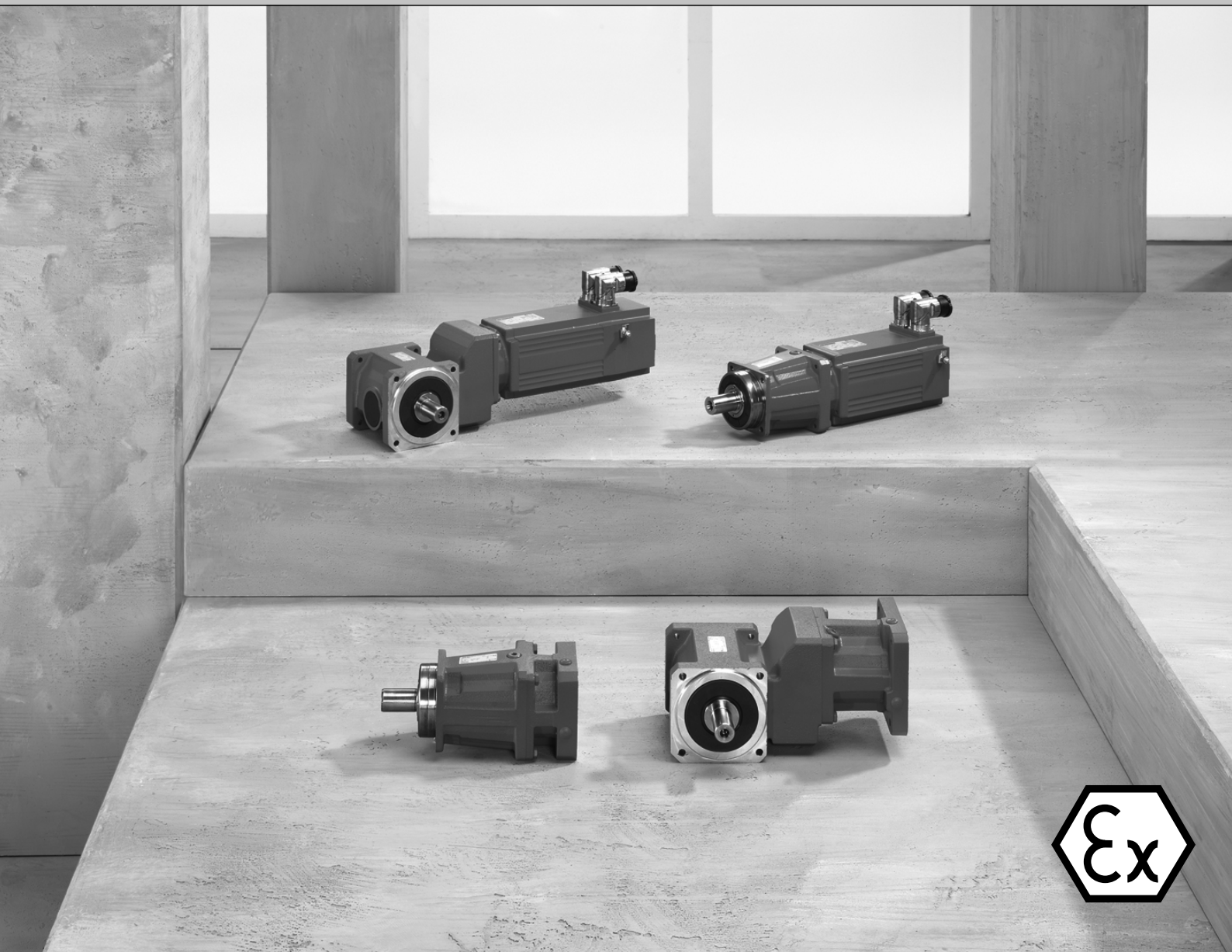




SEW
EURODRIVE

Operating instructions



Explosion-protected gear units, BS.F.. and PS.F.. series



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1 General information

1.1 About this documentation

The documentation at hand is the original.

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

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

1.2 Other applicable documentation

Observe the corresponding documentation for all additional components.

1.3 Structure of the safety notes

1.3.1 Meaning of signal words

The following table shows the graduation and meaning of the signal words in the safety notes.

Signal word	Meaning	Consequences if not observed
▲ DANGER	Imminent danger	Death or severe injuries
▲ WARNING	Possibly dangerous situation	Death or severe injuries
▲ CAUTION	Possibly dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment

1.3.2 Meaning of the hazard symbols

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

Hazard symbol	Meaning
	General hazard
	Warning of hot surfaces
	Warning of risk of crushing
	Warning of explosions

1.3.3 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.

1.3.4 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

▲ SIGNAL WORD! Type and source of danger. Possible consequence(s) if disregarded. Measure(s) to prevent danger.

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 product names mentioned in this documentation are trademarks or registered trademarks of the respective titleholders.

1.7 Copyright notice

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2 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:

- The national and regional regulations governing safety and the prevention of accidents
- The warning and safety signs on the product
- All other associated project planning documents, installation and startup instructions, as well as wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and regulations

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

2.3 Target group

Specialist for mechanical work	Any mechanical work may be performed only by adequately qualified specialists. Specialists in the context of this documentation are persons who are familiar with the design, mechanical installation, troubleshooting, and maintenance of the product, and who possess the following qualifications: • Qualifications in the field of mechanics in accordance with the national regulations • Familiarity with this documentation
Specialist for electrotechnical work	Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product, and who possess the following qualifications: • Qualifications in the field of electrical engineering in accordance with the national regulations • Familiarity with this documentation
Additional qualifications	In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation. The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.
Instructed persons	All work in the areas of transport, storage, installation, operation and waste disposal may only be carried out by persons who are trained and instructed appropriately. These instructions must enable the persons to carry out the required activities and work steps safely and in accordance with regulations.

2.4 Designated use

The gear units are intended for industrial systems and may only be used in accordance with the information provided in the technical documentation of SEW-EURODRIVE and the information given on the nameplate. They meet the requirements set forth in Directive 94/9/EC or 2014/34/EU and comply with the applicable standards and regulations.

The gear units are components for installation in machines and systems according to the 2006/42/EC Machinery Directive. Within the scope of the Directive, you must not operate the machine in the designated fashion until you have established that the end product complies with Machinery Directive 2006/42/EC.

Optional equipment

In addition to the general installation guidelines, the following regulations in accordance with German operating safety regulations (BetrSichV) or other national regulations must be observed for connecting additional devices:

- EN ISO 80079-36 Potentially explosive atmospheres – part 36: Non-electrical equipment for use in potentially explosive atmospheres – Basics and requirements
- EN ISO 80079-37 Potentially explosive atmospheres – part 37: Non-electrical equipment for explosive atmospheres – Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"
- EN 50281-2-1 Electrical apparatus for use in the presence of combustible dust – part 2-1: Test methods; methods for determining the minimum ignition temperatures of dust
- EN 60079-0 Potentially explosive areas – part 0: General requirements
- EN 60079-1 Potentially explosive areas – part 1: Equipment protection by flameproof enclosure "d"
- EN 60079-7 Potentially explosive areas – part 7: Equipment protection by increased safety "e"
- EN 60079-11 Potentially explosive areas – part 11: Equipment protection by intrinsic safety "i"
- EN 60079-14 Potentially explosive areas – part 14: Project planning, selection and setup of electrical machinery
- EN 60079-15 Potentially explosive areas – part 15: Equipment protection by protection type "n"
- EN 60079-17 Potentially explosive areas – part 17: Testing and maintenance of electrical machinery
- EN 60079-31 Potentially explosive areas – part 31: Equipment dust ignition protection by enclosure "t"
- DIN VDE 105-9 "Operating electrical equipment" or other national regulations
- DIN VDE 0100 "Erection of power installations with rated voltages below 1000 V" or other national regulations

Technical data and information on the permitted conditions are given on the nameplate and in the documentation; they have to be observed under all circumstances.

2.5 Safety note for working in potentially explosive areas

Note that explosive gas mixtures or concentrations of dust can lead to explosions in conjunction with hot, live, or moving parts of electrical machinery.

2.6 Performing work on the product safely**2.6.1 Defective or damaged product**

Never install defective or damaged products. Observe the following information to avoid injuries or damage:

- Before installation, check the product for external damage and replace a damaged product.

2.6.2 Use of hazardous substances, lubricants, adhesives

Observe the following information to avoid poisoning or fire hazards:

- Observe the safety data sheets of the used hazardous substances, lubricants and adhesives.
- Wear safety gloves.

2.6.3 Hot surfaces

The surfaces of the product can become very hot during operation. Observe the following information to avoid burns:

- Let the product and its accessories cool down before touching it.
- Do not touch any surfaces of the product during operation, except for the control elements.
- Observe the information signs and product safety labels on the product.

2.6.4 Falling load

Observe the following information to avoid death or severe injury due to falling loads:

- Do not stand under the load.
- Secure the area where loads can fall down.
- Use personal protective equipment (such as helmet and safety shoes).
- Use a suitable lifting tool (chain hoist, forklift) and transport protection.

2.6.5 Rotating parts

When working on the product, there may be a risk of exposed rotating parts and uncontrolled movement of the components. Observe the following information to avoid body parts getting crushed or pulled in:

- Switch off the product before you start working on it.
- Observe all technical data of the product.
- Do not reach into the hazard zone.

2.6.6 Sharp edges

Observe the following information to avoid cuts caused by sharp or non-deburred cutting edges:

- Wear safety gloves.

2.6.7 Toxic vapors due to heating of fluorocarbon rubber

Fluorocarbon rubber is very stable and safe under normal operating conditions and temperatures < 200 °C. However, if fluorocarbon rubber is heated to more than 300 °C, e.g. by fire or the flame of a cutting torch, harmful gases, vapors, and residues can form. The following components can contain elastomers made of fluorocarbon rubber: Oil seals, breather valves, screw plugs. Observe the following information:

- Make sure that components made of fluorocarbon rubber are not exposed to thermal loads > 200 °C. Remove the components, if necessary.
- Observe the temperature ranges specified in the operating instructions when heating components with fluorocarbon rubber.
- Avoid inhaling fluorocarbon rubber gases and vapors, as well as contact with cooled fluorocarbon rubber, as hazardous residues form during thermal load.

2.7 Transportation/storage

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product or the packaging is damaged, do not assemble, install, connect, or start up the product. If the packaging is damaged, the product itself may also be damaged.

Observe the following notes when transporting the device:

- Ensure that the product is not subject to mechanical impact.
- Always use all attachment points if available. The attachment points are designed to carry only the mass of the product. Do not apply any additional loads.

The permissible storage temperature is -30 °C to +50 °C.

If the product is not immediately installed, it must be stored in a dry and dust-free location. The product can be stored for up to 9 months without requiring any special measures before startup. Do not store the product outdoors.

The installed lifting eyebolts are in accordance with DIN 580. Observe the loads and regulations specified there. The tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

The lifting eyes are designed to carry only the weight of the product. Do not mount any additional loads. If the product has several lifting eyes or lifting eyebolts, then you should use all lifting eyes and lifting eyebolts for attaching transport ropes. Tighten the screwed-in lifting eyes.

If necessary, use suitable, adequately dimensioned transport aids.

Observe the notes on the climatic conditions in accordance with chapter "Technical data" in the corresponding product manual.

2.8 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, particularly during transportation and handling. Electrical components must not be mechanically damaged or destroyed.

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

- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.

Before using a stainless steel shrink disk or stainless steel output shaft, check if the ambient conditions are compatible with the stainless steel material. For information on the material, refer to the order confirmation.

2.9 Startup/operation

Check that the direction of rotation is correct in the **decoupled** state. Listen out for unusual grinding noises as the shaft rotates.

Secure the keys for the test run without output elements.

Do not deactivate monitoring and protection devices even for a test run.

Switch off the gearmotor if in doubt whenever changes occur in relation to normal operation (e.g. increased temperatures, unusual noises, vibrations). Determine the cause. It may be necessary to contact SEW-EURODRIVE.

2.10 Cleaning

When using a stainless steel shrink disk or stainless steel output shaft, check if the cleaning agents and chemicals are compatible with the stainless steel material. For information on the material, refer to the order confirmation.

2.11 Inspection/maintenance

Observe the information in chapter "Inspection/maintenance" (→ 71).

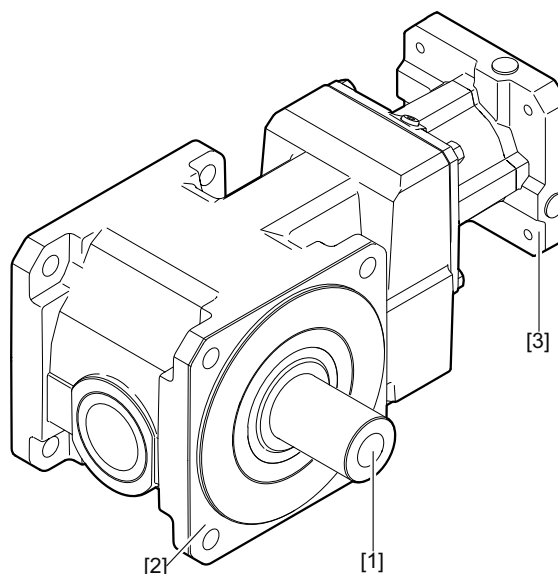
3 Product structure

3.1 Gear unit structure

The following figures are schematic representations. They are intended to assist in identifying components in the spare parts list. Variations may occur depending on the gear unit size and design.

3.2 BSF602 helical-bevel gear unit with EBH.. adapter

The following figure shows an example of a helical-bevel gear unit with solid shaft and B5 output flange.

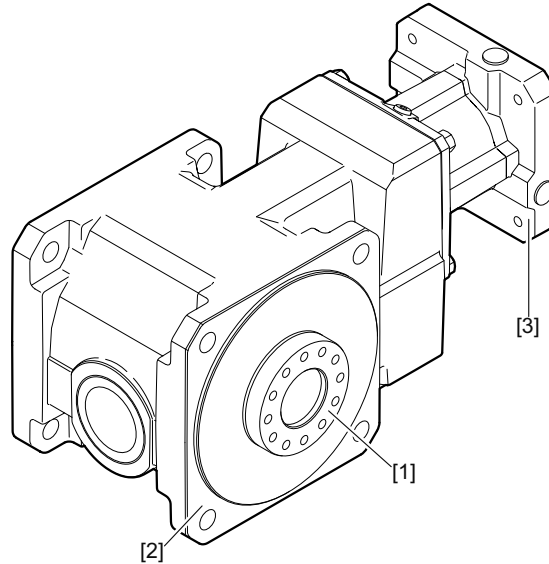


29328913291

- [1] Solid shaft
- [2] B5 output flange
- [3] EBH.. adapter

3.3 BSBF602 helical-bevel gear unit with EBH.. adapter

The following figure shows an example of a helical-bevel gear unit with flange block shaft and B5 output flange.

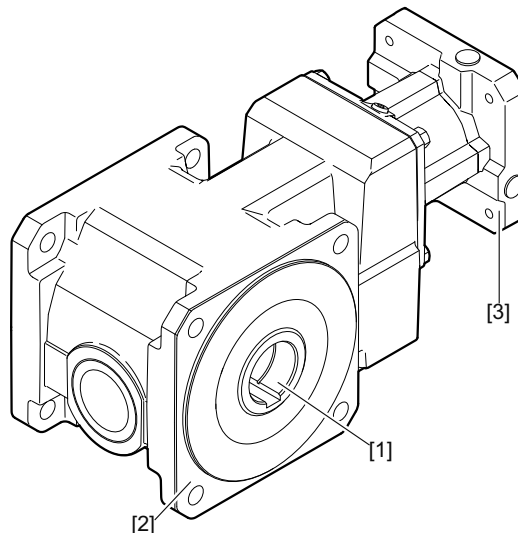


29328910859

- [1] Flange block shaft
- [2] B5 output flange
- [3] EBH.. adapter

3.4 BSAF602 helical-bevel gear unit with EBH.. adapter

The following figure shows an example of a gear unit with hollow shaft and keyway as well as B5 output flange:

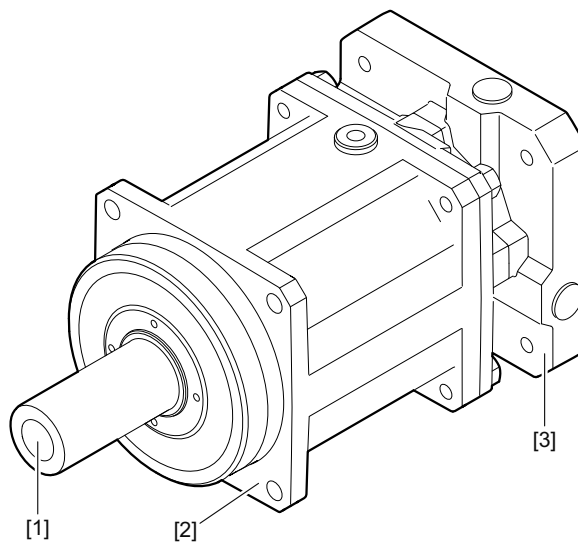


29328907915

- [1] Hollow shaft with keyway
- [2] B5 output flange
- [3] EBH.. adapter

3.5 PSF621 planetary gear unit with EPH.. adapter

The following figure shows a planetary gear unit with solid shaft and B5 output flange:

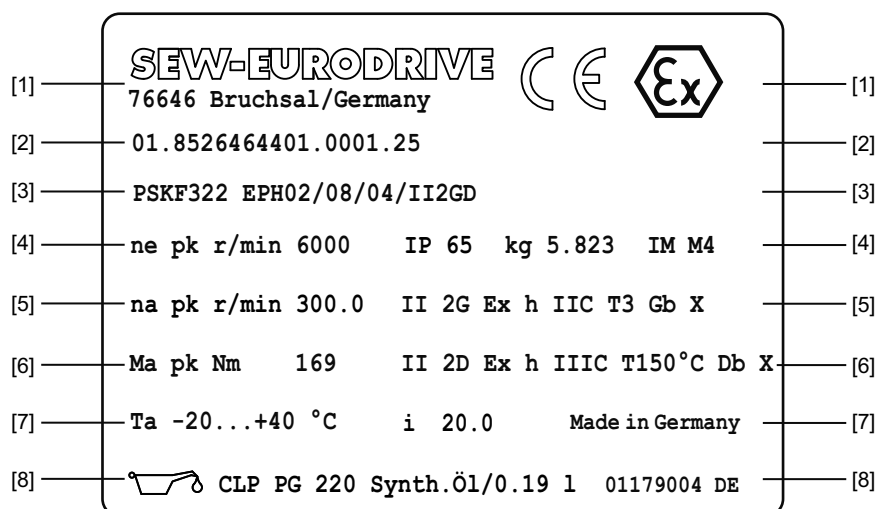


29328938251

- [1] Solid shaft
- [2] B5 output flange
- [3] EPH.. adapter

3.6 Nameplate for combinations with EPH.. adapter

The following figure shows an example of a nameplate:



61897472011

Line	Information
[1]	- Manufacturer, address, CE marking - Explosion protection mark
[2]	Serial number
[3]	Type designation
[4]	- Maximum permitted input speed for short-time duty - Degree of protection - Mass - Mounting position
[5]	- Maximum permitted output speed for short-time duty - Indication of gas explosion protection
[6]	- Maximum permitted output torque for short-time duty - Indication of dust explosion protection
[7]	- Ambient temperature - Gear ratio - Country of manufacture
[8]	- Lubricant and lubricant quantity - Nameplate number

For explosion-protected gearmotors, the nameplates of the motor and gear unit must be compared. When you compare the values (e.g. dust or ambient temperature) on the nameplates, the least common multiple determines the overall unit of motor and gear unit.

