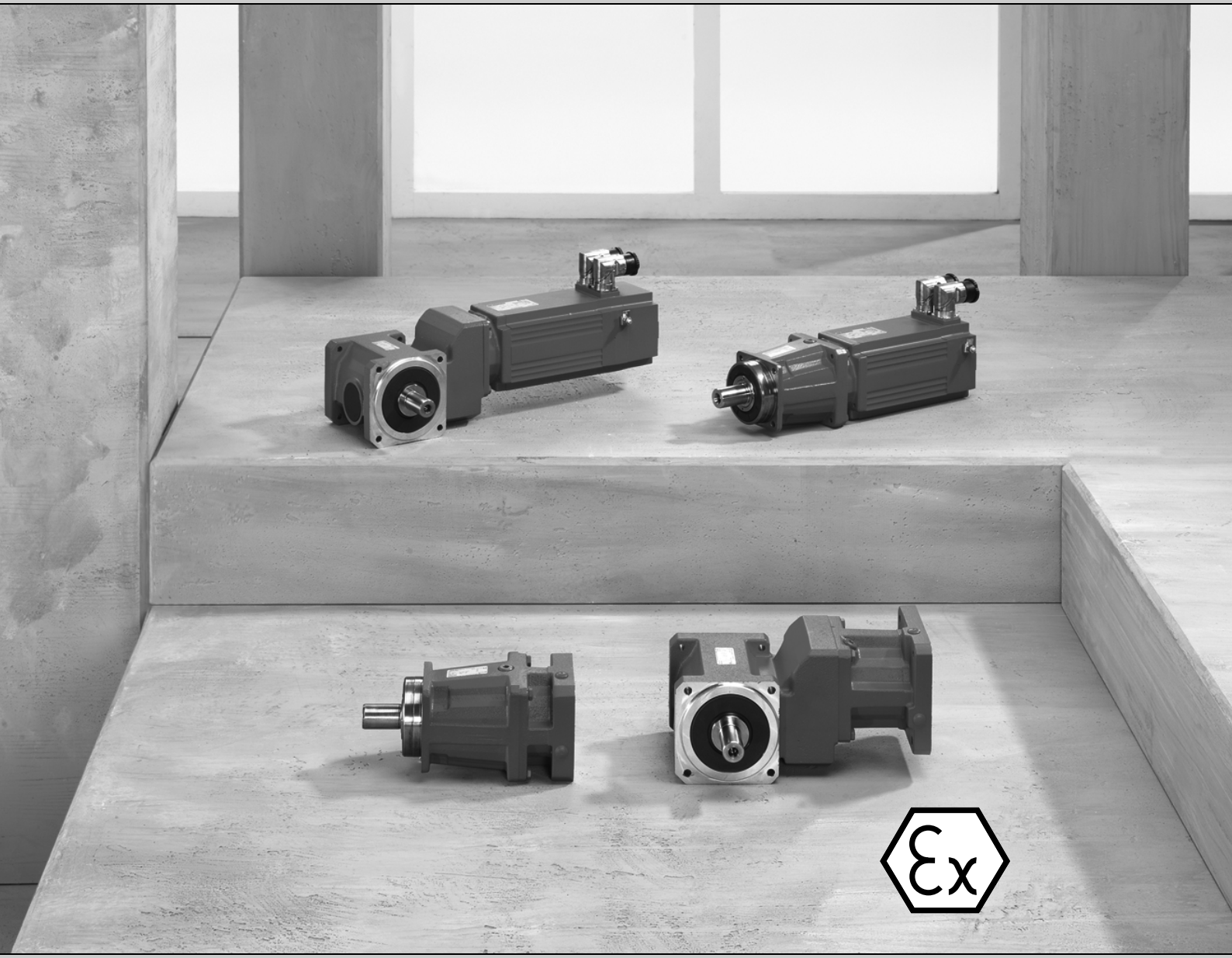
SEW EURODRIVE

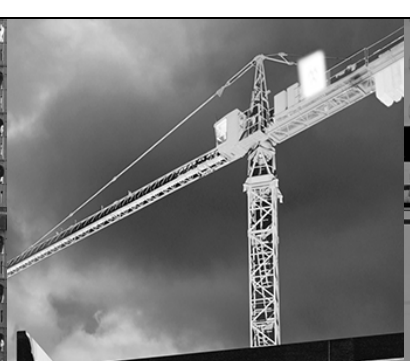
Assembly and Operating Instructions



Explosion-Proof Gear Units
BS.F.. and PS.F.. Series

Edition 09/2012

20051344 / EN




KKFU 144794 3
42G1

Contents

Contents

1 General Information

1.1 How to use this documentation

The documentation is an integral part of the product and contains important information on operation and service. The documentation is written for all employees who assemble, install, startup, and service this product.

The documentation must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, 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 Structure of the safety notes

1.2.1 Meaning of the signal words

The following table shows the grading and meaning of the signal words for safety notes, notes on potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
⚠ **DANGER**	Imminent danger	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
NOTE ON EXPLOSION PROTECTION	Important note on explosion protection	Suspension of explosion protection and resulting hazards
INFORMATION	Useful information or tip: Simplifies the handling of the drive system.	

1.2.2 Structure of the section-related safety notes

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

This is the formal structure of a section-related safety note:

⚠ SIGNAL WORD

Nature and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to avoid the danger.

1.2.3 Structure of the embedded safety notes

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

This is the formal structure of an embedded safety note:

- **⚠ SIGNAL WORD Nature and source of danger.**

  Possible consequence(s) if disregarded.

  – Measure(s) to avoid the danger.

1.3 Rights to claim under limited warranty

Adhering to the operating instructions is a prerequisite for fault-free operation and the fulfillment of any right to claim under warranty. Read the operating instructions before you start working with the unit.

1.4 Exclusion of liability

You must comply with the information contained in the documentation to ensure safe operation of the BS.F.. helical-bevel gear units and PS.F.. planetary gear units and to achieve the specified product characteristics and performance requirements. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of the documentation. In such cases, any liability for defects is excluded.

1.5 Copyright

1.6 Product name and trademarks

The brands and product names contained within this publication are trademarks or registered trademarks of the titleholders.

2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and observed. Make sure that persons responsible for the plant and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

2.1 Preliminary information

The following safety notes are primarily concerned with the use of explosion-proof gear units. If using gearmotors, also refer to the safety notes for motors in the corresponding documentation.

Also observe the supplementary safety notes in the individual sections of this documentation.

2.2 General information

⚠ WARNING

During operation, the motors and gearmotors can have live, bare and movable or rotating parts as well as hot surfaces, depending on their enclosure.

Explosive gas mixtures or concentrations of dust can lead to severe or fatal injuries in conjunction with hot, live and moving parts of electrical machinery.

Severe or fatal injuries.

- All work related to transportation, storage, setup/mounting, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observance of:
  - The relevant detailed operating instructions
  - The warning and safety signs on the motor/gearmotor
  - All other project planning documents, operating instructions and wiring diagrams related to the drive
  - The specific regulations and requirements for the system
  - The national/regional regulations governing safety and the prevention of accidents
- Never install damaged products
- Immediately report any damage to the shipping company

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

Refer to the documentation for additional information.

2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in this context are persons who are familiar with the setup, mechanical installation, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

Any electronic work may only be performed by adequately qualified electricians. Qualified electricians in this context are persons who are familiar with the electronic installation, startup, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Training in electrical engineering, e.g. as an electrician or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

All work in further areas of transportation, storage, operation and waste disposal must only be carried out by persons who are trained appropriately.

All qualified personnel must wear appropriate protective clothing.

2.4 Designated use

The gear units are intended for industrial systems and may only be used in accordance with the information provided in SEW-EURODRIVE's technical documentation and the information given on the nameplate. They fulfill the applicable standards and regulations.

According to the 2006/42/EC Machinery Directive, the gear units are components for the installation in machines and plants. In the scope of the Directive, you must not take the machinery into operation in the proper fashion until you have established that the end product complies with Machinery Directive 2006/42/EC.

NOTE ON EXPLOSION PROTECTION

A drive motor connected to the gear unit may only be operated under the conditions described in the "Startup" section (page 42).

Operate any gear unit connected to the motor on the frequency inverter only if the data on the gear unit nameplate is met!

If a gear unit is operated in combination with a variable speed gear unit, the operating instructions of the variable speed gear unit must be handled separately.

A motor mounted to a gear unit by means of an adapter or belt may only be operated if the data on the gear unit nameplate is met!

There may be no aggressive substances in the vicinity that could damage the paint and seals.

2.5 Other applicable documentation

The following publications and documents have to be observed as well:

- "Explosion-Proof DR.71-225, 315 AC Motors" operating instructions for gearmotors
- "Explosion-Proof CMP40/50/63 Synchronous Servomotors" operating instructions for gearmotors
- Operating instructions of any attached options
- "Explosion-Proof AC Motors" catalog
- "Explosion-Proof Gearmotors" catalog
- "Synchronous Servomotors" catalog
- "Servo Gear Units" catalog

2.6 Transport

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. It may be necessary to preclude startup.

Tighten installed eyebolts. They are designed to only carry the weight of the motor/gearmotor; do not attach any additional loads.

The built-in lifting eyebolts meet DIN 580. Always observe the loads and regulations listed in this standard. If the gearmotor is equipped with 2 suspension eye lugs or lifting eyebolts, then both of the suspension eye lugs should be used for transportation. In this case, the tension force vector of the slings must not exceed a 45° angle according to DIN 580.

Use suitable, sufficiently rated handling equipment if necessary. Remove any transportation fixtures prior to startup.

2.7 Installation/assembly

Observe the notes in chapter "Mechanical Installation" (page 20).

2.8 Startup/operation

Check the oil level before startup as described in chapter "Inspection/Maintenance".

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

Secure keys for test mode without output elements. Do not deactivate monitoring and protection equipment even in test mode.

Switch off the gearmotor if in doubt whenever changes occur in relation to normal operation (e.g. increased temperature, noise, vibration). Determine the cause and contact SEW-EURODRIVE, if required.

2.9 Inspection/maintenance

Observe the notes in chapter "Inspection/Maintenance" (page 44).

3 Checklist

3.1 Before startup

This checklist includes all activities that will have to be performed prior to startup of a gear unit according to Directive 94/9/EC for operation in potentially explosive atmospheres.

Check prior to startup in potentially explosive atmospheres	Checked	Information in section ...
Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. Startup may have to be precluded. Remove transportation safety fixtures prior to startup.		2.6
Does the following information on the gear unit nameplate correspond with the permitted conditions for potentially explosive atmospheres on site: • Equipment group • ATEX category • ATEX zone • Temperature class • Maximum surface temperature		4.3, 5.3 + 5.7
Have arrangements been made to prevent explosive atmospheres, oils, acids, gases, vapors or radiation during installation of the gear unit?		5.2
Is the ambient temperature maintained according to the lubricant table?		9.1
Have arrangements been made for sufficient ventilation and that there will be no external heat generation (e.g. via clutches)? The cooling air may not exceed a temperature of 40 °C.		5.4 + 5.3
Does the mounting position on the gear unit nameplate correspond to the indicated mounting position? Important: The mounting position may only be changed after consultation with SEW-EURODRIVE. ATEX approval will become void without prior consultation.		5.4 + 8
Are all oil check and drain plugs as well as breather plugs and valves freely accessible?		5.4
Do all input and output elements to be installed have ATEX certification?		5.7
Have you checked that the data on the nameplate of the gear unit are not exceeded for standalone gear units with adapter or input shaft assembly?		6.2 + 7.3 + 4.3
For mains-operated motors: • Check that the data specified on the nameplate of the gear unit and the motor corresponds to the ambient conditions at the location where the drive is to be installed.		4.3 + 6.3
For inverter-operated gearmotors: Check that the gearmotor is approved for operation with an inverter • The parameter settings made for the inverter must prevent the gear unit from being overloaded (→ gear unit nameplate).		4.3 + 6

3.2 During startup

This checklist includes all activities that will have to be executed during startup of a gear unit according to Directive 94/9/EC for operation in potentially explosive atmospheres.

Check during startup in potentially explosive atmospheres	Checked	Information in section ...
Measure the surface temperature after three hours of operation. Do not exceed a temperature difference of 55 K compared to the ambient temperature. If the value is > 55 K, stop the drive immediately and contact SEW-EURODRIVE!		6.2
Measure the oil temperature. Add 10 K to the measured value. Determine lubricant change interval using this value.		7.3

4 Gear Unit Design

INFORMATION

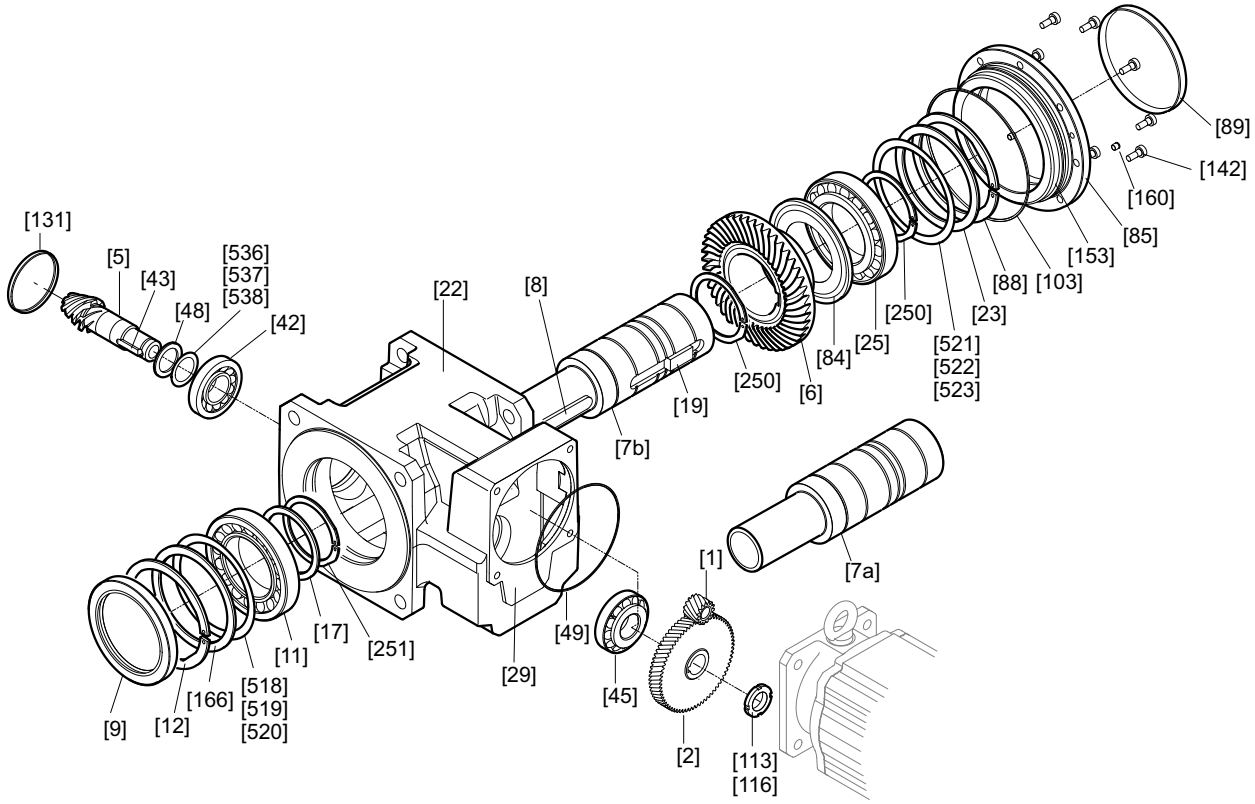
For information about the scope of delivery and project planning, refer to the "Explosion-Proof CMP40/50/63 Synchronous Servomotors" catalog and the operating instructions for the motor used to drive the gear unit.

