



SEW
EURODRIVE

Assembly and Operating Instructions



Industrial Gear Units

Planetary Gear Units XP130 - XP250 Series

Torque Range from 600 to 5200 kNm



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1 General information

1.1 About this documentation

The current version of the documentation is the original.

This documentation is an integral part of the product. The documentation is written for all employees who assemble, install, start up, and service this product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the machinery and its 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 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
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of risk of crushing
	Warning of suspended load
	Warning of automatic restart

1.2.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

1.3 Rights to claim under limited warranty

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

1.4 Exclusion of liability

Read the information in this documentation, otherwise safe operation is impossible. You must comply with the information contained in this documentation to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, SEW-EURODRIVE assumes no liability for defects.

1.5 Copyright notice

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2 Safety notes

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

2.1 Preliminary remark

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

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

2.2 General



▲ WARNING

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

Severe or fatal injuries

- All work related to transportation, storage, installation, assembly, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observance of:
 - The relevant detailed operating instructions
 - Warning and safety signs on the gear unit
 - All other project planning documents, operating instructions and wiring diagrams related to the drive
 - The specific regulations and requirements for the system
 - The national/regional regulations governing safety and the prevention of accidents
- Never install damaged products.
- Report any damage to the shipping company immediately.
- Removing covers without authorization, improper use or incorrect installation and operation may result in severe injuries to persons or damage to machinery.

Refer to the documentation for additional information.

2.3 Target group

Specialist for mechanical work	<p>Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting and maintenance of the product, who possess the following qualifications:</p> <ul style="list-style-type: none"> • Qualification in the field of mechanics according to applicable national regulation. • They are familiar with this documentation
Specialist for electrotechnical work	<p>Any electronic work may only be performed by adequately skilled persons (electrically). Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting and servicing of the product who possess the following qualifications:</p> <ul style="list-style-type: none"> • Qualification in the field of electrical engineering according to applicable national regulation. • They are familiar with this documentation
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 that the persons are capable of performing the required tasks and work steps in a safe and correct manner.</p> <p>All qualified personnel must wear appropriate protective clothing.</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 components for installation in machinery and systems. In the scope of the EC directive, you must not take the machinery into operation in the designated fashion until you have established that the end product complies with Machinery Directive 2006/42/EC.

2.5 Other applicable documentation

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

- "XP130 – XP250 Series Planetary Gear Units" catalog
- Order documents, e.g. dimension sheet, order confirmation, etc.
- 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 symbols	Meaning
	Indicates the oil filling location . Also serves as proper venting during the oil change.
	Indicates the oil drain .
	Indicates the position of the breather . Serves to avoid mistaking the oil measuring position for the venting position.
	Helps avoid errors caused by lack of understanding. Read the information in the operating instructions.
	Indicates the positions for relubrication and makes it easier to find the locations to be lubricated. Helps avoid bearing damage.
	Indicates the water supply and serves to locate the connection option.
	Indicates the water return and serves to locate the connection option.
	Indicates the oil supply and serves to locate the connection option.
	Indicates the oil return and serves to locate the connection option.
	For pivoted mounting positions, this symbol on the information sign indicates the mounting position of the gear unit for checking the oil .

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



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

Meaning		
The brake is not set at the factory.		
<div style="text-align: center;">   <small>18855199</small> </div>	<div style="background-color: #003366; color: white; padding: 5px; font-weight: bold; text-align: center;">VORSICHT NOTICE ATTENTION PRECAUCIÓN VOORZICHTIG OSTROŻNIE</div> <div style="padding: 5px;"> <p>(DE) Die Bremse ist ab Werk nicht eingestellt. Mögliche Sachschäden! • Bremse vor der Inbetriebnahme gemäß Betriebsanleitung einstellen</p> </div>	<div style="padding: 5px;"> <p>(EN) The brake has not been set at the factory Potential damage to property! • Prior to startup, set the brake according to the operating instructions.</p> </div>
	<div style="padding: 5px;"> <p>(F) Le frein n'est pas réglé d'usine Risque de dommages matériels ! • Avant la mise en service, régler le frein conformément aux instructions de la notice d'exploitation.</p> </div>	<div style="padding: 5px;"> <p>(ES) El freno no viene ajustado de fábrica. ¡Posibles daños materiales! • Antes de la puesta en marcha, ajustar el freno según las instrucciones de funcionamiento.</p> </div>
	<div style="padding: 5px;"> <p>(NL) De rem is niet af fabriek ingesteld. Mogelijke materiële schade! • Rem voor de inbedrijfstelling conform technische handleiding instellen.</p> </div>	<div style="padding: 5px;"> <p>(PL) Hamulec nie jest ustawiony fabrycznie. Możliwe szkody materialne! • Przed uruchomieniem należy ustawić hamulec zgodnie z wytycznymi z instrukcji obsługi.</p> </div>

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Meaning

The coupling is supplied without grease.



VORSICHT NOTICE ATTENTION PRECAUCIÓN VOORZICHTIG OSTROŻNIE			
  18977405	<p>(DE) Kupplung wird ohne Fett geliefert.</p> <p>Mögliche Sachschäden!</p> <ul style="list-style-type: none">• Vor der Inbetriebnahme Kupplung mit Fett befüllen.	<p>(EN) Coupling delivered without grease</p> <p>Possible damage to property.</p> <ul style="list-style-type: none">• Fill coupling with grease prior to startup.	
	<p>(F) L'accouplement est livré sans graisse.</p> <p>Risque de dommages matériels !</p> <ul style="list-style-type: none">• Avant la mise en service, remplir l'accouplement de graisse.	<p>(ES) El acoplamiento se suministra sin grasa.</p> <p>¡Posibles daños materiales!</p> <ul style="list-style-type: none">• Llenar el acoplamiento con grasa antes de la puesta en marcha.	
	<p>(NL) Koppeling wordt zonder vet geleverd.</p> <p>Mogelijke materiële schade!</p> <ul style="list-style-type: none">• Koppeling vóór de inbedrijfstelling met vet vullen.	<p>(PL) Sprzęgło jest dostarczane bez smaru.</p> <p>Możliwe szkody materialne!</p> <ul style="list-style-type: none">• Przed uruchomieniem należy wypełnić sprzęgło smarem.	

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The coupling is supplied without oil.




















VORSICHT NOTICE ATTENTION PRECAUCIÓN VOORZICHTIG OSTROŻNIE			
  18977413	<p>(DE) Kupplung wird ohne Öl geliefert.</p> <p>Mögliche Sachschäden!</p> <ul style="list-style-type: none">• Vor der Inbetriebnahme Kupplung mit Öl befüllen.	<p>(EN) Coupling delivered without oil</p> <p>Possible damage to property.</p> <ul style="list-style-type: none">• Fill coupling with oil prior to startup.	
	<p>(F) L'accouplement est livré sans huile.</p> <p>Risque de dommages matériels !</p> <ul style="list-style-type: none">• Avant la mise en service, remplir l'accouplement d'huile.	<p>(ES) El acoplamiento se suministra sin aceite.</p> <p>¡Posibles daños materiales!</p> <ul style="list-style-type: none">• Llenar el acoplamiento con aceite antes de la puesta en marcha.	
	<p>(NL) Koppeling wordt zonder olie geleverd.</p> <p>Mogelijke materiële schade!</p> <ul style="list-style-type: none">• Koppeling vóór de inbedrijfstelling met olie vullen.	<p>(PL) Sprzęgło jest dostarczane bez oleju.</p> <p>Możliwe szkody materialne!</p> <ul style="list-style-type: none">• Przed uruchomieniem należy wypełnić sprzęgło olejem.	




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Meaning							
The gear unit is protected against corrosion with VCI.							
<div style="border: 1px solid black; padding: 10px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid black; margin-bottom: 10px;"> VORSICHT NOTICE ATTENTION PRECAUCIÓN VOORZICHTIG OSTROŻNIE </div> <div style="display: flex;"> <div style="flex: 1; padding-right: 10px;">  <p>18977421</p> </div> <div style="flex: 2;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; vertical-align: top;"> <p>(DE) Getriebe ist mit VCI rostgeschützt. Nicht öffnen!</p> <p>Mögliche Sachschäden!</p> <ul style="list-style-type: none"> • Vor der Inbetriebnahme Vorarbeiten gemäß Betriebsanleitung durchführen. • Keine offene Flamme! </td><td style="width: 33%; vertical-align: top;"> <p>(EN) Gear unit with VCI corrosion protection. Do not open!</p> <p>Potential damage to property!</p> <ul style="list-style-type: none"> • Prior to startup, perform preliminary work according to operating instructions • No open flames! </td></tr> <tr> <td style="vertical-align: top;"> <p>(F) Réducteur protégé contre la corrosion avec VCI. Ne pas ouvrir</p> <p>Risque de dommages matériels !</p> <ul style="list-style-type: none"> • Avant la mise en service, réaliser les travaux préliminaires indiqués dans la notice d'exploitation. • Pas de flammes ouvertes ! </td><td style="vertical-align: top;"> <p>(ES) Reductor está protegido con VCI contra la corrosión. ¡No abrir!</p> <p>¡Posibles daños materiales!</p> <ul style="list-style-type: none"> • Antes de la puesta en marcha, efectuar los trabajos preparatorios según las instrucciones de funcionamiento. • No debe haber fuego abierto. </td></tr> <tr> <td style="vertical-align: top;"> <p>(NL) Tandwielkast is met VCI tegen corrosie beschermd. Niet openen!</p> <p>Mogelijke materiële schade!</p> <ul style="list-style-type: none"> • Vóór de inbedrijfstelling voorbereidingen conform technische handleiding uitvoeren. • Geen open vuur! </td><td style="vertical-align: top;"> <p>(PL) Przekładnia zabezpieczona jest przed korozją za pomocą środka VCI. Nie otwierać!</p> <p>Możliwe szkody materialne!</p> <ul style="list-style-type: none"> • Przed uruchomieniem należy przeprowadzić czynności przygotowawcze zgodnie z informacjami zawartymi w instrukcji obsługi! • Unikać otwartych płomieni! </td></tr> </table> </div> </div> </div>		<p>(DE) Getriebe ist mit VCI rostgeschützt. Nicht öffnen!</p> <p>Mögliche Sachschäden!</p> <ul style="list-style-type: none"> • Vor der Inbetriebnahme Vorarbeiten gemäß Betriebsanleitung durchführen. • Keine offene Flamme! 	<p>(EN) Gear unit with VCI corrosion protection. Do not open!</p> <p>Potential damage to property!</p> <ul style="list-style-type: none"> • Prior to startup, perform preliminary work according to operating instructions • No open flames! 	<p>(F) Réducteur protégé contre la corrosion avec VCI. Ne pas ouvrir</p> <p>Risque de dommages matériels !</p> <ul style="list-style-type: none"> • Avant la mise en service, réaliser les travaux préliminaires indiqués dans la notice d'exploitation. • Pas de flammes ouvertes ! 	<p>(ES) Reductor está protegido con VCI contra la corrosión. ¡No abrir!</p> <p>¡Posibles daños materiales!</p> <ul style="list-style-type: none"> • Antes de la puesta en marcha, efectuar los trabajos preparatorios según las instrucciones de funcionamiento. • No debe haber fuego abierto. 	<p>(NL) Tandwielkast is met VCI tegen corrosie beschermd. Niet openen!</p> <p>Mogelijke materiële schade!</p> <ul style="list-style-type: none"> • Vóór de inbedrijfstelling voorbereidingen conform technische handleiding uitvoeren. • Geen open vuur! 	<p>(PL) Przekładnia zabezpieczona jest przed korozją za pomocą środka VCI. Nie otwierać!</p> <p>Możliwe szkody materialne!</p> <ul style="list-style-type: none"> • Przed uruchomieniem należy przeprowadzić czynności przygotowawcze zgodnie z informacjami zawartymi w instrukcji obsługi! • Unikać otwartych płomieni!
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9007204570575499							
Gear unit is supplied without oil.							
<div style="border: 1px solid black; padding: 10px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid black; margin-bottom: 10px;"> VORSICHT NOTICE ATTENTION PRECAUCIÓN VOORZICHTIG OSTROŻNIE </div> <div style="display: flex;"> <div style="flex: 1; padding-right: 10px;">  <p>18977383</p> </div> <div style="flex: 2;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; vertical-align: top;"> <p>(DE) Getriebe wird ohne Öl geliefert.</p> <p>Mögliche Sachschäden!</p> <ul style="list-style-type: none"> • Vor der Inbetriebnahme Ölbefüllung gemäß Betriebsanleitung durchführen. </td><td style="width: 33%; vertical-align: top;"> <p>(EN) Gear unit is delivered without oil.</p> <p>Potential damage to property!</p> <ul style="list-style-type: none"> • Prior to startup, fill in oil according to operating instructions. </td></tr> <tr> <td style="vertical-align: top;"> <p>(F) Le réducteur ne contient pas d'huile à la livraison.</p> <p>Dommages matériels possibles !</p> <ul style="list-style-type: none"> • Avant la mise en service, effectuer le remplissage d'huile conformément à la notice d'exploitation. </td><td style="vertical-align: top;"> <p>(ES) El reductor se suministra sin aceite.</p> <p>¡Posibles daños materiales!</p> <ul style="list-style-type: none"> • Antes de la puesta en marcha, efectuar el llenado de aceite según las instrucciones de funcionamiento. </td></tr> <tr> <td style="vertical-align: top;"> <p>(NL) Tandwielkast wordt zonder olie geleverd.</p> <p>Mogelijke materiële schade!</p> <ul style="list-style-type: none"> • Vóór de inbedrijfstelling olie conform technische handleiding bijvullen. </td><td style="vertical-align: top;"> <p>(PL) Przekładnia jest dostarczana bez oleju.</p> <p>Możliwe szkody materialne!</p> <ul style="list-style-type: none"> • Przed uruchomieniem należy wlać olej zgodnie z informacjami zawartymi w instrukcji obsługi. </td></tr> </table> </div> </div> </div>		<p>(DE) Getriebe wird ohne Öl geliefert.</p> <p>Mögliche Sachschäden!</p> <ul style="list-style-type: none"> • Vor der Inbetriebnahme Ölbefüllung gemäß Betriebsanleitung durchführen. 	<p>(EN) Gear unit is delivered without oil.</p> <p>Potential damage to property!</p> <ul style="list-style-type: none"> • Prior to startup, fill in oil according to operating instructions. 	<p>(F) Le réducteur ne contient pas d'huile à la livraison.</p> <p>Dommages matériels possibles !</p> <ul style="list-style-type: none"> • Avant la mise en service, effectuer le remplissage d'huile conformément à la notice d'exploitation. 	<p>(ES) El reductor se suministra sin aceite.</p> <p>¡Posibles daños materiales!</p> <ul style="list-style-type: none"> • Antes de la puesta en marcha, efectuar el llenado de aceite según las instrucciones de funcionamiento. 	<p>(NL) Tandwielkast wordt zonder olie geleverd.</p> <p>Mogelijke materiële schade!</p> <ul style="list-style-type: none"> • Vóór de inbedrijfstelling olie conform technische handleiding bijvullen. 	<p>(PL) Przekładnia jest dostarczana bez oleju.</p> <p>Możliwe szkody materialne!</p> <ul style="list-style-type: none"> • Przed uruchomieniem należy wlać olej zgodnie z informacjami zawartymi w instrukcji obsługi.
<p>(DE) Getriebe wird ohne Öl geliefert.</p> <p>Mögliche Sachschäden!</p> <ul style="list-style-type: none"> • Vor der Inbetriebnahme Ölbefüllung gemäß Betriebsanleitung durchführen. 	<p>(EN) Gear unit is delivered without oil.</p> <p>Potential damage to property!</p> <ul style="list-style-type: none"> • Prior to startup, fill in oil according to operating instructions. 						
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<p>(NL) Tandwielkast wordt zonder olie geleverd.</p> <p>Mogelijke materiële schade!</p> <ul style="list-style-type: none"> • Vóór de inbedrijfstelling olie conform technische handleiding bijvullen. 	<p>(PL) Przekładnia jest dostarczana bez oleju.</p> <p>Możliwe szkody materialne!</p> <ul style="list-style-type: none"> • Przed uruchomieniem należy wlać olej zgodnie z informacjami zawartymi w instrukcji obsługi. 						
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2.7 Symbols on the dimension sheet

