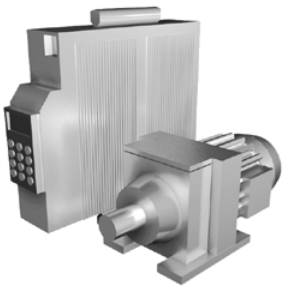
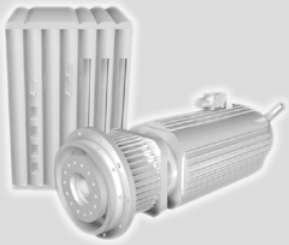
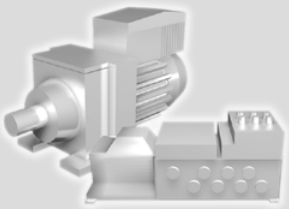
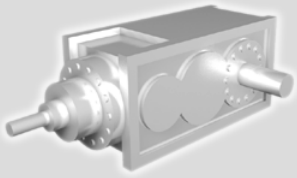
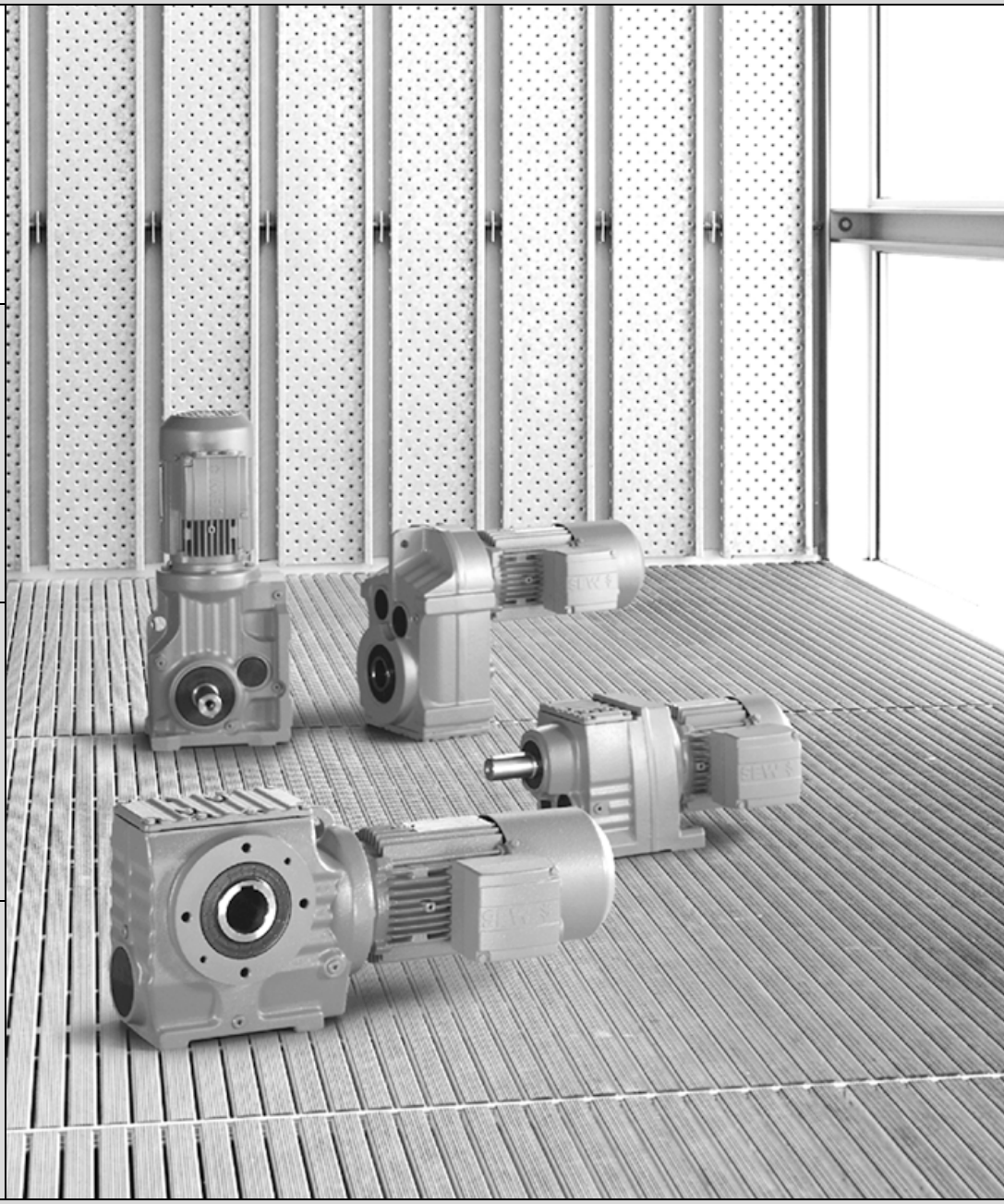
SEW EURODRIVE