Special restrictions apply to the ATEX-compliant operation of the servo drives. Observe the configuration data during startup and operation. Exceeding these values or applying additional loads is only permitted after consultation with SEW-EURODRIVE.

3.7 Nameplate for combinations with CMP../II.. motors

The following figure shows an example of a nameplate:

[1]	SEW-EURODRIVE	CE	Ex	[1]	
	76646 Bruchsal/Germany				
[2]	01.8526464401.0001.25			[2]	
[3]	BSAF502/II2GD CMP71S/PK/RH1M/SM1/II3D			[3]	
[4]	ne pk r/min 4500	IP 65	kg 34.803	IM M2AB	[4]
[5]	na pk r/min 225.0	II 2G	Ex h	IIC T3 Gb X	[5]
[6]	Ma pk Nm 375	II 2D	Ex h	IIIC T150°C Db X	[6]
[7]	Ta -20...+40 °C	i 20.0	Made in Germany		[7]
[8]	 CLP PG 220 Synth.Öl/1.8 l	01179004	DE		[8]

61898089483

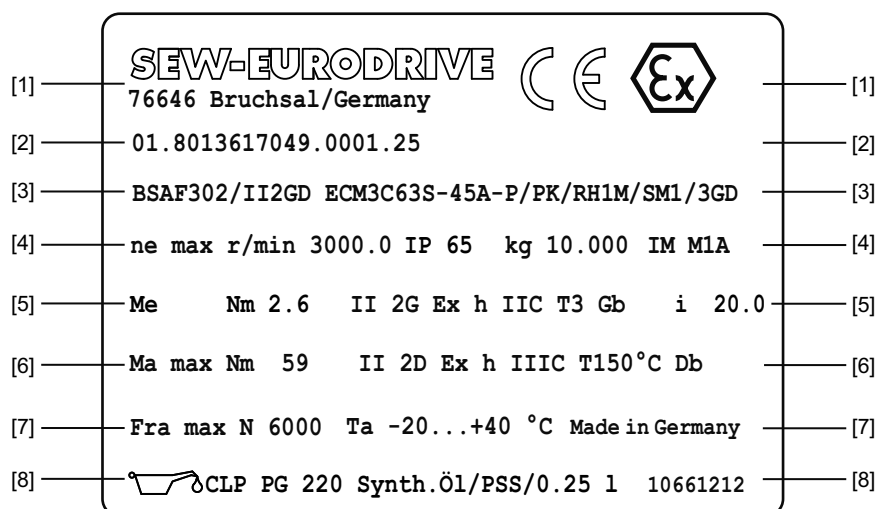
Line	Information
[1]	- Manufacturer, address, CE marking - Explosion protection mark
[2]	Serial number
[3]	Type designation
[4]	- Maximum permitted input speed for short-time duty - Degree of protection - Mass - Mounting position
[5]	- Maximum permitted output speed for short-time duty - Indication of gas explosion protection
[6]	- Maximum permitted output torque for short-time duty - Indication of dust explosion protection
[7]	- Ambient temperature - Gear ratio - Country of manufacture
[8]	- Lubricant and lubricant quantity - Nameplate number

For explosion-protected gearmotors, the nameplates of the motor and gear unit must be compared. When you compare the values (e.g. dust or ambient temperature) on the nameplates, the least common multiple determines the overall unit of motor and gear unit.

Special restrictions apply to the ATEX-compliant operation of the servo drives. Observe the configuration data during startup and operation. Exceeding these values or applying additional loads is only permitted after consultation with SEW-EURODRIVE.

3.8 Nameplate for combinations with ECM3C.. motors

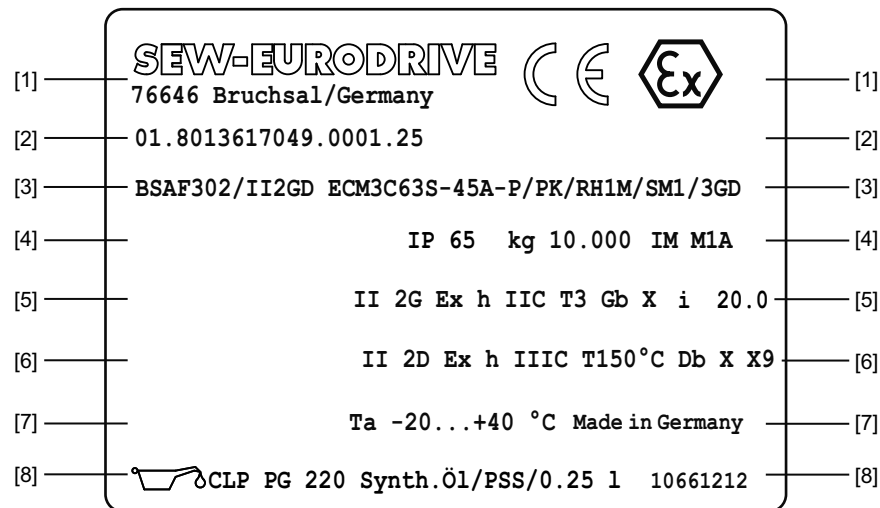
Unconfigured drive The following figure shows an example of a nameplate:



61898646539

Line	Information
[1]	- Manufacturer, address, CE marking - Explosion protection mark
[2]	Serial number
[3]	Type designation
[4]	- Maximum permitted input speed - Degree of protection - Mass - Mounting position
[5]	- Permitted continuous input torque - Indication of gas explosion protection - Gear ratio
[6]	- Maximum permitted output torque - Indication of dust explosion protection
[7]	- Maximum overhung load acting on the output shaft - Ambient temperature - Country of manufacture
[8]	- Lubricant and lubricant quantity - Nameplate number

Configured drive



61898789387

Line	Information
[1]	- Manufacturer, address, CE marking - Explosion protection mark
[2]	Serial number
[3]	Type designation
[4]	- Degree of protection - Mass - Mounting position
[5]	- Indication of gas explosion protection - Gear ratio
[6]	Indication of dust explosion protection
[7]	- Ambient temperature - Country of manufacture
[8]	- Lubricant and lubricant quantity - Nameplate number

For explosion-protected gearmotors, the nameplates of the motor and gear unit must be compared. When you compare the values (e.g. dust or ambient temperature) on the nameplates, the least common multiple determines the overall unit of motor and gear unit.

In some applications, SEW-EURODRIVE gear units/gearmotors must be operated only in compliance with special measures. These applications are identified by the special marking "II..X" on the nameplate. For more information, refer to "Information on special indication X identification" (→ 23).

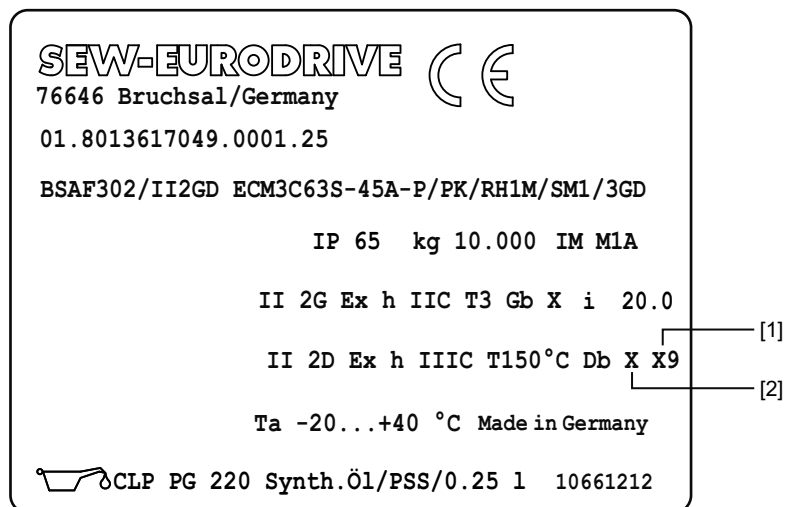
33091889/EN – 04/2026

3.9 Information on special indication X identification

In some applications, SEW-EURODRIVE gear units, motors, or gearmotors must only be operated if special measures are adhered to (e.g. intermittent duty exclusively, reduced output torque, etc.). The need for special measures can have different reasons. The customer has been informed about the required special measures on the initial distribution of the gear unit, motor or gearmotor. The Buyer is obliged to ensure compliance with these special measures.

Gear units, motors, or gearmotors with special measures are indicated with the special "X" marking on the nameplate (see following figure). The relevant special measure is indicated separately by an "X" combined with a number on the nameplate. Special measures are listed in detail below.

X9: Configured explosion-protected drive



62780407947

[1] Special measure X9

[2] Special marking X

Special restrictions apply to the ATEX-compliant operation of the servo drive. Observe the configuration data during startup and operation. The configuration data can be retrieved from the order documents or after delivery of the drive via the existing QR code on the nameplate or in the Online Support. Exceeding these values or applying additional loads is only permitted after consultation with SEW-EURODRIVE.

3.10 Product label for digital services

The figure shows an example of a product label:



18014433531063947

Scan the QR code on the product to access the Digital Services of SEW-EURODRIVE. There you will find, for example, a comprehensive product manual with further information, as well as additional product-specific documents, data, and services.

3.11 Type designation for PS.F.. with EPH.. adapter

The following table shows an example of a type designation:

PS.F721 EPH05/14/13/II2GD	
PS.F	Gear unit type
721	Gear unit size
EPH	Adapter type
05	Performance class key figure
14	Code for flange geometry
13	Coupling bore key figure
II2GD	Explosion protection design

3.12 Type designation of BS.F.. with directly mounted ECM3C.. motor

The following table shows an example of a type designation:

BS.F302/II2GD ECM3C63S-45A-P/PK/RH1M/SM1/3GD	
BS.F	Gear unit type
302	Gear unit size
II2GD	Explosion protection design
ECM3C	Motor series
63	Motor size
S	Motor length
45	Speed class
A	System voltage
P	Motor design
PK	Temperature sensor
RH1M	Encoder
SM1	Connection variant
3GD	Explosion protection design

4 Mechanical installation

4.1 Before you start



⚠ CAUTION

The surface temperatures on the drive can be very high during operation.

Risk of burns.

- Make sure that hot surfaces cannot be touched unintentionally or during normal operation. Install covers or warning signs according to regulations.
- Let the motor cool down sufficiently before you start working on it.

Observe the following points before installing the device:

- The drive is undamaged (no damage caused by transportation or storage).
- Observe the information on the nameplate.
- The gearmotor may only be operated in the mounting positions specified on the nameplate. If you want to install the drive in a deviating mounting position, contact SEW-EURODRIVE.
- SEW-EURODRIVE recommends to adhere to the tolerance class "fine" for the support structure. The substructure must have the following characteristics: level surface, vibration-damping, and torsionally rigid.
- Check the required degree of protection.
- You have ensured that there are no oils, acids, gases, vapors, radiation, etc. present.
- Make sure that no foreign objects impair the function of the device.
- Avoid highly charge-generating processes due to fast-moving elements (e.g., cleaning tools or conveyor belts) on the housing and its coating.
- Ground the housing and use grounding screws on the motor.
- Motor shaft ends, output shafts, and flange surfaces must be thoroughly cleaned of anti-corrosion agents, contamination, or similar. Use a commercially available solvent for this purpose. The solvent must not get into the bearings or sealing rings as this can damage the material.
- Observe the permitted overhung and axial loads. For calculating the permitted radial and axial forces, refer to the "Project planning" section in the gear unit or gear-motor catalog.
- Only install input and output drive components using a mounting device. Use the centering bore and the thread on the shaft end for positioning.
- Use only belts with sufficiently low electrical resistance ($< 10^9 \Omega$) when installing drive and output components.
- Install a suitable protective cover against direct sunlight during outdoor operation. The protection device must not cause heat build-up.
- Ensure adequate heat dissipation from the gearbox into the foundation.
- Protect the device against icing.
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.
- Secure sharp and protruding parts by using covers.
- Protect the gear unit from cold air flows. Condensed water in the gear unit can cause damage.

- Make sure that there is adequate ventilation in the work environment.
- Make sure that the nameplate is legible after assembly.

4.1.1 Notes on prolonged storage

Depending on the duration and ambient conditions, prolonged storage may result in corrosion, lubricant degradation, or embrittlement of sealing elements. For drives that have been stored for more than 9 months prior to mechanical installation, carry out the measures described below.

- Check the gearbox and its components (coating, shafts, connecting parts, fastening parts) for corrosion damage. Repair any corrosion damage.
- Perform a visual inspection of the seals and check for cracks, hardening, and embrittlement. Replace any damaged seals.
- Carry out the following measures after a maximum of 3 years:
 - Oil change
 - Replacement of the oil seals

4.2 Required tools and resources

- Set of wrenches
- Torque wrench
 - EBH/EPH motor adapter
 - Shrink disks
- Screwdriver set
- Mounting device (recommended)
- Compensation elements (washers, spacing rings), if necessary
- Fasteners for input and output elements
- Set of Allen wrenches
- Lubricant (e.g. NOCO-Paste)

4.3 Installation tolerances

Shaft end	Flanges
Diameter tolerance according to DIN 748 • ISO k6 for solid shafts with $\varnothing \leq 50$ mm • ISO m6 for solid shafts with $\varnothing > 50$ mm • ISO H7 for hollow shafts • Centering bore according to DIN 332, shape DR	Centering shoulder tolerance according to DIN EN 50347 • ISO j6 with $N \leq 250$ mm • ISO h6 with $N > 250$ mm

4.4 Surface temperature

The maximum surface temperature of gear units in category II2D is 150 °C. Lower surface temperature limits are permitted only after consultation with SEW-EURODRIVE and must be indicated on the nameplate. The system operator must ensure that any possible dust deposit does not exceed a maximum thickness of 5 mm in accordance with DIN EN IEC 60079-14 and DIN EN IEC 60079-17.

4.5 Degree of protection

All gear unit versions comply with degree of protection IP65 in accordance with EN 60529.

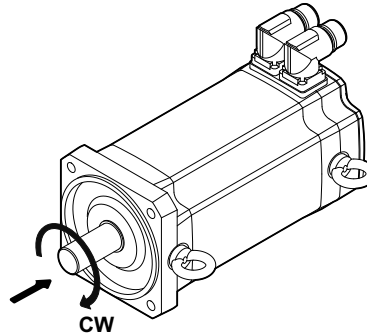
4.6 Special designs

Special designs (e.g., modified output shafts) may be used in potentially explosive atmospheres only after approval by SEW-EURODRIVE.

4.7 Directions of rotation

4.7.1 Direction of rotation of the motor shaft

Clockwise (CW) direction of rotation when looking onto the motor shaft.

