SEW EURODRIVE

Catalog

Mechatronic Drive System
MOVIGEAR® B

Edition 12/2012

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1 Introduction

1.1 The SEW-EURODRIVE Group of Companies

1.1.1 Global presence

Driving the world – with innovative drive solutions for all industries and for every application. Products and systems from SEW-EURODRIVE are used all over the world. Be it in the automotive, building materials, food and beverage or metal-processing industry: The decision to use drive technology "made by SEW-EURODRIVE" stands for reliability for both functionality and investment.

We are represented in the most important branches of industry all over the world: with 15 manufacturing plants and 76 Drive Technology Centers worldwide as well as our customer support, which we consider an integrative service that continues our commitment to outstanding quality.

1.1.2 Always the right drive

The SEW-EURODRIVE modular concept offers millions of combinations. This wide selection enables you to choose the correct drive for any application, each based on the required speed and torque range, space available and the ambient conditions. Gear units and gearmotors offering a unique and finely tuned performance range and the best economic prerequisites to face your drive challenges.

The gearmotors are electronically empowered by MOVITRAC® frequency inverters, MOVIDRIVE® drive inverters and MOVIAXIS® multi-axis servo inverters, a combination that blends perfectly with the existing SEW-EURODRIVE program. As in the case for mechanical systems, the development, production and assembly is also carried out completely by SEW-EURODRIVE. In combination with our drive electronics, these drives provide the utmost in flexibility.

Products of the servo drive system, such as low backlash servo gear units, compact servomotors or MOVIAXIS® multi-axis servo drives provide precision and dynamics. From single-axis or multi-axis applications all the way to synchronized process sequences, servo drive systems by SEW-EURODRIVE offer a flexible and customized implementation of your application.

For economical, decentralized installations, SEW-EURODRIVE offers components from its decentralized drive system, such as MOVIMOT®, the gearmotor with integrated frequency inverter or MOVI-SWITCH®, the gearmotor with integrated switching and protection function. SEW-EURODRIVE hybrid cables have been designed specifically to ensure cost-effective solutions, independent of the philosophy behind or the size of the system. The latest developments from SEW-EURODRIVE: DRC electronic motor, MOVIGEAR® mechatronic drive system, MOVIFIT® decentralized drive control, MOVIPRO® decentralized drive, positioning and application controller, and MOVITRANS® system components for contactless energy transfer.

Power, quality and sturdy design combined in one standard product: With high torque levels, industrial gear units from SEW-EURODRIVE realize major movements. The modular concept will once again provide optimum adaptation of industrial gear units to meet a wide range of different applications.

1.1.3 Your ideal partner

Its global presence, extensive product range and broad spectrum of services make SEW-EURODRIVE the ideal partner for the machinery and plant construction industry when it comes to providing drive systems for demanding drive tasks in all industries and applications.

1.2 Products and systems from SEW-EURODRIVE

The products and systems from SEW-EURODRIVE are divided into the following four product groups:

1. Gearmotors and frequency inverters
2. Servo drive systems
3. Decentralized drive systems
4. Industrial gear units

Products and systems used in several group applications are listed in a separate group entitled "products and systems covering several product groups." Consult the following tables to locate the products and systems included in the respective product group:

1. Gearmotors and frequency inverters		
Gear units/gearmotors	**Motors**	**Frequency inverters**
• Helical gear units/helical gearmotors • Parallel-shaft helical gear units/parallel-shaft helical gearmotors • Helical-bevel gear units/ helical-bevel gearmotors • Helical-worm gear units/ helical-worm gearmotors • Spiroplan® right-angle gearmotors • EMS drives • Geared torque motors • Pole-changing gearmotors • Variable speed gear units/variable speed gear-motors • Aseptic gearmotors • Gear units/gearmotors to ATEX standard • Variable speed gear units/variable speed gear-motors to ATEX standard	• Asynchronous AC motors/ AC brakemotors • Pole-changing AC motors/ AC brakemotors • Energy-efficient motors • Explosion-proof AC motors/AC brakemotors • Torque motors • Single-phase motors/single-phase brakemotors • Asynchronous linear motors	• MOVITRAC® frequency inverters • MOVIDRIVE® drive inverters • Control, technology and communication options for inverters

2. Servo drive systems		
Servo gear units/servo gear-motors	**Servomotors**	**Servo drive inverters/servo inverters**
• Low backlash planetary servo gear units/planetary gear-motors • Low backlash helical-bevel servo gear units/helical-bevel gearmotors • R, F, K, S, W gear units/gear-motors • Explosion-proof servo gear units/servo gearmotors	• Asynchronous servo-motors/servo brakemotors • Synchronous servo-motors/servo brakemotors • Explosion-proof servo-motors/servo brakemotors • Synchronous linear motors	• MOVIDRIVE® servo inverters • MOVIAXIS® multi-axis servo inverters • Control, technology and communication options for servo drive inverters and servo inverters

3. Decentralized drive systems		
Decentralized drives	**Communication and installation**	**Contactless energy transfer**
• DRC electronic motor/ mechatronic drive system MOVIGEAR® – DBC – Direct Binary Communication – DAC – Direct AS-Interface Communication – DSC – Direct SBus Communication – SNI – Single Line Network Installation • MOVIMOT® gearmotors with integrated frequency inverter • MOVIMOT® motors/brake-motors with integrated frequency inverter • MOVI-SWITCH® gearmotors with integrated switching and protection function • MOVI-SWITCH® motors/brakemotors with integrated switching and protection function • Explosion-proof MOVIMOT® and MOVI-SWITCH® gearmotors	• Fieldbus interfaces • Field distributors for decentralized installation • MOVIFIT® product range – MOVIFIT® FDC for controlling MOVIGEAR® and DRC drive units – MOVIFIT® MC for controlling MOVIMOT® drives – MOVIFIT® SC with integrated electronic motor switch – MOVIFIT® FC with integrated frequency inverter • MOVIPRO® product range – MOVIPRO® SDC – Decentralized drive and position controller – MOVIPRO® ADC – Decentralized drive and application controller	• MOVITRANS® system – Stationary components for energy supply – Mobile components for energy consumption – Line cables and installation material

4. Industrial gear units
• Helical gear units • Bevel-helical gear units • Planetary gear units

Products and systems covering several product groups
• Operator terminals • MOVI-PLC® drive-based control system

In addition to products and systems, SEW-EURODRIVE offers a comprehensive range of services. These include:

- Technical consulting
- Application software
- Seminars and training
- Extensive technical documentation
- International customer service

Visit our homepage at

→ **www.sew-eurodrive.com**

The website provides comprehensive information and services.

1.3 Additional documentation

1.3.1 Contents of this publication

This catalog provides the detailed technical data of the following SEW-EURODRIVE product groups:

- MOVIGEAR® DBC-B – Direct Binary Communication
- MOVIGEAR® DAC-B – Direct AS-Interface Communication
- MOVIGEAR® DSC-B – Direct SBus Communication
- MOVIGEAR® SNI-B – Single Line Network Installation
- MOVIFIT® FDC

These catalogs offer the following information:

- Product descriptions
- Type designations
- Project planning information
- Visual representation of mounting positions
- Explanation on the order information
- Design and operating notes
- Important information on tables and dimension sheets
- Description of the different types
- Selection tables
- Dimension sheets
- Technical data

1.3.2 Additional documentation

- "Drive System for Decentralized Installation" catalog

  You find more products for decentralized installation available from SEW-EURODRIVE in the catalog "Drive System for Decentralized Installation".

- Drive Engineering – Practical Implementation "Efficient Plant Automation with Mechatronic Drive Solutions"

  The publication "Drive Engineering – Practical Implementation – Efficient Plant Automation with Mechatronic Drive Solutions" presents current questions, application requirements, and trends, such as

  – Saving energy
  – Flexibility
  – Efficient plant technologies
  – Ambient conditions
  – Logistics processes
  – Process optimization

  and guides you to the ideal and efficient mechatronic drive solution.

This guide always starts with the situation and requirements of your installation site, based on our expertise from numerous, successfully implemented projects.

The focus is on:

– Situation at customer site
– Customer requirements
– Solution approach
– Customer benefits
– SEW-EURODRIVE solution
– Implementation examples/verification

leading you step by step to the ideal solution from SEW-EURODRIVE and the resulting advantages.

1.4 Copyright

2 System Description

2.1 MOVIGEAR® – the mechatronic drive system

The following figure depicts MOVIGEAR® sizes MGF..4 and MGF..2:

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The demands on materials handling systems are becoming both more complex and more specific in many industries, such as automotive, food and beverage industries, airport logistics or general intralogistics. At the same time, less installation space is available for meeting these demands. This is why SEW-EURODRIVE researches and develops ideal application solutions. The result is the mechatronic drive system MOVIGEAR®. It excels by an advantageous, compact design and is ideally suited for the **efficient implementation of conveyor systems**.

The housing has been optimized specifically for these types of applications and can be easily integrated in today's conveyor systems. It also enables **new developments to be implemented from a completely new perspective**. This technology masters high break-away and acceleration torque levels after longer system downtimes without any limitations. **The power required to drive the system can be reduced significantly.**

MOVIGEAR® is the next logical step in the development of the economically and technically successful concept of decentralized drive systems.

2.1.1 Mechatronic drive system comprising motor, gear unit and electronics

A systematic development approach was taken right from the design phase. MOVIGEAR® impresses with its high level of system efficiency, which in turn helps **lower the energy costs**. The integration and coordination of all the drive components lead to a long service life and **high system availability**.

MOVIGEAR® is an intelligent device with its own control concept. Its high-quality networking features help **reduce the startup time** and **support the monitoring and maintenance tasks**. Drive tasks can be solved quickly and easily using the corresponding application software.

2.2 Overview of advantages

- Compact design: Motor, gear unit and electronics are combined in a single mechatronic drive system
- Simplified system planning and design
- The reduction in the number of variants allows for developing and designing standard materials handling systems with pre-fabricated and tested standard modules.
- The power of the drive engineering components is optimized to suit the application
- Reduction in storage due to reduced number of variants
- High degree of protection
- Hygienic surface design for applications in hygienic areas. The following figure shows the optional version for use in wet areas:

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- No air, dirt and germ swirls
- Low noise emission due to operation without fans (suitable for use in manual work stations)
- Reduced energy costs due to high efficiency of all components (gear unit, motor, electronics)
- High degree of reliability due to systematic development of all components
- Reduced total costs as well as operating costs of the materials handling system

2.3 MOVIGEAR® drive units

MOVIGEAR® is available in 3 sizes and 2 mechanical designs. For more information, see the section "Technical data and dimension sheets."

2.3.1 MOVIGEAR® sizes

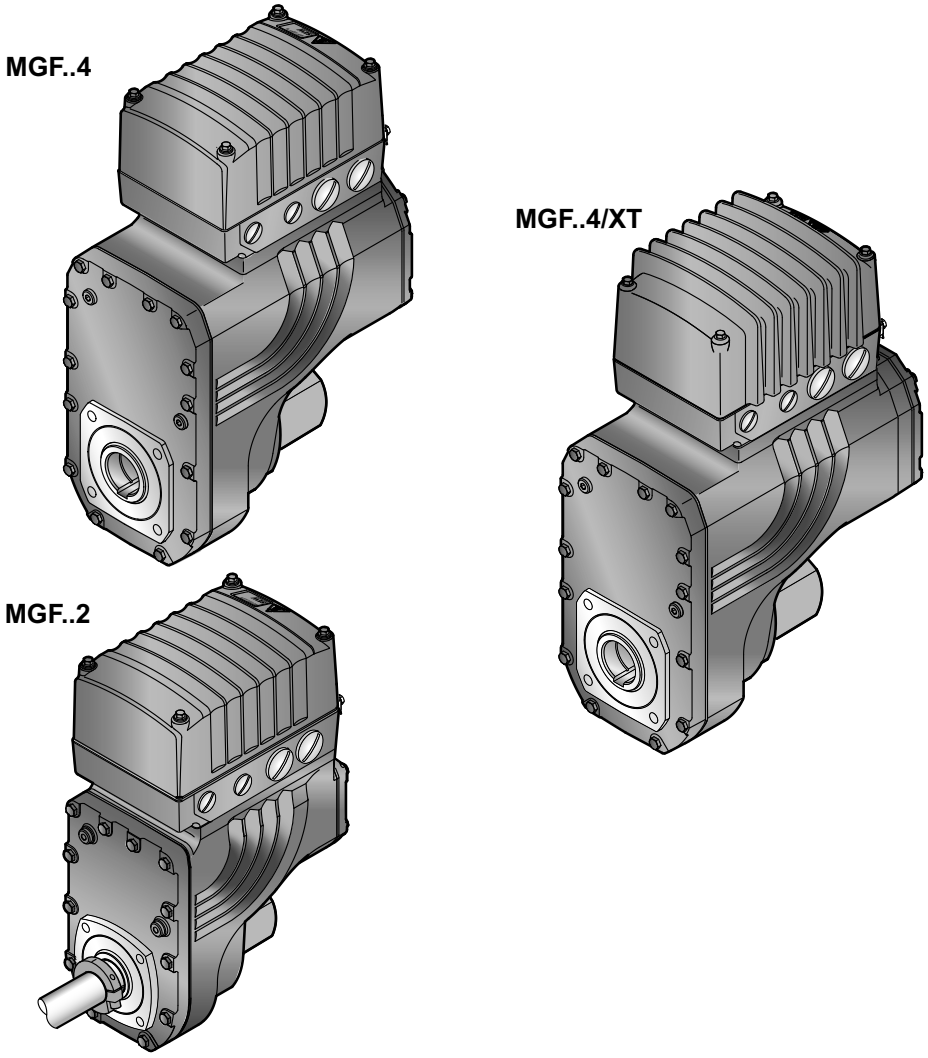
- MGF.2 (torque class: 200 Nm)
- MGF.4 (torque class: 400 Nm)
- MGF.4/XT[1] (torque class: 400 Nm)

2.3.2 MOVIGEAR® design types

- MOVIGEAR® with hollow shaft and keyway
- MOVIGEAR® with TorqLOC® hollow shaft mounting system

2.3.3 Examples

The figure shows a MOVIGEAR® MGFT.2 unit with TorqLOC® hollow shaft mounting system and a MOVIGEAR® MGFA.4 and MGFA.4/XT unit with hollow shaft and keyway:



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1) /XT = "Increased torque" option (expanded nominal motor torque in continuous duty)

2.3.4 Installation technology

You can order the drive units with the following installation technology:

- DBC = **D**irect **B**inary **C**ommunication
- DAC = **D**irect **A**S-Interface **C**ommunication

  For DAC installation technology, you can choose between the variants binary slave GLK30 or double slave GLK31.
- DSC = **D**irect **S**Bus **C**ommunication
- SNI = **S**ingle Line **N**etwork **I**nstallation

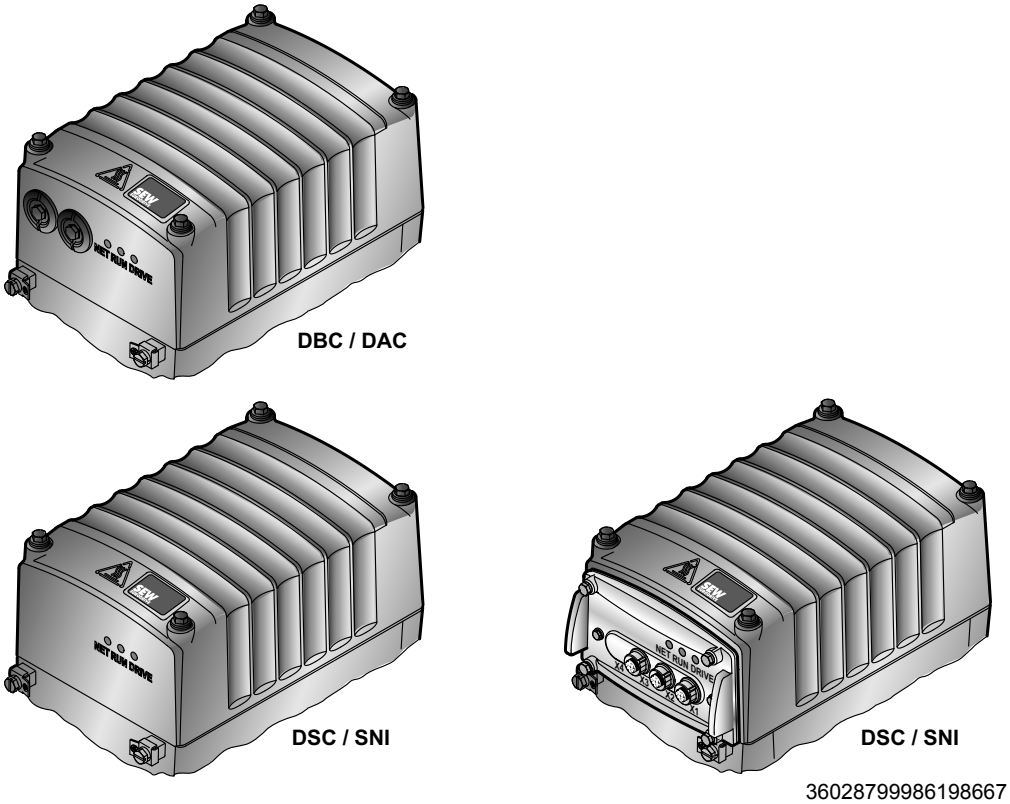
2.3.5 Variant with/without application slot

The following types of DSC and SNI electronics covers are available for all sizes:

- Electronics cover without application slot
- Electronics cover with application slot

Type DBC and DAC electronics covers are designed without application slot.

The following figure shows the possible types:



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Electronics cover **without** application slot

Electronics cover **with** application slot
(in the example shown with installed GIO12B option)

2.3.6 Application options

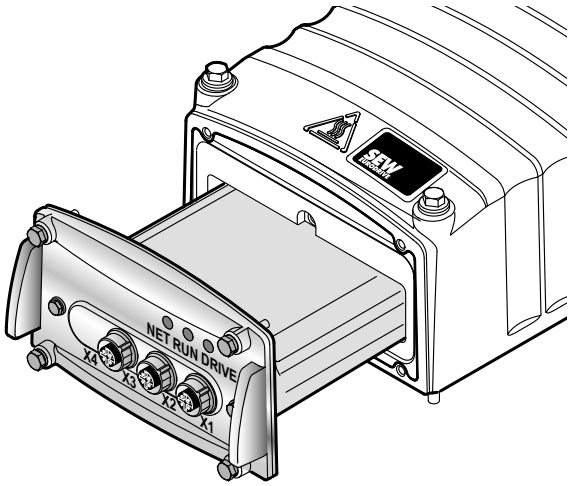
Application options are installed in the application slot of the drive unit and implement specific interfaces, such as binary inputs or binary outputs.

The energy supply of the option as well as the communication between drive unit and option are contactless.

Application option GIO12B

The GIO12B application option allows for controlling up to 2 digital actuators and for processing up to 4 digital sensors.

The following figure shows the GIO12B application option:



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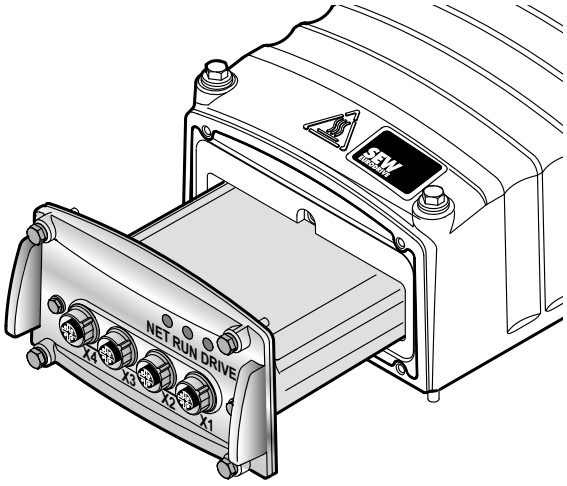
GIO13B application option

The GIO13B application option comes equipped with the following interfaces:

- 1 digital output
- 4 digital inputs (two of them can be used as primary frequency input)
- 1 analog output
- 1 analog input

The following figure shows the GIO13B application option:



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2.3.7 General properties of the units

- Wide voltage range 3 x AC 380 V to AC 500 V
- High overload capacity for all sizes
- 4Q capability due to integrated brake chopper and braking resistor installed as standard
- Line filter integrated as standard. EMC-compliant installation ensures compliance with limit class C3 to EN 61800-3 (class A, group 2 according to EN 55011).
- LED display for operating and fault states
- Protective features for complete protection of the frequency inverter and motor (short-circuit, overload, overvoltage/undervoltage, excess temperature in the frequency inverter, excess temperature in the drive unit).
- Integrated STO safety function
  - **STO** (safe torque off according to IEC 61800-5-2) by disconnecting the STO input.
  - Performance level e according to EN ISO 13849-1.
  - **SS1(c)** (safe stop 1, function variant c according to IEC 61800-5-2) by means of suitable external control (e.g. safety relay with delayed disconnection)

You find the specific unit properties of DBC-B, DAC-B, DSC-B and SNI-B in the subsequent chapters.

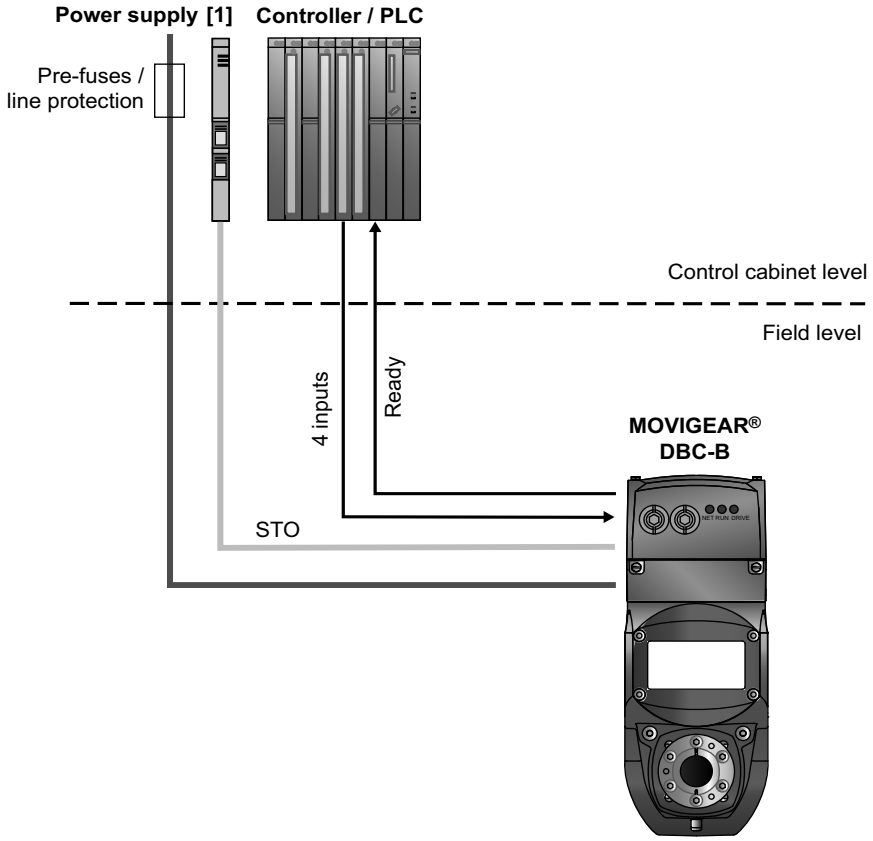
2.4 Installation topology DBC – Direct Binary Communication

2.4.1 Description

The mechatronic drive solution with "DBC" installation topology was developed by SEW-EURODRIVE specifically for stand-alone solutions and applications with simple functionality. DIP switches and potentiometers allow for simple and fast startup without the need for a PC. The unit is controlled via the binary inputs either by a central PLC or in local/manual mode.

2.4.2 Topology

The following figure shows an installation topology with Direct Binary Communication:



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[1] Safety switching device/safety controller

2.4.3 Characteristics

- Simple startup without PC via DIP switches and potentiometer
- Parameterizable fixed speeds and ramps
- Binary input control and signal relay evaluation via PLC
- Local mode via binary inputs
- Interface for diagnostics and parameterization

2.4.4 Application examples

- Simple conveyors
- Rotary tables
- Adjustment drives
- Agitators and mixers
- Crushers and shredders
- Presses

2.4.5 Application options

- Simple stand-alone applications and single applications
- For applications that require soft startup behavior
- Applications with 2 fixed speeds
- For applications with high breakaway torques
- Applications with/without STO safety function

2.5 *Installation topology DAC – Direct AS-Interface Communication*

2.5.1 Description

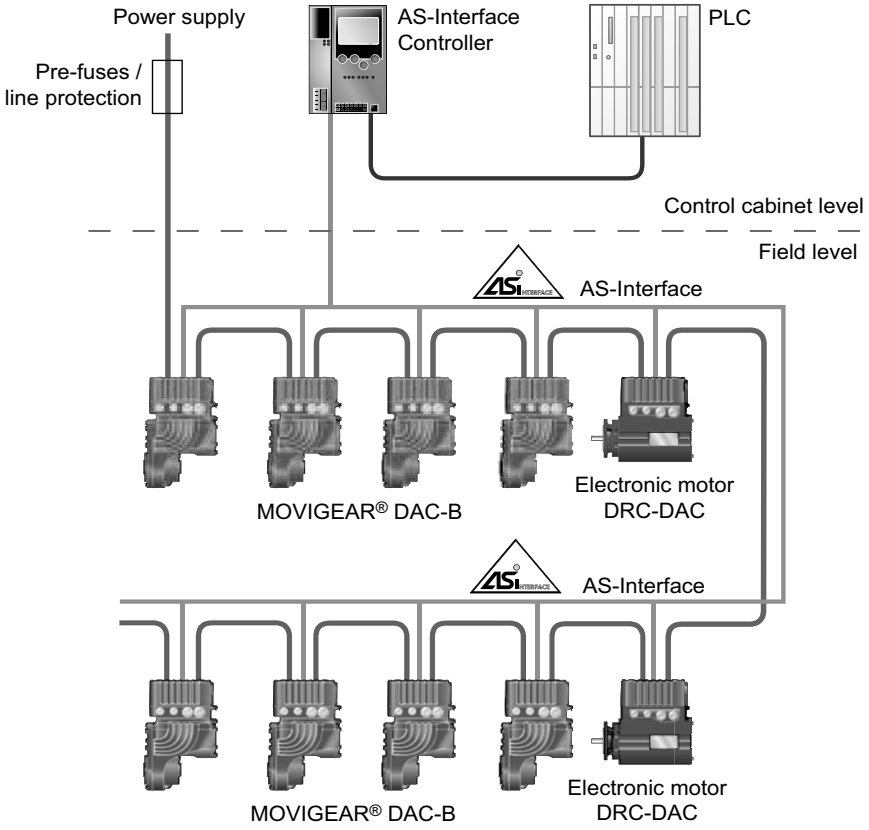
The "DAC" installation topology allows for easy communication connection using the standard AS-Interface protocol. Parameterizable fixed speeds and ramps, integrated STO safety function and connection options for external sensors ensure fast and extremely efficient implementation of material handling systems.

You can choose from the following types:

- Binary slave GLK30
- Double slave GLK31

2.5.2 Topology

The following figure shows an installation topology with Direct AS-Interface Communication:



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2.5.3 Characteristics

- Simple communication connection
- Parameterizable fixed speeds and ramps
- Control via worldwide standard AS-Interface
- Connection of external sensors to the actuator
- Voltage supply for connected sensors
- Local mode via binary inputs
- Interface for diagnostics and parameterization

2.5.4 Application examples

- Accumulating roller conveyor
- Roller and wheel conveyors
- Pallet conveyors
- Rotary tables

2.5.5 Application options

- For applications that require soft startup behavior
- Signal feedback of connected sensors
- For applications that require a lot of space
- Applications with/without STO safety function

2.6 *Installation topology of SNI – Single Line Network Installation*

2.6.1 Description

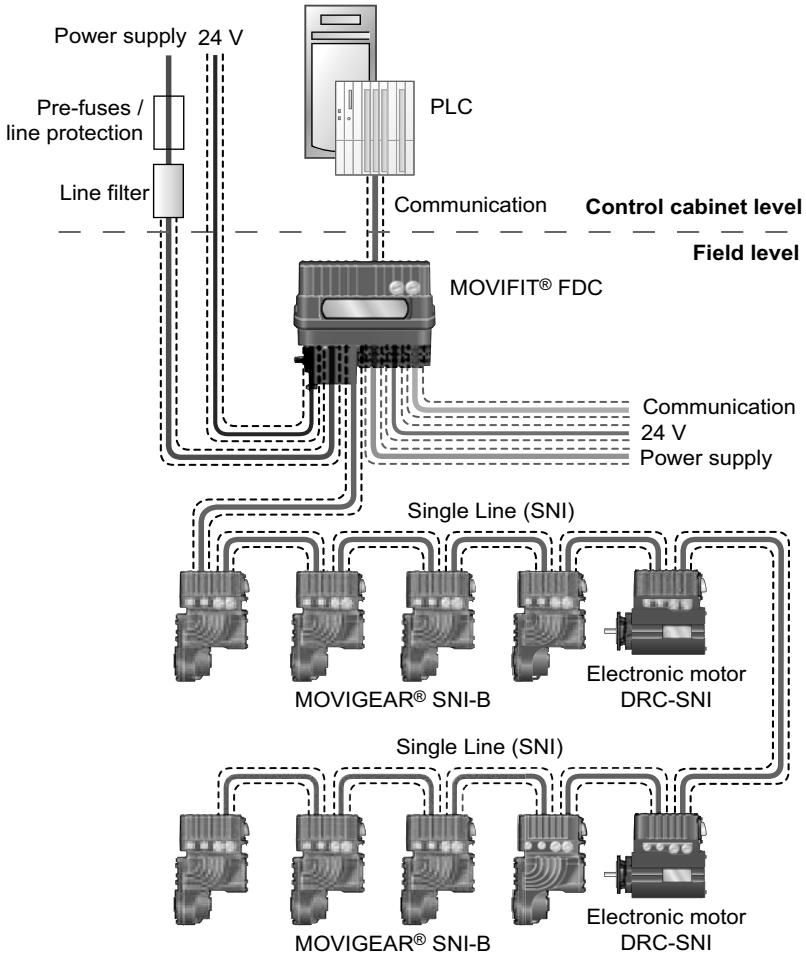
SNI stands for Single line Network Installation and is based on the principle of using a single line for power supply and communication. The signals required for communication are modulated onto the power line in the high-frequency range and are available for each connected station.

The innovative single line network installation (SNI) concept allows for a completely new plant topology for a consistent plant decentralization. Compared to conventional decentralized technology, this new technology reduces installation effort, time and costs. Only one power cable has to be routed instead of three lines (400 V, 24 V, bus). This reduces the time and costs for installation, which in turn decreases the total costs of the plant. The single-line principle also reduces the risk of hidden faults in the wiring for the communication lines.

Single line network installation (SNI) makes separate bus cables almost completely redundant.

2.6.2 Topology

The following figure shows the basic installation topology with SNI (single line network installation):



2.6.3 Features

- Power and communication through one power cable
  - Up to 10 SNI actuators in total
  - Permitted cable length between controller and last actuator max. 100 m
- Reduction in the number of components
- No fieldbus wiring necessary
- No risk of hidden faults in the bus cabling
- Reduced startup time
- Shorter project runtime/reduction of project costs
- Optional motion control inputs (via plug connectors) for local mode or sensor inputs

2.6.4 Application examples

- Belt conveyors
- Pallet conveyors
- Roller and wheel conveyors
- Screw conveyors
- Container and packaging unit transports
- Chain and drag-chain conveyors

2.6.5 Application options

- As a drive for applications with high breakaway and starting torques
- Conveyor systems with variable speeds
- As drive for applications that require soft and/or defined startup behavior.
- As group drive for easier implementation of synchronous operation
- Applications with/without STO safety function

2.7 Installation topology of DSC – Direct SBus Communication

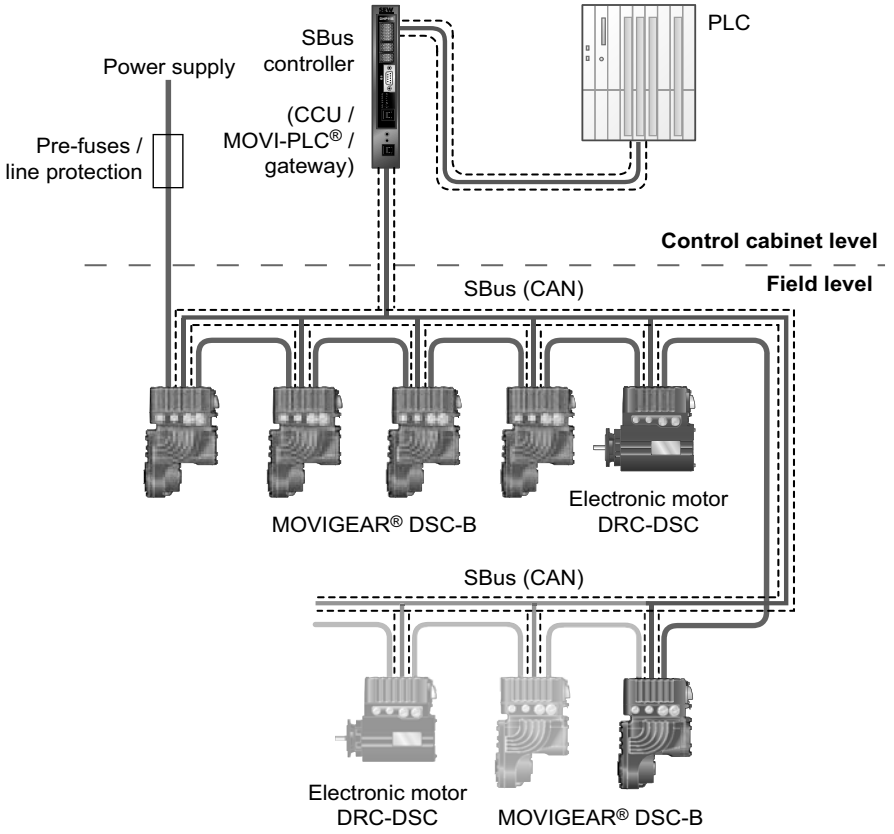
2.7.1 Description

The "DSC" installation topology with SEW system bus allows for the functional integration of the mechatronic drive system in applications close to the machine.

High performance and short response times distinguish this variant and enable reliable implementation of challenging drive tasks in the field of machine automation.

2.7.2 Topology

The following figure shows an installation topology with Direct SBus Communication:



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2.7.3 Features

- Up to 16 SBus actuators can be controlled per controller
- Integrated system interface. Permitted cable length between controller and last actuator when using the recommended hybrid cable per line:
  - 1 Mbaud: 25 m
  - 500 Kbaud: 50 m
- Fast communication for short cycle times
- Hybrid cables for minimum installation effort
- System bus controller for control cabinet or fieldbus installation with integrated PLC
- High drive dynamics and performance
- Optional motion control inputs (via plug connector) for local mode or sensor inputs

2.7.4 Application examples

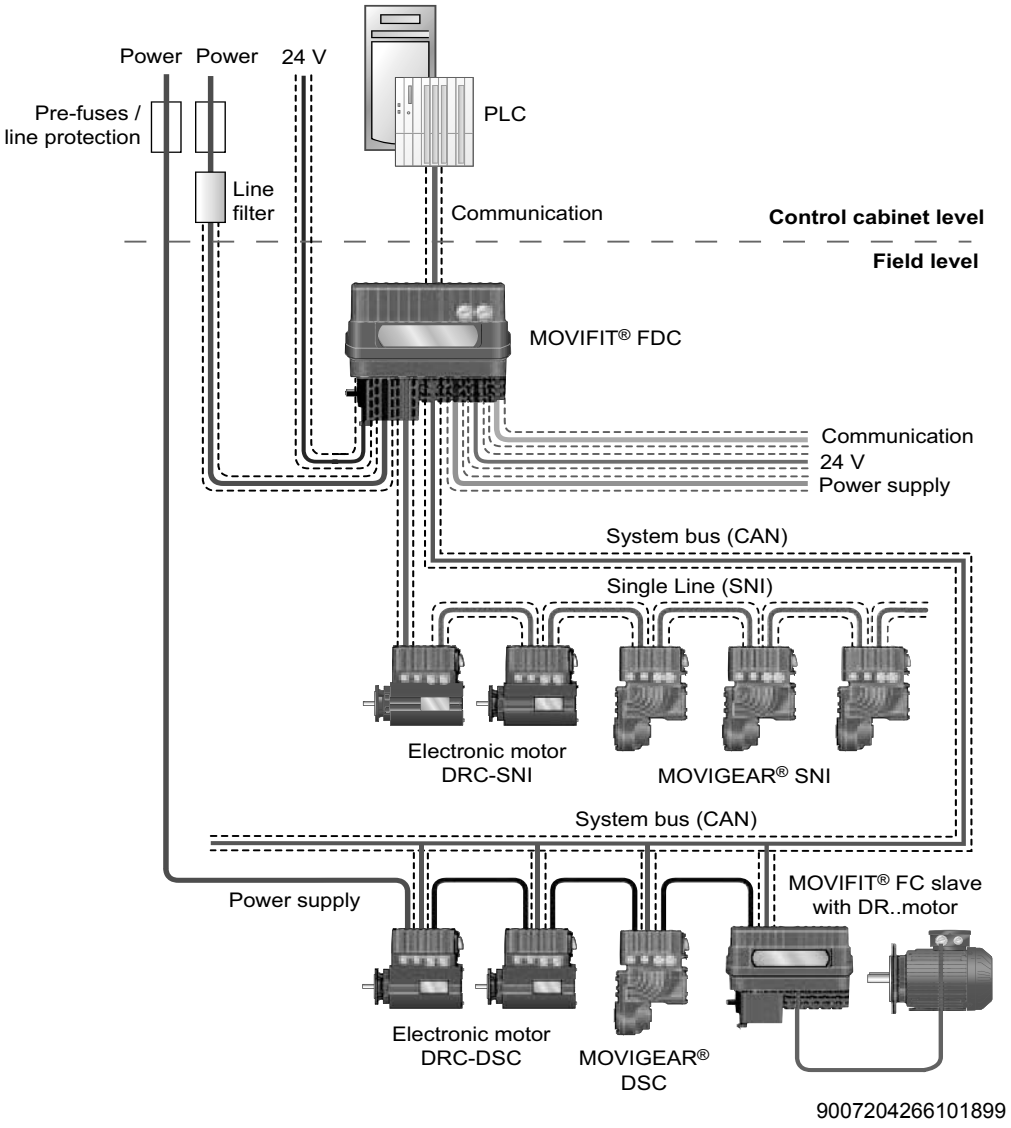
- Pallet conveyors
- Machine-integrated conveyor belts
- Feeding conveyors
- Synchronized feeder conveyors
- Reversing drives

2.7.5 Application options

- As a drive for applications with high breakaway and starting torques
- As a drive for conveyor systems that must be operated dynamically at varying speeds
- Forming intelligent function groups
- Universal application due to large control range of 1:2000
- Applications with/without STO safety function

2.8 Combined installation topology

The following figure shows a combined topology with single line network and SBus installation:



2.9 SEW-EURODRIVE control technology – Overview

2.9.1 Flexible solutions for effective drive automation

Controlling motions efficiently and individually – this is at the focus of control technology from SEW-EURODRIVE for functional and economical automation of machines.

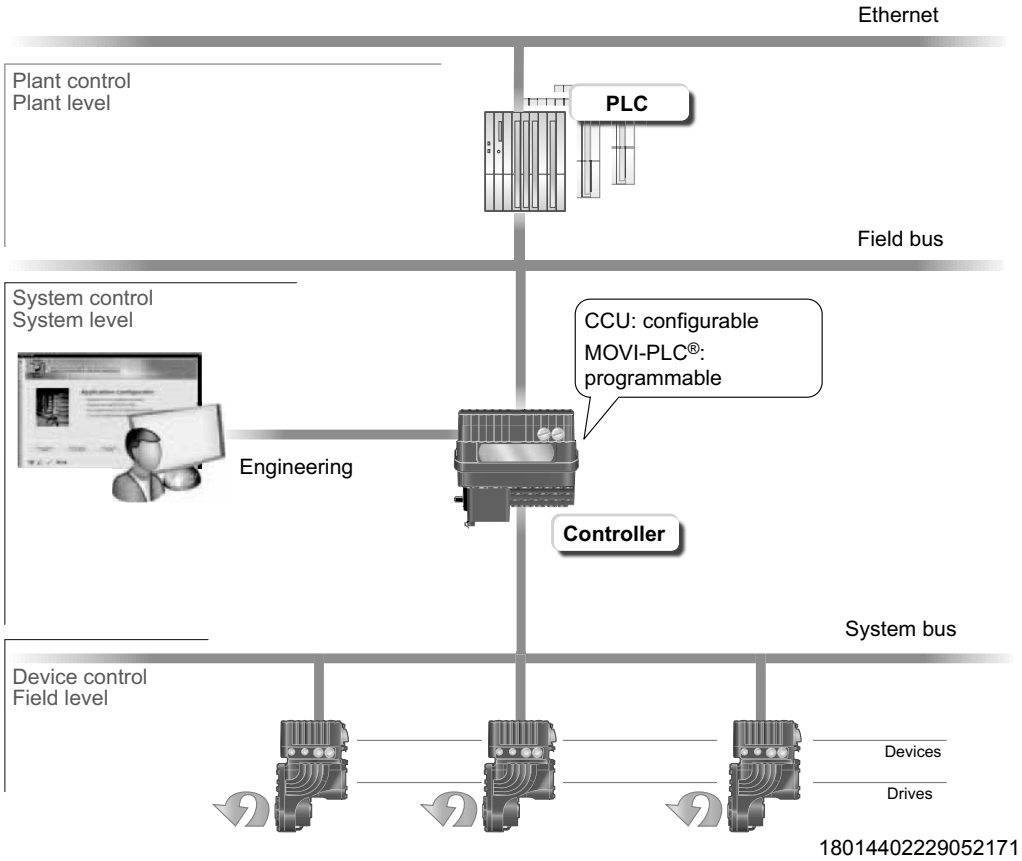
The control technology excels by offering a universal, scalable, and powerful range of controllers and software optimally matched to the drives and drive electronic components of the modular system. The practical benefits are great both in terms of functionality and cost effectiveness.

Control technology from SEW-EURODRIVE offers a wide variety of flexible components. These components can be combined to form efficient drive solutions that can be easily integrated into numerous automation concepts. In this way, new functional and economic potential can be created in many machine automation projects, including the reduction of investment and startup costs, production capacities, or any follow-up costs for maintenance and repair.

2.9.2 System overview

The following figure shows the basic system overview of control technology from SEW-EURODRIVE:

Controllers from SEW-EURODRIVE are available in "configurable" (CCU) or "programmable" (MOVI-PLC®) variants. In addition, the controllers offer different installation options (control cabinet installation or decentralized installation) and different performance classes.



2.10 Controllers / fieldbus gateways

2.10.1 MOVIFIT® FDC for controlling SNI and SBus actuators

MOVIFIT® FDC is a decentralized drive controller for controlling the following units:

- MOVIGEAR® SNI-B drive units
- MOVIGEAR® DSC-B drive units
- DRC-SNI drive units
- DRC-DSC drive units
- MOVIFIT® FC slave units

The following figure shows a MOVIFIT® FDC unit with MOVIGEAR® drive units and DRC electronic motor:

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Features of MOVIFIT® FDC units

MOVIFIT® FDC is characterized by the following features:

- Up to 10 SNI actuators or 16 SBus actuators can be connected
- **S**ingle Line **N**etwork **I**nstallation (SNI) and/or SBus communication
- Industrial Ethernet with the following protocols:
  - PROFINET IO
  - Modbus/TCP
  - EtherNet/IP
- Service interface via:
  - USB
  - Ethernet
- Maintenance switch
- 12 binary inputs + 4 binary inputs/outputs
- Configurable application modules
- User-defined programming in accordance with IEC 61131-3
- Easy data management with SD memory card

SD memory card

The SD memory card is used for central data management of MOVIFIT® FDC and allows for easily replacing the EBOX during servicing. It contains the firmware, the IEC program, and user data.

You find the memory card slot inside the EBOX. This position ensures the degree of protection of MOVIFIT® FDC and enables easy access.

MOVIFIT® FDC is available with the following memory cards:

Code	Performance class	SD card	
		Type	Property
R95	CCU standard	OM**C**41B-T0	Parameterizable
R96	MOVI-PLC® standard	OM**H**41B-T0	Programmable
R97	CCU advanced	OM**C**41B-T0 to OM**C**41B-T25	Parameterizable
R98	MOVI-PLC® advanced	OM**H**41B-T0 to OM**H**41B-T25	Programmable

- When using the SD memory card OM**C**41B-T.., you can freely set the parameters for MOVIFIT® FDC.
- When using SD memory card OM**H**41B-T, you can freely program MOVIFIT® FDC (programming languages in accordance with IEC 61131-3).

Configurable application controller (control card)

When using an SD card of the type OM**C**41B-T0, you can use MOVIFIT® FDC as configurable application controller (CCU). The *Application Configurator* program module can be used to execute standardized application modules created by SEW-EURODRIVE. The application modules can be started up quickly and conveniently by graphical configuration. A defined process data interface provides this functionality to the higher-level controller. A process data monitor with control mode is available to support the startup procedure.

Performance class CCU standard

The performance class CCU standard is intended for application modules with single-axis functionality and medium response times. A maximum of 16 axes (max. 10 of them SNI axes) can be connected to a configurable application controller. The following application modules are available and can be started up using the *Application Configurator* tool.

- Speed control
- Cam positioning
- Bus positioning with 6 process data
- Single-axis universal module

Performance class CCU advanced

The performance class CCU advanced is intended for application modules with single-axis and multi-axis functionality and fast response times. The following application modules are available:

- Single-axis functionality:
  - Speed control
  - Cam positioning
  - Bus positioning with 6 process data words
  - Single-axis universal module
- Multi-axis functionality (in preparation):
  - SyncCrane
  - Energy-efficient SRU

Freely programmable motion and logic controller card (MOVI-PLC®)

When using an SD card of the type OM**H**41B-T0, you can use MOVIFIT® FDC as freely programmable motion and logic controller MOVI-PLC®. MOVI-PLC® is a series of programmable motion and logic controllers. It allows drive solutions, logic processes and sequence controls to be automated simply and efficiently using IEC 61131-3 compliant programming languages.

- MOVI-PLC® is a **universal** solution because it is able to control the entire portfolio of SEW inverters and offers a simple upgrade to a more powerful MOVI-PLC® version thanks to the universal execution of the programs.
- MOVI-PLC® is **scalable** due to several different hardware platforms (MOVI-PLC® standard, MOVI-PLC®advanced, etc.) and modular software concepts (libraries for numerous applications).
- MOVI-PLC® is **powerful** due to extensive technologies (such as electronic cam, synchronous operation) and the control of demanding applications (such as material handling).

Performance class MOVI-PLC® standard

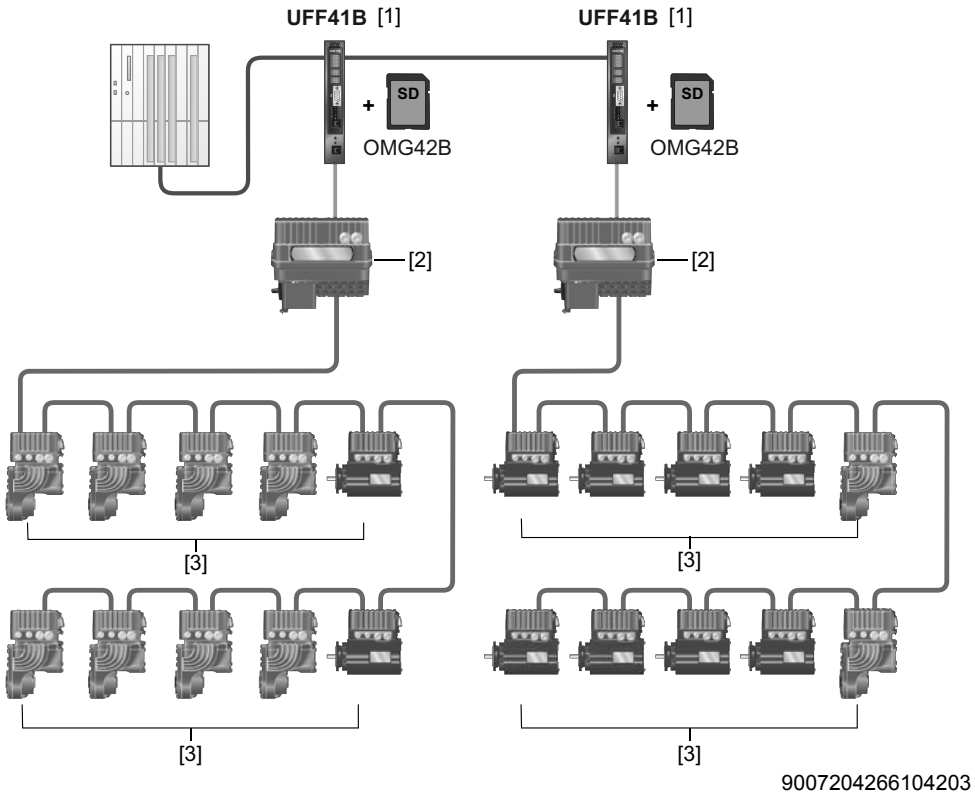
The control card of the performance class MOVI-PLC® standard enables coordinated single axis movements and integration of external inputs/outputs as well as drive operator panels (DOP). The control card is therefore suitable for use as a module controller or stand-alone controller for machines of medium complexity. SEW-EURODRIVE recommends the program module *MultiMotion Light* for programming.

Performance class MOVI-PLC® advanced

The performance class MOVI-PLC® advanced supplements the performance class MOVI-PLC® standard by short response times and the possibility of executing complex technology functions, such as synchronous operation, electronic cam or robotics. SEW-EURODRIVE recommends the program module *MultiMotion* for programming.

2.10.2 PROFIBUS/DeviceNet connection for MOVIFIT® FDC

For connecting a drive system with DRC-SNI or MOVIGEAR® SNI [3] to the PROFIBUS or DeviceNet fieldbus system, you can operate MOVIFIT® FDC [2] together with the UFF41B fieldbus gateway [1].



[1] UFF41B fieldbus gateway with SD card OMG42B
[2] MOVIFIT® FDC
[3] SNI actuators

2.10.3 Controllers and fieldbus gateways for SBus actuators

The following products of SEW-EURODRIVE are available for connecting a drive system with DRC-DSC® electronic motor or MOVIGEAR® DSC-B to a fieldbus or Ethernet system.

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Fieldbus gateways (control cabinet installation)

The following table shows available variants:

	PROFIBUS	Interbus	DeviceNet
Bus systems	DFP21B/UOH DFS11B/UOH	UFI11A	DFD11B/UOH

	PROFINET	EtherNet/IP	Modbus TCP	EtherCAT slave
Industrial Ethernet	DFE32B/UOH DFS21B/UOH	DFE33B/UOH	DFE33B/UOH	DFE24B/UOH

Controller (control cabinet installation)

The following table shows available variants:

Variant	TYPE	Bus system / Industrial Ethernet
CCU / MOVI-PLC®	DHR21B DHR41B	PROFINET Ethernet/IP Modbus TCP
CCU / MOVI-PLC®	DHF21B DHF41B	PROFIBUS DeviceNet
MOVI-PLC®	DHE21B DHE41B	UDP

2.11 Configurable control technology with the Configurable Control Unit (CCU)

2.11.1 Easy configuration of applications

Control technology from SEW-EURODRIVE includes the configurable control unit (CCU) for easily configurable applications with standardized and immediately executable application modules, which merely have to be parameterized. The functions match the specific application and can be configured easily and quickly without any programming knowledge. An integrated diagnostic function enables quick and simple startup.

There is no faster way: Standardized and immediately executable application modules.

2.11.2 Application Configurator

The Application Configurator is a tool that lets users carry out configurations and diagnostics. This practice-oriented solution is independent of the required application module and the SEW-EURODRIVE drive and control components used. All applications are operated in the same easy manner.

2.11.3 Example of a Configurable Control Unit (CCU)

Rapid/creep speed positioning

The "rapid/creep speed positioning" application module is used for simple positioning tasks in materials handling technology (e.g. roller conveyor or rotary table).

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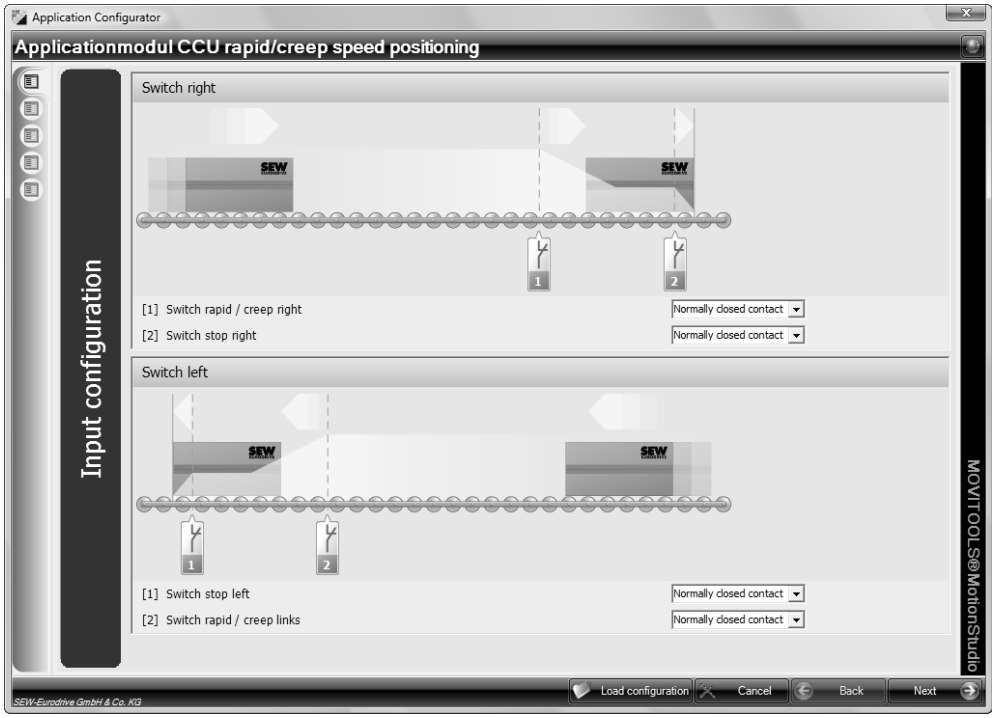
Positioning is carried out via 2 initiators with 2 speeds. The first initiator determines the switching point from rapid to creep speed, the second one determines the stop position. Applications that must position in two directions require four initiators.