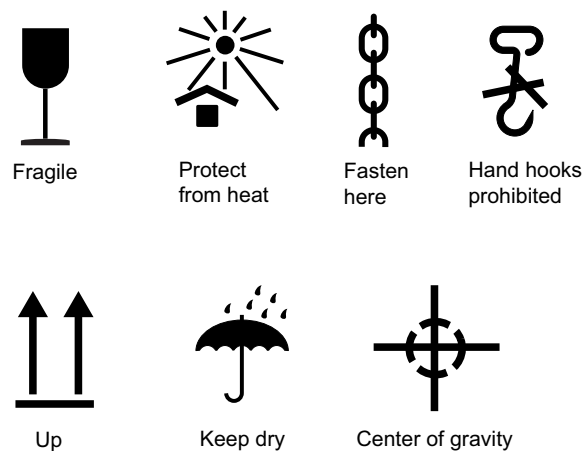
The symbols on the dimension sheet must be observed. They have the following meaning:

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

Symbols	Meaning
	Indicates the position of the air outlet screw .
	Indicates the position of the oil heater .
	Indicates the oil level plug .

2.8 Symbols on the packaging

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



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2.9 Transport

2.9.1 General information



▲ WARNING

Suspended loads can fall.

Severe or fatal injuries.

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



▲ CAUTION

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

Potential risk of crushing due to falling parts.

- Secure the mount-on components.



▲ CAUTION

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

Minor injuries.

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

NOTICE

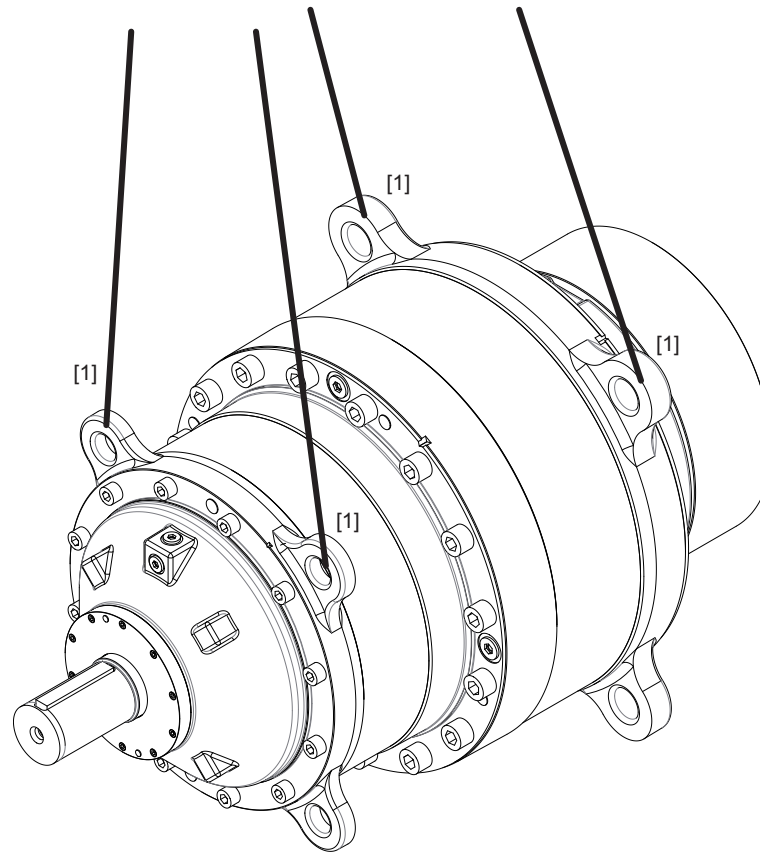
Improper transport can damage the gear unit.

Possible damage to property.

- Observe the following notes.
- Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. It may be necessary to suspend startup.
- The weight of the gear unit (without oil) is indicated on the nameplate or on the dimension sheet. Observe the loads and specifications given there.
- If possible, transport the gear unit without oil fill. If this is not possible, note that the weight indicated on the nameplate refers only to the no-load weight of the gear unit, and replace the breather with a screw plug.

- The gear unit must be transported in a manner that prevents damage to the gear unit and to mount-on components. For example, impacts against exposed shaft ends can damage the gear unit.
- Use only the prescribed suspension points [1] to transport the gear unit (see order documents). The load suspensions of the motor or mount-on components are provided for stabilization purposes only.

The following figure illustrates how to transport the gear unit.



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2.10 Storage and transport conditions

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

2.10.1 Internal conservation

Standard corrosion protection

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

Long-term corrosion protection

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

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

2.10.2 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.

2.10.3 Packaging

Standard packaging

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

Use: Land transport

Long-term packaging

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

Use: Sea transport and/or for extended storage

2.10.4 Storage conditions

NOTICE

Improper storage may result in damages to the gear unit.

Possible damage to property.

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

INFORMATION



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

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

INFORMATION



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

3 Gear unit structure

3.1 Gear unit structure

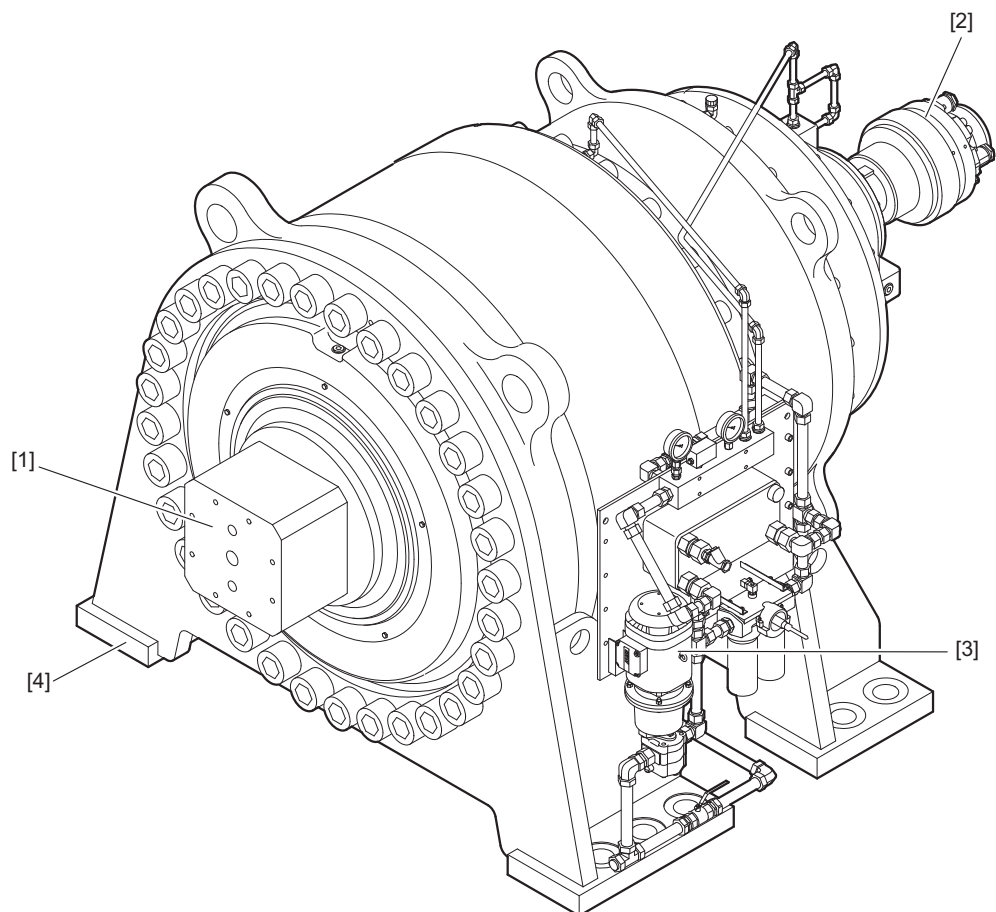
The series consists of 13 sizes of planetary gear units with nominal torques from 600 kNm to 5200 kNm.

As the load is distributed to several planet gears, a significantly higher power density and thus smaller dimensions are possible compared to helical and bevel-helical gear units.

Planetary gear units can have the following options:

- Output shaft as square shaft, as hollow shaft with shrink disk or as solid shaft with keyway
- Foot mounting, flange mounting or torque arm
- Cooling lubrication system
- Articulated shaft
- Safety clutch

The following figure shows an example of a planetary gear unit with squared output shaft, safety clutch, lubrication unit and foot mounting.



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- [1] Squared output shaft
[2] Safety clutch

- [3] Oil-water cooler for pressure lubrication
[4] Foot


3.2 Nameplate

The following example shows the layout of a nameplate.

☐
SEW-EURODRIVE
Indaiatuba/Brasil
☐

Tipo/Type

Nr.

	norm.	min.	max.	i	1:
Pk1 [kW]	<input type="text" value="[4]"/>	<input type="text" value="[5]"/>	<input type="text" value="[6]"/>	Fs	<input type="text" value="[16]"/>
Mk2 [Nm]	<input type="text" value="[7]"/>	<input type="text" value="[8]"/>	<input type="text" value="[9]"/>	FR1 [N]	<input type="text" value="[17]"/>
n1 [1/min]	<input type="text" value="[10]"/>	<input type="text" value="[11]"/>	<input type="text" value="[12]"/>	FR2 [N]	<input type="text" value="[18]"/>
n2 [1/min]	<input type="text" value="[13]"/>	<input type="text" value="[14]"/>	<input type="text" value="[15]"/>	FA1 [N]	<input type="text" value="[19]"/>
Acionar conforme manual				FA2 [N]	<input type="text" value="[20]"/>
Operation instructions have to be observed				Mass [kg]	<input type="text" value="[21]"/>
<input type="text" value="[22]"/>					
Qty of greasing points <input type="text" value="[24]"/>	Fans <input type="text" value="[25]"/>	<input type="text" value="[26]"/>	<input type="text" value="[27]"/>		
 <input type="text" value="[28]"/>				Year	<input type="text" value="[29]"/>
<input type="radio"/> <input type="text" value="[30]"/> <input type="radio"/>					

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[1]	Planetary gear unit type	[16]	Exact gear unit ratio of the gear unit
[2]	(Empty)	[17]	Service factor
[3]	Number of the customer order	[18]	Radial load, input end
[4]	Operating power on the input shaft	[19]	Radial load, output end
[5]	Operating power on the input shaft	[20]	Axial load, input end
[6]	Operating power on the input shaft	[21]	Axial load, output end
[7]	Output torque of the gear unit	[22]	Manufactured in Brazil
[8]	Output torque of the gear unit	[23]	Weight of the gear unit
[9]	Output torque of the gear unit	[24]	Number of lubrication points
[10]	Input speeds	[25]	Number of installed fans
[11]	Input speeds	[26]	(Empty)
[12]	Input speeds	[27]	Mounting position
[13]	Output speeds	[28]	Lubrication type, oil quantity
[14]	Output speeds	[29]	Year of manufacture
[15]	Output speeds	[39]	Number of special design and note

3.3 Type designation

The type designation of the planetary gear unit starts with the component on the output side.

Example: The type designation for a planetary gear unit with 3 stages, hollow output shaft with shrink disk, mounted with torque arm and in size 160.

