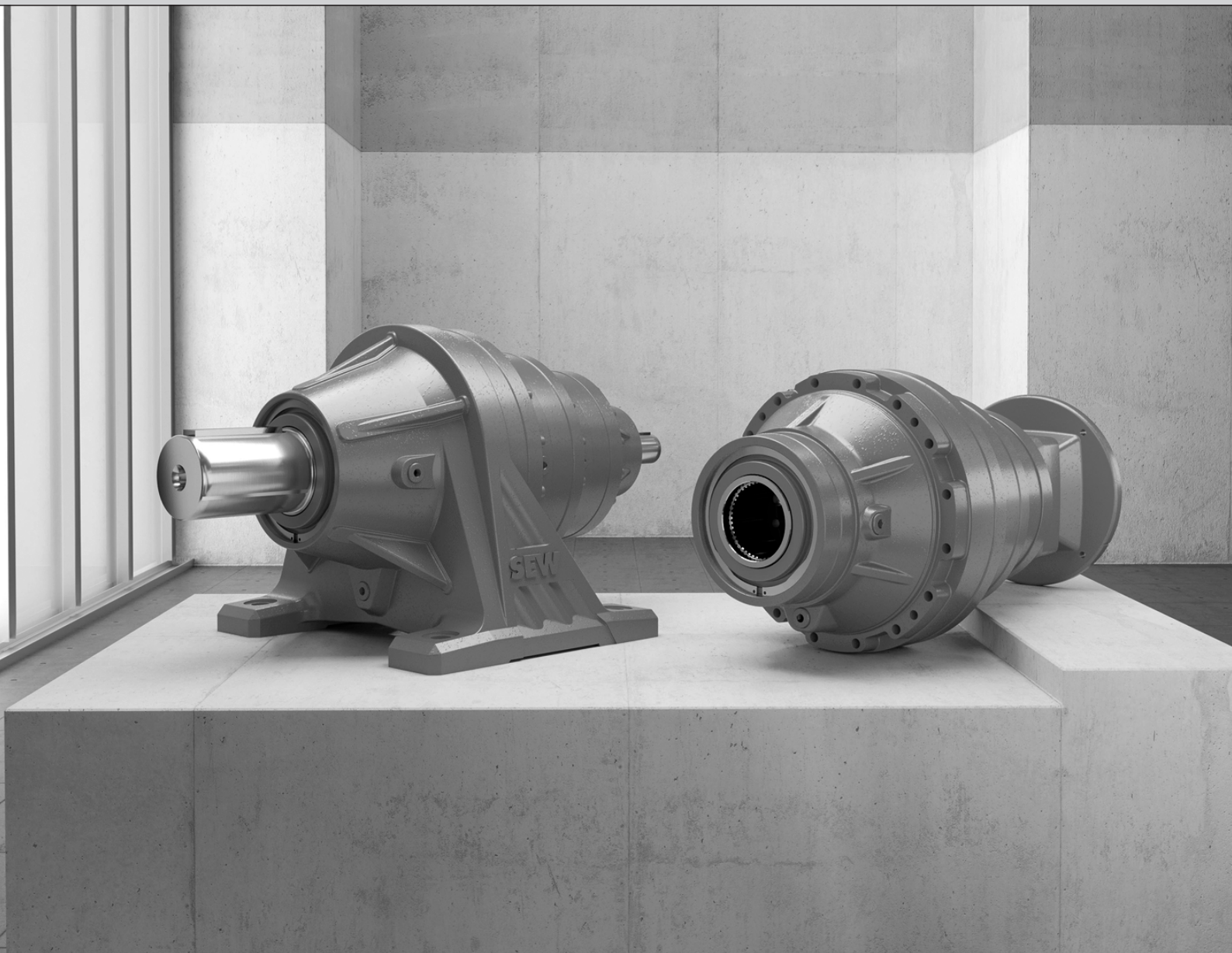




SEW
EURODRIVE

Assembly and Operating Instructions



Industrial Gear Units
PPK.. Series Planetary Gear Units



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1 General information

1.1 About this documentation

The documentation at hand is the original.

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

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

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

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

Signal word	Meaning	Consequences if disregarded
▲ DANGER	Imminent hazard	Severe or fatal injuries
▲ WARNING	Possible dangerous situation	Severe or fatal injuries
▲ CAUTION	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment
INFORMATION	Useful information or tip: Simplifies handling of the product.	

1.2.2 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.

Meaning of the hazard symbols

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

Hazard symbol	Meaning
	General hazard

Hazard symbol	Meaning
	Warning of hot surfaces
	Warning about 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 Decimal separator in numerical values

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

Example: 30.5 kg

1.5 Product names and trademarks

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

1.6 Copyright notice

© 2020 SEW-EURODRIVE. All rights reserved. Unauthorized reproduction, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

2 Safety notes

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components, also observe the relevant warning and safety notes.

2.2 Duties of the user

As the user, you must ensure that the basic safety notes are observed and complied with. Make sure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it.

As the user, you must ensure that all of the work listed in the following is carried out only by qualified specialists:

- Setup and installation
- Installation and connection
- Startup
- Maintenance and repairs
- Shutdown
- Disassembly

Ensure that the persons who work on the product pay attention to the following regulations, conditions, documentation, and information:

- National and regional safety and accident prevention regulations
- Warning and safety signs on the product
- All other relevant project planning documents, installation and startup instructions, and wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and conditions

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

2.3 Target group

Specialist for mechanical work

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

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

Specialist for electrotechnical work	<p>Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product who possess the following qualifications:</p> <ul style="list-style-type: none"> • Qualification in the electrotechnical area in accordance with the national regulations • Familiarity with this documentation
Additional qualification	<p>In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation.</p> <p>The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.</p>
Instructed persons	<p>All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the instruction is to give persons the ability to perform the required tasks and work steps in a safe and correct manner.</p>

2.4 Designated use

The industrial gear units are gear units run by motors for industrial and commercial systems. The units may only be run at the speeds and powers shown in the technical data or on the nameplate. Implementing gear unit loads other than the permitted values or operating the gear units in areas of application other than industrial and commercial systems is only permitted after consultation with SEW-EURODRIVE.

Using these products in potentially explosive atmospheres is prohibited, unless specifically designated otherwise.

In compliance with the EC Machinery Directive 2006/42/EC, the industrial gear units are partly completed machinery 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.

2.5 Other applicable documentation

Note also the following documentation:

- Order documents, e.g. dimension sheet, order confirmation, etc.
- Product brochure
- If required, the "AC Motors" operating instructions
- If required, the operating instructions of the options installed

2.6 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 magnetic oil dipstick .
	Indicates the magnetic oil drain plug .
	For pivoted mounting positions, this symbol on the information sign indicates the mounting position of the gear unit for checking the oil .
	Indicates the air outlet screw .
	Caution: Risk of burns due to hot surface.
	Caution: Removing the dipstick during operation may result in damage to the gear unit.











Safety symbol	Meaning
	Caution: Risk of burns due to hot gear oil.

Meaning													
<p align="center">The gear unit is protected against corrosion with VCI.</p>													
 <p>18977421</p>	<table border="1"> <thead> <tr> <th>VORSICHT</th> <th>NOTICE</th> <th>ATTENTION</th> <th>PRECAUCIÓN</th> <th>VOORZICHTIG</th> <th>OSTROŻNIE</th> </tr> </thead> <tbody> <tr> <td> (DE) Getriebe ist mit VCI rostgeschützt. Nicht öffnen! Mögliche Sachschäden! • Vor der Inbetriebnahme Vorarbeiten gemäß Betriebsanleitung durchführen. • Keine offene Flamme! </td> <td> (EN) Gear unit with VCI corrosion protection. Do not open! Potential damage to property! • Prior to startup, perform preliminary work according to operating instructions • No open flames! </td> </tr> <tr> <td> (F) Réducteur protégé contre la corrosion avec VCI. Ne pas ouvrir Risque de dommages matériels ! • Avant la mise en service, réaliser les travaux préliminaires indiqués dans la notice d'exploitation. • Pas de flammes ouvertes ! </td> <td> (ES) Reductor está protegido con VCI contra la corrosión. ¡No abrir! ¡Posibles daños materiales! • Antes de la puesta en marcha, efectuar los trabajos preparatorios según las instrucciones de funcionamiento. • No debe haber fuego abierto. </td> </tr> <tr> <td> (NL) Tandwielkast is met VCI tegen corrosie beschermd. Niet openen! Mogelijke materiële schade! • Vóór de inbedrijfstelling voorbereidingen conform technische handleiding uitvoeren. • Geen open vuur! </td> <td> (PL) Przekładnia zabezpieczona jest przed korozją za pomocą środka VCI. Nie otwierać! Możliwe szkody materialne! • Przed uruchomieniem należy przeprowadzić czynności przygotowawcze zgodnie z informacjami zawartymi w instrukcji obsługi! • Unikać otwartych płomieni! </td> </tr> </tbody> </table>	VORSICHT	NOTICE	ATTENTION	PRECAUCIÓN	VOORZICHTIG	OSTROŻNIE	(DE) Getriebe ist mit VCI rostgeschützt. Nicht öffnen! Mögliche Sachschäden! • Vor der Inbetriebnahme Vorarbeiten gemäß Betriebsanleitung durchführen. • Keine offene Flamme!	(EN) Gear unit with VCI corrosion protection. Do not open! Potential damage to property! • Prior to startup, perform preliminary work according to operating instructions • No open flames!	(F) Réducteur protégé contre la corrosion avec VCI. Ne pas ouvrir Risque de dommages matériels ! • Avant la mise en service, réaliser les travaux préliminaires indiqués dans la notice d'exploitation. • Pas de flammes ouvertes !	(ES) Reductor está protegido con VCI contra la corrosión. ¡No abrir! ¡Posibles daños materiales! • Antes de la puesta en marcha, efectuar los trabajos preparatorios según las instrucciones de funcionamiento. • No debe haber fuego abierto.	(NL) Tandwielkast is met VCI tegen corrosie beschermd. Niet openen! Mogelijke materiële schade! • Vóór de inbedrijfstelling voorbereidingen conform technische handleiding uitvoeren. • Geen open vuur!	(PL) Przekładnia zabezpieczona jest przed korozją za pomocą środka VCI. Nie otwierać! Możliwe szkody materialne! • Przed uruchomieniem należy przeprowadzić czynności przygotowawcze zgodnie z informacjami zawartymi w instrukcji obsługi! • Unikać otwartych płomieni!
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<p align="right">9007204570575499</p>													

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

2.7 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 sight glass .
	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.

2.8 Transport

2.8.1 General information

Observe the following notes during transport.



⚠ 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).



⚠ 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

Risk of slipping due to lubricant leaking from damaged seals.

Minor injuries.

- Check the gear unit and mount-on components for leaking lubricant.

NOTICE

Improper transport may cause damage to the gear unit.

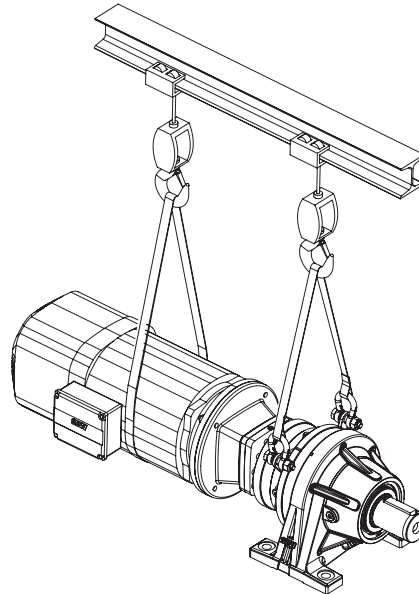
Possible damage to property.

