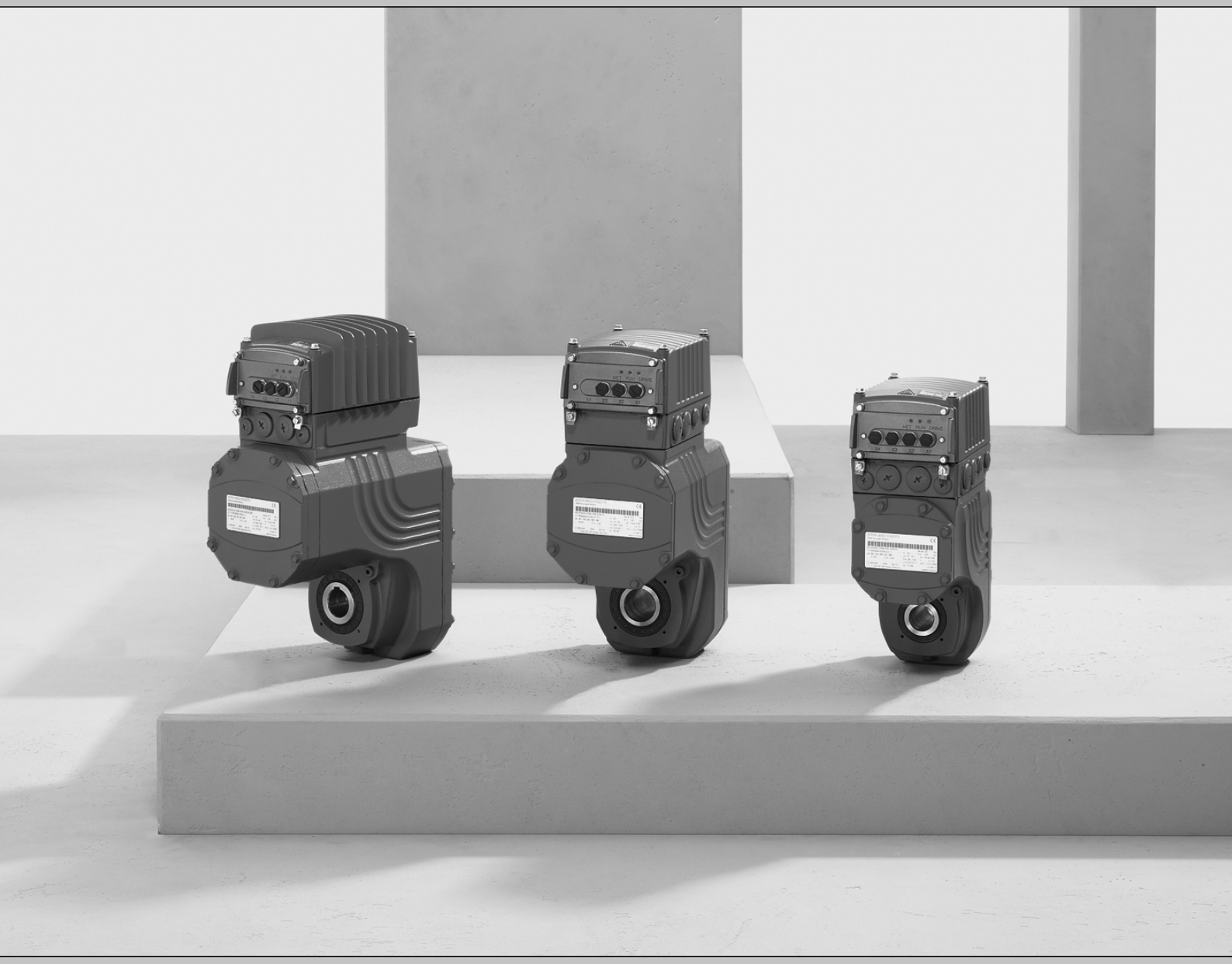
SEW EURODRIVE

Operating Instructions



Mechatronic Drive System
MOVIGEAR® SNI-B
Single Line Network Installation

Edition 11/2022

27798801/EN



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1 General information

1.1 About this documentation

The documentation at hand is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their operation as well as persons who work on the product independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation or if you require further information, contact SEW-EURODRIVE.

1.2 Other applicable documentation

Observe the corresponding documentation for all additional components.

1.3 Structure of the safety notes

1.3.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes:

Signal word	Meaning	Consequences if disregarded
⚠ **DANGER**	Imminent hazard	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

1.3.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:



SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

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Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of risk of crushing
	Warning of automatic restart

1.3.3 Structure of embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

⚠ **SIGNAL WORD!** Type and source of hazard. Possible consequence(s) if disregarded. Measure(s) to prevent the hazard.

1.4 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the product.

1.5 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.6 Copyright notice

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2 Safety notes MOVIGEAR®

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

2.2 Duties of the user

As the user, you must ensure that the basic safety notes are observed and complied with. Make sure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it.

As the user, you must ensure that all of the work listed in the following is carried out only by qualified specialists:

- Setup and installation
- Installation and connection
- Startup
- Maintenance and repairs
- Shutdown
- Disassembly

Ensure that the persons who work on the product pay attention to the following regulations, conditions, documentation, and information:

- National and regional safety and accident prevention regulations
- Warning and safety signs on the product
- All other relevant project planning documents, installation and startup instructions, and wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and conditions

Ensure that systems in which the product is installed are equipped with additional monitoring and protection devices. Observe the applicable safety regulations and legislation governing technical work equipment and accident prevention regulations.

2.3 Target group

Specialist for mechanical work

Any mechanical work may be performed only by adequately qualified specialists. Specialists in the context of this documentation are persons who are familiar with the design, mechanical installation, troubleshooting, and maintenance of the product, and who possess the following qualifications:

- Qualifications in the field of mechanics in accordance with the national regulations
- Familiarity with this documentation

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Specialist for electrotechnical work

Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product, and who possess the following qualifications:

- Qualifications in the field of electrical engineering in accordance with the national regulations
- Familiarity with this documentation

Additional qualifications

In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation.

The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the training is to give persons the ability to perform the required tasks and work steps in a safe and correct manner.

2.4 Designated use

The product is intended for installation in electrical plants or machines.

In case of installation in electrical systems or machines, startup of the product is prohibited until it is determined that the machine meets the requirements stipulated in the local laws and directives. For Europe, Machinery Directive 2006/42/EC as well as the EMC Directive 2014/30/EU apply. Observe EN 60204-1 (Safety of machinery - electrical equipment of machines). The product meets the requirements stipulated in the Low Voltage Directive 2014/35/EU.

The standards given in the declaration of conformity apply to the product.

Technical data and information on the connection conditions are provided on the nameplate and in chapter "Technical data" in the documentation. Always comply with the data and conditions.

Unintended or improper use of the product may result in severe injury to persons and damage to property.

Do not use the product as a climbing aid.

2.4.1 Lifting applications

The product may not be used for lifting applications.

For applications with inclining tracks, you must only use the product after a risk assessment is performed by the user. For further information, consult the information in the documentation.

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2.5 Functional safety technology

The product must not perform any safety functions without a higher-level safety system unless explicitly allowed by the documentation.

2.6 Transportation

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

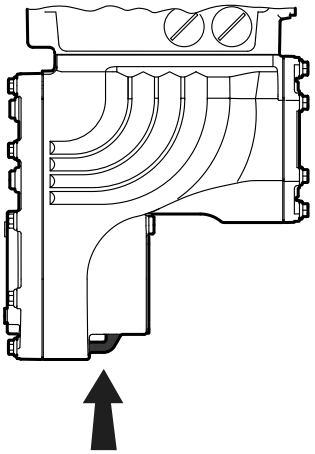
Observe the following notes when transporting the device:

- Ensure that the product is not subject to mechanical impact.
- Do not attach any additional loads.

If necessary, use suitable, sufficiently dimensioned handling equipment.

Observe the information on climatic conditions in chapter "Technical data" of the documentation.

The following figure shows the position of the lifting eye.



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2.7 Installation/assembly

Ensure that the product is installed and cooled according to the regulations in the documentation.

Protect the product from strong mechanical strain. The product and its mounting parts must never protrude into the path of persons or vehicles. Ensure that components are not deformed and insulation spaces are not changed, particularly during transportation and handling. Electric components must not be mechanically damaged or destroyed.

Observe the notes in chapter "Mechanical installation" in the documentation.

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2.7.1 Restrictions of use

The following applications are prohibited unless the device is explicitly designed for such use:

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- Use at an elevation of more than 4000 m above sea level

The product can be used at altitudes above 1000 m above sea level up to 4000 m above sea level under the following conditions:

- The reduction of the nominal output current and/or the line voltage is considered according to the data in chapter "Technical data" in the documentation.
- Above 2000 m above sea level, the air and creepage distances are only sufficient for overvoltage class II according to EN 60664. At altitudes above 2000 m above sea level, limiting measures must therefore be taken that reduce the line side overvoltage from category III to category II for the entire system.
- If a protective electrical separation (in accordance with EN 61800-5-1 and EN 60204-1) is required, then implement this outside the product at altitudes of more than 2000 m above sea level.

2.8 Electrical installation

Ensure that all of the required covers are correctly attached after carrying out the electrical installation.

Make sure that preventive measures and protection devices comply with the applicable regulations (e.g. EN 60204-1 or EN 61800-5-1).

2.8.1 Stationary application

Necessary preventive measure for the product:

Type of energy transfer	Preventive measure
Direct power supply	• Ground connection

2.8.2 Regenerative operation

The drive is operated as a generator due to the kinetic energy of the system/machine. Before opening the connection box, secure the output shaft against rotation.

2.9 Protective separation

The product meets all requirements for protective separation of power and electronics connections in accordance with EN 61800-5-1. To ensure protective separation, all connected circuits must also meet the requirements for protective separation.

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2.10 Startup/operation

Observe the safety notes in chapters "Startup" and "Operation" in this documentation.

Make sure the connection boxes are closed and screwed before connecting the supply voltage.

Depending on the degree of protection, products may have live, uninsulated, and sometimes moving or rotating parts as well as hot surfaces during operation.

When the device is switched on, dangerous voltages are present at all power connections as well as at any connected cables and terminals. This also applies even when the product is inhibited and the motor is at standstill.

Do not separate the connection to the product during operation. This may result in dangerous electric arcs damaging the product.

If you disconnect the product from the voltage supply, do not touch any live components or power connections because capacitors might still be charged. Observe the following minimum switch-off time:

5 minutes.

Observe the corresponding information signs on the product.

The fact that the operation LED and other display elements are no longer illuminated does not indicate that the product has been disconnected from the supply system and no longer carries any voltage.

Mechanical blocking or internal protective functions of the product can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive restarting automatically. If, for safety reasons, this is not permitted for the drive-controlled machine, first disconnect the product from the supply system and then start troubleshooting.

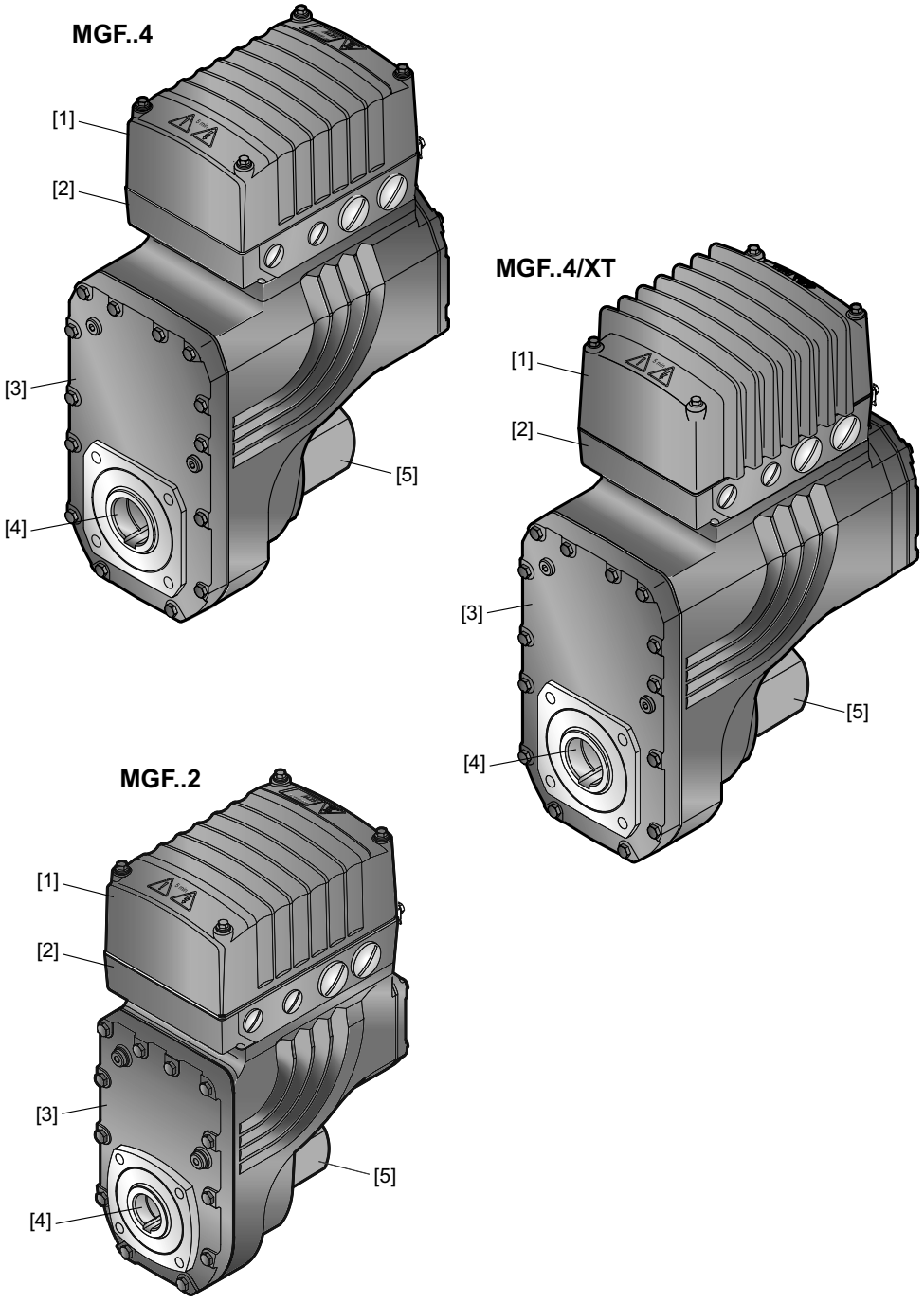
Risk of burns: The surface temperature of the product can exceed 60 °C during operation. Do not touch the product during operation. Let the product cool down before touching it.

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3 Unit structure

3.1 MOVIGEAR® drive unit

MOVIGEAR® drive units are made up of the 3 core components gear unit, motor, and drive electronics. These 3 core components are included in a die-cast aluminum housing (see following figure).



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[1] MOVIGEAR® electronics cover
[2] Connection ring for cable glands
[3] Gear unit cover
[4] Output shaft design (pictured here: hollow shaft with keyway)
[5] Optional safety cover

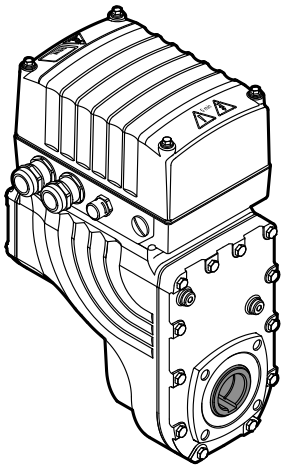
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3.2 Shaft designs

MOVIGEAR® is available with the following shaft designs:

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

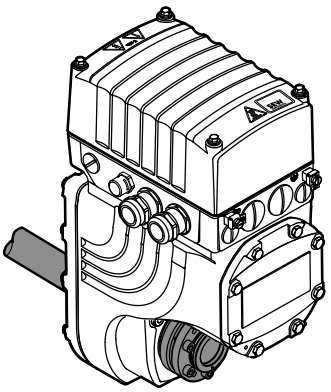
The following figure shows a MOVIGEAR® unit with hollow shaft and keyway:



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

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



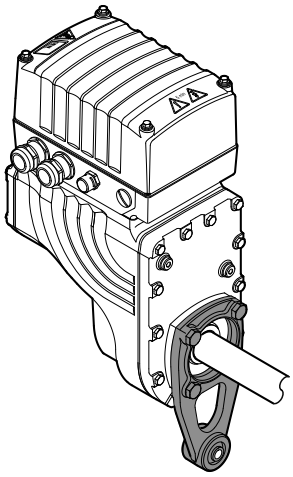
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3.3 Housing mounting types

3.3.1 Torque arm (MGF.T)

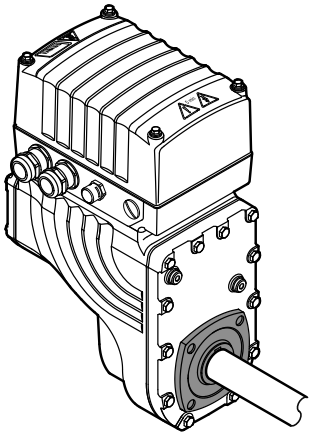
The following figure shows the torque arm for MGF.T:



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3.3.2 Housing with threads (MGF.S)

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



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3.4 Threads for the protection cover

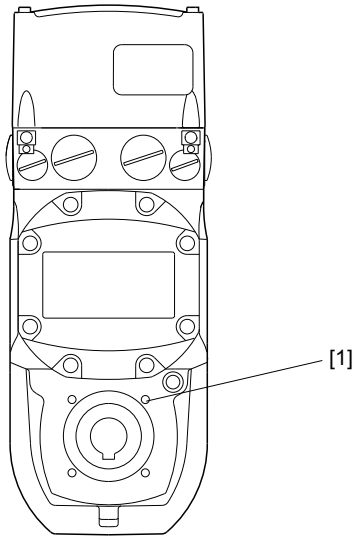
NOTICE

Impermissible use of the threads.

Damage to the drive unit.

- The threads may only be used for other applications after consultation with SEW-EURODRIVE.
- SEW-EURODRIVE assumes no guarantee or liability for resulting product damages.

The following figure shows the threads used for fastening the protection cover:



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[1] Threads for protection cover (4×)

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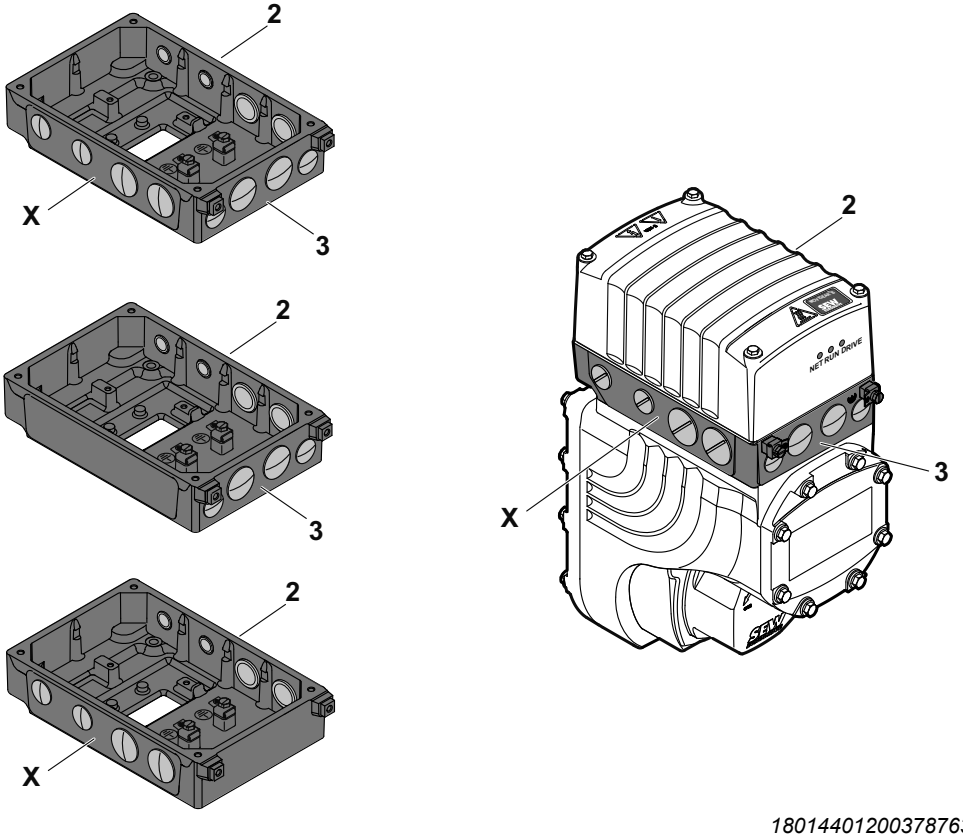
3.5 Cable entry position

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

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

3.5.1 Overview

The following figure shows possible cable entries:



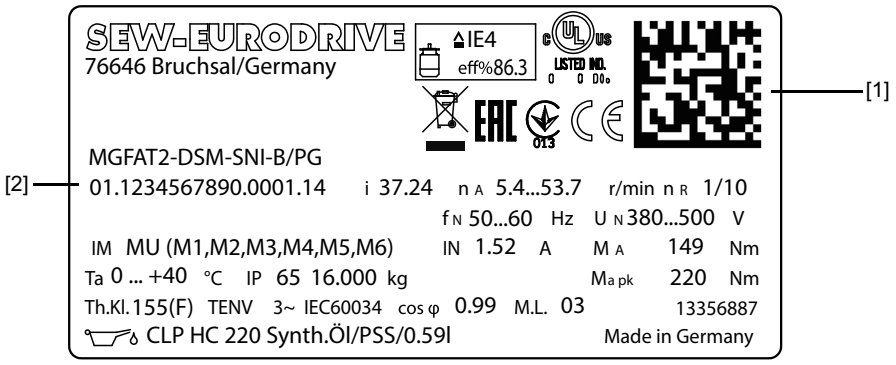
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3.6 Example nameplate and type designation of the drive unit

3.6.1 Nameplate

The following figure shows an example of a drive unit nameplate. For the structure of the type designation, refer to chapter "Type designation".



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[1] The 2D code on the nameplate represents the unique serial number (with period as separator).
[2] Unique serial number

3.6.2 Type designation

The following table shows the type designation of the drive unit:

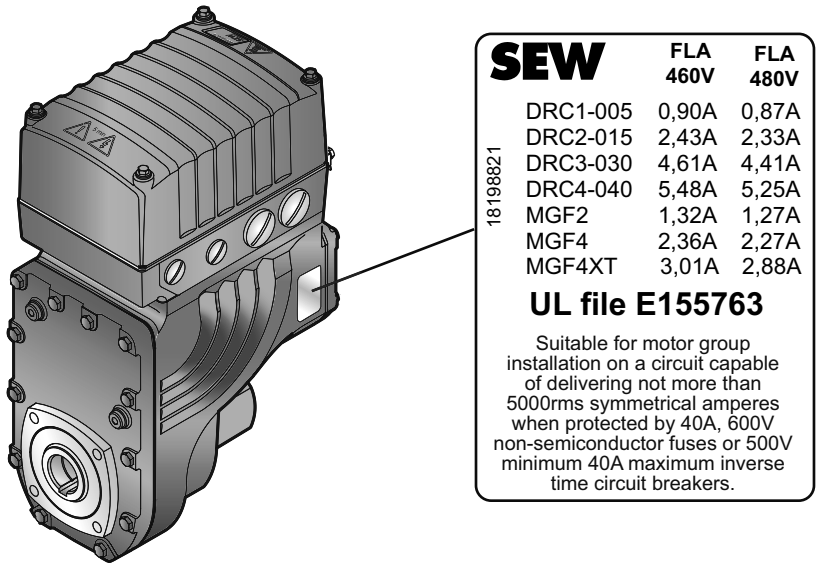
MG	**Product family** MG = MOVIGEAR®
F	**Gear unit type** F = Parallel-shaft helical gear unit
A	**Shaft design** A = Shaft-mounted gear unit (hollow shaft with key) T = TorqLOC® hollow shaft mounting system
S	**Housing mounting types** T = Drive with torque arm S = Housing with threads for mounting a torque arm
2	**Size** 2 = Torque class 200 Nm 4 = Torque class 400 Nm
–	
DSM	**Motor type**
–	
SNI	**MOVIGEAR® installation technology** SNI = **S**ingle Line **N**etwork **I**nstallation
–	
B	**MOVIGEAR® version**
/	

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PG	MOVIGEAR® option
	DSP = Electrodynamic deceleration function DynaStop®
	ECR = Single-turn encoder/Extended control range
	ACR = Multi-turn encoder/Extended control range
	XT = Increased torque
	IV = Plug connector
	WA = Variant for wet areas
	PG = Integrated pressure compensation gear unit
	PE = Pressure compensation fitting electronics
	EBW = Connection option for external braking resistor
	A = Electronics cover with application slot

3.7 Example of the optional nameplate "Electrical regulations UL/CE"

The following figure shows an example of the optional nameplate for drive units according to electrical regulation UL/CE:

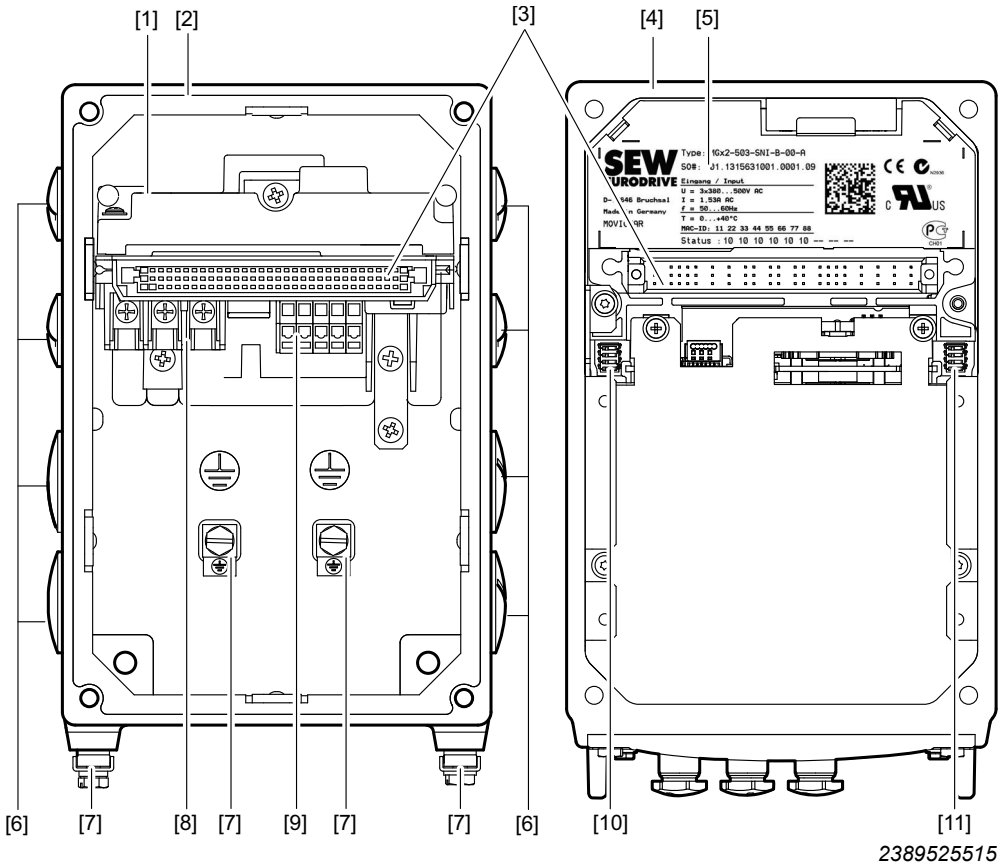


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3.8 Electronics

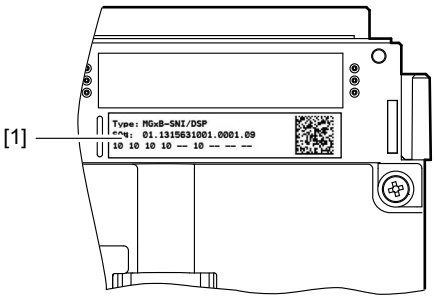
3.8.1 MOVIGEAR® electronics cover (inside) and connection box

The following figure shows the connection box and the bottom side of the MOVIGEAR® electronics cover:



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[1] Nameplate of connection unit, see following detailed view

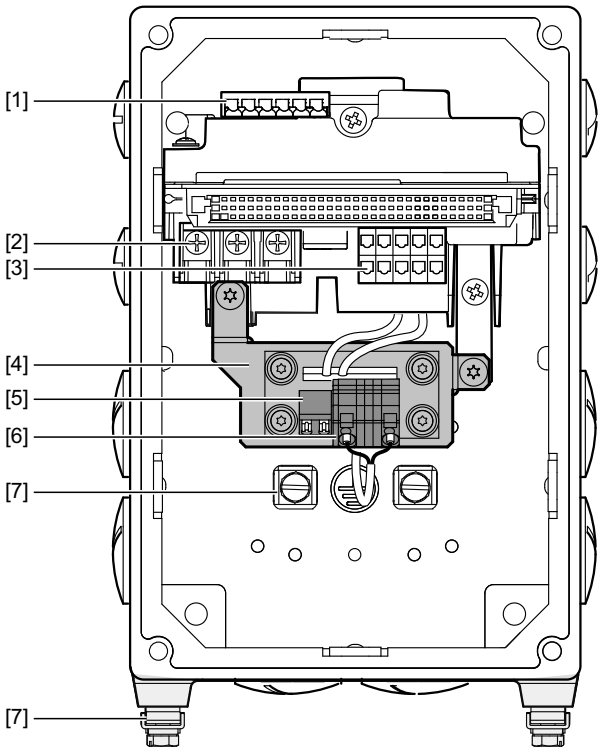


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[2] Connection ring
[3] Connector connection unit for MOVIGEAR® electronics cover
[4] MOVIGEAR® electronics cover
[5] Electronics cover nameplate
[6] Cable glands
[7] Screws for PE connection
[8] Line connection L1, L2, L3
[9] Electronics terminal strips
[10] DIP switches S2/1 – S2/4
[11] DIP switches S1/1 – S1/4

3.8.2 Connection option for external braking resistor (/EBW option)

The following figure shows the MOVIGEAR® option /EBW for operation with external braking resistor:



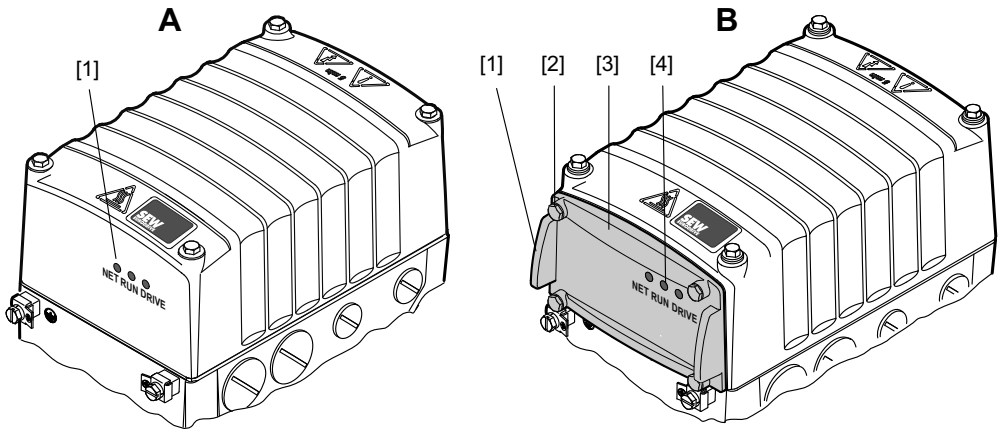
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[1] Communication terminal (only DAC-B and DSC-B, terminal not available for DBC-B and SNI-B design)
[2] Line terminals
[3] Control terminals (this view can differ depending on the design)
[4] Additional board
[5] Dummy terminals
[6] Terminals for braking resistor
– Delivery condition: Wired with internal braking resistor
– Optional: External braking resistor can be connected
[7] PE connection

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3.8.3 Electronics cover (outside)

The following figure shows the possible designs of the electronic cover taking one size as an example:



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A Electronics cover without application slot

[1] LED indicators

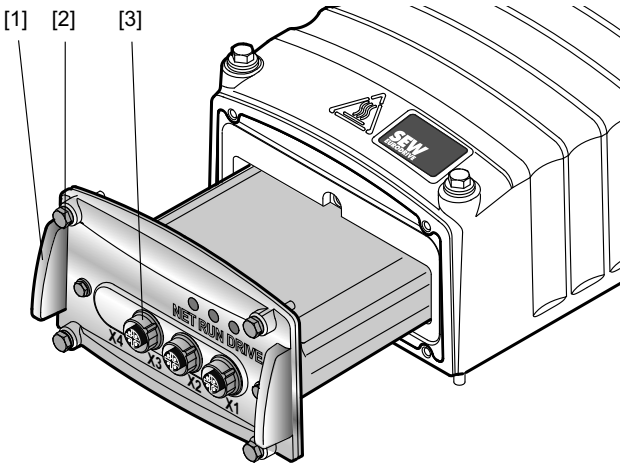
B Electronics cover with application slot

[1] Assembly/disassembly handle
[2] Retaining screws (4x)
[3] Application cover
[4] LED indicators

3.9 Application options

3.9.1 GIO12B application option

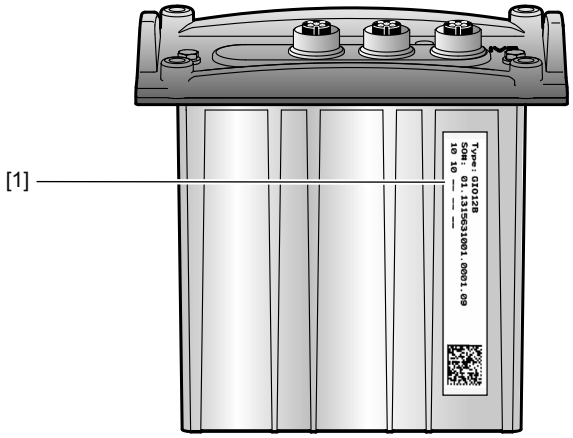
The following figure shows the GIO12B application option:



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[1] Assembly/disassembly handle
[2] Retaining screws (4×)
[3] M12 plug connector for digital I/Os

The following figure shows the position of the GIO12B nameplate:



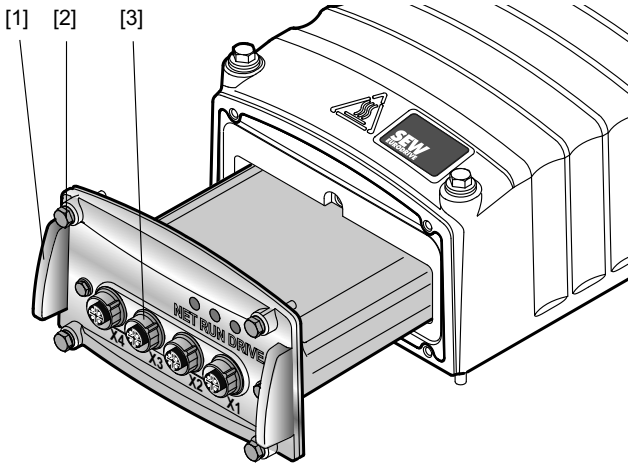
18014401210968331

[1] Nameplate

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3.9.2 GIO13B application option

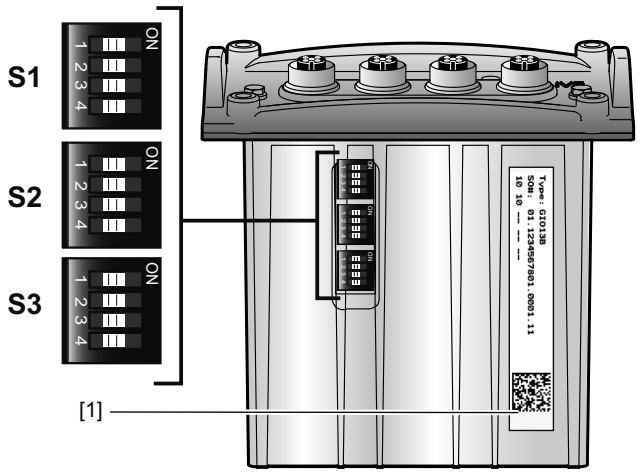
The following figure shows the GIO13B application option:



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[1] Assembly/disassembly handle
[2] Retaining screws (4×)
[3] M12 plug connector for digital/analog I/Os

The following figure shows the DIP switches S1 to S3 of the GIO13B application option:



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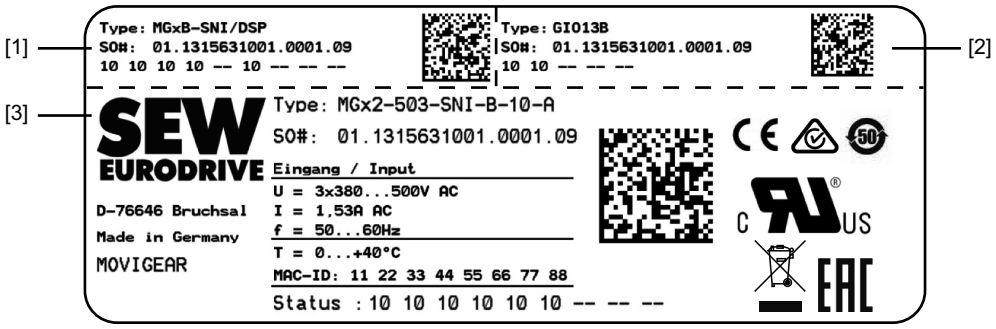
[1] Nameplate

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3.10 Example nameplate and type designation of the electronics

3.10.1 Nameplate

The following figure gives an example of an electronics nameplate. For the structure of the type designation, refer to the chapter "Type designation".



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[1] Connection unit nameplate
[2] Nameplate of application option
[3] Electronics cover nameplate

3.10.2 Type designation of the electronics cover

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

MGx	**Product family** MG = MOVIGEAR®
4	**Size** 2 = Torque class 200 Nm 4 = Torque class 400 Nm
–	
50	**Connection voltage**[1)] 50 = AC 380 – 500 V
3	**Connection type** 3 = 3-phase
–	
SNI	**MOVIGEAR® installation technology** SNI = **S**ingle Line **N**etwork **I**nstallation
–	
B	**MOVIGEAR® version**
–	
10	**Design** 10 = Die-cast design (standard) 11 = Die-cast design (wet areas)
–	

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A	**Electronics cover design** A = With application slot 0 = Without application slot
/	
XT	**Electronics cover option** XT = Increased torque

1) MGF..4/XT has a different connection voltage range, see chapter "Technical data"

3.10.3 Type designation of the connection unit

The following table shows the type designation of the connection unit:

MGx	**Product family** MG = MOVIGEAR®
B	**MOVIGEAR® version**
–	
SNI	**MOVIGEAR® installation technology** SNI = **S**ingle Line **N**etwork **I**nstallation
/	
DSP	**Connection unit option** DSP = Electrodynamic deceleration function DynaStop®

3.10.4 Type designation application options

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

G	**Product family** G = Option for MOVIGEAR®/DRC..
IO	**Functionality** IO = Digital inputs/outputs
12	**Design** 12 = 4 digital inputs + 2 digital outputs 13 = 4 digital inputs (2 of the inputs can be used as primary frequency input) + 1 digital output + 1 analog input + 1 analog output
B	**Version**

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Note on the version of the application option

INFORMATION

For electronics covers in die-cast design, you can only use the application options GIO12B and GIO13B. For electronics covers in sand-cast design, you can only use the 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	
Design	**Part number**
GIO12A application option	On request
GIO13A application option	On request
GIO12B application option	Part number 18238017
GIO13B application option	Part number 18226523

3.11 Integrated pressure compensation (/PG option)

3.11.1 Description

When the gear unit oil heats up, the pressure rises within the gear unit due to expansion. Until now, the pressure has been reduced by means of a breather valve. As this valve cannot be installed in mounting position M3, this mounting position could until now only be used with restrictions concerning the output power.

The /PG option is a fully integrated pressure compensation mechanism that replaces the breather valve and makes it possible to implement applications in mounting position M3 without restrictions concerning the output power.

3.11.2 Advantages

- Universal mounting position without restrictions concerning the output power
- Fully integrated pressure compensation mechanism without external valve
- No oil mist caused by the breather valve
- No risk of damaging the product due to an inactive breather valve
- The position of the breather valve must no longer be adjusted when changing the mounting position
- Reduced risk of oil leakages due to incorrectly installed breather valve

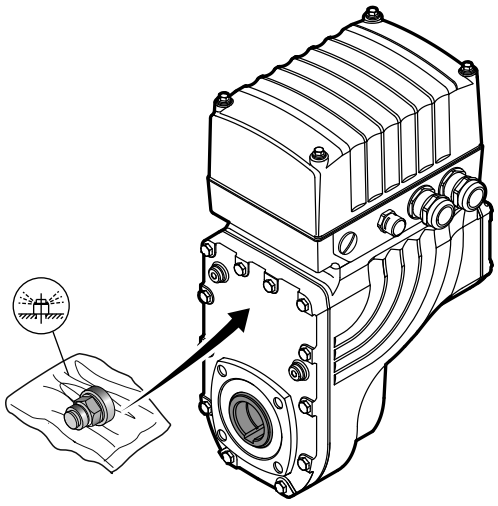
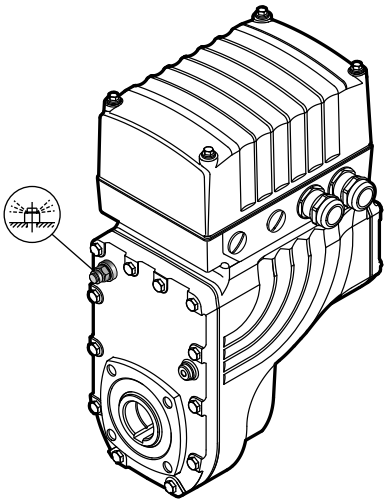
3.11.3 Restrictions

For integrated pressure compensation (/PG option) and drive units with pressure compensation fitting in the electronics cover (/PE option or /WA design for use in wet areas), observe the notes on use according to mounting position (see chapter "Mechanical installation").

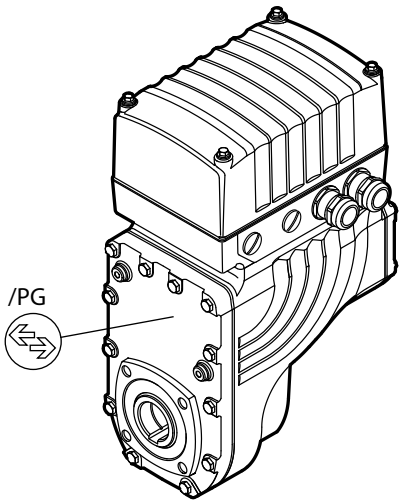
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3.11.4 Combination options

Standard design

Type/mounting position	Pressure compensation design	Illustration
• **MGF../../** • **Universal use in M1/M2/ M4/M5/M6**	• Breather valve included in delivery	 *12847325963*
• **MGF../../** • **Use in the ordered mounting position M1 or M2 or M4 or M5 or M6**	• Breather valve mounted according to the specific mounting position	 *12847328395*

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Type/mounting position	Pressure compensation design	Illustration
• **MGF../../PG** • **Universal mounting position MU**	• Integrated pressure compensation /PG	 *12847352715*

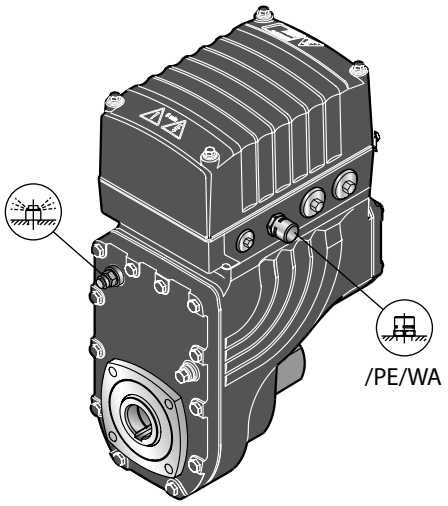
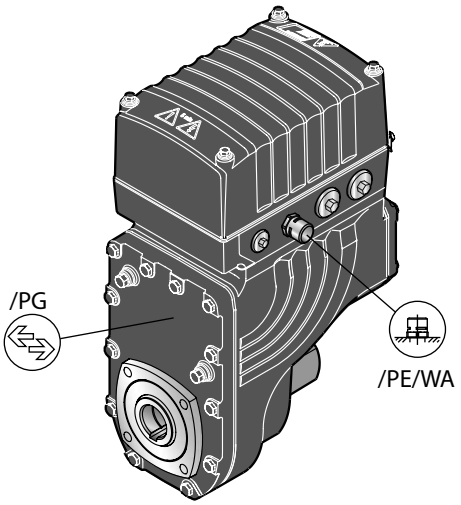
 – Breather valve

 /PG Integrated pressure compensation

 /PE Pressure compensation fitting, electronics

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Design for wet areas (/WA option)

Type/mounting position	Pressure compensation design	Illustration
• **MGF../../PE/WA** • **Use in the ordered mounting position M1 or M2 or M4 or M5 or M6**	• Breather valve and pressure compensation fitting /PE installed according to mounting position	 *12847347851*
• **MGF../../PE/PG/WA** • **Use in the ordered mounting position M1 or M2 or M3 or M4 or M5 or M6**	• Integrated pressure compensation /PG • Pressure compensation fitting /PE installed according to mounting position	 *12847342987*

	/WA	In this documentation, all illustrations depicting the version for use in wet areas are displayed with a shading (= HP200 surface protection)
	–	Breather valve
	/PG	Integrated pressure compensation
	/PE	Pressure compensation fitting, electronics

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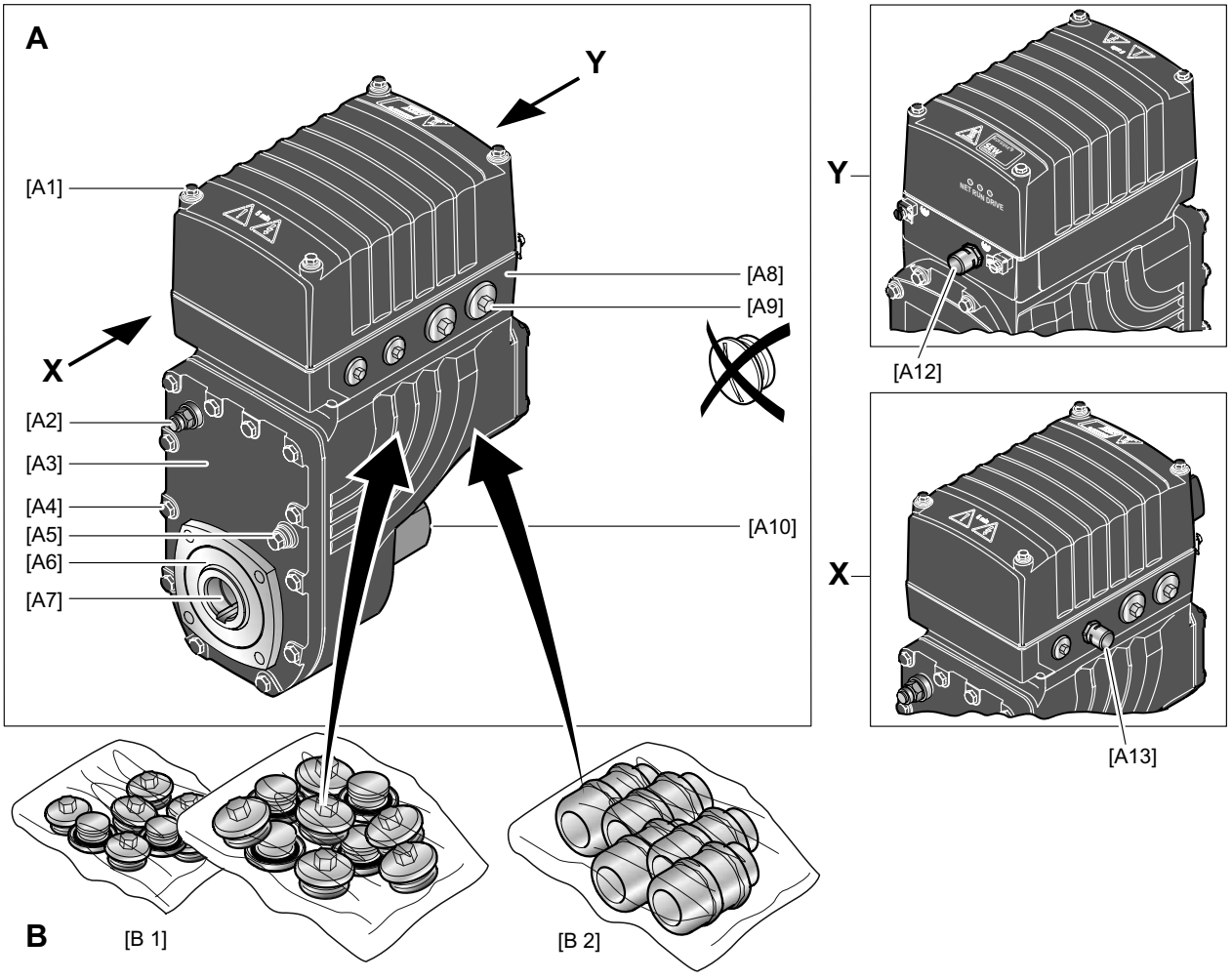
3.12 Design for wet areas (/WA option)

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 (/WA option):

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

3.12.1 Key

A	Scope of delivery
[A1]	Mounting screws for cover made of stainless steel

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A	Scope of delivery	
[A2]	**Standard:** Breather valve mounted and activated according to mounting position, see chapter "Technical data and dimension sheets"	**Optional:** Integrated pressure compensation /PG
[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]	**Standard:** 1 × FKM oil seal (fluorocarbon rubber)	**Optional:** 2 × FKM oil seal (fluorocarbon rubber)
[A7]	Output shaft made of stainless steel	
[A8]	Connection ring only possible with cable outlet "at the bottom" 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:** Screw plugs made of stainless steel	**Optional:** 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 safety cover opposite the output end	
[A12]	Factory-installed pressure compensation fitting electronics /PE (M16) with mounting positions M5, M6	
[A13]	Factory-installed pressure compensation fitting electronics /PE (M16) with mounting position M1, M2, M3, M4	
Optional plug connectors (see chapter "Electrical installation") are available in connection with the design for wet areas.		
B	**Required screw fittings**	
[B1]	Screw plugs made of stainless steel[1)]	
[B2]	Cable glands made of stainless steel[1)]	
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

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4 Mechanical installation

4.1 Installation notes

INFORMATION

Adhere to the safety notes during installation.

⚠ WARNING



Improper installation/disassembly of MOVIGEAR® drive units and mount-on components.

Risk of injury.

- Adhere to the notes about installation and disassembly.
- Before releasing shaft connections, make sure that there are no active torsional moments present (tensions within the system).

⚠ WARNING



Risk of injury if the drive starts up unintentionally and danger of electrical voltage.

Dangerous voltages may still be present for up to 5 minutes after disconnection from the line voltage.

- Disconnect the MOVIGEAR® drive unit from the power supply using suitable external measures before you start working on the unit and secure it against unintentional reconnection to the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least 5 minutes before removing the electronics cover.

⚠ WARNING



Risk of injury caused by rapidly moving output elements.

Serious injuries.

- Disconnect the MOVIGEAR® drive unit from the power supply and secure it against unintentional power up before you start working on it.
- Equip the input and output elements (e.g. customer shaft with contact shoulder or clamping ring, shrink disk) with a touch guard.

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4.2 Required tools and resources

- Set of wrenches
- Torque wrench
- Mounting device
- Compensation elements (washers and spacing rings), if necessary
- Fasteners for output elements
- Lubricant (e.g. NOCO® fluid)
- Standard parts are not included in the delivery

4.2.1 Installation tolerances for shaft ends

Diameter tolerance in accordance with DIN 748:

- ISO H7 for hollow shafts

4.2.2 Tolerances for torque ratings

The specified torques must be adhered to with a tolerance of ±10%.

4.3 Installation requirements

Check that the following conditions have been met:

- The information on the nameplate of the MOVIGEAR® drive unit must match the voltage supply system.
- The drive is undamaged (no damage caused by transportation or storage).
- Ambient temperature according to the operating instructions, nameplate and lubricant table in chapter "Technical data/Lubricants".
- The drive must not be assembled in the following ambient conditions:
  - Potentially explosive atmosphere
  - Oils
  - Acids
  - Gases
  - Vapors
  - Radiation
- For special designs: The drive is designed in accordance with the actual ambient conditions.
- Clean the output shafts and flange surfaces thoroughly to ensure that they are free of anti-corrosion agents, contamination or similar. Use a commercially available solvent. Do not expose the sealing lips of the oil seals to the solvent – damage to the material.
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.

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4.4 Setting up the drive unit

4.4.1 Notes

- Clean the shaft ends thoroughly to ensure they are free of anti-corrosion agents (use a commercially available solvent). Do not expose the bearings and sealing rings to the solvent – damage to the material.
- Carefully align the MOVIGEAR® drive unit and the driven machine to avoid placing any unacceptable strain on the shaft ends.
- Do not butt or hammer the shaft end.
- Ensure that cooling air supply is unobstructed and that air discharged by other units does not influence cooling.
- Use suitable cable glands for the supply leads (use reducing adapters if necessary).
- Seal the cable entry well.
- Clean the sealing surfaces of the MOVIGEAR® cover well before reassembling the unit.
- Restore the corrosion protection if necessary.
- Check the validity of the degree of protection using the information in the operating instructions and the data on the nameplate.

Changing the 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.**

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4.4.2 Electronics cover



⚠ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

- Let the devices cool down before touching them.



NOTICE

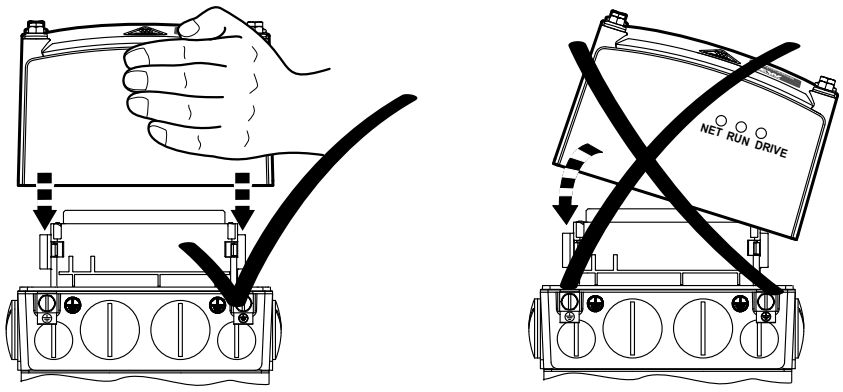
Loss of the guaranteed degree of protection.

Possible damage to property.

- When the electronics cover MOVIGEAR® is removed from the connection box, you have to protect it from humidity, dust or foreign particles.
- Make sure that the electronics cover MOVIGEAR® is mounted properly.

Installing the electronics cover

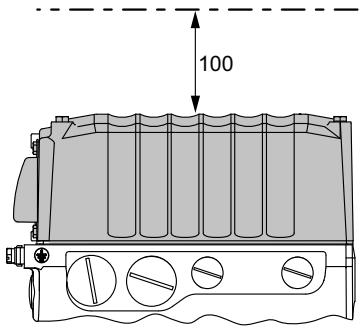
- Use only electronics covers that match the size.
- Be careful not to tilt the electronics cover when placing it on the connection box:



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Minimum installation clearance

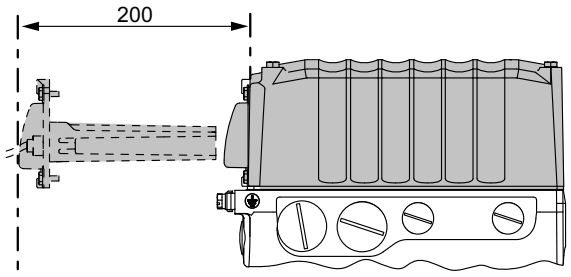
Note the minimum installation clearance (see following figure) required to remove the electronics cover MOVIGEAR®. For detailed dimension drawings, refer to chapter "Technical data".



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Minimum clearance for application options

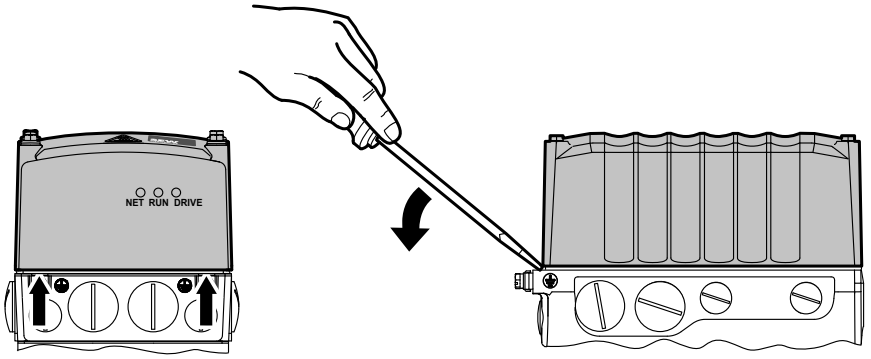
Note the minimum installation clearance (see following figure) required to install and remove the application options.



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Removing the electronics cover

The following figure shows how you can lever off the electronics cover in the intended places:



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4.4.3 Installation in damp areas or in the open

Drives are supplied in corrosion-resistant design for use in damp areas or in the open. Repair any damage to the paint work if necessary.

For variants with HP200 surface treatment, observe the notes in chapter "Drive units with optional design for wet areas".

4.4.4 Painting drive units



NOTICE

Breather valves and oil seals may be damaged during painting or repainting.

Potential damage to property.

- Clean the surface of the drive unit and make sure it is free from grease.
- Before painting, thoroughly cover the breather valves and sealing lip of the oil seals with strips.
- After painting, remove the adhesive strips.

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4.4.5 Gear unit venting

Drive units with installed breather valve

Except for mounting position M3, SEW-EURODRIVE delivers all MOVIGEAR® drive units ordered for a specific mounting position with a breather valve that is activated and installed according to the specific mounting position.

Except for the M3 mounting position, SEW-EURODRIVE delivers MOVIGEAR® drive units with optional design for use in wet areas with an activated breather valve installed according to the mounting position.

Drive units with separately included breather valve



NOTICE

The breather valve cannot be used for MOVIGEAR® drive units in mounting position M3.

Possible damage to property.

- For MOVIGEAR® drive units in mounting position M3, use the option with integrated pressure compensation (/PG option).

SEW-EURODRIVE delivers MOVIGEAR® drive units ordered for universal operation in mounting position M1, M2, M4, M5, M6 with an enclosed breather valve.

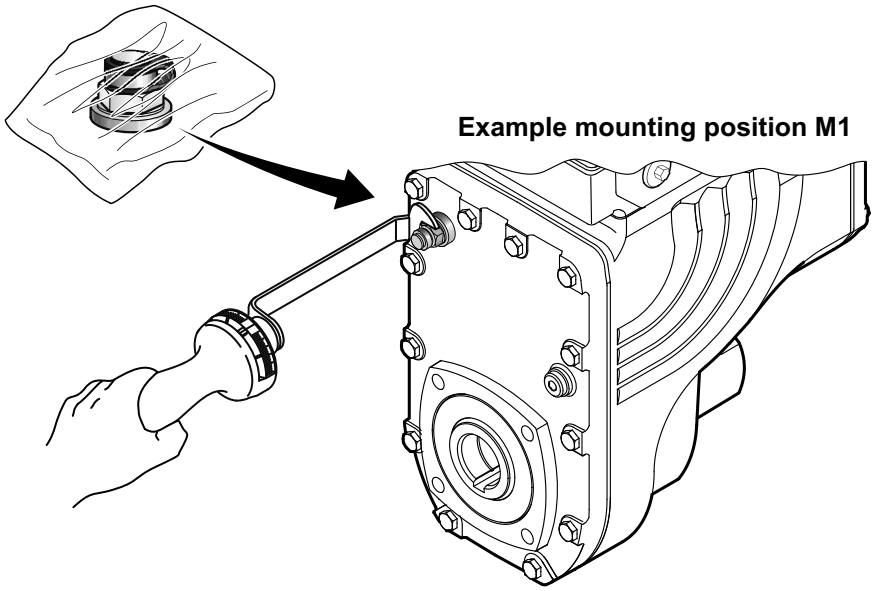
In this case, the breather valve is delivered in the hollow shaft of the drive unit. Before startup, replace the highest oil screw plug with the provided breather valve.

Tightening torque

Tighten the breather valve from SEW-EURODRIVE included in the delivery with 8.0 Nm.

The following figure shows an example. The position of the breather valve is dependent on the mounting position used. Observe chapter "Technical data and dimension sheets/Mounting positions".

Example mounting position M1



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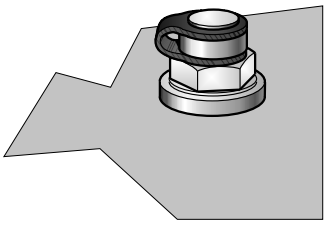
Drive units with integrated pressure compensation (/PG option)

No further measures are required because a breather valve is not required for MOVIGEAR® drive units with integrated pressure compensation (/PG option).

Activating the breather valve (not with integrated pressure compensation /PG option)

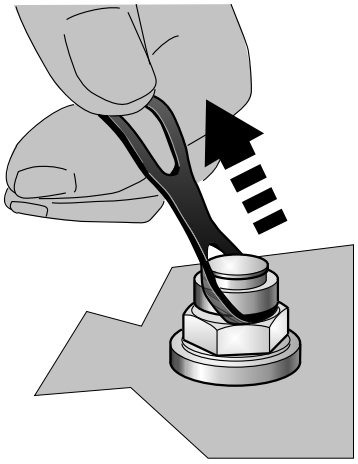
After installing the breather valve, activate it as follows. For designs with the breather valve screwed in: check whether the breather valve is activated. If not, you have to remove the transport protection of the breather valve before you start up the drive unit.

1. Breather valve with transport protection



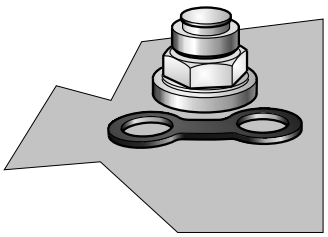
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2. Remove transport protection



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3. Activated breather valve



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4.5 Application options



⚠ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

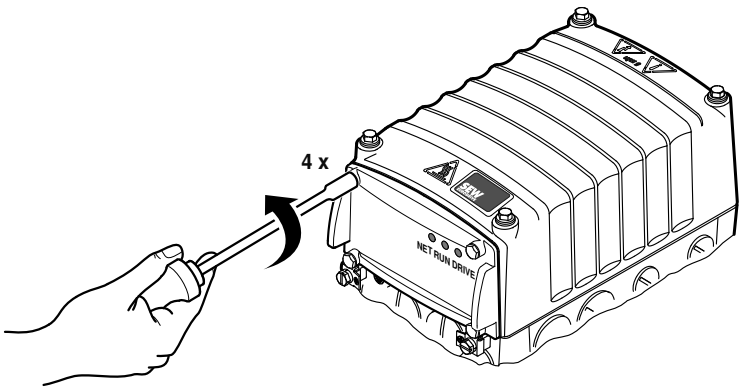
- Let the devices cool down before touching them.

4.5.1 Removing the application cover

MOVIGEAR® drive units with application slot in the electronics cover are delivered with an application cover as standard.

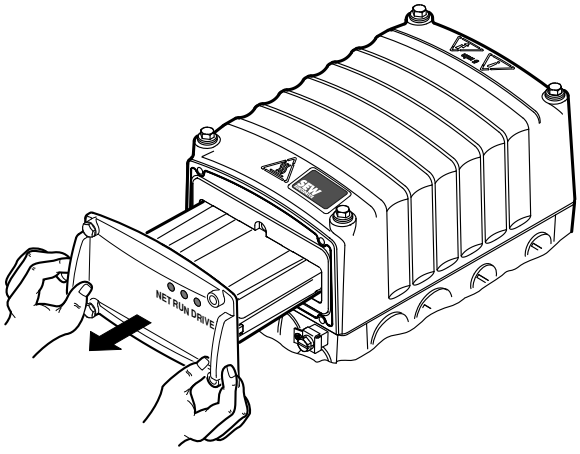
You have to remove the application cover in order to install an application option:

1. Loosen the 4 retaining screws.



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2. Remove the application cover.



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Never use the application slot as a handle when the application cover or application option is not installed.

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4.5.2 Installing application options

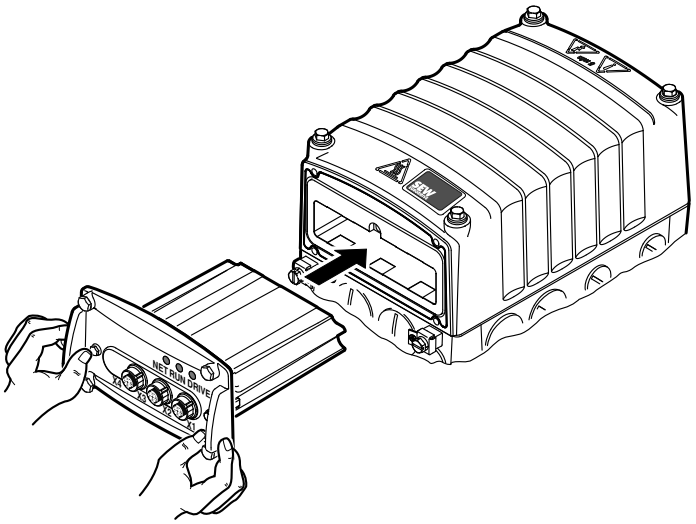
NOTICE

Loss of the guaranteed degree of protection.

Possible damage to property.

- In disassembled condition, you have to protect the GIO13 application option from moisture, dust or foreign particles as there are openings for DIP switches.
- Make sure that the application cover is mounted properly.

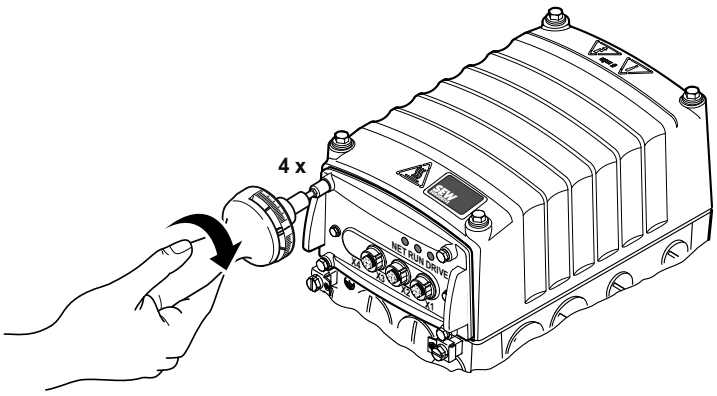
1. You have to remove the application cover or, depending on the design, the paint protector in order to install an application option:
2. Insert the option into the application slot.



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3. Secure the option with the 4 retaining screws.

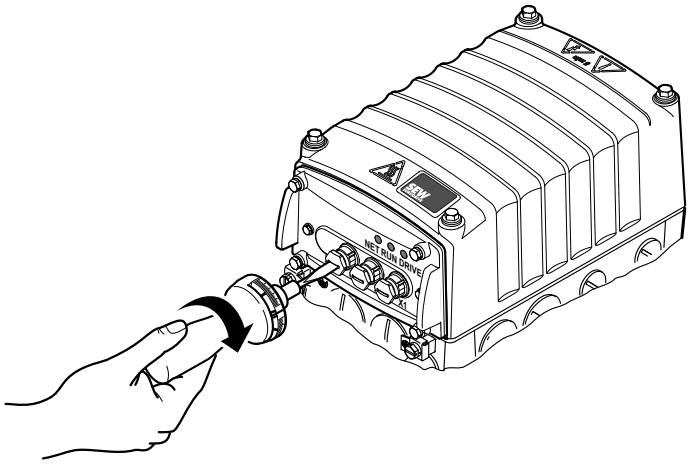
   The permitted tightening torque for the retaining screws is 1.4 to 1.6 Nm.



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4. Use the provided screw plugs to seal the connectors that are not in use.



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Permitted tightening torques:

- Plastic screw plug: 2.0 to 2.4 Nm
- Stainless steel screw plug: 2.0 to 2.4 Nm

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4.6 Shaft-mounted gear unit with keyway

INFORMATION

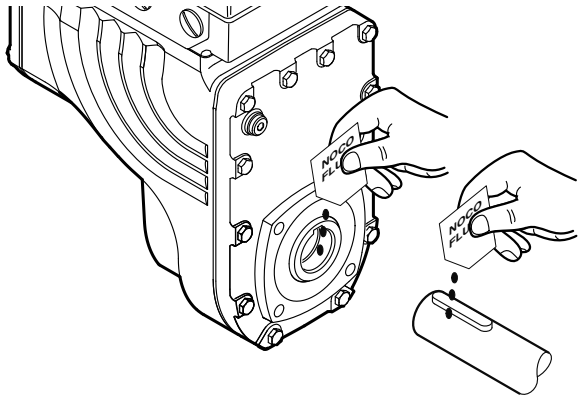
Observe the design notes in chapter "Technical data and dimension sheets" for the customer shaft design.

INFORMATION

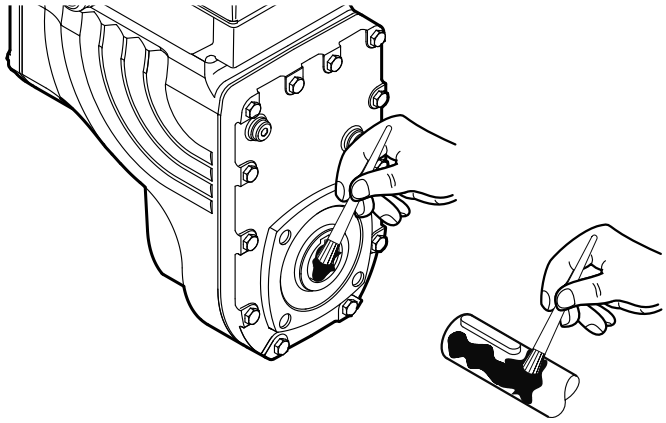
To avoid contact corrosion, SEW-EURODRIVE recommends that the customer shaft should additionally be lathed down between the 2 contact surfaces.

4.6.1 Installation notes

1. Apply NOCO® fluid and spread it thoroughly.



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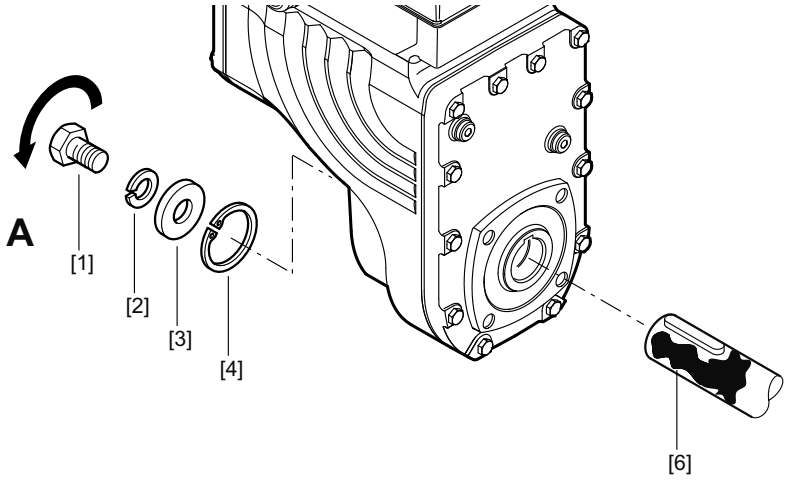


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2. Mount the shaft and secure it axially (using a mounting device makes installation easier). Following a description of the three mounting types:
   - 2A: Standard scope of delivery
   - 2B: Assembly/disassembly kit for customer shaft with contact shoulder
   - 2C: Assembly/disassembly kit for customer shaft without contact shoulder

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2A: Standard installation procedure

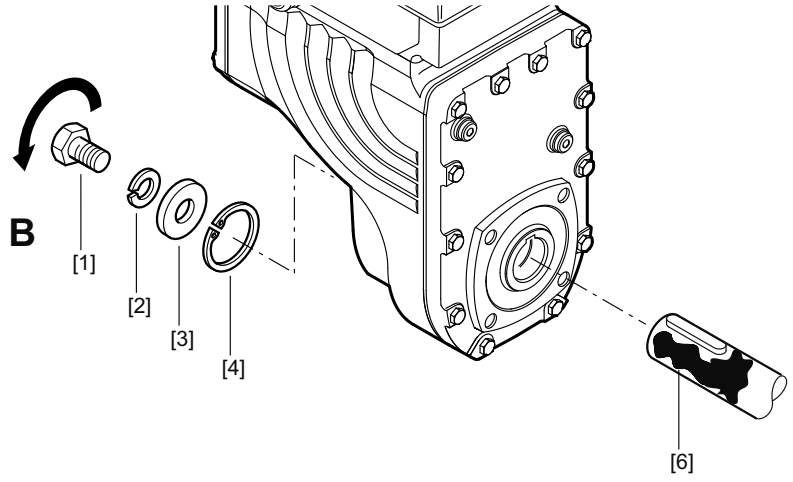


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[1] Short retaining screw (standard scope of delivery)
[2] Lock washer
[3] Washer
[4] Retaining ring
[6] Customer shaft

2B: Installation with SEW-EURODRIVE assembly/disassembly kit[1)]

Customer shaft **with** contact shoulder



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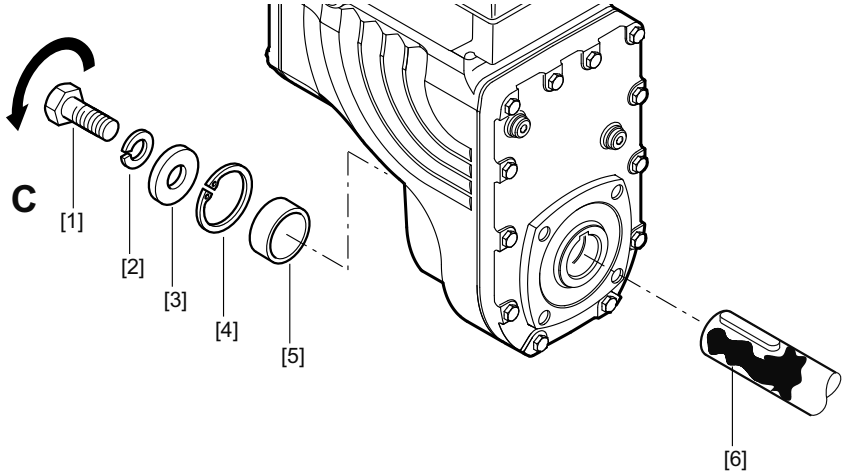
[1)] Observe chapter "Technical data and dimension sheets/Design notes for gear units with hollow shaft and key".

[1] Retaining screw
[2] Lock washer
[3] Washer
[4] Retaining ring
[6] Customer shaft with contact shoulder

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2C: Installation with SEW-EURODRIVE assembly/disassembly kit[1)]

Customer shaft **without** contact shoulder

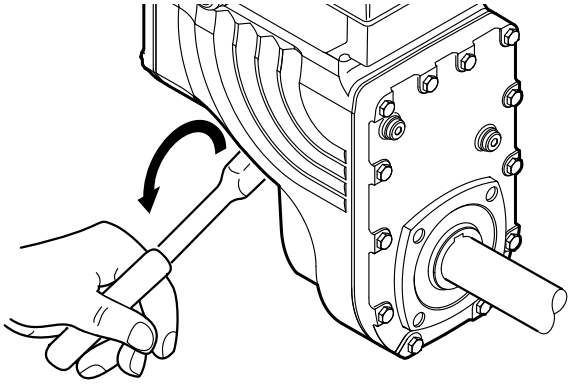


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[1)] Observe chapter "Technical data and dimension sheets/Design notes for gear units with hollow shaft and key".

[1]	Retaining screw	[4]	Retaining ring
[2]	Lock washer	[5]	Spacer tube
[3]	Washer	[6]	Customer shaft without contact shoulder

3. Tighten the retaining screw to the appropriate torque (see table).



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Drive	Screw	Tightening torque [Nm]
MGFA.2	M10	20
MGFA.4	M16	40

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4.6.2 Disassembly notes



⚠ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

- Let the devices cool down before touching them.

