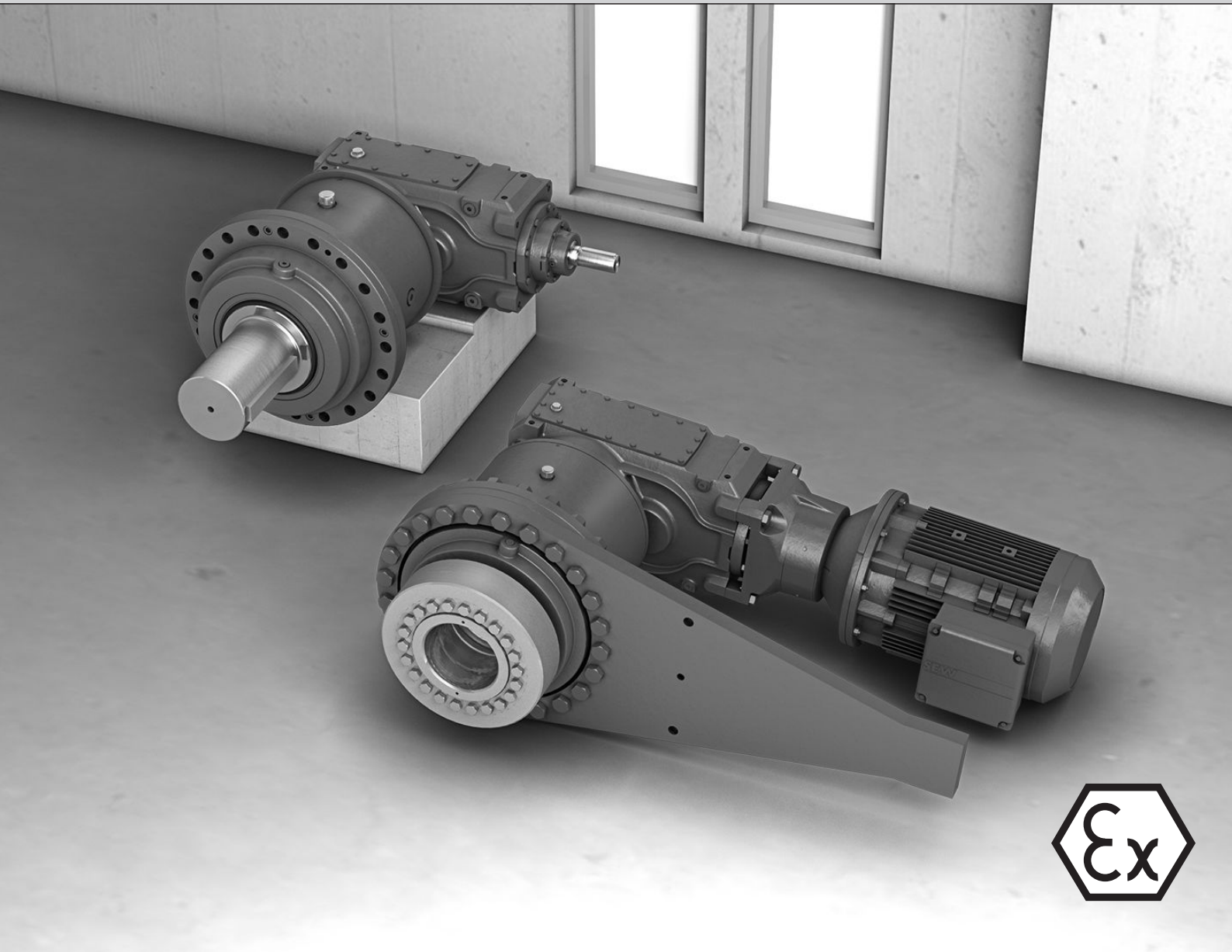
SEW EURODRIVE

Assembly and Operating Instructions



Explosion-Proof Industrial Gear Units

P-X Series

Torque Classes from 100 kNm to 500 kNm

Edition 10/2018

25881930/EN

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1 General information

1.1 About this documentation

The current version of the documentation is the original.

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

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

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

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

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

1.2.2 Structure of section-related safety notes

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

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

SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

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Meaning of the hazard symbols

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

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

1.2.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

1.3 Rights to claim under limited warranty

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

1.4 Copyright notice

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2 Safety notes

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

2.1 Preliminary remark

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

Also observe the supplementary safety notes in the individual sections of these operating instructions.

2.2 EAC marking

On request, the explosion-proof gear units from SEW-EURODRIVE meet the requirements of the technical regulations of the Eurasian Economic customs union (Russia, Kazakhstan, Belarus, and Armenia). The EAC marking on the product certifies the conformity with the safety requirement of the Customs Union.

2.3 General information

INFORMATION

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

During operation, the gear units can have movable or rotating parts and hot surfaces.

Never install or start up damaged products. Submit a complaint to the shipping company immediately in the event of damage.

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

All work related to transportation, storage, installation, assembly, connection, startup, operation, maintenance and repair may only be carried out by qualified specialists, in strict observance of:

- The relevant detailed operating instructions.
- The warning and safety signs on the gear unit and, if necessary, on the motor.
- 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.

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Refer to the documentation for more information.

2.4 Target group

Specialist for mechanical work

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

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

Specialist for electrotechnical work

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

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

Instructed persons

All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the instruction is that the persons are capable of performing the required tasks and work steps in a safe and correct manner.

All qualified personnel must wear appropriate protective clothing.

2.5 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 of the applicable standards and regulations and comply with the following directives and standards regarding explosion protection:

- Directive 2014/34/EU
- EN ISO 80079-36
- EN ISO 80079-37
- EN 60079-11

In compliance with the EC Machinery Directive 2006/42/EC, the industrial gear units are components for installation in machinery and systems. In the scope of the EC directive, you must not take the machinery into operation in the designated fashion until you have established that the end product complies with Machinery Directive 2006/42/EC.

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INFORMATION

Always observe the following information on explosion protection:

- A drive motor connected to the gear unit may only be operated under the conditions described in the chapter "Starting up industrial gear units in potentially explosive areas" (→ 🗎 130).
- Operate any motor connected to the gear unit on the frequency inverter only if the data on the gear unit nameplate is met.
- 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.
- Make sure that there are no aggressive substances in the vicinity that could damage the paint and seals.
- SEW-EURODRIVE delivers the gear units either painted or teated with primer. If the gear unit is delivered with painting, the used paints meet the requirements for preventing electrostatic charging according to EN 60079-0 and EN ISO 80079-36. If you paint a gear unit, you have to meet the requirements for preventing electrostatic charging according to EN 60079-0 and EN ISO 80079-36.

2.6 Other applicable documentation

The following documentation and documents should also be observed:

- Catalog P-X series
- Order documents, e.g. dimension sheet, order confirmation, etc.
- If required, the "AC Motors" operating instructions
- Operating instructions of the options installed, if required

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2.7 Safety symbols on the gear unit

⚠ CAUTION

Safety/caution signs and safety symbols can become dirty or illegible over time.

Risk of injury due to illegible symbols.

- Always make sure that safety, warning, and operating notes are legible.
- Replace damaged safety/caution signs and safety symbols.

The safety symbols on the gear unit must be observed. They have the following meaning:

Safety symbol	Meaning
	Indicates the **oil filling location**. Also serves as proper venting during the oil change.
	Indicates the **oil drain**.
	Indicates the position of the **breather**. Serves to avoid mistaking the oil measuring position for the venting position.
	Helps avoid errors caused by lack of understanding. Read the information in the operating instructions.
	Indicates the positions for **relubrication** and makes it easier to find the locations to be lubricated. Helps avoid bearing damage.
	Indicates the **water supply** and serves to locate the connection option.
	Indicates the **water return** and serves to locate the connection option.
	Indicates the **oil supply** and serves to locate the connection option.
	Indicates the **oil return** and serves to locate the connection option.
	For pivoted mounting positions, this symbol on the information sign indicates the mounting position of the gear unit for **checking the oil**.

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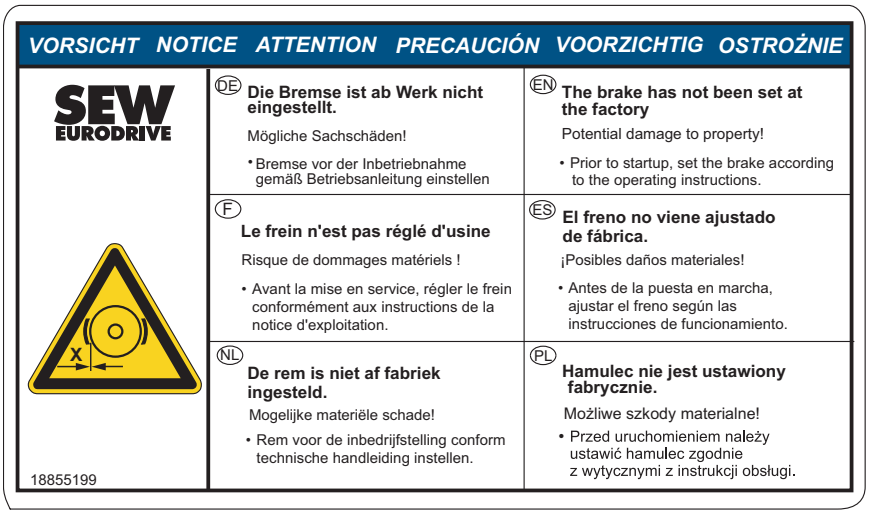
Safety symbol	Meaning
	Indicates the position of the **temperature sensor/temperature switch**.

After startup, you may remove the following labels from the gear unit.

Safety symbols	Meaning
	Indicates the **grease drain plug** and serves to locate the grease drain. Helps avoid bearing damage.
	Caution: Risk of burns due to hot surface.
	Caution: Removing the dipstick during operation may result in damage to the gear unit.
	Caution: Risk of burns due to hot gear oil.

Meaning
The brake is not set at the factory.



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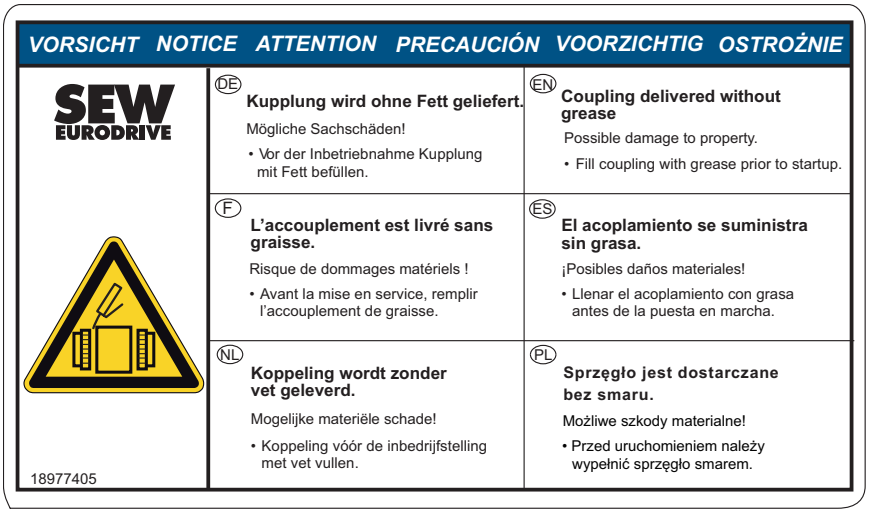
Meaning

The coupling is supplied without grease.



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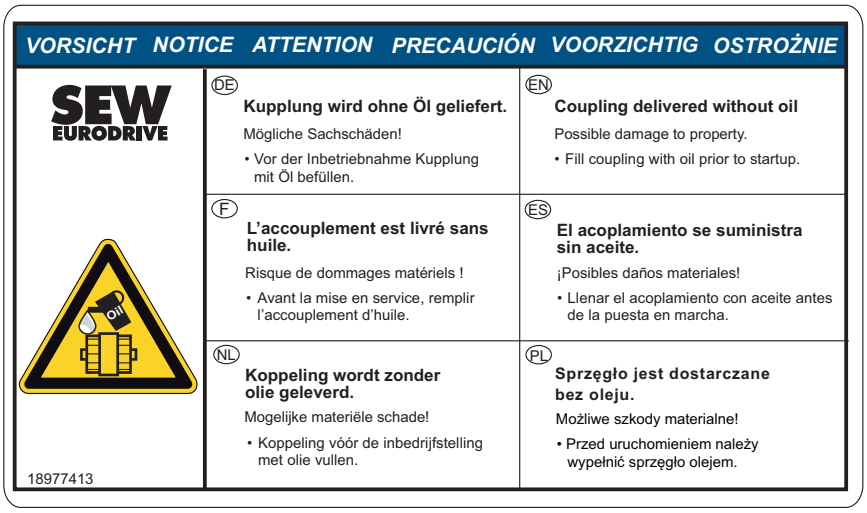
The coupling is supplied without oil.



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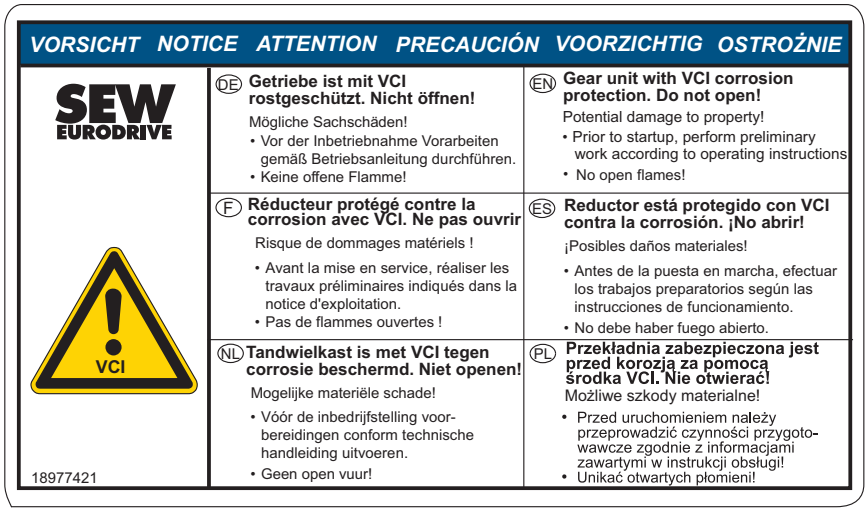
Meaning
The gear unit is protected against corrosion with VCI.



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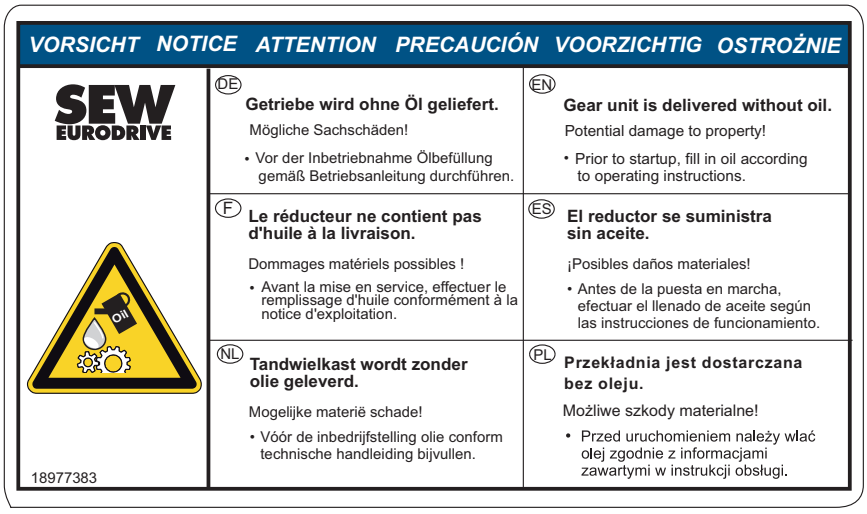
The gear unit is supplied without oil.



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2.8 Symbols on the dimension sheet

The symbols on the dimension sheet must be observed. They have the following meaning:

Symbols	Meaning
	Indicates the **oil filling location**.
	Indicates the **oil drain**.
	Indicates the position of the **breather**.
	Indicates the position of the **inspection cover**.
	Indicates the position of the attachment points for **transport**.
	Indicates the position of the **oil dipstick**.
	Indicates the position of the **oil level glass**.
	Indicates the position of the **oil sight glass**.
	Indicates the position of the **relubrication points**.
	Indicates the position of the **relubrication points**.
	Indicates the position of the **grease outlet**.
	Indicates the **water inflow** with connection dimensions.
	Indicates the **water return** with connection dimensions.
	Indicates the **oil inflow**.
	Indicates the **oil return**.
	Indicates the position of the **magnetic screw plug**.
	Indicates the position of the **torque arm**.
	Indicates the position of the operator's **vibration sensor** with connection dimensions.
	Indicates the position of the **oil heater**.

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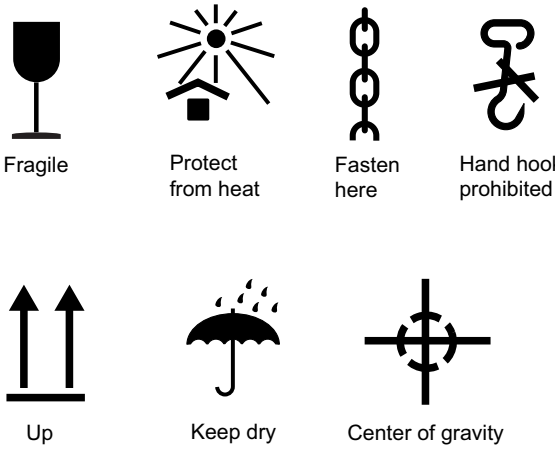
2.9 Symbols on the packaging

The symbols on the packaging must be observed. They have the following meaning:



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2.10 Transport

Observe the following notes during transport.

2.10.1 General information

⚠ WARNING

Suspended loads can fall.

Severe or fatal injuries.

- Do not stand under the suspended load.
- Secure the danger zone.
- Use suitable, sufficiently rated and undamaged handling equipment.
- Consider the gear unit dimensions, the center of gravity and the weight that has to be moved when selecting lifting equipment or crane (see dimension drawing). The weight to be moved is the total weight of the drive package including mount-on components (not only the weight of the gear unit).

⚠ WARNING

Lifted loads may fall over.

Severe or fatal injuries.

- Secure the gear unit against falling over during the lifting process.
- Secure the danger zone.
- Use suitable, sufficiently rated and undamaged handling equipment.
- Consider the gear unit dimensions, the center of gravity and the weight that has to be moved when selecting lifting equipment or crane (see order documents). The weight to be moved is the total weight of the drive package including mount-on components (not only the weight of the gear unit).

⚠ CAUTION

Risk of slipping of unsecured mount-on components, such as keys.

Potential risk of crushing due to falling parts.

- Secure the mount-on components.

⚠ CAUTION

Danger due to lubricant leaking from damaged seals and the breather.

Minor injuries.

- Check the gear unit and mount-on components for leaking lubricant.
- The seals must not come in contact with cleaning agent as this may damage the seals.
- Protect the breather against damage.
- Make sure that there is not too much oil in the gear unit. If the oil level is too high and the temperature rises, lubricant may escape from the breather.

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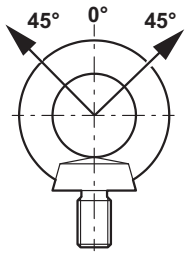
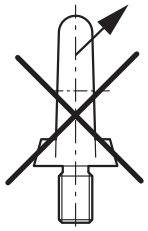
NOTICE

Improper transport can damage the gear unit.

Possible damage to property.

- Note the following information.

- Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. It may be necessary to suspend startup.
- The weight of the gear unit (without oil) is indicated on the nameplate or on the dimension sheet. Observe the loads and specifications given there.
- If possible, transport the gear unit without oil fill. If this is not possible, note that the weight indicated on the nameplate refers only to the no-load weight of the gear unit, and replace the breather with a screw plug.
- The gear unit must be transported in a manner that prevents damage to the gear unit and to mount-on components. For example, impacts against exposed shaft ends can damage the gear unit.
- Use only the prescribed suspension points [1] to transport the gear unit (see order documents). The load suspensions of the motor or mount-on components are provided for stabilization purposes only.
- Observe that the eyebolts are screwed in completely and must be flush to the contact surface. Observe the following note.

Eyebolts DIN 580/DIN 582	
Correct: **Angle of tension force vector towards the ring plane, max. 45°**	**Incorrect:** **Tension away from the ring plane**
	

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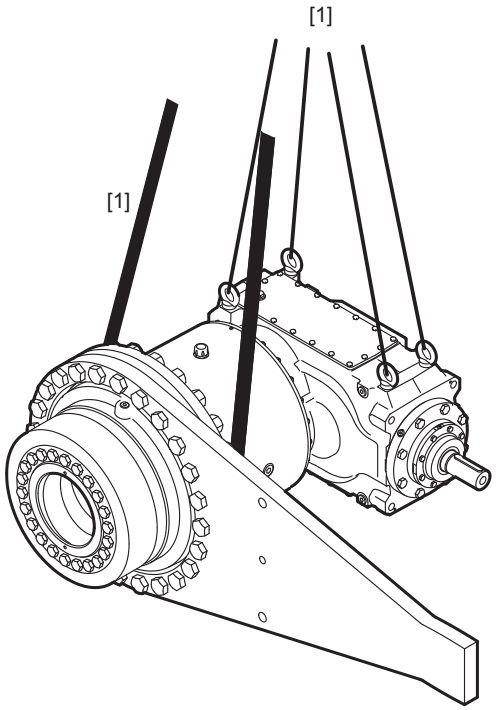
2.10.2 Transport without motor

The following figure illustrates how to transport the gear unit with the provided attachment points [1].



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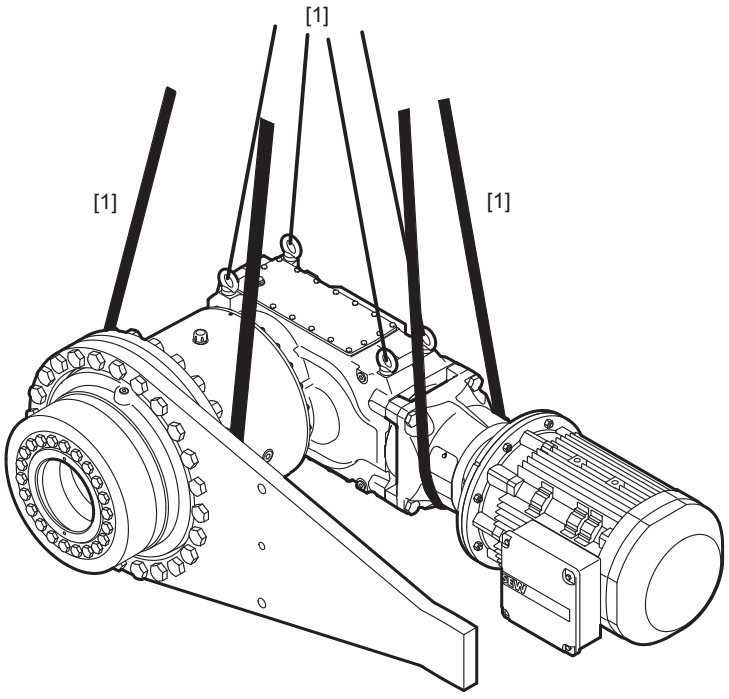
2.10.3 Transport with motor

The following figure illustrates how to transport the gear unit with the provided attachment points [1].



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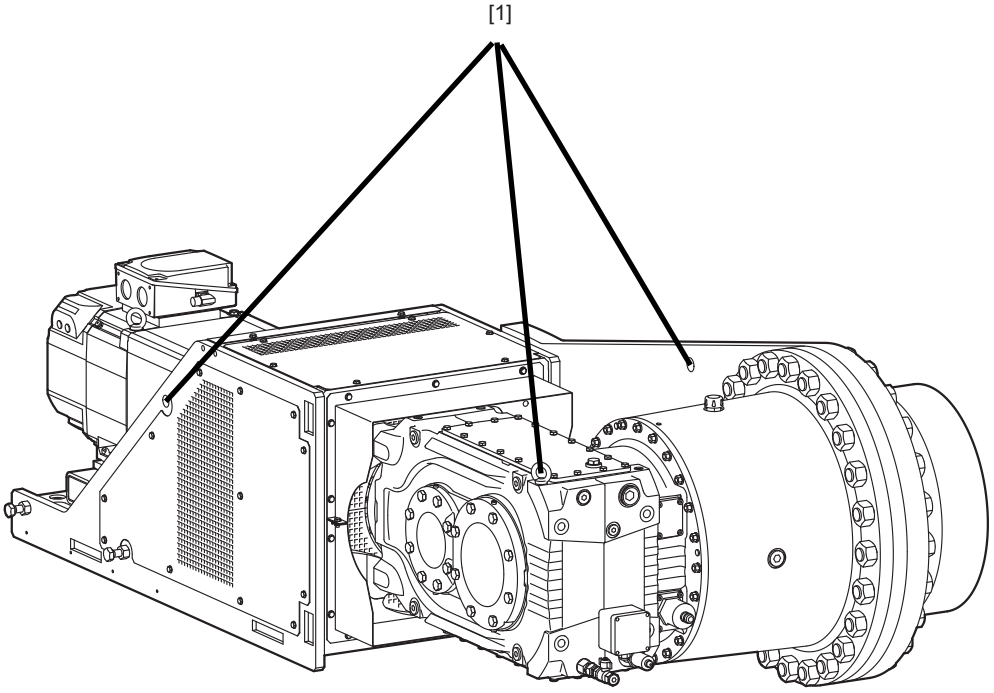
2.10.4 Transport with motor scoop

The following figure illustrates how to transport the gear unit with the provided attachment points [1]. For the actual attachment points refer to the order dimension sheet.



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2.11 Storage and transport conditions

The gear units can be provided with the following protection and packaging types depending on the storage and transport conditions.

2.11.1 Internal conservation

Standard corrosion protection

After the test run, the test oil fill is drained out of the gear unit. The remaining oil film protects the gear unit against corrosion for a limited period of time. If specified in the order, the gear unit can be delivered with oil. Refer to the order documents for more information.

Long-term corrosion protection

After the test run, the test oil fill is drained out of the gear unit and the interior space is filled with a vapor phase inhibitor. The breather is replaced by a screw plug and included in the gear unit delivery.

Corrosion protection with VCI anti-corrosion agent is not permitted for gear units that are operated with food grade lubricants. Contact SEW-EURODRIVE in such cases.

2.11.2 Exterior corrosion protection

The following measures are taken for exterior corrosion protection:

- Anti-corrosion agent is applied to bare, non-painted functional surfaces of shafts, flanges, mounting and foot surfaces of the housing. The anti-corrosion agent must be removed with a suitable solvent that does not damage the oil seal.
- Small spare parts and loose pieces, such as bolts, nuts, etc., are packed in corrosion protection plastic bags (VCI corrosion protection bags).
- Threaded holes and blind holes are covered by plastic plugs.
- If the gear unit is stored longer than 6 months, regularly check the protective coating of unpainted areas as well as the paint coating. Areas in which the protective coating and/or painting has been damaged may have to be repainted.

2.11.3 Packaging

Standard packaging

The gear unit is delivered on a pallet, securely attached and without cover.

Use: Land transport

Long-term packaging

The gear unit is delivered in a wooden box that is also appropriate for sea transport.

Use: Sea transport and/or for extended storage

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2.11.4 Storage conditions

NOTICE

Improper storage may result in damages to the gear unit.

Possible damage to property.

- During storage up to startup, the gear unit must be stored in a shock-free manner to prevent damage to the rolling bearing raceways.
- The output shaft must be rotated at least one full rotation every 6 months so that the position of the rolling elements in the bearings of the input and output shafts changes.

INFORMATION

The gear units are delivered without oil as standard; different protection systems are required depending on the storage period and storage conditions as shown in the following table.

Corrosion protection + packaging	Storage location	Storage duration
Standard corrosion protection + standard packaging	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No aggressive vapors, no shocks.	Max. 6 months with intact surface protection.
Long-term corrosion protection + standard packaging	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation of the storage location with filter (free from dust and dirt). No aggressive vapors, no shocks.	Max. 3 years with regular inspection and checking for intactness.
Long-term corrosion protection + long-term packaging	With roof, protected against rain and shocks.	Max. 3 years with regular inspection and checking for intactness.

INFORMATION

If stored in tropical zones, provide for sufficient protection against insect damage. Contact SEW-EURODRIVE for differing requirements.

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3 Gear unit structure

3.1 P-X gear unit series

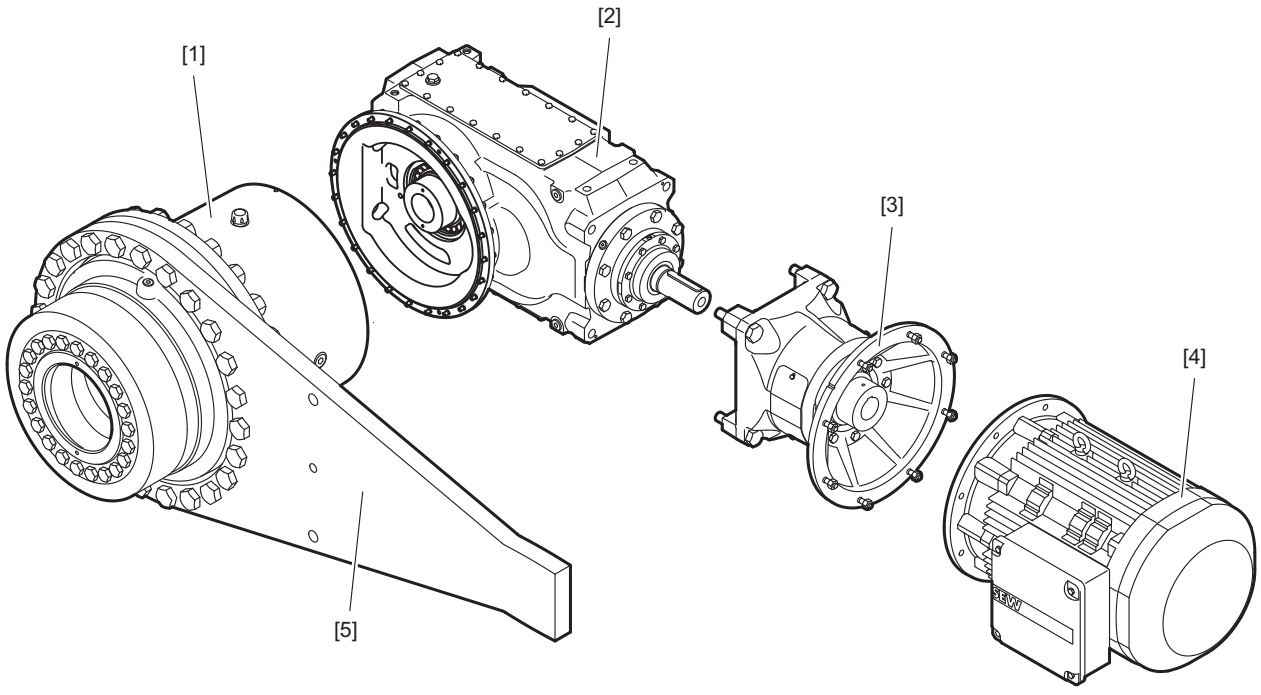
The P-X gear unit is a combination of:

- P.. planetary gear unit Output stage
- Primary gear unit bevel-helical gear unit X... series
- Mount-on components: Motor, coupling and motor adapter

There are 7 sizes of P-X series gear units with rated torques from 100170 Nm to 500000 Nm.

The gear units have a **common oil chamber**.

The following figure shows a sample combination of a planetary gear unit, a primary gear unit and a motor with torque arm design.



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[1] Planetary gear unit
[2] X..series bevel-helical gear unit
[3] Motor adapter
[4] Motor
[5] Torque arm design

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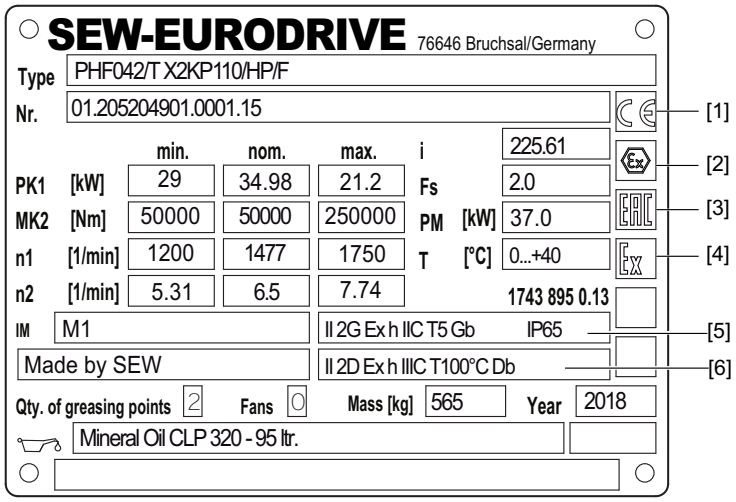
3.2 Nameplate

The following figure shows the structure of the nameplate.



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Type		Type designation
No.		Serial number
P_{K1}	kW	Operating power on the input shaft (HSS)
M_{K2}	Nm	Gear unit output torque
n_1	1/min	Input speed (HSS)
n_2	1/min	Output speed (LSS)
min.		Minimum operating point
norm.		Normal operating point
max.		Maximum operating point
i		Exact gear unit ratio
F_S		Service factor
PM1	kW	Nominal motor power
T_a	°C	Deviation from standard temperature range (−20 °C to +40 °C)
IM		Mounting position and mounting surface
Qty. of greasing points		Number of points that require relubrication
Fans		Number of installed fans
Mass	kg	Weight of the gear unit
Year		Year of manufacture
		Oil grade and viscosity class/oil quantity
[1]		CE symbol
[2]		ATEX symbol
[3]		EAC symbol
[4]		Explosion protection symbol
[5]		Indicates gas explosion protection with degree of protection
[6]		Indicates dust explosion protection

INFORMATION

In some cases, SEW gear units may only be operated in compliance with special measures. These cases are indicated by the special mark **"X"** on the nameplate (for example II2G Ex h IIC T5 Gb **X**). These special measures may be necessary for various reasons (e.g. only intermittent duty, etc.). Special measures are documented in an addendum to the operating instructions. The addendum to the operating instructions must be adhered to.

3.3 Type designation

The type designation is set up as follows:

PHF042 /T X2KP110/HP/F	
P..	P.. series planetary gear unit
PH..	Foot-mounted design, hollow shaft with shrink disk
PF..	Flange-mounted design, solid shaft
PHF..	Flange-mounted design, hollow shaft with shrink disk
042	Size
/T	Torque arm
X2KP	X series bevel-helical gear unit
110	Size
/HP	Housing for planetary gear unit
/F	Flange-mounted design

3.4 Abbreviations for output shaft designs

Gear unit design	Abbrevi-ation	Meaning
Foot-mounted design (solid shaft)	P	• Solid shaft with key • Solid shaft with 2 keys (optional)
	PR	Solid shaft with key
	PL	Splined solid shaft
Flange-mounted design (solid shaft)	PF	• Solid shaft with key • Solid shaft with 2 keys (optional)
	PRF	Solid shaft with key
	PLF	Splined solid shaft
Foot-mounted design (hollow shaft)	PH	Hollow shaft with shrink disk
	PV	Splined hollow shaft
Flange-mounted design (hollow shaft)	PHF	Hollow shaft with shrink disk
	PVF	Splined hollow shaft

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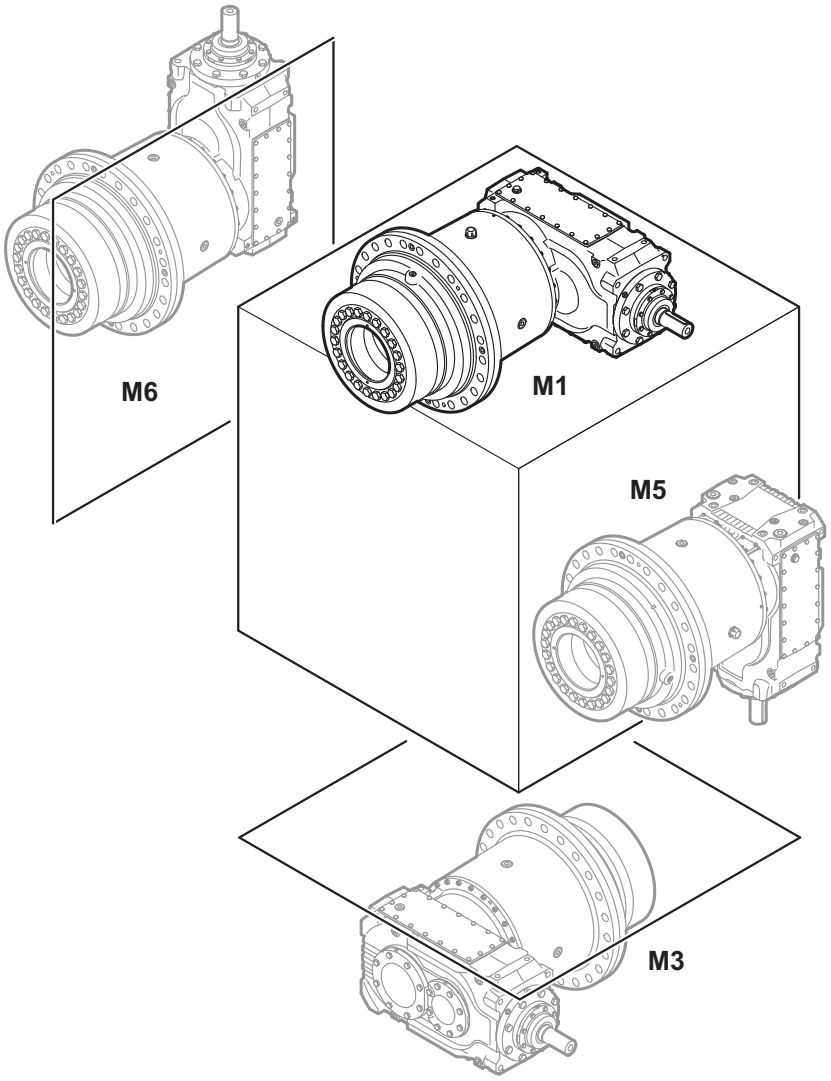
3.5 Mounting positions

3.5.1 Standard mounting position

The mounting position defines the spatial orientation of the gear unit housing and is designated **M1...M6**. The standard mounting position is **M1**.