- Observe the following information.
- Inspect the shipment for any possible transport damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. In the event of damage, do not start up the unit.
- The weight of the gear unit is indicated on the nameplate or dimension sheet. Observe the loads and specifications given on the nameplate.
- If necessary, use suitable, sufficiently dimensioned handling equipment.
- The gear unit must be transported in a manner that prevents damage to the gear unit and to attached components. For example, impacts against exposed shaft ends can damage the gear unit.
- Use only the provided attachment points to transport the gear unit. The load suspensions of the motor or attached components are provided for stabilization purposes only.

- Planetary gear units and planetary gearmotors are suspended from the transport points marked in the figures below.
- Prior to startup, remove the securing devices used for transportation.

Foot-mounted planetary gear unit

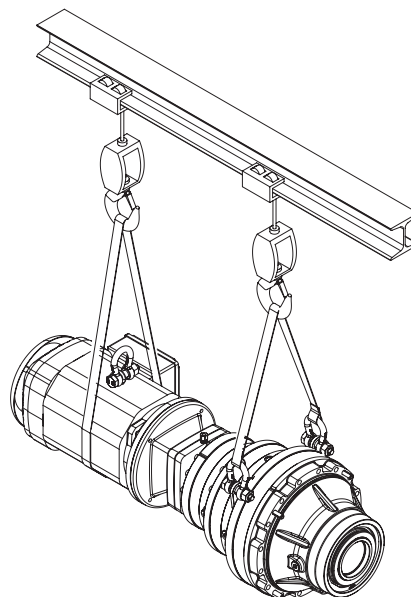
The following figure shows an example of how to transport a foot-mounted planetary gear unit.



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Flange-mounted helical planetary gearmotor

The following figure shows an example of how to transport a flange-mounted planetary gear unit.




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2.9 Storage and transport conditions

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

2.9.1 Internal conservation

The gear unit is filled with oil at the factory. The oil filling protects the gear unit against corrosion for a limited period of time. For storage periods longer than 9 months, SEW-EURODRIVE recommends the "extended storage" gear unit type. For further information, refer chapter "Extended storage" (→  15).

2.9.2 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.

2.9.3 Packaging

Standard packaging

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

2.9.4 Extended storage

INFORMATION



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

INFORMATION



The gear units must remain tightly sealed until taken into operation to prevent the VCI corrosion protection agent from evaporating.

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

- The lubricant is mixed with a VCI anti-corrosion agent (volatile corrosion inhibitors).

Bear in mind that this VCI anti-corrosion agent is only effective in a temperature range from -25 °C to +50 °C.

- The flange contact surfaces and shaft ends are also treated with an anti-corrosion agent.

If a gear unit is ordered to be delivered without oil fill, the inside of the gear unit housing is filled with a vapor-phase inhibitor. The breather is installed but has not been activated yet. In this case, you must remove the transportation protection from the breather. This will activate the breather (see chapter "Activating the breather valve" (→ 34)).

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

Storage conditions

Climate zone	Packaging ¹⁾	Storage ²⁾	Storage duration
Temperate (Europe, USA, Canada, China and Russia, ex- cluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap.	Under roof, protected against rain and snow, no shock loads.	Up to 3 years with regular checks on the packaging and moisture in- dicator (relative atmospheric hu- midity < 50%).
	Open	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No ag- gressive vapors, no shocks.	2 years or more with regular in- spections. Check for cleanness and mechanical damage during the inspection. Check corrosion protection.

Climate zone	Packaging ¹⁾	Storage ²⁾	Storage duration
Tropical (Asia, Africa, Central and South America, Australia, New Zealand and excluding temperate zones)	<p>Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap.</p> <p>Protected against insect damage and mildew by chemical treatment.</p>	Under roof, protected against rain and shocks.	Up to 3 years with regular checks on the packaging and moisture indicator (relative atmospheric humidity < 50%).
	Open	<p>Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, relative humidity < 50%).</p> <p>No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No aggressive vapors, no shocks. Protected against insect damage.</p>	2 years or more with regular inspections. Check for cleanness and mechanical damage during the inspection. Check corrosion protection.

1) The packaging must be carried out by an experienced company using the packaging materials that have been explicitly specified for the particular application.

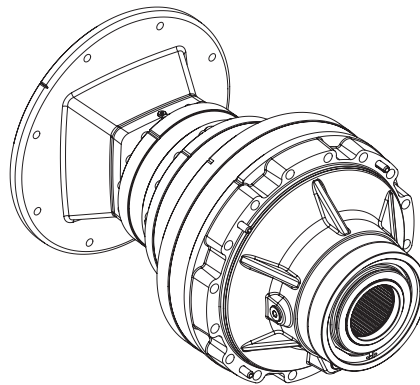
2) SEW-EURODRIVE recommends to store the gear units according to the mounting position.

3 Gear unit structure

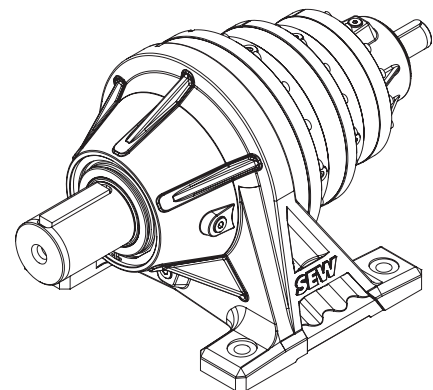
3.1 Gear unit designs

PPK gear units are available with the following mounting types:

- Flange-mounting [PPK.. /F]
- Foot-mounting [PPK.. /B]
- Shaft-mounted gear unit with torque arm [PPK.. /T]

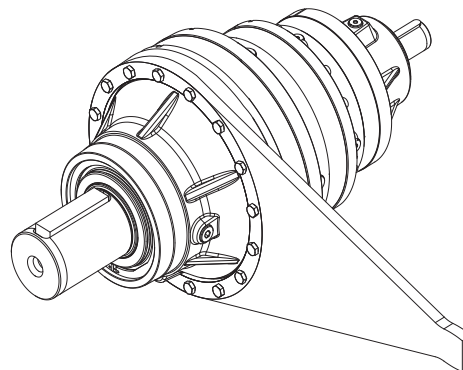


PPK.. /F



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PPK.. /B



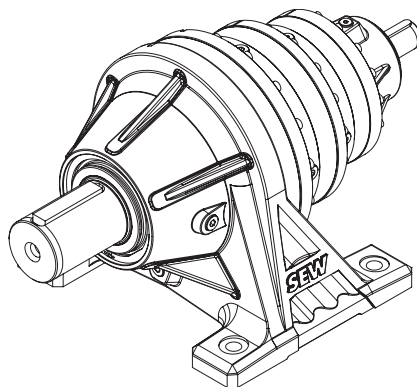
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PPK.. /T

3.2 Output shaft variants

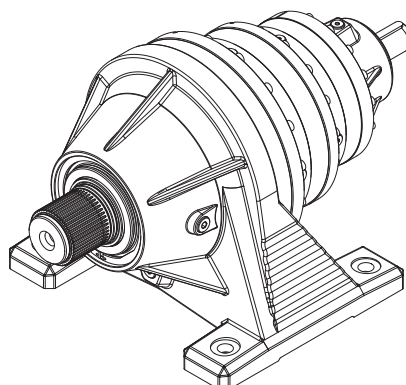
The output shaft [LSS] of the planetary gear unit can have the following design as standard:

3.2.1 PPK.. solid shaft with key



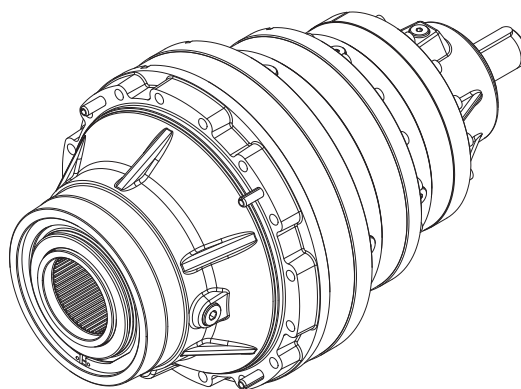
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3.2.2 PPK.. splined solid shaft



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3.2.3 PPK.. splined hollow shaft

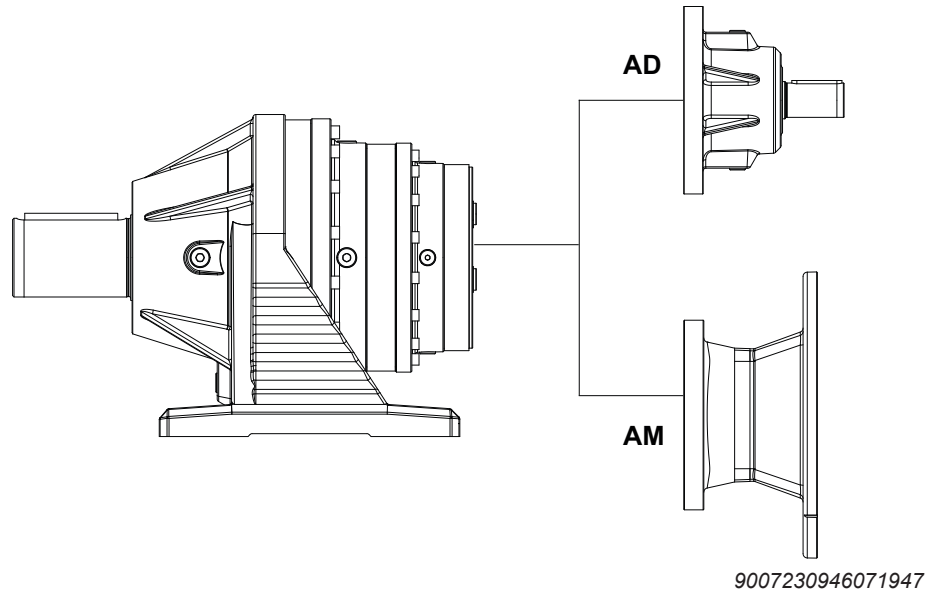


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3.3 Input end designs


The following input end designs are available:

- Input shaft assembly /AD
- Motor adapter /AM




3.4 Nameplate

The following example shows the structure of the nameplate.