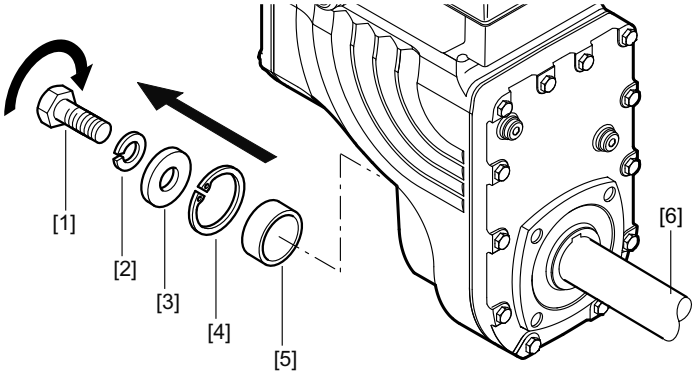


INFORMATION

For information on the SEW-EURODRIVE assembly/disassembly kit, see chapter "Technical data and dimension sheets/Design notes".

The following description only applies when the drive is assembled using the SEW-EURODRIVE assembly/disassembly kit (see previous description, points 2B or 2C).

1. Loosen the retaining screw [1].
2. Remove parts [2] to [4] and, if applicable, the spacer tube [5].



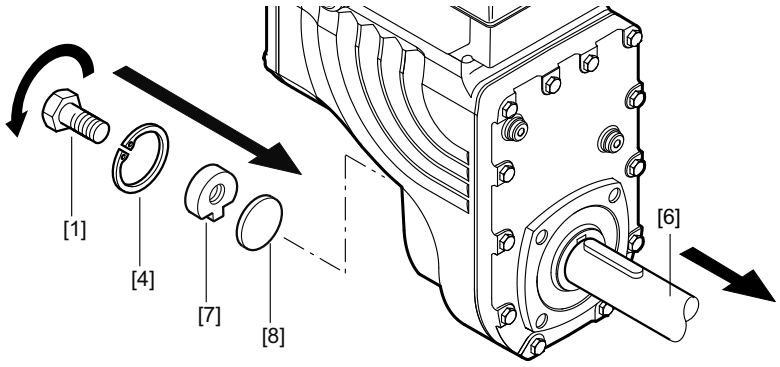
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[1]	Retaining screw	[4]	Retaining ring
[2]	Lock washer	[5]	Spacer tube
[3]	Washer	[6]	Customer shaft

3. Insert the forcing washer [8] and the fixed nut [7] from the SEW-EURODRIVE assembly/disassembly kit between the customer shaft [6] and the retaining ring [4].
4. Re-install the retaining ring [4].

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5. Screw the retaining screw [1] back in. Now you can force the drive off the shaft by tightening the bolt.



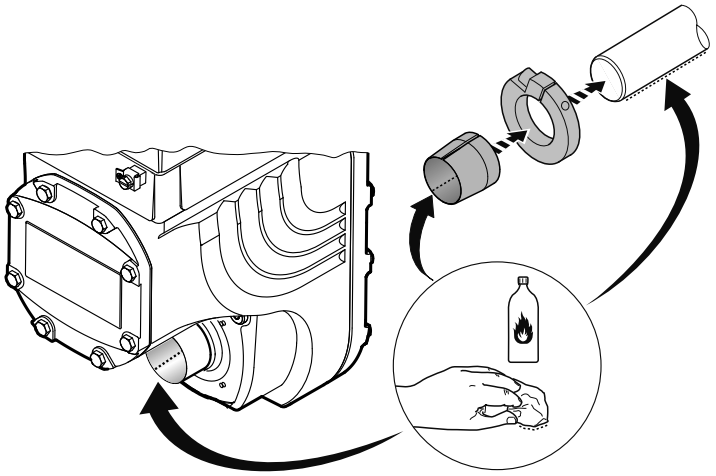
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[4] Retaining ring
[6] Customer shaft
[7] Fixed nut
[8] Forcing washer

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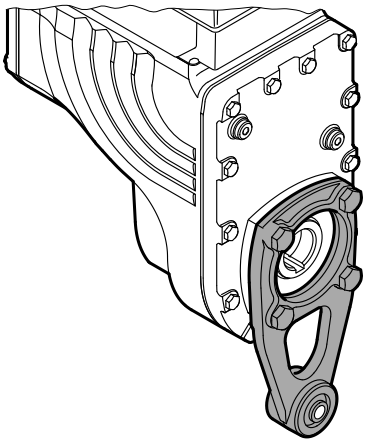
4.7 Shaft-mounted gear unit with TorqLOC® (customer shaft without contact shoulder)

1. Clean the customer shaft and the inside of the hollow shaft. Ensure that all traces of grease or oil are removed.
2. Install the stop ring and the bushing on the customer shaft.



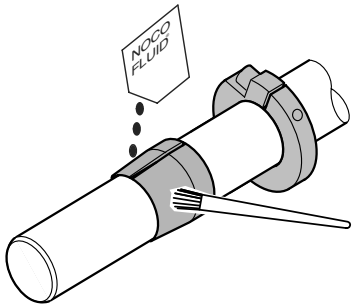
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3. Fasten the torque arm on the MOVIGEAR® drive unit; observe chapter "Torque arm".



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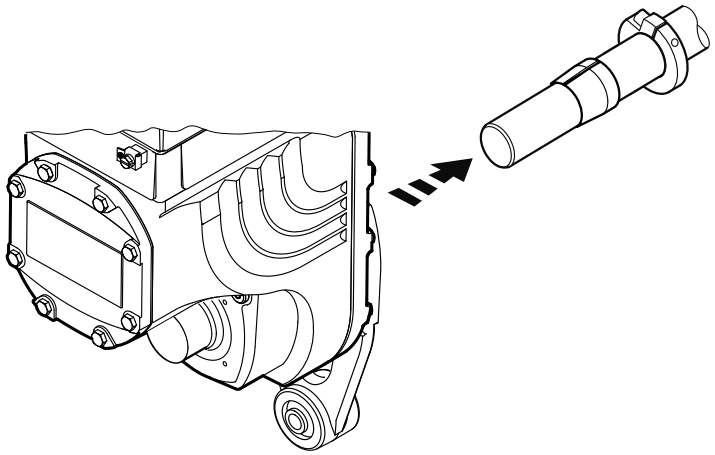
4. Apply NOCO® fluid on the bushing and spread thoroughly.



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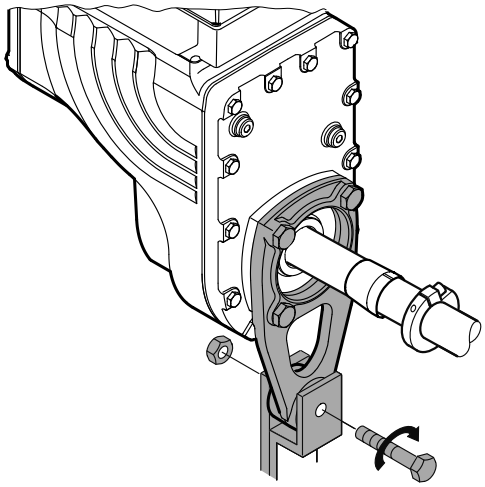
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5. Push the gear unit onto the customer shaft.



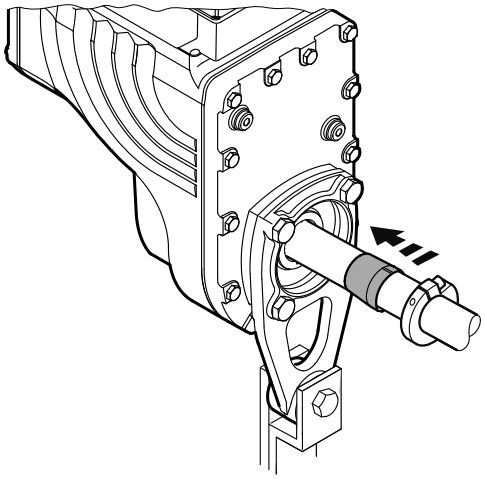
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6. Mount the torque arm onto the system structure/holding fixture (do not tighten the screws).



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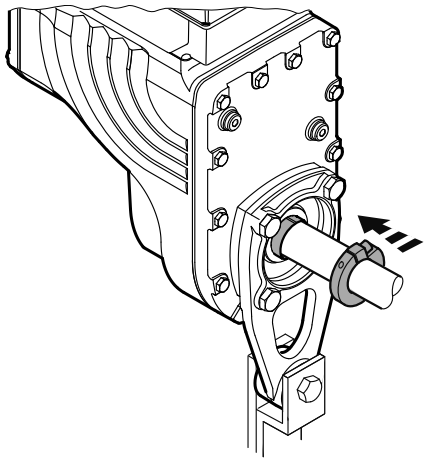
7. Push the bushing into the gear unit up to the stop.



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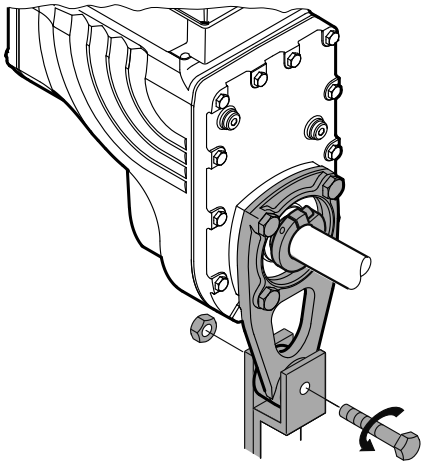
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8. Push the stop ring to the bushing. Mark the position of the stop ring.



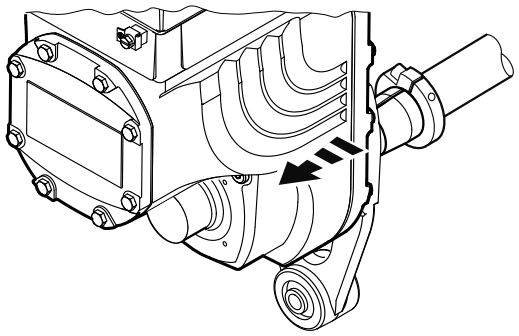
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9. Remove the torque arm from the holding fixture/system structure.



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10. Pull the gear unit off the customer shaft until the stop ring is accessible for fastening.

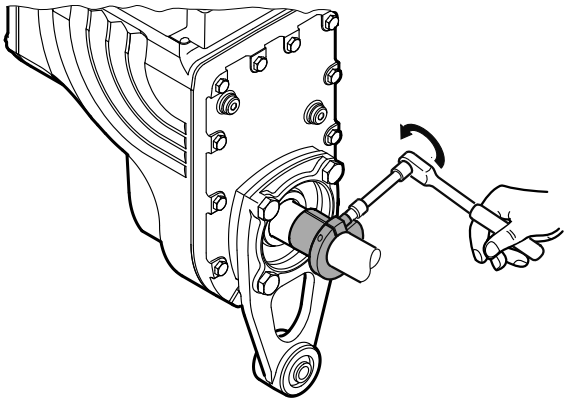


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11. Make sure that the position of the stop ring has not changed (see marking).

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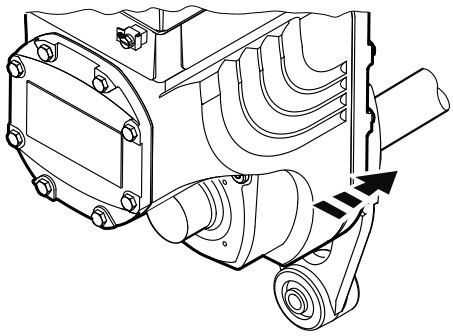
12. Tighten the stop ring using the appropriate torque as specified in the table below.



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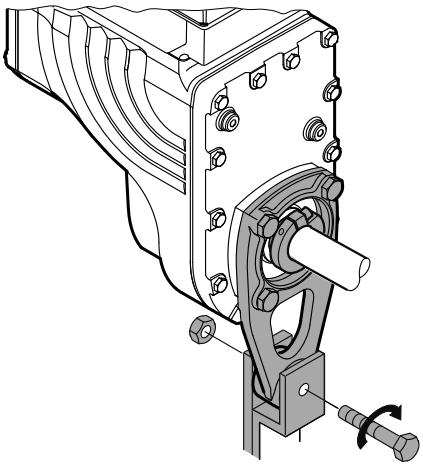
Type	Tightening torque [Nm]	
	Standard design	Stainless steel
MGFT.2	18	7.5
MGFT.4	18	7.5

13. Push the bushing and the gear unit onto the customer shaft up to the fixed stop ring.



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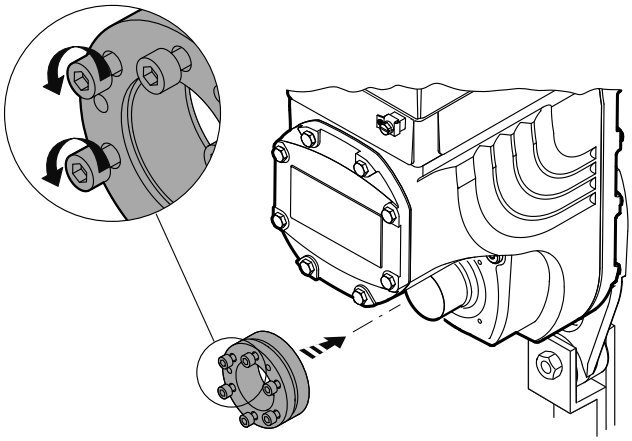
14. Mount the torque arm onto the system structure/holding fixture again (do not tighten the screws).



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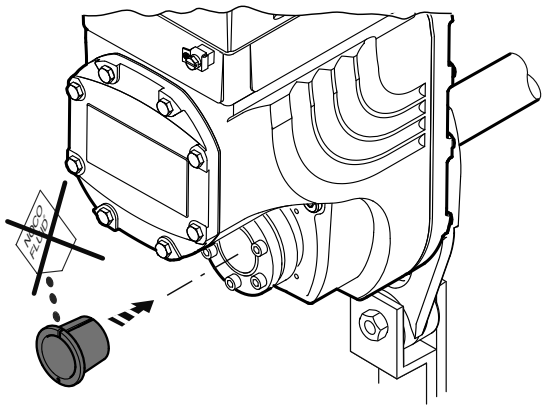
15. Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.

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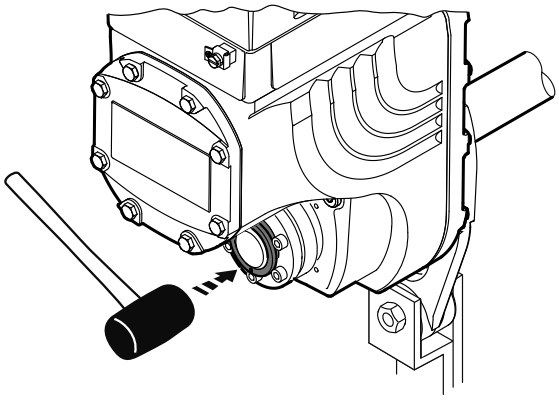
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16. Slide the counter bushing onto the customer shaft and into the hollow shaft.



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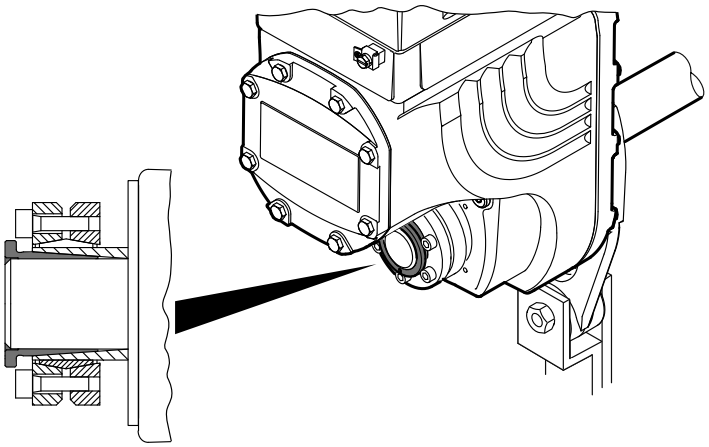
17. Ensure the shrink disk is properly seated.
18. Tap lightly on the flange of the counter bushing to ensure that the bushing is fitted securely in the hollow shaft.



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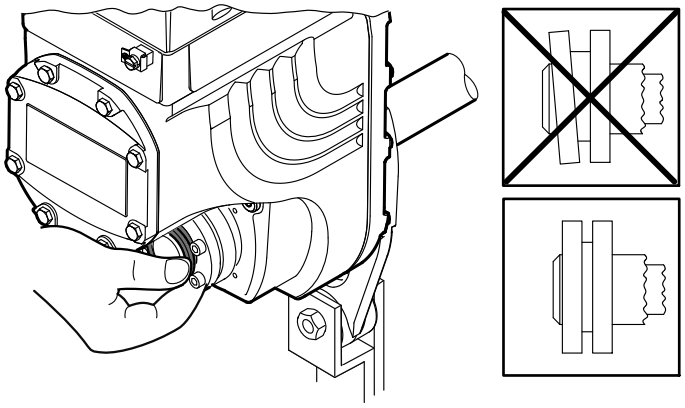
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19. Make sure that the customer shaft is seated in the counter bushing.



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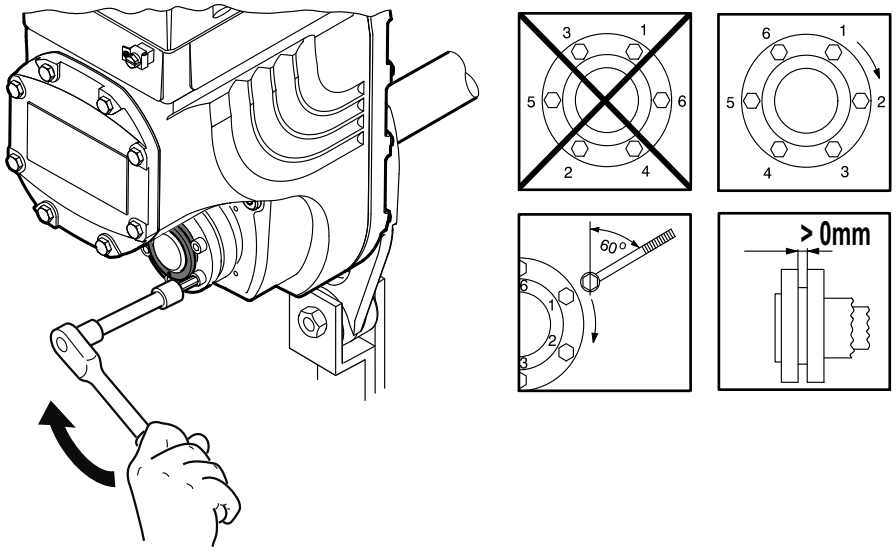
20. Tighten the screws of the shrink disk only hand-tight and ensure that the outer rings of the shrink disk are parallel.



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21. Tighten the locking screws by working round several times from one screw to the next (not in diametrically opposite sequence):

    The exact values for the tightening torques are shown on the shrink disk.

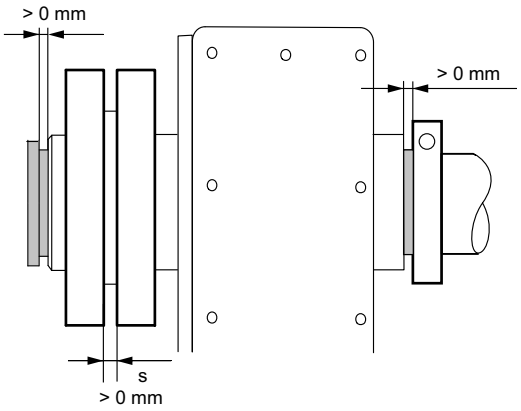


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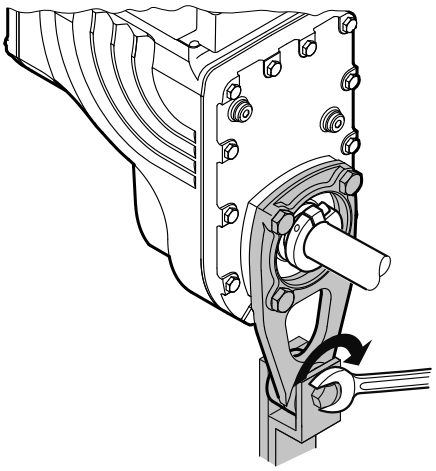
22. After installation, make sure the remaining gap s between the outer rings of the shrink disks is > 0 mm.

    The remaining gap between counter bushing and hollow shaft end as well as bushing and stop ring must be > 0 mm.



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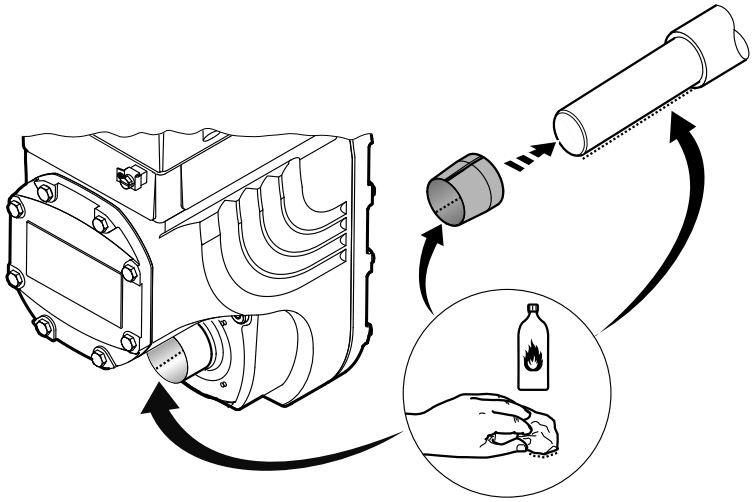
23. Securely tighten the torque arm; observe chapter "Torque arm".



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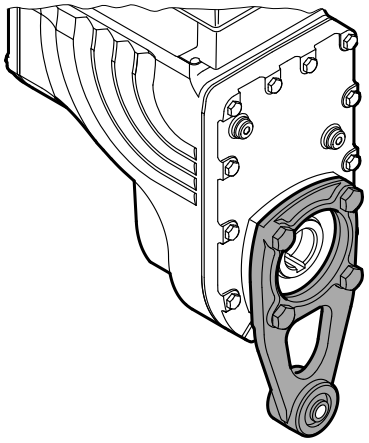
4.8 Shaft-mounted gear unit with TorqLOC® (customer shaft with contact shoulder)

1. Clean the customer shaft and the inside of the hollow shaft. Ensure that all traces of grease or oil are removed.



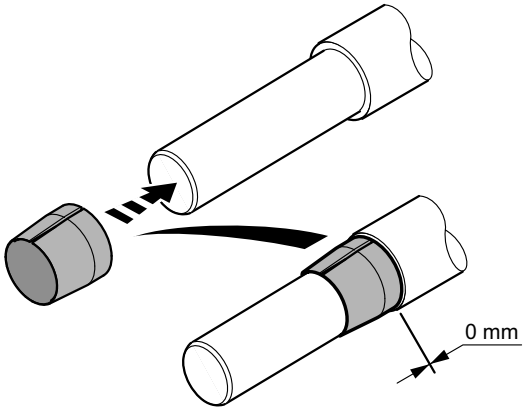
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2. Fasten the torque arm on the MOVIGEAR® drive unit; observe chapter "Torque arm".



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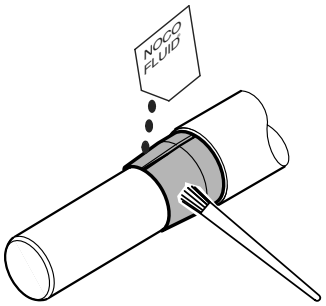
3. Slide the bushing onto the customer shaft.



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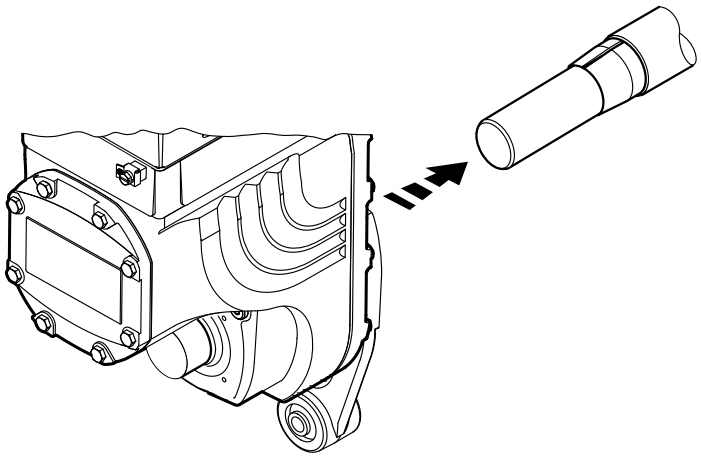
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4. Apply NOCO® fluid on the bushing and spread thoroughly.



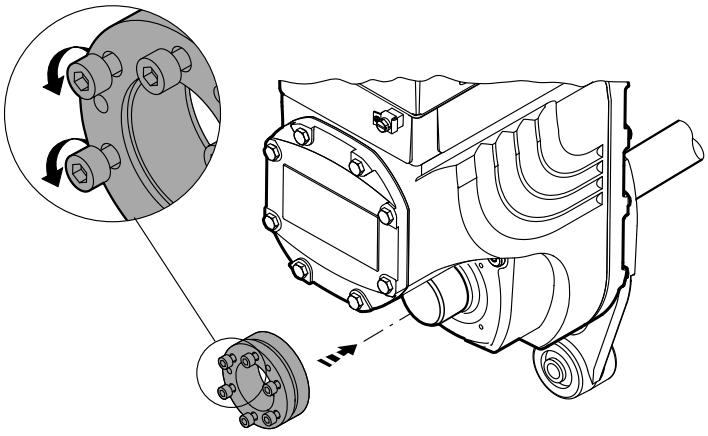
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5. Push the gear unit onto the customer shaft.



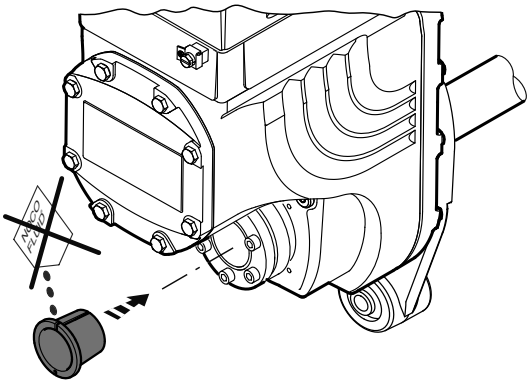
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6. Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.



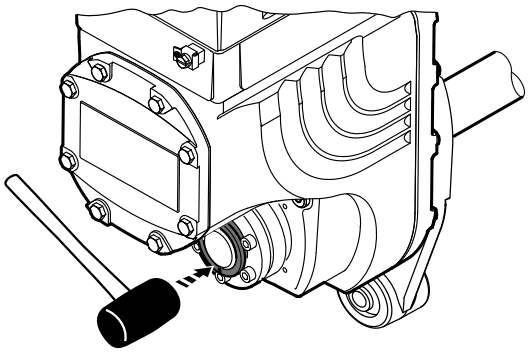
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7. Slide the counter bushing onto the customer shaft and into the hollow shaft.



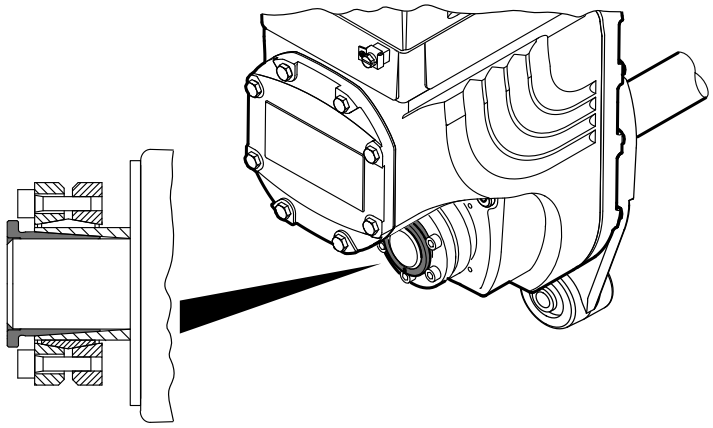
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8. Ensure the shrink disk is properly seated.
9. Tap lightly on the flange of the counter bushing to ensure that the bushing is fitted securely in the hollow shaft.



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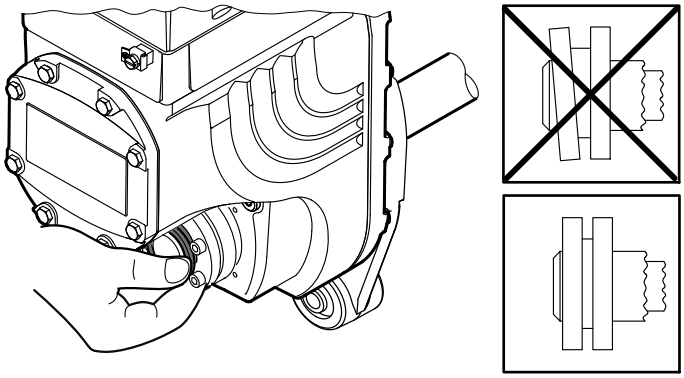
10. Make sure that the customer shaft is seated in the counter bushing.



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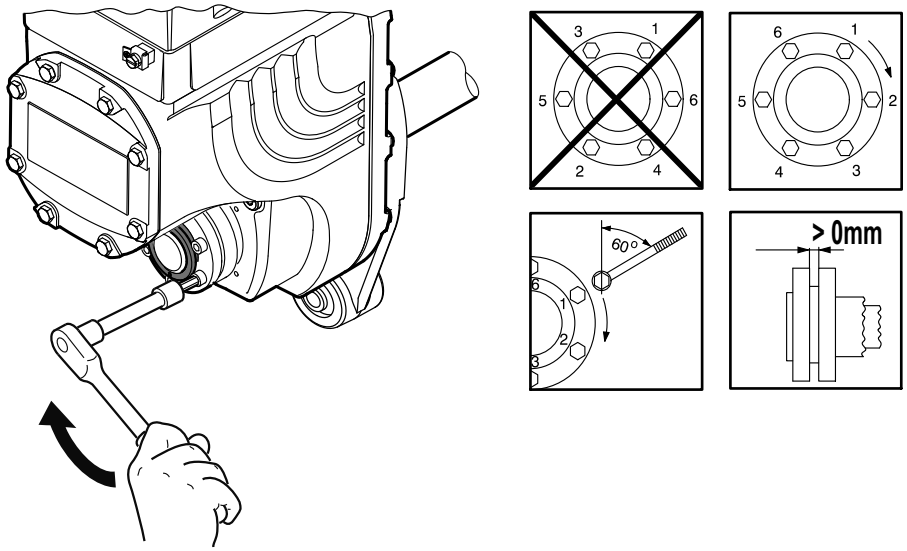
11. Tighten the screws of the shrink disk only hand-tight and ensure that the outer rings of the shrink disk are parallel.



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12. Tighten the locking bolts by working round several times from one bolt to the next (not in diametrically opposite sequence).

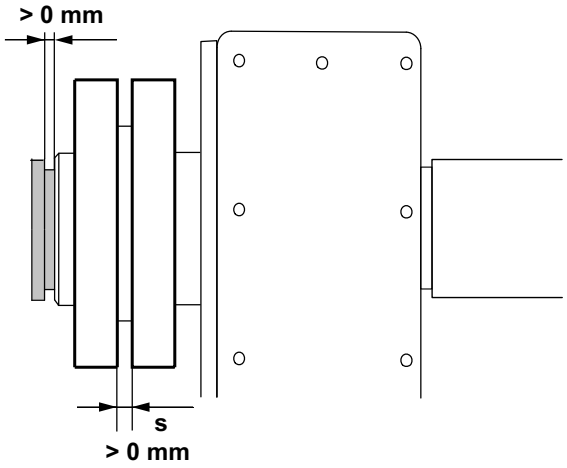
    The exact values for the tightening torques are shown on the shrink disk.



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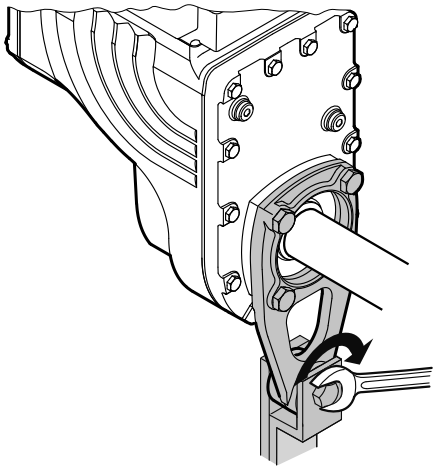
13. After installation, make sure the remaining gap s between the outer rings of the shrink disks is > 0 mm.

14. The remaining gap between counter bushing and hollow shaft end must be > 0 mm.



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15. Mount the torque arm and tighten it securely; observe chapter "Torque arm".



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4.9 Shaft-mounted gear unit with TorqLOC® – disassembly, cleaning, lubrication

4.9.1 Removal notes



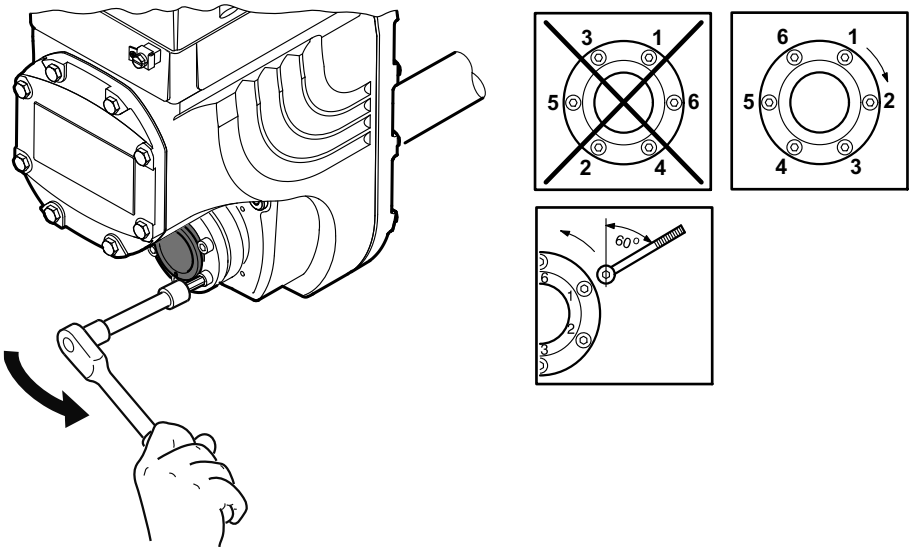
⚠ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

- Let the devices cool down before touching them.

1. Loosen the locking screws one after the other by a quarter rotation each to avoid tilting the outer rings.



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2. Unscrew the locking screws evenly one after the other.

   Do not remove the locking screws completely.

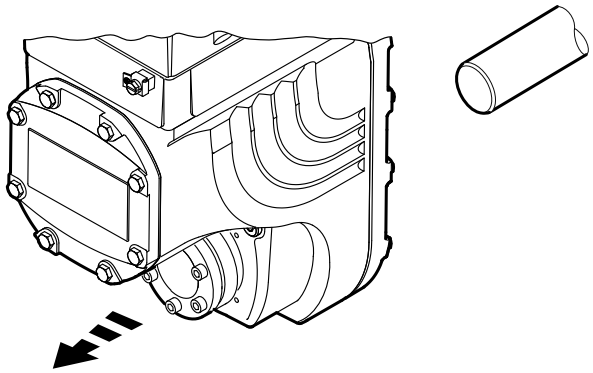
3. Dismantle the conical steel bushing.

   If required, use the outer rings as pullers as follows:

   - Remove all the locking screws.
   - Screw the respective number of screws in the tapped holes of the shrink disk.
   - Support the inner ring against the gear unit housing.
   - Pull off the conical steel bushing by tightening the screws.

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4. Remove the gear unit from the shaft.



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5. Remove the shrink disk from the hub.

4.9.2 Cleaning and lubrication

There is no need to dismantle removed shrink disks before they are reinstalled.

Clean and lubricate the shrink disk if it is dirty.

Lubricate the tapered surfaces with one of the following solid lubricants:

Lubricant (Mo S2)	Sold as
Molykote 321 (lube coat)	Spray
Molykote spray (powder spray)	Spray
Molykote G Rapid	Spray or paste
Aemasol MO 19P	Spray or paste
Aemasol DIO-sétral 57 N (lube coat)	Spray

Grease the locking screws with a multipurpose grease such as Molykote BR 2 or similar.

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4.10 Installing the protective cover

⚠ WARNING

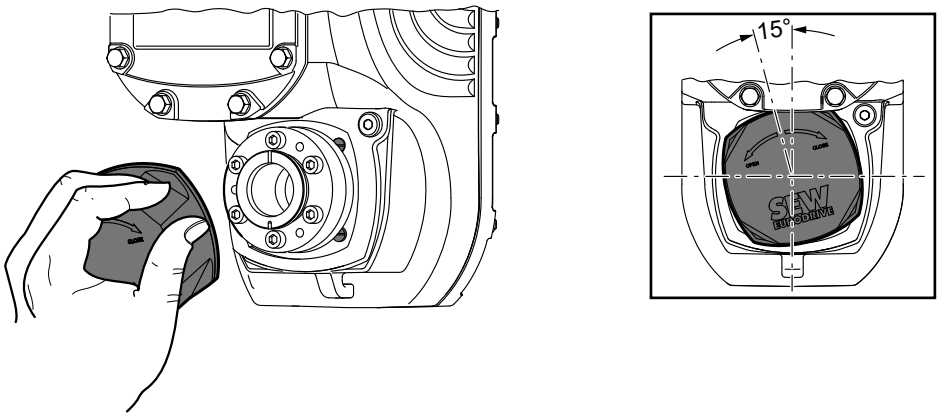
Risk of injury caused by rapidly moving output elements.

Serious injuries.

- Disconnect the drive unit from the power supply and safeguard it against unintentional power up before you start working on it.
- Equip the input and output elements with a touch guard.

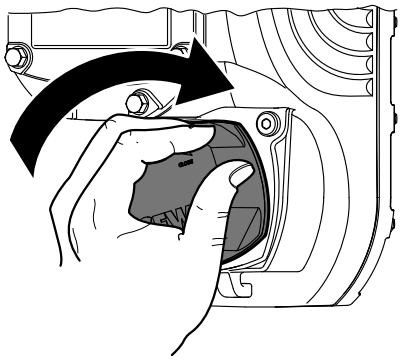
4.10.1 Installing the fixed cover

1. Place the safety cover offset by 15° counterclockwise.



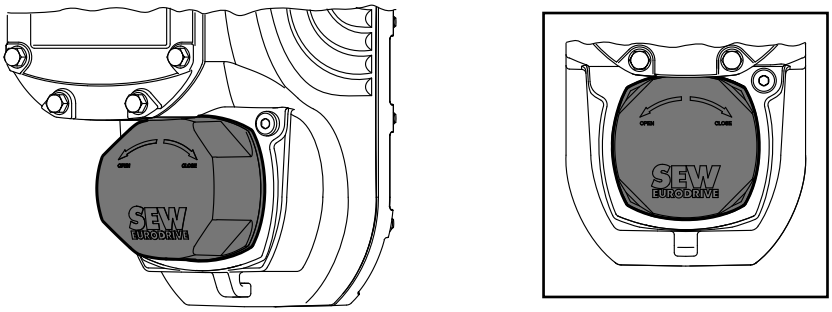
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2. Turn the safety cover clockwise until it locks in position.



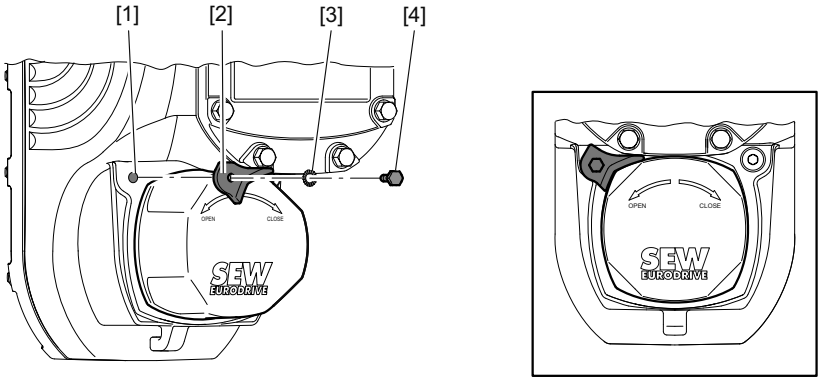
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3. The following figure shows the installed safety cover:



18014400858865547

4. Fasten the locking (in preparation) at the designated bore using the screws included in the delivery. The permitted tightening torque for the screw M4x10 is 3.3 Nm.



27733476107

[1] Bore for the locking device
[2] Locking device
[3] Serrated lock washer
[4] M4x10 screw

4.10.2 Installation without cover

In certain individual cases (e.g. through-shaft), you cannot install the safety cover. In these cases, the safety cover is not necessary if the system or unit manufacturer provides corresponding components to guarantee for compliance with the required degree of protection.

If this results in additional maintenance, you have to describe this in the operating instructions for the system or component.

4.11 Torque arm



NOTICE

Improper assembly can damage the MOVIGEAR® drive unit.

Possible damage to property.

- Do not place torque arms under strain during installation.
- Always use bolts of quality 8.8 to fasten torque arms.

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INFORMATION



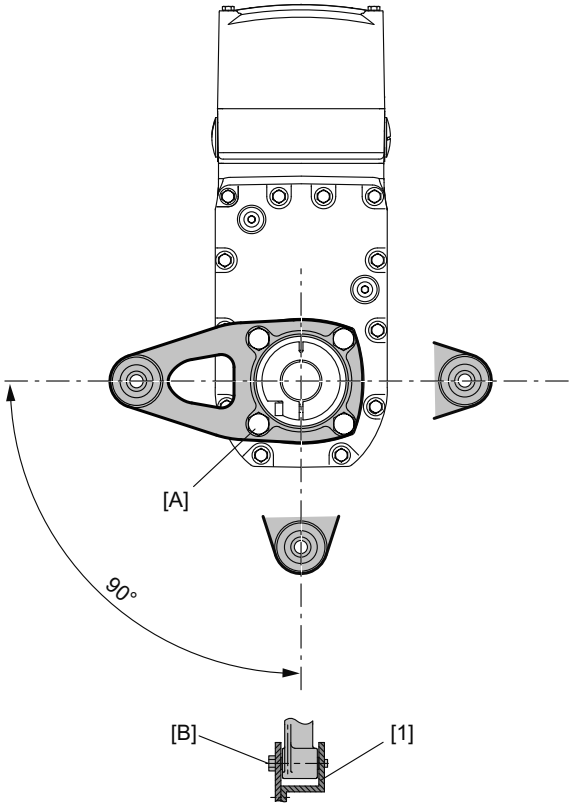
As an option, the necessary bolts can be enclosed in the delivery.

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4.11.1 MGF.T2 and MGF.T4 torque arm

Installation options

The following figure shows the MGF.T2 and MGF.T4 torque arm:



18014400860002443

[1] Bush with bearings on both ends

Tightening torques

The following table shows the required tightening torques:

Drive	Screw [A]		Screw [B]	
	Size	Tightening torque [Nm]	Size	Tightening torque [Nm]
MGF.T2	M10	48 Nm	M10	20 Nm
MGF.T4	M12	70 Nm	M10	20 Nm

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4.12 Tightening torques



⚠ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

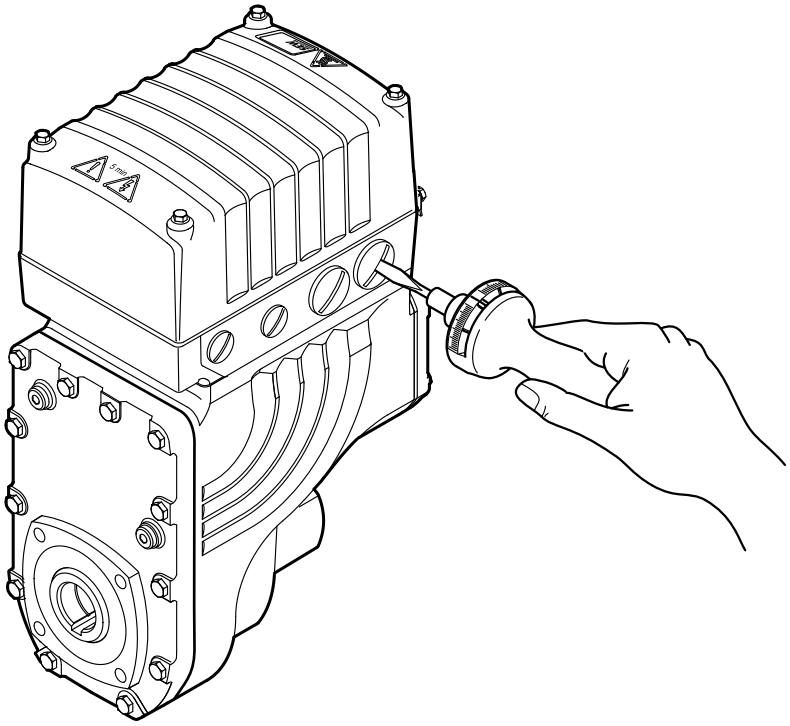
- Let the devices cool down before touching them.

4.12.1 Blanking plugs

Tighten the plastic blanking plugs **included in the delivery** by SEW-EURODRIVE with 2.5 Nm:

Example

The following figure shows an example. The number and position of cable entries depend on the ordered variant.



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4.12.2 Cable glands

Tightening torques

Tighten the EMC cable glands **optionally** supplied by SEW-EURODRIVE to the following torques:

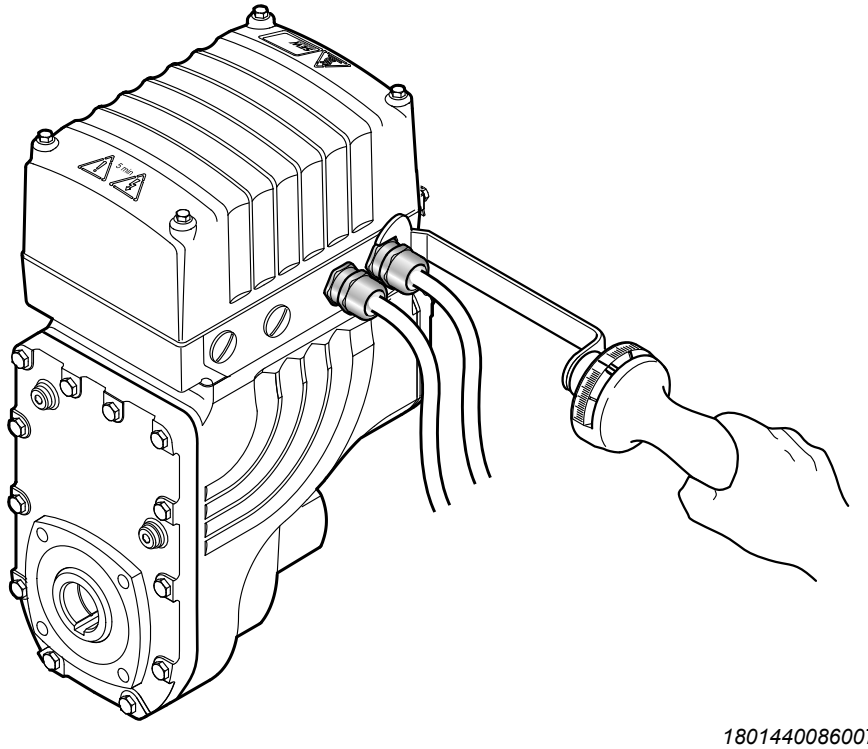
Screw fitting	Part number	Content	Size	Outer cable diameter	Tightening torque
EMC cable glands (nickel-plated brass)	18204783	10 pieces	M16 × 1.5	5 to 9 mm	4.0 Nm
	18204805	10 pieces	M25 × 1.5	11 to 16 mm	7.0 Nm
EMC cable glands (stainless steel)	18216366	10 pieces	M16 × 1.5	5 to 9 mm	4.0 Nm
	18216382	10 pieces	M25 × 1.5	11 to 16 mm	7.0 Nm

The cable retention in the cable gland must withstand the following removal force of the cable from the cable gland:

- Cable with outer diameter > 10 mm: ≥ 160 N
- Cable with outer diameter < 10 mm: = 100 N

Example

The following figure shows an example. The number and position of cable entries depend on the ordered variant.

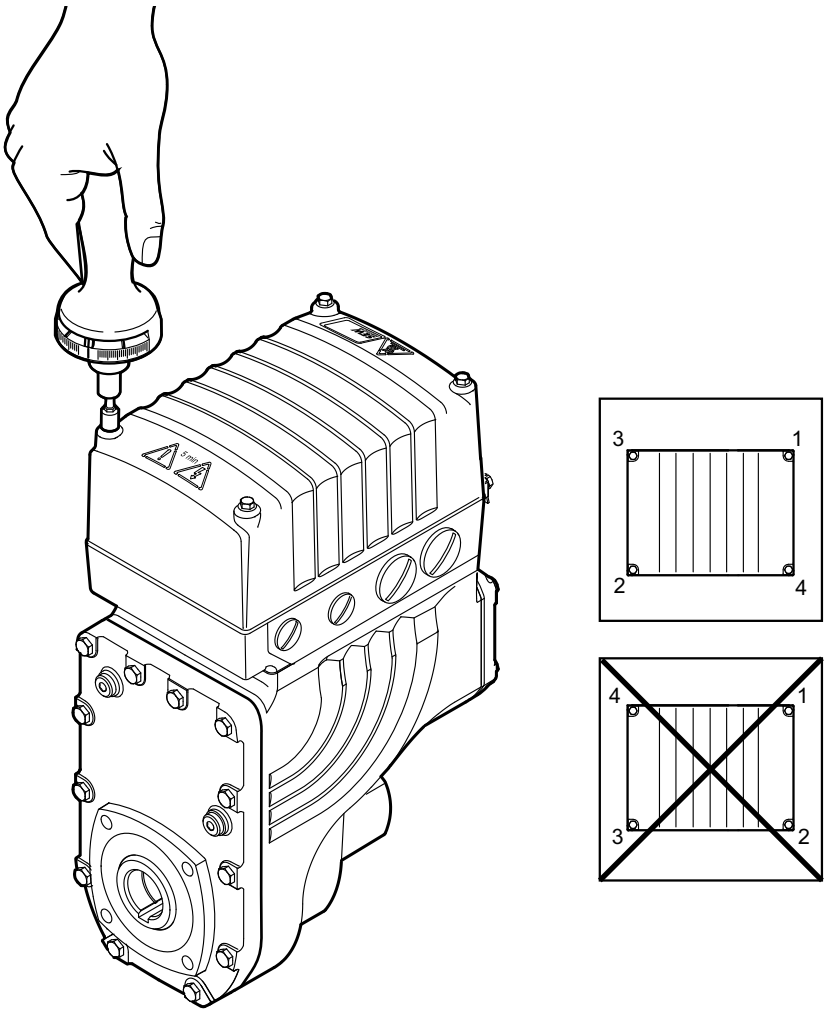


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4.12.3 MOVIGEAR® electronics cover

Proceed as follows when screwing on the MOVIGEAR® electronics cover: Insert the screws and tighten them in diametrically opposite sequence with a tightening torque of 6.0 Nm.



18014400860073995

4.13 Drive units with optional design for use in wet areas

INFORMATION

SEW-EURODRIVE guarantees that the HP200 special surface is free from faults when delivered. Report any transportation damage immediately.

Although the housing surfaces have a high impact resistance, they are to be handled with care. The corrosion protection can be affected by damage to the surface as a result from improper handling during transport, installation, operation, cleaning, etc. SEW-EURODRIVE is not liable for such damage.

4.13.1 Installation notes

NOTICE

Loss of degree of protection IP66 and incompatibility with cleaning agents.

Possible damage to property.

- Replace the optionally supplied plastic screw plugs with suitable stainless steel screw fittings.

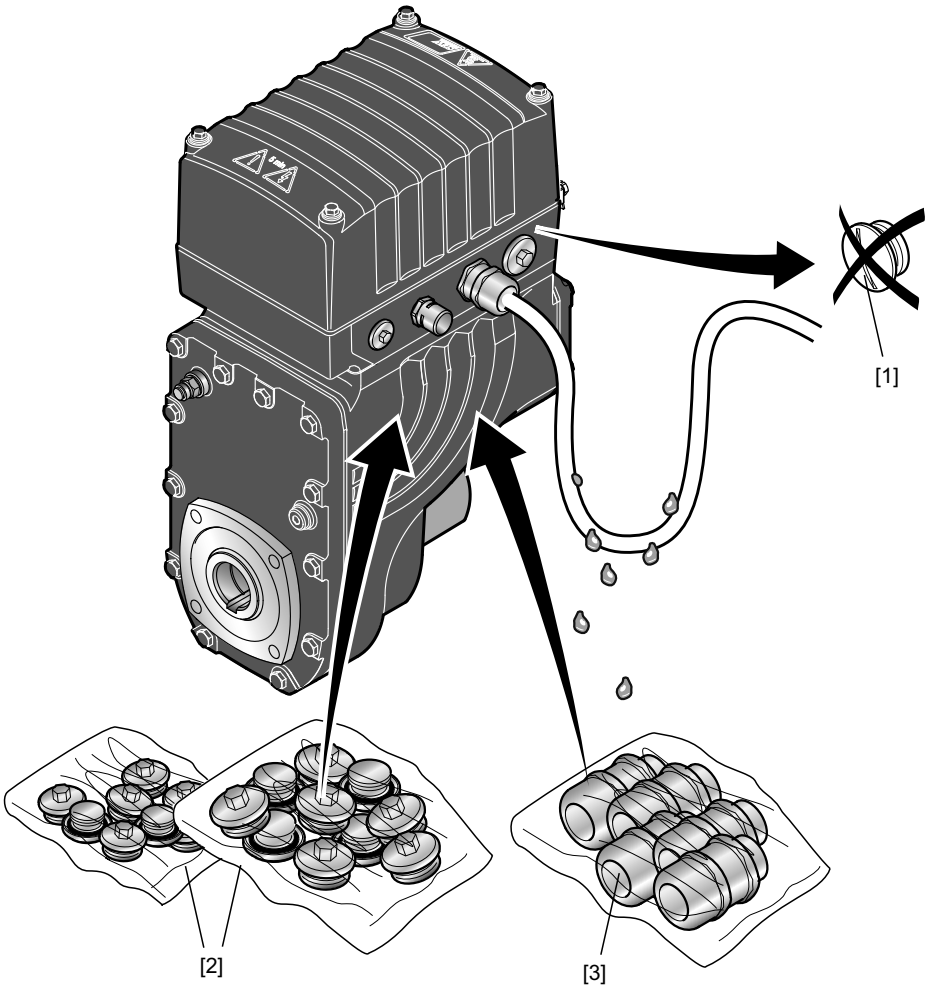
Observe the following additional notes when installing MOVIGEAR® drive units with optional design for use in wet areas:

- Make sure to prevent moisture and dirt from entering the device during installation.
- After electrical installation, make sure that the sealing and sealing surfaces are clean during assembly.
- When performing maintenance work, check the condition of the gaskets as well as the tightening torques of the screw fittings. If damaged, contact SEW-EURODRIVE.
- When the cover/electronics cover is opened after an operating period of ≥ 6 months, the gasket between the connection box and the cover/electronics cover must always be replaced. For this purpose it is essential that you observe the chapter "Inspection and maintenance".
- Make sure to install the cables with a drip loop. Observe the permitted bending radii of the installed cables for cable routing.
- Use only stainless steel cable glands and screw plugs offered by SEW-EURODRIVE, see chapter "Technical data and dimension sheets".
- You must seal unused cable bushings and plug connectors with suitable screw plugs, see chapter "Technical data and dimension sheets".
- To prevent permanent water accumulation in the B-side safety cover, clean it at regular intervals.

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Example

The following figure gives an example of a cable entry with drip loop and replacement of plastic screw plugs supplied as an option with suitable stainless steel screw plugs.



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[1] The optionally delivered plastic screw plugs must be replaced by suitable screw plugs made of stainless steel.
[2] Stainless steel screw plugs, if necessary (see chapter "Technical data and dimension sheets").
[3] Required stainless steel cable glands (see chapter "Technical data and dimension sheets").

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Use according to mounting position

INFORMATION

Also with the option "integrated pressure compensation gear unit (/PG)", MOVIGEAR® drive units must only be used in the ordered mounting position because of the mounting position-dependent pressure compensation fitting electronics (/PE).

MOVIGEAR® drive units with optional design for use in wet areas are delivered with pressure compensating valve and pressure compensation fitting (/PE) both installed according to the mounting position.

As an alternative, you can order the option "integrated pressure compensation gear unit (/PG).

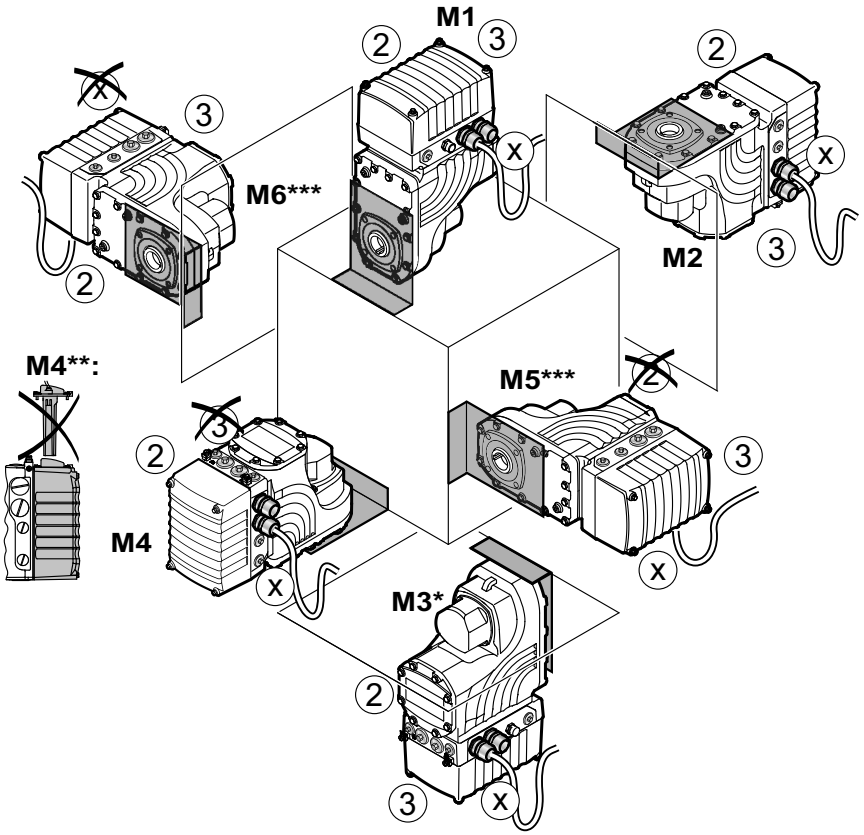
This is why MOVIGEAR® drive units with optional design for use in wet areas must be used only in the mounting position specified in the order:

- Mounting position
  - M1
  - M2
  - M3: Only possible with the option "integrated pressure compensation gear unit (/PG)".
  - M4
  - M5
  - M6
- Cable entries
  - Position 3 (not possible for M4 mounting position)
  - Position 2 (not possible for M5 mounting position)
  - Position X (not possible for M6 mounting position)

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Mounting positions

The following figure shows the position of the MOVIGEAR® drive unit when installed in mounting positions M1 to M6:



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* Mounting position M3 is only possible with the option "integrated pressure compensation gear unit (/PG)".

** Application options in connection with the design for use in wet areas and mounting position M4 are not possible.

*** Mounting positions M5 and M6 in connection with the DAC electronics variant and design for use in wet areas are not possible.

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4.13.2 Tightening torques when using optional design for use in wet areas



⚠ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

- Let the devices cool down before touching them.

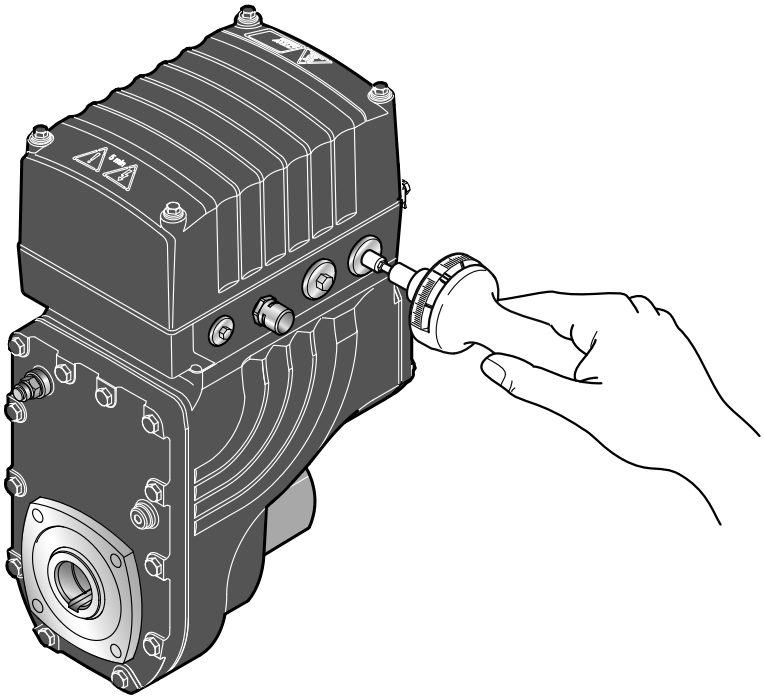
Blanking plugs

Tighten the stainless steel blanking plugs supplied by SEW-EURODRIVE with 6.8 Nm:

Type of screw fitting	Content	Size	Part number	Tightening torque
Hexagon head screw plug (made of stainless steel)	10 pieces	M16 × 1.5	18247342	6.8 Nm
	10 pieces	M25 × 1.5	18247350	6.8 Nm

Example

The following figure shows an example. The number and position of cable entries depend on the ordered variant.

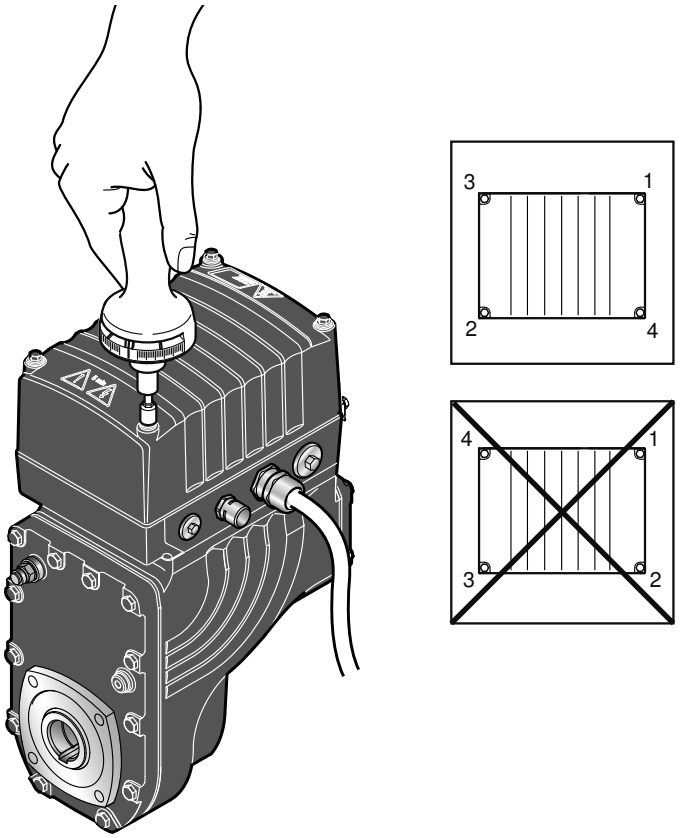


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MOVIGEAR® electronics cover

Proceed as follows when screwing on the MOVIGEAR® electronics cover: Insert the screws and tighten them in diametrically opposite sequence with a tightening torque of 6.0 Nm.



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EMC cable glands

Tighten the EMC cable glands **optionally included in the delivery** with the following tightening torques:

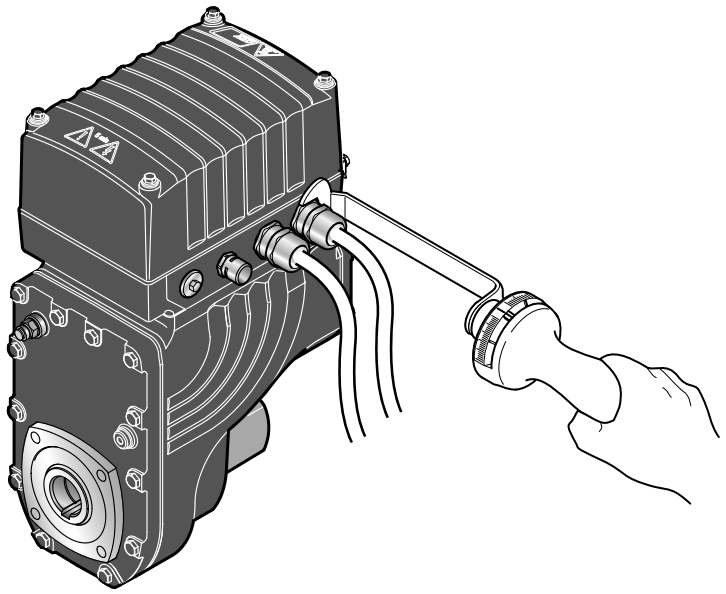
Screw fitting	Part number	Content	Size	Outer cable diameter	Tightening torque
EMC cable glands (nickel-plated brass)	18204783	10 pieces	M16 × 1.5	5 to 9 mm	4.0 Nm
	18204805	10 pieces	M25 × 1.5	11 to 16 mm	7.0 Nm
EMC cable glands (stainless steel)	18216366	10 pieces	M16 × 1.5	5 to 9 mm	4.0 Nm
	18216382	10 pieces	M25 × 1.5	11 to 16 mm	7.0 Nm

The cable retention in the cable gland must withstand the following removal force of the cable from the cable gland:

- Cable with outer diameter > 10 mm: ≥ 160 N
- Cable with outer diameter < 10 mm: = 100 N

Example

The following figure shows an example. The number and position of cable entries depend on the ordered variant.



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5 Electrical installation

INFORMATION

Adhere to the safety notes during installation.

5.1 Installation planning taking EMC aspects into account

5.1.1 Information on arranging and routing installation components

Successful installation of decentralized drives depends on selecting the correct cables, providing correct grounding, and a functioning equipotential bonding.

Always adhere to the **relevant standards**.

Note the following:

5.1.2 EMC-compliant installation

INFORMATION

This drive system is not designed for operation on a public low voltage supply system that supplies residential areas.

This is a product with restricted availability in accordance with IEC 61800-3. This product may cause EMC interference. In this case, it is recommended for the user to take suitable measures.

With respect to the EMC regulation, frequency inverters and compact drives cannot be seen as stand-alone units. They can only be evaluated in terms of EMC when they are integrated in a drive system. Conformity is declared for a described, CE-typical drive system. These operating instructions contain further information.

5.1.3 Cable selection, routing and shielding

⚠ WARNING



Electric shock caused by faulty installation.

Severe or fatal injuries.

- Take the utmost care when installing the units.
- Observe the connection examples.

For more information on cable selection, routing and shielding, refer to chapter "Cable routing and shielding".

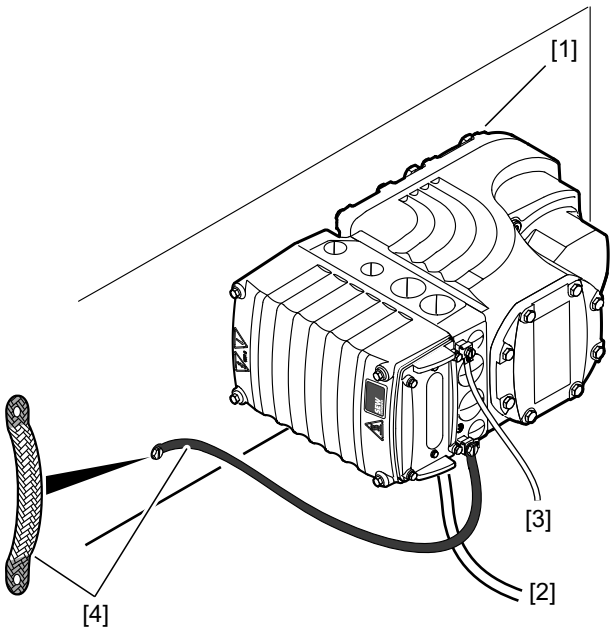
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5.1.4 Equipotential bonding

Regardless of the PE connection, it is essential that **low-impedance, HF-capable equipotential bonding** is provided (see also EN 60204-1 or DIN VDE 0100-540):

- Establish a connection over a wide surface area between the drive unit and the mounting rail.
- To do so, use a ground strap (HF litz wire), for example, to connect the drive unit and the grounding point of the system.

Example



9007204122339595

[1] The mechanical installation of a drive unit with hollow shaft (e.g. MOVIGEAR®) does **not** create a conductive connection of drive unit and mounting plate.
[2] PE conductor in the supply system cable
[3] 2nd PE conductor via separate terminals
[4] EMC-compliant equipotential bonding, for example using a ground strap (HF litz wire)
The contact surfaces must be free of paint.

- Do not use the cable shields of signal cables for equipotential bonding.

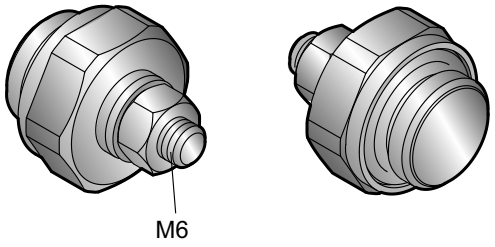
INFORMATION

For detailed information on equipotential bonding for decentralized inverters and drive units, refer to the publication "Drive Engineering – Practical Implementation, EMC in Drive Engineering" in chapter "Equipotential Bonding of Decentralized Inverters" by SEW-EURODRIVE.

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5.2 Equipotential bonding at the connection box

Another option for HF-capable equipotential bonding at a connection box is the following cable gland with M6 stud bolt:



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	Tightening torque of the cable gland	Tightening torque of the M6 nut for stud bolt	Part number
M16 cable gland with M6 stud bolt	4.0 Nm	3.0 Nm	08189234
M25 cable gland with M6 stud bolt	7.0 Nm	3.0 Nm	08192685

You can install this cable gland at a connection box that still has a free cable entry of size M16 or M25.

Screw the cable gland into the free cable entry and install the grounding cable (with ring cable lug) or the HF litz wire at the M6 stud bolt.

5.3 Installation instructions

5.3.1 Connecting supply system cables

- The nominal voltage and frequency of the MOVIGEAR® drive unit must correspond with the data of the supply system.
- Cable cross section: According to input current I_{supply} at rated power (see chapter "Technical data and dimension sheets").
- Install line fuses at the beginning of the power supply cable behind the supply bus junction. Select the fuse size according to the cable cross section.
- Use only copper cables with a minimum temperature range of 85 °C as the connection cable.
- MOVIGEAR® drive units are suitable for operation in voltage supply systems with grounded star point (TN and TT systems) and for operation in voltage supply systems with isolated star point (IT systems).

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5.3.2 Permitted cable cross sections of terminals

Line terminals

Observe the permitted cable cross sections for installation:

Line terminals X2	
Connection cross section (mm^2)	1.0 mm^2 – 4.0 mm^2
Connection cross section (AWG)	AWG17 – AWG12
Permitted tightening torque	1.2 – 1.4 Nm (10.6 – 12.4 in-lbs)
Conductor end sleeves	• **For single assignment:** Connect only single-wire conductors or flexible conductors with conductor end sleeve (DIN 46228 part 1, material E-CU) **with or without plastic collar** • **For double assignment:** Connect only flexible conductors with conductor end sleeve (DIN 46228 part 1, material E-CU) **without plastic collar** • Permitted length of the conductor end sleeve: At least 10 mm

Control terminals

Observe the permitted cable cross sections for installation:

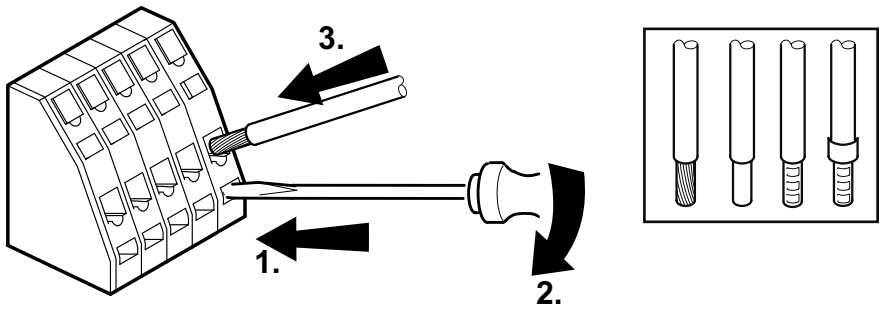
Control terminals X7	**Without conductor end sleeve**	**With conductor end sleeve (without plastic collars)**	**With conductor end sleeves (with plastic collars)**
Connection cross section (mm^2)	0.08 mm^2 – 2.5 mm^2		0.25 mm^2 – 1.5 mm^2
Connection cross section (AWG)	AWG 28 – AWG 14		AWG 23 – AWG 16
Stripping length	5 mm – 6 mm		
Current-carrying capacity	3.5 A (max. loop-through current)		

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5.3.3 Control terminal actuation

Adhere to the following sequence when actuating the control terminals:

Control terminals (the following figure shows a schematic illustration)



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5.3.4 Residual current device



⚠ WARNING

No protection against electric shock if an incorrect type of residual current device is used.

Severe or fatal injuries.

- The product can cause direct current in the PE conductor. If a residual current device (RCD) or a residual current monitoring device (RCM) is used for protection in the event of a direct or indirect contact, only a type B RCD or RCM is permitted at the supply end of the product.

- If the use of a residual current device is not mandatory according to the standards, SEW-EURODRIVE recommends not using a residual current device.

5.3.5 Line contactor



NOTICE

Damage to the MOVIGEAR® inverter when using the line contactor for jog mode.

Damage to the MOVIGEAR® inverter.

- Do not use the line contactor (see wiring diagram) for jog mode but only for switching on or off the inverter. Use the control commands for jog mode.
- Observe a minimum switch-off time of 2 s for the line contactor.

- Use only a contactor of utilization category AC-3 (EN 60947-4-1) as a line contactor.

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5.3.6 Notes on PE connection

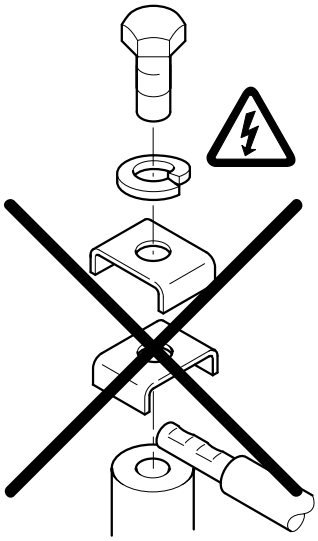
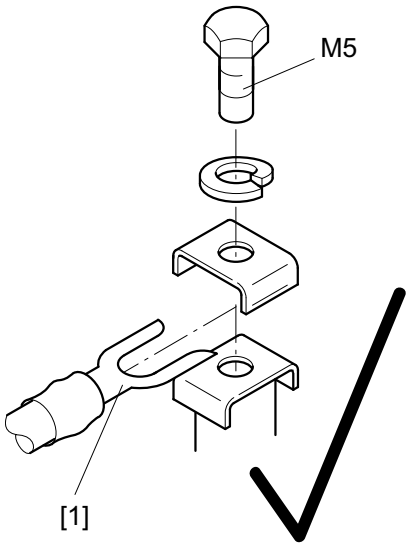
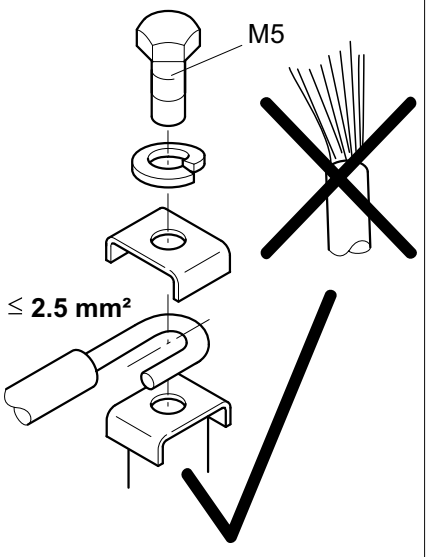


⚠ WARNING

Electric shock due to incorrect connection of PE.

Severe or fatal injuries.

- The permitted tightening torque for the screw is 2.0 to 2.4 Nm (18 to 21 in-lbs).
- Observe the following notes regarding PE connection.

Impermissible assembly	Recommendation: Assembly with forked cable lug Permitted for all cross sections	Assembly with solid connecting wire Permitted for cross sections up to max. 2.5 mm²
		

[1] Forked cable lug suitable for M5 PE screws

Leakage currents

Earth-leakage currents ≥ 3.5 mA can occur during normal operation. Observe the following notes to fulfill EN 61800-5-1:

- The protective earth (PE) connection must meet the requirements for systems with high earth-leakage currents.
- This usually means
  - installing a PE connection cable with a minimum cross section of 10 mm²
  - or installing a second PE connection cable in parallel with the original PE connection.