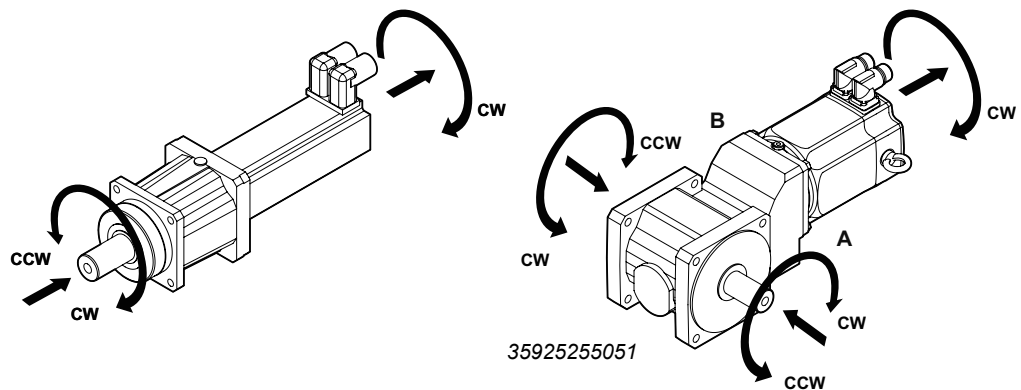


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Direction of rotation of the output shaft

The standard direction of rotation when looking onto the output shaft of the gear unit:

- CW (clockwise)
Clockwise direction of rotation
- CCW (counterclockwise)
Counterclockwise direction of rotation



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4.7.2 Direction of rotation of the gear unit

Shaft position A, B, or AB (shaft output at both ends) is possible for K.. helical-bevel gear units, S.. helical-worm gear units, and SPIROPLAN® W.. right-angle gear units. The direction of rotation is indicated according to the shaft position when looking onto the output end A or B or onto A and B respectively.

The following table specifies the standard direction of rotation for the CW direction of rotation of the motor.

Series	Size	Gear unit stages	Shaft position	Standard direction of rotation when looking onto output shaft ¹⁾
PS.F	121 – 922	1		CW
		2		CW

1) CW = clockwise; CCW = counterclockwise.

Series	Size	Gear unit stages	Shaft position	Standard direction of rotation when looking onto output shaft ¹⁾	
				View onto output end A	View onto output end B
BS.F	202 – 802	2	A	CW	
			AB	CW	CCW
			B		CCW

1) CW = clockwise; CCW = counterclockwise.

4.8 Mounting the gear unit to a machine

- Unless modifications are made, the gear unit or gearmotor may be installed or mounted only in the ordered mounting position (see "Mounting positions" (→ 62)). Observe the information on the nameplate.
- Do not brace the gear unit with mounting options on the face and foot ends (BS.F../B) and gear unit flange against one another!
- Observe the permitted overhung and axial forces.
- Once the gear unit or gearmotor has been mounted or installed, the breather valves must be freely accessible!

4.8.1 Bolt sizes**Foot-mounted gear units**

The following table shows the thread sizes of the foot-mounted gear units depending on the gear unit type and size:

Screw	Gear unit type BS.F..B
M8	202
M10	302
M12	402/502
M16	602
M20	802

Gear units with B5 flange

The following table shows the thread sizes of the gear units with B5 flange depending on the gear unit type and size:

Screw	Gear unit type	
	BS.F..	PS.F..
M4	–	–
M5	–	121, 122/221, 222
M6	202	321, 322
M8	302	521, 522
M10	402	621, 622
M12	502	721, 722
M16	602/802	821, 822/921, 922

4.8.2 Changing the mounting position

If the gear unit or gearmotor is to be installed or mounted in a mounting position other than that ordered and stated on the nameplate, you must undertake the following adaptations:

- Adjust the lubricant fill quantity to the changed mounting position, see "Lubricants" (→ 75).
- Adjust the position of the breather valve to the changed mounting position, see "Mounting positions" (→ 62).

A change in the mounting position is permissible only after consultation with SEW-EURODRIVE. Without prior consultation, the ATEX approval will become void!

Change in mounting position for PS.F.. gear unit

In mounting position M2, this position cannot be changed for PS.F.. gear units! Components dependent on the mounting position are fitted in PS.F.. gear units for mounting position M2. One exception is PS.F.. servo gear units in the M0 universal mounting position. These gear units do not have a breather valve (with the exception of PS(K)F 722). You can use the PS.F.. gear unit with M0 mounting position in any M1 – M6 mounting position without having to adapt the gear unit.

4.8.3 Customer construction

The customer construction must have the following characteristics:

- Evenness
- Vibration damping
- Torsionally rigid

The following table states the permitted maximum flatness defect for foot and flange-mounting (guide values based on DIN ISO 1101):

- | | |
|---------------------------------|----------|
| • Gear unit size PS.F120 – 520: | ≤ 0.2 mm |
| • Gear unit size PS.F620 – 920: | ≤ 0.4 mm |
| • Gear unit size BS.F202 – 402: | ≤ 0.4 mm |
| • Gear unit size BS.F502 – 802: | ≤ 0.5 mm |

4.8.4 Electrochemical corrosion protection

Electrochemical corrosion occurs between various metals, for example, cast iron and stainless steel. Use plastic inserts (2 – 3 mm thick) if there is a risk of electrochemical corrosion between the gear unit and the driven machine. The material used must have an electrical leakage resistance $< 10^9 \Omega$. If necessary, insert the screws with plastic washers. Use the grounding screws on the motor housing to ground the motor.

4.8.5 Tightening torques for retaining screws**Notes concerning tightening torques**

The tightening torques specified below are based on the following friction coefficients:

Friction coefficient $\mu_{G,K}$ for thread and head contact surface	Strength class of screw
0.14	8.8
0.09	10.9, 12.9

If screws with a different friction coefficient are used, the tightening torques must be adapted accordingly.

Only use one of the following tools to tighten the screws:

- Torque wrench
- Torque-controlled torque wrench
- Impulse driver, switched off and controlled mechanically
- Torque wrench with light and sound signal
- Motorized torque wrench with dynamic torque measurement
- Torque-controlled, gradual hydraulic tools

Mounting output components for BSBF.. gear units

Observe the following information when attaching the output drive components to the gear unit. Use suitable washers.

Hex socket head cap screws in accordance with DIN EN ISO 4762	Strength class	Tightening torque $\pm 15\%$ Nm
M4	12.9	4.2
M5	12.9	8.3
M6	12.9	14
M8	12.9	35
M10	12.9	68
M12	12.9	117

Mounting of BS.F302/402/602 gear units with B5 flange and BS.F202B – 402B with foot mounting

Mount the gearmotors with the following tightening torques:

Screw/nut	Strength class	Tightening torque $\pm 15\%$ Nm
M8	8.8	28
M10	8.8	56
M12	8.8	96
M16	8.8	235

Mounting of BS.F202/502/802 gear units, PS.F.. with B5 flange and BS.F502B – 802B with foot mounting

Mount the gearmotors with the following increased tightening torques. Use suitable washers.

Screw/nut	Strength class	Tightening torque $\pm 15\%$ Nm
M4	10.9	3.5
M5	10.9	6.9
M6	10.9	12
M8	10.9	29
M10	10.9	57
M12	10.9	98
M16	10.9	235
M20	10.9	465

Tightening torques for oil level plugs, oil drain plugs, screw plugs, breather valves and oil sight glasses

Observe the tightening torques in the following table when screwing in:

Thread	Tightening torque Nm
M8 $\times$ 1	8
M10 $\times$ 1	12
M12 $\times$ 1.5	15
M16 $\times$ 1.5	40
M22 $\times$ 1.5	60
M33 $\times$ 2	100
M42 $\times$ 2	150

4.8.6 Installation in damp areas or in the open

Drives are supplied in corrosion-resistant design with appropriate surface protection treatment for use in damp areas or outdoors.

- Repair damage to the paint work e.g. on the breather valve or the lifting eyes.
- When mounting motors onto adapters, seal the flange areas with a suitable sealant, such as Loctite® 574.
- The drives must not be exposed to direct sunlight when installed outdoors. Install an appropriate protection device, e.g. a cover or a canopy. The protection device must not cause heat build-up.
- The system operator must ensure that no foreign objects (e.g. falling objects or coverings) affect the operation of the gear unit.

4.8.7 Gear unit venting

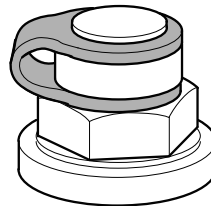
Upon delivery, the breather valve for gear units with a pivoted mounting position and gear units for mounting skew can be found in the motor's terminal box. Before startup, replace the highest screw plug with the provided breather valve.

In the M4 mounting position, the BS.F202-802/PS.F722 gear units require venting.

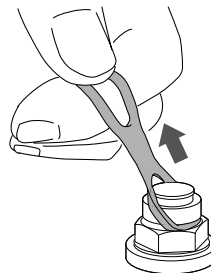
In the M4 mounting position, the BS.F/PS.F722 servo gear units have a screwed-in and activated breather valve in the delivery state.

Activating the breather valve

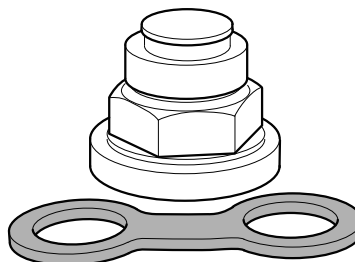
1. Before startup, check whether the transport protection on the breather valve has been removed and the valve is therefore activated. The following figure shows a breather valve with transport protection:



2. Remove the transport protection.



⇒ The following figure shows an activated breather valve.



4.8.8 Painting gear units

SEW-EURODRIVE delivers the drives with a paint finish that meets the requirements against electrostatic charging according to the standard.



⚠ WARNING

Risk of explosion due to electrostatic charge and sparks caused by improper painting.

Severe or fatal injuries from explosion.

- If the motor is painted, observe the requirements for painting to avoid electrostatic charge according to EN 13463-1.



⚠ WARNING

Paint can block the breather valve and damage the sealing lips of the oil seals.

Severe or fatal injuries.

- Thoroughly mask the breather valve and sealing lip of the oil seals with strips prior to painting/re-painting.
- Remove the masking strips after painting.

If customers paint the gear unit themselves, SEW-EURODRIVE will deliver unpainted but prime-coated gear units on request. Depending on the primer, the customer must observe the requirements of the paint structure according to DIN EN 80079-36 with regard to the layer thickness and conductivity of the paint.

Layer thickness of the primer	Usable paints
Standard, OS1: $\leq 200 \mu\text{m}$	All paints
OS2, OS3, OS4: $> 200 \mu\text{m}$	Only conductive and tested paints

4.9 Installation in a machine: BS.F.. helical-bevel gear units

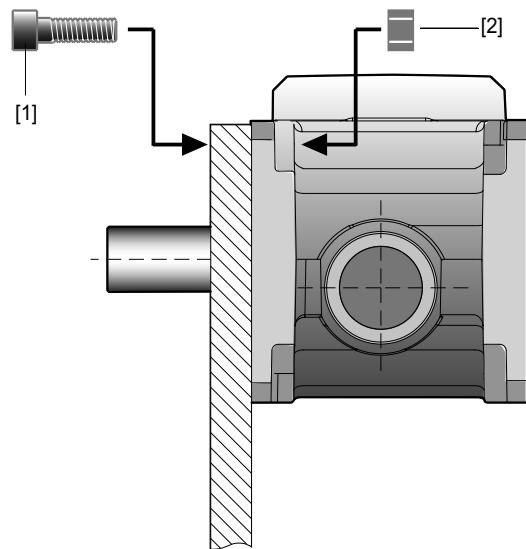
Note the following minimum screw-in depths into the gear unit's output flange:

Gear unit	Minimum screw-in depth
BS.F..202B – 402B	$1.6 \times \text{screw diameter}$
BS.F..502B – 802B	$1.25 \times \text{screw diameter}$

For information on the screw sizes and tightening torques, refer to "Tightening torques for retaining screws" (→ 34).

4.9.1 BS.F... Bolted from the gear unit end via the B5 flange:

The following figure shows the installation of BS.F.. helical-bevel gear units:

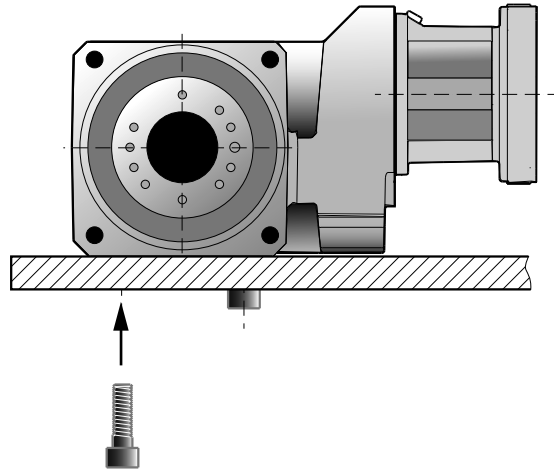


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- [1] Screws
- [2] Nut

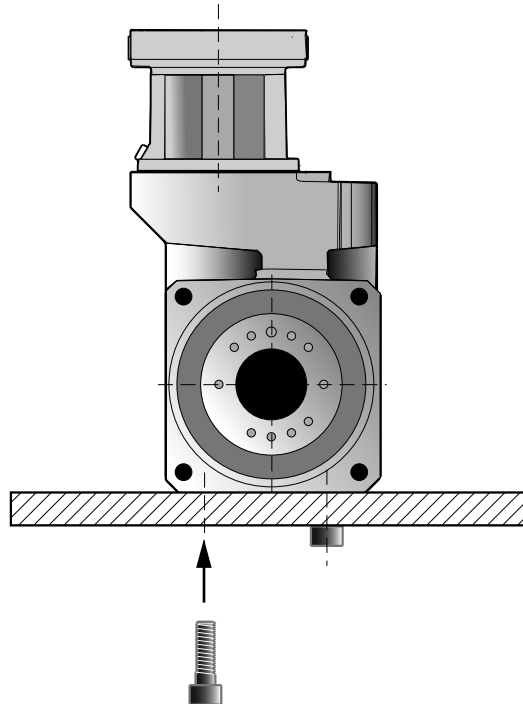
4.9.2 BSBF..B: Screw fitting at the foot and front end

The following figure shows foot-mounting of BSBF..B helical-bevel gear units:



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The following figure shows front-mounting of BSBF..B helical-bevel gear units:



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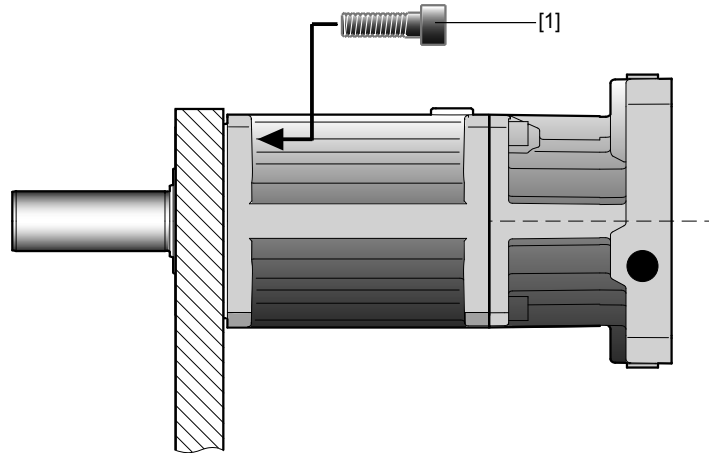
Observe the following minimum screw-in depths:

Gear unit	Minimum screw-in depth
BS.F..202B – 402B	1.6 × screw diameter
BS.F..502B – 802B	1.25 × screw diameter

For information on the screw sizes and tightening torques, refer to chapter "Tightening torques for retaining screws" (→ 34).

4.10 Installation in a machine: PS.F.. planetary gear units**4.10.1 PS.F...: Bolted from the gear unit end via the B5 flange:**

The following figure shows the installation of PS.F.. planetary gear units:



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[1] Screws

4.11 Mounting the output elements to the output shaft

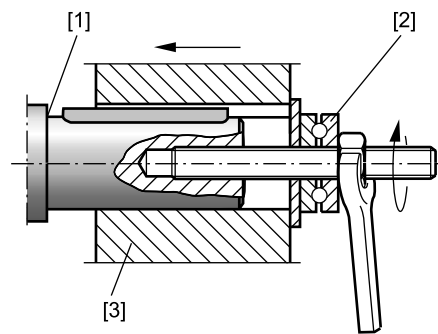
4.11.1 Mounting the gear unit – solid shaft design with key

- Install input and output drive components using a mounting device wherever possible. Use the centering bore and the thread on the shaft end for positioning.
- Push all mount-on components (belt pulleys, couplings, pinions etc.) onto the shaft end without force.
- When installing the belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions.
- Make sure the mounted transmission elements are balanced to prevent impermissible radial or axial forces.

Installation is made easier if you apply a lubricant to the output component or briefly heat it to 80–100 °C before installation.

The following figure shows a sample mounting device for mounting couplings [3] or hubs onto motor or gear shaft ends. It may be possible to dispense with the thrust bearing [2] on the mounting device.

In the BSF.. / BSKF.. / PSF.. / PSKF.. series, you can use the shaft shoulder [1] as the defined attachment point when mounting input and output drive elements.



