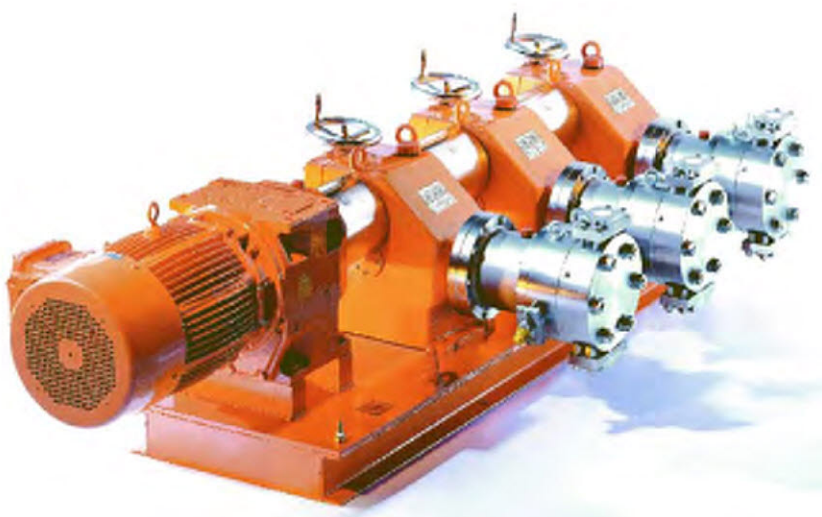


OPERATING MANUAL

for Metering Pumps



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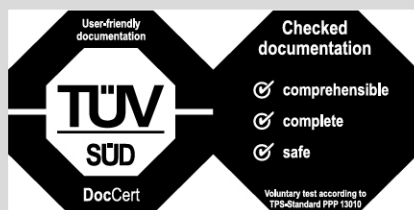
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SEW
EURODRIVE



Gear Units, R..7, F..7, K..7, S..7 Series, SPIROPLAN® W

Edition 02/2008

11691026 / EN

Operating Instructions





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1 General Information

1.1 How to use the operating instructions

The operating instructions are an integral part of the product and contain important information on operation and service. The operating instructions are written for all employees who assemble, install, startup, and service this product.

The operating instructions must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. Consult SEW-EURODRIVE if you have any questions or if you require further information.

1.2 Structure of the safety notes

The safety notes in these operating instructions are structured as follows:

Symbol	SIGNAL WORD
 General hazard	<p>Nature and source of hazard.</p> <p>Possible consequence(s) if disregarded.</p> <ul style="list-style-type: none"> Measure(s) to avoid the hazard.

Symbol	Signal word	Meaning	Consequences if disregarded
Example: General hazard	HAZARD!	Imminent hazard	Severe or fatal injuries
 Specific hazard, e.g. electric shock	WARNING!	Possible hazardous situation	Severe or fatal injuries
	CAUTION!	Possible hazardous situation	Minor injuries
	CAUTION!	Possible damage to property	Damage to the drive system or its environment
NOTE		Useful information or tip. Simplifies handling of the drive system.	



1.3 *Rights to claim under limited warranty*

Adhering to the operating instructions is a prerequisite for fault-free operation and the fulfillment of any right to claim under warranty. Read the operating instructions before you start working with the unit.

1.4 *Exclusion of liability*

You must comply with the information contained in these operating instructions to ensure safe operation of the R..7, F..7, K..7, S..7 series and SPIROPLAN® W gear units and to achieve the specified product characteristics and performance requirements. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.



2 Safety Notes

The following basic safety notes are intended to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and observed. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, please contact SEW-EURODRIVE.

2.1 Preface

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

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

2.2 General information



HAZARD!

During operation, the motors and gearmotors can have live, bare and movable or rotating parts as well as hot surfaces, depending on their enclosure.

Severe or fatal injuries.

- All work related to transportation, storage, setup/mounting, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observation of:
 - the relevant detailed operating instructions
 - The warning and safety signs on the motor/gearmotor
 - all other project planning documents, operating instructions and wiring diagrams belonging to the drive
 - The specific regulations and requirements for the system
 - The national/regional regulations governing safety and the prevention of accidents
- Never install damaged products
- Immediately report any damages to the shipping company

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

Consult the documentation for additional information.



2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in this context are persons who are familiar with the setup, mechanical installation, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- They are educated in the mechanics field (e.g. mechanical or mechatronic engineers) having successfully passed a final exam.
- They are familiar with these operating instructions.

Any electronic work may only be performed by adequately qualified electricians. A qualified electrician in this context are persons who are familiar with the, electronic installation, startup, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- They are educated in the electronics field (e.g. electronic or mechatronic engineers) having successfully passed a final exam.
- They are familiar with these operating instructions.

All work in further areas of transportation, storage, operation and waste disposal may only be carried out by persons who have been adequately trained.

2.4 Designated use

The gear units/gearmotors are intended for industrial systems and may only be used in accordance with the information provided in the technical documentation of SEW-EURODRIVE and the information given on the nameplate. They correspond to the applicable standards and regulations. Using these products in potentially explosive atmospheres is prohibited, unless specifically designated otherwise.

2.5 Other applicable documentation

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

- Operating Instructions "AC Motors, Asynchronous Servomotors" for gearmotors
- Operating instructions of installed options, if applicable
- "Gear Units" catalog or
- "Gearmotors" catalog



2.6 *Transportation*

Immediately upon receipt, inspect the shipment for any damage that may have occurred during transportation. Inform the shipping company immediately. It may be necessary to preclude startup.

Tighten installed eyebolts. They are only intended for the weight of the motor/gearmotor; do not attach any additional loads.

The built-in lifting eyebolts comply with DIN 580. Always observe the loads and regulations listed in this standard. If the gearmotor is equipped with two suspension eye lugs or lifting eyebolts, then both of the suspension eye lugs should be used for transportation. In this case, the tension force vector of the slings must not exceed a 45° angle according to DIN 580.

Use suitable, sufficiently rated handling equipment if necessary. Remove any transportation fixtures prior to startup.

2.7 *Extended storage*

Observe the notes in section "Extended storage" (see page 106).

2.8 *Installation/assembly*

Observe the notes in section "Mechanical Installation" (see page 17)!

2.9 *Startup/operation*

Check the oil level before startup as described in chapter Inspection/Maintenance (see page 61).

Check that the direction of rotation is correct in **decoupled** status. Listen out for unusual grinding noises as the shaft rotates.

Secure keys for test mode without output elements. Do not deactivate monitoring and protection equipment even in test mode.

Switch off the gearmotor if in doubt whenever changes occur in relation to normal operation (e.g. increased temperature, noise, vibration). Determine the cause and contact SEW-EURODRIVE, if required.

2.10 *Inspection/Maintenance*

Observe the notes in chapter "Inspection/Maintenance" (see page 61)!



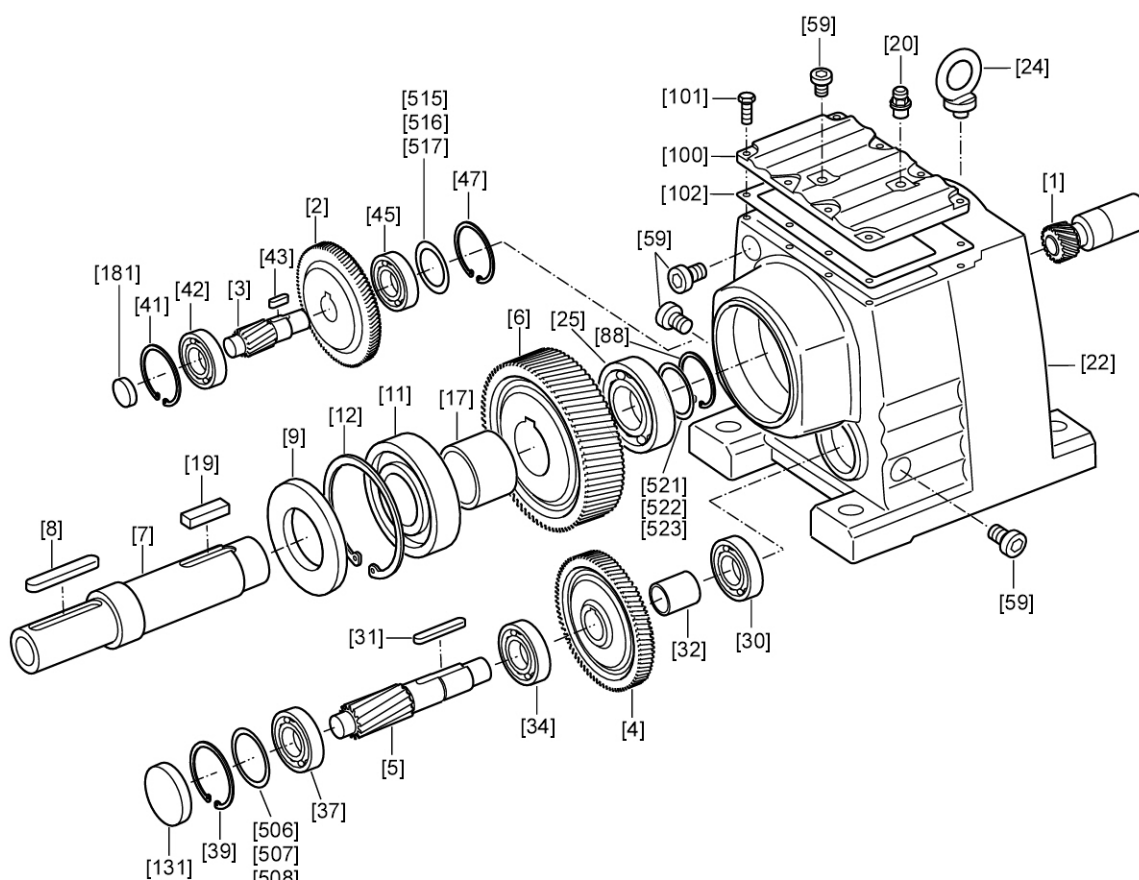
3 Gear Unit Design



NOTE

The following figures are block diagrams. Their purpose is only to make it easier to assign components to the spare parts lists. Discrepancies may occur depending on the gear unit size and version!

3.1 Basic design of helical gear units

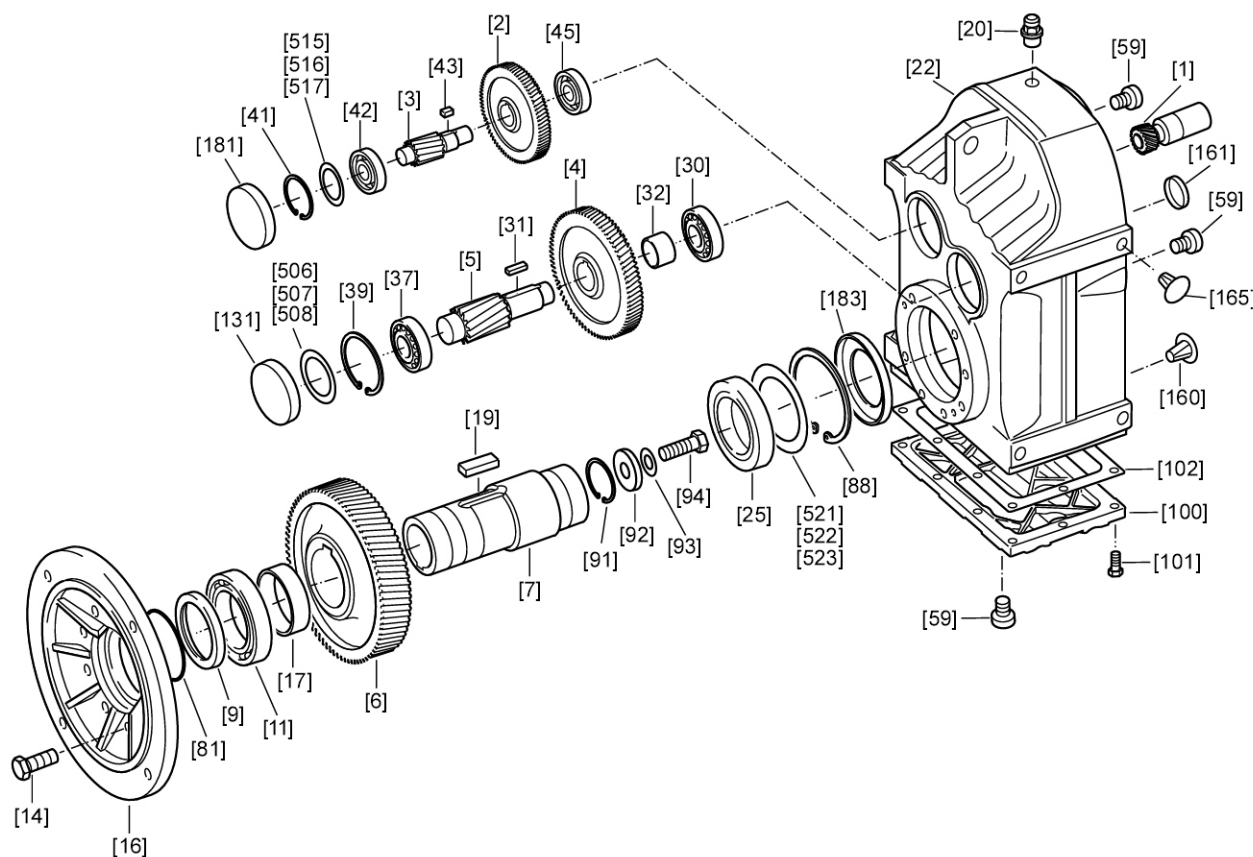


19194251

[1] Pinion	[19] Key	[42] Anti-friction bearing	[507] Shim
[2] Gearwheel	[20] Breather valve	[43] Key	[508] Shim
[3] Pinion shaft	[22] Gear unit housing	[45] Anti-friction bearing	[515] Shim
[4] Gearwheel	[24] Eyebolt	[47] Circlip	[516] Shim
[5] Pinion shaft	[25] Anti-friction bearing	[59] Screw plug	[517] Shim
[6] Gearwheel	[30] Anti-friction bearing	[88] Circlip	[521] Shim
[7] Output shaft	[31] Key	[100] Gear cover plate	[522] Shim
[8] Key	[32] Spacer tube	[101] Hex head bolt	[523] Shim
[9] Oil seal	[34] Anti-friction bearing	[102] Seal	
[11] Anti-friction bearing	[37] Anti-friction bearing	[131] Closing cap	
[12] Circlip	[39] Circlip	[181] Closing cap	
[17] Spacer tube	[41] Circlip	[506] Shim	

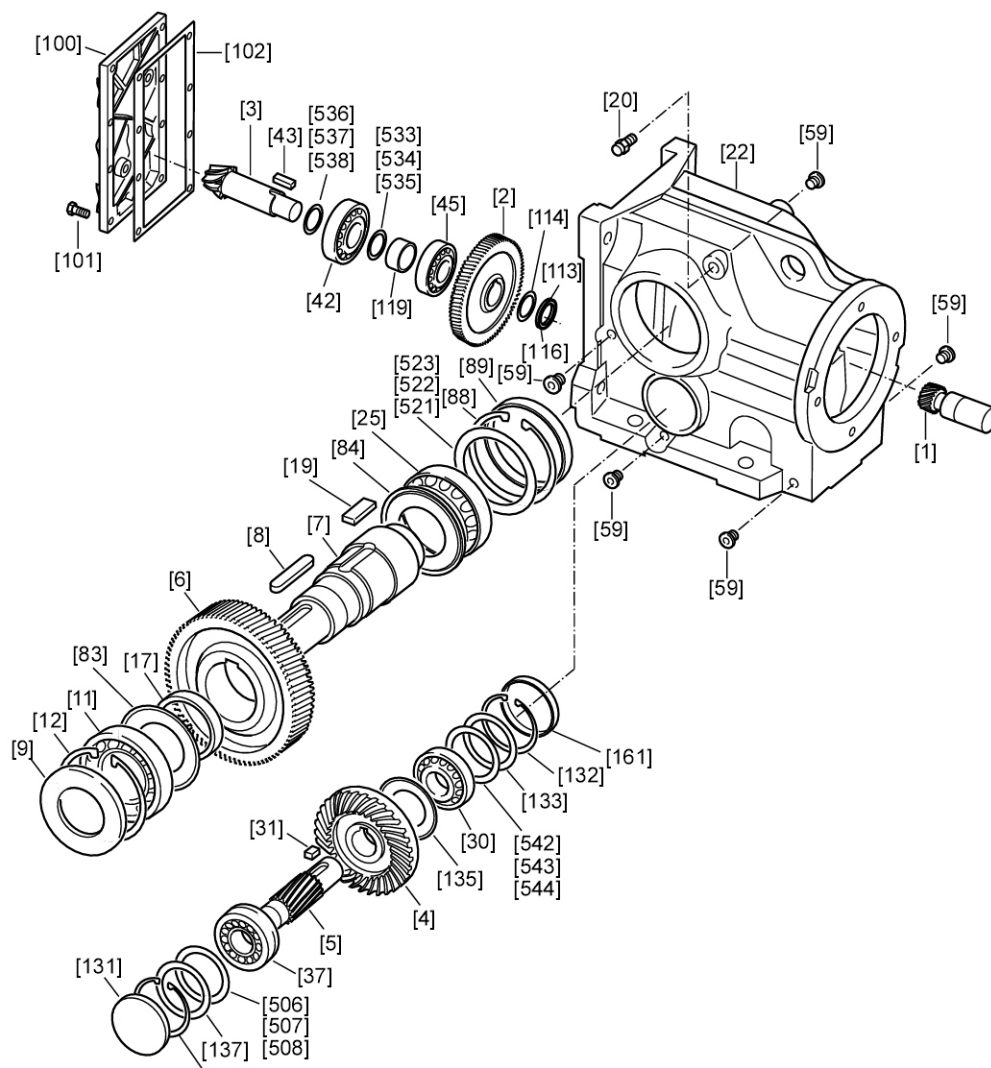


3.2 Basic design of parallel shaft helical gear units





3.3 Basic design of helical-bevel gear units

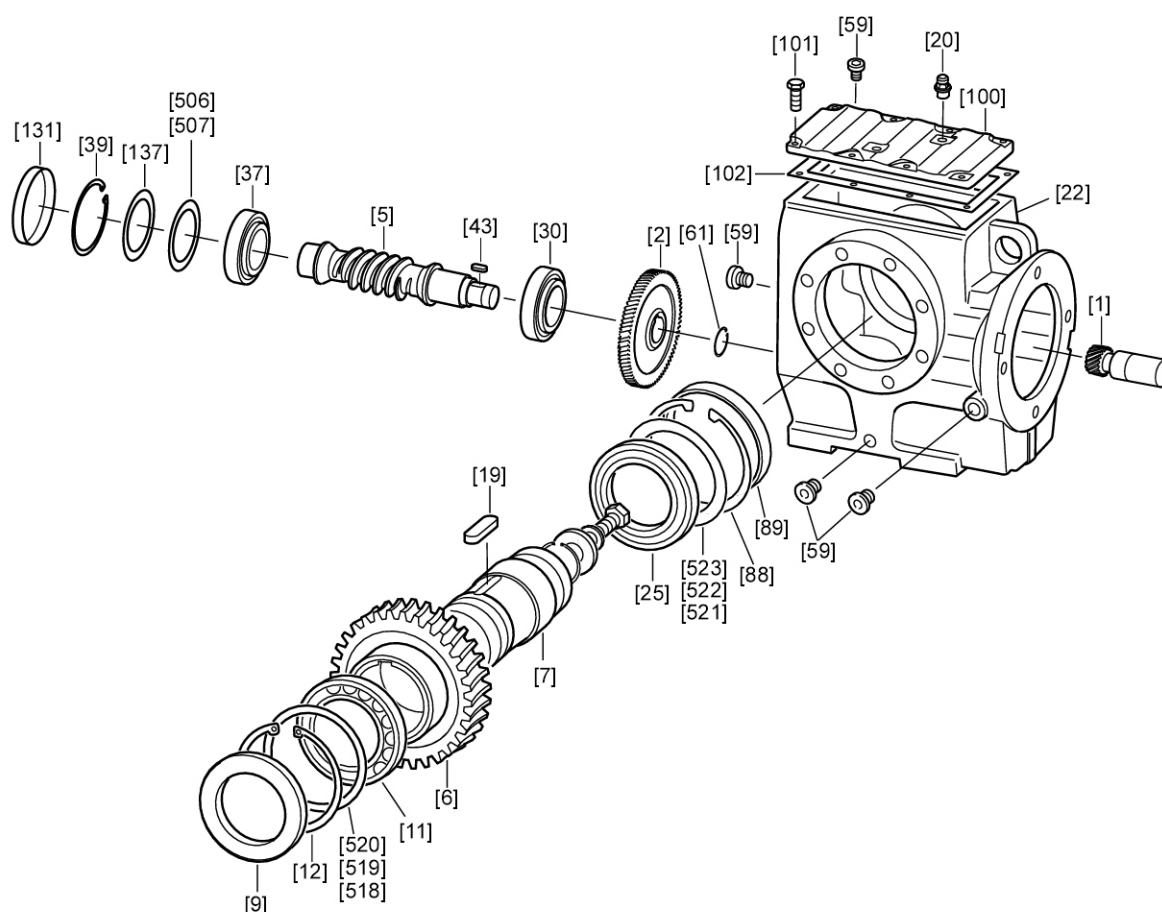


19301131

[1] Pinion	[25] Anti-friction bearing	[102] Seal	[522] Shim
[2] Gearwheel	[30] Anti-friction bearing	[113] Slotted nut	[523] Shim
[3] Pinion shaft	[31] Key	[114] Multi-tang washer	[533] Shim
[4] Gearwheel	[37] Anti-friction bearing	[116] Thread locker	[534] Shim
[5] Pinion shaft	[39] Circlip	[119] Spacer tube	[535] Shim
[6] Gearwheel	[42] Anti-friction bearing	[131] Closing cap	[536] Shim
[7] Output shaft	[43] Key	[132] Circlip	[537] Shim
[8] Key	[45] Anti-friction bearing	[133] Supporting ring	[538] Shim
[9] Oil seal	[59] Screw plug	[135] Nilos ring	[542] Shim
[11] Anti-friction bearing	[83] Nilos ring	[161] Closing cap	[543] Shim
[12] Circlip	[84] Nilos ring	[506] Shim	[544] Shim
[17] Spacer tube	[88] Circlip	[507] Shim	
[19] Key	[89] Closing cap	[508] Shim	
[20] Breather valve	[100] Gear cover plate	[521] Shim	
[22] Gear unit housing	[101] Hex head bolt	[521] Shim	



3.4 Basic design of helical-worm gear units

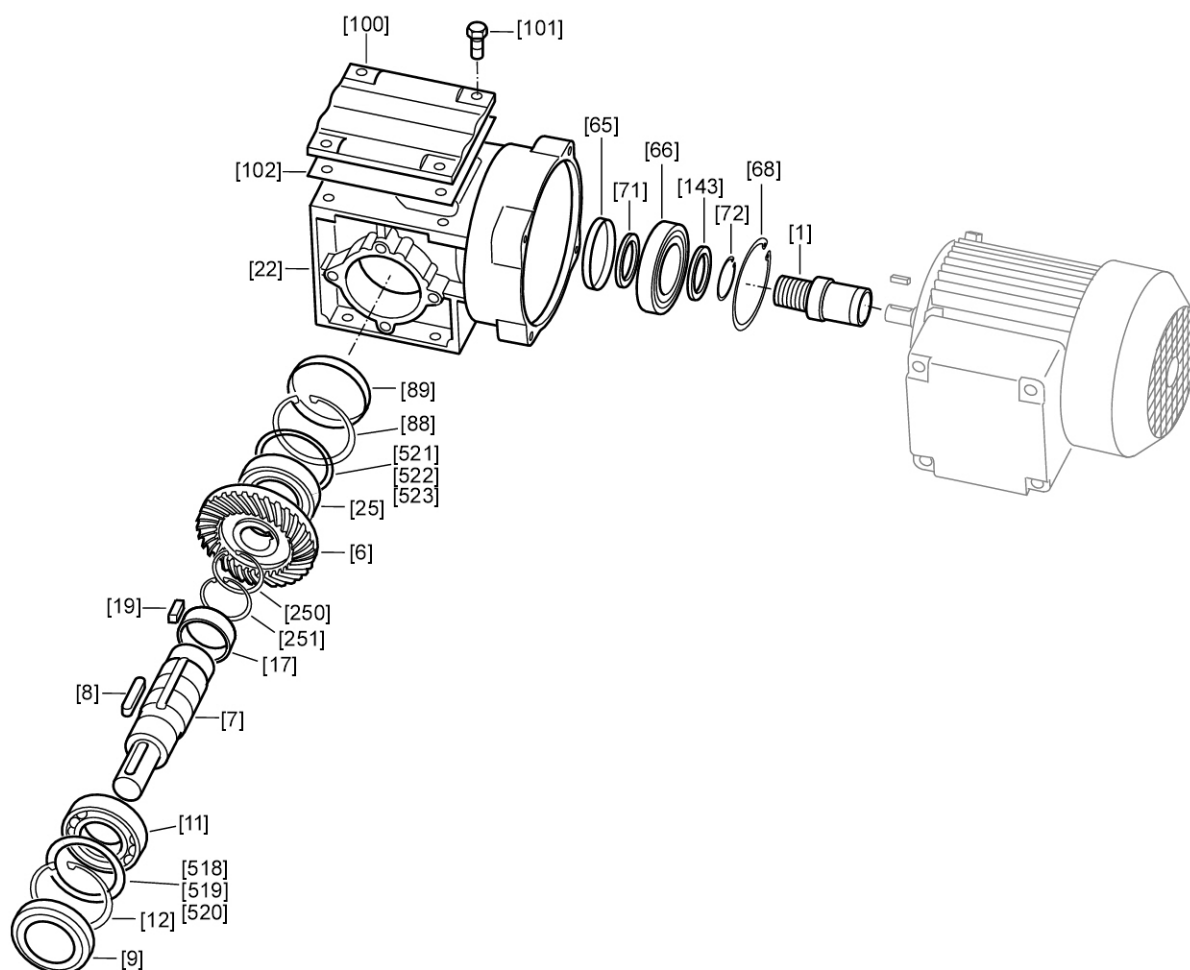


19304203

[1] Pinion	[20] Breather valve	[88] Circlip	[518] Shim
[2] Gearwheel	[22] Gear unit housing	[89] Closing cap	[519] Shim
[5] Worm	[25] Anti-friction bearing	[100] Gear cover plate	[520] Shim
[6] Worm gear	[30] Anti-friction bearing	[101] Hex head bolt	[521] Shim
[7] Output shaft	[37] Anti-friction bearing	[102] Seal	[522] Shim
[9] Oil seal	[39] Circlip	[131] Closing cap	[523] Shim
[11] Anti-friction bearing	[43] Key	[137] Supporting ring	
[12] Circlip	[59] Screw plug	[506] Shim	
[19] Key	[61] Circlip	[507] Shim	



3.5 Basic design of SPIROPLAN® W10-W30 gear units

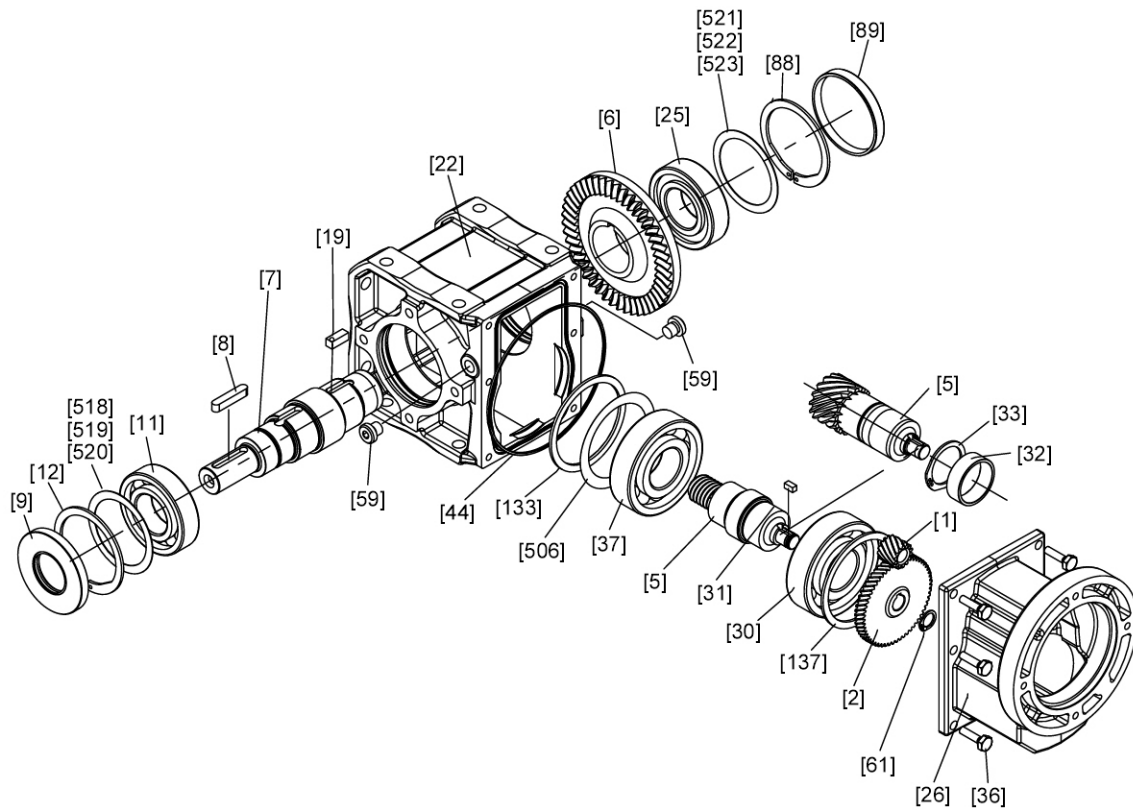


19307275

[1] Pinion	[19] Key	[88] Circlip	[251] Circlip
[6] Gearwheel	[22] Gear unit housing	[89] Closing cap	[518] Shim
[7] Output shaft	[25] Anti-friction bearing	[100] Gear cover plate	[519] Shim
[8] Key	[65] Oil seal	[101] Hex head bolt	[520] Shim
[9] Oil seal	[66] Anti-friction bearing	[102] Seal	[521] Shim
[11] Anti-friction bearing	[71] Supporting ring	[132] Circlip	[522] Shim
[12] Circlip	[72] Circlip	[183] Oil seal	[523] Shim
[17] Spacer tube	[143] Supporting ring	[250] Circlip	



3.6 Basic design of SPIROPLAN® W37 gear units



605872395

[1] Pinion	[22] Gear unit housing	[44] O-ring	[137] Shim
[2] Gearwheel	[24] Eyebolt	[59] Screw plug	[150] Hexagonal nut
[5] Pinion shaft	[25] Deep groove ball bearing	[61] Circlip	[183] Oil seal
[6] Gearwheel	[26] Housing stage 1	[68] Circlip	[506] Shim
[7] Output shaft	[30] Deep groove ball bearing	[72] Circlip	[518] Shim
[8] Key	[31] Key	[80] Key	[519] Shim
[9] Oil seal	[32] Spacer tube	[88] Circlip	[520] Shim
[11] Deep groove ball bearing	[33] Circlip	[89] Closing cap	[521] Shim
[12] Circlip	[36] Hex head bolt	[106] Stud	[522] Shim
[19] Key	[37] Deep groove ball bearing	[133] Shim	[523] Shim



3.7 Nameplate/unit designation

3.7.1 Nameplate

SEW-EURODRIVE		Bruchsal/Germany	
Typ	RF 47 /A		
Nr.	01.11124560001.00001.07		
Pe kW	0.55	Ma Nm	90
n r/min	57		
IM	M1	i 1:	23.59
kg	23.4		
Schmierstoff			
CLP HC 220 Synt. Öl /1,5l		Made in Germany	181 861 9:14

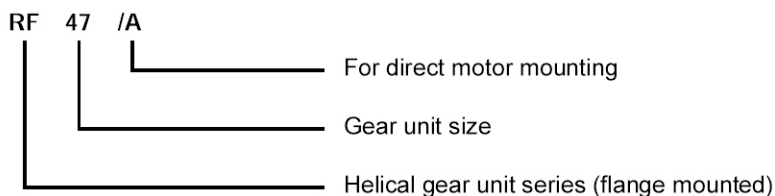
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f_b		= Service factor
$F_{Ra \max}$	[N]	= Maximum overhung load on the output side
$F_{Re \max}$	[N]	= Maximum overhung load on the input side (with input shaft assembly AD)
i		= Gear unit reduction ratio
IM		= Mounting position
IP..		= Enclosure
$n_{e \max}$	[rpm]	= maximum input speed
n_a	[rpm]	= output speed
$M_{e \max}$	[Nm]	= maximum input torque
M_a	[Nm]	= Output torque
M_R	[Nm]	= Overload torque when using an AR adapter
M_{RS}	[Nm]	= Locking torque of the backstop

3.7.2 Unit designation

	NOTE
	<p>For a detailed overview of unit designations and additional information, refer to the following publications:</p> <ul style="list-style-type: none"> • "Gear Units" catalog or • "Gearmotors" catalog

Example: Helical gear unit





4 Mechanical Installation

4.1 Required tools/resources

- Set of wrenches
- Torque wrench for:
 - Shrink disks
 - AQH motor adapter
 - Input shaft assembly with centering shoulder
- Mounting device
- Compensation elements (shims, spacing rings)
- Fasteners for input and output elements
- Lubricant (e.g. NOCO® Fluid)
- Bolt locking compound (for input shaft assembly with centering shoulder), e.g. Loctite® 243
- Standard parts are not part of the delivery

4.1.1 Installation tolerances

Shaft end	Flanges
Diameter tolerance in accordance with DIN 748 <ul style="list-style-type: none"> • ISO k6 for solid shafts with $\varnothing \leq 50$ mm • ISO m6 for solid shafts with $\varnothing > 50$ mm • ISO H7 for hollow shafts • Center bore in accordance with DIN 332, shape DR 	Centering shoulder tolerance to DIN 42948 <ul style="list-style-type: none"> • ISO j6 for $b1 \leq 230$ mm • ISO h6 with $b1 > 230$ mm



4.2 Prerequisites for assembly

	CAUTION!
	<p>Improper assembly may result in damages to the gear unit/gearmotor.</p> <p>Possible damage to property!</p> <ul style="list-style-type: none"> • Do closely observe the notes in this chapter.

Ensure that the following conditions have been met:

- The entries on the nameplate of the gearmotor match the voltage supply system.
- The drive has not been damaged during transportation or storage.
- Ensure that the following requirements have been met:

For standard gear units:

- Ambient temperature according to the technical documentation, nameplate and lubricant table in section "Lubricants" (see page 107).
- No harmful oils, acids, gases, vapors, radiation etc. in the vicinity

For special versions:

- The drive is designed in accordance with the ambient conditions. Refer to the information on the nameplate.

For helical-worm/SPIROPLAN® W gear units:

- No large external mass moments of inertia which could exert a retrodriving load on the gear unit.

[for η' (retrodriving) = $2 - 1/\eta < 0.5$ self-locking]

- You must clean the output shafts and flange surfaces thoroughly to ensure they are free of anti-corrosion agents, contamination or similar. Use a standard solvent. Do not let the solvent come into contact with the sealing lips of the oil seals – danger of damage to the material!
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.