5.3.7 Installation above 1000 m asl

Provided the following conditions are met, you can install MOVIGEAR® drive units at altitudes from 1000 m to a maximum of 4000 m above sea level.[1)]

- The nominal continuous power is reduced due to the reduced cooling above 1000 m (see chapter "Technical data and dimension sheets").

- Above 2000 m above sea level, the air and creeping distances are only sufficient for overvoltage category II. If the installation requires overvoltage category III, you will have to install additional external overvoltage protection to limit overvoltage peaks to 1.5 kV phase-to-phase and 2.5 kV phase-to-ground.
- If safe electrical disconnection is required, it must be implemented outside the unit for altitudes of 2000 m above sea level and higher (safe electrical disconnection in accordance with EN 61800-5-1).
- At installation altitudes between 2000 m and 4000 m above sea level, the permitted rated power supply voltages are reduced as follows:
  - By 6 V per 100 m

1) The maximum altitude is limited by the reduced electric strength due to the lower air density.

5.3.8 Protection devices

INFORMATION

It is essential that you observe the installation instructions in the documentation of the controller you use.

- MOVIGEAR® drive units are equipped with integrated protection devices against overload.
- Cable protection must be implemented using external overload devices.
- Observe the relevant standards concerning the cable cross section, voltage drop and installation type.

5.3.9 UL-compliant installation

INFORMATION

Due to UL requirements, the following chapter is always printed in English independent of the language of the publication.

Power terminals

Observe the following notes for UL-compliant installation:

- Use 75 °C copper wire only.
- Tighten power terminals to 1.2 – 1.4 Nm (10.6 – 12.4 in-lbs).

Short circuit current rating

Suitable for use on a circuit capable of delivering not more than 200,000 rms symmetrical amperes when protected by 600 V non-semiconductor fuses or 500 V minimum inverse time circuit breakers.

- MOVIGEAR®, the max. voltage is limited to 500 V.

Suitable for motor group installation on a circuit capable of delivering not more than 5,000 rms symmetrical amperes when protected by maximum 40 A, 600 V non-semiconductor fuses or 500 V minimum 40 A maximum inverse time circuit breaker.

- MOVIGEAR®, the max. voltage is limited to 500 V.

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Branch circuit protection

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes.

The table below list the permitted maximum branch circuit protection:

Series	Non-semiconductor fuses	Inverse time circuit breakers
MOVIGEAR®	40 A/600 V	500 V minimum/ 40 A maximum

Motor overload protection

MOVIGEAR® is provided with load and speed-sensitive overload protection and thermal memory retention upon shutdown or power loss.

The trip current is adjusted to 150% of the rated motor current.

Ambient temperature

MOVIGEAR® is suitable for an ambient temperature of 40 °C, max. 55 °C with derated output current. To determine the output current rating at temperatures above 40 °C, the output current should be derated by 3.0% per K between 40 °C and 55 °C.

An additional speed-dependent derating may be required. For details, refer to chapter "Technical data and dimension sheets".

Wiring diagrams

For wiring diagrams, refer to chapter "Electrical installation".

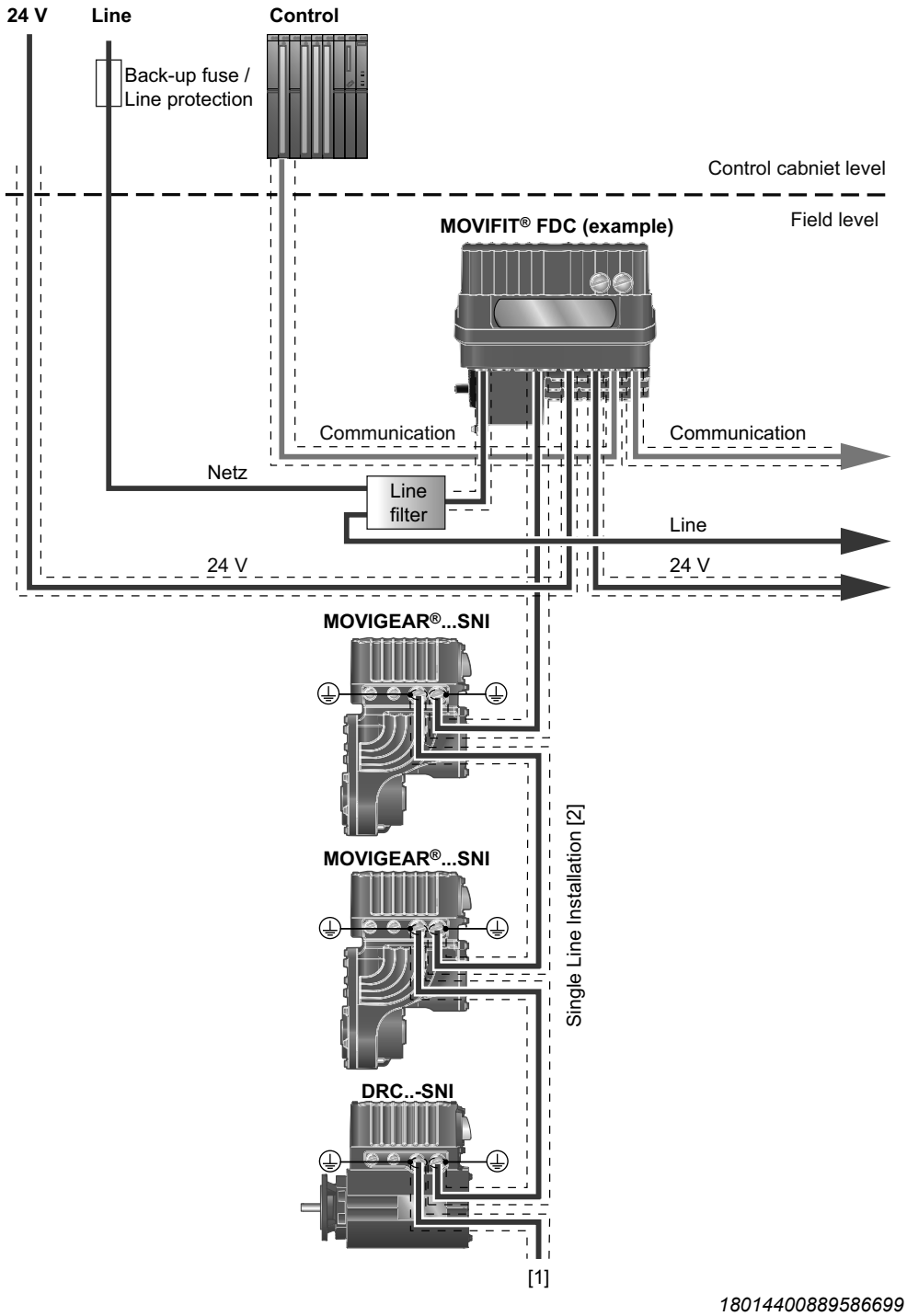
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5.4 Installation topology (example)

INFORMATION

The following figure shows a basic installation topology with MOVIGEAR® DSC.

It is essential that you observe the installation instructions in the documentation of the controller you use.



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[1] A maximum of 10 SNI actuators in total
[2] Permitted cable length between controller and last actuator max. 100 m

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5.5 Terminal assignment

⚠ WARNING

Electric shock due to regenerative operation while the shaft is turning.

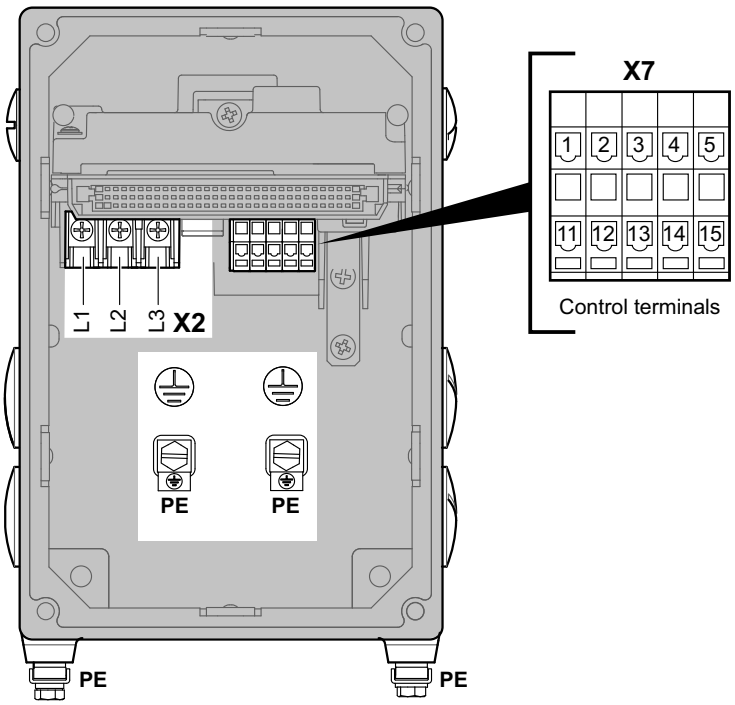
Severe or fatal injuries.

- Secure the output shaft against rotation when the electronics cover is removed.

INFORMATION

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

The following figure shows the terminal assignment of MOVIGEAR® SNI:



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Assignment				
Terminal	**No.**	**Name**	**Marking**	**Function (permitted tightening torque)**
X2 line terminals	–	L1	Brown	Actuator supply phase L1 with SNI communication (1.2 to 1.4 Nm)
	–	L2	Black	Actuator supply phase L2 with SNI communication (1.2 to 1.4 Nm)
	–	L3	Gray	Actuator supply phase L3 with SNI communication (1.2 to 1.4 Nm)
⏚	–	PE	–	Protective earth connection (2.0 to 3.3 Nm)

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Assignment				
Terminal	**No.**	**Name**	**Marking**	**Function**
X7 control terminals	1	STO+	Yellow	Input STO+
	2	STO-	Yellow	Input STO-
	3	+24V_SEN	–	DC 24 V voltage supply for sensors The sensor supply voltage is then available at the optional plug connector
	4	0V24_SEN	–	0V24 reference potential supply for sensors
	5	24V_O	–	DC 24 V output
	11	STO+	Yellow	Output STO+ (to loop through)
	12	STO-	Yellow	Output STO- (to loop through)
	13	+24V_SEN	–	Looping of the DC 24 V voltage supply for sensors
	14	0V24_SEN	–	Looping of the 0V24 reference potential for sensors
	15	0V24_O	–	0 V 24 reference potential

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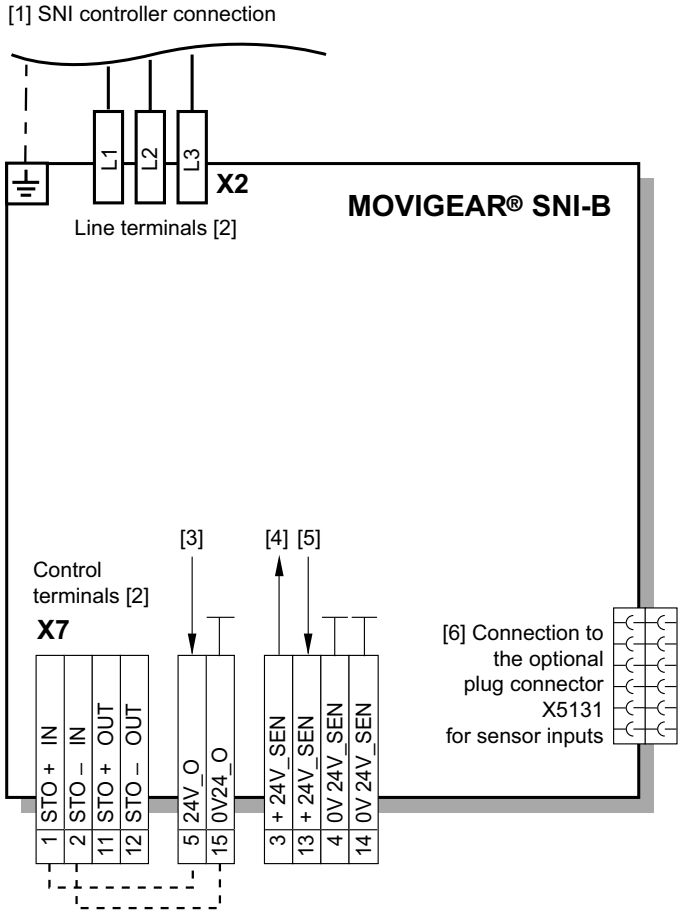
5.6 Connecting the MOVIGEAR® drive unit

⚠ WARNING

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

Severe or fatal injuries.

- Do not use the 24 V output (terminals 5, 15) 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 a safety function.



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[1] See documentation of the SNI controller
[2] See chapter "Terminal assignment"
[3] DC 24 V output
[4] Sensor supply input; the sensor supply voltage is then available at the optional plug connector for sensor inputs
[5] Looping of the sensor supply input
[6] See chapter "Assignment of optional plug connectors"

5.7 External braking resistor (/EBW option)

5.7.1 Important information



⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages can still be present for up to 5 minutes after disconnection from the power supply system.

Severe or fatal injuries.

- Before removing the electronics cover, de-energize the drive units using a suitable external disconnection device.
- Secure the drive unit against unintended reconnection of the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least the following time before removing the electronics cover: **5 minutes**.



⚠ WARNING

Risk of burns due to hot surfaces.

Severe injuries.

- Let the devices cool down before touching them.



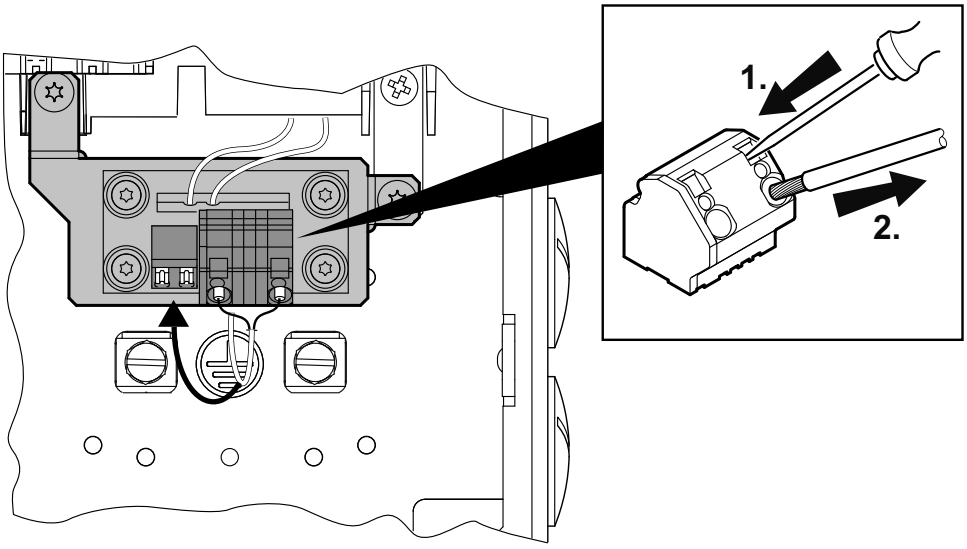
INFORMATION

An external braking resistor can only be connected with the /EBW option.

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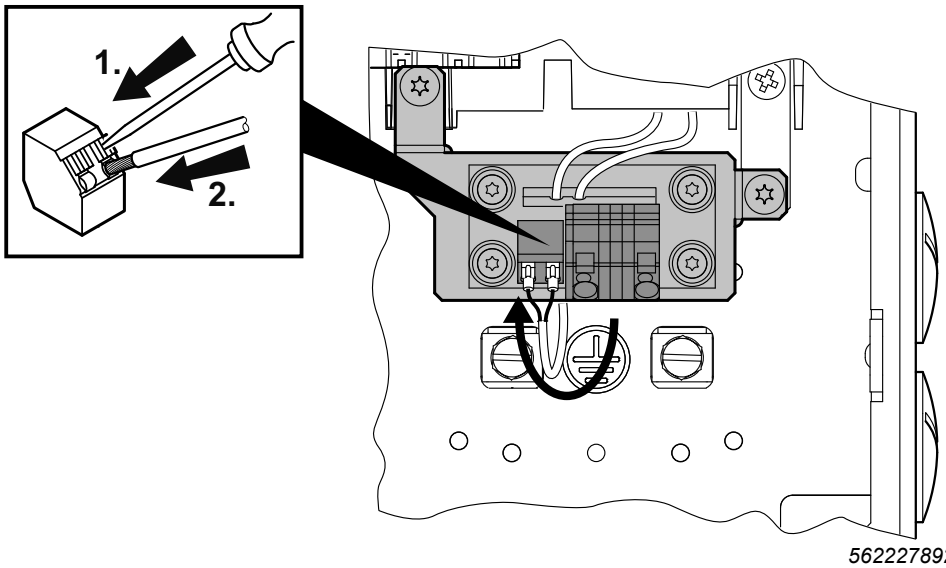
5.7.2 Steps

1. Observe chapter "Important notes".
2. Disconnect all components from the voltage supply and use an external disconnecting device to avoid an unintentional reconnection.
3. Loosen the wiring of the internal braking resistor delivered as standard.



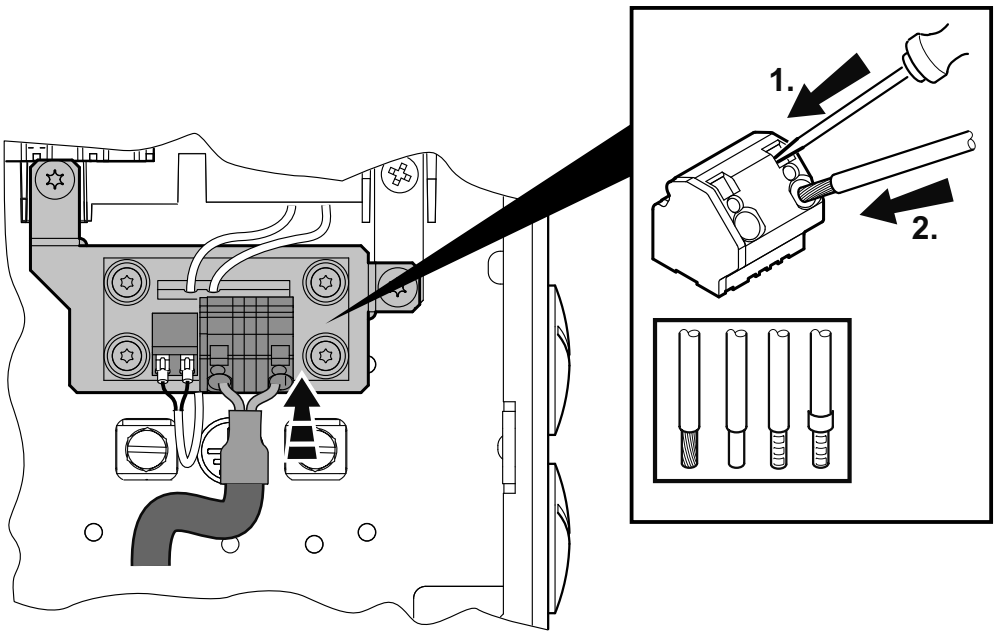
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4. Connect the connections of the internal braking resistor to the dummy terminals provided for this purpose.



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5. Connect the external braking resistor to the respective terminals. Observe chapter "Cable routing and shielding".



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The permitted cable cross sections of the terminal are given in the following table.

Terminals of external braking resistor X5	**Without conductor end sleeve**	**With conductor end sleeves (with or without plastic collar)**
Connection cross section (mm^2)	0.08 mm^2 – 4.0 mm2	0.25 mm^2 – 2.5 mm^2
Connection cross section (AWG)	AWG28 – AWG12	AWG23 – AWG14
Stripping length	8 mm – 9 mm	

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5.8 Cable routing and cable shielding

5.8.1 Accessory bag with installation equipment (part number 18241395)

INFORMATION

For some installation variants, you do not need all the parts of the accessory kit.

The following examples apply to variants with die cast housing. You can identify units with die cast housing by means of the type designation of the electronics cover, see chapter "Unit structure of the die-cast design/type designation".

Each MOVIGEAR® drive unit in die-cast design is delivered with an accessory bag that contains installation equipment for cable shielding (except for when the order did not include all possible connections as plug connector design):

- **A1: Installation material for line cables and hybrid cables:**

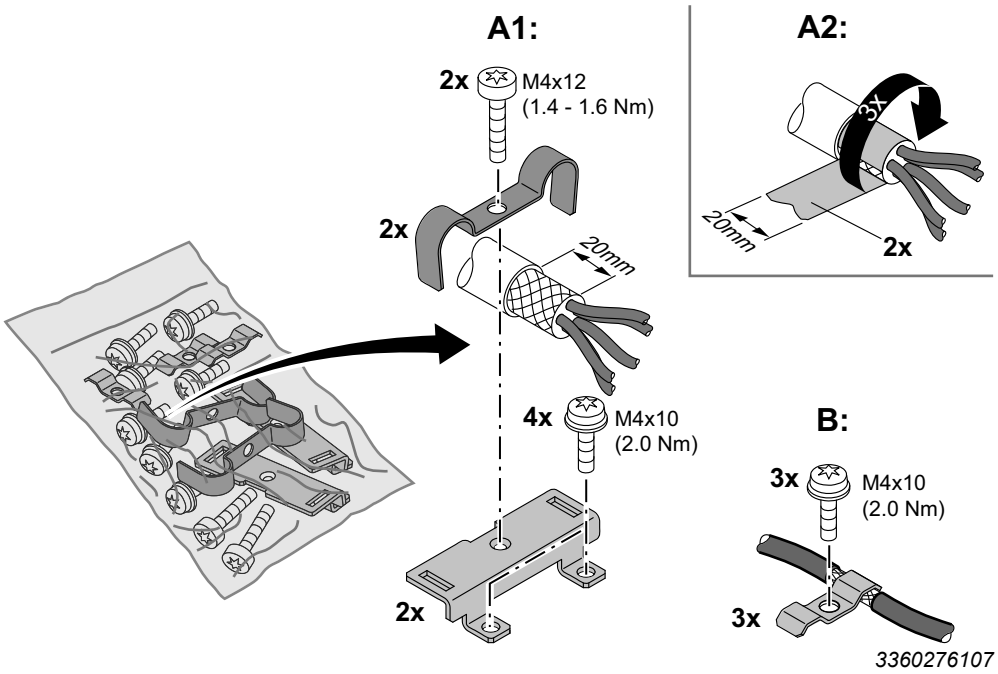
  2 × shield clamps with shield plate and screws to connect the shield of line cables (SNI) or hybrid cables (outer shield).

- **A2: Conductive film:**

  2 × pieces of conductive film to wind around the braided shield. Use the conductive film if required.

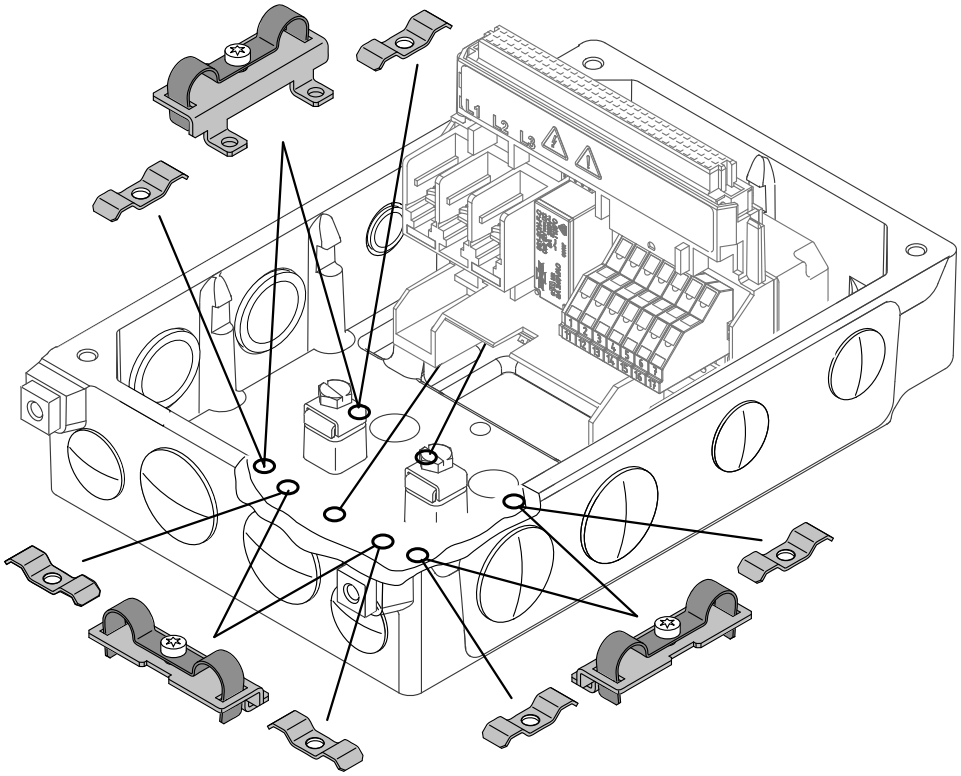
- **B: Installation material for control cables and data cables:**

  3 × shield clamps with screw to connect the shield of control cables or data cables (STO, CAN, binary signals).



5.8.2 General installation options

The following figure shows the general installation options. The following chapters show common examples and contain important notes on cable selection and cable routing.



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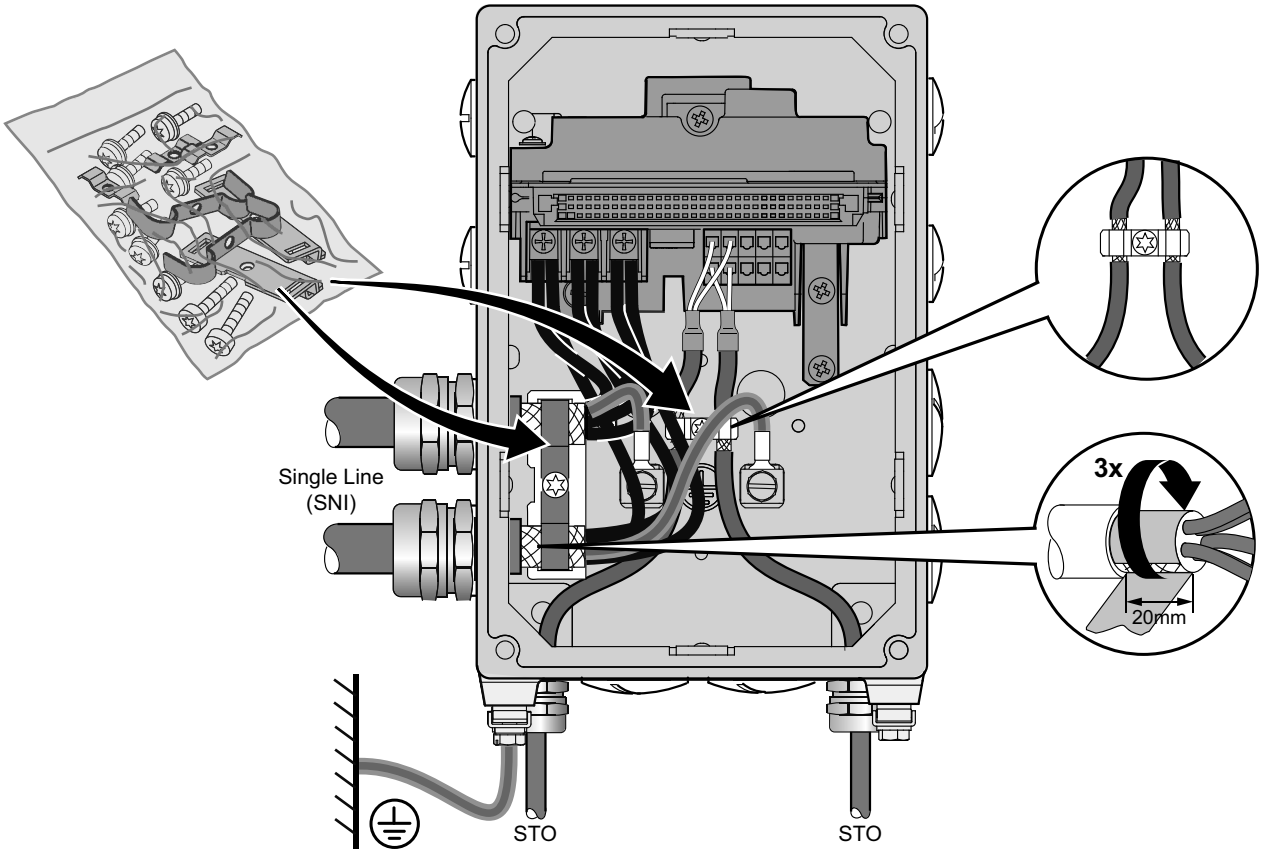
5.8.3 Notes on cable routing and shielding

Note the following when routing and shielding the cables:

- Cable selection
  - Only use cable types prescribed by SEW-EURODRIVE.
  - It is essential that you observe chapter "Technical data and dimension sheets/ Specification of recommended connection cables for single line installation" in the operating instructions.
  - Always use metal cable glands due to their attenuation properties.
- Cable shielding – Control cables
  - Connect the shields of the control cables to the metal housing of the unit using the shield clamps of the installation material kit. To do so, strip off the cable sheath around the shield connection surface.
  - As an alternative, you can use optionally available EMC cable glands to connect the shield of control cables, see chapter "EMC cable glands".
- Cable shielding – Supply system cable (single line)
  - Wind the conductive film included in the installation material kit around the braided shield three times, if required.
  - Connect the cable shields of the supply system cable (single line) to the metal housing of the unit using the shield clamps of the installation material kit.
- External braking resistor (only with /EBW option)
  - Also observe the notes in the chapter "Cable routing and cable shielding/external braking resistor".
- Observe the permitted bending radii of the installed cables for cable routing.

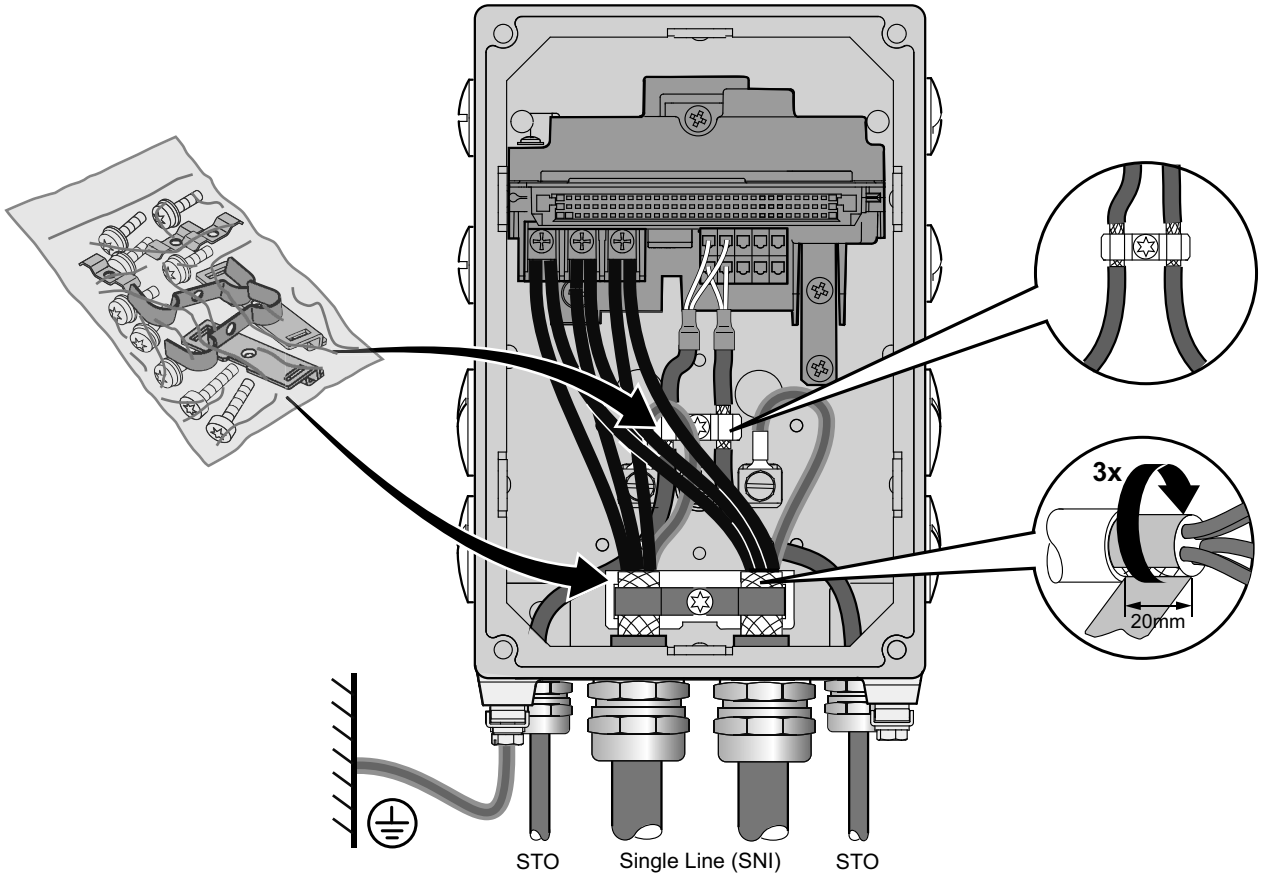
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Recommended cable routing



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Alternative cable routing



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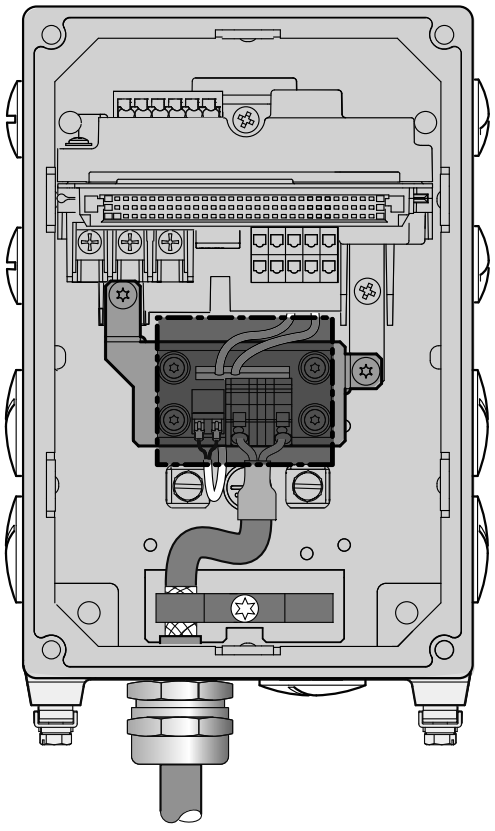
5.8.4 External braking resistor

For installing an external braking resistor in connection with the /EBW option, you have to additionally observe the following notes:

- Connection is only possible with /EBW option, see chapter "Electrical installation/ external braking resistor (/EBW option)".
- Use shielded cables for connecting the external braking resistor.
- Connect the cable shield of the cable for the external braking resistor to the metal housing of the unit using the shield clamps provided in the installation material kit. To do so, strip off the cable sheath around the shield connection surface.
- To prevent interference emission, do not route supply system cables and control cables in the areas indicated in the below figures above or under the additional board (see following examples).

Example of "cable routing of position 3"

The following example shows how to connect the external braking resistor with cable routing of position "3".



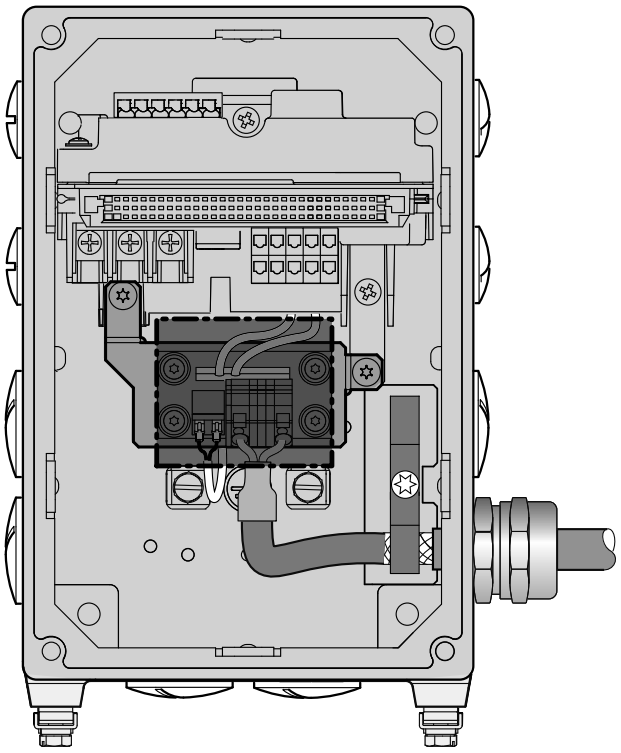
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To prevent interference emission, do not route supply system cables and control cables in this area.

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Example of "cable routing on the side"

The following example shows how to connect the external braking resistor with cable routing on the side.



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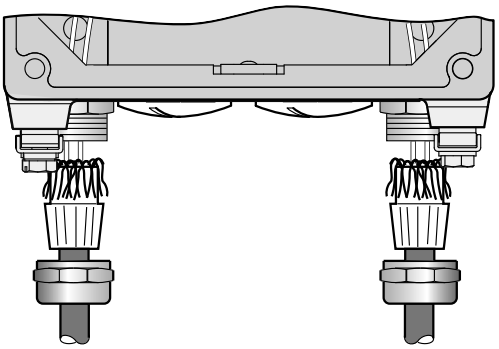
To prevent interference emission, do not route supply system cables and control cables in this area.

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5.9 EMC cable glands

5.9.1 Cable shielding (alternative) – Control cables

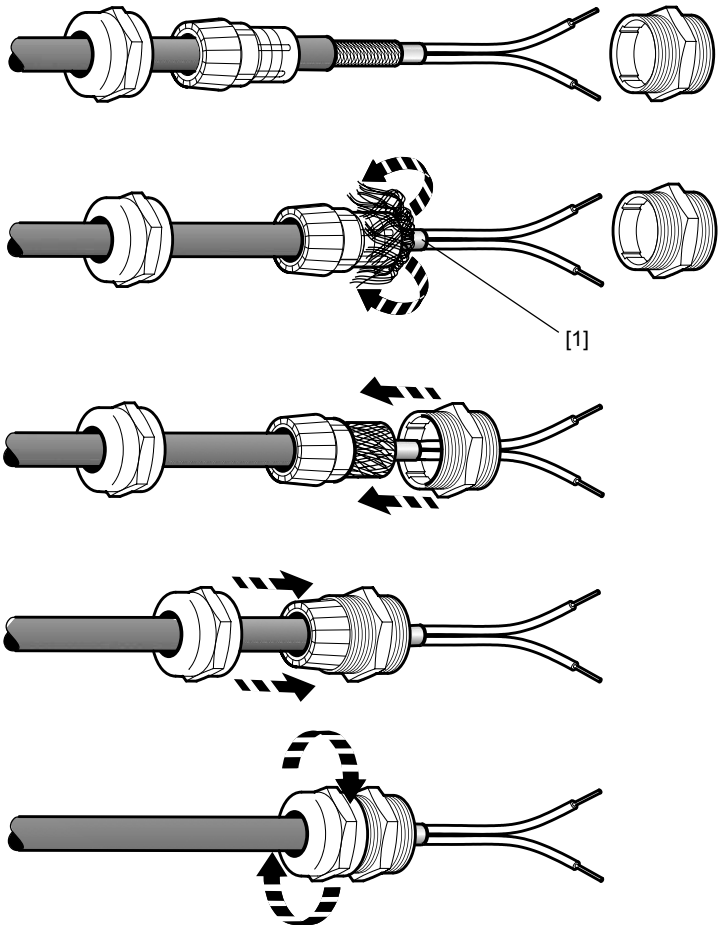
As an alternative to using shield clamps for control cables (STO, binary signals), you can use optionally available EMC cable glands to connect the shield.



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5.9.2 Assembly of EMC cable glands

Fit the EMC screw fittings supplied by SEW-EURODRIVE according to the following picture:



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[1] Cut off insulation foil and fold it back.

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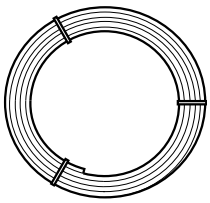
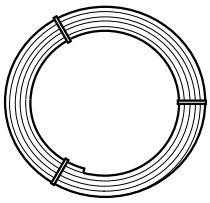
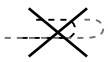
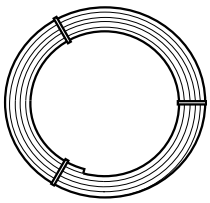
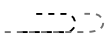
5.10 Required connection cables for single line installation (SNI)

INFORMATION

You find more permitted SNI cables in the technical data/chapter "Prescribed connection cables for single line installation".

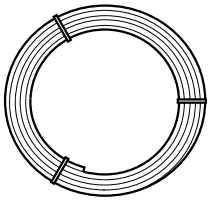
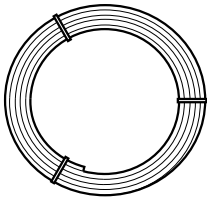
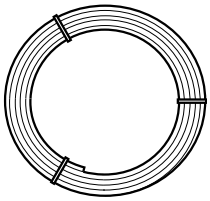
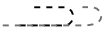
The following tables show the available SNI supply system cables:

5.10.1 Cable cross section 2.5 mm²

SNI line connection cable				
Lengths that can be preassembled	**Conformity/ part number**	**Cable type see also technical data**	**Length/installation type**	**Cable cross section/operating voltage**
Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE: 13303309	HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	Fixed 	2.5 mm² / AC 500 V
Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	UL: 19092156	HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J-UL/CSA	Fixed 	
Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE/UL: 19095090	HELUKABEL TOPSERV® – 109 (halogen-free)	Fixed 	

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5.10.2 Cable cross section 4 mm²

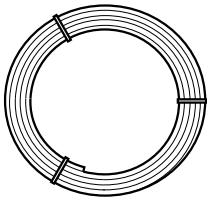
SNI line connection cable				
Lengths that can be preassembled	**Conformity/ part number**	**Cable type see also technical data**	**Length/installation type**	**Cable cross section/operating voltage**
Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE: 13305506	HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J	Fixed 	4 mm² / AC 500 V
Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	UL: 19092164	HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J-UL/CSA	Fixed 	
Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE/UL: 19095104	HELUKABEL TOPSERV® – 109 (halogen-free)	Fixed 	

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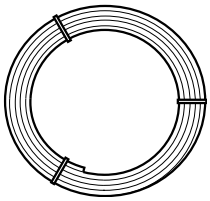
5.11 Hybrid cables AC 400 V, communication (DSC or SNI) and safe disconnection (STO)

The following tables show the hybrid cables available for AC 400 V, communication, and safe disconnection (STO):

5.11.1 Cable cross section 2.5 mm²

Hybrid cable				
Lengths that can be preassembled	**Conformity/ part number**	**Cable type see also technical data**	**Length/ installation type**	**Cable cross section/operating voltage**
Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE/UL: 19162812	LEONI Type: LEHC 005295 (halogen-free)	Fixed 	2.5 mm² / AC 500 V

5.11.2 Cable cross section 4 mm²

Hybrid cable				
Lengths that can be preassembled	**Conformity/ part number**	**Cable type see also technical data**	**Length/ installation type**	**Cable cross section/operating voltage**
Cable reel 100 m Cable reel 200 m  Open cable end (not prefabricated)	CE/UL: 19162820	LEONI Type: LEHC 005296 (halogen-free)	Fixed 	4 mm² / AC 500 V

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5.12 Plug connectors

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

5.12.1 Designation key

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

X	**Terminal**
2	**Group** 1 = Power input 2 = Power output 3 = Encoder 4 = Bus 5 = Inputs and outputs
01	**Function** Function of the plug connector within a group
2	**Type** Wiring diagram of the plug connector within a function
–	
	Group number (optional) For several plug connectors with the same function
	Sequence number (optional) For several plug connectors in a group

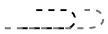
5.12.2 Connection cables

Connection cables are not included in the 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 design of the required connection cables depend on the design of the devices 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 
	Variable length	Not suitable for cable carrier installation 

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Cable routing

Observe the permitted bending radii of the installed cables for cable routing. For detailed information, refer to chapter "Technical data/Dimension sheets/Plug connectors including mating connectors".

Cable types

INFORMATION

For detailed information about cable types, see chapter "Technical data and dimension sheets/Connection cables".

Using prefabricated cables with plug connectors

SEW-EURODRIVE uses prefabricated cables for certifications, type tests and approval of the devices. The cables provided by SEW-EURODRIVE fulfill all requirements necessary to ensure that the device and all connected components function properly. The devices under consideration are always the basic devices including all connected components and corresponding connection cables.

This is why SEW-EURODRIVE recommends to use only the prefabricated cables specified in the documentation.

When using devices with integrated safety functions according to EN ISO 13849, you also have to adhere to all the conditions and requirements for the installation and routing of cables described in the documentation for the devices concerning functional safety.

Using third-party cables with plug connectors

If third-party cables are used – even if these cables are technically adequate – SEW-EURODRIVE does not accept any liability and cannot guarantee device properties or functions.

When using third-party cables to connect the device and/or device components, make sure to comply with all applicable national regulations. Note that the technical features of the device or system of devices might be affected inadvertently when using non-SEW cables. This concerns in particular the following properties:

- Mechanical properties (e.g. IP degree of protection, cable carrier suitability)
- Chemical properties (e.g. silicone and halogen free, resistance to substances)
- Thermal properties (e.g. thermal stability, increase in device temperature, flammability class)
- EMC behavior (such as interference emission limit values, compliance with interference immunity values stipulated in standards)
- Functional safety (approvals according to EN ISO 13849-1)

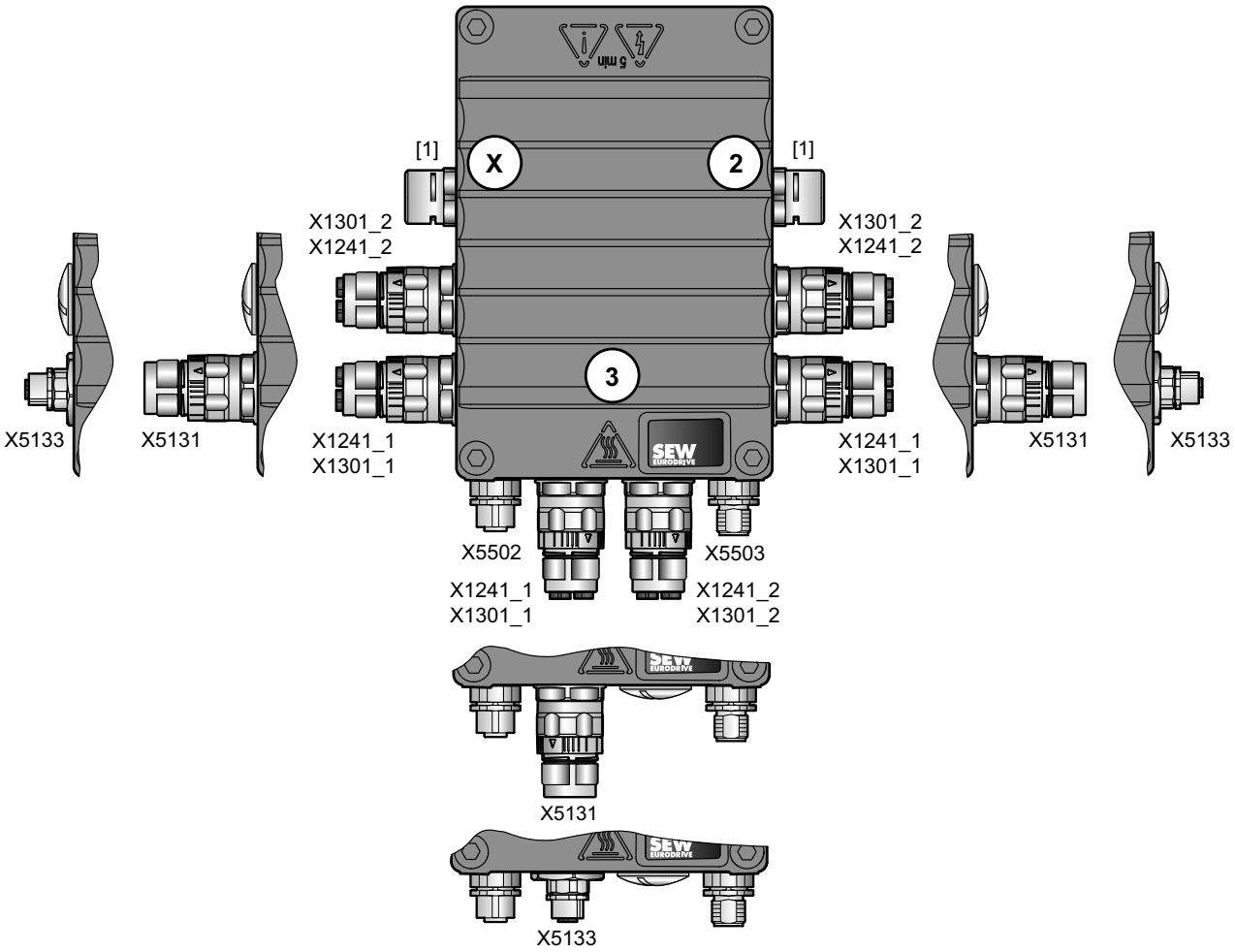
Third-party cables not explicitly recommended by SEW-EURODRIVE must meet at least the requirements of the following standards and have been permitted according to these plug connector standards:

- IEC 60309
- IEC 61984

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5.12.3 Plug connector positions

The following figure shows possible plug connector positions:



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Plug connector	Position	Cannot be combined with plug connector
X5131 Digital inputs/outputs	X, 2 or 3, not together at a position with: • X1241_1/X1241_2 • X1301_1/X1301_2	• X5133
X5133 (black) Digital inputs/outputs	X, 2 or 3, not together at a position with: • X1241_1/X1241_2 • X1301_1/X1301_2	• X5131
X5502 (orange) STO[1)]	3 (left)	• X1301_1/X1301_2
X5503 (orange) STO[1)]	3 (right)	

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Plug connector	Position	Cannot be combined with plug connector
X1241_1 (red) AC 400 V connection with SNI[2)]	X, 2 or 3 not together at a position with: • X5131/X5133	• X1301_1/X1301_2
X1241_2 (red) AC 400 V connection with SNI	Always corresponds to the selection of X1241_1	
X1301_1 (red/yellow) AC 400 V connection with SNI, safe disconnection (STO)[3)]	X, 2 or 3, not together at a position with: • X5131/X5133	• X1241_1/X1241_2 • X5502/X5503
X1301_2 (red/yellow) AC 400 V connection with SNI, safe disconnection (STO)	Always corresponds to the selection of X1301_1	
[1] Optional pressure compensation	Depending on mounting position	

1) Plug connectors X5502 and X5503 can only be ordered together.

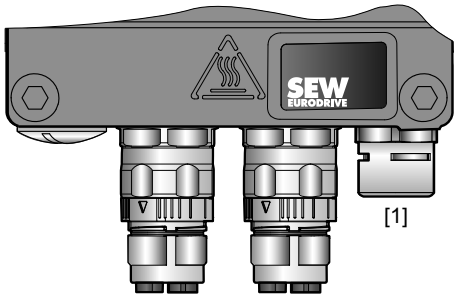
2) Plug connector X1241_1 can also be ordered separately (i.e. without plug connector X1241_2).

3) Plug connector X1301_1 can also be ordered separately (i.e. without plug connector X1301_2).

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5.12.4 Restrictions in conjunction with pressure compensation

In connection with optional pressure compensation and mounting positions M5 and M6, the position for STO plug connectors is occupied by the pressure compensation fitting [1]. In this case, plug connectors for STO are not possible:



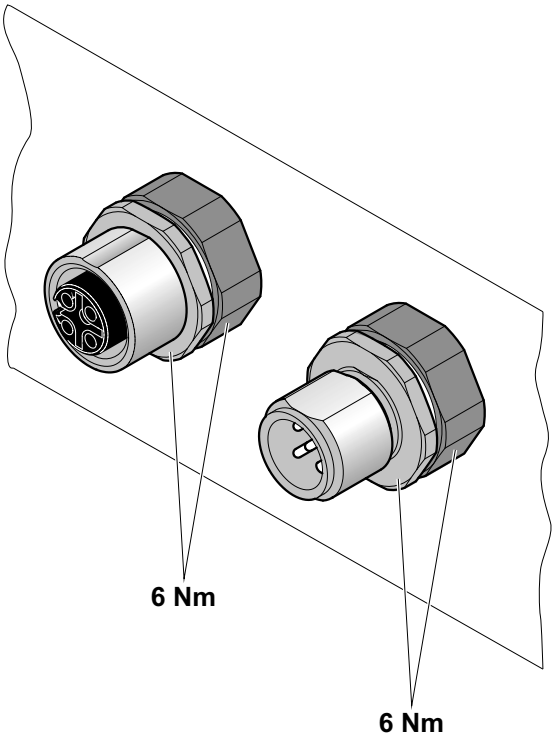
18014400955587339

5.12.5 Plug connector variant

M12 plug connectors

M12 plug connectors are delivered so they match the connection cables provided by SEW-EURODRIVE. Customers can adjust the orientation of plug connectors if required.

The following figure shows a schematic illustration with the permitted tightening torques:



19443420299

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M23 plug connectors



⚠ CAUTION

Possible damage of the right-angle connector when rotated 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.



⚠ CAUTION

Loss of the guaranteed degree of protection.

Potential damage to property.

- Remove the union nut from the M23 plug connector using 3 Nm.
- Between plug connector and bushing is a gap of 2 mm.



⚠ CAUTION

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.
- Do not turn the plug connector regularly once it has been installed.

M23 plug connectors are available in the following variants:

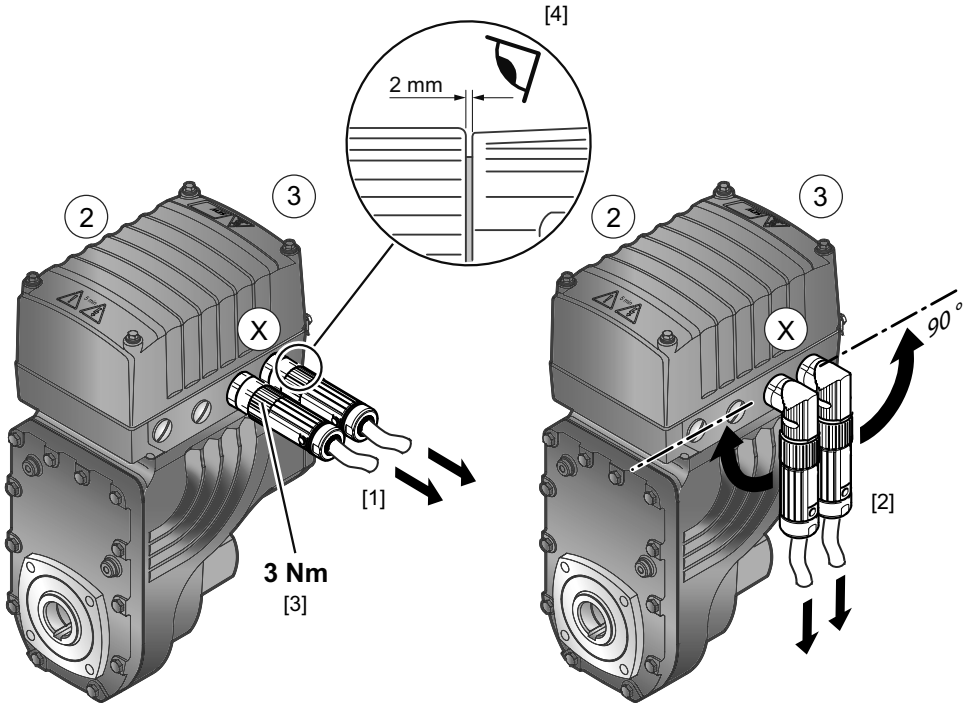
- [1] "Straight" plug connector
- [2] "Right-angle" plug connector

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

Example of MOVIGEAR®

INFORMATION

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



45035999122851595

[1] "Straight" design
[2] "Angled" design
[3] Tightening torque 3 Nm
You can order suitable tools from Intercontec using the following order number:
- Socket wrench 3 Nm, 1/4" external square driver: C1.020.00
- Hook wrench 1/4" square socket, suitable to the 923/723 series with SpeedTec equipment: C6.216.00

[4] There is a gap of 2 mm between plug connector and socket

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5.12.6 Using plug connectors assembled by yourself

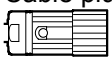
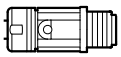
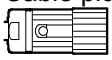
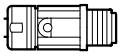
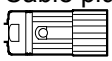
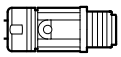
INFORMATION

The power and hybrid plug connectors for assembling connection cables yourself, and the corresponding assembly tool set is available for order from Intercontec.

Contact Intercontec if the order designation is not available in the online order system of Intercontec.

Order information

The table below shows the order designations for Intercontec connectors with the matching coding for assembly by the customer:

Connector type		Designation for ordering from supplier Intercontec
DBC/DAC/DSC **Coding ring: Black**	Cable plug (male) 	H 51 A 019 MR 02 59 0102 000
	Cable socket (female) 	H 52 A 013 FR 02 59 0102 000
SNI **Coding ring: Red**	Cable plug (male) 	H 51 A 031 MR 02 42 0103 000
	Cable socket (female) 	H 52 A 025 FR 02 59 0103 000
DSC hybrid **Coding ring: Violet**	–	Not intended for assembly by customer.
DSC/SNI hybrid+STO **Coding ring: Yellow**	Cable plug (male) 	H 51 A 613 MR 18 59 0110 007
	Cable socket (female) 	H 52 A 613 FR 18 59 0110 007

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5.13 Optional plug connector assignment



⚠ WARNING

Electric shock due to connecting or disconnecting plug connectors when voltage is applied.

Severe or fatal injuries.

- Switch off the line voltage.
- Never plug or unplug plug connectors while they are energized.

5.13.1 X1241_1 and X1241_2: AC 400 V connection with SNI



INFORMATION

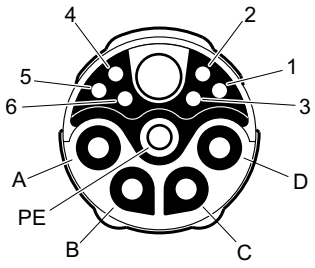
The communication method requires that you must observe the order of the line phases L1, L2, L3 between SNI controller and SNI stations 1 to 10.

The following tables show information about this connection:

Function
AC 400 V connection for supplying the device/for looping through With Single Line Network Installation (SNI)

Connection type
M23, SEW insert, SpeedTec equipment, company: Intercontec, female, coding ring: red, protected against contact

Connection diagram



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	Res.	Reserved
PE	PE	PE connection
1	Res.	Reserved
2	Res.	Reserved
3	Res.	Reserved

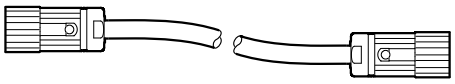
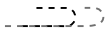
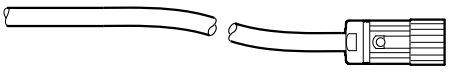
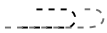
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4	Res.	Reserved
5	Res.	Reserved
6	Res.	Reserved

Connection cables

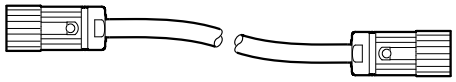
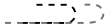
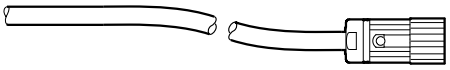
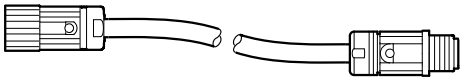
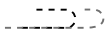
The following tables list the cables available for this connection:

Cable cross section 2.5 mm²

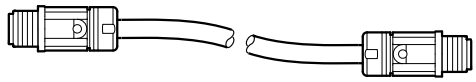
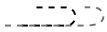
Connection cable	Conformity/ part number	Cable type see also technical data	Length/installation type	Cable cross section/operating voltage
 M23, coding ring: red, male — M23, coding ring: red, male	CE: 18127509	HELUKABEL® TOPFLEX® – EMV-UV-2YSLCYK-J	Variable 	2.5 mm² / AC 500 V
	UL: 18150381	HELUKABEL® TOPFLEX® – EMV-UV-2YSLCYK-J-UL/CSA	Variable 	
	CE/UL: 18120679	HELUKABEL® TOPSERV® – 109 (halogen-free)	Variable 	
 Open — M23, coding ring: red, male	CE: 18127517	HELUKABEL® TOPFLEX® – EMV-UV-2YSLCYK-J	Variable 	2.5 mm² / AC 500 V
	UL: 18150403	HELUKABEL® TOPFLEX® – EMV-UV-2YSLCYK-J-UL/CSA	Variable 	
	CE/UL: 18120687	HELUKABEL® TOPSERV® – 109 (halogen-free)	Variable 	

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Cable cross section 4 mm²

Connection cable	Conformity/ part number	Cable type see also technical data	Length/installation type	Cable cross section/operating voltage
 M23, coding ring: red, male — M23, coding ring: red, male	CE: 18127525	HELUKABEL® TOPFLEX® – EMV-UV-2YSLCYK-J	Variable 	4 mm² / AC 500 V
	UL: 18150411	HELUKABEL® TOPFLEX® – EMV-UV-2YSLCYK-J-UL/CSA	Variable 	
	CE/UL: 18120695	HELUKABEL® TOPSERV® – 109 (halogen-free)	Variable 	
 Open — M23, coding ring: red, male	CE: 18127533	HELUKABEL® TOPFLEX® – EMV-UV-2YSLCYK-J	Variable 	4 mm² / AC 500 V
	UL: 18153259	HELUKABEL® TOPFLEX® – EMV-UV-2YSLCYK-J-UL/CSA	Variable 	
	CE/UL: 18120709	HELUKABEL® TOPSERV® – 109 (halogen-free)	Variable 	
 M23, coding ring: red, male — M23, coding ring: red, female	CE/UL: 18166296	HELUKABEL® TOPSERV® – 109 (halogen-free)	Variable 	4 mm² / AC 500 V

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Connection cable	Conformity/ part number	Cable type see also technical data	Length/installation type	Cable cross section/operating voltage
 M23, coding ring: red, female M23, coding ring: red, female	CE/UL: 18191444	HELUKABEL® TOPSERV® – 109 (halogen-free)	Variable 	4 mm² / AC 500 V

Connection of cables with open end

The following tables show the conductor assignment of cables with the following part numbers:

Part number	Signal name	Color coding	Identification
18127517	L1_SNI	Brown	–
18150403	L2_SNI	Black	–
18127533	L3_SNI	Gray	–
18153259	PE	Green/yellow	–

Part number	Signal name	Color coding	Identification
18120687	L1_SNI	Black	1
18120709	L2_SNI	Black	2
	L3_SNI	Black	3
	PE	Green/yellow	–

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5.13.2 X1301_1 and X1301_2: AC 400 V connection with SNI, safe disconnection (STO)

INFORMATION

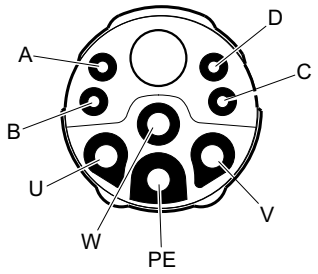
The communication method requires that you must observe the order of the line phases L1, L2, L3 between SNI controller and SNI stations 1 to 10.

The following tables show information about this connection:

Function
AC 400 V connection for unit supply/daisychaining with Single Line Network Installation (SNI), safe disconnection (STO)

Connection type
M23, SEW insert, female, SpeedTec-capable, company: Intercontec, coding ring: Red/yellow, protected against contact

Connection diagram



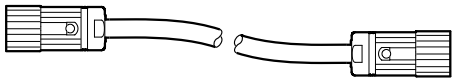
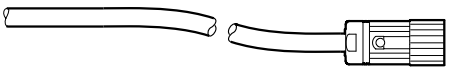
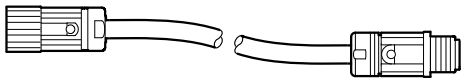
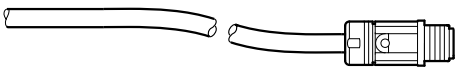
Assignment		
No.	**Name**	**Function**
U	L1_SNI	Actuator supply phase L1 with SNI communication
V	L2_SNI	Actuator supply phase L2 with SNI communication
W	L3_SNI	Actuator supply phase L3 with SNI communication
PE	PE	PE connection
A	STO+	STO+ connection
B	STO-	STO- connection
C	Res.	Reserved
D	Res.	Reserved

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Connection cables

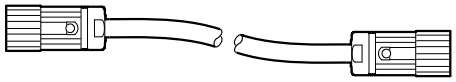
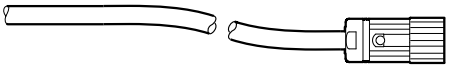
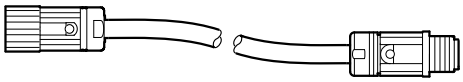
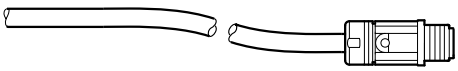
The following tables list the cables available for this connection:

Cable cross section 2.5 mm²

Connection cable	Conformity/ part number	Cable type, see also technical data	Length/in-stallation type	Cable cross section/op-erating voltage
 M23, coding ring: yellow, male — M23, coding ring: yellow, male	CE/UL: 18177867	LEONI Type: LEHC 005295 (halogen-free)	Variable	2.5 mm² / AC 500 V
 Open — M23, coding ring: yellow, male	CE/UL: 18191134	LEONI Type: LEHC 005295 (halogen-free)	Variable	2.5 mm² / AC 500 V
 M23, coding ring: yellow, male — M23, coding ring: yellow, female	CE/UL: 18177883	LEONI Type: LEHC 005295 (halogen-free)	Variable	2.5 mm² / AC 500 V
 Open — M23, coding ring: yellow, female	CE/UL: 18191401	LEONI Type: LEHC 005295 (halogen-free)	Variable	2.5 mm² / AC 500 V

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Cable cross section 4 mm²

Connection cable	Conformity/ part number	Cable type, see also technical data	Length/in-stallation type	Cable cross section/op-erating voltage
 M23, coding ring: yellow, male — M23, coding ring: yellow, male	CE/UL: 18177875	LEONI Type: LEHC 005296 (halogen-free)	Variable	4 mm² / AC 500 V
 Open — M23, coding ring: yellow, male	CE/UL: 18191142	LEONI Type: LEHC 005296 (halogen-free)	Variable	4 mm² / AC 500 V
 M23, coding ring: yellow, male — M23, coding ring: yellow, female	CE/UL: 18177891	LEONI Type: LEHC 005296 (halogen-free)	Variable	4 mm² / AC 500 V
 Open — M23, coding ring: yellow, female	CE/UL: 18191428	LEONI Type: LEHC 005296 (halogen-free)	Variable	4 mm² / AC 500 V

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Connection of cables with open end

The following tables show the conductor assignment of cables with the following part numbers:

Part number	Signal name	Color coding	Identification
18191134 18191401 18191142 18191428	L1_SNI	Black	U/L1
	L2_SNI	Black	V/L2
	L3_SNI	Black	W/L3
	PE	Green/yellow	–
	STO+	Black	2
	STO-	Black	1
	Reserved	Blue	–
	Reserved	Drain wire	–
	Reserved	White	–

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5.13.3 X5131: Digital inputs/outputs

The following table shows information about this connection:

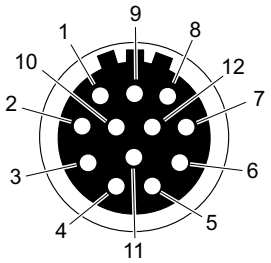
INFORMATION

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

Function
Digital inputs/outputs – motion control MOVIGEAR®

Connection type
M23, P insert 12-pin, SpeedTec-capable, company: Intercontec, female, 0° coded

Connection diagram



Assignment

No.	Name	Function Motion control inputs DIP switch S2/3 = OFF	Function Local mode DIP switch S2/3 = ON
1	DI01	Sensor input DI01	CW/stop
2	DI02	Sensor input DI02	CCW/stop
3	DI03	Sensor input DI03	Setpoint f1/f2
4	DI04	Sensor input DI04	Switch between Automatic/local mode
5	Res.	Reserved	Reserved
6	Res.	Reserved	Reserved
7	Res.	Reserved	Reserved
8	+24V_O	Reserved	DC 24 V output
9	0V24V_O	Reserved	0 V 24 reference potential
10	0V24V_SEN	0V24 reference potential for sensors[1)] Must be supplied via terminals X7.4	Reserved
11	+24V_SEN	DC 24 V sensor supply[1)] Must be supplied via terminals X7.3	Reserved

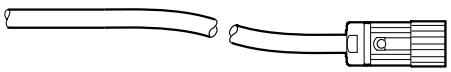
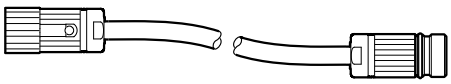
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Assignment			
No.	**Name**	**Function** **Motion control inputs** **DIP switch S2/3 = OFF**	**Function** **Local mode** **DIP switch S2/3 = ON**
12	FE	Equipotential bonding/functional earth	Equipotential bonding/functional earth

[1] See operating instructions, chapter "Connecting the MOVIGEAR® drive unit".

Connection cables

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

Connection cable	Conformity/part number	Length/installation type	Operating voltage
 Open — M23, 12-pin, 0°coded, male	CE/UL: 11741457	Variable	DC 60 V
 M23, 12-pin, 0° coded, male — M23, 12-pin, 0° coded, female	CE/UL: 18123465	Variable (max. 30 m)	DC 60 V

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Connection of cables with open end

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

Part number	Signal name	Color coding
11741457	DI01	Pink
	DI02	Gray
	DI03	Red
	DI04	Blue
	Reserved	Yellow
	Reserved	Green
	Reserved	Violet
	+24V_O	Black
	0V24_O	Brown
	0V24_SEN	White
	+24 V_SEN	Gray/pink
	FE	Red/blue

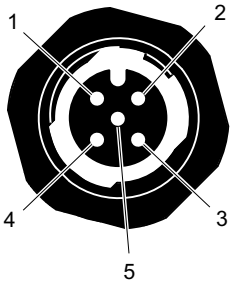
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5.13.4 X5133: Digital inputs/outputs

The following table shows information about this connection:

Function
Digital inputs/outputs – motion control MOVIGEAR®

Connection type
M12, 5-pin, female, A-coded

Wiring diagram


Assignment			
No.	**Name**	**Function** **Motion control inputs** **DIP switch S2/3 = OFF**	**Function** **Local mode** **DIP switch S2/3 = ON**
1	+24 V_SEN	DC 24 V sensor supply[1)] Must be supplied via terminals X7.3	Function is not supported
2	DI01	DI01 sensor input	
3	0V24V_SEN	0V24 reference potential for sensors[1)] Must be supplied via terminals X7.4	
4	DI02	Sensor input DI02 (touchprobe input)	
5	FE	Equipotential bonding / functional earth	

[1)] See operating instructions, chapter "Connecting the MOVIGEAR® drive unit".

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5.13.5 X5502: STO



⚠ WARNING

No safe disconnection of the MOVIGEAR® drive unit.

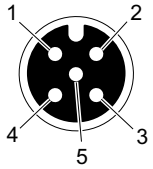
Severe or fatal injuries.

- 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 connection with 24 V when the MOVIGEAR® drive unit is not used to fulfill any safety functions.

The following table shows information about this connection:

Function
Connection for safe disconnection (STO)

Connection type
M12, 5-pin, female, A-coded

Wiring diagram


Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO-	STO- connection
3	0V24_O	0V24 reference potential
4	STO+	STO+ connection
5	Res.	Reserved

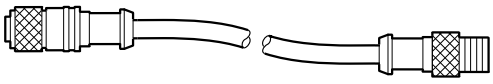
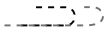
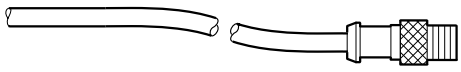
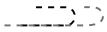
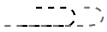
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Connection cables

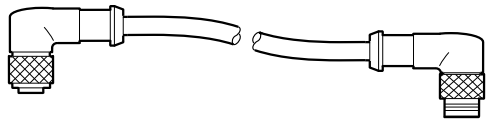
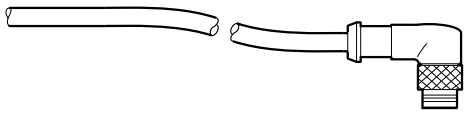
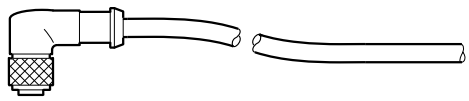
INFORMATION

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

The following table shows the cables available for this connection:

Connection cable	Conformity/ part number	Cable type	Length/in-stallation type	Cable cross section/ operating voltage
 M12, 5-pin, A-coded, female — M12, 5-pin, A-coded, male	CE: 18124968	LEONI BETAflam® – 145C-flex	Variable 	2 × 0.75 mm² / DC 60 V
	CE/UL: 18147402	HELU-KABEL® SUPER-PAAR-TRONIC 340-C-PUR	Variable 	
 Open — M12, 5-pin, A-coded, male	CE: 18124976	LEONI BETAflam® – 145C-flex	Variable 	2 × 0.75 mm² / DC 60 V
	CE/UL: 18147690	HELU-KABEL® SUPER-PAAR-TRONIC 340-C-PUR	Variable 	
 M12, 5-pin, A-coded, female — Open	CE/UL: 18164390	HELU-KABEL® SUPER-PAAR-TRONIC 340-C-PUR	Variable 	2 × 0.75 mm² / DC 60 V

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Connection cable	Conformity/ part number	Cable type	Length/in-stallation type	Cable cross section/ operating voltage
 M12, 5-pin, A-coded, female — M12, 5-pin, A-coded, male	CE: 18127401	LEONI BETAflam® – 145C-flex	Variable	2 × 0.75 mm² / DC 60 V
	CE/UL: 18147704	HELU-KABEL® SUPER-PAAR-TRONIC 340-C-PUR	Variable	
 Open — M12, 5-pin, A-coded, male	CE: 18127398	LEONI BETAflam® – 145C-flex	Variable	2 × 0.75 mm² / DC 60 V
	CE/UL: 18153445	HELU-KABEL® SUPER-PAAR-TRONIC 340-C-PUR	Variable	
 M12, 5-pin, A-coded, female — Open	CE: 18164315	LEONI BETAflam® – 145C-flex	Variable	2 × 0.75 mm² / DC 60 V

Connection of cables with open end

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

Part number	Signal name	Conductor color	Identification
18124976	STO-	Black	1
18147690 18164390 18127398 18153445 18164315	STO+	Black	2

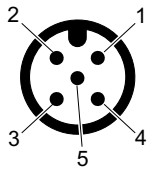
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5.13.6 X5503: STO

The following table shows information about this connection:

Function
Connection for safe disconnection (STO)

Connection type
M12, 5-pin, male, A-coded

Wiring diagram


Assignment		
No.	**Name**	**Function**
1	Res.	Reserved
2	STO-	STO- connection
3	Res.	Reserved
4	STO+	STO+ connection
5	Res.	Reserved

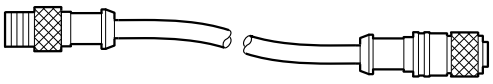
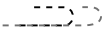
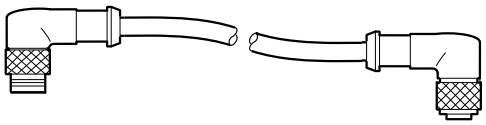
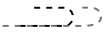
27798801/EN – 11/2022

Connection cables

INFORMATION

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

The following table shows the cables available for this connection:

Connection cable	Conformity/ part number	Cable type	Length/in-stallation type	Cable cross section/ operating voltage
 M12, 5-pin, A-coded, male — M12, 5-pin, A-coded, female	CE: 18124968	LEONI BETAflam® – 145C-flex	Variable 	2 × 0.75 mm² / DC 60 V
	CE/UL: 18147402	HELU-KABEL® SUPER-PAAR-TRONIC 340-C-PUR	Variable 	
 M12, 5-pin, A-coded, male — M12, 5-pin, A-coded, female	CE: 18127401	LEONI BETAflam® – 145C-flex	Variable 	2 × 0.75 mm² / DC 60 V
	CE/UL: 18147704	HELU-KABEL® SUPER-PAAR-TRONIC 340-C-PUR	Variable 	

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5.13.7 STO jumper plug

⚠ WARNING

Safe disconnection of the MOVIGEAR® drive unit is not possible when the STO jumper plug is used.

Severe or fatal injuries.

- You may only use the STO jumper plug when the MOVIGEAR® drive unit does not fulfill any safety function.