INFORMATION

The following illustrations are intended to explain the general structure. They help you to assign components to the spare parts list. Discrepancies may occur depending on the gear unit size and variant.

4.1 Basic structure – Gear unit

4.1.1 BS.F.. helical-bevel gear unit



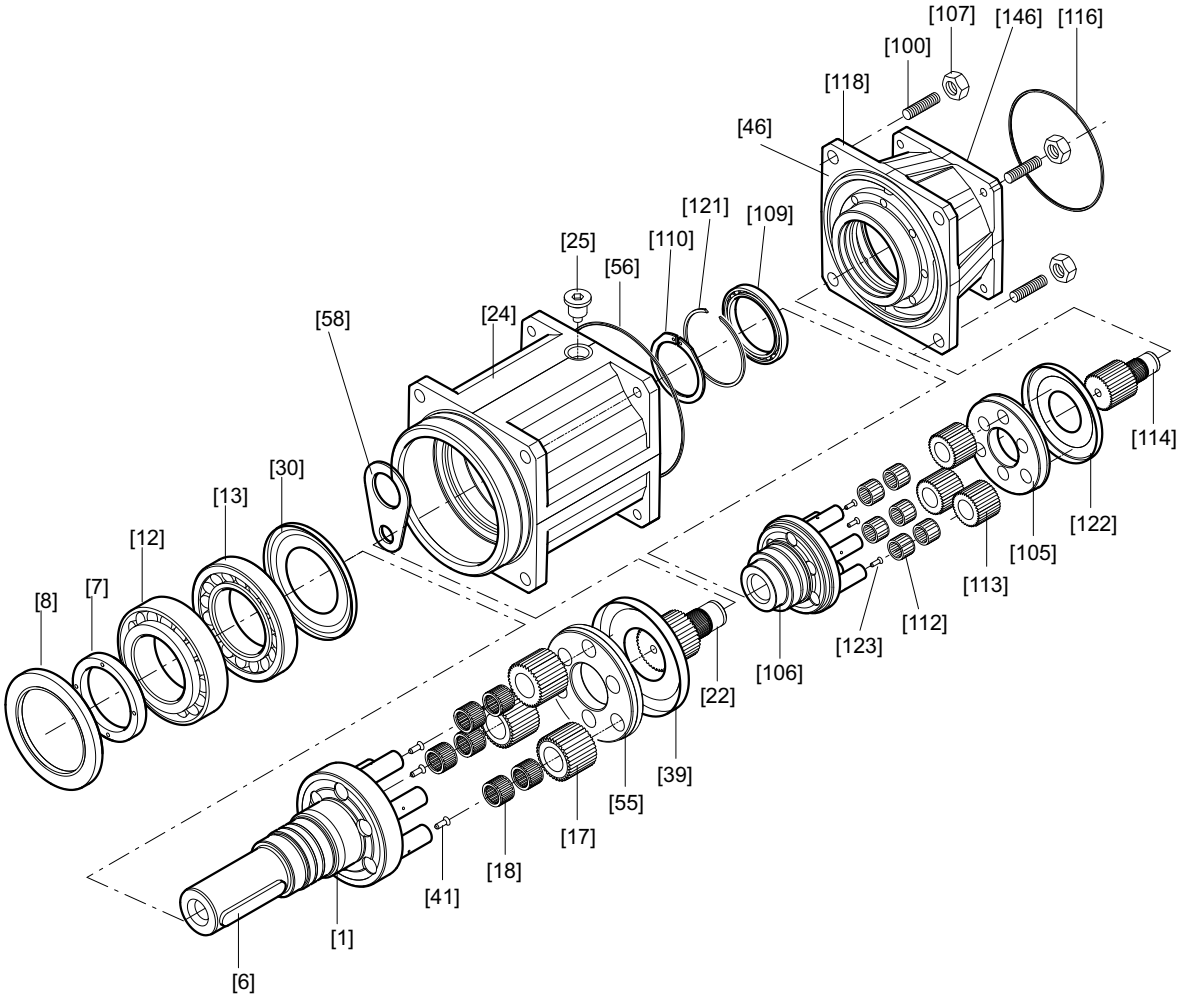
3209632139

[1]	Pinion	[22]	Gear unit housing	[88]	Retaining ring	[251]	Retaining ring
[2]	Gear	[23]	Supporting ring	[89]	Closing cap	[518]	Shim
[5]	Bevel pinion shaft	[25]	Taper roller bearing	[103]	O-ring	[519]	Shim
[6]	Bevel gear	[29]	Adhesive and sealing compound	[113]	Slotted nut	[520]	Shim
[7a]	Output shaft (BS.F..)	[42]	Taper roller bearing	[116]	Thread locker	[521]	Shim
[7b]	Output shaft (BSKF..)	[43]	Key	[131]	Closing cap	[522]	Shim
[8]	Key (BSKF..)	[45]	Taper roller bearing	[142]	Cap screw	[523]	Shim
[9]	Oil seal	[48]	Supporting ring[1)]	[153]	Adhesive and sealing compound	[536]	Shim
[11]	Taper roller bearing	[49]	O-ring	[160]	Closing plug	[537]	Shim
[17]	Supporting ring	[84]	Shield ring[2)]	[166]	Supporting ring	[538]	Shim
[19]	Key	[85]	Centering flange	[250]	Retaining ring		

1) Only with bevel gear stage i = 7.5

2) Only for mounting position M5

4.1.2 PS.F.. planetary gear units 2-stage



3209808011

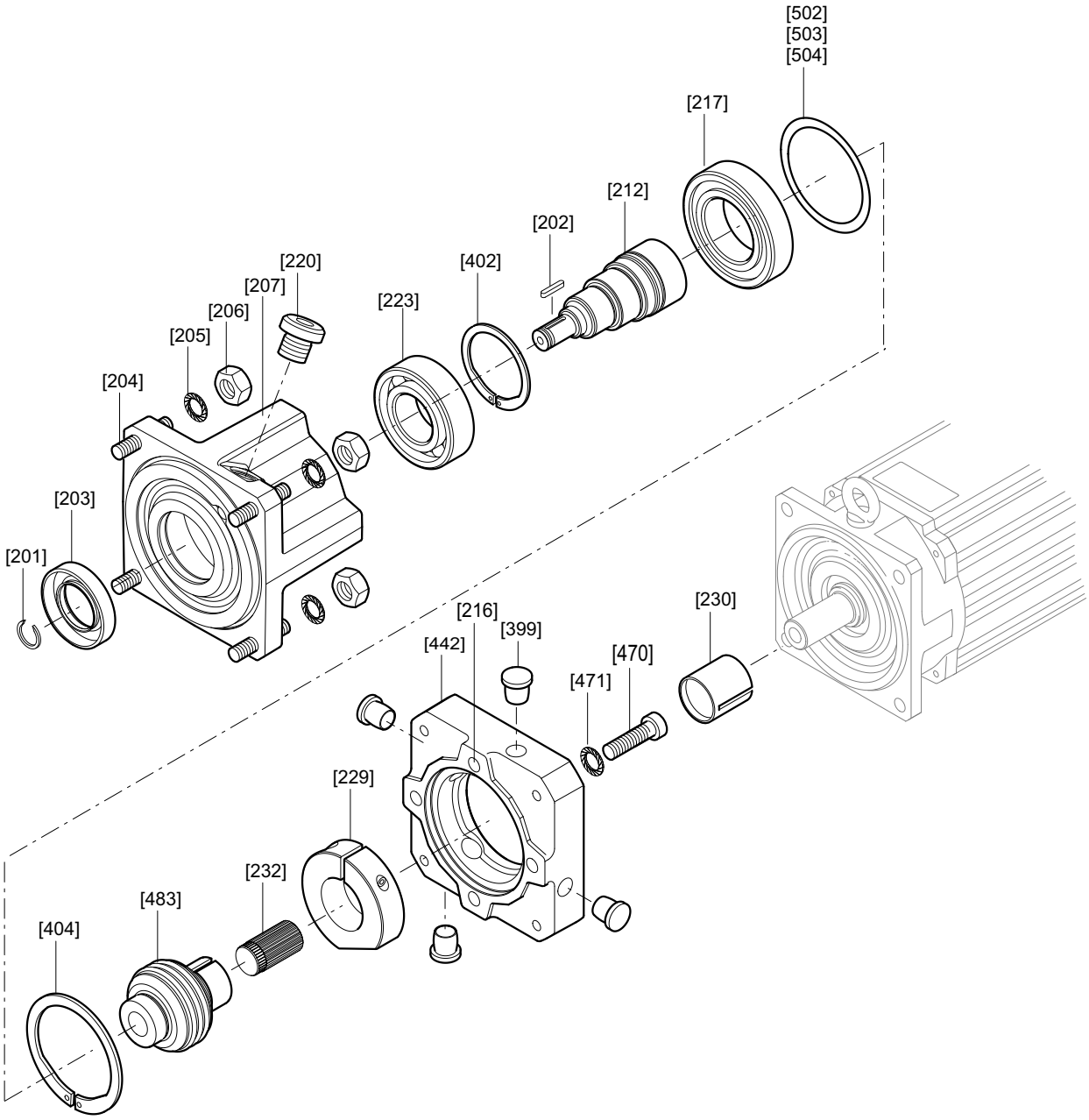
[1]	Planet carrier for output, complete	[30]	Shield ring[1)]	[109]	Grooved ball bearing
[6]	Key[2)]	[39]	Safety disk	[110]	Retaining ring
[7]	Shaft nut	[41]	Countersunk pin	[112]	Needle roller and cage assembly
[8]	Oil seal	[46]	Adhesive and sealing compound	[113]	Planet gear
[12]	Taper roller bearing	[55]	Thrust plate	[114]	Sun gear
[13]	Taper roller bearing	[56]	O-ring	[116]	O-ring
[17]	Planet gear	[58]	Eyebolt	[118]	Housing preliminary stage
[18]	Needle roller and cage assembly	[100]	Stud	[121]	Snap ring
[22]	Sun gear	[105]	Thrust plate	[122]	Safety disk
[24]	Housing	[106]	Planet carrier, complete	[123]	Countersunk pin
[25]	Screw plug	[107]	Hex nut	[146]	Adhesive and sealing compound

1) Only for mounting position M2

2) Only for PSKF122 to PSKF622

4.2 Basic structure – Adapter

4.2.1 EBH.. adapter for BS.F.. helical-bevel gear units

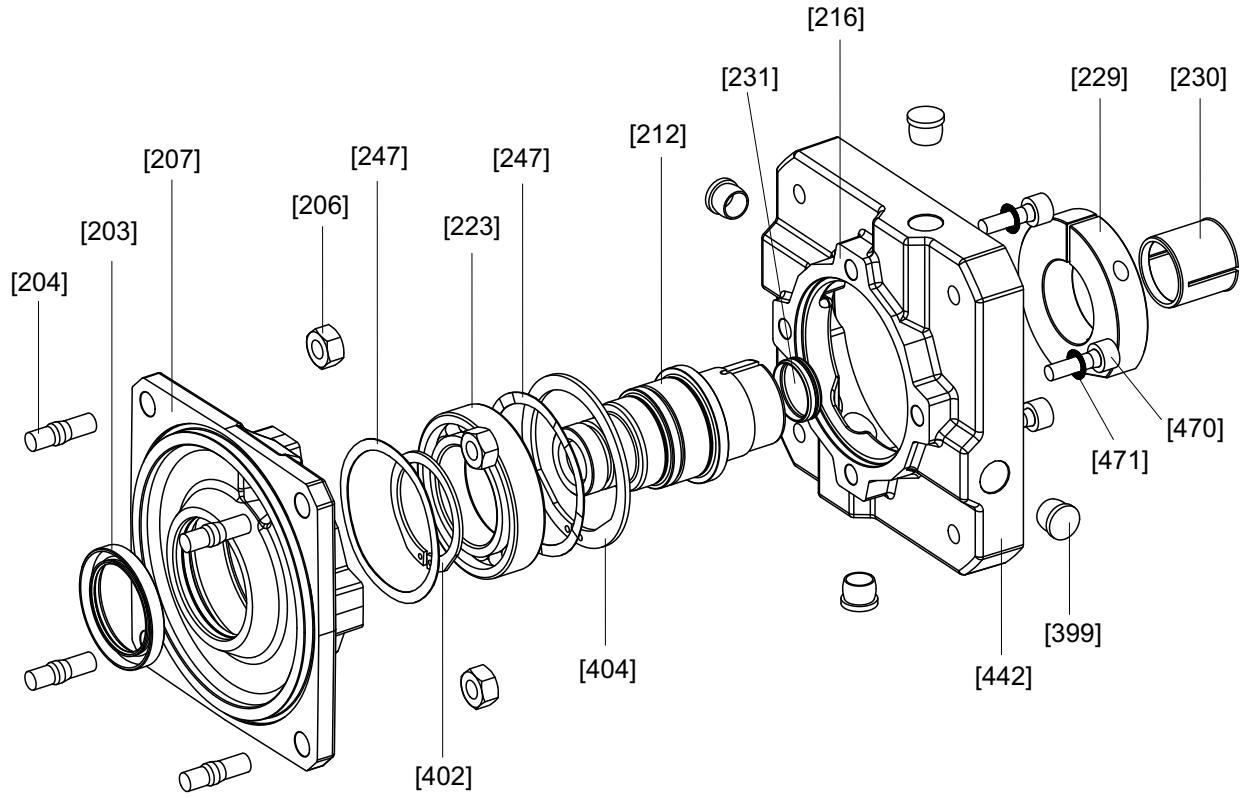


3209813771

[201]	Retaining ring[1] / snap ring	[217]	Grooved ball bearing	[404]	Retaining ring
[202]	Key	[220]	Screw plug[2] / breather valve[3]	[442]	Adapter flange
[203]	Oil seal with optimized spring force	[223]	Grooved ball bearing	[470]	Machine screw
[204]	Stud	[229]	Clamping ring	[471]	Tooth lock washer
[205]	Tooth lock washer	[230]	Coupling sleeve	[483]	Clutch
[207]	Flange	[232]	Press-fit bolt	[502]	Shim
[212]	Adapter shaft	[399]	Closing plug	[503]	Shim
[216]	Adhesive and sealing compound	[402]	Retaining ring	[504]	Shim

1) Depending on the adapter type
2) only for mounting positions M1 ... M3, M5, M6
3) only for mounting position M4

4.2.2 EPH.. adapter for PS.F.. planetary gear units



3209945995

[203]	Oil seal	[223]	Grooved ball bearing	[402]	Retaining ring
[204]	Stud	[229]	Clamping ring	[404]	Retaining ring
[206]	Hex nut	[230]	Coupling sleeve	[442]	Adapter flange
[207]	Flange	[231]	Closing cap	[470]	Machine screw
[212]	Adapter shaft	[247]	Shim washer	[471]	Tooth lock washer
[216]	Adhesive and sealing compound	[399]	Closing plug		

4.3 Nameplate / type designation

INFORMATION

The nameplate of the servo gearmot is fixed to the servomotor.