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The following operating modes are supported:

- Jog
- Feed-in (positioning)
- Feed-out
- Lifting/rotating

2.11.4 Application modules available for DRC electronic motors and MOVIGEAR®

INFORMATION

For detailed information on application modules, refer to the "Configuration Software – Application Configurator for CCU" manual.

The following table lists the permitted combinations of controller types and lower-level units:

Application module	Description	Controller (CCU)	Device (actuator)
Speed control	The "Speed control" application module is used for speed-controlled applications without positioning.	DHF21B, DHR21B	DRC-DSC MOVIGEAR® B-DSC
		DHF41B, DHR41B	DRC-DSC MOVIGEAR® B-DSC
		MOVIPRO® ADC	DRC-DSC on SBus 2 MOVIGEAR® B-DSC on SBus 2
		MOVIFIT® FDC	DRC-SNI MOVIGEAR® B-SNI DRC-DSC on SBus 2 MOVIGEAR® B-DSC on SBus 2
Rapid/creep positioning	The "Rapid/creep positioning" application module is used for simple positioning tasks in materials handling technology. This includes the following typical applications: • Roller and chain conveyors • Lifting table applications • Rotary table applications Positioning is carried out via 2 initiators with 2 speeds. The first initiator determines the switching point from rapid to creep speed, and the second one determines the stop position. Applications that must position in two directions require four initiators. The following operating modes are supported: • Jog • Feed-in (positioning) • Feed-out • Lifting/rotating	DHF21B, DHR21B	DRC-DSC MOVIGEAR® B-DSC
		DHF41B, DHR41B	DRC-DSC MOVIGEAR® B-DSC
		MOVIPRO® ADC	DRC-DSC on SBus 2 MOVIGEAR® B-DSC on SBus 2
		MOVIFIT® FDC	DRC-SNI MOVIGEAR® B-SNI DRC-DSC on SBus 2 MOVIGEAR® B-DSC on SBus 2

Application module	Description	Controller (CCU)	Device (actuator)
Bus positioning 6 PD	The "bus positioning" application module is used for variable positions in conjunction with different speeds and ramps. Positioning is carried out via the built-in motor encoder or an optional distance encoder. Only linear, absolute positioning is supported. You can work with user units. The following operating modes are supported: • Jog • Referencing • Positioning	DHF21B, DHR21B	DRC-DSC MOVIGEAR® B-DSC
		DHF41B, DHR41B	DRC-DSC MOVIGEAR® B-DSC
		MOVIPRO® ADC	DRC-DSC on SBus 2 MOVIGEAR® B-DSC on SBus 2
		MOVIFIT® FDC	DRC-SNI MOVIGEAR® B-SNI DRC-DSC on SBus 2 MOVIGEAR® B-DSC on SBus 2
Universal module	The "Universal module" application module is used for all speed-controlled and positioning applications. Functional extensions such as synchronization or touch probe evaluation allow for a wide range of possible applications. The module is equipped with a consistent process data interface that is simply extended with additional functions, if required. This means the profiles of the universal module are downward compatible. You can work with user units.	DHF21B, DHR21B	DRC-DSC MOVIGEAR® B-DSC
		DHF41B, DHR41B	DRC-DSC MOVIGEAR® B-DSC
		MOVIPRO® ADC	DRC-DSC on SBus 2 MOVIGEAR® B-DSC on SBus 2
		MOVIFIT® FDC	DRC-SNI MOVIGEAR® B-SNI DRC-DSC on SBus 2 MOVIGEAR® B-DSC on SBus 2
Energy-efficient SRU	The "energy-efficient SRS" application module was developed to operate energy-efficient high-bay warehouses. The application module allows for energy savings of up to 25% due to optimized travel cycles of vertical lifting drive and horizontal travel drive. A simple interface allows for specifying the target positions and dynamic parameters for the lifting and travel axes. Integrated functions for buffer travel and slack rope detection. The IEC program controls up to 3 axes and can be used for the following devices: • MOVIAXIS® (incl. MXR regenerative power supply unit) • MOVIDRIVE	DHF41B, DHR41B (Technology level T2)	Main axis: MOVIDRIVE® B MOVIAXIS®
			Auxiliary axis: DRC-B DSC MOVIGEAR®-B DSC (with rapid/creep speed, speed control, bus positioning or universal module)

Application module	Description	Controller (CCU)	Device (actuator)
Transparent	The "Transparent" application module is used when the process output data from the higher-level controller (PLC) is to be sent to the lower-level units via configurable application controller (CCU). The same applies to process data communication in opposite direction. The process input data from the lower-level units are forwarded to the PLC via the CCU. The "Transparent" application module supports all the (IPOS^{plus}-based) application modules running directly on the inverter.	MOVIFIT® FDC	MOVIFIT® FC slave (only transparent 3 PD)

3 Product Description

3.1 General information

3.1.1 Power and torque ratings

The power and torque ratings listed in this catalog refer to mounting position M1 and similar mounting positions in which the input stage is not completely submerged in oil. In addition, the values are based on standard versions with standard lubrication under normal ambient conditions.

3.1.2 Speed ratings

The specified output speeds are recommended values. You can calculate the output speed based on the speed of the motor and the gear unit ratio.

3.1.3 Noise levels

All MOVIGEAR® units are well within the maximum permissible noise levels set forth in ISO 8579-1 for gear units and EN 60034-9 for motors.

3.1.4 Paint

MOVIGEAR® units are painted with "blue and gray" (RAL 7031 7031 according to DIN 1843) machine paint as standard. Special paints are available on request.

3.1.5 Surface and corrosion protection

On request, all MOVIGEAR® units can also be supplied with special surface protection for applications in extremely humid or chemically aggressive environments.

3.1.6 Weight information

Note that all weights listed in this catalog are calculated without the lubricant fill. The weights vary according to design and size. The lubricant fill depends on the mounting position selected, which means that in this case no universally applicable information can be given. Please refer to "Lubricants" in the "Design and operating notes" chapter for recommended lubricant fill quantities depending on the mounting position. For the exact weight, refer to the order confirmation.

3.1.7 Air admission and accessibility

When installing the driven machine, make sure there is enough space in axial and radial direction for a sufficient supply of cooling air and unobstructed heat dissipation.

3.2 Surface protection

3.2.1 General information

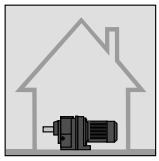
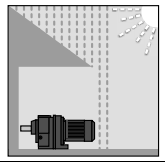
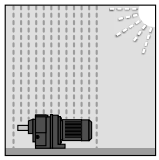
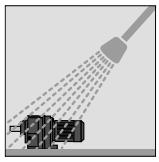
SEW-EURODRIVE offers the following optional protective measures for MOVIGEAR® drive units that are operated under special ambient conditions.

- OS surface protection
- HP200 high protection treatment (only in connection with the optional variant for wet areas)

In addition, special optional protective measures for the output shafts are also available.

3.2.2 Surface protection

Instead of standard surface protection, MOVIGEAR® drive units can be equipped with OS1 to OS3 surface protection as an option. The special procedure Z can also be performed in addition. Special measure Z means that large contour recesses are filled with rubber before painting.

Surface protection		Ambient conditions	Sample applications
Standard		Suitable for machines and systems in buildings and rooms indoors with neutral atmospheres. Similar to corrosivity category[1]: • C1 (negligible)	• Machines and systems in the automobile industry • Conveyor systems in logistics areas • Conveyor systems at airports
OS1		Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as applications outdoors under roof or with protection. Similar to corrosivity category[1]: • C2 (low)	• Systems in saw mills • Hall gates • Agitators and mixers
OS2		Suited for environments with high humidity or mean atmospheric contamination, such as applications outdoors subject to direct weathering. Similar to corrosivity category[1]: • C3 (moderate)	• Funiculars and chair-lifts • Applications in gravel plants
OS3		Suited for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasionally acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. Similar to corrosivity category[1]: • C4 (high)	• Sewage treatment works • Port cranes • Mining applications
HP200 high protection surface treatment[2]		For hygienic areas in the food and beverage industry with regular acidic and caustic wet cleaning. Anti-stick properties support the cleaning process even in inaccessible areas.	• Hygienic and aseptic conveyors in the beverage industry • Systems in cheese dairies and butcher shops • "Splash zones" in the food industry

1) According to DIN EN ISO 12 944-2

2) Only in connection with the optional variant for wet areas

3.2.3 Special protective measures

Output shafts can be treated with special optional protective measures for operation subject to severe environmental pollution or in particularly demanding applications.

Measure	Protection principle	Suitable for
Fluorocarbon rubber oil seal (standard for MOVIGEAR® drive units)	High quality material	Drives subject to chemical contamination
Surface treatment on output shaft end	Surface treatment on the contact surface of the oil seal	Severe environmental impact and in conjunction with fluorocarbon rubber oil seal
Output shaft made of stainless steel (when using the design for use in wet areas - standard)	Surface protection with high-quality material	Particularly demanding applications in terms of surface protection

3.2.4 NOCO® fluid

SEW-EURODRIVE supplies NOCO® fluid, an anti-corrosion agent and lubricant, with every MOVIGEAR® drive unit with hollow shaft as standard. Use NOCO® fluid when installing hollow shaft gear units. Using this fluid can help prevent contact corrosion and makes it easier to disassemble the drive at a later time. NOCO® fluid is also suitable for protecting machined metal surfaces that do not have corrosion protection, such as parts of shaft ends or flanges. You can also order NOCO® fluid in larger quantities from SEW-EURODRIVE.

NOCO® fluid is a food grade substance according to NSF-H1. The food grade NOCO® fluid has a corresponding NSF-H1 label on the packaging.

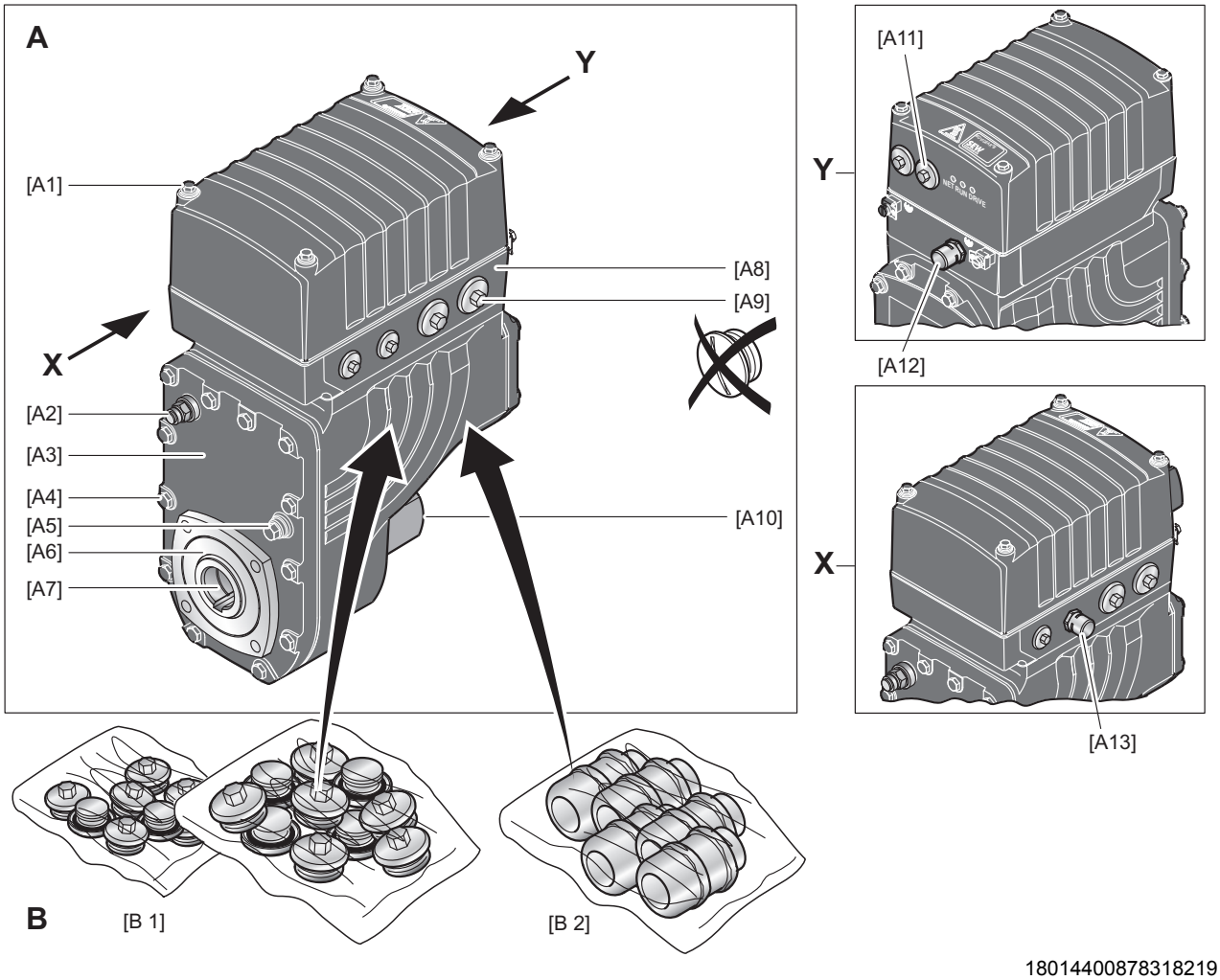
3.3 MOVIGEAR® with optional design for wet areas

INFORMATION

Slight color differences are possible in the HP200 surface finish due to the treatment process (individual treatment of the components).

The following figure shows the additional features of MOVIGEAR® drive units with the optional design for applications in wet areas:

- The variant for use in wet areas is delivered as standard with screw plugs made of stainless steel.
- Plastic screw plugs can be chosen instead. To achieve degree of protection IP66 and compatibility with cleaning agents, you have to replace the plastic screw plugs by suitable screw fittings made of stainless steel.



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In this publication, all illustrations depicting the version for use in wet areas are displayed with a shading (= HP200 surface protection).

A **Scope of delivery**

[A1] Mounting screws for cover made of stainless steel

[A2] Breather valve mounted and activated according to mounting position, see chapter "Technical data and dimension sheets"

[A3] HP200 surface protection, see chapter "Technical data and dimension sheets"

[A4] Mounting screws for gear unit housing made of stainless steel

[A5] Oil screw plug made of stainless steel (hexagon)

[A6] Fluorocarbon rubber oil seal

[A7] Output shaft made of stainless steel

[A8] Connection ring only possible with cable outlet pointing "downward" or "on the side":

– In connection with mounting positions M1, M2, M3*: 2 + 3, 2 + X, X + 3, 2 + X + 3

– In connection with mounting position M4: 2 + X

– In connection with mounting position M5: X + 3

– In connection with mounting position M6: 2 + 3

[A9]

Standard:	Optional:
Screw plugs made of stainless steel	Plastic screw plugs To achieve degree of protection IP66 and compatibility with cleaning agents, you have to replace the plastic screw plugs by suitable screw fittings made of stainless steel.

[A10] Additional cover opposite the output side

[A11] Screw plugs made of stainless steel in the electronics cover (only in connection with DBC and DAC versions)

[A12] Factory-installed pressure compensation fitting (M16) with mounting positions M5, M6

[A13] Factory-installed pressure compensation fitting (M16) with mounting position M1, M2, M4, M4

Optional plug connectors (see chapter "Electrical installation") are available when using the version for use in wet areas.

B **Required screw fittings**

[B1] Screw plugs made of stainless steel [1)]

[B2] Cable glands made of stainless steel [1)]

* = Mounting position M3 only possible after consultation with SEW-EURODRIVE

The required screw fittings can be ordered from SEW-EURODRIVE. For an overview, refer to chapter "Optional metal screw fittings".

1) Make sure to select plug seals that are compatible with the cleaning agents used

3.3.1 Permitted mounting positions

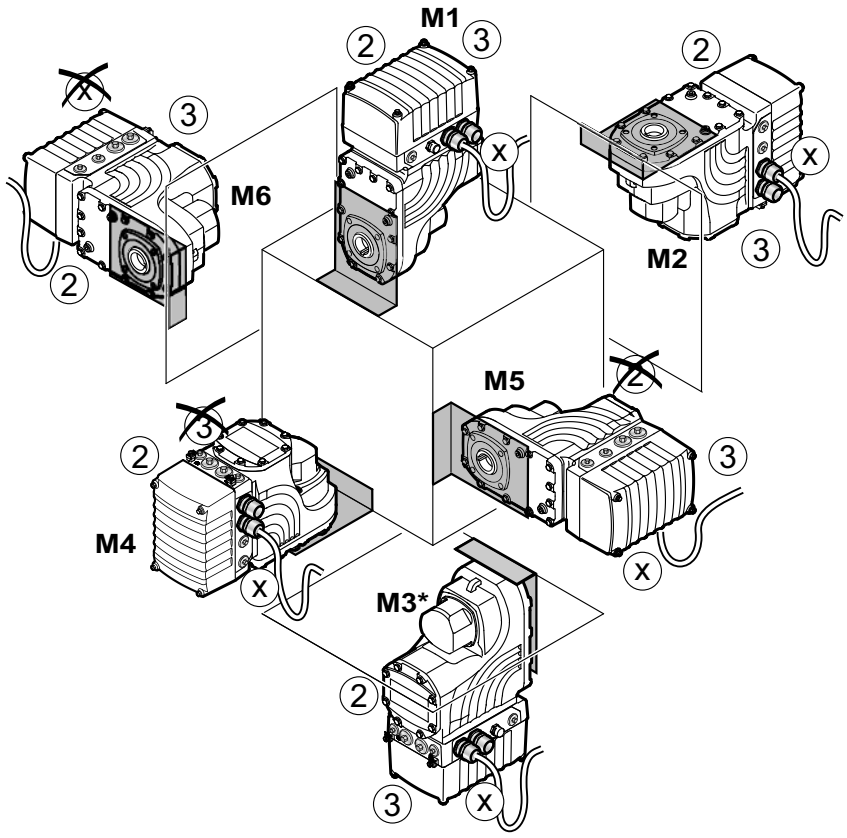
MOVIGEAR® drive units in optional design for use in wet areas are delivered with pressure compensation and breather valve installed according to the mounting position.

This is why MOVIGEAR® drive units with optional design for use in wet areas must be used only in the mounting position specified in the order:

- Mounting position
  - M1
  - M2
  - M3 (only after consultation with SEW-EURODRIVE)
  - M4
  - M5
  - M6
- Cable entries
  - Position 3 (not possible with M4 mounting position)
  - Position 2 (not possible with M5 mounting position)
  - Position X (not possible with M6 mounting position)

Mounting positions

The following figure shows the MOVIGEAR® drive unit installed in mounting positions M1 to M6.



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***** = Mounting position M3 only possible after consultation with SEW-EURODRIVE

3.4 Sealing material

3.4.1 Resistance to cleaning agents

The sealing material used in MOVIGEAR® drive units has been tested for resistance to cleaning agents.

Resistance to the following cleaning agents was proven in the tests performed by the company ECOLAB®:

Alkaline and chlorinated alkaline foam cleaning agents		
Designation	**Application concentration**	**Application temperature**
P3-topax 19	5%	40 °C

Acid foam cleaning agents		
Designation	**Application concentration**	**Application temperature**
P3-topax 56	5%	40 °C
P3-topax 58	5%	40 °C

TFC cleaner		
Designation	**Application concentration**	**Application temperature**
P3-topactive 200	4%	40 °C
P3-topactive 500	4%	40 °C

Disinfectant		
Designation	**Application concentration**	**Application temperature**
P3-topax 990	5%	23 °C

DI water	–	40 °C

Product specifications:

P3-topax 19	Alkaline foam cleaning agent
P3-topax 56	Acid foam cleaning agent based on phosphoric acid
P3-topax 58	Acid foam cleaning agent based on organic acids
P3-topactive 200	Alkaline cleaning agent for operational cleaning as TFC application
P3-topactive 500	Acid cleaning agent for operational cleaning as TFC application
P3-topax 990	Alkaline foam disinfectant based on alkylamine acetate
DI water	Demineralized water

3.5 HP200 surface treatment

INFORMATION

The information in this chapter is based on the current technical knowledge and experience. No legally binding guarantee of certain properties or of the suitability for a specific application purpose can be derived from the given information.

3.5.1 Characteristics

Thermoplastic fluorinated polymer coating with nearly non-porous surface, excellent anti-stick properties and chemical resistance. Approved for contact with food.

3.5.2 Properties

The HP200 surface finish has the following properties:

HP200 surface treatment	
Anti-adhesive properties	Excellent
Wear resistance	Good, not suitable for abrasion or high pressure
Chemical resistance	Excellent
Solvent resistance	Not soluble
Corrosion resistance	DIN 50021, > 1000 h depending on layer structure
Flammability	Not flammable
Temperature resistance	–40 to +200 °C, thermoplastic behavior
Layer thickness	Approx. 25 µm
Color	Silver-gray Slight color differences are possible in the HP200 surface finish due to the treatment process (individual treatment of the components).
Food grade approval	Approved according to German Federal law and US FDA (no. 21 CFR 175.300)

3.5.3 Cleaning

Do not mix cleaning and disinfecting agents under any circumstances.

Never mix acids and chloralkalis, as poisonous chlorine gas will result.

Strictly observe the safety instructions of the cleaning agent manufacturer.

3.5.4 Certificate of Ecolab Deutschland GmbH

Ecolab Deutschland GmbH
P.O. Box 13 04 06
D-40554 Düsseldorf

certifies that

a material resistance test

was performed for

SEW-EURODRIVE GmbH & Co. KG
Ernst-Blickle-Straße 42
D-76646 Bruchsal

with the following cleaning agents and disinfectants:
P3-topax 19, **P3-topax 56**, **P3-topax 58**, **P3-topax 686**, **P3-topactive 200**, **P3-topactive 500**, **P3-topactive DES**, **P3-topax 990** and **P3-oxysan ZS**, and **demineralized water**.

The protective properties of the **High Protection surface treatment HP 200** tested against the above-mentioned Ecolab products used in the test can be considered to be positive according to the cleaning procedures mentioned overleaf.

Düsseldorf, 14 August 2009

Ecolab Deutschland GmbH

i.V.

Thomas Wershofen
Manager Corporate Service RD&E
Center of Excellence EMEA
Food & Beverage Division

i. A.

Karin Uhlenbrock
Service Engineer RD&E
Center of Excellence EMEA
Food & Beverage Divsion

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This certificate for the HP200 surface treatment is based on

- documented test procedures on material resistance
- defined product specifications
- a standardized cleaning procedure

Test procedure

Dipping test:
- Immersion into the test medium with contact surface toward ambient air

Test period:
- 7 days

Evaluation:
- Evaluation approx. 7 days after regeneration
- Evaluation of changes of the protective properties according to DIN EN ISO 4628-1
- Evaluation of decorative changes (color, brightness, blistering)
  (+) no changes
  (o) possible minor changes
  (-) possible changes under long-term influence

The HP200 surface treatment was tested in the following media:

Alkaline and chlorinated foam cleaners			
P3-topax 19	5%	40°C	o
P3-topax 686	5%	40°C	o

Acid foam cleaning agents			
P3-topax 56	5%	40°C	o
P3-topax 58	5%	40°C	+

TFC cleaning agents			
P3-topactive 200	4%	40°C	o
P3-topactive 500	4%	40°C	o

Disinfectants			
P3-topax 990	5%	23°C	+
P3-topactive DES	3%	23°C	+
P3-oxysan ZS	1%	23°C	+

DI water	-	40°C	+

Product specifications:

P3-topax 19
Alkaline foam cleaning agent
P3-topax 56
Acid foam cleaning agent based on phosphoric acid
P3-topax 58
Acid foam cleaning agent based on organic acids
P3-topax 686
Alkaline foam cleaning agent with active chlorine
P3-topactive 200
Alkaline cleaning agent for operational cleaning as TFC application
P3-topactive 500
Acid cleaning agent for operational cleaning as TFC application
P3-topax 990
Alkaline foam disinfectant based on alkylamine acetate
P3-topactive DES
Foam and TFC capable disinfectant based on H_2O_2 and peroxy acid
P3-oxysan ZS
Disinfectant based on peroxy compounds
DI water
Demineralized water

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3.6 Extended storage

3.6.1 Drive

NOTICE

Volatilization of the VCI anti-corrosion agent

Possible damage to property

- MOVIGEAR® drive units must be kept tightly closed until they are started up.

INFORMATION

For storage periods longer than 9 months, SEW-EURODRIVE recommends the "Extended storage" variant. MOVIGEAR® drive units of this type are designated with a corresponding label.

A VCI corrosion inhibitor (volatile corrosion inhibitor) is added to the lubricant in these MOVIGEAR® drive units. Please note that this VCI corrosion inhibitor is only effective in a temperature range between -25 °C and +50 °C. The shaft ends are also treated with an anti-corrosion agent. If not specified otherwise, the MOVIGEAR® drive units in "extended storage" design are equipped with OS2 surface protection. You can also order OS3 instead of OS2. For further information, refer to chapter "Surface protection".

3.6.2 Storage conditions

Observe the storage conditions specified in the following table for extended storage:

Climate zone	Packaging[1)]	Storage location[2)]	Storage duration
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap.	Under roof, protected against rain and snow, no shock loads.	Up to 3 years with regular checks of the packaging and moisture indicator (rel. humidity < 50%).
	Open	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). Protected against aggressive vapors and shocks.	2 years or more with regular inspections. Check for cleanness and mechanical damage during inspection. Check corrosion protection.
Tropical (Asia, Africa, Central and South America, Australia, New Zealand excluding temperate zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap. Protected against insect damage and mildew by chemical treatment.	With roof, protected against rain and shocks.	Up to 3 years with regular checks of the packaging and moisture indicator (rel. humidity < 50%).
	Open	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No aggressive vapors, no shocks. Protected against insect damage.	2 years or more with regular inspections. Check for cleanness and mechanical damage during inspection. Check corrosion protection.

1) The packaging must be carried out by an experienced company using the packaging materials that have been explicitly specified for the particular application.

2) SEW-EURODRIVE recommends to store the drive according to the mounting position.

3.6.3 Electronics

If the unit is stored for a long time, connect it to the supply system voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.

Procedure in case maintenance has been neglected

Electrolytic capacitors are used in the inverters. They are subject to aging effects when de-energized. This effect can damage the capacitors if the unit is connected using the nominal voltage after a longer period of storage. If you have not performed maintenance regularly, SEW-EURODRIVE recommends that you increase the line voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview. After you have completed the regeneration process, the unit can be used immediately or stored again for an extended period with maintenance.

The following stages are recommended:

AC 400/500 V units:

- Stage 1: AC 0 V to AC 350 V within a few seconds
- Stage 2: AC 350 V for 15 minutes
- Stage 3: AC 420 V for 15 minutes
- Stage 4: AC 500 V for 1 hour

4 Type Designations and Variants

4.1 MOVIGEAR® drive unit

The following table shows the type designation of MOVIGEAR®:

M G F A S 2 – D S M – SNI – B / ECR

MOVIGEAR® option
DSP = Electrodynamic deceleration function DynaStop®
ECR = Extended control range
XT = Increased torque
IV = Plug connectors
WA = Version for use in wet areas

MOVIGEAR® version

MOVIGEAR® installation technology
DBC = Direct Binary Communication
DAC = Direct AS-Interface Communication
DSC = Direct SBus Communication
SNI = Single Line Network Installation

Motor type

Size
2 = Torque class 200 Nm
4 = Torque class 400 Nm

Housing mounting
T = Drive with torque arm
S = Housing with threads for mounting a torque arm

Shaft type
A = Shaft-mounted gear unit (hollow shaft with key)
T = TorqLOC® hollow shaft mounting system

Gear unit type
F = Parallel-shaft helical gear unit

Product line
MG = MOVIGEAR®

4.2 MOVIGEAR® electronics cover

The following table shows the type designation of the electronics cover:

M G x 4 – 5 0 3 – SNI – B – 10 – A / XT

Electronics cover option
XT = Increased torque

Electronics cover variant
A = With application slot[1)]
0 = Without application slot

Design
10 = Die-cast design (standard)
11 = Die-cast design (wet areas)

MOVIGEAR® version

MOVIGEAR® installation technology
DBC = Direct Binary Communication
DAC = Direct AS-Interface Communication
DSC = Direct SBus Communication
SNI = Single Line Network Installation

Connection type
3 = 3-phase

Supply voltage
50 = AC 380 – 500 V

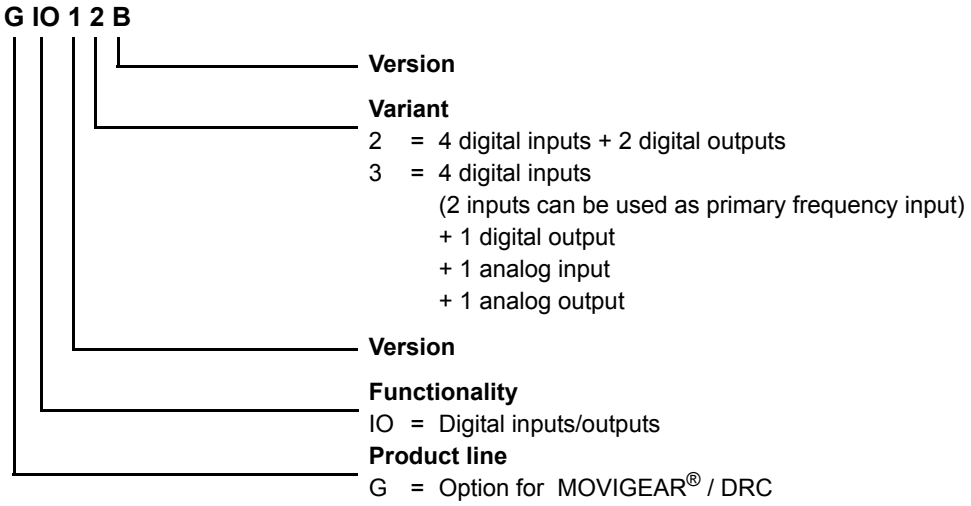
Size
2 = Torque class 200 Nm
4 = Torque class 400 Nm

Product line
MG = MOVIGEAR®

1) Only available for MOVIGEAR® DSC-B and MOVIGEAR® SNI-B

4.3 Type designation of application options

The following table shows the type designation for the available application options:



4.3.1 Notes on the version of the application option

INFORMATION

For electronics covers in die-cast design, you can only use application options GIO12B and GIO13B. For electronics covers in sand-cast design, you can only use application options GIO12A and GIO13A .

You can identify units with die-cast housing by means of the type designation of the electronics cover.

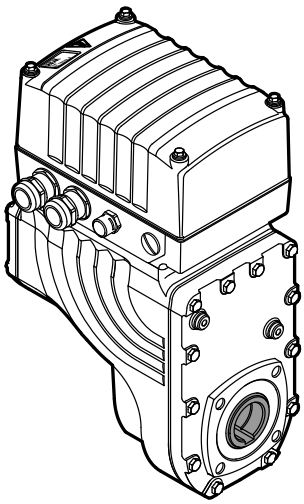
Application options	
Variant	**Part number**
GIO12A application option	On request
GIO13A application option	On request
GIO12B application option	Part number 1 823 801 7
GIO13B application option	Part number 1 822 652 3

4.4 Shaft types

MOVIGEAR® is available with the following shaft types:

4.4.1 MOVIGEAR® with hollow shaft and keyway (MGFA..)

The following figure shows a MOVIGEAR® unit with hollow shaft and keyway:



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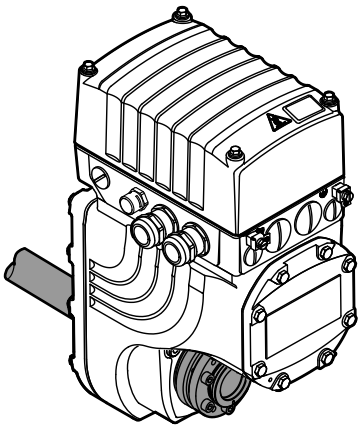
4.4.2 MOVIGEAR® with TorqLOC® hollow shaft mounting system (MGFT..)

The following figure shows a MOVIGEAR® unit with TorqLOC® hollow shaft mounting system



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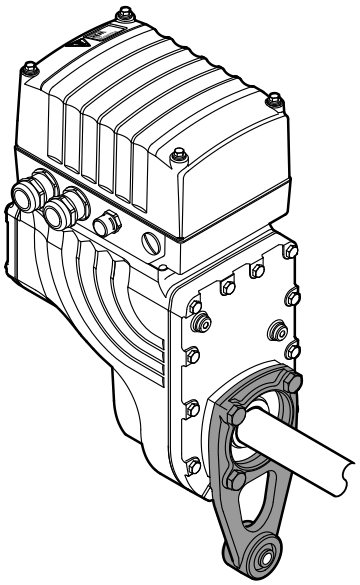
4.5 Housing mounting

4.5.1 Torque arm (MGF.T)

The following figure shows the torque arm for MGF.T:



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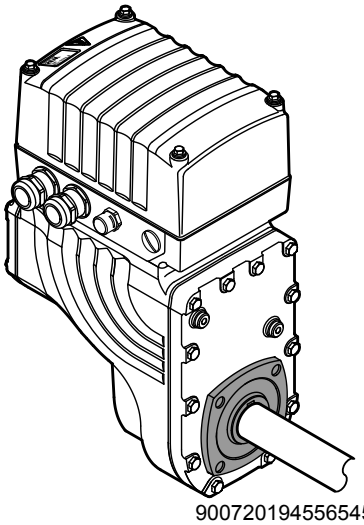
4.5.2 Housing with threads (MGF.S)

The following figure shows the housing type with threads for mounting a torque arm. This type does not include a centering shoulder, which means it is not suitable for direct installation to the machine:



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5 Mounting Positions and Important Order Information

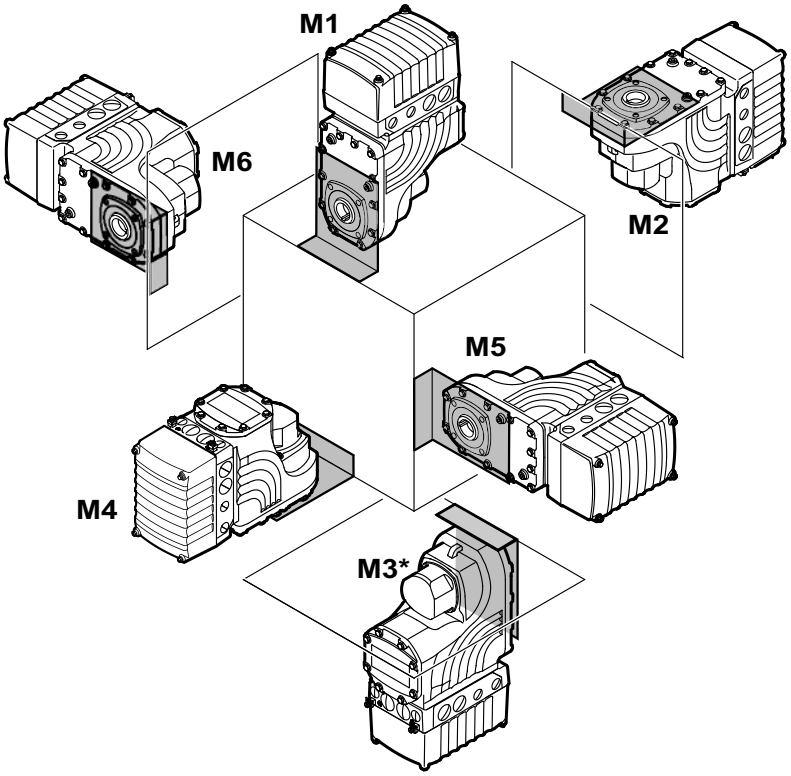
5.1 Mounting position designation

The following mounting positions are possible for MOVIGEAR® drive units:

- Specified mounting position: M1 or M2 or M3* or M4 or M5 or M6
- Universal use in mounting positions M1, M2, M3*, M4, M5, M6

5.1.1 Mounting positions M1 to M6

The following figure shows the position of MOVIGEAR® in mounting positions M1 to M6.



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***** = Mounting position M3 only after consultation with SEW-EURODRIVE

5.2 Important order information

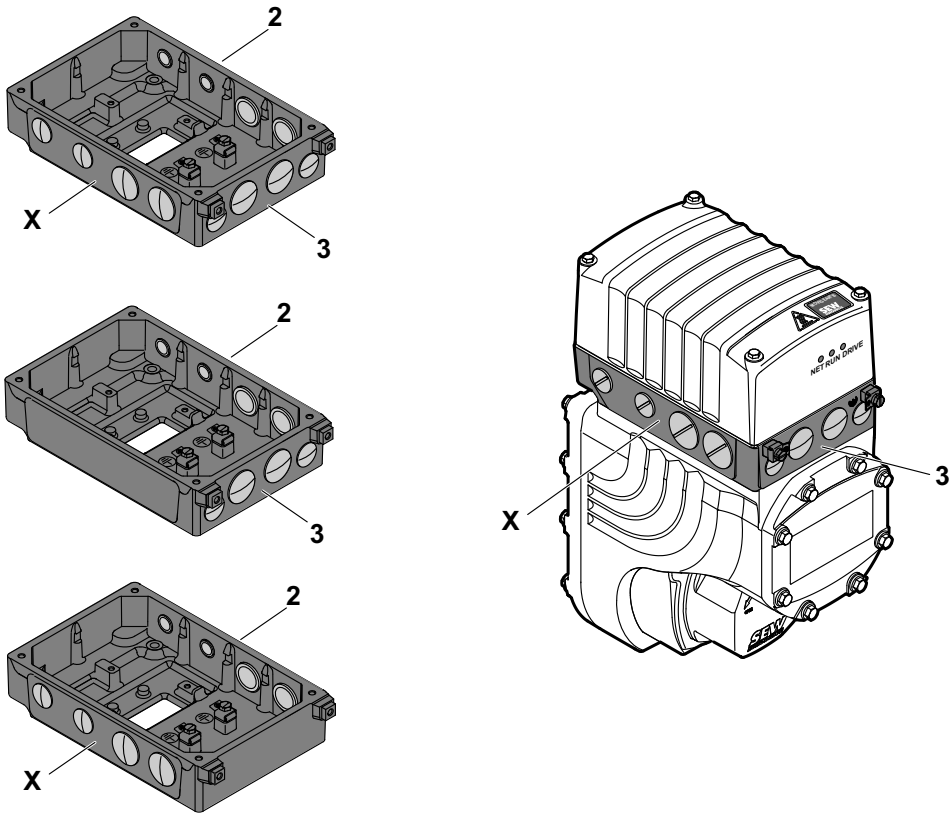
5.2.1 Cable entry positions

The following cable entries are possible for MOVIGEAR® drive units:

- Position X + 2
  - X: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 2: 2 x M25 x 1.5 + 2 x M16 x 1.5
- Position X + 2 + 3
  - X: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 2: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 3: 2 x M25 x 1.5 + 2 x M16 x 1.5
- Position X + 3
  - X: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 3: 2 x M25 x 1.5 + 2 x M16 x 1.5
- Position 2 + 3
  - 2: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 3: 2 x M25 x 1.5 + 2 x M16 x 1.5

Overview

The following figure depicts possible cable entries[1]:



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1) 1 x M16 x 1.5 reserved for pressure compensation fitting (only in conjunction with design for wet areas)

5.2.2 Electronic variant

The following electronics variants are availble for MOVIGEAR®:

- **Installation technology**

  You can order MOVIGEAR® drive units with the following installation technology:

  – DBC = **D**irect **B**inary **C**ommunication

  – DAC = **D**irect **A**S-Interface **C**ommunication

    For DAC, you can choose between the variants binary slave GLK30 or double slave GLK31.

  – DSC = **D**irect **S**Bus **C**ommunication

  – SNI = **S**ingle Line **N**etwork **I**nstallation

  Refer to the "System Description" chapter for additional information on the installation technology.

- **Electronics cover variant**

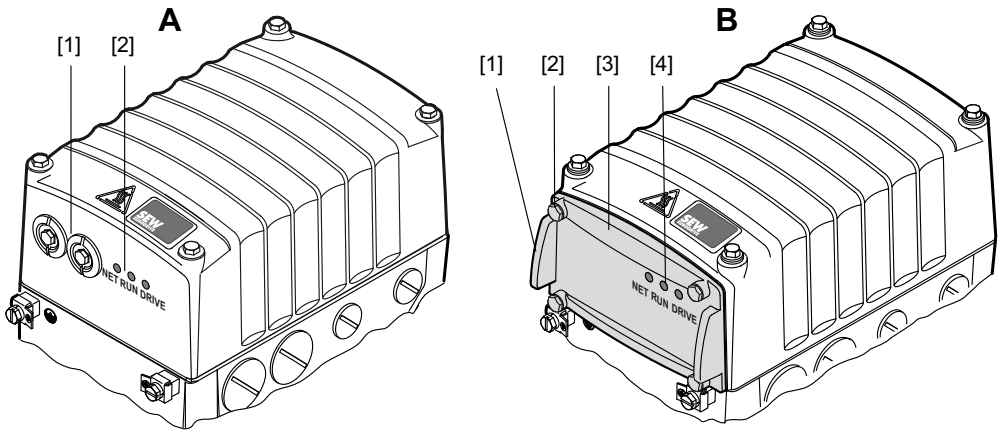
  The following types of electronics covers are available for all MOVIGEAR® DSC-B and MOVIGEAR® SNI-B sizes (MGF.2, MGF.4 and MGF.4/XT):

  – Electronics cover without application slot

  – Electronics cover with application slot and application cover (for integrating application options)

  The electronics cover of MOVIGEAR® DBC-B and MOVIGEAR® DAC-B is designed without application slot.

  The following figure shows possible types of the electronics cover:



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A	**Electronics cover without application slot**	**B**	**Electronics cover with application slot**
[1]	Screw fittings For setpoint potentiometer / Diagnostic interface (only in connection with with DBC/DAC electronic variant)	[1]	Assembly/disassembly handle
		[2]	Retaining screws (4x)
		[3]	Application cover
		[4]	LED indicators
[2]	LED indicators		

For an overview of available application options, refer to chapter "Type designations and variants".

- **DynaStop® – The electrodynamic deceleration function (/DSP option)**
  - The function allows for creating a speed-dependent torque when the motor is de-energized or when "controller inhibit" is activated.
  - This prevents the application from excessive acceleration due to external forces (e.g. sagging on inclining tracks)
  - See chapter "Project Planning" for more information.
- **Extended control range (/ECR option)**
  - This design allows for operating MOVIGEAR® drive units with an extended control range (speed range from 1 rpm to 2000 rpm).
  - For more information, refer to chapter "MOVIGEAR® drive units/selection tables".
- **Increased torque (/XT option)**
  - Optional increase of nominal motor torque in continuous duty.
  - Note that the contour dimension of the MOVIGEAR® electronics cover and the drive unit is different when using this option (see chapter "MOVIGEAR® drive units / Dimension drawings").
  - For more information, refer to chapter "MOVIGEAR® drive units/selection tables".

5.2.3 Plug connectors

MOVIGEAR® B is supplied without plug connector unless specified otherwise in the order. Exception: MOVIGEAR® DAC-B is supplied with the following plug connectors as standard:

- X4271: AS-Interface communication interface
- X5011: AS-Interface sensors

For more information, refer to chapter "Technical data of MOVIGEAR® / Plulg connectors."

Plug connector variant

⚠ NOTICE

Possible damage of the right-angle connector in case of rotation without mating connector.

Irreparable damage to the thread, damage to the sealing surface.

- Do not use pliers to adjust the right-angle connector before connecting it.

⚠ NOTICE

Adjusting the right-angle connector too often can damage it.

Potential damage to property

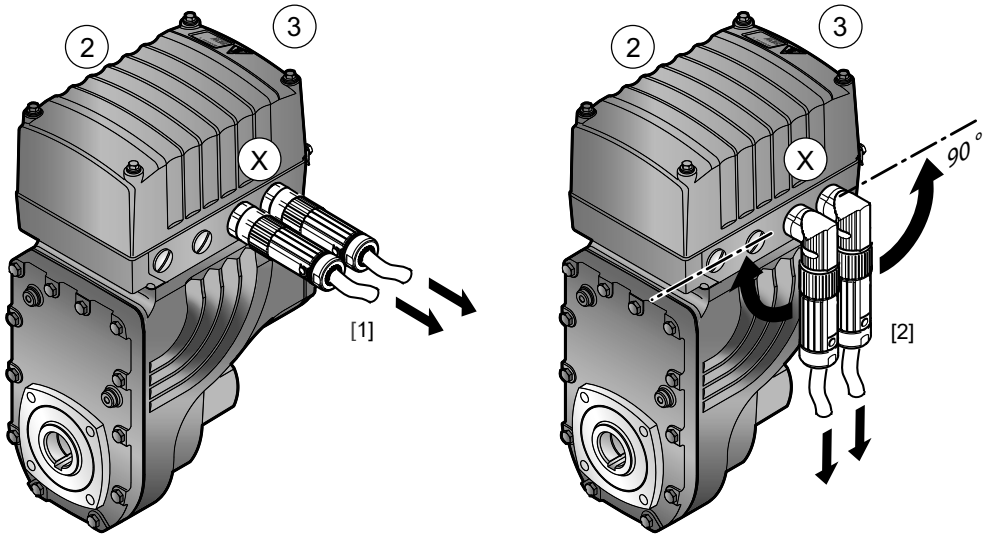
- Adjust the plug connector only when installing and connecting the drive unit.
- Make sure the plug connector is not moved regularly once it has been installed.

The following M23 plug connectors are available:

- [1] "Straight" plug connector
- [2] "Right-angle" plug connector

Once the mating connector has been plugged in, the "right-angle" connector can be adjusted without using additional tools.

Example



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INFORMATION

For the MOVIGEAR® variant MGF..4/**XT** with increased torque, the "right-angle" type is not possible with plug connector position 3.

5.2.4 Design for use in wet areas

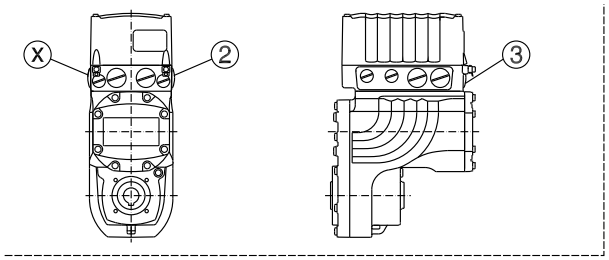
Observe the notes in chapter "Product Description / MOVIGEAR® with optional design for use in wet areas.

5.2.5 Change in mounting position

Make sure to read the following information when you operate the drive unit in a mounting position other than the one indicated in the order:

- Adjust the position of the breather valve and, if necessary, the position of the pressure compensation fitting.

5.3 Mounting positions



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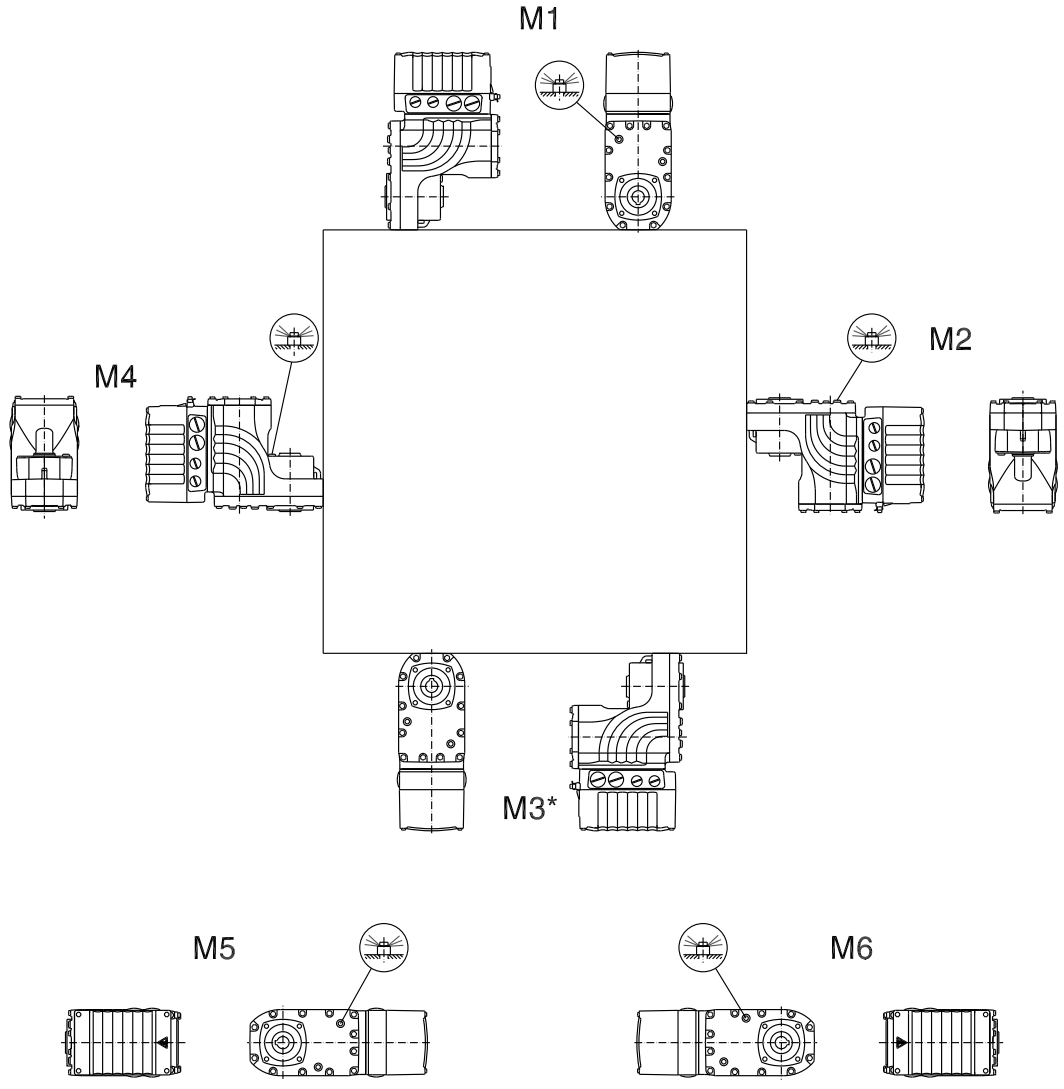

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***** = Mounting position M3 only after consultation with SEW-EURODRIVE

= Breather valve

6 Design and Operating Notes

6.1 Lubricants

6.1.1 Lubricant fill quantities of the die-cast variant

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific gear ratio.

MGF..2		MGF..4	
Gear ratio i	**Fill quantities in liters For mounting positions M1, M2, M3*, M4, M5, M6**	**Gear ratio i**	**Fill quantities in liters For mounting positions M1, M2, M3*, M4, M5, M6**
55.25	0.59 l	56.49	1.3 l
51.51		48.00	
45.03		42.86	
42.19		36.6	
37.24		34.29	
33.02		28.89	
28.07		25.72	1.37 l
22.86	0.63 l	21.82	
19.81		19.70	
18.52		17.33	
16.00		16.36	
13.60		13.93	
12.14		12.66	
10.37		10.97	
9.71		8.96	1.41 l
8.24	0.68 l	7.88	
7.00		7.44	
6.25		6.34	
5.34		5.76	
5.00		4.99	

* M3 mounting position only after consultation with SEW-EURODRIVE

= Preferred gear ratio

6.1.2 Key to lubricant tables

Abbreviations, meaning of shading and notes:

CLP HC	= Synthetic hydrocarbons
E	= Ester oil (water hazard classification 1)
HCE	= Synthetic hydrocarbons + ester oil (USDA - H1 certification)
	= Synthetic lubricant (= synthetic-based roller bearing grease)
4)	Observe the critical starting behavior at low temperatures.
6)	Ambient temperature
	Lubricant for the food industry (food grade oil)
	Biodegradable oil (lubricant for agriculture, forestry, and water management)

6.1.3 Rolling bearing grease

The rolling bearings are filled with the following greases at the factory:

	Ambient temperature	Manufacturer	Type
Gear unit rolling bearings	-40°C ... +80°C	Fuchs	Renolit CX-TOM15[1)]
	-40°C ... +80°C	Klüber	Petamo GHY 133 N
Special grease for gear unit rolling bearings			
	-40°C ... +40°C	Castrol	Obeen FS 2
	-20°C ... +40°C	Fuchs	Plantogel 2S

1) Rolling bearing grease based on semi-synthetic base oil.

6.1.4 Lubricant table

The following table shows the permitted lubricants:

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	6) °C	DIN (ISO)	ISO,NLGI	Mobil®	Shell	Klüber	Aral	Texaco	Tribol	Optimol / Castrol	Fuchs	Total
MGF	Standard -20 … +60	CLP HC	VG 220	Mobil SHC 630	Shell Omala S4 GX 220	Klüberoil GEM 4-220 N	Aral Degol PAS 220	Pinnacle EP 220	Tribol 1510/220	Optigear Synthetic X 220	Renolin Unisyn CLP 220	
	-40 … +40	CLP HC	VG 150	Mobil SHC 629	Shell Omala S4 GX 150	Klübersynth GEM 4-150 N		Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	4) -40 … +20	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68						Renolin Unisyn CLP 68	
	4) -40 … 0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32		Cetus PAO 46		Optileb HY 32	Renolin Unisyn OL 32	
	-10 … +40	CLP HC NSF H1	VG 460			Klüberoil 4UH1-460 N				Optileb GT 460	Cassida Fluid GL 460	Dacnis SH 32
	-20 … +30		VG 220			Klüberoil 4UH1-220 N				Optileb GT 220	Cassida Fluid GL 220	
	4) -40 … 0		VG 68			Klüberoil 4UH1-68 N				Optileb HY 68	Cassida Fluid HF 68	
	4) -20 … +40	E	VG 460		Shell Naturelle Gear Fluid EP 460	Klüberbio CA2-460					Plantogear 460 S	

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6.2 Design notes for gear units with hollow shaft and key

INFORMATION

Always use the supplied NOCO® fluid for assembly. The fluid prevents contact corrosion and facilitates subsequent disassembly.

