	1401	PVC	600	90	1,52	8
1030	PVC	1000	80	0,76	26 – 10	1402	PVC/Nylon	600	90	0,76	22 – 10
1031	PVC/Nylon	1000	80	0,76	26 – 10	1405	PVC/Nylon	600	90	1,98	1 – 4/10
1032	PVC	1000	90	0,76	26 – 10	1408	PVC/Nylon	600	90	0,38	22 – 12
1033	PVC/Nylon	1000	90	0,76	26 – 10	1409	PVC/Nylon	600	90	0,51	10
1037	PVC	300	60	0,30	24 – 20	1410	PVC/Nylon	600	90	0,76	8 – 6
1039	PVC	300	80	0,38	22 – 16	1411	PVC/Nylon	600	90	1,02	4 – 2
1040	P/B	300	80	–	22 – 16	1412	PVC/Nylon	600	90	1,27	1 – 4/10
1041	PVC	300	60	0,76	20 – 16	1413	PVC/Nylon	600	90	1,52	250 – 500
1043	PVC	300	80	0,76	20 – 16	1414	PVC/Nylon	600	90	1,78	600 – 1000
1045	PVC	300	90	0,76	20 – 16	1429	XPVC	150	80	0,25	32 – 16
1049	PVC	300	80	1,14	20 – 16	1430	XPVC	300	105	0,38	30 – 16
1053	PVC	600	60	1,52	18 – 10	1435	PE	300	80	0,41	26 – 16
1054	PVC	600	80	1,52	18 – 10	1436	PE	300	80	0,79	26 – 16
1055	PVC	600	90	1,52	20 – 10	1437	PE	300	80	1,63	26 – 16
1056	PVC	600	105	1,52	20 – 10	1438	PE	300	80	1,14	26 – 16
1060	PVC	600	105	1,91	10 – 10	1439	PE	300	80	0,81	26 – 16
1061	SR PVC	300	80	0,23	30 – 16	1444	PVC	1000	90	1,14	18 – 10
1063	PVC	300	60	–	20 – 18	1452	PVC/Nylon	1000	90	0,38	18 – 12
1095	PVC	300	80	0,30	30 – 16	1453	PVC/Nylon	1000	90	0,51	10
1096	PVC/Nylon	300	80	–	26 – 10	1498	PCV	600	80	0,76	22 – 9
1098	PE	2000	60	0,86	18	1499	PVC	600	90	0,76	22 – 9
1099	PVC	300	80	0,38	28	1500	PVC	600	105	0,76	22 – 9
1107	PE, FRPE	300	60	0,38	30 – 16	1508	ETFE	30	105	0,15	32 – 20
1108	PVC	300	80	–	26 – 16	1517	ETFE	–	105	0,15	32 – 20
1109	PVC, XPVC	300	90	0,38	26 – 16	1523	ETFE	–	105	0,13	32 – 20
1110	PVC; XPVC	300	105	0,38	26 – 16	1533	PVC	–	80	0,23	30 – 10
1113	PE	600	60	–	26 – 16	1536	XPVC	–	80	0,25	30 – 10
1115	PVC	300/600	80	0,38	30 – 16	1538	FEP	125	105	0,15	32 – 20
1116	PVC/Nylon	600	80	–	22 – 8	1542	PE-PVC	10000	80	–	24 – 10
1118	PVC	300	90	0,38	26 – 16	1546	PE-PVC	600	–	–	20
1119	PVC	600	90	0,76	26 – 16	1558	ETFE	–	125	0,10	32 – 20
1120	PVC	600	105	0,76	30 – 4/0	1568	PVC	150	80	0,23	30 – 16
1122	SR PVC	300	80	0,23	30	1569	PVC	300	105	0,38	28 – 10
1123	PVC	300	80	0,76	22 – 20	1570	ETFE	600	250	–	24 – 8
1124	PVC	300	80	0,76	22 – 20	1575	PVC	48	60	0,76	18 – 8
1158	PVC	300	60	0,76	22 – 9	1581	PVC	300	80	0,38	14
1159	PVC	300	60	1,14	8	1586	ETFE	–	105	0,20	32 – 6
1160	PVC	300	60	0,38	22 – 16	1591	FEP	300	150	0,41	26 – 16
1161	PVC	600	60	0,76	22 – 9	1592	FEP	300	200	0,41	26 – 16
1162	PVC	600	60	1,14	22 – 9	1605	PVC	30	60	0,10	min. 46
1164	PTFE	300	150	0,33	32 – 10	1609	ETFE	125	105	0,13	32 – 6
1180	PTFE	300	200	0,38	28 – 10	1610	ETFE	not specified**	105	0,25	32 – 10
1181	PVC/Nylon	600	60	0,76	18 – 16	1612	PVDF	125	150	–	–
1185	PVC	300	80	0,38	30 – 4/0	1618	PVC	300	80	0,38	–
1195	PVC	300	80	0,38	26 – 14	1624	PVC	160	80	0,25	30 – 16
1198	PTFE	600	150	0,51	26 – 10	1662	PVC	300	80	variable	18 – 1/10
1199	PTFE	600	200	0,51	26 – 10	1680	PVC	–	105	–	18 – 1/10
1206	PVC	300	80	0,33	30 – 16	1683	PVC	–	80	–	3/0
1208	PVC	300	80	0,33	26 – 16	1692	PVC	30	80	2,54	min. 42
1227	FEP	not specified*	105	0,20	32 – 14	17107	PFA	30	200	0,127	32 – 20
1228	PVC	600	90	1,14	18 – 8	1708	PFA	not specified**	200	0,127	32 – 20
1229	PVC	600	90	1,52	8 – 2	1722	TPR	600	125	VAR	22 – 4/0
1230	PVC	600	105	0,76	26 – 8	1729	PVC	300	80	0,22	32 – 16
1231	PVC	600	105	1,14	18 – 8	1792	PE, PVC	30	80	0,05	min. 40
1232	PVC	600	105	1,52/2,03	8 – 4/0	1847	FEP	30	105	0,08	min. 40
1233	PVC	600	80	1,52	18 – 8	1848	FEP	300	150 o. 200	0,38	min. 24
1235	PVC	600	105	1,52	18 – 8	1860	PFA	150	200	0,25	32 – 16
1237	PVC	600	80	1,14	22 – 19	1888	TPR	300	125	0,41	–
1239	PVC	600	105	1,14	22 – 19	1908	PVC	300	80	0,38	26 – 4/0
1270	PVC	600	90	1,14	18 – 9	1909	PVC	600	80	0,76	26 – 4/0
1271	PVC	600	90	1,52	8 – 2	1926	PE o. FRPE	300	60+80	0,17	30 – 16
1272	PVC	600	90	1,91	1 – 4/0	1948	PVC	60	60	0,10	min. 46
1279	PVC	600	80	1,52	7 – 2	1967	PVC	30	60+80	0,38	20 – 4/0
1280	PVC	600	80	1,14	18 – 8	1968	PVC	–	60+80	0,38	20 – 4/0
1283	PVC	600	105	1,52	8 – 2	1986	FEP	30	80	0,05	min. 50
1284	PVC	600	105	1,91	1 – 4/0	1990	ETFE	600	105	0,50	30 – 4/0
1287	PVC	600	105	1,91	18 – 12	1999	Zell. FEP	300	150	0,45	min. 36
1306	PVC	600	80	2,29	8	10009	Zell. FEP	300	150	0,45	min. 36
1308	PVC	600	105	2,29	8	10011	PFA	30	80	0,0254	min. 40
						10030	PFA	300	250	0,025	30 – 10
						10032	PFA	600	250	0,38	30 – 10
						10050	FEP	600	150	0,457	30 – 4/0

* not specified

List of UL-Styles (Multicore cables)

UL-Style No.	Insulation Material	Voltage Volt	Temp. °C	Insulation thickness mm	AWG Size	UL-Style No.	Insulation Material	Voltage Volt	Temp. °C	Insulation thickness mm	AWG Size
2006	PVC	300	80	1,14	20 – 16	2464	variable	300	80	–	–
2007	PVC	300	90	1,14	20 – 16	2468	PVC	300	80	0,38	32 – 16
2012	PVC	300	80	1,52	18 – 16	2474	PVC	600	105	–	26 – 16
2015	PVC	300	80	1,52	18 – 16	2477	PVC	600	60	–	33 – 16
2030	PVC	600	80	1,91	14 – 10	2483	PVC	600	105	–	26 – 16
2031	PVC	600	90	1,91	14 – 10	2489	PVC	600	60	–	18
2032	PVC	600	105	1,91	14 – 10	2490	AWM	not specified*	60	AWM	min. 36
2089	PVC	300	60	–	20 – 18	2493	PP	600	60	–	30 – 16
2090	PVC	300	60	–	20 – 18	2498	PE	300	80	–	28 – 16
2091	PVC	300	60	–	20 – 18	2501	PVC	600	105	–	30
2092	PE	300	60	–	26 – 16	2502	variable	30	80	–	–
2093	PE	300	60	–	26 – 16	2504	PVC	600	105	–	20 – 14
2094	PE	300	60	–	26 – 16	2507	PVC	600	60	–	26 – 16
2095	PVC	300	90	–	32 – 16	2516	PVC	600	105	–	30 – 9
2096	PVC	300	80	–	30 – 16	2517	PVC	300	105	–	32 – 16
2097	PVC	300	80	–	30 – 18	2532	PVC	30	60	–	30 – 16
2098	PVC	300	90	–	26 – 16	2535	PVC	30	80	–	30 – 16
2099	PVC	300	90	–	26 – 16	2548	PE	300	80	–	–
2100	PVC	300	90	–	26 – 16	2549	PVC	300	90	–	30 – 16
2101	PVC	300	105	0,38	30 – 16	2550	AWM	600	90	AWM	min. 40
2102	PVC	300	105	–	30 – 16	2551	AWM	30	105	AWM	min. 40
2103	PVC	300	105	0,38	30 – 16	2560	PVC	30	60	–	30
2106	PE	600	60	–	26 – 12	2564	PVC	125	75	–	22
2107	PE	600	60	–	26 – 12	2567	PVC	600	60	–	–
2108	PE	600	60	–	26 – 12	2570	PVC	600	80	–	30 – 9
2112	PVC	300	80	0,38	26 – 16	2571	PVC	–	80	–	30 – 16
2113	PVC	300	80	0,38	26 – 16	2574	AWM	30	105	AWM	min. 40
2114	PVC	300	80	0,38	26 – 16	2576	PVC	150	80	–	30 – 9
2115	PVC	600	80	–	26 – 16	2582	PE	150	60	–	30 – 16
2116	PVC	600	80	–	26 – 16	2584	PVC	125	80	–	30 – 9
2117	PVC	600	80	–	26 – 16	2586	PVC	600	105	–	30 – 9
2121	PVC	300/600	90	0,38	26 – 16	2587	PVC	600	90	–	30 – 9
2122	PVC	300/600	90	0,38	26 – 16	2589	AWM	30	105	AWM	see AWM Requirements
2123	PVC	300/600	90	0,38	26 – 16	2598	VAR	300	60	–	30 – 16
2124	PVC	600	90	0,76	28 – 9	2606	PE	300	60	–	30
2125	PVC	600	90	0,76	28 – 9	2610	labeled Style 1007	300	80	labeled Style 1007	see 1007 Requirements
2126	PVC	600	90	0,76	28 – 9	2614	AWM	30	105	AWM	min. 40
2127	PVC	600	105	0,76	28 – 9	2623	PE	30	80	–	30 – 20
2128	PVC	600	105	0,76	29 – 9	2626	AWM	30	80	AWM	not specified*
2129	PVC	600	105	0,76	28 – 9	2629	PE	300	80	–	30 – 16
2243	PVC	300	105	1,14	20 – 16	2630	AWM	125	90	AWM	30 – 9
2261	PVC	300	105	0,76	18	2631	AWM	not specified*	90	AWM	min. 40
2262	PE	600 (isol.) 300 (Jacket)	60	0,76	26 – 16	2637	AWM	30	90	AWM	min. 40
2263	PE	600 (isol.) 300 (Jacket)	60	0,76	26 – 16	2653	AWM	600	90	AWM	36 – 6
2264	PE	600 (isol.) 300 (Jacket)	60	0,76	26 – 16	2654	AWM	300	90	AWM	36 – 6
2265	PVC	300	80	0,38	26 – 16	2655	PVC	300	80	–	33 – 10
2266	PVC	300	80	–	26 – 16	2656	AWM	600	80	AWM	36 – 6
2267	PVC	300	80	–	36 – 30	2660	AWM	not specified*	60	AWM	–
2268	PVC	300	80	–	26 – 16	2661	AWM	300	105	AWM	36 – 6
2269	PVC	300	80	–	26 – 16	2662	PVC	600	105	–	33 – 10
2270	PVC	300	80	–	26 – 16	2668	AWM	30	60	AWM	min. 40
2271	as for SVT	300	60	as for SVT	26 – 16	2678	PVC	30	105	–	–
2272	as for SVT	300	60	as for SVT	26 – 16	2704	PVC	30	60	–	30
2273	as for SVT	300	60	as for SVT	26 – 16	2778	AWM	150	60	AWM	30 – 16
2274	as for SVT	300	60	as for SVT	26 – 16	2789	AWM	30	60	AWM	see AWM
2275	as for SVT	300	60	as for SVT	26 – 16	2833	AWM	30	60	AWM	–
2276	as for SVT	300	60	as for SVT	26 – 16	2835	PP	30	80	–	22
2277	as for SVT	300	60	as for SVT	26 – 16	2919	PP	30	80	–	28 – 18
2278	as for SVT	300	60	as for SVT	26 – 16	2920	AWM	30	60	AWM	min. 40
2279	as for SVT	300	60	as for SVT	26 – 16	2921	AWM	30	60	AWM	min. 40
2280	as for SVT	300	60	as for SVT	26 – 16	2930	AWM	not specified*	105	AWM	min. 40
2317	PE	600	60	–	26 – 16	2931	AWM	125	105	AWM	min. 40
2351	PE	600	80	–	26 – 16	2937	AWM	300	80	AWM	AWM
2352	PE	300	80	–	26 – 16	3071	S/GB	600	200	0,76	18 – 14
2353	PE	300	80	–	26 – 16	3075	S/GB	600	200	0,76	10 – 2
2354	PE	600	80	–	26 – 16	3173	XLPE	600	125	0,76	26 – 9
2355	PE	600	80	–	26 – 16	3199	XLPE	300	105	0,38	22 – 16
2376	PVC	300	105	–	–	3212	SIR	600	150	1,14	26 – 10
2384	variable	30	60	–	30	3213	SIR	600	150	1,52	8 – 2
2385	VAR	30	60	–	30	3214	SIR	600	150	1,91	1 – 4/0
2386	VAR	30	60	–	30	3239	SIR	VAR	150	VAR	24 – 10
2387	VAR	30	60	–	30	3265	XLPE	150	125	0,25	28 – 20
2388	PVC	30	60	–	–	3266	XLPE	300	125	0,38	26 – 16
2405	PVC	300	80	–	30 – 16	3271	XLPE	600	125	VAR	24 – 12
2439	PE	600	80	–	26 – 16	3272	XLPE	600	125	VAR	22 – 4
2448	variable	30	60	–	30	3291	XPVC	300	105	–	26 – 16
2461	PVC	30	60	–	26 – 16	20063	PE	300	80	0,5	28 – 16
2462	PVC	300	60	–	–	20083	PE	300	80	AWM	various AWC
2463	PVC	600	80	–	26 – 10	20601	AWM	300	80	AWM	AWM

* not specified

Index British Standard

91	Electric cables, soldering buckets
125	Electric conductors, copper & copper-cadmium, for overhead transmission
215	Electric conductors, aluminium & steel-cored aluminium
801	Cable sheaths, lead and lead alloy
1441	Galvanised steel wire, for submarine cables
1442	Galvanised steel wire, for land cables
1791	Electric conductors, copper, cotton-covered
1843	Insulated cables, twin compensating cables, thermocouples, colour codes
1990	Communication transmission lines, wood poles
2316	Coaxial cables, radio frequency
2848	Cable sheaths, flexible
3242	Electric conductors, aluminium alloy, stranded, for power transmission
3573	Communication cables, polyolefin insulated & sheathed copper-conductor cables
3858	Electric cables, sleeves, binding & identification
3988	Electric conductors, aluminium solid conductors, for insulated cables
4066	Superseded by BSEN 50266-1:2001
4553	Insulated cables, PVC-insulated, split concentric copper
4565	Electric conductors, steel wire for reinforcing aluminium conductors
4579	Electric cables, mechanical & compression joints in connectors
4653	Electric conductors, copper, paper covered
4799	Electric conductors, copper glass fibre lapped
4801	Electric conductors, copper, glass fibre braided
4808	Communication cables, LE, PVC insulated & sheathed
4927	Electric conductors, copper, textile covered
50266	Test methods for cables under fire conditions
5055	Insulated cables, PVC & elastomer-insulated, for discharge-tube installations
5099	Cable sheaths, spark testing
5308	Insulated cables, instrumentation, intrinsically safe
5372	Electric cables, terminations for 3 & 4 core insulated cables, dimensions
5425	Communication cables, coaxial
5467	Power cables, armoured thermosetting-polymer insulated, for electricity supply
5593	Sheathed cables, aluminium-sheathed CONSAC cables
5819	Communication cables for interconnection between video recorder and television receivers
6004	Insulated cables, PVC insulated, non-armoured
6007	Insulated cables, rubber-insulated, non-armoured
6116	Flexible cables, elastomer-insulated flexible trailing cables, for mines and quarries
6141	Flexible conductors, for high temperature zones
6195	Flexible cables, insulated, for coil leads
6207	Mineral-insulated cables, copper sheathed, with copper conductors
6231	Single-core cables, PVC insulated, for switchgear and controlgear
6234	Insulated cables, polyethylene
6346	Power cables, PVC-insulated, for electricity supply
6360	Electric conductors, insulated cables
6387	Electric cables, fire-resistant, tests
6425	Electric cables, combustion gases, test methods
6469	Insulated cables, insulation and sheaths, test methods
6480	Power cables, impregnated paper-insulated, lead or lead alloy sheathed electric cables
6485	Electric conductors, PVC covered overhead power line conductors
6500	Flexible cables, insulated cords and cables
6622	Power cables, thermosetting-polymer insulated, high voltage
6708	Flexible cables, trailing cables, mining equipment
6724	Thermosetting polymer insulated, for electricity supply, low smoke
6726	Flexible conductors, for festoon and temporary lighting
6746	Cable sheaths, PVC

Index British Standard

6862	Electric cables, road vehicles
6883	Insulated cables, elastomer insulated cables, for ships
6899	Cable sheaths, rubber
6946	Electric cables, metal channel support systems
6977	Multicore cables, insulated flexible cables, for lifts
7211	Power cables, thermosetting polymer insulated, non-armoured, low smoke
7365	Electric conductors, hard drawn aluminium wire, for overhead lines
7919	Electric cables, flexible cables rated up to 450/750v for use with appliances and equipment intended for industrial and similar environments
9530	Electric cables, cable fitting accessories, assessed quality, for circular electrical connectors
4737	Insulated cables, PVC-insulated, for intruder alarm systems
5425	Coaxial cables, for wideband distribution systems
638	Flexible cables, arc welding
6746C	Insulated cables, PVC insulation, colour chart
Aero 2E21	Pren type electric cables, for aircraft
Aero G177	Insulated cables, Nyvin type for aircraft
Aero G189	Tersil electric cables, for aircraft, imperial units
Aero G192	Specification for Efglas type electric cables with copper conductors, for aircraft
Aero G195	Insulated cables, Minyvin type, for aircraft, imperial units
Aero G206	Fepsil-type cables, for aircraft
Aero G210	Specification for PTFE insulated equipment wires (with silver plated copper conductors)
Aero G212	Electric cables, for aircraft
Aero G215	Insulated cables, thermocouple extension cables, for aircraft
Aero G221	Insulated cables, Minyvin-type, for aircraft, metric units
Aero G222	Insulated cables, Efglas-type, for aircraft, metric units
Aero G227	Tersil electric cables, for aircraft, metric units
Aero G230	Specification for general requirements for aircraft electrical cables (second series)
Aero G231	Electric conductors, copper and copper alloy, for aircraft cables
Aero G232	Insulated cables, lightweight thin-wall, wrapped for aircraft
Aero G233	Insulated cables, lightweight thin-wall, extruded for aircraft
Aero G235	Insulated cables, lightweight thin-wall, wrapped, silver plated copper conductors for aircraft
Aero G236	Insulated cables, lightweight thin-wall, wrapped, nickel plated copper conductors for aircraft
Aero G237	Insulated cables, lightweight thin-wall, extruded, nickel plated copper conductors for aircraft
Aero G238	Insulated cables, lightweight thin-wall, wrapped, nickel plated copper conductors for aircraft
Aero G241	Electric cables, fire-proof, for aircraft
Aero G242	Communication cables, for aircraft data bus interconnecting systems
Aero G243	Electric cables, ignition, for aircraft engines
Aero G291	Insulated cables, Efglas-type, for aircraft, imperial units
AU231	Specification for seven-core connecting cable for road vehicles
AU237	Flexible conductors, jumper lead sets, for automotive starting
AU7	Electric cables, automotive, colour codes
AU88	Electric cables, automobile, light duty, ratings
AU88a	Recommendations for ratings for light duty cables for automobile use
PD2379	Electric cables, manufacturers' identification threads, Commonwealth, South Africa, colour register

International abbreviations

AFNOR	A ssociation F rançaise de NOR malisation (France)	IEEE	I nstitute of E lectrical and E lectronics E ngineers
ANSI	A merican N ational S tandards I nstitute (USA)	ISDN	I ntegrated S ervices D igital N etwork (International)
AS	A ustralian S tandard (Australia)	ISO	I nternational O rganization for S tandardization (International)
ASTM	A merican S tandard of T esting M aterials (USA)	KEMA	K euring van E lektrotechnische M aterialien (Netherlands)
BS	B ritish S tandard (Great Britain)	LCIE	L aboratoire C entral des I ndustries E lectriques (France)
BSI	B ritish S tandard I nstitution (Great Britain)	MIL	M ilitary S pecification (USA)
BV	B ureau V eritas (France)	NEC	N ational E lectrical C ode (USA)
CATV	C ommunity A ntenna T elevisi O n (International)	NEMA	N ational E lectrical M anufacturers A ssociation (USA)
CEBEC	C omité E lectrotechnique B elge (Belgium)	NEMKO	N orges E lektriske M ateriellkontroll (Norway)
CEE	I nternational C ommission on Ruls for the Approval of E lectrical E quipment (International Commission)	NEN	N ederlands N ormalisatie-Instituut (Netherlands)
CEI	C ommission E lectrotechnique I nternationale (International)	NF	N ormes F rançaises (France)
CEMP	C entre d' E tude des M atières P lastiques (France)	NFC	N ormes F rançaises C lass C (France)
CEN	C omité E uropéen de N ormalisation E lectrotechniques	ÖVE	Ö sterreichischer V erband für E lektrotechnik (Austria)
CENELEC	C omité E uropéen de N ormalisation E lectrotechniques	SAE	S ociety of A utomotive E ngineers
CNET	C entre N ational d' E tude de T élécommuni C ation (France)	SEK	S venska E lektriska K ommissionen (Sweden)
CNOMO	C omité de N ormalisation des M oyens de P roduction	SEMKO	S venska E lektriska M ateriellkontrollanstalten (Sweden)
CSA	C anadian S tandards A ssociation (Canada)	SETI	S ähkötarkastuslaitos (Finland)
CSTB	C entre S cientifique et T echnique du B âtiment (France)	SEV	S chweizerischer E lektrotechnischer V erein (Switzerland)
DEMKO	D anmarks E lektriske M ateriellkontroll (Denmark)	SNV	S chweizerischer N ormenverband (Switzerland)
DIN	D eutsches I nstitut für N ormung (Germany)	TGL	DDR-Standard s: Technische Normen, Gütevorschriften und Lieferbedingungen (ehemalige GDR)
DKE	D eutsche E lektrotechnische K ommission im DIN und VDE (Germany)	UL	U nderwriters L aboratories Inc. (USA)
EN	E uropean S tandards (Germany)	UNI	U nificazione N azionale I taliana (Italy)
FAR	F ederal A ir R egulation (USA)	UTE	U nion T echnique de l' E lectricité (France)
FTZ	F ernmeldetechnisches Z entralamt (Germany)	VDE	V erein D eutscher E lektroingenieure (Germany)
GOST	U SSR- S tandards	VDEW	V ereinigung D eutscher E lektrizitätswerke e. V. (Germany)
HD	H armonisierungs- D okumente (International)	ZVEH	Z entralverband der D eutschen E lektrohandwerke e. V. (Germany)
HN	H armonisation des N ormes (France)	ZVEI	Z entralverband der E lektrotechnik- und E lektronik I ndustrie e. V. (Germany)
IEC	I nternational E lectrotechnical C ommission (International)		
IEE	I nstitution of E lectrical E ngineers (Great Britain)		