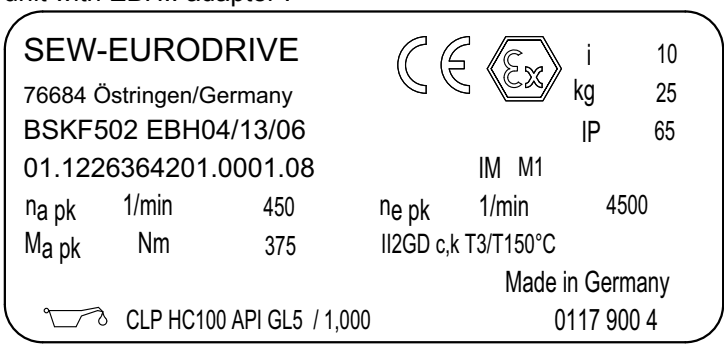
NOTE ON EXPLOSION PROTECTION

For a detailed overview of unit designations and additional information, refer to the following publications:

- "Explosion-Proof Gear Units" catalog
- "Explosion-Proof CMP40/50/63 Synchronous Servomotors" catalog

4.3.1 Example: Nameplate of BS.F.. helical-bevel gear unit with EBH.. adapter

The following figure shows an example of a nameplate for a BS.F.. helical-bevel gear unit with EBH.. adapter :

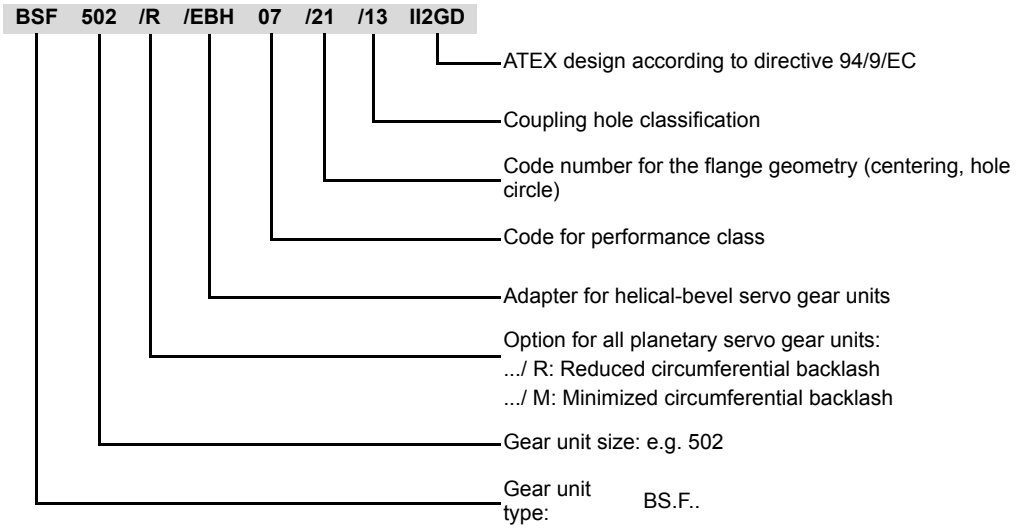


3209972107

i	Gear unit reduction ratio	n_{epk}	[rpm]	Maximum permitted input speed
IM	Mounting position	n_{apk}	[rpm]	Maximum permitted output speed
IP	Degree of protection	M_{apk}	[Nm]	Maximum permitted output torque

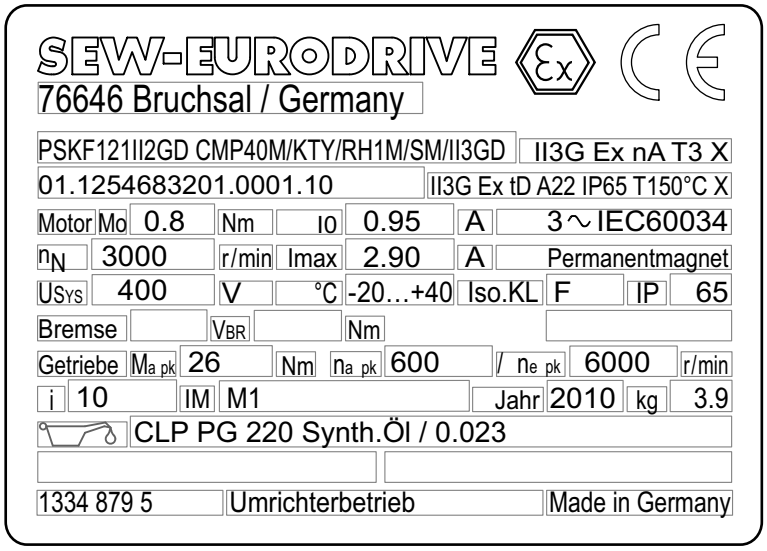
4.3.2 Example: Type designation of BS.F.. helical-bevel gear unit in category II2GD

A helical-bevel gear unit with adapter has, for example, the following unit designation:



4.3.3 Example: Nameplate of directly mounted PS.F.. planetary gear unit

The following figure shows an example of a nameplate for a directly mounted PS.F.. planetary gear unit:

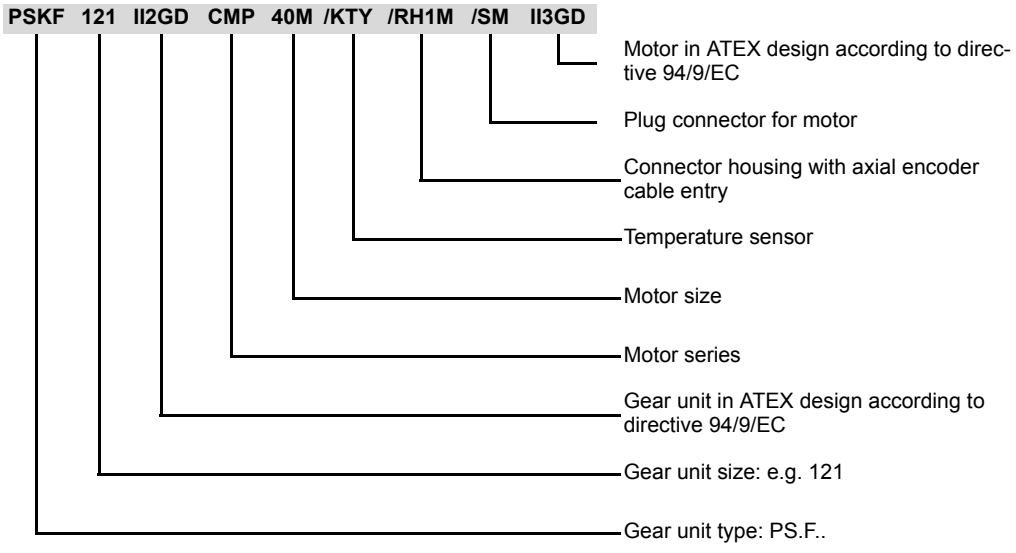


3312638859

i		Gear unit reduction ratio	n_N	[rpm]	Rated speed
IM		Mounting position	M_o	[Nm]	Rated torque
IP		Degree of protection	I_o	[A]	Rated current
n_{epk}	[rpm]	Maximum permitted input speed	I_{max}	[A]	Maximum permitted current
n_{apk}	[rpm]	Maximum permitted output speed	U_{sys}	[V]	Maximum permitted voltage
M_{apk}	[Nm]	Maximum permitted output torque			

4.3.4 Example: Type designation of PS.F.. planetary gear unit in category II2GD

A planetary gear unit with adapter has, for example, the following unit designation:



4.3.5 Information on the special indication

NOTE ON EXPLOSION PROTECTION

In some cases SEW gear units/gearmotors must only be operated in compliance with special measures. For these cases, there is a special indication on the nameplate **"II..X"**.

These special measures may be necessary due to varying reasons (e.g. intermittent operation only, reduced output torque, etc.). The customer has been informed about the required special measures on the initial distribution of the gear unit/gearmotor. The customer is obliged to ensure the compliance with these special measures.

5 Mechanical Installation

5.1 Required tools and resources

- Set of wrenches
- Torque wrench for:
  - EBH / EPH motor adapter
- Set of screwdrivers with long hexagon shaft
- Mounting device
- Shims and distance rings if necessary
- Fixing devices for input and output elements
- Set of Allen keys
- Lubricant (e.g. NOCO® Fluid)
- Bolt locking compound (for input shaft assembly with centering shoulder), e.g. Loctite® 243
- Standard parts are not included in the delivery

5.1.1 Mounting tolerances

Shaft end	Flanges
Diameter tolerance in accordance with DIN 748 • ISO k6 for solid shafts with Ø ≤ 50 mm • ISO m6 for solid shafts with Ø > 50 mm • ISO H7 for hollow shafts • Center bore in accordance with DIN 332, shape DR	Centering shoulder tolerance to DIN 42948 • ISO j6 for b1 ≤ 230 mm • ISO h6 with b1 > 230 mm

5.2 Installation requirements

⚠ CAUTION

Risk of injury due to protruding gear unit parts.

Minor injuries.

- Keep a sufficient safety distance to the gear unit/gearmotor.

NOTICE

Damage to the gear unit/gearmotor due to improper installation.

Possible damage to property

- Do closely observe the notes in this chapter.

NOTE ON EXPLOSION PROTECTION

Check the transportation packaging for oil residues. Oil residues could indicate an oil leak. In this case, the lubrication of the gear unit is not guaranteed. This could cause excessive temperature on the surface.

Please contact SEW-EURODRIVE if there are oil residues on the gear unit.

Ensure that the following requirements have been met:

- The entries on the nameplate of the gearmotor match the voltage supply system.
- The drive has not been damaged during transportation or storage.
- **For standard gear units:**
  - Ambient temperature according to the technical documentation, nameplate and lubricant table in section "Technical Data" / "Lubricants" (page 55).
  - No harmful oils, acids, gases, vapors, radiation etc. in the vicinity

  For special designs:
  - The drive is designed in accordance with the ambient conditions. Observe the information on the nameplate.
- You must clean the output shafts and flange surfaces thoroughly to ensure they are free of anti-corrosion agents, contamination or similar. Use a commercially available solvent. Do not expose the sealing lips of the oil seals to the solvent – damage to the material.
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.
- Do not assemble the drive without having ensured that there will be sufficient ventilation after installation to prevent heat build-up.

5.3 Installation of gear units in a potentially explosive atmosphere

NOTE ON EXPLOSION PROTECTION

Explosion-proof BS.F/PS.F series gear units and gearmotors comply with the design requirements for unit group II, categories 2G (potentially explosive gas atmosphere) and 2D (potentially explosive dust atmosphere). These units are intended for use in zones 1 and 21.

5.3.1 Ambient temperature

Gear units in category II2D may be operated at ambient temperatures of –20 °C to +40 °C only.

NOTE ON EXPLOSION PROTECTION

This means that other ambient temperatures must be specified in the order. These ambient temperatures will be separately indicated on the nameplate.

5.3.2 Temperature class

The gear units/gearmotors of category II2G (explosive gas atmosphere) are approved for temperature class T3. The temperature class of the gear unit is indicated on the nameplate.

5.3.3 Surface temperature

The maximum surface temperature of category II2D units is 150 °C. Lower surface temperature limits are only permitted after consultation with SEW-EURODRIVE and must be indicated on the nameplate. The system operator must guarantee that a possible accumulation of dust will not exceed a maximum thickness of 5 mm, in accordance with EN 50281-1-2.

5.3.4 Degree of protection

The degree of protection for all gear unit versions is IP65 according to EN 60529.

5.3.5 Ambient conditions

Provide for sufficient ventilation for the gear units and prevent external heat generation (e.g. via couplings). In addition, there must be sufficient heat dissipation from the gear unit to the foundation.

5.3.6 Output power and torque

Observe the output torque and the permitted overhung loads.

5.3.7 Special designs

Special designs (e.g. modified output shaft) may only be operated in potentially explosive atmospheres after prior approval by SEW-EURODRIVE.

5.4 Installing the gear unit

⚠ NOTICE

Improper assembly may result in damages to the gear unit/gearmotor.

Possible damage to property

- Do closely observe the notes in this chapter.

NOTE ON EXPLOSION PROTECTION

The mounting position may only be changed after consultation with SEW-EURODRIVE. ATEX approval will become void without prior consultation.

- Work on the gear unit only when the machine is not in use. Secure the drive unit against unintentional power-up.
- Protect the gear unit from direct cold air currents. Condensation may cause water to accumulate in the oil.

The gear unit or gearmotor is only allowed to be installed in the specified mounting position. Refer to the information on the nameplate.

The support structure must have the following characteristics:

- Level
- Vibration damping
- Torsionally rigid

The maximum permitted flatness error for foot and flange mounting (guide values with reference to DIN ISO 1101):

- Gear unit size PS.F 120 – 520: Max. 0.2 mm
- Gear unit size PS.F 620 – 920: Max. 0.4 mm
- Gear unit size BS.F 202 – 402: Max. 0.4 mm
- Gear unit size BS.F 502 – 802: Max. 0.5 mm

Do not tighten the housing legs and mounting flanges against one another and ensure that you comply with the permitted overhung and axial loads! Observe chapter "Project Planning" in the Gear unit/gearmotor catalog for calculating the permitted overhung and axial loads.

INFORMATION

When installing the gear unit, make sure that the oil drain plugs as well as the breather plugs are easily accessible.

NOTE ON EXPLOSION PROTECTION

Processes that cause strong electrical charge due to fast moving particles on the coating must be excluded.

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 Ω. Electrochemical corrosion can occur between various metals, for example, cast iron and high-grade steel. Also fit the bolts with plastic washers.

NOTE ON EXPLOSION PROTECTION

Electrical sparks could be generated if the housing is not grounded additionally.

Possible generation of electrical sparks.

- Ground the housing additionally and use grounding screws on the motor.

