



SEW
EURODRIVE

Operating Instructions



Drive Unit
MOVIGEAR® classic
MGF..-DSM-C



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1 General information

1.1 About this documentation

The current version of the documentation 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 further 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.

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

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 Decimal separator in numerical values

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

1.5 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.

1.6 Product names and trademarks

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

1.7 Copyright notice

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2 MOVIGEAR® classic safety notes

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 who possess the following qualifications:

- Qualification in the mechanical area in accordance with the national regulations
- Familiarity with this documentation

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 who possess the following qualifications: • Qualification in the electrotechnical area in accordance with the national regulations • Familiarity with this documentation
Additional qualification	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 instruction 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 the 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 or on slopes.

2.5 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.

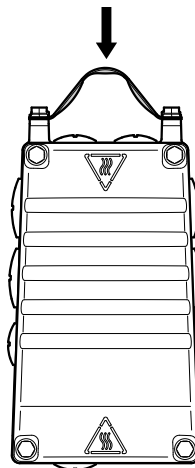
Observe the following notes when transporting the device:

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

If necessary, use suitable, sufficiently dimensioned handling equipment.

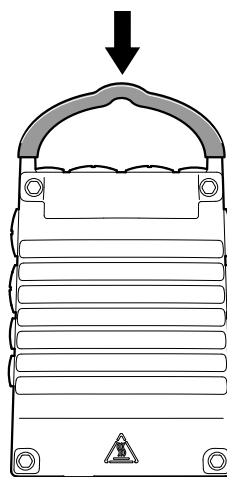
Observe the information on climatic conditions in the chapter "Technical data" of the documentation.

The following figure depicts the position of the lifting eye for size 1.



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The following figure depicts the position of the lifting eye for size 2 and 4.



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Remove the lifting eye before connecting the PE cable, see chapter "Electrical installation" > "Installation instructions".

Store the lifting eyes for future service work, see chapter "Service" > "Unit replacement".

2.6 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.

2.6.1 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

2.7 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.

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 is:

Type of power transmission	Preventive measure
Inverter operation	• 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 Startup/operation

Observe the safety notes in the 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.

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.

2.10 Magnetic fields

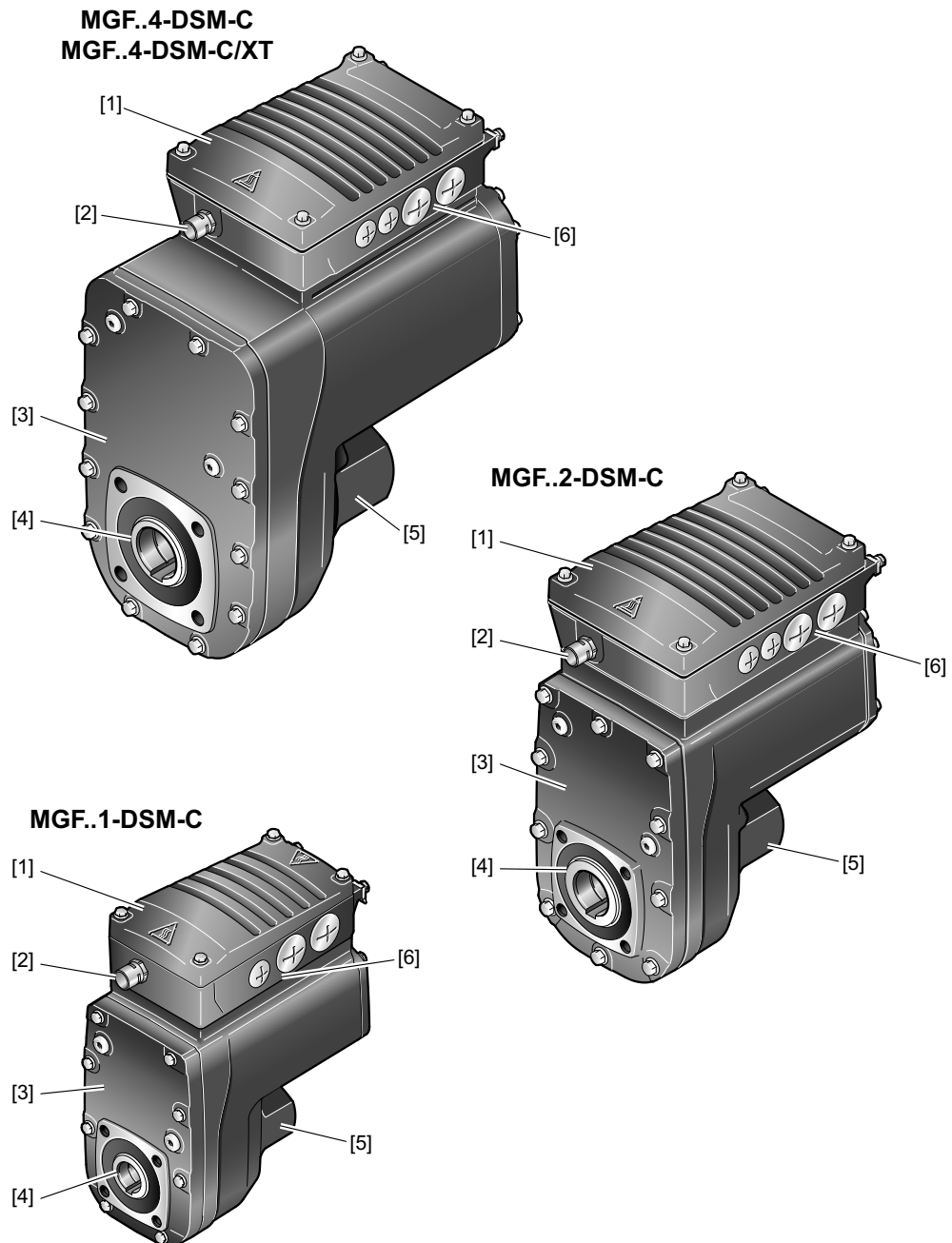
The device contains permanent magnets that create strong magnetic fields even when de-energized. Magnetic fields may pose a health risk. This especially applies to persons with active medical implants. During operation, additional electromagnetic fields are generated.

Observe DGUV (German Social Accident Insurance) regulation 15 – "Electromagnetic fields" for use in industrial workplaces. In other countries, the corresponding national and local regulations and provisions must be complied with.

3 Unit structure

3.1 Drive unit MOVIGEAR® classic

MOVIGEAR® classic is a unit consisting of a gear unit and a synchronous motor in a compact aluminum die-cast housing (see following figure).



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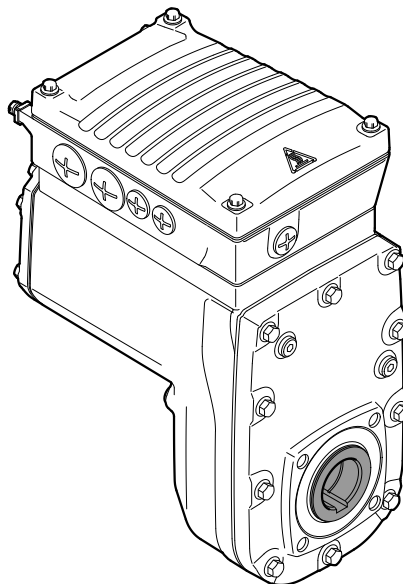
- [1] Cover
- [2] Option /PE (pressure compensation fitting electronics)
- [3] Gear unit cover
- [4] Output shaft variant (pictured here: hollow shaft with keyway)
- [5] Optional safety cover
- [6] Connection box for cable glands

3.2 Shaft types

MOVIGEAR® classic is available with the following shaft types:

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

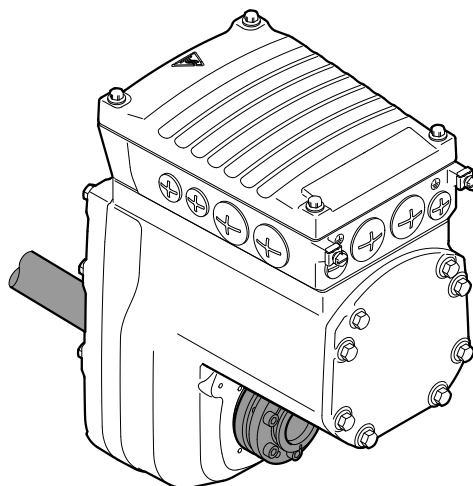
The following figure shows a MOVIGEAR® classic unit with hollow shaft and keyway:



9007220746621195

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

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

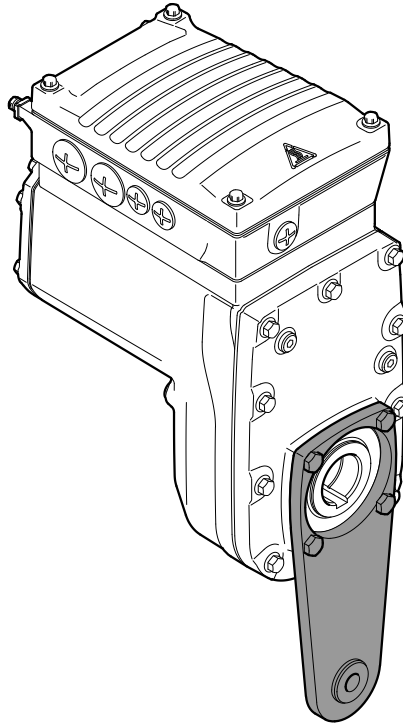


9007220746624139

3.3 Mounting types of the housing

3.3.1 Torque arm (MGF.T.-...-C)

The following figure shows the torque arm for MOVIGEAR® classic:



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3.3.2 Housing with threads (MGF.S-...-C)

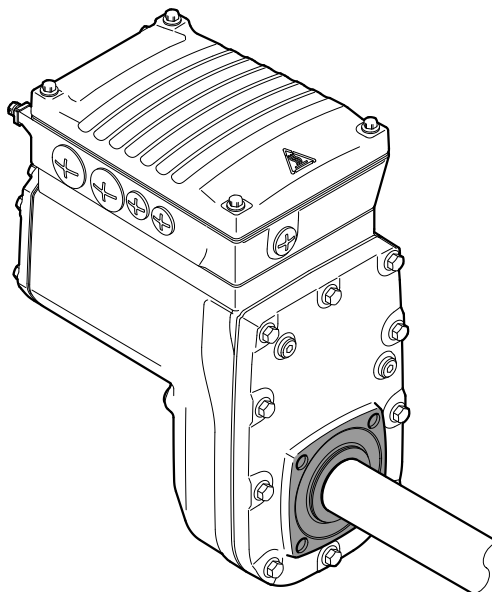
**▲ WARNING**

Improper installation of the drive unit without torque arm.

Severe or fatal injuries.

- Only mount the drive units to the plant structure together with a torque arm. Installation without a torque arm is not permitted.

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



9007220746655627

3.4 Threads for the protective cover



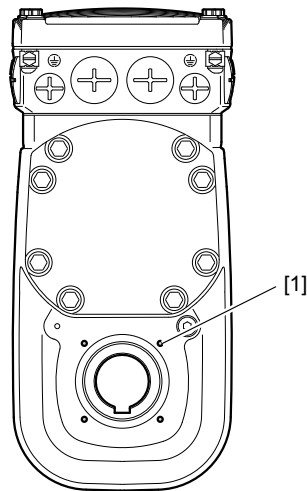
NOTICE

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 protective cover:



9007220787251595

[1] Threads for protective cover (5×)

3.5 Cable entry position

The following cable entries are possible for the drive unit MOVIGEAR® classic MGF..1-DSM-C:

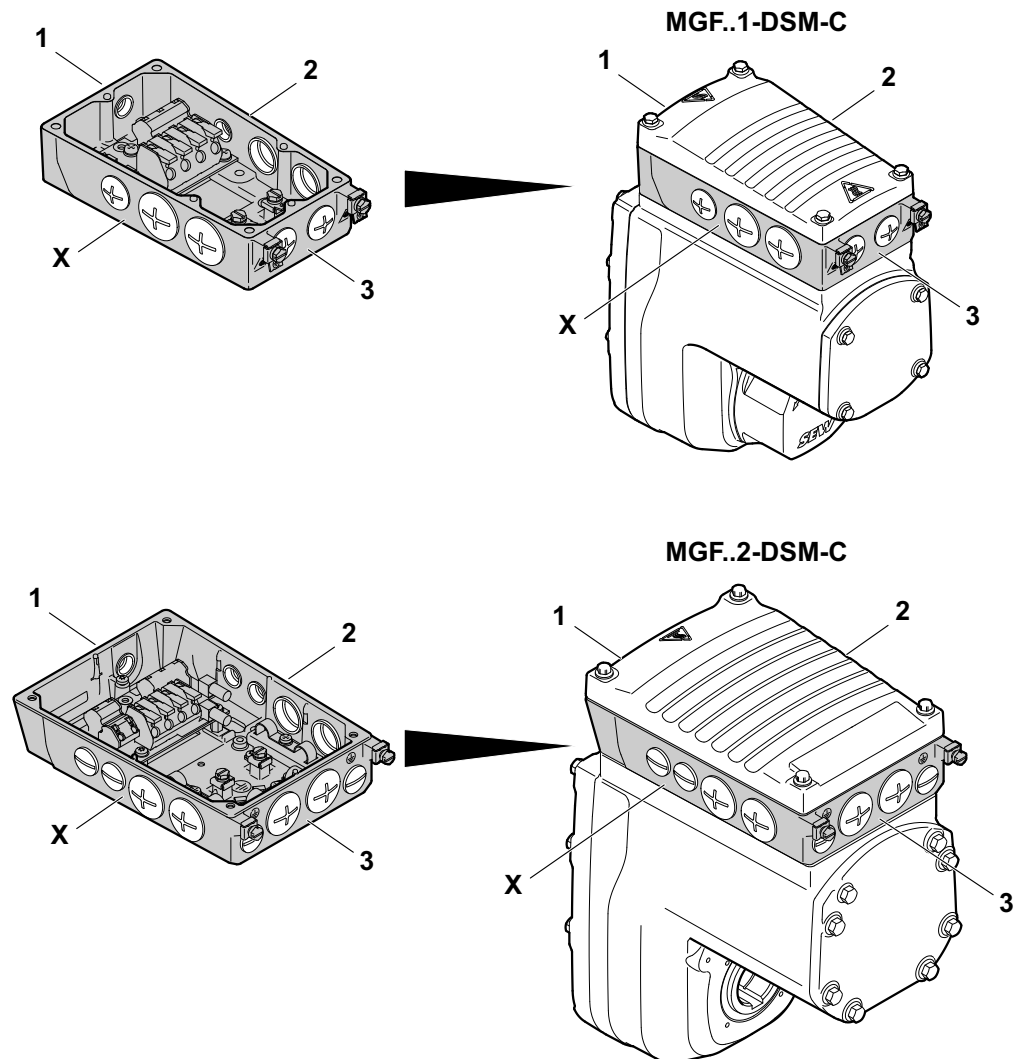
- Position X + 1 + 2 + 3
 - X: $2 \times M25 \times 1.5 + 1 \times M16 \times 1.5$
 - 1: $1 \times M16 \times 1.5$
 - 2: $2 \times M25 \times 1.5 + 1 \times M16 \times 1.5$
 - 3: $2 \times M16 \times 1.5$

The following cable entries are possible for MOVIGEAR® classic drive units MGF..2-DSM-C to MGF..4-DSM-C/XT:

- Position X + 1 + 2 + 3
 - X: $2 \times M25 \times 1.5 + 2 \times M16 \times 1.5$
 - 1: $1 \times M16 \times 1.5$
 - 2: $2 \times M25 \times 1.5 + 2 \times M16 \times 1.5$
 - 3: $2 \times M25 \times 1.5 + 2 \times M16 \times 1.5$

3.5.1 Overview

The following figure shows the possible cable entries:



25125407499

The cable entries are identical to MOVIGEAR® classic MGF..2-DSM-C for MOVIGEAR® classic MGF..4-DSM-C and MOVIGEAR® classic MGF..4-DSM-C/XT.

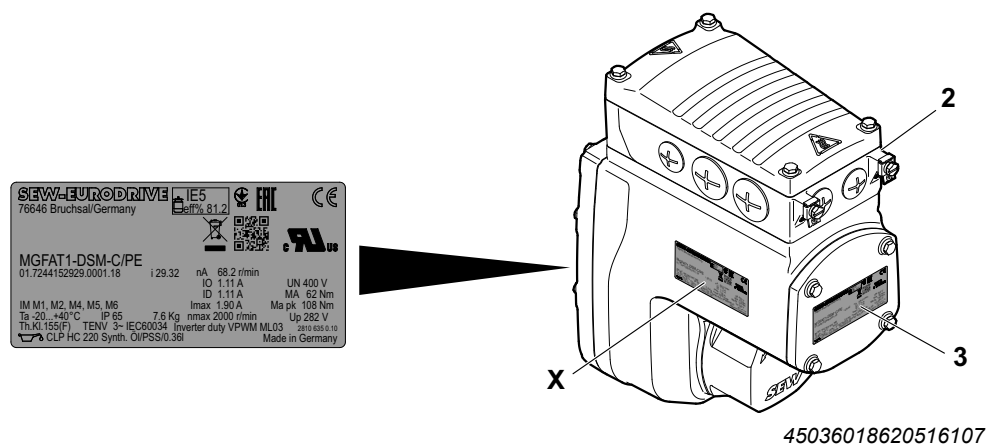
3.6 Nameplate position

The following nameplate positions are possible for MOVIGEAR® performance and MOVIGEAR® classic:

- X
- 2
- 3 (standard position)

3.6.1 Overview

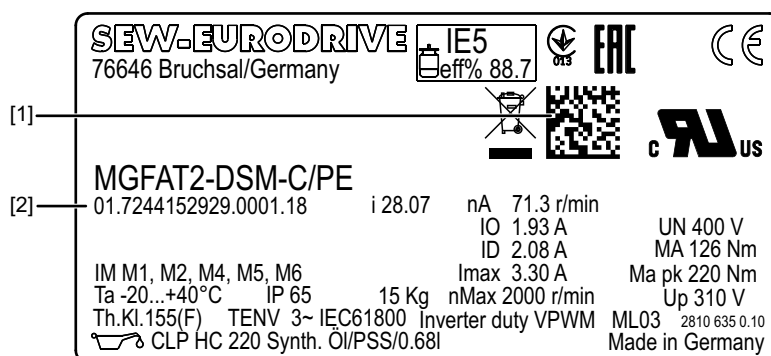
The following figure shows the possible positions:



3.7 Example nameplate and type designation of the drive unit

3.7.1 Nameplate

The following figure gives an example of a nameplate for MOVIGEAR® classic. For the structure of the type designation, refer to the chapter "Type designation".



18014423644167179

[1] The 2D code on the nameplate indicates the unique serial number.

[2] Unique serial number

3.7.2 Type designation

The following table shows the type designation of MOVIGEAR® classic:

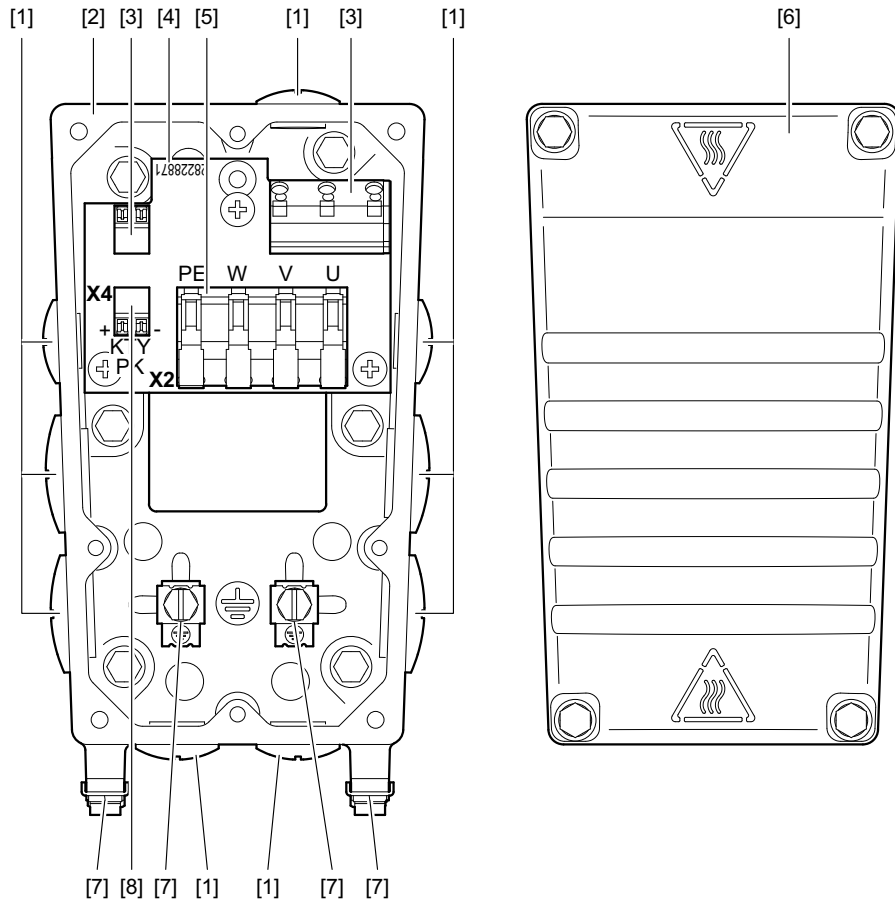
MG	Product family MG = MOVIGEAR®
F	Gear unit type F = Parallel-shaft helical gear unit
A	Shaft design A = Shaft-mounted gear unit (hollow shaft with key) T = TorqLOC® hollow shaft mounting system
T	Housing mounting types T = Drive with torque arm S = Housing with threads for mounting a torque arm
2	Size 1 = Torque class 100 Nm 2 = Torque class 200 Nm 4 = Torque class 400 Nm
-	
DSM	MOVIGEAR® variant DSM = Drive unit without electronics
-	
C	MOVIGEAR® version
/	

PE	MOVIGEAR® option
	XT = Increased torque (only with size 4)
	DI = Digital interface (MOVILINK® DDI)
	AZ1Z = Multi-turn encoder with MOVILINK® DDI connection
	KD1 = Plug connector for digital motor integration
	KO1 = Plug connector for standard (brake) motor
	PE = Pressure compensation fitting electronics
	PG = Integrated pressure compensation gear unit

3.8 Cover and connection box

3.8.1 MGF..1-DSM-C design

The following figure shows the connection box and cover on the MOVIGEAR® classic MGF..1-DSM-C:

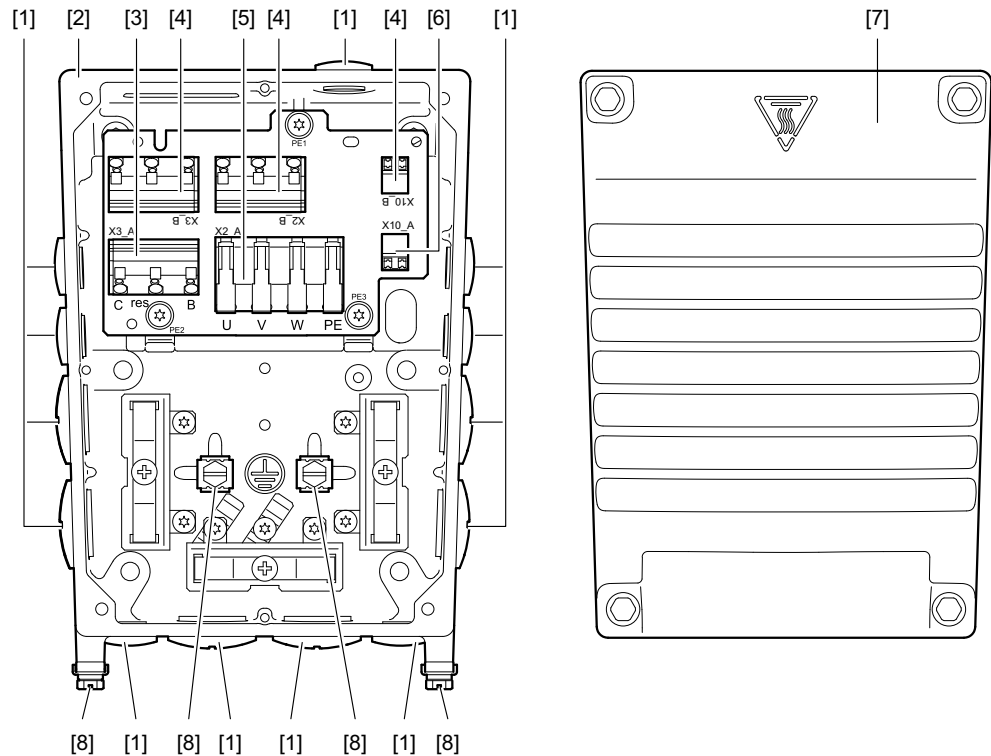


21491922059

- [1] Cable glands
- [2] Connection box
- [3] Terminals for internal wiring
- [4] Connection board
- [5] Terminals X2 for motor connection PE, W, V, U
- [6] Cover
- [7] Screws for PE connection
- [8] Terminals X4 for PK (PT1000) temperature sensor

3.8.2 MGF..2-DSM-C, MGF..4-DSM-C and MGF..4-DSM-C/XT design

The following figure shows the connection box and the cover of MOVIGEAR® classic MGF..2-DSM-C without MOVILINK® DDI Slave and without encoder:



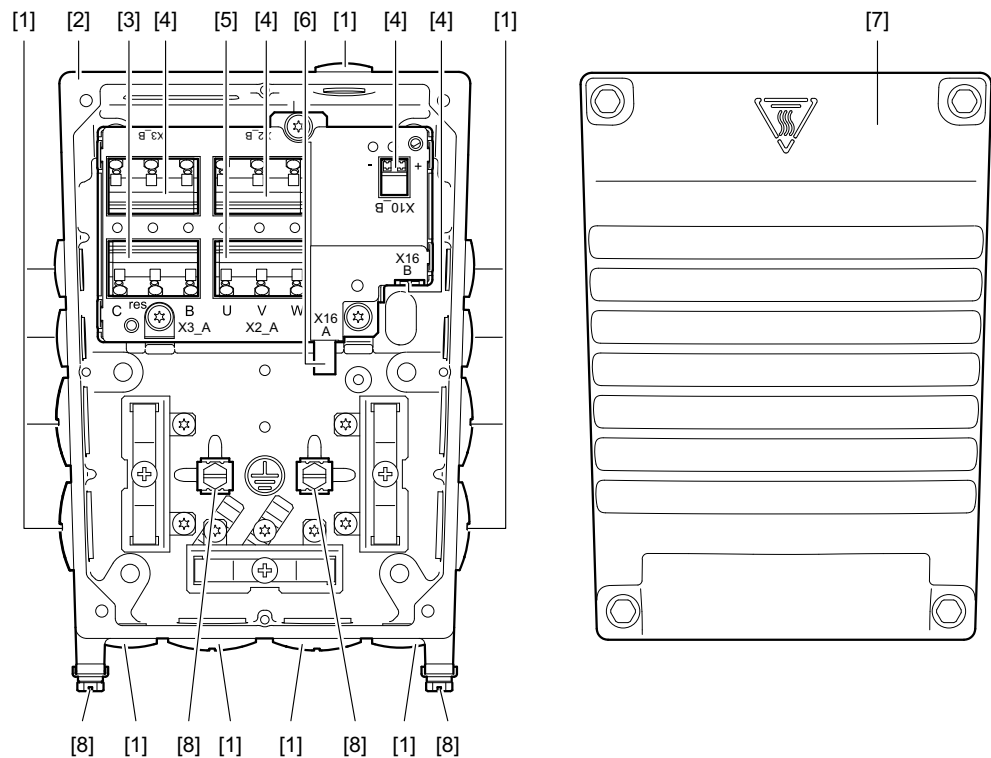
9007224385913739

- [1] Cable glands
- [2] Connection box
- [3] Reserved terminals
- [4] Terminals for internal wiring
- [5] Terminal X2_A for motor connection U, V, W, PE
- [6] Terminals X10_A for PK (PT1000) temperature sensor
- [7] Cover
- [8] Screws for PE connection

The connection board is identical for the drive units MOVIGEAR® MGF..2-DSM-C, MGF..4-DSM-C and MGF..4-DSM-C/XT.

3.8.3 MGF..2-DSM-C/DI, MGF..4-DSM-C/DI and MGF..4-DSM-C/XT/DI design

The following figure shows the connection box and the cover of MOVIGEAR® classic MGF..2-DSM-C/DI with MOVILINK® DDI Slave and without encoder:



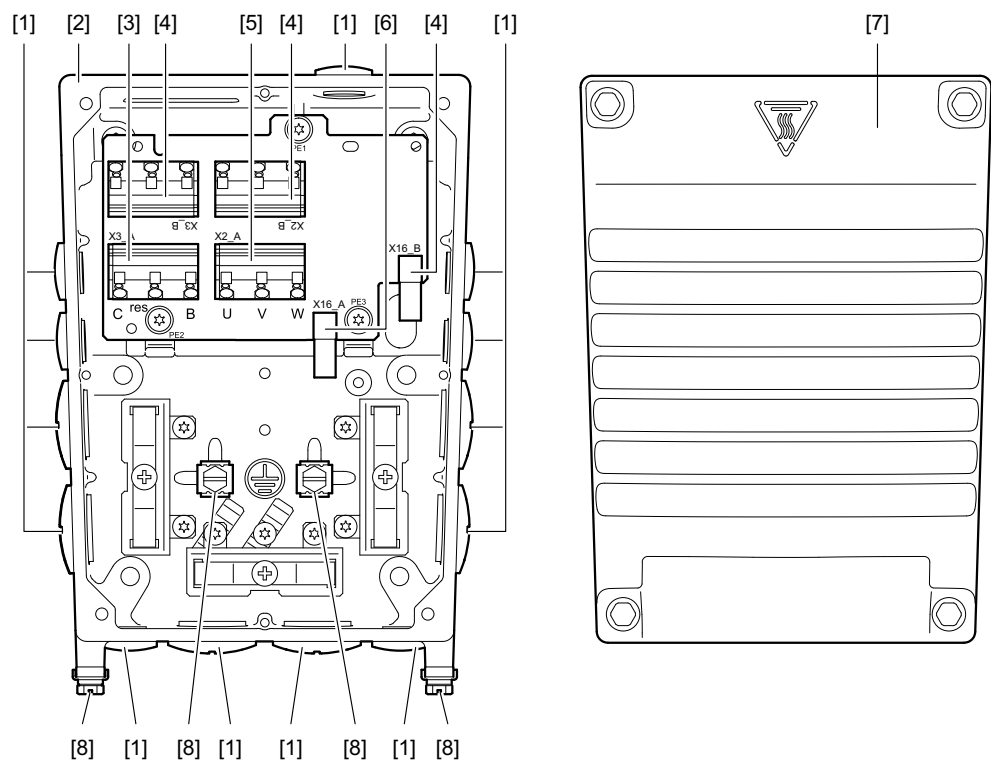
9007224862245899

- [1] Cable glands
- [2] Connection box
- [3] Reserved terminals
- [4] Terminals for internal wiring
- [5] Terminal X2_A for motor connection U, V, W
- [6] X16_A connection for MOVILINK® DDI
- [7] Cover
- [8] Screws for PE connection

The connection board is identical for the drive units MOVIGEAR® MGF..2-DSM-C/DI, MGF..4-DSM-C/DI and MGF..4-DSM-C/XT/DI.

3.8.4 MGF..2-DSM-C/DI/AZ1Z, MGF..4-DSM-C/DI/AZ1Z and MGF..4-DSM-C/XT/DI/AZ1Z design

The following figure shows the connection box and the cover of MOVIGEAR® classic MGF..2-DSM-C/DI/AZ1Z with MOVILINK® DDI Slave and with AZ1Z encoder:



9007224862249483

- [1] Cable glands
- [2] Connection box
- [3] Reserved terminals
- [4] Terminals for internal wiring
- [5] Terminal X2_A for motor connection U, V, W
- [6] X16_A connection for MOVILINK® DDI
- [7] Cover
- [8] Screws for PE connection

The connection board is identical for the drive units MOVIGEAR® MGF..2-DSM-C/DI/AZ1Z, MGF..4-DSM-C/DI/AZ1Z and MGF..4-DSM-C/XT/DI/AZ1Z.

3.9 Example nameplate and type designation of connection unit

3.9.1 Nameplate

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

Type: CBI0X-DSM-5X3-C
S0#: 01.7659637421.0001.18
00 00 00 00 00 00 00 00 00

36028822722592779

3.9.2 Type designation of connection unit

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

CB	Product family CB = CB connection board (Motor without electronics)
I	Hardware design I = Hardware design for MOVIGEAR® classic
0	Flange dimensions for relevant cover size 0 = Suitable for: • MOVIGEAR® MGF..1-..-C 1 = Suitable for: • MOVIGEAR® MGF..2-..-C • MOVIGEAR® MGF..4-..-C • MOVIGEAR® MGF..4-..-C/XT
X	Fieldbus connection configuration X = Without fieldbus connection
–	
DSM	Communication version DSM = Drive unit without electronics
–	
5	Connection voltage 5 = AC 500 V
X	EMC variant X = Without basic interference suppression
3	Connection type 3 = 3-phase
–	
C	Version
/	

DI	Option
	DI = Digital Interface (MOVILINK® DDI)
	CO = Digital interface (MOVILINK® DDI) via coaxial element

4 Mechanical installation

4.1 Installation notes



INFORMATION

Adhere to the safety notes during installation.



⚠ WARNING

Improper installation/disassembly of drive unit and mount-on components.
Serious injuries.

- 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

Improper installation of the drive unit without torque arm.
Severe or fatal injuries.

- Only mount the drive units to the plant structure together with a torque arm. Installation without a torque arm is not permitted.



⚠ WARNING

Risk of injury if the device starts up unintentionally, and danger of electrical voltage.
Severe or fatal injuries.

- Disconnect the device from the power supply with suitable external measures before you start working on the device and secure it against unintentional reconnection to the voltage supply.
- Secure the output shaft against rotation.



⚠ 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 (e.g. customer shaft with contact shoulder or clamping ring, shrink disk) with a touch guard.

4.2 Required tools and resources

- Set of wrenches, set of screwdrivers, set of socket wrenches
- Torque wrench
- Mounting device
- Compensation elements (shims 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 drive unit's nameplate must match the voltage supply system.
- The drive unit is undamaged (no damage caused by shipping or storage).
- Ambient temperature according to the operating instructions, nameplate and lubricant table in chapter "Technical data" > "Lubricants".
- The drive unit must not be installed in the following ambient conditions:
 - Potentially explosive atmosphere
 - Oils
 - Acids
 - Gases
 - Vapors
 - Radiation
- For special designs: The drive unit is designed in accordance with the actual ambient conditions.
- Clean the output shafts and flange surfaces thoroughly to ensure 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.

4.4 Setting up the drive unit

4.4.1 Notes

- Only mount the drive units to the plant structure together with a torque arm. Installation without a torque arm is not permitted.
- 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 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 faces of the 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.

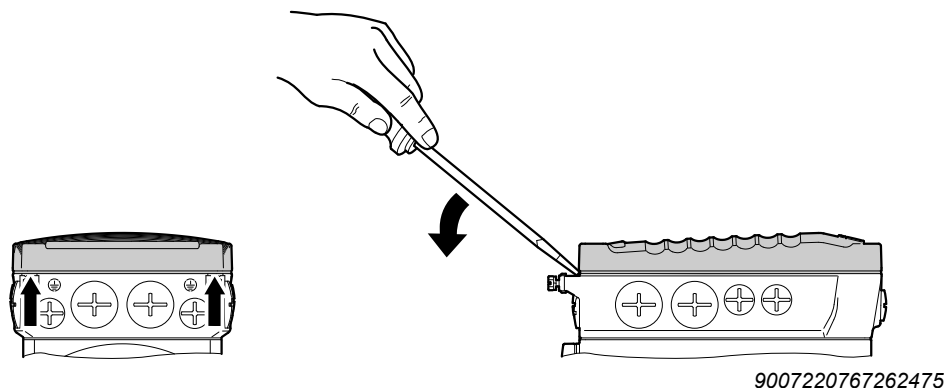
Changing the mounting position

Observe the following information when you operate the drive unit in a mounting position other than indicated in the order:

- **Mounting position M3 is only available in combination with the option “integrated pressure compensation /PG”. Observe the documentation “Integrated Pressure Compensation (Option /PG)”.**
- **Adjust the position of the breather valve.**
- **If present, adjust the position of the pressure compensation fitting.**

4.4.2 Removing the cover

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

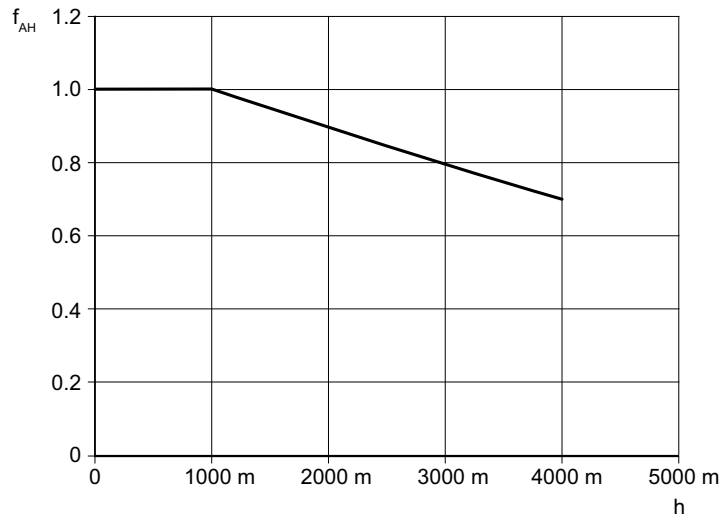


4.4.3 Installation in damp areas or in the open

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

4.4.4 Derating depending on the installation altitude

The following diagram shows the factor f_{AH} (according to IEC 60034-1:2017, Table 12) by which the thermal motor torque has to be reduced depending on the installation altitude H . Observe the additional chapter "Technical Data and Dimension Drawings" > "Derating for increased ambient temperature".



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4.4.5 Painting drive units



NOTICE

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

Potential damage to property.

- Clean the surface of the drive unit and make sure it is free from grease.
- Thoroughly cover the breather valves and sealing lip of the oil seals with strips prior to painting.
- Remove the masking strips after painting.

4.4.6 Gear unit venting

Drive units with installed breather valve

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

Drive units with separately included breather valve



NOTICE

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

Possible damage to property

- For drive units in mounting position M3, use the variant with integrated pressure compensation (/PG option). Observe the documentation "Integrated Pressure Compensation (Option /PG)".
- The MGF..1-DSM-C drive unit can be operated in M3 mounting position without breather valve and without any restrictions. The option "/PG" is not available for this size.

SEW-EURODRIVE delivers 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.

