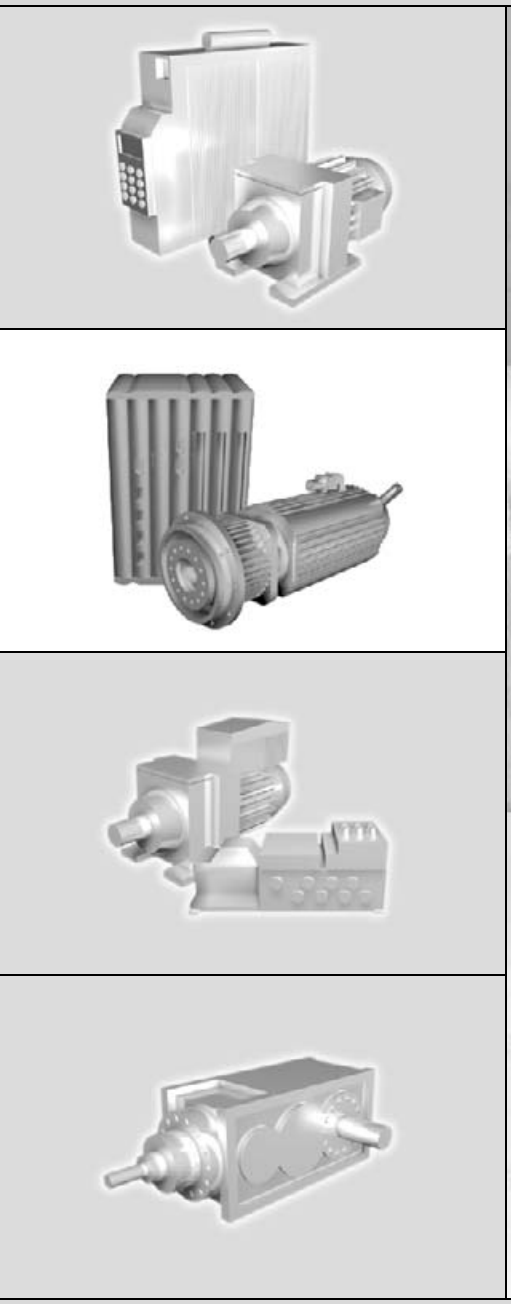
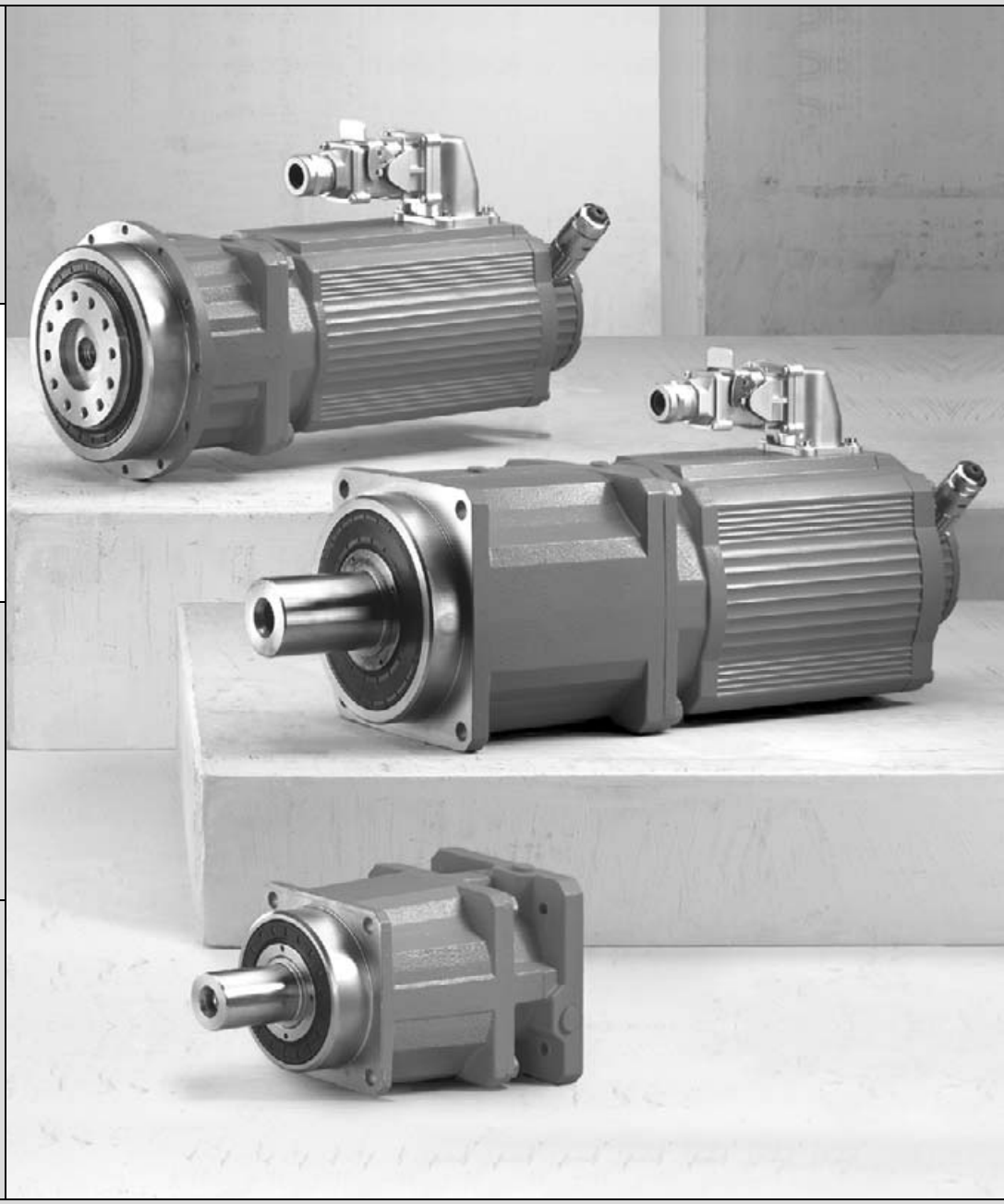
SEW EURODRIVE





Explosion-Proof
PSF.. Planetary Servo Gear Units

GB111100

Edition 11/2005

11384611 / EN

Operating Instructions

SEW
EURODRIVE

1 Important Information about the Operating Instructions

1.1 Important information and designated use

1.1.1 Integral part of the product

The operating instructions are part of the PSF.. planetary servo gear units and contain important information for operation and service. The operating instructions are written for assembly, installation, startup and service employees who are involved in the installation and maintenance of PSF.. planetary servo gear units.

1.1.2 Designated use

The designated use refers to the procedure specified in the operating instructions.

The PSF.. planetary servo gear units are units run by motors for industrial and commercial systems. Gear unit utilizations other than the permitted values or the operation of PSF.. planetary servo gear units in areas of application other than industrial and commercial systems is only allowed after consultation with SEW-EURODRIVE.

In compliance with the EG Machinery Directive 98/37/EG, the PSF.. planetary servo gear units are components for installation in machinery and systems. In the scope of the EG directive, you must not take the machinery into operation in the designated fashion until you have established that the end product complies with the Machinery Directive 98/37/EG.

1.1.3 Qualified personnel

PSF.. planetary servo gear units represent a potential hazard for persons and material. Consequently, assembly, installation, startup and service work may only be performed by trained personnel who are aware of the potential hazards.

The personnel must be appropriately qualified for the task in hand and must be familiar with the assembly, installation, startup and operation of the product. The personnel must read the operating instructions, in particular the safety notes section, carefully and ensure that they understand and comply with them.

1.1.4 Liability for defects

Incorrect handling or any action performed that is not specified in these operating instructions could impair the properties of the product. In this case, you lose any right to claim under limited warranty against SEW-EURODRIVE GmbH & Co KG.

1.1.5 Product names and trademarks

The brands and product names contained within these operating instructions are trademarks or registered trademarks of the titleholders.

1.1.6 Waste disposal

Please follow the current national instructions.

Dispose of the following materials separately in accordance with the country-specific regulations in force, as:

- Steel scrap
  - Housing parts
  - Gears
  - Shafts
  - Roller bearings
  - Cast parts
- Aluminum scrap
  - Housing parts
  - Adapter parts
- Collect waste oil and dispose of it according to the regulations in force.

1.2 Explanation of symbols

Hazard

Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

Important information about explosion protection

Explosive gas mixtures or dust concentrations in combination with hot, energized and moving parts of electrical machinery can cause serious injury or death.

Warning

Indicates an imminently hazardous situation caused by the product which, if not avoided, WILL result in death or serious injury. You will also find this signal to indicate the potential for damage to property.

Caution

Indicates a potentially hazardous situation which, if not avoided, MAY result in minor injury or damage to products.

Note

Indicates a reference to useful information, e.g. on startup.

Documentation reference

Indicates a reference to a document, such as operating instructions, catalog, data sheet.

2 Safety Notes

2.1 Preface

The following safety notes apply to the operation of explosion-proof PSF.. planetary servo gear units .

If using **gearmotors**, please also refer to the safety notes for motors in the corresponding operating instructions.

Please also consider the supplementary safety notes in the individual sections of these operating instructions.

Burns hazard!

Touching the gear unit when it has not been cooled will result in burns. The gear unit can have a surface temperature of up to 110 °C.

Never touch the gear unit during operation or in the cool down phase once the unit has been switched off.

2.2 General information

Never install damaged products or take them into operation.

Submit a complaint to the shipping company immediately in the event of damage.

During or after operation, gearmotors, gear units and motors have:

- Live parts
- Moving parts
- Hot surfaces (may be the case)

Only qualified personnel may carry out the following work:

- Installation / assembly
- Connection
- Startup
- Maintenance
- Servicing

The following information and documents must be observed during these processes:

- Relevant operating instructions and wiring diagrams
- Warning and safety signs on the gear unit / gearmotor
- System-specific regulations and requirements
- National / regional regulations governing safety and the prevention of accidents

Serious injuries and property damage may result from:

- Improper use
- Incorrect installation or operation
- Unauthorized removal of necessary protection covers or the housing

2.3 Shipping / storage

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. Do not operate the gear unit if it is damaged.

The screwed in transport eyebolts are only designed for the weight of the gearmotor / gear unit. Do not attach any additional loads.

If the gearmotor has two suspension eye lugs or lifting eyebolts, then you should also use both suspension eye lugs for attaching transport ropes. In this case, the tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

Use suitable, sufficiently rated handling equipment if necessary. Remove securing devices used for transportation prior to startup.

Possible damage caused by incorrect storage!

Store the gear unit in a dry, dust-free room if it is not to be installed straight away.

2.4 Installation / assembly

Adhere to the instructions in section 4, "Mechanical Installation."

2.5 Startup / operation

- Check that the direction of rotation is correct in **decoupled** status. Listen out for unusual grinding noises as the shaft rotates.
- Secure the keys for the test run without output elements. Do not deactivate monitoring and protection devices for the test run.
- Switch off the gearmotor if in doubt whenever changes occur in relation to normal operation (e. g. increased temperature, noise, vibration).

  Determine the cause of the fault and, if necessary, contact SEW-EURODRIVE.

Also refer to the information in Sec. 5, "Software limit switches."

2.6 Inspection / maintenance

Adhere to the instructions in Sec. 6, "Inspection and Maintenance."

2.7 Safety notes for use in potentially explosive atmospheres

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

Installation, connection, startup, maintenance and repair work on the gear unit and the optional electrical components may only be performed by qualified personnel while taking the following into account:

- the operating instructions
- the warning and information signs on the gear unit
- all other operating instructions and wiring diagrams belonging to the drive
- The specific regulations and requirements for the system
- currently valid national / regional regulations (explosion protection, safety, prevention of accidents).

2.7.1 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 meet the requirements set forth in Directive 94/9EC and comply with the valid standards and regulations.

A drive motor connected to the gear unit is only allowed to be operated under the conditions described in Sec. 4.8, "Starting up gear units in potentially explosive atmospheres".