The key dimension X is defined by the customer; however, X must be > DK.

6.2.1 Installation

SEW-EURODRIVE recommends 2 variants for installing the hollow shaft and key on the input shaft of the driven machine (= customer shaft):

1. Use the provided fastening parts for installation.
2. Use the optional assembly/disassembly kit for installation.

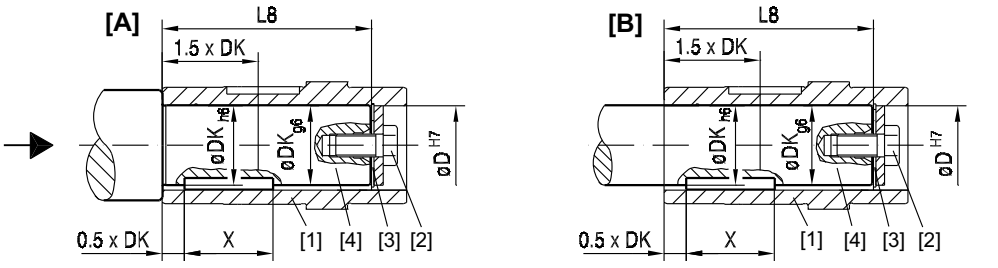
6.2.2 1. Supplied fastening parts

The following fastening parts are provided as standard:

- Retaining screw with washer [2]
- Retaining ring [3]

Customer shaft

00 001 00 02



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[1] Hollow shaft
[2] Retaining screw with washer
[3] Retaining ring
[4] Customer shaft

- The installation length of the customer shaft with contact shoulder [A] must be L8 - 1 mm.
- The installation length of the customer shaft without contact shoulder [B] must equal L8.

Dimensions and tightening torque

The retaining screw [2] must be tightened to the tightening torque MS given in the following table.

Gear unit type	D^{H7} [mm]	DK [mm]	L8 [mm]	MS [Nm]
MGFA.2	25	25	100	20
MGFA.2	30	30	101	20
MGFA.4	30	30	124	20
MGFA.4	35	35	123.5	20
MGFA.4	40	40	123	40

6.2.3 2. Assembly/disassembly kit

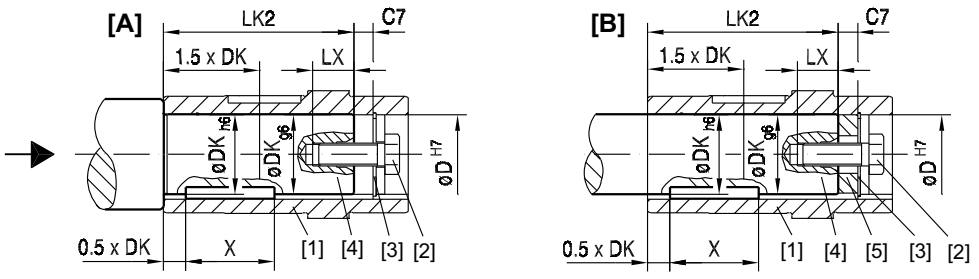
You can use the optional assemblydisassembly kit for installation. You can order the kit for the specific size by quoting the part numbers in the table below. The delivery includes:

- Spacer tube for installation without contact shoulder [5]
- Retaining screw for installation [2]
- Forcing washer for removal [7]
- Locked nut for removal [8]

The short retaining screw delivered as standard is not required.

Customer shaft

00 002 00 02



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[1] Hollow shaft
[2] Retaining screw with washer
[3] Retaining ring
[4] Customer shaft
[5] Spacer tube

- The installation length of the customer shaft must be LK2. Do not use the spacer if the customer shaft **has a contact shoulder [A]**.
- The installation length of the customer shaft must be LK2. Use the spacer if the customer shaft **has a contact shoulder [B]**.

Dimensions, tightening torque, and part numbers

The retaining screw [2] must be tightened to the tightening torque MS given in the following table.

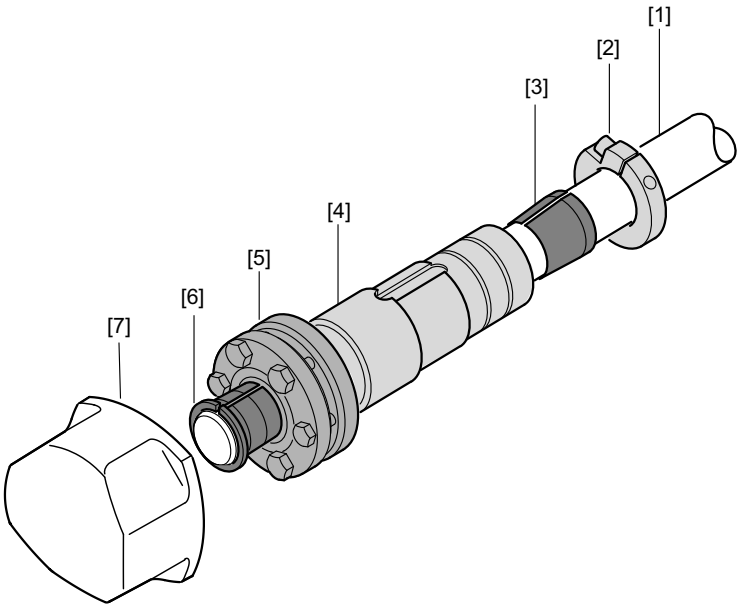
Type	D^{H7} [mm]	DK [mm]	LK2 [mm]	LX^{+2} [mm]	C7 [mm]	MS [Nm]	Part number of assembly/disassembly kit
MGFA.2	25	25	83.5	22	16	20	064 368 46
MGFA.2	30	30	84.5	22	16	20	064 368 54
MGFA.4	30	30	106	22	16	20	064 368 54
MGFA.4	35	35	105.5	28	18	20	064 368 62
MGFA.4	40	40	105.5	36	18	40	064 368 70

6.3 TorqLOC® hollow shaft mounting system for gear units with hollow shaft

6.3.1 Description of TorqLOC®

The TorqLOC® hollow shaft mounting system is used for creating a non-positive connection between the customer shaft and the drive. As a result, the TorqLOC® hollow shaft mounting system is an alternative to the hollow shaft with shrink disk, the hollow shaft with key and the splined hollow shaft that have been used so far.

The TorqLOC® hollow shaft mounting system consists of the following components:



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[1] Customer shaft
[2] Locking collar
[3] Conical bushing
[4] Hollow shaft in gear unit
[5] Shrink disk
[6] Conical bushing
[7] Protective canopy

6.3.2 Advantages of TorqLOC®

The TorqLOC® hollow shaft mounting system offers the following advantages:

- Cost savings because the customer shaft can be made from drawn material up to quality h11.
- Cost saving since different customer shaft diameters can be covered by one hollow shaft diameter and different bushings (→ reduction in the number of variants).
- Simple installation as there is no need to accommodate any shaft connections.
- Simple disassembly even after many hours of operation since the formation of contact corrosion has been reduced and the conical connections can easily be released.

7 Technical Data of MOVIGEAR®

7.1 MOVIGEAR® DBC-B

7.1.1 General technical data of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Torque class	M	200 Nm	400 Nm	
Supply voltages Permitted range	V_{line}	3 x AC 380 V - 5% to AC 500 V + 10%		3 x AC 400 V - 5% to AC 500 V + 10%
Line frequency	f_{line}	50 Hz ... 60 Hz		
Input current	I_N	1.52 A (n_{Motor} = 2000 rpm)	2.72 A (n_{Motor} = 2000 rpm)	3.46 A (n_{Motor} = 2000 rpm)
	$I_{max\ start}$	5.32 A	9.52 A	11.42 A
Nominal output current	$I_{N\ Motor}$	1.85 A	3.0 A	3.7 A
Current carrying capacity of terminals		See operating instructions, chapter "Electrical Installation / Installation instructions / Permitted cable cross section of terminals"		
PWM frequency		4 / 8 kHz		
Interference immunity		EN 61800-3; 2. Environment (industrial environment)		
Electromagnetic interference		EN 61800-3 category C3 (class A group 2 of EN 55011)		
Climate class		EN 60721-3-3, class 3K3		
Storage temperature	ϑ_F	− 25 °C to + 70 °C (EN 60721-3-3)		
Proof of mechanical strength		According to EN 61800-5-1		
Degree of protection	**IP**	Standard: IP65 according to EN 60529 (MOVIGEAR® housing closed and all cable glands sealed) With optional design for applications in wet areas: IP66 according to EN 60529 (MOVIGEAR® housing closed and all cable glands sealed)		
Duty cycle		S1, DB (EN 60034-1)		
Type of cooling		Self-cooling to DIN 41751 and EN 61800-5-1		
Signaling functions		Display elements on housing to indicate the unit state		
Installation altitude	h	Up to h ≤ 1000 m without restrictions. The following restrictions apply to heights ≥ 1000 m: • From 1000 m to max. 4000 m: – I_N reduction by 1% per 100 m • From 2000 m to max. 4000 m: – V_N reduced by AC 6 V per 100 m Over 2000 m only overvoltage class 2; external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.		
Required preventive measures		Grounding the unit		

7.1.2 Ambient temperature of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Electronic variant		**DBC-B, DAC-B, DSC,B**		
Ambient temperature	ϑ_A	– 25 °C to + 60 °C[1)]		
$I_{N\ motor}$ reduction Ambient temperature		3% I_N per K at 40 °C to 60 °C		

1) Observe the permitted temperature range of the oil to be used (see chapter "Lubricant table").

7.1.3 Binary inputs / signal relays

Binary inputs / signal relays		
Input type	DI01 to DI04	Isolated via optocoupler; PLC-compatible to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0\ k\Omega$, $I_E \approx 10\ mA$, sampling cycle ≤ 5 ms
Number of inputs		4
Signal level		+15 to +30 V = "1" = Contact closed –3 to +5 V = "0" = Contact open
Signal relays Contact data	K1a K1b	Response time ≤ 15 ms DC 24 V / 50 mA / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)
Signaling function		N.O. contact for ready signal Contact closed: – with voltage present – if no fault was detected – after completion of self-testing phase (when unit is turned on)

7.1.4 Internal voltage supply 24V_O

Internal voltage supply for non-safety-related enable signal via STO input		
Voltage supply	+24V_O 0V24_O	DC 24 V to EN 61131-2, interference voltage proof and short circuit proof
Permitted total current		60 mA
Required current for STO-IN supply		30 mA

7.1.5 Current carrying capacity of terminals and plug connectors

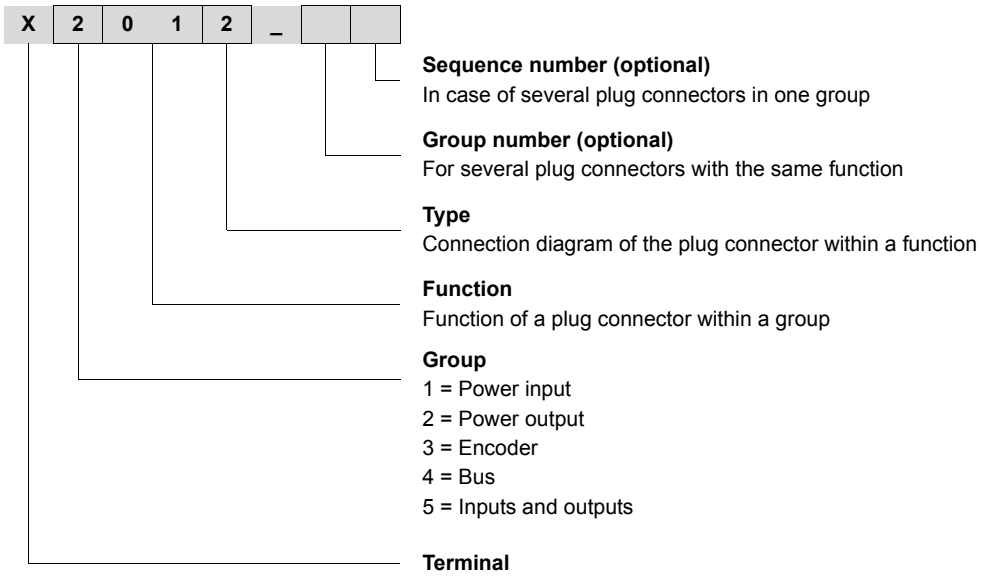
Current carrying capacity of terminals and plug connectors		
Supply system terminals	X2	24 A (max. loop-through current)
Control terminals	X7	3.5 A

7.1.6 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

Designation key

The designation of plug connectors is specified according to the following key:



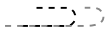
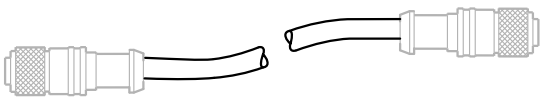
Connection cables

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation  Not suitable for cable carrier installation 
	Variable length	

Using plug connectors assembled by yourself

INFORMATION

Power and hybrid plug connectors as well as the associated assembly tools are also available from Intercontec.

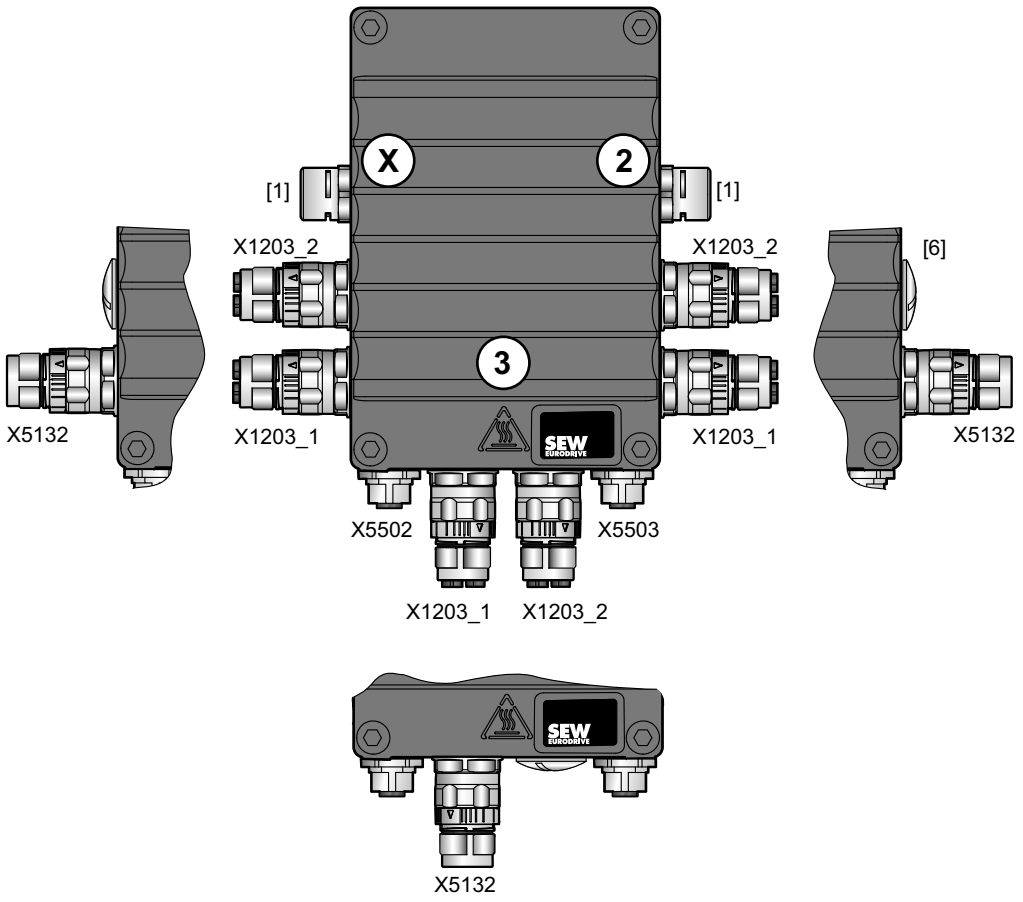
Plug connector positions

The following figure shows the possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connectors	Color	Position	Location
X5132: Digital inputs/outputs	–	As required	X, 2 or 3, not together with X1203_1, X1203_2
X5502: STO – IN	Orange	Fixed	3 (left)
X5503: STO – OUT	Orange	Fixed	3 (right)
X1203_1: AC 400 V connection [1)]	Black	As required	X, 2 or 3, not together with X5132
X1203_2: AC 400 V connection	Black	As required	X, 2 or 3, not together with X5132
[1] Pressure compensation [2)]	–	Fixed	Depends on mounting position

1) Plug connector X1203_1 is also available separately (that is without plug connector X1203_2).

2) Only in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).



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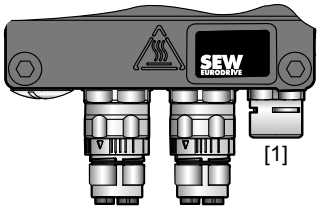
Restrictions in conjunction with pressure compensation

The position for STO plug connectors is occupied by the pressure compensation fitting [1] when using the optional design for use in wet areas (with MOVIGEAR®)/ASEPTIC^{plus} design (with DRC) and M5, M6 mounting position. In this case, plug connectors for STO are not possible:



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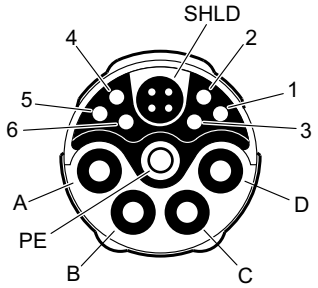
7.1.7 X1203_1 and X1203_2: AC 400 V connection

The following table shows information about this connection:

Function
AC 400 V connection for supplying the unit/for looping through
Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: black, protected against contact
Wiring diagram



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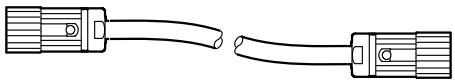
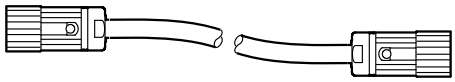
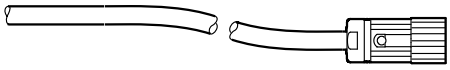
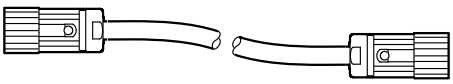
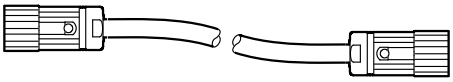
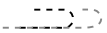
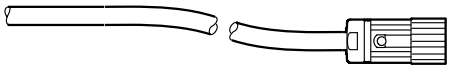
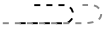
Assignment

No.	Name	Function
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

Connection cables The following table provides an overview of cables available for this connection:

Compliance	Connection cables	Length/ Installation type	Cable cross section	Operating voltage
CE	**Part number 1 812 746 0**  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 813 395 9 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 812 747 9  Open — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 813 396 7 Halogen-free  Open — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V

Compli-ance	Connection cables	Length/ Installa-tion type	Cable cross section	Operat-ing volt-age
CE	**Part number 1 812 748 7**  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 813 397 5 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 812 749 5  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 813 398 3 Halogen-free  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V

Connection of cables with open end

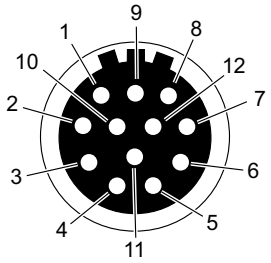
The following table shows the conductor assignment of cables with the following part numbers:

1 812 747 9, 1 813 396 7, 1 812 749 5 and 1 813 398 3

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow

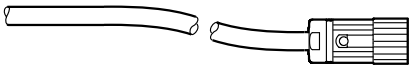
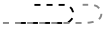
7.1.8 X5132: Digital inputs/outputs

The following table shows information about this connection:

Function		
Digital inputs/outputs for: MOVIGEAR®		
Connection type		
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded		
Wiring diagram		
 2264820107		
Assignment		
No.	**Name**	**Function**
1	DI01	Binary input DI01
2	DI02	Binary input DI02
3	DI03	Binary input DI03
4	DI04	Binary input DI04
5	n.c.	Not connected
6	K1a	Signal relay K1a
7	K1b	Signal relay K1b
8	+24V_O	DC 24 V output
9	0V24_O	0V24 reference potential
10	n.c.	Not connected
11	n.c.	Not connected
12	FE	Equipotential bonding/functional ground

Connection cables

The following table provides an overview of the cable available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 174 145 7  Open — M23, 12-pole, 0°-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
K1a	Green
K1b	Purple
+24V_O	Black
0V24_O	Brown
Reserved	White
Reserved	Gray/pink
FE	Red/blue

7.1.9 X5502: STO – IN

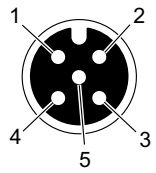
⚠ WARNING

No safety-related disconnection of the MOVIGEAR® drive unit.

Severe or fatal injuries.

- Do not use the 24 V output (pins 1 and 3) for safety-related applications with MOVIGEAR® drive units.
- You may only jumper the STO input with 24 V when the MOVIGEAR® drive unit need not fulfill any safety function.

The following table shows information about this connection:

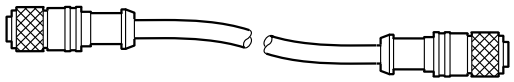
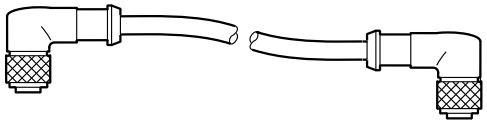
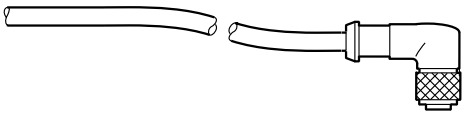
Function		
Input for safe torque off (STO)		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
 2264816267		
Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO −	Input STO –
3	0V24_O	0V24 reference potential
4	STO +	STO + input
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 497 6  Open — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 740 1  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 739 8  Open — M12, 5-pole, A-coded	Variable 	DC 60 V

Connection of cables with open end

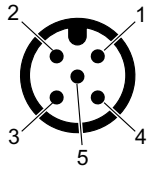
The following table shows the conductor assignment of cables with the following part numbers:

1 812 497 6 and 1 812 739 8

Signal name	Core color/designation
STO −	Black / 1
STO +	Black / 2

7.1.10 X5503: STO – OUT

The following table shows information about this connection:

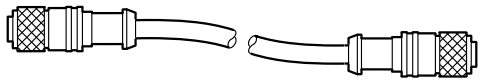
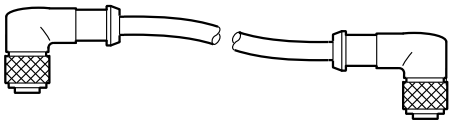
Function		
Connection for safe torque off (STO) for looping through		
Connection type		
M12, 5-pole, male, A-coded		
Wiring diagram		
 2264818187		
Assignment		
No.	**Name**	**Function**
1	res.	Reserviert
2	STO −	Output STO – (to loop through)
3	res.	Reserved
4	STO +	Output STO + (to loop through)
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 740 1  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V

7.2 MOVIGEAR® DAC-B

7.2.1 General technical data of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Torque class	M	200 Nm	400 Nm	
Supply voltages Permitted range	V_{line}	3 x AC 380 V - 5% to AC 500 V + 10%		3 x AC 400 V - 5% to AC 500 V + 10%
Line frequency	f_{line}	50 Hz ... 60 Hz		
Input current	I_N	1.52 A (n_{Motor} = 2000 rpm)	2.72 A (n_{Motor} = 2000 rpm)	3.46 A (n_{Motor} = 2000 rpm)
	$I_{max\ start}$	5.32 A	9.52 A	11.42 A
Nominal output current	$I_{N\ Motor}$	1.85 A	3.0 A	3.7 A
Current carrying capacity of terminals		See operating instructions, chapter "Electrical Installation / Installation instructions / Permitted cable cross section of terminals"		
PWM frequency		4 / 8 kHz		
Interference immunity		EN 61800-3; 2. Environment (industrial environment)		
Electromagnetic interference		EN 61800-3 category C3 (class A group 2 of EN 55011)		
Climate class		EN 60721-3-3, class 3K3		
Storage temperature	ϑ_F	− 25 °C to + 70 °C (EN 60721-3-3)		
Proof of mechanical strength		According to EN 61800-5-1		
Degree of protection	**IP**	Standard: IP65 according to EN 60529 (MOVIGEAR® housing closed and all cable glands sealed) With optional design for applications in wet areas: IP66 according to EN 60529 (MOVIGEAR® housing closed and all cable glands sealed)		
Duty cycle		S1, DB (EN 60034-1)		
Type of cooling		Self-cooling to DIN 41751 and EN 61800-5-1		
Signaling functions		Display elements on housing to indicate the unit state		
Installation altitude	h	Up to h ≤ 1000 m without restrictions. The following restrictions apply to heights ≥ 1000 m: • From 1000 m to max. 4000 m: – I_N reduction by 1% per 100 m • From 2000 m to max. 4000 m: – V_N reduced by AC 6 V per 100 m Over 2000 m only overvoltage class 2; external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.		
Required preventive measures		Grounding the unit		

7.2.2 Ambient temperature of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Electronic variant		**DBC-B, DAC-B, DSC,B**		
Ambient temperature	ϑ_A	– 25 °C to + 60 °C[1)]		
$I_{N\ motor}$ reduction Ambient temperature		3% I_N per K at 40 °C to 60 °C		

1) Observe the permitted temperature range of the oil to be used (see chapter "Lubricant table").

7.2.3 Binary inputs / signal relays

Binary inputs / signal relays		
Input type	DI01 to DI04	Isolated via optocoupler; PLC-compatible to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0\ k\Omega$, $I_E \approx 10\ mA$, sampling cycle ≤ 5 ms
Number of inputs		4
Signal level		+15 to +30 V = "1" = Contact closed –3 to +5 V = "0" = Contact open
Signal relays Contact data	K1a K1b	Response time ≤ 15 ms DC 24 V / 50 mA / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)
Signaling function		N.O. contact for ready signal Contact closed: – with voltage present – if no fault was detected – after completion of self-testing phase (when unit is turned on)

7.2.4 Internal voltage supply 24V_O

Internal voltage supply for non-safety-related enable signal via STO input		
Voltage supply	+24V_O 0V24_O	DC 24 V to EN 61131-2, interference voltage proof and short circuit proof
Permitted total current		60 mA
Required current for STO-IN supply		30 mA

7.2.5 Current carrying capacity of terminals and plug connectors

Current carrying capacity of terminals and plug connectors		
Supply system terminals	X2	24 A (max. loop-through current)
Control terminals	X7	3.5 A

7.2.6 Derating factors

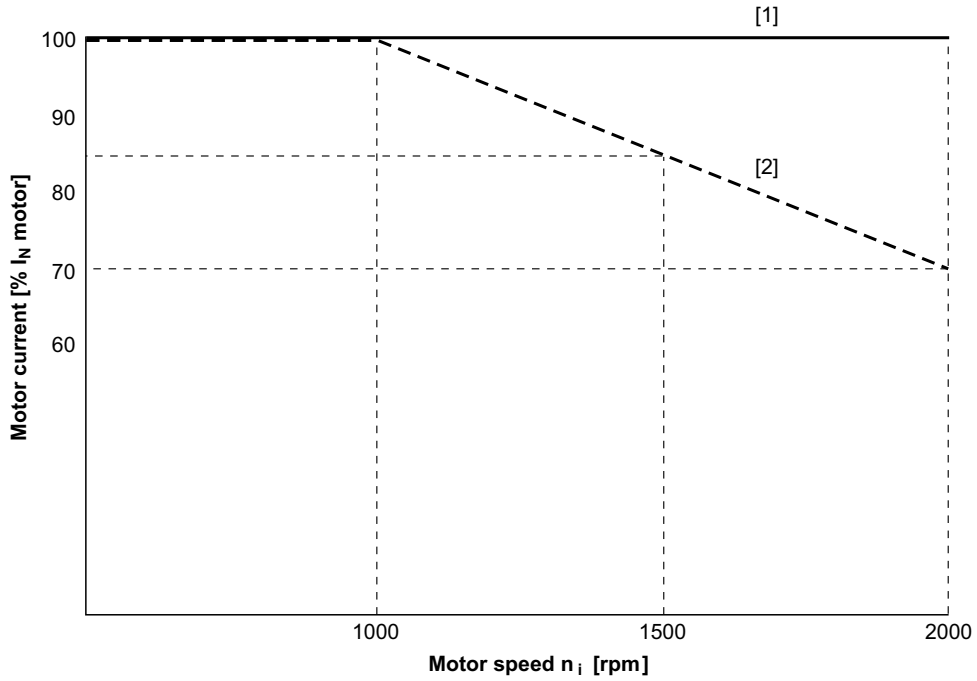
Affected unit variants

The table shows the unit variants for which you have to/do not have to use the additional $I_{N\ motor}$ reduction in the following chapter:

$I_{N\ motor}$ reduction	
not required	**Required**
MGF..2 (all variants)	MGF..4..DSC–B / XT with application option
MGF..4..DSC–B / XT without application option	MGF..4..DSC–B with application option
MGF..4..DSC–B without application option	MGF..4..SNI–B / XT with application option
MGF..4..SNI–B / XT without application option	MGF..4..SNI–B with application option
MGF..4..SNI–B without application option	MGF..4..DAC–B / XT
MGF..4..DBC–B / XT	GF..4..DAC–B
MGF..4..DBC–B	

$I_{N\ motor}$ reduction

The following figure shows the $I_{N\ Motor}$ reduction depending on the motor speed:



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[1] Ambient temperature ≤ 35 °C
[2] Ambient temperature = 40 °C

INFORMATION

Derating is based on typical operating conditions with a supply voltage of 24 V (AS-Interface electronics supply, signal level of binary inputs, input voltage of STO input).

7.2.7 Technical data of AS-Interface

AS-Interface		
AS-Interface electronics supply	Tl. AS + Tl. AS - I_E only AS-Interface:	29.5 V – 31.6 V (AS-Interface power supply to EN 50295) ≤ 50 mA[1)]
Control input	Tl. AS + Tl. AS -	Connection of the AS-interface data line Connection of the AS-interface data line
Sensor connection	Tl. DI2 Tl. DI3 Tl. V024 Tl. V0⊥	External sensor input External sensor input 24 V for sensor supply Reference potential for sensor supply
Sensor inputs	PLC-compatible in accordance with EN 61131-2 R_i about 3.0 kΩ I_E about 10 mA	
Signal level	+15 V to +30 V –3 V to +5 V	"1" "0"
Maximum sensor cable length	15 m	

1) The current increases by the demand of the connected sensors (max. sensor current 75 mA).

AS-Interface GLK30A binary slave

AS-Interface GLK30A	
Protocol variant	AS-Interface binary slave with a S-7.F profile "four bit I/O mode slave"
AS-Interface profile	S-7.F
I/O configuration	7_{hex}
ID code	F_{hex}
ext. ID code 2	E_{hex}
ext. ID code1	F_{hex}
Address	1 to 31 (factory setting: 0), can be changed as often as required

AS-Interface GLK31A double slave

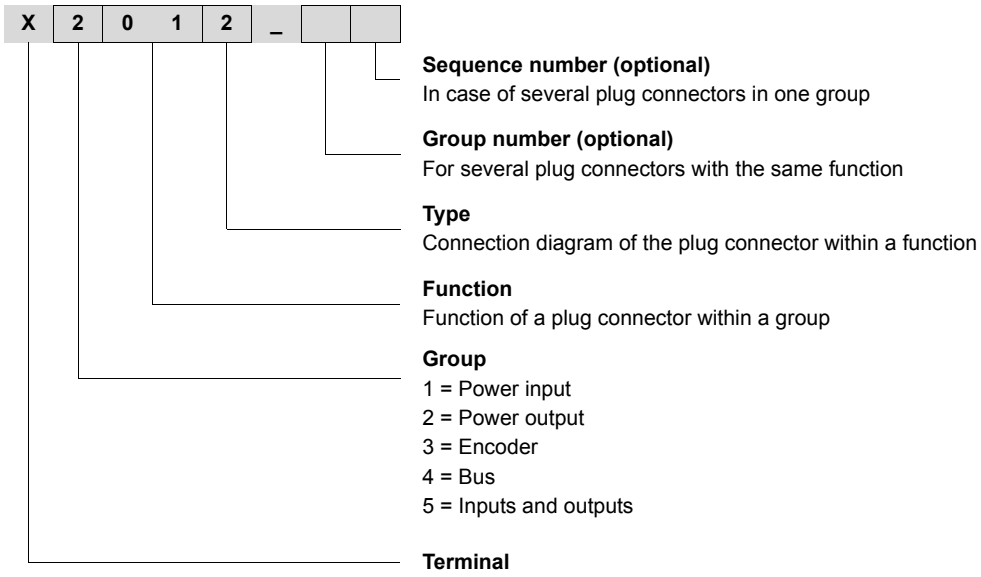
AS-Interface GLK31A	Slave A	Slave B
Protocol variant	AS-Interface double slave in extended address mode AS-Interface specification V3.0, rev.02 in conjunction with M4 master profile	
AS-Interface profile	S-7.A.7.7	S-7.A.5.F
I/O configuration	7_{hex}	7_{hex}
ID code	A_{hex}	A_{hex}
ext. ID code 2	7_{hex}	5_{hex}
ext. ID code1	7_{hex}	7_{hex}
Function	4DI/4DO cyclical 4PDI/3PDO	Serial acyclic
Address	1 to 31 (factory setting: 0), can be changed as often as required	

7.2.8 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

Designation key

The designation of plug connectors is specified according to the following key:



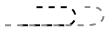
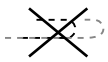
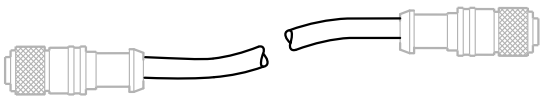
Connection cables

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation  Not suitable for cable carrier installation 
	Variable length	

Using plug connectors assembled by yourself

INFORMATION

Power and hybrid plug connectors as well as the associated assembly tools are also available from Intercontec.

Plug connector positions

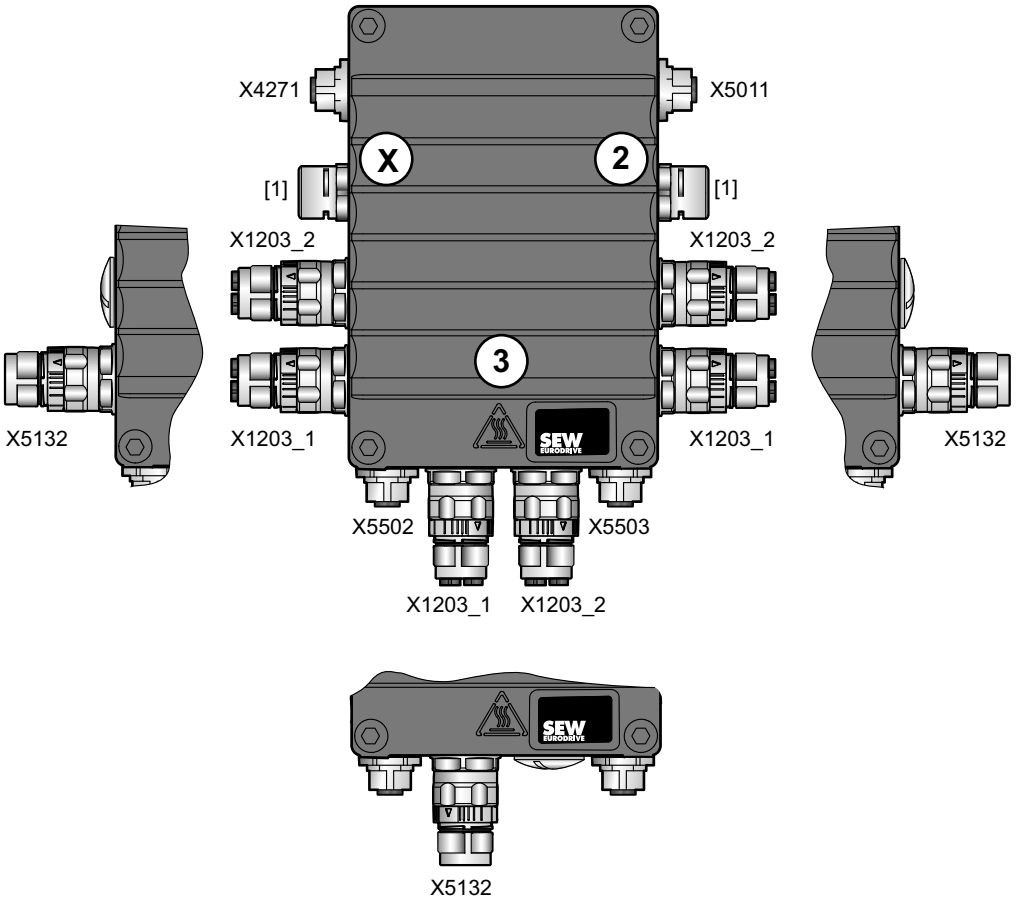
The following figure shows the possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connectors	Color	Position	Location
X5132: Digital inputs/outputs	–	As required	X, 2 or 3, not together with X1203_1, X1203_2
X5502: STO – IN	Orange	Fixed	3 (left)
X5503: STO – OUT	Orange	Fixed	3 (right)
X4271: AS-Interface communication interface[1)]	Yellow	Fixed	X
X5011: AS-Interface sensors [1)]	Black	Fixed	2
X1203_1: AC 400 V connection [2)]	Black	As required	X, 2 or 3, not together with X5132
X1203_2: AC 400 V connection	Black	As required	X, 2 or 3, not together with X5132
[1] Pressure compensation [3)]	–	Fixed	Depends on mounting position

1) Standard scope of delivery

2) Plug connector X1203_1 is also available separately (that is without plug connector X1203_2).

3) Only in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).



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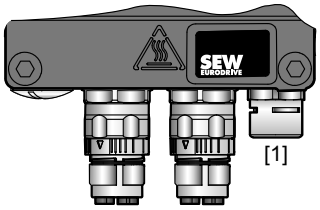
Restrictions in conjunction with pressure compensation

The position for STO plug connectors is occupied by the pressure compensation fitting [1] when using the optional design for use in wet areas (with MOVIGEAR®)/ASEPTIC^{plus} design (with DRC) and M5, M6 mounting position. In this case, plug connectors for STO are not possible:



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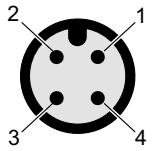
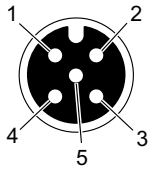
7.2.9 X4271: AS-Interface communication interface

The following table shows information about this connection:

Function		
Connection of AS-Interface data cable		
Connection type		
M12, 4-pole, male, A-coded		
Wiring diagram		
 2384154763		
Assignment		
No.	**Name**	**Function**
1	AS+	AS-Interface data cable (+)
2	res.	Reserviert
3	AS−	AS-Interface data cable (−)
4	res.	Reserved

7.2.10 X5011: AS-Interface sensor connection

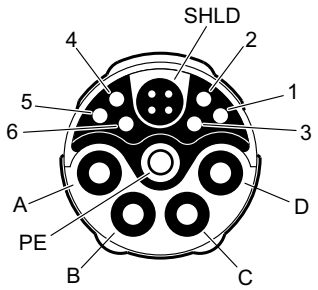
The following table shows information about this connection:

Function		
Connection of AS-Interface sensors		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
 2264816267		
Assignment		
No.	**Name**	**Function**
1	+24V_SEN	DC 24 V voltage supply for sensors
2	DI3	DI3 sensor input
3	0V24_SEN	0V24 reference potential for sensors
4	DI2	DI2 sensor input
5	res.	Reserved

7.2.11 X1203_1 and X1203_2: AC 400 V connection

The following table shows information about this connection:

Function
AC 400 V connection for supplying the unit/for looping through
Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: black, protected against contact
Wiring diagram



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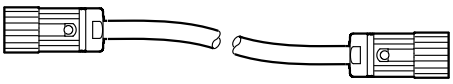
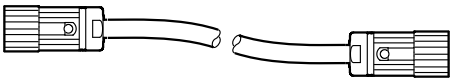
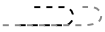
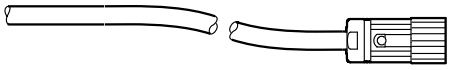
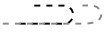
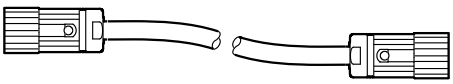
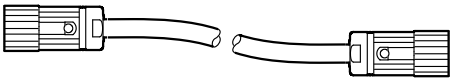
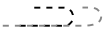
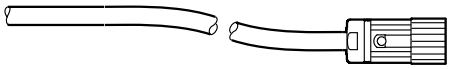
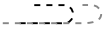
Assignment

No.	Name	Function
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

Connection cables The following table provides an overview of cables available for this connection:

Compliance	Connection cables	Length/ Installation type	Cable cross section	Operating voltage
CE	**Part number 1 812 746 0**  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 813 395 9 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 812 747 9  Open — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 813 396 7 Halogen-free  Open — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V

Compli-ance	Connection cables	Length/ Installa-tion type	Cable cross section	Operat-ing volt-age
CE	**Part number 1 812 748 7**  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 813 397 5 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 812 749 5  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 813 398 3 Halogen-free  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V

Connection of cables with open end

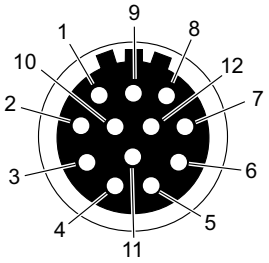
The following table shows the conductor assignment of the cable with the following part number:

1 812 747 9, 1 813 396 7, 1 812 749 5 and 1 813 398 3

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow

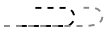
7.2.12 X5132: Digital inputs/outputs

The following table shows information about this connection:

Function		
Digital inputs/outputs for: MOVIGEAR®		
Connection type		
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded		
Wiring diagram		
 2264820107		
Assignment		
No.	**Name**	**Function**
1	DI01	Binary input DI01 (CW/stop)
2	DI02	Binary input DI02 (CCW/stop)
3	DI03	Binary input DI03 (setpoint f1/f2)
4	DI04	Binary input DI04 (changeover automatic/local mode)
5	n.c.	Not connected
6	K1a	Signal relay K1a
7	K1b	Signal relay K1b
8	+24V_O	DC 24 V output
9	0V24_O	0V24 reference potential
10	n.c.	Not connected
11	n.c.	Not connected
12	FE	Equipotential bonding/functional ground

Connection cables

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 174 145 7  Open — M23, 12-pole, 0°-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
K1a	Green
K1b	Purple
+24V_O	Black
0V24_O	Brown
Reserved	White
Reserved	Gray/pink
FE	Red/blue

7.2.13 X5502: STO – IN

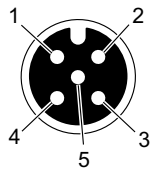
⚠ WARNING

No safety-related disconnection of the MOVIGEAR® drive unit.

Severe or fatal injuries.

- Do not use the 24 V output (pins 1 and 3) for safety-related applications with MOVIGEAR® drive units.
- You may only jumper the STO input with 24 V when the MOVIGEAR® drive unit need not fulfill any safety function.

The following table shows information about this connection:

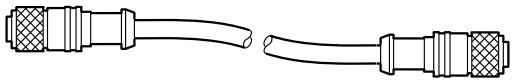
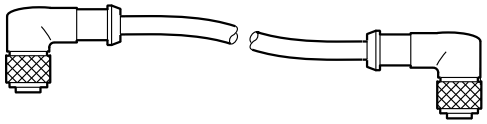
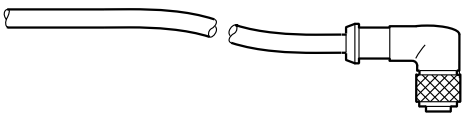
Function		
Input for safe torque off (STO)		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
 2264816267		
Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO −	Input STO –
3	0V24_O	0V24 reference potential
4	STO +	STO + input
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 497 6  Open — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 740 1  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 739 8  Open — M12, 5-pole, A-coded	Variable 	DC 60 V

Connection of cables with open end

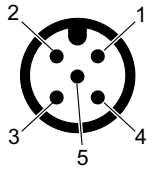
The following table shows the conductor assignment of cables with the following part numbers:

1 812 497 6 and 1 812 739 8

Signal name	Core color/designation
STO −	Black / 1
STO +	Black / 2

7.2.14 X5503: STO – OUT

The following table shows information about this connection:

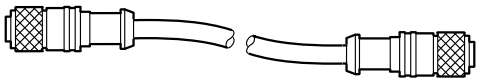
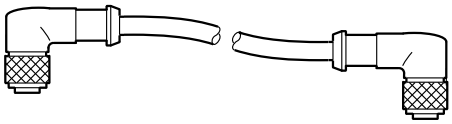
Function		
Connection for safe torque off (STO) for looping through		
Connection type		
M12, 5-pole, male, A-coded		
Wiring diagram		
 2264818187		
Assignment		
No.	**Name**	**Function**
1	res.	Reserviert
2	STO −	Output STO – (to loop through)
3	res.	Reserved
4	STO +	Output STO + (to loop through)
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 740 1  M12, 5-pole, A-coded M12, 5-pole, A-coded	Variable 	DC 60 V

7.3 MOVIGEAR® DSC-B

7.3.1 General technical data of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Torque class	M	200 Nm	400 Nm	
Supply voltages Permitted range	V_{line}	3 x AC 380 V - 5% to AC 500 V + 10%		3 x AC 400 V - 5% to AC 500 V + 10%
Line frequency	f_{line}	50 Hz ... 60 Hz		
Input current	I_N	1.52 A (n_{Motor} = 2000 rpm)	2.72 A (n_{Motor} = 2000 rpm)	3.46 A (n_{Motor} = 2000 rpm)
	$I_{max\ start}$	5.32 A	9.52 A	11.42 A
Nominal output current	$I_{N\ Motor}$	1.85 A	3.0 A	3.7 A
Current carrying capacity of terminals		See operating instructions, chapter "Electrical Installation / Installation instructions / Permitted cable cross section of terminals"		
PWM frequency		4 / 8 kHz		
Interference immunity		EN 61800-3; 2. Environment (industrial environment)		
Electromagnetic interference		EN 61800-3 category C3 (class A group 2 of EN 55011)		
Climate class		EN 60721-3-3, class 3K3		
Storage temperature	ϑ_F	− 25 °C to + 70 °C (EN 60721-3-3)		
Proof of mechanical strength		According to EN 61800-5-1		
Degree of protection	**IP**	Standard: IP65 according to EN 60529 (MOVIGEAR® housing closed and all cable glands sealed) With optional design for applications in wet areas: IP66 according to EN 60529 (MOVIGEAR® housing closed and all cable glands sealed)		
Duty cycle		S1, DB (EN 60034-1)		
Type of cooling		Self-cooling to DIN 41751 and EN 61800-5-1		
Signaling functions		Display elements on housing to indicate the unit state		
Installation altitude	h	Up to h ≤ 1000 m without restrictions. The following restrictions apply to heights ≥ 1000 m: • From 1000 m to max. 4000 m: – I_N reduction by 1% per 100 m • From 2000 m to max. 4000 m: – V_N reduced by AC 6 V per 100 m Over 2000 m only overvoltage class 2; external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.		
Required preventive measures		Grounding the unit		

7.3.2 Ambient temperature of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Electronic variant		**DBC-B, DAC-B, DSC,B**		
Ambient temperature	ϑ_A	– 25 °C to + 60 °C[1)]		
$I_{N\ motor}$ reduction Ambient temperature		3% I_N per K at 40 °C to 60 °C		

1) Observe the permitted temperature range of the oil to be used (see chapter "Lubricant table").

7.3.3 Motion control inputs

Motion control inputs		
Input type	DI01 to DI04[1)]	PLC-compatible according to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0\ k\Omega$, $I_E \approx 10$ mA, sampling interval 2 ms
Number of inputs		4
Signal level		+15 V to +30 V "1" = Contact closed –3 V to +5 V "0" = Contact open
Permitted total current For 4 sensors		400 mA

1) Only in conjunction with optional plug connector

7.3.4 Internal voltage supply 24V_O

Internal voltage supply for non-safety-related enable signal via STO input		
Voltage supply	+24V_O	DC 24 V to EN 61131-2, interference voltage proof and short circuit proof
	0V24_O	
Permitted total current		60 mA
Required current for STO-IN supply		30 mA

7.3.5 Current carrying capacity of terminals and plug connectors

Current carrying capacity of terminals and plug connectors		
Supply system terminals	X2	24 A (max. loop-through current)
Control terminals	X7	3.5 A (max. loop-through current)
Signal plug connector	X5131	400 mA (max. current for 24 V sensor supply)

7.3.6 Derating factors

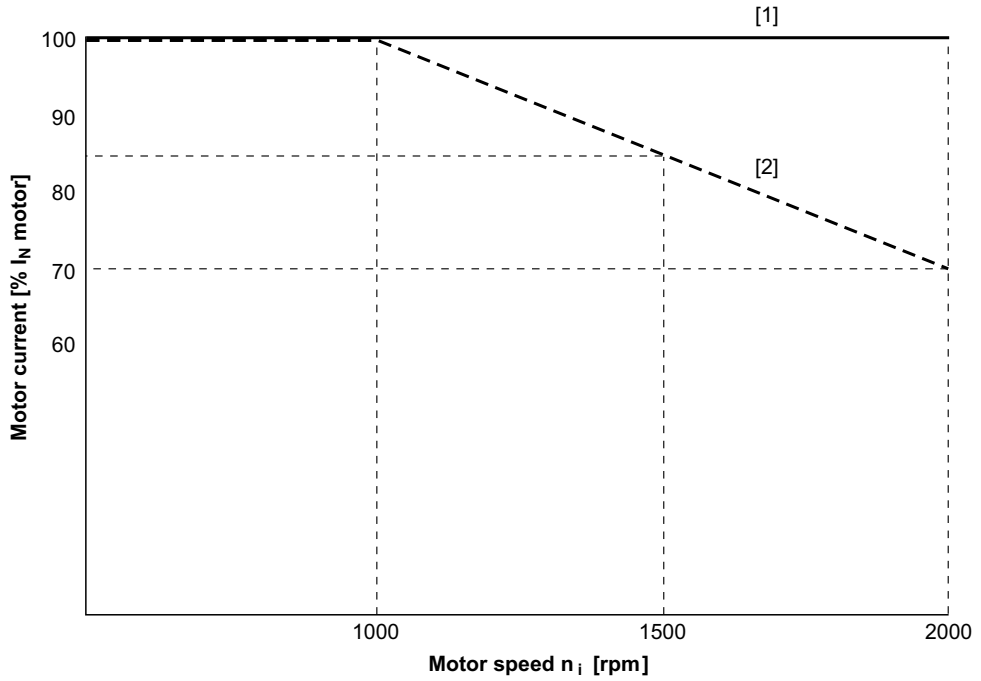
Affected unit variants

The table shows the unit variants for which you have to/do not have to use the additional $I_{N\ motor}$ reduction in the following chapter:

$I_{N\ motor}$ reduction	
not required	**Required**
MGF..2 (all variants)	MGF..4..DSC–B / XT with application option
MGF..4..DSC–B / XT without application option	MGF..4..DSC–B with application option
MGF..4..DSC–B without application option	MGF..4..SNI–B / XT with application option
MGF..4..SNI–B / XT without application option	MGF..4..SNI–B with application option
MGF..4..SNI–B without application option	MGF..4..DAC–B / XT
MGF..4..DBC–B / XT	GF..4..DAC–B
MGF..4..DBC–B	

$I_{N\ motor}$ reduction

The following figure shows the $I_{N\ Motor}$ reduction depending on the motor speed:



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[1] Ambient temperature ≤ 35 °C
[2] Ambient temperature = 40 °C

INFORMATION

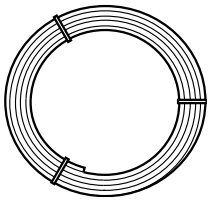
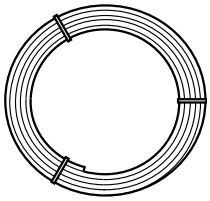
Derating is based on typical operating conditions with a supply voltage of 24 V (sensor supply, input voltage of STO input).

7.3.7 Technical data of SBus interface

Standard	CAN specification 2.0 parts A and B
Baud rate	Can be set via DIP switch: 1000, 500 kBd
ID range	3...775
Address	Can be set via DIP switch: Number of drives that can be addressed: 32
Number of process data words	Fixed setting: 3 PD
Cable length	Depending on the baud rate, max. 50 m
Number of stations	Max. 110 CAN stations (thereof max. 32 MOVIGEAR® DSC stations)
Interface	According to operating instructions / "Electrical Installation" chapter
Type	CAN1
Profile	MOVILINK®
Connection technology	Terminal
Bus termination	According to "Startup" chapter
Control/setpoint source Index 8461.0 / 8462.0	SBus 1
Timeout monitoring	Yes, via parameter index 8602.0 to 8615.0
Process data	Configuration using parameter index 8304.0 to 8309.0
Master/slave	No
Manual mode (MOVITOOLS® MotionStudio)	Yes
IPOS bus type	5

7.3.8 Recommended hybrid cables

The following table shows the available hybrid cables:

Compliance 1)	Hybrid cable		Cable cross section/manufacturer	Operating voltage
CE / UL	**Part number 1 328 477 0**	**Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (bulk cable)	2.5 mm^2 LEONI Elocab Type: EHRK 016281	AC 500 V
	Part number 1 331 363 0	**Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (bulk cable)	4 mm^2 LEONI Elocab Type: EHRK 018473	AC 500 V

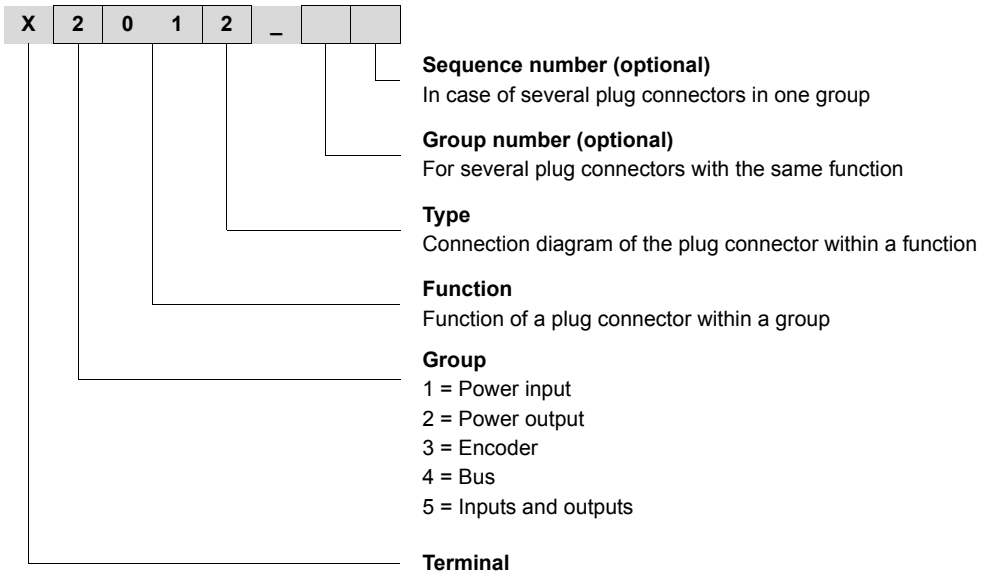
1) See also technical data

7.3.9 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

Designation key

The designation of plug connectors is specified according to the following key:



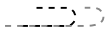
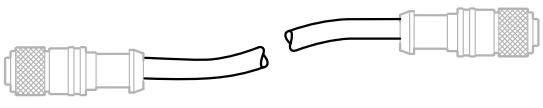
Connection cables

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation  Not suitable for cable carrier installation 
	Variable length	

Using plug connectors assembled by yourself

INFORMATION

Power and hybrid plug connectors as well as the associated assembly tools are also available from Intercontec.

