

Supplier Approval

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63107848.14



SEW drives of the series

X.e / M1..N / ML..2 / MC.. / P..2e / P..2 / XP.. / P-X.e / PPK..

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Change information:

Chap./page	Description (changes to the previous edition)	Modification no.
All	SEW product designations updated	230624
1 / 3	Added a note on product quality of lubricants	
1.1 / 3	Added abbreviations	
1.4 / 5-6	- Added shaft end pumps from Rickmeier and Nippon - Added notes on other oil supply facilities	
2 / 8-10	- Revised SEW product designations - Revised table layout - Removed Shell Omala GX lubricant - Added a note to older or discontinued SEW products	
2.1 / 11	- Included a chapter with further approved lubricants (without factory filling) - Added VG150, VG1000 from Total Carter EP - Added VG1000 from Total Carter SH - Approval granted for "PetroChina Lubricant Company – KunLun KPM/S Synthetic Heavy-duty Industrial Gear Oil" - Approval for "Sinopec – AP-S Industrial Gear Oil" granted	

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1 Introduction/area of application

The present document describes the approved lubricants for SEW-EURODRIVE industrial gear units (helical gear units, bevel gear units and planetary gear units). The approvals are valid worldwide.

SEW accepts no liability if different lubricants are used in the gear units and/or they are used outside of the recommended temperature ranges.

Lubricants for industrial gear units are subject to approval. The approval will be made according to the document "Supplier approval for qualification and approval of lubricants – gear unit oils" 07004__13 in its current version.

The responsibility for the consistent quality of the lubricants lies with the respective manufacturer.

INFORMATION: Printed documents may not include the latest changes. For the latest version of this document, refer to <https://www.sew-eurodrive.de/lubricants>.

1.1 Explanation of the structure of the tables and abbreviations

Typ / Type		Öltyp / Oil Type	ISO, SAE NLGI	SEW EURODRIVE	
Viscosity class			VG 150	-20	+65
				-5	
				+5	
				GearOil Base 150 E1 / US1 / CN1 / BR1 SEW070040313	
Note on special approvals	X...		VG 220	-15	+75
				0	
				+10	
				GearOil Base 220 E1 / US1 / CN1 / BR1 SEW070040313	
Gear unit type		CLP	VG 320	-10	+85
				+5	
				+15	
				GearOil Base 320 E1 / US1 / CN1 / BR1 SEW070040313	

Abbreviations:

 Mineral lubricant

 Synthetic lubricant

CLP Mineral oil

CLP HC Synthetic hydrocarbons – polyalphaolefins (PAO)

E Ester-based lubricant

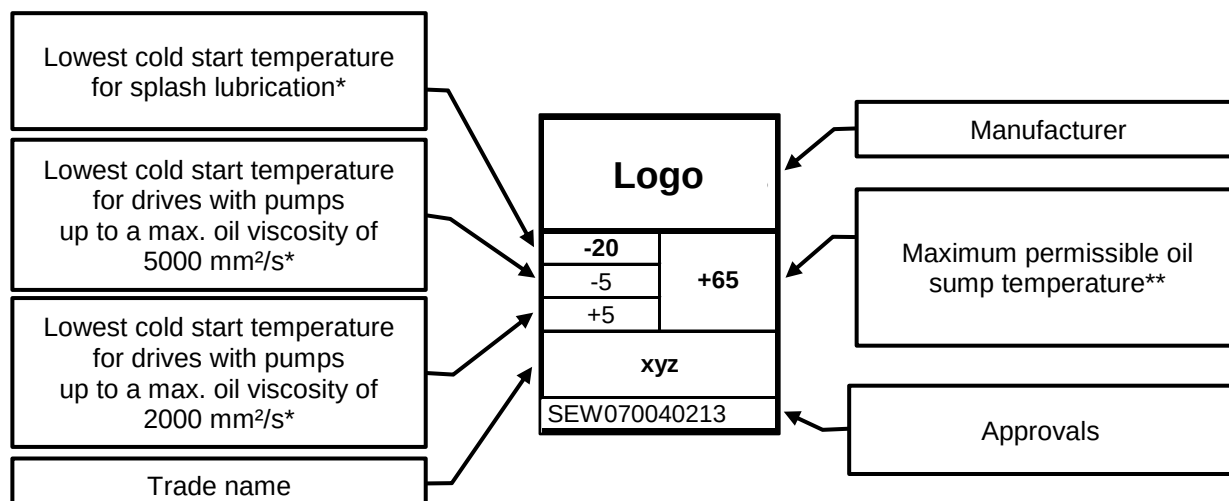
 Lubricant for the food processing industry and feed industry.
Oils are NSF-H1 registered and compliant according to FDA 21 CFR § 178.3570.

