



SEW
EURODRIVE

Gear Units

R..7, F..7, K..7, S..7 Series, Spiroplan® W

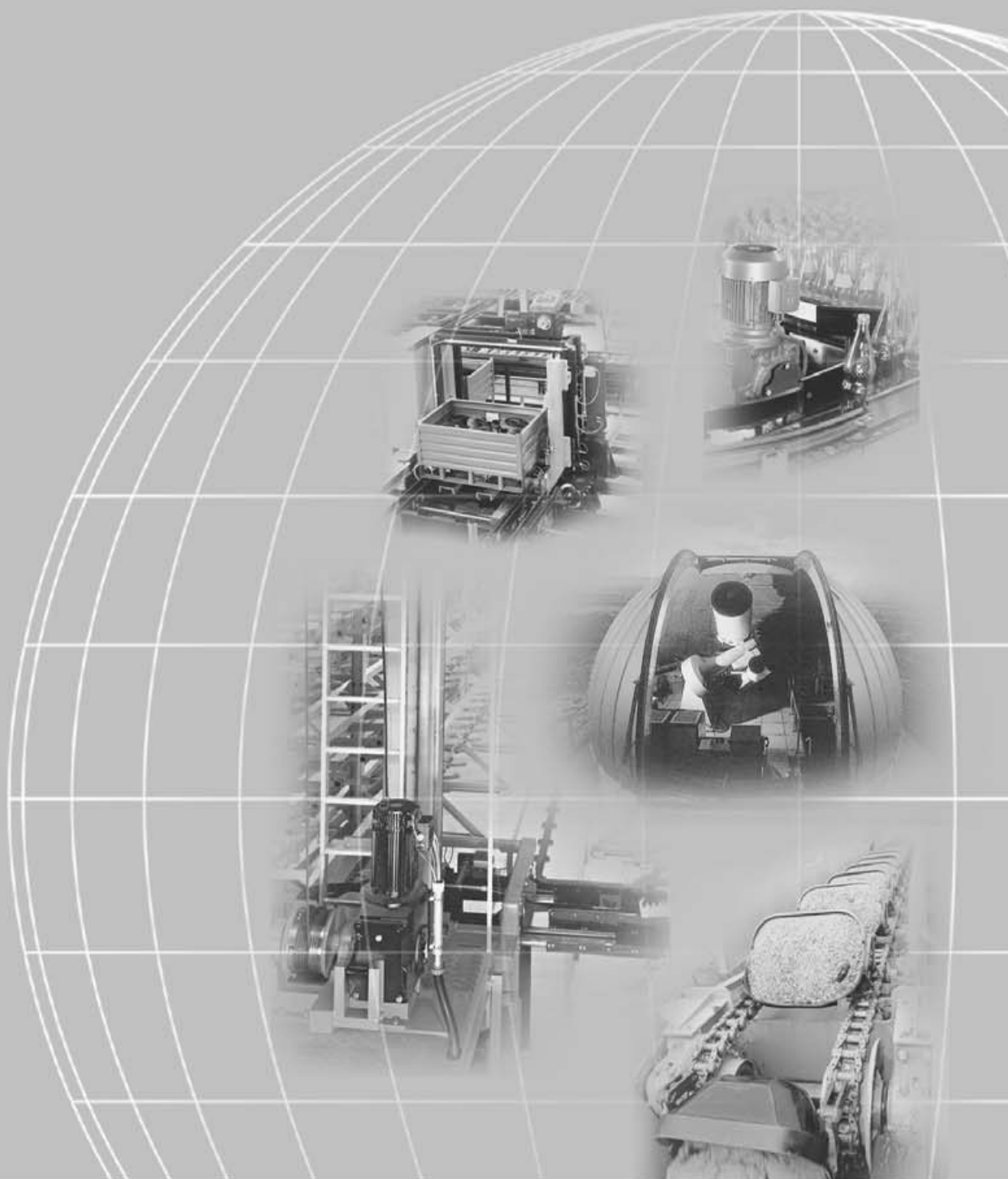
Edition

07/2002



Operating Instructions

1055 2715 / EN



SEW-EURODRIVE





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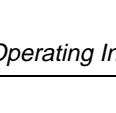


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1 Important Notes

Safety and warning instructions

Always follow the safety and warning instructions contained in this publication!



Electrical hazard

Possible consequences: Severe or fatal injuries.



Hazard

Possible consequences: Severe or fatal injuries.



Hazardous situation

Possible consequences: Slight or minor injuries.



Harmful situation

Possible consequences: Damage to the drive and the environment.



Tips and useful information.



A requirement of fault-free operation and fulfillment of any rights to claim under guarantee is that you adhere to the information in the operating instructions. Consequently, read the operating instructions before you start operating the gear unit!

The operating instructions contain important information about servicing; as a result, they should be kept in the vicinity of the gear unit.



- **Adjust the lubricant fill volumes and position of the breather valve accordingly in case you change the mounting position (see Sec. 'Lubricants' and 'Mounting Positions').**
- **Please follow the instructions in Sec. 'Mechanical Installation' / 'Installing the gear unit'!**

Waste disposal



Please follow the current instructions:

- Dispose of housing parts, gears, shafts and anti-friction bearings of the gear units as scrap steel. The same applies to gray cast iron castings unless there are separate collection arrangements.
- Some worm gears are made of non-ferrous metals and must be disposed of accordingly.
- Collect waste oil and dispose of it correctly.



2 Safety Notes

Preliminary remarks

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

Please also take account of the supplementary safety notes in the individual sections of these operating instructions.

General information

During and after operation, geared motors, gear units and motors have live and moving parts and their surfaces may be hot.

All work related to transport, putting into storage, setting up/mounting, connection, startup, maintenance and repair should only be performed by trained personnel observing

- the corresponding detailed operating instructions booklet(s) and wiring diagrams,
- the warning and safety signs on the gear unit/geared motor,
- the specific regulations and requirements for the system and
- national/regional regulations governing safety and the prevention of accidents.

Severe injuries and damage to property may result from

- incorrect use,
- incorrect installation or operation,
- removal of required protective covers or the housing when this is not permitted.

Designated use

These geared motors/gear units are intended for industrial systems. They correspond to the applicable standards and regulations.

The technical data and the information about permitted conditions are to be found on the nameplate and in the documentation.

It is essential that you observe all specified information!

Transportation

Inspect the delivery for any damage in transit as soon as you receive the delivery. Inform the shipping company immediately. It may be necessary to preclude startup.

Tighten screwed in transport lugs firmly. They are only designed for the weight of the geared motor/gear unit; do not attach any additional loads.

The installed lifting eyebolts are in accordance with DIN 580. The loads and regulations specified in that document must always be observed. If the geared motor is equipped with two suspension eye lugs or lifting eyebolts, then both of the suspension eye lugs should be used for transport. In this case, the tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

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



Extended storage of gear units

Gear units of the 'extended storage' type have

- an oil fill suitable for the mounting position so the unit is ready to run (mineral oil CLP and synthetic oil CLPHC). You must still check the oil level before startup (see Sec. 'Inspection and Maintenance' / 'Inspection and maintenance').
- a higher oil level in some cases (synthetic oil CLP PG). Correct the oil level before startup (see Sec. 'Inspection and Maintenance' / 'Inspection and maintenance').

Comply with the storage conditions specified in the following table for extended storage:

Climate zone	Packaging ¹⁾	Storage location	Storage time
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic film.	With roof, protected against rain and snow, no shock loads.	Max. 3 years with regular checks on the packaging and moisture indicator (rel. atmospheric humidity < 50 %).
	Open	With roof, enclosed, at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50 % relative atmospheric humidity). No sudden temperature fluctuations and controlled ventilation with filter (free from dirt and dust). No aggressive vapors and no shock loads.	2 years or more given regular inspections. Check for cleanliness and mechanical damage as part of the inspection. Check the corrosion protection is intact.
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 film. Protected against insect damage and mildew by chemical treatment.	With roof, protected against rain, no shock loads.	Max. 3 years with regular checks on the packaging and moisture indicator (rel. atmospheric humidity < 50 %).
	Open	With roof, enclosed, at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50 % relative atmospheric humidity). No sudden temperature fluctuations and controlled ventilation with filter (free from dirt and dust). No aggressive vapors and no shock loads. Protection against insect damage.	2 years or more given regular inspections. Check for cleanliness and mechanical damage as part of the inspection. Check the corrosion protection is intact.

1) Packaging must be performed by an experienced company using the packaging materials which have been expressly qualified for the particular application.

Installation/mounting

Comply with the instructions in Sec. 'Installation' and Sec. 'Assembly/removal'!

Startup/operation

Check the direction of rotation is correct in **decoupled** status (also listen out for unusual grinding noises as the shaft rotates).

Secure the shaft keys for test mode without drive components. Do not render monitoring and protection equipment inoperative even for test mode.

Switch off the geared motor if in doubt whenever changes occur in relation to normal operation (e.g. increased temperature, noise, vibration). Determine the cause; contact SEW if necessary.

Inspection and maintenance

Follow the instructions in Sec. 'Inspection and Maintenance'!

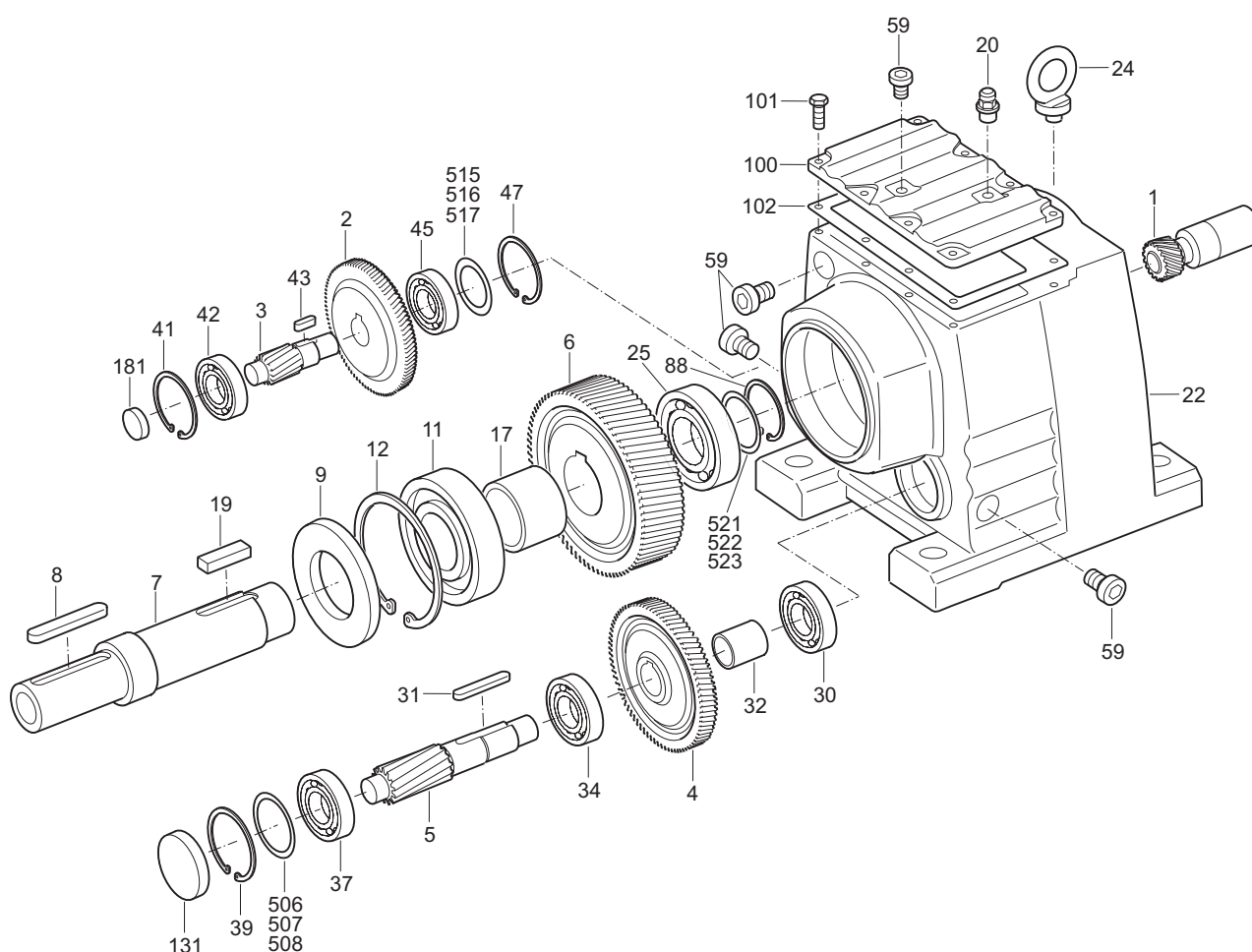


3 Gear Unit Structure



The following illustrations are intended to explain the general structure. Their purpose is only to make it easier to assign components to the spare parts lists. Discrepancies are possible depending on the gear unit size and version!

3.1 Basic structure of helical gear units



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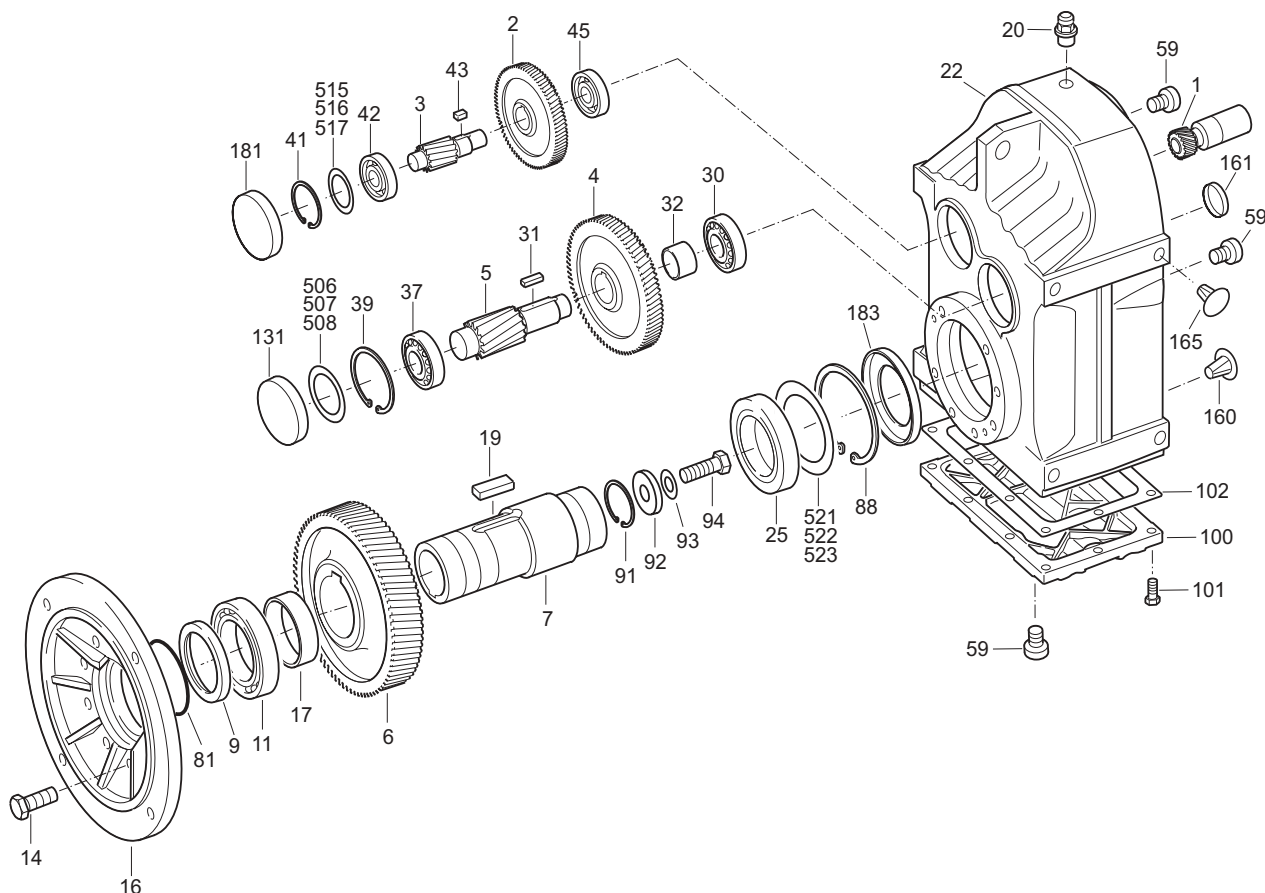
Figure 1: Basic structure of helical gear units

Key

1 Pinion	19 Key	42 Anti-friction bearing	507 Shim
2 Gear	20 Breather valve	43 Key	508 Shim
3 Pinion shaft	22 Gearcase	45 Anti-friction bearing	515 Shim
4 Gear	24 Lifting eyebolt	47 Circlip	516 Shim
5 Pinion shaft	25 Anti-friction bearing	59 Screw plug	517 Shim
6 Gear	30 Anti-friction bearing	88 Circlip	521 Shim
7 Output shaft	31 Key	100 Gearcase cover	522 Shim
8 Key	32 Distance piece	101 Hex head screw	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 Distance piece	41 Circlip	506 Shim	



3.2 Basic structure of parallel shaft helical gear units



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Figure 2: Basic structure of parallel shaft helical gear units

Key

1 Pinion	22 Gearcase	91 Circlip	506 Shim
2 Gear	25 Anti-friction bearing	92 Washer	507 Shim
3 Pinion shaft	30 Anti-friction bearing	93 Lock washer	508 Shim
4 Gear	31 Key	94 Hex head screw	515 Shim
5 Pinion shaft	32 Distance piece	100 Gearcase cover	516 Shim
6 Gear	37 Anti-friction bearing	101 Hex head screw	517 Shim
7 Hollow shaft	39 Circlip	102 Seal	521 Shim
9 Oil seal	41 Circlip	131 Closing cap	522 Shim
11 Anti-friction bearing	42 Anti-friction bearing	160 Closing plug	523 Shim
14 Hex head screw	43 Key	161 Closing cap	
16 Output flange	45 Anti-friction bearing	165 Closing plug	
17 Distance piece	59 Screw plug	181 Closing cap	
19 Key	81 O-ring	183 Oil seal	
20 Breather valve	88 Circlip		



3.3 Basic structure of helical-bevel gear units

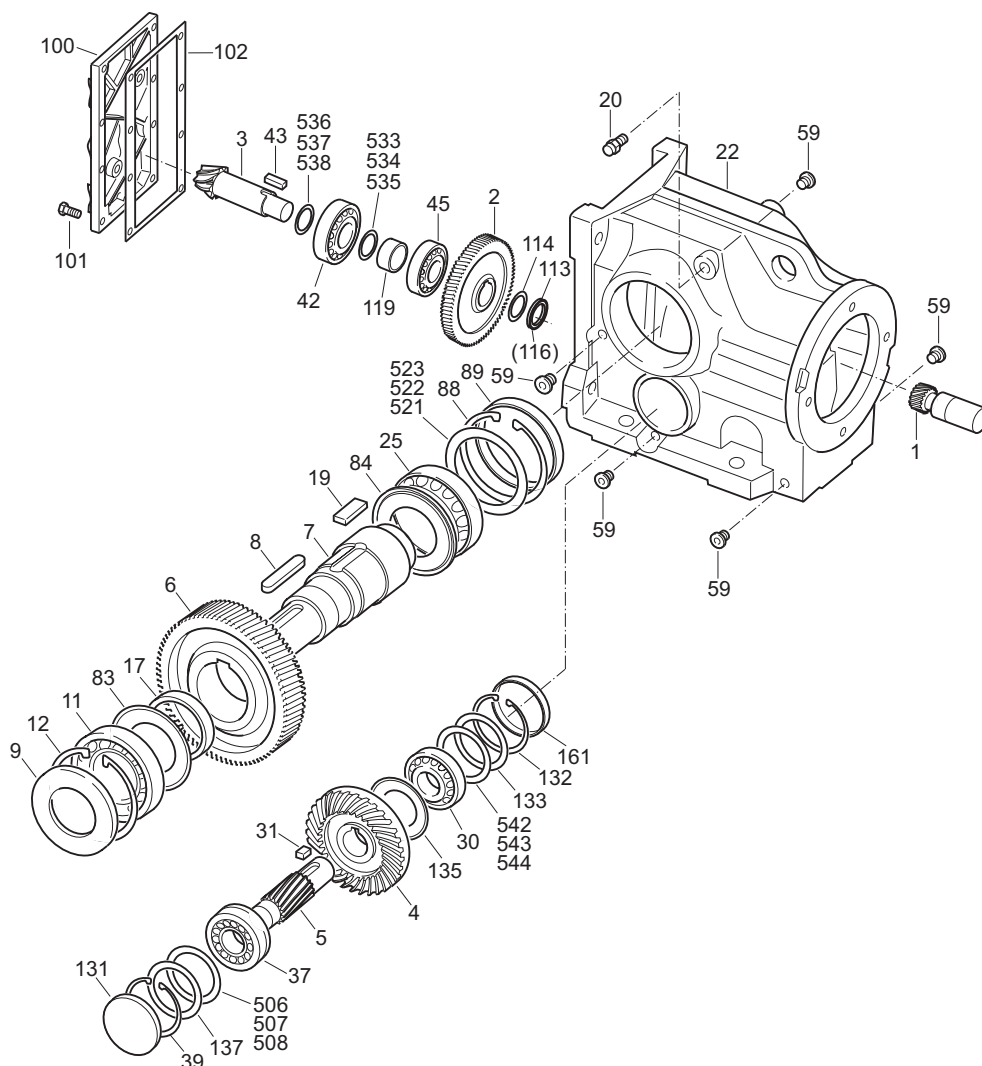


Figure 3: Basic structure of helical-bevel gear units

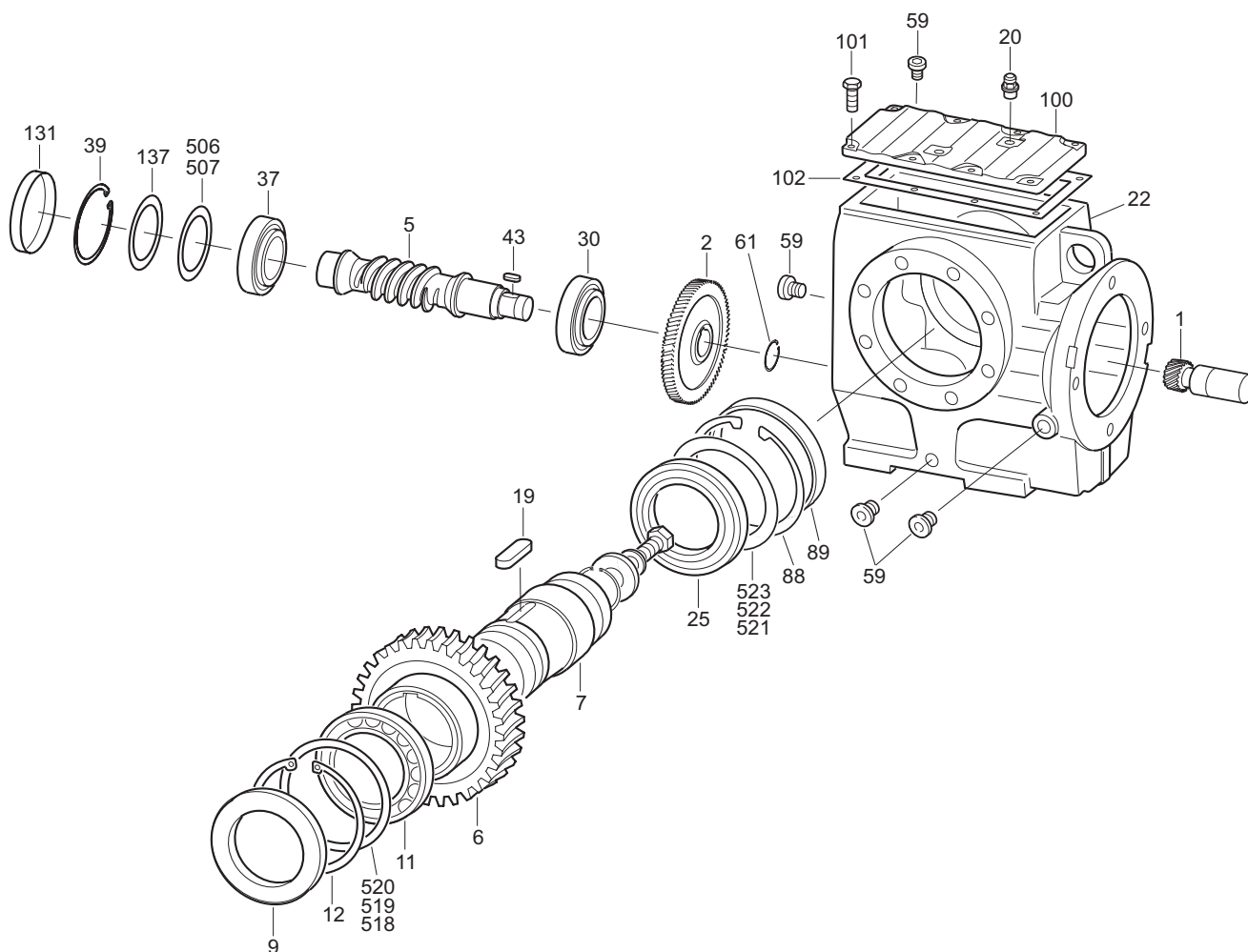
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Key

