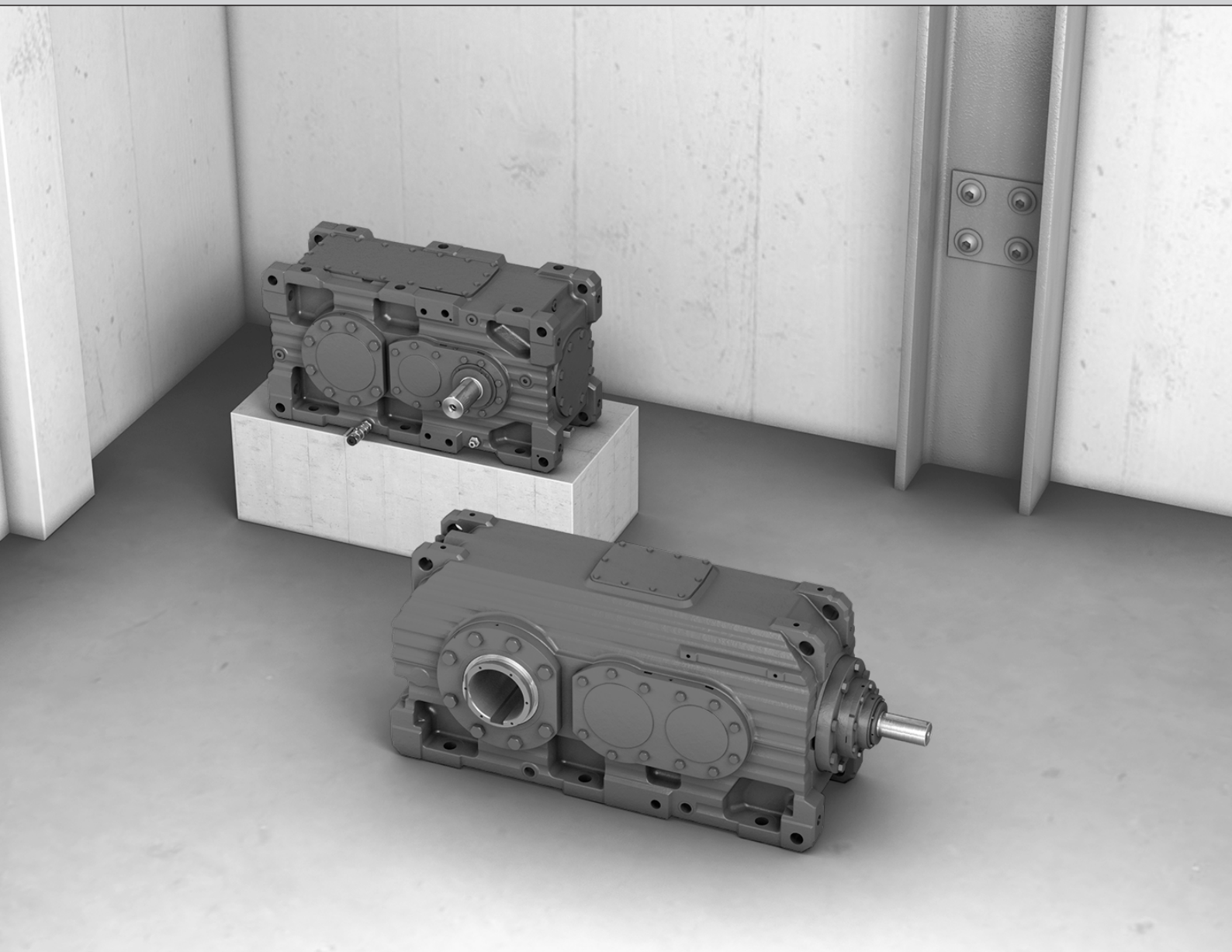




SEW
EURODRIVE

Addendum to the Assembly and Operating Instructions



Industrial Gear Units

X.. Series Helical and Bevel-Helical Gear Units

Oil-Water Cooler for Splash or Bath Lubrication /OWC



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1 Important information



INFORMATION

This addendum describes amendments to the Oil-Water Cooler operating instructions. Observe the additional information specified in this document.