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

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

2.7.2 Checklists

Before startup

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

Check prior to startup in potentially explosive atmospheres	Check	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. It may be that you are not permitted to startup the gear unit due to the damage. Remove securing devices used for transportation prior to startup.		2.3
Does the following information on the gear unit nameplate correspond with the permitted conditions for potentially explosive atmospheres on site: • Equipment group • Ex category • Ex zone • Temperature class • Maximum surface temperature		3.3 and 4.5
Have arrangements been made to prevent explosive atmospheres, oils, acids, gases, vapors or radiation during installation of the gear unit?		4.2
Is the ambient temperature maintained according to the lubricant table?		8.2
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.		4.4 and 4.5
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!		4.4
Are all screws easily accessible?		4.4
Do all input and output elements to be installed have ATEX certification?		4.8.5
Have you checked that the data on the nameplate of the gear unit are not exceeded for standalone gear units with adapter?		5

During startup

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

Check during startup in potentially explosive atmospheres	Check	Information in section ...
Measure the surface temperature after three hours of operation. Do not exceed a temperature difference of 70 K compared to the ambient temperature. If the value is > 70 K, stop the drive immediately and contact SEW-EURODRIVE!		5.1
Measure the surface temperature. Add 10 K to the measured value. Use this value to determine the lubricant change interval.		5.1 and 6.2

3 Delivery Scope and Unit Design

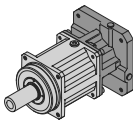
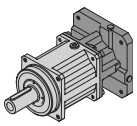
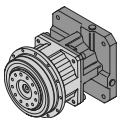
For scope of delivery and project planning, refer to the "Low Backlash Servo Gearmotors (BSF.., PSF..)" catalog and the operating instructions for the motor used to drive the gear unit.

3.1 Scope of delivery

Scope of delivery[1] PSF.. planetary servo gear units

- One operating instructions per order

3.2 Types and options

PSF.. planetary servo gear units with B5 output flange		
Type		**Description**
	PSF..	Planetary servo gear units with solid shaft
	PSKF..	Planetary servo gear units with solid shaft and key
	PSBF..	Planetary servo gear units with flange block shaft to EN ISO 9409
Options for PSF.. planetary servo gear units /PSKF.. /PSBF..		
Type		**Description**
	PSF.. /R	Option for reduced circumferential backlash. This **option applies to all types** of the planetary servo gear units.

1) When ordering several PSF.. planetary servo gear units, the customer can reduce the number of operating instructions.

3.3 Nameplate and unit designation

3.3.1 Example: Order code for PSF.. planetary servo gear units with EPH.. adapter

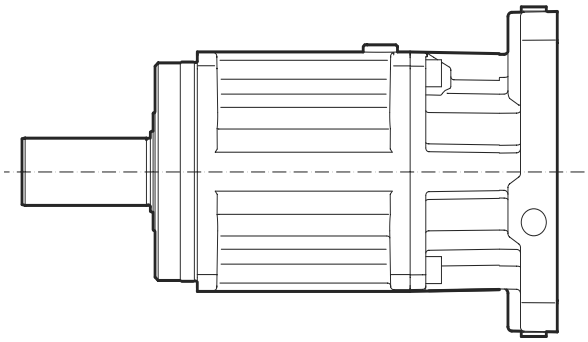


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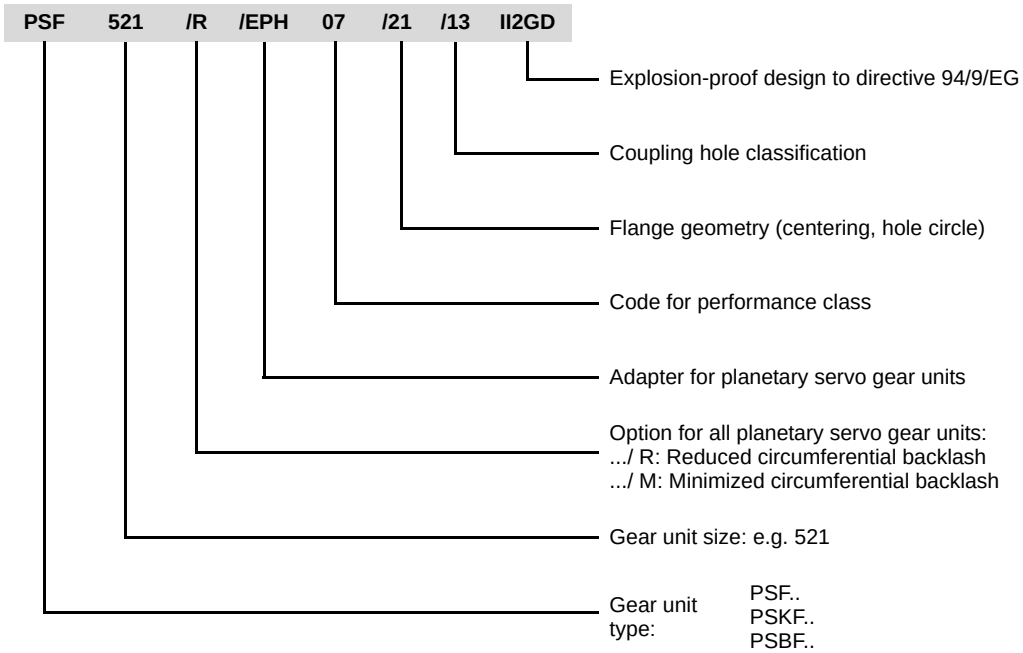
Figure 1: Example for a PSF.. planetary servo gear unit with EPH adapter

The unit designation of the PSF.. planetary servo gear unit with adapter begins with the series of the gear unit. For example, a category II2GD planetary servo gear unit with adapter has the following unit designation:



3.3.2 Nameplate (example)

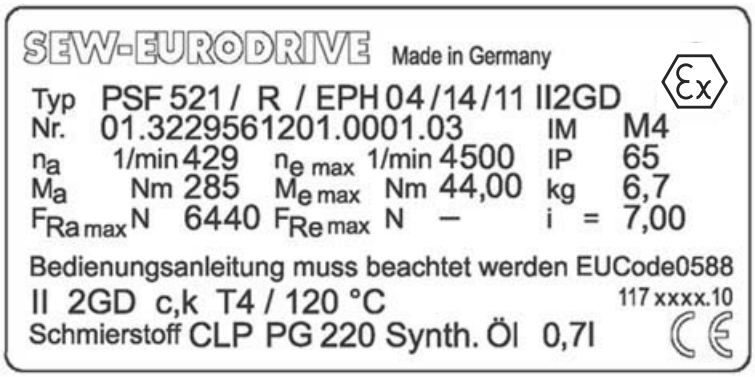


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Figure 2: Example nameplate

F_{Ramax}	[N]	= Maximum overhung load on the output side
F_{Remax}	[N]	= Maximum overhung load on the input side
i		= Gear unit reduction ratio
IM		= Mounting position
IP..		= Enclosure
n_{emax}	[1/min]	= Maximum input speed
n_a	[1/min]	= Output speed
M_{emax}	[Nm]	= Maximum input torque
M_a	[Nm]	= Output torque

3.4 Gear unit structure

The following illustrations are intended to explain the general structure. Their purpose is only to make it easier to assign components to the spare parts lists. Discrepancies may occur depending on the gear unit size and version!

3.4.1 Basic structure of single-stage planetary servo gear units PSF121 / PSKF121 to PSF621 / PSKF621

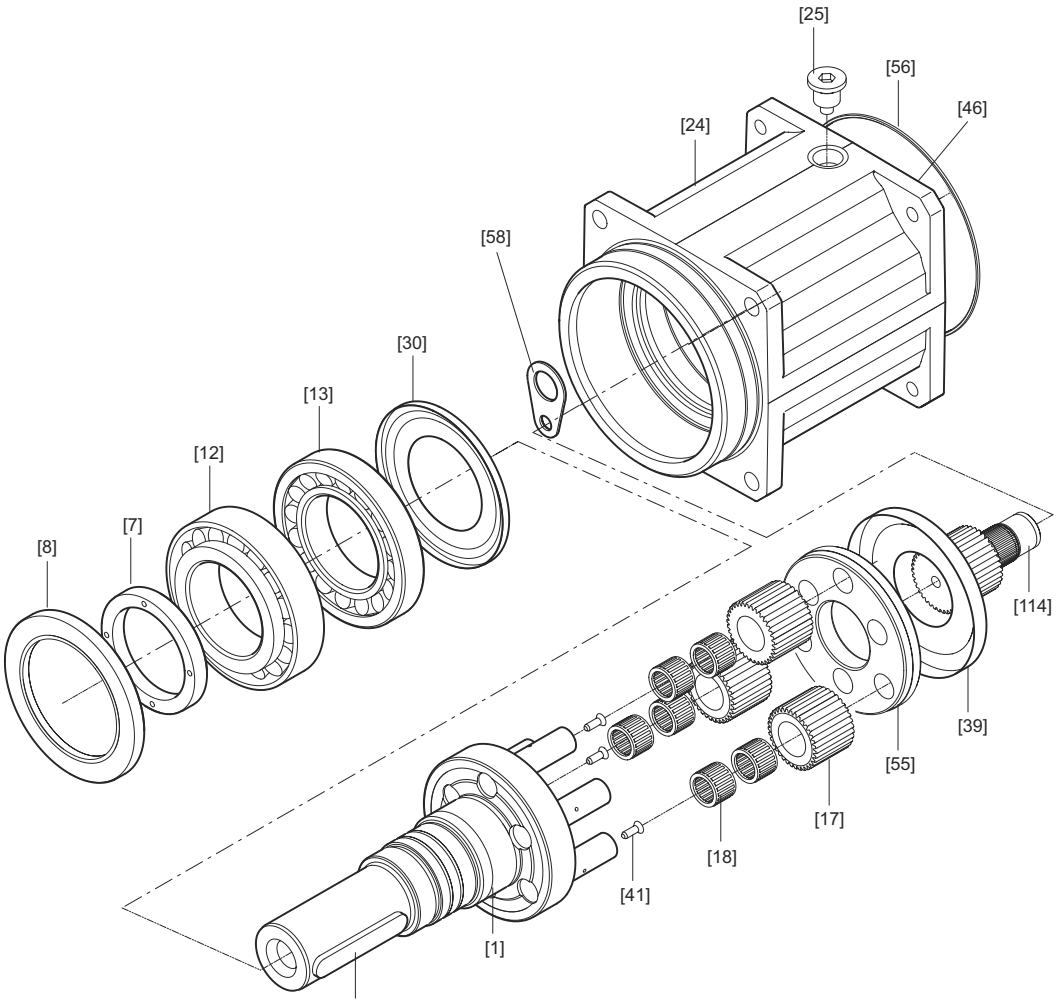

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Figure 3: Basic structure of planetary servo gear units PSF121 / PSKF121 to PSF621 / PSKF621

[1]	Planet carrier for output, complete	[17]	Planet wheel	[41]	Countersunk pin
[6]	Key[1)]	[18]	Needle roller	[46]	Adhesive and sealing compound
[7]	Shaft nut	[24]	Housing	[56]	O-ring
[8]	Oil seal	[25]	Screw plug	[58]	Eyebolt[2)]
[12]	Tapered roller bearing	[30]	Nilos ring[3)]	[114]	Sun wheel
[13]	Tapered roller bearing	[39]	Safety disk		

1) Only for PSKF121 to PSKF621
2) Only for PSF621 and PSKF621
3) Only for mounting position M2