SEW-EURODRIVE		
76646 Bruchsal/Germany		
[1]	PPK3PS010/F	
[2]	01.7715943905.0001.20	
		i 109,3
PK1 kW	3,29	F _s 4,99
MK2 Nm	2222	PM kW 4.0
n1 rpm	1464	T _a °C 0...30
n2 rpm	13,4	2859 197 6 PT
IM M1		
Made in Germany		
	Mass kg 136	Year 2020
	CLP 320 Miner. Oil	~ 4.0 l

9007230824733195

[1]		Type designation
[2]		Serial number
PK1	kW	Operating power on the input shaft (HSS)
MK2	Nm	Gear unit output torque
n1	r/min	Input speed (HSS)
n2	r/min	Output speed (LSS)
i		Exact gear unit ratio
F _s		Service factor
PM	kW	Nominal motor power
T _A	°C	Deviation from standard temperature range (-20 °C to +40 °C)
IM		Mounting position
Mass	kg	Gear unit weight
		Oil grade and viscosity class/oil quantity
Year		Year of manufacture

3.5 Type designation

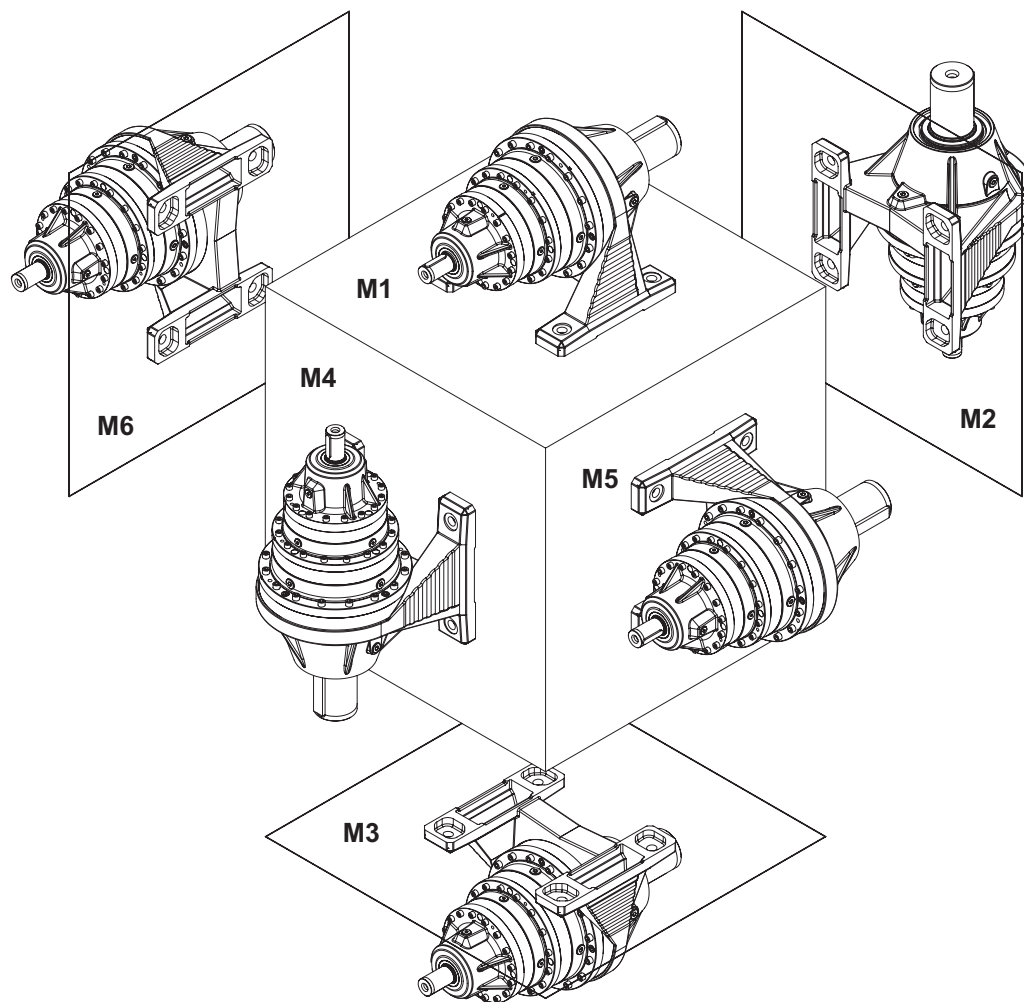
The following example shows the structure of the type designation:

PPK3PS017/B/AD	
PPK	Industrial gear unit of the PPK series
3	Number of gear unit stages <ul style="list-style-type: none"> • 1 – 3
P	Gear unit type <ul style="list-style-type: none"> • P = Coaxial planetary gear unit
S	Type of output shaft <ul style="list-style-type: none"> • S = Solid shaft with key • L = Splined solid shaft • V = Splined hollow shaft
017	Size <ul style="list-style-type: none"> • 010 – 017
/B	Gear unit mounting <ul style="list-style-type: none"> • /B = Foot mounting • /F = Flange mounting • /T = Torque arm
/AD	Mounting to the input shaft <ul style="list-style-type: none"> • /AD = Input shaft assembly • /AM = Adapter for mounting IEC motors

3.6 Mounting position

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

With mounting position M2/M4 an oil expansion tank is required. See chapter "Oil expansion tank" (→ 24).



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3.7 Torque arm

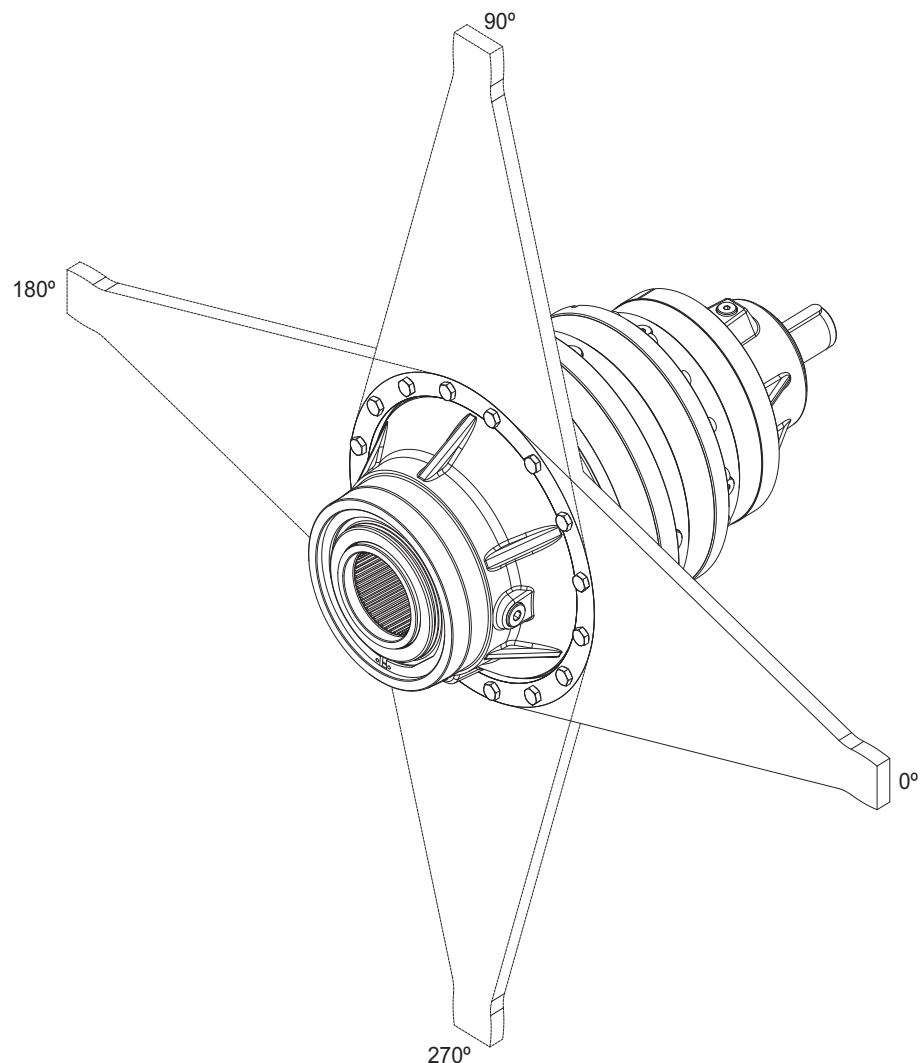
An optional torque arm is available to support the reaction torque of solid and hollow shaft gear units in the shaft-mounted version.

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

3.7.1 Single torque arm

The torque arm is enclosed in the delivery or can already 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 single torque arm.



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3.8 Oil expansion tank

The oil expansion tank is designed to compensate for oil volume variations in the system caused by temperature fluctuations. When the gear unit temperature increases, the oil expansion tank absorbs some of the increasing oil volume and feeds it back to the gear unit as the temperature goes down, which means the gear unit is always completely filled with oil.

Based on the oil level specified by SEW-EURODRIVE, the oil expansion tank is designed to compensate the oil volume change within the permitted operating temperature range. A temperature decrease below the permitted temperature range causes the oil expansion tank to be completely emptied and air being sucked into the gear unit. This might result in insufficient lubrication and a malfunction of the gear unit. An increase above the permitted temperature range causes an overfilling of the expansion tank and oil might leak from the gear unit. During operation, any oil level above the level specified by SEW-EURODRIVE is permitted as long as there is oil in the expansion tank and the oil expansion tank does not overflow. During operation, the oil level must not be below the min. marking on the oil dipstick.

If there is little space available for installing the oil expansion tank (mounting position M2 or M4), you can request an order-specific dimension drawing from SEW-EURODRIVE.

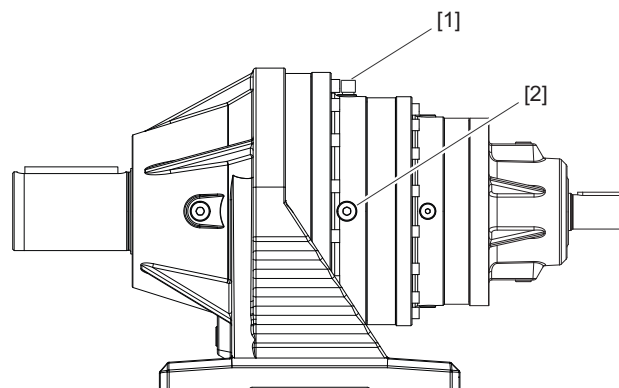
Fill in oil via the breather plug at the oil expansion tank.

3.9 Types of lubrication

Depending on the mounting position of the planetary gear unit, two different standard lubrication variants are possible.

3.9.1 Splash lubrication for horizontal mounting positions: M1/M3/M5/M6

The gear unit is half filled with oil. Gearing and bearing parts that are not immersed in the oil bath are lubricated by splashing oil. The oil level is checked at the oil sight glass [2] on the housing gear rim. Oil is filled into the gear unit through the bore in which the breather [1] is installed. The breather [1] must be removed before you fill in oil.



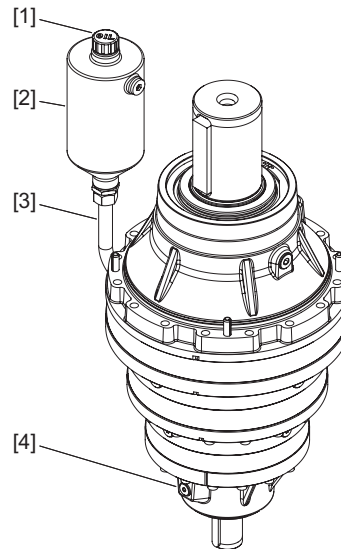
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3.9.2 Bath lubrication for vertical mounting positions: M2/M4

Standard lubrication type with oil expansion tank. The gear unit is (nearly completely) filled with oil. All tooth engagement or bearing points are immersed in the oil bath completely or partly.

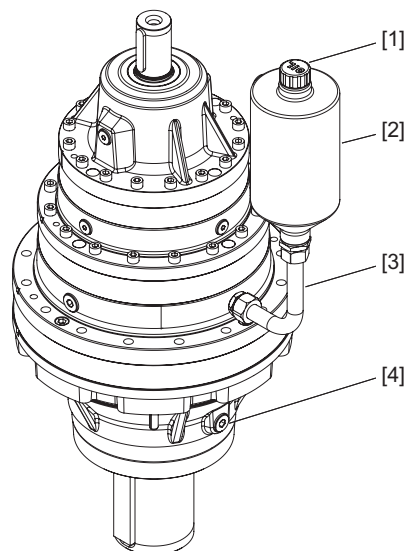
Mounting position M2



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- | | |
|------------------------|--------------------|
| [1] Breather | [3] Riser pipe |
| [2] Oil expansion tank | [4] Oil drain plug |

Mounting position M4



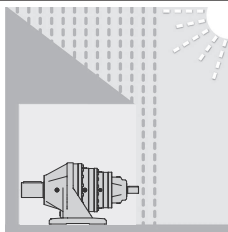
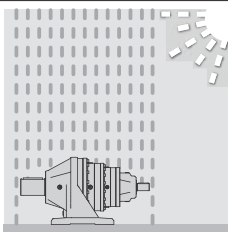
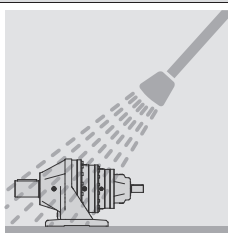
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- | | |
|------------------------|--------------------|
| [1] Breather | [3] Riser pipe |
| [2] Oil expansion tank | [4] Oil drain plug |

3.10 Coating and surface protection systems

The following description provides an overview of the coating and surface protection system.