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INFORMATION

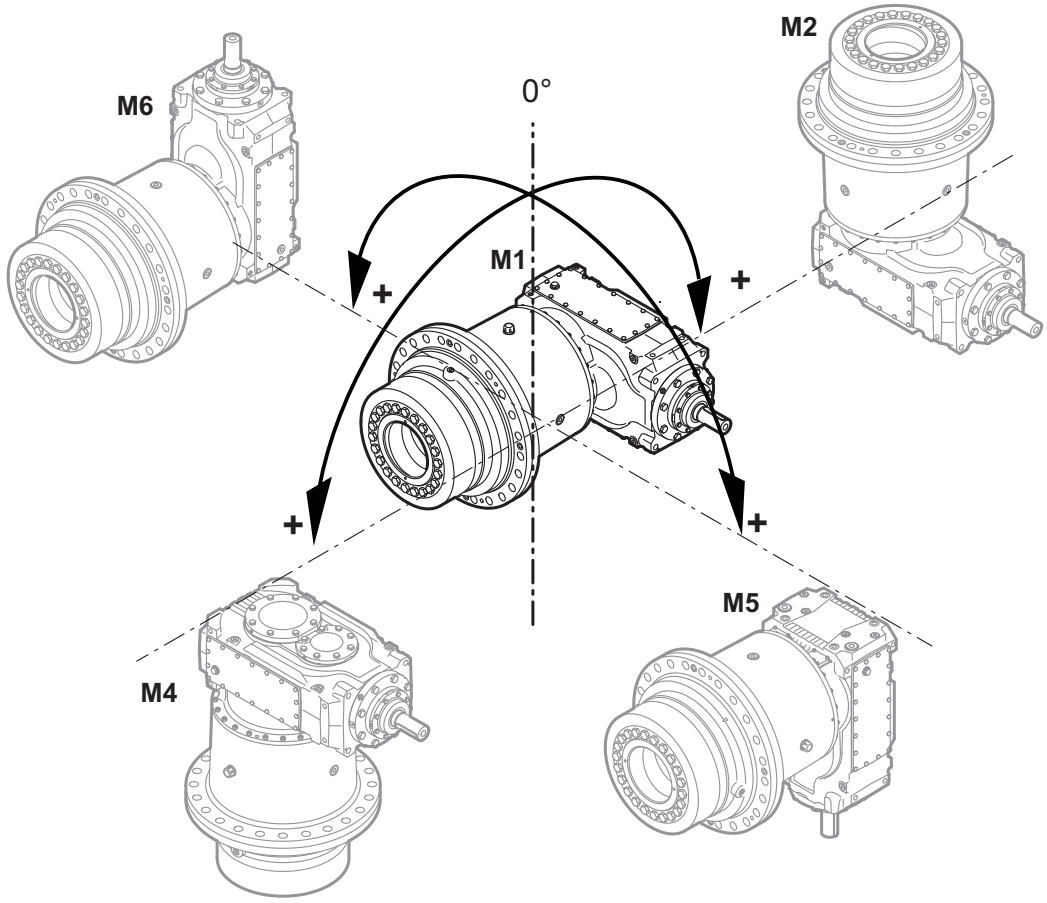
Contact SEW-EURODRIVE in case of a mounting position deviating from M1.

3.6 Fixed and variable pivoted mounting positions

Mounting positions deviating from the standard are differentiated between **fixed** and **variable** pivoted mounting positions.

INFORMATION

- Fixed and variable pivoted mounting positions are only possible after consultation with SEW-EURODRIVE. Observe the order documents, such as the dimension sheet.
- Fixed and variable pivoted mounting positions might involve restrictions concerning accessories and technical data. Also, delivery times might be longer. Contact SEW-EURODRIVE.



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3.6.1 Fixed pivoted mounting position

Definition:

Gear units with fixed pivoted mounting position have a fixed mounting position that differs from the standard.

This means the gear unit does not change its mounting position during operation.

Example:

The type designation is set up as follows:

M1-M5/9°

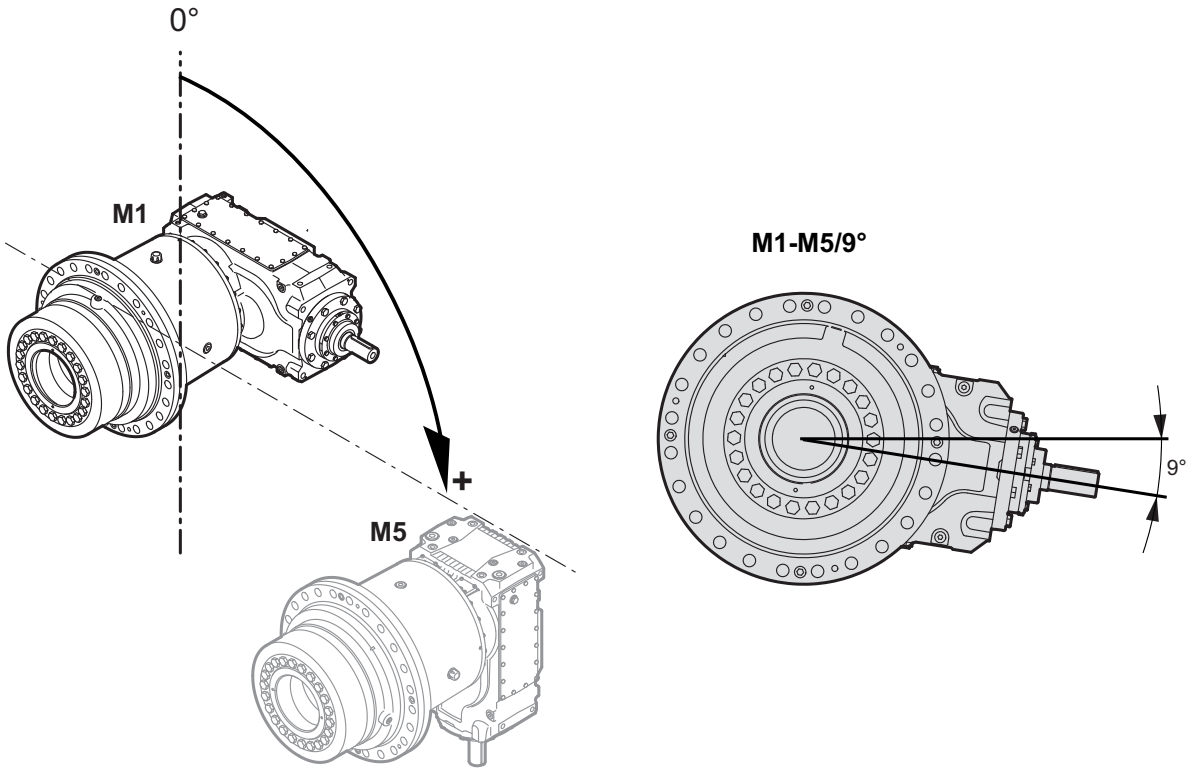
M1 = Initial mounting position

M5 = Pivoting direction

9° = Fixed pivoting angle

Pivoted from mounting position M1 to M5 by 9°.

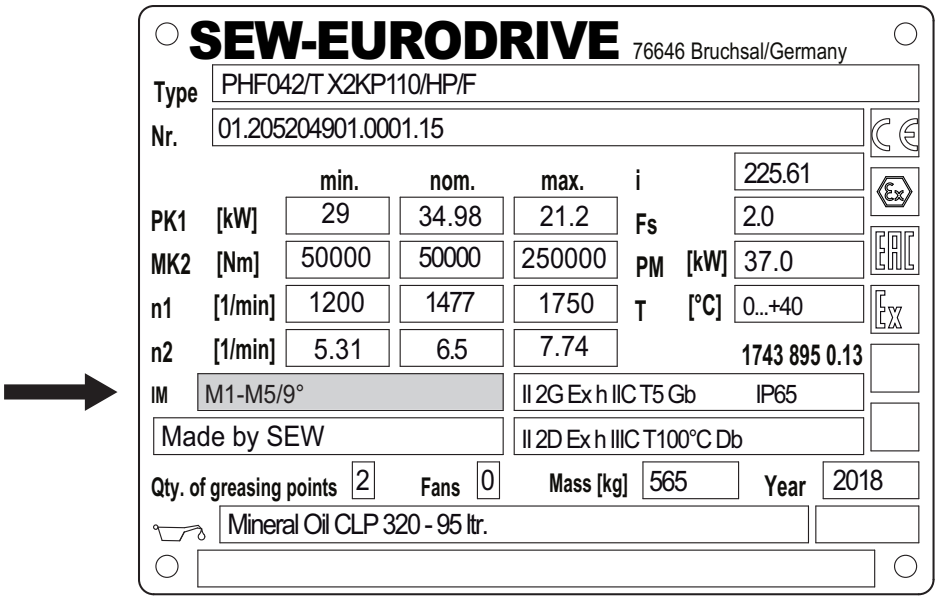
This results in the following fixed pivoted mounting position:



9007213705011339

The oil level is checked in the selected fixed pivoted mounting position.

The fixed pivoted mounting position is shown on the nameplate.



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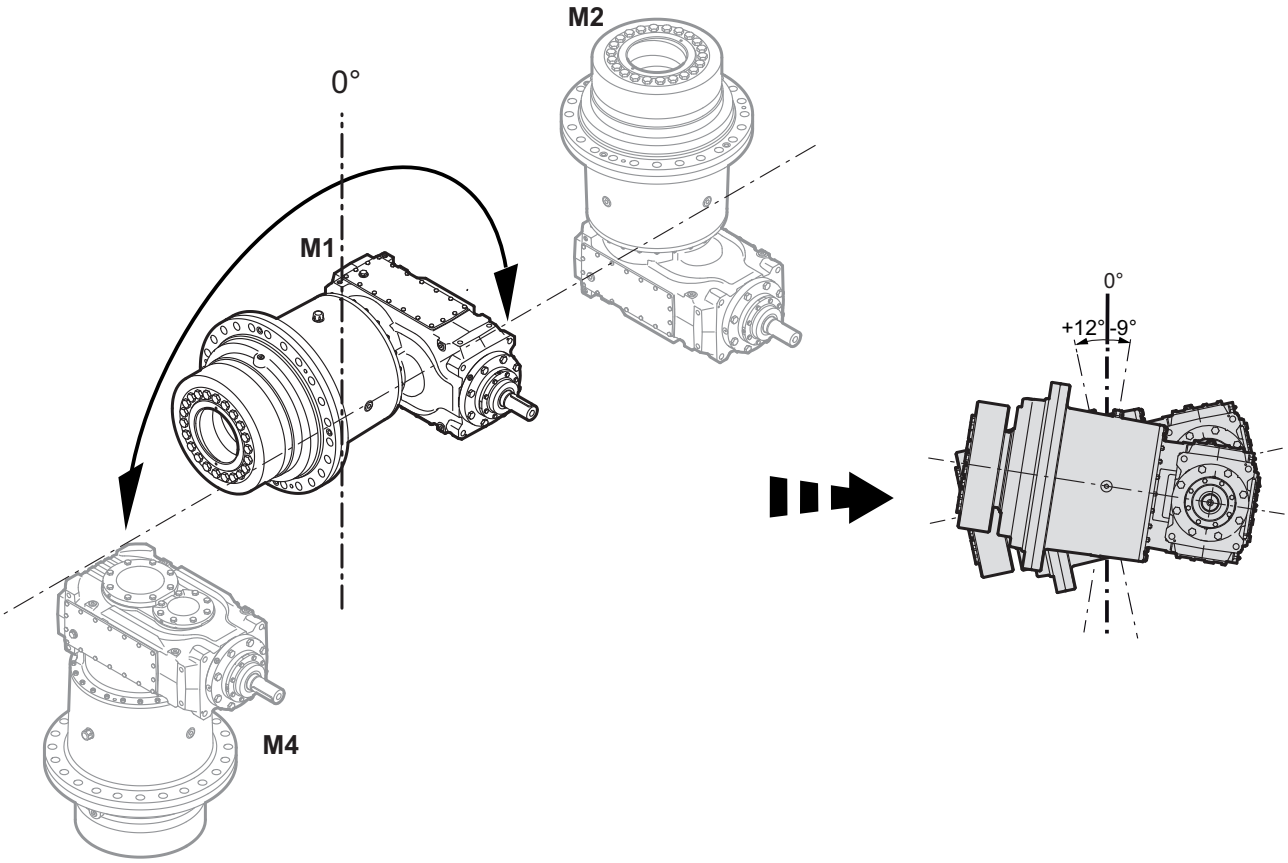
3.6.2 Variable pivoted mounting position

Definition:

Gear units with variable pivoted mounting position can change the mounting position during operation **variably** within the specified max./min. range.

Example:

The gear unit is operated in variable pivoted mounting position M1 to M2 = 9° and M1 to M4 = 12°.



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Step 1:

The largest pivoting angle determines the positive pivoting direction (12° > 9°). In this example, this is 12° towards M4.

Pivoted from M1 to M4 by +12°

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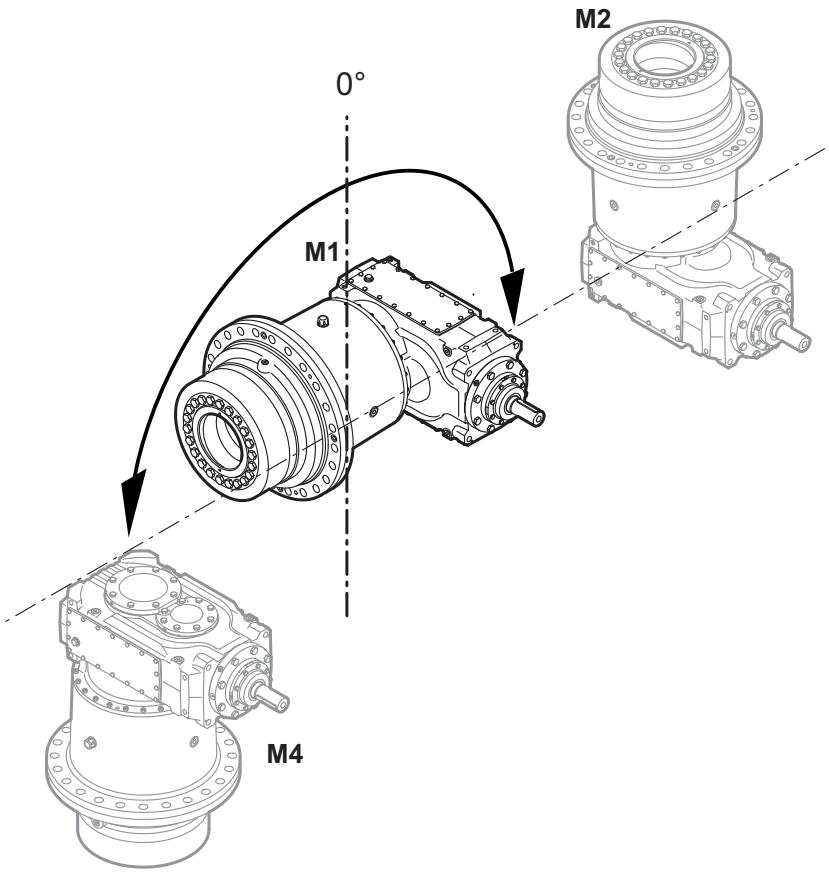
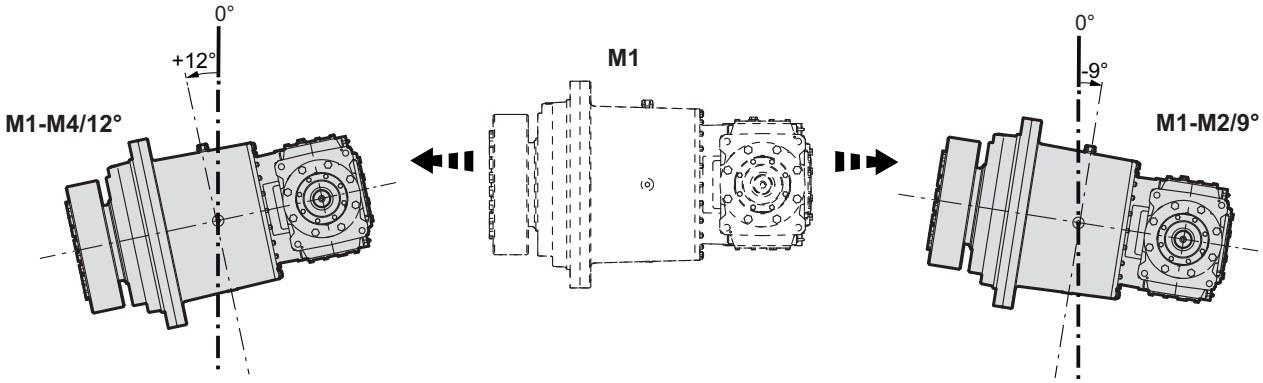
Pivoted from M1 to M2 by -9°





14457419019

The type designation for this example is:

M1-M4/–9°...12°

M1 = Initial mounting position

M4 = Pivoting direction

12° = pivoted from M1 to M4 by 12°

-9° = pivoted from M1 to M2 by 9° (= pivoted from M1 to M4 by -9°)

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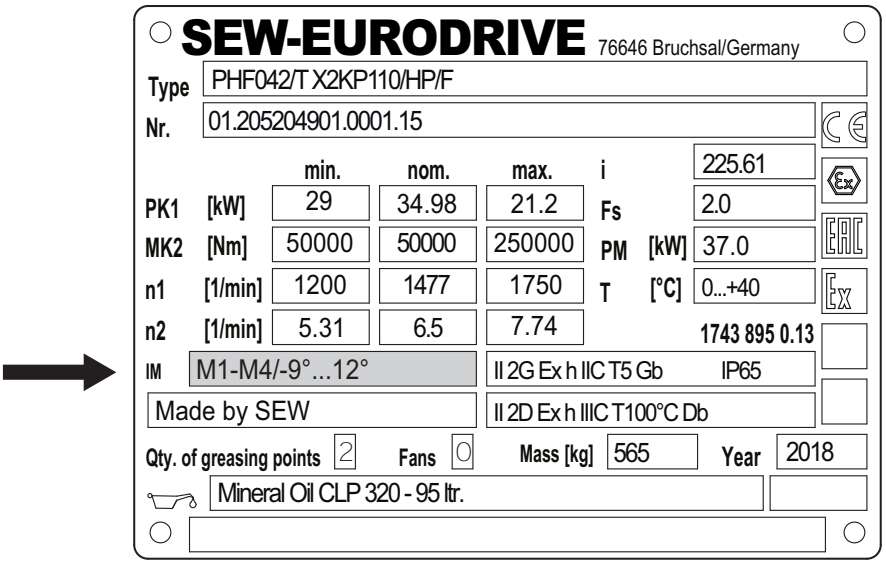
The variable pivoted mounting position is shown on the nameplate.



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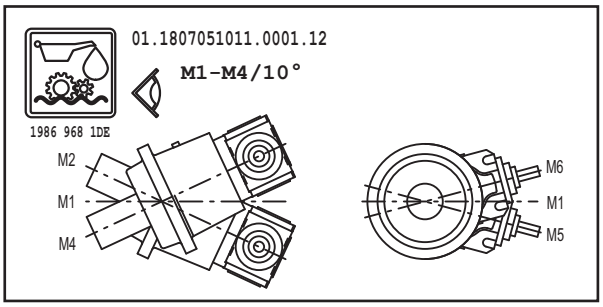
Step 2:

For variable pivoted mounting positions, the customer must determine the pivoting angle in which the oil level is checked.

An additional nameplate is used to clearly indicate the oil check angle. This nameplate lists the mounting position for the oil level check.



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3.6.3 Combination of fixed and variable pivoted mounting positions

Fixed and variable pivoted mounting positions can be combined.

Example:

The following example shows a combination of fixed and variable pivoted mounting position.

The type designation is set up as follows:

M1-M4/9° (fixed pivoted mounting position)

M1 = Initial mounting position

M4 = Pivoting direction

9° = Fixed pivoting angle

M1-M6/–9°...12° (variable pivoted mounting position)

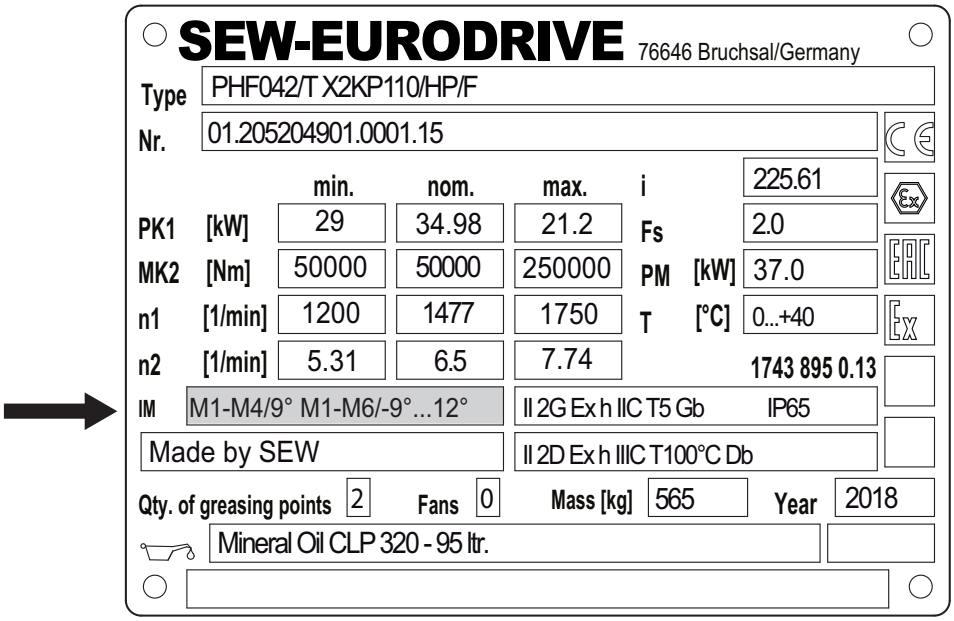
M1 = Initial mounting position

M6 = Pivoting direction

12° = 12° from M1 to M6

-9° = 9° from M1 to M5 (= -9° from M1 to M6)

The fixed and variable pivoted mounting position are shown on the nameplate.



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When combining fixed and variable pivoted mounting position, the customer must determine the variable pivoting angle in which the oil level is checked. The fixed angle for the oil level check is already defined.

The gear unit has an additional nameplate to ensure correct oil level checks. This nameplate lists the mounting position for the oil level check.

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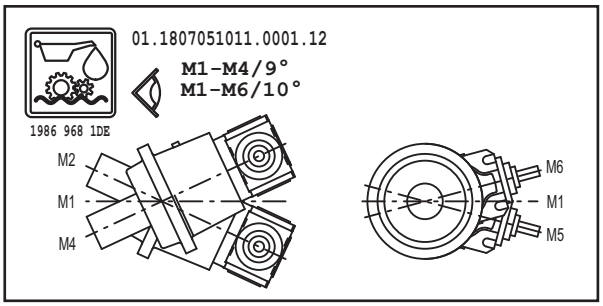
In this example, the operator checks the oil level at M1-M4/9° M1-M6/10°.



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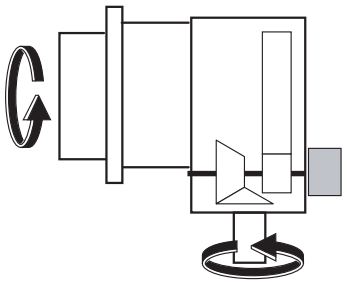
3.7 Directions of rotation dependencies

The following figure shows the direction of rotation dependency between input and output shaft. The gear units as well as the position of the backstop are schematically shown.

Shaft position 03 Pos. of end gear 4	
P.X2K..	

▯ = Position of the backstop

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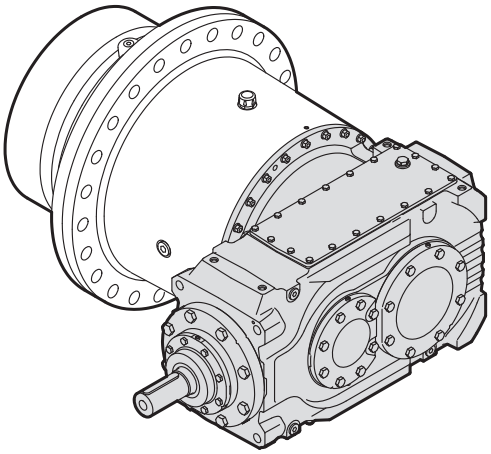
3.8 Mounting position of the primary gear unit

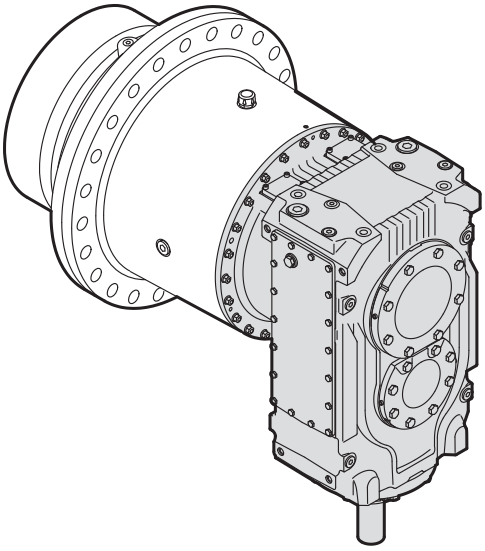
As standard, the primary gear unit can be mounted in the mounting positions **0°, 90°, 180° and 270°**.

The following figure shows the planetary gear unit in mounting position M1. For additional information on the mounting position, refer to chapter "Mounting position" (→ 🗎 27).

Primary gear unit mounting position 0°



Primary gear unit mounting position 90°



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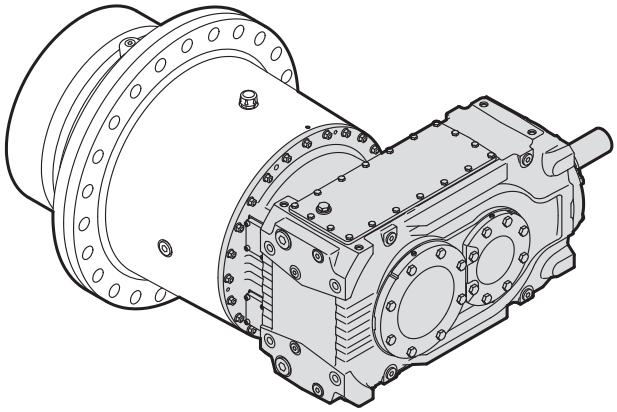
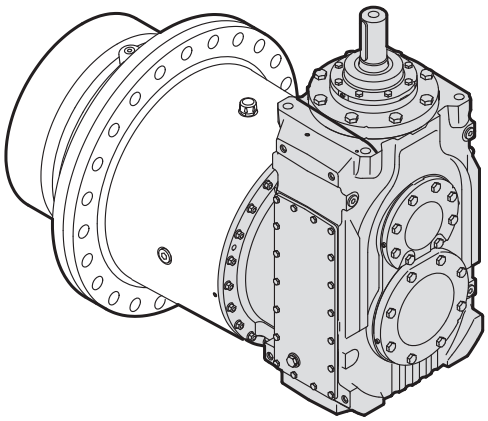
Primary gear unit mounting position 180°



Primary gear unit mounting position 270°



INFORMATION

In case of mounting positions of the primary gear unit of 90° (lower input shaft) and 270° (upper input shaft) contact SEW-EURODRIVE. In this case different accessories are available.

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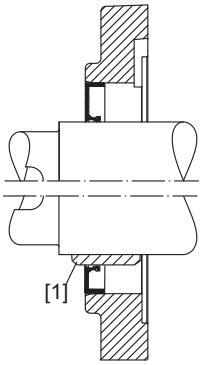
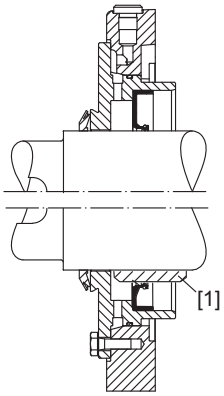
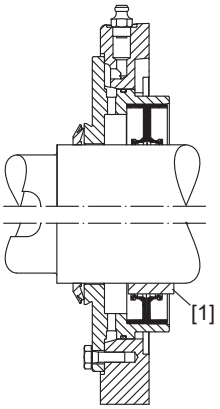
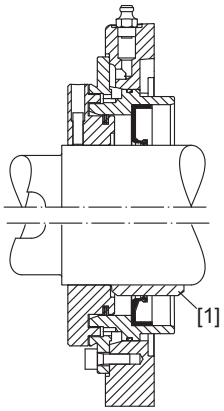
3.9 Sealing system

3.9.1 Input shaft

Designation	Property	Environment	Illustration
Standard	Single oil seal with dust protection lip	Normal environment	
Dust-protected	Single oil seal with dust protection cover	**Medium** dust load with abrasive particles	
Protected against dust, regreasable	Double lip seal with dust protection cover	**High** dust load with abrasive particles	
Radial labyrinth seal (Taconite), regreasable	Single oil seal with radial labyrinth seal	**Very high** dust load with abrasive particles	

[1] Optional with oil seal sleeve

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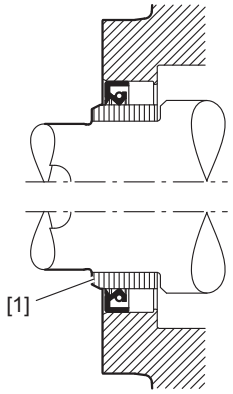
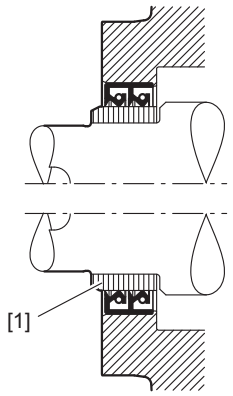
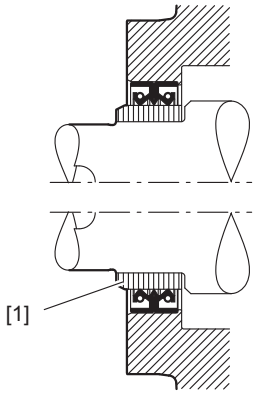
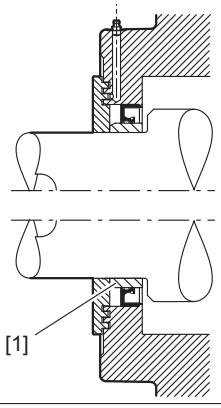
3.9.2 Output shaft

Designation	Property	Environment	Figure
Standard for mounting position M1/M3/M5/M6	Single oil seal, inside sealing with dust protection lip on a hardened sleeve [1]	• Normal environment	
Standard for mounting position M1/M3/M5/M6	2 oil seals, inside sealing on a hardened sleeve [1]	• **Medium** dust load with abrasive particles	
Standard for mounting position M1/M3/M5/M6	1 oil seal, inside sealing, and 1 oil seal, outside sealing, on a hardened sleeve [1]	• **High** dust load with abrasive particles and splash water load	
Radial labyrinth seal regreasable for mounting position M1M3/5/M6	Single oil seal with radial labyrinth seal on a hardened sleeve [1]	• **Very high** dust load with abrasive particles	

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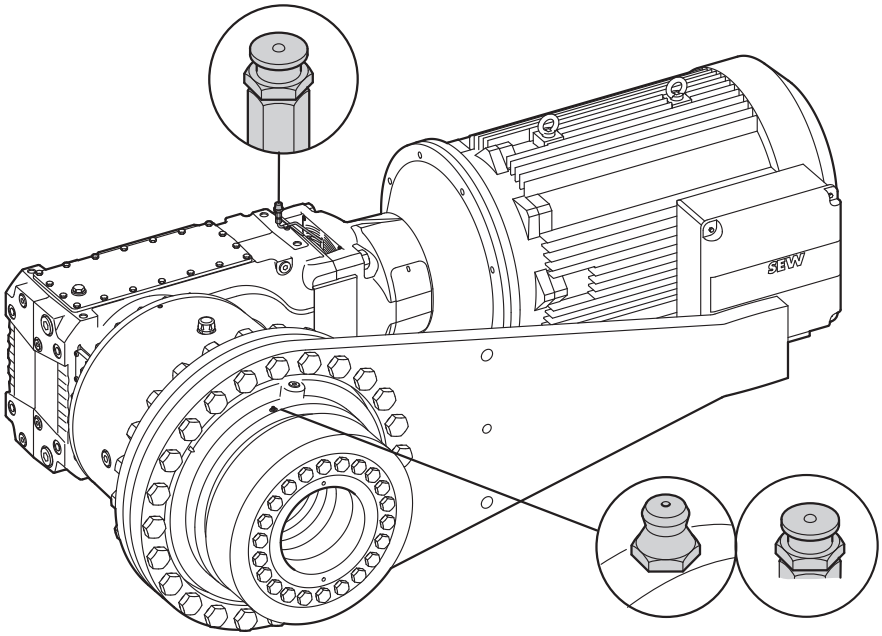
3.9.3 Position of lubrication points



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Planetary gear unit

Regreasable sealing systems are usually equipped with taper greasing nipples according to DIN 71412 A R1/8 or with flat greasing nipples according to DIN 3404 A G1/8. Relubrication must be carried out at regular intervals. The lubrication points are near the input and/or output shaft. Observe chapter "Inspection and maintenance intervals" (→ 🗎 144).

Bevel-helical gear unit

When installed in a restricted space, the lubrication points can be relocated to the top side of the gear unit. Flat greasing nipples according to DIN 3404 A G1/8 are used. Relubrication must be carried out at regular intervals. Observe chapter "Inspection and maintenance intervals" (→ 🗎 144).

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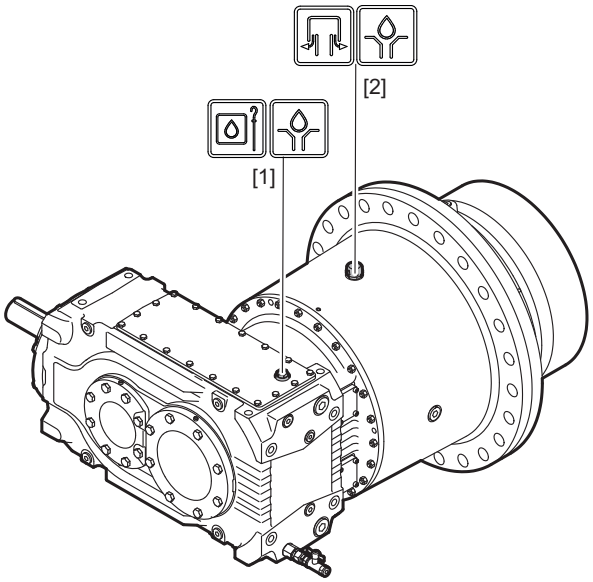
3.10 Oil level check and gear unit venting

Due to the shared oil chamber, the oil level check is performed via oil dipstick [1] at the upper inspection cover of the primary gear unit depending on the mounting position. The gear unit venting [2] is performed at the planetary gear unit.

As standard, oil dipstick [1] and breather [2] are made of steel. They are available made of plastic or stainless steel as an option.



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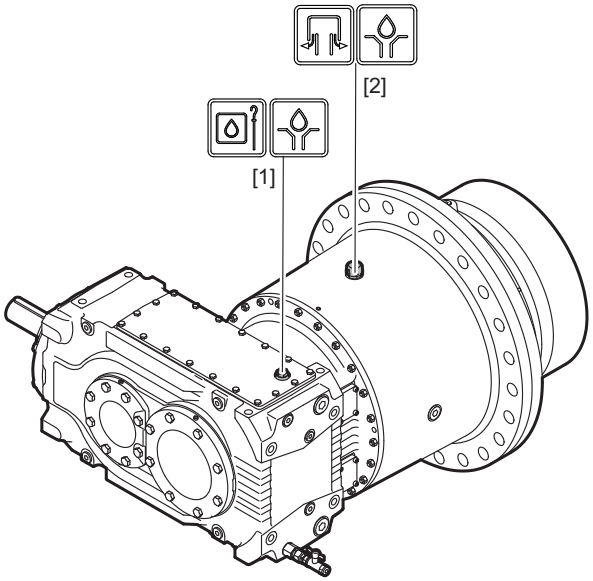
3.11 Oil filling

Oil filling can be performed either via the oil dipstick bores [1] on the primary gear unit or via the breather [2] on the planetary gear unit.



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3.12 Oil drain

As standard the oil drain is performed via the oil drain valve [1] at the primary gear unit.

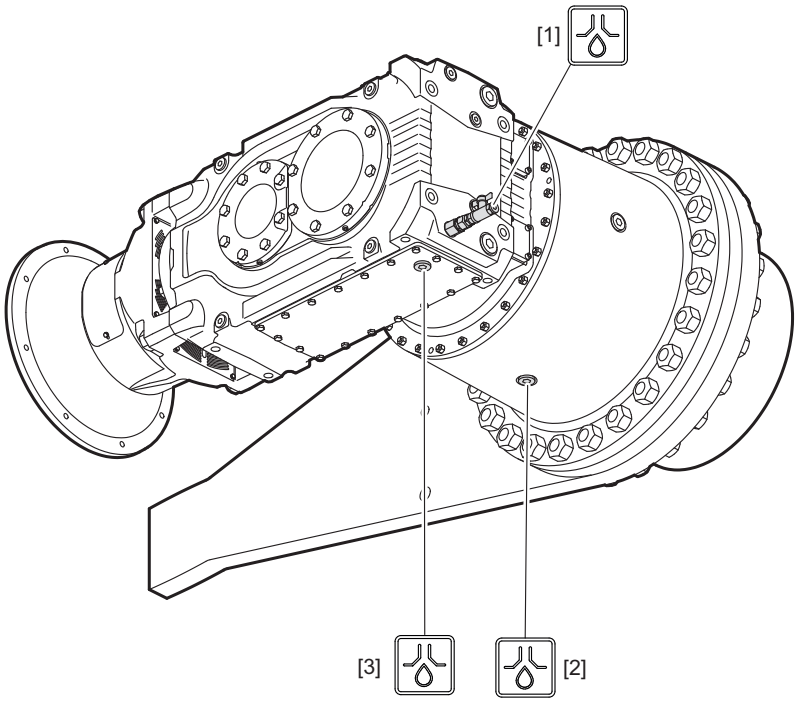
In case a complete oil drain is required, additional screw plugs [2] at the planetary gear unit or the primary gear unit [3] can be used.

These screw plugs are optionally also available in magnetic design.

As an alternative, an additional oil drain valve can be attached to the planetary gear unit instead of the screw plug [2].

INFORMATION

The position of the oil drain can change at pivoted mounting positions. Please contact SEW-EURODRIVE in this case.



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NOTICE

The oil drain valve might be damaged if it is not sufficiently secured.

Possible damage to property.

- The oil drain valve must be additionally secured using a screw plug. At temperatures below -20 °C, the permeability of the valve might be limited.

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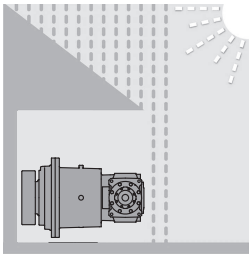
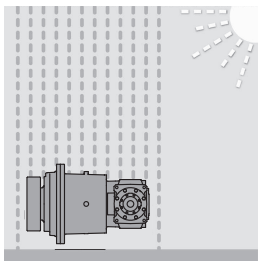
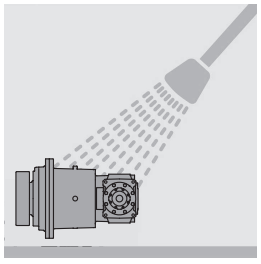
3.13 Coating and surface protection systems

The following tables give an overview of coating and surface protection systems.

Used as surface protection under typical ambient conditions, corrosivity category DIN EN ISO 12944-2.

OS 1 low environmental pollution	
	Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as outdoor applications under roof or with protection, unheated buildings where condensation can build up. Based on corrosivity category: C2 (low)
Sample applications	• Systems in saw mills • Agitators and mixers
Condensation test ISO 6270	120 h
Salt spray test ISO 7253	–

OS 2 medium environmental pollution	
	Suitable for environments with high humidity or moderate atmospheric contamination, such as applications outdoors subject to direct weathering. Based on corrosivity category: C3 (moderate)
Sample applications	• Applications in gravel plants • Cable cars
Condensation test ISO 6270	120 h
Salt spray test ISO 7253	240 h

OS 3 high environmental pollution	
	Suitable for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasional acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. Based on corrosivity category: C4 (high)
Sample applications	• Port cranes • Sewage treatment plants • Mining applications
Condensation test ISO 6270	240 h

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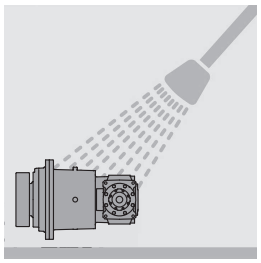
OS 3 high environmental pollution	
Salt spray test ISO 7253	480 h

OS 4 high environmental pollution	
	Suitable for environments with permanent humidity or severe atmospheric or chemical contamination. Regular acidic and caustic wet cleaning also with chemical cleaning agents. Based on corrosivity category: C5 (very high)
Sample applications	• Drives in malting plants • Wet areas in the beverage industry • Conveyor belts in the food industry
Condensation test ISO 6270	360 h
Salt spray test ISO 7253	600 h

INFORMATION

- Standard top coat color RAL 7031, can deviate depending on the order, see order documents.
- Colors according to RAL – Yes
- Water and hand perspiration repelling rust preventive for external preservation applied to uncoated parts, shaft ends/flanges.
- Sheet metal parts (such as protection covers) are painted in RAL 1003 as standard.
- If you need surface protection systems of a higher quality, contact SEW-EURODRIVE.