1 Pinion	25 Anti-friction bearing	102 Adhesive and sealant	522 Shim
2 Gear	30 Anti-friction bearing	113 Slotted round nut	523 Shim
3 Pinion shaft	31 Key	114 Multi-tang washer	533 Shim
4 Gear	37 Anti-friction bearing	116 Thread lock	534 Shim
5 Pinion shaft	39 Circlip	119 Distance piece	535 Shim
6 Gear	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 Spacer	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 Distance piece	88 Circlip	507 Shim	
19 Key	89 Closing cap	508 Shim	
20 Breather valve	100 Gearcase cover	521 Shim	
22 Gearcase	101 Hex head screw	521 Shim	



3.4 Basic structure of helical-worm gear units



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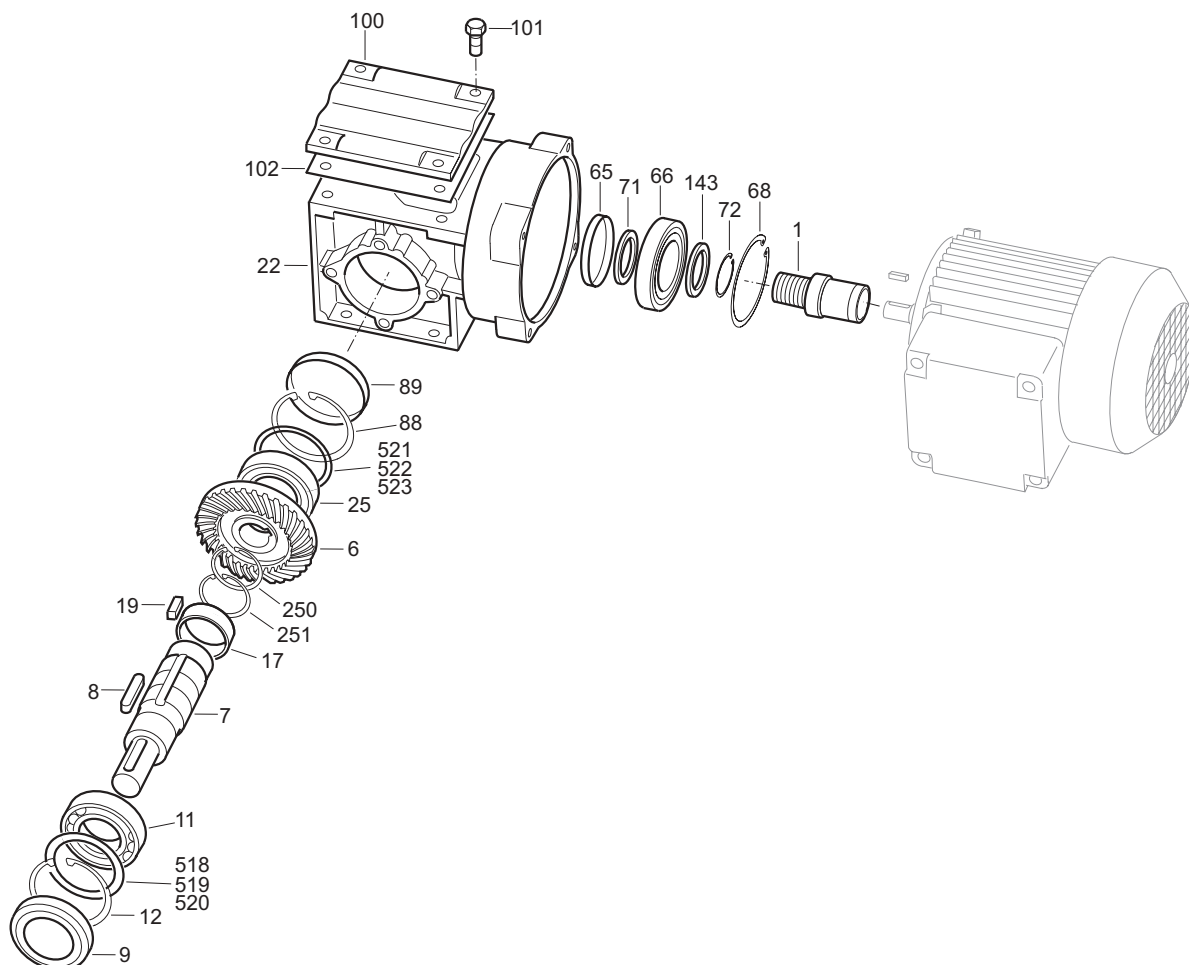
Figure 4: Basic structure of helical-worm gear units

Key

1	Pinion	20	Breather valve	88	Circlip	518	Shim
2	Gear	22	Gearcase	89	Closing cap	519	Shim
5	Worm	25	Anti-friction bearing	100	Gearcase cover	520	Shim
6	Worm gear wheel	30	Anti-friction bearing	101	Hex head screw	521	Shim
7	Output shaft	37	Anti-friction bearing	102	Rubber seal	522	Shim
9	Oil seal	39	Circlip	131	Closing cap	523	Shim
11	Anti-friction bearing	43	Key	137	Spacer		
12	Circlip	59	Screw plug	506	Shim		
19	Key	61	Circlip	507	Shim		



3.5 Basic structure of SPIROPLAN® gear units



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Figure 5: Basic structure of SPIROPLAN® gear units

Key

1	Pinion	19	Key	88	Circlip	251	Circlip
6	Gear	22	Gearcase	89	Closing cap	518	Shim
7	Output shaft	25	Anti-friction bearing	100	Gearcase cover	519	Shim
8	Key	65	Oil seal	101	Hex head screw	520	Shim
9	Oil seal	66	Anti-friction bearing	102	Seal	521	Shim
11	Anti-friction bearing	71	Spacer	132	Circlip	522	Shim
12	Circlip	72	Circlip	183	Oil seal	523	Shim
17	Distance piece	143	Spacer	250	Circlip		



4 Mechanical Installation

4.1 Required tools / resources

- Set of spanners
- Torque wrench (for shrink disks, AQH motor adapter, input shaft assembly with centering shoulder)
- Mounting device
- Shims and distance rings if necessary
- Fastening devices for input and output elements
- Lubricant (e.g. NOCO® Fluid)
- Bolt locking compound (for input shaft assembly with centering shoulder), e.g. Loctite 243

Installation tolerances

Shaft end	Flanges
Diametric 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 hole in accordance with DIN 332, shape DR.. 	Centering shoulder tolerance in accordance with DIN 42948 <ul style="list-style-type: none"> • ISO j6 with $b1 \leq 230$ mm • ISO h6 with $b1 > 230$ mm

4.2 Before you begin

The drive may only be installed if

- the entries on the nameplate of the geared motor match the voltage supply system,
- the drive is undamaged (no damage caused by transportation or storage) and
- it is certain that the following requirements have been met:
 - **with standard gear units:**
ambient temperature according to the lubricant table in Sec. 'Lubricants' (see standard), no oil, acid, gas, vapors, radiation, etc.
 - **with special designs:**
drive configured in accordance with the ambient conditions
 - **with helical-worm / Spiroplan® W gear units:**
no large external mass moments of inertia which could exert a retrodriving load on the gear unit
[at η' (retrodriving) = $2 - 1/\eta < 0.5$ self-locking]

4.3 Preliminary work

The output shafts and flange surfaces must be thoroughly cleaned of anti-corrosion agents, contamination or such like (use a commercially available solvent). Do not let the solvent come into contact with the sealing lips of the oil seals since it could damage the material!



4.4 Installing the gear unit

The gear unit or geared motor may only be mounted or installed in the specified mounting position (Spiroplan® gear units are not dependent on the mounting position) on a level¹, vibration damping and torsionally rigid support structure. Do not tighten the housing legs and mounting flanges against one another and comply with the permitted overhung and axial loads!

Always use bolts of quality 8.8 for mounting geared motors.

Bolts of **quality 10.9** must be used for fastening the flange to the customer unit in order to transmit the rated torque specified in the catalog in case of the following flange-mounted helical geared motors (RF..) and foot/flange-mounted helical geared motors (R..F):

- RF37, R37F with flange Ø 120 mm
- RF47, R47F with flange Ø 140 mm
- RF57, R57F with flange Ø 160 mm



The oil level plug and drain screws as well as the breather valves must be freely accessible!

At the same time, also check that the oil fill is as specified for the mounting position (see Sec. 'Lubricants' / 'Lubricant fill quantities' 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. **Adjust the lubricant fill volumes and the position of the breather valve accordingly in case you change the mounting position.**

Please contact our customer service if you change the mounting position of K gear units to M5 or M6 or between M5 and M6.

Please contact customer service if you change the mounting position of size S47...S97 S gear units to mounting position M2.

Use plastic inserts (2 – 3 mm thick) if there is a risk of electrochemical corrosion between the gear unit and the driven machine (connection between different metals such as cast iron and high-grade steel)! Also fit the bolts with plastic washers! Ground the housing additionally – use the grounding bolts on the motor.

Installation in damp areas or in the open

Drives are supplied in corrosion-resistant versions for use in damp areas or in the open. Any damage to the paint work (e.g. on the breather valve) must be repaired.

1. Maximum permitted flatness error for flange mounting (approximate values with reference to DIN ISO 1101): with → flange 120...600 mm max. error 0.2...0.5 mm

**Gear unit venting**

No breather plug is required for the following gear units:

- R07 in mounting positions M1, M2, M3, M5 and M6
- R17, R27 and F27 in mounting positions M1, M3, M5 and M6
- Spiroplan® W gear units

All other gear units are delivered by SEW-EURODRIVE ready for the respective mounting position with the breather valve fitted and activated.

Exception:

Gear units for extended storage, with pivoting mounting positions and for mounting at an angle are delivered with a screw plug on the vent hole. Prior to startup, the customer must replace the highest screw plug by the supplied breather valve on each individual gear unit

- **With geared motors** for extended storage, with pivoting mounting positions and for mounting at an angle, the supplied breather valve is located in the **terminal box of the motor**.
- **With gear head units** requiring venting on the input end, a breather valve is supplied in a plastic bag.
- **Enclosed gear units** are delivered without a breather valve.

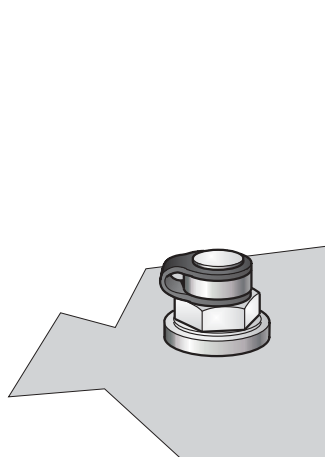
Activating the breather valve

As a rule, the breather valve is already activated at the factory. If this is not the case, remove the transportation fixture from the breather valve before starting up the gear unit!

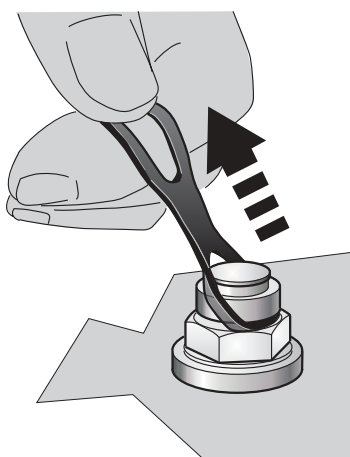
1. Breather valve with transportation fixture

2. Remove the transportation fixture

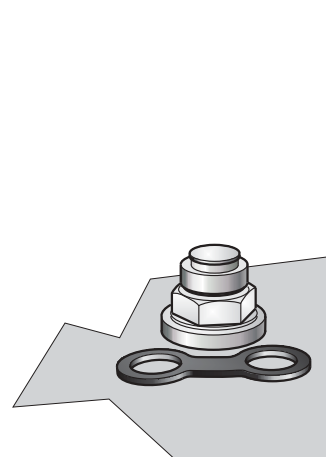
3. Breather valve activated



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Painting the gear unit

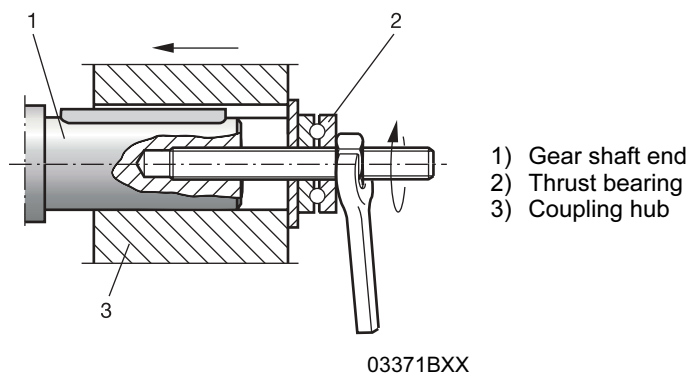
If all or some of the drive surface is to be painted over, make sure that you carefully mask over the breather valve and the oil seals. Remove the strips of tape after completing the paint job.



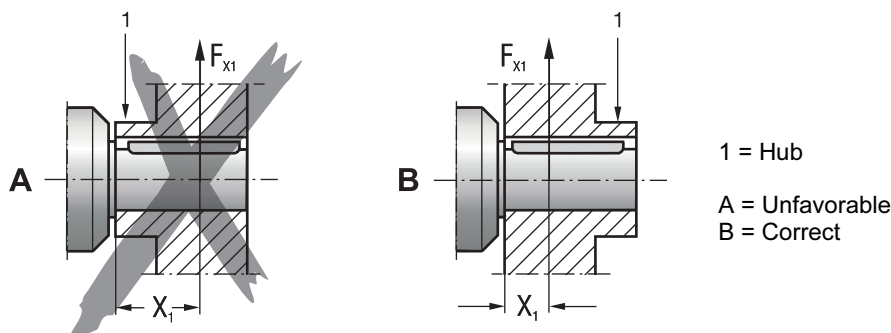
4.5 Gear units with solid shafts

Installing input and output elements

The following illustration shows an example of a mounting device for installing couplings or hubs on gear unit or motor shaft ends. It may be possible to dispense with the thrust bearing on the mounting device.



The following illustration shows the correct mounting arrangement **B** of a gear or chain sprocket for avoiding impermissibly high overhung loads.



- Only use a mounting device for installing input and output elements. Use the center bore and the thread on the shaft end for positioning purposes.
- **Never drive belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer (damage to bearings, housing and the shaft!).**
- **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 'Geared Motors' catalog for permitted values).



Note:

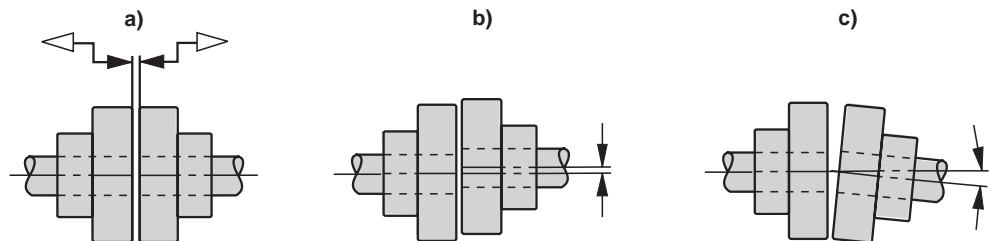
Mounting is easier if you first apply lubricant to the output element or heat it up briefly (to 80 – 100 °C).



Mounting of couplings

Couplings must be mounted and balanced according to the information provided by the coupling manufacturer:

- a) Maximum and minimum clearance
- b) Axial misalignment
- c) Angular misalignment



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Figure 6: Clearance and misalignment for clutch mounting



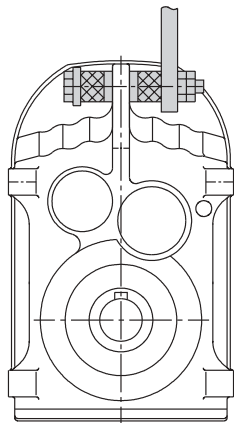
Input and output elements such as belt pulleys, couplings, etc. must be equipped with touch guards!



4.6 Installing torque arms for shaft-mounted gear units

Do not place torque arms under strain during installation!

Parallel shaft helical gear units

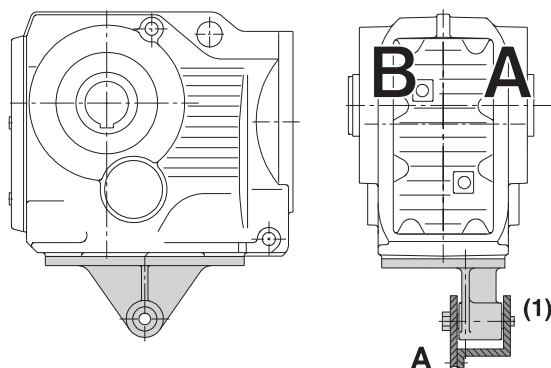


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Figure 7: Torque arm for parallel shaft helical gear units

Helical-bevel gear units

- Bushing with bearings on both ends → (1)
- Install connection end B as a mirror image of A



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Figure 8: Torque arm for helical-bevel gear units


**Helical-worm
gear units**

- Bushing with bearings on both ends → (1)

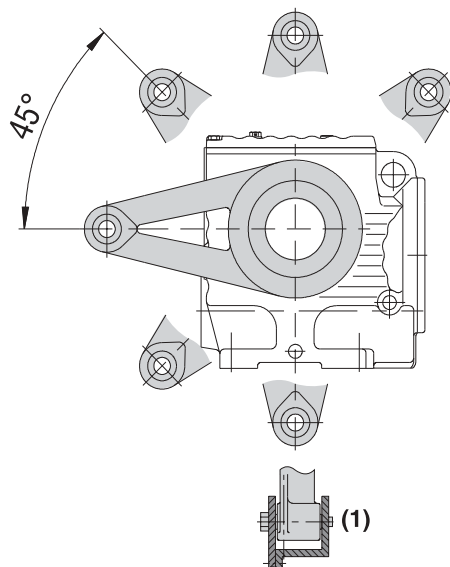


Figure 9: Torque arm for helical-worm gear units

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**SPIROPLAN® W
gear units**

- Bushing with bearings on both ends → (1)

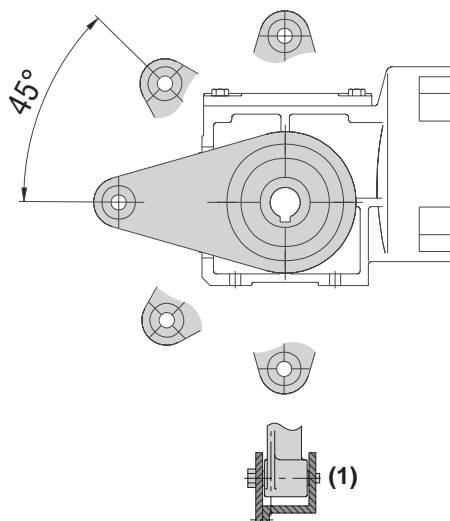


Figure 10: Torque arm for SPIROPLAN® W gear units

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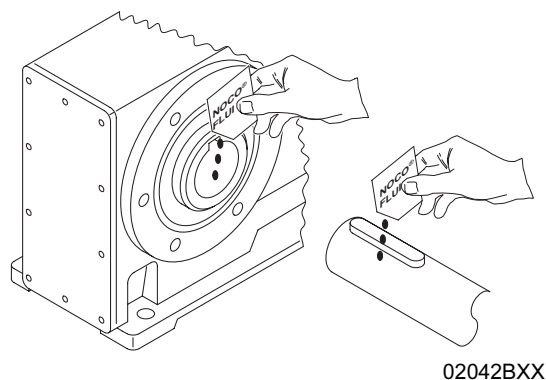
4.7 Assembly/removal of shaft-mounted gear units with keyway or splined hollow shaft



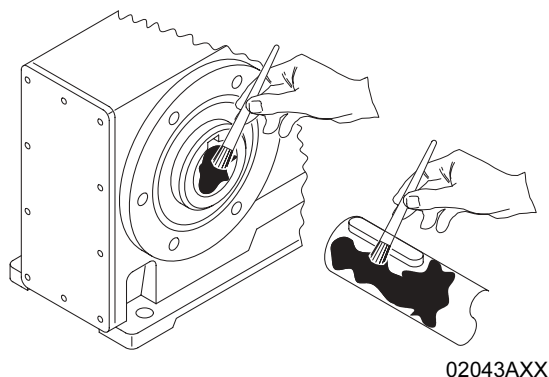
Please also refer to the design notes in the Geared Motors catalog concerning configuration of the customer shaft!