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	<ul style="list-style-type: none"> • Systems in saw mills • Agitators and mixers
Condensation test ISO 6270	120 hours
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	<ul style="list-style-type: none"> • Applications in gravel plants • Cable cars
Condensation test ISO 6270	120 hours
Salt spray test ISO 7253	240 hours
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	<ul style="list-style-type: none"> • Port cranes • Sewage treatment plants • Mining applications
Condensation test ISO 6270	240 hours
Salt spray test ISO 7253	480 hours

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.

3.11 Sealing systems

3.11.1 Input shaft

Standard
Single oil seal, inside sealing with dust protection lip
Normal environment

3.11.2 Output shaft

Standard
Single oil seal, inside sealing with dust protection lip
Normal environment

4 Installation/assembly

4.1 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, such as NOCO® fluid from SEW-EURODRIVE → except for hollow shaft gear units with shrink disk
- For hollow-shaft gear units → aids for mounting onto/removal from the machine shaft
- Fastening parts for the gear unit base

4.2 Tolerances

Observe the following tolerances.

4.2.1 PPK.. planetary gear units

Shaft ends

Diameter tolerance according to DIN 748:

Ø	≤ 50 mm	→ ISO k6
Ø	> 50 mm	→ ISO m6

Center bores:

Ø	60 mm – 110 mm	→ M24 – for solid shaft with key
		→ M10 – for solid shaft with DIN 5480 splining, in the example additional 3 threads M10/M14 for mounting the gear unit

Mounting flange

Centering shoulder tolerance: ISO f7

4.3 Important information

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

An operator machine that is not appropriately secured can fall down 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, make sure that there are no active torsional moments present (tensions within the system).



⚠ WARNING

Danger due to installing impermissible components.
Severe or fatal injuries.

- Do not mount any impermissible components to the gear unit.
- Mounting impermissible components may lead to material failure at the gear unit. This may cause the gear unit to fall over or down.



⚠ 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.



⚠ 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.



⚠ 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.

- 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.
- Note that the oil quantities on the nameplates are approximate values. The marks on the oil sight glass or oil dipstick are decisive for determining the correct oil quantity.
- Do not change the mounting position without prior consultation with SEW-EURODRIVE. The warranty will become void without prior consultation. An oil expansion tank and/or an oil riser pipe are required if you change to a vertical mounting position. Adjust the lubricant fill quantities and the position of the breather accordingly.
- The oil level plug and the oil drain plug as well as the breather must be freely accessible.
- Use plastic inserts (2 to 3 mm thick) 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 high-grade steel). Also fit the bolts with plastic washers. Always ground the gear unit housing.
- Only authorized personnel may 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 parts and bearings.
- Units installed outdoors must be protected from the sun. Suitable protection devices are required, such as covers or roofs. When using protective devices, avoid 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 units are delivered with the ordered painting. Repair any damage to the paint work (e.g. on the breather).
- Do not modify the gear unit or mount-on components without prior consultation of SEW-EURODRIVE.
- Observe the safety notes in the individual chapters.

4.4 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.
- The ambient temperature matches the information in the order documents.
- 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 standard solvent. Do not let the solvent come into contact with the sealing lips of the oil seals.
-

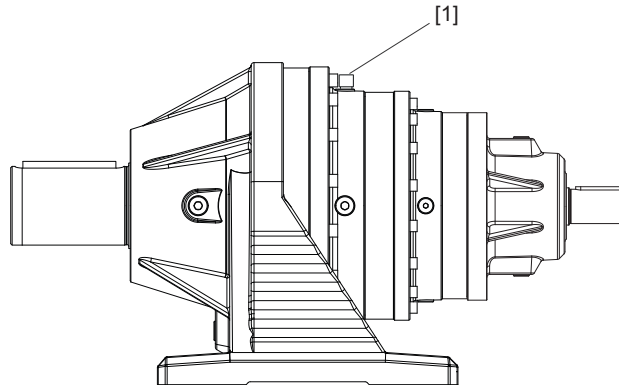
4.4.1 Extended storage

Observe the following: 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).

4.4.2 Gear units delivered with oil fill (standard)

In the standard design, the gear unit is filled with oil at the factory. The breather is installed according to the mounting position.

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



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1. Check whether the breather [1] is activated. For further information, refer to chapter "Gear unit venting" (→ 34).
2. Activate the breather [1], if necessary.
3. Check the oil level. Observe chapter "Checking the oil level" (→ 61).

4.4.3 Planetary gear units delivered without oil fill (optional)

Observe the notes in chapter "Important information" (→ 29).

Planetary gear units can optionally be delivered without oil fill.

NOTICE

Improper oil filling may cause damage to the gear unit.

Possible damage to property.

- Observe the following information.

- Fill in the oil when the gear unit is in the intended mounting position.
- Make sure the oil is at the ambient temperature when filling it into the gear unit.
- Observe the additional notes depending on the lubrication type in the following chapters.
- Fill the gear unit with the oil grade and oil quantity specified on the nameplate. The oil quantity specified on the nameplate is an approximate quantity. The mark on the "oil sight glass or oil dipstick" (→ 61) is the decisive indicator of the correct oil level.
- Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm). For more information, refer to chapter "Changing the oil" (→ 65).

4.4.4 Gear unit venting

Dirt and dust in the environment affect the function of the breather valve. Observe the following information to prevent damages to the gear unit:

- Check the breather valve function regularly and replace it if necessary.
- In case of high dirt and dust load use a breather filter instead of a breather valve.

Gear units with installed breather valve

Depending on gear unit size and mounting position, the gear units are delivered with the activated breather valve installed according to the mounting position. If the breather valve has not been activated, yet, remove the transport protection as described in chapter "Activating the breather valve" (→ 34).

Gear units with separately included breather valve

In case of gear units with separately included breather valve, install and activate the breather valve before startup.

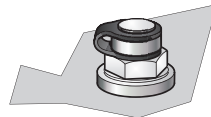
Replace the screw plug with the provided breather valve before startup.

Gear units with oil expansion tank

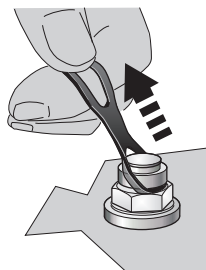
Gear units with expansion tank, and with ventilation filter are delivered without a breather valve. The ventilation filter is operational, activating the filter is not necessary.

Activating the breather valve

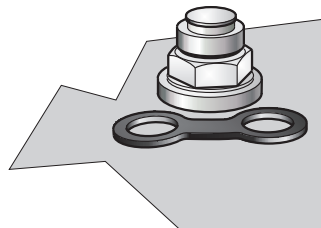
1. Before startup, check whether the transport protection on the breather valve has been removed and the valve is therefore activated. The following figure shows a breather valve with transport protection:



2. Remove the transport protection.



⇒ The following figure shows an activated breather valve:



4.5 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 tightening the retaining screws. Unevenness must be leveled out appropriately.
- Observe the weight specified on the nameplate.

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.

Tighten retaining screws or nuts to the specified torque. Use the screws and tightening torques specified in chapter Gear unit mounting.

4.5.1 Foot-mounted gear units

The following table shows the thread sizes and the tightening torques for mounting the individual gear unit sizes.

Size	Screw/nut	Tightening torque screw/nut Strength class 8.8	Amount
		Nm	
PPK.010	M24	710	4
PPK.017			

INFORMATION



Do not lubricate the screw connections during installation.

4.5.2 Tightening torques for retaining screws

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

INFORMATION



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

Screw/nut	Tightening torque
	Strength class 8.8 Nm
M5	6.5
M6	11
M8	27
M10	54
M12	93

INFORMATION



Do not lubricate the bolts connection during assembly.

4.5.3 Aligning the shaft axis



▲ WARNING

Shafts can break if the shaft axis is not aligned accurately.

Severe or fatal injuries.

- Refer to the separate operating instructions regarding the requirements of the coupling.

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, you should also consult the special operating instructions regarding the requirements of the couplings, for example.

4.6 Gear unit with solid shaft

4.6.1 Assembling the input and output components

NOTICE

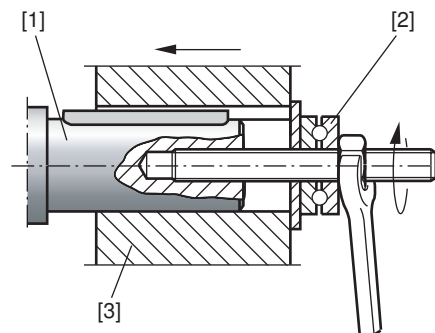
Bearings, housing or shaft may be damaged due to improper assembly.

Possible damage to property.

- Always use a mounting device for installing input and output elements. Use the threaded centering bore on the shaft end for positioning.
- Never force belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer. This may damage the bearing, the housing and the shaft.
- If belt pulleys are used, make sure that the belt is tensioned correctly in accordance with the manufacturer's instructions.

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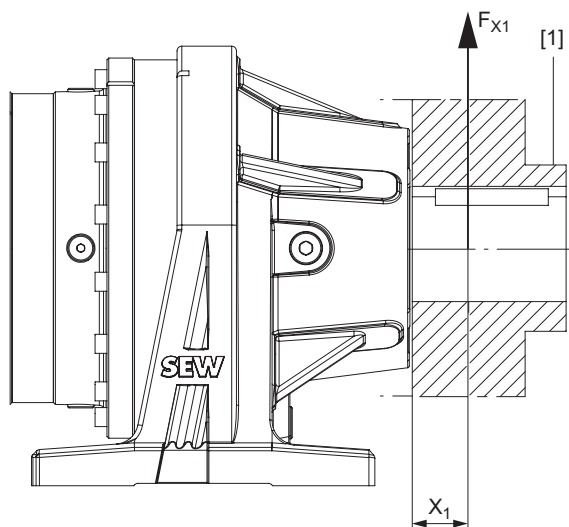
- [1] Gear unit shaft end
- [2] Thrust bearing
- [3] Coupling hub

4 Installation/assembly

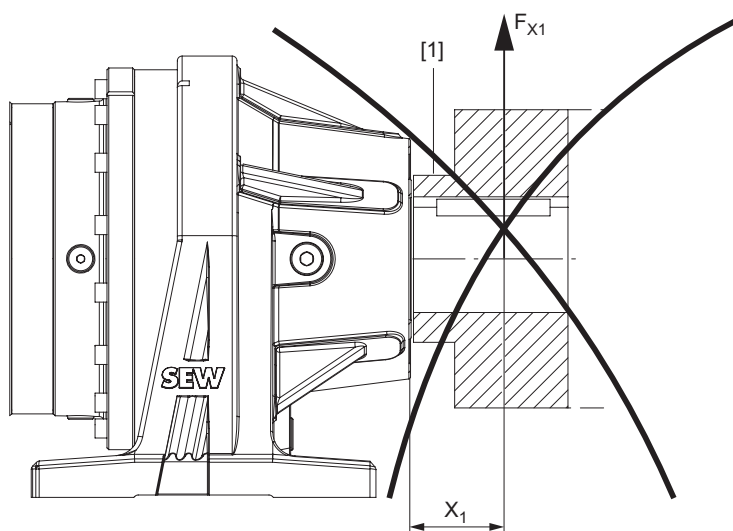
Gear unit with solid shaft

Avoid excessive overhung loads

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



[A]



[B]

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- [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).