3.14 Lubrication type

Splash lubrication is the standard lubrication type.

The mark on the oil dipstick is decisive for filling of the gear unit. Gearing and bearing parts that are not immersed in the oil bath are lubricated by splashing oil.

For other mounting positions than the mounting position M1 oil bath lubrication might be necessary. Please contact SEW-EURODRIVE in such cases.

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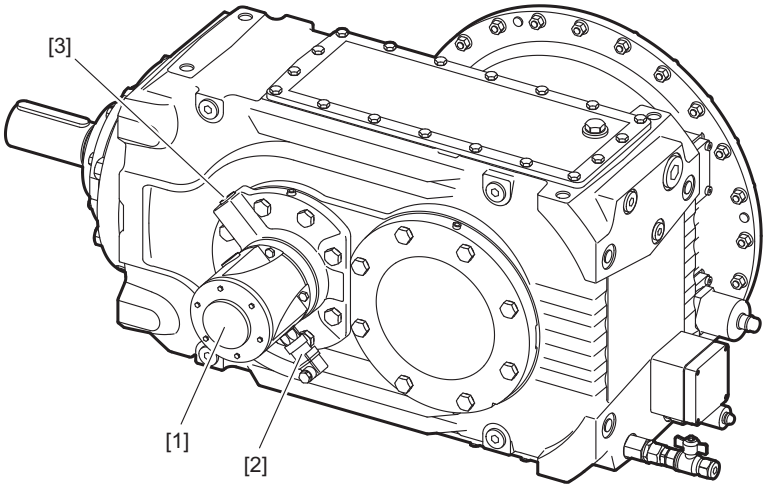
4 Structure of options

4.1 Shaft end pump /SEP

The figure shows an example of a shaft end pump.



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[1] Shaft end pump
[2] Pressure switch
[3] Oil fill opening

With pressure lubrication, a direction-independent shaft end pump [1] supplies all bearing points and gearing outside the oil sump with oil via a tube system.

The shaft end pump [1] is mounted externally to the gear unit and is driven by the input shaft or intermediate shaft of the gear unit. A high reliability of the pump function is ensured in this way.

The shaft end pump [1] is available in 5 different pump sizes. The adequate flow rate for the specific application depends on the following factors:

- Oil quantity required to supply the lubrication points
- Pump position (connected to input shaft or intermediate shaft)
- Gear unit ratio
- Dimensioned for a speed of the gear unit

INFORMATION

- Proper functioning of the shaft end pump is monitored via the connected pressure switch. For information, refer to chapter "Pressure switch" (→ 🗎 54).
- Contact SEW-EURODRIVE for selecting the suitable pump size.
- A minimum input speed is required for the shaft end pump to operate properly. If you use variable input speeds (e.g. inverter-controlled drives) or if you intend to change the input speed of an already delivered gear unit with a shaft end pump, it is essential that you contact SEW-EURODRIVE.

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4.2 Motor pump /ONP

INFORMATION

For a description of the unit structure, refer to the addendum to the operating instructions "Motor pump /ONP".

4.3 Motor pump /ONP1L

INFORMATION

For a description of the unit structure, refer to the addendum to the operating instructions "Motor pump /ONP1L".

4.4 Motor pump /ONP1

INFORMATION

For a description of the unit structure, refer to the addendum to the operating instructions "Motor pump /ONP1".

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4.5 Torque arm /T

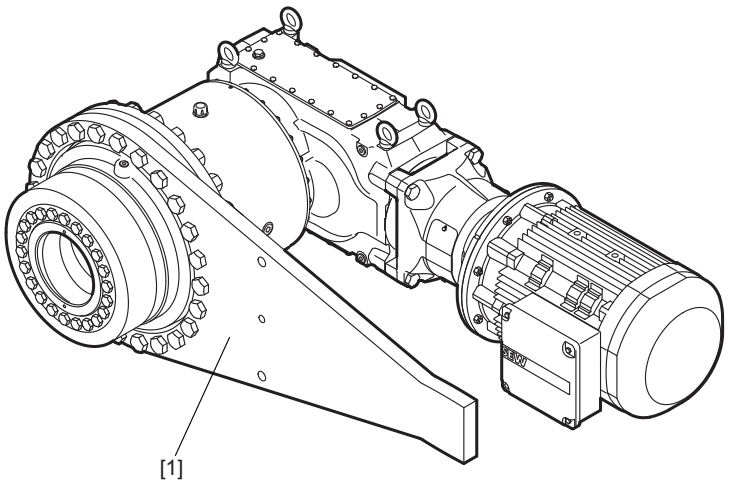
A torque arm is available as option for shaft-mounted gear units to support the reaction torque.

Depending on the load direction and type of the customer load bearing point, the reaction torque acts as a tensile or compressive force.

4.5.1 Single-sided torque arm

The torque arm [1] is enclosed in the delivery or can be mounted according to customer requirements. The retaining screws are included in the scope of delivery.

The following figure shows a sample combination of a planetary gearmotor with a torque arm on one side.



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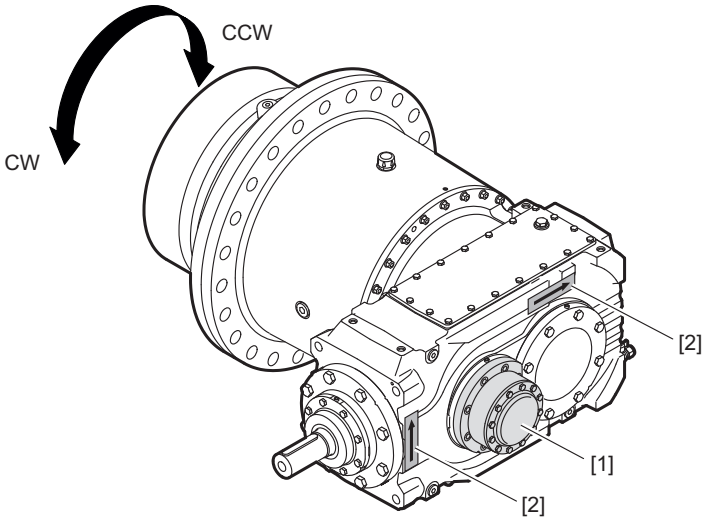
4.6 Backstop /BS

The purpose of a backstop [1] is to prevent unwanted directions of rotation. During operation, the backstop permits rotation in only one specified direction of rotation.

The backstop functions by using centrifugal lift-off sprags. Once the lift-off speed is reached, the sprags completely lift off from the contact surface of the outer ring. The backstop is lubricated with gear oil.



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The direction of rotation is specified as viewed onto the output shaft (LSS).

- CW = Clockwise rotation
- CCW = Counterclockwise rotation

The permitted direction of rotation [2] is indicated on the housing.

Contact SEW-EURODRIVE for differing requirements.

Wear can occur on the backstop when operated below lift-off speed.

In the following cases **always** contact SEW-EURODRIVE for specifying the maintenance intervals:

- Input shaft speed rates $n_1 < 950\ min^{-1}$
- or any of the following gear unit designs:

n_1 min^{-1}	Size
950...1150	X2K100..170 $i_N \geq 10$

n_1 = Input speed (HSS) i_N = Nominal gear unit ratio

INFORMATION

X2K primary gear units with a gear unit ratio $i_N \geq 10$ are marked with * in the chapter "Selection tables".

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4.7 Motor adapter /MA

Motor adapters [1] are available for mounting

- **IEC (B5) motors** of sizes 200 to 355
- **NEMA ("C" face) motors** of sizes 324 to 449

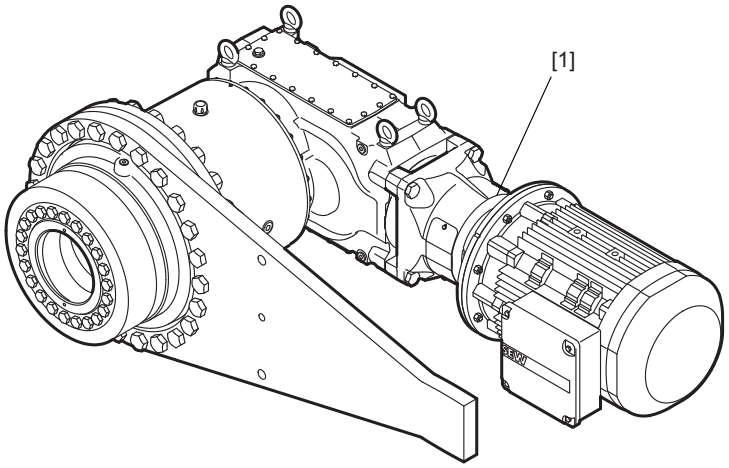
INFORMATION

- The gear unit must be installed in such a way that liquids cannot enter the motor adapter (HSS end) and accumulate there. Otherwise, the oil seal can be damaged, and subsequent damage can create a possible ignition source.

INFORMATION

- An elastic claw coupling is included in the scope of delivery.
- All motor adapters can have a fan installed.

The following figure shows an example of the motor adapter [1] connected to the gear unit:



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4.8 Cooling types

4.8.1 Fan cooling

A fan is installed on the gear unit input shaft. Its airflow improves the transmission of heat from the gear unit surface to the environment. Refer to chapter "Fan" for further information.

4.8.2 Built-in cooling

This refers to cooling systems installed directly in the gear unit housing or mounted very close to it, such as a water cooling cartridge.

4.8.3 Circulation cooling

The gear unit oil is pumped out of the gear unit to an external heat exchanger by a pump (motor pump or shaft end pump). This normally involves oil supply systems with oil-water or oil-air heat exchangers.

4.9 Fan

A fan may be installed in the motor adapter to raise the thermal rating or when the ambient conditions change after gear unit startup. The direction of rotation of the gear unit does not influence the operation of the fan.

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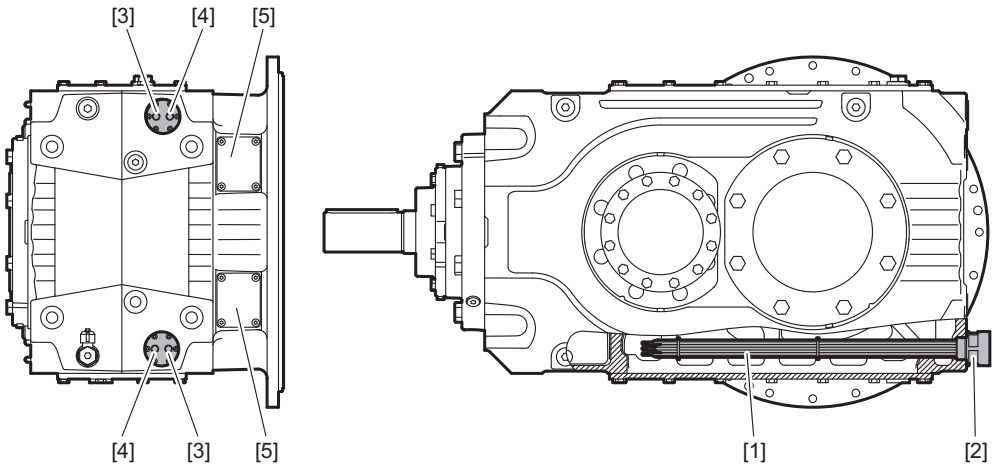
4.10 Water cooling cartridge /CCT

The water cooling cartridge can be installed above or beneath the oil level. The water connection must be installed by the user.

The amount of heat that can be dissipated depends on the intake temperature and the flow rate of the cooling medium that flows through the unit.

The data given in the technical specifications must be observed.

4.10.1 Structure



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[1] Cooling pipes
[2] Tube plate with connection piece
[3] Return
[4] Supply
[5] Assembly opening for optional water cooling cartridge

The water cooling cartridge consists of 3 main parts:

- Cooling pipes (CuNi alloy)
- Tube plate (brass)
- Connection piece (brass; gray cast iron; steel)

For connection to the cooling circuit, the following 2 bores with

- pipe thread G1/4" for sizes X110 – X170

are available. The piping is not included in the delivery.

Gear units with water cooling cartridge are delivered completely assembled.

Water cooling cartridges can be retrofitted to a certain extent. Contact SEW-EURODRIVE.

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4.10.2 Notes on connection and operation

Thermal rating is specified in the selection tables of the Industrial Gear Units P-X Series catalog. To achieve the thermal rating, various cooling water flow rates are required for the different gear unit designs. The required cooling water flow rate depends on the following characteristics:

- Gear unit size
- Mounting position
- Type of lubrication

The cooling water quantity has to be dimensioned individually for each cooling cartridge.

Size/Connection	Max. cooling water volume flow l/min
X2K110/X2K130 – G1''	12
X2K150/X2K170 – G1 1/4''	15

INFORMATION

The specified cooling water volume flow refers to 1 cooling cartridge. The cooling circuit must be connected in parallel for gear units with several water cooling cartridges. Connecting several cooling cartridges in series is not permitted. Observe chapter Installation > Water cooling cartridge.

INFORMATION

Contact SEW-EURODRIVE in the following cases:

- When special cooling media are used (then the cooling capacity of the water cooling cartridge changes).
- When aggressive cooling media are used, such as brackish water or salt water.

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4.11 Oil-water cooler for splash lubrication /OWC

INFORMATION

For descriptions on the unit structure, refer to the addendum to the operating instructions "Oil-Water Cooler for Splash Lubrication /OWC".

4.12 Oil-air cooler for splash lubrication /OAC

INFORMATION

For descriptions on the unit structure, refer to the addendum to the operating instructions "Oil-Air Cooler for Splash Lubricaton /OAC".

4.13 Oil-water cooler for pressure lubrication /OWP

INFORMATION

For descriptions on the unit structure, refer to the addendum to the operating instructions "Oil-Water Cooler for Pressure Lubrication /OWP".

4.14 Oil-air cooler for pressure lubrication /OAP

INFORMATION

For descriptions on the unit structure, refer to the addendum to the operating instructions "Oil-Air Cooler for Pressure Lubrication /OAP".

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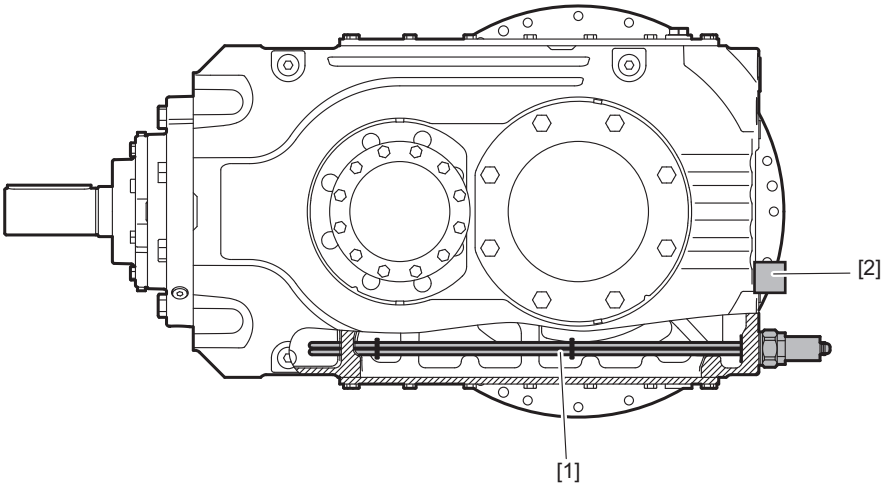
4.15 Oil heater/OH

An oil heater may be required to ensure lubrication during a cold gear unit startup when the ambient temperature is low.

The oil heater consists of 2 basic parts:

1. Heating element in the oil sump ("oil heater") with connection unit
2. Thermostat with integrated temperature sensor



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[1] Oil heater

[2] Thermostat with integrated temperature sensor

INFORMATION

- For reduced heating times a second heating element (OH-F) can optionally be used at the mounting flange. Contact SEW-EURODRIVE in this case.
- The position of the thermostat varies with design and mounting position of the gear unit.

4.16 Pressure switch /PS

The pressure switch signals the correct oil pressure in the pressure pipe und in this way indicates that the pressure lubrication is ready for operation. The pressure switch must be monitored by the operator.

Pressure might build up with a delay during the startup phase of the gear unit with shaft end pump. The slow pressure build-up in this phase can lead to an error signal by the pressure switch that can be bridged. The pressure switch signal must then be bridged for **5 to a maximum of 10 seconds**.

Longer shutdown delays may damage the gear unit and are not permitted.

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4.17 Temperature sensor /PT100

The temperature sensor PT100 can be used to measure the temperature of the oil in the gear unit.

The temperature sensor is located in the oil sump of the gear unit. The exact position depends on the gear unit type and shaft position.

4.18 Temperature switch /NTB

A temperature switch with preset switching temperatures of 70, 80, 90 or 100 °C is used for monitoring the gear unit oil temperature.

For various functions, the temperature switch is also used as limit value switch, for example

- as "early warning"

  or

- as "main alarm" for switching off the main motor.

To guarantee a long service life and functioning under all conditions, it is recommended to use a relay in the power circuit instead of a direct connection through the temperature switch.

The temperature switch is located in the gear unit's oil sump. The exact position depends on the gear unit version and position of the shaft.

4.19 Temperature switch /TSK

A temperature switch with preset switching temperatures is available for monitoring the gear unit's oil temperature.

The temperature switch is designed with 2 fixed switching points for controlling and monitoring the system function.

For various functions, the temperature switch is also used as limit value switch, for example

- as "early warning"

  or

- as "main alarm" for switching off the main motor.

To guarantee a long service life and functioning under all conditions, it is recommended to use a relay in the power circuit instead of a direct connection through the temperature switch.

The temperature switch is located in the gear unit's oil sump. The exact position depends on the gear unit version and the location of the shaft.

The temperature switch must be integrated in the controller of the operator in such a way that the order-specific switching points are achieved. For further information, refer to the chapter Electrical connection.

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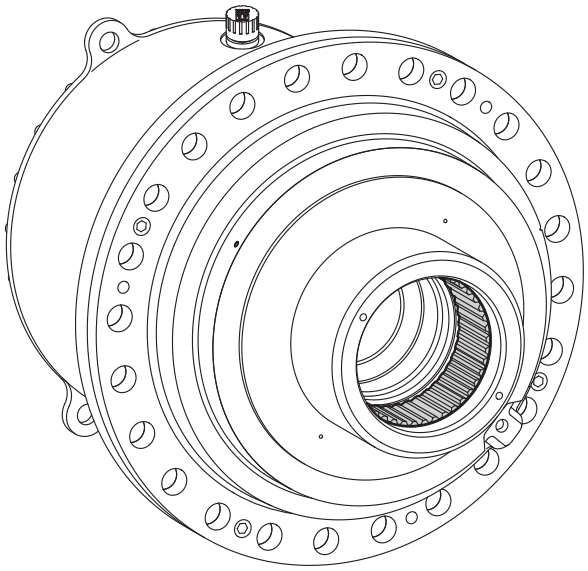
4.20 Output shaft as a splined hollow shaft /..V

The hollow shaft has splining according to DIN 5480. There is a centering in front of and behind the splined shaft for absorbing radial loads as well as for easier assembly of the output element.



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INFORMATION

Contact SEW-EURODRIVE regarding the permitted radial load.

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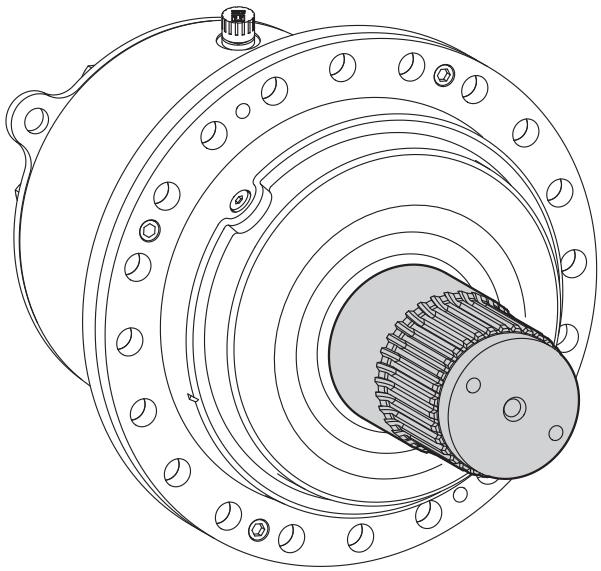
4.21 Output shaft as a splined solid shaft /..L

The solid shaft has splining according to DIN 5480. There is a centering in front of and behind the splined shaft for absorbing radial loads as well as for easier assembly of the output element. There are threads for mounting an end plate at the front of the shaft.



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INFORMATION

Contact SEW-EURODRIVE regarding the permitted radial load.

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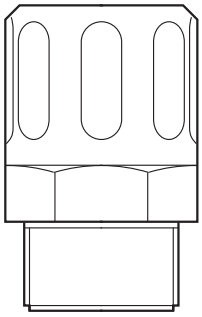
4.22 Breather /BPG

The following breathers can be used.

4.22.1 Breather (standard)

Structure



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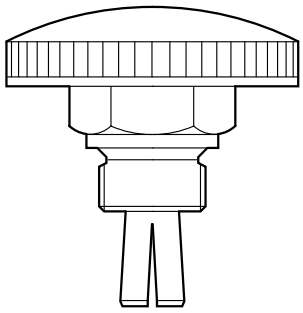
Housing material	Steel
Filter inserts	Wire mesh
Design	Pipe taper thread according to DIN 3858

4.22.2 Breather for harsh operating conditions

Structure



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Housing material	Stainless steel
Filter inserts	Steel and aluminum wire mesh
Design	Cylindrical pipe thread according to DIN EN ISO 228-1 Dimensioned for operating conditions with special protection against drip and splash water

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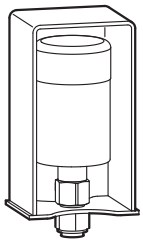
4.22.3 Desiccant breather filter /DC

INFORMATION

For explosion-proof drives, the desiccant breather filter is protected by a guard plate. The gear unit leaves the factory with the guard plate already mounted.



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The breather has the following characteristics:

- Absorbs water moisture and humidity
- Reduces oil mist

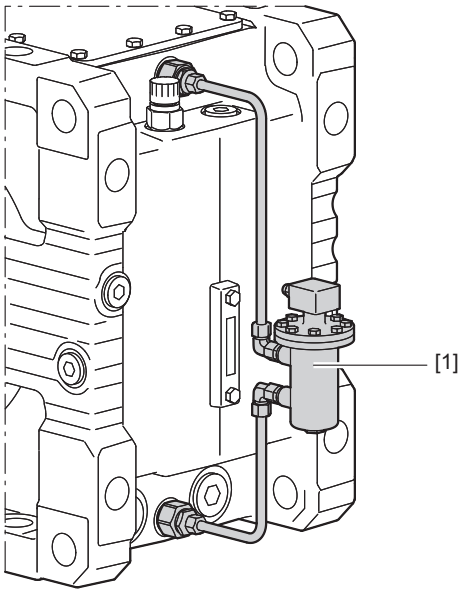
Structure

Features	
Housing material	Polycarbonate
Filter inserts	• Polyester filter: Removes air particles > 3 µm • Silica gel: Absorbs water moisture and humidity. Saturation is indicated by the color changing from blue to pink. • Foam pad: Absorbs oil mist.
Threads	3/8" or 1"

4.23 Float switch

The float switch [1] is used if level monitoring in the bypass is necessary due to limited space or due to high temperatures.

As soon as the float switch housing is filled half with liquid, the float switch moves upwards and triggers a switching contact. This switching contact activates e.g. solenoid valves, signal lamps or pumps via suitable electric auxiliary equipment (relays, contactors).



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5 Checklist

5.1 Before startup

This checklist provides an overview of the points that must be checked **before starting up** a gear unit in a potentially explosive area in accordance with Directive 2014/34/EU.

Check the following points before starting up a gear unit in a potentially explosive atmosphere:	Checked	See chapter
Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. It may be necessary to suspend startup. Remove any transport protection prior to startup.		"Transport" (→ 🗎 18)
Does the data on the nameplate of the drive match the situation on site for operation in a potentially explosive area? • Equipment group • Explosion protection category • Temperature class • Ambient temperature range		"Gear unit mounting in potentially explosive atmospheres" (→ 🗎 71) "Starting up industrial gear units in potentially explosive areas" (→ 🗎 130)
Have arrangements been made to prevent potentially explosive atmospheres (oils, acids, gases, vapors or radiation) during installation of the gear unit?		"Prerequisites for installation" (→ 🗎 68)
Does the ambient temperature comply with the specifications (nameplate and order confirmation)?		"Gear units and gearmotor in equipment group II" (→ 🗎 71)
Have measures been taken to ensure that the gear units are sufficiently ventilated and that they are not heated by an external heat source (e.g. the coupling)?		"Structure of options" (→ 🗎 45) "Installation/assembly" (→ 🗎 64)
Does the mounting position correspond to the specification on the gear unit nameplate? Please note: Contact SEW-EURODRIVE before you change the mounting position. Else the ATEX EU declaration of conformity may no longer be valid.		"Nameplate" (→ 🗎 25)
Does the current mounting position correspond to the specified mounting position for the oil level check? (Refer to the nameplate for the required mounting position.)		"Nameplate" (→ 🗎 25)
Does the oil level in this mounting position comply with the markings of the oil dipstick?		"Checking the oil level" (→ 🗎 147)
Do you have ready access to all oil level plugs and oil drain plugs as well as to the breather plugs and valves?		"Important notes" (→ 🗎 64)
Have measures been taken to ensure that the performance data and ambient conditions specified on the nameplate of the gear unit are not exceeded?		"Starting up industrial gear units in potentially explosive areas" (→ 🗎 130)
For motors operated on the supply system: • Check that the data specified on the nameplate of the gear unit and the motor corresponds to real conditions at the location where the drive is to be installed.		"Starting up industrial gear units in potentially explosive areas" (→ 🗎 130)

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Check the following points before starting up a gear unit in a potentially explosive atmosphere:	Checked	See chapter
Check that oil level monitoring and oil heater have been set and connected properly.		"Oil heater /OH" (→ 🗎 110)
General information on how to mount accessories: If operators change the gear unit after having installed it into the system, they must re-assess the gear unit in terms of additional/new ignition sources.		"Important notes" (→ 🗎 64)
If the "extended storage" option applies, check if the loosely enclosed breather plug has been replaced by the respective screw plug (see dimension sheet for position) and if thread locking compound has been applied.		"Startup of gear units with long-term protection" (→ 🗎 131)

5.2 During startup

This checklist includes all activities that have to be performed **during startup** of a gear unit in a potentially explosive atmosphere according to Directive 2014/34/EU.

Check the following points during gear unit startup in a potentially explosive area:	Checked	See chapter
Measure the surface temperature after initial startup. Before measuring the surface temperature, operate the gear unit under load in continuous duty for about 6 hours.		"Nameplate" (→ 🗎 25) "Gear units and gearmotor in equipment group II" (→ 🗎 71) "Measuring the surface and oil temperatures" (→ 🗎 138)
Measure the oil temperature to determine the oil change intervals. Observe chapter "Lubricant change intervals" (→ 🗎 146).		"Measuring the surface and oil temperatures" (→ 🗎 138)

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6 Installation/assembly

6.1 Required tools/resources

Not included in the delivery:

- Set of wrenches
- Torque wrench
- Mounting device
- Compensation elements (washers, spacer rings), if necessary
- Fasteners for input and output elements
- Lubricant, e.g. NOCO® fluid from SEW-EURODRIVE → except for hollow shaft gear units
- For hollow shaft gear units → aids for mounting onto/removal from the machine shaft
- Fasteners for the gear unit base

6.2 Tolerances

6.2.1 Gear unit P-X series

INFORMATION

Refer to the dimension sheet in your order documents for the tolerances of the interfaces for gear unit connection.

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6.3 Important notes

Read the following notes prior to installation/mounting.

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Work on the gear unit only when the machine is not in use. Secure the drive unit against unintentional power-up. Attach an information sign near the ON switch to warn that the gear unit is being worked on.

⚠ WARNING

Danger due to mounting in impermissible mounting position.

Severe or fatal injuries.

- Install/mount the gear unit only in the specified mounting position on a level, vibration-damping, and torsionally rigid support structure. Do not twist housing legs and mounting flanges against each other.
- Contact SEW-EURODRIVE before mounting the gear unit in another mounting position than the one permitted.

⚠ WARNING

Danger due to freely accessible, rotating parts.

Severe or fatal injuries.

- Secure rotating components such as shafts, couplings, gears or belt drives using suitable protection covers.
- Ensure that installed protection covers are sufficiently attached.

⚠ WARNING

A customer machine that is not appropriately secured can fall during gear unit installation or removal.

Severe or fatal injuries.

- Protect the operator's machine against unintentional movement when installing or removing the gear unit.
- Before releasing shaft connections, be sure that there are no active torsional moments present (tensions within the system).

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⚠ WARNING

Danger due to installing impermissible components.

Severe or fatal injuries.

- Do not mount any impermissible components to the gear unit.
- Additional installation of invalid components or assemblies that impact on the functioning of the gear unit can invalidate the conformity.
- Additional installation of invalid components or assemblies can cause new ignition sources. Manufacturers must ensure that the machine/overall system complies with applicable regulations by performing their own ignition hazard analysis and their own compliance assessment method.
- Mounting impermissible components may lead to material failure at the gear unit. This may cause the gear unit to fall over or down.

⚠ WARNING

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

Severe or fatal injuries from explosion.

- If you paint the gear unit and/or other parts of a drive package delivered by SEW-EURODRIVE, then adhere to the requirements on the paint in order to prevent electrostatic charge according to EN 60079-0 and EN ISO 80079-36.

⚠ WARNING

Danger due to using impermissible gear unit oil.

Severe or fatal injuries.

- Only use food-grade oils when the gear unit is used in the food industry.

⚠ WARNING

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

Serious injury.

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

⚠ CAUTION

Risk of falling or ejecting of unsecured mount-on components, such as keys.

Possible injuries.

- Install appropriate protective devices.
- Secure the mount-on components.

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⚠ CAUTION

Danger due to lubricant leaking from damaged seals and the breather.

Minor injuries.

- Check the gear unit and mount-on components for leaking lubricant.
- The seals must not come in contact with cleaning agent as this may damage the seals.
- Protect the breather against damage.
- Make sure that there is not too much oil in the gear unit. If the oil level is too high and the temperature rises, lubricant may escape from the breather.

⚠ CAUTION

Risk of injury due to protruding parts.

Minor injuries.

- Gear units and mount-on components must not protrude into footways.

NOTICE

Starting up the gear unit below the permitted ambient temperature may damage the unit.

Possible damage to property.

- Before startup, the oil must be heated up to the specified temperature.

NOTICE

Improper installation and assembly can damage the gear unit.

Possible damage to property.

- Observe the following notes.

- Make sure that the customer components are designed for the load.
- The gear units are delivered without an oil fill as standard.
- The most important technical data is provided on the nameplate.

  Additional data relevant for operation is available in drawings, on the order confirmation or in an order-specific documentation.
- Do not change the mounting position without prior consultation with SEW-EURODRIVE. The warranty will become void without prior consultation.
- Note that the oil quantities on the nameplates are approximate values. The mark on the oil dipstick or the oil level glass is the decisive indicator of the correct oil quantity.
- Do not modify the gear unit or mount-on components without prior consultation of SEW-EURODRIVE.
- Make sure that the oil level and oil drain plugs, as well as the breather plugs are freely accessible.
- When installing a filter in the OAP and OWP cooling units, make sure there is sufficient height for removing the filter element and the filter hood.

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- Use plastic inserts if there is a risk of electrochemical corrosion between the gear unit and the driven machine (connection between different metals such as cast iron and stainless steel). Also install the bolts with plastic washers. Always ground the gear unit housing.
- It is important that only authorized personnel is allowed to assemble gear head units with motors and adapters. Contact SEW-EURODRIVE.
- Do not weld anywhere on the drive. Do not use the drive as a ground point for welding work. Welding may destroy gearing components and bearings.
- Units installed outdoors must be protected from the sun. Install suitable protective devices, such as covers or roofs. Avoid a heat build-up. The user must ensure that foreign objects do not impair the function of the gear unit (e.g. falling objects or coverings).
- Protect the gear unit from direct cold air currents. Condensation may cause water to accumulate in the oil.
- The gear unit is delivered with the paint you have ordered or with a primer. Repair any damage to the paint, and paint a gear unit delivered with primer before taking the gear unit into operation. Adhere to the requirements on the paint in order to prevent electrostatic charge according to EN 60079-0 and EN ISO 80079-36
- Do not modify the existing piping.
- For gear units that are filled with oil at the factory, check to see that the breather plugs are installed before you start up the gear unit.
- Adhere to the safety notes in the individual chapters.

INFORMATION

- Depending on the order, the gear unit can be delivered with or without oil. Observe the information on the nameplate.
- The electrical installation must comply with the standard EN 60079-14.
- The gear unit must be installed in such a way that liquids cannot enter the motor adapter (HSS end) and accumulate there. Otherwise, the oil seal can be damaged, and subsequent damage can create a possible ignition source.
- When touching up the surface coating, make sure that used coatings have a sufficiently low leakage resistance to avoid the risk of ignition due to electrostatic charge. Observe the standards EN 60079-0 and EN ISO 80079-36.
- Do not change the mounting position without prior consultation with SEW-EURODRIVE. Warranty as well as EU declaration of conformity will become void without prior consultation.
- Make sure that the gear unit housing is grounded. Electrical mount-on components, such as motors, frequency inverters, etc., must be grounded separately.
- Observe the instructions in chapter "Installing the gear unit".

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6.4 Prerequisites for installation

Check that the following conditions have been met:

- The information on the motor's nameplate must match the voltage supply system.
- The drive has not been damaged during transportation or storage.
- Ambient temperature according to the order documents and the nameplate.
- No harmful oils, acids, gases, vapors, radiation etc. in the vicinity

NOTICE

Danger due to insufficiently cleaned flange surfaces.

Possible damage to property.

- 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 let the solvent come into contact with the sealing lips of the oil seals.

INFORMATION

The drive must **not** be assembled in the following ambient conditions:

- Presence of explosive atmosphere
- Oils
- Acids
- Gases
- Vapors
- Radiation

INFORMATION

The ambient temperature must comply with the specifications on the nameplate. If the nameplate does not specify any ambient temperature range, contact SEW-EURODRIVE.

6.4.1 Extended storage of gear units

Please note: The service life of the lubricant in the bearings is reduced if the unit is stored for ≥ 1 year (applies only to bearings with grease lubrication).

Replace the provided breather filter with the screw plug.

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6.5 Installing the gear unit

⚠ WARNING

Danger due to insufficient attachment options on the part of the operator.

Severe or fatal injuries.

- Make sure that there are sufficient and suitable attachment options for the gear unit at the operator's machine before mounting the gear unit to the operator's machine.

NOTICE

An improper foundation may result in damage to the gear unit.

Possible damage to property.

- The foundation must be level and flat; the gear unit may not be deformed when the retaining screws are tightened. Irregularity of the surface must be leveled out appropriately.
- Observe the weight specified on the nameplate.

INFORMATION

Processes that cause strong electrical charge due to fast moving particles on the coating must be excluded (e.g. due to fluid liquids and solids)!

To ensure quick and successful mounting of a gear unit with foot mounting, the proper foundation should be selected and the mounting carefully planned in advance. Foundation drawings with all necessary construction and dimension details should be available.

To ensure quick and successful mounting of a gear unit with foot mounting, a suitable steel construction should be selected and the mounting carefully planned in advance. Foundation drawings with all necessary construction and dimension details should be available.

To prevent harmful vibrations and oscillations, ensure sufficient rigidity of the foundation or the steel construction during installation of the gear unit with foot or flange mounting. The foundation and steel construction must be dimensioned according to the weight and torque of the gear unit, taking into account the forces acting on the gear unit.

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6.5.1 Tightening torques: Retaining screws of gear unit mount-on parts

Observe the notes in chapter "Important information" (→ 🗎 64).

Tighten the screws of gear unit mount-on parts and protection covers using the following tightening torque.

INFORMATION

The tightening torques do not apply to mounting types like flange coupling, torque arm, mounting flange, hollow shaft with shrink disk etc. Those are described in the individual chapters.

Screw/nut	Tightening torque Strength class 8.8 Nm
M6	11
M8	27
M10	54
M12	93
M14	148
M16	230

INFORMATION

Do not lubricate the screw connection during installation.

6.5.2 Aligning the shaft axis

⚠ WARNING

Shafts can break if shaft axes are not aligned exactly.

Severe or fatal injuries.

- Refer to the separate operation instructions regarding the requirements of the couplings.

The service life of the shafts, bearings and couplings depends on the precision of the alignment of the shaft axes with each other.

Always try to achieve zero misalignment. When doing so, also consult the special operating instructions regarding the requirements of the couplings, for example.

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6.6 Gear unit mounting in potentially explosive atmospheres

INFORMATION

- Make sure to observe the safety notes in chapter 2 when installing the gear unit in a potentially explosive atmosphere.
- Processes that cause strong electrical charge are not permitted.

6.7 Gear units and gearmotor in equipment group II

Observe the following notes on explosion-proof industrial gear units:

INFORMATION

Industrial gear units of the explosion-proof P-X.. series correspond with the design requirements for equipment group II.

The operating instructions describe the use of a gear unit in potentially explosive atmospheres. Potentially explosive atmospheres are specified in Directive 2014/34/EU.

Explosion-proof industrial gear units of the P-X.. series by SEW-EURODRIVE meet the following construction requirements:

- Equipment group II, category 2G or 3G (potentially explosive gas atmosphere), 2D or 3D (potentially explosive dust atmosphere).

6.7.1 Temperature information

Limit values have been defined for gear units regarding surface temperature, oil bath temperature, and ambient temperature.

The limit values for the surface temperature are indicated on the nameplate in the Ex labeling for dust and gas.

The limit values for the ambient temperature are also specified on the nameplate.

The limit values for the oil bath temperature during operation must be determined depending on the oil in use based on the lubricant table, as well as based on the minimum temperature difference between surface temperature and oil bath temperature. The minimum temperature difference is 30 K for drives without fan, and 20 K for drives with fan.

Observe the descriptions in the following chapters.

Determine the lowest and highest limit value from the temperature ranges for surface and oil bath temperatures. Make sure that the gear unit is only operated within this temperature range.

Do the following to determine the temperature range permitted for operating the gear unit:

The lowest oil bath temperature stated in the lubricant table defines the lower permissible limit for operating the gear unit. The gear unit may be operated as long as the ambient temperature doesn't fall below the limit specified for the oil bath temperature.

If the gear unit is equipped with an oil heater, it may also be started at lower ambient temperatures. The prerequisite is that the gear unit oil is heated to the minimum temperature specified in the lubricant table. Independent of the used lubricant, the gear unit must be heated to a minimum oil temperature of -25 °C. For further information, refer to chapter "Oil heater /OH" (→ 🗎 110).

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The maximum permitted oil bath temperature specified in the lubricant table must be compared to the permitted oil bath temperature that is calculated based on the maximum permitted surface temperature and the minimum temperature difference. The lower value of the 2 oil bath temperatures defines the upper limit for the oil bath temperature during operation.

Example:

Ex labeling gas: II 2G Ex h IIC **T5** Gb IP65

Ex labeling dust: II 2D Ex h IIIC **T100°C** Gb IP65

Oil in use: CLP HC 320 from Castrol

Temperature information	Limit values °C	
	Min.	Max.
Ambient temperature (standard)	-20	+40
Surface temperature (according to Ex labeling)	-	+100
Oil bath temperature (according to lubricant table)	-20	+90
Oil bath temperature (depending on surface temperature)	-20	+70 (+100 – 30K)

Assessment:

The oil bath temperature must not exceed a maximum value of 70 °C and must not drop below a minimum value of -20 °C. If these limit values are adhered to during operation, gear units may be operated in an ambient temperature range from -20°C to +40 °C. If the limit values are exceeded during operation, for example because the gear unit heats up, the gear unit must be stopped immediately.