Installation notes

1. Apply NOCO[®] fluid.

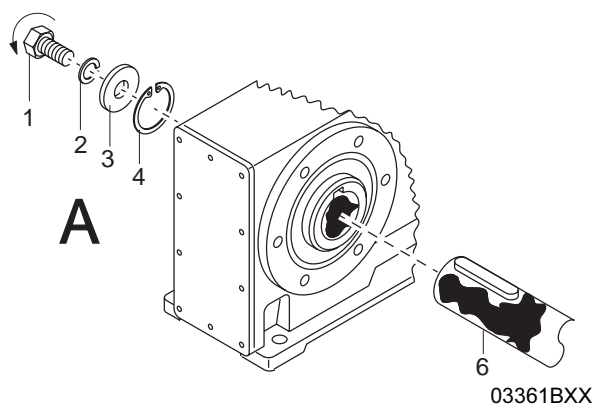


2. Distribute the NOCO[®] fluid carefully.



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

3A: Mounting with standard scope of supply

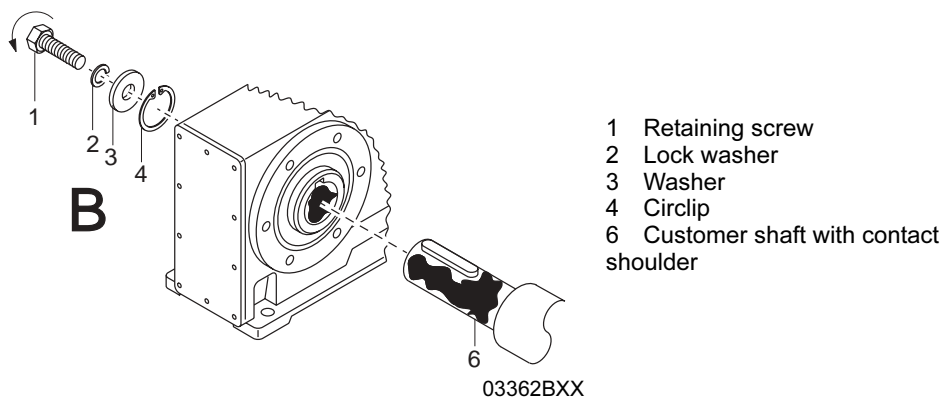


- 1 Short retaining screw
(standard scope of supply)
- 2 Lock washer
- 3 Washer
- 4 Circlip
- 6 Customer shaft



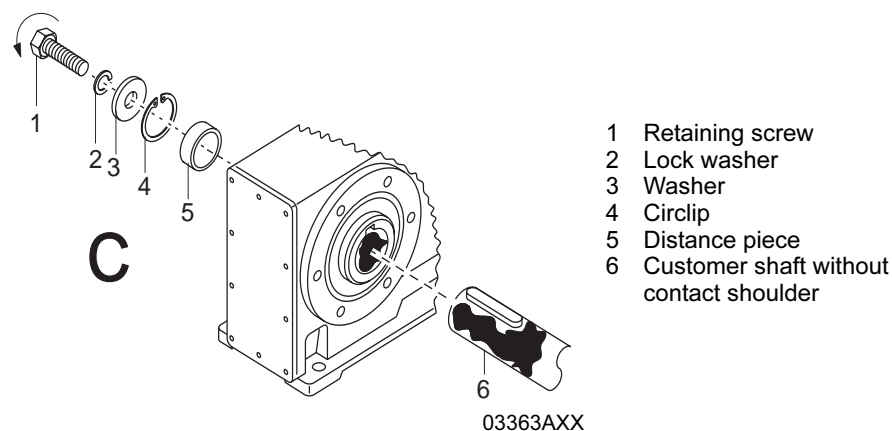
3B: Mounting with SEW-EURODRIVE assembly/removal kit (→ page 22)

– Customer shaft **with** contact shoulder

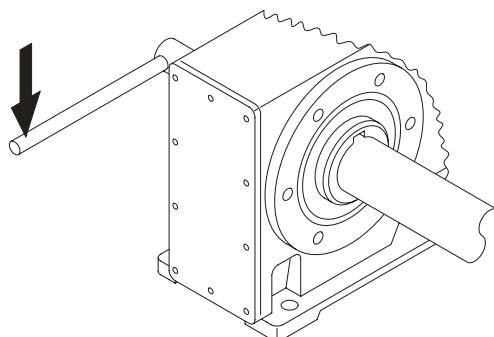


3C: Mounting with SEW-EURODRIVE assembly/removal kit (→ page 22)

– Customer shaft **without** contact shoulder



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



Bolt	Tightening torque [Nm]
M5	5
M6	8
M10/12	20
M16	40
M30	80
M24	200



Note:

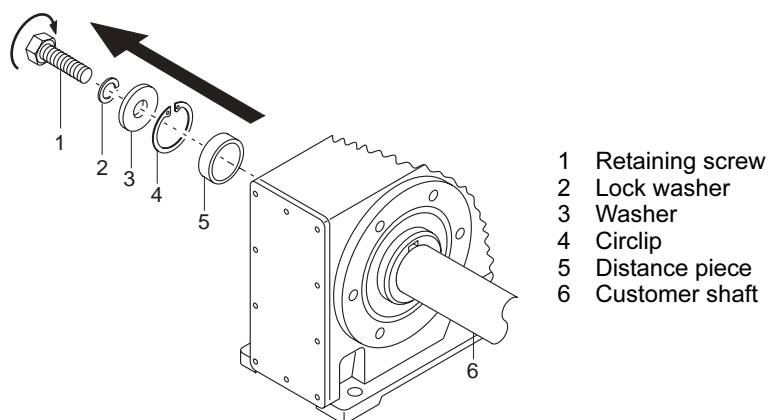
To avoid contact corrosion, we recommend that the customer shaft should additionally be recessed between the two contact surfaces!



Information about removal

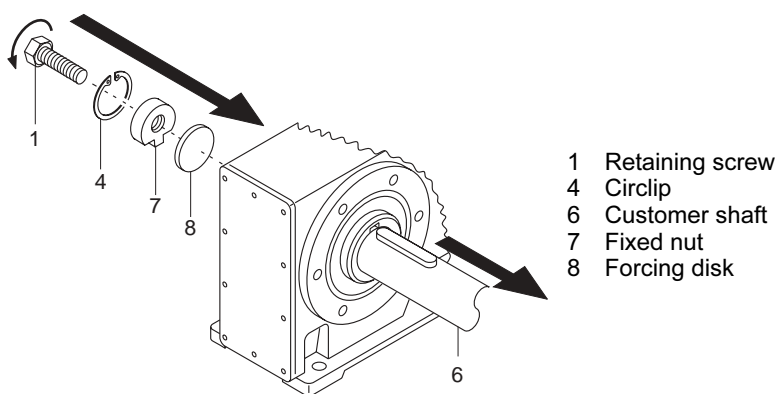
This description only applies if the gear unit was mounted using the SEW-EURODRIVE assembly/removal kit (→ page 22 and the description above, points 3B or 3C).

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



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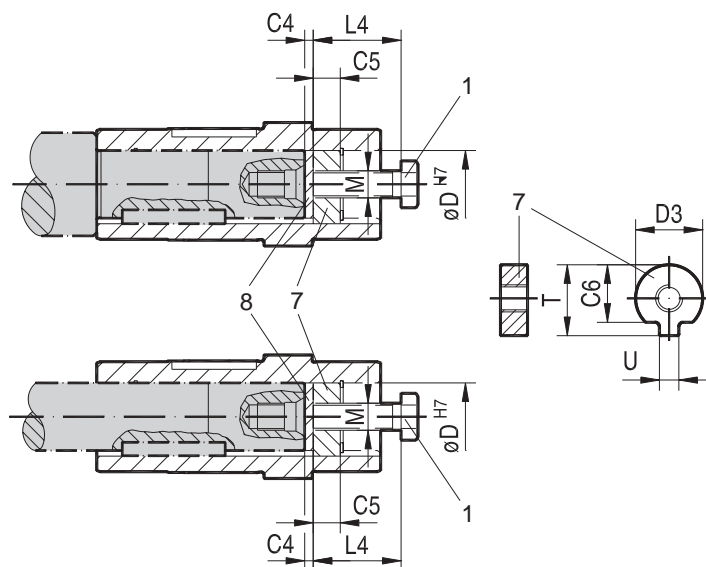
3. Insert the forcing disk 8 and the fixed nut 7 from the SEW-EURODRIVE assembly/removal kit between the customer shaft 6 and the circlip 4.
4. Re-insert the circlip 4.
5. Screw the retaining screw 1 back in. Now you can force the gear unit off the shaft by tightening the screw.



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**SEW assembly/
removal kit**

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



03394CXX

Figure 11: SEW-EURODRIVE assembly/removal kit

- 1 Retaining screw
- 7 Fixed nut for removal
- 8 Forcing disk

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]	Assembly/ removal kit part number
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	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



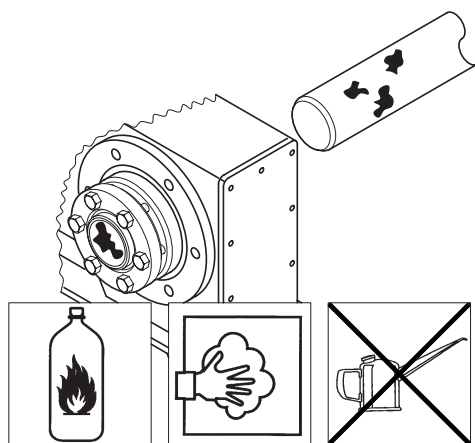
4.8 Assembly/removal of shaft-mounted gear units with shrink disk

Installation notes

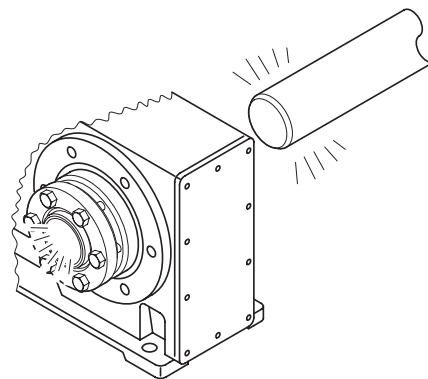
- Do not tighten the locking screws unless the shaft is installed since the hollow shaft could become deformed!

1. Carefully degrease the hollow shaft bore and the input shaft.

2. Hollow shaft/input shaft after degreasing.



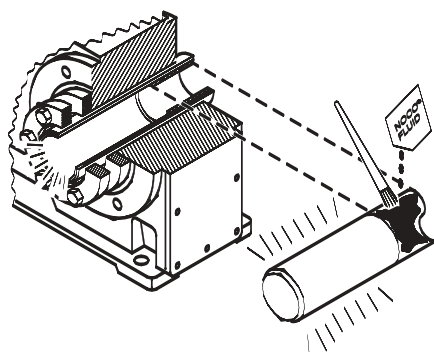
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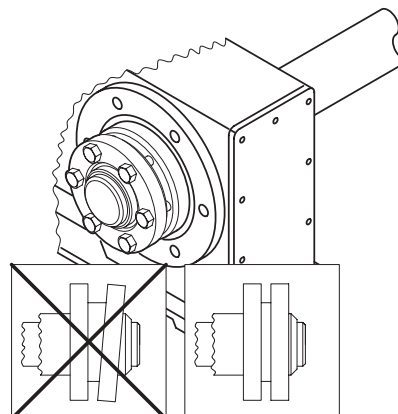
01816AXX

3. Apply NOCO® fluid to the input shaft¹⁾ in the area of the bushing.

4. Install the shaft, making sure that the locking collars of the shrink disk are equally spaced²⁾.



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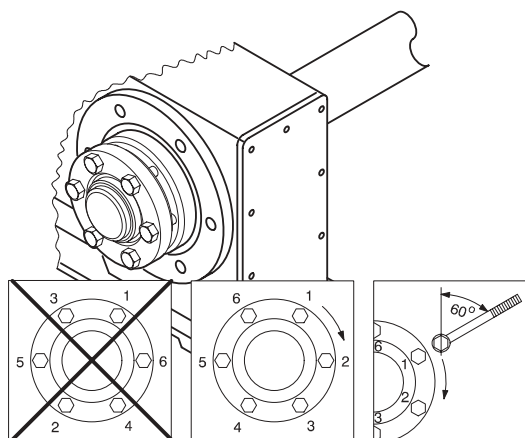
01818AXX



- 1) **Make sure that the clamping area of the shrink disk is free from grease!** As a result, never apply NOCO® fluid directly to the bushing. The paste may get into the clamping area of the shrink disk when the input shaft is installed.
- 2) **After assembly**, grease the outside of the hollow shaft in the area of the shrink disk. This is in order to prevent corrosion.



5. Tighten the locking screws by working clockwise several times from one screw to the next (not in opposite sequence). See the table for tightening torques.



01819AXX

Gear unit type			Bolt	Nm	max. ¹⁾
FH27	SH37		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		M12	100	

1) Maximum tightening angle per cycle

Notes on removal of the shrink disk

1. Unscrew the locking screws evenly one after the other. Each locking screw may only be unscrewed by about one quarter turn in the initial cycle to avoid tilting and jamming of the locking collars. Do not fully unscrew the locking screws!
2. Remove the shaft or pull the hub off the shaft. (It is first necessary to remove any rust which may have formed between the hub and the end of the shaft.)
3. Pull the shrink disk off the hub.



Important!

Risk of injury if the shrink disk is not removed correctly!

Cleaning and lubricating the shrink disk

There is no need to disassemble and re-grease the removed shrink disks before they are installed once again.

The shrink disk only needs to be cleaned and re-greased if it is contaminated.

Use one of the following solid lubricants for the tapered surfaces:

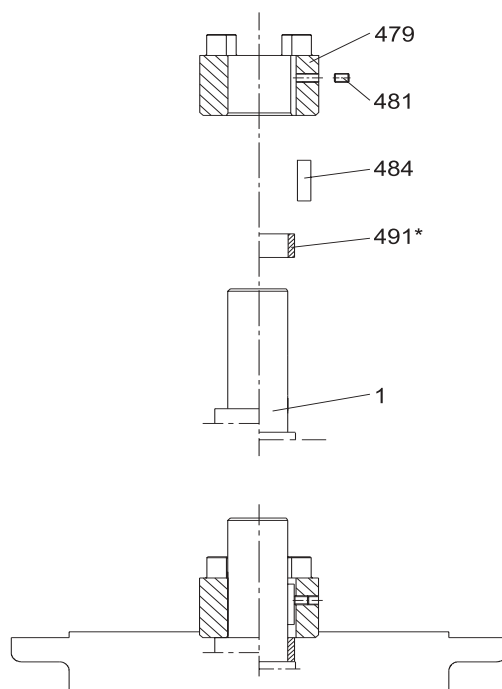
Lubricant (Mo S2)	Sold as
Molykote 321 (lube coat)	Spray
Molykote spray (powder spray)	Spray
Molykote G Rapid	Spray or paste
Aemasol MO 19P	Spray or paste
AemasolDIO-sétral 57 N (lube coat)	Spray

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



4.9 Mounting the coupling of adapter AM

IEC adapter
AM63...225 /
NEMA adapter
AM56...365



* = NEMA adapter only
 1 = Motor shaft

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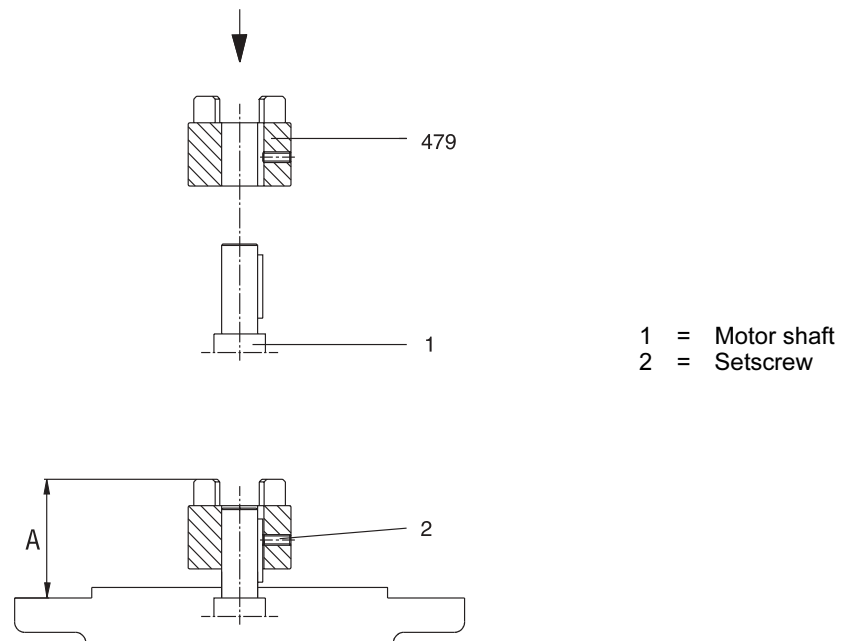
1. Clean the motor shaft and flange surfaces of the motor and the adapter.
2. **IEC adapter:** Remove the key from the motor shaft and replace it with the supplied key (484).
NEMA adapter: Remove the key from the motor shaft, push the distance piece (491) onto the motor shaft and insert the supplied key (484).
3. Heat the coupling half (479) to approx. 80 – 100 °C, push the coupling half onto the motor shaft.
IEC adapter: Insert up to the stop against the motor shaft collar.
NEMA adapter: Insert up to the stop against the distance piece.
4. Use the setscrew (481) to secure the key and coupling half on the motor shaft.
5. Mount the motor on the adapter. When doing this, make sure the coupling claws of the adapter shaft engage in the plastic cam ring.



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



**IEC adapter
AM250/AM280**



02047CXX

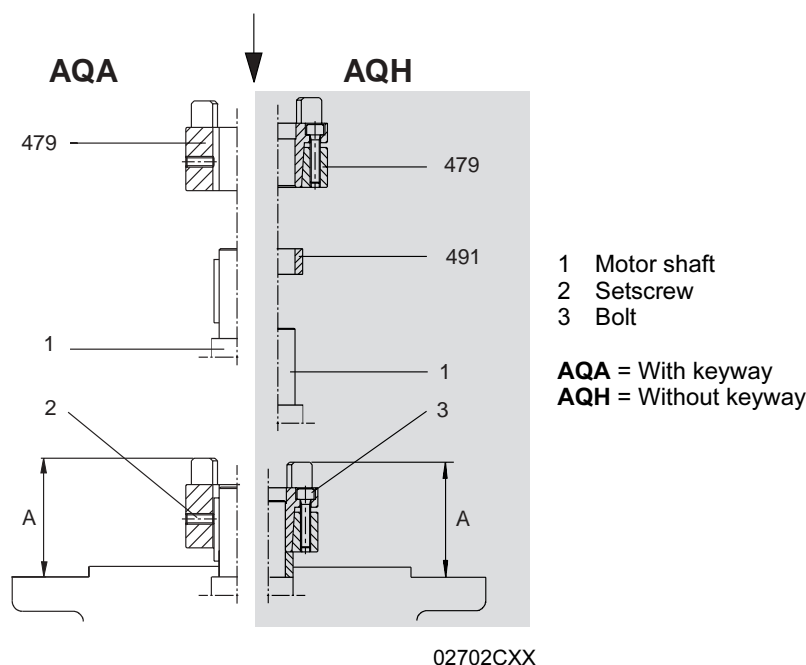
1. Clean the motor shaft and flange surfaces of the motor and the adapter.
2. Remove the key from the motor shaft and insert the supplied key (**size AM280 only**).
3. Heat the coupling half (479) to 80°C – 100°C) and push it onto the motor shaft (A = 139 mm).
4. Secure the coupling half with a setscrew and check its position (clearance 'A').
5. Mount the motor on the adapter. When doing this, make sure the claws of both coupling halves engage in the plastic cam ring.



Note: To avoid contact corrosion, we recommend applying NOCO[®] fluid to the motor shaft before mounting the coupling half.



4.10 Mounting the coupling of adapter AQ



1. Clean the motor shaft and flange surfaces of the motor and the adapter.
2. **Type AQH:** Push distance piece (491) onto the motor shaft.
3. **Type AQH:** Unscrew the bolts of the coupling half (479) and loosen the conical connection.
4. Heat the coupling half (80 °C 100 °C) and push it onto the motor shaft.
Type AQH: Insert up to the stop against the distance piece (491).
Type AQA: Insert up to clearance 'A' (see table).
5. **Type AQH:** Tighten the bolts on the coupling half (work round several times tightening the bolts evenly one after the other) until all bolts reach the tightening torque TA specified in the table.
Type AQA: Use a setscrew to secure the coupling half.
6. Check the position of the coupling half (clearance 'A', see table).
 Fit the motor onto the adapter, making sure that the claws of the two coupling halves engage in one another. The force which 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.

Setting dimensions, tightening torques

Type	Coupling size	Clearance 'A' [mm]	Bolts DIN 912 ¹⁾	Tightening torque TA ¹⁾ [Nm]
AQA /AQH 80 /1/2/3	19/24	44.5	M4	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	6
AQA /AQH 140 /1/2		62		
AQA /AQH 140 /3	28/38	74.5	M5	6
AQA /AQH 190 /1/2		76.5		
AQA /AQH 190 /3	38/45	100	M6	10

1) only type without keyway (AQH)

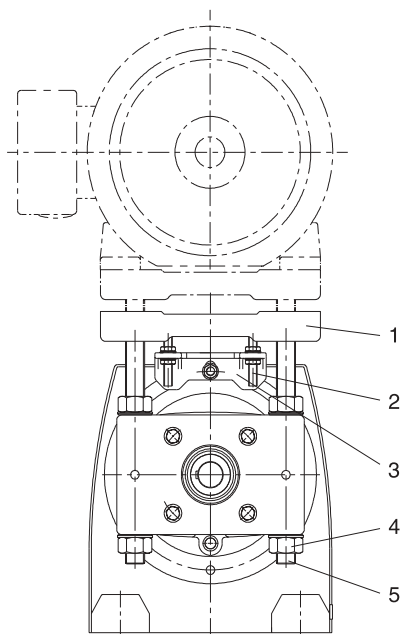


4.11 Mounting on input shaft assembly AD

Please refer to Sec. 'Installing input and output shafts' concerning the mounting of input elements.

Cover with motor mounting platform AD../P

Mounting the motor and adjusting the motor mounting platform



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

03519BXX

1. Set the motor mounting platform to the required mounting position by evenly tightening the adjusting nuts. It may be necessary to 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. Correct the motor position again if necessary.
4. Put on 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 one another when doing this.
5. Tighten the threaded columns using the nuts which are not used for adjustment.

Only AD6/P and AD7/P:

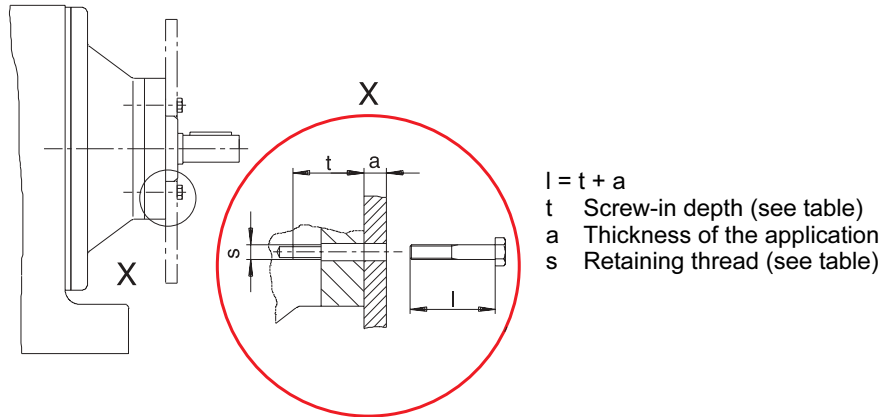
Unscrew the nuts on the stud bolts before adjustment to allow the stud bolts to move axially in the support without restriction. Do not tighten the nuts until the final adjustment position has been achieved. Do not adjust the motor mounting platform using the support.



Type with centering shoulder AD../ZR

Mounting applications on the input shaft assembly with centering shoulder

1. Provide retaining bolts of a suitable length for the application. The length l of the new bolts is calculated as follows:



02725CXX

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

2. Remove the retaining bolts 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. Position the application against the centering shoulder and tighten the retaining bolts to the specified tightening torque T_A (see table).

Type	Screw-in depth t	Retaining thread s	Tightening torque T_A [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

Cover with backstop AD../RS

Check the direction of rotation of the drive before installation and startup. Please inform the SEW-EURODRIVE customer service if the direction of rotation is incorrect.

The backstop is maintenance-free in operation and does not require any further maintenance work.



5 Startup

5.1 Startup of helical-worm and Spiroplan® W gear units



Please 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 direction of rotation: Swap over two motor feeder cables.

Running-in period

Spiroplan® and helical-worm gear units require a running-in period of at least 24 hours before reaching their maximum efficiency. A separate running-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 running-in period.