This document does not replace the detailed operating instructions.

2 Oil-water cooler for splash or bath lubrication /OWC

2.1 Structure/function

2.1.1 Structure

An oil-water cooling system can be used if the thermal rating of the naturally cooled gear unit or cooling using a fan on the input shaft is not sufficient. The prerequisite for using an oil-water cooling system is that appropriate cooling water is available on site.

INFORMATION



- Contact SEW-EURODRIVE if you use chemically aggressive cooling media such as brackish water or salt water.
- The following information applies to gear units with splash lubrication or bath lubrication.
- Also refer to the operating instructions of the cooling system manufacturer.

SEW-EURODRIVE uses 2 types of oil-water coolers:

- A plate heat exchanger is used for the oil-water cooling system OWC 005/015/025.
- A shell and tube heat exchanger is used for the oil-water cooling system OWC 10/20/30/40/50/60/70.

2.1.2 General information

The cooling system including the cooling circuit piping but without electrical wiring is mounted directly to the gear unit at factory.

Optionally, the cooling system can be delivered on a mounting frame for separate mounting but without electrical wiring and piping to the gear unit.

The standard delivery of the cooling system includes:

- Pump with directly mounted asynchronous motor
- Oil-water heat exchanger
- Temperature switch /TSK2 with 2 switching points for
 - Controlled start of the pump motor at an oil temperature > 60 °C
 - Monitoring of the cooling group, i.e. warning or gear unit shutdown when the oil temperature exceeds 90 °C

The following cooling system types are available:

- Directly mounted on the gear unit, incl. cooling circuit piping, or
- On the mounting frame, for separate mounting, but without piping to the gear unit

Optional accessories

The cooling system can be equipped with the following components as an option:

- PT100 temperature sensor
- Oil filter with electrical/optical maintenance indicator
 - Single filter
 - Duplex filter
- Flow rate sensor
- Manometer
- Thermometer
- Thermostat valve

2.1.3 Function

Observe the following control information for the individual components.

Oil-water cooler

The gear unit is cooled by an oil-water cooler.

- SEW-EURODRIVE recommends using the cooling water at a temperature of 60 °C or higher. An optional thermostat valve can be used for controlling the cooling system if the user is required to adjust the switching temperature.

Temperature switch /TSK2

The temperature of the plant is monitored via a temperature switch with defined switching points.

- At $T > 60\text{ °C}$ → **Pump of the oil-water cooler – ON**
- At $T < 50\text{ °C}$ → **Pump of the oil-water cooler – OFF**
- At $T > 90\text{ °C}$ → **STOP GEAR UNIT/WARNING**

PT100 temperature sensor (optional)

Optionally, a PT100 temperature sensor instead of a temperature switch /TSK2 can be used to control the cooling system. The evaluation of the temperature signal and the controlling of the operator's switching devices is performed by the operator's control.

- At $T > 60\text{ °C}$ → **Pump of the oil-water cooler – ON**
- At $T < 50\text{ °C}$ → **Pump of the oil-water cooler – OFF**
- At $T > 90\text{ °C}$ → **STOP GEAR UNIT/WARNING**

Filter (optional)

The filter is monitored visually by a pressure deviation indicator, and electrically by a pressure deviation monitoring device.

When $\Delta p > 2.2\text{ bar}$ → **WARNING** (clean filter)

2.1.4 Interlocking specifications**Enabling of the gear unit**

The gear unit is enabled if the following condition is met:

- Oil temperature $T < 90\text{ °C}$

STOP gear unit/warning

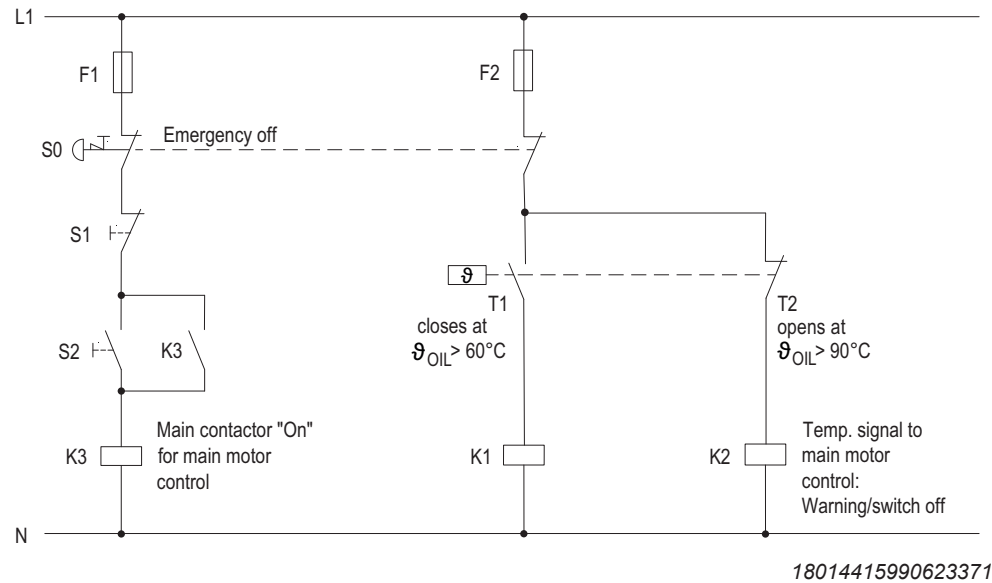
STOP gear unit/warning if the following condition is met:

- Oil temperature $T > 90\text{ °C}$

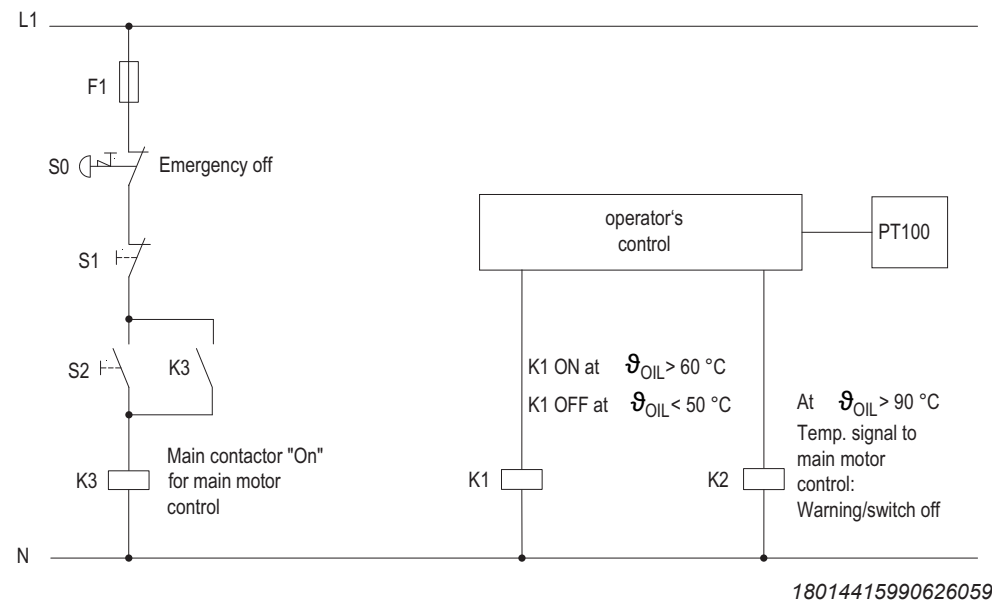
2.2 Wiring diagram (schematic illustration)

The wiring diagrams show a possible setup of the control for the cooling system when a TSK2 temperature switch and, optionally, a PT100 temperature sensor are used. Use the wiring diagrams according to the structure of the cooling system.