 Lubricants with slight bio-degradability for environmentally sensitive areas
(> 60% according to OECD 301 or according to appendix A of EPA 2013 VGP).

RWDR Radial oil seal

1.2 Explanations of the various lubricants

The minimum and maximum permitted oil sump temperature depends on the lubricant used and serves as a coarse preselection. If the actually measured or configured oil temperature in your drive is outside the specified limits, contact SEW-EURODRIVE.



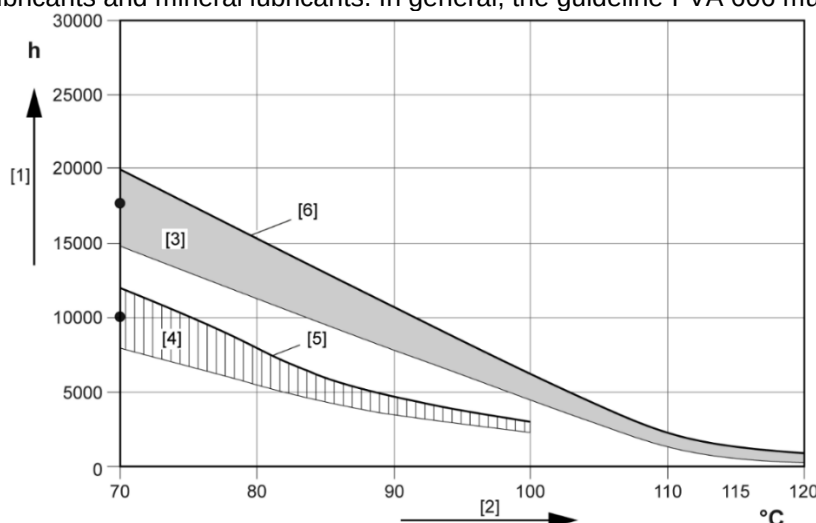
* In case of low temperatures, the oil must be heated to the specified minimum temperature, for example, by using an oil heater. The maximum permitted oil viscosity per pump type can be found in chapter 1.4.

** The service life will be considerably reduced when exceeded. Observe the lubricant change intervals according to chapter 1.3.

1.3 Lubricant change intervals

The following image depicts the change intervals for industrial gear units under normal ambient conditions. In case of special designs under severe/aggressive ambient conditions, change the lubricant more frequently.

Notice: Filling of wrong lubricant may lead to a loss of the lubricant properties and thus damage the gear unit. Do not mix synthetic lubricants and mineral lubricants. In general, the guideline FVA 606 must be adhered to.