No. of starts	Worm		Spiroplan®	
	Power reduction	i range	Power reduction	i range
1 start	approx. 12 %	approx. 50 280	approx. 15 %	approx. 40 75
2 start	approx. 6 %	approx. 20 75	approx. 10 %	approx. 20 30
3 start	approx. 3 %	approx. 20 90	approx. 8 %	approx. 15
4 start	-	-	approx. 8 %	approx. 10
5 start	approx. 3 %	approx. 6 25	approx. 5 %	approx. 8
6 start	approx. 2 %	approx. 7 25	-	-

5.2 Startup of helical, parallel shaft helical and helical-bevel gear units

No special startup instructions are required for helical, parallel shaft helical and helical-bevel gear units provided the gear units have been installed in accordance with Sec. 'Mechanical Installation'.



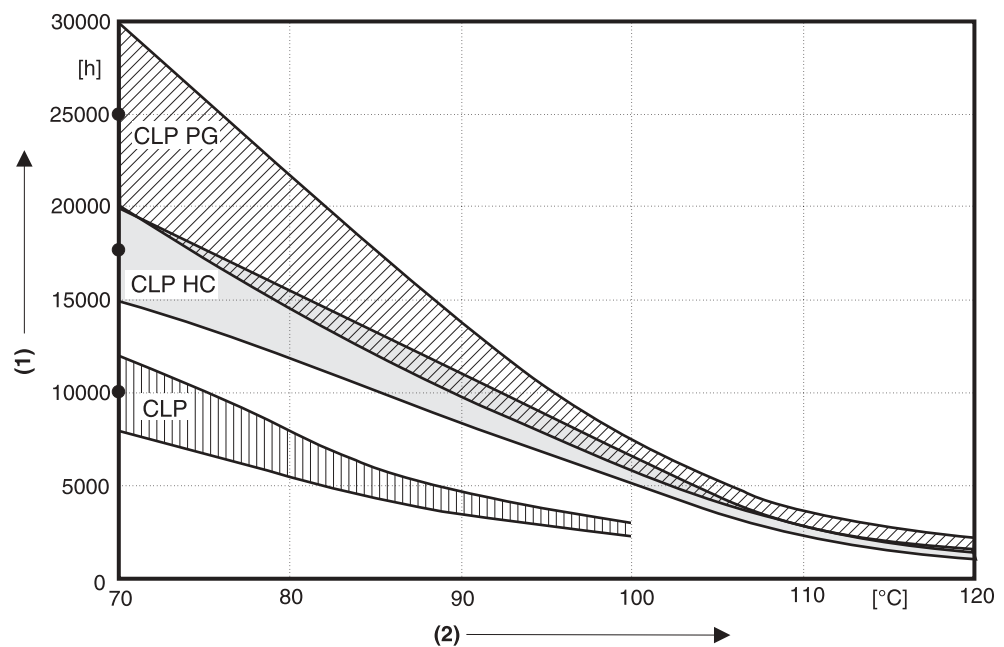
6 Inspection and Maintenance

6.1 Inspection and maintenance intervals

Frequency	What to do
• Every 3000 machine hours, at least every 6 months	• Check the oil
• Depending on the operating conditions (see illustration below), at the latest every 3 years	• Change mineral oil
	• Renew the anti-friction bearing grease
• Depending on the operating conditions (see illustration below), at the latest every 5 years	• Change synthetic oil
	• Renew the anti-friction bearing grease
• R07, R17, R27, F27 and Spiroplan® gear units have lubrication for life and are therefore maintenance-free	
• Varying (depending on external factors)	• Touch up or renew the surface/anticorrosion coating

6.2 Lubricant change intervals

Change the oil more frequently when using special designs subject to more severe/aggressive environmental conditions!



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Figure 12: Oil change intervals for standard gear units under normal environmental conditions.

- (1) Operating hours
(2) Sustained oil bath temperature
• Average value per oil type at 70 °C



6.3 Inspection and maintenance of the gear unit

Do not mix synthetic lubricants with each other and do not mix synthetic with mineral lubricants!

Mineral oil is the standard lubricant.

The position of the oil level plug and oil drain plug as well as the breather valve depends on the mounting position. Refer to the diagrams of the mounting positions.

Checking the oil level



1. **De-energize the geared motor and secure it to prevent it from being switched back on inadvertently!**

Wait until the gear unit has cooled down – Danger of burns!

2. Refer to Sec. 'Installing the gear unit' when changing the mounting position!
3. For gear units with oil level plug: Remove the oil level plug, check the fill level and correct if necessary. Reinstall the oil level plug.

Check the oil



1. **De-energize the geared motor and secure it to prevent it from being switched back on inadvertently!**

Wait until the gear unit has cooled down – Danger of burns!

2. Remove some oil from the oil drain plug
3. Check the oil consistency
 - Viscosity
 - If you see that the oil is heavily contaminated, we recommend you change the oil even if it is outside the service intervals specified in 'Inspection and maintenance periods'
4. For gear units with oil level plug: Remove the oil level plug, check the fill level and correct if necessary. Reinstall oil level plug.

Changing the oil



Only change the oil when the gear unit is at operating temperature.

1. **De-energize the geared motor and secure it to prevent it from being switched back on inadvertently!**

Wait until the gear unit has cooled down – Danger of burns!

Note: The gear unit must still be warm since the high viscosity of cold oil will make it harder to drain the oil completely.

2. Place a container underneath the oil drain plug.
3. Remove the oil level plug, breather plug/breather valve and oil drain plug.
4. Drain all the oil.
5. Reinstall the oil drain plug.
6. Pour in new oil of the same type through the vent hole (if changing the oil type, please contact our customer service first)
 - Fill in the amount of oil in accordance with the mounting position (see Sec. 'Lubricant fill quantities') or as stated on the nameplate.
 - Check the oil level plug
7. Reinstall the oil level plug
8. Reinstall the breather plug/breather valve



7 Malfunctions

7.1 Gear unit malfunctions

Fault	Possible cause	Remedy
Unusual, regular running noise	A Meshing/grinding noise: Bearing damage B Knocking noise: Irregularity in the gearing	A Check the oil (see Sec. 'Inspection and Maintenance'), change bearings B Contact customer service
Unusual, irregular running noise	Foreign bodies in the oil	<ul style="list-style-type: none"> Check the oil (see Sec. 'Inspection and Maintenance') Stop the drive, contact customer service
Oil leaking ¹⁾ <ul style="list-style-type: none"> from the gear cover plate from the motor flange from the motor oil seal from the gear unit flange from the output end oil seal 	A Rubber seal on the gear cover plate leaking B Seal defective C Gear unit not vented	A Tighten the bolts on the gear cover plate and observe the gear unit. Oil still leaking: Contact customer service B Contact customer service C Vent the gear unit (see Sec. 'Mounting Positions')
Oil emerging from breather valve	A Too much oil B Drive used with the wrong mounting position C Frequent cold starts (oil foams) and/or high oil level	A Correct the oil level (see Sec. 'Inspection and Maintenance') B Mount the breather valve correctly (see Sec. 'Mounting Positions') and correct the oil level (see Sec. 'Lubricants')
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/geared motor for repair

1) It is normal for small amounts of oil/grease to emerge from the oil seal during the running-in phase - (24 hour running time, see also DIN 3761).

Customer service

Please provide the following information when contacting customer service:

- Nameplate data (complete)
- Nature and extent of the fault
- Time and peripheral circumstances of the fault
- Presumed cause

8 Mounting Positions

8.1 General information about mounting positions

Mounting position designation

SEW differentiates between six mounting positions M1...M6 for gear units. The following figure shows the spatial orientation of the gear unit in mounting positions M1...M6.

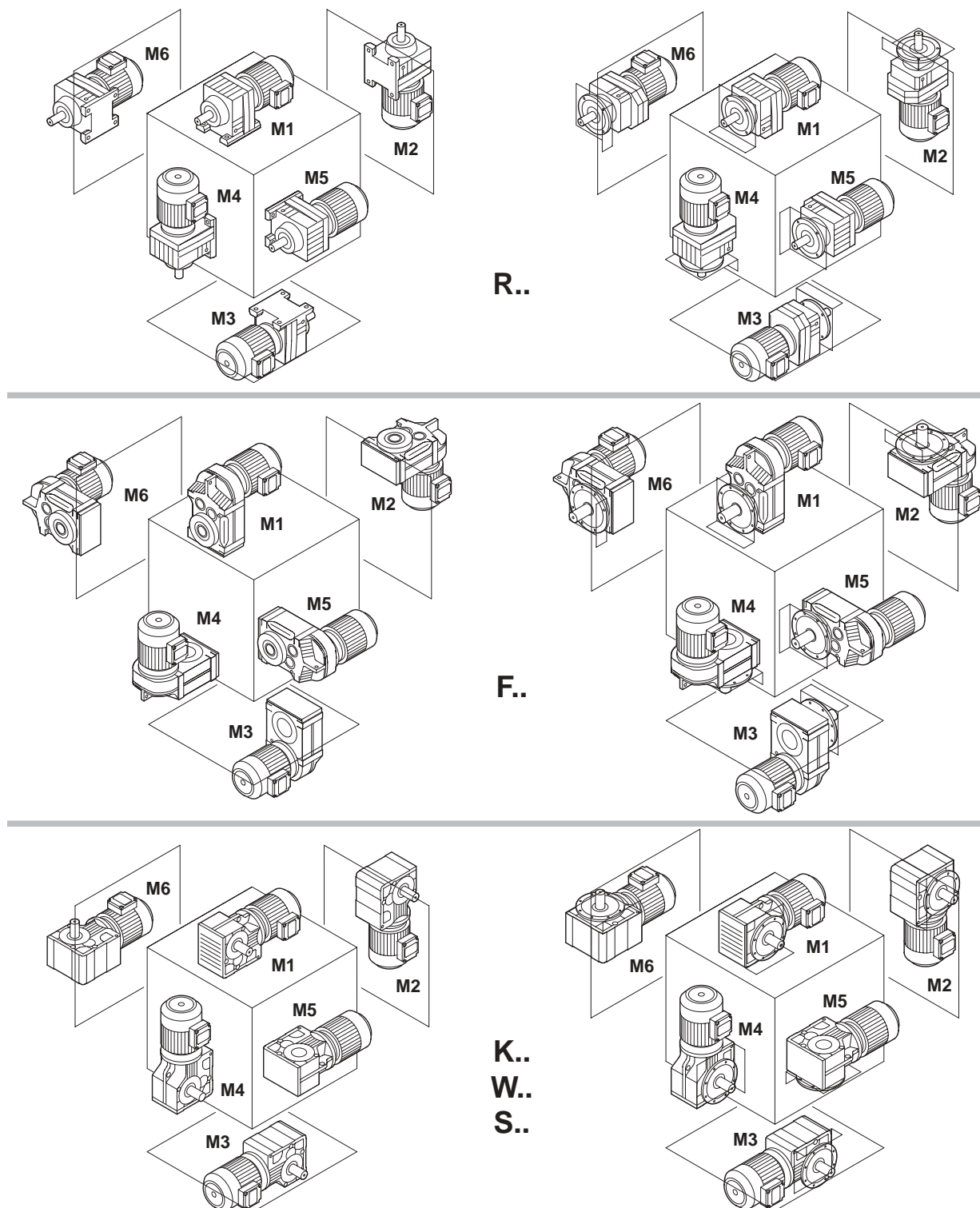


Figure 13: Depiction of mounting positions M1 M6

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8.2 Key to the mounting position sheets


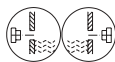



Spiroplan® geared motors do not change with their mounting position. However, mounting positions M1 to M6 are also shown for Spiroplan® geared motors to assist you in working with this documentation.

Important: No breather valves or oil level checking and drain plugs can be fitted on Spiroplan® geared motors.

Symbols used

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

Symbol	Meaning
	Breather valve
	Oil level plug
	Oil drain plug

Churning losses



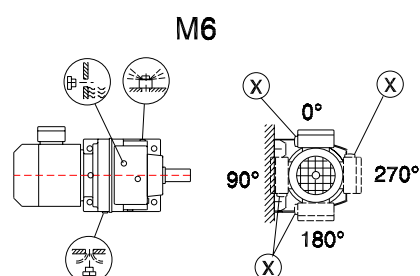
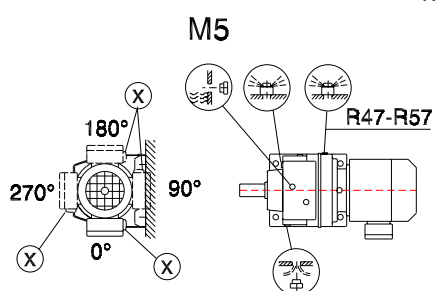
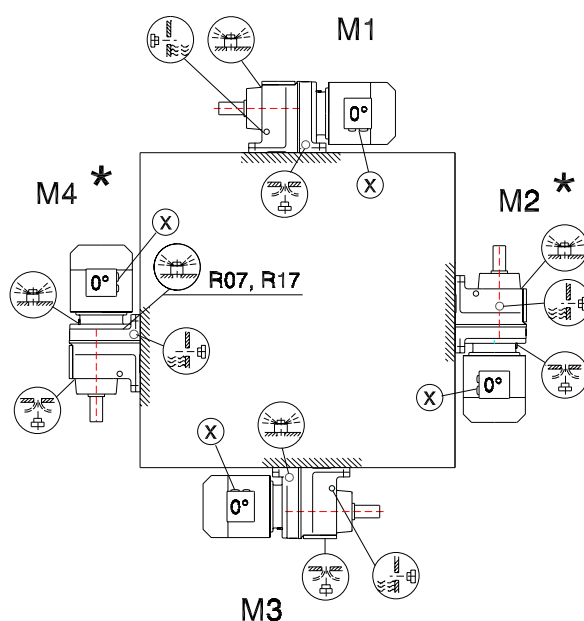
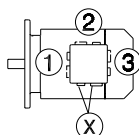
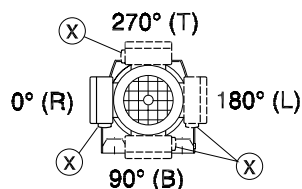
Increased churning losses may arise in some mounting positions. Please contact SEW-EURODRIVE in case of the following combinations:

Mounting position	Gear unit type	Gear unit size	Input speed [1/min]
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

8.3 Mounting positions of R helical gear units

R07-R167

04 040 200

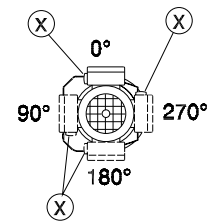
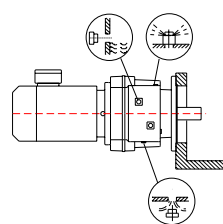
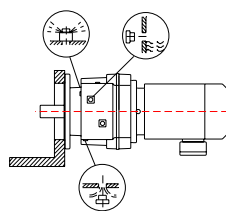
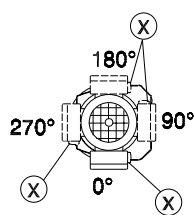
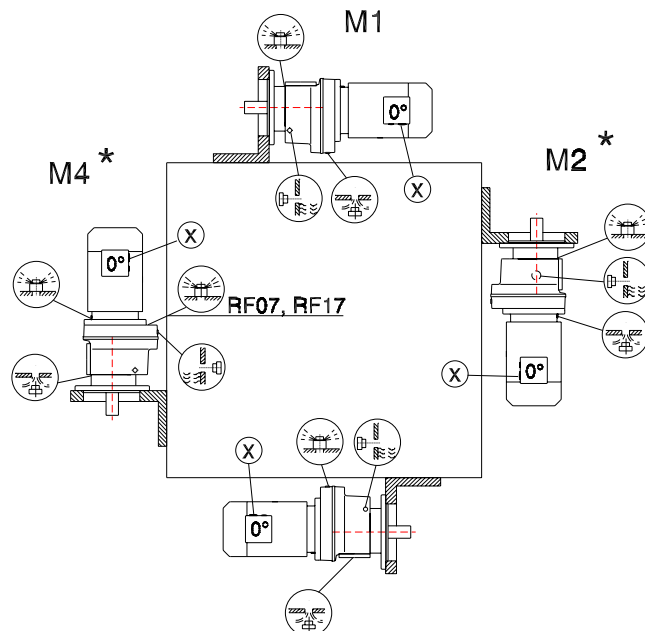
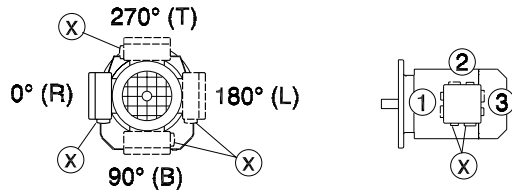


R07		M1, M2, M3, M5, M6
R17, R27		M1, M3, M5, M6
R07, R17, R27		
R47, R57		M5

* → page 35

RF07-RF167

04 041 200

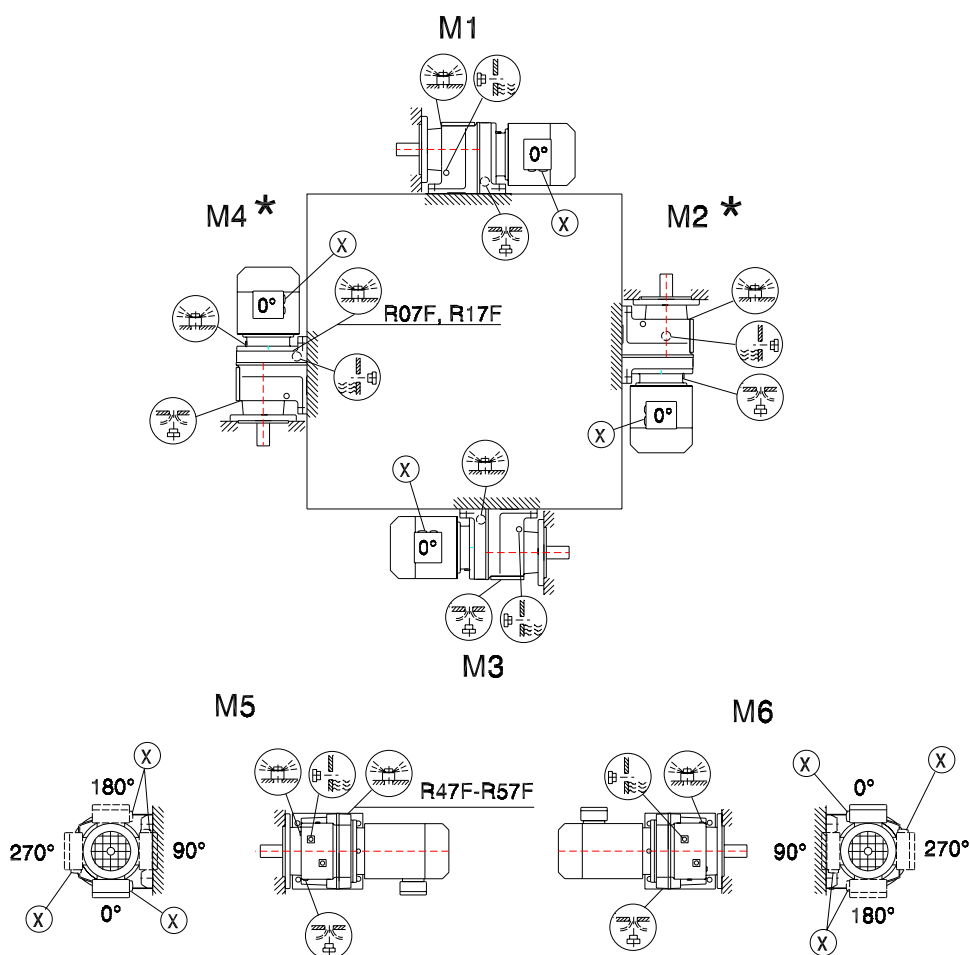
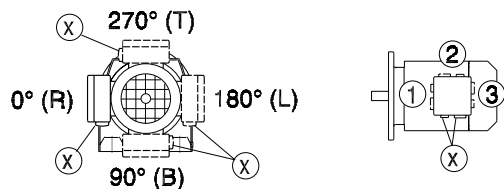


RF07		M1, M2, M3, M5, M6
RF17, RF27		M1, M3, M5, M6
RF07, RF17, RF27		
RF47, RF57		M5

* → page 35

R07F-R87F

04 042 200



R07F		M1, M2, M3, M5, M6
R17F, R27F		M1, M3, M5, M6
R07F, R17F, R27F		
R47F, R57F		M5

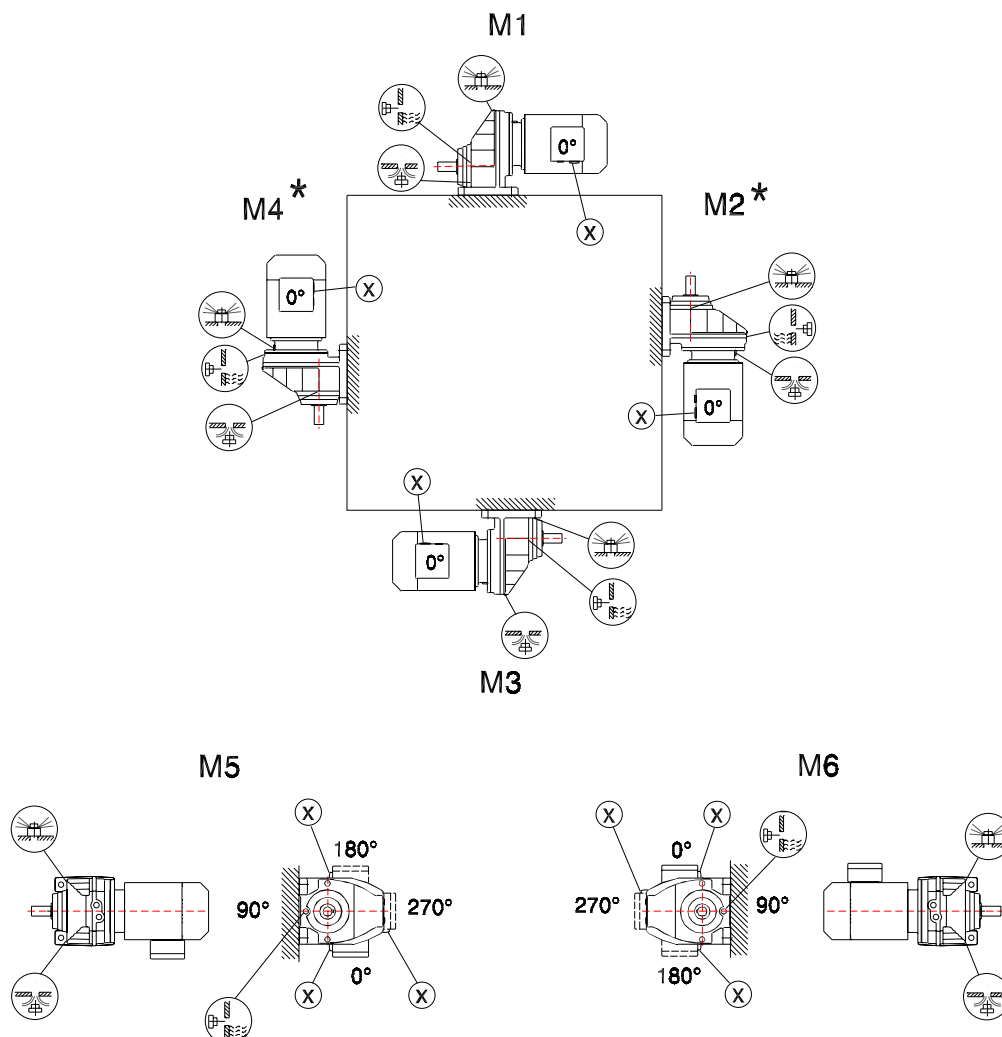
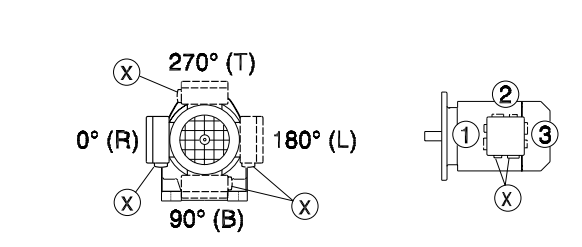
* → page 35

Important: Please refer to the information in the 'Geared Motors' catalog, Sec. 'Project Planning for Gear Units/Overhung and axial loads'.