3.4.2 Basic structure of single-stage planetary servo gear units PSF721 / PSKF721 to PSF921 / PSKF921

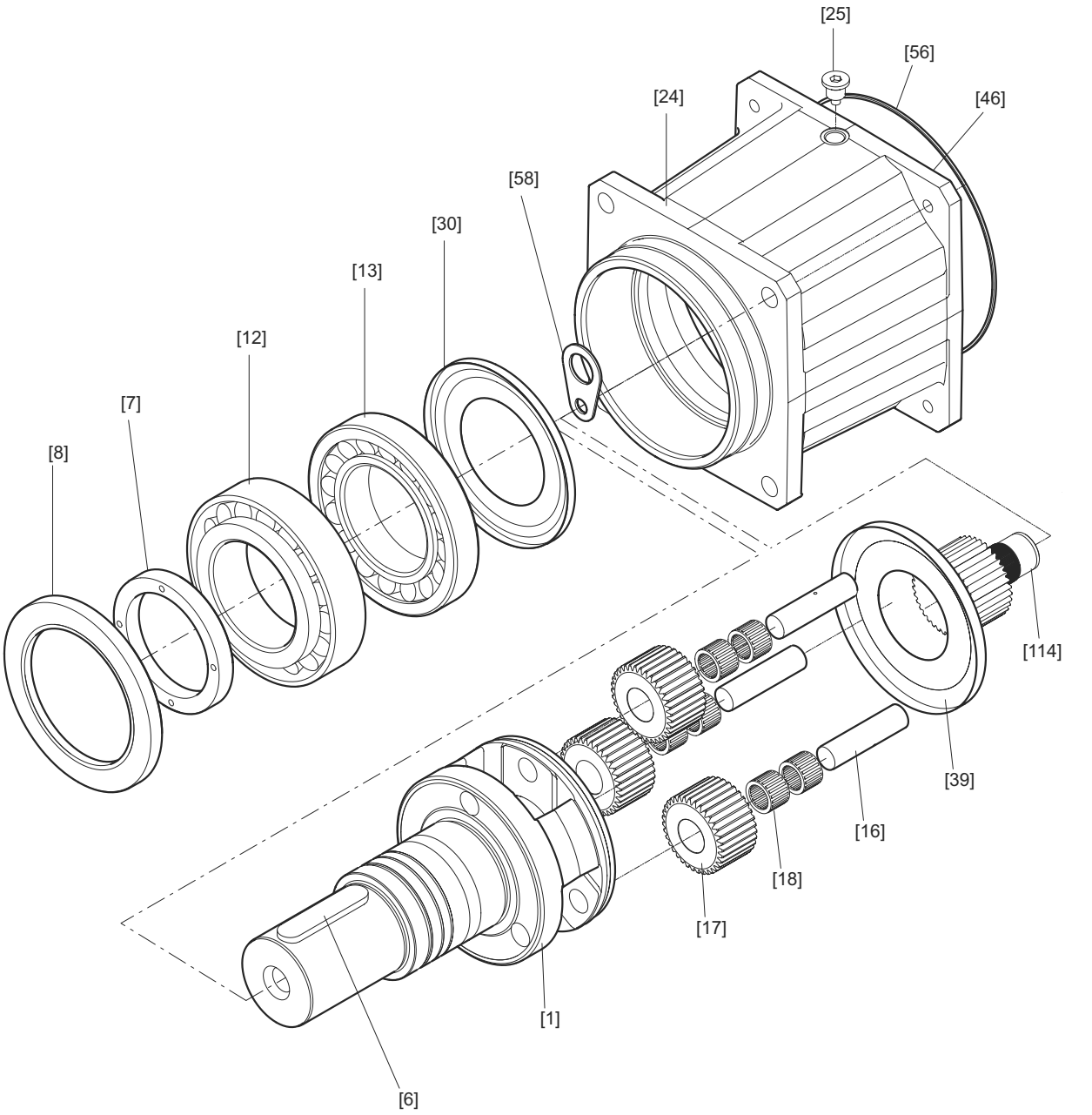

Figure 4: Basic structure of planetary servo gear units PSF721 / PSKF721 to PSF921 / PSKF921

[1]	Planet carrier for output	[16]	Planetary gear axle	[39]	Safety disk
[6]	Key[1)]	[17]	Planet wheel	[46]	Adhesive and sealing compound
[7]	Shaft nut	[18]	Needle roller	[56]	O-ring
[8]	Oil seal	[24]	Housing	[58]	Eyebolt
[12]	Tapered roller bearing	[25]	Screw plug	[114]	Sun wheel
[13]	Tapered roller bearing	[30]	Nilos ring[2)]		

1) Only for PSKF721 to PSKF921

2) Only for mounting position M2

3.4.3 Basic structure of two-stage planetary servo gear units PSF122 / PSKF122 to PSF622 / PSKF622

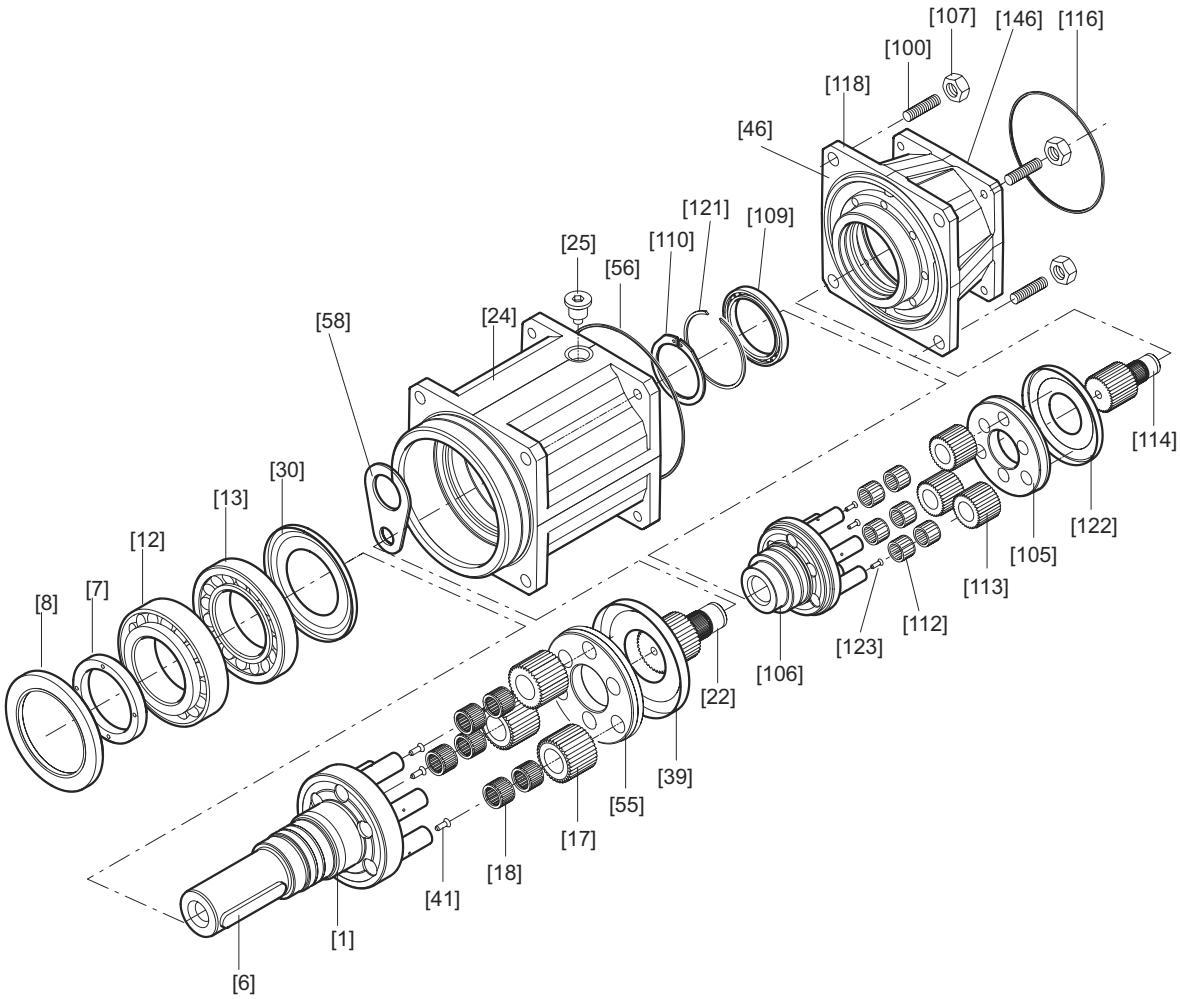

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Figure 5: Basic structure of planetary servo gear units PSF122 / PSKF122 to PSF622 / PSKF622

[1]	Planet carrier for output, complete	[30]	Nilos ring[1)]	[109]	Grooved ball bearing
[6]	Key[2)]	[39]	Safety disk	[110]	Circlip
[7]	Shaft nut	[41]	Countersunk pin	[112]	Needle roller
[8]	Oil seal	[46]	Adhesive and sealing compound	[113]	Planet wheel
[12]	Tapered roller bearing	[55]	Thrust plate	[114]	Sun wheel
[13]	Tapered roller bearing	[56]	O-ring	[116]	O-ring
[17]	Planet wheel	[58]	Eyebolt[3)]	[118]	Housing preliminary stage
[18]	Needle roller	[100]	Stud	[121]	Spring ring
[22]	Sun wheel	[105]	Thrust plate	[122]	Safety disk
[24]	Housing	[106]	Planet carrier, complete	[123]	Countersunk pin
[25]	Screw plug	[107]	Hexagonal nut	[146]	Adhesive and sealing compound

1) Only for mounting position M2
2) Only for PSKF122 to PSKF622
3) Only for PSF622 / PSKF622

3.4.4 Basic structure of two-stage planetary servo gear units PSF722 / PSKF722 and PSF822 / PSKF822

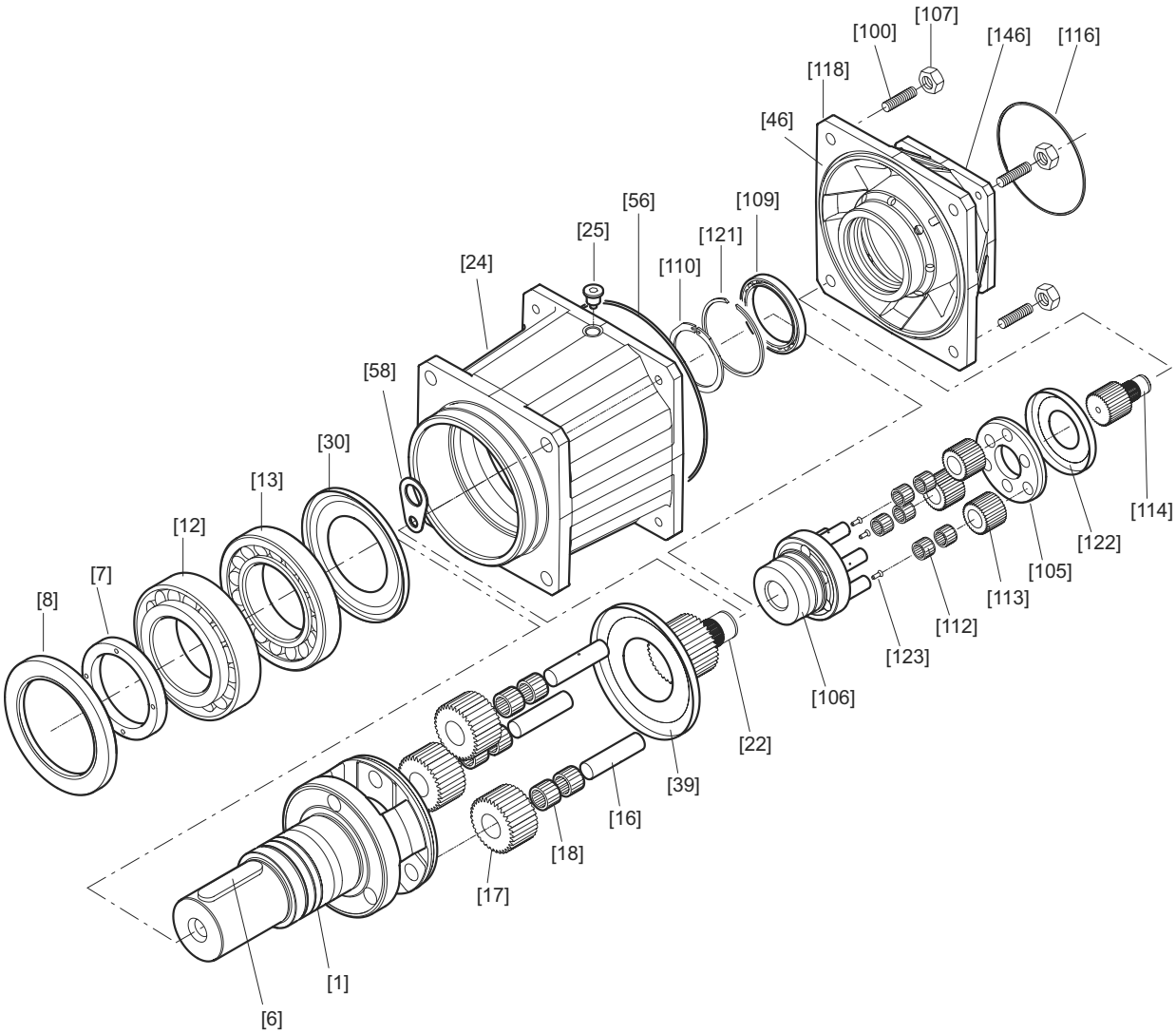

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Figure 6: Basic structure of planetary servo gear units PSF722 / PSKF722 and PSF822 / PSKF822