[1] Operating hours

[2] Sustained oil bath temperature, average value per oil type at 70 °C

[3] CLP HC/CLP HC NSF H1

[4] CLP (CC)/E

[5] GearOil Base by SEW-EURODRIVE

[6] GearOil Synth (H1) by SEW-EURODRIVE

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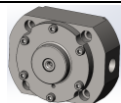
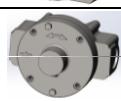
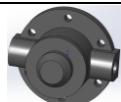
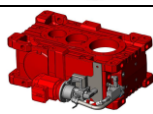
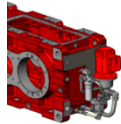
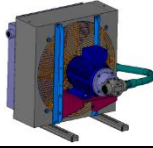
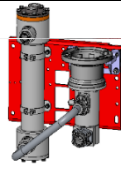
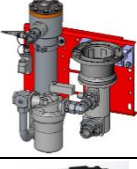
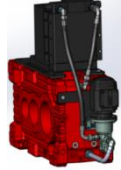
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1.4 Explanation of the oil supply systems and their viscosity

Type	Name	Supplier	Maximum oil viscosity [mm ² /s]	Image	Comment
Shaft end pump for pressure lubrication	SEP		5000		Flanged on the gear unit housing
Shaft end pump for pressure lubrication	SEP		5000		Mounted inside the vertical agitator drive
Shaft end pump for pressure lubrication	SEP		5000		Mounted inside the vertical agitator drive
Shaft end pump for pressure lubrication	SEP		5000		Mounted inside the vertical agitator drive
Shaft end pump for pressure lubrication	SEP		5000		Mounted inside the vertical agitator drive
Shaft end pump for pressure lubrication	SEP		5000		Mounted inside the vertical agitator drive
Motor pump for pressure lubrication	ONP1L		5000		
Motor pump for pressure lubrication	ONP1		5000		
System for oil cooling by air	OAC		2000		
System for oil cooling by water	OWC		2000		
Motor pump and heat exchanger for pressure lubrication and cooling by water	OWP		2000		
System for oil cooling by air	OAC1		5000		

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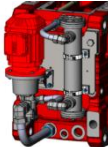
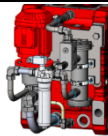
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Motor pump and heat exchanger for pressure lubrication and cooling by air	OAP1		5000		
System for oil cooling by water	OWC1		5000		
Motor pump and heat exchanger for pressure lubrication and cooling by water	OWP1		5000		

Comment: For the maximum permitted oil viscosity for oil supply systems that are not included in the table above, refer to the order documents or operating instructions or contact SEW-EURODRIVE if necessary.

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1.5 Lubricant compatibility with radial oil seals

SEW07004_13: A lubricant especially recommended by SEW-EURODRIVE, also in regard of compatibility with the approved oil seals. The lubricant exceeds the state-of-the-art requirements.

Limitations of use of radial oil seals with the specific lubricant are indicated in the following table:

Material class		Manufacturer		Material	Approved oil sump temperature		
S	1	NBR	1	Freudenberg	72 NBR 902	-40 °C ... +80 °C	
			2	Trelleborg	4NV11	-40 °C ... +80 °C	
	2	FKM	1	Freudenberg	1	75 FKM 585	-25 °C ... +115 °C
			2		75 FKM 170055	-25 °C ... +115 °C	
			2	Trelleborg	1	VCBVR	-25 °C ... +115 °C
			3	SKF	1	FKM 00934	-25 °C ... +115 °C

In the low temperature range, oil seals can withstand shaft deflections (e.g. through overhung load) only to a limited extent. Especially avoid or limit pulsating or changing radial displacements of the shaft. Please contact SEW-EURODRIVE if required.

Example 1:

S11 - Only the elastomer 72 NBR 902 from Freudenberg meets the requirements of the SEW-EURODRIVE approval in regard of the specific lubricant.

Example 2:

S2 - Only the elastomer FKM meets the requirements of the SEW-EURODRIVE approval in regard of the specific lubricant.

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2 Industrial gear units (X.e / M1..N / ML..2 / MC.. / P..2e / P..2 / XP.. / P-X.e / PPK..)

Comment: Lubricant recommendations also apply to older or discontinued SEW industrial gear unit series.

