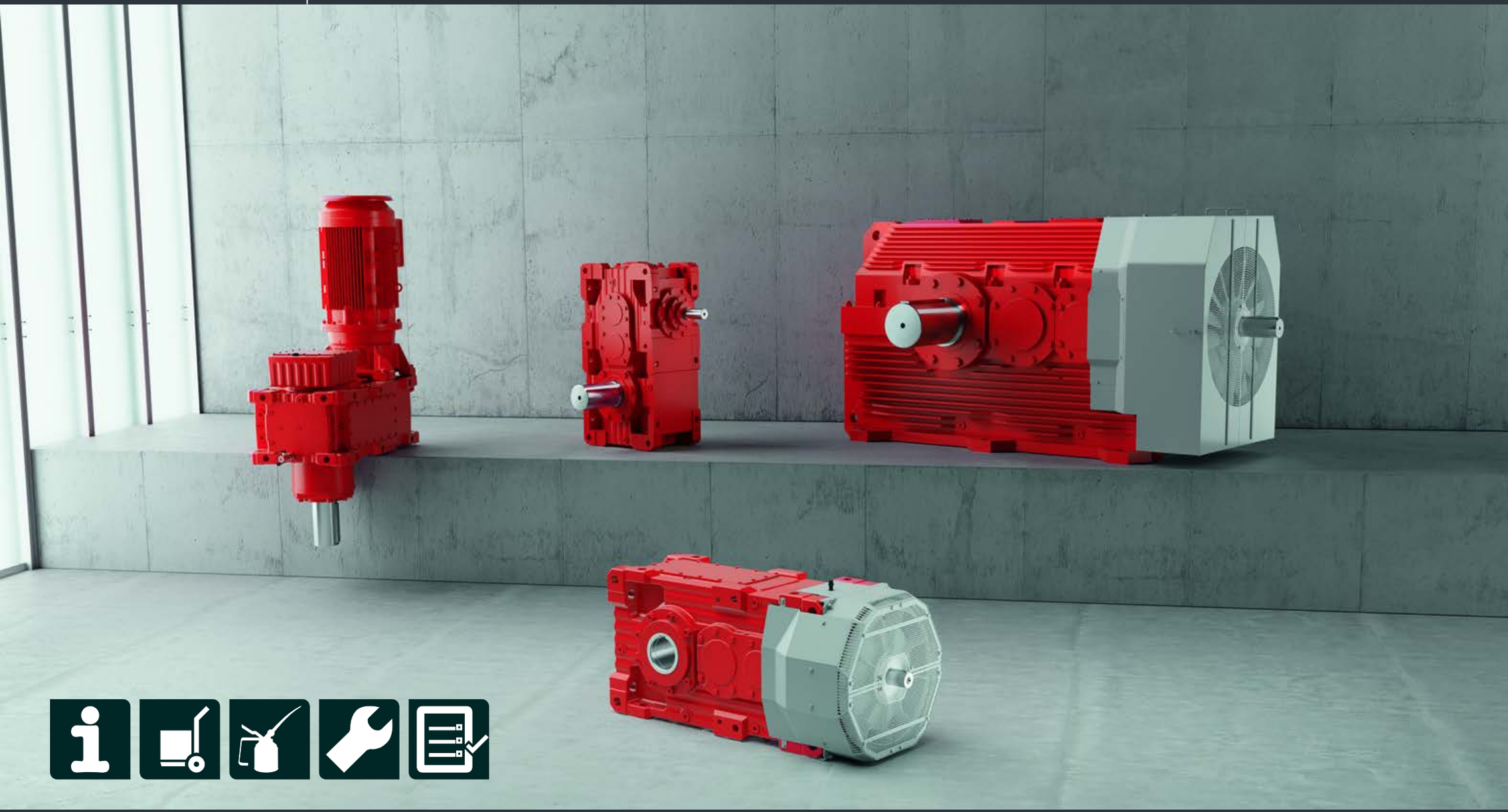
SEW-EURODRIVE Easy Guide

Edition 09/2023
30593069 / EN



Industrial gear units

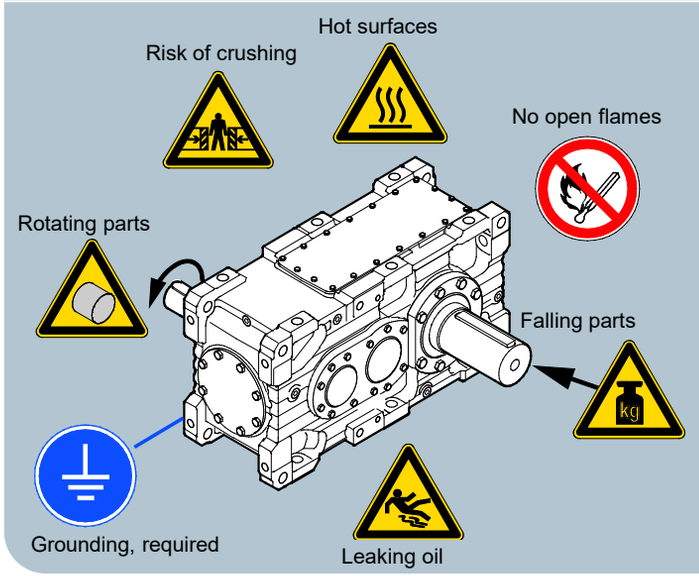
X..e Series Helical and Bevel-Helical Gear Units

X..e industrial gear unit series

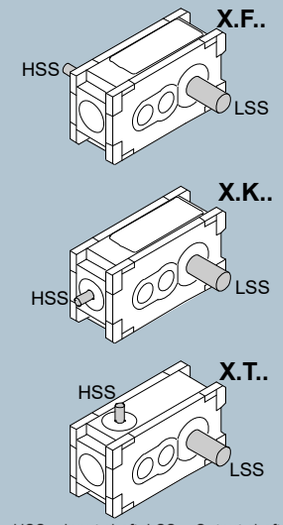
Gear unit structure

The displayed illustrations are examples.

1 Safety notes

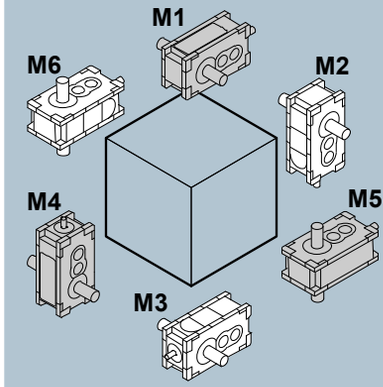


2 Gear unit designs

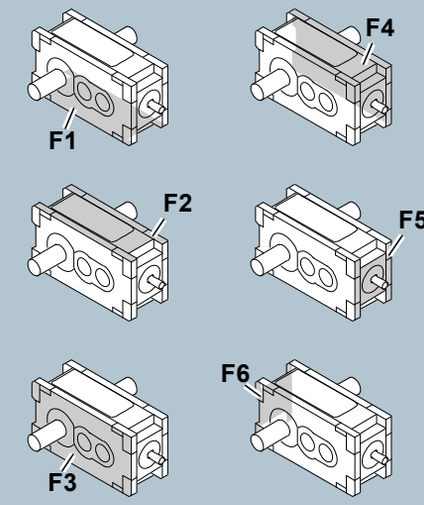


HSS = Input shaft LSS = Output shaft

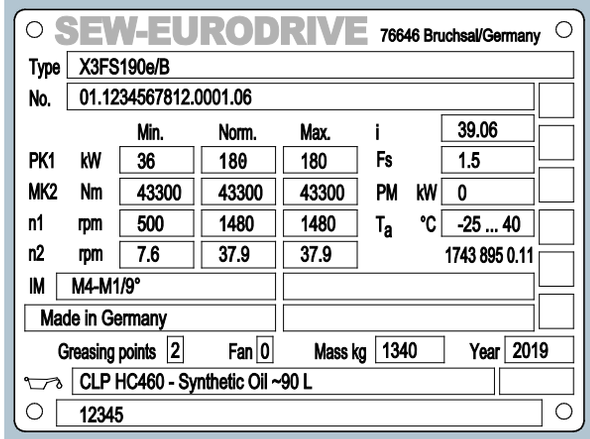
3 Mounting positions



4 Mounting surfaces



5 Nameplate



Type	Type designation
No.	Serial number
PK1	Operating power on the input shaft (HSS)
MK2	Gear unit output torque
n1	Input speed (HSS)
n2	Output speed (LSS)
i	Exact gear unit ratio
Fs	Service factor
PM	Nominal motor power
T_a	Deviation from the standard temperature range
IM	Mounting position and mounting surface
Greasing points	Number of greasing points
Fan	Fan
Mass	Gear unit weight
Year	Year of manufacture
	Oil type / Viscosity / Oil quantity
12345	Additional text, e.g. service number

6 Safety symbols on the gear unit

- Oil dipstick
- Oil filling opening
- Oil drain opening
- Temperature sensor
- Breather
- Greasing points
- Grease drain
- Water return/connection
- Water supply/connection
- Oil return/connection
- Oil supply/connection
- Hot surfaces
- Risk of burns due to gear unit oil
- Brake not set at factory

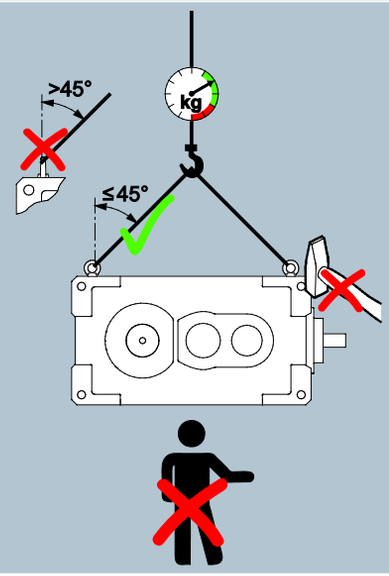
⚠ ATTENTION!
This document does not replace the detailed, applicable operating instructions.