Characteristics* of insulating and sheath materials

Designation			Electrical					Thermic								
			Density g/m ³	Break-down-voltage- KV/mm (20°C)	Specific volume resistivity Ohm · cm 20°C	Dielectric constant 50 Hz/20°C	Dielectric loss-factor tan δ	Working temperature		Melt-temperature +°C	Flame-resistance	Oxygen index LOI (% O ₂)	Heating value H ₀ MJ · kg ⁻¹			
VDE initial-code	Abbre-viations	Materials														
															permanent °C	short time °C
Thermoplastic	Y	PVC	Polyvinylchloride compounds	1,35–1,5	25	10 ¹³ –10 ¹⁵	3,6–6			– 30 + 70	+100	>140	self-extin-guishing	23–42	17–25	
	YW	PVC	Heat-resistant 90°C	1,3–1,5	25	10 ¹² –10 ¹⁵	4–6,5	4 x 10 ⁻² to 1 x 10 ⁻¹		– 20 + 90	+120	>140			16–22	
	Yw	PVC	Heat-resistant 105°C	1,3–1,5	25	10 ¹² –10 ¹⁵	4,5–6,5			– 20 +105	+120	>140			24–42	16–20
	Yk	PVC	Cold resistant	1,2–1,4	25	10 ¹² –10 ¹⁵	4,5 –6,5			– 40 + 70	+100	>140				17–24
	2Y	LDPE	Low density Polyethylene	0,92–0,94	70	10 ¹⁷	2,3		2 x 10 ⁻⁴		– 50 + 70	+100	105–110	flam- mable	≅22	42-44
	2Y	HDPE	High density Polyethylene	0,94–0,98	85	10 ¹⁷	2,3	3 x 10 ⁻⁴		– 50 +100	+120	130				
	2X	VPE	Cross-linked Polyethylene	0,92	50	10 ¹² –10 ¹⁶	4–6	2 x 10 ⁻³		– 35 + 90	+100	–				
	02Y		Foamed Polyethylene	~0,65	30	10 ¹⁷	~1,55	5 x 10 ⁻⁴		– 40 + 70	+100	105			18–30	
	3Y	PS	Polystrole	1,05	30	10 ¹⁶	2,5	1 x 10 ⁻⁴		– 50 + 80	+100	>120			≅22	40–43
	4Y	PA	Polyamide	1,02 –1,1	30	10 ¹⁵	4	2 x 10 ⁻² bis 1 x 10 ⁻³		– 60 +105	+125	210			≅22	27–31
	9Y	PP	Polypropylene	0,91	75	10 ¹⁶	2,3 –2,4	4 x 10 ⁻⁴		– 10 + 90	+140	160				42–44
	11Y	PUR	Polyurethane	1,15 –1,2	20	10 ¹⁰ –10 ¹²	4–7	2,3 x 10 ⁻²		– 55 + 80	+100	150			20–26	20–26
	TPE-E (12Y)		Polyester Elastomer	1,2 –1,4	40	>10 ¹⁰	3,7 –5,1	1,8 x 10 ⁻²			+140	190			≅29	20–25
	TPE-O		Polyolefine Elastomer	0,89–1,0	30	>10 ¹⁴	2,7–3,6			– 50 +100	+130	150			≅25	23–28
Elastomere	G	NR SBR	Natural rubber Styrol-butadiene- rubber-compounds	1,5–1,7	20	10 ¹² –10 ¹⁵	3–5	1,9 x 10 ⁻²		– 65 + 60	+120	–	flam- mable	≅22	21–25	
	2G	SiR	Silicone rubber	1,2 –1,3	20	10 ¹⁵	3–4	6 x 10 ⁻³		– 60 +180	+260	–	high flash point	25–35	17–19	
	3G	EPR	Ethylen-propylene rubber-compounds	1,3–1,55	20	10 ¹⁴	3–3,8	3,4 x 10 ⁻³		– 30 + 90	+160	–	flam- mable	≅22	21–25	
	4G	EVA	Ethylen-vinylacetat copolymer-compunds	1,3–1,5	30	10 ¹²	5–6,5	2 x 10 ⁻²		– 30 +125	+200	–			19–23	
	5G	CR	Polychloroprene compounds	1,4–1,65	20	10 ¹⁰	6–8,5	5 x 10 ⁻²		– 40 +100	+140	–	self-extin- guishing	30–35	14–19	
	6G	CSM	Chlorsulfonated Polyethylene compunds	1,3–1,6	25	10 ¹²	6–9	2,8 x 10 ⁻²		– 30 + 80	+140	+160				19–23
High temp. materials	10Y	PVDF	Polyvinylidene fluoride Kynar/Dyflor	1,7–1,9	25	10 ¹⁴	9–7	1,4 x 10 ⁻²		– 40 +135	+160	>170	self-extin- guishing	40–45	15	
	7Y	ETFE	Ethylene-Tetrafluor ethylene	1,6–1,8	36	10 ¹⁶	2,6	8 x 10 ⁻⁴		–100 +150	+180	>265	self-extin- guishing	30–35	14	
	6Y	FEP	Fluorine ethylene propylene	2,0–2,3	25	10 ¹⁸	2,1	3 x 10 ⁻⁴		–100 +205	+230	>225	self-extin- guishing	>95	5	
	5YX	PFA	Perfluoralkoxypolimeric	2,0–2,3	25	10 ¹⁸	2,1	3 x 10 ⁻⁴		–190 +260	+280	>290	self-extin- guishing	>95	5	
	5Y	PTFE	Polytetrafluorethylene	2,0–2,3	20	10 ¹⁸	2,1	3 x 10 ⁻⁴		–190 +260	+300	>325	self-extin- guishing	>95	5	
halogen-free compounds	H	not cross- linked	halogen-free polymer-compounds	1,4–1,6	25	10 ¹² –10 ¹⁴	3,4–5	~10 ⁻³		– 30 + 70	+100	>130	self-extin- guishing	≅40	17-22	
	HX	cross- linked	halogen-free polymer-compounds	1,4–1,6	25	10 ¹³ –10 ¹⁴	3,4–5	10 ⁻² –10 ⁻³		– 30 + 90	+150	–	self-extin- guishing	≅40	16–25	

* The characteristics valid for unprocessed material

Characteristics* of insulating and sheath materials

		Thermic			Mechanical				Halogen	Weather		Designation											
Thermal-conductivity W·K ⁻¹ ·m ⁻¹	Corrosive gases in case of fire	Radiation-resistance-max Mrad	tensile strength N/mm ²	Elongation at break %	Shore-hardness	Corrosion behaviour	Abrasion resistance	halogen-free	Weather resistance	Cold resistance	VDE-Initial-code	Abbre- viat- ions	Material										
0,17	Hydrogen chloride	80	10–25	130–350	70–95 (A)	medium	0,4	no	medium in black	moderate-good	Y	PVC	Polyvinylchloride-compounds	Thermoplastic									
											Yw	PVC	Heat-resistant 90°C										
											Yw	PVC	Heat-resistant 105°C										
											YK	PVC	Cold resistant										
	0,3	no	100	10–20	400–600	43–50 (D)	medium	0,1	yes	good	good	2Y	LDPE		Low density Polyethylene								
												2Y	HDPE		High density Polyethylene								
												2X	VPE		Cross-linked Polyethylene								
	0,3	no	100	12,5–20	300–400	40–45 (D)	medium	–	conditional ¹⁾	–	good	02Y	Foamed Polyethylene										
	0,25			8–12	350–450	–	–					–											
	0,25	no	80	55–65	300–400	35–50 (D)	good	0,4	–	medium - good	moderate - good	3Y	PS		Polystrole								
0,23	no	10	50–60	50–170	–	very good	1,0–1,5	yes	good	good	4Y	PA	Polyamide										
0,19											20–35	300	55–60 (D)	medium	0,1	moderate	good	9Y	PP	Polypropylene			
0,25											100 (500)	30–45	500–700	70–100 (A)	very good	1,5	yes ²⁾	very good	very good	11Y	PUR	Polyurethane	
0,5	no	10	30	>300	85 (A) 70 (D)	good	1,5	yes	very good	very good	TPE-E (12Y)	Polyester Elastomer											
1,5											10	20	55 (A) 70 (D)	good	1,5	yes	very good	very good	TPE-O	Polyolefine Elastomer			
–	no	100	5–10	300–600	60–70 (A)	moderate	1,0	yes	moderate	very good	G	NR SBR	Natural rubber Styrol-butadiene-rubber-compounds	Elastomere									
0,22											50	40–80 (A)	1,0		yes	good	good	2G	SIR	Silicone rubber			
–											200	200–400						65–85 (A)	1,0	yes	good	good	3G
–											100	8–12	250–350		70–80 (A)	1,0	yes	good					good
–											Hydrogen chloride	50	10–20		400–700				55–70 (A)	medium	1,5	no	
–	350–600	60–70 (A)	medium	1,5	no	very good	moderate	6G	CSM	Chlorsulfonated Polyethylene compunds													
0,17	Hydro-fluoric	10	50–80	150	75–80 (D)	very good	0,01	no	very good	very good	10Y	PVDF	Polyvinylidene fluoride Kynar/Dyflor	High temp. materials									
0,24	yes	10	40–50	150	70–75 (D)	very good	0,02				very good	very good	7Y		ETFE	Ethylene-Tetrafluor ethylene							
0,26	yes	1	15–25	250	55–60 (D)	very good	0,01				very good	very good	6Y		FEP	Fluorine ethylene propylene							
0,21	yes	0,1	25–30	250	55–60 (D)	very good	0,01				very good	very good	5YX		PFA	Perfluoralkoxypolimeric							
0,26	yes	0,1	80	50	55–60 (D)	very good	0,01				very good	very good	5Y		PTFE	Polytetrafluorethylene							
0,17	no	100	8–13	150–250	65–95 (A)	medium	0,2–1,5	yes	medium in black: good	average	H	not cross-linked	halogen-free polymer-compounds	halogen-free compunds									
0,20	no	200	8–13	150–250		medium					0,2–1,5	yes	medium in black: good		average	HX	cross-linked	halogen-free polymer-compounds					

¹⁾ The propellent may be e.g. Fluor-Chlor-Hydrcarbon

²⁾ depend on the type compound

Definitions: Classes of Stress (Duty) in Flexible Cables and Insulated Wires

The application of a flexible cable in certain areas as, or in, operating materials as well as for certain combinations of external influences that can occur in these areas, is described by the collective term "stress" or "duty". Suitable flexible cables and insulated wires are defined in the applicable equipment standards for the devices in question. On the basis of mechanical influences, as well the general expressions used, the term "stress" or "duty" is divided into the following categories.

Normal stress / Ordinary duty

– Normal stress is present when the cables are subject to low mechanical stresses in the areas of application, and the risk of mechanical damage is low, as is the case to be expected in the normal use of small to medium size equipment in domestic and commercial as well as in light industrial premises. Such equipment includes amongst others, vacuum cleaners, toasters, washing machines, refrigerators.

Low stress / Light duty

– Low stress is then present when the risk of mechanical damage and mechanical stress is low in the areas of application, as is the case to be expected for normal use of lightweight hand-held devices and lightweight operating materials in domestic households. Included in such equipment are radios, floor lamps, hairdryers, small desktop office equipment.

Very low stress / Extra light duty

– Very low stress is then present when the risk of mechanical damage and mechanical stress is very low and can be considered negligible, i.e. under those influences that are to be expected for lightweight appliances in households and offices; Cases of applications where the cables having a greater mechanical protection would restrict the freedom of movement by the appliance. Included in such types of appliances are electric clocks and electric shavers.

High stress / Heavy duty

– High stress is then present when the risk of mechanical damage or a mechanical stress is of medium severity appreciable, e.g. for normal use of equipment in moderately heavy branches of industry or agricultural workshops, and the temporary use of such at building sites. Included in such equipment are, amongst others, moderately heavy portable machinery and motors at a building site or in agricultural workings, large hot-water boiling installations, hand-held lamps, hoists, and fixed installations in temporary buildings.

High stress (Heavy duty) in multi-core cables

– Applications as for high stress, though primarily for use in areas of manufacturing facilities including tool-making machinery, or mechanical handling equipment. The cables can be used inside or outside buildings for an ambient temperatures ranging from between -25°C and $+50^{\circ}\text{C}$ and the stabilised conductor temperatures do not exceed $+60^{\circ}\text{C}$. Examples are for connecting a control unit to a production machine, connections between a control unit and a machine, e.g. in hoists or cranes where the cable length does not normally exceed 10 m. Longer cable lengths are permissible for fixed inter-connections.

Application: Indoor and outdoor use

The terms are in conjunction with the limiting conditions, such as for example, minimum and maximum operating temperatures, or the influence of the ambient temperatures, understood as being limited by the design and intended usage. This context is defined by "the intended environment".

Indoor use

– The cables are installed or connected to an apparatus device and can be used permanently in the building at all times, namely in "the intended environment". The building can be used for commercial, industrial or residential purposes.

Outdoor use for a limited period

– The cables may be used outdoors as "the intended environment" for short periods of time, e.g. connected to electric lawnmowers or drills.

Permanent outdoor use

– The cables are designed to resist the various stresses that can occur outdoors in "the intended environment" (including weather conditions).

Safety Requirements in the Use of Cables and Insulated Wires

Fundamental requirements

The cables and insulated wires shall be of adequate safety for proper use in the intended manner such that these do not constitute any unacceptable risk to life or damage to property. The prevention of danger to persons and property during usage and storage of operating equipment means safety to include the detection of stress, risk and potential faults, as well as their rectification or a limitation to a minimum risk level.

Unless otherwise specified, cables and insulated wires should only be used for the conductance and distribution of electricity.

General requirements

The choice in the selection of cables and insulated wires should be such that the voltages and currents prevailing in the operating equipment, a system or device used shall meet all operating conditions to be expected.

The cables shall be constructed, installed, protected, used and maintained to prevent danger as far as its reasonably practical.

Limiting conditions

The limiting conditions in the DIN VDE and HD specifications shall be taken into account. An acceptable service life will be attained by compliance with the limiting conditions, depending on the circuit designed under defined conditions for use. The usable life of a permanently installed cable for power distribution is longer than that of a flexible cable.

The influence by all of the factors given in the following sections must be considered as an interrelationship and not on an individual basis.

Selection of cables and insulated wires

The choice in the selection of cables and insulated wires shall be made such that these are suitable for the operating conditions as well as for all other external influences and compliance with the respective protection class.

- a) Operating conditions are, for example:
 - voltage
 - protective measures
 - grouping of cables
 - current
 - method of installation
 - accessibility

- b) External influences are, for example:
 - ambient temperature
 - presence of rain, water vapour or the accumulation of water
 - presence of corrosive, contaminating or other chemical substances
 - mechanical stresses (such as holes or sharp edges from metal constructions for example)
 - animal world (such as rodents)
 - plant world (such as fungal growths)
 - irradiation (such as sunlight).

Note: The colour black provides a higher degree of protection than other colours.

Safety Requirements in the Use of Cables and Insulated Wires

Requirements for cables

- for permanent installation, and
- for flexible applications

Requirements for fixed installation

In the normal case, cables for permanent installation have solid single wire or stranded conductors. In certain circumstances, e.g. for greater ease of installation, the conductor may be Class 5 according to HD 383 or DIN VDE 0295.

Cables should not be in contact with, or close to, hot surfaces if the cables are not intended for such conditions.

Cables should not be buried directly in the earth and should be fastened by a suitable means while making allowance for the maximum spacing between fixing points.

The cable should not be damaged by any mechanical restraint used for its support. Cables which have been in use over longer periods of time may become damaged by movement. This can be caused by the natural effects of ageing on the physical properties of the materials used for the insulation sheath and jacket which can become brittle with time.

For flexible applications

Flexible cables are made up of conductors consisting of multiplicity of small wires and are either stranded or bunched. These cables meet either Class 5 or Class 6 of HD 383 and DIN VDE 0295.

Flexible cables should be used for connections to mobile operating equipment. The length of the connecting cable must be chosen such that response by the short-circuit protecting device is assured.

The cable length should be as short as is needed for the practical application so as to reduce the risk of mechanical damage. In cases of applications where flexible PVC-sheathed cables are permissible, the use of spiral cables can be considered for shortening the effective length.

Flexible PVC-sheathed cables are not necessarily suitable for processing further to spiral cables. Multicore control cables shall be protected against permanent bending stress. Abrasion, notches and sharp bends are to be avoided.

Except for cables for connections to permanently installed operating equipment, flexible cables should not be permanently fixed (with the exception of heavy-duty cable designs for permanent installation in temporary facilities) unless these are contained in an enclosure affording mechanical protection. For a fixed installation, at least one cable should be used for "normal" stress.

Flexible cables should not be subjected to excessive straining from tensile forces, compression, twisting or kicking. This applies in particular at the point of entry into the device, and strain relief or the point of connection to the fixed wiring. These should not be damaged by any strain relief or clamping device at points to the permanent installation.

Flexible cables should not be placed under floorcoverings or carpets because there is the danger that this can cause thermal insulating effects, leading to increased temperatures, or that the weight of furniture from traffic can damage the cables.

Flexible cables should neither be in contact with, or close to, hot surfaces nor extend into the immediate vicinity of such, as they are not suitable for this purpose.

On account of their characteristics, this also applies in particular for PVC-sheathed and/or jacketed cables. The suitability of flexible cables for outdoor applications, either for short periods or continuous operation, is defined in the tables of the HD 516 and in DIN VDE Part 300.

Flexible PVC-sheathed cables are not suitable for permanent use in outdoor applications.

The types of structures for PVC-sheathed cables for short-term use in outdoor applications should not however be operated in conditions other than these, e.g. at temperatures lower than the specified temperature.

Safety Requirements in the Use of Cables and Insulated Wires

Cables without a jacket may neither be used as a substitute for a jacketed cable nor as an extension cable. These shall principally not be used for connecting Class 2 equipment unless the cable in the constructional standard has been defined as a cable for extra light duty and the equipment standard explicitly permits this cable type.

The corresponding VDE and HD regulations shall be observed for the cables used in deep mining operations, in quarrying as well as for moveable equipment, such as in cranes with spring-loaded reeling devices for example.

Voltage

The rated voltage for a cable is the reference voltage for which the cable is designed and which serves to define the electrical testing requirements.

The rated voltage is expressed as the ratio of two values, U_0 / U , whereby U_0 is the effective value (r.m.s.) of the voltage between any insulated conductor and the "earth" (metal covering of the cable or surrounding medium)

U is the effective value (r.m.s.) between any two phase conductors of a multicore cable or of a system of single core cables. In an alternating current system, the rated voltage of a cable shall be at least equal to the nominal voltage to the value U_0 and U . In direct current system, the rated voltage of the system shall not be higher than 1,5 times that of the nominal voltage of the cable.

Note: The operating voltage of a system may permanently exceed the rated voltage for the cable by 10 %.

Current carrying capacity

The nominal cross-section of each conductor should be selected such that the current carrying capacity is not less than the maximum continuous current that flows through the conductor under normal conditions of operation. The limiting temperature with respect to the current carrying capacity should not be exceeded for the cable insulation and sheath concerned.

Included in the defined conditions is also the method of installation for the cable used. The regulations for the permissible current rating shall be observed here for the current.

Correction factors may also be included in the values given for the load rating to allow for other conditions, such as for example:

1. cable grouping
2. type of overcurrent protection
3. ambient temperature
4. reeled / drummed cables
5. thermal insulation
6. frequency of the current (if other than 50 Hz)
7. effects of harmonic waves

Serious damage can be caused if cables are operated for longer periods of time above those limits given in the tables and can lead to early failure or considerable deterioration in the cable characteristics.

Thermal influences

Cables should be selected, located and installed so that the intended heat dissipation is not inhibited and they do not present a fire hazard to adjacent materials.

The limiting temperatures for the individual cables are given separately in our catalogue. Under no circumstances may these values be exceeded by an interaction of internal joulean heat (to the material of the cable, connections and terminals) by the ambient conditions.

Safety Requirements in the Use of Cables and Insulated Wires

Mechanical stress

Allowance shall be made for all possible mechanical stress that can arise during a normal installation process for laying cable in order to assess the risk of mechanical damage to cables.

Tension

The following values for tension should not be exceeded for each conductor in use. This applies up to a maximum value of 1000 N for the tensile stress of all conductors unless HELUKABEL® has approved limits deviating from this value.

50 N/mm² by permanent operation for fixed installation.

15 N/mm² for flexible cables under static tension for fixed installation that are used in current circuits.

It is recommended for those cases where the above values are exceeded, that a separate strain-relieving element or similar protection should be used. The connection of such a strain-relieving element to the cable shall be made such that the cable is not damaged.

If flexible cables are subjected to dynamic tensile stress (including those due to the mass inertia, e.g. for reeling drums), the permissible tension or the fatigue life should be agreed between the user and HELUKABEL®.

Notes for cables which are installed vertically, without any intermediate support, can be found in DIN VDE 0298 part 300 and HD 516 S2, item 5.4.1, and Table 6.

Bending stress

The internal bending radius of a cable should be chosen such that the cable is not damaged by this.

The internal bending radii are given in Table 6 of HD 516 S2 and DIN VDE 0298 part 300.

The choice of bending radii smaller than specified shall be concurred with HELUKABEL®.

Attention shall be given when stripping the insulation that the conductor is not damaged by this as the bending characteristics will otherwise seriously deteriorate.

The bending radii given apply for ambient temperatures of (20 ±10)°C. The recommendations from HELUKABEL® shall be enquired for ambient temperatures other than those given.

For flexible cables and cords, particularly at terminations and at the point of entry of moveable appliances, it may be necessary to use a device which ensures that the cable is not bent to an internal bending radius less than that specified in Table 6 of HD 516 S2 and DIN VDE 0298 part 300.

Bending too close to any internal and/or external anchorage shall be avoided.

Kink-protection sleeves or other devices shall not impede the movement of the cores within the cable.

Compression

Cables shall not be compressed to an extent that this will damage the cable.

Torsional stress

In general, flexible cables are not designed for torsional stress. In those cases where such torsional stress cannot be avoided, then the design of the cable and the installation arrangements should be agreed between user and HELUKABEL®.

Safety Requirements in the Use of Cables and Insulated Wires

Compatibility

The following points shall be considered in the selection and installation of cables:

- The avoidance of interference mechanical and electrical influences between adjacent circuits.
- Dissipation of heat from cables, or the chemical/physical influences from the materials used for the cables on bordering materials, such as for example, constructional and decorative materials, insulation tubes, supports, etc.
- Mutual interference by adjacent materials and the materials used for the cables. This applies for instance, for an absorption of plasticiser from PVC-sheathed cables by certain materials that are used for thermal insulation purposes, for strapping materials or for the equipment.

