

6 Design and operating notes

6.1 Lubricants

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific gear unit and mounting position. The decisive factor is the mounting position specified when ordering the drive. If you change the mounting position later, you must adapt the lubricant fill quantity accordingly.

6.1.1 SEW GearOil – Premium lubricant for gear units

With decades of experience in gear unit development and construction, as well as numerous customer applications, SEW-EURODRIVE has extensive tribological knowledge. Based on this and the results of long-term testing, SEW-EURODRIVE has developed a special formulation for our first premium gear unit oil – SEW GearOil. It provides the perfect protection for your valuable SEW-EURODRIVE gear unit.

By using high-quality base materials and additives and appropriate logistics, SEW-EURODRIVE can ensure you always receive the highest level of quality.

SEW GearOil increases the performance of gear units – be they standard, servo or industrial. The premium gear oil reduces the friction between gears, as it creates a very good lubrication film. This increases the service life of lubricant and wear parts, such as seals and bearings. The high damage load stage of the SEW GearOil Base mineral lubricant (damage load stage 14) improves protection from fretting on the gearing. At the same time, SEW GearOil increases the efficiency of the gear unit and protects it from corrosion and damaging oil foaming. The "self-cleaning" properties of the lubricants prevent deposits as they bind water and dirt particles.

As an option, SEW GearOil can be selected as initial filling for gear units and gearmotors. In addition, the premium gear oil can be ordered in cans or barrels for service and maintenance purposes. In an unopened packing unit, SEW GearOil can be stored for up to 6 years.

Refer to the following table for the amounts available to order and the respective part numbers:





SEW GearOil	Part numbers			
	5 liter can	20 liter can	205 liter barrel	1000 liter IBC
Base 150 E¹	–	03287866	03287742	03096750
Base 220 E¹	–	03287858	03287734	03096688
Base 320 E¹	–	03287831	03287726	03096742
Base 460 E¹	–	03287823	03287718	03096734
Base 680 E¹	–	03287815	03287696	03096726
Base 680 S E¹	–	03287807	03287688	03096718
Poly 460 W E¹	03096599	03287750	03287645	03096696
Poly 460 H1 E¹	03287076	03288099	03287068	–

For additional information on using SEW GearOil lubricants, as well as most important technical properties, refer to chapter "Lubricant table" (→ 110). Technical data sheets and safety data sheets are available upon request from SEW-EURODRIVE.

6.1.2 Bearing greases

The gear unit rolling bearings are given a factory-fill with the greases listed below. SEW-EURODRIVE recommends re-greasing the rolling bearings with a grease filling at the same time as changing the oil.

The table shows the lubricants recommended by SEW-EURODRIVE:

Area of operation	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	Fuchs	Renolit CX-TOM 15 ¹⁾
	-40 °C to +80 °C	Klüber	Petamo GHY 133 N
 ²⁾	-40 °C to +40 °C	Bremer & Leguil	Cassida Grease GTS 2
 ³⁾	-20 °C to +40 °C	Fuchs	Plantogel 2S

1) Bearing grease based on semi-synthetic base oil

2) Lubricant for the food processing industry

3) Easily biodegradable lubricant for environmentally sensitive areas

INFORMATION



The following grease quantities are required:

- **For fast-running bearings (gear unit input side):** Fill the cavities between the rolling elements one-third full with grease.
- **For slow-running bearings (gear unit output side):** Fill the cavities between the rolling elements two-thirds full with grease.

6.1.3 Lubricant table


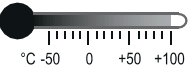

NOTICE

Damage to the gear unit due to improper lubricants.

Possible damage to property.

- 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 you use other lubricants for the gear units and/or use the lubricants at temperatures outside the recommended temperature range, SEW-EURODRIVE does not assume liability.
- 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 their product.
- Do not mix synthetic lubricants.
- Do not mix synthetic lubricants and mineral lubricants.
- Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimally and maximally permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.
- The values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants is subject to dynamic change on the part of the lubricant manufacturers. For the latest information about the lubricants, visit: www.sew-eurodrive.de/lubricants.

Information on table structure

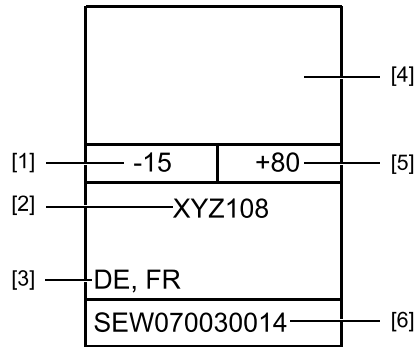
[1]	[2]			[3]
R.. 				ISO, SAE NLGI
	-15	+40		VG 460
	-25	+30	CLP HC - NSF H1 - PSS	VG 220
			[4]	[5]

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- [1] Gear unit type
- [2] Ambient temperature range
- [3] Viscosity class
- [4] Note on special approvals
- [5] Lubricant type

The specified ambient temperatures are guide values for the preselection of a suitable lubricant. The exact upper and lower temperature limits for project planning are specified in the table with the respective trade name.

Information on the various lubricants



- [1] Lowest oil sump temperature in °C, **going below this value during operation is not permitted**
- [2] Trade name
- [3] Factory filling for the listed countries
BR: Brazil
CN: China
DE: Germany
FR: France
US: United States of America
- [4] Manufacturer
- [5] Highest oil sump temperature in °C. The service life will be considerably reduced when exceeded. Adhere to the lubricant change intervals in chapter "Current lubricant change intervals" in the operating instructions.
- [6] Approvals regarding compatibility of the lubricant with approved oil seals

Lubricant compatibility with oil seal

Approval	Explanation
SEW07004__13:	A lubricant especially recommended with regard to compatibility with the approved oil seals. The lubricant exceeds the state-of-the-art requirements regarding elastomer compatibility.

Approved application temperature range of the oil seals

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. Contact SEW-EURODRIVE, if required.

Oil seal Material class	Permitted Oil sump temperature
NBR	-40 °C to +80 °C
FKM	-25 °C to +115 °C
FKM-PSS	-25 °C to +115 °C

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

Material class		Manufacturer		Material		
S	1	NBR	1	Freudenberg	72 NBR 902	
			2	Trelleborg	4NV11	
	2	FKM	1	Freudenberg	1	75 FKM 585
			2	Trelleborg	1	75 FKM 170055
					VCBVR	






Examples:

S11: Only the elastomer 72NBR902 of the Freudenberg company meets the requirements of the approval in conjunction with the specific lubricant.

S2: Only the elastomer FKM meets the requirements of the approval in conjunction with the specific lubricant.

Key




The following table shows the abbreviations and icons used in the lubricant table and explains what they mean:

Abbreviation/icon	Meaning
	Synthetic lubricant (marked gray)
	Mineral lubricants
CLP	Mineral oil
CLP PG	Polyglycol (PG)
CLP HC	Synthetic hydrocarbons – polyalphaolefin (PAO)
E	Ester-based oil
	Lubricant for the food processing industry – NSF-H1-compliant
	Easily biodegradable oil for environmentally sensitive areas
	Lubricant suitable for ATEX environment.
1)	Helical-worm gear units with CLP-PG: Contact SEW-EURODRIVE
2)	Special lubricant for SPIROPLAN® gear units only
3)	W..10, W..20, W..30: SEW $f_b \geq 1.0$ required W..37, W..47: SEW $f_b \geq 1.2$ required
4)	Observe the critical starting behavior at low temperatures
7)	With appropriate measures, the gear units can be operated at ambient temperatures as low as -40 °C. Contact SEW-EURODRIVE.
Oil seal	Oil seal
PSS	Oil seal type Premium Sine Seal (PSS). The addendum "PSS" at the lubricant type signals compatibility with the sealing system.

Lubricant table for R., F., and K..7 gear units

The lubricant table is valid at the day this document is published. Refer to www.sew-eurodrive.de/lubricants for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seal" (→ 111).

R. RES	K..7 KES	HK..	F. 	ISO,SAE NLGI	[2]	[1]	[3] °C	[4]		SEW EURODRIVE	brenner & leguit	Castrol	FUCHS	Mobil®	KUBER LUBRICATION	Shell	TOTAL	
								-15	+80									
				VG 220	CLP		-15	+80	SEW GearOil Base 220 E ¹		Optigear BM 220	Renolin CLP220 Plus	Mobilgear 600 XP 220 DE,FR	Klüberoil GEM 1-220 N	Shell Omala S2 G 220 CN,US	Cater EP 220		
				VG 150	CLP		-15	+80	SEW GearOil Base 150 E ¹		Optigear BM 150	Renolin CLP150 Plus	Mobilgear 600 XP 150 DE,FR	Klüberoil GEM 1-150 N	Shell Omala S2 G 150	Cater EP 150		
				VG 220	CLP PG		-25	+80			Optigear Synthetic 800/220	Renolin PG220	Mobil Glyolyte 220 DE,FR	Klüberoil GH 6-220	Shell Omala S2 WE 220 CN,US	Cater SY 220		
				VG 220	CLP PG		-25	+80										

[1] Note on special approvals
[2] Oil type

[3] Ambient temperature range
[4] Standard

The lubricant table is valid at the day this document is published. Refer to www.sew-eurodrive.de/lubricants for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seal" (→ 111).

[3] °C -50 0 +50 +100	[4] -25 -30 -40 -40	[4] +60 +50 +20 0	[1] 	[2] CLP HC - PSS	ISO, SAE NLGI	SEW EURODRIVE				Mobil®			
					VG 220								
					VG 150 ⁴⁾								
					VG 68 ⁴⁾								
					VG 32 ⁴⁾								
					VG 220								
					VG 150 ⁴⁾								

[1] Note on special approvals
[2] Oil type

[3] Ambient temperature range
[4] Standard

The lubricant table is valid at the day this document is published. Refer to www.sew-eurodrive.de/lubricants for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seal" (→ 111).

[3] °C	[4]	[1]	[2]	ISO/SAE NLGI	SEW EURODRIVE	Brenner & leguit	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TOTAL
-50	-15		CLP HC - NSF H1	VG 460		Cassida Fluid GL 460	Optileb GT 460			Klüberoil 4UH1-460 N		
0	+30			VG 220		Cassida Fluid GL 220	Optileb GT 220			Klüberoil 4UH1-220 N		
+50	+40			VG 68 ⁴⁾		Cassida Fluid HF 68	Optileb HY 68			Klüberoil 4UH1-68 N		
+100	-10			VG 32 ⁴⁾		Cassida Fluid HF 32	Optileb HY 32			KlüberSummit HySynFG32		
	+40		CLP HC - NSF H1 - PSS	VG 460			Optileb C GT 460					
	+30			VG 220			Optileb GT 220					
	+40		E	VG 460			Optileb Plantogear 460 S					
	-20											

[1] Note on special approvals
[2] Oil type

[3] Ambient temperature range
[4] Standard

Lubricant table for K..9 gear units

The lubricant table is valid at the day this document is published. Refer to www.sew-eurodrive.de/lubricants for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seal" (→ 111).

				CLP PG - H1 (-PSS)	ISO, SAE NLGI					Mobil®				-20 +95 Klübersynth GH 6-460 DE, FR, US, BR, CN	
														-15 +115 Klübersynth GH 6-680 DE, FR, US, BR, CN	
-25 +40				CLP PG (-PSS)	VG 220					Mobil®				-25 +70 Klübersynth GH 6-220 DE, FR, US, BR, CN	
-30 +30														-30 +60 Klübersynth GH 6-150 DE, FR, US, BR, CN	
-20 +60				CLP PG - H1 (-PSS)	VG 460					Mobil®				-20 +95 Klübersynth UHI 6-460 DE, FR, US, BR, CN	
-15 +80														-15 +115 Klübersynth UHI 6-680 DE, FR, US, BR, CN	
-25 +40				CLP PG - H1 (-PSS)	VG 220					Mobil®				-25 +70 Klübersynth UHI 6-220 DE, FR, US, BR, CN	
-30 +30														-30 +60 Klübersynth UHI 6-150 DE, FR, US, BR, CN	

K..9

[1] Note on special approvals
 [2] Oil type

[3] Ambient temperature range
 [4] Standard

Lubricant table for S.. gear units

The lubricant table is valid at the day this document is published. Refer to www.sew-eurodrive.de/lubricants for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seal" (→ 111).

[3]		[1]	[2]	ISO, SAE NLGI	SEW EURODRIVE	bremner & leguit	Castrol	FUCHS	Mobil®	KLÜBERS LUBRICATION	Shell	TOTAL
°C -40 0 +50 +100	[4] 0		CLP	VG 680	SEW GearOil Base 680 S E ¹		Optigear EM 680	Renolin CLP 680 Plus	Mobilgear 600 XP 680	Klüberoil GEM 1-680 N	Shell Omala S2 G 680	Carter EP 680
					SEW070040013			SEW070040013				
	[4] -20			VG 150	SEW GearOil Base 150 E ¹		Optigear BM150	Renolin CLP 150 Plus	Mobilgear 600 XP 150	Klüberoil GEM 1-150 N	Shell Omala S2 G 150	Carter EP 150
	[4] -15		CLP PG	VG 680 ¹⁾	SEW070040013		Optigear Synthetic 800/680	Renolin PG 680	Mobil Glygoyle 680	Klüberoil GH 6-680	Shell Omala S4 WE 680	
	[4] -25			VG 220 ¹⁾			Optigear Synthetic 800/220	Renolin PG 220	Mobil Glygoyle 220	Klüberoil GH 6-220	Shell Omala S4 WE 220	Carter SY 220
	[4] -15		CLP PG - PSS	VG 680 ¹⁾						Klüberoil GH 6-680		
	[4] -25			VG 220 ¹⁾						Klüberoil GH 6-220		

S..
HS.. 

[1] Note on special approvals
[2] Oil type

[3] Ambient temperature range
[4] Standard

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Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seal" (→ 111).


[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	b bremer & leguit	Castrol	FUCHS	Mobil®	KUBBER LUBRICATION	Shell	TOTAL	[4]	
												-15	+105
		CLP HC	VG 460			Optigear Synthetic PD 460	Renolin Unisyn CLP 460	Mobil SHC 634 DE, FR	Klütbersynth GEM 4-460 N	Shell Omala S4 GX 460	Carter SH 460	-15	+105
			VG 150 ⁴⁾			Optigear Synthetic PD 150	Renolin Unisyn CLP 150	Mobil SHC 629 DE, FR	Klütbersynth GEM 4-150 N	Shell Omala S4 GX 150	Carter SH 150	-30	+70
			VG 68 ⁴⁾				Renolin Unisyn CLP 68	Mobil SHC 626 DE, FR		Shell Omala S4 GX 68		-40	+50
			VG 32 ⁴⁾				Renolin Unisyn OL 32	Mobil SHC 624 DE, FR			Dacnis SH 32	-40	+30
		CLP HC - PSS	VG 460					Mobil SHC 634 DE, FR, US, BR, CN				-20	+105
			VG 150 ⁴⁾					Mobil SHC 629 DE, FR, US, BR, CN				-30	+75








[1] Note on special approvals
[2] Oil type

[3] Ambient temperature range
[4] Standard

The lubricant table is valid at the day this document is published. Refer to www.sew-eurodrive.de/lubricants for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seal" (→  111).

[3]	[1]	[2]	ISO.SAE NLGI	SEW EURODRIVE	b remer & leguit	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TOTAL
[4] -15		CLP HC - NSF H1	VG 460	SEW EURODRIVE	Cassida Fluid GL 460	Optileb GT 460 DE, FR	FUCHS	Mobil®	Klüberoil 4UH1-460 N	Shell	TOTAL
			VG 220			SEW070040013					
[4] -25		CLP HC - NSF H1	VG 68 ⁴⁾	SEW EURODRIVE	Cassida Fluid GL 220	Optileb GT 220 DE, FR	FUCHS	Mobil®	Klüberoil 4UH1-220 N	Shell	TOTAL
			VG 32 ⁴⁾			SEW070040013					
[4] -40		CLP HC - NSF H1 - PSS	VG 460	SEW EURODRIVE	Cassida Fluid HF 32	Optileb HY 32 DE, FR	FUCHS	Mobil®	KlüberSummit HySyn FG 32	Shell	TOTAL
			VG 220			SEW070040013					
[4] -25		E	VG 460	SEW EURODRIVE	Cassida Fluid HF 32	Optileb GT 220 DE, FR, US, BR, CN	FUCHS	Mobil®	Klüberbio CA2-460	Shell	TOTAL
			VG 460			SEW070040013					
[4] -20		E	VG 460	SEW EURODRIVE			FUCHS	Mobil®	Klüberbio CA2-460	Shell	TOTAL

S..
HS..


[1] Note on special approvals

[2] Oil type

[3] Ambient temperature range

[4] Standard

Lubricant table for W.. gear units

The lubricant table is valid at the day this document is published. Refer to www.sew-eurodrive.de/lubricants for the latest tables.

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seal" (→ 111).

[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	D member & legit	Castrol	FUCHS	Mobil®	KLOPPER LUBRICATION	Shell	TOTAL	W.. HW..		[4]	[4]	[4]
														[4]	[4]	[4]

[1] Note on special approvals
[2] Oil type

[3] Ambient temperature range
[4] Standard

6.1.4 Lubricant fill quantities

INFORMATION

The specified fill quantities are **guide values**. The exact values vary depending on the number of gear stages and gear ratio. Check the **oil level plug for the exact oil quantity**.

INFORMATION

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific mounting position. The mounting position (see chapter "Gear unit mounting positions and order information" (→ 63)) must therefore be specified in the drive order.

When the mounting position is changed, the lubricant fill quantity must be adapted accordingly (see the following chapters). Consequently, a mounting position may only be **changed** after consultation with SEW-EURODRIVE, **otherwise your rights to claim under limited warranty no longer apply**.

The following tables show guide values for lubricant fill quantities in relation to the mounting position M1 – M6.

Helical (R) gear units

R..., R..F

Gear units	Fill quantity in liters					
	M1 ¹⁾	M2	M3	M4	M5	M6
R07	0.12	0.20				
R17	0.25	0.55	0.35	0.55	0.35	0.40
R27	0.25/0.40	0.70	0.50	0.70	0.50	
R37	0.30/0.95	0.85	0.95	1.05	0.75	0.95
R47	0.70/1.50	1.60	1.50	1.65	1.50	
R57	0.80/1.70	1.90	1.70	2.10	1.70	
R67	1.10/2.30	2.40	2.80	2.90	1.80	2.00
R77	1.20/3.00	3.30	3.60	3.80	2.50	3.40
R87	2.30/6.0	6.4	7.2		6.3	6.5
R97	4.60/9.8	11.7		13.4	11.3	11.7
R107	6.0/13.7	16.3	16.9	19.2	13.2	15.9
R127	6.4/17	18.3	18.2	22.0	16.8	17.9
R137	10.0/25.0	28.0	29.5	31.5	25.0	
R147	15.4/40.0	46.5	48.0	52.0	39.5	41.0
R167	27.0/70.0	82.0	78.0	88.0	66.0	69.0

1) The larger gear unit of compound gear units must be filled with the larger oil volume.

RF..., RZ..