⚠ WARNING

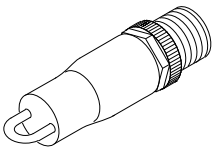
Deactivation of safety-related disconnection of other drive units due to parasitic voltages when using an STO jumper.

Severe or fatal injuries.

- You may only use the STO jumper plug when all incoming and outgoing STO connections have been removed from the drive unit.

The STO jumper plug can be connected to the STO plug connector X5502 of MOVIGEAR®. The STO jumper plug deactivates the safety functions of the MOVIGEAR® drive unit.

The following figure shows the STO jumper plug, part number 11747099:

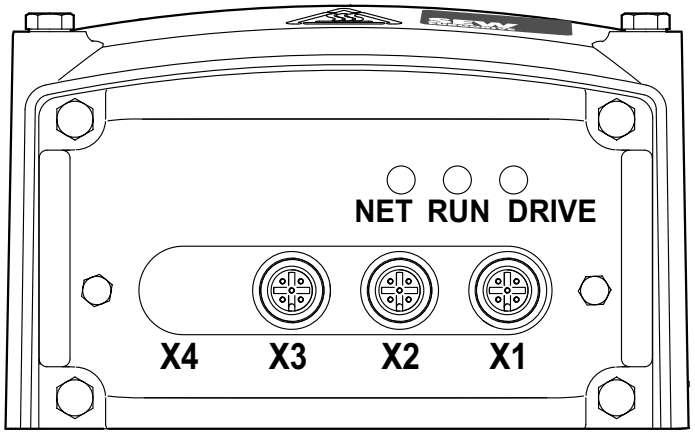


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5.14 Application options

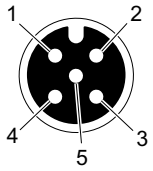
5.14.1 GIO12B

The following figure shows the M12 plug connectors of the GIO12B option:



9007201701475211

Function
Connection of I/Os
Connection type
M12, 5-pin, female, A-coded
Connection diagram



Assignment			
No.		**Name**	**Function**
X3	1	+24V	DC 24 V sensor supply
	2	DI13	Digital input DI13 (switching signal)
	3	0V24	0V24 reference potential for sensors
	4	DI12	Digital input DI12 (switching signal)
	5	res.	Reserved
X2	1	+24V	DC 24 V sensor supply
	2	DI11	Digital input DI11 (switching signal)
	3	0V24	0V24 reference potential for sensors
	4	DI10	Digital input DI10 (switching signal)
	5	res.	Reserved

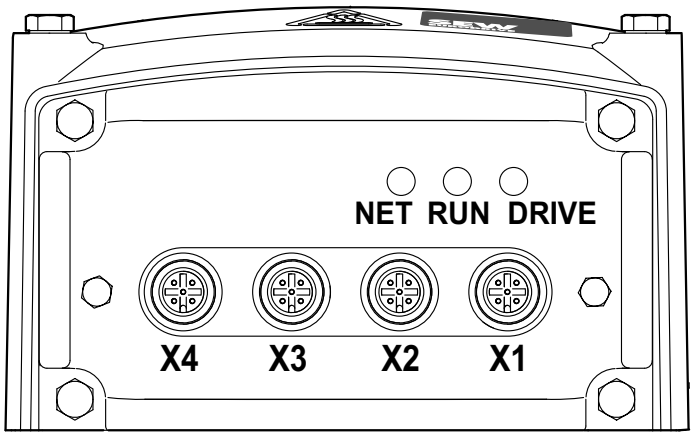
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Assignment			
No.		**Name**	**Function**
X1	1	+24V	DC 24 V actuator supply
	2	DO11	Digital output DO11 (switching signal)
	3	0V24	0V24 reference potential for actuators
	4	DIO10	Digital output DO10 (switching signal)
	5	res.	Reserved

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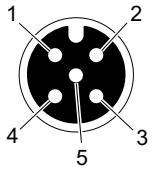
5.14.2 GIO13B

The following figure shows the M12 plug connectors of the GIO13B option:



9007201994722699

Function
Connection of I/Os
Connection type
M12, 5-pin, female, A-coded
Connection diagram



Assignment				
No.		**Name**	**Function**	
X4	1	AI10+	Analog input AI10+	Diff. input 1
	2	AI10-	Analog input AI10-	Diff. input 2
	3	0V24	0V24 reference potential for sensors	
	4	AO10	Analog output AO10	4 – 20 mA
	5	res.	Reserved	
X3	1	+24V	DC 24 V sensor supply	
	2	DI13/LFI B	Digital input DI13/primary frequency (B)	
	3	0V24	0V24 reference potential for sensors	
	4	DI12/LFI A	Digital input DI12/primary frequency (A)	
	5	res.	Reserved	
X2	1	+24V	DC 24 V sensor supply	
	2	DI11	Digital input DI11	
	3	0V24	0V24 reference potential for sensors	
	4	DI10	Digital input DI10	
	5	res.	Reserved	

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Assignment			
No.		**Name**	**Function**
X1	1	DO10_A1	Relay contact (common)
	2	DO10_A3	Relay contact (NC contact)
	3	0V24	0V24 reference potential for actuators
	4	DO10_A2	Relay contact (NC contact)
	5	res.	Reserved

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6 Startup

6.1 Startup notes

INFORMATION

It is essential to comply with the safety notes during startup.

⚠ WARNING



Risk of injury due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the system according to the instructions.
- Never start the MOVIGEAR® drive unit if the protective covers are not installed.

⚠ WARNING



Electric shock caused by dangerous voltages in the connection box. Dangerous voltages can still be present for up to 5 minutes after disconnection from the power supply system.

Severe or fatal injuries.

- Before removing the electronics cover, de-energize the MOVIGEAR® drive units with a suitable external disconnection device.
- Secure the drive unit against unintended reconnection of the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least the following time before removing the electronics cover: **5 minutes**

⚠ WARNING



Risk of burns due to hot surfaces.

Severe injuries.

- Let the devices cool down before touching them.

⚠ WARNING



Device malfunction due to incorrect device setting.

Severe or fatal injuries.

- Observe the startup instructions.
- Always have the installation carried out by trained specialists.
- Only use settings that are correct for the function.

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NOTICE

Device fault 45 or 94 due to power disconnection during the initialization phase.

Possible damage to property.

- After replacing the cover and switching on the power supply, wait at least for 30 s before disconnecting the drive from the supply system again.



INFORMATION

- Before startup, remove the paint protection cap from the LED displays.
- Before startup, remove the paint protection film from the nameplates.
- Observe a minimum switch-off time of 2 seconds for the line contactor.



INFORMATION

- To ensure fault-free operation, do not disconnect or connect signal cables during operation.

6.2 Requirements for startup

The following requirements apply to startup:

- Correct project planning of the MOVIGEAR® drive unit. For project planning notes, refer to the catalog.
- The MOVIGEAR® drive unit is installed correctly, both mechanically and electrically.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures are taken to prevent risk of injury or damage to the machine.

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6.3 Description of DIP switches

6.3.1 Overview

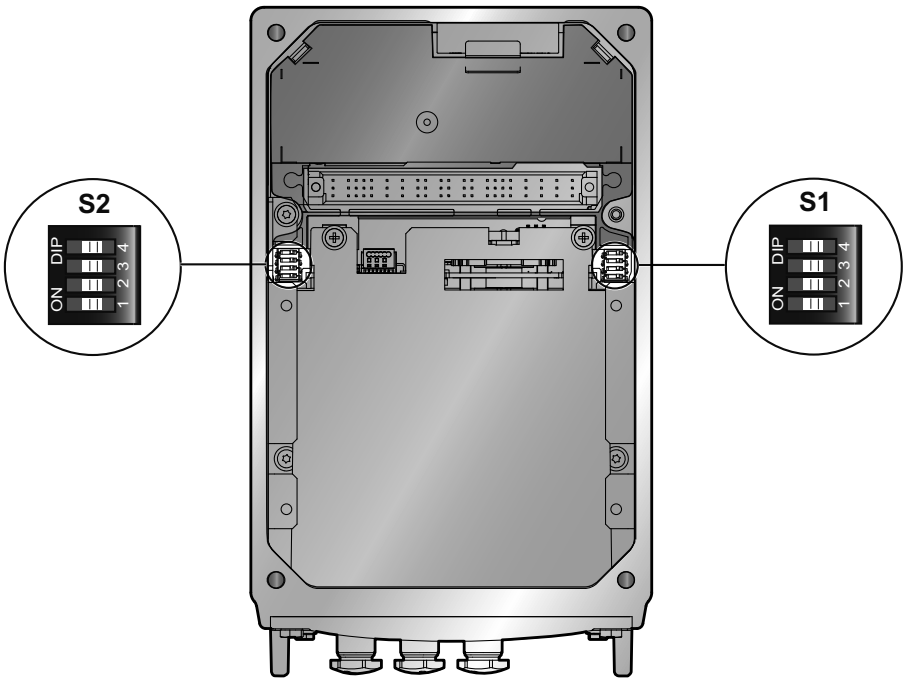
NOTICE

Damage to the DIP switches caused by unsuitable tools.

Possible damage to property.

- Set the DIP switches using only suitable tools, such as a slotted screwdriver with a blade width of no more than 3 mm.
- The force used for setting the DIP switches must not exceed 5 N.

The following figure shows DIP switches S1 and S2:



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DIP switch S1

The following table shows the functions of DIP switch S1:

DIP switch	S1			
	1	2	3	4
	Binary coding SNI device address			
	Bit 2^0	Bit 2^1	Bit 2^2	Bit 2^3
ON	1	1	1	1
OFF	**0**	**0**	**0**	**0**

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DIP switch S2

The following table shows the functions of DIP switch S2:

DIP switch	S2			
	1	2	3	4
	Binary coding operating mode		Using motion control inputs	Reserved
	Bit 2^0	Bit 2^1		
ON	**1**	**1**	Local mode	res.
OFF	0	0	**Sensors**	**res.**

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6.3.2 Description of DIP switches

DIP switches S1/1 – S1/4

Setting the SNI address

These DIP switches are used to set the SNI addresses of the MOVIGEAR® drive units. You can set addresses from 0 to 9. Other settings are not permitted.

SNI address	0	1	2	3	4	5	6	7	8	9
S1/1	–	X	–	X	–	X	–	X	–	X
S1/2	–	–	X	X	–	–	X	X	–	–
S1/3	–	–	–	–	X	X	X	X	–	–
S1/4	–	–	–	–	–	–	–	–	X	X

X = ON

– = OFF

DIP switches S2/1 and S2/2

Setting the operating mode

This DIP switch is used to set the operating mode of the MOVIGEAR® drive unit. Determines how the device is controlled.

When using MOVIFIT® SNI, the operating mode must be set to "SNI-SEWOS", when using MOVIFIT® FDC SNI, it must be set to "VARIABLE".

Mode	MOVIFIT® SNI (SNI-SEWOS)	Reserved	Reserved	MOVIFIT® FDC (VARIABLE)
S2/1	–	X	–	X
S2/2	–	–	X	X

X = ON

– = OFF

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DIP switch S2/3

Using motion control inputs

Use this DIP switch to determine the function of the motion control inputs (accessible only via optional M23 plug connector).

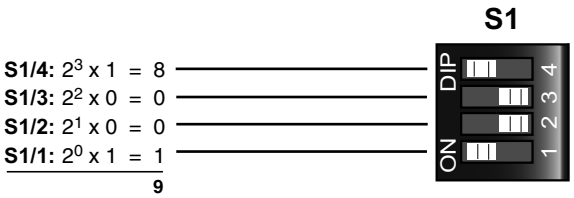
- When DIP switch S2/3 is set to "OFF", the motion control inputs are used for connecting and evaluating sensors. It is not possible to control the actuator via the motion control inputs.
- When DIP switch S2/3 is set to "ON", the motion control inputs can be used for local operation:

Motion control inputs	Functionality with DIP switch S2/3 = ON
Motion control input 1	CW/stop
Motion control input 2	CCW/stop
Motion control input 3	Setpoint selection n_f1/n_f2
Motion control input 4	Local/automatic

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6.4 Startup procedure

1. It is essential that you observe the startup instructions.
2. Disconnect all components from the voltage supply and use an external disconnecting device to avoid unintentional reconnection.
3. Check the correct connection of all connected MOVIGEAR® drive units and, if installed, of the options. Observe chapter "Electrical installation".
4. **NOTICE!** Damage to the DIP switches caused by unsuitable tools. Possible damage to property. Set the DIP switches using only suitable tools, such as a slotted screwdriver with a blade width of ≤ 3 mm. The force used for setting the DIP switches must not exceed 5 N.
   Set the MOVIGEAR® device address: The following figure shows an example of the DIP switch setting for address 9:



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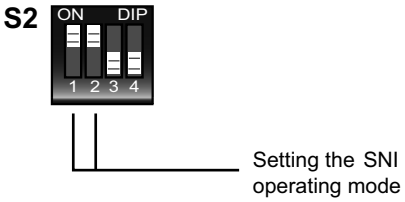
5. ⚠ **WARNING!** Uncontrolled drive enable due to incorrect address setting. Severe or fatal injuries. Assign each device address only once. Check the address settings before you enable the drive for the first time.
   The following table shows how you have to set the DIP switches for device addresses 0 to 9. Other settings are not permitted.

SNI address	0	1	2	3	4	5	6	7	8	9
S1/1	–	X	–	X	–	X	–	X	–	X
S1/2	–	–	X	X	–	–	X	X	–	–
S1/3	–	–	–	–	X	X	X	X	–	–
S1/4	–	–	–	–	–	–	–	–	X	X

X = ON

– = OFF

6. **NOTICE!** Damage to the DIP switches caused by unsuitable tools. Possible damage to property. Set the DIP switches using only suitable tools, such as a slotted screwdriver with a blade width of ≤ 3 mm. The force used for setting the DIP switches must not exceed 5 N.
   Set the operating mode with DIP switch S2:



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   ⇨ The operating mode determines how the device is controlled. The following table shows the setting options:

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⇨ When using MOVIFIT® SNI, the operating mode must be set to "SNI-SEWOS", when using MOVIFIT® FDC SNI, it must be set to "VARIABLE".

Mode	MOVIFIT® SNI (SNI-SEWOS)	Reserved	Reserved	MOVIFIT® FDC (VARIABLE)
S2/1	–	X	–	X
S2/2	–	–	X	X

X = ON

– = OFF

7. Secure the MOVIGEAR® electronics cover on the connection boxes.
8. Start up the assigned SNI controller, observing the instructions in the documentation of the controller in use.

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6.5 Starting up the GIO13B application option



⚠ WARNING

Risk of burns due to hot surfaces.

Severe injuries.

- Let the devices cool down before touching them.

6.5.1 Overview of DIP switches



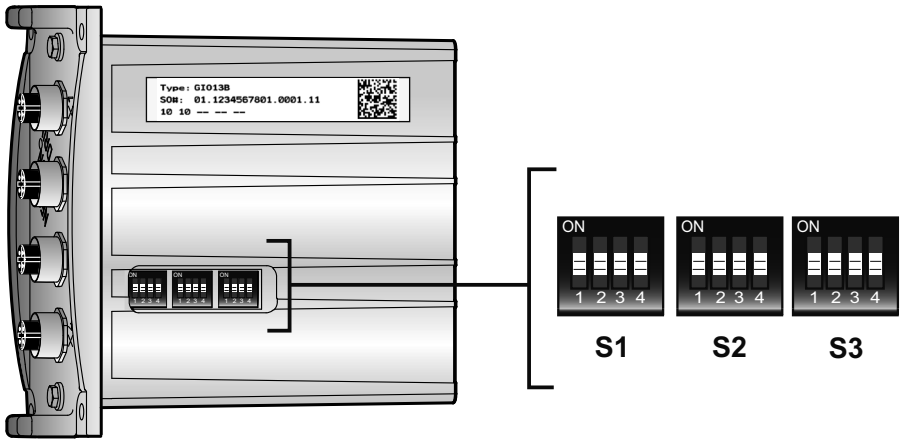
NOTICE

Loss of the guaranteed degree of protection.

Possible damage to property.

- In disassembled condition, you have to protect the GIO13B application option from moisture, dust or foreign particles as there are openings for DIP switches.
- Make sure that the application cover is mounted properly.

The following figure shows the position of the DIP switches in the GIO13B application option:



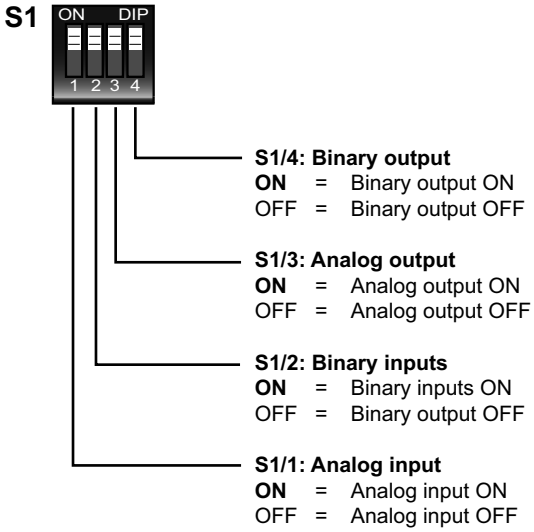
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6.5.2 Setting the DIP switches

DIP switch S1

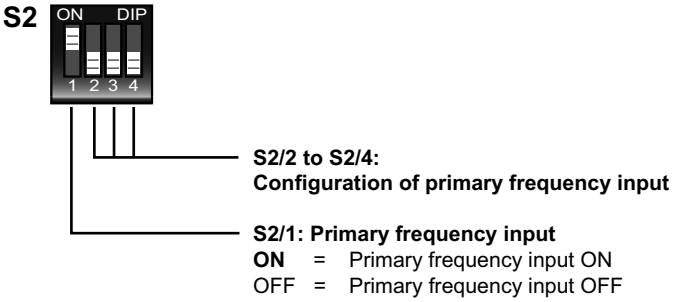
The following figure shows the possible settings for DIP switch S1:



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DIP switch S2

The following figure shows the possible settings for DIP switch S2:



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DIP switches S2/2 to S2/4 are used to configure the primary frequency input. The following table shows the corresponding configuration options:

DIP switch			Configuration
S2/2	**S2/3**	**S2/4**	**Primary frequency input, maximum frequency**
OFF	**OFF**	**OFF**	f = 1 kHz
ON	OFF	OFF	f = 2 kHz
OFF	ON	OFF	f = 5 kHz
ON	ON	OFF	f = 10 kHz
OFF	OFF	ON	f = 20 kHz
ON	OFF	ON	f = 40 kHz
OFF	ON	ON	f = 80 kHz
ON	ON	ON	f = 120 kHz

DIP switch S3

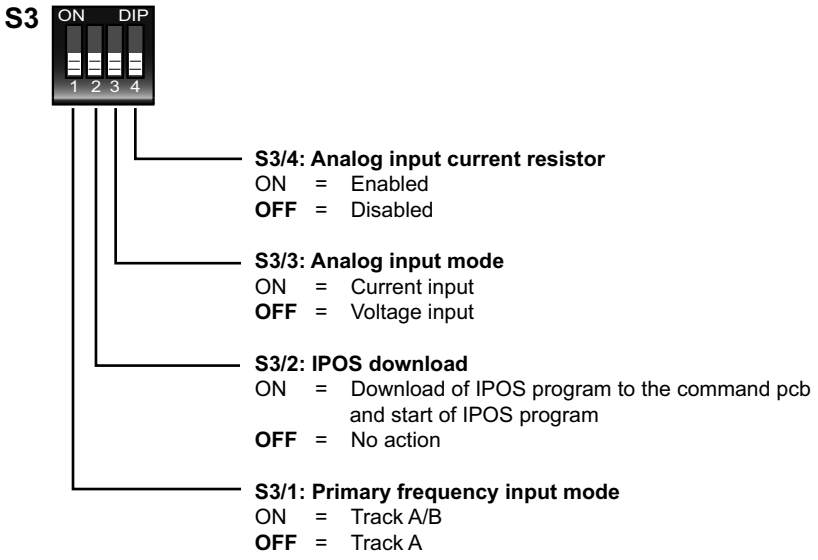
The following figure shows the possible settings for DIP switch S3:

INFORMATION

If the current input mode is set with DIP switch "S3/3 = ON", the current resistor must be activated with DIP switch "S3/4 = ON".

INFORMATION

Notice: Setting DIP switch S3/2 to "ON" will overwrite any IPOS program on the command pcb.



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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

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6.6 Disabling DynaStop® for startup purposes

6.6.1 Important notes on disabling DynaStop®

⚠ WARNING



Removing the MOVIGEAR® electronics cover will disable DynaStop®.

Severe or fatal injuries.

- If it is not permitted to deactivate the system, additional measures are required (e.g. mechanical disconnection).

⚠ WARNING



Electric shock due to regenerative energy created by movement of the system or machine.

Severe or fatal injuries.

- Never touch the MOVIGEAR® wiring space with wiring board and plug connector.
- If you cannot rule out that the wiring space is touched, provide for suitable protection covers.

NOTICE



Damage to the connector plug due to regenerative energy created by movement of the system or machine.

Potential damage to property.

- To prevent the connection plug from being damaged (destroyed contacts), you have to remove the MOVIGEAR® electronics cover completely in order to disable DynaStop®.

INFORMATION



The brake function parameter (index 8584.0) specifies whether DynaStop® is to be activated when revoking enable (enable = "0") or whether the drive unit generates a motor holding torque.

- **Brake function = OFF:** The drive decelerates along the set ramp when the enable signal is revoked. When the speed reaches "0", the drive changes to "No enable" state. DynaStop® is not enabled. The drive generates a motor holding torque.
- Brake function = ON: The drive decelerates along the set ramp when the enable signal is revoked. When the speed reaches "0", the drive changes to "No enable" state. DynaStop® is enabled. The drive does not generate a motor holding torque.

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6.6.2 Steps for disabling DynaStop®

INFORMATION

For more information about the DynaStop® function, refer to chapters "Operation" and "Technical data and dimension sheets".

1. It is essential that you observe chapter "Startup notes".
2. Also observe chapter "Important notes on disabling DynaStop®".
3. Disconnect all components from the voltage supply and use an external disconnecting device to avoid unintentional reconnection.
4. Remove the MOVIGEAR® electronics cover completely.
5. The DynaStop® function is now disabled and the system/machine can be moved mechanically observing the notes in chapter "Important notes on disabling DynaStop®".

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7 Operation of MOVITOOLS® MotionStudio

7.1 About MOVITOOLS® MotionStudio

7.1.1 Tasks

The software package enables you to perform the following tasks with consistency:

- Establishing communication with devices
- Executing functions of the devices

7.1.2 Establishing communication with the devices

The SEW Communication Server is integrated into the MOVITOOLS® MotionStudio software package for establishing communication with the devices.

The SEW Communication Server allows you to create **communication channels**. Once the channels are established, the devices communicate via these communication channels using their communication options. You can operate up to four communication channels at the same time.

MOVITOOLS® MotionStudio supports the following types of communication channels:

- Serial (RS485) via interface adapters
- System bus (SBus) via interface adapters
- Ethernet
- EtherCAT®
- Fieldbus (PROFIBUS DP/DP-V1)
- Tool Calling Interface

The available channels can vary depending on the device and its communication options.

7.1.3 Executing functions with the devices

The software package offers uniformity in executing the following functions:

- Parameterization (e. g. in the parameter tree of the device)
- Startup
- Visualization and diagnostics
- Programming

The following basic components are included in the MOVITOOLS® MotionStudio software package, allowing you to use the devices to execute functions:

- MotionStudio
- MOVITOOLS®

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7.2 First steps

7.2.1 Starting the software and creating a project

To start MOVITOOLS® MotionStudio and create a project, proceed as follows:

1. Start MOVITOOLS® MotionStudio from the Windows start menu via the following menu item:

   [Start]/[Programs]/[SEW]/[MOVITOOLS MotionStudio]/[MOVITOOLS MotionStudio]

2. Create a project with a name and directory.

7.2.2 Establishing communication and scanning the network

To establish communication with MOVITOOLS® MotionStudio and to scan your network, proceed as follows:

1. Set up a communication channel to communicate with your devices.
2. Scan your network (device scan). To do so, click the [Start network scan] button [1] in the toolbar.



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7.2.3 Additional information

INFORMATION

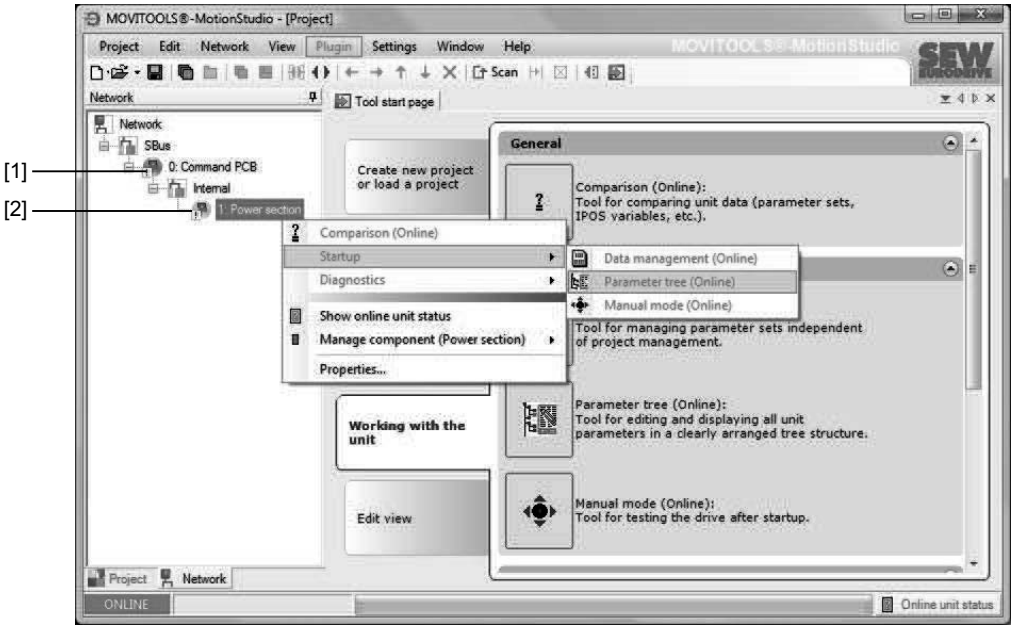
The PC is connected to the MOVIGEAR® inverter via the controller or gateway in use. For detailed information on how to configure a communication channel, refer to the documentation of the controller in use.

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7.2.4 Configuring devices

Do the following to configure a device:

1. Select the device in the network view.
2. Right-click to open the context menu and display the tools for configuring the device.

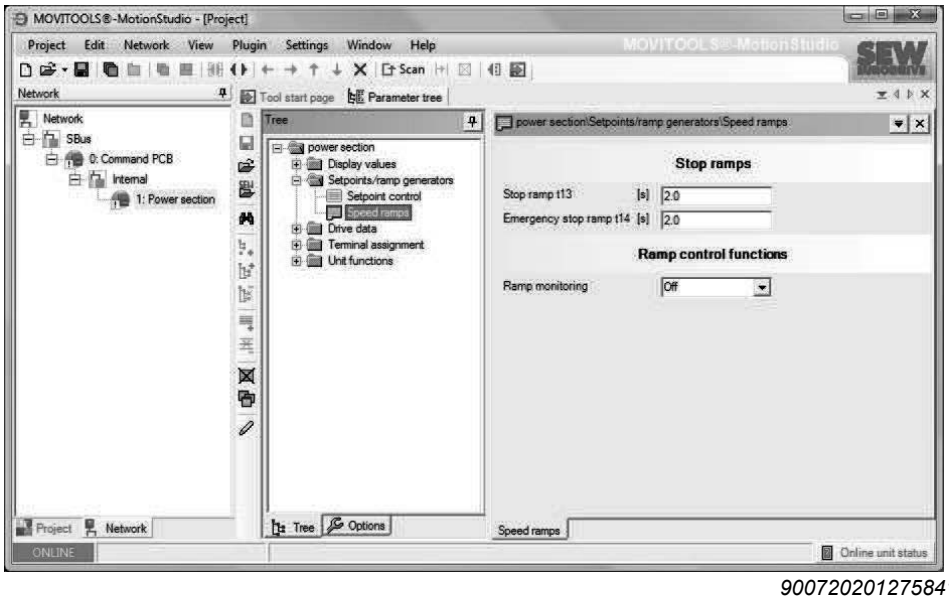


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[1] Command pcb
[2] Power section

The example shows the context menu with the tools for a MOVIGEAR® power section [2]. The communication mode is set to "online" and the device was scanned in the network view.

3. Select a tool (e.g. "Parameter tree") to configure the device.



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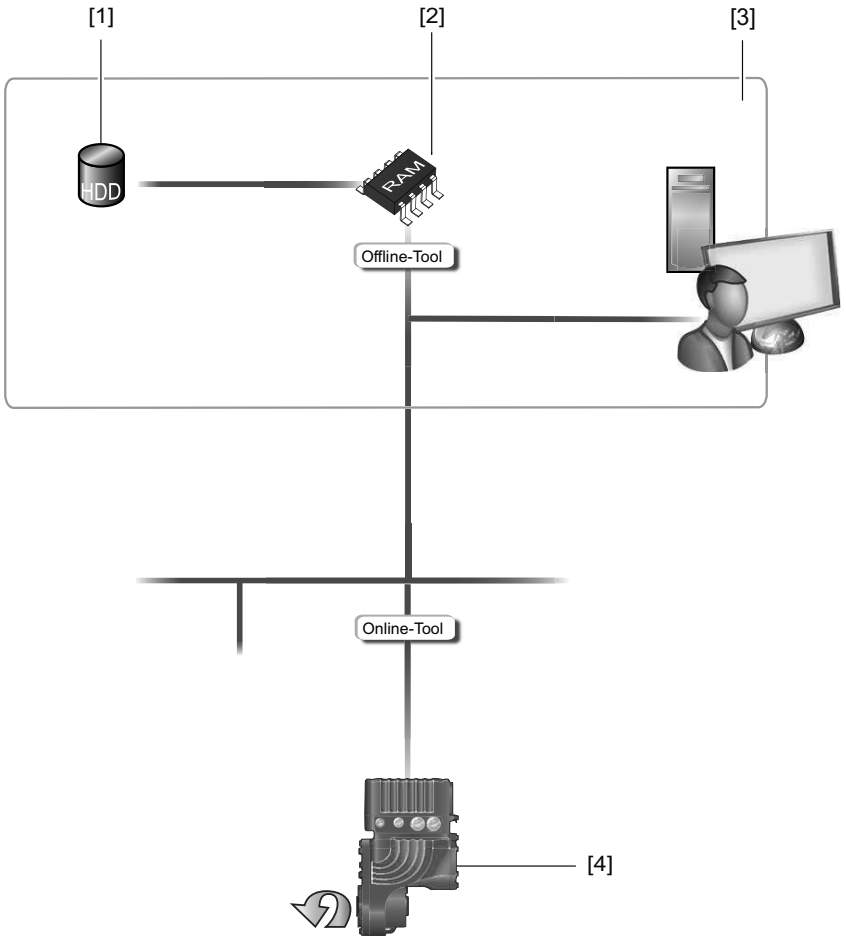
7.3 Connection mode

7.3.1 Overview

MOVITOOLS® MotionStudio differentiates between "online" and "offline" connection mode. You determine the connection mode yourself. Depending on the selected connection mode, you can choose offline or online tools specific to your device.

Overview of offline/online tools

The following figure illustrates the two types of tools:



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[1] Hard drive of the engineering PC
[2] RAM of the engineering PC
[3] Engineering PC
[4] Device

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Description of offline/online tools

INFORMATION

- The "online" connection status is **NOT** a response message which informs you that you are currently connected to the device or that your device is ready for communication. If you need this response message, refer to chapter "Setting up the cyclic availability test" in the online help (or in the manual) of MOVITOOLS® MotionStudio.
- Project management commands (such as "download" and "upload"), the online device status, and the "device scan" work independently of the set connection mode.
- MOVITOOLS® MotionStudio starts up in the connection state that you set before you closed down.

The following figure illustrates the two types of tools:

Tools	Description
Offline tools	Changes made using offline tools affect **"ONLY"** the RAM [2] at first. • Save your project so that the changes can be stored on the hard disk [1] of your engineering PC [3]. • Execute the "Download (PC -> device)" function if you want to transfer the changes to your device [4] as well.
Online tools	Changes made using online tools affect **"ONLY"** the device [4] at first. • Execute the "Upload (device -> PC)" function if you want to transfer the changes to your RAM [2]. • Save your project so that the changes can be stored on the hard disk [1] of your engineering PC [3].

7.3.2 Selecting the connection mode (online or offline)

Proceed as follows to set the connection mode:

1. Select the connection mode:
   - "Switch to online mode" [1] for functions (online tools) that should directly influence the device.
   - "Switch to offline mode" [2] for functions (offline tools) that should influence your project.



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[1] "Switch to online mode" icon
[2] "Switch to offline mode" icon

2. Select the device node.
3. Right-click to open the context menu and display the tools for configuring the device.

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7.4 Executing functions of the devices

7.4.1 Parameterizing a device

Devices are parameterized in the parameter tree. The parameter tree displays all device parameters, grouped into folders.

You can manage the device parameters using the context menu and the toolbar. The following steps illustrate how to read or edit device parameters.

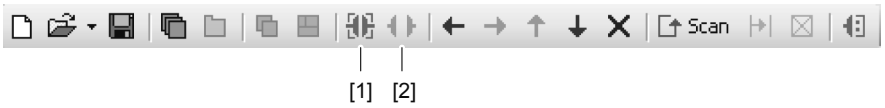
7.4.2 Reading or changing device parameters

INFORMATION

For detailed information about device parameters, refer to chapter "Parameter list".

Proceed as follows to read or change device parameters:

1. Switch to the required view (project view or network view).
2. Select the connection mode:
   - Click the "Switch to online mode" icon [1] if you want to read or change parameters directly in the **device**.
   - Click the "Switch to offline mode" icon [2] if you want to read or change parameters in the **project**.



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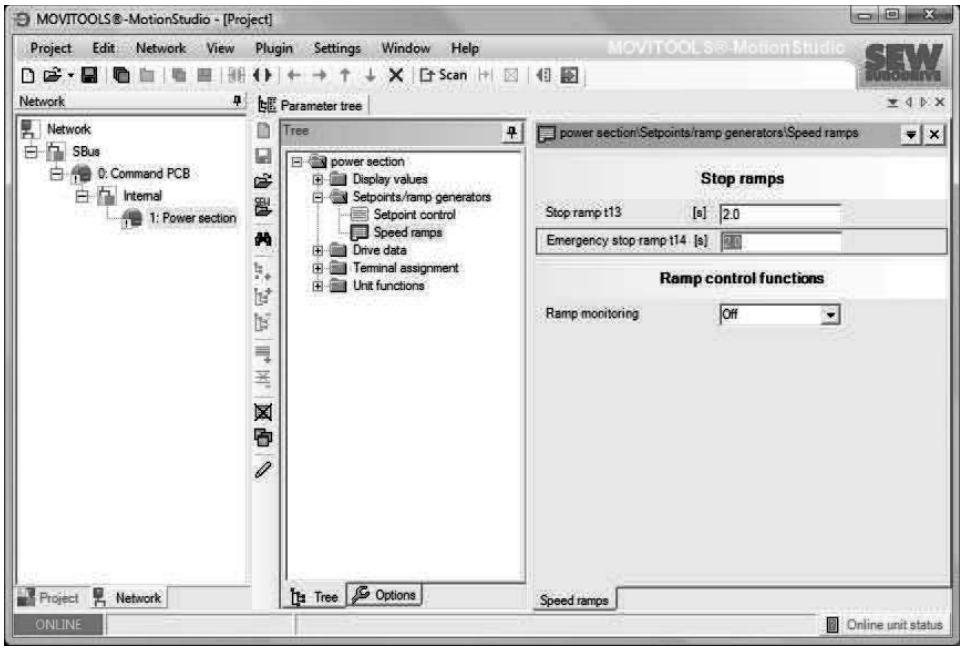
[1] "Switch to online mode" icon
[2] "Switch to offline mode" icon

3. Select the device you want to parameterize.
4. Open the context menu and select the [Parameter tree] command.

   The "Parameter tree" view opens to the right of the screen.

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5. Expand the "Parameter tree" to the node you require.



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6. Double-click to display a particular group of device parameters.
7. Press the enter key to finalize any changes you make to numerical values in the input fields.

7.4.3 Starting up the devices (online)

Do the following to start up the devices (online):

1. Switch to network view.
2. In the toolbar, click on "Switch to online mode" [1].



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[1] "Switch to online mode" icon

3. Select the device you want to start up.
4. Open the context menu and select the [Startup]/[Startup] command.

   The Startup wizard opens.
5. Follow the instructions of the startup wizard and then load the startup data into your device.

8 Parameters

8.1 Overview of command pcb parameters

8.1.1 Display values

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Command pcb parameters\display values**device status**			
Device status			
8310.0	Operating state	[Text]	
DIP switch			
9621.10, bit 0	Position of DIP switch S1/1	[Bit field]	
9621.10, bit 1	Position of DIP switch S1/2	[Bit field]	
9621.10, bit 2	Position of DIP switch S1/3	[Bit field]	
9621.10, bit 3	Position of DIP switch S1/4	[Bit field]	
9621.10, bit 4	Position of DIP switch S2/1	[Bit field]	
9621.10, bit 5	Position of DIP switch S2/2	[Bit field]	
9621.10, bit 6	Position of DIP switch S2/3	[Bit field]	
9621.10, bit 7	Position of DIP switch S2/4	[Bit field]	
Command pcb parameters \ display values \ **digital inputs**			
8334.0, bit 1	Digital input DI01 state	[Bit field]	
8334.0, bit 2	Digital input DI02 state	[Bit field]	
8334.0, bit 3	Digital input DI03 state	[Bit field]	
8334.0, bit 4	Digital input DI04 state	[Bit field]	
Command pcb parameters\display values**device data**			
Command level			
–	Device family	[Text]	
9701.1, 9701.2, 9701.3, 9701.4, 9701.5	Device names	[Text]	
9823.1, 9823.2, 9823.3, 9823.4, 9823.5	Device signature	[Text]	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
9701.30	Firmware command level	[Text]	
9701.31	Firmware status command level	[Text]	
SNI interface			
9701.36	SNI interface firmware	[Text]	
9701.37	Firmware status SNI interface	[Text]	
Application option			
10453.1	Application option type	[Text]	
Command pcb parameters\display values**address settings**			
SNI network			
8995.0	MAC address	[Text]	
8996.0	MAC address	[Text]	

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8.1.2 Parameters that can be changed

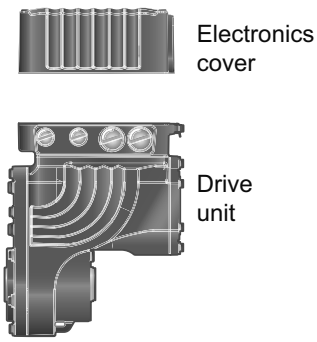
Storage location

INFORMATION

The following parameters are stored in the drive unit.

If the drive unit is replaced, for example for servicing, changes made to these parameters must be made again.

The changes remain active after changing the electronics cover.



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Setpoints/ramp generators

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Command pcb parameters\setpoints/ramp generators**setpoints**			
10096.35	Setpoint n_f1	0.00 – **1500.00** – 2000.00 [min^{-1}]	1 digit = 0.001 min^{-1}
10096.36	Setpoint n_f2	0.00 – **200.00** – 2000.00 [min^{-1}]	1 digit = 0.001 min^{-1}

Device functions

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Command pcb parameters\device functions**setup**			
8594.0	Factory setting	• **0 = No** • 1 = Default • 2 = Delivery state	

Application option

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Command pcb parameters\application option**communication**			

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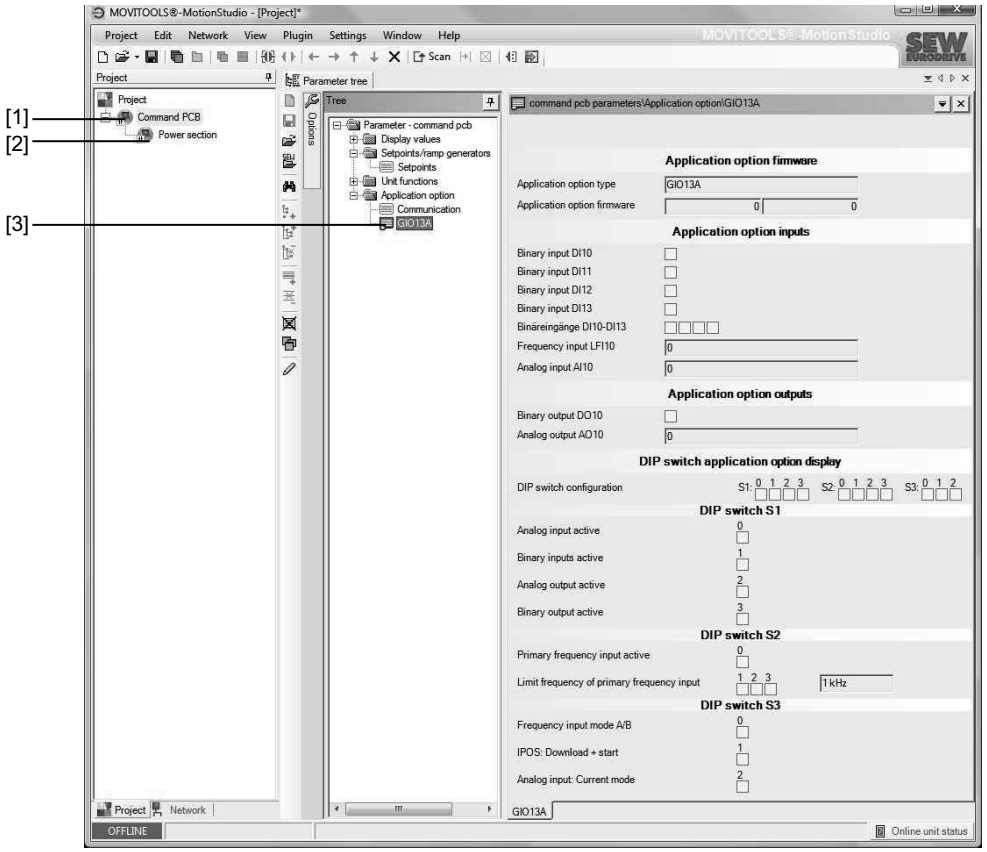
Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
10453.1	Application option type ID	[Text]	
10453.4	Application option monitoring	• 0 = Off • **1 = On**	

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8.2 Overview of application option parameters

8.2.1 Display of application option in MOVITOOLS® MotionStudio

The parameters of the application option are displayed in the parameter tree of the command pcb:



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[1] Command pcb
[2] Power section
[3] Application option

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8.2.2 GIO12B application option

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Command pcb parameters\application option**GIO12B**			
10453.1	Application option type	[Text]	
Application option inputs			
9619.11, bit 2	Digital input DI10	[Bit field]	
9619.11, bit 3	Digital input DI11	[Bit field]	
9619.11, bit 4	Digital input DI12	[Bit field]	
9619.11, bit 5	Digital input DI13	[Bit field]	
Application option outputs			
9619.112, bit 0	Digital output DO10	[Bit field]	
9619.112, bit 1	Digital output DO11	[Bit field]	

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8.2.3 GIO13B application option

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Command pcb parameters\application option**GIO13B**			
Application option firmware			
10453.1	Application option type	[Text]	
10453.16	Application option firmware	[Text]	
10453.17	Firmware status application option	[Text]	
Application option inputs			
9619.11, bit 0	Digital input DI10	[Bit field]	
9619.11, bit 1	Digital input DI11	[Bit field]	
9619.11, bit 2	Digital input DI12	[Bit field]	
9619.11, bit 3	Digital input DI13	[Bit field]	
9619.26	Frequency input LFI10	[Text]	
9619.36	Analog input AI10	[Text]	
Application option outputs			
9619.112, bit 0	Digital output DO10	[Bit field]	
9619.123	Analog output AO10	[Text]	
Display of application option DIP switch settings			
10453.12, bits 0 to 10	DIP switch configuration	[Bit field]	
DIP switch S1			
10453.12, bit 0	Analog input active	[Bit field]	
10453.12, bit 1	Digital inputs active	[Bit field]	
10453.12, bit 2	Analog output active	[Bit field]	
10453.12, bit 3	Digital output active	[Bit field]	
DIP switch S2			
10453.12, bit 4	Primary frequency input active	[Bit field]	
10453.12, bits 5 to 7	Limit frequency of primary frequency input	[Bit field]	
DIP switch S3			
10453.12, bit 8	Frequency input mode A/B	[Bit field]	
10453.12, bit 9	IPOS: Download + start	[Bit field]	
10453.12, bit 10	Analog input: Voltage mode	[Bit field]	

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8.3 Overview of power section parameters

8.3.1 Display values

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Power section parameters\display values**process values**			
Actual drive values			
8318.0	Actual speed	[min^{-1}]	1 digit = 0.001 min^{-1}
8501.0	User display	[Text]	
Output currents			
8321.0	Apparent output current	[% I_N]	1 digit = 0.001% I_N
8322.0	Active output current	[%]	1 digit = 0.001%
8326.0	Apparent output current	[A]	1 digit = 0.001 A
Actual device values			
8325.0	DC link voltage	[V]	1 digit = 0.001 V
8730.0	Device utilization	[%]	1 digit = 0.001%
8327.0	Heat sink temperature	[°C]	1 digit = 1 °C
Motor status			
8323.0	Motor utilization	[%]	1 digit = 0.001%
9872.255	Motor temperature	[°C]	1 digit = 10^{-6} °C
Power section parameters/display values/**device status**			
Device status			
9702.2	Power section status	[Text]	
9702.7	Drive status	[Text]	
9702.5	Fault code	[Text]	
10071.1	Subfault code	[Text]	
10404.5	Fault source	[Text]	
Statistical data			
8328.0	Power-applied hours	[h]	1 digit = 1 min = 1/60 h
8329.0	Drive running hours	[h]	1 digit = 1 min = 1/60 h
8330.0	Work	[kWh]	1 digit = 1Ws = 1/3600000
Power section parameters\display values**digital inputs**			
Digital inputs			
8334.0, bit 0	Digital input DI00 state	Fixed assigned with /Controller inhibit	
8334.0, bit 1	Digital input DI01 state	[Bit field]	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8334.0, bit 2	Digital input DI02 state	[Bit field]	
8334.0, bit 3	Digital input DI03 state	[Bit field]	
8334.0, bit 4	Digital input DI04 state	[Bit field]	
8335.0	Digital input DI01 function	[Text]	
8336.0	Digital input DI02 function	[Text]	
8337.0	Digital input DI03 function	[Text]	
8338.0	Digital input DI04 function	[Text]	
Virtual digital inputs			
8348.0, bit 0	Digital input DI10 state	[Bit field]	
8348.0, bit 1	Digital input DI11 state	[Bit field]	
8348.0, bit 2	Digital input DI12 state	[Bit field]	
8348.0, bit 3	Digital input DI13 state	[Bit field]	
8348.0, bit 4	Digital input DI14 state	[Bit field]	
8348.0, bit 5	Digital input DI15 state	[Bit field]	
8348.0, bit 6	Digital input DI16 state	[Bit field]	
8348.0, bit 7	Digital input DI17 state	[Bit field]	
8340.0	Digital input DI10 function	[Text]	
8341.0	Digital input DI11 function	[Text]	
8342.0	Digital input DI12 function	[Text]	
8343.0	Digital input DI13 function	[Text]	
8344.0	Digital input DI14 function	[Text]	
8345.0	Digital input DI15 function	[Text]	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8346.0	Digital input DI16 function	[Text]	
8347.0	Digital input DI17 function	[Text]	
Power section parameters\display values**digital outputs**			
Virtual digital outputs			
8360.0, bit 0	Digital output DO10 state	[Bit field]	
8360.0, bit 1	Digital output DO11 state	[Bit field]	
8360.0, bit 2	Digital output DO12 state	[Bit field]	
8360.0, bit 3	Digital output DO13 state	[Bit field]	
8360.0, bit 4	Digital output DO14 state	[Bit field]	
8360.0, bit 5	Digital output DO15 state	[Bit field]	
8360.0, bit 6	Digital output DO16 state	[Bit field]	
8360.0, bit 7	Digital output DO17 state	[Bit field]	
8352.0	Digital output DO10 function	[Text]	
8353.0	Digital output DO11 function	[Text]	
8354.0	Digital output DO12 function	[Text]	
8355.0	Digital output DO13 function	[Text]	
8356.0	Digital output DO14 function	[Text]	
8357.0	Digital output DO15 function	[Text]	
8358.0	Digital output DO16 function	[Text]	
8359.0	Digital output DO17 function	[Text]	
Power section parameters\display values**device data**			
Basic unit			
9701.10	Device family	[Text]	
9701.11	Variant ID	[Text]	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
9701.1 – 9701.5	Device name	[Text]	
10204.2	Device variant	[Text]	
9823.1 – 9823.5	Device signature	[Text]	
9701.100 – 9701.105	Serial number	[Text]	
8361.0	Nominal device current (rms)	[A]	1 digit = 0.001 A
10079.9	Motor size	[Text]	
9610.1	Nominal motor torque	[Nm]	1 digit = 0.00001 Nm (10^{-5})
Basic device firmware			
9701.30	Basic device firmware	[Text]	
9701.31	Firmware status basic unit	[Text]	
Power section parameters\display values**gear unit data**			
10079.3	Gear unit reduction ratio "numerator" (only in connection with MOVIGEAR® drive units	[Text]	
10079.4	Gear unit reduction ratio "denominator" (only in connection with MOVIGEAR® drive units	[Text]	
–	Gear unit ratio (only in connection with MOVIGEAR® drive units	[Text]	
10079.5	Number of gear unit stages (only in connection with MOVIGEAR® drive units	[Text]	
Power section parameters/display values/fault memory 0-4/**fault memory t-0**			
Fault status			
8366.0	Fault t-0 fault code	[Text]	
10072.1	Fault t-0 subfault code	[Text]	
8883.0	Fault t-0 internal	[Text]	
10404.6	Source of fault t-0	[Text]	
Input/output state			
8371.0, bit 0..4	Digital inputs DI00 – DI04 t-0	[Bit field]	
8376.0, bit 0..7	Digital inputs (virtual) DI10 – DI17 t-0	[Bit field]	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8386.0, bit 0..7	Digital outputs (virtual) DO10 – DO17 t-0	[Bit field]	
Actual drive values			
8401.0	Actual speed t-0	[min^{-1}]	1 digit = 0.001 min^{-1}
8406.0	Apparent output current t-0	[%]	1 digit = 0.001%
8411.0	Active output current t-0	[%]	1 digit = 0.001%
8416.0	Device utilization t-0	[%]	1 digit = 0.001%
8441.0	Motor utilization t-0	[%]	1 digit = 0.001%
8421.0	DC link voltage t-0	[V]	1 digit = 0.001 V
Device status			
8391.0	Power section status t-0	[Text]	
8426.0	Power-applied hours t-0	[h]	1 digit = 1 min = 1/60 h
8431.0	Drive running hours t-0	[h]	1 digit = 1 min = 1/60 h
10083.1	Work t-0	[kWh]	1 digit = 1Ws = 1/3600000
Temperatures			
8396.0	Heat sink temperature t-0	[°C]	1 digit = 1 °C
10070.1	Motor temperature t-0	[°C]	1 digit = 10^{-6} °C
Power section parameters/display values/fault memory 0-4/**fault memory t-1**			
Fault status			
8367.0	Fault t-1 fault code	[Text]	
10072.2	Fault t-1 subfault code	[Text]	
8884.0	Fault t-1 internal	[Text]	
10404.7	Source of fault t-1	[Text]	
Input/output state			
8372.0, bit 0..4	Digital inputs DI00 – DI04 t-1	[Bit field]	
8377.0, bit 0..7	Digital inputs (virtual) DI10 – DI17 t-1	[Bit field]	
8387.0, bit 0..7	Digital outputs (virtual) DO10 – DO17 t-1	[Bit field]	
Actual drive values			
8402.0	Actual speed t-1	[min^{-1}]	1 digit = 0.001 min^{-1}
8407.0	Apparent output current t-1	[%]	1 digit = 0.001%
8412.0	Active output current t-1	[%]	1 digit = 0.001%
8417.0	Device utilization t-1	[%]	1 digit = 0.001%

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8442.0	Motor utilization t-1	[%]	1 digit = 0.001%
8422.0	DC link voltage t-1	[V]	1 digit = 0.001 V
Device status			
8392.0	Power section status t-1	[Text]	
8427.0	Power-applied hours t-1	[h]	1 digit = 1 min = 1/60 h
8432.0	Drive running hours t-1	[h]	1 digit = 1 min = 1/60 h
10083.2	Work t-1	[kWh]	1 digit = 1Ws = 1/3600000
Temperatures			
8397.0	Heat sink temperature t-1	[°C]	1 digit = 1 °C
10070.2	Motor temperature t-1	[°C]	1 digit = 10^{-6} °C
Power section parameters/display values/fault memory 0-4/**fault memory t-2**			
Fault status			
8368.0	Fault t-2 fault code	[Text]	
10072.3	Fault t-2 subfault code	[Text]	
8885.0	Fault t-2 internal	[Text]	
10404.8	Source of fault t-2	[Text]	
Input/output state			
8373.0, bit 0..4	Digital inputs DI00 – DI04 t-2	[Bit field]	
8378.0, bit 0..7	Digital inputs (virtual) DI10 – DI17 t-2	[Bit field]	
8388.0, bit 0..7	Digital outputs (virtual) DO10 – DO17 t-2	[Bit field]	
Actual drive values			
8403.0	Actual speed t-2	[min^{-1}]	1 digit = 0.001 min^{-1}
8408.0	Apparent output current t-2	[%]	1 digit = 0.001%
8413.0	Active output current t-2	[%]	1 digit = 0.001%
8418.0	Device utilization t-2	[%]	1 digit = 0.001%
8443.0	Motor utilization t-2	[%]	1 digit = 0.001%
8423.0	DC link voltage t-2	[V]	1 digit = 0.001 V
Device status			
8393.0	Power section status t-2	[Text]	
8428.0	Power-applied hours t-2	[h]	1 digit = 1 min = 1/60 h
8433.0	Drive running hours t-2	[h]	1 digit = 1 min = 1/60 h
10083.3	Work t-2	[kWh]	1 digit = 1Ws = 1/3600000

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Temperatures			
8398.0	Heat sink temperature t-2	[°C]	1 digit = 1 °C
10070.3	Motor temperature t-2	[°C]	1 digit = 10^{-6} °C
Power section parameters/display values/fault memory 0-4/**fault memory t-3**			
Fault status			
8369.0	Fault t-3 fault code	[Text]	
10072.4	Fault t-3 subfault code	[Text]	
8886.0	Fault t-3 internal	[Text]	
10404.9	Source of fault t-3	[Text]	
Input/output state			
8374.0, bit 0..4	Digital inputs DI00 – DI04 t-3	[Bit field]	
8379.0, bit 0..7	Digital inputs (virtual) DI10 – DI17 t-3	[Bit field]	
8389.0, bit 0..7	Digital outputs (virtual) DO10 – DO17 t-3	[Bit field]	
Actual drive values			
8404.0	Actual speed t-3	[min^{-1}]	1 digit = 0.001 min^{-1}
8409.0	Apparent output current t-3	[%]	1 digit = 0.001%
8414.0	Active output current t-3	[%]	1 digit = 0.001%
8419.0	Device utilization t-3	[%]	1 digit = 0.001%
8444.0	Motor utilization t-3	[%]	1 digit = 0.001%
8424.0	DC link voltage t-3	[V]	1 digit = 0.001 V
Device status			
8394.0	Power section status t-3	[Text]	
8429.0	Power-applied hours t-3	[h]	1 digit = 1 min = 1/60 h
8434.0	Drive running hours t-3	[h]	1 digit = 1 min = 1/60 h
10083.4	Work t-3	[kWh]	1 digit = 1Ws = 1/3600000
Temperatures			
8399.0	Heat sink temperature t-3	[°C]	1 digit = 1 °C
10070.4	Motor temperature t-3	[°C]	1 digit = 10^{-6} °C
Power section parameters/display values/fault memory 0-4/**fault memory t-4**			
Fault status			
8370.0	Fault t-4 fault code	[Text]	
10072.5	Fault t-4 subfault code	[Text]	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8887.0	Fault t-4 internal	[Text]	
10404.10	Source of fault t-4	[Text]	
Input/output state			
8375.0, bit 0..4	Digital inputs DI00 – DI04 t-4	[Bit field]	
8380.0, bit 0..7	Digital inputs (virtual) DI10 – DI17 t-4	[Bit field]	
8390.0, bit 0..7	Digital outputs (virtual) DO10 – DO17 t-4	[Bit field]	
Actual drive values			
8405.0	Actual speed t-4	[min^{-1}]	1 digit = 0.001 min^{-1}
8410.0	Apparent output current t-4	[%]	1 digit = 0.001%
8415.0	Active output current t-4	[%]	1 digit = 0.001%
8420.0	Device utilization t-4	[%]	1 digit = 0.001%
8445.0	Motor utilization t-4	[%]	1 digit = 0.001%
8425.0	DC link voltage t-4	[V]	1 digit = 0.001 V
Device status			
8395.0	Power section status t-4	[Text]	
8430.0	Power-applied hours t-4	[h]	1 digit = 1 min = 1/60 h
8435.0	Drive running hours t-4	[h]	1 digit = 1 min = 1/60 h
10083.5	Work t-4	[kWh]	1 digit = 1Ws = 1/3600000
Temperatures			
8400.0	Heat sink temperature t-4	[°C]	1 digit = 1 °C
10070.5	Motor temperature t-4	[°C]	1 digit = 10^{-6} °C
Power section parameters\display values**process data monitor**			
Process data description			
8451.0	Process data configuration	[Text]	
Process output data (receive data)			
8455.0	PO1 Setpoint	[Text]	
8456.0	PO2 Setpoint	[Text]	
8457.0	PO3 Setpoint	[Text]	
Process input data (send data)			
8458.0	PI1 Actual value	[Text]	
8459.0	PI2 Actual value	[Text]	
8460.0	PI3 Actual value	[Text]	

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8.3.2 Parameters that can be changed

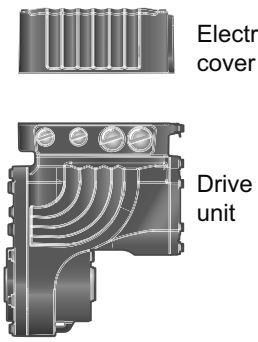
Storage location

INFORMATION

The following parameters are stored in the drive unit.

If the drive unit is replaced, for example for servicing, changes made to these parameters must be made again.

The changes remain active after changing the electronics cover.



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Setpoints/ramp generators

Index	Parameter name	Unit	Meaning / value range
Power section parameters\setpoints/ramp generators**setpoint monitoring**			
Setpoint adjustment			
8468.0	Setpoint filter	0.00 – **5.00** – 3000.00 [ms]	1 digit = 0.001 ms
Stop by setpoint function			
8578.0	Stop by setpoint function	• **0 = Off** • 1 = On	
8579.0	Stop setpoint	**160** – 500 [min^{-1}]	1 digit = 0.001 min^{-1}
8580.0	Start offset	0 – **30** – 500 [min^{-1}]	1 digit = 0.001 min^{-1}
Power section parameters\setpoints/ramp generators**speed ramps**			
Ramp generator 1			
8470.0	Ramp t11 up CW	0.0 – **4.0** – 2000.0 [s]	1 digit = 0.001 s
8471.0	Ramp t11 down CW	0.0 – **4.0** – 2000.0 [s]	1 digit = 0.001 s
8472.0	Ramp t11 up CCW	0.0 – **4.0** – 2000.0 [s]	1 digit = 0.001 s
8473.0	Ramp t11 down CCW	0.0 – **4.0** – 2000.0 [s]	1 digit = 0.001 s
Stop ramps			
8476.0	Stop ramp t13	0.0 – **2.0** – 2000.0 [s]	1 digit = 0.001 s
8477.0	Emergency stop ramp t14	0.0 – **2.0** – 2000.0 [s]	1 digit = 0.001 s
Ramp monitoring functions			

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Index	Parameter name	Unit	Meaning / value range
8928.0	Ramp monitoring	• **0 = Off** • 1 = On	
Power section parameters\setpoints/ramp generators**fixed setpoints**			
Fixed internal setpoints			
8489.0	Fixed setpoint n11	-2000.0 – **150.0** – 2000.0 [min^{-1}]	1 digit = 0.001 min^{-1}
8490.0	Fixed setpoint n12	-2000.0 – **750.0** – 2000.0 [min^{-1}]	1 digit = 0.001 min^{-1}
8491.0	Fixed setpoint n13	-2000.0 – **1500.0** – 2000.0 [min^{-1}]	1 digit = 0.001 min^{-1}

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Drive data



NOTICE

Damage to the MOVIGEAR® drive unit.

Potential damage to property.

- Consult SEW-EURODRIVE before you change the torque limit.

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Power section parameters\drive data**motor parameters**			
Motor operating mode			
8574.0	Operating mode (display value)	• **16 = Servo** • 18 = Servo & IPOS	
Motor direction of rotation			
8537.0	Direction of rotation reversal	• **0 = Off** • 1 = On	
Modulation			
8827.0	PWM frequency	• 0 = 4 kHz • **1 = 8 kHz**	
Power section parameters\drive data**monitoring functions**			
Speed monitoring			
8557.0	Speed monitoring	• 0 = Off • 1 = Motor mode • 2 = Regenerative mode • **3 = Motor/regenerative**	
8558.0	Speed monitoring delay time	0.00 – **1.00** – 10.00 [s]	1 digit = 0.001 s
Power section parameters\drive data**limit values**			
Setpoint limits			
8516.0	Minimum speed	0.0 – **200.0** – 2000.0 [min^{-1}]	1 digit = 0.001 min^{-1}
8517.0	Maximum motor speed	0.0 – 200.0 – **2000.0** [min^{-1}]	1 digit = 0.001 min^{-1}
Drive limits			
8518.0	Current limit	**In connection with mechatronic MOVIGEAR® drive unit:** 0 – **250** – 400 [%I_N]	1 digit = 0.001% I_N
		In connection with DRC.. electronic motor: 0 – **250** – 300 [% I_N]	1 digit = 0.001% I_N

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
9951.3	Effective current limit	**Only in connection with mechatronic MOVIGEAR® drive unit:** 0 – 400 [% I_N]	1 digit = 0.001% I_N
8688.0	Torque limit	**In connection with mechatronic MOVIGEAR® drive unit:** 0 – **250** – 400 [% I_N]	1 digit = 0.001% I_N
		In connection with DRC.. electronic motor: 0 – **250** – 300 [% I_N]	1 digit = 0.001% I_N

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Terminal assignment

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Power section parameters\terminal assignment**digital inputs**			
Digital inputs			
8334.0, bit 0	Digital input DI00 state	Fixed assigned with /Controller inhibit	
8334.0, bit 1	Digital input DI01 state	[Bit field]	
8334.0, bit 2	Digital input DI02 state	[Bit field]	
8334.0, bit 3	Digital input DI03 state	[Bit field]	
8334.0, bit 4	Digital input DI04 state	[Bit field]	
8335.0	Digital input DI01 function	• **0 = No function** • 1 = Enable/stop • 2 = CW/stop • 3 = CCW/stop • 4 = n11 • 5 = n12 • 8 = Speed ramp switchover • 9 = Reserved • 10 = Reserved • 11 = /External fault • 12 = Fault reset • 13 = Reserved • 14 = /Limit switch right • 15 = /Limit switch left • 16 = IPOS input • 17 = Reference cam • 18 = Reference travel start • 19 = Slave free running • 20 = Setpoint acceptance active • 30 = /Controller inhibit	
8336.0	Digital input DI02 function		
8337.0	Digital input DI03 function		
8338.0	Digital input DI04 function		
Virtual digital inputs			
8348.0, bit 0	Digital input DI10 state	[Bit field]	
8348.0, bit 1	Digital input DI11 state	[Bit field]	
8348.0, bit 2	Digital input DI12 state	[Bit field]	
8348.0, bit 3	Digital input DI13 state	[Bit field]	
8348.0, bit 4	Digital input DI14 state	[Bit field]	
8348.0, bit 5	Digital input DI15 state	[Bit field]	
8348.0, bit 6	Digital input DI16 state	[Bit field]	
8348.0, bit 7	Digital input DI17 state	[Bit field]	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8340.0	Digital input DI10 function	• **0 = No function** • 1 = Enable/stop • 2 = CW/stop • 3 = CCW/stop • 4 = n11 • 5 = n12 • 8 = Speed ramp switchover • 9 = Reserved • 10 = Reserved • 11 = /External fault • 12 = Fault reset • 13 = Reserved • 14 = /Limit switch right • 15 = /Limit switch left • 16 = IPOS input • 17 = Reference cam • 18 = Reference travel start • 19 = Slave free running • 20 = Setpoint acceptance active • 30 = /Controller inhibit	
8341.0	Digital input DI11 function		
8342.0	Digital input DI12 function		
8343.0	Digital input DI13 function		
8344.0	Digital input DI14 function		
8345.0	Digital input DI15 function		
8346.0	Digital input DI16 function		
8347.0	Digital input DI17 function		
Power section parameters\terminal assignment**digital outputs**			
Virtual digital outputs			
8360.0, bit 0	Digital output DO10 state	[Bit field]	
8360.0, bit 1	Digital output DO11 state	[Bit field]	
8360.0, bit 2	Digital output DO12 state	[Bit field]	
8360.0, bit 3	Digital output DO13 state	[Bit field]	
8360.0, bit 4	Digital output DO14 state	[Bit field]	
8360.0, bit 5	Digital output DO15 state	[Bit field]	
8360.0, bit 6	Digital output DO16 state	[Bit field]	
8360.0, bit 7	Digital output DO17 state	[Bit field]	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8352.0	Digital output DO10 function	• **0 = No function** • 1 = /Fault • 2 = Ready • 3 = Output stage ON • 4 = Rotating field ON • 5 = Brake released • 6 = Brake applied • 7 = Motor standstill • 8 = Reserved • 9 = Speed reference signal • 10 = Speed reference signal • 11 = Setpoint-actual value comparison signal • 12 = Current reference signal • 13 = Imax signal • 14 = /Warning motor utilization 1 • 19 = IPOS in position • 20 = IPOS referenced • 21 = IPOS output • 22 = /IPOS fault • 27 = STO – safe torque off • 34 = Process data bit	
8353.0	Digital output DO11 function		
8354.0	Digital output DO12 function		
8355.0	Digital output DO13 function		
8356.0	Digital output DO14 function		
8357.0	Digital output DO15 function		
8358.0	Digital output DO16 function		
8359.0	Digital output DO17 function		

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Diagnostic functions

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Power section parameters\diagnostics functions**reference signals**			
Speed reference signal			
8539.0	Speed reference value	0.0 ... 1500.0 ... 2000.0 [min^{-1}]	1 digit = 0.001 min^{-1}
8540.0	Hysteresis	0.0 ... 100.0 ... 500.0 [min^{-1}]	1 digit = 0.001 min^{-1}
8541.0	Delay time	0.0 ... 1.0 ... 9.0 [s]	1 digit = 0.001 s
8542.0	Signal = "1" if:	• **0 = n < n ref** • 1 = n > n ref	
Speed window signal			
8543.0	Window center	0 ... 1500 ... 2000 [min^{-1}]	1 digit = 0.001 min^{-1}
8544.0	Range width	**0** ... 2000 [min^{-1}]	1 digit = 0.001 min^{-1}
8545.0	Delay time	0 ... 1 ... 9 [s]	1 digit = 0.001 s
8546.0	Signal = "1" if:	• **0 = internal** • 1 = external	
Speed setpoint/actual value comparison			
8547.0	Hysteresis	1 ... 100 ... 300 [min^{-1}]	1 digit = 0.001 min^{-1}
8548.0	Delay time	0 ... 1 ... 9 [s]	1 digit = 0.001 s
8549.0	Signal = "1" if:	• **0 = n <> nset** • 1 = n = nset	
Current reference signal			
8550.0	Current reference value	0 ... 100 ... 400 [%]	1 digit = 0.001%
8551.0	Hysteresis	0 ... 5 ... 30 [%]	1 digit = 0.001%
8552.0	Delay time	0 ... 1 ... 9 [s]	1 digit = 0.001 s
8553.0	Signal = "1" if:	• **0 = I < Iref** • 1 = I > Iref	
Imax signal			
8554.0	Hysteresis	**5** ... 50 [%]	1 digit = 0.001%
8555.0	Delay time	0 ... 1 ... 9 [s]	1 digit = 0.001 s
8556.0	Signal = "1" if:	• 0 = I = Imax • **1 = I < Imax**	

Technology functions

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Power section parameters\technology functions**IPOS reference travel**			

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8702.0	IPOS axis referenced (display value)	• **0 = No** • 1 = Yes	
8623.0	Reference offset	**0** – 2147483647	
8624.0	Reference speed 1	0 – **200** – 2000 [min^{-1}]	1 digit = 0.001 min^{-1}
8625.0	Reference speed 2	0 – **50** – 2000 [min^{-1}]	1 digit = 0.001 min^{-1}
8626.0	Reference travel type	• **0 = Left zero pulse** • 1 = Left end of reference cam • 2 = Right end of reference cam • 3 = Limit switch right • 4 = Limit switch left • 5 = No reference travel • 6 = Reference cam flush with right limit switch • 7 = Reference cam flush with left limit switch • 8 = Without enable	
8839.0	Reference travel to zero pulse	• 0 = No • **1 = Yes**	
10455.1	Cam distance (display value)	Increments [inc]	

Control functions

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Power section parameters\control functions**brake functions**			
8893.0	Deactivate DynaStop® without enable	• 0 = No • **1 = Yes**	
8584.0	Brake function	• **0 = Off** • 1 = On	

Device functions

Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
Power section parameters\device functions**setup**			
8594.0	Factory setting	• **0 = No** • 1 = Default • 2 = Delivery state	

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8595.0	Parameter lock	• **0 = No** • 1 = Yes	
Power section parameters\device functions**fault monitoring**			
Programmable responses			
9729.16	Response to ext. fault	• 0 = No response • 1 = Display only • 2 = Output stage inhibit/locked • 3 = Emergency stop/locked • 4 = Stop/locked • 5 = Output stage inhibit/waiting • **6 = Emergency stop/waiting** • 7 = Stop/waiting	
9729.4	Response to line phase failure	• 0 = No response • **1 = Display only** • 2 = Output stage inhibit/locked • 3 = Emergency stop/locked • 4 = Stop/locked • 5 = Output stage inhibit/waiting • 6 = Emergency stop/waiting • 7 = Stop/waiting	
9729.9	TF signal response	• 0 = No response • 1 = Display only • 2 = Output stage inhibit/locked • 3 = Emergency stop/locked • 4 = Stop/locked • 5 = Output stage inhibit/waiting • **6 = Emergency stop/waiting** • 7 = Stop/waiting	
8615.0	Only in connection with DSC (**D**irect **S**Bus **I**nstallation) device variant: SBus 1 timeout response	• 0 = No response • 1 = Display only • 2 = Output stage inhibit/locked • 3 = Emergency stop/locked • 4 = Stop/locked • 5 = Output stage inhibit/waiting • **6 = Emergency stop/waiting** • 7 = Stop/waiting	
Fault acknowledgment			

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Index	Parameter name	MOVITOOLS® MotionStudio (range/ factory setting)	MOVILINK® scaling
8617.0	Manual reset	• **0 = No** • 1 = Yes	
Power section parameters\device functions**scaling**			
Speed scaling			
8747.0	Scaling factor for user display numerator	**1** – 65535	
8748.0	Scaling factor for user display denominator	**1** – 65535	
8772.0	User unit	[Text]	
8773.0	User unit	[Text]	
Actual position scaling[1)]			
9543.1	Scaling factor numerator	1	
9544.1	Scaling factor denominator	1 – 65535	

[1)] The functions are available from the following firmware version of the power section:

- MOVIGEAR® ≥ ".17"
- DRC.. electronic motor ≥ ".15"

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8.4 Description of command pcb parameters

8.4.1 Display values

Command pcb parameters\display values\device status

Operating state index 8310.0

The parameter indicates the current operating state.

Setting of DIP switch S1, S2 index 9621.10

The parameter indicates the setting of DIP switches S1 and S2:

DIP switch	Bit in index 9621.10	Functionality	
S1/1	0	Device address	Device address bit 2^0
S1/2	1		Device address bit 2^1
S1/3	2		Device address bit 2^2
S1/4	3		Device address bit 2^3
S2/1	4	Binary coding operating mode	Operating mode bit 2^0
S2/2	5		Operating mode bit 2^1
S2/3	6	Use of the motion control inputs	0: Sensors 1: Local mode
S2/4	7	res.	Reserved

Display of the DIP switch setting is independent of whether the DIP switch function is activated or deactivated.

Command pcb parameters\display values\digital inputs

Digital input DI01 index 8334.0, bit 1

The parameter indicates the state of digital input DI01.

Digital input DI02 index 8334.0, bit 2

The parameter indicates the state of digital input DI02.

Digital input DI03 index 8334.0, bit 3

The parameter indicates the state of digital input DI03.

Digital input DI04 index 8334.0, bit 4

The parameter indicates the state of digital input DI04.

Command pcb parameters\display values\device data

Device series

The parameter indicates the device family, for example MOVIGEAR®

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Device name index 9701.1 – 9701.5

The parameter indicates the type designation of the command pcb.

Device signature index 9823.1 – 9823.5

The parameter is used to indicate and enter the device signature. This parameter is used to assign a name to the command pcb so you can identify it in the hardware tree or in other visualization elements.

Firmware command level index 9701.30, 9701.31

The parameter indicates the part number of the firmware used in the command pcb.

Firmware SNI-Interface index 9701.36, 9701.37

The parameter indicates the program version of the firmware used for SNI communication.

Application option type index 10453.1

The parameter indicates the designation of the application option inserted in the application slot.

Command pcb parameters\display values\address settings

MAC address index 8995.0 – 8996.0

The parameter indicates the MAC address of the MOVIGEAR® SNI drive unit.

8.4.2 Setpoints/ramp generators

Command pcb parameters\setpoints/ramp generators\setpoints

Setpoint n_f1 index 10096.35

Use this parameter to set setpoint "n_f1".

- Unit: [min^{-1}]
- Setting range: 0 – **1500** – 2000 min^{-1}

The setpoint "n_f1" is valid if

- local mode is active (DIP switch S2/3 = "1") and a "0" signal is present at digital input DI03 "f1/f2".

Setpoint n_f2 index 10096.36

Use this parameter to set setpoint "n_f2".

- Unit: [min^{-1}]
- Setting range: 0 – **200** – 2000 min^{-1}

The setpoint n_f2 is valid if

- local mode is active (DIP switch S2/3 = "1") and a "1" signal is present at digital input DI03 "f1/f2".

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8.4.3 Device functions

Command pcb parameters\device functions\setup

Factory setting index 8594.0

Parameter 8594.0 is used to reset the factory settings stored in EEPROM for almost all parameters.

Setting range:

- **0 = No**
- 1 = Default
- 2 = Delivery state

The following data is not reset when "Default" is selected:

- IPOS program
- Speed task 1/2

The "delivery state" setting also resets the data listed above.

Once the data has been reset, parameter 8594.0 automatically reverts to "NO".

8.4.4 Application option

Command pcb parameters\application option\communication

Application option type detection index 10453.1

The parameter indicates the designation of the application option inserted in the application slot.

Application option monitoring index 10453.4

Use this parameter to set communication monitoring with the application option:

- 0 = Off
- **1 = On**

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8.5 Description of application option parameters

8.5.1 GIO12B application option

Command pcb parameters\application option\GIO12B

Application option type index 10453.1

The parameter indicates the designation of the application option inserted in the application slot.

Digital input DI10 index 9619.11, bit 1

The parameter indicates the state and function of digital input DI10 on the application option.

Digital input DI11 index 9619.11, bit 2

The parameter indicates the state and function of digital input DI11 on the application option.

Digital input DI12 index 9619.11, bit 3

The parameter indicates the state and function of digital input DI12 on the application option.

Digital input DI13 index 9619.11, bit 4

The parameter indicates the state and function of digital input DI13 on the application option.

Digital output DO10 index 9619.112, bit 0

The parameter indicates the state and function of digital output DO10 on the application option.

Digital output DO11 index 9619.112, bit 1

The parameter indicates the state and function of digital output DO11 on the application option.

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8.5.2 GIO13B application option

Command pcb parameters\application option\GIO13B

Application option firmware

Application option type index 10453.1

The parameter indicates the designation of the application option inserted in the application slot.

Application option firmware index 10453.16

The parameter indicates the program version of the firmware used in the application option.

Application option firmware status index 10453.17

The parameter indicates the status of the firmware used in the application option.