Dynamic stress

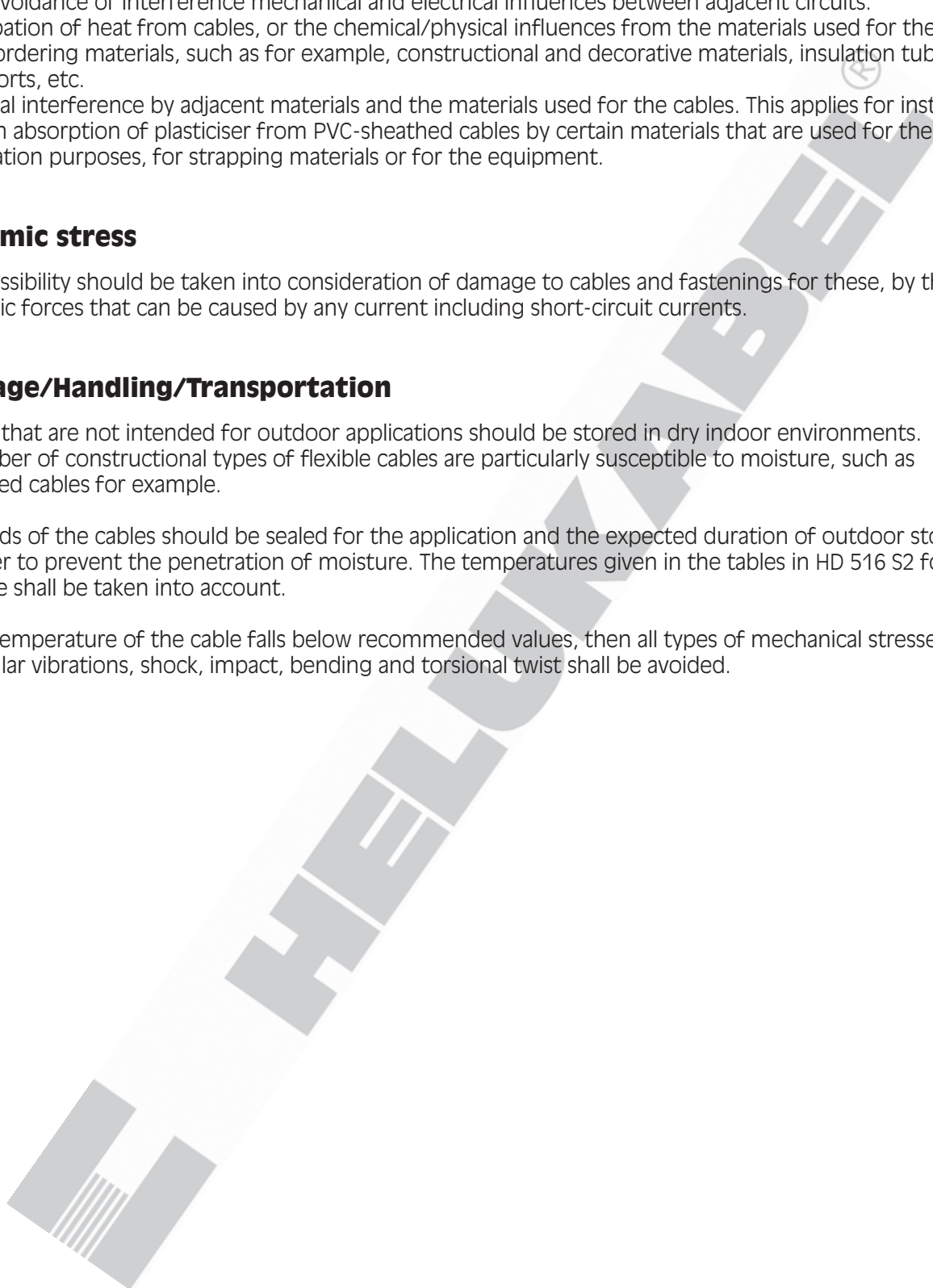
The possibility should be taken into consideration of damage to cables and fastenings for these, by the dynamic forces that can be caused by any current including short-circuit currents.

Storage/Handling/Transportation

Cables that are not intended for outdoor applications should be stored in dry indoor environments. A number of constructional types of flexible cables are particularly susceptible to moisture, such as screened cables for example.

The ends of the cables should be sealed for the application and the expected duration of outdoor storage in order to prevent the penetration of moisture. The temperatures given in the tables in HD 516 S2 for storage shall be taken into account.

If the temperature of the cable falls below recommended values, then all types of mechanical stresses, in particular vibrations, shock, impact, bending and torsional twist shall be avoided.



Glossary of Terms: Cables and Wires

A

Acceptance angle - The half-angle of the cone within which incident light is totally internally reflected by the fiber core. It is equal to $\arcsin(NA)$.

$$\Theta = \arcsin \sqrt{n_1^2 - n_2^2}$$

Aerial cable - A cable suspended in the air on poles or other overhead structure.

Appliance Wire and Cable - A classification covering insulated wire and cable for internal wiring of appliances and equipment.

Armoured Cable - A cable provided with a wrapping of metal for mechanical protection.

ASA - Abbreviation for American Standards Association. Former name of ANSI.

ASME - Abbreviation for American Society of Mechanical Engineers.

ASTM - Abbreviation for the American Society for Testing and Materials.

ATM (Asynchronous Transfer Mode) - A new emerging data standard that uses many of the same data rates as Fiber Channel and SONET.

Attenuation - The power drop or signal loss in a circuit, expressed in decibels (db). Generally attenuation increases (signal level decreases) with both frequency and cable length.

AWG - Abbreviation for American Wire Gauge. A standard measurement of the size of a conductor.

AWM - Designation for Appliance Wiring Material.

B

Bit - A binary digit, smallest element of information in binary system.

Bit (Binary Digit) - A basic unit for the data of a digital transmitting system. A group of 8 Bit is usually expressed as one Byte.

Bit rate - The number of bits of data transmitted over a phone line per second.

B & S Gauge - Standard for Brown & Sharpe Gauge. The wire diameter standard is same as AWG.

Breakdown Voltage - The voltage at which the insulation between two conductors will break down. Performed as a type test in the laboratory.

British Standard Wire Gauge - A modification of the Birmingham Wire Gauge and the legal standard of Great Britain for all wires. It is variously known as

Standard Wire Gauge (SWG), New British Standard (NBS), English Legal Standard, and Imperial Wire Guide.

Building Wire - Insulated wires used in building for light and power, 600 volts or less, usually not exposed to outdoor environment.

Buffer - A protective coating over an optical fibre. A soft material extruded tightly over the fibre coating, mechanically isolates individual fibres.

BUS - A network which functions like a signal line and is shared by a number of nodes.

C

Cable - Multicore stranded insulated wires under protective sheath to conduct electrical energy e.g. power cable, telecommunication cable, installation cable, data cable etc.

Cable Core - The portion of an insulated cable lying under the protective covering.

Cable Sheath - A protecting covering over the cable core to prevent outer damages.

Capacitance (Capacity) - That property of a system of conductors and a dielectric which permits the storage of electricity when potential difference exists between the conductors. A capacitance value is always positive.

Capacitive Coupling - Electrical interaction between two conductors caused by the capacitance between them.

CATV - Acronym for Community Antenna Television.

CEBEC - Belgium approval agency; Comité Electrotechnique Belge Service de la Marque.

CEE - European standards agency; International Commission on Rules for the Approval of Electrical Equipment.

Cellular insulation - Insulating material in foamed or sponge form with the cells closed or interconnected.

CENELEC - European standards agency; European Committee for Electrotechnical Norms.

Chromatic dispersion - The speed of an optical pulse travelling in a fiber changes if its wavelength changes. Chromatic dispersion can be measured by the measurement of travel time at different wavelength.

Circuit - The entire route of an electrical current. A complete path over which electrons can flow from the negative terminals of a voltage source through parts and wires to the positive terminals of the same voltage source.

Glossary of Terms: Cables and Wires

C

Circuit Sizes - A popular term for building wire sizes 14 through 10 AWG.

Circular Mil (CM) - Used to define cross-sectional areas of conductors. Area of a circle 1/1000 inches in a diameter. 1 mil (0,001 inch) is equal to square mil x 0,78540.

Cladding - A low-refractive index, glass or plastic that surrounds the core of a fiber. Optical cladding promotes total internal reflection for the propagation of light in a fiber.

Coaxial Cable - A cable consisting of two cylindrical conductors with a common axis, separated by a dielectric. The outer conductor or shield is commonly used to prevent external radiation from affecting the current flowing in the inner conductor.

Coherent waves - The phenomenon related to the existence of a correlation between the phases of the corresponding components of two waves or between the values of the phase of a given component of one wave at two instants in time or two points in space.

Colour Code - A system of identifying different insulated cores by means of colours, numbers, printing etc.

Concentric lay - Cable core composed of a central core surrounded by one or more layers of helically laid insulated wires or cores.

Conductor - A material capable of easily carrying an electrical conductivity. A wire or combination of wires not insulated from one another, suitable for carrying electric current.

Control Cable - A multi-conductor cable made for operation in control of signal circuits.

Copolymer - A compound resulting from the polymerization of two different monomers.

Copperweld - Copper covered steel wire. Copper and steel welded together. The trade name of Flexo Wire Division (Copperweld Steel Corp.) for their copper-clad steel conductors.

Cord - A small, flexible insulated cable.

Cord Set - Portable cords fitted with a wiring device at one or both ends. Cord is a small flexible insulated conductor or group of conductors, normally not larger than AWG 10 - up to 4 cores.

Core - In cables, a component or assembly of components over which other materials are applied, such as additional components, shield, sheath, or armour.

Corona - A discharge due to ionization of air around a conductor with a potential gradient exceeding a certain critical value. A high voltage electrical discharge that attacks insulation.

Crimp - Act of compressing a connector barrel around a cable in order to make an electrical connection.

Cross-linked - Setting up the chemical links between the molecular chains. A form of polyethylen material whose moleculars are more closely linked to produce a greater balance of physical and electrical properties. (XLPE - compound)

Crosstalk - Interference caused by audio frequencies. Undesired electrical currents in conductors caused by electromagnetic or electrostatic coupling from other conductors or from external sources. Also, leakage of optical power from one optical conductor to another.

CSA - Abbreviation for Canadian Standards Association, a non-profit independent organization which operates a listing service for electrical and electronic materials and equipment. The Canadian counterpart of the Underwriter's Laboratories.

Current - Flow of electricity measured in amperes. Practical unit is the ampere which represents the transfer of one coulomb per second.

Current rating - The maximum continuous electrical flow of current recommended by a given wire in a given situation, expressed in amperes.

Cut off wavelength - For a singlemode fiber, the wavelength above which the fiber exhibits singlemode operation.

D

dB - see decibel

D. C. - Abbreviation for direct current (D – C), Electricity that flows in one direction only.

Decibel (dB) - One-tenth of a bel. Unit to express differences of power level. Example: The decibel is 10 times the common logarithm of the power ratio. It is used to express power gain in amplifiers or power loss in passive circuits or cables.

DEMKO - Approval agency of Denmark. Denmark's Elektriske Material Kontrol.

Dielectric Breakdown - The voltage required to cause an electrical failure or breakthrough of the insulation.

Glossary of Terms: Cables and Wires

Dielectric Strength - The maximum voltage insulation can withstand without rupture. Usually expressed as a voltage gradient, e. g. volts per mil.

Dispersion - A general term for those phenomena that cause a broadening or spreading of light as it propagates through an optical fiber. The three types are modal, material, and waveguide

Drain Wire - An uninsulated wire used as an earth connection. This is generally laid over the component or under the screening, braiding etc.

Duct - An underground or overhead tube or conduit for carrying electrical cables.

E

EIA - Abbreviation for Electronic Industries Association.

Elastomer - Any material that will return to its original size after stretching. Elastomer is a rubber or rubber-like material which will stretch repeatedly to 200 percent or more and return rapidly with force to its approximate original shape.

Electromagnetic Coupling - Energy transfer by means of a varying magnetic field.

Electromagnetic Induction - The production of a voltage in a coil due to a change in the number of magnetic lines of force (flux linkages) passing through the coil.

Elongation - The fractional increase in the length of a material stressed in tension.

EMC - Electromagnetic Compatibility (EMV).

EMF - Abbreviation for Electro Motive Force – force determining flow of electricity (voltage).

EMI - Any electrical or electromagnetic interference that causes undesirable response, degradation, or failure in electronic equipment. Optical fibers neither emit or receive EMI.

EMV - Designation for electromagnetic compatibility (EMC).

EPR - Ethylene-propylene copolymer rubber. The copolymer is chemically cross-linked.

ETFE - Ethylene tetrafluoroethylene

F

FDDI - Fiber Distributed Data Interface. Very high speed Computer Network working with fiber optics.

FEP - Fluorinated ethylene propylene

Ferrule - A component of a connector that holds fiber in place and aids in its alignment, usually cylindrical in shape with a hole through the center.

Filled Cable - A telephone cable construction in which the cable core is filled with a material that will prevent moisture from entering or passing through the cable.

Fine Stranded Wire - Stranded wire with component strands of 36 AWG or smaller.

Flame Resistance - The ability of a material not to propagate flame once the heat source is removed.

Flammability - The measure of the material's ability to support combustion.

Flat Cable - A cable in flat form, where the cores lying parallel longitudinally but essentially with flat surfaces.

Foamed Plastics - Insulations having a cellular structure.

Foils - A thin supporting film of continuous sheet such as plastic foil, metal foil, laminated foil etc. for static shielding, contacts and other electrical applications.

FR-1 - A flammability rating established by Underwriters Laboratories for wires and cables that pass a specially designed vertical flame test. This designation has been replaced by VW-1.

FRNC - Flame Retardant Non Corrosive

G

Gauge - A term used to denote the physical size of a wire.

Graded-index fiber - An optical fiber whose core has a nonuniform index of refraction. The core is composed of concentric rings of glass whose refractive indices decrease from the center axis. The purpose is to reduce modal dispersion and thereby increase fiber bandwidth.

Ground Conductor - An electrical conductor for the connection to the earth, making a complete electrical circuit.

H

Helix - A continuous spiral winding.

Henry - The unit of inductance (H).

Hertz (Hz) - A unit of measurements of the frequency equal to one cycle per second.

High Temperature Wire and Cable - Electrical wire and cables having thermal operating characteristics of 150°C and higher.

Glossary of Terms: Cables and Wires

Hi-Pot - A test designed to determine the highest voltage that can be applied to a conductor without electrically breaking down the insulation.

High Voltage - Generally, a wire or cable with an operating voltage of 600 volts and above.

Hook-up Wire - Single conductor used to hook-up electrical parts of instruments for low current and voltage (under 1000 volts).

Hybrid Cable - Multi-conductor cable containing two or more types of components.

Hypalon - Du Pont's trade name for their chlorosulfonated polyethylene, an ozone resistant synthetic rubber (90°C).

Hz - Abbreviation for Hertz.

I

ICEA - Abbreviation for Insulated Cable Engineers Association.

IEC - European Standardization agency; International Electrotechnical Commission.

IEEE - Abbreviation for Institute of Electrical and Electronics Engineers.

Impedance - Resistance to flow of an alternating current at a particular frequency, expressed in ohms. It is a combination of resistance R and reactance X, measured in ohms.

Index profile - A graded-index optical fiber, the refractive index as a function of radius.

Induction - An influence exerted by a charged body or by a magnetic field on adjacent bodies without apparent communication.

Inductive Coupling - Crosstalk resulting from the action of the electromagnetic field of one conductor on the other.

Insulation - A non-conducting substance, named as dielectric, surrounding the conductor.

Interface - The two surfaces on the contact side of both halves of a multiple-contact connector which face each other when the connector is assembled. Common interconnection point for devices, e.g. RS232 Interface: Mouse-Personalcomputer.

ISDN - Integrated Services Digital Network. A standard protocol for digital telecommunications transmissions.

J

Jacket - An overall covering of a cable, called also sheath – which protects against the environment and stress.

Jumper - A short length of conductor used to make a temporary connection between terminals, around a break in a circuit, or around an instrument.

K

KEMA KEUR - Approval agency of Netherlands. Keuring van Elektrotechnische Materialien.

KV - Abbreviation for kilovolt = 1000 volts.

KVA - Abbreviation for kilovolt ampere = 1000 volts x amperes.

KW - Abbreviation for kilowatt = 1000 watt.

Kynar - Fluorocarbon insulation rated -65°C to +135°C, typically used as insulation for wire wrapwire. A Pennwalt trade name for polyvinylidene fluoride.

L

Laser - Light Amplification by Stimulated Emission of Radiation. An electro-optic device that produces coherent light with a narrow range of wavelengths, typically centered around 780 nm, 1310 nm, or 1550 nm.

Laminated Tape - A tape consisting of two or more layers of different materials bonded together.

LAN = Local Area Network - A network located in a localised area e.g. in an office, building, complex buildings whose communication technology provides a high-bandwidth, low-cost medium to which many nodes can be connected.

LED - Light Emitting Diode.

LOCA - Abbreviation for Loss of Coolant Accident, a system malfunction associated with nuclear generating stations.

Loop Resistance - The total resistance of two conductors in a closed circuit, measured round trip from one end.

Loss Factor - The loss factor of an insulating material is equal to the product of its dissipation and dielectric constant.

M

MCM - Cross-section of greater AWG-sizes. 1 MCM= 1000 circular mils = 0,5067 mm².

Meg or Mega - Prefix meaning 1 million = 1.000000 = 10⁶.

Glossary of Terms: Cables and Wires

M

Megarad - A unit for measuring radiation dosage. 1 megarad = one million rads = 10^6 rad or 10^6 cJ/kg.

Mho - The unit of conductivity. The reciprocal of an ohm.

MHz - One million cycles per second = megahertz = 10^6 Hz.

Modem - Abbreviation for Modulator/Demodulator. Device which allows to transmit electrical data via analogues transmission paths with limited bandwidth, e. g. Computer data via telephone lines.

MTW - An acronym for thermoplastic insulated Machine Tool Wire.

Multi-conductor - A combination of two or more conductors in a cable under jacket.

Multimode-Fiber - A type of optical fiber that supports more than one propagation mode.

Mutal Capacitance - Capacitance between two conductors when all other conductors are connected together to shield and ground.

Mylar - Du Pont trademark for polyester material.

N

National Electric Code Article 725 - The NEC Article which covers remote control, signal and communication power limited circuits that are not an integral part of the device or appliance.

National Electric Code Article 760 - The NEC Article which covers the fire and burglar alarms installation of wire and equipment operating at 600 Volts or less.

National Electric Code (NEC) - A set of regulations governing construction and installation of electrical wiring and apparatus in the United States, established by the American National Board of Fire Underwriters.

NEMA - National Electrical Manufacturers Association.

NEMKO - Approval agency of Norway. Norges Elektriske Materiellkontroll.

Neoprene - A synthetic rubber of thermosetting material with good resistance to oil, chemical, and flame, known as polychloroprene - mostly used as jacketing.

Neper - An electrical unit similar to decibel, used to express the ratio between two amount of power existing at two distinct points. 1 Neper = 8,686 decibels.

NFPA - Abbreviation for National Fire Protection Association. Administrative Sponsor of the National Electric Code (ANSI Standards Committee CI).

Numerical Aperture NA - The "light-gathering ability" of a fiber, defining the maximum angle to the fiber axis at which light will be accepted and propagated through the fiber. $NA = \sin \vartheta$, where ϑ is the acceptance angle.

$$NA = \sin \Theta\text{-max} = \sqrt{n_1^2 - n_2^2}$$

Nylon - A group of polyamide polymers, used for wire and cable jacketings with good chemical and abrasion resistance.

O

Ohm - The electrical unit of resistance. The value of resistance through which a potential difference of one volt will maintain a current of one ampere.

Optical Fiber - Any filament or fiber, made of dielectric materials, that guides light, whether or not it is used to transmit signals. Synonym: optical waveguide.

OSHA - Abbreviation for Occupational Safety and Health Act. Specifically the Williams-Steiger law passed in 1970 covering all factors relating to safety in places of employment.

OVE - Approval agency of Austria.

Overlap - A certain portion of a foil or band which laps over the leading edge of a helical or longitudinally wrapping tape.

Ozone - A faintly blue gaseous, reactive form of oxygen, obtained by the silent discharge of electricity in ordinary oxygen or in air.

Ozone Index - Percentage of oxygen necessary to support combustion in gas mixture.

P

Pair - 2 insulated wires twisted together in a certain lay-length to built a single circuit of transmission line.

Patch Cable - A cable with plugs or terminals on each end of the conductors to temporarily connect circuits of equipment together. In the IBM Cabling System, a length of Type 6 cable with data connectors on both ends.

Patch Cord - A flexible piece of electrical cord terminated at both ends with plugs, used for interconnecting circuits on a pasteboard.

Patch Panel - Distribution area to rearrange fiber connections and circuits.

Glossary of Terms: Cables and Wires

pH - The measure of acidity or alkalinity of a substance. PH values are described from 0 to 14. Value 7 indicate the neutrality. Numbers below 7 result increasing acidity and number greater than 7 increasing alkalinity.

Pick - Distance between two adjacent crossover points of braiding wires or filaments, measured in picks per inch.

Pigtail - A short length of optical fiber, permanently fixed to a component, used to couple power between the component and a transmission fiber.

Plenum - The air return way of a central air handling system, either ductwork or open space over a dropped ceiling.

Plenum Cable - Cable approved by Underwriters Laboratories for installation in plenums without the need for conduit.

Plug - The part of the two mating halves of a connector which is movable when not fastened to the other mating half.

Polychloroprene - Chemical name of neoprene. A rubber-like compound for jacketing and also for insulating where cables are subject to rough usage, oils, moisture, solvents, greases and chemicals.

Polyester (PETP) - A resin formed by the reaction between a dibasic acid and a dithydroxy alcohol. Polyethylene terephthalate, used extensively as a moisture resistant cable core wrap.

Polyethylene (PE) - This material is basically pure hydrocarbon resins with excellent dielectric properties, i. e. low dielectric constant, low dielectric loss across the frequency spectrum, mechanically rugged and resists abrasion and cold flow. The insulating materials derived from polymerization of ethylene gas.

Polyerm - A material of high molecular weight formed by polymerization of lower molecular weight molecules.

Polyolefin - A group of thermoplastics based upon the unsaturated hydrocarbons, known as olefins. When combined with butylene or styrene polymers, the form compounds such as polyethylene and polypropylene.

Polypropylene (PP) - A thermoplastic similar to polyethylene but stiffer and having higher softening point (temperature); excellent electrical properties.

Polyurethane (PUR) - Class of polymers known for good abrasion and solvent resistance. A copolymer of urethane is similar in properties to neoprene, usually used as a coldcuring moulding compound.

Polyvinyl Chloride (PVC) - This is a group of thermoplastic compounds composed of polymers of polyvinyl chloride or its polymer, vinylacetate, in combination with certain stabilizers, fillers, plasticizers, pigments etc., widely used for wire and cable insulations and several jackets.

Power Cables - Cables of several sizes, construction, and insulation, single or multi-conductor, designed to distribute primary power to various types of equipment, such as cables $\geq 0,6/1$ kV.

Power Factor - The ratio between the true power in watts and the apparent power in volts – amperes.

Primary Coating - The plastic coating applied directly to the cladding surface of the fiber during manufacture to preserve the integrity of the surface.

Printed Wiring - A printed circuit intended to provide point-to-point electrical connections.

Propagation - Delay time required for an electrical wave to travel between two points on a transmission line.

R

Rayleigh Scattering - The scattering of light that results of from small inhomogeneities in material density or composition.

Reel - A revolvable flanged device made of wood or metal, used for winding of wires or cables.

Refractive index - The ratio of the velocity of light in a vacuum to its velocity in the medium. Synonym: Index of Refraction.

Resistance - Property of an electric circuit which determines for a given current the rate at which electric energy is converted into a heat and has a value, is measured in ohms.

RG/U - Abbreviation for Radio Government, Universal. RG is the military designation for coaxial cable in Mil-C-17. R = Radio, G = Guide, U = Utility.

Ribbon Cable - A flat cable consisting of two or more insulated conductors laid parallel in one plane and held together by means of adhesive or woven textile yarns.

RMS (Root Mean Square) - The effective value of an alternating current or voltage.

Rubber (Wire Insulation) - Term used to describe wire insulations made of thermosetting elastomers, occur naturally or may be made synthetically.

Glossary of Terms: Cables and Wires

S

S - Rubber insulated heavy duty flexible cable, stranded copper wires with separator. Two or more colour coded, stranding with filler, wrapped with separator, rubber jacket. 600 V.

Semi-Rigid - A cable containing a flexible inner core and a relatively inflexible sheathing.

Semi-Rigid PVC - A hard semi-flexible polyvinylchloride compound with low plasticizer content, (shore A ≥ 97), for Termi-Point – connecting technique.

Semi-Solid - An insulation cross-section having a partially open space between the conductor and the insulation perimeter.