Gear units	Fill quantity in liters					
	M1 ¹⁾	M2	M3	M4	M5	M6
RF07	0.12	0.20				
RF17	0.25	0.55	0.35	0.55	0.35	0.40
RF27	0.25/0.40	0.70	0.50	0.70	0.50	
RF37	0.35/0.95	0.90	0.95	1.05	0.75	0.95
RF47	0.65/1.50	1.60	1.50	1.65	1.50	
RF57	0.80/1.70	1.80	1.70	2.00	1.70	
RF67	1.20/2.50	2.50	2.70	2.80	1.90	2.10
RF77	1.20/2.60	3.10	3.30	3.60	2.40	3.00
RF87	2.40/6.0	6.4	7.1	7.2	6.3	6.4
RF97	5.1/10.2	11.9	11.2	14.0	11.2	11.8
RF107	6.3/14.9	15.9	17.0	19.2	13.1	15.9
RF127	6.6/16.0	18.3	18.2	21.4	15.9	17.0
RF137	9.5/25.0	27.0	29.0	32.5	25.0	
RF147	16.4/42.0	47.0	48.0	52.0	42.0	42.0
RF167	26.0/70.0	82.0	78.0	88.0	65.0	71.0

1) The larger gear unit of compound gear units must be filled with the larger oil volume.

RX..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RX57	0.60	0.80	1.30		0.90	
RX67	0.80		1.70	1.90	1.10	
RX77	1.10	1.50	2.60	2.70	1.60	
RX87	1.70	2.50	4.80		2.90	
RX97	2.10	3.40	7.4	7.0	4.80	
RX107	3.90	5.6	11.6	11.9	7.7	

RXF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RXF57	0.50	0.80	1.10		0.70	
RXF67	0.70	0.80	1.50	1.40	1.00	

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RXF77	0.90	1.30	2.40	2.00	1.60	
RXF87	1.60	1.95	4.90	3.95	2.90	
RXF97	2.10	3.70	7.1	6.3	4.80	
RXF107	3.10	5.7	11.2	9.3	7.2	

Parallel shaft helical (F) gear units

F., FA..B, FH..B, FV..B

Gear units	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.25	3.15	1.65	3.15	2.40	2.50
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.90	7.30	4.30	8.00	6.00	6.30
F..87	10.8	13.0	7.70	13.8	10.8	11.0
F..97	18.5	22.5	12.6	25.2	18.5	20.0
F..107	24.5	32.0	19.5	37.5	27.0	27.0
F..127	39.5	51.7	31.5	60.1	45.6	44.2
F..157	69.0	104.0	63.0	105.0	86.0	78.0

FF..

Gear units	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
FF27	0.60	0.80	0.65	0.70	0.60	0.60
FF37	1.00	1.25	0.70	1.30	1.00	1.10
FF47	1.60	1.85	1.10	1.90	1.50	1.70
FF57	2.30	3.10	1.70	3.10	2.30	2.40
FF67	2.70	3.80	1.90	3.80	2.90	3.20
FF77	5.90	7.30	4.30	8.10	6.00	6.30
FF87	10.8	13.2	7.80	14.1	11.0	11.2
FF97	19.0	22.5	12.6	25.6	18.9	20.5
FF107	25.5	32.0	19.5	38.5	27.5	28.0
FF127	40.6	51.6	31.5	61.2	46.3	44.9
FF157	72.0	105.0	64.0	106.0	87.0	79.0

FA., FH., FV., FAF., FAZ., FHF., FZ., FHZ., FVF., FVZ., FT., FM., FAM..

Gear units	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.70	3.50	2.10	3.40	2.90	3.00
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.90	7.30	4.30	8.00	6.00	6.30
F..87	10.8	13.0	7.70	13.8	10.8	11.0
F..97	18.5	22.5	12.6	25.2	18.5	20.0
F..107	24.5	32.0	19.5	37.5	27.0	27.0
F..127	38.3	50.9	31.5	59.7	44.7	43.3
F..157	68.0	103.0	62.0	104.0	85.0	77.0

Helical-bevel (K) gear units

INFORMATION



All K..19 and K..29 gear units have a universal mounting position, which means that K..19 and K..29 gear units of the same design are filled with the same oil quantity independent of the mounting position. An exception to this is the M4 mounting position.

K.., KA..B, KH..B, KV..B

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19		0.40		0.45		0.40
K..29		0.70		0.85		0.70
K..39	0.90	1.70	1.55	1.9	1.55	1.30
K..49	1.70	3.40	2.80	4.20	3.15	2.80
K..37	0.50	1.00		1.25	0.95	
K..47	0.80	1.30	1.50	2.00	1.60	
K..57	1.10	2.20		2.80	2.30	2.10
K..67	1.10	2.40	2.60	3.45	2.60	
K..77	2.20	4.10	4.40	5.80	4.20	4.40
K..87	3.70	8.0	8.70	10.90	8.0	
K..97	7.0	14.0	15.70	20.0	15.70	15.50
K..107	10.0	21.0	25.50	33.50	24.0	
K..127	21.0	41.50	44.0	54.0	40.0	41.0
K..157	31.0	65.0	68.0	90.0	62.0	63.0
K..167	33.0	97.0	109.0	127.0	89.0	86.0
K..187	53.0	156.0	174.0	207.0	150.0	147.0

KF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF19		0.40		0.45		0.40
KF29		0.70		0.85		0.70
KF39	0.90	1.70	1.55	1.9	1.55	1.30
KF49	1.70	3.40	2.80	4.20	3.15	2.80
KF37	0.50	1.10		1.50	1.00	
KF47	0.80	1.30	1.70	2.20	1.60	
KF57	1.20	2.20	2.40	3.15	2.50	2.30
KF67	1.10	2.40	2.80	3.70	2.70	
KF77	2.10	4.10	4.40	5.90	4.50	
KF87	3.70	8.20	9.0	11.90	8.40	
KF97	7.0	14.70	17.30	21.50	15.70	16.50
KF107	10.0	21.80	25.80	35.10	25.20	
KF127	21.0	41.50	46.0	55.0	41.0	
KF157	31.0	66.0	69.0	92.0	62.0	63.0

KA.., KH.., KV.., KAF.., KHF.., KVF.., KZ.., KAZ.., KHZ.., KVZ.., KT.., KM.., KAM..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19		0.40		0.45		0.40
K..29		0.70		0.85		0.70
K..39	0.90	1.70	1.55	1.9	1.55	1.30
K..49	1.70	3.40	2.80	4.20	3.15	2.80
K..37	0.50	1.00		1.40	1.00	
K..47	0.80	1.30	1.60	2.15	1.60	
K..57	1.20	2.20	2.40	3.15	2.70	2.40

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..67	1.10	2.40	2.70	3.70	2.60	
K..77	2.10	4.10	4.60	5.90	4.40	
K..87	3.70	8.20	8.80	11.10	8.0	
K..97	7.0	14.70	15.70	20.0	15.70	
K..107	10.0	20.50	24.0	32.40	24.0	
K..127	21.0	41.50	43.0	52.0	40.0	
K..157	31.0	65.0	68.0	90.0	62.0	63.0
K..167	33.0	97.0	109.0	127.0	89.0	86.0
K..187	53.0	156.0	174.0	207.0	150.0	147.0

Helical-worm (S) gear units

S..

Gear unit	Fill quantity in liters					
	M1	M2	M3 ¹⁾	M4	M5	M6
S37	0.25	0.40	0.50	0.55	0.40	
S47	0.35	0.80	0.70/0.90	1.03	0.80	
S57	0.50	1.20	1.00/1.20	1.43	1.30	
S67	1.00	2.00	2.20/3.10	3.10	2.60	2.60
S77	1.90	4.20	3.70/5.4	5.9	4.40	
S87	3.30	8.1	6.9/10.4	11.3	8.4	
S97	6.8	15.0	13.4/18.0	21.8	17.0	

1) The larger gear unit of multi-stage gear units must be filled with the larger oil volume.

SF..

Gear unit	Fill quantity in liters						
	M1	M2	M3 ¹⁾	M4		M5	M6
				Output A or B	Output A + B		
SF37	0.25	0.40	0.50	0.55	0.6	0.40	
SF47	0.40	0.90	0.90/1.05	1.08	1.13	1.00	
SF57	0.50	1.20	1.00/1.50	1.48	1.53	1.40	
SF67	1.00	2.20	2.30/3.00	3.20	3.5	2.70	
SF77	1.90	4.10	3.90/5.8	6.5	7.2	4.90	
SF87	3.80	8.0	7.1/10.1	12.0	13.2	9.1	
SF97	7.4	15.0	13.8/18.8	23.1	25.2	18.0	

1) The larger gear unit of multi-stage gear units must be filled with the larger oil volume.

SA.., SH.., SAF.., SHZ.., SAZ.., SHF.., ST..

Gear unit	Fill quantity in liters					
	M1	M2	M3 ¹⁾	M4	M5	M6
S..37	0.25	0.40	0.50		0.40	
S..47	0.40	0.80	0.70/0.90	1.03	0.80	
S..57	0.50	1.10	1.00/1.50	1.43	1.20	
S..67	1.00	2.00	1.80/2.60	2.90	2.50	
S..77	1.80	3.90	3.60/5.0	5.8	4.50	
S..87	3.80	7.4	6.0/8.7	10.8	8.0	
S..97	7.0	14.0	11.4/16.0	21.0	15.7	

1) The larger gear unit of multi-stage gear units must be filled with the larger oil volume.

SPIROPLAN® (W) gear units

INFORMATION



SPIROPLAN® gear units W..10 to W..30 have a universal mounting position, which means that gear units of the same design are filled with the same oil quantity independent of the mounting position.

The oil fill quantity of SPIROPLAN® gear units W..37 and W..47 in mounting position M4 is different from that of the other mounting positions.

W.., WA..B, WH..B

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
W..10	0.16					
W..20	0.24					
W..30	0.40					
W..37	0.50		0.70		0.50	
W..47	0.90		1.40		0.90	

WF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
WF10	0.16					
WF20	0.24					
WF30	0.40					
WF37	0.50		0.70		0.50	
WF47	0.90		1.55		0.90	

WA.., WAF..,WH.., WT.., WHF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
W..10	0.16					
W..20	0.24					
W..30	0.40					
W..37	0.50		0.70		0.50	
W..47	0.80		1.40		0.80	

6.2 Gear unit venting

INFORMATION



The function of breather valves can be impaired by dirt and dust in the environment. If necessary, contact SEW-EURODRIVE to discuss alternative venting systems.

6.3 Reduced backlash gear unit design /R

Helical, parallel-shaft helical and helical-bevel gear units with reduced backlash are available as of gear unit size 37. The rotational clearance of these gear units is considerably less than that of the standard designs so that positioning tasks can be solved with great precision. The rotational clearance is specified in angular minutes in the chapter "Geometrically possible combinations". The rotational clearance for the output shaft is specified without load (max. 1% of the rated output torque); the gear unit input side is blocked. The specified values have a tolerance of ± 2 angular minutes.

(→ 176)

The reduced backlash variant is available for the following gear units:

- Helical gear units (R), sizes 37 to 167
- Parallel-shaft helical gear units (F), sizes 37 to 157
- Helical-bevel gear units (only K..7) in gear unit sizes 37 – 187

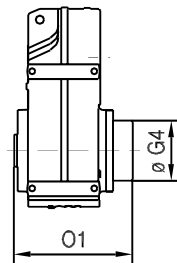
Multi-stage gear units are not available with reduced backlash.

The dimensions of the reduced backlash variants correspond to the dimensions of the standard designs, except for parallel-shaft gear units FH.87 and FH.97 with reduced backlash.

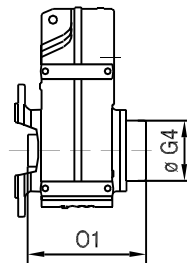
The following figure shows the dimensions of the FH.87 and FH.97 gear units with reduced backlash:

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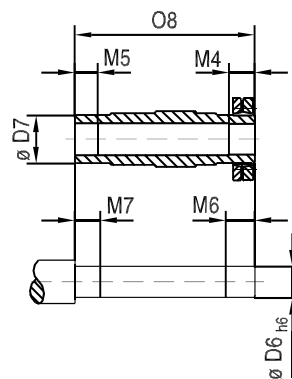
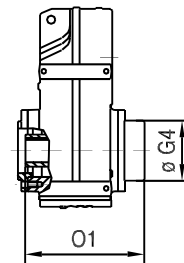
FH../R
FH..B/R



FHF../R



FHZ../R



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Type	Dimensions in mm								
	D6	D7	G4	M4	M5	M6	M7	O1	O8
FH.87/R	Ø 65 _{h6}	Ø 85	Ø 163	41	40	46	45	312.5	299.5
FH.97/R	Ø 75 _{h6}	Ø 95	Ø 184	55	50	60	55	382.5	367

6.4 Assembly/disassembly of gear units with hollow shaft and key

INFORMATION



The data in this chapter applies to the FAM.. and KAM.. braking resistors.

INFORMATION



Use the supplied NOCO® fluid for mounting. The fluid prevents contact corrosion and facilitates subsequent dismounting.

INFORMATION



The key dimension X is specified for the customer and depends on the application requirements and the used materials.

See figure "Customer shaft with [A] and without [B] contact shoulder".

INFORMATION



For the dimensioning of the keyed connection, observe that the hollow shaft of the gear unit (hub) is made of the material C45R(1.1201).

SEW-EURODRIVE recommends **2 options for mounting** gear units with hollow shaft and key onto the input shaft of the driven machine (= customer shaft):

- Mounting using supplied fastening parts
- Mounting/dismounting with SEW-EURODRIVE assembly and disassembly kit

The following sections describe the two options.

6.4.1 Assembly using supplied fastening parts

The following fastening parts are provided as standard:

- Retaining screw with washer [2]
- Retaining ring [3]

Note the following information concerning the customer shaft:

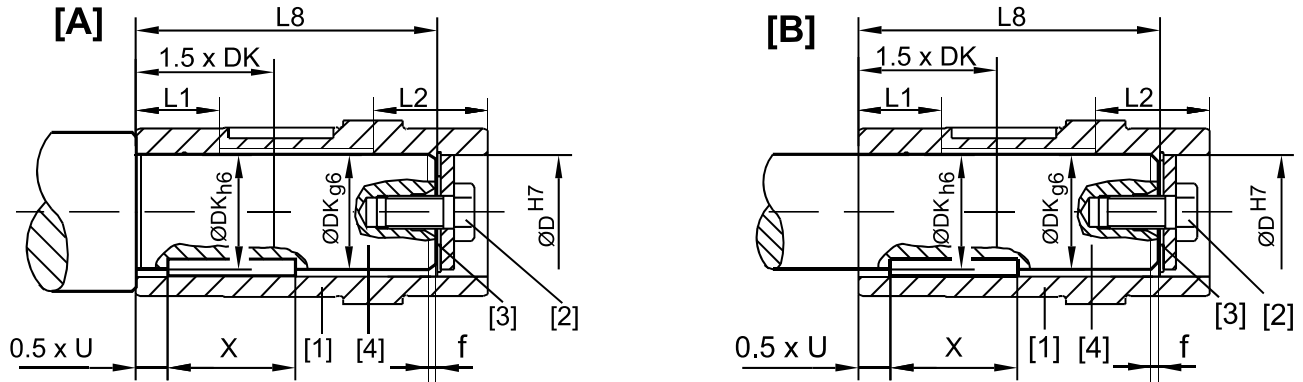
- The installation length of the customer shaft with contact shoulder [A] must be "L8" - 1 mm.
- The installation length of the customer shaft without contact shoulder [B] must equal "L8".

6

Design and operating notes

Assembly/disassembly of gear units with hollow shaft and key

The following figure shows the customer shaft with contact shoulder [A] and without contact shoulder [B].



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- DK Diameter of customer shaft
- U Key width
- L1 / L2 Cylinder section length with dimension H7
- [1] Hollow shaft
- [3] Retaining ring

- X Key length
- L8 Customer shaft length
- f Shaft end chamfer
- [2] Retaining screw with washer
- [4] Customer shaft

Dimensions and tightening torques MS for retaining screw [2] for the **standard gear units**:

Gear unit type	D ^{H7} mm	DK mm	L1 mm	L2 mm	f mm	L8 mm	MS Nm	U mm
WA..10	16		24	24	0.5	69	8	5
WA..20	18		27	27	1	84	8	6
WA..20	20		26	30	1	84	8	6
KA..19	20		28	30	1	92	8	6
FA..27	25		30	30	1	89	20	8
KA..29	25		30	38	1	107	20	8
KA..29	30		35	35	1	107	20	8
WA..30	20		30	30	1	105	8	6
SA..37	20		40	40	1	104	8	6
WA37	20		28	30	1	105	8	6
WA37	25		40	40	1	105	20	8
FA..37, KA..37	30		39	45	1	105	20	8
KA..39	30		35	45	1	137	20	8
KA..39	35		35	45	1	137	20	10
KA..49	35		35	45	1	160	20	10
KA..49	40		35	45	1	154	40	12
SA..47	25		38	38	1	105	20	8
SA..47	30		39	45	1	105	20	8
FA..47, KA..47	35		45	52	1	132	20	10

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Gear unit type	D ^{H7} mm	DK mm	L1 mm	L2 mm	f mm	L8 mm	MS Nm	U mm
WA..47	30		35	45	1	122	20	8
SA..57	30		39	45	1	132	20	8
SA..57	35		45	52	1	132	20	10
FA..57, KA..57	40		50	60	1	142	40	12
FA..67, KA..67	40		50	60	1	156	40	12
SA..67	40		50	60	1	144	40	12
SA..67	45		50	60	1	144	40	14
FA..77, KA..77	50		65	75	1	183	40	14
SA..77	50		63	75	1	180	40	14
SA..77	60		72	90	1	180	80	18
FA..87, KA..87	60		75	90	1	210	80	18
SA..87	60		75	90	1	220	80	18
SA..87	70		90	105	2	220	80	20
FA..97, KA..97	70		90	105	2	270	80	20
SA..97	70		90	105	2	260	80	20
SA..97	90		110	125	2	255	200	25
FA..107, KA..107	90		110	125	2	313	200	25
FA..127, KA..127	100		120	150	2	373	200	28
FA..157, KA..157	120		180	180	2	460	200	32

6.4.2 Assembly/disassembly with SEW-EURODRIVE assembly and disassembly kit

Assembly

You can also use the optional assembly/disassembly kit for mounting. This can be ordered for the specific gear unit types by quoting the part numbers in the following table. The delivery includes:

- Spacer tube for installation without contact shoulder [5]
- Retaining screw for assembly [2]
- Forcing washer for disassembly [7]
- Fixed nut for disassembly [8]

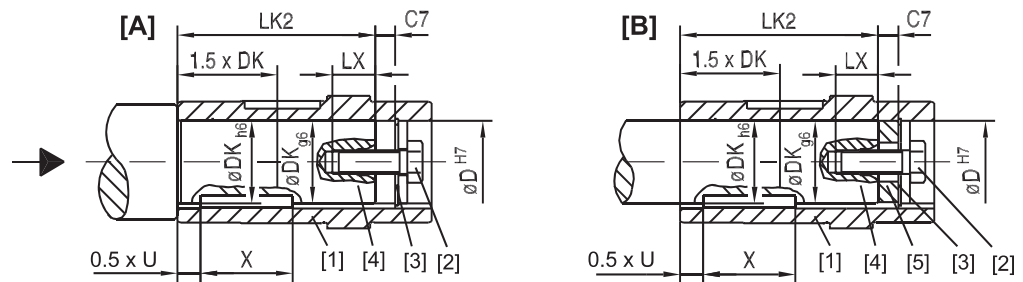
The short retaining screw delivered as standard is not required.