4 Mechanical installation

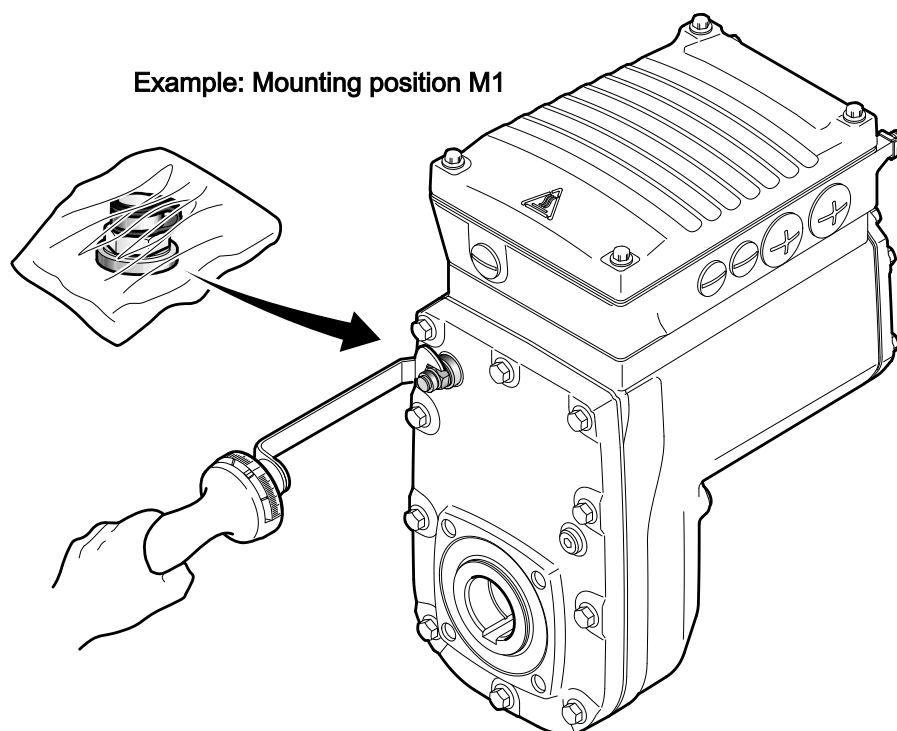
Setting up the drive unit

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 depends on the mounting position in use. Observe the chapter "Technical data and dimension sheets" > "Mounting positions".

Example: Mounting position M1

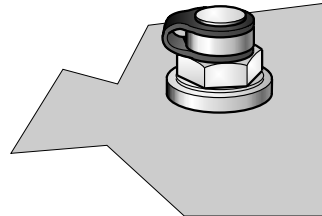


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Activating the breather valve

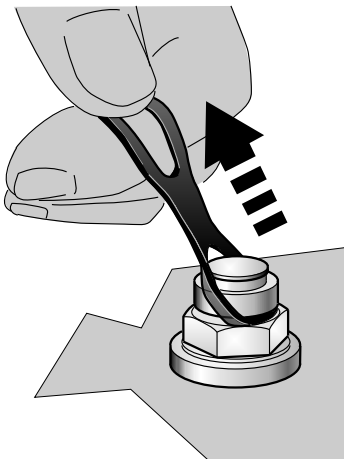
After installing the breather valve, activate it as follows. For designs with the breather valve screwed in: Check whether the breather valve is activated. If not, you have to remove the transport fixture of the breather valve before you start up the drive unit.

1. Breather valve with transport protection



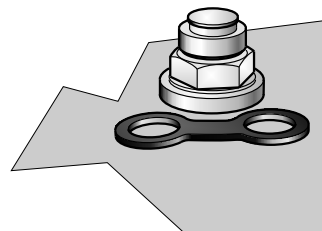
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2. Remove transport fixture



22858631819

3. Activated breather valve



22858720011

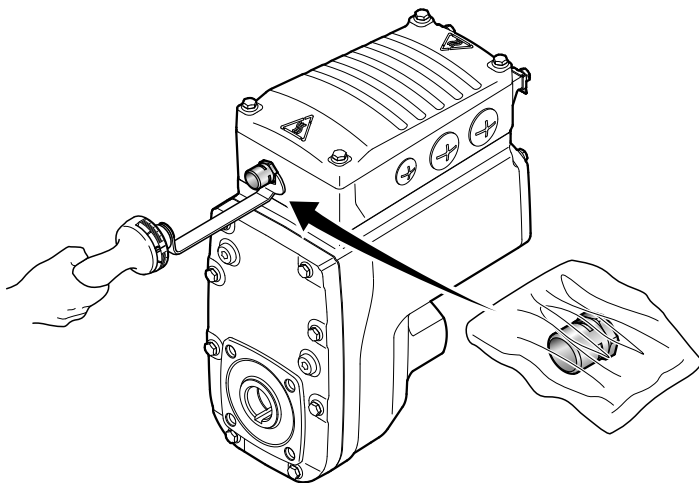
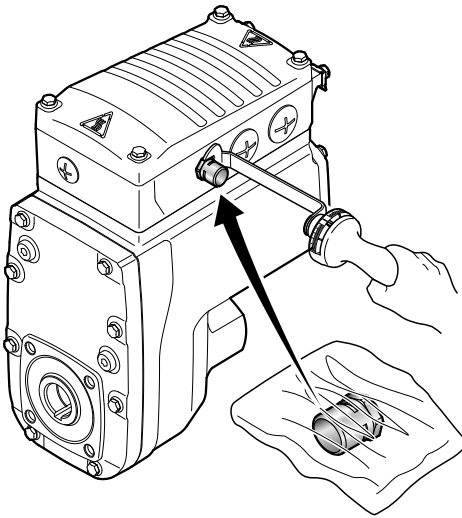
4.4.7 Pressure compensation on electronics (option /PE)

Designs with included pressure compensation fitting (option /PE)

On designs with an included pressure compensation fitting (option /PE), install the fitting depending on the mounting position used. The tightening torque is 4.0 Nm.

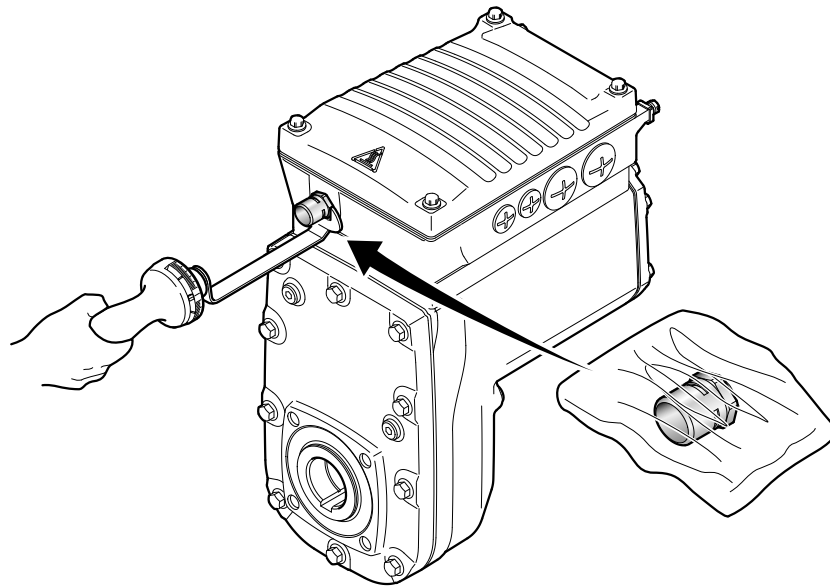
The following table shows the installation positions depending on the mounting positions:

Mounting positions for MGF..1-DSM-C

Mounting position M1, M3, M5, M6
 22484999947
Mounting position M2, M4
 22485002379

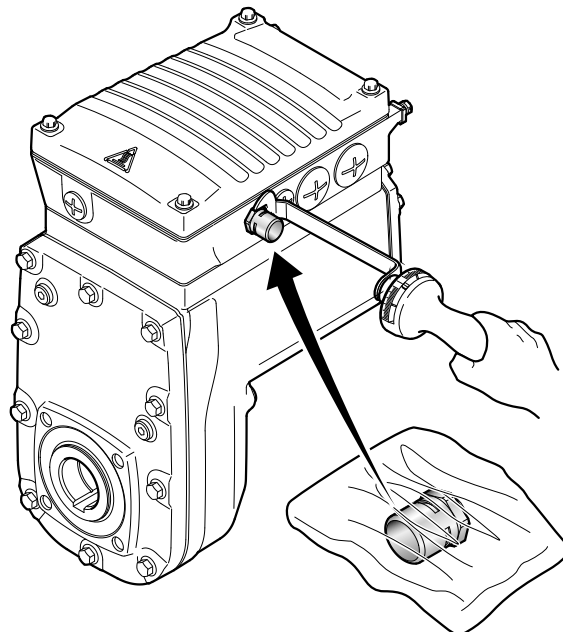
Mounting positions for MGF..2-DSM-C/MGF..4-DSM-C

Mounting position M1, M3*, M5, M6



25425427723

Mounting position M2, M4



25425430155

- * Mounting position M3 is only possible with the option "integrated pressure compensation /PG". Observe the documentation "Integrated Pressure Compensation (Option /PG)".

4.5 Shaft-mounted gear unit with keyway**INFORMATION**

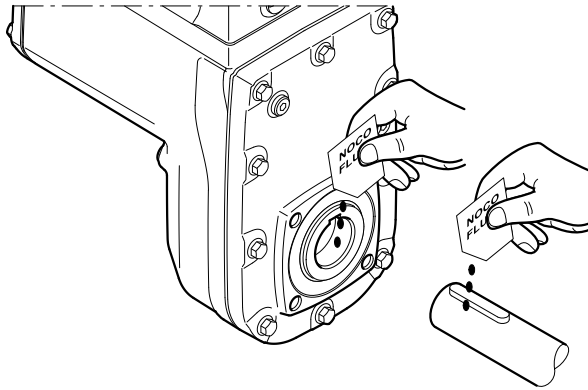
Observe the design notes in chapter "Technical data and dimension sheets" for the customer shaft design.

INFORMATION

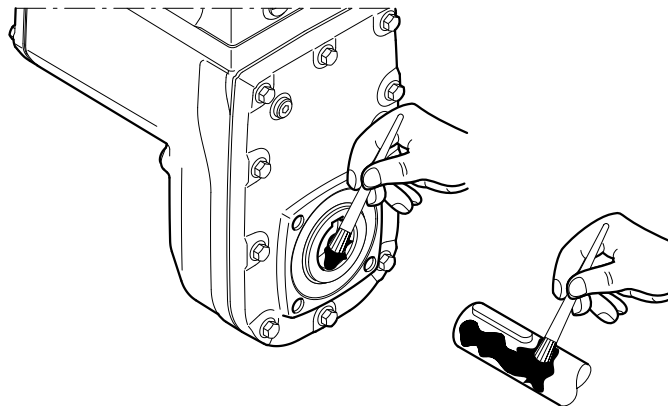
To avoid contact corrosion, SEW-EURODRIVE recommends that the customer shaft should additionally be lathed down between the 2 contact surfaces.

4.5.1 Installation notes

1. Apply NOCO® fluid and spread it thoroughly.



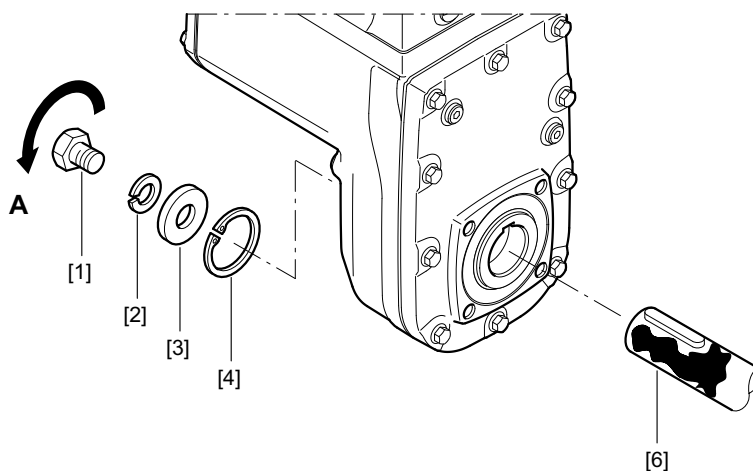
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2. Mount the shaft and secure it axially (using a mounting device makes installation easier). The three mounting types are described below:

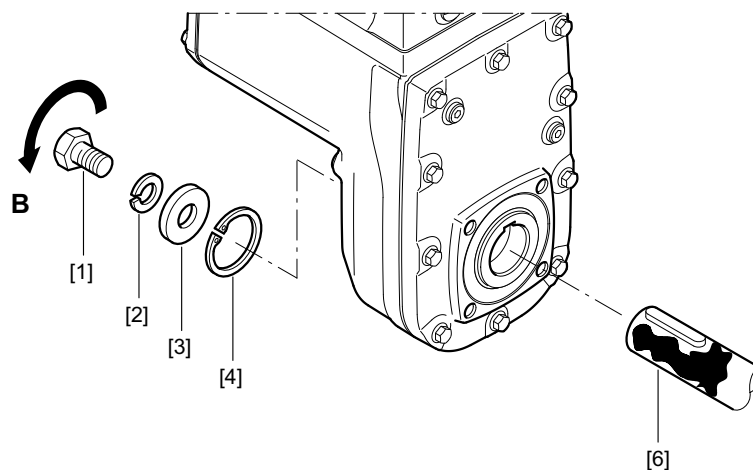
⇒ 2A: Standard scope of delivery



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

⇒ 2B: Assembly/disassembly kit for customer shaft **with** contact shoulder. Observe chapter "Technical data and dimension sheets" > "Design notes for gear units with hollow shaft and key".



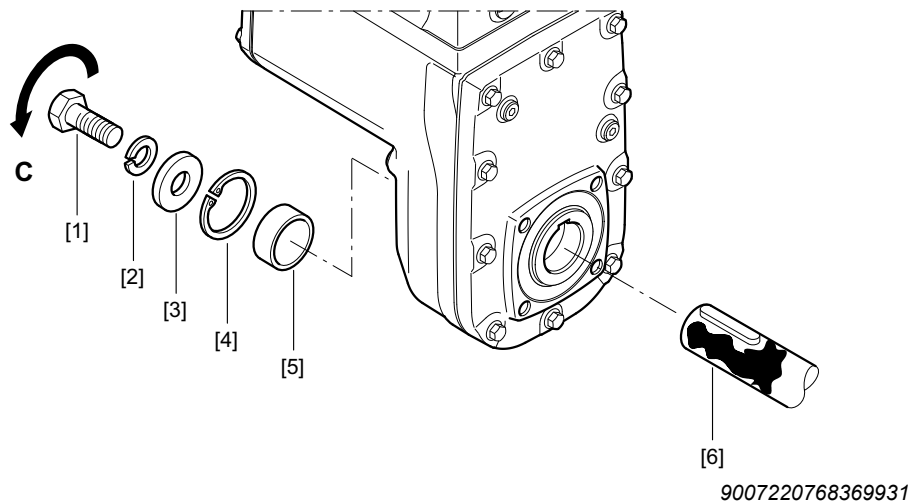
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- [1] Retaining screw
- [2] Lock washer
- [3] Washer
- [4] Retaining ring
- [6] Customer shaft with contact shoulder

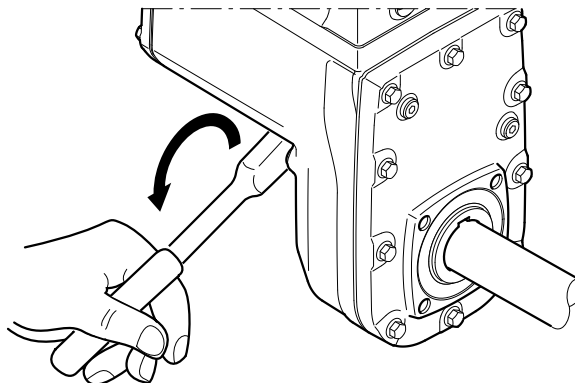
⇒ 2C: Assembly/disassembly kit for customer shaft **without** contact shoulder. Observe chapter "Technical data and dimension sheets" > "Design notes for gear units with hollow shaft and key".

4 Mechanical installation

Shaft-mounted gear unit with keyway



3. Tighten the retaining screw with the specified torque (see chapter "Tightening torques for retaining screws").



4.5.2 Tightening torques for retaining screws

Drive	Screw	Tightening torque
MGFA.1-.-C (D ^{H7} 20 mm)	M6	8 Nm
MGFA.1-.-C (D ^{H7} 25 mm)	M10	20 Nm
MGFA.2-.-C	M10	20 Nm
MGFA.4-.-C	M16	40 Nm

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4.5.3 Disassembly notes



▲ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

- Let the devices cool down before touching them.

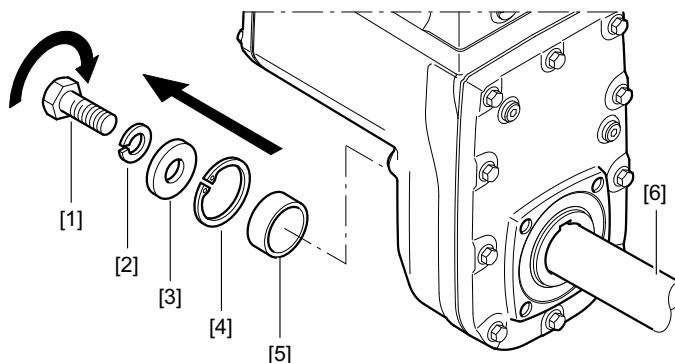


INFORMATION

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].

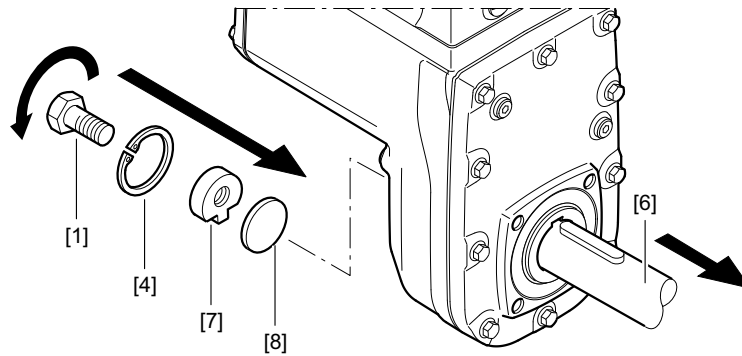


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- [1] Retaining screw
- [2] Lock washer
- [3] Washer
- [4] Retaining ring
- [5] Spacer tube
- [6] Customer shaft

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

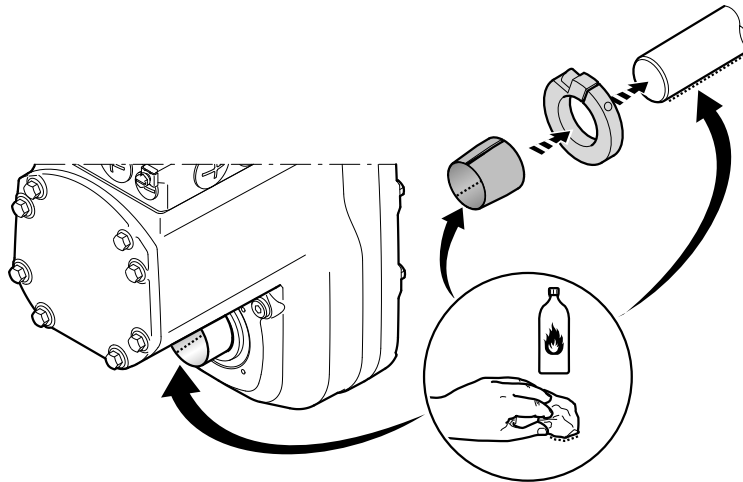


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- | | |
|-----|-----------------|
| [1] | Retaining screw |
| [4] | Retaining ring |
| [6] | Customer shaft |
| [7] | Fixed nut |
| [8] | Forcing washer |

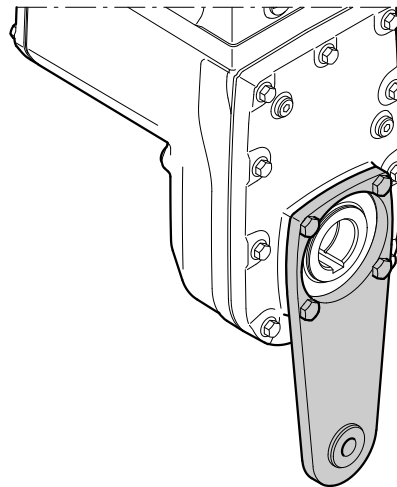
4.6 Shaft-mounted gear unit with TorqLOC® (customer shaft without contact shoulder)

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.



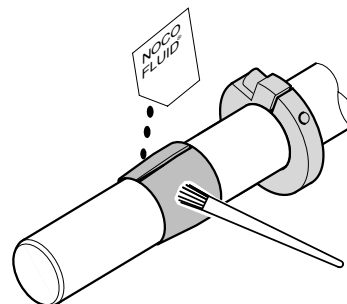
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3. Fasten the torque arm on the drive unit; observe the chapter "Torque arm".



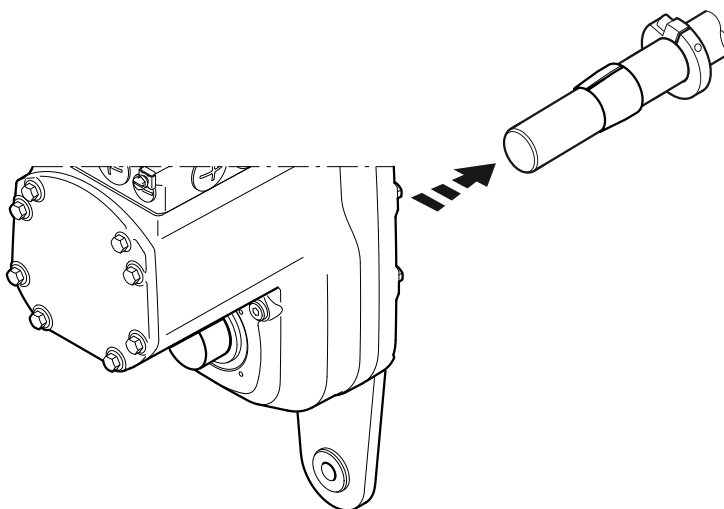
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4. Apply NOCO® fluid on the bushing and spread thoroughly.



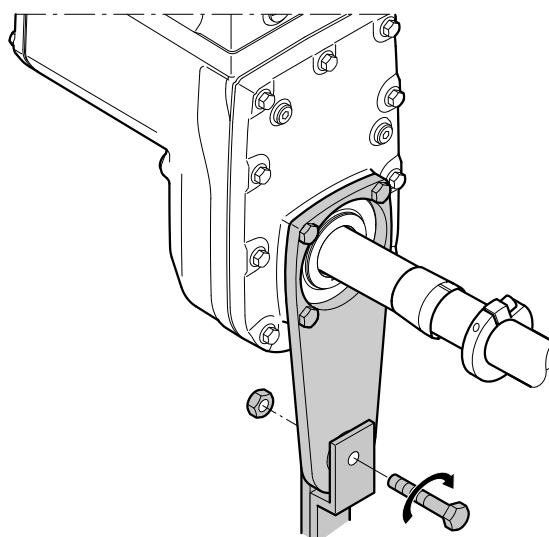
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5. Push the gear unit onto the customer shaft.



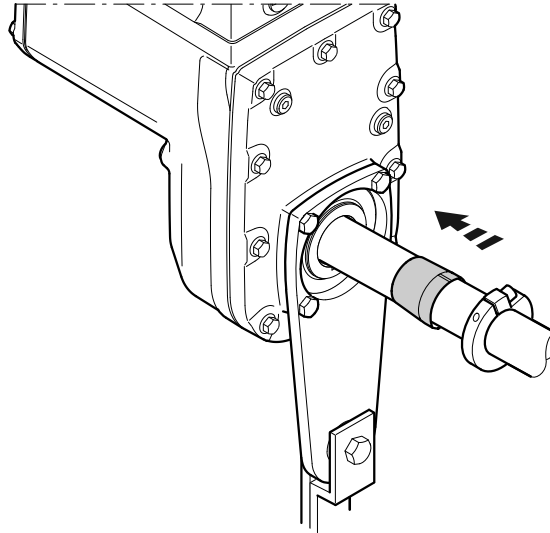
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6. Mount the torque arm onto the system structure/holding fixture (do not tighten the screws).



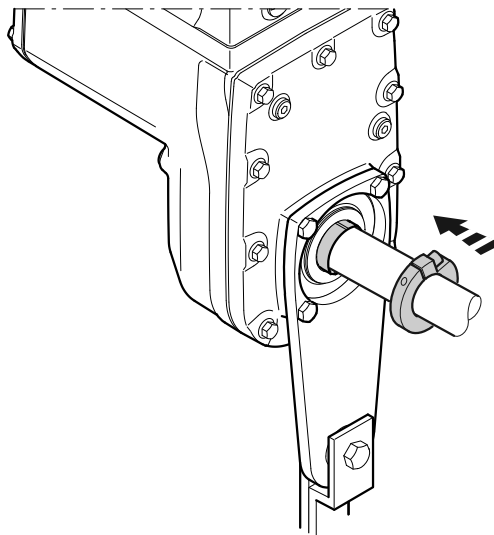
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7. Push the bushing into the gear unit up to the stop.



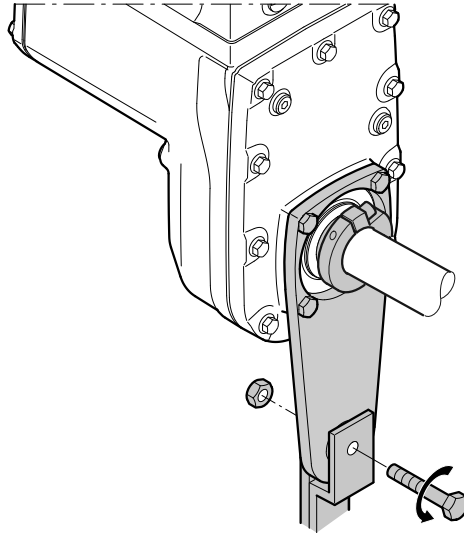
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8. Push the stop ring to the bushing. Mark the position of the stop ring.



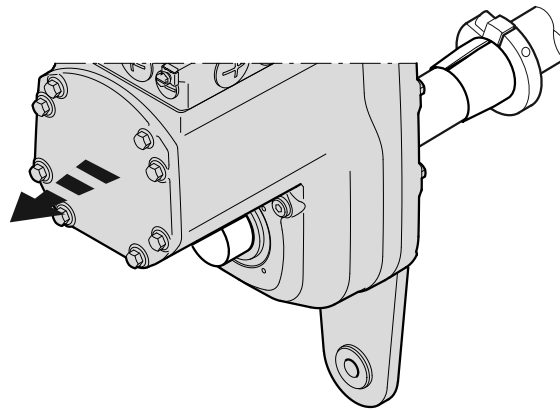
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9. Remove the torque arm from the holding fixture/system structure.



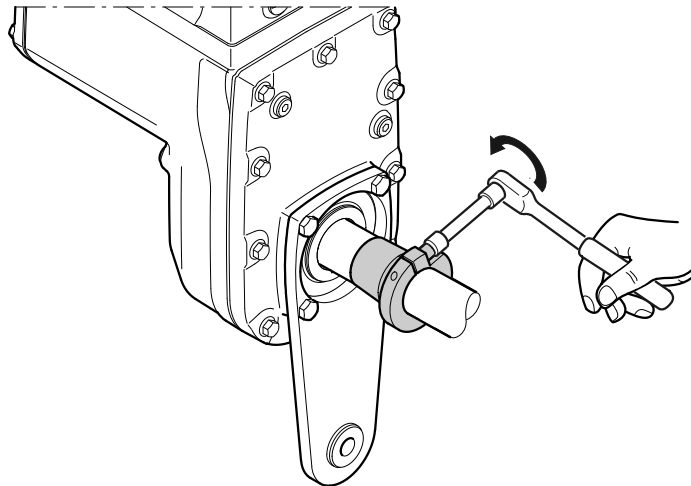
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10. Pull the gear unit off the customer shaft until the stop ring is accessible for fastening.



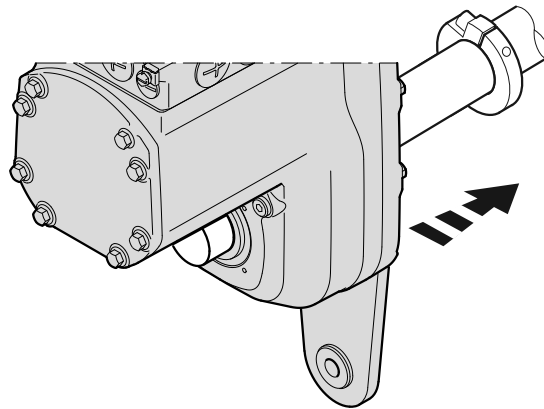
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11. Make sure that the position of the stop ring has not changed (see marking).
12. Tighten the stop ring to the appropriate torque.
- ⇒ Standard design: 18 Nm
 - ⇒ Stainless steel: 7.5 Nm



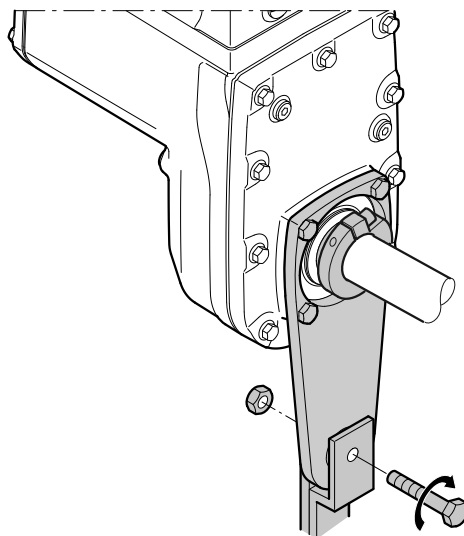
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13. Push the bushing and the gear unit onto the customer shaft up to the fixed stop ring.



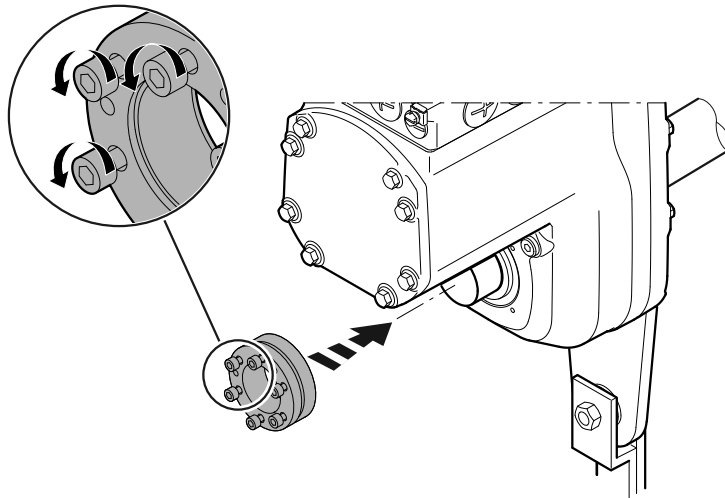
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14. Mount the torque arm onto the system structure/holding fixture again (do not tighten the screws).



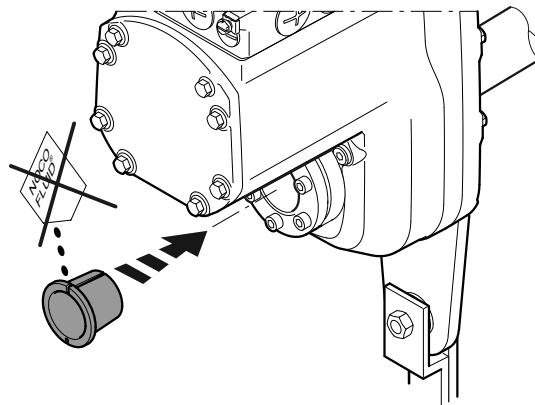
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15. Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.



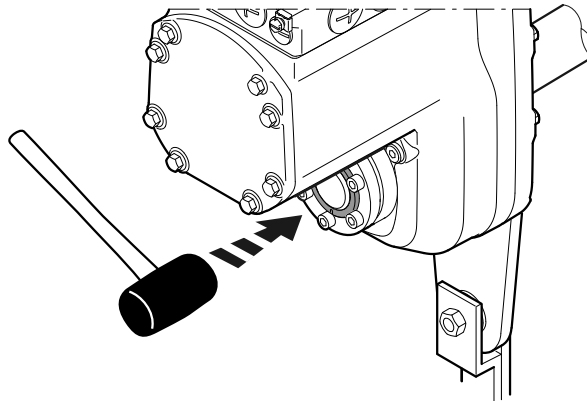
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16. Slide the counter bushing onto the customer shaft and into the hollow shaft.



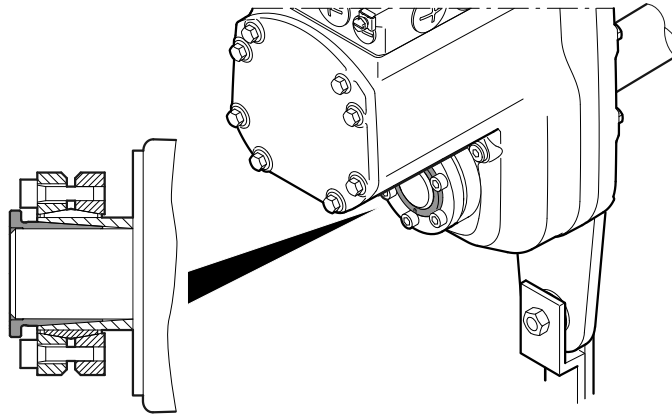
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17. In the case of a gear unit **with shaft shoulder**, mount the shrink disk at the shaft shoulder up to the stop. In the case of a gear unit **without shaft shoulder**, mount the shrink disk at a distance of 6.5 mm to 7.5 mm from the gear unit housing.
18. Tap lightly on the flange of the counter bushing to ensure that the bushing is fitted securely in the hollow shaft.



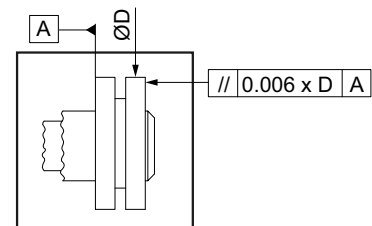
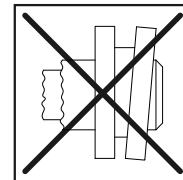
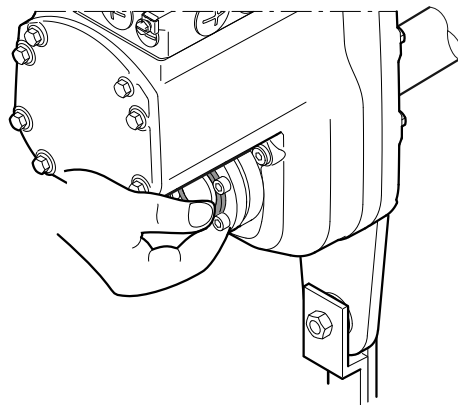
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19. Make sure that the customer shaft is seated in the counter bushing.



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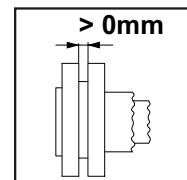
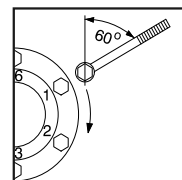
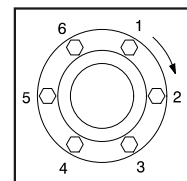
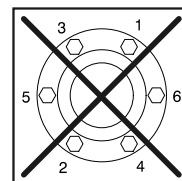
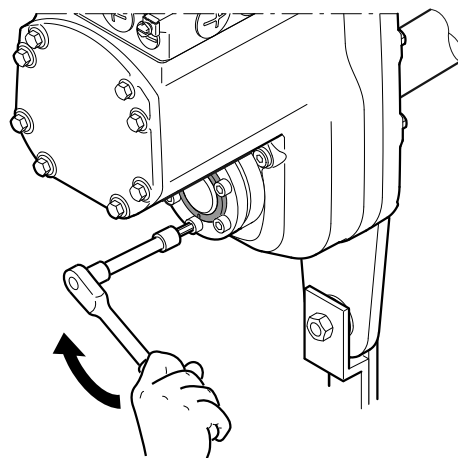
20. Tighten the screws of the shrink disk only hand-tight and ensure that the outer rings of the shrink disk are parallel.



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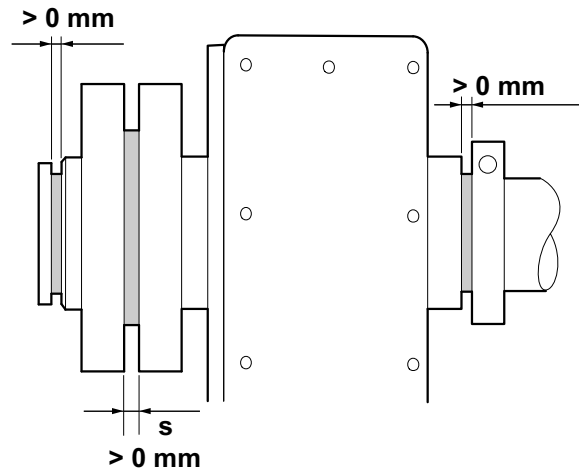
21. Tighten the locking screws by working round several times from one screw to the next (not in diametrically opposite sequence):

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



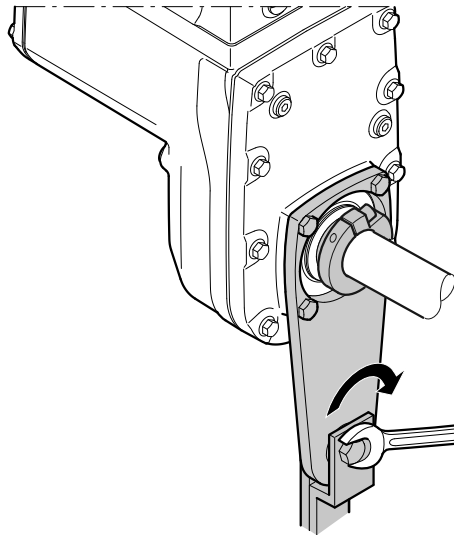
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22. After installation, make sure the remaining gap s between the outer rings of the shrink disks is $> 0 \text{ mm}$.
- ⇒ The remaining gap between counter bushing and hollow shaft end as well as bushing and stop ring must be $> 0 \text{ mm}$.



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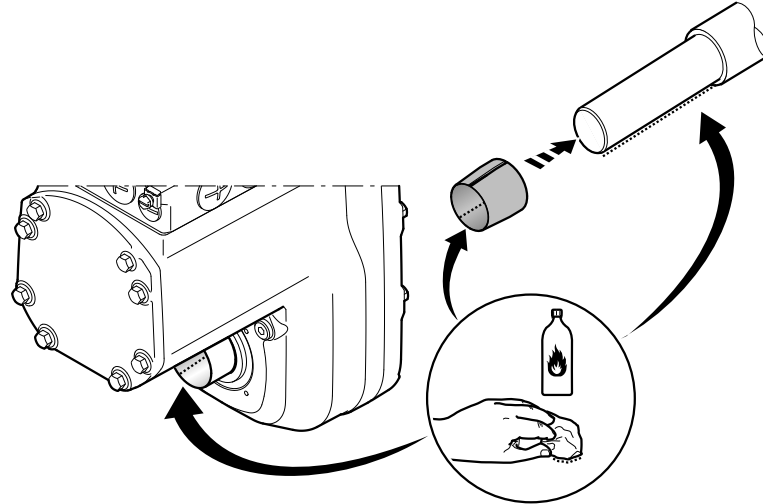
23. Securely tighten the torque arm; observe the chapter "Torque arm".