4.3 Installing the gear unit

The gear unit or gearmotor is only allowed to be installed in the specified mounting position. Refer to the information on the nameplate. Apart from the W37, SPIROPLAN® gear units do not imply a particular mounting position.

The support structure must have the following characteristics:

- Level
- Vibration damping
- Torsionally rigid

The Maximum permitted flatness error for foot and flange mounting (guide values with reference to DIN ISO 1101):

- Gear unit size ≤ 67 : max. 0.4 mm
- Gear unit size 77 ... 107: max. 0.5 mm
- Gear unit size 137 ... 147: max. 0.7 mm
- Gear unit size 157 ... 187: max. 0.8 mm

Do not tighten the housing legs and mounting flanges against one another and ensure that you comply with the permitted overhung and axial loads! Observe chapter "Project Planning" in the Gear unit/gearmotor catalog for calculating the permitted overhung and axial loads.

Secure gearmotors using quality 8.8 screws.

Secure the following gearmotors using quality 10.9 screws:

- RF37, R37F with flange \varnothing 120 mm
- RF47, R47F with flange \varnothing 140 mm
- RF57, R57F with flange \varnothing 160 mm
- and RZ37, RZ47, RZ57, RZ67, RZ77, RZ87



NOTE

When installing the gear unit, make sure that the oil level and drain plugs as well as the breather plugs are easily accessible!

At the same time, also check that the oil fill corresponds to the specifications for the intended mounting position (see section "Lubricant fill quantities" (see page 110) or refer to the information on the nameplate). The gear units are filled with the required oil volume at the factory. There may be slight deviations at the oil level plug as a result of the mounting position, which are permitted within the manufacturing tolerances.



If you change the mounting position, make sure that you change the lubricant fill quantities and the position of the breather valve accordingly. Observe section "Lubricant fill quantities" (see page 110) and chapter "Mounting Positions" (see page 79).

Consult the SEW customer service if you intend to change the mounting position of K gear units to or between M5 and M6.

Consult the SEW customer service if you intend to change the mounting position of S gear units sizes S47 ... S97, to M2 and M3.

In case there is a risk of electrochemical corrosion between the gear unit and the driven machine, use plastic inserts that are 2 to 3 mm thick. The material used must have an electrical leakage resistance; $10^9 \Omega$. Electrochemical corrosion can occur between various metals, for example, cast iron and high-grade steel. Also fit the bolts with plastic washers! Ground the housing additionally – use the grounding bolts on the motor.

4.3.1 Tightening torques for retaining screws

Mount the gearmotors with the following tightening torques:

Screw/nut	Tightening torque screw/nut Strength class 8.8 [Nm]
M6	11
M8	25
M10	48
M12	86
M16	210
M20	410
M24	710
M30	1450
M36	2500
M42	4600
M48	6950
M56	11100

Mount the helical gearmotors in flange-mounted design with the following increased tightening torques:

Flange	Gear unit	Screw/nut	Tightening torque screw/nut Strength class 10.9 [Nm]
120	RF37	M6	14
140	RF47	M8	35
160	RF57	M8	35
60ZR	RZ37	M8	35
70ZR	RZ47	M8	35
80ZR	RZ57	M10	69
95ZR	RZ67	M10	69
110ZR	RZ77	M12	120
130ZR	RZ87	M12	120



4.3.2 Securing the gear unit

Foot-mounted gear unit

The following table shows the thread sizes of the gear units in foot-mounted design depending on the gear unit type and size:

Screw	Gear unit type					
	R / R..F	RX	F / FH..B / FA..B	K / KH..B / KV..B / KA..B	S	W
M6	07					10/20
M8	17/27/37		27/37		37	30/37
M10		57	47	37/47	47/57	
M12	47/57/67	67	57/67	57/67	67	
M16	77/87	77/87	77/87	77	77	
M20	97	97/107	97	87	87	
M24	107		107	97	97	
M30	137		127	107/167		
M36	147/167		157	127/157/187		

Gear unit with B14 flange and/or hollow shaft

The following table shows the thread sizes of the gear units with B14 flange and/or hollow shaft depending on the gear unit type and size:

Screw	Gear unit type				
	RZ	FAZ / FHZ	KAZ / KHZ / KVZ	SA / SAZ / SHZ	WA
M6	07/17/27			37	10/20/30
M8	37/47	27/37/47	37/47	47/57	37
M10	57/67				
M12	77/87	57/67/77	57/67/77	67/77	
M16		87/97	87/97	87/97	
M20		107/127	107/127		
M24		157	157		

Gear unit with B5 flange

The following table shows the thread sizes of the gear units with B5 flange depending on the gear unit type, size and flange diameter:

Ø - Flange [mm]	Screw	Gear unit type				
		RF / R..F / RM	FF / FAF / FHF	KF / KAF / KHF / KVF	SF / SAF / SHF	WF / WAF
80	M6					10
110	M8					20
120	M6	07/17/27			37	10/20/30/37
140	M8	07/17/27				
160	M8	07/17/27/37/47	27/37	37	37/47	30/37
200	M10	37/47/57/67	47	47	57/67	
250	M12	57/67/77/87	57/67	57/67	77	
300	M12	67/77/87	77	77		
350	M16	77/87/97/107	87	87	87	
450	M16	97/107/137/147	97/107	97/107	97	
550	M16	107/137/147/167	127	127		
660	M20	147/167	157	157		



4.3.3 Installation in damp locations or in the open

Drives are supplied in corrosion-resistant versions with an according surface protection coating for use in damp areas or outdoors. Repair any damage to the paint work (e.g. on the breather valve or the eyebolts).

When mounting the motors onto AM, AQ, AR, AT adapters, seal the flange areas with a suitable sealing compound, e.g. Loctite® 574.

4.3.4 Breather

The following gear units do not require a breather:

- R07 in mounting positions M1, M2, M3, M5 and M6
- R17, R27 and F27 in mounting positions M1, M3, M5 and M6
- SPIROPLAN® W10, W20, W30 gear units

SEW-EURODRIVE supplies all other gear units with the breather valve installed and activated according to the particular mounting position.

Exceptions:

1. SEW supplies the following gear units with a screw plug on the vent hole provided:
 - Pivoted mounting positions, if possible
 - Gear units for mounting on a slant

The breather valve is located in the motor terminal box. Before startup, you must replace the highest screw plug with the provided breather valve.

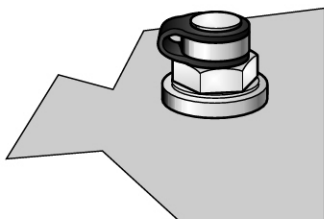
2. SEW supplies a breather valve in a plastic bag for **gear head units** requiring venting on the input end.
3. **Enclosed gear units** are supplied without a breather valve.



Activating the breather valve

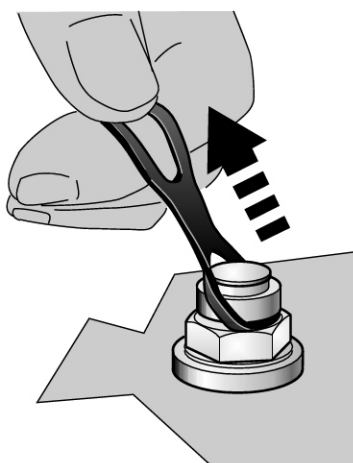
Check whether the breather valve is activated. If the breather valve has not been activated, you must remove the transport fixture from the breather valve before starting up the gear unit!

1. Breather valve with transport fixture



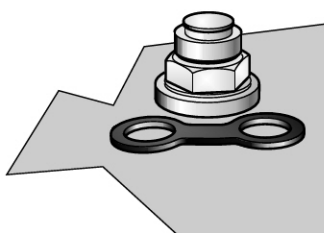
211319051

2. Remove transport fixture



211316875

3. Activated breather valve



211314699

4.3.5 Painting the gear units



CAUTION!

Breather valves and oil seals may be damaged during the painting or re-painting process.


Potential damage to property.

- Thoroughly cover the breather valves and the sealing lip of the oil seals with strips prior to the painting process.
- Remove the strips after the process.



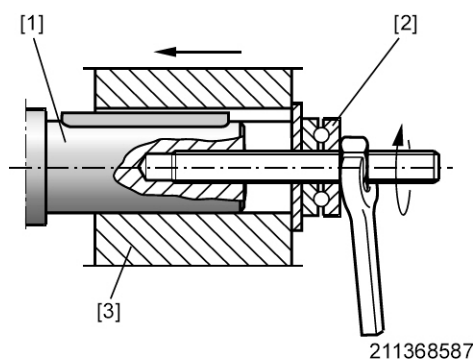
4.4 Gear units with solid shaft

4.4.1 Assembling the input and output components

	CAUTION!
	<p>Bearing, housing or shaft may be damaged due to improper assembly.</p> <p>Potential damage to property!</p> <ul style="list-style-type: none"> • Only assemble the input and output components with a mounting device. Use the center bore and the thread on the shaft end for positioning. • Never force belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer. • In the case of belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions. • Power transmission elements should be balanced after fitting and must not give rise to any impermissible radial or axial forces (see the "Gearmotors" or "Explosion-Proof Drives" catalog for permitted values).

Assembly with mounting device

The following figure shows a mounting device for installing couplings or hubs on gear unit or motor shaft ends. Should you be able to tighten the screw without any problems, you may not need the thrust bearing on the mounting device.

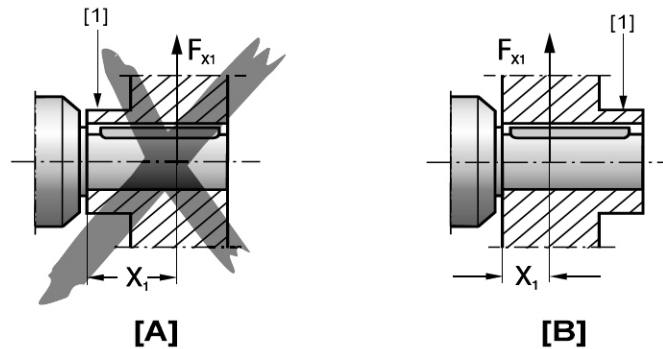


- [1] Gear shaft end
- [2] Thrust bearing
- [3] Coupling hub



Avoid excessive
overhung loads

Avoid high overhung loads by: Installing the gear or chain sprocket according to figure B if possible.



211364235

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



NOTE

Mounting is easier if you first apply lubricant to the output element or heat it up briefly (to 80 ... 100 °C).

4.4.2 Assembling the couplings



CAUTION!

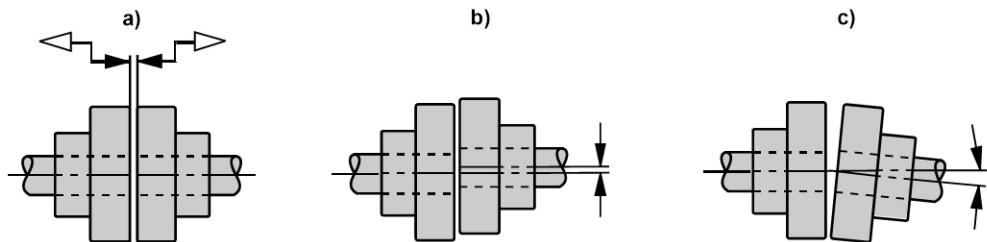
Input and output elements such as belt pulleys, couplings etc. are in fast motion during operation.

Risk of jamming and crushing.

- Cover input and output elements with a touch guard.

Adjust the following misalignments according to the coupling manufacturer's specifications when mounting couplings.

- Maximum and minimum clearance
- Axial misalignment
- Angular misalignment



211395595



4.5 Torque arms for shaft-mounted gear units



CAUTION!

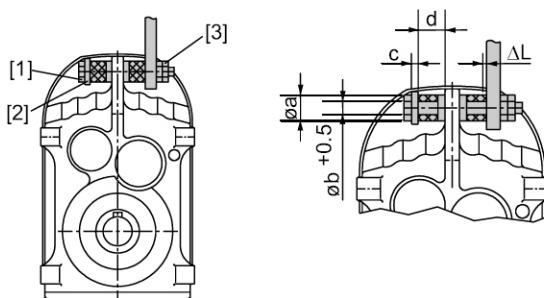
Improper assembling may result in damages to the gear unit.

Potential damage to property!

- Do not place torque arms under strain during installation.
- Use bolts of quality 8.8 to fasten torque arms.

4.5.1 Parallel shaft helical gear units

The following figure shows the torque arm for parallel shaft helical gear units.



211366411

- [1] Screw
[2] Washer
[3] Nut

Proceed as follows to mount the rubber buffers:

1. Use screws [1] and washers according to the following table.
2. Use two nuts to secure the screw connection [3].
3. Tighten the screw until the initial stress "Δ L" of the buffers is reached according to the table.

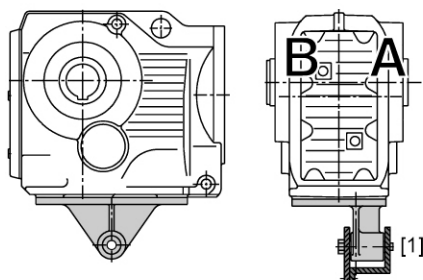
Gear unit	Diameter [mm]	rubber buffer		Washer width d [mm]	Δ L (taut) [mm]
		Internal diameter b [mm]	Length (loose) c [mm]		
FA27	40	12.5	20	5	1
FA37	40	12.5	20	5	1
FA47	40	12.5	20	5	1.5
FA57	40	12.5	20	5	1.5
FA67	40	12.5	20	5	1.5
FA77	60	21.0	30	10	1.5
FA87	60	21.0	30	10	1.5
FA97	80	25.0	40	12	2
FA107	80	25.0	40	12	2
FA127	100	32.0	60	15	3
FA157	120	32.0	60	15	3



4.5.2 Helical-bevel gear units

The following figure shows the torque arm for helical-bevel gear units.

- Bushing [1] with bearings on both ends.
- Install connection end B as a mirror image of A.



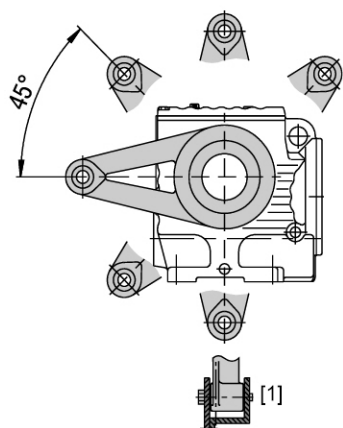
211362059

Gear unit	Screws	Tightening torque
KA37	4 × M10 × 25 – 8.8	48 Nm
KA47	4 × M10 × 30 – 8.8	48 Nm
KA67	4 × M12 × 35 – 8.8	86 Nm
KA77	4 × M16 × 40 – 8.8	210 Nm
KA87	4 × M16 × 45 – 8.8	210 Nm
KA97	4 × M20 × 50 – 8.8	410 Nm
KA107	4 × M24 × 60 – 8.8	710 Nm
KA127	4 × M36 × 130 – 8.8	2500 Nm
KA157	4 × M36 × 130 – 8.8	2500 Nm

4.5.3 Helical worm gear units

The following figure shows the torque arm for helical-worm gear units.

- Bushing [1] with bearings on both ends.



211491723

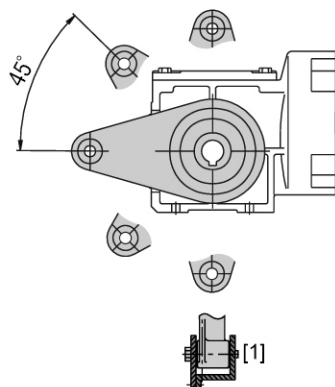
Gear unit	Screws	Tightening torque
SA37	4 × M6 × 16 – 8.8	11 Nm
SA47	4 × M8 × 20 – 8.8	25 Nm
SA57	6 × M8 × 20 – 8.8	25 Nm
SA67	8 × M12 × 25 – 8.8	86 Nm
SA77	8 × M12 × 35 – 8.8	86 Nm
SA87	8 × M16 × 35 – 8.8	210 Nm
SA97	8 × M16 × 35 – 8.8	210 Nm



4.5.4 SPIROPLAN® W gear units

The following figure shows the torque arm for SPIROPLAN® W gear units.

- Bushing [1] with bearings on both ends.



211489547

Gear unit	Screws	Tightening torque
WA10	4 x M6 x 16	11 Nm
WA20	4 x M6 x 16	11 Nm
WA30	4 x M6 x 16	11 Nm
WA37	4 x M8 x 20	25 Nm



4.6 Shaft-mounted gear unit with keyway or splined hollow shaft

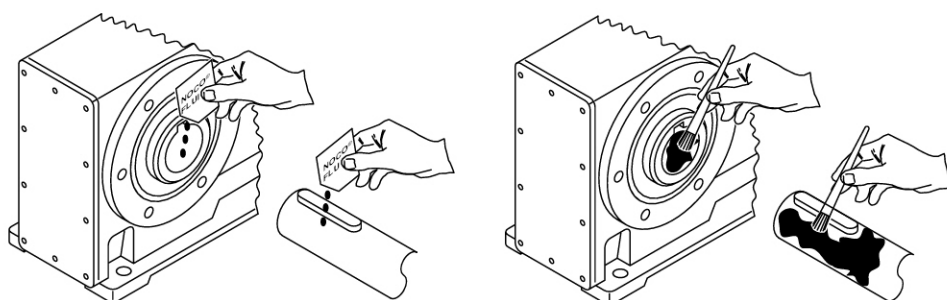


NOTE

Concerning the configuration of the customer shaft, please also refer to the design notes in the Gearmotors catalog!

4.6.1 Installation notes

1. Apply and thoroughly spread NOCO® Fluid



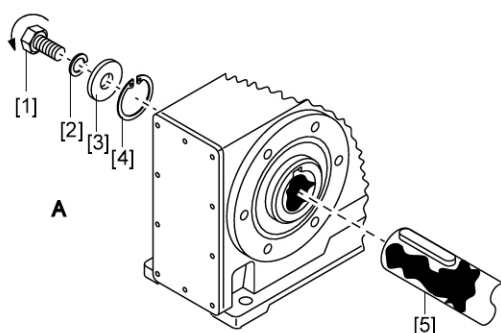
211516171

2. Install the shaft and secure it axially
(mounting is facilitated by using a mounting device)

The three mounting types are described below:

- 2A: standard scope of delivery
- 2B: installation and removal kit for customer shaft with contact shoulder
- 2C: installation and removal kit for customer shaft without contact shoulder

2A: Installation with standard scope of delivery



211518347

- [1] Short retaining screw (standard scope of delivery)
- [2] Lock washer
- [3] Washer
- [4] Circlip
- [5] Customer shaft

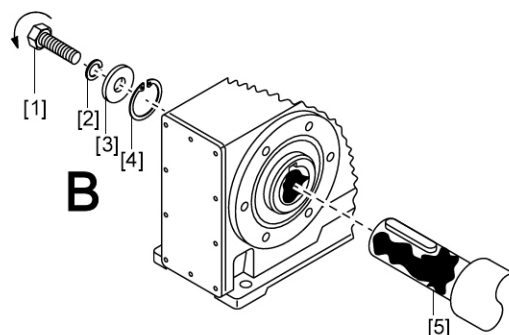


Mechanical Installation

Shaft-mounted gear unit with keyway or splined hollow shaft

2B: Installation with SEW-EURODRIVE installation and removal kit (see page 34)

– customer shaft **with** contact shoulder

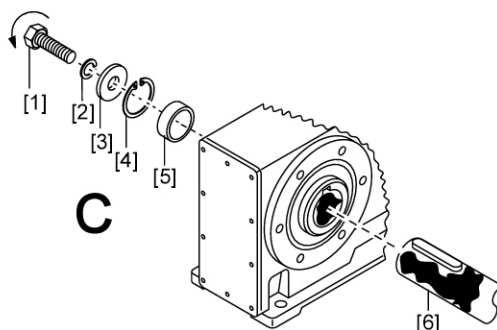


211520523

- [1] Retaining screw
- [2] Lock washer
- [3] Washer
- [4] Circlip
- [5] Customer shaft with contact shoulder

2C: Installation with SEW-EURODRIVE installation and removal kit (see page 34)

– customer shaft **without** contact shoulder

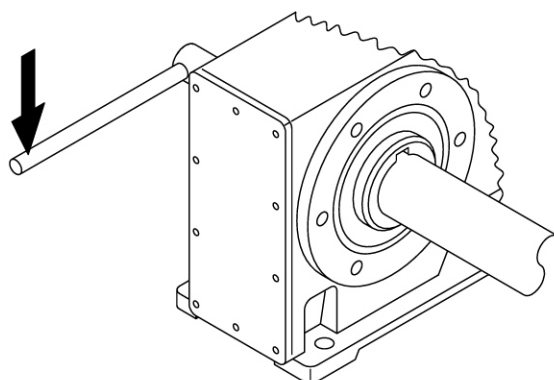


211522699

- [1] Retaining screw
- [2] Lock washer
- [3] Washer
- [4] Circlip
- [5] Spacer tube
- [6] Customer's shaft without contact shoulder



3. Tighten the retaining screw to the appropriate torque (see table).



211524875

Screw	Tightening torque [Nm]
M5	5
M6	8
M10/12	20
M16	40
M20	80
M24	200



NOTE

To avoid contact corrosion, we recommend that the customer shaft should turn freely between the two contact surfaces!



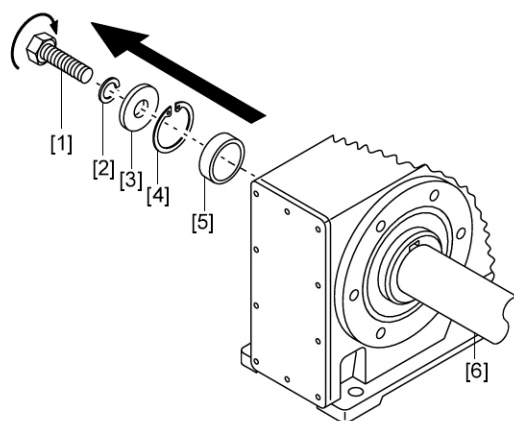
Mechanical Installation

Shaft-mounted gear unit with keyway or splined hollow shaft

4.6.2 Removal notes

This description is only applicable when the gear unit was assembled using the installation and removal kit (see page 34) from SEW-EURODRIVE. Observe section "Installation notes" (see page 29), 2B or 2C.

1. Loosen the retaining screw [1].
2. Remove parts [2] to [4] and, if applicable, the distance piece [5].



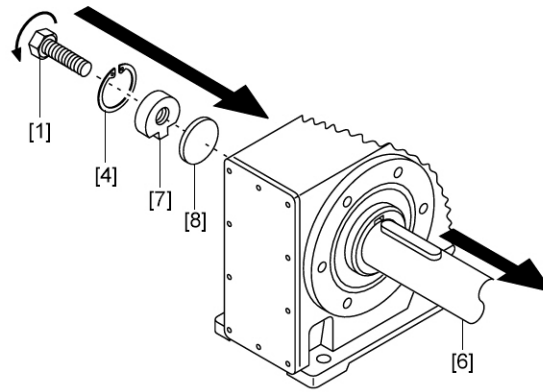
211527051

- [1] Retaining screw
- [2] Lock washer
- [3] Washer
- [4] Circlip
- [5] Spacer tube
- [6] Customer shaft

3. Insert the forcing disc [8] and the fixed nut [7] from the SEW-EURODRIVE installation/removal kit between the customer shaft [6] and the circlip [4].
4. Re-install the circlip [4].



5. Screw the retaining screw [1] back in. Now you can force the gear unit off the shaft by tightening the bolt.



211529227

- [1] Retaining screw
- [4] Circlip
- [6] Customer shaft
- [7] Fixed nut
- [8] Forcing washer

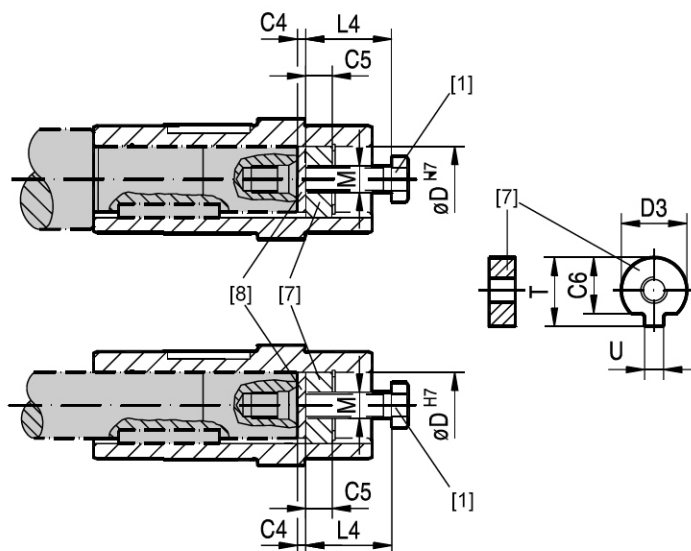


Mechanical Installation

Shaft-mounted gear unit with keyway or splined hollow shaft

4.6.3 SEW installation and removal kit

The SEW-EURODRIVE assembly/disassembly kit can be ordered by quoting the specified part number.



211531403

- [1] Retaining screw
- [7] Fixed nut for disassembly
- [8] Forcing washer

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 installation/ removal kit
WA..10	16	M5	5	5	12	4.5	18	15.7	50	643 712 5
WA..20	18	M6	5	6	13.5	5.5	20.5	17.7	25	643 682 X
WA..20, WA..30, SA..37, WA..37	20	M6	5	6	15.5	5.5	22.5	19.7	25	643 683 8
FA..27, SA..47	25	M10	5	10	20	7.5	28	24.7	35	643 684 6
FA..37, KA..37, SA..47, SA..57	30	M10	5	10	25	7.5	33	29.7	35	643 685 4
FA..47, KA..47, SA..57	35	M12	5	12	29	9.5	38	34.7	45	643 686 2
FA..57, KA..57, FA..67, KA..67, SA..67	40	M16	5	12	34	11.5	41.9	39.7	50	643 687 0
SA..67	45	M16	5	12	38.5	13.5	48.5	44.7	50	643 688 9
FA..77, KA..77, SA..77	50	M16	5	12	43.5	13.5	53.5	49.7	50	643 689 7
FA..87, KA..87, SA..77, SA..87	60	M20	5	16	56	17.5	64	59.7	60	643 690 0
FA..97, KA..97, SA..87, SA..97	70	M20	5	16	65.5	19.5	74.5	69.7	60	643 691 9
FA..107, KA..107, SA..97	90	M24	5	20	80	24.5	95	89.7	70	643 692 7
FA..127, KA..127	100	M24	5	20	89	27.5	106	99.7	70	643 693 5
FA..157, KA..157	120	M24	5	20	107	31	127	119.7	70	643 694 3

1) Retaining screw



NOTE

The SEW installation kit for attaching the customer shaft is a recommendation by SEW-EURODRIVE. You must always check whether this design can compensate the axial loads. In particular applications (e.g. mounting mixer shafts), a different design may have to be used to secure the shaft axially. In these cases, customers can use their own devices. However, you must ensure that these designs do not cause potential sources of combustion according to DIN EN 13463 (for example, impact sparks).



4.7 Shaft-mounted gear units with shrink disk

4.7.1 Installation notes



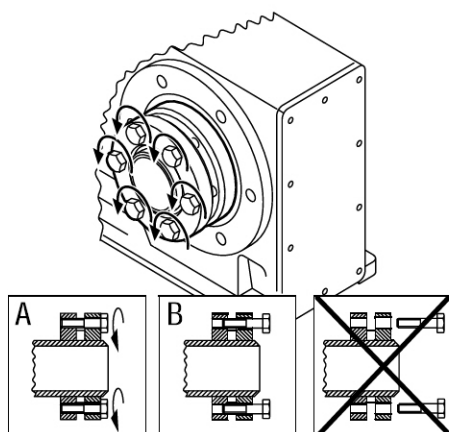
CAUTION!

Tightening the screws without installed shaft may result in the hollow shaft being deformed.

Potential damage to property!

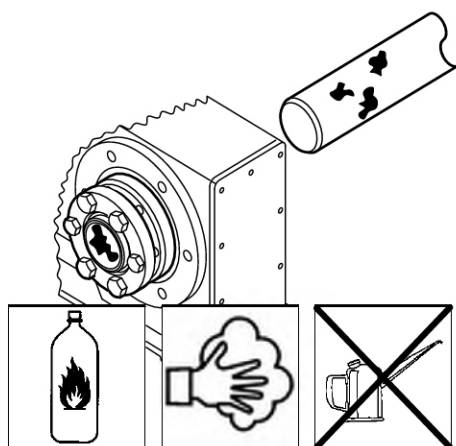
- Only tighten the locking screws with the shaft installed.

1. Loosen the locking screws by a few turns (do not unscrew them completely!).



211533579

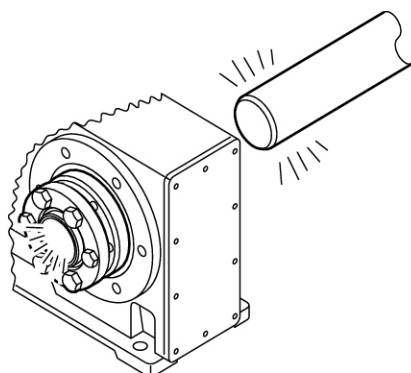
2. Carefully degrease the hollow shaft hole and the input shaft.



211535755



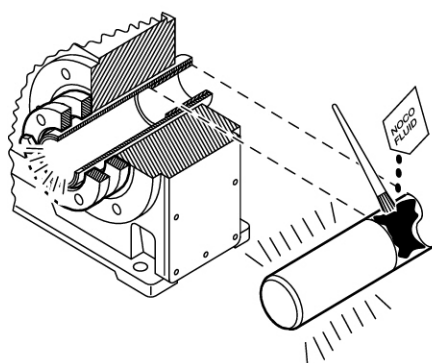
3. Hollow shaft/input shaft after degreasing.



211537931

4. Apply NOCO® Fluid to the input shaft in the area of the bushing.

It is essential to make sure that the clamping area of the shrink disk is free from grease! Never apply NOCO® Fluid directly to the socket, since the paste may get into the clamping area of the shrink disk when the input shaft is put on.



211540107

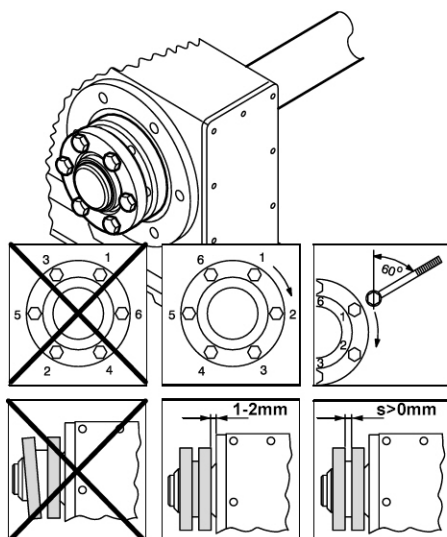


Mechanical Installation

Shaft-mounted gear units with shrink disk

5. Install the input shaft.

- Make sure that the locking collars of the shrink disk are installed in parallel to each other.
- For gearcases with shaft shoulder:
Mount the shrink disk onto the stop on the shaft shoulder.
- For gearcases without shaft shoulder:
Install the shrink disk with a 1 to 2 mm distance from the gearcase.
- Tighten the locking screws by working round with the torque wrench several times from one screw to the next (not in diametrically opposite sequence). For tightening torques, refer to the following table.



211542283

6. After the installation, make sure the remaining gap between the outer rings is > 0 mm.
7. Grease the the area around the shrink disk outside of the hollow shaft to prevent corrosion.

Gear unit type			Screw	Nm	max. ¹⁾
SH37 WH37			M5	5	60°
KH37...77	FH37...77	SH47...77	M6	12	
KH87/97	FH87/97	SH87/97	M8	30	
KH107	FH107		M10	59	
KH127/157	FH127/157		M12	100	
KH167			M16	250	
KH187			M20	470	

1) Maximum tightening angle per rotation



4.7.2 Removal notes

	⚠ CAUTION!
	<p>Risk of jamming and crushing due to improper removal of heavy components.</p> <p>Risk of injury.</p> <ul style="list-style-type: none"> • Observe the following removal notes. • Removing the shrink disk properly.

1. Loosen the locking screws one after the other by a quarter rotation to avoid tilting the outer rings.
2. Unscrew the locking bolts evenly one after the other. Do not remove the locking screws completely.
3. Remove the shaft or pull the hub off the shaft. (remove any rust that may have formed between the hub and the end of the shaft beforehand).
4. Remove the shrink disk from the hub.

4.7.3 Cleaning and lubrication

There is no need to dismantle removed shrink disks before they are reinstalled.

Clean and lubricate the shrink disk if it is dirty.

Lubricate the tapered surfaces with one of the following solid lubricants:

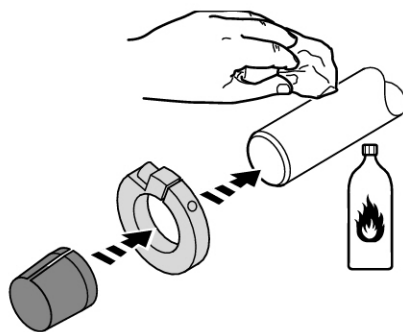
Lubricant (Mo S2)	Sold as
Molykote 321 (lube coat)	Spray
Molykote spray (powder spray)	Spray
Molykote G Rapid	Spray or paste
Aemasol MO 19P	Spray or paste
Aemasol DIO-sétral 57 N (lube coat)	Spray

Grease the locking screws with a multipurpose grease such as Molykote BR 2 or similar.



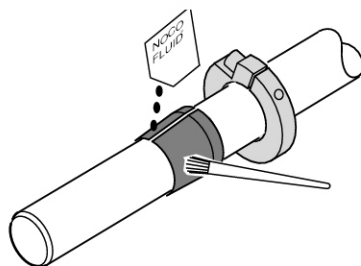
4.8 Shaft-mounted gear units with TorqLOC®

1. Clean the customer shaft and the inside of the hollow shaft. Ensure that all traces of grease or oil are removed.
2. Install the stop ring and the bushing on the customer shaft.



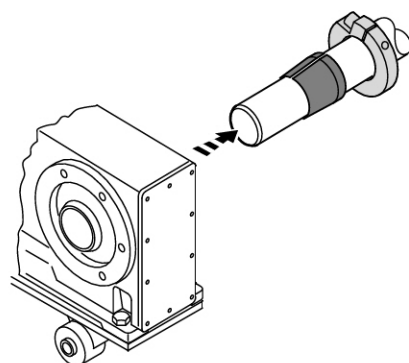
211941003

3. Apply and thoroughly spread NOCO® Fluid on the bushing.



211938827

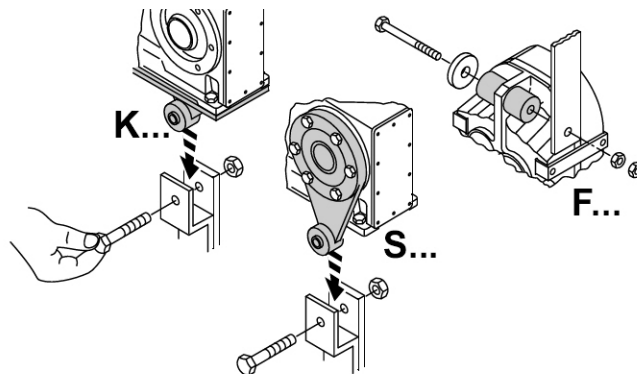
4. Push the gear unit onto the customer shaft.