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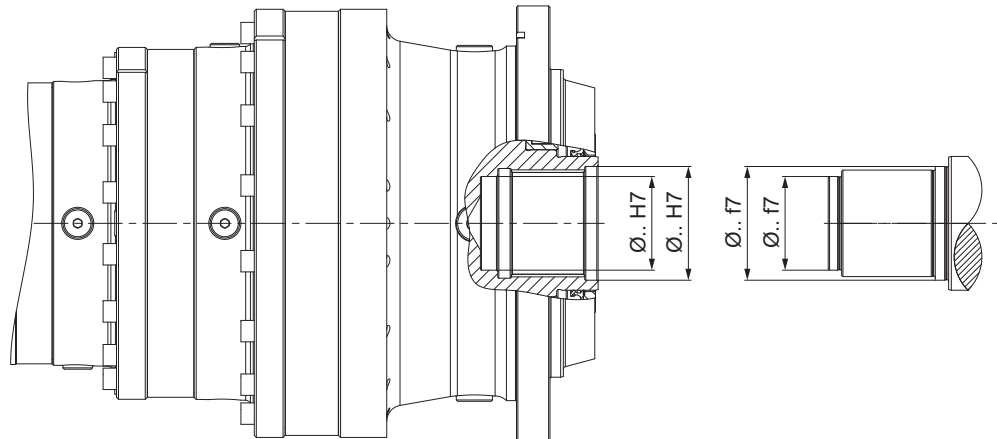
4.7 Gear unit with splining

4.7.1 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.

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 two 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.

4.7.2 Mounting the gear unit onto the machine shaft

INFORMATION

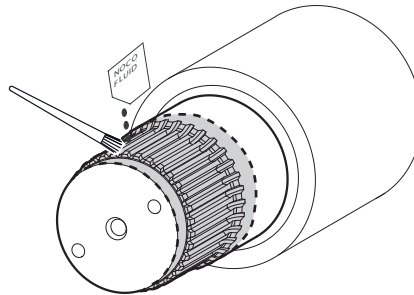


Make sure the dimensions of the machine shaft correspond to SEW-EURODRIVE specifications → refer to the dimension sheet in your order documents.

Output shaft as a splined hollow shaft /..V

Observe the notes in chapter "Important information" (→ 29).

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



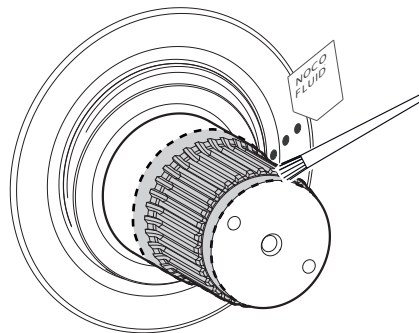
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2. Push the gear unit onto the machine shaft. The splining of the gear shaft must mesh with the splining of the machine shaft.
3. Make sure that the customer shaft is at the correct position in axial direction.

Output shaft as a splined solid shaft /..L

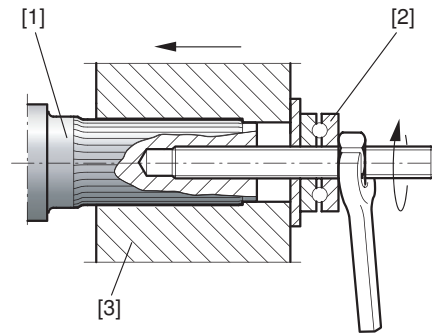
Observe the notes in chapter "Important information" (→ 29).

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.

4.7.3 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.

4.8 Coupling

4.8.1 Mounting tolerances

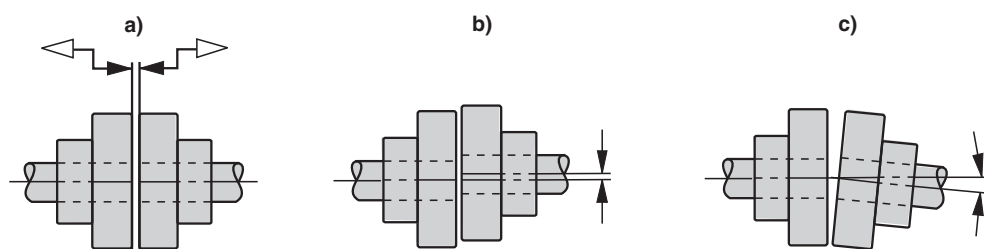
INFORMATION



Observe the operating instructions of the respective coupling manufacturer.

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

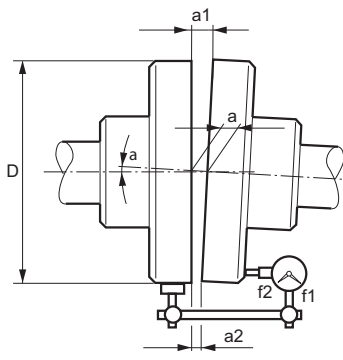
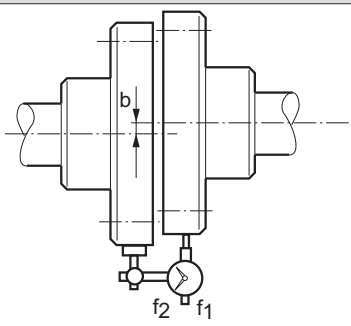
- a) Axial misalignment
- b) Radial misalignment
- c) Angular misalignment



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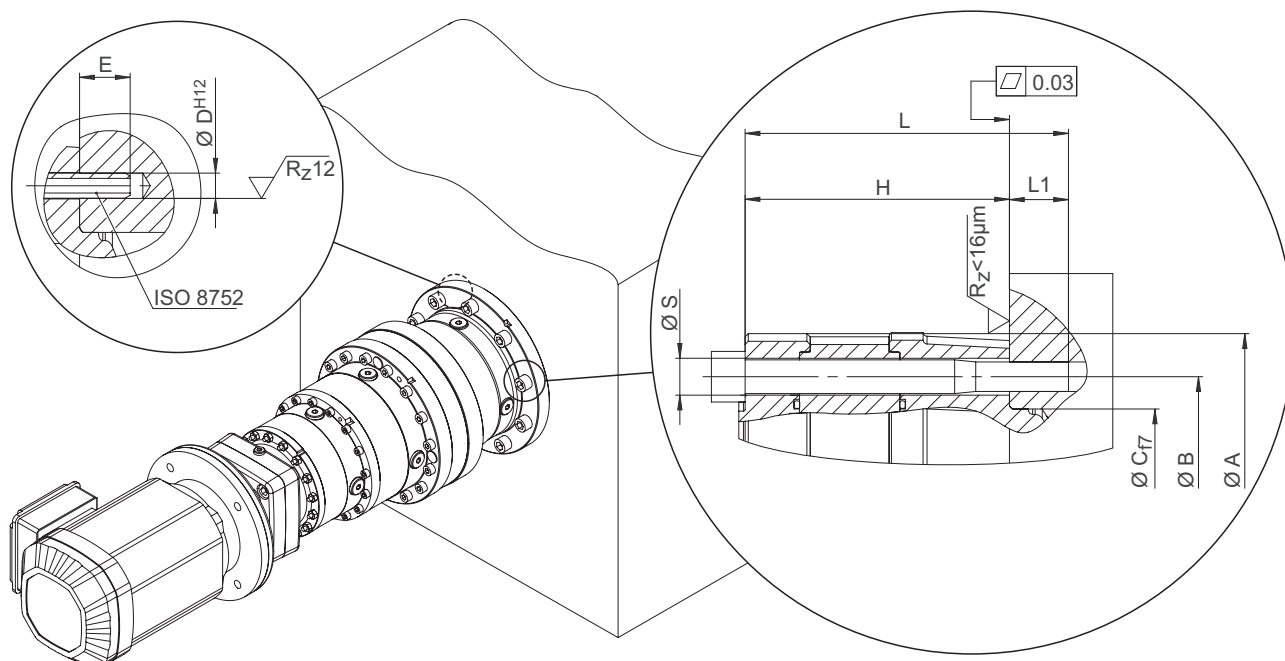
The following table shows various methods for measuring the differing tolerances.

Measuring instruments	Angular offset	Axis offset
Feeler gauge		
	<p>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 ($a1 - a2$).</p>	<p>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.</p>

Measuring instruments	Angular offset	Axis offset
Micrometer dial	 <p>899597451</p> <p>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).</p>	 <p>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").</p>

4.9 Fastening gear units in flange design

When mounting the gear unit to the torque arm and/or machine frame, secure the screws additionally using Loctite® 640. The following figure shows an example of how gear units with a flange-mounted design are installed.



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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 $\mu = 0.14$.

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

Size	Thread	Quantity	Tightening torque	Dimensions in mm							Strength classes	Screws EN ISO
			Nm	Ø S	H	L	L1	Ø A	Ø B	Ø C		
PPK.010	M16	10	330	17.5	25	50	27	325	295	230 _{f7}	10.9	4762
PPK.017	M12	16	135	13.5	113	140	30	388	357	330 _{f7}		

Size	Dowel pin	Quantity	Ø D	E
PPK.010	EN ISO 8752	4	12.5 ^{H12}	24
PPK.017				

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4.10 Torque arm for hollow shaft gear units

4.10.1 Notes on installation



⚠ WARNING

Insufficiently secured gear units can fall during assembly and 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 scope of delivery.

4.10.2 Single-sided torque arm

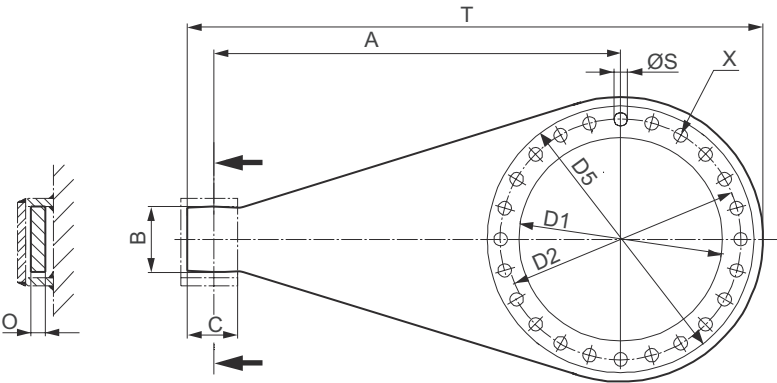
The reactive force resulting from the gear unit torque is absorbed via the torque arm with lever arm A. The following figure shows an example of a customer fixture in a welded structure. Two supporting plates are welded on the machine design with the suggested dimensions. Once the gear unit has been 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.

4 Installation/assembly

Torque arm for hollow shaft gear units

Dimensions

The following figure shows a sample torque arm with dimensions.



9007231518883467

Size	Dimensions in mm									Quantity	Mass
	A	B	C	D1	D2	D5	O	ØS	T	X	kg
PPK.010	500	120	100	232	295	330	25	17.5	715	10	28
PPK.017	600	120	100	332	357	400	30	13.5	850	16	39

INFORMATION



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

Tightening torques

INFORMATION



The tightening torques listed in the following table are based on the friction coefficient for threads and mounting surface of $\mu = 0.14$.

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

Size	Thread	Quantity	Tightening torque	Strength class	DIN screws
			Nm		
PPK.010	M16	10	330	10.9	DIN EN ISO 4017
PPK.017	M12	16	135		DIN EN ISO 4762

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4.11 AM adapter

NOTICE

Dampness might enter the adapter when mounting a motor to the adapter.

Possible damage to property.

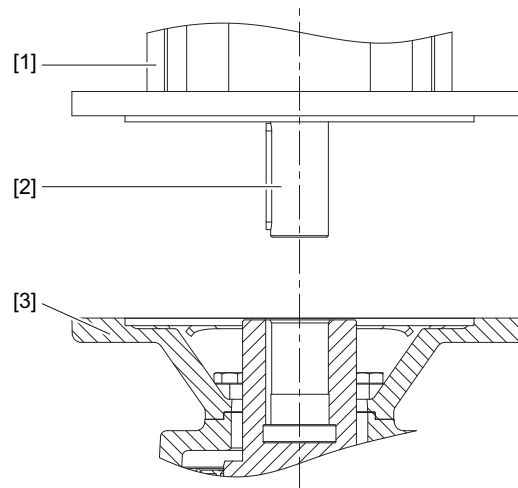
Seal the adapter with an anaerobic fluid seal.