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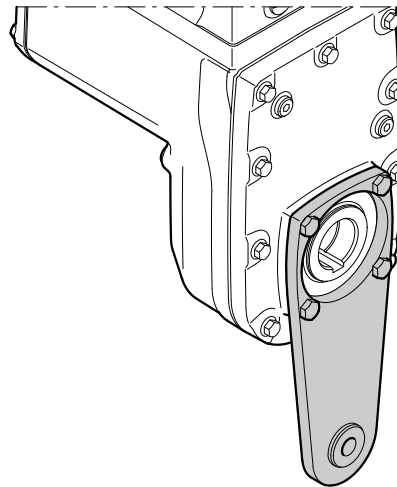
4.7 Shaft-mounted gear unit with TorqLOC® (customer shaft with contact shoulder)

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



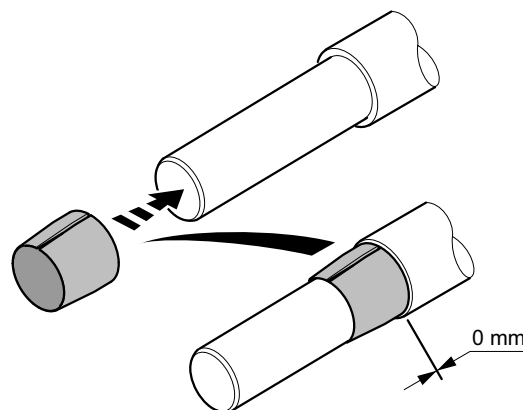
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2. Fasten the torque arm on the drive unit; observe the chapter "Torque arm".



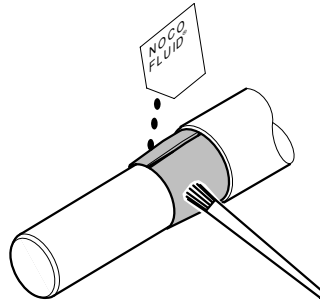
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3. Slide the bushing onto the customer shaft.



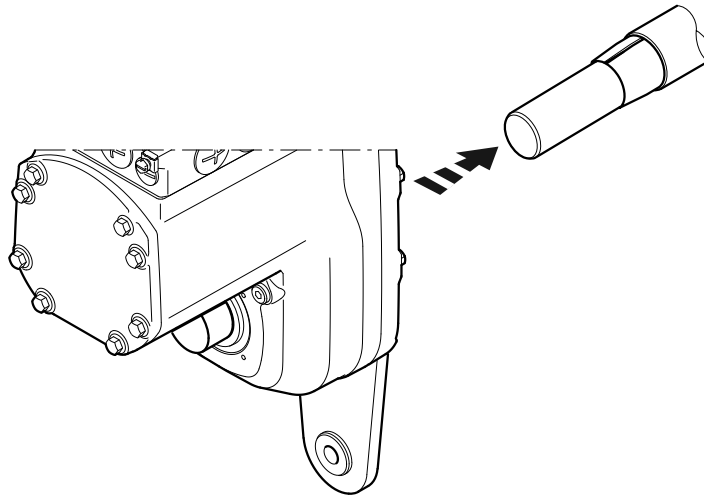
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4. Apply NOCO® fluid on the bushing and spread thoroughly.



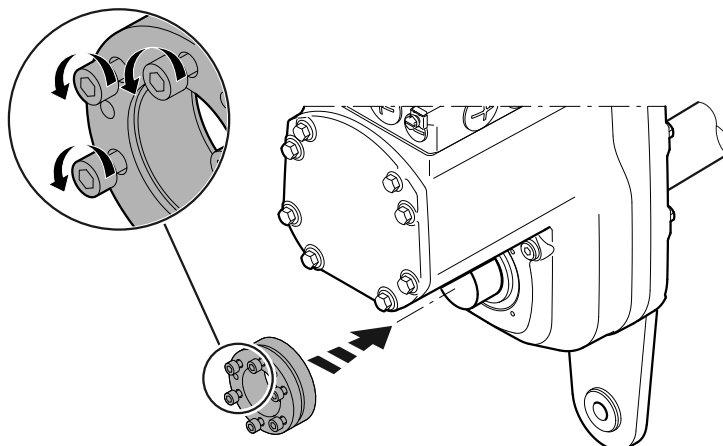
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5. Push the gear unit onto the customer shaft.



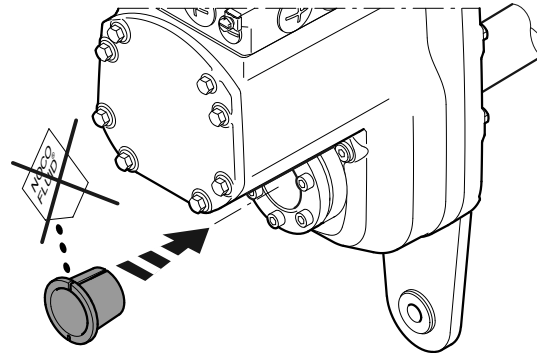
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6. Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.



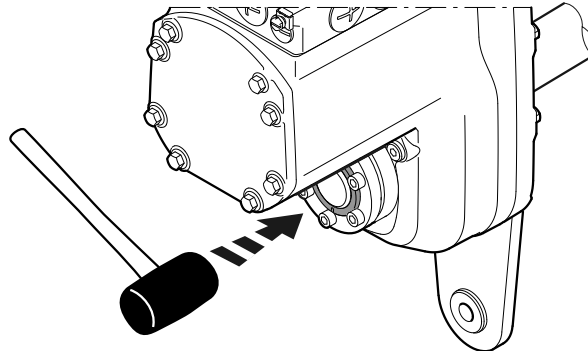
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7. Slide the counter bushing onto the customer shaft and into the hollow shaft.



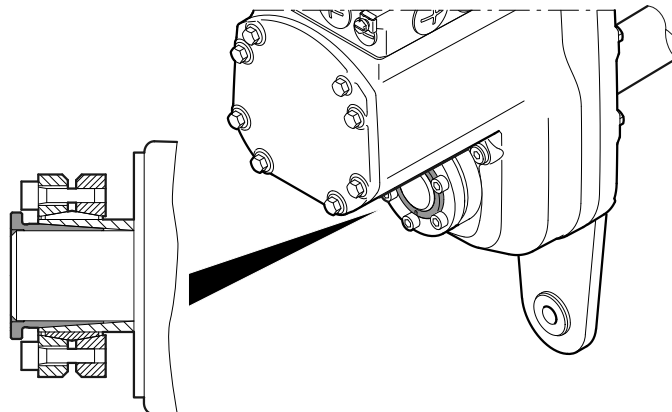
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8. In the case of a gear unit **with shaft shoulder**, mount the shrink disk at the shaft shoulder up to the stop. In the case of a gear unit **without shaft shoulder**, mount the shrink disk at a distance of 6.5 mm to 7.5 mm from the gear unit housing.
9. Tap lightly on the flange of the counter bushing to ensure that the bushing is fitted securely in the hollow shaft.



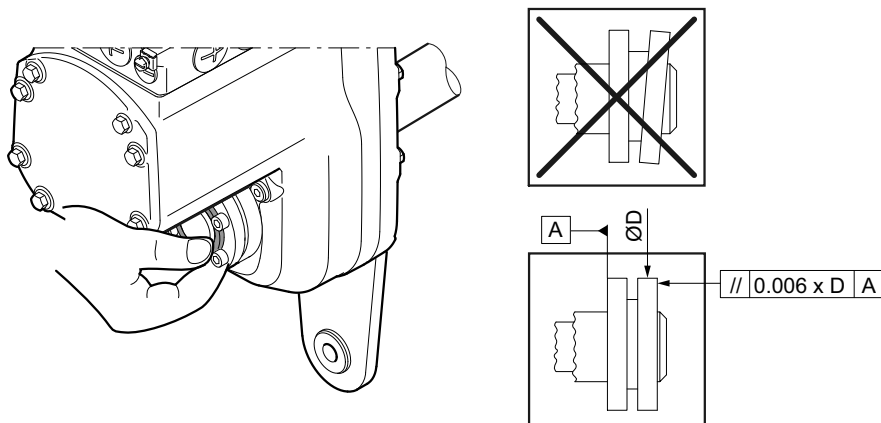
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10. Make sure that the customer shaft is seated in the counter bushing.



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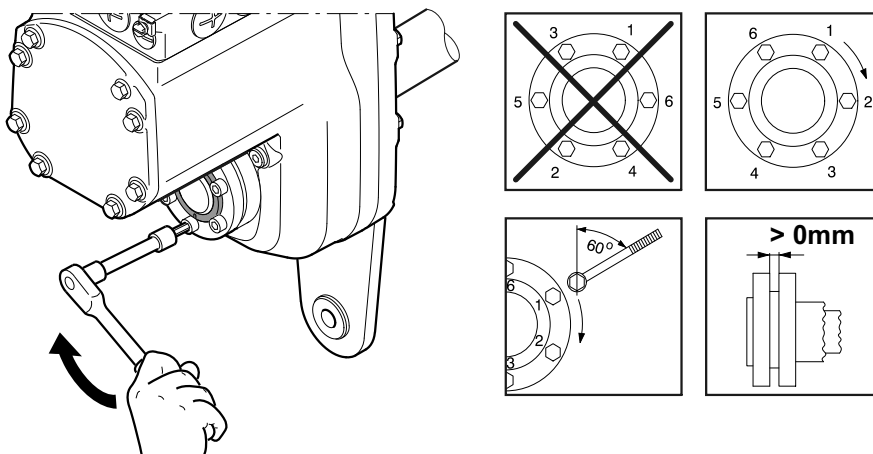
11. Tighten the screws of the shrink disk only hand-tight and ensure that the outer rings of the shrink disk are parallel.



18014420038463755

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

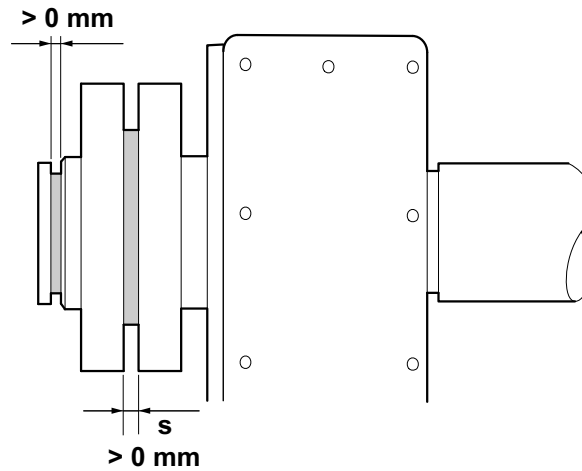
⇒ The exact values for the tightening torques are shown on the shrink disk.



18014420038466187

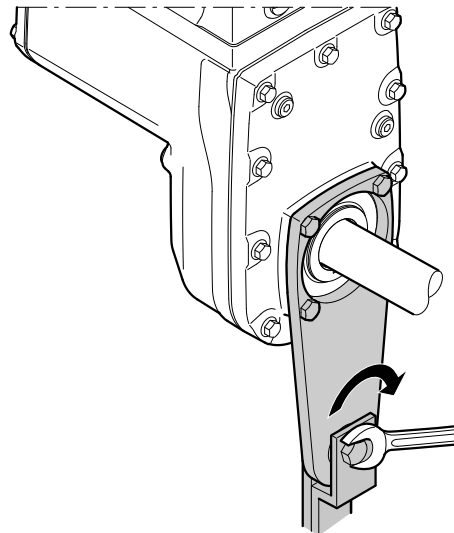
13. After installation, make sure the remaining gap s between the outer rings of the shrink disks is > 0 mm.

14. The remaining gap between counter bushing and hollow shaft end must be $> 0 \text{ mm}$.



21528986635

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



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

4.8.1 Removal notes



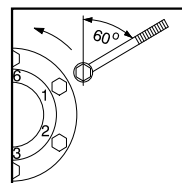
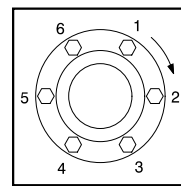
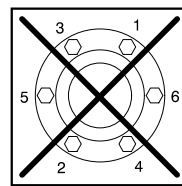
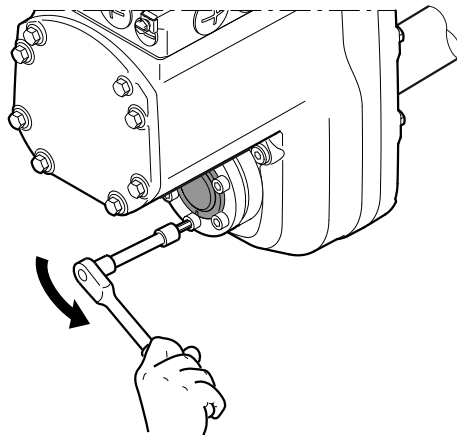
▲ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

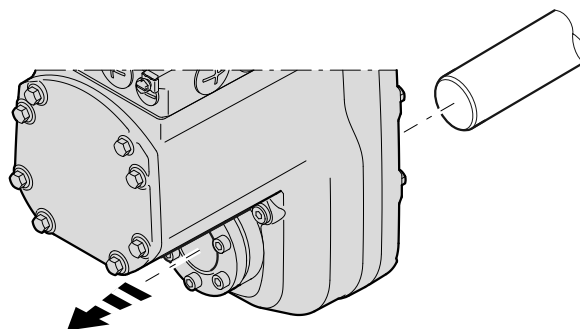
- Let the devices cool down before touching them.

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



9007220782951563

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.
4. Remove the gear unit from the shaft.



9007220783043595

5. Remove the shrink disk from the hub.

4.8.2 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.

4.9 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 (e.g. customer shaft with contact shoulder or clamping ring, shrink disk) with a touch guard.



NOTICE

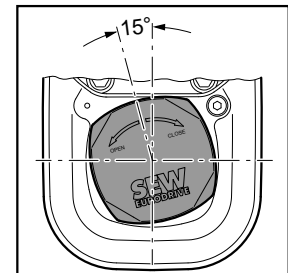
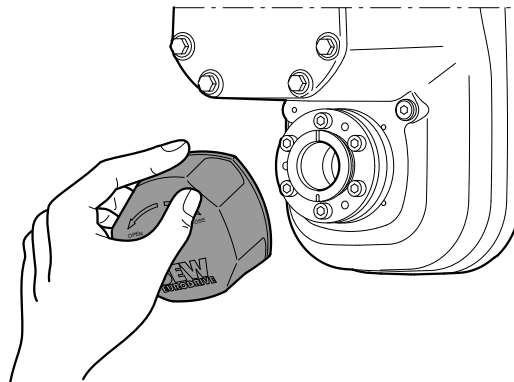
Impermissible use of the threads.

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.

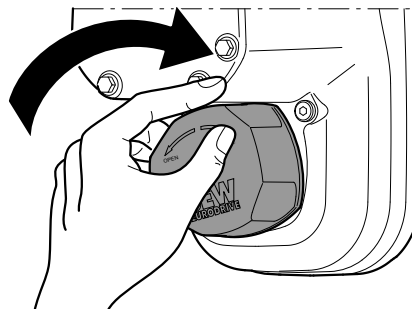
4.9.1 Installing the fixed cover

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



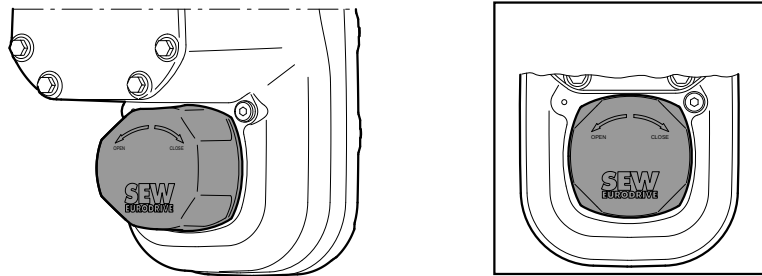
9007220768946955

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



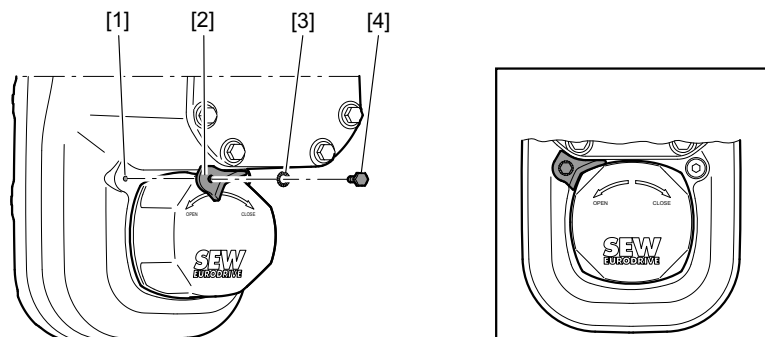
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3. The following figure shows the installed safety cover.



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4. Fasten the locking device in the bore provided for this purpose using the enclosed screw and serrated lock washer. The permitted tightening torque for the screw M4x10 is 3.3 Nm.



9007224601197451

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

4.9.2 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 the 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.

4.10 Torque arm



NOTICE

Improper assembly may damage the 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.
-

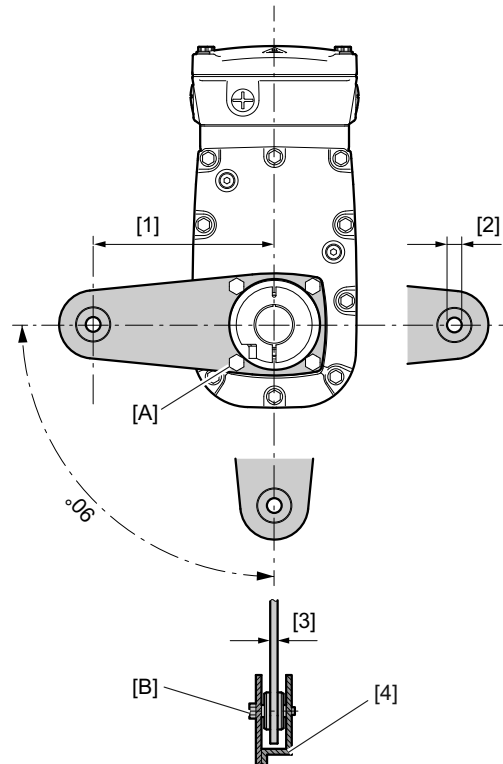


INFORMATION

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

4.10.1 Installation options

The following figure shows the possible mounting positions of the torque arm:



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- [1] Torque arm axis length
- [2] Bore diameter
- [3] Torque arm thickness
- [4] Bush with bearings on both ends

The following table shows the required tightening torques:

Drive	Torque arm				Tightening torque			
	Part number	[1] Axis length	[3] Thick- ness	[2] Bore Ø	Screw [A]		Screw [B]	
MGF.T1-..-C	23010371	120 mm	5 mm	11 mm	M8	27 Nm	M10	20 Nm
MGF.T2-..-C	24850497	130 mm	6 mm	13 mm	M10	48 Nm	M12	20 Nm
MGF.T2-..-C	24850357	160 mm	10 mm	13 mm	M10	48 Nm	M12	20 Nm
MGF.T4-..-C	24849405	160 mm	10 mm	13 mm	M12	70 Nm	M12	20 Nm

4.11 Tightening torques



▲ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

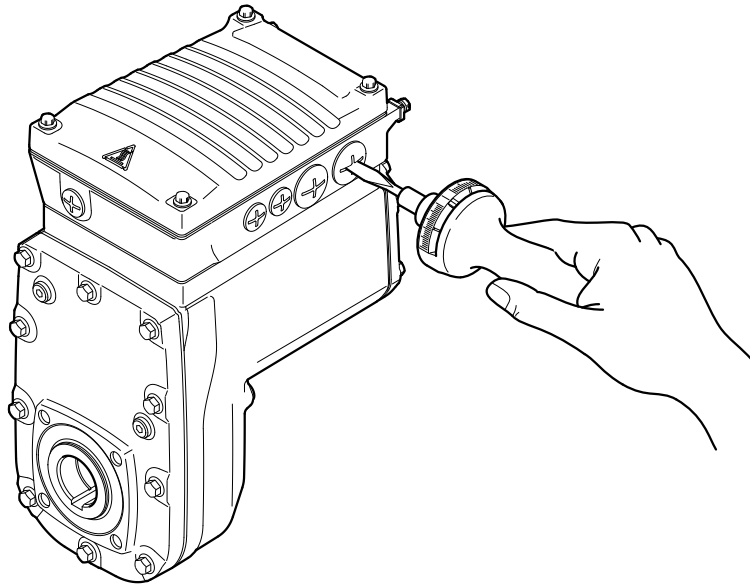
- Let the devices cool down before touching them.

4.11.1 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 the cable entries depends on the ordered variant.



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4.11.2 Cable glands

Tightening torques

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

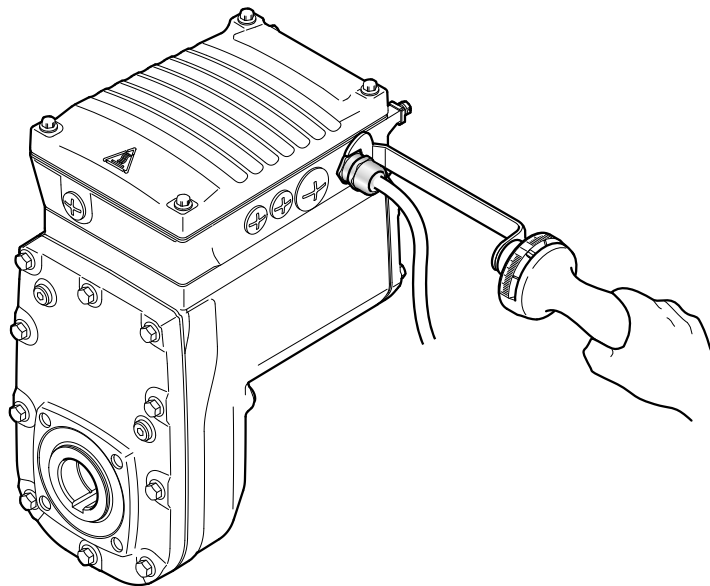
Screw fitting	Part number	Content	Size	Outer cable diameter	Tightening torque
EMC cable glands (nickel-plated brass)	18204783	10 pcs	M16 x 1.5	5 to 9 mm	4.0 Nm
	18204805	10 pcs	M25 x 1.5	11 to 16 mm	7.0 Nm
EMC cable glands (stainless steel)	18216366	10 pcs	M16 x 1.5	5 to 9 mm	4.0 Nm
	18216382	10 pcs	M25 x 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 the cable entries depends on the ordered variant.



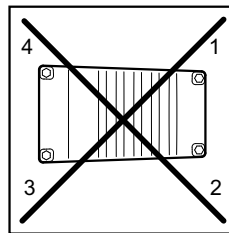
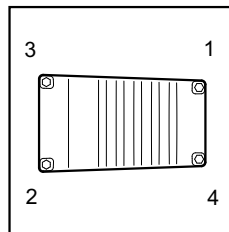
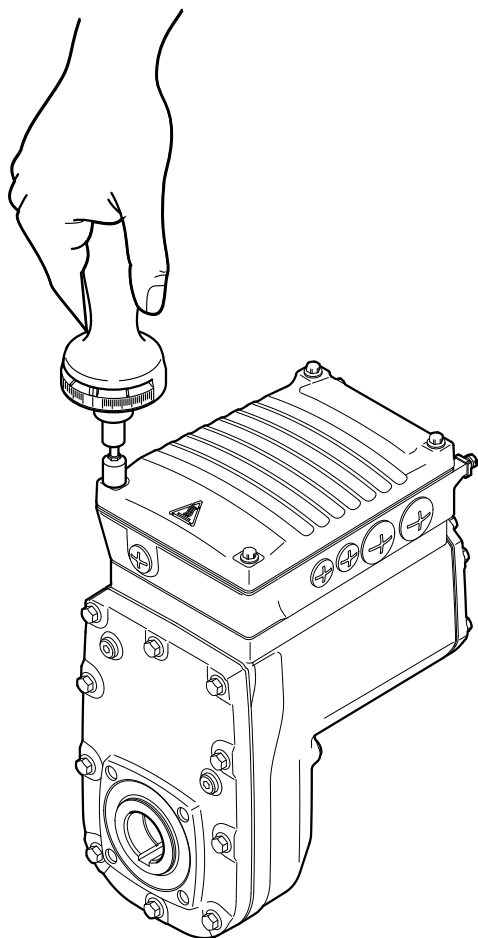
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4 Mechanical installation

Tightening torques

4.11.3 Cover

Proceed as follows when installing the cover: Insert the screws and tighten them in diametrically opposite sequence **step by step** with a tightening torque of 6.0 Nm.



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5 Electrical installation

INFORMATION



Adhere to the safety notes during installation.

5.1 Equipotential bonding

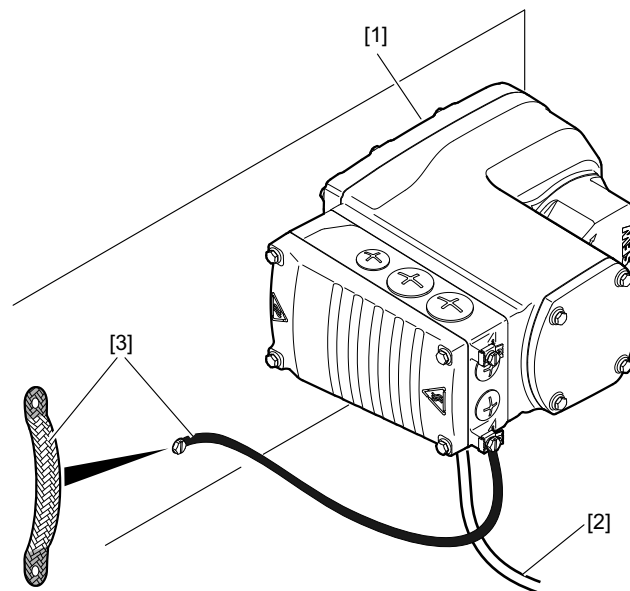
INFORMATION



For gearmotors in hollow-shaft design, **additional** Hf-capable equipotential bonding can be required independent of the mandatory PE connection. For this kind of drive (hollow shaft), high-frequency currents (e.g. by frequency inverters) are not ideally discharged to the system structure.

To minimize and/or prevent EMC interferences, additional **Hf-capable equipotential bonding** is recommended independent of the PE connection. This applies especially to optionally integrated signal electronics, such as: encoders, DDI slaves, etc. Equipotential bonding can be realized with the following measures:

- Shield, connected at both ends, for the motor cable [2].
- EMC-compliant equipotential bonding by highly flexible, fine-stranded PE conductor $\geq 6 \text{ mm}^2$ or by a ground strap (HF litz wire) [3]. The contact surfaces must be conductive (free of paint).

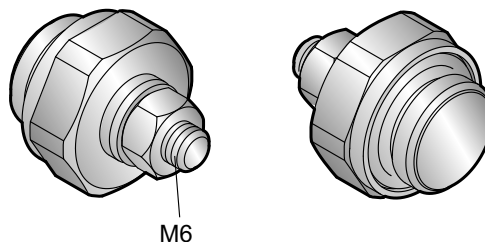


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- [1] The mechanical installation of a drive unit with hollow shaft does **not** create a conductive connection of drive unit and mounting plate.
- [2] Motor cable
- [3] Ground strap (HF litz wire)

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:



3884960907

	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 Thermal motor protection



NOTICE

Faulty installation.

Electromagnetic interference of the drives.

- Install the connecting lead of the PK (PT1000) separately from other power cables maintaining a distance of at least 200 mm. Laying together is only permitted if either the cable of the PK (PT1000) or the power cable is shielded.

5.3.2 Permitted cable cross section of terminals

Terminals X2 for motor connection

Observe the permitted cable cross section for installation work:

Terminals X2 for motor connection	
Connection cross section	0.5 mm ² – 6.0 mm ²
Stripping length	11 mm – 12 mm

Terminals X2_A for motor connection

Observe the permitted cable cross sections for installation:

Terminals X2_A for motor connection	Without conductor end sleeve	With conductor end sleeves (with or without plastic collar)
Connection cross section	0.08 mm ² – 4 mm ²	0.25 mm ² – 2.5 mm ²
Stripping length	8 mm – 9 mm	

Terminals X4 for temperature sensor

Observe the permitted cable cross sections for installation:

Terminals X4 for temperature sensor	Without conductor end sleeves	With conductor end sleeves (without plastic collar)	With conductor end sleeves (with plastic collar)
Connection cross section	0.2 mm ² – 1.5 mm ²	0.25 mm ² – 1.5 mm ²	0.25 mm ² – 0.75 mm ²
Stripping length	8 mm		

Terminals X10_A for temperature sensor

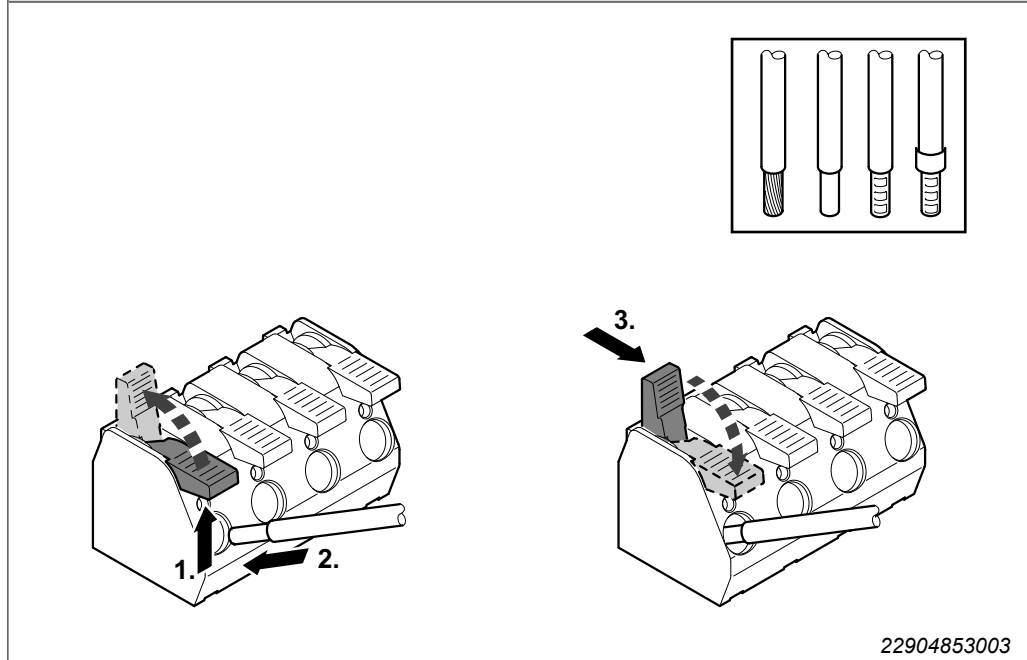
Observe the permitted cable cross sections for installation:

Terminals X10_A for temperature sensor	Without conductor end sleeves	With conductor end sleeves (without plastic collar)	With conductor end sleeves (with plastic collar)
Connection cross section	0.2 mm ² – 1.5 mm ²	0.25 mm ² – 1.5 mm ²	0.25 mm ² – 0.75 mm ²
Stripping length	8 mm		

5.3.3 Activating terminals X2 for motor connection

Adhere to the following sequence when activating the terminals X2 for motor connection:

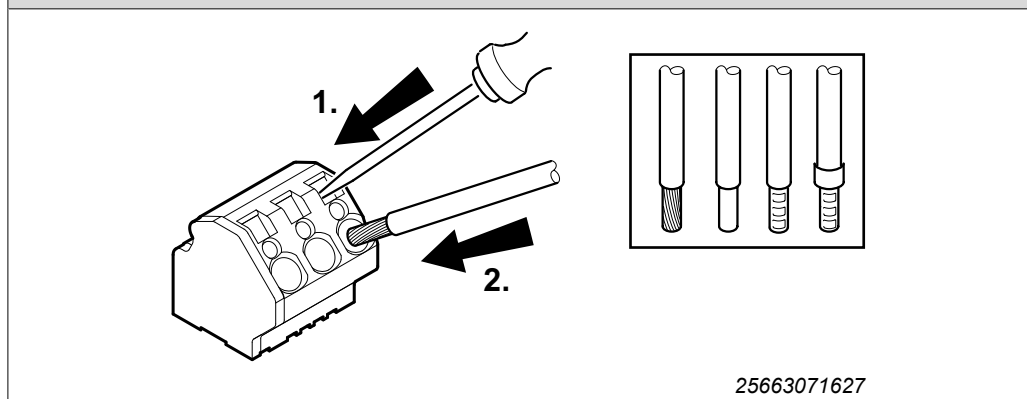
Terminals X2 for motor connection (the following figure shows a schematic illustration)



5.3.4 Activating terminals X2_A for the motor connection

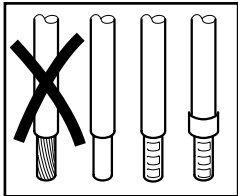
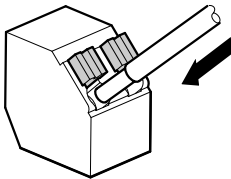
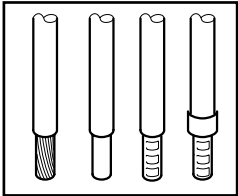
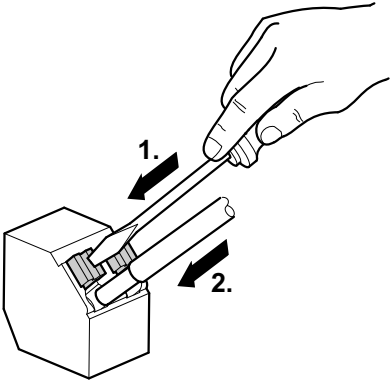
Adhere to the following sequence when you activate the terminals X2 for motor connection:

Terminals X2_A for motor connection (the following figure shows a schematic illustration)



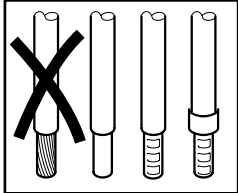
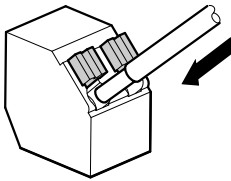
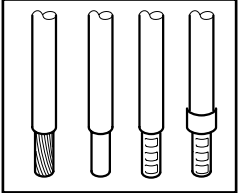
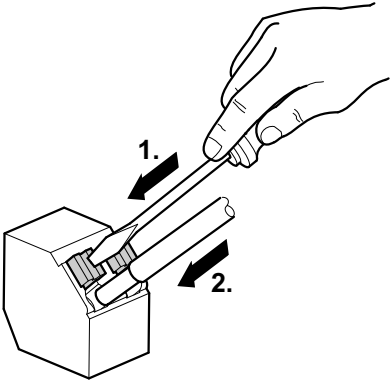
5.3.5 Activating terminals X4 for temperature sensor

Adhere to the following sequence when you activate the terminals X4 for motor connection:

Terminals X4 for temperature sensor (the following figure shows a schematic illustration)	
Connect conductor, without pushing the activation button.	Connect conductor, after pressing the activation button.
  22904860811	  22904932619
The following conductors can be installed directly (without tool) up to two cross-section sizes below the nominal cross section: • Single-wire conductors • Flexible conductors with end sleeves	When connecting the following conductors, you must press the actuation button on top to open the clamping spring: • Untreated, flexible conductors • Conductors with small cross sections that cannot be plugged in directly.

5.3.6 Activating terminals X10_A for the temperature sensor

Adhere to the following sequence when activating the terminals X10_A for the temperature sensor:

Terminals X10_A for the temperature sensor (the following figure shows a schematic illustration)	
Connect conductor, without pushing the activation button.	Connect conductor, after pressing the activation button.
  22904860811	  22904932619
The following conductors can be installed directly (without tool) up to two cross-section sizes below the nominal cross section: • Single-wire conductors • Flexible conductors with end sleeves	When connecting the following conductors, you must press the actuation button on top to open the clamping spring: • Untreated, flexible conductors • Conductors with small cross sections that cannot be plugged in directly.

5.3.7 Notes on PE connection

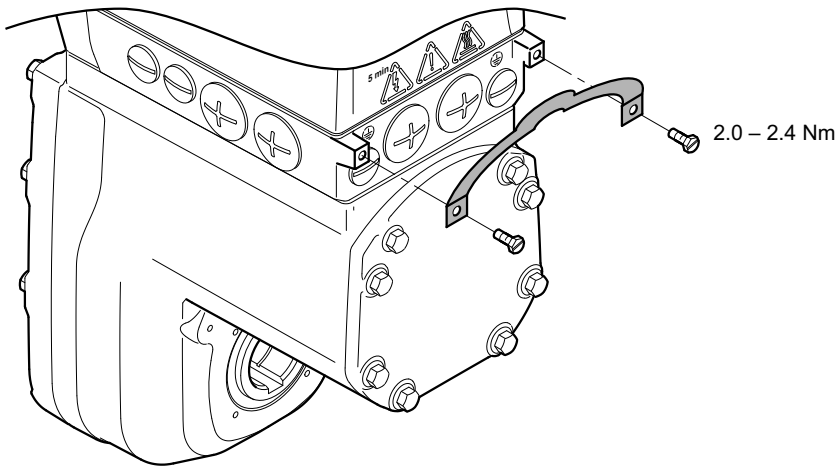


▲ WARNING

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.
- Observe the following notes regarding PE connection.

Make sure the handle has been removed before you connect the PE cable.
Store the handle for future service work.



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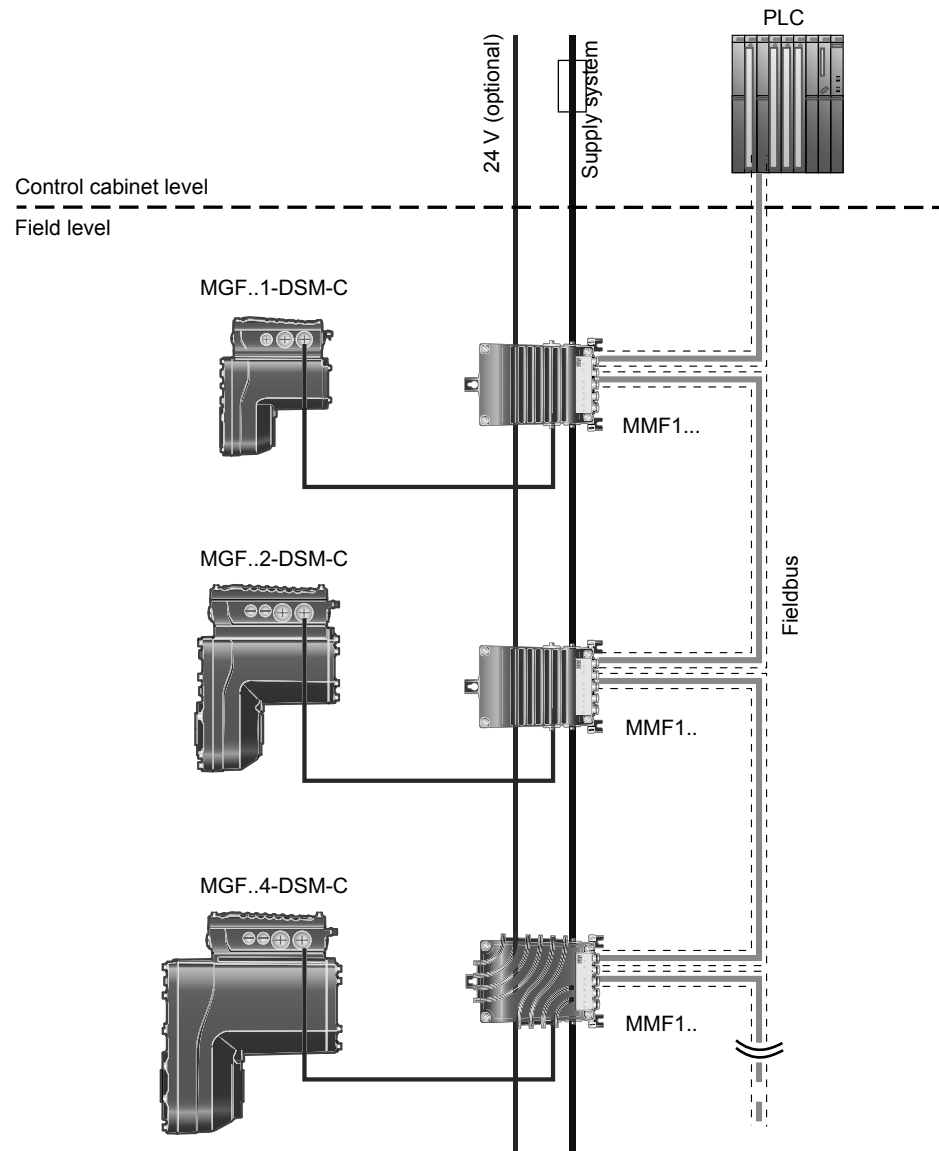
Impermissible assembly	Recommendation: Assembly with cable lug ¹⁾ Permitted for all cross sections	Assembly with solid connecting wire ¹⁾ Permitted for cross sections up to max. 2.5 mm ²

1) Use the specified material for the assembly that is included in the accessory bag.