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

Edition 10/2007

11226811 / US

Operating Instructions

SEW EURODRIVE

1 Important Notes

Safety and warning instructions

Always follow the safety and warning instructions 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.

You must adhere to the operating instructions to ensure:

- Trouble-free operation
- Fulfillment of any rights to claim under guarantee

Consequently, read the operating instructions before you start working with the gear unit!

The operating instructions contain important information about servicing. Therefore, keep the operating instructions close to the gear unit.

- Adjust the lubricant fill volume and position of the breather valve accordingly in the event of a change of mounting position (see Sec. "Lubricants" and "Mounting Positions").
- Follow the instructions in Sec. "Mechanical installation" / "Installing the gear unit"!

Waste disposal

Please follow the latest instructions: Dispose of the following materials in accordance with the regulations in force:

- Steel scrap:
  - Housing parts
  - Gears
  - Shafts
  - Anti-friction bearing
  - Gray-cast iron (if there is no special collection)
- 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 correctly.

2 Safety Notes

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 relevant operating instructions.

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

General information

During and after operation, gearmotors, gear units and motors have:

- Live parts
- Moving parts
- Hot surfaces (may be the case)

Only qualified personnel may carry out the following work:

- Transportation
- Putting into storage
- Installation / assembly
- Connection
- Startup
- Maintenance
- Servicing

The following information and documents must be observed during these processes:

- Relevant operating instructions and wiring diagrams
- Warning and safety signs on the gear unit / gearmotor
- System-specific regulations and requirements
- National / regional regulations governing safety and the prevention of accidents

Serious injuries and property damage may result from:

- Improper use
- Incorrect installation or operation
- Unauthorized removal of necessary protection covers or the housing

Designated use

Gearmotors / gear units from SEW are intended for industrial systems. They correspond to the applicable standards and regulations.

Technical data and information about the permitted conditions can be found on the nameplate and in the documentation.

It is essential that you follow all the instructions!

Transportation

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. It may be that you are not permitted to startup the drive due to the damage.

Tighten installed eyebolts. The eyebolts are only designed for the weight of the gearmotor / gear unit. Do not attach any additional loads.

The installed lifting eyebolts comply with DIN 580. The loads and regulations specified in this standard must always be observed. If two eyebolts are available, use both of them 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 CLP HC). You should still check the oil level before startup (see Sec. "Inspection / Maintenance" / "Inspection and maintenance of the gear unit").
- A higher oil level in some cases (synthetic oil CLP PG / food grade oil). Correct the oil level before startup (see Sec. "Inspection / Maintenance" / "Inspection and maintenance of the gear unit").

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 wrap.	With roof, protected against rain and snow, no shock loads.	Up to three years with regular checks on the packaging and moisture indicator (relative 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.	Two years or more given regular inspections. Check for cleanliness and mechanical damage as part of the 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.	With roof, protected against rain, no shock loads.	Up to three years with regular checks on the packaging and moisture indicator (relative 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.	Two years or more given regular inspections. Check for cleanliness and mechanical damage as part of the inspection. Check corrosion protection.

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

Installation / assembly	Observe the instructions in the sections "Installation" and "Assembly/Removal"!
Startup / operation	Check that the direction of rotation is correct in **decoupled** status. 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 gearmotor if in doubt whenever changes occur in relation to normal operation (e.g. increased temperature, noise, vibration). Determine the cause; contact SEW-EURODRIVE if necessary.
Inspection / maintenance	Follow the instructions in the section "Inspection and Maintenance"!