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

1) Only for PSKF722 and PSKF822

2) Only for mounting position M2

3.4.5 Basic structure of two-stage planetary servo gear units PSF922 / PSKF922

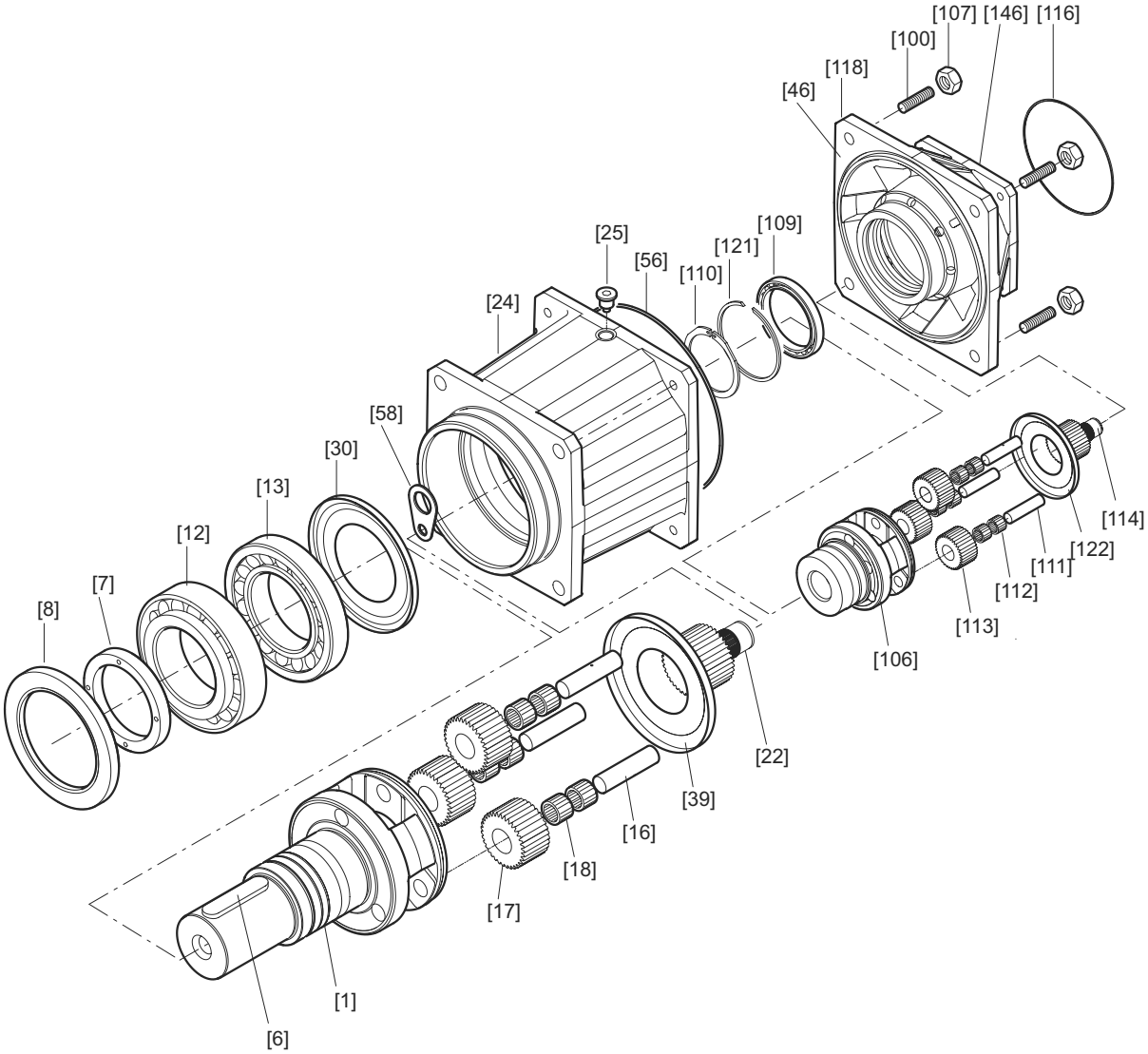

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Figure 7: Basic structure of planetary servo gear units PSF922 / PSKF922

[1]	Planet carrier for output	[25]	Screw plug	[110]	Circlip
[6]	Key[1)]	[30]	Nilos ring[2)]	[111]	Planetary gear axle
[7]	Shaft nut	[39]	Safety disk	[112]	Needle roller
[8]	Oil seal	[46]	Adhesive and sealing compound	[113]	Planet wheel
[12]	Tapered roller bearing	[56]	O-ring	[114]	Sun wheel
[13]	Tapered roller bearing	[58]	Eyebolt	[116]	O-ring
[16]	Planetary gear axle	[100]	Stud	[118]	Housing preliminary stage
[17]	Planet wheel	[105]	Thrust plate	[121]	Spring ring
[18]	Needle roller	[106]	Planet carrier	[122]	Safety disk
[22]	Sun wheel	[107]	Hexagonal nut	[123]	Countersunk pin
[24]	Housing	[109]	Grooved ball bearing	[146]	Adhesive and sealing compound

1) Only for PSKF922

2) Only for mounting position M2

3.4.6 Basic structure of single-stage servo planetary gear units PSBF221, PSBF321 to PSBF521, PSBF621 and PSBF821

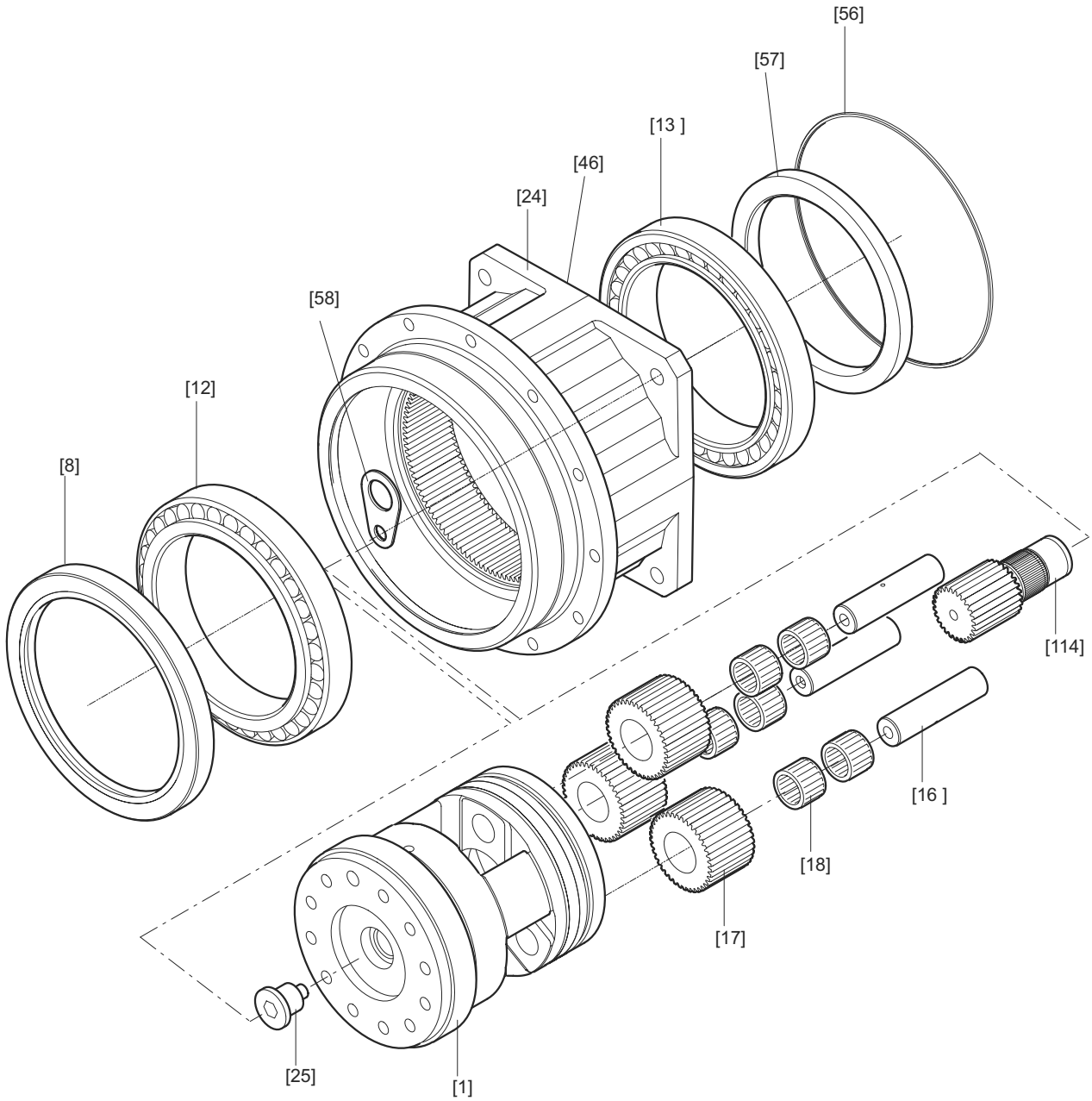

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Figure 8: Basic structure of servo planetary gear units PSBF221, PSBF321 to PSBF521, PSBF621 and PSBF821

[1]	Planet carrier for output	[16]	Planetary gear axle	[56]	O-ring
[8]	Oil seal	[17]	Planet wheel	[57]	Shaft nut
[12]	Angular contact ball bearing[1)]	[18]	Needle roller	[58]	Eyebolt [3]
[12]	Tapered roller bearing[2)]	[24]	Housing	[114]	Sun wheel
[13]	Angular contact ball bearing[2)]	[25]	Screw plug		
[13]	Tapered roller bearing[2)]	[46]	Adhesive and sealing compound		

1) Only for PSBF221

2) Only for PSBF321 to PSBF521, PSBF621 and PSBF821

3.4.7 Basic structure of two-stage servo planetary gear units PSBF222, PSBF322 to PSBF522, PSBF622 and PSBF822

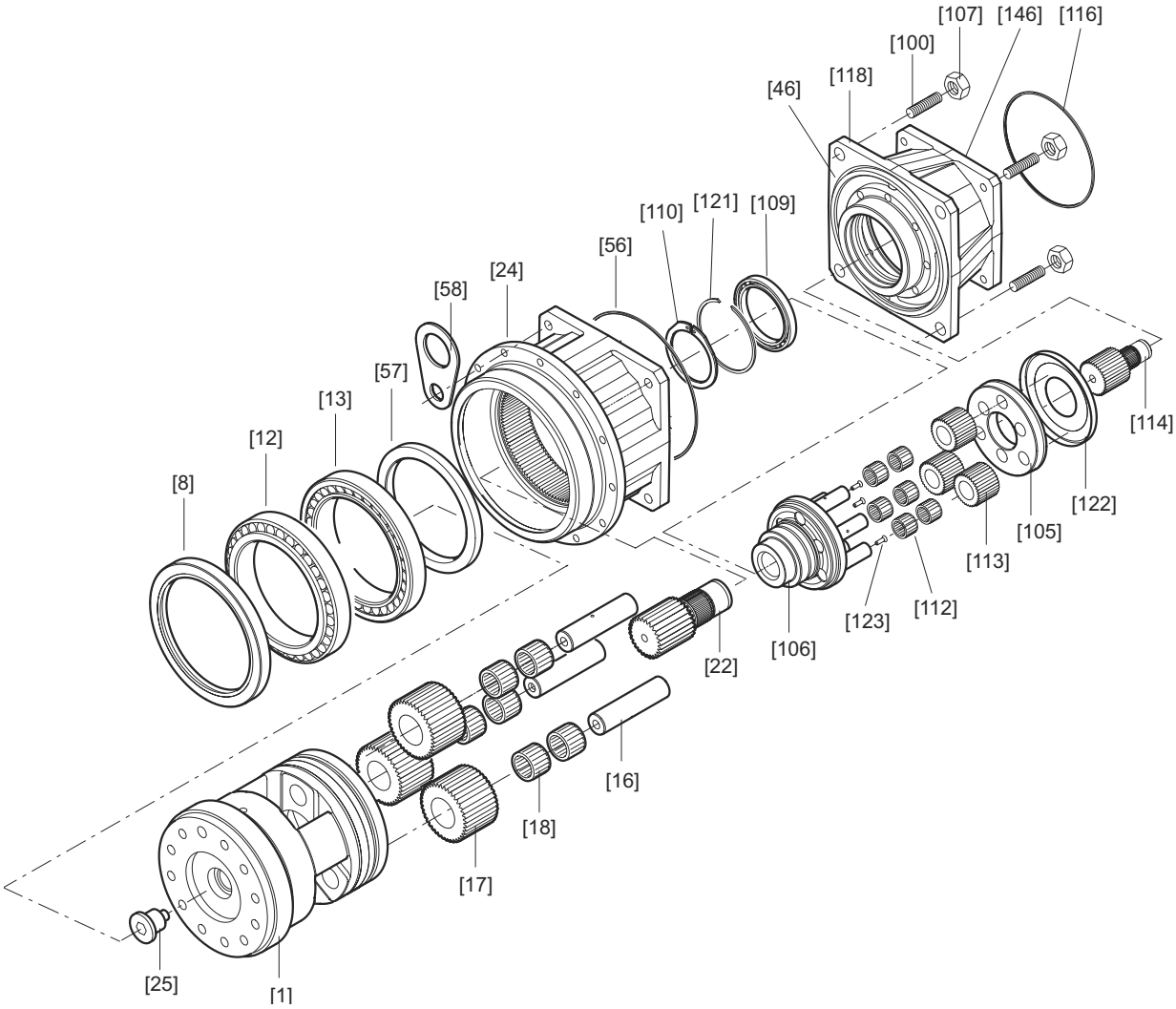

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Figure 9: Basic structure of servo planetary gear units PSBF222, PSBF322 to PSBF522, PSBF622 and PSBF822