XP3PS160/B	
XP	XP series industrial gear units
3	Number of stages <ul style="list-style-type: none"> • 1 = 1 stage • 2 = 2 stages • 3 = 3 stages • 4 = 4 stages
P	Gear unit variant <ul style="list-style-type: none"> • P = Planetary gear unit • K = Bevel-planetary gear unit • F = Helical-planetary gear unit
S	Output shaft (LSS) <ul style="list-style-type: none"> • S = Solid shaft with key • H = Hollow shaft with shrink disk • C = Square solid shaft
160	Size <ul style="list-style-type: none"> • 130 to 250
/B	Mounting: <ul style="list-style-type: none"> • B = Foot • F = Flange • T = Torque arm

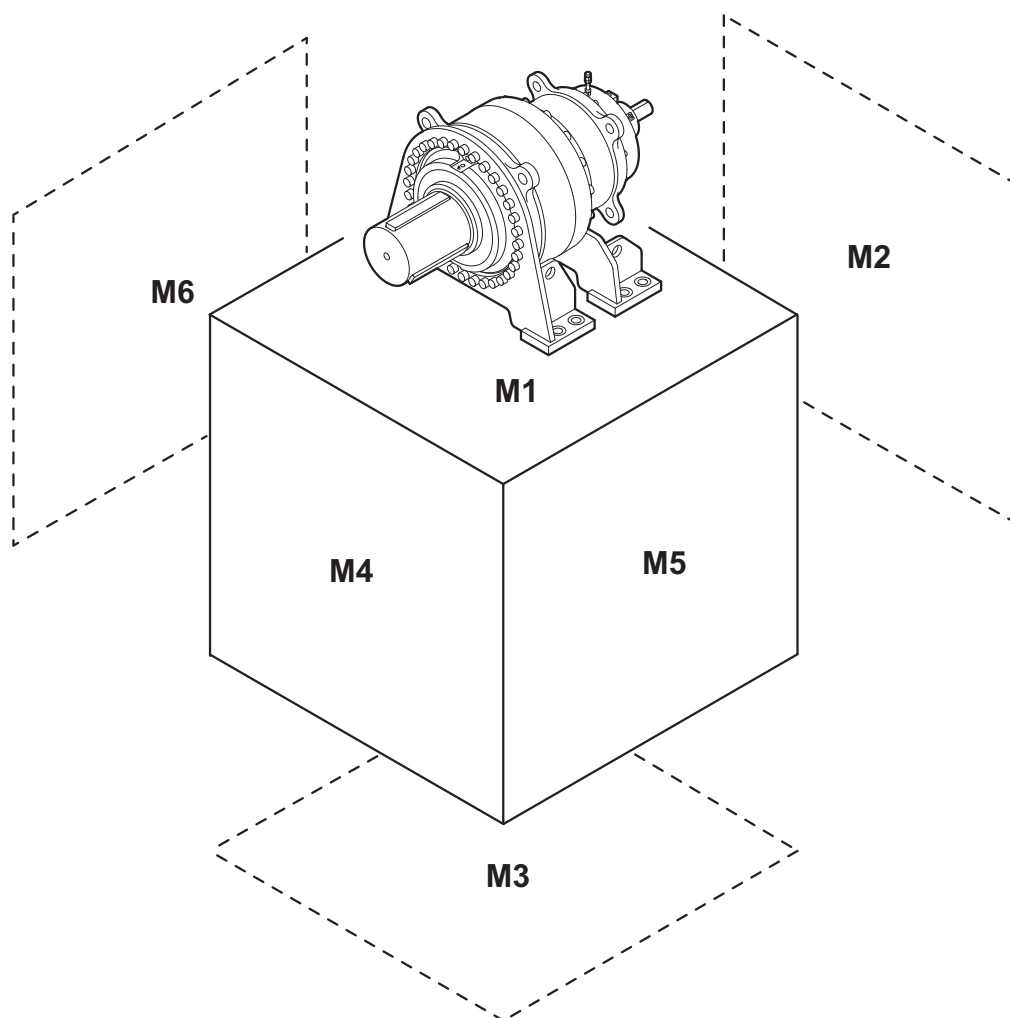
3.4 Type designations of options

Designation	
XP.S.../B	Solid shaft, foot mounting
XP.H.../B	Hollow shaft with shrink disk, foot mounting
XP.C.../B	Square shaft, foot mounting
XP.H.../T	Hollow shaft with shrink disk, torque arm mounting
XP.S.../T	Solid shaft, torque arm mounting
XP.S.../F	Solid shaft, flange mounting
XP.H.../F	Hollow shaft with shrink disk, flange mounting
XP.C.../F	Square shaft, flange mounting

3.5 Mounting positions

The mounting position defines the position of the gear unit housing in the space and is designated **M1**. The mounting positions apply to planetary gear units with solid shafts and hollow shafts.

For other mounting positions, please contact SEW-EURODRIVE.

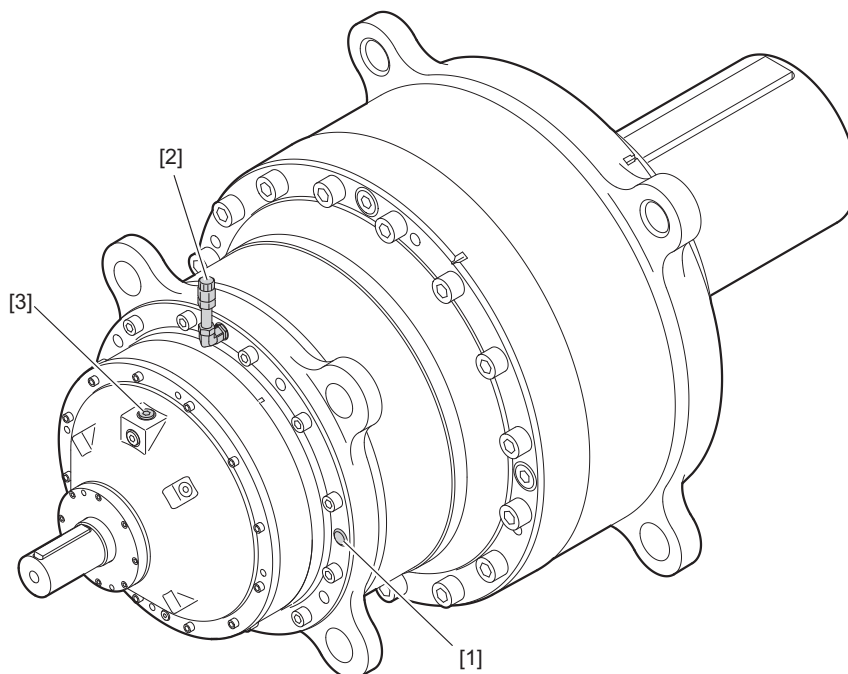


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3.6 Checking the oil level/filling oil

The oil is filled into the gear unit via the riser pipe [2]. As an alternative, the oil can be filled in via the gear unit opening [3].

The oil level is checked via the oil sight glass [1].



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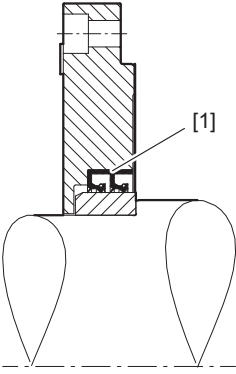
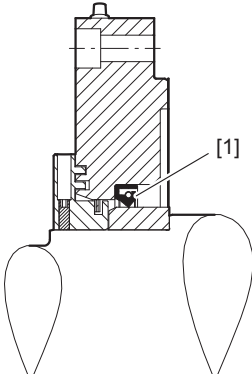
3.7 Lubrication type

The lubrication type depends on the mounting position of the gear unit.

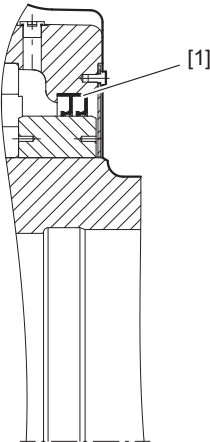
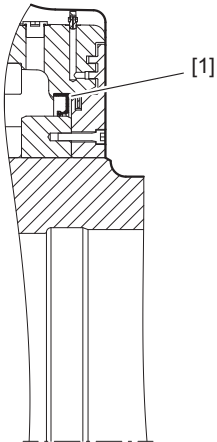
In horizontal mounting position M1, the gear unit is half filled with oil. Gearing and bearing parts that are not immersed in the oil bath are lubricated by splashing oil.

3.8 Overview of sealing systems

Input shaft

Standard	Radial labyrinth seal (Taconite), re-greasable
Two oil seals [1] with dust protection lip on bearing race	Single oil seal [1] on bearing race with radial labyrinth seal
Normal environment	Very dusty environments with abrasive particles
	

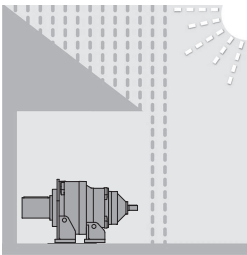
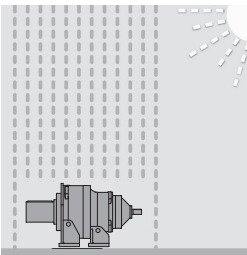
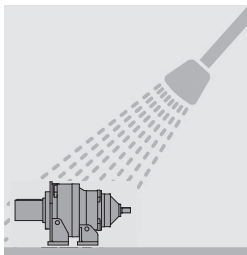
Output shaft

Standard	Radial labyrinth seal (Taconite), re-greasable
Two oil seals [1] with dust protection lip on bearing race	Single oil seal [1] on bearing race with radial labyrinth seal
Normal environment	Very dusty environments with abrasive particles
	

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3.9 Coating and surface protection systems

The following table gives an overview of coating and surface protection systems.

SEW design	OS 1 Low environmental pollution	OS 2 Medium environmental pollution	OS 3 High environmental pollution
Use as surface protection with typical environmental conditions Corrosion categories DIN EN ISO 12944-2	 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. According to corrosivity category: C2 (low)	 Suited for environments with high humidity or moderate atmospheric contamination, such as applications outdoors subject to direct weathering. According to corrosivity category: C3 (moderate)	 Suitable for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasionally acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. According to corrosivity category C4 (high)
Sample applications	<ul style="list-style-type: none"> • Systems in saw mills • Agitators and mixers 	<ul style="list-style-type: none"> • Applications in gravel plants • Cable cars 	<ul style="list-style-type: none"> • Port cranes • Sewage treatment plants • Mining applications
Condensation test ISO 6270	120 h	120 h	240 h
Salt spray test ISO 7253	–	240 h	480 h
Top coat color ¹⁾	RAL 7031	RAL 7031	RAL 7031
Color according to RAL	Yes	Yes	Yes
Uncoated parts, shaft end/flanges	Water and hand perspiration repelling anticorrosion agent applied at the factory for external preservation.		

1) Standard color

INFORMATION

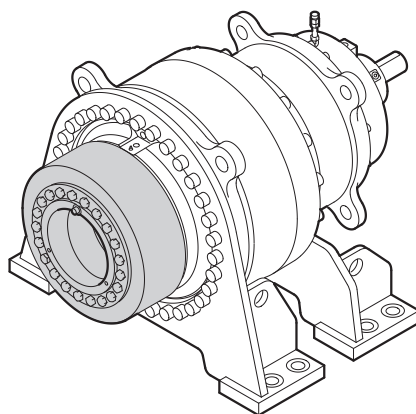


Sheet metal parts (e.g. protection covers, fan guard) are painted in RAL 1003.

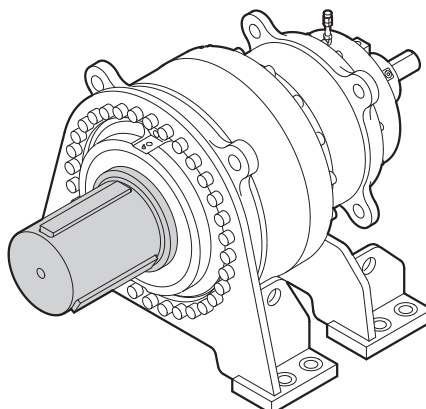
3.10 Output shaft variants

The output shaft can have the following standard designs. Other options are available on request.

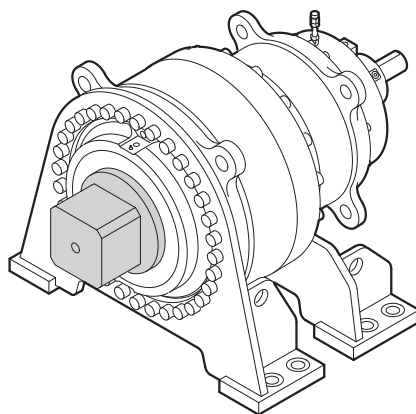
Hollow shaft with shrink disk /H



Solid shaft with key /S



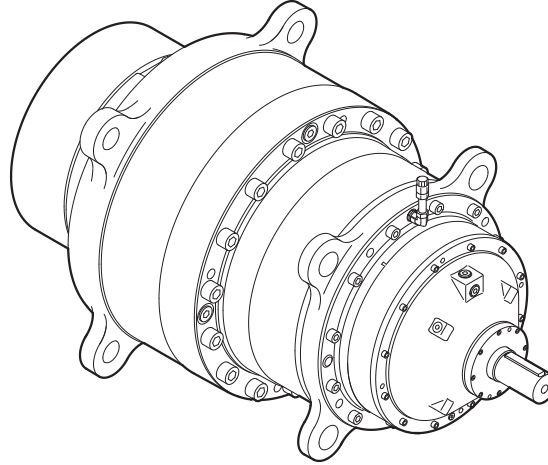
Square shaft /C



3.11 Basic designs

3.11.1 XP..P.: Planetary gear unit with coaxial shaft arrangement

The following gear ratios are possible $i = 22.4 - 3600$

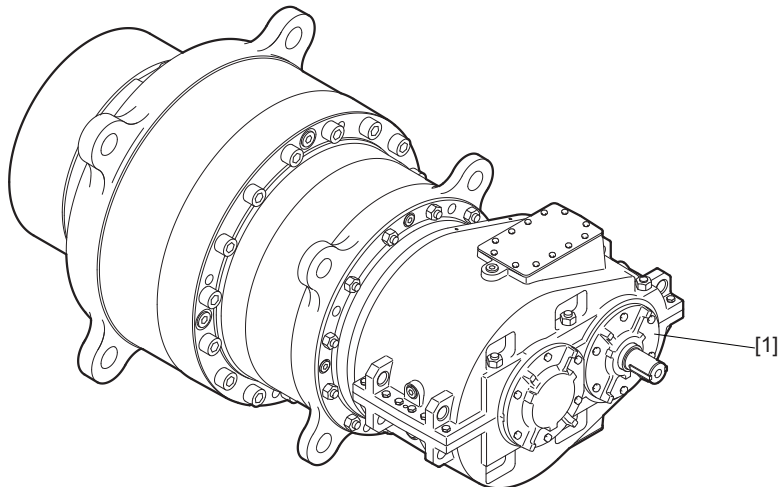


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3.11.2 XP..F: Helical-planetary gear unit with axially shifted shaft arrangement

The preliminary stage [1] is available in the size XP130 – 250

The following gear ratios are possible $i = 45 - 110$

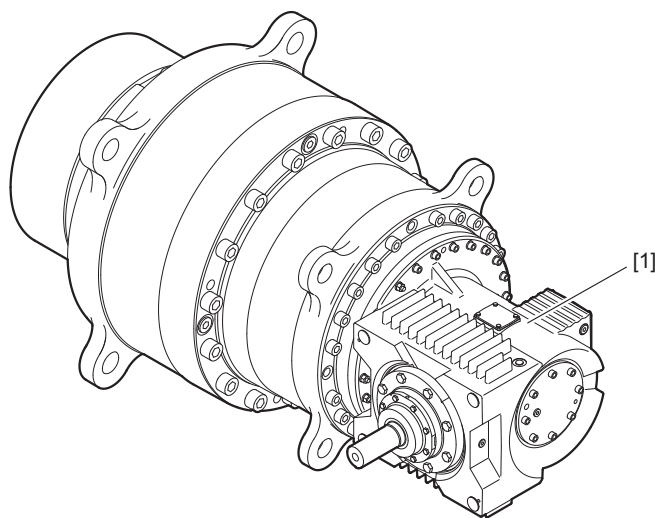


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3.11.3 XP..K: Bevel-planetary gear unit with right-angle shaft arrangement

The preliminary stage [1] is available in the size XP130 – 250

The following gear ratios are possible $i = 180 - 1000$



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4 Structure of options

4.1 Torque arm /T

The torque arm can be mounted according to customer requirements.