211936651

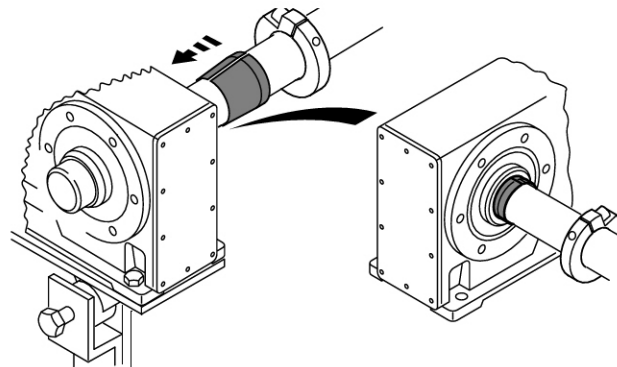


5. Preassemble the torque arm (do not tighten the bolts).



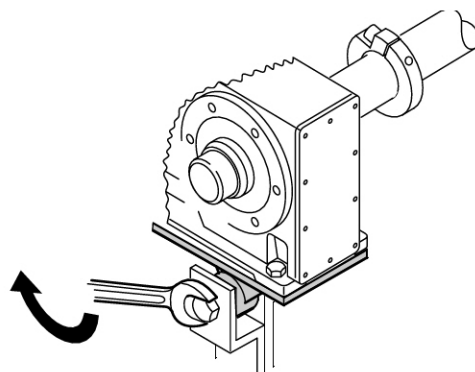
211943179

6. Push the busing onto the gear unit up to the stop.



211945355

7. Tighten all the retaining screws of the torque arm.



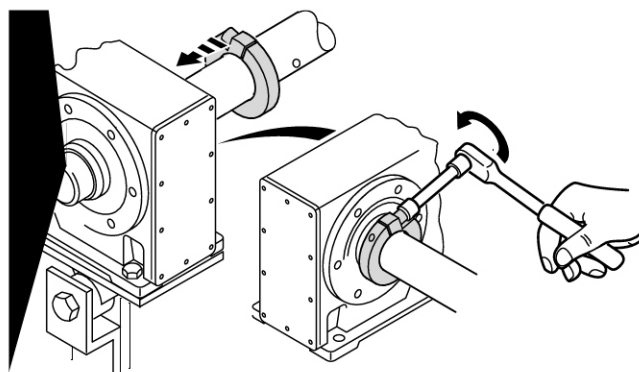
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Mechanical Installation

Shaft-mounted gear units with TorqLOC®

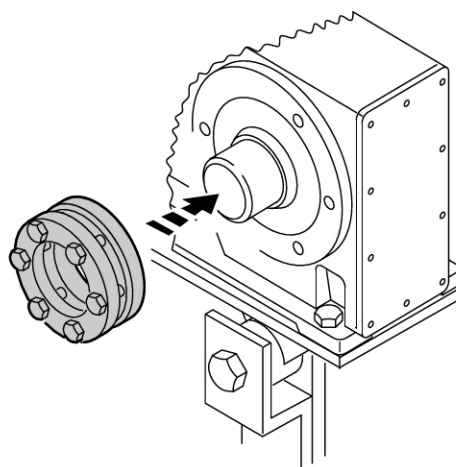
8. Secure the bushing with the split ring. Tighten the split ring on the bushing using the appropriate torque as specified in the following table:



212000907

Type		nickel-plated [Standard]	stainless steel
KT/FT	ST	Torque [Nm] ([in-lb])	
-	37	18	7.5
37	47	18	7.5
47	57	18	7.5
57, 67	67	35	18
77	77	35	18
87	87	35	18
97	97	35	18
107	-	38	38
127	-	65	65
157	-	150	150

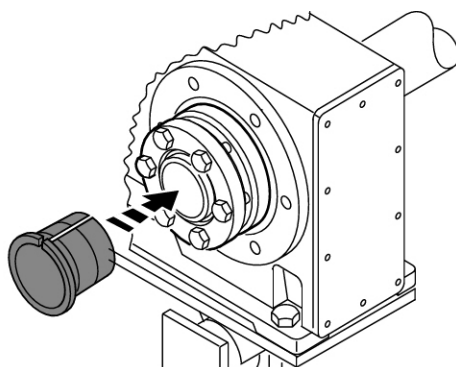
9. Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.



212003083

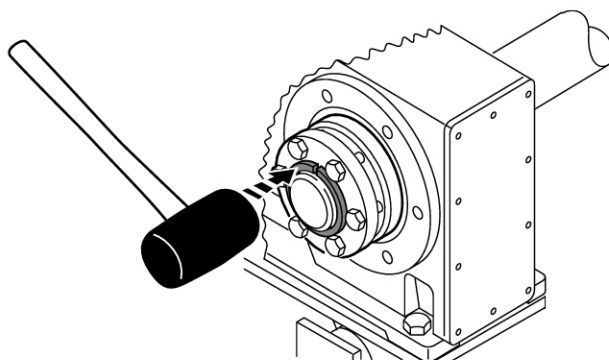


10. Slide the counter bushing onto the customer shaft and into the hollow shaft



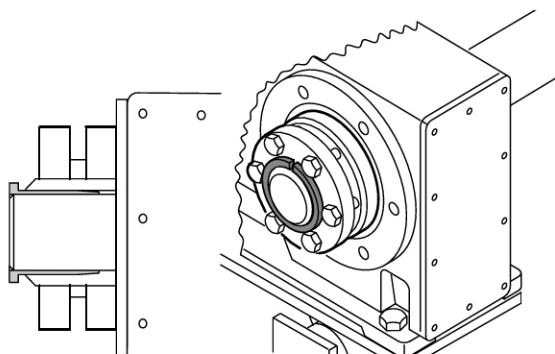
212005259

11. Make sure the shrink disk is properly seated.
12. Tap lightly on the flange of the counter bushing to ensure that the socket is fitted securely in the hollow shaft.



212007435

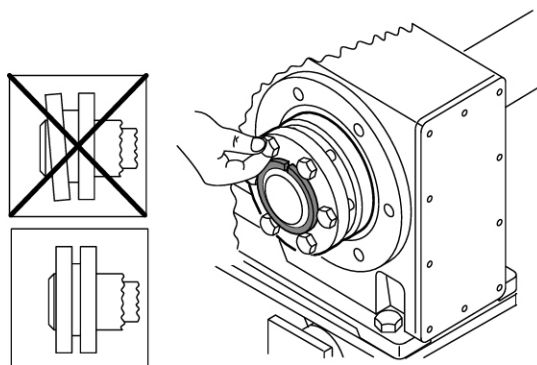
13. Make sure that the customer shaft is seated in the counter bushing.



212009611

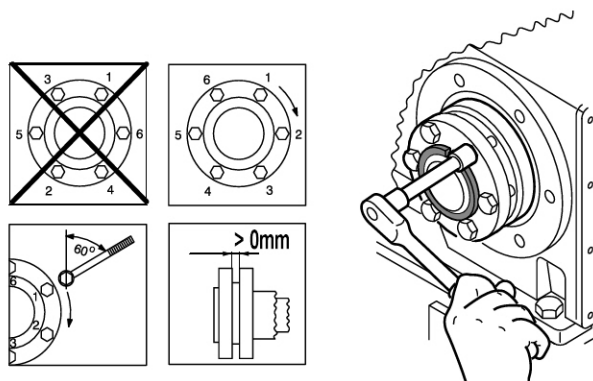


14. Manually tighten the bolts of the shrink disc and ensure that the end rings of the shrink disc are parallel.



212011787

15. Tighten the locking screws with a torque wrench by working round several times from one bolt to the next (not in diametrically opposite sequence) according to the following table:

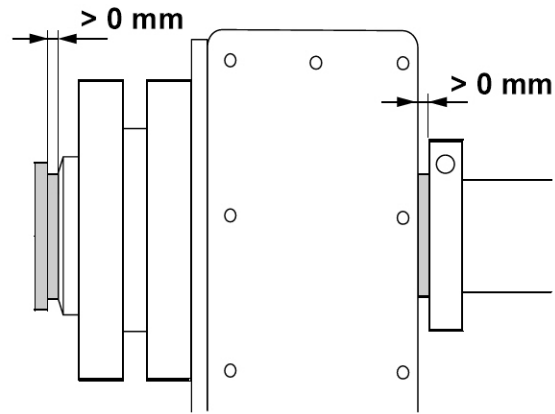


212013963

Type		nickel-plated [Standard]	stainless steel
KT/FT	ST		
Torque [Nm] ([in-lb])			
-	37	4.1	6.8
37	47	10	6.8
47	57	12	6.8
57, 67	67	12	15
77	77	30	30
87	87	30	50
97	97	30	50
107	–	59	50
127	–	100	120
157	–	100	120




16. After the installation, make sure the remaining gap between the outer rings is > 0 mm.
17. The remaining gap between counter bushing and hollow shaft end as well as stop ring bushing and split ring must be > 0 mm.



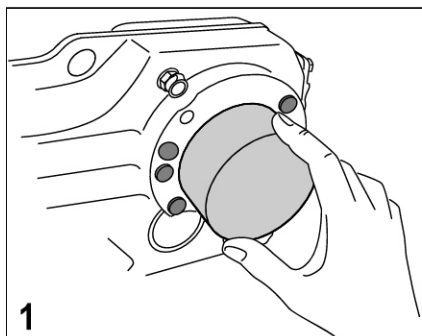
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4.9 Installing the protective cover

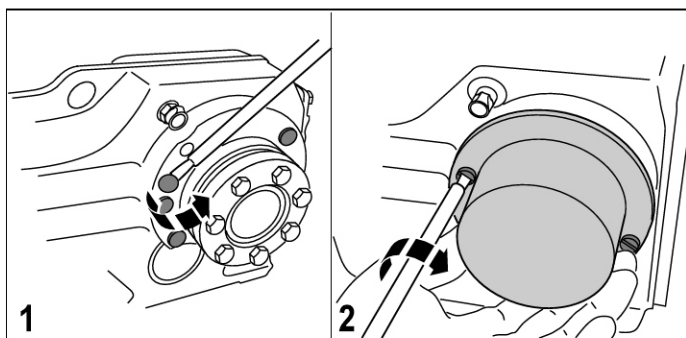
	⚠ CAUTION!
	<p>During operation, output components are in fast motion.</p> <p>Risk of jamming and crushing.</p> <ul style="list-style-type: none"> • Disconnect the motor from the power supply before starting work and safeguard against accidental startup. • Cover input and output elements with a touch guard.

4.9.1 Installing the rotating cover



1. Slide the rotating cover onto the shrink disk until it snaps in.

4.9.2 Installing the fixed cover



1. To fasten the cover, remove the plastic plug on the gearcase (see figure 1)
2. Use the delivered screws to mount the cover to the gearcase (see figure 2).



4.9.3 Installation without cover

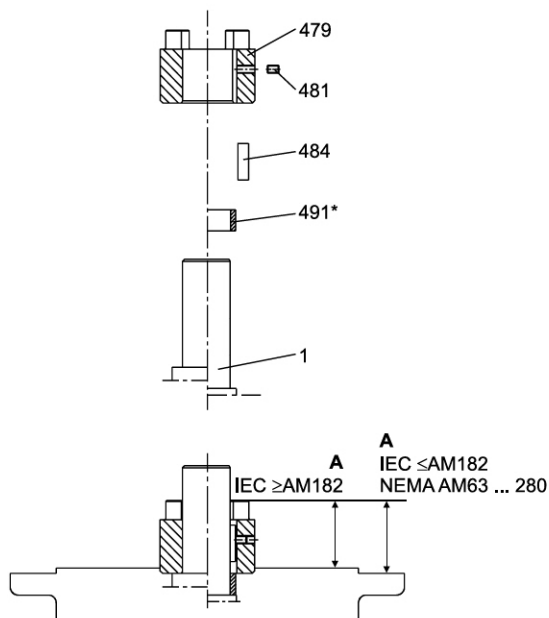
In certain individual cases (e.g. through-shaft), you cannot install the cover. In such cases, the cover is not necessary if the system or unit manufacturer provides corresponding components to guarantee for the compliance with the required degree of protection.

If this results in additional maintenance, you have to describe this in the operating instructions for system/component.



4.10 AM adapter coupling

4.10.1 IEC adapter AM63 - 280 / NEMA adapter AM56 - 365



212099979

- [1] Motor shaft
- [479] Coupling half
- [481] Setscrew
- [484] Key
- [491] Spacer tube

1. Clean the motor shaft and the flange surfaces of the motor and the adapter.
2. Remove the key from the motor shaft and replace it with the supplied key [484] (not AM63 and AM250).
3. Heat the coupling half [479] to approx. 80 - 100 °C and push the coupling half onto the motor shaft. Position as follows:
 - IEC adapter AM63 - 225 Until stop at motor shaft shoulder.
 - IEC adapter AM250 - 280 to dimension A.
 - NEMA adapter with spacer tube [491] to dimension A.
4. Secure the key and coupling half using the setscrew [481] and tightening torque T_A according to the table on the motor shaft.



5. Check the dimension **A**.
6. Seal the contact surfaces between the adapter and motor using a suitable sealing compound.
7. Mount the motor on the adapter. Ensure that the coupling claw of the adapter shaft is engaged in the plastic cam ring.

IEC AM	63 / 71	80 / 90	100 / 112	132	160 / 180	200	225	250 / 280
A	24.5	31.5	41.5	54	76	78.5	93.5	139
T_A	1.5	1.5	4.8	4.8	10	17	17	17
Thread	M4	M4	M6	M6	M8	M10	M10	M10
NEMA AM	56	143 / 145	182 / 184	213 / 215	254 / 256	284 / 286	324 / 326	364 / 365
A	46	43	55	63.5	78.5	85.5	107	107
T_A	1.5	1.5	4.8	4.8	10	17	17	17
Thread	M4	M4	M6	M6	M8	M10	M10	M10



NOTE

To avoid contact corrosion, we recommend applying NOCO® Fluid to the motor shaft before mounting the coupling half.



CAUTION!

Dampness might enter the adapter when mounting a motor to the adapter.

Potential damage to property!

- Seal adapter with anaerobic fluid seal



Permitted loads

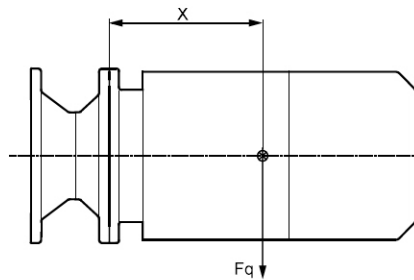


CAUTION!

Imperissibly high loads may occur when mounting a motor.

Potential damage to property!

- The load data specified in the following table are not to be exceeded.



18513419

Adapter type		$x^{1)}$ [mm]	$F_q^{1)}$ [N]	
IEC	NEMA		IEC adapter	NEMA adapter
AM63/71	AM56	77	530	410
AM80/90	AM143/145	113	420	380
AM100/112	AM182/184	144	2000	1760
AM132 ²⁾	AM213/2152 ²⁾	186	1600	1250
AM132..	AM213/215		4700	3690
AM160/180	AM254/286	251	4600	4340
AM200/225	AM324-AM365	297	5600	5250
AM250/280	-	390	11200	-

- 1) The maximum permitted weight of the attached motor F_{qmax} must be reduced linearly as the center of gravity distance x increases. If this distance is reduced, the maximum permitted weight F_{qmax} cannot be increased.
- 2) Diameter of the adapter output flange: 160 mm



AM adapter with
AM../RS backstop

Check the direction of rotation of the drive prior to assembly or startup. Please inform the SEW-EURODRIVE service in the case of incorrect direction of rotation.

The backstop is maintenance-free in operation, and does not require any further maintenance work. Backstops have a minimum lift-off speed depending on the size (see following table).



CAUTION!

If the minimum lift-off speeds are exceeded, the backstops are subject to wear, and the resulting friction causes the temperature to increase.

Potential damage to property!

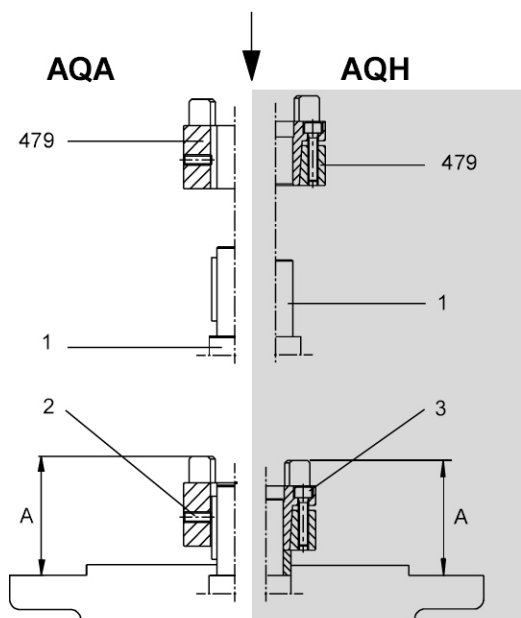
- In rated operation, the lift-off speeds must not drop below the minimum values.
- During startup or braking, the lift-off speeds may drop below the minimum levels.

Type	Maximum locking torque of backstop [Nm]	Minimum lift-off speed [rpm]
AM80/90/RS, AM143/145/RS	45	800
AM100/112/RS, AM182/184/RS	200	670
AM132/RS, AM213/215/RS	470	660
AM160/180/RS, AM254/286/RS	630	550
AM200/225/RS, AM324-365/RS	1430	600



4.11 AQ adapter coupling

4.11.1 AQA80 - 190 adapter / AQH80 - 190 adapter



212114955

- 1 Motor shaft
- 2 Setscrew
- 3 Screw

AQA = With keyway

AQH = Without keyway

1. Clean the motor shaft and the flange surfaces of the motor and the adapter.
2. **Type AQH:** Loosen the screws of the coupling half (479) and loosen the conical connection.
3. Heat up the coupling half (80 °C - 100 °C) and slide it onto the motor shaft.

AQA / AQH design: up to clearance "A" (see table)



4. **Type AQH:** Tighten the screws evenly in diametrically opposite sequence, working round several times. Make sure that all the screws are tightened with the tightening torque T_A according to the following table.

Type AQA: Secure the coupling halves using the setscrew (see table).

5. Check the position of the coupling half (clearance "A", see table).

Install motor onto the adapter making sure that the dogs of the two coupling halves engage in each other. The force that must be applied when joining the two coupling halves is dissipated after final assembly, so there is no risk of any axial load being applied to adjacent bearings.

	NOTE
	Only for AQA, not permitted for AQH: To avoid contact corrosion, we recommend applying NOCO [®] Fluid to the motor shaft before mounting the coupling half.
	CAUTION!
	Dampness might enter the adapter when mounting a motor to the adapter. Potential damage to property! • Seal adapter with anaerobic fluid seal

4.11.2 Setting dimensions/tightening torques

Type	Coupling size	Clearance "A" [mm]	Bolts DIN 912		Tightening torque T_A [Nm]	
			AQA	AQH	AQA	AQH
AQA /AQH 80 /1/2/3	19/24	44,5	M5	M4	2	3
AQA /AQH 100 /1/2		39				
AQA /AQH 100 /3/4		53				
AQA /AQH 115 /1/2		62				
AQA /AQH 115 /3	24/28	62	M5	M5	2	6
AQA /AQH 140 /1/2		62				
AQA /AQH 140 /3	28/38	74,5	M8	M5	10	6
AQA /AQH 190 /1/2		76,5				
AQA /AQH 190 /3	38/45	100	M8	M6	10	10

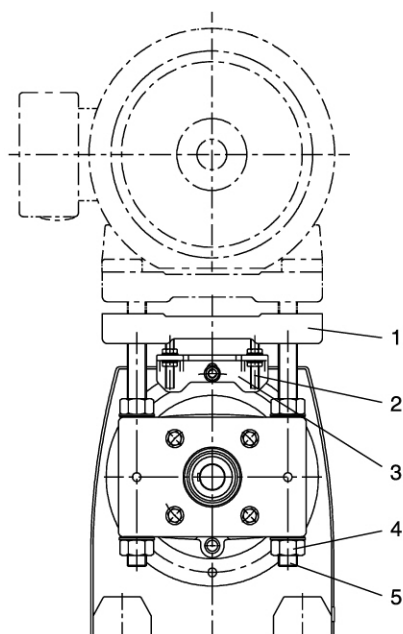


4.12 AD input cover

Observe section "Assembling the input and output components" (see page 24) when installing input components

4.12.1 AD../P – cover with motor mounting platform

Mounting the motor and adjusting the motor mounting platform.



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- [1] Motor mounting platform
- [2] Stud bolt (only AD6/P / AD7/P)
- [3] Support (only AD6/P / AD7/P)
- [4] Nut
- [5] Threaded column

1. Set the motor mounting platform to the required mounting position by evenly tightening the adjusting nuts. Remove the lifting eyebolt from helical gear units in order to achieve the lowest adjustment position. Touch up any damage to the paint work.
2. Align the motor on the motor mounting platform (shaft ends must be in alignment) and secure it.
3. Mount the input elements on the input shaft end and the motor shaft, line them up with one another and correct the motor position again, if necessary.
4. Put on the traction elements (V-belt, chain, etc.) and apply a preload by evenly adjusting the motor mounting platform. Do not stress the motor mounting platform and the columns against each other when doing this.
5. Tighten all the nuts not used for adjustment in order to fix the threaded columns.



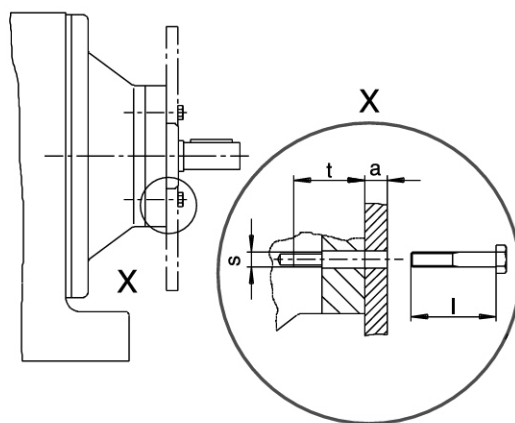
4.12.2 Only AD6/P and AD7/P

Unscrew the nuts on the stud bolts before adjustment to allow the stud bolts to move axially in the support without restriction. Do not tighten the nuts until the final adjustment position has been reached. Do not adjust the motor mounting platform using the support.

4.12.3 AD../ZR – input cover with centering shoulder

Mounting applications on the input cover with centering shoulder.

1. Retaining bolts of a suitable length must be used to secure the application. The length l of the new bolts is calculated as follows:



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- [l] $t+a$
- [t] Screw-in depth (see table)
- [a] Thickness of the application
- [s] Retaining thread (see table)

Round down the calculated screw length to the next smaller standard length.

2. Remove the retaining screws from the centering shoulder.
3. Clean the contact surface and the centering shoulder.



4. Clean the threads of the new bolts and apply a bolt locking compound (e.g. Loctite® 243) to the first few threads.
5. Attach the application to the centering shoulder and tighten the retaining screws with the specified tightening torque T_A (see table).

Type	Screw-in depth t [mm]	Retaining threads	Tightening torque T_A for connection screws of strength class 8.8 [Nm]
AD2/ZR	25,5	M8	25
AD3/ZR	31,5	M10	48
AD4/ZR	36	M12	86
AD5/ZR	44	M12	86
AD6/ZR	48,5	M16	210
AD7/ZR	49	M20	410
AD8/ZR	42	M12	86



Permitted loads

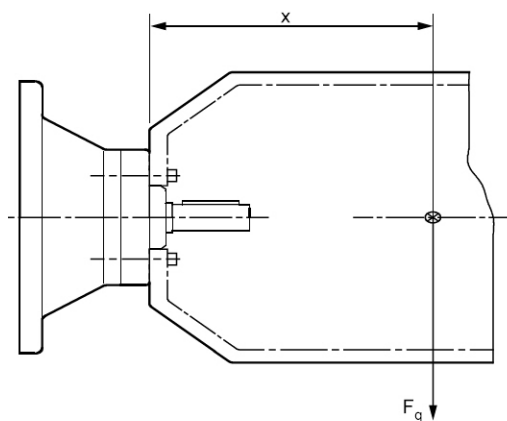


CAUTION!

Impermissibly high loads may occur when mounting a motor.

Potential damage to property!

- The load data specified in the following table are not to be exceeded.



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Type	$x^{1)}$ [mm]	$F_q^{1)}$ [N]
AD2/ZR	193	330
AD3/ZR	274	1400
AD4/ZR ²⁾	361	1120
AD4/ZR		3300
AD5/ZR	487	3200
AD6/ZR	567	3900
AD7/ZR	663	10000
AD8/ZR	516	4300

- 1) Maximum load values for connection screws of strength class 8.8. The maximum permitted weight of the attached motor F_{qmax} must be reduced linearly as the center of gravity distance x increases. When this distance is reduced, F_{qmax} cannot be increased.
- 2) Diameter of the adapter output flange: 160 mm



4.12.4 AD../RS – cover with backstop

Check the direction of rotation of the drive prior to assembly or startup. Please inform the SEW-EURODRIVE service in the case of incorrect direction of rotation.

The backstop is maintenance-free in operation, and does not require any further maintenance work. Backstops have a minimum lift-off speed depending on the size (see following table).



CAUTION!

If the minimum lift-off speeds are exceeded, the backstops are subject to wear, and the resulting friction causes the temperature to increase.

Potential damage to property!

- In rated operation, the lift-off speeds must not drop below the minimum values.
- During startup or braking, the lift-off speeds may drop below the minimum levels.

Type	Maximum locking torque of backstop [Nm]	Minimum lift-off speed [rpm]
AD2/RS	45	800
AD3/RS	200	670
AD4/RS	470	660
AD5/RS	630	550
AD6/RS	1430	600
AD7/RS	1430	600
AD8/RS	1430	600



5 Startup

5.1 Checking the oil level

Before startup, make sure that the oil level corresponds to the mounting position. Observe section "[Checking the oil level and changing the oil](#)".

5.2 Helical-worm and SPIROPLAN® W gear units



NOTES

Note: The direction of rotation of the output shaft in series S..7 helical-worm gear units has been changed from CW to CCW; this is different from the S..2 series. Change in direction of rotation: Swap over two motor feeder cables.

5.2.1 Run-in period

SPIROPLAN® and helical-worm gear units require a running-in period of at least 48 h before reaching their maximum efficiency. A separate run-in period applies for each direction of rotation if the gear unit is operated in both directions of rotation. The table shows the average power reduction during the run-in period.

Helical-worm gear unit

	Worm	
	i range	η reduction
1 start	ca. 50 ... 280	approx. 12 %
2 start	ca. 20 ... 75	approx. 6 %
3 start	ca. 20 ... 90	approx. 3 %
4 start	-	-
5 start	ca. 6 ... 25	approx. 3 %
6 start	ca. 7 ... 25	approx. 2 %

Spiroplan® gear units

W10 / W20 / W30		W37	
i range	η reduction	i range	η reduction
ca. 35 ... 75	approx. 15 %		
ca. 20 ... 35	approx. 10 %		
ca. 10 ... 20	approx. 8 %	ca. 30...70	approx. 8 %
ca. 8	approx. 5 %	ca. 10 ... 30	approx. 5 %
ca. 6	approx. 3 %	ca. 3...10	approx. 3 %



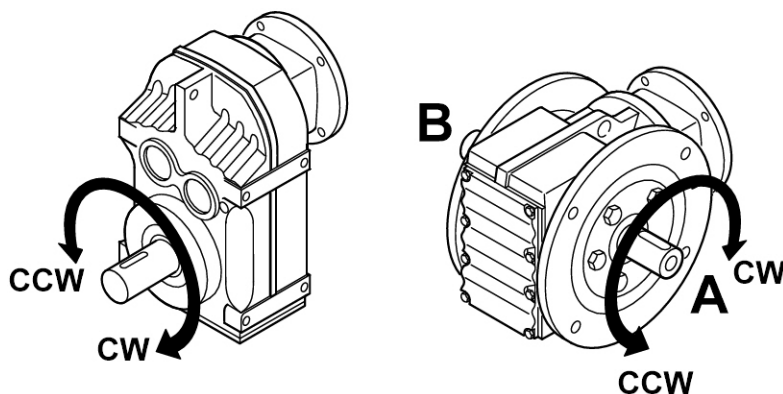
5.3 Helical/parallel shaft helical/helical-bevel gear units

No special startup instructions are required for helical, parallel shaft helical and helical-bevel gear units providing the gear units have been installed in accordance with section "Mechanical installation" (see page 17).

5.4 Gear units with backstop

The purpose of a backstop is to prevent undesirable reverse rotation. During operation, the backstop permits rotation in only one specified direction of rotation.

	CAUTION!
	<p>Operating the motor in the direction that is blocked could destroy the backstop. Potential damage to property!</p> <ul style="list-style-type: none"> • Do not start up the motor in the blocking direction. In order to achieve the desired direction of rotation, observe the correct power supply for the motor. • The backstop can be operated in blocking direction with half the output torque once for control purposes.

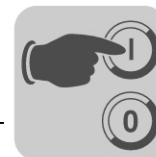


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The direction of rotation is determined with a view to the output shaft (LSS).

- Clockwise (CW)
- Counterclockwise (CCW)

The permitted direction of rotation is indicated on the housing.



6 Inspection/Maintenance

The following gear units are lubricated for life and are thus maintenance-free:

- Helical gear units R07, R17, R27
- F27 Parallel Shaft Helical Gear Units
- SPIROPLAN® gear units

Depending on external factors, the surface/corrosion protection might have to be repaired or renewed.

The following inspection and maintenance intervals apply for all the other gear units.

6.1 Preliminary work regarding gear unit inspection/maintenance

Observe the following notes before you start with the inspection/maintenance work.

	<p>HAZARD!</p> <p>Risk of crushing if the drive starts up unintentionally.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> • Disconnect the gearmotor from the power supply before starting work and protect it against unintentional re-start.
	<p>WARNING!</p> <p>Danger of burns due to hot gear unit and hot gear unit oil.</p> <p>Fatal injuries.</p> <ul style="list-style-type: none"> • Let motor cool down before beginning work! • Only remove the oil level and oil drain plug very carefully.
	<p>CAUTION!</p> <p>Filling in the wrong oil may result in significantly different lubricant characteristics.</p> <p>Potential damage to property!</p> <ul style="list-style-type: none"> • Do not mix different synthetic lubricants and do not mix synthetic with mineral lubricants. • Mineral oil is used as standard lubricant.
	<p>NOTE</p> <p>The position of the oil level plug, oil drain plug and the breather valve depends on the mounting position. Refer to the diagrams of the mounting positions. See chapter "Mounting Positions" (see page 79).</p>

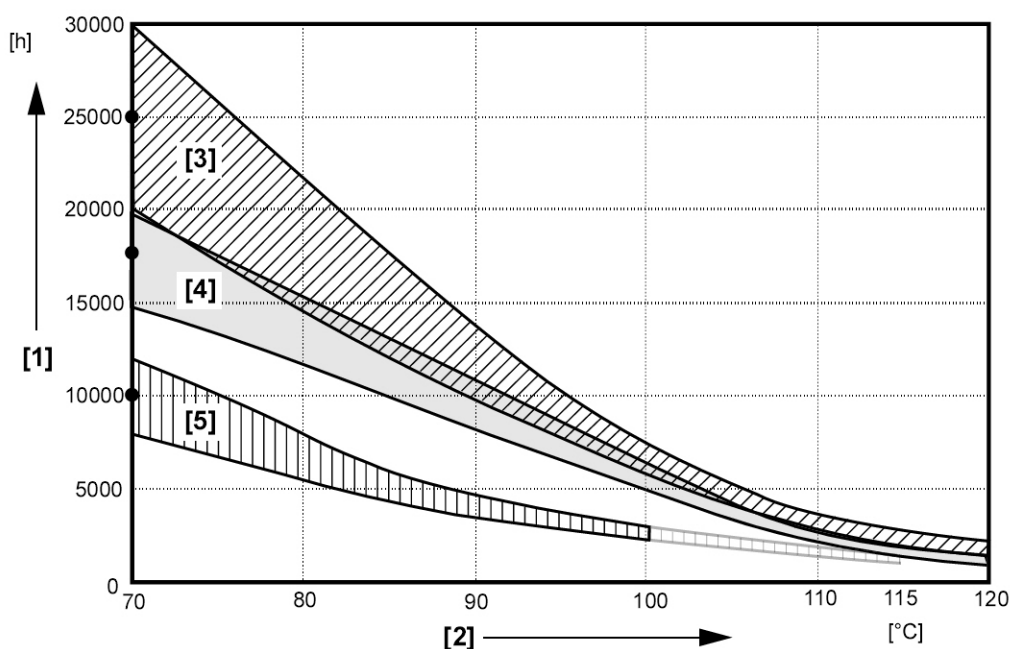


6.2 Inspection/maintenance intervals

Time interval	Action
<ul style="list-style-type: none"> Every 3000 operating hours, at least every 6 months 	<ul style="list-style-type: none"> Check oil and oil level Check running noise for possible bearing damage Visually check the seals for leakage For gear units with a torque arm: Check the rubber buffer and change it, if necessary
<ul style="list-style-type: none"> Depending on the operating conditions (see illustration below), at the latest every 3 years according to oil temperature 	<ul style="list-style-type: none"> Change mineral oil Replace anti-friction bearing grease (recommendation) Replace oil seal (do not install it in the same track)
<ul style="list-style-type: none"> Depending on the operating conditions (see illustration below), at the latest every 5 years according to oil temperature 	<ul style="list-style-type: none"> Change synthetic oil Replace anti-friction bearing grease (recommendation) Replace oil seal (do not install it in the same track)
<ul style="list-style-type: none"> Varying (depending on external factors) 	<ul style="list-style-type: none"> Touch up or renew the surfaces / anticorrosion coating

6.3 Lubricant change intervals

The following figure shows the change intervals for standard gear units under normal environmental conditions. Change the oil more frequently when using special versions subject to more severe/aggressive environmental conditions!



[1] Operating hours

[2] Sustained oil bath temperature

- Average value per oil type at 70 °C

[3] CLP PG

[4] CLP HC / HCE

[5] CLP / HLP / E





6.4 *Inspection/maintenance for the AL/AM/AQ adapter*

Time interval	Action
<ul style="list-style-type: none"> Every 3000 operating hours, at least every 6 months 	<ul style="list-style-type: none"> Check torsional play Visually check the elastic annular gear Check running noise for possible bearing damage Visually check the adapter for leakage
<ul style="list-style-type: none"> After 25 000 - 30 000 hours of operation 	<ul style="list-style-type: none"> Renew the anti-friction bearing grease Replace oil seal (do not install it in the same track) Change the elastic annular gear

6.5 *Inspection/maintenance for the AD input cover*

Time interval	Action
<ul style="list-style-type: none"> Every 3000 operating hours, at least every 6 months 	<ul style="list-style-type: none"> Check running noise for possible bearing damage Visually check the adapter for leakage
<ul style="list-style-type: none"> After 25 000 - 30 000 hours of operation 	<ul style="list-style-type: none"> Renew the anti-friction bearing grease Change the oil seal



6.6 Inspection/maintenance for the gear unit

6.6.1 Checking the oil level and changing the oil

The procedure when checking the oil level and changing the oil depends on the following factors:

- Gear unit type
- Size
- Mounting position

Observe the references to the respective sections as well as the following table. Refer to chapter "Mounting Positions" (see page 79) for notes on the mounting positions. You cannot check the oil level of gear units in pivoted mounting position. The gear units are delivered with the correct oil level. Observe the designations and fill quantities on the nameplate if you have to change the oil.