Plug connector positions

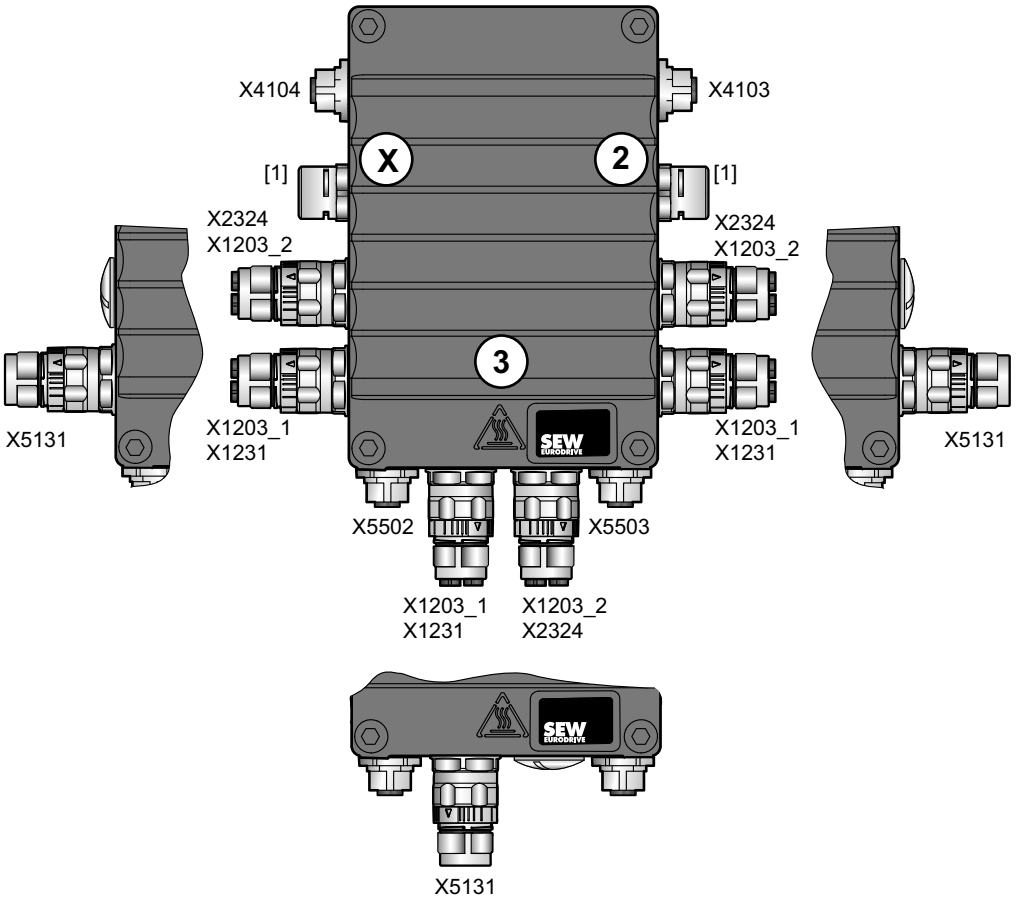
The following figure shows the possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connector	Color	Position	Location
X5131: Digital inputs/outputs	–	As required	X, 2 or 3, not together with X1231, X2324, X1203_1, X1203_2
X5502: STO – IN	Orange	Fixed	3 (left)
X5503: STO – OUT	Orange	Fixed	3 (right)
X4104: CAN bus – system bus – input	Violet	Fixed	X
X4103: CAN bus – system bus – output	Violet	Fixed	2
X1231: AC 400 V connection and CAN bus [1)]	Violet	As required	X, 2 or 3, not together with X5131
X2324: AC 400 V output and CAN bus	Violet		
X1203_1: AC 400 V connection [2)]	Black	As required	X, 2 or 3, not together with X5131
X1203_2: AC 400 V connection	Black		
[1] Pressure compensation [3)]	–	Fixed	Depends on mounting position

1) Plug connector X1231 is also available separately (i.e. without plug connector X2324).

2) Plug connector X1203_1 is also available separately (that is without plug connector X1203_2).

3) Only in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).



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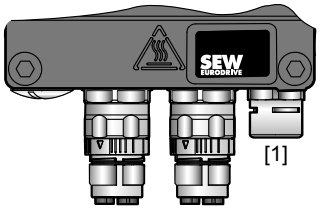
Restrictions in conjunction with pressure compensation

The position for STO plug connectors is occupied by the pressure compensation fitting [1] when using the optional design for use in wet areas (with MOVIGEAR®)/ASEPTIC^{plus} design (with DRC) and M5, M6 mounting position. In this case, plug connectors for STO are not possible:



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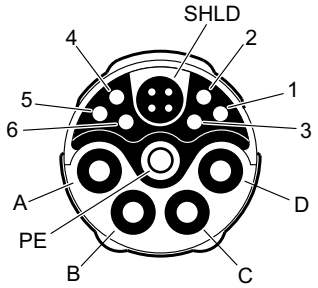
7.3.10 X1203_1 and X1203_2: AC 400 V connection

The following table shows information about this connection:

Function
AC 400 V connection for supplying the unit/for looping through
Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: black, protected against contact
Wiring diagram



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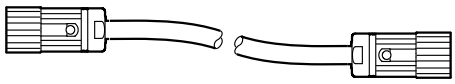
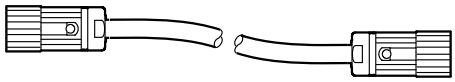
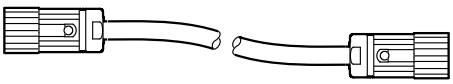
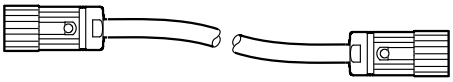
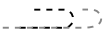
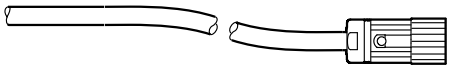
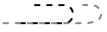
Assignment

No.	Name	Function
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

Connection cables The following table provides an overview of cables available for this connection:

Compliance	Connection cables	Length/ Installation type	Cable cross section	Operating voltage
CE	**Part number 1 812 746 0**  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 813 395 9 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 812 747 9  Open — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V
	Part number 1 813 396 7 Halogen-free  Open — M23, coding ring: black	Variable 	2.5 mm²	AC 500 V

Compli-ance	Connection cables	Length/ Installa-tion type	Cable cross section	Operat-ing volt-age
CE	**Part number 1 812 748 7**  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 813 397 5 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 812 749 5  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V
	Part number 1 813 398 3 Halogen-free  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

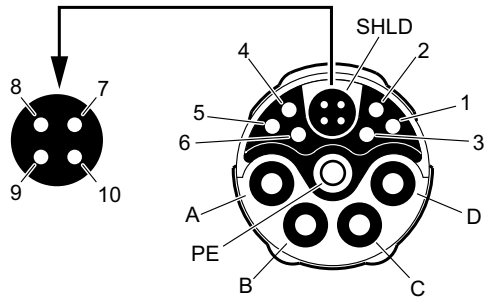
1 812 747 9, 1 813 396 7, 1 812 749 5 and 1 813 398 3

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow

7.3.11 X1231: AC 400 V input and CAN bus

The following table shows information about this connection:

Function
AC 400 V unit supply input, CAN bus (system bus)
Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: purple, protected against contact
Wiring diagram



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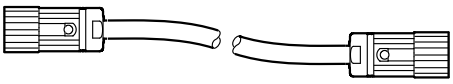
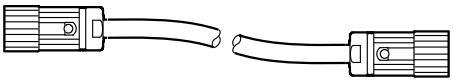
Assignment		
No.	**Name**	**Function**
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	CAN_L	CAN data line (low)
8	CAN_GND	Reference potential CAN bus
9	CAN_H	CAN data line (high)
10	n.c.	Not connected
SHLD	CAN_SHLD	Shield/equipotential bonding CAN bus

Connection cables The following table provides an overview of cables available for this connection:

Compliance 1)	Connection cable	Length/ Installation type	Cable cross section/cable type	Operating voltage
CE / UL	**Part number 1 812 742 8**  M23, coding ring: purple — M23, coding ring: purple	Variable 	2.5 mm² LEONI Elocab Type: EHRK 016281	AC 500 V
	Part number 1 812 743 6  Open — M23, coding ring: purple	Variable 	2.5 mm² LEONI Elocab Type: EHRK 016281	AC 500 V
	Part number 1 812 744 4  M23, coding ring: purple — M23, coding ring: purple	Variable 	4 mm² LEONI Elocab Type: EHRK 018473	AC 500 V
	Part number 1 812 745 2  Open — M23, coding ring: purple	Variable 	4 mm² LEONI Elocab Type: EHRK 018473	AC 500 V

1) See also technical data

Connection of cables with open end

The following table shows the conductor assignment of cables with the following part numbers:

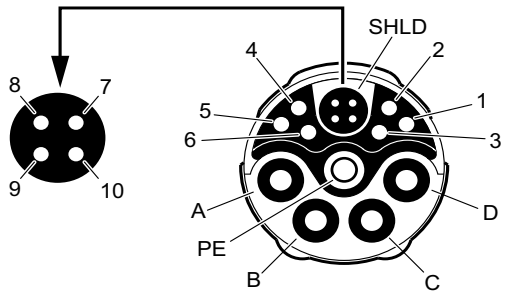
1 812 743 6 and 1 812 745 2

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow
CAN_L	Blue
CAN_GND	Black
CAN_H	White

7.3.12 X2324: AC 400 V output and CAN bus

The following table shows information about this connection:

Function
AC 400 V output for looping, CAN bus (system bus)
Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: purple, protected against contact
Wiring diagram



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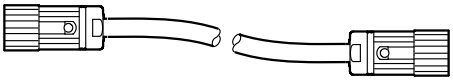
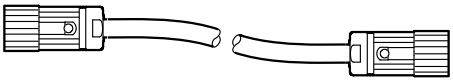
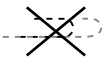
Assignment

No.	Name	Function
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	CAN_L	CAN data line (low)
8	CAN_GND	Reference potential CAN bus
9	CAN_H	CAN data line (high)
10	n.c.	Not connected
SHLD	CAN_SHLD	Shield/equipotential bonding CAN bus

INFORMATION

When the bus terminating resistor is activated, the CAN bus is separated The input and output end of the plug connectors must not be confused.

Connection cables The following table provides an overview of the cables available for this connection:

Compliance [1]	Connection cable	Length/ Installation type	Cable cross section/ cable type	Operating voltage
CE / UL	**Part number 1 812 742 8**  M23, coding ring: purple — M23, coding ring: purple	Variable 	2.5 mm² LEONI Elocab Type: EHRK 016281	AC 500 V
	Part number 1 812 744 4  M23, coding ring: purple — M23, coding ring: purple	Variable 	4 mm² LEONI Elocab Type: EHRK 018473	AC 500 V

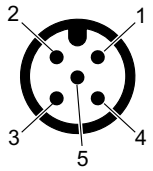
1) See also technical data

7.3.13 X4104: CAN bus – system bus – input

INFORMATION

To ensure a continuous connection from the housing to the unit, use CAN connection cables whose shield is connected with the connector housing in such a way that it is EMC capable.

The following table shows information about this connection:

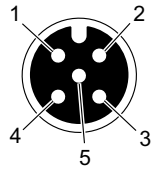
Function		
CAN bus (system bus) – input		
Connection type		
M12, 5-pole, male, A-coded		
Wiring diagram		
 2264818187		
Assignment		
No.	**Name**	**Function**
1	Drain	Shield/equipotential bonding CAN bus
2	res.	Reserved
3	CAN_GND	Reference potential CAN bus
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

7.3.14 X4103: CAN bus – system bus – output

INFORMATION

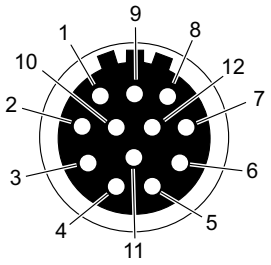
To ensure a continuous connection from the housing to the unit, use CAN connection cables whose shield is connected with the connector housing in such a way that it is EMC capable.

The following table shows information about this connection:

Function		
CAN bus (system bus) – output		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
 2264816267		
Assignment		
No.	**Name**	**Function**
1	Drain	Shield/equipotential bonding CAN bus
2	res.	Reserved
3	GND	Reference potential CAN bus
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

7.3.15 X5131: Digital inputs/outputs

The following table shows information about this connection:

Function			
Digital inputs/outputs for MOVIGEAR® MotionControl			
Connection type			
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded			
Wiring diagram			
 2264820107			
Assignment			
No.	**Name**	**Function** **Motion control inputs** **DIP switch S2/3 = OFF**	**Function** **Local mode** **DIP switch S2/3 = ON**
1	DI01	DI01 sensor input	CW/stop
2	DI02	DI02 sensor input	CCW/stop
3	DI03	DI03 sensor input	Setpoint f1/f2
4	DI04	DI04 sensor input	Changeover Automatic/local mode
5	n.c.	Not connected	Not connected
6	n.c.	Not connected	Not connected
7	n.c.	Not connected	Not connected
8	+24V_O	Reserved	DC 24 V output
9	0V24V_O	Reserved	0V24 reference potential
10	0V24V_SEN	0V24 reference potential for sensors [1] Must be supplied via terminals X7.4	Reserved
11	+24 V_SEN	DC 24 V sensor supply [1] Must be supplied via terminals X7.3	Reserved
12	FE	Equipotential bonding/functional ground	Equipotential bonding/functional ground

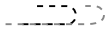
1) see operating instructions, chapter "Connecting MOVIGEAR® drive units"

INFORMATION

Use actuator/sensor distributors with 4 slots for the sensor inputs. Use the DC 24 V output only for local mode.

Connection cables

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 174 145 7  Open — M23, 12-pole, 0°-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
Reserved	Green
Reserved	Purple
+24V_O	Black
0V24_O	Brown
0V24_SEN	White
+24 V_SEN	Gray/pink
FE	Red/blue

7.3.16 X5502: STO – IN

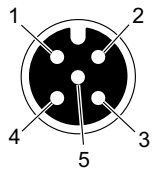
⚠ WARNING

No safety-related disconnection of the MOVIGEAR® drive unit.

Severe or fatal injuries.

- Do not use the 24 V output (pins 1 and 3) for safety-related applications with MOVIGEAR® drive units.
- You may only jumper the STO input with 24 V when the MOVIGEAR® drive unit need not fulfill any safety function.

The following table shows information about this connection:

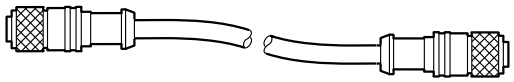
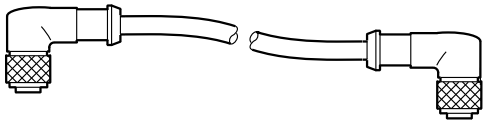
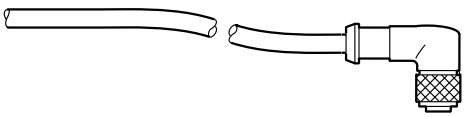
Function		
Input for safe torque off (STO)		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
 2264816267		
Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO −	Input STO –
3	0V24_O	0V24 reference potential
4	STO +	STO + input
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 497 6  Open — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 740 1  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 739 8  Open — M12, 5-pole, A-coded	Variable 	DC 60 V

Connection of cables with open end

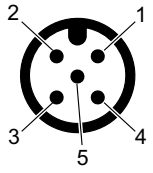
The following table shows the conductor assignment of the cable with the following part number:

1 812 497 6 and 1 812 739 8

Signal name	Core color/designation
STO −	Black / 1
STO +	Black / 2

7.3.17 X5503: STO – OUT

The following table shows information about this connection:

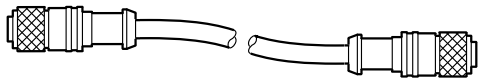
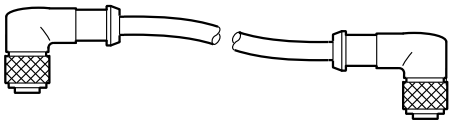
Function		
Connection for safe torque off (STO) for looping through		
Connection type		
M12, 5-pole, male, A-coded		
Wiring diagram		
 2264818187		
Assignment		
No.	**Name**	**Function**
1	res.	Reserviert
2	STO −	Output STO – (to loop through)
3	res.	Reserved
4	STO +	Output STO + (to loop through)
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 740 1  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V

7.4 MOVIGEAR® SNI-B

7.4.1 General technical data of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Torque class	M	200 Nm	400 Nm	
Supply voltages Permitted range	V_{line}	3 x AC 380 V - 5% to AC 500 V + 10%		3 x AC 400 V - 5% to AC 500 V + 10%
Line frequency	f_{line}	50 Hz ... 60 Hz		
Input current	I_N	1.52 A (n_{Motor} = 2000 rpm)	2.72 A (n_{Motor} = 2000 rpm)	3.46 A (n_{Motor} = 2000 rpm)
	$I_{max\ start}$	5.32 A	9.52 A	11.42 A
Nominal output current	$I_{N\ Motor}$	1.85 A	3.0 A	3.7 A
Current carrying capacity of terminals		See operating instructions, chapter "Electrical Installation / Installation instructions / Permitted cable cross section of terminals"		
PWM frequency		4 / 8 kHz		
Interference immunity		EN 61800-3; 2. Environment (industrial environment)		
Electromagnetic interference		EN 61800-3 category C3 (class A group 2 of EN 55011)		
Climate class		EN 60721-3-3, class 3K3		
Storage temperature	ϑ_F	− 25 °C to + 70 °C (EN 60721-3-3)		
Proof of mechanical strength		According to EN 61800-5-1		
Degree of protection	**IP**	Standard: IP65 according to EN 60529 (MOVIGEAR® housing closed and all cable glands sealed) With optional design for applications in wet areas: IP66 according to EN 60529 (MOVIGEAR® housing closed and all cable glands sealed)		
Duty cycle		S1, DB (EN 60034-1)		
Type of cooling		Self-cooling to DIN 41751 and EN 61800-5-1		
Signaling functions		Display elements on housing to indicate the unit state		
Installation altitude	h	Up to h ≤ 1000 m without restrictions. The following restrictions apply to heights ≥ 1000 m: • From 1000 m to max. 4000 m: – I_N reduction by 1% per 100 m • From 2000 m to max. 4000 m: – V_N reduced by AC 6 V per 100 m Over 2000 m only overvoltage class 2; external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.		
Required preventive measures		Grounding the unit		

7.4.2 Ambient temperature of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Electronic variant		**SNI-B**		
Ambient temperature	ϑ_A	0 °C to + 60 °C[1)]		
$I_{N\ motor}$ reduction Ambient temperature		3% I_N per K at 40 °C to 60 °C		

1) Observe the permitted temperature range of the oil to be used (see chapter "Lubricant table").

7.4.3 Motion control inputs

Motion control inputs		
Input type	DI01 to DI04[1)]	PLC-compatible according to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0\ k\Omega$, $I_E \approx 10$ mA, sampling interval 2 ms
Number of inputs		4
Signal level		+15 V to +30 V "1" = Contact closed –3 V to +5 V "0" = Contact open
Permitted total current For 4 sensors		400 mA

1) Only in conjunction with optional plug connector

7.4.4 Internal voltage supply 24V_O

Internal voltage supply for non-safety-related enable signal via STO input		
Voltage supply	+24V_O	DC 24 V to EN 61131-2, interference voltage proof and short circuit proof
	0V24_O	
Permitted total current		60 mA
Required current for STO-IN supply		30 mA

7.4.5 Current carrying capacity of terminals and plug connectors

Current carrying capacity of terminals and plug connectors		
Supply system terminals	X2	24 A (max. loop-through current)
Control terminals	X7	3.5 A (max. loop-through current)
Signal plug connector	X5131	400 mA (max. current for 24 V sensor supply)

7.4.6 Derating factors

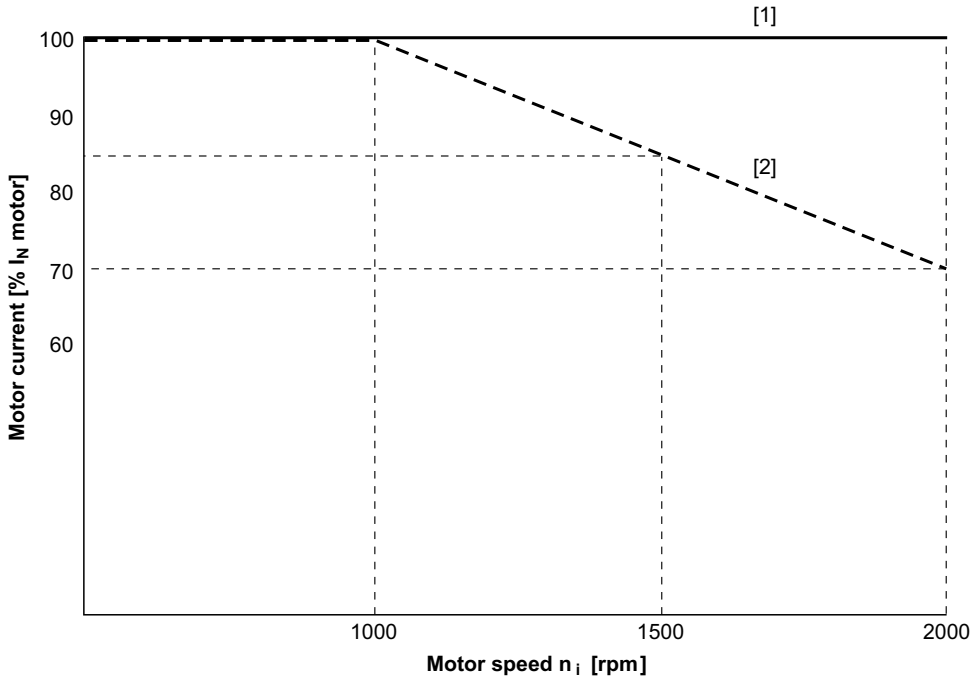
Affected unit variants

The table shows the unit variants for which you have to/do not have to use the additional $I_{N\ motor}$ reduction in the following chapter:

$I_{N\ motor}$ reduction	
not required	**Required**
MGF..2 (all variants)	MGF..4..DSC–B / XT with application option
MGF..4..DSC–B / XT without application option	MGF..4..DSC–B with application option
MGF..4..DSC–B without application option	MGF..4..SNI–B / XT with application option
MGF..4..SNI–B / XT without application option	MGF..4..SNI–B with application option
MGF..4..SNI–B without application option	MGF..4..DAC–B / XT
MGF..4..DBC–B / XT	GF..4..DAC–B
MGF..4..DBC–B	

$I_{N\ motor}$ reduction

The following figure shows the $I_{N\ Motor}$ reduction depending on the motor speed:



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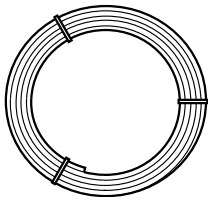
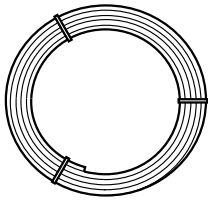
[1] Ambient temperature ≤ 35 °C
[2] Ambient temperature = 40 °C

INFORMATION

Derating is based on typical operating conditions with a supply voltage of 24 V (sensor supply, input voltage of STO input).

7.4.7 Required power leads

The following table shows the available SNI supply system cables:

Compliance 1)	SNI supply system cable		Cable cross section cable type	Operating voltage
CE	**Part number 1 330 330 9**	**Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (bulk cable)	2.5 mm^2 HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
	Part number 1 330 550 6	**Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (bulk cable)	4 mm^2 HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V

1) See also technical data

INFORMATION

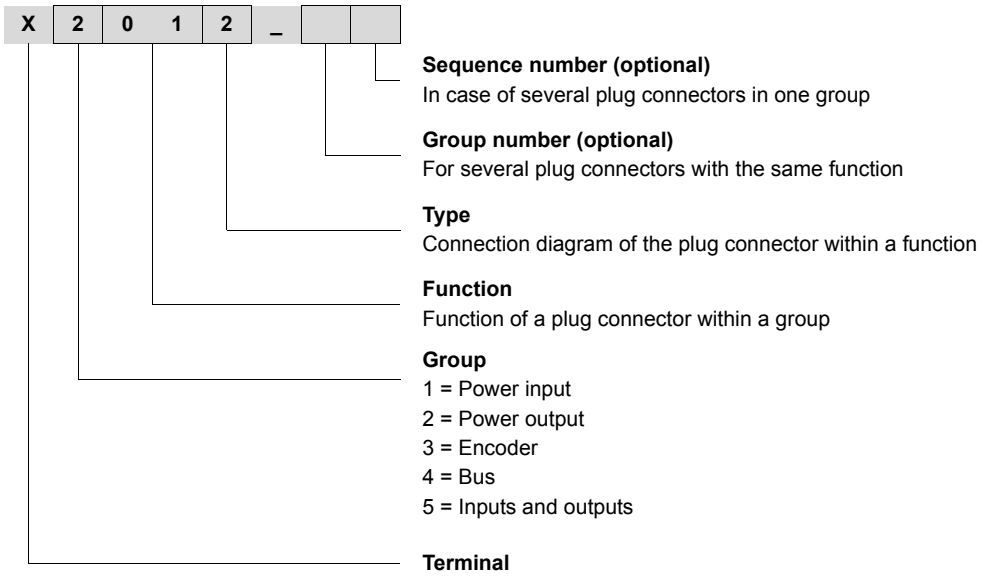
You find more permitted SNI cables (e.g. for UL-compliant installation) in the technical data / "Required connection cables for single line installation" chapter.

7.4.8 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

Designation key

The designation of plug connectors is specified according to the following key:



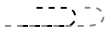
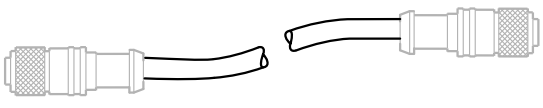
Connection cables

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation  Not suitable for cable carrier installation 
	Variable length	

Using plug connectors assembled by yourself

INFORMATION

Power and hybrid plug connectors as well as the associated assembly tools are also available from Intercontec.

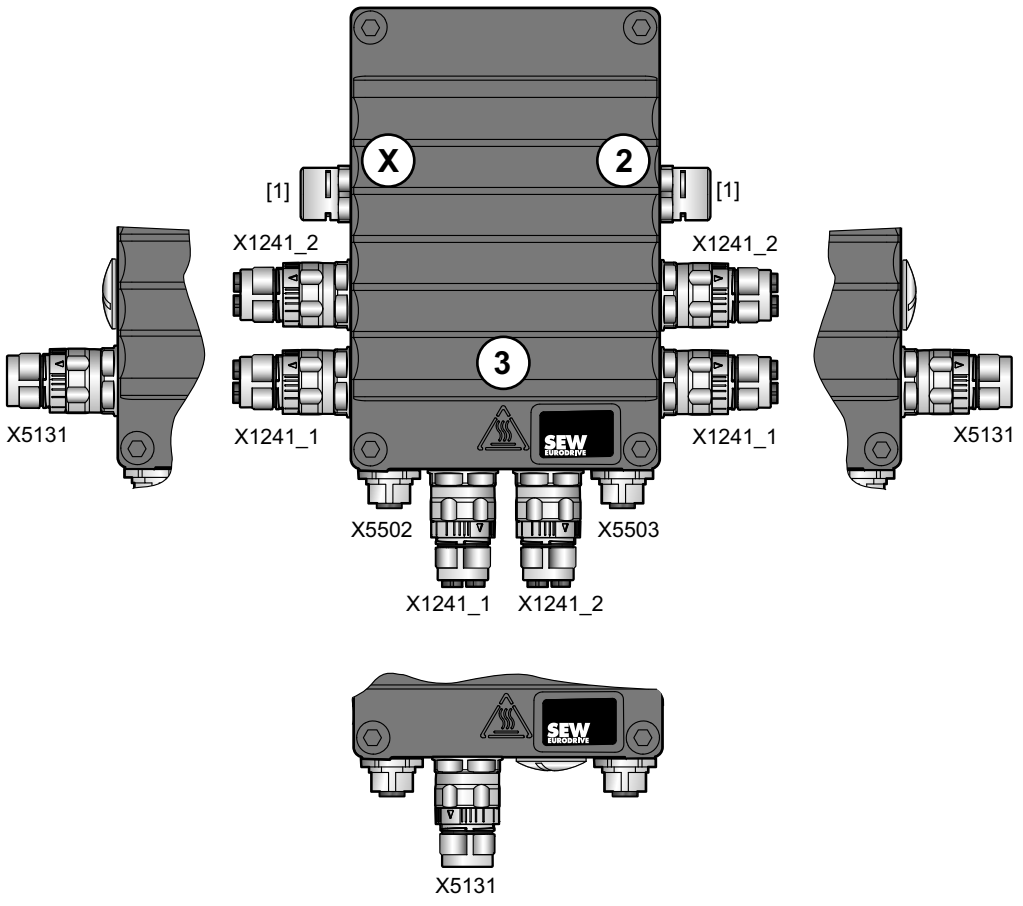
Plug connector positions

The following figure shows the possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connectors	Color	Position	Location
X5131: Digital inputs/outputs	–	As required	X, 2 or 3, not together with X1241_1, X1241_2
X5502: STO – IN	Orange	Fixed	3 (left)
X5503: STO – OUT	Orange	Fixed	3 (right)
X1241_1: AC 400 V connection with SNI [1)]	Red	As required	X, 2 or 3, not together with X5131
X1241_2: AC 400 V connection with SNI	Red	As required	X, 2 or 3, not together with X5131
[1] Pressure compensation [2)]	–	Fixed	Depends on mounting position

1) Plug connector X1241_1 is also available separately (i.e. without plug connector X1241_2).

2) Only in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).



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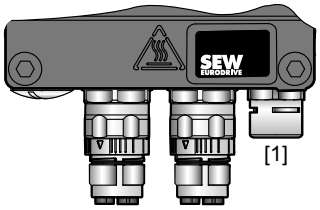
Restrictions in conjunction with pressure compensation

The position for STO plug connectors is occupied by the pressure compensation fitting [1] when using the optional design for use in wet areas (with MOVIGEAR®)/ASEPTIC^{plus} design (with DRC) and M5, M6 mounting position. In this case, plug connectors for STO are not possible:



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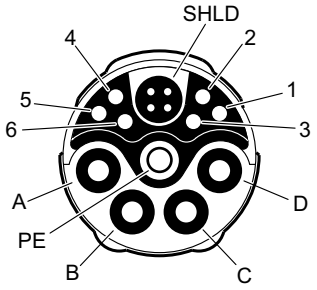
7.4.9 X1241_1 and X1241_2: AC 400 V connection with SNI

The following table shows information about this connection:

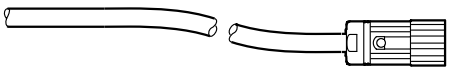
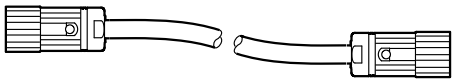
Function		
AC 400 V connection for supplying the unit/for looping through With single line network installation (SNI)		
Connection type		
M23, SEW insert, SpeedTec equipment, Intercontec, female, coding ring: red, protected against contact		
Wiring diagram		
 2497125387		
Assignment		
No.	**Name**	**Function**
A	L1_SNI	Actuator supply phase L1 with SNI communication
B	L2_SNI	Actuator supply phase L2 with SNI communication
C	L3_SNI	Actuator supply phase L3 with SNI communication
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

INFORMATION

The communication method requires that you must observe the order of the line phases L1, L2, L3 between SNI controller and MOVIGEAR® SNI drive units 1 to 10.

Connection cables

The following table provides an overview of cables available for this connection:

Compliance 1)	Connection cable	Length/ Installation type	Cable cross section/ cable type	Operating voltage
CE	**Part number 1 812 750 9**  M23, coding ring: red — M23, coding ring: red	Variable 	2.5 mm² HELU-KABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
	Part number 1 812 751 7  Open — M23, coding ring: red	Variable 	2.5 mm² HELU-KABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
	Part number 1 812 752 5  M23, coding ring: red — M23, coding ring: red	Variable 	4 mm² HELU-KABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
	Part number 1 812 753 3  Open — M23, coding ring: red	Variable 	4 mm² HELU-KABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V

1) See also technical data

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

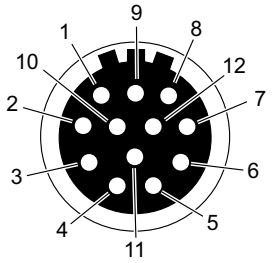
1 812 751 7 and 1 812 753 3

Signal name	Color coding
L1_SNI	Brown
L2_SNI	Black
L3_SNI	Gray
PE	Green/yellow

7.4.10 X5131: Digital inputs/outputs

The following table shows information about this connection:

Function
Digital inputs/outputs for MOVIGEAR® MotionControl
Connection type
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded
Wiring diagram



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Assignment

No.	Name	Function Motion control inputs DIP switch S2/3 = OFF	Function Local mode DIP switch S2/3 = ON
1	DI01	DI01 sensor input	CW/stop
2	DI02	DI02 sensor input	CCW/stop
3	DI03	DI03 sensor input	Setpoint f1/f2
4	DI04	DI04 sensor input	Changeover Automatic/local mode
5	n.c.	Not connected	Not connected
6	n.c.	Not connected	Not connected
7	n.c.	Not connected	Not connected
8	+24V_O	Reserved	DC 24 V output
9	0V24V_O	Reserved	0V24 reference potential
10	0V24V_SEN	0V24 reference potential for sensors [1] Must be supplied via terminals X7.4	Reserved
11	+24 V_SEN	DC 24 V sensor supply [1] Must be supplied via terminals X7.3	Reserved
12	FE	Equipotential bonding/functional ground	Equipotential bonding/functional ground

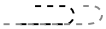
1) see operating instructions, chapter "Connecting MOVIGEAR® drive units"

INFORMATION

Use actuator/sensor distributors with 4 slots for the sensor inputs. Use the DC 24 V output only for local mode.

Connection cables

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 174 145 7  Open — M23, 12-pole, 0°-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
Reserved	Green
Reserved	Purple
+24V_O	Black
0V24_O	Brown
0V24_SEN	White
+24 V_SEN	Gray/pink
FE	Red/blue

7.4.11 X5502: STO – IN

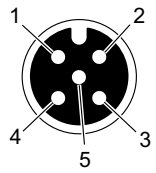
⚠ WARNING

No safety-related disconnection of the MOVIGEAR® drive unit.

Severe or fatal injuries.

- Do not use the 24 V output (pins 1 and 3) for safety-related applications with MOVIGEAR® drive units.
- You may only jumper the STO input with 24 V when the MOVIGEAR® drive unit need not fulfill any safety function.

The following table shows information about this connection:

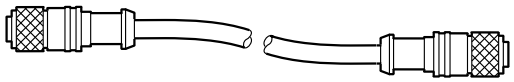
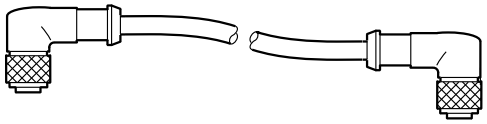
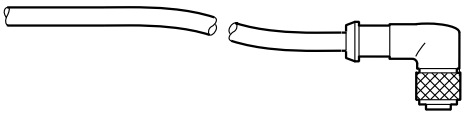
Function		
Input for safe torque off (STO)		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
 2264816267		
Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO −	Input STO –
3	0V24_O	0V24 reference potential
4	STO +	STO + input
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 497 6  Open — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 740 1  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 739 8  Open — M12, 5-pole, A-coded	Variable 	DC 60 V

Connection of cables with open end

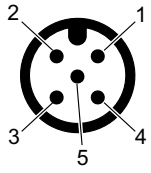
The following table shows the conductor assignment of cables with the following part numbers:

1 812 497 6 and 1 812 739 8

Signal name	Core color/designation
STO −	Black / 1
STO +	Black / 2

7.4.12 X5503: STO – OUT

The following table shows information about this connection:

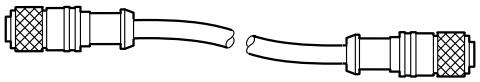
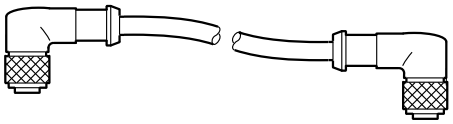
Function		
Connection for safe torque off (STO) for looping through		
Connection type		
M12, 5-pole, male, A-coded		
Wiring diagram		
 2264818187		
Assignment		
No.	**Name**	**Function**
1	res.	Reserviert
2	STO −	Output STO – (to loop through)
3	res.	Reserved
4	STO +	Output STO + (to loop through)
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 740 1  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V

7.5 Application options

7.5.1 GIO12B application option

GIO12B application option	
Degree of protection	IP66
Number of inputs	4
Number of outputs	2
Connection technology	M12 plug connector (A-coded, female)
Input type	PLC-compatible according to EN 61131-2 (digital inputs type 3) R_i about 8 kΩ, sampling cycle 4 ms Signal level +11 V to +30 V "1" = Contact closed –3 V to +5 V "0" = Contact open
Output type	PLC-compatible to EN 61131-2, interference voltage proof and short circuit proof
Sensor/actuator supply **Permitted total current**	DC 24 V to EN 61131-2, Interference voltage proof and short circuit proof 250 mA (total of all connected sensors/actuators, maximum individual load: 250 mA)
Part number	1 823 801 7

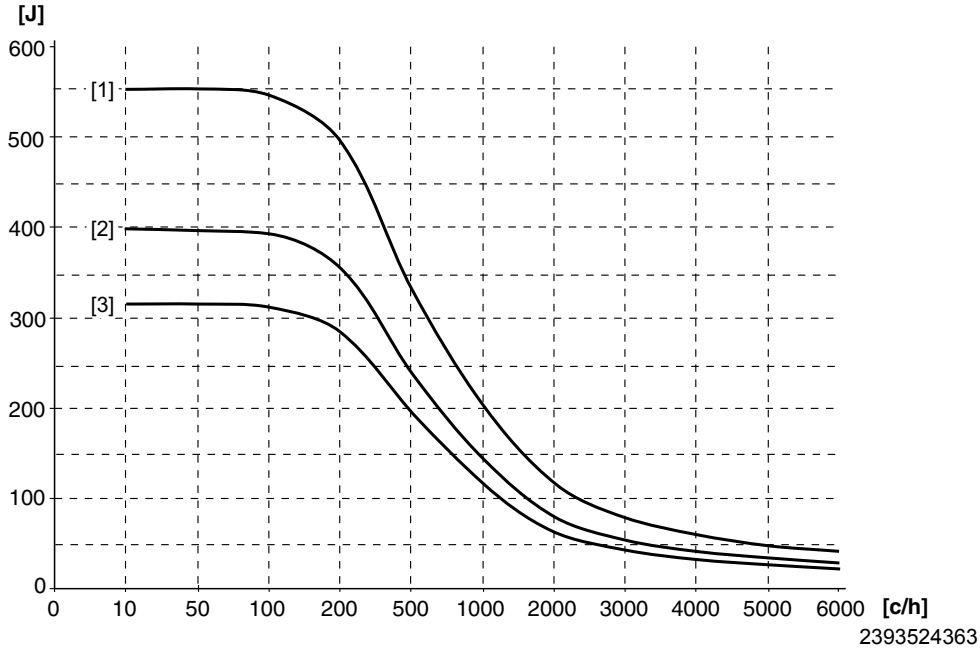
7.5.2 GIO13B application option

GIO13B application option		
Binary inputs / binary outputs		
Number of binary inputs	4 (2 inputs can be used as primary frequency input)	
Primary frequency input	The primary frequency input function occupies a maximum of 2 digital inputs. The function is used to evaluate frequency input signals that are provided, for example, by a distance encoder (A/B tracks or only A track) or an external controller. The frequency value is then converted into a digital value for further processing. Input frequency range: 0 to 120 KHz Signal voltage: HTL signal level	
Input type	PLC-compatible according to EN 61131-2 (digital inputs type 3) R_i about 8 kΩ, sampling cycle 4 ms Signal level +11 V to +30 V "1" = Contact closed –3 V to +5 V "0" = Contact open	
Number of binary outputs	1	
Output type	Relay with change-over contact U_{max} = DC 30 V I_{min} = DC 100 mA I_{max} = DC 800 mA	
Analog inputs / analog outputs		
Number of analog inputs	1	
Analog input type	Differential input	
	Voltage input V_{in} = DC 0 to +10V Resolution 10 bit Internal resistance R_i >10 kΩ	Current input I_{in} = DC 4 to 20 mA Resolution 10 bit Internal resistance R_i = 250 Ω
Number of analog outputs	1	
Analog output type	Output characteristics: 4 to 20 mA Max. output voltage: 25 V Short circuit proof Resolution 10 bit	

GIO13B application option		
General technical data		
Degree of protection	IP65 (only when installed)	
Connection technology	M12 plug connector (A-coded, female)	
Sensor/actuator supply	DC 24 V to EN 61131-2, Interference voltage proof and short circuit proof	
Permitted total current	250 mA (total of all connected sensors/actuators, maximum individual load: 140 mA)	
Part number	1 822 652 3	
Refresh times of primary frequency inputs depending on the set scaling frequency		
Scaling frequency [Hz]	**Refresh times [ms]**	
	LFI mode = trace A	**LFI mode = traces A + B**
1	500	250
2	250	125
5	100	50
10	50	25
20	25	12
40	12	6
80	6	3
120	3	2

7.6 Integrated BW1 braking resistor

The following diagram shows the load capacity per braking operation of the BW1 braking resistor integrated in MOVIGEAR® as standard:



[1] Brake ramp 10 s
[2] Brake ramp 4 s
[3] Brake ramp 0.2 s
c/h cycles per hour

7.6.1 Calculation example

The known values are:

- Average braking power: 144 W
- Brake ramp: 2 s
- 200 brake applications per hour

Calculating energy from the power of the brake ramp:

$W = P \times t$

$W = 144\ W \times 2\ s$

$W = 288\ J$

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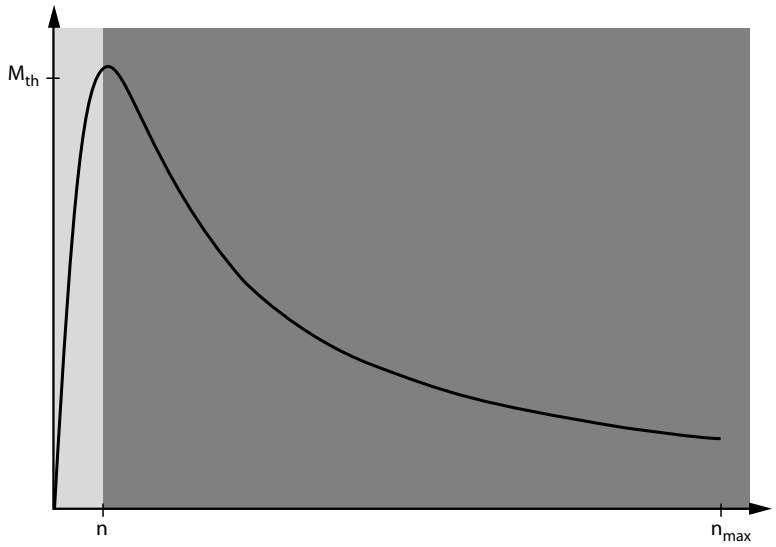
For the brake ramp of 2 s, you can use brake ramp [3] (0.2 s) in the diagram. Use the characteristic curve with the shorter brake ramp because a shorter brake ramp means more braking energy.

The diagram permits 290 J of braking energy for the 0.2 s brake ramp at 200 cycles per hour. In this case, the required 288 J can be dissipated via BW1.

7.7 DynaStop® deceleration torque



2393701003

= DynaStop® operating range
= Impermissible operating range of DynaStop®

MGF.. 2	i_{tot}	Deceleration torque	
		M_{DSP} [Nm]	With n_{DSP} (gear unit shaft speed) [rpm]
3-stage	55.25	200	2.08
	51.51	189	2.23
	45.03	173	2.55
	42.19	162	2.73
	37.24	143	3.08
	33.02	127	3.48
	28.07	108	4.10
2-stage	22.86	89	5.03
	19.81	77	5.81
	18.52	72	6.2
	16.00	62	7.19
	13.60	53	8.46
	12.14	47	9.47
	10.37	40	11.09
	9.71	38	11.84
	8.24	32	13.96
	7.00	27	16.43
	6.25	24	18.40
	5.34	21	21.54
	5.00	19	23.00

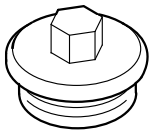
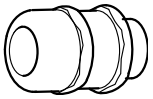
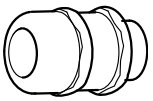
MGF.. 4	i_{tot}	Deceleration torque	
		M_{DSP} [Nm]	With n_{DSP} (gear unit shaft speed) [rpm]
3-stage	56.49	434	0.71
	48.00	369	0.83
	42.86	329	0.93
	36.61	281	1.09
	34.29	263	1.17
	28.88	222	1.39
2-stage	25.72	200	1.56
	21.82	169	1.83
	19.70	153	2.03
	17.33	134	2.31
	16.36	127	2.44
	13.93	108	2.87
	12.66	98	3.16
	10.97	85	3.65
	8.96	70	4.46
	7.88	61	5.08
	7.44	58	5.38
	6.34	49	6.56
	5.76	45	6.94
	4.99	39	8.02

MGF.. 4/XT	i_{tot}	Deceleration torque	
		M_{DSP} [Nm]	With n_{DSP} (gear unit shaft speed) [rpm]
3-stage	56.49	542	0.56
	48.00	461	0.66
	42.86	411	0.74
	36.61	351	0.87
	34.29	329	0.93
	28.88	277	1.10
2-stage	25.72	247	1.24
	21.82	209	1.46
	19.70	189	1.62
	17.33	166	1.84
	16.36	157	1.95
	13.93	134	2.29
	12.66	122	2.52
	10.97	105	2.90
	8.96	86	3.55
	7.88	76	4.04
	7.44	71	4.28
	6.34	61	5.02
	5.76	55	5.53
	4.99	48	6.38

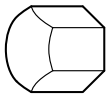
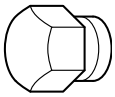
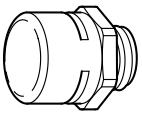
= Preferred gear ratio

7.8 Accessories

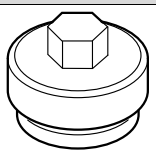
7.8.1 Cable glands / screw plugs

Type of screw fitting	Figure	Content	Size	Part number
Screw plugs Hexagon (made of stainless steel)		10 pcs	M16 x 1.5	1 824 734 2
		10 pcs	M25 x 1.5	1 824 735 0
EMC cable gland (nickel-plated brass)		10 pcs	M16 x 1.5	1 820 478 3
		10 pcs	M25 x 1.5	1 820 480 5
EMC cable gland (made of stainless steel)		10 pcs	M16 x 1.5	1 821 636 6
		10 pcs	M25 x 1.5	1 821 638 2

7.8.2 Screw fittings: plug connectors/pressure compensation

Type of screw fitting	Figure	Content	Size	Part number
M12 plug for plug connectors with male thread (made of stainless steel)		10 pcs	M12 x 1.0	1 820 279 9
M12 plug for plug connectors with female thread (made of stainless steel)		10 pcs	M12 x 1.0	1 820 227 6
Pressure compensation fitting (made of stainless steel)		1 pc	M16 x 1.5	1 820 409 0

7.8.3 Screw fittings: diagnostic interface / potentiometer

Type of screw fitting	Figure	Content	Size	Part number
Screw plug Hexagon For f1 potentiometer And diagnostic interface (made of stainless steel)		10 pcs	M24 x 1.5	1 824 107 7

7.8.4 Accessories for parameterization and diagnostics

DBC and DAC electronic drive unit variants are equipped with an interface for parameterization and diagnostics. The following chapter shows the accessories for connection with the PC/laptop.

INFORMATION

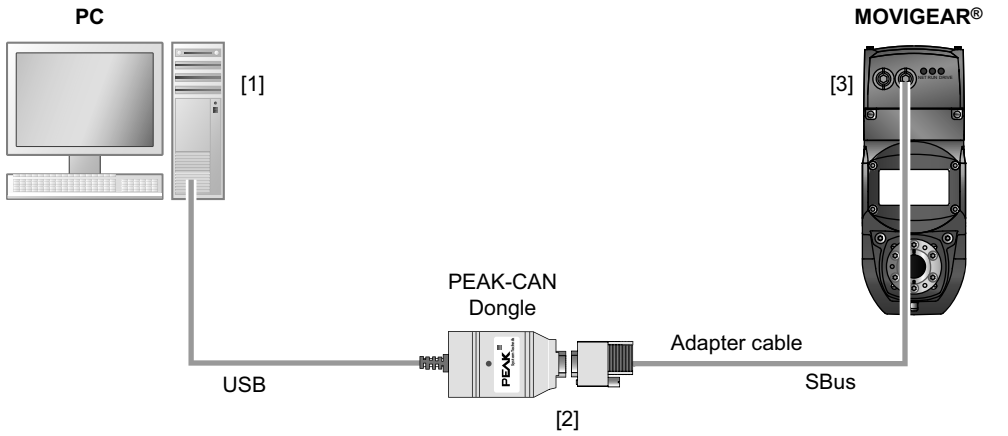
For DSC and SNI electronic drive unit variants, the connection between PC and drive unit is established via the controller used. Read the information in the relevant documentation.

PC connection

The diagnostic interface [3] can be connected to a commercially available PC/laptop [1] using one of the following options:

- [2] PEAK-CAN dongle with adapter cable
  - Part number of PEAK-CAN dongle: 1821 0597
  - Part number of adapter cable: 1812 3864

Connection example



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7.8.5 STO jumper plug

⚠ WARNING

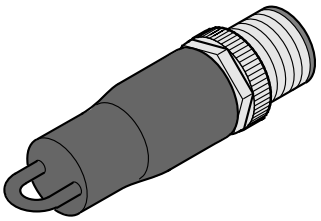
Safety-related disconnection of the MOVIGEAR® drive unit is not possible when using the STO jumper plug.

Severe or fatal injuries.

- You may only jumper the STO input with 24 V when the MOVIGEAR® drive unit need not fulfill any safety function.

The STO jumper plug can be connected to the STO plug connector of the MOVIGEAR® drive unit. The STO jumper plug deactivates the safety functions of the MOVIGEAR® drive unit.

The following figure shows the STO jumper plug, part number 1 174 709 9:



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7.9 Connection cables

7.9.1 Required connection cables for single line installation

SEW-EURODRIVE prescribes the following cable types for the connection between MOVIGEAR® SNI drive units and SNI controllers:

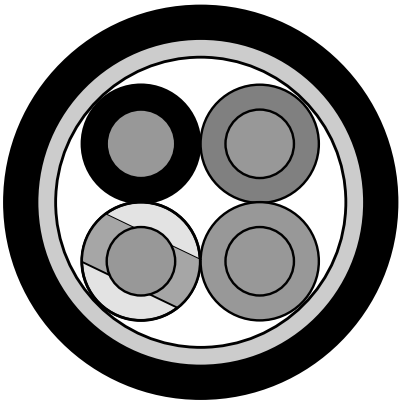
HELUKABEL TOPFLEX®

- **HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J**
- **HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J/UL/CSA**

  (UL-compliant installation)
- **HELUKABEL TOPFLEX® – EMV-2YSLCY-J**

  The following figure shows the cable structure:

HELUKABEL TOPFLEX®
– EMV-UV-2YSLCYK-J
– EMV-UV-2YSLCYK-J/UL/CSA
Black outer cable sheath (UV-resistant)



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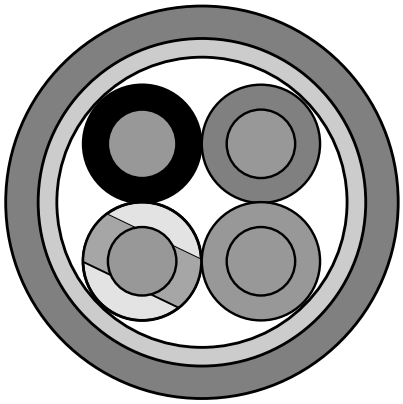
HELUKABEL TOPFLEX® – EMV-2YSLCY-J
Transparent outer cable sheath

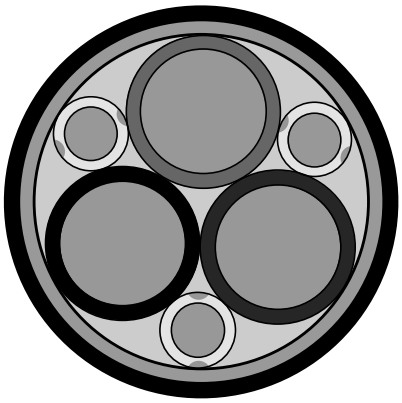


2688418699

- **HELUKABEL TOPFLEX® – EMV-UV-3 PLUS 2YSLCYK-J**

  The following figure shows the cable structure:

HELUKABEL TOPFLEX® – EMV-UV-3 PLUS 2YSLCYK-J
Black outer cable sheath (UV-resistant)



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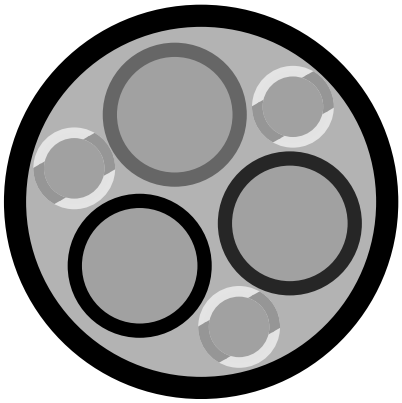
LAPP ÖLFLEX®

- **LAPP ÖLFLEX® SERVO 2YSLCYK-JB**
  LAPP ÖLFLEX® SERVO 2YSLCY-JB

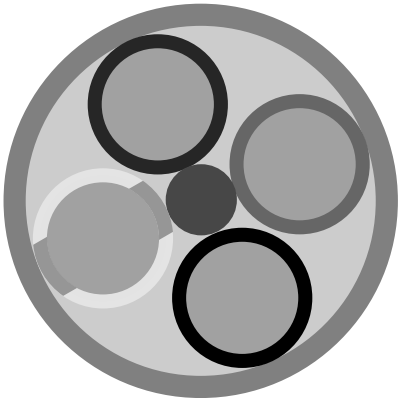
  The following figures show the cable structure:

LAPP ÖLFLEX® SERVO 2YSLCYK-JB
Black outer cable sheath (UV-resistant)



3336402059

LAPP ÖLFLEX® SERVO 2YSLCY-JB
Transparent outer cable sheath



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INFORMATION

A high signal quality is achieved due to the low operating capacitance of the specified cables.