The retaining screws are included in the delivery.

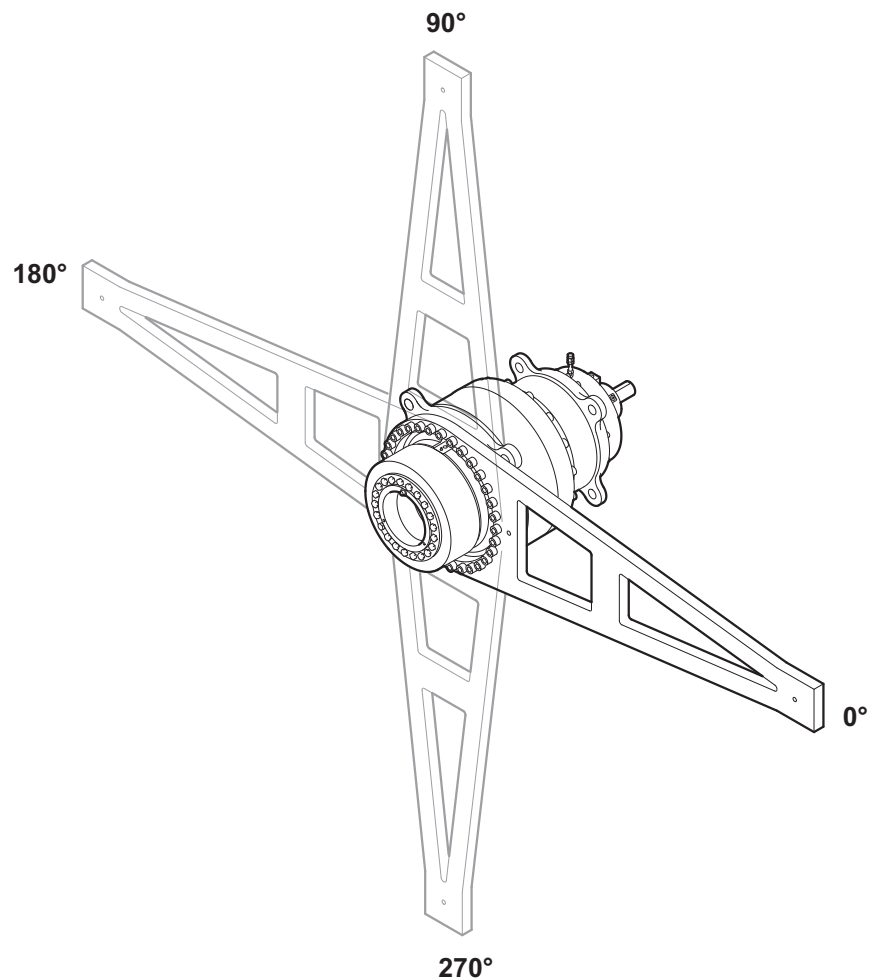
The position of the torque arm is determined as looking onto the output shaft (mounting position 0°, 90°, 180°, 270°).

INFORMATION



Different mounting positions are possible depending on the angle division (number of retaining screws).

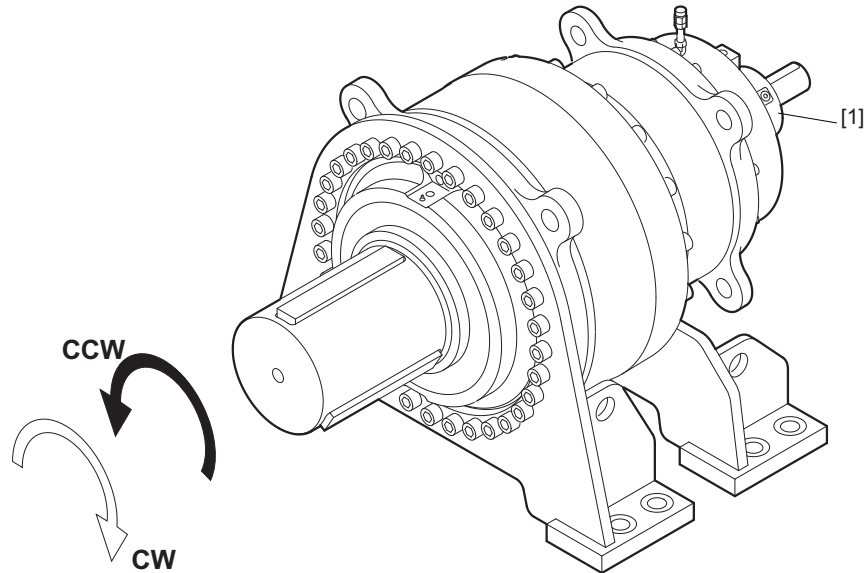
The following figure shows a sample mounting position and combination of a planetary gear unit and a torque arm.



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4.2 Backstop /BS

The backstop is installed in the input cover [1]. The purpose of it is to prevent undesirable reverse rotation. During operation, the backstop permits rotation in only one specified direction of rotation.



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CW Rotation in clockwise direction
 CCW Rotation in counterclockwise direction

4.3 Temperature sensor /PT100

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

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

5 Installation/assembly

5.1 Required tools/resources

Not included in the delivery:

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

5.2 Tolerances

5.2.1 Planetary gear unit

INFORMATION



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

5.3 Important information

Read the following notes prior to installation/mounting.

NOTICE

Improper installation and assembly can damage the gear unit.

Possible damage to property.

- Observe the following notes.

▲ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

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





▲ WARNING

Danger due to mounting in impermissible mounting position.

Severe or fatal injuries.

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



▲ WARNING

Danger due to freely accessible, rotating parts.

Severe or fatal injuries.

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



▲ WARNING

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

Severe or fatal injuries.

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



▲ 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.
- Carefully remove the oil level plug and the oil drain plug.



▲ CAUTION

Danger due to unsecured mount-on components, such as 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.



▲ 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.
- Strictly observe the safety notes in the individual chapters.
- The most important technical data is provided on the nameplate. Additional data relevant for operation is available in drawings, on the order confirmation or any order-specific documentation.
- Planetary gear units are delivered without oil fill as standard.
- Note that the oil quantities on the nameplates are approximate values. The mark on the oil sight glass or oil dipstick is the decisive indicator of 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.
- 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.
- Work on the gear unit only when the machine is not in use. Secure the drive unit against unintentional power-up. Place an information sign near the ON switch to warn that the gear unit is being worked on.
- The oil level plug, oil drain plug, and 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 stainless steel). Also fit the bolts with plastic washers. Always ground the gear unit housing.
- It is important that only authorized personnel is allowed to assemble gear head units with motors and adapters. Contact SEW-EURODRIVE.
- Do not weld anywhere on the drive. Do not use the drive as a ground point for welding work. Welding may destroy gearing parts and bearings.
- Protect rotating drive parts, such as couplings, gears, or belt drives from contact using suitable protection devices.
- Units installed outdoors must be protected from the sun. Suitable protective devices are required, such as covers or roofs. When using protective devices, avoid heat build-up. The operator 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.
- For the standard mounting positions, the breather on planetary gear units is mounted at the factory and activated if the gear unit is supplied without an oil fill. Check the correct mounting and the function of the breather.
- For planetary gear units that are filled with oil at the factory, check to see that the breather is installed before you start up the gear unit.
- 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 the mount-on components without prior consultation of SEW-EURODRIVE.
- Adhere to the safety notes in the individual chapters.

5.4 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.

5.4.1 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).

Replace the breather with a screw plug.

5.5 Gear units delivered without oil fill (standard)

Observe the notes in chapter "Important information" (→ 33).

Planetary gear units are delivered without oil fill as standard. Observe the following notes:



▲ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

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

NOTICE

Improper oil filling may cause damage to the gear unit.

Possible damage to property.

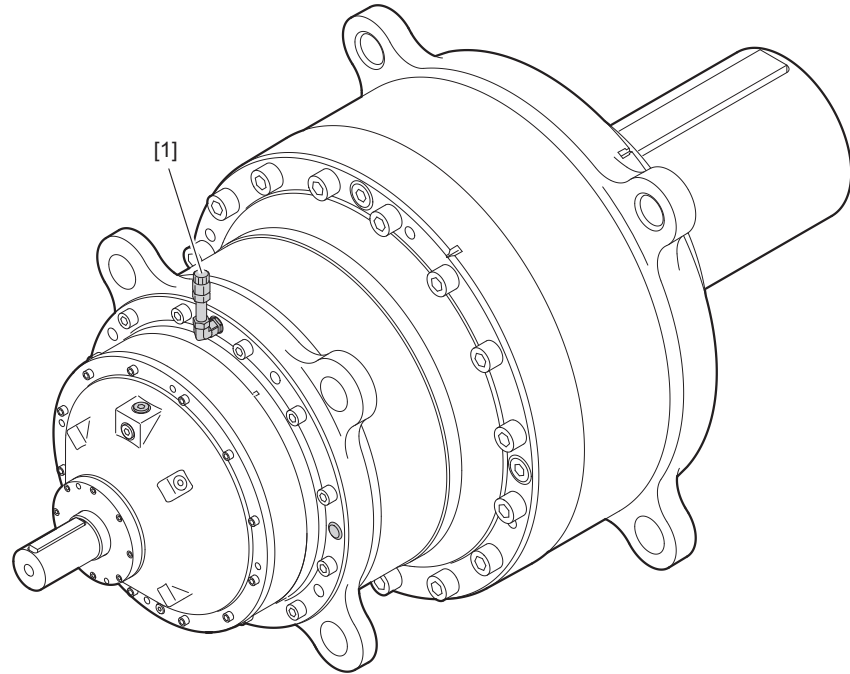
- Observe the following information.
- Fill in the oil when the gear unit is in the intended mounting position.
- Observe the additional notes depending on the lubrication type in the following chapters.
- Fill the gear unit with the oil grade and oil quantity specified on the nameplate. The oil quantity specified on the nameplate is an approximate quantity. The required oil level depends on the respective marks on the oil sight glass. When additional attachments, e.g. an oil supply system, are mounted to the gear unit, the required oil fill quantity is higher. In this case, observe the respective SEW operating instructions: Oil supply system. For more information, refer to chapter "Changing the oil of planetary gear units" (→ 73).
- Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm).
- Check the oil level at the oil sight glass. For additional information, refer to chapter Checking the oil level of the planetary gear unit.

5.6 Gear units delivered with oil fill (option)

Observe the notes in chapter "Important information" (→ 33).

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


The position of the breather is specified in the order documents.



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1. Remove the closing plug.
2. Insert the breather [1].
3. Check the oil level. Observe the information in chapter Checking the oil level of the planetary gear unit.

5.7 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" (→  77)).

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.
-

5.8 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.

5.8.1 Foot-mounted gear units

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

Size	Screw/nut	Tightening torque bolt/nut in Nm Strength class 8.8	Quantity
XP130	M48	6022	8
XP140			
XP150	M56	9650	
XP160			
XP170	M64	14415	
XP180			
XP190	M64	14415	10
XP200			
XP210	M72	20800	
XP220			
XP230	M90	41650	
XP240			
XP250			

INFORMATION



Do not lubricate the bolts connection during assembly.

5.8.2 Tightening torques for retaining screws

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

INFORMATION



The tightening torques do not apply to mounting types like 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
M16	230
M20	464

INFORMATION



Do not lubricate the bolts connection during assembly.

5.8.3 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.

5.9 Gear units with solid shaft



INFORMATION

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

5.9.1 Assembling the input and output components

NOTICE

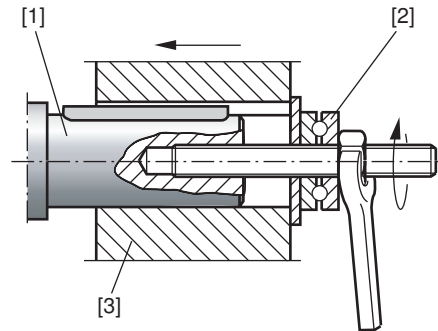
Bearings, housing or shaft may be damaged due to improper assembly.

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 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 or motor shaft ends. Should you be able to tighten the screw without any problems, you may not need the thrust bearing on the mounting device.