X..e industrial gear unit series

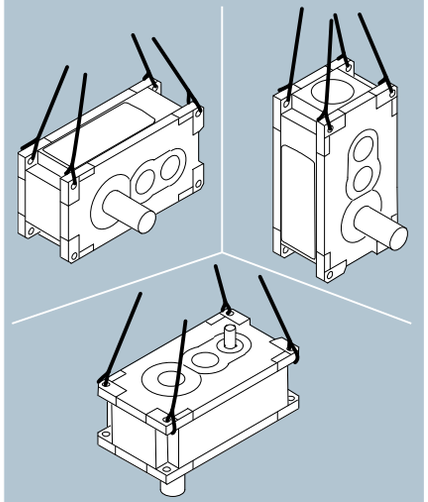
Lifting and moving/setting up

The displayed illustrations are examples.

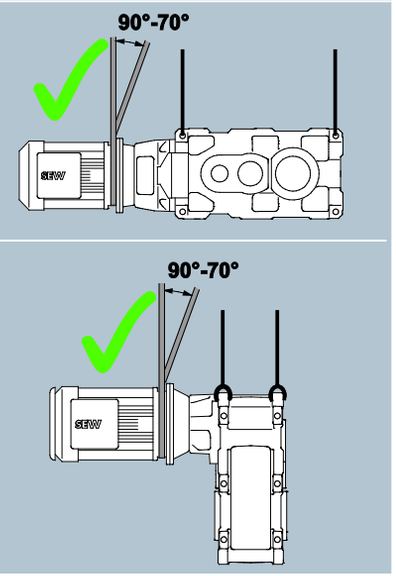
1 Transport Information



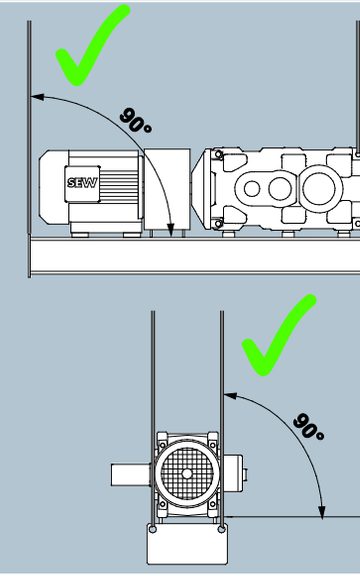
2 Transport Loading points



3 Transport Motor adapter

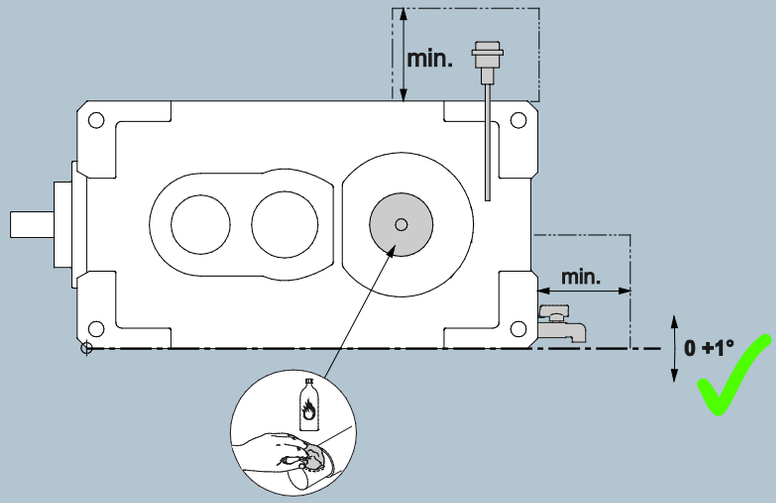


4 Transport Swing base

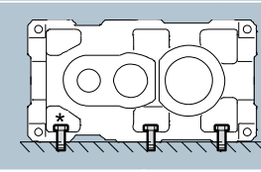


5 Gear unit installation Information

Observe the information specified on the dimension sheet



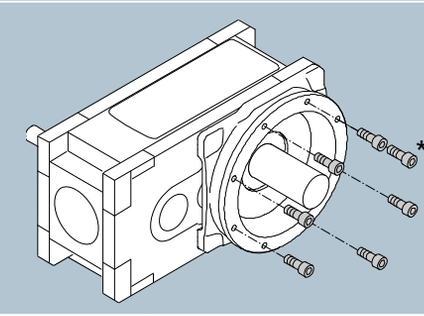
6 Gear unit installation Foot mounting



Size	Screws*	Tightening torque Nm Strength class 8.8
X100 – 110	M20	460
X120 – 130	M24	795
X140 – 150	M30	1590
X160 – 170	M36	2770
X180 – 190	M36	2770
X200 – 230	M42	4410
X240 – 280	M48	6650
X290 – 320	M56	10600

* Screws are not included in the scope of delivery.

7 Gear unit installation Mounting flange



Screws*	Tightening torque Nm Strength class 10.9
M12	135
M16	330
M20	645
M24	1120

* Screws are not included in the scope of delivery.

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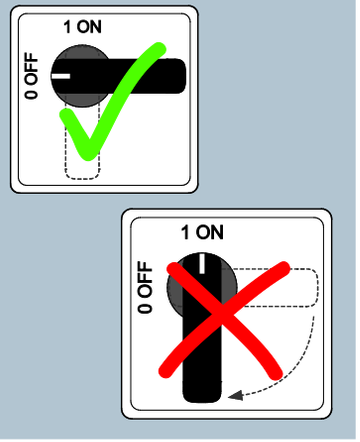
X..e industrial gear unit series

First filling prior to startup

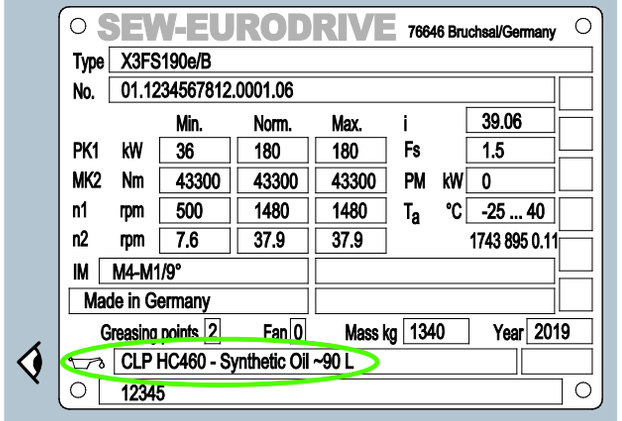
The displayed illustrations are examples.

1 Before you switch on

Before switching on the drive for the first time, you have to fill the gear unit with oil.

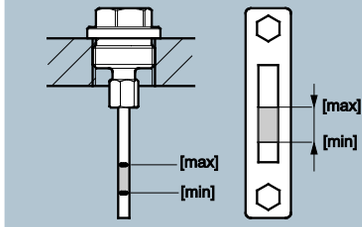


2 Oil type/oil quantity



3 Check the oil level

The oil quantity on the nameplate is an approximate value. Check the exact oil level using the oil dipstick or by checking the oil level glass.