INFORMATION



To avoid contact corrosion, we recommend applying NOCO® fluid to the motor shaft.

4.11.1 AM112 – 225 IEC adapter



32310766603

- [1] Motor
- [2] Motor shaft
- [3] AM adapter

Observe the notes in chapter "Important information" (→ 29).

1. Clean the motor shaft [2] and flange surfaces of the motor [1] and the adapter [3].
2. Apply NOCO® fluid directly to the motor shaft [2].
3. Apply a suitable surface sealant to the contact surfaces between adapter [3] and motor [1].
4. Attach the motor [1] to the AM adapter [3].

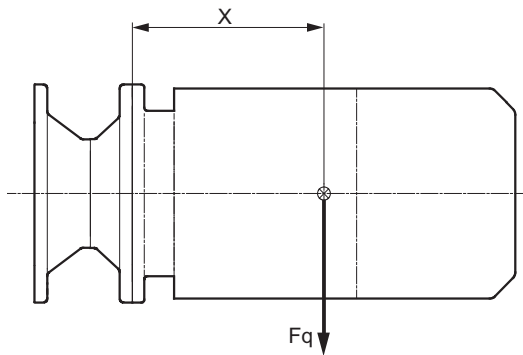
4.11.2 Permitted loads

NOTICE

Impermissibly high loads may occur when mounting a motor.

Potential damage to property.

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



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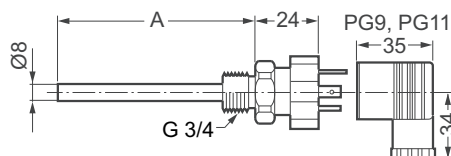
Adapter type		$F_q^{1)}$ N
EC	$x^{1)}$ mm	IEC adapter
AM112	144	2000
AM132 ²⁾	186	1600
AM132..		4700
AM160/180	251	4600
AM200/225	297	5600

- 1) The maximum permitted weight of the attached motor F_{qmax} must be reduced linearly as the center of gravity distance x increases. If this distance is reduced, the maximum permitted weight F_{qmax} cannot be increased.
- 2) Diameter of the adapter output flange: 160 mm

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4.12 Temperature sensor /PT100

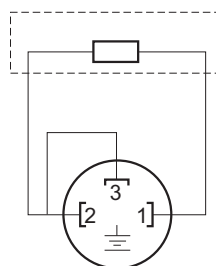
4.12.1 Dimensions



31899949067

A 50 mm

4.12.2 Electrical connection



359158539

[1] [2] Resistor element connection

4.12.3 Technical data

- Design with thermowell and changeable measuring insert
- Sensor tolerance $K \pm (0.3 + 0.005 \times T)$, (corresponds to DIN IEC 751 class B),
T = Oil temperature °C
- Plug connector: DIN 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.

4.13 Limit temperature for gear unit start

Check if the gear unit/gearmotor is designed for the ambient temperature. For the application limits refer to the technical documentation, the nameplate or the lubricant table (see chapter "Permitted lubricants" (→ 67)).

NOTICE

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

Possible damage to property.

- Observe the specified start temperatures for gear unit startup.

5 Startup

5.1 Important information

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.

NOTICE

Improper startup may result in damage to the gear unit.

Possible damage to property.

- Observe the following information.

- Planetary gear units are delivered with oil fill as standard.
- In case of gear units without oil fill, fill the gear unit with the oil type specified on the nameplate. The oil quantity specified on the nameplate is an approximate quantity. The mark on the oil sight glass or oil dipstick is the decisive indicator of the correct oil level.
- Before startup, check that the oil level is correct.
Check the oil level again after the first few operating hours; see chapter "Checking the oil level" (→ 61).
- Check the thermal rating/heating for the following operating conditions:
 - High ambient temperatures (over 45 °C).
 - Mounting position M2/M4 and/or motor speed above 1800 min⁻¹.

Consult SEW-EURODRIVE.

- The most important technical data is provided on the nameplate. Additional data relevant for operation is available in drawings, 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 orientation has not changed after tightening the mounting elements.
- It is essential that there is no open fire or risk of sparks when working on the gear unit.
- If there are any oil drain valves, ensure that they cannot be opened unintentionally.
- Protect the oil sight glass against damage.
- Protect the gear unit from falling objects.
- Make sure that the gear unit is grounded. Electrical mount-on components, such as motor, frequency inverter, etc., must be grounded separately.
- When using gear units with long-term protection: Replace the screw plug at the location indicated on the gear unit with a breather (position → see order documents).
- Before and during start up the unit, make sure that the monitoring devices are functioning properly.
- Observe the safety notes in the individual chapters.

5.2 Run-in period

SEW-EURODRIVE recommends running in the gear unit as the first phase of startup. Increase the load and speed of revolutions in two to three steps up to maximum level. The run-in phase takes approximately 10 hours.

Note the following during the running-in phase:

- Verify the power values specified on the nameplate because their frequency is a decisive factor for the service life of the gear unit.

- Does the gear unit run smoothly?
- Are there vibrations or unusual running noises?
- Are there signs of leakage (lubricants) on the gear unit?
- Check to be sure that the additional devices (such as oil pump, cooler, etc.) are functioning properly.

INFORMATION



For further information and troubleshooting measures, refer to the "Malfunctions" chapter.

5.3 Startup of gear units with long-term protection

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

5.3.1 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.
-

5.3.2 Breather

Check whether the breather is activated.

5.4 Measuring surface and oil temperature

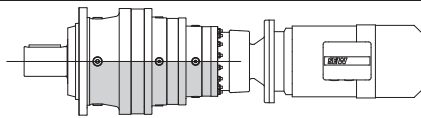
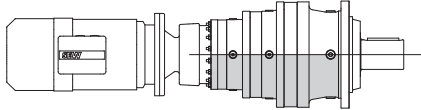
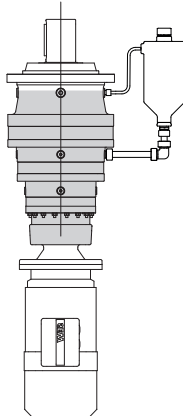
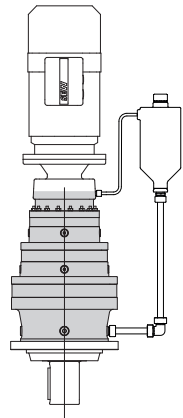
5.4.1 Measuring the surface temperature


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 temperature must not exceed 100 °C (synthetic oil) and 90 °C (mineral oil).

Stop the drive immediately if the temperature is above this value. Contact SEW-EURODRIVE.

The measuring of the surface temperature depends on the mounting position of the planetary gear unit. The area marked in gray shows where the surface temperature of the gear unit must be measured.

Mounting position	Measuring point of the surface temperature
M1	
M3 M5 M6	
M2	
M4	

 = Area for measuring points

5.4.2 Measuring the oil temperature

The oil temperature must be measured to determine the oil change intervals. See chapter "Lubricant change intervals" (→ 60) for a description. Measure the temperature at the bottom of the gear unit. If the gear unit has an oil drain plug, measure the temperature on this screw. Add 10 K to the measured value. This value is the basis for the oil change intervals.

5.5 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.

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.

5.5.1 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.
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.
 - Replace the breather with a screw plug and close the gear unit so that it is air tight. The breather must be installed correctly again before startup.
- **After longer gear unit operation:**
 - As the oil might be contaminated (due to e.g. oil sludge, water, etc.) after longer operating periods, drain the oil and thoroughly rinse the inside of the gear unit with new oil prior to conservation. Observe the notes in chapter "Changing the oil" (→ 65). The inside of the gear unit can then be conserved as described above.

INFORMATION



For gear units with contactless sealing systems, consult 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. Fill in oil at the highest point of the gear unit. In order to provide for sufficient conservation, all the gearing and bearing components 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.

5.5.2 Exterior 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.

Also observe the information in chapter "Storage and transport conditions" (→ 14). This chapter provides information on the possible storage periods in conjunction with adequate packaging – depending on the storage location.

Refer to chapter "Startup" (→ 50) before re-starting the gear unit.

6 Inspection/maintenance

6.1 Preliminary work regarding inspection/maintenance

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



⚠ 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

An operator machine that is not appropriately secured can fall down 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, make 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.



⚠ 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.

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.
- Strict adherence to the inspection and maintenance intervals is absolutely necessary to ensure safe working conditions.
- Adhere to the tightening torques.
- If using motors, also refer to the maintenance information for motors in the corresponding operating instructions.
- Use only original spare parts according to the delivered spare and wearing parts lists.
- Before releasing shaft connections, make sure that there are no active torsional moments present (tensions within the system).
- Prevent foreign particles from entering into the gear unit during maintenance and inspection work.
- 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.
- Perform a safety check and functional check following all maintenance and repair work.
- Observe the safety notes in the individual chapters.

6.2 Inspection and maintenance intervals

Adhere to the following inspection and maintenance intervals:

6.2.1 PPK.. planetary gear units

Time interval	What to do?
<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • Check the housing temperature: <ul style="list-style-type: none"> – Mineral oil: max 90 °C – Synthetic oil: max. 100 °C • Check for gear unit noise
<ul style="list-style-type: none"> • Monthly 	<ul style="list-style-type: none"> • Check the gear unit for signs of leakage • Check the oil level
<ul style="list-style-type: none"> • After 500 operating hours 	<ul style="list-style-type: none"> • First oil change after initial startup
<ul style="list-style-type: none"> • Every 3000 operating hours, at least every 6 months 	<ul style="list-style-type: none"> • Check the oil consistency
<ul style="list-style-type: none"> • At least every 12 months, depending on the operating conditions 	<ul style="list-style-type: none"> • Check whether retaining screws are tightly secured • Check the breather, replace if necessary • Check the alignment of the input and output shaft
<ul style="list-style-type: none"> • Depending on the operating conditions, at least every 3 years 	<ul style="list-style-type: none"> • Change mineral oil
<ul style="list-style-type: none"> • Depending on the operating conditions, at least every 5 years 	<ul style="list-style-type: none"> • Change synthetic oil
<ul style="list-style-type: none"> • Varying (depending on external factors) 	<ul style="list-style-type: none"> • Clean the outer gear unit housing • Touch up or renew the surface/anti-corrosion coating

6.2.2 AM adapter

Time interval	What to do?
<ul style="list-style-type: none"> • Every 3000 operating hours, at least every 6 months 	<ul style="list-style-type: none"> • Check rotational clearance • Visually inspect the elastic ring gear • Check running noise for possible bearing damage • Visually check the adapter for leakage
<ul style="list-style-type: none"> • After 25000 to 30000 operating hours 	<ul style="list-style-type: none"> • Change the bearing grease • Replace oil seal (do not install it in the same track) • Change the elastic spider

6.2.3 AD input shaft assembly

Time interval	What to do?
<ul style="list-style-type: none"> • Every 3000 operating hours, at least every 6 months 	<ul style="list-style-type: none"> • Check running noise for possible bearing damage • Visually check the adapter for leakage
<ul style="list-style-type: none"> • After 25000 to 30000 operating hours 	<ul style="list-style-type: none"> • Change the bearing grease • Replace the oil seal