Code letter	Section "Checking the oil level and changing the oil"	Reference
A:	<ul style="list-style-type: none"> • Helical gear units... • Parallel shaft helical gear units... • Helical-bevel gear units... • Helical-worm gear units... with oil level plug	(see page 65)
B :	<ul style="list-style-type: none"> • Helical gear units... • Parallel shaft helical gear units... • SPIROPLAN® gear units... without oil level plug, with cover plate	(see page 67)
C:	<ul style="list-style-type: none"> • S37... helical-worm gear units without oil level plug and cover plate	(see page 71)
D:	<ul style="list-style-type: none"> • SPIROPLAN® W37... in mounting positions: M1, M2, M3, M5, M6 with oil level plug	(see page 74)
EN:	<ul style="list-style-type: none"> • SPIROPLAN® W37... in M4 mounting position without oil level plug and cover plate	(see page 76)

Rows	Gear unit	Code letter for section "Checking the oil level and changing the oil"					
		M1	M2	M3	M4	M5	M6
R	R07...R27	B					
	R47...R57	A				B	A
	R57...R167	A					
	RX57...R107	A					
F	F27	B					
	F37...F157	A					
K	K37...K187	A					
S	S37	C					
	S47...S97	A					
W	W10...W30	B					
	W..37	D			E	D	

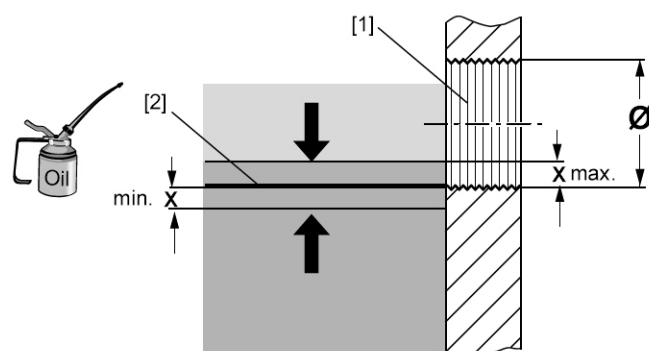


6.6.2 Helical, parallel shaft helical, helical-bevel and helical-worm gear units with oil level plug

Checking the oil level via the oil level plug

Proceed as follows to check the oil level of the gear unit:

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Determine the position of the oil level plug and the breather valve using the mounting position sheets. See chapter "Mounting Positions" (see page 79).
3. Place a container underneath the oil level plug.
4. Slowly remove the oil level plug. Small amounts of oil may leak out as the permitted max. oil level is higher than the lower edge of the oil level bore.
5. Check the oil level according to the following figure and the corresponding table.



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[1] Oil level bore

[2] Reference oil level

Ø Oil level bore	min and max fill level = x [mm]
M10 x 1	1
M12 x 1.5	1
M22 x 1.5	2
M33 x 2	2
M42 x 2	2

6. Proceed as follows if the oil level is too low:
 - Remove the breather valve.
 - Fill in additional oil of the same type via the vent hole until the oil level is at the lower edge of the oil level bore.
 - Re-insert the breather valve.
7. Re-insert the oil level plug.



Inspection/Maintenance

Inspection/maintenance for the gear unit

Checking the oil via the oil drain plug

Proceed as follows to check the oil of the gear unit:

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Determine the position of the oil drain plug using the mounting position sheets. See chapter "Mounting Positions" (see page 79).
3. Remove a little oil from the oil drain plug.
4. Check the oil consistency.
 - Viscosity
 - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (see page 62).
5. Check the oil level. See previous section.

Changing the oil via the oil drain plug and the breather valve



! WARNING!

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

Fatal injuries.

- Let motor cool down before beginning work!
- The gear unit must still be warm otherwise the high viscosity of excessively cold oil will make it harder to drain the oil correctly.

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Determine the position of the oil drain plug, the oil level plug and the breather valve using the mounting position sheets. See chapter "Mounting Positions" (see page 79).
3. Place a container underneath the oil drain plug.
4. Remove the oil level plug, the breather valve and the oil drain plug.
5. Drain all the oil.
6. Re-insert the oil drain plug.
7. Fill in new oil of the same type via the vent hole (otherwise consult the customer service). Do not mix synthetic lubricants.
 - Observe the oil fill quantities according to the specifications on the nameplate or according to the mounting position. See sect "Lubricant fill quantities" (see page 108).
 - Check the oil level at the oil level plug.
8. Re-insert the oil level plug and the breather valve.

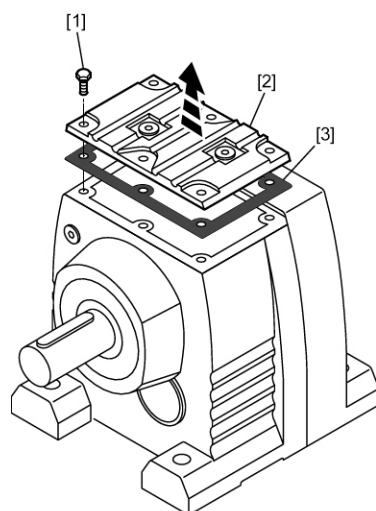


6.6.3 Helical, parallel shaft helical, SPIROPLAN® gear units without oil level plug with cover plate

Checking the oil level via the cover plate

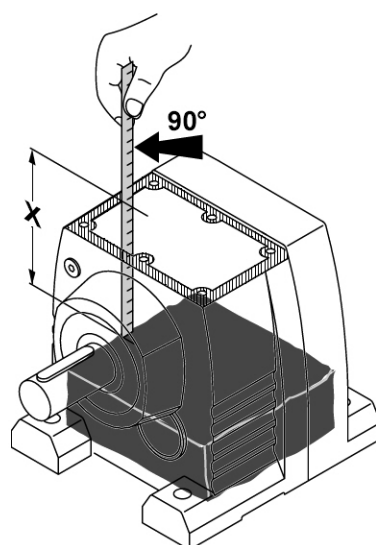
For gear units without oil level bore, the oil level is checked via the cover plate opening. Proceed as follows:

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. For the cover plate to be on top, you have to set up the gear unit in the following mounting position.
 - R07 - R57 in M1 mounting position
 - F27 in M3 mounting position
 - W10 - W30 in M1 mounting position
3. Loosen the screws [1] of the cover plate [2] and remove the cover plate [2] and the corresponding seal [3] (see following figure).



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4. Determine the vertical distance "x" between oil level and sealing surface of the gear-case (see following figure).



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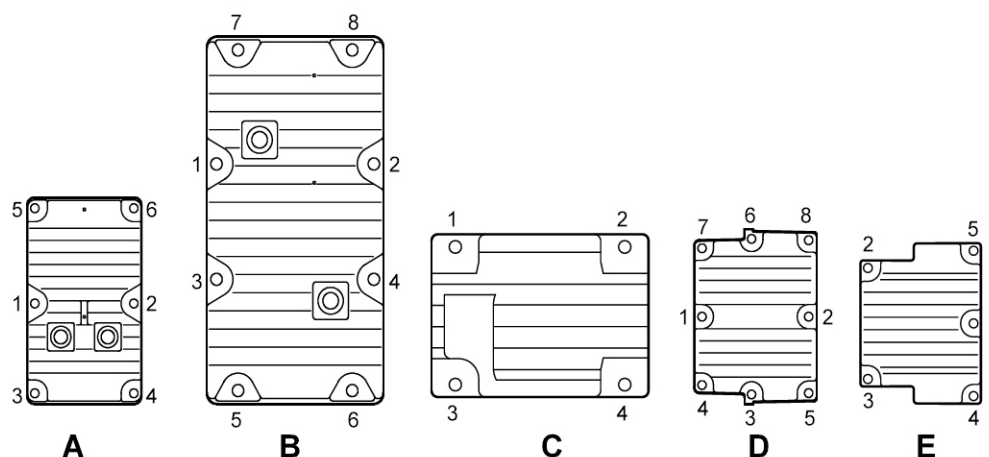
5. Compare the determined value "x" to the max. distance between oil level and sealing surface of the gear case specified in the following table. Adjust the fill level if required.

Gear unit type		Max. distance x [mm] between oil level and sealing surface of the gear-case for mounting position					
		M1	M2	M3	M4	M5	M6
R07	2-stage	52 ± 1	27 ± 1	27 ± 1	27 ± 1	27 ± 1	27 ± 1
	3-stage	49 ± 1	21 ± 1	21 ± 1	21 ± 1	21 ± 1	21 ± 1
R17	2-stage	63 ± 1	18 ± 1	46 ± 1	18 ± 1	46 ± 1	46 ± 1
	3-stage	58 ± 1	11 ± 2	40 ± 2	11 ± 2	40 ± 2	40 ± 2
R27	2-stage	74 ± 1	22 ± 1	45 ± 1	22 ± 1	45 ± 1	45 ± 1
	3-stage	76 ± 1	19 ± 1	42 ± 1	19 ± 1	42 ± 1	42 ± 1
R47	2-stage	–	–	–	–	39 ± 1	–
	3-stage	–	–	–	–	32 ± 1	–
R57	2-stage	–	–	–	–	32 ± 1	–
	3-stage	–	–	–	–	28 ± 1	–
F27	2-stage	78 ± 1	31 ± 1	72 ± 1	56 ± 1	78 ± 1	78 ± 1
	3-stage	71 ± 1	24 ± 1	70 ± 1	45 ± 1	71 ± 1	71 ± 1
		irrespective of the mounting position					
W10		12 ± 1					
W20		19 ± 1					
W30		31 ± 1					



6. Close the gear unit after the oil level check:

- Re-attach the seal of the cover plate. Make sure that the sealing surfaces are clean and dry.
- Screw on the cover plate. Tighten the cover screws with the rated tightening torque according to the following table from the inside to the outside in the order illustrated in the figure. Repeat the tightening procedure until the screws are properly tightened. Only use impulse drivers or torque wrenches in order to prevent the cover plate from being damaged (no impact drivers).



18649739

Gear unit type	Figure	Retaining thread	Rated tightening torque T_N [Nm]	Minimum tightening torque T_N [Nm]
R/RF07	E	M5	6	4
R/RF17/27	D	M6	11	7
R/RF47/57	A			
F27	B			
W10	C	M5	6	4
W20	C	M6	11	7
W30	A			



Checking the oil via the cover plate

Proceed as follows to check the oil of the gear unit:

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Open the cover plate of the gear unit according to section "Checking the oil via the cover plate" (see page 67).
3. Take an oil sample via the cover plate opening.
4. Check the oil consistency.
 - Viscosity
 - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (see page 62).
5. Check the oil level. See section "Checking the oil level via the cover plate" (see page 67).
6. Screw on the cover plate. Observe the order and the tightening torques according to section "Checking the oil level via the cover plate" (see page 67)

Checking the oil via the cover plate



! WARNING!

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

Fatal injuries.

- Let motor cool down before beginning work!
- The gear unit must still be warm otherwise the high viscosity of excessively cold oil will make it harder to drain the oil correctly.

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Open the cover plate of the gear unit according to section "Checking the oil via the cover plate".
3. Completely drain the oil in to a vessel via the cover plate opening.
4. Fill in new oil of the same type via the cover plate opening (otherwise consult the customer service). Do not mix synthetic lubricants.
 - Pour in the oil in accordance with the mounting position or as specified on the nameplate. See section "Lubricant fill quantities" (see page 108).
5. Check the oil level.
6. Screw on the cover plate. Observe the order and the tightening torques according to section "Checking the oil level via the cover plate" (see page 67)

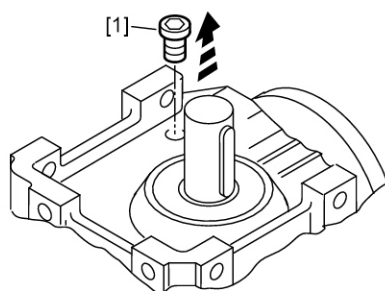


6.6.4 S37 helical-worm gear units without oil level plug and cover plate

Checking the oil level via the breather plug

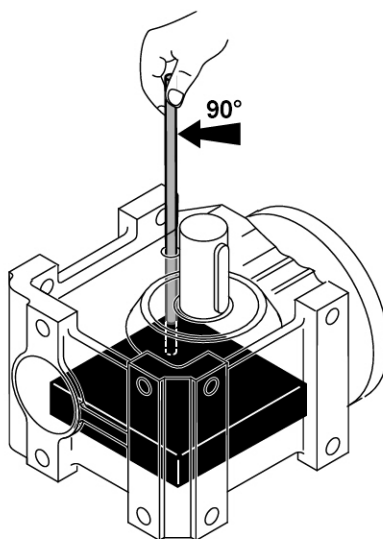
The S37 gear unit is not equipped with an oil level plug or a cover plate. This is why the oil level is checked via the control bore.

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Set up the gear unit in M5 or M6 mounting position, i.e. control bore always on top.
3. Remove the screw plug [1] (see following figure).



18655371

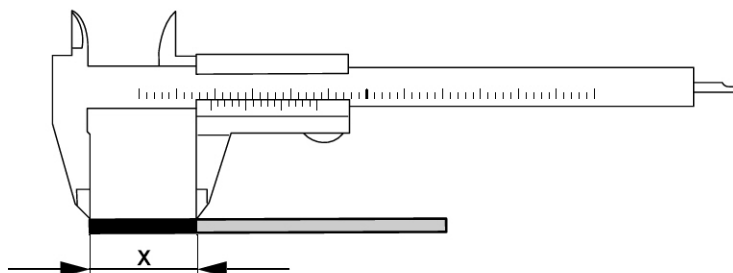
4. Insert the dipstick vertically via the control bore all the way to the bottom of the gear-case. Pull out the dipstick vertically (see following figure).



18658699



5. Determine the size of the section "x" of the dipstick covered with lubricant using a caliper (see following figure).



18661771

6. Compare the determined value "x" to the min. value depending on the mounting position specified in the following table. Correct the fill level if required.

Gear unit type	Oil level = wetted section x [mm] of the dipstick					
	Mounting position					
	M1	M2	M3	M4	M5	M6
S37	10 ± 1	24 ± 1	34 ± 1	37 ± 1	24 ± 1	24 ± 1

7. Re-insert and tighten the screw plug.



*Checking the oil
via the screw plug*

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Open the cover plate of the gear unit according to section "Checking the oil via the screw plug".
3. Take an oil sample via the screw plug bore.
4. Check the oil consistency.
 - Viscosity
 - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (see page 62).
5. Check the oil level. See previous section.
6. Re-insert and tighten the screw plug.

*Changing the oil
via the screw plug*



! WARNING!

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

Fatal injuries.

- Let motor cool down before beginning work!
- The gear unit must still be warm otherwise the high viscosity of excessively cold oil will make it harder to drain the oil correctly.

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Open the cover plate of the gear unit according to section "Checking the oil via the screw plug".
3. Completely drain the oil via the screw plug bore.
4. Fill in new oil of the same type via the control bore (otherwise consult the customer service). Do not mix synthetic lubricants.
 - Observe the oil fill quantities according to the specifications on the nameplate or according to the mounting position. Observe section "Lubricant fill quantities" (see page 107).
5. Check the oil level.
6. Re-insert and tighten the screw plug.

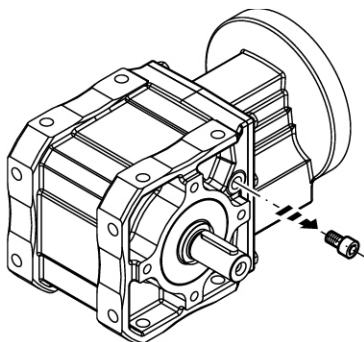


6.6.5 SPIROPLAN® W37 in mounting positions: M1, M2, M3, M5, M6 with oil level plug

Checking the oil level via the oil level plug

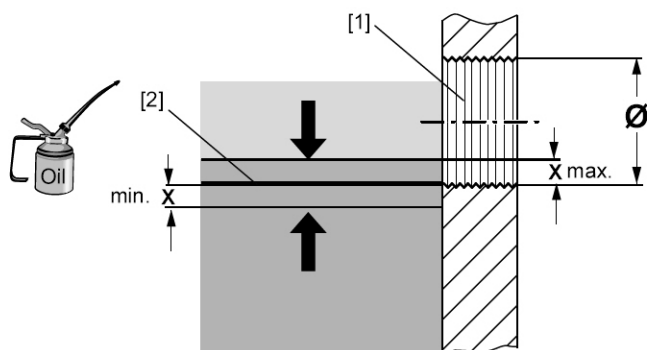
Proceed as follows to check the oil level of the gear unit:

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Set up the gear unit in M1 mounting position.
3. Slowly remove the oil level plug (see following figure). Small amounts of oil may leak out.



787235211

4. Check the oil level according to the following figure.



634361867

- [1] Oil level bore
[2] Reference oil level

Ø Oil level bore	min and max fill level = x [mm]
M10 x 1	1

5. If the oil level is too low, fill in new oil of the same type via the oil level bore until the oil level reaches the lower edge of the bore.
6. Re-insert the oil level plug.



*Checking the oil
via the oil level
plug*

Proceed as follows to check the oil of the gear unit:

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Remove a little oil at the oil level plug.
3. Check the oil consistency.
 - Viscosity
 - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (see page 62).
4. Check the oil level. See previous section.

*Changing the oil
via the oil level
plug*



! WARNING!

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

Fatal injuries.

- Let motor cool down before beginning work!
- The gear unit must still be warm otherwise the high viscosity of excessively cold oil will make it harder to drain the oil correctly.

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting Positions" (see page 79).
3. Place a container underneath the oil level plug.
4. Remove the oil level plugs on the A and B side of the gear unit.
5. Drain all the oil.
6. Re-insert the lower oil level plug.
7. Fill in new oil of the same type via the upper oil level plug bore (otherwise consult the customer service). Do not mix synthetic lubricants.
 - Observe the oil fill quantities according to the specifications on the nameplate or according to the mounting position. See section "Lubricant fill quantities" (see page 108).
 - Check the oil level according to section "Checking the oil level via the oil level plug"
8. Re-insert the upper oil level plug.

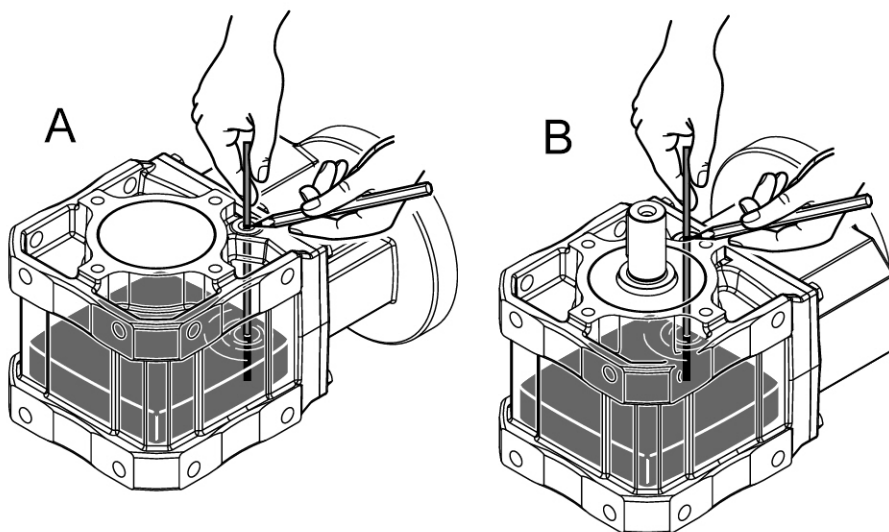


6.6.6 SPIROPLAN® W37 in M4 mounting position without oil level plug and cover plate

Checking the oil level via the breather plug

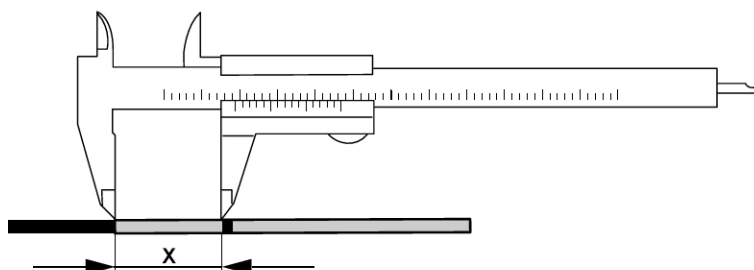
The W37 gear unit is not equipped with an oil level plug or a cover plate. This is why the oil level is checked via the control bore.

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
2. Set up the gear unit in M5 or M6 mounting position.
3. Remove the screw plug.
4. Insert the dipstick vertically via the control bore all the way to the bottom of the gear-case. Mark the point of the dipstick where it exits the gear unit. Pull out the dipstick vertically (see following figure).



784447371

5. Determine the section "x" between the wetted part and the marking using a caliper (see following figure).



785020811



- Compare the determined value "x" to the min. value depending on the mounting position specified in the following table. Correct the fill level if required.

Gear unit type	Oil level = wetted section x [mm] of the dipstick	
	Mounting position during the check	
	M5 Lying on the A side	M6 Lying on the B side
W37 in M4 mounting position	37 ± 1	29 ± 1

- Re-insert and tighten the screw plug.

Checking the oil via the screw plug

Proceed as follows to check the oil of the gear unit:

- Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
- Remove a little oil at the oil screw plug.
- Check the oil consistency.
 - Viscosity
 - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (see page 62).
- Check the oil level. See previous section.

Changing the oil via the screw plug

	WARNING!
	<p>Danger of burns due to hot gear unit and hot gear unit oil.</p> <p>Fatal injuries.</p> <ul style="list-style-type: none"> Let motor cool down before beginning work! The gear unit must still be warm otherwise the high viscosity of excessively cold oil will make it harder to drain the oil correctly.

- Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (see page 61).
- Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting Positions" (see page 79).
- Place a container underneath the screw plug.
- Remove the screw plugs on the A and B side of the gear unit.
- Drain all the oil.



6. Re-insert the lower screw plug.
7. Fill in new oil of the same type via the upper screw plug bore (otherwise consult the customer service). Do not mix synthetic lubricants.
 - Observe the oil fill quantities according to the specifications on the nameplate or according to the mounting position. See section "Lubricant fill quantities" (see page 108).
 - Check the oil level according to section "Checking the oil level via the oil level plug"
8. Re-insert the upper screw plug.

6.6.7 Changing the oil seal



CAUTION!

Oil seals with a temperature below 0 °C may get damaged during installation.

Potential damage to property.

- Store oil seals at ambient temperatures over 0 °C.
- Warm up the oil seals prior to installation if required.

1. When changing the oil seal, ensure that there is a sufficient grease reservoir between the dust lip and protective lip, depending on the type of gear unit.
2. If you use double oil seals, fill one-third of the gap with grease.

6.6.8 Painting gear units



CAUTION!

Breather valves and oil seals may be damaged during the painting or re-painting process.

Potential damage to property.

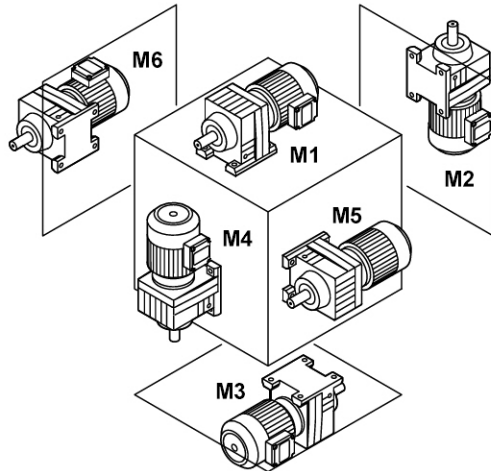
- Thoroughly cover the breather valves and the sealing lip of the oil seals with strips prior to the painting process.
- Remove the strips after the process.



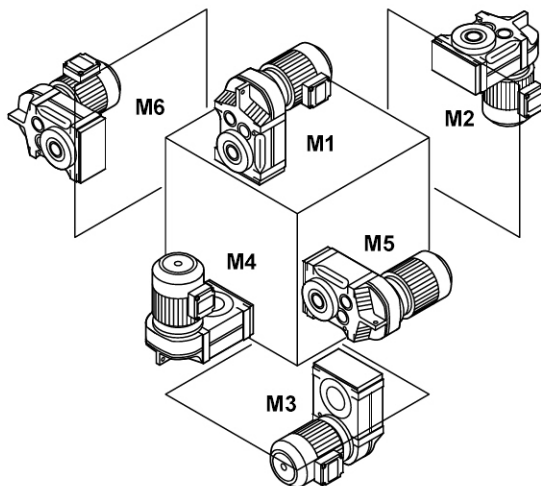
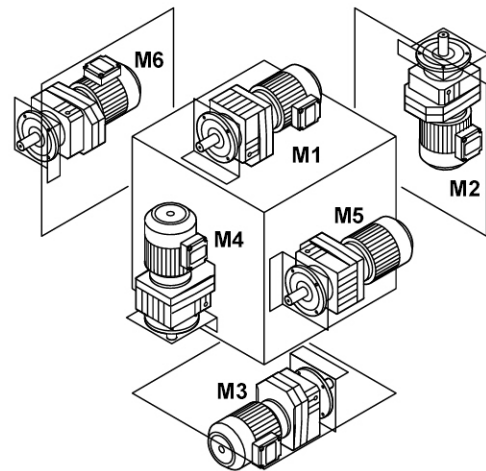
7 Mounting Positions

7.1 Designation of the mounting positions

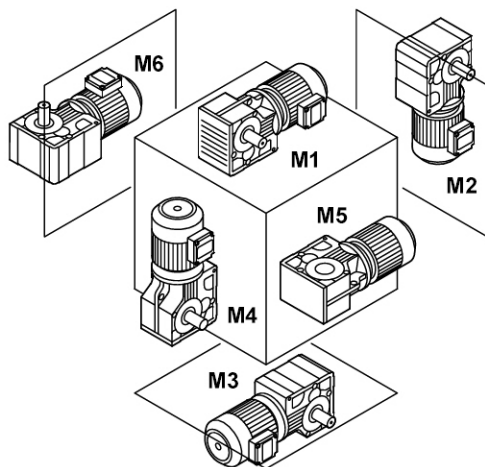
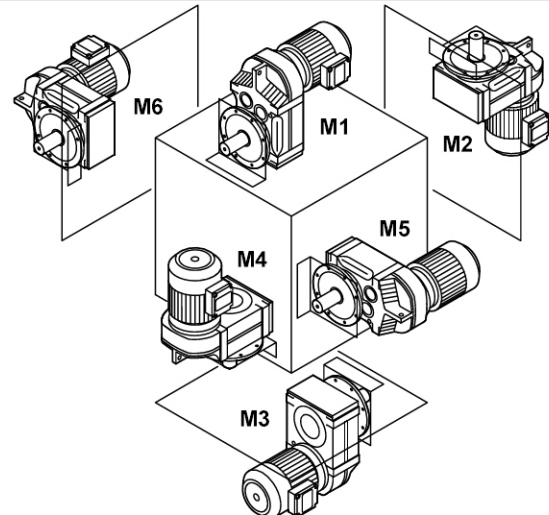
SEW differentiates between the six mounting positions M1 ... M6. The following illustration shows the position of the gear unit in mounting positions M1 ... M6.



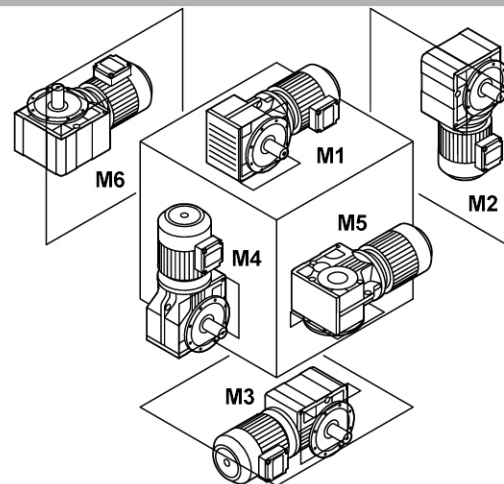
R..

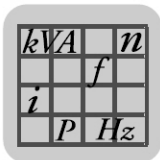


F..



K..
W..
S..





7.2 Key



NOTE

The SPIROPLAN® gearmotors are not dependent on the mounting position, except for W37 in M4 mounting position. However, mounting positions M1 to M6 are also shown for SPIROPLAN® gearmotors to assist you in working with this documentation.

Note: Apart from W37, the SPIROPLAN® gearmotors cannot be equipped with breather valves, oil level plugs or drain plugs.

7.2.1 Symbols used

The following table shows the symbols used in the mounting position sheets and what they mean:

Symbol	Meaning
	Breather valve
	Oil level plug
	Oil drain plug

7.2.2 Churning losses

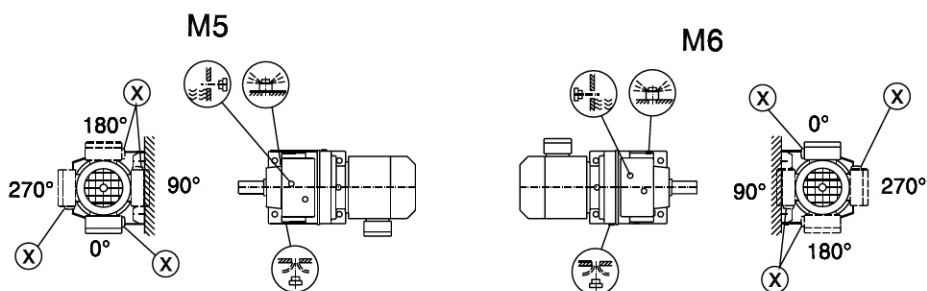
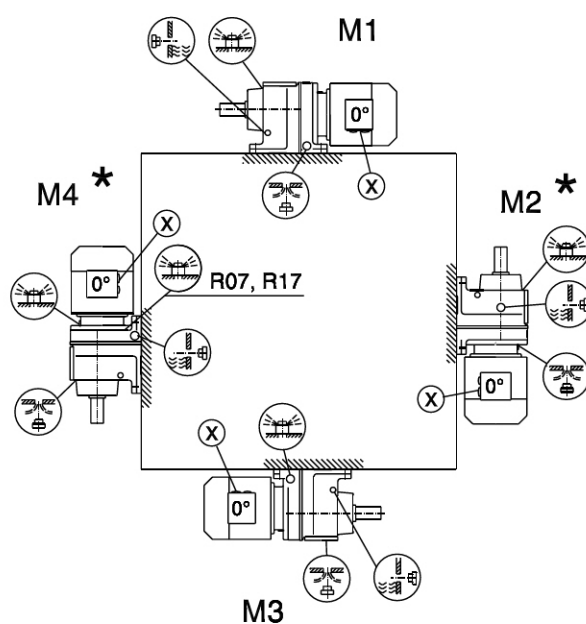
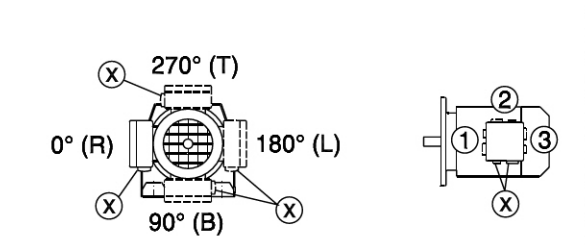
Churning losses may occur in some mounting positions. Contact SEW-EURODRIVE in case of the following combinations:

Mounting position	Gear unit type	Gear unit size	Input speed [rpm]
M2, M4	R	97 ... 107	> 2500
		> 107	> 1500
M2, M3, M4, M5, M6	F	97 ... 107	> 2500
		> 107	> 1500
	K	77 ... 107	> 2500
		> 107	> 1500
	S	77 ... 97	> 2500

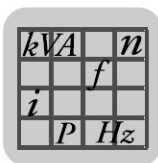
7.3 Helical gearmotors R

7.3.1 R07 ... R167

04 040 03 00

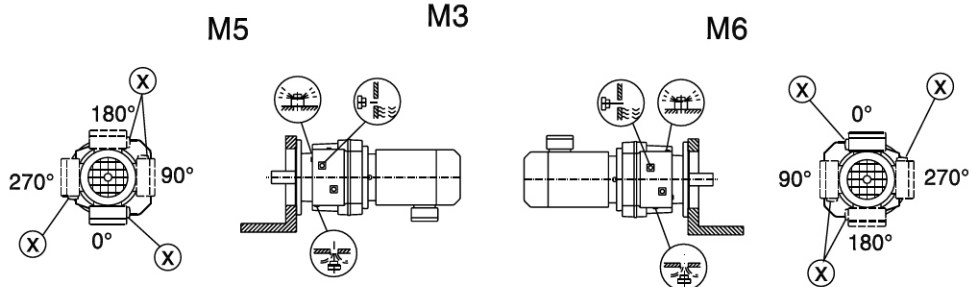
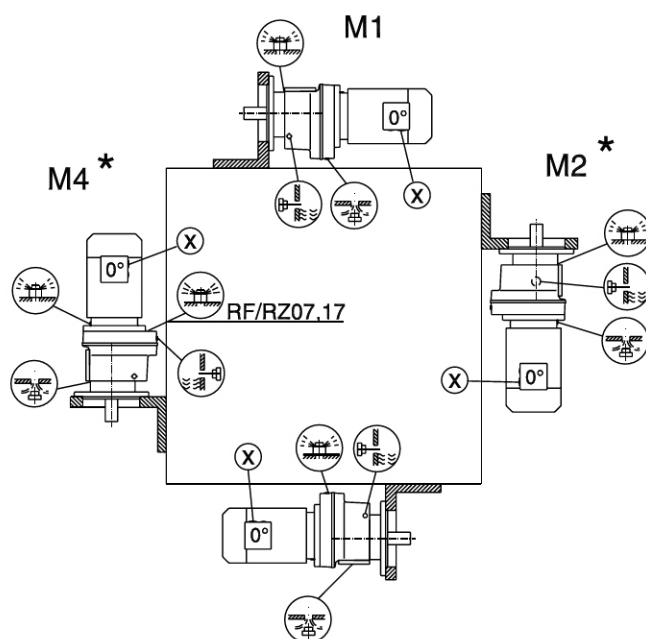
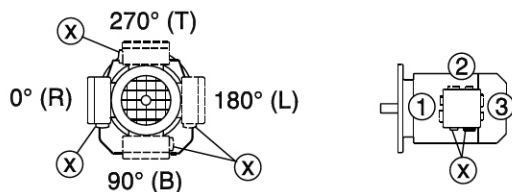