Typ / Type	Öltyp / Oil Type	ISO, SAE NLGI	SEW EURODRIVE	Castrol	FUCHS	KLÜBER LUBRICATION	Mobil	SINOPEC	TotalEnergies								
 	CLP	VG 150	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65				
			GearOil Base 150 E1 / US1 / CN1 / BR1		Optigear BM 150	Alpha SP 150	Renolin CLP 150 Plus	Renolin HighGear 150	Klüberoil GEM 1-150 N	Mobilgear 600 XP 150	AP-SGO 150						
			SEW070040313				SEW070040313			SEW070040013	SEW070040313						
			-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	Carter EP 220
			GearOil Base 220 E1 / US1 / CN1 / BR1		Optigear BM 220	Alpha SP 220	Renolin CLP 220 Plus	Renolin HighGear 220	Klüberoil GEM 1-220 N	Mobilgear 600 XP 220	AP-SGO 220						
			SEW070040313				SEW070040313			SEW070040013	SEW070040313						
			-10 +5 +15 +85	-10 +5 +15 +85	-10 +5 +15 +85	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	Carter EP 320
			GearOil Base 320 E1 / US1 / CN1 / BR1		Optigear BM 320	Alpha SP 320	Renolin CLP 320 Plus	Renolin HighGear 320	Klüberoil GEM 1-320 N	Mobilgear 600 XP 320	AP-SGO 320						
			SEW070040313				SEW070040313			SEW070040013	SEW070040313						
			-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	Carter EP 460
			GearOil Base 460 E1 / US1 / CN1 / BR1		Optigear BM 460	Alpha SP 460	Renolin CLP 460 Plus	Renolin HighGear 460	Klüberoil GEM 1-460 N	Mobilgear 600 XP 460	AP-SGO 460						
			SEW070040313				SEW070040313			SEW070040013	SEW070040313						
0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	Carter EP 680			
GearOil Base 680 E1 / US1 / CN1 / BR1		Optigear BM 680	Alpha SP 680	Renolin CLP 680 Plus	Renolin HighGear 680	Klüberoil GEM 1-680 N	Mobilgear 600 XP 680	AP-SGO 680									
SEW070040313				SEW070040313			SEW070040013	SEW070040313									
VG 1000			+5 +20 +30 +90														
			Optigear BM 1000														

NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.

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Typ / Type	Öltyp / Oil Type	ISO, SAE NLGI								
 	CLP HC	VG 32					-40 -30 -25 +30 SHC 624			
		VG 68				-35 -20 -10 +50 Renolin Unisyn CLP 68	-35 -20 -10 +50 Klübersynth GEM 4-68 N	-40 -25 -15 +50 SHC 626		
		VG 150	-35 -15 -5 +75 GearOil Synth 150 E1 SEW 070040313	-25 -10 0 +70 Alphasyn EP 150	-30 -10 0 +70 Optigear Synthetic X 150	-30 -10 0 +70 Renolin Unisyn CLP 150	-25 -10 0 +70 Klübersynth GEM 4-150 N	-30 -10 0 +75 SHC 629	-35 -15 -5 +75 SHC Gear 150	-35 -15 -5 +75 Carter SH 150
		VG 220	-30 -10 0 +85 GearOil Synth 220 E1 SEW 070040313	-25 -5 +5 +80 Alphasyn EP 220	-25 -5 +5 +80 Optigear Synthetic X 220	-25 -5 +5 +80 Renolin Unisyn CLP 220	-25 -5 +5 +80 Klübersynth GEM 4-220 N	-25 -5 0 +85 SHC 630	-30 -10 +5 +85 SHC Gear 220	-25 -5 +5 +80 Carter SH 220
		VG 320	-25 -5 +5 +100 GearOil Synth 320 E1 SEW 070040313	-20 0 +10 +90 Alphasyn EP 320	-20 0 +10 +90 Optigear Synthetic X 320	-20 0 +10 +90 Renolin Unisyn CLP 320	-20 0 +10 +95 Klübersynth GEM 4-320 N	-20 0 +10 +95 SHC 632	-25 -5 +10 +100 SHC Gear 320	-20 0 +10 +90 Carter SH 320
		VG 460	-20 0 +15 +110 GearOil Synth 460 E1 SEW 070040313	-15 +5 +15 +100 Alphasyn EP 460	-15 +5 +15 +100 Optigear Synthetic X 460	-15 +5 +15 +100 Renolin Unisyn CLP 460	-15 +5 +20 +105 Klübersynth GEM 4-460 N	-15 +5 +15 +105 SHC 634	-20 0 +15 +110 SHC Gear 460	-15 +5 +15 +100 Carter SH 460
		VG 680	-15 +5 +20 +110 GearOil Synth 680 E1 SEW 070040313		-10 +10 +25 +110 Optigear Synthetic X 680	-10 +10 +25 +110 Renolin Unisyn CLP 680	-10 +10 +25 +110 Klübersynth GEM 4-680 N	-10 +10 +25 +110 SHC 636	-15 +10 +25 +110 SHC Gear 680	-10 +10 +25 +110 Carter SH 680
		VG 1000					0 +20 +30 +110 Klübersynth EG 4-1000	-10 +15 +30 +110 SHC 639	-10 +15 +30 +110 SHC Gear 1000	

NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.

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Typ / Type	Öltyp / Oil Type	ISO, SAE NLGI																										
 		CLP HC NSF H1 ²⁾	VG 68 ¹⁾	-35 -20 -10		+45	-40 -25 -15		+45	-35 -20 -10		+45	-35 -20 -10		+45	Cassida Fluid HF 68		Optileb HY 68		Cassida Fluid HF 68		Klüberoil 4UH1-68 N						
				Cassida Fluid HF 68			Optileb HY 68			Cassida Fluid HF 68			Klüberoil 4UH1-68 N															
				Cassida Fluid HF 68			Optileb HY 68			Cassida Fluid HF 68			Klüberoil 4UH1-68 N															
				Cassida Fluid HF 68			Optileb HY 68			Cassida Fluid HF 68			Klüberoil 4UH1-68 N															
			VG 220 ¹⁾	-30 -5 0		+80	-20 -5 +5		+75	-25 -5 +5		+75	-20 -5 +5		+75	-25 -5 +5		+75	GearOil Synth 220 H1 E1 SEW 070040313		Cassida Fluid GL 220		Optileb GT 220 SEW 070040213		Cassida Fluid GL 220		Klüberoil 4UH1-220 N	
				GearOil Synth 220 H1 E1 SEW 070040313			Cassida Fluid GL 220			Optileb GT 220 SEW 070040213			Cassida Fluid GL 220			Klüberoil 4UH1-220 N												
				GearOil Synth 220 H1 E1 SEW 070040313			Cassida Fluid GL 220			Optileb GT 220 SEW 070040213			Cassida Fluid GL 220			Klüberoil 4UH1-220 N												
				GearOil Synth 220 H1 E1 SEW 070040313			Cassida Fluid GL 220			Optileb GT 220 SEW 070040213			Cassida Fluid GL 220			Klüberoil 4UH1-220 N												
			VG 460 ¹⁾	-20 0 +15		+100	-15 +5 +20		+90	-15 +5 +20		+95	-15 +5 +20		+90	-15 +5 +15		+95	GearOil Synth 460 H1 E1 SEW 070040313		Cassida Fluid GL 460		Optileb GT 460 SEW 070040313		Cassida Fluid GL 460		Klüberoil 4UH1-460 N	
				GearOil Synth 460 H1 E1 SEW 070040313			Cassida Fluid GL 460			Optileb GT 460 SEW 070040313			Cassida Fluid GL 460			Klüberoil 4UH1-460 N												
				GearOil Synth 460 H1 E1 SEW 070040313			Cassida Fluid GL 460			Optileb GT 460 SEW 070040313			Cassida Fluid GL 460			Klüberoil 4UH1-460 N												
				GearOil Synth 460 H1 E1 SEW 070040313			Cassida Fluid GL 460			Optileb GT 460 SEW 070040313			Cassida Fluid GL 460			Klüberoil 4UH1-460 N												
	VG 680 ¹⁾	-10 10 +25		+105	-10 10 +25		+105	-10 10 +25		+110	-10 10 +25		+110	-10 10 +25		+110	Cassida Fluid GL 680		Cassida Fluid GL 680		Optileb GT 680 SEW 070040313		Cassida Fluid GL 680		Klüberoil 4UH1-680 N			
		Cassida Fluid GL 680			Cassida Fluid GL 680			Optileb GT 680 SEW 070040313			Cassida Fluid GL 680			Klüberoil 4UH1-680 N														
		Cassida Fluid GL 680			Cassida Fluid GL 680			Optileb GT 680 SEW 070040313			Cassida Fluid GL 680			Klüberoil 4UH1-680 N														
		Cassida Fluid GL 680			Cassida Fluid GL 680			Optileb GT 680 SEW 070040313			Cassida Fluid GL 680			Klüberoil 4UH1-680 N														
		E	VG 320	-20 0 +10		+85	-20 0 +10		+85	-20 0 +10		+85	-20 0 +10		+85	Plantogear 320 S S2		Klüber Bio EG 2-320 S2										
				Plantogear 320 S S2			Klüber Bio EG 2-320 S2																					
Plantogear 320 S S2				Klüber Bio EG 2-320 S2																								
Plantogear 320 S S2				Klüber Bio EG 2-320 S2																								
VG 460			-15 +5 +15		+95	-15 +5 +15		+95	-15 +5 +15		+95	-15 +5 +15		+95	Plantogear 460 S S2		Klüber Bio EG 2-460 S2											
			Plantogear 460 S S2			Klüber Bio EG 2-460 S2																						
			Plantogear 460 S S2			Klüber Bio EG 2-460 S2																						
			Plantogear 460 S S2			Klüber Bio EG 2-460 S2																						