8.4 Mounting positions of RX helical gear units

RX57-RX107

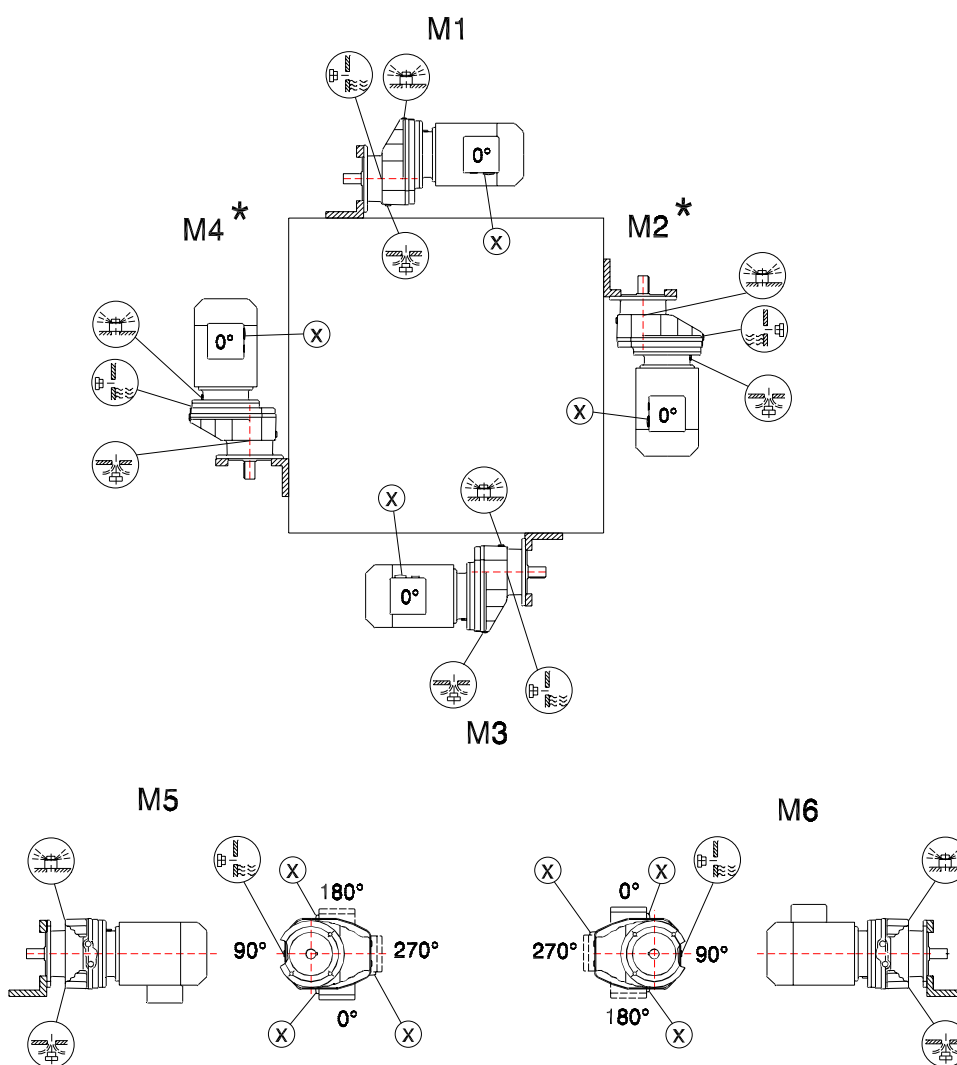
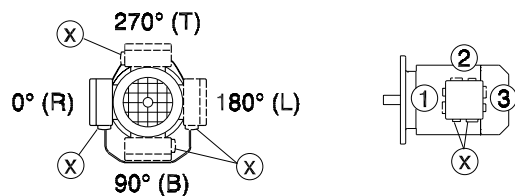
04 043 200



* → page 35

RXF57-RXF107

04 044 200

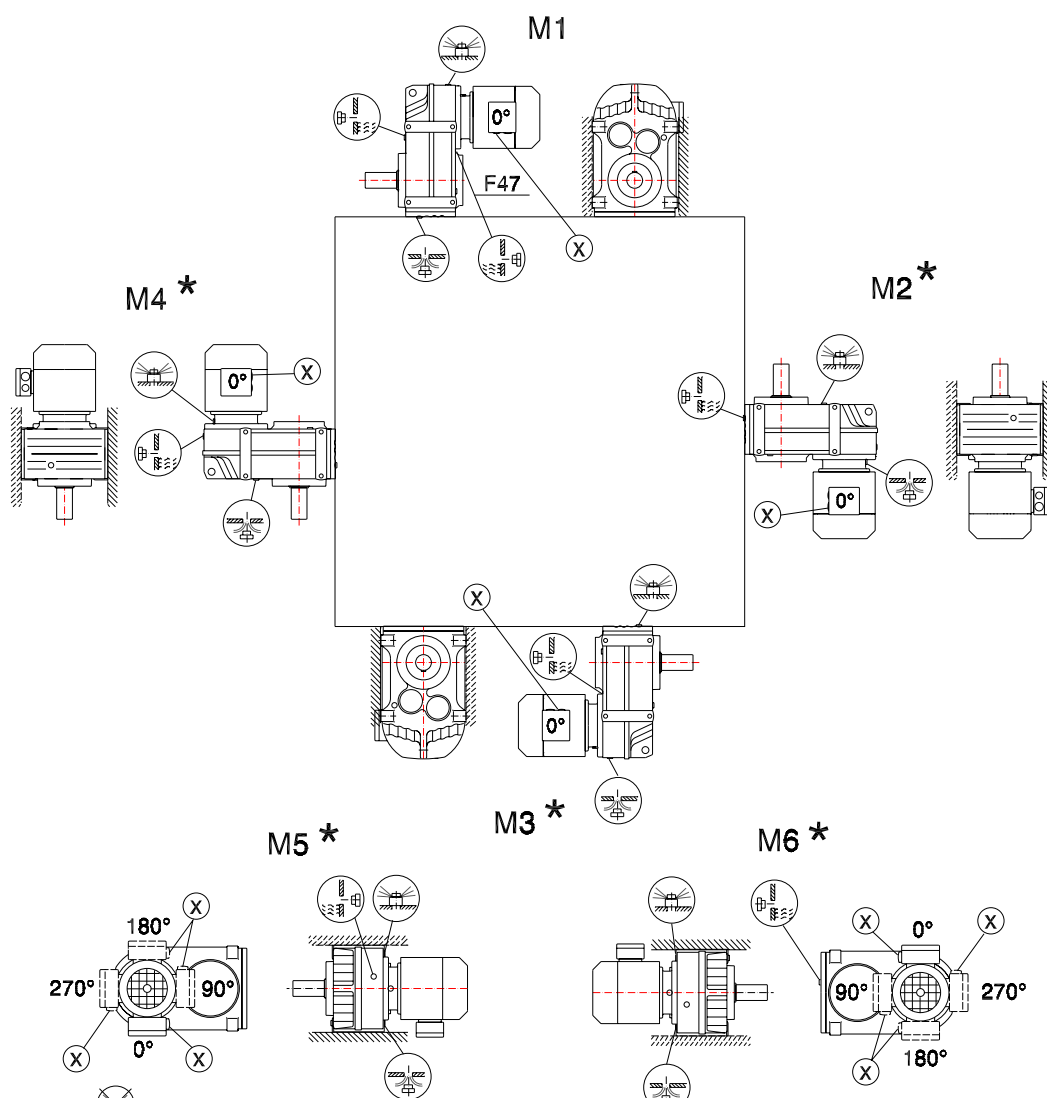
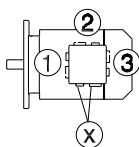
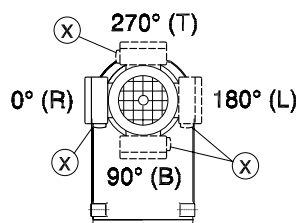



* → page 35

8.5 Mounting positions of parallel shaft helical gear units


F/FA..B/FH27B-157B, FV27B-107B

42 042 200



F..27  M1, M3, M5, M6

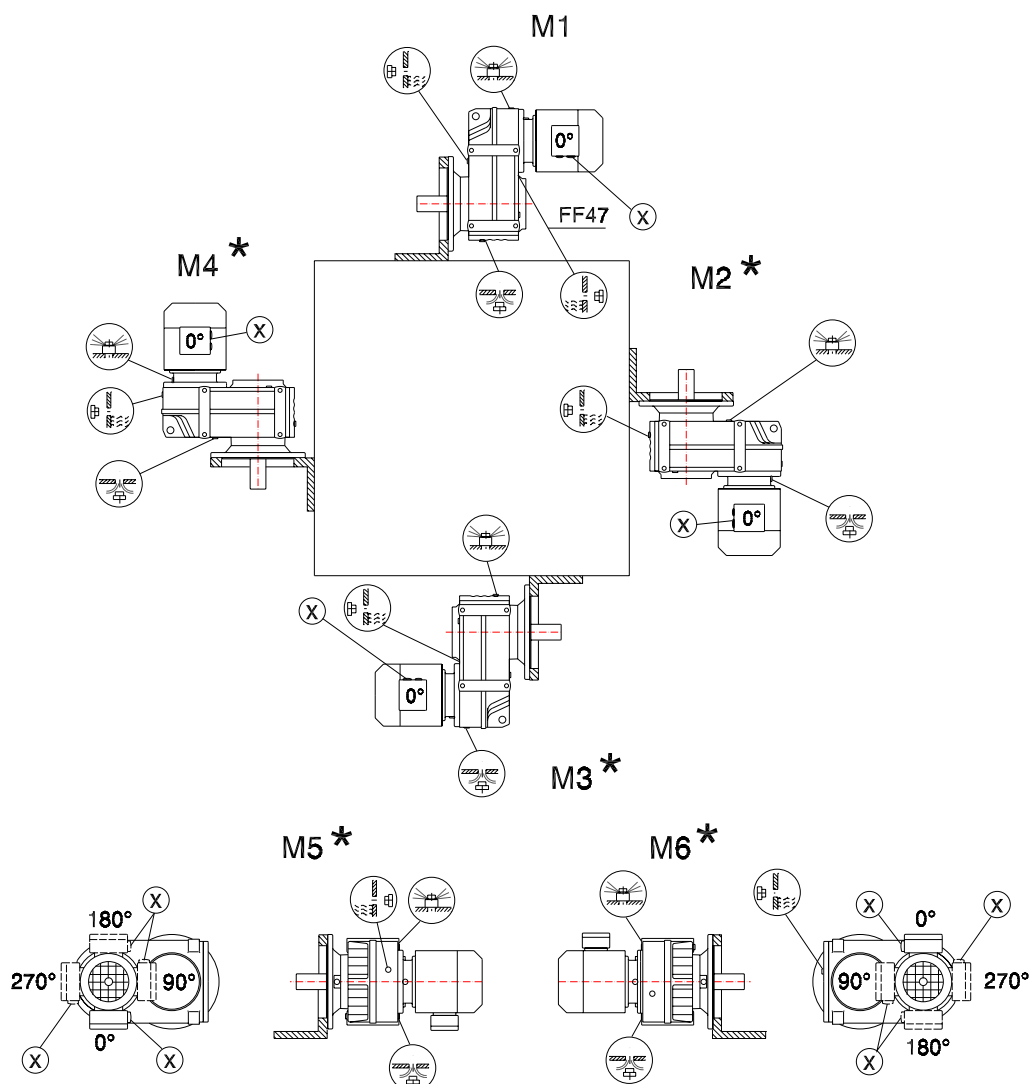
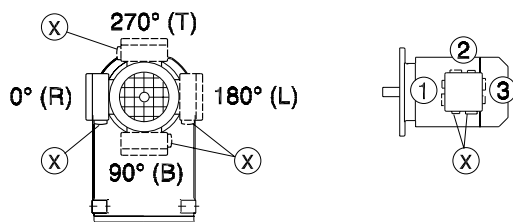


F..27  M1 - M6

F..27  M1, M3, M5, M6

* → page 35

FF/FAF/FHF/FAZ/FHZ27-157, FVF/FVZ27-107

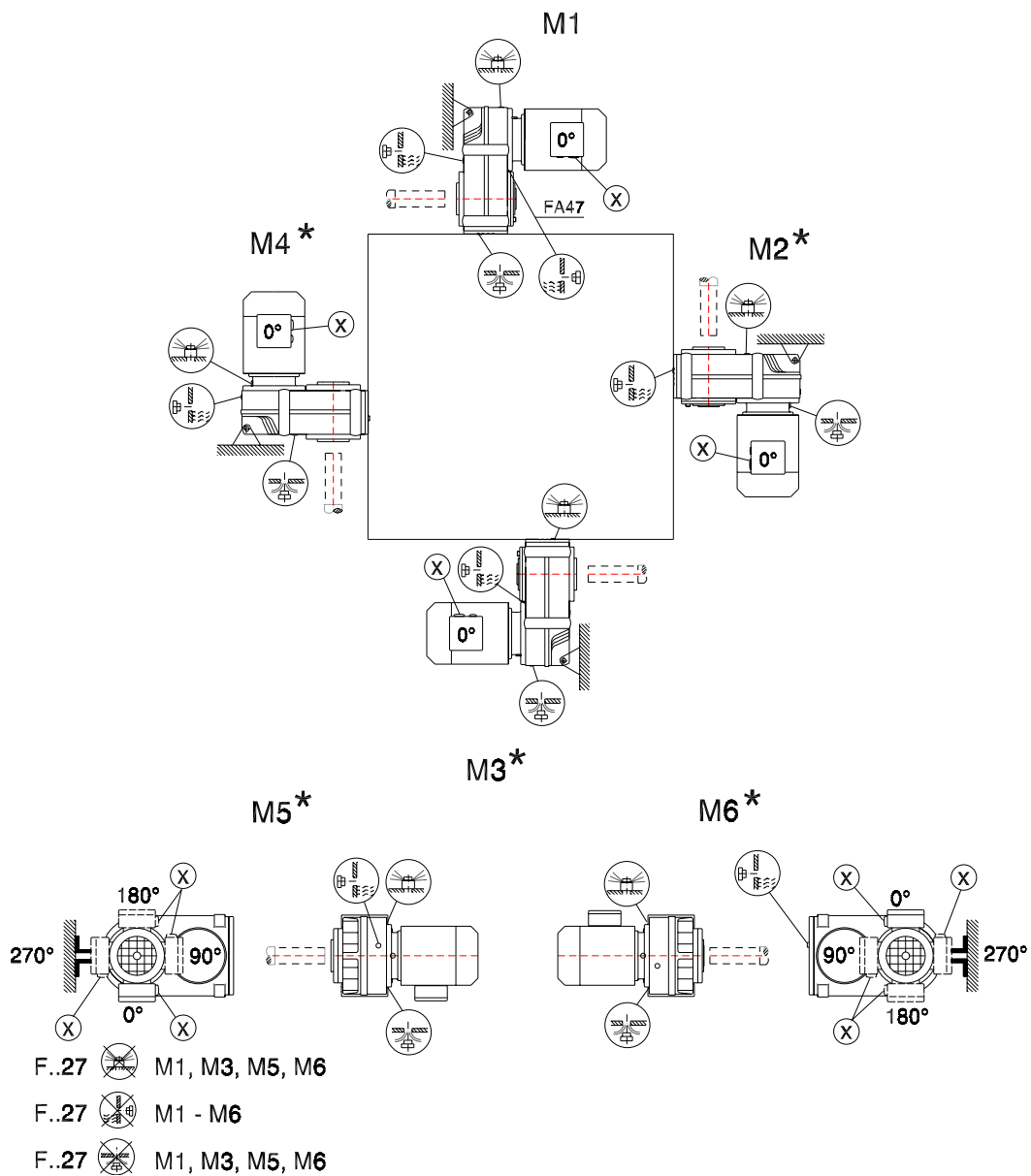
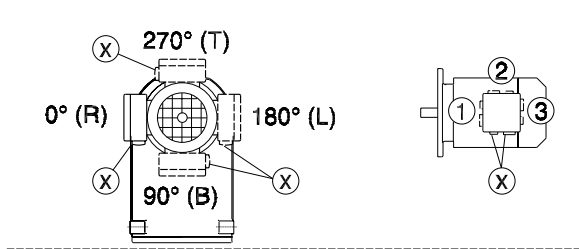
42 043 200

F..27  M1, M3, M5, M6F..27  M1 - M6F..27  M1, M3, M5, M6

* → page 35

FA/FH27-157, FV27-107

42 044 200

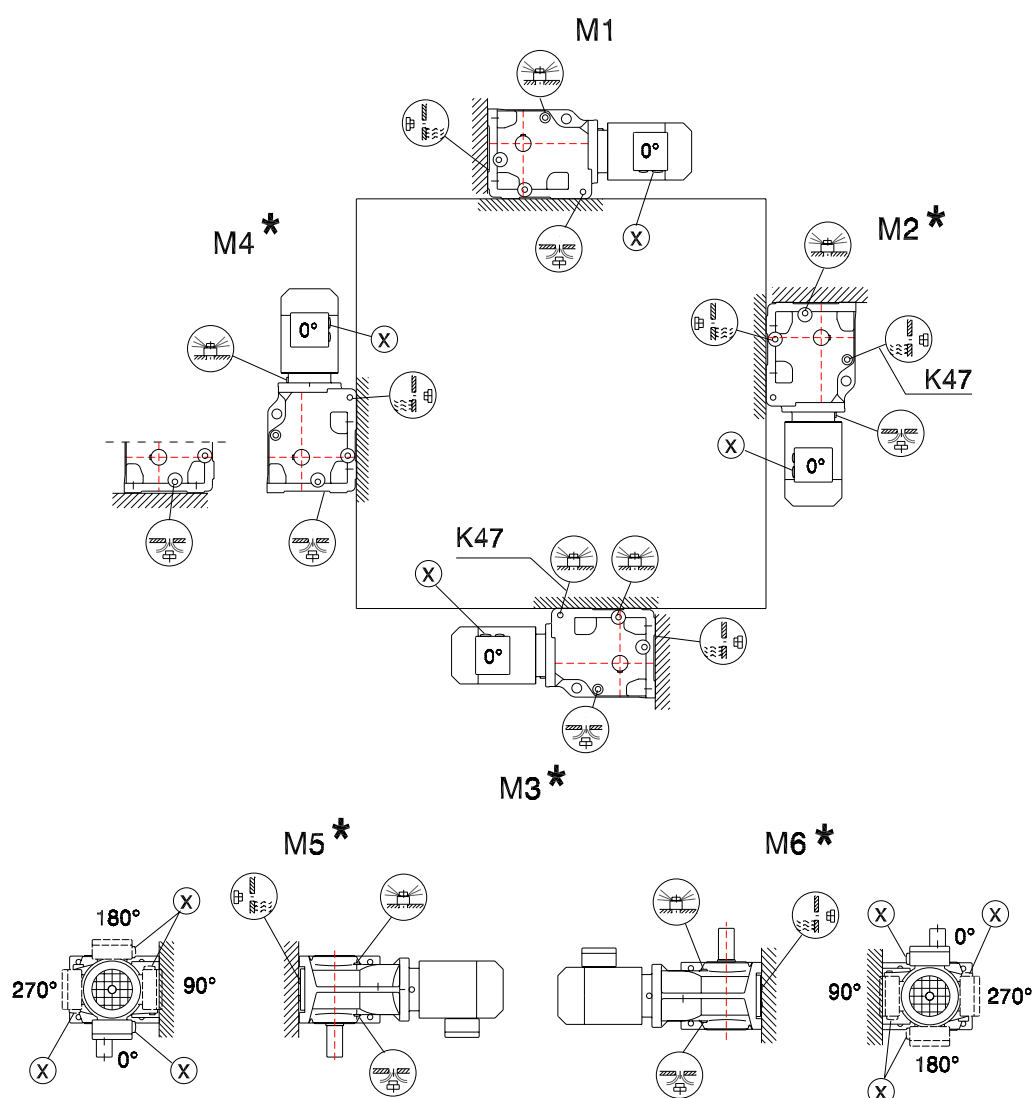
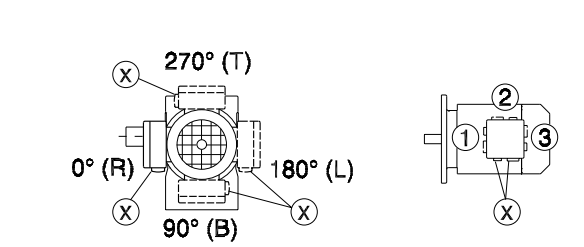


* → page 35


8.6 Mounting positions of helical-bevel gear units

K/KA..B/KH37B-157B, KV37B-107B

34 025 200

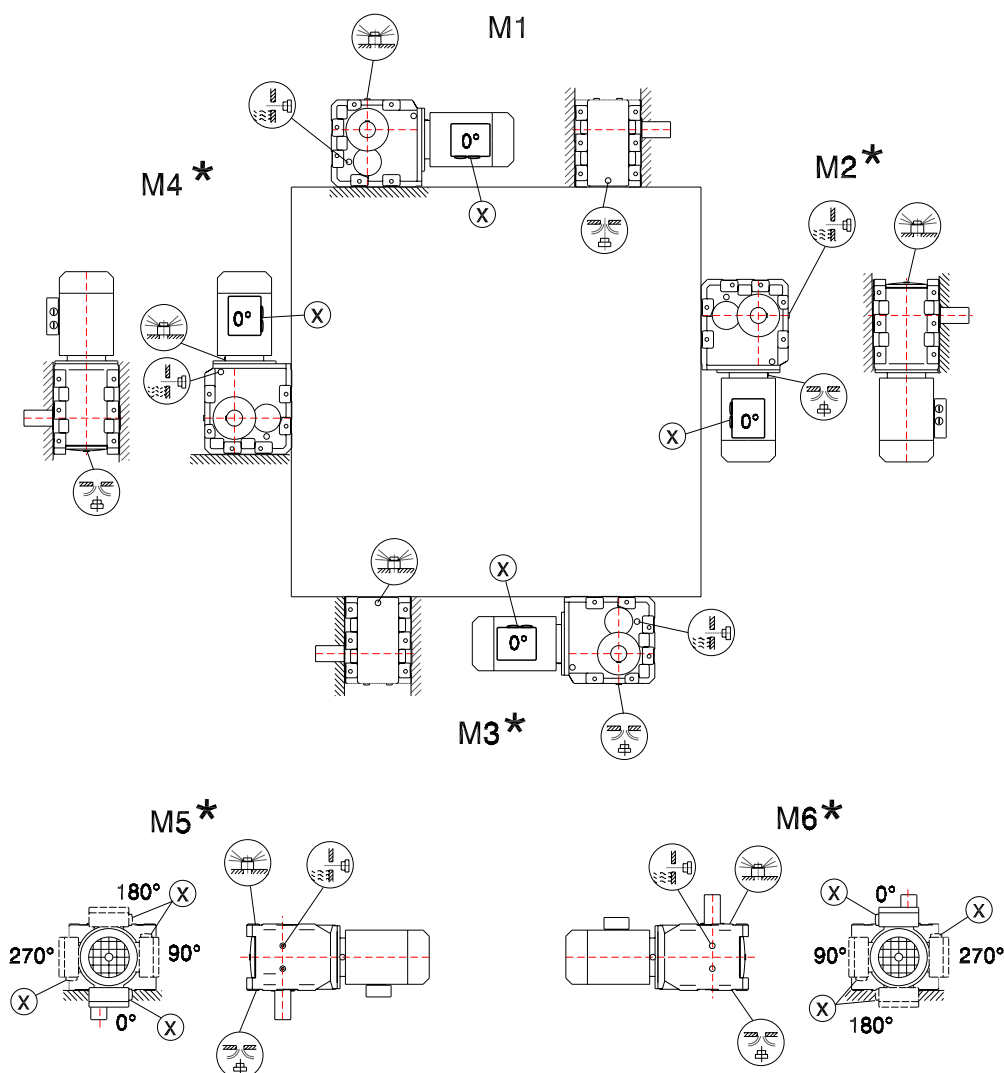
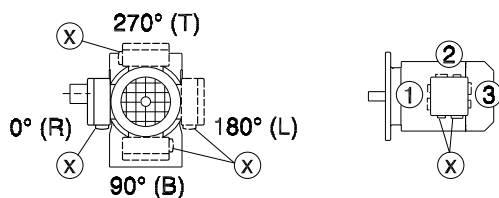


* → page 35

Important: Please refer to the  information in the 'Geared Motors' catalog, Sec. 'Project Planning for Gear Units/Overhung and axial loads'.