The shielding prevents interference emission resulting from the data transmission modulated onto the line.

7.9.2 Specification of recommended CAN connection cable

When individual CAN connection cables are used, SEW-EURODRIVE recommends the cable type *"Belden 9841/LOW-capacitance computer cable for EIA".*

Description

24 AWG stranded TC wire, insulated with polyethylene, drilled, shielded with Beldfoil® (100%) + TC braid (90% shielding), 24 AWG stranded TC drain wire, PVC sheath.

Physical properties (in total)

Conductor: AWG			
Twisted-pairs	**AWG**	**Stranding**	**Conductor material**
1	24	7x32	TC – tinned copper

Mechanical properties (in total)

Mechanical properties (in total)	
Operating temperature	−30 °C to +80 °C
Nominal UL temperature	+80 °C
Weight of raw cable	36 lbs/1000 ft.
Max. recommended tensile stress	72.3 lbs.
Min. bending radius of secondary axis	2.5 inches

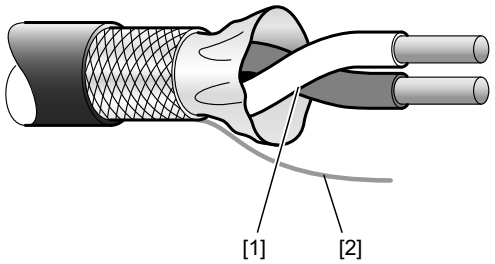
Applicable specifications and compliance with regulatory specifications (in total) Applicable standards	
NEC/(UL) specification	CM
CEC/C(UL) specification	CM
AWM specification	UL style 2919 (30 V 80°)
EU CE mark (Y/N)	Yes
EU RoHS compliant (Y/N)	Yes
EU RoHS compliance date (MM/DD/YYYY)	01/01/2004
Plenum / Non-Plenum: Plenum (Y/N)	No
Plenum number	82841, 89841

Electrical properties (in total)

Electrical properties (in total)	
Characteristic rated impedance **Impedance (ohms)**	120
Nominal capacitance conductor/conductor **Capacitance (pF/ft)**	12.8
Nominal capacitance conductor/other conductor and shield **Capacitance (pF/ft)**	23.0
Nominal propagation speed **VP (%)**	66
Nominal delay time **Delay (ns/ft)**	1.6
Nominal value of the direct current resistance of the conductor **Nominal DC resistance at 20 °C (ohm/1000 ft)**	24.0
Nominal value of the direct current resistance of the outer shield **Nominal DC resistance at 20 °C (ohm/1000 ft)**	3.4
Nominal attenuation **Attenuation (dB/100ft)**	0.6 (at 1 MHz)
Max. operating voltage – UL **Voltage**	300 V RMS 20 V RMS (UL AWM Style 2919)
Max. recommended amperage **Amperage**	2.1 A per conductor at 25 °C

Notes on connection

The following figure shows the structure of the cable and how the connections are used:



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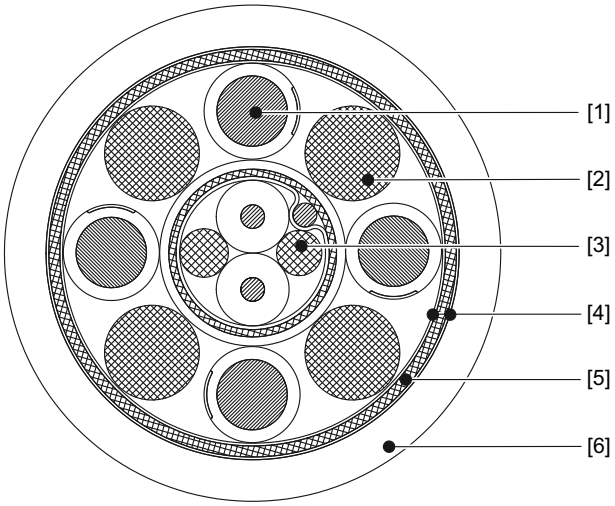
[1] CAN_H / CAN_L connection
[2] CAN_GND connection via drain wire

7.9.3 Specification of recommended hybrid cables

SEW-EURODRIVE recommends the following hybrid cables for connecting MOVIGEAR® DSC drive units and controllers: The following figure shows the structure of the hybrid cable:



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	Type: LEONI Elocab EHRK 016281	Type: LEONI Elocab EHRK 018473
[1]	4 cores 2.5 mm^2 Conductor (141 x 0.15 mm) blank copper Insulation TPE Colors black, with printed numbers 1-3 1 x yellow-green	4 cores 4.0 mm ^{2} Conductor (228 x 0,15 mm) blank copper Insulation TPE Colors black, with printed numbers 1-3 1 x yellow-green
[2]	Filler	
[3]	1 conductor pair 0.25 mm^2 Conductor (19 x 0.13 mm) blank copper Insulation PE Colors white/blue	
	Foil shield aluminum-clad side toward the braided shield Opt. coverage 100%	
	Drain wire 0.25 mm^2 Conductor (19 x 0.13 mm) blank copper	
	Shield braided Conductor (0.10 mm) tin-plated copper	
	Sheathing TPE Color purple	
[4]	Windings	
[5]	Shield braided Conductor (0.161 mm) tinned copper Opt. coverage at least 85%	
[6]	Outer sheath Polyurethane, flame retardant, halogen-free Color black	

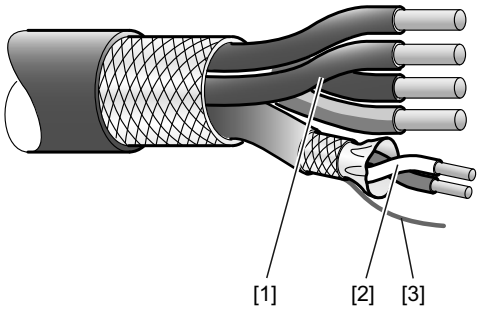
Technical data of hybrid cables

The following table shows the technical data of the hybrid cable:

Properties	Type: LEONI Elocab EHRK 016281	Type: LEONI Elocab EHRK 018473
UL features	UL style 20234 80 °C 1000 V c UL us certified 80 °C 600 V	
Operating voltage	1000 V	
Test voltage core/core	DC 4700 V	
Test voltage core/shield	DC 3110 V	
Test voltage shield Position [3]	DC 3000 V (spark test)	
Operating temperature	-30 °C to +80 °C (fixed installation)	
Weight of cable	Nom. 291 g/m	Nom. 333 g/m
Wave impedance Position [3]	120 Ω .. ± 10%	
Attenuation Position [3]	Nom. 1.8 dB / 100 m at 1 MHz Nom. 5.6 dB / 100 m at 10 MHz	
Delay Position [3]	Nom. 5 ns / m	
Bending radii	Single bending when routing the cable: 2x cable diameter	

Notes on connection

The following figure shows the structure of the cable and how the connections are used:



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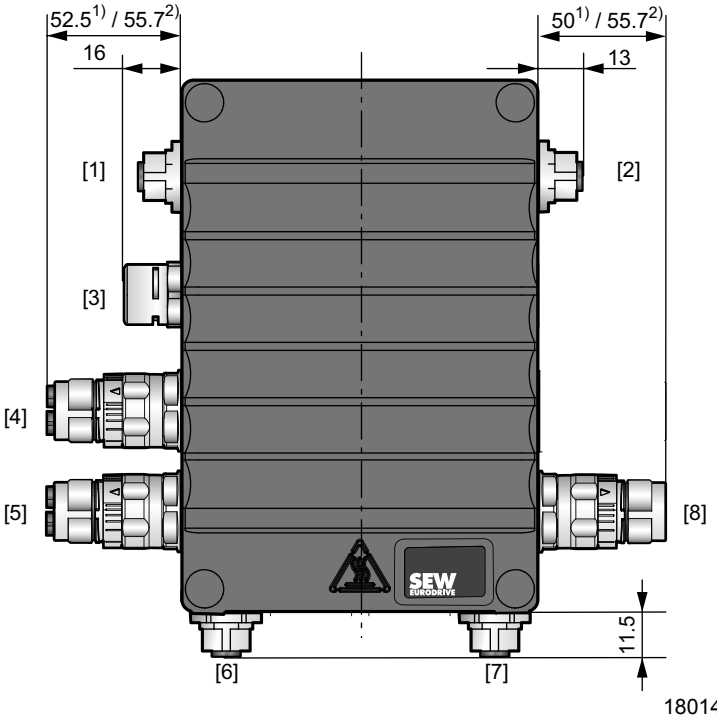
[1] Power supply / PE connection
[2] CAN_H / CAN_L connection
[3] CAN_GND connection via drain wire

7.10 Dimension drawings of plug connectors

7.10.1 Plug connectors

The following figure shows an example of the additional dimensions of optional plug connectors:



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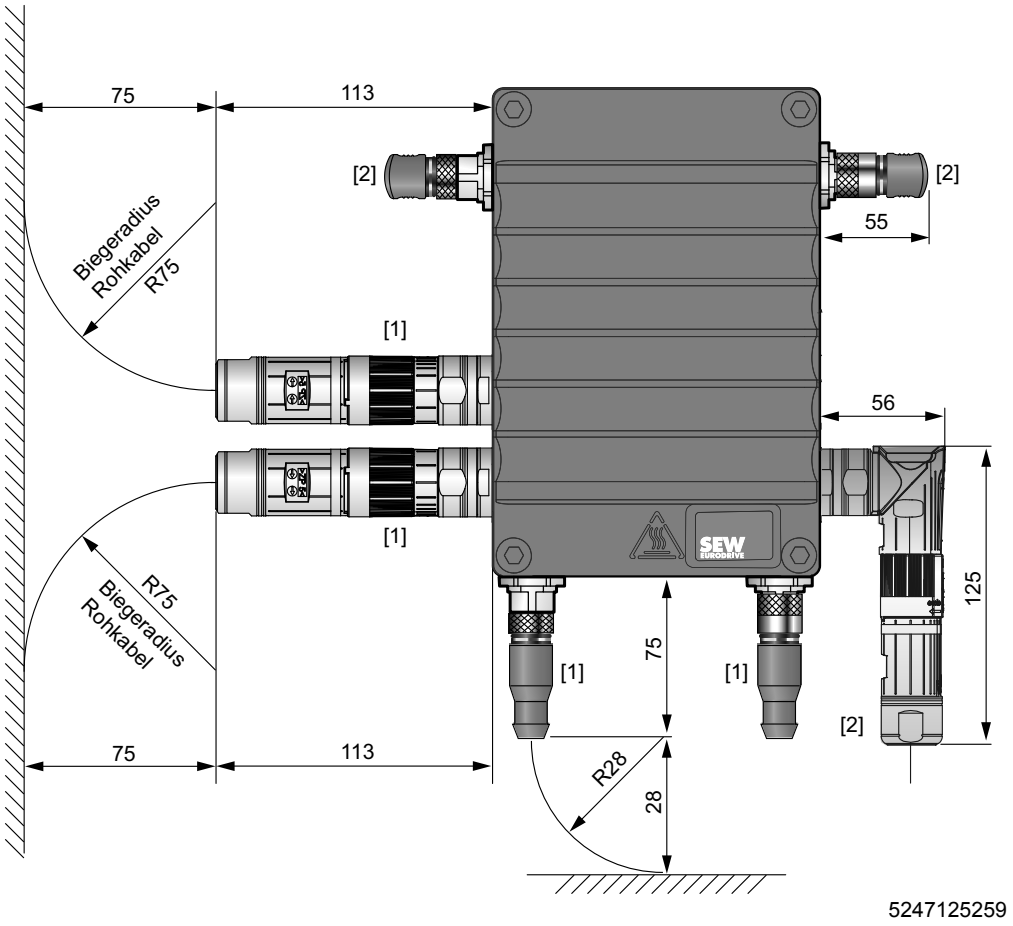
1) "Straight" plug connector variant
2) "Right-angle" plug connector variant

	Electronic variant			
	DBC	**SNI**	**DAC**	**DSC**
[1]	Not possible	Not possible	X4271: AS-Interface communication interface	X4104: CAN bus – system bus – input
[2]	Not possible	Not possible	X5011: AS-Interface sensors	X4103: CAN bus – system bus – output
[3]	Pressure compensation in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).			
[4]	X1203_2: AC 400 V connection	X1203_2: AC 400 V connection with SNI	X1203_2: AC 400 V connection	X1203_2: AC 400 V connection / X1231: AC 400 V output and CAN bus
[5]	X1203_1: AC 400 V connection	X1203_1: AC 400 V connection with SNI	X1203_1: AC 400 V connection	X1203_1: AC 400 V connection / X2324: AC 400 V input and CAN bus
[6]	X5502: STO – IN	X5502: STO – IN	X5502: STO – IN	X5502: STO – IN
[7]	X5503: STO – OUT	X5503: STO – OUT	X5503: STO – OUT	X5503: STO – OUT
[8]	X5132: Digital inputs/outputs	X5131: Digital inputs/outputs	X5132: Digital inputs/outputs	X5131: Digital inputs/outputs

7.10.2 Plug connectors and mating connectors

The following figure shows the additional dimensions / bending radii of the optional plug connectors including mating connector in connection with prefabricated cables from SEW-EURODRIVE.



[1] "Straight" plug connector variant
[2] "Right-angle" plug connector variant

8 Technical Data of MOVIFIT® FDC

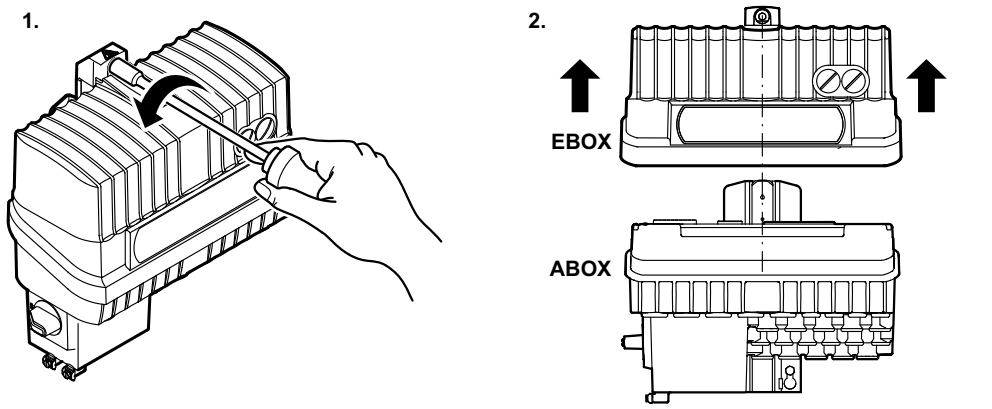
8.1 Type designation and housing concept

8.1.1 Features

The MOVIFIT® FDC housing has the following characteristics:

- Aluminum die-cast housing
  - High rigidity
  - IP65 design for industrial requirements
  - Optional variant for use in wet areas with special surface finish for the food industry.
- Separation of connection unit (ABOX) and electronics (EBOX):
  - No damage to the electronics during installation and maintenance
  - Data backup of user parameters in the SD memory card of the EBOX
  - Fast replacement of electronics without wiring: Only one screw is required to connect the EBOX to the ABOX, see following figures.

Remove EBOX



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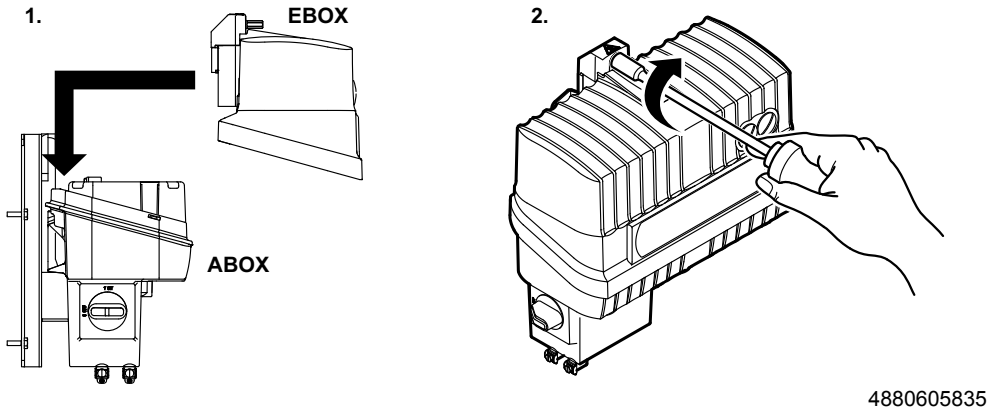
Place EBOX on top of ABOX and screw it on



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8.1.2 Sample type designation

For example
EBOX

MT C 11 A 000 - 503 - R9500 - 00

EBOX variant
00 = Series

Performance class type (SD card)
R95.. = OMC41B-T0
(CCU standard, parameterizable)
R96.. = OMH41B-T0
(MOVI-PLC® standard, programmable)
R97.. = OMC41B-T0 – OMC41B-T25
(CCU advanced, parameterizable)
R98.. = OMH41B-T0 – OMH41B-T25
(MOVI-PLC® advanced, programmable)

Supply phases
3 = 3-phase (AC)

Supply voltage
50 = 380 V – 500 V

Power
000 = MTC variant (MOVIFIT® FDC)

Version A

Series
11 = Standard (IP65)
13 = Variant for wet areas (IP65)

Unit type
C = MOVIFIT® FDC

MT = MOVIFIT® product line

Example: ABOX

MT A 11 A - 50 3 - S04 3 - M16 - 00 / M11

ABOX option
M11 = Stainless steel mounting rail

ABOX variant
00 = Series

Maintenance switch
M16 = Load disconnector and line protection up to 15 A
M20 = Load disconnector and line protection up to 20 A

Fieldbus
3 = PROFINET IO, EtherNet/IP, Modbus/TCP

Connection configuration
S04 = Standard ABOX
With terminals and cable bushings
S54 = Hybrid ABOX with M12 for I/Os + bus and plug connector for MOVIGEAR® / DRC
S64 = Hybrid ABOX with M12 for I/Os, push-pull RJ45 for bus and plug connector for MOVIGEAR® / DRC

Supply phases
3 = 3-phase (AC)

Supply voltage
50 = 380 V – 500 V

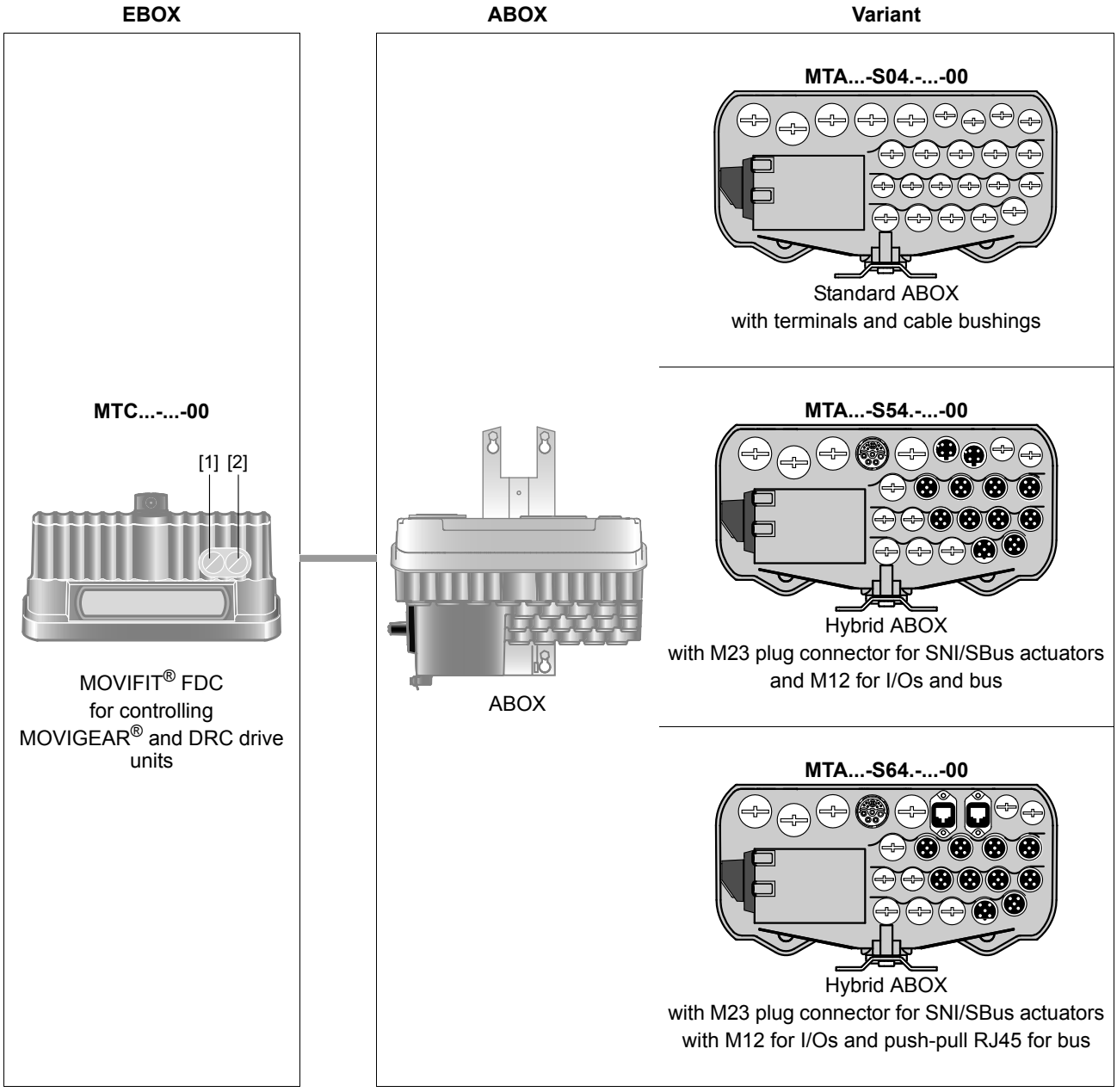
A = Version

Series
11 = Standard (IP65)
13 = Variant for wet areas (IP65)

Unit type
A = ABOX (connection box)

MT = MOVIFIT® product line

8.1.3 Combination options with MOVIFIT® FDC



[1]	X51	USB interface (underneath the screw plug)	USB socket type B
[2]	X52	Ethernet service interface (underneath the screw fitting)	RJ45

8.2 Technical data

8.2.1 Basic unit

Input		
Supply voltage	V_{line}	AC 3 x 380 V - 5% to AC 3 x 500 V + 10%
Line frequency	f_{line}	50 – 60 Hz ±5%
Line input current 100% **(at V_{line} = AC 3 x 380 V)**	I_{line}	AC 20 A
Output		
Nominal output power	P_N	8 kW
Nominal output current	I_N	AC 15 A for the M16 motor circuit breaker variant AC 20 A for the M20 motor circuit breaker variant
Line protection to MOVIGEAR® / DRC drive unit		Motor protection switch; ABB MS325, Factory setting depends on cable cross section of SNI cable/hybrid cable • 3 x 2.5 mm^2 => type M16 (15 A) • 3 x 4.0 mm^2 => type M20 (20 A)
Cable length between MOVIFIT® and the MOVIGEAR® DRC drive unit		SNI cable, for example HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J max. 100 m
		Hybrid cable, for example LEONI Elocab EHRK 016281 at 1 MBaud: max. 25 m at 500 kBaud: max. 50 m
General information		
Interference immunity		Meets EN 61800-3
Interference emission with EMC compliant installation		According to limit value class C3 to EN 61800-3
Ambient temperature	ϑ_A	0 – +40 °C, non-condensing, no moisture condensation
Climate class		EN 60721-3-3, class 3K3
Storage temperature	ϑ_F	-25 – +75 °C (EN 60721-3-3, class 3K3)
Permissible oscillation and impact load		According to EN 61800-5-1
Degree of protection		IP65 according to EN 60529 (MOVIFIT® housing closed and all cable glands and plug connections sealed)
Cooling type (DIN 41751)		Self-cooling
Overvoltage category		III according to IEC 60664-1 (VDE 0110-1)
Pollution class		2 according to IEC 60664-1 (VDE 0110-1) within the housing
Installation altitude	**h**	Up to 2000 m without restrictions (installation altitudes higher than 2000: see operating instructions, chapter "Electrical Installation" / "Installation instructions" / "Installation heights above 1000 asl)
Mass	**m**	about 9 kg
Dimensions	**W x H x D**	334 x 190 x 333 mm

8.2.2 Electronics data

Electronics data	
DC 24 V supply **24V_C (continuous)**	V_{IN} = DC 24 V -15% / +20% according to EN 61131-2 Current consumption: I_E ≤ 500 mA, typically 200 mA (for MOVIFIT® electronics) • plus up to 2000 mA (4 outputs with 500 mA each) • plus up to 1400 mA (for sensor supply depending on the number and type of connected sensors)
Sensor supply X25	2 circuits • Total current terminals 30 – 33: 700 mA • Total current terminals 34 – 37: 700 mA
Electrical isolation	Separate potentials for: • Fieldbus connection (X30, X31 internal or X11, X12 external) • 24V_C for: – MOVIFIT® electronics including USB interface – DI00 – DI15 – SBus interface – RS485 interface – 24 V outputs for sensors
Shielding of bus cables	using EMC metal cable glands and fittings, and with EMC shield clamp (see operating instructions, chapter "Installation instructions")

8.2.3 Communication and control unit

Control card				
Performance class	CCU standard	MOVI-PLC® standard	CCU advanced	MOVI-PLC® advanced
SD memory card	OM**C**41B-T0 (parameterizable)	OM**H**41B-T0 (programmable)	OM**C**41B-T0 to OM**C**41B-T25 (parameterizable)	OM**H**41B-T0 to OM**H**41B-T25 (programmable)
Task system	1 x free-running, minimum 10 ms 1 x cyclical 10 – 10000 ms		1 x free-running 8 x cyclical 1 – 10000 ms	
Memory	• Program memory: 2 MB (for user program, incl. IEC libraries) • Data memory: 4 MB (for IEC application) • Retain data: 32 kB • System variables (retain): 8 kB		• Program memory: 4 MB (for user program, incl. IEC libraries) • Data memory: 12 MB (for IEC application) • Retain data: 32 kB • System variables (retain): 8 kB	
Engineering	Engineering for all SEW components connected to MOVIFIT® FDC is carried out via • USB service interface (X51) • Ethernet service interface (X52) • Ethernet fieldbus interface (X30 / X31 internal) or (X11 / X12 external) using the MOVITOOLS® MotionStudio PC software with PLC Editor.			
Ethernet fieldbus interface	Connection options: • Engineering PC • Intranet • Higher-level controller (see following sections)			

Binary inputs

Binary inputs	
Number of inputs	16
Input type	PLC-compatible according to EN 61131-2 (digital inputs type 1) R_i about 3 kΩ, sampling cycle ≤ 10 ms Signal level: DC +13 V – +30 V "1" = contact closed DC -3 V – +5 V "0" = contact open
Sensor supply	DC 24 V to EN 61131-2, interference voltage proof and short circuit proof
Rated current	500 mA
Internal voltage drop	max. 2 V

Binary outputs

Binary outputs	
Number of outputs	4
Output type	PLC-compatible to EN 61131-2, interference voltage proof and short circuit proof
Rated current	500 mA
Leakage current	max. 0.2 mA
Internal voltage drop	max. 2 V

8.2.4 Interfaces

SBus interface

SBus	
SBus interface	Interface to other SBUS-capable SEW units CAN bus to CAN specification 2.0, parts A and B
Connection technology	M12, terminals
Transmission technology	ISO 11898 compliant
Bus termination	120 Ω terminating resistor can be activated using DIP switch S3 (ABOX).
CAN interface sensor supply	DC 5 V
Rated current	max. 100 mA

RS485 interface

RS485 interface	
RS485 interface	Electrically isolated from MOVIFIT® electronics
Connection technology	M12, terminals
Standard	RS485 to EIA standard (with integrated dynamic terminating resistor)

USB service interface

USB	
USB service interface	Service interface, not electrically isolated from MOVIFIT® electronics according to USB-2.0 specification
Connection technology	USB socket, type B (on the EBOX)

Ethernet service interface

EtherNet/IP	
Automatic baud rate detection	10 MBd / 100 MBd
Connection technology	RJ45 (on the EBOX)
Maximum line length	100 m according to IEEE 802.3
Addressing	4 byte IP address or MAC ID (00-0F-69-xx-xx-xx) IP address: 192.168.10.4 Subnet mask: 255.255.255.0 Standard gateway: 192.168.10.1

Ethernet fieldbus interface

One of the following protocols can be used for communication via the Ethernet fieldbus interface (depending on DIP switch S12/2):

PROFINET interface

PROFINET	
PROFINET protocol option	PROFINET IO RT
Supported baud rates	100 Mbit/s (full duplex)
SEW ID number	$010A_{hex}$
Device ID number	2
Connection technology	2 x M12, 2 x RJ45 (push-pull) or 2 x RJ45 plug connector (in the ABOX)
Integrated switch	Supports auto-crossing, auto-negotiation
Permitted cable types	Category 5 and higher, class D according to IEC 11801
Maximum line length (from switch to switch)	100 m according to IEEE 802.3
GSD file name	`GSDML-V2.1-SEW-MOVIFIT_FDC-20100401.xml`
Bitmap file name	`SEW-MOVIFIT-FDC.bmp`

EtherNet/IP fieldbus interface

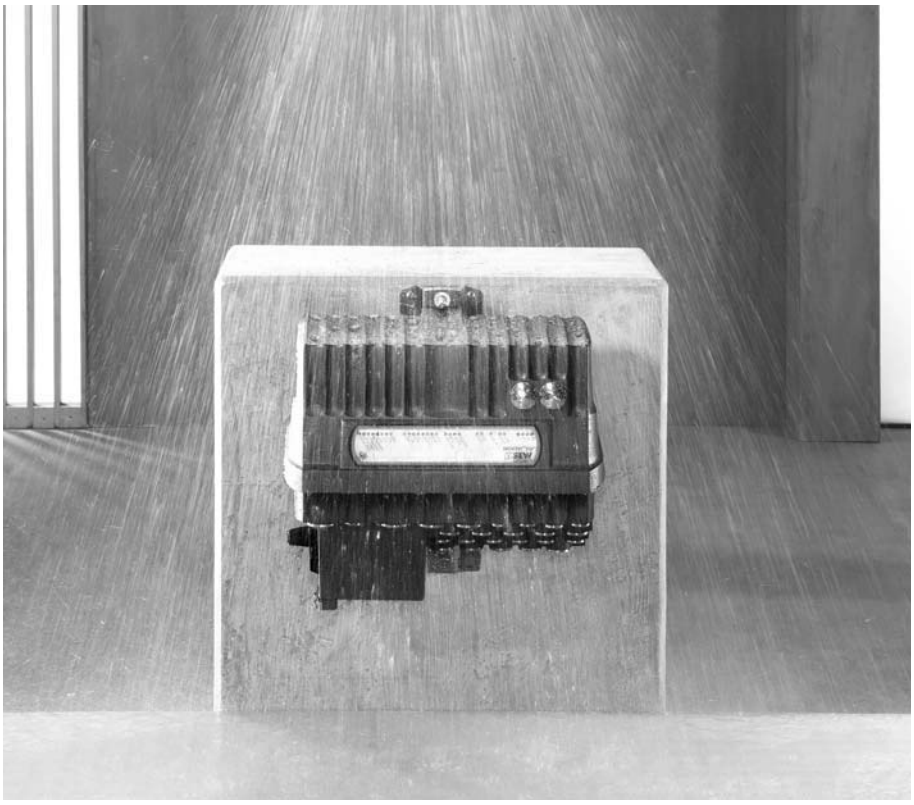
EtherNet/IP	
Automatic baud rate detection	10 MBd / 100 MBd
Connection technology	2 x M12, 2 x RJ45 (push-pull) or 2 x RJ45 plug connector (in the ABOX)
Integrated switch	Supports auto-crossing, auto-negotiation
Maximum line length	100 m according to IEEE 802.3
Addressing	4 byte IP address or MAC ID (00-0F-69-xx-xx-xx) Configurable via DHCP server or MOVITOOLS® MotionStudio version 5.5 and higher, Default address 192.168.10.4 (depending on the setting of DIP switch S12/1)
Manufacturer ID (vendor ID)	$013B_{hex}$
Name of EDS files	`SEW_MOVIFIT_FDC.eds`
Name of icon files	`SEW_MOVIFIT_FDC.ico`

Modbus/TCP interface

Modbus/TCP	
Automatic baud rate detection	10 MBd / 100 MBd
Connection technology	2 x M12, 2 x RJ45 (push-pull) or 2 x RJ45 plug connector (in the ABOX)
Integrated switch	Supports auto-crossing, auto-negotiation
Maximum line length	100 m according to IEEE 802.3
Addressing	4 byte IP address or MAC ID (00-0F-69-xx-xx-xx) Configurable via DHCP server or MOVITOOLS® MotionStudio version 5.5 and higher, Default address 192.168.10.4 (depending on the setting of DIP switch S12/1)
Supported services	FC3, FC16, FC23, FC43

8.3 Variant for use in wet areas

The following figure shows the MOVIFIT® variant for use in wet areas:



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8.3.1 Features

The variant for use in wet areas has the following characteristics:

- IP65 in accordance with EN 60529 (MOVIFIT® housing closed and all cable entries and plug connection sealed according to the relevant degree of protection)
- Easy-to-clean housing (self-draining design)
- Specially treated surface with anti-stick properties (= surface protection HP200)
- High impact resistance of the surface against mechanical damage
- Specifically treated mounting rail with anti-stick properties
- The design for use in wet areas perfectly complements DRC drive units in ASEPTIC / ASEPTIC^{plus} design and MOVIGEAR® drive units with optional package for wet areas.

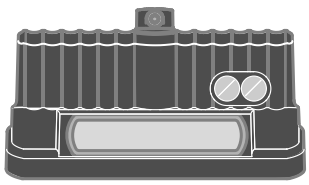
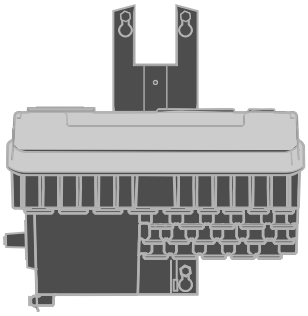
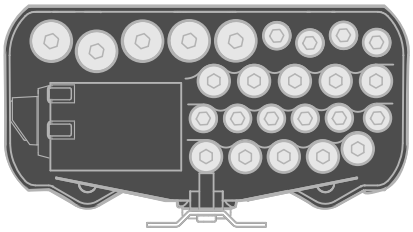
INFORMATION

For more information, refer to the "MOVIFIT® FDC" operating instructions.

8.3.2 Possible combinations in connection with the design for use in wet areas

INFORMATION

The design for use in wet areas is only available in connection with the standard ABOX with terminals and cable bushings.

EBOX	ABOX	Variant
MTC13...-...-00  MOVIFIT® FDC for controlling MOVIGEAR® and DRC drive units		**MTA13....-S04.-...-00**  Standard ABOX with terminals and cable bushings

In SEW-EURODRIVE publications, all illustrations of MOVIFIT® variants for use in wet areas are shown as hatched (= special surface finish).

8.4 HP200 surface treatment

INFORMATION

The information in this chapter is based on the current technical knowledge and experience. No legally binding guarantee of certain properties or of the suitability for a specific application purpose can be derived from the given information.

8.4.1 Characteristics

Thermoplastic fluorinated polymer coating with nearly non-porous surface, excellent anti-stick properties and chemical resistance. Approved for contact with food.

8.4.2 Properties

The HP200 surface finish has the following properties:

HP200 surface treatment	
Anti-adhesive properties	Excellent
Wear resistance	Good, not suitable for abrasion or high pressure
Chemical resistance	Excellent
Solvent resistance	Not soluble
Corrosion resistance	DIN 50021, > 1000 h depending on layer structure
Flammability	Not flammable
Temperature resistance	–40 to +200 °C, thermoplastic behavior
Layer thickness	Approx. 25 µm
Color	Silver-gray Slight color differences are possible in the HP200 surface finish due to the treatment process (individual treatment of the components).
Food grade approval	Approved according to German Federal law and US FDA (no. 21 CFR 175.300)

8.4.3 Cleaning

Do not mix cleaning and disinfecting agents under any circumstances.

Never mix acids and chloralkalis, as poisonous chlorine gas will result.

Strictly observe the safety instructions of the cleaning agent manufacturer.

8.4.4 Certificate of Ecolab Deutschland GmbH

Ecolab Deutschland GmbH
P.O. Box 13 04 06
D-40554 Düsseldorf

certifies that

a material resistance test

was performed for

SEW-EURODRIVE GmbH & Co. KG
Ernst-Blickle-Straße 42
D-76646 Bruchsal

with the following cleaning agents and disinfectants:
P3-topax 19, **P3-topax 56**, **P3-topax 58**, **P3-topax 686**, **P3-topactive 200**, **P3-topactive 500**, **P3-topactive DES**, **P3-topax 990** and **P3-oxysan ZS**, and **demineralized water**.

The protective properties of the **High Protection surface treatment HP 200** tested against the above-mentioned Ecolab products used in the test can be considered to be positive according to the cleaning procedures mentioned overleaf.

Düsseldorf, 14 August 2009

Ecolab Deutschland GmbH

i.V.

Thomas Wershofen
Manager Corporate Service RD&E
Center of Excellence EMEA
Food & Beverage Division

i. A.

Karin Uhlenbrock
Service Engineer RD&E
Center of Excellence EMEA
Food & Beverage Divsion

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ECOLAB®

SEW EURODRIVE

This certificate for the HP200 surface treatment is based on

- documented test procedures on material resistance
- defined product specifications
- a standardized cleaning procedure

Test procedure

Dipping test:
- Immersion into the test medium with contact surface toward ambient air

Test period:
- 7 days

Evaluation:
- Evaluation approx. 7 days after regeneration
- Evaluation of changes of the protective properties according to DIN EN ISO 4628-1
- Evaluation of decorative changes (color, brightness, blistering)
  (+) no changes
  (o) possible minor changes
  (-) possible changes under long-term influence

The HP200 surface treatment was tested in the following media:

Alkaline and chlorinated foam cleaners			
P3-topax 19	5%	40°C	o
P3-topax 686	5%	40°C	o

Acid foam cleaning agents			
P3-topax 56	5%	40°C	o
P3-topax 58	5%	40°C	+

TFC cleaning agents			
P3-topactive 200	4%	40°C	o
P3-topactive 500	4%	40°C	o

Disinfectants			
P3-topax 990	5%	23°C	+
P3-topactive DES	3%	23°C	+
P3-oxysan ZS	1%	23°C	+

DI water	-	40°C	+

Product specifications:

P3-topax 19
Alkaline foam cleaning agent
P3-topax 56
Acid foam cleaning agent based on phosphoric acid
P3-topax 58
Acid foam cleaning agent based on organic acids
P3-topax 686
Alkaline foam cleaning agent with active chlorine
P3-topactive 200
Alkaline cleaning agent for operational cleaning as TFC application
P3-topactive 500
Acid cleaning agent for operational cleaning as TFC application
P3-topax 990
Alkaline foam disinfectant based on alkylamine acetate
P3-topactive DES
Foam and TFC capable disinfectant based on H_2O_2 and peroxy acid
P3-oxysan ZS
Disinfectant based on peroxy compounds
DI water
Demineralized water

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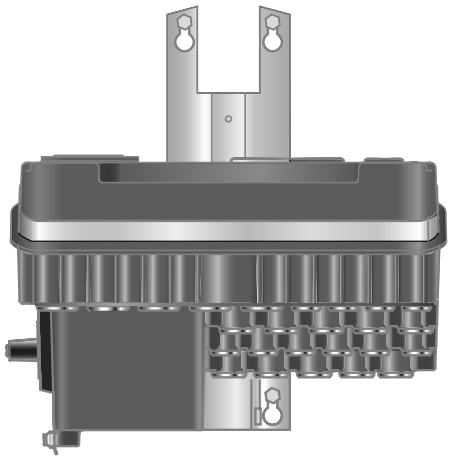
8.5 Flexible connection technology

8.5.1 Overview

The flexible connection technology of MOVIFIT® FDC allows the unit to be adjusted to suit various installation philosophies. This flexibility is made possible thanks to the fact that in addition to the standard version that has to be wired up, there are also prewired solutions with industry-standard connectors.

- **Standard ABOX**
  - With terminals and cable bushings



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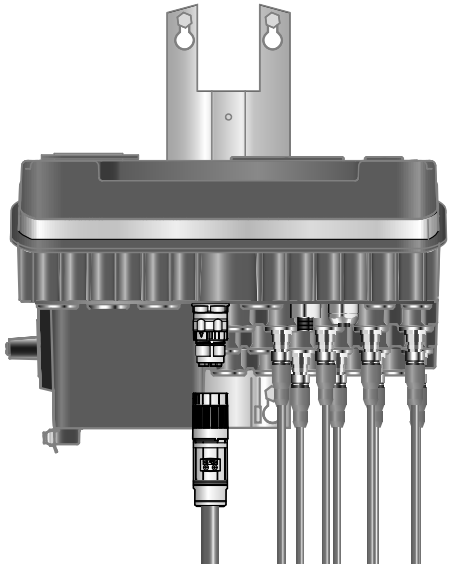
- **Hybrid ABOX**
  - with M23 plug connector for MOVIGEAR® / DRC
  - with M12 for I/Os and bus

    or with M12 for I/Os and push-pull RJ45 for bus



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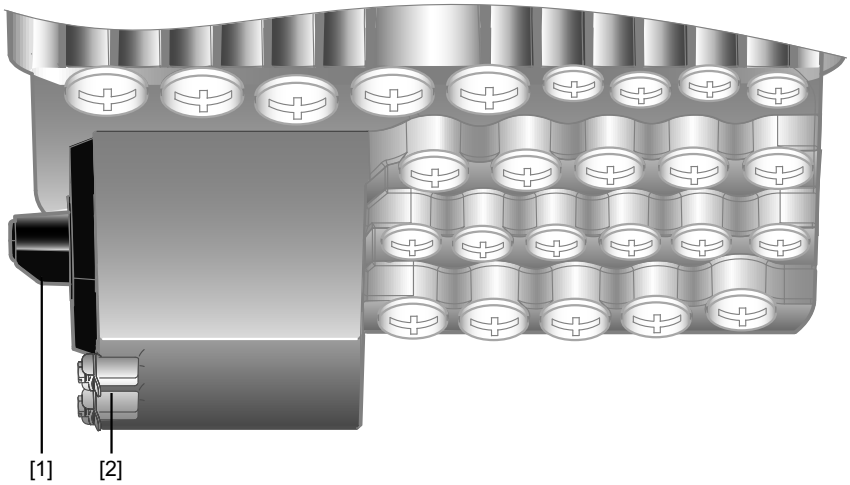
8.6 Available ABOXes

8.6.1 Standard ABOX "MTA...-S04.-...-00"

Description The following figure depicts the standard ABOX "MTA...-S04.-...-00" with terminals and cable bushings:



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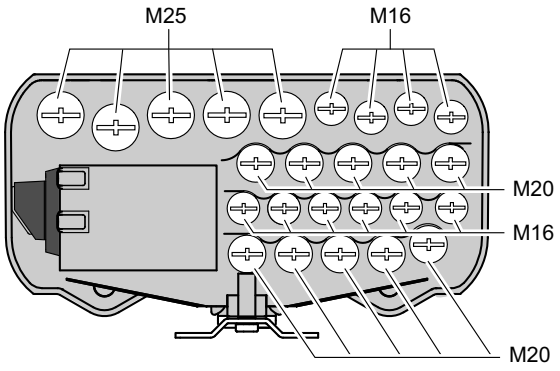
[1] Maintenance switch
[2] PE connection

Screw fittings The following figure depicts the screw fittings of the standard ABOX:

PROFINET MTA11A-503-S043-...-00
EtherNet/IP MTA11A-503-S043-...-00
Modbus/TCP MTA11A-503-S043-...-00



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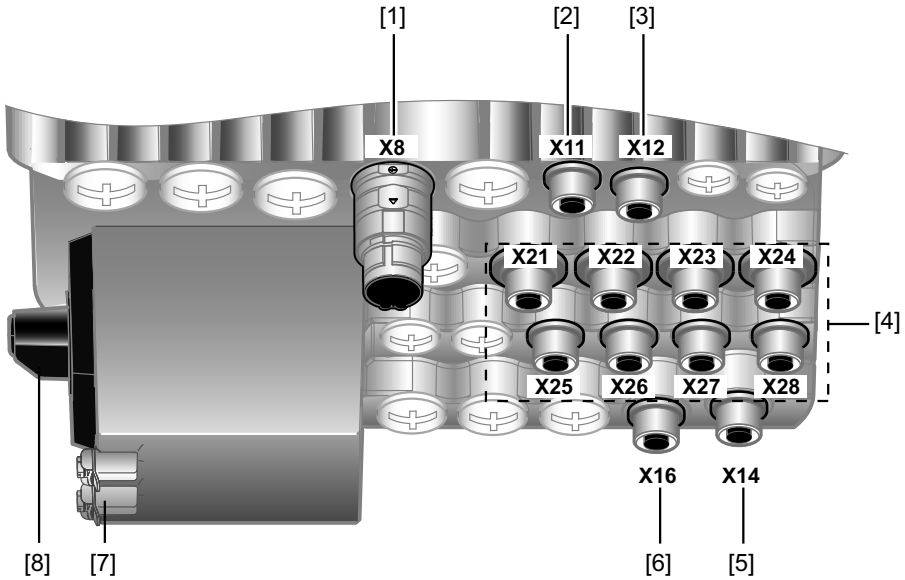
8.6.2 Hybrid ABOX "MTA...-S54.-...-00"

INFORMATION

- The hybrid ABOX is based on the standard ABOX "MTA...-S02.-...-00". The following therefore only describes the additional plug connectors in comparison with the standard ABOX.

Description

The following figure depicts the hybrid ABOX with M12 plug connectors for connecting I/Os and bus:



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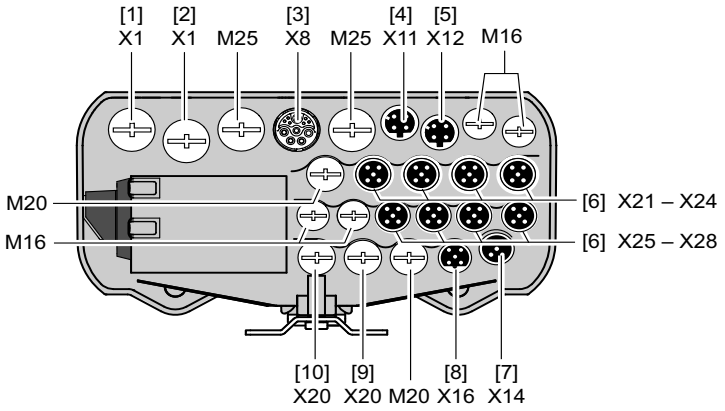
[1]	X8	Drive unit connection • AC 400 V output (SNI cable) • or AC 400 V output and CAN bus (hybrid cable) • or AC 400 V output
[2]	X11	Ethernet interface, port 1
[3]	X12	Ethernet interface, port 2
[4]	X21 – X28	Binary inputs/outputs
[5]	X14	RS485 interface – external
[6]	X16	SBus (CAN) – external
[7]		PE connection
[8]		Maintenance switch

Plug connector positions

The following figure shows the cable glands and plug connectors of the hybrid ABOX:

PROFINET MTA11A-503-S543-...-00
EtherNet/IP MTA11A-503-S543-...-00
Modbus/TCP MTA11A-503-S543-...-00



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[1]	X1	AC 400 V input	(terminals underneath the M25 gland)
[2]	X1	Reserved	(M25 gland)
[3]	X8	Drive unit connection • AC 400 V output (SNI cable) • or AC 400 V output and CAN bus (hybrid cable) • or AC 400 V output	(M23 H-Tec, SEW P-insert 15-pole, female)
[4]	X11	Ethernet fieldbus, port 1	(M12, 4-pole, female, D-coded)
[5]	X12	Ethernet fieldbus, port 2	(M12, 4-pole, female, D-coded)
[6]	X21 – X28	Binary inputs/outputs	(M12, 5-pole, female, A-coded)
[7]	X16	RS485 interface – external	(M12, 5-pole, female, B-coded)
[8]	X14	SBus (CAN) – external	(M12, 5-pole, female, A-coded)
[9]	X20	Reserved	(M25 gland)
[10]	X20	DC 24 V input	(terminals underneath the M25 gland)

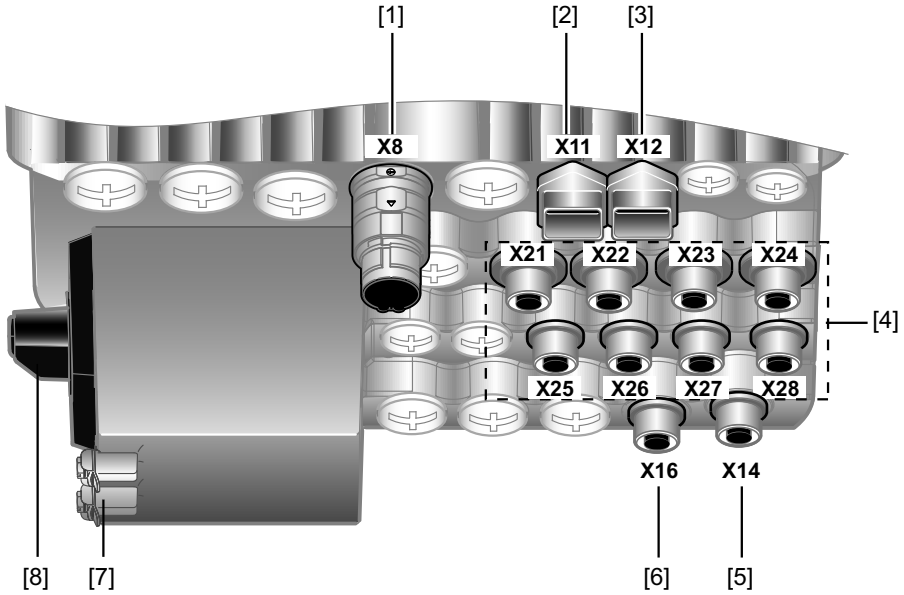
8.6.3 Hybrid-ABOX "MTA...-S64.-...-00"

INFORMATION

- The hybrid ABOX is based on the standard ABOX "MTA...-S02.-...-00". The following therefore only describes the additional plug connectors in comparison with the standard ABOX.