Temperature class

The maximum surface temperature differs depending on power, speed, housing size, lubrication type, reduction ratio, mounting position, etc.

The maximum surface temperature results from the division into temperature classes. The temperature classes indicate the maximum surface temperature for potentially explosive gas atmospheres. The maximum surface temperature for potentially explosive dust atmospheres is indicated in the separate dust labeling.

The maximum permitted surface temperature for SEW-EURODRIVE gear units deviates from the values specified in directive 2014/34/EU and is less than 450 °C. For information on the maximum surface temperature, refer to the nameplate and to chapter Temperature information. Also observe the following chapters.

- **Equipment of group II G**

  Equipment of group II G must be categorized in a temperature class from which the maximum surface temperature results, see the following table.

  For information on temperature classes and surface temperatures of the electrical and electromechanical equipment used, refer to the nameplate of the equipment and to the declaration of conformity according to directive 2014/34/EU.

Temperature class	Maximum surface temperature in °C
T1	450
T2	300
T3	200

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Temperature class	Maximum surface temperature in °C
T4	135
T5	100
T6	85

- **Equipment of group II D**

  Equipment of group II D must be clearly defined according to the actual maximum surface temperature. They are marked accordingly.

Ambient temperature

INFORMATION

Directive 2014/34/EU specifies a temperature range from -20 °C to +60 °C for the ambient temperature. Ambient temperatures that deviate from the normal range of validity of the directive are indicated on the nameplate. If the nameplate does not specify any ambient temperature range, contact SEW-EURODRIVE.

The ambient temperatures permitted for gear units in equipment group II deviate from the range of validity of the directive from -20 °C to +60 °C.

Gear units in equipment group II may only be operated at ambient temperatures of -20 °C to +40 °C as standard. Deviations are allowed in individual cases and are indicated on the nameplate.

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Surface temperature

The maximum surface temperature of gear units of category II2D and II3D, II2G and II3G differs depending on the power rating, speed, reduction ratio, and mounting position.

The maximum permitted surface temperature results from the Ex classification on the nameplate. Other temperatures are only permitted after consultation with SEW-EURODRIVE.

To determine the temperature range for the drive at which the gear unit may be operated, you have to compare the information for the surface temperature (Ex classification) and the information for the oil bath temperature (lubricant table).

The surface temperature must not exceed the following values:

- The maximum permitted surface temperature according to the assigned temperature class (gas).
- The maximum surface temperature for dust (see Ex labeling on the nameplate).

The system operator must ensure that the accumulation of dust does not exceed a maximum thickness of 5 mm in accordance with EN 60079-17.

The surface temperature of the drive may deviate ≤ 70 K from the ambient temperature if the maximum surface temperatures of the "Ex classification or the oil bath temperature" (→ 🗎 71) are not exceeded. If the specified limit values are exceeded, switch off the drive immediately and contact SEW-EURODRIVE.

6.7.2 Degree of protection

The IP code on the nameplate indicates the degree of protection.

6.7.3 Ambient conditions

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

6.7.4 Output power and output torque

Ensure that the output torque, speed and permitted overhung and axial loads are maintained according to the data given on the nameplate.

6.7.5 Special designs

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

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6.8 Filling gear units with oil / delivered without oil fill (standard)

6.8.1 Notes

Observe the notes in chapter "Important information" (→ 🗎 64).

The gear unit is delivered without oil fill as standard. Observe the following information for gear units:

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Work on the gear unit only when the machine is not in use. Secure the drive unit against unintentional power-up. Attach an information sign near the ON switch to warn that the gear unit is being worked on.

NOTICE

Improper oil filling may cause damage to the gear unit.

Possible damage to property.

- Observe the following notes.

- Fill in the oil when the gear unit is in the intended mounting position.
- Use an oil from the current lubricant table www.sew-eurodrive.de/lubricants.
- Make sure the oil is flowable when filling it into the gear unit. The flowability can be enhanced by prior heating, e.g. by using an oil heater.
- For gear units with external supply pipes, e.g. oil supply systems, establish the connections before filling the oil.
- Observe the additional notes in the following chapters depending on the lubrication type.
- Fill the gear unit with the oil grade specified on the nameplate. The oil quantity specified on the nameplate is an approximate quantity. The mark on the oil dipstick or oil level glass is the decisive indicator of the correct oil quantity to be filled in. When the gear unit is equipped with an oil dipstick and an oil sight glass, refer to the oil dipstick for the correct oil level. For further information, refer to chapters Checking the oil level and Changing the oil.

  The required oil fill quantity is higher when additional attachments are mounted to the gear unit, such as an oil supply system. In this case, observe the respective operating instructions by SEW-EURODRIVE: Oil supply system.
- Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm).

INFORMATION

- The oil level and drain plugs as well as the breather valves must be easily accessible.
- Check the correct oil fill specified for the relevant mounting position prior to startup (data on the nameplate).

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6.8.2 Gear units with shaft end pump /SEP

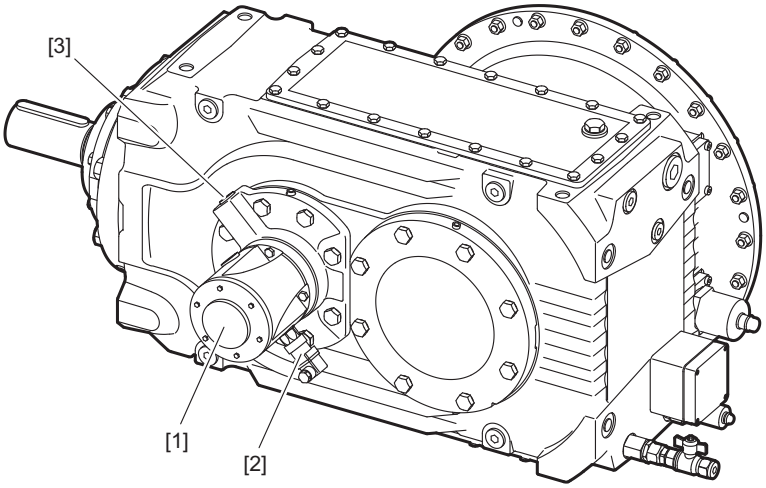
NOTICE

Improper installation and mounting of the shaft end pump [1] can damage the gear unit.

Possible damage to property.

- Note the following information.

- Fill the gear unit with the oil type and oil quantity corresponding to the nameplate data, see chapter "Changing the oil" (→ 🗎 152).
- Check the oil level using the oil dipstick. For additional information, refer to chapter "Checking the oil level" (→ 🗎 147).
- Before startup, fill the additional mount-on components (such as piping, cooler matrix...) with oil on the pressure side. This ensures that sufficient oil is in the overall system during startup. The oil filling holes are marked in the order dimension sheet.
- Directly before taking the gear unit into operation the first time, open the screw plug [3] and fill the shaft end pump [1] completely with oil. After having filled in the oil, close the screw plug [3].



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This procedure must be repeated after an idling time of more than 6 months.

For detailed information, refer to chapter "Startup > Shaft end pump /SEP" (→ 🗎 132) and the manufacturer documentation.

Pressure switch

Gear units with shaft end pump are equipped with a pressure switch [2] for function monitoring as standard. Connection has to be carried out by the operator. Observe the chapter Pressure switch.

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6.9 Gear units delivered with oil fill (option)

Observe the notes in chapter "Important information" (→ 🗎 64).

NOTICE

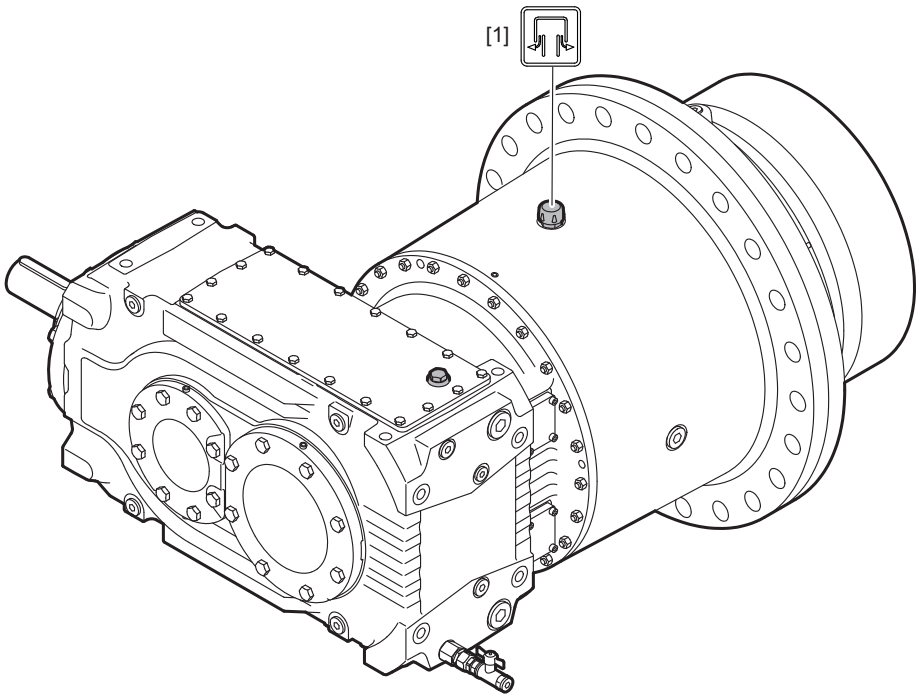
Improper startup can result in damage to the gear unit.

Possible damage to property.

- It is important that gear units with shaft end pump, motor pump or customer-installed cooling system are vented before taking them into operation the first time.

If the gear unit is delivered with oil fill, you have to install the breather plug prior to startup. It is enclosed with the delivery.

The following figure serves as an example. The position of the breather plug is specified in the order documents.



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1. Remove the closing plug.
2. Insert the breather plug [1].
3. Check the oil level. Observe the information in chapter "Checking the oil level" (→ 🗎 147).

6.10 Gear units with solid shaft

INFORMATION

The material of the machine shaft should be dimensioned by the customer according to the loads that will occur. The shaft material should have a yield point of at least 320 N/mm².

6.10.1 Mounting input and output components

NOTICE

Bearing, housings, or shafts may be damaged due to improper assembly.

Possible damage to property.

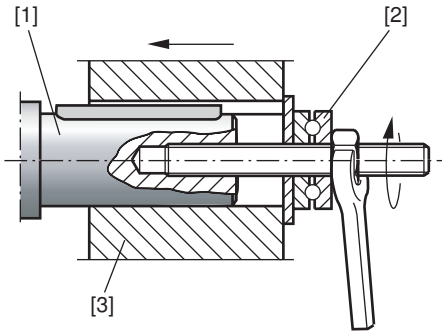
- Only use a mounting device for installing input and output elements. Use the center bore and the thread on the shaft end for positioning.
- Never force belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer. Doing so can damage bearings, housing, and shaft.
- Make sure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

INFORMATION

Only drive components with corresponding ATEX approval are permitted, assuming that these components are covered by Directive 2014/34/EU.

Installation with mounting device

The following figure shows a mounting device for installing couplings or hubs on gear unit ends or motor shaft ends. Should you be able to tighten the screw connection without any problems, you may not need the thrust bearing on the mounting device.



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[1] Gear unit shaft end
[2] Thrust bearing
[3] Coupling hub

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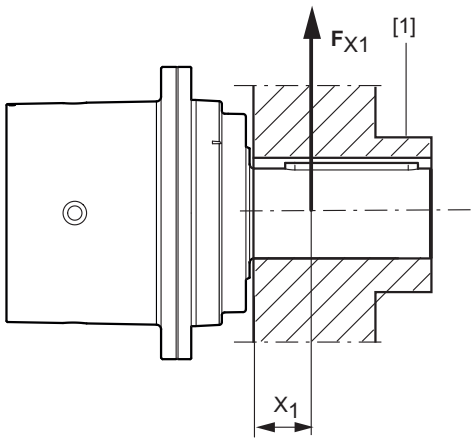
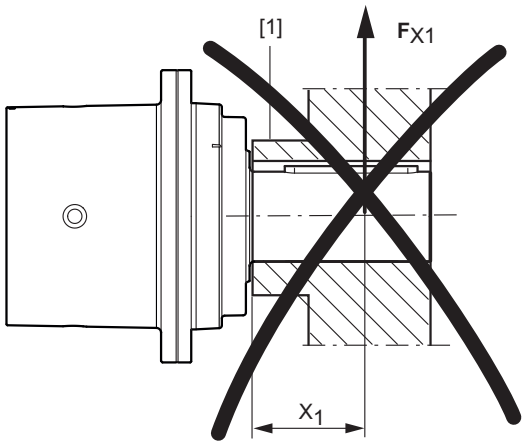
Avoid excessive overhung loads

To avoid high overhung loads: Install gear wheels or chain sprockets according to figure **A** if possible.



[A]



[B]

19114510347

[1] Hub
[A] Correct
[B] Incorrect

INFORMATION

Mounting is easier if you first apply lubricant containing MoS2 to the output element and/or heat it up briefly (to 80 – 140° C).

6.11 Output shaft as hollow shaft with shrink disk

INFORMATION

Only drive components with corresponding ATEX approval are permitted, assuming that these components are covered by Directive 2014/34/EU.

INFORMATION

If the nameplate lists F_{a2} = 0 N, ensure correct installation and designated use to prevent axial loads on the gear unit. Otherwise, the gear unit might heat up excessively.

INFORMATION

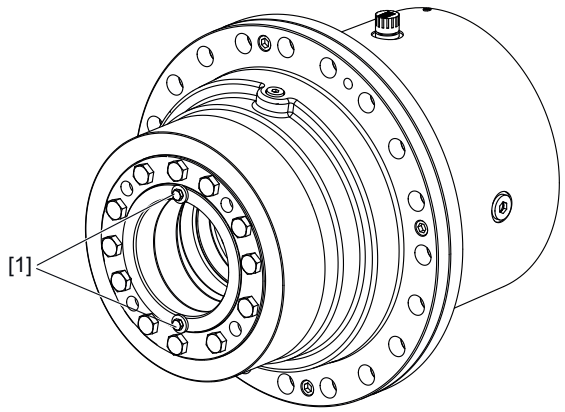
Ensure that the dimensions of the machine shaft correspond to the SEW-EURODRIVE specifications.

INFORMATION

The material of the machine shaft should be dimensioned by the customer according to the loads that will occur. The shaft material should have a yield point of at least 320 N/mm².

INFORMATION

Note that the shrink disk is secured with 2 screws [1] on delivery. Remove the screws prior to assembly.



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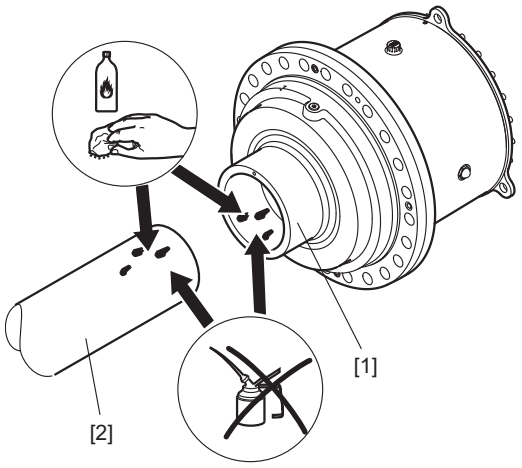
6.11.1 Installation

1. Before installing the shrink disk, clean and degrease the hub [1] and the machine shaft [2]. This is very important for reliable torque transmission.



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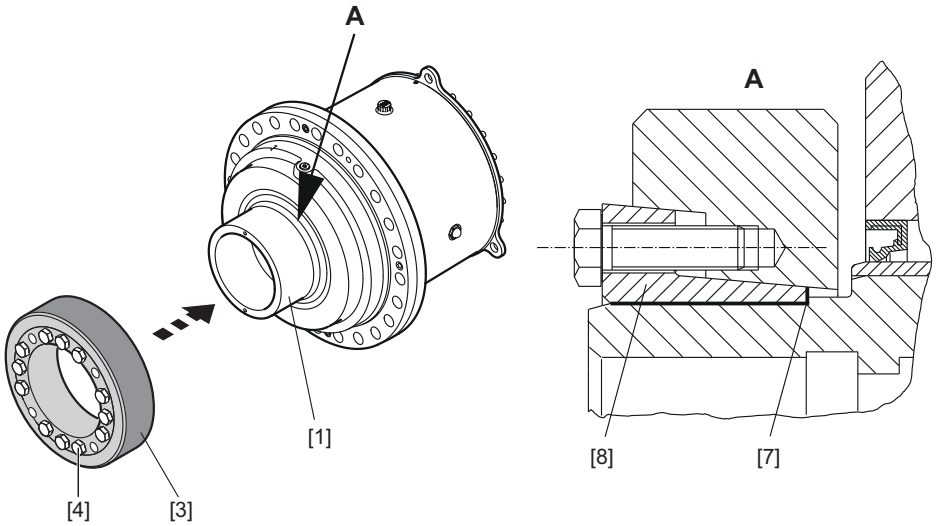
2. ⚠ **CAUTION!** The loose shrink disk could slip. Risk of injury to persons and damage to property. Secure the shrink disk against slipping.
   Slide the shrink disk with untightened screws onto the hollow shaft [1] and position the inner ring of the shrink disk [9].
3. **NOTICE!** Tightening the locking screws [4] without installed machine shaft may result in the hollow shaft being deformed. Possible damage to property. Only tighten the locking screws [4] with the machine shaft [2] installed.
   Check the correct position of the shrink disk [3]. The shrink disk is positioned correctly when it is in contact with the shaft shoulder [8].



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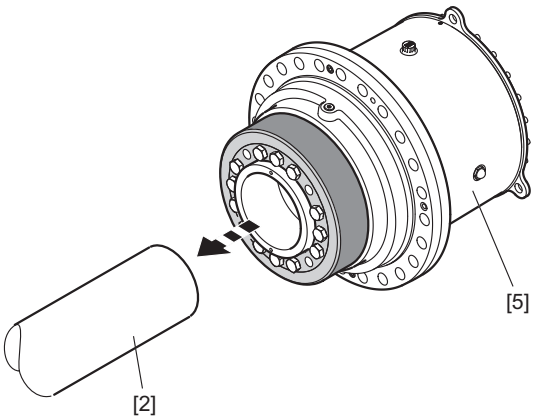
4. Install the machine shaft [2], or push the gear unit [5] onto the machine shaft [2] to the stop. Carry out the individual installation steps slowly to allow the compressed air to escape around the outside of the shaft.



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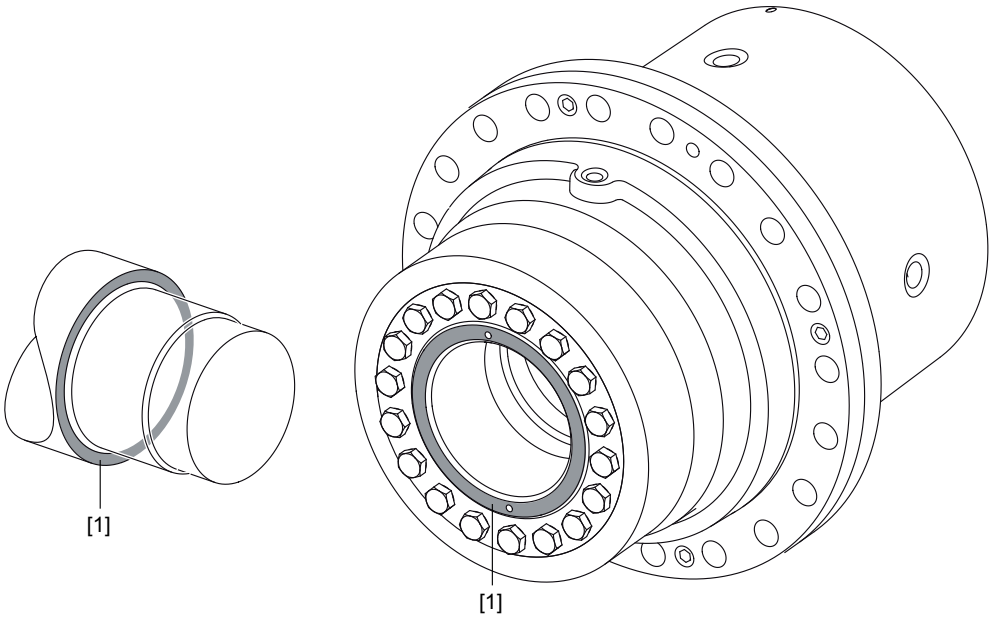
5. To guarantee a complete torque transmission from the gear unit to the machine shaft, observe the following procedure during assembly. Push the gear unit onto the machine shaft until the contact surfaces [1] touch.



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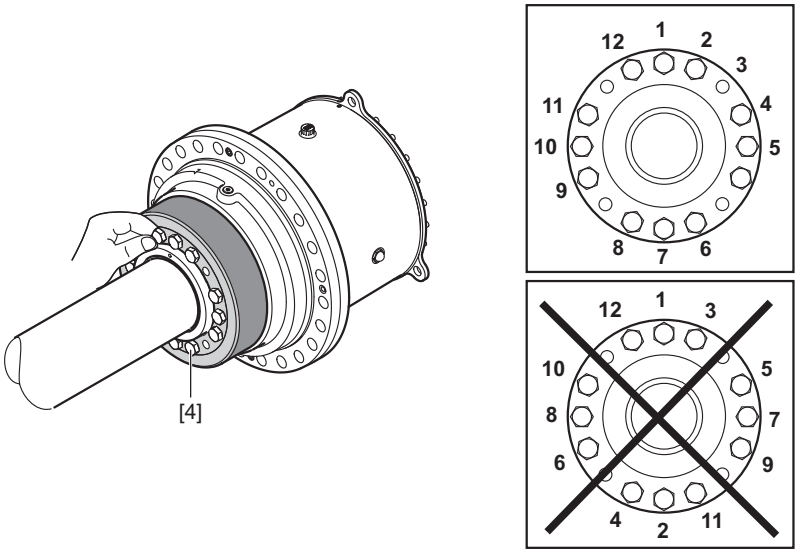
6. First tighten the locking screws [4] manually. Then tighten all locking screws by working round equally (not in diametrically opposite sequence) in 1/4 turn increments.



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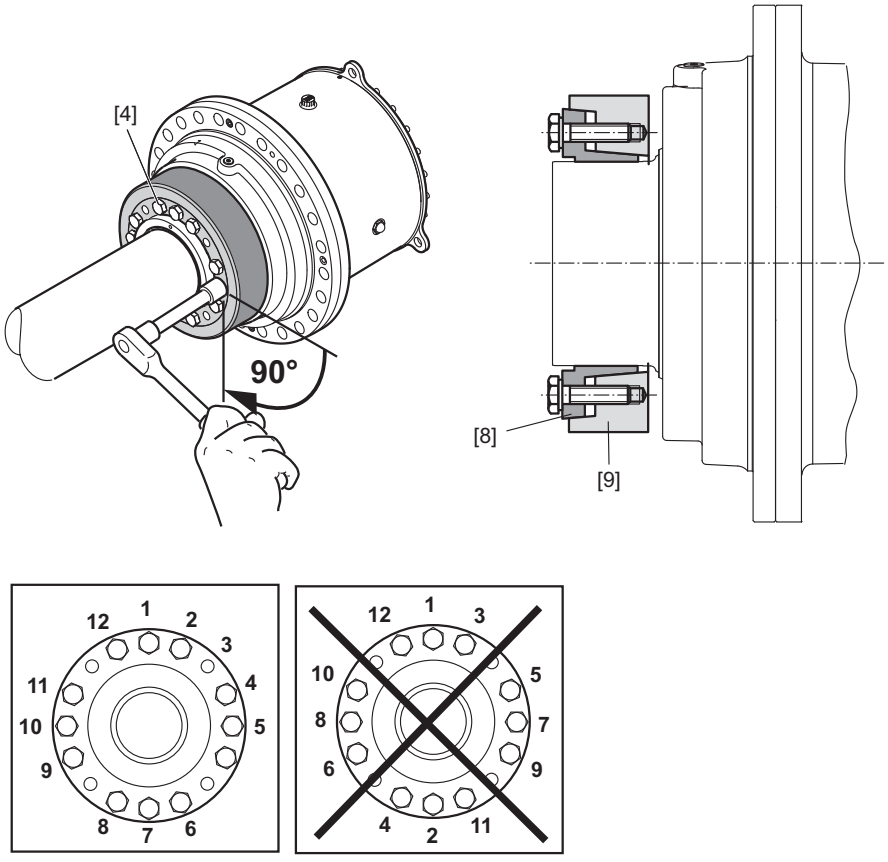
7. Observe the tightening torque in the table below. Tighten the locking screws [4] by continuing to work round in 1/4 turns until you reach the tightening torque.



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8. Verify the type details on your shrink disk and choose the tightening torque.

Shrink disk type	Size	Screws	Rated torque Nm	Tightening torque Nm ± 20%
3181	P.042	M20	194000	570
	P.052	M20	255000	570
	P.062	M24	405000	980
	P.072	M24	525000	980
	P.082	M24	720000	980
	P.092	M27	906000	1450
	P.102	M27	1160000	1450

INFORMATION

The front end surfaces of inner ring [9] and outer ring [10] need not necessarily be flush when the locking screws are tightened.

For gear units with hollow shaft with shrink disk, a protection cover may be installed as an option. The protection cover provides protection against touching the rotating output shaft.

⚠ CAUTION

Improper assembly of the protection cover may result in risk of injury due to rotating parts.

Possible injury to persons.

- After assembly, check to see that the protection cover is properly attached.

INFORMATION

If the SEW cover is not used, the system manufacturer undertakes to use appropriate accessories in line with EN ISO 80079-36 and EN ISO 80079-37 to prevent possible ignition sources between housing and shrink disk (e.g. friction due to high amount of built-up dirt).

If special maintenance work is necessary for this purpose, it must be described in the operating instructions for the machine or components.

6.11.2 Removal

⚠ WARNING

Improper disassembly may cause the shrink disk and/or the gear unit to fall down.

Serious injury.

- Never completely unscrew the shrink disk locking screw.
- Secure the shrink disk and the gear unit against slipping.

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NOTICE

Removing the gear unit incorrectly from the machine shaft may damage bearings and other components.

Possible damage to property.

- You may only use the hollow shaft as a support for disassembly. Note that supporting on any other parts of the gear unit may damage the material.
- Remove the shrink disk properly. Never completely unscrew the retaining screws because the shrink disk might jump off and cause an injury.
- Shrink disks and corresponding parts of different gear units must not be swapped.

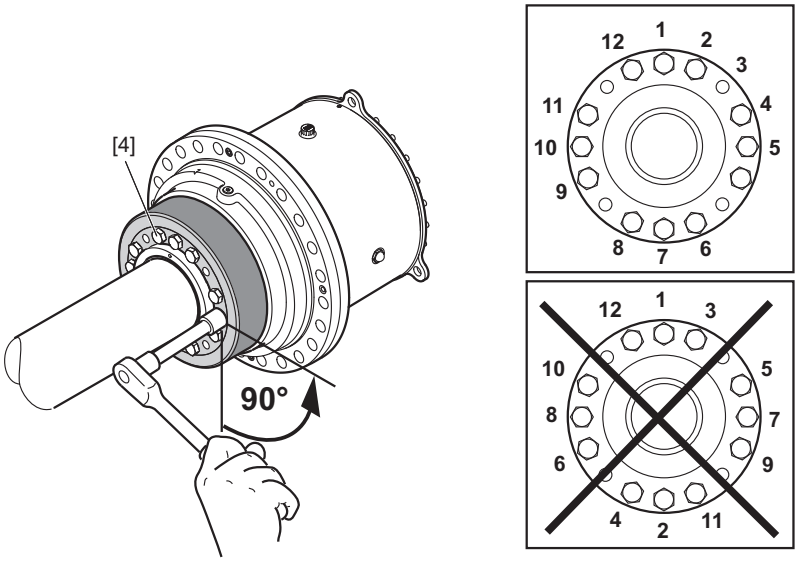
Observe the notes in chapter "Important information" (→ 🗎 64).

1. **NOTICE!** Improper loosening of the locking screws can lead to straining of the connecting surface. Possible damage to property.
   Loosen the locking screws [4] by a quarter turn one after the other to avoid straining the connecting surface.

INFORMATION

If the bevel (outer ring) [9] and the taper bushing (inner ring) [8] do not separate by themselves:

- Take the necessary number of locking screws and screw them evenly into the disassembly bores. Tighten the locking screws in several steps until the tapered bushing separates from the tapered ring.



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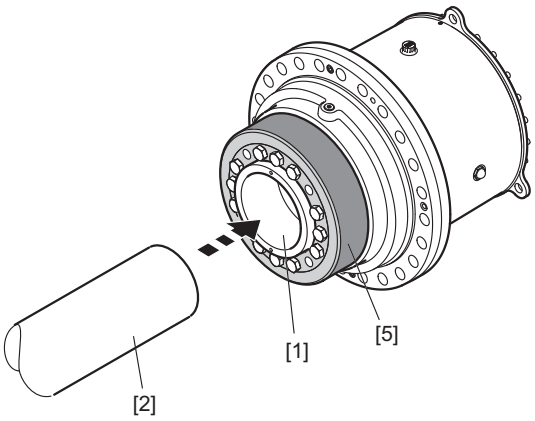
2. Remove the machine shaft [2] or pull the hub [1] off the machine shaft. If rust has formed on the shaft in front of the hub, you must remove the rust first.



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3. ⚠ **WARNING!** The loose shrink disk could slip. Risk of injury to persons and damage to property. Secure the shrink disk against slipping.
Remove the shrink disk [3] from the hub [1].

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6.11.3 Cleaning and lubrication

INFORMATION

You must perform the following steps carefully to ensure proper functioning of the shrink disk. Use only products that are comparable to the specified solid lubricant.

- If the tapered surfaces of the shrink disk are damaged, the shrink disk can no longer be used and must be replaced.
- Used shrink disks have to be disassembled and cleaned. The manufacturer has applied a solid lubricant to the tapered surfaces. Regrease undamaged tapered surfaces. Grease screw threads with solid lubricant.
- Use a solid lubricant with a friction factor of μ = 0.04.

Solid lubricant	Sold as
Weicon "Anti-Seize"	Spray or paste
Molykote 321 R (lube coat)	Spray
Molykote spray (powder spray)	Spray
Molykote G Rapid	Spray or paste
Aemasol MO 19R	Spray or paste
Molykombin UMFT 1	Spray
Unimoly P5	Powder

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6.12 Gear unit with splining

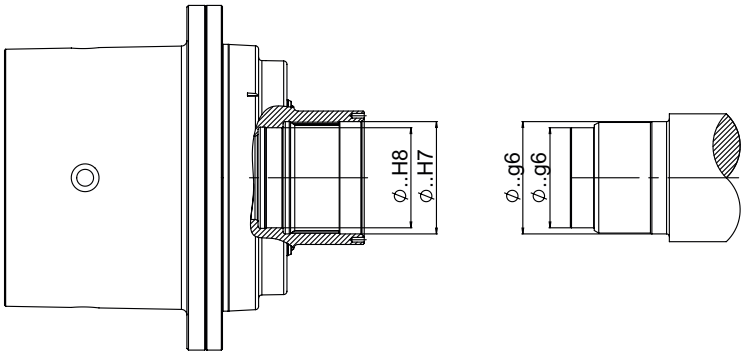
INFORMATION

Only drive components with corresponding ATEX approval are permitted, assuming that these components are covered by Directive 2014/34/EU.

6.12.1 Notes for mounting the gear unit

INFORMATION

The material of the machine shaft should be dimensioned by the customer according to the loads that will occur. The shaft material should have a yield point of at least 320 N/mm².



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The specified tolerances for gear shaft and machine shaft correspond to the standard design. If requested by the customer, other tolerances of the gear shaft are possible.

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NOTICE

Constraining forces can occur on the output shaft bearing due to the rigid connection between the machine shaft and the gear shaft. This may result in damages to the output shaft bearing and increased fretting corrosion in the connection between the machine shaft and the gear shaft.

Possible damage to property.

- The gear unit is usually foot or flange-mounted and used as bearing point when the machine shaft has no individual bearing or merely provides one bearing point. You have to provide for an accurate coaxial alignment with the bearing point.
- If the machine shaft has at least 2 bearing points, the gear unit should be connected merely to the machine shaft and supported with a torque arm. In order to prevent excess stress on the bearing, gear units with foot or flange mounting are to be avoided.

6.12.2 Mounting the gear unit onto the machine shaft

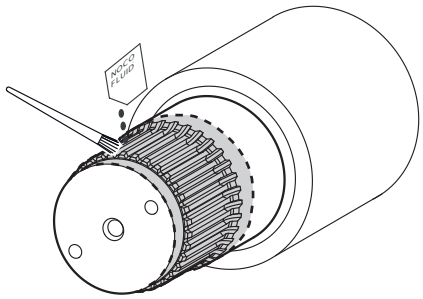
INFORMATION

Make sure the dimensions of the machine shaft correspond to SEW-EURODRIVE specifications → see dimension sheet in your order documents.

Output shaft as a splined hollow shaft /..V

Observe the notes in chapter "Important information" (→ 🗎 64).

1. Apply some NOCO® fluid on the machine shaft around the centering seat and the splining.



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2. Push the gear unit onto the machine shaft. The splining of the gear shaft must mesh with the splining of the machine shaft.
3. Make sure that the customer shaft is at the correct position in axial direction.

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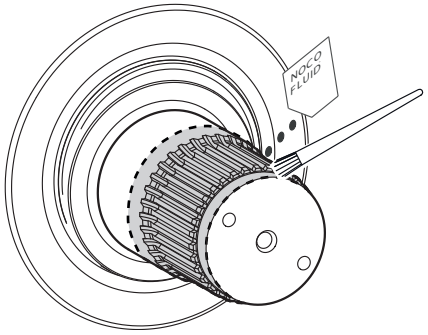
Output shaft as a splined solid shaft /..L

Observe the notes in chapter "Important information" (→ 🗎 64).

1. Apply some NOCO® fluid on the gear shaft around the centering seat and the splining.



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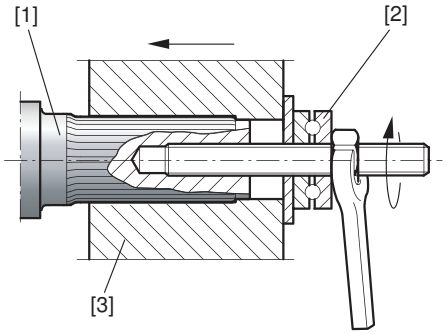
2. Push the gear unit onto the machine shaft. Use a mounting device, if necessary. The splining of the gear shaft must mesh with the splining of the machine shaft.



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[1] Splined solid shaft
[2] Thrust bearing
[3] Coupling hub

3. Make sure that the customer shaft is at the correct position in axial direction.

6.12.3 Disassembling the gear unit from the machine shaft

NOTICE

Improper disassembly of the gear unit and machine shaft may damage bearings and other components.

Possible damage to property.

- You may only use the gear shaft as a support for disassembly. Note that supporting on any other parts of the gear unit may damage the material.

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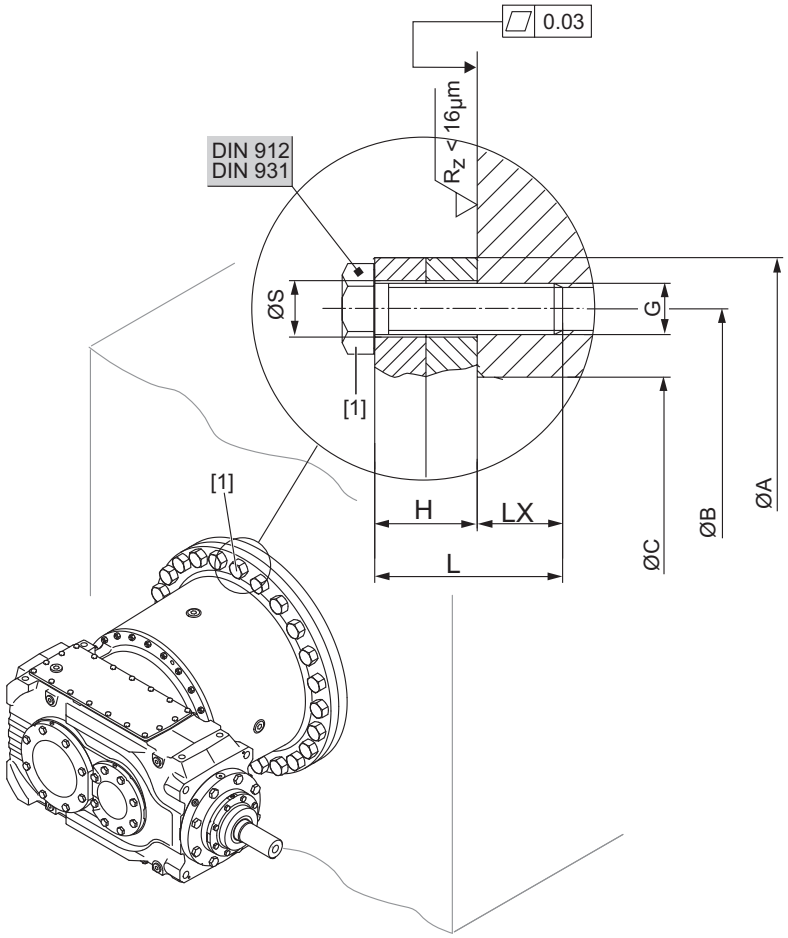
6.13 Flange-mounted gear units

The following figure shows an example of how flange-mounted gear units are installed.

Retaining screws [1] are not included in the delivery.



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INFORMATION

The tightening torques listed in the following table are based on the friction coefficient for threads and mounting surface of µ = 0.11.

Screws are not included in the delivery. Adjust the tightening torques to the new friction conditions.

Only use the following tools for the installation:

- Signal-generating torque wrench
- Motorized torque wrench with dynamic torque measuring
- Torque-controlled, gradual hydraulic tools

The following values in the table apply to steel constructions. Observe the additional information on the customer dimension sheet.

Size	Thread	Quantity	Tightening torque	Dimensions in mm							Strength classes	Screws EN ISO
			Nm	Ø S	H	min. L	min. LX	Ø A	Ø B	Ø C		
P.042	M30	20	1910	33	64	114	50	620	560	480_{f9}	10.9	4017 4762
P.052	M30	24	1910	33	64	114	50	650	590	530_{f9}		
P.062	M36	24	3320	39	74	134	60	760	690	610_{f9}		
P.072	M36	24	3320	39	84	144	60	840	770	690_{f9}		
P.082	M42	24	5310	45	84	154	70	920	840	750_{f9}		
P.092	M42	24	5310	45	90	160	70	950	870	800_{f9}		
P.102	M42	24	5310	45	100	180	80	1050	960	850_{f9}		

6.14 Torque arm

6.14.1 Notes on installation

⚠ WARNING

Insufficiently secured gear units can fall down during assembly/disassembly.

Severe or fatal injuries.

- Secure the gear unit during assembly/disassembly. Support the gear unit using appropriate tools.

NOTICE

Deforming the torque arm leads to constraining forces on the output shaft, which may negatively influence the service life of the output shaft bearings.

Possible damage to property.

- Do not deform the torque arm.

NOTICE

Strain on the torque arm might break the housing.

Possible damage to property.

- Adhere to the specified screw size, tightening torques and required screw strength.

INFORMATION

- Retaining screws are included in the delivery.
- When using a shrink disk cover, install the torque arm before mounting the cover.