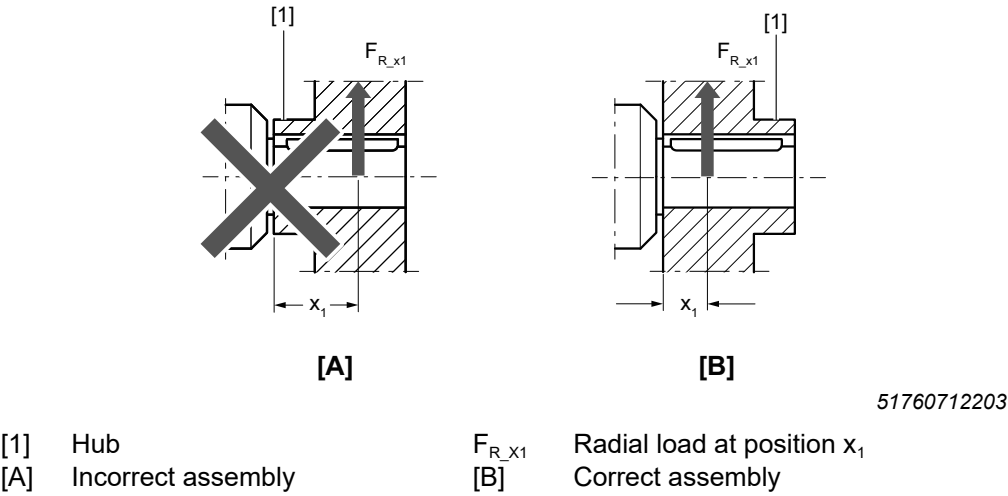
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- | | |
|-----|----------------|
| [1] | Shaft shoulder |
| [2] | Thrust bearing |
| [3] | Coupling hub |

In the delivery state, the output shafts are already coated with a rust preventive agent. Remove the rust preventive before mounting.

Avoiding high radial loads

To avoid high radial loads, mount gear wheels and sprockets according to figure B.



4.11.2 Mounting the gear unit – smooth solid shaft design

▲ CAUTION

Insufficient shaft-hub connection with the use of clamping sets on a smooth shaft end due to greasy or dirty shaft.

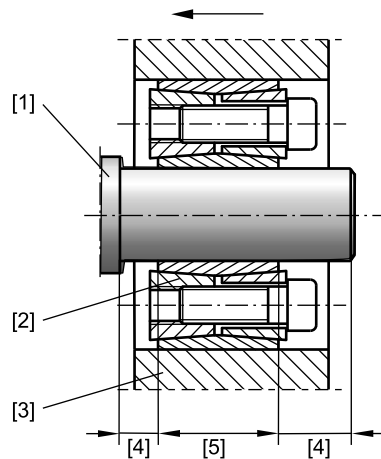
Malfunction.

- Make sure the clamping area [5] is free of dirt and grease. Otherwise, the shaft-hub connection may not function properly.

INFORMATION

The shaft collar [1] can be used as defined stop for mounting output elements onto the solid shaft.

The following figure shows an example of shaft assembly with inner clamping set:



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- [1] Shaft shoulder
- [2] Clamping set
- [3] Output element, e. g. gear or sprocket
- [4] Greased shaft areas
- [5] Ungreased clamping area

Grease accessible areas [4] of the shaft after mounting.

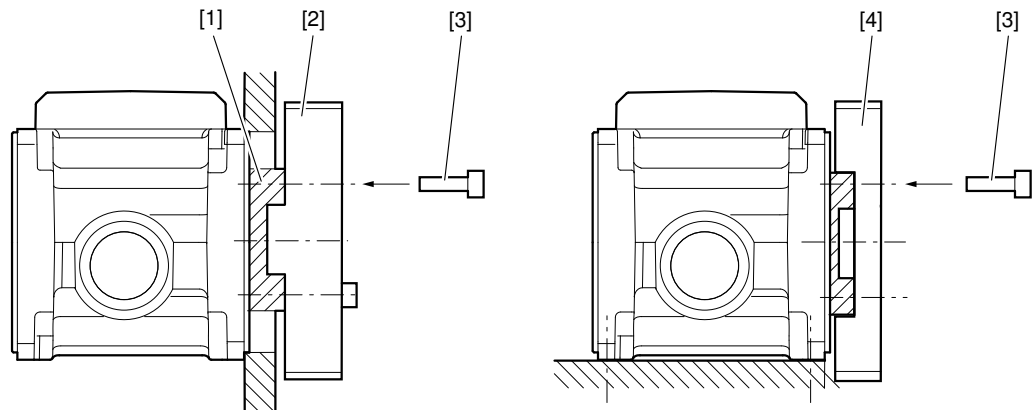
4.11.3 Flange block shaft assembly

INFORMATION



Mounting is easier if you first apply lubricant to the drive component or heat it up briefly (to 80 – 100 °C).

The following figure shows the correct mounting arrangement of a shaft connection in combination with an inner and outer centering ring using the example of a BSBF.. flange block:

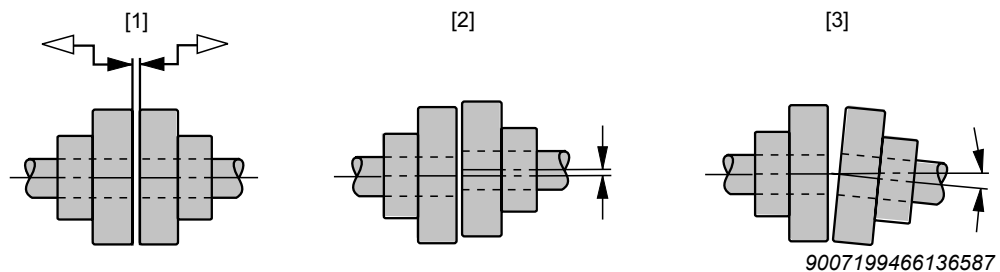


- [1] BSBF... flange block
- [2] Gear wheel/belt pulley with inner centering ring
- [3] Bolts of strength class 12.9
- [4] Gear wheel/belt pulley with outer centering ring

4.12 Mounting of couplings

Adjust the following misalignments according to the coupling manufacturer's specifications when mounting couplings.

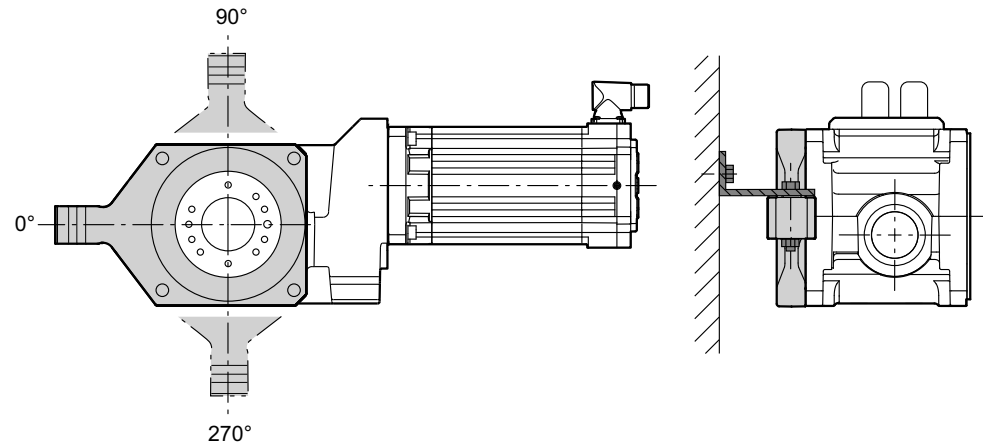
- 1) Axial misalignment
- 2) Radial misalignment
- 3) Angular misalignment



4.13 Installing a torque arm on BS.F.. shaft-mounted gear units

Mount the torque arm without any stress!

The following illustration shows the possible torque arm positions for BS.F.. gear units:



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With aluminum parts, use suitable tooth lock washers.

Tighten the retaining screws according to the following table:

Gear unit size	Number of screws × screw size ¹⁾	Tightening torque Nm
202	4 × M6 × 35 – 8.8	12
302	4 × M8 × 40 – 8.8	28
402	4 × M10 × 45 – 8.8	56
502	4 × M12 × 40 – 8.8	96
602	4 × M16 × 55 – 8.8	235
802	4 × M16 × 55 – 8.8	235

1) strength class according to DIN EN ISO 4762

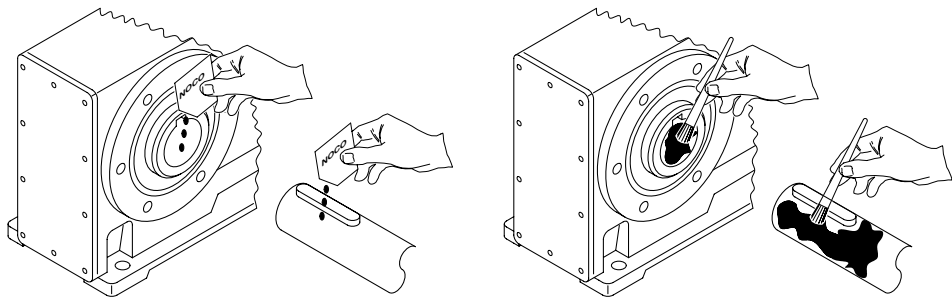
4.14 Mounting shaft-mounted gear units with a keyway

INFORMATION

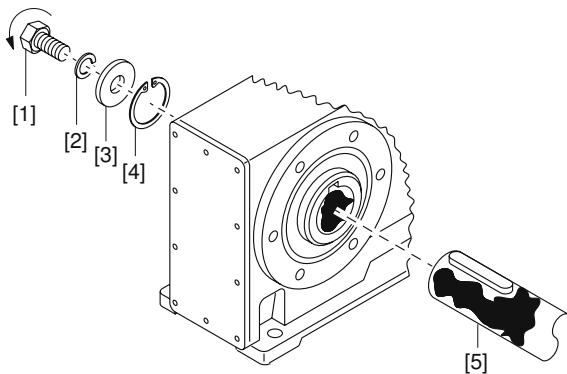


Wherever possible, use a mounting device.

1. Apply NOCO-Paste and spread it evenly.



2. Install the shaft and secure it axially.



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

3. Tighten the retaining screw using the appropriate torque:

Screw	Tightening torque in Nm
M5	5
M6	8
M10, M12	20
M16	40
M20	80
M24	200

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4.15 Shaft-mounted gears unit with shrink disk

4.15.1 Mounting shaft mounted gear units with shrink disk



NOTICE

Deformation of the hollow shaft due to tightening the locking screws without first installing the shaft.

Gear unit damage.

- Never tighten the locking screws without the shaft installed.



INFORMATION

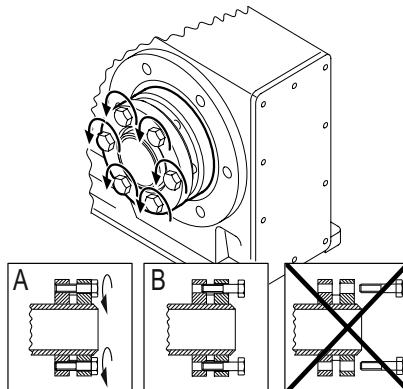
The exact values for the tightening torques are shown on the shrink disk.



INFORMATION

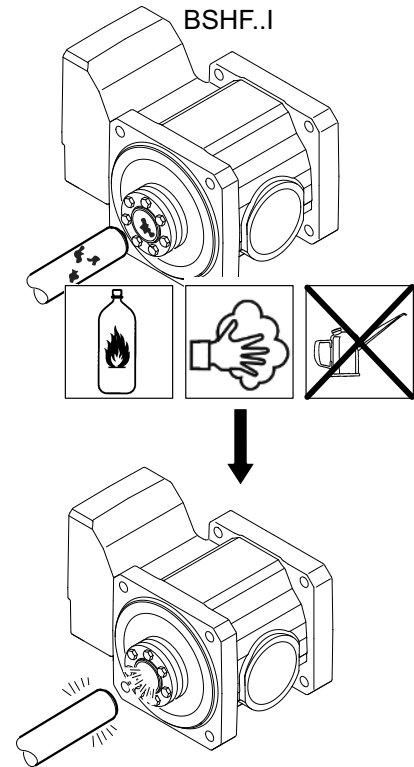
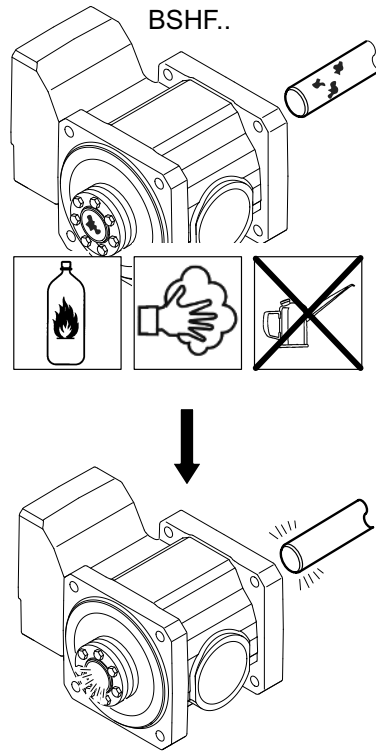
Standard shrink disks and stainless steel shrink disks have the same tightening torques.

1. Loosen the locking screws slightly. Do not unscrew them completely.



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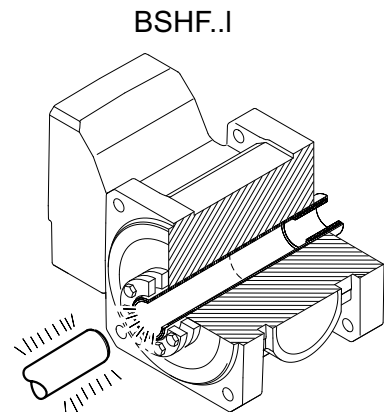
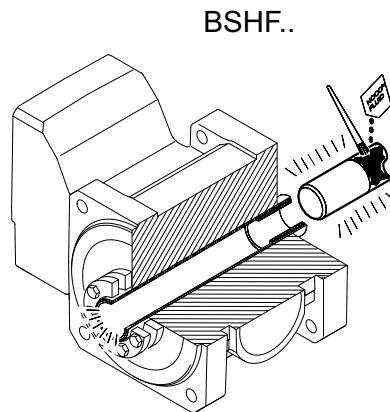
2. Carefully **degrease** the hollow shaft bore and the input shaft with commercially available solvent.



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3. **⚠ CAUTION!** Never apply NOCO-Paste directly onto the bushing, since the compound can get into the clamping area of the shrink disk when the machine shaft is fitted.

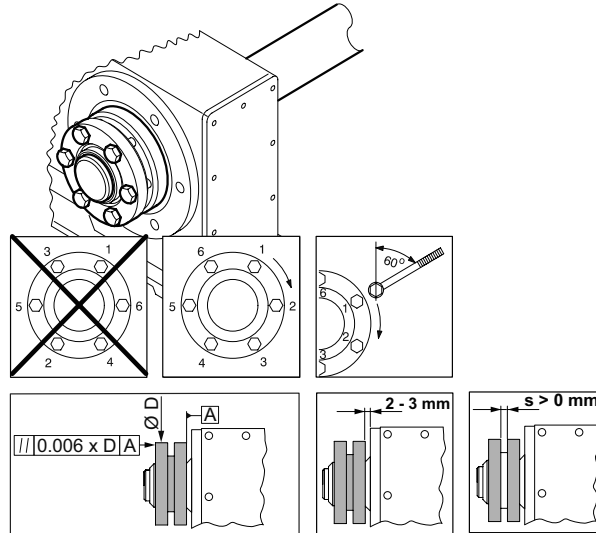
Apply NOCO-Paste to the machine shaft in the vicinity of the bushing. The clamping area of the shrink disk must remain free of grease!



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4. **⚠ CAUTION!** Risk of injury due to falling shrink disk. Secure the shrink disk immediately after fitting the shaft.
5. Install the input shaft. Make sure that the outer rings of the shrink disk are plane-parallel.
6. For a gear unit with a shaft shoulder, fit the shrink disk to the shaft shoulder as far as it will go, whereby the minimum distance between the outer ring of the shrink disk facing the gear unit and the gear unit housing must be no less than 2 mm.

7. For a gear unit without shaft shoulder, mount the shrink disk at a distance of 2 to 3 mm from the gear unit housing.
8. Tighten the locking screws by working round several times from one screw to the next (not in diametrically opposite sequence). The tightening torques can be found in the following table. After installation, grease the outer surface of the hollow shaft in the vicinity of the shrink disk as corrosion protection.



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9. After installation, make sure the remaining gap "s" between the outer rings of the shrink disk is > 0 mm. Observe the table of tightening torques below.
10. To prevent corrosion, grease the outer surface of the hollow shaft around the shrink disk.
11. **⚠ CAUTION!** Install the provided safety cover or another, suitable protective cover at the shrink disk to prevent injuries. Never start up the drive if the protective covers are not installed.

Gear unit type	Locking screw ISO 4014/ISO 4017/ ISO 4762	Tightening torque
BSHF402	M6	12

4.15.2 Removing shaft-mounted gear units with shrink disk

Note: There is no need to dismantle clean, removed shrink disks before they are reinstalled.

1. **▲ CAUTION!** Risk of injury due to falling shrink disk. Secure the shrink disk before disassembly.
2. To prevent the outer rings from jamming, loosen the locking screws a quarter turn, one after the other.
3. Steadily loosen the locking screws one after the other, but do not remove the locking screws completely.
4. If rust has formed on the shaft in front of the hub, remove the rust.
5. Remove the shaft or pull the hub off the shaft.
6. Remove the shrink disk from the hub.