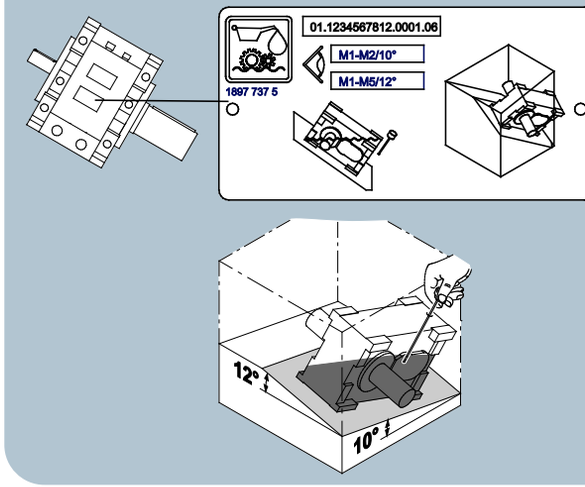


Video instructions

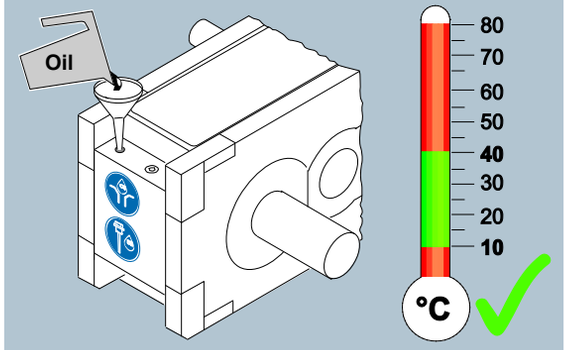
German English

4 Check the oil level in pivoted mounting position (option)

The required mounting position for the oil level check is specified on an additional information sign.



5 Fill in the oil

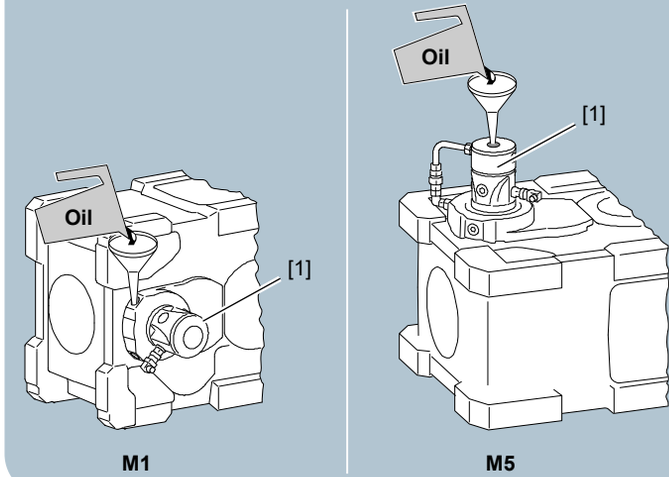


Video instructions

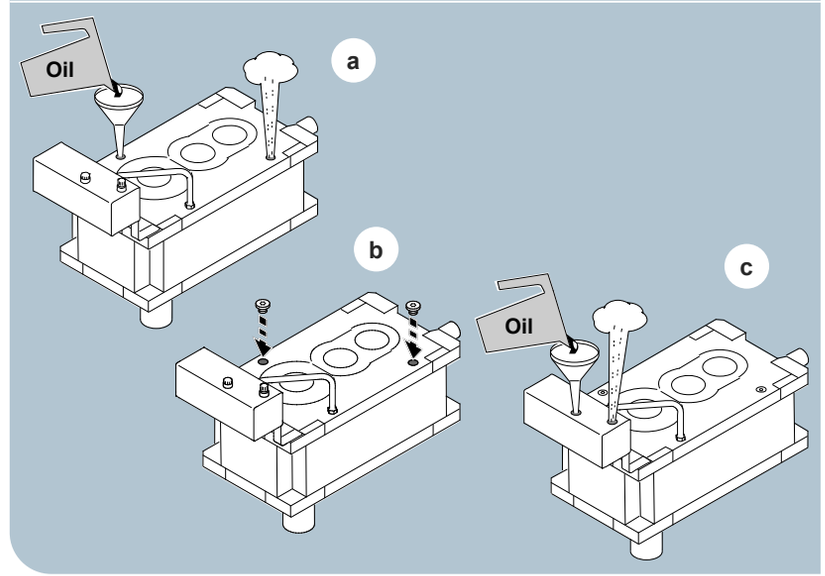
German English

6 Gear units with shaft end pump (option)

The shaft end pump [1] must be filled with oil prior to startup.



7 Gear units with oil expansion tank (option)



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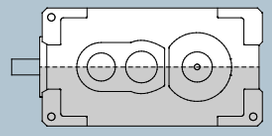
X..e industrial gear unit series

Generation X.e with reduced oil level

The displayed illustrations are examples.

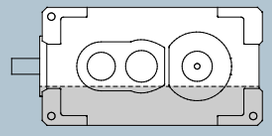
1 Gear unit with reduced oil level (option)

Standard



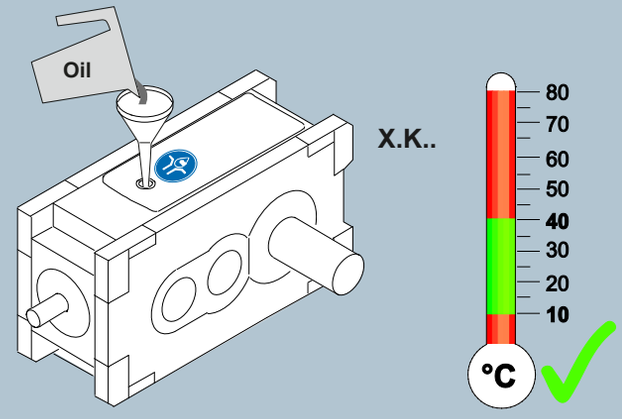
Icon =

Reduced oil level

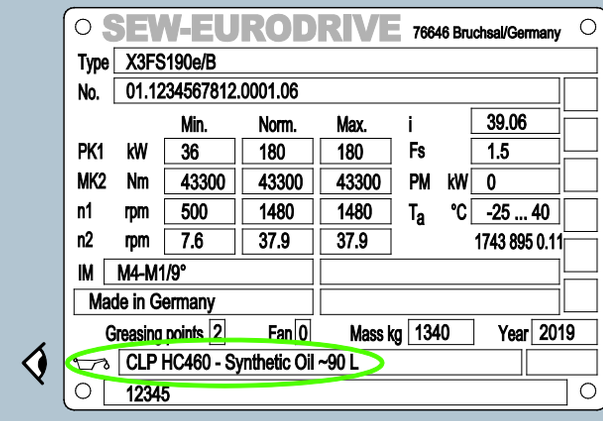


Icon =

2 Fill in oil with reduced oil level

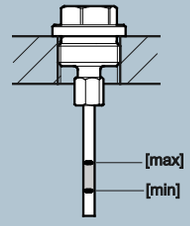


3 Oil type/oil quantity



4 Check oil level with reduced oil level

The oil quantity on the nameplate is an approximate value. Check the exact oil level using the oil dipstick.

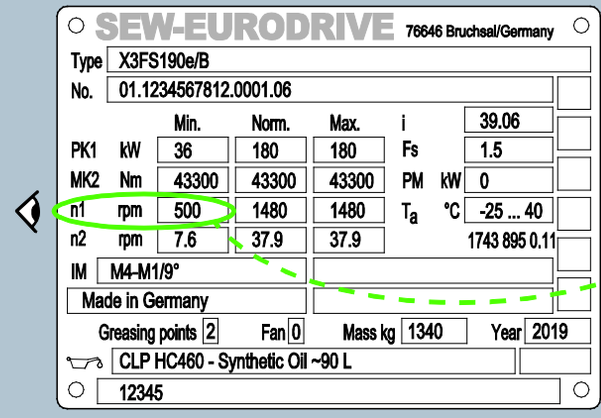


Video instructions

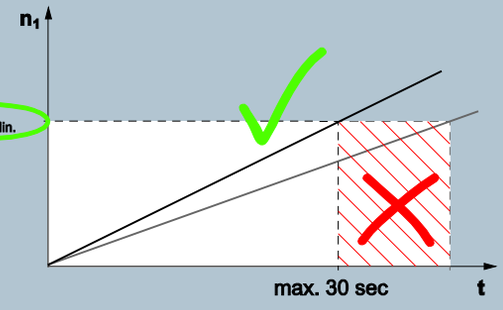
German

English

5 Limit speed with reduced oil level



n_1 Minimum



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The displayed illustrations are examples.