Application option inputs

Digital input DI10 index 9619.11, bit 0

The parameter indicates the state and function of digital input DI10 on the application option.

You can enable the digital outputs using DIP switch S1/2 of the application option (enabled = DIP switch set to "ON").

Digital input DI11 index 9619.11, bit 1

The parameter indicates the state and function of digital input DI11 on the application option.

You can enable the digital outputs using DIP switch S1/2 of the application option (enabled = DIP switch set to "ON").

Digital input DI12 index 9619.11, bit 2

The parameter indicates the state and function of digital input DI12 on the application option.

You can enable the digital outputs using DIP switch S1/2 of the application option (enabled = DIP switch set to "ON").

Digital input DI13 index 9619.11, bit 3

The parameter indicates the state and function of digital input DI13 on the application option.

You can enable the digital outputs using DIP switch S1/2 of the application option (enabled = DIP switch set to "ON").

Frequency input LFI10 index 9619.26

LFI10 frequency input of the application option.

You can enable the frequency input using DIP switch S2/1 of the application option (enabled = DIP switch set to "ON").

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The scaling is:

0 Hz = 0 digit

The maximum frequency is set to = ± 32767 digit

The maximum frequency is set using DIP switches S2/2 to S2/4.

Mode track A: 0 – 32767 digit

Mode tracks A/B: – 32767 digit – +32767 digit

You set the mode of the frequency input using DIP switch S3/1.

Analog input AI10 index 9619.36

Analog input AI10 of the application option.

You can enable the analog input using DIP switch S1/1 of the application option (enabled = DIP switch set to "ON").

The scaling is:

Voltage input:	0 V = 0 digit
	10 V = 32767 digit
Current input:	4 mA = 0 digit
	20 mA = 32767 digit
	< 4 mA = -1 (wire break monitoring)

You set the mode of the analog input using DIP switch S3/3.

If you set the current input mode using DIP switch "S3/3 = ON", then you have to activate the current resistor using DIP switch "S3/4 = ON".

Voltage input mode:	S3/3 = OFF
	S3/4 = OFF
Current input mode:	S3/3 = ON
	S3/4 = ON

Application option outputs

Digital output DO10 index 9619.112, bit 0

Digital output DO10 of the application option.

You can enable the digital input using DIP switch S1/4 of the application option (enabled = DIP switch set to "ON").

Analog output AO10 index 9619.123

Analog output AO10 of the application option

The scaling is:

32767 digit = 20 mA

0 digit = 4 mA

You can enable the analog output using DIP switch S1/3 of the application option (enabled = DIP switch set to "ON").

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Display of application option DIP switch settings

DIP switch configuration index 10453.12, bits 0 to 10

The parameter indicates the DIP switch configuration of the application option.

DIP switch S1

Index 10453.12, bit 0 analog input enabled

The parameter indicates the setting of DIP switch S1/1 on the application option.

Index 10453.12, bit 1 digital inputs enabled

The parameter indicates the setting of DIP switch S1/2 on the application option.

Index 10453.12, bit 2 analog output enabled

The parameter indicates the setting of DIP switch S1/3 on the application option.

Index 10453.12, bit 3 digital output enabled

The parameter indicates the setting of DIP switch S1/4 on the application option.

DIP switch S2

Index 10453.12, bit 4 master frequency input enabled

The parameter indicates the setting of DIP switch S2/1 on the application option.

Index 10453.12, bits 5 to 7 limit frequency of master primary input

The parameter indicates the setting of DIP switches S2/1 to S2/4 on the application option.

DIP switch S3

Index 10453.12, bit 8 master frequency input A/B mode

The parameter indicates the setting of DIP switch S3/1 on the application option.

Index 10453.12, bit 9 IPOS: Download + start

The parameter indicates the setting of DIP switch S3/2 on the application option.

Index 10453.12, bit 10 analog input: Voltage mode

The parameter indicates the setting of DIP switch S3/3 on the application option.

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8.6 Description of power section parameters

8.6.1 Display values

Power section parameters\display values\process values

Actual speed index 8318.0

The parameter indicates the motor speed:

- Unit: [min^{-1}]
- Resolution ±0.2 min^{-1}

User display index 8501.0

The user display is defined by the following parameters:

- 8747.0 Scaling factor for user display numerator
- 8748.0 Scaling factor for user display denominator
- 8772.0/8773.0 User-defined unit
- Unit: [Text]

Apparent output current index 8321.0

The parameter indicates the apparent current:

- Unit: [% I_N]

Active output current index 8322.0

The parameter indicates the active current. The display value is positive when torque is applied in the positive direction of rotation; negative when torque is applied in the negative direction of rotation.

- Unit: [% I_N]

Apparent output current index 8326.0

The parameter indicates the apparent output current:

- Unit: [A]

DC link voltage index 8325.0

The parameter indicates the voltage measured in the DC link circuit:

- Unit: [V]

Device utilization index 8730.0

The parameter indicates the device utilization Ixt:

- Unit: [%]

Heat sink temperature index 8327.0

The parameter indicates the heat sink temperature of the power section:

- Unit: [°C]

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Motor utilization index 8323.0

The parameter indicates the motor utilization calculated using motor model and current.

- Unit: [%]

Motor temperature index 9872.255

The parameter indicates the measured motor temperature.

- Unit: [°C]

Power section parameters/display values/device status

Status of power section index 9702.2

The parameter indicates the status of the power section:

- **0 = Not ready**
- 1 = Ready, output stage inhibited
- 2 = Ready, output stage enabled

Drive status index 9702.7

The parameter indicates the operating state of the power section:

- 0 = Inhibited
- 1 = Controller inhibit
- 2 = System error
- 3 = No enable
- 6 = Enabled
- 7 = Rapid stop
- 8 = Integrator stop
- 9 = Emergency stop
- 11 = Limit switch operation
- 12 = Pos. operation
- 15 = Reference travel
- 18 = Release brake
- 19 = Apply brake

Fault and fault code index 9702.5

The parameter indicates a pending fault with the fault number in plain text.

Fault and subfault code index 10071.1

The parameter provides detailed information on the fault of a fault group.

Fault source index 10404.5

The parameter indicates the fault source of a pending fault:

- **0 = No fault**
- 1 = Power section
- 2 = Command pcb

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Operating hours index 8328.0

The parameter indicates the total number of hours for which the inverter has been connected to the power grid or an external DC 24 V supply.

- Storage cycle every 15 min
- Unit: [h]

Enable hours index 8329.0

The parameter indicates the total number of hours for which the power section was in ENABLE operating state:

- Storage cycle every 15 min
- Unit: [h]

Energy index 8330.0

The parameter indicates the total of active electrical energy the motor has consumed:

- Storage cycle every 15 min
- Unit: [kWh]

Power section parameters\display values\digital inputs

Digital inputs DI00 – DI04 index 8334.0, bit 0 – bit 4

The parameter shows the present state of digital inputs DI00 – DI04.

Digital input DI00 is always assigned with /Controller inhibit.

Digital inputs DI00 – DI04 index 8335.0 – 8338.0

The parameter shows the current function assignment of digital inputs DI00 – DI04.

Digital input DI00 is always assigned with /Controller inhibit.

Digital inputs DI10 – DI17 index 8348.0, bits 0 – 7

The parameter indicates the present state of the digital input of an application option (e.g. GIO12B). If the option is not installed, the virtual digital inputs will be displayed.

Digital inputs DI10 – DI17 index 8340.0 – 8347.0

The parameter indicates the current function assignment of the digital input of an application option (e.g. GIO12B). If the option is not installed, the virtual digital inputs will be displayed.

Power section parameters\display values\digital outputs

Digital outputs DO10 – DO17 index 8360.0, bits 0 – 7

The parameter indicates the present state of the digital outputs of an application option (e.g. GIO12B). If the option is not installed, the virtual digital outputs will be displayed.

Digital outputs DO10 – DO17 index 8352.0 – 8359.0

The parameter indicates the current function assignment of the digital outputs of an application option (e.g. GIO12B). If the option is not installed, the virtual digital outputs will be displayed.

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Power section parameters\display values\device data

Device series index 9701.10

The parameter indicates the device family, for example "MOVIGEAR®".

Variant ID index 9701.11

The parameter indicates the device generation, for example "B".

Device name index 9701.1, 9701.2, 9701.3, 9701.4, 9701.5

The parameter indicates the type designation of the power section.

Device variant index 10204.2

The parameter indicates the MOVIGEAR® installation technology, e.g.:

- DBC = **D**irect **B**inary **C**ommunication
- DAC = **D**irect **A**S-Interface **C**ommunication
- DSC = **D**irect **S**Bus **C**ommunication
- SNI = **S**ingle Line **N**etwork **I**nstallation

Device signature index 9823.1, 9823.2, 9823.3, 9823.4, 9823.5

The parameter is used to indicate and enter the device signature. This parameter is used to assign a name to the power section so you can identify it in the hardware tree or in other visualization elements.

Manufacturing number index 9701.100, 9701.101, 9701.102, 9701.103, 9701.104, 9701.105

Displays the manufacturing number of the basic unit.

Value range: 6 parameters with 4 ASCII characters each.

Nominal device current (rms) index 8361.0

The parameter indicates the nominal device current (rms value).

- Unit: [A]

Motor size index 10079.9

The parameter indicates the torque class (size) of the MOVIGEAR® drive unit.

Nominal motor torque index 9610.1

The parameter indicates the available continuous torque of the motor.

- Unit: [Nm × 10^{-5}]

Basic unit firmware index 9701.30

The parameter indicates the part number of the firmware used in the power section.

Status of basic unit firmware index 9701.31

The parameter indicates the status of the firmware used in the power section.

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Power section parameters\display values\gear unit data

Gear unit ratio "denominator" index 10079.3

The parameter indicates the gear ratio tooth numbers. This allows for representing the gear ratio in whole numbers.

Gear unit ratio "numerator" index 10079.4

The parameter indicates the gear ratio tooth numbers. This allows for representing the gear ratio in whole numbers.

Gear unit ratio

The parameter indicates the gear ratio.

Number of gear unit stages index 10079.5

The parameter indicates the number of existing gear unit stages.

Power section parameters\display values\fault memory 0-4\fault memory t-0 – 4

There are 5 fault memories (t-0 to t-4). The faults are stored in a chronological sequence with the most recent fault event being held in fault memory t-0. If there are more than 5 faults, the fault event of longest standing stored in t-4 is deleted.

Programmable fault responses: see chapter "Device functions/Fault monitoring".

The following information available at the time of the fault is stored and can be used for detailed diagnostics:

- State of digital inputs/digital outputs
- Actual speed
- Apparent output current
- Active current
- Device utilization
- Motor utilization
- DC link voltage
- Power section status
- Power-applied hours
- Drive running hours
- Work
- Heat sink temperature
- Motor temperature
- Electronics temperature

Fault t-0 – 4 fault code index 8366.0, 8367.0, 8368.0, 8369.0, 8370.0

The parameter indicates the fault group with the fault number in plain text.

Fault t-0 – 4 subfault code index 10072.1, 10072.2, 10072.3, 10072.4, 10072.5

The parameter provides detailed information on the fault of a fault group.

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Fault t-0 – 4 internal index 8883.0, 8884.0, 8885.0, 8886.0, 8887.0

The parameter provides detailed information on the fault and can only be evaluated by SEW-EURODRIVE.

Source of fault t-0 – 4 index 10404.6, 10404.7, 10404.8, 10404.9, 10404.10

The parameter indicates the source of the fault:

- **0 = No fault**
- 1 = Power section
- 2 = Command pcb

Digital inputs DI00 – DI04 t-0 – 4 index 8371.0, 8372.0, 8373.0, 8374.0, 8375.0 bits 0 – 4

The parameter indicates the state of the digital inputs at the time of the fault.

Digital inputs DI10 – DI17 t-0 – 4 index 8376.0, 8377.0, 8378.0, 8379.0, 8380.0 bits 0 – 7

The parameter indicates the state of the digital inputs at the time of the fault.

Digital outputs DO10 – DO17 t-0 – 4 index 8386.0, 8387.0, 8388.0, 8389.0, 8390.0 bits 0 – 7

The parameter indicates the state of the digital outputs at the time of the fault.

Actual speed t-0 – 4 index 8401.0, 8402.0, 8403.0, 8404.0, 8405.0

The parameter indicates the actual motor speed at the time of the fault.

- Unit [min^{-1}]

Apparent output current t-0 – 4 index 8406.0, 8407.0, 8408.0, 8409.0, 8410.0

The parameter indicates the apparent output current in percent of the nominal device current at the time of the fault.

- Unit [%]

Active output current t-0 – 4 index 8411.0, 8412.0, 8413.0, 8414.0, 8415.0

The parameter indicates the active output current in percent of the nominal device current at the time of the fault.

- Unit [%]

Device utilization t-0 – 4 index 8414.0, 8417.0, 8418.0, 8419.0, 8420.0

The parameter indicates the device utilization Ixt at the time of the fault.

- Unit: [%]

Motor utilization t-0 – 4 index 8441.0, 8442.0, 8443.0, 8444.0, 8445.0

The parameter indicates the motor utilization calculated using motor model and current at the time of the fault.

- Unit: [%]

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DC link voltage t-0 – 4 index 8421.0, 8422.0, 8423.0, 8424.0, 8425.0

The parameter indicates the voltage measured in the DC link circuit at the time of the fault.

- Unit: [V]

Power section status t-0 – 4 index 8391.0, 8392.0, 8393.0, 8394.0, 8395.0

The parameter indicates the operating state of the power section at the time of the fault:

- 0 = Inhibited
- 1 = Controller inhibit
- 2 = System error
- 3 = No enable
- 6 = Enabled
- 7 = Rapid stop
- 8 = Integrator stop
- 9 = Emergency stop
- 11 = Limit switch operation
- 12 = Pos. operation
- 15 = Reference travel
- 18 = Release brake
- 19 = Apply brake

Power-applied hours t-0 – 4 index 8426.0, 8427.0, 8428.0, 8429.0, 8430.0

The parameter indicates the total number of hours for which the inverter has been connected to the power supply at the time of the fault.

- Storage cycle every 15 min
- Unit: [h]

Drive running hours t-0 – 4 index 8431.0, 8432.0, 8433.0, 8434.0, 8435.0

The parameter indicates the total number of hours for which the power section was in ENABLE operating state at the time of the fault.

- Storage cycle every 15 min
- Unit: [h]

Work t-0 – 4 index 10083.1, 10083.2, 10083.3, 10083.4, 10083.5

The parameter indicates the total of active electrical energy the motor has consumed at the time of the fault.

- Storage cycle every 15 min

Heat sink temperature t-0 – 4 index 8396.0, 8397.0, 8398.0, 8399.0, 8400.0

The parameter indicates the heat sink temperature of the power section at the time of the fault.

- Unit: [°C]

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Motor temperature t-0 – 4 index 10070.1, 10070.2, 10070.3, 10070.4, 10070.5

The parameter indicates the motor temperature measured at the time of the fault.

- Unit: [°C]

Power section parameters\display values\process data monitor

Process data configuration index 8451.0

The parameter indicates the set process data word configuration.

PO1 – PO3 setpoint index 8455.0, 8456.0, 8457.0

The parameter indicates the value currently transmitted in the process data word.

PO setpoint	Description
Index 8455.0 PO1 Setpoint	Index 8304.0 Setpoint description PO1
Index 8456.0 PO2 Setpoint	Index 8305.0 Setpoint description PO2
Index 8457.0 PO3 Setpoint	Index 8306.0 Setpoint description PO3

PI1 – PI3 actual value index 8458.0, 8459.0, 8460.0

The parameter indicates the value currently transmitted in the process data word.

PO setpoint	Description
Index 8458.0 PI1 Actual value	Index 8307.0 Actual value description PO1
Index 8459.0 PI2 Actual value	Index 8308.0 Actual value description PO2
Index 8460.0 PI3 Actual value	Index 8309.0 Actual value description PO3

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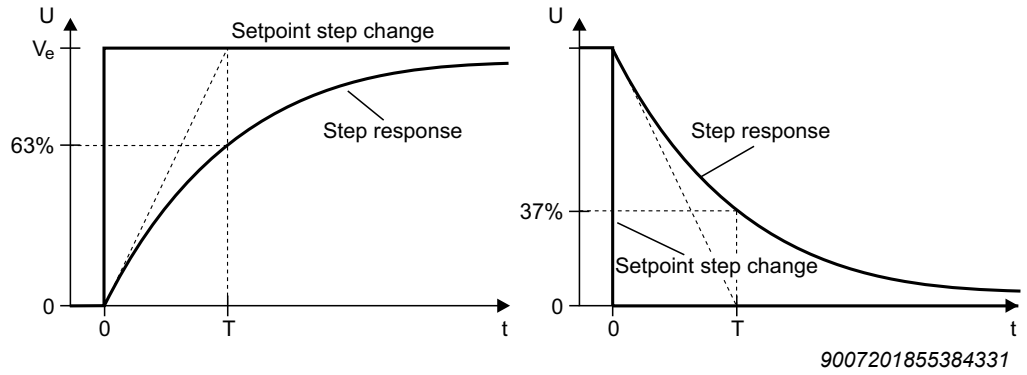
8.6.2 Setpoints/ramp generators

Power section parameters\setpoints/ramp generators\setpoint monitoring

Setpoint filter index 8468.0

The speed ramp is filtered. The filter can be used for dampening stepped setpoint selections, e.g. from external controllers or interference pulses at the analog input.

- Setting range: T = 0 – **5** – 3000 ms (0 = setpoint filter off)

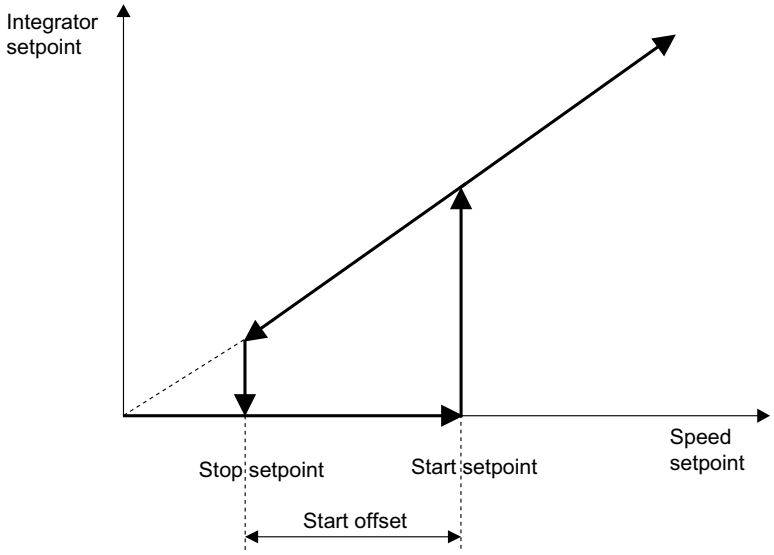


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Stop by setpoint function index 8578.0; stop setpoint index 8579.0; start offset index 8580.0

If the stop by setpoint function is activated, the inverter is enabled when the speed setpoint is larger than stop setpoint + start offset.

Inverter enable is revoked when the speed setpoint falls below the stop setpoint.



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Power section parameters\setpoints/ramp generators\speed ramps

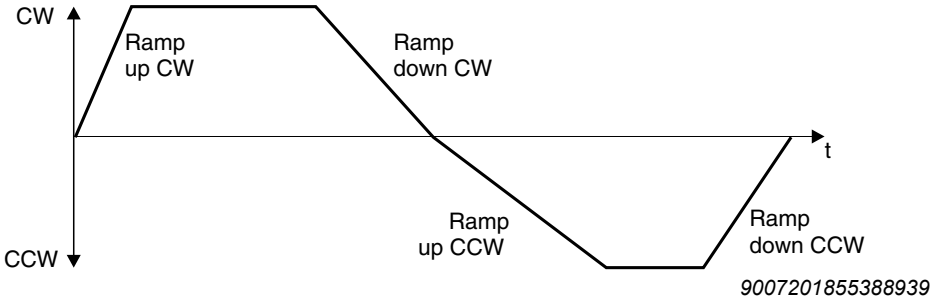
Ramp t11 up/down CW/CCW index 8470.0 8471.0, 8472.0, 8473.0

These parameters are used to set ramp t11:

- Parameter 8470.0 ramp t11 up CW
- Parameter 8471.0 ramp t11 down CW
- Parameter 8472.0 ramp t11 up CCW
- Parameter 8473.0 ramp t11 down CCW

The ramp times refer to a setpoint step change of Δn = 3000 min^{-1}. The ramp takes effect when the speed setpoint is changed and the enable signal is revoked via the CW/CCW terminal.

- Unit: [s]
- Setting range: 0 – 2 – 2000 s



Stop ramp t13 index 8476.0

This parameter is used to set stop ramp t13:

- Unit: [s]
- Setting range: 0 – **2** – 2000 s

The stop ramp is active in the event of a voltage drop or a fault (parameterizable fault responses).

Emergency stop ramp t14 index 8477.0

This parameter is used to set emergency stop ramp t14:

- Unit: [s]
- Setting range: 0 – **2** – 2000 s

The emergency stop ramp is activated in the event of a fault (parameterizable fault responses).

The system monitors whether the drive reaches zero speed within the set time. After expiry of the set time, the output stage is inhibited and DynaStop® is activated (if installed) even if zero speed has not yet been reached.

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Ramp monitor index 8928.0

This parameter is used to activate ramp monitoring:

- Setting range: YES/NO

If you set the deceleration ramps to a value that is much shorter than can be physically achieved in the system, the rotating drive will be stopped once the monitoring time has expired.

The respective ramp time also has to be increased, if the ramp timeout is definitely triggered by a preset ramp that cannot be traveled. This parameter is an additional monitoring function for speed monitoring. However, it only applies to the deceleration ramp. This means the parameter can be used to monitor the deceleration ramp, stop ramp or emergency stop ramp if speed monitoring is not desired.

Power section parameters\setpoints/ramp generators\fixed setpoints

Fixed setpoints n11, n12, n13 index 8489.0, 8490.0, 8491.0

Use this parameter to set the fixed setpoints n11, n12, n13:

- Setting range: 0 – 2000 min^{-1}

You can activate up to three fixed setpoints (binary coded) using the virtual digital inputs or process data words.

Fixed setpoints	Factory setting
Index 8489.0 **Internal setpoint n11**	n11 = 150 min^{-1}
Index 8490.0 **Internal setpoint n12**	n12 = 750 min^{-1}
Index 8491.0 **Internal setpoint n13**	n13 = 1500 min^{-1}

Programming the input terminals:

Response	Virtual terminal		
	n11	n12	Enable/stop
Stop with t13	x	x	0
Fixed setpoint not active	0	0	1
n11 effective	1	0	1
n12 effective	0	1	1
n13 effective	1	1	1

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8.6.3 Drive data

Power section parameters\drive data\motor parameters

Operating mode index 8574.0

The parameter indicates the set operating mode:

- **16 = Servo**
- 18 = Servo & IPOS

Direction of rotation reversal index 8537.0



⚠ WARNING

Risk of injury due to undesirable movements of the axis.

Severe or fatal injuries.

- Never change the "Direction of rotation reversal" parameter after referencing the system.

This parameter is used to activate direction of rotation reversal.

Setting range: ON/OFF:

- OFF: The drive turns clockwise for a positive setpoint and counterclockwise for a negative setpoint.
- ON: The drive turns counterclockwise for a positive setpoint and clockwise for a negative setpoint.

If you alter the "Direction of rotation reversal" parameter after the system has been referenced, the system will lose its reference point for the absolute position. The result may be undesirable movements of the axis.

PWM frequency index 8827.0

This parameter is used to set the nominal cycle frequency at the inverter output. The cycle frequency can change automatically depending on the device utilization:

- 0 = 4 kHz
- **1 = 8 kHz**

Power section parameters\drive data\monitoring functions

The following monitoring functions have been implemented to monitor what happens to drive-specific parameters in the specific application and to be able to react in case of impermissible deviations. You can set the response to triggered monitoring functions under "Device functions/Fault monitoring".

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Speed monitoring index 8557.0

This parameter is used to activate speed monitoring.

Setting range:

- OFF
- MOTOR MODE
- GENERATOR MODE
- **MOTOR/GENERATOR**

The speed required by the setpoint can only be achieved if there is sufficient torque available to meet the load requirements. Once the current limit (index 8518.0) has been reached, the device assumes that the torque has reached its maximum and the desired speed cannot be reached. Speed monitoring is triggered if this situation persists for the duration specified in the delay time (index 8558.0).

Delay time for speed monitoring index 8558.0

This parameter is used to set the delay time for speed monitoring:

- Setting range: 0 – **5** – 10 s

The set current limit can be reached briefly during acceleration, deceleration, or load peaks. You can prevent speed monitoring from responding too sensitively by setting the delay time accordingly. The current limit must be reached permanently for the duration of the delay time before the monitoring function trips.

Power section parameters\drive data\limit values

Minimum speed index 8576.0

This parameter is used to set the speed value, the lower limit of which must not be exceeded even when zero is selected as the setpoint:

- Setting range: 200 – 2000 min^{-1}
- Setting range in connection with option /ECR: 0 – 2000 min^{-1}

Maximum speed index 8517.0

This parameter is used to set the speed value, which cannot be exceeded by a specified setpoint:

- Setting range: 200 – 2000 min^{-1}
- Setting range in connection with option /ECR: 0 – 2000 min^{-1}

When $n_{min} > n_{max}$ is set, then n_{max} applies.

Current limit index 8518.0

This parameter is used to set the current limit:

- Setting range: 0 – **250** – 400% I_N

The current limit is given in % IN. It is based on the continuous apparent current of the power section. The actually effective current limit calculated by the device can be lower to protect the gear unit. It is shown in the parameter "effective current limit".

Effective current limit index 9951.3

The effective current limit is calculated from the current limit (index 8518.0) and a limiting factor that depends on the gear ratio. It is shown in % IN.

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Torque limit index 8688.0



NOTICE

Damage to the MOVIGEAR® drive unit.

Potential damage to property.

- Consult SEW-EURODRIVE before you change the torque limit.

This parameter is used to set the torque limit:

- Setting range: 0 – **250** – 400%

The parameter limits the maximum torque of the motor. The setting acts on the set-point of the motor torque ($k_T \times I_{N_inverter}$).

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8.6.4 Terminal assignment

Power section parameters\terminal assignment\digital inputs

Digital inputs DI01 – DI04 index 8334.0, bits 0 – 4

The parameters show the state of digital inputs DI00 to DI04.

Digital inputs DI01 – DI04 index 8335.0 – 8338.0

This parameter is used to specify the assignment of digital inputs DI01 – D04. Digital input DI00 is always assigned with /Controller inhibit.

You can program the digital inputs to the following functions:

Function		Effect in case of		
		"0" signal	"1" signal	
0 = No function		–	–	
1 = Enable/stop		Stop at t13	Enable	
2 = CW/stop		Stop at t11 or t12	Enable CW	
3 = CCW/stop		Stop at t11 or t12	Enable CCW	
4 = n11	**n13**	External setpoints only	n11	n13
5 = n12		External setpoints only	n12	
8 = Speed ramp switchover		1st ramp (t11) active	2nd ramp (t12) active	
9 = Reserved		–	–	
10 = Reserved		–	–	
11 = /External fault, 0 active		External fault	–	
12 = Fault reset		Reset on positive edge ("0" to "1")		
13 = Reserved		–	–	
14 = /Limit switch right		Right limit switch reached	Not reached	
15 = /Limit switch left		Left limit switch reached	Not reached	
16 = IPOS input		Function depends on IPOS function		
17 = Reference cam		Not activated	Activated	
18 = Reference travel start		–	Start referencing for IPOS	
19 = Slave free running		Master/slave mode	Slave free running	
20 = Setpoint acceptance active		Do not accept	Accept setpoint	
30 = /Controller inhibit, 0 active		Controller inhibit active	Inverter enabled	

Digital inputs DI10 – DI17 index 8348.0, bits 0 – 7

The parameters show the state of virtual digital inputs DI10 to DI17.

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Digital inputs DI10 – DI17 index 8340.0 – 8347.0

This parameter is used to specify the assignment of virtual digital inputs DI10 to DI17, or the assignment of the digital inputs of an application option. You can program the digital inputs to the following functions:

Function		Effect in case of		
		"0" signal	"1" signal	
0 = No function		–	–	
1 = Enable/stop		Stop at t13	Enable	
2 = CW/stop		Stop at t11 or t12	Enable CW	
3 = CCW/stop		Stop at t11 or t12	Enable CCW	
4 = n11	**n13**	External setpoints only	n11	n13
5 = n12		External setpoints only	n12	
8 = Speed ramp switchover		1st ramp (t11) active	2nd ramp (t12) active	
9 = Reserved		–	–	
10 = Reserved		–	–	
11 = /External fault, 0 active		External fault	–	
12 = Fault reset		Reset on positive edge ("0" to "1")		
13 = Reserved		–	–	
14 = /Limit switch right		Right limit switch reached	Not reached	
15 = /Limit switch left		Left limit switch reached	Not reached	
16 = IPOS input		Function depends on IPOS function		
17 = Reference cam		Not activated	Activated	
18 = Reference travel start		–	Start referencing for IPOS	
19 = Slave free running		Master/slave mode	Slave free running	
20 = Setpoint acceptance active		Do not accept	Accept setpoint	
30 = /Controller inhibit, 0 active		Controller inhibit active	Inverter enabled	

Power section parameters\terminal assignment\digital outputs

Digital outputs DO10 – DO17 index 8360.0, bits 0 – 7

The parameters show the state of the virtual digital outputs DO10 to DO17.

Digital outputs DO10 – DO17 index 8352.0 – 8359.0

INFORMATION

The binary signals are only valid if the inverter has signaled "ready" after it has been switched on and if no error message has been issued. Binary signals have "0" state while the device is being initialized.

Several terminals can be assigned the same function.

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This parameter is used to specify the assignment of virtual digital outputs DO10 to DO17, or the assignment of the digital outputs of an application option. You can program the digital outputs to the following functions:

Function	Digital output has	
	"0" signal	"1" signal
0 = No function	Always "0" signal	–
1 = /Fault	Collective fault signal	–
2 = Ready	Not ready for operation	Ready
3 = Output stage ON	Device inhibited	Device enabled and motor energized
4 = Rotating field ON	No rotating field	Rotating field
5 = Brake released[1)]	**In connection with mechatronic MOVIGEAR® drive unit:** DynaStop® is active	**In connection with mechatronic MOVIGEAR® drive unit:** DynaStop® is deactivated
	In connection with DRC.. electronic motor: Brake applied	**In connection with DRC.. electronic motor:** Brake released
6 = Brake applied[1)]	**In connection with mechatronic MOVIGEAR® drive unit:** DynaStop® is deactivated	**In connection with mechatronic MOVIGEAR® drive unit:** DynaStop® is active
	In connection with DRC.. electronic motor: Brake released	**In connection with DRC.. electronic motor:** Brake applied
7 = Motor standstill	Motor running	Motor stopped
8 = Reserved	–	–
9 = Speed reference signal	$n > n_{ref}$ ($n < n_{ref}$)	$n < n_{ref}$ ($n > n_{ref}$)
10 = Speed reference signal	Speed is outside (within) speed window	Speed is within (outside) speed window
11 = Setpoint-actual value comparison signal	$n <> n_{setpoint}$ ($n = n_{setpoint}$)	$n = n_{setpoint}$ ($n <> n_{setpoint}$)
12 = Current reference signal	$I > I_{ref}$ ($I < I_{ref}$)	$I < I_{ref}$ ($I > I_{ref}$)
13 = Imax signal	$I < I_{max}$ ($I = I_{max}$)	$I = I_{max}$ ($I < I_{max}$)
14 = /Warning motor utilization	100% prewarning of motor protection function	–
19 = IPOS in position	Position not reached	Position reached
20 = IPOS referenced	No referencing	Referencing finished
21 = IPOS output	Depends on IPOS program	

Function	Digital output has	
	"0" signal	"1" signal
22 = /IPOS fault	IPOS program error message	–
27 = STO – safe torque off	Not active	Active
34 = Process data bit	Bit not set	Bit set

1) Controlled by the inverter. The "Brake released" and "Brake applied" signals are intended to be passed on to a master controller.

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8.6.5 Diagnostic functions

Power section parameters\diagnostics functions\reference signals

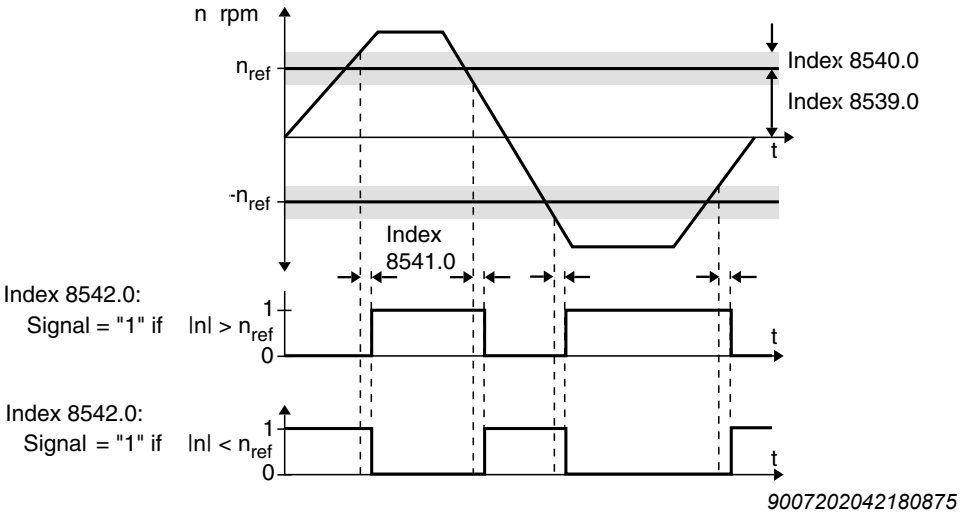
INFORMATION

The signals are only valid if the inverter has signaled "ready" after switch-on and no fault is indicated.

The following reference values are used for detecting and reporting certain operating states. All signals of this parameter group can be output via virtual digital outputs.

Speed reference signal

Signal if the speed is less than or greater than the set reference speed.



9007202042180875

Speed reference value index 8539.0

Setting range: 0 – **1500** – 6000 min^{-1}

Hysteresis index 8540.0

Setting range: 0 – **100** – 500 min^{-1}

Delay time index 8541.0

Setting range: 0 – **1** – 9 s

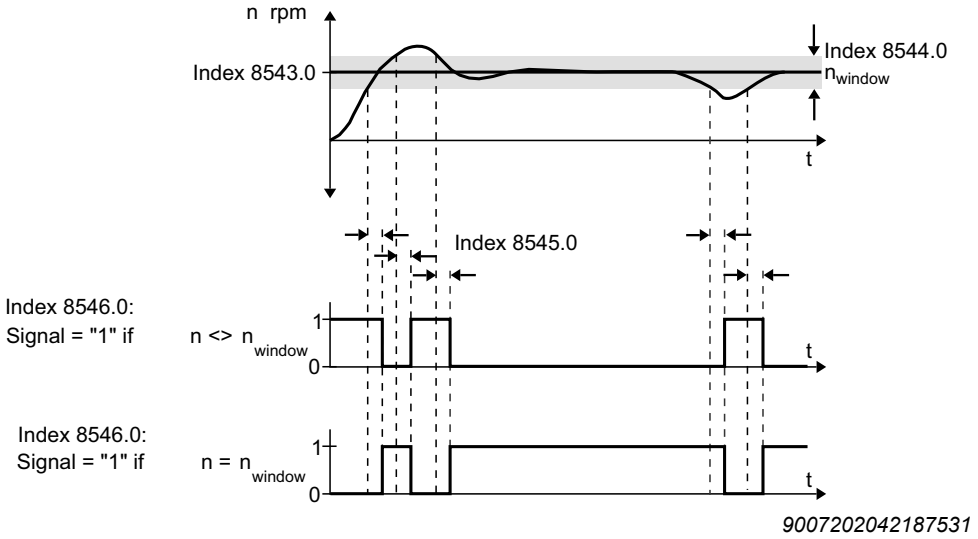
Signal = "1" if: Index 8542.0

n < n_{ref}/n > n_{ref}

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Speed window signal

Signals whether the speed is within or outside the set window range.



Window center index 8543.0

Setting range: 0 – **1500** – 6000 min^{-1}

Range width index 8544.0

Setting range: **0** – 6000 min^{-1}

Delay time index 8545.0

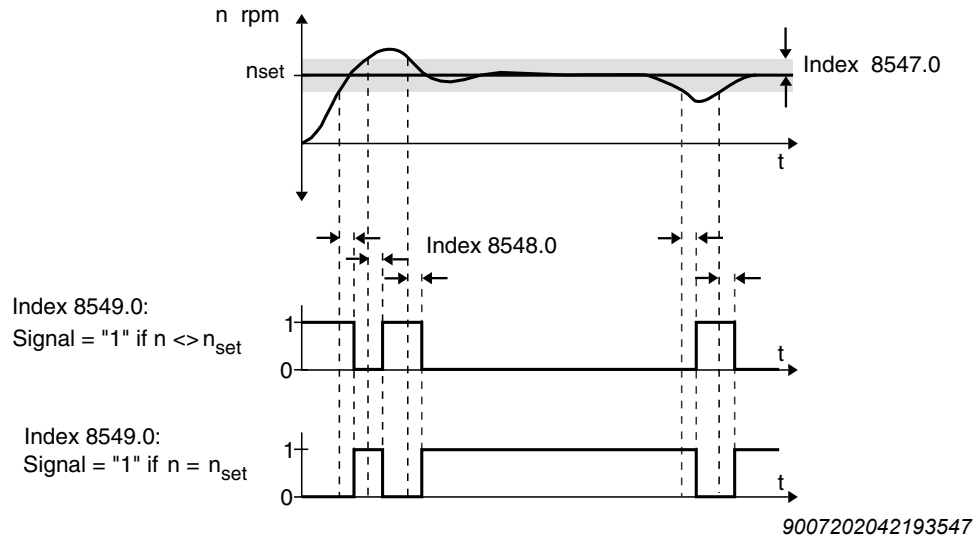
Setting range: 0 – **1** – 9 s

Signal = "1" if: Index 8546.0

Setting range: **WITHIN**/OUTSIDE

Speed setpoint actual value comparison

Signal if the speed is equal to or not equal to the setpoint speed.



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Hysteresis index 8547.0

Setting range: 1 – **100** – 300 min^{-1}

Delay time index 8548.0

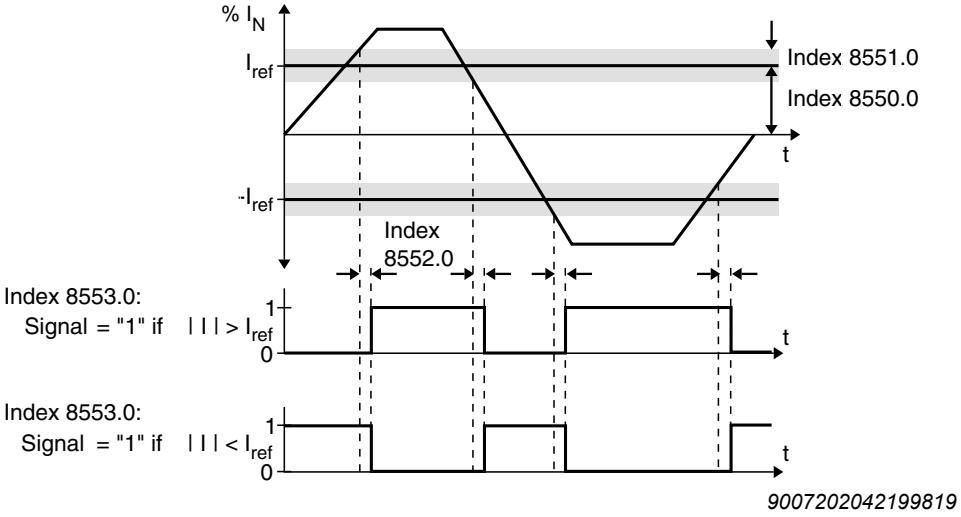
Setting range: 0 – **1** – 9 s

Signal = "1" if: Index 8549.0

Setting range: **n = n_{set}**/n <> n_{set}

Current reference signal

Signal if the output current is greater or less than the reference value.



9007202042199819

Current reference value index 8550.0

Setting range: 0 – **100** – 400% I_N

Hysteresis index 8551.0

Setting range: 0 – **5** – 30% I_N

Delay time index 8552.0

Setting range: 0 – **1** – 9 s

Signal = "1" with index 8553.0

I < I_{ref}/I > I_{ref}

Imax signal

Signal if the inverter has reached the current limiting.

Hysteresis index 8554.0

Setting range: **5** – 50% I_N

Delay time index 8555.0

Setting range: 0 – **1** – 9 s

Signal = "1" with index 8556.0

I < I$_{max}$/I = I$_{max}$

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8.6.6 Technology functions

INFORMATION

For detailed information on the following parameters, refer to the "IPOS$^{plus®}$" manual.

Power section parameters\technology functions\IPOS reference travel

⚠ WARNING



Risk of injury if the drive unit starts up automatically.

Severe or fatal injuries.

- Ensure that the motor cannot start unintentionally.
- Note that modifying these parameters without knowledge of the IPOS$^{plus®}$ program, which may be active, can cause unexpected movements and result in unwanted loads on the mechanical drive train. It is essential that you are familiar with the IPOS$^{plus®}$ manual to make the setting for these parameters.

Reference travel is used to establish a **machine zero** to which all absolute positioning commands refer. For this purpose, you can choose between various so-called reference strategies index 8626.0 Reference travel type. These strategies define appropriate travel modes, for example, to search for a reference cam. Using the reference point determined by reference travel, the machine zero point can be changed using P900 Reference offset according to the following equation:

Machine zero = reference position + reference offset.

The speeds of the travel movements required for the reference travel type are set using index 8624.0 reference speed 1/index 8625.0 reference speed 2.

IPOS axis referenced index 8702.0

INFORMATION

Device behavior in connection with multi-turn encoder und system referencing.

When using a multi-turn encoder, the referenced bit in parameter 8702.0, bit 0 is set permanently after successful reference travel. This bit can only be reset by starting reference travel again or by writing the value "0" to parameter 8702.0.

- The bit is cleared automatically when a multi-turn encoder is replaced by SEW-EURODRIVE Service.
- If a referenced drive is used as an overall unit at another location in the system, a reference travel must be performed again before positioning for the first time.
- When replacing the electronics cover, no reference travel is necessary. Downloading a saved parameter set into a device even sets the referenced bit permanently if the encoder has an identical serial number and the drive was referenced at the time of data backup.

The parameter indicates whether the MOVIGEAR® drive was referenced.

Reference offset index 8623.0

Reference offset (zero offset) is used to determine the machine zero (origin).

- Setting range: $-(2^{31}-1) - \mathbf{0} - 2^{31}-1$

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The following applies: Machine zero = reference position + reference offset.

The corresponding actual positions are indicated by IPOS$^{plus®}$ variables.

- H511 Actual position motor encoder

The reference offset becomes active after reference travel has been completed successfully.

Reference travel 1 index 8624.0

Reference speed 1 determines the travel speed for the first part of the reference travel. Stop ramp t13 is always used to change the speed. The search directions during reference travel are determined by the respective reference travel type. The speed is in effect until the reference cam has been reached.

- Setting range: 0 – **200** – 2000 min^{-1}

Reference travel 2 index 8625.0

Reference speed 2 determines the travel speed for the second part of the reference travel. Stop ramp t13 is always used to change the speed. The search directions during reference travel are determined by the respective reference travel type. The speed is effective from the time the drive leaves the reference cam until it reaches the first zero pulse.

- Setting range: 0 – **50** – 2000 min^{-1}

The reference speed is limited to 50 min^{-1} for reference travel type 0 and for referencing to a zero pulse.

Reference travel type index 8626.0

The reference travel type specifies the reference travel strategy that is used to establish the machine zero of a machine.

- Setting range: **0** – 8

This setting also defines the search direction for the reference cam in the individual referencing phases.

Use parameter index 8839.0 referencing to zero pulse to determine if the reference travel takes place to the edge change of the reference cam or the next zero pulse of the encoder.

The drive must be **ready for operation** and **enabled** for all types of reference travel to take place.

Some types are available that work without a reference cam.

- **Type 0: Left zero pulse**
  - First search direction is CCW
  - Reference position = left zero pulse from current position
  - Machine zero = reference position + reference offset
- **Type 1: Left end of the reference cam**
  - First search direction is CCW
  - Reference position = first zero pulse or falling edge to the left of the reference cam
  - Machine zero = reference position + reference offset
- **Type 2: Right end of the reference cam**
  - First search direction is CW

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  - Reference position = first zero pulse or falling edge to the right of the reference cam
  - Machine zero = reference position + reference offset
- **Type 3: Limit switch right**
  - First search direction is CW
  - Reference position = first zero pulse or falling edge to the left of the right limit switch
  - Machine zero = reference position + reference offset
  - Reference travel should take place to zero pulse.
- **Type 4: Limit switch left**
  - First search direction is CCW
  - Reference position = first zero pulse or falling edge to the right of the left limit switch
  - Machine zero = reference position + reference offset
  - Reference travel should take place to zero pulse.
- **Type 5: No reference travel**
  - Reference position = current position
  - Machine zero = reference offset
- **Type 6: Reference cam flush with right limit switch**
  - First search direction is CW
  - Reference position = first zero pulse or falling edge to the left of the reference cam
  - Machine zero = reference position + reference offset
  - Note: Reference cam and limit switch must be flush.
- **Type 7: Reference cam flush with left limit switch**
  - First search direction is CCW
  - Reference position = first zero pulse or falling edge to the right of the reference cam
  - Machine zero = reference position + reference offset
  - Note: Reference cam and limit switch must be flush.
- **Type 8: Without enable**
  - Reference position = current position
  - Machine zero = reference offset

Referencing to zero pulse index 8839.0

Setting range: YES/NO.

- **YES:** The drive is referenced to the zero pulse of the selected IPOS$^{plus®}$ encoder.
- NO: Reference travel takes place with the falling edge of the reference cam.

Cam distance index 10455.0

Indicates the distance between reference cam and 0-pulse after reference travel in increments.

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8.6.7 Control functions

Power section parameters\control functions\brake functions

Deactivate DynaStop® without enable index 8893.0

INFORMATION

For more information about disabling DynaStop® without drive enable, refer to chapter "Operation".

This parameter is used to set the function "Deactivate DynaStop® without enable":

- 0 = NO
- **1 = YES**

When the function is activated (1 = YES), DynaStop® can even be deactivated without drive enable.

Brake function index 8584.0

INFORMATION

DynaStop® is **always** activated when /CONTROLLER INHIBIT = 0.

This function gives users the option to choose between electrically holding the load and activating DynaStop® in "no enable" state (hold status).

Specifies whether DynaStop® is to be activated when revoking enable (enable = "0") or whether the drive generates a motor holding torque.

- **0 = OFF**: The drive decelerates along the set ramp. When the speed reaches "0", the drive changes to "No enable" state. DynaStop® is not activated. The drive generates a motor holding torque.
- 1 = ON: The drive decelerates along the set ramp. When the speed reaches "0", the drive changes to "No enable" state. DynaStop® is activated. The drive does not generate a motor holding torque.

8.6.8 Device functions

Power section parameters\device functions\setup

Factory setting index 8594.0

Parameter 8594.0 is used to reset the factory settings stored in EEPROM for almost all parameters.

Setting range:

- **0 = No**
- 1 = Default
- 2 = Delivery state

The following data is not reset when "default" is selected:

- IPOS program
- Speed control
- Limits
- Serial communication SBus 1

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- Speed task 1/2
- Fault memory
- Statistical data

The "delivery state" setting also resets the data listed above.

Once the data has been reset, parameter 8594.0 automatically reverts to "NO".

Parameter lock index 8595.0

Setting range: ON/**OFF**

Setting parameter 8595.0 to "ON" prevents any change to the parameters (except for index 8617.0 manual reset and the parameter lock itself). This is useful, for example, after having optimized the drive settings. To enable changes to parameters again, index 8595.0 must be set to "OFF".

INFORMATION

The parameter lock also acts on the SBus interface and on IPOS$^{plus®}$.

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Power section parameters\device functions\fault monitoring



⚠ WARNING

Risk of injury if the drive unit starts up automatically.

Severe or fatal injuries.

- Note that fault messages can reset automatically depending on the programmed fault response. This means the drive units receive the current process output data from the controller again as soon as the fault is no longer present. If this is not permitted for the driven machine for safety reasons, disconnect the device from the supply system before you start troubleshooting.



NOTICE

If "Output stage inhibit" is programmed as fault response, DynaStop® is activated in the event of a fault even at high speed.

This can cause a high torque load, which can damage the drive and the application.

Potential damage to property.

- When using DynaStop®, do not program "Output stage inhibit" as fault response.

The following responses can be programmed:

Response	Description
[0] NO RESPONSE	The fault is not displayed, and there is no fault response. The indicated fault is ignored.
[1] DISPLAY ONLY	The fault is displayed and the fault output is set (if programmed). The device does not perform any other fault response. The fault can be reset (fieldbus, auto reset).
[2] OUTPUT STAGE INHIBIT/LOCKED	The inverter switches off immediately and issues a fault message. The output stage is inhibited and DynaStop® (if installed) is activated. The ready signal is revoked and the fault output is set, if programmed. A restart is only possible after a fault reset during which the inverter is re-initialized.
[3] EMERGENCY STOP/ LOCKED	The drive is braked along the set emergency stop ramp t14. The output stage is inhibited once the stop speed has been reached and DynaStop® (if installed) is activated. The fault is signaled immediately. The ready signal is revoked and the fault output is set, if programmed. A restart is only possible after a fault reset during which the inverter is re-initialized.
[4] STOP/LOCKED	The drive is braked along the set stop ramp t13. The output stage is inhibited once the stop speed has been reached and DynaStop® (if installed) is activated. The fault is signaled immediately. The ready signal is revoked and the fault output is set, if programmed. A restart is only possible after a fault reset during which the inverter is re-initialized.

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Response	Description
[5] OUTPUT STAGE INHIBIT/WAITING	The inverter switches off immediately and issues a fault message. The output stage is inhibited and DynaStop® (if installed) is activated. The fault is signaled via the terminal, if programmed. The ready signal is revoked. The drive restarts without device re-initialization if the fault is rectified by an internal procedure or by a fault reset.
[6] EMERGENCY STOP/WAITING	The drive is braked along the set emergency stop ramp t14. The output stage is inhibited once the stop speed has been reached and DynaStop® (if installed) is activated. The fault is signaled immediately. The fault is signaled via the terminal, if programmed. The ready signal is revoked. The drive restarts without device re-initialization if the fault is rectified by an internal procedure or by a fault reset.
[7] STOP/WAITING	The drive is braked along the set stop ramp t13. The output stage is inhibited once the stop speed has been reached and DynaStop® (if installed) is activated. The fault is signaled immediately. The fault is signaled via the terminal, if programmed. The ready signal is revoked. The drive restarts without device re-initialization if the fault is rectified by an internal procedure or by a fault reset.

Response to ext. fault index 9729.16

Factory setting: EMERGENCY STOP/WAITING

The fault is only triggered in the ENABLED inverter status. Index 9729.16 programs the fault response that is triggered by a virtual input terminal programmed to "/EXT. FAULT".

Response to line phase failure index 9729.4

Factory setting: DISPLAY ONLY

The supply system input phases are monitored for failure of a single phase. If a phase failure is detected in two phases, then the DC link will be de-energized, which corresponds to a supply system disconnection.

Since the supply system input phases cannot be monitored directly, monitoring has to be done indirectly via the DC link ripple, which increases drastically in case one phase fails. The DC link voltage is monitored at a time interval D_t = 1 ms for dropping below a minimum voltage level that depends on the rated supply voltage of the device. A line phase failure can only be detected when the drive is enabled and under load.

The result is the following nominal guide value for detecting a phase failure:

- 50 Hz system: approx. t_{max} = 3.0 s
- 60 Hz system: approx. t_{max} = 2.5 s

The programmed response is activated when a line phase failure is detected.

Response to TF signal index 9729.9

Factory setting: EMERGENCY STOP/WAITING

Index 9729.9 is used to program the fault response that is triggered by the temperature sensor monitoring function of the TF or TH that might be installed in the motor winding.

Manual reset index 8617.0

Setting range: YES/NO

YES: The pending fault is reset. Index 8617.0 automatically reverts to NO after the reset. Activating the manual reset does not have any effect if there is no fault present.

NO: No reset.

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Power section parameters\device functions\scaling of actual speed value

Scaling factor for user display speed numerator index 8747.0

Setting range: 1 – 65535

Actual speed scaling defines a user-specific display parameter "index 8501.0 User display". For example, the user display is to be shown in 1/s.

This requires a scaling factor of 1/60. This means the numerator scaling factor has to be set to 1 and the denominator scaling factor to 60. The scaling unit 1/s is entered in "index 8772.0/8773.0 User-defined unit".

The scaling factor also acts on:

- PO1...3 Setpoint speed in user-defined units
- PI1...3 Actual speed in user-defined units

Scaling factor for user display speed denominator index 8748.0

Setting range: 1 – 65535

Actual speed scaling defines a user-specific display parameter "index 8501.0 User display". For example, the user display is to be shown in 1/s.

This requires a scaling factor of 1/60. This means the numerator scaling factor has to be set to 1 and the denominator scaling factor to 60. The scaling unit 1/s is entered in "index 8772.0/8773.0 User-defined unit".

The scaling factor also acts on:

- PO1...3 Setpoint speed in user-defined units
- PI1...3 Actual speed in user-defined units

User-defined unit index 8772.0, 8773.0

Factory setting: min^{-1}.

Max. 8 ASCII characters; displayed in index 8501.0 User display.

Scaling factor for actual position numerator index 9543.1

Permanently set to "1"

With the actual position scaling, a user-specific return value of the actual position is output to the process input data PI1..3 when selecting actual position user-defined units.

Resolution of the actual position: 4096 inc/motor revolution

Scaling factor for actual position denominator index 9544.1

Setting range: 1 – 65535

With the actual position scaling, a user-specific return value of the actual position is output to the process input data PI1..3 when selecting actual position user-defined units.

Resolution of the actual position: 4096 inc/motor revolution

$$Actual\ position\ UU(16\,Bit) = Actual position\ (32\,Bit) \times \frac{1}{Scaling\ factor\ denominator}$$

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9 Operation

9.1 Local mode (only with optional plug connector)

9.1.1 Notes



⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages can still be present for up to 5 minutes after disconnection from the power supply system.

Severe or fatal injuries.

- Before removing the electronics cover, de-energize the MOVIGEAR® drive units with a suitable external disconnection device.
- Secure the drive unit against unintended re-connection of the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least 5 minutes before removing the electronics cover.



⚠ WARNING

Risk of burns due to hot surfaces.

Severe injuries.

- Let the devices cool down before touching them.

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9.1.2 Activating local mode

INFORMATION

Local mode can only be activated when the drive is **not** enabled.

Set DIP switch S2/3 to "ON" (see also "Startup" chapter). This allows for local mode with optional plug connector "X5131" (see also the "Electrical installation" chapter).



Use of motion control inputs

OFF = Used as sensor inputs
ON = Used for local mode

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The effect of the DIP switch setting is that motion control input "DI04" serves for switching between sensor inputs/local mode irrespective of the set function.

When DIP switch S2/3 is set to "ON" and motion control input DI04 is set to "1", then motion control inputs DI01 to DI03 are used for local mode with the following functions:

Motion control input	Function when DIP switch S2/3 = ON
DI01	CW/stop
DI02	CCW/stop
DI03	Setpoint selection "0" = Setpoint n_f1 active (parameter 10096.35, factory set to 1500 min^{-1}) "1" = Setpoint n_f2 active (parameter 10096.36, factory set to 200 min^{-1})
DI04	Switching between local mode/automatic mode

9.1.3 Deactivating local mode

⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Before deactivating local mode, take measures to prevent the drive unit from starting up unintentionally, e.g. by activating "STO".
- Take additional safety precautions depending on the application to avoid injury to people and damage to machinery.

9.2 DynaStop®

9.2.1 Functional description



⚠ WARNING

The DynaStop® electrodynamic deceleration function 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 be used for inclining tracks only 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® makes it possible to generate 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.

9.2.2 Deceleration torques



INFORMATION

For possible deceleration torques, refer to chapter "Technical data and dimension sheets/DynaStop® deceleration torques".

9.3 Deactivating DynaStop®



INFORMATION

For information on how to deactivate the DynaStop® function, refer to chapter "Start-up".

9.3.1 Activating the function

Activate the function by setting parameter 8893.0 "Deactivate DynaStop® without enable" to the value "1 = YES (factory setting, see also chapter "Parameters"). This allows for deactivating the DynaStop® function even when the drive is not enabled and the unit is in controller inhibit state.

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9.3.2 Functional description with automatic mode (bus mode)

INFORMATION

For releasing DynaStop® without drive enable, observe the notes in the documentation of the controller in use.

9.3.3 Functional description of local mode (only in conjunction with optional plug connector)

Activate local mode by setting DIP switch S2/3 = ON. Refer to the "Local mode" chapter.

If parameter 8893.0 is set to "1 = ON" and local mode is activated with DI04 and DIP switch S2/3 is set to "ON", then DynaStop® can be deactivated by setting the signal at DI03. The following conditions must be met in this case:

Terminal status				Device status	Fault status	DynaStop® function
DI01	DI02	DI03	DI04			
R ↷	L ↶	f1/f2	Automatic/ local			
"1" "0"	"0" "1"	"0"	"1"	Enabled	No device fault	DynaStop® is controlled by MOVIGEAR®, setpoint f1
"1" "0"	"0" "1"	"1"	"1"	Enabled	No device fault	DynaStop® is controlled by MOVIGEAR®, setpoint f2
"1"	"1"	"0"	"1"	No enable	No device fault	DynaStop® is controlled by MOVIGEAR®
"0"	"0"	"0"	"1"	No enable	No device fault	DynaStop® is active
"1"	"1"	"1"	"1"	No enable	No device fault	DynaStop® is controlled by MOVIGEAR®
"0"	"0"	**"1"**	"1"	**Controller inhibit or STO**	**No device fault**	**DynaStop® is deactivated for manual operation**
All states possible			"1"	Fault	Device fault	DynaStop® is active

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Setpoint selection

Setpoint selection in binary control depending on the state of terminal f1/f2:

Enable state	DI03	Active setpoint
Enabled	f1/f2 = "0"	Setpoint n_f1 active (parameter 10096.35, factory set to 1500 min^{-1})
Enabled	f1/f2 = "1"	Setpoint n_f2 active (parameter 10096.36, factory set to 200 min^{-1})

LED display



⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Before deactivating local mode, take measures to prevent the drive unit from starting up unintentionally, e.g. by activating "STO".
- Take additional safety precautions depending on the application to avoid injury to people and damage to machinery.

The DRIVE LED flashes periodically when DynaStop® has been deactivated for manual operation.

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9.4 DynaStop® in conjunction with STO

INFORMATION

For using the STO function, refer to the "Functional Safety MOVIGEAR® B" document.

⚠ WARNING

The DynaStop® electrodynamic deceleration function 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 be used for inclining tracks only after a risk assessment.

The optional DynaStop® function is not safety-related and is not part of the safety functions described in the "Functional Safety" manual.

9.4.1 Using the DynaStop® function in connection with the STO function

To use the DynaStop® function in connection with the STO function, SEW-EURODRIVE recommends control according to SS1(c).

In connection with electronic variants DAC, DSC, and SNI, the parameter "8584.0 – Brake function" must be set to "1" for this purpose.

The following table shows the behavior of the DynaStop® function depending on the parameter setting:

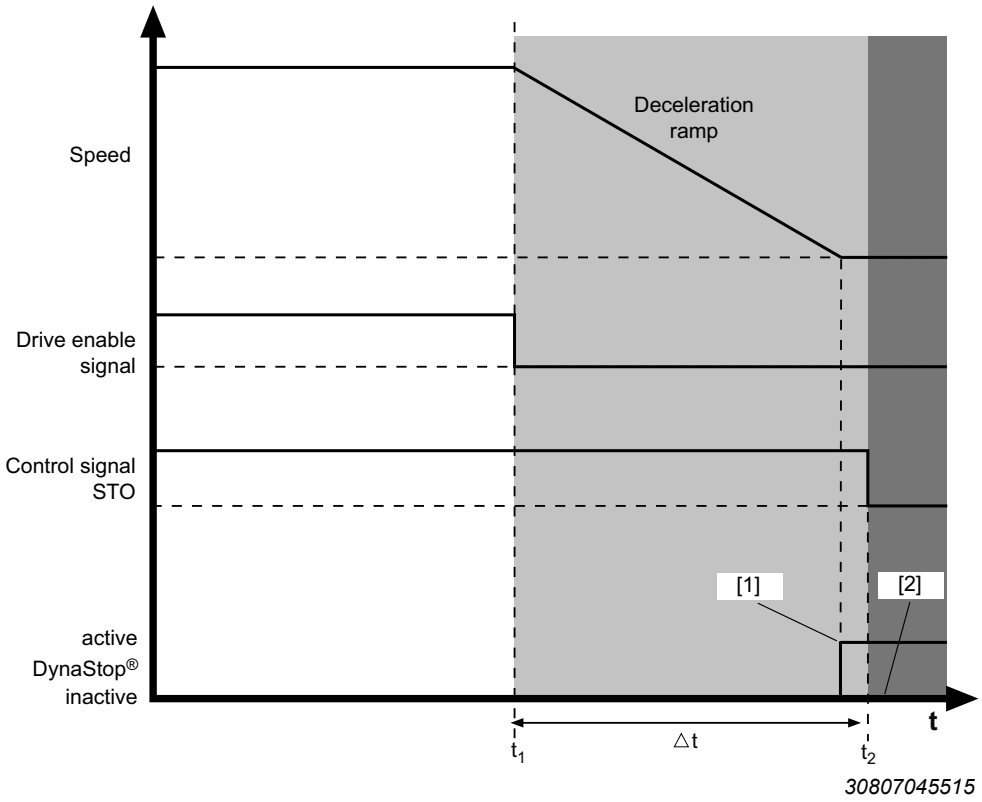
Index	Parameter/setting	Meaning	
		DAC, DSC, SNI electronics variant:	**DBC electronics variant**
8584.0	Brake function **0 = OFF**	The drive decelerates along the set ramp. When the drive reaches speed "0", DynaStop® is **not** activated.	The drive decelerates along the set ramp. When the speed reaches "0", DynaStop® is activated.
	Brake function 1 = ON	The drive decelerates along the set ramp. When the drive reaches speed "0", DynaStop® is not activated in a safety-related manner.	
9833.20	Activation of DynaStop® for STO **0 = NO**	The DynaStop® status remains unchanged when STO is triggered.	
	Activation of DynaStop® for STO 1 = Yes	DynaStop® is activated (not safety-related) when STO is triggered.	

Necessary setting in connection with electronic variants DAC, DSC, SNI

Recommended setting

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The following figure shows the use of the DynaStop® function in connection with the STO function:



[1] Parameter setting "8584.0 – Brake function": 1 = ON (all variants)

[2] Factory setting of parameter "8584.0 – Brake function": 0 = OFF (in connection with electronic variants DAC, DSC, SNI)

t Time

t_1 Point of time when brake ramp is initiated

t_2 Point of time when STO is triggered

Δt Time between initiating the brake ramp and STO

Safe time delay range

Disconnection range

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9.4.2 Behavior when STO is activated before standstill (motor speed = 0)



NOTICE

Depending on the setting in parameter "9833.20", the DynaStop® function can be activated outside the permitted operating range.

This can cause a high torque load/high motor currents, which may damage the drive unit and the application.

- Use the factory settings or recommended settings.

If STO is activated before the motor has reached speed "0", the DynaStop® function behaves as set in parameter "9833.20 – Activation of DynaStop® for STO":

Parameter "9833.20 – Activation of DynaStop® for STO": 1 = Yes

- DynaStop® is activated when STO is triggered.

Parameter "9833.20 – Activation of DynaStop® for STO": 0 = NO

(factory setting/recommended setting)

The DynaStop® status remains unchanged when STO is triggered.

- Depending on the application, the motor coasts to a halt or even accelerates.
- The deceleration distance is not defined.

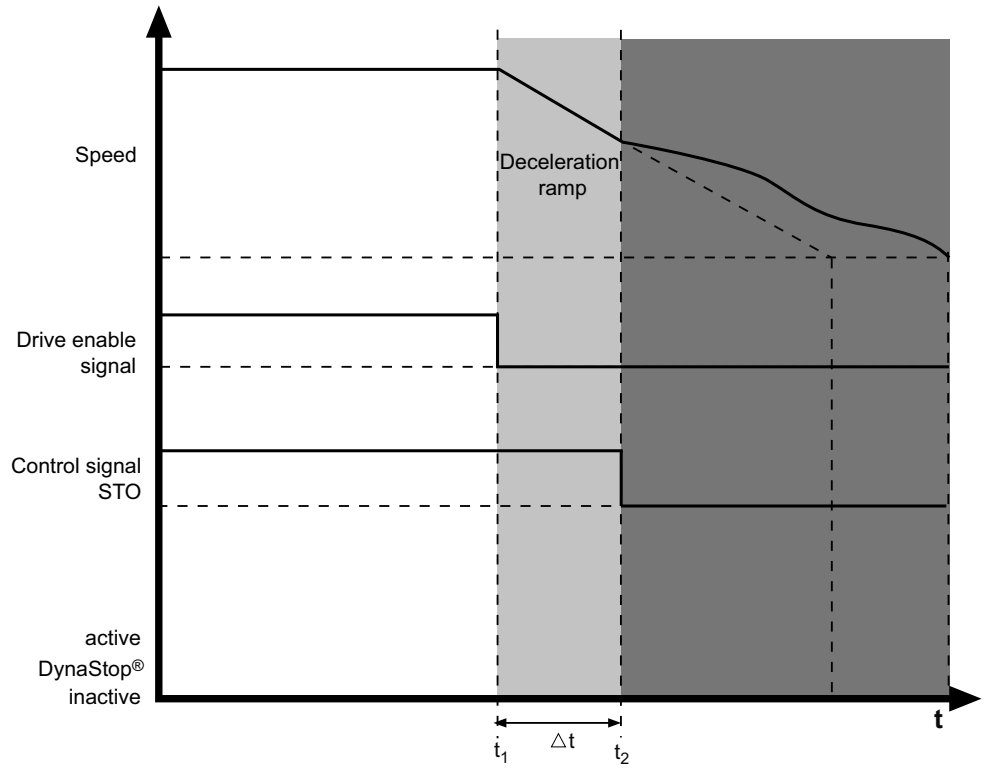
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Factory setting/recommended settings

The following figure shows the behavior when STO is activated before the motor is at standstill in connection with the following parameter setting:

Parameter "9833.20 – Activation of DynaStop® for STO": 0 = NO

(factory setting/recommended settings):



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t	Time
t_1	Point of time when brake ramp is initiated
t_2	Point of time when STO is triggered
Δt	Time between initiating the brake ramp and STO
	Safe time delay range
	Disconnection range

Activating the STO function during the deceleration ramp aborts controlled deceleration:

Possible reasons for premature activation of STO:

- Deceleration time Δt too short
- Extension of the deceleration ramp due to the current limit

  e.g. when load is too high

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10 Service

NOTICE



Improper work on MOVIGEAR® drive units can lead to damage.

Possible damage to property.

- Note that only qualified personnel is permitted to repair drives from SEW-EURODRIVE.
- Consult SEW-EURODRIVE Service.

10.1 Malfunctions of mechanical drive MOVIGEAR®

The following table shows fault diagnostics options for failures of the mechanical drive MOVIGEAR®:

Fault	Possible cause	Measure
Unusual, regular running noise	Meshing/grinding noise: Bearing damage	Contact SEW-EURODRIVE Service
	Knocking noise: Irregularity in the gearing	
Unusual, irregular running noise	Foreign objects in the oil	Stop the drive and contact SEW-EURODRIVE Service
Oil leaking from the gear unit cover	Gear unit cover seal leaking	Contact SEW-EURODRIVE Service
Oil leaking from the connection box	Internal seal defective	Contact SEW-EURODRIVE Service
Oil leaking from oil seal at output end[1)]	Oil seal defective	Replace the oil seal
	Too much oil	Correct the oil quantity
	Drive installed in the wrong mounting position or breather valve installed at wrong position	Install the breather valve correctly
Drive shaft does not turn although the motor is running (see chapter "Meaning of LEDs")	Shaft-hub connection in the gear unit interrupted	Send MOVIGEAR® in for repair

1) Short-term oil/grease leakage at the oil seal is possible in the run-in phase (24 hours runtime)

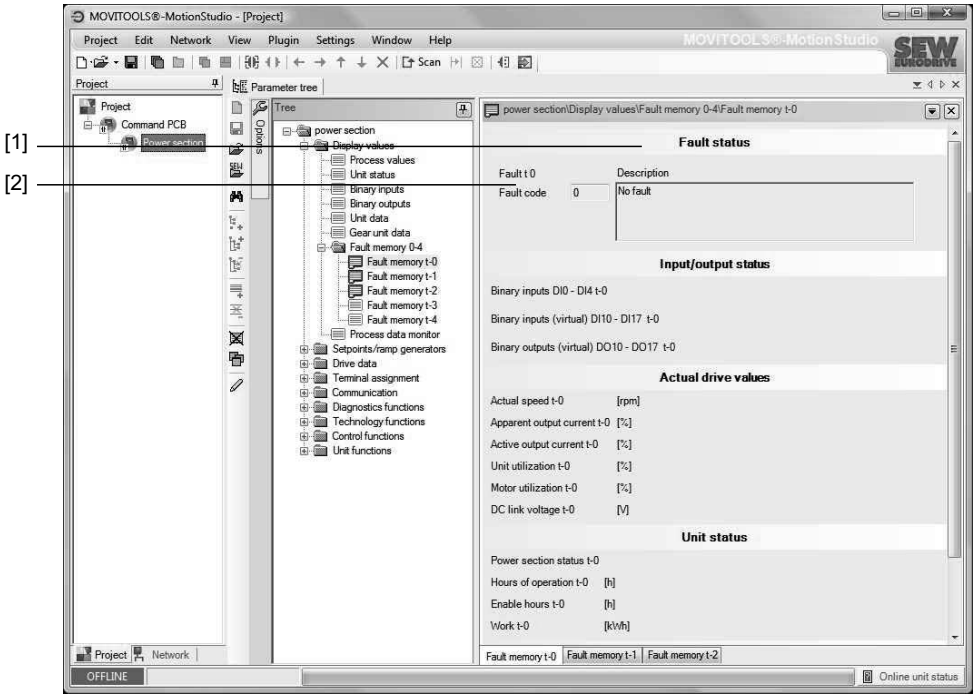
10.2 Evaluating fault messages

10.2.1 MOVITOOLS® MotionStudio

The following section shows a sample evaluation of a fault message in MOVITOOLS® MotionStudio:

1. In MOVITOOLS® MotionStudio, open the MOVIGEAR® parameter tree (power section). Observe chapter "Operation of MOVITOOLS® MotionStudio".

2. In the parameter tree, select the following node (in the example for fault memory t-0):
   - **Power section** parameters/display values/fault memory 0-4/fault memory t-0 [2]
3. You can read out fault messages in the fault status group [1].



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[1] Fault messages group
[2] Power section parameters/display values/fault memory 0-4/fault memory t-0

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10.3 Switch-off responses

There are 4 switch-off responses depending on the fault; the inverter remains locked during a failure:

10.3.1 Output stage inhibit (immediate switch-off)

The unit is no longer able to decelerate the drive, the output stage goes to high resistance in the event of a fault. The DynaStop® function is activated immediately for units that are equipped with DynaStop®.

10.3.2 Stop

The drive is decelerated along stop ramp t13. Once the stop speed is reached, the DynaStop® function is activated for units equipped with DynaStop®. The output stage then goes to high resistance.

10.3.3 Emergency stop

The drive is decelerated along emergency stop ramp t14. Once the stop speed is reached, the DynaStop® function is activated for units equipped with DynaStop®. The output stage then goes to high resistance.

10.3.4 Standard stop

The drive is decelerated along the set standard ramp. Once the stop speed is reached, the DynaStop® function is activated for units equipped with DynaStop®. The output stage then goes to high resistance.

10.4 Resetting fault messages

⚠ WARNING



Eliminating the cause of the problem or performing a reset may result in the drive restarting automatically.

Severe or fatal injuries.

- Prevent the drive from starting up inadvertently, for example by activating STO.

A fault message can be acknowledged by:

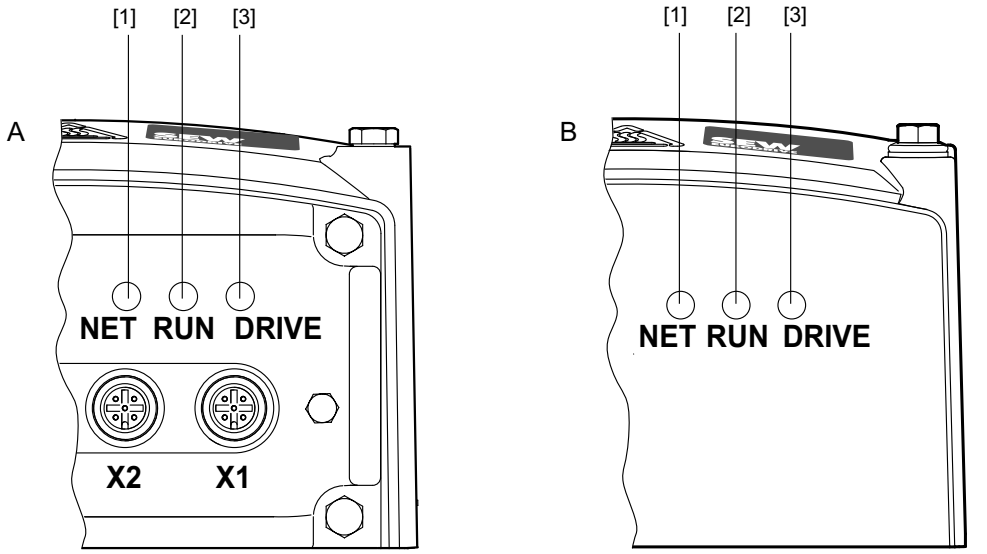
- Switching the power off and on again
- Controller/PLC: Send "reset command"

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10.5 Description of status and operating indicators

10.5.1 LED indicators

The following figure shows the MOVIGEAR® LED indicators:



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[A] Variants with application slot
[B] Variants without application slot
[1] NET LED
[2] RUN LED
[3] "DRIVE" status LED

10.5.2 "NET" LED

LED	Meaning
Green **Steady light**	Communication with the controller not established completely. Reboot required.
Green **Flashing**	Communication active; data packages are being sent and received.
Green/red **Flashing (mixed color orange)**	Communication active; data packages are being sent and received, Ethernet collision.

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10.5.3 "RUN" LED

LED	Operating status	Meaning
- **Off**	Not ready for operation	No line voltage → Check supply cable and line voltage for interruption.
Yellow **flashing steadily**	Not ready for operation	Initialization phase
Green **flashing steadily**	Not ready for operation	Power section parameters are being loaded or firmware is being updated
Green **steady light**	Ready	System ready
Yellow **steady light**	Ready but device inhibited	"STO" signal detected, safe disconnection → Check voltage at STO terminal. → See also status LED "DRIVE/yellow flashing steadily".
Green/yellow **alternating colors**	Ready but timeout	Cyclical data exchange communication interrupted (fault 47 or 67). → No SBus/SNI connection between inverter and controller. Check and establish connection, especially terminating resistor. → EMC influence. Check shielding of data lines and improve, if necessary. → Protocol time between the individual telegrams is longer than the set time (timeout interval). Shorten telegram cycle.
Red **steady light**	Error	Possible errors: • CPU error (17, 37) • NV memory error (25) • Error transmitting parameters (97) • IPOS error (10) • Boot synchronization error (40, 41) • Safety error (119) → More detailed diagnostic information via Drive LED.