4.15.3 Cleaning and lubricating the shrink disk

Proceed as follows:

1. If the shrink disk is dirty, clean and lubricate the shrink disk.
2. Lubricate the tapered surfaces. Use one of the following solid lubricants:

Lubricant (Mo S2)	Trade form
Molykote® 321 (lube coat)	Spray
Molykote® spray (powder spray)	Spray
Molykote® G Rapid	Spray or paste
Aemasol® MO 19P	Spray or paste
Aemasol® DIO-setral-57 N (lube coat)	Spray

3. Grease the locking screws with a multipurpose grease such as Molykote® BR 2.

4.16 Cover



⚠ CAUTION

Risk of injury due to moving input and output drive components during operation.

Risk of jamming and crushing.

- Cover the input and output drive components with touch guards.

Observe the following points during installation:

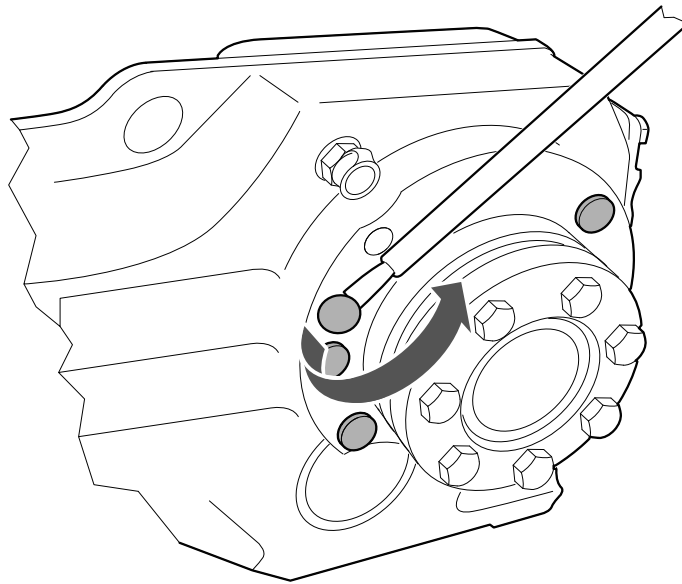
- The seal must not be damaged.
- The glued connection between gasket and cover must be flawless.
- The bores of the gasket and the cover must match.

4.16.1 Mounting the fixed cover

Assembly

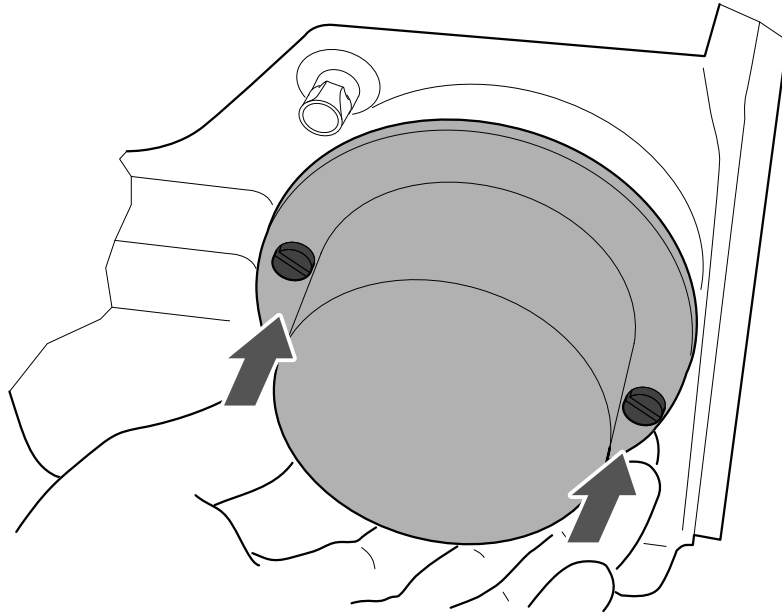
Proceed as follows:

1. Remove the plastic plugs from the gear unit housing.



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2. Fasten the safety cover to the gear unit housing using the supplied screws.



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4.16.2 Operation without cover

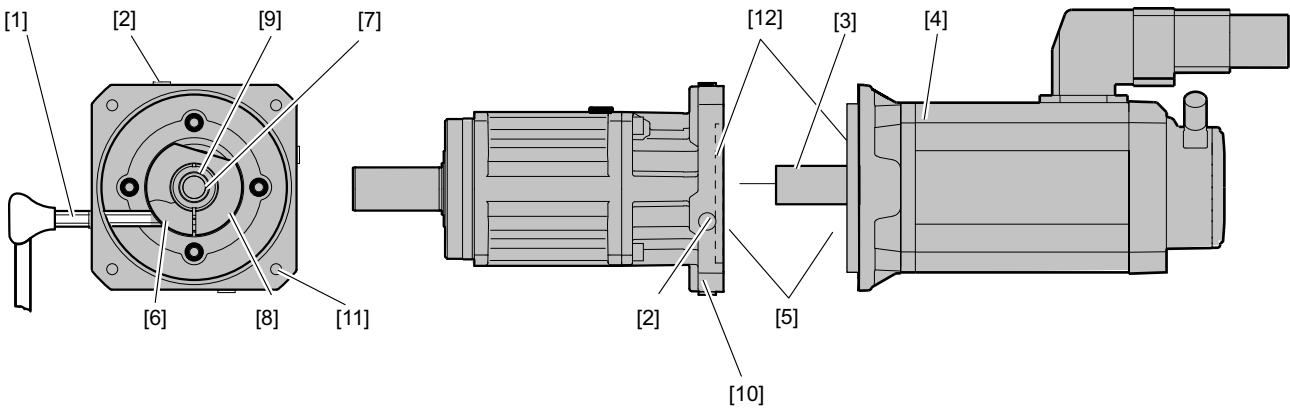
In certain application cases, e.g. with a through-shaft, a cover cannot be installed. The cover is not necessary if the system or unit manufacturer provides corresponding components to guarantee compliance with the required degree of protection. If this results in additional maintenance, the manufacturer has to describe this in the operating instructions for the system or component.

4.17 Mounting the motor on a gear unit using an adapter

Make sure that the servomotor is not misaligned when mounting it to the EBH../EPH../ECH.. adapters, and carry out the clamping connection properly to avoid impairing torque transmission.

4.17.1 Mounting motor via EBH.. and EPH.. adapters

The following figure illustrates motor mounting via EPH.. adapter:



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- | | |
|-----------------------------|------------------------|
| [1] Torque wrench | [7] Coupling sleeve |
| [2] Closing plug | [8] Clamping ring |
| [3] Motor shaft | [9] Adapter shaft |
| [4] Motor | [10] EPH adapter |
| [5] Flange contact surfaces | [11] Connection bores |
| [6] Clamping screw | [12] Flange centerings |

- ✓ As far as possible, attach the motor in vertical direction with the motor at the top. You may install the components in another mounting position only if the application or space circumstances do not permit the standard position.
 - ✓ To avoid tensions due to misalignments, you must support the motor and align the motor shaft.
 - ✓ The motor must have at least true-running, face runout, and coaxiality accuracy level "N" according to DIN 42955.
1. **▲ WARNING!** Risk of injury if the drive starts up unintentionally. Severe or fatal injuries. Disconnect the drive from the power supply before starting work. Prevent the drive from starting up unintentionally, for example by locking the key switch or removing the fuses from the current supply. Use a product safety label to indicate that the drive must not be switched on.
 2. Check the flange contact surfaces [5] of the motor and adapter for possible scoring and smoothen them if necessary.
 3. Clean, degrease and dry the following drive components. Use a grease-dissolving, non-aggressive cleaning agent:
 - ⇒ The hollow shaft bore of the adapter shaft [9]
 - ⇒ The coupling sleeve [7] (if available)
 - ⇒ The motor shaft [3]
 - ⇒ The flange contact surfaces of motor and adapter [5]

- ⇒ The flange centering of motor and adapter [12]
4. Remove one of the 4 closing plugs [2].
 5. For motors without a keyway: Turn the adapter shaft [9] with clamping ring [8] until the screw head of the clamping screw [6] can be accessed via the mounting bore. Loosen the clamping screw [6] by 1 turn.
 6. For motors with keyway: SEW-EURODRIVE recommends inserting a half key into the keyway to compensate for the imbalance. The half key must not protrude from the groove in the motor shaft extension. Turn the keyway by 90° to the slots in the adapter shaft [9].
 7. When using coupling sleeves [7], make sure to align the slots in the coupling sleeve [7], the adapter shaft [9] and the clamping ring [8].
 8. Carefully and without using force, insert the motor shaft [3] into the hollow shaft bore of the adapter shaft [9] until the flange contact surfaces [5] of motor and adapter touch. There must be no gap between the flange contact surfaces. The connection bores [11] must be aligned.
 9. Insert the connecting screws into the tapped holes of the adapter flange [11] via the through bores of the motor flange. Evenly tighten the screws in diametrically opposite sequence with increasing torque. Use the tightening torques stated in the table below ("Tightening torques for mounting EPH../EBH.. adapters with motor") and observe the information provided under "Information relating to tightening torques" (→ 34).
 10. Use a suitable torque wrench [1] to tighten the clamping screw [6]. Use the tightening torques stated in the table below "Tightening torques for clamping screws".

Tightening torques
for mounting EPH/
EBH adapters with
motor

Screw size	Strength class	Tightening torque ±15% Nm
M4	8.8	3.4
M5	8.8	6.8
M6	8.8	12
M8	8.8	28
M10	8.8	56
M12	8.8	96
M16	8.8	235

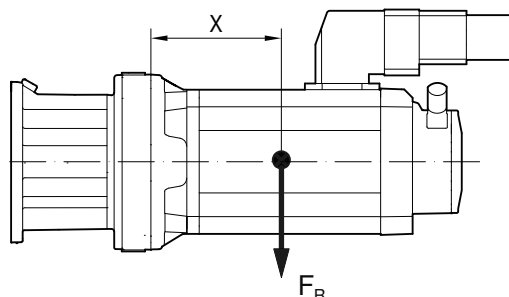
Tightening torques
for clamping
screws

Adapter type	Motor shaft diameter mm	Number of clamp- ing screws	Clamping screw tightening torque Nm	Wrench size
EBH03	≤ 14	1	18	5
EBH04	≤ 19	1	18	5
EBH05	≤ 24	1	43	6
EBH06	≤ 35	1	43	6
EBH07	≤ 35	1	43	6
EBH08	≤ 38	1	83	8
EBH09	≤ 42	1	83	8
EBH10	≤ 55	1	145	10
EPH01	≤ 11	1	10	4

Adapter type	Motor shaft diameter mm	Number of clamping screws	Clamping screw tightening torque Nm	Wrench size
EPH02	≤ 14	1	18	5
EPH03	≤ 14	1	18	5
EPH04	≤ 19	1	18	5
EPH05	≤ 24	1	43	6
EPH06	≤ 35	1	43	6
EPH07	≤ 32	1	43	6
EPH08	≤ 38	1	83	8
EPH09	≤ 42	1	83	8
EPH10	≤ 55	1	145	10

4.17.2 Permitted motor weight with adapter EBH.., EPH..

The following diagram shows the permitted distance x from the motor center of mass to the adapter flange depending on the permitted motor weight:



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- ⊗ Motor center of mass
- x Distance between adapter flange and motor center of mass
- F_R Permitted overhung load

The values in the following table are maximum load values for bolts of property class 8.8. If the center of gravity distance x increases, the maximum permitted weight F_R of the attached motor must be reduced linearly. If the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

BSF.. EBH..

EBH.. adapter type	x mm	F_R N
EBH03/01-14	182	157
EBH04/12-15	182	157
EBH05/14-20	220	273
EBH05/26		
EBH06/19	290	312
EBH07/20-22	290	312
EBH07/27-28		
EBH08/21-22	351	600
EBH09/22-25	400	680
EBH10/22-25	400	680

PSF.. EPH..

EPH.. adapter type	x mm	F_R N
EPH01/01-03	100	120
EPH02/04-13	120	150
EPH03/01-14	182	157
EPH04/01-15	182	157
EPH05/14-20	220	273
EPH05/26		
EPH06/19	290	312

EPH.. adapter type	x mm	F _R N
EPH07/20-22 EPH07/27-28	290	312
EPH08/21-22	351	600
EPH09/22-25	400	680
EPH10/22-25	400	680

4.17.3 Mounting motors to gear units directly



NOTICE

Mounting the motor to the gear unit may cause malfunctions.

Possible fault

- Never mount a motor directly to the gear unit.

4.18 Removing the motor from the adapter and the gear unit

NOTICE

If the customer removes an adapter from the gear unit, there is a risk of damage to the gear unit.

Gear unit damage.

- The customer must never remove an adapter from a gear unit.

NOTICE

If the customer removes an adapter from a gear unit directly mounted on the motor, there is a risk of damage to the gear unit.

Gear unit damage.

- The customer must never remove a directly mounted gear unit from a motor.

4.18.1 Sequence for dismounting the motor from the EBH.. or EPH.. adapter

Adhere to the following sequence during disassembly of the EBH.. adapter:

1. Switch off the drive
2. Secure the load
3. Turn off the current to the motor
4. Allow the drive to cool
5. Unscrew the clamping screws
6. Unscrew the connection screws between the motor and adapter
7. Remove the motor without tilting or jamming it

5 Startup

5.1 General information

Switch off the gearmotor if in doubt whenever changes occur in relation to normal operation, e.g. noises or vibrations. Determine the cause and, if necessary, contact SEW-EURODRIVE.

Gear unit with motor adapter

For gear units with an adapter, the values specified on the nameplate and in the project planning documents for the gear unit must not be exceeded. Overloading of the gear unit must be ruled out.

Inverter-operated gearmotors

The inverter parameters must prevent the gear unit from being overloaded. Refer to the nameplate and the project planning documents for the permitted gear unit performance data.

When starting up inverter-operated gearmotors, observe the permitted maximum values and RMS values specified in the design documentation. The buyer is obliged to provide the data to the user. When starting up gear units in combination with controlled motors, activate the "speed" and "torque or current limit" application limit in the frequency inverter. For further details, refer to the respective operating instructions of the motor.

5.2 Design-related special features

5.2.1 BS.F.. helical-bevel gear units for mounting position M5

INFORMATION



With mounting position M5, it is important that you only operate the gear unit at a maximum of 50% of the limit speed for the first 24 hours of operation.

5.2.2 PSF.. /PSKF.. planetary gear units for mounting position M2

INFORMATION



With mounting position M2, it is important that you only operate the gear unit at a maximum of 50% of the limit speed for approx. the first 24 operating hours.

5.3 Checklist

5.3.1 Before startup

This checklist includes all activities that will have to be executed prior to startup of a gear unit according to Directive 2014/34/EU for operation in potentially explosive atmospheres.

Check before starting up a gear unit in a potentially explosive atmosphere	Verified	For additional information, refer to ...
Inspect the shipment for any possible transport damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. It may be necessary to rule out startup. Remove the transport locks before startup.		"Transportation/storage" (→ 14)
Does the following information on the nameplate of the gear unit match the permitted Ex classification on site? - Equipment group - ATEX category - ATEX zone - Temperature class - Maximum surface temperature		Nameplates under "Product structure" (→ 16)
Is it ensured that no explosive atmosphere, oils, acids, gases, vapors, or radiation are present during the installation of the gear unit?		Nameplates under "Product structure" (→ 16)
Is the ambient temperature maintained in accordance with the lubricant table?		"Lubricants" (→ 75)
Is it ensured that the gear units are adequately ventilated and that there is no external heat input (e.g., via couplings)? The cooling air must not exceed a temperature of 40 °C.		–
Does the mounting position on the gear unit nameplate correspond to the indicated mounting position? Notice: Do not change the mounting position without prior consultation with SEW-EURODRIVE. Without prior consultation, the ATEX approval will become void!		Nameplates under "Product structure" (→ 16) "Mounting positions" (→ 62)
Are all oil drain and oil level plugs as well as breather plugs and valves freely accessible?		–
Do all input and output drive components to be installed have ATEX approval?		–
Is it ensured that, for stand-alone gear units with adapters or with a drive-end cover, the data specified on the gear unit nameplate is not exceeded?		"Measuring the surface temperature" (→ 61) "Lubricant change intervals" (→ 74) Nameplates under "Product structure" (→ 16)

Check before starting up a gear unit in a potentially explosive atmosphere	Verified	For additional information, refer to ...
For line-operated motors: Check whether the data specified on the nameplate of the gear unit and the motor match the ambient conditions at the installation site.		Nameplates under "Product structure" (→ 16)
For inverter-operated gearmotors: Check whether the gearmotor is approved for operation with an inverter. The inverter parameters must prevent the gear unit from being overloaded (→ gear unit nameplate)		Nameplates under "Product structure" (→ 16)

5.3.2 During startup

This checklist includes all activities that will have to be executed during startup of a gear unit according to Directive 2014/34/EU for operation in potentially explosive atmospheres.

Check the following points during gear unit startup in a potentially explosive area:	Verified	For additional information, refer to ...
Check the surface temperature.		"Measuring the surface temperature" (→ 61)
Determine the lubricant change interval.		"Lubricant change intervals" (→ 74)

5.4 Measuring the surface temperature

During startup of the gear unit, it is imperative to measure the surface temperature at maximum load at regular intervals over a period of at least 3 hours at several points on the gear unit.