Description

The following figure shows the hybrid ABOX with M12 plug connectors for connecting I/Os and push-pull RJ45 plug connectors for Ethernet connection:



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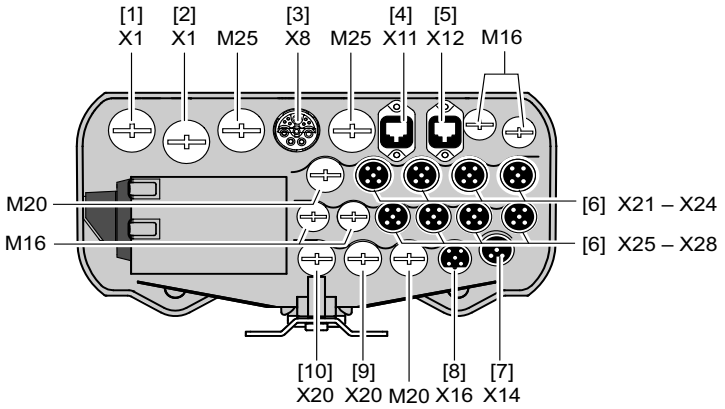
[1]	X8	Drive unit connection • AC 400 V output (SNI cable) • or AC 400 V output and CAN bus (hybrid cable) • or AC 400 V output
[2]	X11	Ethernet interface, port 1
[3]	X12	Ethernet interface, port 2
[4]	X21 – X28	Binary inputs/outputs
[5]	X14	RS485 interface – external
[6]	X16	SBus (CAN) – external
[7]		PE connection
[8]		Maintenance switch

Plug connector positions

The following figure shows the cable glands and plug connectors of the hybrid ABOX:

PROFINET MTA11A-503-S643-...-00
EtherNet/IP MTA11A-503-S643-...-00
Modbus/TCP MTA11A-503-S643-...-00



27021600817498635

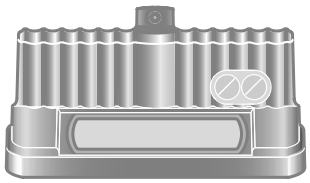
[1]	X1	AC 400 V input	(terminals underneath the M25 gland)
[2]	X1	Reserved	(M25 gland)
[3]	X8	Drive unit connection • AC 400 V output (SNI cable) • or AC 400 V output and CAN bus (hybrid cable) • or AC 400 V output	(M23 H-Tec, SEW P-insert 15-pole, female)
[4]	X11	Ethernet fieldbus, port 1	(Han® 3 A RJ45)
[5]	X12	Ethernet fieldbus, port 2	(Han® 3 A RJ45)
[6]	X21 – X28	Binary inputs/outputs	(M12, 5-pole, female, A-coded)
[7]	X16	RS485 interface – external	(M12, 5-pole, female, B-coded)
[8]	X14	SBus (CAN) – external	(M12, 5-pole, female, A-coded)
[9]	X20	Reserved	(M25 gland)
[10]	X20	DC 24 V input	(terminals underneath the M25 gland)

8.7 Selection tables – Available MOVIFIT® FDC combinations

8.7.1 MOVIFIT® FDC in connection with standard ABOX MTA...-S04.-...-00

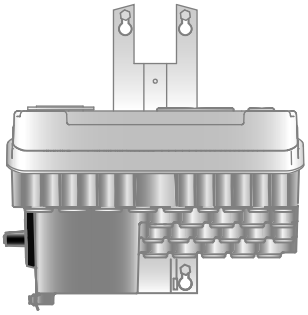
EBOX

MTC...-...-00

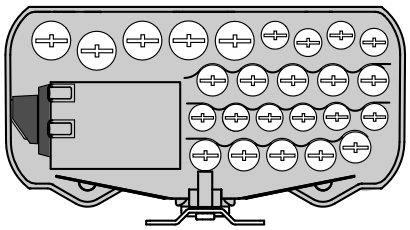


MOVIFIT® FDC
for controlling
MOVIGEAR® and DRC drive units

ABOX



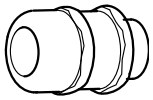
MTA...-S04.-...-00:



Standard ABOX
with terminals and cable bushings

Performance class	Fieldbus	EBOX Type	ABOX Type
CCU standard (R95..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9500-00	MTA11A-503-S043-M16-00 MTA11A-503-S043-M20-00
MOVI-PLC® standard (R96..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9600-00	MTA11A-503-S043-M16-00 MTA11A-503-S043-M20-00
CCU advanced (R97..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9700-00	MTA11A-503-S043-M16-00 MTA11A-503-S043-M20-00
MOVI-PLC® advanced (R98..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9800-00	MTA11A-503-S043-M16-00 MTA11A-503-S043-M20-00

Accessories

Type	Figure	Content	Size	Part number
EMC cable gland (brass, nickel plated)		10 pcs	M16 x 1.5	1820 478 3
		10 pcs	M20 x 1.5	1820 479 1
		10 pcs	M25 x 1.5	1820 480 5
Screw plug for interfaces on the EBOX		1 pc		1 813 062 3

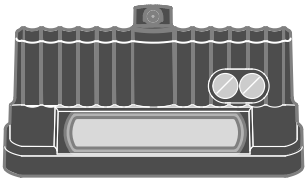
Option

Option	Integrated in	Type
Stainless steel mounting rail	**ABOX**	**/M11**

8.7.2 MOVIFIT® FDC in connection with standard ABOX and design for use in wet areas

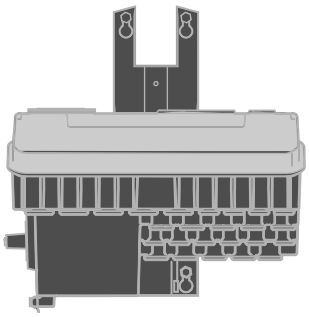
EBOX

MTC13...-...-00
(design for use in wet areas)

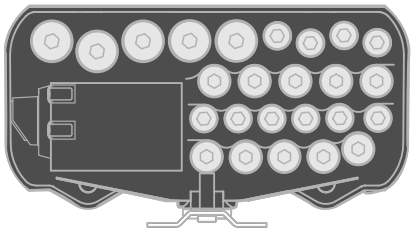


MOVIFIT® FDC
for controlling
MOVIGEAR® and DRC drive units

ABOX



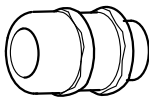
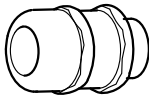
MTA13...-S04.-...-00
(design for use in wet areas)



Standard ABOX
with terminals and cable bushings

Performance class	Fieldbus	EBOX Type	ABOX Type
CCU standard (R95..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC13A000-503-R9500-00	MTA13A-503-S043-M16-00 MTA13A-503-S043-M20-00
CCU standard (R96..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC13A000-503-R9600-00	MTA13A-503-S043-M16-00 MTA13A-503-S043-M20-00
MOVI-PLC® advanced (R97..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC13A000-503-R9700-00	MTA13A-503-S043-M16-00 MTA13A-503-S043-M20-00
MOVI-PLC® advanced (R98..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC13A000-503-R9800-00	MTA13A-503-S043-M16-00 MTA13A-503-S043-M20-00

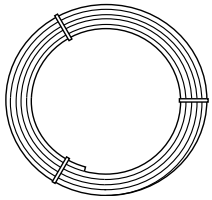
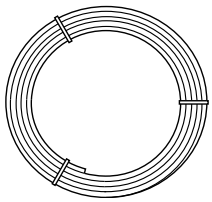
Accessories

Type	Figure	Content	Size	Part number
EMC cable gland (brass, nickel plated)		10 pcs	M16 x 1.5	1820 478 3
		10 pcs	M20 x 1.5	1820 479 1
		10 pcs	M25 x 1.5	1820 480 5
EMC cable gland (stainless steel)		10 pcs	M16 x 1.5	1821 636 6
		10 pcs	M20 x 1.5	1821 637 4
		10 pcs	M25 x 1.5	1821 638 2
Stainless steel screw plugs		10 pcs	M16 x 1.5	1820 223 3
		10 pcs	M20 x 1.5	1820 224 1
		10 pcs	M25 x 1.5	1820 226 8
Screw plug for interfaces on the EBOX		1 pc		1 813 062 3

Option

Option	Integrated in	Type
Stainless steel mounting rail	**ABOX**	**/M11**

8.7.3 Required cables for connecting MOVIFIT® FDC and SNI actuator

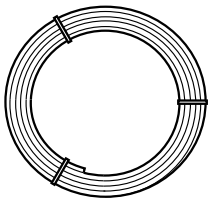
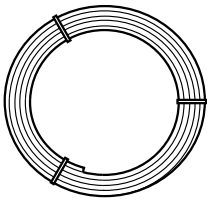
Compli-ance 1)	MOVIFIT® FDC	SNI connection cables	Length/installation type	Cable cross section/cable type	Operating voltage
CE	**Standard ABOX:** **MTA...-S04.-...-00**	**Part number 1 330 330 9** **Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (not prefabricated)	^		AC 500 V
		Part number 1 330 550 6 **Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (not prefabricated)	Variable 	4 mm^2 HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V

1) See also technical data

INFORMATION

You find more permitted SNI cables (e.g. for UL-compliant installation) in the technical data / "Required connection cables for single line installation" chapter.

8.7.4 Hybrid cables for connecting MOVIFIT® FDC and SBus actuator

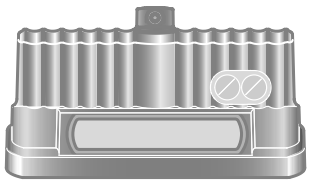
Compli-ance 1)	MOVIFIT® FDC	Hybrid cable with CAN bus	Length/ Installa-tion type	Cable cross sec-tion/cable type	Operating voltage
CE / UL	**Standard ABOX:** **MTA...-S04.-...-00**	**Part number 1 328 477 0** **Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (bulk cable)	Variable 	2.5 mm^2 LEONI Elocab Type: EHRK 016281	AC 500 V
		Part number 1 331 363 0 **Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (bulk cable)	Variable 	4 mm^2 LEONI Elocab Type: EHRK 018473	AC 500 V

1) See also technical data

8.7.5 MOVIFIT® FDC in connection with hybrid ABOX MTA...-S54.-...-00

EBOX

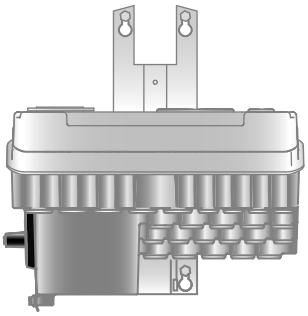
MTC...-...-00

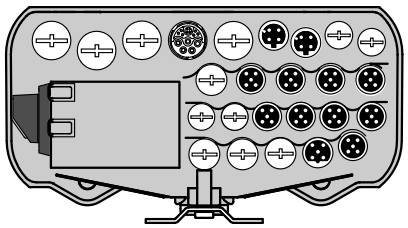


MOVIFIT® FDC
for controlling
MOVIGEAR® and DRC drive units

ABOX

MTA...-S54.-...-00

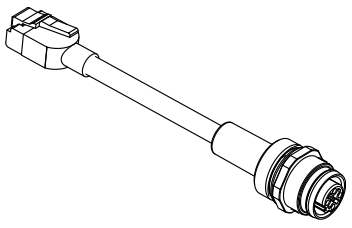




Hybrid ABOX
with M23 plug connector for SNI/SBus actuators
and M12 for I/Os and bus

Performance class	Fieldbus	EBOX Type	ABOX Type
CCU standard (R95..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9500-00	MTA11A-503-S543-M16-00 MTA11A-503-S543-M20-00
MOVI-PLC® standard (R96..)	**PROFINET (Cu) EtherNet/IP (Cu) Modbus/TCP (Cu)**	MTC11A000-503-R9600-00	MTA11A-503-S543-M16-00 MTA11A-503-S543-M20-00
CCU advanced (R97..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9700-00	MTA11A-503-S543-M16-00 MTA11A-503-S543-M20-00
MOVI-PLC® advanced (R98..)	**PROFINET (Cu) EtherNet/IP (Cu) Modbus/TCP (Cu)**	MTC11A000-503-R9800-00	MTA11A-503-S543-M16-00 MTA11A-503-S543-M20-00

Accessories

Type	Figure	Content	Part number
RJ45-M12 Ethernet adapter RJ45 (internal) M12 (external) 2 required for each unit.		1 pc	1 328 168 2
Screw plug for interfaces on the EBOX		1 pc	1 813 062 3

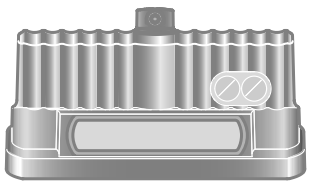
Option

Option	Integrated in	Type
Stainless steel mounting rail	**ABOX**	**/M11**

8.7.6 MOVIFIT® FDC in connection with hybrid ABOX MTA...-S64.-...-00

EBOX

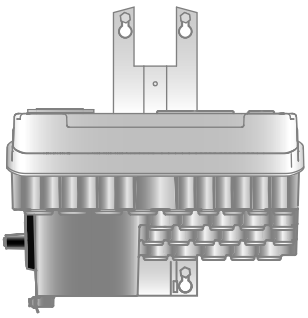
MTC...-...-00

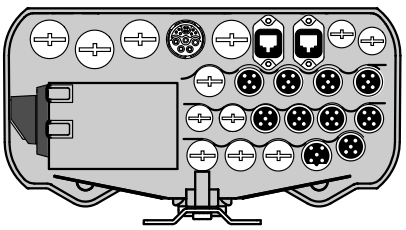


MOVIFIT® FDC
for controlling
MOVIGEAR® and DRC drive units

ABOX

MTA...-S64.-...-00

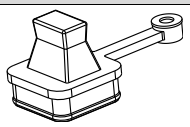
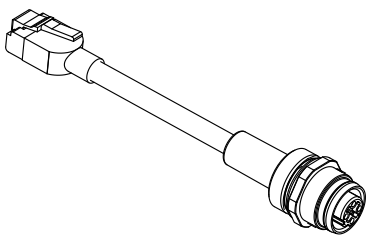




Hybrid ABOX
with M23 plug connector for SNI/SBus actuators,
M12 for I/Os and push-pull RJ45 for bus

Performance class	Fieldbus	EBOX Type	ABOX Type
CCU standard (R95..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9500-00	MTA11A-503-S643-M16-00 MTA11A-503-S643-M20-00
MOVI-PLC® standard (R96..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9600-00	MTA11A-503-S643-M16-00 MTA11A-503-S643-M20-00
CCU advanced (R97..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9700-00	MTA11A-503-S643-M16-00 MTA11A-503-S643-M20-00
MOVI-PLC® advanced (R98..)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R9800-00	MTA11A-503-S643-M16-00 MTA11A-503-S643-M20-00

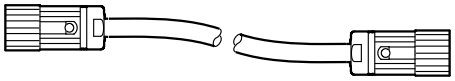
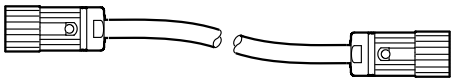
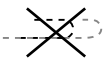
Accessories

Type	Figure	Content	Part number
Ethernet closing plug for push-pull RJ45 socket		10 pcs	1 822 370 2
		30 pcs	1 822 371 0
RJ45-M12 Ethernet adapter RJ45 (internal) M12 (external) 2 required for each unit.		1 pc	1 328 168 2
Screw plug for interfaces on the EBOX		1 pc	1 813 062 3

Option

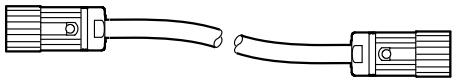
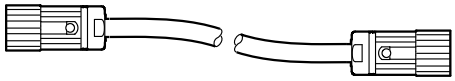
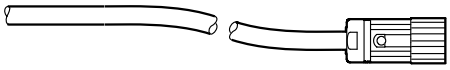
Option	Integrated in	Type
Stainless steel mounting rail	**ABOX**	**/M11**

8.7.7 Cables for connecting MOVIFIT® FDC and SNI actuator

Compliance 1)	MOVIFIT® FDC	SNI connection cables	Length/installation type	Cable cross section/cable type	Operating voltage
CE	**Hybrid ABOX:** **MTA...-S54.-...-00** **MTA...-S64.-...-00**	**Part number 1 812 750 9**  M23, coding ring: Red — M23, coding ring: Red	Variable 	2.5 mm² HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
		Part number 1 812 751 7  M23, coding ring: Red — Open	Variable 	2.5 mm² HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
		Part number 1 812 752 5  M23, coding ring: Red — M23, coding ring: Red	Variable 	4 mm² HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
		Part number 1 812 753 3  M23, coding ring: Red — Open	Variable 	4 mm² HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V

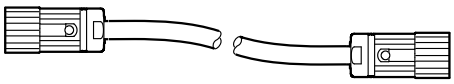
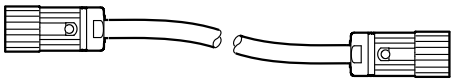
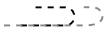
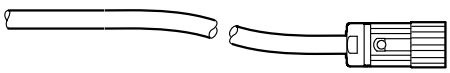
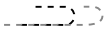
1) See also technical data

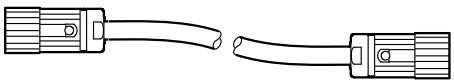
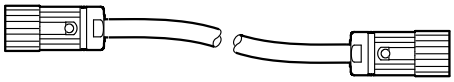
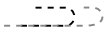
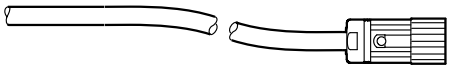
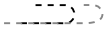
8.7.8 Hybrid cables for connecting MOVIFIT® FDC and SBus actuator

Compliance 1)	MOVIFIT® FDC	Hybrid cable with CAN bus	Length/ Installation type	Cable cross section/cable type	Operating voltage
CE / UL	**Hybrid ABOX:** **MTA...-S54.-...-00** **MTA...-S64.-...-00**	**Part number 1 812 742 8**  M23, coding ring: purple — M23, coding ring: purple	Variable 	2.5 mm² LEONI Elocab Type: EHRK 016281	AC 500 V
		Part number 1 812 743 6  Open — M23, coding ring: purple	Variable 	2.5 mm² LEONI Elocab Type: EHRK 016281	AC 500 V
		Part number 1 812 579 4  M23, coding ring: purple — M23, coding ring: purple	Variable 	4 mm² LEONI Elocab Type: EHRK 018473	AC 500 V
		Part number 1 812 745 2  Open — M23, coding ring: purple	Variable 	4 mm² LEONI Elocab Type: EHRK 018473	AC 500 V

1) See also technical data

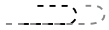
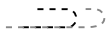
8.7.9 Power supply cables

Compliance [1)]	MOVIFIT® FDC	Connection cables	Length/ Installation type	Cable cross section	Operating voltage
CE	**Hybrid ABOX:** **MTA...-S54.-...-00** **MTA...-S64.-...-00**	**Part number 1 812 746 0**  M23, coding ring: Black — M23, coding ring: Black	Variable 	2.5 mm²	AC 500 V
		Part number 1 813 395 9 Halogen-free  M23, coding ring: Black — M23, coding ring: Black	Variable 	2.5 mm²	AC 500 V
		Part number 1 812 747 9  Open — M23, coding ring: Black	Variable 	2.5 mm²	AC 500 V
		Part number 1 813 396 7 Halogen-free  Open — M23, coding ring: Black	Variable 	2.5 mm²	AC 500 V

Compliance 1)	MOVIFIT® FDC	Connection cables	Length/ Installation type	Cable cross section	Operating voltage
CE	**Hybrid ABOX:** **MTA...-S54.-...-00** **MTA...-S64.-...-00**	**Part number 1 812 748 7**  M23, coding ring: Black — M23, coding ring: Black	Variable 	4 mm²	AC 500 V
		Part number 1 813 397 5 Halogen-free  M23, coding ring: Black — M23, coding ring: Black	Variable 	4 mm²	AC 500 V
		Part number 1 812 749 5  Open — M23, coding ring: Black	Variable 	4 mm²	AC 500 V
		Part number 1 813 398 3 Halogen-free  Open — M23, coding ring: Black	Variable 	4 mm²	AC 500 V

1) See also technical data

8.7.10 CAN connection cables

MOVIFIT® FDC	External CAN bus connection cable	Length/ Installation type	Operating voltage
Hybrid ABOX: MTA...-S54.-...-00 MTA...-S64.-...-00	**Length 5 m: Part number 1 328 633 1** **Length 10 m: Part number 1 328 635 8** **Length 15 m: Part number 1 328 636 6** Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12 M12, female	Fixed length 	DC 60 V
	Length 5 m: Part number 1 328 140 2 **Length 10 m: Part number 1 328 141 0** **Length 15 m: Part number 1 328 142 9** Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12 Open (Conductor end sleeves)	Fixed length 	DC 60 V

8.8 Connection cables

8.8.1 Required connection cables for single line installation

SEW-EURODRIVE prescribes the following cables types for the connection between MOVIGEAR® SNI drive units and SNI controllers:

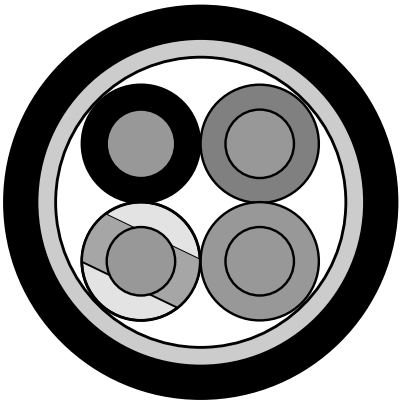
HELUKABEL TOPFLEX®

- **HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J**
- **HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J/UL/CSA**

  (UL-compliant installation)
- **HELUKABEL TOPFLEX® – EMV-2YSLCY-J**

  The following figure shows the cable structure:

HELUKABEL TOPFLEX®
– EMV-UV-2YSLCYK-J
– EMV-UV-2YSLCYK-J/UL/CSA
Black outer cable sheath (UV-resistant)



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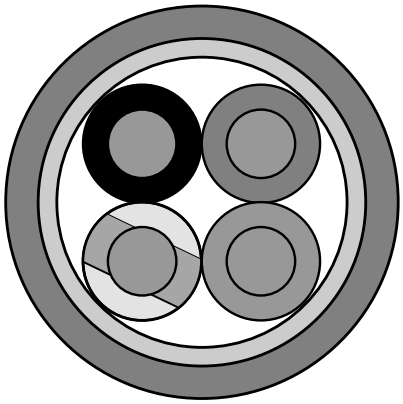
HELUKABEL TOPFLEX® – EMV-2YSLCY-J
Transparent outer cable sheath



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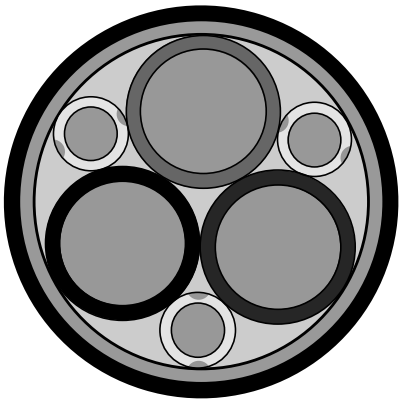
- **HELUKABEL TOPFLEX® – EMV-UV-3 PLUS 2YSLCYK-J**

  The following figure shows the cable structure:

HELUKABEL TOPFLEX® – EMV-UV-3 PLUS 2YSLCYK-J
Black outer cable sheath (UV-resistant)



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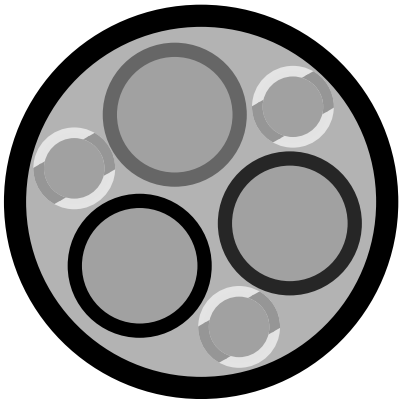
LAPP ÖLFLEX®

- **LAPP ÖLFLEX® SERVO 2YSLCYK-JB**
  LAPP ÖLFLEX® SERVO 2YSLCY-JB

  The following figures show the cable structure:

LAPP ÖLFLEX® SERVO 2YSLCYK-JB
Black outer cable sheath (UV-resistant)



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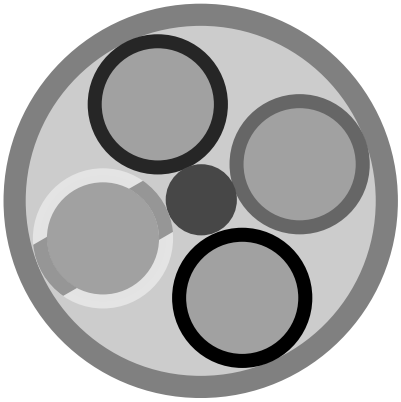
LAPP ÖLFLEX® SERVO 2YSLCY-JB
Transparent outer cable sheath



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INFORMATION

A high signal quality is achieved due to the low operating capacitance of the specified cables.

The shielding prevents interference emission resulting from the data transmission modulated onto the line.

8.8.2 Specification of recommended CAN connection cable

When individual CAN connection cables are used, SEW-EURODRIVE recommends the cable type *"Belden 9841/LOW-capacitance computer cable for EIA".*

Description

24 AWG stranded TC wire, insulated with polyethylene, drilled, shielded with Beldfoil® (100%) + TC braid (90% shielding), 24 AWG stranded TC drain wire, PVC sheath.

Physical properties (in total)

Conductor: AWG			
Twisted-pairs	**AWG**	**Stranding**	**Conductor material**
1	24	7x32	TC – tinned copper

Mechanical properties (in total)

Mechanical properties (in total)	
Operating temperature	−30 °C to +80 °C
Nominal UL temperature	+80 °C
Weight of raw cable	36 lbs/1000 ft.
Max. recommended tensile stress	72.3 lbs.
Min. bending radius of secondary axis	2.5 inches

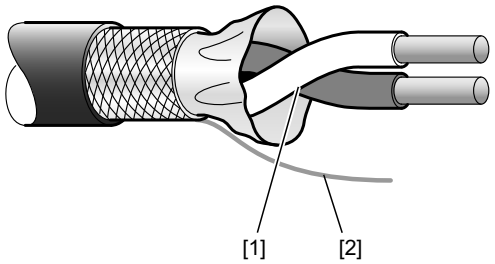
Applicable specifications and compliance with regulatory specifications (in total) Applicable standards	
NEC/(UL) specification	CM
CEC/C(UL) specification	CM
AWM specification	UL style 2919 (30 V 80°)
EU CE mark (Y/N)	Yes
EU RoHS compliant (Y/N)	Yes
EU RoHS compliance date (MM/DD/YYYY)	01/01/2004
Plenum / Non-Plenum: Plenum (Y/N)	No
Plenum number	82841, 89841

Electrical properties (in total)

Electrical properties (in total)	
Characteristic rated impedance **Impedance (ohms)**	120
Nominal capacitance conductor/conductor **Capacitance (pF/ft)**	12.8
Nominal capacitance conductor/other conductor and shield **Capacitance (pF/ft)**	23.0
Nominal propagation speed **VP (%)**	66
Nominal delay time **Delay (ns/ft)**	1.6
Nominal value of the direct current resistance of the conductor **Nominal DC resistance at 20 °C (ohm/1000 ft)**	24.0
Nominal value of the direct current resistance of the outer shield **Nominal DC resistance at 20 °C (ohm/1000 ft)**	3.4
Nominal attenuation **Attenuation (dB/100ft)**	0.6 (at 1 MHz)
Max. operating voltage – UL **Voltage**	300 V RMS 20 V RMS (UL AWM Style 2919)
Max. recommended amperage **Amperage**	2.1 A per conductor at 25 °C

Notes on connection

The following figure shows the structure of the cable and how the connections are used:

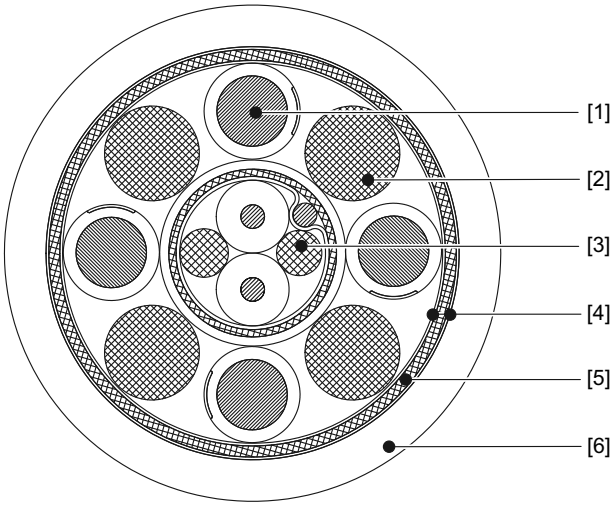


5841958411

[1] CAN_H / CAN_L connection
[2] CAN_GND connection via drain wire

8.8.3 Specification of recommended hybrid cables

SEW-EURODRIVE recommends the following hybrid cables for connecting MOVIGEAR® DSC drive units and controllers: The following figure shows the structure of the hybrid cable:



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	Type: LEONI Elocab EHRK 016281	Type: LEONI Elocab EHRK 018473
[1]	4 cores 2.5 mm^2 Conductor (141 x 0.15 mm) blank copper Insulation TPE Colors black, with printed numbers 1-3 1 x yellow-green	4 cores 4.0 mm ^{2} Conductor (228 x 0,15 mm) blank copper Insulation TPE Colors black, with printed numbers 1-3 1 x yellow-green
[2]	Filler	
[3]	1 conductor pair 0.25 mm^2 Conductor (19 x 0.13 mm) blank copper Insulation PE Colors white/blue	
	Foil shield aluminum-clad side toward the braided shield Opt. coverage 100%	
	Drain wire 0.25 mm^2 Conductor (19 x 0.13 mm) blank copper	
	Shield braided Conductor (0.10 mm) tin-plated copper	
	Sheathing TPE Color purple	
[4]	Windings	
[5]	Shield braided Conductor (0.161 mm) tinned copper Opt. coverage at least 85%	
[6]	Outer sheath Polyurethane, flame retardant, halogen-free Color black	

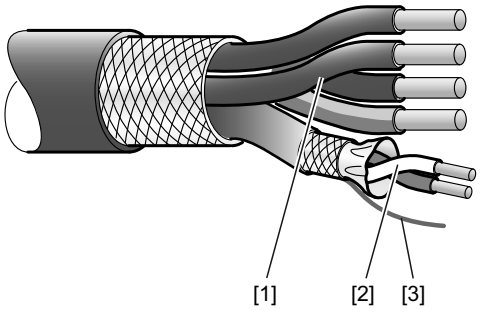
Technical data of hybrid cables

The following table shows the technical data of the hybrid cable:

Properties	Type: LEONI Elocab EHRK 016281	Type: LEONI Elocab EHRK 018473
UL features	UL style 20234 80 °C 1000 V c UL us certified 80 °C 600 V	
Operating voltage	1000 V	
Test voltage core/core	DC 4700 V	
Test voltage core/shield	DC 3110 V	
Test voltage shield Position [3]	DC 3000 V (spark test)	
Operating temperature	-30 °C to +80 °C (fixed installation)	
Weight of cable	Nom. 291 g/m	Nom. 333 g/m
Wave impedance Position [3]	120 Ω .. ± 10%	
Attenuation Position [3]	Nom. 1.8 dB / 100 m at 1 MHz Nom. 5.6 dB / 100 m at 10 MHz	
Delay Position [3]	Nom. 5 ns / m	
Bending radii	Single bending when routing the cable: 2x cable diameter	

Notes on connection

The following figure shows the structure of the cable and how the connections are used:

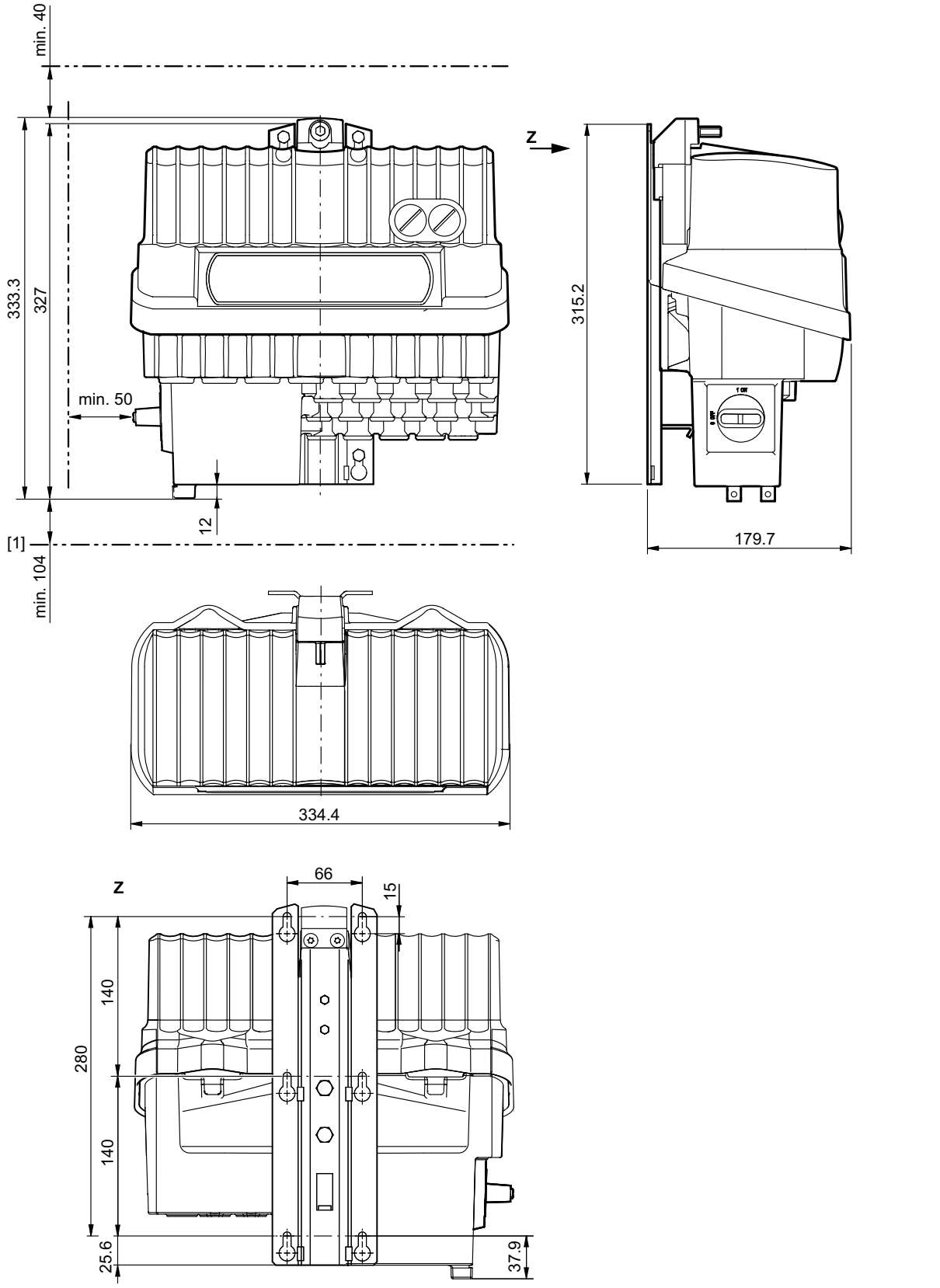


6580241163

[1] Power supply / PE connection
[2] CAN_H / CAN_L connection
[3] CAN_GND connection via drain wire

8.9 Dimension drawings

8.9.1 MOVIFIT® FDC with standard mounting rail



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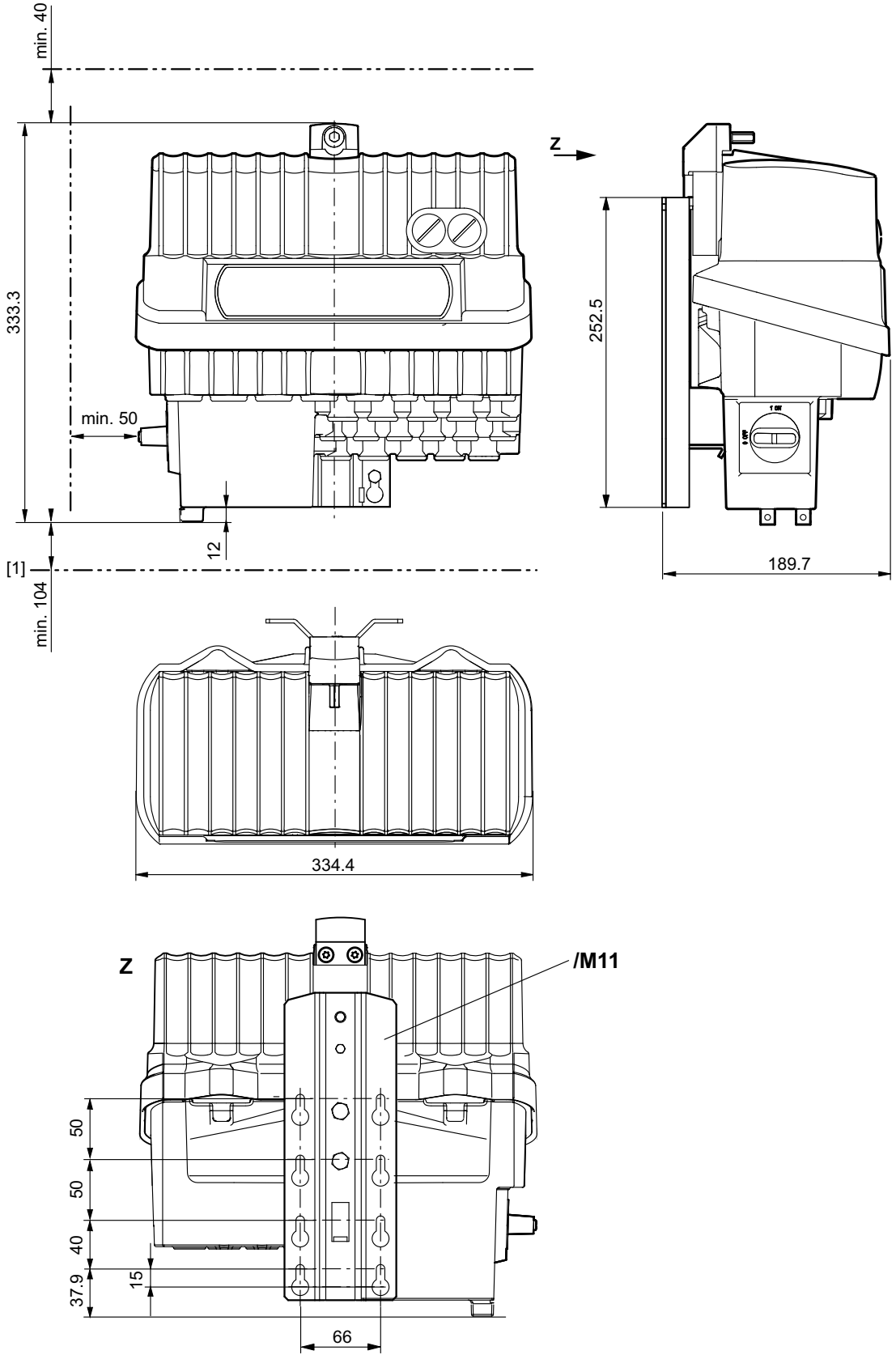
[1] The clearance of 104 mm below is only necessary for ABOXes with plug connector for connecting the drive unit.

8.9.2 MOVIFIT® FDC with optional stainless steel mounting rail M11



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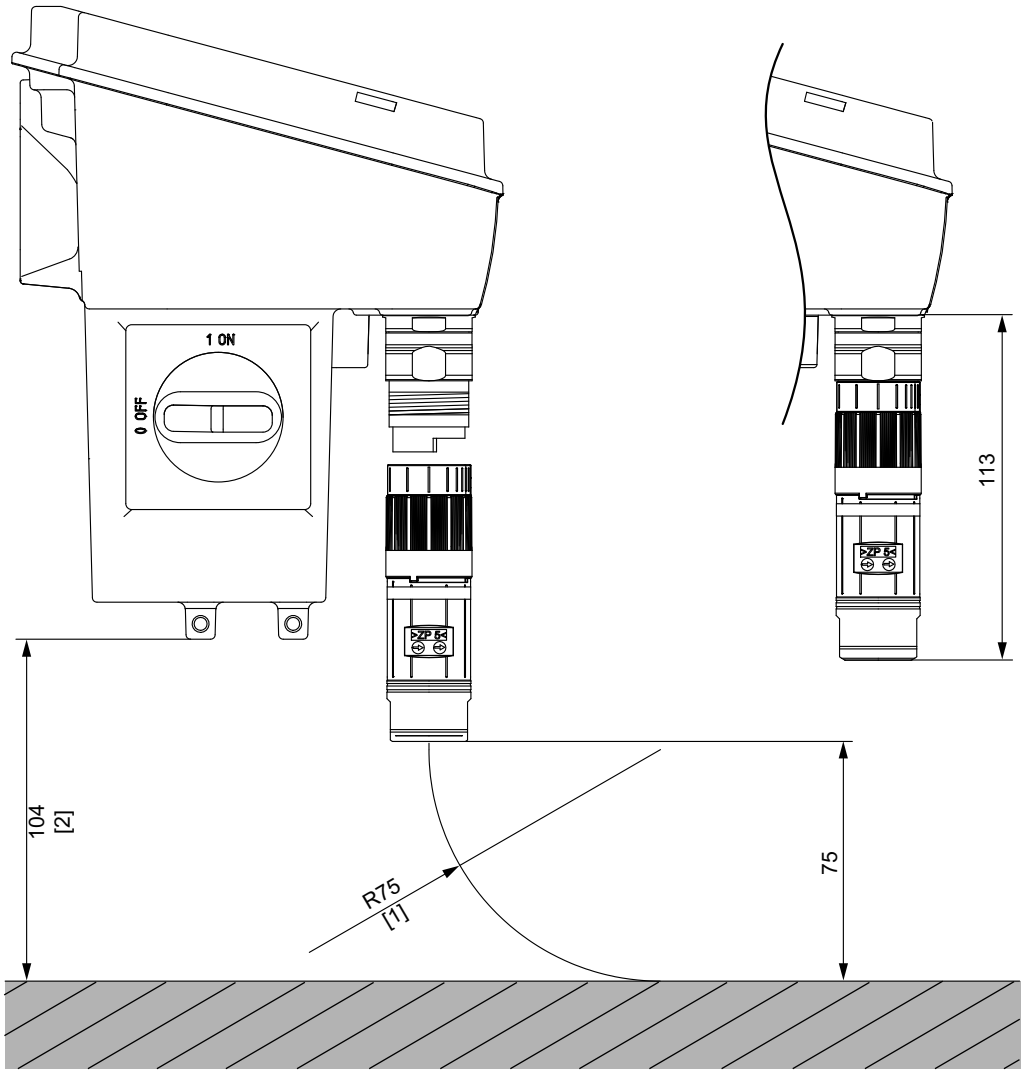
[1] The clearance of 104 mm below is only necessary for ABOXes with plug connector for connecting the drive unit.

8.9.3 ABOX with plug connector for connecting the drive units

The following figure shows the minimum installation clearance of the hybrid ABOX with plug connector for connecting the drive units.



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[1] Smallest permitted pending radius of bulk cable: 75 mm
[2] Minimum distance to the bottom of the ABOX: 104 mm

9 Project Planning

9.1 Preliminary information

INFORMATION

Data may differ due to continuous product development.

9.1.1 Abbreviation key

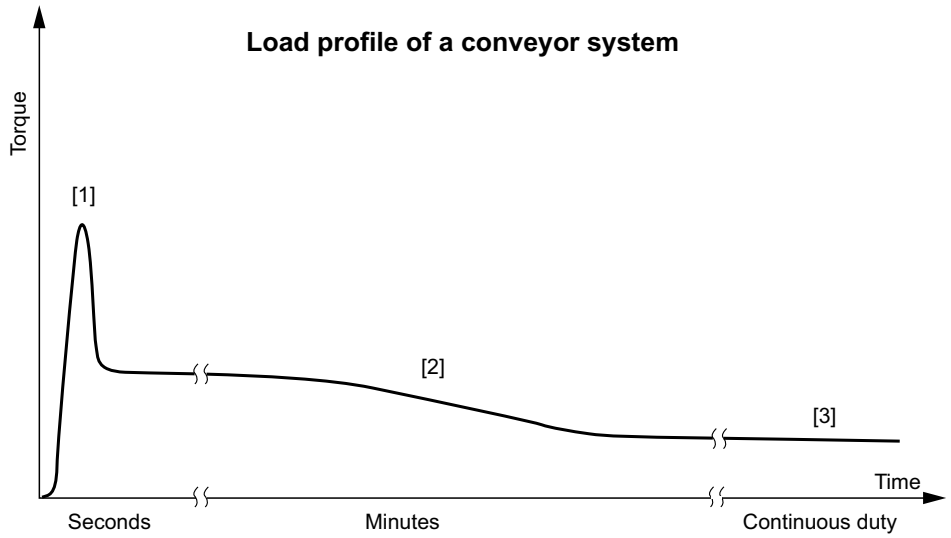
The following table provides a description of abbreviations used in this chapter:

Abbreviation	Description
M_a	MOVIGEAR® continuous output torque
M_{apk}	Maximum permitted torque for short-time duty
$M_{aNotAus}$	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
n_a	Output speed
n_e	Motor speed
n_{amin}	Minimum output speed
n_{amax}	Maximum output speed
W	Mean braking work
M_{DSP}	Maximum torque DynaStop® (base torque DynaStop®)
M_{ar}	Retrodriving application torque
η_{Last}	Efficiency of the application

9.2 MOVIGEAR® load profile

The MOVIGEAR® drive unit is specifically designed to meet the requirements of horizontal conveyor applications. The following figure shows typical load characteristics.

Refer to the following table for the exact values regarding the static breakaway torque and the continuous torque of the drive units.



MOVIGEAR® type	Operating range [1] (Static breakaway torque, 5 s)	Operating range [2] (5 min.)	Operating range [3] (duration)
MGF.2	M_{apk}	200% M_a (but max. M_{apk})	100% M_a
MGF.4	M_{apk}	200% M_a (but max. M_{apk})	100% M_a

9.3 Drive selection data

Certain data is required to be able to precisely define the components for your drive. These are:

Drive selection data			Your entry
n_{amin}	Minimum output speed	rpm	
n_{amax}	Maximum output speed	rpm	
M_a at n_{amin}	Output torque at minimum Output speed	Nm	
M_a at n_{amax}	Output torque at maximum Output speed	Nm	
S.., ..% cdf	Duty type and cyclic duration factor (cdf) or exact load cycle can be entered.		
Z	Starting frequency; alternatively, exact load cycle can be specified	1/h	
M4, M1..M6	Mounting position		
IP..	Required degree of protection		
ϑ_{Amb}	Ambient temperature	°C	
H	Installation altitude	m	

9.3.1 Determining the motor data

To select the proper drive, you first need the data (mass, speed, setting range, etc.) of the machine to be driven.

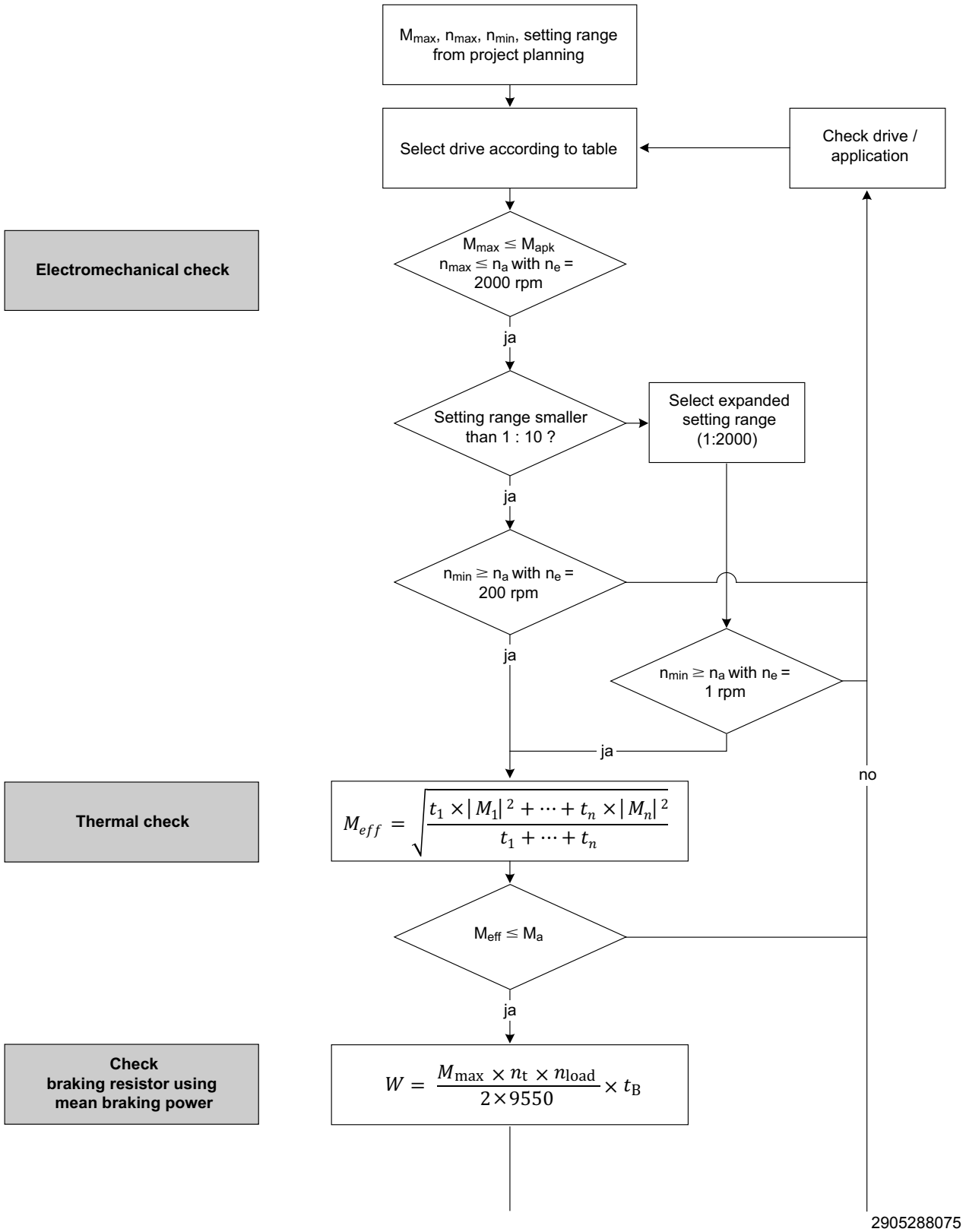
These data help determine the required power, torque and speed. Refer to the "Drive Engineering – Practical Implementation, Project Planning" publication or the SEW Workbench project planning software for assistance.

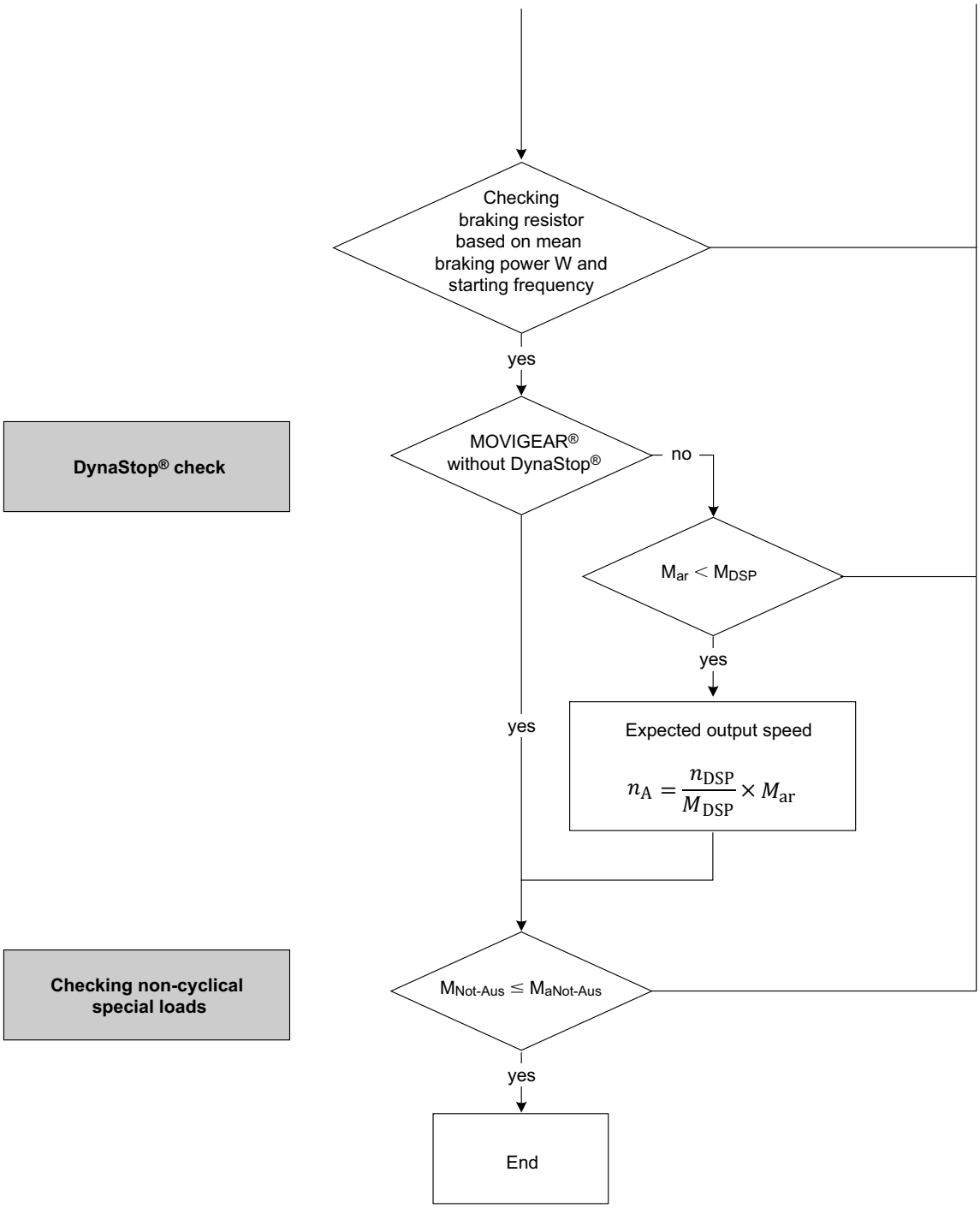
9.3.2 Selecting the proper drive

The appropriate drive can be determined with the calculated power and speed and with other mechanical requirements taken into account.