5.4.1 Tightening torques for retaining screws

Mounting of output elements

Adhere to the following information when mounting the output elements to the gear unit:

Machine screws with hexagon socket to DIN EN ISO 4762	Strength class	Tightening torque [Nm]
M4	12.9	5.1
M5	12.9	10
M6	12.9	18
M8	12.9	43
M10	12.9	84
M12	12.9	145

Mounting of gear unit BS.F202 – BS.F802 with B5 flange and BS.F202B – BS.F402B with foot-mounting

Mount the gearmotors with the following tightening torques:

Screw/nut	Strength class	Tightening torque [Nm]
M6	8.8	11
M8	8.8	25
M10	8.8	48
M12	8.8	86
M16	8.8	210
M20	8.8	410

Mounting of gear unit PS.F with B5 flange and BS.F502B – BS.F802B with foot-mounting

Mount the gearmotors with the following increased tightening torques:

Screw/nut	Strength class	Tightening torque [Nm]
M4	10.9	4,6
M5	10.9	8.6
M6	10.9	14
M8	10.9	35
M10	10.9	69
M12	10.9	120
M16	10.9	300
M20	10.9	600

5.4.2 Bolt sizes

Foot-mounted gear unit

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

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

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

Gear unit with B14 flange

The following table shows the thread sizes of the gear units with B14 flange depending on the gear unit type and size:

Bolt	Gear unit type PS.CZ
M5	221, 222
M6	321, 322
M8	521, 522
M10	621, 622

5.4.3 Installation in damp locations or in the open

Drives are supplied in corrosion-resistant versions with an according surface protection coating for use in damp areas or outdoors. Repair any damage to the paint work (e.g. on the breather valve or the eyebolts).

When mounting motors onto adapters, seal the flange areas with a suitable sealing compound, e.g. Loctite® 574.

Units installed outdoors must be protected from the sun. Suitable protective devices are required, such as covers or roofs. Avoid any heat accumulation. The operator must ensure that foreign objects do not impair the function of the gear unit (e.g. falling objects or coverings).

5.4.4 Gear unit ventilation

SEW-EURODRIVE supplies BS.F gear units with activated breather valve.

Exceptions:

SEW supplies the following gear units with a screw plug on the vent hole provided:

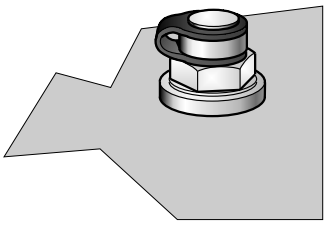
- Pivoted mounting positions, if possible
- Gear units for mounting on a slant

The breather valve is located in the motor terminal box. Before startup, you must replace the highest screw plug with the provided breather valve.

Activating the breather valve

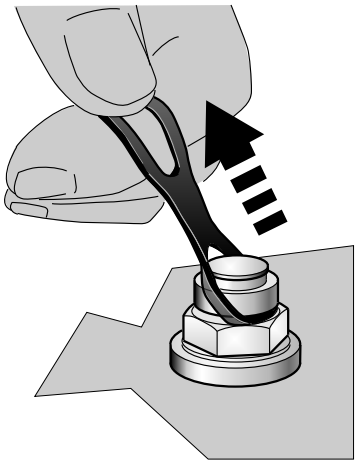
Check whether the breather valve is activated. If the breather valve has not been activated, you must remove the transport fixture from the breather valve before starting up the gear unit!

1. Breather valve with transport fixture



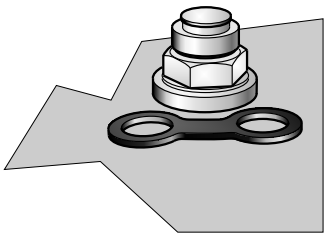
211319051

2. Remove transport fixture



211316875

3. Activated breather valve



211314699

5.4.5 Painting the gear unit

NOTICE

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

Potential damage to property.

- Thoroughly cover the breather valves and the sealing lip of the oil seals with strips prior to painting.
- Remove the strips after painting.

If you want to paint the gear unit, check that the new paint is compatible with the existing protective varnish. If they are incompatible, this can damage the paint, which means that the protective properties of the paint may no longer be ensured.

5.5 Installation in a machine: BS.F.. helical-bevel gear unit

For a definition of mounting positions, refer to chapter "Mounting positions" (page 48).

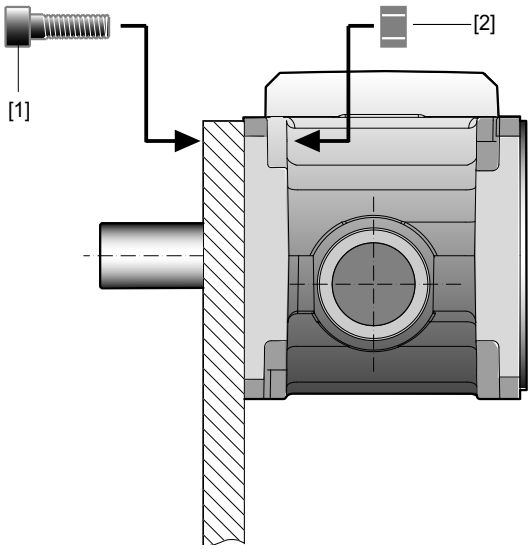
INFORMATION

For the BS.F..202B – 402B gear unit variant, ensure that there is an engagement depth of 1.6-times the screw diameter in the gear unit's output flange.

For the BS.F..502B – 802B gear unit variant, ensure that there is an engagement depth of 1.25-times the screw diameter in the gear unit's output flange.

5.5.1 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:

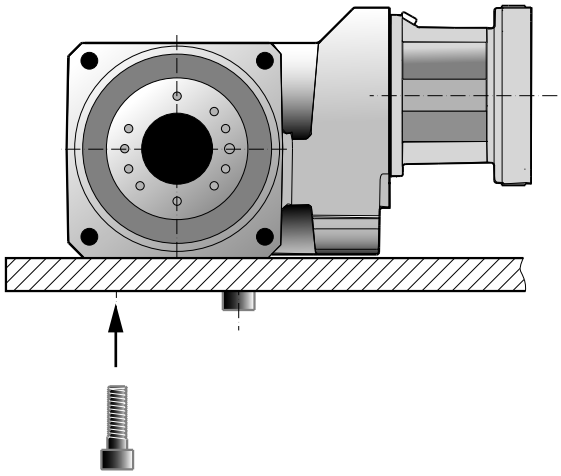


1839202059

[1] Bolts of quality 8.8
[2] Nut

5.5.2 BSBF..B: Mounting at the foot end

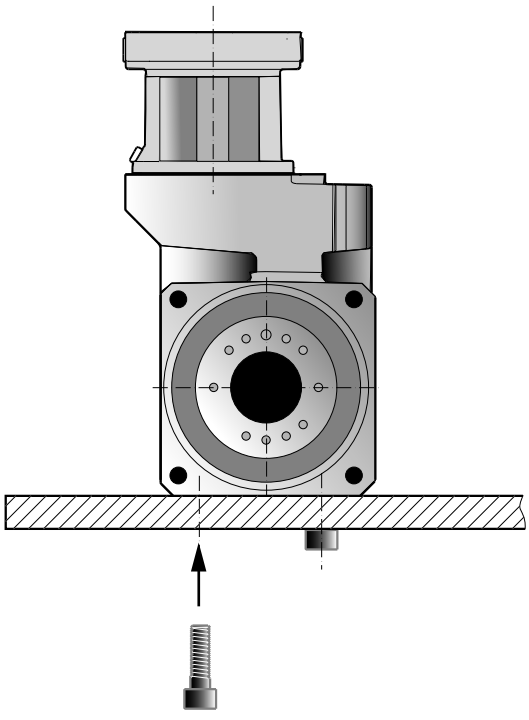
The following figure shows foot-mounting of BSBF..B helical-bevel gear units:



1839204747

5.5.3 BSBF..B: Mounting at the front end

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

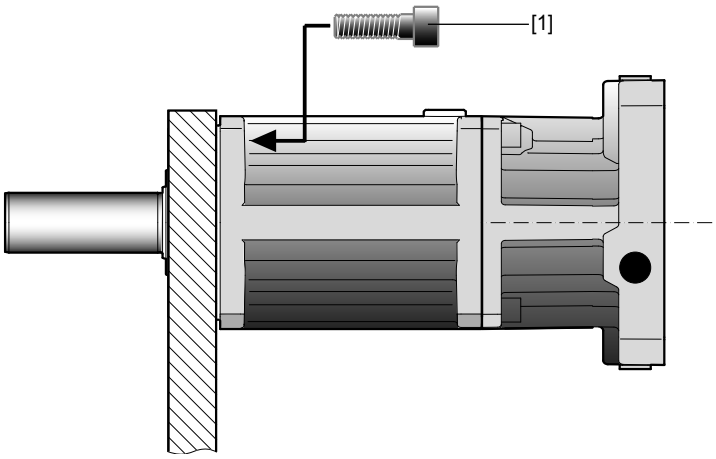


1839207435

5.6 Installation in a machine: PS.F.. planetary gear units

5.6.1 PS.F..: Bolted from the gear unit end via the B5 flange:

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



1881669387

[1] Bolts of quality 10.9

5.7 Mounting output elements to solid shafts of BS.F.. and PS.F.. gear units

NOTICE

Bearing, hosing or shaft may be damaged due to improper assembly.

Possible damage to property

- Only assemble the input and output components with a mounting device. Use the center bore and the thread on the shaft end for positioning.
- Never force belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer.
- In the case of belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions.
- Power transmission elements should be balanced after fitting and must not give rise to any excessive radial or axial forces (see the "Synchronous Servo Gearmotors" catalog for permitted values).

NOTE ON EXPLOSION PROTECTION

Only use input and output elements with ATEX certification, if these are subject to Directive 94/9/EC.

- Only use a mounting device for installing input and output elements. Use the center bore and the thread on the shaft end for positioning.

NOTE ON EXPLOSION PROTECTION

Use belts with sufficient electrical bleeder resistance < 10^9 Ω only.

- These have to meet the requirements set forth in IEC 60695-11-10, category FV-0.
- Power transmission elements should be balanced after fitting and must not give rise to any impermissible radial or axial forces (see the "Gearmotors" or "Explosion-Proof Drives" catalog for permitted values).

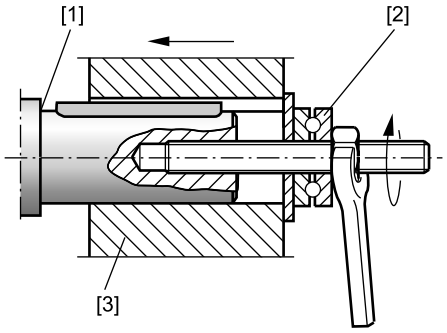
INFORMATION

Mounting is easier if you first apply lubricant to the output element or heat it up briefly (to 80 - 100 °C).

5.7.1 Assembly with key

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

The following figure shows the assembly process with a mounting device:



1839217419

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

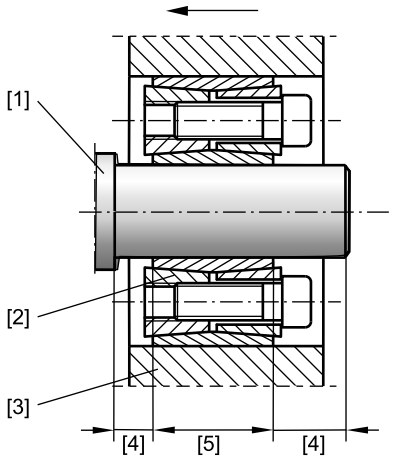
INFORMATION

The shaft shoulder [1] may be used as a defined stop point when mounting input or output elements to BSF.. / BSKF.. / PSF.. / PSKF.. gear units.

The output shafts are coated with an antirust agent on delivery. Remove the antirust agent before assembly, e.g. using a cleaning solvent.

5.7.2 Assembly without key

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



1839232907

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

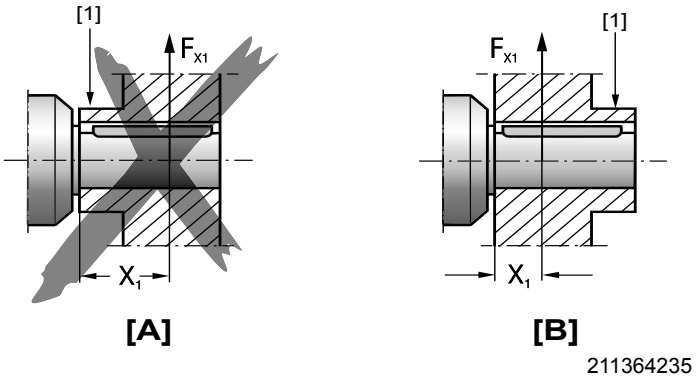
INFORMATION

When using clamping sets on smooth shaft ends, ensure that the shaft is free from residue and that any grease is removed. The clamping area [5] must be absolutely free of grease. Otherwise the shaft/hub connection may not function properly.

To prevent corrosion on the shaft, grease any uncovered areas [4] after assembly.

5.7.3 Avoiding excessive overhung loads

Avoid high overhung loads by: Installing the gear or chain sprocket according to figure **B** if possible.



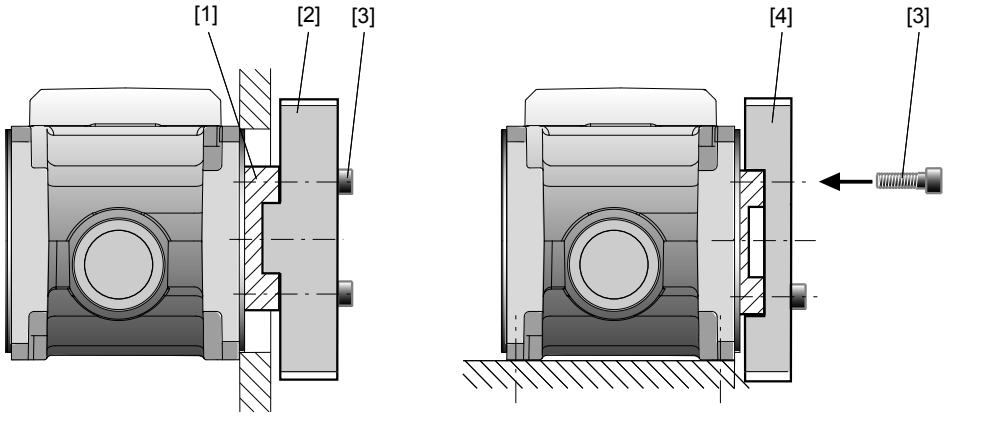
[1] Hub
[A] unfavorable
[B] correct

INFORMATION

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

5.7.4 Flange block shaft mounting

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] Flange block
[2] Gear/belt pulley with inner centering ring
[3] Bolts of quality 12.9
[4] Gear/belt pulley with outer centering ring

5.8 Mounting of couplings

⚠ CAUTION

Input and output components such as belt pulleys, couplings etc. are in fast motion during operation.

Risk of jamming and crushing.

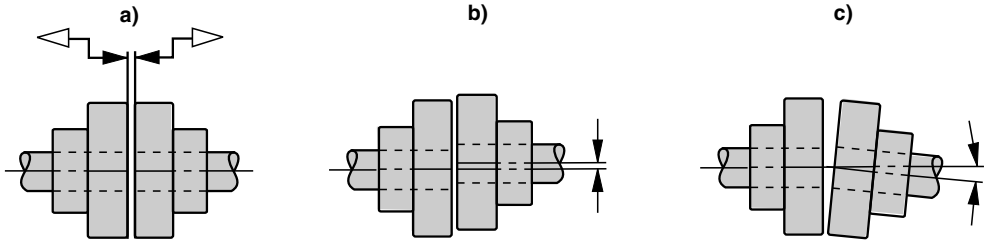
- Cover input and output components with a touch guard.