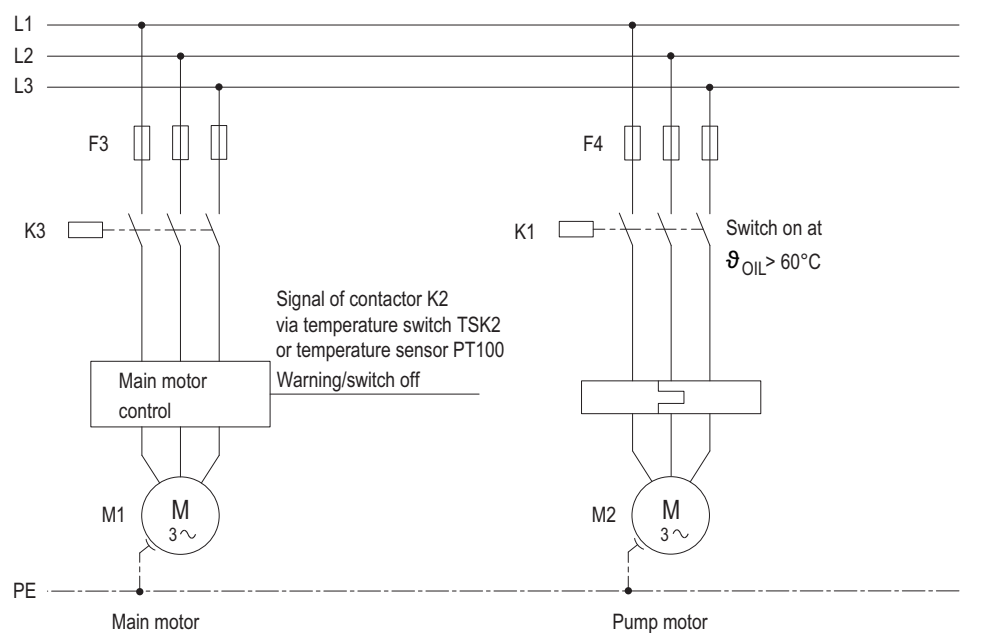
2.2.1 Control circuit with control via temperature switch /TSK2



2.2.2 Control circuit with control via PT100 temperature sensor



2.2.3 Main circuit



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2.3 Installation/assembly

INFORMATION



First adhere to the operating instructions of the oil supply system manufacturer.

2.3.1 Installation and connection information

The cooling system is mounted directly on the gear unit as standard.

Optionally, the cooling system can be delivered as a complete unit on a mounting frame for separate mounting but without electrical wiring and piping. Ensure that the installation site is subject to minimal vibrations and is a maximum distance of 1 m from the gear unit. Install the cooling system at the same level as the gear unit or lower. If this is not possible, contact SEW-EURODRIVE.

INFORMATION



For the dimensions of the cooling system and detailed technical data, refer to the operating instructions of the cooling system manufacturer.

2.3.2 Mechanical connection

Connect the cooling system to the gear unit and the water supply according to the designations observing the country-specific regulations.

Adhere to the following basic conditions when connecting the cooling system to the gear unit:

- Do not reduce the specified cable cross sections.
- It is important that you choose the correct wall thickness and material when selecting pipes, hoses and screw fittings. Preferably use screw fittings with non-metallic gaskets.

2.3.3 Electrical connection

Observe country-specific regulations during the electrical connection.


Connect the motor and the temperature switch.

- Make sure that the pump rotates in the correct direction.
- Observe the motor data sheet.
- If a temperature switch/TSK2 is used, it must be integrated in the circuit in a way that
 - The pump of the oil-water cooler is switched on at the first switching point (at 60 °C oil temperature).
 - Either a warning signal is activated or the main drive is switched off at the second switching point (at 90 °C oil temperature).
- If a temperature sensor/PT100 is used, it must be integrated in the circuit in a way that
 - The pump of the oil-water cooler is switched on at an oil temperature of 60 °C.
 - The pump of the oil-water cooler is switched off if the oil temperature falls below 50 °C.
 - Either a warning signal is issued or the main drive is switched off when the oil temperature reaches 90 °C.

When using options:

- Connect the electrical maintenance indicator of the oil filter to the customer-provided control.
- Connect the flow rate sensor to the customer-provided control.

2.3.4 Limit temperature for start-up of the oil supply system

To ensure a correct function of the oil supply system the gear unit oil must have at least the minimum oil viscosity. The viscosity depends on the used oil, and on the oil temperature in the oil pipes/hoses and in the oil pump. Observe chapter "Permitted lubricants" (→  18).

When the oil supply system is used at low ambient temperatures, it may be required to adjust the oil supply system. Contact SEW-EURODRIVE, if required.