9.4 Project planning procedure

The following flow diagram illustrates the project planning procedure for MOVIGEAR®:





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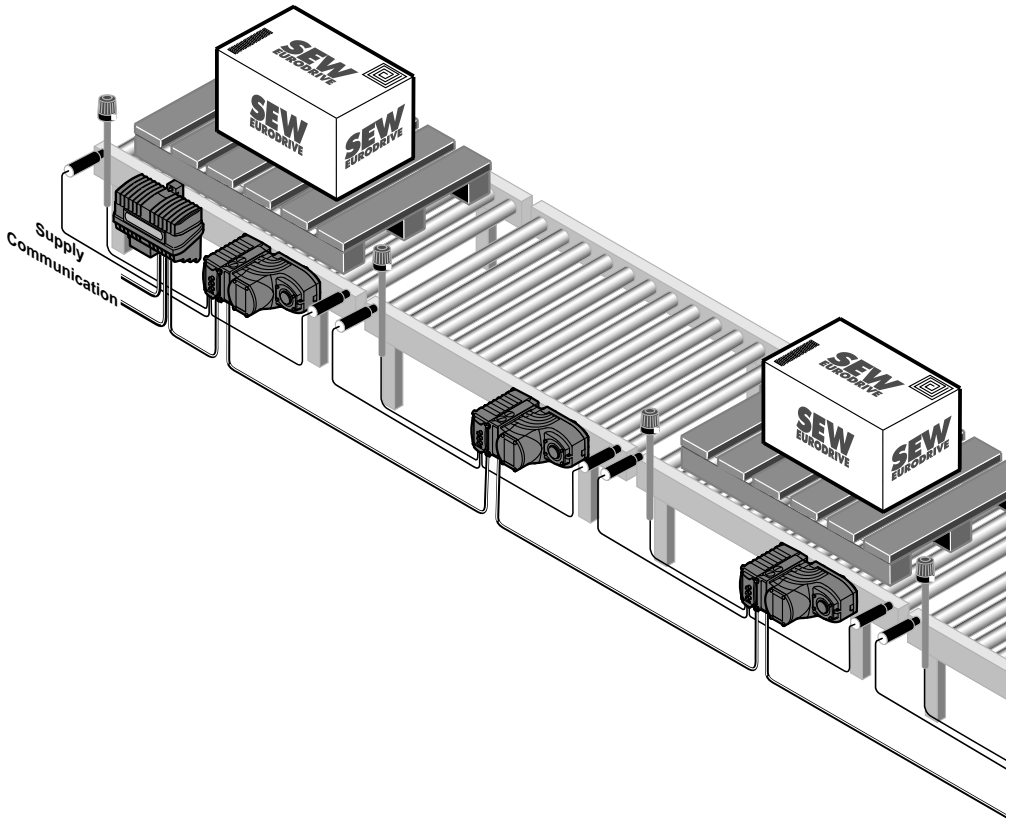
9.5 Drive selection using the example of a roller conveyor

9.5.1 Description of the application

This chapter illustrates the MOVIGEAR® drive unit selection using the example of a roller conveyor for transporting wooden pallets with the following specifications:

Load mass	m	2500 kg
Transport speed	v	22 m/min
Positioning speed		5 m/min
Acceleration	a	0.4 m/s^2
Number of rollers		8
Efficiency of the application with rollers	η_{App}	0.7
Roller diameter	D	140 mm
Lever arm of the rolling friction (wood/steel)	f	1,2
Bearing diameter	d	28 mm
Bearing friction value	$\mu_{bearing}$	0.005
Switching frequency		6 times/hour
Maximum external force at standstill	F_{ext}	800 N

The following figure shows a schematic illustration:



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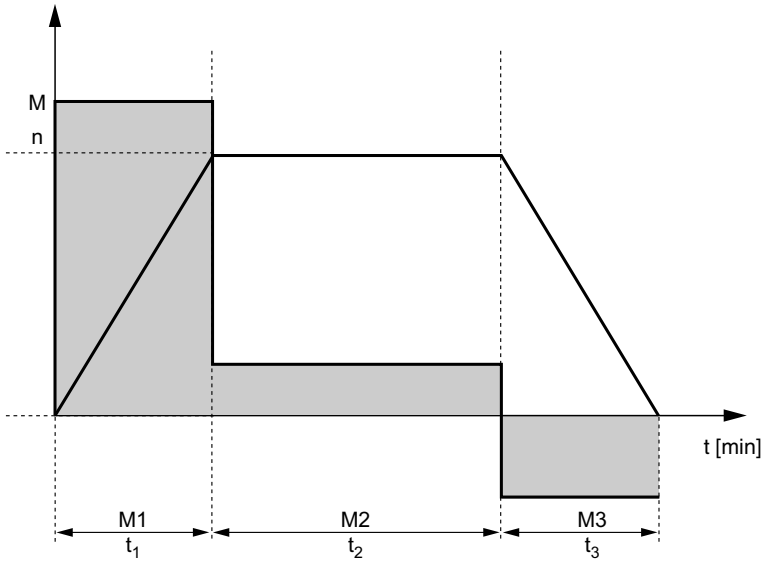
9.5.2 Calculating the application

The travel profile consists of the 3 travel sections acceleration, constant movement, and deceleration.



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The following table shows the calculations for the application that are required to determine the MOVIGEAR® drive units:

Calculations	
Static travel resistance	$F_R = \mu \times m \times g$ $\mu = \left[\frac{2}{D} x \left(\mu_{bearing} \times \frac{d}{2} + f \right) + c \right]$ $\mu = \left[\frac{2}{140mm} x \left(0.005 \times \frac{28mm}{2} + 1.2 \right) + 0 \right]$ $\mu = 0.01814$ $F_R = 0.01814 \times 2500kg \times 9.81$ $F_R = 445N$
Dynamic travel resistance	$F_{Dyn} = m \times a$ $F_{Dyn} = 2500kg \times 0.4\,m/s^2$ $F_{Dyn} = 1000N$
Torque in range M1	$M_1 = \frac{\left(F_R + F_{Dyn}\right) \times D}{2 \times \eta}$ $M_1 = \frac{\left(445N + 1000N\right) \times 0.14m}{2 \times 0.7} = 145.5Nm$
Torque in range M2	$M_2 = \frac{F_R \times D}{2 \times \eta} = 45.5Nm$
Torque in range M3	$M_3 = \left(\frac{F_R}{\eta} - F_{Dyn} \times \eta \right) \times \frac{D}{2}$ $M_3 = \left(\frac{445N}{0.7} - 1000 \times 0.7 \right) \times \frac{0.14m}{2} = -4.5Nm$
Output speed	$n_{a\min} = \frac{v_{\min}}{\pi \times D} = \frac{5\,m/\min}{\pi \times 0.14m} = 11.4\,\min^{-1}$ $n_{a\max} = \frac{v_{\max}}{\pi \times D} = \frac{22\,m/\min}{\pi \times 0.14m} = 50.0\,\min^{-1}$

9.5.3 Selecting the MOVIGEAR® drive unit

Observe the following procedure when selecting the MOVIGEAR® drive unit:

1. Which torque class (size) is required?

   Requirement: The maximum possible startup torque of the MOVIGEAR® drive unit must be higher than the maximum application torque:

   $$M_{max} \leq M_{apk}$$

   Due to the application calculations, the maximum application torque is M_{max} = 145 Nm.

   MGF..2 drive units with i > 10.37 meet this requirement.

   Result: A MOVIGEAR® of torque class MGF..2 is selected.

2. Selecting the ratio with the output speed:

   Requirement: The application calculations result in an output speed of n_a = 50 rpm. To achieve a high setting range and an optimum efficiency, the required output speed should be achieved as precisely as possible at an input speed of n_e = 2000 rpm.

   Result: The drive with a ratio of i_{tot} = 37.24 and an output speed of n_a = 53.7 at n_e= 2000 rpm is selected from the table in chapter "MOVIGEAR® drive units / Selection tables:

MGF..2

	n_a at n_e= 200 rpm [rpm]	n_a at n_e= 2000 rpm [rpm]	M_a at n_e= 500 rpm [Nm]	M_a at n_e= 1000 rpm [Nm]	M_a at n_e= 1500 rpm [Nm]	M_a at n_e= 2000 rpm [Nm]	M_{apk} at n_e= 200 – 1500 rpm [Nm]	M_{apk} at n_e= 1750 rpm [Nm]	M_{apk} at n_e= 2000 rpm [Nm]	$M_{aEmerg.Off}$ [Nm]	i_{tot}	Weight [kg]
2-stage	40.0	400.0	20	20	20	20	70 *	45	33	210	5.00	15.7
	37.5	374.5	21	21	21	21	75 *	48	35	215	5.34	
	32.0	320.0	25	25	25	25	88 *	56	41	225	6.25	
	28.6	285.7	28	28	28	28	98 *	63	46	235	7.00	
	24.3	242.7	33	33	33	33	115 *	74	54	245	8.24	
	20.6	206.0	39	39	39	39	136 *	87	64	330	9.71	
	19.3	192.9	42	42	42	42	145 *	93	68	330	10.37	
	16.5	164.7	49	49	49	49	170 *	109	80	330	12.14	
	14.7	147.1	55	55	55	55	190 *	122	90	330	13.6	
	12.5	125.0	64	64	64	64	224 *	144	106	330	16.00	
	10.8	108.0	74	74	74	74	220 *	167	122	330	18.52	
	10.1	101.0	80	80	80	80	220 *	178	131	330	19.81	
	8.7	87.5	92	92	92	92	220	206	151	330	22.86	
3-stage	7.1	71.3	113	113	113	113	220	220	185	330	28.07	16.0
	6.1	60.6	133	133	133	133	220	220	218	330	33.02	
	5.4	53.7	149	149	149	149	220	220	220	330	37.24	
	4.7	47.4	169	169	169	169	220	220	220	330	42.19	
	4.4	44.4	181	181	181	181	220	220	220	330	45.03	
	3.9	38.8	200	200	200	200	220	220	220	330	51.51	
	3.6	36.2	200	200	200	200	220	220	220	330	55.25	

3. Checking the setting range and minimum speed

   Setting range 5 m/min: 22 m/min ≈ 1:4.4.

   This means the standard setting range of 1:10 is sufficient. The /ECR option (expanded control range 1:2000) need not be selected.

   n_a at n_e 200 rpm = 5.4 rpm < n_{min} =11.4 rpm.

4. Thermal check of MOVIGEAR®:

   Requirement: To avoid thermal problems, the effective torque of the application must be smaller than the continuous output torque of the MOVIGEAR® drive unit:

$$M_{eff} < M_a$$

$$t_1 = t_3 = \frac{v}{a} = \frac{22 m/\min}{0.4 \frac{m}{s^2} \times 60} = 0.92 s$$

$$t_2 = 10 \min \times 60 \frac{s}{\min} - t1 - t3 = 598.16 s$$

$$M_{eff} = \sqrt[2]{\frac{t_1 \times \left|M_1\right|^2 + t_2 \times \left|M_2\right|^2 + t_3 \times \left|M_3\right|^2}{t_1 + t_2 + t_3}}$$

$$M_{eff} = \sqrt[2]{\frac{0.92 s \times \left|145.5 Nm\right|^2 + 598.16 s \times \left|45.5 Nm\right|^2 + 0.92 s \times \left|-4.5 Nm\right|^2}{0.92 s + 598.16 s + 0.92 s}} = 45.1 Nm$$

   The application calculation results in an effective torque of M_{eff} = 45.1 Nm. The continuous output torque of the selected MOVIGEAR® drive unit is M_a at n_e 2000 rpm = 149 Nm.

   If applicable, observe derating factors (derating for installation altitude and ambient temperature).

   Result: The requirements are met.

5. Checking the braking resistance

   Calculating the regenerative braking power during deceleration:

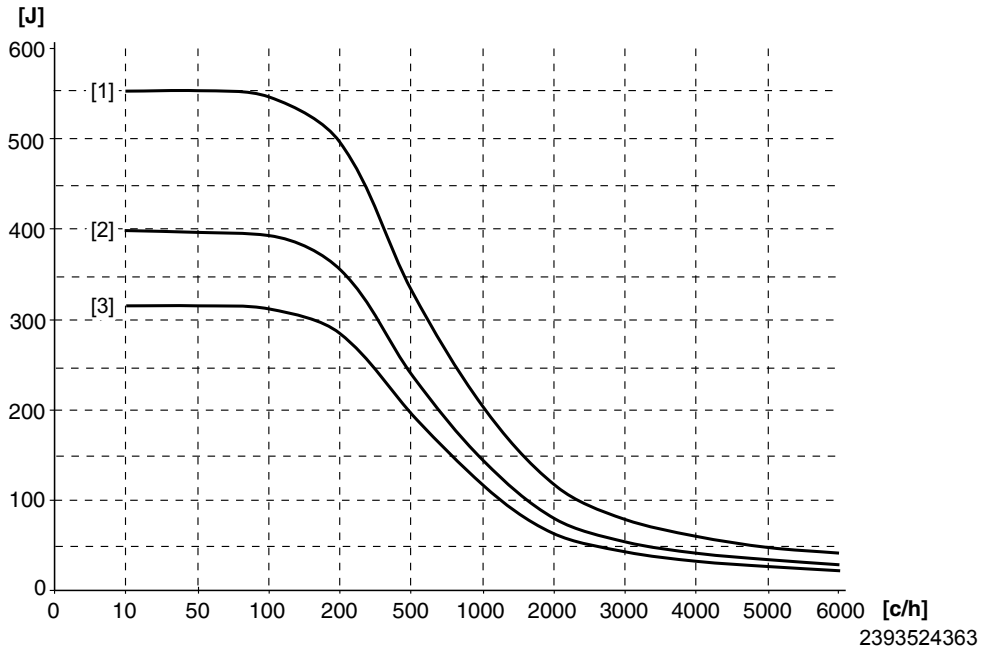
$$P_{brake} = \left| \frac{1}{2} \times \frac{M_3 \times n_3}{9.55} \right|$$

$$P_{brake} = \left| \frac{1}{2} \times \frac{4.5 Nm \times 50 \frac{1}{\min}}{9.55} \right| = 11.8 W$$

   Proceed as described in chapter "Regenerative load capacity of the integrated braking resistor".

9.6 Regenerative load capacity of the integrated braking resistor

The following diagram shows the load capacity per braking operation of the BW1 braking resistor integrated in MOVIGEAR® as standard:



[1] Brake ramp 10 s
[2] Brake ramp 4 s
[3] Brake ramp 0.2 s
c/h cycles per hour

9.6.1 Calculation example

The known values are:

- Average braking power: 11.8 W
- Brake ramp: 0.92 s
- 6 brake applications per hour

Calculating the energy from the power of the brake ramp:

$$W = P \times t = 11.8W \times 0.92s = 10.9J$$

The specified brake ramp in seconds refers to a speed change of 3000 rpm.

Calculating the brake ramp of MOVIGEAR®: a_{out} = 3000 rpm x 0.92 s / 1863 rpm = 1.5 s.

The brake ramp [3] (0.2 s) can be used for the brake ramp of 1.5 s in the diagram. Use the characteristic curve with the shorter brake ramp because a shorter brake ramp means more power.

The diagram allows a power of 310 J with a 0.2 s brake ramp at 6 cycles per hour. In this case, the required 10.9 J can be dissipated with BW1.

9.7 DynaStop® – the electrodynamic deceleration function

9.7.1 Functional description

⚠ WARNING

The electrodynamic deceleration function DynaStop® does not allow for a definite stop at a position.

Severe or fatal injuries.

- Do not use the electrodynamic deceleration function for hoists.
- DynaStop® may only be used for inclining tracks after a risk assessment.

NOTICE

Setting the controller inhibit when the drive is running will activate DynaStop®. This can cause high torque loads, which may damage the drive and the application!

Possible damage to property

- Only activate the controller inhibit when the speed is "0".

DynaStop® allows for generating a speed-dependent torque when the motor is de-energized or "controller inhibit" is activated. This prevents the application from excessive acceleration due to external forces (e.g. sagging on inclining tracks)

MOVIGEAR® has the following function when the drive is running: In the event of a voltage failure, the kinetic energy is used to supply the frequency inverter via regeneration. This allows for controlled deceleration.

DynaStop® is activated when the regenerative power is insufficient.

9.7.2 Checking whether DynaStop® can be used

Requirement:

To use DynaStop®, the retrodriving torque M_{ar} must be smaller than the maximum deceleration torque M_{DSP}:

$$M_{ar} < M_{DSP}$$

Calculating the retrodriving torque:

Known values of the application:

F_{ex} = 800 N

F_R = 445 N

$$M_{ar} = (F_{ex} - F_R) \times \eta \times \frac{D}{2}$$

$$M_{ar} = (800N - 445N) \times 0.7 \times \frac{0.14m}{2} = 17Nm$$

Result:

In the application, an MGF2 unit with i_{tot} = 37.24 is used.

The maximum deceleration torque M_{DSP} 143 Nm at n_{DSP} 3.08 rpm for this variant can be seen from the table in chapter "Technical Data MOVIGEAR® / Deceleration torques DynaStop®" .

The retrodriving torque M_{ar} is smaller than the maximum deceleration torque. This means DynaStop® can be used:

$$M_{ar} < M_{DSP}$$
$$17Nm < 143Nm$$

Checking the application velocity:

$$n_A = \frac{n_{DSP}}{M_{DSP}} \times M_{ar}$$

$$n_A = \frac{3.08 \frac{1}{\text{min}}}{143Nm} \times 17Nm = 0.37 \frac{1}{\text{min}}$$

$$v = n_a \times D \times \pi = 0.37 \frac{1}{\text{min}} \times 0.14 \times \pi = 0.16 \frac{m}{\text{min}}$$

Result:

Due to the external force, the velocity for the application example is 0.16 m/min.

9.8 Applications in wet areas

SEW-EURODRIVE recommends to use MOVIGEAR® with optional package for applications in wet areas under the following conditions:

- Large temperature differences (e.g. when the drive is cleaned with cold water immediately after operation).
- In case of changing temperatures (e. g. "Cold storage lock" application)
- When sealing surfaces come into contact with water during operation
- When the drive is cleaned with low surface tension water and/or chemicals
- In case of cycle operation (S3) in cold and/or humid environment

9.8.1 Support through special consultants

INFORMATION

- These requirements cannot always be imparted in written form. Consulting talks between system operators, system suppliers and component suppliers have proved to be productive means to clarify the existing conditions and necessary measures.
- SEW-EURODRIVE has a team of competent consultants that offer their active support when it comes to selecting optimum configurations and economical solutions.

9.8.2 Questionnaire

INFORMATION

Please complete the following questionnaire and submit it to SEW in order to provide for an optimal preparation for a consultation with SEW-EURODRIVE.

Company: .....

Contact person: .....

Phone/fax: .....

Email: .....

Street: .....

Zip code: .....

Place, date: .....

1. Information regarding the location

- Detailed description of the plant (e.g. bottle filling, transportation of empty bottles, cans etc.)

.....

.....

.....

- What is the ambient temperature in the plant?

  In the summer approx.: ..... In the winter approx.: .....

- What is the relative humidity in the vicinity of the motor?

  min.: ..... max.: .....
  .

- Which duty cycles apply to the motor? (e.g. S1, S3, etc.)

.....

.....

- Is the drive subject to extreme temperature fluctuations? (e.g. does the drive run for an extended period of time and then cool down or does the operating environment heat up and then cool down again?)

.....

.....

.....

- Are you operating other products (non-SEW products) in the same area?

.....

.....

2. Cleaning the installation site

- How often does cleaning take place?

  ..... times a day ..... times a week

- Are pressure washers used to clean the location? (e.g. Kärcher)

  ☐ Yes, with ..... ☐ No

- Does the water contain solvents or cleaning agents?

  ☐ Yes, with ..... ☐ No

- Is the drive regularly exposed to liquids, emulsions or other substances used in the current production?

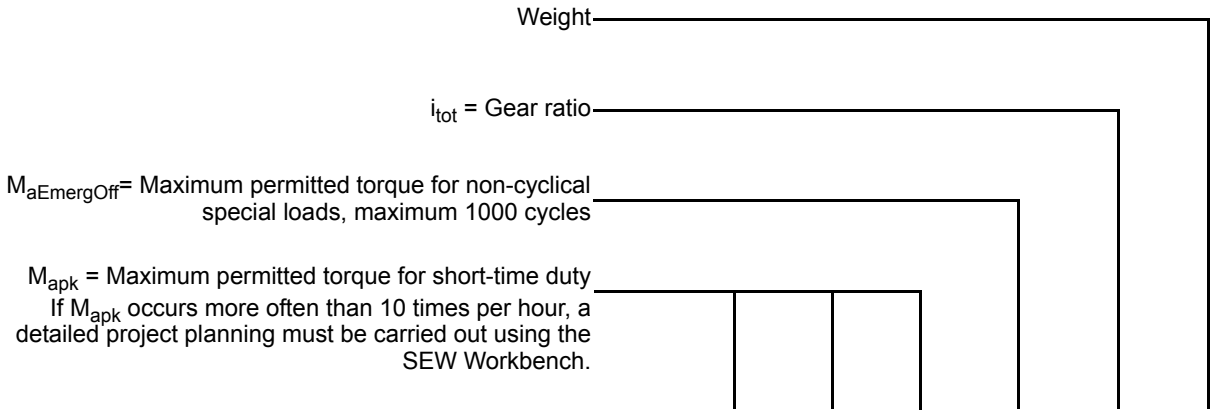
  ☐ Yes, with ..... ☐ No

- Are the components compatible with sealing compounds?

  ☐ Yes ☐ No

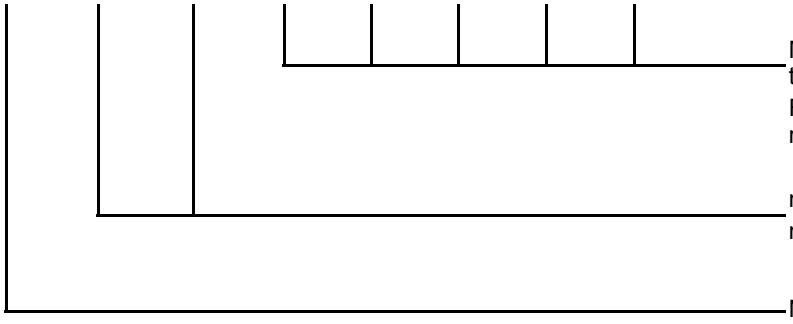
10 Important Notes on Selection Tables and Dimension Drawings

10.1 Information on the selection tables



MGF..4../ECR (extended control range)

	n_a		M_a					M_{apk}			$M_{aEmerg\ Off}$	i_{tot}	Weight
	at n_e= 1 rpm [rpm]	at n_e= 2000 rpm [rpm]	at n_e= 5 rpm [Nm]	at n_e= 500 rpm [Nm]	at n_e= 1000 rpm [Nm]	at n_e= 1500 rpm [Nm]	at n_e= 2000 rpm [Nm]	at n_e= 5 – 1500 rpm [Nm]	at n_e= 1750 rpm [Nm]	at n_e= 2000 rpm [Nm]	[Nm]		[kg]
2-stage	0.20	400.8	34	34	34	34	34	120 *	95 *	75	420	4.99	23.6
	0.17	347.2	39	39	39	39	39	225 *	109 *	86	450	5.76	
	0.16	315.5	43	43	43	43	43	152 *	120 *	95	470	6.34	
	...	...	...	...	...	...	...	...	...	...	...	...	
3-stage	...	...	...	...	...	...	...	...	...	...	...	...	24.0
	0.02	46.7	293	293	293	293	293	475	475	475	710	42.86	
	0.02	41.7	328	328	328	328	328	475	475	475	710	48.00	
	0.02	35.4	386	386	386	386	386	475	475	475	710	56.49	



= Preferred gear ratio

* = The illustrated values are realized if the setting of parameter 8518.0 (current limit) and 8688.0 (torque limit) is increased to up to 350 [% I_N] (factory setting: 250 [% I_N]).

10.2 Notes on the dimension sheets

10.2.1 Scope of delivery

= Standard parts supplied by SEW-EURODRIVE.

= Standard parts not supplied by SEW-EURODRIVE.

10.2.2 Tolerances

Shaft ends

Diameter tolerance:

Ø	≤ 50 mm	→ ISO k6
Ø	> 50 mm	→ ISO m6

Center bores according to DIN 332, shape DR:

Ø	= 7...10 mm	→ M3
Ø	> 10...13 mm	→ M4
Ø	> 13...16 mm	→ M5
Ø	> 16...21 mm	→ M6
Ø	> 21...24 mm	→ M8
Ø	> 24...30 mm	→ M10
Ø	> 30...38 mm	→ M12
Ø	> 38...50 mm	→ M16

Keys: according to DIN 6885 (domed type).

Hollow shafts

Diameter tolerance:

Ø	→ ISO H7 measured with plug gauge

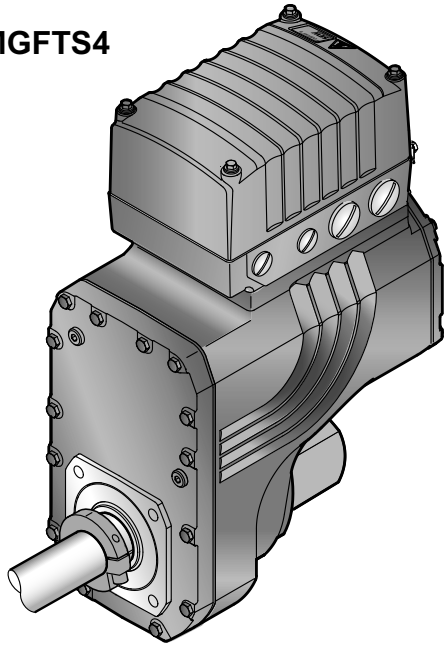
10.2.3 Breather valves and cable glands

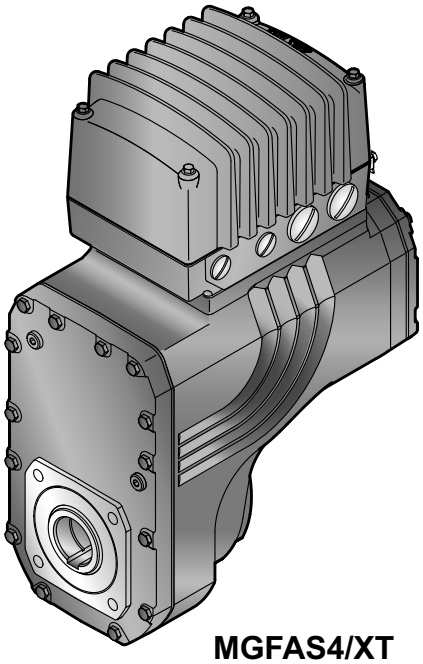
The dimension drawings always show the screw plugs. The contour dimensions may vary slightly due to preinstalled breather valves, plug connectors or pressure compensation fittings (e.g. in conjunction with the MOVIGEAR® package for wet areas).

11 MOVIGEAR® Drive Units

11.1 Variants

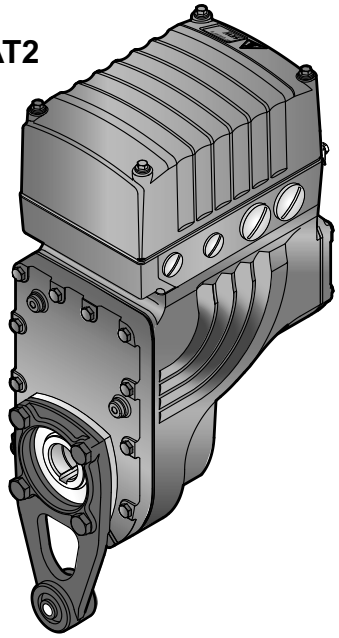
MGFTS4





MGFAS4/XT

MGFAT2



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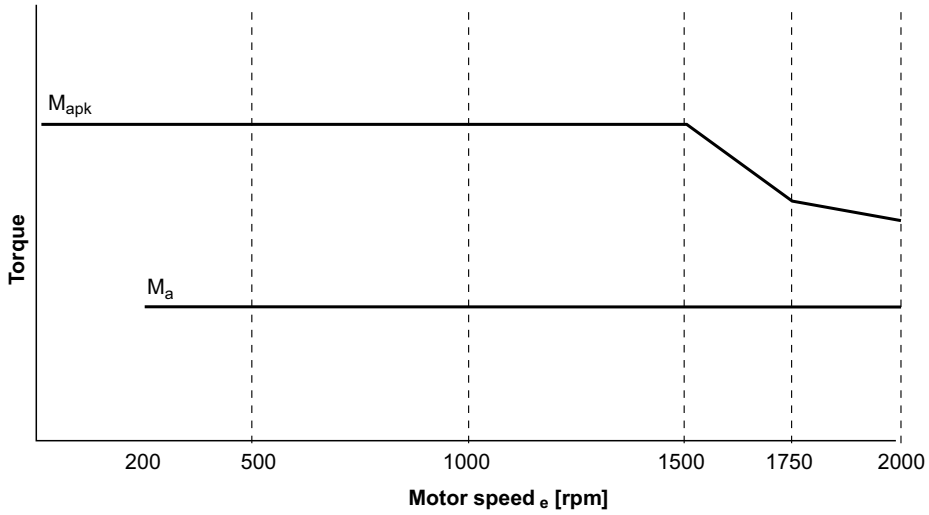
11.2 Selection tables

11.2.1 Control range 1:10

The following figure shows schematic characteristic curves. The tables below list the exact values.



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MGF..2

	n_a at n_e= 200 rpm [rpm]	n_a at n_e= 2000 rpm [rpm]	M_a at n_e= 500 rpm [Nm]	M_a at n_e= 1000 rpm [Nm]	M_a at n_e= 1500 rpm [Nm]	M_a at n_e= 2000 rpm [Nm]	M_{apk} at n_e= 200 – 1500 rpm [Nm]	M_{apk} at n_e= 1750 rpm [Nm]	M_{apk} at n_e= 2000 rpm [Nm]	M_{aEmerg} Off [Nm]	i_{tot}	Weight [kg]
2-stage	40.0	400.0	20	20	20	20	70 *	45	33	210	5.00	15.7
	37.5	374.5	21	21	21	21	75 *	48	35	215	5.34	
	32.0	320.0	25	25	25	25	88 *	56	41	225	6.25	
	28.6	285.7	28	28	28	28	98 *	63	46	235	7.00	
	24.3	242.7	33	33	33	33	115 *	74	54	245	8.24	
	20.6	206.0	39	39	39	39	136 *	87	64	330	9.71	
	19.3	192.9	42	42	42	42	145 *	93	68	330	10.37	
	16.5	164.7	49	49	49	49	170 *	109	80	330	12.14	
	14.7	147.1	55	55	55	55	190 *	122	90	330	13.6	
	12.5	125.0	64	64	64	64	220 *	144	106	330	16.00	
	10.8	108.0	74	74	74	74	220 *	167	122	330	18.52	
	10.1	101.0	80	80	80	80	220 *	178	131	330	19.81	
	8.7	87.5	92	92	92	92	220	206	151	330	22.86	

MGF..2

	n_a at n_e= 200 rpm [rpm]	n_a at n_e= 2000 rpm [rpm]	M_a at n_e= 500 rpm [Nm]	M_a at n_e= 1000 rpm [Nm]	M_a at n_e= 1500 rpm [Nm]	M_a at n_e= 2000 rpm [Nm]	M_{apk} at n_e= 200 – 1500 rpm [Nm]	M_{apk} at n_e= 1750 rpm [Nm]	M_{apk} at n_e= 2000 rpm [Nm]	$M_{aEmerg\ Off}$ [Nm]	i_{tot}	Weight [kg]
3-stage	7.1	71.3	113	113	113	113	220	220	185	330	28.07	16.0
	6.1	60.6	133	133	133	133	220	220	218	330	33.02	
	5.4	53.7	149	149	149	149	220	220	220	330	37.24	
	4.7	47.4	169	169	169	169	220	220	220	330	42.19	
	4.4	44.4	181	181	181	181	220	220	220	330	45.03	
	3.9	38.8	200	200	200	200	220	220	220	330	51.51	
	3.6	36.2	200	200	200	200	220	220	220	330	55.25	

	=	Preferred gear ratio
*	=	The illustrated values are realized if the setting of parameter 8518.0 (current limit) and 8688.0 (torque limit) is increased to up to 350 [% I_N] (factory setting: 250 [% I_N]).
M_{apk}	=	Maximum permitted torque for short-time duty If M_{apk} occurs more often than 10 times per hour, a detailed project planning must be carried out using the SEW Workbench.
$M_{aEmergOff}$	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	MOVIGEAR® continuous output torque
n_a	=	Output speed
n_e	=	Motor speed

MGF..4

	n_a at n_e= 200 rpm [rpm]	n_a at n_e= 2000 rpm [rpm]	M_a at n_e= 500 rpm [Nm]	M_a at n_e= 1000 rpm [Nm]	M_a at n_e= 1500 rpm [Nm]	M_a at n_e= 2000 rpm [Nm]	M_{apk} at n_e= 200 – 1500 rpm [Nm]	M_{apk} at n_e= 1750 rpm [Nm]	M_{apk} at n_e= 2000 rpm [Nm]	$M_{aEmerg\ Off}$ [Nm]	i_{tot}	Weight [kg]
2-stage	40.1	400.8	34	34	34	34	120 *	95 *	75	420	4.99	23.6
	34.7	347.2	39	39	39	39	138 *	109 *	86	450	5.76	
	31.5	315.5	43	43	43	43	152 *	120 *	95	470	6.34	
	26.9	268.8	51	51	51	51	179 *	141 *	112	515	7.44	
	25.4	253.8	54	54	54	54	189 *	150 *	118	525	7.88	
	22.3	223.2	61	61	61	61	215 *	170 *	134	560	8.96	
	18.2	182.3	75	75	75	75	263 *	208 *	165	675	10.97	
	15.8	158.0	87	87	87	87	304 *	241 *	190	710	12.66	
	14.4	143.6	95	95	95	95	334 *	265 *	209	710	13.93	
	12.2	122.2	112	112	112	112	393 *	311 *	245	710	16.36	
	11.5	115.4	119	119	119	119	416 *	329 *	260	710	17.33	
	10.2	101.5	135	135	135	135	473 *	374 *	296	710	19.70	
	9.2	91.7	149	149	149	149	475 *	415 *	327	710	21.82	
	7.8	77.8	176	176	176	176	475 *	475 *	386	710	25.72	
3-stage	6.9	69.3	198	198	198	198	475	475	433	710	28.88	24.0
	5.8	58.3	235	235	235	235	475	475	475	710	34.29	
	5.5	54.6	250	250	250	250	475	475	475	710	36.61	
	4.7	46.7	293	293	293	293	475	475	475	710	42.86	
	4.2	41.7	328	328	328	328	475	475	475	710	48.00	
	3.5	35.4	386	386	386	386	475	475	475	710	56.49	

	=	Preferred gear ratio
*	=	The illustrated values are realized if the setting of parameter 8518.0 (current limit) and 8688.0 (torque limit) is increased to up to 350 [% I_N] (factory setting: 250 [% I_N]).
M_{apk}	=	Maximum permitted torque for short-time duty If M_{apk} occurs more often than 10 times per hour, a detailed project planning must be carried out using the SEW Workbench.
$M_{aEmergOff}$	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	MOVIGEAR® continuous output torque
n_a	=	Output speed
n_e	=	Motor speed

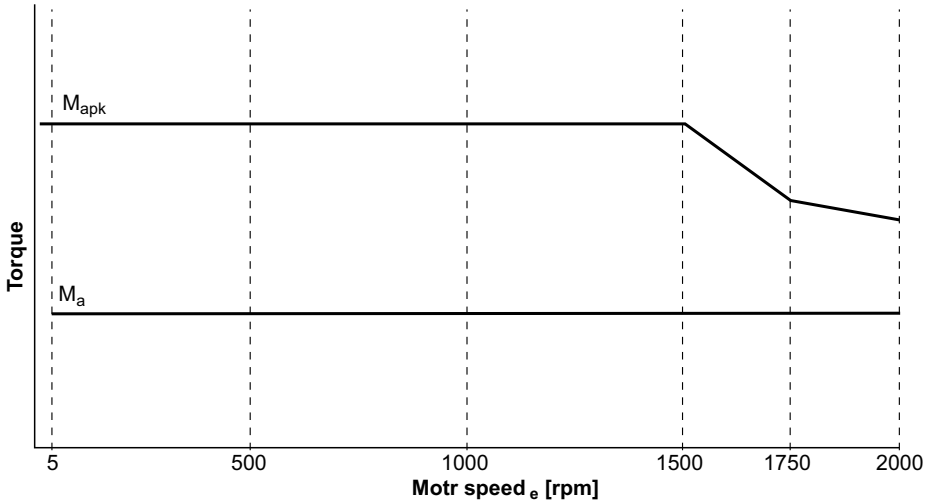
MGF..4/XT (increased torque)

	n_a at n_e= 200 rpm [rpm]	n_a at n_e= 2000 rpm [rpm]	M_a at n_e= 500 rpm [Nm]	M_a at n_e= 1000 rpm [Nm]	M_a at n_e= 1500 rpm [Nm]	M_a at n_e= 2000 rpm [Nm]	M_{apk} at n_e= 200 – 1500 rpm [Nm]	M_{apk} at n_e= 1750 rpm [Nm]	M_{apk} at n_e= 2000 rpm [Nm]	$M_{aEmerg\ Off}$ [Nm]	i_{tot}	Weight [kg]
2-stage	40.1	400.8	50	50	50	50	150 *	100	75	420	4.99	23.6
	34.7	347.2	57	57	57	57	173 *	115	86	450	5.76	
	31.5	315.5	63	63	63	63	190 *	127	95	470	6.34	
	26.9	268.8	74	74	74	74	223 *	149	112	515	7.44	
	25.4	253.8	78	78	78	78	236 *	158	118	525	7.88	
	22.3	223.2	89	89	89	89	269 *	179	134	560	8.96	
	18.2	182.3	109	109	109	109	329 *	219	165	675	10.97	
	15.8	158	126	126	126	126	380 *	253	190	710	12.66	
	14.4	143.6	139	139	139	139	418 *	279	209	710	13.93	
	12.2	122.2	163	163	163	163	475 *	327	245	710	16.36	
	11.5	115.4	173	173	173	173	475 *	347	260	710	17.33	
	10.2	101.5	197	197	197	197	475	394	296	710	19.7	
	9.2	91.7	218	218	218	218	475	436	327	710	21.82	
	7.8	77.8	257	257	257	257	475	475	386	710	25.72	
3-stage	6.9	69.3	288	288	288	288	475	475	433	710	28.88	24.0
	5.8	58.3	342	342	342	342	475	475	475	710	34.29	
	5.5	54.6	366	366	366	366	475	475	475	710	36.61	
	4.7	46.7	400	400	400	400	475	475	475	710	42.86	
	4.2	41.7	400	400	400	400	475	475	475	710	48	
	3.5	35.4	400	400	400	400	475	475	475	710	56.49	

	=	Preferred gear ratio
*	=	The illustrated values are realized if the setting of parameter 8518.0 (current limit) and 8688.0 (torque limit) is increased to up to 350 [% I_N] (factory setting: 250 [% I_N]).
M_{apk}	=	Maximum permitted torque for short-time duty If M_{apk} occurs more often than 10 times per hour, a detailed project planning must be carried out using the SEW Workbench.
$M_{aEmergOff}$	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	MOVIGEAR® continuous output torque
n_a	=	Output speed
n_e	=	Motor speed

11.2.2 Extended control range 1:2000 (/ECR option)

The following figure shows schematic characteristic curves. The tables below list the exact values.



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MGF..2../ECR (extended control range)

	n_a		M_a					M_{apk}			$M_{aEmerg\ Off}$	i_{tot}	Weight
	at n_e= 1 rpm	at n_e= 2000 rpm	at n_e= 5 rpm	at n_e= 500 rpm	at n_e= 1000 rpm	at n_e= 1500 rpm	at n_e= 2000 rpm	at n_e= 5 – 1500 rpm	at n_e= 1750 rpm	at n_e= 2000 rpm			
	[rpm]	[rpm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	0.20	400.0	20	20	20	20	20	70 *	45	33	210	5.00	15.7
	0.19	374.5	21	21	21	21	21	75 *	48	35	215	5.34	
	0.16	320.0	25	25	25	25	25	88 *	56	41	225	6.25	
	0.14	285.7	28	28	28	28	28	98 *	63	46	235	7.00	
	0.12	242.7	33	33	33	33	33	115 *	74	54	245	8.24	
	0.10	206.0	39	39	39	39	39	136 *	87	64	330	9.71	
	0.10	192.9	42	42	42	42	42	145 *	93	68	330	10.37	
	0.08	164.7	49	49	49	49	49	170 *	109	80	330	12.14	
	0.07	147.1	55	55	55	55	55	190 *	122	90	330	13.6	
	0.06	125.0	64	64	64	64	64	220 *	144	106	330	16.00	
	0.05	108.0	74	74	74	74	74	220 *	167	122	330	18.52	
	0.05	101.0	80	80	80	80	80	220 *	178	131	330	19.81	
	0.04	87.5	92	92	92	92	92	220	206	151	330	22.86	

MGF..2../ECR (extended control range)

	n_a		M_a					M_{apk}			$M_{aEmerg\ Off}$	i_{tot}	Weight
	at n_e= 1 rpm	at n_e= 2000 rpm	at n_e= 5 rpm	at n_e= 500 rpm	at n_e= 1000 rpm	at n_e= 1500 rpm	at n_e= 2000 rpm	at n_e= 5 – 1500 rpm	at n_e= 1750 rpm	at n_e= 2000 rpm			
	[rpm]	[rpm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
3-stage	0.04	71.3	113	113	113	113	113	220	220	185	330	28.07	16.0
	0.03	60.6	133	133	133	133	133	220	220	218	330	33.02	
	0.03	53.7	149	149	149	149	149	220	220	220	330	37.24	
	0.02	47.4	169	169	169	169	169	220	220	220	330	42.19	
	0.02	44.4	181	181	181	181	181	220	220	220	330	45.03	
	0.02	38.8	200	200	200	200	200	220	220	220	330	51.51	
	0.02	36.2	200	200	200	200	200	220	220	220	330	55.25	

	=	Preferred gear ratio
*	=	The illustrated values are realized if the setting of parameter 8518.0 (current limit) and 8688.0 (torque limit) is increased to up to 350 [% I_N] (factory setting: 250 [% I_N]).
M_{apk}	=	Maximum permitted torque for short-time duty If M_{apk} occurs more often than 10 times per hour, a detailed project planning must be carried out using the SEW Workbench.
$M_{aEmergOff}$	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	MOVIGEAR® continuous output torque For motor speeds n_e < 5 rpm, you have to reduce the output torque M_a by factor 0.9.
n_a	=	Output speed
n_e	=	Motor speed

MGF..4../ECR (extended control range)

	n_a		M_a					M_{apk}			$M_{aEmerg\ Off}$	i_{tot}	Weight
	at n_e= 1 rpm	at n_e= 2000 rpm	at n_e= 5 rpm	at n_e= 500 rpm	at n_e= 1000 rpm	at n_e= 1500 rpm	at n_e= 2000 rpm	at n_e= 5 – 1500 rpm	at n_e= 1750 rpm	at n_e= 2000 rpm			
	[rpm]	[rpm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	0.20	400.8	34	34	34	34	34	120 *	95 *	75	420	4.99	23.6
	0.17	347.2	39	39	39	39	39	138 *	109 *	86	450	5.76	
	0.16	315.5	43	43	43	43	43	152 *	120 *	95	470	6.34	
	0.13	268.8	51	51	51	51	51	179 *	141 *	112	515	7.44	
	0.13	253.8	54	54	54	54	54	189 *	150 *	118	525	7.88	
	0.11	223.2	61	61	61	61	61	215 *	170 *	134	560	8.96	
	0.09	182.3	75	75	75	75	75	263 *	208 *	165	675	10.97	
	0.08	158.0	87	87	87	87	87	304 *	241 *	190	710	12.66	
	0.07	143.6	95	95	95	95	95	334 *	265 *	209	710	13.93	
	0.06	122.2	112	112	112	112	112	393 *	311 *	245	710	16.36	
	0.06	115.4	119	119	119	119	119	416 *	329 *	260	710	17.33	
	0.05	101.5	135	135	135	135	135	473 *	374 *	296	710	19.70	
	0.05	91.7	149	149	149	149	149	475 *	415 *	327	710	21.82	
	0.04	77.8	176	176	176	176	176	475 *	475 *	386	710	25.72	
3-stage	0.03	69.3	198	198	198	198	198	475	475	433	710	28.88	24.0
	0.03	58.3	235	235	235	235	235	475	475	475	710	34.29	
	0.03	54.6	250	250	250	250	250	475	475	475	710	36.61	
	0.02	46.7	293	293	293	293	293	475	475	475	710	42.86	
	0.02	41.7	328	328	328	328	328	475	475	475	710	48.00	
	0.02	35.4	386	386	386	386	386	475	475	475	710	56.49	

	=	Preferred gear ratio
*	=	The illustrated values are realized if the setting of parameter 8518.0 (current limit) and 8688.0 (torque limit) is increased to up to 350 [% I_N] (factory setting: 250 [% I_N]).
M_{apk}	=	Maximum permitted torque for short-time duty If M_{apk} occurs more often than 10 times per hour, a detailed project planning must be carried out using the SEW Workbench.
$M_{aEmergOff}$	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	MOVIGEAR® continuous output torque For motor speeds n_e < 5 rpm, you have to reduce the output torque M_a by factor 0.9.
n_a	=	Output speed
n_e	=	Motor speed

MGF..4../ECR/XT
(extended control range /ECR and increased torque /XT)

	n_a		M_a					M_{apk}			$M_{aEmerg\ Off}$	i_{tot}	Weight
	at n_e= 1 rpm	at n_e= 2000 rpm	at n_e= 5 rpm	at n_e= 500 rpm	at n_e= 1000 rpm	at n_e= 1500 rpm	at n_e= 2000 rpm	at n_e= 5 – 1500 rpm	at n_e= 1750 rpm	at n_e= 2000 rpm			
	[rpm]	[rpm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	0.2	400.8	50	50	50	50	50	150 *	100	75	420	4.99	23.6
	0.17	347.2	57	57	57	57	57	173 *	115	86	450	5.76	
	0.16	315.5	63	63	63	63	63	190 *	127	95	470	6.34	
	0.13	268.8	74	74	74	74	74	223 *	149	112	515	7.44	
	0.13	253.8	78	78	78	78	78	236 *	158	118	525	7.88	
	0.11	223.2	89	89	89	89	89	269 *	179	134	560	8.96	
	0.09	182.3	109	109	109	109	109	329 *	219	165	675	10.97	
	0.08	158	126	126	126	126	126	380 *	253	190	710	12.66	
	0.07	143.6	139	139	139	139	139	418 *	279	209	710	13.93	
	0.06	122.2	163	163	163	163	163	475 *	327	245	710	16.36	
	0.06	115.4	173	173	173	173	173	475 *	347	260	710	17.33	
	0.05	101.5	197	197	197	197	197	475	394	296	710	19.7	
	0.05	91.7	218	218	218	218	218	475	436	327	710	21.82	
	0.04	77.8	257	257	257	257	257	475	475	386	710	25.72	
3-stage	0.03	69.3	288	288	288	288	288	475	475	433	710	28.88	24.0
	0.03	58.3	342	342	342	342	342	475	475	475	710	34.29	
	0.03	54.6	366	366	366	366	366	475	475	475	710	36.61	
	0.02	46.7	400	400	400	400	400	475	475	475	710	42.86	
	0.02	41.7	400	400	400	400	400	475	475	475	710	48	
	0.02	35.4	400	400	400	400	400	475	475	475	710	56.49	

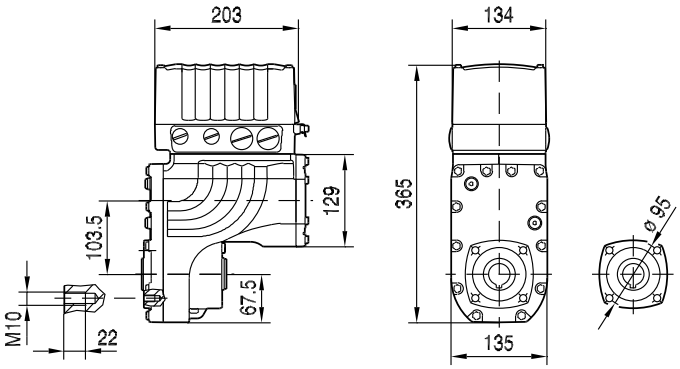
	=	Preferred gear ratio
*	=	The illustrated values are realized if the setting of parameter 8518.0 (current limit) and 8688.0 (torque limit) is increased to up to 350 [% I_N] (factory setting: 250 [% I_N]).
M_{apk}	=	Maximum permitted torque for short-time duty If M_{apk} occurs more often than 10 times per hour, a detailed project planning must be carried out using the SEW Workbench.
$M_{aEmergOff}$	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	MOVIGEAR® continuous output torque For motor speeds n_e < 5 rpm, you have to reduce the output torque M_a by factor 0.9.
n_a	=	Output speed
n_e	=	Motor speed

11.3 Dimension drawings

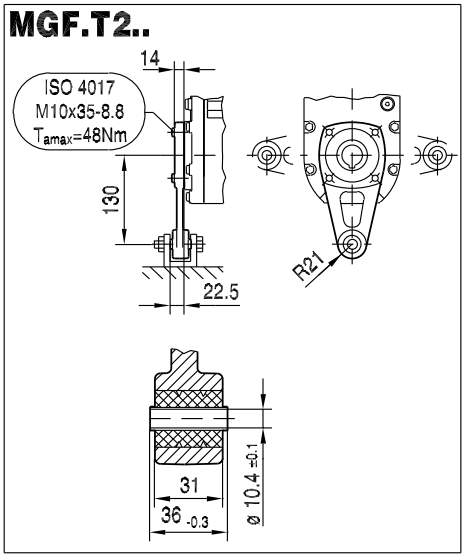
11.3.1 MGF..2

03 016 01 10

MGFAS2..-B



MGF.T2..



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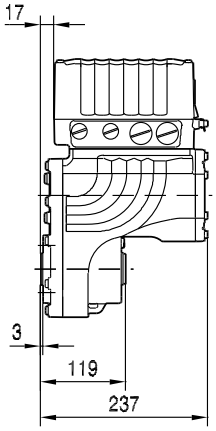

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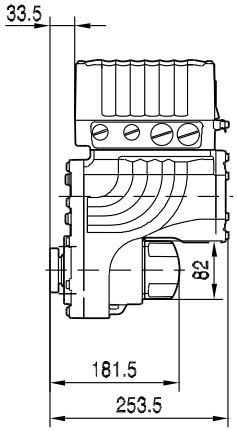
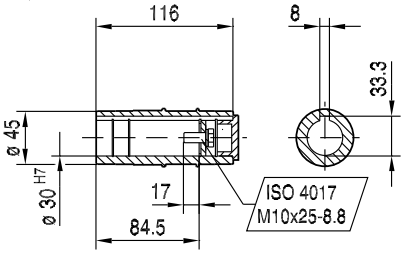
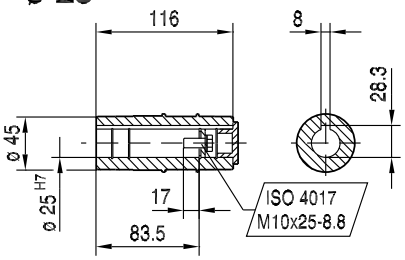


ø 30 H7



ø 25 H7



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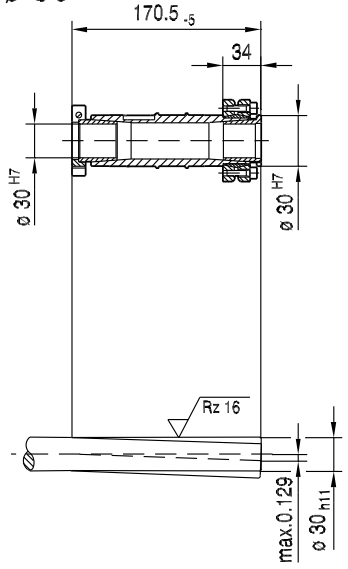

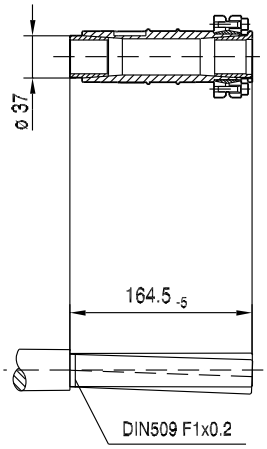

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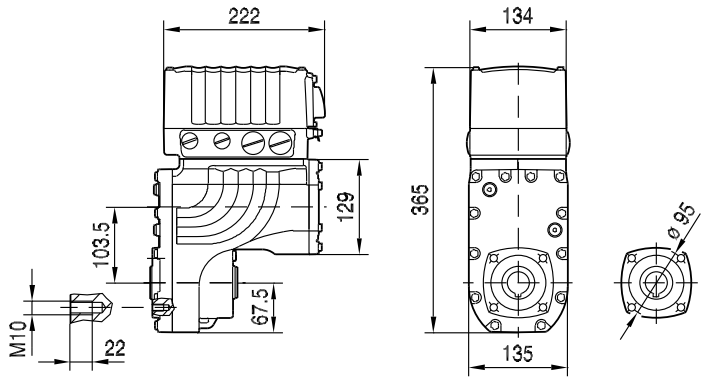
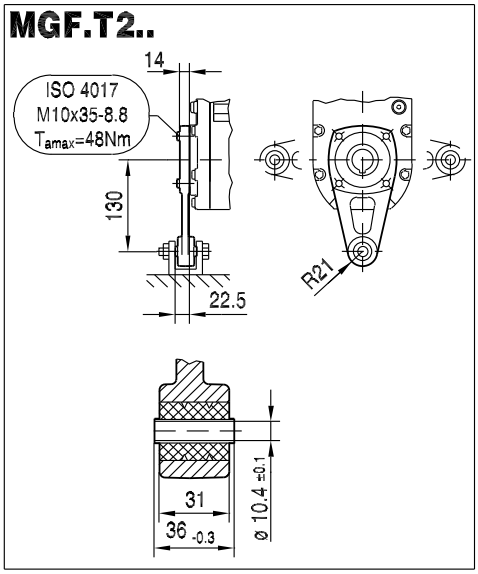
11.3.2 MGF..2 with application option

03 014 01 10

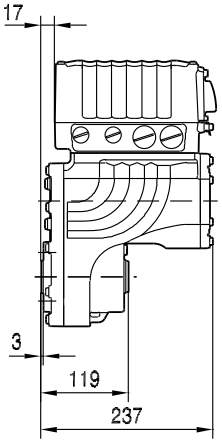
MGFAS2..-B



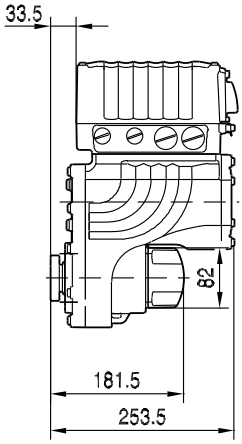
MGF.T2..