R07		M1, M2, M3, M5, M6
R17, R27		M1, M3, M5, M6
R07, R17, R27		
R47, R57		M5



7.3.2 RF07 ... RF167, RZ07 ... RZ87

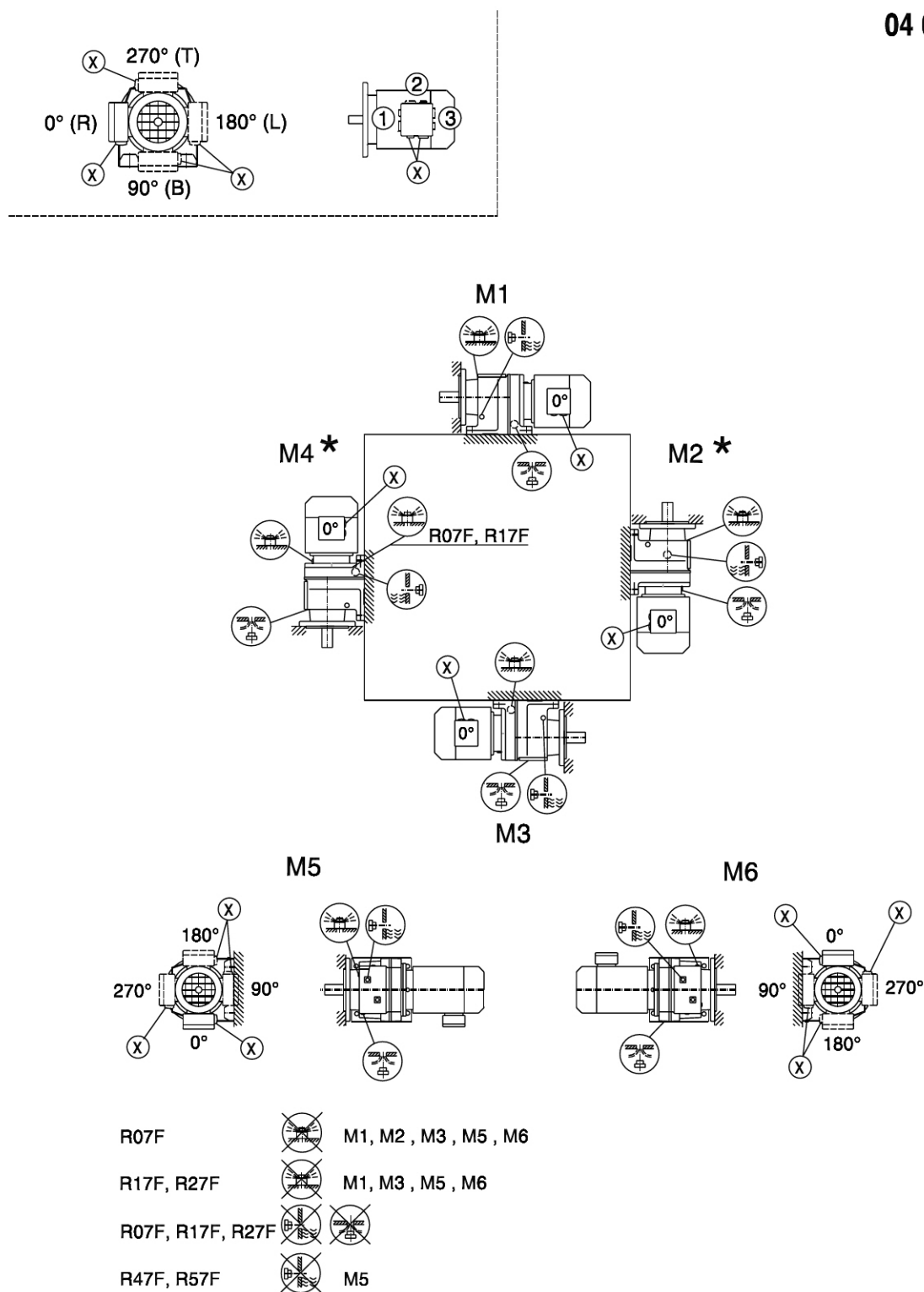
04 041 03 00

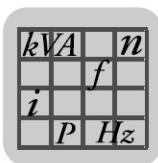


RF/RZ07		M1, M2, M3, M5, M6
RF/RZ17,27		M1, M3, M5, M6
RF/RZ07, 17, 27		
RF/RZ47, 57		M5

7.3.3 R07F ... R87F

04 042 03 00

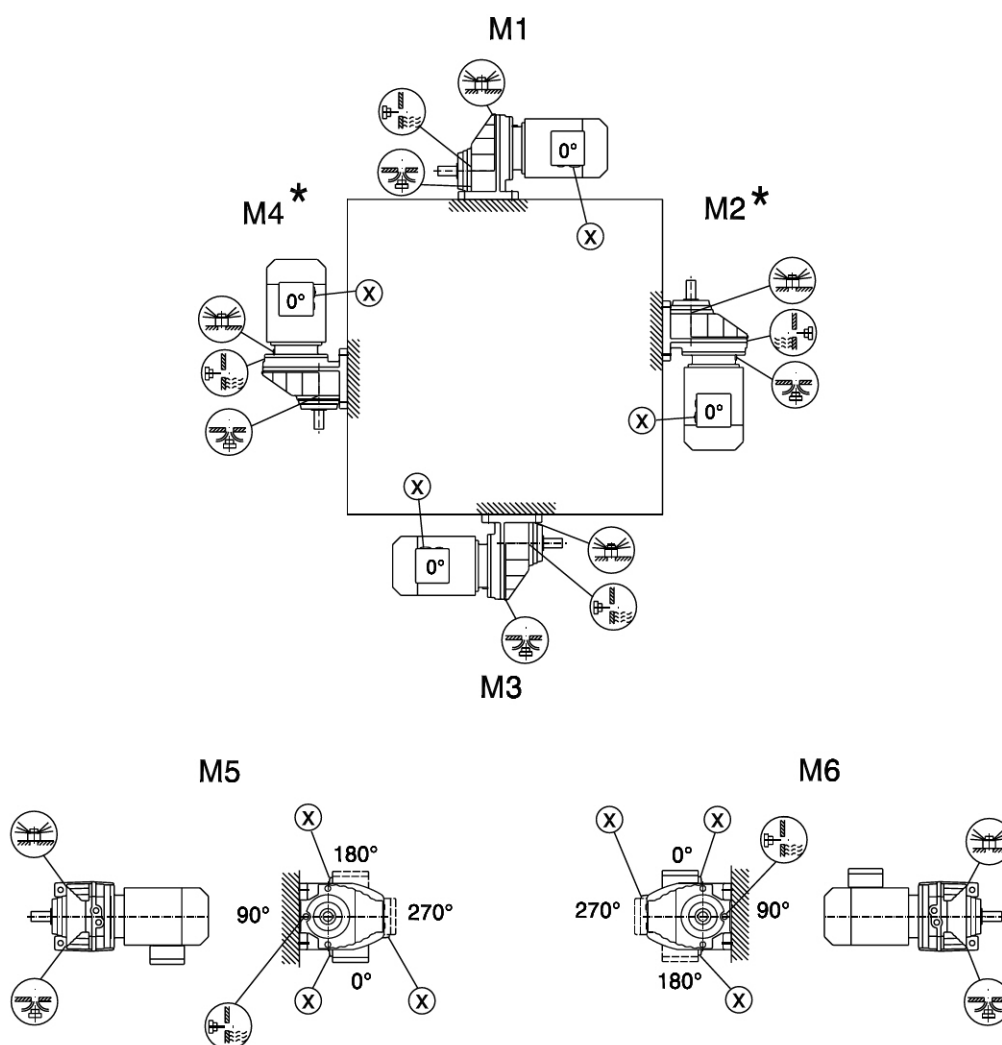
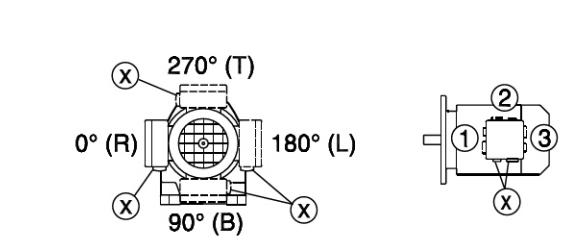




7.4 Helical gearmotors RX

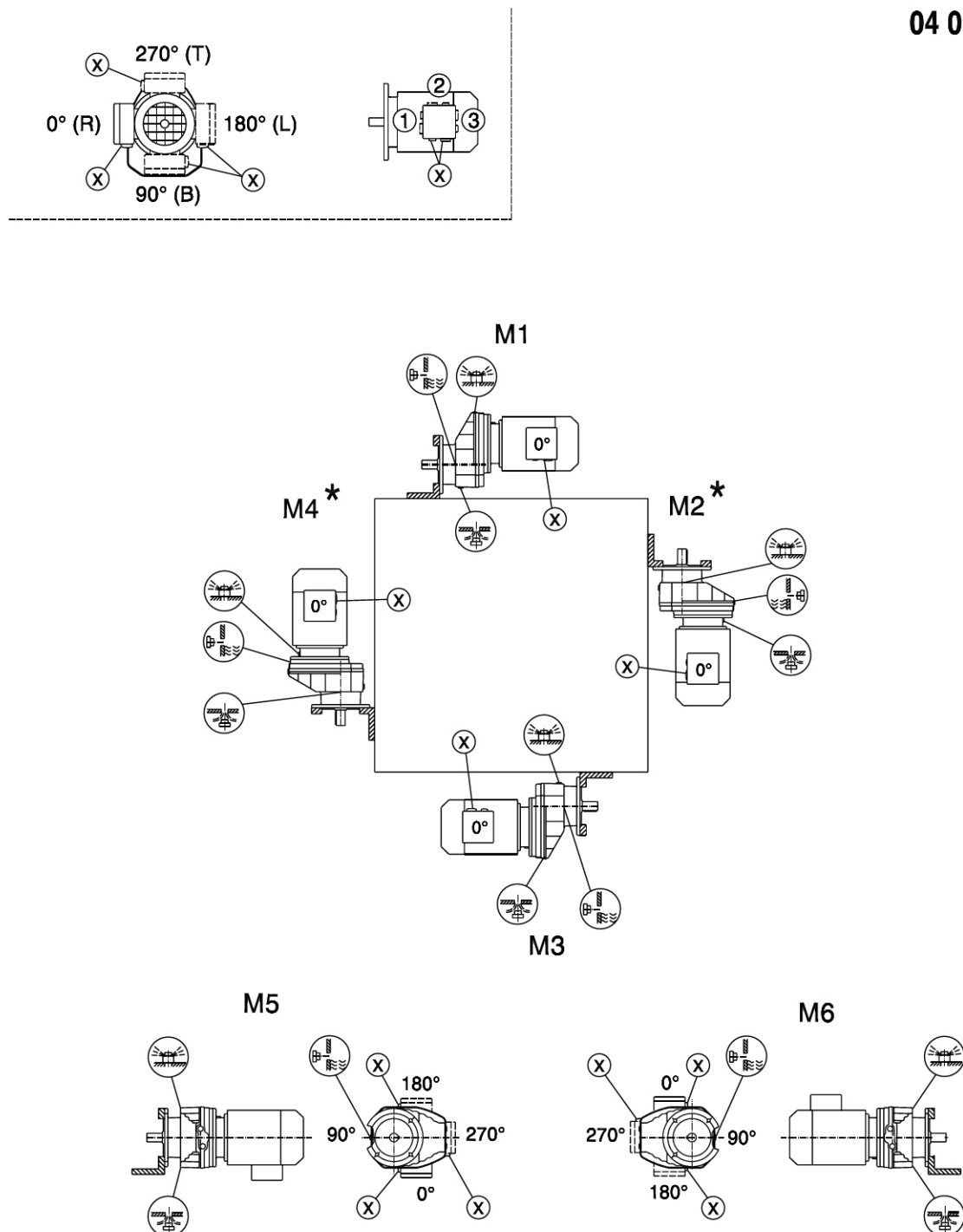
7.4.1 RX57 ... RX107

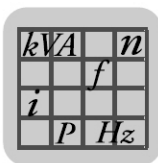
04 043 02 00



7.4.2 RXF57 ... RXF107

04 044 02 00

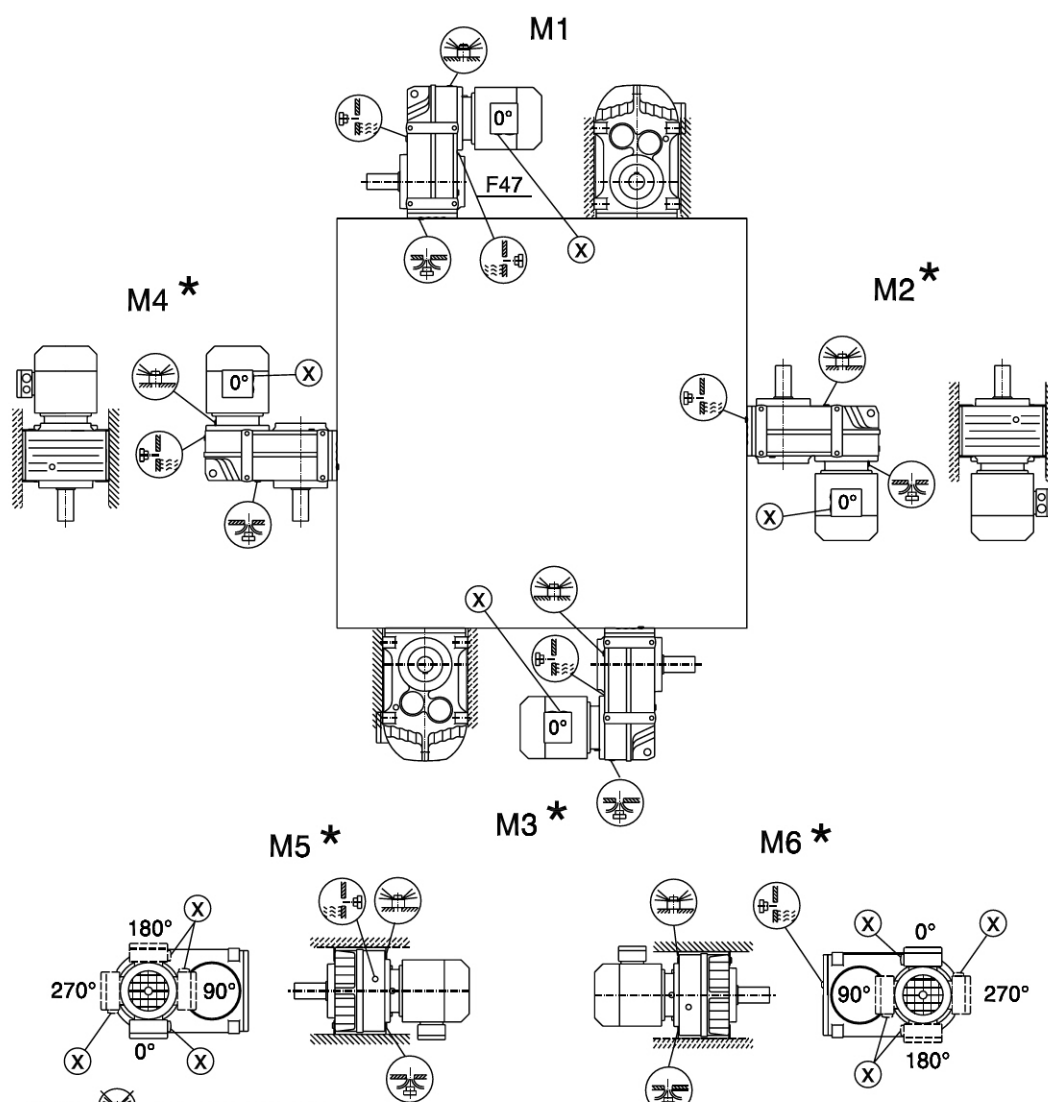
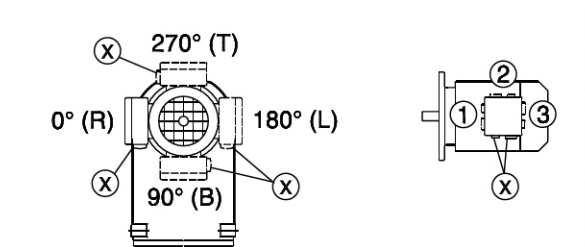




7.5 Parallel shaft helical gearmotors F

7.5.1 F27 ... F157 / FA27B ... F157B / FH27B .. FH157B / FV27B ... FV107B

42 042 03 00



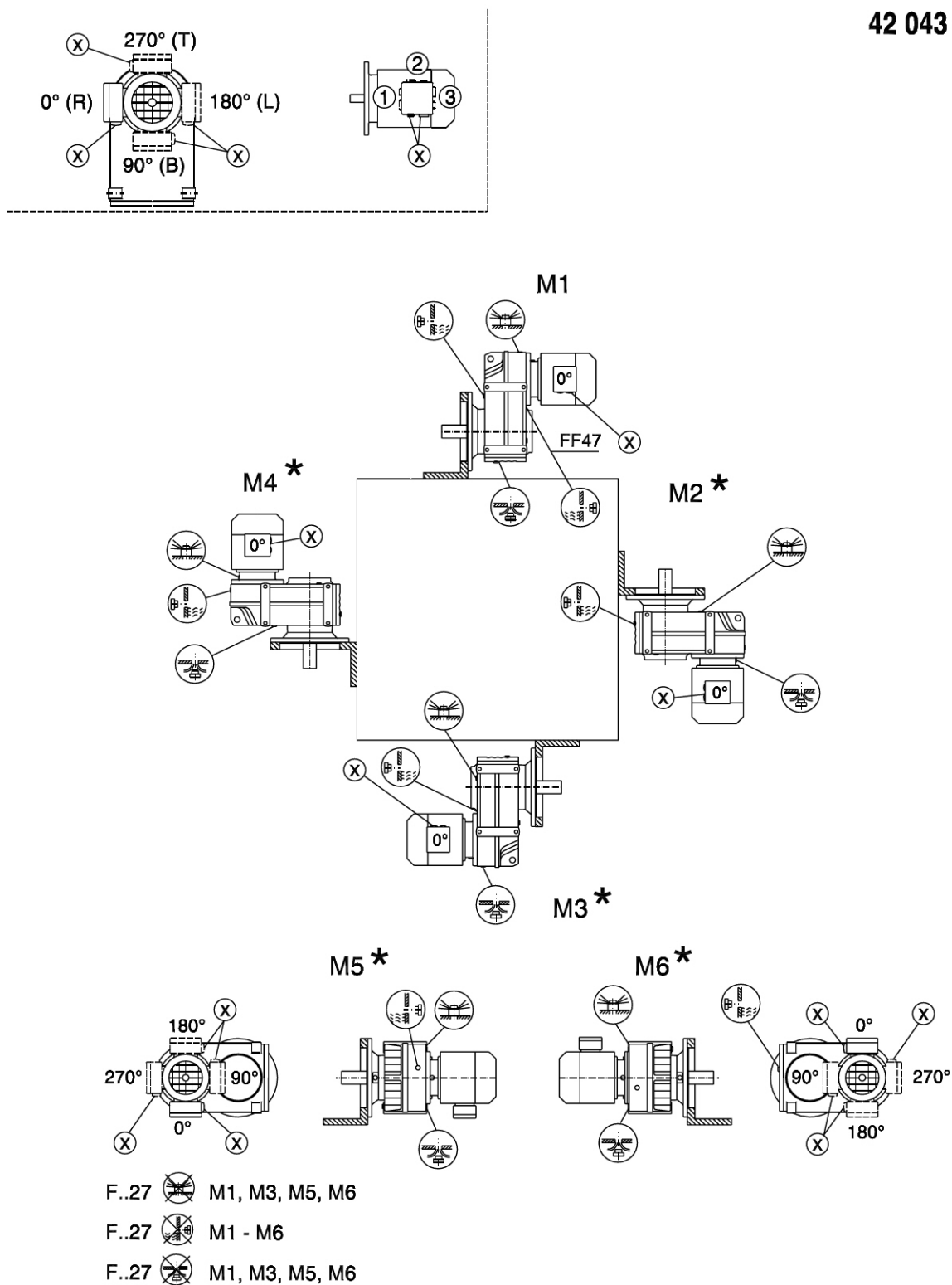
F..27 M1, M3, M5, M6

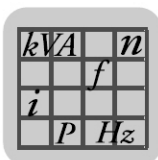
F..27 M1 - M6

F..27 M1, M3, M5, M6

7.5.2 FF27 ... FF157 / FAF27 ... FAF157 / FHF27 ... FHF157 / FAZ27 ... FAZ157 / FHZ27 ... FHZ157 / FVF27 ... FVF107 / FVZ27 ... FVZ107

42 043 03 00



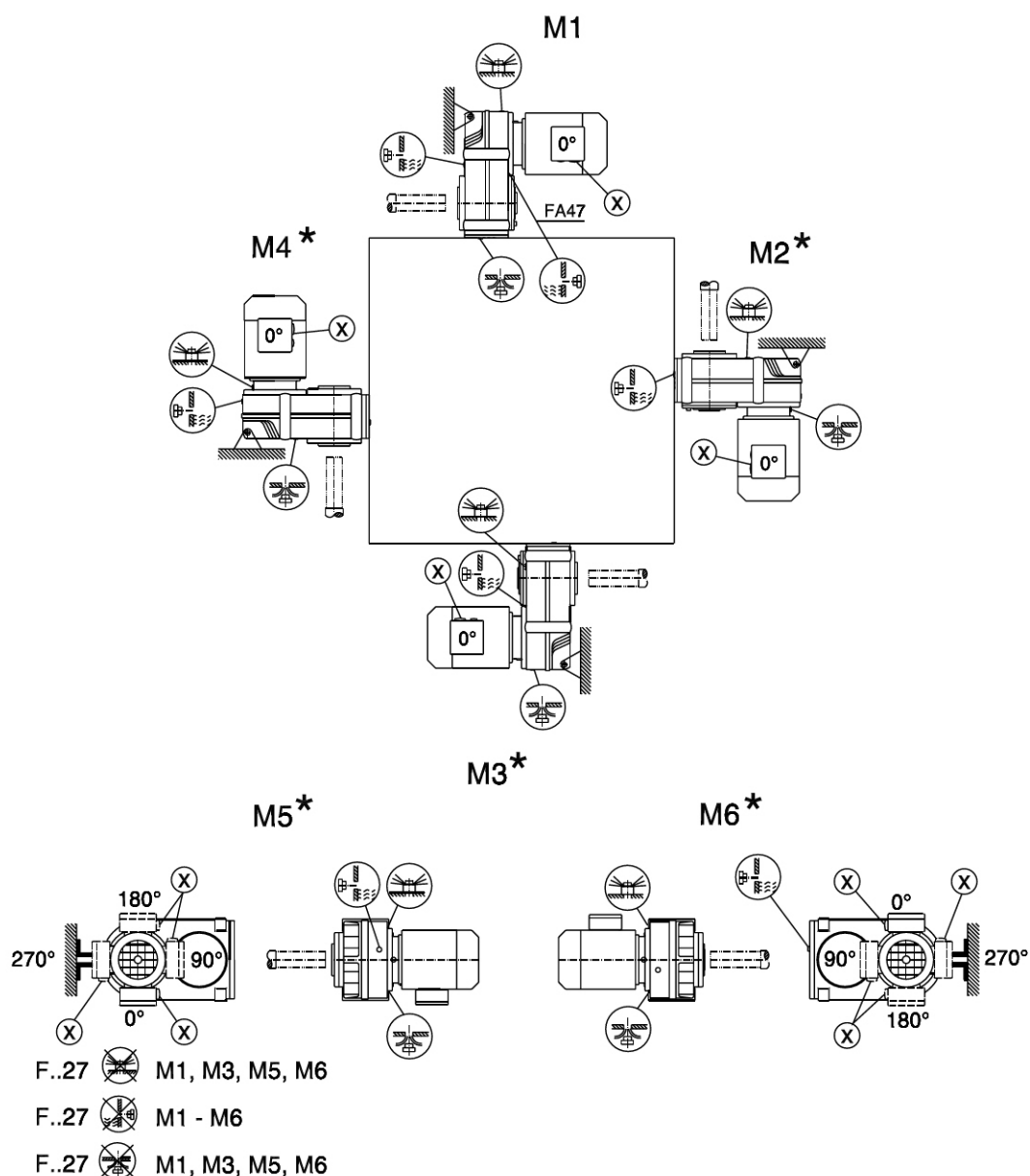
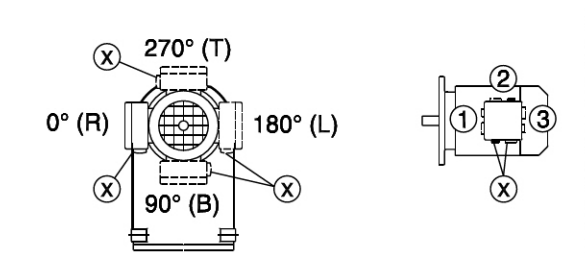


Mounting Positions

Parallel shaft helical gearmotors F

7.5.3 FA27 ... FA157 / FH27 ... FH157 / FV27 ... FV107 / FT37 ... FT157

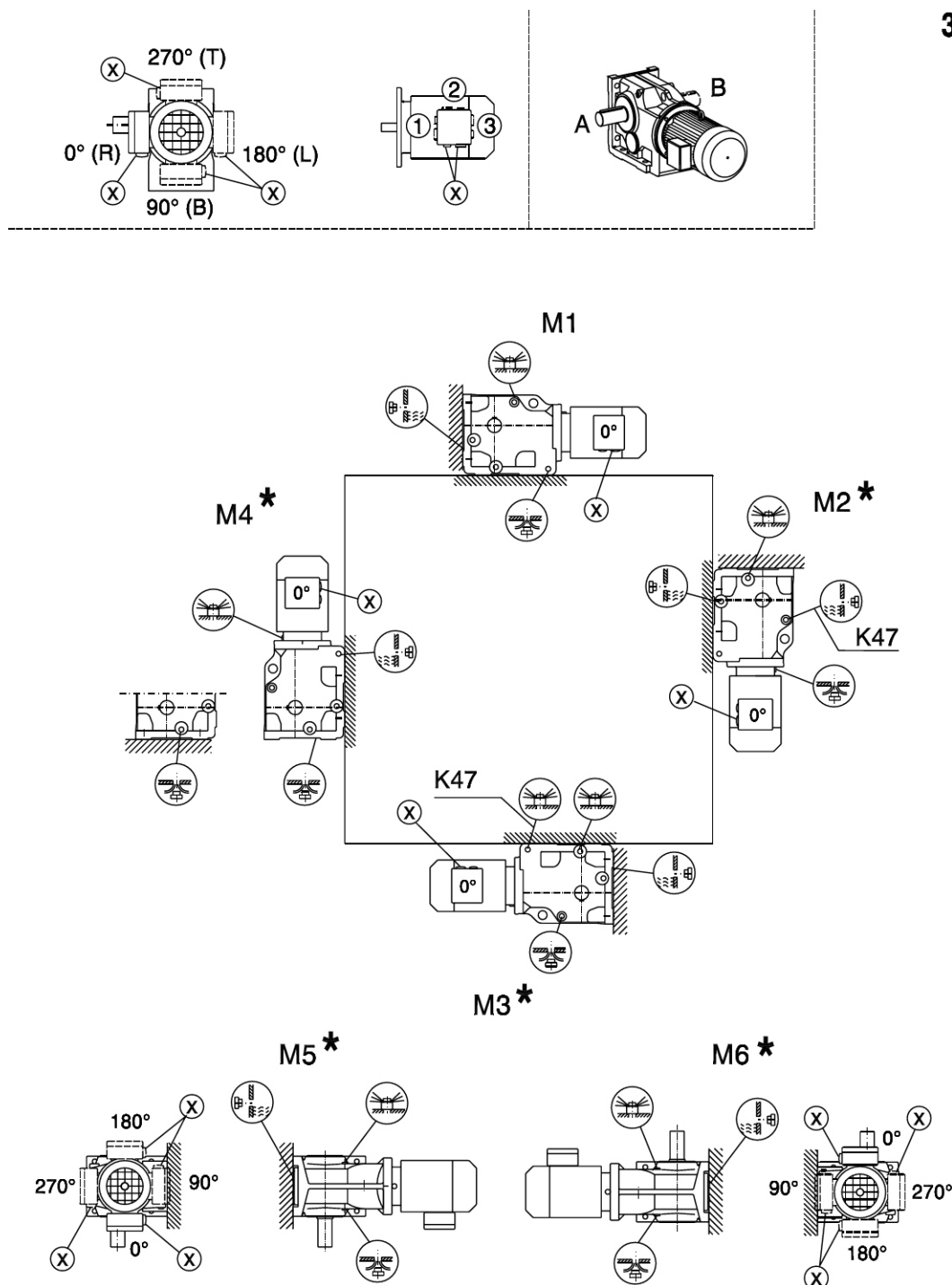
42 044 03 00

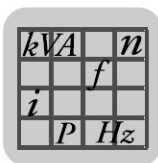


7.6 Helical-bevel gearmotors K

7.6.1 K37 ... K157 / KA37B ... KA157B / KH37B ... KH157B / KV37B ... KV107B

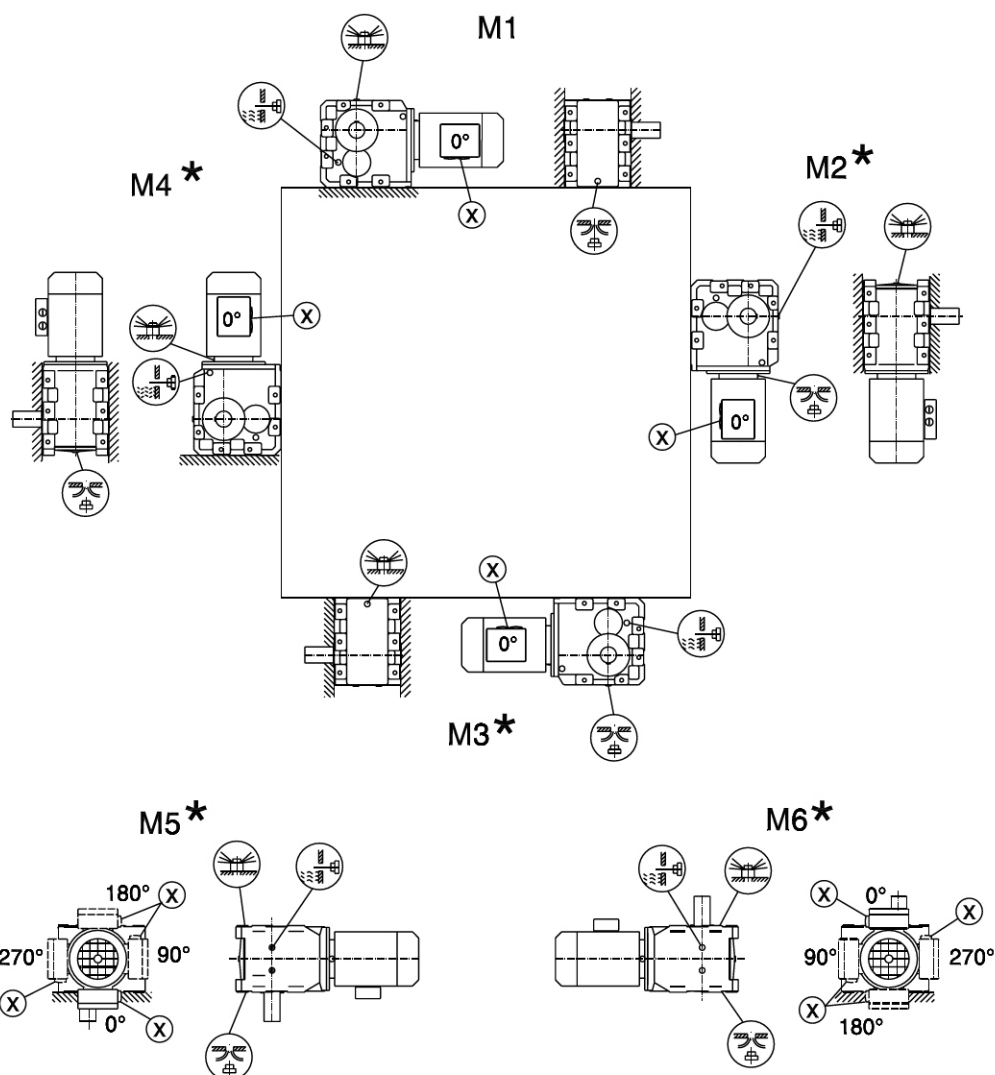
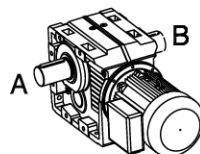
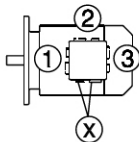
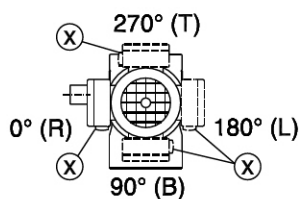
34 025 03 00





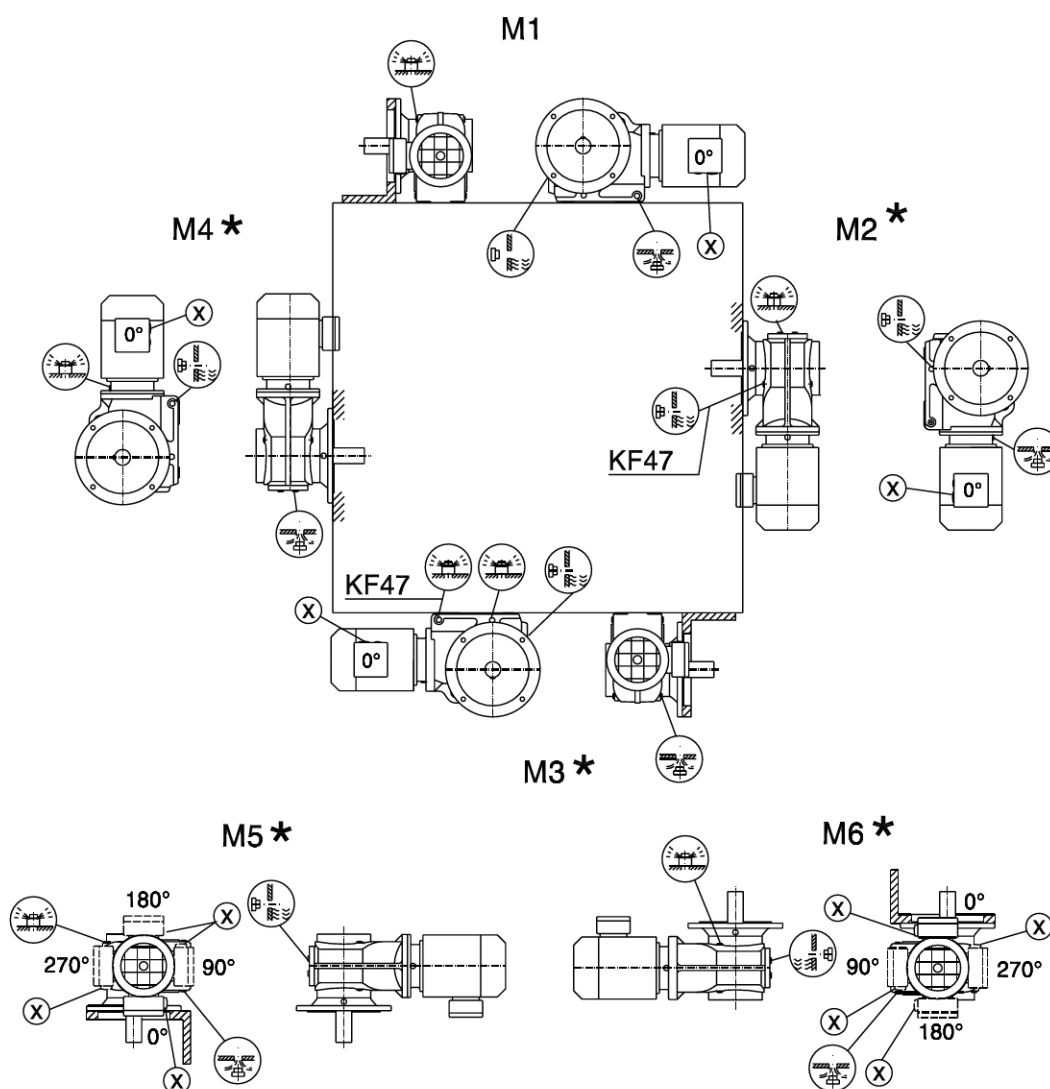
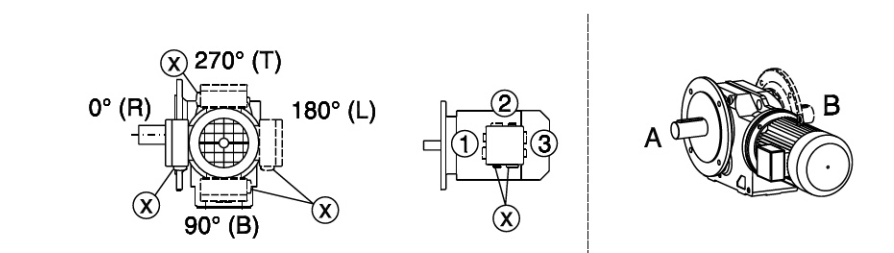
7.6.2 K167 ... K187 / KH167B ... KH187B