[1] Forked cable lug suitable for M5 PE screws

5.4 Installation topology with MOVIMOT® flexible

The following figure shows a basic installation topology with MOVIMOT® flexible decentralized drive electronics. Observe the installation notes in the documentation of the inverter that you use.



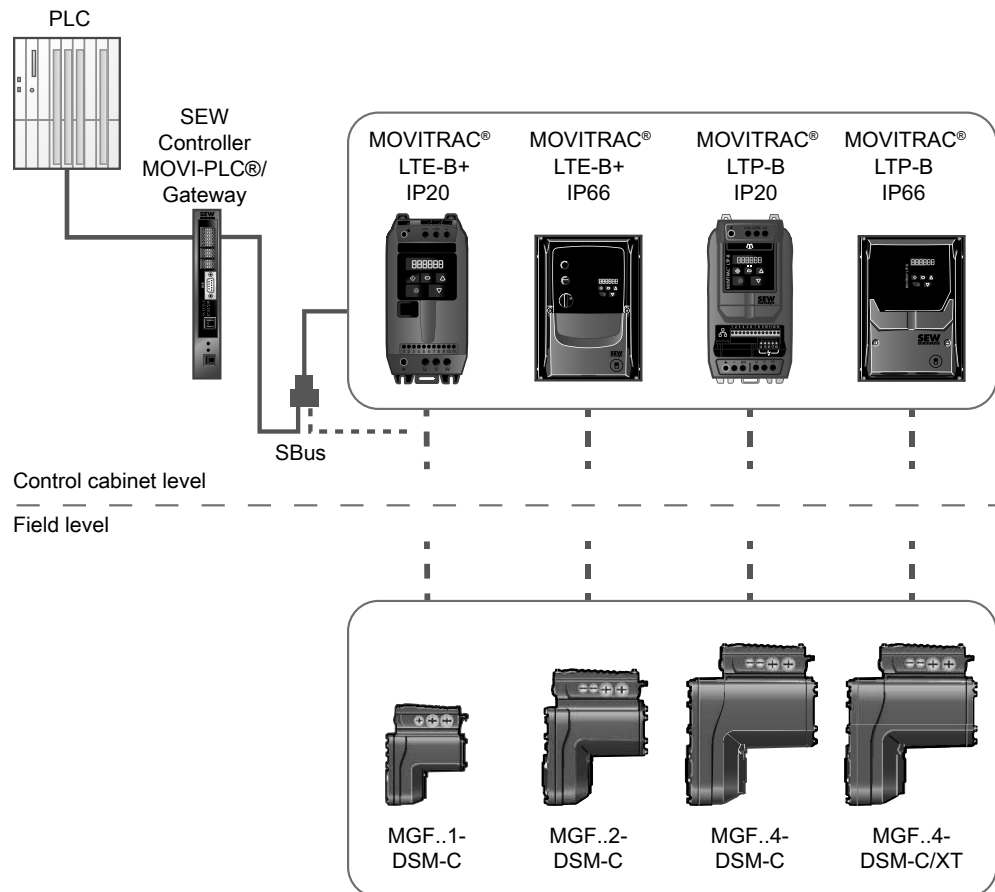
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5.5 Installation topology with MOVITRAC® LTP-B, LTE-B+ and MOVI-PLC® with CCU

The following figure shows a schematic installation topology with the frequency inverter MOVITRAC® LTP-B, LTE-B+, SEW-EURODRIVE controller MOVI-PLC® with CCU and MOVIGEAR® classic..

Observe the installation notes in the documentation of the inverter/controller that you use.

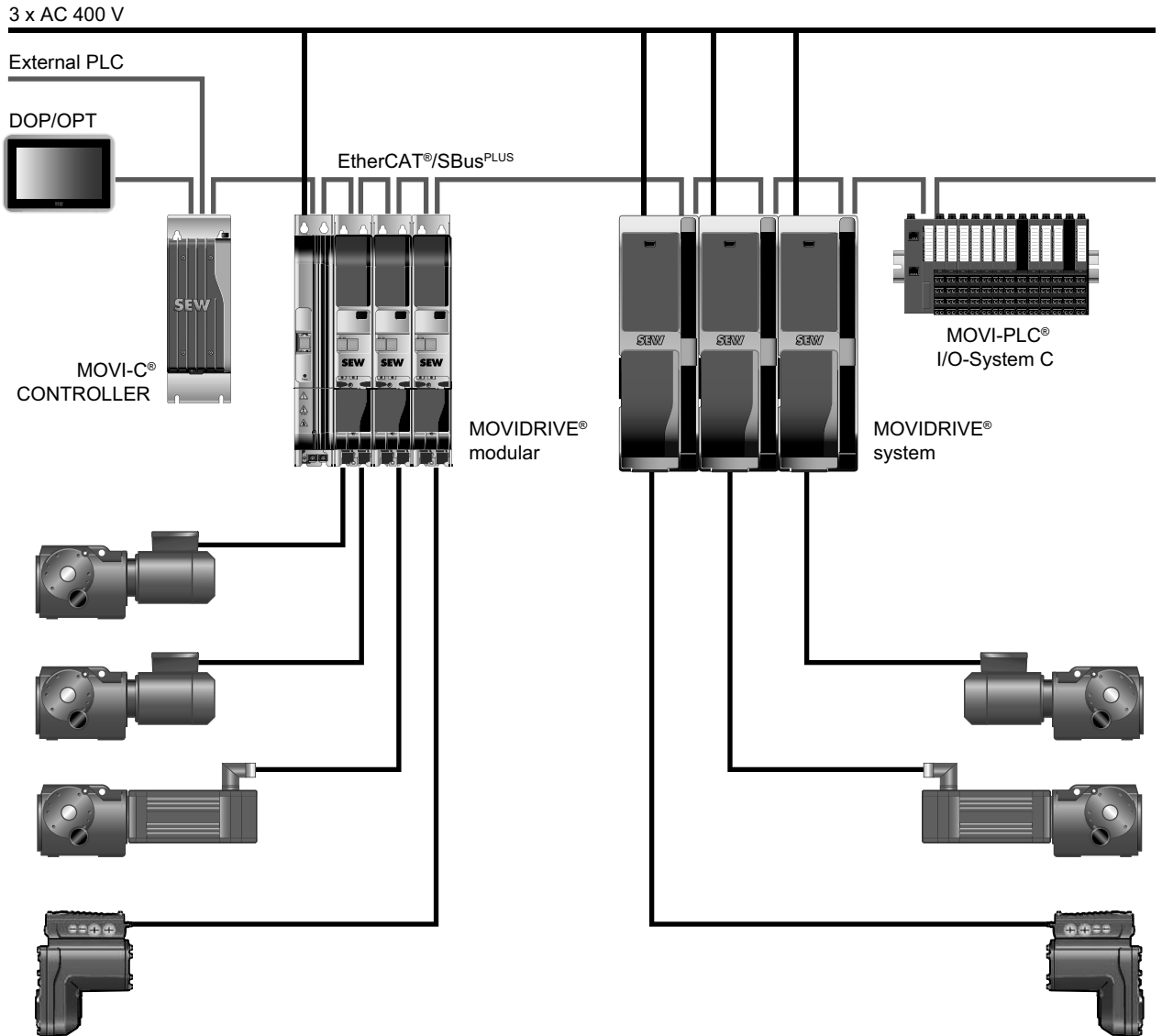


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5.6 Installation topology with MOVIDRIVE® and MOVI-C® CONTROLLER

The following figure shows a schematic installation topology with the MOVIDRIVE® modular application inverter, MOVIDRIVE® system, MOVI-C® CONTROLLER, and MOVIGEAR® classic by SEW-EURODRIVE.

Observe the installation notes in the documentation of the inverter/controller that you use.



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5.7 Terminal assignment

5.7.1 Terminal assignment for MGF..1-DSM-C



⚠ WARNING

Electric shock due to regenerative operation when the shaft is turning.
Severe or fatal injuries.

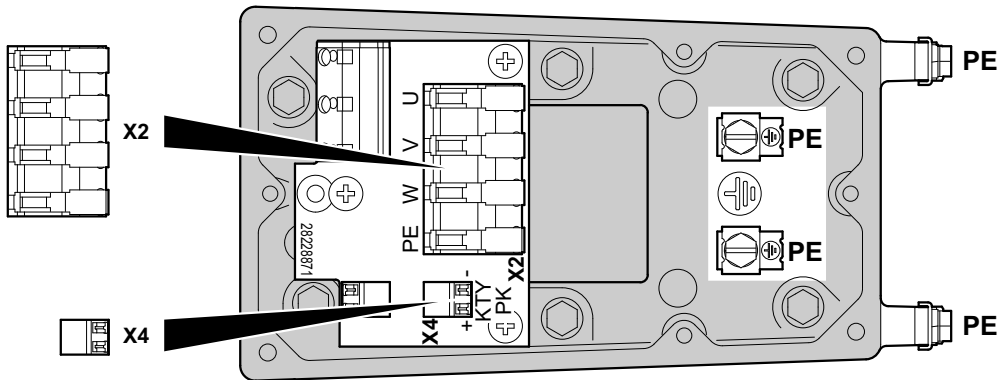
- Secure the output shaft against rotation while the cover is removed.



INFORMATION

It is essential that you observe the wiring instructions in the documentation of the frequency inverter that you use.

The following figure shows the terminal assignment of the MOVIGEAR® MGF..1-DSM-C drive unit:



Frequency inverter connection			
Terminal	Name		Function
X2 terminals for motor con- nection	PE		PE connection
	W		Phase W
	V		Phase V
	U		Phase U
⊕	PE		PE connection
X4 terminals for temperature sensor	KTY	+	Temperature sensor PK (PT1000) +
	PK		
	KTY	-	Temperature sensor PK (PT1000) -
	PK		

5.7.2 Terminal assignment MGF..2-DSM-C, MGF..4-DSM-C and MGF..4-DSM-C/XT

⚠ WARNING



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

Severe or fatal injuries.

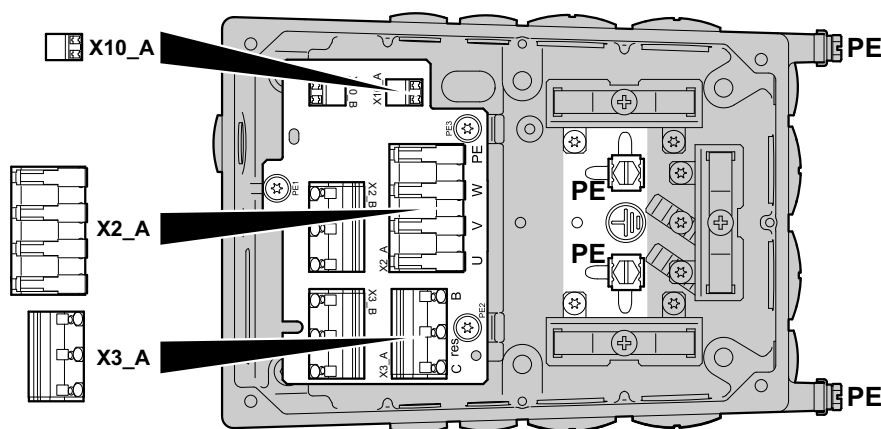
- Secure the output shaft against rotation while the cover is removed.

INFORMATION



It is essential that you observe the wiring instructions in the documentation of the frequency inverter that you use.

The following image shows the terminal assignment of the MOVIGEAR® MGF..2-DSM-C drive unit (without MOVILINK® DDI Slave, without encoder):



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Frequency inverter connection			
Terminal	Name	Marking	Function
X2_A terminals for motor con- nection	U	—	Phase U
	V	—	Phase V
	W	—	Phase W
	PE	—	PE connection
⊕	PE	—	PE connection
X3_A	C	Pink	Reserved
	Res.	—	Reserved
	B	Orange	Reserved
X10_A terminals for temperature sensor	KTY PK +	—	Temperature sensor PK (PT1000) +
	KTY PK -	—	Temperature sensor PK (PT1000) -

This terminal assignment also applies to MOVIGEAR® MGF..4-DSM-C and MGF..4-DSM-C/XT.

5.7.3 Terminal assignment MGF..2-DSM-C/DI, MGF..4-DSM-C/DI and MGF..4-DSM-C/XT/DI



▲ WARNING

Electric shock due to regenerative operation when the shaft is turning.
Severe or fatal injuries.

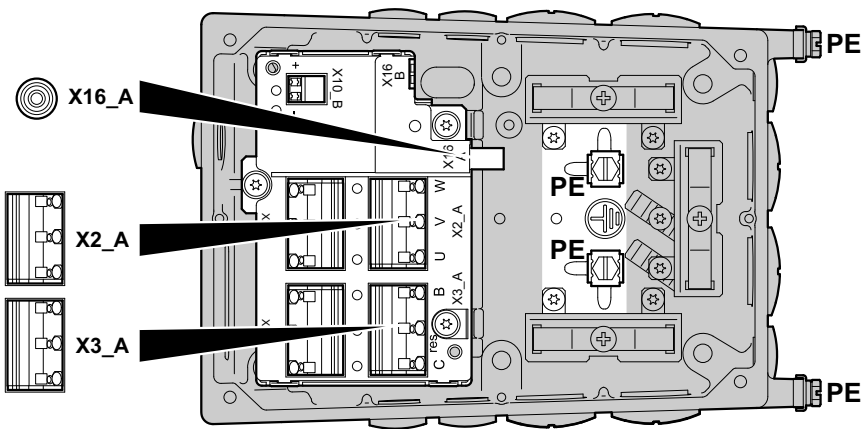
- Secure the output shaft against rotation while the cover is removed.



INFORMATION

It is essential that you observe the wiring instructions in the documentation of the frequency inverter that you use.

The following image shows the terminal assignment of the MOVIGEAR® MGF..2-DSM-C/DI drive unit (with MOVILINK® DDI Slave, without encoder):



Frequency inverter connection			
Terminal	Name	Marking	Function
X2_A terminals for motor con- nection	U	–	Phase U
	V	–	Phase V
	W	–	Phase W
	PE	–	PE connection
X3_A	C	Pink	Reserved
	Res.	–	Reserved
	B	Orange	Reserved
X16_A MOVILINK® DDI interface	DDI	–	MOVILINK® DDI interface

This terminal assignment also applies to MOVIGEAR® MGF..4-DSM-C/DI and MGF..4-DSM-C/XT/DI.

5.7.4 Terminal assignment MGF..2-DSM-C/DI/AZ1Z, MGF..4-DSM-C/DI/AZ1Z and MGF..4-DSM-C/XT/DI/AZ1Z



▲ WARNING

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

Severe or fatal injuries.

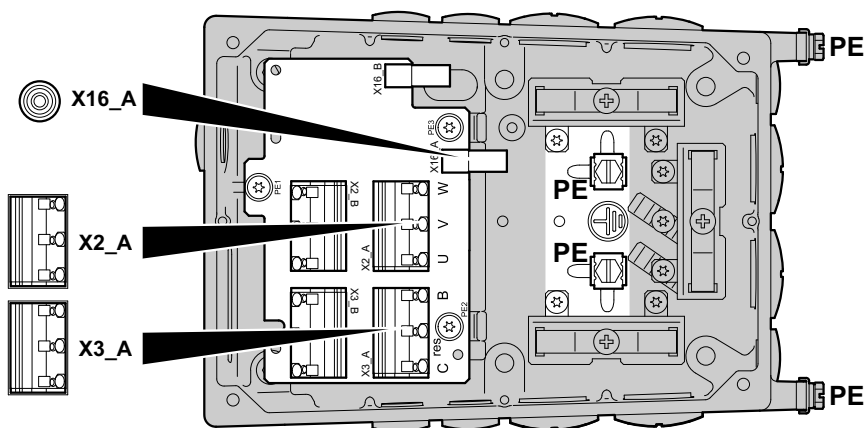
- Secure the output shaft against rotation while the cover is removed.



INFORMATION

It is essential that you observe the wiring instructions in the documentation of the frequency inverter that you use.

The following image shows the terminal assignment of the MOVIGEAR® MGF..2-DSM-C/DI/AZ1Z drive unit (with MOVILINK® DDI Slave, with AZ1Z encoder):



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Frequency inverter connection			
Terminal	Name	Marking	Function
X2_A terminals for motor con- nection	U	—	Phase U
	V	—	Phase V
	W	—	Phase W
⊕	PE	—	PE connection
X3_A	C	Pink	Reserved
	Res.	—	Reserved
	B	Orange	Reserved
X16_A MOVILINK® DDI interface	DDI	—	MOVILINK® DDI interface

This terminal assignment also applies to MOVIGEAR® MGF..4-DSM-C/DI/AZ1Z and MGF..4-DSM-C/XT/DI/AZ1Z.

5.8 Thermal motor protection



NOTICE

Overheating of the device due to the low thermal time constants of the winding.

Possible damage to property.

- In addition to the temperature sensor also activate current monitoring (I^2t , effective current monitoring), or activate a motor model for thermal protection, providing your inverter supports such functions.

5.8.1 PK (PT1000) temperature sensor



NOTICE

Damage to the temperature sensor and the motor winding caused by excessive test currents.

Possible damage to property.

- Use test currents $< 3 \text{ mA}$ in the PK (PT1000) circuit. Doing so avoids excessive self-heating of the temperature sensor and consequently prevents its insulation and the motor winding from damage.

For detailed information about how to connect the PK (PT1000) temperature sensor, refer to chapter "Terminal assignment".

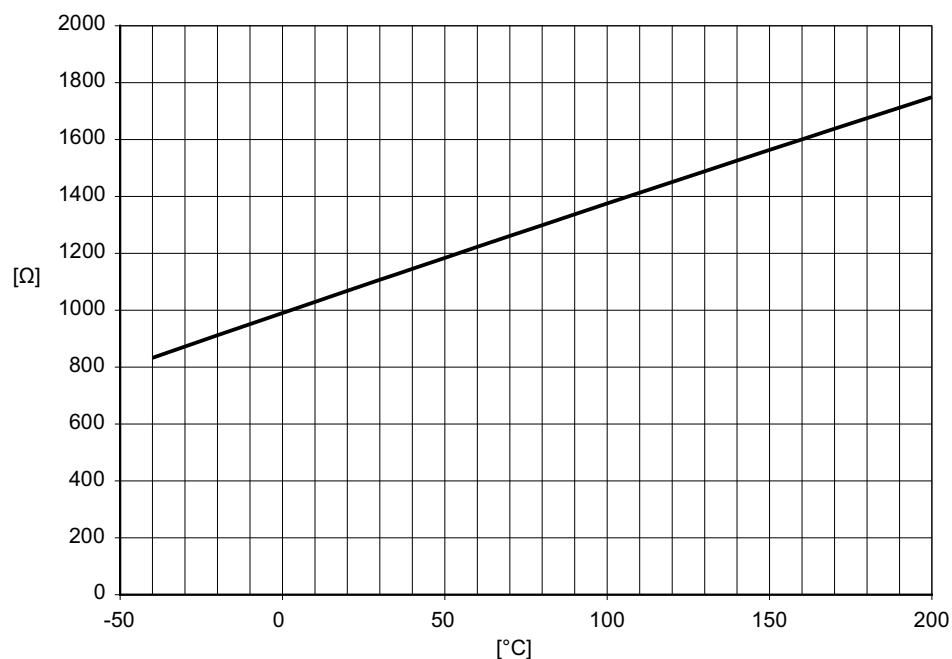
Typical characteristic curve

INFORMATION



The temperature sensor is unipolar which means that interchanging the incoming cables does not change the measurement result.

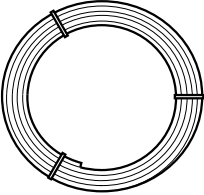
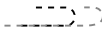
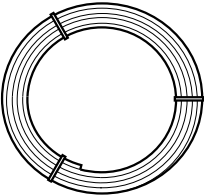
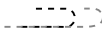
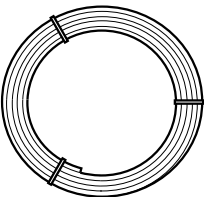
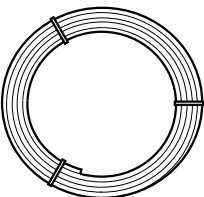
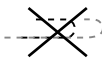
The following figure shows a typical characteristic curve of the PK (PT1000):



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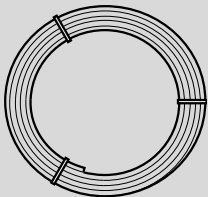
5.9 Bulk cable

5.9.1 Brakemotor cable for motors with digital interface MOVILINK® DDI

Connection cable	Conformity/ Operating voltage	Cable reel/in- stallation type	Cable type/ properties	Cable cross section/part number
Motor connection with MOVILINK® DDI  Open cable end (not prefabricated)	CE UL AC 500 V	100 m 200 m 	LEONI LEHC 005796 Halogen-free	1.5 mm ² 28123336
Motor connection with MOVILINK® DDI  Open cable end (not prefabricated)	CE UL AC 500 V	100 m 200 m 	LEONI LEHC 005770 Halogen-free	2.5 mm ² 28123344
Motor connection with MOVILINK® DDI  Open cable end (not prefabricated)	CE UL AC 500 V	100 m 200 m 	LEONI LEHC 005775	1.5 mm ² 28123395
Motor connection with MOVILINK® DDI  Open cable end (not prefabricated)	CE UL AC 500 V	100 m 200 m 	LEONI LEHC 005776	2.5 mm ² 28123409

Connection of bulk cables

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

Part numbers							
28123336, 28123344, 28123395, 28123409							
Connection description							
Bulk cable			Motor connection depending on brake control				
			Without brake	3-wire brake AC 110-500 V	2-wire brake DC 24 V	Brake rectifier integrated in motor	Brake rectifier integrated in motor
				(BE/BZ brake)	BK/BP brake	BGI500	BGI24
Core color/ Core cross section	Identification	Signal	Description				
Black 1.5 or 2.5 mm ²	U/L1	U	Motor phase connection U				
Black 1.5 or 2.5 mm ²	V/L2	V	Motor phase connection V				
Black 1.5 or 2.5 mm ²	W/L3	W	Motor phase connection W				
Green/yellow 1.5 or 2.5 mm ²	–	PE	PE connection				
Purple coaxial cable	-	DDI	MOVILINK® DDI connection				
Yellow 1.0 mm ²	A	Brake A	Reserved ¹⁾	Reserved ¹⁾	Brake -	Reserved ¹⁾	0V24 ³⁾
Orange 1.0 mm ²	B	B brake	Reserved ¹⁾	Brake 15	Reserved ¹⁾	L2(N) ²⁾	+DC 24 V ³⁾
Pink 1.0 mm ²	C	Brake C	Reserved ¹⁾	Brake 13	Reserved ¹⁾	Reserved ¹⁾	Reserved ¹⁾
Purple 1.0 mm ²	D	Brake D	Reserved ¹⁾	Brake 14	Brake +	L1 ²⁾	Reserved ¹⁾

1) Reserved wires must be isolated and fixed in the wiring space.

2) Supply voltage of the brake rectifier (voltage depends on nominal voltage of the brake AC 110-500 V)

3) Supply voltage of the brake rectifier (DC 24 V)

5.10 Plug connectors

5.10.1 Representation of connections

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

5.10.2 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) In case of several plug connectors in one group

5.10.3 Connection cables



INFORMATION

For more information on cable types, refer to the chapter "Technical data".

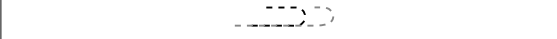
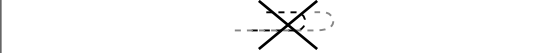
Connection cables are not included in the delivery.

Prefabricated cables for connecting SEW-EURODRIVE components can be ordered. For each connection, the available prefabricated cables are listed. 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 type of the device and the components to be connected. This is why you do not need all listed cables.

Cable types

The table below shows the depiction and what they mean:

Representation	Meaning
	Fixed length
	Variable length
	Suitable for cable carriers
	Not suitable for cable carriers

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".

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 unit 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 unit or system of units might be affected inadvertently when using non-SEW cables. This concerns in particular the following properties:

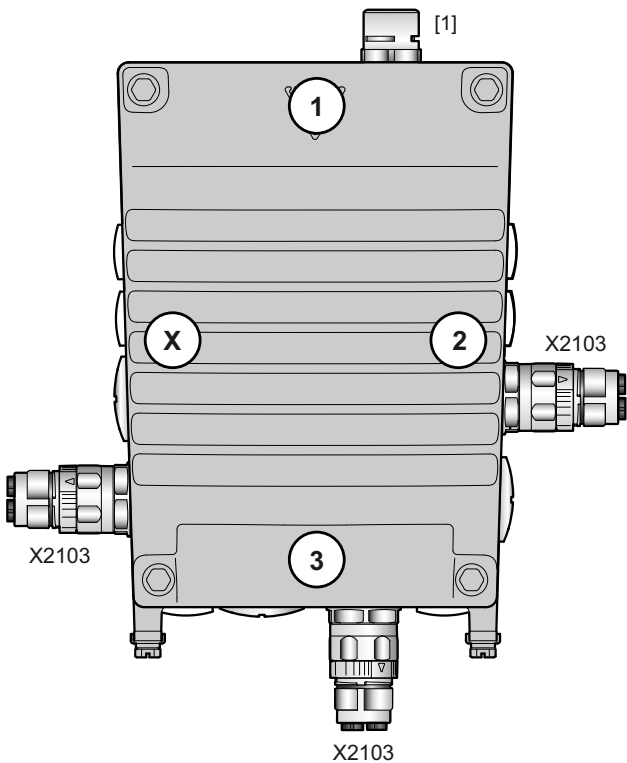
- Mechanical properties (e.g. IP degree of protection, cable carrier suitability)
- Chemical properties (e.g. silicone and halogen free, resistance to substances)
- Thermal properties (e.g. thermal stability, increase in unit temperature, flammability class)
- EMC behavior (such as interference emission 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

5.10.4 MGF..2-DSC-C, MGF..4-DSC-C, MGF..4-DSC-C/XT plug connector positions

The following figure shows possible plug connector positions:



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Plug connector			
Designation	Coding ring color	Function	Position
X2103	Without coding ring	Connecting the inverter of drive units with digital interface (MOVILINK® DDI)	X, 2 or 3
–	–	[1] Optional pressure compensation	1

5.10.5 Plug connector variants

M23 plug connector



⚠ 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.

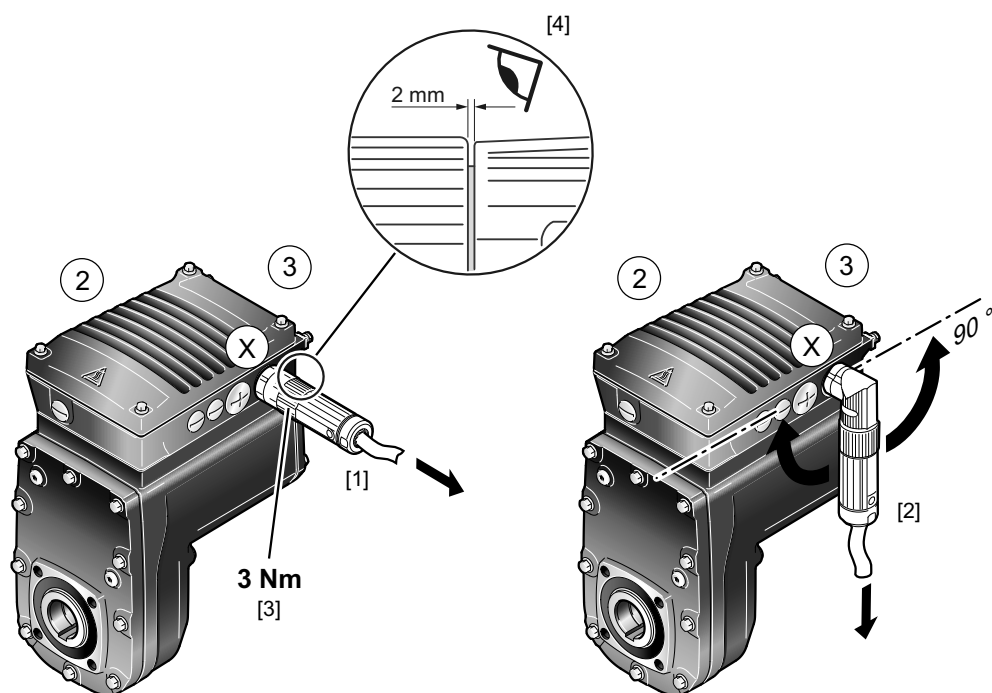
- Adjust the plug connector only when installing and connecting the drive unit.
- Do not turn the plug connector regularly once it has been installed.

The 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® classic



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- [1] "Straight" design
- [2] "Angled" design
- [3] The tightening torque for the union nut is 3 Nm.
You can order suitable tools from TE Connectivity - Intercontec products 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] Between plug connector and bushing is a gap of 2 mm.

5.10.6 Using plug connectors assembled by yourself

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

Contact TE Connectivity - Intercontec products if the order designation is not available in the online order system of Intercontec.

5.11 Optional plug connector assignment



⚠ WARNING

Electric shock when disconnecting or connecting voltage-carrying plug connectors.

Severe or fatal injuries

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

5.11.1 X2103 (Option /KD1): Motor connection for units with digital interface (MOVILINK® DDI)

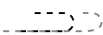
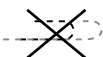
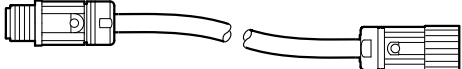
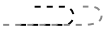
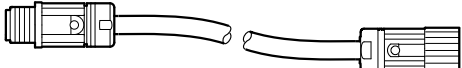
The following table shows information about this connection:

Function		
Motor connection for units with digital interface (MOVILINK® DDI)		
Connection type		
M23, male, male thread, TE Connectivity - Intercontec Products, series 723, SEW insert, SpeedTec equipment, coding ring: without, protected against contact		
Connection diagram		
Assignment		
Contact	Signal	Description
U	U	Motor connection , phase U
V	V	Motor connection , phase V
W	W	Motor connection , phase W
A	Brake A	Reserved
B	B brake	Reserved
C	Brake C	Reserved
D	Brake D	Reserved
PE	PE	PE connection
DDI	DDI	MOVILINK® DDI

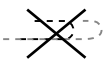
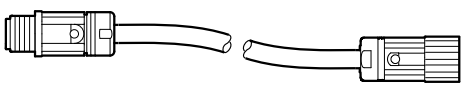
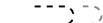
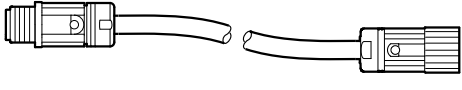
Connection cables

The following tables list the cables available for this connection:

Cable cross section 1.5 mm²

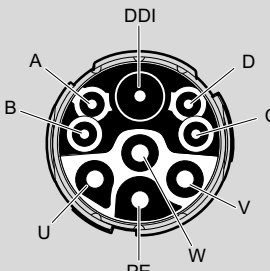
Connection cable	Conformity/ part num- ber	Cable type	Length/in- stallation type	Cable cross sec- tion/operat- ing voltage
 M23, without coding ring, fe- male Open	CE/UL: 28123743	LEONI LEHC 005769	Variable 	1.5 mm ² / AC 500 V
 M23, without coding ring, fe- male Open	CE/UL: 28123805	LEONI LEHC 005775	Variable 	1.5 mm ² / AC 500 V
 M23, without coding ring, male M23, without coding ring, fe- male	CE/UL: 28123859	LEONI LEHC 005769	Variable 	1.5 mm ² / AC 500 V
 M23, without coding ring, male M23, without coding ring, fe- male	CE/UL: 28123905	LEONI LEHC 005775	Variable 	1.5 mm ² / AC 500 V

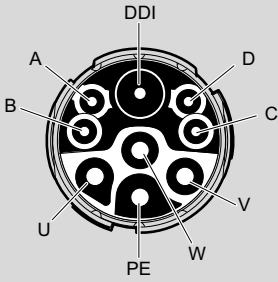
Cable cross section 2.5 mm²

Connection cable	Conformity/ part num- ber	Cable type	Length/in- stallation type	Cable cross sec- tion/operat- ing voltage
 M23, without coding ring, fe- male Open	CE/UL: 28123751	LEONI LEHC 005770	Variable 	2.5 mm ² / AC 500 V
 M23, without coding ring, fe- male Open	CE/UL: 28123816	LEONI LEHC 005776	Variable 	2.5 mm ² / AC 500 V
 M23, without coding ring, male M23, without coding ring, fe- male	CE/UL: 28123867	LEONI LEHC 005770	Variable 	2.5 mm ² / AC 500 V
 M23, without coding ring, male M23, without coding ring, fe- male	CE/UL: 28123913	LEONI LEHC 005776	Variable 	2.5 mm ² / AC 500 V

Connection of cables with open end

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

Part numbers									
28105818, 18191541, 28105826, 18191568									
Prefabrication									
Open cable end			Motor connection depending on brake control					Prefabricated plug connectors	
			Without brake	3-wire brake AC 110-500 V	2-wire brake DC 24 V	Brake rectifier	Brake rectifier		
				(BE/BZ brake)	BK/BP brake	BGI500	BGI24		
Core color/ core cross section	Identification	Prefabrication	Description					Signal	Contact
Black 1.5 or 2.5 mm ²	U/L1	Not pre-fabricated	Motor phase connection U					U	U
Black 1.5 or 2.5 mm ²	V/L2	Not pre-fabricated	Motor phase connection V					V	V
Black 1.5 or 2.5 mm ²	W/L3	Not pre-fabricated	Motor phase connection W					W	W
Green/yellow 1.5 or 2.5 mm ²	-	Not pre-fabricated	PE connection					PE	PE
Purple coaxial cable	-	Coaxial connector	MOVILINK® DDI connection					DDI	DDI
Yellow 1.0 mm ²	A	Not pre-fabricated	Reserved ¹⁾	Reserve d ¹⁾	Brake -	Reserve d ¹⁾	0V24 ²⁾	Brake A	A
Orange 1.0 mm ²	B	Not pre-fabricated	Reserve d ¹⁾	Brake 15	Reserve d ¹⁾	L2(N) ³⁾	+DC 24 V ²⁾	Brake B	B
Pink 1.0 mm ²	C	Not pre-fabricated	Reserve d ¹⁾	Brake 13	Reserve d ¹⁾	Reserve d ¹⁾	Reserved ¹⁾	Brake C	C

Prefabrication									
Open cable end			Motor connection depending on brake control					Prefabricated plug connectors	
			Without brake	3-wire brake AC 110-500 V	2-wire brake DC 24 V	Brake rectifier	Brake rectifier		
				(BE/BZ brake)	BK/BP brake	BGI500	BGI24		
Core color/ core cross section	Identification	Prefabrication	Description					Signal	Contact
Purple 1.0 mm ²	D	Not pre-fabricated	Reserved d ¹⁾	Brake 14	Brake +	L1 ³⁾	Reserved ¹⁾	Brake D	D

1) Reserved wires must be isolated and fixed in the wiring space.

2) Supply voltage of the brake rectifier (DC 24 V)

3) Supply voltage of the brake rectifier (voltage depends on nominal voltage of the brake AC 110-500 V)

6 Startup

6.1 Startup notes

INFORMATION



- It is essential to comply with the safety notes during startup.
- Correct project planning for the drive is a prerequisite for successful startup. See chapter "Project Planning" for more information.
- The motor speed must not exceed 2000 min^{-1} . Set the maximum speed on the frequency inverter. For information on the procedure, refer to the documentation of the frequency inverter.



⚠ 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 device if the protection covers are not installed.



⚠ WARNING

Electric shock caused by dangerous voltages in the connection box.

Severe or fatal injuries.

- Before removing the connection box cover, de-energize unit via a suitable external disconnection device.
- Secure the device against unintended re-connection of the voltage supply.



⚠ WARNING

Risk of burns due to hot surfaces.

Serious injuries.

- Let the devices cool down before touching them.

6.2 Startup requirements

6.2.1 Before startup

Make sure the following requirements are met before startup:

- The drive unit is undamaged and not blocked.
- The measures stipulated in chapter "Extended storage of motors" are performed after extended storage periods.
- All connections are installed correctly.
- The direction of rotation on the drive unit matches the application.
- All protective covers are installed correctly.
- All motor protection equipment is active and set for the rated motor current.
- In general, there must be no other sources of danger present.
- The surface of the drive unit must not be covered by heat-sensitive or insulating materials.

6.2.2 During startup

Make sure that the motor is running correctly during startup. During startup, none of the following problems must occur:

- Overload
- Speed fluctuations
- Loud noises
- Noticeable vibrations etc.

In case of problems, refer to chapter "Service".

7 Service



NOTICE

Improper work on the 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 department.