3 Gear Unit Structure

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 structure of helical gear units

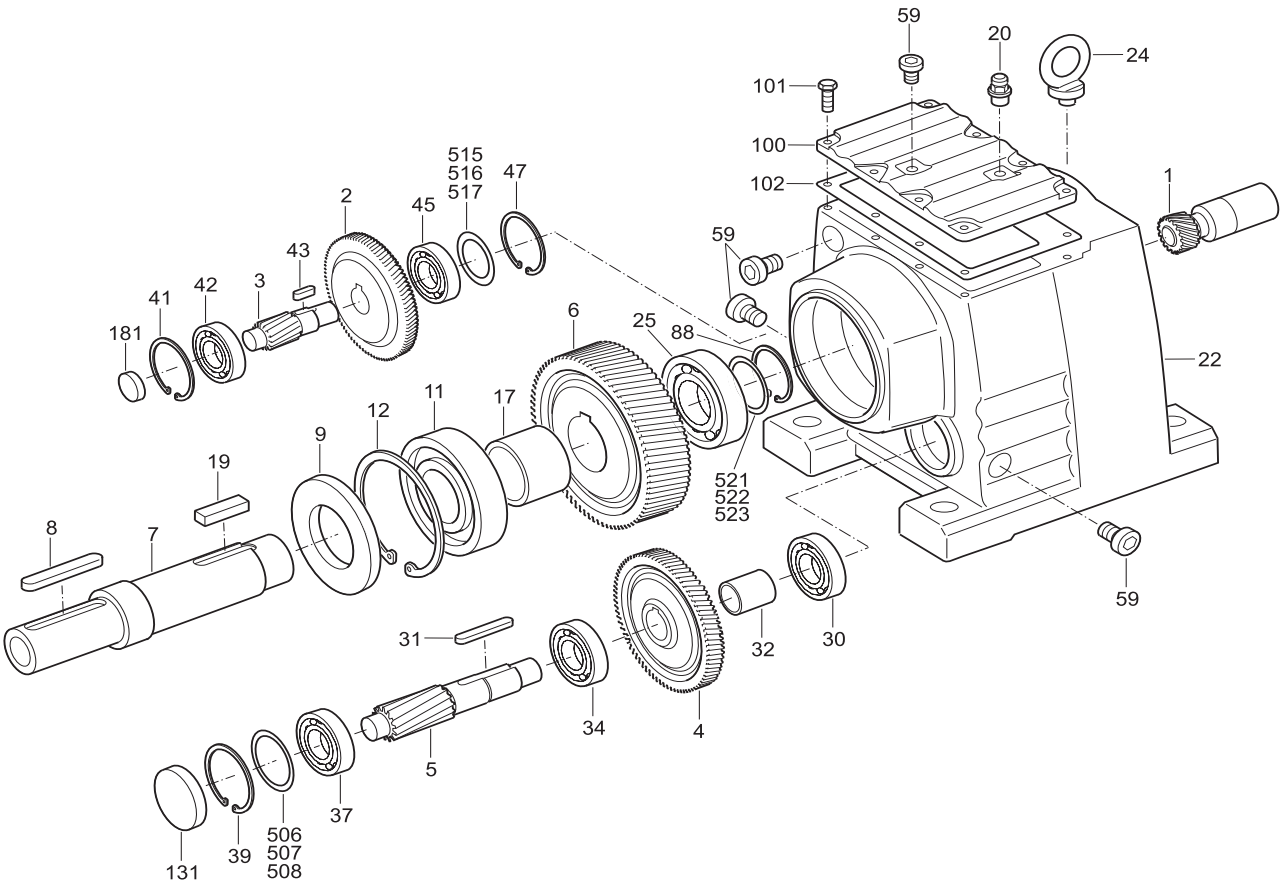


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Figure 1: Basic structure of helical gear units