[1]	Planet carrier for output	[25]	Screw plug	[112]	Needle roller
[8]	Oil seal	[46]	Adhesive and sealing compound	[113]	Planet wheel
[12]	Angular contact ball bearing[1)]	[56]	O-ring	[114]	Sun wheel
[12]	Tapered roller bearing[2)]	[57]	Shaft nut	[116]	O-ring
[13]	Angular contact ball bearing[1)]	[58]	Eyebolt[3)]	[118]	Housing preliminary stage
[13]	Tapered roller bearing[2)]	[100]	Stud	[121]	Spring ring
[16]	Planetary gear axle	[105]	Thrust plate	[122]	Safety disk
[17]	Planet wheel	[106]	Planet carrier, complete	[123]	Countersunk pin
[18]	Needle roller	[107]	Hexagonal nut	[146]	Adhesive and sealing compound
[22]	Sun wheel	[109]	Grooved ball bearing		
[24]	Housing	[110]	Circlip		

1) Only for PSBF222

2) Only for PSBF322 to PSBF522, PSBF622 and PSBF822

3) Only for PSBF622 and PSBF822

3.4.8 Basic design of the adapter for planetary servo gear units

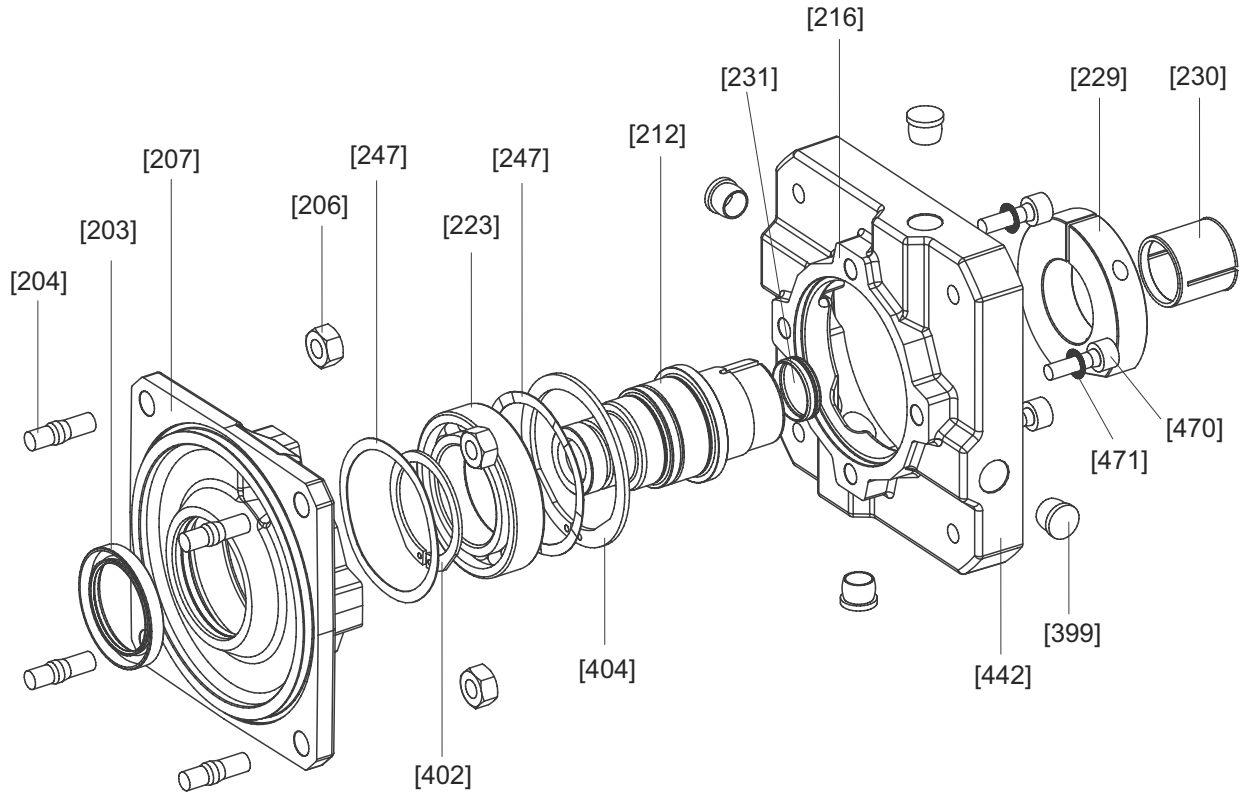

Figure 10: Basic design of the adapter for planetary servo gear units

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

4 Mechanical Installation

4.1 Before you start

The drive may only be installed if:

- the entries on the nameplate of the motor match the voltage supply system
- the drive is undamaged (no damage caused by transportation or storage)

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.

4.2 Prerequisites for assembly

- Ensure that the following requirements have been met:
  - The ambient temperature must be between -20 °C and +40 °C according to the lubricant table in section 8, "Lubricants." Please contact SEW-EURODRIVE if your ambient temperature is higher.
  - The drive must not be assembled in the following ambient conditions:
    - Potentially explosive atmosphere
    - Oils
    - Acids
    - Gas
    - Vapors
    - Radiation
- 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.

Possible material damages!

Do not let the solvent come into contact with the sealing lips of the oil seals!

- Do not assemble the drive without having ensured that there will be sufficient ventilation after installation to prevent heat accumulation.
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.

4.3 Required tools / resources

- Set of wrenches
- Torque wrench (+ set of screwdrivers with long hexagon shaft)
- Mounting device
- Shims and distance rings if necessary
- Fixing devices for input and output elements

4.4 Installing the gear unit

The gear unit is only allowed to be installed in the specified mounting position on a level[1)] , vibration damping and torsionally rigid support structure. Vibrations from the environment must be avoided.

Always use **screws** of **quality 10.9** for mounting planetary servo gearmotors.

The drain screw must be easily accessible!

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

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 bleeder resistor < 10^9 Ω. Electrochemical corrosion can occur between various metals, for example, cast iron and high-grade steel. Also install the bolts with plastic washers!

Possible generation of electrical sparks !

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

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

1) Maximum permitted deviation for flange attachment to DIN ISO 1101.

4.5 Installation of gear units in a potentially explosive atmosphere

Make sure to observe the safety notes listed in section 2 when installing the gear unit in a potentially explosive atmosphere!

SEW explosion-proof PSF.. planetary servo gear units meet the design requirements of equipment group II, category 2G (explosive gas atmosphere) and 2D (explosive dust atmosphere). These gear units are intended for use in zones 1 and 21.

4.5.1 Ambient temperature

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

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

4.5.2 Surface temperature

The maximum surface temperature of category II2D units is 120 °C depending on the speed, gear ratio, and mounting position. 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.

4.5.3 Degree of protection

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

4.5.4 Ambient conditions

Provide sufficient ventilation for the gear units and prevent external heat generation (e.g. via clutches).

4.5.5 Output power and output torque

Maintain output torque and permitted overhung load requirements.

4.5.6 Special designs

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

4.5.7 Installation in damp locations or in the open

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

4.6 Installation in a machine

PSF.. planetary servo gear units Mounting at gear unit end via the B5 mounting flange

Mounting position M1:

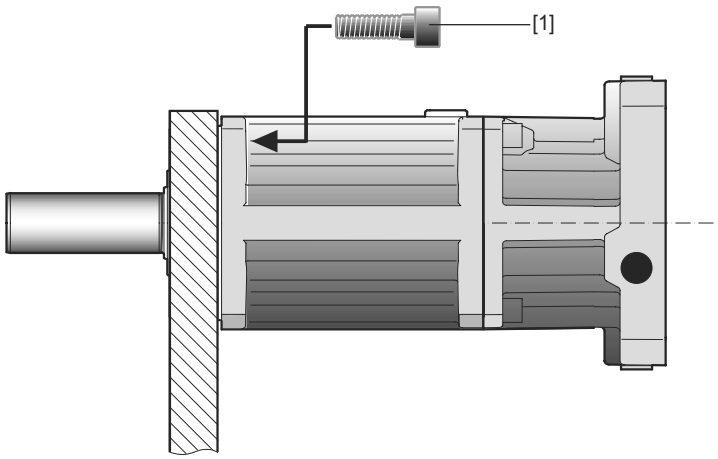

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Figure 11: Installing the PSF.. planetary servo gear unit in the machine

[1] Screws of quality 10.9

4.7 Mounting output elements on solid shafts

When mounting and removing output elements, ensure that the gear unit shaft and consequently the planetary servo gear unit is not damaged. Otherwise your right to claim under warranty against SEW-EURODRIVE GmbH & Co KG becomes invalid.

4.7.1 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.

In the **PSF.. / PSKF.. series**, you can use the **shaft shoulder** (see position [1]) **as** defined **stop when mounting input and output elements**.

The output shafts are coated as standard with an **antirust agent**. **Remove** the antirust agent **before assembly**, e.g. using benzine.

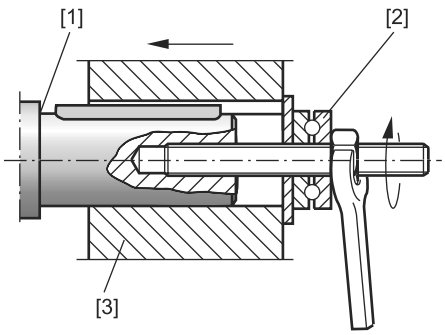

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Figure 12: Assembly with mounting device

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

4.7.2 Assembly without key

The following figure is an example of shaft assembly with clamping set.

When using, for example, clamping sets with smooth shaft ends, ensure that the shaft is free from residue and that any grease is removed. It is essential to make sure that the **clamping area** [5] is **free from grease**. Otherwise the shaft/hub connection may not function properly.

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

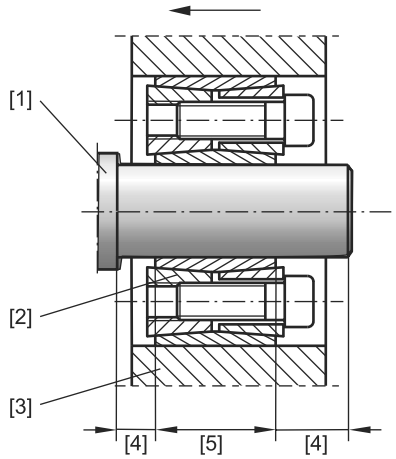

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Figure 13: Assembly with clamping sets

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

4.7.3 Avoiding impermissibly high overhung loads

The following illustration shows the correct mounting arrangement of a gear or chain sprocket for avoiding impermissibly high overhung loads.

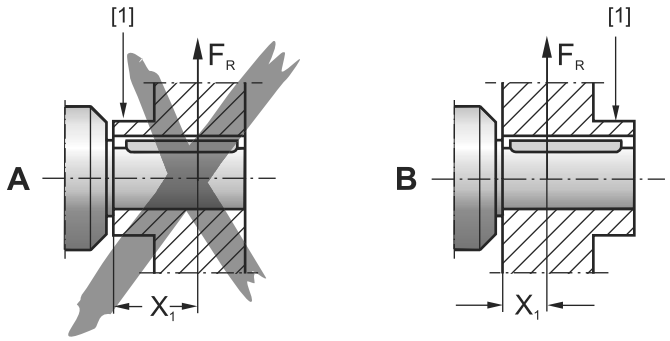

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Figure 14: Mounting arrangement of a gear or sprocket wheel

[1] Hub

Illustration A = Not correct

Illustration B = Correct

4.7.4 Inner and outer centering ring

The following illustration shows the correct mounting arrangement for a shaft connection with an inner and outer centering ring.

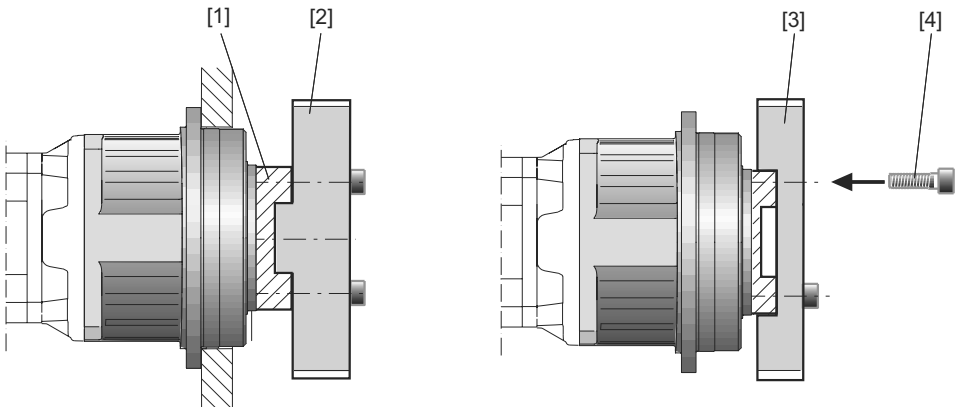

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Figure 15: Sample mounting for a PSBF.. flange block

[1] Flange block

[2] Gear / belt pulley with inner centering ring

[3] Gear / belt pulley with outer centering ring

[4] Screws of quality 12.9

4.7.5 Installation notes

Observe the following installation instructions:

Use only input and output elements with ATEX approval, if these are subject to Directive 94/9/EG.