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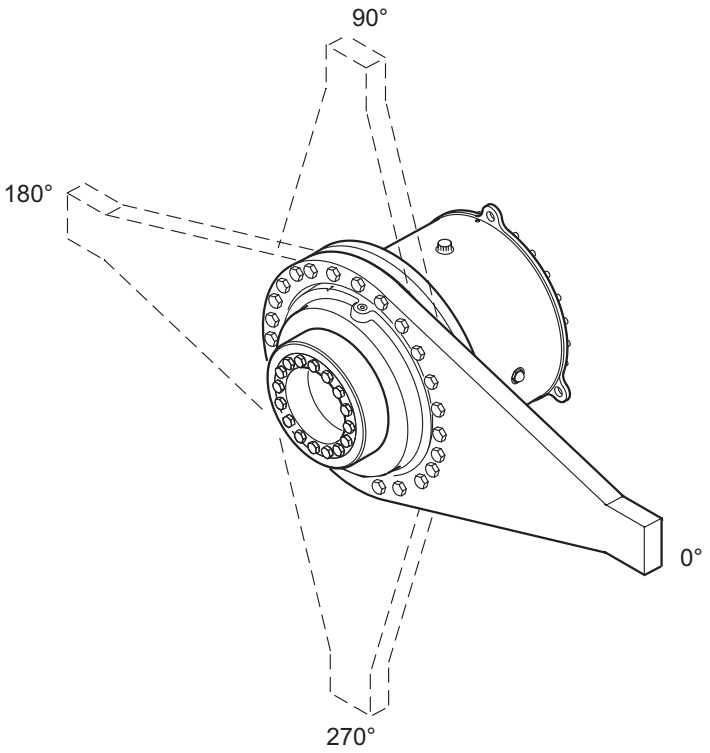
6.14.2 Single-sided torque arm (standard)

Installation situation

The torque arm can be installed at 0° to 360° in consideration of the order-specific configuration.



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The reactive force resulting from the gear unit torque is absorbed via the torque arm with lever arm A. The figure on the next page shows an example of a customer fixture in a welded structure. Two supporting plates are welded on the machine design with the suggested dimensions. Once the gear unit has been mounted, a connecting cover plate is welded onto the two supporting plates. The force of the gear unit torque acts on the support, divided by the length of the lever arm A. The reaction force also acts on the gear unit and machine shafts.

The figure shows a sample mounting position and the combination of a planetary gear unit with torque arm.

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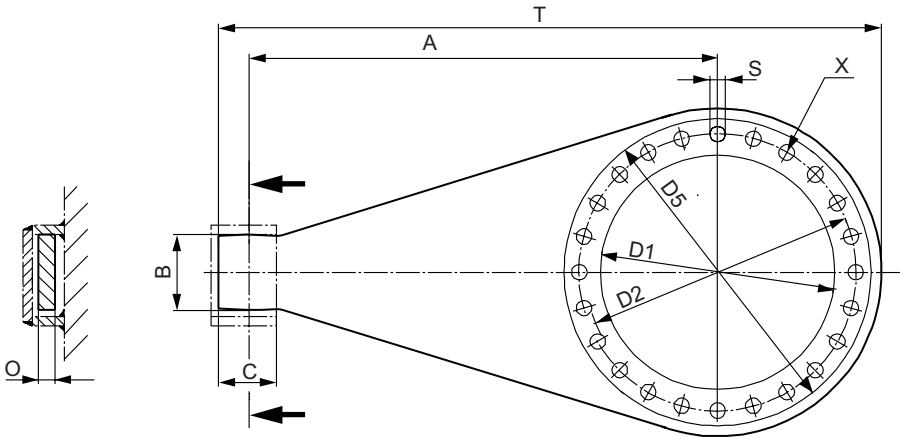
Dimensions

The following figure shows a sample torque arm with dimensions.



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Size	Dimensions in mm								Amount	Weight
	A	B	C	D1	D2	O	S	T	X	kg
P.042	900	150	120	484	560	40	33	1270	20	93
P.052	1000	160	130	534	590	40	33	1390	24	102
P.062	1200	180	150	614	690	50	39	1655	24	183
P.072	1500	230	200	694	770	60	39	2020	24	317
P.082	1600	230	200	754	840	70	45	2160	24	420
P.092	1650	250	220	804	870	70	45	2235	24	440
P.102	1700	250	220	854	960	70	45	2335	24	510

INFORMATION

The torque arm seat must be sufficiently dimensioned by the user.

Tightening torques

INFORMATION

The tightening torques listed in the following table are based on the friction coefficient for threads and mounting surface of μ = 0.11.

When you use other screws than the screws included in the delivery, the tightening torques must be adjusted to the new friction conditions.

Only use the following tools for the installation:

- Signal-generating torque wrench
- Motorized torque wrench with dynamic torque measuring
- Torque-controlled, gradual hydraulic tools

Size	Thread	Tightening torque Nm	Strength class	DIN screws
P.042 – P.052	M30	1910	10.9	DIN EN ISO 4017 DIN EN ISO 4762
P.062 – P.072	M36	3320		
P.082 – P.102	M42	5310		

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6.15 Couplings

INFORMATION

The couplings must be marked for the use in potentially explosive areas.

Also adhere to the special operating instructions given by the respective coupling manufacturer.

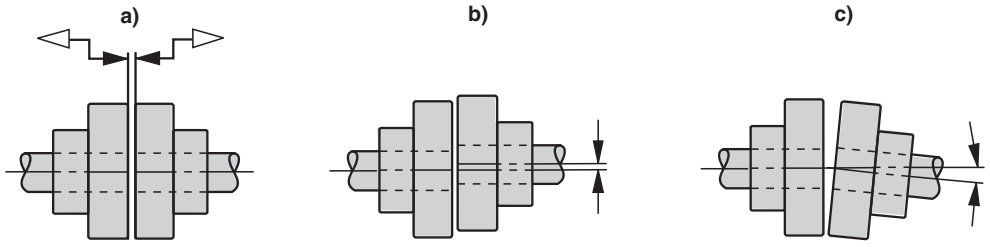
6.15.1 Mounting tolerances

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

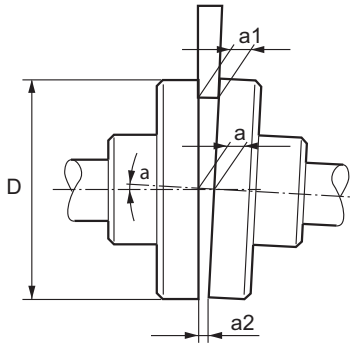
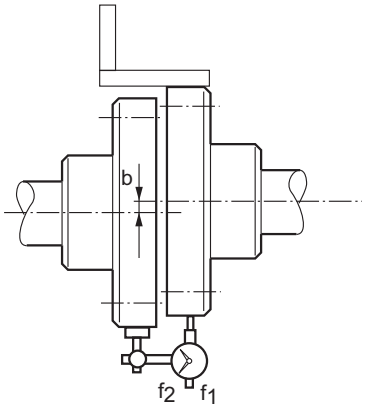
a) Axial misalignment

b) Radial misalignment

c) Angular misalignment



The following table shows various methods for measuring the differing tolerances.

Measuring instruments	Angular offset	Axis offset
Feeler gauge		
	This method only achieves an accurate result when the deviation of the coupling faces is eliminated by turning both coupling halves by 180° and then calculating the mean value from the difference (a1 – a2).	The following figure shows the measurement of axial offset using a straight-edge. Permissible values for axial offset are usually so small that the best measurement results can be achieved with a micrometer dial. If you rotate one coupling half together with the micrometer dial and divide the deviation by two, the deviation displayed on the dial indicator indicates the offset (dimension "b") that includes the axial offset of the other coupling half.

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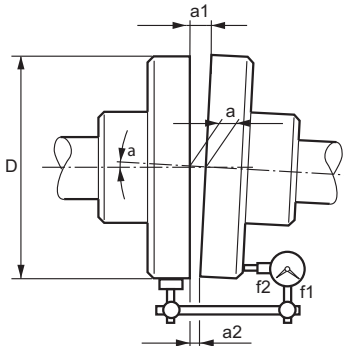
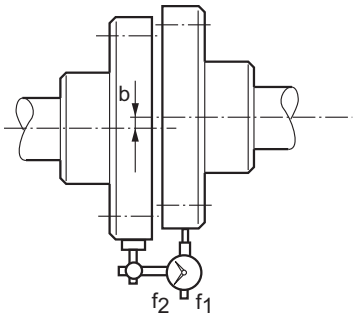
Measuring instruments	Angular offset	Axis offset
Micrometer dial		
	A prerequisite for this measuring method is that there is no axial play in the shaft bearings when the shafts rotate. If this condition is not fulfilled, the axial play between the faces of the coupling halves must be eliminated. As an alternative, you can use two micrometer dials positioned on the opposite sides of the coupling (to calculate the difference of the two dial indicators when rotating the coupling).	The following figure shows the how to measure axial offset using a more accurate measuring method, as described above. The coupling halves are rotated together without letting the point of the dial indicator slide onto the measuring surface. The axial offset is obtained by dividing the deviation displayed on the dial indicator (dimension "b").

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6.16 Motor adapter /MA

6.16.1 Max. permitted motor weight

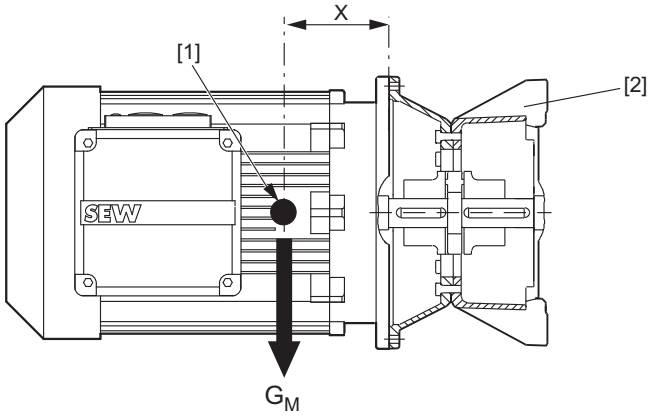
When mounting a motor at the gear unit the approved maximum motor weight in regard to the motor adapter size must be verified.

INFORMATION

- The maximally permitted motor weight may not be exceeded.
- In case of a deviating mounting position, contact SEW-EURODRIVE.

2. Maximum motor weight depending on motor adapter size

The following maximum loads on the motor adapter must not be exceeded.



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[1] Center of gravity of the motor
[2] Motor adapter
X = Distance from the center of gravity
G_M = Weight of the mounted motor

INFORMATION

The table only applies to stationary applications. For mobile applications (e.g. travel drives), contact SEW-EURODRIVE.

Motor adapter		G_M	X
IEC	NEMA	kg	mm
100/112	182/184	60	190
132	213/215	110	230
160/180	254/286	220	310
200	324	280	340
225	326	400	420
250 / 280	364 - 405	820	480
315S-L	444 - 449	1450	680
315		2000	740
355		2500	740

The maximum permitted weight G_M must be linearly reduced if the centroidal distance **X** is increased. G_M cannot be increased if the centroidal distance is reduced.

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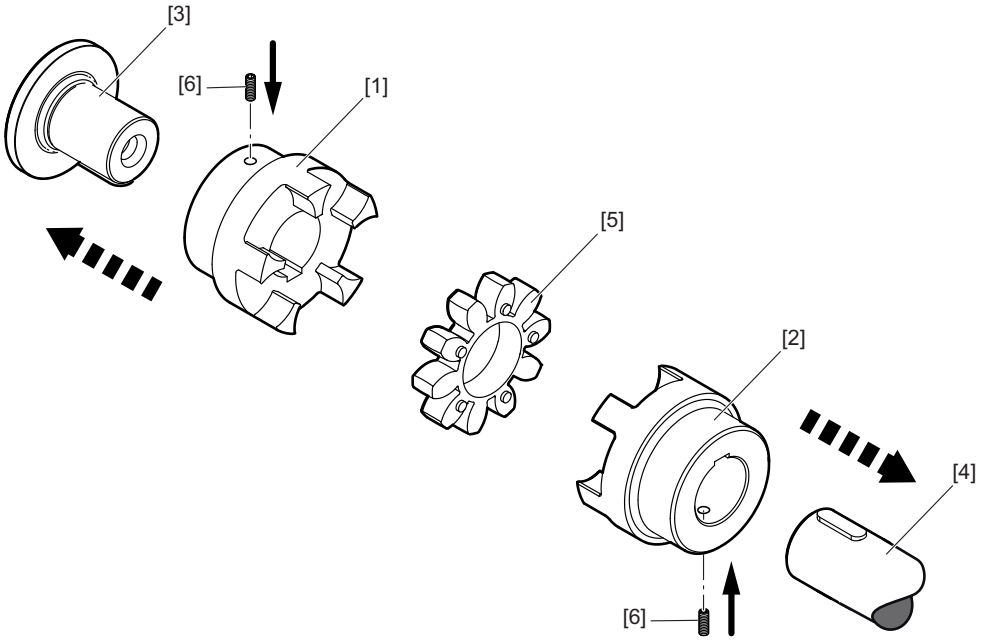
6.16.2 Claw coupling

INFORMATION

Observe the operating instructions of the respective coupling manufacturer.

ROTEX® coupling



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Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

1. **NOTICE!** Improper assembly can damage the coupling halves [1][2]. Possible damage to property.
   Heat the hub to about 80 °C to facilitate the assembly.
2. Mount the coupling halves [1][2] onto the input and output side [3][4].
3. Insert the spider [5] or DZ elements into the claws of the input and output coupling halves [1][2].
4. Push the gear unit/motor in axial direction until dimension **E** is reached. If the gear unit/motor has already been installed permanently, set dimension **E** by moving the hubs [1][2] axially on the input and output shafts [3][4].
5. **NOTICE!** Improper mounting may result in damage to the coupling. Possible damage to property.
   During assembly, it is essential to observe dimension **E** so that the spider remains axially flexible during operation. The dimension **E** is listed in the following table.

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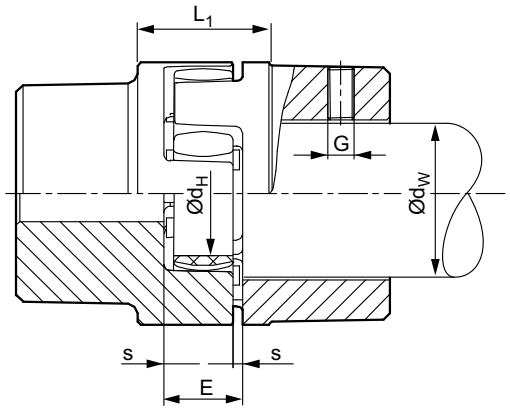

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6. Secure the coupling halves by tightening the set screws [6].

Coupling size	Mounting dimensions			Set screw	
	E [mm]	s [mm]	d_H [mm]	G	Tightening torque Nm
14	13	1.5	10	M4	1.5
19	16	2	18	M5	2
24	18	2	27	M5	2
28	20	2.5	30	M8	10
38	24	3	38	M8	10
42	26	3	46	M8	10
48	28	3.5	51	M8	10
55	30	4	60	M10	17
65	35	4.5	68	M10	17
75	40	5	80	M10	17
90	45	5.5	100	M12	40
100	50	6	113	M12	40
110	55	6.5	127	M16	80
125	60	7	147	M16	80
140	65	7.5	165	M20	140
160	75	9	190	M20	140
180	85	10.5	220	M20	140

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Displacement – Aligning the coupling

NOTICE

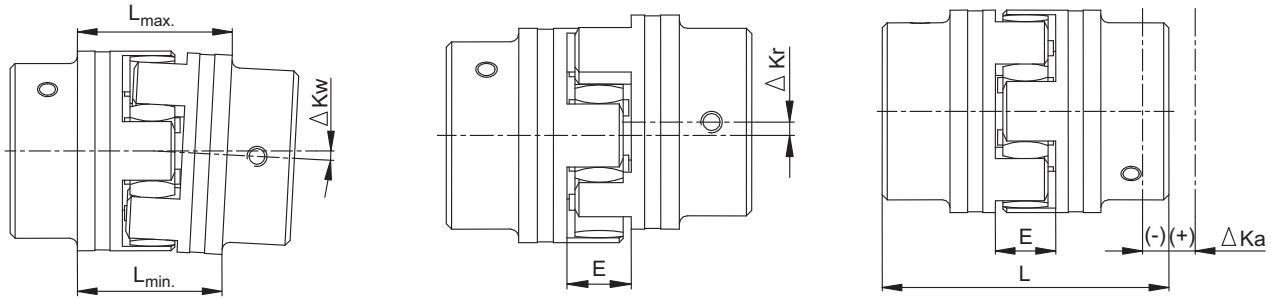
Improper mounting of the coupling may result in damage.

Possible damage to property.

- The shaft ends must be aligned accurately to ensure a long service life of the coupling. Strictly adhere to the displacement values specified in the following chapter. Exceeding these values will damage the coupling. Exact coupling alignment increases its service life.

Important:

- The displacement values specified in the table (see next page) are maximum values that must not occur simultaneously. If radial offset and angular offset occur at the same time, the permitted displacement values may only be used proportionately.
- Use dial indicator, linear or feeler gauge to check whether the permitted displacement values specified in the table (see next page) are adhered to.



Angular misalignments | Radial misalignments | Axial misalignments

$\Delta K_w = L_{1max.} - L_{1min.}$ [mm]

$L_{max} = L + \Delta K_a$ [mm]

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Example of specified displacement combinations (see diagram):

Example 1:	Example 2:
ΔK_r = 30%	ΔK_r = 60%
ΔK_w = 70%	ΔK_w = 40%

$\Delta K_{total} = \Delta K_r + \Delta K_w \leq 100\ \%$

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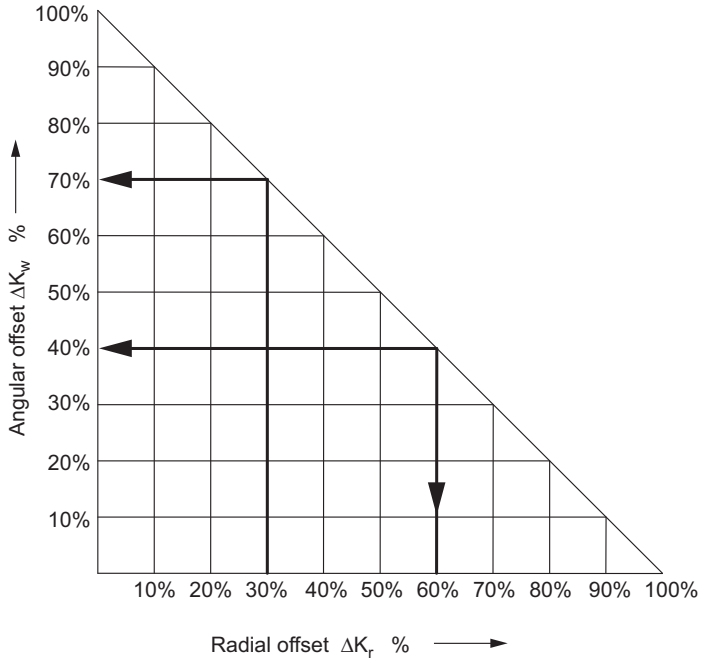

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Displacement values

The table below shows the displacement values:

ROTEX® size		14	19	24	28	38	42	48	55	65	75	90	100	110	125	140	160	180
Max. axial displacement ΔK_a [mm]		-0.5	-0.5	-0.5	-0.7	-0.7	-1.0	-1.0	-1.0	-1.0	-1.5	-1.5	-1.5	-2.0	-2.0	-2.0	-2.5	-2.5
		1.0	1.2	1.4	1.5	1.8	2.0	2.1	2.2	2.6	3.0	3.4	3.8	4.2	4.6	5.0	5.7	6.4
Max. radial displacement ΔK_r [mm]	1500 1/min	0.17	0.20	0.22	0.25	0.28	0.32	0.36	0.38	0.42	0.48	0.50	0.52	0.55	0.60	0.62	0.64	0.68
	1800 1/min	0.11	0.13	0.15	0.17	0.19	0.21	0.25	0.26	0.28	0.32	0.34	0.36	0.38	-	-	-	-
ΔK_w [degree] angular displacement when n = 1500 1/min		1.2	1.2	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.2
ΔK_w [mm]		0.67	0.82	0.85	1.05	1.35	1.7	2.0	2.3	2.7	3.3	4.3	4.8	5.6	6.5	6.6	7.6	9.0
ΔK_w [degree] angular displacement when n = 3000 1/min		1.1	1.1	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.1	1.1	-	-	-	-
ΔK_w [mm]		0.62	0.7	0.75	0.84	1.1	1.4	1.6	2.0	2.3	2.9	3.8	4.2	5.0	-	-	-	-

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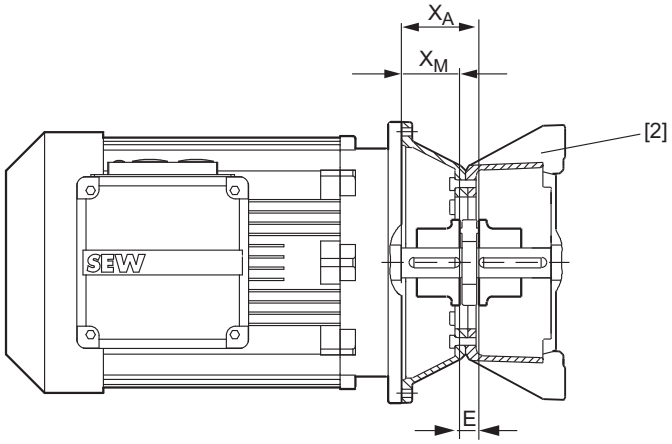
6.16.3 Attaching the motor to the motor adapter

1. Clean the motor shaft and flange surfaces of the motor and the motor adapter. They must be dry and free of grease.

INFORMATION

To avoid contact corrosion, SEW-EURODRIVE recommends to apply NOCO® fluid to the motor shaft before mounting the coupling half.

2. Push the coupling half onto the motor shaft and position it. When doing this, observe the information in chapter "Claw coupling" (→ 🗎 98) and the figure below. The coupling size and type are indicated on the coupling.



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[1] Motor adapter

E Installation dimensions

→ XM = XA - E

XA Distance between the coupling and the motor adapter flange surface

XM Distance between the coupling and the motor flange surface

3. Secure the coupling halves using the set screw.
4. Mount the motor onto the motor adapter, making sure that the claws of the coupling engage each other.

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6.17 Motor pump /ONP

Observe the notes in chapter "Important information" (→ 🗎 64).

INFORMATION

Before installation/assembly, first read the addendum to the operating instructions "Motor Pump /ONP".

6.18 Motor pump /ONP1L

Observe the notes in chapter "Important information" (→ 🗎 64).

INFORMATION

Before installation/assembly, first read the addendum to the operating instructions "Motor Pump /ONP1L".

6.19 Motor pump /ONP1

Observe the notes in chapter "Important information" (→ 🗎 64).

INFORMATION

Before installation/assembly, first read the addendum to the operating instructions "Motor Pump /ONP1".

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6.20 Fan /FAN

Note the following

- If protective devices for couplings or similar are installed on gear units equipped with a fan, sufficient clearance must be provided for the intake of cooling air.

  For the required clearance, refer to the dimension drawing in the catalog or the order documents.
- Never operate the gear unit if the protective housing is not installed.
- Protect the fan guard from external damage.
- Make sure the air intake vents of the fan are not blocked or covered.

Observe the following tightening torques for installing the fan guard:

Bolt/nut	Tightening torque Strength class 8.8 Nm
M6	11
M8	27
M10	54
M12	93
M14	148
M16	230

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6.21 Water cooling cartridge /CCT

INFORMATION

Water cooling cartridges may only be used in connection with a temperature monitoring device on the gear unit.

6.21.1 Notes on connection/installation

INFORMATION

Make sure that the connection to the cooling circuit complies with ATEX requirements. If connections with a limited service life are used (e.g. rubber hoses), the operator must be informed about the relevant maintenance and service measures. The connection must ensure permanent operational capability of the cooling system.

NOTICE

Improper installation of the water cooling cartridge can damage the gear unit.

Possible damage to property.

- Observe the following notes:

- Using calking strip on the pipe threads increases the resistance between the connection parts as well as the risk of cracking in the cast parts of the water cooling cartridge. Do not tighten the threads excessively.
- The water cooling cartridges are not equipped with a water drain. In the event of repair work, you have to install a drain on the cooling water outlet to ensure proper draining of the cooling water.
- For connecting the water cooling cartridge, use only piping and mounting parts of the same or of compatible material.
- Check the water cooling cartridge to see that it is free from soiling and foreign objects in the pipe connection to ensure unobstructed flow of the cooling media.
- Avoid tensions on the connection points when connecting the piping. Support the pipes properly, if required.
- Install the cooling water outlet pipe in such a way that the water cooling cartridge is permanently flooded by cooling water.
- Refer to chapter Cooling media to determine the permitted cooling media.
- Cooling water temperature and volume flow according to the order documents.
- Make sure the cooling water pressure does not exceed 10 bars.
- In the event of temperature levels below 0 °C and longer downtimes, drain the cooling water from the circuit. Use compressed air to remove any remaining water.
- The recommended filtering is 100 µm.
- Connect the water cooling cartridge to the existing cooling circuit. The direction of flow is user-defined.
- For gear units with 2 water cooling cartridges, connect the cooling circuit in parallel, see following figure.

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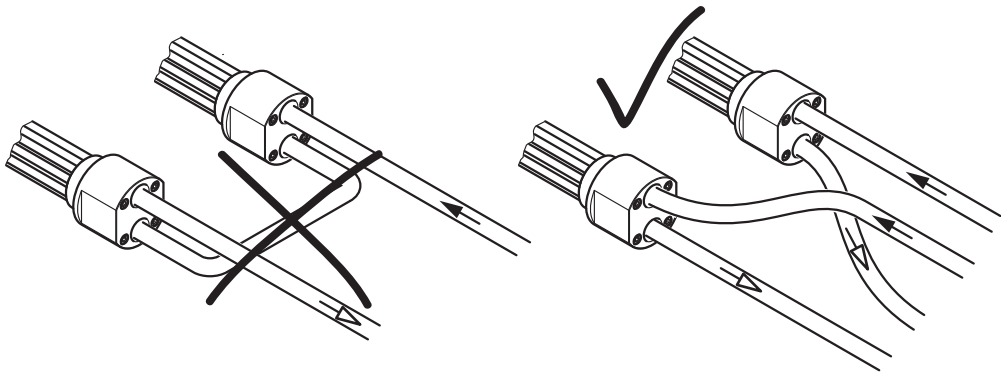

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← Supply (cold water)

→ Return (warm water discharge)

The following measures can be taken to ensure proper functioning in different systems:

- Install a safety valve in the cooling water inlet to prevent fluctuations in pressure and volume.
- Install filters in the cooling water inlet to prevent the heat exchanger from dirt and mud in particular if the cooling water is obtained from sources other than the public water supply system.
- Install an automatic throttle valve in the respective inlet to compensate pressure.

6.21.2 Removal

Observe the notes in chapter Inspection/maintenance.

6.21.3 Requirements on the water quality

INFORMATION

Special measures have to be taken when using sea water or brackish water. Contact SEW-EURODRIVE.

The following requirements on the water quality are recommendations. In exceptional cases, certain concentrations of substances of content might cause unforeseen reactions.

The quality of the water as well as its substances are important factors for assessing the cooling water available for water cooling cartridges. The water quality is determined by the water hardness and the pH value of the water.

Water hardness

Water hardness is defined by the amount of hardeners (carbonates and bicarbonates) in the water. Hardeners accumulate on the surface of the water cooling cartridge in particular at high temperatures and in this way impair the performance. Take these deposits into account when selecting the water cooling cartridge for extremely hard water.

The following table shows the classification of German degrees of hardness to water quality °dH:

Degree of hardness[1)]	Water quality

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0 – 5 °dH	Very soft water
5 – 10 °dH	Soft water
10 – 20 °dH	Medium hard water
20 – 30 °dH	Hard water
> 30 °dH	Very hard water

1) 10 mg/l of hardener corresponds to 1 °dH

pH value

- The water cooling cartridge partially consists of a copper and nickel alloy, to which the following applies:

  → Corrosion problems when **pH value < 6**
- With alkaline water:

  → Corrosion problems when **water hardness < 6°dH**

  Smaller values can cause corrosion due to free carbonic acid.

  The following table describes the classification of the water quality based on the pH value:

pH Value	Water quality
4.5	Very acidic
4.5 – 6.0	Acidic
6.0 – 6.8	Slightly acidic
7.0	Neutral
7.2 – 7.7	Slightly alkaline
7.7 – 8.2	Alkaline
8.2	Very alkaline

Cooling water assessment based on water substances

The following table provides an overview of the resistance of copper-nickel pipes against substances in non-potable water.

Assessment criterion	Approximate concentration mg/l	Evaluation CuNi10Fe1Mn
pH value	< 6	0
	6 to 9	+
	> 9	0
Chloride	up to 1000	+
	> 1000	+ (< 25000 mg/l)
Sulfate	to 70	+
	70 to 300	+
	> 300	+ (< 25000 mg/l)
Nitrate	Up to 100	+
	> 100	0
Free (aggressive) carbonic acid	to 20	+
	20 to 50	0
	> 50	–
Oxygen	up to 2	+
	> 2	+
Ammonium	up to 2	+
	2 to 20	+
	> 20	–
Iron (dissolved)	to 10	0
	> 10	–

Manganese (dissolved)	to 1	0
	> 1	–
Free chlorine	to 5	permanently < 0.5 mg/l
	> 5	intermittently < 3.0 mg/l
Sulfide		0
Ammonia		+ (< 15 mg/l)

\+ = usually good resistivity

0 = corrosion problems can occur in particular if several factors are assessed with 0

– = we advise against use

Types of cooling water/characteristics

Note the following conditions:

Industrial water

- Usually untreated water (no drinking water)
- Often very contaminated
- A water analysis is necessary for assessment
- Copper, brass and steel are very resistant against industrial water

Stream water and river water

- We recommend using copper brass pipes
- Cast iron parts must be protected against corrosion by suitable coating
- Usually untreated water (no drinking water)
- Often very contaminated
- A water analysis is necessary for assessment

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6.22 Oil-water cooler for splash lubrication /OWC

Observe the notes in chapter "Important information" (→ 🗎 64).

INFORMATION

Before installation/assembly, first read the addendum to the operating instructions "Oil-Water Cooler with Motor Pump for Splash Lubricaton /OWC".

6.23 Oil-air cooler for splash lubrication /OAC

Observe the notes in chapter "Important information" (→ 🗎 64).

INFORMATION

Before installation/assembly, first read the addendum to the operating instructions "Oil-Air Cooler for Splash Lubricaton /OAC".

6.24 Oil-water cooler for pressure lubrication /OWP

Observe the notes in chapter "Important information" (→ 🗎 64).

INFORMATION

Before installation/assembly, first read the addendum to the operating instructions "Oil-Water Cooler for Pressure Lubrication /OWP".

6.25 Oil-air cooler for pressure lubrication /OAP

Observe the notes in chapter "Important information" (→ 🗎 64).

INFORMATION

Before installation/assembly, first read the addendum to the operating instructions "Oil-Air Cooler for Pressure Lubrication /OAP".

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6.26 Limit temperature for gear unit start

The minimum permitted ambient temperature/oil temperature for gear unit startup depends on the viscosity of the oil used and the lubrication type of the gear unit.

INFORMATION

- Before startup, it might be necessary to heat up the oil with an oil heater to the temperature specified under "Initial temperature". Observe the lubricant table in chapter "Permitted lubricants" (→ 🗎 166). For the design and dimensioning of the required oil heater, contact SEW-EURODRIVE.
- For the minimally permitted initial temperature for mineral and synthetic oil, refer to the chapter "Permitted lubricants" (→ 🗎 166).

6.27 Oil heater /OH

Observe the following notes regarding the oil heater.

⚠ WARNING

Danger of electric shock.

Severe or fatal injuries.

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

NOTICE

Improper installation of the oil heater may result in damage to the gear unit.

Possible damage to property.

- Make sure that all the heating elements are fully immersed in the oil bath in order to avoid any damage.

NOTICE

An improper change of the mounting position may cause the gear unit heater to malfunction.

Possible damage to property.

- Do not change the mounting position without prior consultation with SEW-EURODRIVE. The warranty will become void without prior consultation.

INFORMATION

- Using an oil heater is only permitted after consultation with SEW-EURODRIVE. Also observe the separate operating instructions of the manufacturer.
- The oil heater may only be operated with properly connected oil level monitoring.

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INFORMATION

The explosion-proof oil heating elements are monitored and controlled using a control circuit that is separated from oil temperature monitoring. The control circuits for excessive temperature in the oil heating rods and for the oil temperature must be evaluated separately by the operator's controller. The separate control circuits must be implemented by the operator by means of an appropriate cabling of the oil heater.

INFORMATION

The electrical connection of the oil heater may only be established by qualified personnel according to the power supply conditions on site.

Observe the connection voltage and the switching capacity. Improper or incorrect cabling can damage electrical components.

6.27.1 Notes regarding the function of the oil heater

- The heater is screwed into the gear unit housing and controlled by a thermostat attached to the gear unit housing, by a /PT100 temperature sensor or by a thermocouple (depending on the size) for the oil bath temperature. The trip temperature on the thermostat for when the oil needs to be heated is set at the factory depending on the lubricant used.
- The trip point of the oil heater thermostat is factory-set to a temperature of about 5 K above and below the respective limit temperature initial temperature for gear unit startup; see chapter "Limit temperature for gear unit startup" (→ 🗎 110).

  The thermostat will switch off the oil heater at 5 K above the limit temperature. The gear unit may not be started up until then. The thermostat activates the oil heater again once the temperature is about 5 K below the switching point.
- The /PT100 temperature sensor for the oil bath temperature must be installed in the operator's controller in such a way that the oil heater is switched on or off whenever the temperature falls below the lower limit temperature or exceeds the upper limit temperature.
- In order to prevent the oil from burning, the heating elements of the heater have a maximum surface load. This is why the heating process for cold gear unit oil can take between one and several hours. The exact duration of the heating process before the start varies depending on the gear unit size, design, mounting position, oil quantity, and ambient temperature.

  This is why heating control must be running permanently even if the drive is at standstill for a short time.

  If the drive is at standstill over a longer period and the heating control is not active, make sure that the control is activated in due time before the drive is started up.
- Thermostat, oil bath temperature sensor and oil heater are installed at the gear unit and ready for operation. Prior to startup, wire them properly and connect them to the control provided by the operator.
- Contact SEW-EURODRIVE if a differing oil viscosity class is used or if ambient temperatures fall below the specified limit temperature.
- During installation, check the thermostat setting.
- Oil heaters are equipped with an integrated temperature sensor to prevent overheating. The temperature sensor must be evaluated by the control provided by the operator. Observe chapter "Temperature sensors in heating elements" (→ 🗎 114).

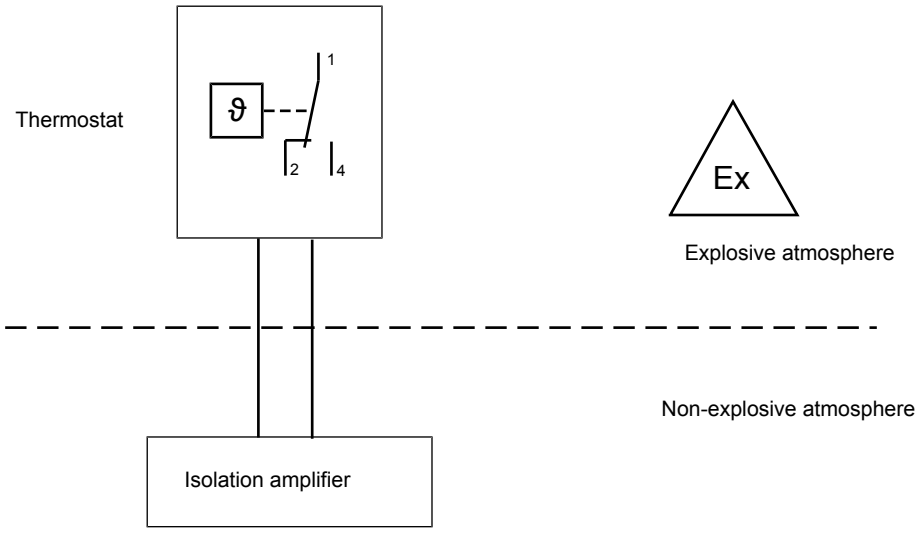
6.27.2 Thermostat

INFORMATION

Observe the manufacturer's documentation included in the delivery.

INFORMATION

- The thermostat must be used with an isolation amplifier that enables intrinsically safe switching operations. The isolation amplifier must be located outside the potentially explosive atmosphere.
- The isolation amplifier must be designed according to EN 60079-11 taking account of the minimum ignition energy (gas group); for dust at least IIB. The thermostat itself is a simple electrical device according to EN 60079-11 and does not require a separate Ex marking. The isolation amplifier and the thermostat must be installed in compliance with EN 60079-14.



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INFORMATION

For information on the electrical connection of /PT100 temperature sensors for monitoring the oil bath temperature, refer to chapter "Temperature sensor /PT100".

Electrical connection

⚠ WARNING

Risk of injury due to electric shock.

Severe or fatal injuries.

- Disconnect the unit from the supply system if live parts can be touched during work on the unit.

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If you operate the oil heater in potentially explosive atmospheres, do not switch on or off the oil heater directly via the thermostat.

Requirements for operating the oil heater in potentially explosive atmospheres:

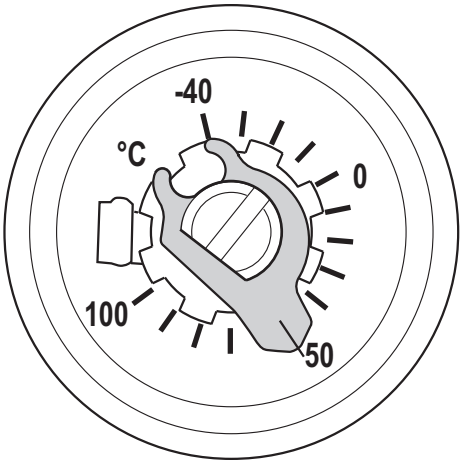
- The switching signal of the thermostat must be routed to the operator's control via isolation amplifier.
- The switching signal of the thermostat is evaluated by the operator's control.
- The oil heater must be supplied with voltage directly fron the operator's control.
- The voltage supply of the oil heater is switched on and off using a power contactor in the operator's control.

Technical data

<table>
<tr><th colspan="4">Maximum switching capacity:</th></tr>
<tr><td rowspan="3">AMTHs-SW-2</td><td colspan="2">Current</td><td rowspan="2">Voltage</td></tr>
<tr><td>Terminal 2</td><td>Terminal 4</td></tr>
<tr><td>10 A</td><td>10 A</td><td>AC 230 + 10% cosφ = 1 (0.6)</td></tr>
<tr><td>0.25 A</td><td>0.25 A</td><td>DC 230 + 10%</td></tr>
<tr><td colspan="4">Contact reliability:
To ensure the greatest contact reliability possible, the manufacturer recommends a minimum load of AC/DC 24 V, 100 mA for silver terminals.</td></tr>
<tr><td colspan="2">Nominal impulse voltage:
Overvoltage category II</td><td colspan="2">2500 V
(via the switching contacts 400 V)</td></tr>
<tr><td colspan="2">Required fusing:</td><td colspan="2">See maximum switching current</td></tr>
</table>

- Permitted ambient temperature: -40˚ C to +80° C
- Permitted storage temperature: min. -50° C, max. +50° C
- Scale range: -40˚ C to +100° C
- Cable entry: M20x1.5 for a cable diameter of 6 to 13 mm
- IP65 degree of protection according to EN 60529

The following figure shows the possible setting range of the thermostat. In this example, the pointer is on 50 °C.



16834938379

INFORMATION

When operating the thermostat via isolation amplifier, only a small amount of current flows across the switch contact.

The small amount of switching current results in a reduced switching reliability.

- Using a thermostat with gold-plated switch contacts will significantly increase the switching reliability.

6.27.3 Oil level monitoring

INFORMATION

- Observe the manufacturer's operating instructions.
- If the oil level is too low, switch off the drive and the oil heater.