SEMKO - Approval agency of Sweden.

Separator - A layer of insulating material which is placed between a conductor and its dielectric, between a cable jacket and the component it covers, or between various components of a multiple-conductor cable.

Silicone - A thermosetting elastomer with excellent heat-resistant. Polymeric materials in which the recurring chemical groups contain silicon and oxygen atoms at links in the main chain.

Simplex - Transmission only in one direction.

Singlemode-Fiber - A small-core optical fiber that supports only one mode of light propagation above the cutoff wavelength. Typical diameter is 9 – 10 μm , the dispersion very low. Singlemode fibers are proper for long distance transmissions.

SJ - Junior hard service, rubber-insulated pendant or portable cord. Same construction as type S, but 300 V. Jacket thickness different.

SJO - Same as SJ, but neoprene, oil resistant compound outer jacket. Can also be made „waterresistant“ 300 V, 60°C.

SJT - Junior hard service thermoplastic or rubberinsulated conductors with overall thermoplastic jacket. 300 V, 60°C to 105°C.

SJTO - Same as SJT but oil resistant thermoplastic outer jacket. 60°C.

SO - Hard service cord, same construction as type S except oil resistant neoprene jacket. 600 V, 60°C to 90°C.

SOOW – like SO, but oil and water-resistant.

Solid Conductor - A conductor consisting of a single wire.

SONET - Synchronous Optical Network.

SP-1 - All rubber, parallel-jacketed, two-conductor light duty cord for pendant or portable use in damp locations. 300 V.

SP-2 - Same as SP-1, but heavier construction, with or without third conductor for grounding purposes. 300 V.

SP-3 - Same as SP-2, but heavier construction for refrigerators or room air conditioners. 300 V.

SPT-1 - Same as SP-1, except all-thermoplastic. 300 V. With or without third conductor for grounding.

SPT-2 - Same as SP-2, except all-thermoplastic. 300 V. With or without third conductor for grounding.

SPT-3 - Same as SP-3, except all-thermoplastic. 300 V. With or without third conductor for grounding.

Spark Test - A test designed to locate pinholes in an insulated wire by application of an electrical potential across the material for a very short period of time while the wire is drawn through an electrode field.

Splice - An interconnection method for joining the ends of two optical fibers in a permanent or semipermanent fashion. Maybe thermally fused or mechanically applied.

ST - Hard service cord, jacketed, same as type S, except all-plastic design. 600 V, 60°C to 105°C.

Step index Fiber - An optical fiber, either multi-mode or singlemode, in which the core refractive index is uniform throughout so that a sharp step in refractive index occurs at the core-to-cladding interface.

STO - Same as ST but with oil resistant thermoplastic outer jacket. 600 V, 60°C.

SV - Vacuum cleaner cord, two or three-conductor, rubber-insulated. Overall rubber jacket. For light duty in damp locations. 300 V, 60°C.

SVO - Same as SV except neoprene jacket. 300 V, 60°C.

SVT - Same as SV except all-plastic, construction. With or without third conductor for grounding purposes only. 300 V, 60°C to 90°C.

T

Tape Wrap - A spirally applied tape over an insulated or uninsulated wire.

Tear Strength - The force required to initiate or continue a tear in a material under specified conditions.

Temperature Rating - The maximum temperature at which an insulating material may be used in continuous operation without loss of its basic properties.

Glossary of Terms: Cables and Wires

TEW - Canadian Standard Association type appliance wires. Solid or stranded single conductor, plastic-insulated. 600 V, 105°C.

TF - Fixture wire, thermoplastic-covered solid or 7 strands. 60°C.

TFE - Tetrafluoroethylene.

TFF - Same as TF but flexible stranding. 60°C.

THHN - 90°C, 600 V nylon jacketed building wire.

Thermocouple Lead Wire - An insulated pair of wires used from the couple to a junction box.

Thermoplastic - A material which softens when heated and becomes firm on cooling.

THW - Thermoplastic vinyl insulated building wire. Flame-retardant, moisture and heat-resistant 75°C. Dry and wet locations.

THWN - Same as THW but with nylon jacket overall. 75°C.

Transmission - Transfer of electric energy from one location to another through conductors or by radiation or induction fields.

Tray Cable - A factory-assembled multi-conductor or multipair control cable approved under the National Electrical Code for installation in cable trays.

Triaxial Cable - A three-conductor cable constructed in three coincident axes, of which one conductor in the centre, second circular conductor concentric with the first and the third circular conductor insulated from the concentric with the first and second, usually with insulation, a braiding and a outer jacket.

TW - Thermoplastic vinyl-jacketed building wire, moisture resistant 60°C.

Twisted Pairs - A cable composed of two small insulated conductors twisted together without a common covering.

U

UL - Abbreviation for Underwriter's Laboratories, Inc.

Ultraviolet - Optical radiation for which the wavelengths are shorter than those for visible radiation, that is approximately between 1 nm and 400 nm.

Unilay Stranding - A conductor constructed in bunch form having more than one layer in a concentric stranding with a common length and direction of lay and contains 19, 27, 37 and any number of strands.

V

VDE - West Germany approval agency.

Velocity of light - The velocity of light is 300.000 km/s in vacuum. In a medium it depends on the refractive index and the wavelength.

Velocity of Propagation - Ratio of speed of flow of electric current in an insulated cable to the speed of light. Usually expressed in percentage.

Volt - A unit of electromotive force.

Voltage - The term most often used in place of electromotive force, potential difference, or voltage drop to designate the electric pressure that exists between two points and is capable of producing a current when a closed circuit is connected between two points.

Voltage Drop - The amount of voltage loss from original input to point of electrical device.

Voltage Rating - The highest voltage that may be continuously applied to a wire in conformance with standards.

VW-1 - A flammability rating established by Underwriters Laboratories for wires and cables that pass a specially designed vertical flame test, (formerly designated FR-1).

W

Wall Thickness - The thickness of the applied insulation or jacket.

WAN - Wide Area Network. A network of connected computers that covers a great geographical area.

Water Absorption - A test to determine the water absorbed by a material after a given immersion period.

Wire - A conductor, either bare or insulated. A slender rod of metal usually referring to a single conductor, such as size 9 AWG and smaller.

Wire Gauge - A system of numerical designation of wire sizes.

X

XLPE - Cross-linked polyethylene.




















Y

Yield Strength - The minimum stress at which a material will start to physically deform without further increase in load.

Z

zytel - Du Pont's trade name for nylon resins.

International Certification Marks and Testing Institute

Country	Certification marks	Testing Institutes/ Registration Agency
Belgien		Comité Electrotechnique Belge Belgisch Elektrotechnisch Comité (CEBEC)
China		Chinesische Zwangsläufige Zertifikation (China Compulsory Certification)
Denmark		Danmarks Elektriske Materielkontrol (DEMKO)
Germany		VDE-Prüfstelle (Verband Deutscher Elektrotechniker e. V.)
Germany		VDE-Prüfstelle (Verband Deutscher Elektrotechniker e. V.)
Germany		Fraunhofer Institut Produktionstechnik und Automatisierung
Europe		Communauté Européenne
Finland		FIMKO LTD
France		Union Technique de l'Electricité (UTE)
Great Britain		BSI British Standards Institution (Zeichenvergabestelle)
Italy		IMQ Istituto Italiano de Marchio Qualità
Canada		Canadian Standards Association (CSA)
Netherlands		Naamloze Vennootschap tot Keuring van Electrotechnische Materialen (KEMA)
Norway		Norges Elektriske Materiekkontroll (NEMKO)
Austria		Österreichischer Verband für Elektrotechnik (Registration Agency)
Russia		GOST-R Certification (SGS)
Sweden		Svenska Elektriska Materiekkontrollanstalten (SEMKO)
Switzerland		Schweizerischer Elektrotechnischer Verein (SEV)
USA		Underwriters Laboratories (UL)

Formulas of electrotechnic and electronic

Cross-section for **single wire round**

$$q = \frac{D^2 \cdot \pi}{4} \text{ or } D^2 \cdot 0,7854$$

Cross-section for **bunched wire**

$$q = \frac{d^2 \cdot \pi}{4} \cdot n \text{ or } d^2 \cdot 0,7854 \cdot n$$

Diameter for

single wires cross-section

$$D = \sqrt{\frac{q \cdot 4}{\pi}} \text{ or } \sqrt{q \cdot 1,2732}$$

Diameter for **bunched wires**

$$D = \sqrt{1,34 \cdot n \cdot d}$$

q = cross-section (mm²)

D = conductor diameter (mm)

d = single wire diameter (mm)

n = number of wires

Conductor Resistance

$$R = \frac{l}{\kappa \cdot q} \text{ oder } \frac{\rho \cdot l}{q}$$

$$R_{\text{Schleife}} = \frac{2 \cdot l}{\kappa \cdot q} \text{ oder } \frac{2 \cdot l \cdot \rho}{q}$$

R = Electrical direct-current resistant (Ohm)

R_{Schleife} = Resistance of a complete circuit

q = cross-section (mm² or q mm)

κ (Kappa) = Conductivity

ρ (Rho) = Specific resistance ($\rho = \frac{1}{\kappa}$)

l = Conductor length (m)

Materials	Conductivity $\frac{m}{\Omega \cdot mm^2}$	Spec. resistance $\frac{\Omega \cdot mm^2}{m}$
Copper	58,00	0,01724
Aluminium	33,00	0,0303
Silver	62,00	0,0161
Iron	7,70	0,1299
Constantan	2,00	0,50

Serial connection

Resistance: $R = R_1 + R_2 + R_3 + \dots + R_n$

Capacitance: $\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} + \dots + \frac{1}{C_n}$

Inductance: $L = L_1 + L_2 + L_3 + \dots + L_n$

Parallel connection

Resistance: $R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}}$

Capacitance: $C = C_1 + C_2 + C_3 + \dots + C_n$

Inductance: $L = \frac{1}{\frac{1}{L_1} + \frac{1}{L_2} + \frac{1}{L_3} + \dots + \frac{1}{L_n}}$

Equivalent resistance of 2 parallel connected resistance

$$R = \frac{R_1 \cdot R_2}{R_1 + R_2}$$

Mutual capacity (C)

• coaxial cable $C = \frac{\xi r \cdot 10^3}{18 \cdot \ln \frac{D_a}{d}}$ (nF/km)

• parallel core $C = \frac{\xi r \cdot 10^3}{36 \cdot \ln \frac{D_a}{d}}$ (nF/km)

• shielded twisted pair

$$C_B = \frac{\xi r \cdot 10^3}{36 \ln \frac{2a}{d} \cdot \frac{(D_a^2 - a^2)}{(D_a^2 - a^2)}} \text{ (nF/km)}$$

Da = Outer diameter over insulation

Ds = diameter over shield

d = diameter of conductor

a = distance - mid to mid of both conductors

ξ = dielectric constant

Ohm's Law

The current intensity (I) is proportional to voltage (U) and inversely proportional to resistance (R)

$$I = \frac{U}{R} \quad R = \frac{U}{I} \quad U = I \cdot R$$

I = current intensity (Amps - A)

R = electrical resistance (Ω)

U = electrical voltage (V)

Conductance

$$G = \frac{1}{R} \quad 1S = \frac{1}{1 \Omega} \quad \text{or} \quad 1 \mu S = \frac{1}{1 M \Omega}$$

S (Siemens) = reziprocal value of a resistance

is used as **conductance**

1 Siemens = 1/Ohm

G = electrical conductance

Capacitance

• Single core against earth

$$C_B = \frac{\xi r \cdot 10^3}{18 \ln \frac{D_i}{d}} \text{ (nF/km or pF/m)}$$

• Unshielded symmetrical twisted pair

$$C_B = \frac{\xi r \cdot 10^3}{36 \ln \frac{2a}{d}} \text{ (nF/km or pF/m)}$$

• Coaxial pair

$$C_B = \frac{\xi r \cdot 10^3}{18 \ln \frac{D_i}{d}} \text{ (nF/km or pF/m)}$$

• Shielded symmetrical twisted pair

$$C_B = \frac{\xi r \cdot 10^3}{36 \ln \frac{2a}{d} \cdot \frac{(D_a^2 - a^2)}{(D_a^2 - a^2)}} \text{ (nF/km or pF/m)}$$

Di = outer diameter over single core (mm)

Da = outer diameter of multicores (mm)

d = conductor diameter (mm)

a = distance between two conductors mid to mid of both conductors

Inductance of parallel cores

at low frequencies

$$L = 0,4 \left(\ln \frac{D_a}{r} + 0,25 \right) \text{ mH/km}$$

at high frequencies

$$L = 0,4 \left(\ln \frac{D_a}{r} + 0 \right) \text{ mH/km}$$

Inductance of coaxial cable

at high frequencies

$$L = 0,2 \left(\ln \frac{D_a}{r} + 0 \right) \text{ mH/km}$$

Da = distance between two conductors mid to mid of both conductors

r = radius of a conductor

ξr = dielectric constant

Impedance (Z)

$$\text{for coaxial cable} \quad Z = \frac{60}{\sqrt{\xi r}} \cdot \ln \frac{D}{d} \text{ (}\Omega\text{)}$$

D = diameter over insulation

d = conductor diameter

for communication cable

$$\text{at low frequencies} \quad Z = \sqrt{\frac{R}{\omega C}} \text{ (}\Omega\text{)} \cdot \tan \varphi = 1, \quad \varphi = 45^\circ$$

$$\text{at high frequencies} \quad Z = \sqrt{\frac{L}{C}} \text{ (}\Omega\text{)}$$

R = Resistance (Ω/km)

L = Inductance (mH/km)

C = Capacitance (nF/km)

ω = 2πf

Wave length $\lambda = \frac{V}{f}$

λ = wave length

V = propagation velocity

(velocity of light: 300 000 km/s)

f = frequency

units of attenuation - Neper (N), decibel (dB) and Bel (B)

1 Np = 8,686 dB

1 dB = 0,1151 Np = $\frac{1}{10}$ Bel

1 Bel = 10 dB = 1,1513 Np

Formulas of power engineering

Cross section

- for direct current and single phase alternative current of known current

$$q = \frac{2 \cdot I \cdot l}{\kappa \cdot U} \text{ (mm}^2\text{)}$$

$$q = \frac{1,732 \cdot I \cdot \cos \varphi \cdot l}{\kappa \cdot U} \text{ (mm}^2\text{)}$$
- for direct current and single phase alternative current of known power for three-phase current

$$q = \frac{2 \cdot I \cdot P}{\kappa \cdot U \cdot U} \text{ (mm}^2\text{)}$$

$$q = \frac{I \cdot P}{\kappa \cdot U \cdot U} \text{ (mm}^2\text{)}$$

Voltage drop

For low voltage cable network of normal operation, it is advisable of a voltage drop of 3-5%.
 On exceptional case, higher values (up to 7%) can be permitted in case of network-extension or in short-circuit.

- for direct current of known current

$$u = \frac{2 \cdot I \cdot l}{\kappa \cdot q} \text{ (V)}$$
- for single phase alternative current

$$u = \frac{2 \cdot I \cdot \cos \varphi \cdot l}{\kappa \cdot q} \text{ (V)}$$
- for three-phase current

$$u = \frac{1,732 \cdot I \cdot \cos \varphi \cdot l}{\kappa \cdot q} \text{ (V)}$$
- for direct current of known power

$$u = \frac{2 \cdot I \cdot P}{\kappa \cdot q \cdot U} \text{ (V)}$$
- for single phase alternative current

$$u = \frac{2 \cdot I \cdot P}{\kappa \cdot q \cdot U} \text{ (V)}$$
- for three-phase current

$$u = \frac{I \cdot P}{\kappa \cdot q \cdot U} \text{ (V)}$$

u = voltage drop (V)
 U = operating voltage (V)
 P = power (W)
 R_w = effective resistance (Ω /km)
 L = Inductance (mH/km)
 ωL = induktiver Widerstand (Ω /km) ($\omega = 2 \cdot \pi \cdot f$ at 50 Hz = 314)
 q = cross-section (mm²)
 I = working current (A = Ampere)
 l = length of the line in m
 κ (Kappa) = electrical conductivity of conductors (m/ $\Omega \cdot \text{mm}^2$)
 κ -copper : 58
 κ -Alu : 33

Nominal voltage

The nominal voltage is to be expressed with two values of alternative current U_0/U in V (Volt).
 U_0/U = phase-to-earth voltage
 U_0 : Voltage between conductor and earth or metallic covering (shields, armouring, concentric conductor)
 U : Voltage between two outer conductors
 U_0 : $U/\sqrt{3}$ for three-phase current systems
 U_0 : $U/2$ for single-phase and direct current systems
 U_0/U_0 : an outer conductor is earth-connected for A. C.- and Nominal current

Active current

I in (A)

Reactive current

$I_w = I \cdot \cos \varphi$

Blindstrom

$I_0 = I \cdot \sin \varphi$

Apparent power (VA)

$S = U \cdot I$ for single phase current (A. C.)
 $S = 1,732 \cdot U \cdot I$ for three-phase current

Active power (W)

$P = U \cdot I \cdot \cos \varphi$ for single phase current (A. C.)
 $P = 1,732 \cdot U \cdot I \cdot \cos \varphi$ for three-phase current
 $P = U \cdot I$ for direct current

Reactive power (var)

$Q = U \cdot I \cdot \sin \varphi$ for single phase current (A. C.)
 $Q = 1,732 \cdot U \cdot I \cdot \sin \varphi$ for three-phase current
 (Voltampere reaktiv)
 $Q = P \cdot \tan \varphi$

Phase angle

φ is a phase angle between voltage and current

$\cos \varphi = 1,0 \ 0,9 \ 0,8 \ 0,7 \ 0,6 \ 0,5$
 $\sin \varphi = 0 \ 0,44 \ 0,6 \ 0,71 \ 0,8 \ 0,87$

Insulation resistance

$R_{iso} = \frac{S_{iso}}{l} \cdot \ln \frac{D_a}{d} \cdot 10^{-8} \text{ (M}\Omega \cdot \text{km)}$

Specific Insulation resistance

$R_s = \frac{R \cdot 2\pi \cdot l \cdot 10^8}{\ln \frac{D_a}{d_i}}$

D_a = outer diameter over insulation (mm)
 d = conductor diameter (mm)
 d_i = inner diameter of insulation (mm)
 l = length of the line (m)
 S_{iso} = Spec. resistance of insulation materials ($\Omega \cdot \text{cm}$)

Mutual capacity (C_B) for single-core, three-core and H-cable

$C_B = \frac{\xi r \cdot 10^3}{18 \ln \frac{D_a}{d}} \text{ (nF/km)}$

Inductance

Single-phase $0,4 \cdot (\ln \frac{D_a}{r} + 0,25) \text{ mH/km}$

three-phase $0,2 \cdot (\ln \frac{D_a}{r} + 0,25) \text{ mH/km}$

D_a = distance - mid to mid of both conductors
 r = radius of conductor (mm)
 ξr = dielectric constant
 $0,25$ = factor for low frequency

Earth capacitance

$E_C = 0,6 \cdot C_B$

Charging current (only for three-phase current)

$I_{Lad} = U \cdot 2 \pi f \cdot C_B \cdot 10^{-6} \text{ A/km je Ader bei 50 Hz}$

Charging power

$P_{Lad} = I_{Lad} \cdot U$

Leakage and loss factor

$G = \tan \delta \cdot \omega C \text{ (S)}$ $\omega = 2 \pi f$
 C = Capacity
 $\tan \delta = \frac{G}{\omega C}$ $\tan \delta = \text{loss factor}$
 $S = \text{Siemens} = \frac{1}{1\Omega}$

Dielectric loss

$D_v = U^2 \cdot 2 \pi f \cdot C_B \cdot \tan \delta \cdot 10^{-6} \text{ (W/km)}$
 f on 50 Hz
 $\tan \delta$ PE/VPE cables $\sim 0,0005$
 EPR $\sim 0,005$
 Paper-single core, three-core, H-cable $\sim 0,003$
 Oil-filled and pressure cable $\sim 0,003$
 PVC-cable $\sim 0,05$

It should be noted that for the current load of the insulated cables and wires of selected cross-section, the power ratings table is also be considered.

To estimate the voltage drop of insulated wires and cables for heavy (big) cross-sections of single- and three-phase-overhead line, the active resistance as well as the inductive resistance must be considered.

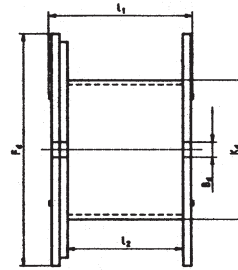
The formula for single-phase (A. C.):

$U = 2 \cdot l \cdot I \cdot (R_w \cdot \cos \varphi + \omega L \cdot \sin \varphi) \cdot 10^{-3} \text{ (V)}$

Three-phase:

$U = 1,732 \cdot l \cdot I \cdot (R_w \cdot \cos \varphi + \omega L \cdot \sin \varphi) \cdot 10^{-3} \text{ (V)}$

Capacity of KTG-Pool drums



F_d = Flange- \emptyset
 K_d = Drum Barrel- \emptyset
 B_d = Bore- \emptyset
 l_1 = Width over all
 l_2 = Width for windings

Wooden drums (standard)

Drum-code numbers	Drum-size	Flange \emptyset F_d	Drum-Barrel \emptyset K_d	Bore \emptyset B_d	Width over all l_1	Width for windings l_2	Load bearing capacity max. kg	Drum weight kg
051	05	500	150	56	470	410	100	8
061	06	630	315	56	415	315	250	17
071	07	710	355	80	520	400	250	25
081	08	800	400	80	520	400	400	31
091	09	900	450	80	690	560	750	47
101	10	1000	500	80	710	560	900	71
121	12	1250	630	80	890	670	1700	144
141	14	1400	710	80	890	670	2000	175
161	16/8	1600	800	80	1100	850	3000	280
181	18/10	1800	1000	100	1100	840	4000	380
201	20/12	2000	1250	100	1350	1045	5000	550
221	22/12	2240	1400	125	1450	1140	6000	710
250	25/14	2500	1400	125	1450	1140	7500	875
251	25/16	2500	1600	125	1450	1130	7500	900
281	28/18	2800	1800	140	1635	1280	10000	1175

Plastic drums

Drum-code numbers	Flange \emptyset F_d	Drum-Barrel \emptyset K_d	Width over all l_1	Width-for windings l_2	Load bearing capacity max. kg	Drum weight kg
050	500	150	456	404	100	4
070	710	355	510	400	250	15
080	800	400	510	400	350	16
090	900	450	680	560	400	23
100	1000	500	704	560	500	32

One-way wooden drums

Drum-code numbers	Flange \emptyset F_d	Drum-Barrel \emptyset K_d	Width over all l_1	Width-for windings l_2	Bore \emptyset max. B_d	Drum weight kg
HE 350	350	150	320	300	56	1,8
HE 400	400	150	320	300	56	2,1
HE 401	400	150	425	405	56	2,3
HE 501	500	150	320	300	56	3,0
HE 500	500	150	425	405	56	3,3
HE 600	600	150	425	405	56	4,5
HE 760	760	300	425	400	80	8,0