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10.5.4 "DRIVE" status LED

LED	Operating status	Meaning
– **Off**	Not ready for operation	No line voltage
Yellow **flashing steadily**	Not ready for operation	Initialization phase, line voltage NOT OK or "STO" signal detected, safe disconnection. → See also "RUN/yellow steady light" LED.
Yellow **flashing briefly at regular intervals**	Ready	**In conjunction with mechatronic MOVIGEAR® drive unit:** Deactivating DynaStop® without drive enable active. **In conjunction with DRC.. electronic motor:** Brake release without drive enable active.
Yellow **steady light**	Ready but device inhibited	Line voltage OK, output stage inhibited
Yellow **2 x flashing, pause**	Ready but manual mode/local mode without device enable	Line voltage OK
Green/yellow **alternating colors**	Ready but timeout	Communication interrupted during cyclical data exchange (error 43, 46, or 47)
Green **steady light**	Device enabled	Motor running
Green **flashing evenly, fast**	Current limit active	Drive operating at current limit.
Green **flashing steadily**	Ready	Line voltage OK but no enable signal. Output stage is energized.
Green/red **alternating colors** **(2 × green, 2 × red)**	Ready	Displayed error is pending. Output stage is energized.
Green/red **flashing quickly with alternating colors**	Not ready for operation	Boot error on command pcb.
Yellow/red **alternating colors** **(2 x yellow, 2 x red)**	Ready	Displayed error is pending. Output stage inhibited.
Red **steady light**	Error 40	Boot synchronization error
	Error 41	Watchdog option error
	Error 116	MOVI-PLC® timeout
	Error 119	Safety error

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LED	Operating status	Meaning
Red **flashing slowly**	Error 08	Speed monitoring error
	Error 26	External terminal error
	Error 30	Emergency stop timeout error
	Error 15	Encoder fault
	Error 16	Incorrect startup
	Error 45	Initialization error Incorrect motor/inverter assignment
	Error 50	Internal voltage supply too low
	Errors 17, 18, 37, 53	CPU error
	Error 25	NV memory error
	Errors 27, 29	"Limit switch" error
	Error 39	"Reference travel" error
	Error 42	Positioning lag error
	Error 94	Checksum error
	Error 97	Parameter transmission error
	Errors 10, 32, 77	IPOS error
	Error 123	Positioning interruption error
Red **2 flashes, pause**	Error 07	DC link voltage too high
Red **3 flashes, pause**	Error 01	Overcurrent in output stage
	Error 11	Overtemperature of heat sink or electronics
Red **4 flashes, pause**	Error 31	TF trip
	Error 44	Ixt utilization/UL monitoring
	Error 52	Machine control error
Red **5 flashes, pause**	Error 89	**Only in conjunction with DRC.. electronic motor:** Brake overtemperature
Red **6 flashes, pause**	Error 06	Power supply system phase failure

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10.6 Fault/error table

Code	Meaning	Response	Possible cause	Measure
Error 01	Overcurrent in output stage	Output stage inhibit/locked	Short circuit on inverter output	• Check the connection between the inverter output and the motor as well as the motor winding for short circuits. • Reset the fault by switching off the device or by fault reset function
Error 06	Power supply system phase failure	Parameterizable	–	• Check the supply system cable for phase failure • Reset the fault by switching off the device or by fault reset function
Error 07	DC link voltage too high	Output stage inhibit/waiting	Ramp time too short	• Extend the ramp times • Reset the fault by switching off the device or by fault reset function
			Faulty braking resistor connection	• Check the braking resistor connection and correct it, if necessary • Reset the fault by switching off the device or by fault reset function
			Invalid voltage range of supply input voltage	• Check supply input voltage for permitted voltage range • Reset the fault by switching off the device or by fault reset function
Error 08	Speed monitoring error	Output stage inhibit/waiting	Speed monitoring has tripped, load on the drive too high	• Reduce the load on the drive • Increase the n-monitoring delay time • Check the current limit/ torque limit • Deactivate speed monitoring • Reset the fault by switching off the device or by fault reset function
Error 10	IPOS error	Output stage inhibit/locked	Faulty IPOS program (e.g. invalid command)	• Correct the program • Reset the fault by switching off the device or by fault reset function

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Code	Meaning	Response	Possible cause	Measure
Error 11	Overtemperature of heat sink or electronics	Emergency stop/waiting	–	• Clean the heat sink • Lower the ambient temperature • Prevent heat build-up • Reduce the load on the drive • Reset the fault by switching off the device or by fault reset function
Error 15	Encoder fault	Output stage inhibit/locked	Loose encoder plug-in connection	• Check encoder plug connector at connection board
			Encoder defective	• Contact SEW Service
Error 16	Incorrect startup	Output stage inhibit/locked	Encoder not calibrated	• Contact SEW Service
Error 17	CPU error	Output stage inhibit/locked	–	• Reset the error by switching off the device or by fault reset function • If the fault occurs again, contact SEW Service
Error 18	CPU error	Output stage inhibit/locked	–	• Reset the error by switching off the device or by fault reset function • If the fault occurs again, contact SEW Service
Error 25	NV memory error	Output stage inhibit/locked	Error accessing NV memory	• Set delivery state and reset device parameters • If the error occurs again, contact SEW Service.
Error 26	External terminal error	Parameterizable	External error signal read-in at programmable terminal	• Rectify external error • Reset the error by switching off the device or by fault reset function
Error 27	"Limit switch" error	Output stage inhibit/locked	A limit switch was reached in positioning mode	Check the travel range
			Wire break/both limit switches missing or inverted	Check the wiring
Error 29	"Limit switch" error	Emergency stop/waiting	A limit switch was reached in positioning mode	Check the travel range
			Wire break/both limit switches missing or inverted	Check the wiring

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Code	Meaning	Response	Possible cause	Measure
Error 30	Emergency stop timeout error	Output stage inhibit/waiting	Emergency stop ramp too short	Extend the emergency stop ramp
			Drive overloaded	Check the project planning
Error 31	TF trip	Parameterizable	Thermal overload of the motor or short circuit/wire break of the temperature sensor	• Lower the ambient temperature • Prevent heat build-up • Reduce the load on the drive • Leave the motor to cool for at least 1 minute before you reset the error by switching off the device or via fault reset function • If the error occurs again or occurs repeatedly, contact SEW Service.
Error 32	IPOS error	Output stage inhibit/locked	Faulty IPOS program (e.g. invalid command)	Correct the program Reset the error by switching off the device or by error fault function
Error 37	CPU error	Output stage inhibit/locked	–	• Reset the error by switching off the device or by fault reset function • If the error occurs again, contact SEW Service
Error 39	"Reference travel" error	Output stage inhibit/locked	The reference cam is missing or does not switch	• Check reference cam • Limit switches are connected incorrectly • Check limit switch connection • Reference travel type changed during reference travel • Check reference travel type setting and required parameters
Error 40	Boot synchronization error	Output stage inhibit/locked	Command pcb defective or connection to command pcb interrupted	Contact SEW Service
Error 41	Watchdog option error	Output stage inhibit/locked	Command pcb defective or connection to command pcb interrupted	Contact SEW Service
			Option defective or connection to option interrupted	• Check whether an option is installed • Replace the option

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Code	Meaning	Response	Possible cause	Measure
Error 42	Positioning lag error	Output stage inhibit/waiting	Acceleration ramps too short	Extend the ramps
			P component of positioning controller too small	Increase the P component
			Value of lag error tolerance too small	• Increase the lag error tolerance • Check whether mechanical components can move freely
Error 43	Manual mode timeout via any interface	Parameterizable	Connection between inverter and PC interrupted	Check/establish connection
Error 44	Ixt utilization/UL monitoring	Output stage inhibit/waiting	Output stage overload	• Reduce the load on the drive • Reset the error by switching off the device or by fault reset function
Error 45	Initialization error Incorrect motor/inverter assignment	Output stage inhibit/locked	Hardware fault	Contact SEW Service
			Incorrect motor/inverter assignment	Replace electronics
Error 46	Timeout internal system bus connection between command pcb and power section	Emergency stop/waiting	–	Contact SEW Service
Error 47	Communication interrupted during cyclical data exchange	Parameterizable	Power section fault: Missing system bus connection between inverter and controller.	Check and establish connection, especially terminating resistor.
			Power section fault: EMC influence	Check shielding of data lines and improve, if necessary.
			Power section fault: Protocol period between the individual telegrams is longer than the set time (timeout time).	Shorten telegram cycle
			Command pcb error: Connection to AS-Interface master interrupted.	Check/establish connection
			Command pcb error: Connection between AS-Interface option and command pcb interrupted.	Contact SEW Service
Error 50	Internal supply voltage too low	Output stage inhibit/locked	Hardware fault	Contact SEW Service

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Code	Meaning	Response	Possible cause	Measure
Error 52	Machine control error	Output stage inhibit/locked	Operation without encoder a speed that is too low	• Increase the speed • Reset the error by switching off the device or by fault reset function. • If the error occurs again or occurs repeatedly, contact SEW Service.
			Load too high in controlled operation	• Reduce the load on the drive • Reset the error by switching off the device or by fault reset function. • If the error occurs again or occurs repeatedly, contact SEW Service.
Error 53	CPU error	Output stage inhibit/locked	−	• Reset the error by switching off the device or by fault reset function. • Consult SEW Service if the error occurs repeatedly.
Error 77	IPOS error	Output stage inhibit/locked	Faulty IPOS program (e.g. invalid command)	• Correct the program • Reset the error by switching off the device or by fault reset function.
Error 89	**Only in conjunction with DRC.. electronic motor:** Brake overtemperature	Output stage inhibit/locked	Brake coil not sufficient to dissipate the regenerative energy.	Use a braking resistor
			Wrong size of braking resistor selected.	Use a larger braking resistor
Error 94	Checksum error	Output stage inhibit/locked	NV memory defective	Contact SEW Service
Error 97	Parameter transmission error	Output stage inhibit/locked	Error during data transmission	• Repeat copying process • Set delivery state and reset device parameters
Error 116	MOVI-PLC® timeout	Emergency stop/waiting	Timeout in communication with higher-level controller	−
Error 119	Safety error	Output stage inhibit/locked	Safety hardware defective	Contact SEW Service
Error 123	Positioning interruption error	Stop/waiting	Target monitoring when interrupted positioning process is resumed. Target would be overrun.	Perform positioning process without interruption until it is complete

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10.7 Device replacement



⚠ WARNING

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages can still be present for up to 5 minutes after disconnection from the power supply system.

Severe or fatal injuries.

- Before removing the electronics cover, de-energize the MOVIGEAR® drive units with a suitable external disconnection device.
- Secure the drive unit against unintended reconnection of the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least the following time before removing the electronics cover: **5 minutes**



INFORMATION

Device behavior in connection with multi-turn encoder und system referencing.

When using a multi-turn encoder, the referenced bit in parameter 8702.0, bit 0 is set permanently after successful reference travel. This bit can only be reset by starting reference travel again or by writing the value "0" to parameter 8702.0.

- The bit is cleared automatically when a multi-turn encoder is replaced by SEW-EURODRIVE Service.
- If a referenced drive is used as an overall unit at another location in the system, a reference travel must be performed again before positioning for the first time.
- When replacing the electronics cover, no reference travel is necessary. Downloading a saved parameter set into a device even sets the referenced bit permanently if the encoder has an identical serial number and the drive was referenced at the time of data backup.

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10.7.1 Replacing the electronics cover



NOTICE

Device fault 45 or 94 due to power disconnection during the initialization phase.

Possible damage to property.

- After replacing the cover and switching on the power supply, wait at least for 30 s before disconnecting the drive from the supply system again.



INFORMATION

When ordering a new electronics cover, always provide the complete type designation or manufacturing number of the entire drive or of the electronics cover.

Replacing an electronics cover that has been ordered by quoting only the part number can result in device fault 45 or 94.

1. Observe the safety notes.
2. Remove the screws and take off the electronics cover from the connection box.
3. Compare the data on the nameplate of the previous electronics cover with the data on the nameplate of the new electronics cover.
4. Set all the controls (e.g. DIP switches, see "Startup" chapter) on the new electronics cover in the same way as the controls of the previous electronics cover.
5. Place the new electronics cover onto the connection box and screw it on.
6. Supply voltage to the drive.
7. Check the new electronics cover for proper functioning.

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10.7.2 Replacing the drive unit

1. Observe the safety notes.
2. When you replace the drive unit including the electronics cover, you also have to carry out the steps described in chapter "Replacing the electronics cover".
3. Disassemble the drive unit. Observe the notes in the "Mechanical installation" chapter.
4. Compare the data on the nameplate of the old drive unit with the data on the nameplate of the new drive unit.

INFORMATION

Always replace the drive unit with a drive unit that has the same properties.

5. Mount the drive unit. Observe the "Mechanical installation" chapter.
6. Perform the installation according to the "Electrical installation" chapter.
7. Place the electronics cover onto the connection box and screw it on.
8. Supply voltage to the drive.
9. Parameters that can be changed are saved in the drive unit (see "Parameters" chapter). This means you have to change these parameters again when replacing the drive unit.

INFORMATION

If you only replace the electronics cover, the parameter changes are preserved.

10. Check the new drive unit for proper functioning.

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10.8 SEW-EURODRIVE Service

10.8.1 Sending in a unit for repair

If a fault cannot be rectified, contact the SEW-EURODRIVE Electronics Service (see chapter "Address list").

When you contact the SEW-EURODRIVE Electronics Service, always quote the digits on the status label so that our service personnel can assist you more effectively.

Provide the following information when sending the unit in for repair:

- Serial number (see nameplate)
- Type designation
- Unit variant
- Short description of the application (application, control mode, etc.)
- Nature of the fault
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

10.9 Shutdown



⚠ WARNING

Electric shock due to incompletely discharged capacitors.

Severe or fatal injuries.

- Before removing the electronics cover, de-energize the MOVIGEAR® drive units with a suitable external disconnection device.
- Secure the drive unit against unintended reconnection of the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least the following time before removing the electronics cover: 5 minutes

To shut down the MOVIGEAR® drive unit, disconnect the unit using appropriate measures.

10.10 Storage

Observe the following instructions when shutting down or storing the MOVIGEAR® drive unit:

- If you shut down and store the MOVIGEAR® drive unit for an extended period, close open cable bushings and cover ports with protective caps.
- Make sure that the unit is not subject to mechanical impact during storage.

Observe the notes on storage temperatures in the "Technical data" chapter.

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10.11 Extended storage

10.11.1 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" design. MOVIGEAR® drive units in this design are designated with a corresponding label.

The lubricant of those MOVIGEAR® drive units is mixed with a VCI anti-corrosion agent (**v**olatile **c**orrosion **i**nhibitors). Note that this VCI anti-corrosion agent is only effective in a temperature range of -25 °C and +50 °C. The shaft ends are also treated with an anti-corrosion agent. MOVIGEAR® drive units of the "extended storage" type are equipped with OS2 surface protection unless stated otherwise in the order. Instead of OS2, you can order OS3. For more information refer to chapter "Surface protection".

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10.11.2 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 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 (relative 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.	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 plastic wrap. Protected against insect damage and mildew by chemical treatment.	Under roof, protected against rain and shocks.	Up to 3 years with regular checks of the packaging and moisture indicator (relative 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 storing the drive according to the mounting position.

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10.11.3 Electronics

INFORMATION

For electronics components, adhere to the following notes in addition to the notes in the chapters "Extended storage" > "Drive" and "Extended storage" > "Storage conditions".

If the device is in extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device'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 device is connected directly to 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 device can be used immediately or stored again for an extended period with maintenance.

The following graduations 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

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10.12 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately.

- Oil and grease

  Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.
- Capacitors

Waste disposal according to WEEE Directive 2012/19/EU



This product and its accessories may fall within the scope of the country-specific application of the WEEE Directive. Dispose of the product and its accessories according to the national regulations of your country.

For further information, contact the responsible SEW-EURODRIVE branch or an authorized partner of SEW-EURODRIVE.

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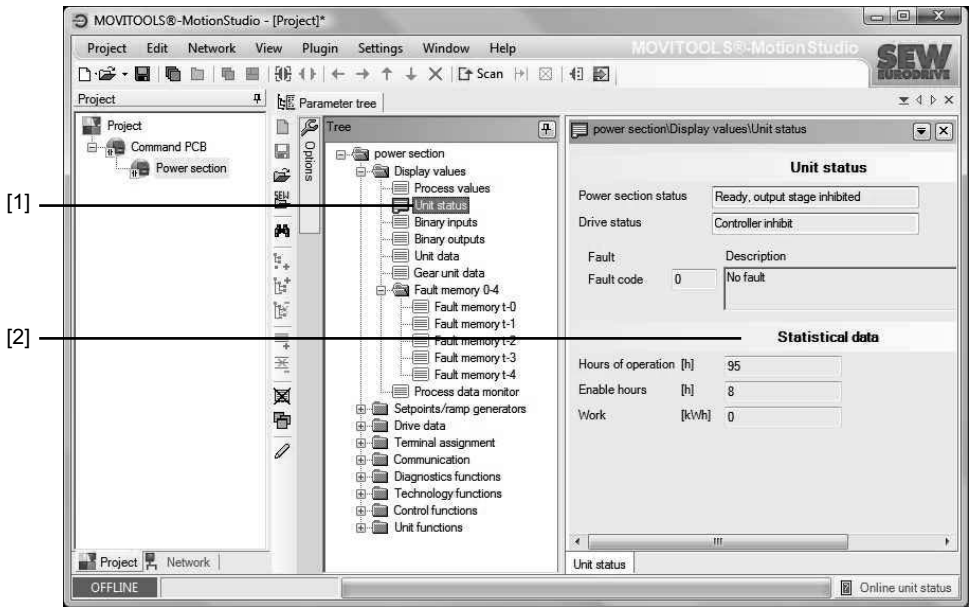
11 Inspection and maintenance

11.1 Determining the operating hours

11.1.1 About MOVITOOLS® MotionStudio

MOVIGEAR® drive units can read out the hours of operation so you can plan inspection and maintenance work more easily. Proceed as follows to determine the performed hours of operation:

1. In MOVITOOLS® MotionStudio, open the MOVIGEAR® parameter tree, see chapter "Configuration and diagnostics".
2. In the parameter tree, select the node "Power section parameters/display values/ device status" MOVIGEAR® [1].
3. In the statistics data group [2], you can read out the performed hours of operation:



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[1] Power section parameters/display values/device status
[2] Statistics data group

11.2 Inspection and maintenance intervals

11.2.1 Determining motor oil seal and options

The following information must be known to being able to specify the inspection and maintenance intervals:

- [1] Use of the "Integrated pressure compensation" option

  You can see from the type designation on the nameplate whether the option is used:

  – /PG = "Integrated pressure compensation" option

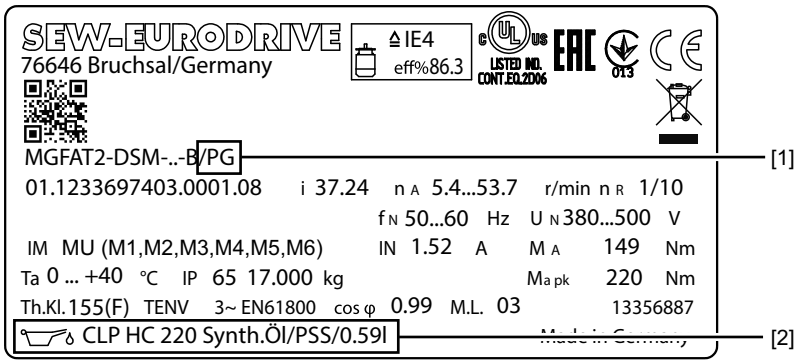
- [2] Type of motor oil seal: FKM or Premium Sine Seal FKM

  The "Premium Sine Seal FKM" motor oil seal is indicated on the nameplate as "PSS" in the oil group. If the nameplate does not indicate "PSS", an FKM motor oil seal is used.

  – Example: CLP HC 220 Synth. oil/**PSS**/..l = drive units with Premium Sine Seal FKM motor oil seal

  – Example: CLP HC 220 Synth. oil/..l = drive units with FKM motor oil seal

The following figure shows an example of a MOVIGEAR® drive unit nameplate.



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[1] /PG = "Integrated pressure compensation" option
[2] Oil group

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11.2.2 Inspection and maintenance intervals

The following table shows the inspection and replacement intervals for MOVIGEAR® drive units.

Time interval	What to do?	Who is permitted to perform the work?
Every 3000 operating hours, at least every 6 months	Check running noise for possible bearing damage	Specialists at customer site
	In the event of bearing damage: Have the bearing replaced by SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE.	SEW-EURODRIVE Service
		Qualified personnel trained by SEW-EURODRIVE
	Visual inspection of the seals for leakage	Specialists at customer site
	In the event of leakage at the output oil seal: Change the oil seal	Specialists at customer site
	In the event of any other leakage: Contact SEW-EURODRIVE Service.	SEW-EURODRIVE Service
	For gear units with a torque arm: Check rubber buffers and replace them if necessary	Specialists at customer site
Recommendation: Every 10000 operating hours[1)]	Drive units with **FKM motor oil seal**: Have the motor inspected by SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE.	SEW-EURODRIVE Service
		Qualified personnel trained by SEW-EURODRIVE
	Have the integrated pressure compensation (/PG option) inspected by SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE.	SEW-EURODRIVE Service
		Qualified personnel trained by SEW-EURODRIVE
Recommendation: Every 20000 operating hours[1)]	Drive units with **Premium Sine Seal FKM motor oil seal ("PSS"):** Have the motor inspected by SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE.	

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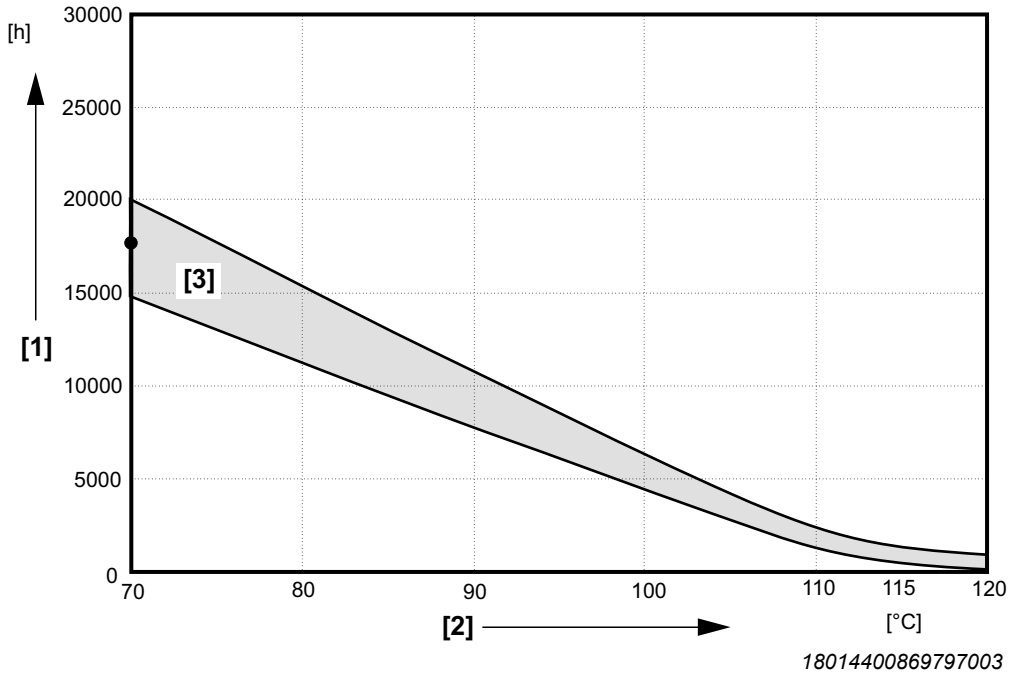
Time interval	What to do?	Who is permitted to perform the work?
MOVIGEAR® drive units are delivered with long-term lubrication. Depending on the operating conditions and the oil temperature, the oil must be changed at least every 5 years (see chapter "Lubricant change intervals").	Change synthetic oil	Specialists at customer site
	Replace oil seal on output end (do not install it in the same track)	Specialists at customer site
When the cover/electronics cover is opened after an operating period of ≥ 6 months.	When the cover/electronics cover is opened after an operating period of ≥ 6 months, the gasket between the connection box and the cover/electronics cover must always be replaced. The 6-month period can be shortened by harsh ambient/operating conditions, e.g. cleaning with aggressive chemicals or frequent temperature fluctuations.	Specialists at customer site
Each time the cover/ electronics cover is opened	Visual inspection of the gasket between connection box and cover/electronics cover: Replace the gasket if it is damaged or separating from the connection box.	Specialists at customer site
Varying (depending on external factors)	Touch up or renew the surface/ anti-corrosion coating	Specialists at customer site
	To prevent permanent water accumulation in the B-side safety cover, clean it at regular intervals.	Specialists at customer site

1) Wear times are influenced by many factors. The system manufacturer must calculate the required inspection/maintenance intervals individually in accordance with the project planning documents.

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11.3 Lubricant change intervals

The following figure shows the lubricant change intervals for normal ambient conditions. In case of severe/aggressive ambient conditions, the lubricant must be changed more frequently:



[1] Operating hours
[2] Sustained oil bath temperature
[3] CLP HC
- Average value per oil type at 70 °C

11.4 Inspection and maintenance work

11.4.1 Preliminary work regarding inspection and maintenance

Observe the following notes before you start with inspection/maintenance work on MOVIGEAR®:

⚠ WARNING



Risk of injury if the drive starts up unintentionally.

Electric shock caused by dangerous voltages in the connection box. Dangerous voltages can still be present for up to 5 minutes after disconnection from the power supply system.

- Before removing the electronics cover, de-energize the MOVIGEAR® drive units using a suitable external disconnection device.
- Secure the drive unit against unintended reconnection of the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least the following time before removing the electronics cover: **5 minutes**

⚠ WARNING



Risk of burns due to hot surfaces and hot gear unit oil.

Serious injuries.

- Let the devices cool down before touching them.
- Remove the screw plugs and the breather valve carefully.
- The gear unit must still be warm, otherwise the high viscosity of excessively cold oil will make it more difficult to drain the oil correctly.

NOTICE



Damage to the MOVIGEAR® drive unit.

- Make sure that only the SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE opens the gear unit cover.

NOTICE



Filling in the wrong oil may result in significantly different lubricant characteristics.

Potential damage to property.

- Do not mix different synthetic lubricants and do not mix synthetic and mineral lubricants.
- Synthetic oil is used as the standard lubricant.

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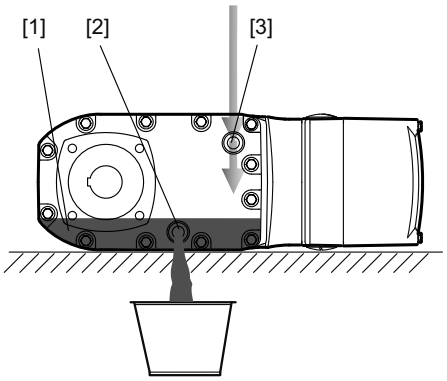
11.4.2 Changing the oil

Draining the oil

1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
2. ⚠ **WARNING!** Risk of burns due to hot surfaces. Serious injuries. Let the devices cool down before touching them.
   Remove the MOVIGEAR® drive unit from the system, otherwise it is not possible to change the oil.
3. SEW-EURODRIVE recommends that you drain the oil in the position depicted in the figure below.
4. Place an adequate container underneath the oil drain plug [2].
5. ⚠ **WARNING!** Risk of burns due to hot gear oil. Serious injuries. Let the devices cool down before touching them.
   Remove the lowest screw plug [2] or the breather valve installed there (depends on the mounting position used according to the mounting position sheet).
6. It is easier to drain the oil when you also remove the upper screw plug [3] or breather valve installed there (flowing in of air).
7. Drain the oil. Completely remove the residual oil [1] in the drive with a suitable device.

Recommended position

The following figure shows the position recommended for draining the oil:



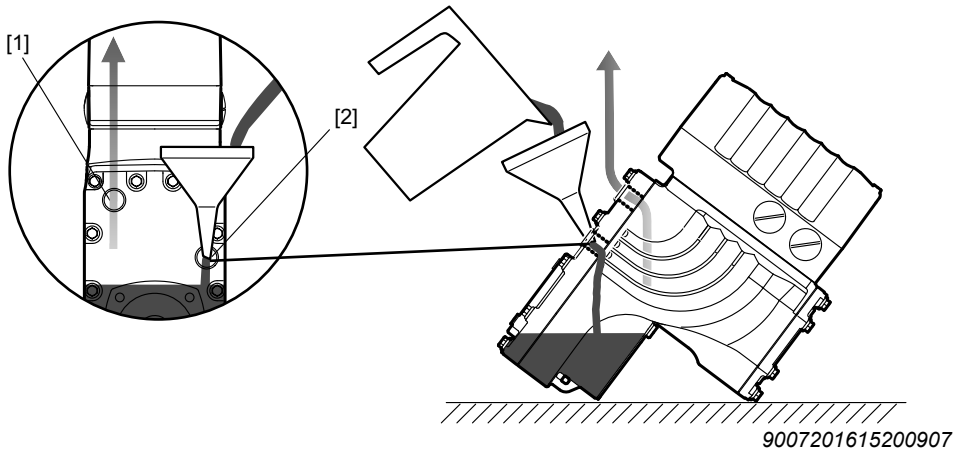
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Filling in the oil

1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
2. SEW-EURODRIVE recommends that you fill in the new oil in the position depicted in the figure below.
3. **NOTICE!** Filling in the wrong oil may result in significantly different lubricant characteristics. Potential damage to property. Do not mix different synthetic lubricants and do not mix synthetic and mineral lubricants. Synthetic oil is used as the standard lubricant.
   Fill in new oil of the same type via the lower bore hole [2].
   - ⇨ The oil viscosity and type (synthetic) that are to be used are determined by SEW-EURODRIVE specifically for each order. This information is noted in the order confirmation and on the gear unit's nameplate.
   - ⇨ It is easier to fill in the oil when you also remove the upper breather plug [1] or breather valve installed there (air can flow out).
   - ⇨ For the required oil quantity, refer to the nameplate or chapter "Technical data and dimension sheets/lubricants" depending on the mounting position.
4. Re-insert the screw plug and the breather valve. Depending on the mounting position used, observe the mounting position sheet.
5. Touch up or renew the surface/anti-corrosion coating.

Recommended position

The following figure shows the position recommended for filling in the new oil:



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[1] Upper bore (air can flow out)
[2] Lower bore (filling in oil)

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11.4.3 Replacing the output oil seal

1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
2. Remove the MOVIGEAR® drive unit from the system.
3. **NOTICE!** Oil seals with a temperature below 0 °C may get damaged during installation. Potential damage to property. Store oil seals at ambient temperatures over 0 °C. Warm up the oil seals before you install them, if necessary.
   When changing the oil seal, ensure that there is a sufficient grease reservoir between the dust lip and sealing lip, depending on the type of gear unit.
   - ⇨ If you use double oil seals, fill one-third of the gap with grease.
   - ⇨ Do not install the oil seal on the same track.
4. Touch up or renew the surface/anti-corrosion coating.

11.4.4 Painting the drive unit

1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
2. **NOTICE!** Breather valves and oil seals may be damaged during painting or repainting. Potential damage to property. Thoroughly cover the breather valves and sealing lip of the oil seals with strips prior to painting.
   Clean the surface of the drive unit and make sure it is free from grease.
3. Remove the masking strips after painting.

11.4.5 Cleaning the drive unit

Observe the notes in chapter "Preliminary work for inspection and maintenance".

Excessive dirt, dust or shavings can have a negative impact on the function of synchronous motors; in extreme cases, these factors can cause the motor to break down.

For this reason, clean the drives at regular intervals (after one year at the latest) to ensure a sufficiently large area for heat dissipation.

Insufficient heat dissipation can have unwanted consequences. The bearing service life is reduced through operation at impermissibly high temperatures (bearing grease degrades).

11.4.6 Connection cables

Observe the notes in chapter "Preliminary work for inspection and maintenance".

Check the connection cables for damage at regular intervals and replace if necessary.

11.4.7 Replacing the gasket between connection box and electronics cover

Spare part kit

The gasket is available as spare part from SEW-EURODRIVE.

Content	Part number
	MOVIGEAR® MGF..2/MGF..4/MGF..4/ET/MGF..4/XT (die-cast design)
1 piece	28211626
10 pieces	28211634
50 pieces	28211642

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Steps

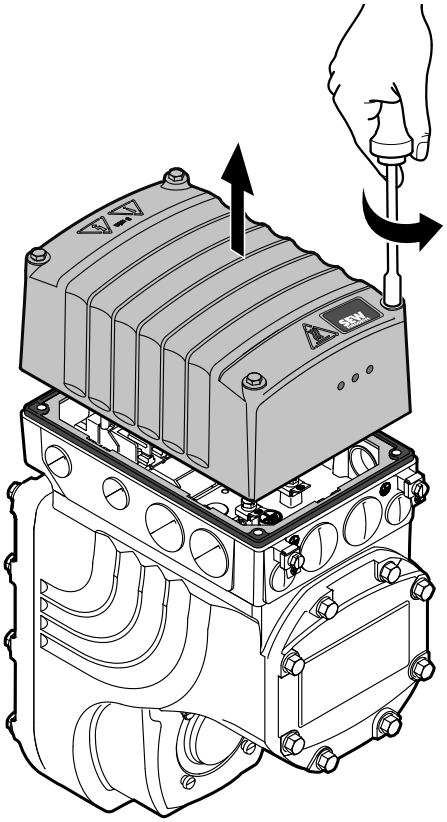
NOTICE

Loss of the guaranteed degree of protection.

Possible damage to property.

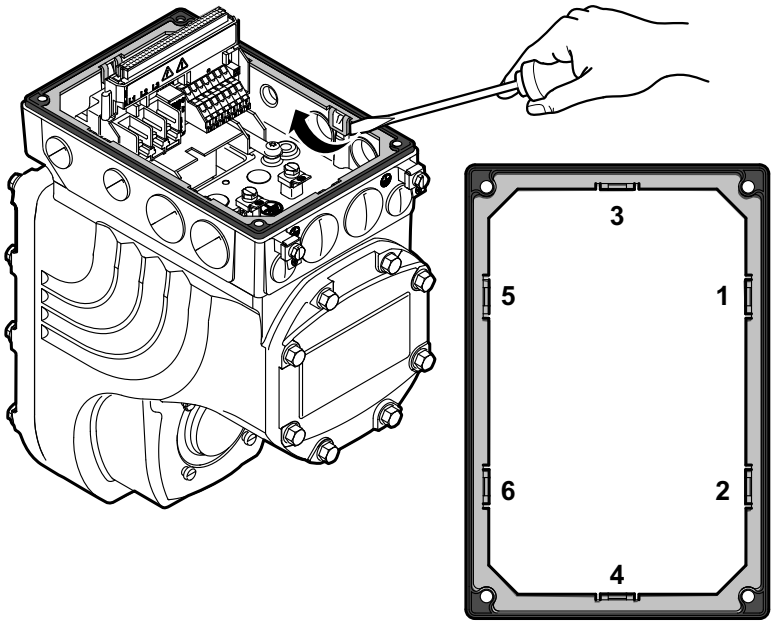
- When the electronics cover is removed from the connection box, you have to protect it from humidity, dust or foreign particles.
- Make sure that the electronics cover is mounted properly.

1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
2. Loosen the screws of the electronics cover and remove it.



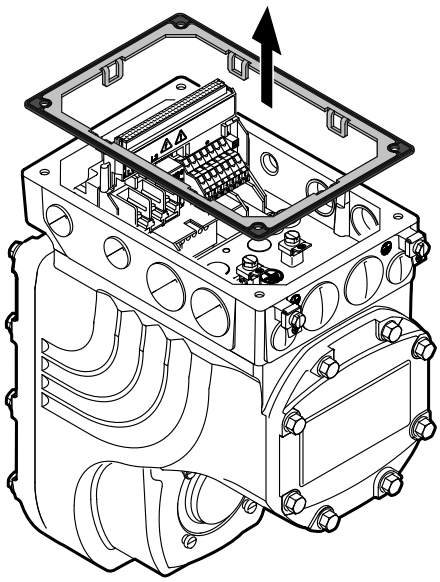
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3. **NOTICE!** Loss of the guaranteed degree of protection. Possible damage to property. Make sure not to damage the sealing surfaces when removing the gasket. Loosen the used gasket by levering it off the retaining cams.
   ⇨ Doing so will be easier if you adhere to the sequence shown in the figure below.



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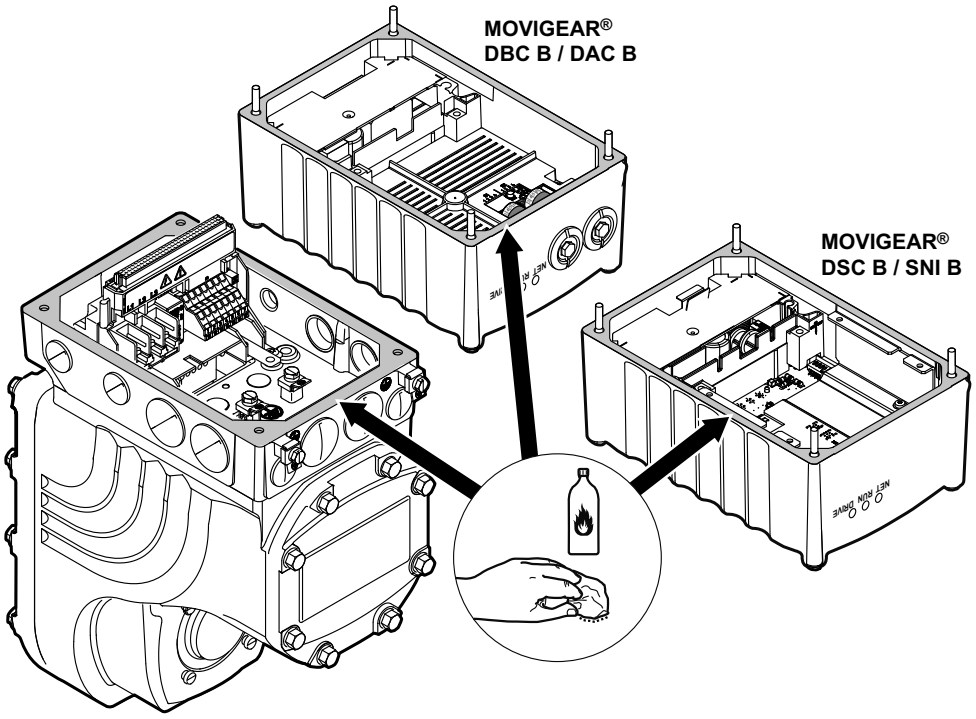
4. Remove the old gasket completely from the connection box.



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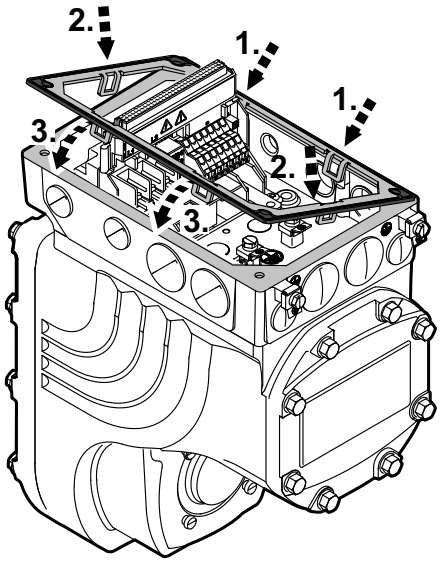
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5. ⚠ **CAUTION!** Risk of injury due to sharp edges. Risk of cutting injuries. Use protective gloves for cleaning. Work may only be carried out by qualified personnel. Clean the sealing surfaces of the connection box and the electronics cover carefully.



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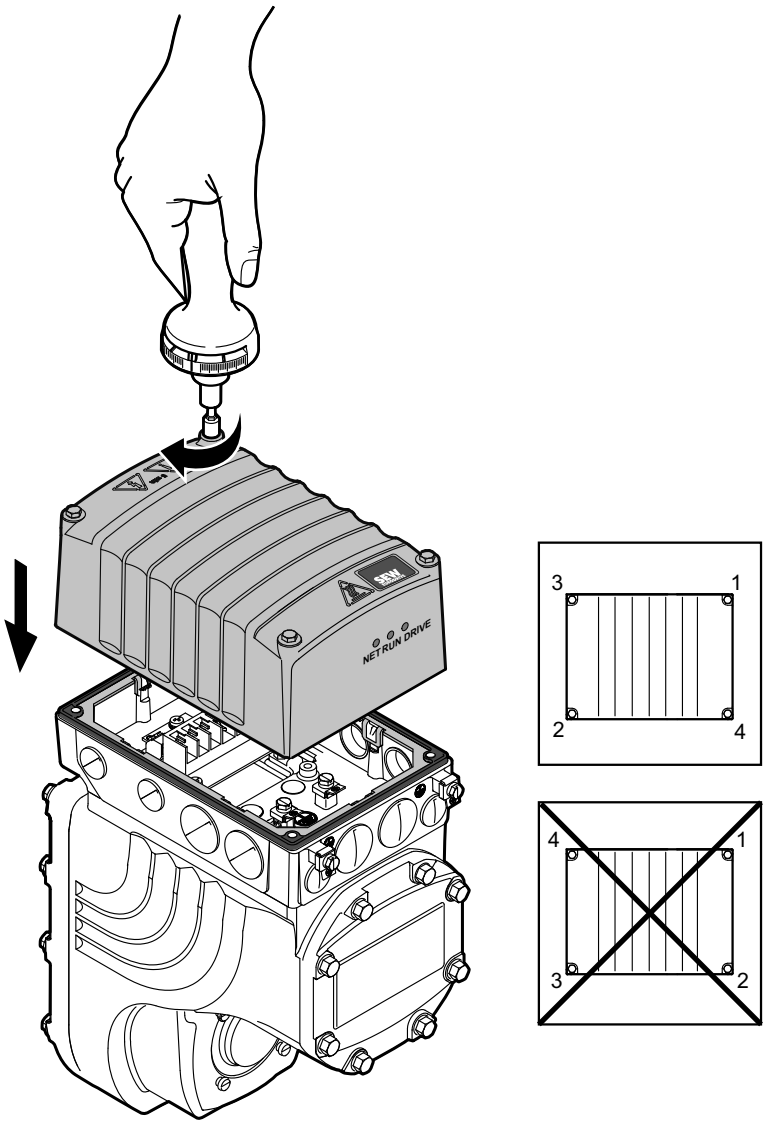
6. Place the new gasket on the connection box and fix it in position with the retaining cams. Doing so will be easier if you adhere to the sequence shown in the figure below.



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7. Check the installation and startup of the drive unit using the applicable operating instructions.
8. Place the electronics cover on the connection box again and fasten it.
   ⇨ Proceed as follows when screwing on the MOVIGEAR® electronics cover: Insert the screws and tighten them in diametrically opposite sequence with a tightening torque of 6.0 Nm.



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12 Project planning

12.1 Preliminary information

INFORMATION

Data may differ due to continuous product development.

12.1.1 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_{a_eso}	Maximum permitted torque for non-cyclical special loads, max. 1000 cycles
n_a	Output speed
n_e	Motor speed
n_{G_min}	Minimum output speed
n_{G_max}	Maximum output speed
W	Mean braking work
M_{DSP}	Maximum torque DynaStop® (base torque DynaStop®)
M_{ar}	Retrodriving application torque
η_{load}	Efficiency of the application

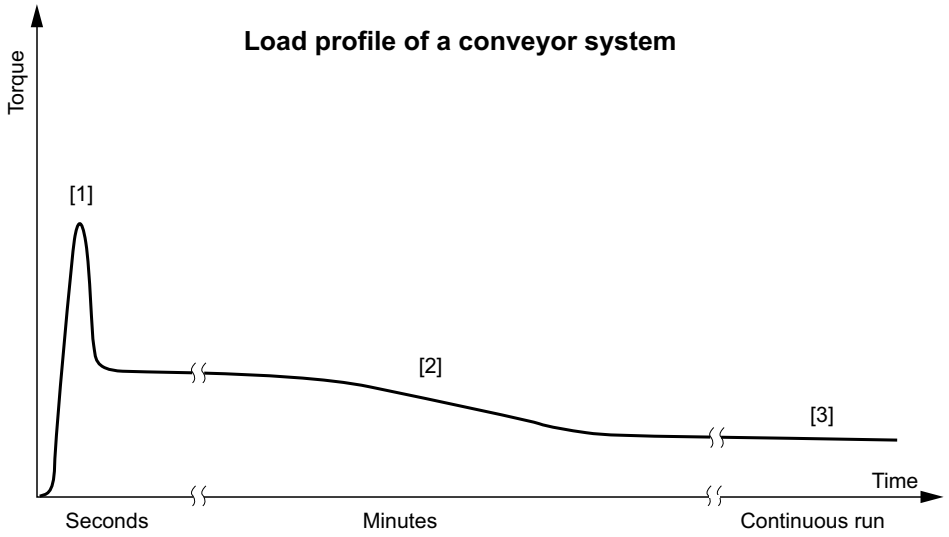
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12.2 MOVIGEAR® load profile

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.

Load profile of a conveyor system



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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

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12.3 Drive selection data

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

Drive selection data			Your entry
n_{G_min}	Minimum output speed	min^{-1}	
n_{G_max}	Maximum output speed	min^{-1}	
M_a at n_{amin}	Output torque at minimum output speed	Nm	
M_a at n_{amax}	Output torque at maximum output speed	Nm	
M_{ar}	Retrodriving torque at input shaft	Nm	
S.., ..% cdf	Duty type and relative cyclic duration factor cdf; the exact load cycle can be entered instead.		
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	

12.3.1 Determining the motor data

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

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

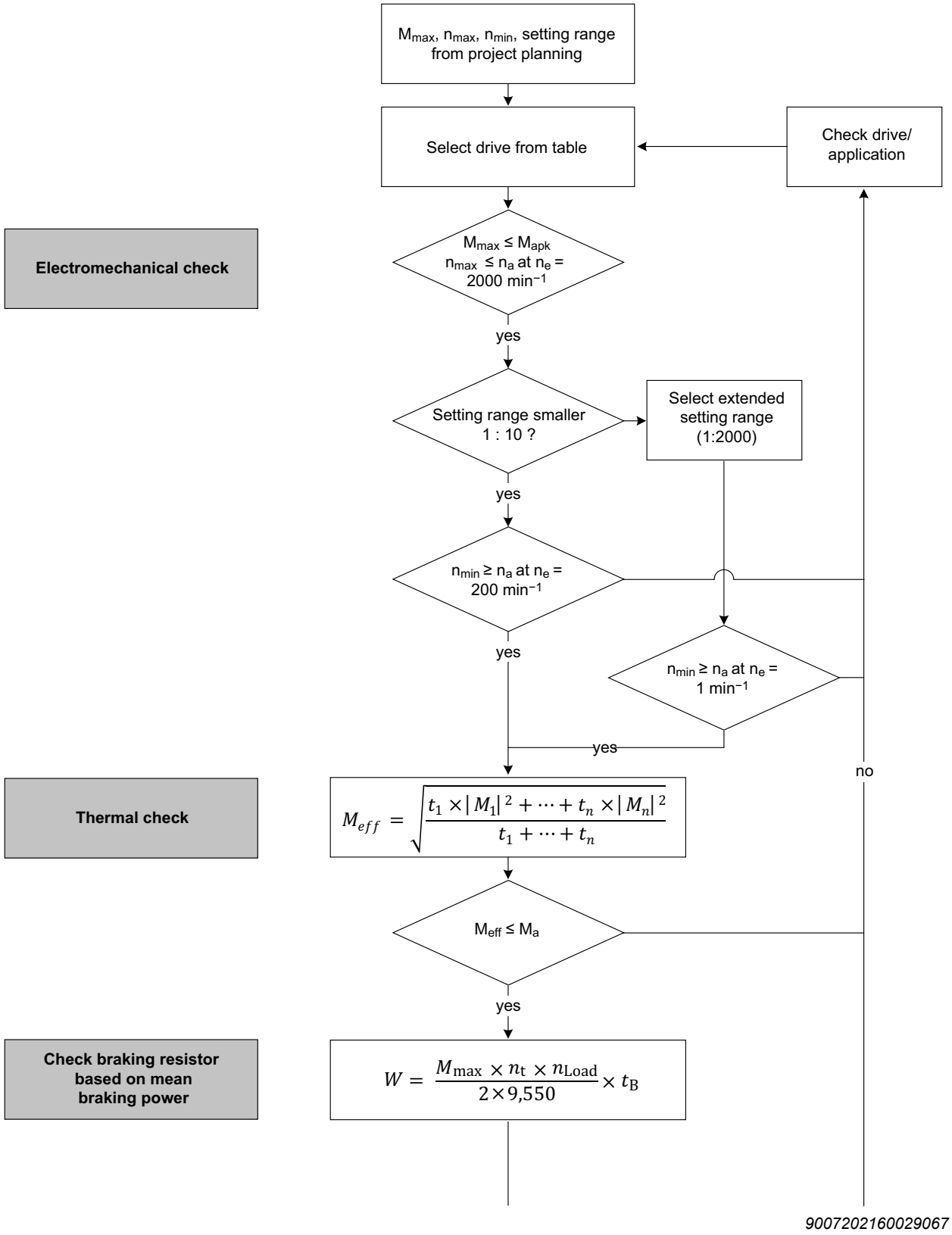
12.3.2 Selecting the proper drive

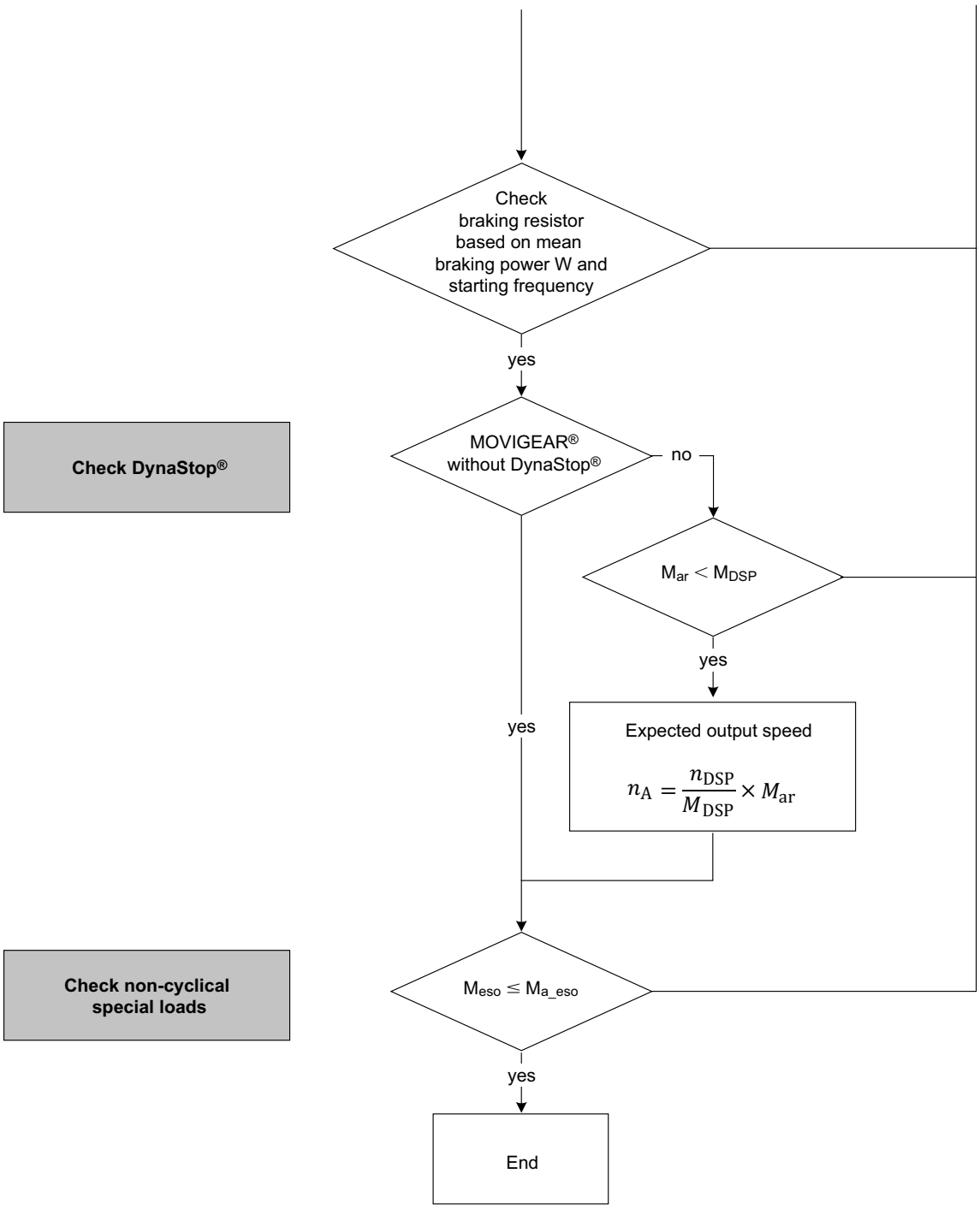
The appropriate drive can be determined with the calculated power and speed and with other mechanical requirements taken into account.

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12.4 Project planning procedure

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





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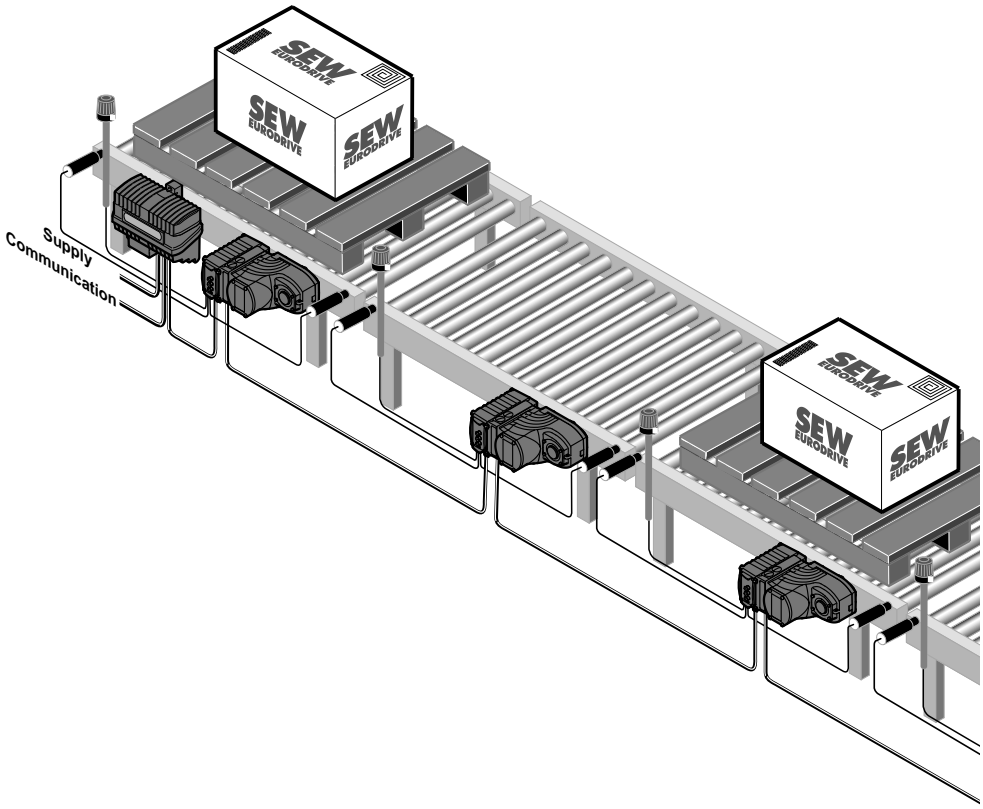
12.5 Drive selection using the example of a roller conveyor

12.5.1 Description of the application

This chapter illustrates how to select a MOVIGEAR® drive unit taking as example a roller conveyor for transporting wooden pallets with the following specifications:

Load weight	m	2500 kg
Conveying 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

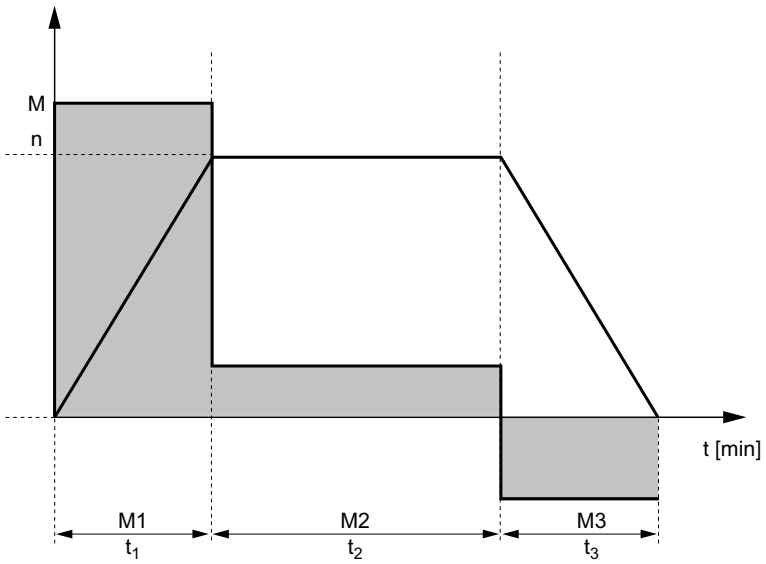
The following figure shows a schematic illustration:



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12.5.2 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 required for determining the MOVIGEAR® drive units:

Calculations	
Static travel resistance	$F_R = \mu \times m \times g$ $\mu = \left[\frac{2}{D} x \left(\mu_{bearing} \times \frac{d}{2} + f \right) + c \right]$ $\mu = \left[\frac{2}{140mm} x \left(0.005 \times \frac{28mm}{2} + 1.2 \right) + 0 \right]$ $\mu = 0.01814$ $F_R = 0.01814 \times 2500kg \times 9.81$ $F_R = 445N$ 2896365451
Dynamic travel resistance	$F_{Dyn} = m \times a$ $F_{Dyn} = 2500kg \times 0.4\, m/s^2$ $F_{Dyn} = 1000N$
Torque in range M1	$M_1 = \frac{(F_R + F_{Dyn}) \times D}{2 \times \eta}$ $M_1 = \frac{(445N + 1000N) \times 0.14m}{2 \times 0.7} = 145.5Nm$
Torque in range M2	$M_2 = \frac{F_R \times D}{2 \times \eta} = 45.5Nm$

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Calculations	
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	$n_{amin} = \frac{v_{min}}{\pi \times D} = \frac{5\,m/min}{\pi \times 0.14m} = 11.4\,min^{-1}$ $n_{amax} = \frac{v_{max}}{\pi \times D} = \frac{22\,m/min}{\pi \times 0.14m} = 50.0\,min^{-1}$

12.5.3 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.

2. Selecting the gear ratio with output speed:

   Requirement: The application calculations result in an output speed of n_a = 50 min^{-1}. To achieve a high setting range and optimum efficiency, the required output speed should be achieved as precisely as possible at an input speed of n_e = 2000 min^{-1}.

   Result: The drive with a ratio of i_{tot} = 37.24 and an output speed of n_a = 53.7 at n_e = 2000 min^{-1} is selected from the table in chapter "Technical data"/"Selection tables":

MGF..2-..-C												
	n_a	n_a	M_a				M_{apk}			M_{a_eso}	i_{tot}	Weight
	at n_e= 200 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 500 min^{-1}	at n_e= 1000 min^{-1}	at n_e= 1500 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 200 – 1500 min^{-1}	at n_e= 1750 min^{-1}	at n_e= 2000 min^{-1}			
	[min^{-1}]	[min^{-1}]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	59.4	593.5	14	14	14	14	51**	30	22	65	3.37	15
	...	...	...	...	...	...	...	...	...	...	...	
	...	...	...	...	...	...	...	...	...	...	...	
	...	...	...	...	...	...	...	...	...	...	...	
3-stage	7.1	71.3	112	112	112	112	220	220	185	330	28.07	16
	6.1	60.6	132	132	132	132	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	180	180	180	180	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 min^{-1} = 5.4 min^{-1} < n_{min} =11.4 min^{-1}.

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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: $M_{eff} < M_a$

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

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

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

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

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   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 min^{-1} = 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:

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

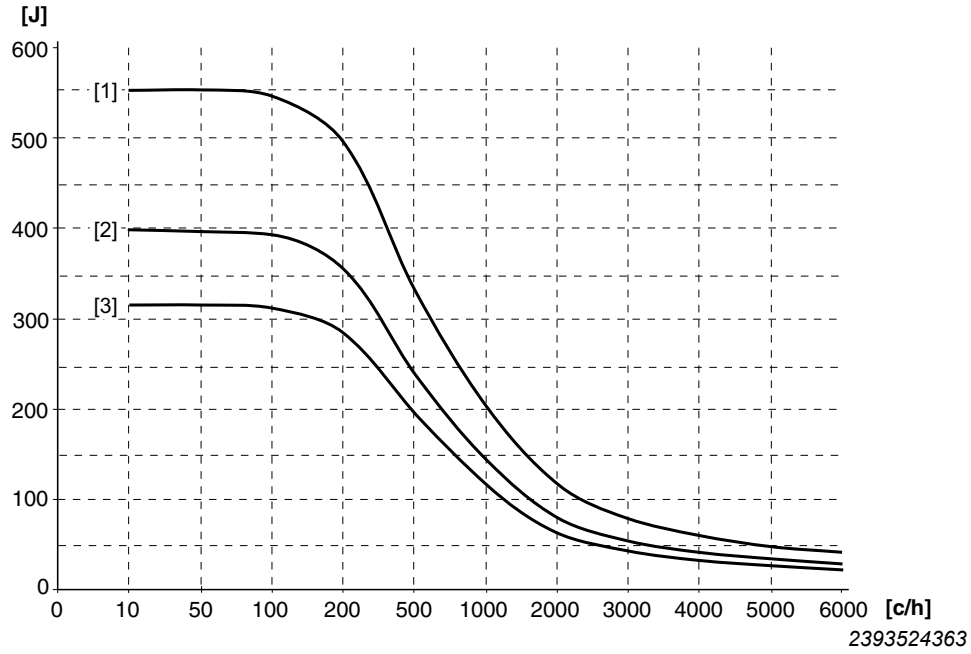
$$P_{brake} = \left|\frac{1}{2} \times \frac{4.5Nm \times 50\frac{1}{\min}}{9.55}\right| = 11.8W$$

   Proceed according to chapter "Regenerative current-carrying capacity – integrated braking resistor".

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12.6 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

12.6.1 Calculation example

The known values are:

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

Calculating the energy from the power of the deceleration ramp:

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

The specified deceleration ramp in seconds refers to a speed change of 3000 min^{-1}.

Calculation of the deceleration ramp for MOVIGEAR®: a_{down} = 3000 min^{-1} × 0.92 s / 1863 min^{-1} = 1.5 s.

For the deceleration ramp of 1.5 s, you can use deceleration ramp [3] (0.2 s) in the diagram. Use the characteristic curve with the shorter deceleration ramp because a shorter deceleration ramp means more braking energy.

The diagram permits 310 J of energy for the 0.2 s deceleration ramp at 6 cycles per hour. In this case, the required 10.9 J can be dissipated via BW1.

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12.7 DynaStop® – electrodynamic deceleration function

12.7.1 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 min^{-1} 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 speed:

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

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

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

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Result:

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

12.8 Applications in wet areas

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

- Large temperature differences (e.g. in case the drive is cleaned with cold water immediately after operation)
- In case of changing temperatures (e. g. access to refrigerated storage application)
- In case 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

12.8.1 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 proven to be a productive means of clarifying 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.

12.8.2 Questionnaire

INFORMATION

To better prepare for a consultation with SEW-EURODRIVE, we ask you to submit the following questionnaire to the nearest SEW location.

Company: .....

Contact: .....

Tel./fax: .....

E-mail: .....

Street: .....

Postal code: .....

Place, date: .....

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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 (third-party products) in the same area?

.....

.....

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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 ongoing production?

  ☐ yes, with ..... ☐ no

- Are the components compatible with sealing compounds?

  ☐ yes ☐ no

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13 Technical data and dimension sheets

13.1 Conformity

13.1.1 CE marking

- Low Voltage Directive:

  The MOVIGEAR® drive system fulfills the regulations of the Low Voltage Directive 2014/35/EU.

- Electromagnetic compatibility (EMC):

  The devices are designed for use as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 "Variable-speed electrical drives". Provided that the installation notes are followed, the requirements for CE marking of the entire machine/system equipped with these units on the basis of the EMC Directive 2014/30/EU are met. For detailed information on EMC-compliant installation, refer to the "Electromagnetic Compatibility in Drive Technology" publication from SEW-EURODRIVE.

CE

The CE mark on the nameplate represents conformity with the Low Voltage Directive 2014/35/EU and the EMC Directive 2014/30/EU.

13.1.2 UL approval

c UL us LISTED

UL and cUL approval (USA) has been granted for the MOVIGEAR® series.

cUL is equivalent to CSA approval.

13.1.3 EAC

EAC

The MOVIGEAR® drive unit series fulfills the requirements of the technical regulations of the Customs Union of Russia, Kazakhstan, and Belarus.

The EAC marking on the nameplate certifies the conformity with the safety requirements of the Custom Union.

13.1.4 UkrSEPRO (Ukrainian Certification of Products)

013

The UkrSEPRO marking on the nameplate certifies adherence to the technical regulations of Ukraine for the MOVIGEAR® series.

13.1.5 RCM approval

RCM approval has been granted for the MOVIGEAR® series.

RCM certifies conformity with ACMA (Australia Communication and Media Authority) standards.

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13.2 General information

13.2.1 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.

13.2.2 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.

13.2.3 Paint

MOVIGEAR® units are painted with "blue-gray" (RAL 7031 according to DIN 1843) machine paint as standard. Special paints or no paint at all (just aluminum) are possible on request.

13.2.4 Surface and corrosion protection

MOVIGEAR® is optionally available in a design for use in wet areas with IP66 degree of protection and HP200 special surface treatment (option /WA).

13.2.5 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.

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13.3 Technical data

13.3.1 General technical data of MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Torque class	M	200 Nm	400 Nm	
Connection voltages **Permitted range**	U_{line}	3 × AC 380 V -5% to AC 500 V +10%		3 × AC 400 V -5% to AC 500 V +10%
Line frequency	f_{line}	50 Hz ... 60 Hz ± 5%		
Input current **(n_{Motor}= 2000 min^{-1})**	I_N at U_{line} = 400 V	1.52 A	2.72 A	3.46 A
	I_N at U_{line} = 460 V	1.32 A	2.36 A	3.01 A
	I_N at U_{line} = 480 V	1.27 A	2.27 A	2.88 A
	I_{max}	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"		
Motor mass moment of inertia	J_{mot}	2303 $kgm^2 \times 10^{-4}$	11.4695 $kgm^2 \times 10^{-4}$	14.8614 $kgm^2 \times 10^{-4}$
PWM frequency		4/8 kHz		
Interference immunity		EN 61800-3; 2. Environment (industrial environment)		
Interference emission		EN 61800-3 category C3 (class A group 2 of EN 55011)		
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 entries sealed) With optional design for applications in wet areas: IP66 according to EN 60529 (MOVIGEAR® housing closed and all cable entries sealed)		
Duty type		S1, DB (EN 60034-1)		
Type of cooling		Natural cooling to DIN 41751 and EN 61800-5-1		
Signaling functions		Display elements on the housing to indicate the device 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 category II, external measures are required for overvoltage category III. Overvoltage categories according to EN 60664-1.		

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MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Required preventive measures		Grounding the device		

13.3.2 Ambient conditions MOVIGEAR®

MOVIGEAR® type		MGF..2	MGF..4	MGF..4/XT
Electronic variant		**SNI-B**		
Climate class		EN 60721-3-3; class 3K3, non-condensing, no condensation		
Storage temperature	ϑ_L	-25 °C to +70 °C (different to class 3K3)		
Ambient temperature	ϑ_{amb}	0 °C to + 60 °C (different to class 3K3)[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 in use (see chapter "Lubricant table")

13.3.3 Current-carrying capacity of terminals and plug connectors

Current-carrying capacity of terminals and plug connectors		
Line 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)

13.3.4 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 -3 V to +5 V	"1" = contact closed "0" = contact open
Permitted total current For 4 sensors		400 mA	

1) Only in conjunction with optional plug connector X5131

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13.3.5 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

13.3.6 Derating factors

Affected device variants

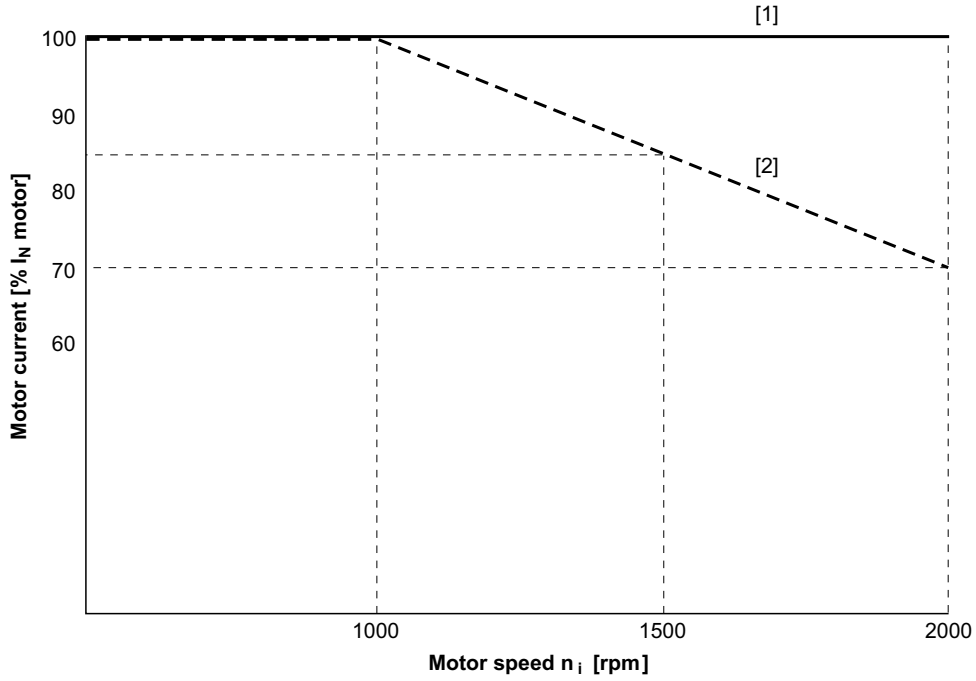
The table shows the device variants for which you have to/do not have to use the additional $I_{N\ motor}$ reduction in the following chapter:

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

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$I_{N\ motor}$ 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

Notes

INFORMATION

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

13.4 System characteristics of "/ECR" and "/ACR" options

System characteristics of /ECR and /ACR options in connection with MOVIGEAR®/DRC..	Single-turn resolution (position resolution per motor revolution)		Multi-turn resolution (max. counter for complete motor revolutions)	
/ECR Single-turn absolute encoders	12 bit	4096 inc	–	–
/ACR Multi-turn absolute encoders			20 bit	1048576 revolutions

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13.5 Technical data of application options

13.5.1 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 approx. 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	DC 24 V to EN 61131-2, external-voltage-proof and short-circuit proof
Permitted total current	250 mA (total of all connected sensors/actuators, maximum individual load: 250 mA)
Part number	18238017

13.5.2 GIO13B application option

GIO13B application option		
Digital inputs/outputs		
Number of digital 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 digital 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 +10 V 10-bit resolution Internal resistance R_i >10 kΩ	Current input I_{in} = DC 4 to 20 mA 10-bit resolution 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 10-bit resolution	
General technical data		
Degree of protection	IP66 (only when installed)	
Connection technology	M12 plug connector (A-coded, female)	
Sensor/actuator supply	DC 24 V to EN 61131-2, External-voltage-proof and short-circuit proof	
Permitted total current	140 mA (total of all connected sensors/actuators, maximum individual load: 140 mA)	

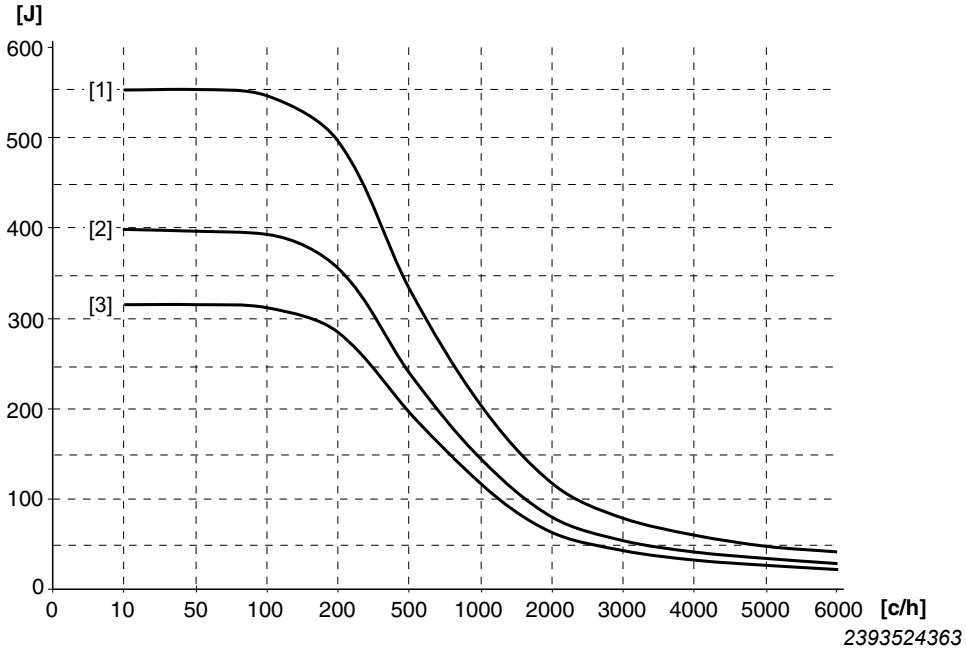
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GIO13B application option		
Part number	18226523	
Refresh times of primary frequency inputs depending on the set scaling frequency		
Scaling frequency [kHz]	**Refresh times [ms]**	
	LFI mode = track A	**LFI mode = tracks A + B**
1	500	250
2	250	125
5	100	50
10	50	25
20	25	12
40	12	6
80	6	3
120	3	2

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13.6 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] Deceleration ramp 10 s
[2] Deceleration ramp 4 s
[3] Deceleration ramp 0.2 s
c/h Cycles/hour

13.6.1 Calculation example

The known values are:

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

Calculating the energy from the power of the deceleration ramp:

$$W = P \times t$$
$$W = 144\ W \times 2\ s$$
$$W = 288\ J$$

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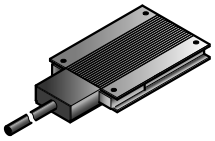
For the brake ramp of 2 s, you can use brake ramp [3] (0.2 s) in the diagram. Use the characteristic curve with the shorter deceleration ramp because a shorter deceleration ramp means more braking energy.

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.