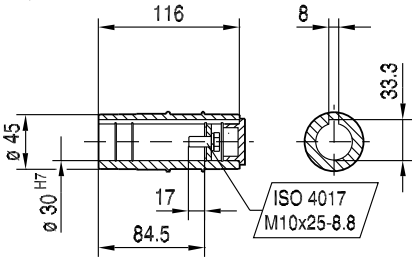
MGFAS2..-B



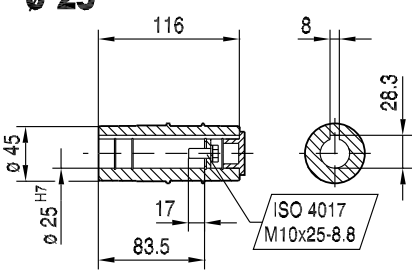
MGFTS2..-B



ø 30 H7



ø 25 H7



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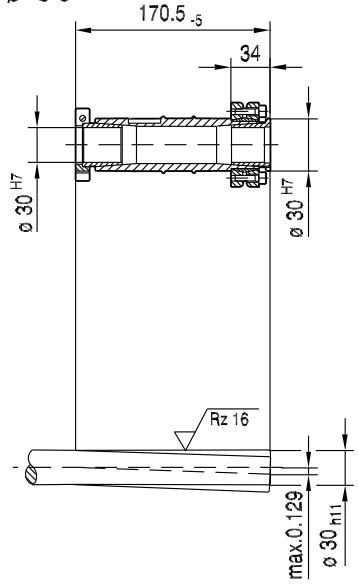

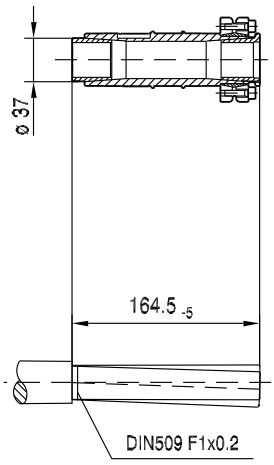

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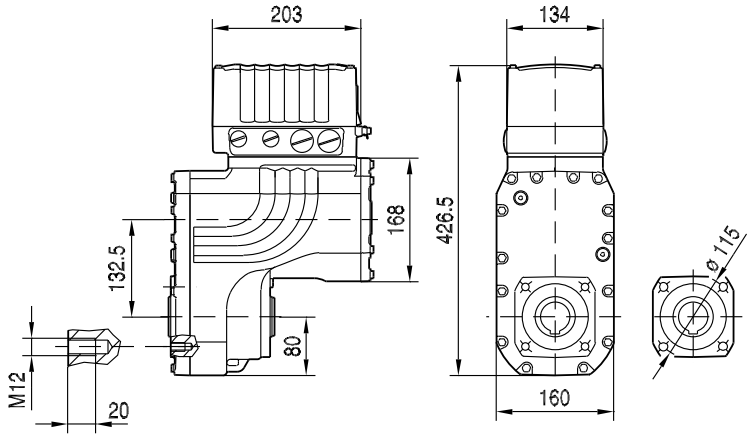
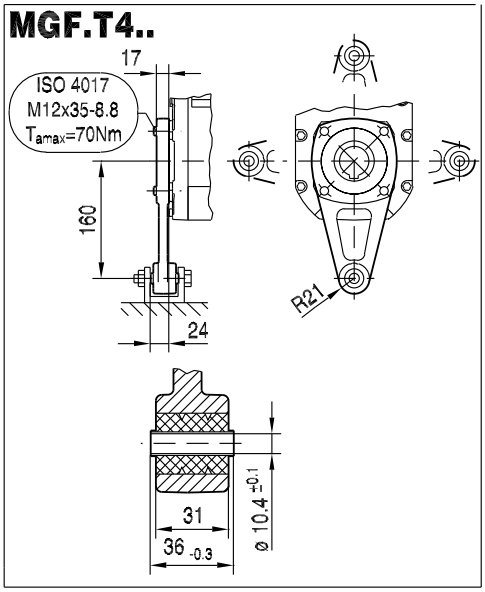
11.3.3 MGF..4

03 018 01 10

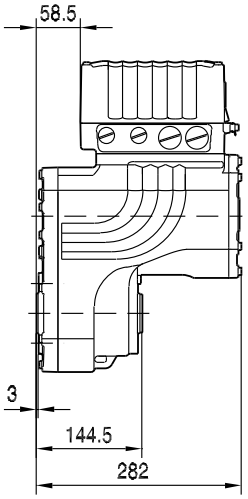
MGFAS4..-B



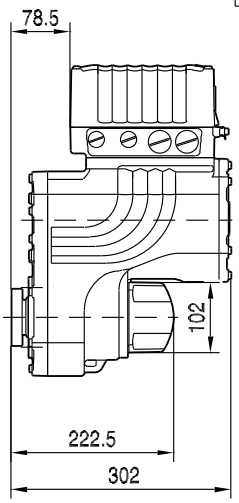
MGF.T4..



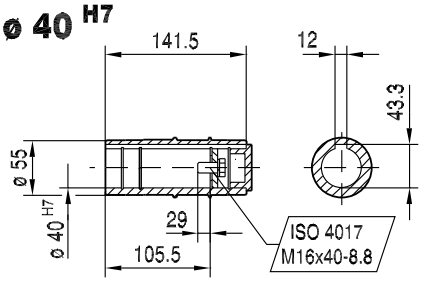
MGFAS4..-B



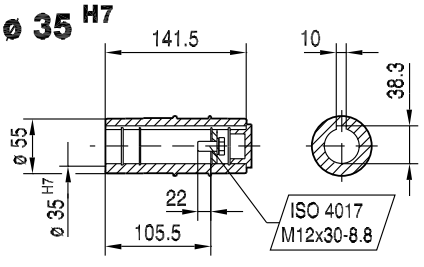
MGFTS4..-B



ø 40 H7



ø 35 H7



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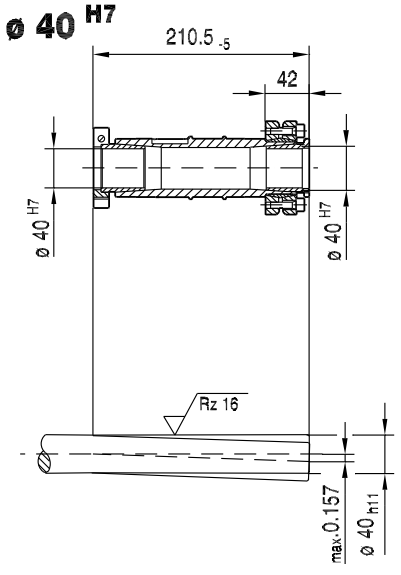

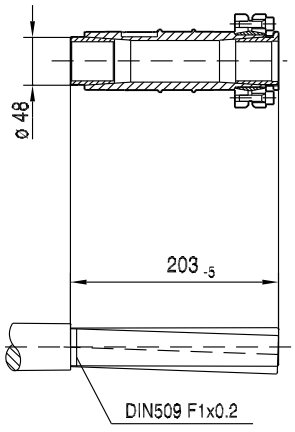

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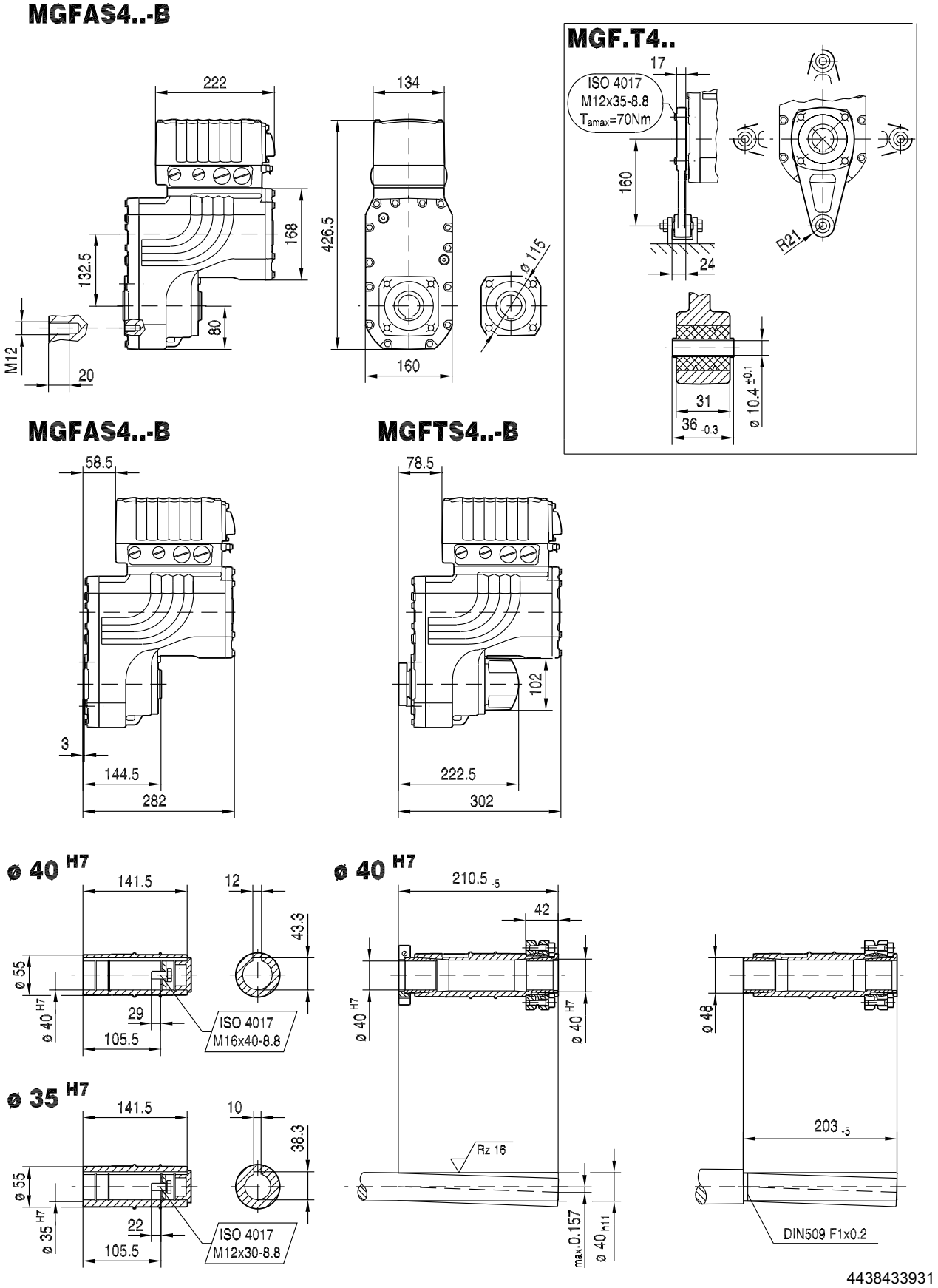
11.3.4 MGF..4 with application option

03 015 01 10



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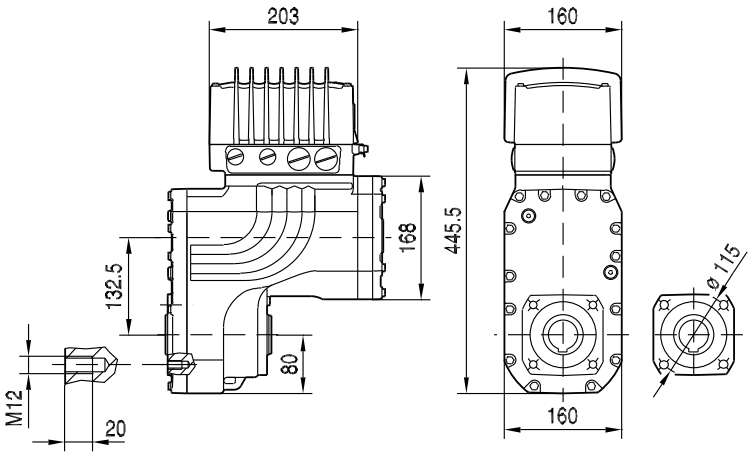
11.3.5 MGF..4../XT with increased torque

03 007 01 11

MGFAS4..-B/XT



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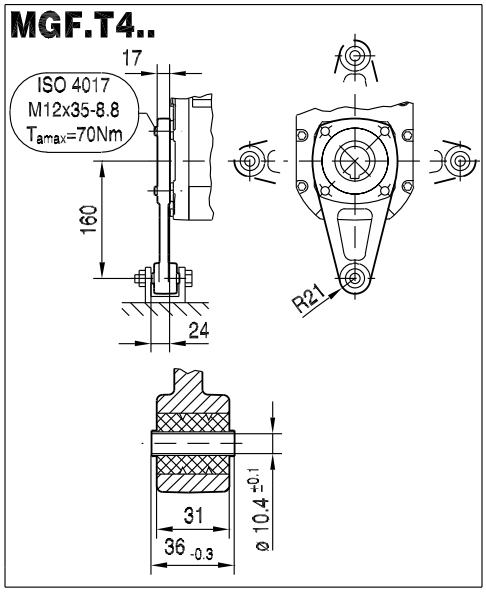

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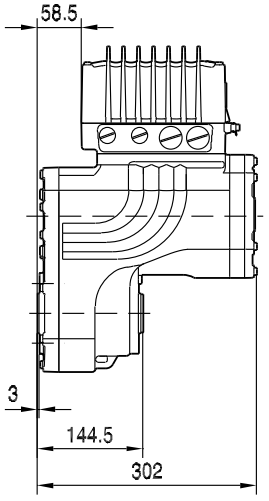
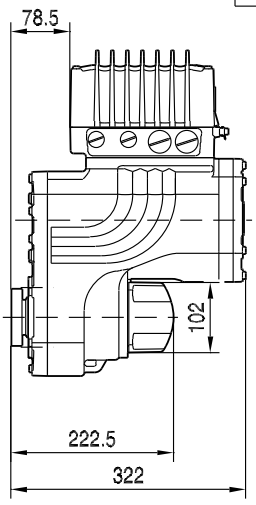
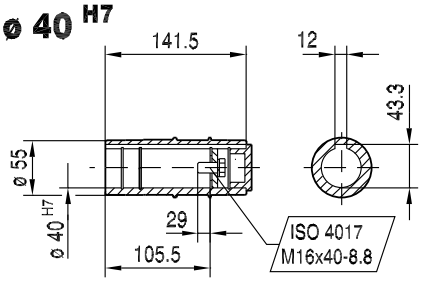


MGFTS4..-B/XT



ø 40 H7



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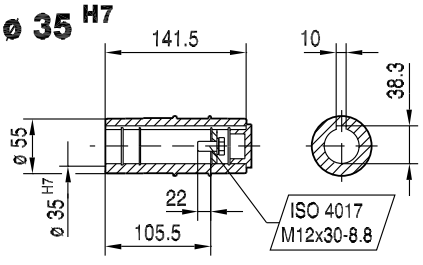

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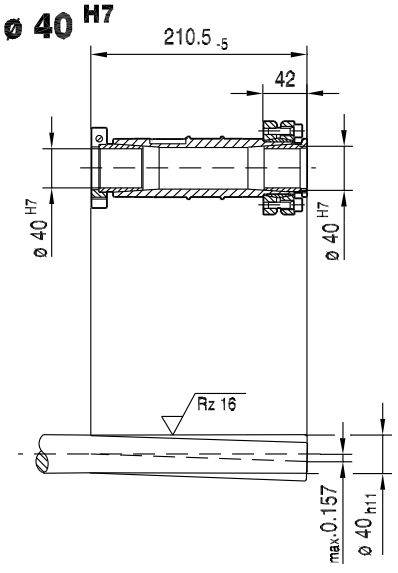

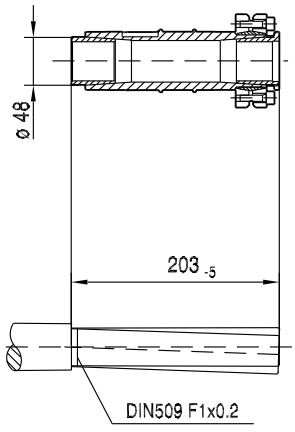

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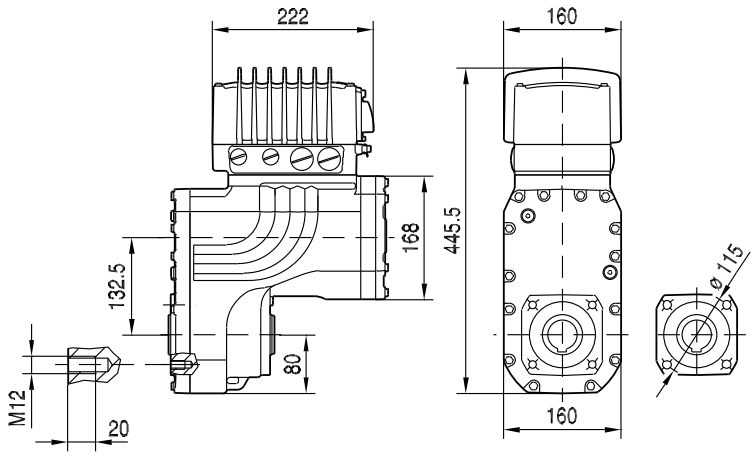

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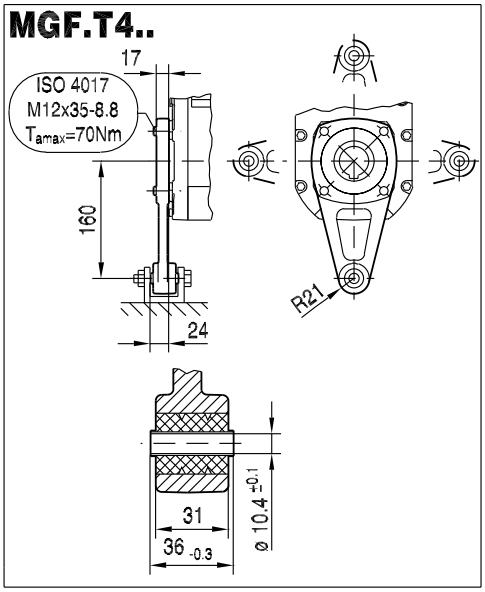

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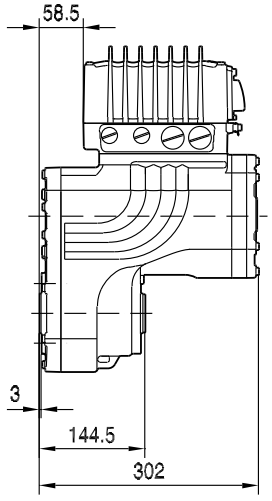

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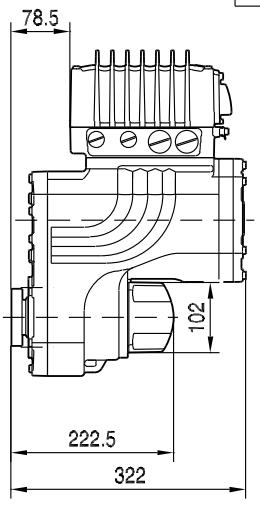

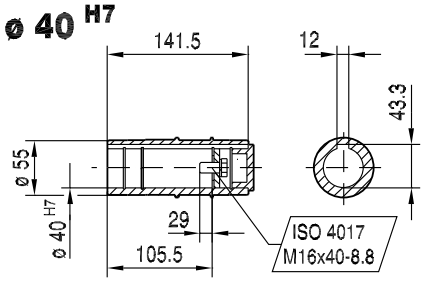

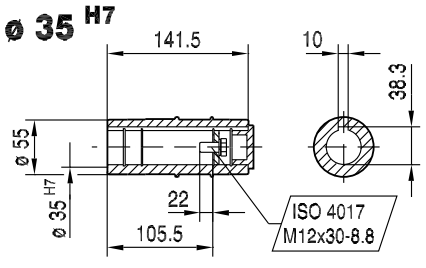

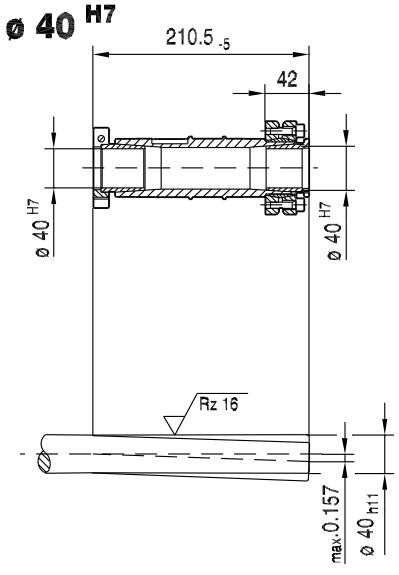

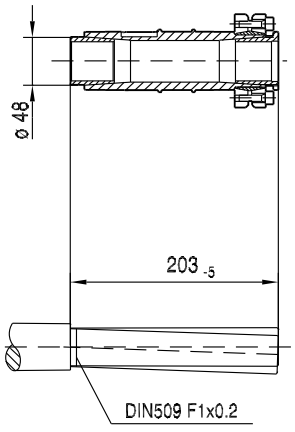

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12 Address Directory

Germany			
Headquarters **Production** **Sales**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
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	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357 14 euro cents/min on the German landline network. Max 42 euro cents/min from a German mobile network. Prices for mobile and international calls may differ.
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	Bodensee	SEW-EURODRIVE GmbH & Co KG Dornierstraße 4 D-88677 Markdorf	Tel. +49 7544 96590-90 Fax +49 7544 96590-99 tb-bodensee@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Bornstr.19 ... 22 D-28195 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de

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	Hannover/Garbsen	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Str.40-42 D-30823 Garbsen P.O. Box Postfach 1104 53 • D-30804 Garbsen	Tel. +49 5137 8798-10 Fax +49 5137 8798-50 tb-hannover@sew-eurodrive.de
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	Lahr	SEW-EURODRIVE GmbH & Co KG Europastraße 3/1 D-77933 Lahr / Schwarzwald	Tel. +49 7821 90999-60 Fax +49 7821 90999-79 tb-lahr@sew-eurodrive.de
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	München	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim	Tel. +49 89 90955-110 Fax +49 89 90955-150 tb-muenchen@sew-eurodrive.de

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	Drive Center Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 D-97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 tb-wuerzburg@sew-eurodrive.de
	Zwickau / Meerane	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg1 D-08393 Meerane	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 tb-zwickau@sew-eurodrive.de

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Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
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Nord-Pas-de-Calais	SEW-USOCOME 209 route d'Hesdigneul F-62360 Hesdin l'Abbé	Tel. +33 3 21 10 86 86 Fax +33 3 21 10 86 87
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Provence-Alpes-Côte d'Azur	SEW-USOCOME Résidence Les Hespérides Bât. B2 67 boulevard des Alpes F-13012 Marseille	Tel. +33 4 91 18 00 11 Fax +33 4 91 18 00 12

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	Rhône-Alpes North	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 03 Fax +33 4 72 15 37 15
	Rhône-Alpes West	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 04 Fax +33 4 72 15 37 15

Algeria			
Sales	**Algiers**	REDUCOM Sarl 16, rue des Frères Zaghnoune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 info@reducom-dz.com http://www.reducom-dz.com

Argentina			
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	Córdoba	SEW EURODRIVE ARGENTINA S.A. Ruta Nacional 19, Manzana 97, Lote 5 (X5125) Malvinas Argentinas Prov. de Córdoba	Tel. +54 351-490-0010 sewcor@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar
	Santa Fe	SEW EURODRIVE ARGENTINA S.A. Ruta Prov. 21 Km 7, Lote 41 Parque Industrial Alvear (2126) Gral. Alvear Prov. de Santa Fe	Tel. +54 341-317-7277 sewsfe@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar
Service	**Mendoza**	SEW EURODRIVE ARGENTINA S.A. Ayacucho 760 (M5500DOE) Mendoza Prov. de Mendoza	Tel. +54 261-430-0060 sewmen@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar
Technical Offices	**Tucumán**	SEW EURODRIVE ARGENTINA S.A. Balcarce 609 (T4000IAM) S.M. de Tucumán Prov. de Tucumán	Tel. +54 381-400-4569 sewtuc@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar
	Bahía Blanca	SEW EURODRIVE ARGENTINA S.A. O'Higgins 95, 1er Piso A (B8000IVA) Bahía Blanca Prov. de Buenos Aires	Tel. +54 291-451-7345 sewtuc@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar
	Comahue	SEW EURODRIVE ARGENTINA S.A. Puerto Rico 1885 (R8324IOE) Cipolletti Prov. de Río Negro	Tel. +54 299-478-1290 sewcomahue@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar
Mining	**Mendoza**	SEW EURODRIVE ARGENTINA S.A. Ayacucho 760 (M5500DOE) Mendoza Prov. de Mendoza	Tel. +54 261-430-0060 mineria@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar

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	Brisbane	SEW-EURODRIVE PTY.LTD. 1 /34 Collinsvale St Rocklea, Queensland, 4106	Tel. +61 7 3276 5100 Fax +61 7 3276 5102 enquires@sew-eurodrive.com.au
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Service Compe-tence Center	**Industrial Gears**	**SEW-EURODRIVE n.v./s.a.** Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be

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	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
	Indaiatuba	SEW-EURODRIVE Brasil Ltda. Estrada Municipal Jose Rubim, 205 Rodovia Santos Dumont Km 49 13347-510 - Indaiatuba / SP	Tel. +55 19 3835-8000 sew@sew.com.br

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Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 info@sew-eurodrive.cn http://www.sew-eurodrive.cn

China			
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. Zeleni dol 10 HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr

Czech Republic			
Sales **Assembly** **Service**	**Hostivice**	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
		SEW-EURODRIVE CZ s.r.o. Lužná 591 16000 Praha 6 - Vokovice	
	Drive Service Hotline / 24 Hour Service	HOT-LINE +420 800 739 739 (800 SEW SEW)	**Servis:** Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz
Assembly **Service**	**Plzeň**	SEW-EURODRIVE CZ s.r.o. Areal KRPA a.s. Zahradni 173/2 326 00 Plzeň	Tel. +420 378 775 320 Fax +420 377 970 710 sew@sew-eurodrive.cz
Technical Offices	**Brno**	SEW-EURODRIVE CZ s.r.o. Křenová 52 60200 Brno	Tel. +420 543 254 174 Fax +420 543 256 845 radek.chmela@sew-eurodrive.cz
	Hradec Králové	SEW-EURODRIVE CZ s.r.o. Čechova 498 50202 Hradec Králové	Tel. +420 495 510 141 Fax +420 495 521 313 miroslav.moravec@sew-eurodrive.cz

Czech Republic			
	Ostrava	SEW-EURODRIVE CZ s.r.o. Studentská 6202/17 708 00 Ostrava-Poruba	Tel. +420 597 329 044 jan.kurs@sew-eurodrive.cz
	Klatovy	SEW-EURODRIVE CZ s.r.o. Vídeňská 841 33901 Klatovy	Tel. +420 376 331 634 Fax +420 376 331 634 viktor.kubernat@sew-eurodrive.cz
Service	**Horní Moštěnice**	SEW-EURODRIVE CZ s.r.o. Nám.Dr.M.Tyrše 14/64 751 17 Horní Moštěnice	Tel. +420 581 224 374 Fax +420 581 224 374 servis@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Copenhagen**	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Egypt			
Sales **Service**	**Cairo**	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 22566-299 +1 23143088 Fax +20 2 22594-757 http://www.copam-egypt.com/ copam@datum.com.eg

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Technical Offices	**Helsinki**	SEW-EURODRIVE OY Luutnantintie 5 FIN-00410 Helsinki	Tel. +358 201 589-300 sew@sew.fi
	Vaasa	SEW-EURODRIVE OY Asemakatu 7 FIN-65100 Vaasa	Tel. +358 201 589-300 sew@sew.fi
	Kuopio	SEW-EURODRIVE OY Viestikatu 3 FIN-70600 Kuopio	Tel. +358 201 589-300 sew@sew.fi
Production **Assembly**	**Karkkila**	SEW Industrial Gears Oy Valurinkatu 6, PL 8 FI-03600 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate Normanton West Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk

Great Britain			
	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
Service Competence Center	**Southern England**	SEW-EURODRIVE Ltd. Unit 41 Easter Park Benyon Road Silchester Reading Berkshire RG7 2PQ	Tel. +44 1189 701-699 Fax +44 1189 701-021
Technical Offices	**Midlands**	SEW-EURODRIVE Ltd. 5 Sugar Brook court Aston Road Bromsgrove Worcs. B60 3EX	Tel. +44 1527 877-319 Fax +44 1527 575-245
	Scotland	SEW-EURODRIVE Ltd. No 37 Enterprise House Springkerse Business Park Stirling FK7 7UF	Tel. +44 17 8647-8730 Fax +44 17 8645-0223

Greece			
Sales	**Athens**	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Technical Office	**Thessaloniki**	Christ. Boznos & Son S.A. Asklipiou 26 562 24 Evosmos, Thessaloniki	Tel. +30 2 310 7054-00 Fax +30 2 310 7055-15 info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu

Iceland			
Sales	**Reykjavik**	VARMA & VELAVERK EHF Dalshrauni 5 IS-220 Hafnarjördur	Tel. +354 585 1070 Fax +354 585)1071 varmaverk@varmaverk.is http://www.varmaverk.is

India			
Registered Office **Assembly** **Sales** **Service**	**Vadodara**	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200, +91 265 2831086 Fax +91 265 3045300, +91 265 2831087 http://www.seweurodriveindia.com salesvadodara@seweurodrivein-dia.com

India			
Assembly **Sales** **Service**	**Chennai**	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
Technical Offices	**Ahmedabad**	SEW-EURODRIVE India Private Limited 306, Shaan office complex, Behind Sakar-IV, Ellisebridge, Ashram Road Ahmedabad – Gujarat	Tel. +91 79 40072067/68 Fax +91 79 40072069 salesahmedabad@seweurodrivein-dia.com
	Aurangabad	SEW-EURODRIVE INDIA PRIVATE LIMITED	Tel. +91 86000 12333 salesaurangabad@seweurodrivein-dia.com
	Bangalore	SEW-EURODRIVE India Private Limited Sy.no:41-P3, Peenya1, Phase 1A, Peenya Village, Yeswanthapura Hobli, Bangalore North Taluk, Bangalore Dist, Karnataka	Tel. +91 80 22266565 Fax +91 80 22266569 salesbangalore@seweurodrivein-dia.com
	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED Genetic Udayanchal, House-96 (6th Floor), Road-23/A, Block-B, Banani, Dhaka-1213, Bangladesh	Mobile +88 01729 097309 salesdhaka@seweurodrivebangla-desh.com
	Bellary	SEW-EURODRIVE India Private Limited Door no-56/279 Ward No-16, Sindhigi compound, Near Raghavendra talkies, Bellary-583101 Karnataka	Tel. +91 77609 88668 salesbellary@seweurodriveindia.com
	Chandigarh	SEW-EURODRIVE India Private Limited # 72, Type- 4, Power Colony, Chandigarh - Rupnagar Highway Rupnagar- 140001, Punjab	Tel. +91 81462 67606 saleschandigarh@seweurodrivein-dia.com
	Chennai	SEW-EURODRIVE India Private Limited 2nd Floor, Josmans Complex, No. 5, McNichols Road, Chetpet Chennai - 600031 - Tamil Nadu	Tel. +91 44 42849813 Fax +91 44 42849816 saleschennai@seweurodriveindia.com
	Cochin	SEW-EURODRIVE India Private Limited CF7-(2), Block No 1, Vasanth Nagar, Opposite Jawahar Lal Nehru Stadium, Palarivattom – Cochin 682025	Tel. +91 98951 30375 salescochin@seweurodriveindia.com
	Coimbatore	SEW-EURODRIVE INDIA PRIVATE LIMITED 687/2, SRI SAKTHIVEL TOWERS (NEAR DEEPAM HOSPITAL) TRICHY ROAD, RAMANATHAPURAM COIMBATORE - 641 045.Tamilnadu	Tel. +91 422 2322420 Fax +91 422 2323988 salescoimbatore@seweurodrivein-dia.com
	Cuttack	SEW-EURODRIVE India Private Limited Plot No.- 1764, Nuasahi, Nayapalli Bhubaneswar-12 Orissa	Tel. +91 9937446333 salescuttack@seweurodriveindia.com
	Gandhidham	SEW-EURODRIVE India Private Limited TCX-S-28, FF, Ward 12/A, Gandhidham - Kutch - 370201	Tel. +91 81282 36850 salesgandhidham@seweurodrivein-dia.com
	Hyderabad	SEW-EURODRIVE India Private Limited 408, 4th Floor, Meridian Place Green Park Road Amerpeet Hyderabad - 500016 - Andhra Pradesh	Tel. +91 40 23414698 Fax +91 40 23413884 saleshyderabad@seweurodrivein-dia.com

India			
	Jamshedpur	SEW-EURODRIVE India Private Limited Flat No :- S1 " Kashi Kunj",h. No. 60, New Rani Kudar Road No - 3 P.o. + P.s. - Kadma Jamshedpur - Pin - 831005 Jharkhand	Tel. +91 9934123671 salesjamshedpur@seweurodrivein-dia.com
	Kolhapur	SEW EURODRIVE India Private Limited	Tel. +91 86000 20846 saleskolhapur@seweurodriveindia.com
	Kolkata	SEW EURODRIVE India Private Limited 2nd floor, Room No. 35 Chowringhee Court 55, Chowringhee Road Kolkata - 700 071 - West Bengal	Tel. +91 33 22827457 Fax +91 33 22894204 saleskolkata@seweurodriveindia.com
	Lucknow	SEW-EURODRIVE India Private Limited 69, Shiv Vihar Colony Vikas Nagar-5 Lucknow 226022 - Uttar Pradesh	Tel. +91 9793627333 saleslucknow@seweurodriveindia.com
	Mumbai	SEW-EURODRIVE India Private Limited 312 A, 3rd Floor, Acme Plaza, J.B. Nagar, Andheri Kurla Road, Andheri (E) Mumbai - 400059 - Maharashtra	Tel. +91 22 28348440 Fax +91 22 28217858 salesmumbai@seweurodriveindia.com
	Nagpur	SEW-EURODRIVE India Private Limited Plot No 49, New Kailash Nager, Samta colony, Nagpur-440027	Tel. +91 95610 89525 salesnagpur@seweurodriveindia.com
	Nashik	SEW-EURODRIVE India Private Limited 107, "YOG" Bunglow, Mahatama Nagar, Trimbak Road, Nashik, Maharashtra – 422 007	Tel. +91 9665752978 salesnashik@seweurodriveindia.com
	New Delhi	SEW-EURODRIVE India Private Limited 1008, 10th Floor, 12th Level 'Westend Mall' Tower Plot, District Centre Adjacent Hotel Hilton Janak Puri, New Delhi – 110058	Tel. +91 11 25544111 Fax +91 11 25544113 salesdelhi@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Jai Tulajabhavani Complex. Office No:- 15 First Floor, Opp. Century Enka Company, MIDC Bhosari , Pune 411 026	Tel. +91 20-65118890 / 91 Fax +91 20 25380721 salespune@seweurodriveindia.com
		SEW-EURODRIVE India Private Limited LUNAWAT PRISM 4th Floor, S.No. 148 Opposite Wanaz Company, Besides Mega Mart At Neena Co-Operative Housing Society, Paud Road, Pune 411038 - Maharashtra	Tel. +91 20 25380730/735 Fax +91 20 25380721 salespune@seweurodriveindia.com praveen.hosur@seweurodriveindia.com
	Raipur	SEW-EURODRIVE India Private Limited A-42, Ashoka Millenium Complex, Ring Road-1, Raipur 492 001 - Chhattisgarh	Tel. +91 771 4090765 Fax +91 771 4090765 salesraipur@seweurodriveindia.com
	Ranchi	SEW-EURODRIVE India Private Limited Flat No : A - 101, Krishna Shree Apartment, Anantpur, P.O. Doranda – Ranchi 834002	Tel. +91 8294630772 salesranchi@seweurodriveindia.com

India			
	Tiruchirappalli	SEW-EURODRIVE India Private Limited A-106,Trichy Towers, Chandrasekarapuram, Salai Road, Trichy – 620018.	Mobile +91 95009 88081 salestrichy@seweurodriveindia.com
	Vadodara	SEW-EURODRIVE India Private Limited Unit No. 301, Savorite Bldg, Plot No. 143, Vinayak Society, off old Padra Road, Vadodara - 390 007. Gujarat	Tel. +91 265 2325258 Fax +91 265 2325259 salesvadodara@seweurodrivein-dia.com
	Vijayawada	SEW-EURODRIVE India Private Limited Door No:40-5/3-10A, Syam Nagar,NGO's Col-ony, Tikkle Road, Vijayawada-520010	Tel. +91 99895 01748 Fax +91 8662475157 Mobile 09989501748 salesvijayawada@seweurodrivein-dia.com

Indonesia			
Sales	**Jakarta**	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel: +62 21 65310599 Fax: +62 21 65310600 csajkt@cbn.net.id
		PT. Agrindo Putra Lestari Jl.Prof.DR.Latumenten no27/A Jakarta 11330	Tel: +62 21 63855588 Fax: +62 21 63853789 aplindo@indosat.net.id
		PT. Sentratek Adimitra Jln. Krekot Jaya Molek Block D No. 12A Jakarta 10710	Tel: +62 21 3865504 / +62 21 3865505 / +62 21 3507178 Fax: +62 21 34833170 sew@adimitra.com
	Medan	PT. Serumpun Indah Lestari Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60122	Tel: +62 31 5990128 Fax: +62 31 5962666 triagri@indosat.net.id
		CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel: +62 31 5458589 / +62 31 5317224 Fax: +62 31 5317220 / +62 31 5994629 sianhwa@sby.centrin.net.id

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il

Italy			
Assembly **Sales** **Service**	**Solaro**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Italy			
Technical Offices	**Bologna**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via della Grafica, 47 I-40064 Ozzano dell'Emilia (Bo)	Tel. +39 051 65-23-801 Fax +39 051 796-595
	Caserta	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Viale Carlo III Km. 23,300 I-81020 S. Nicola la Strada (Caserta)	Tel. +39 0823 219011 Fax +39 0823 421414
	Milan	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 799781
	Pescara	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Viale Europa,132 I-65010 Villa Raspa di Spoltore (PE)	Tel. +39 085 41-59-427 Fax +39 085 41-59-643
	Torino	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Filiale Torino c.so Unione Sovietica 612/15 - int. C I-10135 Torino	Tel. +39 011 3473780 Fax +39 011 3473783
	Verona	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via P. Sgulmero, 27/A I-37132 Verona	Tel. +39 045 89-239-11 Fax +39 045 97-6079

Ivory Coast			
Sales	**Abidjan**	SICA Société Industrielle & Commerciale pour l'Afrique 165, Boulevard de Marseille 26 BP 1173 Abidjan 26	Tel. +225 21 25 79 44 Fax +225 21 25 88 28 sicamot@aviso.ci

Japan			
Assembly **Sales** **Service**	**Iwata**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373855 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Technical Offices	**Fukuoka**	SEW-EURODRIVE JAPAN CO., LTD. C-go, 5th-floor, Yakuin-Hiruzu-Bldg. 1-5-11, Yakuin, Chuo-ku Fukuoka, 810-0022	Tel. +81 92 713-6955 Fax +81 92 713-6860 sewkyushu@jasmine.ocn.ne.jp
	Osaka	SEW-EURODRIVE JAPAN CO., LTD. Higobashi Shimizu Bldg. 10th flor 1-3-7 Tosabori, Nishi-ku Osaka, 550-0001	Tel. +81 6 6444--8330 Fax +81 6 6444--8338 sewosaka@crocus.ocn.ne.jp
	Tokyo	SEW-EURODRIVE JAPAN CO., LTD. Omarimon Yusen Bldg. 13th floor 3-23-5 Nishinbashi, Minato-ku Tokyo 105-0003	Tel. +81 3 3239-0469 Fax +81 3 3239-0943 sewtokyo@basil.ocn.ne.jp

Kazakhstan			
Sales	**Almaty**	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz

Kenya			
Sales	**Nairobi**	Barico Maintenances Ltd Kamutaga Place Commercial Street Industrial Area P.O.BOX 52217 - 00200 Nairobi	Tel. +254 20 6537094/5 Fax +254 20 6537096 info@barico.co.ke

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales Lebanon	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
		After Sales Service	service@medrives.com
Sales Jordan / Kuwait / Saudi Arabia / Syria	**Beirut**	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 info@medrives.com http://www.medrives.com
		After Sales Service	service@medrives.com

Lithuania			
Sales	**Alytus**	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 irmantas@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brussels**	**SEW-EURODRIVE n.v./s.a.** Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.lu info@sew-eurodrive.be

Macedonia			
Sales	**Skopje**	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk

Madagascar			
Sales	**Antananarivo**	Ocean Trade BP21bis. Andraharo Antananarivo. 101 Madagascar	Tel. +261 20 2330303 Fax +261 20 2330330 oceantrabp@moov.mg

Malaysia			
Assembly **Sales** **Service**	**Johor**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Technical Offices	**Kota Kinabalu**	SEW-EURODRIVE Sdn Bhd (Kota Kinabalu Branch) Lot No. 2,1st Floor, Inanam Baru Phase III, Miles 5.1 /2, Jalan Tuaran, Inanam 89350 Kota Kinabalu Sabah, Malaysia	Tel. +60 88 424792 Fax +60 88 424807
	Kuala Lumpur	SEW-EURODRIVE Sdn. Bhd. No. 2, Jalan Anggerik Mokara 31/46 Kota Kemuning Seksyen 31 40460 Shah Alam Selangor Darul Ehsan	Tel. +60 3 5229633 Fax +60 3 5229622 sewsa@sew-eurodrive.com.my

Malaysia			
	Kuching	SEW-EURODRIVE Sdn. Bhd. Lot 268, Section 9 KTLD Lorong 9, Jalan Satok 93400 Kuching, Sarawak East Malaysia	Tel. +60 82 232380 Fax +60 82 242380
	Penang	SEW-EURODRIVE Sdn. Bhd. No. 38, Jalan Bawal Kimsar Garden 13700 Prai, Penang	Tel. +60 4 3999349 Fax +60 4 3999348 sewpg@sew-eurodrive.com.my

Mauritania			
Sales	**Zouérat**	AFRICOM - SARL En Face Marché Dumez P.B. 88 Zouérate	Tel. +222 45 44 50 19 Fax +222 45 44 03 14 contact@africom-sarl.com

Mexico			
Assembly **Sales** **Service**	**Quéretaro**	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales **Service**	**Mohammedia**	SEW-EURODRIVE SARL 2 bis, Rue Al Jahid 28810 Mohammedia	Tel. +212 523 32 27 80/81 Fax +212 523 32 27 89 sew@sew-eurodrive.ma http://www.sew-eurodrive.ma

Namibia			
Sales	**Swakopmund**	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 sales@dbmining.in.na

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Technical Offices	**Palmerston North**	SEW-EURODRIVE NEW ZEALAND LTD. C/-Grant Shearman, RD 5, Aronui Road Palmerston North	Tel. +64 6 355-2165 Fax +64 6 355-2316 sales@sew-eurodrive.co.nz

Nigeria			
Sales	**Lagos**	EISNL Engineering Solutions and Drives Ltd Plot 9, Block A, Ikeja Industrial Estate (Ogba Scheme) Adeniyi Jones St. End Off ACME Road, Ogba, Ikeja, Lagos Nigeria	Tel. +234 (0)1 217 4332 team.sew@eisnl.com http://www.eisnl.com

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Pakistan			
Sales	**Karachi**	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Philippines			
Sales	**Luzon**	Totaltech Corporation 5081-B C&L Mansion Filmore Ave. Cor. Fahrenheit St. 1235 Makati City	Tel: +63 2 551-9265 / +63 2 551-9271 / +63 2 551-9378 Fax: +63 2 551-9273 totaltek@info.com.ph
	All Areas	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz, Makati City 1205	Tel: +63 2 519 6214 Fax: +63 2 890 2802 mech_drive_sys@ptcerna.com

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 6765332 / 42 6765343 Fax +48 42 6765346	Linia serwisowa Hotline 24H Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Technical Office	**Tychy**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Strzelecka 66 PL-43-109 Tychy	Tel. +48 32 32 32 610 Fax +48 32 32 32 648
	Bydgoszcz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Fordońska 246 PL-85-959 Bydgoszcz	Tel. +48 52 3606590 Fax +48 52 3606591
	Gdańsk	SEW-EURODRIVE Polska Sp.z.o.o. ul. Galaktyczna 30A PL-80-299 Gdańsk	Tel. +48 58 762 70 00 Fax +48 58 762 70 09
	Poznan	SEW-EURODRIVE Polska Sp.z.o.o. ul. Romana Maya 1 PL-61-371 Poznań	Tel. +48 61 6465500 Fax +48 61 6465519

Poland			
	Radom	SEW-EURODRIVE Polska Sp.z.o.o. ul. Słowackiego 84 PL-26-600 Radom	Tel. +48 48 365 40 50 Fax +48 48 365 40 52

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Service Competence Center	**Lisboa**	SEW-EURODRIVE, LDA. Núcleo Empresarial I de São Julião do Tojal Rua de Entremuros, 54 Fracção I P-2660-533 São Julião do Tojal	Tel. +351 21 958-0198 Fax +351 21 958-0245 esc.lisboa@sew-eurodrive.pt
Technical Office	**Porto**	SEW-EURODRIVE, LDA. Av. 25 de Abril, 68 4440-502 Valongo	Tel. +351 229 350 383 Fax +351 229 350 384 Tel. +351 9 32559110 esc.porto@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucharest**	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 RUS-195220 St. Petersburg	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Technical Office	**Yekaterinburg**	ZAO SEW-EURODRIVE Kominterna Str. 16 Office 614 RUS-620078 Ekaterinburg	Tel. +7 343 310 3977 Fax +7 343 310 3978 eso@sew-eurodrive.ru
	Irkutsk	ZAO SEW-EURODRIVE 5-Armii Str., 31 RUS-664011 Irkutsk	Tel. +7 3952 25 5880 Fax +7 3952 25 5881 iso@sew-eurodrive.ru
	Moscow	ZAO SEW-EURODRIVE Malaja Semjonowskaja Str. д. 9, корпус 2 RUS-107023 Moskau	Tel. +7 495 9337090 Fax +7 495 9337094 mso@sew-eurodrive.ru
	Novosibirsk	ZAO SEW-EURODRIVE pr. K Marksa 30 RUS-630087 Novosibirsk	Tel. +7 383 3350200 Fax +7 383 3462544 nso@sew-eurodrive.ru
	Perm	ZAO SEW-EURODRIVE Stakhanovskaya str., 45 Office 512 RUS-614066 Perm	Tel. +7 342 2219494 Fax +7 342 2219444 pso@sew-eurodrive.ru
	Togliatti	ZAO SEW-EURODRIVE Sportivnaya Str. 4B, office 2 Samarskaya obl. RUS-445057 Togliatti	Tel. +7 8482 710529 Fax +7 8482 810590

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn http://www.senemeca.com

Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV sprat SRB-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

South Africa			
Technical Offices	**Port Elizabeth**	SEW-EURODRIVE PTY LTD. 8 Ruan Access Park Old Cape Road Greenbushes 6000 Port Elizabeth	Tel. +27 41 3722246 Fax +27 41 3722247 dtait@sew.co.za
	Richards Bay	SEW-EURODRIVE PTY LTD. 103 Bulion Blvd Richards Bay P.O. Box 458 Richards Bay, 3900	Tel. +27 35 797-3805 Fax +27 35 797-3819 jswart@sew.co.za

South Korea			
Assembly **Sales** **Service**	**Ansan**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate #1048-4, Shingil-Dong, Danwon-Gu, Ansan-City, Kyunggi-Do Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr
Technical Offices	**Daegu**	SEW-EURODRIVE KOREA Co., Ltd. No.1108 Sungan officetel 87-36, Duryu 2-dong, Dalseo-ku Daegu 704-712	Tel. +82 53 650-7111 Fax +82 53 650-7112
	Daejeon	SEW-EURODRIVE KOREA Co., Ltd. No. 1502, Hongin officetel 536-9, Bongmyung-dong, Yusung-ku Daejeon 305-301	Tel. +82 42 828-6461 Fax +82 42 828-6463
	Gwangju	SEW-EURODRIVE KOREA Co., Ltd. 4fl., Dae-Myeong B/D 96-16 Unam-dong, Buk-ku Kwangju 500-170	Tel. +82 62 511-9172 Fax +82 62 511-9174
	Seoul	SEW-EURODRIVE KOREA Co., Ltd. No.504 Sunkyung officetel 106-4 Kuro 6-dong, Kuro-ku Seoul 152-054	Tel. +82 2 862-8051 Fax +82 2 862-8199

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Technical Offices	**Barcelona**	Delegación Barcelona Avda. Francesc Macià, 60 – Planta 16, porta 1 Eix Macià – "Torre Milenium" E-08208 Sabadell (Barcelona)	Tel. +34 93 7162200 Fax +34 93 7233007
	Madrid	Delegación Madrid Gran Via. 48-2° A-D E-28220 Majadahonda (Madrid)	Tel. +34 91 6342250 Fax +34 91 6340899
	Seville	MEB Pólogono Calonge, C/A Nave 2 - C E-41.077 Sevilla	Tel. +34 954 356 361 Fax +34 954 356 274 mebsa.sevilla@mebsa.com
	Valencia	MEB Músico Andreu i Piqueres, 4 E-46.900 Torrente (Valencia)	Tel. +34 961 565 493 Fax +34 961 566 688 mebsa.valencia@mebsa.com

Sri Lanka			
Sales	**Colombo**	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981

Swaziland			
Sales	**Manzini**	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se
Sales	**Göteborg**	SEW-EURODRIVE AB Gustaf Werners gata 8 S-42132 Västra Frölunda	Tel. +46 31 70968 80 Fax +46 31 70968 93 goteborg@sew.se
	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 S-14146 Huddinge	Tel. +46 8 44986 80 Fax +46 8 44986 93 stockholm@sew.se
	Malmö	SEW-EURODRIVE AB Borrgatan 5 S-21124 Malmö	Tel. +46 40 68064 80 Fax +46 40 68064 93 malmo@sew.se
	Skellefteå	SEW-EURODRIVE AB Trädgårdsgatan 8 S-93131 Skellefteå	Tel. +46 910 7153 80 Fax +46 910 7153 93 skelleftea@sew.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Technical Offices	**Rhaetian Switzerland**	André Gerber Es Perreyres CH-1436 Chamblon	Tel. +41 24 445 3850 Fax +41 24 445 4887
	Bern / Solothurn	Rudolf Bühler Muntersweg 5 CH-2540 Grenchen	Tel. +41 32 652 2339 Fax +41 32 652 2331
	Central Switzerland, Aargau	Armin Pfister Stierenweid CH-4950 Huttwill, BE	Tel. +41 62 962 54 55 Fax +41 62 962 54 56
	Zürich, Ticino	Gian-Michele Muletta Fischerstrasse 61 CH-8132 Egg bei Zürich	Tel. +41 44 994 81 15 Fax +41 44 994 81 16
	Bodensee and East Switzerland	Markus Künzle Eichweg 4 CH-9403 Goldach	Tel. +41 71 845 2808 Fax +41 71 845 2809

Taiwan (R.O.C.)			
Sales	**Nan Tou**	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878
	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Hwa South Road, Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net

Thailand			
Assembly **Sales** **Service**	**Chonburi**	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Technical Offices	**Bangkok**	SEW-EURODRIVE (Thailand) Ltd. 6th floor, TPS Building 1023, Phattanakarn Road Suanluang Bangkok,10250	Tel. +66 2 7178149 Fax +66 2 7178152 sewthailand@sew-eurodrive.com
	Hat Yai	SEW-EURODRIVE (Thailand) Ltd. Hadyai Country Home Condominium 59/101 Soi.17/1 Rachas-Utid Road. Hadyai, Songkhla 90110	Tel. +66 74 359441 Fax +66 74 359442 sewthailand@sew-eurodrive.com
	Khon Kaen	SEW-EURODRIVE (Thailand) Ltd. 4th Floor, Kaow-U-HA MOTOR Bldg, 359/2, Mitraphab Road. Muang District Khonkaen 40000	Tel. +66 43 225745 Fax +66 43 324871 sew-thailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri Sanayi Ticaret Limited Şirketi Gebze Organize Sanayi Bölgesi 400.Sokak No:401 TR-41480 Gebze KOCAELİ	Tel. +90-262-9991000-04 Fax +90-262-9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Technical Offices	**Adana**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Kizilay Caddesi 8 Sokak No 6 Daðtekin Is Merkezi Kat 4 Daire 2 TR-01170 SEYHAN / ADANA	Tel. +90 322 359 94 15 Fax +90 322 359 94 16
	Ankara	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Özcelik Is Merkezi, 14. Sok, No. 4/42 TR-06370 Ostim/Ankara	Tel. +90 312 385 33 90 Fax +90 312 385 32 58
	Bursa	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Üçevler Mah. Bayraktepe Sok. Akay İş Merkezi Kat:3 No: 7/6 TR Nilüfer/Bursa	Tel. +90 224 443 45 60 Fax +90 224 443 45 58
	Izmir	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. 1203/11 Sok. No. 4/613 Hasan Atli Is Merkezi TR-35110 Yenisehir-İzmir	Tel. +90 232 469 62 64 Fax +90 232 433 61 05

Ukraine			
Assembly **Sales** **Service**	**Dnipropetrovsk**	ООО «СЕВ-Евродрайв» ул.Рабочая, 23-В, офис 409 49008 Днепропетровск	Тел. +380 56 370 3211 Факс. +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

Ukraine			
Sales	**Kiev**	ООО «СЕВ-Евродрайв» ул.С.Олейника, 21 02068 Киев	Тел. +380 44 503 95 77 Факс. +380 44 503 95 78 kso@sew-eurodrive.ua
	Donetsk	ООО «СЕВ-Евродрайв» ул.25-летия РККА, 1-В, оф. 805 83000 Донецк	Тел. +380 62 38 80 545 Факс. +380 62 38 80 533 dso@sew-eurodrive.ua
	Ivano-Frankivsk	ООО «СЕВ-Евродрайв» ул.Независимости, 4, оф.303 83000 Ивано-Франковск	Тел. +380 342 725 190 Факс. +380 342 725 191 ifso@sew-eurodrive.ua

United Arab Emirates			
Sales **Service**	**Sharjah**	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae

Uruguay			
Assembly **Sales**	**Montevideo**	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-89 sewuy@sew-eurodrive.com.uy

USA			
Production **Assembly** **Sales** **Service**	**Southeast Region**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manufacturing +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**Northeast Region**	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net

Vietnam			
Sales	**Ho Chi Minh City**	**All sectors except harbor, steel, coal power and offshore:** Nam Trung Co., Ltd 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn truongtantam@namtrung.com.vn khanh-nguyen@namtrung.com.vn
		Harbor and offshore: DUC VIET INT LTD Industrial Trading and Engineering Services A75/6B/12 Bach Dang Street, Ward 02, Tan Binh District, 70000 Ho Chi Minh City	Tel. +84 8 62969 609 Fax +84 8 62938 842 totien@ducvietint.com
		Coal power and steel: Thanh Phat Co Ltd DMC Building, L11-L12, Ward3, Binh Thanh Dist, Ho Chi Minh City	Tel. +84 835170381 Fax +84 835170382 sales@thanh-phat.com
	Hanoi	Nam Trung Co., Ltd R.205B Tung Duc Building 22 Lang ha Street Dong Da District, Hanoi City	Tel. +84 4 37730342 Fax +84 4 37762445 namtrunghn@hn.vnn.vn

Zambia			
Sales	**Kitwe**	EC Mining Limited Plots No. 5293 & 5294,Tangaanyika Road, Off Mutentemuko Road, Heavy Industrial Park, P.O.BOX 2337 Kitwe	Tel. +260 212 210 642 Fax +260 212 210 645 sales@ecmining.com http://www.ecmining.com

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