Key

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

3.2 Basicstructure of parallel shaft helical gear units

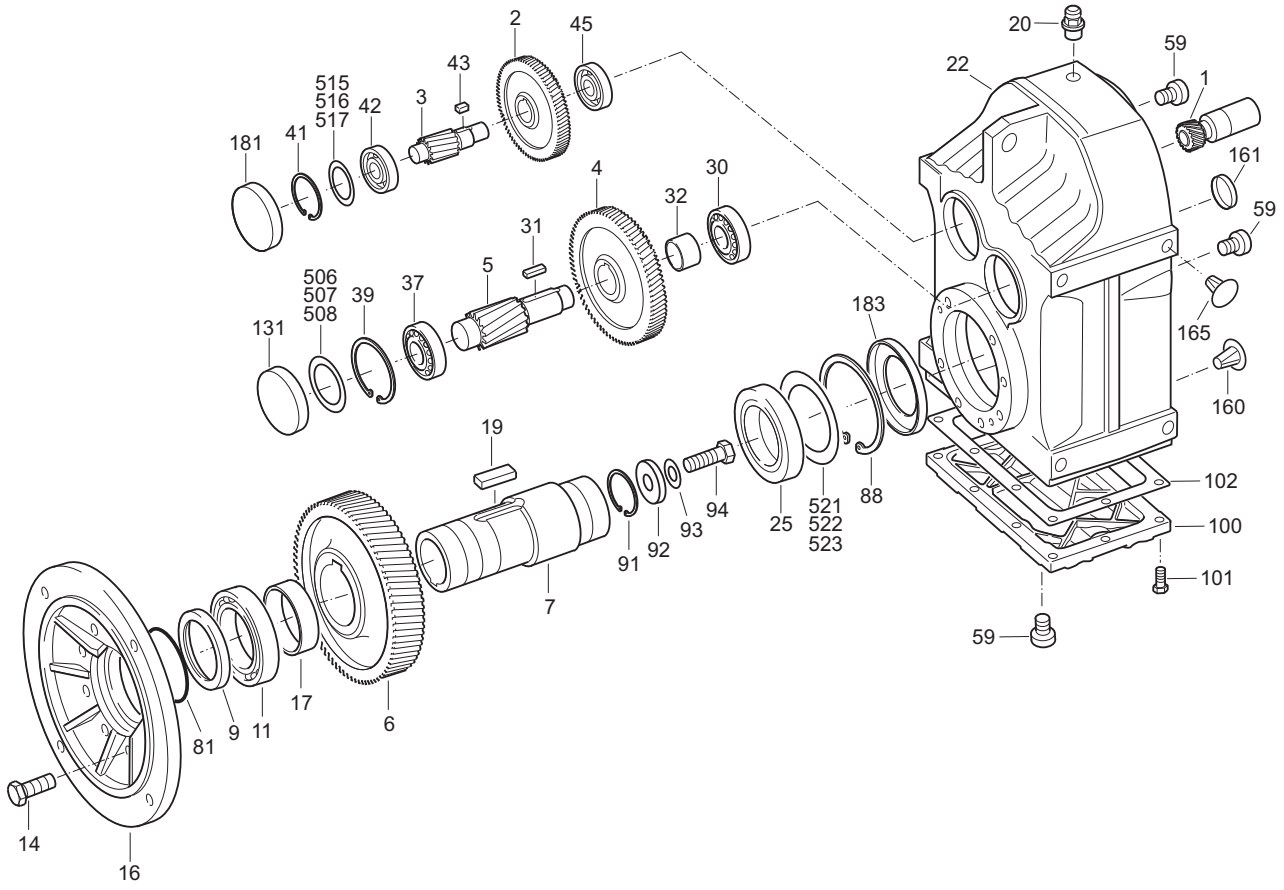

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Figure 2: Basic structure of parallel shaft helical gear units

Key

1	Pinion	22	Gearcase	91	Circlip	506	Shim ring
2	Gear	25	Anti-friction bearing	92	Washer	507	Shim ring
3	Pinion shaft	30	Anti-friction bearing	93	Lock washer	508	Shim ring
4	Gear	31	Key	94	Hex head bolt	515	Shim ring
5	Pinion shaft	32	Spacer	100	Gearcase cover	516	Shim ring
6	Gear	37	Anti-friction bearing	101	Hex head bolt	517	Shim ring
7	Hollow shaft	39	Circlip	102	Gasket	521	Shim ring
9	Oil seal	41	Circlip	131	Closing cap	522	Shim ring
11	Anti-friction bearing	42	Anti-friction bearing	160	Closing plug	523	Shim ring
14	Hex head bolt	43	Key	161	Closing cap		
16	Output flange	45	Anti-friction bearing	165	Closing plug		
17	Spacer	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