13.7 Braking resistors

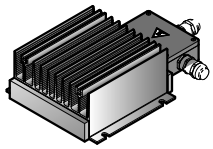
13.7.1 Overview

BW...-.../K-1.5



	BW100-005/K-1.5	BW150-003/K-1.5
Part number	08282862	08282927
Function	Dissipating the regenerative energy	
Degree of protection	IP65	IP65
Resistance	100 Ω	150 Ω
Power in S1, 100% cdf	200 W	100 W
Dimensions W × H × D	252 × 15 × 80 mm	146 × 15 × 80 mm
Cable length	1.5 m	1.5 m

BW...-...-T



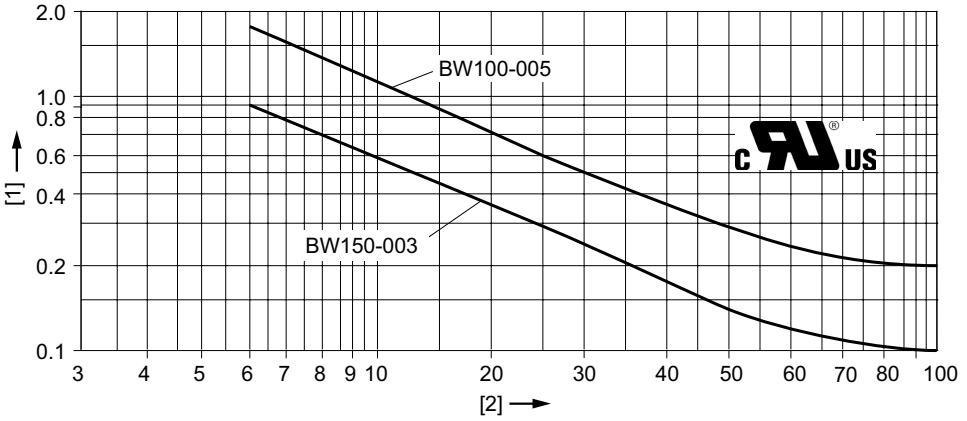
	BW150-006-T	BW100-009-T
Part number	17969565	17969573
Function	Dissipating the regenerative energy	
Degree of protection	IP66	IP66
Resistance	150 Ω	100 Ω
Power in S1, 100% cdf	600 W	900 W
Dimensions W × H × D	285 × 75 × 174 mm	435 × 75 × 174 mm
Prescribed connection cables	Shielded cables with a temperature resistance of $T_{amb} \geq 90$ °C (194 °F)	
Maximum permitted cable length	15 m	15 m

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13.7.2 Technical data of BW100-005/K-1.5 and BW150-003/K-1.5

Power diagrams

The following figure shows the power diagrams of the braking resistors BW100-005/K-1.5, BW150-003/K-1.5:

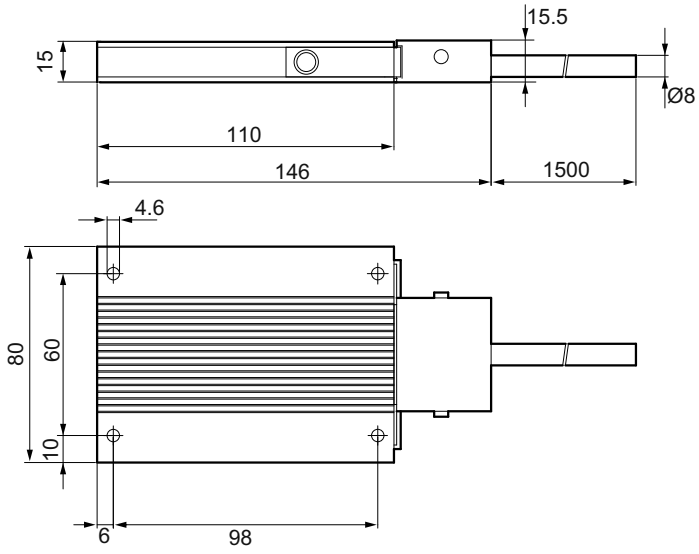


9007204104879499

[1] Power in KW
[2] Cyclic duration factor cdf in %

Dimension drawing of BW150-003/K-1.5

The following figure shows the dimensions of the external braking resistor BW150-003/K-1.5:

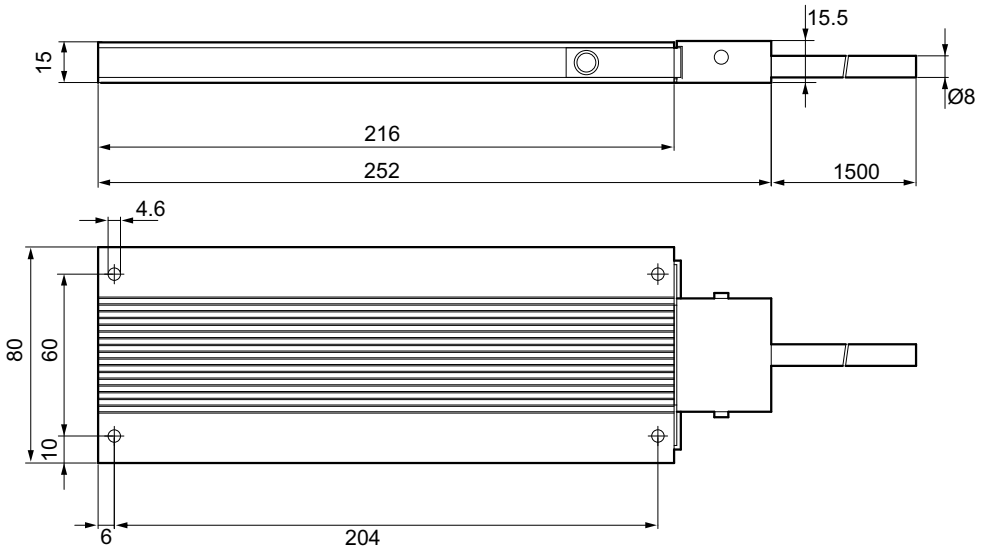


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Dimension drawing of BW100-005/K-1.5

The following figure shows the dimensions of the external braking resistor BW100-005/K-1.5:

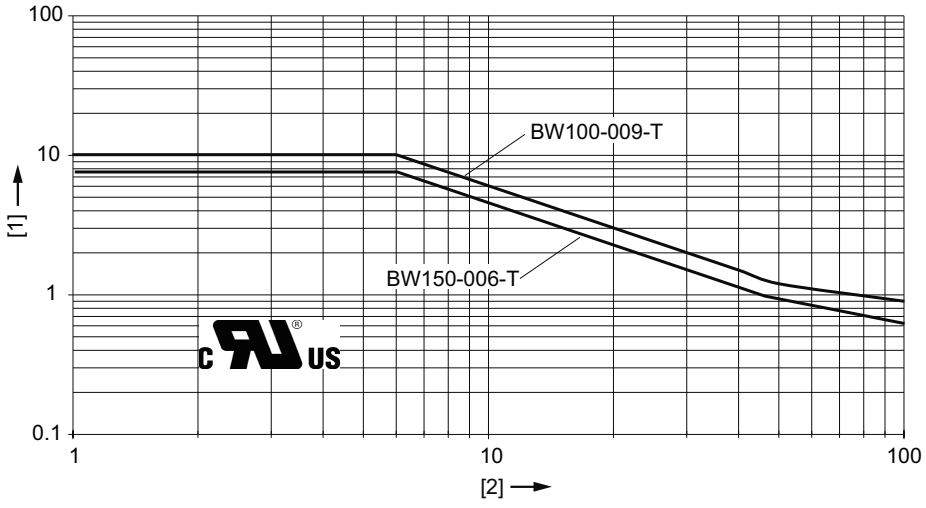


4850166795

13.7.3 Technical data of BW150-006-T and BW100-009-T

Power diagrams

The following figure shows the power diagrams of the braking resistors BW150-006-T and BW100-009-T:

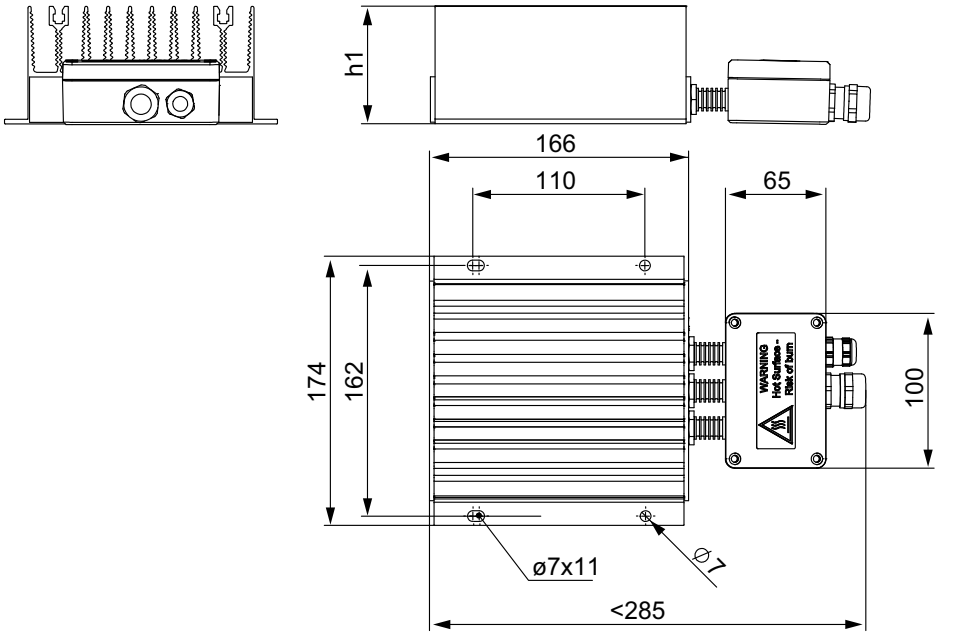


20933056395

[1] Power in KW
[2] Cyclic duration factor cdf in %
ED Cyclic duration factor of the braking resistor, based on a cycle duration of 120 s.

Dimension drawing of BW150-006-T

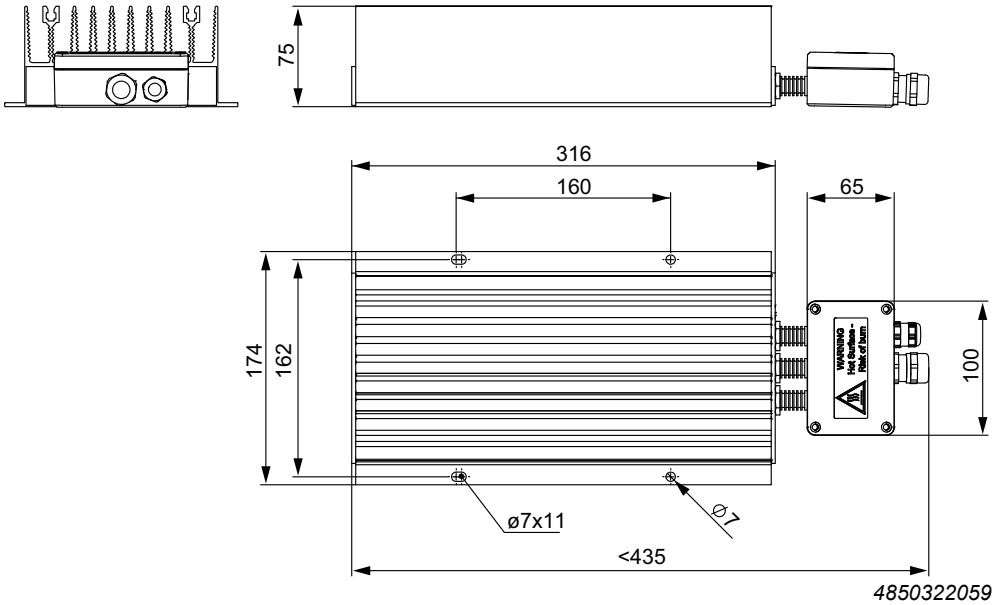
The following figure shows the dimensions of the external braking resistor BW150-006-T:



4850243339

Dimension drawing of BW100-009-T

The following figure shows the dimensions of the external braking resistor BW100-009-T:



4850322059

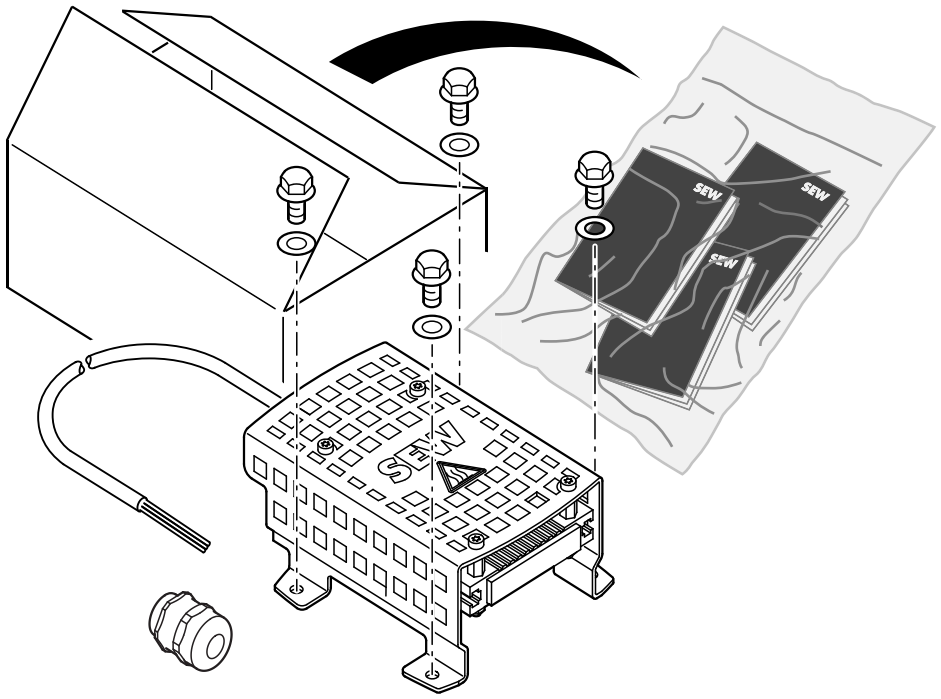
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13.8 Mounting kit for braking resistor BW...-.../..A

INFORMATION

- The BW...-.../..A braking resistor must always be mounted and installed by the customer.
- Observe the installation instructions "Braking resistor BW...-.../..A".

The following figure shows the mounting kit for braking resistor BW...-.../..A:



20930754315

13.8.1 Assignment

INFORMATION

The /EBW option is required for connecting an external braking resistor.

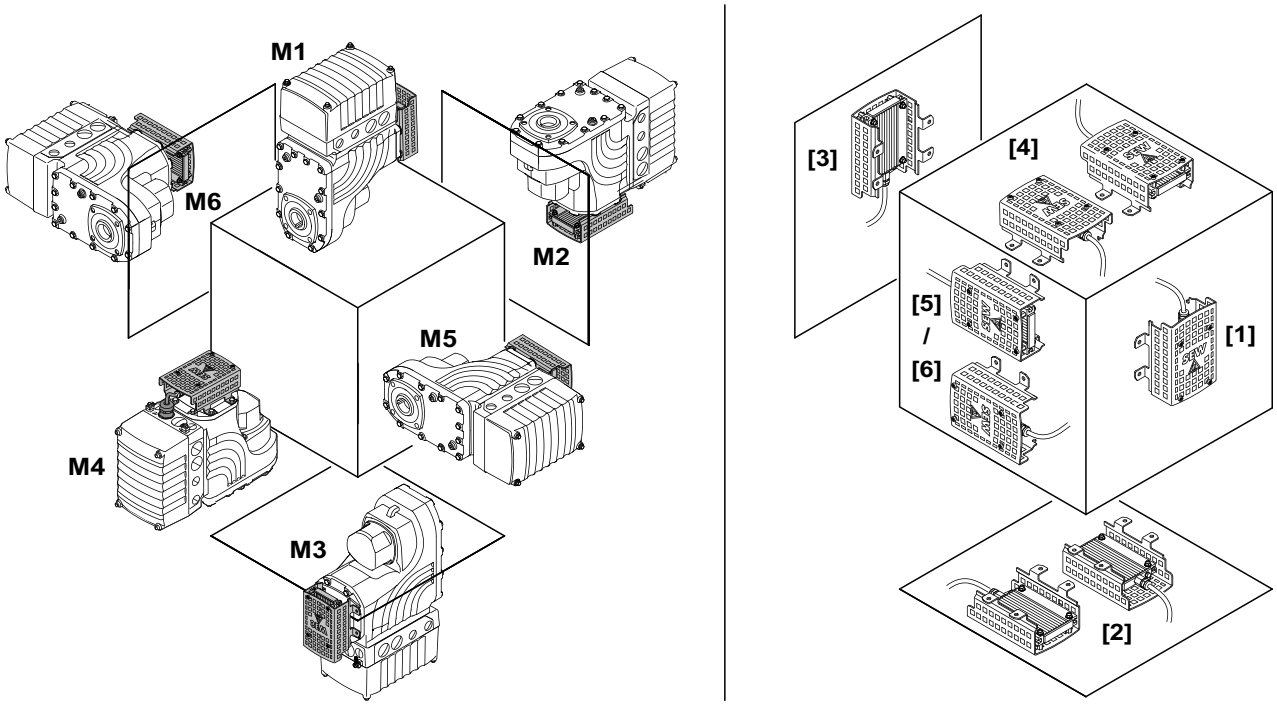
Drive unit	Mounting kit	
	Part number	Type
MGF..2../EBW	18259073	BW100-001/K-1.5/M2A
	18259138	BW100-002/K-1.5/M2A
MGF..4../EBW	18259081	BW100-001/K-1.5/M4A
MGF..4../XT/EBW	18259146	BW100-002/K-1.5/M4A

13.8.2 Technical data

Technical data	Type	
	BW100-001/.../...	**BW100-002/.../...**
Nominal continuous power at T_{amb}~40 °C	100 W	200 W
Resistance value R_{BW}	100 Ω ±10%	100 Ω ±10%
Design	Flat design	
Connections	3 × AWG 20; l = 150 cm	
Degree of protection (EN 60529)	IP66	
Operating temperature range	-25 °C to +40 °C	
Type of cooling	Natural convection	
Housing temperature at nominal continuous power at T_{amb}~40 °C	< 300 °C	
Conformity	CE/UL/CSA	
Derating at T_{amb}> 40 °C	5% per 10 K to 60 °C	

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13.8.3 Load capacity

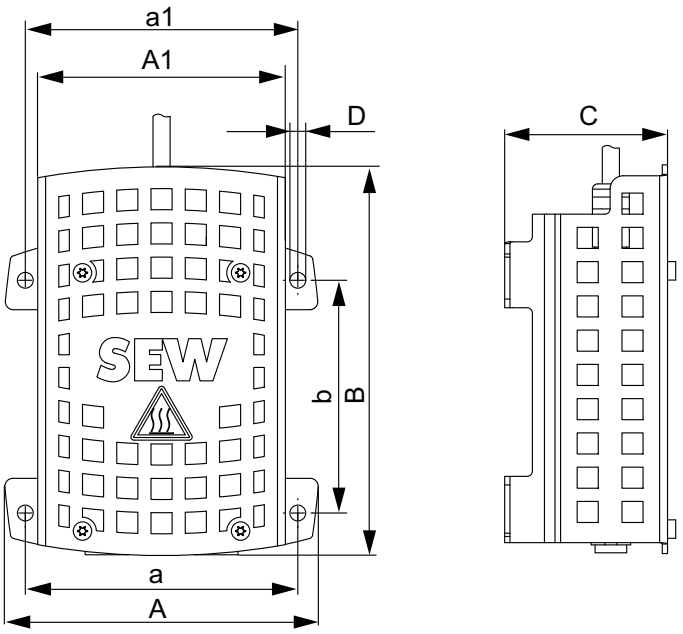


20907651979

BW100-001/.../..	Load capacity at % cdf in [W]				
cdf	**M1** **[1]**	**M2** **[2]**	**M3** **[3]**	**M4** **[4]**	**M5/M6** **[5] / [6]**
100%	100	100	100	100	100
50%	150	150	150	150	150
25%	250	250	250	250	250
12%	300	300	300	300	300
6%	500	500	500	500	500
cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration TD ≤ 120 s					

BW100-002/.../..	Load capacity at % cdf in [W]				
cdf	**M1** **[1]**	**M2** **[2]**	**M3** **[3]**	**M4** **[4]**	**M5/M6** **[5] / [6]**
100%	200	200	200	160	160
50%	300	300	300	240	240
25%	500	500	500	400	400
12%	600	600	600	480	480
6%	1000	1000	1000	800	800
cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration TD ≤ 120 s					

13.8.4 Dimension drawing



20907654411

	A	A1	B	C	D	a	a1	b
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
18259073 (BW100-001/K-1.5/M2A)	133.00	94.00	147.50	61.80	6	107.50	107.50	57.00
18259138 (BW100-002/K-1.5/M2A)								
18259081 (BW100-001/K-1.5/M4A)	154.00	94.00	147.50	61.80	6	143.00	128.00	94.00
18259146 (BW100-002/K-1.5/M4A)								

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13.9 Line choke

The line choke can be used as an option:

- To support overvoltage protection
- To smoothen the line current
- For protection in the event of distorted line voltage
- To limit the charging current, for example, when several inverters are connected together in parallel on the input end (nominal current of line choke = total of nominal input currents)

13.9.1 UL and cUL approval

The listed line chokes have cRUus approval independent of the drive unit.

13.9.2 Technical data

Line choke	ND0070-503	ND0160-503	ND0300-503	ND0420-503
Part number	17984173	17984181	17983800	17983819
Nominal line voltage V_L	3 × AC 230 V – 500 V 50/60 Hz			
Nominal current I_N	7 A	16 A	30 A	42 A
Nominal inductance	0.36 mH	0.2 mH	0.1 mH	0,045 mH
Nominal power loss	4 W	9 W	11 W	13 W
Ambient temperature ϑ_{amb}	-10 °C – 45 °C (reduction: 3% I_N up to maximum 60 °C)			
Connection contacts L1/L2/L3 – L1'/L2'/L3'	0.2 – 4 mm²		0.2 – 10 mm²	2.5 – 16 mm²
Tightening torque L1/L2/L3 – L1'/L2'/L3'	0.5 – 1 Nm		1.2 – 2 Nm	2.5 Nm
PE connection contact	M4		M5	
Tightening torque PE	1.5 Nm		3 Nm	
Degree of protection	IPXXB in accordance with EN 60529			
Mass	0.5 kg	1.3 kg	1.95 kg	1.82 kg

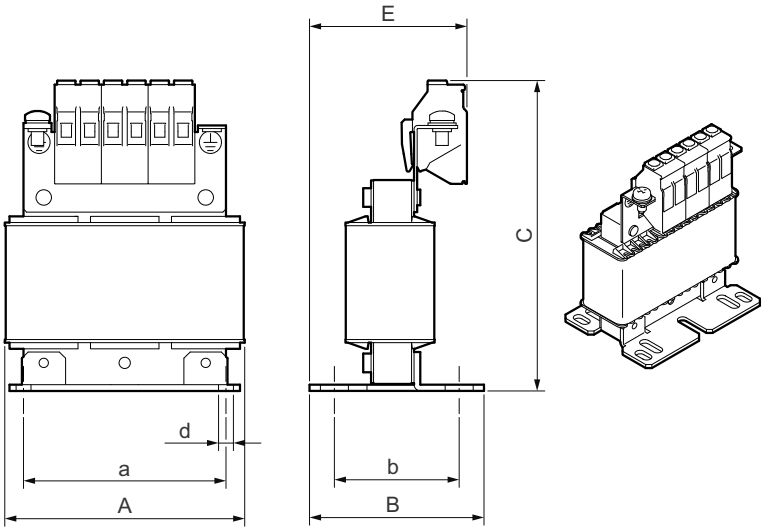
Line choke	ND020-013	ND030-023	ND045-013
Part number	08260125	08271518	08260133
Nominal line voltage V_L	3 × AC 380 V – 500 V, 50/60 Hz		
Nominal current I_N	AC 20 A	AC 30 A	AC 45 A
Nominal inductance	0.1 mH	0.2 mH	0.1 mH
Nominal power loss	10 W	30 W	15 W
Ambient temperature ϑ_{amb}	-25 °C – +45 °C		
Terminal strip connections	4 mm²	2.5 – 10 mm²	10 mm²
Tightening torque	0.6 – 0.8 Nm	Max. 2.5 Nm	
Degree of protection	IP00 to EN 60529		
Mass	0.5 kg	2.5 kg	2.5 kg

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13.9.3 Dimension drawing

Dimension drawing line chokes ND0070.., ND0160.., ND0300.., ND0420..

The following figure shows the dimension drawing of the line choke:

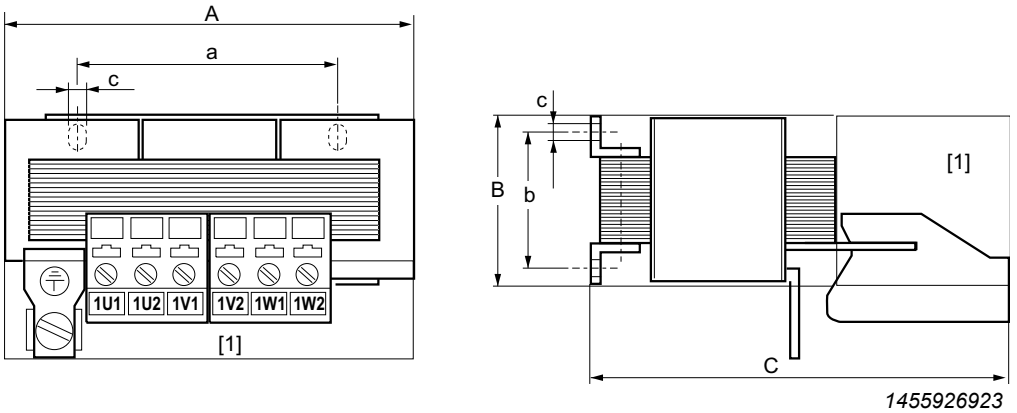


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Line choke	Main dimensions in mm				Mounting dimensions in mm			Connection
	A	B	C	E	a	b	d	PE
ND0070-503	78	57	105	56	65	40	4.8	M4
ND0160-503	96	70	120	65	71	54	4.8	M4
ND0300-503	121	86	145	86	105	70	4.8	M5
ND0420-503	121	86	150	90	105	70	4.8	M5

Dimension drawing line chokes ND020.., ND030.., ND045..

The following figure shows the dimension drawing of the line choke:



1455926923

[1] Space for installation terminals

Any mounting position

Input: 1U1, 1V1, 1W1

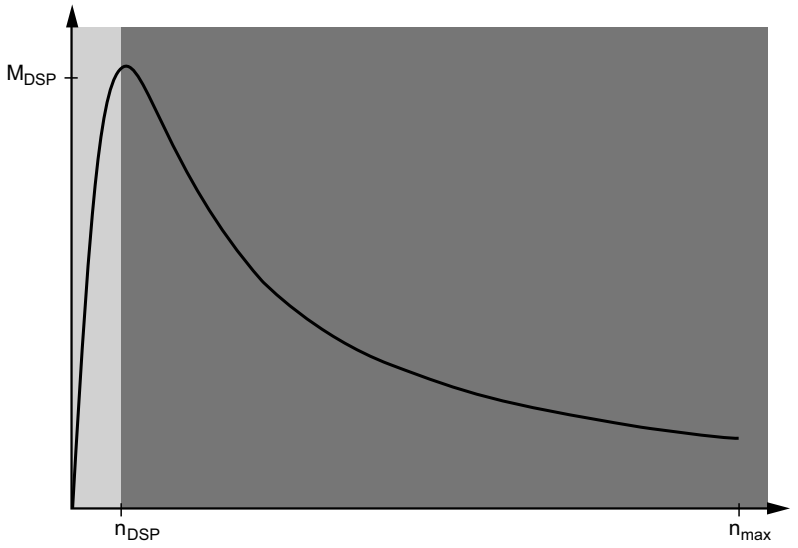
Output: 1U1, 1V2, 1W2

Line choke type	Main dimensions mm			Mounting dimensions mm		Hole dimension mm	Mass
	A	B	C	a	b	c	kg
ND020-013	85	60	120	50	31 - 42	5 - 10	0.5

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Line choke type	Main dimensions mm			Mounting dimensions mm		Hole dimension mm	Mass
	A	B	C	a	b	c	kg
ND030-023 ND045-013	125	95	170	84	55-75	6	2.5

13.10 Deceleration torques DynaStop®



9007201648441995

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

MGF.. 2	i_{tot}	Deceleration torque		MGF.. 4	i_{tot}	Deceleration torque		MGF.. 4/XT	i_{tot}	Deceleration torque	
		M_{DSP}	at n_{DSP} (gear shaft speed)			M_{DSP}	at n_{DSP} (gear shaft speed)			M_{DSP}	at n_{DSP} (gear shaft speed)
		[Nm]	[min^{-1}]			[Nm]	[min^{-1}]			[Nm]	[min^{-1}]
3-stage	55.25	200	2.08	**3-stage**	56.49	400	0.65	**3-stage**	56.49	400	0.42
	51.51	189	2.23		48.00*	369	0.83		48.00*	400	0.57
	45.03	173	2.55		42.86	329	0.93		42.86	400	0.72
	42.19	162	2.73		36.61	281	1.09		36.61	351	0.87
	37.24	143	3.08		34.29	263	1.17		34.29	329	0.93
	33.02	127	3.48		28.88	222	1.39		28.88	277	1.10
	28.07	108	4.10								

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MGF.. 2	i_{tot}	Deceleration torque		MGF.. 4	i_{tot}	Deceleration torque		MGF.. 4/XT	i_{tot}	Deceleration torque	
		M_{DSP}	at n_{DSP} (gear shaft speed)			M_{DSP}	at n_{DSP} (gear shaft speed)			M_{DSP}	at n_{DSP} (gear shaft speed)
		[Nm]	[min^{-1}]			[Nm]	[min^{-1}]			[Nm]	[min^{-1}]
2-stage	22.86	89	5.03	**2-stage**	25.72	200	1.56	**2-stage**	25.72	247	1.24
	19.81	77	5.81		21.82	169	1.83		21.82	209	1.46
	18.52	72	6.2		19.70	153	2.03		19.70	189	1.62
	16.00	62	7.19		17.33	134	2.31		17.33	166	1.84
	13.60*	53	8.46		16.36	127	2.44		16.36	157	1.95
	12.14	47	9.47		13.93	108	2.87		13.93	134	2.29
	10.37	40	11.09		12.66	98	3.16		12.66	122	2.52
	9.71	38	11.84		10.97	85	3.65		10.97	105	2.90
	8.24	32	13.96		8.96	70	4.46		8.96	86	3.55
	7.00*	27	16.43		7.88	61	5.08		7.88	76	4.04
	6.25*	24	18.40		7.44*	58	5.38		7.44*	71	4.28
	5.34	21	21.54		6.34	49	6.56		6.34	61	5.02
	5.00*	19	23.00		5.76	45	6.94		5.76	55	5.53
	4.22	16	27.25		4.99	39	8.02		4.99	48	6.38
	3.37	13	34.12		4.34*	34	9.22		4.34*	42	7.34
					3.53*	27	11.34		3.53*	34	9.02

= Preferred gear ratio

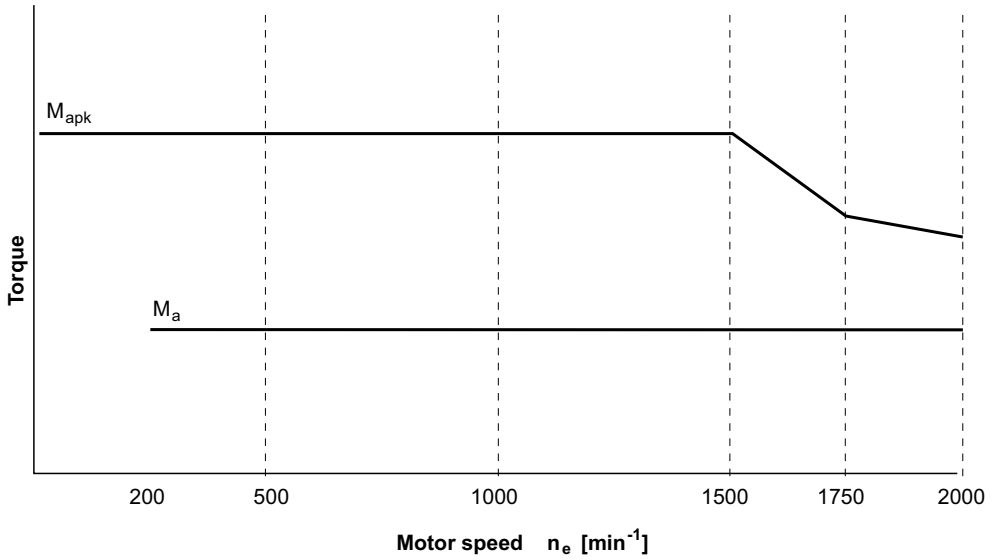
* = Finite gear unit ratio

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13.11 Torque curves

13.11.1 Control range 1:10

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



18014400900807179

MGF..2

MGF..2												
	n_a	n_a	M_a				M_{apk}			M_{a_eso}	i_{tot}	Weight
	at n_e= 200 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 500 min^{-1}	at n_e= 1000 min^{-1}	at n_e= 1500 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 200 – 1500 min^{-1}	at n_e= 1750 min^{-1}	at n_e= 2000 min^{-1}			
	[min^{-1}]	[min^{-1}]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	59.4	593.5	14	14	14	14	51**	30	22	65	3.37	15
	47.4	473.9	17	17	17	17	64**	38	28	85	4.22	
	40.0	400.0	20	20	20	20	76**	45	33	210	5.00*	
	37.5	374.5	21	21	21	21	81**	48	35	215	5.34	
	32.0	320.0	25	25	25	25	95**	56	41	225	6.25*	
	28.6	285.7	28	28	28	28	106**	63	46	235	7.00*	
	24.3	242.7	33	33	33	33	125**	74	54	245	8.24	
	20.6	206.0	39	39	39	39	147**	87	64	330	9.71	
	19.3	192.9	42	42	42	42	158**	93	68	330	10.37	
	16.5	164.7	49	49	49	49	185**	109	80	330	12.14	
	14.7	147.1	54	54	54	54	207**	122	90	330	13.60 *	
	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	79	79	79	79	220**	178	131	330	19.81	
	8.8	87.5	91	91	91	91	220	206	151	330	22.86	
3-stage	7.1	71.3	112	112	112	112	220	220	185	330	28.07	16
	6.1	60.6	132	132	132	132	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	180	180	180	180	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	

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Key

	=	Preferred gear ratio
*	=	Finite gear unit ratio
**	=	The illustrated values are realized if the setting of parameters 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_{a_eso}	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	Continuous output torque of MOVIGEAR®
n_a	=	Output speed
n_e	=	Motor speed

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MGF..4

MGF..4												
	n_a	n_a	M_a				M_{apk}			M_{a_eso}	i_{tot}	Weight
	at n_e= 200 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 500 min^{-1}	at n_e= 1000 min^{-1}	at n_e= 1500 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 200 – 1500 min^{-1}	at n_e= 1750 min^{-1}	at n_e= 2000 min^{-1}			
	[min^{-1}]	[min^{-1}]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	56.7	566.6	24	24	24	24	85**	67**	53	147	3.53*	27
	46.1	460.8	30	30	30	30	105**	83**	65	165	4.34*	
	40.1	400.8	34	34	34	34	120**	95**	75	420	4.99	
	34.7	347.2	39	39	39	39	139**	110**	86	450	5.76	
	31.5	315.5	43	43	43	43	153**	121**	95	470	6.34	
	26.9	268.8	51	51	51	51	180**	142**	111	515	7.44*	
	25.4	253.8	54	54	54	54	190**	150**	118	525	7.88	
	22.3	223.2	61	61	61	61	216**	171**	134	560	8.96	
	18.2	182.3	75	75	75	75	265**	209**	164	675	10.97	
	15.8	158.0	86	86	86	86	306**	241**	189	710	12.66	
	14.4	143.6	95	95	95	95	336**	265**	208	710	13.93	
	12.2	122.2	111	111	111	111	395**	311**	245	710	16.36	
	11.5	115.4	118	118	118	118	418**	330**	259	710	17.33	
	10.2	101.5	134	134	134	134	475**	375**	295	710	19.70	
	9.2	91.7	148	148	148	148	475**	416**	326	710	21.82	
	7.8	77.8	175	175	175	175	475**	475**	385	710	25.72	
3-stage	6.9	69.3	196	196	196	196	475	475	432	710	28.88	27
	5.8	58.3	233	233	233	233	475	475	475	710	34.29	
	5.5	54.6	249	249	249	249	475	475	475	710	36.61	
	4.7	46.7	291	291	291	291	475	475	475	710	42.86	
	4.2	41.7	326	326	326	326	475	475	475	710	48.00 *	
	3.5	35.4	384	384	384	384	475	475	475	710	56.49	

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Key

	=	Preferred gear ratio
*	=	Finite gear unit ratio
**	=	The illustrated values are realized if the setting of parameters 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_{a_eso}	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	Continuous output torque of MOVIGEAR®
n_a	=	Output speed
n_e	=	Motor speed

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MGF..4/XT

MGF..4/XT (increased torque)												
	n_a	n_a	M_a				M_{apk}			M_{a_eso}	i_{tot}	Weight
	at n_e= 200 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 500 min^{-1}	at n_e= 1000 min^{-1}	at n_e= 1500 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 200 – 1500 min^{-1}	at n_e= 1750 min^{-1}	at n_e= 2000 min^{-1}			
	[min^{-1}]	[min^{-1}]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	56.7	566.6	35	35	35	35	106**	71	53	147	3.53*	28
	46.1	460.8	43	43	43	43	130**	87	65	165	4.34*	
	40.1	400.8	50	50	50	50	150**	100	75	420	4.99	
	34.7	347.2	58	58	58	58	173**	115	86	450	5.76	
	31.6	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	79	79	79	79	236**	158	118	525	7.88	
	22.3	223.2	90	90	90	90	269**	179	134	560	8.96	
	18.2	182.3	110	110	110	110	329**	219	165	675	10.97	
	15.8	158.0	127	127	127	127	380**	253	190	710	12.66	
	14.4	143.6	139	139	139	139	418**	279	209	710	13.93	
	12.2	122.2	164	164	164	164	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	19.70	
	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	289	289	289	289	475	475	433	710	28.88	29
	5.8	58.3	343	343	343	343	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	48.00 *	
	3.5	35.4	400	400	400	400	475	475	475	710	56.49	

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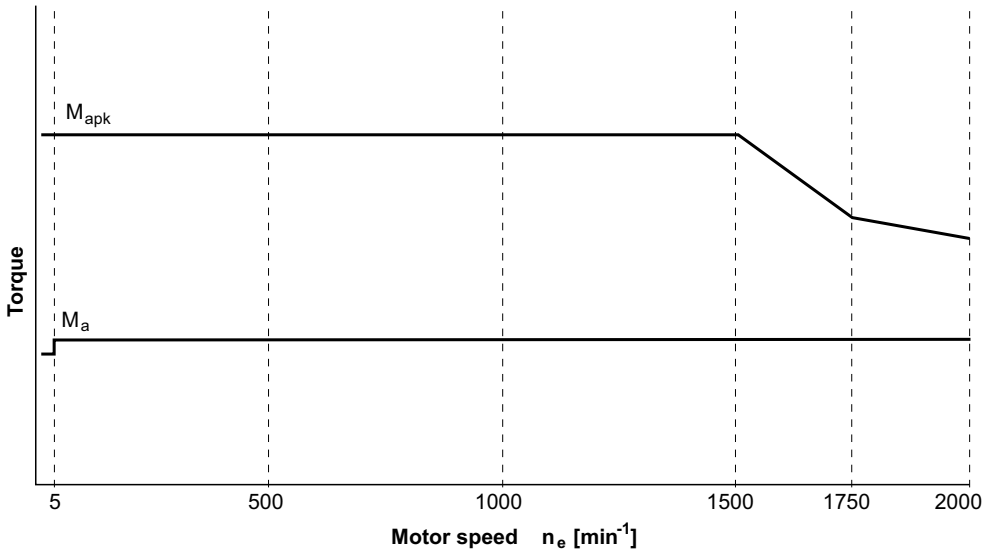
Key

	=	Preferred gear ratio
*	=	Finite gear unit ratio
**	=	The illustrated values are realized if the setting of parameters 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_{a_eso}	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	Continuous output torque of MOVIGEAR®
n_a	=	Output speed
n_e	=	Motor speed

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13.11.2 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

MGF..2../ECR (extended control range)													
	n_a		M_a					M_{apk}			M_{a_eso}	i_{tot}	Weight
	at n_e= 1 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 5 min^{-1}	at n_e= 500 min^{-1}	at n_e= 1000 min^{-1}	at n_e= 1500 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 5 – 1500 min^{-1}	at n_e= 1750 min^{-1}	at n_e= 2000 min^{-1}			
	[min^{-1}]	[min^{-1}]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	0.29	593.5	14	14	14	14	14	51**	30	22	65	3.37	15
	0.24	473.9	17	17	17	17	17	64**	38	28	85	4.22	
	0.20	400.0	20	20	20	20	20	76**	45	33	210	5.00*	
	0.19	374.5	21	21	21	21	21	81**	48	35	215	5.34	
	0.16	320.0	25	25	25	25	25	95**	56	41	225	6.25*	
	0.14	285.7	28	28	28	28	28	106**	63	46	235	7.00*	
	0.12	242.7	33	33	33	33	33	125**	74	54	245	8.24	
	0.10	206.0	39	39	39	39	39	147**	87	64	330	9.71	
	0.10	192.9	42	42	42	42	42	158**	93	68	330	10.37	
	0.08	164.7	49	49	49	49	49	185**	109	80	330	12.14	
	0.07	147.1	54	54	54	54	54	207**	122	90	330	13.60*	
	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	79	79	79	79	79	220**	178	131	330	19.81	
	0.04	87.5	91	91	91	91	91	220	206	151	330	22.86	
3-stage	0.04	71.3	112	112	112	112	112	220	220	185	330	28.07	16
	0.03	60.6	132	132	132	132	132	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	180	180	180	180	180	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	

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Key

	=	Preferred gear ratio
*	=	Finite gear unit ratio
**	=	The illustrated values are realized if the setting of parameters 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_{a_eso}	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	Continuous output torque of MOVIGEAR® For motor speeds n_e < 5 min^{-1}, you have to reduce the output torque M_a to 90%.
n_a	=	Output speed
n_e	=	Motor speed

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MGF..4../ECR

MGF..4../ECR (extended control range)													
	n_a		M_a					M_{apk}			M_{a_eso}	i_{tot}	Weight
	at n_e= 1 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 5 min^{-1}	at n_e= 500 min^{-1}	at n_e= 1000 min^{-1}	at n_e= 1500 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 5 – 1500 min^{-1}	at n_e= 1750 min^{-1}	at n_e= 2000 min^{-1}			
	[min^{-1}]	[min^{-1}]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	0.29	566.6	24	24	24	24	24	85**	67**	53	147	3.53*	27
	0.23	460.8	30	30	30	30	30	105**	83**	65	165	4.34*	
	0.20	400.8	34	34	34	34	34	120**	95**	75	420	4.99	
	0.17	347.2	39	39	39	39	39	139**	110**	86	450	5.76	
	0.16	315.5	43	43	43	43	43	153**	121**	95	470	6.34	
	0.13	268.8	51	51	51	51	51	180**	142**	111	515	7.44*	
	0.13	253.8	54	54	54	54	54	190**	150**	118	525	7.88	
	0.11	223.2	61	61	61	61	61	216**	171**	134	560	8.96	
	0.09	182.3	75	75	75	75	75	265**	209**	164	675	10.97	
	0.08	158.0	86	86	86	86	86	306**	241**	189	710	12.66	
	0.07	143.6	95	95	95	95	95	336**	265**	208	710	13.93	
	0.06	122.2	111	111	111	111	111	395**	311**	245	710	16.36	
	0.06	115.4	118	118	118	118	118	418**	330**	259	710	17.33	
	0.05	101.5	134	134	134	134	134	475**	375**	295	710	19.70	
	0.05	91.7	148	148	148	148	148	475**	416**	326	710	21.82	
	0.04	77.8	175	175	175	175	175	475**	475**	385	710	25.72	
3-stage	0.03	69.3	196	196	196	196	196	475	475	432	710	28.88	27
	0.03	58.3	233	233	233	233	233	475	475	475	710	34.29	
	0.03	54.6	249	249	249	249	249	475	475	475	710	36.61	
	0.02	46.7	291	291	291	291	291	475	475	475	710	42.86	
	0.02	41.7	326	326	326	326	326	475	475	475	710	48.00 *	
	0.02	35.4	384	384	384	384	384	475	475	475	710	56.49	

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Key

	=	Preferred gear ratio
*	=	Finite gear unit 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_{a_eso}	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	Continuous output torque of MOVIGEAR® For motor speeds $n_e < 5\ min^{-1}$, you have to reduce the output torque M_a to 90%.
n_a	=	Output speed
n_e	=	Motor speed

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MGF..4../ECR/XT

MGF..4../ECR/XT (extended control range /ECR and increased torque /XT)													
	n_a		M_a					M_{apk}			M_{a_eso}	i_{tot}	Weight
	at n_e= 1 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 5 min^{-1}	at n_e= 500 min^{-1}	at n_e= 1000 min^{-1}	at n_e= 1500 min^{-1}	at n_e= 2000 min^{-1}	at n_e= 5 – 500 min^{-1}	at n_e= 1750 min^{-1}	at n_e= 2000 min^{-1}			
	[min^{-1}]	[min^{-1}]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]		[kg]
2-stage	0.29	566.6	35	35	35	35	35	106**	71	53	147	3.53*	28
	0.23	460.8	43	43	43	43	43	130**	87	65	165	4.34*	
	0.20	400.8	50	50	50	50	50	150**	100	75	420	4.99	
	0.17	347.2	58	58	58	58	58	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	79	79	79	79	79	236**	158	118	525	7.88	
	0.11	223.2	90	90	90	90	90	269**	179	134	560	8.96	
	0.09	182.3	110	110	110	110	110	329**	219	165	675	10.97	
	0.08	158.0	127	127	127	127	127	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	164	164	164	164	164	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	19.70	
	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	289	289	289	289	289	475	475	433	710	28.88	29
	0.03	58.3	343	343	343	343	343	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	48.00 *	
	0.02	35.4	400	400	400	400	400	475	475	475	710	56.49	

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Key

	=	Preferred gear ratio
*	=	Finite gear unit 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_{a_eso}	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
M_a	=	Continuous output torque of MOVIGEAR® For motor speeds n_e < 5 min^{-1}, you have to reduce the output torque M_a to 90%.
n_a	=	Output speed
n_e	=	Motor speed

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13.12 Surface protection

13.12.1 General information

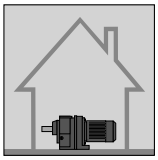
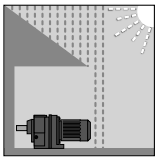
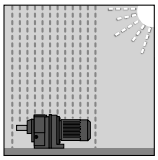
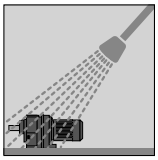
SEW-EURODRIVE offers the following optional protective measure for operating MOVIGEAR® drive units under special environmental conditions.

- 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.

13.12.2 Surface protection

Instead of the 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		For machines and systems in buildings and enclosed rooms with neutral atmospheres. Similar to corrosivity category[1]: • C1 (negligible)	• Machines and systems in the automotive industry • Conveyor systems in logistics areas • Conveyor systems at airports
OS1		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		For environments with high humidity or mean atmospheric contamination, such as applications outdoors subject to direct weathering. Similar to corrosivity category[1]: • C3 (moderate)	• Cable cars and chairlifts • Applications in gravel plants
OS3		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

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Surface protection		Ambient conditions	Sample applications
HP200 high protection surface treatment[2]		For hygienic areas in the food and beverage industry with regular acidic and caustic wet cleaning. Antistick 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

13.12.3 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	Suited for
Fluorocarbon rubber oil seal Standard on 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 (standard when using the design for use in wet areas)	Surface protection with high-quality material	Particularly demanding applications in terms of surface protection

13.12.4 NOCO® fluid

As standard, SEW-EURODRIVE supplies NOCO® fluid corrosion protection and lubricant with every MOVIGEAR® drive unit with hollow shaft. Use NOCO® fluid when installing gear units with hollow shafts. 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. You can tell that NOCO® fluid is a food grade oil by the NSF-H1 identification label on its packaging.

13.13 Design for use in wet areas

13.13.1 Sealing material

Resistance to cleaning agents

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

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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

13.13.2 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.

Characteristics

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

Properties

The HP200 surface has the following properties:

HP200 surface treatment	
Anti-adhesive properties	Excellent
Abrasion 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 (similar to RAL 7012) • Slight color differences are possible due to the paint process. • 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)

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Cleaning

Observe the following information for cleaning the unit.

⚠ **WARNING!** Risk of intoxication due to developing chlorine gas when acids and chlorine alkalis are mixed. Severe or fatal injuries.
Do not mix acids and chlorine alkalis under any circumstances. Observe the safety instructions of the cleaning agent manufacturer.

⚠ **WARNING!** Unwanted secondary reactions (such as development of toxic fumes or odors) when cleaning agents and disinfectants are mixed. Severe or fatal injuries.
Do not mix cleaning agents and disinfectants under any circumstances. Observe the safety instructions of the cleaning agent manufacturer.

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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	**Evaluation:**
Dipping test: • Immersion into the test medium with contact surface toward ambient air **Test period:** • 7 days	• 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

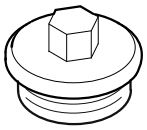
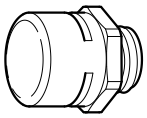
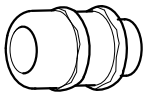
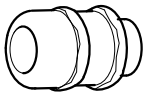
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13.14 Screw fittings

The following tables show the screw fittings available from SEW-EURODRIVE:

13.14.1 Cable glands/screw plugs/pressure compensation

Type of screw fitting	Image	Content	Size	Tightening torque[1)]	Outer cable diameter	Part number
Screw plugs external hexagon (made of stainless steel)		10 pieces	M16 × 1.5	6.8 Nm	–	18247342
		10 pieces	M25 × 1.5	6.8 Nm	–	18247350
Pressure compensation screw fittings (made of stainless steel)		1 piece	M16 × 1.5	4 Nm	–	28214617
EMC cable gland (brass, nickel-plated)		10 pieces	M16 × 1.5	4 Nm	5 to 9 mm	18204783
		10 pieces	M25 × 1.5	7 Nm	11 to 16 mm	18204805
EMC cable gland (made of stainless steel)		10 pieces	M16 × 1.5	4 Nm	5 to 9 mm	18216366
		10 pieces	M25 × 1.5	7 Nm	11 to 16 mm	18216382

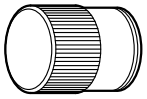
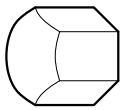
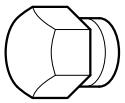
1) The specified torques must be adhered to with a tolerance of ± 10%.

The cable retention in the cable gland must withstand the following removal force of the cable from the cable gland:

- Cable with outer diameter > 10 mm: ≥ 160 N
- Cable with outer diameter < 10 mm: = 100 N

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13.14.2 Screw fittings: plug connectors

Type of screw fitting	Image	Content	Size	Tightening torque[1)]	Part number
M23 plug (made of stainless steel)		1 piece	M23 × 1.5	Tighten fully	19094558
M12 plug for plug connector with male thread (made of stainless steel)		10 pieces	M12 × 1.0	2.3 Nm	18202799
M12 plug for plug connector with female thread (made of stainless steel)		10 pieces	M12 × 1.0	2.3 Nm	18202276

1) The specified torques must be adhered to with a tolerance of ± 10%.

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13.15 Connection cables

13.15.1 Required connection cables for single line installation (SNI)

INFORMATION

Compare the outer diameter of the specified connection cables for single-line installation with the technical data of the EMC cable glands supplied with certain products.

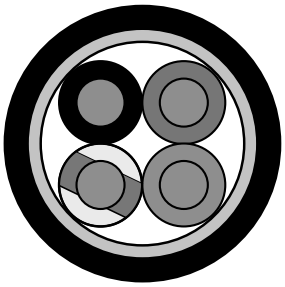
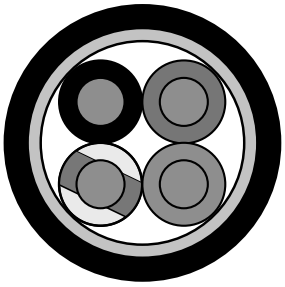
INFORMATION

SEW-EURODRIVE recommends using approved, cable-carrier-suited connection cables for single-line installation **only** in areas where this property is actually needed.

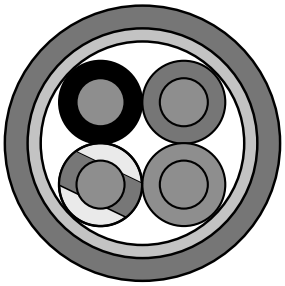
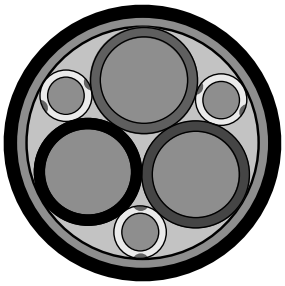
SEW-EURODRIVE specifies the following cable types for connecting SNI drive units MOVIGEAR® and SNI controller:

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.

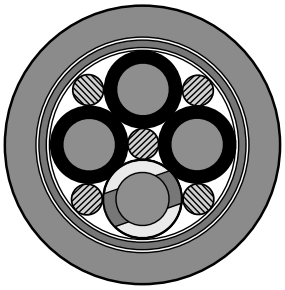
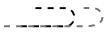
HELUKABEL TOPFLEX®

Cable type	Outer cable sheath	Conformity	Properties
HELUKABEL TOPFLEX®– EMV-UV-2YSLCYK-J 	**Color:** • Black **Diameter:** • 12.3 mm (2.5 mm²) • 14.5 mm (4.0 mm²)	CE	• UV resistant • Not suitable for cable carriers 
HELUKABEL TOPFLEX®– EMV-UV-2YSLCYK-J/ UL/CSA 	**Color:** • Black **Diameter:** • 12.5 mm (2.5 mm²) • 14.2 mm (4.0 mm²)	CE/UL	• UV resistant • Not suitable for cable carriers 

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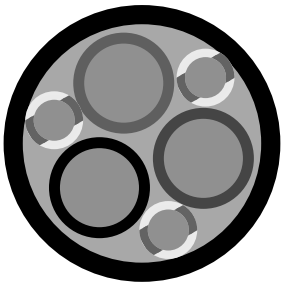
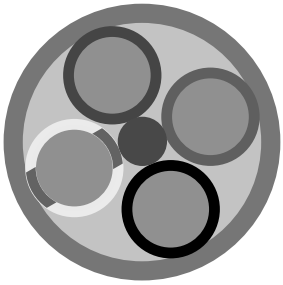
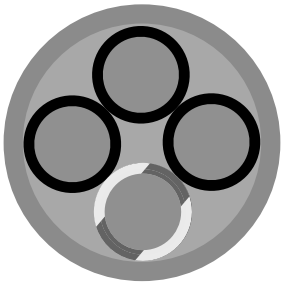
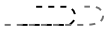
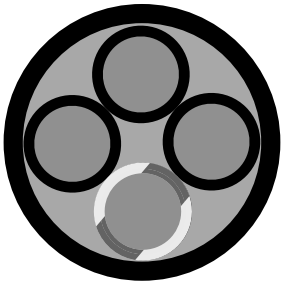
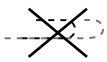
Cable type	Outer cable sheath	Conformity	Properties
HELUKABEL TOPFLEX®– EMV-2YSLCY-J 	**Color:** • Transparent **Diameter:** • 11.9 mm (2.5 mm²) • 13.6 mm (4.0 mm²)	CE	• Not suitable for cable carriers 
HELUKABEL TOPFLEX®– EMV-UV-3 PLUS 2YSLCYK-J 	**Color:** • Black **Diameter:** • 10.8 mm (2.5 mm²) • 12.3 mm (4.0 mm²)	CE	• UV resistant • Not suitable for cable carriers 

HELUKABEL TOPSERV®

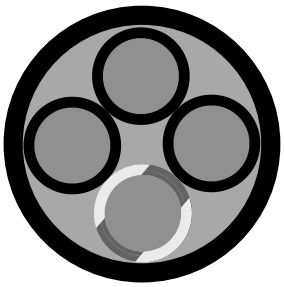
Cable type	Outer cable sheath	Conformity	Properties
HELUKABEL TOPSERV® – 109 PUR 	**Color:** • Orange **Diameter:** • 10.6 mm (2.5 mm²) • 11.9 mm (4.0 mm²)	CE/UL	• Halogen-free • UV resistant • Suitable for cable carriers 

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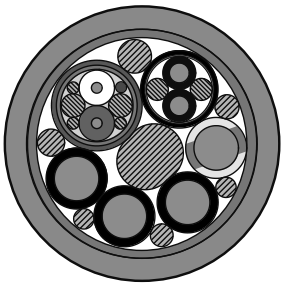
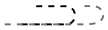
LAPP ÖLFLEX®

Cable type	Outer cable sheath	Conformity	Properties
LAPP ÖLFLEX® **SERVO 2YSLCYK-JB** 	**Color:** • Black **Diameter:** • 12.2 mm (2.5 mm²) • 14.4 mm (4.0 mm²)	CE	• UV resistant • Not suitable for cable carriers 
LAPP ÖLFLEX® **SERVO 2YSLCY-JB** 	**Color:** • Transparent **Diameter:** • 12.4 mm (2.5 mm²) • 15.6 mm (4.0 mm²)	CE	• Not suitable for cable carriers 
LAPP ÖLFLEX® **SERVO FD796 CP** 	**Color:** • Orange **Diameter:** • 10.6 mm (2.5 mm²) • 11.9 mm (4.0 mm²)	CE/UL	• Halogen-free • UV resistant • Suitable for cable carriers 
LAPP ÖLFLEX® **VFD XL** 	**Color:** • Black **Diameter:** • 14.8 mm (2.5 mm²) • 16.5 mm (4.0 mm²)	• CE/UL	• UV resistant • TC-ER approval • Not suitable for cable carriers 

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Cable type	Outer cable sheath	Conformity	Properties
LAPP ÖLFLEX® **VFD 2XL** 	**Color:** • Black **Diameter:** • 14.8 mm (2.5 mm²) • 16.7 mm (4.0 mm²)	• CE/UL	• UV resistant • TC-ER approval • Not suitable for cable carriers 

Leoni LEHC

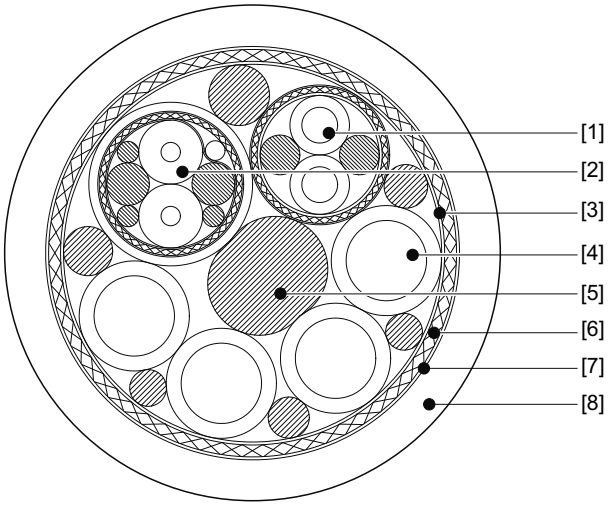
Cable type	Outer cable sheath	Conformity	Properties[1)]
Leoni **LEHC 005295 Rev.2** **LEHC 005296 Rev.2** 	**Color:** • Orange **Diameter:** • LEHC 00529**5** Rev.2: 15.6 mm (2.5 mm²) • LEHC 00529**6** Rev.2: 16.7 mm (4.0 mm²)	CE/UL	• Halogen-free • UV resistant • Suitable for cable carriers 

1) See also chapter "Specification of hybrid cables AC 400 V, communication (DSC or SNI) and safe disconnection (STO)"

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13.15.2 Specification of hybrid cables AC 400 V, communication (DSC or SNI) and safe disconnection (STO)

The following figure shows the structure of the hybrid cable:



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	Type: Leoni LEHC 005295 Rev.2		**Type: Leoni LEHC 005296 Rev.2**
[1]	1 core pair	0.75 mm²	
	Conductor	Stranded copper wire, 42 × 0.15 mm	
	Insulation	Polypropylene	
	Colors	Black cores with white digits 1, 2	
	Shield	Braided copper wire, 0.1 mm, tinned	
	Optical coverage	min. 85%	
	Sheath	Banding	
[2]	1 core pair	2 × 0.24 mm²	
	Conductor	Stranded copper wire, blank, 19 × 0.127 mm	
	Insulation	Polypropylene	
	Colors	White and blue	
	Shield	Banding	
	Drain wire	0.34 mm²	
	Conductor	Stranded copper wire, blank, 19 × 0.15 mm	
	Shield	Braided copper wire, 0.10 mm, tinned	
	Optical coverage	min. 85%	
	Sheath	TPE	
	Color	Violet	
[3]	Banding		

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	Type: Leoni LEHC 005295 Rev.2		Type: Leoni LEHC 005296 Rev.2	
[4]	4 cores	2.5 mm^2	4 cores	4.0 mm^2
	Conductor	Stranded copper wire, blank, 147 × 0.15 mm	Conductor	Stranded copper wire, blank, 224 × 0.15 mm
	Insulation	Polypropylene	Insulation	Polypropylene
	Colors	Green/yellow, black with lettering U/L1; V/L2; W/L3	Colors	Green/yellow, black with lettering U/L1; V/L2; W/L3
[5]	Filler			
[6]	Shield	Braided tinned copper wires, 0.15 mm	Shield	Braided tinned copper wires, 0.20 mm
	Optical cover-age	min. 87%	Optical cover-age	min. 87%
[7]	Banding	EMC fleece		
[8]	Outer cable sheath	Polyurethane		
	Color	Orange (similar to RAL2003)		

Technical data of hybrid cables

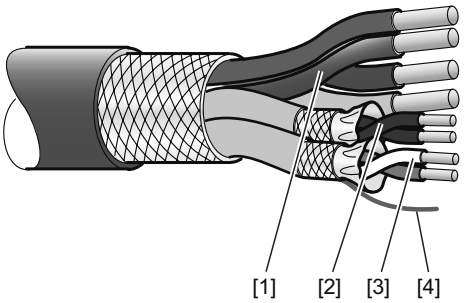
The following table shows the technical data of the hybrid cable:

Properties	Type: Leoni LEHC 005295 Rev.2	Type: Leoni LEHC 005296 Rev.2
UL properties	UL style 20234, 80 °C, 1000 V E47543-LIL c UL us certified	
Test voltage core/core	4.0 kV 50 Hz AC	
Test voltage core/shield	3.0 kV 50 Hz AC	
Operating voltage **Position [4]**	1000 V	
Surge impedance **Position [2]**	125 Ω ±10%	
Damping **Position [2]**	Nom. 2.5 dB/100 m at 1 MHz Nom. 6.5 dB/100 m at 10 MHz	
Runtime **Position [2]**	Nom. 5 ns/m	
Operating temperature	-30 °C to +80 °C (fixed installation) -25 °C to +80 °C (cable carrier)	
Weight of cable	Nom. 342 g/m	Nom. 428 g/m
Bending radiuses	Min. 5 × outer diameter (fixed installation) Min. 10 × outer diameter (cable carrier)	
Cable diameter	15.6 mm ± 0.5 mm	16.7 mm ± 0.5 mm
Chemical properties	• Oil resistance according to DIN VDE 0282-10/ HD 22.10 S2 • General fuel resistance (e.g. diesel, gasoline) • Flame retardant according to UL 1581 section 1060 Vertical Flame Test (FT1) • Flame retardant according to CSA C22.2 No.3-92 Vertical Flame Test (FT1) • Flame retardant according to IEC 60332-1-2 • Halogen-free according to IEC 60754-1 • General resistance to acids, alkalis, and cleaning agents • Generally hydrolysis-resistant • General resistance against UV radiation • Free of paint-wetting impairment substances	

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Notes on connection

The following figure shows the cable design and use of connections:



19800410891

[1] Connection for supply system/PE
[2] STO connection
[3] CAN_H/CAN_L connection
[4] CAN_GND connection via drain wire

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13.16 Mounting positions

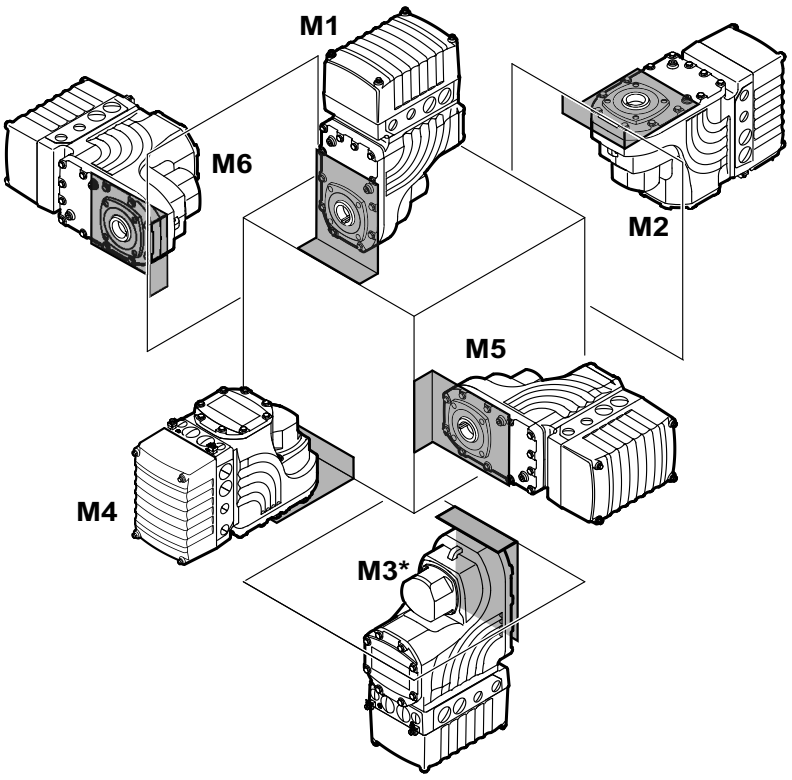
13.16.1 Description of mounting positions

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, M4, M5, M6
- Universal mounting position MU (= M1 to M6) with "integrated pressure compensation /PG" option

Mounting positions M1 to M6

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

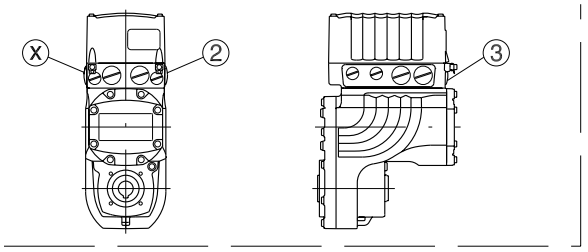


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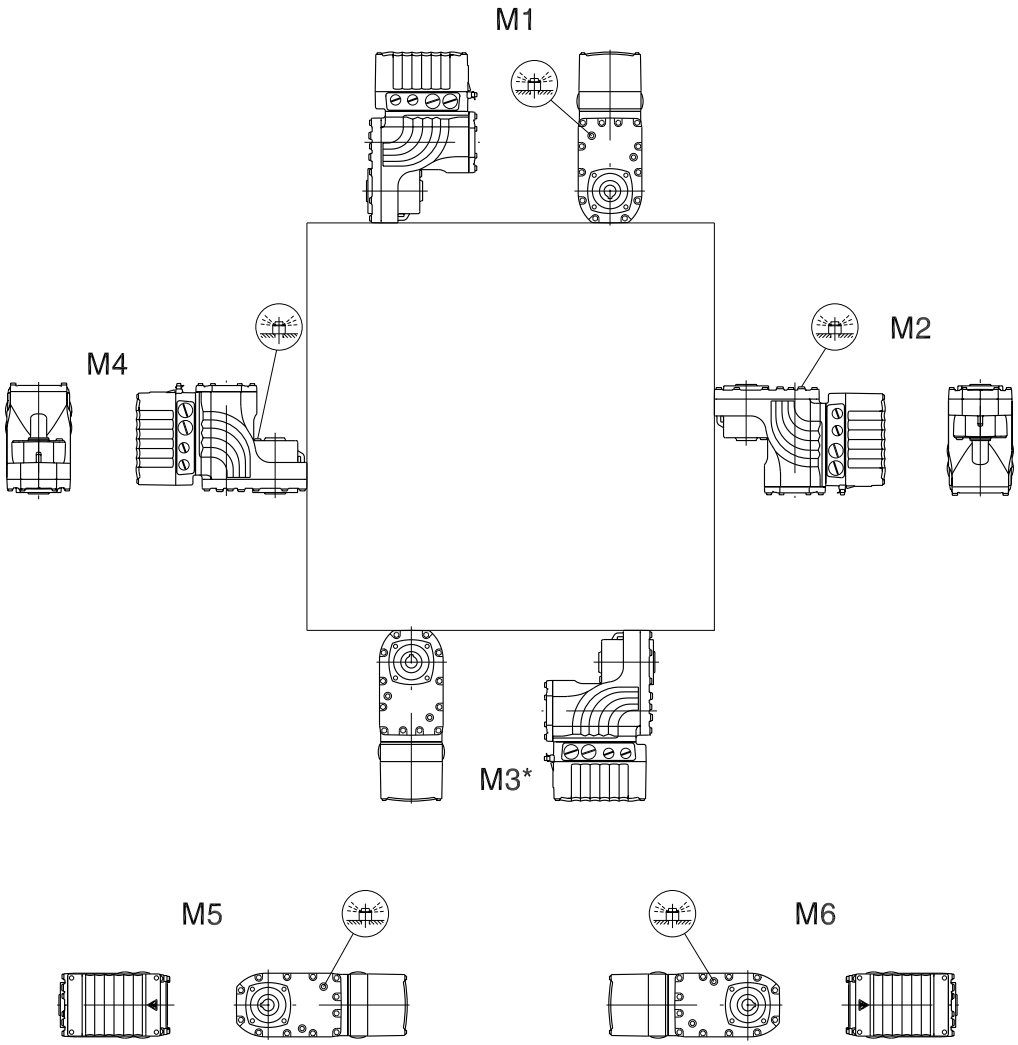
* = Mounting position M3 is only possible with the "integrated pressure compensation /PG" option.

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13.16.2 Mounting position sheet



03 022 01 09



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* = Mounting position M3 is only possible with "integrated pressure compensation /PG" option.

= Breather valve

13.17 Lubricants

13.17.1 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	**Fill quantities in liters**	**Gear ratio**	**Fill quantities in liters**
i	**for mounting positions M1, M2, M3**, M4, M5, M6**	**i**	**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	
4.22		4.34*	
3.37		3.53*	

* = Finite gear unit ratio

** = Mounting position M3 is only possible with the option "integrated pressure compensation /PG".

= Preferred gear ratio

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13.17.2 Rolling bearing greases

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

	Ambient temperature	Manufacturer	Type
Gear unit rolling bearings	-40 °C to +80 °C	Fuchs	Renolit CX-TOM 15[1)]
	-40 °C to +80 °C	Klüber	Petamo GHY 133 N
	-40 °C to +40 °C	Bremer & Leguil	Cassida Grease GTS 2

1) Bearing grease based on semi-synthetic base oil.

13.17.3 Lubricant table



NOTICE

Selecting improper lubricants may damage the gear unit.

Possible damage to property.

- Observe the following information.

Notes

- The oil viscosity and type (synthetic) that are to be used are determined by SEW-EURODRIVE specifically for each order. This information is noted in the order confirmation and on the gear unit's nameplate.

  If you use other lubricants for the gear units and/or use the lubricants at temperatures outside the recommended temperature range, SEW-EURODRIVE does not assume liability.

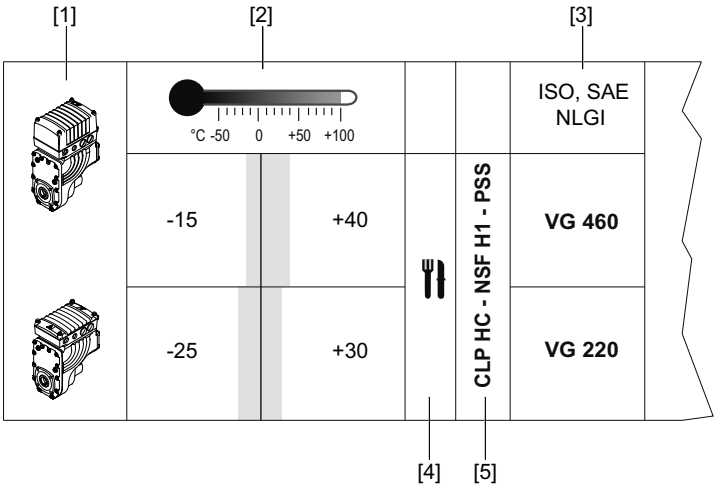
  The lubricant recommendation in the lubricant table in no way represents a guarantee regarding the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of their product.
- Do not mix synthetic lubricants.
- Do not mix synthetic and mineral lubricants.
- Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimally and maximally permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.
- The values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants is subject to dynamic change on the part of the lubricant manufacturers. For up-to-date information about the lubricants, visit:

  www.sew-eurodrive.de/lubricants

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Information on the table structure

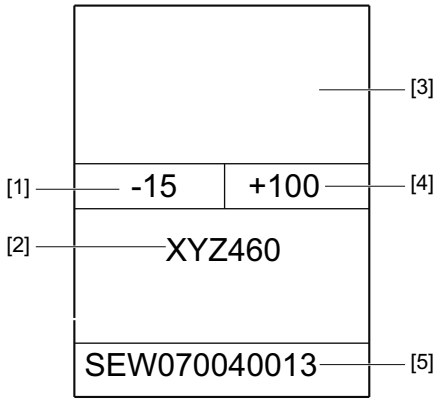
The specified **ambient temperatures** are **guide values for the preselection** of a suitable lubricant. The exact upper and lower temperature limits for project planning are specified in the table with the respective trade name.



22296347915

[1] Device type
[2] Ambient temperature range
[3] Viscosity class
[4] Note on special approvals
[5] Lubricant type

Explanations of the various lubricants



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[1] Lowest oil sump temperature in °C,
may not be undershot in operation
[2] Trade name
[3] Manufacturer
[4] Highest oil sump temperature in °C[1)]
[5] Approvals regarding compatibility of the lubricant with approved oil seals

1) Service life is significantly reduced when exceeded. The lubricant change intervals in chapter "Inspection and maintenance" must be observed.

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Lubricant compatibility with oil seal

Approval	Explanation
SEW07004_ _13:	A lubricant especially recommended with regard to compatibility with the approved oil seal. The lubricant exceeds the state-of-the-art requirements concerning elastomer compatibility.

Approved application temperature range of the oil seals

Oil seal material class	Permitted oil sump temperature
FKM	-25 °C to +115 °C
FKM-PSS	-25 °C to +115 °C

Limitations of use of oil seals with the specific lubricant are described in the following table:

Material class			Manufacturer		Material		Approved oil sump temperature
S	2	FKM	1	Freudenberg	1	75 FKM 585	-25 °C to +115 °C
					2	75 FKM 170055	
			2	Trelleborg	1	VCBVR	

Examples:

S2: Only the elastomer FKM meets the requirements of the approval in conjunction with the specific lubricant.

Key to the lubricant tables

The following table shows the abbreviations and symbols used in the lubricant table and explains what they mean:

Abbreviation/ symbol	Meaning
	Synthetic lubricant (marked gray)
CLP HC	Synthetic hydrocarbons – polyalphaolefin (PAO)
	Lubricant for the food processing industry – NSF-H1-compliant
Oil seal	Oil seal
PSS	"Premium Sine Seal" oil seal. The addendum "PSS" for the lubricant type indicates compatibility with the sealing system.

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Lubricant table

The lubricant table is valid as of the time of printing of this document. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limits of the oil seal materials, see chapter "Lubricant compatibility with oil seals".

	[1]	[2]	[3]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	TOTAL
MGF..	[4] -25		CLP HC	VG 220			-30 | +110 Optigear Synthetic PD 220	-25 | +110 Renolin Unisyn CLP 220	-25 | +110 Mobil SHC 630	-25 | +110 Klübersynth GEM 4-220 N	-25 | +110 Shell Omala S4 GX 220	-25 | +110 Carter SH 220
	-30			VG 150			-30 | +100 Optigear Synthetic PD 150	-30 | +95 Renolin Unisyn CLP 150	-30 | +100 Mobil SHC 629	-30 | +100 Klübersynth GEM 4-150 N	-30 | +100 Shell Omala S4 GX 150	-30 | +95 Carter SH 150
	[4] -25		CLP HC - PSS	VG 220					-25 | +110 Mobil SHC 630			
	-30			VG 150					-30 | +100 Mobil SHC 629			
MGF.. -DSM	[4] -15		CLP HC - NSF H1	VG 460		-15 | +100 Cassida Fluid GL 460	-15 | +100 Optileb GT 460	-15 | +100 Cassida Fluid GL 460		-15 | +105 Klüberoil 4UH1-460 N		
	-25			VG 220		-25 | +80 Cassida Fluid GL 220	-25 | +80 Optileb GT 220	-25 | +80 Cassida Fluid GL 220		-25 | +80 Klüberoil 4UH1-220 N		
	[4] -15		CLP HC - NSF H1 - PSS	VG 460			SEW070040313 -15 | +100 Optileb GT 460					
	-25			VG 220			SEW070040313 -25 | +80 Optileb GT 220					

	[1]	[2]	[3]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	TOTAL
MGF..	[4] -25		CLP HC	VG 220			-30 | +110 Optigear Synthetic PD 220	-25 | +110 Renolin Unisyn CLP 220	-25 | +110 Mobil SHC 630	-25 | +110 Klübersynth GEM 4-220 N	-25 | +110 Shell Omala S4 GX 220	-25 | +110 Carter SH 220
	-30			VG 150			-30 | +100 Optigear Synthetic PD 150	-30 | +95 Renolin Unisyn CLP 150	-30 | +100 Mobil SHC 629	-30 | +100 Klübersynth GEM 4-150 N	-30 | +100 Shell Omala S4 GX 150	-30 | +95 Carter SH 150
	[4] -25		CLP HC - PSS	VG 220					-25 | +110 Mobil SHC 630			
	-30			VG 150					-30 | +100 Mobil SHC 629			
MGF.. -DSM	[4] -15		CLP HC - NSF H1	VG 460		-15 | +100 Cassida Fluid GL 460	-15 | +100 Optileb GT 460	-15 | +100 Cassida Fluid GL 460		-15 | +105 Klüberoil 4UH1-460 N		
	-25			VG 220		-25 | +80 Cassida Fluid GL 220	-25 | +80 Optileb GT 220	-25 | +80 Cassida Fluid GL 220		-25 | +80 Klüberoil 4UH1-220 N		
	[4] -15		CLP HC - NSF H1 - PSS	VG 460			SEW070040313 -15 | +100 Optileb GT 460					
	-25			VG 220			SEW070040313 -25 | +80 Optileb GT 220					

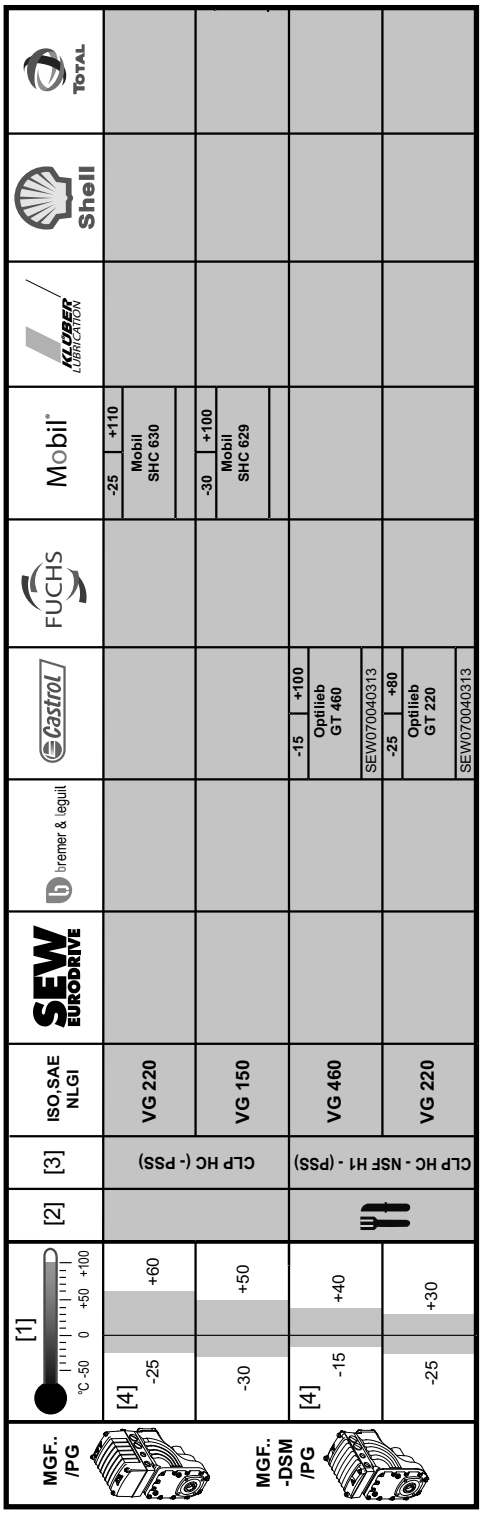
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[1] Ambient temperature range
[2] Note on special approvals
[3] Oil type
[4] Standard

Lubricant table for drive units with /PG option

The lubricant table is valid as of the time of printing of this document. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal limits of the oil seal materials, see chapter "Lubricant compatibility with oil seals".