6.27.4 Temperature sensors in heating elements

The operator's control evaluates the temperature sensor and controls the operator's switching devices. The switch-off temperature depends on the operating temperature range specified for the gear unit. Observe chapter "Gear units and gearmotor in equipment group II" (→ 🗎 71). Integrate the temperature sensors in the oil heating elements in the operator's control in such a way that the following switching points are realized:

Maximum operating temperature	Switching temperature	Switching operation
≥120 °C	110 °C	**WARNING/SWITCH OFF**
≥100 °C	90 °C	
≥85 °C	75 °C	

INFORMATION

Observe the manufacturer's documentation included in the delivery.

6.27.5 Temperature sensor for oil bath temperature

In standard design, the oil heater is controlled by a thermostat installed on the gear unit. Instead, the oil heater can be controller by a temperature sensor installed on the gear unit.

The operator's control evaluates the temperature sensor and controls the operator's switching devices. Integrate the temperature sensor for the oil temperature to the operator's control in such a way that the order-specific switching points are implemented.

INFORMATION

Observe the manufacturer's documentation included in the delivery.

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6.27.6 Connection power

The table shows the power of the heating that may be installed.

Boundary conditions: T_{amb} = -25 °C; Mounting position M1 (splash lubrication)					
Size	Heating element		P_{Inst} W	Heating after 4 h K	Max. heating K
P042 X2K110	1	OH	340	10	12
	2	OH-F + OH	170 + 340	14	17
P052 X2K110	1	OH	340	8	11
	2	OH-F + OH	170 + 340	13	16
P052 X2K130	1	OH	410	9	11
	2	OH-F + OH	200 + 410	13	17
P062 X2K130	1	OH	410	7	10
	2	OH-F + OH	200 + 410	12	14
P072 X2K130	1	OH	410	7	9
	2	OH-F + OH	200 + 410	10	13
P072 X2K150	1	OH	490	7	10
	2	OH-F + OH	200 + 490	10	13
P082 X2K150	1	OH	490	6	9
	2	OH-F + OH	200 + 490	8	12
P092 X2K150	1	OH	490	5	8
	2	OH-F + OH	200 + 490	8	11
P102 X2K150	1	OH	490	4	7
	2	OH-F + OH	200 + 490	7	10
P092 X2K170	1	OH	570	5	8
	2	OH-F + OH	340 + 570	8	12
P102 X2K170	1	OH	570	5	7
	2	OH-F + OH	340 + 570	7	11

P_{inst} = Power of the installed heater

OH = Oil heater in the gear unit

OH-F = Oil heater in the flange

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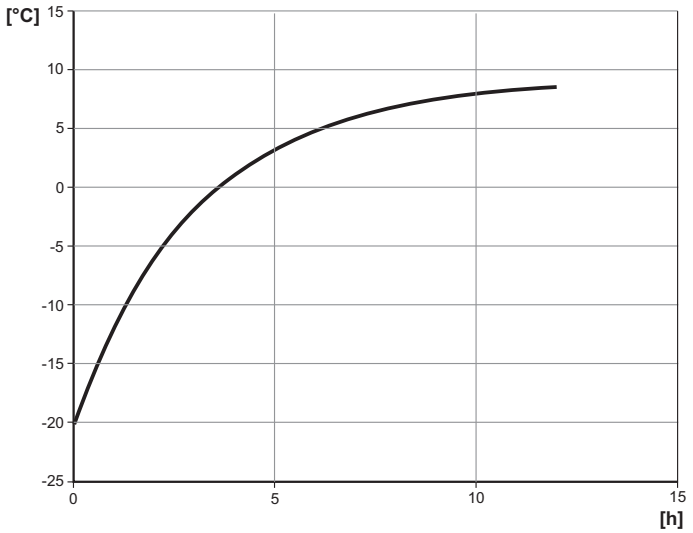
6.27.7 Example of heating

Example of heating with the gear unit combination P072 X2K150

With the following basic conditions:

2 heating elements Peripheral Conditions: T_{Amb} = -20 °C; Mounting position M1 (Splash lubrication)		
Duration h	**Heating K**	**Temperature °C**
0	0	-20
1	8.0	-12.0
2	13.9	-6.1
3	18.1	-1.9
4	21.2	1.2
5	23.4	3.4
6	25.0	5.0
7	26.2	6.2
8	27.1	7.1
9	27.7	7.7
10	28.1	8.1
11	28.5	8.5
12	28.7	8.7



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°C = Temperature

h = Heating duration

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6.28 Pressure switch /PS

INFORMATION

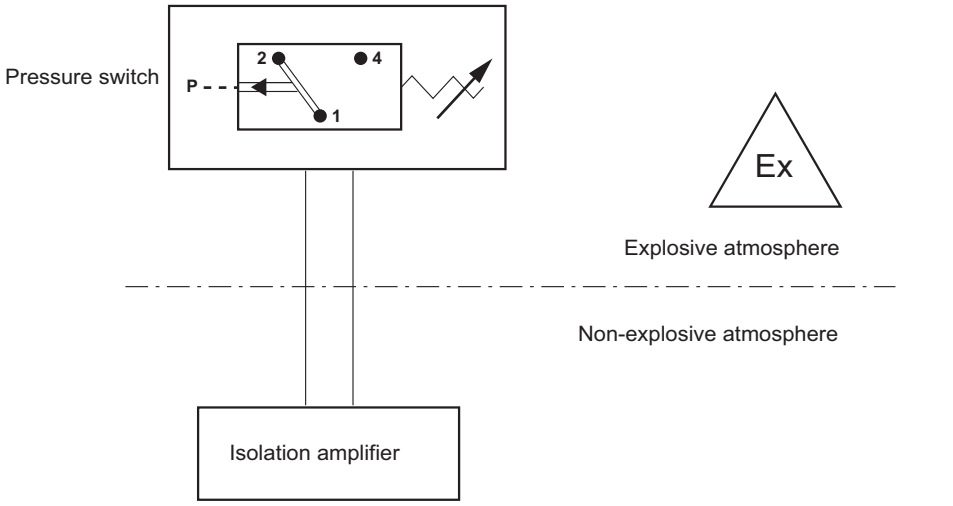
All gear units with pressure lubrication are equipped with a pressure switch for function monitoring.

The pressure switch is to be connected and integrated into the system in such a way that the gear unit can only be operated when the oil pump is building up pressure. A short-term compensation (max. 10 s) during startup is permitted.

6.28.1 Notes

INFORMATION

- The pressure switch must be used together with a switch amplifier that enables intrinsically safe switching operations. The isolation amplifier must be located outside the potentially explosive atmosphere.
- The isolation amplifier must be designed according to EN 60079-11 taking account of the minimum ignition energy (gas group); for dust at least IIB. The pressure switch itself is a simple electrical device according to EN 60079-11 and does not require a separate Ex marking. The isolated switch amplifier and the pressure switch must be installed in compliance with EN 60079-14.



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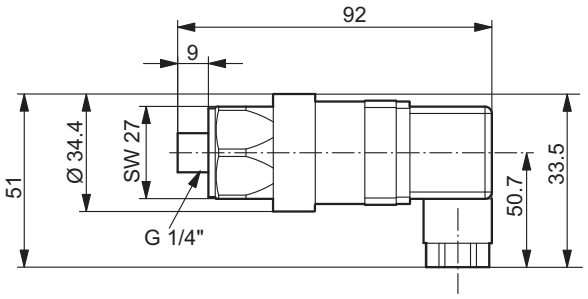
6.28.2 Dimensions



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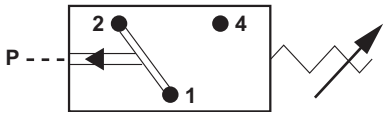
6.28.3 Electrical connection



722003723

[1][2] NC contact

[1][4] NO contact

6.28.4 Technical data

- Switching pressure 0.5 ± 0.2 bars
- Maximum switching capacity 4 A - 250 V_{AC}; 4 A - 24 V_{DC}
- Plug connector DIN EN 175301-803
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm

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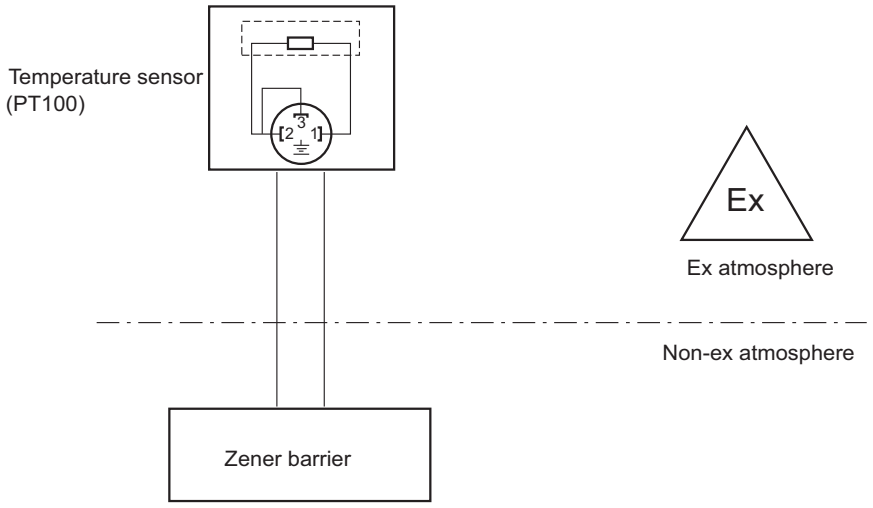
6.29 Temperature sensor /PT100

6.29.1 Information

INFORMATION

- To ensure intrinsically safe wiring, the temperature sensor must be used with a Zener barrier whose current consumption enables correct measuring operation.
- The Zener barrier must be located outside the potentially explosive atmosphere.
- The Zener barrier must be designed according to EN 60079-11 taking account of the minimum ignition energy (gas group); for dust at least IIB. The temperature sensor itself is a simple electrical device according to EN 60079-11 and does not require a separate Ex marking. The Zener barrier and the temperature sensor must be installed in compliance with EN 60079-14.



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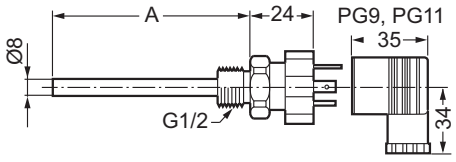
6.29.2 Dimensions



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Size	A [mm]
X100 – 170	50
X180 – 320	150

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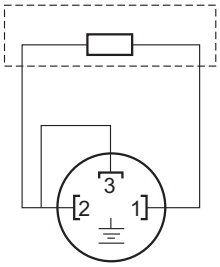
6.29.3 Electrical connection



359158539

[1] [2] Resistor element connection

6.29.4 Technical data

- Design with thermowell and changeable measuring insert
- Sensor tolerance [K] ± (0.3 + 0.005 x T), (corresponds to DIN IEC 751 class B),
  T = Oil temperature [°C]
- Plug connector: EN 60751
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm.

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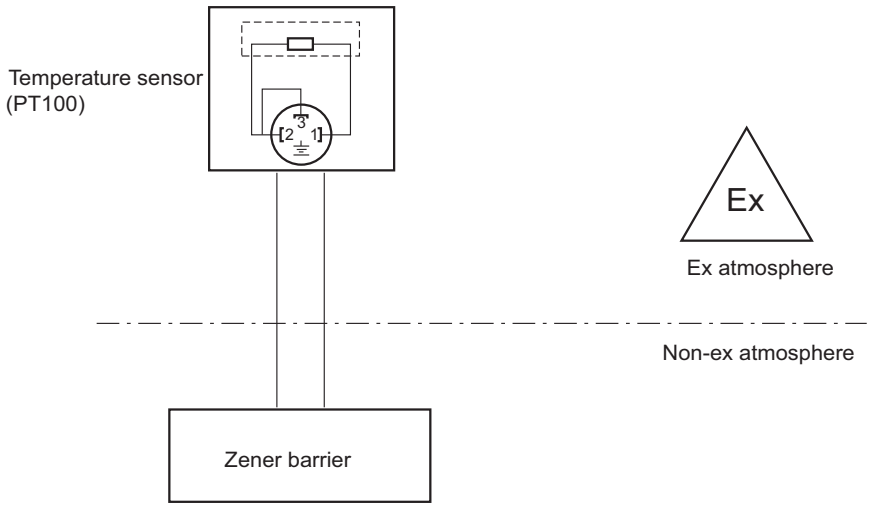
6.30 Temperature sensor /PT100 (metallic)

INFORMATION

- To ensure intrinsically safe wiring, the temperature sensor must be used with a Zener barrier whose current consumption enables correct measuring operation.
- The Zener barrier must be located outside the potentially explosive atmosphere.
- The Zener barrier must be designed according to EN 60079-11 taking account of the minimum ignition energy (gas group); for dust at least IIB. The temperature sensor itself is a simple electrical device according to EN 60079-11 and does not require a separate Ex marking. The Zener barrier and the temperature sensor must be installed in compliance with EN 60079-14.



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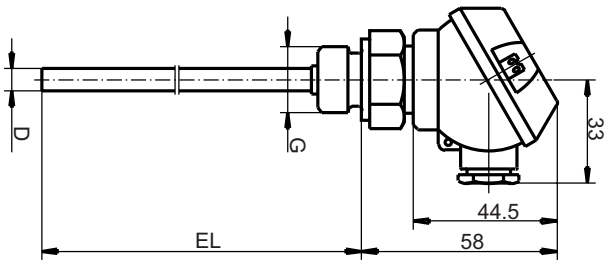
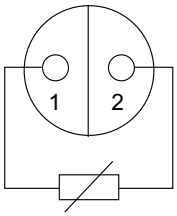
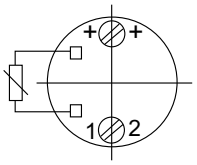
6.30.1 Technical data



4401813899

Area of application	For monitoring the oil temperature
Operating temperature	-50 °C to 400 °C
Thermowell diameter	Ø 7 mm
Installation length	100 mm
Process connection	G1/2 screw fitting
Measuring insert	1 x PT100 in double-wire circuit
Tolerance class in accordance with EN 60751	Class B (standard)

6.30.2 Electrical connection

Connection type	Double-wire
Standard connector	
Connection socket	

[1] [2] Resistor element connection

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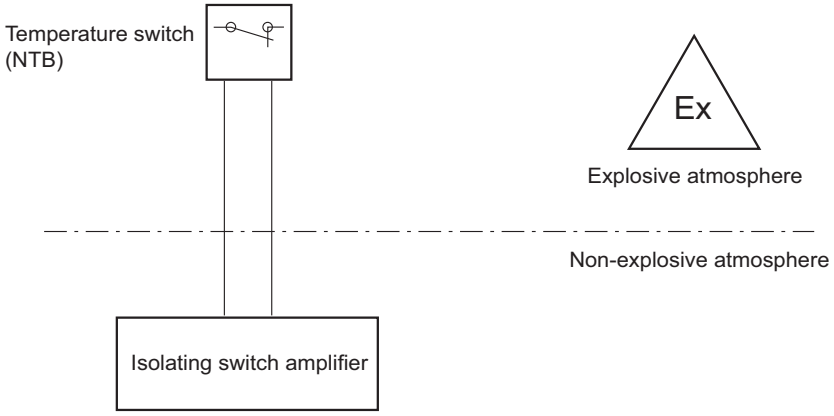
6.31 Temperature switch /NTB

6.31.1 Notes

INFORMATION

- The temperature switch must be used with an isolation amplifier that enables intrinsically safe switching operations. The isolation amplifier must be located outside the potentially explosive atmosphere.
- The isolation amplifier must be designed according to EN 60079-11 taking account of the minimum ignition energy (gas group); for dust at least IIB. The temperature switch itself is a simple electrical device according to EN 60079-11 and does not require a separate Ex marking. The isolated switch amplifier and the temperature switch must be installed in compliance with EN 60079-14.



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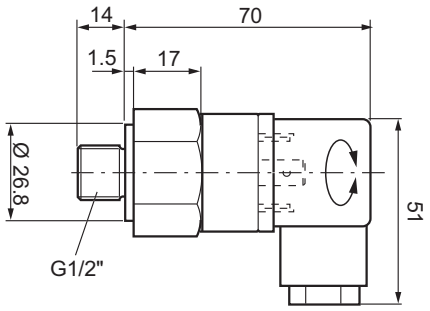
6.31.2 Dimensions



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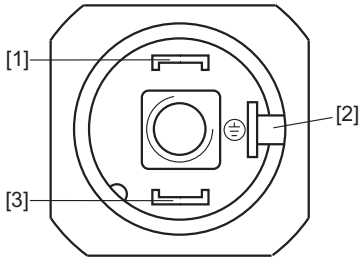
6.31.3 Electrical connection

To guarantee a long service life and trouble-free functioning, we recommend that you use a relay in the power circuit instead of a direct connection through the temperature switch.



366532491

[1][3] NC contact (without vacuum)

[2] Grounding terminal 6.3 x 0.8

6.31.4 Technical data

- Trip temperature: 70 °C, 80 °C, 90 °C, 100 °C ± 5 °C
- Contact capacity: 10 A - AC 240 V
- Plug connector: EN 175301-803 PG9 (IP65)
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm

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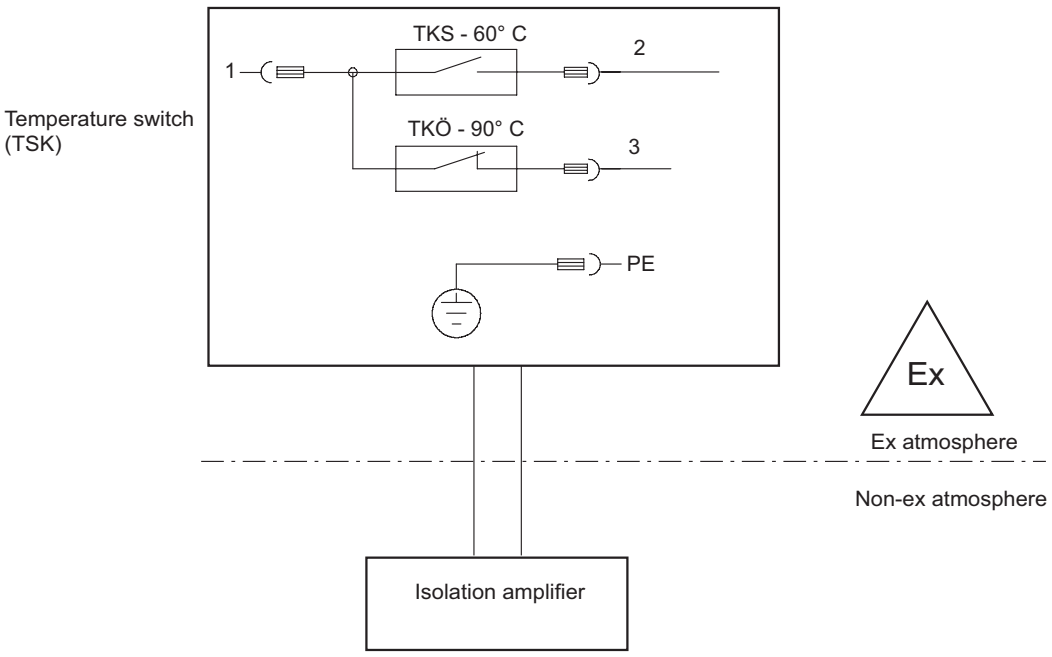
6.32 Temperature switch /TSK

6.32.1 Notes

INFORMATION

- The temperature switch must be used with an isolation amplifier that enables intrinsically safe switching operations. The isolation amplifier must be located outside the potentially explosive atmosphere.
- The isolation amplifier must be designed according to EN 60079-11 taking account of the minimum ignition energy (gas group); for dust at least IIB. The temperature switch itself is a simple electrical device according to EN 60079-11 and does not require a separate Ex marking. The isolated switch amplifier and the temperature switch must be installed in compliance with EN 60079-14.



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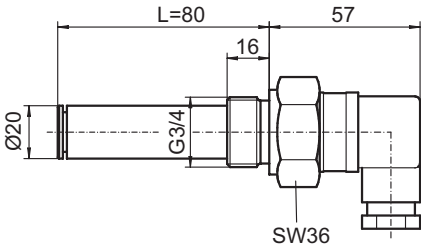
6.32.2 Dimensions



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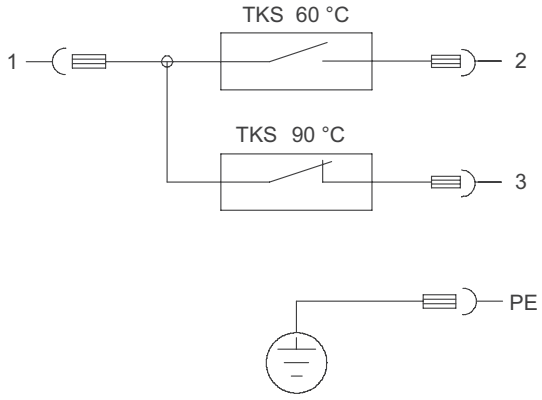
6.32.3 Electrical connection

To guarantee a long service life and trouble-free functioning, we recommend that you use a relay in the power circuit instead of a direct connection through the temperature switch.



36028797912842123

[1][2] Switch 60 °C NO contact
[1][3] Switch 90 °C NC contact
PE Grounding terminal

6.32.4 Technical data

- Switching temperatures: 60 °C and 90 °C
- Contact capacity: 2 A - AC 240 V
- Plug connector: EN 175301-803 PG11 (IP65)
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm

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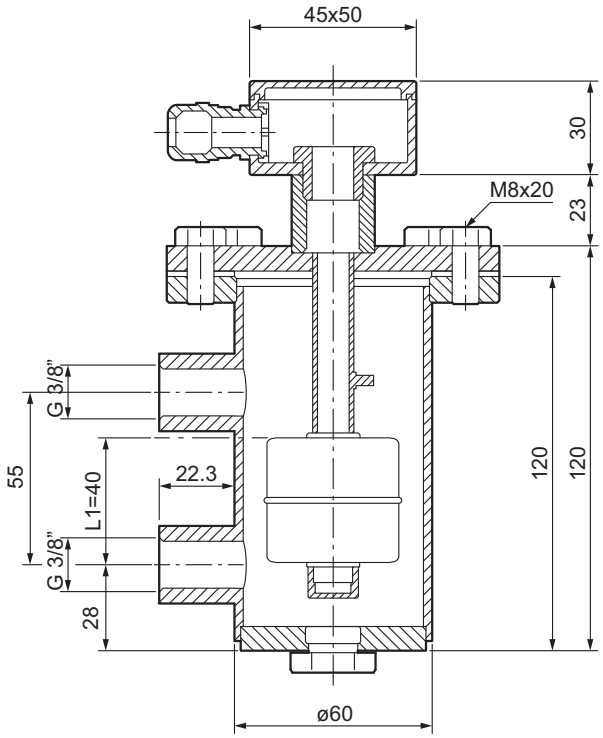
6.33 Float switch

6.33.1 Dimensions

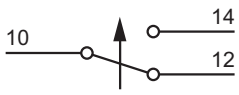


18888473995

6.33.2 Technical data

Technical data	
Connections	G3/8“ female thread
Tightening torque (Fittings 3/8”)	20 Nm
Switching capacity	Max. 24 VA
Switching voltage	SELV 24 V DC
Inrush current	Max. 1 A
Hysteresis	Approx. 3 – 5 mm
Cable gland	PSG9 (M16)

6.33.3 Electrical connection



18888476683

[10] White
[12] Green
[14] Brown

7 Startup

7.1 Important notes

Read the following notes prior to startup.

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Work on the gear unit only when the machine is not in use. Secure the drive unit against unintentional power-up. Attach an information sign near the ON switch to warn that the gear unit is being worked on.

⚠ WARNING

Danger due to freely accessible, rotating parts.

Severe or fatal injuries.

- Secure rotating components such as shafts, couplings, gears or belt drives using suitable protection covers.
- Ensure that installed protection covers are sufficiently attached.

⚠ WARNING

Danger due to using impermissible gear unit oil.

Severe or fatal injuries.

- Only use food-grade oils when the gear unit is used in the food industry.

⚠ CAUTION

Danger due to unsecured mount-on components, e.g. keys.

Possible injury to persons due to falling parts.

- Install appropriate protective devices.
- Secure the mount-on components.

⚠ CAUTION

Danger due to lubricant leaking from damaged seals and the breather.

Minor injuries.

- Check the gear unit and mount-on components for leaking lubricant.
- The seals must not come in contact with cleaning agent as this may damage the seals.
- Protect the breather against damage.
- Make sure that there is not too much oil in the gear unit. If the oil level is too high and the temperature rises, lubricant may escape from the breather.

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NOTICE

Improper startup may result in damage to the gear unit.

Possible damage to property.

- Observe the following information.

- Fill the gear unit with the oil grade specified on the nameplate. The oil quantity specified on the nameplate is an approximate quantity. The markings on the oil dipstick are the decisive indicators for the oil quantity to be filled into the unit. For additional information, refer to the chapter "Checking the oil level" (→ 🗎 147) and the chapter "Changing the oil" (→ 🗎 152).

  The required oil fill quantity is higher when additional attachments are mounted to the gear unit, such as an oil supply system. In this case, observe the respective "Oil Supply System" operating instructions.

  Check the oil level again after the first few operating hours; see the chapter "Checking the oil level" (→ 🗎 147).
- The most important technical data is provided on the nameplate. Additional data relevant for operation is available in drawings, on the order confirmation, or any order-specific documentation.
- After installing the gear unit, check to see that all retaining screws are tight.
- Make sure that the alignment has not changed after tightening the mounting elements.
- If there are any oil drain valves, ensure that they cannot be opened unintentionally.
- Prior to startup, make sure the monitoring devices (pressure switch, temperature switch, etc.) are fully operational.
- If an oil level glass is used for checking the oil level, ensure that it is protected against damage.
- Make sure that the external coolant supply is guaranteed for gear units with circulation cooling, water cooling cover and water cooling cartridge.
- Gear units with pressure lubrication may only be taken into operation when the pressure switch is connected.
- It is essential that there is no open fire or risk of sparks when working on the gear unit.
- Make sure that the gear unit is grounded. Electrical attached components, such as motors, frequency inverters, etc., must be grounded separately.
- Protect the gear unit from falling objects.
- When ambient temperatures are low, adhere to the limit temperature for gear unit startup. Allow for sufficient warm-up time.
- When using gear units with long-term protection: Replace the screw plug at the location indicated on the gear unit with a breather plug (position → see order documents).
- Remove any available transport protection prior to startup.
- If the gear unit is equipped with a fan on the input shaft, check for free air intake within the specified angle.
- Adhere to the safety notes in the individual chapters.

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7.1.1 Permitted axial force

For applications with axial loads, consult SEW-EURODRIVE.

INFORMATION

- Please consult SEW-EURODRIVE if you use the PH.. design in combination with overhung forces, or the PHF.. variant with flange mounting.
- If only an axial load but no additional overhung load act on the output shaft, it is necessary that you contact SEW-EURODRIVE.

7.1.2 Permitted external loads

During project planning, the drives are dimensioned according to the radial and axial loads described in the order confirmation.

INFORMATION

If the configured loads are exceeded during operation, the drive may be damaged and impermissibly high temperatures may occur.

The ATEX EU declaration of conformity and the guarantee no longer apply without prior consultation with SEW-EURODRIVE.

7.2 Starting up industrial gear units in potentially explosive areas

Note the following information.

INFORMATION

- Define measure to ensure that the values on the nameplate of the gear unit are not exceeded. It is essential that the gear unit is not overloaded. Make sure that the data specified on the nameplate of the gear unit corresponds to real conditions at the location where the drive is to be installed.
- If the project planning documents require the use of oil temperature monitoring, the gear unit may only be started up with an installed oil temperature monitor.
- Check the monitoring system for proper functioning prior to startup. The shutdown temperature of the drive is specified in the delivered documents.
- Processes that cause strong electrical charge are not permitted.

7.2.1 Gear unit with frequency inverter and motor

INFORMATION

- Ensure that the motor is approved for operation with a frequency inverter.
- Ensure that the gear unit is designed for operation with a frequency inverter. The "min." and "max." specifications on the nameplate indicate if the gear unit is approved for operation with a frequency inverter.
- The parameters of the frequency inverter must be set to prevent an overload of the gear unit. The technical data for the gear unit can be found on the nameplate.

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7.3 Startup of gear units with long-term protection

Adhere to the following points for gear units with long-term protection:

7.3.1 Anti-corrosion agent

Clean the output shafts and flange surfaces thoroughly to ensure they are free of anti-corrosion agents, contamination or similar. Use a standard solvent.

NOTICE

If the sealing lips of the oil seal come in contact with solvents, the sealing lips can be damaged.

Possible damage to property.

- Do not let the solvent come into contact with the sealing lips.

7.3.2 Breather

Replace the screw plug at the location indicated on the gear unit with a breather (position → see order documents).

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7.4 Shaft end pump /SEP

NOTICE

Improper startup of gear units with pressure lubrication can damage the gear unit.

Possible damage to property.

- Observe the following notes.

- Do not start up the gear unit if the pressure switch is not connected.
- It is essential that the gear unit is sufficiently lubricated from the very beginning. Consult SEW-EURODRIVE if the pump does not build up pressure within 20 seconds after the gear unit has been started up.
- A minimum speed of ≥ 400 min^{-1} is required for proper operation of the shaft end pump. If you use variable input speeds (e.g. inverter-controlled drives) or if you intend to change the input speed of a gear unit equipped with a shaft end pump, it is essential that you contact SEW-EURODRIVE.
- An oil heater is mandatory when operating gear units with shaft end pump at low ambient temperatures. For further information, refer to the chapter "Limit temperature for gear unit start" (→ 🗎 110).
- Observe the information in the chapter "Filling gear units with oil / delivered without oil fill (standard)" (→ 🗎 75).

7.5 Motor pump /ONP

INFORMATION

Before startup, first read the addendum to the operating instructions "Motor Pump / ONP", which includes the manufacturer's documentation.

7.6 Motor pump /ONP1L

INFORMATION

Before startup, first read the addendum to the operating instructions "Motor Pump / ONP1L", which includes the manufacturer's documentation.

7.7 Motor pump /ONP1

INFORMATION

Before startup, first read the addendum to the operating instructions "Motor Pump / ONP1", which includes the manufacturer's documentation.

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7.8 Water cooling cartridge /CCT

NOTICE

Risk of damage to the system due to performance loss.

Possible damage to property.

- A loss of performance may result from the formation of scale on the inside of the pipe. Refer to chapter "Inspection/Maintenance".

NOTICE

Risk of damage to components caused by aggressive cooling media, such as sea water or brackish water.

Possible damage to property.

- Sea water or brackish water and other caustic fluids must not be used as cooling media for the standard models. Special materials are necessary when using these aggressive cooling media.

After having installed the water cooling cartridge in the system, it can be taken into operation and operated without taking further preparatory measures. After startup, check the water cooling cartridge for proper function.

Make the following checks:

- Check the connection points for tightness.
- If necessary, check the valves, fittings, and filters for unrestricted flow and proper functioning.
- Check for proper function of the water cooling cartridge.

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7.9 Oil-water cooler for splash lubrication /OWC

INFORMATION

Before startup, first read the addendum to the operating instructions "Oil-Water Cooler for Splash Lubrication /OWC".

7.10 Oil-air cooler for splash lubrication /OAC

INFORMATION

Before startup, first read the addendum to the operating instructions "Oil-Air Cooler for Splash Lubricaton /OAC".

7.11 Oil-water cooler for pressure lubrication /OWP

INFORMATION

Before startup, first read the addendum to the operating instructions "Oil-Water Cooler for Pressure Lubrication /OWP".

7.12 Oil-air cooler for pressure lubrication /OAP

INFORMATION

Before startup, first read the addendum to the operating instructions "Oil-Air Cooler for Pressure Lubrication /OAP".

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7.13 Oil heater /OH

⚠ WARNING

Risk of explosion due to an incorrect oil level.

Severe or fatal injuries.

- If the heater is operated with insufficient oil level, surfaces might heat up and turn into an ignition source.
- Oil heaters may only be used together with oil level monitoring, see chapter Float switch. Operators must make sure that oil level monitoring and heater are wired in such a way that the oil heater can only be operated when the oil level is sufficiently high.

INFORMATION

- Observe the manufacturer's documentation.

NOTICE

Malfunctioning oil heater when changing the mounting position

Possible damage to property.

- Do not change the mounting position without prior consultation with SEW-EURODRIVE, otherwise proper functioning is no longer ensured.

Oil heaters come equipped with integrated overtemperature switching-off. This function prevents the heating rod from overheating if it is sufficiently covered by oil.

Observe the respective manufacturer's documentation for electrical connection and operation.

The oil heater is switched on or switched off by the operator depending on the oil temperature and based on the evaluation of the temperature sensor. For information on the minimum oil temperature required for starting the gear unit and depending on the oil type in use, refer to the table in chapter "Permitted lubricants" (→ 🗎 166).

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7.14 Backstop /BS

INFORMATION

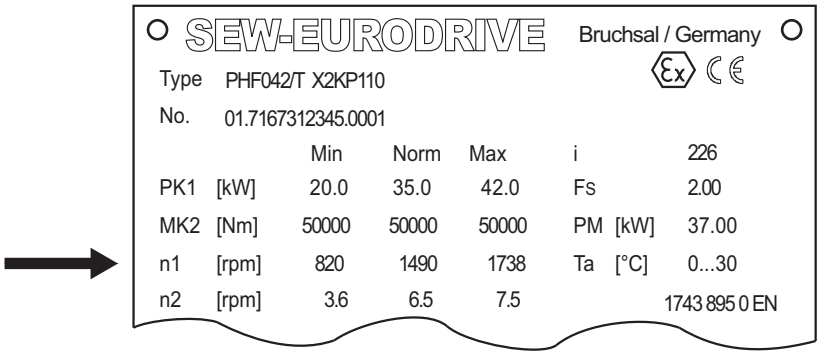
Regular operation of the backstop below the lift-off speed is not permitted, except during temporary starting and braking and in auxiliary drive mode. The permitted minimum speed rating is listed on the nameplate.

NOTICE

Operation in blocking direction might destroy the backstop [1]!

Possible damage to property

- Do not start up the motor in blocking direction. Ensure a correct current supply to the motor, so that it rotates in the required direction. Operation in blocking direction might destroy the backstop [1]!
- Observe the addendum to the operating instructions if you change the blocking direction!
- When a backstop is used, additional values for the speed range that must be adhered can be found on the nameplate. Operation that exceeds the speed range specified on the nameplate is not permitted.



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The direction of rotation is determined with a view to the output shaft (LSS):

- Clockwise rotation (CW)
- Counterclockwise rotation (CCW)

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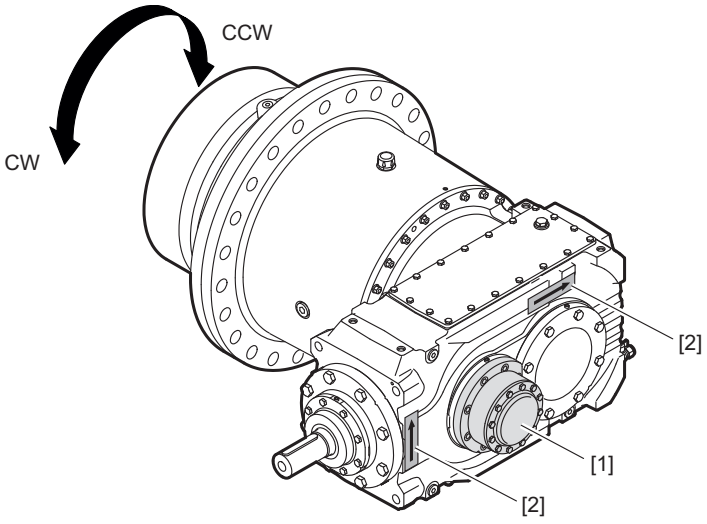
The permitted direction of rotation [2] is indicated on the housing.



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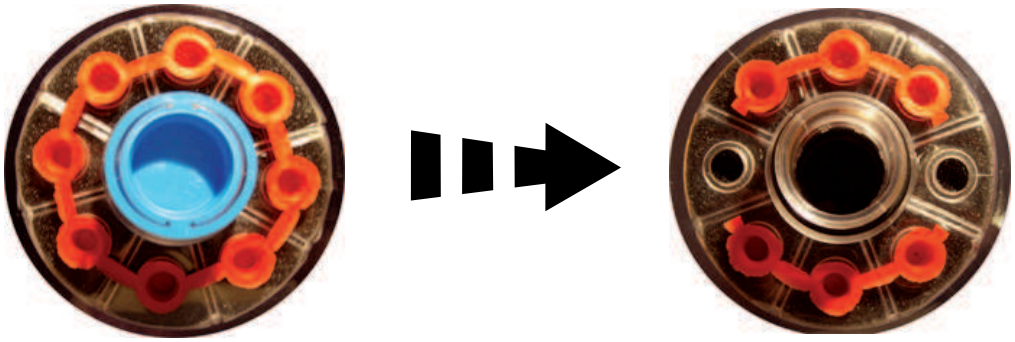
7.15 Desiccant breather filter /DC

7.15.1 Usage

Before startup

Open only 2 of the air openings (180° opposite) at the bottom of the breather filter. Remove the blue cap that protects the rising pipe. If required install a suitable adapter to the filter before installing the filter at the gear unit.



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7.16 Measuring the surface and oil temperatures

Observe the following information to measure the surface and oil temperature.

INFORMATION

Even slight changes in the ambient conditions (such as limited installation space) can have a significant impact on the temperature profile. For more information, refer to chapters "Temperature information" (→ 🗎 71) and "Permitted lubricants" (→ 🗎 166).

Ambient conditions (such as installation space) may not be changed without consultation of SEW-EURODRIVE.

Measure the surface temperature and oil temperature to make sure that the "limit values permitted" (→ 🗎 71) for the drive are not exceeded. Determine the limit values for your drive and measure the surface temperature according to the "inspection and maintenance intervals" (→ 🗎 144). Check the oil temperature by means of temperature monitoring.

It is essential to measure the surface temperature at maximum load when starting up the gear unit.

The measurement can be made using standard thermometers. The surface temperature must be measured in a steady-state condition. The surface temperature must not exceed the maximum surface temperatures for gas and dust of the drive according to Ex classification.

INFORMATION

Stop the drive immediately if the temperature exceeds the limit value. Contact SEW-EURODRIVE.

7.17 Starting up the gear unit at low ambient temperatures

NOTICE

Starting up the gear unit below the permitted minimum oil temperature for gear unit startup may damage the unit.

Possible damage to property.

- Before starting up the gear unit, make sure that the oil heater heats up the oil to the temperature specified for "without heater" (→ 🗎 166).

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7.18 Gear unit shutdown / gear unit conservation

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Work on the gear unit only when the machine is not in use. Secure the drive unit against unintentional power-up. Attach an information sign near the ON switch to warn that the gear unit is being worked on.

INFORMATION

Gear units with water cooling system: disrupt the cooling water supply and drain the water from the cooling circuit. Gear units with oil supply system: Please contact SEW-EURODRIVE.

Additional conservation measures are required if the gear unit is to be shut down for a longer period. Depending on the location, the ambient conditions, and the lubrication state, even a few weeks of downtime might require conservation measures.

7.18.1 Internal conservation

- **New or hardly used gear units:**
  - For internal conservation, SEW-EURODRIVE recommends the VCI conservation method.
  - Apply the required amount of VCI anti-corrosion agent to the inside of the gear unit (e.g. FUCHS LUBRITECH Anticorit VCI UNI IP-40, www.fuchs-lubritech.com). The amount depends on the free space inside the gear unit. Any existing oil may usually remain in the drive.
  - Replace the breather with a screw plug and close the gear unit so that it is air tight. Prior to startup, re-install the breather.
- **After longer gear unit operation:**
  - The oil might be contaminated (oil sludge, water, etc.) after long periods of operation. Therefore, drain the oil and thoroughly rinse the inside of the gear unit with new oil prior to conservation. Observe the information in chapter "Changing the oil" (→ 🗎 152) in the corresponding operating instructions. The inside of the gear unit can then be conserved as described above.

INFORMATION

For gear units with contactless sealing systems, contact SEW-EURODRIVE.