1 Lubricant table

Required minimum oil temperature in °C			DIN (ISO) API	ISO,SAE NLGI	SEW EURODRIVE	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	SINOPEC	TOTAL
-20	-5	+5	CLP Mineral oil	VG 150*)	GearOil Base 150 E1 / US1 / CN1 / BR1	Optigear BM 150 Alpha SP 150	Renolin CLP 150 Plus Renolin High Gear 150	Mobilgear 600 XP 150	Klüberoil GEM 1-150 N	AP-SGO 150	
-15	0	+10		VG 220	GearOil Base 220 E1 / US1 / CN1 / BR1	Optigear BM 220 Alpha SP 220	Renolin CLP 220 Plus Renolin High Gear 220	Mobilgear 600 XP 220	Klüberoil GEM 1-220 N	AP-SGO 220	Carter EP 220
-10	+5	+15		VG 320	GearOil Base 320 E1 / US1 / CN1 / BR1	Optigear BM 320 Alpha SP 320	Renolin CLP 320 Plus Renolin High Gear 320	Mobilgear 600 XP 320	Klüberoil GEM 1-320 N	AP-SGO 320	Carter EP 320
-5	+10	+20		VG 460	GearOil Base 460 E1 / US1 / CN1 / BR1	Optigear BM 460 Alpha SP 460	Renolin CLP 460 Plus Renolin High Gear 460	Mobilgear 600 XP 460	Klüberoil GEM 1-460 N	AP-SGO 460	Carter EP 460
0	+15	+25		VG 680	GearOil Base 680 E1 / US1 / CN1 / BR1	Optigear BM 680 Alpha SP 680	Renolin CLP 680 Plus Renolin High Gear 680	Mobilgear 600 XP 680	Klüberoil GEM 1-680 N	AP-SGO 460	Carter EP 680
+5	+20	+30		VG 1000		Optigear BM 1000					
-40	-30	-25	CLP HC Synthetic oil	VG 32				SHC 624			
-35	-20	-10		VG 68			Renolin Unisyn CLP 68	SHC 626	Klübersynth GEM 4-68 N		
-25	-10	0		VG 150	GearOil Synth 150 E1	Alphasyn EP 150 Optigear Synthetic X 150	Renolin Unisyn CLP 150	SHC 629 SHC Gear 150	Klübersynth GEM 4-150 N		Carter SH 150
-20	0	+10		VG 220	GearOil Synth 220 E1	Alphasyn EP 220 Optigear Synthetic X 220	Renolin Unisyn CLP 220	SHC 630 SHC Gear 220	Klübersynth GEM 4-220 N		Carter SH 220
-15	0	+15		VG 320	GearOil Synth 320 E1	Alphasyn EP 320 Optigear Synthetic X 320	Renolin Unisyn CLP 320	SHC 632 SHC Gear 320	Klübersynth GEM 4-320 N		Carter SH 320
-10	+5	+20		VG 460	GearOil Synth 460 E1	Alphasyn EP 460 Optigear Synthetic X 460	Renolin Unisyn CLP 460	SHC 634 SHC Gear 460	Klübersynth GEM 4-460 N		Carter SH 460
-5	+10	+25		VG 680	GearOil Synth 680 E1	Optigear Synthetic X 680	Renolin Unisyn CLP 680	SHC 636 SHC Gear 680	Klübersynth GEM 4-680 N		Carter SH 680
0	+20	+30		VG 1000				SHC 639 SHC Gear 1000	Klübersynth EG 4-1000 N		
-35	-20	-10	CLP HC NSF H1 Food grade oil	VG 68		Optileb HY 68	Cassida Fluid HF 68		Klüberoil 4UH1-68 N		
-20	-5	+5		VG 220	GearOil Synth 220 H1 E1	Optileb GT 220	Cassida Fluid GL 220		Klüberoil 4UH1-220 N		
-15	+5	+20		VG 460	GearOil Synth 460 H1 E1	Optileb GT 460	Cassida Fluid GL 460		Klüberoil 4UH1-460 N		
-20	0	+10	E Ester oil	VG 320			Plantogear 320 S		Klüber Bio EG2-320		

*) Only when service factor ≥ 1.3

Further information at www.sew-eurodrive.de/lubricants

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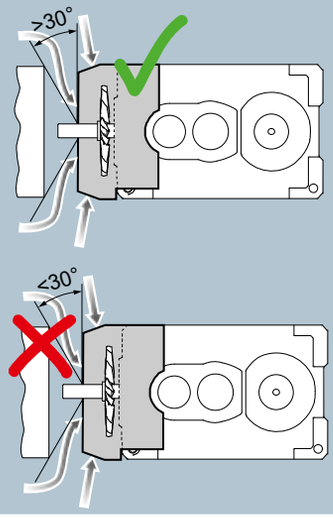
X..e industrial gear unit series

Gear unit cooling

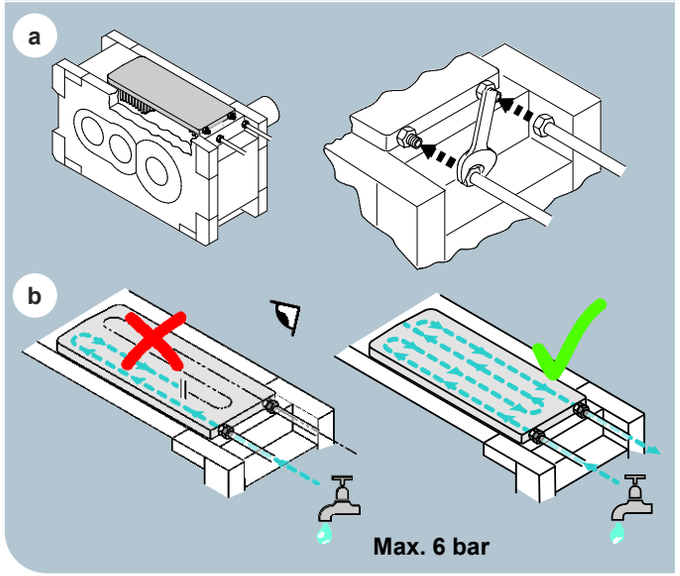
The displayed illustrations are examples.

1 Gear unit with fan (option)

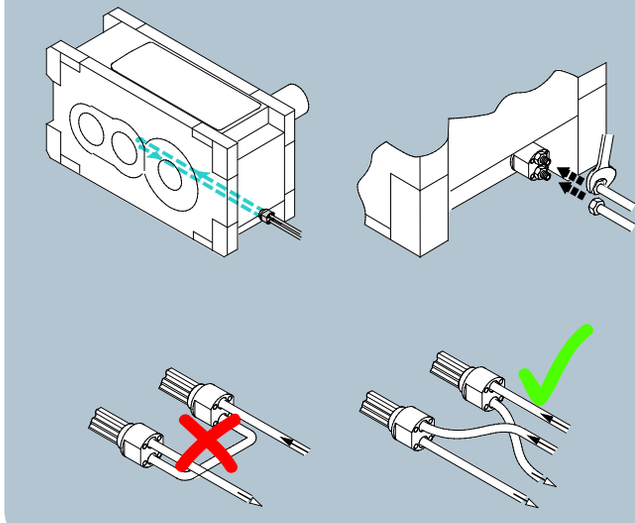
Universal cover with various fans



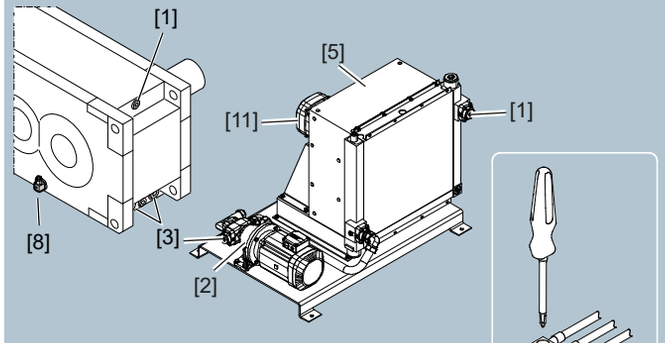
2 Gear unit with water cooling cover (option)



3 Gear unit with cooling water cartridge (option)



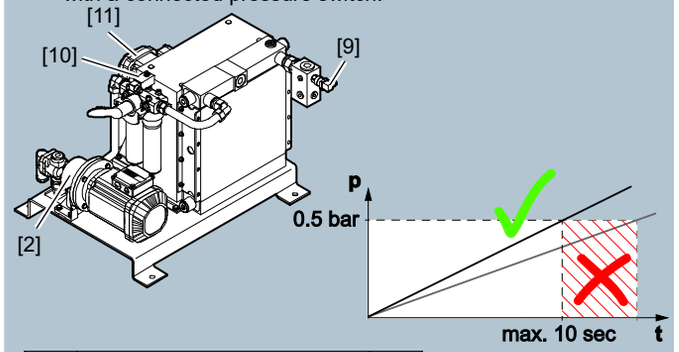
4 Oil-air cooler for splash lubrication /OAC1 (option)



[1]	Gear unit oil supply	
[2]	Pump with motor	
[3]	Oil pump suction pipe	
[5]	Heat exchanger	
[8]	Temperature switch /TSK	
[11]	Fan motor	

5 Oil-air cooler for pressure lubrication /OAP1 (option)

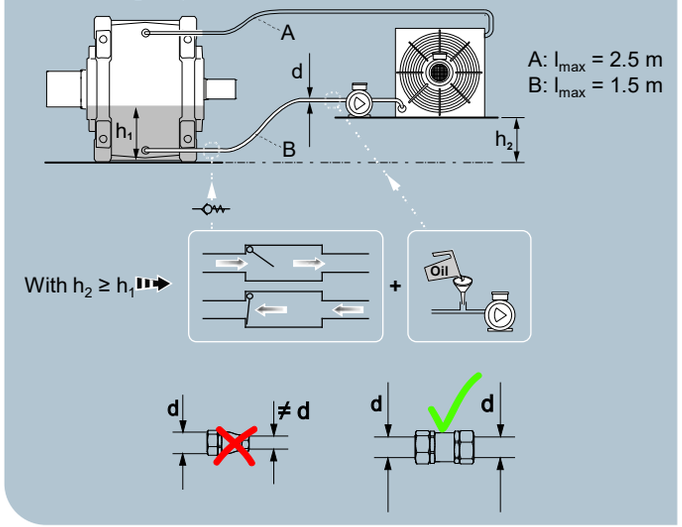
ℹ Gear units with pressure lubrication must only be operated with a connected pressure switch.