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

a) Maximum and minimum clearance

b) Axial offset

c) Angular offset



211395595

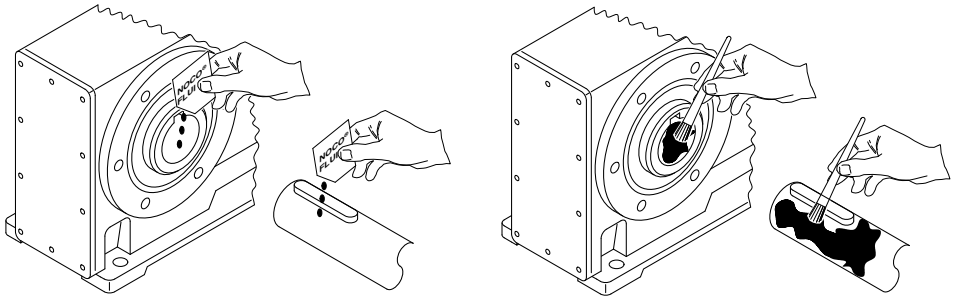
5.9 Shaft-mounted gear units with keyway

INFORMATION

Concerning the configuration of the customer shaft, please also refer to the design notes in the Gearmotors catalog!

5.9.1 Assembly notes

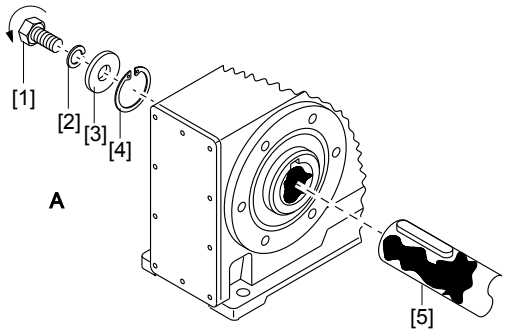
1. Apply NOCO® fluid and thoroughly spread it.



211516171

2. Install the shaft and secure it axially

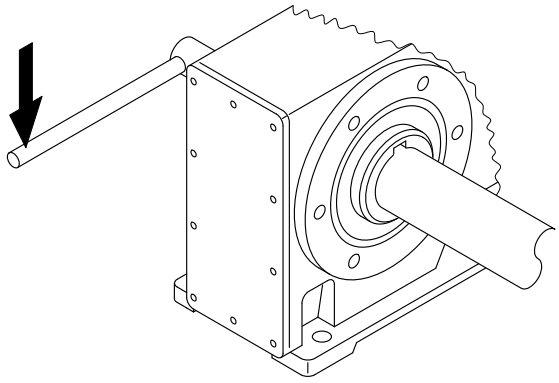
   (using a mounting device facilitates installation).



211518347

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

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



211524875

Screw	Tightening torque [Nm]
M5	5
M6	8
M10/12	20
M16	40
M20	80
M24	200

INFORMATION

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

5.10 Motor mounting

NOTICE

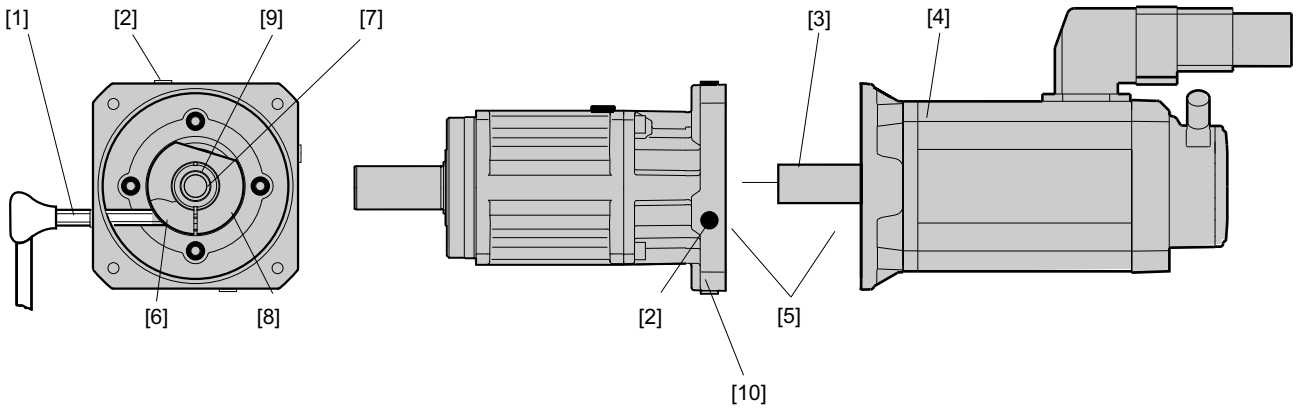
Torque is not transferred properly if the servomotor is tilted or jammed when mounting/removing the EBH.. / EPH.. adapter.

Possible unit fault

- The motor must only be installed/removed by qualified personnel.
- Observe the notes for removal in the operating instructions.

5.10.1 Motor mounting via EBH.. and EPH.. adapters

The following figure shows an example for mounting a motor to adapter EPH..:



1882119691

[1]	Torque wrench	[6]	Clamping screw
[2]	Closing plug	[7]	Coupling sleeve
[3]	Motor shaft	[8]	Clamping ring
[4]	Motor	[9]	Adapter shaft
[5]	Face	[10]	EPH adapter

5.10.2 Sequence for mounting a motor to EBH.. and EPH.. adapters

A motor [4] with a minimum rotational accuracy to DIN 42955 can be mounted in any position.

Observe the following sequence for installation:

1. Check the plane surfaces [5] of the motor and adapter for scoring and smooth them if necessary.
2. Clean and de-grease the hollow shaft hole of the adapter shaft [9], the coupling sleeve [7] and the motor shaft [3].
3. Remove one of the 4 closing plugs [2].
4. Turn the adapter shaft [9] with the clamping ring [8] until the screw head of the clamping screw [6] is in alignment with the open mounting hole in the adapter housing. Loosen the clamping screw [6].
   – For motors with a keyway: Turn the keyway by 90° to the slots in the adapter shaft. To compensate imbalance, we recommend inserting a half key in the keyway.
5. If using coupling sleeves [7], make sure that the slots in the coupling sleeve [7] are in alignment with the slots in the adapter shaft [9] and clamping ring [8].
6. Carefully push the gear unit and motor [4] together.

7. Insert the connecting screws through the holes of the motor flange into the threads of the adapter flange and tighten the screws slightly.
8. Tighten the screws diagonally with even force.
9. Use a torque wrench [1] to tighten the clamping screw [6] to the prescribed tightening torque as described in the relevant table.

Adapter type EBH:

Adapter type	Motor shaft diameter [mm]	Number of clamping screws	Tightening torque of the clamping screw [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

Adapter type EPH:

Adapter type	Motor shaft diameter [mm]	Number of clamping screws	Tightening torque of the clamping screw [Nm]	Wrench size
EPH01	≤11	1	10	4
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

5.10.3 Permitted maximum weights of motors connected to BS.F.. and PS.F.. gear units

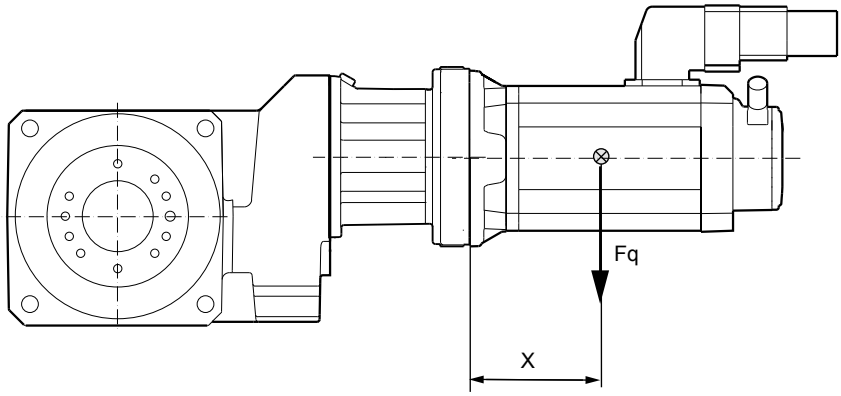
⚠ NOTICE

Impermissibly high loads may occur when mounting a motor.

Potential damage to property

- The load data specified in the following table are not to be exceeded.

The following figure shows the allowed force application points of the permitted maximum weights using a BS.F.. gearmotor as an example:



1839378315

⊗ Motor's center of gravity
X Distance from adapter flange to the middle of the motor
Fq Overhung load

Gear unit type	Adapter type EBH..	X [mm]	Fq [N][1)]
BSF..202 BSF..302	EBH03/01-14	182	157
	EBH04/12-15	182	157
	EBH05/14-20, EBH05/26	220	273
BSF..402	EBH03/01-14	182	157
	EBH04/12-15	182	157
	EBH05/14-20, EBH05/26	220	273
	EBH06/19	290	312
	EBH07/20-22, EBH07/27-28	290	312
BSF..502 BSF..602	EBH03/01-14	182	157
	EBH04/12-15	182	157
	EBH05/14-20, EBH05/26	220	273
	EBH06/19	290	312
	EBH07/20-22, EBH07/27-28	290	312
	EBH08/21-22	351	600
BSF..802	EBH05/14-20, EBH05/26	220	273
	EBH06/19	290	312
	EBH07/20-22, EBH07/27-28	290	312
	EBH08/21-22	351	600
	EBH09/22-25	400	680
	EBH10/22-25	400	680

Gear unit type	Adapter type EPH..	X [mm]	Fq [N][1)]
PSF..121 **PSF..122** **PSF..222**	EPH01/01-03	100	120
	EPH02/04-13	120	150
PSF..221 **PSF..322**	EPH01/01-03	100	120
	EPH02/04-08	120	150
	EPH03/01-14	182	157
	EPH04/01-15	182	157
PSF..321 **PSF..522**	EPH04/01-15	182	157
	EPH05/14-20, EPH05/26	220	273
PSF..521 **PSF..622** **PSF..722**	EPH04/01-15	182	157
	EPH05/14-20, EPH05/26	220	273
	EPH06/19	290	312
	EPH07/20-22, EPH07/27-28	290	312
PSF..621 **PSF..822**	EPH05/14-20, EPH05/26	220	273
	EPH06/19	290	312
	EPH07/20-22, EPH07/27-28	290	312
	EPH08/21-22	351	600
PSF..721 **PSF..922**	EPH05/14-20, EPH05/26	220	273
	EPH06/19	290	312
	EPH07/20-22, EPH07/27-28	290	312
	EPH08/21-22	351	600
PSF..821	EPH09/22-25	400	680
	EPH10/22-25	400	680
PSF..921	EPH09/22-25	400	680
	EPH10/22-25	400	680

1) Maximum load values for connection screws of strength class 8.8. The maximum permitted weight of the attached motor F_{qmax} must be reduced proportionally as the distance between the adapter flange and the middle of the motor (x) increases When this distance is reduced, F_{qmax} cannot be increased.

5.10.4 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.

5.11 Demounting the motor

NOTICE

Demounting the adapter from the gear unit may cause malfunctions.

Possible fault

- Never demount the adapter EBH.. or EPH.. from the gear unit yourself.

NOTICE

Demounting the motor from the gear unit may cause malfunctions.

Possible fault

- Never demount a motor from the gear unit yourself.

Proper functioning will no longer be assured and the right to claim on warranty is no longer valid if you remove the motor yourself.

5.11.1 Sequence for demounting the motor from adapter EBH.. or EPH..

Adhere to the following sequence when demounting the EBH.. or EPH.. adapter:

1. Switch off the drive
2. Secure the load
3. Turn off the power supply 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

6 Startup

Check for the correct direction of rotation in decoupled status. Listen out for unusual grinding noises as the shaft rotates.

⚠ WARNING

Uncontrolled unit behavior.

Severe or fatal injuries.

- Secure key for test mode without output elements.
- Do not deactivate monitoring and protection equipment even in test mode.

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

Gear unit with motor adapter

For gear units with an adapter, you must ensure that the data specified on the nameplate and in the project planning documents for the gear unit are not exceeded. It is essential that the gear unit is not overloaded.

Inverter-operated gearmotors

The parameter settings made for the inverter must prevent the gear unit from being overloaded. Refer to the nameplate and the project planning documents for the correct gear unit data.

6.1 Design-related special features

6.1.1 BS.F.. helical-bevel gear unit in 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.

6.1.2 PSF.. planetary gear units / PSKF.. for mounting positions M0 and M2

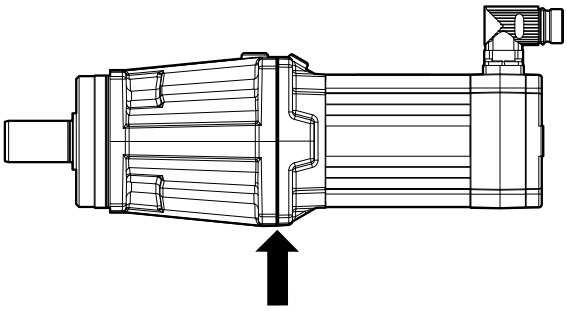
INFORMATION

For mounting positions M0 (universal mounting position) and M2, 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.

6.2 Measuring the surface temperature

It is absolutely necessary to measure the surface temperature at maximum load during startup of the gear unit. A commercially available thermometer is sufficient for this measurement.

Measure the surface temperature at the transition space between gear unit and adapter or motor where the position of the terminal box prevents venting by the motor fan.



3311812491

The maximum surface temperature will be reached after approximately three hours and may not exceed a difference value of 55 K when compared with the ambient temperature.

NOTICE

Lubricant damage due to overheating.

Gear unit damage due to lubricant failure.

- Monitor the surface temperature during startup.
- If the surface temperature is > 95 °C, stop the drive immediately and contact SEW-EURODRIVE.

NOTE ON EXPLOSION PROTECTION

Stop the drive immediately if the difference exceeds the given value. Consult SEW-EURODRIVE in this case.

The surface temperature of gear units with EBH or EPH adapter are measured at the joint between gear unit housing and adapter flange.

7 Inspection and Maintenance

7.1 Preliminary work regarding gear unit inspection/maintenance

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

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before starting work and protect it against unintentional re-start.
- Before releasing shaft connections, be sure that there are no active torsional moments present (tensions within the system).

⚠ WARNING

Danger of burns due to hot gear unit and hot gear unit oil.

Severe injuries.

- Let the gear unit cool down before you begin with your work.
- Only remove the oil level and oil drain plug very carefully.

NOTICE

Filling in the wrong oil may result in significantly different lubricant characteristics.

Potential damage to property

- Do not mix different synthetic lubricants and do not mix synthetic with mineral lubricants.

NOTICE

Improper maintenance may result in damage to the gear unit.

Possible damage to property.

- Heed the information in this chapter.

INFORMATION

The position of the oil drain plug and the breather valve depends on the mounting position. Refer to the diagrams of the mounting positions. See chapter "Mounting positions".