Note the following information concerning the customer shaft:

- The installation length of the customer shaft must be LK2. **Do not use the spacer tube** if the customer shaft **has a contact shoulder [A]**.
- The installation length of the customer shaft must be LK2. **Use the spacer tube** if the customer shaft **has no contact shoulder [B]**.

The following figure shows the customer shaft with contact shoulder [A] and without contact shoulder [B].

00 002 00 02



27021602073190027

DK Diameter of customer shaft
X Key dimension
U Key width
[1] Hollow shaft

[2] Retaining screw with washer
[3] Retaining ring
[4] Customer shaft
[5] Spacer tube

Dimensions, tightening torque MS and part numbers for retaining screw [2]:

Type	D ^{H7} mm	DK mm	LK2 mm	LX ⁺² mm	C7 mm	MS Nm	Part number of the assembly/disassembly kit	U mm
WA..10		16	58	12.5	11	8	6437125	5
WA..20		18	72	16	12	8	643682X	6
WA..20		20	72	16	12	8	6436838	6
WA..30, WA..37		20	93	16	12	8	6436838	6
SA..37		20	92	16	12	8	6436838	6
KA..19		20	80	16	12	8	6436838	6
KA..29		25	91	22	16	20	6436846	8
FA..27		25	73	22	16	20	6436846	8
SA..47, WA..37		25	89	22	16	20	6436846	8
WA..47		30	106	22	16	20	6436854	8
FA..37, KA..37		30	89	22	16	20	6436854	8
SA..47		30	89	22	16	20	6436854	8
SA..57		30	116	22	16	20	6436854	8
KA..29		30	91	22	16	20	6436854	8
KA..39		30	121	22	16	20	6436854	8
KA..39		35	119	28	18	20	6436862	10
FA..47, KA..47, SA..57		35	114	28	18	20	6436862	10
KA..49		35	142	28	18	20	6436862	10
KA..49		40	136	36	18	40	6436870	12
FA..57, KA..57		40	124	36	18	40	6436870	12
FA..67		40	138	36	18	40	6436870	12
KA..67		40	138	36	18	40	6436870	12

Type	D ^{H7} mm	DK mm	LK2 mm	LX ⁺² mm	C7 mm	MS Nm	Part number of the assembly/disassembly kit	U mm
SA..67	40	126	36	18	40	6436870	12	
SA..67	45	126	36	18	40	6436889	14	
FA..77, KA..77, SA..77	50	165	36	18	40	6436897	14	
FA..87, KA..87	60	188	42	22	80	6436900	18	
SA..77	60	158	42	22	80	6436900	18	
SA..87	60	198	42	22	80	6436900	18	
FA..97, KA..97	70	248	42	22	80	6436919	20	
SA..87	70	198	42	22	80	6436919	20	
SA..97	70	238	42	22	80	6436919	20	
FA..107, KA..107	90	287	50	26	200	6436927	25	
SA..97	90	229	50	26	200	6436927	25	
FA..127, KA..127	100	347	50	26	200	6436935	28	
FA..157, KA..157	120	434	50	26	200	6436943	32	

Disassembly

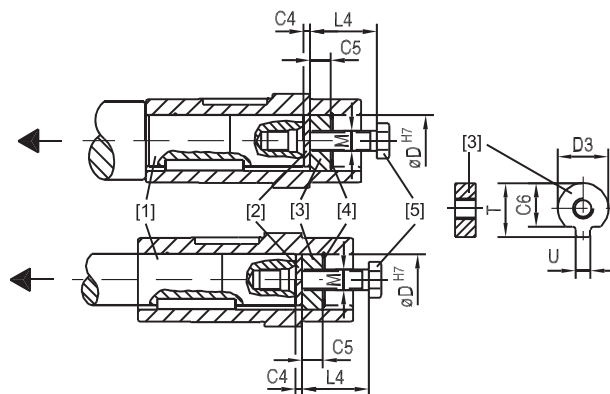
INFORMATION



The depicted assembly kit for attaching the customer shaft is a recommendation by SEW-EURODRIVE.

- You must always check whether this design can compensate the present axial loads.
- In particular applications (e.g. mounting agitator shafts), a different design may have to be used to secure the shaft axially. You can use your own devices to secure the shaft axially, if you ensure that these designs do not cause potential sources of combustion according to DIN EN 13463 (e.g. impact sparks).

The following figure shows the SEW-EURODRIVE assembly/disassembly kit.



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- | | |
|-------------------------------|---------------------|
| [1] Customer shaft | [4] Retaining ring |
| [2] Forcing washer | [5] Retaining screw |
| [3] Fixed nut for disassembly | |

Dimensions and part numbers of the assembly/disassembly kit:

Type	D ^{H7} mm	M ¹⁾	C4 mm	C5 mm	C6 mm	U ^{-0.5} mm	T ^{-0.5} mm	D3 ^{-0.5} mm	L4 mm	Part number of the assembly/disassembly kit
WA..10	16	M5	5	5	12	4.5	18	15.7	50	6437125
WA..20	18	M6	5	6	13.5	5.5	20.5	17.7	25	643682X
WA..20, WA..30, SA..37, WA..37, KA..19	20	M6	5	6	15.5	5.5	22.5	19.7	25	6436838
FA..27, SA..47, WA..47, KA..29	25	M10	5	10	20	7.5	28	24.7	35	6436846
FA..37, KA..29, KA..37, KA..39, SA..47, SA..57, WA..47	30	M10	5	10	25	7.5	33	29.7	35	6436854
FA..47, KA..39, KA..47, KA..49, SA..57	35	M12	5	12	29	9.5	38	34.7	45	6436862
FA..57, KA..57, FA..67, KA..49, KA..67, SA..67	40	M16	5	12	34	11.5	41.9	39.7	50	6436870
SA..67	45	M16	5	12	38.5	13.5	48.5	44.7	50	6436889
FA..77, KA..77, SA..77	50	M16	5	12	43.5	13.5	53.5	49.7	50	6436897
FA..87, KA..87, SA..77, SA..87	60	M20	5	16	56	17.5	64	59.7	60	6436900
FA..97, KA..97, SA..87, SA..97	70	M20	5	16	65.5	19.5	74.5	69.7	60	6436919
FA..107, KA..107, SA..97	90	M24	5	20	80	24.5	95	89.7	70	6436927
FA..127, KA..127	100	M24	5	20	89	27.5	106	99.7	70	6436935
FA..157, KA..157	120	M24	5	20	107	31	127	119.7	70	6436943

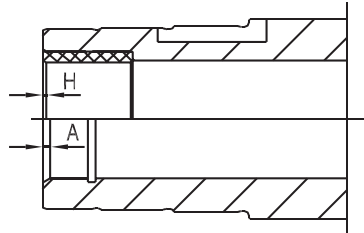
1) Retaining screw

6.5 Gear units with hollow shaft

6.5.1 Chamfers on hollow shafts

The following illustration shows the chamfers of parallel-shaft helical, helical-bevel, helical-worm and SPIROPLAN® gear units with hollow shaft:

00 004 002



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Dimension tables for the chamfers of the F, K, S, and W gear units:

Gear unit	Design	
	with hollow shaft (A)	with hollow shaft and shrink disk (H)
W..10	1.5 × 30°	-
W..20	2 × 30°	-
W..30	2 × 30°	-
F..27	2 × 30°	0.5 × 45 °
K..19	2 × 30°	0.5 × 45 °
K..29	2 × 30°	0.5 × 45 °
F../K../S../W..37	2 × 30°	0.5 × 45 °
K..39	2 × 30°	-
F../K../S../W..47	2 × 30°	0.5 × 45 °
K..49	2 × 30°	-
S..57	2 × 30°	0.5 × 45 °
F../K..57	2 × 30°	0.5 × 45 °
F../K../S..67	2 × 30°	0.5 × 45 °
F../K../S..77	2 × 30°	0.5 × 45 °
F../K../S..87	3 × 30°	0.5 × 45 °
F../K../S..97	3 × 30°	0.5 × 45 °
F../K..107	3 × 30°	0.5 × 45 °
F../K..127	5 × 30°	0.5 × 45 °
F../K..157	5 × 30°	0.5 × 45 °
KH167	-	0.5 × 45 °
KH187	-	0.5 × 45 °

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6.5.2 Special motor/gear unit combinations

Please note for parallel-shaft helical gearmotors with hollow shaft (FA..B, FV..B, FH..B, FAF, FVF, FHF, FA, FV, FH, FT, FAZ, FVZ, FHZ):

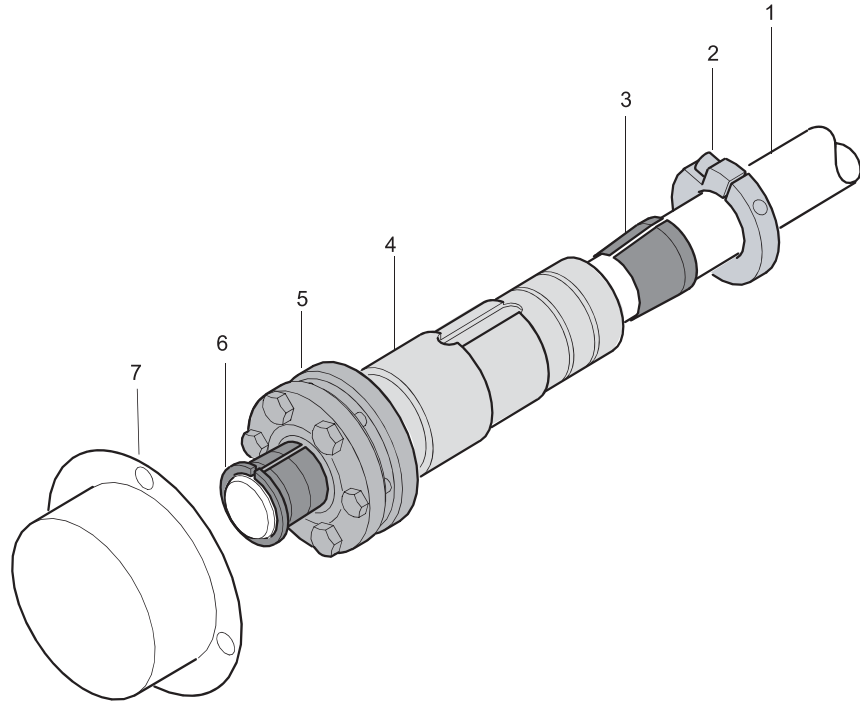
- If you are using a customer shaft pushed through on the motor end, there may be a collision when a "small gear unit" is used in combination with a "large motor."
- Check the motor dimension AC to decide whether there will be a collision with a pushed-through customer shaft.

6.6 TorqLOC® mounting system for gear units with hollow shaft

6.6.1 Description of TorqLOC®

The TorqLOC® hollow shaft mounting system is used for achieving a non-positive connection between the customer's shaft and the hollow shaft in the gear unit. The TorqLOC® hollow shaft mounting system is an alternative to the hollow shaft with shrink disk, the hollow shaft with key and the splined hollow shaft that have been used so far.

The TorqLOC® hollow shaft mounting system consists of the following components:



4309625867

- | | | | |
|-----|---------------------------|-----|-----------------------|
| [1] | Customer shaft | [5] | Shrink disk |
| [2] | Clamping ring | [6] | Conical steel bushing |
| [3] | Conical bronze bushing | [7] | Fixed hood cover |
| [4] | Hollow shaft in gear unit | | |

6.6.2 Benefits of TorqLOC®

The TorqLOC® hollow shaft mounting system provides the following advantages:

- Cost saving because the customer shaft can be made from drawn material up to quality h11.
- Cost saving because different customer shaft diameters can be covered by one hollow shaft diameter and different bushings.
- Simple installation since there is no need to accommodate any shaft connections.
- Simple removal even after many hours of operation because the formation of contact corrosion has been reduced and the conical connections can easily be released.

6.6.3 Technical data of TorqLOC®

The TorqLOC® hollow shaft mounting system is approved for output torques of 92 Nm to 20000 Nm.

The following gear units are available with TorqLOC® hollow shaft mounting system:

- Parallel-shaft helical gear units in gear unit sizes 37 to 157 (FT37 – FT157)
- Helical-bevel gear units in gear unit sizes 37 to 157 (KT37 – KT157), 39 and 49 (KT39, KT49)
- Helical-worm gear units in gear unit sizes 37 to 97 (ST37 – ST97)
- SPIROPLAN® gear units in gear unit sizes 37 and 47 (WT.7)

Available options

The following options are available for gear units with a TorqLOC® hollow shaft mounting system:

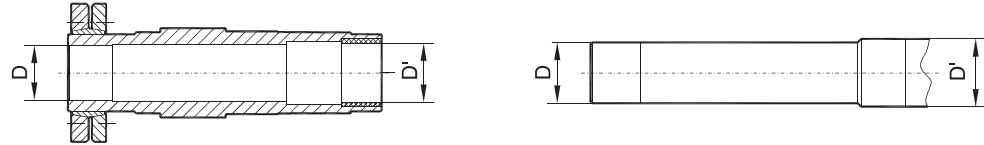
- For helical-bevel, helical-worm and SPIROPLAN® gear units (KT.., ST.., WT.7..): "torque arm" option (../T)
- For parallel-shaft helical gear units (FT..): "rubber buffer" option (../G)

6.7 Shouldered hollow shaft option with shrink disk

The following gear units with a hollow shaft and shrink disk also have the option of the larger bore diameter D':

- Parallel-shaft helical gear units FH/FHF/FHZ37 – 157
- Helical-bevel gear units KH/KHF/KHZ37 – 157
- Helical-worm gear units SH/SHF47 – 97

D' = D as standard.



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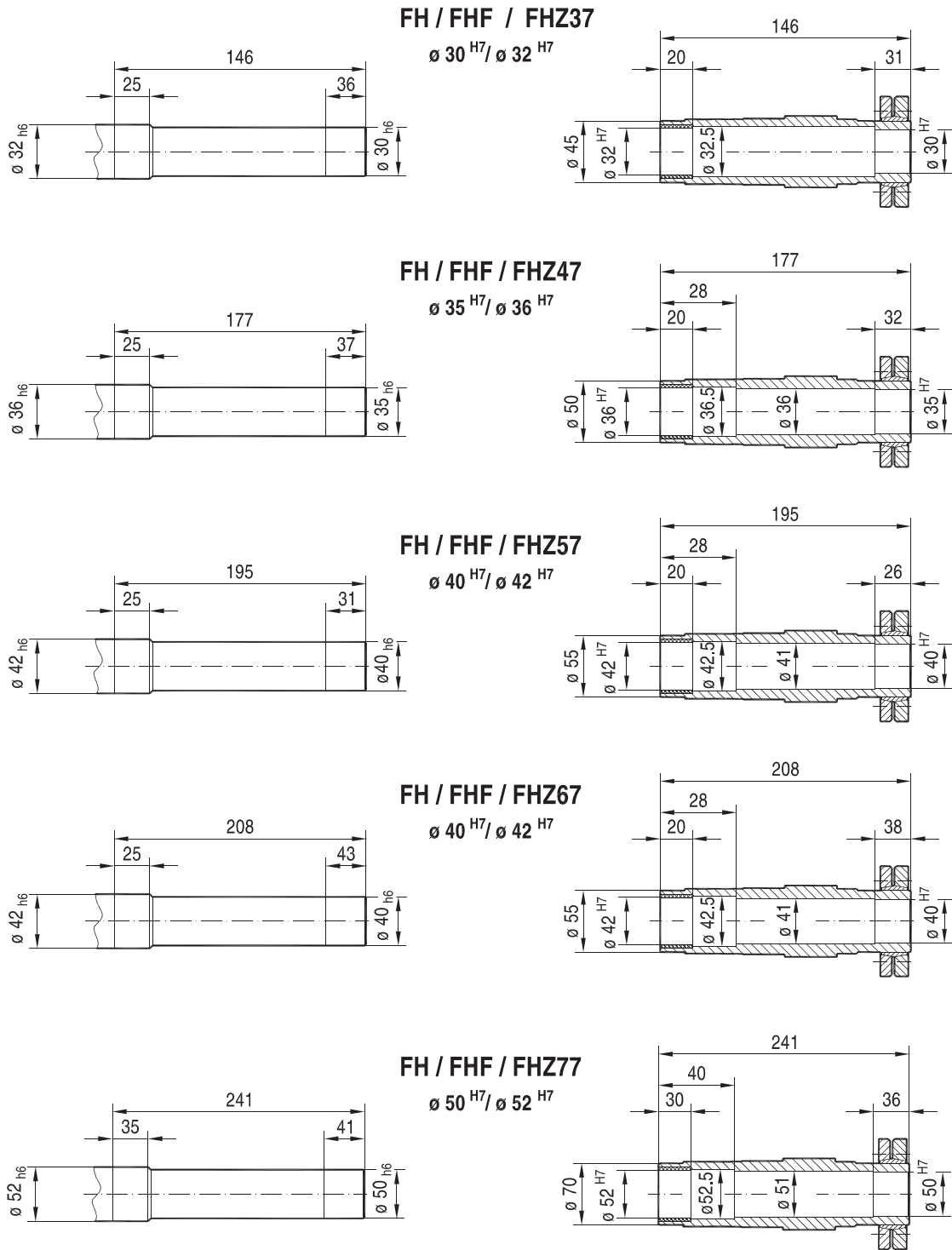
Gear unit	Bore diameter D/ optionally D' mm
FH/FHF/FHZ37, KH/KHF/KHZ37, SH/SHF/SHZ47	30/32
FH/FHF/FHZ47, KH/KHF/KHZ47, SH/SHF/SHZ57	35/36
FH/FHF/FHZ57, KH/KHF/KHZ57	40/42
FH/FHF/FHZ67, KH/KHF/KHZ67, SH/SHF/SHZ67	40/42
FH/FHF/FHZ77, KH/KHF/KHZ77, SH/SHF/SHZ77	50/52
FH/FHF/FHZ87, KH/KHF/KHZ87, SH/SHF/SHZ87	65/66
FH/FHF/FHZ97, KH/KHF/KHZ97, SH/SHF/SHZ97	75/76
FH/FHF/FHZ107, KH/KHF/KHZ107	95/96
FH/FHF/FHZ127, KH/KHF/KHZ127	105/106
FH/FHF/FHZ157, KH/KHF/KHZ157	125/126

Diameter D/D' must be specified when ordering gear units with a shouldered hollow shaft (optional bore diameter D').