Cable lengths (m) to KTG-Drums - capacity of pool drums

Drum sizes and code numbers																	
Cable Ø D mm	051 05	061 06	071 07	081 08	091 09	101 10	121 12	141 14	161 16/8	181 18/10	201 20/12	221 22/14	250 25/14	251 25/16	281 28/18	Cable Ø D mm	
6	1130	1110	2024	2755												6	
7	815	840	1480	2340												7	
8	630	640	1064	1463	2730											8	
9	460	470	890	1152	2202	2866										9	
10	390	388	680	980	1768	2349										10	
11	320	315	564	760	1404	1910										11	
12	260	254	470	643	1206	1540										12	
13	220	238	385	542	1032	1339	2727									13	
14	190	190	360	454	880	1159	2265	2967								14	
15	170	180	300	430	749	1000	1990	2480								15	
16	150	140	239	358	632	860	1756	2205								16	
17	130	134	228	294	603	736	1545	1960								17	
18	110	102	218	280	505	705	1355	1737								18	
19	105	96	172	228	485	599	1184	1535	2722							19	
20	100	92	165	220	402	576	1139	1352	2435	2830						20	
21	80	90	159	210	387	485	990	1304	2172	2527						21	
22		65	122	167	315	468	856	1145	1930	2248						22	
23		62	117	160	304	389	827	999	1870	2172	2954					23	
24		60	113	156	294	377	709	967	1657	1927	2608					24	
25		58	110	150	285	365	688	839	1608	1867	2522					25	
26		56	80	116	226	299	668	814	1420	1650	2218					26	
27			78	113	220	290	567	700	1244	1450	2150	2860				27	
28			76	109	215	282	550	680	1210	1410	1880	2777				28	
29			73	106	209	226	462	663	1180	1370	1826	2450			2976	29	
30			70	103	162	220	450	564	1028	1200	1583	2383			2893	30	
31				76	157	214	438	550	1003	1166	1540	2089			2558	31	
32				74	153	209	428	537	866	1009	1500	2035	2978		2490	32	
33				72	150	204	352	450	846	985	1289	1984	2908		2428	33	
34					146	158	344	440	828	962	1257	1726	2605		2134	34	
35					108	154	336	430	710	824	1227	1685	2547		2083	2890	35
36					105	150	329	422	692	806	1040	1646	2270		2035	2820	36
37					103	148	265	348	678	788	1017	1418	2223		1774	2760	37
38						144	259	340	664	772	994	1386	1969		1735	2432	38
39						110	254	334	560	653	972	1356	1930		1697	2380	39
40						105	249	327	549	640	812	1328	1892		1486	2330	40
41						102	244	264	539	627	795	1130	1664		1435	2036	41
42						100	190	259	529	615	779	1107	1633		1406	1995	42
43							187	254	437	510	763	1085	1603		1199	1956	43
44							183	249	430	502	750	1065	1574		1175	1692	44
45							180	245	422	492	610	890	1373		1153	1660	45
46							177	240	415	484	600	874	1349		1130	1630	46
47							174	187	408	475	589	858	1326		1110	1600	47
48							130	184	330	386	578	842	1144		930	1366	48
49							127	180	325	380	568	828	1125		914	1342	49
50							125	178	319	373	558	878	1107		898	1320	50
51							123	175	314	367	442	666	1089		883	1298	51
52							120	172	310	360	435	655	1072		869	1276	52
53								170	305	356	428	644	912		715	1072	53
54								126	230	280	420	634	898		700	1056	54
55								124	235	276	414	624	885		690	1040	55
56								122	232	270	408	614	872		680	1022	56
57								121	228	267	400	488	860		668	1006	57
58								119	225	263	304	480	720		658	990	58
59								117	222	260	300	473	710		649	815	59
60									220	256	295	466	700		640	803	60
61									216	252	290	460	690		610	790	61
62									160	190	287	453	680		500	780	62
63									158	187	282	448	670		494	770	63
64									156	184	280	440	662		487	760	64
65									154	182	275	435	640		480	748	65
66									152	180	270	430	634		474	738	66
67									150	178	266	426	628		468	728	67
68										174	264	420	620		462	720	68
69										172	262	418	618		460	716	69
70										170	260	416	616		458	712	70
71										168	258	414	614		456	708	71
72										166	256	412	612		454	704	72
73										164	254	410	610		452	700	73
74										162	252	408	608		450	696	74
75										160	250	406	606		448	692	75
76										112	170	291	380		322	526	76
77										110	168	287	375		318	520	77
78										109	166	284	370		314	514	78
79										108	164	281	367		310	508	79
80										107	163	278	363		306	502	80
81										106	161	276	360		304	498	81
82										105	158	274	356		300	492	82
83										103	156	272	352		297	486	83
84											155	190	349		294	480	84
85											154	188	345		290	474	85
86											152	186	342		288	468	86
87											150	184	338		285	462	87
88											149	182	335		282	456	88
89											147	180	332		280	450	89
90											146	178	329		278	444	90
91											144	176	326		276	438	91
92											90	175	325		275	430	92

- min. Drum-Barrel-Ø ≅ 40 · D
 - min. Drum-Barrel-Ø ≅ 30 · D
 - min. Drum-Barrel-Ø ≅ 25 · D
 - min. Drum-Barrel-Ø ≅ 20 · D
 - min. Drum-Barrel-Ø ≅ 15 · D
- Kd = Drum-Barrel-Ø
D = Cable-Ø

Explanatory notes on CE marking

Low Voltage Directive (NSR), EMC Legislation

The Manufacturers must have to identify those products by the CE marking which fall within the applicability of certain EC (European Community) directives.

This applies to products which are covered by these directives in accordance with the new concept to include particular requirements on the technical characteristics of products.

The realization of these requirements is the condition for marketing the products in Europe. Then these CE directives constitute binding legislation for the European Union.

The inclusion of the CE marking confirms the compliance by the products with the basic requirements of all specifications applicable to that product. This means that CE marking is thus the compelling requirement in order of placing the products on the market within the EU. This also applies in the country of manufacture.

These directives are only then binding when these have been implemented in the national legislation of individual EU member states. An implementation in the national legislation of individual members states does not always occurs at the same time and is not always accomplished within the foreseen period.

Furthermore, certain transition rules may apply. If the obligation for implementation of these directives is not met, then these directives can still be directly applicable in certain circumstances.

The validity for these directives are not always clearly formulated and are sometimes abstract and not differentiated such that it cannot always be unambiguously established whether a product is covered by one or more directives and thus requires the CE marking.

The CE marking serves as evidence to the supervisory authorities of compliance with these directives. It is however often misinterpreted as being a "symbol for safety or quality" which is why it is often requested from customers without any legal justification.

EC Low Voltage Directive (NSR)

The EC Low Voltage Directive (NSR) is one of these CE Designation Directives (Article 13 of the CE Marking Directive). This means that electrical equipment used in low voltage range applications must also be identified by the CE marking. The CE marking is affixed on these products since 01.01.1997.

The CE Marking Directive will apply to a large number of electrical products, alone on account of the extensive range of applicability of the Low Voltage (NSR) and Electromagnetic Compatibility (EMC) Directives.

The following directives are of particular significance for the electrical industry:

**2006/95/EG
73/23/EEC and 93/68/EEC
Electrical equipment for use within specified voltage limits (Low Voltage Directive)**

**89/106/EEC
Construction products**

**89/336/EEC
Electromagnetic compatibility (EMC Directive)**

**89/392/EEC
Safety of machinery**

**91/263/EEC
Telecommunications terminal equipment**

For HELUKABEL as manufacturer and supplier of cables and wires, only the Low Voltage Directive is of significance. The EMC directive is of indirect applicability – for customer enquiries – in that queries could arise regarding the immunity of cables to interference, capacitance unbalance values and similar characteristics.

The EMC Directive

The EMC Directive, which applies for the electromagnetic compatibility of electrical and electronic equipment in their environments, can only be applied in complete systems.

For example, systems which are made up of several units, whereby each individual unit alone meet EMC requirements, are tested as a system for EMC together with the interconnecting cables.

EMC testing of a single cable or a single wire cannot be specified.

Title:

73/23/EEC and 93/68/EEC: Directive of the Council dated February 19, 1973, for harmonisation of the legislation in member states regarding electrical equipment for use within specified voltage ranges – with amendments dated July 22, 1993.

Explanatory notes on CE marking

Low Voltage Directive (NSR), EMC Legislation

Important information regarding the Low Voltage Directive (NSR):

1. General Conditions:

- a) The major characteristics required for knowledge and observance, for use in accordance with the intended application, are given on the electrical equipment, or, if this is not possible, in the accompanying instructions.
- b) The manufacturer's symbol or trade mark shall be clearly visible on the electrical equipment, or, where this is not possible, shall be affixed on the packaging.
- c) The electrical devices as well as the components for these, shall be procured such that these can be connected safely and properly.
- d) The electrical equipment shall be designed and constructed such that protection from the hazards listed in item 2 and 3, is assured during use and proper maintenance in accordance with the intended application.

2. Protection against hazards which may arise from electrical equipment – technical measures shall be foreseen in accordance with item 1, such that:

- a) Humans and working animals are protected from injury or other harm which can be caused by either direct or indirect contact.
- b) No high temperatures, arcs or radiation are generated from which hazards could arise.
- c) Humans, working animals and property are adequately protected against non-electrical hazards which, from experience, can arise from electrical equipment.
- d) The insulation complies to the property requirements.

3. Protection against hazards which can arise from external influences on electrical equipment – technical measures are foreseen in accordance with item 1, such that the electrical equipment:

- a) can withstand the mechanical loads such that humans, working animals or property are not endangered.
- b) can withstand the non-mechanical effects under foreseen environmental conditions such that humans, working animals or property are not endangered.

- c) cannot endanger humans, working animals or property in any way by the foreseen overloads.

Equipment and areas which do **not** fall within the Directive.

- Electrical equipment for use in explosive atmospheres
- Electrical-radiological and electrical medical equipment
- Electrical components of passenger and goods lifts
- Electricity meters, household plug-in fixtures, radio interference suppression devices
- Installation for supplying power to electrified pasture fencing
- Specified electrical equipment intended for use on ships, in aircraft or railways and which comply with the safety regulations of member states for international installations.

Electrical equipment within the context of the Low Voltage Directive is electrical equipment for applications with a rated voltage between 50 and 1000 V alternating current and between 75 and 1500 V direct current.

For a more **exact** interpretation of the Directive, cables and wires are covered by the regulation, **not** however cables with a rated voltage exceeding 1000 V alternating current or 1500 V direct current.

HELUKABEL as manufacturer and supplier must act in accordance with the Low Voltage Directive, that is to say:

Cables and wires up to 1000 V nominal voltage **must** be identified by the CE marking, refer to page X 111.

The identification can be attached either to the product or on the label.

European Directives WEEE, RoHS and ElektroG

The European Union has approved directives with a view to protecting man and environment. The member states have made these directives into national law.

Directives and Laws

WEEE

Waste Electrical and Electronic Equipment Directive 2002/96/EC of the European Parliament and the Council on used electrical and electronic devices dated January 27, 2003

Aim:

- To attain a consistent level of health and environmental protection throughout the member states.
- To harmonise the responsibility held by the manufacturers.
- To attain equivalent participation by the traders.

The member states are to employ suitable measures for ensuring that used electrical and electronic devices are treated in such a way as to prevent their entry into the waste stream. They are to set out regulations for the dismantling, reuse and recycling of these devices.

RoHS

Restriction of Hazardous Substances in electric and electronic equipment Directive 2002/95/EC of the European Parliament and the Council on restriction of use of certain hazardous substances in electrical and electronic equipment dated January 27, 2003.

Aim:

- To reconcile the legal regulations of the member states on restriction of use of hazardous substances and electrical and electronic equipment.
- Substance bans and restrictions.

The member states guarantee that from July 1, 2006, use of the following substances in electrical and electronic equipment will be restricted:

Lead, Mercury, Cadmium, Chromium VI
Polybrominated biphenyl (PBB)
Polybrominated diphenylether (PBDE)

Law on the use, return and environmentally-compatible disposal of electrical and electronic equipment.

ElektroG (Electrical and Electronic Equipment Act) of March 16, 2005.

This Act enforces the EU Directives 2002/96/EC and 2002/95/EC.

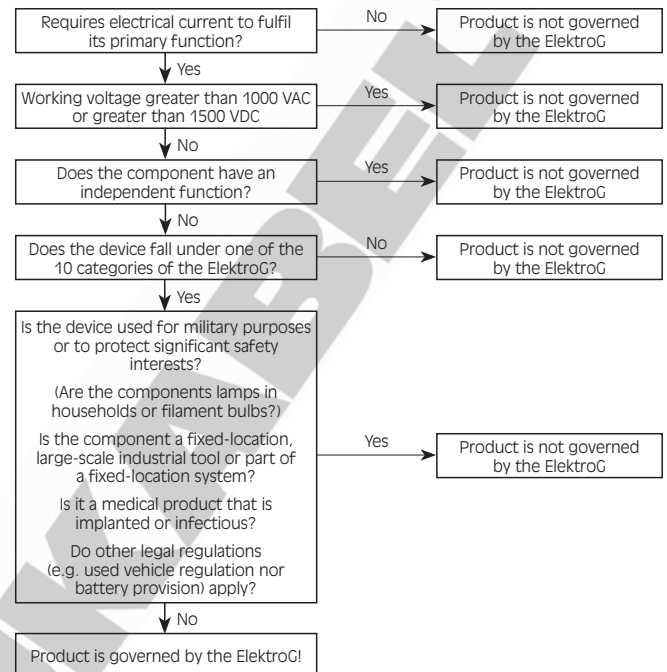
Aims:

- To avoid electrical and electronic equipment waste.
- To reuse and/or recycle the materials from this waste.

Scope:

This Act applies for all electrical and electronic devices that fall under certain categories, insofar as they are not part of another device not covered by the scope of this Act.

Orientation aid



Substance bans

§ 5 from ElektroG (RoHS)

It is forbidden to bring into circulation new electrical and electronic devices containing more than 0.1 percent by weight of lead, mercury, hexavalent chromium, polybrominated biphenyl (PBB) or polybrominated diphenylether (PBDE) for each homogenous material or more than 0.01 percentage by weight of cadmium per homogenous material. Clause 1 does not apply for category 8 and 9 electrical and electronic devices nor for electrical and electronic devices brought into a member state of the European Union for the first time before July 1, 2006. Nor does it apply for spare parts for the repair or reuse of electrical and electronic devices brought into circulation for the first time before July 1, 2006.

Definition

The majority of our products are not governed by the ElektroG (WEEE/RoHS), as they do not have an independent function. As the possibility of our customers using our products in devices that are governed by the ElektroG, and as such are declarable, cannot be ruled out, we have decided to mark in this catalogue the products that either comply with the limit values indicated in accordance with ElektroG (WEEE/RoHS) § 5 and/or do not infringe provisions of the ElektroG (WEEE/RoHS).

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
2YSLCY-J (TOPFLEX-EMV)	D 21 - D 22	Breakout-Cable (LWL)	R 7, R 41 - R 44
2YSLCYK-J (TOPFLEX-EMV-UV)	D 23 - D 24	British Standard	N 154 - N 157
400 Hz	T 49 - T 50	BUS Cables DESINA-HYBRID-BUS	R 114
A		BUS Cables Multibus-Cable	R 145 - R 146
A07 RN-F	F 8	BUS Cables A-BUS EPDM	R 147
A-2Y(L)2Y	P 4	BUS Cables AS-Interface	R 151
A-2YF(L)2Y	P 5	BUS Cables Belden DeviceNet™ CPE	R 155
A-DF(ZN) 2Y	R 24	BUS Cables CAN Bus	R 132 - R 141
A-DF(ZN)2Y4Y	R 26	BUS Cables CC-Link BUS	R 157
A-DF(ZN)B2Y	R 25	BUS Cables DeviceNet™	R 153 - R 154, R 156
A-DQ(ZN)2Y	R 17 - R 18	BUS Cables E-BUS	R 160 - R 162
A-DQ(ZN)B2Y	R 19	BUS Cables FOUNDATION	R 122 - R 125
A-DQ(ZN)B2Y, fibrecombi MM+SM	R 23	BUS Cables HMCB	R 126 - R 129
A-DSF(L)(ZN)2Y	R 32	BUS Cables I-Bus	R 142 - R 144
Aerial Fibre Optic Cable (LWL)	R 33	BUS Cables KH-BUS	R 163
Aircraft lifter-T	T 13	BUS Cables LON BUS	R 159
AIRPORT 400 Hz	T 49 - T 50	BUS Cables Profibus ET200X + ECOFAST	R 112
A-LiY(StE)YÖ	Q 20	BUS Cables Profibus L2	R 107 - R 111, R 115
ASI-Bus	R 147 - R 150	BUS Cables Profibus PA	R 116 - R 118
Audio-Cable, analogue	S 4 - S 8	BUS Cables Profibus SHIPLINE	R 113
Audio-Cable, digital	S 9 - S 12	BUS Cables Profibus SK	R 119 - R 121
B		BUS Cables SafetyBUS	R 158
BAM	Q 19 - Q 20	BUS Cables SENSOR-AKTOR	R 152
BAULIFTKABEL B101 / B102 / B103	T 14	BUS Cables USB	R 130 - R131
Bell Sheathed Cables	O 4	BUS Cables WK CAN Bus 105	R 134
BIOFLEX-500® -JZ	A 84	C	
BIOFLEX-500® -JZ-C	A 85 - A 86	C.N.O.M.O	N 16
BIOFLEX-500®-JZ-HF	C 26	Cables CAN	R 132 - R 141
BIOFLEX-500®-JZ-HF-C	C 27 - C 28	Cables for AS-INTERFACE	R 151
Bio-oil-resistant	A 84 - A 86 C 26 - C 27	Cables for Bussystems	R 89 - R 163
Blue outer jacket	A 49 - A 50, A 58 - A 59, A 80 - A 82, B 26, B 28 - B 29, B 31 - B 32	Cables for EIB	R 160 - R 162
Breakout-Cable (LWL)	R 9, R 12 - R 33, R 45	Cables for INTERBUS	R 142 - R 144
		Cables for PROFIBUS	R 107 - R 121

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
CAN (Controller Area Network)	R 132 - R 141	DeviceNet™ PUR	R 156
CAN-Bus 0,22 mm ²	R 132	DeviceNet™ PVC	R 153
CAN-Bus 0,25 mm ²	R 140	DMX + Power	S 17
CAN-Bus 0,34 mm ²	R 135	DMX Cable	S 13 - S 17
CAN-Bus 0,50 mm ²	R 137	Drag chain Cables	C 5 - C 35, D 9, D 11, D 15, D 17, N 82 - N 106, T 46 - T 47
CAT.5 100 MHz	R 54 - R 64, R 91 - R 97	DREINORM	N 111 - N 112
CAT.6 250 MHz	R 66 - R 67	Drinking water	I 4 - I 5
CAT.7 600 MHz	R 71 - R 76, R 89	E	
CATV-Cables	M 8	E 30	Q 31 - Q 38
CCC	prefix page 18	E 90	Q 39 - Q 46
CC-Link-Bus	R 157	Earth Conductors	Q 6 - Q 22
CEE-Extensions	U 62	Earth Conductors ESUY and ESY	K 33
CEI 20-22	N 15	EDV-PiMF-CY	B 25
Cheapernet	R 85	EIB-Bus	R 160 - R 161
Clean Room Qualified Cable	prefix page 19	EIB-Bus 4-pairs PVC	R 161
COAXIAL-Cable	M 4 - M 12, S 27	ETHERNET LAN-Cable	R 54 - R 85
COAXIAL-Cable RG	M 4 - M 7	EWKF	E 9, E 19
COAXIAL-Cable RGB transmission cables	M 12	Extensions / Supply Cables	U 59, U 62
COAXIAL-Cable SAT	M 9	F	
Command Cable UL (LiYCY)	N 69 - N 71	F-C-PURö-JZ	A 54 - A 55
Command Cable UL (LiYCY-TP)	N 72 - N 73	F-CY-JZ	A 27 - A 28
Command Cable UL (LiYY)	N 65 - N 66	F-CY-OZ (LiY-CY)	A 25 - A 26
Command Cable UL (LiYY-TP))	N 67 - N 69	Feedback Cable	D 13 - D 16, N 135 - N 136
Compensating Cables	L 2 - L 12	FEP 6Y (HELUFLO [®])	E 11 - E 12
Compensating Cables for thermo elements	L 6 - L 12	Fibre Optic Cables (LWL)	R 6 - R 47
Computer Cable	B 28 - B 29	Fire warning Cable	P 8
CSA, see selection table	prefix page 28	Fire warning Cable halogen-free	P 11, Q 29 - Q 30, T 35
D		FIVENORM	N 113 - N 114
DATAFLAMM [®]	B 8	Flat Cables	J 4 - J 10
DATAFLAMM [®] -C	B 23	FLRY (Vehicle Cable)	K 44
DATAFLAMM [®] -C-PAAR	B 24	FLY (Vehicle Cable)	K 41 - K 43
DATAPUR [®] -C	B 22	FMGCC (Ships Telephone Cables)	W 7
DESINA, see selection table	prefix page 21	FMGCH (Ships Telephone Cables)	W 7
DeviceNet™ Belden	R 155		
DeviceNet™ FRNC	R 154		

Glossary of Therms: Cables and Wires

Types	Page
FOUNDATION™ Fieldbus FF Type A	R 123 - R 125
Frequency converters	D 17 - D 24
Front connecting Cables for Simatic® S7	U 63
FROR CEI 20-22 II	N 15
Functionality E30/E90	Q 31 - Q 46
FZ-LSi / FZ-LS / Neon Light Cables	K 26
G	
GALVANICABLE®	T 11
GOST	prefix page 28
H	
H01N2-D/-E	K 34
H03VV-F	A 18
H05 BQ-F / H07 BQ-F (NGMH11YÖ)	A 48
H05 RR-F / H05 RN-F	F 5
H05 V2-K	K 19
H05 V-K	K 6 - K 7
H05 V-K / (H)07 V-K**	K 12
H05 V-K, H07 V-K	K 13
H05 V-U / (H)05 V-U / (H)07 V-U	K 10
H05G-U / -K/ H07G-U / -R / -K	K 18
H05SS-F / H05SST-F	E 10
H05VV5-F (NYSLYÖ-JZ)	A 11 - A 12
H05VVC4V5-K (NYSLYCYÖ-JZ)	A 29 - A 30
H05VV-F	A 19 - A 20
H05VV-F/SJT	N 12 - N 13
H05VV-F/UL	N 14
(H)03 Z1Z1-F	A 69
(H)05 Z1Z1-F	A 70
(H)05VV5-F ((N) YSLYÖ-JZ)	A 13 - A 14
(H)05VVC4V5-K ((N)YSLCYÖ-JZ)	A 31
H05VVH6-F	J 4
H05Z-K / H07Z-K	K 16 - K 17
H07 RN8-F	I 6 - I 7
H07 RN-F	F 6 - F 7
H07 V2-K	K 21
H07 V-K / (H)07 V-K	K 8 - K 9

Types	Page
H07 V-R	K 11
H07ZZ-F	F 12 - F 13
halogen-free	prefix page 27
Heavy duty Cable	S 28
Heavy duty rubber Cable	F 14
HELUCOM® pact LWL-outside Cable A-DQ(ZN)B2Y, central	R 19
HELUCOM® pact LWL-universal Cable A/IDQ(ZN)BH	R 11
HELUCOM® pact LWL-universal Cable A/IDQ(ZN)BH OM3	R 12
HELUFロン® -FEP-6Y	E 11 - E 12, K 27
HELUFロン® -PTEF-5Y	K 28
HELUKABEL BS 5308-1	N 154
HELUKABEL BS 5308-2	N 155
HELUKABEL BS 5467	N 156
HELUKABEL BS 6724	N 157
HELUKAT® 100 FTP flex	R 59
HELUKAT® 100 UTP flex	R 57
HELUKAT® 1200 S-STP duplex massive	R 80
HELUKAT® 1200 S-STP massive	R 79
HELUKAT® 155 FTP massive	R 58
HELUKAT® 155 UTP massive	R 54
HELUKAT® 200 S-FTP duplex massive	R 63
HELUKAT® 200 S-FTP flex	R 64
HELUKAT® 200 S-FTP massive	R 62
HELUKAT® 450 S-STP duplex massive	R 67
HELUKAT® 450 S-STP massive	R 66
HELUKAT® 600 S-STP duplex massive	R 72
HELUKAT® 600 S-STP flex	R 73
HELUKAT® 600 S-STP massive	R 71
HELUKAT® 600A S-STP massive out	R 74
HELULIGHT®	S 1 - S 31
HELUSOUND®	S 1 - S 31
HELUSOUND® 500 PUR	S 25
HELUSOUND® 600 FRNC	S 26