K167-187, KH167B-187B

34 026 200

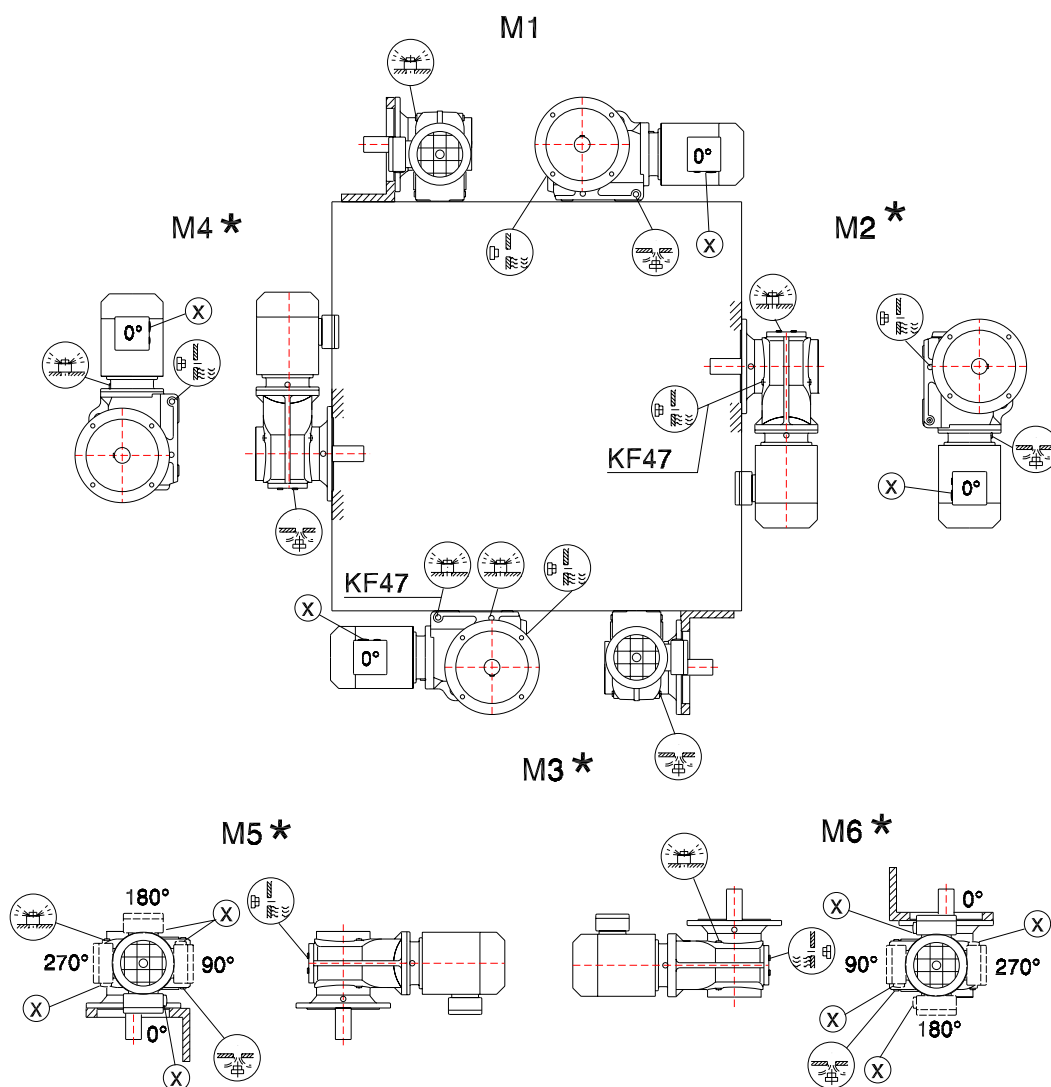
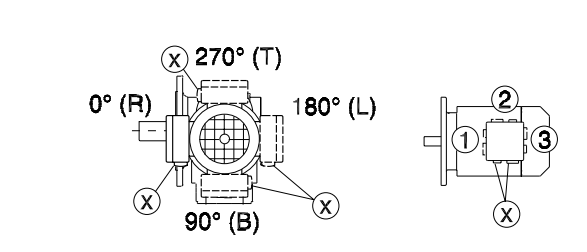


* → page 35

Important: Please refer to the  information in the 'Geared Motors' catalog, Sec. 'Project Planning for Gear Units/ Overhung and axial loads'.

KF/KAF/KHF/KAZ/KHZ37-157, KVF/KVZ37-107

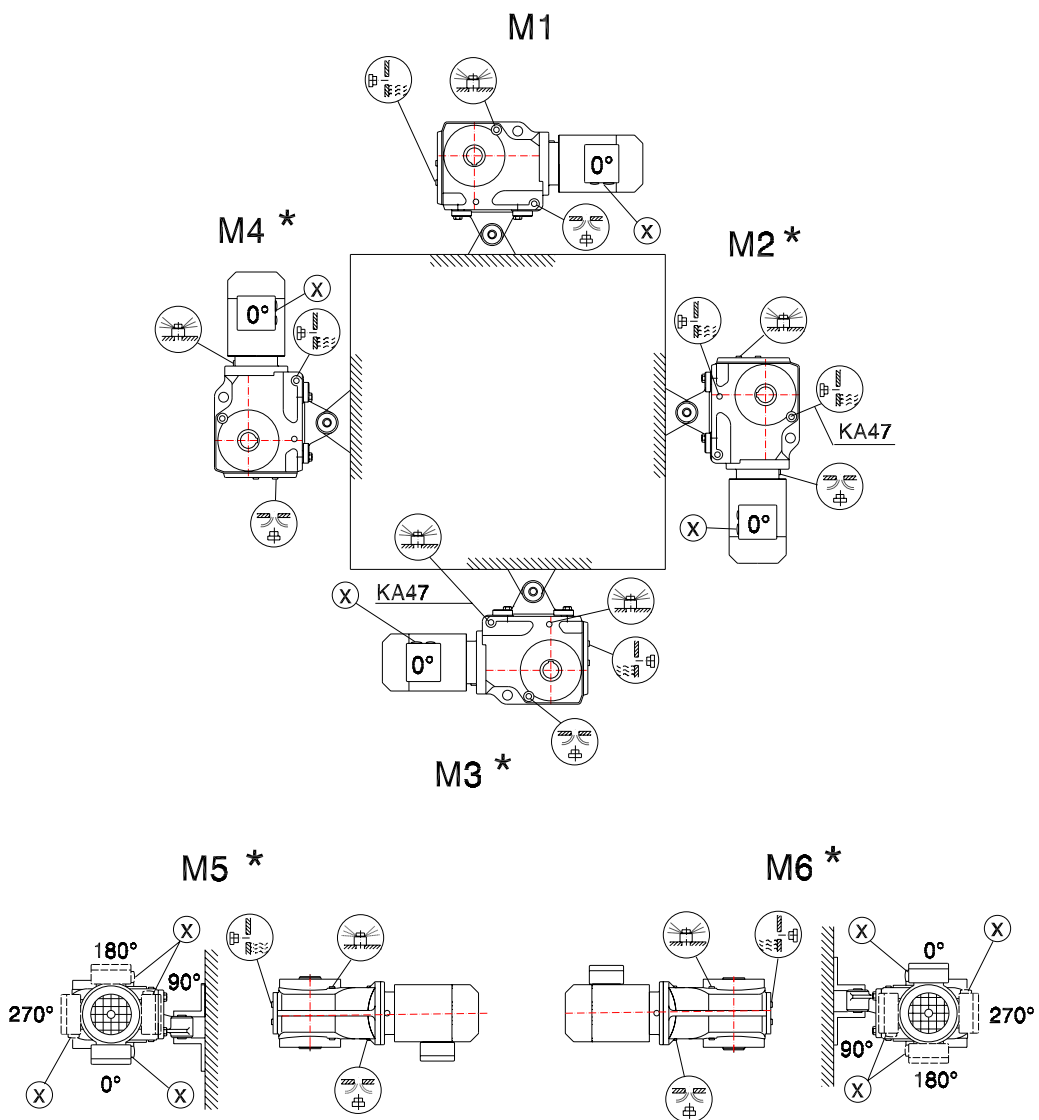
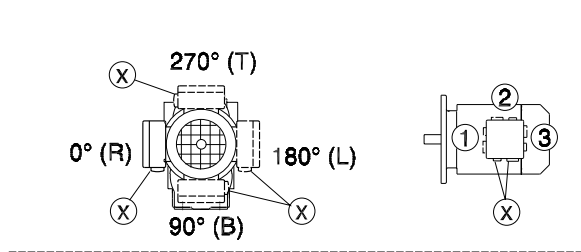
34 027 200



* → page 35

KA/KH37-157, KV37-107

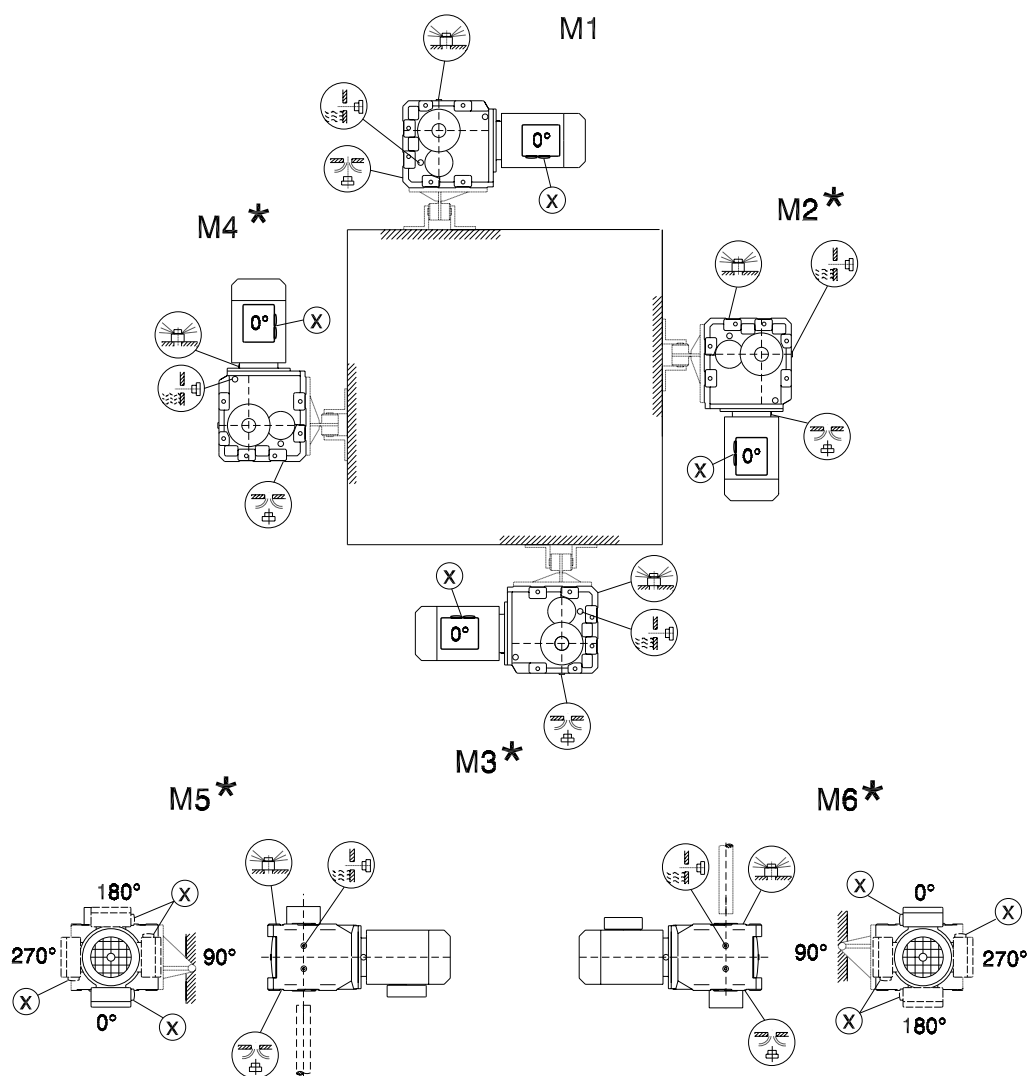
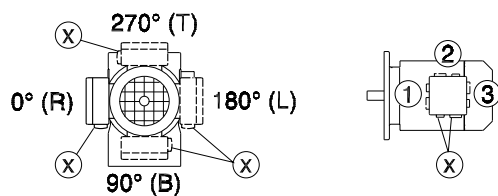
39 025 200



* → page 35

KH167-187

39 026 200

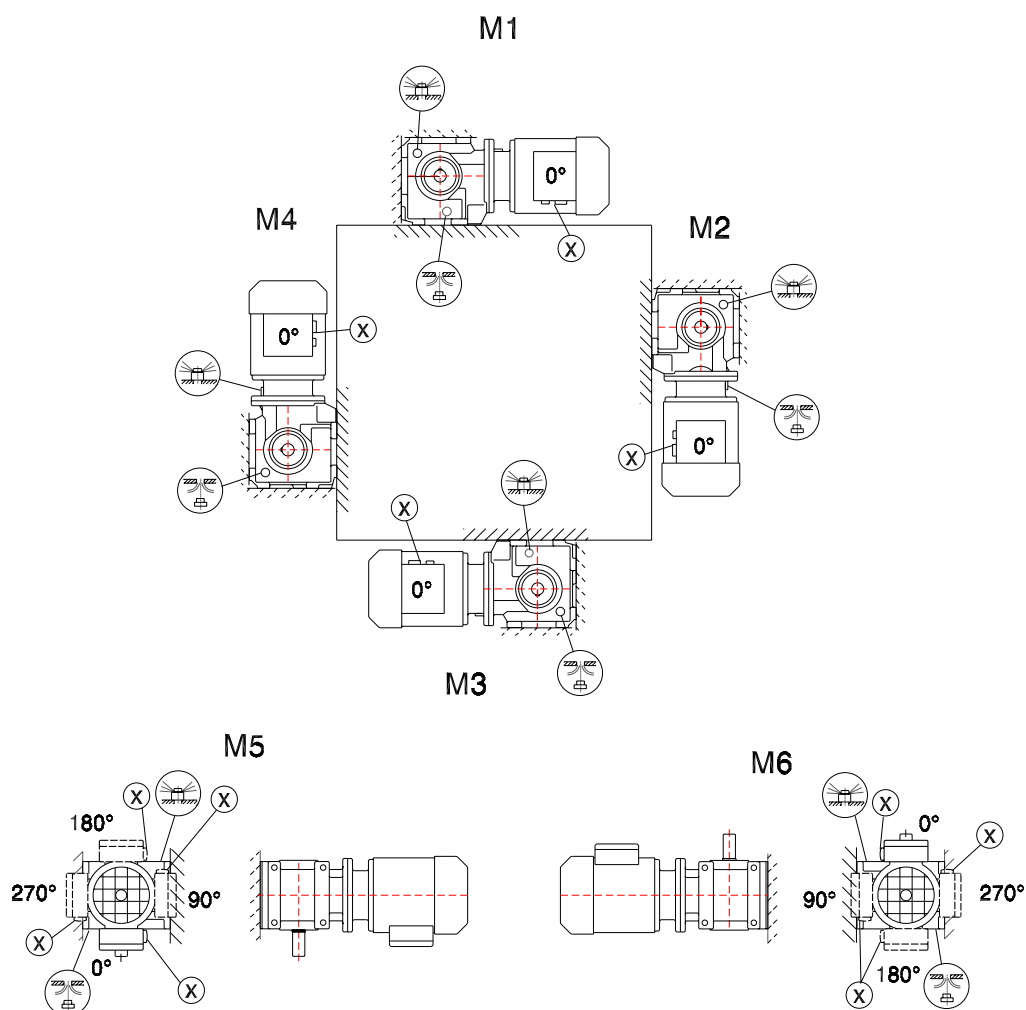
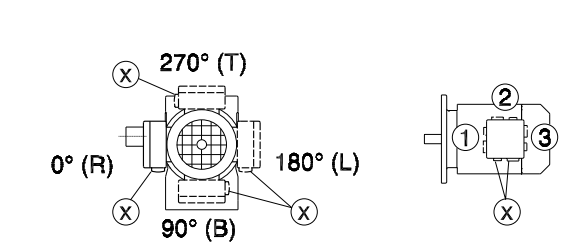


* → page 35

8.7 Mounting positions of helical-worm gear units

S37

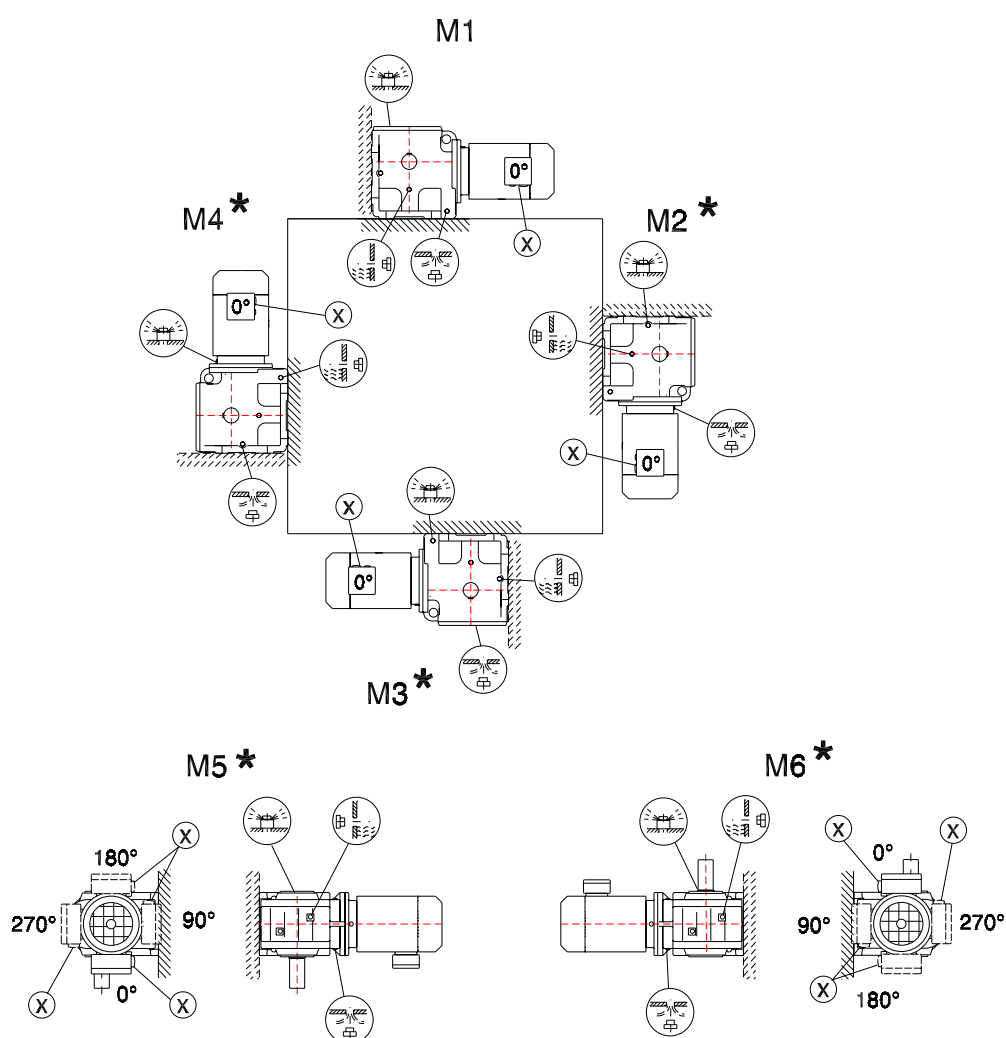
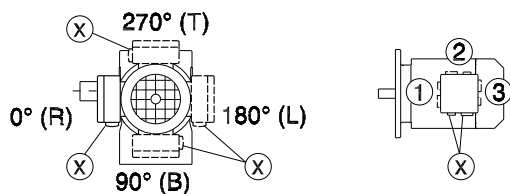
05 025 200



Important: Please refer to the  information in the 'Geared Motors' catalog, Sec. 'Project Planning for Gear Units/ Overhung and axial loads'.

S47-S97

05 026 200

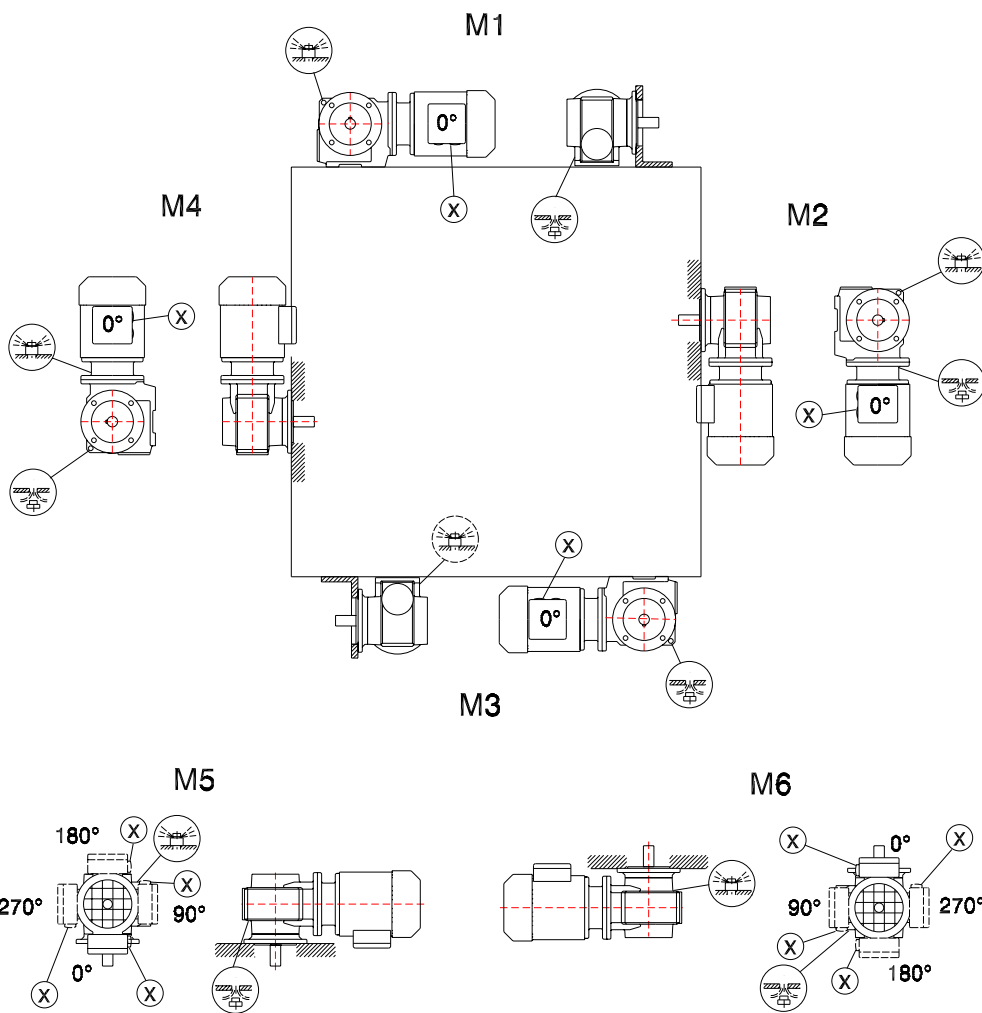
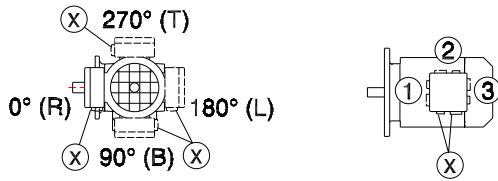


* → page 35

Important: Please refer to the  information in the 'Geared Motors' catalog, Sec. 'Project Planning for Gear Units/Overhung and axial loads'.