6.7.1 Sample order

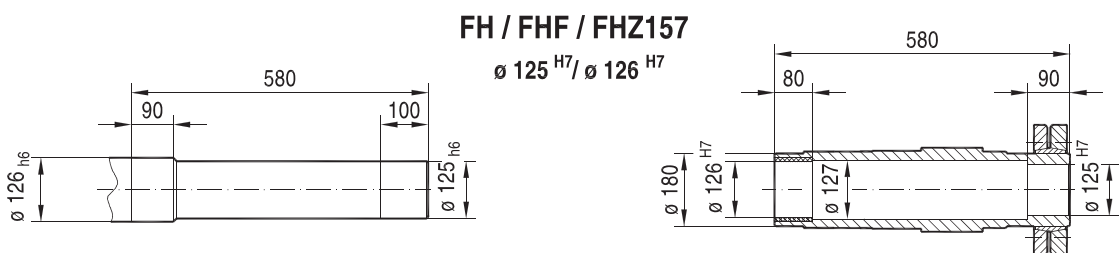
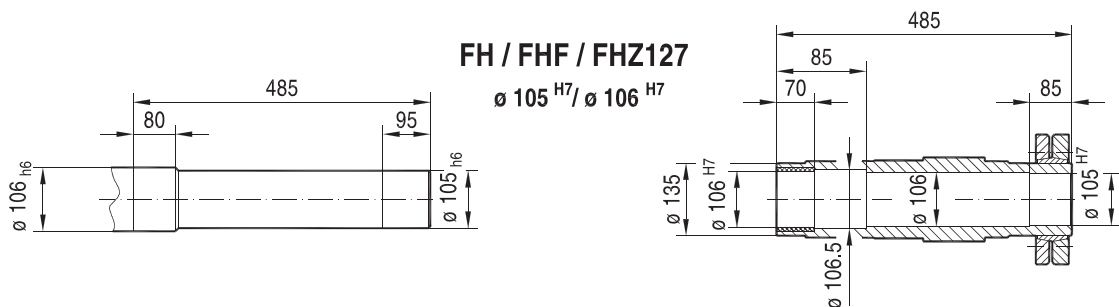
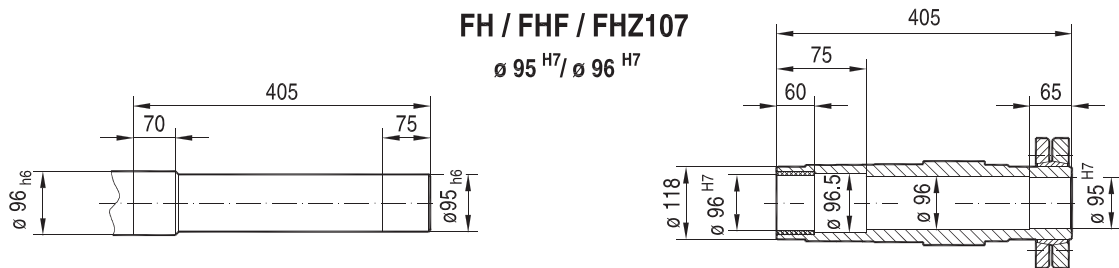
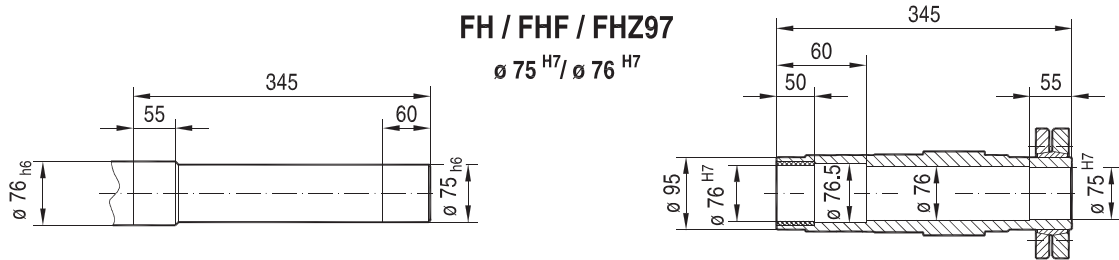
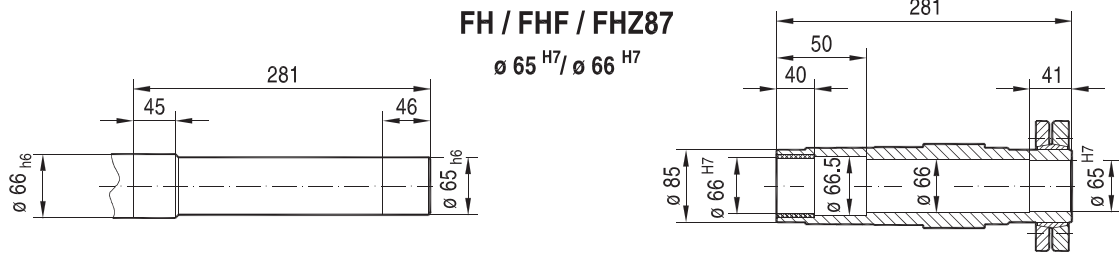
FH37 DRN80M4 with hollow shaft 30/32 mm

6.7.2 Parallel-shaft helical gear units with shouldered hollow shaft (dimensions in mm):



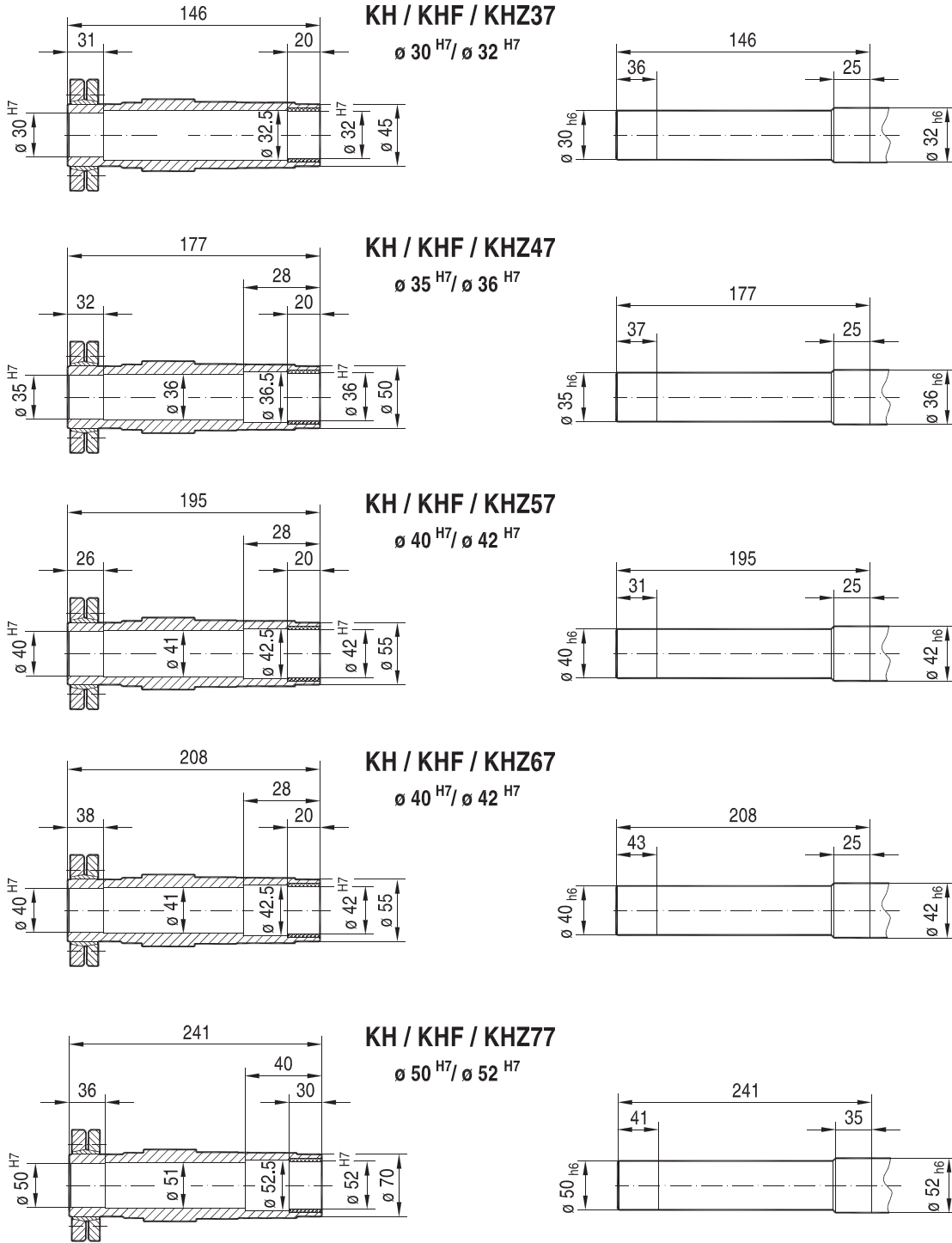
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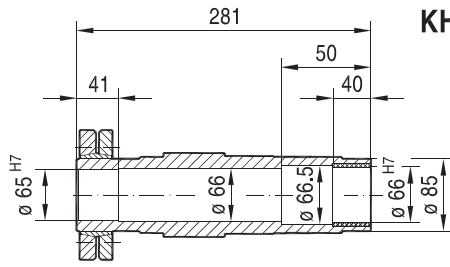


4987060747

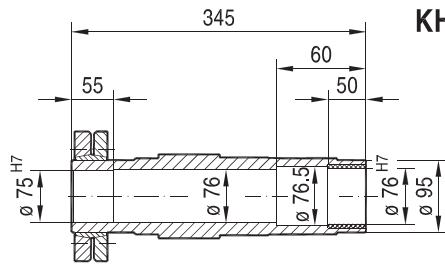
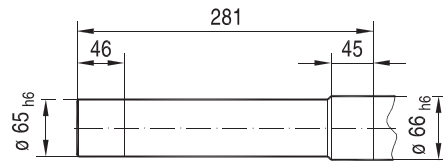
6.7.3 Helical-bevel gear units with shouldered hollow shaft (dimensions in mm):



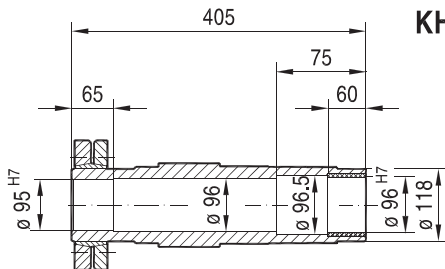
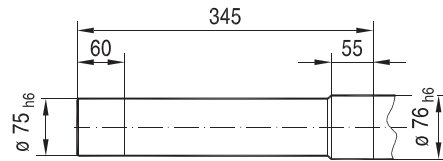
4987063435



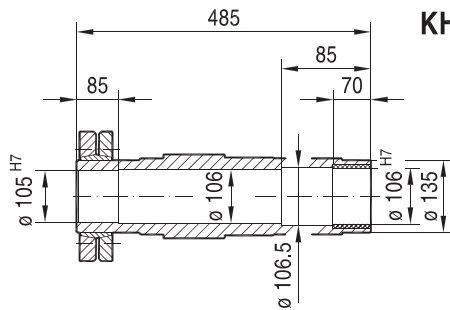
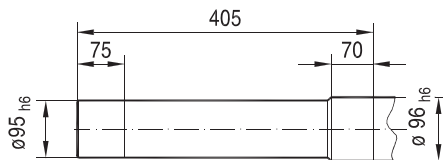
KH / KHF / KHZ87
 $\varnothing 65^{H7} / \varnothing 66^{H7}$



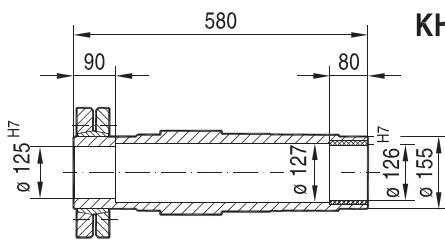
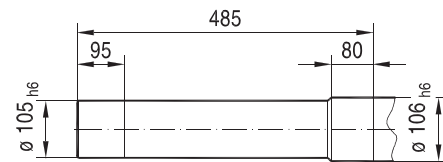
KH / KHF / KHZ97
 $\varnothing 75^{H7} / \varnothing 76^{H7}$



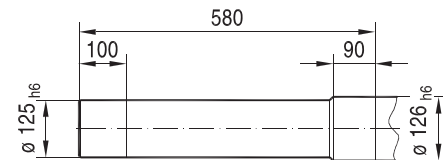
KH / KHF / KHZ107
 $\varnothing 95^{H7} / \varnothing 96^{H7}$



KH / KHF / KHZ127
 $\varnothing 105^{H7} / \varnothing 106^{H7}$

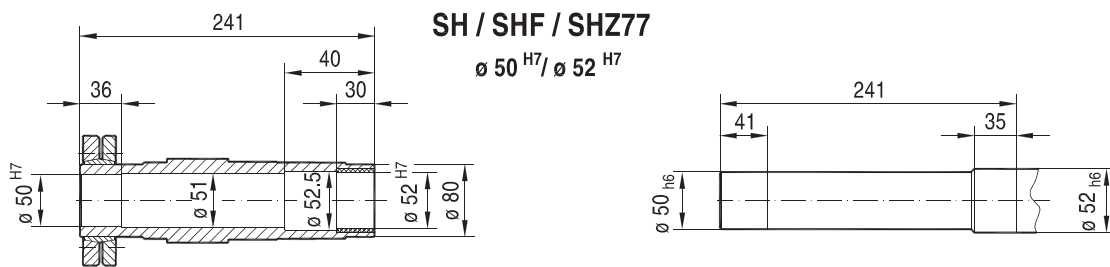
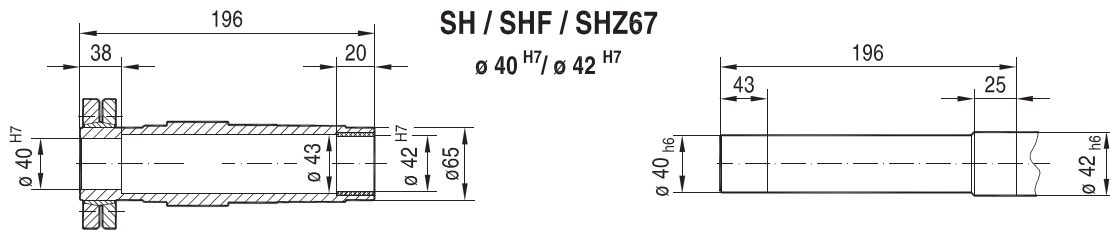
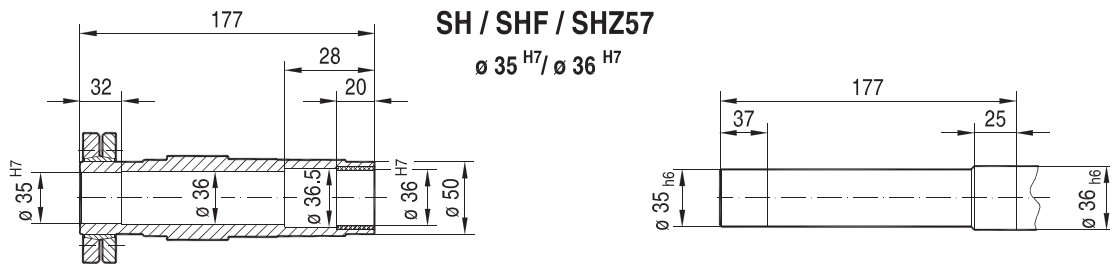
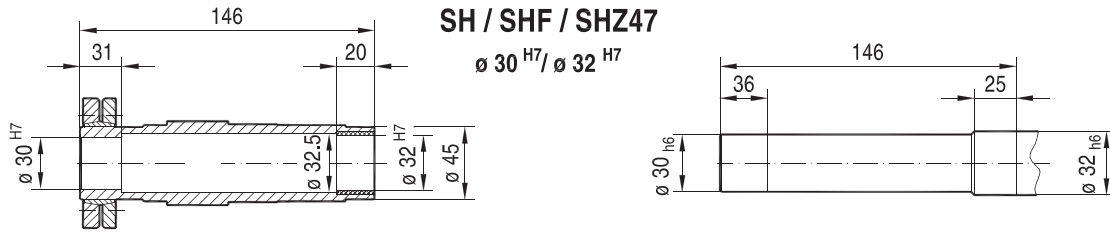


KH / KHF / KHZ157
 $\varnothing 125^{H7} / \varnothing 126^{H7}$

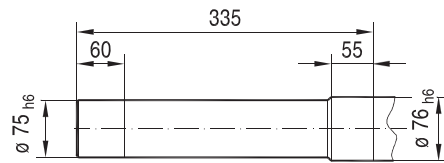
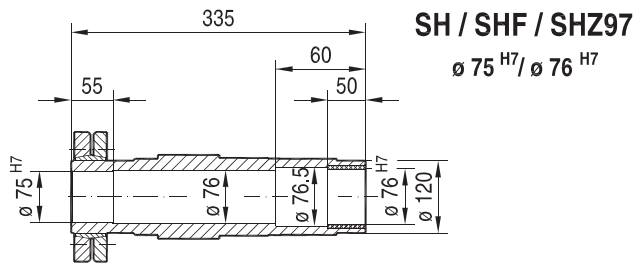
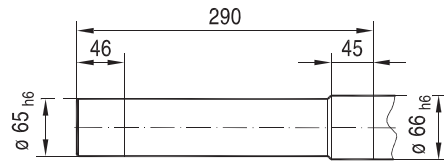
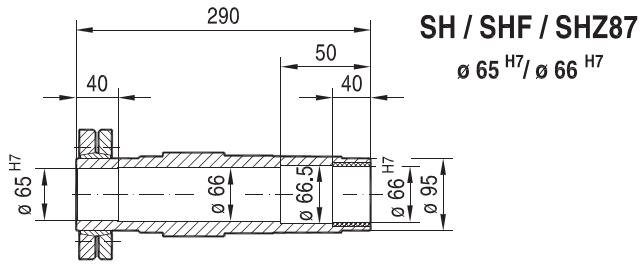


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6.7.4 Helical-worm gear units with shouldered hollow shaft (dimensions in mm):



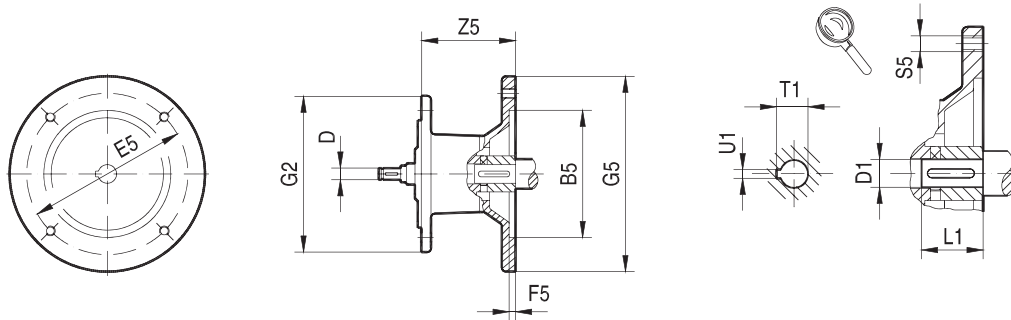
4987067787



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6.8 Adapters for mounting IEC motors

23 002 100



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Gear unit type	Adapter type	Dimensions in mm											
		B5	D	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
R..27, R..37 F..27, F..37, F..47 K..19, K..29, K..37 S..37, S..47, S..57 W..37	AM63	95	10	115	3.5	120	140	M8	72	11	23	12.8	4
	AM71 ¹⁾	110	10	130	4	120	160	M8	72	14	30	16.3	5
	AM80 ¹⁾	130	12	165	4.5	120	200	M10	106	19	40	21.8	6
	AM90 ¹⁾	130	14	165	4.5	120	200	M10	106	24	50	27.3	8
R..47, R..57, R..67 F..57, F..67 K..39, K..47 ²⁾ , K..57, K..67 S..67 W..47 ³⁾	AM63	95	10	115	3.5	160	140	M8	66	11	23	12.8	4
	AM71	110	10	130	4	160	160	M8	66	14	30	16.3	5
	AM80	130	12	165	4.5	160	200	M10	99	19	40	21.8	6
	AM90	130	14	180	4.5	160	200	M10	99	24	50	27.3	8
	AM100 ¹⁾	180	16	215	5	160	250	M12	134	28	60	31.3	8
	AM112 ¹⁾	180	18	215	5	160	250	M12	134	28	60	31.3	8
R..77 F..77 K..49, K..77 S..77	AM132S/M ¹⁾	230	22	265	5	160	300	M12	191	38	80	41.3	10
	AM63	95	10	115	3.5	200	140	M8	60	11	23	12.8	4
	AM71	110	10	130	4	200	160	M8	60	14	30	16.3	5
	AM80	130	12	165	4.5	200	200	M10	92	19	40	21.8	6
	AM90	130	14	165	4.5	200	200	M10	92	24	50	27.3	8
	AM100 ¹⁾	180	16	215	5	200	250	M12	126	28	60	31.3	8
	AM112 ¹⁾	180	18	215	5	200	250	M12	126	28	60	31.3	8
R..87 F..87 K..87 S..87 ⁴⁾	AM132S/M ¹⁾	230	22	265	5	200	300	M12	179	38	80	41.3	10
	AM132ML ¹⁾	230	28	265	5	200	300	M12	179	38	80	41.3	10
	AM80	130	12	165	4.5	250	200	M10	87	19	40	21.8	6
	AM90	130	14	165	4.5	250	200	M10	87	24	50	27.3	8
	AM100	180	16	215	5	250	250	M12	121	28	60	31.3	8
	AM112	180	18	215	5	250	250	M12	121	28	60	31.3	8
	AM132S/M	230	22	265	5	250	300	M12	174	38	80	41.3	10
	AM132ML	230	28	265	5	250	300	M12	174	38	80	41.3	10
AM160 ¹⁾	250	28	300	6	250	350	M16	232	42	110	45.3	12	
AM180 ¹⁾	250	32	300	6	250	350	M16	232	48	110	51.8	14	

1) Check dimension 1/2 G5 because component may protrude past foot mounting surface if installed on R, K, S or W foot-mounted gear unit.