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
HELUSPEADER	G 8	Industrial Ethernet 100T S-FTP TORDIERFLEX	R 99
HELUTHERM® 120	E 4	Industrial Ethernet 200IND S-FTP MEGAFLEX	R 94
HELUTHERM® 1200 / 1200-ES	K 32	Industrial Ethernet 200S S-FTP 4-CORE Drag Chain	R 98
HELUTHERM® 125-J/-O	K 20	Industrial Ethernet 200S S-FTP 4-PAIR Drag Chain	R 100
HELUTHERM® 145	K 22 - K 23, N 117 - N 118	Industrial Ethernet 250S S-FTP Drag Chain	R 93
HELUTHERM® 145 MULTI	E 5 - E 6	Industrial Ethernet 600IND S-STP Shipline	R 90
HELUTHERM® 145 MULTI-C	E 14 - E 15	Industrial Ethernet 600IND S-SPT ROBUST	R 89
HELUTHERM® 400	K 29	Industrial Ethernet 600IND S-SPT ROBUST UL	R 91
HELUTHERM® 600 / 600-ES	K 30	Industrial Ethernet PROFinet B SHIPLINE	R 104
HELUTHERM® 800 / 800-ES	K 31	Industrial Ethernet PROFinet C Torsion	R 106
HELUTRAIN 3GKW	K 39	Industrial Ethernet PROFinet type A Cat. 6a	R 92
HELUTRAIN 4GKW	K 40	Industrial Ethernet PROFinet type B + C	R 105
HELUTRUCK® 270	T 52	Industrial Ethernet PROFinet type A, radiation resistant + sheathed	R 102
HELUTRUCK® 271	T 53	Industrial Ethernet PROFinet type A, standard und robust	R 101
HELUTRUCK® 272 / 273	T 54	Industrial Ethernet PROFinet type B hybride	R 103
HELUWIND® Thermflex 145	T 39	Industrial Ethernet WK 105	R 95
HELUWIND® WK fire warning Cable Torsion	T 35	Industrial electronic	B 31 - B 33
HELUWIND® WK 101 H	T 34	Industrial Cable (LWL)	R 39 - R 45
HELUWIND® WK 103k EMV D-T	T 28	Installation Cable halogen-free	P 10 - P 11, O 7 - O 9
HELUWIND® WK 103w EMV D-T	T 27	Installation Cable J-2Y(ST)Y...ST III BD	P 12
HELUWIND® WK 135-Torsion	T 29	Installation Cable/fire warning Cable halogen-free	P 10 - P 11, Q 29 - Q 30, T 35
HELUWIND® WK 137-Torsion	T 30	Installation manual	prefix page 36
HELUWIND® WK 300w-Torsion	T 31	Instrument Cable	S 18, N 156 - N 157
HELUWIND® WK 305-Torsion	T 32	Instrumentation Cable	B 26 - B 27, B 34
HELUWIND® WK DLO 2KV	T 37	Insulation integrity FE180	Q 28 - Q 46
HELUWIND® WK H07BN4N4-F WIND-Torison	T 33		
HELUWIND® WK Powerline ALU	T 38		
HELUWIND® WK-NTSCGEWOEU-Torsion	T 36		
High voltage igniton Cables	K 26		
I			
IBM Typ 1A	R 83		
Industrial Ethernet 100S S-FTP 4-CORE Drag Chain ECO	R 96		
Industrial Ethernet 100S S-FTP 4-PAIR Drag Chain ECO	R 97		

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
INTERBUS	R 142 - R 144	JZ-600 HMH	A 66 - A 67
Interbus drag chain	R 144	JZ-600 HMH-C	A 75 - A 76
Interbus fixed installation	R 142 - R 144	JZ-600 PUR	N 49 - N 50
Intrinsically safe circuits, data Cables	B 26, B 28 - B 29, B 31 - B 32	JZ-600 UL/CSA	N 10 - N 11
Intrinsically safe circuits, flexible Cables	A 49 - A 50 A 58 - A 59 A 80 - A 82	JZ-600-YC-PUR	N 52 - N 53
J		JZ-600-Y-CY	A 36 - A 37
J-2Y(St)H	P 12	JZ-600-Y-CY UL/CSA	N 20 - N 21
J-2Y(St)Y	B 30	JZ-602	N 7 - N 8
JB-500	A 21	JZ-602 RC*	N 3
JB-750	A 22	JZ-602 RC* -C-PUR	N 91
JB-750 HMH	A 68	JZ-602 RC* -CY	N 85
JB-750 HMH-C	A 77 - A 78	JZ-602 RC* -PUR	N 86
JB-750 yellow	A 23	JZ-602-C-PUR	N 51
JE-H(St)H	Q 28 - Q 29	JZ-602-CY	N 17 - N 18
JE-H(St)HRH	Q 30	JZ-602-PUR	N 46 - N 47
JE-LiHCH	B 33	JZ-602-PUR DC/AC	N 48
JE-LiYCY	B 32	JZ-603	N 9
JE-Y(St)Y	B 31	JZ-603-CY	N 19
J-H(St)H	P 10 - P 11	JZ-HF	C 5 - C 6
Jumper wire	O 4	JZ-HF-CY	C 8 - C 9
J-Y(St)Y Lg	P 7 - P 8	K	
J-YY Bd	P 6	KH-Bus	R 163
JZ 500-FC-PUR	A 52 - A 53	KOMPOFLEX® JZ-500	A 87
JZ 604 TC TRAY Cable	N 25 - N 26	KOMPOFLEX® JZ-500-C	A 88
JZ 604-FCY TC TRAY Cable	N 33	KOMPOSPEED® 600 / 600-C	K 37
JZ 604-YCY TC TRAY Cable	N 34	KOMPOSPEED® JZ-HF-500	C 29
JZ-500	A 6 - A 7	KOMPOSPEED® JZ-HF-500-C	C 30
JZ-500 black	A 9	L	
JZ-500 C black	A 24	LAN-Cable for „structured cabling“	R 54 - R 85
JZ-500 COLD	A 8	LAN-Cable 100 UPT flex	R 57
JZ-500 HMH	A 62 - A 63	LAN-Cable 1000 S-STP	R 77
JZ-500 HMH-C	A 71 - A 72	LAN-Cable 1000 S-STP duplex	R 78
JZ-500 orange	A 10	LAN-Cable 1200 S-STP	R 79
JZ-500 PUR	A 43	LAN-Cable 1200 S-STP duplex	R 80
JZ-600	A 16 - A 17	LAN-Cable 155 FTP	R 58
		LAN-Cable 155 UPT	R 54
		LAN-Cable 155 UPT UL	R 55

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
LAN-Cable 200 FTP flex UL	R 61	Light Marine Telecommunication Cables LFMGSSGO	W 10
LAN-Cable 200 S-FPT flex	R 64	Light Marine Telecommunication Cables XLFMKK	W 5
LAN-Cable 200 S-FTP	R 62	Light Marine Telecommunication Cables LFMMSGSSGO	W 11
LAN-Cable 200 S-FTP duplex	R 63	LiY	K 4
LAN-Cable 300 UPT UL	R 56	LiYCY (F-CY-OZ)	A 25 - A 26
LAN-Cable 300 U-SPT UL	R 65	LiYCY (TRONIC-CY)	B 9 - B 10
LAN-Cable 450 S-STP	R 66	LiYCY (UL)	N 69 - N 71
LAN-Cable 450 S-STP duplex	R 67	LiYCY-CY (PAAR-TRONIC-CY-CY)	B 14 - B 15
LAN-Cable 500 S-STP duplex	R 69	LiYCY-TP (UL)	N 72 - N 73
LAN-Cable 500 S-STP flex	R 70	LiY-TPC-Y	B 21
LAN-Cable 500 S-STP simplex	R 68	LiYW / H05 V2-K	K 19
LAN-Cable 600 S-STP	R 71	LiYY (TRONIC)	B 4 - B 5
LAN-Cable 600 S-STP duplex	R 72	LiYY (UL)	N 65 - N 66
LAN-Cable 600 S-STP flex	R 73	LiYY-TP (UL)	N 67 - N 68
LAN-Cable ETHERNET Cheapernet Cable, Yellow Cable, Transceiver Cable	R 85	LMGSSGO (Marine Power Cables)	W 6
LAN-Cable for outdoor use 600A S-STP PVC/PVC	R 74	Loudspeaker Cables	S 22 - S 27
LAN-Cable for outdoor use 600AE S-STP FRNC/PE	R 76	Loudspeaker Cables HELUSOUND® 400	S 23
LAN-Cable for outdoor use 600E S-STP PVC	R 75	Loudspeaker Cables round	S 24
LAN-Cable IVS IBM P/N 33G2772, IBM P/N 33G8224, IBM P/N 33G2775	R 84	Low torsion	C 7, C 10, C 16, C 21 - C 24, N 82, N 84, N 89 - N 90, N 94 - N 99
LAN-Cable TWINAX IBM P/N 7 362 211	R 83	LWL-Aerial Fibre Optic Cable metall free, ADSS	R 33
LAN-Cable 100 FE 60 F-FTP	R 60	LWL-Cable outdoor, A-DQ(ZN)B2Y, fibre combi, stranded	R 23
LAN-Cable 100 FTP flex	R 59	LWL-Cable outdoor, A-DQ(ZN)SR2Y	R 29
LAN-Cable for ETHERNET-systems	R 54 - R 85	LWL-Cable outdoor, A-DSQ(ZN)B2Y	R 31
LAN-Cable for IBM-systems	R 83 - R 84	LWL-Cable	R 6 - R 47
LAN type 1A	R 84	LWL-Cable bundle core, I-D(ZN)H	R 9
LAN type Twinax	R 83	LWL-Cable outdoor, divisible AT-V(ZN)HH(BN)2Y	R 38
Li-2YCYv	B 16	LWL-Fibre Optic Breakout Cable flexible HCS AT-V(ZN)HH	R 43
LIFT- 2S	F 11	LWL-Fibre Optic Breakout Cable robust HCS AT-VQH(ZN)B2Y	R 42
Lift hoist control Cable	F 10 - F 11, T 14	LWL-Fibre Optic Breakout Cable robust HCS A/IDQ(ZN)BH, flexible	R 44
LIFT-TRAGO-30 / -60	F 10		
LifY Single Core	K 14		
LifYCY	B 18		
Light + Power	S 16		

Glossary of Therms: Cables and Wires

Types	Page
LWL-Fibre Optic Breakout Cable robust, R 44 flexible, HCS I-V(ZN)YY	
LWL-Fibre Optic Breakout Cable robust, R 41 flexible, HCS I-V(ZN)Y11Y	
LWL-Fibre Optic Breakout-Cable I-V(ZN)HH	R 7
LWL-Fibre Optic Cable mobile, flexible A-V(ZN)YY	R 35
LWL-Fibre Optic Cable flexible WK - mobile A-V(ZN)11Y	R 34
LWL-Fibre Optic Cable flexible AT-V(ZN)H(ZN)11Y, AT-V(ZN)Y(ZN)Y	R 36
LWL-Fibre Optic Cable flexible AT-V(ZN)YY	R 37
LWL-Fibre Optic Cable flexible HCS I-VH, I-VHH	R 40
LWL-Fibre Optic Cable Industry	R 40 - R 45
LWL-Fibre Optic Cable robust AT-VYY	R 39
LWL-Fibre Optic Cable with AI-D(ZN)BH(SR)H E90	R 16
LWL-Fibre Optic Cable with Functionality, A-DQ(ZN)BH E30	R 15
LWL-Fibre Optic Indoor Cable	R 9
LWL-Fibre Optic Indoor Cable I-VH, I-V11Y, I-VHH, I-V11Y11Y	R 6
LWL-Fibre Optic Indoor/Outdoor Cable A/I-VQ(ZN)BH	R 10
LWL-Fibre Optic Indoor/Outdoor Cable A/IDQ(ZN)BH, stranded	R 14
LWL-Fibre Optic Indoor/Outdoor Cable A/IDQ(ZN)B, central	R 13
LWL-Fibre Optic Minibreakout Cable I-V(ZN)H	R 8
LWL-Fibre Optic Outdoor Cable	R 17 - R 32
LWL-Fibre Optic Outdoor Cable A-DQ(ZN)2Y, central	R 17
LWL-Fibre Optic Outdoor Cable A-DQ(ZN)B2Y, central	R 20
LWL-Fibre Optic Outdoor Cable Microduct, A-DQ2Y, central	R 27
LWL-Fibre Optic Outdoor Cable A-DF(ZN)2Y	R 24
LWL-Fibre Optic Outdoor Cable A-DF(ZN)2Y(SR)2Y	R 30

Types	Page
LWL-Fibre Optic Outdoor Cable A-DF(ZN)2Y4Y	R 26
LWL-Fibre Optic Outdoor Cable A-DF(ZN)B2Y	R 25
LWL-Fibre Optic Outdoor Cable acc DIN VDE 0888	R 22
LWL-Fibre Optic Outdoor Cable A-DQ(ZN)2Y, stranded	R 18
LWL-Fibre Optic Outdoor Cable A-DQ(ZN)B2Y, stranded	R 21
LWL-Fibre Optic Outdoor Cable Microduct, A-DQ2Y, stranded	R 28
LWL-Fibre Optic Outdoor Cable Hybrid A-DSF(L)(ZN)2Y	R 32
M	
Marine Cables	W 4 - W 6, W 8 - W 11
Marine Power Cables LMGSGO	W 6
Marine Power Cables MGSGO	W 4
Marine Telecommunication Cables FMGSGO	W 8
Marine Telecommunication Cables FMSGSGO 250 V	W 9
Marine Telecommunication	W 8 - W 11
MAXI-TERMI-POINT	B 17, B 26 - B 27
MCHÖU (NEO-flat-C)	J 7
Medium voltage power Cables	Q 47 - Q 62
MEGAFLEX® 500	A 64 - A 65, N 54 - N 55
MEGAFLEX® 500-C	A 73 - A 74, N 56 - N 57
MEGAFLEX® 600	N 58 - N 59
MEGAFLEX® 600-C	N 60 - N 61
MGSGO (Marine Power Cables)	W 4
Microphone Cable	S 19 - S 21
Minibreakout-Cable (LWL)	R 8, R 10
Mobile Cable (LWL)	R 34 - R 35
MPRX (Ships Power Cables)	W 14
MPRXCX (Ships Power Cables)	W 15
MULTIFLEX 512®-C-PUR	C 19 - C 20
MULTIFLEX 512®-C-PUR UL/CSA	N 92 - N 93
MULTIFLEX 512®-PUR	C 14 - C 15

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
MULTIFLEX 512®-PUR UL/CSA	N 87 - N 88	N2XS(F)2Y 6/10kV, 12/20kV, 18/30kV	Q 58 - Q 59
MULTIFLEX® 600	N 62	N2XS2Y 6/10kV, 12/20kV, 18/30kV	Q 54 - Q 55
MULTIFLEX® 600-C	N 63	N2XSEY 3 x ... 6/10kV	Q 62
Multimedia-Coaxial-Cable	M 10	N2XSY 6/10kV, 12/20kV, 18/30kV	Q 50 - Q 51
Multimedia-Kabel 1500 S-STP	R 81	N2XY	Q 8
Multimedia-Kabel 1500 S-STP duplex	R 82	NA2XS(F)2Y 6/10kV, 12/20kV, 18/30kV	Q 60 - Q 61
MULTISPEED® 500-C-PUR	C 21	NA2XS2Y 6/10kV, 12/20kV, 18/30kV	Q 56 - Q 57
MULTISPEED® 500-C-PUR UL/CSA	N 94 - N 95	NA2XSY 6/10kV, 12/20kV, 18/30kV	Q 52 - Q 53
MULTISPEED® 500-C-PVC	C 10	NA2XY	Q 11
MULTISPEED® 500-C-PVC UL/CSA	N 84	NANOFLEX® HC 500	A 91
MULTISPEED® 500-C-TPE	C 24	NANOFLEX® HC 500-C	A 92
MULTISPEED® 500-C-TPE UL/CSA	N 98 - N 99	NANOFLEX® HC TRONIC	A 93
MULTISPEED® 500-PUR	C 16	NANOFLEX® HC TRONIC-C	A 95 - A 96
MULTISPEED® 500-PUR UL/CSA	N 89 - N 90	NAYCWY	Q 18
MULTISPEED® 500-PVC	C 7	NAYY-J	Q 9 - Q 10
MULTISPEED® 500-PVC UL/CSA	N 82	NEO-flat	J 5
MULTISPEED® 500-TPE	C 22 - C 23	NEO-flat-C	J 7
MULTISPEED® 500-TPE UL/CSA	N 96 - N 97	Neon Light Cables	K 26
MULTISPEED® 600-C-PUR -J/-O	N 125	NEOPREN Command Cable	F 9
MULTISPEED® 600-PUR -J/-O	N 124	NFPA 79	N 25 ff
MULTISPEED® TRONIC-C-PUR	N 106	NGFLGÖU (NEO-flat)	J 5
MULTISPEED® TRONIC-PUR	N 105	NHMH-J	O 8
MULTITHERM® 400 -ES	E 20	NHMH-O	O 7
MULTITHERM® 400	E 13	NHXCH-FE 180/E 30	Q 37 - Q 38
N		NHXCH-FE 180/E 90	Q 45 - Q 46
(N)SHTÖU-V	G 7	NHXH-FE 180/E 30	Q 35 - Q 36
(N)TSCGEWöu	G 9	NHXH-FE 180/E 90	Q 43 - Q 44
(N)YM(St)-J PVC-Sheathed Cable	O 6	NHXHM-O/-J	O 9
(N)YYÖ-J (Petrol Station Cable)	Q 20	NSGAFÖU 3kV	K 35
N07RN-F/SOOW	N 80	NSHTÖU	G 6
N2HX	Q 24 - Q 25	NSHXAFÖ 3kV	K 36
N2XCH	Q 26 - Q 27	NSSHÖU	F 14
N2XCH-FE 180/E 30	Q 33 - Q 34	NYCWY	Q 16 - Q 17
N2XCH-FE 180/E 90	Q 41 - Q 42	NYCY	Q 12 - Q 13
N2XCY	Q 14 - Q 15	NYKY-J 0,6/1kV	Q 21 - Q 22
N2XH-FE 180/E 30	Q 31 - Q 32	NYM-J/-O PVC-Sheathed Cable	O 5
N2XH-FE 180/E 90	Q 39 - Q 40	NYY-J und NYY-O	Q 6 - Q 7

Glossary of Therms: Cables and Wires

Types	Page
O	
OB-BL-PAAR-CY	A 82
OZ-BL	A 80
OZ-BL-CY	A 81
P	
PAAR-CY-OZ	B 13
PAAR-TRONIC	B 6 - B 7
PAAR-TRONIC-CY	B 11 - B 12
PAAR-TRONIC-CY-CY (LiYCY-CY)	B 14 - B 15
PAAR-TRONIC-Li-2YCY / -Li-2YCYV	B 16
Patch Cable: preassembled	Catalogue DNB
Petrol Station Cable	Q 20
Petrol-resistant	Q 19 - Q 22
PiMF	B 25, B 29
Pitch	J 9 - J 10
Plastic-fibre Cable industry	R 46 - R 47
Power Cables	N 25 - N 26 N 33 - N 34 N 156 - N 157 Q 24 - Q 27
Pre-assembled Cables	chapter U
Profibus ET200X	R 112
Profibus Hybrid	R 103
Profibus L2	R 107 - R 111
Profibus PA	R 116 - R 118
Profibus SK	R 119 - R 121
PTFE 5Y (HELUFLOX)	K 28
PUR-750	A 51
PUR-connecting Cables orange	U 61
PUR-C-PUR	A 60
PUR-electronic spiral Cables	V 9 - V 10
PUR-electronic spiral Cables screened	V 11 - V 12
PURö-JZ	A 44 - A 45
PURö-JZ-HF	C 12 - C 13
PURö-JZ-HF-YCP	C 17 - C 18
PUR-ORANGE	A 46
PUR-Single Core	K 15
PUR-spiral Cables black	V 5 - V 6

Types	Page
PUR-spiral Cables orange	V 7 - V 8
PUR-YELLOW	A 47
PVC-Connecting Cables	U 58
PVC-flat (H05 VVH6-F/H07 VVH6-F)	J 4
PVC-flat-CY	J 6
PVC-Single Core	K 6 - K 11, K 19, K 21, N 116
PVC-Spiral Cable	V 4
Q	
Questionnaire	prefix page 37
R	
RD-H(St)H	B 34
RD-Y(St)Y	B 26
RD-Y(St)Yv / RD-Y(St)YY	B 27
RE-2Y(St)Yv	B 28
RE-2Y(St)Yv PiMF	B 29
Reg.-No.	A 6 - A 10, A 13, A 25 - A 28, A 31 - A 35, A 38 - A 41, A 80 - A 81, C 5 - C 6, C 8 - C 9
Resistant to microbial attack	A 48 - A 49, A 51, A 58 - A 59, A 84 - A 89, C 29 - C 30
RGB-KOAX-CY / RGB-KOAX-(St) Y	M 12
RG-Coaxial Cables halogen-free	M 7
RG-Coaxial-Cable	M 4 - M 6
Ribbon Cables	J 8
ROBOFLEX 150, 151, 152, 153	H 7 - H 8
ROBOFLEX 156-flat	H 9
ROBOFLEX 2001 / 2001-C	H 6
ROBOFLEX recycle	H 4 - H 5
ROBOFLEX robot Cable	H 10
ROBOFLEX-recycle	U 41 - U 57
Rubber Cable for use in water	I 4 - I 7
Rubber Cable with strain bearing element	F 9
Rubber connecting Cables	U 59

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
Rubber-/Neoprene Control Cable	N 79	SiHF-C-Si	E 17 - E 18
Rubber-sheathed Cable harmonized type	I 4 - I 5, F 5 - F 7	SiHF-C-Si UL/CSA	N 77
Rubber-sheathed Cable harmonized type	I 6 - I 7, F 5 - F 7	Silicone Cables	E 7 - E 9, E 16 - E 19, N 75 - N 77, N 119
Rubber-sheathed Cable (SO, SJO)	N 79	Silicone single cores	K 24 - K 25, N 119
Rupper insulated single core	K 16 - K 17, K 35	Simatic® S7 front connecting Cable	U 60
Rupper insulated single core halogen-free	K 16 - K 17	Single 600-CY-J/-O	N 121
S		Single 600-J/-O	N 120
SafetyBUS	R 158	Single 602-RC* -CY -J/O	N 123
SAT-Coaxial Cable	M 9 + M 11	Single 602-RC* -J/O	N 122
Sensor-Aktuator-Cable	N 151 - N 152 T 42 - T 47	Single cores, halogen-free	K 15 - K 17, K 22 - K 25, K 30 - K 32, K 37, N 117 - N 119, N 124 - N 125
SENSORFLEX	T 42	Single cores, HELUFLO®-insulated	E 11 - E 12, K 27 - K 28
Sensorflex-H	T 46 - T 47	Single cores, highly fl exible	K 14, T 5 - T 11
Servo-Cables	D 9	Single cores, PUR	K 15, T 9
Sheated Cables	O 5 - O 9	Single cores, PVC	K 4 - K 15, K 19 - K 21, N 108 - N 114, N 116, T 5 - T 6, T 8
SHIPFLEX 109	W 20 - W 21	Single cores, silicone-insulated	N 119, K 24 - K 25
SHIPFLEX 113	W 22	Single cores, temperature-resistant	K 19 - K 32, N 117 - N 119
SHIPFLEX 121	W 23	SJT	N 12 - N 13
SHIPFLEX 330	W 18	SOLARFLEX®-X PV1-F	T 18
SHIPFLEX 340	W 19	SOLARFLEX®-X PV1-F Twin	T 19
SHIPFLEX 512	W 17	Spiral Cable	V 4 - V 5
Ships Power Cables MPRX 0,6/1kV	W 14	Steel wire braiding	A 34 - A 35, A 40 - A 41
Ships Power Cables MPRXCX 0,6/1kV	W 15	Structured cabling 100 MHz CAT.5 Class D	R 54 - R 58 R 94 - R 100
Ships Telephone Cables FMGCH 250 V (FMGCC*)	W 7	Structured cabling 250 MHz CAT.6 Class E	R 66 - R 67
Ships Wiring Cables-SY single cores	W 12	Structured cabling 600 MHz CAT.7 Class F	R 71 - R 76 R 81
Ships Wiring Cables-SY stranded type	W 13	SUPER-PAAR-TRONIC 340-C-PUR	N 104
Short-circuit-proof installation	K 35 - K 36	SUPER-PAAR-TRONIC-C-PUR	C 35
SID	K 25	SUPERTRONIC 330 C-PURö	N 103
SiF / SiFF	K 24		
SiF/GL, SiD, SiD/GL	K 25		
SiHF	E 7 - E 8		
SiHF UL/CSA	N 75 - N 76		
SiHF/GL-P	E 16		