For gear units without contactless sealing systems, you may also use the oil type indicated on the nameplate to perform the conservation. In this case, the gear unit must be completely filled with clean oil. Replace the breather with a screw plug and fill in the oil from the highest point of the gear unit. In order to provide for sufficient conservation, all the gearing components and bearing points must be completely covered in oil.

Prior to startup, re-install the breather. Observe the information on the nameplate regarding the oil grade and oil quantity.

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7.18.2 External corrosion protection

- Clean the respective surfaces.
- Grease the shaft near the sealing lip to separate the sealing lip of the oil seal and the anti-corrosion agent.
- Apply a wax-based protective coating to shaft ends and unpainted surfaces as external corrosion protection (e.g. Herm. Hölterhoff Hölterol MF 1424, www.hoelterhoff.de).

INFORMATION

Consult the respective supplier regarding the compatibility with the oil that is used and the duration of corrosion protection for your particular gear unit design.

Observe the information in chapter "Storage and transport conditions" (→ 🗎 22) in the corresponding operating instructions. This chapter provides information on the possible storage periods in conjunction with adequate packaging – depending on the storage location.

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8 Inspection/maintenance

8.1 Preliminary work regarding inspection and maintenance

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

⚠ WARNING

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

Severe or fatal injuries from explosion.

- If you paint the gear unit and/or other parts of a drive package delivered by SEW-EURODRIVE, then adhere to the requirements on the paint in order to prevent electrostatic charge according to EN 60079-0 and EN ISO 80079-36.

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Work on the gear unit only when the machine is not in use. Secure the drive unit against unintentional power-up. Attach an information sign near the ON switch to warn that the gear unit is being worked on.

⚠ WARNING

A customer machine that is not appropriately secured can fall during gear unit installation or removal.

Severe or fatal injuries.

- Protect the operator's machine against unintentional movement when installing or removing the gear unit.
- Before releasing shaft connections, be sure that there are no active torsional moments present (tensions within the system).

⚠ WARNING

Danger due to using impermissible gear unit oil.

Severe or fatal injuries.

- Only use food-grade oils when the gear unit is used in the food industry.

⚠ WARNING

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

Serious injury.

- Let the gear unit cool down before you start working on it.
- Remove the oil drain plug very carefully.

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⚠ CAUTION

Danger due to lubricant leaking from damaged seals and the breather.

Minor injuries.

- Check the gear unit and mount-on components for leaking lubricant.
- The seals must not come in contact with cleaning agent as this may damage the seals.
- Protect the breather against damage.
- Make sure that there is not too much oil in the gear unit. If the oil level is too high and the temperature rises, lubricant may escape from the breather.

⚠ CAUTION

Danger due to leakage of lubricant.

Injuries.

- Remove any dripping oil immediately with oil binding agent.

INFORMATION

- Processes that cause strong electrical charge are not permitted. Do not use dry cotton cloth to clean the gear unit.
- Avoid dust accumulation of more than 5 mm.

NOTICE

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

Possible damage to property.

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

NOTICE

Improper maintenance may result in damage to the gear unit.

Possible damage to property.

- Observe the following notes.

- Maintenance work on explosion-proof gear units must only be carried out by qualified personnel (qualified according to Directive 1999/92/EC). See the chapter "Target group" (→ 🗎 10).
- Strict adherence to the inspection and maintenance intervals is absolutely necessary to ensure safe working conditions.
- Note that the gear units have a **common oil chamber**.
- Use only original spare parts according to the delivered spare and wearing parts lists.
- If you remove the gear unit cover, you must apply new sealing compound to the sealing surface. Otherwise, the sealing properties of the gear unit may be impaired. Consult SEW-EURODRIVE in this case.
- Prevent foreign particles from entering into the gear unit during maintenance and inspection work.

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- Never clean the gear unit using a high-pressure cleaning device. Water might enter the gear unit and the seals might be damaged.
- Replace any damaged seals.
- Adhere to the tightening torques.
- The gear unit must be cleaned in such a way that liquids cannot enter the motor adapter (HSS end) or the mounting flange (LSS end) and accumulate there.
- Perform a safety check and functional check following all maintenance and repair work.
- For third-party parts, such as cooling systems, observe the separate inspection and maintenance intervals of the manufacturer's documentation.
- Strictly observe the safety notes in the individual chapters.

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8.2 Inspection and maintenance intervals

Adhere to the following inspection and maintenance intervals:

Time interval	What to do?
Daily	• Check the housing temperature/surface temperature • Check for gear unit noise.
Monthly	• Check the gear unit for signs of leakage. • Check the oil level.
After 500 operating hours	• First oil change after initial startup
Every 6 months	• Check all the screw fittings and piping for leakage.
Every 3000 operating hours, at least every 6 months	• Check the oil consistency. • Fill regreasable sealing systems with grease. • For V-belt drives: Check the belt tension and condition of the V-belt pulleys and belts.
At least every 12 months, depending on the operating conditions	• Check whether retaining screws are tightly secured. • Check if the gear unit surface is free of dust and dirt, so that the gear unit can be optimally cooled. • Clean the oil filter. If required, replace the filter element. • Check the breather. If required, replace it. • Check the alignment of the input and output shaft. • Check the condition and tightness of all the rubber tubes (aging effects). • Check the condition of the motor pump /ONP1. If required (see addendum to the operating instructions), replace the filter element. • Check the condition of the oil-air cooler /OAC (see addendum to the operating instructions). • Check the condition of the oil-air cooler /OAP. If required (see addendum to the operating instructions), replace the filter element. • Check the condition of the oil-water cooler /OWC (see addendum to the operating instructions). • Check the condition of the oil-water cooler /OWP; replace the filter element if necessary (see addendum to the operating instructions). • Check the condition of the water cooling cartridge /CCT.
At least every 3 years, depending on the operating conditions (see figure on next page)	• Change mineral oil.
At least every 5 years, depending on the operating conditions (see figure on next page)	• Change synthetic oil.

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Time interval	What to do?
Varying (depending on external factors)	• Check the installed hose pipes. • Clean the gear unit housing surface and the fan. • Touch up or renew the surface/anti-corrosion coating. • Replace the backstop. The backstop might wear off when operated below lift-off speed. This is why you should consult SEW-EURODRIVE for defining the maintenance intervals for: – Speed on input shaft < 950 1/min – see chapter "Backstop". • Check the built-in cooler (such as water cooling cover / CCT and water cooling cartridge /CCV) for deposits. • Check the oil heater (at same time as the oil change): – Check whether all connection cables and terminals are securely fixed and free from corrosion. – Clean encrusted heating elements. Replace if necessary.

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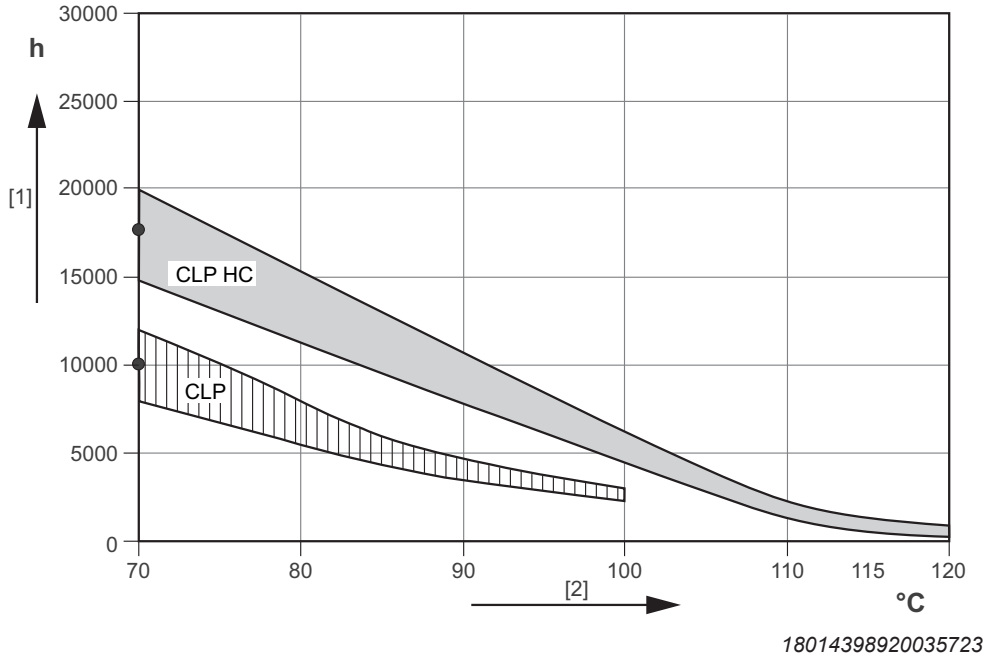
8.3 Lubricant change intervals

It might be necessary to change the oil more frequently when using special designs or under more severe/aggressive ambient conditions.

INFORMATION

Mineral CLP lubricants and synthetic polyalphaolefin-based (PAO) lubricants are used for lubrication. The synthetic lubricant CLP HC (according to DIN 51502) shown in the following illustration corresponds to the PAO oils.



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[1] Operating hours
[2] Sustained oil bath temperature
[A] Average value per oil type at 70 °C

INFORMATION

SEW-EURODRIVE recommends that the gear unit oil is analyzed regularly (see chapter "Checking the oil consistency" (→ 🗎 151)) to optimize the lubricant change intervals.

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8.4 Checking the oil level

8.4.1 General information

Note the following when checking the oil level.

NOTICE

Improper checking of the oil level may result in damage to the gear unit.

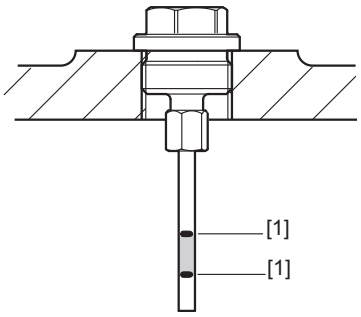
Possible damage to property.

- Check the oil level only when the gear unit is at standstill.
- For gear units in fixed and variable pivoted mounting position, observe the notes on the following pages.
- Elements for controlling the oil level, oil drain, and oil fill openings are indicated on the gear unit by safety symbols.
- Check the oil level again after a few operating hours.

8.4.2 Standard procedure

Oil dipstick

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).



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1. Unscrew the oil dipstick and remove it.
2. Clean the oil dipstick and re-insert it by turning it hand-tight into the gear unit up to the stop.
3. Remove the oil dipstick and check the oil level. The oil level must be between the markings [1].
4. Proceed as follows if the oil level is too low:
   - Open the oil fill plug.
   - Fill in oil of the same oil grade until the oil level is between the markings [1].
5. If you filled in too much oil, proceed as follows:
   - Adjust the oil level. The oil level must be between the markings [1].
6. Screw in the oil fill plug.
7. Insert the oil dipstick.

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8.4.3 Notes on the procedure for fixed and variabel pivoted mounting positions

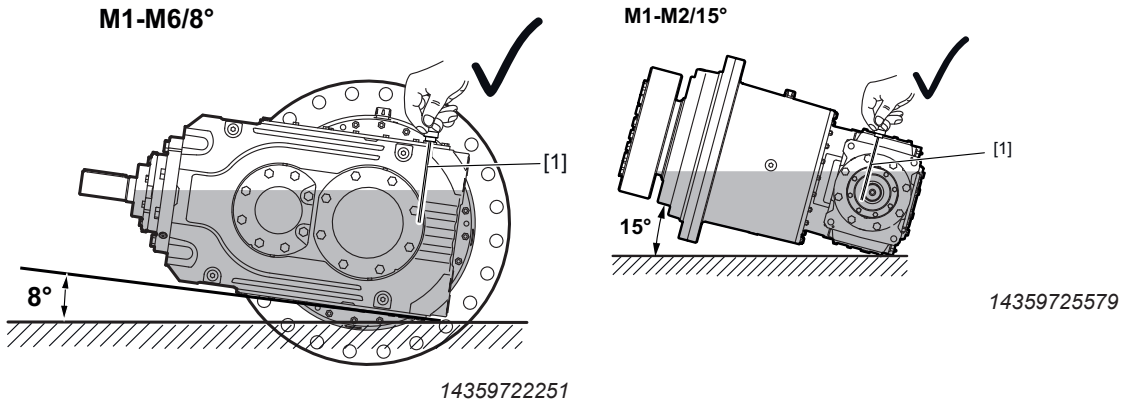
Observe the information on the nameplate and in the order documents.

Fixed pivoted mounting positions

Procedure

Check the oil level in the fixed, intended position. Observe the notes in chapter "Standard procedure" (→ 🗎 147).

The following figure shows an example of how to check the oil level.



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[1] Oil dipstick

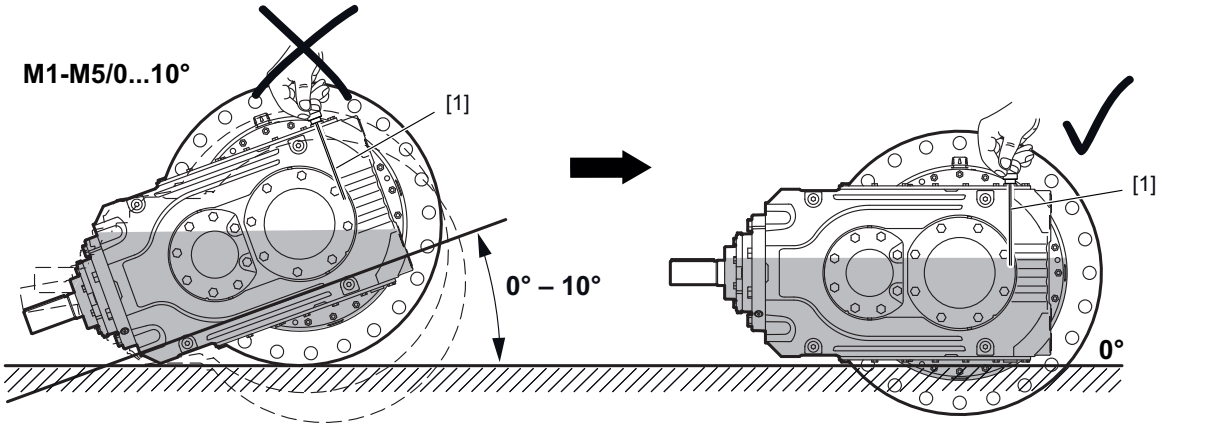
Oil

Variable pivoted mounting positions

Procedure

Before checking the oil level of gear units with variable pivoted mounting position, position the gear unit in the mounting position defined in the order documents. Observe the notes in chapter "Standard procedure" (→ 🗎 147).

The following figure shows an example of how to check the oil level.



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[1] Oil dipstick

Oil

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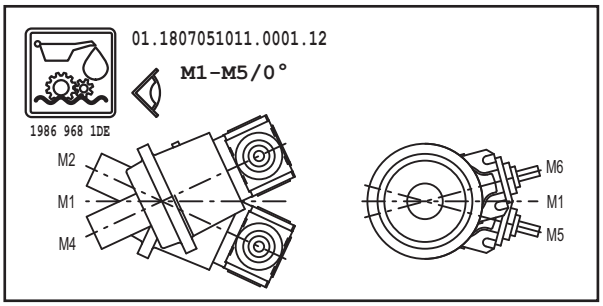
Information sign

Observe the additional **information sign on the gear unit**. Check the oil level in the test mounting position specified on the information sign.

The following figure shows an example of the information sign for check mounting position 0°.



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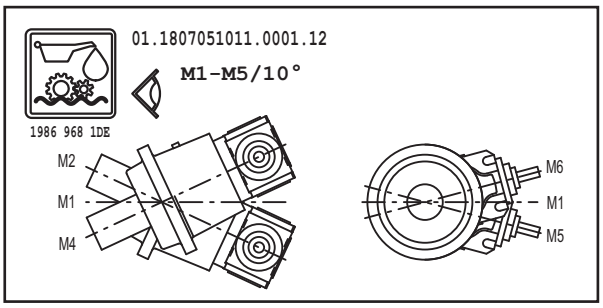
The following figure shows an example of the information sign for check mounting position 10°.



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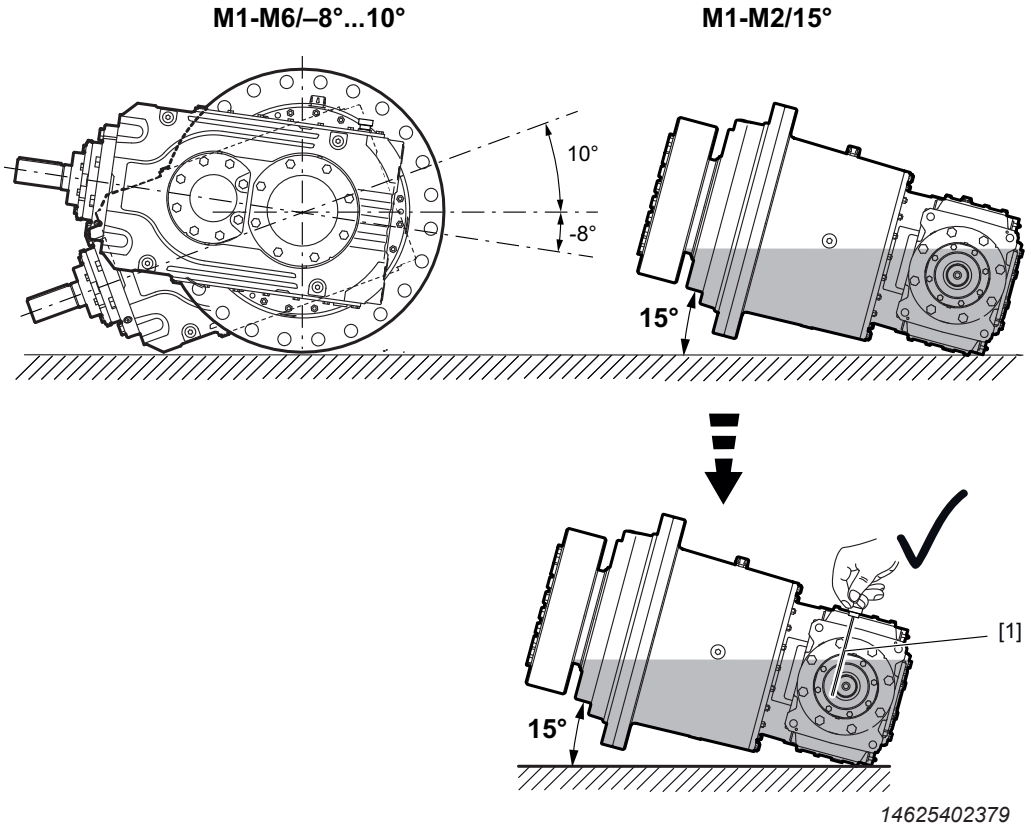
Combination of fixed and variable pivoted mounting positions

Procedure

Observe the following procedure when combining **fixed and variable pivoted mounting position**.

Before checking the oil level of gear units with fixed and variable pivoted mounting position, position the gear unit in the mounting position defined in the order documents. Observe the notes in chapter "Standard procedure" (→ 🗎 147).

The following figure shows an example of the position that must be used to check the oil level.



[1] Oil dipstick

Oil

Information sign

Observe the additional information sign on the gear unit. Check the oil level in the test mounting position specified on the nameplate.

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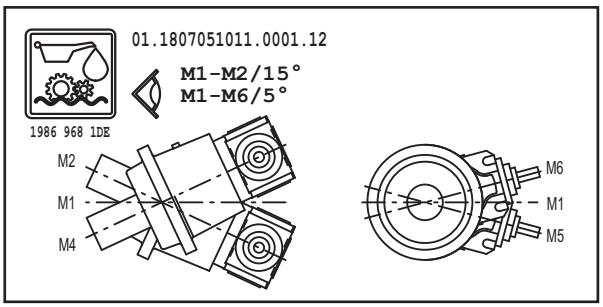
The following figure shows an example of the information sign for check mounting position M1-M2/15° at M1-M6/5°.



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8.5 Checking the oil consistency

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

Proceed as follows to check the oil consistency:

1. Start the gear unit for a short time for the oil to mix with suspended particles.
2. Determine the oil drain position and place a container underneath.
3. ⚠ **WARNING!** Risk of burns due to hot gear unit and hot gear unit oil. Serious injury. Let the gear unit cool down before you start working on it. Remove the oil level plug and oil drain plug carefully.
   Open the oil drain carefully and drain some oil.
4. Close the oil drain valve.
5. Check the oil consistency:

- Check the drained oil for appearance, color, and contamination.
- If the oil sample is severely contaminated (e.g. water, color, dirt), consult a specialist to find out the cause.
- For more detailed information on checking the oil for water content and viscosity, contact your lubricant manufacturer.

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8.6 Changing the oil

8.6.1 Notes

Observe the following when changing the oil.

⚠ WARNING

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

Serious injury.

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

NOTICE

Improper oil change may result in damage to the gear unit.

Possible damage to property.

- Observe the following information.

- Perform the oil change quickly after you have switched off the gear unit to prevent solids from settling. You should drain the oil while it is still warm. Avoid oil temperatures well above 50 °C.
- Always fill the gear unit with the same oil grade as before. Mixing oils of different grades and/or manufacturers is not permitted. Synthetic oils in particular must not be mixed with mineral oils or other synthetic oils. When switching from mineral oil and/or when switching from synthetic oil of one basis to synthetic oil of another basis, thoroughly flush the gear unit with the new oil grade.

  Refer to the lubricant table for information on the permitted oil of the various lubricant manufacturers.
- The oil grade and oil viscosity are listed on the nameplate of the gear unit. The oil quantity specified on the nameplate is an approximate quantity. The markings on the oil dipstick are the decisive indicators for the oil quantity to be filled into the unit.

  The required oil fill quantity is higher when additional attachments are mounted to the gear unit, such as an oil supply system. Observe the operating instructions of the oil supply system.
- When changing the oil, flush the gear unit interior thoroughly with oil to remove oil sludge, oil residue, and abrasion. Use the same oil grade as for operating the gear unit. Fill in fresh oil only after all residues have been removed.
- For the position of the oil level plug, oil drain plug, and breather plug, refer to the order documents.
- An oil level above the max. marking might indicate that foreign liquids (e.g. water) have entered. An oil level below the min. marking might indicate a leakage. Find out and eliminate the cause before you fill in new oil.
- If required, empty accessories e.g. filters and pipes.
- Replace any damaged gaskets on the oil drain plug.
- If present, clean the magnetic oil drain plug and the oil dipstick with magnet tip.
- Empty the oil-bearing system of gear units with circulation lubrication and oil supply systems according to the manufacturer's maintenance instructions.

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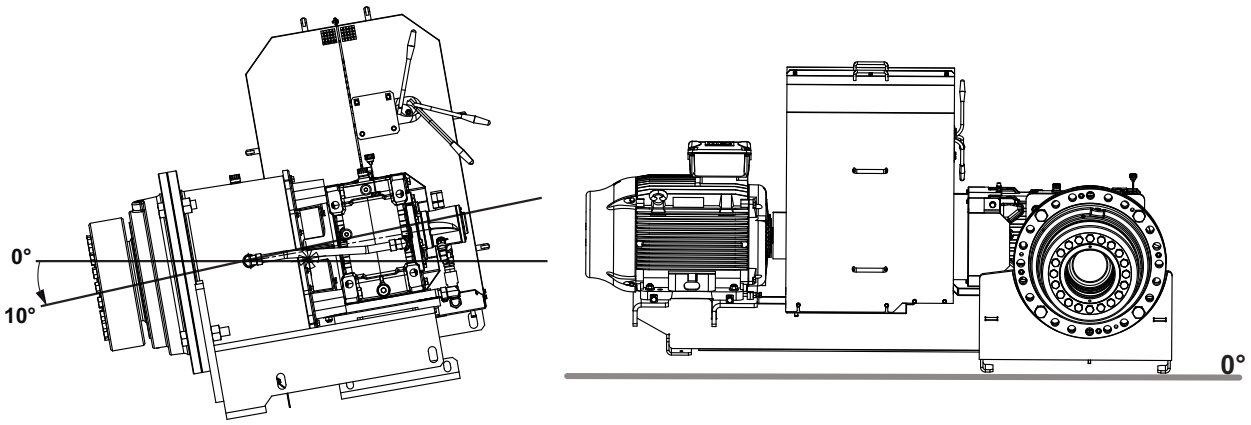
- Elements for controlling the oil level, oil drain, and oil fill openings are indicated by safety symbols on the gear unit.
- Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm).
- Remove any dripping oil immediately with oil binding agent. Dispose of the used oil in accordance with applicable regulations.
- Before changing the oil, bring the gear unit into the following initial mounting position.



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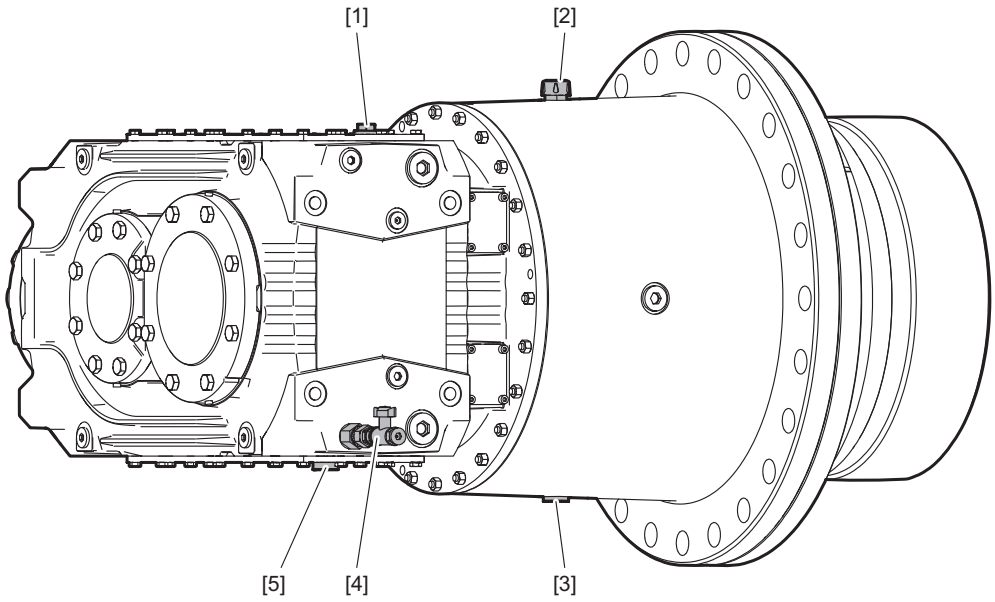
8.6.2 Gear units with shaft end pump /SEP

INFORMATION

- Read the manufacturer's documentation first before beginning inspection/maintenance work.
- Fill the shaft end pump completely with oil shortly before taking it into operation. Observe the procedure described in chapter Gear units with shaft end pump / SEP.
- Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

8.6.3 Procedure

The following figure shows an example of a gear unit.



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Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

1. Place a suitable container underneath the oil drain [3][4][5].
2. Open the oil drain valve [4].
3. Remove the oil dipstick [1] and the breather plugs [2].
4. Drain the oil into the container.

   To completely drain the remaining oil remove the oil drain plugs [3][5].
5. Close the oil drain [3][4][5] appropriately.
6. Fill the oil via the openings [2].
   - Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm).
   - Fill the gear unit with the oil grade specified on the nameplate. The oil quantity specified on the nameplate is an approximate quantity. The mark on the oil dipstick is the decisive indicator of the correct oil quantity, see chapter "Checking the oil level" (→ 🗎 147).
7. Insert the breather plug [2] and the oil dipstick [1].

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⚠ CAUTION

Danger due to leakage of lubricant.

Injuries.

- Remove any dripping oil immediately with oil binding agent.

8.7 Breather /BPG

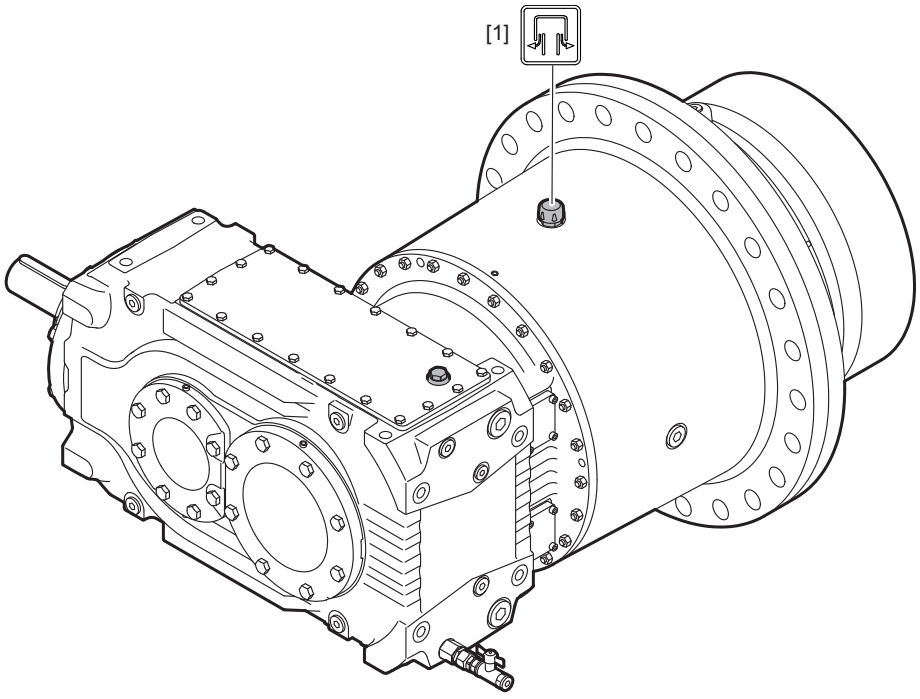
8.7.1 Checking and cleaning the breather

NOTICE

Improper cleaning of the venting may damage the gear unit.

Possible damage to property.

- Prevent foreign particles from entering into the gear unit when performing the following work.



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Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

1. Remove any deposits near the breather [1].
2. Replace the clogged breather [1] with a new one.

8.7.2 Desiccant breather filter /DC

Proper operation:

If possible, use desiccant breather filters only for gear units filled with new oil that do not contain water. Only then can the maximum service life of the filter be ensured.

The service life of the filters usually is 12 months, after that time the filters must be replaced. In case the filters are operated in a highly contaminated environment, the service life of the filters can be limited to 2 months or less. The color of the granulate indicates whether a filter needs to be replaced or whether it can still be used.

Color/color transition	Distribution of color gradient	Meaning	Action
Blue → pink	Filter top → filter bottom	Moisture in the gear unit	Determine the cause
Entirely pink or white	Entire filter	Filter capacity exhausted	Replace the filter

Once the capacity of the filter is exhausted, the desiccant breather filters change their color from blue to pink, proceeding from the bottom of the filter to the top.

If the main part of the breather valve has changed its color to pink (or white after a longer time), the breather filter must be replaced by a new one.

If the color changes from top to bottom, this indicates that a large amount of moisture is in the gear unit.

Disposal

If the desiccant breather filter must be replaced, it is likely to contain oil vapor. The filter must be disposed of in accordance with the corresponding regulations.

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8.8 Refilling grease

⚠ WARNING

Risk of crushing due to rotating parts.

Severe or fatal injuries.

- Make sure to provide for sufficient safety measures for relubrication.

INFORMATION

Make sure that the old grease cannot escape uncontrolled (preventing explosions, e.g. due to chemical reactions).

INFORMATION

- Slowly turn the shaft when you relubricate the gaskets to ensure a better spreading of the grease.
- Immediately remove the old grease that leaked out.

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🖹 141).

Regreasable sealing systems can be refilled with lithium-soap grease, see chapter "Sealing greases/bearing greases" (→ 🖹 173). Use moderate pressure to force about 30 g of grease into each lubrication point until new grease leaks out of the sealing gap.

Used grease, including contaminants and sand, is in this way pressed out of the sealing gap.

8.8.1 Planetary gear unit

1. Use moderate pressure to force grease into each lubrication point [1] until grease leaks out of the sealing gap [2]. The grease must leak out evenly over the entire circumference of the sealing gap.

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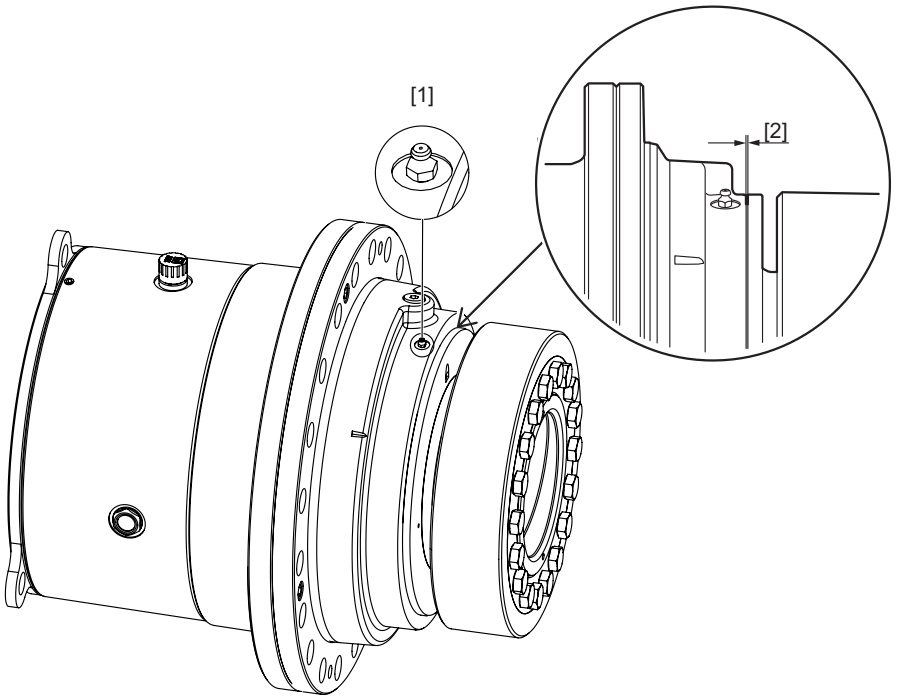

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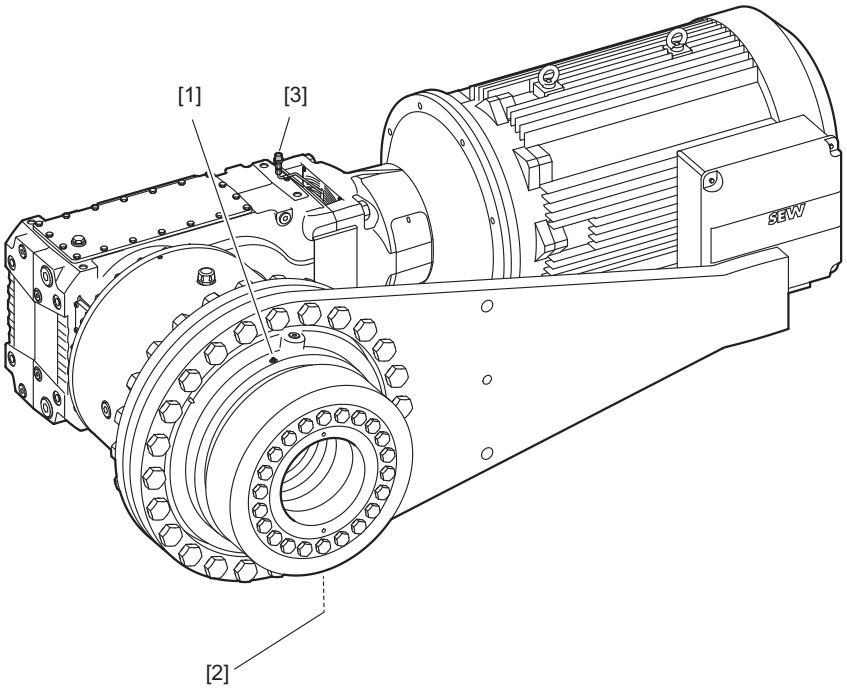
INFORMATION

Immediately remove the old grease that leaked out. Old grease can leak out between labyrinth ring and output flange.

8.8.2 Bevel-helical gear unit

1. Use moderate pressure to force grease into lubrication point [3].



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8.9 Motor pump /ONP

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

Before inspection/maintenance, first read the addendum to the operating instructions "Motor pump /ONP" including the manufacturer's documentation.

8.10 Motor pump /ONP1L

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

Before starting inspection/maintenance work, first read the addendum to the operating instructions "Motor Pump /ONP1L".

8.11 Motor pump /ONP1

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

Before starting inspection/maintenance work, first read the addendum to the operating instructions "Motor Pump /ONP1".

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8.12 Shaft end pump /SEP

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

- Observe the procedure described in the chapter Gear units with shaft end pump / SEP.
- Observe the manufacturer's documentation.

8.13 Fan /FAN

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

1. Remove the fan guard.
2. Remove any dirt from the fan wheel, fan guard and protective grid using a hard brush, for example.
3. Before starting the fan again, make sure the fan guard is mounted properly. The fan must not touch the fan guard.

8.14 Water cooling cartridge /CCT

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

Do not carry out any repair work on the pipe bundle of the water cooling cartridge unless in case of an emergency. Contact SEW-EURODRIVE in that case. Analyze the situation and report the failure symptoms.

8.14.1 Maintenance intervals

The service life of the water cooling cartridge depends to a large degree on the quality of the media and their substances. The operator is responsible for specifying the maintenance intervals. Use the performance parameters and power rating determined during operation to define the maintenance intervals.

Specify the maintenance intervals in such a way that a power loss of the water cooling cartridge does not pose a hazard to the operation of the system.

8.14.2 Cleaning

Use the performance parameters and power rating determined during operation to define the cleaning intervals. Specify the intervals in such a way that a power loss of the water cooling cartridge does not pose a hazard to the operation of the system.

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Safety notes

⚠ WARNING

Risk of burns due to media under pressure and hot component parts.

Serious injury.

- Unpressurize all systems before carrying out any disassembly work on the water cooling cartridge. Safeguard the systems according to the applicable accident prevention regulations.
- Risk of burns when touching hot parts (such as supply lines) of the water cooling cartridge. Let the parts cool down before you remove the water cooling cartridge and the supply lines.

⚠ WARNING

Cleaning the water cooling cartridge with cleaning agents such as hydrochloric acid and comparable cleaning agents can pose a risk of chemical burn to parts of the body and the eyes if the applicable work safety regulations are not adhered to.

Serious injury.

- Always adhere to the applicable work safety regulations when handling cleaning agents. Wear protective clothing, protective gloves and, if necessary, safety goggles and breathing protection when working with aggressive cleaning media.

NOTICE

Risk of destroying components of the water cooling cartridge.

Possible damage to property.

- To prevent damage resulting from improper handling of the water cooling cartridge, always contact SEW-EURODRIVE before you use other comparable, aggressive cleaning agents.

NOTICE

Risk of contamination of the medium.

Possible damage to property.

- From our experience, it is not possible to remove the cleaning agent without any residues. It is therefore important that you select only cleaning agents that are compatible with the medium.

NOTICE

Risk of damaging components of the water cooling cartridge.

Possible damage to property.

- Properly vent the water cooling cartridge and the connected systems before taking them into operation again.

NOTICE

Risk of contamination due to drained media.

Possible damage to property.

- Drain media in such a way that it is not discharged into the soil or sewage system. Drain media in suitable containers and dispose of them according to the applicable environmental regulations.

Expansion

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

1. Unpressurize the water cooling cartridge and the connected system pipes. Shut them off with the corresponding valve.
2. Before "disassembly" (→ 🗎 152), drain all the gear unit oil.
3. Completely drain the cooling medium using the drain screws and/or drains provided for this purpose.
4. Loosen the water cooling cartridge by applying torque only to the head of the hex screw on the tube plate and remove the water cooling cartridge.
5. Remove the flat gasket. Remove any gasket residues from the sealing surface.
   - **NOTICE** Be careful not to damage the sealing surface.

     Possible damage to property.