1) Lubricants must only be used if the service factor F_s and peak load factor $F_F \geq 1.6$.

The peak output torque M_{K2per} is limited as follows: $F_F \geq 1.6 \rightarrow M_{K2per} \leq 1.25 \times M_{N2}$ (nominal torque) $\rightarrow M_{K2per} \leq 2 \times M_{N2} / F_F = 2/1.6 \times M_{N2}$. In case of deviations, contact SEW-EURODRIVE.

2) NSF-H1 registered oils for the food processing industry can not be combined with the gear unit option "Extended storage" (a VCI anti-corrosion agent is added).

NOTICE: The thermal application limits of radial oil seal materials (Ch. 1.5) have to be considered as well.

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2.1 Other approved lubricants

The lubricants listed below meet the SEW requirements according to SEW specification SEW07004__13 for use in industrial gear units of the X.e / M1..N / ML..2 / MC.. / P..2e / P..2 / XP.. / P-X.e / PPK.. series, they are, however, not available as initial filling ex works.

The responsibility for the consistent quality of the lubricants lies with the respective manufacturer.

The maximum permitted oil bath temperatures must not be exceeded.

The viscosity temperature behavior can vary greatly depending on the selected lubricant product.

The minimum and maximum permissible operating viscosities must be observed. Please contact SEW-EURODRIVE for this.

Oil type	Manufacturer – product name	Viscosity
CLP (mineral) Max. oil bath temperature 80 °C (90 °C for a short time)	Total Energies – Carter EP	VG150, VG1000
CLP HC (synthetic based on polyalphaolefin) Max. oil bath temperature 100 °C (short-term 110 °C)	PetroChina Lubricant Company – KunLun KPM/S Synthetic Heavy-duty Industrial Gear Oil	VG150 – VG680
	Sinopec – AP-S Industrial Gear Oil granted	VG150 – VG680
	Total Energies – Carter SY	VG1000