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
SUPERTRONIC-310-C-PVC	N 101	TOPFLEX® 302 / 302-UL	T 8
SUPERTRONIC-310-PVC	N 100	TOPFLEX® 303 X07V-K-Yö	T 5
SUPERTRONIC-330 PURö	N 102	TOPFLEX® 304 / 304-C	T 10
SUPERTRONIC-C-PURö	C 34	TOPFLEX® 304 / 304-C	T 10
SUPERTRONIC-C-PVC	C 32	TOPFLEX® 600 VFD	N 137
SUPERTRONIC-PURö	C 33	TOPFLEX® 600-PVC, 600-C-PVC	D 4 + D 6
SUPERTRONIC-PVC	C 31	TOPFLEX® 611 PUR / C-PUR	D 5 + D 7
SY-JB	A 40 - A 41	TOPFLEX® 611-C-PUR	D 7
SY-JZ	A 34 - A 35	TOPFLEX® 650 VFD	N 138
S-YY Lg	P 9	TOPFLEX® MOTOR 103	N 150
T		TOPFLEX® MOTOR 109	D 25 - D 26
Tachofeedback-Cable-C-PUR	D 11	TOPFLEX® MOTOR EMV 1/1	N 147
Tachofeedback-Cable-C-PVC	D 10	TOPFLEX® MOTOR EMV 3/3	N 148 - N 149
Tauchflex-FL	I 5	TOPFLEX®-PUR	D 14 + D 16
Tauchflex-R	I 4	TOPFLEX®-PVC	D 13 + D 15
Telephone indoor Cable	P 6 - P 7	TOPGEBER® 511 PVC	N 130
Telephone outdoor Cable	P 4 - P 5	TOPGEBER® 512 PUR	N 135 - N 136
Temperature up to +105°C	E 4, K 19, N 66, N 71, N 108 - N 109, N 113 - N 114	TOPSERV® 510	N 136 - N 137
Temperature up to +400°C	Chapter E	TOPSERV® 600 VFD	N 139
TERMI-POINT-technic	B 16, B 25 - B 26	TOPSERV® 650 VFD	N 140
THERMFLEX 145	T 39	TOPSERV® 108 PVC	N 127
THERMFLEX 180 EWKF	E 9	TOPSERV® 109 PUR	N 131
THERMFLEX 180 EWKF-C	E 19	TOPSERV® 110 / 120 Feedback-Cable	D 9
THHN/THWN	N 115	TOPSERV® 112 PVC	N 128
TOPFLEX® - EMV UV 2YSLC11Y-J	N 145 - N 146	TOPSERV® 113 PUR	N 132 - N 133
TOPFLEX® - EMV-2YSLCYK-J	D 17 - D 18	TOPSERV® 119 PVC	N 129
TOPFLEX® - EMV-3 PLUS 2YSLCY-J	D 21 - D 22	TOPSERV® 121	N 135
TOPFLEX® - EMV-UV-2YSLCYK-J	D 19 + N 141	TOPSERV® 121 PUR	N 134
TOPFLEX® - EMV-UV-3 PLUS 2YSLCYK-J	D 23 + N 143	TOPSERV® 130	D 8
TOPFLEX® 1002	T 7	TRAGO / Lift-2S	F 11
TOPFLEX® 240-PVC / 240-PUR	D 12	Trailing Cables	T 13 - T 14
TOPFLEX® 240-PVC / 240-PUR	D 12	TRAY-Cable	N 33 - N 34
TOPFLEX® 300	T 6	TRAYCONTROL 300	N 382 - N 39
TOPFLEX® 301 / 301-C	T 9	TRAYCONTROL 300 TP	N 42 - N 43
TOPFLEX® 301 / 301-C	T 9	TRAYCONTROL 300-C	N 40 - N 41
		TRAYCONTROL 300-C TP	N 44 - N 45
		TRAYCONTROL 500	N 27 - N 28

Glossary of Therms: Cables and Wires

Types	Page	Types	Page
TRAYCONTROL 500-C	N 35 - N 36	UNIPUR-CP	A 58 - A 59
TRAYCONTROL 530	N 29	Use in water	I 4 - I 6
TRAYCONTROL 600	N 30 - N 31	V	
TRAYCONTROL 600-C	N 37	Vehicle Cable FLRY	K 44
TRAYCONTROL 670 HDP / 670-C HDP	N 32	Vehicle Cable FLY	K 41 - K 43
TRIAx Camera Cable	S 31	VERTEILERFLEX	T 45
TROMM-PUR	G 5	VERTEILERFLEX two-approvals	N 151 - N 152, T 43 - T 44
TROMM-PUR-H	G 4	Video	S 29 - S 31
TRONIC (LiYY)	B 4 - B 5	W	
TRONIC 1-CY	B 18	Warning indication	A 23
TRONIC 2-CY	B 19	Welding Cables	K 34
TRONIC-CY (LiY-CY)	B 9 - B 10	Wind Power Cable	T 27 - T 40
Truck Cables	T 52 - T 54	WK (N)A2XH	T 40
TUBEFLEX -(St)-CY	J 10	Y	
TUBEFLEX -Y	J 9	Y-CY-JB	A 38 - A 39
Twin Cables	S 22	Y-CY-JZ	A 32 - A 33
Twinaxial Cable	R 83	YELLOWFLEX	F 4
Two approvals control Cables	N 17 - N 18, N 46 - N 48, N 51, N 83, N 85 - N 88, N 91 - N 93	YELLOWFLEX - Connecting Cables	U 60
U		Yö-C-PURö-JZ	A 56 - A 57
UL (LiYCY)	N 69 - N 71	YV-Equipment Wires/ YR-Bell Sheathed Cables	O 4
UL (LiYCY-TP)	N 72 - N 73		
UL (LiYY)	N 65 - N 66		
UL (LiYY-TP)	N 67 - N 68		
UL/CSA JZ-600	N 10 - N 11		
UL/CSA JZ-600-Y-CY	N 20 - N 21		
UL/H05 VV-F	N 12 - N 13		
UL-CSA-approved	prefix page 28		
UL-Style 1007, CSA TR 65	N 108		
UL-Style 1011	N 115 - N 116		
UL-Style 1015	N 110		
UL-Style 1569, CSA TR 64	N 109		
UL-Style 2464	N 65, N 67 - N 70, N 72 - N 73		
UL-Style 3135	N 119		
UNIPUR®	A 49 - A 50		

Part No. index

From Part No.
10001 – 13360

Part No.	Page	Part No.	Page	Part No.	Page
10001 – 10047	A 6	11700 – 11813	A 72	12680 – 12722	N 91
10048 – 10168	A 7	11815 – 11846	N 10	12723 – 12746	A 66
10169	A 6	11847 – 11876	N 11	12747 – 12804	A 67
10170	A 7	11880 – 11911	N 10	12805 – 12846	N 48
10172 – 10173	A 6	11912 – 11941	N 11	12850 – 12877	A 75
10174 – 10176	A 7	11942 – 11952	A 77	12878 – 12907	A 76
10177	A 6	11953 – 11964	A 78		
10178 – 10182	A 7	11965 – 11987	A 68	13001 – 13024	A 11
10183	A 6			13025 – 13059	A 12
10184 – 10333	A 7	12001 – 12056	A 34	13060 – 13083	A 29
10334 – 10339	A 23	12057 – 12111	A 35	13084 – 13118	A 30
10340 – 10387	A 9	12112 – 12114	A 34	13119 – 13121	A 12
10533 – 10536	A 7	12115 – 12119	A 35	13122 – 13123	A 11
10537 – 10547	A 10	12188	A 34	13124	A 12
10550 – 10615	A 16	12200 – 12310	A 40	13125 – 13126	A 11
10616 – 10746	A 17	12311	A 41	13127 – 13128	A 12
10747 – 10749	A 10	12312 – 12315	A 40	13129 – 13130	A 29
10750 – 10797	A 8	12316 – 12317	A 41	13131 – 13132	A 30
10934 – 10980	A 24	12318 – 12324	A 40	13133 – 13136	A 13
		12325 – 12326	A 41	13137	A 37
11001 – 11112	A 21	12327	A 35	13138	A 13
11121 – 11169	A 22	12328	A 41	13139 – 13140	A 7
11201 – 11220	A 62	12345 – 12371	N 20	13141 – 13146	A 13
11221 – 11331	A 63	12372 – 12405	N 21	13147	A 37
11332 – 11334	A 62	12410 – 12436	N 20	13148 – 13166	A 13
11335 – 11341	A 63	12437 – 12470	N 21	13170 – 13199	A 31
11342 – 11347	A 71	12471 – 12517	N 46	13200 – 13215	N 58
11348 – 11350	A 72	12518 – 12543	N 47	13216 – 13343	N 59
11574 – 11629	A 37	12550 – 12620	N 51	13344 – 13367	A 64
11656 – 11689	A 71	12630 – 12671	N 86	13344 – 13360	N 54

Part No.	Page	Part No.	Page	Part No.	Page
13361 – 13489	N 55	15876 – 15894	C 8	16491 – 16493	A 28
13368 – 13489	A 65	15925 – 15929	C 9	16500 – 16530	B 10
13500 – 13515	A 73	15930 – 15952	C 8	16531 – 16556	A 25
13500 – 13515	N 56	15961 – 15983	C 9	16557 – 16585	A 26
13520 – 13597	A 74	15987 – 16000	B 18		
13520 – 13597	N 57			17001 – 17022	B 12
13920 – 13930	A 11	16001 – 16049	B 10	17023 – 17044	B 13
13931 – 13949	A 12	16050 – 16118	A 26	17047 – 17056	B 12
13951 – 13962	A 29	16119	A 39	17172	A 32
13963 – 13985	A 30	16120	B 10		
		16121 – 16152	A 38	18001 – 18054	B 4
14001 – 14027	A 80	16153 – 16156	A 39	18055 – 18113	B 5
14028 – 14059	A 81	16157 – 16160	A 33	18114 – 18115	B 4
14075 – 14076	A 80	16161	C 12	18116	B 5
14077 – 14099	A 82	16163 – 16164	B 10	18117 – 18118	B 4
14100 – 14102	A 80	16165	A 27	1812_ – 1832_	A 49
		16166	A 28	1833_ – 1876_	A 50
15001 – 15036	C 5	16167 – 16168	A 33		
15037 – 15089	C 6	16169 – 16175	A 32	19001 – 19033	B 6
15090 – 15091	C 5	16176 – 16183	A 33	19034 – 19078	B 7
15092	C 6	16196 – 16239	A 32	19101 – 19141	C 35
15093 – 15141	K 14	16240 – 16318	A 33	1915_ – 1935_	A 58
151xx – 159xx	K 14	16319	A 39	1936_ – 1979_	A 59
15142 – 15150	C 6	16320 – 16343	A 27	19798 – 19809	W 20
15152 – 15163	C 9	16344 – 16452	A 28	19810 – 19821	W 21
15214 – 15216	C 6	16453	A 32	19822 – 19835	W 22
15217 – 15232	N 60	16454 – 16468	A 33	19836 – 19845	W 23
15233 – 15283	N 61	16469 – 16474	A 39	19846 – 19863	W 18
15520 – 15589	C 12	16475 – 16489	B 10	19864 – 19926	W 17
15590 – 15656	C 13	16490	A 27	19927 – 19968	W 19

Part No. index

From Part No.
19969 – 22827

Part No.	Page	Part No.	Page	Part No.	Page
19969	W 21	21323 – 21329	B 21	22343 – 22362	E 10
19970 – 19995	B 12	21330 – 21410	W 20	22364 – 22367	A 60
		21340 – 21373	B 21	22368 – 22374	D 21
20001 – 20028	B 9	21385 – 21387	B 21	22375 – 22382	D 22
20029 – 20090	B 10	21400 – 21447	A 56	22385 – 22388	A 60
20091	B 9	21451 – 21534	A 57	22389 – 22393	N 145
20092 – 20093	B 10	21535 – 21554	B 29	22394 – 22399	N 146
20099 – 20109	B 28	21559 – 21580	N 87	22400 – 22433	C 17
20115 – 20124	B 29	21581 – 21629	N 88	22434 – 22494	C 18
20125 – 20132	B 28	21630 – 21640	N 92	22501 – 22522	C 14
20133 – 20138	B 29	21641 – 21699	N 93	22523 – 22565	C 15
20139	B 9			22566 – 22568	N 146
20140 – 20148	B 26	22001 – 22046	A 46	22571 – 22581	C 19
20149 – 20159	B 28	22050 – 22083	A 48	22582 – 22634	C 20
20160 – 20168	B 27	22084 – 22087	D 17	22637 – 22667	N 77
20169 – 20179	B 28	22088 – 22097	D 18	22673 – 22687	D 24
20180 – 20188	B 27	22100 – 22163	A 44	22689 – 22706	N 150
20189 – 20197	B 26	22164 – 22192	A 45	22707 – 22717	D 25
20200 – 20232	B 34	22193 – 22199	N 144	22718 – 22723	D 26
20233 – 20255	B 28	22200 – 22222	A 47	22724	D 25
2026_ – 2037_	K 27	22223 – 22230	N 144	22800	D 15
		22233	A 47	22801	D 12
21001 – 21010	B 11	22234 – 22239	D 19	22802	D 15
21011 – 21064	B 12	22240 – 22247	D 20	22803	D 15
21065 – 21076	B 14	22250 – 22273	A 46	22806	D 15
21077 – 21110	B 15	22290 – 22309	E 10	22818	D 11
21111 – 21127	B 17	22315 – 22319	A 60	22820	D 13
21129 – 21150	B 16	22320 – 22327	N 141	22823	D 11
21200 – 21251	A 54	22328 – 22333	N 142	22824 – 22825	D 10
21253 – 21322	A 55	22339 – 22342	A 60	22827	D 12

Part No.	Page	Part No.	Page	Part No.	Page
22828 – 22833	A 48	23147 – 23149	K 26	24333 – 24334	N 95
22834	D 14	23150	E 18	24335 – 24367	N 84
22835 – 22843	A 48	23151 – 23168	E 17	24370 – 24386	N 89
22845 – 22846	D 13	23169 – 23198	E 18	24387 – 24406	N 90
22847	D 16	232xx – 248xx	K 24	24410 – 24426	N 94
22848 – 22849	D 14	23214 – 23237	N 75	24427 – 24444	N 95
22850 – 22854	D 16	23238 – 23290	N 76	24450 – 24467	N 96
22854 – 22855	D 4	23291 – 23292	E 17	24468 – 24488	N 97
22856 – 22859	D 6	23293 – 23294	E 18	24567 – 24582	N 105
22860 – 22869	D 4	23314 – 23388	A 43	24614 – 24629	N 106
22870 – 22877	D 5	23414 – 23443	A 52	2490_ – 2499_	K 27
22878 – 22883	C 15	23444 – 23488	A 53		
22884 – 22889	C 20	23914 – 23930	N 98	25001 – 25075	F 9
22890 – 22892	D 12	23931 – 23949	N 99	25080 – 25101	F 11
22940 – 22943	E 7	23953 – 23959	K 24	2511x – 2545x	K 28
22944 – 22949	E 8			25259 – 25268	F 10
22960 – 22967	D 6	24002 – 24042	E 4	25269 – 25281	N 124
22970 – 22977	D 7	24043	C 23	25282 – 25294	N 125
22978	D 5	24044 – 24046	E 4	25439 – 25559	H 6
22979	D 5	24050 – 24085	C 7	2551x – 2561x	K 27
22980 – 22981	D 5	24086 – 24118	C 10	25620 – 25690	A 84
22982 – 22985	D 7	24119 – 24155	C 16	25691 – 25734	A 85
22989 – 23008	E 7	24156 – 24190	C 21	25735 – 25760	A 86
		24191 – 24208	C 22	25761 – 25825	C 26
23009 – 23059	E 8	24209 – 24235	C 23	25826 – 25871	C 27
23062 – 23103	E 16	24236 – 24272	C 24	25872 – 25887	C 28
23104 – 23105	E 7	24273 – 24285	E 11	25888 – 25900	N 124
23106 – 23110	K 26	24291 – 24292	E 4	25901 – 25913	N 125
23127 – 23132	E 7	24295 – 24330	N 82	25914	E 12
23133 – 23146	E 8	24331 – 24332	N 90	25989 – 25990	E 12

Part No. index

From Part No.
26001 – 32429

Part No.	Page	Part No.	Page	Part No.	Page
26001 – 26032	G 6	28034 – 28081	N 12	29800 – 29812	K 41
26035 – 26059	G 5	28100 – 28104	J 7	29813 – 29819	K 9
26060 – 26119	K 9	28145 – 28184	K 10	29825 – 29826	A 19
26125 – 26216	A 87	28185 – 28237	K 11	29840 – 29933	K 9
26217 – 26272	A 88	28240 – 28271	N 49	29942 – 29968	K 19
26273 – 26306	A 89	28272 – 28301	N 50	29970 – 30104	K 21
26307 – 26346	C 29	28302	J 7		
26347 – 26385	C 30	28305 – 28336	N 49	3011_ – 3026_	A 20
26386 – 26391	K 6	28337 – 28366	N 50	3027_ – 3047_	A 70
26392 – 26394	K 7	28370 – 28396	N 52		
26395 – 26402	K 8	28397 – 28423	N 53	31001 – 31039	K 34
26403 – 26404	K 9	28430 – 28456	N 52	31040 – 31096	G 7
26405 – 26500	K 4	28457 – 28483	N 53	3110_ – 3125_	N 13
26505 – 26584	K 5	28484 – 28571	K 44		
26590 – 26637	K 6	28761 – 28824	K 10	32001 – 32015	Q 6
26640 – 26687	K 7	28825 – 28877	K 11	32016 – 32088	Q 7
26690 – 26753	K 8	28900 – 28928	O 4	32089 – 32103	Q 6
26755 – 26936	K 9	28930 – 28947	K 33	32104 – 32176	Q 7
26937 – 26960	K 10			32177 – 32199	Q 9
26980 – 27030	J 4	29081 – 29128	K 6	32200 – 32223	Q 12
		29129 – 29192	K 8	32224 – 32255	Q 13
27031 – 27089	A 91	29193 – 29368	K 9	32256 – 32257	Q 7
27090 – 27104	J 6	29400 – 29417	A 18	32258	Q 9
27105 – 27163	A 92	29418 – 29449	K 9	32260 – 32283	Q 16
27164 – 27196	A 93	29450 – 29493	A 19	32284 – 32292	Q 17
27197 – 27234	A 94	29494 – 29499	K 9	32293 – 32300	Q 7
27235 – 27268	A 95	29500 – 29526	K 19	32301 – 32310	Q 9
27269 – 27321	A 96	29590 – 29599	K 9	32311 – 32399	Q 10
		29600 – 29735	N 116	3233_ – 3238_	A 69
28001 – 28033	J 5	29736 – 29744	A 18	32400 – 32429	Q 50

Part No. index

From Part No.
32430 – 40151

Part No.	Page	Part No.	Page	Part No.	Page
32430 – 32437	Q 51	33240 – 33274	Q 15	37219 – 37258	F 13
32440 – 32467	Q 52	33275 – 33290	Q 10	37259 – 37286	F 4
32468 – 32478	Q 53			37287 – 37332	I 6
32480 – 32509	Q 54	34007 – 34040	P 5	37333 – 37358	I 7
32510 – 32517	Q 55	34050 – 34071	P 10		
32520 – 32547	Q 56	34072 – 34080	Q 30	38001 – 38040	F 14
32548 – 32555	Q 57	34081 – 34089	Q 28	38501 – 38516	K 35
32556 – 32559	Q 6	34090	F 7	38517 – 38532	K 36
32560 – 32583	Q 58	34091 – 34099	Q 29	38533 – 38547	G 9
32584 – 32591	Q 59	34100 – 34115	P 4		
32592 – 32596	Q 20	34116 – 34126	P 11	39001 – 39024	O 5
32597 – 32599	Q 19	34130 – 34147	P 4	39025 – 39039	N 80
32600 – 32622	Q 60	34148 – 34156	Q 28	39040 – 39048	G 9
32623 – 32630	Q 61	34157 – 34165	Q 29	39050 – 39079	O 5
32633 – 32634	Q 19	34166 – 34177	P 12		
32640 – 32652	Q 21	34300 – 34311	P 9	40001 – 40005	M 4
32653 – 32685	Q 22	34339 – 34348	Q 62	40006 – 40010	M 5
32686	Q 21	34349	F 7	40011	M 6
32687 – 32689	Q 22	34350 – 34356	B 33	40012	M 5
3269_ – 3283_	N 14			40013	M 4
32840 – 32849	Q 18	35001 – 36008	F 5	40015 – 40021	M 11
32850 – 32893	Q 8			40022	S 29
		37001 – 37028	F 6	40023 – 40027	S 22
33001 – 33034	P 7	37029 – 37068	F 7	40028	S 29
33035 – 33053	P 8	37069 – 37090	F 8	40056	S 29
33100	P 6	37091 – 37099	F 7	40073	S 29
33101 – 33112	P 6	37100 – 37153	I 4	40085	M 11
33113 – 33156	Q 11	37154	F 7	40135 – 40144	M 8
33200 – 33211	B 30	37155 – 37175	I 5	40145 – 40149	M 12
33212 – 33239	Q 14	37176 – 37218	F 12	40150 – 40151	M 9

Part No. index

From Part No.
40159 – 52808

Part No.	Page	Part No.	Page	Part No.	Page
40159	M 9	48510 – 48518	B 32	51716 – 51728	K 31
40160 – 40167	G 8	48519 – 48528	B 31	51729 – 51740	K 32
40168 – 40169	M 9	48529 – 48537	B 32	51741 – 51767	E 13
40170 – 40175	S 29			51768 – 51848	K 16
40176 – 40178	M 10	49501 – 49520	B 19	51849 – 51902	K 17
40179	M 8	49521 – 49535	B 20	51970 – 51991	O 7
40180 – 40189	S 22	49550 – 49582	C 31	51992 – 52017	O 8
40190 – 40196	M 7	49583 – 49615	C 33		
40197	M 5	49620 – 49652	C 32	52018 – 52057	E 20
40198 – 40203	M 6	49653 – 49685	C 34	52058 – 52067	Q 31
40204 – 40333	K 41	49700 – 49763	A 51	52068 – 52097	Q 32
40334 – 40567	K 42	49764 – 49796	N 102	52098 – 52103	Q 33
40568 – 40801	K 43	49797 – 49829	N 103	52104 – 52134	Q 34
40802 – 40814	K 42	49830 – 49870	N 104	52194 – 52197	E 14
		49885 – 49917	N 100	52198 – 52292	E 15
43050 – 43065	O 6	49918	A 51	52300 – 52361	B 8
43524 – 43564	B 25	49920 – 49952	N 101	52365 – 52382	B 23
				52383	Q 32
44001 – 44058	J 8	50060 – 50072	E 13	52384 – 52429	B 23
		50209	K 29	52430 – 52431	B 8
451xx – 459xx	K 24	50475 – 50486	K 30	52432 – 52434	Q 32
45130 – 45145	J 9	50488 – 50499	K 31	52435 – 52484	B 24
45150 – 45165	J 10	50635 – 50646	K 32	52490 – 52533	B 22
		50650 – 50889	K 15	52534 – 52541	Q 39
461xx – 469xx	K 25	50890 – 50997	K 29	52542 – 52612	Q 40
		50998 – 51391	K 22	52614 – 52629	Q 32
47001 – 47020	K 25			52700 – 52714	Q 35
47021 – 47076	N 119	51419 – 51558	K 23	52715 – 52770	Q 36
		51559 – 51702	K 29	52771 – 52780	Q 41
48500 – 48509	B 31	51703 – 51715	K 30	52781 – 52808	Q 42