- Only use a mounting device for installing input and output elements. Use the center bore and the thread on the shaft end for positioning.
- Never drive belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer as this can damage the bearings, housing and shaft.
- In the case of belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions.

Use belts with sufficient electrical leakage resistance < 109 Ω only.

- The belts 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).

Only use screws in strength class 12.9 to fasten the output elements onto the planetary servo gear unit; see the following table:

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 is easier if you heat the bore of the output element briefly to between 80 °C and 100 °C.

4.8 Installing couplings

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

A Maximum and minimum clearance

B Axial misalignment

C Angular misalignment

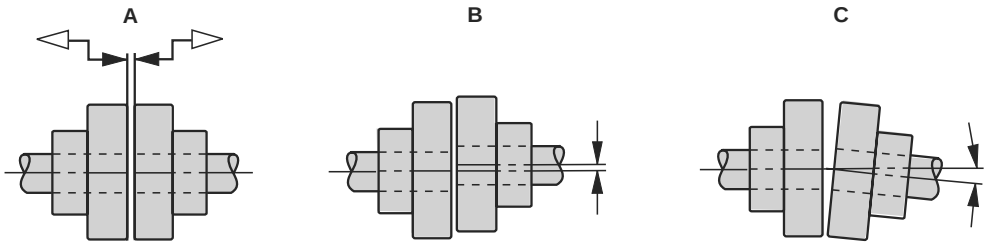

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Figure 16: Maximum and minimum clearance (A), axial misalignment (B), angular misalignment (C)

Caution! Risk of crushing and injury!

Input and output elements such as belt pulleys, couplings, etc. must be covered with a touch guard to prevent injuries.

4.9 Motor mounting with EPH.. adapter

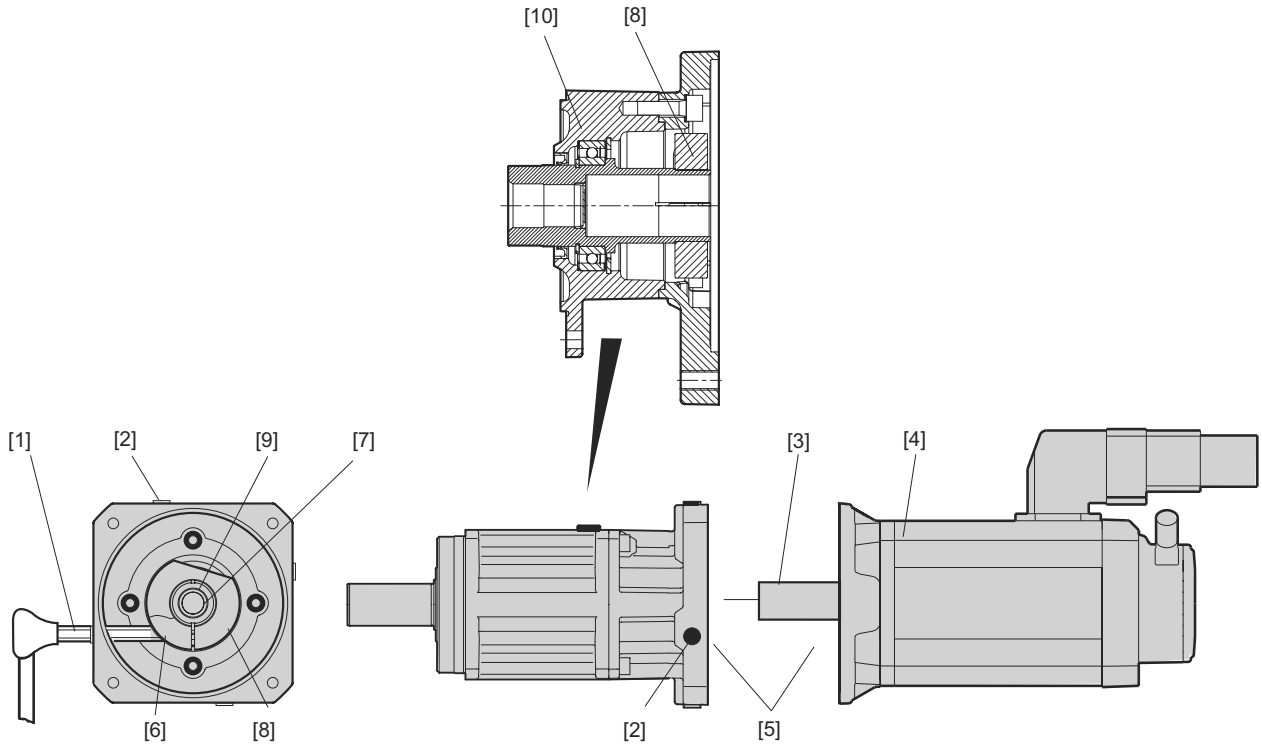


Figure 17: Motor mounting with EPH.. adapter

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

STOP

When installing or removing the EPH.. adapter, take care not to tilt or jam the servomotor, otherwise the function for transferring the torque may not work properly.

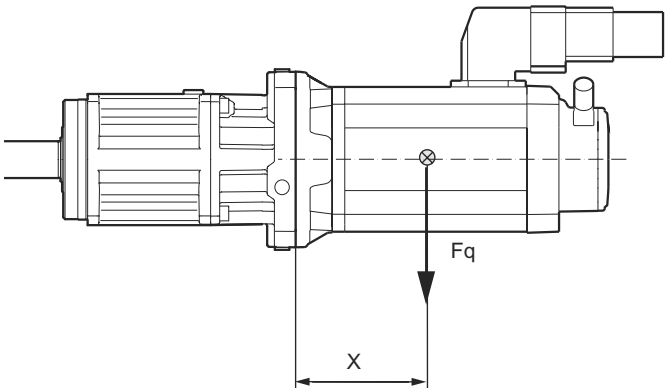
4.9.1 Installation sequence

Observe the following sequence for installation:

1. A motor [4] with a minimum rotational accuracy to DIN 42955 can be mounted in any position. Protect the encoder and other assemblies.
2. Check the plane surfaces [5] of motor and adapter for scoring and smoothen them if necessary.
3. Clean and degrease the hollow shaft bore in coupling [10] and motor shaft [3].
4. Remove one of the four closing plugs [2].
5. Turn the coupling [10] with the clamping ring [9] until the screw head of the clamping screw (7) is in alignment with the mounting hole in the built-on housing. Loosen the clamping screw [7].
   – For motors with a keyway: Turn the key by 90° to the slots in the adapter shaft. We recommed to insert a half key into the keyway to compensate for the imbalance.
6. If coupling sleeves [8] are used, make sure that the slots in the coupling sleeve [8] are in alignment with the slots in the coupling [10] and clamping ring [9].
7. Carefully slide the gear unit onto the motor shaft [3].
8. Insert the connecting screws through the holes of the motor flange into the threads of the adapter flange.
9. Tighten the screws diagonally with even force.
10. Use a torque wrench [1] to tighten the clamping screw(s) [7] to the prescribed tightening torque.

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

4.9.2 Maximum permitted weight of motors



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⊗ .. Motor's center of gravity

X .. Distance from adapter flange to the middle of the motor

Fq .. Overhung load

Gear unit type	Adapter type EPH	X [mm]	Fq [N][1)]
PSF..121 **PSF..122** **PSF..222**	EPH01/01-03	100	120
	EPH02/04-11	120	150
PSF..221 **PSF..322**	EPH01/01-03	100	120
	EPH02/04-08	120	150
	EPH03/06-14	182	157
	EPH04/12-14	182	157
PSF..321 **PSF..522**	EPH04/03-14	182	157
	EPH05/14-20	290	273
PSF..521 **PSF..622** **PSF..722**	EPH04/12-14	182	157
	EPH05/14-20	220	273
	EPH06/19	290	312
	EPH07/20-22	290	312
PSF..621 **PSF..822**	EPH05/14-20	220	273
	EPH06/19	290	312
	EPH07/20-22	290	312
	EPH08/22	351	600
PSF..721 **PSF..922**	EPH05/14-20	220	273
	EPH06/19	290	312
	EPH07/20-22	290	312
	EPH08/22	351	600
PSF..821	EPH09/22-24	400	680
	EPH10/24-25	400	680
PSF..921	EPH09/22-24	400	680
	EPH10/24-25	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.

4.10 Removing the motor with EPH.. adapter

If the customer removes the adapter on the planetary servo gear unit, this can cause the unit to malfunction!

Never remove the adapter for the PSF.. planetary servo gear unit yourself. If a customer removes the PSF.. planetary servo gear unit themselves, this can cause the unit to malfunction. In this case, the customer's right to claim on warranty is no longer valid.

4.10.1 Removing the EPH.. adapter from the motor .

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

5 Startup

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

Secure the keys for the test run without output elements. Do not deactivate monitoring and protection devices for the test run.

Switch off the gear unit immediately if the surface temperature exceeds 110 °C.

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.

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

5.1 Measuring surface and oil temperature

The nameplate data on maximum surface temperature are based on measurements at standard ambient conditions and installation altitudes. Even slight changes of these conditions (such as limited installation space) can have a tremendous impact on the temperature.

5.1.1 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 where the position of the terminal box prevents venting by the motor fan. The maximum surface temperature will be reached after approximately three hours and may not exceed a difference value of 70 K when compared with the ambient temperature.

Switch off the drive immediately if the temperature exceeds 70 K compared with the ambient temperature. Contact SEW-EURODRIVE in this case.

5.1.2 Measuring the oil temperature

It is necessary to measure the oil temperature to determine the lubricant change intervals set forth in the section "Inspection and Maintenance." It will be necessary to 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.

6 Service and Maintenance

6.1 Maintenance

The PSF.. planetary servo gear units are designed for high endurance when operated according to the designated use specified in the catalog. Wearing parts are an exception, for example, the bearings, oils seals for the specific application and the lubricant.

The maintenance work listed in the table below must be carried out for the PSF.. planetary servo gear units.

Time interval	What to do?
• Every 3000 machine hours, at least every 6 months	• Check running noise for possible bearing damage • Check the adapter visually for leakage • Check the seals visually for leakage. If you notice a leakage, contact service.
• If required (depending on external factors)	• Touch up or renew the surface / anticorrosion coating
• Depending on the operating conditions, at the latest every 5 years	• Change synthetic oil • Touch up or renew the surface / anticorrosion coating
• After 25000 ... 30000 operating hours	• Renew the anti-friction bearing grease • Change the oil seal

Mixing lubricants!

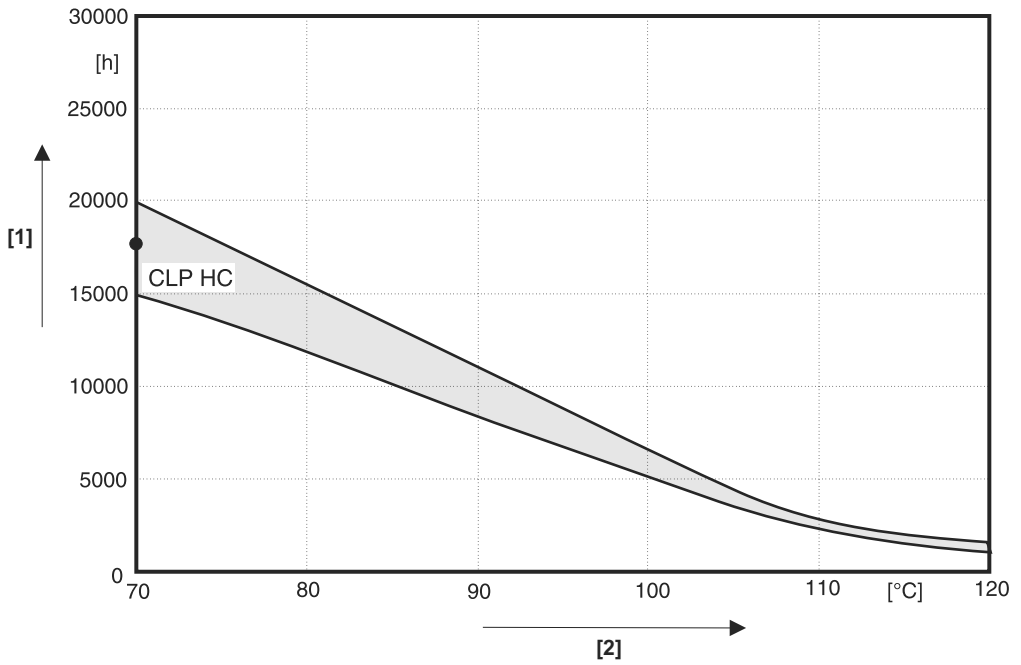
Do not mix the factory-filled lubricant with other lubricants.