[2]	Pump with motor	
[9]	Pressure switch	
[10]	Contamination indicator	
[11]	Fan motor	

6 Installing the oil-air cooler

Standard: $h_2 < h_1$



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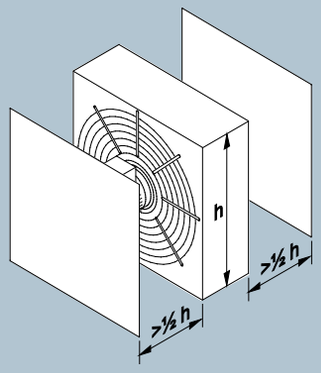
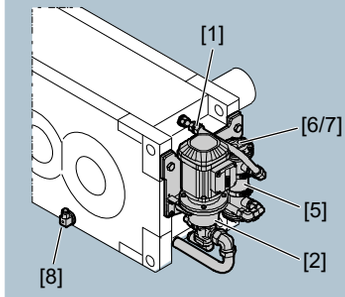
The displayed illustrations are examples.

7 Minimum distance to the cooler

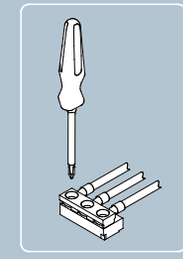


8 Oil-water cooler for splash lubrication /OWC1 (option)



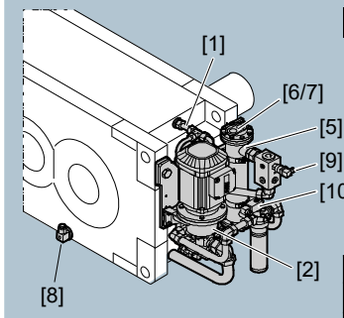
Design and connection

- Observe the requirements for the cooling media (see operating instructions).



[1]	Gear unit oil supply	
[2]	Pump with motor	⊃
[5]	Heat exchanger	
[6]	Cooling water return	⊂
[7]	Cooling water inflow	⊂
[8]	Temperature switch /TSK	⊃

9 Oil-water cooler for pressure lubrication /OWP1 (option)

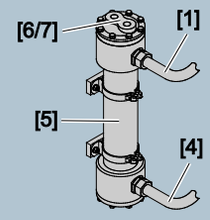


Design and connection

ℹ Gear units with pressure lubrication must only be operated with a connected pressure switch.

[1]	Gear unit oil supply	
[2]	Pump with motor	⊃
[5]	Heat exchanger	
[6]	Cooling water return	⊂
[7]	Cooling water inflow	⊂
[8]	Temperature switch /TSK	⊃
[9]	Pressure switch	⊃
[10]	Contamination indicator	⊃

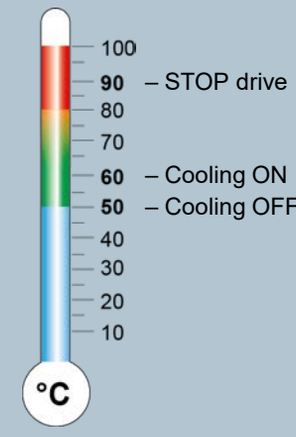
10 Heat exchanger (OWC1/OWP1)



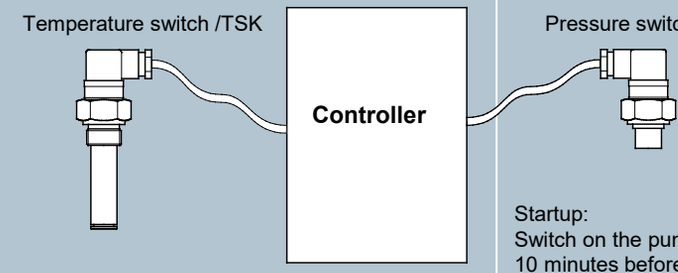
[1]	Gear unit oil supply
[4]	Oil pump pressure pipe
[5]	Heat exchanger
[6]	Cooling water return
[7]	Cooling water inflow

11 Control of the oil cooling system

Switching points



In the case of pressure lubrication



Startup:
Switch on the pump at least 10 minutes before the main drive.
Operation:
Switch on the pump at least 20 seconds before the main drive.

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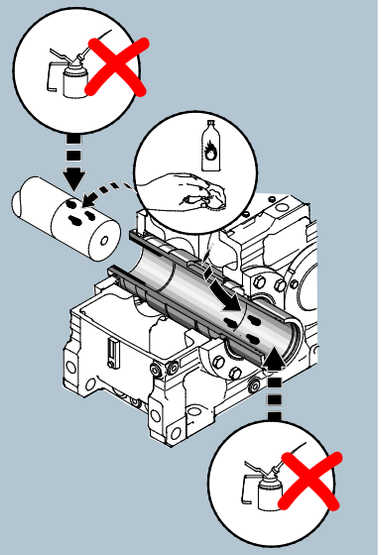
X..e industrial gear unit series

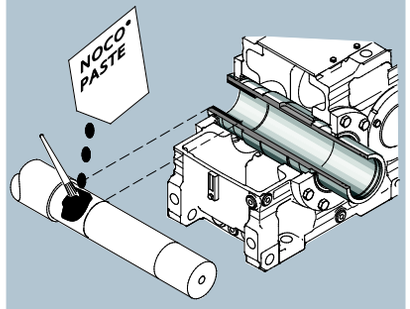
Installing shrink disk X100 – X160

The displayed illustrations are examples.

1



2



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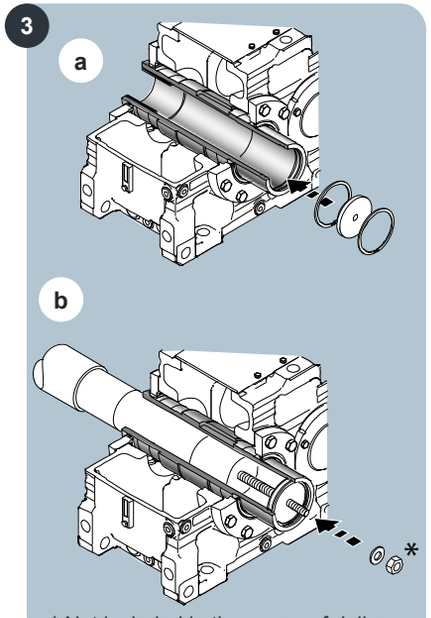
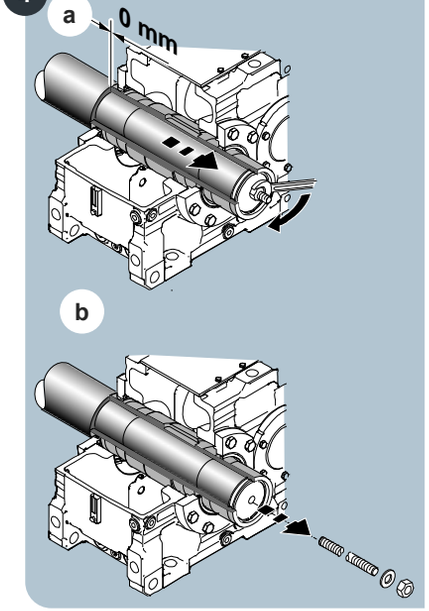