Part No.	Page	Part No.	Page	Part No.	Page
52809 – 52867	K 17	53350 – 53375	O 9	60000 – 60051	N 16
52872 – 52898	K 16	53376 – 53387	E 5	601xx – 618xx	N 110
52899	Q 40	53388 – 53389	E 6	60216 – 60226	K 37
52900 – 52921	Q 37	53390	Q 44	60250 – 60287	N 15
52922 – 52944	Q 38	53391 – 53549	E 6	60288 – 60298	K 37
52945 – 52968	K 16	53758 – 53761	Q 26		
52969 – 52980	K 17	53762 – 53777	K 39	61816 – 61927	N 117
52990 – 52999	Q 44			61928 – 61980	N 42
		541_ – 564_	K 18	61981 – 61998	N 43
53000 – 53003	Q 43			61999	N 44
53004 – 53031	Q 44	59114 – 59135	K 39		
53032 – 53047	Q 45	59138 – 59145	W 7	620xx – 624xx	N 108
53048 – 53069	Q 46	59150 – 59156	W 9	62500	K 37
53070	Q 44	59212 – 59219	D 8	62501	N 110
53071 – 53082	K 16	59262 – 59269	K 40	62502 – 62554	N 62
53083 – 53088	K 17	59270 – 59311	W 4	62556 – 62600	N 63
53100 – 53135	Q 24	59312 – 59318	K 40	62601	N 110
53136 – 53142	Q 25	59336 – 59338	W 5	62602 – 62605	N 63
53143 – 53151	Q 24	59360 – 59377	W 6	62607 – 62624	N 139
53152 – 53179	Q 25	59380 – 59386	W 8	62625 – 62684	N 38
53180 – 53191	Q 43	59390 – 59395	W 10	62685 – 62700	N 39
53200 – 53235	Q 26	59396 – 59397	W 11	62701	N 110
53236 – 53238	Q 27	59450 – 59457	W 12	62702 – 62709	N 39
53239 – 53242	Q 26	59460 – 59471	W 13	62710 – 62765	N 40
53243 – 53245	Q 27	59472 – 59653	N 118	62766 – 62793	N 41
53246 – 53247	Q 26	59654 – 59706	W 14	62794 – 62800	N 42
53248 – 53292	Q 24	59707 – 59758	W 15	62801	N 110
53293 – 53299	Q 25	59760 – 59810	N 44	62802 – 62812	N 28
53300 – 53308	O 9	59811 – 59836	N 45	62813 – 62868	N 35
53309 – 53336	Q 25	59837 – 59854	N 140	62869 – 62875	N 36

Part No.	Page	Part No.	Page	Part No.	Page
62876 – 62884	N 138	65243 – 65285	N 68	71789	H 8
62901	N 110	65286 – 65313	K 20	71820	H 8
62902 – 62942	N 30	65314 – 65349	N 72	71901	T 14
62943 – 62969	N 31	65350 – 65385	N 73	71990 – 71997	D 9
62970 – 62988	N 30				
62989 – 62996	N 31	660xx – 668xx	N 109	72042 – 72043	D 9
62997	N 37	66820 – 66837	N 32	72082	T 5
		66840 – 66883	N 29	72106	D 9
				72184 – 72185	T 5
63010 – 63048	N 79	69601 – 69624	N 122	72214	H 8
63049 – 63078	N 37	69631 – 69654	N 123	72872	T 6
63079 – 63133	N 27	69661 – 69714	N 25	72944 – 72950	T 8
63136	N 62	69715 – 69737	N 26	72951	T 45
63137	N 137	69750 – 69803	N 33	72961	T 45
63138	N 138	69804 – 69826	N 34	72973	T 42
63139 – 63155	N 137				
63156 – 63163	N 138	70116	H 8	73368	T 42
63164	N 27	70377	T 14	73466 – 73485	T 42
63165 – 63199	N 28	70402	T 14	73519	T 14
6320x – 6332x	N 115	70518 – 70519	T 6	73548	T 42
63331 – 63401	N 115	70536	T 6	73571	N 151
635xx – 638xx	N 108	70561	H 8	73571	T 43
63815 – 63862	N 111	70736	T 13	73574	T 45
63863 – 64070	N 112	70931	T 14	73575	T 47
				73579 – 73580	N 134
64075 – 64122	N 113	71254	T 45	73587	N 152
64123 – 64330	N 114	71369	T 14	73587	T 44
		71491 – 71493	D 9	73657	T 42
65044 – 65087	N 70	71544	T 10	73714	T 6
65114 – 65133	N 71	71705 – 71711	D 9	73726	T 14
65214 – 65242	N 67				

Part No. index

From Part No.
73728 – 77469

Part No.	Page	Part No.	Page	Part No.	Page
73728	T 42	75450 – 75458	T 8	76348	T 43
73774	N 134	75460 – 75479	T 5	76349	N 151
73859	T 5	75497 – 75499	T 11	76349	T 43
73870	T 42	75507 – 75515	T 54	76350	N 152
73884 – 73885	T 6	75528 – 75541	T 53	76350	T 44
73913	T 14	75614	N 152	76351	N 151
73924	T 8	75614	T 44	76351	T 43
73993	T 45	75642	N 151	76352	N 152
		75642	T 43	76352	T 44
74034	T 45	75801	T 47	76353	N 152
74094 – 74096	N 134	75932	T 53	76353	T 44
74221	T 5	75940	H 8	76354	N 152
74293	T 14	75943 – 75951	N 131	76354	T 44
74297	T 14	75956 – 75959	N 133	76355	N 152
74506 – 74514	N 133	75978 – 75980	N 134	76355	T 44
74551	N 152	75992	T 49	76356	N 152
74551	T 44			76356	T 44
74658	H 8	76061 – 76099	T 42	76639 – 76640	T 45
74670	T 14	76103	N 134	76705	T 47
74729	T 45	76105 – 76123	T 45	76706	T 54
74749	T 11	76157 – 76175	H 8		
74992 – 75019	E 9	76283 – 76294	T 46	77144 – 77175	G 4
		76295 – 76298	T 47	77261 – 77270	H 8
75167	H 8	76299 – 76310	T 46	77352	N 152
75251 – 75253	H 8	76311 – 76314	T 47	77352	T 44
75254 – 75319	T 52	76345	N 151	77376	N 133
75375 – 75410	T 9	76345	T 43	77424	H 8
75415 – 75418	H 8	76347	N 151	77427 – 77429	T 47
75431 – 75445	T 6	76347	T 43	77468	T 47
75449	T 5	76348	N 151	77469	H 8

Part No. index

From Part No.
77532 – 80450

Part No.	Page	Part No.	Page	Part No.	Page
77532	T 14	78499	H 9	80072 – 80073	R 83
77538	T 14	78614 – 78626	N 149	80074 – 80076	R 85
77548	T 13	78828	N 136	80084 – 80116	R 25
77642	T 45	78948 – 78952	N 133	80120 – 80130	R 25
77741 – 77753	N 136	78955 – 78958	N 134	80131 – 80138	R 17
		78963	N 136	80139 – 80146	R 18
78079 – 78081	N 136	78983	T 54	80148 – 80155	R 17
78106 – 78117	T 6			80156 – 80162	R 18
78122 – 78125	T 14	79513	N 136	80164 – 80171	R 17
78240 – 78241	T 42	79613	N 136	80172	R 18
78265 – 78268	T 46	79623 – 79638	T 6	80175 – 80178	R 18
78269 – 78275	T 47	79639 – 79666	T 10	80180 – 80187	R 20
78284	N 151	79685	T 10	80188 – 80195	R 21
78284	T 43	79804 – 79830	E 19	80196 – 80204	R 20
78286	N 151	79850	N 151	80207 – 80211	R 21
78286	T 43	79850	T 43	80212 – 80218	R 20
78287	N 151	79907	N 151	80219	R 21
78287	T 43	79907	T 43	80220	R 20
78288	N 151	79921	T 45	80223 – 80227	R 21
78288	T 43			80264 – 80265	R 13
78289	N 152	80000 – 80028	R 24	80267	R 111
78289	T 44	80031	R 25	80270 – 80281	R 13
78290	N 152	80032 – 80041	R 24	80294	R 73
78290	T 44	80043	R 58	80316	R 6
78291	N 152	80044	R 85	80363	R 34
78291	T 44	80045	R 9	80382	R 34
78359	T 47	80046 – 80051	R 24	80384	R 107
78372	N 136	80053	R 54	80388	R 46
78377 – 78388	N 147	80055	R 57	80418 – 80435	R 8
78479	N 147	80068 – 80071	R 84	80436 – 80450	R 18

Part No. index

From Part No.
80473 – 82431

Part No.	Page	Part No.	Page	Part No.	Page
80473 – 80475	R 24	80810	R 71	81278	R 59
80495 – 80518	R 32	80813 – 80821	R 7	81286 – 81287	R 132
80532	R 46	80824 – 80825	R 147	81382	R 21
80534	R 34	80826	R 161	81446	R 72
80576 – 80578	R 26	80846	R 14	81447	R 163
80627	R 26	80851	R 13	81448	R 107
80629 – 80630	R 46	80868 – 80894	R 9	81478	R 23
80631	R 9	80895	R 26	81495	R 14
80672	R 26	80896 – 80908	R 9	81501	R 120
80681	R 13	80912 – 80914	R 24	81557	R 143
80688	R 7	80915 – 80959	R 26	81609 – 81610	R 62
80691	R 26			81611	R 46
80699	R 6	81003	R 111	81663	R 160
80725	R 13	81036 – 81038	R 34	81699	R 79
80732	R 26	81077	R 161	81712	R 152
80735	R 26	81081	R 160	81713	R 114
80743	R 7	81085	R 163	81882	R 46
80753 – 80754	R 7	81108 – 81121	R 21	81900	R 6
80759	R 25	81123	R 63	81903 – 81904	R 119
80764	R 24	81133 – 81136	R 21	81905	R 120
80769	R 7	81137 – 81149	R 25	81906	R 121
80771	R 25	81155	R 99	81907 – 81908	R 155
80774	R 24	81186	R 108	81909 – 81910	R 156
80777	R 24	81202	R 142	81911 – 81912	R 140
80778	R 142	81203	R 144		
80782 – 80791	R 6	81209	R 31	82032 – 82033	R 46
80792	R 108	81238	R 40	82190	R 30
80793	R 9	81246	R 9	82390 – 82407	R 33
80795 – 80806	R 7	81254	R 64	82408 – 82412	R 6
80809	R 26	81255 – 81260	R 31	82431	R 13

Part No. index

From Part No.
82434 – 87919

Part No.	Page	Part No.	Page	Part No.	Page
82434	R 148	83233 – 83253	N 66	85686 – 85795	V 10
82488	N 18	83254 – 83280	N 69	85900 – 86001	V 11
82501	R 66	83286 – 83344	N 70		
82502	R 67	83350 – 83370	N 71	86004 – 86073	V 12
82509	R 133	83371 – 83498	N 65	86303 – 86411	V 5
82561	R 31	83565	N 7	86415 – 86491	V 6
82648	R 21	83624 – 83644	N 66	86740 – 86741	U 59
82696	R 144	83650 – 83708	N 9	86762	U 62
82780 – 82783	N 18	83709 – 83773	N 19	86764 – 86765	U 58
82786	R 31	83774 – 83809	N 72	86774 – 86782	U 61
82792 – 82803	R 11	83810 – 83845	N 73	86867 – 86870	U 58
82804 – 82818	R 10	83904 – 83932	N 67	86960 – 86961	U 59
82822	R 148	83933 – 83975	N 68	86989	U 61
82824	R 109	83976 – 83997	N 69		
82835 – 82836	R 116			87074	U 58
82838	R 96	84178	U 62	87084	U 59
82839	R 97	84400 – 84476	U 58	87127 – 87143	U 58
82913	R 112	84481 – 84499	U 59	87145	U 59
82914 – 82940	N 18	84500 – 84612	V 4	87164, 87196	U 62
82941 – 82942	N 17	84653 – 84655	U 59	87277	U 58
82943 – 82944	N 18	84656 – 84673	U 61	87328	U 8
82945 – 83000	N 17	84674 – 84691	U 62	87406	U 59
		84700 – 84812	V 4	87410	U 58
83001 – 83024	N 8	84867 – 84875	U 63	87416, 87445	U 62
83031 – 83044	N 7	84903 – 84915	V 5	87503	U 58
83045 – 83050	N 65	84919 – 84979	V 6	87549	U 62
83051 – 83054	N 7			87604	U 59
83055 – 83059	N 65	85221 – 85355	V 7	87725, 87748	U 58
83060 – 83104	N 7	85357 – 85508	V 8	87845, 87919	U 62
83130 – 83227	N 65	85550 – 85675	V 9		

Part No. index

From Part No.
89293 – 660870

Part No.	Page	Part No.	Page	Part No.	Page
89293	U 8	400109 – 400115	S 25	660666 – 660667	U 5
89800 – 89802	U 6	400116 – 400122	S 26	660668	U 6
89900 – 89941	N 83	400143 – 400150	S 28	660669 – 660675	U 7
89950 – 89992	N 85	400151	S 17	660676 – 660679	U 8
400000 – 400002	S 3	600154 – 600157	V 11	660680 – 660688	U 13
400003 – 400010	S 4	650086 – 650092	U 63	660689 – 660730	U 15
400011	S 5	650122	U 8	660731	U 18
400012 – 400020	S 6	650200 – 650213	U 63	660732 – 660737	U 15
400021	S 8	650950 – 650965	U 60	660738	U 18
400022 – 400024	S 9	660014 – 660038	U 8	660739 – 660751	U 15
400025 – 400029	S 10	660053 – 660089	U 6	660752 – 660756	U 16
400030	S 11	660090 – 660160	U 14	660757 – 660761	U 17
400031	S 12	660207 – 660222	U 7	660762 – 660764	U 18
400032 – 400033	S 13	660224 – 660259	U 5	660766 – 660771	U 19
400034	S 14	660260 – 660314	U 17	660772 – 660773	U 20
400035	S 15	660334	U 18	660774	U 21
400036 – 400037	S 18	660335	U 20	660776 – 660785	U 24
400038 – 400039	S 19	660350	U 18	660786 – 660794	U 25
400040	S 20	660351	U 22	660795 – 660814	U 26
400041	S 21	660445	U 21	660815 – 660821	U 27
400042 – 400043	S 7	660482	U 18	660822 – 660823	U 30
400056 – 400059	S 24	660500	U 19	660824 – 660833	U 31
400060	S 23	660510	U 25	660834 – 660837	U 32
400061 – 400062	S 27	660627	U 15	660838 – 660841	U 33
400068 – 400072	S 30	660628	U 17	660842 – 660845	U 34
400073 – 400078	S 31	660630	U 26	660846 – 660849	U 35
400080	S 20	660648	U 19	660850	U 23
400081	S 16			660851 – 660852	U 28
400089 – 400094	S 23			660853 – 660854	U 29
				660855 – 660870	U 9

Part No. index

From Part No.
660871 – 702808

Part No.	Page	Part No.	Page	Part No.	Page
660871 – 660886	U 10	671341	U 44	700035	T 54
660887 – 660889	U 11	671351	U 49	700114	T 8
660890 – 660892	U 12	671356	U 49	700142	T 52
660893	U 36	671426 – 671433	U 47	700159 – 700160	T 7
660894	U 37	671434 – 671441	U 42	700199	N 133
660897	U 30	671473 – 671478	U 41	700231 – 700235	T 8
		671483 – 671489	U 45	700437	N 131
670656 – 670659	U 48	671493 – 671499	U 44	700540	N 136
670660 – 670667	U 51	671533 – 671537	U 45	700560	N 136
670668 – 670675	U 48	671543 – 671557	U 41	700561 – 700565	N 134
670676 – 670683	U 51	671720	U 42	700566 – 700572	T 50
670684 – 670696	U 48	671759	U 54	700573 – 700754	T 49
670710 – 670717	U 47	671833 – 671889	U 53	700575	T 52
670718 – 670725	U 42	671893 – 671949	U 52	700576 – 700583	T 52
670726 – 670733	U 47	671953 – 672019	U 54	700585 – 700596	T 53
670734 – 670741	U 42			700653 – 700657	N 136
670742 – 670749	U 41	672023 – 672039	U 55	700768 – 700771	T 11
670750 – 670753	U 44	672303 – 672339	U 46	700897	N 131
670757 – 670769	U 45	672343 – 672369	U 43		
670771 – 670777	U 44	672373 – 672379	U 46	701219	E 19
670781 – 670793	U 45	672393 – 672409	U 43	701308	N 147
670802 – 670817	U 44	672413 – 672414	U 43	701351 – 701359	T 8
670822 – 670825	U 49	672416 – 672417	U 43	701377 – 701388	T 7
670826 – 670833	U 50	672419	U 43	701889 – 701900	H 4
670834 – 670837	U 49	672443 – 672444	U 46	701901 – 701913	H 5
670838 – 670845	U 50	672446 – 672447	U 46		
670849 – 670865	U 49	672449	U 46	702050	N 136
670866 – 670867	U 44			702803 – 702805	H 4
		700016 – 700018	T 52	702806 – 702808	H 5
671332 – 671335	U 50	700032	T 52		

Part No. index

**From Part No.
703843 – 802145**

Part No.	Page	Part No.	Page	Part No.	Page
703843 – 703902	H 5	707417	N 130	800980	R 41
		707418	N 136		
704225 – 704234	T 18	707738 – 707740	N 136	801147	R 74
		707746 – 707747	N 133	801182	R 32
705221	N 136			801183	R 23
705413	N 136	770001 – 770005	T 50	801190	R 15
705461	N 130			801191	R 123
705462	H 6	800044	R 112	801192	R 124
705738 – 705739	T 18	800067	R 100	801193	R 125
705769	T 19	800068	R 94	801194	R 101
705775 – 705778	T 18	800088	R 98	801195	R 102
705891 – 705894	T 18	800109	R 115	801196	R 42
		800126	R 39	801197	R 89
706003	N 134	800497	R 157	801198	R 45
706288 – 706289	T 18	800571	R 137	801200 – 801202	R 47
706333	N 136	800579	R 40	801217 – 801221	R 15
706839 – 706840	T 18	800647	R 80	801352	R 38
		800648	R 110	801572 – 801573	R 135
707077	N 130	800649	R 115	801650	R 102
707221 – 707225	N 128	800650	R 118	801651	R 103
707228 – 707232	N 133	800651 – 800652	R 158	801659	R 121
707234 – 707236	T 19	800653	R 101	801727	R 34
707250 – 707258	N 127	800654 – 800655	R 105	801733	R 44
707280 – 707288	N 128	800681 – 800682	R 154	801846 – 801847	R 149
707290 – 707296	N 129	800683 800684	R 153	801954 – 801955	R 150
707389 – 707390	N 130	800685	R 137	801982	R 134
707392	N 130	800708 – 800710	R 30		
707394	N 130	800715	R 118	802001 – 802004	R 45
707397 – 707398	N 130	800753	R 32	802131 – 802142	R 19
707400 – 707410	N 136	800754 – 800762	R 19	802143 – 802145	R 11

Part No. index

From Part No.
802167 – 804045

Part No.	Page	Part No.	Page	Part No.	Page
802167	R 75	802473	R 129	804043	R 70
802168	R 76	802792	R 35	804045	R 60
802169	R 81	802800	R 162		
802170	R 82	802917 – 802918	R 29		
802171	R 55				
802172	R 56	803037 – 803038	R 22		
802173	R 61	803295	R 104		
802174	R 65	803344	R 136		
802177	R 109	803346 – 803349	R 36		
802178 – 802179	R 113	803354	R 122		
802180 – 802181	R 117	803364	R 37		
802182	R 141	803378	R 68		
802183	R 151	803379	R 69		
802184	R 91	803380	R 77		
802185	R 104	803381	R 78		
802186	R 106	803382	R 90		
802187 – 802188	R 159	803383 – 803384	R 139		
802247 – 802249	R 12	803387	R 93		
802260	R 43	803658 – 803661	R 28		
802261 – 802276	R 14	803664	R 27		
802277 – 802278	R 12	803668	R 28		
802281	R 14	803672	N 130		
802293	R 95	803672	R 128		
802339	R 141	803693	R 92		
802469	R 130	803722	R 138		
802470	R 131	803917 – 803920	R 16		
802471	N 130	803923 – 803924	R 22		
802471	R 126	803925 – 803928	R 29		
802472	R 127	803930 – 803932	R 28		
802473	N 136	803934 – 803935	R 35		

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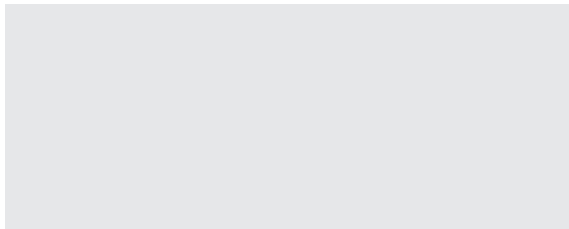
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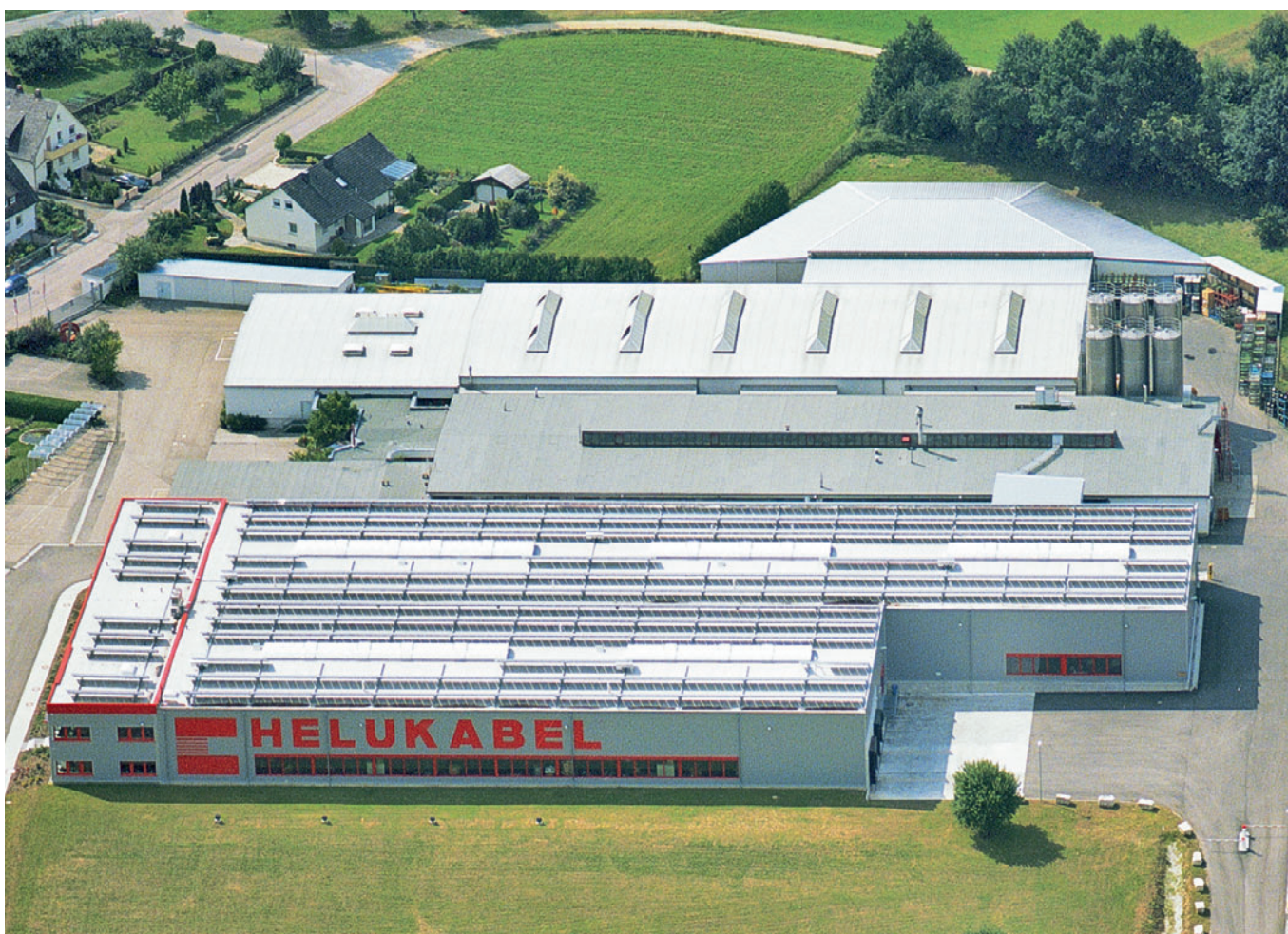


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