2.3.5 Cooling media

INFORMATION



- Note that the service life, the efficiency, and the maintenance intervals of the heat exchanger depend to a great degree on the quality and ingredients of the cooling medium.
- Special measures have to be taken when using sea water or brackish water. Contact SEW-EURODRIVE.
- Observe the information in the supplied manufacturer's documentation regarding water quality.

Permitted cooling media

- Water, water/glycol cooling liquids
- Cooling water temperature and flow rate of oil and cooling water according to the order documents.

2.4 Notes on checking the oil level

Using an oil supply system might influence the oil level. The fill quantities specified on the nameplate are guide values and refer only to the gear unit. The mark on the oil dipstick, oil level glass or oil sight glass is the decisive indicator of the correct oil quantity.

Observe the chapter "Checking the oil level" in the operating instructions for the gear unit.

2.4.1 Additional gear unit oil

The following table shows the lubricant fill quantity which has to be filled into the gear unit additionally for the oil supply system.

The information is based on the standard cross section of the pipes for a suction pipe length of 1.5 m and a pressure pipe length of 2.5 m.

Size	Additional oil quantity in the gear unit in l
OWC 005	2.5
OWC 010	2.5
OWC 015	4.5
OWC 020	5.5
OWC 025	5.5
OWC 030	5.5
OWC 040	7.0
OWC 050	7.0
OWC 060	10.0
OWC 070	10.0

2.5 Startup

2.5.1 Notes



NOTICE

Improper startup may result in damages to the gear unit or oil supply system.

Possible damage to property.

- Observe the following information.

- Before startup, check the functionality of the monitoring devices. (Depending on the types of pressure switch, flow monitor, temperature switch/temperature sensor, maintenance indicator etc.)
- Before taking the gear unit into operation for the first time and after each oil change, run the oil pump at least 10 minutes to ensure that all oil chambers are filled with oil. Switch off the oil pump and control the oil level after a short period of time. Correct the oil level if necessary.
- An oil heater is mandatory when operating the oil supply system at low ambient temperatures. For further information, refer to chapter "Limit temperature for start-up of the oil supply system" (→ 12).
- If there is a risk of frost and the oil-water cooler is not operated for an extended time, drain the cooling water.
- The user party must provide for the necessary water connections.

2.5.2 Venting the pump



⚠ WARNING

Danger due to leaking and squirting gear unit oil.

Serious injury.

- You must wear safety goggles.
- Be very careful when you vent the pump.

If the pump does not supply oil immediately when the oil supply system starts, do the following:

- Fill the pump with oil.
- Vent the pump on the pressure side during start, if possible at the highest point.

2.5.3 Setting the thermostat valve (optional)

The thermostat valve is not preset upon delivery. The system must be set depending on the local conditions by the user during startup or during operation.

Set the thermostat valve so that the oil temperature at maximum operating power is within the range specified in the order.

2.6 Inspection/maintenance

INFORMATION



First adhere to the operating instructions of the oil supply system manufacturer.

2.6.1 Inspection and maintenance intervals

Adhere to the following inspection and maintenance intervals.

Time interval	What is to be done?
<ul style="list-style-type: none"> Depending on the operating conditions, at least every 12 months 	<ul style="list-style-type: none"> Check condition of oil-water cooler, replace filter element if necessary
<ul style="list-style-type: none"> Varying (depending on external factors) 	<ul style="list-style-type: none"> Check all hose pipes for tightness.

2.6.2 Checking hose pipes

NOTICE

Hoses and hose pipes are subject to natural aging even if they are properly stored and used. This is why the period of use is limited.

- The period of use of hose pipes should not exceed 6 years from the date of manufacture printed on them.
- The operator of the plant is responsible for making sure that hose pipes are replaced at adequate intervals even if they do not show any signs of safety-related defects.
- Have hose pipes checked by a specialist at least once a year to ensure operational safety.