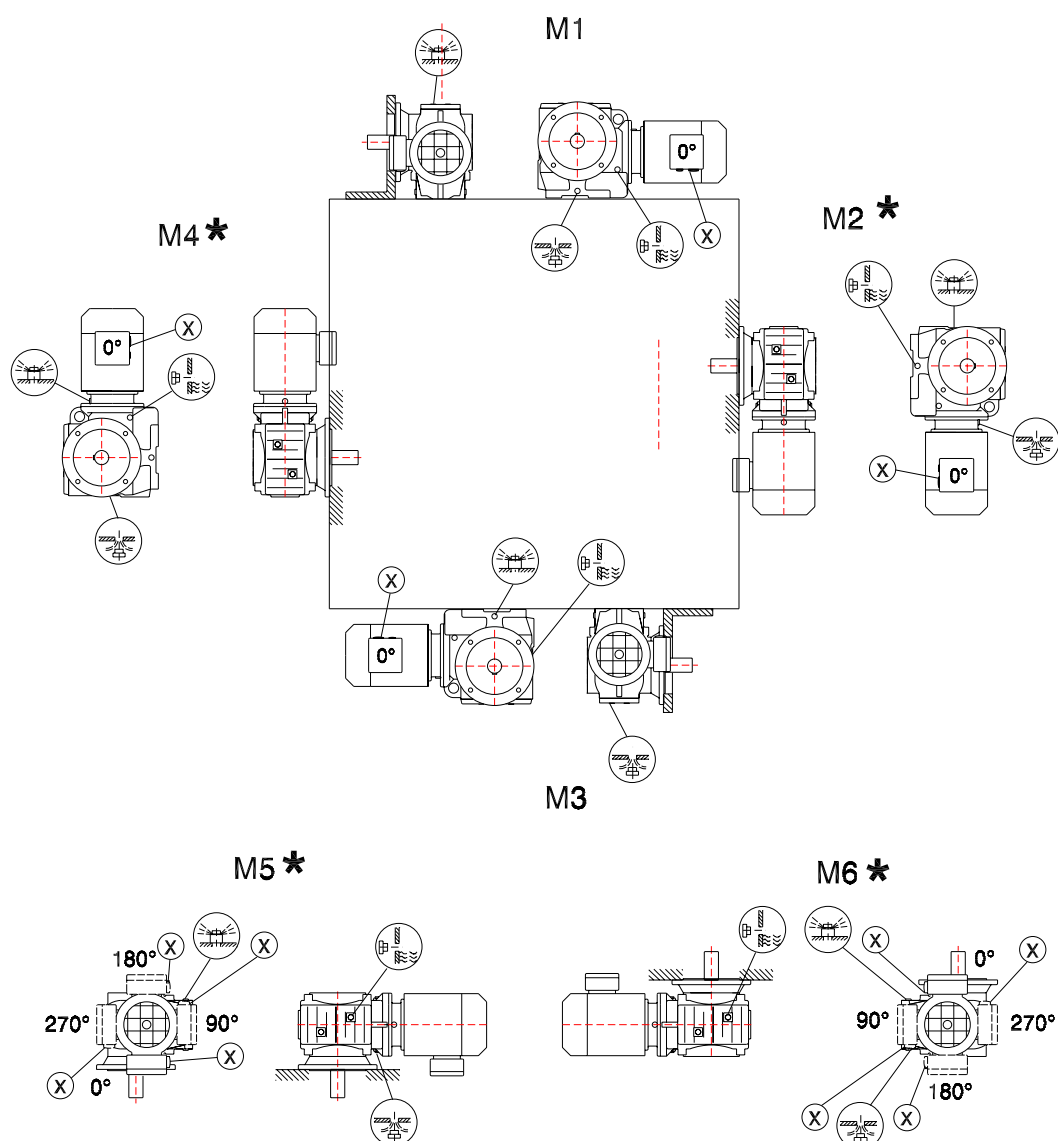
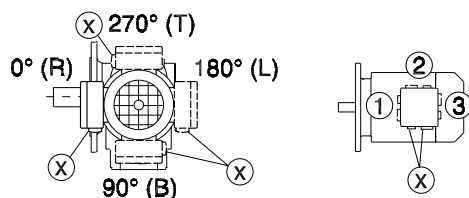
SF/SAF/SHF37

05 027 200



SF/SAF/SHF/SAZ/SHZ47-97

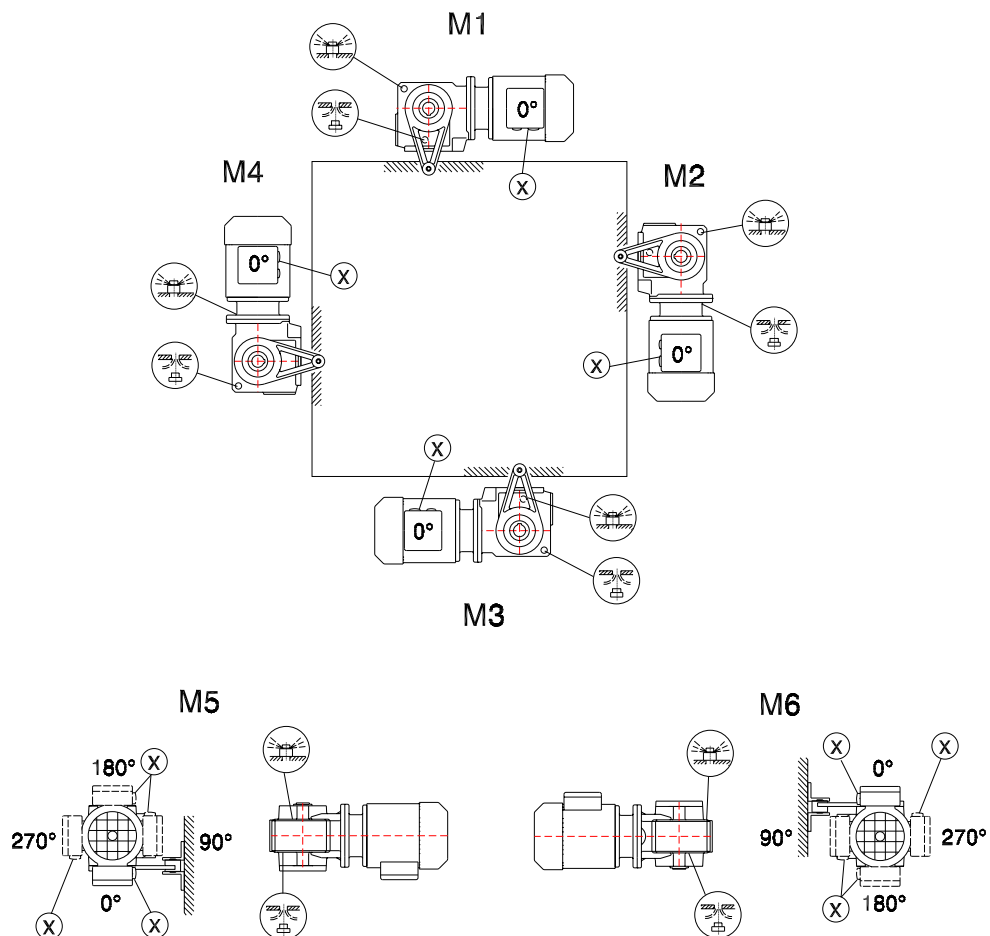
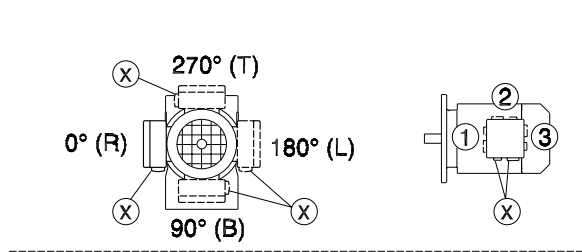
05 028 200



* → page 35

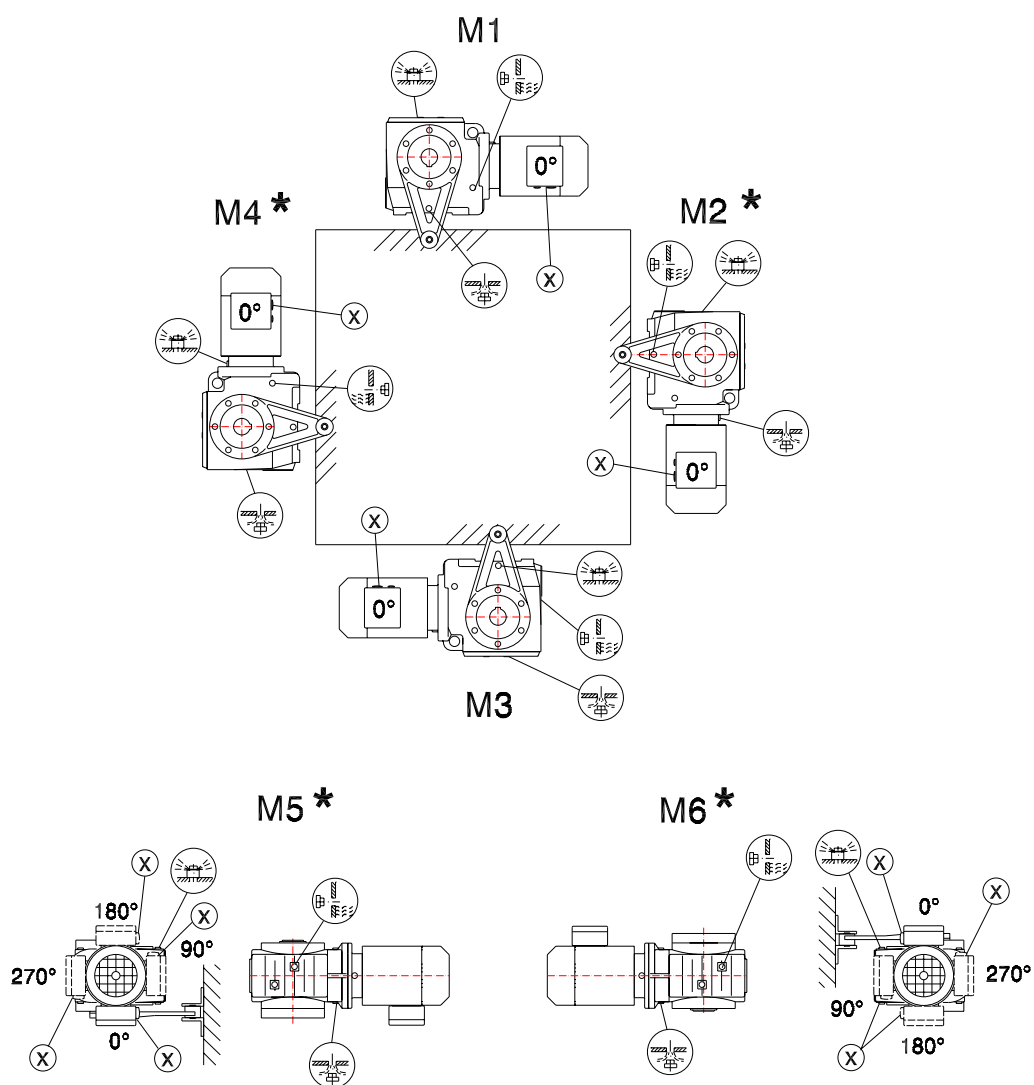
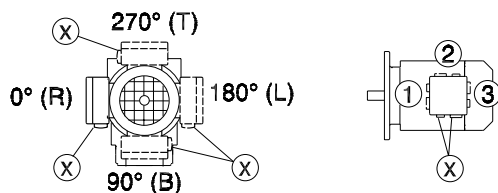
SA/SH37

28 020 200



SA/SH47-97

28 021 200

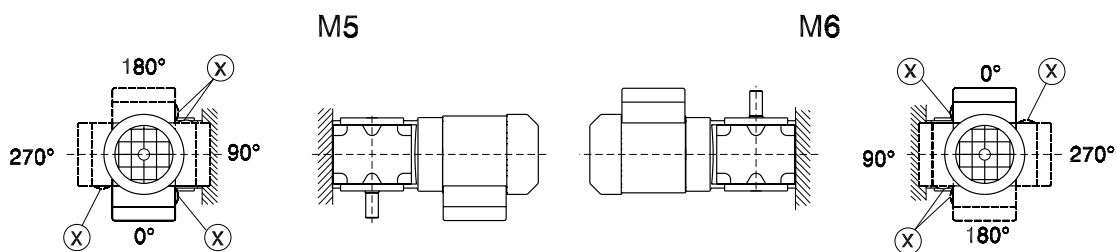
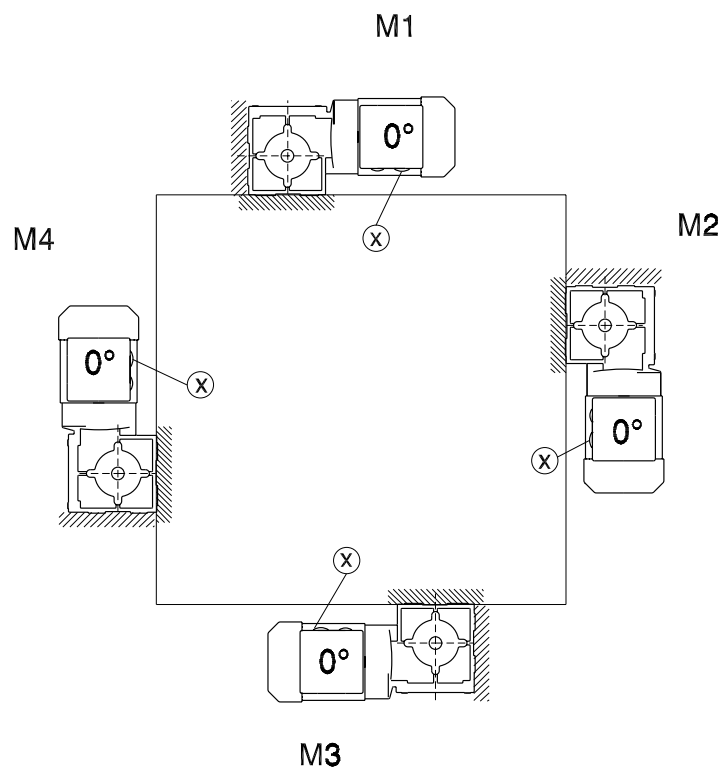
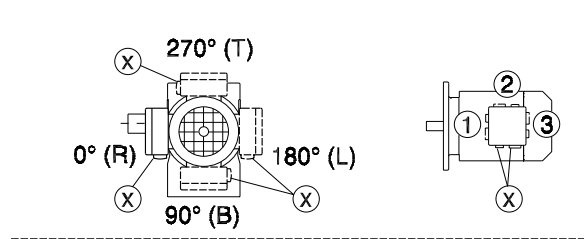


* → page 35

8.8 Mounting positions of Spiroplan® W gear units

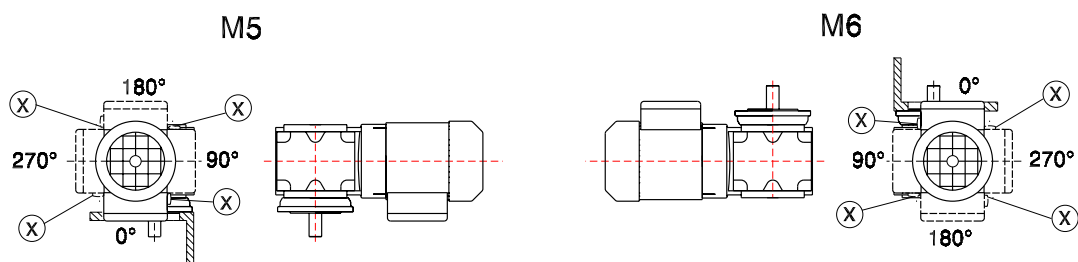
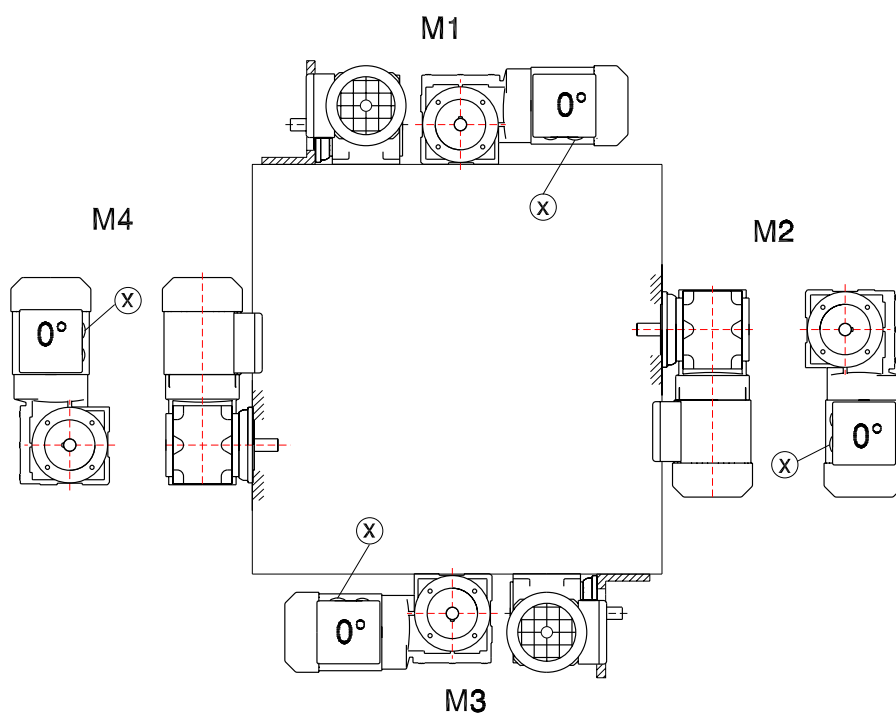
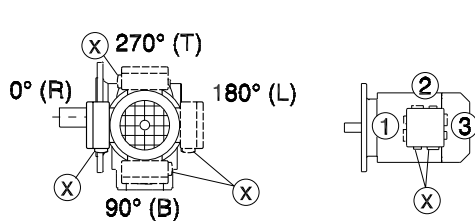
W10-30

20 001 002



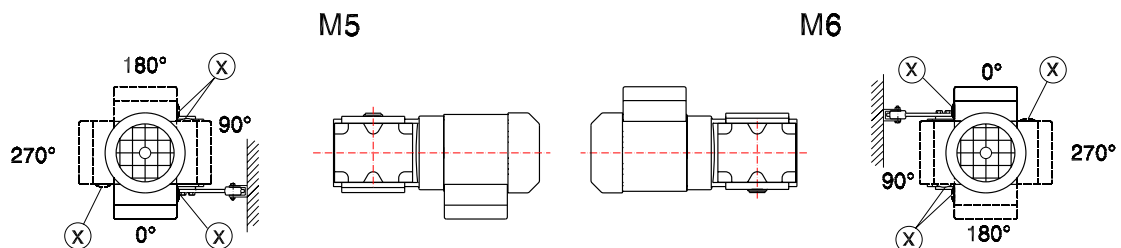
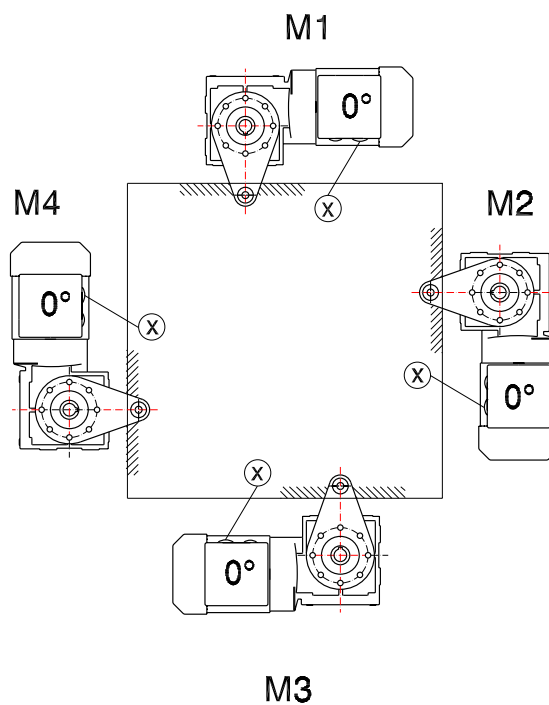
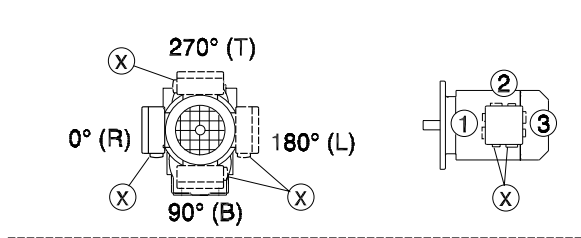
WF/WAF10-30

20 002 002



WA10-30

20 003 002





9 Lubricants

General information

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill specifically for the gear unit and mounting position. The decisive factor is the mounting position (M1...M6, → Sec. 'Mounting Positions and Important Order Information') specified when ordering the drive. You must adapt the lubricant fill to any subsequent changes made to the mounting position (→ Lubricant fill quantities).