- Strict adherence to the inspection and maintenance intervals is absolutely necessary to ensure safe working conditions.
- Prevent foreign bodies from entering into the gear unit during maintenance and inspection work.
- Do not clean the gear unit with a high-pressure cleaning system as water might enter the gear unit and the seals might be damaged.
- Perform safety and function tests following all maintenance and repair work.

7.1.1 Cleaning the gear unit

NOTE ON EXPLOSION PROTECTION

Do not use materials or procedures (e.g. compressed air) that result in processes causing electrical charge on the coating.

7.1.2 Replacing the oil seal

NOTICE

Oil seals with a temperature below 0 °C may get damaged during installation.

Possible damage to property

- Store oil seals above 0 °C.
- Warm up the oil seals prior to installation if required.

1. When changing the oil seal, ensure that there is a sufficient grease reservoir between the dust lip and protective lip, depending on the type of gear unit.
2. If you use double oil seals, fill one-third of the gap with grease.

7.1.3 Painting gear units

NOTICE

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

Possible damage to property

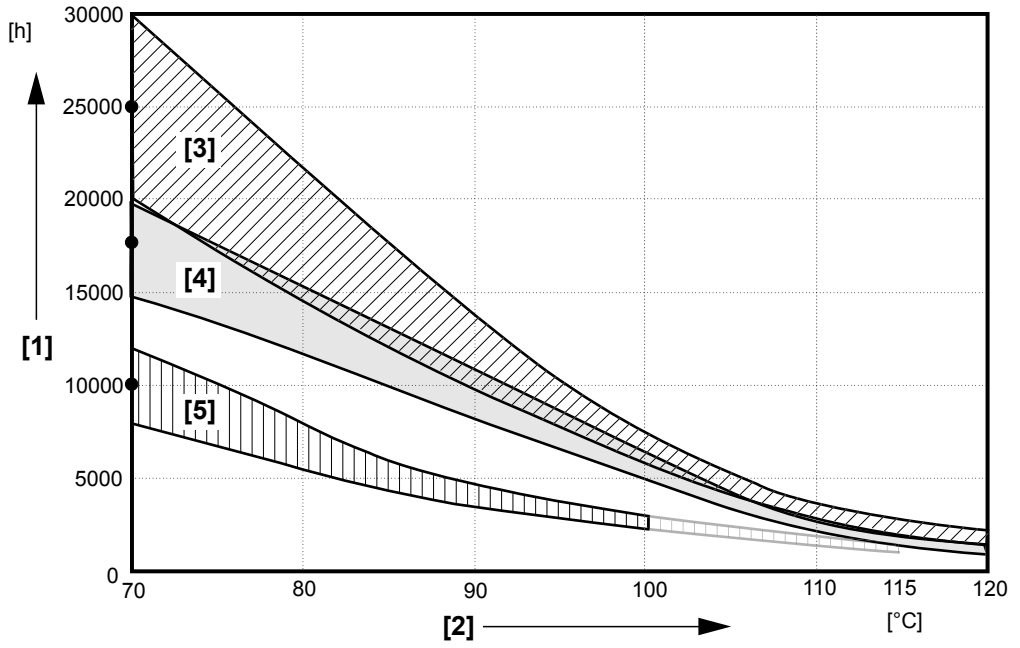
- Thoroughly cover the breather valves and the sealing lip of the oil seals with strips prior to painting.
- Remove the strips after painting.

7.2 Inspection/maintenance intervals

Time interval	Required steps
• Every 3000 operating hours, at least every 6 months	• Check running noise for possible bearing damage • Visually check the seals and the adapter for leakage • For gear units with a torque arm: Check and replace the rubber buffers, if necessary
• Depending on the operating conditions (see illustration below), every 5 years at the latest • according to oil temperature	• Replace anti-friction bearing grease (recommendation) • Replace oil seal (do not install it in the same track)
• Varying (depending on external factors)	• Touch up or renew the surfaces/anticorrosion coating

7.3 Lubricant change intervals

The following figure shows the change intervals for servo gear units under normal environmental conditions. Change the oil more frequently when using special versions subject to more severe/aggressive environmental conditions!



18729611

[1]	Operating hours	[3]	CLP PG / CLP PG
[2]	Sustained oil bath temperature	[4]	[3] CLP HC / HCE
●	Average value per oil type at 70 °C	[5]	CLP / HLP / E

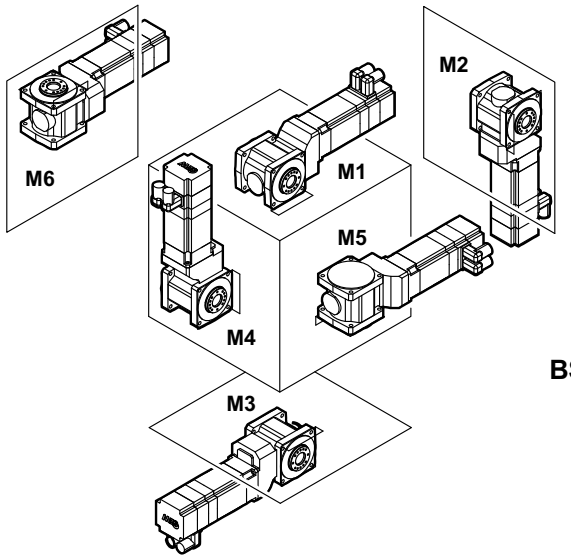
7.3.1 Measuring the oil temperature

The oil temperature must be measured to determine the lubricant change intervals stipulated in the section "Inspection and Maintenance". To do so, measure the temperature at the bottom of the gear unit. Add 10 K to the measured value. Use this temperature value to determine the lubricant change interval.

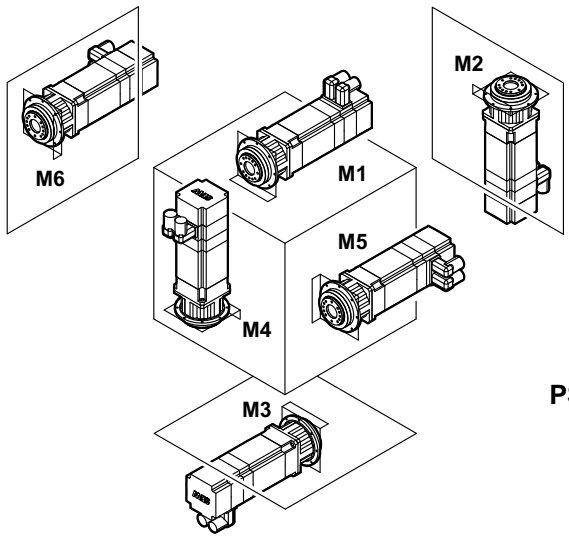
8 Mounting Positions

8.1 Designation of the mounting positions

SEW-EURODRIVE distinguishes between the gear unit mounting positions M1 to M6. The following figure shows the spatial orientation of the gear unit in mounting positions M1 to M6 with output end A:



BS.F..



PS.F..

3263396107

INFORMATION

Note the following information regarding the way in which shafts are depicted in the mounting position sheets:

- **For gear units with solid shaft:** The displayed shaft is always on the A end.
- **For shaft-mounted gear units:** The shaft with dashed lines represents the customer shaft. The output end is always shown on the A end.

8.2 Key

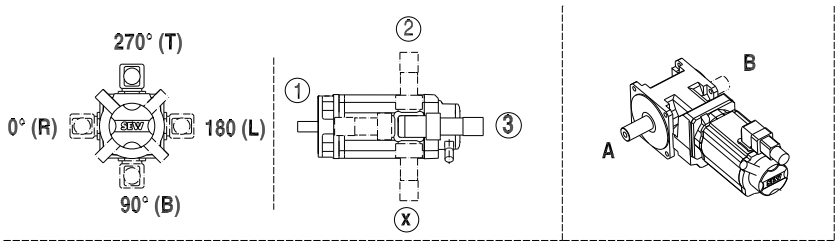
8.2.1 Symbols used

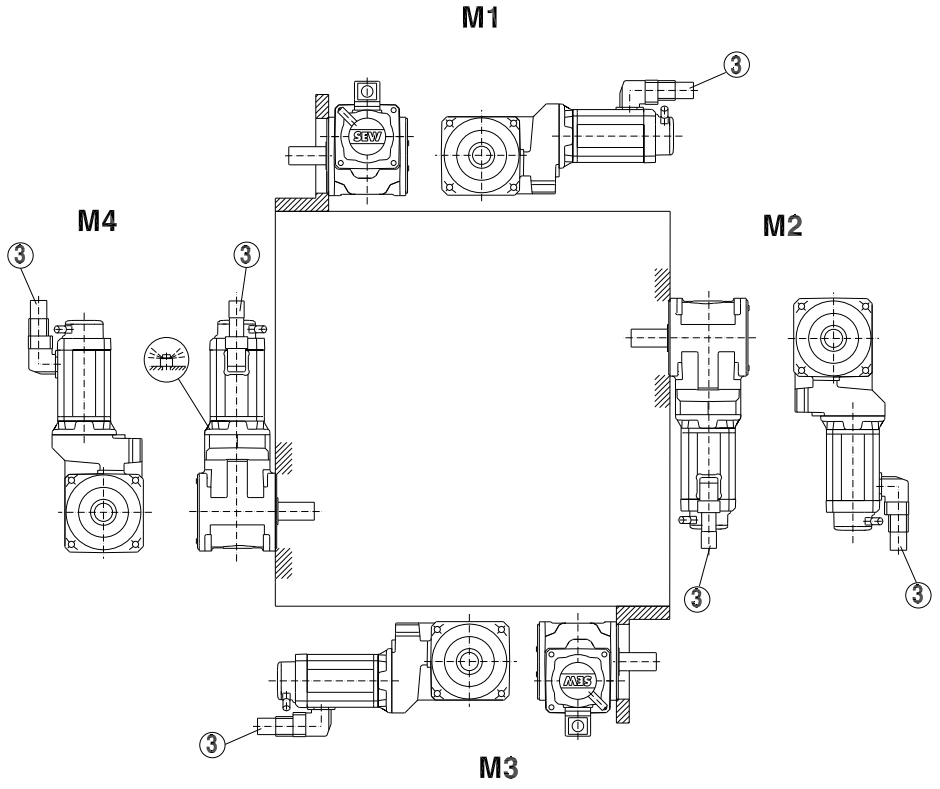
The following table shows the symbols used in the mounting position sheets and what they mean:

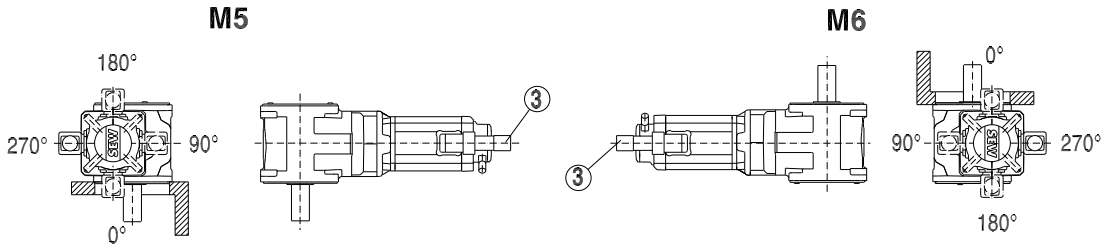
Symbol	Meaning
	Breather valve
3	Cable entry position "Normal"