2) Maximum AM100

3) Maximum AM90

4) Not with AM180

23 003 100

Fig.1

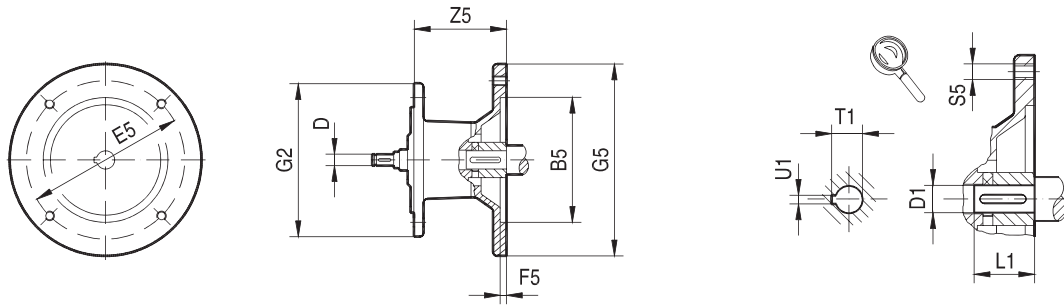
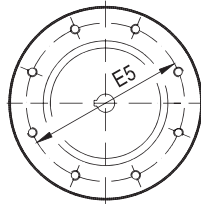


Fig.2



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Gear unit type	Adapter type	Fig.	Dimensions in mm											
			B5	D	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
R..97 F..97 K..97 S..97 ¹⁾	AM100	1	180	16	215	5	300	250	M12	116	28	60	31.3	8
	AM112	1	180	18	215	5	300	250	M12	116	28	60	31.3	8
	AM132S/M	1	230	22	265	5	300	300	M12	169	38	80	41.3	10
	AM132ML	1	230	28	265	5	300	300	M12	169	38	80	41.3	10
	AM160	1	250	28	300	6	300	350	M16	227	42	110	45.3	12
	AM180	1	250	32	300	6	300	350	M16	227	48	110	51.8	14
	AM200	1	300	38	350	7	300	400	M16	268	55	110	59.3	16
R..107, R..127 F..107 K..107	AM100	1	180	16	215	5	350	250	M12	110	28	60	31.3	8
	AM112	1	180	18	215	5	350	250	M12	110	28	60	31.3	8
	AM132S/M	1	230	22	265	5	350	300	M12	163	38	80	41.3	10
	AM132ML	1	230	28	265	5	350	300	M12	163	38	80	41.3	10
	AM160	1	250	28	300	6	350	350	M16	221	42	110	45.3	12
	AM180	1	250	32	300	6	350	350	M16	221	48	110	51.8	14
	AM200	1	300	38	350	7	350	400	M16	262	55	110	59.3	16
	AM225	2	350	38	400	7	350	450	M16	277	60	140	64.4	18
R..137	AM132S/M	1	230	22	265	5	400	300	M12	156	38	80	41.3	10
	AM132ML	1	230	28	265	5	400	300	M12	156	38	80	41.3	10
	AM160	1	250	28	300	6	400	350	M16	214	42	110	45.3	12
	AM180	1	250	32	300	6	400	350	M16	214	48	110	51.8	14
	AM200	1	300	38	350	7	400	400	M16	255	55	110	59.3	16
	AM225	2	350	38	400	7	400	450	M16	270	60	140	64.4	18

1) Not with AM200

23 004 100

Fig.1

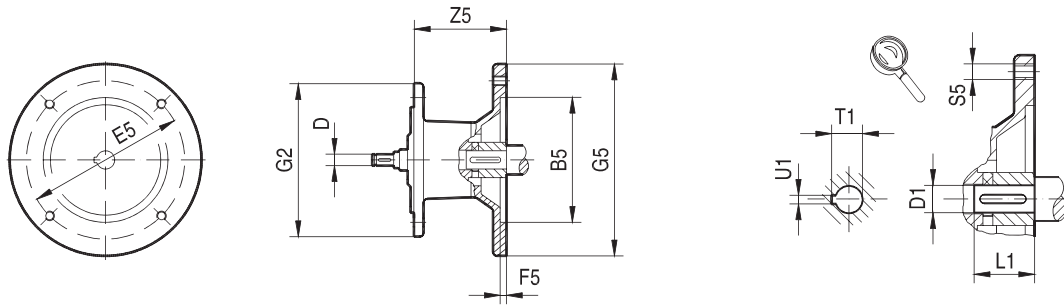
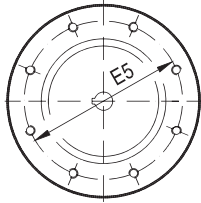


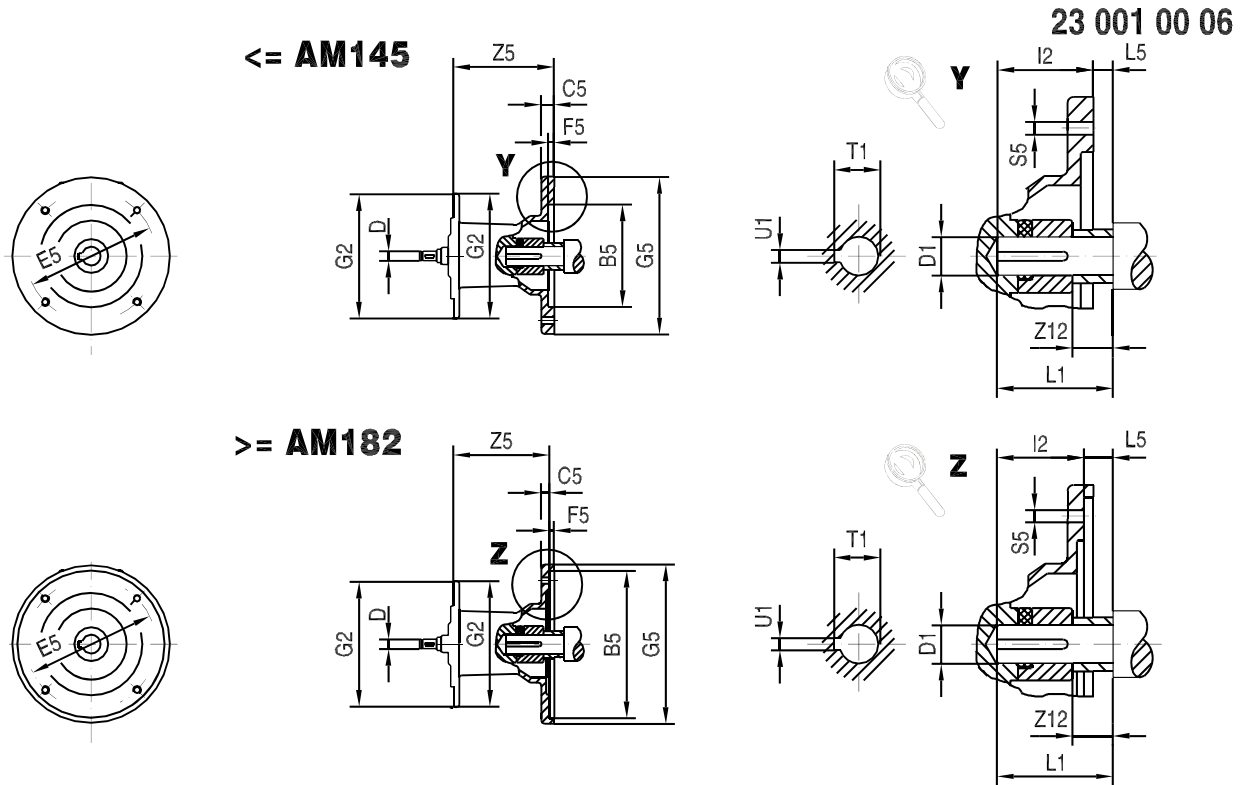
Fig.2



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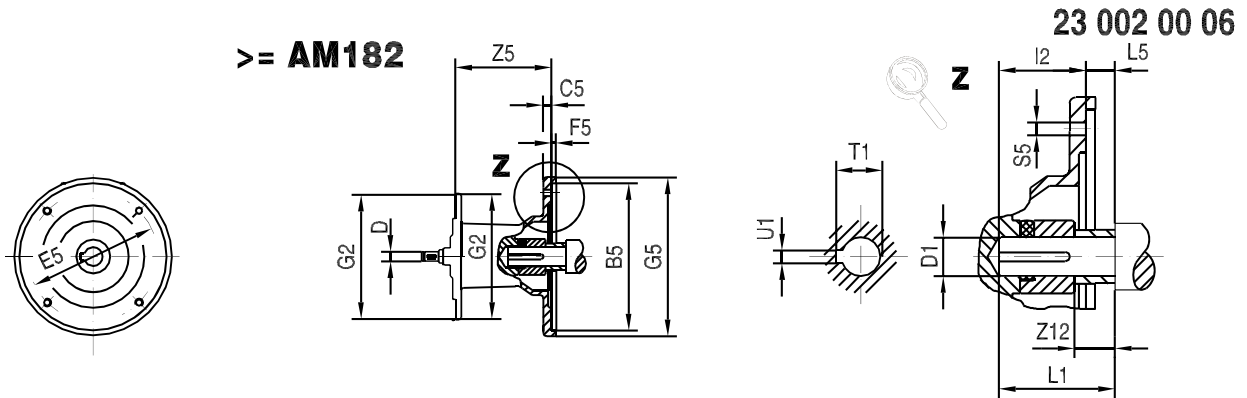
Gear unit type	Adapter type	Fig.	Dimensions in mm											
			B5	D	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
R..147 F..127 K..127	AM132S/M	1	230	22	265	5	450	300	M12	148	38	80	41.3	10
	AM132ML	1	230	28	265	5	450	300	M12	148	38	80	41.3	10
	AM160	1	250	28	300	6	450	350	M16	206	42	110	45.3	12
	AM180	1	250	32	300	6	450	350	M16	206	48	110	51.8	14
	AM200	1	300	38	350	7	450	400	M16	247	55	110	59.3	16
	AM225	2	350	38	400	7	450	450	M16	262	60	140	64.4	18
	AM250	2	450	48	500	7	450	550	M16	336	65	140	69.4	18
R..167 F..157 K..157 K..167 K..187	AM280	2	450	48	500	7	450	550	M16	336	75	140	79.9	20
	AM160	1	250	28	300	6	550	350	M16	198	42	110	45.3	12
	AM180	1	250	32	300	6	550	350	M16	198	48	110	51.8	14
	AM200	1	300	38	350	7	550	400	M16	239	55	110	59.3	16
	AM225	2	350	38	400	7	550	450	M16	254	60	140	64.4	18
	AM250	2	450	48	500	7	550	550	M16	328	65	140	69.4	18
	AM280	2	450	48	500	7	550	550	M16	328	75	140	79.9	20

6.9 Adapters for mounting NEMA motors



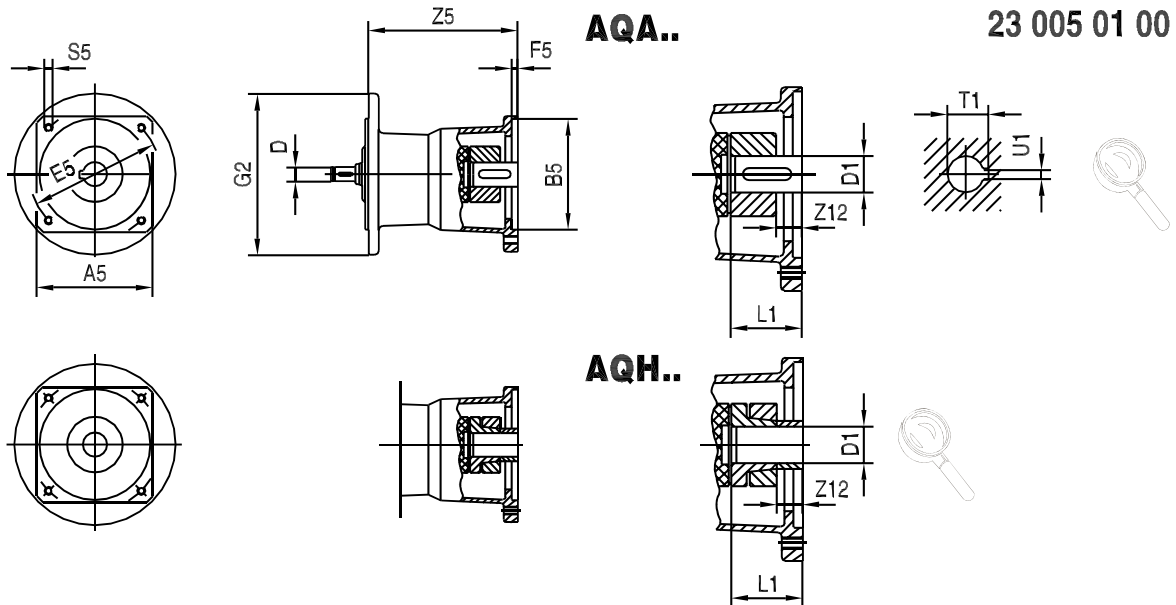
Gear unit type	Adapter type	Dimensions in mm															
		B5	C5	D	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
R..27, R..37 F..27, F..37, F..47 K..19, K..29, K..37 S..37, S..47, S..57 W..37	AM56	114.3	11	10	149.2	4.5	120	170	52.55	-4.8	10.5	93.5	16.5	15,875	47	18.1	4.76
	AM143	114.3	12	12	149.2	4.5	120	170	54.1	3	10.5	117	14.5	22,225	57	24.7	4.76
	AM145	114.3	12	14	149.2	4.5	120	170	54.1	3	10.5	117	14.5	22,225	57	24.7	4.76
R..47, R..57, R..67 F..57, F..67 K..39, K..47, K..57, K..67 S..67 W..47 ¹⁾	AM56	114.3	11	10	149.2	4.5	160	170	52.55	-4.8	10.5	87	16.5	15,875	47	18.1	4.76
	AM143	114.3	12	12	149.2	4.5	160	170	54.1	3	10.5	110.5	14.5	22,225	57	24.7	4.76
	AM145	114.3	12	14	149.2	4.5	160	170	54.1	3	10.5	110.5	14.5	22,225	57	24.7	4.76
	AM182	215.9	10	16	184	5	160	228	66.85	3	15	147.5	16.5	28,575	69	31.7	6.35
	AM184	215.9	10	18	184	5	160	228	66.85	3	15	147.5	16.5	28,575	69	31.7	6.35
R..77 F..77 K..49, K..77 S..77	AM213/215	215.9	11	22	184	5	160	228	79.55	6.3	15	200.5	15.8	34,925	85	38.7	7.94
	AM56	114.3	11	10	149.2	4.5	200	170	52.55	-4.8	10.5	81	16.5	15,875	47	18.1	4.76
	AM143	114.3	12	12	149.2	4.5	200	170	54.1	3	10.5	103.5	14.5	22,225	57	24.7	4.76
	AM145	114.3	12	14	149.2	4.5	200	170	54.1	3	10.5	103.5	14.5	22,225	57	24.7	4.76
	AM182	215.9	10	16	184	5	200	228	66.85	3	15	139.5	16.5	28,575	69	31.7	6.35
	AM184	215.9	10	18	184	5	200	228	66.85	3	15	139.5	16.5	28,575	69	31.7	6.35
R..87 F..87 K..87 S..87	AM213/215	215.9	11	22	184	5	200	228	79.55	6.3	15	188.5	15.8	34,925	85	38.7	7.94
	AM143	114.3	12	12	149.2	4.5	250	170	54.1	3	10.5	98.5	14.5	22,225	57	24.7	4.76
	AM145	114.3	12	14	149.2	4.5	250	170	54.1	3	10.5	98.5	14.5	22,225	57	24.7	4.76
	AM182	215.9	10	16	184	5	250	228	66.85	3	15	134.5	16.5	28,575	69	31.7	6.35
	AM184	215.9	10	18	184	5	250	228	66.85	3	15	134.5	16.5	28,575	69	31.7	6.35
	AM213/215	215.9	11	22	184	5	250	228	79.55	6.3	15	183.5	15.8	34,925	85	38.7	7.94
AM254/256	215.9	12	28	184	5	250	228	95.3	6.3	15	234	8.8	41,275	101	45.8	9.53	
	AM284/286	266.7	15	32	228.6	5	250	286	111.05	6.3	15	241	15.8	47,625	117	53.4	12.7