* Not included in the scope of delivery

4



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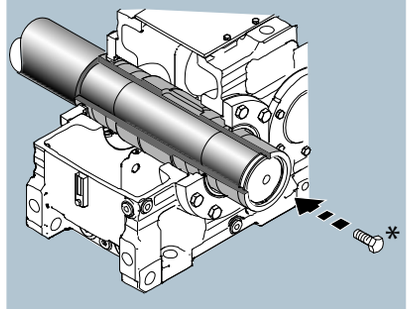
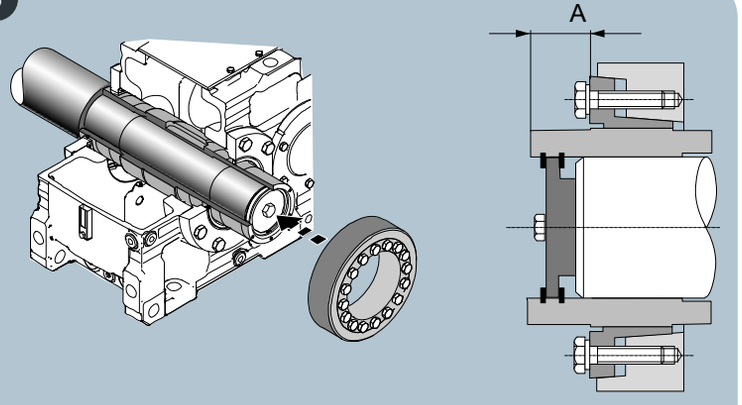


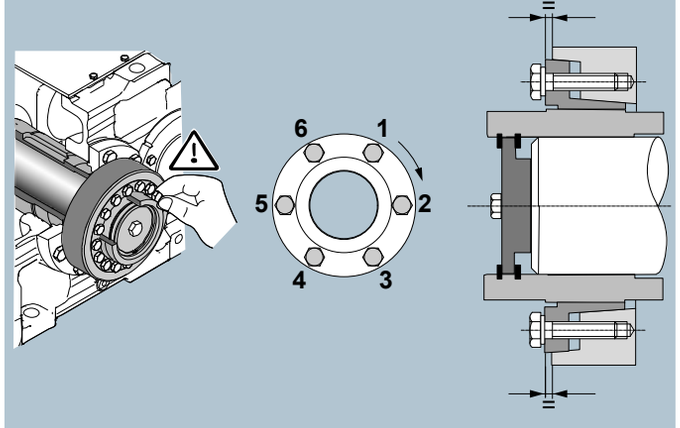
* Not included in the scope of delivery

6



Size	A (mm) ± 0.5	Size	A (mm) ± 0.5
X100	37.5	X130 – 140	41
X110	38	X150	42
X120	39	X160	48

7



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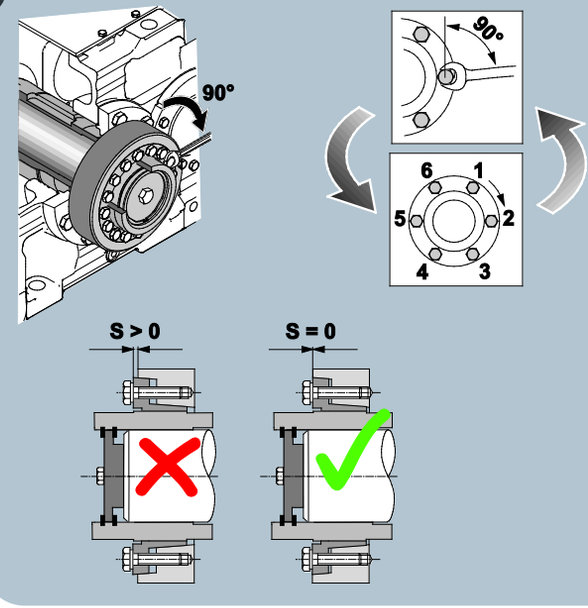

⚠ ATTENTION!
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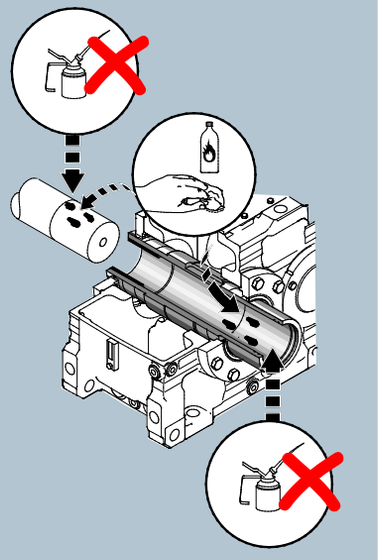
X..e industrial gear unit series

Installing shrink disk X170 – X320

The displayed illustrations are examples.

1



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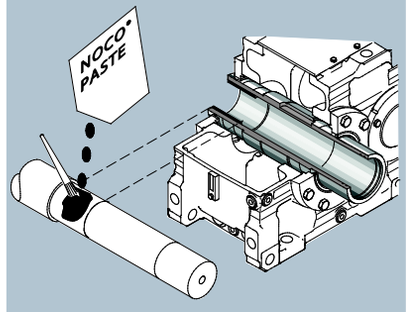

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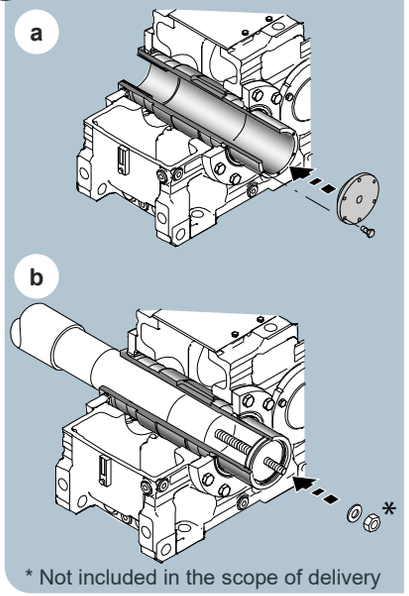

* Not included in the scope of delivery

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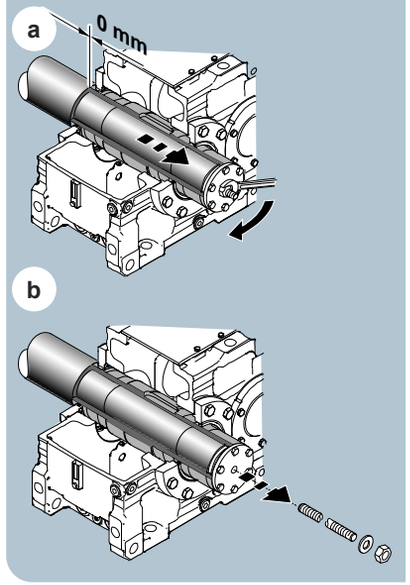

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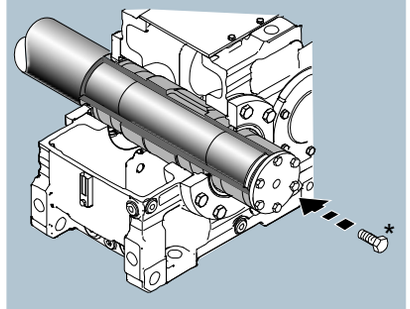

* Not included in the scope of delivery

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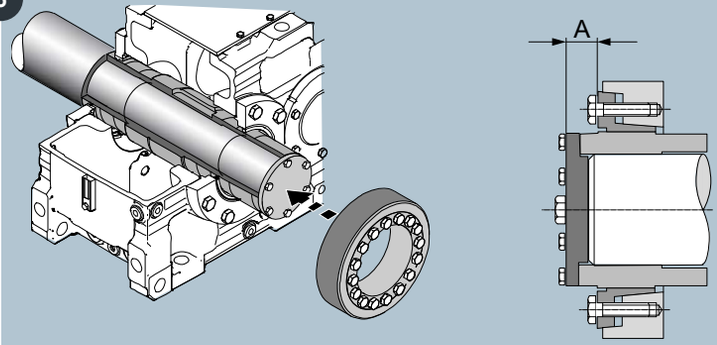
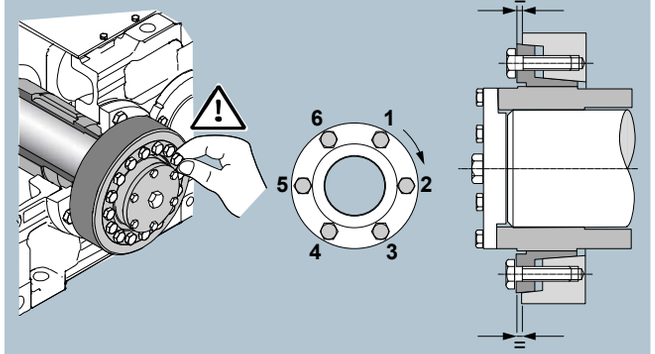


Size	A (mm) ± 0.5	Size	A (mm) ± 0.5
X180 – 190	37	X240 – 280	49
X200 – 210	38	X290 – 300	49
X220 – 230	39	X310 – 320	60
X240 – 260	48		