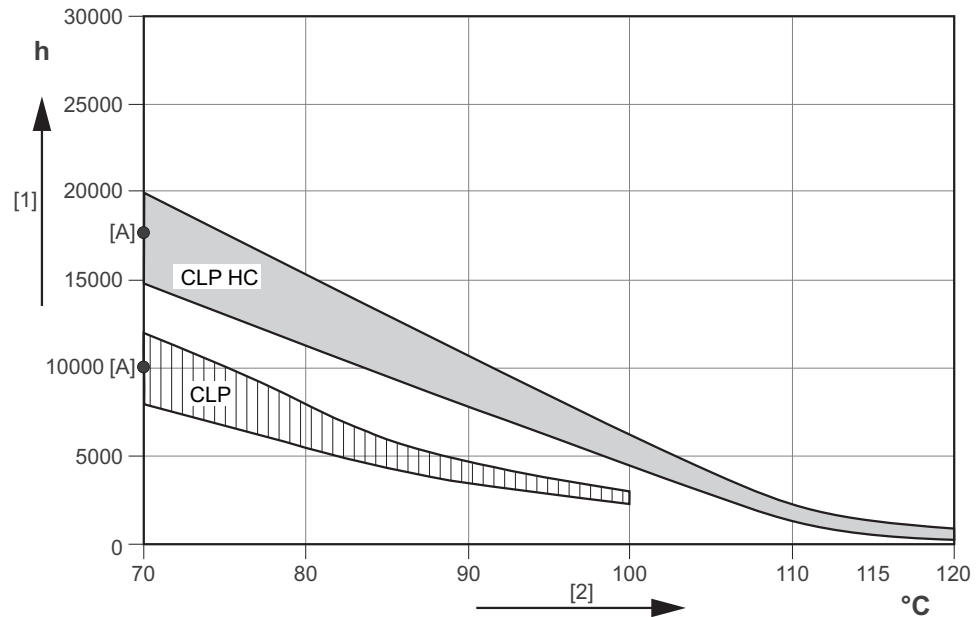
6.3 Lubricant change intervals

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 figure 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" (→ 64)) to optimize the lubricant change intervals.

6.4 Checking the oil level

Note the following when checking the oil level.

6.4.1 General information



NOTICE

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

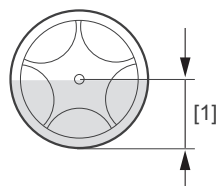
Possible damage to property.

- Check the oil level only when the gear unit is cooled down to room temperature.
- Check the oil level again after the first few operating hours.
- To check the oil, stop the gear unit and wait for 5 minutes. This ensures that the oil accumulates in the gear unit.

6.4.2 Oil sight glass

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 56).

1. Check the oil level on the oil sight glass as shown in the following figure. The oil level must be within the marked range [1].



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2. Proceed as follows if the oil level is too low:

- Open the oil fill plug.
- Fill in new oil of the same type via the oil fill plug until the oil level reaches the center of the oil sight glass.
- Screw in the oil fill plug.

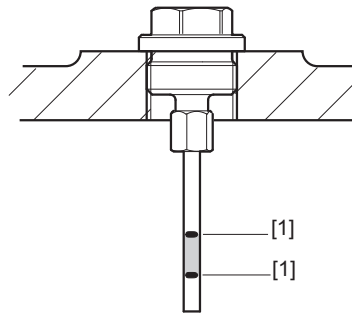
INFORMATION



The oil fill quantity must not exceed the upper edge of the oil sight glass.

6.4.3 Oil dipstick

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 56).



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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. Screw in the oil dipstick.

INFORMATION



Refer to the dimension sheet and the order documents for further information on the oil level check.

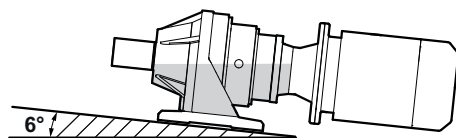
6.4.4 Notes on the procedure for fixed and variable pivoted mounting positions

Observe the information on the nameplate.

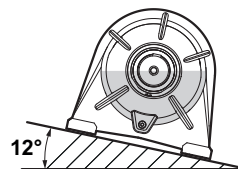
Fixed pivoted mounting positions

Check the oil level in the fixed, intended position.

M1-M2/6°



M1-M5/12°

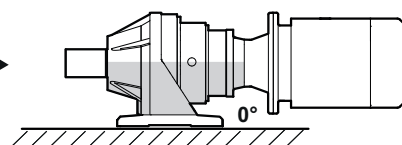
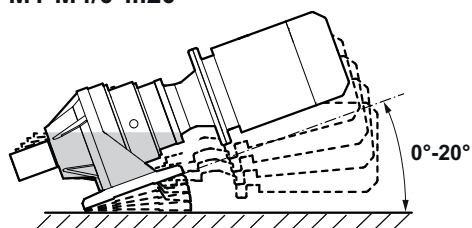


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Variable pivoted mounting positions


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.

M1-M4/0°...20°



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6.5 Checking the oil consistency

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→  56).

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.

6.6 Changing the oil

6.6.1 Notes

Observe the following when changing the oil.

NOTICE

Improper oil change can damage 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. If possible, 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.

- 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 mark on the oil dipstick or oil level glass is the decisive indicator of the correct oil quantity to be filled in.
- When changing the oil, flush the interior of the gear unit 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, the oil drain plug, and the breather, 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.
- Replace any damaged seals on the oil drain plug.
- 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 the applicable regulations.

6.6.2 Procedure



⚠ 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.

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 56).

1. Place a suitable container underneath the oil drain.
2. Remove the oil fill plug/breather.
3. Open the oil drain valve and drain all the oil into the container.
4. Close the oil drain valve.
5. Fill in new oil of the same grade via the oil filling hole.
 - Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm).
 - The oil quantity specified on the nameplate is an approximate quantity. The markings on the oil sight glass or on the oil dipstick are the decisive indicators of the correct oil quantity, see chapter "Checking the oil level" (→ 61).
6. Re-insert the oil fill plug/breather.



▲ CAUTION

Danger due to leakage of lubricant.

Injuries.

- Remove any dripping oil immediately with oil binding agent.

6.7 Checking and cleaning the breather

NOTICE

Improper cleaning of the breather may damage the gear unit.

Possible damage to property.

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

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 56).

1. Remove any deposits near the breather.
2. If the breather is clogged, replace it.

7 Permitted lubricants

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

7.1 Lubricant selection

Note the following when selecting the lubricants.

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 with mineral lubricants.
- Check the compatibility of the greases and oils used.
- Strictly observe the safety notes in the individual chapters.

7.2 Structure of the tables and abbreviations





		DIN (ISO) API	ISO,SAE NLGI					
[2]				-20	+65	-20	+65	
			-5	-5				
			+5	+5				
		VG 150 ¹⁾		Optigear BM 150		Alpha SP 150		
[1]	CLP			S0		S0		
				-15	+75	-15	+75	
				0		0		
				+10		+10		
			VG 220		Optigear BM 220		Alpha SP 220	
				S0		S0		
				-10	+85	-10	+80	
				+5		+5		
				+15		+15		
			VG 320		Optigear BM 320		Alpha SP 320	
				S0		S0		

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[1] Lubricant type

[2] Viscosity class

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 $F_s \geq 1.3$

7.3 Explanation of the various lubricants

			[5]
[1]	-20		
[2]	-5	+65	[6]
[3]	+5		
[4]	xyz		
	SEW070040013		[7]

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- [1] Lowest cold start temperature in °C for splash lubrication¹⁾
- [2] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 5000 cSt¹⁾
- [3] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 2000 cSt¹⁾
- [4] Trade name
- [5] Manufacturer
- [6] Highest oil bath temperature in °C²⁾
- [7] Approvals

1) In case of low temperatures, the oil must be heated to the specified minimum temperature, for example by using an oil heater. For the maximum permitted oil viscosity per pump type, refer to the following chapter.

2) Service life is significantly reduced when exceeded. Observe chapter "Lubricant change intervals".

7.4 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
			-20	+65		-20	+65					
CLP	VG 150 ¹⁾	SEW GearOil Base 150 E¹	-20	+65		-20	+65		-20	+65		
			-5			-5			-5			
			+5			+5			+5			
	VG 220	SEW GearOil Base 220 E¹	-15	+75		-15	+75		-15	+75		
			0			0			0			
			+10			+10			+10			
	VG 320	SEW GearOil Base 320 E¹	-10	+85		-10	+85		-10	+85		
			+5			+5			+5			
			+15			+15			+15			
	VG 460	SEW GearOil Base 460 E¹	-5	+90		-5	+90		-5	+90		
			+10			+10			+10			
			+20			+20			+20			
	VG 680	SEW GearOil Base 680 E¹	0	+90		0	+90		0	+90		
			+15			+15			+15			
			+25			+25			+25			
	VG 1000	SEW GearOil Base 1000 E¹	+5	+90		+5	+90		+5	+90		
			+20			+20			+20			
			+30			+30			+30			
	VG 1500	SEW GearOil Base 1500 E¹	+10	+90		+10	+90		+10	+90		
			+20			+20			+20			
			+30			+30			+30			
	VG 2200	SEW GearOil Base 2200 E¹	+15	+90		+15	+90		+15	+90		
			+25			+25			+25			
			+35			+35			+35			

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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]																
																	
	VG 32 ¹⁾					SHC 624											
	VG 68 ¹⁾					SHC 626											
	VG 150 ¹⁾					SHC 629											
	VG 220					SHC 630											
	VG 320					SHC 632											
	VG 460					SHC 634											
	VG 680					SHC 636											
	VG 1000					SHC 639											

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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]	[3]																							
 CLP HC NSF H1	E	VG 68 ¹⁾	<table><tr><td>-35</td><td rowspan="3">+45</td><td rowspan="3">Optileb HY 68</td></tr><tr><td>-20</td></tr><tr><td>-10</td></tr><tr><td colspan="3">Cassida Fluid HF 68</td></tr></table>	-35	+45	Optileb HY 68	-20	-10	Cassida Fluid HF 68			<table><tr><td>-35</td><td rowspan="3">+45</td></tr><tr><td>-20</td></tr><tr><td>-10</td></tr><tr><td colspan="2">Cassida Fluid HF 68</td></tr></table>	-35	+45	-20	-10	Cassida Fluid HF 68		<table><tr><td>-35</td><td rowspan="3">+45</td></tr><tr><td>-20</td></tr><tr><td>-10</td></tr><tr><td colspan="2">Klüberoil 4UH1-68 N</td></tr></table>	-35	+45	-20	-10	Klüberoil 4UH1-68 N	
			-35	+45			Optileb HY 68																		
			-20																						
			-10																						
Cassida Fluid HF 68																									
-35	+45																								
-20																									
-10																									
Cassida Fluid HF 68																									
-35	+45																								
-20																									
-10																									
Klüberoil 4UH1-68 N																									
		VG 220 ¹⁾	<table><tr><td>-20</td><td rowspan="3">+75</td></tr><tr><td>-5</td></tr><tr><td>+5</td></tr><tr><td colspan="2">Cassida Fluid GL 220</td></tr></table>	-20	+75	-5	+5	Cassida Fluid GL 220		<table><tr><td>-20</td><td rowspan="3">+75</td></tr><tr><td>-5</td></tr><tr><td>+5</td></tr><tr><td colspan="2">Cassida Fluid GL 220</td></tr></table>	-20	+75	-5	+5	Cassida Fluid GL 220		<table><tr><td>-25</td><td rowspan="3">+75</td></tr><tr><td>-5</td></tr><tr><td>+5</td></tr><tr><td colspan="2">Klüberoil 4UH1-220 N</td></tr></table>	-25	+75	-5	+5	Klüberoil 4UH1-220 N			
			-20	+75																					
			-5																						
			+5																						
Cassida Fluid GL 220																									
-20	+75																								
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Cassida Fluid GL 220																									
-25	+75																								
-5																									
+5																									
Klüberoil 4UH1-220 N																									
		VG 460 ¹⁾	<table><tr><td>-15</td><td rowspan="3">+90</td></tr><tr><td>+5</td></tr><tr><td>+20</td></tr><tr><td colspan="2">Cassida Fluid GL 460</td></tr></table>	-15	+90	+5	+20	Cassida Fluid GL 460		<table><tr><td>-15</td><td rowspan="3">+90</td></tr><tr><td>+5</td></tr><tr><td>+20</td></tr><tr><td colspan="2">Cassida Fluid GL 460</td></tr></table>	-15	+90	+5	+20	Cassida Fluid GL 460		<table><tr><td>-15</td><td rowspan="3">+95</td></tr><tr><td>+5</td></tr><tr><td>+15</td></tr><tr><td colspan="2">Klüberoil 4UH1-460 N</td></tr></table>	-15	+95	+5	+15	Klüberoil 4UH1-460 N			
			-15	+90																					
			+5																						
			+20																						
Cassida Fluid GL 460																									
-15	+90																								
+5																									
+20																									
Cassida Fluid GL 460																									
-15	+95																								
+5																									
+15																									
Klüberoil 4UH1-460 N																									
		VG 460	<table><tr><td>-15</td><td rowspan="3">+95</td></tr><tr><td>+5</td></tr><tr><td>+15</td></tr><tr><td colspan="2">Plantogear 460 S</td></tr></table>	-15	+95	+5	+15	Plantogear 460 S		<table><tr><td>-15</td><td rowspan="3">+95</td></tr><tr><td>+5</td></tr><tr><td>+15</td></tr><tr><td colspan="2">Klüberbio CA2-460</td></tr></table>	-15	+95	+5	+15	Klüberbio CA2-460		<table><tr><td>-15</td><td rowspan="3">+95</td></tr><tr><td>+5</td></tr><tr><td>+15</td></tr><tr><td colspan="2">Klüberbio CA2-460</td></tr></table>	-15	+95	+5	+15	Klüberbio CA2-460			
			-15	+95																					
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Plantogear 460 S																									
-15	+95																								
+5																									
+15																									
Klüberbio CA2-460																									
-15	+95																								
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+15																									
Klüberbio CA2-460																									