1) Maximum AM143/AM145



Gear unit type	Adapter type	Dimensions in mm															
		B5	C5	D	E5	F5	G2	G5	I2	L5	S5	Z5	Z12	D1	L1	T1	U1
R..97 F..97 K..97 S..97	AM182	215.9	10	16	184	5	300	228	66.85	3	15	129.5	16.5	28,575	69	31.7	6.35
	AM184	215.9	10	18	184	5	300	228	66.85	3	15	129.5	16.5	28,575	69	31.7	6.35
	AM213/215	215.9	11	22	184	5	300	228	79.55	6.3	15	178.5	15.8	34,925	85	38.7	7.94
	AM254/256	215.9	12	28	184	5	300	228	95.3	6.3	15	229	8.8	41,275	101	45.8	9.53
	AM284/286	266.7	20	32	228.6	5	300	286	111.05	6.3	15	236	15.8	47,625	117	53.4	12.7
	AM324/326	317.5	17	38	279.4	5	300	356	127.05	6.3	17.5	296	34.8	53,975	133	60	12.7
	AM364/365	317.5	17	38	279.4	5	300	356	143.05	6.3	17.5	296	34.8	60,325	149	67.6	15,875
R..107, R127 F..107 K..107	AM182	215.9	10	16	184	5	350	228	66.85	3	15	123.5	16.5	28,575	69.85	31.7	6.35
	AM184	215.9	10	18	184	5	350	228	66.85	3	15	123.5	16.5	28,575	69.85	31.7	6.35
	AM213/215	215.9	11	22	184	5	350	228	79.55	6.3	15	172.5	15.8	34,925	85.85	38.7	7.94
	AM254/256	215.9	12	28	184	5	350	228	95.3	6.3	15	223	8.8	41,275	101.6	45.8	9.53
	AM284/286	266.7	15	32	228.6	5	350	286	111.05	6.3	15	230	15.8	47,625	117.35	53.4	12.7
	AM324/326	317.5	17	38	279.4	5	350	356	127.05	6.3	17.5	290	34.8	53,975	133.35	60	12.7
	AM364/365	317.5	17	38	279.4	5	350	356	143.05	6.3	17.5	290	34.8	60,325	149.35	67.6	15,875
R..137	AM213/215	215.9	11	22	184	5	400	228	79.55	6.3	15	165.5	15.8	34,925	85.85	38.7	7.94
	AM254/256	215.9	12	28	184	5	400	228	95.3	6.3	15	216	8.8	41,275	101.6	45.8	9.53
	AM284/286	266.7	15	32	228.6	5	400	286	111.05	6.3	15	223	15.8	47,625	117.35	53.4	12.7
	AM324/326	317.5	17	38	279.4	5	400	356	127.05	6.3	17.5	283	34.8	53,975	133.35	60	12.7
	AM364/365	317.5	17	38	279.4	5	400	356	143.05	6.3	17.5	283	34.8	60,325	149.35	67.6	15,875
R..147 F..127 K..127	AM213/215	215.9	11	22	184	5	450	228	79.55	6.3	15	157.5	15.8	34,925	85.85	38.7	7.94
	AM254/256	215.9	12	28	184	5	450	228	95.3	6.3	15	208	8.8	41,275	101.6	45.8	9.53
	AM284/286	266.7	15	32	228.6	5	450	286	111.05	6.3	15	215	15.8	47,625	117.35	53.4	12.7
	AM324/326	317.5	17	38	279.4	5	450	356	127.05	6.3	17.5	275	34.8	53,975	133.35	60	12.7
	AM364/365	317.5	17	38	279.4	5	450	356	143.05	6.3	17.5	275	34.8	60,325	149.35	67.6	15,875
R..167 F..157 K..157 K..167 K..187	AM254/256	215.9	12	28	184	5	550	228	95.3	6.3	15	200	8.8	41,275	101.6	45.8	9.53
	AM284/286	266.7	15	32	228.6	5	550	286	111.05	6.3	15	207	15.8	47,625	117.35	53.4	12.7
	AM324/326	317.5	17	38	279.4	5	550	356	127.05	6.3	17.5	267	34.8	53,975	133.35	60	12.7
	AM364/365	317.5	17	38	279.4	5	550	356	143.05	6.3	17.5	267	34.8	60,325	149.35	67.6	15,875

6.10 Adapters for mounting servomotors

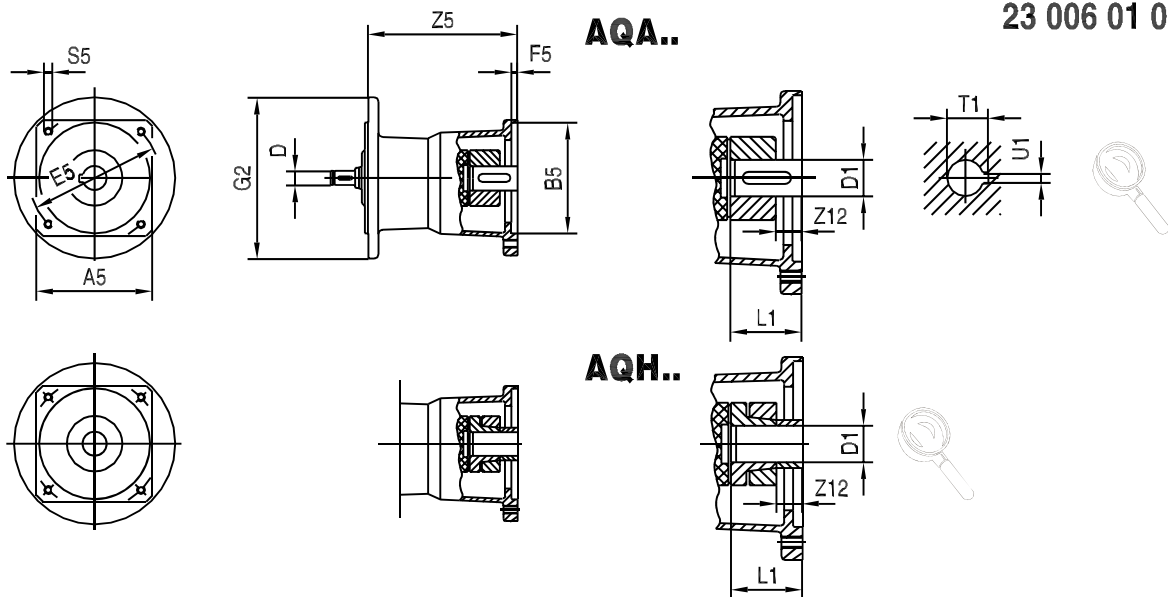


Gear unit type	Adapter type	Dimensions in mm													
		A5	B5	D	E5	F5	G2	S5	Z5	Z12 ¹⁾	Z12 ²⁾	D1	L1	T1 ¹⁾	U1 ¹⁾
R..27, R..37 F..27, F..37, F..47 K..19, K..29, K..37 S..37, S..47, S..57 W..37	AQ..80/1	82	60	10/12	75	3	120	M5	104.5	5.5	5.5	11	23	12.8	4
	AQ..80/2	82	60	10/12	75	3	120	M5	104.5	5.5	5.5	14	30	16.3	5
	AQ..80/3	82	50	10/12	95	3	120	M6	104.5	5.5	5.5	14	30	16.3	5
	AQ..100/1	100	80	10/12/14/16	100	4	120	M6	129.5	-	-	14	30	16.3	5
	AQ..100/2	100	95	10/12/14/16	115	4	120	M8	129.5	-	-	14	30	16.3	5
	AQ..100/3	100	80	10/12/14/16	100	4	120	M6	143.5	2	14	19	40	21.8	6
	AQ..100/4	100	95	10/12/14/16	115	4	120	M8	143.5	2	14	19	40	21.8	6
	AQ..115/1	115	95	10/12/14/16	130	4	120	M8	152.5	11	23	19	40	21.8	6
	AQ..115/2	115	110	10/12/14/16	130	4	120	M8	152.5	11	23	19	40	21.8	6
AQ..115/3	115	110	10/12/14/16	130	4	120	M8	152.5	16	16	24	50	27.3	8	
R..47, R..57, R..67 F..57, F..67 K..39, K..47 ³⁾ , K..57, K..67 S..67 W..47	AQ..80/1	82	60	10/12	75	3	160	M5	98	5.5	5.5	11	23	12.8	4
	AQ..80/2	82	60	10/12	75	3	160	M5	98	5.5	5.5	14	30	16.3	5
	AQ..80/3	82	50	10/12	95	3	160	M6	98	5.5	5.5	14	30	16.3	5
	AQ..100/1	100	80	10/12/14/16	100	4	160	M6	122.5	-	-	14	30	16.3	5
	AQ..100/2	100	95	10/12/14/16	115	4	160	M8	122.5	-	-	14	30	16.3	5
	AQ..100/3	100	80	10/12/14/16	100	4	160	M6	136.5	2	14	19	40	21.8	6
	AQ..100/4	100	95	10/12/14/16	115	4	160	M8	136.5	2	14	19	40	21.8	6
	AQ..115/1	115	95	10/12/14/16	130	4	160	M8	145.5	11	23	19	40	21.8	6
	AQ..115/2	115	110	10/12/14/16	130	4	160	M8	145.5	11	23	19	40	21.8	6
	AQ..115/3	115	110	10/12/14/16	130	4	160	M8	145.5	16	16	24	50	27.3	8
	AQ..140/1	140	110	16/18/22	165	5	160	M10	175	16	16	24	50	27.3	8
	AQ..140/2	140	130	16/18/22	165	5	160	M10	175	16	16	24	50	27.3	8
	AQ..140/3	140	130	16/18/22	165	5	160	M10	188	22	22	32	60	35.5	10
	AQ..140/4	140	130	16/18/22	165	5	160	M10	188	22	22	28	60	31.3	8
	AQ..160/1	162	155	16/18/22	190	5	160	M10	188	22	22	32	60	35.3	10
AQ..190/1	190	130	22/28	215	5	160	M12	237.5	24	24	32	60	35.3	10	
AQ..190/2	190	180	22/28	215	5	160	M12	237.5	24	24	32	60	35.3	10	
AQ..190/3	190	180	22/28	215	5	160	M12	261.5	34	34	38	80	41.3	10	

- 1) For designs with keyway (AQA..)
- 2) For designs with clamping ring hub (AQH..)
- 3) Not with AQ190

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23 006 01 00

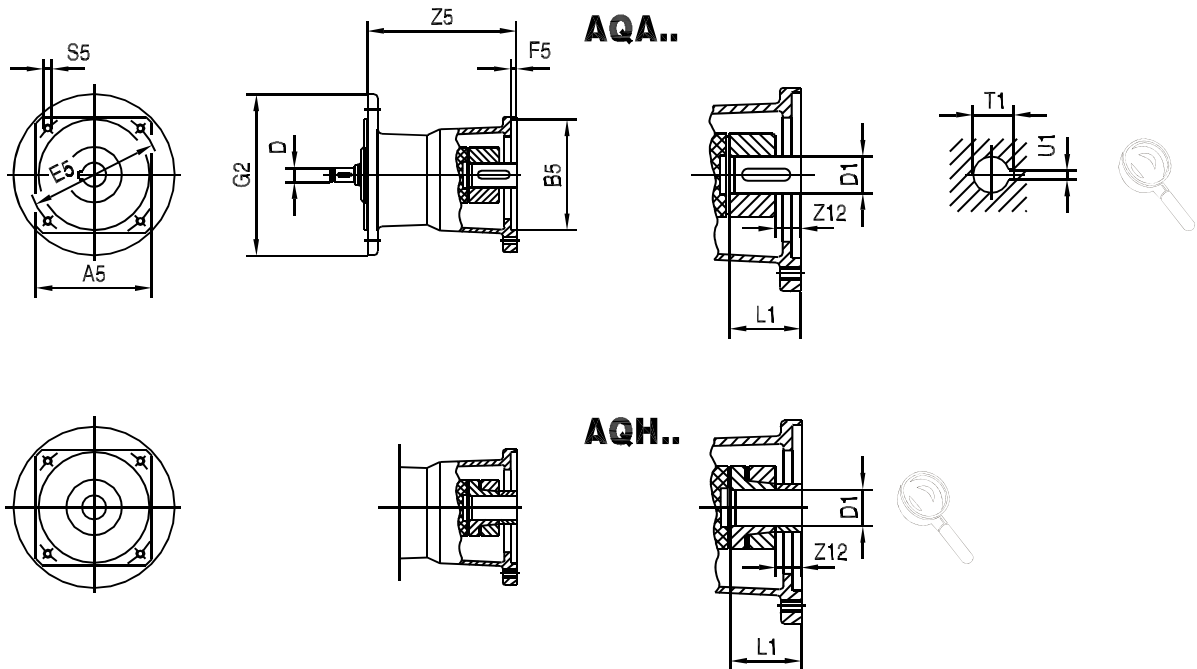


Gear unit type	Adapter type	Dimensions in mm													
		A5	B5	D	E5	F5	G2	S5	Z5	Z12 ¹⁾	Z12 ²⁾	D1	L1	T1 ¹⁾	U1 ¹⁾
R..77 F..77 K..49, K..77 S..77	AQ..80/1	82	60	10/12	75	3	200	M5	92	5.5	5.5	11	23	12.8	4
	AQ..80/2	82	60	10/12	75	3	200	M5	92	5.5	5.5	14	30	16.3	5
	AQ..80/3	82	50	10/12	95	3	200	M6	92	5.5	5.5	14	30	16.3	5
	AQ..100/1	100	80	10/12/14/16	100	4	200	M6	115.5	-	-	14	30	16.3	5
	AQ..100/2	100	95	10/12/14/16	115	4	200	M8	115.5	-	-	14	30	16.3	5
	AQ..100/3	100	80	10/12/14/16	100	4	200	M6	129.5	2	14	19	40	21.8	6
	AQ..100/4	100	95	10/12/14/16	115	4	200	M8	129.5	2	14	19	40	21.8	6
	AQ..115/1	115	95	10/12/14/16	130	4	200	M8	138.5	11	23	19	40	21.8	6
	AQ..115/2	115	110	10/12/14/16	130	4	200	M8	138.5	11	23	19	40	21.8	6
	AQ..115/3	115	110	10/12/14/16	130	4	200	M8	138.5	16	16	24	50	27.3	8
	AQ..140/1	140	110	16/18/22	165	5	200	M10	167	16	16	24	50	27.3	8
	AQ..140/2	140	130	16/18/22	165	5	200	M10	167	16	16	24	50	27.3	8
	AQ..140/3	140	130	16/18/22	165	5	200	M10	180	22	22	32	60	35.3	10
	AQ..140/4	140	130	16/18/22	165	5	200	M10	180	22	22	28	60	31.3	8
	AQ..160/1	162	155	16/18/22	190	5	200	M10	180	22	22	32	60	35.3	10
	AQ..190/1	190	130	22/28	215	5	200	M12	225.5	24	24	32	60	35.3	10
AQ..190/2	190	180	22/28	215	5	200	M12	225.5	24	24	32	60	35.3	10	
AQ..190/3	190	180	22/28	215	5	200	M12	249.5	34	34	38	80	41.3	10	
R..87 F..87 K..87 S..87	AQ..100/1	100	80	12/14/16	100	4	250	M6	110.5	-	-	14	30	16.3	5
	AQ..100/2	100	95	12/14/16	115	4	250	M8	110.5	-	-	14	30	16.3	5
	AQ..100/3	100	80	12/14/16	100	4	250	M6	124.5	2	14	19	40	21.8	6
	AQ..100/4	100	95	12/14/16	115	4	250	M8	124.5	2	14	19	40	21.8	6
	AQ..115/1	115	95	12/14/16	130	4	250	M8	133.5	11	23	19	40	21.8	6
	AQ..115/2	115	110	12/14/16	130	4	250	M8	133.5	11	23	19	40	21.8	6
	AQ..115/3	115	110	12/14/16	130	4	250	M8	133.5	16	16	24	50	27.3	8
	AQ..140/1	140	110	16/18/22	165	5	250	M10	162	16	16	24	50	27.3	8
	AQ..140/2	140	130	16/18/22	165	5	250	M10	162	16	16	24	50	27.3	8
	AQ..140/3	140	130	16/18/22	165	5	250	M10	175	22	22	32	60	35.3	10
	AQ..140/4	140	130	16/18/22	165	5	250	M10	175	22	22	28	60	31.3	8
	AQ..160/1	162	155	16/18/22	190	5	250	M10	175	22	22	32	60	35.3	10
	AQ..190/1	190	130	22/28	215	5	250	M12	220.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	22/28	215	5	250	M12	220.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	22/28	215	5	250	M12	244.5	34	34	38	80	41.3	10

1) For designs with keyway (AQA..)

2) For designs with clamping ring hub (AQH..)

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6

Gear unit type	Adapter type	Dimensions in mm													
		A5	B5	D	E5	F5	G2	S5	Z5	Z12 ¹⁾	Z12 ²⁾	D1	L1	T1 ¹⁾	U1 ¹⁾
R..97 F..97 K..97 S..97	AQ..140/1	140	110	16/18/22	165	5	300	M10	157	16	16	24	50	27.3	8
	AQ..140/2	140	130	16/18/22	165	5	300	M10	157	16	16	24	50	27.3	8
	AQ..140/3	140	130	16/18/22	165	5	300	M10	170	22	22	32	60	35.3	10
	AQ..140/4	140	130	16/18/22	165	5	300	M10	170	22	22	28	60	31.3	8
	AQ..160/1	162	155	16/18/22	190	5	300	M10	170	22	22	32	60	35.3	10
	AQ..190/1	190	130	22/28	215	5	300	M12	215.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	22/28	215	5	300	M12	215.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	22/28	215	5	300	M12	239.5	34	34	38	80	41.3	10
R..107, R127 F..107 K..107	AQ..140/1	140	110	16/18/22	165	5	350	M10	151	16	16	24	50	27.3	8
	AQ..140/2	140	130	16/18/22	165	5	350	M10	151	16	16	24	50	27.3	8
	AQ..140/3	140	130	16/18/22	165	5	350	M10	164	22	22	32	60	35.3	10
	AQ..140/4	140	130	16/18/22	165	5	350	M10	164	22	22	28	60	31.3	8
	AQ..160/1	162	155	16/18/22	190	5	350	M10	164	22	22	32	60	35.3	10
	AQ..190/1	190	130	22/28	215	5	350	M12	209.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	22/28	215	5	350	M12	209.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	22/28	215	5	350	M12	233.5	34	34	38	80	41.3	10
R..137	AQ..190/1	190	130	22/28	215	5	400	M12	202.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	22/28	215	5	400	M12	202.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	22/28	215	5	400	M12	226.5	34	34	38	80	41.3	10
R..147 F..127 K..127	AQ..190/1	190	130	22/28	215	5	450	M12	194.5	24	24	32	60	35.3	10
	AQ..190/2	190	180	22/28	215	5	450	M12	194.5	24	24	32	60	35.3	10
	AQ..190/3	190	180	22/28	215	5	450	M12	218.5	34	34	38	80	41.3	10

1) For designs with keyway (AQA..)

2) For designs with clamping ring hub (AQH..)

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6.11 Gear unit mounting

Strength class of the screws

Always mount gearmotors using screws of strength class 8.8. The gearmotors in flange-mounted design and in foot-/flange-mounted design listed in the following table are an exception. Always use screws of strength class 10.9 for these gearmotors. Use suitable washers.

Gear unit	Ø flange mm	Strength class of the screws
RF37/R37F	120	10.9
RF47/R47F	140	
RF57/R57F	160	
FF/FAF77 KF/KAF77	250	
FM/FAM67, FM/FAM77 KM/KAM67, KM/KAM77	300	
FM/FAM87 KM/KAM87	350	
FM/FAM97 KM/KAM97	400	
RF147 FM/FAM107 KM/KAM107	450	
RF167 FM/FAM127 KM/KAM127	550	
FM/FAM157 KM/KAM157	660	
RZ37 – RZ87	60ZR – 130ZR	

6.12 Torque arms



NOTICE

Danger due to static overdetermination if gear units with foot (e.g. KA19/29B, KA127/157B or FA127/157B) are mounted both via the torque arm and via the foot plate.

Risk of injuries and damage to property

- Especially with the KA.9B/T variant, it is not permitted to use the foot plates and the torque arm at the same time.
- Attach the KA.9B/T design only via the torque arm.
- Attach the K.9 or KA.9B design only via the foot plate.
- If you want to use foot plates and torque arms for mounting, contact SEW-EURODRIVE.