7.1 Malfunctions of the mechanical drive

The following table shows troubleshooting options for malfunctions of the mechanical drive:

Fault	Possible cause	Measure
Unusual, regular running noise	Meshing/grinding noise: Bearing damage	Contact SEW-EURODRIVE Service
Unusual, regular running noise	Knocking noise: Irregularity in the gearing	Contact SEW-EURODRIVE Service
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 the output-side oil seal	Oil seal defective Short-term oil and/or grease leakage at the oil seal is possible in the run- in phase (24 hours running time).	Replace oil seal
Oil leaking from the output-side oil seal	Too much oil Short-term oil and/or grease leakage at the oil seal is possible in the run- in phase (24 hours running time).	Correct the oil quantity

Fault	Possible cause	Measure
Oil leaking from the out-put-side oil seal	Drive installed in the wrong mounting position or breather valve installed in wrong position. Short-term oil and/or grease leakage at the oil seal is possible in the run-in phase (24 hours running time).	Install the breather valve correctly
Output shaft does not turn even though the motor is running	Shaft-hub connection in the gear unit interrupted	Send in the drive unit for repair
Drive unit does not start	Supply cable interrupted	Check connections, correct if necessary
Drive unit does not start	Fuse blown	Replace fuse
Drive unit does not start	Motor protection tripped	Check motor protection for correct setting, correct fault if necessary
Drive unit does not start	Frequency inverter defective, overloaded, incorrectly wired, or incorrectly set	Check frequency inverter, check wiring
Incorrect direction of rotation	Incorrect setpoint polarity	Check frequency inverter, check setpoints
Drive unit hums and has high current consumption	Drive is blocked	Check drive
Drive unit hums and has high current consumption	Frequency inverter set incorrectly	Check frequency inverter
Drive unit heats up excessively (measure temperature, significantly higher than 100 °C)	Overload	Measure power, use larger drive unit or reduce load if necessary, check travel profile
Drive unit heats up excessively (measure temperature, significantly higher than 100 °C)	Ambient temperature too high	Observe permitted temperature range
Drive unit heats up excessively (measure temperature, significantly higher than 100 °C)	Insufficient cooling	Correct cooling air supply or clear cooling air passages
Drive unit heats up excessively (measure temperature, significantly higher than 100 °C)	Nominal duty type (S1 to S10, EN 60034-1) exceeded, e.g. due to excessive effective torque	Adjust nominal duty type to required operating conditions; if necessary, call in a specialist to determine the correct drive

Fault	Possible cause	Measure
Drive unit heats up excessively (measure temperature, significantly higher than 100 °C)	Frequency inverter not optimized	Check frequency inverter

7.2 Device replacement



⚠ WARNING

Electric shock caused by dangerous voltages in the connection box.

Severe or fatal injuries.

- Before removing the connection box cover, de-energize unit via a suitable external disconnection device.
- Secure the device against unintended re-connection of the voltage supply.



⚠ WARNING

Improper installation/disassembly of 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).

7.2.1 Replacing the drive unit

1. Observe the safety notes.
2. Install the lifting eyes to the drive unit, see chapter "Service" > "Unit replacement" > "Installing the lifting eyes".
3. Disassemble the drive unit. Observe the notes in chapter "Mechanical Installation".
4. Compare the data on the nameplates of the old drive unit to the data on the nameplates 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. Remove the lifting eyes from the new drive unit. Store the lifting eyes for future service work.
7. Perform the installation according to the "Electrical Installation" chapter.
8. Observe the notes in chapter "Startup" > "Startup requirements".
9. Place the cover onto the connection box and screw it on.
10. Supply voltage to the drive.
11. Check the functions of the new drive unit.

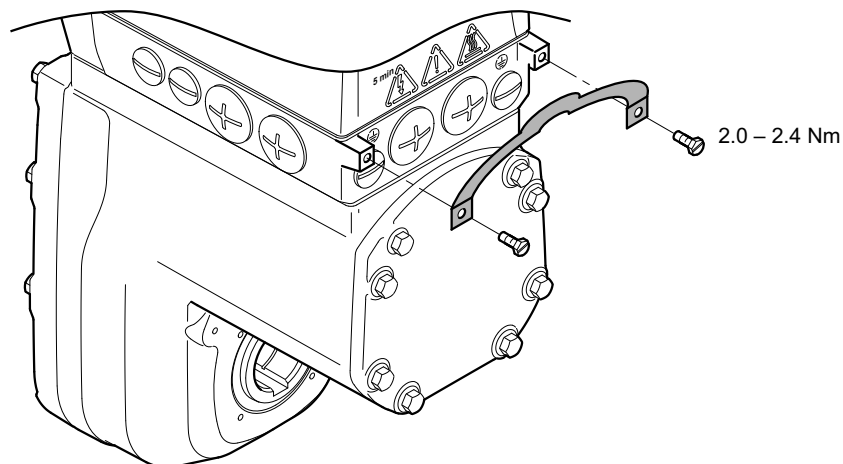
7.2.2 Installing the handle

1. Remove the PE connection cable.
2. Install handle eye for transportation as depicted in the following image:

INFORMATION



The following figure shows an example for the handle. Various designs are used, depending on the size.



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7.3 SEW-EURODRIVE Service

7.3.1 Sending in a unit for repair

If a fault cannot be repaired, please contact SEW-EURODRIVE Service (see "Address list").

Please always specify the digits of the status label when you contact the SEW electronics service so our Service personnel can assist you more effectively.

Provide the following information when sending the device in for repair:

- Serial number (see nameplate)
- Type designation
- Unit design
- Short description of the application (application, control type, etc.)
- Nature of the fault
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

7.4 Shutdown



⚠ WARNING

Electric shock caused by dangerous voltages in the connection box.

Severe or fatal injuries.

- Before removing the connection box cover, de-energize unit via a suitable external disconnection device.
- Secure the device against unintended re-connection of the voltage supply.

To shut down the unit, de-energize the unit using appropriate measures.

7.5 Storage

Observe the following instructions when shutting down or storing the device:

- If you shut down and store the device for a longer 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 temperature in chapter "Technical data".

7.6 Extended storage

7.6.1 Drive



NOTICE

Volatilization of the VCI anti-corrosion agent

Possible damage to property

- 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. Drive units in this design are designated with a corresponding label.

The lubricant of those drive units is then mixed with a VCI anti-corrosion agent (volatile corrosion inhibitors). Please note that this VCI anti-corrosion agent is only effective in a temperature range of -25 °C to +50 °C. The shaft ends are also treated with an anti-corrosion agent. Drive units of the "extended storage" design are equipped with OS2 surface protection without further notice. Instead of OS2, you can order OS3. For further information refer to the chapter "Surface protection".

7.6.2 Storage conditions

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

Climate zone	Packaging ¹⁾	Storage location ²⁾	Storage duration
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in 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 the 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 the 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.

7.7 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 of 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.

8 Inspection and maintenance

8.1 Inspection and maintenance intervals

The following table shows the inspection and replacement intervals for the drive units:

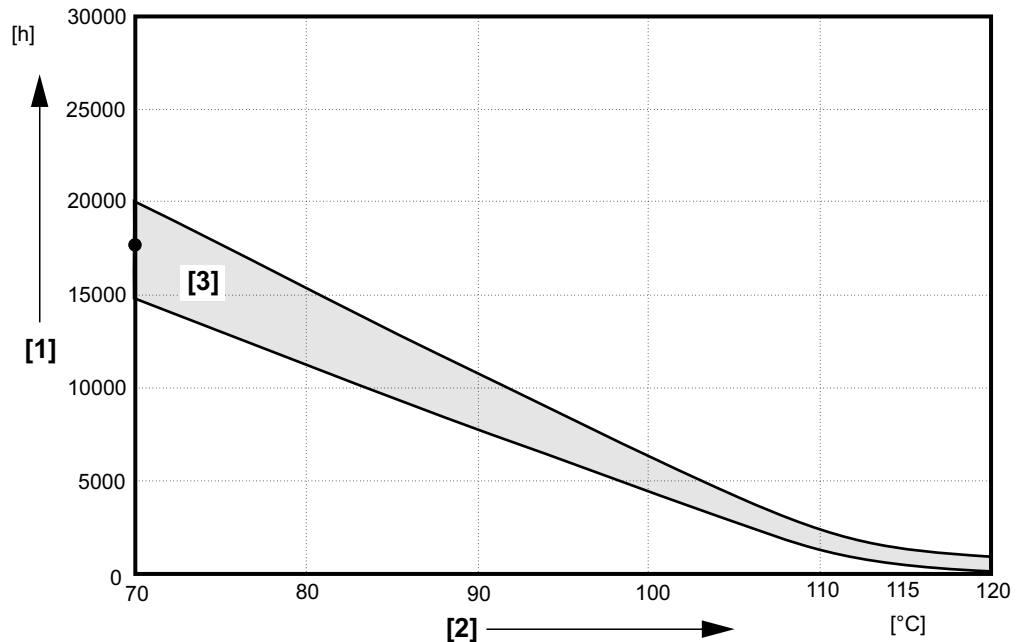
Time interval	What to do?	Who is permitted to perform the work?
Every 3000 operating hours, at least every 6 months	Check running noise for possible bearing damage	Specialists at customer site
	In the event of a bearing damage: Have the bearing replaced by SEW-EURODRIVE Service or qualified personnel 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 a leakage at the output oil seal: Change the oil seal	Specialists at customer site
	• In the event of any other leakage:	
	– Replace the drive unit	Specialists at customer site
	– Recommendation: 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
Every 20 000 operating hours ¹⁾	Have the motor inspected by SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE.	SEW-EURODRIVE Service
		Qualified personnel trained by SEW-EURODRIVE
The drive units are equipped 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

Time interval	What to do?	Who is permitted to perform the work?
When the cover / electronics cover is removed 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 removed	Visual inspection of the gasket between connection box and cover / electronics cover: The gasket must be replaced in the event of damage.	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, you must 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.

8.2 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:



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- [1] Operating hours
- [2] Sustained oil bath temperature
- [3] CLP HC
- Average value per oil type at 70 °C

8.3 Inspection and maintenance work

8.3.1 Preliminary work regarding inspection and maintenance

Observe the following notes before you start with inspection/maintenance work on the MOVIGEAR® classic:



⚠ WARNING

Risk of injury if the device starts up unintentionally, and danger of electrical voltage.
Severe or fatal injuries.

- Disconnect the device from the power supply with suitable external measures before you start working on the device and secure it against unintentional reconnection to the voltage supply.
- Secure the output shaft against rotation.



⚠ 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 drive unit.

Potential damage to property.

- 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.

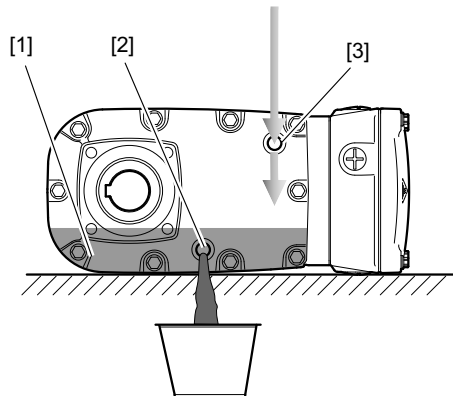
8.3.2 Changing the oil

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 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:



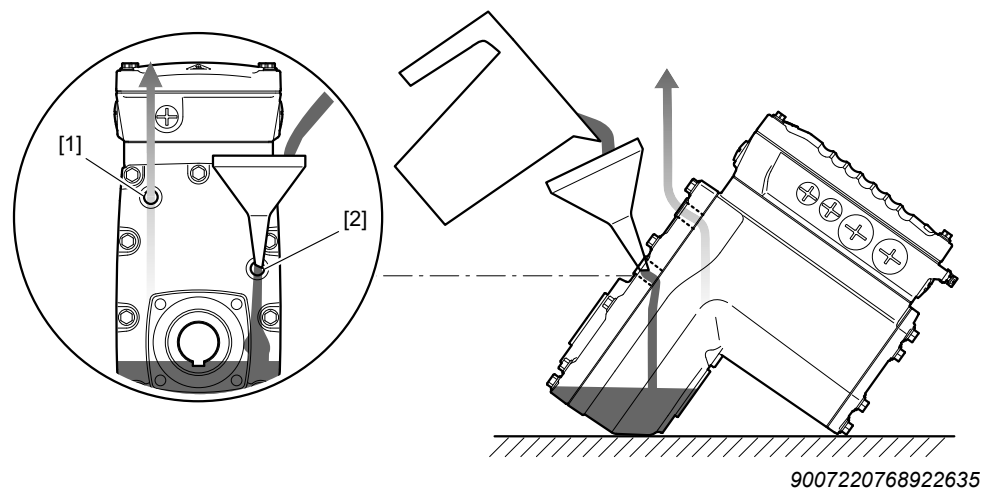
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Filling in the oil

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 drive 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 the 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 surfaces / anti-corrosion coating.

Recommended position

The following figure shows the position recommended for filling in the new oil:



8.3.3 Replacing the output oil seal

1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
2. Remove the 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 surfaces / anti-corrosion coating.

8.3.4 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 re-painting. 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 strips after painting.

8.3.5 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, you must 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).

8.3.6 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.

8.3.7 Replacing the gasket between connection box and cover

Spare part kit

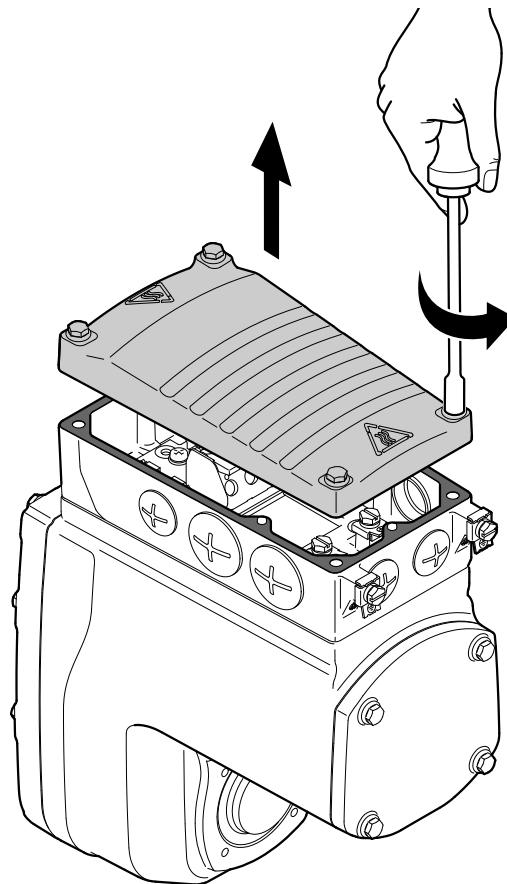
The gasket is available as a spare part (1, 10 or 50 pieces) from SEW-EURODRIVE.

Contents	Part number	
	MOVIGEAR® classic MGF..1-...-C	MOVIGEAR® classic MGF..2-...-C MGF..4-...-C MGF..4-...-C/XT
1 piece	23010347	24850209

Contents	Part number	
	MOVIGEAR® classic MGF..1-..-C	MOVIGEAR® classic MGF..2-..-C MGF..4-..-C MGF..4-..-C/XT
10 piece	28266137	28264800
50 piece	28266145	28264819

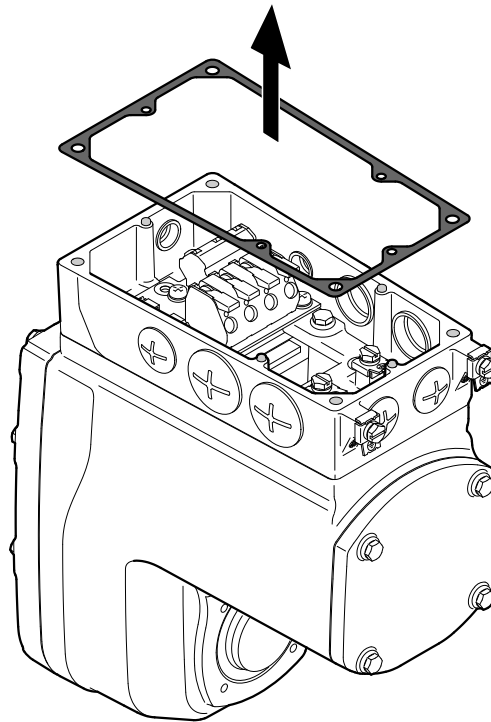
Steps

1. Observe the notes in chapter "Preliminary work for inspection and maintenance".
2. Loosen the screws of the cover and remove it.



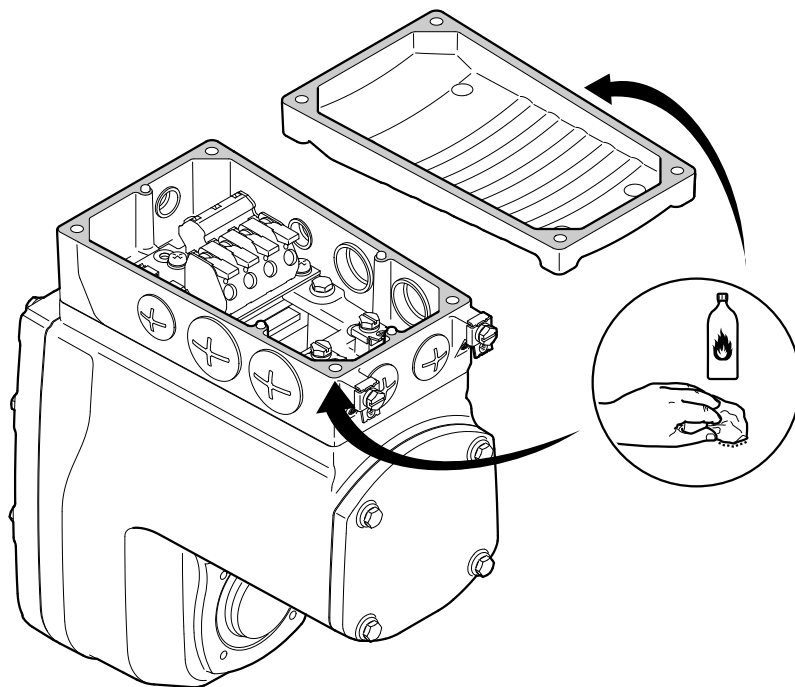
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3. **NOTICE!** Loss of the guaranteed degree of protection. Possible damage to property. Make sure not to damage the sealing surfaces when removing the gasket. Remove the old gasket completely from the connection box.



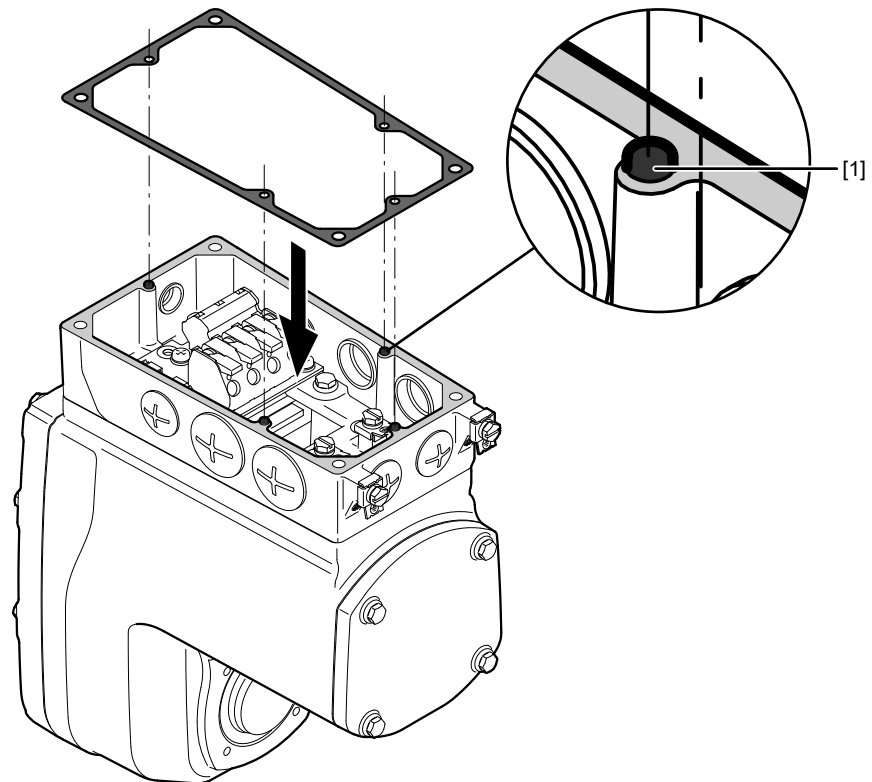
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4. **CAUTION!** Risk of injury due to sharp edges. Cuts. Use protective gloves for cleaning. Work may only be carried out by qualified personnel. Clean the sealing surfaces of the connection box and the cover carefully.



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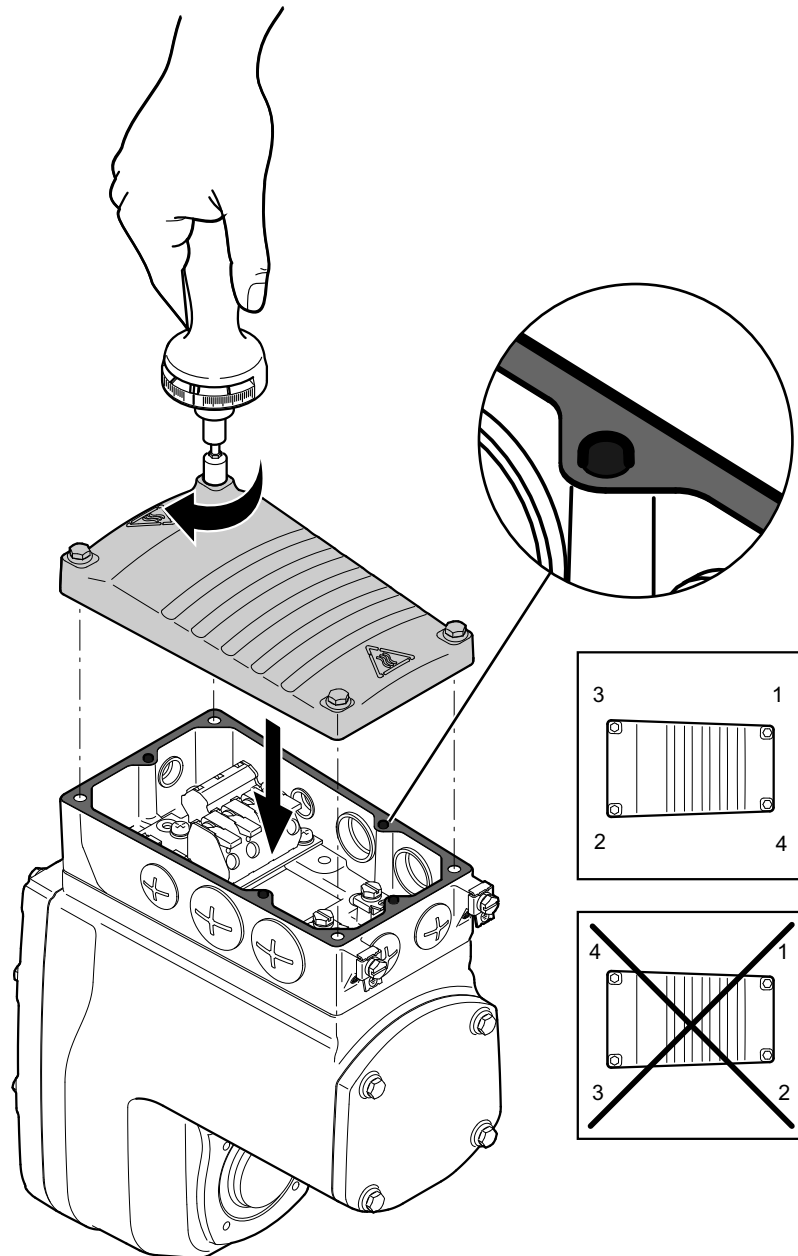
5. Place the new gasket on the connection box and fix it in position with the retaining cams [1].



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[1] Retaining cams

6. Check the installation and startup of the drive unit using the applicable operating instructions.
7. Place the cover on the connection box again and fasten it.
 - ⇒ Proceed as follows when installing the cover: Insert the screws and tighten them in diametrically opposite sequence **step by step** with a tightening torque of 6.0 Nm.



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9 Configuration

9.1 Preliminary information

INFORMATION



Data may differ due to continuous product development.

9.1.1 Abbreviation key

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

Abbreviation	Description
M_a	MOVIGEAR® continuous output torque
M_{apk}	Maximum permitted torque for short-time duty
M_{a_eso}	Maximum permitted torque for non-cyclical special loads, max. 1000 cycles
M_{DSP}	Maximum torque DynaStop®
M_{ar}	Retrodriving application torque
n_a	Output speed
n_e	Motor speed
n_{G_min}	Minimum output speed
n_{G_max}	Maximum output speed
n_{DSP}	Gear shaft speed
W	Mean braking work
η_{load}	Efficiency of the application

9.2 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}	
n_{max}	Highest application speed	min^{-1}	
n_{min}	Lowest application speed	min^{-1}	
M_{max}	Maximum application torque	Nm	
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 cyclic duration factor (cdf) or exact load cycle can be entered.		
Z	Starting frequency; alternatively, exact load cycle can be specified	1/h	
M4, M1..M6	Mounting position		
IP..	Required degree of protection		
ϑ_{amb}	Ambient temperature	°C	
H	Installation altitude	m	

9.2.1 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.

This determines the torque and the rotational speed. Refer to the documentation "Drive Engineering – Practical Implementation, Project Planning" or the SEW-Workbench project planning software for assistance.

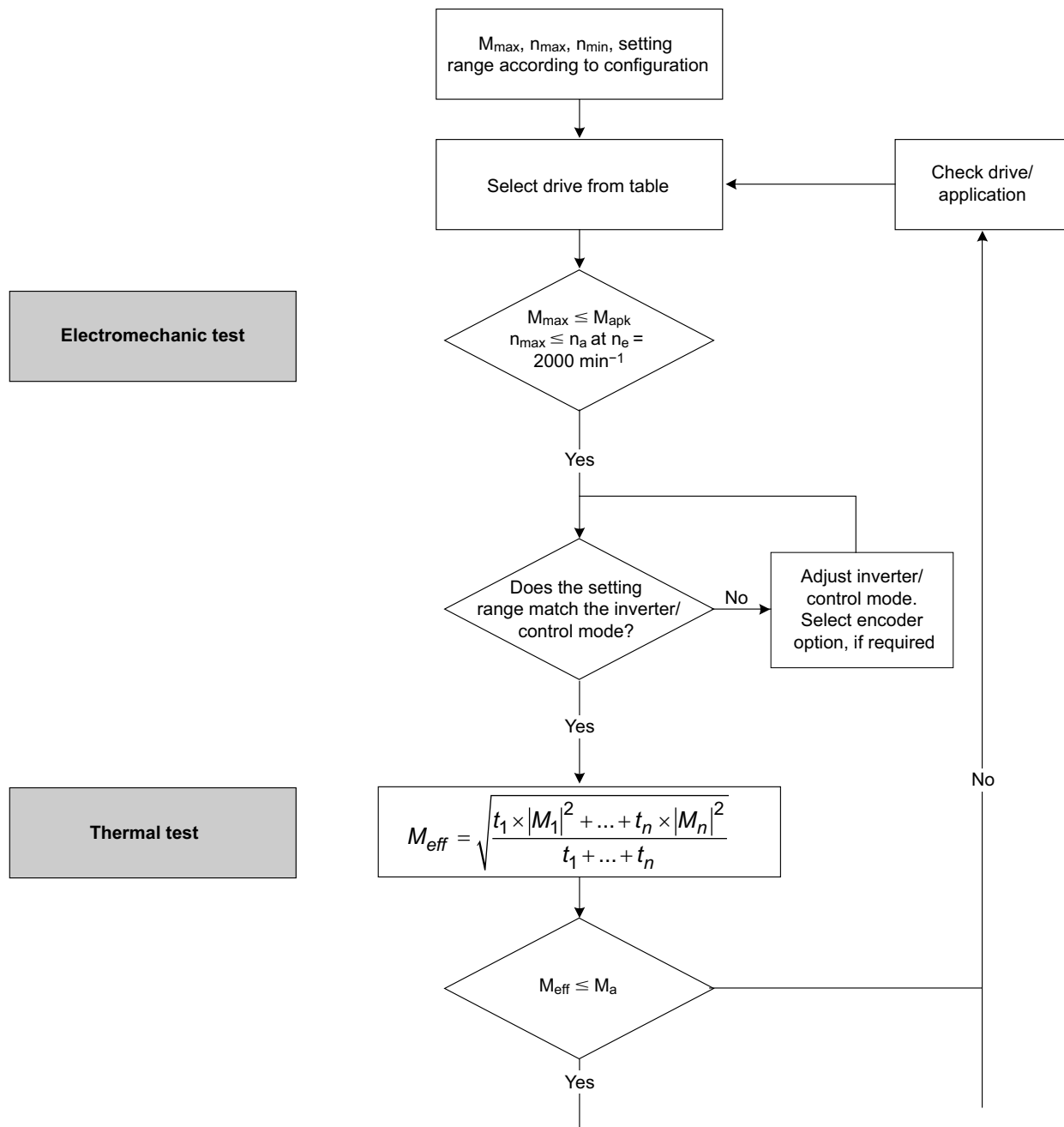
9.2.2 Selecting the proper drive

Based on the calculated values for torque and rotational speed, the suitable drive can now be configured under adherence of any other mechanical requirements.

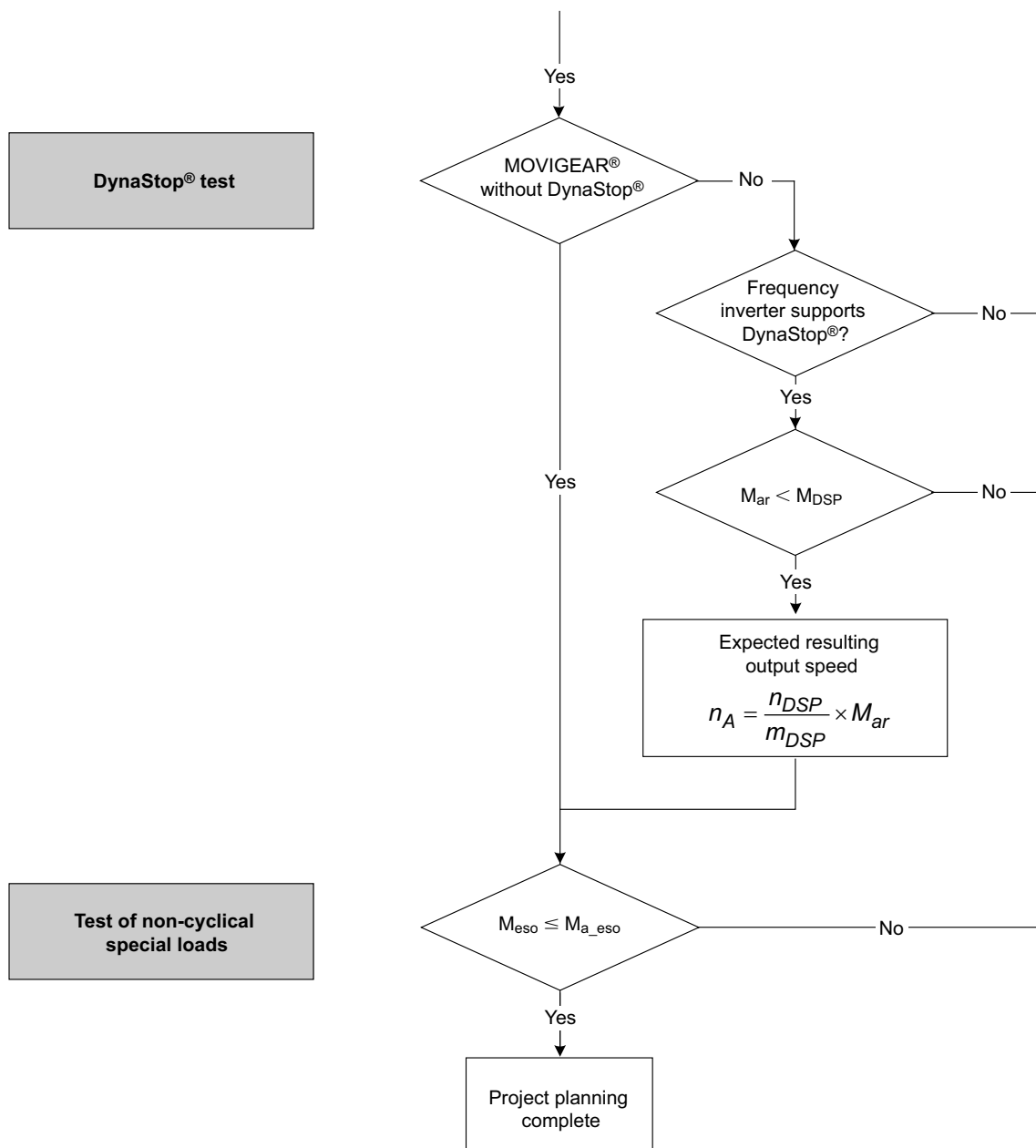
9.3 MOVIGEAR® classic

9.3.1 Project planning procedure

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



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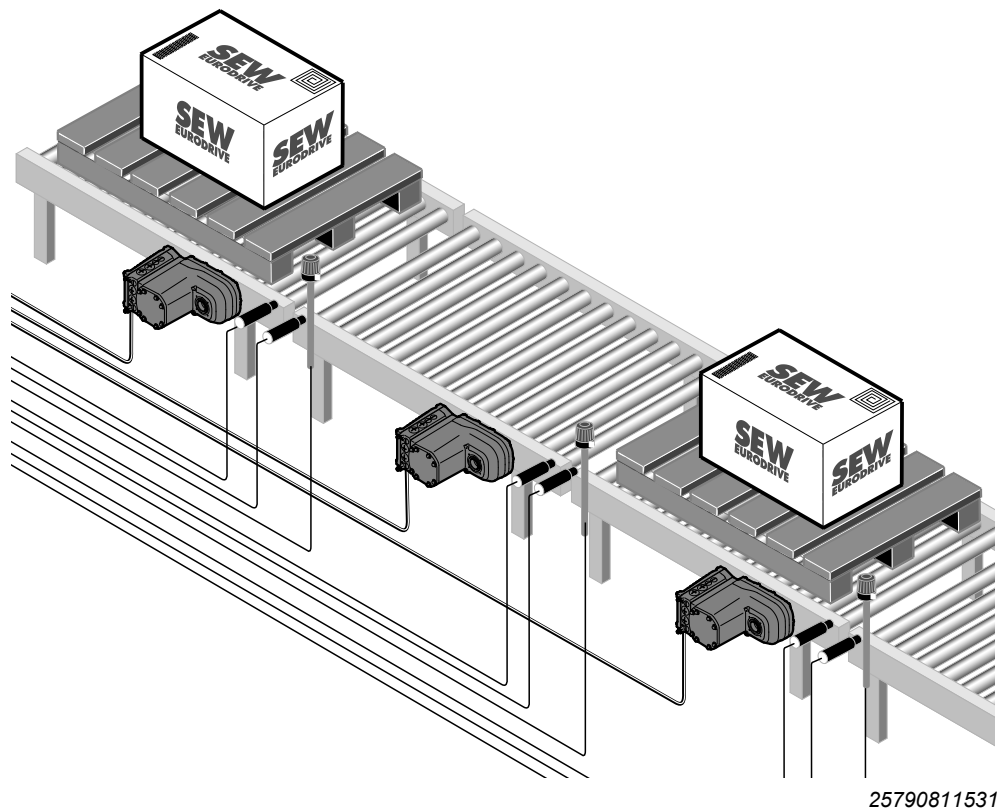
9.3.2 Drive selection using the example of a roller conveyor

Description of the application

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

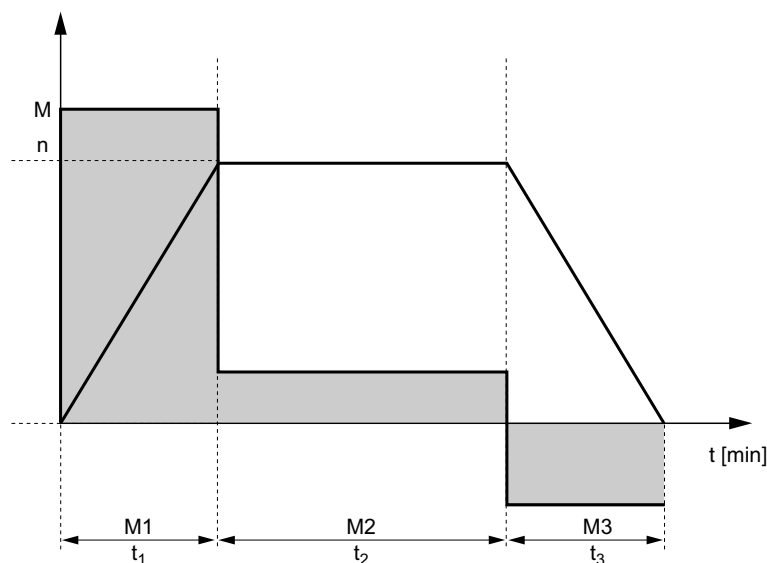
Load weight	m	2.500 kg
Conveying speed	v	22 m/min
Positioning speed		5 m/min
Acceleration	a	0.4 m/s ²
Number of rollers		8
Efficiency of the application with rollers	η_{app}	0.7
Roller diameter	D	140 mm
Lever arm of the rolling friction (wood/steel)	f	1.2
Bearing diameter	d	28 mm
Bearing friction value	$\mu_{bearing}$	0.005
Switching frequency		6 times/hour
Maximum external force at standstill	F _{ext}	800 N

The following figure shows a schematic illustration:



Calculating the application

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



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

Calculation	
Static travel resistance	$F_R = \mu \times m \times g$ $\mu = \left[\frac{2}{D} \times \left(\mu_{bearing} \times \frac{d}{2} + f \right) + c \right]$ $\mu = \left[\frac{2}{140mm} \times \left(0.005 \times \frac{28mm}{2} + 1.2 \right) + 0 \right]$ $\mu = 0.01814$ $F_R = 0.01814 \times 2500kg \times 9.81$ $F_R = 445N$ 25222496907
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	$M_2 = \frac{F_R \times D}{2 \times \eta} = 45.5Nm$

Calculation	
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	$n_{amin} = \frac{v_{min}}{\pi \times D} = \frac{5 m/min}{\pi \times 0.14m} = 11.4 min^{-1}$ $n_{amax} = \frac{v_{max}}{\pi \times D} = \frac{22 m/min}{\pi \times 0.14m} = 50.0 min^{-1}$

Selecting the drive unit MOVIGEAR® classic

Observe the following points when selecting the drive unit MOVIGEAR® classic:

1. Which torque class (size) is required?

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

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

Due to the application calculations, the maximum application torque for startup is $M_{\max} = 145 \text{ Nm}$

MGF..2-DSM-C drive units with $i > 10.37$ meet this requirement.

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

2. Selecting the gear ratio with output speed:

Requirement: The application calculations result in an output speed of $n_a = 50 \text{ min}^{-1}$. 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 $n_e = 2000 \text{ min}^{-1}$.

Result: The drive with a gear ratio of $i_{\text{tot}} = 37.24$ and an output speed of $n_a = 53.71$ at $n_e = 2000 \text{ min}^{-1}$ is selected from the table in chapter "Technical data" > "Permitted currents, speeds and torques":

MGF..2-DSM-C								
	n_a	M_a	$I_{\text{cont.}}$	M_{apk}	I_{max}	$M_{a_{\text{eso}}}$	i_{tot}	Weight
	at							Weight
	$n_e = 2000 \text{ min}^{-1}$							kg
2-stage	593.47	15	2.08	46	5.73	145	3.37	15.7
	...	...	...	...	...	...	...	
	...	...	...	...	...	...	...	
	...	...	...	...	...	...	...	
3 stage	71.25	126	2.08	220	3.30	330	28.07	16
	60.57	149	2.08	220	2.80	330	33.02	
	53.71	168	2.08	220	2.50	330	37.24	
	47.40	190	2.08	220	2.20	330	42.19	
	44.41	200	2.08	220	2.10	330	45.03	
	38.83	200	1.80	220	1.80	330	51.51	
	36.20	200	1.70	220	1.70	330	55.25	

3. Checking the setting range and minimum speed

Setting range 5 m/min: 22 m/min $\approx 1:4.4$.

Check the setting range and the resulting minimum speed in combination with the properties of the control mode of the connected inverter. Select an encoder option if required.