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7.5 Lubricant fill quantities

INFORMATION



- The specified lubricant fill quantities are guide values. The exact values vary depending on the number of gear stages and gear ratio.
- The required oil level depends on the mark on the oil dipstick or on the oil sight glass.
- For 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 mark on the oil dipstick or the oil sight glass is the decisive indicator of the correct oil quantity.

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7.5.1 PPK.. planetary gear units

The table below shows the lubricant fill quantities for planetary gear units.

Size	Mounting position					
	M1	M2	M3	M4	M5	M6
	Liters					
PPK.010	4	8	4	8	4	4
PPK.017	7	14	7	14	7	7

7.6 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 OEM¹⁾	-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	Mobilux EP 2	-20
	Shell	Gadus S2 V220 2	-20
	Total	Multis EP 2	-20
	Bremer & Leguil	Cassida Grease GTS2 ¹⁾	-40
	Fuchs	Plantogel 2¹⁾	-40

1) Use the greases used at the factory if possible

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.

8 Malfunctions/remedy

8.1 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.

8.2 Malfunctions of PPK.. planetary gear units

Fault	Possible cause	Measure
Unusual, regular running noise	<ul style="list-style-type: none"> • Meshing/grinding noise: Bearing damage • Knocking noise: Irregularity in the gearing • Deformation of the housing upon tightening • Noise generated by insufficient stiffness of the gear unit foundation 	<ul style="list-style-type: none"> • Check oil consistency, change bearings • Consult SEW-EURODRIVE • Check the gear unit mounting for possible deformation and correct if necessary • Reinforce the gear unit foundation
Unusual, irregular running noises	<ul style="list-style-type: none"> • Foreign objects in the oil 	<ul style="list-style-type: none"> • Check the oil consistency • Stop the drive, contact SEW-EURODRIVE

Fault	Possible cause	Measure
Unusual noise in the area where the gear unit is mounted	<ul style="list-style-type: none"> Gear unit mounting has loosened 	<ul style="list-style-type: none"> Tighten retaining screws and nuts to the specified torque Replace the damaged/defective retaining screws or nuts
Operating temperature too high	<ul style="list-style-type: none"> Too much oil Oil too old The oil is heavily contaminated Ambient temperature too high 	<ul style="list-style-type: none"> Check oil level, correct if necessary Check when the oil was last changed; change the oil, if necessary Analyze the oil to determine the cause; take measures, if necessary; change the oil Protect the gear unit from external heat sources (e.g. provide shade)
Temperature at bearing points too high	<ul style="list-style-type: none"> Not enough oil Oil too old Bearing damaged 	<ul style="list-style-type: none"> Check oil level; correct if necessary Check when the oil was last changed; change the oil if necessary Check the bearing and replace it if necessary. Contact SEW-EURODRIVE
Oil leaking ¹⁾ <ul style="list-style-type: none"> From oil seal 	<ul style="list-style-type: none"> Too much oil Sealing lip of the oil seal turned up Oil seal damaged/worn 	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> At the gear unit breather 	<ul style="list-style-type: none"> Too much oil Drive not installed in proper mounting position Frequent cold starts (oil foaming) and/or high oil level 	<ul style="list-style-type: none"> Check oil level, correct if necessary Install gear unit breather correctly and adjust the oil level Install oil expansion tank
Oil leaking <ul style="list-style-type: none"> From the screw plug From the oil drain valve 	<ul style="list-style-type: none"> Seal not tight Fittings loosened 	<ul style="list-style-type: none"> Retighten the screw Retighten the fitting and screw

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).

8.3 Malfunctions of AM adapters

Fault	Possible cause	Measure
Unusual, regular running noise	<ul style="list-style-type: none"> Meshing/grinding noise: Bearing damage 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE
Oil leaking	<ul style="list-style-type: none"> Seal defective 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE
Output shaft does not turn although the motor is running or the input shaft is rotated	<ul style="list-style-type: none"> Shaft-hub connection in the gear unit interrupted 	<ul style="list-style-type: none"> Send in the gear unit/gearmotor for repair
Change in running noise and/or vibrations	<ul style="list-style-type: none"> Spider wear, short-term torque transmission through metal contact 	<ul style="list-style-type: none"> Change the spider
	<ul style="list-style-type: none"> Screws to secure hub axially are loose 	<ul style="list-style-type: none"> Tighten the screws
Premature wear of spider	<ul style="list-style-type: none"> Contact with aggressive fluids/oils; ozone influence; excessive ambient temperatures, etc. that can change the physical properties of the spider 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE
	<ul style="list-style-type: none"> Impermissibly high ambient/contact temperature for the spider; maximum permitted temperature: -20 °C to +80 °C 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE
	<ul style="list-style-type: none"> Overload 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE

8.4 Malfunctions at the AD input shaft assembly

Fault	Possible cause	Measure
Unusual, regular running noise	<ul style="list-style-type: none"> Meshing/grinding noise: Bearing damage 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE
Oil leaking	<ul style="list-style-type: none"> Seal defective 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE
Output shaft does not turn although the motor is running or the input shaft is rotated	<ul style="list-style-type: none"> Shaft-hub connection in the gear unit interrupted 	<ul style="list-style-type: none"> Send in the gear unit/gearmotor for repair

8.5 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

8.6 Waste disposal

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

- Iron, steel or cast iron
- Stainless steel
- Aluminum
- Copper
- Plastics

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

- Oil and grease

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

9 Address list

Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
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
Belarus			
Sales	Minsk	Foreign unitary production enterprise SEW- EURODRIVE RybalkoStr. 26 220033 Minsk	Tel. +375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by
Belgium			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue du Parc Industriel, 31 6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-IG@sew-eurodrive.be
Brazil			
Production Sales Service	São Paulo	SEW-EURODRIVE Brasil Ltda. Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49 Indaiatuba – 13347-510 – SP	Tel. +55 19 3835-8000 sew@sew.com.br
Assembly Sales Service	Rio Claro	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Jvl / Ind Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

Cameroon

Sales	Douala	SEW-EURODRIVE S.A.R.L. Ancienne Route Bonabéri P.O. Box B.P 8674 Douala-Cameroun	Tel. +237 233 39 02 10 Fax +237 233 39 02 10 sew@sew-eurodrive-cm
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Canada

Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2001 Ch. de l'Aviation Dorval Quebec H9P 2X6	Tel. +1 514 367-1124 Fax +1 514 367-3677 n.paradis@sew-eurodrive.ca

Chile

Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMP Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
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China

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

Colombia			
Assembly Sales Service	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 17 No. 132-18 Interior 2 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Assembly Sales Service	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
	Drive Service Hotline / 24 Hour Service	+420 800 739 739 (800 SEW SEW)	Service Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Copenhagen	SEW-EURODRIVEA/S Geminivej 28-30 2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Service	Vejle	SEW-EURODRIVE A/S Bødkervej 2 7100 Vejle	Tel. +45 43 9585 00 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 Loomäe tee 1, Lehmja küla 75306 Rae vald Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee veiko.soots@alas-kuul.ee
Finland			
Assembly Sales Service	Hollola	SEW-EURODRIVE OY Vesimäentie 4 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
	Tornio	SEW-EURODRIVE Oy Lossirannankatu 5 95420 Tornio	Tel. +358 201 589 300 Fax +358 3 780 6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
France			
Production Sales Service	Hagenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Hagenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocom.com sew@usocom.com
Production	Forbach	SEW USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 57604 Forbach Cedex	Tel. +33 3 87 29 38 00

France			
	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
	Lyon	SEW USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 Fax +33 4 74 99 60 15
	Nantes	SEW USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Gabon			
Representation: Cameroon			
Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 43 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dankritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909551-21 Fax +49 89 909551-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Hamburg	SEW-EURODRIVE GmbH & Co KG Hasselbinnen 44 22869 Schenefeld	Tel. +49 40298109-60 Fax +49 40298109-70 dc-hamburg@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE c/o BASF SE Gebäude W130 67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de

Germany			
	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
	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. Csillaghegyi út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
Iceland			
Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavik	Tel. +354 585 1070 Fax +354 585)1071 http://www.varmaverk.is vov@vov.is
India			
Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 http://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
Sales Service	Gurgaon	SEW-EURODRIVE India Private Limited Drive Center Gurugram Plot no 395, Phase-IV, UdyogVihar Gurugram , 122016 Haryana	Tel. +91 99588 78855 salesgurgaon@seweurodriveindia.com
Indonesia			
Sales	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com

Indonesia			
	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 In- dustri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
Ireland			
Sales Service	Dublin	Alpert Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alpert.ie info@alpert.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 S.a.s. di SEW S.r.l. & Co. Via Bernini,12 20020 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 21 21 81 05 Fax +225 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Kazakhstan			
Sales Service	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com

Lebanon			
Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Sales (Jordan, Kuwait , Beirut Saudi Arabia, Syria)		Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
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
Mexico			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@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, MN	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service Assembly	Bouskoura	SEW-EURODRIVE Morocco SARL Parc Industriel CFCIM, Lot. 55/59 27182 Bouskoura Grand Casablanca	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB MINING & INDUSTRIAL SUPPLIES CC Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
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

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

Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» 188660, Russia, Leningrad Region, Vse- volozhsky District, Korabselki, Aleksandra Nevskogo str. building 4, block 1 P.O. Box 36 195220 St. Petersburg	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 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	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel. +421 2 33595 202, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE KOREA CO., LTD. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com

South Korea			
	Busan	SEW-EURODRIVE KOREA CO., LTD. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd Simunye street Matsapha, Manzini	Tel. +268 7602 0790 Fax +268 2 518 5033 charles@cgtrading.co.sz www.cgtradingswaziland.com
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Taiwan			
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