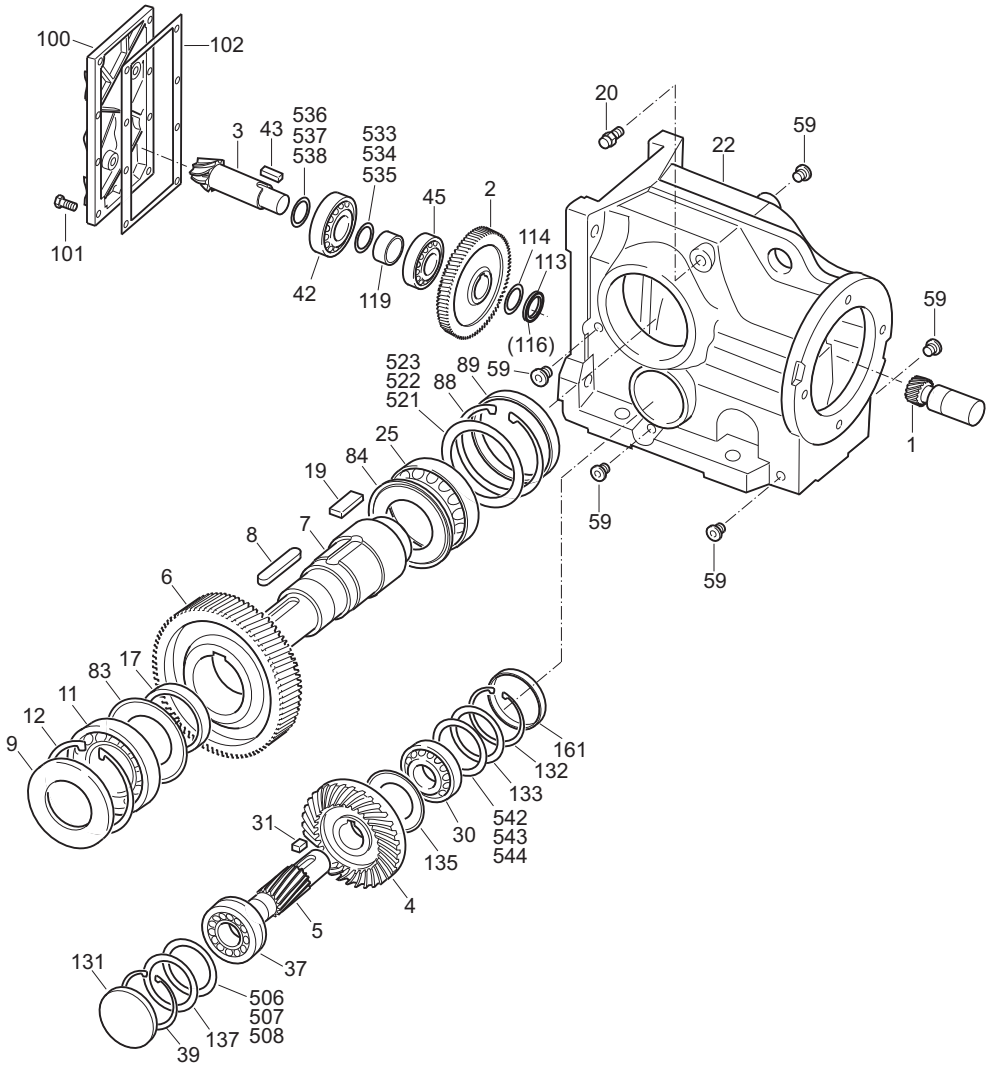

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Figure 3: Basic structure of helical-bevel gear units