4. Thermal check of MOVIGEAR® classic:

Requirement: In order to avoid thermal problems, the effective torque of the application must be smaller than the continuous output torque of the drive unit MOVIGEAR® classic: $M_{eff} < M_a$

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

$$t_2 = 10 \text{ min} \times 60 \frac{s}{min} - t_1 - t_3 = 598.16s$$

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

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

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The application calculation results in an effective torque of $M_{eff} = 45.1 \text{ Nm}$. The continuous output torque of the selected MOVIGEAR® drive unit is M_a at n_e $2000 \text{ min}^{-1} = 149 \text{ Nm}$.

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

Result: The requirements are met.

9.4 DynaStop® – The electrodynamic deceleration function

9.4.1 Functional description



INFORMATION

DynaStop® may only be used with a frequency inverter that provides this function. The functions of DynaStop® are described in the corresponding documentation of the frequency inverter.

9.4.2 Checking whether DynaStop® can be used

Requirement:

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

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

Calculating the retrodriving torque:

Known values of the application:

$$F_{ex} = 800 \text{ N}$$

$$F_R = 445 \text{ N}$$

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

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

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 design can be found in chapter "Technical data and dimension drawings" > "Deceleration torques DynaStop®":

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

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

$$17 \text{ Nm} < 143 \text{ Nm}$$

Checking the application velocity:

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

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

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

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Result:

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

10 Technical data and dimension sheets

10.1 Conformity

10.1.1 CE marking

- Low voltage directive:

The documented device series 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 about EMC-compliant installation, refer to the publication "Electromagnetic Compatibility in Drive Technology" from SEW-EURODRIVE.



The CE mark on the nameplate represents conformity with the low voltage directive 2014/35/EU and the EMC directive 2014/30/EU.

10.1.2 Recognized Component Mark (not in combination with "/DI" option)



The Recognized Component Mark on the nameplate indicates compliance with the Canadian and US-American requirements, checked by UL (Underwriters Laboratory).

10.1.3 EAC



The documented device 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.

10.1.4 UkrSEPRO (Ukrainian Certification of Products)



The UkrSEPRO mark on the nameplate certifies adherence to the technical regulations of Ukraine for the documented unit series.

10.2 General information

10.2.1 Power and torque ratings

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

10.2.2 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.

10.2.3 Paint

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

10.2.4 Surface and corrosion protection

All drive units can also be supplied with special surface protection for applications in extremely humid or chemically aggressive environments upon request.

10.2.5 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.

10.3 General technical data of MOVIGEAR® classic

MGF...DSM-C		
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}	-25 °C to +60 °C (different to class 3K3) ¹⁾ From +40 °C, factors that lead to a reduction in power must be taken into account (see chapter "Derating for increased ambient temperature").
Proof of mechanical strength		3M5/5M1 according to DIN EN 60721-3-3/-5
Degree of protection	IP	Standard: IP65 in accordance to EN 60529 (housing closed and all cable entries sealed)
Operating mode		S1, DB (EN 60034-1)
Type of cooling		Natural cooling to DIN 41751 and EN 61800-5-1
Installation altitude	h	Up to $h \leq 1000$ m without restrictions. The following restrictions apply to heights ≥ 1000 m: From 1,000 m to max. 4,000 m: – I_N reduction by 1% 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.
Required preventive measures		Grounding the device

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

10.4 Derating factors

10.4.1 Derating depending on the installation altitude

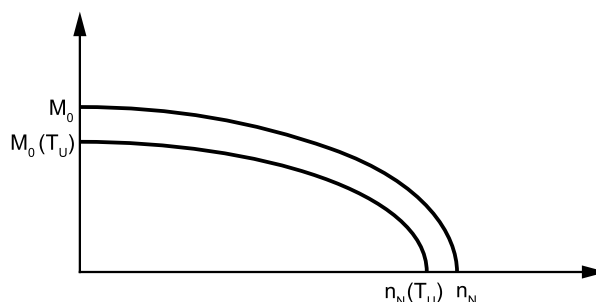
Observe the derating according to the chapter "Mechanical installation" > "Setting up the drive unit" > "Derating depending on the installation altitude".

10.4.2 Derating depending on the ambient temperature

Drive unit without /DI option

The following derating applies for operating the drive unit **without** "/DI" option in the ambient temperature range from +40 °C to +60 °C:

The thermal speed/limit torque characteristic curve is re-scaled towards the origin (minimized). The thermal operating point based on rms torque and thermally effective speed of the application must be below the re-scaled characteristic curve.



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$$M_0(T_U) = M_0 \times \left(\sqrt{\frac{145^\circ\text{C} - T_U}{105^\circ\text{C}}} \right)$$

$$n_N(T_U) = K_e \times n_N \times \left(\sqrt{\frac{145^\circ\text{C} - T_U}{105^\circ\text{C}}} \right)$$

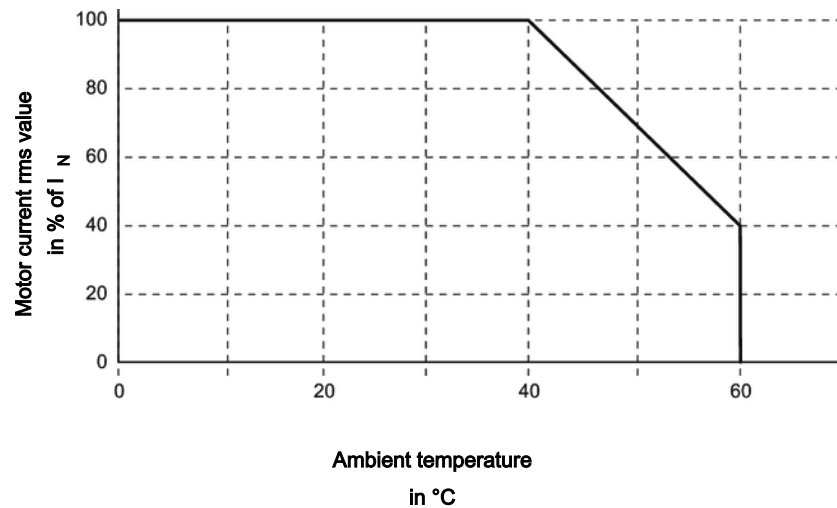
T_A	Ambient temperature [°C]
M_0	Standstill torque under nominal conditions
$M_0(T_U)$	Standstill torque at increased temperature 40 °C < T_U < 60 °C
n_N	Rated speed
$n_N(T_U)$	Rated speed at increased temperature 40 °C < T_U < 60 °C
K_e	Transmitter factor = 1

Drive unit with /DI option

The following derating applies for operating the drive unit **with** "/DI" option in the ambient temperature range from +40 °C to +60 °C:

I_N reduction: 2.5% I_N per K at 40 °C to 60 °C

The following figure shows the I_N reduction depending on the ambient temperature:



29491406091

10.5 Motor data for MOVIGEAR® classic

10.5.1 System voltage: 400 V, connection type of motor: 3

Motor	J _{mot}	n _N	n _{max}	PK limit	U _N	M ₀	I ₀	V _{p0} cold	V _{p0} cold	C _T	R ₁	L ₁	Number of poles	f _N	eff
	kgm ² × 10 ⁻⁴	min ⁻¹	min ⁻¹	°C	V	Nm	A	V/ 1000 min ⁻¹	V/ 2000 min ⁻¹	Nm/ A	Ω	mH	Motor	Hz	%
MGF..1-DSM-C	1.38	2000	2000	150	400	2.1	1.11	141	282	1.89	14.7	31.8	8	133.3	81.2 △ IE5
MGF..2-DSM-C	7.64	2000	2000	150	400	4.5	1.93	155	310	2.33	4.86	17.4	8	133.3	88.7 △ IE5
MGF..4-DSM-C	23.30	2000	2000	150	400	10	3.94	168	336	2.54	1.03	12.7	8	133.3	93.0 △ IE5
MGF..4-DSM-C/XT	30.4	2000	2000	150	400	14.3	5.2	181	362	2.75	0.796	10.3	8	133.3	93.7 △ IE5

J _{mot}	=	Mass moment of inertia of the motor
n _N	=	Rated speed
n _{max}	=	Maximum permitted speed
PK limit	=	Maximum permitted motor temperature measured on PK
U _N	=	Nominal voltage
M ₀	=	Standstill torque (thermal continuous torque at low speeds)
I ₀	=	Standstill current
V _{p0} cold	=	Internal voltage
C _T	=	Torque constant
R ₁	=	Resistance between connection phase and star point
L ₁	=	Inductance between connection phase and star point
f _N	=	Frequency at rated speed
eff	=	Motor efficiency

10.6 Technical data for the PK (PT1000) temperature sensor

The PK (PT1000) temperature sensor continuously detects the motor temperature.

Type	PK (PT1000)
Total resistance at 20 – 25 °C	$1050\ \Omega < R < 1150\ \Omega$
Test current	$< 3\ \text{mA}$

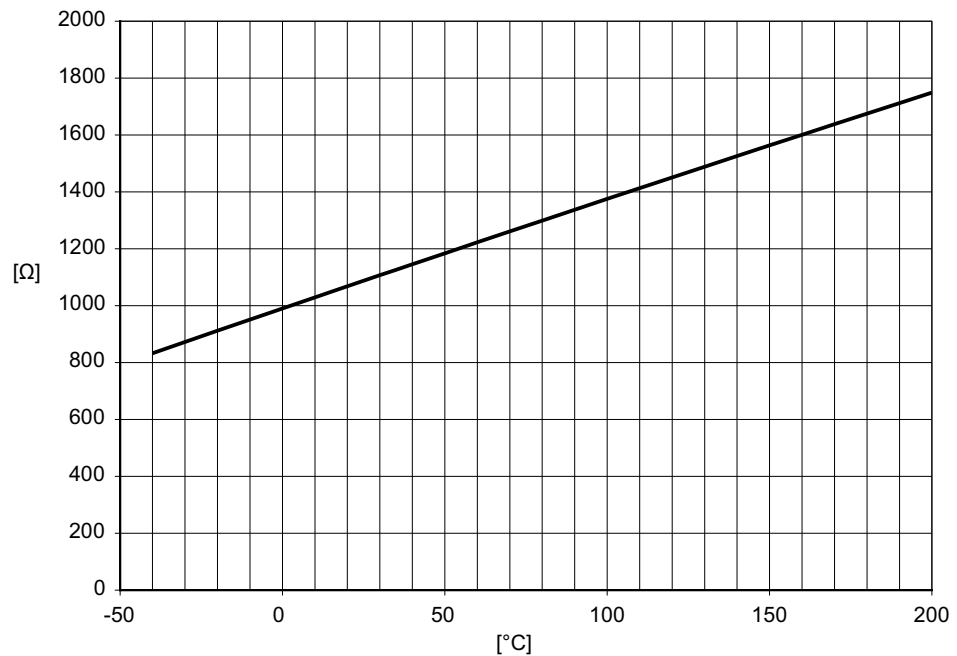
10.6.1 Typical characteristic curve of PK (PT1000)

INFORMATION



The temperature sensor is unipolar which means that interchanging the incoming cables does not change the measurement result.

The following figure shows a typical characteristic curve of the PK (PT1000):



21532449547

10.7 Permitted currents, speeds and torques



NOTICE

Damage to the MGF...DSM unit

Potential damage to property!

- To protect the MGF...DSM unit, you must observe the following currents, speeds, and torques.

10.7.1 Key

	=	Preferred gear ratio
*	=	Finite gear unit ratio
i_{tot}	=	Gear unit ratio
I_0	=	Standstill current
I_{max}	=	Maximum permitted current for short-time duty
$I_{\text{cont.}}$	=	Continuous current S1 duty
M_{apk}	=	Maximum permitted torque for short-time operation ¹⁾
M_a	=	Continuous output torque
M_{a_eso}	=	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles
n_a	=	Output speed
n_e	=	Motor speed

1) If M_{apk} occurs more often than 10 times per hour, detailed project planning must be carried out using SEW Workbench.

10.7.2 MOVIGEAR® classic MGF..1-DSM-C

MGF..1-DSM-C								
	n_a	M_a	$I_{cont.}$	M_{apk}	I_{max}	$M_{a_{eso}}$	i_{tot}	Weight
	at $n_e =$ 2000 min^{-1}							
	min^{-1}	Nm	A	Nm	A	Nm		kg
2 stage	555.56	8	1.11	23	3.30	74	3.60*	7
	484.26	9	1.11	26	3.33	81	4.13	
	451.47	9	1.11	28	3.33	82	4.43	
	390.24	11	1.11	32	3.33	90	5.13*	
	361.83	12	1.11	35	3.33	94	5.53	
	309.12	14	1.11	41	3.33	100	6.47	
	260.84	16	1.11	48	3.33	108	7.67	
	238.31	18	1.11	53	3.33	112	8.39	
	234.25	18	1.11	54	3.33	112	8.54	
	204.19	21	1.11	62	3.33	117	9.79	
	190.26	22	1.11	66	3.33	122	10.51	
	164.55	26	1.11	77	3.33	128	12.15	
	152.57	28	1.11	83	3.33	130	13.11	
	130.34	32	1.11	93	3.20	140	15.34	
	109.99	38	1.11	99	2.90	148	18.18	
	100.48	42	1.11	102	2.70	153	19.90	
3 stage	97.12	43	1.11	91	2.30	136	20.59	7.6
	84.66	50	1.11	99	2.20	148	23.62	
	78.88	53	1.11	102	2.10	153	25.36	
	68.22	62	1.11	108	1.90	162	29.32	
	63.25	66	1.11	111	1.90	166	31.62	
	54.82	77	1.11	120	1.70	180	36.48	
	54.04	75	1.11	112	1.60	168	37.01	
	47.79	85	1.11	127	1.60	190	41.85	
	45.60	76	0.90	114	1.40	171	43.86	
	44.53	88	1.00	128	1.50	192	44.92	
	41.66	80	0.90	120	1.30	180	48.01	
	38.51	94	1.00	128	1.30	192	51.94	
	35.70	97	0.90	128	1.20	192	56.01	

10.7.3 MOVIGEAR® classic MGF..2-DSM-C

MGF..2-DSM-C								
	n_a	M_a	$I_{cont.}$	M_{apk}	I_{max}	$M_{a_{eso}}$	i_{tot}	Weight
	at $n_e =$ 2000 min^{-1}							
	min^{-1}	Nm	A	Nm	A	Nm		kg
2 stage	593.47	15	2.08	46	5.73	145	3.37	15.7
	473.93	19	2.08	57	5.73	190	4.22	
	400.00	23	2.08	68	5.73	210	5.00*	
	374.53	24	2.08	72	5.73	215	5.34	
	320.00	28	2.08	84	5.73	225	6.25*	
	285.71	32	2.08	95	5.73	235	7.00*	
	242.72	37	2.08	111	5.73	245	8.24	
	205.97	44	2.08	131	5.73	330	9.71	
	192.86	47	2.08	140	5.73	330	10.37	
	164.74	55	2.08	164	5.73	330	12.14	
	147.06	61	2.08	184	5.73	330	13.60*	
	125.00	72	2.08	216	5.73	330	16.00	
	107.99	83	2.08	220	5.00	330	18.52	
	100.96	89	2.08	220	4.70	330	19.81	
	87.49	103	2.08	220	4.10	330	22.86	
3 stage	71.25	126	2.08	220	3.30	330	28.07	16
	60.57	149	2.08	220	2.80	330	33.02	
	53.71	168	2.08	220	2.50	330	37.24	
	47.40	190	2.08	220	2.20	330	42.19	
	44.41	200	2.08	220	2.10	330	45.03	
	38.83	200	1.80	220	1.80	330	51.51	
	36.20	200	1.70	220	1.70	330	55.25	

10.7.4 MOVIGEAR® classic MGF..4-DSM-C

MGF..4-DSM-C								
	n_a	M_a	$I_{cont.}$	M_{apk}	I_{max}	$M_{a_{eso}}$	i_{tot}	Weight Weight
	at $n_e =$ 2000 min^{-1}							
	min^{-1}	Nm	A	Nm	A	Nm		kg
2 stage	566.57	35	4.16	106	12.00	147	3.53*	23.6
	460.83	43	4.16	130	12.00	165	4.34*	
	400.80	50	4.16	150	12.00	420	4.99	
	347.22	58	4.16	173	12.00	450	5.76	
	315.46	63	4.16	190	12.00	470	6.34	
	268.82	74	4.16	223	12.00	515	7.44*	
	253.81	79	4.16	236	12.00	525	7.88	
	223.21	90	4.16	269	12.00	560	8.96	
	182.32	110	4.16	329	12.00	675	10.97	
	157.98	127	4.16	380	12.00	710	12.66	
	143.58	139	4.16	418	12.00	710	13.93	
	122.25	164	4.16	475	11.60	710	16.36	
	115.41	173	4.16	475	11.00	710	17.33	
	101.52	197	4.16	475	9.60	710	19.70	
	91.66	218	4.16	475	8.70	710	21.82	
	77.76	257	4.16	475	7.40	710	25.72	
3 stage	69.25	289	4.16	475	6.50	710	28.88	24
	58.33	343	4.16	475	5.50	710	34.29	
	54.63	366	4.16	475	5.10	710	36.61	
	46.66	400	3.90	475	4.40	710	42.86	
	41.67	400	3.50	475	3.90	710	48.00*	
	35.40	400	3.00	475	3.30	710	56.49	

10.7.5 MOVIGEAR® classic MGF..4-DSM-C/XT

MGF..4-DSM-C/XT								
	n_a	M_a	$I_{cont.}$	M_{apk}	I_{max}	$M_{a_{eso}}$	i_{tot}	Weight
	at							Weight
	$n_e = 2000 \text{ min}^{-1}$							
	min^{-1}	Nm	A	Nm	A	Nm		kg
2 stage	566.57	51	5.50	152	16.50	330	3.53*	23.6
	460.83	62	5.50	186	16.50	370	4.34*	
	400.80	71	5.50	214	16.50	420	4.99	
	347.22	82	5.50	247	16.50	450	5.76	
	315.46	91	5.50	272	16.50	470	6.34	
	268.82	106	5.50	319	16.50	515	7.44*	
	253.81	113	5.50	338	16.50	525	7.88	
	223.21	128	5.50	375	16.10	560	8.96	
	182.32	157	5.50	450	15.80	675	10.97	
	157.98	181	5.50	475	14.40	710	12.66	
	143.58	199	5.50	475	13.00	710	13.93	
	122.25	234	5.50	475	11.00	710	16.36	
	115.41	248	5.50	475	10.40	710	17.33	
	101.52	282	5.50	475	9.10	710	19.70	
	91.66	312	5.50	475	8.20	710	21.82	
	77.76	368	5.50	475	6.80	710	25.72	
3 stage	69.25	400	5.30	475	6.00	710	28.88	24
	58.33	400	4.50	475	5.00	710	34.29	
	54.63	400	4.20	475	4.70	710	36.61	
	46.66	400	3.60	475	3.90	710	42.86	
	41.67	400	3.20	475	3.50	710	48.00*	
	35.40	400	2.70	475	2.90	710	56.49	

10.8 DynaStop® torques

10.8.1 Notes

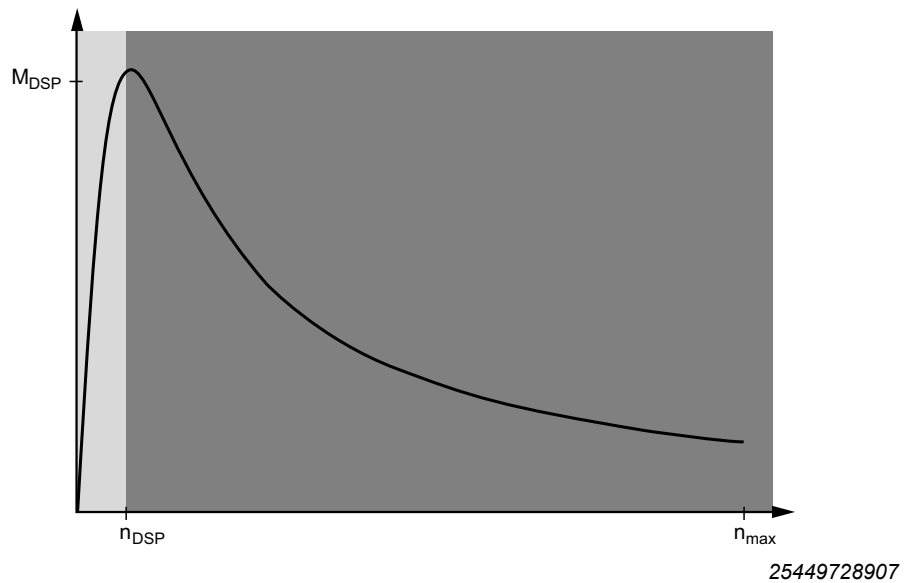


INFORMATION

DynaStop® may only be used with a frequency inverter that provides this function. The functions of DynaStop® are described in the corresponding documentation of the frequency inverter.

10.8.2 Operating range

The following figure depicts the permissible/impermissible operating range of DynaStop®:



- = Continuously permitted range of DynaStop®
- = Impermissible operating range of DynaStop®

10.8.3 MGF..1-...-C

MGF..1-...-C	i_{tot}	DynaStop® torque	
		M_{DSP}	at n_{DSP} (gear shaft speed)
		Nm	min ⁻¹
2-stage	3.60*	9	92.17
	4.13	10	80.34
	4.43	11	74.90
	5.13*	12	64.68
	5.53	13	60.00
	6.47	15	51.28
	7.67	18	43.26
	8.39	20	39.55
	8.54	20	38.85
	9.79	23	33.89
	10.51	25	31.57
	12.15	29	27.31
	13.11	31	25.31
	15.34	37	21.63
	18.18	43	18.25
	19.90	47	16.67
3-stage	20.59	49	16.11
	23.62	56	14.05
	25.36	60	13.08
	29.32	70	11.32
	31.62	74	10.49
	36.48	80	9.10
	37.01	75	8.97
	41.85	85	7.93
	43.86	76	7.56
	44.92	88	7.39
	48.01	80	6.91
	51.94	94	6.39
	56.01	97	5.92

= Preferred gear ratio

* = Ultimate gear unit ratio

10.8.4 MGF..2-...-C

MGF..2-...-C	i_{tot}	DynaStop® torque	
		M_{DSP}	at n_{DSP} (gear shaft speed)
		Nm	min ⁻¹
2-stage	3.37	15	44.63
	4.22	19	35.64
	5.00*	22	30.08
	5.34	23	28.16
	6.25*	28	24.06
	7.00*	31	21.49
	8.24	36	18.25
	9.71	43	15.49
	10.37	46	14.50
	12.14	53	12.39
	13.60*	60	11.06
	16.00	70	9.40
	18.52	81	8.12
	19.81	87	7.59
	22.86	101	6.58
3-stage	28.07	124	5.36
	33.02	145	4.55
	37.24	164	4.04
	42.19	186	3.56
	45.03	198	3.34
	51.51	200	2.92
	55.25	200	2.72

= Preferred gear ratio
 * = Ultimate gear unit ratio

10.8.5 MGF..4-...-C

MGF..4-...-C	i_{tot}	DynaStop® torque	
		M_{DSP}	at n_{DSP} (gear shaft speed)
		Nm	min ⁻¹
2-stage	3.53*	27	14.12
	4.34*	33	11.49
	4.99	38	9.99
	5.76	44	8.65
	6.34	49	7.86
	7.44*	57	6.70
	7.88	61	6.33
	8.96	69	5.56
	10.97	85	4.54
	12.66	98	3.94
	13.93	107	3.58
	16.36	126	3.05
	17.33	134	2.88
	19.70	152	2.53
	21.82	168	2.28
	25.72	198	1.94
3-stage	28.88	223	1.73
	34.29	264	1.45
	36.61	282	1.36
	42.86	330	1.16
	48.00*	370	1.04
	56.49	400	0.88

= Preferred gear ratio

* = Ultimate gear unit ratio

10.8.6 MGF..4-...C/XT

MGF..4-...C/XT	i_{tot}	DynaStop® torque	
		M_{DSP}	at n_{DSP} (gear shaft speed)
		Nm	min ⁻¹
2-stage	3.53*	38	12.65
	4.34*	47	10.29
	4.99	54	8.95
	5.76	62	7.76
	6.34	69	7.05
	7.44*	81	6.00
	7.88	85	5.67
	8.96	97	4.99
	10.97	119	4.07
	12.66	137	3.53
	13.93	151	3.21
	16.36	177	2.73
	17.33	188	2.58
	19.70	213	2.27
	21.82	236	2.05
	25.72	278	1.74
3-stage	28.88	312	1.55
	34.29	371	1.30
	36.61	396	1.22
	42.86	400	1.04
	48.00*	400	0.93
	56.49	400	0.79

= Preferred gear ratio
 * = Ultimate gear unit ratio

10.9 Surface protection

10.9.1 General information

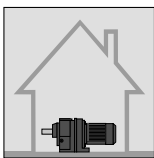
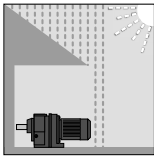
SEW-EURODRIVE offers the following optional protective measure for operating drive units under special environmental conditions.

- OS surface protection

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

10.9.2 Surface protection

Instead of the standard surface protection, the drive units are optionally available with the OS1 surface protection.

Surface protection		Ambient conditions	Sample applications
Standard		Suitable 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		Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as applications outdoors under roof or with protection. Similar to corrosivity category ¹⁾ : • C2 (low)	• Systems in saw mills • Hall gates • Agitators and mixers

1) According to DIN EN ISO 12 944-2

10.9.3 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
Standard with MOVIGEAR®: FKM oil seal (fluorocarbon rubber)	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 FKM oil seal (fluorocarbon rubber)
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

10.9.4 NOCO® fluid

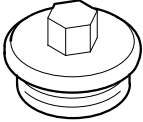
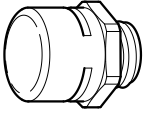
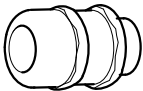
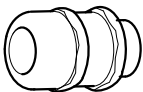
As standard, SEW-EURODRIVE supplies NOCO® fluid corrosion protection and lubricant with every drive unit with hollow shaft. Use NOCO® fluid when installing gear units with hollow shafts. Using this fluid can help prevent contact corrosion and makes it easier to disassemble the drive at a later time. 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.

10.10 Screw fittings

The following tables show the screw connections available from SEW-EURODRIVE.

10.10.1 Cable glands / screw plugs / pressure compensation

Type of screw fitting	Figure	Content	Size	Tightening torque ¹⁾	Outer cable diameter	Part number
Screw plugs external hexagon (made of stainless steel)		10 pcs	M16 x 1.5	6.8 Nm	–	18247342
		10 pcs	M25 x 1.5	6.8 Nm	–	18247350
Pressure compensation screw fittings (made of stainless steel)		1 piece	M16 x 1.5	4 Nm	–	28214617
EMC cable gland (brass, nickel-plated)		10 pcs	M16 x 1.5	4 Nm	5 to 9 mm	18204783
		10 pcs	M25 x 1.5	7 Nm	11 to 16 mm	18204805
EMC cable gland (made of stainless steel)		10 pcs	M16 x 1.5	4 Nm	5 to 9 mm	18216366
		10 pcs	M25 x 1.5	7 Nm	11 to 16 mm	18216382

1) The specified torques must be adhered to with a tolerance of +/- 10%.

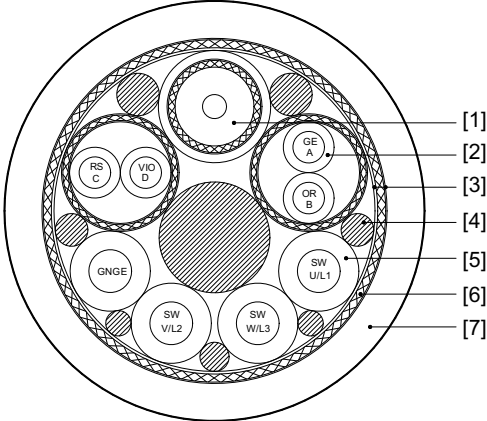
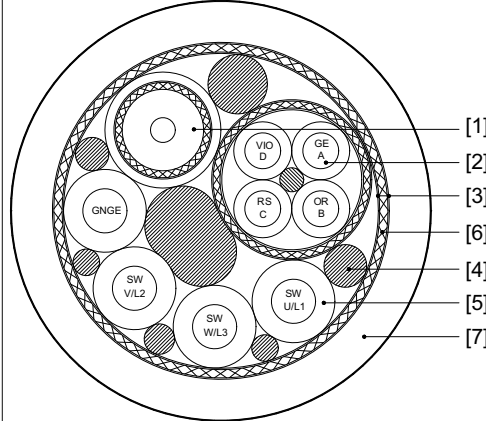
The cable retention in the cable gland must withstand the following removal force of the cable from the cable gland:

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

10.11 Connection cables

10.11.1 Hybrid cable specification for motors with MOVILINK® DDI

Mechanical design

		Type: Leoni LEHC 005796 Rev. 0 28123336	Type: Leoni LEHC 005770 Rev. 0 28123344	Type: Leoni LEHC 005775 Rev. 0 28123395	Type: Leoni LEHC 005776 Rev. 0 28123409
Mechanical design		 29346392715		 29346395147	
[1]	Coaxial cable	Coax Z50 in accordance with RG58			
	Conductor	Stranded copper wire, tinned, 19 × 0,182 mm			
	Dielectric	Polypropylene Ø 2.95 ± 0.1 mm			
	Shielding	Braided copper wires, tinned, 0.128 mm, optical coverage min. 90%,			
	Sheath	TPE			
	Diameter	4.2 mm ±0.1 mm			
	Color	Purple based on RAL 4005			
[2]	Cores	2 shielded conductor pairs 2 × 1.0 mm ² Stranded copper wire, bare, Single wire 0.15 mm According to DIN EN 60228 Class 6/IEC 60228, Class 6	Shielded element 4 × 1.0 mm ² Stranded copper wire, bare, Single wire 0.20 mm According to DIN EN 60228 Class 5/IEC 60228, Class 5		
	Insulation	Polypropylene	Polypropylene		
	Shielding	Braided copper wires, 0.10 mm, tinned optical coverage min. 85%	Braided copper wires, 0,128 mm, tinned optical coverage min. 85%		
	Diameter	2.1 ±0.1 mm	2.1 ±0.1 mm		
	Colors	Yellow based on RAL 1021 with black label A Orange based on RAL 2003 with black label B Pink based on RAL 3015 with black label C Purple based on RAL 4005 with black label D			

		Type: Leoni LEHC 005796 Rev. 0 28123336	Type: Leoni LEHC 005770 Rev. 0 28123344	Type: Leoni LEHC 005775 Rev. 0 28123395	Type: Leoni LEHC 005776 Rev. 0 28123409
[3]	Banding	-			
[4]	Filler	-			
[5]	Cores	4 × 1.5 mm ²	4 × 2.5 mm ²	4 × 1.5 mm ²	4 × 2.5 mm ²
	Conductor	Stranded copper wire, bare, single wire 0.15 mm according to DIN EN 60228 class 6/IEC 60228, Class 6		Stranded copper wire, bare, single wire 0.25 mm according to DIN EN 60228 class 5/IEC 60228, Class 5	
	Diameter	3.0 ±0.1 mm	3.6 ±0.1 mm	3.0 ±0.1 mm	3.6 ±0.1 mm
	Insulation	Polypropylene			
	Colors	Green/yellow, black with lettering U/L1; V/L2; W/L3			
[6]	Shield	Braided copper wires, tinned, 0.15 mm, optical coverage min. 85%,			
[7]	Outer cable sheath	Polyurethane, flame retardant, halogen-free		PVC	
	Color	Orange based on RAL 2003			
	Label	SEW EURODRIVE 28123336 4x1.5+2x2x1C+1x Z50 LEHC005796 Rev. 0 E47543-LIL  AWM STYLE 21223 I/II A/ B 80 °C 1000 V FT1 Week/year of pro- duction	SEW EURODRIVE 28123344 4x2.5+2x2x1C+1x Z50 LEHC005770 Rev. 0 E47543-LIL  AWM STYLE 21223 I/II A/ B 80 °C 1000 V FT1 Week/year of pro- duction	SEW EURODRIVE 28123395 4x1.5+4x1C+1x Z50 LEHC005775 Rev. 0 E47543-LIL  AWM STYLE 2570 I/II A/B 80 °C 1000 V FT1 Week/year of pro- duction	SEW EURODRIVE 28123409 4x2.5+4x1C+1x Z50 LEHC005776 Rev. 0 E47543-LIL  AWM STYLE 2570 I/II A/B 80 °C 1000 V FT1 Week/year of pro- duction
	Diameter	15.7 ± 0.5 mm	16.7 ± 0.5 mm	15.2 ± 0.5 mm	16.1 ± 0.5 mm

Technical data of hybrid cables

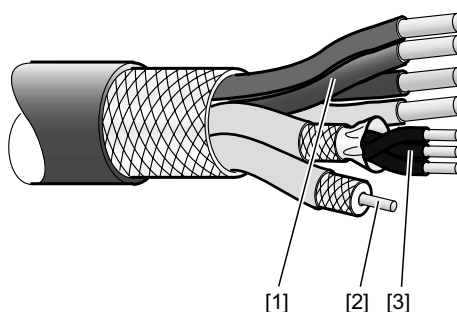
The following table shows the technical data of the hybrid cable:

Properties	Type: Leoni LEHC 005796 Rev. 0 28123336	Type: Leoni LEHC 005770 Rev. 0 28123344	Type: Leoni LEHC 005775 Rev. 0 28123395	Type: Leoni LEHC 005776 Rev. 0 28123409
UL properties	UL Subject 758, Style 21223 and CSA-C22.2 No.210, UL Style 21223 80° C 1000 V FT1 cUL AWM I/II A/B 80°C 1000 V FT1 E47543 		UL Subject 758, Style 2570 and CSA-C22.2 No.210, UL Style 2570 80° C 1000 V FT1 cUL AWM I/II A/B 80°C 1000 V FT1 E47543 	
Test voltage core/ core	4.0 kV 50 Hz AC			
Test voltage core/ shield	3.0 kV 50 Hz AC			
Operating voltage Position [5]	1000 V			
Surge impedance position [1]	50 ±2Ω			
Damping position [1]	nom. 17.5 dB/100 m at 100 MHz			
Operating tempera- ture	-40 °C to +80 °C (fixed installation) -30 °C to +80 °C (cable carrier)		-40 °C to +80 °C (fixed installation)	
Weight of cable	nom. 332 kg/km	nom. 392 kg/km	nom. 312 kg/km	Nom. 361 kg/km
Bending radiuses	5 × outer diameter (fixed installation)			
	10 × outer diameter (cable carrier)			
Bending cycles	Min. 5 million			
Outer diameter	15.7 ±0.5 mm	16.7 ±0.5 mm	15.2 ± 0.5 mm	16.1 ±0.5 mm

Properties	Type: Leoni LEHC 005796 Rev. 0 28123336	Type: Leoni LEHC 005770 Rev. 0 28123344	Type: Leoni LEHC 005775 Rev. 0 28123395	Type: Leoni LEHC 005776 Rev. 0 28123409
Chemical properties	Oil resistance according to DIN VDE 0282-10/HD 22.10 S2		Oil resistance according to DIN EN 50363--4-1	
	- 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 - Free of paint-wetting impairment substances			
	- Halogen-free according to IEC 60754-1 - General fuel resistance (e.g. diesel, gasoline) - General resistance to acids, alkalis, and cleaning agents - General resistance against dusts - General resistance against microbes and fungi - Generally hydrolysis-resistant - General resistance against UV radiation		—	

Notes on connection

The following figure shows the cable design and use of connections:



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- [1] Motor/PE connection
- [2] MOVILINK® DDI connection
- [3] Brake connection

10.12 Mounting positions

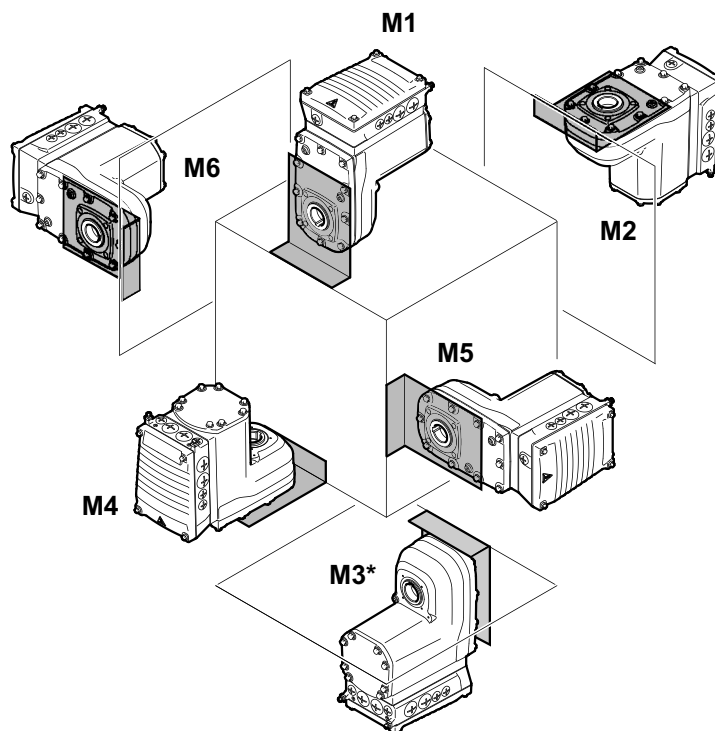
10.12.1 Description of mounting positions

The following mounting positions are possible for the 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, M2, M3, M4, M5, M6) with option "integrated pressure compensation /PG". Observe the documentation "Integrated Pressure Compensation (Option /PG)".