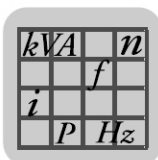
34 026 03 00



7.6.3 KF37 ... KF157 / KAF37 ... KAF157 / KHF37 ... KHF157 / KAZ37 ... KAZ157 / KHZ37 ... KHZ157 / KVF37 ... KVF107 / KVZ37 ... KVZ107

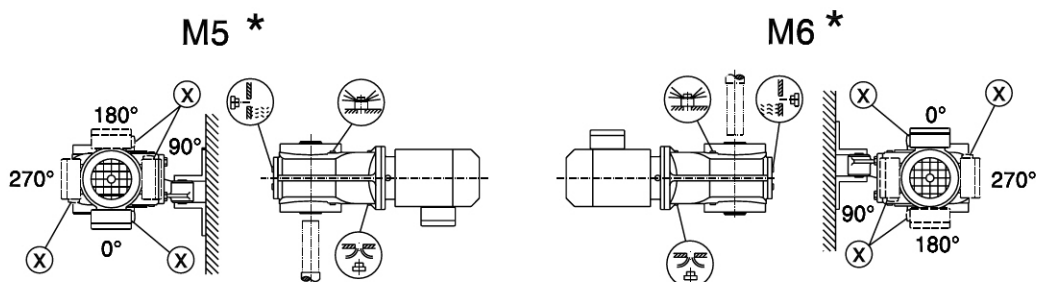
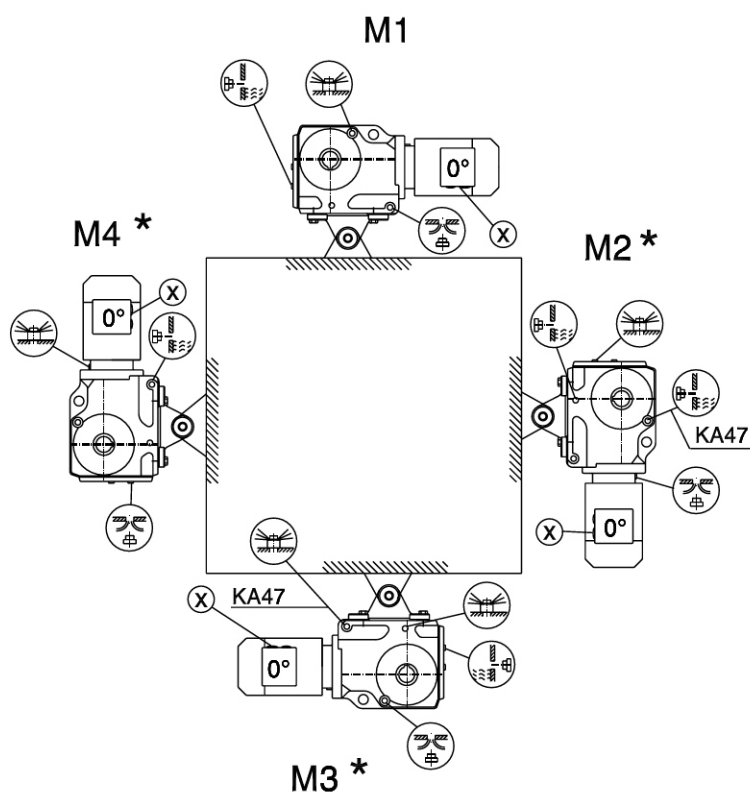
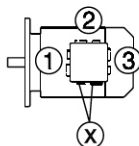
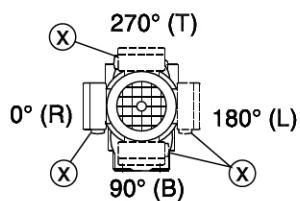
34 027 03 00





7.6.4 KA37 ... KA157 / KH37 ... KH157 / KV37 ... KV107 / KT37 ... KT157

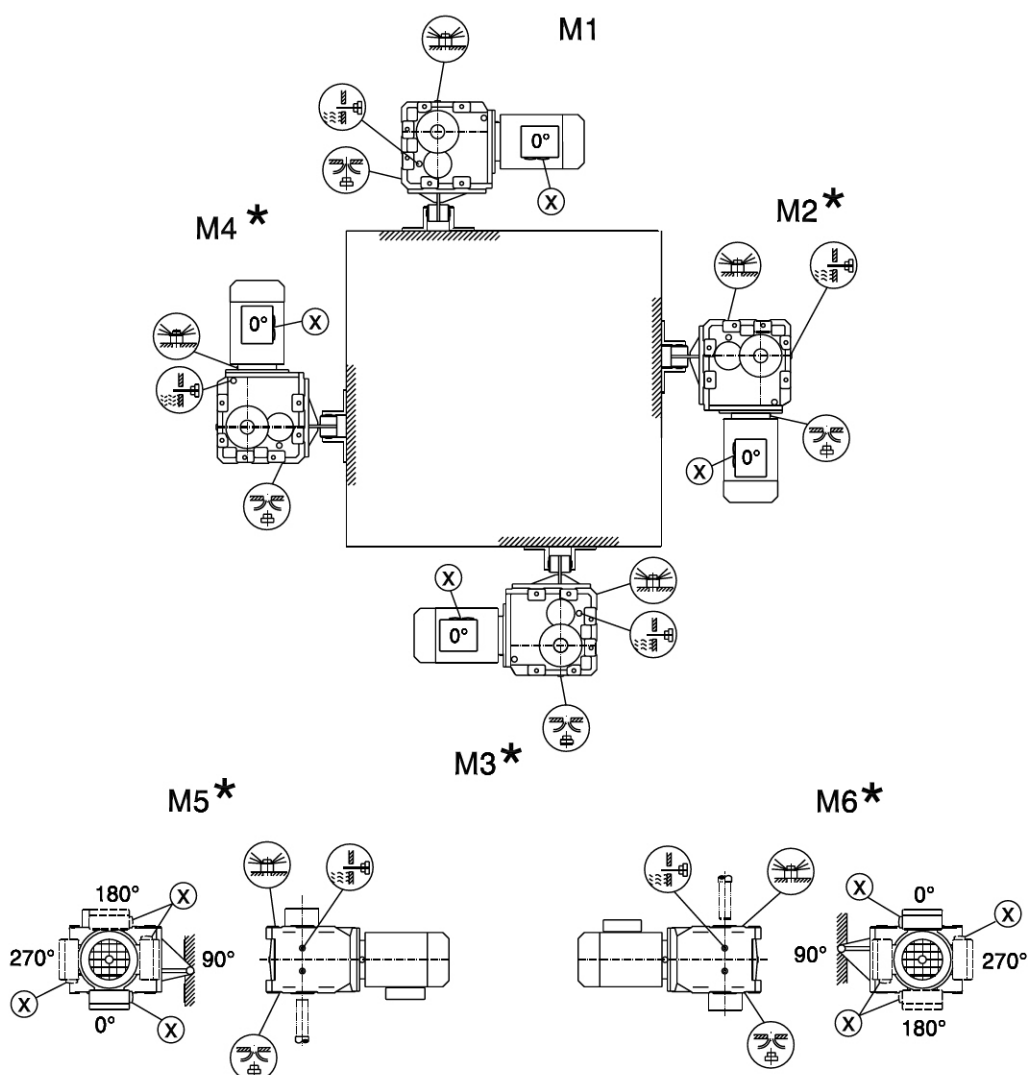
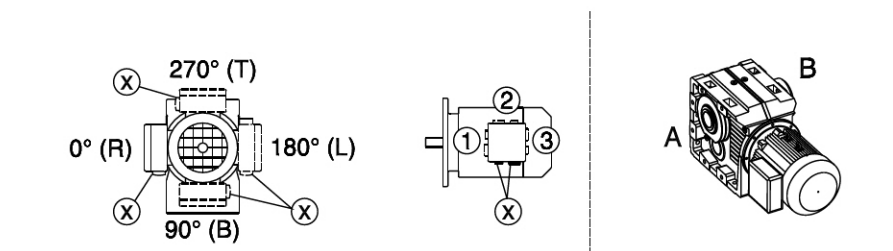
39 025 04 00

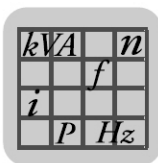


kVA	n
f	
i	
P	H_z

7.6.5 KH167 ... KH187

39 026 04 00

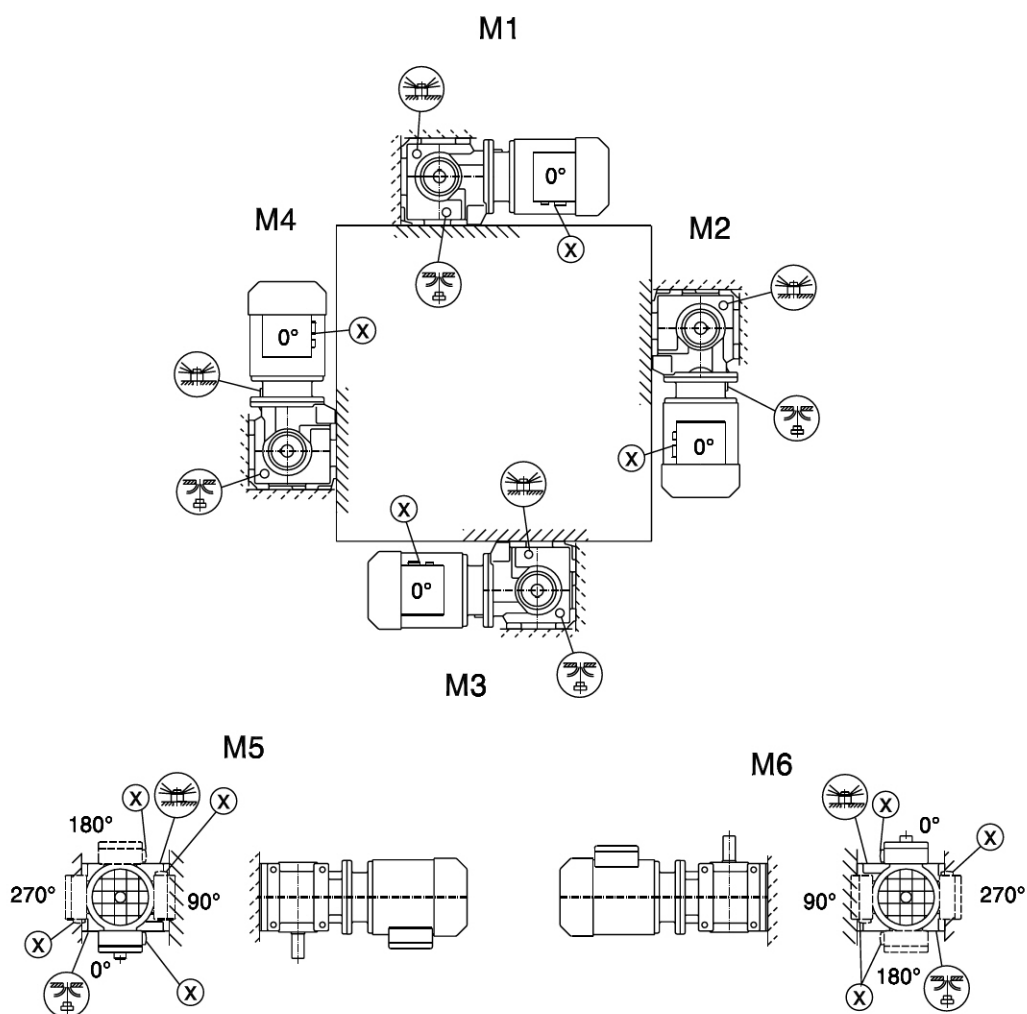
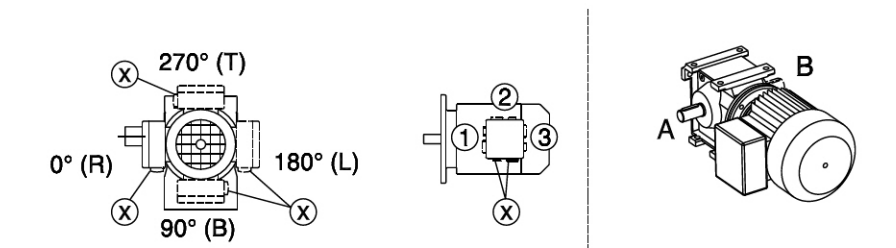




7.7 Helical-worm gearmotors S

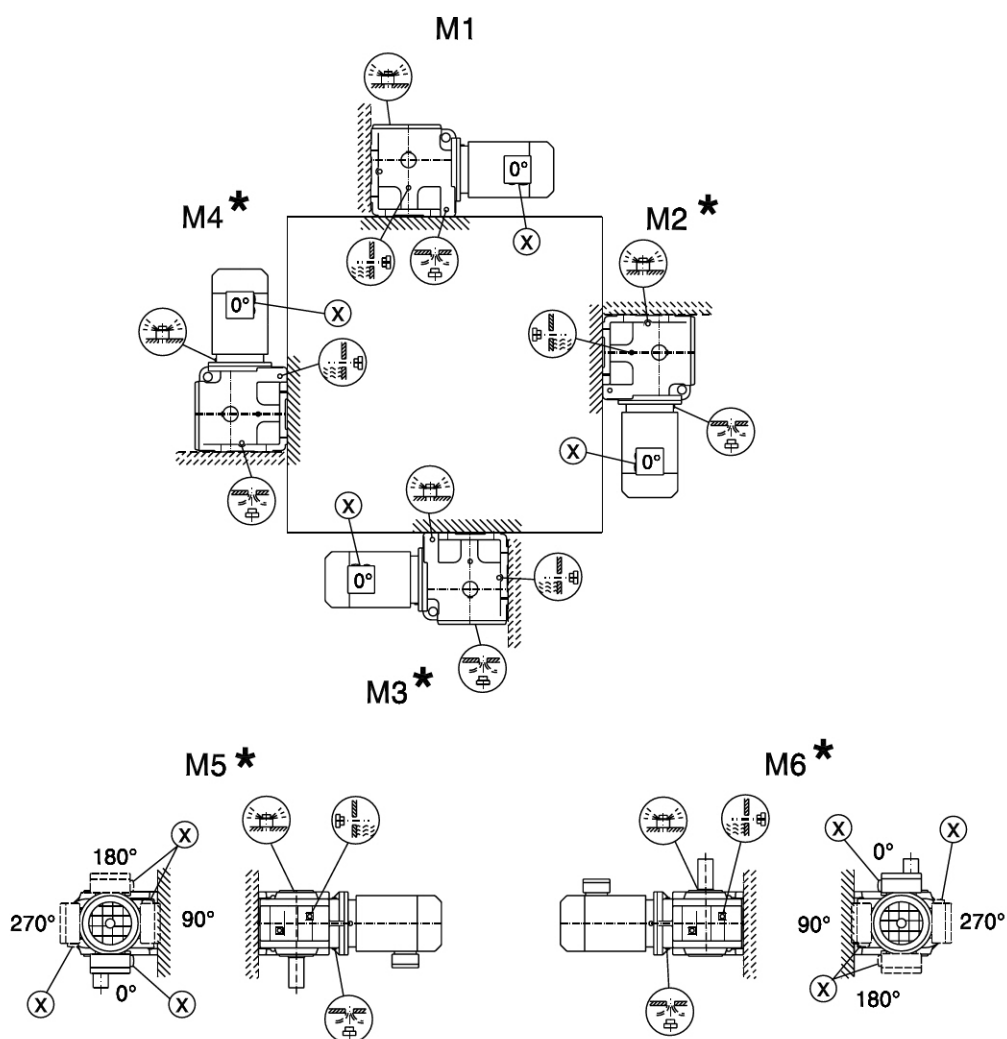
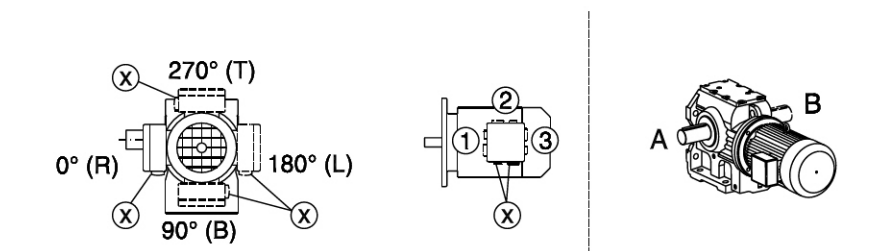
7.7.1 S37

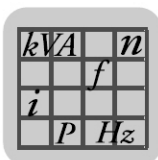
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7.7.2 S47 ... S97

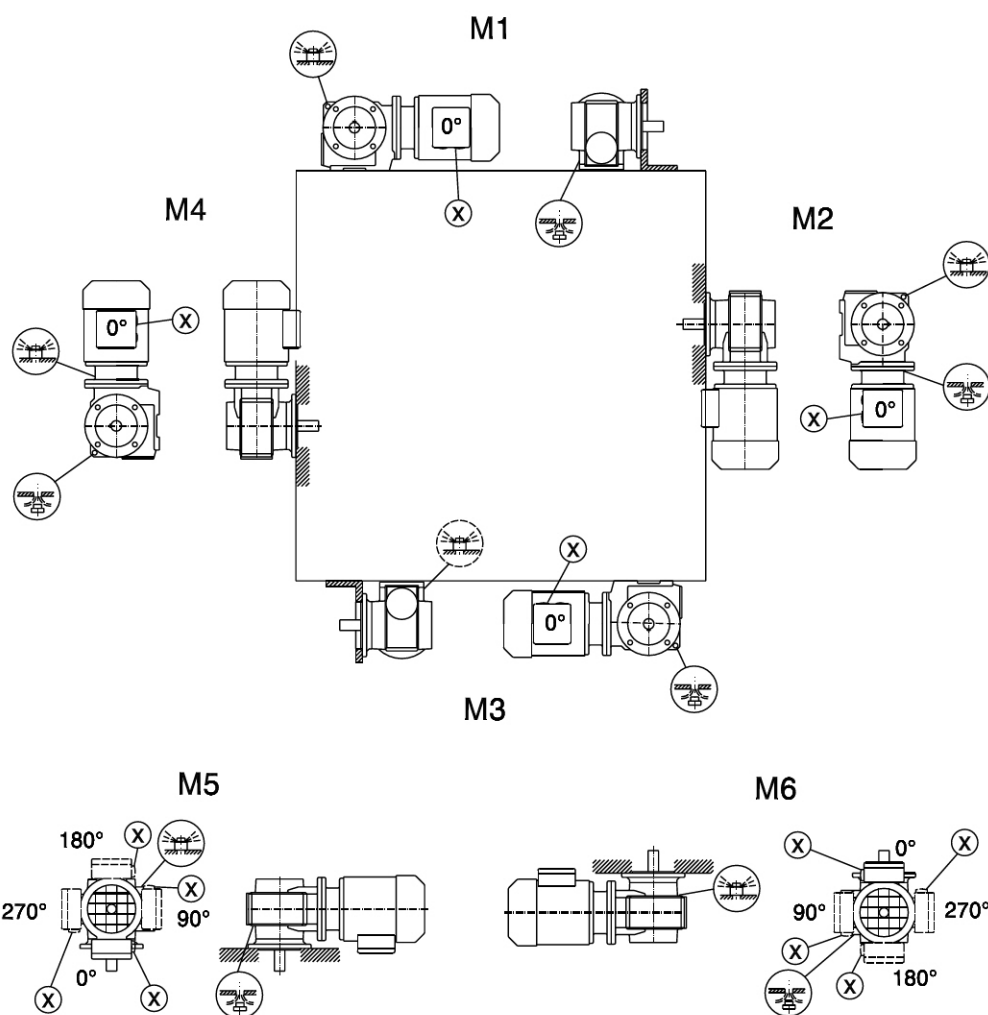
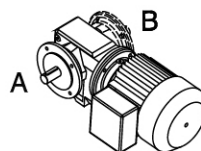
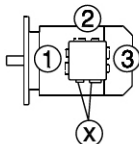
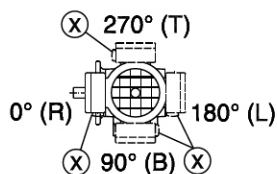
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7.7.3 SF37 / SAF37 / SHF37

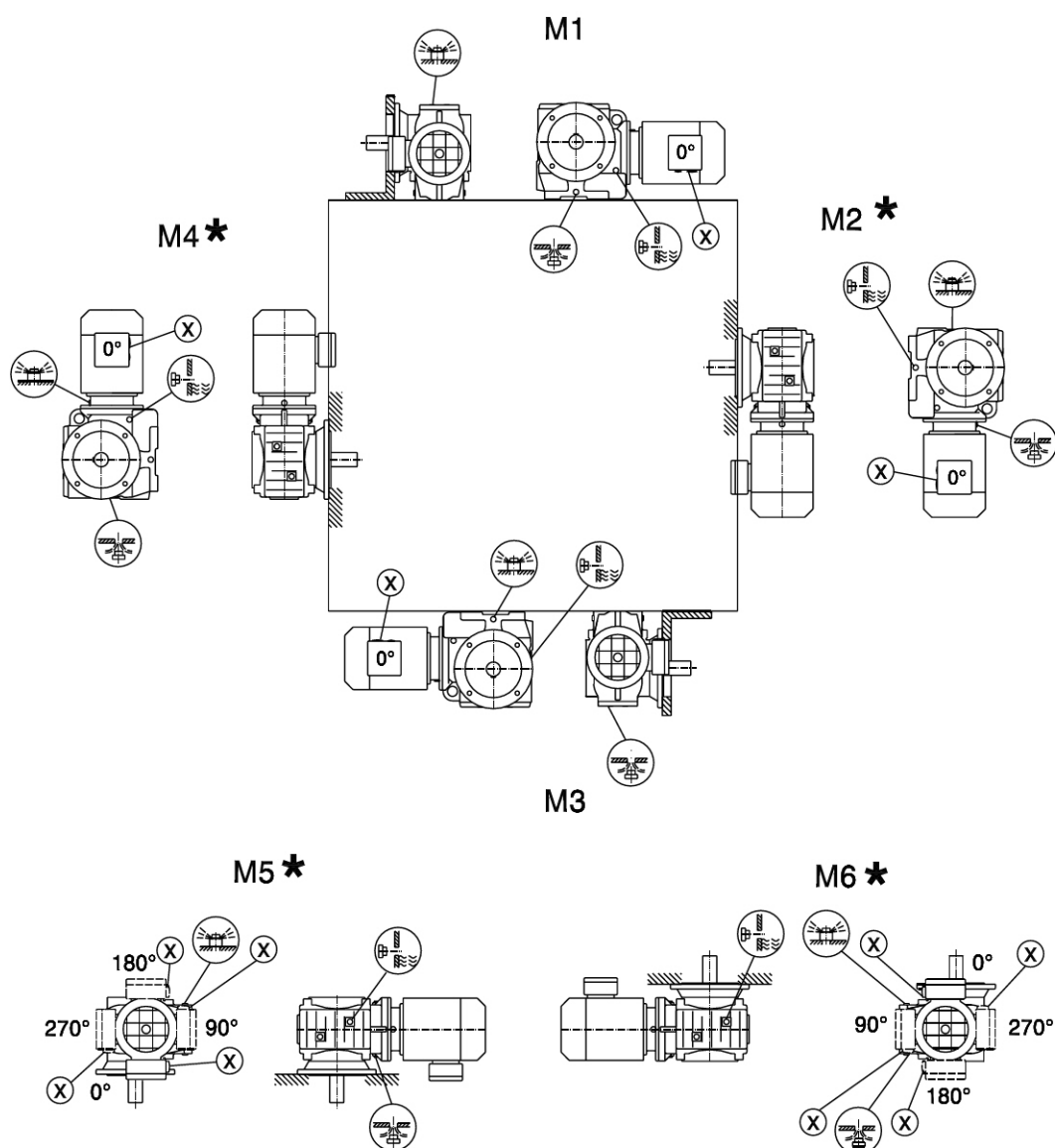
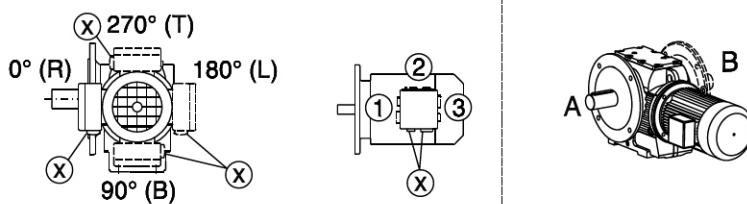
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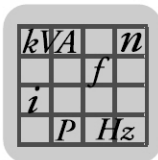


kVA	n
f	
i	
P	H_z

7.7.4 SF47 ... SF97 / SAF47 ... SAF97 / SHF47 ... SHF97 / SAZ47 ... SAZ97 / SHZ47 ... SHZ97

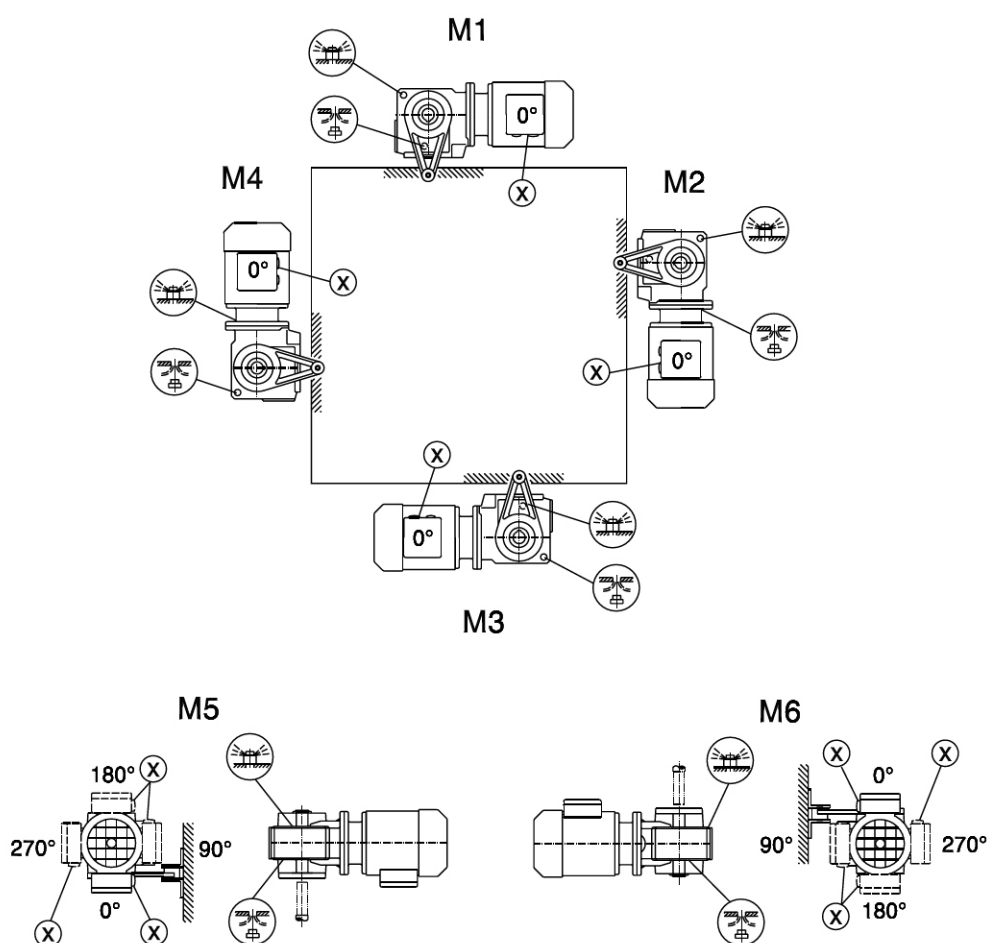
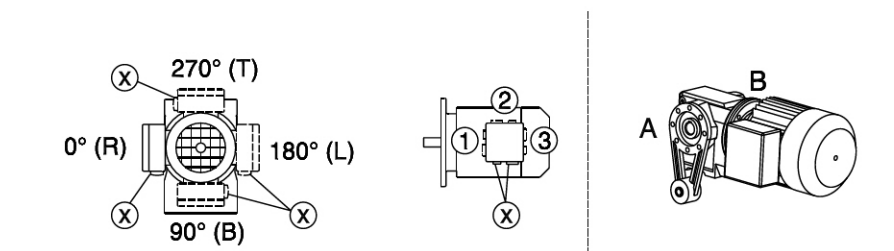
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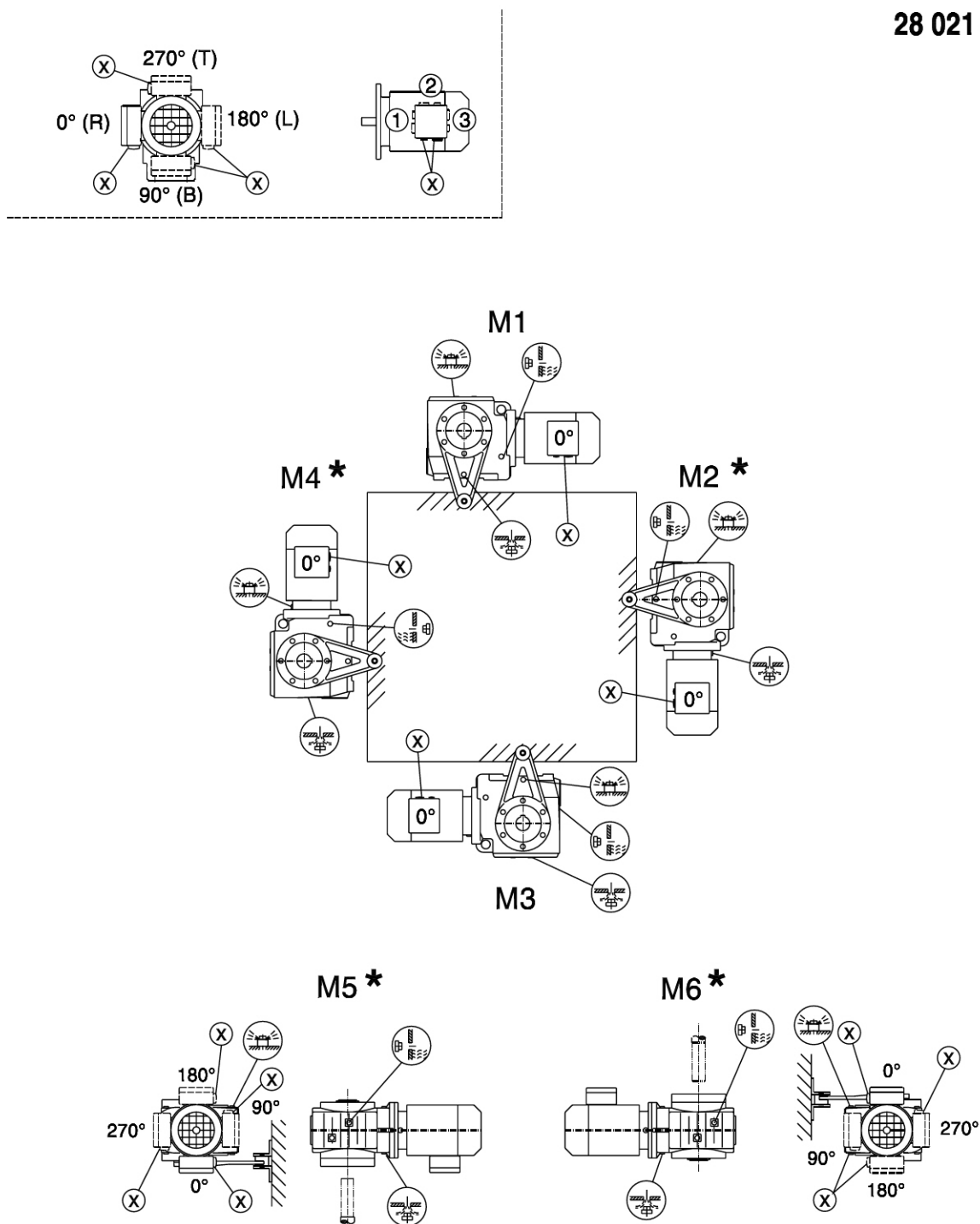
7.7.5 SA37 / SH37 / ST37

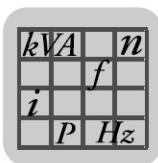
28 020 04 00



7.7.6 SA47 ... SA97 / SH47 ... SH97 / ST47 ... ST97

28 021 03 00

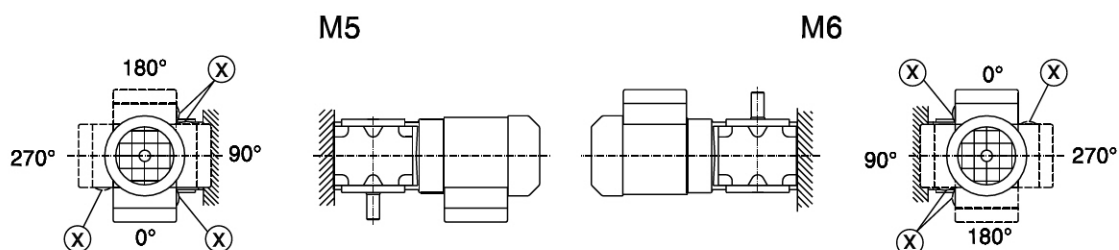
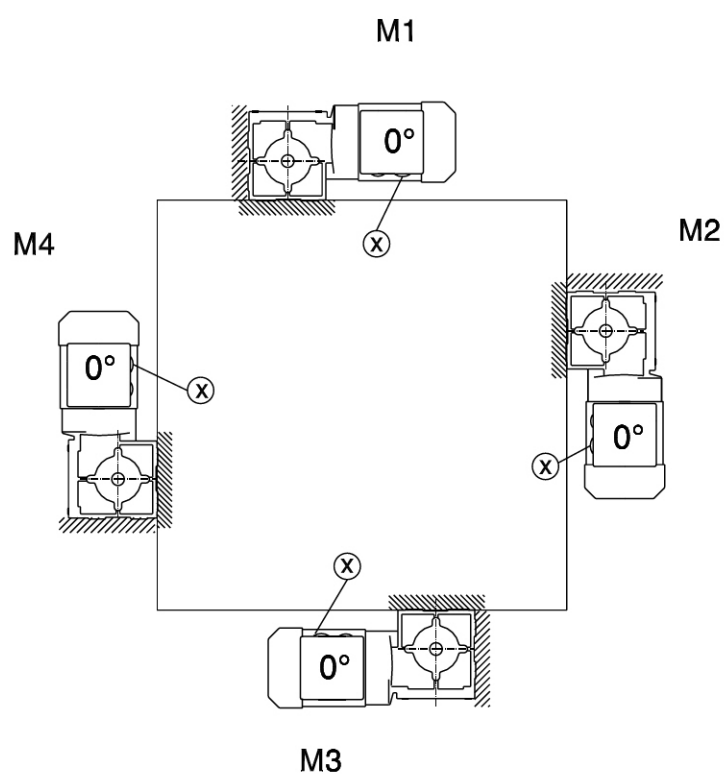
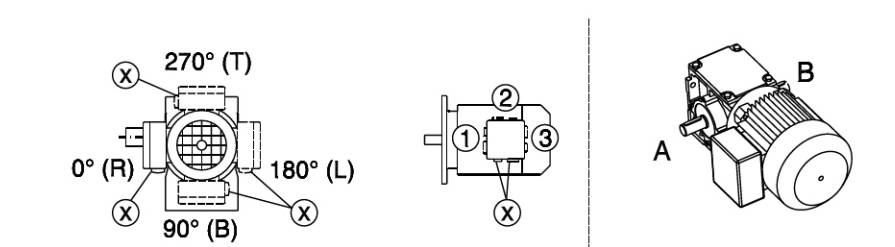