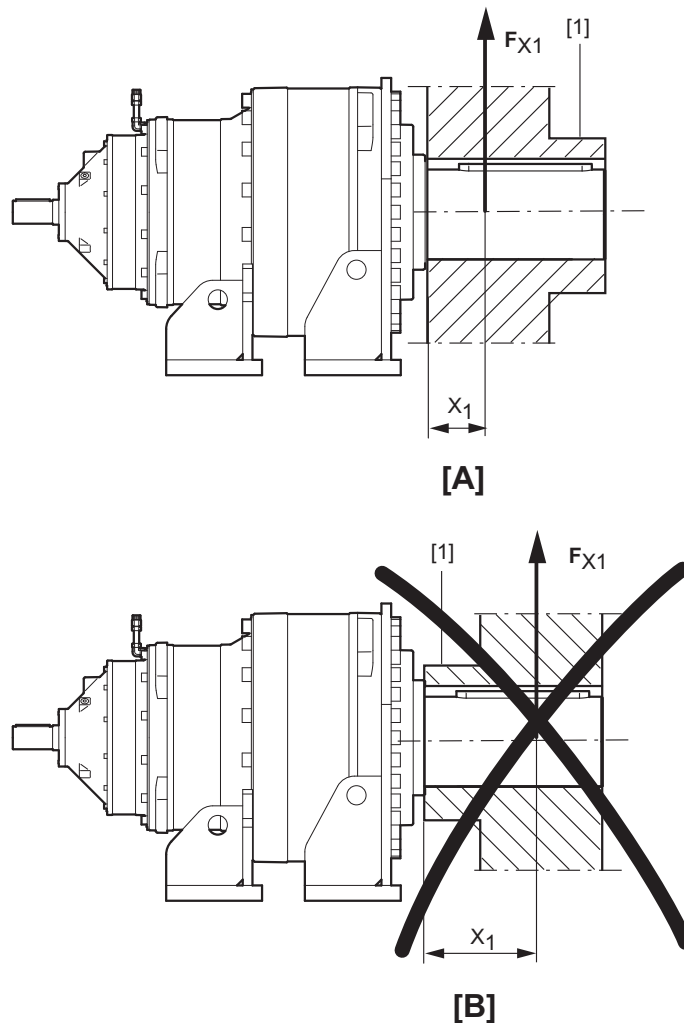


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- [1] Gear unit shaft end
- [2] Thrust bearing
- [3] Coupling hub

Avoid excessive overhung loads

To avoid high overhung loads: Installing the gear or chain sprocket according to figure A if possible.



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

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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).

5.10 Coupling

5.10.1 Mounting tolerances

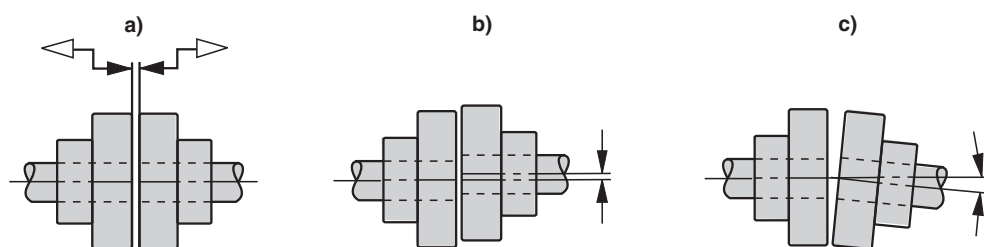


INFORMATION

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

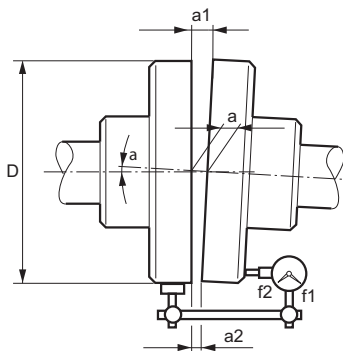
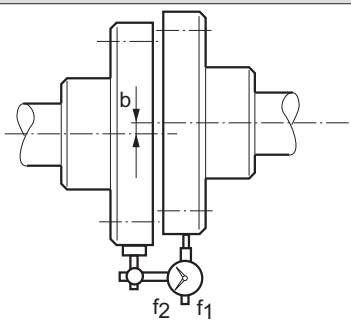


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The following table shows various methods for measuring the differing tolerances.

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>

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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>

5.11 Torque arm

5.11.1 Notes on installation



⚠ WARNING

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

Severe or fatal injuries.

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

NOTICE

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

Possible damage to property.

- Do not deform the torque arm.

NOTICE

Strain on the torque arm might break the housing.

Possible damage to property.

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



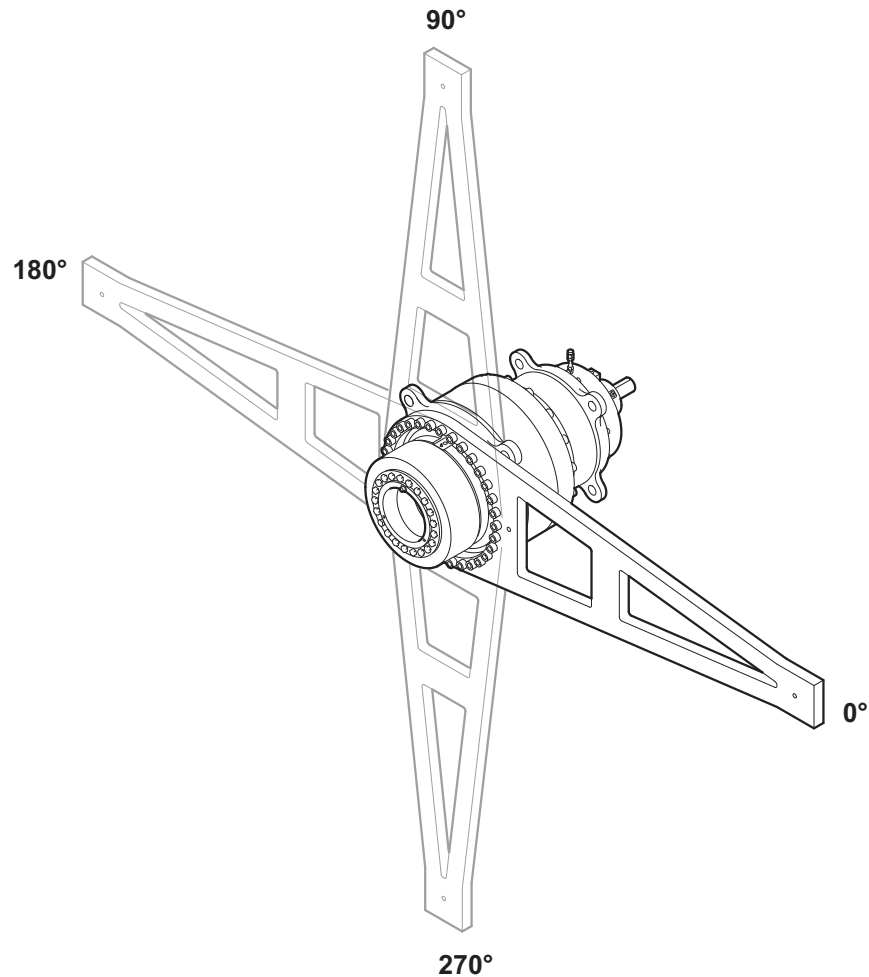
INFORMATION

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

5.11.2 Single-sided torque arm (standard)

Installation situation

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



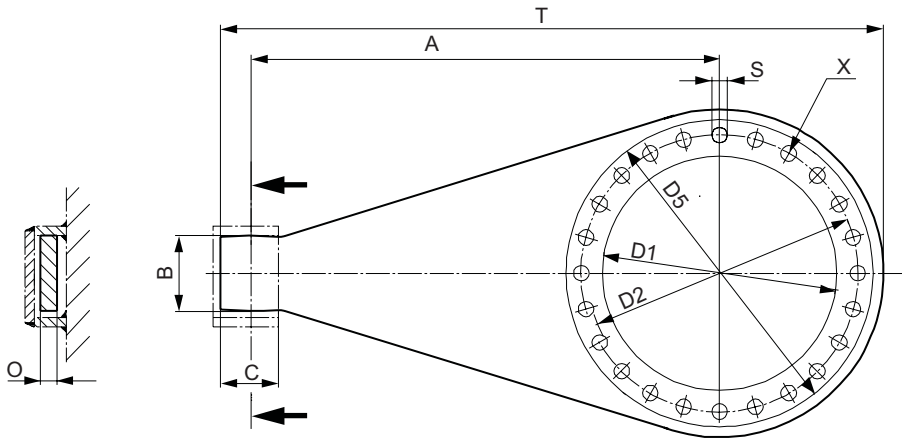
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The reactive force resulting from the gear unit torque is absorbed via the torque arm with lever arm A. The figure on the next page shows an example of a customer fixture in a welded structure. Two supporting plates are welded on the machine design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

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

Dimensions

The following figure shows a sample torque arm with dimensions.



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Size	Dimensions in mm							Quantity	Mass
	A	B	D1	D2	D3	S	T	X	kg
XP130	2000	76	879	955	1035	39	2518	32	600
XP140	2500	76	879	955	1035	45	3018	32	785
XP150	3000	76	884	975	1060	45	3530	32	1000
XP160	3000	76	964	1060	1150	45	3575	32	1060
XP170	4000	76	1054	1150	1250	52	4625	32	1655
XP180	4500	90	1094	1185	1290	52	5145	32	2335
XP190	5500	90	1154	1270	1380	52	6190	32	3095
XP200	6000	101	1254	1380	1490	62	6745	32	4000
XP210	6500	101	1364	1490	1615	70	7308	32	4600
XP220	8000	101	1424	1550	1680	70	8840	32	5970
XP230	8500	101	1484	1600	1730	70	9365	32	6490
XP240	10 000	101	1644	1780	1920	70	10960	32	8400
XP250	10 000	101	1634	1780	1930	86	10965	32	8420

INFORMATION



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

Tightening torques



INFORMATION

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

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

Only use the following tools for the installation:

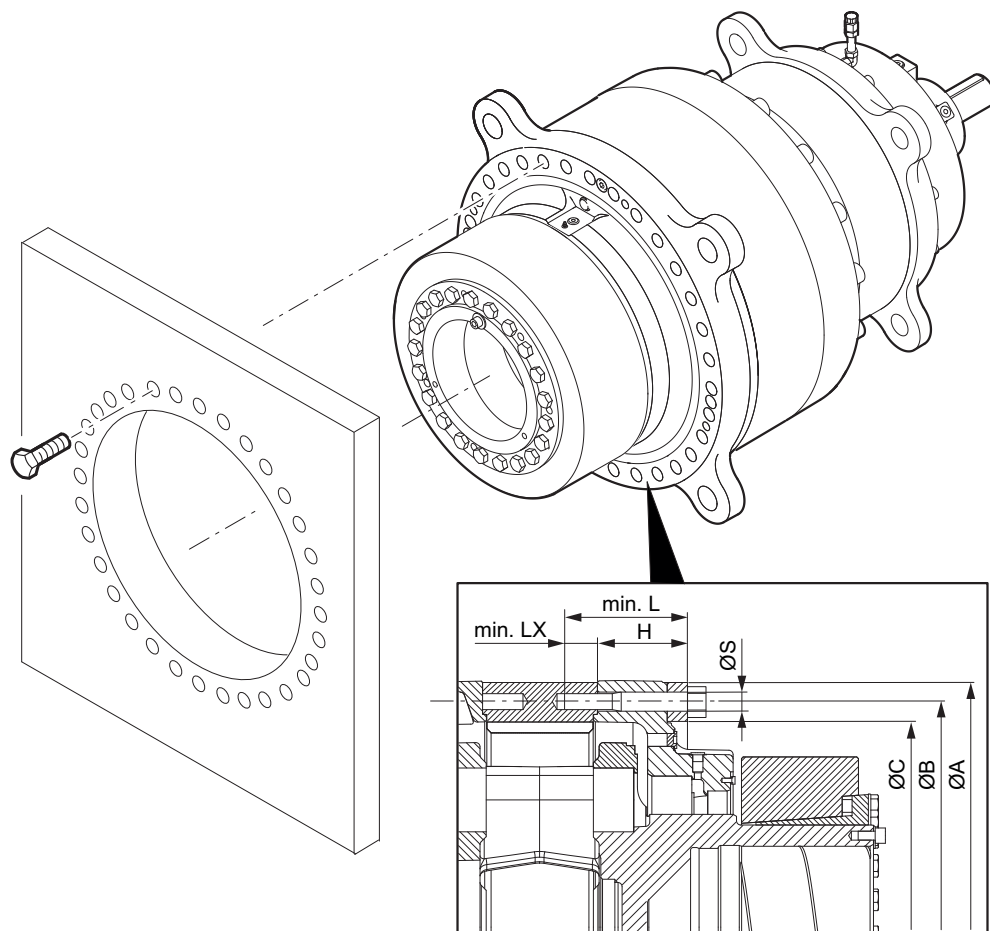
- Signal-generating torque wrench
- Motorized torque wrench with dynamic torque measuring
- Torque-controlled, gradual hydraulic tools

Size	Thread	Quantity	Tightening torque Nm	Strength classes	Screws EN ISO
XP130	M36	32	3957	10.9	4762
XP140	M42	32	5610		
XP150	M42	32	5610		
XP160	M42	32	5610		
XP170	M48	32	8475		
XP180	M48	32	8475		
XP190	M48	32	8475		
XP200	M56	32	13583		
XP210	M64	32	20300		
XP220	M64	32	20300		
XP230	M64	32	20300		
XP240	M64	32	20300		
XP250	M80	32	40700		

5.12 Flange-mounted gear units

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

Retaining screws are not included in the scope of delivery.



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INFORMATION

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

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

The following values in the table apply to steel constructions.

Size	Thread	Quantity	Tightening torque	Dimensions in mm							Strength classes	Screws EN ISO
			Nm	Ø S	H	min. L	min. LX	Ø A	Ø B	Ø C		
XP130	M36	32	3957	39	209	254	45	1035	955	875	10.9	4762
XP140	M42	32	5610	45	215	267	52	1035	955	875		
XP150	M42	32	5610	45	231	283	52	1060	975	880		
XP160	M42	32	5610	45	240	292	52	1150	1060	960		
XP170	M48	32	8475	52	245	305	60	1250	1150	1050		
XP180	M48	32	8475	52	265	325	60	1290	1185	1090		
XP190	M48	32	8475	52	293	353	60	1380	1270	1150		
XP200	M56	32	13583	62	314	384	70	1490	1380	1250		
XP210	M64	32	20300	70	338	418	80	1615	1490	1360		
XP220	M64	32	20300	70	349	429	80	1680	1550	1420		
XP230	M64	32	20300	70	372	452	80	1730	1600	1480		
XP240	M64	32	20300	70	382	462	80	1920	1780	1640		
XP250	M80	32	40700	86	402	502	100	1930	1780	1630		

5.13 Output shaft as hollow shaft with shrink disk

Observe the notes in chapter "Important information" (→ 33).