Key

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

3.4 Basic structure of helical-worm gear units

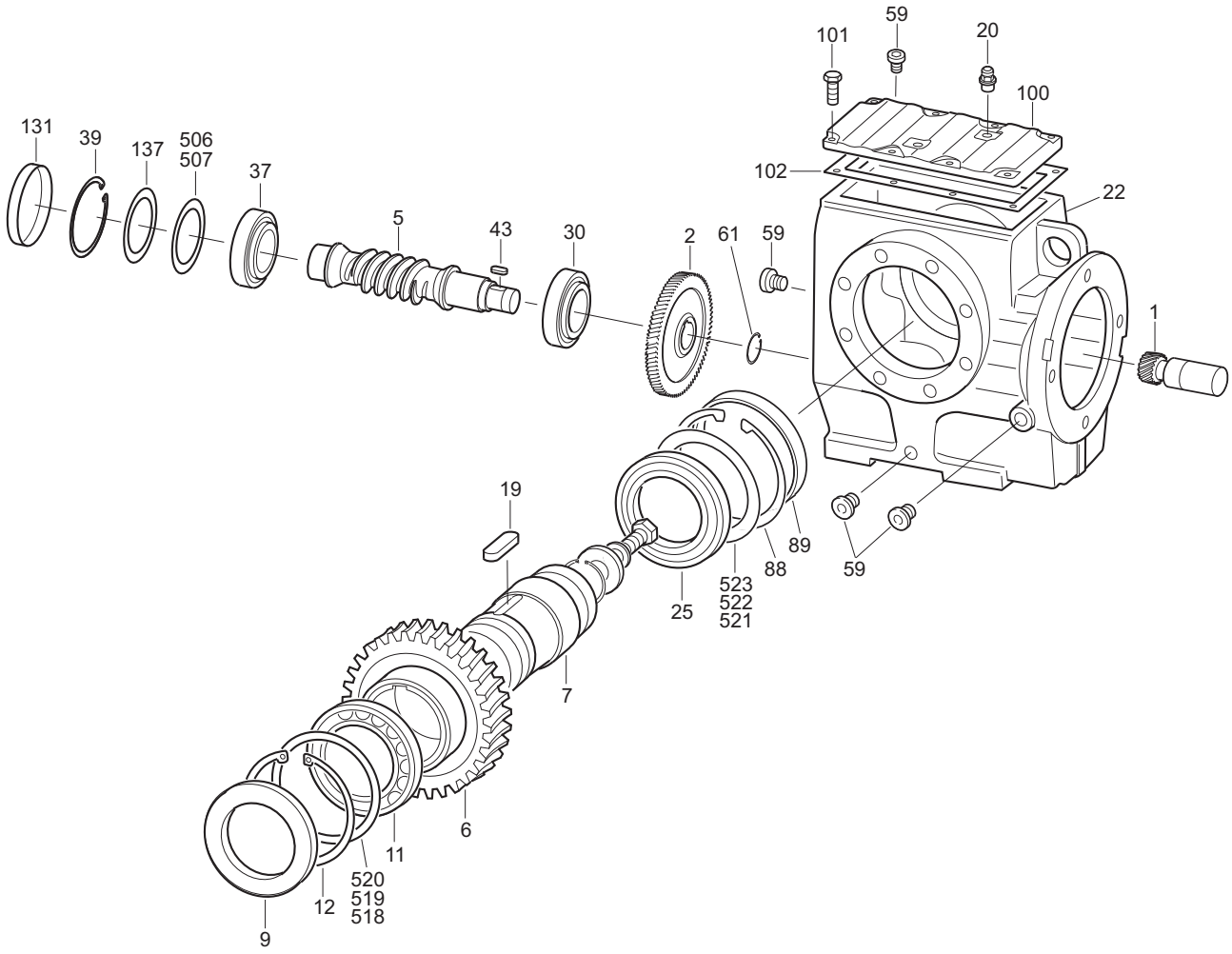

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Figure 4: Basic structure of helical-worm gear units