2.7 Malfunctions

Fault	Possible cause	Measure
No oil pump suction	<ul style="list-style-type: none"> Air in the pipes Not enough oil in the gear unit Wrong oil grade in the gear unit Motor not running Wrong direction of rotation of the motor 	<ul style="list-style-type: none"> Fill the suction line and oil pump with oil Vent pressure pipe on startup Check oil level in gear unit Check oil grade (in particular when temperatures are low) Check electrical connections Change the direction of rotation
Delivery rate of oil pump not sufficient	<ul style="list-style-type: none"> Oil circulation clogged Wrong oil grade Wrong motor speed Negative pressure at pump suction side too high 	<ul style="list-style-type: none"> Open valves and plugs Check oil grade (in particular when temperatures are low) Check pump motor speed Increase cross section of suction line Decrease suction lift
Oil pump very loud	<ul style="list-style-type: none"> Negative pressure at pump suction side too high 	<ul style="list-style-type: none"> Increase cross section of suction line Decrease suction lift Avoid distortion of the suction line Avoid reductions in the suction pipes
Oil pump delivers froth	<ul style="list-style-type: none"> Not enough oil in the gear unit Suction line leaking 	<ul style="list-style-type: none"> Check oil level in gear unit Check screw fittings for leaks
Cooling capacity is not reached	<ul style="list-style-type: none"> Cooling water supply closed Cooler dirty 	<ul style="list-style-type: none"> Check cooling water supply Clean the cooler

2.8 Permitted lubricants





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

INFORMATION



- The standard for viscosity and oil grade is the type of oil that is specified by SEW-EURODRIVE in the order (see order confirmation and nameplate).
- Contact SEW-EURODRIVE if you use bio and food grade lubricants or polyglycol oils.
- Check the compatibility of the greases and oils used.
- The tables contain the lubricants approved by SEW-EURODRIVE.
- 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 the latest information about the lubricants, visit: www.sew-eurodrive.de/lubricants

2.8.1 Explanation of the structure of the tables and abbreviations

Icons	Designation
CLP	= Mineral oil
CLP HC	= Synthetic polyalphaolefin (PAO)
E	= Oil based on esters
	= 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 $F_s \geq 1.3$
RWDR	= Radial oil seal

2.8.2 Explanation of the various lubricants

			[5]
[1]	-20	+65	[6]
[2]	-5		
[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.

2.8.3 Explanation of the oil supply systems and the oil viscosity

In standard design, the motor pump of the cooling system is dimensioned for an oil viscosity of **2000 cSt**.

Optionally, a motor pump with an increased suction capacity can be used. This motor pump is dimensioned for an oil viscosity of **5000 cSt**. Contact SEW-EURODRIVE, if required.

2.8.4 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							
CLP	VG 150 ¹⁾	-20 -5 0 +5	-20 -5 0 +5	-20 -5 0 +5	-20 -5 0 +5	-20 -5 0 +5	-20 -5 0 +5	-20 -5 0 +5
		Optigear BM 150	Alpha SP 150	Renolin CLP 150 Plus	Renolin HighGear 150	Mobilgear 600 XP 150	Kilberoil 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	Kilberoil GEM 1-220 N	Shell Omala Oil F 220
		SO	SO	SO	SO	SO	SO	SO
		-10 -5 +5 +15	-10 -5 +5 +15	-10 -5 +5 +15	-10 -5 +5 +15	-10 -5 +5 +15	-10 -5 +5 +15	-10 -5 +5 +15
		Optigear BM 320	Alpha SP 320	Renolin CLP 320 Plus	Renolin HighGear 320	Mobilgear 600 XP 320	Kilberoil GEM 1-320 N	Shell Omala Oil F 320
	VG 460	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	Kilberoil 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	Kilberoil 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	Kilberoil 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	Kilberoil GEM 1-1000 N	Meropa 1000