Lubricant table

The lubricant table on the following page shows the permitted lubricants for SEW-EURODRIVE gear units. Please note the following key 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 pollution danger category WGK 1)
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 contact SEW
2)	Special lubricant for Spiroplan® gear units only
3)	Recommendation: Select SEW $f_B \geq 1.2$
4)	Note critical starting behavior at low temperatures!
5)	Low-viscosity grease
6)	Ambient temperature
	Lubricant for the foodstuffs industry (food industry oil)
	Biodegradable oil (lubricant for use in agriculture, forestry and water resources)

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
Anti-friction bearing in gear unit	-30 °C +60 °C	Mobil	Mobilux EP 2
	-40 °C +80 °C	Mobil	Mobiltemp SHC 100
Anti-friction bearing in motor	-25 °C +80 °C	Esso	Unirex N3
	-25 °C +60 °C	Shell	Alvania R3
	+80 °C +100 °C	Klüber	Barrierta L55/2
	-45 °C -25 °C	Shell	Aero Shell Grease 16
Special greases for anti-friction bearings in gear units:			
	-30 °C +40 °C	Aral	Aral Eural Grease EP 2
	-20 °C +40 °C	Klüber	Klüberbio M32-82



The following grease quantities are required:

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



Lubricant table

01 805 792

	6) °C -50 0 +50 +100 Standard -10 +40	DIN (ISO) 	ISO, NLGI	Mobil®	Shell	Klüber LUBROL	ARAL	BP	Tribol	TEAC	Optimat	FUCHS
R...		CLP (CC)	VG 220	Mobilgear 630	Shell Omala 220	Klüberoil GEM 1-220	Aral Degol BG 220	BP Energol GR-XP 220	Tribol 1100/220	Meropa 220	Optigear BM 220	Renolin CLP 220
K... (HK...)		CLP PG	VG 220	Mobil Glygoyle 30	Shell Tivela WB	Klüberoil GH 6-220	Aral Degol GS 220	BP Energol SG-XP 220	Tribol 800/220	Synlube CLP 220	Optiflex A 220	
F...		CLP HC	VG 220	Mobil SHC 630	Shell Omala 220 HD	Klüberoil EG 4-220	Aral Degol PAS 220		Tribol 1510/220	Pinnacle EP 220	Optigear Synthetic A 220	Renolin Unisyn CLP 220
			VG 150	Mobil SHC 629		Klüberoil EG 4-150				Pinnacle EP 150		
		CLP (CC)	VG 150	Mobilgear 627	Shell Omala 100	Klüberoil GEM 1-150	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150
		HLP (HM)	VG 68-46	Mobil D.T.E. 13M	Shell Tellus T 32	Klüberoil GEM 1-68	Aral Degol BG 46		Tribol 1100/68	Rando EP Ashless 46	Optigear 32	Renolin B 46 HVI
		CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32				Cetus PAO 46		
		HLP (HM)	VG 22	Mobil D.T.E. 11M	Shell Tellus T 15	Isotex MT 30 ROT		BP Energol HLP-HM 10		Rando HDZ 15		
		CLP (CC)	VG 680	Mobilgear 636	Shell Omala 680	Klüberoil GEM 1-680	Aral Degol BG 680	BP Energol GR-XP 680	Tribol 1100/680	Meropa 680	Optigear BM 680	Renolin CLP 680
		CLP PG	VG 680 ¹⁾	Mobil Glygoyle HE 680		Klüberoil GH 6-680		BP Energol SG-XP 680	Tribol 800/680	Synlube CLP 680		
		CLP HC	VG 460	Mobil SHC 634	Shell Omala 460 HD	Klüberoil EG 4-460				Pinnacle EP 460		
			VG 150	Mobil SHC 629		Klüberoil EG 4-150				Pinnacle EP 150		
		CLP (CC)	VG 150	Mobilgear 627	Shell Omala 100	Klüberoil GEM 1-150	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 100	Optigear BM 100	Renolin CLP 150
		CLP PG	VG 220 ¹⁾	Mobil Glygoyle 30		Klüberoil GH 6-220			Tribol 800/220	Synlube CLP 220	Optiflex A 220	
		CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32				Cetus PAO 46		
		HCE	VG 460		Shell Cassida Fluid GL 460	Klüberoil 4UH1-460	Aral Eural Gear 460				Optileb GT 460	
		E	VG 460			Klüberoil CAZ-460	Aral Degol BAB 460				Optisynth BS 460	
		SEW PG	VG 460 ²⁾			Klüber SEW HT-460-5						
		API GL5	SAE 75W90 (~VG 100)	Mobilube SHC 75 W90-LS								
		CLP PG	VG 460 ³⁾			Klüberoil UH1 6-460						
			00	Glygoyle Grease 00	Shell Tivela Compound A	Klüberoil GE 46-1200				Multifak 6833 EP 00		
		DIN 51 818 ⁵⁾	000 - 0	Mobilux EP 004	Shell Alvania GL 00		Aralub MFL 00	BP Energol LS-EP 00		Multifak EP 000	Longtime PD 00	Renolin SF 7 - 041

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Lubricant fill quantities

The specified fill quantities are **recommended values**. The precise values vary depending on the 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 recommended values for lubricant fill quantities depending on the mounting position M1...M6.

Helical (R) gear units

Gear unit type R..., R..F	Fill quantity in liters					
	M1 ¹⁾	M2 ¹⁾	M3	M4	M5	M6
R07/R07F	0.12	0.20	0.20	0.20	0.20	0.20
R17/R17F	0.25	0.55	0.35	0.55	0.35	0.35
R27/R27F	0.25/0.40	0.70	0.50	0.70	0.50	0.50
R37/R37F	0.30/0.95	0.85	0.95	1.05	0.75	0.95
R47/R47F	0.70/1.50	1.60	1.50	1.65	1.50	1.50
R57/R57F	0.80/1.70	1.90	1.70	2.1	1.70	1.70
R67/R67F	1.10/2.3	2.6/3.5	2.8	3.2	1.80	2.0
R77/R77F	1.20/3.0	3.8/4.1	3.6	4.1	2.5	3.4
R87/R87F	2.3/6.0	6.7/8.2	7.2	7.7	6.3	6.5
R97	4.6/9.8	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	39.5	41.0
R167	27.0/70	82	78	88	66	69
Gear unit type RF..	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	0.35
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
RF/RM57	0.80/1.70	1.80	1.70	2.0	1.70	1.70
RF/RM67	1.20/2.5	2.7/3.6	2.7	3.1	1.90	2.1
RF/RM77	1.20/2.6	3.8/4.1	3.3	4.1	2.4	3.0
RF/RM87	2.4/6.0	6.8/7.9	7.1	7.7	6.3	6.4
RF/RM97	5.1/10.2	11.9/14.0	11.2	14.0	11.2	11.8
RF/RM107	6.3/14.9	15.9	17.0	19.2	13.1	15.9
RF/RM137	9.5/25.0	27.0	29.0	32.5	25.0	25.0
RF/RM147	16.4/42.0	47.0	48.0	52	42.0	42.0
RF/RM167	26.0/70	82	78	88	65	71

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



Helical (RX) gear units

Gear unit type RX..	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	2.6	2.7	1.60	1.60
RX87	1.70	2.5	4.8	4.8	2.9	2.9
RX97	2.1	3.4	7.4	7.0	4.8	4.8
RX107	3.9	5.6	11.6	11.9	7.7	7.7
Gear unit type RXF..	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	2.4	1.80	1.60	1.60
RXF87	1.60	2.0	4.9	4.0	2.9	2.9
RXF97	2.1	3.7	7.1	6.3	4.8	4.8
RXF107	3.1	5.7	11.2	9.3	7.2	7.2

Parallel shaft helical (F) gear units

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

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.70	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	2.6	3.5	2.1	3.5	2.8	2.9
F..67	2.7	3.8	1.9	3.8	2.9	3.2
F..77	5.9	7.3	4.3	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	55	34.0	61	46.5	47.0
F..157	69	104	63	105	86	78

FF..:

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
FF27	0.60	0.80	0.70	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	2.8	3.5	2.1	3.7	2.9	3.0
FF67	2.7	3.8	1.90	3.8	2.9	3.2
FF77	5.9	7.3	4.3	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	25.5	18.9	20.5
FF107	25.5	32.0	19.5	38.5	27.5	28.0
FF127	41.5	56	34.0	63	46.5	49.0
FF157	72	105	64	106	87	79



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

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.70	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	2.7	3.5	2.1	3.4	2.9	3.0
F..67	2.7	3.8	1.90	3.8	2.9	3.2
F..77	5.9	7.3	4.3	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	25.0	18.5	20.0
F..107	24.5	32.0	19.5	37.5	27.0	27.0
F..127	39.0	55	34.0	61	45.0	46.5
F..157	68	103	62	104	85	77

*Helical-bevel (K)
gear units*

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

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..37	0.50	1.00	1.00	1.30	0.95	0.95
K..47	0.80	1.30	1.50	2.0	1.60	1.60
K..57	1.20	2.3	2.5	3.0	2.6	2.4
K..67	1.10	2.4	2.6	3.4	2.6	2.6
K..77	2.2	4.1	4.4	5.9	4.2	4.4
K..87	3.7	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	40.0	41.0
K..157	31.0	62	65	90	58	62
K..167	33.0	95	105	123	85	84
K..187	53	152	167	200	143	143

KF..:

Gear unit type	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	2.2	1.60	1.60
KF57	1.30	2.3	2.7	3.2	2.9	2.7
KF67	1.10	2.4	2.8	3.6	2.7	2.7
KF77	2.1	4.1	4.4	6.0	4.5	4.5
KF87	3.7	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	22.0	26.0	35.0	25.0	25.0
KF127	21.0	41.5	46.0	55	41.0	41.0
KF157	31.0	66	69	92	62	62



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

Gear unit type	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	2.1	1.60	1.60
K..57	1.30	2.3	2.7	3.2	2.9	2.7
K..67	1.10	2.4	2.7	3.6	2.6	2.6
K..77	2.1	4.1	4.6	6.0	4.4	4.4
K..87	3.7	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	32.0	24.0	24.0
K..127	21.0	41.5	43.0	52	40.0	40.0
K..157	31.0	66	67	87	62	62
KH167	33.0	95	105	123	85	84
KH187	53	152	167	200	143	143

Spiroplan® (W)
gear units

The fill quantity of Spiroplan® gear units does not vary with their mounting position:

Gear unit type	Fill quantity in liters, regardless of mounting position
W..10	0.16
W..20	0.26
W..30	0.50

Helical-worm (S)
gear units

S..:

Gear unit type	Fill quantity in liters					
	M1	M2	M3 ¹⁾	M4	M5	M6
S37	0.25	0.40	0.50	0.55	0.40	0.40
S47	0.35	0.80	0.70/0.90	1.00	0.80	0.80
S57	0.50	1.20	1.00/1.20	1.45	1.30	1.30
S67	1.00	2.0	2.2/3.1	3.1	2.6	2.6
S77	1.90	4.2	3.7/5.4	5.9	4.4	4.4
S87	3.3	8.1	6.9/10.4	11.3	8.4	8.4
S97	6.8	15.0	13.4/18.0	21.8	17.0	17.0

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

SF..:

Gear unit type	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	0.90/1.10	1.05	1.00	1.00
SF57	0.50	1.20	1.00/1.50	1.55	1.40	1.40
SF67	1.00	2.2	2.3/3.0	3.2	2.7	2.7
SF77	1.90	4.1	3.9/5.8	6.5	4.9	4.9
SF87	3.8	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 large gear unit of multi-stage gear units must be filled with the larger oil volume.



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

Gear unit type	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	2.0	1.80/2.6	2.9	2.5	2.5
S..77	1.80	3.9	3.6/5.0	5.8	4.5	4.5
S..87	3.8	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 large gear unit of multi-stage gear units must be filled with the larger oil volume.

10 Index

10.1 Index of changes

The following additions and changes have been made to the previous edition of the Gear Units operating instructions (publication number: 1050 3005, edition 05/2001):

**General
information**

- The R07 series has been adopted into the operating instructions.

Sec. Safety Notes

- A summary table has been added dealing with the conditions for extended storage of gear units in the various climate zones.

**Sec. Mounting
Positions**

- All mounting position sheets have been revised. The mounting position sheets for Spiroplan® gear units have been added. The comparison between old and new mounting positions has been deleted.

Sec. Lubricants

- The lubricant table has been completely revised. The lubricant fill quantities have been updated and supplemented by the values for the R07 series.



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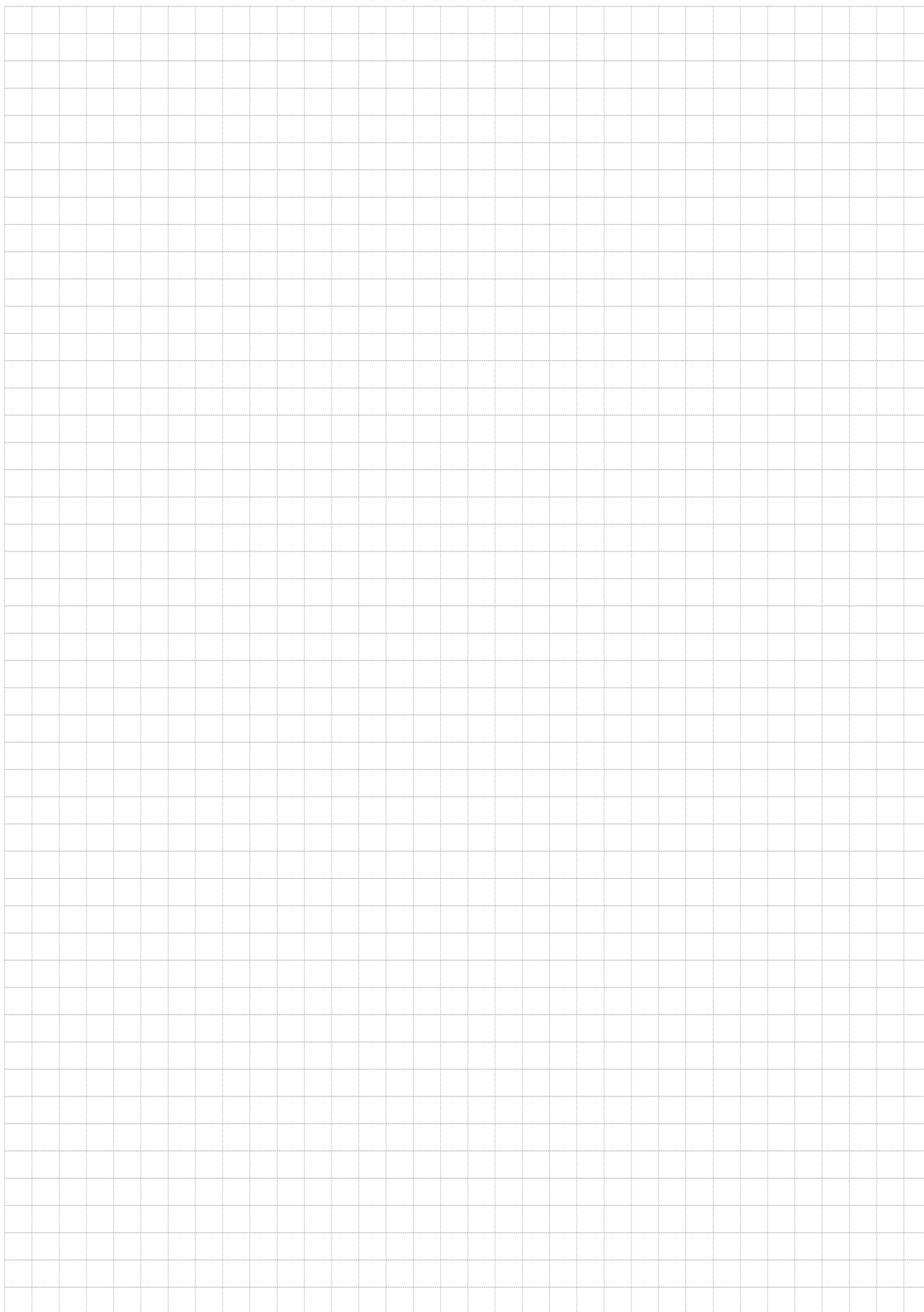


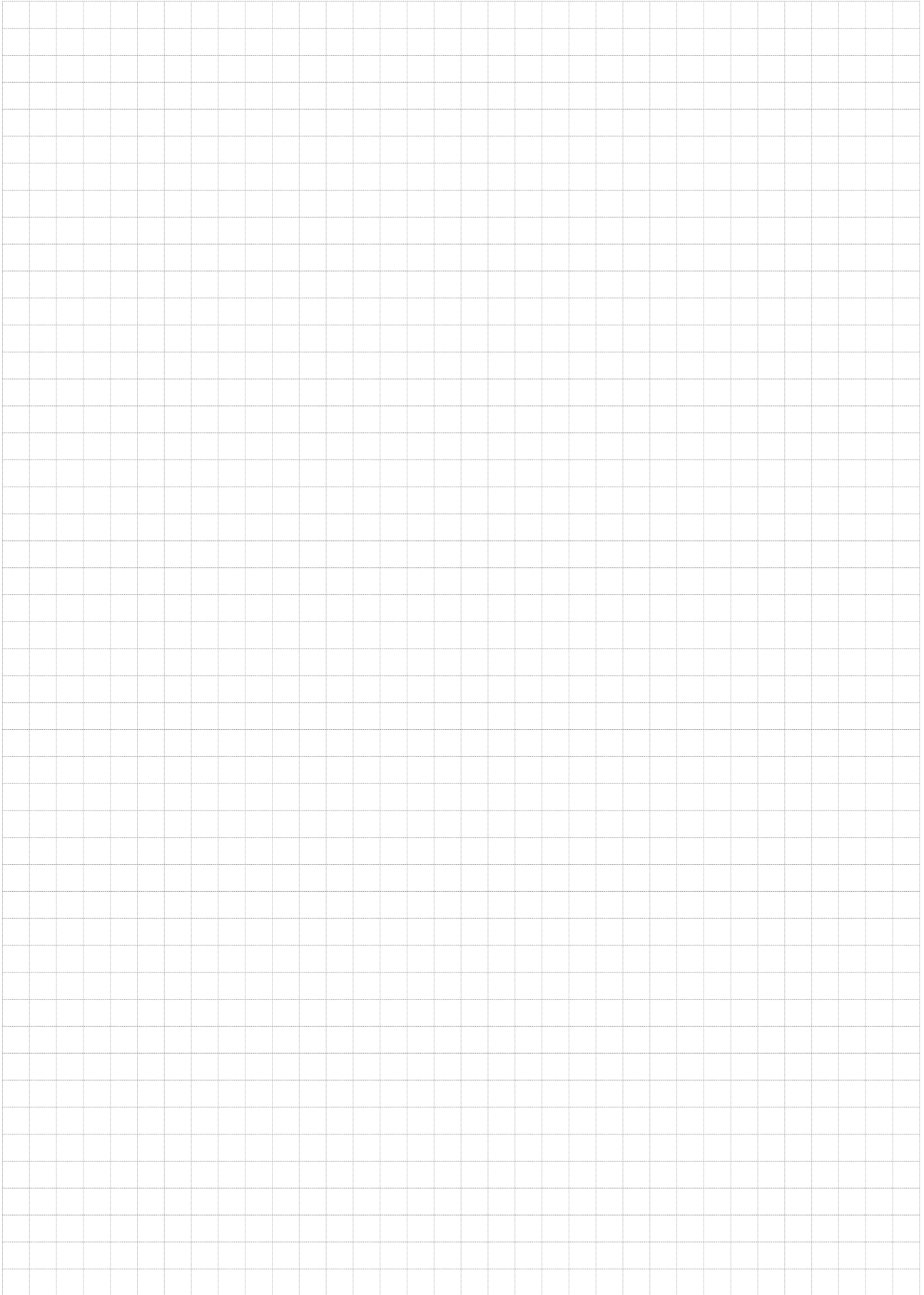
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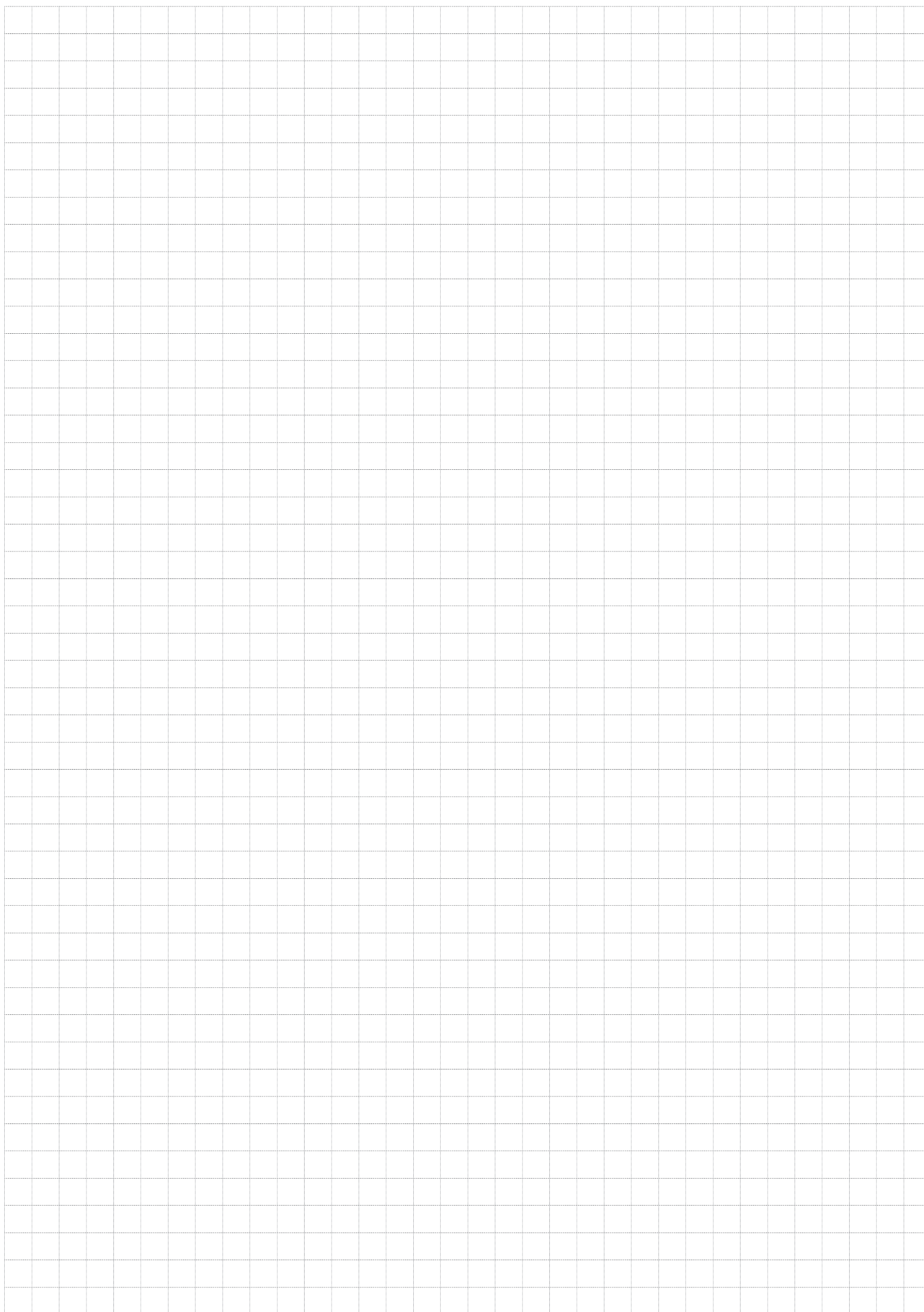


Address List

Turkey			
Assembly Sales Service	Istanbul	SEW-EURODRIVE Hareket Sistemleri Sirketi Bagdat Cad. Koruma Cikmazi No. 3 TR-81540 Maltepe ISTANBUL	Tel. +90 (0) 216 4 41 91 63 + 216 4 41 91 64 + 216 3 83 80 14 Fax +90 (0) 216 3 05 58 67 seweurodrive@superonline.com.tr
USA			
Production Assembly Sales Service	Greenville	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 (0) 864 4 39 75 37 Fax Sales +1 (0) 864 439-78 30 Fax Manuf. +1 (0) 864 4 39-99 48 Fax Ass. +1 (0) 864 4 39-05 66 Telex 805 550 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	San Francisco	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, California 94544-7101	Tel. +1 (0) 510 4 87-35 60 Fax +1 (0) 510 4 87-63 81 cshayward@seweurodrive.com
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 200 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 (0) 856 4 67-22 77 Fax +1 (0) 856 8 45-31 79 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 (0) 9 37 3 35-00 36 Fax +1 (0) 9 37 4 40-37 99 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 (0) 214 3 30-48 24 Fax +1 (0) 214 3 30-47 24 csdallas@seweurodrive.com
Additional addresses for service in the USA provided on request!			
Venezuela			
Assembly Sales Service	Valencia	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 (0) 241 8 32 98 04 Fax +58 (0) 241 8 38 62 75 sewventas@cantv.net sewfinanzas@cantv.net







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