8.3 BS.F.. helical-bevel servo gearmotors

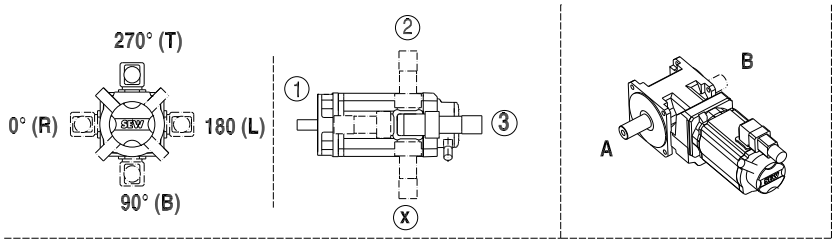
8.3.1 BS.F202 – 802

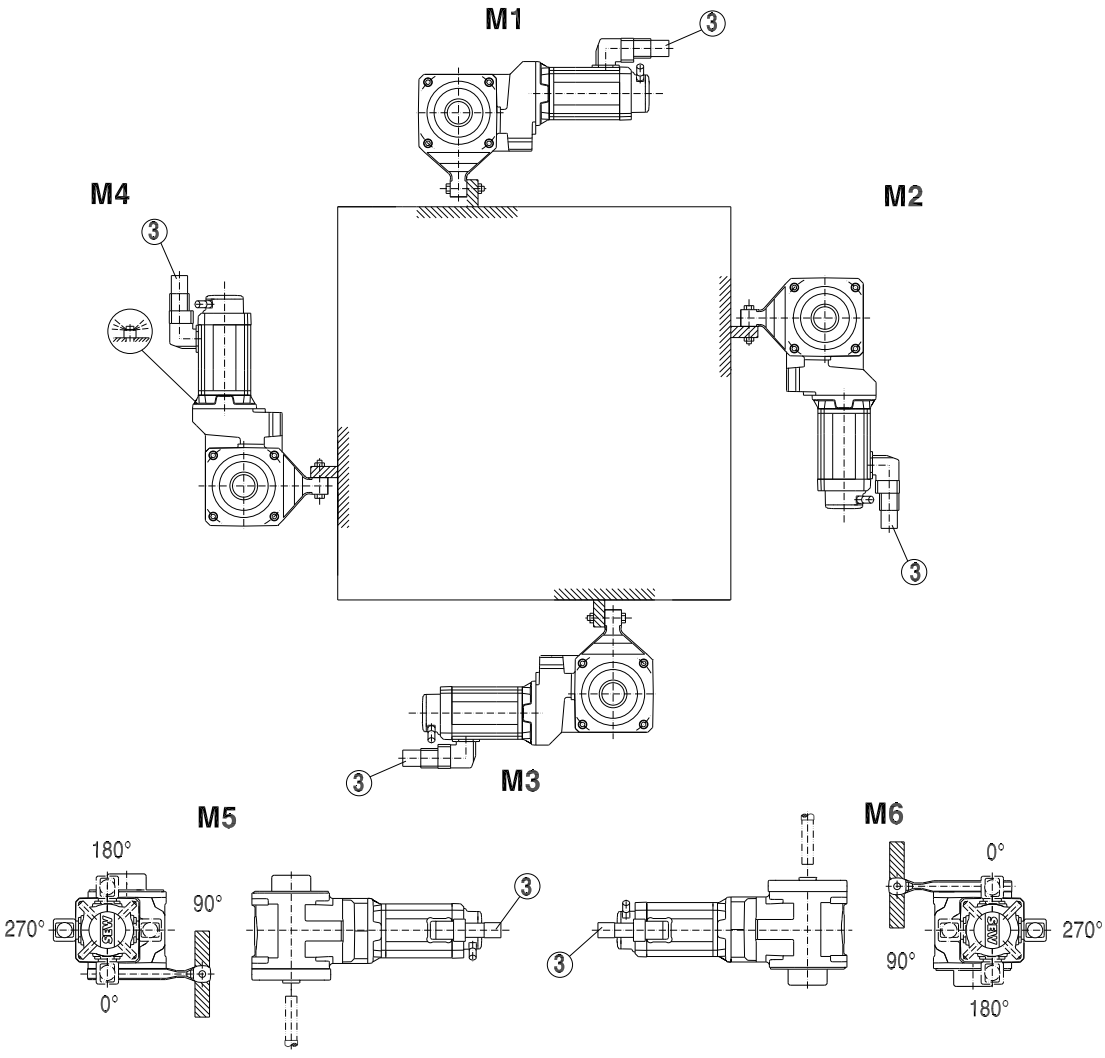




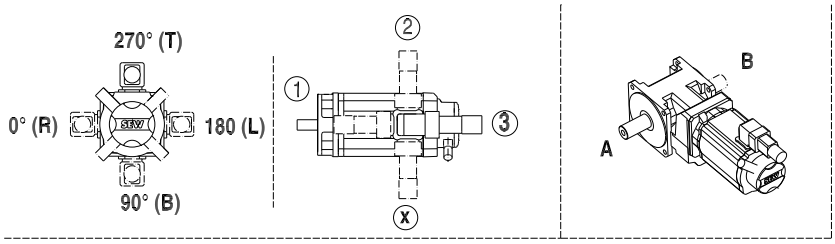


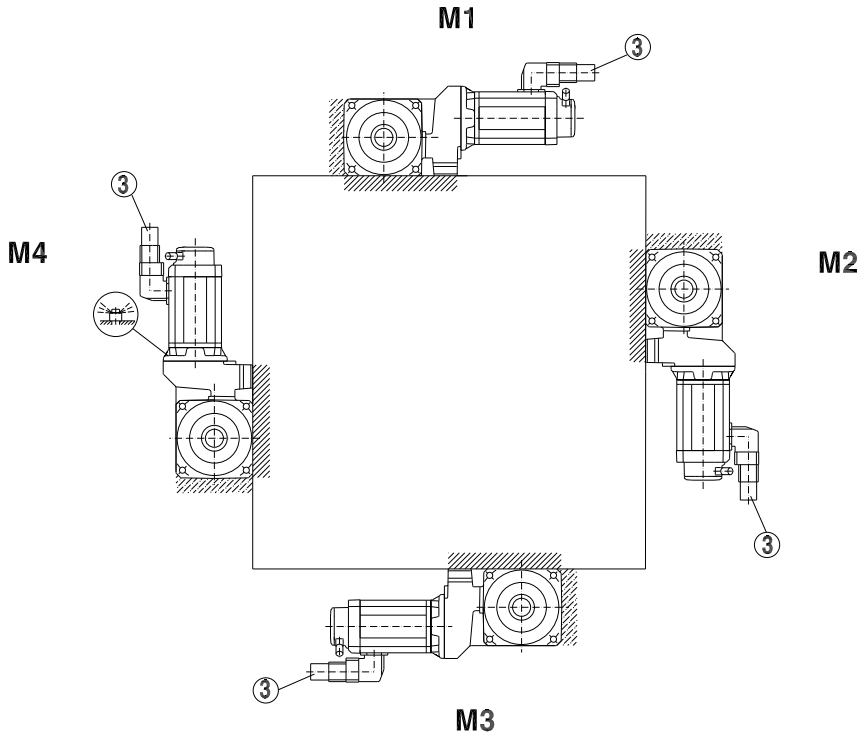
8.3.2 BSHF202 – 802 /T

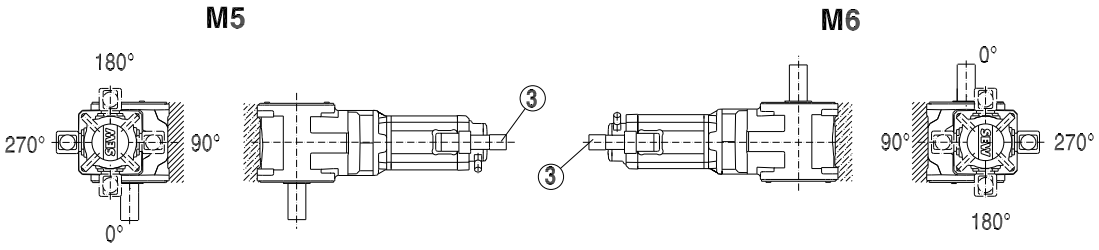




8.3.3 BS.F202 B – 802 B

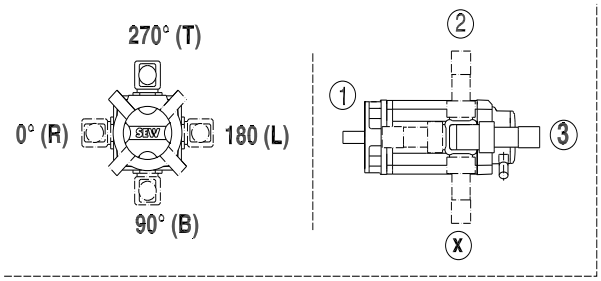




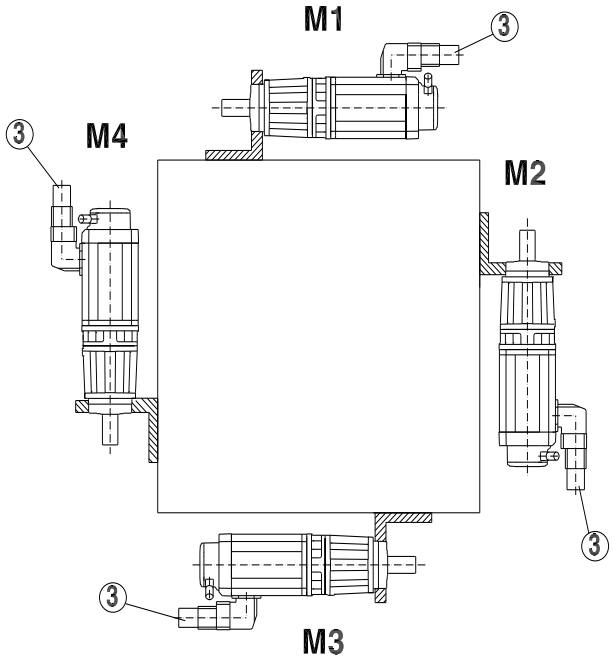


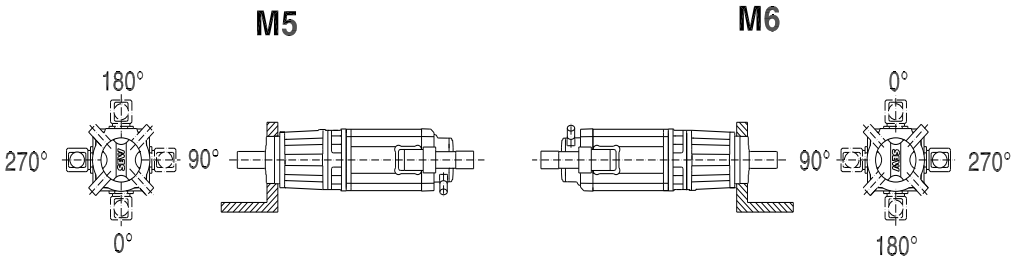
8.4 PS.F.. planetary servo gearmotors

8.4.1 PS.F121 – 922

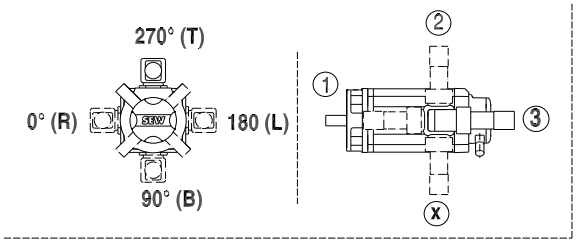


58 001 00 03

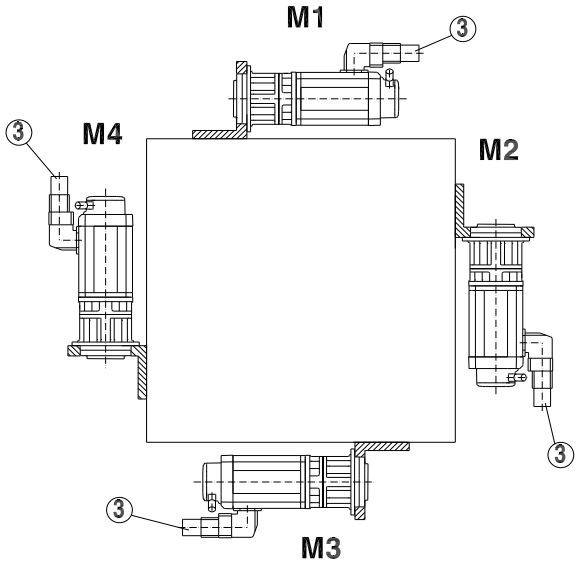


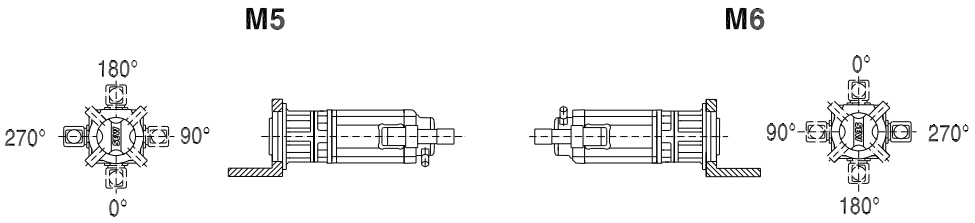


8.4.2 PSBF221 – 822



58 002 00 03





9 Technical Data

9.1 Lubricants

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific gear unit and mounting position. The decisive factor is the mounting position (M1 – M6) specified when ordering the drive.

NOTE ON EXPLOSION PROTECTION

SEW-EURODRIVE fills the gear units with the amount of oil specified for the specific mounting positions. If the mounting position is changed, the amount of oil must be adapted as required. Consequently, a mounting position may only be changed after consultation with SEW-EURODRIVE, otherwise your right to claim under warranty and the ATEX approval no longer apply.

The following lubricant tables show the permitted standard lubricants for BS.F.. helical-bevel gear units and PS.F.. planetary gear units from SEW-EURODRIVE.

9.1.1 Anti-friction bearing greases

The anti-friction bearings in gear units and motors are given a factory-fill with the greases listed below. SEW-EURODRIVE recommends regreasing anti-friction bearings with a grease fill at the same time as changing the oil.

	Ambient temperature	Manufacturer	Type
Gear unit rolling bearings	-40 °C ... +80 °C	Fuchs	Renolit CX-TOM 15
	-40 °C ... +80 °C	Klüber	Petamo GHY 133 N
	-40 °C ... +40 °C	Castrol	Obeen FS 2

INFORMATION

The following grease quantities are required:

- **For fast-running bearings (gear unit input end):**
  Fill the cavities between the rolling elements one-third full with grease.
- **For slow-running bearings (gear unit input side):**
  Fill the cavities between the rolling elements two-thirds full with grease.

9.1.2 Lubricant table

The lubricant table on the following page shows the permitted lubricants for SEW-EURODRIVE gear units. Observe the following legend with regards to the lubricant table.

Key to the lubricant table

Abbreviations, meaning of shading and notes:

CLP	= Mineral oil
CLP PG	= Polyglycol (W gear units, conforms to USDA-H1)
CLP HC	= Synthetic hydrocarbons
E	= Ester oil (water hazard classification 1)
HCE	= Synthetic hydrocarbons + ester oil (USDA - H1 certification)
HLP	= Hydraulic oil
	= Synthetic lubricant (= synthetic-based roller bearing grease)
	= Mineral lubricant (= mineral-based rolling bearing grease)

1)	Helical-worm gear units with PG oil: consult SEW-EURODRIVE.
2)	Special lubricant for SPIROPLAN® gear units only
3)	Recommendation: Select SEW $f_B \geq 1.2$
4)	Observe the critical starting behavior at low temperatures.
5)	Low-viscosity grease
6)	Ambient temperature
7)	Grease
	Lubricant for the food industry (food grade oil)
	Biodegradable oil (lubricant for agriculture, forestry, and water management)

Lubricant table

017680600

	6) °C	DIN (ISO)	ISO,NLGI	Mobil®	Shell	KLÜBER LUBRICATION	TEXACO	Castrol Tribol	Castrol Optimol	FUCHS	TOTAL
R... K... F...	Standard -20	CLP HC	VG 220	Mobil SHC 630	Shell Omala S4 GX 220	Klübersynth GEM 4-220 N	Pinnacle EP 220	Tribol 1510/220	Optigear Synthetic X 220	Renolin Unisyn CLP 220	
	4) -40	CLP HC	VG 150	Mobil SHC 629	Shell Omala S4 GX 150	Klübersynth GEM 4-150 N	Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	4) -40	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68					Renolin Unisyn CLP 68	
	4) -40	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32	Cetus PAO 46		Optileb HY 32	Renolin Unisyn OL 32	Dacnis SH 32
S...(HS...)	Standard -20	CLP HC	VG 460	Mobil SHC 634	Shell Omala S4 GX 460	Klübersynth GEM 4-460 N	Pinnacle EP 460		Optigear Synthetic X 460	Renolin Unisyn CLP 460	
	4) -40	CLP HC	VG 150	Mobil SHC 629	Shell Omala S4 GX 150	Klübersynth GEM 4-150 N	Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	4) -40	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68					Renolin Unisyn CLP 68	
	4) -40	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32	Cetus PAO 46		Optileb HY 32	Renolin Unisyn OL 32	Dacnis SH 32
R...,K...(HK...), F...,S...(HS...)	Standard -10	CLP HC NSF H1	VG 460			Klüberoil 4UH1-460 N			Optileb GT 460	Cassida Fluid GL 460	
	-20		VG 220			Klüberoil 4UH1-220 N			Optileb GT 220	Cassida Fluid GL 220	
	4) -40		VG 68			Klüberoil 4UH1-68 N			Optileb HY 68	Cassida Fluid HF 68	
	-20	E	VG 460		Shell Naturelle Gear Fluid EP 460	Klüberbio CA2-460				Plantogear 460S	
W...(HW...)	Standard -20	SEW PG	VG 460 1)			Klüber SEW HT-460-5					
	-40	API GL5	SAE 75W90 (~VG 100)	Mobil Synth Gear Oil 75 W90							
	-20	CLP PG NSF H1	VG 460 2)			Klübersynth UH1 6-460					
PS.F..	Standard -20	CLP PG	VG 220			Klübersynth GH-6-220					
	-20	CLP PG NSF H1	VG 460 2) 3)			Klübersynth UH1 6-460					
	4) -40	CLP HC	VG 32	Mobil SHC 624							
BS.F..	4) -20	CLP PG	VG 220			Klübersynth GH 6-220					
	-20	CLP PG 460 NSF H1	VG 460 2) 3)			Klübersynth UH1 6-460					

3185839755

9.1.3 Fill quantities depending on the mounting position for BS.F.. helical-bevel gear units

The following tables show guide values for lubricant fill quantities in relation to the mounting position M1 - M6.