7



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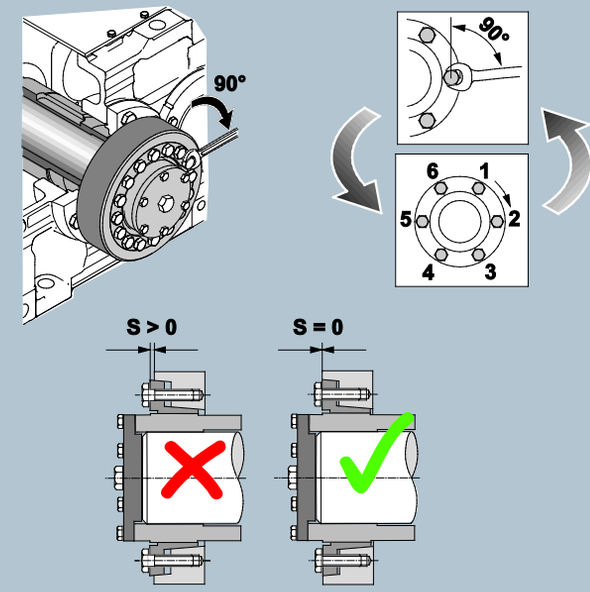

⚠ ATTENTION!
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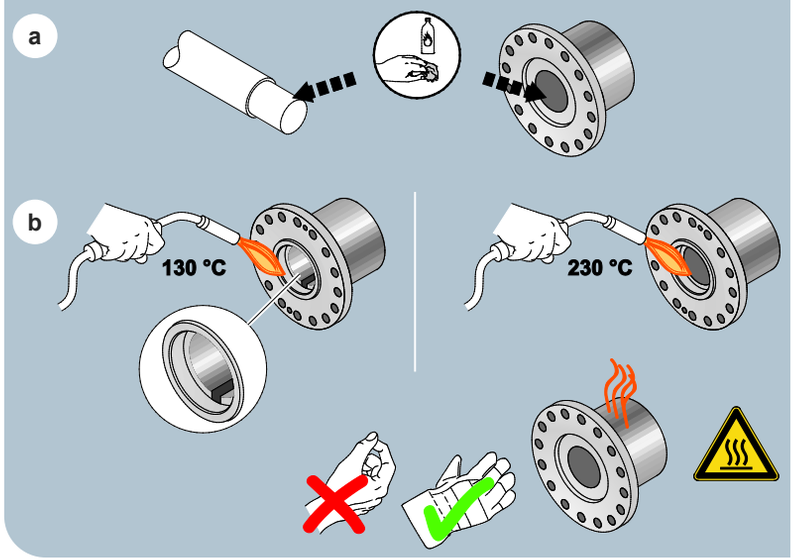
X..e industrial gear unit series

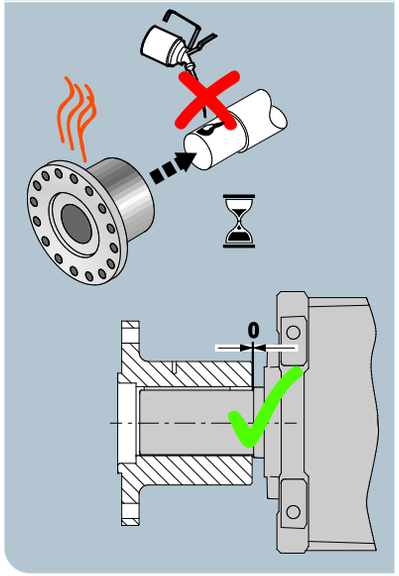
Mounting the flange coupling

The displayed illustrations are examples.

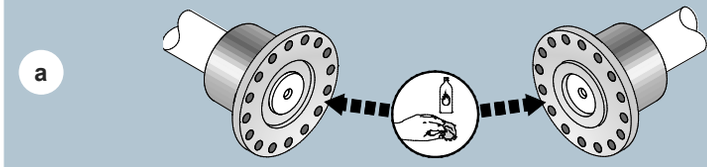
1 Clean coupling and shaft
Heat the coupling

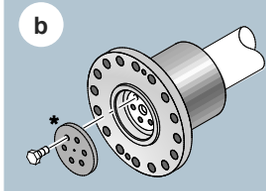


3 Mount coupling onto shaft



4 Clean the coupling flange
Screw on the end ring

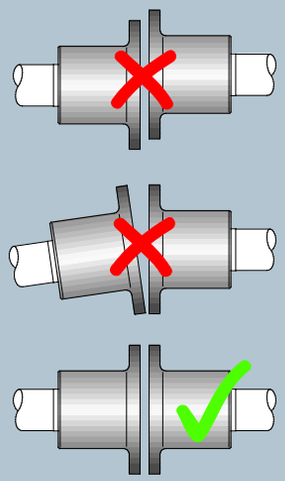




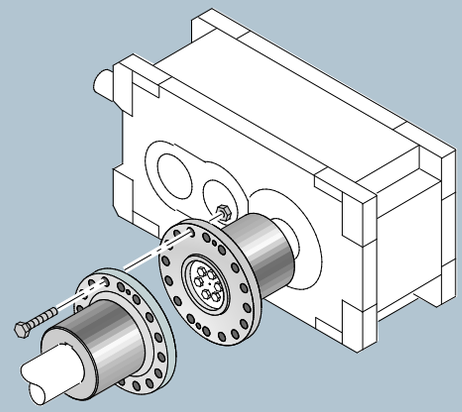
* Only with key

Size	Screws	Tightening torque in Nm Strength class 8.8	10.9
X100 – 110	M16	138	171
X120 – 140	M20	278	333
X150 – 170	M24	478	576
X180 – 220	M30	958	1146
X230 – 300	M36	1666	1992
X310 – 320	M42	2397	3186

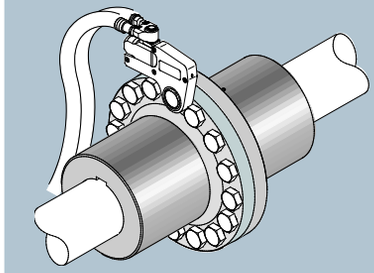
5 Align the shafts

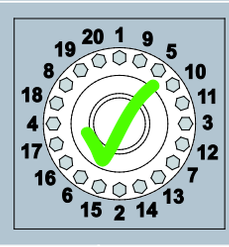


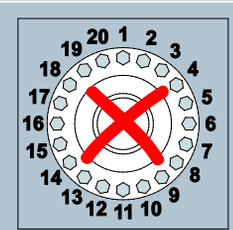
6 Connect the coupling halves



7 Tighten the screws







Size	Screws	Tightening torque in Nm Strength class 8.8	10.9
X100 – 110	M16	235	285
X120 – 140	M20	460	555
X150 – 170	M24	795	960
X180 – 220	M30	1590	1910
X230 – 300	M36	2760	3320
X310 – 320	M42	4410	5310

⚠ ATTENTION!
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X..e industrial gear unit series

Startup

The displayed illustrations are examples.

1 Checks prior to startup

Checklist	OK
The gear unit has not been damaged during transport.	
All transport protection has been removed.	
All retaining screws are tightened to the specified torque.	
The correct oil level of the gear unit has been checked by means of the oil dipstick or oil level glass.	
When using water cooling: The cooling water supply is connected and is working properly.	
When using oil-air cooling system: The fan motor and pump motor are connected and are functioning properly.	
When using fan motor and pump motor: The direction of rotation has been checked and is correct.	
When using an oil heater /OH: The oil heater is connected and is working properly.	

Checklist	OK
When using an oil heater /OH: The thermostat is connected and is working properly.	
When using a PT100 temperature sensor: The temperature sensor is connected and is working properly.	
When using a pressure switch /PS: The pressure switch is connected and is working properly.	
When using a temperature switch /TSK /NTB: The temperature switch is connected and is working properly.	
The gear unit and all electrical mount-on components are grounded.	
The shafts are aligned correctly.	
Rotating shafts and couplings are equipped with protection covers.	
For gear units with long-term protection: The screw plug has been replaced by a breather.	

2 Startup of the shaft end pump (option)

Checklist	OK
The pressure switch is connected and ready for operation.	
The limit temperature (minimum oil temperature) for gear unit start is observed.	
The shaft end pump was filled with oil before startup.	
The shaft end pump provides sufficient oil pressure within 20 seconds.	
The minimum speed of the shaft end pump ≥ 400 min^{-1} is maintained.	