Use only OEM spare parts according to the delivered spare parts lists.

6.2 Lubricant change intervals

PSF.. planetary servo gear units can be used in ambient temperatures between –20 °C and +40 °C.

The following table lists lubricant change intervals for the above mentioned temperature range.



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[1] Operating hours

[2] Sustained oil bath temperature

- Average value per oil type at 70 °C

See chapter 8 for more information on lubricants.

6.2.1 Fill quantities dependent on mounting position

PSF.. planetary servo gear units	Adapter mounting - Fill quantity in liters [l]			Direct mounting Fill quantity in liters [l]		
Type	M1 (M3, M5, M6)	M2	M4	M1 (M3, M5, M6)	M2	M4
121	0.023	0.025	0.023	0.023	0.037	0.023
122	0.035	0.056	0.054	0.035	0.068	0.054
221	0.035	0.052	0.035	0.035	0.063	0.035
222	0.045	0.075	0.085	0.045	0.085	0.085
321	0.070	0.100	0.070	0.070	0.120	0.070
322	0.095	0.170	0.190	0.095	0.185	0.190
521	0.140	0.215	0.150	0.140	0.245 (0.270)*	0.150
522	0.200	0.360	0.395	0.200	0.380	0.395
621	0.300	0.465	0.320	0.300	0.500 (0.550)*	0.320
622	0.410	0.680	0.780	0.410	0.710	0.780
721	0.600	0.930	0.650	0.600	1.060	0.650
722	0.750	1.230	1.645	0.750	1.280	1.645
821	1.000	1.750	1.350	-	-	-
822	1.550	2.550	3.350	1.550	2.640	3.350
921	1.400	2.450	1.900	-	-	-
922	2.050	3.500	4.350	2.050	3.650	4.350

PSBF.. planetary servo gear units	Adapter mounting - Fill quantity in liters [l]			Direct mounting Fill quantity in liters [l]		
Type	M1 (M3, M5, M6)	M2	M4	M1 (M3, M5, M6)	M2	M4
221	0.025	0.040	0.025	0.025	0.051	0.025
222	0.035	0.061	0.060	0.035	0.074	0.060
321	0.050	0.073	0.055	0.050	0.090	0.055
322	0.075	0.140	0.135	0.075	0.150	0.135
521	0.100	0.150	0.110	0.100	0.175 (0.200)*	0.110
522	0.150	0.295	0.280	0.150	0.315	0.280
621	0.200	0.320	0.190	0.200	0.360 (0.410)*	0.190
622	0.300	0.540	0.500	0.300	0.570	0.500
821	0.600	1.100	0.800	-	-	-
822	1.100	1.900	2.100	1.100	2.000	2.100

*) Fill quantities for direct mounting of CFM90 servomotors	
PSF.. and PSBF.. planetary servo gear units	Fill quantity tolerance in liters [l]
100	± 0.001
200	± 0.001
300	± 0.002
500	± 0.005
600	± 0.005
700	± 0.010
800	± 0.010
900	± 0.010

7 Malfunctions

7.1 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
- Type and accompanying circumstances of the problem
- Assumed cause

7.2 Faults and troubleshooting

Fault	Possible cause	Remedy
Unusual, irregular running noise	• Meshing / grinding noise: Bearing damage • Knocking noise: Irregularity in the gearing	• Contact customer service
	• Controller setting	• Check inverter parameters
Oil leaking	• Defect oil seal or pseudo-leakage[1)]	• Contact customer service
Lubricant leaks from adapter	• Defect oil seal or pseudo-leakage[1)]	• Contact customer service
Difference between surface temperature and ambient temperature >70 °C	**SWITCH OFF DRIVE IMMEDIATELY !**	
	• Restricted air supply	• Ensure air supply is unrestricted and / or contact customer service
	• Speed/torque is too high	• Check the configuration and / or contact customer service

1) A temporary leakage caused by too much grease between the sealing lip and protective lip. The superfluous grease appears as a pseudo-leakage.

7.3 Send in for repair

Please contact the SEW-EURODRIVE service if a malfunction cannot be rectified.

Please provide the following information when sending the drive in for repair:

- Serial number (→ nameplate)
- Unit designation
- Digits of the service code
- Brief description of the application
- Connected motor (motor type, motor voltage, ⅄ or Δ circuit, rated speed)
- Nature of the error
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

8 Lubricants

8.1 General information

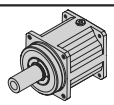
Unless a special arrangement is made, SEW-EURODRIVE supplies the gear units with a lubricant fill adapted for the specific mounting position. The decisive factor is the mounting position (M1...M6) specified when ordering the drive. The standard synthetic lubricant has a service life of approximately 5 years under normal operating conditions. When subject to increased stress, such as higher temperatures, the oil must be changed according to the lubrication intervals specified in page 37.

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 no longer applies.

- The PSF.. planetary gear units from SEW-EURODRIVE are supplied exclusively with synthetic lubricants.
- Food-grade lubricants are available from SEW-EURODRIVE on request.

The following lubricant table shows the permitted lubricants for PSF.. planetary servo gear units from SEW-EURODRIVE.

8.2 Lubricant table for gear unit oil

PSF..	Ambient temperature °C -20 0 +20 +40 +60	DIN ISO	ISO	Oil	Anti-friction bearing grease
	- 20 ... + 40	CLP PG 220[1)]	VG 220	Klübersynth GH6-220	Klüber Petamo GHY 133 N

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1) CLP PG = Polyglycol

9 Mounting Positions

9.1 General information on mounting positions

In the case of planetary servo gear units, SEW-EURODRIVE distinguishes between mounting positions M1 to M6. The following figure shows the position of the gear unit in mounting positions M1 to M6.

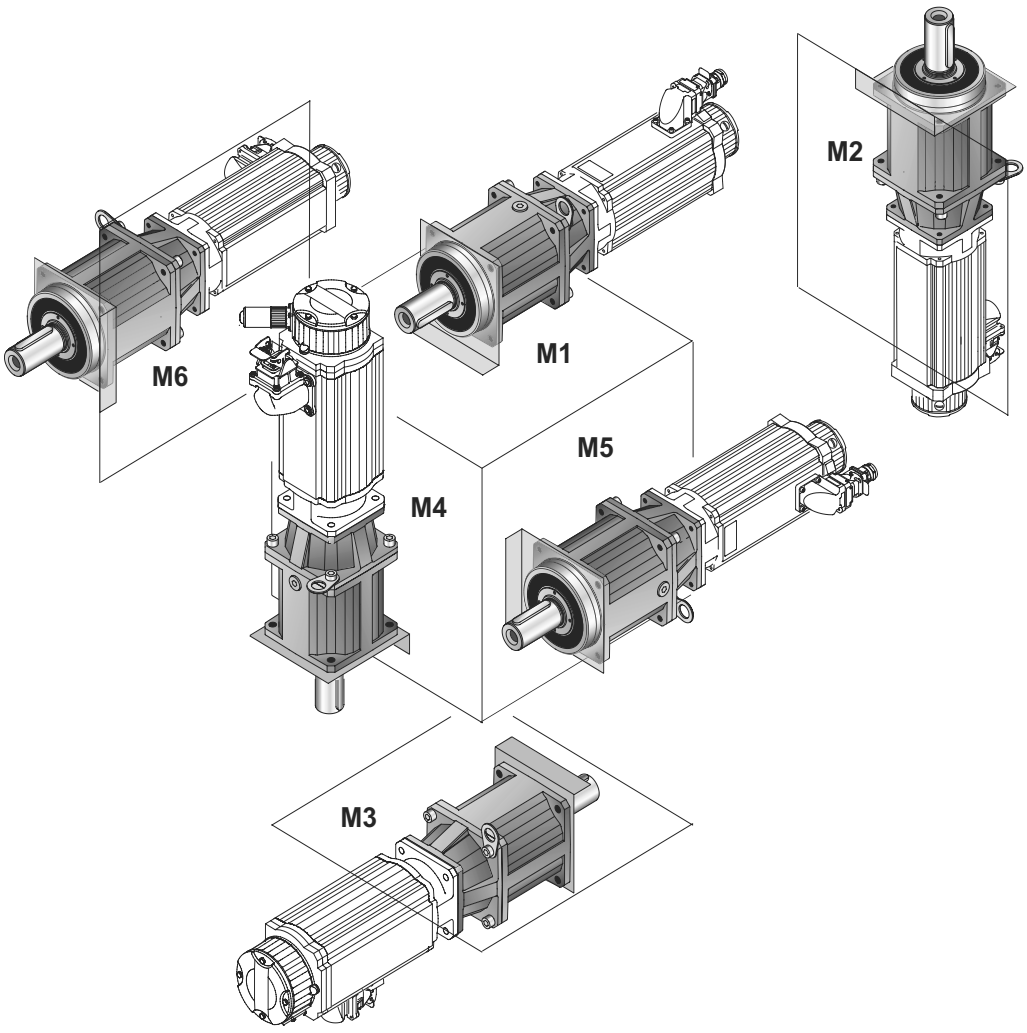

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Figure 18: Depiction of mounting positions M1 to M6 for the PSF.. planetary servo gear units

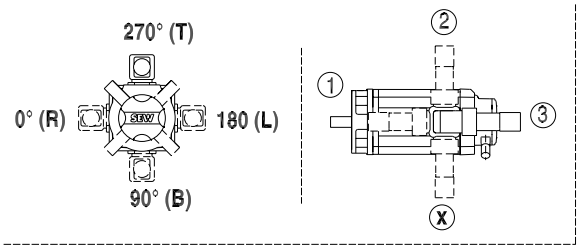
9.1.1 Symbols used

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

Symbol	Description
3	"Standard" cable entry position

9.2 Mounting positions for planetary servo gearmotors

9.2.1 PSF112-912



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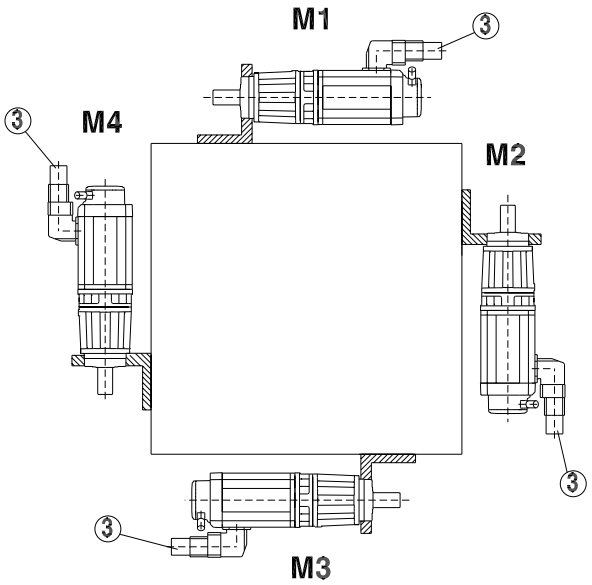