6.12.1 Standard torque arms

The following table lists the part numbers of all galvanized steel or gray cast iron torque arms available for shipment:

Gear unit	Size					
	19	29	39	49		
KA, KH, KT	10684115	10684107	10682163	06442439		
Gear unit	Size					
	27	37	47	57	67	77
KA, KH, KV, KT	-	6434258	6434282	6434312	6434312	6434347
SA, SH, ST	-	1269941	6442374	6442404	6442439	6442463
FA, FH, FV, FT Rubber buffer (2 pieces)	0133485	0133485	0133485	0133485	0133485	0133493
Gear unit	Size					
	87	97	107	127	157	
KA, KH, KV, KT	6434371	6434401	6434436	6432948	-	
SA, SH, ST	6442498	6442528	-	-	-	
FA, FH, FV, FT Rubber buffer (2 pieces)	0133493	0133507	0133507	0133515	0133477	
Gear unit	Size					
	10	20	30	37	47	
WA, WH, WT	10610219	1680730	1680110	10611290	10611851	

6.12.2 Stainless steel torque arm

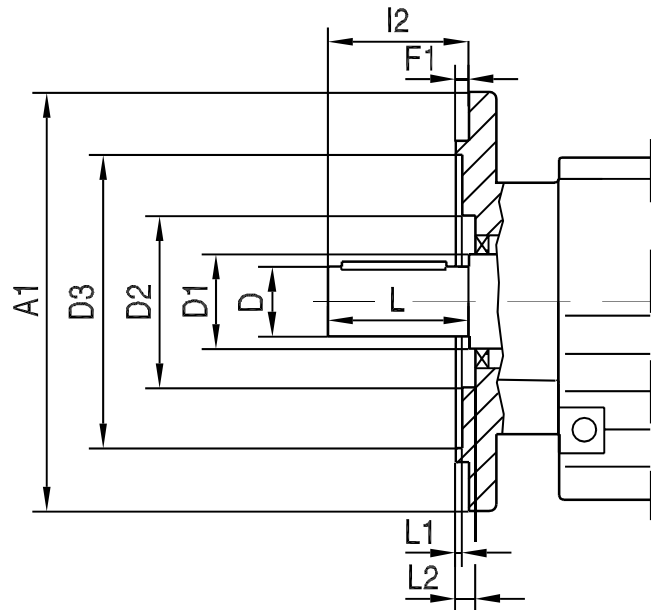
Torque arms made of stainless steel are available for K..19/29 and SPIROPLAN® gear units. Suitable retaining screws made of stainless steel are included in the delivery in a bag.

Gear unit	Size				
	19	29			
KA, KH, KT	10638008	10638016			
Gear unit	Size				
	10	20	30	37	47
WA, WH, WT	10638024	10638032	10638040	10638059	10638067

6.12.3 Torque arms for KH167.., KH187..

As standard, torque arms are not available for gear unit sizes KH167.. and KH187... Consult SEW-EURODRIVE if you need torque arms for these gear units.

6.13 Flange contours of RF.. and R..F gear units



Check dimensions L1 and L2 for selection and installation of output elements!

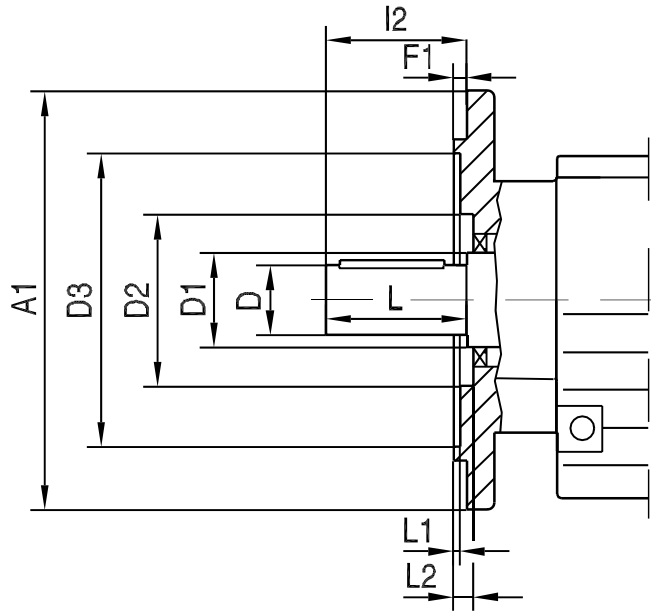
Type	Dimensions in mm											
	A1	D	D1	D2		D3	F1	I2	L	L1		L2
				RF	R..F					RF	R..F	
RF07, R07F	120	20	22	38	38	72	3	40	40	2	2	6
	140 ¹⁾	20	22	38	-	85	3	40	40	2	-	6
	160 ¹⁾	20	22	38	-	100	3.5	40	40	2.5	-	6.5
RF17, R17F	120	20	25	46	46	65	3	40	40	1	1	5
	140	20	25	46	-	78	3	40	40	1	-	5
	160 ¹⁾	20	25	46	-	95	3.5	40	40	1	-	6
RF27, R27F	120	25	30	54	54	66	3	50	50	1	1	6
	140	25	30	54	-	79	3	50	50	3	-	7
	160	25	30	54	-	92	3.5	50	50	3	-	7
RF37, R37F	120	25	35	60	63	70	3	50	50	5	4	7
	160	25	35	60	-	96	3.5	50	50	1	-	7.5
	200 ¹⁾	25	35	60	-	119	3.5	50	50	1	-	7.5
RF47, R47F	140	30	35	72	64	82	3	60	60	4	1	6
	160	30	35	72	-	96	3.5	60	60	0.5	-	6.5
	200	30	35	72	-	116	3.5	60	60	0.5	-	6.5
RF57, R57F	160	35	40	76	75	96	3.5	70	70	4	2.5	5
	200	35	40	76	-	116	3.5	70	70	0	-	5
	250 ¹⁾	35	40	76	-	160	4	70	70	0.5	-	5.5
RF67, R67F	200	35	50	90	90	118	3.5	70	70	2	4	7
	250	35	50	90	-	160	4	70	70	1	-	7.5
RF77, R77F	250	40	52	112	100	160	4	80	80	0.5	2.5	7
	300 ¹⁾	40	52	112	-	210	4	80	80	0.5	-	7
RF87, R87F	300	50	62	123	122	210	4	100	100	0	1.5	8
	350	50	62	123	-	226	5	100	100	1	-	9
RF97	350	60	72	136		236	5	120	120	0		9
	450	60	72	136		320	5	120	120	0		9

1) The flange contour protrudes from under the base surface.

6

Design and operating notes

Flange contours of RF.. and R..F gear units

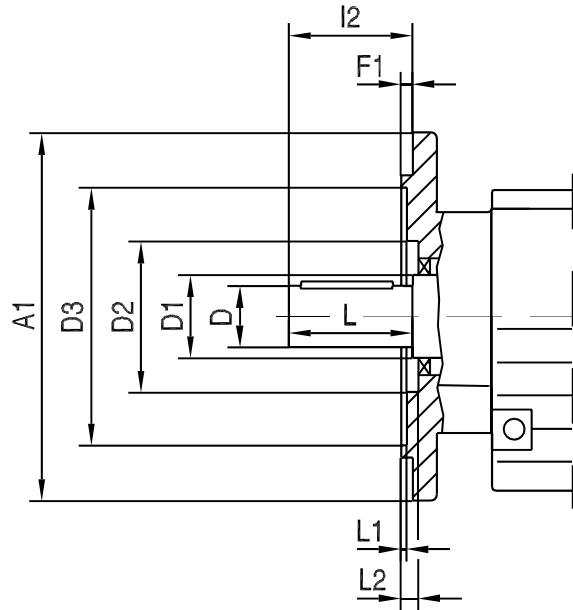


Check dimensions L1 and L2 for selection and installation of output elements!

Type	Dimensions in mm											
	A1	D	D1	D2		D3	F1	I2	L	L1		L2
				RF	R..F					RF	R..F	
RF107	350	70	82	157		232	5	140	140	0		11
	450	70	82	186		316	5	140	140	0		11
RF127	450	90	108	180		316	5	170	170	0		10
RF137	450	90	108	180		316	5	170	170	0		10
	550	90	108	180		416	5	170	170	0		10
RF147	450	110	125	210		316	5	210	210	0		10
	550	110	125	210		416	5	210	210	0		10
RF167	550	120	145	290		416	5	210	210	1		10
	660	120	145	290		517	6	210	210	2		11

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6.14 Flange contours of FF..., KF..., SF... and WF... gear units



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Check dimensions L1 and L2 for selection and installation of output elements!

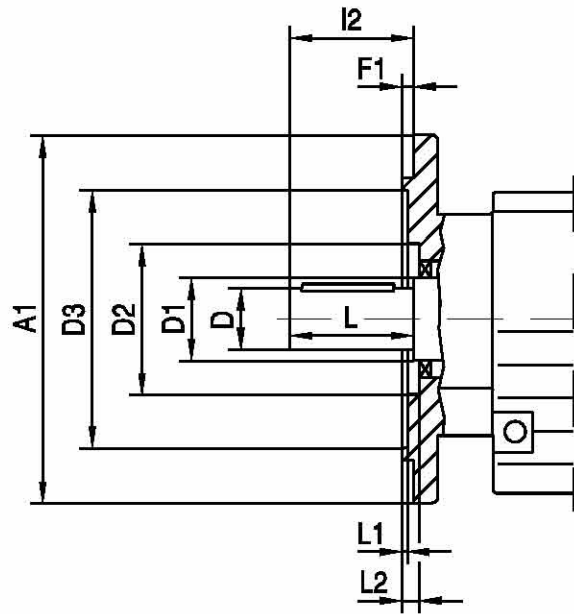
Type	Dimensions in mm									
	A1	D	D1	D2	D3	F1	I2	L	L1	L2
FF27	160	25	40	66	96	3.5	50	50	3	18.5
FF37	160	25	30	70	94	3.5	50	50	2	6
FF47	200	30	40	72	115	3.5	60	60	3.5	7.5
FF57	250	35	40	84	155	4	70	70	4	9
FF67	250	40	50	84	155	4	80	80	4	9
FF77	300	50	55	82	205	4	100	100	5	9
FF87	350	60	65	115	220	5	120	120	5	9
FF97	450	70	75	112	320	5	140	140	8	10
FF107	450	90	100	159	318	5	170	170	16	9
FF127	550	110	118	-	420	5	210	210	10	-
FF157	660	120	135	190	520	6	210	210	8	14
KF19	120	20	25	-	70	2.5	40	40	-	11.5
KF19	160	20	25	-	100	2.5	40	40	-	11.5
KF29	160	25	30	-	109	3.5	50	50	-	6.5
KF29	200	25	30	-	115	3.5	50	50	-	6.5
KF37	160	25	30	70	94	3.5	50	50	2	6
KF39	160	30	39	68	96	3.5	60	60	13.5	23.5
KF47	200	30	40	72	115	3.5	60	60	3.5	7.5
KF49	200	35	49	76	115	3.5	70	70	24.5	28
KF57	250	35	40	84	155	4	70	70	4	9
KF67	250	40	50	84	155	4	80	80	4	9
KF77	300	50	55	82	205	4	100	100	5	9
KF87	350	60	65	115	220	5	120	120	5	9
KF97	450	70	75	112	320	5	140	140	8	10
KF107	450	90	100	159	318	5	170	170	16	9
KF127	550	110	118	-	420	5	210	210	10	-
KF157	660	120	135	190	520	6	210	210	8	14

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Design and operating notes

Flange contours of FF.., KF.., SF.. and WF.. gear units



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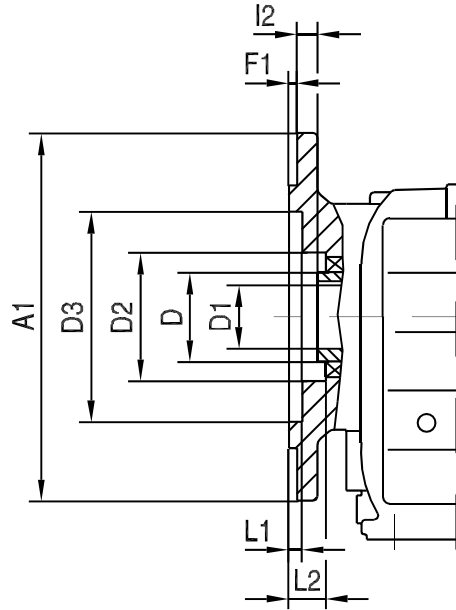
Check dimensions L1 and L2 for selection and installation of output elements!

Type	Dimensions in mm									
	A1	D	D1	D2	D3	F1	I2	L	L1	L2
SF37	120	20	25	-	68	3	40	40	6	-
SF37	160	20	25	-	96	3.5	40	40	5.5	-
SF47	160	25	30	70	94	3.5	50	50	2	6
SF57	200	30	40	72	115	3.5	60	60	3.5	7.5
SF67	200	35	45	-	115	3.5	70	70	8.5	-
SF77	250	45	55	108	160	4	90	90	8	9
SF87	350	60	65	130	220	5	120	120	6	10
SF97	450	70	75	150	320	5	140	140	8.5	10
WF10	80	16	25	-	39	2.5	40	40	30	-
WF10	120	16	25	39	74	3	40	40	5	30
WF20	110	20	30	44	53	4	40	40	27	35
WF20	120	20	30	-	45	2.5	40	40	37.5	-
WF30	120	20	30	48	63	2.5	40	40	18	27
WF30	160	20	30	48	63	2.5	40	40	33	42
Revised — WF37	120	20	30	-	63	2.5	40	40	-	10.5
Revised — WF37	160	20	30	-	63	2.5	40	40	-	25.5
WF47	160	30	35	-	92	3.5	10	60	6	-

Revised
Revised

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6.15 Flange contours of FAF..., KAF..., SAF.. and WAF.. gear units



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Check dimensions L1 and L2 for selection and installation of output elements!

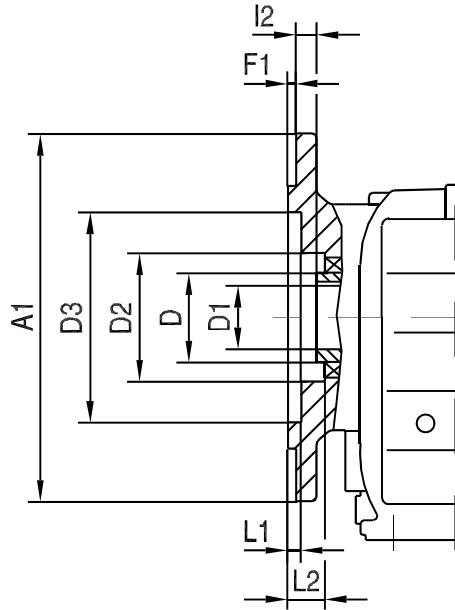
Type	Dimensions in mm								
	A1	D	D1	D2	D3	F1	I2	L1	L2
FAF27	160	40	25	66	96	3.5	20	3	18.5
FAF37	160	45	30	62	94	3.5	24	2	30
FAF47	200	50	35	70	115	3.5	25	3.5	31.5
FAF57	250	55	40	76	155	4	23.5	4	31
FAF67	250	55	40	76	155	4	23	4	31
FAF77	300	70	50	95	205	4	37	5	45
FAF87	350	85	60	120	220	5	30	5	39
FAF97	450	95	70	135	320	5	41.5	5.5	51
FAF107	450	118	90	224	320	5	41	16	52
FAF127	550	135	100	185	420	5	51	6	63
FAF157	660	155	120	200	520	6	60	10	74
KAF19	120	30	20	60	70	2.5	25	9	25.5
KAF19	160	30	20	60	100	2.5	25	9	25.5
KAF29	160	40	25 / 30	-	105	3.5	33.5	-	6.5
KAF29	200	40	25 / 30	-	118	3.5	33.5	-	6.5
KAF39	160	50	30 / 35	68	96	3.5	24.5	10	27
KAF37	160	45	30	62	94	3.5	24	2	30
KAF47	200	50	35	70	115	3.5	25	3.5	8.5
KAF49	200	55	35 / 40	76	115	3.5	32.5	16	34.5
KAF57	250	55	40	76	155	4	23.5	4	31
KAF67	250	55	40	76	155	4	23	4	31
KAF77	300	70	50	95	205	4	37	5	45
KAF87	350	85	60	120	220	5	30	5	39
KAF97	450	95	70	135	320	5	41.5	5.5	51
KAF107	450	118	90	224	320	5	41	16	52
KAF127	550	135	100	185	420	5	51	6	63
KAF157	660	155	120	200	520	6	60	10	74

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Design and operating notes

Flange contours of FAF..., KAF..., SAF.. and WAF.. gear units



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Check dimensions L1 and L2 for selection and installation of output elements!

Type	Dimensions in mm								
	A1	D	D1	D2	D3	F1	I2	L1	L2
SAF37	120	35	20	-	68	3	15	6	-
SAF37	160	35	20	-	96	3.5	15	5.5	-
SAF47	160	45	30 / 25	62	94	3.5	24	2	30
SAF57	200	50	35 / 30	70	115	3.5	25	3.5	31.5
SAF67	200	65	45 / 40	91	115	3.5	42.5	4	48.5
SAF77	250	80	60 / 50	112	164	4	45.5	5	53.5
SAF87	350	95	70 / 60	131	220	5	52.5	6	62.5
SAF97	450	120	90 / 70	160	320	5	60	6.5	69
WAF10	80	25	16	-	39	2.5	23	30	-
WAF10	120	25	16	39	74	3	23	5	30
WAF20	110	30	18 / 20	45	53	-4	30	27	35
WAF20	120	30	18 / 20	-	45	2.5	30	37.5	-
WAF30	120	30	20	48	63	2.5	19.5	18	27
WAF30	160	30	20	48	63	2.5	34.5	22	42
WAF37	120	35	20 / 25	62	63	2.5	19.5	9	24.5
WAF37	160	35	20 / 25	62	63	2.5	34.5	24	39.5
WAF47	160	45	30	62.5	92	3.5	35	6	41
WAF47	200	45	30	62.5	115	3.5	35	6	41

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6.16 Safety covers

6.16.1 Rotating safety cover

The following gear unit types with hollow shaft and shrink disk are equipped with a rotating safety cover as standard:

Gear unit type	Sizes
KH..	19 – 49 and 37 – 97
FH.., SH.., WH..	37 – 97

Should you require a fixed plastic or metal safety cover for safety reasons, refer to the part numbers in the following chapters.

6.16.2 High fixed plastic safety cover

The following gear unit types with hollow shaft and shrink disk are equipped with a high fixed plastic safety cover as standard:

Gear unit type	Sizes
FH..	27 and 107 – 127
KH..	107 – 127

Should you require a high fixed plastic safety cover for other gear unit types or sizes due to safety reasons, refer to the part numbers in the following chapters.

6.16.3 Fixed sheet metal safety cover

The following gear unit types with hollow shaft and shrink disk are equipped with a fixed sheet metal safety cover as standard:

Gear unit type	Sizes
KH..	157, 167 and 187
FH..	157
FT.., KT.., ST.., WT.. (with TorqLOC® hollow shaft mounting system)	All available sizes
Explosion-proof gear units FH.., KH.., SH.., WH.. gear units	All available sizes

Should you require a fixed sheet metal safety cover for other gear unit types or sizes, the part number required to order the cover can be found in the following chapter.