7.8 SPIROPLAN® W gear units

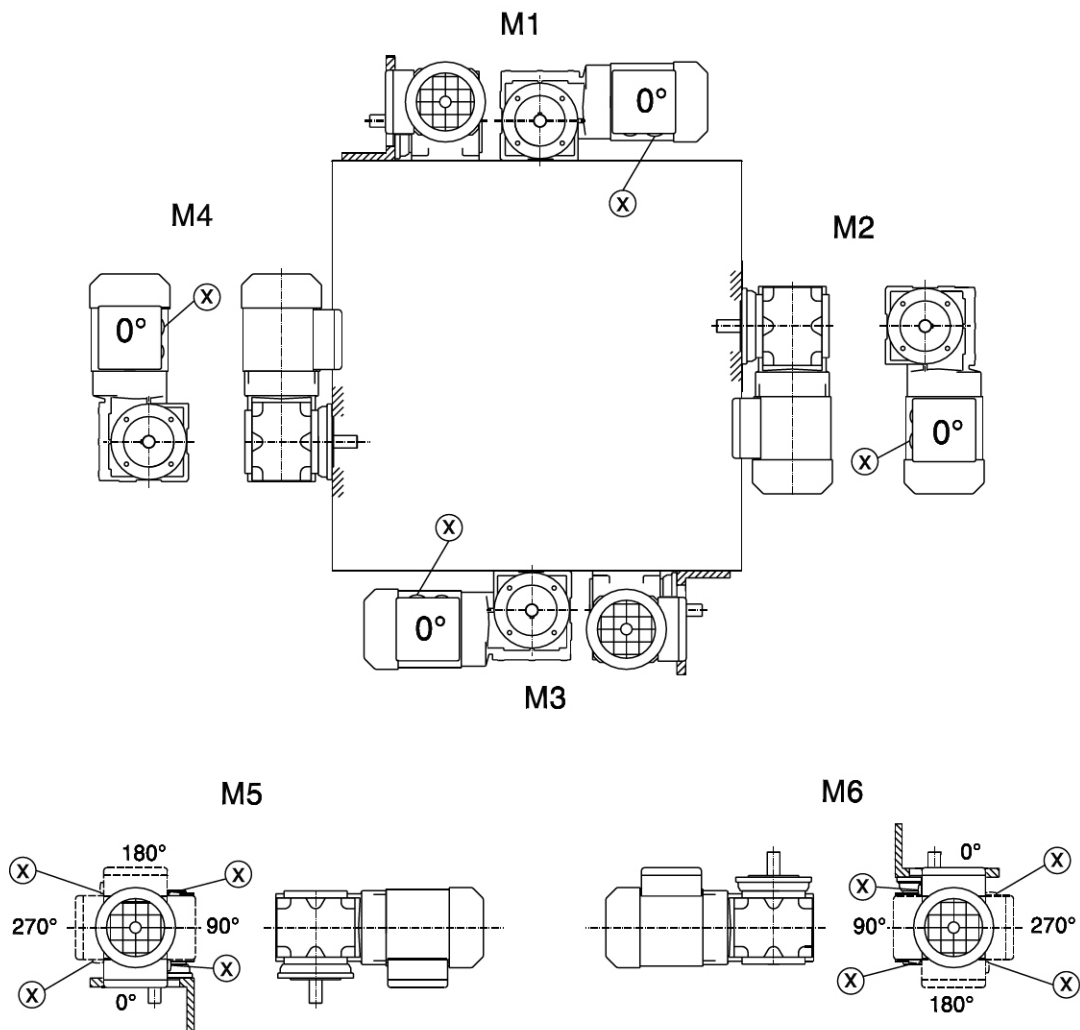
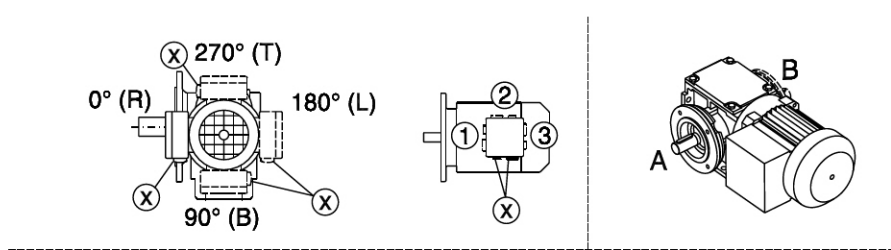
7.8.1 W10 ... W30

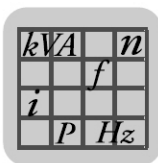
20 001 01 02



7.8.2 WF10 ... WF30 / WAF10 ... WAF30

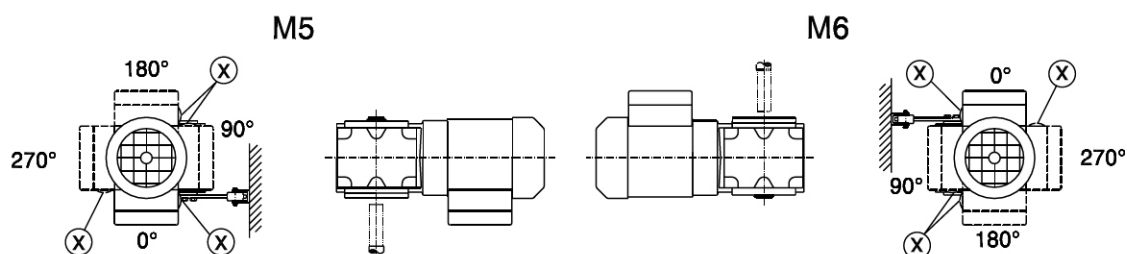
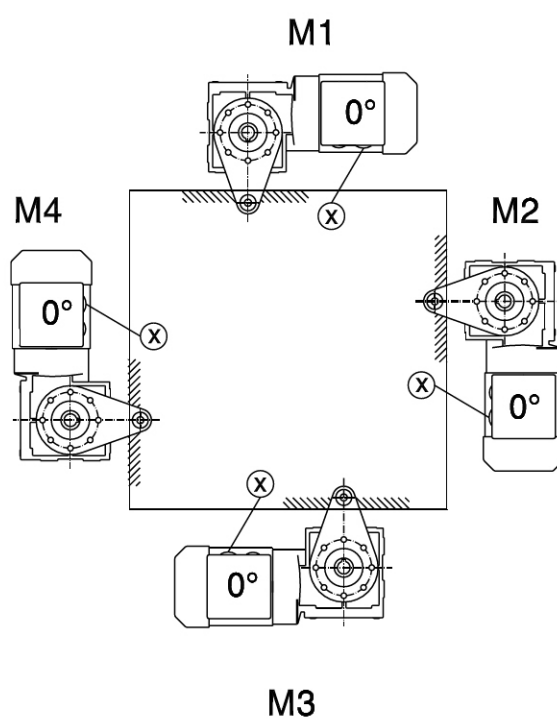
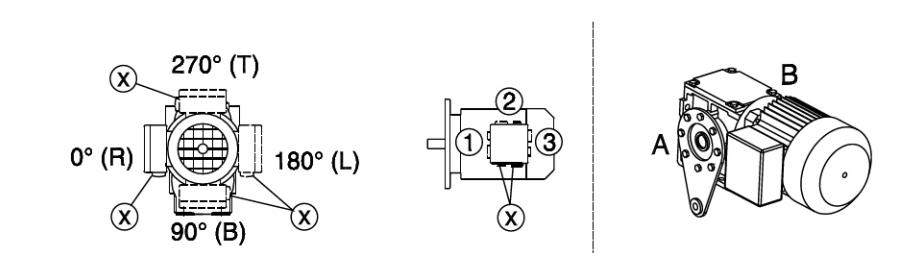
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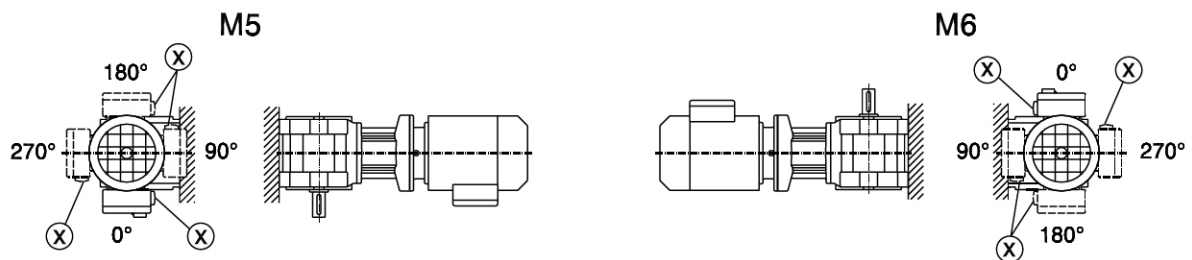
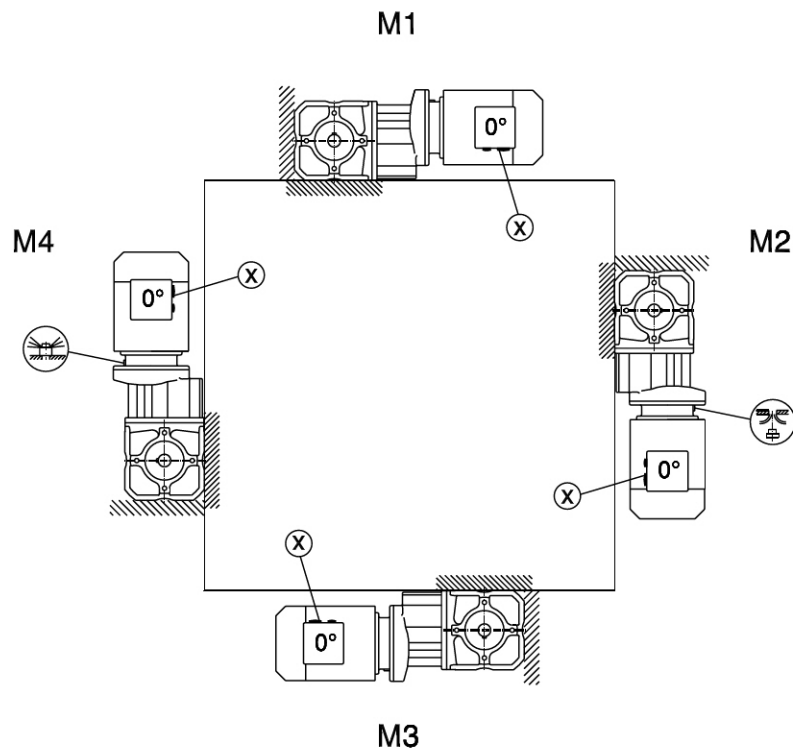
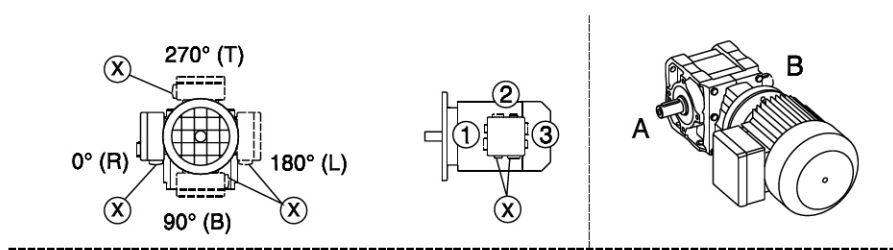
7.8.3 WA10 ... WA30

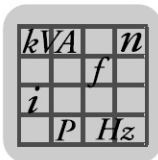
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7.8.4 W37/WA37B/WH37B

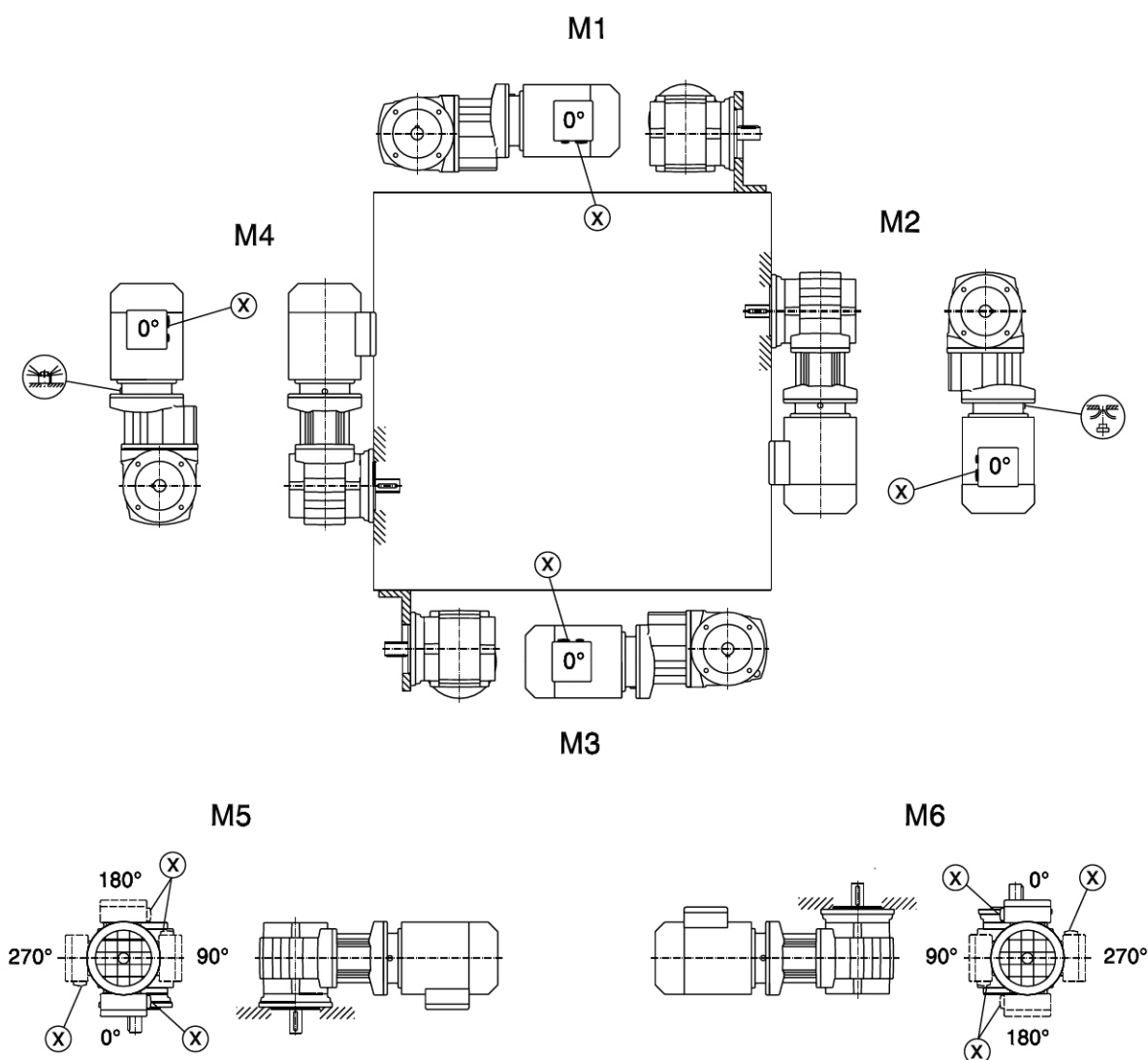
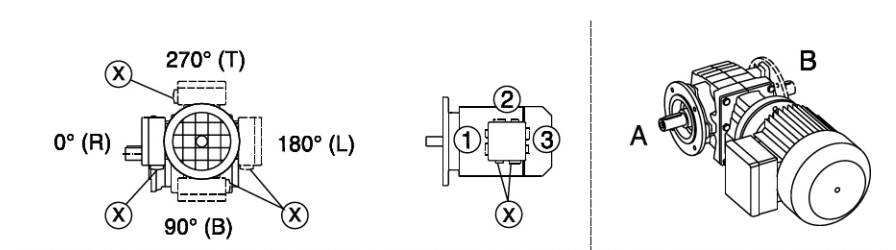
20 012 01 07





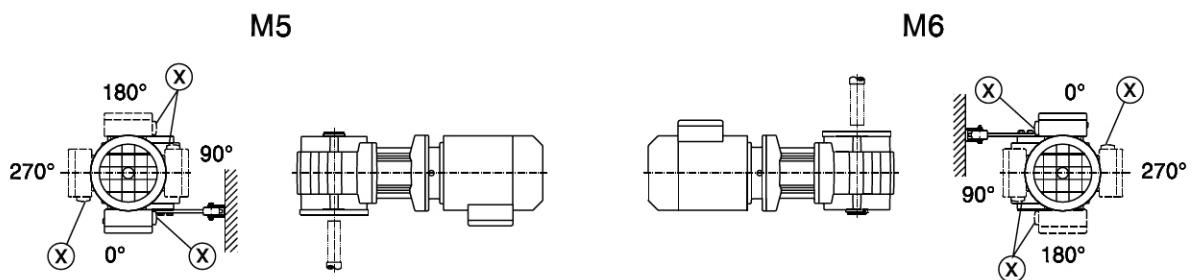
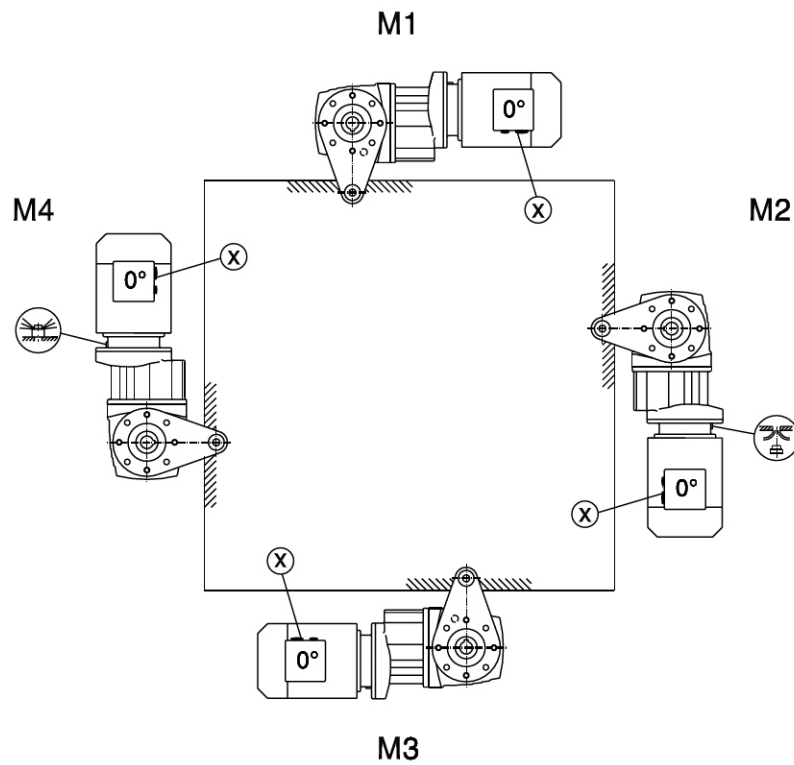
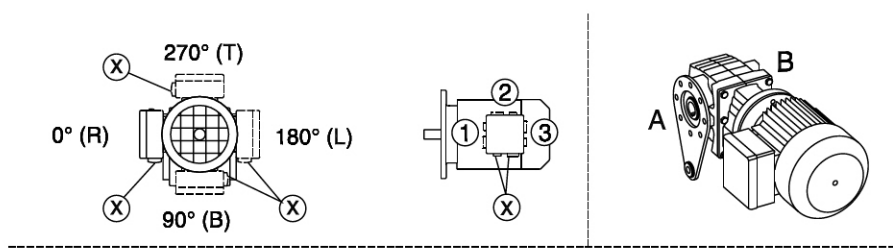
7.8.5 WF37/WAF37/WHF37

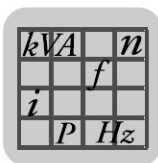
20 013 01 07



7.8.6 WA37 / WH37 / WT 37

20 014 01 07





8 Technical Data

8.1 Extended storage



NOTE

For storage periods longer than 9 months, SEW-EURODRIVE recommends the "Extended storage" design. Gear units in this design are designated with a corresponding label.

In this case, a VCI corrosion inhibitor (volatile corrosion inhibitor) is added to the lubricant in these gear units. Please note that this VCI corrosion inhibitor is only effective in a temperature range of -25 °C ... +50 °C. The flange contact surfaces and shaft ends are also treated with an anti-corrosion agent.

Observe the storage conditions specified in the following table for extended storage:

8.1.1 Storage conditions

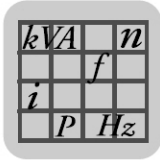
The gear units must remain tightly sealed until taken into operation to prevent the VCI corrosion protection agent from evaporating.

Gear units will be supplied with an oil fill according to the mounting position (M1 ... M6) and are ready for operation. Check the oil level before you start operating the gear unit for the first time!

Climate zone	Packaging ¹⁾	Storage location ²⁾	Storage duration
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap.	With roof, protected against rain and snow, no shock loads.	Up to three years with regular checks of the packaging and moisture indicator (rel. humidity < 50 %).
	Open	Under roof, enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50 % relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). Protected against aggressive vapors and shocks.	Two years or more with regular inspections. Check for cleanliness and mechanical damage during inspection. Check corrosion protection.
Tropical (Asia, Africa, Central and South America, Australia, New Zealand excluding temperate zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap. Protected against insect damage and mildew by chemical treatment.	Under roof, protected against rain and shocks.	Up to three years with regular checks of the packaging and moisture indicator (rel. humidity < 50 %).
	Open	Under roof, enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, < 50 % relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). Protected against aggressive vapors and shocks. Protected against insect damage.	Two years or more with regular inspections. Check for cleanliness and mechanical damage during inspection. Check corrosion protection.

1) Packaging must be carried out by an experienced company using the packaging materials that have been explicitly specified for the particular application.

2) SEW-EURODRIVE recommends to store the gear units according to the mounting position.



8.2 Lubricants

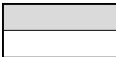



Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific gear unit and mounting position. You have to specify the mounting position (M1...M6, see section. "Mounting Positions") when you order the drive. You must adapt the lubricant fill in case of any subsequent changes made to the mounting position (→ Lubricant fill quantities).

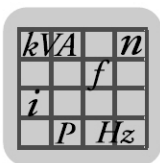
8.2.1 Lubricant table

The lubricant table on the following page shows the permitted lubricants for SEW-EURODRIVE gear units. Observe the following legend with regards to the lubricant table.

Key to the lubricant table



Abbreviations used, meaning of shading, and notes:

- CLP = Mineral oil
- CLP PG = Polyglycol (W gear units, conforms to USDA-H1)
- CLP HC = Synthetic hydrocarbons
- E = Ester oil (water hazard class 1 (German regulation))
- HCE = Synthetic hydrocarbons + ester oil (USDA - H1 certification)
- HLP = Hydraulic oil
-  = Synthetic lubricant (= synthetic-based anti-friction bearing grease)
-  = Mineral lubricant (= mineral-based anti-friction bearing grease)
- 1) Helical-worm gear units with PG oil: Please coordinate with SEW
- 2) Special lubricant for Spiroplan® gear units only
- 3) Recommendation: Select SEW $f_B \geq 1.2$
- 4) Pay attention to critical starting behavior at low temperatures!
- 5) Low-viscosity grease
- 6) Ambient temperature
-  Lubricant for the food industry (food grade oil)
-  Biodegradable oil (lubricant for agriculture, forestry, and fisheries)



Anti-friction bearing greases

The anti-friction bearings in gear units and motors are given a factory-fill with the greases listed below. SEW-EURODRIVE recommends regreasing anti-friction bearings with a grease fill at the same time as changing the oil.

	Ambient temperature	Manufacturer	Type
Gear unit anti-friction bearings	-40 °C ... +80 °C	Fuchs	Renolit CX-TOM 15
	-30 °C ... +40 °C	Aral	Eural Grease EP 2
	-20 °C ... +40 °C	Aral	Aralube BAB EP2













NOTE

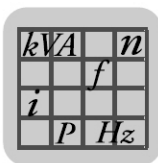
The following grease quantities are required:

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

Lubricant table

01 805 10 92

			ISO, NLGI	Mobil®								
R...		CLP (CC)	VG 220	Mobilgear 600 XP 220	Shell Omala 220	Klüberoil GEM 1-220 N	Aral Degol BG 220	BP Energol GR-XP 220	Meropa 220	Tribol 1100/220	Renolin CLP 220	Carter EP 220
K...(HK...)		CLP PG	VG 220	Mobil Glycoyle 30	Shell Tellus S 220	Klüberoil GEM 6-220	Aral Degol GS 220	BP Energol SG-XP 220	Synlube CLP 220	Tribol 800/220	Renolin CLP 220	Carter SY 220
F...		CLP HC	VG 220	Mobil SHC 630	Shell Omala HD 220	Klüberoil GEM 4-220 N	Aral Degol PAS 220		Pinnacle EP 220	Tribol 1510/220	Renolin Unisyn CLP 220	
			VG 150	Mobil SHC 629	Shell Omala HD 150	Klüberoil GEM 4-150 N			Pinnacle EP 150			Carter SH 150
		CLP (CC)	VG 150	Mobilgear 600 XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Meropa 150	Tribol 1100/100	Renolin CLP 150	Carter EP 100
		HLP (HM)	VG 32	Mobil D.T.E. 13M	Shell Tellus T 32	Klüberoil GEM 1-68 N	Aral Degol BG 46		Rando EP	Tribol 1100/68	Renolin B 46 HVI	Equi-vis ZS 46
		CLP HC	VG 68	Mobil SHC 626								
		CLP HC	VG 32	Mobil SHC 624	Shell Tellus T 15	Klüberoil GEM 1-32						Dacnis SH 32
		HLP (HM)	VG 15	Mobil D.T.E. 11M	Shell Tellus T 15	Isotex MT 30 ROT		BP Energol HLP-HM 15	Rando HDZ 15			Equi-vis ZS 15
		CLP (CC)	VG 680	Mobilgear 600 XP 680	Shell Omala 680	Klüberoil GEM 1-680 N	Aral Degol BG 680	BP Energol GR-XP 680	Meropa 680	Tribol 1100/680	Renolin SEW 680	Carter EP 680
		CLP PG	VG 680		Shell Omala S 680	Klüberoil GEM 6-680		BP Energol SG-XP 680	Synlube CLP 680	Tribol 800/680		
		CLP HC	VG 460	Mobil SHC 634	Shell Omala HD 460	Klüberoil GEM 4-460 N			Pinnacle EP 460			
			VG 150	Mobil SHC 629	Shell Omala HD 150	Klüberoil GEM 4-150 N			Pinnacle EP 150			Carter SH 150
		CLP (CC)	VG 150	Mobilgear 600 XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Meropa 150	Tribol 1100/100	Renolin CLP 150	Carter EP 100
		CLP PG	VG 220	Mobil Glycoyle 30	Shell Tellus S 220	Klüberoil GEM 6-220	Aral Degol GS 220	BP Energol SG-XP 220	Synlube CLP 220	Tribol 800/220		Carter SY 220
		CLP HC	VG 68	Mobil SHC 626								
		CLP HC	VG 32	Mobil SHC 624	Shell Omala 32	Klüberoil GEM 1-32			Cetus PAO 46			Dacnis SH 32
		HCE	VG 460		Shell Cassida Fluid GL 460	Klüberoil 4UH1-460 N	Aral Eural Gear 460					
		E	VG 460			Klüberoil CA2-460	Aral Degol BAB 460			Tribol Bio Top 1418/460		
		SEW PG	VG 460			Klüberoil HT-460-5						
		API GL5	SAE 75W90 (-VG 100)	Delvac Synth. GearOil LS 75 W90								
		CLP PG	VG 460			Klüberoil UH1 6-460						
			00	Glygoyle Grease 00	Shell Tellus GL 00	Klüberoil GE 46-1200			Multifak 6833 EP 00		Sphereol EPL 0	Marson SY 00
		DIN 51 818	000 - 0	Mobilux EP 004	Shell Alvania GL 00		Aralub MFL 00	BP Energol LS-EP 00	Multifak EP 000		Renolin SF 7 - 041	Multis EP 00



8.2.2 Lubricant fill quantities

The specified fill quantities are **recommended values**. The precise values vary depending on the number of stages and gear ratio. When filling, it is essential to check the **oil level plug** since it indicates the precise oil capacity.

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

Helical (R) gear units

R...

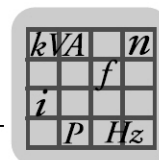
Gear unit	Fill quantity in liters					
	M1 ¹⁾	M2 ¹⁾	M3	M4	M5	M6
R07	0.12	0.20	0.20	0.20	0.20	0.20
R17	0.25	0.55	0.35	0.55	0.35	0.40
R27	0.25/0.40	0.70	0.50	0.70	0.50	0.50
R37	0.30/0.95	0.85	0.95	1.05	0.75	0.95
R47	0.70/1.50	1.60	1.50	1.65	1.50	1.50
R57	0.80/1.70	1.90	1.70	2.10	1.70	1.70
R67	1.10/2.30	2.40/3.20	2.80	2.90	1.80	2.00
R77	1.20/3.00	3.30/4.20	3.60	3.80	2.50	3.40
R87	2.30/6.0	6.4/8.1	7.2	7.2	6.3	6.5
R97	4.60/9.8	11.7/14.0	11.7	13.4	11.3	11.7
R107	6.0/13.7	16.3	16.9	19.2	13.2	15.9
R137	10.0/25.0	28.0	29.5	31.5	25.0	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 multi-stage gear units must be filled with the larger oil volume.

RF..

Gear unit	Fill quantity in liters					
	M1 ¹⁾	M2 ¹⁾	M3	M4	M5	M6
RF07	0.12	0.20	0.20	0.20	0.20	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	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	1.50
RF57	0.80/1.70	1.80	1.70	2.00	1.70	1.70
RF67	1.20/2.50	2.50/3.20	2.70	2.80	1.90	2.10
RF77	1.20/2.60	3.10/4.10	3.30	3.60	2.40	3.00
RF87	2.40/6.0	6.4/8.2	7.1	7.2	6.3	6.4
RF97	5.1/10.2	11.9/14.0	11.2	14.0	11.2	11.8
RF107	6.3/14.9	15.9	17.0	19.2	13.1	15.9
RF137	9.5/25.0	27.0	29.0	32.5	25.0	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 multi-stage gear units must be filled with the larger oil volume.

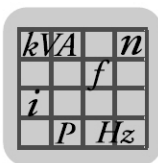


RX..

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

RXF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RXF57	0.50	0.80	1.10	1.10	0.70	0.70
RXF67	0.70	0.80	1.50	1.40	1.00	1.00
RXF77	0.90	1.30	2.40	2.00	1.60	1.60
RXF87	1.60	1.95	4.90	3.95	2.90	2.90
RXF97	2.10	3.70	7.1	6.3	4.80	4.80
RXF107	3.10	5.7	11.2	9.3	7.2	7.2



Parallel shaft heli-
cal (F) gear units

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

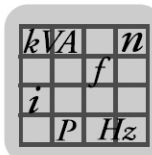
Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.60	3.50	2.10	3.50	2.80	2.90
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.9	7.3	4.30	8.0	6.0	6.3
F..87	10.8	13.0	7.7	13.8	10.8	11.0
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	40.5	54.5	34.0	61.0	46.3	47.0
F..157	69.0	104.0	63.0	105.0	86.0	78.0

FF..

Gear unit	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	2.80	3.50	2.10	3.70	2.90	3.00
FF67	2.70	3.80	1.90	3.80	2.90	3.20
FF77	5.9	7.3	4.30	8.1	6.0	6.3
FF87	10.8	13.2	7.8	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	41.5	55.5	34.0	63.0	46.3	49.0
FF157	72.0	105.0	64.0	106.0	87.0	79.0

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

Gear unit	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	5.9	7.3	4.30	8.0	6.0	6.3
F..87	10.8	13.0	7.7	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	39.0	54.5	34.0	61.0	45.0	46.5
F..157	68.0	103.0	62.0	104.0	85.0	77.0



Helical-bevel (K)
gear units

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

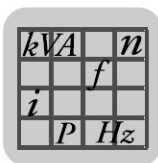
Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..37	0.50	1.00	1.00	1.25	0.95	0.95
K..47	0.80	1.30	1.50	2.00	1.60	1.60
K..57	1.10	2.20	2.20	2.80	2.30	2.10
K..67	1.10	2.40	2.60	3.45	2.60	2.60
K..77	2.20	4.10	4.40	5.8	4.20	4.40
K..87	3.70	8.0	8.7	10.9	8.0	8.0
K..97	7.0	14.0	15.7	20.0	15.7	15.5
K..107	10.0	21.0	25.5	33.5	24.0	24.0
K..127	21.0	41.5	44.0	54.0	40.0	41.0
K..157	31.0	62.0	65.0	90.0	58.0	62.0
K..167	33.0	95.0	105.0	123.0	85.0	84.0
K..187	53.0	152.0	167.0	200	143.0	143.0

KF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF37	0.50	1.10	1.10	1.50	1.00	1.00
KF47	0.80	1.30	1.70	2.20	1.60	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	2.70
KF77	2.10	4.10	4.40	5.9	4.50	4.50
KF87	3.70	8.2	9.0	11.9	8.4	8.4
KF97	7.0	14.7	17.3	21.5	15.7	16.5
KF107	10.0	21.8	25.8	35.1	25.2	25.2
KF127	21.0	41.5	46.0	55.0	41.0	41.0
KF157	31.0	66.0	69.0	92.0	62.0	62.0

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..37	0.50	1.00	1.00	1.40	1.00	1.00
K..47	0.80	1.30	1.60	2.15	1.60	1.60
K..57	1.20	2.20	2.40	3.15	2.70	2.40
K..67	1.10	2.40	2.70	3.70	2.60	2.60
K..77	2.10	4.10	4.60	5.9	4.40	4.40
K..87	3.70	8.2	8.8	11.1	8.0	8.0
K..97	7.0	14.7	15.7	20.0	15.7	15.7
K..107	10.0	20.5	24.0	32.4	24.0	24.0
K..127	21.0	41.5	43.0	52.0	40.0	40.0
K..157	31.0	66.0	67.0	87.0	62.0	62.0
K..167	33.0	95.0	105.0	123.0	85.0	84.0
K..187	53.0	152.0	167.0	200	143.0	143.0



Helical-worm (S) gear units

S

Gear unit	Fill quantity in liters					
	M1	M2	M3 ¹⁾	M4	M5	M6
S..37	0.25	0.40	0.50	0.55	0.40	0.40
S..47	0.35	0.80	0.70/0.90	1.00	0.80	0.80
S..57	0.50	1.20	1.00/1.20	1.45	1.30	1.30
S..67	1.00	2.00	2.20/3.10	3.10	2.60	2.60
S..77	1.90	4.20	3.70/5.4	5.9	4.40	4.40
S..87	3.30	8.1	6.9/10.4	11.3	8.4	8.4
S..97	6.8	15.0	13.4/18.0	21.8	17.0	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
SF37	0.25	0.40	0.50	0.55	0.40	0.40
SF47	0.40	0.90	0.90/1.05	1.05	1.00	1.00
SF57	0.50	1.20	1.00/1.50	1.55	1.40	1.40
SF67	1.00	2.20	2.30/3.00	3.20	2.70	2.70
SF77	1.90	4.10	3.90/5.8	6.5	4.90	4.90
SF87	3.80	8.0	7.1/10.1	12.0	9.1	9.1
SF97	7.4	15.0	13.8/18.8	22.6	18.0	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..