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[1] Ambient temperature range
[2] Note on special approvals
[3] Oil type
[4] Standard

13.18 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 makes disassembly at a later time easier.

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

13.18.1 Installation

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

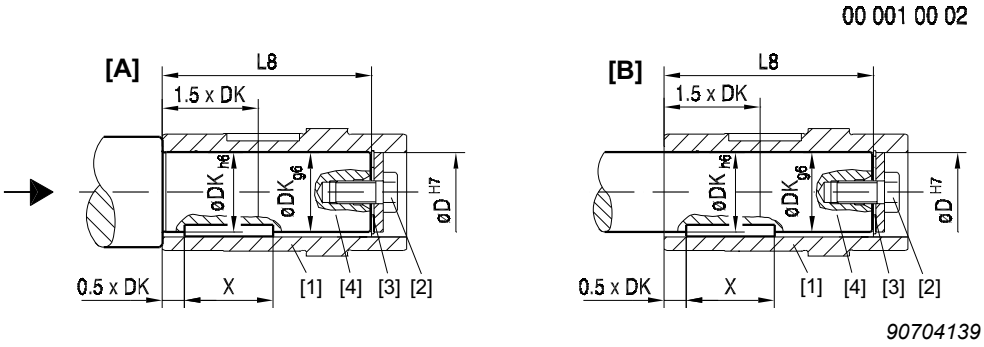
1. Use the provided fastening parts for installation.
2. Use the optional installation/removal kit for installation.

13.18.2 1. Supplied fastening parts

The following fastening parts are provided as standard:

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

Customer shaft



[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.

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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]	Key type	DK [mm]	L8 [mm]	MS [Nm]
MGFA.2	25	DIN 6885-1 (domed type)	25	100	20
	30		30	101	20
	35		35	97.9	20
	40	DIN 6885-3 (low type)	40	101.85	40
MGFA.4	30	DIN 6885-1 (domed type)	30	124	20
	35		35	123.5	20
	40		40	123	40

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13.18.3 2. Installation/removal kit

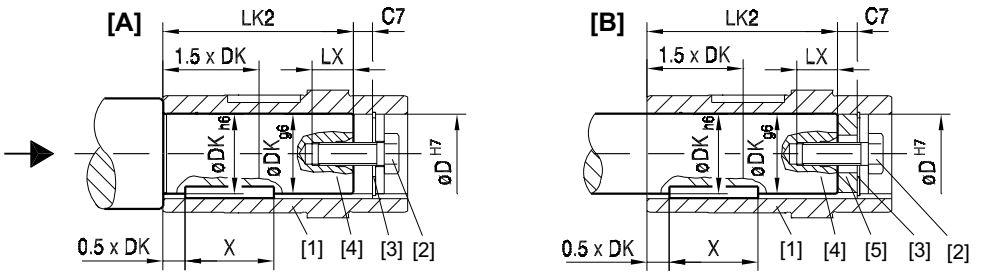
You can use the optional assembly/disassembly kit for mounting. You can order the kit for the specific size by quoting the part numbers in the table below. The scope of delivery includes:

- Spacer tube for installation without contact shoulder [5]
- Retaining screw for assembly [2]
- Forcing washer for disassembly [7]
- Fixed nut for disassembly [8]

The short retaining screw delivered as standard is not required. It is mandatory that you use the retaining screw [2] of the assembly/disassembly kit.

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 tube** if the customer shaft **has a contact shoulder [A]**.
- The installation length of the customer shaft must be LK2. **Use the spacer tube if the customer shaft has no contact shoulder [B]**.

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Dimensions, tightening torques and part numbers

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

Type	D^{H7} [mm]	Key type	DK [mm]	LK2 [mm]	LX^{+2} [mm]	C7 [mm]	MS [Nm]	Part number of the assembly/disassembly kit
MGFA.2	25	DIN 6885-1 (domed type)	25	83.5	22	16	20	06436846
	30		30	84.5	22	16	20	06436854
	35		35	80	28	17.9	20	06436862
	40	DIN 6885-3 (low type)[1]	40	89	36	12.85	40	-[1]
MGFA.4	30	DIN 6885-1 (domed type)	30	107.3	22	16	20	06436854
	35		35	105.5	28	18	20	06436862
	40		40	105.5	36	18	40	06436870

1) Not in conjunction with the assembly/disassembly kit of SEW-EURODRIVE.

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13.19 Dimension drawings

13.19.1 Dimension sheet notes

Scope of delivery



= Standard parts supplied by SEW-EURODRIVE.



= Standard parts not supplied by SEW-EURODRIVE.

Tolerances

Shaft ends

Diameter tolerance:

Ø	≤ 50 mm	→ ISO k6
Ø	> 50 mm	→ ISO m6

Center holes according to DIN 332, shape DR:

Ø	= 7 to 10 mm	→ M3
Ø	> 10...13 mm	→ M4
Ø	> 13 to 16 mm	→ M5
Ø	> 16 to 21 mm	→ M6
Ø	> 21 to 24 mm	→ M8
Ø	> 24 to 30 mm	→ M10
Ø	> 30 to 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

Breather valves and cable glands

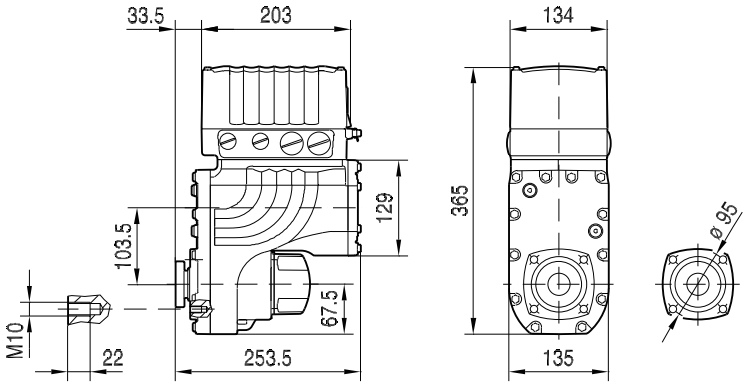
The dimension drawings always show the screw plugs. The contour dimensions may vary slightly due to preinstalled breather valves, plug connectors or pressure compensation fittings (in conjunction with the design for wet areas MOVIGEAR®).

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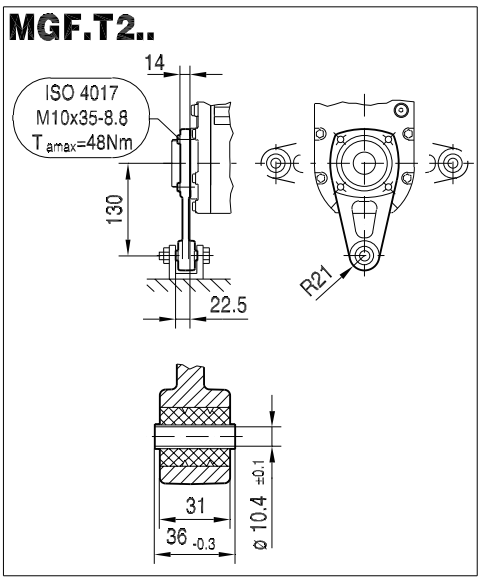
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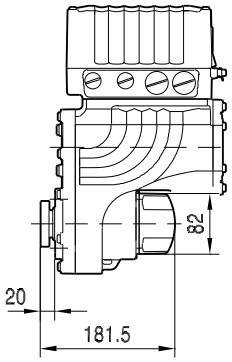
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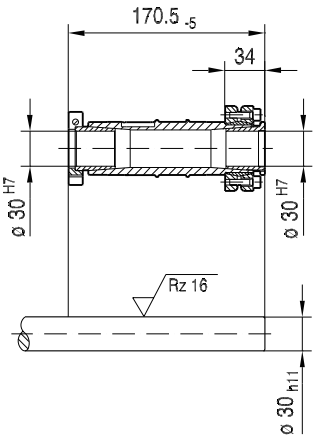
MGFTS2..-B

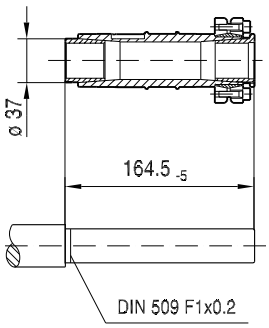


MGF.T2..



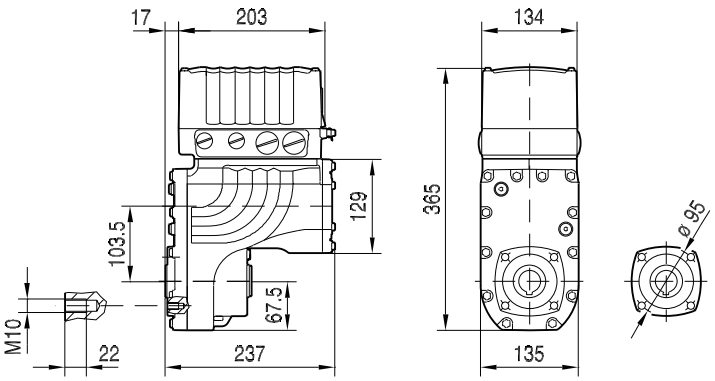




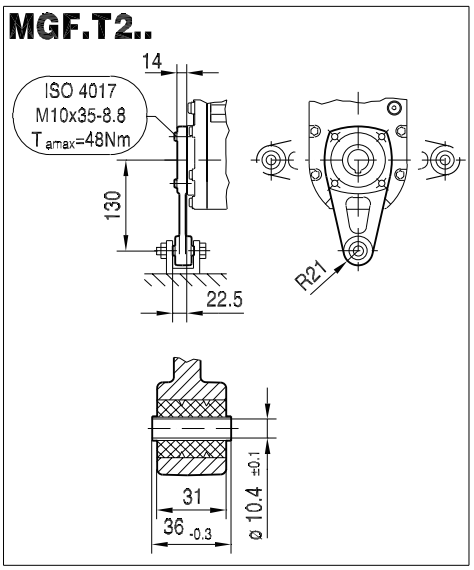


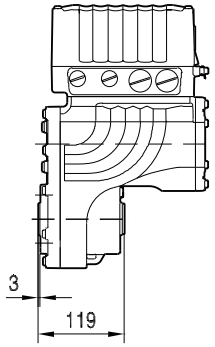
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MGFAS2..-B

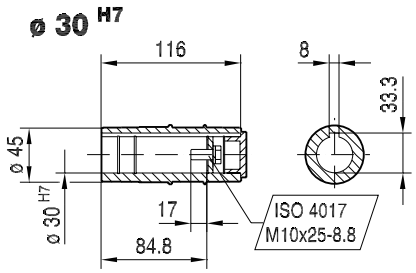


MGF.T2..

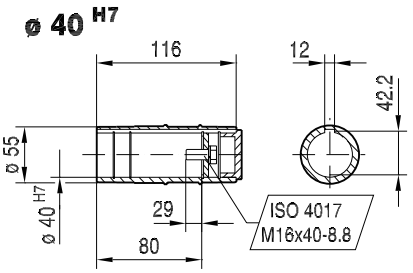




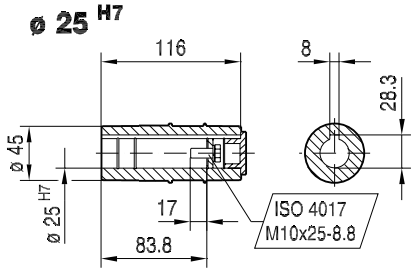
ø 30 H7



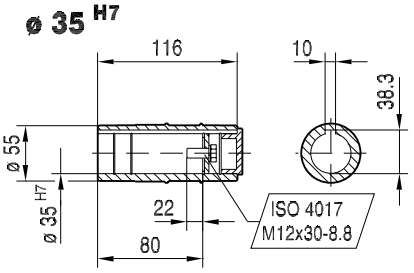
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ø 25 H7



ø 35 H7

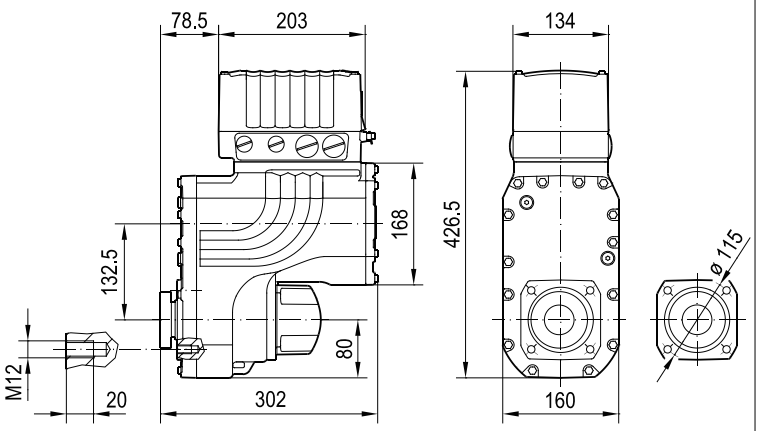


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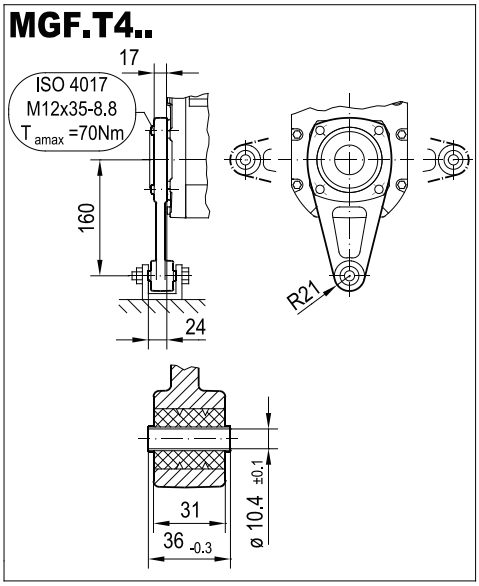
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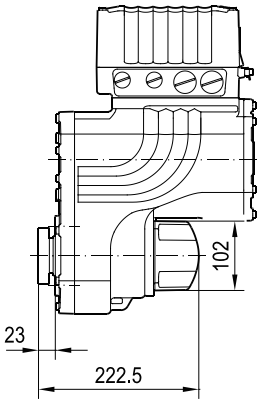
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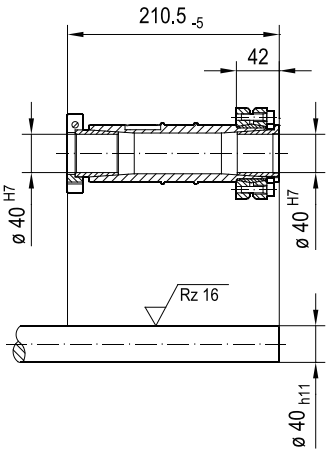
MGFTS4..-B

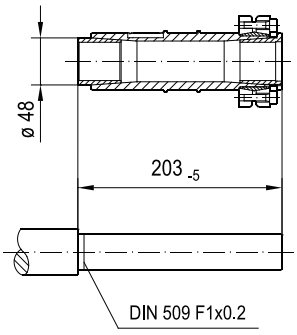


MGF.T4..





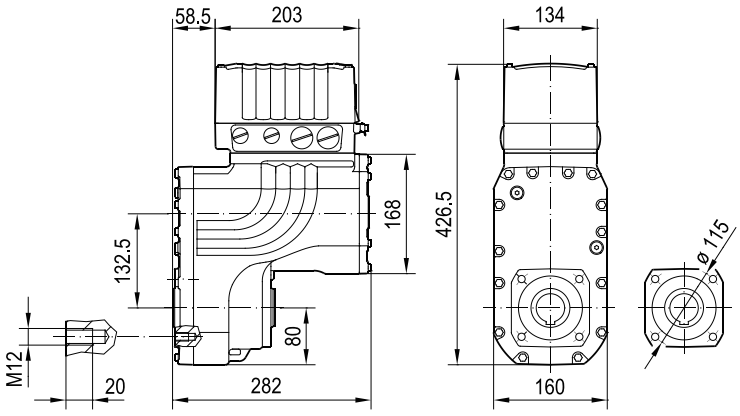




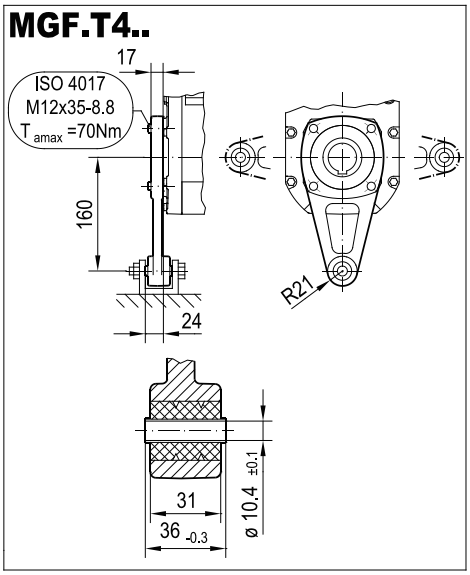
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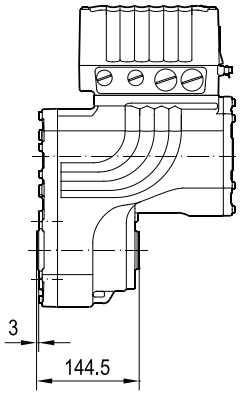
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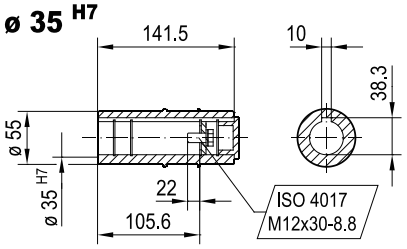


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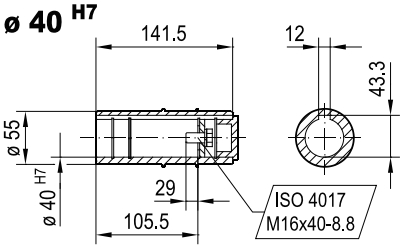




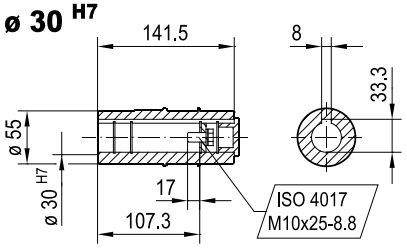
ø 35 H7



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ø 30 H7

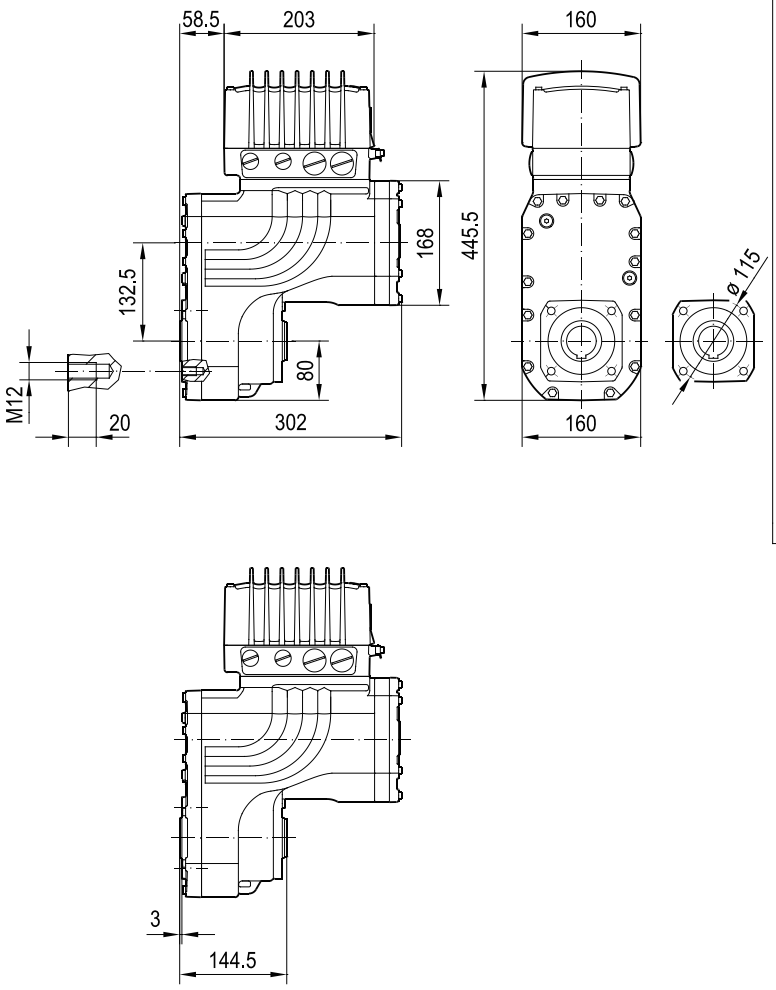


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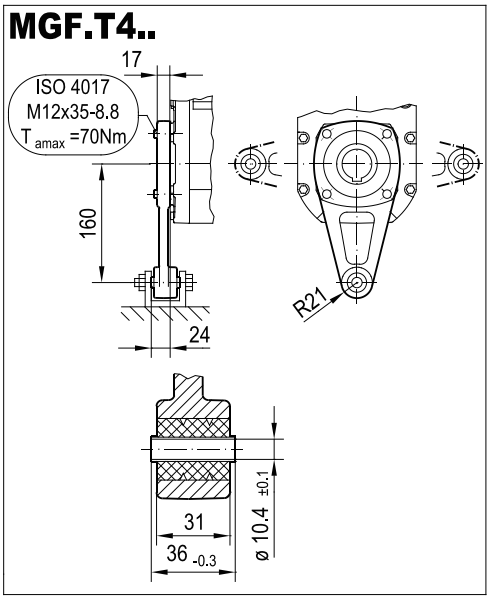
13.19.4 MGF..4../XT with increased torque

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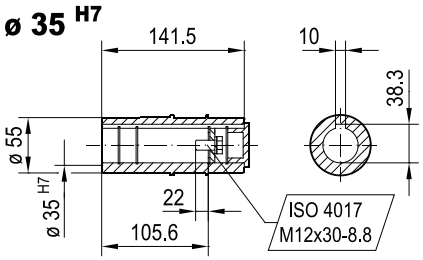
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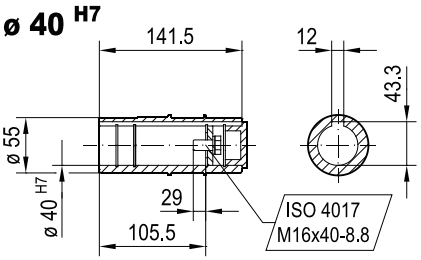
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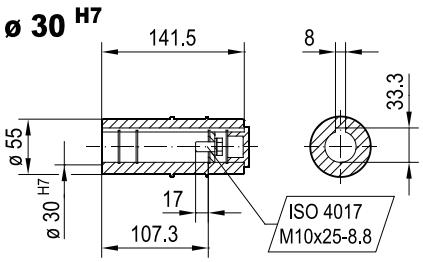
ø 35 H7



ø 40 H7

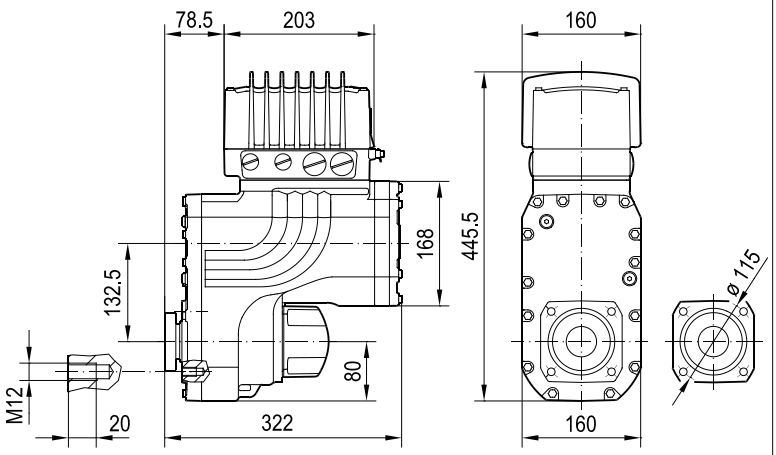


ø 30 H7

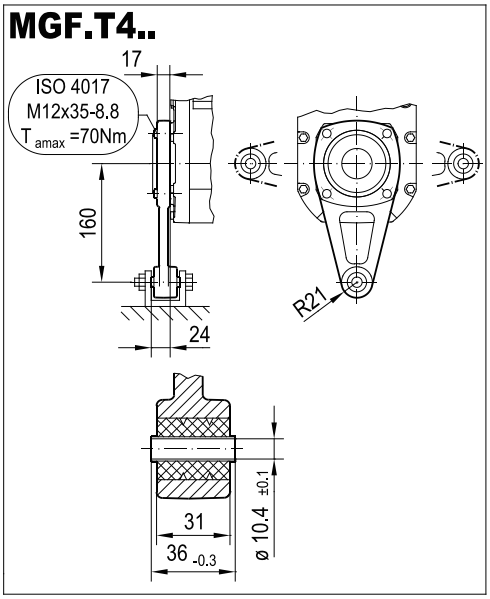


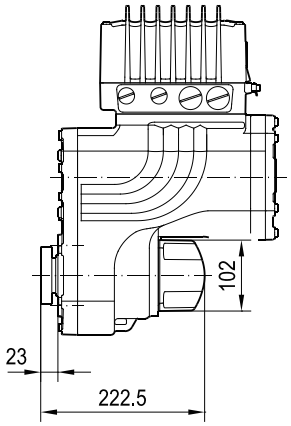
03 012 01 17

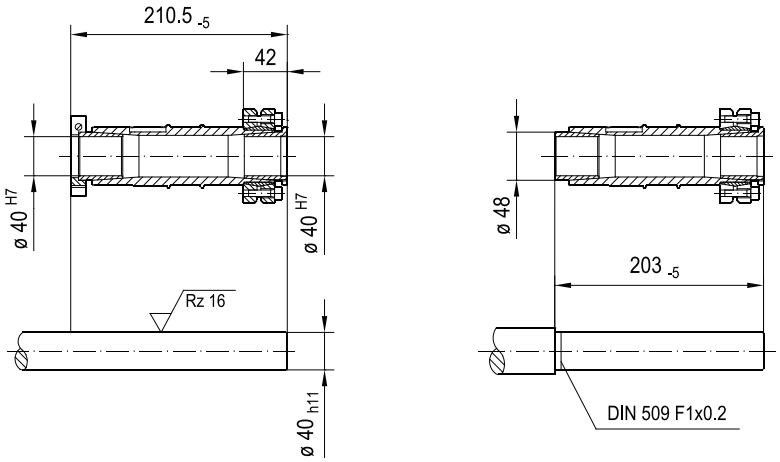
MGFTS4..-B/XT



MGF.T4..





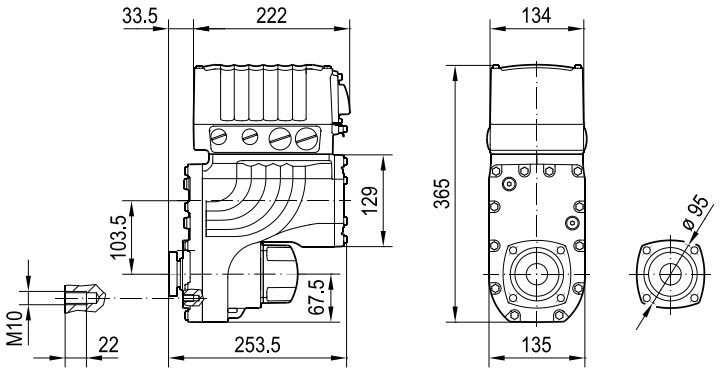


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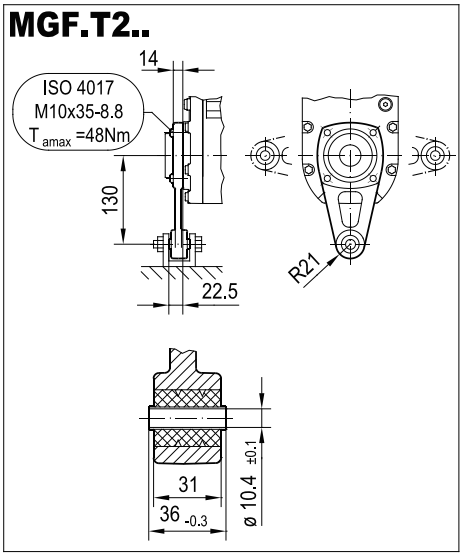
13.19.5 MGF..2 with application option

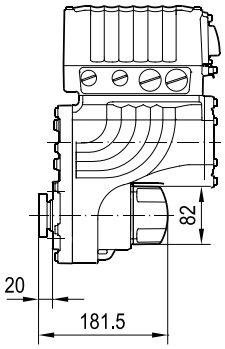
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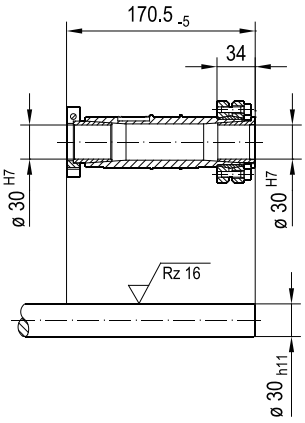
MGFTS2..-B

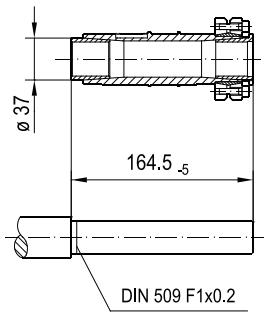


MGF.T2..





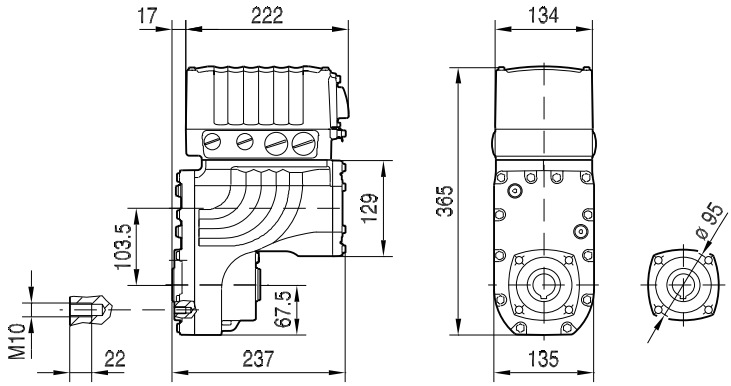




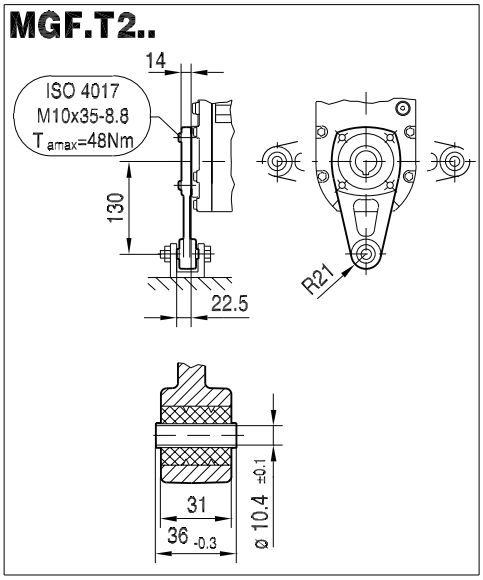
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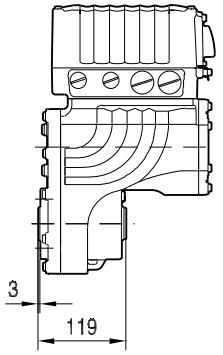
03 014 02 10

MGFAS2..-B

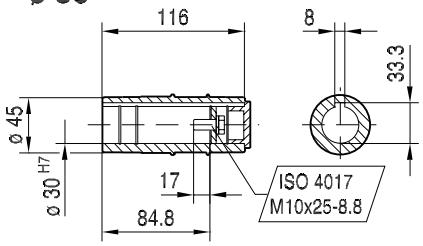


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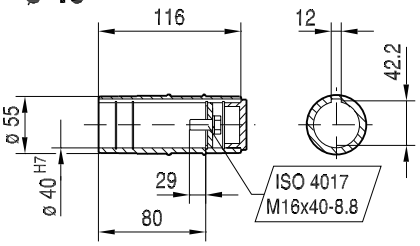




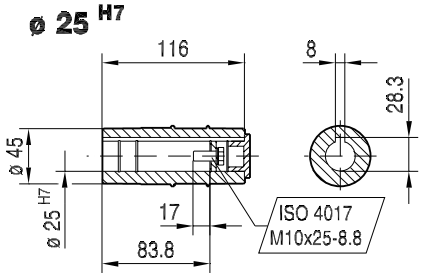
ø 30 H7



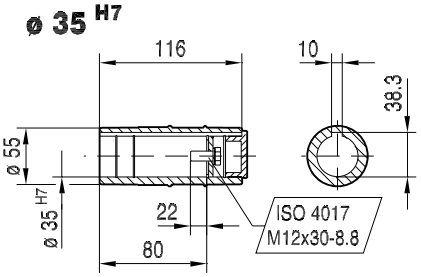
ø 40 H7



ø 25 H7



ø 35 H7

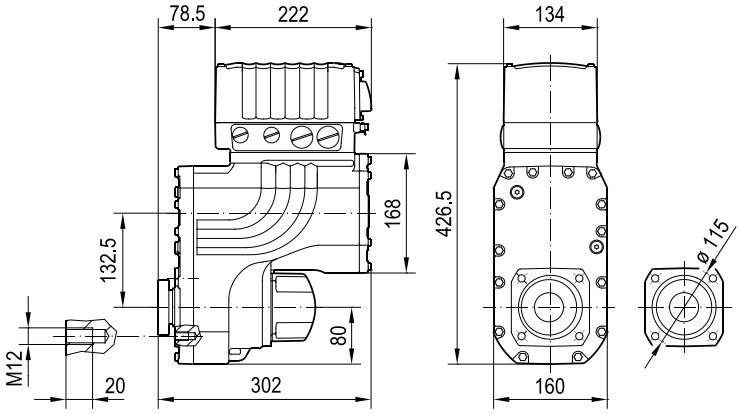


27798801/EN – 11/2022

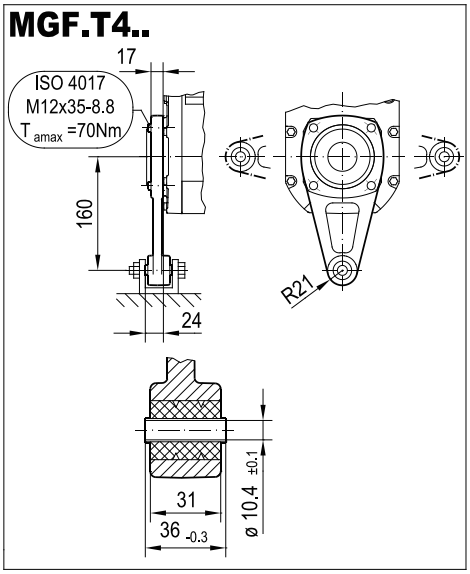
13.19.6 MGF..4 with application option

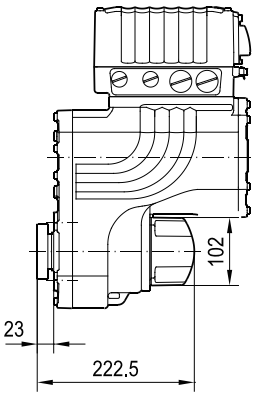
03 008 01 17

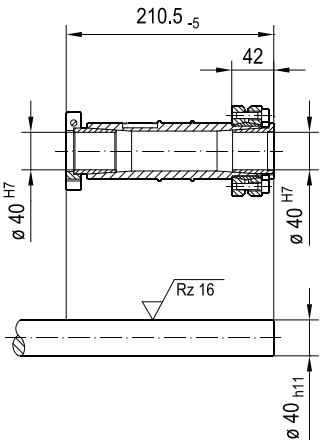
MGFTS4..-B

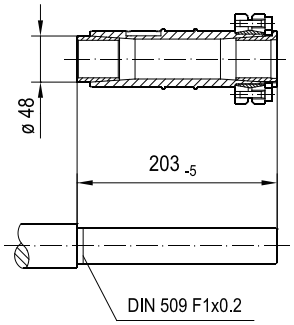


MGF.T4..





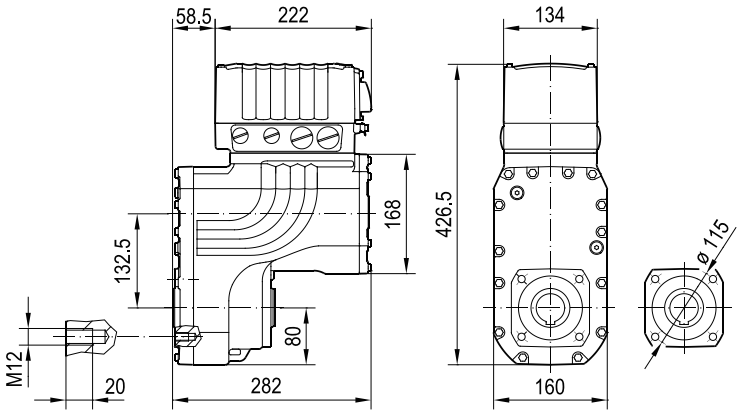




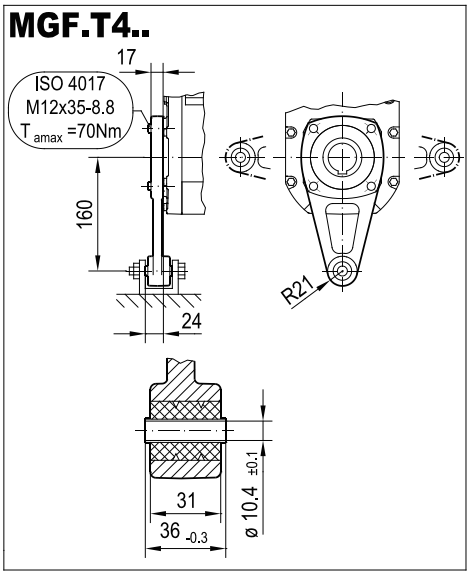
27798801/EN – 11/2022

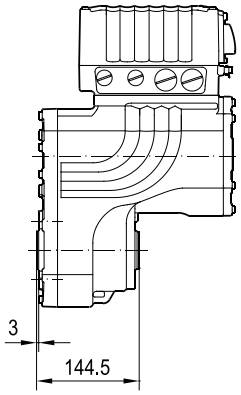
03 015 03 10

MGFAS4..-B

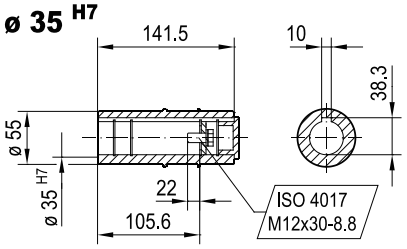


MGF.T4..

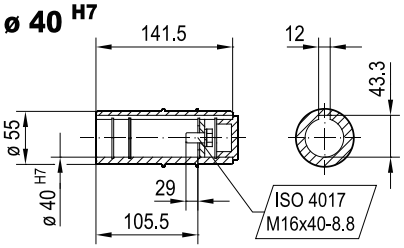




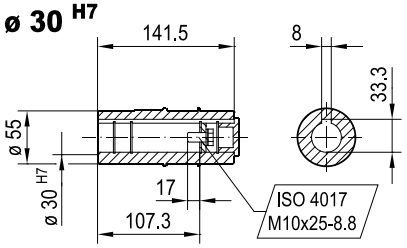
ø 35 H7



ø 40 H7



ø 30 H7

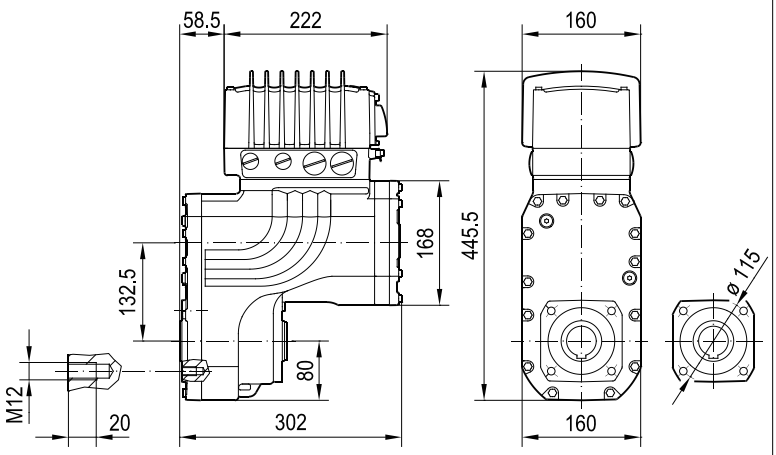


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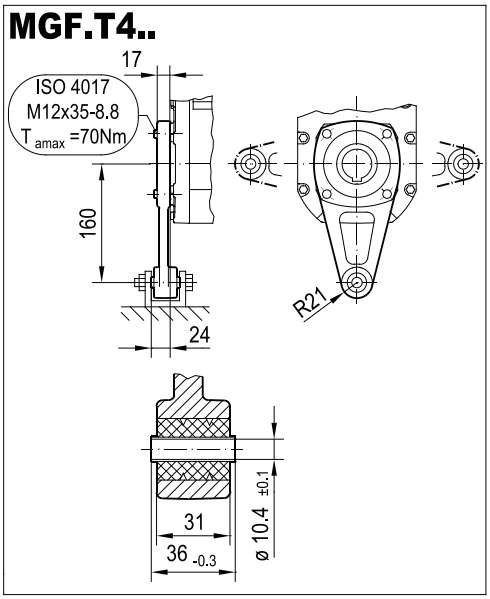
13.19.7 MGF..4../XT with increased torque and application option

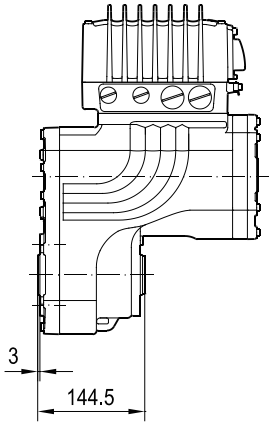
03 006 03 11

MGFAS4..-B/XT

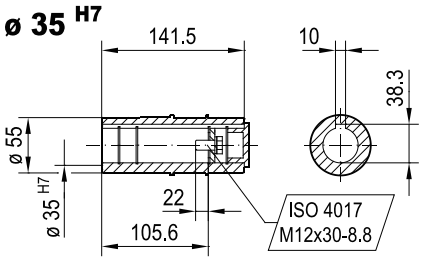


MGF.T4..

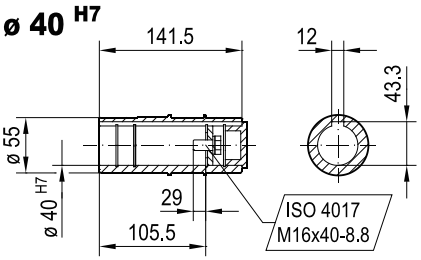




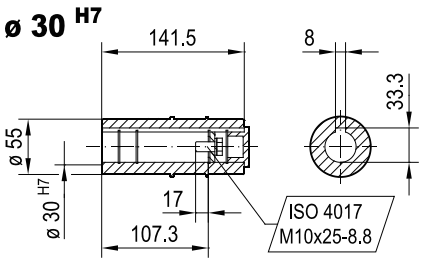
ø 35 H7



ø 40 H7



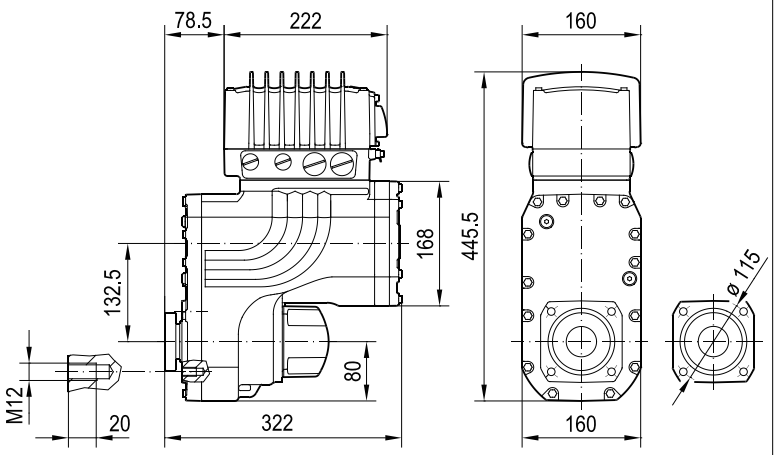
ø 30 H7



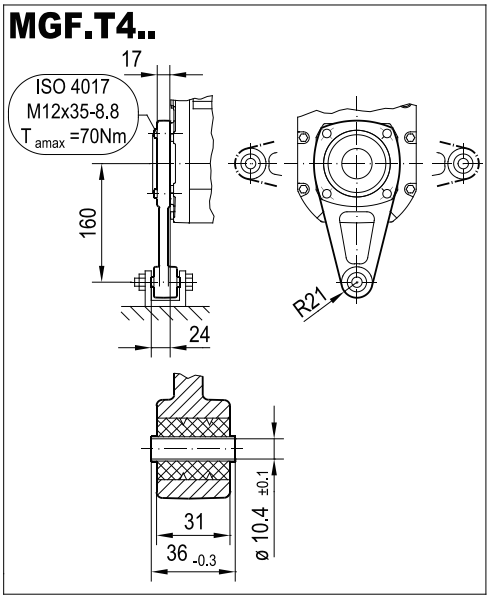
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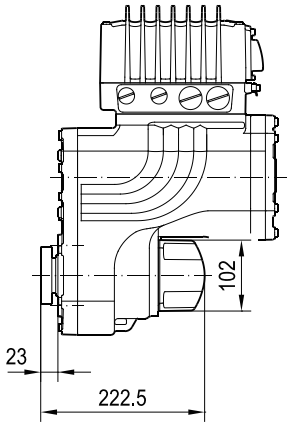
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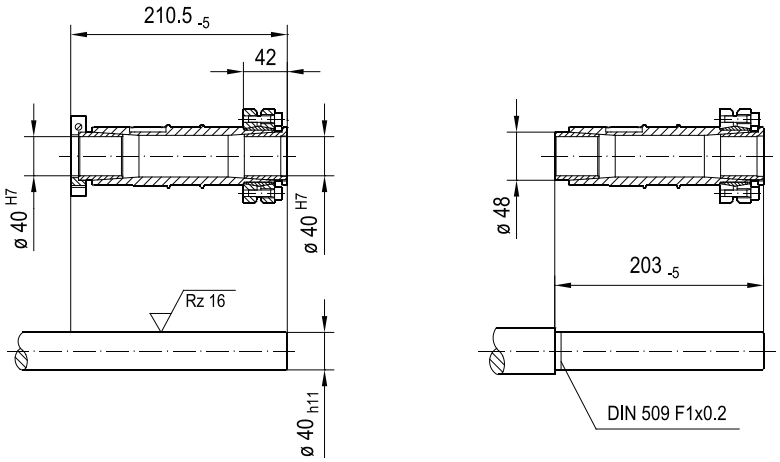
MGFTS4..-B/XT



MGF.T4..





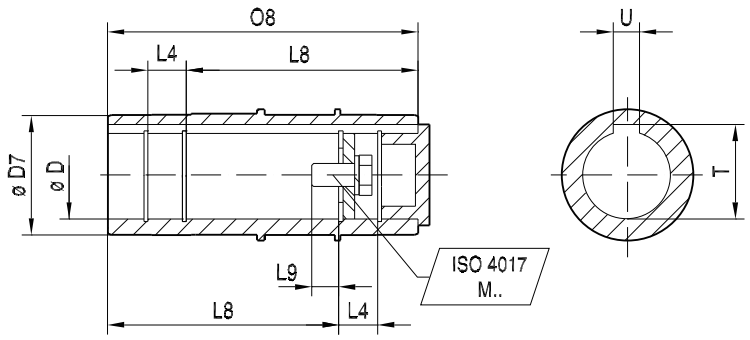


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13.19.8 Shaft designs

MGFAS..B [mm]

03 003 01 16

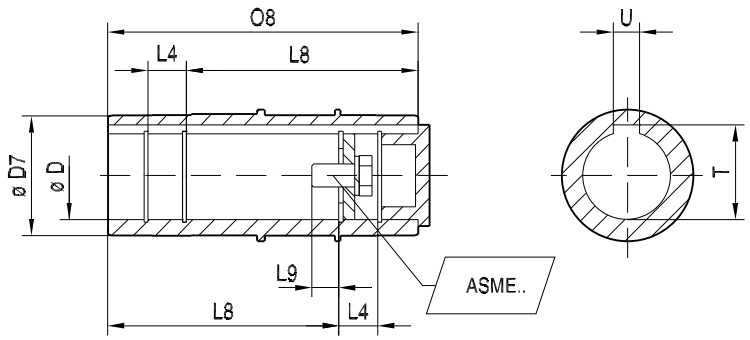


	ø D H7	ø D7	L4	L8	L9	O8	T	U	ISO 4017
MGFAS2..B	25	45	16.2	83.8	17	116	28.3	8	M10 × 25-8.8
MGFAS2..B	30	45	16.2	84.8	17	116	33.3	8	M10 × 25-8.8
MGFAS2..B	35	55	17.9	80	22	116	38.3	10	M12x30-8.8
MGFAS2..B	40	55	12.85	89	29	116	42.2	12	M16x40-8.8
	ø D H7	**ø D7**	**L4**	**L8**	**L9**	**O8**	**T**	**U**	**ISO 4017**
MGFAS4..B	30	55	16.2	107.3	17	141.5	33.3	8	M10 × 25-8.8
MGFAS4..B	35	55	17.9	105.6	22	141.5	38.3	10	M12x30-8.8
MGFAS4..B	40	55	17.65	105.5	29	141.5	43.3	12	M16x40-8.8

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MGFAS..B [inch]

03 004 00 16

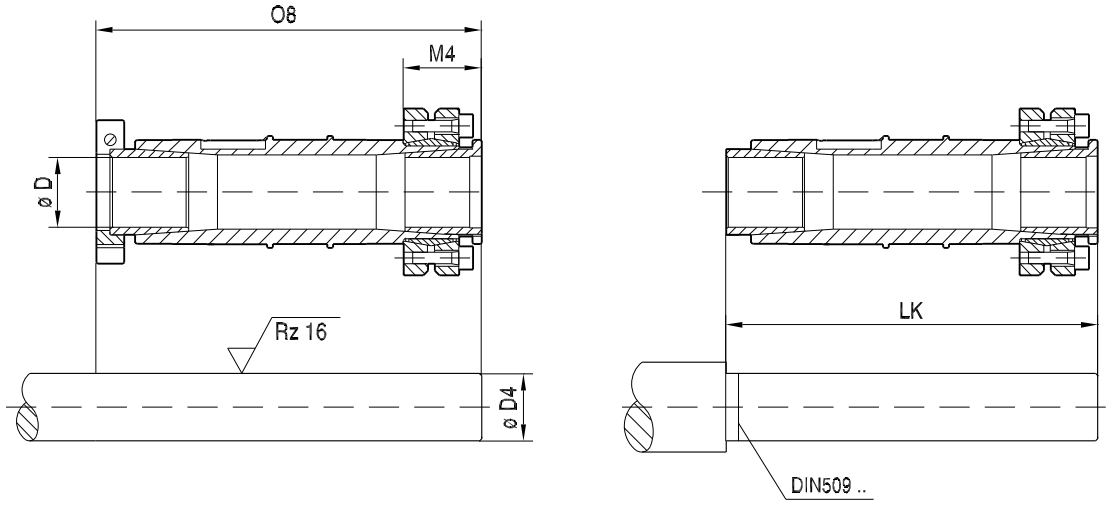


	ø D H7	ø D7	L4	L8	L9	O8	T	U	ASME
MGFAS2..B	1.000	1.772	0.638	3.299	0.69	4.567	1.122	0.250	3/8-16x1.00
MGFAS2..B	1.250	1.772	0.638	3.339	0.68	4.567	1.374	0.250	7/16-14x1.00
	ø D H7	**ø D7**	**L4**	**L8**	**L9**	**O8**	**T**	**U**	**ASME**
MGFAS4..B	1.250	2.165	0.717	4.146	0.68	5.571	1.374	0.250	7/16-14x1.00
MGFAS4..B	1.437	2.165	0.705	4.154	1.40	5.571	1.610	0.375	5/8-11x1.75
MGFAS4..B	1.500	2.165	0.705	4.154	1.40	5.571	1.669	0.375	5/8-11x1.75

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MGFTS..B [mm]

03 005 00 16

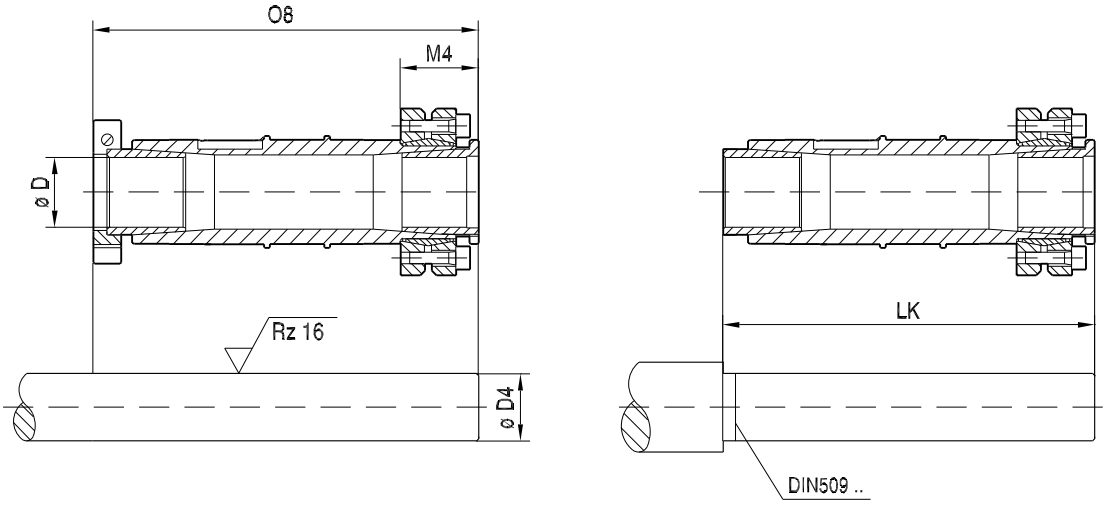


	ø D4 $_{h11}$	ø D $^{+0.1}$	M4	O8 $_{-5}$	LK $_{-5}$	DIN 509
MGFTS2..B	25	25.1	33	170.5	164.5	F1 × 0.2
MGFTS2..B	30	30.26	33	170.5	164.5	F1 × 0.2
	ø D4 $_{h11}$	**ø D $^{+0.1}$**	**M4**	**O8 $_{-5}$**	**LK $_{-5}$**	**DIN 509**
MGFTS4..B	35	35.03	44	210.5	203	F1 × 0.2
MGFTS4..B	40	40.1	44	210.5	203	F1 × 0.2

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MGFTS..B [inch]

03 006 00 16



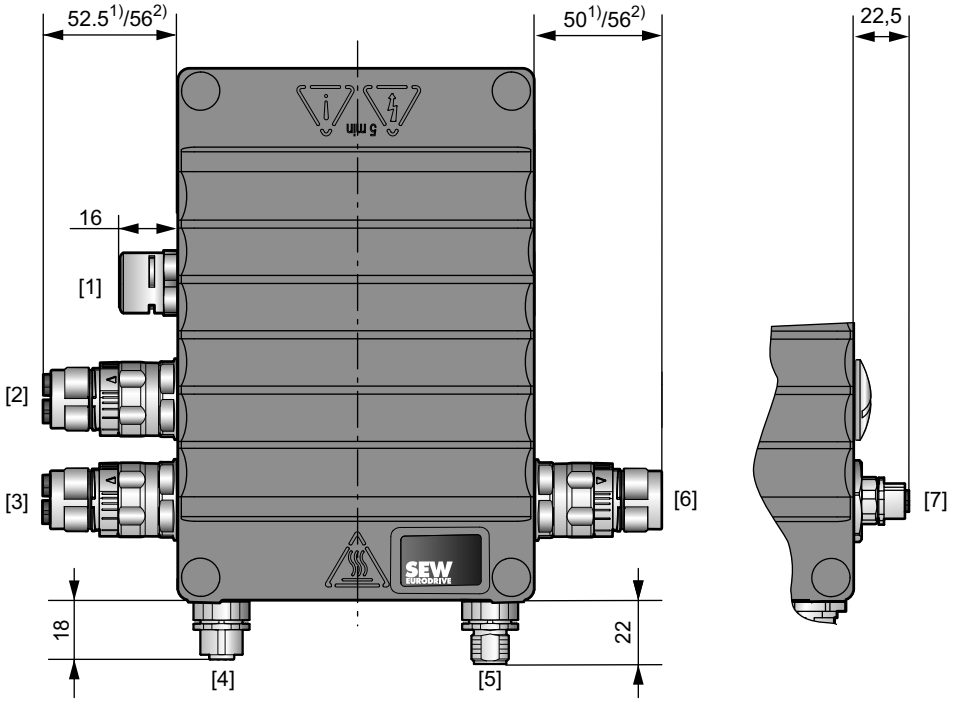
	ø D4 $_{h11}$	ø D $^{+0,004}$	M4	O8 $_{-0,197}$	LK $_{-0,197}$	DIN 509
MGFTS2..B	1.000	1.004	1.299	6.713	6.476	F1 × 0.2
MGFTS2..B	1.1875	1.191	1.299	6.713	6.476	F1 × 0.2
MGFTS2..B	1.250	1.254	1.299	6.713	6.476	F1 × 0.2
	ø D4 $_{h11}$	**ø D $^{+0,004}$**	**M4**	**O8 $_{-0,197}$**	**LK $_{-0,197}$**	**DIN 509**
MGFTS4..B	1.250	1.250	1.732	8.287	7.992	F1 × 0.2
MGFTS4..B	1.375	1.379	1.732	8.287	7.992	F1 × 0.2
MGFTS4..B	1.4375	1.441	1.732	8.287	7.992	F1 × 0.2
MGFTS4..B	1.500	1.504	1.732	8.287	7.992	F1 × 0.2
MGFTS4..B	1.625	1.629	1.732	8.287	7.992	F1 × 0.2

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13.19.9 Plug connectors

INFORMATION

- The following figure shows an example of the additional dimensions of the optional plug connectors for a possible plug connector configuration.
- For more information, refer to chapter "Plug connector positions".



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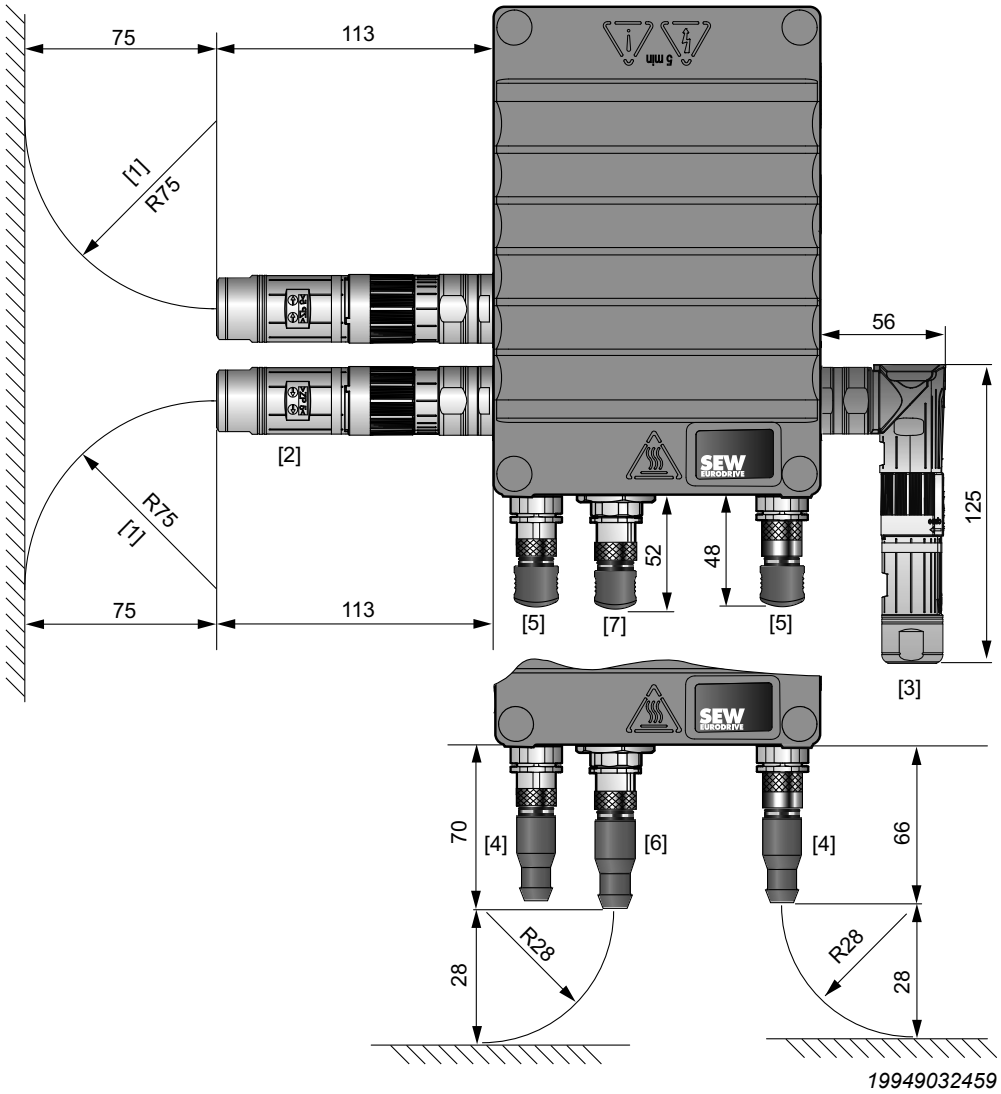
1) "Straight" plug connector variant
2) "Right-angle" plug connector variant
[1] Pressure compensation fitting in connection with the optional design for use in wet areas (MOVIGEAR®)/ASEPTIC variant (DRC..).
[2] X1241_2: AC 400 V connection with SNI
[3] X1241_1: AC 400 V connection with SNI
[4] X5502: STO – IN
[5] X5503: STO – OUT
[6] X5131: Digital inputs/outputs
[7] X5133: Digital inputs/outputs

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13.19.10 Plug connectors with mating connector

INFORMATION

- 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.
- For more information, refer to chapter "Plug connector positions".



[1] Bending radius
[2] "Straight" plug connector variant M23
[3] "Right-angle" plug connector variant M23
[4] "Straight" plug connector variant M12
[5] "Right-angle" plug connector variant M12
[6] "Straight" plug connector variant M12 (with adapter M23 to M12)
[7] "Right-angle" plug connector variant M12 (with adapter M23 to M12)

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14 Address list

Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
Austria			
Assembly Sales Service	Vienna	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Straße 24 1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
Bangladesh			
Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
Belarus			
Sales	Minsk	Foreign unitary production enterprise SEW-EURODRIVE Novodvorskij village council 145 223016, Minsk region	Tel. +375 17 319 47 56 / +375 17 378 47 58 Fax +375 17 378 47 54 http://www.sew-eurodrive.by sew@sew-eurodrive.by
Belgium			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue du Parc Industriel, 31 6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be info@sew.be
Brazil			
Production Sales Service	São Paulo	SEW-EURODRIVE Brasil Ltda. Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49 Indaiatuba – 13347-510 – SP	Tel. +55 19 3835-8000 sew@sew.com.br
Assembly Sales Service	Rio Claro	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Jvl / Ind 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
Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

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Cameroon			
Sales	Douala	SEW-EURODRIVE SARLU Ancienne Route Bonabéri P.O. Box B.P 8674 Douala-Cameroun	Tel. +237 233 39 12 35 Fax +237 233 39 02 10 www.sew-eurodrive.ci/ info@sew-eurodrive.cm
Canada			
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. 2001 Ch. de l'Aviation Dorval Quebec H9P 2X6	Tel. +1 514 367-1124 Fax +1 514 367-3677 n.paradis@sew-eurodrive.ca
Chile			
Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMPA Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 http://www.sew-eurodrive.cn info@sew-eurodrive.cn
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
	Taiyuan	SEW-EURODRIVE (Taiyuan) Co,. Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@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
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

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Colombia			
Assembly Sales Service	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 17 No. 132-18 Interior 2 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Assembly Sales 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
Denmark			
Assembly Sales Service	Copenhagen	SEW-EURODRIVEA/S Geminivej 28-30 2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Service	Vejle	SEW-EURODRIVE A/S Bødkervej 2 7100 Vejle	Tel. +45 43 9585 00 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Technical Office	Cairo	SEW-EURODRIVE Representative Office in Egypt 47 Office Building, Section 1, City Centre, New Cairo Cairo	
Estonia			
Sales	Tallin	ALAS-KUUL AS Loomäe tee 1, Lehmja küla 75306 Rae vald Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee info@alas-kuul.ee
Finland			
Assembly Sales Service	Hollola	SEW-EURODRIVE OY Vesimäentie 4 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
	Tornio	SEW-EURODRIVE Oy Lossirannankatu 5 95420 Tornio	Tel. +358 201 589 300 Fax +358 3 780 6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
France			
Production Sales	Haguenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 http://www.usocome.com sew@usocome.com
Production	Forbach	SEW USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW USOCOME 1 Rue de Bruxelles 67670 Mommenheim Cedex	Tel. +33 3 88 37 48 00

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France			
Assembly Sales Service	Bordeaux	SEW USOCOME Parc d'activités de Magellan 62 avenue de Magellan – B. P. 182 33607 Pessac Cedex	Tel. +33 5 57 26 39 00 dtcbordeaux@usocome.com
	Haguenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 dtchaguenau@usocome.com
	Lyon	SEW USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 dtclyon@usocome.com
	Nantes	SEW USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 dtcnantes@usocome.com
	Paris	SEW USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 dtcparis@usocome.com
Gabon			
Representation: Cameroon			
Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production / Precision Gear Units	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Straße 12 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
	MAXOLU-TION® Factory Automation	SEW-EURODRIVE GmbH & Co KG Eisenbahnstraße 11 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 43 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909551-21 Fax +49 89 909551-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Melitta-Schiller-Straße 8 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Allerkai 4 28309 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de

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Germany			
	Hamburg	SEW-EURODRIVE GmbH & Co KG Hasselbinnen 11 22869 Schenefeld	Tel. +49 40298109-60 Fax +49 40298109-70 dc-hamburg@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyí út 13. 1037 Budapest	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 & Vélaverk ehf. Knarrarvogi 4 104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 https://vov.is/ vov@vov.is
India			
Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited 302, NOTUS IT PARK, Sarabhai Campus, Beside Notus Pride, Genda Circle, Vadodara 390023 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 https://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
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
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
	Tapukara	SEW-EURODRIVE India Private Limited Plot No SP-6-46, Tapukara, Karoli Industrial Area, No. 1, district : Alwar , Rajasthan - 301707	Tel. +91 265 3045200 Fax +91 265 3045300 tapukara.plant@seweurodriveindia.com
Sales Service	Gurgaon	SEW-EURODRIVE India Private Limited Drive Center Gurugram Plot no 395, Phase-IV, UdyogVihar Gurugram , 122016 Haryana	Tel. +91 99588 78855 salesgurgaon@seweurodriveindia.com

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Indonesia			
Sales	Medan	PT. Serumpun Indah Lestari Jl.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 http://www.serumpunindah.com
	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
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
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 http://www.alperton.ie info@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	Milan	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Bernini,12 20033 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 27 21 21 81 05 Fax +225 27 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.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 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Kazakhstan			
Sales Service	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.com kazakhstan@sew-eurodrive.com
	Tashkent	Representative Office SEW-EURODRIVE Representative office in Uzbekistan 95A Amir Temur ave, office 401/3 100084 Tashkent	Tel. +998 97 134 01 99 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn

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Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv 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
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 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
Representation: Belgium			
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
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
Mexico			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service Assembly	Bouskoura	SEW-EURODRIVE Morocco SARL Parc Industriel CFCIM, Lot. 55/59 27182 Bouskoura Grand Casablanca	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB MINING & INDUSTRIAL SUPPLIES CC Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com

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Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 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. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd 64C Toyin Street Opebi-Allen Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com sales@greenpegltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 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
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L Nu Guazu No. 642 casi Campo Esperanza Santisima Trinidad Asuncion	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU 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	Makati	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 http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

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Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 http://www.sialco.ro sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» 188660, Russia, Leningrad Region, Vse-volozhsky District, Korabselki, Aleksandra Nevskogo str. building 4, block 1 P.O. Box 36 195220 St. Petersburg	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
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 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 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. 9, Tuas Drive 2 Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel.+421 2 48 212 800 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 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 32 O'Connor Place Eurodrive House Aeroton Johannesburg 2190 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 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	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

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South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE Korea Co., Ltd. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE Korea Co., Ltd. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Assembly Service	Siheung	SEW-EURODRIVE Korea Co., Ltd. 35, Emtibeui 26-ro 58beon-gil, Siheung-si, Gyeonggi-do	http://www.sew-eurodrive.kr
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
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 Simunye street Matsapha, Manzini	Tel. +268 7602 0790 Fax +268 2 518 5033 charles@cgtrading.co.sz www.cgtradingswaziland.com
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	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 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
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
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

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Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRIVE Ana Merkez Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Ukraine			
Assembly Sales Service	Dnipropetrovsk	SEW-EURODRIVE, LLC Robochya str., bld. 23-B, office 409 49008 Dnipro	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
United Arab Emirates			
Drive Technology Center	Dubai	SEW-EURODRIVE FZE PO Box 263835 Jebel Ali Free Zone – South, P.O. Box Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 info@sew-eurodrive.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 21181-90 sewuy@sew-eurodrive.com.uy
USA			
Production 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 Production +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. 202 W. Danieldale Rd. DeSoto, TX 75115	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
	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385	Tel. +1 864 439-7537 Fax +1 864 661 1167 IGOrders@seweurodrive.com
		SEW-EURODRIVE INC. 220 Finch Rd. Wellford, S.C. 29385-9630	
	Additional addresses for service provided on request!		
Vietnam			
Sales	Ho Chi Minh City	SEW-EURODRIVE PTE. LTD. RO at Hochiminh City Floor 8, KV I, Loyal building, 151-151 Bis Vo Thi Sau street, ward 6, District 3, Ho Chi Minh City, Vietnam	Tel. +84 937 299 700 huytam.phan@sew-eurodrive.com
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn
Zambia			
Representation: South Africa			

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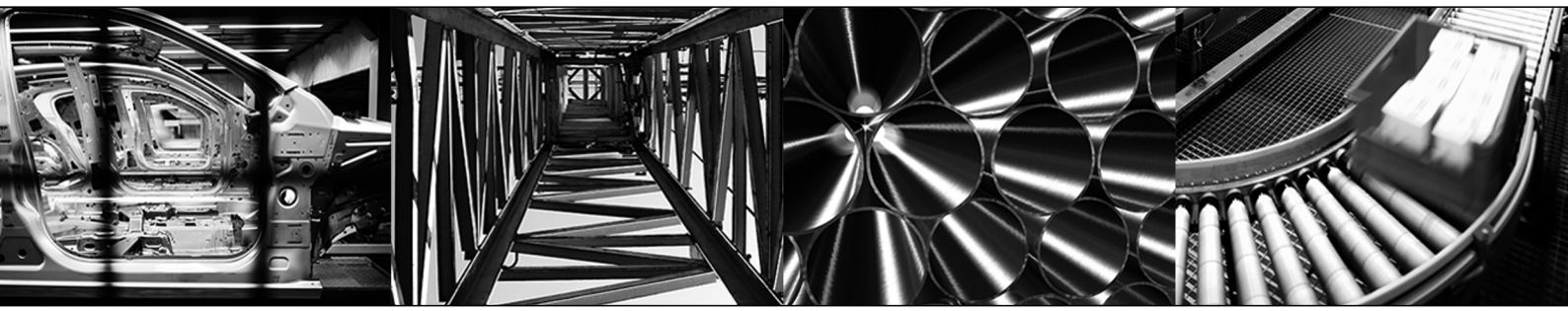
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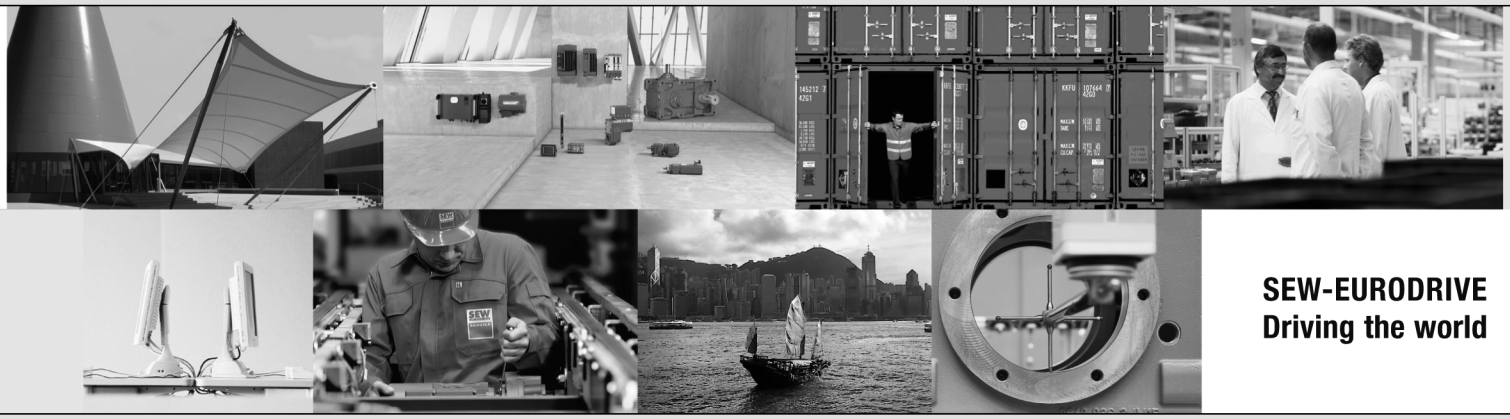
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SEW-EURODRIVE
Driving the world

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Str. 42
76646 BRUCHSAL
GERMANY
Tel. +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com
➞ **www.sew-eurodrive.com**