INFORMATION

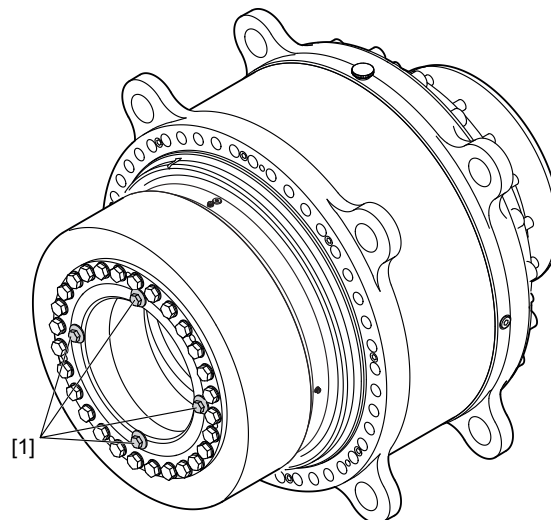


Ensure that the dimensions of the machine shaft correspond to the SEW-EURODRIVE specifications.

INFORMATION



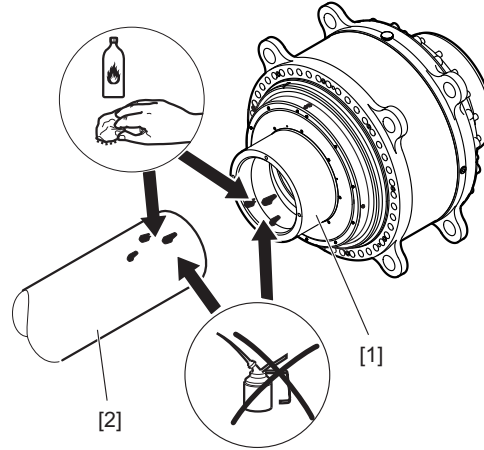
Note that the shrink disk is secured with 4 screws [1] on delivery. Remove the screws prior to assembly.



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5.13.1 Assembly

1. Before installing the shrink disk, clean and degrease the hub [1] and the machine shaft [2]. The clamping area of the shrink disk between the machine shaft [2] and the hollow shaft [1] must remain absolutely free of any grease.



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2. **▲ WARNING!**

The loose shrink disk could slip.

Severe or fatal injuries due to falling parts.

- Secure the shrink disk against slipping.
- Slide the shrink disk onto the hollow shaft.

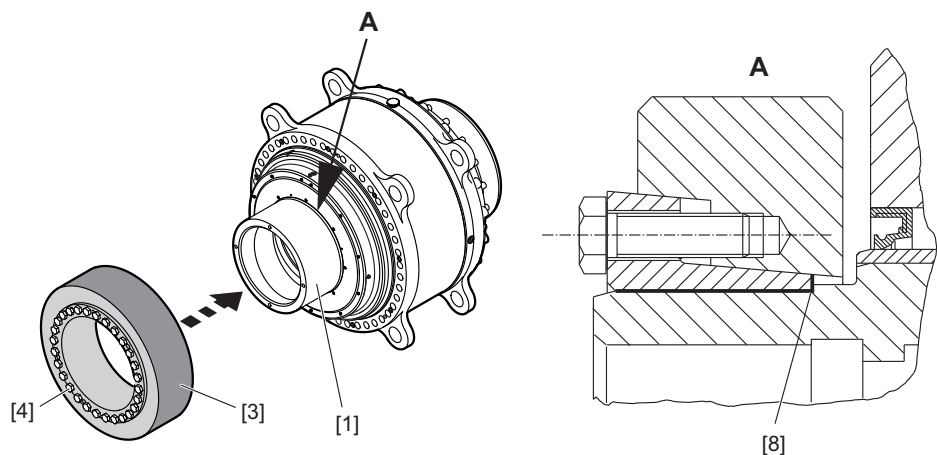
3. **NOTICE!**

Tightening the locking screws [4] without installed shaft might deform the hollow shaft.

Possible damage to property.

- Never tighten the locking screws [4] without the shaft installed [2].

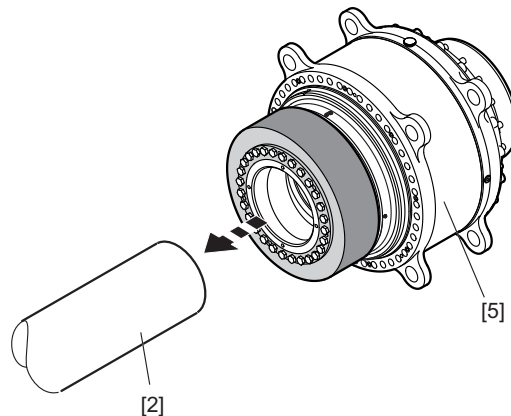
Check the correct position of the shrink disk [3]. The shrink disk is positioned correctly when it is in contact with the shaft shoulder [8].



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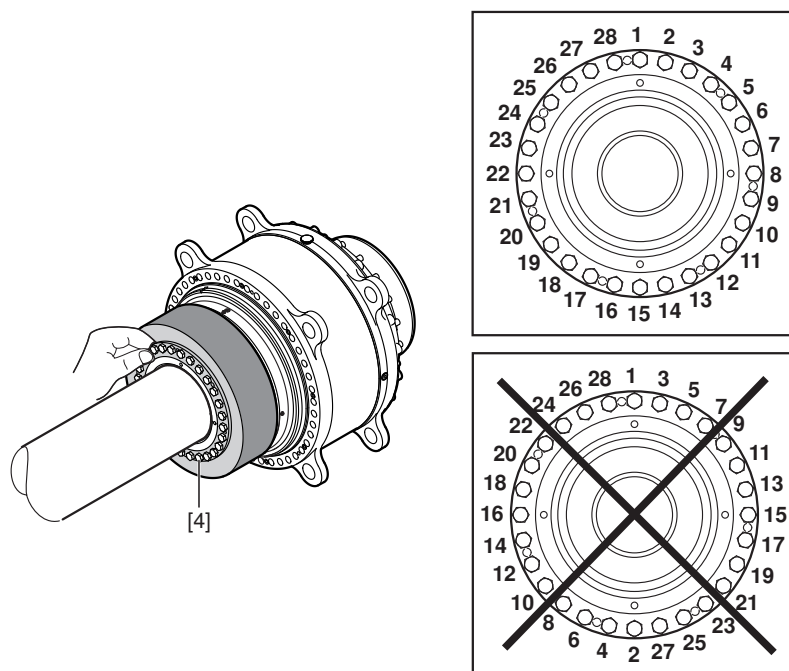
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4. Install the machine shaft [2] or push the gear unit [5] onto the machine shaft [2] until the stop. Carry out the individual installation steps slowly to allow the compressed air to escape around the outside of the shaft.



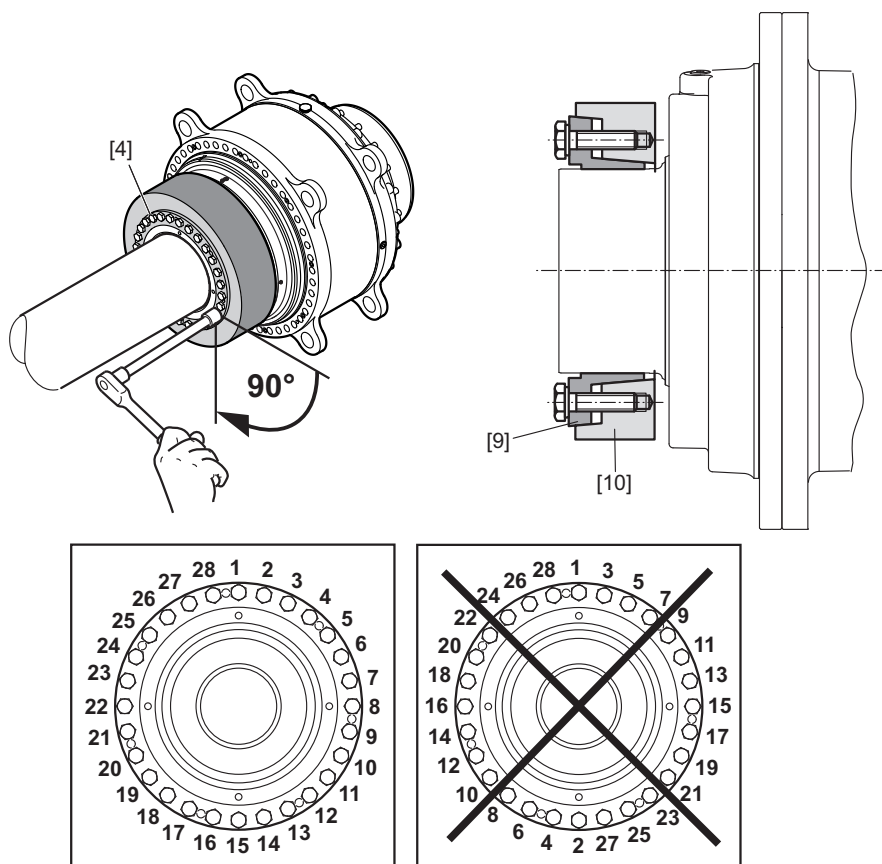
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5. First tighten the locking screws [4] manually. Then tighten all locking screws by working round equally (not in diametrically opposite sequence) in 1/4 turn increments.



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6. Adhere to the tightening torque in the following table. Tighten the locking screws [4] by continuing to work round in 1/4 turns until you reach the tightening torque. The front end surfaces of inner ring [9] and outer ring [10] must not necessarily be flush when the locking screws are tightened.



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Size	Retaining screw	Tightening torque in Nm Strength class 12.9
XP130	M27	1310
XP140 – 180	M30	1800
XP190 – 200	M33	2400
XP210 – 250	M36	3100

5.13.2 Removal

NOTICE

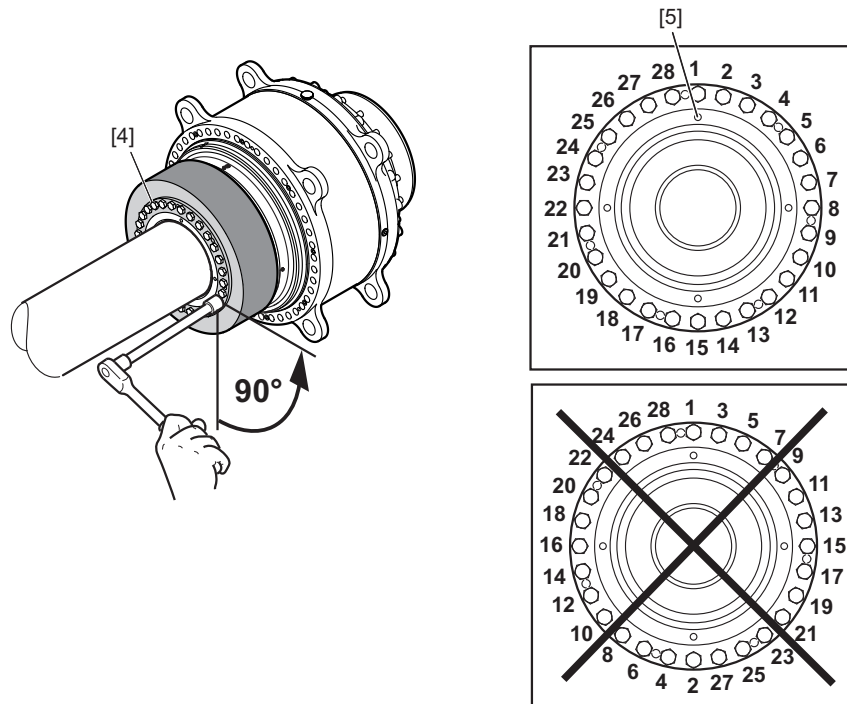
Improper disassembly may damage bearings and other components.

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

1. Loosen the locking screws [4] by a quarter turn one after the other to avoid straining the connecting surface.

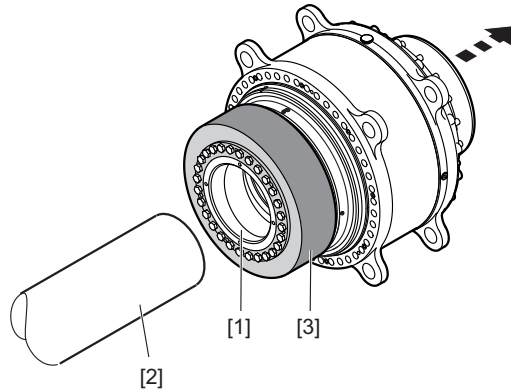
- **NOTE** If the bevel (outer ring) and the taper bushing (inner ring) do not separate by themselves:

Screw the locking screws evenly into the 4 forcing threads [5]. Tighten the locking screws in several steps until the tapered bushing separates from the tapered ring.



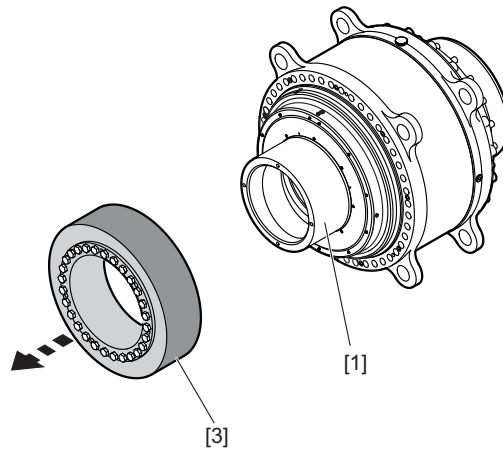
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2. Remove the machine shaft [2] or pull the hub [1] off the customer shaft. If rust has formed on the shaft in front of the hub, you must remove the rust first.



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3. **▲ WARNING!**
The loose shrink disk could slip.
Severe or fatal injuries due to falling parts.
 - Secure the shrink disk against slipping.Remove the shrink disk [3] from the hub [1].



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5.13.3 Cleaning and lubrication

INFORMATION

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

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

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

6 Startup

6.1 Important notes

Read the following notes prior to startup.



▲ CAUTION

Risk of slipping due to lubricant leaking from damaged seals.

Minor injuries.

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



▲ 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.

- Note the following:
 - Before startup, check that the oil level is correct. Refer to the unit's nameplate for lubricant fill quantities.