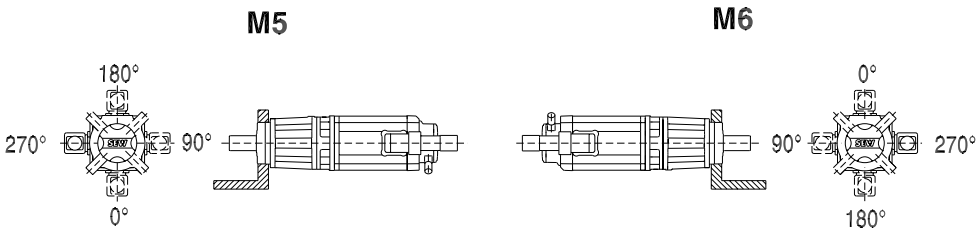

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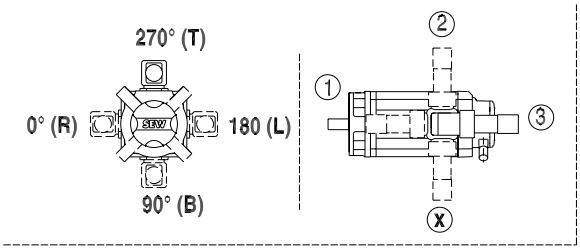
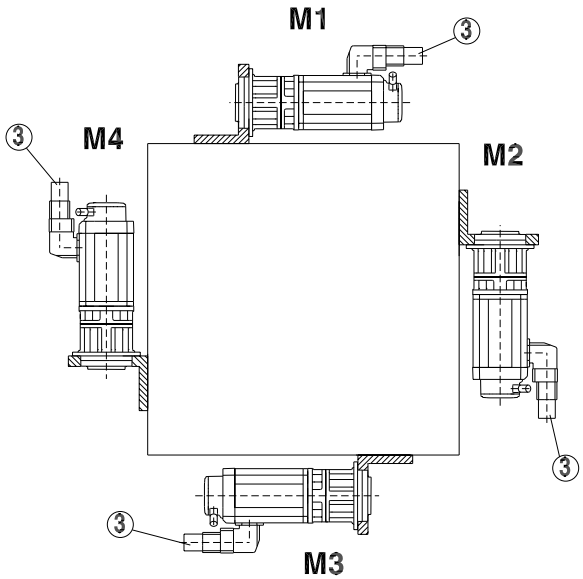
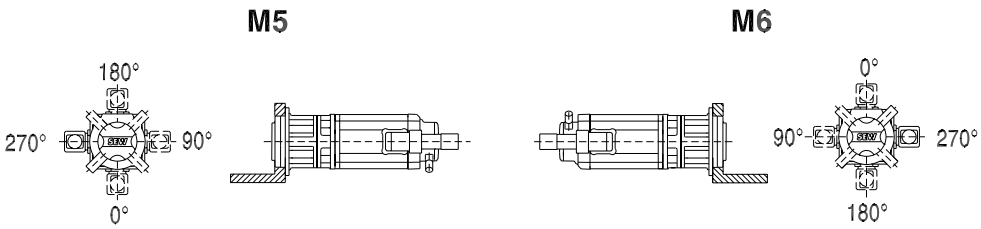
9.2.2 PSBF112-912



58 002 00 03





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10 Declaration of Conformity

EG-Konformitätserklärung

EC-Declaration of Conformity
Déclaration de conformité CE

DIN EN ISO 9001

im Sinne der Richtlinie 94/9/EG, Anhang VIII **Nr**./*No*/*N°* **151.01**
according to EC Directive 94/9/EC, Appendix VIII
au sens de la directive CE 94/9/CE, Annexe VIII

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

erklärt in alleiniger Verantwortung die Konformität der folgenden Produkte:
declares under sole responsibility conformity of the following products:
déclare, sous sa seule responsabilité, que les produits :

Servogetriebe mit Motoradapter	**BSF..EBH../PSF..EPH..**	**der Kategorien**	**2GD**
Servo gear units with motor adapter	*BSF..EBH../PSF..EPH..*	*in categorys*	*2GD*
Réducteurs servo avec adaptateur moteur	*BSF..EBH../PSF..EPH..*	*des catégories*	*2GD*

mit der Richtlinie:	***94/9 EG***
with the directive:	*94/9 EC*
respectent la directive :	*94/9 CE*

angewandte Normen:	**EN 1127-1 : 1997-10**
applied standards:	**EN 13463-1 : 2001-11**
Normes appliquées :	**EN 13463-5 : 2003-12**
	EN 13463-8 : 2003-09
	EN 60529 : 2000-09

SEW-EURODRIVE hinterlegt die gemäß 94/9EG, Anhang VIII geforderten Unterlagen bei benannter Stelle: FSA GmbH, EU - Kennnummer 0558

SEW-EURODRIVE will archive the documents required according to 94/9/EC, Appendix VIII at the following location: FSA GmbH, EU Code 0558

SEW-EURODRIVE tient à disposition la documentation spécifiée dans la directive 94/9/CEE, Annexe VIII pour consultation à l'endroit désigné : FSA GmbH, code UE 0558

Ort / Datum
Place/date / Lieu et date

Bruchsal, 12.09.2005

Geschäftsführer Vertrieb und Marketing
Managing Director Sales and Marketing
Directeur général international commercial et marketing

H. Sondermann

11 Appendix

11.1 List of Abbreviations

Abbreviation	Definition/ meaning
PSF..	Planetary servo gear unit [engl.: **P**lanetary **S**ervo **F**lange]
DIN (German Industrial Standard)	**D**eutsches **I**nstitut für **N**ormung e.V. [German institute for standardization]
EN	**E**uropäische **N**orm [European standard]
ISO	**I**nternational **O**rganization for **S**tandardization • The ISO creates ISO standards that should be adopted unrevised by the member states.
SW	**S**chlüssel**w**eite [Wrench size]

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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
Service **Competence Center**	**Central** Gear units / Motors	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-gm@sew-eurodrive.de
	Central Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-mitte-e@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
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
	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
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
	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	**Alger**	Réducom 16, rue des Frères Zaghnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84

Argentina			
Assembly **Sales** **Service**	**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

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://sew-eurodrive.at sew@sew-eurodrive.at

Belgium			
Assembly **Sales** **Service**	**Brüssel**	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
	Additional addresses for service in Brazil provided on request!		

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9532565 Fax +359 2 9549345 bever@fastbg.net

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 4322-99 Fax +237 4277-03

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.reynolds@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta. B.C. V4G 1 E2	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 Street LaSalle, Quebec 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 de Chile**	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 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 25322611 gm-tianjin@sew-eurodrive.cn http://www.sew.com.cn

China			
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021 P. R. China	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew.com.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 sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@net.hr

Czech Republic			
Sales	**Praha**	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Luná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 a220121236 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Kopenhagen**	SEW-EURODRIVEA/S Geminivej 28-30, P.O. Box 100 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Paldiski mnt.125 EE 0006 Tallin	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

Gabon			
Sales	**Libreville**	Electro-Services B.P. 1889 Libreville	Tel. +241 7340-11 Fax +241 7340-12

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-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

Greece			
Sales **Service**	**Athen**	Christ. Boznos & Son S.A. 12, 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 2 7960477 + 79604654 Fax +852 2 7959129 sew@sewhk.com

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 office@sew-eurodrive.hu

India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi · Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 mdoffice@seweurodriveindia.com
Technical Offices	**Bangalore**	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bangalore	Tel. +91 80 22266565 Fax +91 80 22266569 salesbang@seweurodriveinindia.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

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 lirazhandasa@barak-online.net

Italy			
Assembly **Sales** **Service**	**Milano**	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 sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36

Japan			
Assembly **Sales** **Service**	**Toyoda-cho**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 sewjapan@sew-eurodrive.co.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate Unit 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 master@sew-korea.co.kr

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139386 Fax +371 7139386 info@alas-kuul.ee

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com

Lithuania			
Sales	**Alytus**	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.caron-vector.be info@caron-vector.be

Malaysia			
Assembly **Sales** **Service**	**Johore**	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**	**Queretaro**	SEW-EURODRIVE, Sales and Distribution, S. A. de C. V. Privada Tequisquiapan No. 102 Parque Ind. Queretaro C. P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	S. R. M. Société de Réalisations Mécaniques 5, rue Emir Abdelkader 05 Casablanca	Tel. +212 2 6186-69 + 6186-70 + 6186-71 Fax +212 2 6215-88 srm@marocnet.net.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

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 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 69 241-020 Fax +47 69 241-040 sew@sew-eurodrive.no

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 sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Lodz	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@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**	**Bucuresti**	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 195220 St. Petersburg Russia	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. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoo.sn

Serbia and Montenegro			
Sales	**Beograd**	DIPAR d.o.o. Kajmakcalanska 54 SCG-11000 Beograd	Tel. +381 11 3088677 / +381 11 3088678 Fax +381 11 3809380 dipar@yubc.net

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 sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Sered**	SEW-Eurodrive SK s.r.o. Trnavska 920 SK-926 01 Sered	Tel. +421 31 7891311 Fax +421 31 7891312 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 dross@sew.co.za
	Capetown	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 dswanepoel@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 9 4431 84-70 Fax +34 9 4431 84-71 sew.spain@sew-eurodrive.es

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 info@sew-eurodrive.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**	**Chon Buri**	SEW-EURODRIVE (Thailand) Ltd. Bangpakong Industrial Park 2 700/456, Moo.7, Tambol Donhuaroh Muang District Chon Buri 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.co.th

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service 7, rue Ibn EI Heithem Z.I. SMMT 2014 Mégrine Erriadh	Tel. +216 1 4340-64 + 1 4320-29 Fax +216 1 4329-76

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri Sirketi Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 + 216 4419164 + 216 3838014 Fax +90 216 3055867 sew@sew-eurodrive.com.tr

Ukraine			
Sales **Service**	**Dnepropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 sew@sew-eurodrive.ua

USA			
Production **Assembly** **Sales** **Service**	**Greenville**	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 Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**San Francisco**	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com
	Philadelphia/PA	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
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
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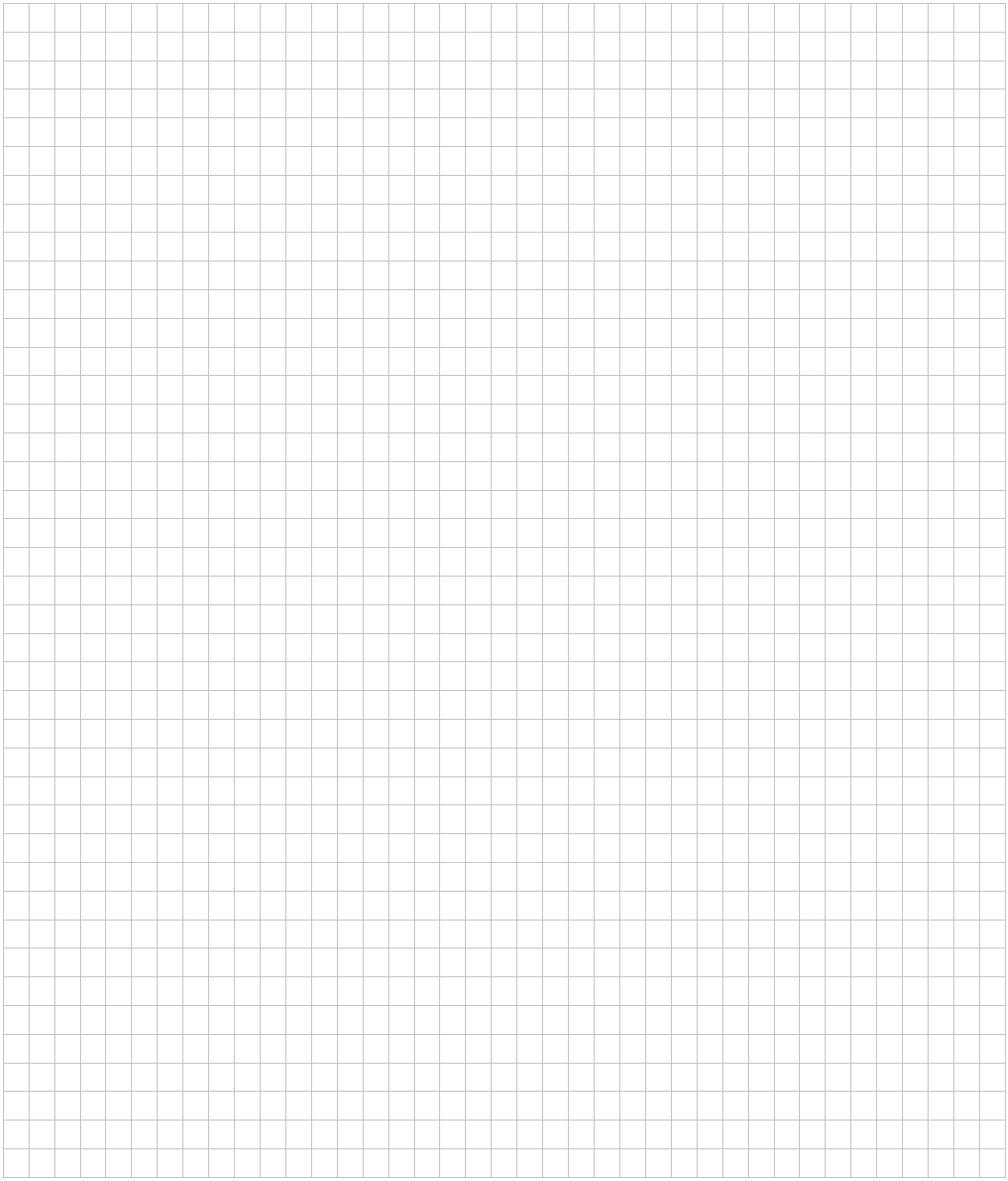
Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 sewventas@cantv.net sewfinanzas@cantv.net



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