Mounting positions M1 to M6

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



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* **MOVEGEAR® classic MGF..2-.-C, MGF..4-.-C, MGF..4-.-C/XT:**

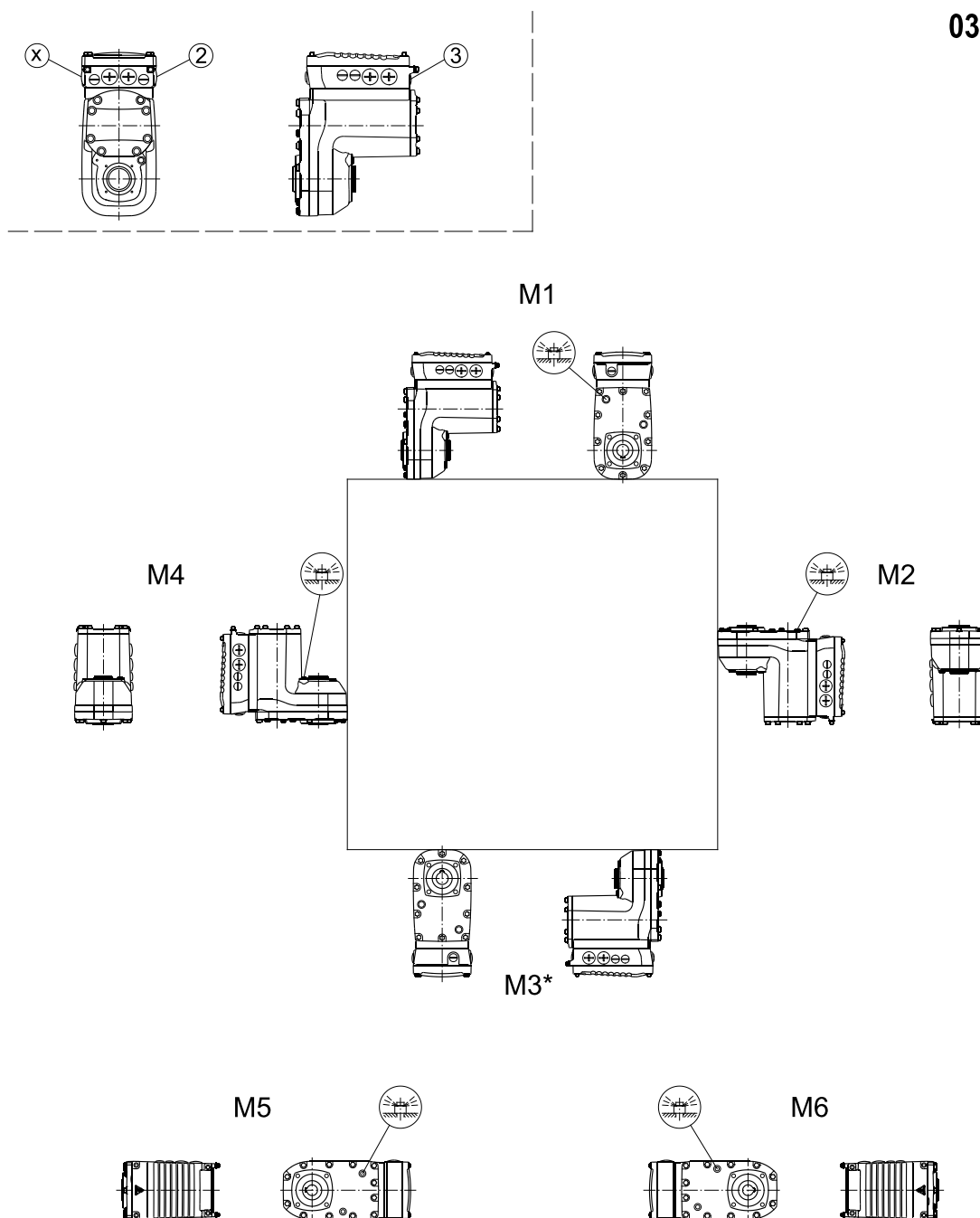
Mounting position M3 is only possible with the option "integrated pressure compensation /PG". Observe the documentation "Integrated Pressure Compensation (Option /PG)".

MOVEGEAR® classic MGF..1-.-C:

No restrictions

10.12.2 Mounting position sheet

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- * **MOVIGEAR® classic MGF..2-..-C, MGF..4-..-C, MGF..4-..-C/XT:**
 Mounting position M3 is only possible with the option "integrated pressure compensation /PG". Observe the documentation "Integrated Pressure Compensation (Option /PG)".
- MOVIGEAR® classic MGF..1-..-C:**
 No restrictions

 = Breather valve

10.13 Lubricants

Observe the information in the gearmotor catalog for the chapters "Bearing grease", "Lubricant fill quantities" and "Lubricant table".

10.14 Lubricants

10.14.1 Roller bearing greases

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

Area of operation	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	Fuchs	Renolit CX-TOM 15
	-40 °C to +80 °C	Klüber	Petamo GHY 133 N
	-40 °C to +40 °C	Bremer & Leguil	Cassida Grease GTS 2

10.14.2 Lubricant fill quantities

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

MGF..1-DSM-C

MGF..1-DSM-C (3 stages)		MGF..1-DSM-C (2 stages)	
Gear ratio i	Fill quantities in liters for mounting positions M1, M2, M3, M4, M5, M6	Gear ratio i	Fill quantities in liters for mounting positions M1, M2, M3, M4, M5, M6
56.01	0.36 l	19.90	0.42 l
51.94		18.18	
48.01		15.34	
44.92		13.11	
43.86		12.15	
41.85		10.51	
37.01		9.79	
36.48		8.54	
31.62		8.39	
29.32		7.67	
25.36		6.47	
23.62		5.53	
20.59		5.13*	
		4.43	
		4.13	
		3.60*	

* = Finite gear unit ratio

= Preferred gear ratio

MGF..2-...C/MGF..4-...C

MGF..2-...C		MGF..4-...C	
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	0.68 l	56.49	1.69 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	1.75 l
22.86	0.71 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	1.80 l
8.24	0.76 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". Observe the documentation "Integrated Pressure Compensation (Option /PG)".

■ = Preferred gear ratio

10.14.3 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

Information on 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.

[1]	[2]		[3]	
			ISO, SAE NLGI	
	-15		VG 460	
	-25		CLP HC - NSF H1 - PSS	VG 220
		[4]	[5]	

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- [1] Device type
- [2] Ambient temperature range
- [3] Viscosity class
- [4] Note on special approvals
- [5] Lubricant type

Information on the various lubricants

				[4]
[1]	-15	+100	[5]	
[2]	XYZ460			
[3]	DE, FR, US, BR, CN			
	SEW070040013			[6]

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[1] Lowest oil sump temperature in °C,
may not be undershot in operation

[2] Trade name

[3] Factory filling for these countries

BR = Brazil

CN = China

DE = Germany

FR = France

US = United States

[4] Manufacturer

[5] Highest oil sump temperature in °C¹⁾

[6] Approvals regarding compatibility of the lubricant with approved oil seals

1) Service life is significantly reduced when exceeded. The lubricant change intervals in the chapter "Inspection and maintenance" must be observed.

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	Trelleborg	1	VCBVR	

Examples:

S2: Only the elastomer FKM meets the requirements of the approval in conjunction with the specific lubricant.

Key to lubricant tables

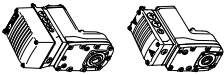
The following table shows the abbreviations and icons used in the lubricant table and explains what they mean:

Abbreviation/ icon	Meaning
	Synthetic lubricant (marked gray)
CLP HC	Synthetic hydrocarbons – polyalphaolefin (PAO)
	Lubricant for the food processing industry – NSF-H1-compliant
4)	Observe the critical starting behavior at low temperatures
Oil seal	Oil seal
PSS	"Premium Sine Seal" oil seal. The addendum "PSS" at the lubricant type signals compatibility with the sealing system.

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".

MGF.- ..C 	[1] 	[2]	[3]	ISO SAE NLGI	SEW EURODRIVE	b remer & egul	Castrol	FUCHS	Mobil®			
	[4]		CLP HC - NSF H1 - PSS	VG 220	SEW EURODRIVE	b remer & egul	Castrol	FUCHS	Mobil®			
	[4]		CLP HC - NSF H1 - PSS	VG 460	SEW EURODRIVE	b remer & egul	Castrol	FUCHS	Mobil®			
	[4]		CLP HC - NSF H1 - PSS	VG 220	SEW EURODRIVE	b remer & egul	Castrol	FUCHS	Mobil®			

- [1] Ambient temperature range
- [2] Note on special approvals
- [3] Oil type
- [4] Standard

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10.15 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.

INFORMATION



The key dimension L12 is determined by the customer and depends on the requirements of the application, as well as on the used materials. See figure "Customer shaft with [A] and without [B] contact shoulder".

INFORMATION



For dimensioning the keyed connection, observe that the hollow gear shaft (hub) is made of the material C45R(1.1201) or X17CrNi16-2+QT900(1.4057+QT900) depending on the ordered variant.

10.15.1 Installation

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

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

The following sections describe the two options.

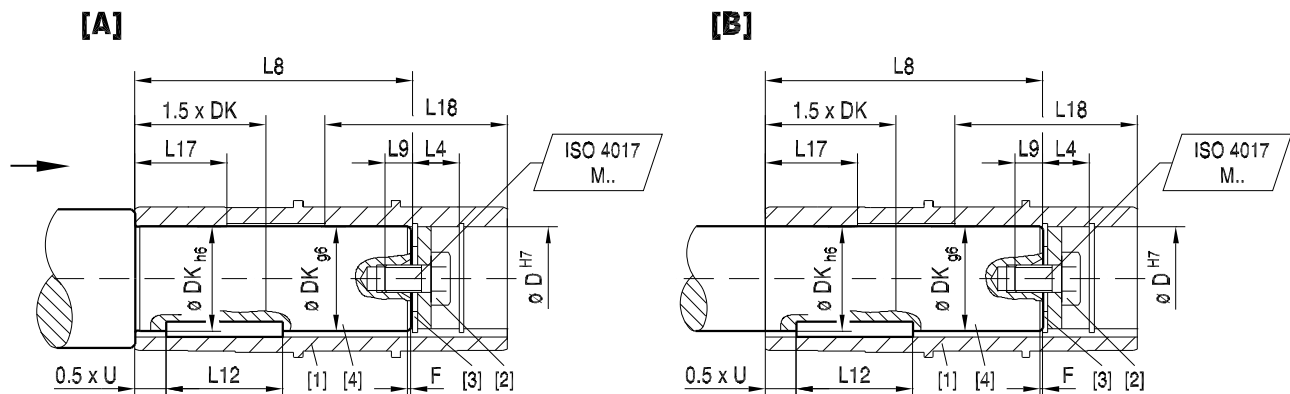
10.15.2 Mounting using supplied fastening parts

The following fastening parts are provided as standard:

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

Customer shaft

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- [1] Hollow shaft
- [2] Retaining screw with washer
- [3] Retaining ring
- [4] Customer shaft
- L8 Length of customer shaft (With retaining ring positioned outside: Length of customer shaft L8+L4)
- L12 Key length
- U Key width
- F Chamfer at the shaft end (always 1 mm with MOVIGEAR®)
- DK Customer shaft diameter
- D Hollow shaft diameter
- L9 Screw-in depth of the included retaining screw
- L17/L18 Cylinder section length with dimension H7

Dimensions and tightening torque for MGFA.1-C

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

Gear unit type	D ^{H7}	DK ¹⁾	L8 ²⁾	L4 ³⁾	L17	L18	F	U	L9	Supplied retaining screw	MS
	mm	mm	mm	mm	mm	mm	mm	mm	mm	ISO 4017	Nm
MGFA.1-...-C	20	20	73.6	16.4	35	35	1	6 ⁴⁾	10	M6 × 16-8.8	8
	25	25	73.8	16.2	35	35	1	8 ⁴⁾	17	M10 × 25-8.8	20

Dimensions and tightening torque for MGFA.2-...-C/MGFA.4-...-C

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

Gear unit type	D ^{H7}	DK ¹⁾	L8 ²⁾	L4 ³⁾	L17	L18	F	U	L9	Supplied retaining screw	MS
	mm	mm	mm	mm	mm	mm	mm	mm	mm	ISO 4017	Nm
MGFA.2-...-C	20	20	84.6	16.4	35	55	1	6 ⁴⁾	10	M6 × 16-8.8	8
	25	25	83.8	16.2	35	55	1	8 ⁴⁾	17	M10 × 25-8.8	20
	30	30	83.8	16.2	35	55	1	8 ⁴⁾	17	M10 × 25-8.8	20
	35	35	80	17.9	45	45	1	10 ⁴⁾	22	M12x30-8.8	20
	40	40	89	12.85	35	55	1	12 ⁵⁾	30	M16x40-8.8	40
MGFA.4-...-C	30	30	107.3	16.2	40	60	1	8 ⁴⁾	17	M10 × 25-8.8	20
	35	35	105.6	17.9	40	60	1	10 ⁴⁾	22	M12x30-8.8	20
	40	40	105.5	17.65	40	60	1	12 ⁴⁾	29	M16x40-8.8	40

Key

- Up to a distance of at least $1.5 \times DK$, the diameter of the customer shaft must be $\varnothing DK_{h6}$, and with the other length $\varnothing DK_{g6}$.
- Position of retaining ring: **INSIDE**
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 be **equal L8**.
With this configuration, the customer shaft can be pressed out using the optional assembly/disassembly kit (doesn't apply to MGF.2-C and 40 mm hollow shaft).
- Position of retaining ring: **OUTSIDE**
The installation length of the customer shaft **with** contact shoulder [A] must be **(L8 + L4) -1 mm**.
The installation length of the customer shaft **without** contact shoulder [B] must be equal to **L8 + L4**.
- For keyway types: DIN6885-1 (domed type)
- For keyway types: DIN6885-3 (low type)

10.15.3 Mounting/dismounting with SEW-EURODRIVE assembly and disassembly kit

You can also 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]

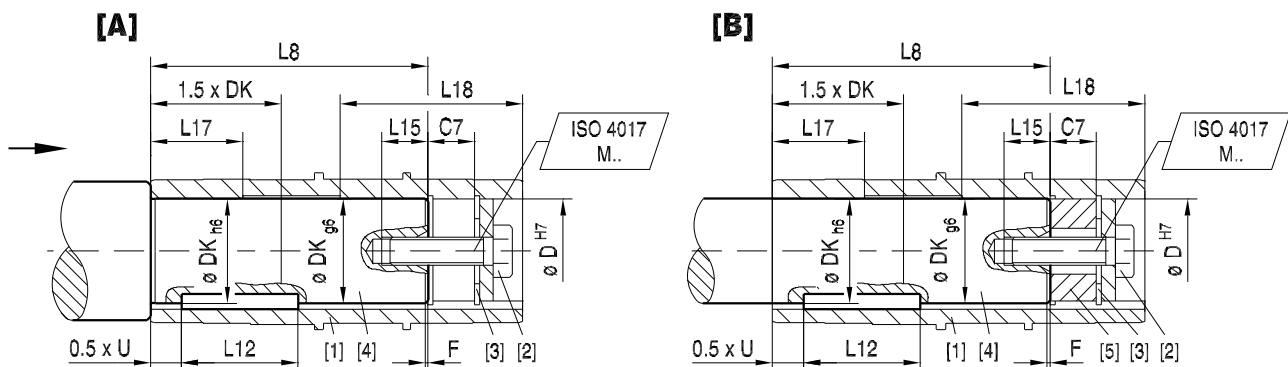
The short retaining screw delivered as standard is not required.

Customer shaft

- The installation length of the customer shaft must be L8. **Do not use the spacer tube if the customer shaft has a contact shoulder [A].**
- The installation length of the customer shaft must be L8. **Use the spacer tube if the customer shaft has no contact shoulder [B].**

The following figure shows the customer shaft with contact shoulder [A] and without contact shoulder [B].

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- | | |
|---------|--|
| [1] | Hollow shaft |
| [2] | Retaining screw with washer |
| [3] | Retaining ring |
| [4] | Customer shaft |
| [5] | Spacer tube |
| L8 | Customer shaft length |
| L12 | Key length |
| U | Key width |
| F | Chamfer at the shaft end (always 1 mm with MOVIGEAR®) |
| DK | Customer shaft diameter |
| D | Hollow shaft diameter |
| L15 | Screw-in depth of the retaining screws included in the assembly/disassembly kit. |
| C7 | Dimension of the included spacer, or the included ejector plate and fixed nut. |
| L17/L18 | Cylinder section length with dimension H7 |

Dimensions, tightening torques and part numbers for MGFA.1-...-C

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

Gear unit type	D ^{H7}	DK ¹⁾	L8	C7	L17	L18	F	U	L15 ⁺²	Retaining screw [2] from the assembly/ disassembly kit	MS	Installation/ removal kit
	mm	mm	mm	mm	mm	mm	mm	mm	mm	ISO 4017	Nm	Part number
MGFA.1-...-C	20	20	73.6	16	35	35	1	6 ²⁾	16	M6 × 25 - 8.8	8	06436838
	25	25	73.8	16	35	35	1	8 ²⁾	22	M10 × 35 - 8.8	20	06436846

1) Up to a distance of at least 1.5 × DK, the diameter of the customer shaft must be ØDKh6, and with the other length ØDKg6.

2) For keyway types: DIN6885-1 (domed type)

Dimensions, tightening torques and part numbers for MGFA.2-...-C/MGFA.4-...-C

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

Gear unit type	D ^{H7}	DK ¹⁾	L8	C7	L17	L18	F	U	L15 ⁺²	Retaining screw [2] from the assembly/ disassembly kit	MS	Installation/ removal kit
	mm	mm	mm	mm	mm	mm	mm	mm	mm	ISO 4017	Nm	Part number
MGFA.2-...-C	20	20	84.6	16	35	55	1	6 ²⁾	16	M6 × 25 - 8.8	8	06436838
	25	25	83.8	16	35	55	1	8 ²⁾	22	M10 × 35 - 8.8	20	06436846
	30	30	83.8	16	35	55	1	8 ²⁾	22	M10 × 35 - 8.8	20	06436854
	35	35	80	18	45	45	1	10 ²⁾	28	M12 × 45 - 8.8	20	06436862
	40	40	89	13	35	55	1	12 ³⁾	36	M16 × 50 - 8.8	40	— ⁴⁾
MGFA.4-...-C	30	30	107.3	16	40	60	1	8 ²⁾	22	M10 × 35 - 8.8	20	06436854
	35	35	105.6	18	40	60	1	10 ²⁾	28	M12 × 45 - 8.8	20	06436862
	40	40	105.5	18	40	60	1	12 ²⁾	36	M16 × 50 - 8.8	40	06436870

29128250/EN – 08/2019

- 1) Up to a distance of at least $1.5 \times DK$, the diameter of the customer shaft must be $\varnothing DKh6$, and with the other length $\varnothing DKg6$.
- 2) For keyway types: DIN6885-1 (domed type)
- 3) For keyway types: DIN6885-3 (low type)
- 4) Not with the assembly/disassembly kit by SEW-EURODRIVE

Disassembly

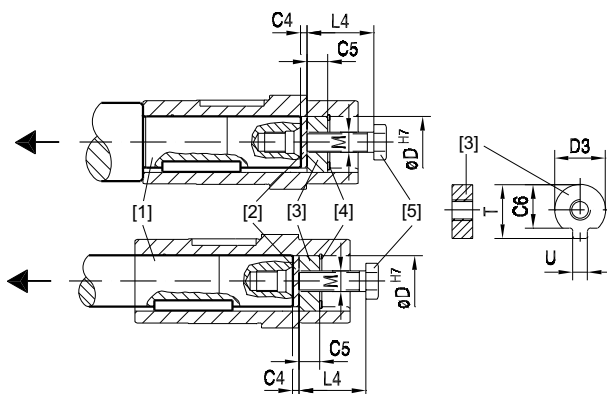
INFORMATION



The depicted assembly kit for attaching the customer shaft is a recommendation by SEW-EURODRIVE.

- Check whether this design can compensate the present axial loads.
- You may need to use another construction for axial securing in certain applications.

The following figure shows the SEW-EURODRIVE assembly/disassembly kit.



25843977355

- [1] Customer shaft
- [2] Forcing washer
- [3] Fixed nut for disassembly
- [4] Retaining ring
- [5] Retaining screw

The following table lists the dimensions and part numbers of the assembly/disassembly kit:

Gear unit type	D^{H7}	C4	C5	C6	$U^{-0.5}$	$T^{-0.5}$	$D3^{-0.5}$	L4	$M^{1)}$	Installation/ removal kit
	mm	mm	mm	mm	mm	mm	mm	mm		Part number
MGFA.1-...-C ²⁾	20	5	6	15.5	5.5	22.5	19.7	25	M6	6436838
MGFA.1-...-C MGFA.2-...-C	25	5	10	20	7.5	28	24.7	35	M10	6436846
MGFA.2-...-C MGFA.4-...-C	30	5	10	25	7.5	33	29.7	35	M10	6436854

Gear unit type	D ^{H7}	C4	C5	C6	U ^{-0.5}	T ^{-0.5}	D3 ^{-0.5}	L4	M ¹⁾	Installation/ removal kit
	mm	mm	mm	mm	mm	mm	mm	mm		Part number
MGFA.2-...-C MGFA.4-...-C	35	5	12	29	9.5	38	34.7	45	M12	6436862
MGFA.2-...-C MGFA.4-...-C	40	5	12	34	11.5	41.9	39.7	50	M16	6436870

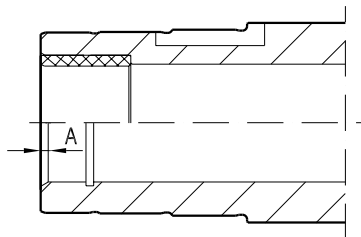
1) Retaining screw

2) Only with MOVIGEAR® classic

10.16 Drive unit with hollow shafts

10.16.1 Hollow shaft chamfer

The following figure illustrates the hollow shaft chamfer:



25844033035

The following table shows the dimensions of the chamfer:

Gear unit type	Design with hollow shaft (A)
MGFA.1-...-C ¹⁾	2 × 30°
MGFA.2-...-C	2 × 30°
MGFA.4-...-C	2 × 30°

1) Only with MOVIGEAR® classic

10.17 Dimension drawings of the drive unit

10.17.1 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...16 mm → M5

Ø > 16...21 mm → M6

Ø > 21...24 mm → M8

Ø > 24...30 mm → M10

Ø > 30...38 mm → M12

Ø > 38...50 mm → M16

Keys: according to DIN 6885 (domed type).

Hollow shafts

Diameter tolerance:

Ø → ISO H7 measured with plug gauge

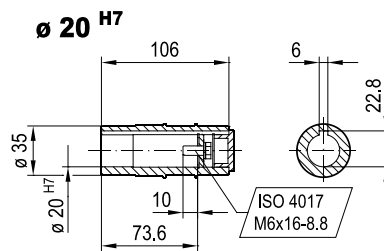
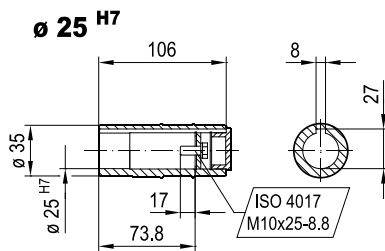
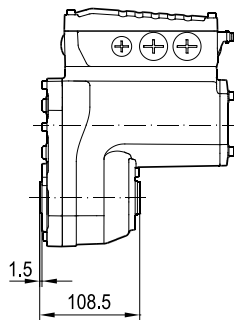
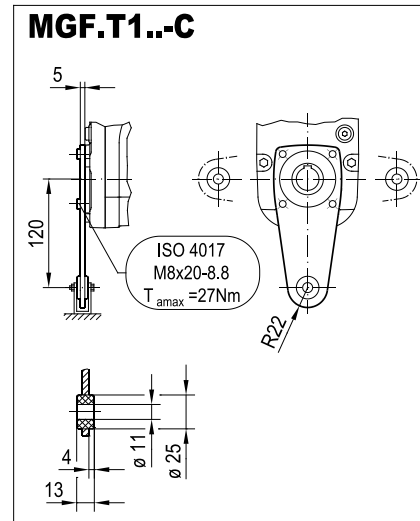
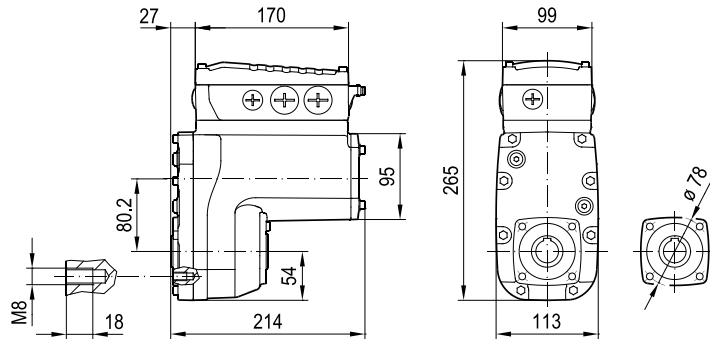
Breather valves and cable glands

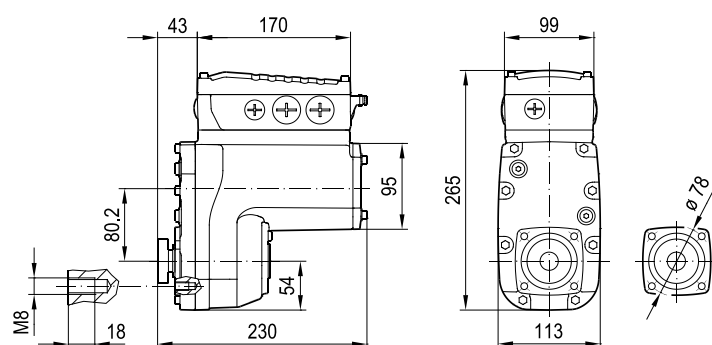
The dimension drawings always show the screw plugs. The contour dimensions may vary slightly due to preinstalled breather valves, plug connectors or pressure compensation fittings (in conjunction with the design for wet areas).

10.17.2 MGF..1-DSM-C

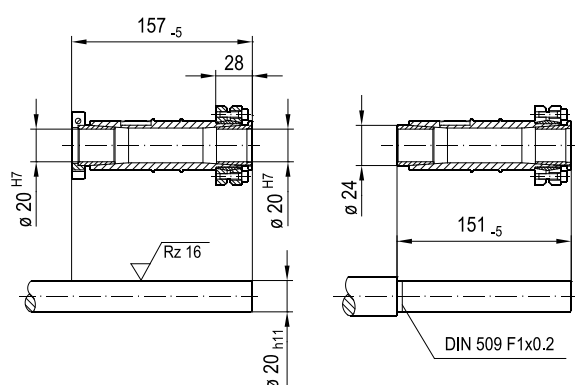
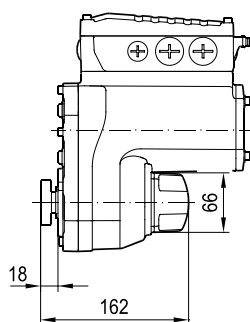
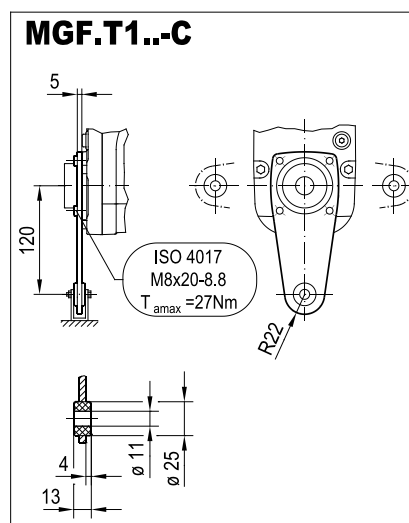
MGFAS1-DSM-C

03 003 03 17



MGFTS1-DSM-C

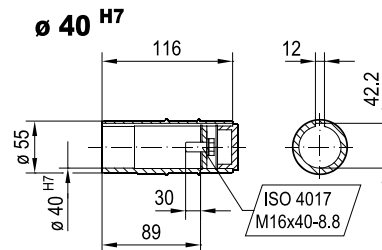
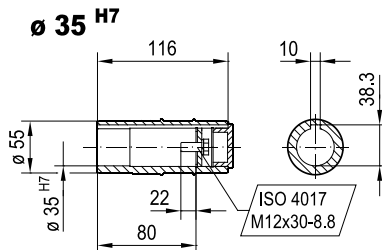
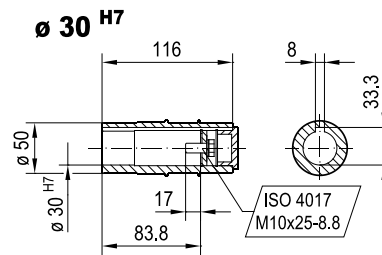
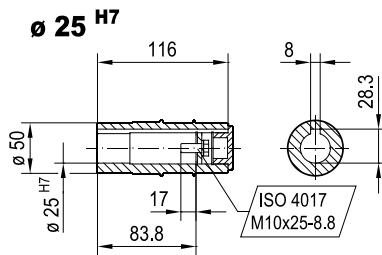
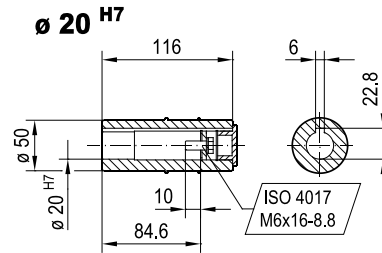
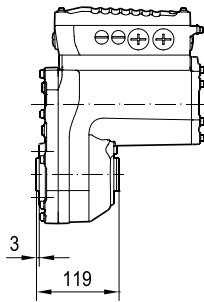
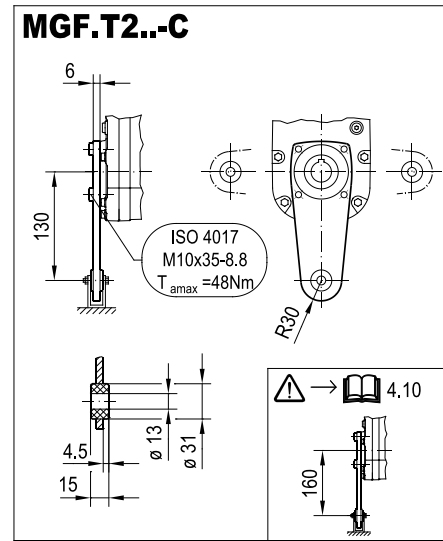
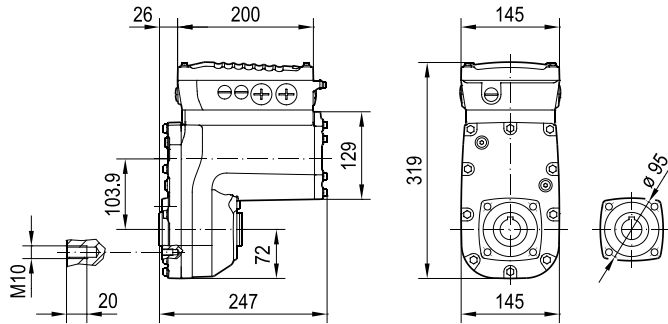
03 004 02 17

MGF.T1.-C

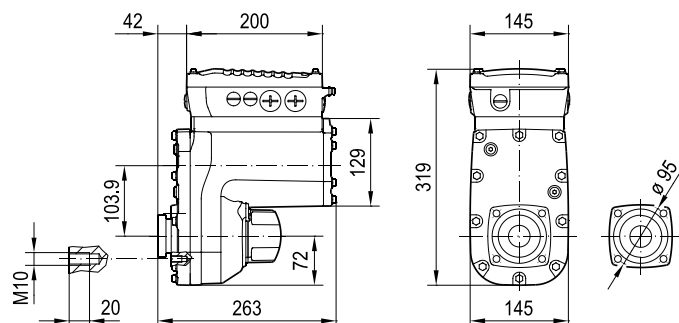
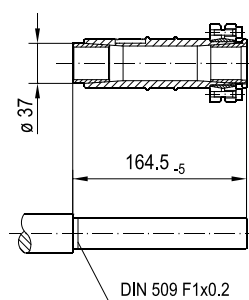
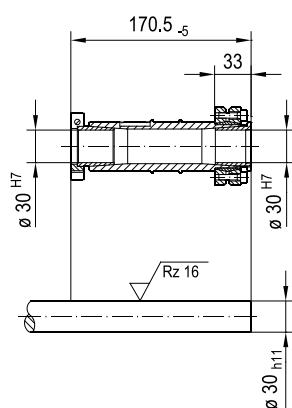
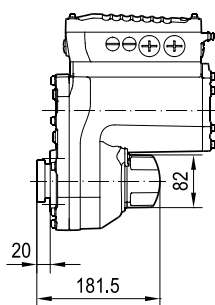
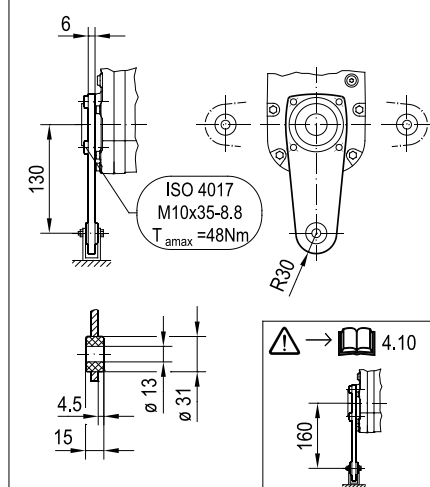
10.17.3 MGF..2-DSM-C

03 003 01 18

MGFAS2-DSM-C



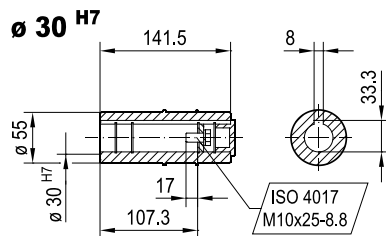
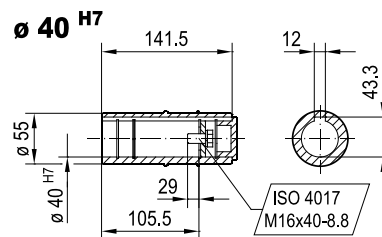
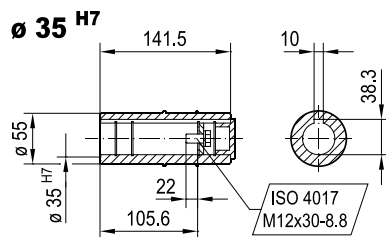
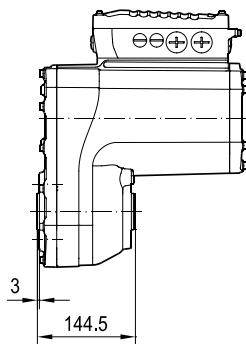
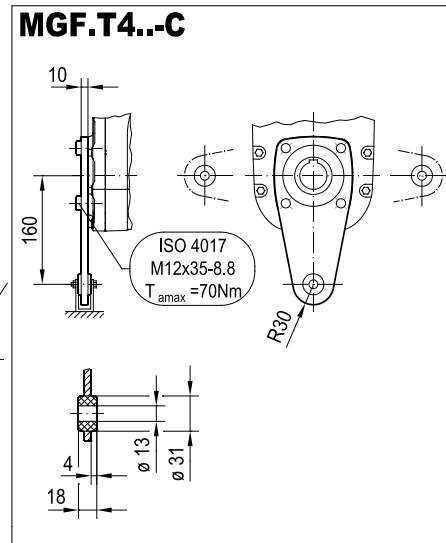
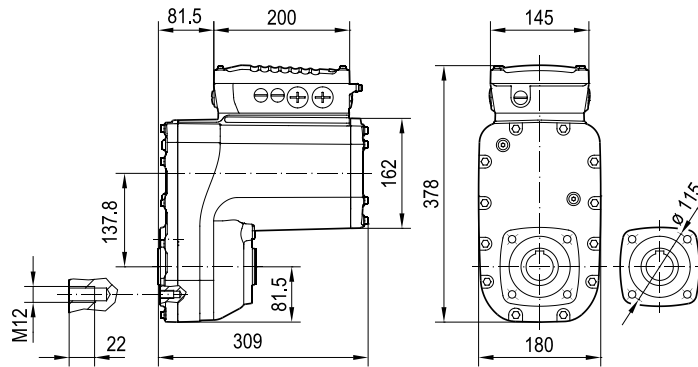
03 005 01 18

MGFTS2-DSM-C**MGF.T2..-C**

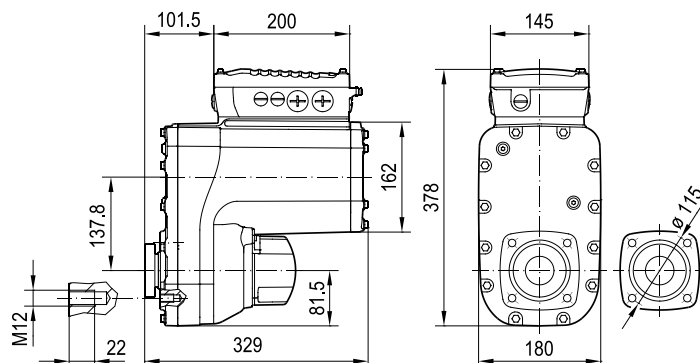
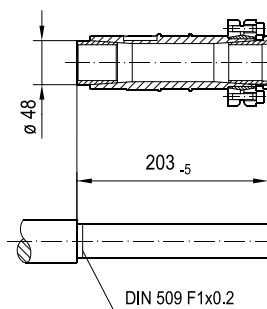
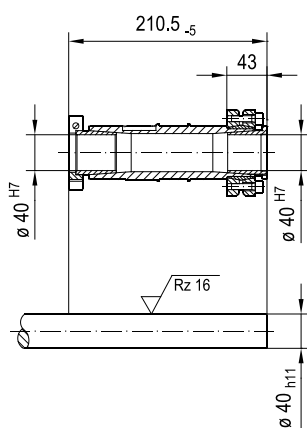
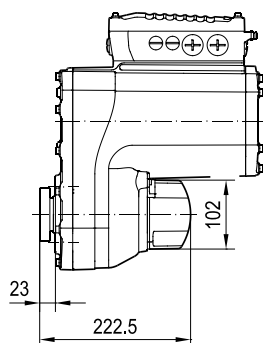
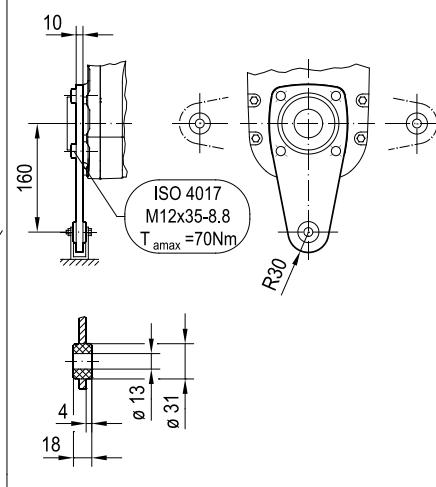
10.17.4 MGF..4-DSM-C

03 010 00 18

MGFAS4-DSM-C



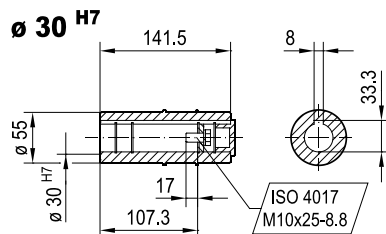
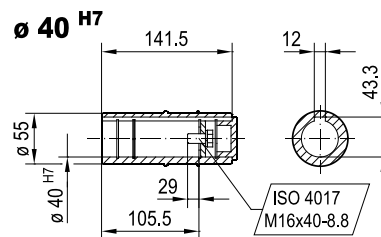
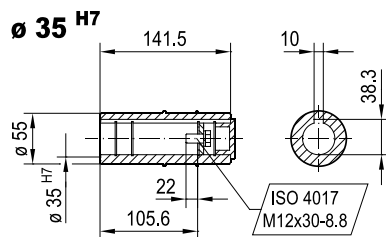
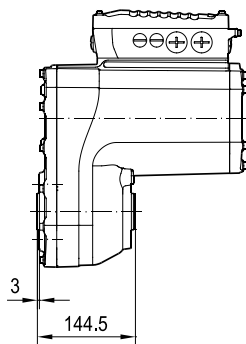
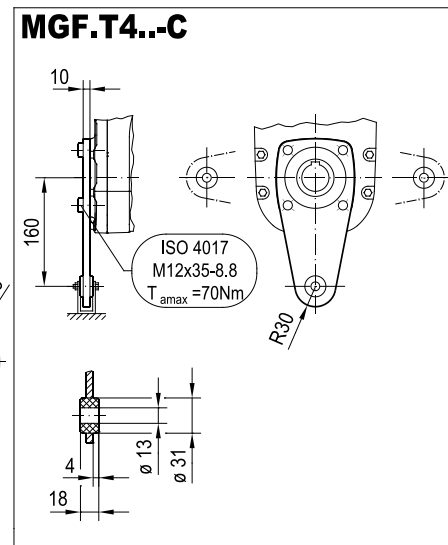
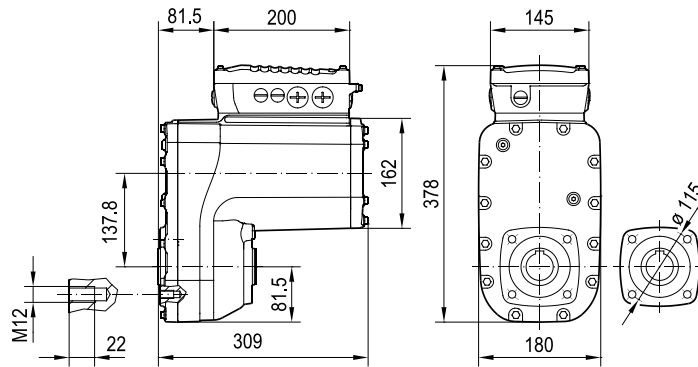
03 011 00 18

MGFTS4-DSM-C**MGF.T4..-C**

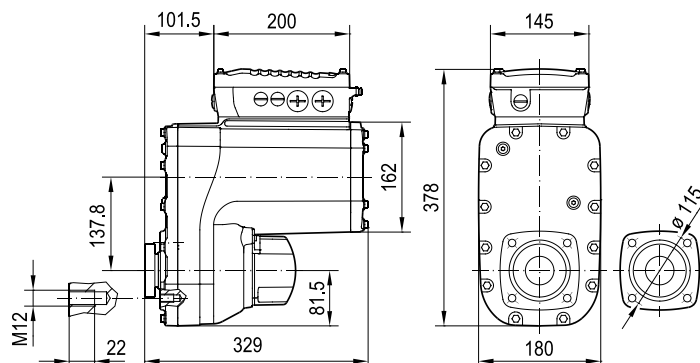
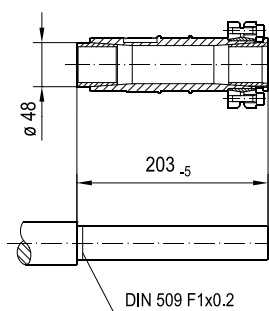
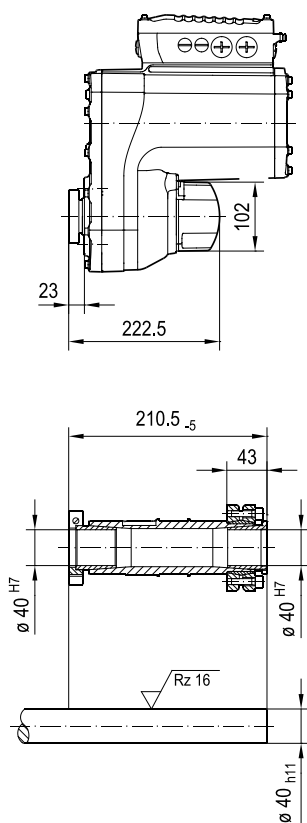
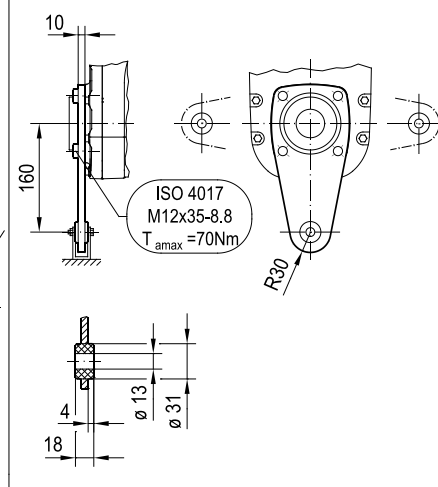
10.17.5 MGF..4..-DSM/XT with increased torque

03 012 00 18

MGFAS4-DSM-C/XT



03 013 00 18

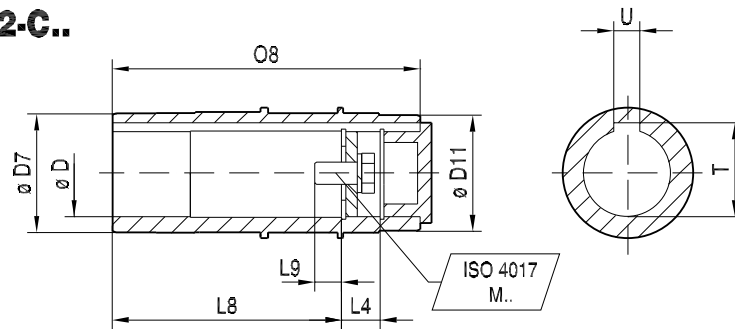
MGFTS4-DSM-C/XT**MGF.T4..-C**

10.17.6 Shaft designs

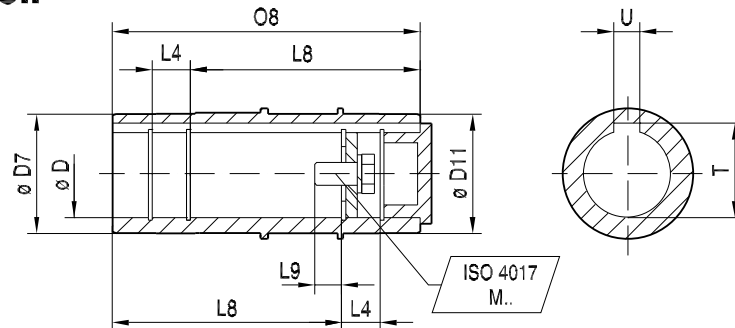
MGFAS..C/mm (MGFAS1..C only with MOVIGEAR® classic)

03 016 02 17

MGF.1-2-C..