Fill quantities for BS.F.. helical-bevel gear units

BS.F.. helical-bevel gear units	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
BS.F202	0.15	0.25	0.25	0.30	0.25	0.25
BS.F302	0.25	0.50	0.50	0.55	0.35	0.35
BS.F402	0.45	0.80	0.80	1.05	0.65	0.65
BS.F502	1.00	1.80	1.80	2.50	1.50	1.50
BS.F602	1.60	2.50	2.80	4.10	2.00	2.60
BS.F802	3.30	5.30	5.70	7.90	4.50	4.50

Fill quantity tolerances for BS.F..

Fill quantity in liters [l]	Tolerance
up to 1 l	0.01 l
> 1 l	1% of the fill quantity

9.1.4 Fill quantities depending on the mounting position for PS.F.. planetary gear units

The following tables show guide values for lubricant fill quantities in relation to the mounting position M1 – M6.

Fill quantities for PS(K)F.. planetary gear units

PS(K)F.. planetary gear units	Adapter mounting Fill quantity in liters [l]			Direct motor mounting Fill quantity in liters [l]		
	M1 (M3, M5, M6)	M2	M4	M1 (M3, M5, M6)	M2	M4
PS(K)F121	0.023	0.025	0.023	0.023	0.037	0.023
PS(K)F122	0.035	0.056	0.054	0.035	0.068	0.054
PS(K)F221	0.035	0.052	0.035	0.035	0.063	0.035
PS(K)F222	0.045	0.075	0.085	0.045	0.085	0.085
PS(K)F321	0.070	0.100	0.070	0.07	0.12	0.07
PS(K)F322	0.095	0.170	0.190	0.095	0.185	0.19
PS(K)F521	0.140	0.215	0.150	0.14	0.245 (0.270)[1)]	0.15
PS(K)F522	0.200	0.360	0.395	0.2	0.38	0.395
PS(K)F621	0.300	0.465	0.320	0.3	0.500 (0.550)[1)]	0.32
PS(K)F622	0.410	0.680	0.780	0.41	0.71	0.78
PS(K)F721	0.600	0.930	0.650	0.6	1.060	0.65
PS(K)F722	0.750	1.230	1.645	0.75	1.280	1.645
PS(K)F821	1.000	1.750	1.350	–	–	–
PS(K)F822	1.550	2.550	3.350	1.550	2.640	3.350
PS(K)F921	1.400	2.450	1.900	–	–	–
PS(K)F922	2.050	3.500	4.350	2.050	3.650	4.350

Fill quantities for PSBF.. planetary gear units

PSBF.. planetary gear units	Adapter mounting Fill quantity in liters [l]			Direct motor mounting Fill quantity in liters [l]		
	M1 (M3, M5, M6)	M2	M4	M1 (M3, M5, M6)	M2	M4
PSBF221	0.025	0.040	0.025	0.025	0.051	0.025
PSBF222	0.035	0.061	0.060	0.035	0.074	0.06
PSBF321	0.045	0.068	0.050	0.045	0.085	0.05
PSBF322	0.070	0.135	0.130	0.07	0.145	0.13
PSBF521	0.093	0.143	0.103	0.093	0.168 (0.193)[1)]	0.103
PSBF522	0.143	0.288	0.273	0.143	0.308	0.273
PSBF621	0.198	0.318	0.188	0.198	0.358 (0.408)[1)]	0.188
PSBF622	0.298	0.538	0.498	0.298	0.568	0.498
PSBF721	0.474	0.684	0.314	0.404	0.544	0.314
PSBF722	0.564	0.884	1.004	0.544	0.834	1.004
PSBF821	0.495	0.995	0.695	–	–	–
PSBF822	0.995	1.795	1.995	0.995	1.895	1.995

1) Fill quantities for direct mounting of CFM90 servomotors

Fill quantity tolerances for PS.F..

Planetary gear unit	Fill quantity in liters [l]
PS.F121/122	± 0.001
PS.F221/222	± 0.001
PS.F321/322	± 0.002
PS.F521/522	± 0.005
PS.F621/622	± 0.005
PS.F721/722	± 0.010
PS.F821/822	± 0.010
PS.F921/922	± 0.010

10 Malfunctions

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the motor before you start working on the unit.
- Secure the motor against unintended power-up.

⚠ CAUTION

Danger of burns due to hot gear unit and hot gear unit oil.

Severe injuries.

- Let the gear unit cool down before you start working on it.
- Only remove the oil level and oil drain plug very carefully.

⚠ NOTICE

Improper handling of the gear unit and the motor may lead to damage.

Possible damage to property

- SEW drives may only be repaired by qualified personnel who are familiar with the technical rules for industrial safety and health.
- Only qualified personnel is permitted to separate drive and motor.
- Consult SEW-EURODRIVE customer service.

10.1 Gear units

Malfunction	Possible cause	Remedy
Unusual, regular running noise	Meshing/grinding noise: Bearing damage	Contact customer service.
	Knocking noise: Irregularity in the gearing Incorrect controller setting	Check controller setting. Contact customer service.
Unusual, irregular running noise	Foreign bodies in the oil	• Check the oil → see "Inspection and Maintenance" (page 45) • Stop the drive, contact customer service
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 customer service.
	Only for BSF.. gear units in mounting position M4: Gear unit not ventilated	Vent the gear unit → see "Activating the breather valve" (page 26).
Only for BSF.. Mounting position M4: Oil leaking from breather valve	Too much oil	Contact customer service.
	Drive operated in incorrect mounting position	Mount the gear unit in the correct mounting position.
	Frequent cold starts (oil foams) 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.
Difference between surface temperature and ambient temperature > 55 K	• Restricted air supply • Speed/torque is too high	• Ensure unrestricted air supply and/or contact customer service. • Check project planning and/or contact customer service.

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

10.2 Customer service

Please have the following information to hand if you require the assistance of our customer service:

- Nameplate data (complete)
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause

10.3 Disposal

Dispose gear units in accordance with the regulations in force regarding respective materials:

- Steel scrap
  - Housing parts
  - Gears
  - Shafts
  - Roller bearing
- Parts of the worm gears are made of non-ferrous metals. Dispose of the worm gears as appropriate.
- Collect waste oil and dispose of it according to the regulations in force.

11 Declaration of Conformity

11.1 Gear units in category 2GD

EC Declaration of Conformity

SEW EURODRIVE

900560110

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

declares under sole responsibility that the

gear units of the series	**BS.F.. PS.F..**	
category	**2GD**	
are in conformity with		
ATEX Directive	**1994/9/EC**	**2)**
Applied harmonized standards	**EN 1127-1:2007 EN 13463-1:2009 EN 13463-5:2003 EN 13463-8:2003 EN 60529:2000**	

2) SEW-EURODRIVE lodges the documents required by 1994/9/EC, appendix VIII, with the notified body: FSA GmbH, EU ID no.: 0588

Bruchsal	16.02.11	Johann Soder	
Place	Date	Managing Director Technology	a) b)

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

11.2 Gear units in category 2GD with EPH or EBH adapter

EC Declaration of Conformity

SEW EURODRIVE

900570110

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

declares under sole responsibility that the

gear units of the series	**BS.F..** **PS.F..**	
with mount-on components of the series	**EPH..** **EBH..**	
category	**2GD**	
are in conformity with		
ATEX Directive	**1994/9/EC**	**2)**
Applied harmonized standards	**EN 1127-1:2007** **EN 13463-1:2009** **EN 13463-5:2003** **EN 13463-8:2003** **EN 60529:2000**	

2) SEW-EURODRIVE lodges the documents required by 1994/9/EC, appendix VIII, with the notified body: FSA GmbH, EU ID no.: 0588

Bruchsal	16.02.11	Johann Soder	
Place	Date	Managing Director Technology	a) b)

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

12 Address List

Germany			
Headquarters **Production** **Sales**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Service Competence Center	**Central**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357 14 euro cents/min on the German landline network. Max 42 euro cents/min from a German mobile network. Prices for mobile and international calls may differ.
	Additional addresses for service in Germany provided on request!		

France			
Production **Sales** **Service**	**Haguenau**	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Production	**Forbach**	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15

France			
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
	Additional addresses for service in France provided on request!		

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

Argentina			
Assembly **Sales**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at

Belarus			
Sales	**Minsk**	SEW-EURODRIVE BY RybalkoStr. 26 BY-220033 Minsk	Tel.+375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by

Belgium			
Assembly **Sales** **Service**	**Brussels**	**SEW-EURODRIVE n.v./s.a.** Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	**Industrial Gears**	**SEW-EURODRIVE n.v./s.a.** Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be

Brazil			
Production **Sales** **Service**	**São Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 152 - Rodovia Presidente Dutra Km 208 Guarulhos - 07251-250 - SP SAT - SEW ATENDE - 0800 7700496	Tel. +55 11 2489-9133 Fax +55 11 2480-3328 http://www.sew-eurodrive.com.br sew@sew.com.br

Brazil			
Assembly **Sales** **Service**	**Rio Claro**	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
	Indaiatuba	SEW-EURODRIVE Brasil Ltda. Estrada Municipal Jose Rubim, 205 Rodovia Santos Dumont Km 49 13347-510 - Indaiatuba / SP	Tel. +55 19 3835-8000 sew@sew.com.br

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 33 431137 Fax +237 33 431137 electrojemba@yahoo.fr

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

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

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 info@sew-eurodrive.cn http://www.sew-eurodrive.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn

China			
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
	Additional addresses for service in China provided on request!		

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. Zeleni dol 10 HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr

Czech Republic			
Sales **Assembly** **Service**	**Prague**	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
		SEW-EURODRIVE CZ s.r.o. Lužná 591 16000 Praha 6 - Vokovice	
	Drive Service Hotline / 24 Hour Service	HOT-LINE +420 800 739 739 (800 SEW SEW)	**Servis:** Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Copenhagen**	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Egypt			
Sales **Service**	**Cairo**	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 22566-299 +1 23143088 Fax +20 2 22594-757 http://www.copam-egypt.com/ copam@datum.com.eg

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Production **Assembly**	**Karkkila**	SEW Industrial Gears Oy Valurinkatu 6, PL 8 FI-03600 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate Normanton West Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911

Greece			
Sales	**Athens**	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu

India			
Registered Office **Assembly** **Sales** **Service**	**Vadodara**	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200, +91 265 2831086 Fax +91 265 3045300, +91 265 2831087 http://www.seweurodriveindia.com salesvadodara@seweurodrivein-dia.com

India			
Assembly **Sales** **Service**	**Chennai**	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il

Italy			
Assembly **Sales** **Service**	**Solaro**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Société Industrielle & Commerciale pour l'Afrique 165, Boulevard de Marseille 26 BP 1173 Abidjan 26	Tel. +225 21 25 79 44 Fax +225 21 25 88 28 sicamot@aviso.ci

Japan			
Assembly **Sales** **Service**	**Iwata**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373855 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp

Kazakhstan			
Sales	**Almaty**	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz

Kenya			
Sales	**Nairobi**	Barico Maintenances Ltd Kamutaga Place Commercial Street Industrial Area P.O.BOX 52217 - 00200 Nairobi	Tel. +254 20 6537094/5 Fax +254 20 6537096 info@barico.co.ke

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales Lebanon	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
		After Sales Service	service@medrives.com
Sales Jordan / Kuwait / Saudi Arabia / Syria	**Beirut**	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 info@medrives.com http://www.medrives.com
		After Sales Service	service@medrives.com

Lithuania			
Sales	**Alytus**	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 irmantas@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brussels**	**SEW-EURODRIVE n.v./s.a.** Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.lu info@sew-eurodrive.be

Madagascar			
Sales	**Antananarivo**	Ocean Trade BP21bis. Andraharo Antananarivo. 101 Madagascar	Tel. +261 20 2330303 Fax +261 20 2330330 oceantrabp@moov.mg

Malaysia			
Assembly **Sales** **Service**	**Johor**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my

Mexico			
Assembly **Sales** **Service**	**Quéretaro**	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales **Service**	**Mohammedia**	SEW-EURODRIVE SARL 2, rue El Jahidz 20800 Mohammedia	Tel. +212 523 32 27 80/81 Fax +212 523 32 27 89 sew@sew-eurodrive.ma http://www.sew-eurodrive.ma

Namibia			
Sales	**Swakopmund**	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 sales@dbmining.in.na

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Pakistan			
Sales	**Karachi**	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 6765332 / 42 6765343 Fax +48 42 6765346	Linia serwisowa Hotline 24H Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucharest**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 RUS-195220 St. Petersburg	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn http://www.senemeca.com

Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV sprat SRB-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za info@sew.co.za

South Africa			
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

South Korea			
Assembly **Sales** **Service**	**Ansan**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate #1048-4, Shingil-Dong, Danwon-Gu, Ansan-City, Kyunggi-Do Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

Swaziland			
Sales	**Manzini**	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chonburi**	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri Sanayi Ticaret Limited Şirketi Gebze Organize Sanayi Bölgesi 400.Sokak No:401 TR-41480 Gebze KOCAELİ	Tel. +90-262-9991000-04 Fax +90-262-9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

Ukraine			
Assembly **Sales** **Service**	**Dnipropetrovsk**	ООО «СЕВ-Евродрайв» ул.Рабочая, 23-В, офис 409 49008 Днепропетровск	Тел. +380 56 370 3211 Факс. +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

United Arab Emirates			
Sales **Service**	**Sharjah**	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae

USA			
Production **Assembly** **Sales** **Service**	**Southeast Region**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manufacturing +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**Northeast Region**	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net

Vietnam			
Sales	**Ho Chi Minh City**	**All sectors except harbor, steel, coal power and offshore:** Nam Trung Co., Ltd 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn truongtantam@namtrung.com.vn khanh-nguyen@namtrung.com.vn
		Harbor and offshore: DUC VIET INT LTD Industrial Trading and Engineering Services A75/6B/12 Bach Dang Street, Ward 02, Tan Binh District, 70000 Ho Chi Minh City	Tel. +84 8 62969 609 Fax +84 8 62938 842 totien@ducvietint.com
		Coal power and steel: Thanh Phat Co Ltd DMC Building, L11-L12, Ward3, Binh Thanh Dist, Ho Chi Minh City	Tel. +84 835170381 Fax +84 835170382 sales@thanh-phat.com
	Hanoi	Nam Trung Co., Ltd R.205B Tung Duc Building 22 Lang ha Street Dong Da District, Hanoi City	Tel. +84 4 37730342 Fax +84 4 37762445 namtrunghn@hn.vnn.vn

Zambia			
Sales	**Kitwe**	EC Mining Limited Plots No. 5293 & 5294,Tangaanyika Road, Off Mutentemuko Road, Heavy Industrial Park, P.O.BOX 2337 Kitwe	Tel. +260 212 210 642 Fax +260 212 210 645 sales@ecmining.com http://www.ecmining.com

Index




SEW-EURODRIVE
Driving the world

SEW-EURODRIVE GmbH & Co KG
P.O. Box 3023
D-76642 Bruchsal/Germany
Phone +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com

➞ **www.sew-eurodrive.com**