Check the oil level again after a few operating hours, see chapter Checking the oil level at the planetary gear unit.
 - Planetary gear units are delivered without oil fill as standard.
 - Fill the gear unit with the oil grade specified on the nameplate. The oil quantity specified on the nameplate is an approximate quantity. The required oil level depends on the respective marks on the oil sight glass. For additional information, refer to chapter Checking the oil level at the planetary gear unit and chapter "Changing the oil at the planetary gear unit" (→ 73).

When additional attachments, e.g. an oil supply system, are mounted to the gear unit, the required oil fill quantity is higher. In this case, observe the respective operating instructions "Oil Supply System" by SEW-EURODRIVE.

Check the oil level again after a few operating hours, see chapter Checking the oil level at the planetary gear unit.
- 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.
- Prior to startup, make sure the monitoring devices (pressure switch, temperature switch etc.) are fully operational.
- Ensure that all retaining screws are tight after the gear unit has been installed.
- 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.
- Ensure that rotating shafts as well as couplings are equipped with suitable protective covers.
- 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 motors, frequency inverters, etc. must be grounded separately.
- For 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 you start up the unit, make sure the monitoring devices are functioning properly.
- Adhere to the safety information in the individual chapters.

6.2 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.

6.3 Backstop

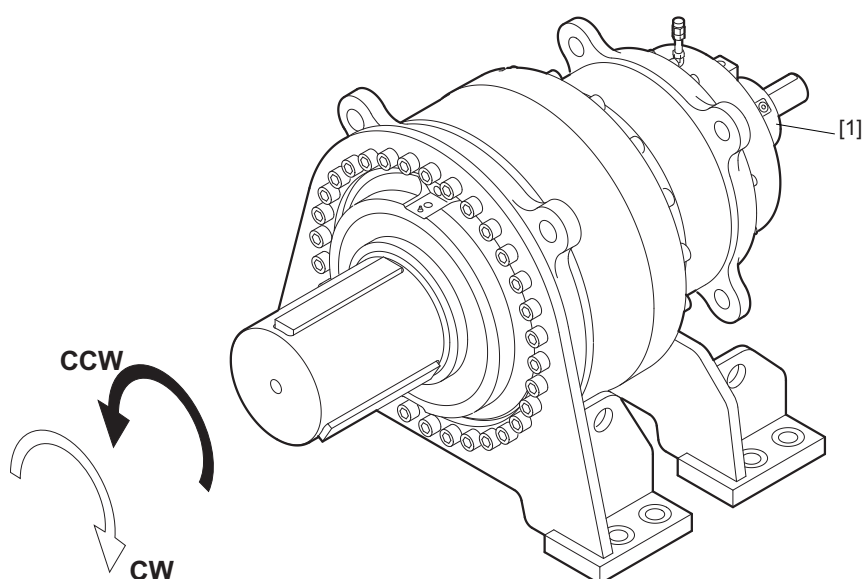
NOTICE

Operation in blocking direction might destroy the backstop.

Possible damage to property.

- The motor may not be operated in blocking direction. Ensure a correct voltage supply to the motor, so that it rotates in the required direction.
- The backstop can be operated in blocking direction with half the output torque once for control purposes.

The backstop is installed in the input cover [1]. The purpose of it is to prevent undesirable reverse rotation. During operation, the backstop permits rotation in only one specified direction of rotation.



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CW Rotation in clockwise direction

CCW Rotation in counterclockwise direction

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

- CW rotation
- CCW rotation

The permitted direction of rotation is indicated on the housing.

6.4 Startup of gear units with long-term protection

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

6.4.1 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.
-

6.4.2 Breather

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

6.5 Gear unit shutdown/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.

6.5.1 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 of planetary gear units" (→ 73). The inside of the gear unit can then be conserved as described above.

INFORMATION



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

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

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


6.5.2 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" (→  18). This chapter provides information on the possible storage periods in conjunction with adequate packaging – depending on the storage location.

Refer to the chapter "Startup" (→  60) before re-starting the gear unit.

7 Inspection/maintenance

7.1 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

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

Severe or fatal injuries.

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



▲ WARNING

Danger due to using impermissible gear unit oil.

Severe or fatal injuries.

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



▲ WARNING

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

Serious injury.

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



▲ 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.
- Observe the tightening torques.
- Replace any damaged seals.
- Use only original spare parts according to the delivered spare and wearing parts lists.
- Prevent foreign bodies from entering into the gear unit during the following work.
- Never clean the gear unit with a high-pressure cleaning system. Water might enter the gear unit and the seals might be damaged.
- Perform a safety check and functional check following all maintenance and repair work.
- Adhere to the safety notes in the individual chapters.

7.2 Inspection and maintenance intervals

7.2.1 XP.. planetary gear unit

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 gear unit noise
<ul style="list-style-type: none"> Monthly 	<ul style="list-style-type: none"> Check the gear unit for signs of leakage Checking the oil level
<ul style="list-style-type: none"> After 500 hours of operation 	<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"> Depending on the operating conditions, at least every 6 months 	<ul style="list-style-type: none"> Fill regreasable sealing systems with grease
<ul style="list-style-type: none"> Depending on the operating conditions, at least every 12 months 	<ul style="list-style-type: none"> Check whether retaining screws are tightly secured Clean the oil filter, replace filter element if necessary 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, every 3 years at the latest 	<ul style="list-style-type: none"> Change mineral oil
<ul style="list-style-type: none"> Depending on the operating conditions, at the latest 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"> Touch up or renew the surfaces/anticorrosion coating

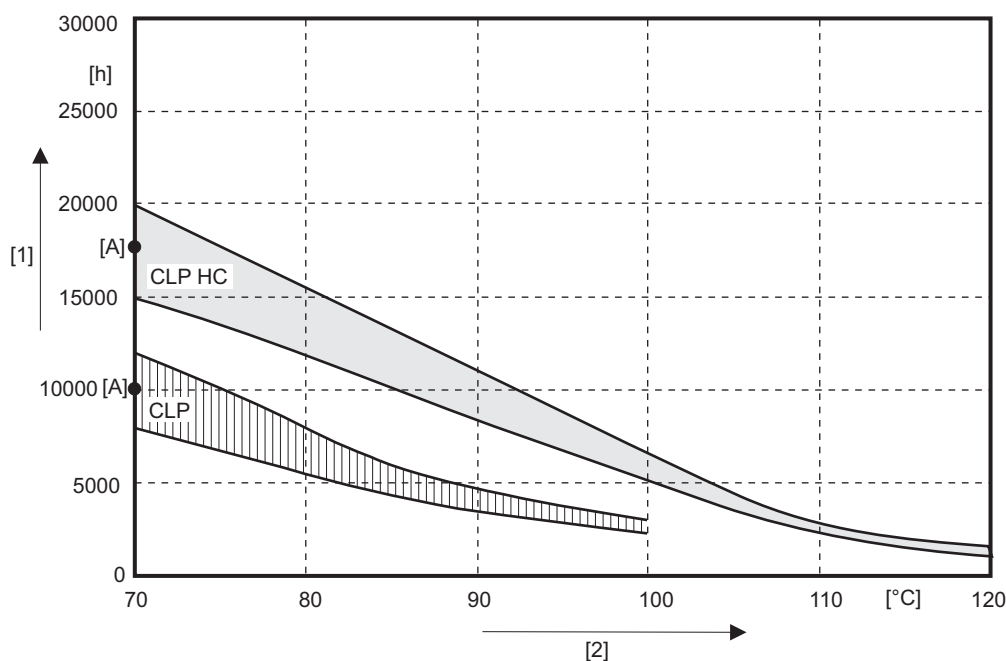
7.3 Lubricant change intervals

Change the oil more frequently when using special designs subject to 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.



- [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" (→ 72)) to optimize the lubricant change intervals.

7.4 Check oil level

7.4.1 General information



NOTICE

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

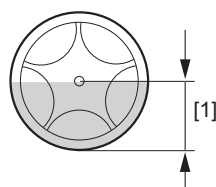
Possible damage to property.

- Check the oil level only when the gear unit has cooled down.
- Check the oil level again after a few operating hours.

7.4.2 Oil sight glass

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 67).

1. Check the oil level on the oil sight glass as shown in the following figure.



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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 up to the mark [1].
- Screw in the oil fill plug.

INFORMATION



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

7.5 Check the oil consistency

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→  67).

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.

7.6 Oil change

7.6.1 Notes

Observe the following when changing the oil.



▲ WARNING

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

Serious injury.

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

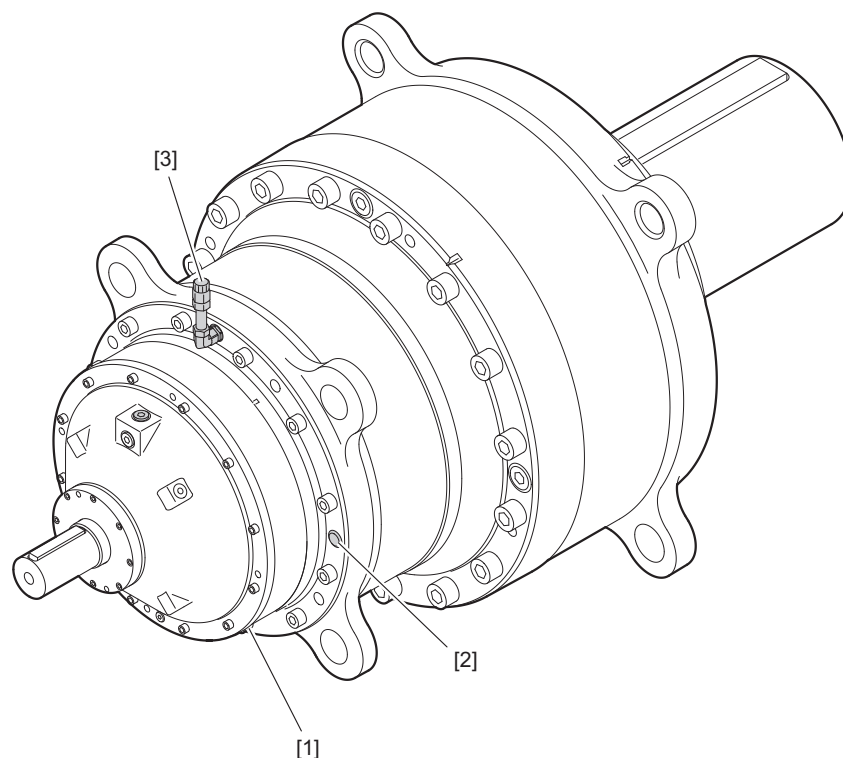
NOTICE

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

Possible damage to property.

- Observe the following information.
- Perform the oil change quickly after you have switched off the gear unit to prevent solids from settling. You should drain the oil while it is still warm. Avoid oil temperatures well above 50 °C.
- Always fill the gear unit with the same oil grade as before. Mixing oils of different grades and/or manufacturers is not permitted. Synthetic oils in particular must not be mixed with mineral oils or other synthetic oils. When switching from mineral oil and/or when switching from synthetic oil of one basis to synthetic oil of another basis, thoroughly flush the gear unit with the new oil grade.
Refer to the lubricant table for information on the permitted oil of the various lubricant manufacturers.
- Information such as the oil grade, oil viscosity and required oil quantity is given on the nameplate of the gear unit. 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.
- When changing the oil, flush the gear unit interior thoroughly with oil to remove oil sludge, oil residue, and abrasion. Use the same oil grade you use to operate the gear unit. Fill in fresh oil only after all residues have been removed. When additional attachments, e.g. an oil supply system, are mounted to the gear unit, the required oil fill quantity is higher. In this case, observe the respective SEW operating instructions: Oil supply system.
- For the position of the oil level plug, oil drain plug and breather plug, refer to the order documents.
- Clean the magnetic oil drain plugs, if applicable.
- Replace any damaged gaskets of the oil drain plug.
- Use a filling filter to fill the oil into the gear unit (max. filter mesh 25 µm).
- Remove any dripping oil immediately with oil binding agent.
- Dispose of the used oil in accordance with applicable regulations.

7.6.2 Procedure



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Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 67).

1. Place a suitable container underneath the oil drain [1].
2. Remove the oil fill plug(s) [3]/breather.
3. Open the oil drain valve [1] and drain all the oil into the container.
4. Close the oil drain valve [1].
5. Fill in new oil of the same grade through the oil filling hole [3].
 - 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 required oil quantity depends on the respective marks on the oil sight glass [2], see chapter Checking the oil level.
6. Re-insert the oil fill plug(s) [3]/breather.

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7.7 Refilling sealing grease



▲ WARNING

Risk of crushing due to rotating parts.

Severe or fatal injuries.

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

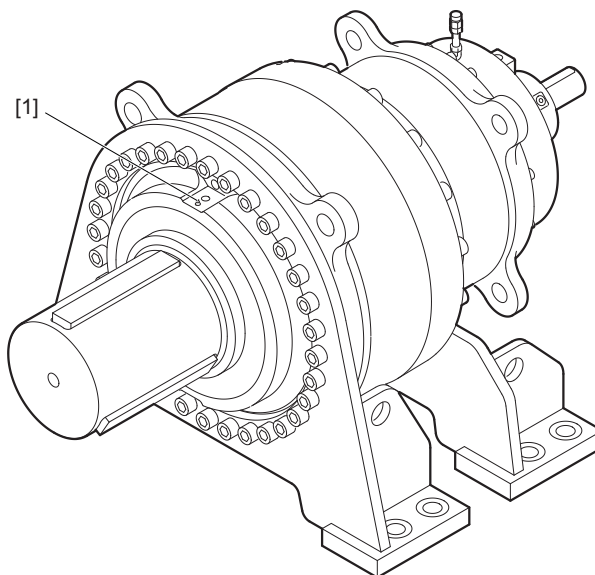


INFORMATION

Turn the shaft slowly when you relubricate the labyrinth seal. Doing so provides for a better grease distribution.

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 67).

1. Use moderate pressure to force grease into each lubrication point [1] until grease leaks out of the sealing gap.



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INFORMATION

Immediately remove the old grease that leaked out.