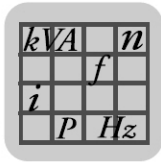
Gear unit	Fill quantity in liters					
	M1	M2	M3 ¹⁾	M4	M5	M6
S..37	0.25	0.40	0.50	0.50	0.40	0.40
S..47	0.40	0.80	0.70/0.90	1.00	0.80	0.80
S..57	0.50	1.10	1.00/1.50	1.50	1.20	1.20
S..67	1.00	2.00	1.80/2.60	2.90	2.50	2.50
S..77	1.80	3.90	3.60/5.0	5.8	4.50	4.50
S..87	3.80	7.4	6.0/8.7	10.8	8.0	8.0
S..97	7.0	14.0	11.4/16.0	20.5	15.7	15.7

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

Spiroplan® (W) gear units

The fill quantity of Spiroplan® gear units W10, W20 and W30 does not vary, regardless of the mounting position. Only the Spiroplan® W37 gear unit has a different fill quantity in M4 mounting position.

Gear unit	Fill quantity in liters, regardless of mounting position
W..10	0.16
W..20	0.24
W..30	0.40
W..37	0.50
W..37 in M4	0.70



9 Malfunctions/Service



CAUTION!

Improper handling of the gear unit and the motor may lead to damages.

Potential damage to property!

- Any repair work on SEW drives may be performed by qualified personnel only.
- Only qualified personnel is permitted to separate drive and motor.
- Consult SEW-EURODRIVE customer service.

9.1 Gear unit

Malfunction	Possible cause	Remedy
Unusual, regular running noise	Meshing/grinding noise: Bearing damage	Check the oil →see "Inspection/maintenance for the gear unit" (see page 64), change bearings.
	Knocking noise: Irregularity in the gearing	Contact customer service
Unusual, irregular running noise	Foreign bodies in the oil	<ul style="list-style-type: none"> • Check the oil →see "Inspection/maintenance for the gear unit" (see page 64), • Stop the drive, contact customer service
Oil leaking ¹⁾ <ul style="list-style-type: none"> • From gear unit cover • at the motor flange • at the motor oil seal • at the gear unit flange • From the output end oil seal 	Rubber seal on the gear cover plate leaking	Tighten the screws on the gear cover plate and observe the gear unit. If oil still leaks: Contact customer service
	Seal defective	Contact customer service
	Gear unit not ventilated	Vent the gear unit → see "Mounting Positions" (see page 79)
Oil leaking from breather valve	Too much oil	Correct the oil fill quantity →see "Inspection/maintenance for the gear unit" (see page 64),
	Drive operated in incorrect mounting position	<ul style="list-style-type: none"> • Properly adjust the breather valve → see "Mounting Positions" (see page 79) • Correct the oil level →see "Inspection/maintenance for the gear unit" (see page 64),
	Frequent cold starts (oil foams) and/or high oil level.	Use an oil expansion tank
Output shaft does not turn although the motor is running or the input shaft is rotated	Connection between shaft and hub in gear unit interrupted	Send in the gear unit/gearmotor for repair.

1) Short-term oil / grease leakage at the oil seal is possible in the run-in phase (48 hours running time).



9.2 **AM / AQ / AL. adapter**

Malfunction	Possible cause	Remedy
Unusual, regular running noise	Meshing/grinding noise: Bearing damage.	Contact SEW-EURODRIVE customer service
Oil leaking	Seal defective	Contact SEW-EURODRIVE customer service
Output shaft does not turn although the motor is running or the input shaft is rotated	Connection between shaft and hub in gear unit interrupted	Send the gear unit to SEW-EURODRIVE for repair.
Change in running noise and / or vibrations.	Annular gear wear, short-term torque transfer through metal contact	Change the annular gear
	Bolts to secure hub axially are loose.	Tighten the screws
Premature wear in annular gear	<ul style="list-style-type: none"> • Contact with aggressive fluids / oils; ozone influence; too high ambient temperatures etc, which can cause a change in the physical properties of the annular gear. • Impermissibly high ambient/contact temperature for the annular gear; maximum permitted temperature: 20°C to +80°C • Overload 	Contact SEW-EURODRIVE customer service

9.3 **AD input cover**

Malfunction	Possible cause	Remedy
Unusual, regular running noise	Meshing/grinding noise: Bearing damage.	Contact SEW-EURODRIVE customer service
Oil leaking	Seal defective	Contact SEW-EURODRIVE customer service
Output shaft does not turn although the input shaft is rotated.	Connection between shaft and hub in gear unit or cover interrupted	Send the gear unit to SEW-EURODRIVE for repair.



9.4 Customer service

Please have the following information available if you require customer service assistance:

- Nameplate data (complete)
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause

9.5 Disposal

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

- Steel scrap
 - Housing parts
 - Gears
 - Shafts
 - Anti-friction bearing
- Parts of the worm gears are made of non-ferrous metals. Dispose of the worm gears as appropriate.
- Collect waste oil and dispose of it according to the regulations in force.



10 Address List

Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Service Compe- tence Center	Central	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dankritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
	Additional addresses for service in Germany provided on request!		
France			
Production Sales Service	Hagenau	SEW-USOCOME 48-54, route de Soufflenheim B. P. 20185 F-67506 Hagenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocom.com sew@usocom.com
Production	Forbach	SEW-EUROCOME Zone Industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
Assembly Sales Service	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62, avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'Affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Paris	SEW-USOCOME Zone industrielle 2, rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Additional addresses for service in France provided on request!			



Algeria			
Sales	Alger	Réducom 16, rue des Frères Zagnoun Bellevue El-Harrach 16200 Alger	Tel. +213 21 8222-84 Fax +213 21 8222-84 reducom_sew@yahoo.fr
Argentina			
Assembly Sales Service	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar
Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
	Townsville	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au
Austria			
Assembly Sales Service	Wien	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://sew-eurodrive.at sew@sew-eurodrive.at
Belarus			
Sales	Minsk	SEW-EURODRIVE BY Rybalko Str. 26 BY-220033 Minsk	Tel. +375 (17) 298 38 50 Fax +375 (17) 29838 50 sales@sew.by
Belgium			
Assembly Sales Service	Brüssel	SEW Caron-Vector S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.sew-eurodrive.be info@caron-vector.be
Service Competence Center	Industrial Gears	SEW Caron-Vector S.A. Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be
Brazil			
Production Sales Service	Sao Paulo	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 152 – Rodovia Presidente Dutra Km 208 Guarulhos – 07251-250 - SP SAT – SEW ATENDE – 0800 7700496	Tel. +55 11 6489-9133 Fax +55 11 6480-3328 http://www.sew.com.br sew@sew.com.br
Additional addresses for service in Brazil provided on request!			
Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@fastbg.net



Cameroon			
Sales	Douala	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 33 431137 Fax +237 33 431137
Canada			
Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, Ontario L6T3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca marketing@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. 7188 Honeyman Street Delta, B.C. V4G 1 E2	Tel. +1 604 946-5535 Fax +1 604 946-2513 marketing@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger LaSalle, Quebec H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 marketing@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		
Chile			
Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25322611 info@sew-eurodrive.cn http://www.sew-eurodrive.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267891 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
Additional addresses for service in China provided on request!			
Colombia			
Assembly Sales Service	Bogotá	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. PIT Erdödy 4 II HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr



Czech Republic			
Sales	Praha	SEW-EURODRIVE CZ S.R.O. Business Centrum Praha Lužná 591 CZ-16000 Praha 6 - Vokovice	Tel. +420 220121234 Fax +420 220121237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Kopenhagen	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Sales Service	Cairo	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 22566-299 + 1 23143088 Fax +20 2 22594-757 http://www.copam-egypt.com/ copam@datum.com.eg
Estonia			
Sales	Tallin	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee
Finland			
Assembly Sales Service	Lahti	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 sew@sew.fi http://www.sew-eurodrive.fi
Production Assembly Service	Karkkila	SEW Industrial Gears OY Valurinkatu 6 FIN-03600 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi
Gabon			
Sales	Libreville	Electro-Services B.P. 1889 L breville	Tel. +241 7340-11 Fax +241 7340-12
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate P.O. Box No.1 GB-Normanton, West- Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Greece			
Sales Service	Athen	Christ. Boznos & Son S.A. 12, Mavromichali Street P.O. Box 80136, GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hong Kong			
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		24 Hour Service	Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
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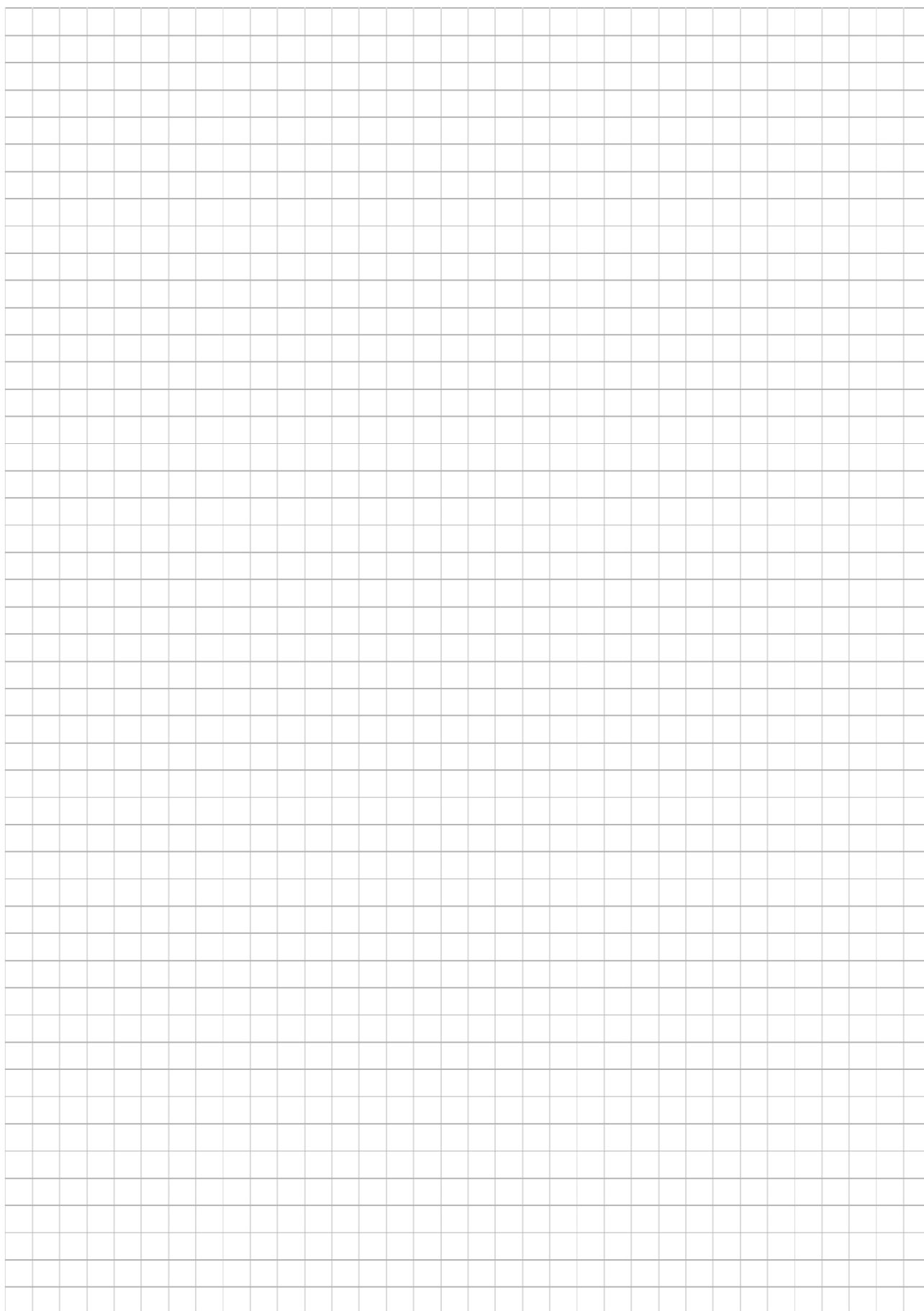
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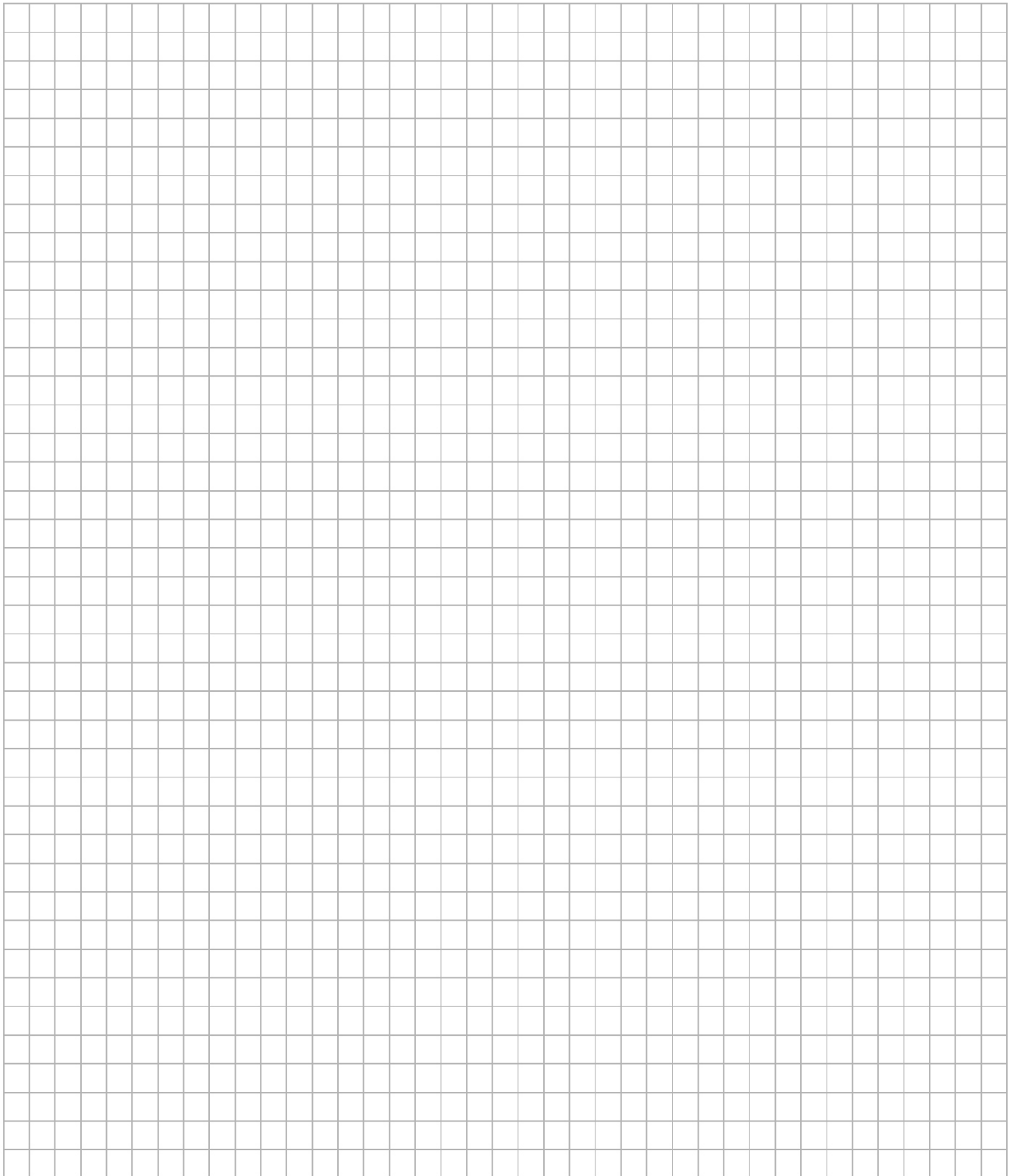
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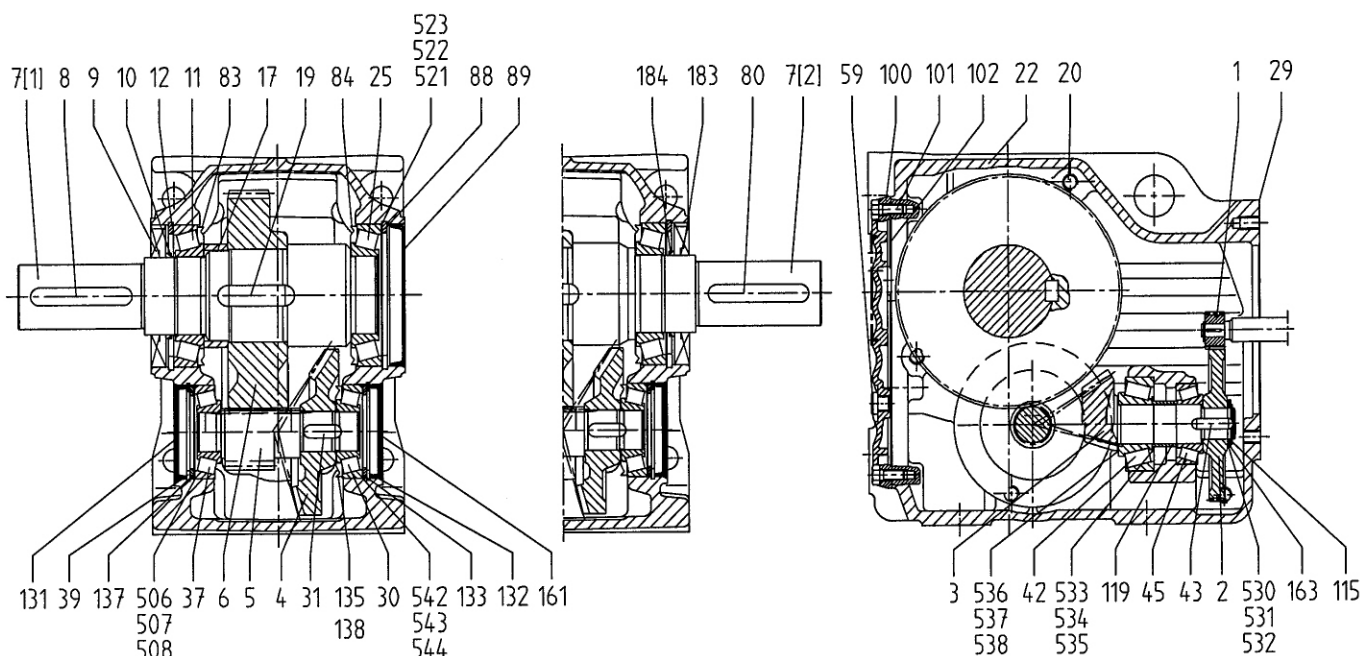
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Parts List

Helical-bevel gear units K77A [1], K77A with 2.shaft end [2]

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No.	Description	DIN standard label	Part No.	Qty	No.	Description	DIN standard label	Part No.	Qty
1	Pinion		*	1	19	Key	DIN6885 B16x10x45-C45K	0 013 479 1	1
2	Wheel		*	1	20	Vent Valve	M12x1,5-MS	0 013 031 1	1
3	Pinion shaft		*	1	22	Gear Housing		0 643 019 8	1
4	Gear wheel		*	1	25	Tapered Roller Bear.	DIN720 302 12	0 013 937 8	1
5	Pinion Shaft 5		*	1	29	Sealing Compound		0 910 255 8	X)
6	Wheel		*	1	30	Tapered Roller Bear.	DIN720 303 06	0 012 477 X	1
7	Output Shaft [1]	Ø 50x100 mm	0 643 263 8	1	31	Key	DIN6885 AB10x8x25-55HRC	0 013 544 5	1
7	Output Shaft (inch) [1]	Ø 2.000x3.94 in.	0 643 311 1	1	37	Tapered Roller Bear.	DIN720 303 06	0 012 477 X	1
7	Double Output Shaft [2]	Ø 50x100 mm	0 643 385 5	1	39	Circlip/Snap r.	DIN472 72x2,5	0 010 322 5	1
7	Output Shaft (inch) 2.WE [2]	Ø 2.000x3.94 in.	0 643 373 1	1	42	Tapered Roller Bear.	DIN720 323 06	0 013 926 2	1
8	Key	DIN6885 A 14x9x80-C45K	0 010 038 2	1	43	Key	DIN6885 B8x7x25-55HRC	0 010 055 2	1
8	Key (inch)	1/2x1/2x2-5/8 in.	0 806 926 3	1	45	Tapered Roller Bear.	DIN720 322 06	0 012 473 7	1
9	Oil Seal	BA-SF60x110x12/7-NBR	0 017 765 2	1	59	Screw Plug	M12x1,5	0 011 430 8	9
9	Oil Seal a) h)	BA-SF 60x110x12/7-FKM	0 017 805 5	1	80	Key	DIN6885 A 14x9x80-C45K	0 010 038 2	1
10	Oil Seal b) h)	B1-SF60x104x10/14,5-FKM	0 017 365 7	1	80	Key (inch)	1/2x1/2x2-5/8 in.	0 806 926 3	1
11	Tapered Roller Bear.	DIN720 302 12	0 013 937 8	1	83	Nilos Ring	30212AV	0 013 720 0	1
12	Circlip/Snap r.	DIN472 110x4	0 010 328 4	1	84	Nilos Ring	30212AV	0 013 720 0	1
17	Distance Piece	Ø70xØ80x18,75 mm	0 643 265 4	1					

Parts with dimensions given in Imperial System units are written in italics and highlighted in grey.

* Gearing parts have embossed part numbers which must always be quoted.

X) As required

a) optional oil seal in FKM (Viton)

b) double sealing

e) Only for mounting position M5A (or mounting position M5B with inverted rotating direction)

f) Only for mounting position M6B (or mounting position M6A with inverted rotating direction)

h) ATEX model according to category II2G, II2D, II3G, II3D

When ordering spare parts please quote designation with part number and nameplate data with serial number!

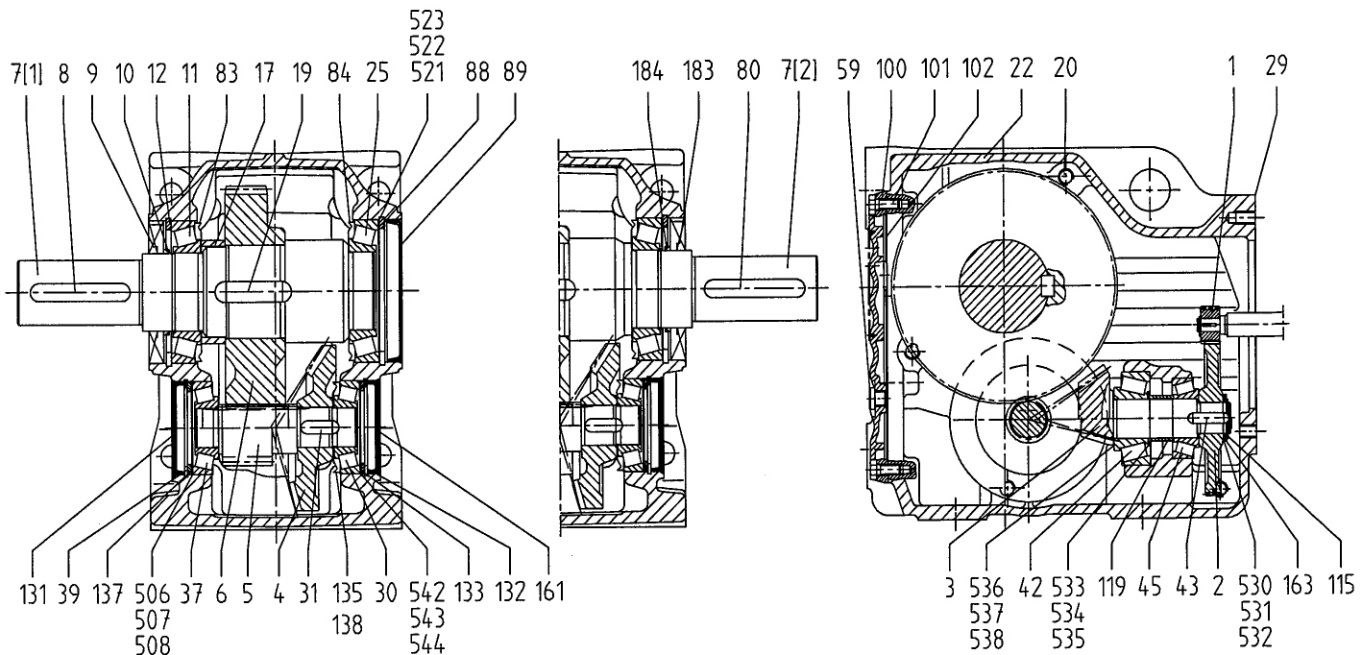
Built-on gear units have motors, variable speed gear units or special input shaft assemblies mounted at the drive end. For parts see appropriate parts list.

Parts List

Helical-bevel gear units K77A [1], K77A with 2.shaft end [2]

33 257 795

Page 2 of 2



No.	Description	DIN standard label	Part No.	Qty	No.	Description	DIN standard label	Part No.	Qty
88	Circlip/Snap r.	DIN472 110x4	0 010 328 4	1	506	Shim	DIN988 56x72x0,1	0 010 377 2	X)
89	Closing Cap	110x12	0 011 166 X	1	507	Shim	DIN988 56x72x0,3	0 010 401 9	X)
100	Gear Cover Plate		0 643 337 5	1	508	Shim	DIN988 56x72x0,5	0 010 425 6	X)
101	Hexagon Head Screw	ISO4017 M8x20-8.8	0 011 025 6	8	521	Shim	DIN988 90x110x0,1	0 010 382 9	X)
102	Gasket		0 643 506 8	1	522	Shim	DIN988 90x110x0,3	0 010 406 X	X)
115	Circlip/Snap r.	DIN471 24x1,2	0 010 273 3	1	523	Shim	DIN988 90x110x0,5	0 010 422 1	X)
119	Distance Piece	Ø30,6x Ø35x20 mm	0 643 344 8	1	530	Shim	DIN988 24x36x0,1	0 012 370 6	X)
131	Closing Cap	72x9	0 010 692 5	1	531	Shim	DIN988 24x36x0,3	0 012 371 4	X)
132	Circlip/Snap r.	DIN472 72x2,5	0 010 322 5	1	532	Shim	DIN988 24x36x0,5	0 012 372 2	X)
133	Spacer	DIN988 S56x72x3	0 010 356 X	1	533	Shim	DIN988 30x42x0,1	0 010 385 3	X)
135	Nilos Ring e)	30306AV	0 013 680 8	1	534	Shim	DIN988 30x42x0,3	0 010 409 4	X)
137	Spacer	DIN988 S56x72x3	0 010 356 X	1	535	Shim	DIN988 30x42x0,5	0 012 345 5	X)
138	Nilos Ring f)	30306 AV	0 013 680 8	1	536	Shim	DIN988 30x42x0,1	0 010 385 3	X)
161	Closing Cap	72x9	0 010 692 5	1	537	Shim	DIN988 30x42x0,3	0 010 409 4	X)
163	Spacer	DIN988 S24x36x2	0 012 400 1	1	538	Shim	DIN988 30x42x0,5	0 012 345 5	X)
183	Oil Seal	BA-SF60x110x12/7-NBR	0 017 765 2	1	542	Shim	DIN988 56x72x0,1	0 010 377 2	X)
183	Oil Seal a) h)	BA-SF 60x110x12/7-FKM	0 017 805 5	1	543	Shim	DIN988 56x72x0,3	0 010 401 9	X)
184	Oil Seal b) h)	B1-SF60x104x10/14,5-FKM	0 017 365 7	1	544	Shim	DIN988 56x72x0,5	0 010 425 6	X)

* Gearing parts have embossed part numbers which must always be quoted.

X) As required

a) optional oil seal in FKM (Viton)

b) double sealing

e) Only for mounting position M5A (or mounting position M5B with inverted rotating direction)

f) Only for mounting position M6B (or mounting position M6A with inverted rotating direction)

h) ATEX model according to category II2G, II2D, II3G, II3D

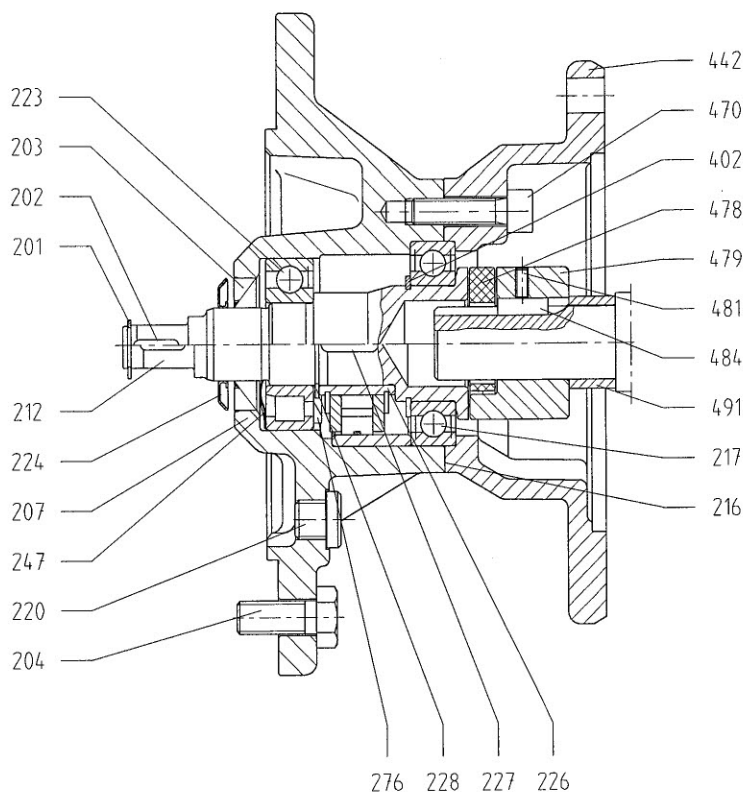
When ordering spare parts please quote designation with part number and nameplate data with serial number!

Built-on gear units have motors, variable speed gear units or special input shaft assemblies mounted at the drive end. For parts see appropriate parts list.

Parts List

Adapter AM182-184 /RS for mounting NEMA motors version with square tooth clutch

23 269 100



No.	Description	DIN standard label	Part No.	Qty	No.	Description	DIN standard label	Part No.	Qty
201	Circlip/Snap r. pi. sp. Ø16	DIN471 16x1	0 010 268 7	1	217	Deep Groove Ball Brg	DIN625 6208-2Z -K3N	0 010 501 5	1
201	Circlip/Snap r. pi. sp. Ø18	DIN471 18x1,2	0 010 270 9	1	217	Deep groove ball bearing h)	DIN625 6208 -2Z-J-KE2R-40	1 322 403 4	1
202	Key pi. sp. Ø16	DIN6885 A 4x4x18-C45K	0 011 438 3	1	220	Screw Plug	M10X1 fl. Ø160	0 011 426 X	1
202	Key pi. sp. Ø18	DIN6885 A 4x4x20-C45K	0 010 003 X	1	220	Vent Valve	M10x1-Ms fl. Ø160	0 013 030 3	1
203	Oil Seal	DIN3760 A 28x47x7-NBR	0 011 148 1	1	220	Screw Plug	M12x1,5 Fl. Ø200-250	0 011 430 8	1
203	Oil Seal a) h)	DIN3760 A 28x47x7-FKM	0 017 535 8	1	220	Vent Valve	M12x1,5-Ms Fl. Ø200-250	0 013 031 1	1
204	Hexagon Head Screw fl. Ø160	ISO4017 M 8x20-8.8	0 011 025 6	4	220	Screw Plug	M22x1,5 Fl. Ø300-350	0 011 431 6	1
204	Hexagon Head Screw fl. Ø200	ISO4017 M 10x25-8.8	0 010 116 8	4	220	Vent Valve	M22x1,5-Ms Fl. Ø300-350	0 013 032 X	1
204	Hexagon Head Screw fl. Ø250-300	ISO4017 M 12x30-8.8	0 010 122 2	4	223	Deep Groove Ball Brg	DIN625 6306-Z-J	0 010 523 6	1
204	Hexagon Head Screw fl. Ø350	ISO4017 M 16x35-8.8	0 011 029 9	4	223	Cyl. Roll. Bearing RS	DIN5412 NJ 306E	0 017 115 8	1
207	Flange Ø160		0 165 026 2	1	224	Oel Flinger	-28	0 011 676 9	1
207	Flange Ø200		0 165 024 6	1	226	Backstop RS		0 165 369 5	1
207	Flange Ø250		0 165 034 3	1	227	Key RS	DIN6885 A 8x5x28-C45K	0 011 628 9	1
207	Flange Ø300		0 165 032 7	1	228	Circlip/Snap r. RS	DIN471 35x1,5	0 010 280 6	1
207	Flange Ø350		0 165 028 9	1	247	Waved Distance Ring RS	61x71x0,4	0 011 584 3	1
207	Flange Ø160 RS		0 165 197 8	1	276	Nilos Ring RS	6306 AV	0 010 718 2	1
207	Flange Ø200 RS		0 165 198 6	1	402	Circlip/Snap r.	DIN471 40x1,75	0 010 283 0	1
207	Flange Ø250 RS		0 165 199 4	1	442	Adapter Flange		0 165 188 9	1
207	Flange Ø300 RS		0 165 200 1	1	470	Slotted Head Screw	DIN912 M 10x35-8.8	0 011 409 X	4
207	Flange Ø350 RS		0 165 289 3	1	478	Spacer ring		0 165 731 3	1
212	Adapter Shaft AM182	Rz.Ø16	0 165 712 7	1	479	Coupling Halfe	Hole Ø1.125"	0 165 746 1	1
212	Adapter Shaft AM184	Rz.Ø18	0 165 713 5	1	481	Stud bolt	DIN914 M6x8	0 010 459 0	1
212	Adapter shaft AM182/RS	Rz.Ø16	0 165 737 2	1	484	Key	ANSI B17.2 1/4x1/4x13/16	0 806 994 8	1
212	Adapter shaft AM184/RS	Rz.Ø18	0 165 738 0	1	491	Distance piece		0 165 547 7	1
216	Surface sealing compound		0 910 255 8	X)					

X) As required

a) optional oil seal in FKM (Viton)

h) ATEX model according to category II2G, II2D, II3G, II3D

When ordering spare parts always quote nameplate data with serial number and designation and part number!