Key

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

3.5 Basic structure of SPIROPLAN® gear units

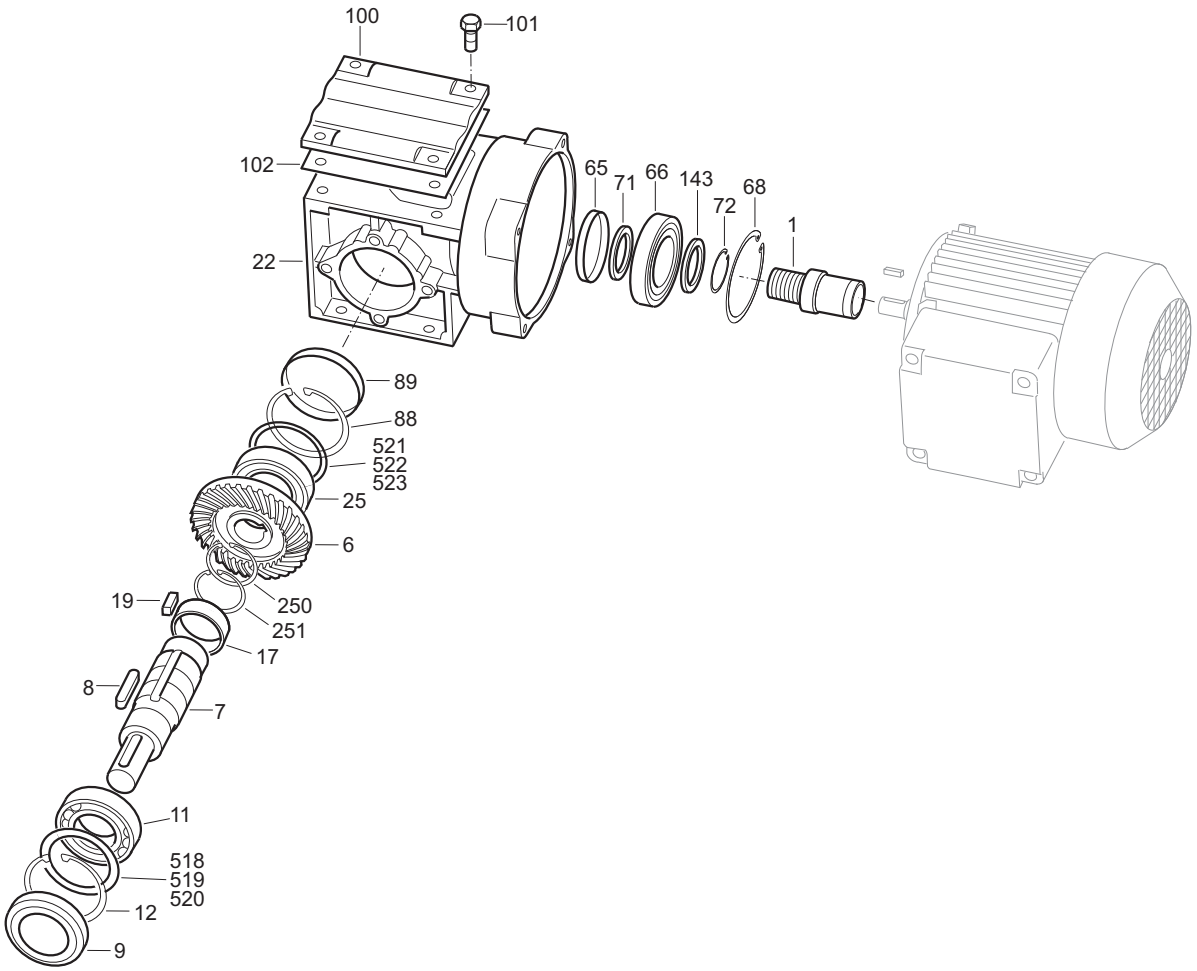

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Figure 5: Basic structure of SPIROPLAN® gear units