6.16.4 Flat fixed plastic safety cover

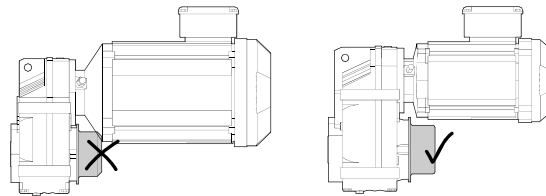
The following gear unit types with hollow shaft can optionally be equipped with a flat fixed plastic safety cover:

Gear unit type	Sizes
FA., FV..	27 – 97
KA..	19 – 49 and 37 – 97
KV..	37 – 97
SA..	37 – 97
WA..	10 – 30 and 37/47

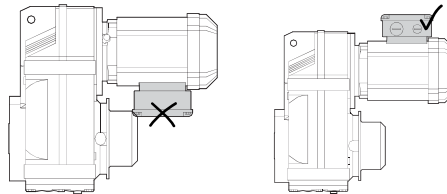
Should you require a flat fixed plastic safety cover for these gear unit types due to safety reasons, refer to the part numbers in the following chapters.

6.16.5 Motor mounting sizes and terminal box position with fixed safety cover

The size of the attached motor may be limited by the use of a high fixed safety cover for parallel-shaft helical gear units.



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INFORMATION



SEW-EURODRIVE recommends the terminal box position $\neq 90^\circ$ for parallel-shaft helical gear units with high safety cover to simplify assembly and maintenance.

If necessary, check the configuration in the product configurator on the SEW-EURODRIVE website.

High fixed plastic safety cover

The following table shows the maximum possible motor mounting sizes, depending on the gear unit size, for a high fixed plastic safety cover:

Gear unit size	F..37	F..47	F..57	F..67	F..77	F..87	F..97
Maximum possible motor mounting sizes	71M	80M	90L	112M	132L	160L	180L

Fixed sheet metal safety cover

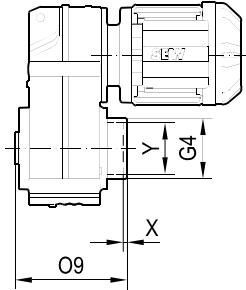
The following table shows the maximum possible motor sizes, depending on the gear unit size, for a high fixed sheet metal safety cover:

Gear unit size	F..37	F..47	F..57	F..67	F..77	F..87	F..97
Maximum possible motor mounting sizes	71M	71M	80M	100L	132L	160L	180L

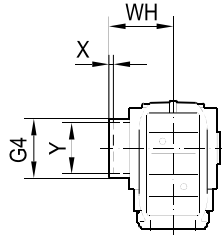
6.16.6 Part numbers and dimensions for high fixed plastic covers

19 002 00 18

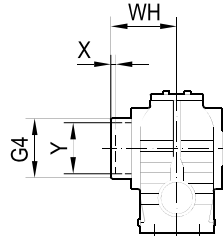
FH.. / FA..



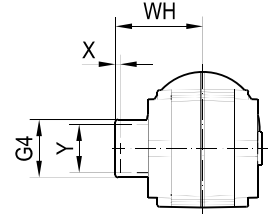
KH.. / KA..



SH.. / SA..



WH.. / WA..



9007213691434635

Parallel-shaft helical gearmotors	FH/FA ..27	FH/FA ..37	FH/FA ..47	FH/FA ..57	FH/FA ..67	FH/FA ..77	FH/FA ..87	FH/FA ..97
Part number	06435319	6435130	6435149	6435157	6435157	6435165	6435173	6435181
G4 in mm	58	78	88	100	100	121	164	185
O9 in mm	134	157	188.5	207.5	221.5	255	295	363.5
X in mm	0.8	2	4.5	7.5	6	6	4	6.5
Y in mm	56	75	83	83	93	114	159	174
Helical-bevel gearmotors	KH/KA ..19	KH/KA ..29						
Part number	10684158	10684166						
G4 in mm	62	68						
WH in mm	83	90						
X in mm	2	4						
Y in mm	50	60						
Helical-bevel gearmotors ¹⁾	KH/KA ..37	KH/KA ..47	KH/KA ..57	KH/KA ..67	KH/KA ..77	KH/KA ..87	KH/KA ..97	
Part number	6435130	6435149	6435157	6435157	6435165	6435173	6435181	
G4 in mm	78	88	100	100	121	164	185	
WH in mm	95	111.5	122.5	129	147	172	210.5	
X in mm	0	1.5	5.5	3	1	2	4.5	
Y in mm	75	83	83	93	114	159	174	

1) Not possible in foot-mounted helical-bevel gear units with hollow shafts (KH..B and KA..B)

Helical-worm gearmotors	SH/SA ..37	SH/SA ..47	SH/SA ..57	SH/SA ..67	SH/SA ..77	SH/SA ..87	SH/SA ..97
Part number	6435122	6435130	6435149	6435157	6435165	6435173	6435181
G4 in mm	59	78	88	100	121	164	185
WH in mm	88	95	111.5	123	147	176	204.5
X in mm	1	0	1.5	3	1	0	0.5
Y in mm	53	75	83	93	114	159	174
SPIROPLAN® gearmotors	WH/WA ..37	WH/WA ..47					
Part number	10611363	10611940					
G4 in mm	68	80.5					
WH in mm	95.5	109.5					
X in mm	11	12.5					
Y in mm	50	72					

6.16.7 Part numbers and dimensions for fixed sheet metal covers

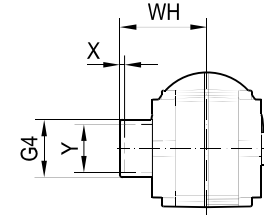
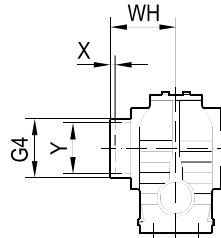
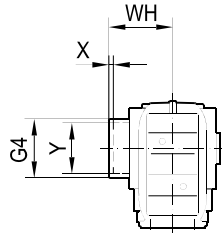
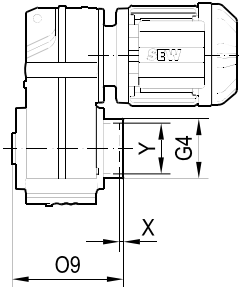
19 004 00 18

FT.. / FH.. / FA..

KT.. / KH.. / KA..

ST.. / SH.. / SA..

WT.. / WH.. / WA..



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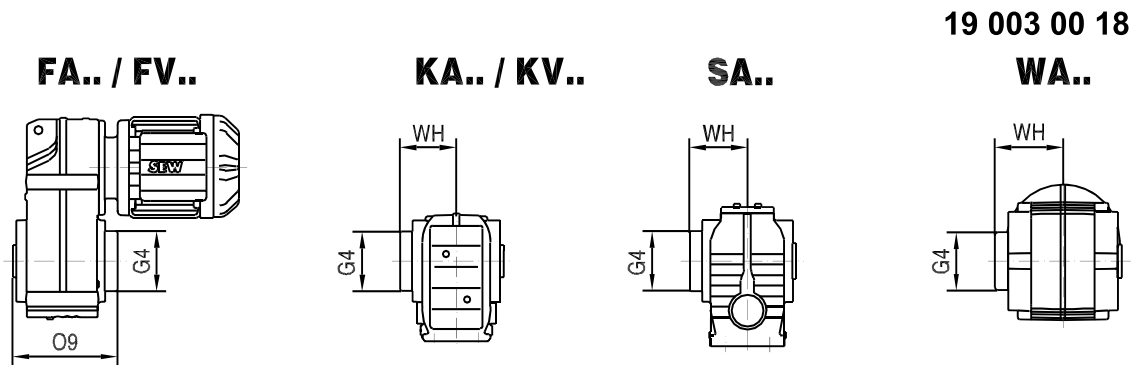
Parallel-shaft helical gearmotors	FT/FH/FA ..37	FT/FH/FA ..47	FT/FH/FA ..57	FT/FH/FA ..67	FT/FH/FA ..77	FT/FH/FA ..87	FT/FH/FA ..97	FT/FH/FA ..107	FT/FH/FA ..127	FT/FH/FA 157
Part number	0643584X	06435858	06435866	06435866	06435874	06435882	06435890	06421814	06421822	06421830
G4 in mm	81	90	101	101	124	165	200	196	229	275
O9 in mm	166	199	222	236	285	322	382	421	502	605
X in mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Y in mm	78	87	98	98	121	162	197	193	226	272
Helical-bevel gearmotors	KH/KA ..19	KH/KA ..29	KT/KH/KA ..39	KT/KH/KA ..49						
Part number	10686320	10686339	10682651	10682964						
G4 in mm	60	68	86	97						
WH in mm	84.5	91.5	117.5	138						
X in mm	1.5	1.5	1	1						
Y in mm	50	60	84	95						
Helical-bevel gearmotors ¹⁾	KT/KH/KA ..37	KT/KH/KA ..47	KT/KH/KA ..57	KT/KH/KA ..67	KT/KH/KA ..77	KT/KH/KA ..87	KT/KH/KA ..97	KT/KH/KA ..107	KT/KH/KA ..127	KT/KH/KA ..157
Part number	0643584X	06435858	06435866	06435866	06435874	06435882	06435890	06421814	06421822	06421879
G4 in mm	81	90	101	101	124	165	200	196	229	275
WH in mm	104	122	137	143	177	229	382	246	297	375
X in mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Y in mm	78	87	98	98	121	162	197	193	226	272

1) Not possible in foot-mounted helical-bevel gear units with hollow shafts (KH..B and KA..B)

Helical-worm gearmotors	ST/SH/SA ..37	ST/SH/SA ..47	ST/SH/SA ..57	ST/SH/SA ..67	ST/SH/SA ..77	ST/SH/SA ..87	ST/SH/SA ..97
Part number	06444768	0643584X	06435858	06435866	06435874	06435882	06435882
G4 in mm	64	81	90	101	124	165	165
WH in mm	98	104	122	137	177	203	223
X in mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Y in mm	61	78	87	98	121	162	162
SPIROPLAN® gearmotors	WT/WH/WA ..37	WT/WH/WA ..47					
Part number	10611479	10611959					
G4 in mm	67	78					
WH in mm	95.5	109					
X in mm	1	1					
Y in mm	64	76					

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6.16.8 Part numbers and dimensions for flat fixed plastic covers



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Parallel-shaft helical gearmotors	FA/FV..27	FA/FV..37	FA/FV..47	FA/FV..57	FA/FV..67	FA/FV..77	FA/FV..87	FA/FV..97	
Part number	10688684	10688293	10688390	10688498	10688498	10688595	10688692	10688781	
G4 in mm	57.4	80.4	80.4	84.7	84.7	117.4	147.5	187.4	
O9 in mm	111	134	163	179	193	223	251	313	
Helical-bevel gearmotors	KA ..19	KA ..29	KA ..39	KA ..49					
Part number	10688684	10688293	10688498	10688498					
G4 in mm	57.4	80.4	84.7	84.7					
WH in mm	63.2	73.5	90	90					
Helical-bevel gearmotors ¹⁾	KA/KV..37	KA/KV..47	KA/KV..57	KA/KV..67	KA/KV..77	KA/KV..87	KA/KV..97		
Part number	10688293	10688390	10688498	10688498	10688595	10688692	10688781		
G4 in mm	80.4	80.4	84.7	84.7	117.4	147.5	187.4		
WH in mm	72.5	87	95	101.5	116	131	161		
1) Not possible in foot-mounted helical-bevel gear units with hollow shafts (KH..B and KA..B)									
Helical-worm gearmotors	SA ..37	SA..47	SA ..57	SA..67	SA..77	SA.. 87	SA..97		
Part number	10687890	10688293	10688390	10688498	10688595	10688692	10688781		
G4 in mm	57.4	80.4	80.4	84.7	117.4	147.5	187.4		
WH in mm	68	72.5	87	95.5	116	135	155		
SPIROPLAN® gearmotors	WA..10	WA..20	WA..30	WA..37	WA..47				
Part number	10687998	10687998	10688099	10688099	10688196				
G4 in mm	42.4	42.4	57.4	57.4	62.4				
WH in mm	51	58.5	69	69	82.5				




6.17 Technical data condition monitoring

6.17.1 Information on oil aging sensor /DUO10A

Technical data

	Technical data		
Preset oil grades	OIL1	CLP mineral oil	$T_{\max} = 100\text{ °C}$
		Biodegradable oil	$T_{\max} = 100\text{ °C}$
	OIL2	CLP HC synthetic oil	$T_{\max} = 130\text{ °C}$
		CLP PAO oil	$T_{\max} = 130\text{ °C}$
	OIL3	CLP PG polyglycol	$T_{\max} = 130\text{ °C}$
OIL4	Food grade oil	$T_{\max} = 100\text{ °C}$	
Switch outputs	1: Early warning (time to next oil change can be set to between 2 and 100 days) 2: Main alarm (time to oil change 0 days) 3: Exceeded temperature T_{\max} 4: DUO10A is ready for operation		
Permitted oil temperature	-40 °C – +130 °C		
Permitted temperature sensor	PT1000		
EMC	IEC1000-4-2/3/4/6		
Ambient temperature	-25 °C – +70 °C		
Operating voltage	DC 18 – 28 V		
Current consumption for DC 24 V	< 90 mA		
Protection class	III		
Degree of protection	IP67 (optionally IP69K)		
Housing materials	Evaluation unit: V2A, EPDM/X, PBT, FPM Temperature sensor: V4A		
Electrical connection	Evaluation unit: M12 plug connector PT1000 temperature sensor: M12 plug connector		

Designations and part numbers

Designation	Description	Part number
 DUO10A	Evaluation unit (basic device)	13438751
DUO10A-PUR-M12-5m	5 m PUR cable with 1 connector	13438778
DUO10A-PVC-M12-5m	5 m PVC cable with 1 connector	13438786
DUO10A	Angle bracket	13438808
DUO10A D = 34	Mounting clamp	13438794
 W4843 PT1000	PT1000 temperature sensor	13438816
W4843_4x0.34-2m-PUR	2 m PUR cable for PT1000 ¹⁾	13438824
W4843_4x0.34-2m-PVC	2 m PVC cable for PT1000 ²⁾	13438832
 DUO10A	Protection cap (for aseptic design, IP69K)	13439022

1) PUR cables are particularly suited for use in oil-contaminated environments.

2) PVC cables are particularly suited for use in moist environments.

Mounting to standard gear units (R, F, K,S)

Adapter for mounting the PT1000 temperature sensor in screw plug bores:

Complete adapter for PT1000 sensor	Part number
M10 × 1	13439030
M12 × 1.5	13439049
M22 × 1.5	13439057
M33 × 2	13439065

Complete adapter for PT1000 sensor	Part number
M42 × 2	13439073

Mounting base for installing the diagnostic unit at the gear unit with an angle bracket:

Mounting base with sealing ring	Part number
M10 × 1	13434411
M12 × 1.5	13438271
M22 × 1.5	13438298
M33 × 2	13438301
M42 × 2	13438328

6.17.2 Information on Vibration SmartCheck /DUV40A

Scope of delivery

- Device Vibration SmartCheck with integrated software FAG SmartWeb
- User documentation Vibration SmartCheck and FAG SmartWeb on CD-ROM
- FAG SmartUtility Light software with user documentation on CD-ROM
- 1 Retaining screw: Hexagon socket head screw M6 x 45
- 1 O-ring to secure the retaining screw against loss
- 1 plug with logo to close assembly opening
- 3 closing plugs to close unused M12 connections

INFORMATION



Cables for connecting the device are not included in the standard delivery of Vibration SmartCheck devices.

Technical data

Vibration SmartCheck	
Housing	Glass fiber reinforced plastic
Fastening	Hexagon socket head screw M6 x 45 Contact surface on the machine: 25 mm Ø
Current consumption	< 200 mA at 24 V
Ambient temperature	-20 to +70 °C
Internal operating temperature	-20 to +85 °C
Voltage supply	11 – 32 VDC or Power over Ethernet (PoE) based on 802.3af Mode A
Size	44 mm x 57 mm x 55 mm
Weight	Approx. 210 g
Degree of protection	IP 67
Operating system	Embedded Linux

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Vibration SmartCheck	
Software	FAG SmartWeb (Mozilla Firefox ESR 38 (recommended), Internet Explorer 11, Internet Explorer 9 not recommended due to performance reasons) Vibration SmartUtility Light or optionally Vibration SmartUtility Languages: German, English, Chinese, Spanish, and French
Internal sensor technology	
Vibration	Acceleration sensor (piezoelectric sensor) Frequency range 0.8 Hz – 10 kHz Measuring range ± 50 g
Temperature	Measuring range -20 to +70 °C
Measurement	
Measurement functions	Acceleration Speed and distance by integration System temperature Process parameters (e.g. speed, load, pressure)
Diagnostic methods	Time signal, envelope, spectrum and trend analysis, speed and frequency checking
Characteristic values (time and frequency range)	
Defined characteristic values	DIN/ISO 10816
Calculated characteristic values	RMS, frequency selected RMS, direct component, peak, peak to peak, crest factor, Wellhausen count, carpet level, condition monitoring Other user-defined characteristic values are available.
Signal processor	
Frequency resolution	1600, 3200, 6400, or 12800 lines Line width min. 0.0039 Hz at 50 Hz (depending on low pass)
Measurement resolution	24 Bit (A/D converter)
Frequency range	0.8 Hz – 10 kHz
Low passes	50 Hz – 10 kHz (50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10 kHz)
High passes (only envelope)	750 Hz, 1 kHz, 2 kHz (other filters upon request)
Memory	
Program and data	64 MB RAM, 128 MB flash
Inputs and outputs	
Inputs	2 analog inputs (0 – 10 V / 0 – 24 V / 0 – 20 mA / 4 – 20 mA), frequency range 0 – 500 Hz, 12 Bit 1 digital input (0 – 30 V, 0.1 Hz – 1 kHz)

Inputs and outputs	
Outputs	1 analog output (0 – 10 V / -20 mA / 4 – 20 mA), 12 Bit 1 switching output (open collector, max. 1 A, 28 V) Optional galvanic isolation between inputs and outputs

Interfaces	
Control elements	2 capacitive pushbuttons (learning mode, alarm reset, restart, factory settings)
Display elements	1 LED to display status and alarm 1 LED to acknowledge the pushbuttons 2 LEDs to display communication
Communication	Ethernet 100 Mb/s RS485 (currently not yet supported)
Electrical connections	3 M12 plug connectors (polarity reversal protected) for supply, RS485, inputs/outputs, and Ethernet

Part numbers

	Description	Part number
Sensor	Vibration SmartCheck	19175892
Cables	8-pin voltage supply cable for SmartCheck, 5 m; M12(B) <-> open end	19179596
Cables	Ethernet cable for SmartCheck, 5 m; M12 <-> RJ45	19179618
Cables	I/O cable 8-pin for SmartCheck 5 m; M12(St) <-> open end	19179626

	Description	Part number
Base for mounting on standard gear units (R, F, K, and S gear units)	Mounting base with sealing ring M10 x 1	20593422
	Mounting base with sealing ring M12 x 1.5	20593430
	Mounting base with sealing ring M22 x 1.5	20593449
	Mounting base with sealing ring M33 x 2	20593457
	Mounting base with sealing ring M42 x 2	20593465

	Description	Part number
Base for mounting on industrial gear units	Mounting base with sealing ring G3/4	20593384
	Mounting base with sealing ring G1	20593392
	Mounting base with sealing ring G1 1/4	20593406
	Mounting base with sealing ring G1 1/2	20593414

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	Description	Part number
Base for mounting on standard motors	Mounting base M5	21014175
	Mounting base M6	21014167
	Mounting base M8	20593503
	Mounting base M10	21014248
	Mounting base M12	20593473
	Mounting base M16	20593481
	Mounting base M20	20593511