     – Damage to the sealing surfaces can result in leakage.
6. Clean the water cooling cartridge.
7. Insert a new gasket and make sure it is seated properly. If present, replace the O-ring.
8. Apply LOCTITE® 577 to 2 threads and screw on the water cooling cartridge by tightening the hex head screw on the tube plate.
9. Re-connect the cooling water supply and return pipes to the water cooling cartridges.
10. Fill new oil of the same type as the old oil through the oil fill plug (if you want to change the oil type, contact our customer service first).
    - Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm).
    - Fill in the oil according to the oil quantity specified on the nameplate. The oil quantity specified on the nameplate is an approximate value.
    - Check the oil level.
11. Before starting the system again, vent the lines.

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Cleaning the inside of the water cooling cartridge

Observe the notes in the previous chapter.

NOTICE

Risk of corrosion due to scratches.

Possible damage to property.

- Scratches on the inner surface of the pipe bundle can result in increased corrosion. Use a brush with soft bristles to clean the inner surface of the pipe bundle.

NOTICE

Risk of damaging components of the water cooling cartridge.

Possible damage to property.

- For information on suitable cleaning agents, contact SEW-EURODRIVE.

We recommend that you take the following measures for cleaning:

- To remove scale deposits from the inside of pipes, use a mixture of 50% hydrochloric acid with inhibitors and 50% water.
- To clean the inside of the pipe bundle, you can use a brush if the pipe diameter is > 5 mm. Make sure you use a brush with soft bristles to prevent the surface from pipe walls from being scratched.
- Contact SEW-EURODRIVE if you want to use other cleaning agents to remove scale deposits.
- After cleaning, make sure all cleaning agents have been removed completely from the pipes before taking the water cooling cartridge into operation again.

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8.15 Oil-water cooler for splash lubrication /OWC

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

Before inspection/maintenance, first read the addendum to the operating instructions "Oil-Water Cooler for Splash Lubrication /OWC".

8.16 Oil-air cooler for splash lubrication /OAC

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

Before inspection/maintenance, first read the addendum to the operating instructions "Oil-Air Cooler for Splash Lubricaton /OAC".

8.17 Oil-water cooler for pressure lubrication /OWP

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

Before inspection/maintenance, first read the addendum to the operating instructions "Oil-Water Cooler for Pressure Lubrication /OWP".

8.18 Oil-air cooler for pressure lubrication /OAP

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

INFORMATION

Before inspection/maintenance, first read the addendum to the operating instructions "Oil-Air Cooler for Pressure Lubrication /OAP".

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8.19 Oil heater /OH

⚠ WARNING

Danger of electric shock

Severe or fatal injuries

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

INFORMATION

Deactivate the heating resistor before you drain the oil. The heating resistor can cause the evaporating oil to explode.

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 🗎 141).

1. Before disassembling the oil heater, drain the "oil" (→ 🗎 152).
2. **NOTICE!** Improper cleaning of the oil heater may damage the heating elements. Possible damage to property. Do not destroy the heating elements by scratching or scraping. Clean the tubular heating elements with solvent. Replace the defective heating elements.
   Remove the oil heater.
3. Apply LOCTITE® 577 to two threads and screw on the oil heater and tighten the hex head screw by applying torque only to the head of the screw using an adequate tool.
4. Close the oil drain valve.
5. Fill new oil of the same type as the old oil through the oil fill plug (if you want to change the oil type, contact our customer service first).

- Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm).
- Fill the oil according to the oil quantity specified on the nameplate. The oil quantity specified on the nameplate is an approximate value.
- Check to see that the oil level is correct, refer to chapter "Checking the oil level" (→ 🗎 147).

6. Connect the oil heater.

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9 Permitted lubricants

This chapter describes the permitted lubricants and the permitted temperatures for industrial gear units from SEW-EURODRIVE.

9.1 Lubricant selection

Note the following when selecting the lubricants.

INFORMATION

- Always contact SEW-EURODRIVE before changing the mounting position to a mounting position other than the one specified on the nameplate. Otherwise, the ATEX certification will become void.

NOTICE

Selecting improper lubricants may damage the gear unit.

Possible damage to property.

- Observe the following notes.

- The oil viscosity and type (mineral/synthetic) to be used are determined by SEW-EURODRIVE specifically for each order. This information is noted in the order confirmation and on the gear unit's nameplate.

  If other lubricants are used in the gear units and/or in other temperature ranges as those recommended, the right to claim under warranty will become invalid. Exceptions are application-specific approvals that have to be confirmed by SEW-EURODRIVE in written form.

  The lubricant recommendation in the lubricant table in no way represents a guarantee regarding the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of its product.
- Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimum permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.
- The minimum permitted oil bath temperatures depend on the lubrication type used. These temperatures are specified in the lubricant tables. The values correspond to the maximum viscosity of the individual lubricants.
- The values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants are subject to dynamic change on the part of the lubricant manufacturers. For up-to-date information about the lubricants, visit:

  www.sew-eurodrive.de/lubricants
- Do not mix different synthetic lubricants and do not mix synthetic lubricants with mineral lubricants.
- Check the compatibility of the greases and oils used.
- Adhere to the safety notes in the individual chapters.

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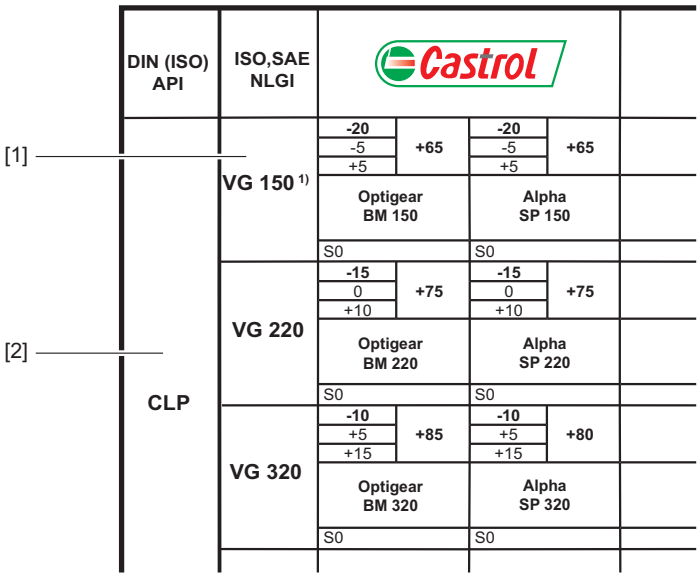
9.2 Structure of the tables and abbreviations



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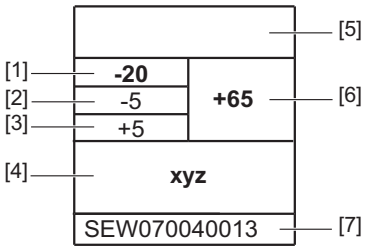
[1] Viscosity class
[2] Lubricant type

Abbreviations

Icons	Designation
CLP	= Mineral oil
CLP HC	= Synthetic polyalphaolefin (PAO)
E	= Ester-based oil
▭	= Mineral lubricant
▬	= Synthetic lubricant
	= Lubricant for the food industry (**NSF H1**-compliant)
	= Biodegradable oil (lubricant for agriculture, forestry, and water management)
1)	= Lubricants may only be used if service factor $F_s \geq 1.3$

9.3 Explanation of the various lubricants



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[1] Lowest cold start temperature in °C for splash lubrication*
[2] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 5000 cSt*
[3] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 2000 cSt*
[4] Trade name
[5] Manufacturer
[6] Highest oil bath temperature in °C. MUST NOT BE EXCEEDED.
[7] Approvals

*In case of low temperatures, the oil must be heated to the specified minimum temperature, for example by using an oil heater. The maximally permitted oil viscosity per pump type is specified in the following chapter.

9.4 Explanation of the oil supply systems and the oil viscosity

The following pressure lubrications are designed for an oil viscosity of 2000 cSt:

- Motor pump for pressure lubrication /ONP
- Motor pump incl. air cooler for pressure lubrication /OAP
- Motor pump incl. water cooler for pressure lubrication /OWP

Exceptions are the shaft end pumps. They are designed for an oil viscosity of 5000 cSt.

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9.5 Lubricant tables

This lubricant table is valid when the document is published. Please refer to www.sew-eurodrive.de/lubricants for the latest version of the table.

[1]									
[2]	SEW EURODRIVE	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TOTAL		
CLP									
VG 150 [1]	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65				
	SEW GearOil Base 150 E[1]	Optigear BM 150	Alpha SP 150	Renolin CLP 150 Plus	Renolin HighGear 150	Mobilgear 600 XP 150	Klüberoil GEM 1-150 N		
	SEW07004013					SEW07003013			
VG 220	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	
	SEW GearOil Base 220 E[1]	Optigear BM 220	Alpha SP 220	Renolin CLP 220 Plus	Renolin HighGear 220	Mobilgear 600 XP 220	Klüberoil GEM 1-220 N	Shell Omala Oil F 220	Carter EP 220
	SEW07004013					SEW07003013			
VG 320	-10 +5 +15 +85	-10 +5 +15 +85	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80
	SEW GearOil Base 320 E[1]	Optigear BM 320	Alpha SP 320	Renolin CLP 320 Plus	Renolin HighGear 320	Mobilgear 600 XP 320	Klüberoil GEM 1-320 N	Shell Omala Oil F 320	Carter EP 320
	SEW07004013					SEW07003013			
VG 460	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90
	SEW GearOil Base 460 E[1]	Optigear BM 460	Alpha SP 460	Renolin CLP 460 Plus	Renolin HighGear 460	Mobilgear 600 XP 460	Klüberoil GEM 1-460 N	Shell Omala Oil F 460	Carter EP 460
	SEW07004013					SEW07003013			
VG 680	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90		0 +15 +25 +90
	SEW GearOil Base 680 E[1]	Optigear BM 680	Alpha SP 680	Renolin CLP 680 Plus	Renolin HighGear 680	Mobilgear 600 XP 680	Klüberoil GEM 1-680 N		Carter EP 680
	SEW07004013					SEW07003013			
VG 1000	+5 +20 +30 +90								
	Optigear BM 1000								

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[1]	[2]	Castrol		FUCHS		Mobil®		KLÜBER LUBRICATION		Shell		TOTAL	
CLP HC	VG 32 [1]					-40 -30 -25	+30 SHC 624						
	VG 68 [1]			-35 -20 -10	+50 Renolin Unisyn CLP 68	-40 -25 -15	+50 SHC 626	-35 -20 -10	+50 Klübersynth GEM 4-68 N	-40 -20 -10	+50 Omala S4 GX 68		
	VG 150 [1]	-25 -10 0	+70 Alphasyn EP 150	-30 -10 0	+70 Renolin Unisyn CLP 150	-30 -10 0	+75 SHC 629	-25 -10 0	70 Klübersynth GEM 4-150 N	-30 -10 0	+75 Omala S4 GX 150	-35 -15 -5	+75 Carter SH 150
	VG 220	-25 -5 +5	+80 Alphasyn EP 220	-25 -5 +5	+80 Renolin Unisyn CLP 220	-25 -5 0	+85 SHC 630	-25 -5 +5	+80 Klübersynth GEM 4-220 N	-25 -5 +5	+85 Omala S4 GX 220	-25 -5 +5	+80 Carter SH 220
	VG 320	-20 0 +10	+90 Alphasyn EP 320	-20 0 +10	+90 Renolin Unisyn CLP 320	-20 0 +10	+95 SHC 632	-20 0 +10	+95 Klübersynth GEM 4-320 N	-20 0 +10	+95 Omala S4 GX 320	-20 0 +10	+90 Carter SH 320
	VG 460	-15 +5 +15	+100 Alphasyn EP 460	-15 +5 +15	+100 Renolin Unisyn CLP 460	-15 +5 +15	+105 SHC 634	-15 +5 +20	+105 Klübersynth GEM 4-460 N	-15 +5 +15	+105 Omala S4 GX 460	-15 +5 +15	+100 Carter SH 460
	VG 680	-10 +10 +25	+110 Optigear Synthetic X 680	-10 +10 +25	+110 Renolin Unisyn CLP 680	-10 +10 +25	+110 SHC 636	-10 +10 +25	+110 Klübersynth GEM 4-680 N	-10 +10 +25	+110 Omala S4 GX 680	-10 +10 +25	+110 Carter SH 680
	VG 1000					-10 +15 +30	+110 SHC 639	0 +20 +30	+110 Klübersynth EG4-1000				

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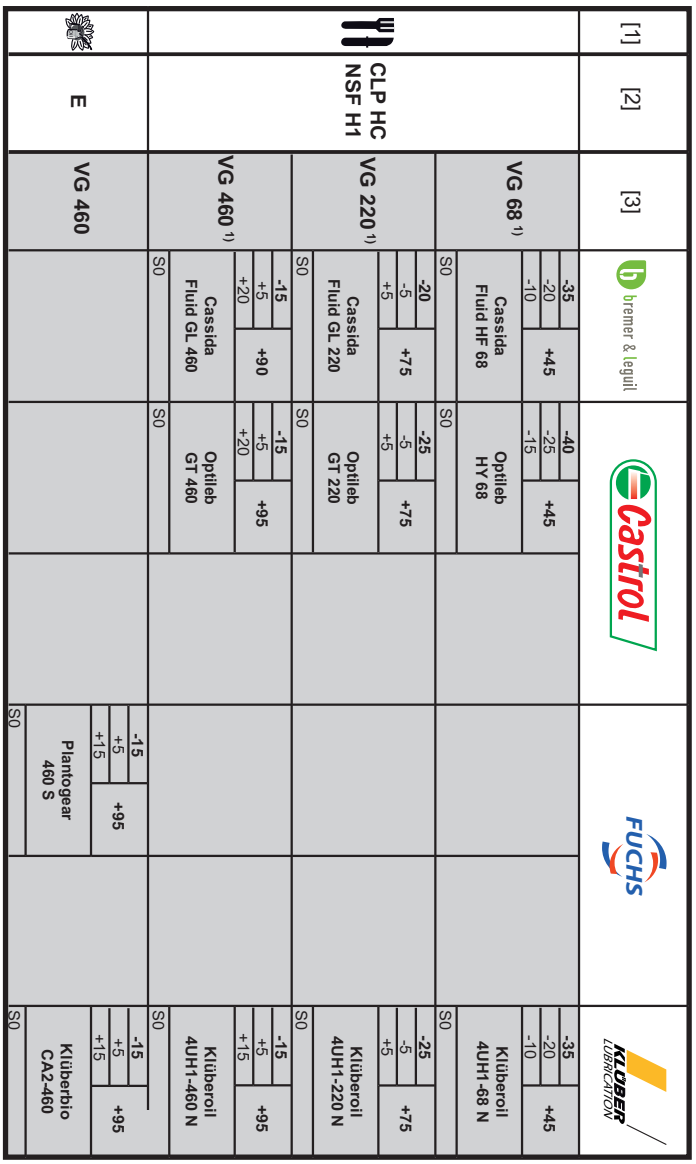

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9.6 Lubricant fill quantities

The specified lubricant fill quantities are **guide values** and apply only to the gear unit without mount-on components such as the oil supply system. The precise value varies depending on the gear ratio and the number of stages.

INFORMATION

- P-X gear units are supplied without lubricant.
- The required oil quantity depends on the mark on the oil dipstick.
- In case of pivoted mounting positions, the lubricant fill quantity on the nameplate may vary from the standard. The fill quantity specified on the nameplate is a guide value. The required oil quantity depends on the respective marks on the oil dipstick.
- For variable pivoted mounting positions adhere to the control mounting position on the additional nameplate "Oil control angle".

The following table shows the lubricant quantities for splash lubrication.

X2K..	P042		P052		P062		P072		P082		P092		P102	
i_{tot}	155-285	≥285-550	155-285	≥285-550	155-285	≥285-550	155-285	≥285-550	155-285	≥285-550	155-285	≥285-550	155-285	≥285-550
110	27	27	-	29	-	-	-	-	-	-	-	-	-	-
130	-	-	36	-	43	43	-	47	-	-	-	-	-	-
150	-	-	-	-	-	-	63	-	74	74	-	84		93
170	-	-	-	-	-	-		-	-	-	111	-	119	-

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9.7 Sealing greases/rolling bearing greases

The table shows the grease types recommended by SEW-EURODRIVE for operating temperatures from the lower limit temperature to 100 °C.

Area of operation	Manufacturer	Grease	Lower limit temperature °C
Standard	Fuchs	**Renolit CX TOM 15 OEM**[1)]	-40
	BP	Energrease LS EP-2	-30
	Castrol	Longtime PD 2	-35
		Spheerol EPL 2	-20
	Klüber	Centoplex EP 2	-25
		Petamo GHY 133 N	-40
	Mobil	Moliux EP 2	-20
	Shell	Gadus S2 V220 2	-20
	Total	Multis EP 2	-20
	Bremer & Leguil	Cassida Grease GTS2[1)]	-40
	Fuchs	**Plantogel 2**[1)]	-40

1) Grease used by the factory should be preferred.

INFORMATION

- Do not mix permitted greases from different areas of application.
- If the lubricant used is not listed in the above table, you have to make sure that it is suitable for the intended application.

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10 Malfunctions/remedy

10.1 Troubleshooting information

Read the following notes before you proceed with troubleshooting.

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Work on the gear unit only when the machine is not in use. Secure the drive unit against unintentional power-up. Attach an information sign near the ON switch to warn that the gear unit is being worked on.

⚠ WARNING

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

Serious injury.

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

NOTICE

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

Possible damage to property.

- Only qualified personnel is permitted to separate drive and motor and to carry out repair work on drives by SEW-EURODRIVE.
- Please contact the SEW-EURODRIVE Service.

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10.2 Possible malfunctions/remedy

Fault	Possible cause	Measure
Unusual noise in the area where the gear unit is mounted	• Gear unit mounting has loosened	• Tighten retaining screws and nuts to the specified torque • Replace the damaged/defective retaining screws or nuts
Operating temperature too high	• Too much oil	• Check oil level, correct if necessary
	• Oil too old	• Check when the oil was last changed; change the oil, if necessary
	• The oil is heavily contaminated	• Analyze the oil to determine the cause; take measures, if necessary; change the oil
	• Ambient temperature too high	• Protect the gear unit from external heat sources (e.g. provide shade)
Operating temperature too high	• Too much oil	• Check oil level, correct if necessary
	• Oil too old	• Check when the oil was last changed; change the oil, if necessary
	• The oil is heavily contaminated	• Analyze the oil to determine the cause; take measures, if necessary; change the oil
	• Ambient temperature too high	• Protect the gear unit from external heat sources (e.g. provide shade)
	• Gear units with fan: Air intake opening/gear unit housing contaminated	• Check air intake openings, clean them if necessary; clean the gear unit housing
	• For gear units with built-in cooling: Cooling liquid flow rate too low; cooling liquid temperature too high; deposits in cooling system	• Check the cooling liquid flow rate; check the entry temperature of the cooling liquid; clean the cooling system
	• Malfunctions of the oil/air or oil-water cooling system	• Observe the separate operating instructions for the oil-water and oil-air cooling system.
	• Malfunction in the water cooling (water cooling cover, water cooling cartridge)	• Check the cooling water throughput and the entry temperature of the cooling water, clean the cooling system
Temperature at bearing points too high	• Not enough oil	• Check oil level, correct if necessary
	• Oil too old	• Check when the oil was last changed; change the oil, if necessary
	• Bearing damaged	• Check the bearing and replace it if necessary. Contact SEW-EURODRIVE.

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Fault	Possible cause	Measure
Oil leaking • From cover plate • From inspection cover • From bearing cover • From mounting flange	• Seal not tight at: – Cover plate – Inspection cover – Bearing cover – Mounting flange	• Tighten the bolts on the respective cover. Observe the gear unit. Contact SEW-EURODRIVE if oil is still leaking
Oil leaking[1)] • From oil seal	• Too much oil • Sealing lip of the oil seal turned up • Oil seal damaged/worn	• Check oil level, correct if necessary • Vent the gear unit, observe the gear unit. Contact SEW-EURODRIVE if oil is still leaking. • Check oil seals; replace if necessary
Oil leaking • At the gear unit breather	• Too much oil • Drive not installed in proper mounting position • Frequent cold starts (oil foaming) and/or high oil level	• Check oil level, correct if necessary • Install gear unit breather correctly and adjust the oil level • Install oil expansion tank
Oil leaking • From the screw plug • From the oil drain valve	• Seal not tight • Fittings loosened	• Retighten the screw • Retighten the fitting and screw
Gear unit does not reach cold start temperature	• Thermostat set incorrectly • Oil heating defective or connected incorrectly • Heat dissipation too great due to unfavorable climatic conditions	• Check the setting of the thermostat • Check the oil heater for proper connection and function; replace if necessary • Protect the gear unit from cooling off during the warm-up phase
Operating temperature at backstop too high, no blocking function	• Damaged/defective backstop	• Check the backstop, replace it if necessary • Contact SEW-EURODRIVE
Malfunction in the oil-water or oil-air cooling system	• Malfunction of the oil-water or oil-air cooling system	• Observe the separate operating instructions for the oil-water or oil-air cooling system.

1) During the run-in phase (24-hour runtime), it is normal for (small amounts of) oil/grease to leak from the oil seal (see also DIN 3761).

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10.3 Service

Please have the following information available if you require customer service assistance:

- Complete nameplate data
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause
- A digital photograph, if possible

10.4 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately.

- Oil and grease

  Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.
- Screens
- Capacitors

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11 Declaration of conformity

EU Declaration of Conformity

SEW EURODRIVE

Translation of the original text **900770215/EN**

SEW-EURODRIVE GmbH & Co. KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal
declares under sole responsibility that the following products

Industrial gear units of the series	**X...100.. - X...320..** **P..002.. - P..102..** **P..042-X2K110 - P..102-X2K170**	
according to		
Category	**3G** **3D**	
Designation	**Ex h IIC T4 Gc or** **Ex h IIC T4 Gc X or** **Ex h IIIC T120 °C Dc or** **Ex h IIIC T120 °C Dc X**	**15)**
in accordance with		
ATEX Directive	**2014/34/EU** **(L 96, 29.03.2014, 309-356)**	
Applied harmonized standards:	**EN ISO 80079-36:2016** **EN ISO 80079-37:2016** **EN 60529:1991/A1:2000/A2:2013**	

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

Bruchsal	**01.02.2018**		
Place	Date	Johann Soder 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

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SEW EURODRIVE

EU Declaration of Conformity

SEW EURODRIVE

Translation of the original text **900760215/EN**

SEW-EURODRIVE GmbH & Co. KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal
declares under sole responsibility that the following products

industrial gear units of the series	**X...100.. - X...320.. P..002.. - P..102.. P..042-X2K110-P..102-X2K170**	
according to		
Category	**2G 2D**	
Designation	**Ex h IIC T4 Gb or Ex h IIC T4 Gb X or Ex h IIIC T120 °C Db or Ex h IIIC T120 °C Db X**	**15)**
in accordance with		
ATEX Directive	**2014/34/EU (L 96, 29.03.2014, 309-356)**	**2)**
Applied harmonized standards:	**EN ISO 80079-36:2016 EN ISO 80079-37:2016 EN 60529:1991/A1:2000/A2:2013**	

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

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

Bruchsal	**01.02.2018**	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

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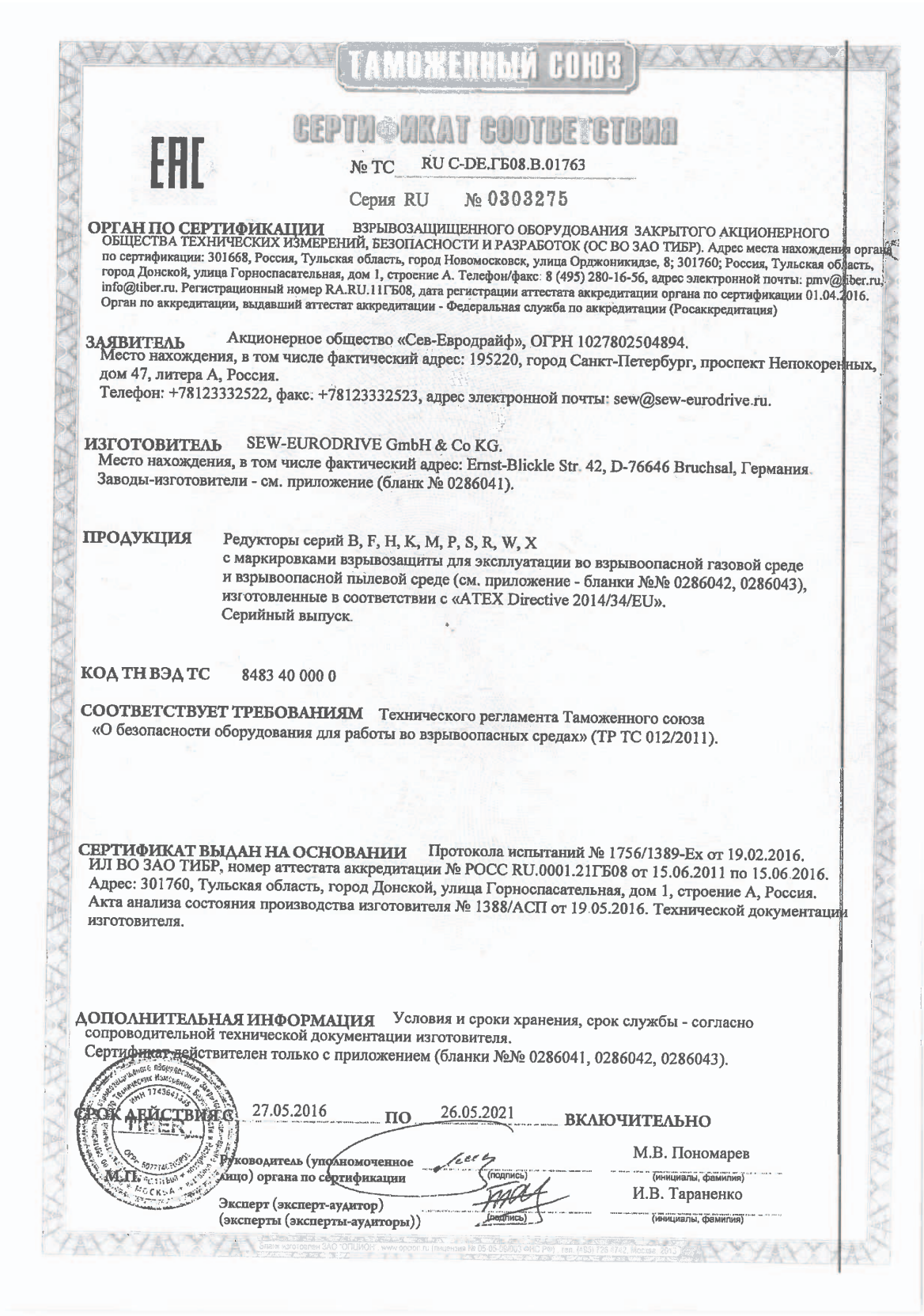
12 Ex EAC certificates



ТАМОЖЕННЫЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

EAC

№ ТС RU C-DE.ГБ08.В.01763

Серия RU № 0303275

ОРГАН ПО СЕРТИФИКАЦИИ ВЗРЫВОЗАЩИЩЕННОГО ОБОРУДОВАНИЯ ЗАКРЫТОГО АКЦИОНЕРНОГО ОБЩЕСТВА ТЕХНИЧЕСКИХ ИЗМЕРЕНИЙ, БЕЗОПАСНОСТИ И РАЗРАБОТОК (ОС ВО ЗАО ТИБР). Адрес места нахождения органа по сертификации: 301668, Россия, Тульская область, город Новомосковск, улица Орджоникидзе, 8; 301760; Россия, Тульская область, город Донской, улица Горноспасательная, дом 1, строение А. Телефон/факс: 8 (495) 280-16-56, адрес электронной почты: pmv@tiber.ru, info@tiber.ru. Регистрационный номер RA.RU.11ГБ08, дата регистрации аттестата аккредитации органа по сертификации 01.04.2016. Орган по аккредитации, выдавший аттестат аккредитации - Федеральная служба по аккредитации (Росаккредитация)

ЗАЯВИТЕЛЬ Акционерное общество «Сев-Евродрайф», ОГРН 1027802504894.
Место нахождения, в том числе фактический адрес: 195220, город Санкт-Петербург, проспект Непокоренных, дом 47, литера А, Россия.
Телефон: +78123332522, факс: +78123332523, адрес электронной почты: sew@sew-eurodrive.ru.

ИЗГОТОВИТЕЛЬ SEW-EURODRIVE GmbH & Co KG.
Место нахождения, в том числе фактический адрес: Ernst-Blickle Str. 42, D-76646 Bruchsal, Германия.
Заводы-изготовители - см. приложение (бланк № 0286041).

ПРОДУКЦИЯ Редукторы серий B, F, H, K, M, P, S, R, W, X
с маркировками взрывозащиты для эксплуатации во взрывоопасной газовой среде и взрывоопасной пылевой среде (см. приложение - бланки №№ 0286042, 0286043), изготовленные в соответствии с «ATEX Directive 2014/34/EU».
Серийный выпуск.

КОД ТН ВЭД ТС 8483 40 000 0

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ Технического регламента Таможенного союза «О безопасности оборудования для работы во взрывоопасных средах» (ТР ТС 012/2011).

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ Протокола испытаний № 1756/1389-Ех от 19.02.2016. ИЛ ВО ЗАО ТИБР, номер аттестата аккредитации № РОСС RU.0001.21ГБ08 от 15.06.2011 по 15.06.2016. Адрес: 301760, Тульская область, город Донской, улица Горноспасательная, дом 1, строение А, Россия. Акта анализа состояния производства изготовителя № 1388/АСП от 19.05.2016. Технической документации изготовителя.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Условия и сроки хранения, срок службы - согласно сопроводительной технической документации изготовителя.
Сертификат действителен только с приложением (бланки №№ 0286041, 0286042, 0286043).

СРОК ДЕЙСТВИЯ С 27.05.2016 **ПО** 26.05.2021 **ВКЛЮЧИТЕЛЬНО**

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ТАМОЖЕННЫЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

EAC

№ ТС RU C-DE.ГБ08.В.01762

Серия RU № 0303274

ОРГАН ПО СЕРТИФИКАЦИИ ВЗРЫВОЗАЩИЩЕННОГО ОБОРУДОВАНИЯ ЗАКРЫТОГО АКЦИОНЕРНОГО ОБЩЕСТВА ТЕХНИЧЕСКИХ ИЗМЕРЕНИЙ, БЕЗОПАСНОСТИ И РАЗРАБОТОК (ОС ВО ЗАО ТИБР). Адрес места нахождения органа по сертификации: 301668, Россия, Тульская область, город Новомосковск, улица Орджоникидзе, 8; 301760; Россия, Тульская область, город Донской, улица Горноспасательная, дом 1, строение А. Телефон/факс: 8 (495) 280-16-56, адрес электронной почты: pmv@tiber.ru, info@tiber.ru. Регистрационный номер RA.RU.11ГБ08, дата регистрации аттестата аккредитации органа по сертификации 01.04.2016. Орган по аккредитации, выдавший аттестат аккредитации - Федеральная служба по аккредитации (Росаккредитация)

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Заводы-изготовители - см. приложение (бланк № 0286038).

ПРОДУКЦИЯ Электродвигатели переменного тока серий D, ED, C
с маркировками взрывозащиты для эксплуатации во взрывоопасной газовой среде и взрывоопасной пылевой среде (см. приложение - бланки №№ 0286039, 0286040), изготовленные в соответствии с «ATEX Directive 2014/34/EU».
Серийный выпуск.

КОД ТН ВЭД ТС 8501 51 000 0, 8501 52 200 0, 8501 52 300 0, 8501 52 900 0

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ Технического регламента Таможенного союза «О безопасности оборудования для работы во взрывоопасных средах» (ТР ТС 012/2011).

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ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Условия и сроки хранения, срок службы - согласно сопроводительной технической документации изготовителя.
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СРОК ДЕЙСТВИЯ С 27.05.2016 **ПО** 26.05.2021 **ВКЛЮЧИТЕЛЬНО**

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Руководитель (уполномоченное лицо) органа по сертификации (подпись) М.В. Пономарев (инициалы, фамилия)

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13 Address list

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Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
Austria			
Assembly Sales Service	Vienna	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Straße 24 1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
Bangladesh			
Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
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Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue du Parc Industriel, 31 6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-IG@sew-eurodrive.be
Brazil			
Production Sales Service	São Paulo	SEW-EURODRIVE Brasil Ltda. Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49 Indaiatuba – 13347-510 – SP	Tel. +55 19 3835-8000 sew@sew.com.br
Assembly Sales Service	Rio Claro	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

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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
Chile			
Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMPA Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 http://www.sew-eurodrive.cn info@sew-eurodrive.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Taiyuan	SEW-EURODRIVE (Taiyuan) Co,. Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Colombia			
Assembly Sales Service	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 17 No. 132-18 Interior 2 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Assembly Sales Service	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
	Drive Service Hotline / 24 Hour Service	+420 800 739 739 (800 SEW SEW)	Service Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Copenhagen	SEW-EURODRIVEA/S Geminivej 28-30 2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Sales Service	Cairo	Copam Egypt for Engineering & Agencies Building 10, Block 13005, First Industrial Zone, Obour City Cairo	Tel. +202 44812673 / 79 (7 lines) Fax +202 44812685 http://www.copam-egypt.com copam@copam-egypt.com
Estonia			
Sales	Tallin	ALAS-KUUL AS Reti tee 4 75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee veiko.soots@alas-kuul.ee
Finland			
Assembly Sales Service	Hollola	SEW-EURODRIVE OY Vesimäentie 4 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
France			
Production Sales Service	Hagenau	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 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 57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW-USOCOME 1 Rue de Bruxelles 67670 Mommenheim Cedex	Tel. +33 3 88 37 48 00
Assembly Sales Service	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan – B. P. 182 33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09

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France			
	Lyon	SEW-USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 Fax +33 4 74 99 60 15
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Gabon			
Sales	Libreville	SEW-EURODRIVE SARL 183, Rue 5.033.C, Lalala à droite P.O. Box 15682 Libreville	Tel. +241 03 28 81 55 +241 06 54 81 33 http://www.sew-eurodrive.cm sew@sew-eurodrive.cm
Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de

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Germany			
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyí út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
Iceland			
Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 http://www.varmaverk.is vov@vov.is
India			
Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 http://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
Indonesia			
Sales	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com

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Indonesia			
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
Ireland			
Sales Service	Dublin	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alperton.ie info@alperton.ie
Israel			
Sales	Tel Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
Italy			
Assembly Sales Service	Milan	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 20020 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 21 21 81 05 Fax +225 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp hamamatsu@sew-eurodrive.co.jp
Kazakhstan			
Sales	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn
Kenya			
Sales	Nairobi	SEW-EURODRIVE Pty Ltd Transnational Plaza, 5th Floor Mama Ngina Street P.O. Box 8998-00100 Nairobi	Tel. +254 791 398840 http://www.sew-eurodrive.co.tz info@sew.co.tz
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com

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Lebanon			
Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Sales (Jordan, Kuwait , Saudi Arabia, Syria)	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
representation: Belgium			
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexiko			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service	Bouskoura	SEW-EURODRIVE Morocco Parc Industriel CFCIM, Lot 55 and 59 Bouskoura	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl

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New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd Plot 296A, Adeyemo Akapo Str. Omole GRA Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com bolaji.adekunle@greenpegltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» а. я. 36 195220 Санкт-Петербург	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

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Sambia			
representation: South Africa			
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybničná 40 831 06 Bratislava	Tel.+421 2 33595 202, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 Mobile +421 907 671 976 sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE KOREA CO., LTD. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com

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South Korea			
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Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd 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 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn
Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

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United Arab Emirates			
Sales Service	Dubai	SEW-EURODRIVE FZE PO Box 263835 Office No. S3A1SR03 Jebel Ali Free Zone – South, Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 http://www.sew-eurodrive.ae info@sew-eurodrive.ae
Ukraine			
Assembly Sales Service	Dnipropetrovsk	ООО «СЕВ-Евродрайв» ул. Рабочая, 23-В, офис 409 49008 Днепр	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
Uruguay			
Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
USA			
Production Assembly Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385	Tel. +1 864 439-7537 Fax +1 864 661 1167 IGOrders@seweurodrive.com
	Additional addresses for service provided on request!		
Vietnam			
Sales	Ho Chi Minh City	Nam Trung Co., Ltd Huế - South Vietnam / Construction Materials 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 khanh-nguyen@namtrung.com.vn http://www.namtrung.com.vn
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn

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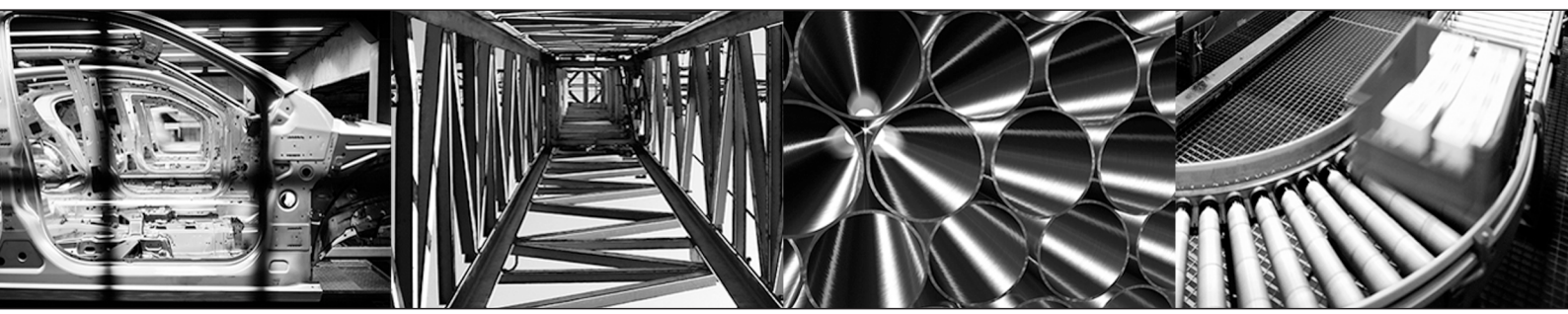

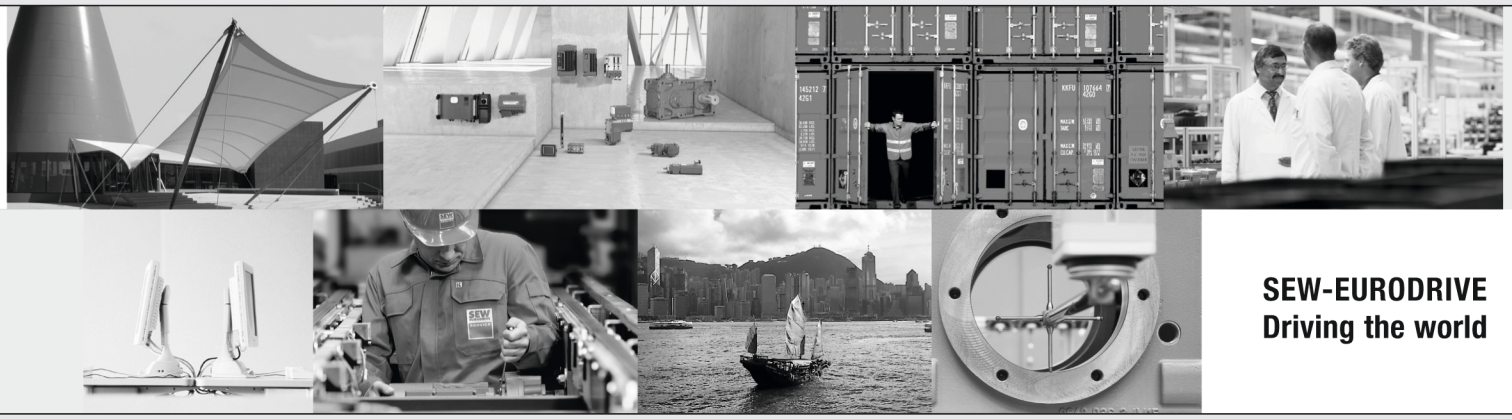

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