MGF.4-C..



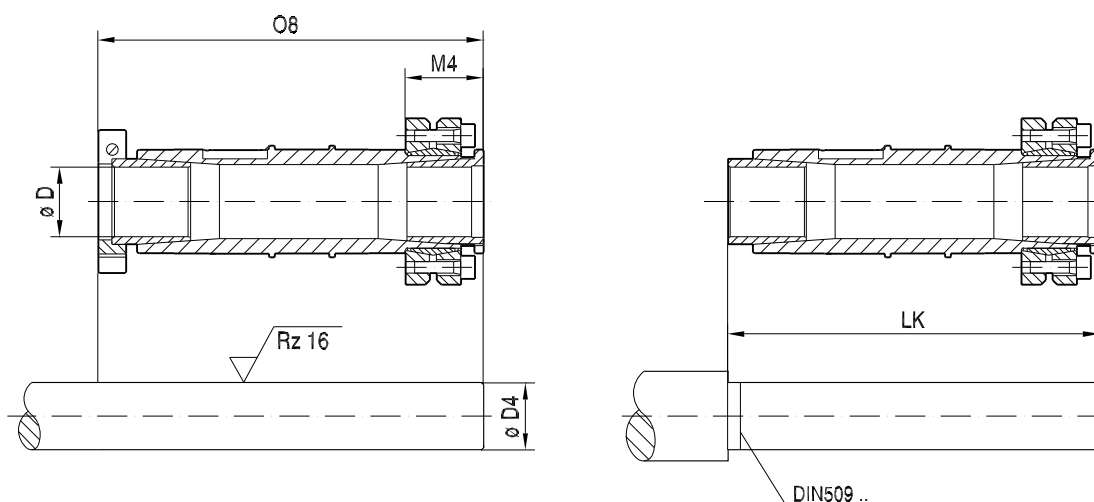
	$\varnothing D^{H7}$	$\varnothing D7$	$\varnothing D11$	L4	L8	L9	O8	T	U	ISO 4017
MGFAS1..C	20	35	38	16.4	73.6	10	106	22.8	6	M6x16-8.8
MGFAS1..C	25	35	38	16.2	73.8	17	106	27	8	M10x25-8.8

	$\varnothing D^{H7}$	$\varnothing D7$	$\varnothing D11$	L4	L8	L9	O8	T	U	ISO 4017
MGFAS2..C	20	50	45	16.4	84.6	10	116	22.8	6	M6x16-8.8
MGFAS2..C	25	50	45	16.2	83.8	17	116	28.3	8	M10x25-8.8
MGFAS2..C	30	50	45	16.2	83.8	17	116	33.3	8	M10x25-8.8
MGFAS2..C	35	55	50	17.9	80	22	116	38.3	10	M12x30-8.8
MGFAS2..C	40	55	50	12.85	89	30	116	42.2	12	M16x40-8.8

	$\varnothing D^{H7}$	$\varnothing D7$	$\varnothing D11$	L4	L8	L9	O8	T	U	ISO 4017
MGFAS4..C	30	55	55	16.2	107.3	17	141.5	33.3	8	M10x25-8.8
MGFAS4..C	35	55	55	17.9	105.6	22	141.5	38.3	10	M12x30-8.8
MGFAS4..C	40	55	55	17.65	105.5	29	141.5	43.3	12	M16x40-8.8

MGFTS..C/mm (MGFTS1..C only with MOVIGEAR® classic)

03 017 00 17

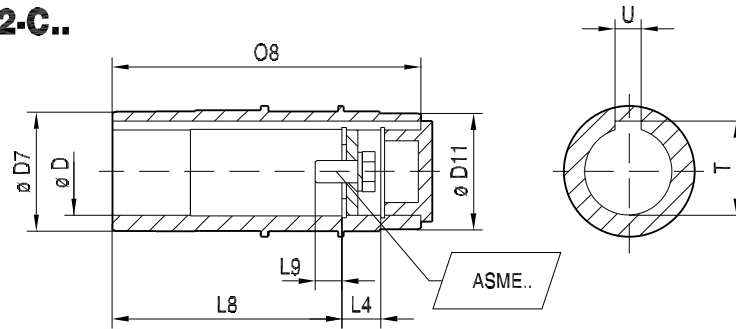


	$\varnothing D4_{h11}$	$\varnothing D^{+0.1}$	M4	O8 _{.5}	LK _{.5}	DIN 509
MGFTS1..C	20	20.1	28	157	151	F1x0.2
	$\varnothing D4_{h11}$	$\varnothing D^{+0.1}$	M4	O8 _{.5}	LK _{.5}	DIN 509
MGFTS2..C	25	25.1	33	170.5	164.5	F1x0.2
MGFTS2..C	30	30.26	33	170.5	164.5	F1x0.2
	$\varnothing D4_{h11}$	$\varnothing D^{+0.1}$	M4	O8 _{.5}	LK _{.5}	DIN 509
MGFTS4..C	35	35.03	43	210.5	203	F1x0.2
MGFTS4..C	40	40.1	43	210.5	203	F1x0.2

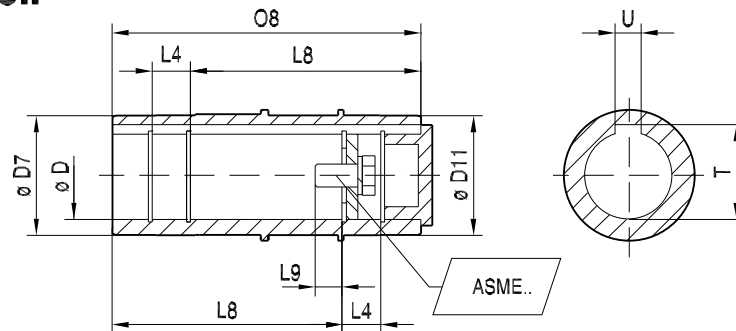
MGFAS..C/inch (MGFAS1..C only with MOVIGEAR® classic)

03 016 00 18

MGF.1-2-C..



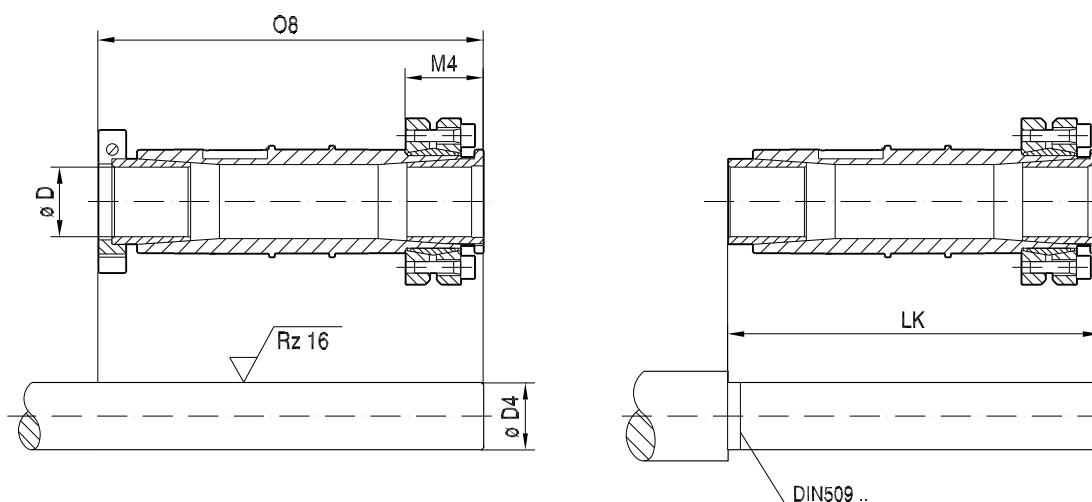
MGF.4-C..



	$\varnothing D^{H7}$	$\varnothing D7$	$\varnothing D11$	$L4$	$L8$	$L9$	$O8$	T	U	ASME
MGFAS1..C	0.750	1.378	1.496	0.646	2.898	0.347	4.173	0.846	0.187	1/4-20x0.625
MGFAS1..C	0.875	1.378	1.496	0.646	2.937	0.347	4.173	0.965	0.187	1/4-20x0.625
MGFAS1..C	1.000	1.378	1.496	0.638	2.906	0.695	4.173	1.122	0.250	3/8-16x1.00
	$\varnothing D^{H7}$	$\varnothing D7$	$\varnothing D11$	$L4$	$L8$	$L9$	$O8$	T	U	ASME
MGFAS2..C	1.000	1.969	1.969	0.638	3.339	0.69	4.567	1.122	0.250	3/8-16x1.00
MGFAS2..C	1.250	1.969	1.969	0.638	3.339	0.69	4.567	1.374	0.250	7/16-14x1.00
MGFAS2..C	1.4375	2.165	1.969	0.516	3.494	1.39	4.567	1.610	0.375	5/8-11x1.75
	$\varnothing D^{H7}$	$\varnothing D7$	$\varnothing D11$	$L4$	$L8$	$L9$	$O8$	T	U	ASME
MGFAS4..C	1.250	2.165	2.165	0.717	4.146	0.69	5.571	1.374	0.250	7/16-14x1.00
MGFAS4..C	1.437	2.165	2.165	0.705	4.154	1.39	5.571	1.610	0.375	5/8-11x1.75
MGFAS4..C	1.500	2.165	2.165	0.705	4.154	1.39	5.571	1.669	0.375	5/8-11x1.75

MGFTS..C/inch (MGFTS1..C only with MOVIGEAR® classic)

03 017 00 18



	$\varnothing D4_{h11}$	$\varnothing D^{+0.004}$	M4	O8 $_{-0.197}$	LK $_{-0.197}$	DIN 509
MGFTS1..C	0.750	0.754	1.102	6.181	5.945	F1x0.2
	$\varnothing D4_{h11}$	$\varnothing D^{+0.004}$	M4	O8 $_{-0.197}$	LK $_{-0.197}$	DIN 509
MGFTS2..C	1.000	1.004	1.299	6.713	6.476	F1x0.2
MGFTS2..C	1.1875	1.191	1.299	6.713	6.476	F1x0.2
MGFTS2..C	1.250	1.254	1.299	6.713	6.476	F1x0.2
	$\varnothing D4_{h11}$	$\varnothing D^{+0.004}$	M4	O8 $_{-0.197}$	LK $_{-0.197}$	DIN 509
MGFTS4..C	1.250	1.250	1.693	8.287	7.992	F1x0.2
MGFTS4..C	1.375	1.379	1.693	8.287	7.992	F1x0.2
MGFTS4..C	1.4375	1.441	1.693	8.287	7.992	F1x0.2
MGFTS4..C	1.500	1.504	1.693	8.287	7.992	F1x0.2
MGFTS4..C	1.625	1.629	1.693	8.287	7.992	F1x0.2

10.18 Dimension drawings of plug connectors

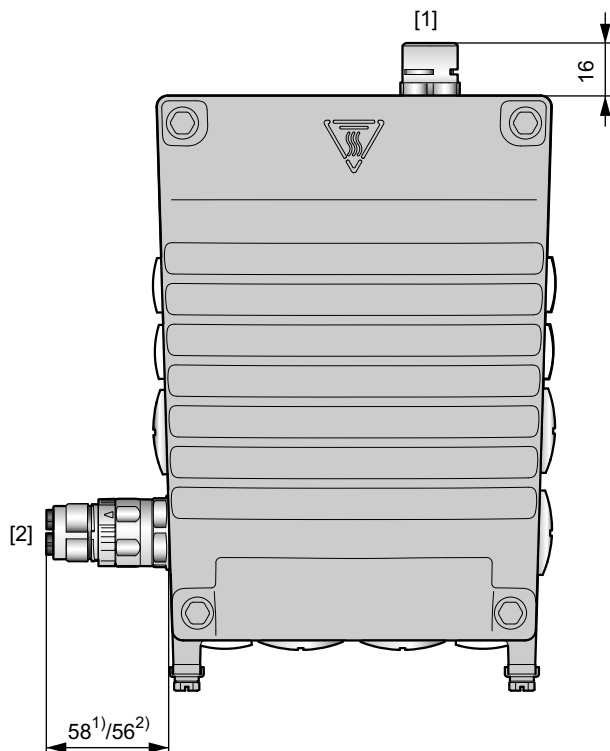
10.18.1 MGF..2-DSM-C/K.1, MGF..4-DSM-C/K.1, MGF..4-DSM-C/XT/K.1

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 the chapter "Plug connector positions".



9007225001504139

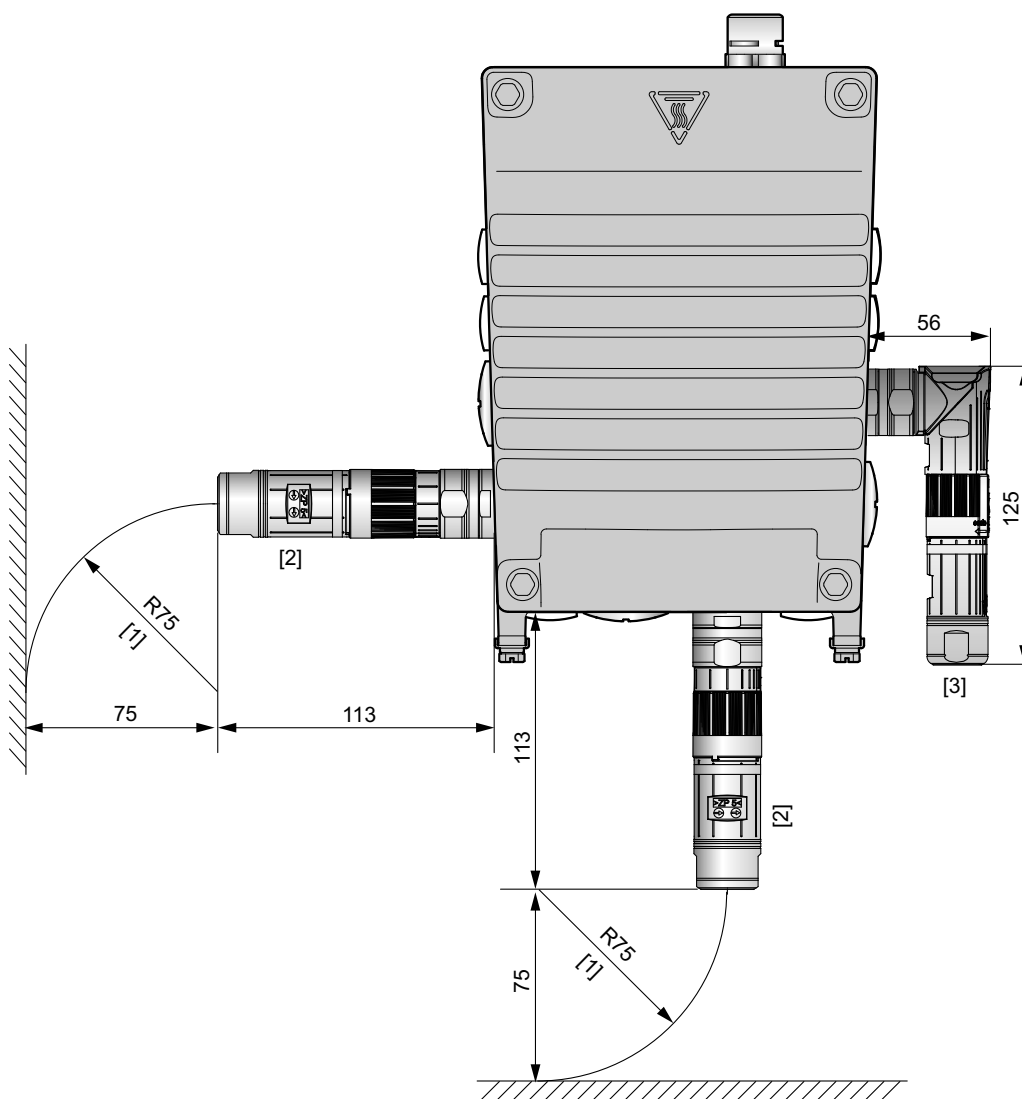
- 1) "Straight" plug connector variant
- 2) "Right-angle" plug connector variant
- [1] Optional pressure compensation
- [2] X2101: Connecting the inverter for drive units with MOVILINK® DDI interface

Plug connector including 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 the chapter "Plug connector positions".



25751807115

- [1] Bending radius
 [2] "Straight" plug connector variant M23
 [3] "Right-angle" plug connector variant M23

11 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
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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
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Bangladesh

Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
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Belarus

Sales	Minsk	Foreign unitary production enterprise SEW- EURODRIVE Rybalko Str. 26 220033 Minsk	Tel. +375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by
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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 service-IG@sew-eurodrive.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 S.A.R.L. Ancienne Route Bonabéri P.O. Box B.P 8674 Douala-Cameroun	Tel. +237 233 39 02 10 Fax +237 233 39 02 10 sew@sew-eurodrive-cm
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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
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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
	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

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
	Drive Service Hotline / 24 Hour Service	+420 800 739 739 (800 SEW SEW)	Service Tel. +420 255 709 632 Fax +420 235 358 218 servis@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
Egypt			
Sales Service	Cairo	Copam Egypt for Engineering & Agencies Building 10, Block 13005, First Industrial Zone, Obour City Cairo	Tel. +202 44812673 / 79 (7 lines) Fax +202 44812685 http://www.copam-egypt.com copam@copam-egypt.com
Estonia			
Sales	Tallin	ALAS-KUUL AS Reti tee 4 75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee veiko.soots@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 Service	Hagenau	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Hagenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 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 Mommernheim Cedex	Tel. +33 3 88 37 48 00

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 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 Fax +33 4 74 99 60 15
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
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	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
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 Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dankritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Hamburg	SEW-EURODRIVE GmbH & Co KG Hasselbinnen 11 22869 Schenefeld	Tel. +49 40 298109-60 Fax +49 40 298109-70 tb-hamburg@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@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

Germany

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
Drive Service Hotline / 24 Hour Service			Tel. 01924 896911

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
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Hungary

Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyi 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
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Iceland

Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavik	Tel. +354 585 1070 Fax +354 585)1071 http://www.varmaverk.is vov@vov.is
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India

Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 http://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
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

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

Indonesia			
	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	Alpertone Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alpertone.ie info@alpertone.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 di R. Blickle & Co.s.a.s. Via Bernini,14 20020 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 21 21 81 05 Fax +225 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.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 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
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

Lebanon

Sales (Jordan, Kuwait , Beirut Saudi Arabia, Syria)	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
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Lithuania

Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
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Luxembourg

Representation: Belgium

Macedonia

Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
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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
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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@sew-eurodrive.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@sew-eurodrive.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
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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
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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
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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 Plot 296A, Adeyemo Akapo Str. Omole GRA Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com bolaji.adekunle@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 Com- mercial 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 De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	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
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» а. я. 36 195220 Санкт-Петербург	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. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybničná 40 831 06 Bratislava	Tel. +421 2 33595 202, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 Mobile +421 907 671 976 sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. 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 Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 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
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

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
Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRIVE Hareket Sistemleri San. Ve TIC. Ltd. Sti 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 Esquina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
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USA

Production Assembly Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax 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. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	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

Additional addresses for service provided on request!

Vietnam

Sales	Ho Chi Minh City	SEW-EURODRIVE PTE. LTD. RO at Hochim- inh 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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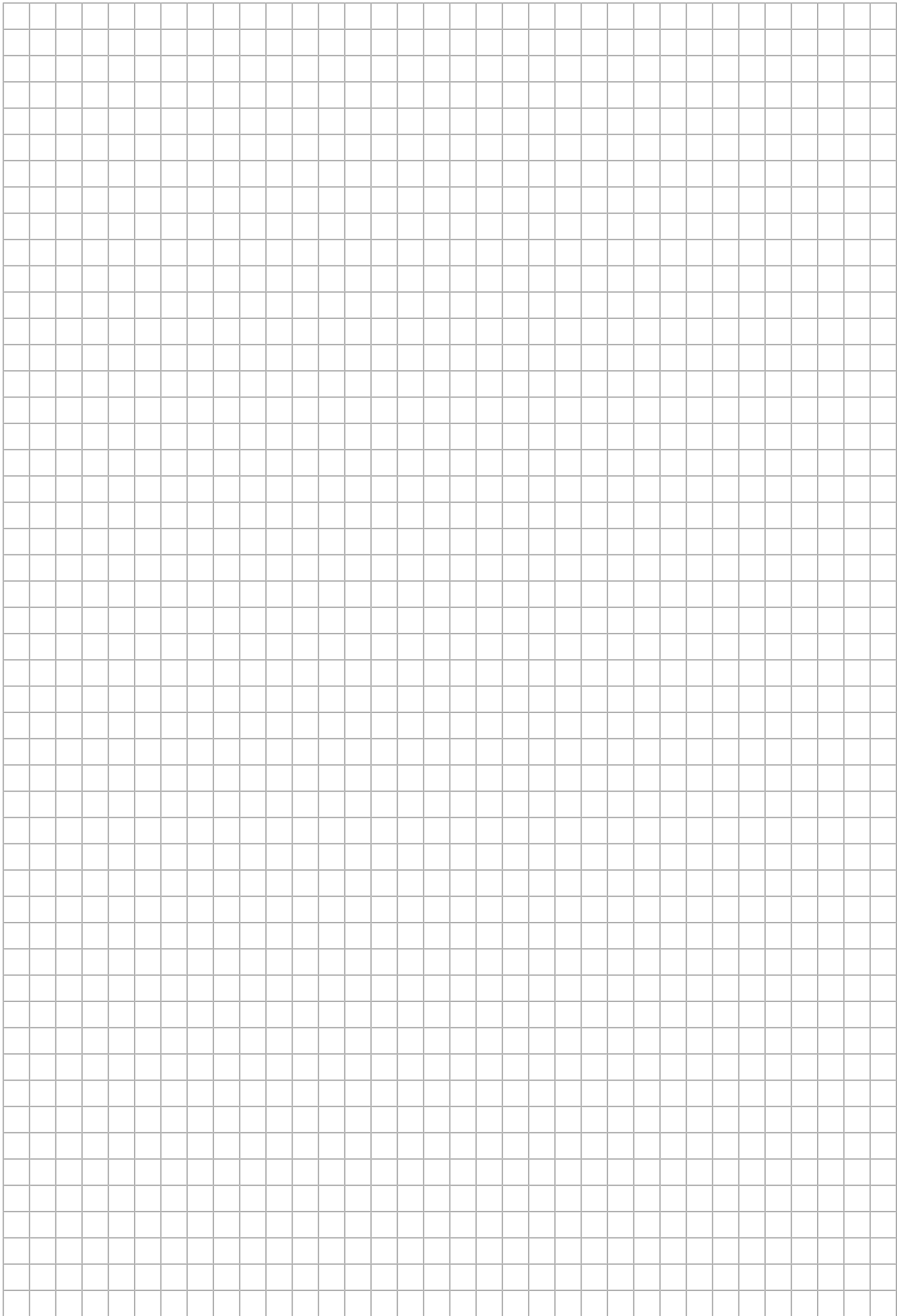
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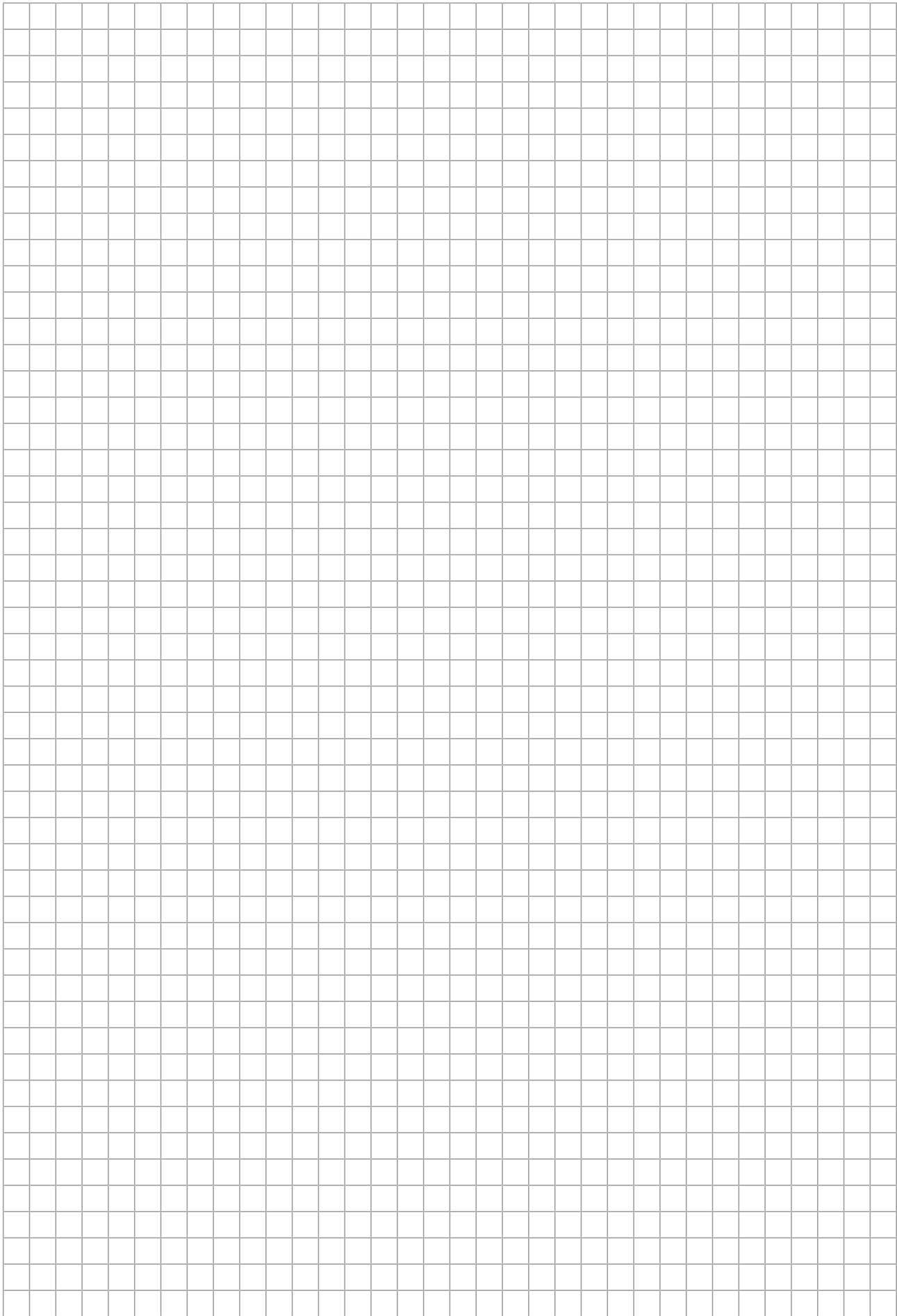
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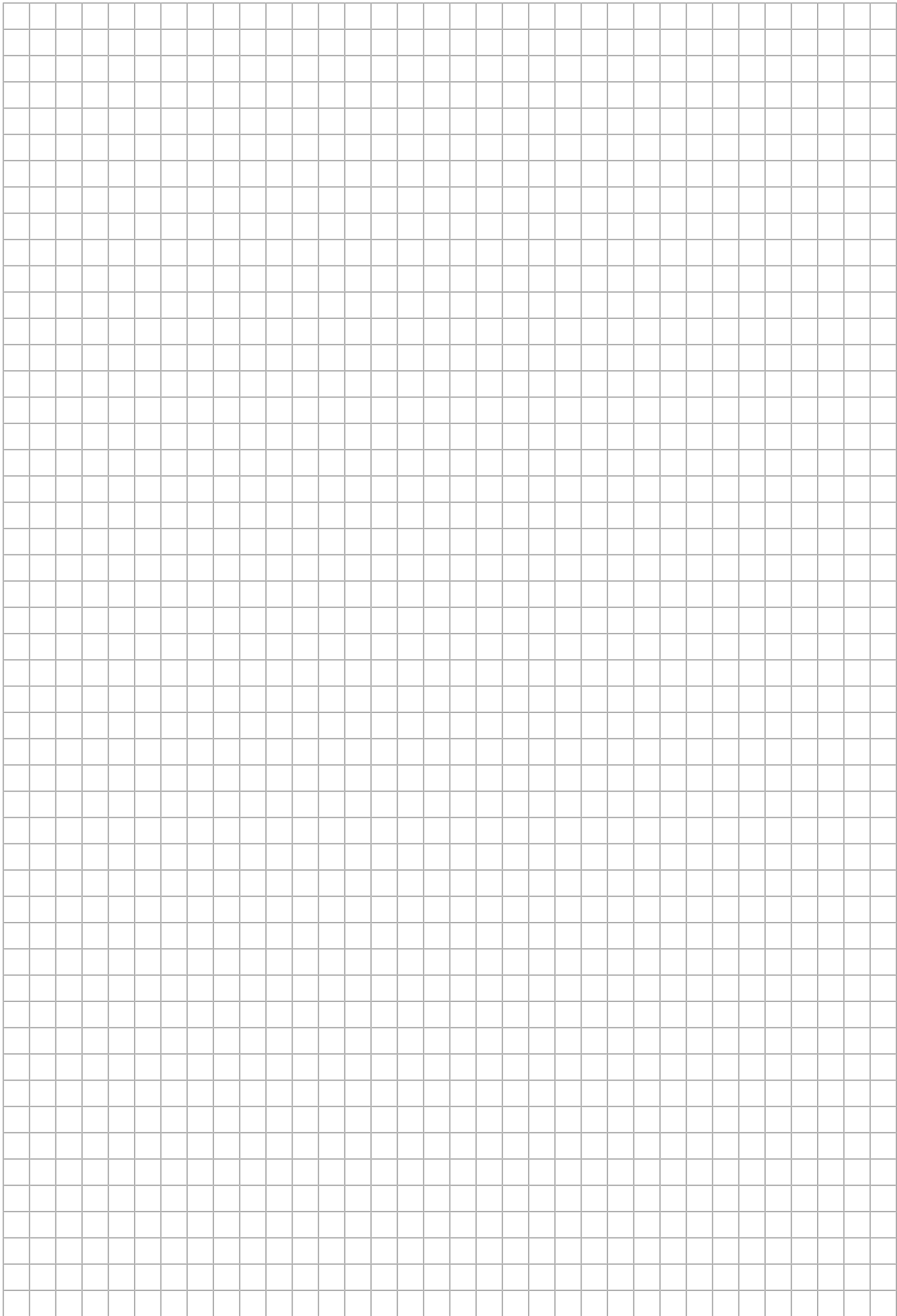
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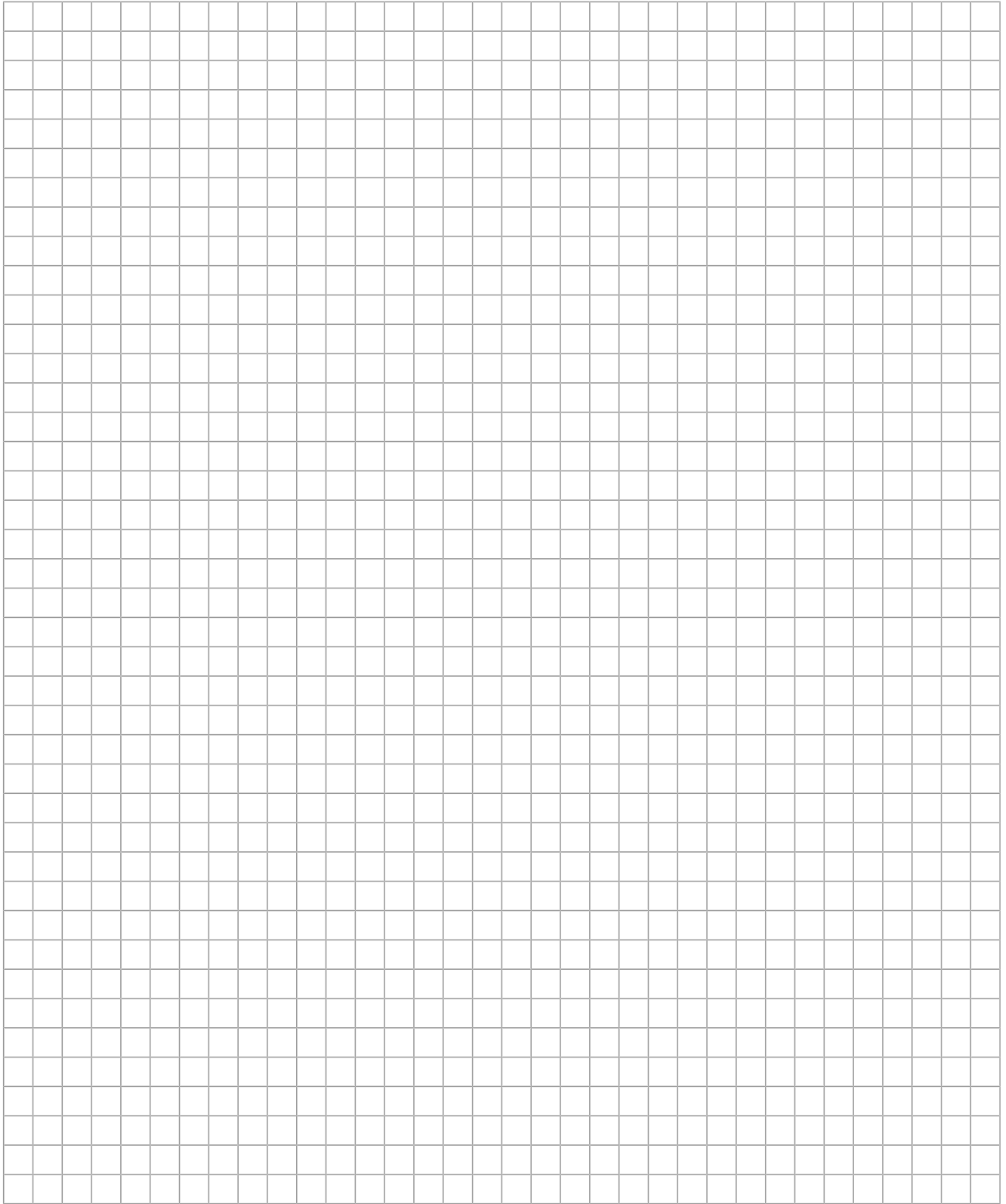
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SEW
EURODRIVE

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