3 Startup Motor pump (option)

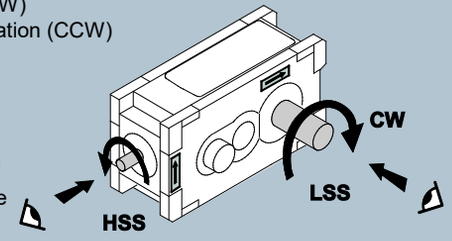
Checklist	OK
The pressure switch is connected and ready for operation.	
The motor pump has been running for 10 min. prior to startup.	
The oil level has been checked and corrected after motor pump startup.	
The limit temperature (minimum oil temperature) for gear unit start is observed.	

4 Startup Gear unit with backstop (option)

Checklist	OK
The direction of rotation of the input shaft (HSS) matches the direction arrow on the input end.	
The direction of rotation of the output shaft (LSS) matches the direction arrow on the output end.	

The direction of rotation is defined with a view to the output shaft (LSS).
- Clockwise rotation (CW)
- Counterclockwise rotation (CCW)

The permitted direction of rotation is indicated on the housing.



5 Inspection intervals

Time interval	What should I do?
Daily	• Check the housing temperature • Check gear unit noise
Monthly	• Check the oil level • Check the gear unit for tightness
After 500 operating hours*	• First oil change after initial startup
Every 6 months	• Check the screw fittings and piping for tightness
Every 3000 operating hours	• Check the oil consistency • Fill in sealing grease
Depending on the operating conditions, and every 12 months at the latest	• Check the breather • Check alignment of the shafts • Check retaining screws • Check condition of the oil-water or oil-air cooler • Clean housing • Touch up or renew the surface/corrosion protection coating
Approx. 5000 oper. hours**	• Change mineral oil
Approx. 10 000 oper. hours**	• Change synthetic oil

* Can be omitted under certain conditions. ** Depending on the operating conditions.

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X..e industrial gear unit series

Possible failures/remedy

The displayed illustrations are examples.

1

You can find support from the Service in your area at www.sew-eurodrive.com

Failure	Possible cause	Remedy
Unusual noise in the area of the gear unit mounting	Gear unit mounting has become loose	Tighten retaining screws and nuts with the specified torque. Replace damaged or defective retaining screws/nuts.
Operating temperature too high	Too much oil	Check the oil level and correct, if necessary.
	Oil is too old	Check when the oil was last changed; change the oil, if necessary.
	Oil is heavily contaminated	Analyze the oil to determine the cause; take measures, if necessary; change the oil.
	Ambient temperature too high	Protect the gear unit from external heat sources (e.g. provide shade).
	On gear units with a fan: Air intake opening/gear unit housing heavily contaminated	Check air intake opening and clean it, if necessary; clean the gear unit housing.
	On gear units with a built-in cooler: Cooling liquid flow rate too low; cooling liquid temperature too high; deposits in cooling system	Check the cooling liquid flow rate; check the entry temperature of the cooling liquid; clean cooling system.
	Failure of the oil-water or oil-air cooling system	Follow the separate operating instructions for the oil-water or oil-air cooling system.
	Failure in the water cooling (water cooling cover, water cooling cartridge)	Check the cooling water throughput and the entry temperature of the cooling water, and clean the cooling system.
Temperature at bearing points too high	Insufficient oil	Check the oil level and correct, if necessary.
	Oil is too old	Check when the oil was last changed; change the oil, if necessary.
	Bearing damage	Check the bearing and replace it, if necessary. Contact SEW-EURODRIVE.
Oil leaking at the cover plate, gear unit cover, or bearing cover	Seal broken at the cover plate, gear unit cover, or bearing cover	Tighten screws on respective cover; monitor gear unit. Contact SEW-EURODRIVE if oil is still leaking.
Oil leaking from oil seal	Too much oil	Check the oil level and correct, if necessary
	Sealing lip of oil seal turned up	Vent the gear unit; monitor the gear unit. Contact SEW-EURODRIVE if oil is still leaking.
	Oil seal damaged/worn	Check the oil seals; replace, if necessary.
Oil leaking from gear unit breather	Too much oil	Check the oil level and correct, if necessary.
	Drive installed in incorrect mounting position	Install breather plug correctly and adjust the oil level.
	Frequent cold starts (oil foams) and/or high oil level	Install an oil expansion tank.

The displayed illustrations are examples.

2

You can find support from the Service in your area at www.sew-eurodrive.com

Failure	Possible cause	Remedy
Oil leaking – from screw plug – from the oil drain valve	Seal not tight	Retighten screw.
	Fittings loosened	Retighten the fitting and screw.
Severe V-belt wear	Inadequate alignment of the V-belt pulleys	Check the V-belt pulley alignment and the belt pretension.
	Harmful ambient conditions (e.g. abrasive particles, chemical substances)	Protect the V-belt drive from environmental influences, but also ensure sufficient aeration.
	Overload of the V-belt drive	Replace the V-belt, if necessary; contact SEW-EURODRIVE.
Oil pump does not suck in	Air in the suction pipe of the oil pump	Fill oil into the suction line and the oil pump, and vent the pump at the pressure side.
	Oil pump defective	Contact SEW-EURODRIVE.
Pressure switch does not switch	Air in the suction pipe of the oil pump	Fill oil into the suction line and the oil pump and vent the pump at the pressure side.
	Pressure switch connected incorrectly	Check the connection.
	Pressure switch defective	Replace the pressure switch.
	Oil pump defective	Contact SEW-EURODRIVE.
Failure in the oil-water or oil-air cooling system	Failure of the oil-water or oil-air cooling system	Observe the separate operating instructions for the oil-water or oil-air cooling system.
Gear unit does not reach cold start temperature	Thermostat set incorrectly	Check the setting of the thermostat.
	Oil heater faulty or connected incorrectly	Check the oil heater for proper connection and function; replace, if necessary.
	Heat dissipation too great due to unfavorable climatic conditions	Prevent gear unit from cooling off during warm-up phase.
Operating temperature at backstop too high; no blocking function	Damaged/faulty backstop	Check the backstop and change, if necessary.
		Contact SEW-EURODRIVE.

The displayed illustrations are examples.

1 Important information

1.1 Safety notes

The following basic safety notes are intended to prevent personal injury 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.

1.2 General

Do not install or start up damaged products. Report any damage to the shipping company immediately. During operation, gear units can have movable or rotating parts or hot surfaces. All work related to transportation, storage, installation, assembly, connection, startup, maintenance, and repair may be performed only by qualified personnel, in strict observance of the comprehensive operating instructions. Improper removal of the required cover, improper use, or incorrect installation or operation may result in severe injury to persons or damage to property.

1.3 Target group

Any mechanical work may only be performed by trained specialists. Specialists within the meaning of these operating instructions are persons who are familiar with the structure, mechanical installation, troubleshooting, and maintenance of the product and who have training in the field of mechanics (e.g. as mechanics or mechatronics technicians) with a successful final examination.

Any electronic work may only be performed by an electrically skilled person with the appropriate training. Electrically skilled persons within the meaning of these operating instructions are persons who are familiar with the electrical installation, startup, troubleshooting, and maintenance of the product and who have training in the field of electrical engineering (e.g. as an electronics technician or mechatronics technician) with a successful final examination.

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

All qualified personnel must have read and understood the comprehensive operating instructions and wear appropriate protective clothing.

1.4 Designated use

Industrial gear units are gear units driven by motors for industrial and commercial systems. Permitted speeds and power ratings must be observed in accordance with the technical data or nameplate. Implementing gear unit loads that deviate from the permitted values or operating the gear units in areas of application other than industrial and commercial systems are permitted only 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 X..e series industrial gear units are components for installation in machinery and systems. In the scope of the EC Directive, you must not put the machinery into operation in the designated fashion until you have established that the end product complies with Machinery Directive 2006/42/EC.

1.5 Other applicable documentation

The following documentation and documents must also be observed:

- "Helical and Bevel-Helical Gear Units – X..e Series" operating instructions
- "Helical and Bevel-Helical Gear Units – X..e Series" catalog
- Order documents, e.g. dimension sheet, order confirmation, etc.
- "Oil Cooling System" operating instructions, if required
- "Oil Supply System" operating instructions, if necessary
- "AC Motors" operating instructions, if necessary
- Operating instructions of the mounted components, if necessary

1.6 Safety symbols on the gear unit

The safety symbols on the gear unit must be observed. Refer to the detailed operating instructions for the meaning of the symbols.

1.7 Transport/storage

Observe the information for transport, storage, and proper handling in the detailed operating instructions. Climatic conditions must be observed in accordance with chapter "Storage and transport conditions".

1.8 Installation/assembly

Installation/assembly must be performed in accordance with the specifications in the corresponding documentation.

1.9 Startup

Startup must be performed in accordance with the specifications in the corresponding documentation.

⚠ **ATTENTION!**
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SEW-EURODRIVE
Driving the world

SEW EURODRIVE

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Str. 42
76646 Bruchsal/Germany
Tel. +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com

➟ **www.sew-eurodrive.com**