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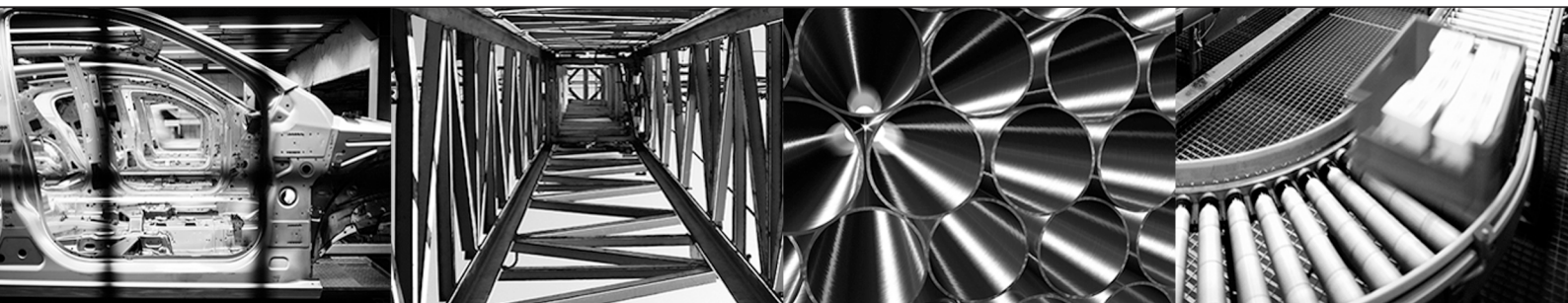
DIN (ISO) API	ISO, SAE NLGI	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
CLP HC	VG 32 ¹⁾			-40 -30 -25 SHC 624 S0				
	VG 68 ¹⁾		-35 -20 -10 Renolin Unisyn CLP 68 S0	-40 -25 -15 +50 SHC 626 S0	-35 -20 -10 Klübersynth GEM 4-68 N S0	-40 -20 -10 Omala S4 GX 68 S0		
	VG 150 ¹⁾	-25 -10 0 Alphasyn EP 150 S0	-30 -10 +0 Renolin Unisyn CLP 150 S0	-35 -15 -5 +75 SHC Gear 150 S0	-25 -10 0 Klübersynth GEM 4-150 N S0	-30 -10 0 Omala S4 GX 150 S0	-25 -10 0 Pinnacle EP 150 S0	-35 -15 -5 Carter SH 150 S0
	VG 220	-25 -5 +5 Alphasyn EP 220 S0	-25 -5 +5 Renolin Unisyn CLP 220 S0	-25 -5 +5 +85 SHC 630 S0	-25 -5 +5 +80 Klübersynth GEM 4-220 N S0	-25 -5 +5 +85 Omala S4 GX 220 S0	-25 -5 +5 +80 Pinnacle EP 220 S0	-25 -5 +5 +80 Carter SH 220 S0
	VG 320	-20 0 +10 Alphasyn EP 320 S0	-20 0 +10 Renolin Unisyn CLP 320 S0	-20 0 +10 +95 SHC 632 S0	-20 0 +10 +95 Klübersynth GEM 4-320 N S0	-20 0 +10 +95 Omala S4 GX 320 S0	-20 0 +10 +90 Pinnacle EP 320 S0	-20 0 +10 +90 Carter SH 320 S0
	VG 460	-15 +5 +15 Alphasyn EP 460 S0	-15 +5 +15 Renolin Unisyn CLP 460 S0	-15 +5 +15 +105 SHC 634 S0	-15 +5 +20 +105 Klübersynth GEM 4-460 N S0	-15 +5 +15 +105 Omala S4 GX 460 S0	-15 +5 +15 +100 Pinnacle EP 460 S0	-15 +5 +15 +100 Carter SH 460 S0
	VG 680	-10 +10 +25 Optigear Synthetic X 680 S0	-10 +10 +25 Renolin Unisyn CLP 680 S0	-10 +10 +25 +110 SHC 636 S0	-10 +10 +25 +110 Klübersynth GEM 4-680 N S0	-10 +10 +25 +110 Omala S4 GX 680 S0		-10 +10 +25 Carter SH 680 S0
	VG 1000			-10 +15 +30 +110 SHC Gear 1000 S0	0 +20 +30 +110 Klübersynth EG4-1000 S0			

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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
		-20	-25		-20
		-10	-15		-10
		+45	+45		+45
		Cassida Fluid HF 68	Optileb HY 68		Küberoil 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		Küberoil 4UH1-220 N
VG 460 ¹⁾	VG 460 ¹⁾	S0	S0		S0
		-15	-15		-15
		+5	+5		+5
		+20	+20		+15
		+90	+95		+95
	Cassida Fluid GL 460				
E	VG 460	S0	S0		S0
	VG 460				

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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