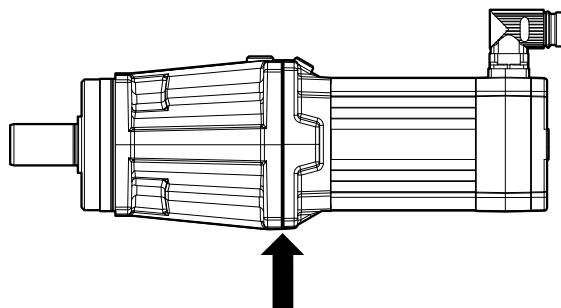
Commercially available temperature measuring devices can be used to measure the temperature.

The measured surface temperature must not exceed the minimum of the following values:

- Maximum permitted oil temperature of the lubricant used minus 10 K, according to the specifications in "Lubricant table" (→ 76)
- Minimum confirmed surface temperature according to the explosion protection marking

If these values are exceeded, stop the drive immediately and contact SEW-EURODRIVE.

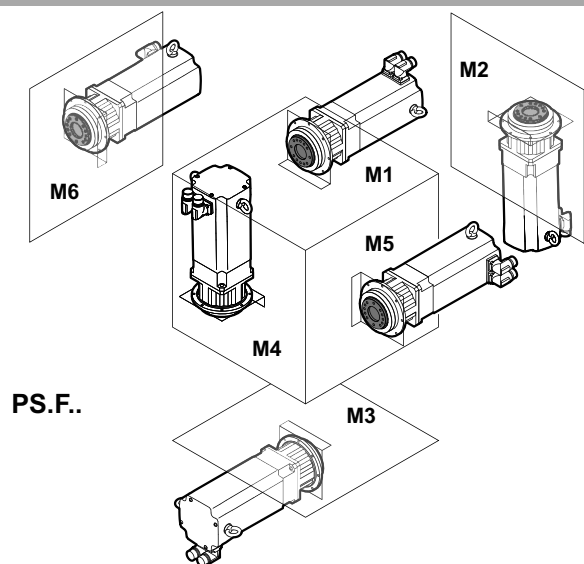
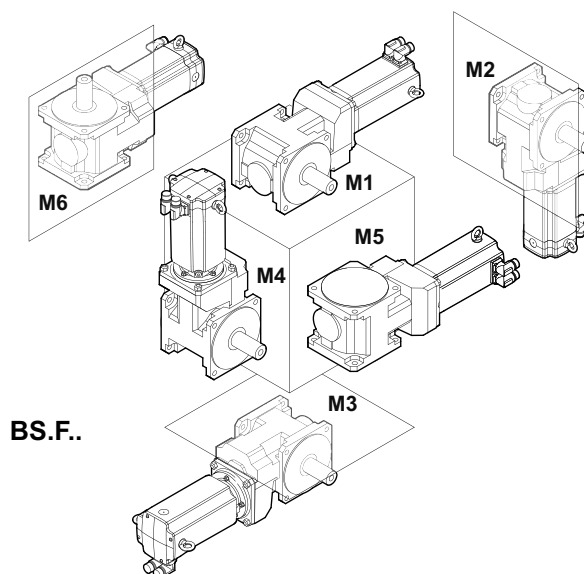
For gear units with an EBH or EPH adapter, measure the surface temperature at the joint between the gear unit housing and the adapter flange.



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6 Mounting positions**6.1 General information on mounting positions – BS.F-, PS.F gear units**

The following illustration shows the SEW-EURODRIVE mounting positions M1 – M6:



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6.2 Mounting position sheets

6.2.1 Dimension sheet information

Position of the valves and screws	The positions of the breather valve specified in the mounting position sheets are binding and comply with the assembly specifications. The motors are only depicted symbolically on the mounting position sheets.
Representation of the shaft	For gear units with solid shaft, the shaft shown is always on the A-side. For shaft-mounted gear units, the customer shaft is shown as a dashed line. The output end (position of the output shaft) is always shown on the A-side.
Mounting position M0	Some gear units can be supplied in mounting position M0. In this case, the gear unit is delivered in a universal mounting position and can be adjusted to various mounting positions by the customer. It may be necessary to contact SEW-EURODRIVE.

Symbols used

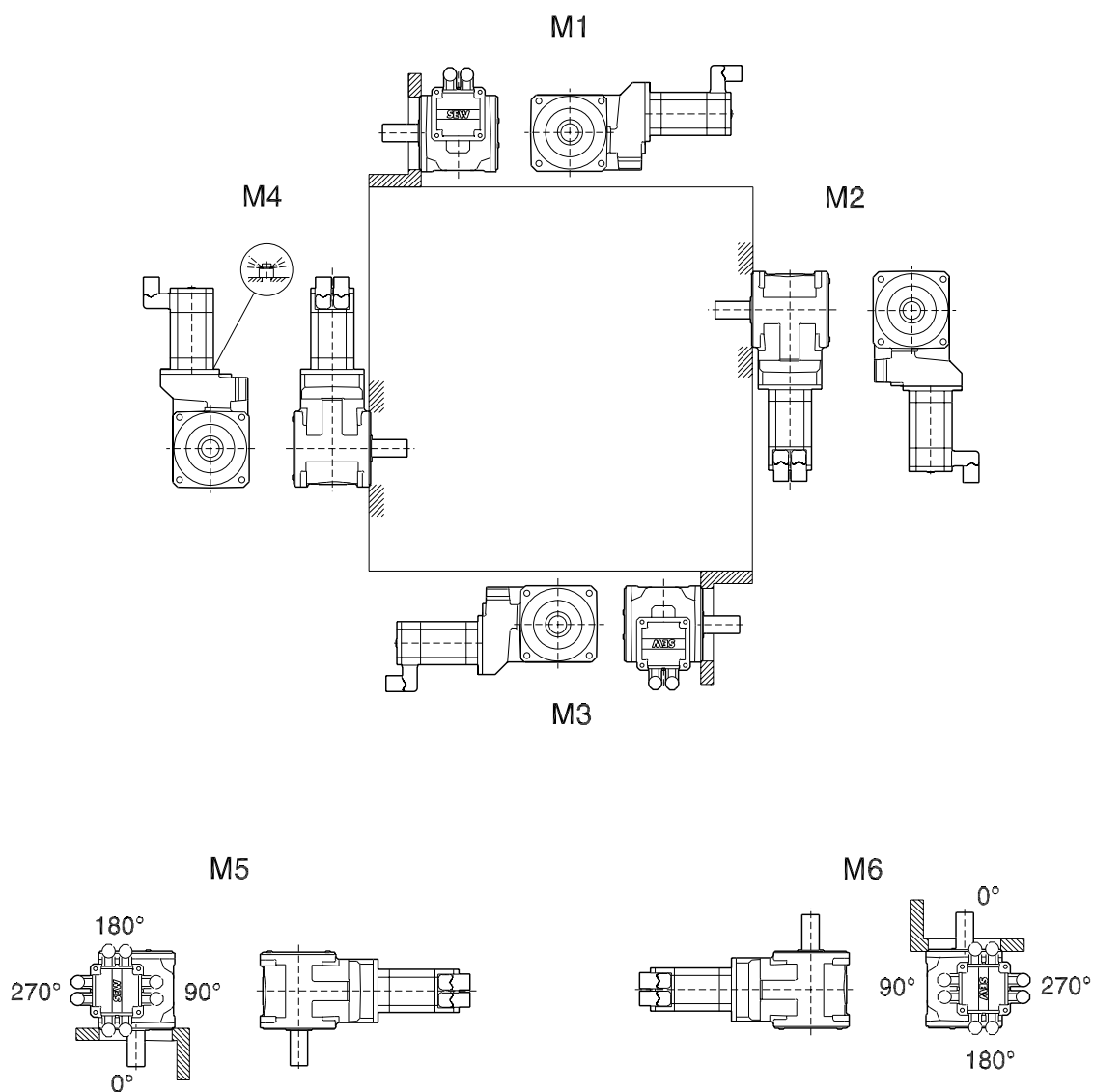
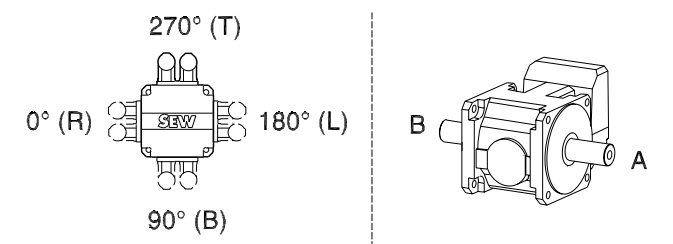
The following table shows the symbols used in the mounting position sheets and what they mean:

Symbol	Meaning
	Breather valve

6.2.2 Mounting positions of BS.F helical-bevel gearmotors

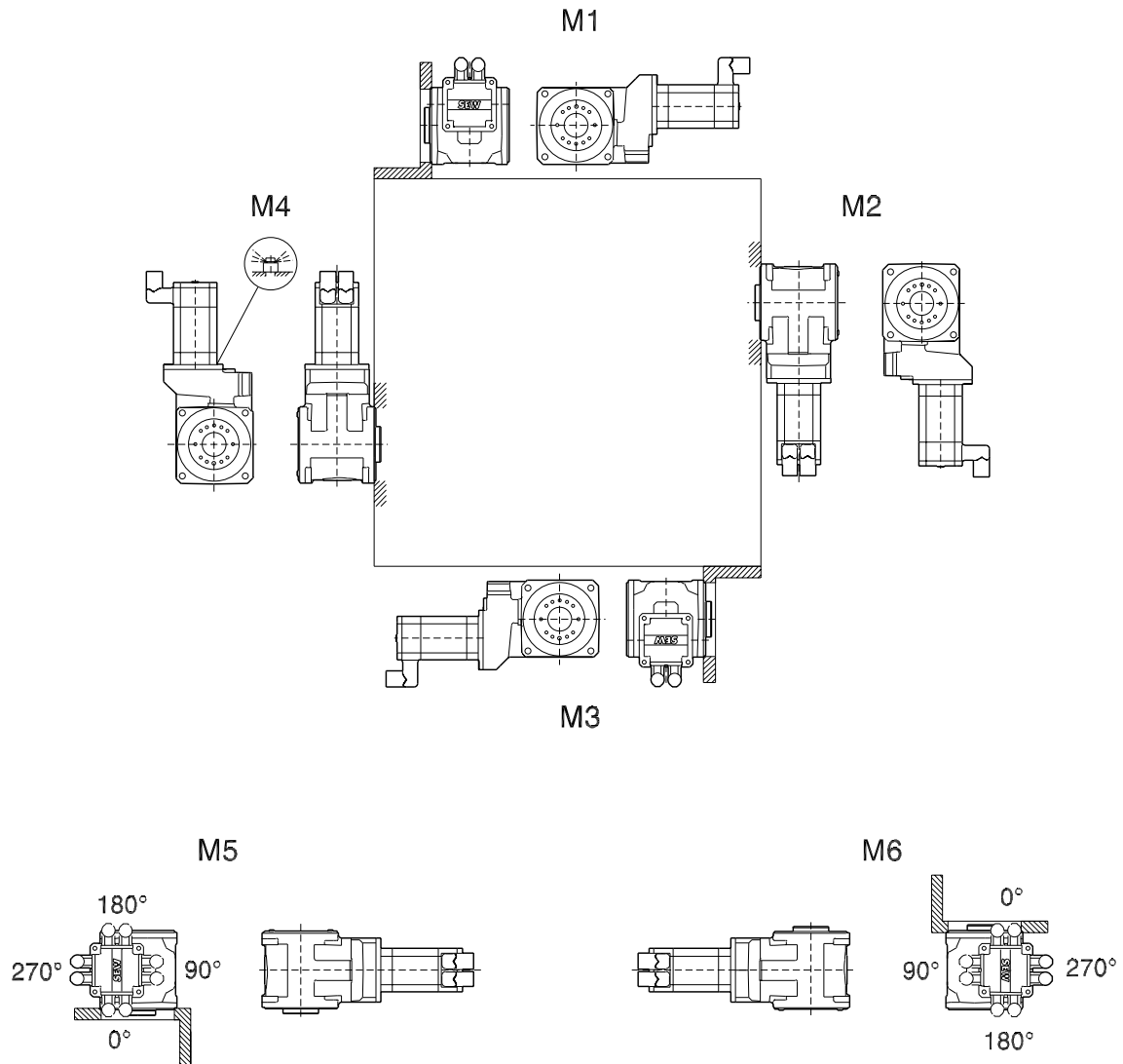
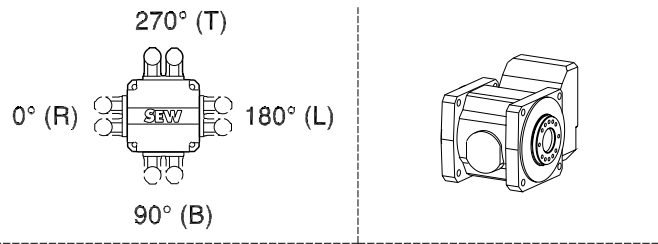
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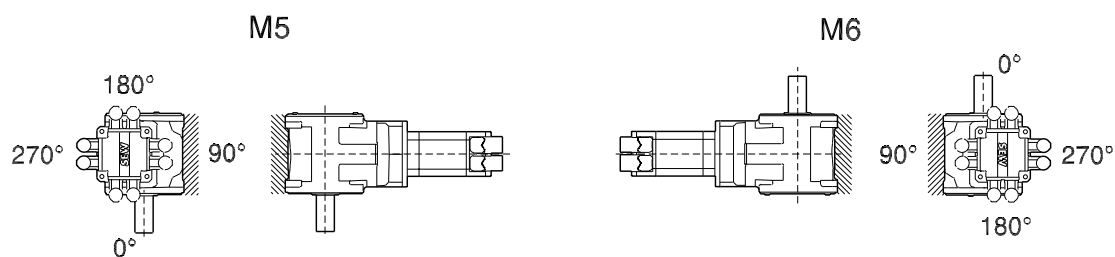
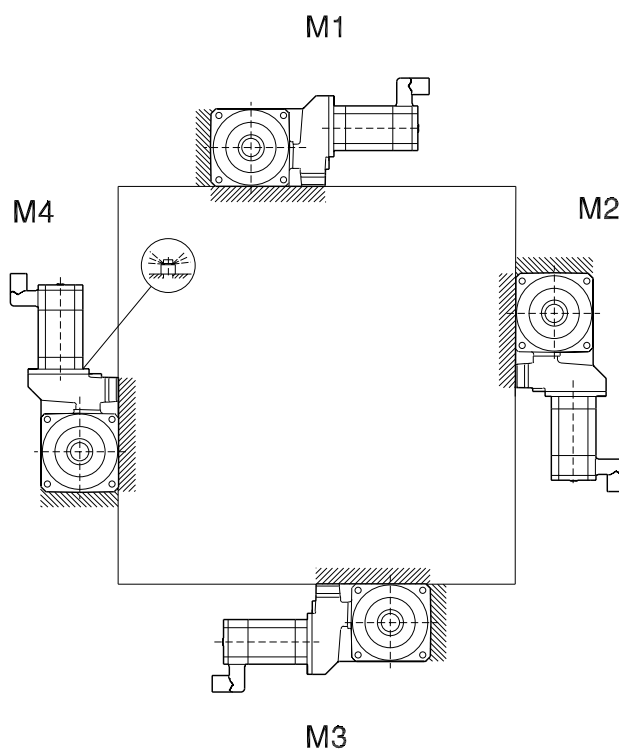
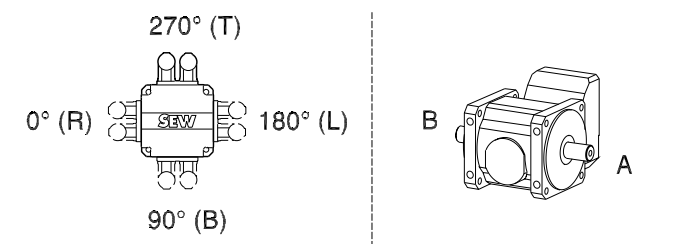
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56 038 02 03