7.8 Checking and cleaning the breather

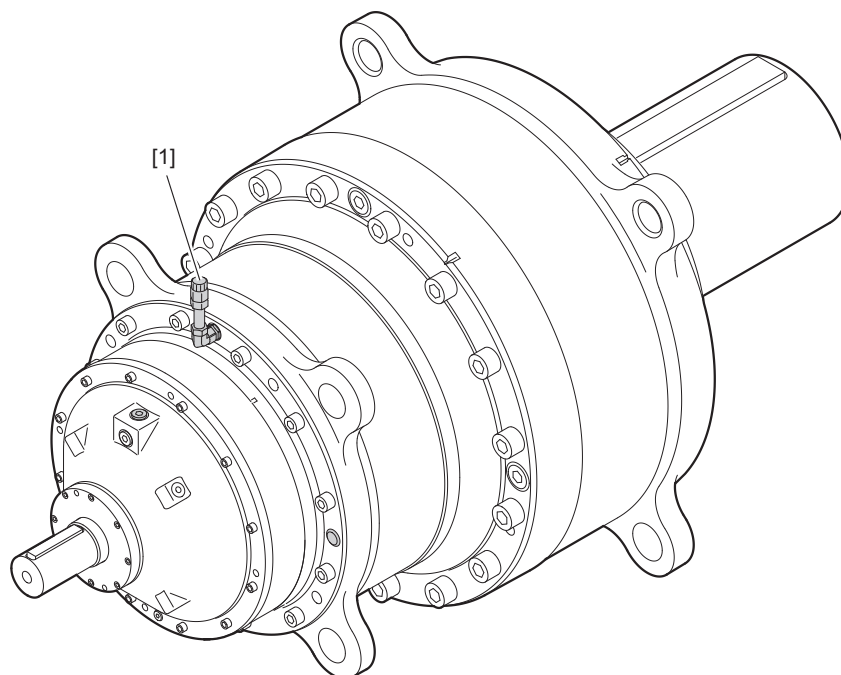
**NOTICE**

Improper cleaning may result in damages to the gear unit.

Possible damage to property.

- Prevent foreign objects from entering into the gear unit.

Observe the notes in chapter "Preliminary work regarding inspection and maintenance" (→ 67).



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

8 Permitted lubricants

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

8.1 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.

8.2 Structure of the tables and abbreviations





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

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[1] Viscosity class

[2] Lubricant type

Abbreviations

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

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

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

8.4 Lubricant tables

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

DIN (ISO) API	ISO, SAE NLGI	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
CLP	VG 150 ¹⁾	-20 -5 +65	-20 -5 +65	-20 -5 +65	-20 -5 +65	-20 -5 +65	-20 -5 +65	-15 0 +75
		Optigear BM 150	Alpha SP 150	Renolin CLP 150 Plus	Renolin HighGear 150	Mobilgear 600 XP 150	Kluberoil GEM 1-150 N	Meropa 150
		SO	SO	SO	SO	SO	SO	SO
		-15 0 +10	-15 0 +10	-15 0 +10	-15 0 +10	-15 0 +10	-15 0 +10	-15 0 +10
	VG 220	Optigear BM 220	Alpha SP 220	Renolin CLP 220 Plus	Renolin HighGear 220	Mobilgear 600 XP 220	Kluberoil GEM 1-220 N	Shell Omala Oil F 220
		SO	SO	SO	SO	SO	SO	SO
		-10 +5 +15	-10 +5 +15	-10 +5 +15	-10 +5 +15	-10 +5 +15	-10 +5 +15	-10 +5 +15
		Optigear BM 320	Alpha SP 320	Renolin CLP 320 Plus	Renolin HighGear 320	Mobilgear 600 XP 320	Kluberoil GEM 1-320 N	Shell Omala Oil F 320
	VG 320	SO	SO	SO	SO	SO	SO	SO
		-5 +10 +20	-5 +10 +20	-5 +10 +20	-5 +10 +20	-5 +10 +20	-5 +10 +20	-5 +10 +20
		Optigear BM 460	Alpha SP 460	Renolin CLP 460 Plus	Renolin HighGear 460	Mobilgear 600 XP 460	Kluberoil GEM 1-460 N	Shell Omala Oil F 460
		SO	SO	SO	SO	SO	SO	SO
	VG 680	0 +15 +25	0 +15 +25	0 +15 +25	0 +15 +25	0 +15 +25	0 +15 +25	0 +15 +25
		Optigear BM 680	Alpha SP 680	Renolin CLP 680 Plus	Renolin HighGear 680	Mobilgear 600 XP 680	Kluberoil GEM 1-680 N	Meropa 680
		SO	SO	SO	SO	SO	SO	SO
		+5 +20 +30	+5 +20 +30	+5 +20 +30	+5 +20 +30	+5 +20 +30	+5 +20 +30	+5 +20 +30
	VG 1000	Optigear BM 1000	Alpha SP 1000	Renolin CLP 1000 Plus	Renolin HighGear 1000	Mobilgear 600 XP 1000	Kluberoil GEM 1-1000 N	Meropa 1000
		SO	SO	SO	SO	SO	SO	SO
		-5 +10 +20	-5 +10 +20	-5 +10 +20	-5 +10 +20	-5 +10 +20	-5 +10 +20	-5 +10 +20
		Optigear BM 1000	Alpha SP 1000	Renolin CLP 1000 Plus	Renolin HighGear 1000	Mobilgear 600 XP 1000	Kluberoil GEM 1-1000 N	Meropa 1000

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

DIN (ISO) API	ISO,SAE NLGI	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
CLP HC	VG 32 ¹⁾			<div> <div>-40</div> <div>+30</div> <div>SHC 624</div> <div>S0</div> </div>				
	VG 68 ¹⁾		<div> <div>-35</div> <div>+50</div> <div>Renolin Unisyn CLP 68</div> <div>S0</div> </div>	<div> <div>-40</div> <div>+50</div> <div>SHC 626</div> <div>S0</div> </div>	<div> <div>-35</div> <div>+50</div> <div>Klübersynth GEM 4-68 N</div> <div>S0</div> </div>	<div> <div>-40</div> <div>+50</div> <div>Omala S4 GX 68</div> <div>S0</div> </div>		
	VG 150 ¹⁾	<div> <div>-25</div> <div>+70</div> <div>Alphasyn EP 150</div> <div>S0</div> </div>	<div> <div>-30</div> <div>+70</div> <div>Renolin Unisyn CLP 150</div> <div>S0</div> </div>	<div> <div>-35</div> <div>+75</div> <div>SHC Gear 150</div> <div>S0</div> </div>	<div> <div>-25</div> <div>70</div> <div>Klübersynth GEM 4-150 N</div> <div>S0</div> </div>	<div> <div>-30</div> <div>+75</div> <div>Omala S4 GX 150</div> <div>S0</div> </div>	<div> <div>-25</div> <div>+70</div> <div>Pinnacle EP 150</div> <div>S0</div> </div>	<div> <div>-35</div> <div>+75</div> <div>Carter SH 150</div> <div>S0</div> </div>
	VG 220	<div> <div>-25</div> <div>+80</div> <div>Alphasyn EP 220</div> <div>S0</div> </div>	<div> <div>-25</div> <div>+80</div> <div>Renolin Unisyn CLP 220</div> <div>S0</div> </div>	<div> <div>-30</div> <div>+85</div> <div>SHC Gear 220</div> <div>S0</div> </div>	<div> <div>-25</div> <div>+80</div> <div>Klübersynth GEM 4-220 N</div> <div>S0</div> </div>	<div> <div>-25</div> <div>+85</div> <div>Omala S4 GX 220</div> <div>S0</div> </div>	<div> <div>-25</div> <div>+80</div> <div>Pinnacle EP 220</div> <div>S0</div> </div>	<div> <div>-25</div> <div>+80</div> <div>Carter SH 220</div> <div>S0</div> </div>
	VG 320	<div> <div>-20</div> <div>+90</div> <div>Alphasyn EP 320</div> <div>S0</div> </div>	<div> <div>-20</div> <div>+90</div> <div>Renolin Unisyn CLP 320</div> <div>S0</div> </div>	<div> <div>-25</div> <div>+95</div> <div>SHC Gear 320</div> <div>S0</div> </div>	<div> <div>-20</div> <div>+95</div> <div>Klübersynth GEM 4-320 N</div> <div>S0</div> </div>	<div> <div>-20</div> <div>+95</div> <div>Omala S4 GX 320</div> <div>S0</div> </div>	<div> <div>-20</div> <div>+90</div> <div>Pinnacle EP 320</div> <div>S0</div> </div>	<div> <div>-20</div> <div>+90</div> <div>Carter SH 320</div> <div>S0</div> </div>
	VG 460	<div> <div>-15</div> <div>+100</div> <div>Alphasyn EP 460</div> <div>S0</div> </div>	<div> <div>-15</div> <div>+100</div> <div>Renolin Unisyn CLP 460</div> <div>S0</div> </div>	<div> <div>-15</div> <div>+105</div> <div>SHC Gear 460</div> <div>S0</div> </div>	<div> <div>-15</div> <div>+105</div> <div>Klübersynth GEM 4-460 N</div> <div>S0</div> </div>	<div> <div>-15</div> <div>+105</div> <div>Omala S4 GX 460</div> <div>S0</div> </div>	<div> <div>-15</div> <div>+100</div> <div>Pinnacle EP 460</div> <div>S0</div> </div>	<div> <div>-15</div> <div>+100</div> <div>Carter SH 460</div> <div>S0</div> </div>
	VG 680	<div> <div>-10</div> <div>+110</div> <div>Optigear Synthetic X 680</div> <div>S0</div> </div>	<div> <div>-10</div> <div>+110</div> <div>Renolin Unisyn CLP 680</div> <div>S0</div> </div>	<div> <div>-15</div> <div>+110</div> <div>SHC Gear 680</div> <div>S0</div> </div>	<div> <div>-10</div> <div>+110</div> <div>Klübersynth GEM 4-680 N</div> <div>S0</div> </div>	<div> <div>-10</div> <div>+110</div> <div>Omala S4 GX 680</div> <div>S0</div> </div>	<div> <div>-10</div> <div>+110</div> <div>Pinnacle EP 680</div> <div>S0</div> </div>	<div> <div>-10</div> <div>+110</div> <div>Carter SH 680</div> <div>S0</div> </div>
	VG 1000			<div> <div>-10</div> <div>+110</div> <div>SHC Gear 1000</div> <div>S0</div> </div>	<div> <div>0</div> <div>+110</div> <div>Klübersynth EG4-1000</div> <div>S0</div> </div>			

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

DIN (ISO) API	ISO, SAE NLGI				
CLP HC NSF H1	VG 68 ¹⁾	-35	-40	-35	-35
		-20	-25	-20	-20
		-10	-15	-10	-10
		+45	+45		+45
		Cassida Fluid HF 68	Optileb HY 68		Klüberoil 4UH1-68 N
	VG 220 ¹⁾	S0	S0		S0
		-20	-25		-25
		-5	-5		-5
		+5	+5		+5
		Cassida Fluid GL 220	Optileb GT 220		Klüberoil 4UH1-220 N
VG 460 ¹⁾	VG 460 ¹⁾	S0	S0		S0
		-15	-15		-15
		+5	+5		+5
		+20	+20		+15
		+90	+95		+95
	VG 460 ¹⁾	Cassida Fluid GL 460	Optileb GT 460		Klüberoil 4UH1-460 N
		S0	S0		S0
E	VG 460				
	VG 460				

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8.5 Lubricant fill quantities

The specified fill quantity are guide values for gear units in coaxial design. The exact values depend on the number of stages and the gear ratio of the gear unit.

The required oil quantity depends on the mark on the oil sight glass.

INFORMATION



The gear units are supplied without lubricant.

8.5.1 XP2.P.: 2-stage planetary gear unit

Size	Oil quantity in liters/mounting position M1
XP130	90
XP140	100
XP150	115
XP160	135
XP170	160
XP180	170
XP190	245
XP200	265
XP210	Contact SEW-EURODRIVE.
XP220	
XP230	
XP240	
XP250	

8.5.2 XP3.P.: 3-stage planetary gear unit

Size	Oil quantity in liters/mounting position M1
XP130	97
XP140	105
XP150	120
XP160	145
XP170	170
XP180	182
XP190	260
XP200	285
XP210	390
XP220	415
XP230	475
XP240	550
XP250	660

8.5.3 XP4.P.: 4-stage planetary gear unit

Size	Oil quantity in liters/mounting position M1
XP130	115
XP140	125
XP150	145
XP160	170
XP170	200
XP180	215
XP190	305
XP200	330
XP210	450
XP220	480
XP230	550
XP240	635
XP250	765

8.5.4 XP3F.: 3-stage helical-planetary gear unit



Size	Oil quantity in liters/mounting position M1
XP130	110
XP140	120
XP150	135
XP160	160
XP170	190
XP180	205
XP190	290
XP200	315
XP210	430
XP220	560
XP230	525
XP240	605
XP250	730

8.5.5 XP4K.: 4-stage bevel-planetary gear unit

Size	Oil quantity in liters/mounting position M1
XP130	112
XP140	120
XP150	145
XP160	170
XP170	200
XP180	212
XP190	300
XP200	325
XP210	450
XP220	475
XP230	550
XP240	625
XP250	740

8.6 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
	Mobile	Moliux 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) Grease used by the factory should be preferred.

INFORMATION



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

9 Malfunctions/remedy

9.1 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.

9.2 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

9.3 Gear unit malfunctions

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)
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 screw Retighten the fitting and screw
Main drive does not start	<ul style="list-style-type: none"> Wrong direction of rotation, motor rotates in blocking direction of the overrunning clutch Overload at the output side Overrunning clutch blocked (cage with sprags of the overrunning clutch not installed correctly or overrunning clutch defective) Main drive defective 	<ul style="list-style-type: none"> Change the direction of rotation of the motor (switch 2 phases) Reduce load Install cage of the overrunning clutch the other way around (180°) or replace it Repair motor in a specialist workshop

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).

9.4 Waste disposal

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

- Steel scrap
 - Housing parts

- Gears
- Shafts
- Rolling bearing
- Collect waste oil and dispose of it according to the regulations in force.

10 Address list

Algeria			
Sales	Algiers	REDUCOM Sarl 16, rue des Frères Zaghroune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 http://www.reducom-dz.com info@reducom-dz.com
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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
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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
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Bangladesh			
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Belarus			
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Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue de 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
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	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
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