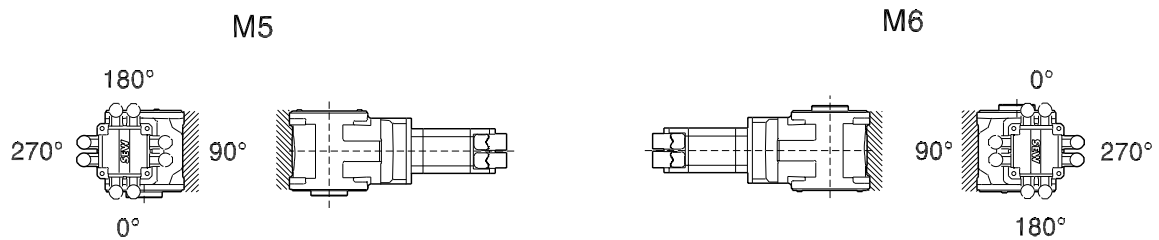
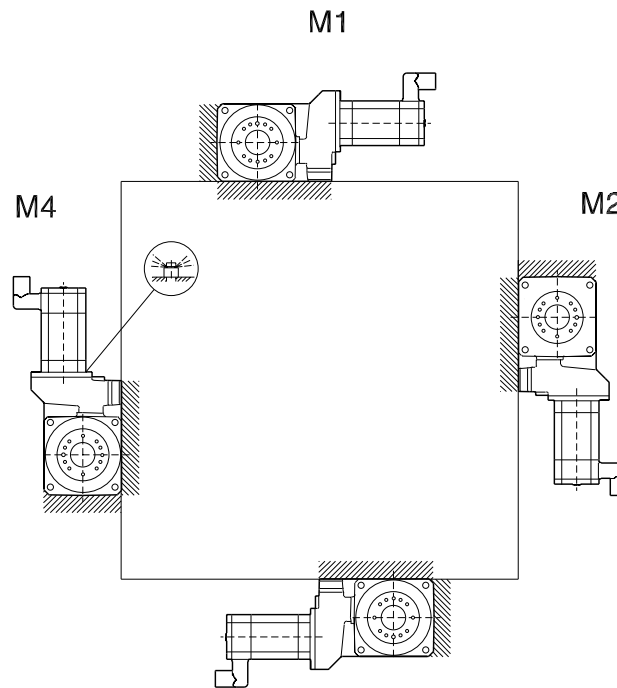
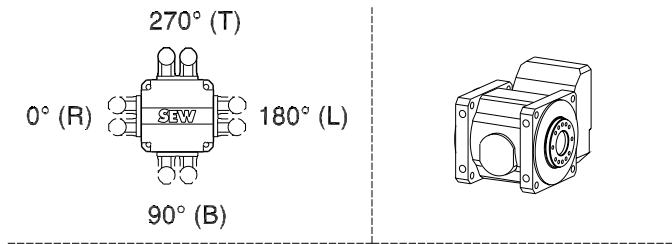
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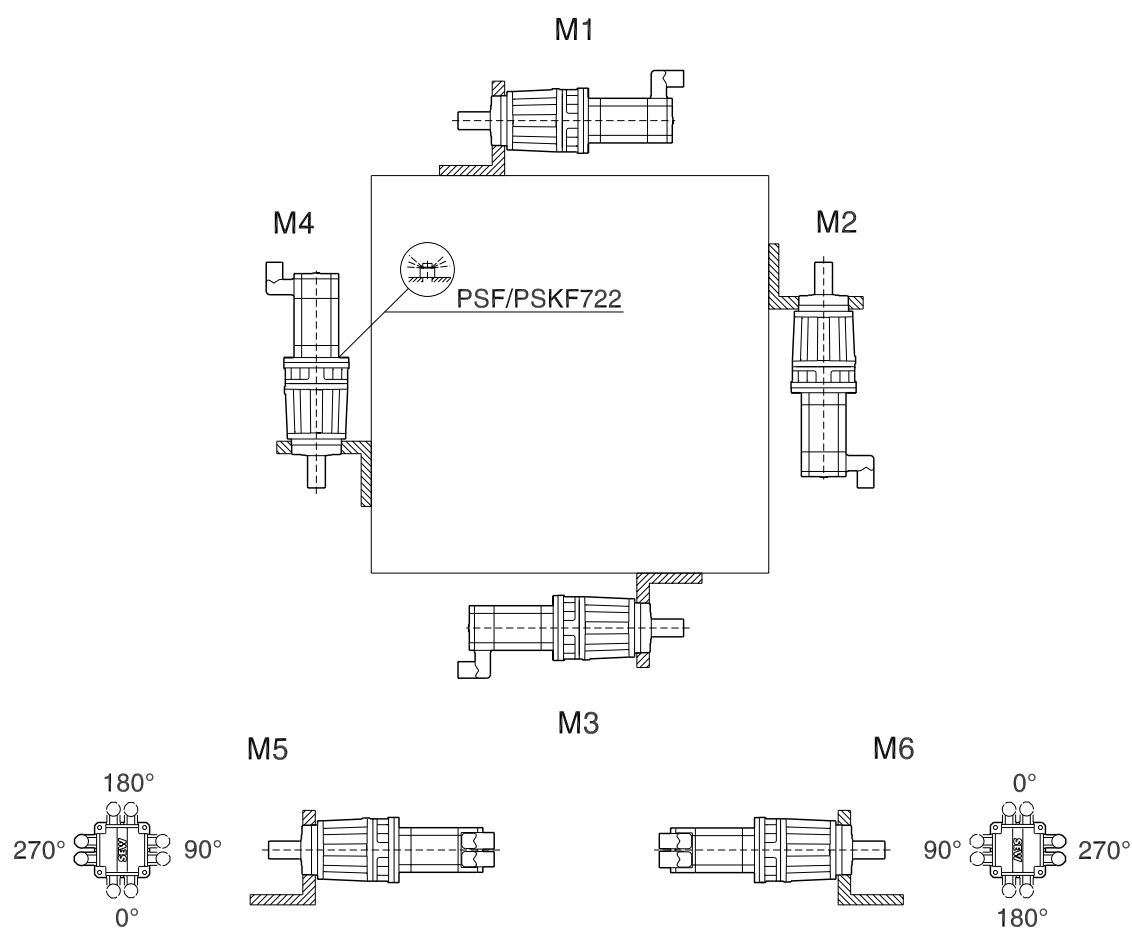
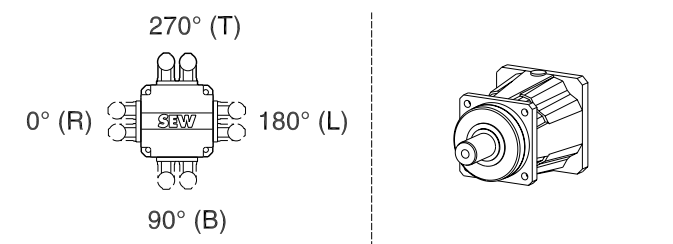
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6.2.3 Mounting positions of PS.F planetary gearmotors

PS.F121-922

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7 Operation

7.1 Failures on the servo gear unit

Fault	Possible cause	Measure
Unusual, regular running noise.	Meshing/grinding noise: Bearing damage	Contact SEW-EURODRIVE.
	Knocking noise: Irregularity in the gearing	Contact SEW-EURODRIVE.
	Incorrect controller setting	Check the controller settings.
Unusual, irregular running noises	Foreign objects in the oil	- Check the oil consistency - Stop the drive, contact SEW-EURODRIVE
Oil leakage ¹⁾ - From the motor flange - From the motor oil seal - From the gear unit flange - From the output end oil seal.	Seal defective.	Contact SEW-EURODRIVE.
	Only for BSF.. gear units in mounting position M4: Gear unit not ventilated	Vent gear unit
Only for BSF.. Mounting position M4: Oil leaking from breather valve.	Too much oil	Contact SEW-EURODRIVE.
	Drive operated in incorrect mounting position	Mount the gear unit in the correct mounting position
	Frequent cold starts (oil foaming) and/or high oil level	Install oil expansion tank.
Output shaft does not turn although the motor is running or the input shaft is rotated	Shaft-hub connection in the gear unit interrupted	Send in the gear unit/gearmotor for repair
Housing temperature is > 95 °C	Restricted air supply	Ensure unrestricted air supply and/or contact SEW-EURODRIVE.
	Speed/torque is too high	Check dimensioning and/or contact SEW-EURODRIVE.

1) Short-term oil / grease leakage at the oil seal is possible in the run-in phase (48 hours running time).

8 Service

8.1 SEW-EURODRIVE Service

If you are unable to rectify a fault, contact SEW-EURODRIVE Service. For addresses, refer to www.sew-eurodrive.com.

When contacting SEW-EURODRIVE Service, always specify the following information so that our service personnel can assist you more effectively:

- Information on the nameplate (e.g. type designation, serial number, part number, product key, purchase order number)
- Brief description of the application
- Error message on the status display
- Type of fault
- Accompanying circumstances
- Unusual events preceding the problems

8.2 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
- Aluminum
- Copper
- 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.

9 Inspection/maintenance

9.1 General information

SEW-EURODRIVE recommends having the SEW-EURODRIVE Service carrying out maintenance work.

This particularly applies to all steps that require power transmitting connections to be opened or loosened.

If maintenance work is carried out independently, the responsibility and liability for the proper performance is passed to the operator.

9.2 Preliminary work regarding gear unit inspection/maintenance

Observe the following notes before you start with the inspection/maintenance work.

- Observe the 5 safety rules before commencing the work: Disconnect. Secure the device against a restart. Check that no voltage is applied. Ground and short-circuit it. Cover or cordon off neighboring live parts.
- Let the unit cool down sufficiently before you start working on it.
- Before releasing shaft connections, make sure that there are no active torsional moments present (tensions within the system).
- Do not mix different synthetic lubricants and do not mix synthetic and mineral lubricants.

The position of the breather valve depends on the mounting position. Refer to the mounting position sheets (see "Mounting positions" (→ 62)).

- Prevent foreign particles from entering into the gear unit during maintenance and inspection work.
- Do not clean the gear unit with a high-pressure cleaning device. Water might enter the gear unit and the seals might be damaged.
- Perform safety and functional checks following all maintenance and repair work.

9.3 Inspection and maintenance intervals

Maintain the inspection and maintenance intervals. This is necessary to ensure operational safety.

Time interval	Required steps
500 operating hours or 3 months after startup	- Visual inspection for external damage and leaks at the seals. - Check the tightening torque of the clamping screw for the clamping ring. The tightening torque is specified in the table "Tightening torques for clamping screws" and on the clamping ring. - Check the tightening torques of the bolted connections between the gear unit and the machine, as well as between the output drive components and the output shaft.
Every 3 months	Visual inspection for external damage and leaks at the seals.
Annually	- Check the tightening torque of the clamping screw for the clamping ring. The tightening torque is specified in the table "Tightening torques for clamping screws" and on the clamping ring. - Check the tightening torques of the bolted connections between the gear unit and the machine, as well as between the output drive components and the output shaft.

9.3.1 Wearing parts

Gearing

If you observe the SEW-EURODRIVE design criteria and the inspection and maintenance intervals, then the gearing components of the gear units will be wear-free after the run-in period. The worm gearing is an exception for design reasons. Depending on the operating conditions, material on the tooth flanks of the worm gear is removed to different extents. The main influencing factors are:

- Speed
- Load
- Operating temperature
- Lubricant (type, viscosity, additives, pollution)
- Switching frequency

For information on the worm gearing service life under certain operating conditions, contact SEW-EURODRIVE.

Rolling bearings

Rolling bearings in the gear unit, adapter, and input shaft assembly have a limited service life, even under ideal operating conditions. This nominal bearing service life is a solely statistical value. The actual service life of an individual bearing may deviate greatly from this value. The main influencing factors are:

- Speed
- Equivalent bearing load
- Operating temperature
- Lubricant (type, viscosity, additives, pollution)
- Lubricant supply of the bearing
- Misalignment under operating load

For information on the nominal bearing service life under certain operating conditions, contact SEW-EURODRIVE.

Lubricant

Lubricants are subject to aging. Their service life is limited depending on the operating conditions.

The service life depends largely on the oil operating temperature. The relationship between lubricant change intervals and operating temperature is shown in the figure under "Lubricant change intervals" (→ 74).

If you have any questions regarding lubricant changes, consult SEW-EURODRIVE.

Oil seals

Oil seals are contact seals that seal unit housings at emerging elements, such as shafts, from the environment. Oil seals are wear parts with a service life that is influenced by the following factors, among others:

- Shaft speed and circumferential speed at the sealing lip
- Ambient conditions (temperature, dust, humidity, pressure, chemicals, radiation)
- Lubricant (type, viscosity, additives, pollution)
- Surface quality of the sealing
- Lubricant supply of the sealing
- Oil seal material

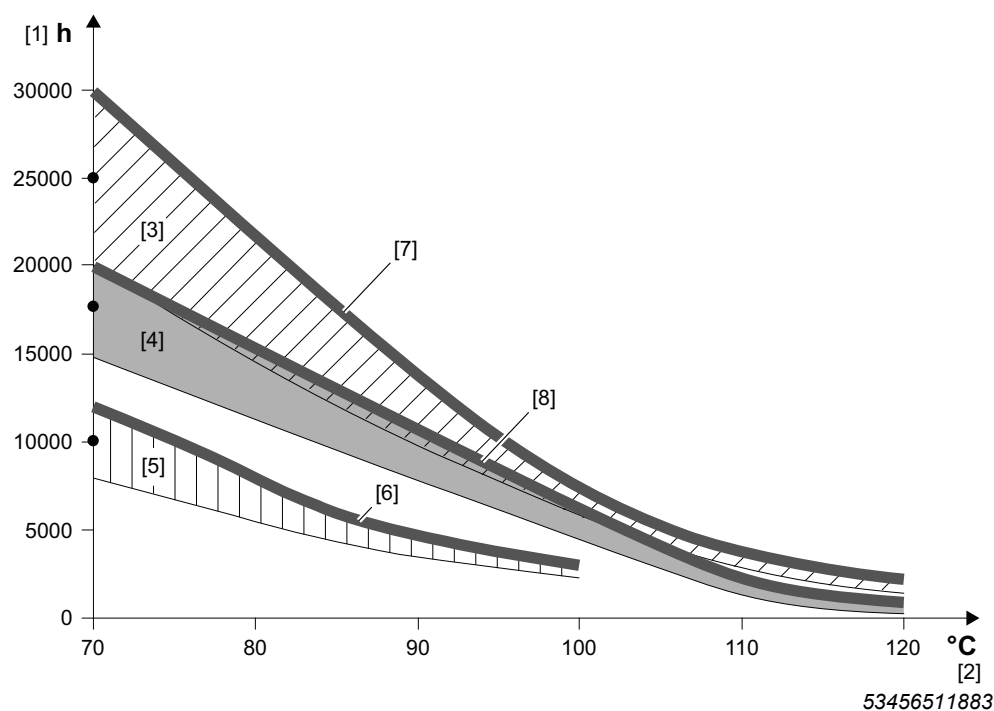
9.4 Lubricant change intervals

In the following figure, you can determine, for standard ambient conditions, the number of operating hours between two oil changes based on the determined continuous oil-bath temperature.

To do so, measure the surface temperature at several points on the gear unit. Add 10 K to the measured value.

In special designs or under severe/aggressive ambient conditions, change the lubricant more frequently.

For more information on the approved oils, refer to the lubricant table or to www.sew-eurodrive.de/lubricants.



- [1] Operating hours
- [2] Continuous oil bath temperature
- [3] CLP PG / CLP PG NSF H1
- [4] CLP HC / CLP HC NSF H1
- [5] CLP / E
- [6] GearOil Base by SEW-EURODRIVE
- [7] GearOil Poly (H1) / GearFluid Poly (H1) by SEW-EURODRIVE
- [8] GearOil Synth (H1) by SEW-EURODRIVE
- Average value for each oil type at 70 °C

9.5 Lubricants

The BS.F.. helical-bevel gear units and PS.F.. planetary gear units from SEW-EURODRIVE are supplied exclusively with synthetic lubricants.

For drives for the food industry, contact SEW-EURODRIVE.

9.5.1 Bearing greases

The table shows the lubricants recommended by SEW-EURODRIVE:

Area of application	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	SEW-EURODRIVE	Grease HL 2 E1 ¹⁾
		Fuchs	Renolit CX-TOM 15 ¹⁾
		Klüber	Petamo GHY 133 N
 2)	-40 °C to +40 °C	SEW-EURODRIVE	Grease HL 2 H1 E1
		Bremer & Leguil	Cassida Grease GTS 2
 3)	-20 °C to +40 °C	Fuchs	Plantogel 2S

1) Bearing grease based on semi-synthetic base oil.

2) Lubricant for the food processing industry.

3) Easily biodegradable lubricant for environmentally sensitive areas.

9.5.2 Lubricant table

NOTICE

Damage to the gear unit due to improper lubricants.

Possible damage to property.

- Do not mix synthetic lubricants.
- Do not mix synthetic lubricants and mineral lubricants.

The lubricant recommendation provided in the lubricant table in no way represents a guarantee as to the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of their product.

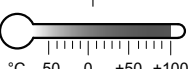
Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimum and maximum permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.

The oil viscosity and type (mineral/synthetic) 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 values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants are subject to dynamic change on the part of the lubricant manufacturers. For the latest information about the lubricants, visit: **www.sew-eurodrive.de/lubricants**.

To avoid gear unit damage, use only one lubricant type.

Information on the table structure

[1]	[2]	[3]
	 °C -50 0 +50 +100	ISO, SAE NLGI
	-15 +40	VG 460
	-25 +30	VG 220
		CLP HC - NSF H1 - PSS
	[4]	[5]

53456509451

- [1] Gear unit type
- [2] Ambient temperature range
- [3] Viscosity class
- [4] Information about special approvals
- [5] Lubricant type

The specified ambient temperatures are guide values for selecting a suitable lubricant. The exact upper and lower temperature limits for project planning are specified in the table with the respective trade name. Bear in mind during project planning that the viscosity increases at low temperatures and that this might influence the starting behavior.

Information on the various lubricants

			[3]
[1]	-15	+80	[4]
[2]	XYZ108		
	SEW070030014		
			[5]

- [1] Lowest oil sump temperature in °C, going below this value during operation is not permitted.
- [2] Trade name
- [3] Manufacturer
- [4] Highest oil sump temperature in °C. The service life will be considerably reduced when this temperature is exceeded. Observe the lubricant change intervals. For more information, refer to chapter "Lubricant change intervals" (→ 74).
- [5] Approvals regarding compatibility of the lubricant with approved oil seals

Lubricant compatibility with oil seals

Approval	Explanation
SEW07004__13:	A lubricant especially recommended with regard to compatibility with the approved oil seals. The lubricant exceeds the state-of-the-art requirements regarding elastomer compatibility.

In the low temperature range, oil seals can withstand shaft deflections (e.g. through overhung load) only to a limited extent. Take special care to avoid or limit pulsating and changing radial displacements of the shaft. Contact SEW-EURODRIVE if necessary.

Oil seal Material class	Permitted Oil sump temperature
NBR	-40°C to +80°C
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	
S	1	NBR	1	Freudenberg		72 NBR 902
			2	Trelleborg		4NV11
	2	FKM	1	Freudenberg	1	75 FKM 585
					2	75 FKM 170055
			2	Trelleborg	1	VCBVR
			3	SKF	1	FKM 00934

Examples:

S11: Only the elastomer 72NBR902 from Freudenberg meets the approval requirements in conjunction with the specific lubricant.

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

Key

The following table shows the symbols and abbreviations used in the lubricant table and their meaning.

Abbreviation/symbol	Meaning
	Synthetic lubricant (marked gray)
	Mineral lubricant
CLP	Mineral oil
CLP PG	Polyglycol (PG)
rPCF	Reduced Product Carbon Footprint
CLP HC	Synthetic hydrocarbons – polyalphaolefins (PAO)
E	Ester-based oil
	Lubricant for the food processing industry and feed industry. Oils are NSF-H1 registered and compliant in accordance with FDA 21 CFR § 178.3570.
	Lubricants with particularly reduced CO ₂ footprint (cradle-to-gate) with sustainable raw materials
	Lubricants with good bio-degradability for environmentally sensitive areas (> 60% according to OECD 301 or according to appendix A of EPA 2013 VGP)
	Lubricant suitable for explosion-protected gear units and gearmotors
1)	Helical-worm gear units with CLP-PG: Contact SEW-EURODRIVE.
2)	Low-viscosity grease
3)	With appropriate measures, the gear units can be operated at ambient temperatures as low as -40 °C. Contact SEW-EURODRIVE.
4)	Oils for the food processing industry cannot be combined with the gear unit option "Extended storage" (a VCI anti-corrosion agent is added).
RWDR	Oil seal
PSS	Oil seal of the Premium Sine Seal type. The addendum "PSS" for the lubricant type indicates compatibility with the sealing system.
SPC	Special product classification: Observe the safety data sheet for product classification. Separate handling is required.

Lubricant table for BS.F.. and PS.F.. gear units

The lubricant table is valid on the day this document is published. Refer to www.sew-eurodrive.de/lubricants for the latest tables.

Observe the thermal application limit of the oil seal materials under "Lubricant compatibility with oil seals" (→ 78).

 BS.F	 [3] °C -50 0 +50 +100	 [2] [1]	ISO, SAE NLGI	VG 220	 SEW EURODRIVE	 Brenntag & Leguit	 Castrol	 FUCHS	 Mobil	 KUBBER LUBRICATION	 Shell	 SINOPEC	 TotalEnergies	 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460				
														 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460		
														 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	
														 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460
														 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460
 PS.F	 [3] °C -50 0 +50 +100	 [2] [1]	ISO, SAE NLGI	VG 220	 SEW EURODRIVE	 Brenntag & Leguit	 Castrol	 FUCHS	 Mobil	 KUBBER LUBRICATION	 Shell	 SINOPEC	 TotalEnergies	 GearOil Poly 220 E1/CN1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460			
														 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460		
														 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	
														 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460
														 GearOil Poly 220 E1	 Kubersynth GH 6-220	 Kubersynth GH 6-220	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460
 [3] °C -50 0 +50 +100	 [2] [1]	ISO, SAE NLGI	VG 32	 SEW EURODRIVE	 Brenntag & Leguit	 Castrol	 FUCHS	 Mobil	 KUBBER LUBRICATION	 Shell	 SINOPEC	 TotalEnergies	 GearOil Poly 460 H1 E1	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460				
													 GearOil Poly 460 H1 E1	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460			
													 GearOil Poly 460 H1 E1	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460		
													 GearOil Poly 460 H1 E1	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460		
													 GearOil Poly 460 H1 E1	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460	 Kubersynth UHf 6-460		

- [1] Information about special approvals
[2] Oil type

- [3] Ambient temperature range
[4] Standard

The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Observe the thermal application limit of the oil seal materials under "Lubricant compatibility with oil seals" (→ 78).

9.5.3 Lubricant fill quantities

For the specified lubricant fill quantities for the explosion-protected gear units, refer to the nameplate of the gear unit.

After filling, always check the oil level; see "Inspection and maintenance intervals" (→ 72).

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific mounting position. The specified mounting position (see "Mounting positions" (→ 62)) at the time the drive is ordered is decisive in this regard.

When the mounting position is changed, the lubricant fill quantity must be adapted accordingly. Do not change the mounting position without prior consultation with SEW-EURODRIVE. Without prior consultation, the declaration of conformity and any warranty claims will become void.

9.6 Extended storage

For storage periods longer than 9 months, SEW-EURODRIVE recommends the "extended storage" gear unit design. Gear units in "extended storage" design are designated with a corresponding label.

The gear units must remain tightly sealed until startup to prevent the VCI anti-corrosion agent from evaporating.

For gear units of the "extended storage" design, the following measures are taken:

- The lubricant is mixed with a VCI anti-corrosion agent (**V**olatile **C**orrosion **I**nhibitor).
- The flange contact surfaces and the shaft ends are coated with an anti-corrosion agent. The gear units are equipped with OS1 surface protection as standard.

9.6.1 Storage conditions for extended storage

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

Packaging ¹⁾	Storage location	Storage period
• Packed in containers • With desiccant and moisture indicator sealed in the plastic wrap	• Temperature: -25 °C < ϑ < 50 °C • Roofed • Protected against rain and snow • Vibration-free	Up to 3 years with regular inspection of the packaging and humidity indicator (rel. humidity < 50%)
Open	• Roofed and enclosed at a temperature range of 5 °C < ϑ < 50 °C, relative humidity < 50%. • No sudden temperature variations and controlled ventilation of the storage room with filter (free of dirt and dust) • No aggressive vapors or shocks	Max. 3 years with regular inspection • Check for cleanliness and mechanical damage during the inspection. • Check that the corrosion protection is intact.

1) Packaging must be carried out by an experienced company using packaging material specifically suited for the application.

- When starting up the unit, observe the measures described under "Startup".
- Store the gear units in the respective mounting position.
- If the storage time is greater than specified in the table above, contact SEW-EURODRIVE.
- When storing in tropical areas, ensure adequate protection against insect damage. In case of deviating requirements, contact SEW-EURODRIVE.

10 Declarations of conformity

EU Declaration of Conformity



Translation of the original text

901550316/EN

SEW-EURODRIVE GmbH & Co KG**Ernst-Blickle-Str. 42, 76646 Bruchsal**

declares under sole responsibility that the following products

Servo gear units of the series	BS.F.. PS.F..	
optionally with mount-on components of the series	EPH.. EBH..	
variant	/II2GD	
Category	2G 2D	
Designation	Ex h IIC T3 Gb Ex h IIC T3 Gb X Ex h IIIC T150 °C Db Ex h IIIC T150 °C Db X	15)

are in conformity with

ATEX Directive	2014/34/EU (L 96, 29.03.2014, 309-356)	2)
Applied harmonized standards:	EN ISO 80079-36:2016 EN ISO 80079-37:2016 EN 60529:1991/A2:2013/AC:2019-02	

2) SEW-EURODRIVE lodges the documents required by 2014/34/EU, appendix VIII, with the notified body: FSA GmbH, EU ID no.: 0588

15) This classification of the temperature class / surface temperature is an example. The order-specific Ex identification can be found on the nameplate.

Bruchsal

9/1/2021

Page 1 of 1

Place

Date

Dr. Jörg Hermes

Managing Director Innovation/Mechanics

a) b)

a) Authorized representative for issuing this declaration on behalf of the manufacturer

b) Authorized representative for compiling the technical documents

EU Declaration of Conformity

SEW
EURODRIVE

Translation of the original text

901690316/EN

SEW-EURODRIVE GmbH & Co KG**Ernst-Blickle-Str. 42, 76646 Bruchsal**

declares under sole responsibility that the following products

Servo gear units of the series	BS.F.. PS.F..
optionally with mount-on components of the series	EPH.. EBH..
variant	/II3GD
according to	
Category	3G 3D
Designation	Ex h IIC T3 Gc Ex h IIC T3 Gc X Ex h IIIC T150 °C Dc Ex h IIIC T150 °C Dc X

are in conformity with

ATEX Directive	2014/34/EU (L 96, 29.03.2014, 309-356)
----------------	---

Applied harmonized standards:	EN ISO 80079-36:2016 EN ISO 80079-37:2016 EN 60529:1991/A2:2013/AC:2019-02
-------------------------------	--

15) This classification of the temperature class / surface temperature is an example. The order-specific Ex identification can be found on the nameplate.

Bruchsal 9/1/2021

Place Date


Dr. Jörg Hermes
Managing Director Innovation/Mechanics

Page 1 of 1

a) b)

- a) Authorized representative for issuing this declaration on behalf of the manufacturer
b) Authorized representative for compiling the technical documents

EU Declaration of Conformity



Translation of the original text

907400225/EN

SEW-EURODRIVE GmbH & Co KG

Ernst-Blickle-Str. 42, 76646 Bruchsal

declares under sole responsibility that the following products

Gearmotors, consisting of

Gear units of the series
and combinations of these gear units

PS.F..
BS.F..

with attached motor of the series

CMP..
ECM3C..

Category

2G, 2D
3G, 3D

Designation

II2G Ex h IIC T3 Gb
II2G Ex h IIC T3 Gb X
II2D Ex h IIC T150 °C Db
II2D Ex h IIC T150 °C Db X
II3G Ex h IIC T3 Gc
II3G Ex h IIC T3 Gc X
II3D Ex h IIC T150 °C Dc
II3D Ex h IIC T150 °C Dc X

are in conformity with

ATEX Directive

2014/34/EU
(L 96, 29.03.2014, 309-356)

2)

RoHS Directive

2011/65/EU
(L 174, 01.07.2011, 88-110)

Applied harmonized standards:

EN ISO 80079-36:2016
EN ISO 80079-37:2016
EN 60034-1:2010+AC:2010
EN IEC 60079-0:2018
EN IEC 60079-7:2015+A1:2018
EN 60079-15:2010
EN 60079-31:2014
EN IEC 63000:2018

2) SEW-EURODRIVE lodges the documents required by 2014/34/EU, appendix VIII, with the notified body: FSA GmbH, EU ID no.: 0588.

Bruchsal

2/25/2026

Page 1 of 1

Place

Date

Dr. Markus Wöppermann
Managing Director Innovation/Mechanics

a) b)

- a) Authorized representative for issuing this declaration on behalf of the manufacturer
b) Authorized representative for compiling the technical documents

11 Contacting SEW-EURODRIVE

You can find the worldwide contact data and locations on the **SEW-EURODRIVE website** via the following link or the QR code shown below.

<https://www.sew-eurodrive.de/contacts-worldwide>



SEW
EURODRIVE



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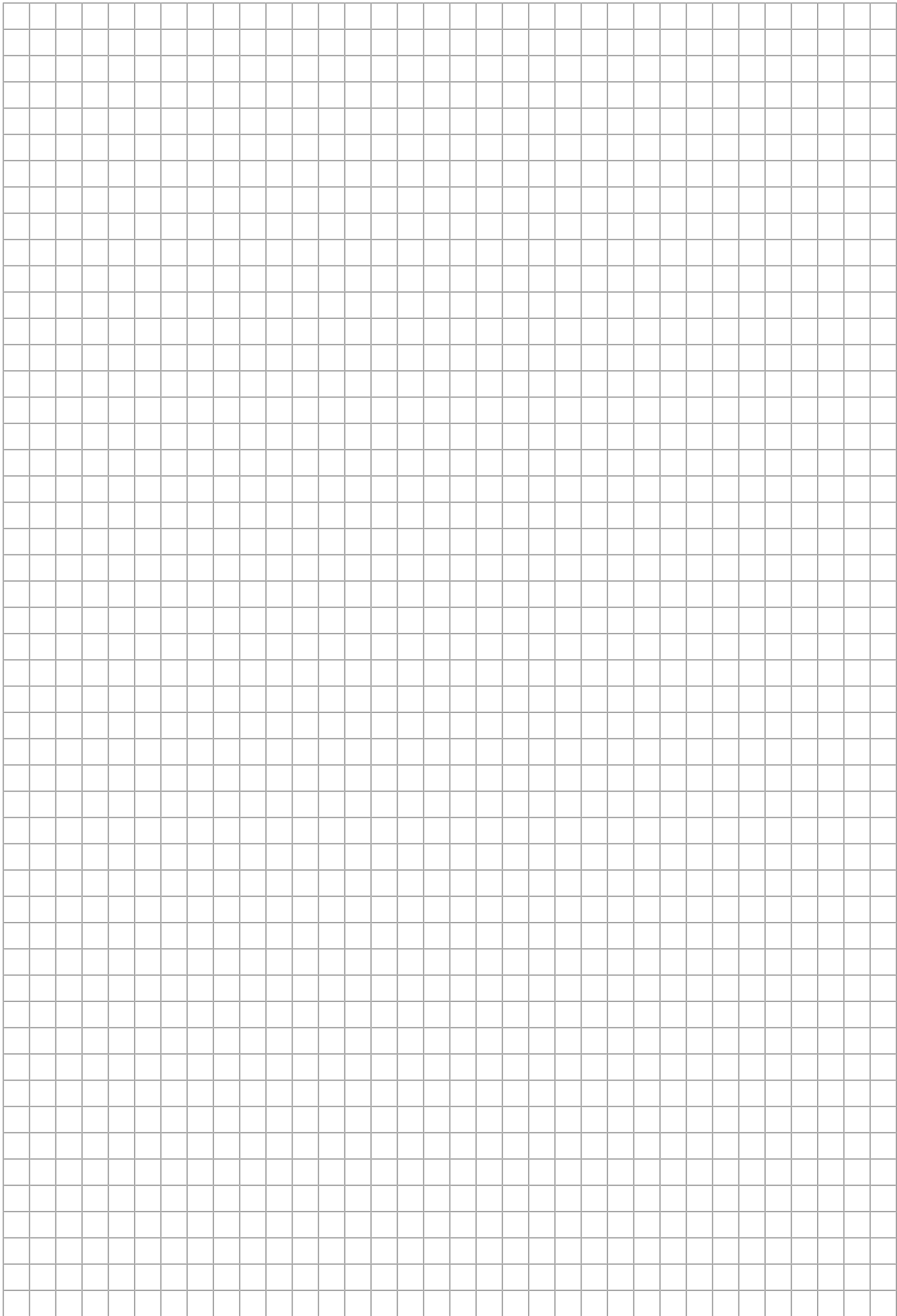
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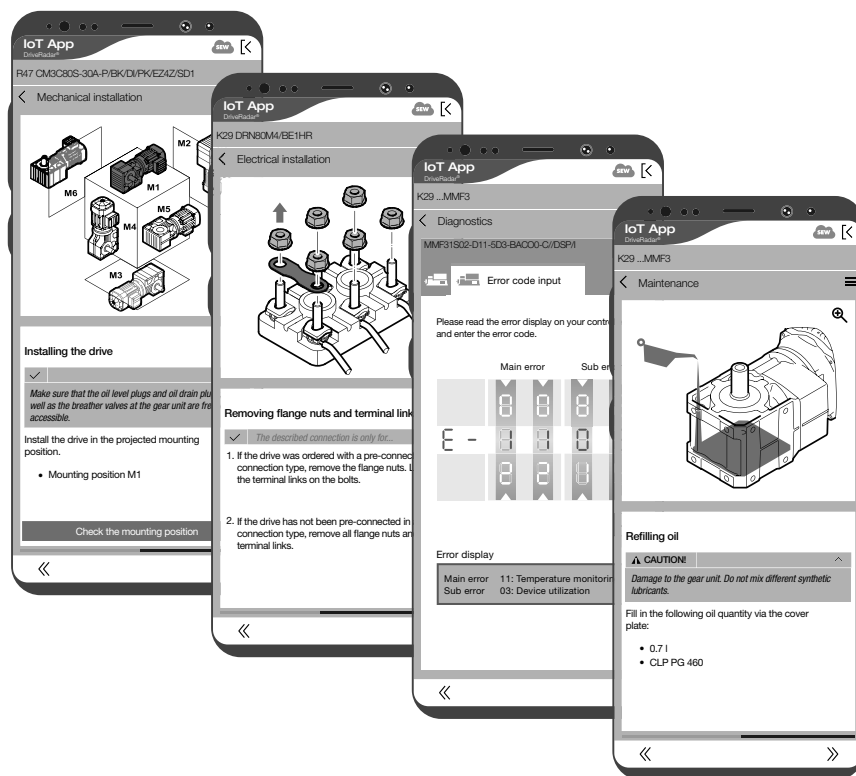
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Driving the world

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EURODRIVE

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