Key

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

3.6 Nameplate, unit designation

Sample nameplate

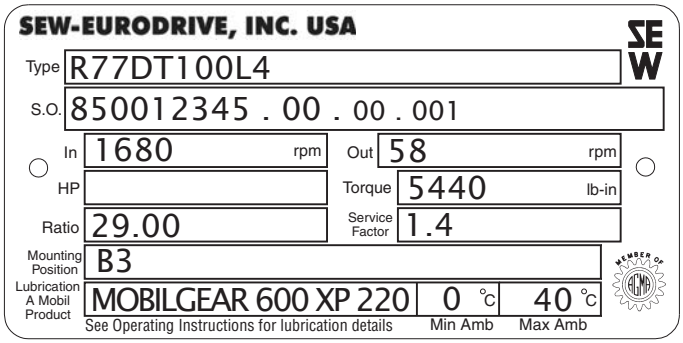

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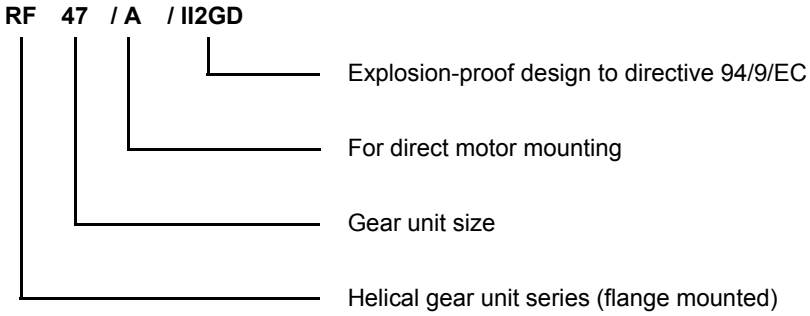
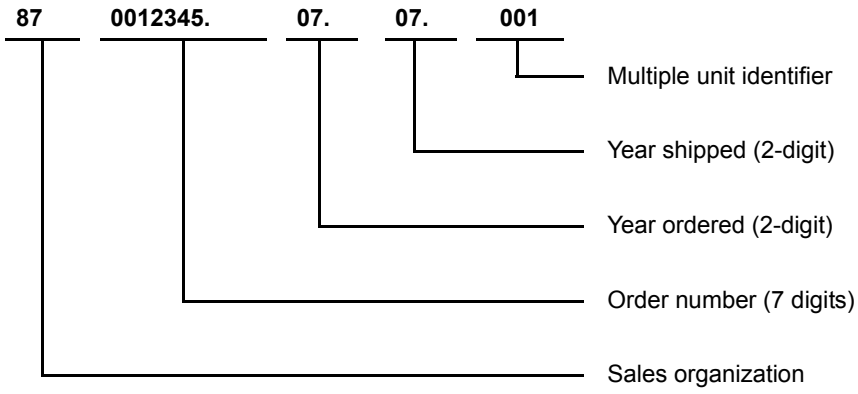
Figure 6: Sample nameplate

Unit designation

Example: Helical gear unit, category II2GD



Example: Serial number



4 Mechanical Installation

4.1 Required tools / aids

- Set of spanners
- Torque wrench for:
  - Shrink discs
  - AQH motor adapter
  - Input shaft assembly with centering shoulder
- Mounting device
- Shims and distance rings if necessary
- Fixing devices for input and output elements
- Lubricant (e.g. NOCO® Fluid)
- Bolt adhesive (for input shaft assembly with centering shoulder), e.g. Loctite® 243
- Standard parts are not part of the delivery

Installation tolerances

Shaft end	Flanges
Diameter tolerance in accordance with DIN 748 • ISO k6 for solid shafts with ∅ ≤ 50 mm (1.97") • ISO m6 for solid shafts with ∅ > 50 mm (1.97") • ISO H7 for hollow shafts • Center bore in accordance with DIN 332, shape DR	Centering shoulder tolerance in accordance with DIN 42948 • ISO j6 with b1 ≤ 230 mm (9.06") • ISO h6 with b1> 230 mm (9.06")

4.2 Prerequisites for assembly

Check that the following conditions have been met:

- The data on the nameplate of the gearmotor matches 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 lubricant table in Sec. "Lubricants" (see standard).
    The drive must not be assembled in the following ambient conditions:
    - Potentially explosive atmosphere
    - Oil
    - Acids
    - Gas
    - Vapors
    - Radiation
  - **For special versions:**
    The drive configured in accordance with the ambient conditions.
  - **For 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]

- You must clean the output shafts and flange surfaces thoroughly to ensure they are free of anti-corrosion agents, contamination or similar. Use a commercially available 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. SPIROPLAN® gear units are not dependent on the mounting position.

The support structure must have the following characteristics:

- Level
- Vibration damping
- Torsionally rigid

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

- Gear unit size ≤ 67: max. 0.4 mm (0.016")
- Gear unit size 77 ... 107: max. 0.5 mm (0.020")
- Gear unit size 137 ... 147: max. 0.7 mm (0.028")
- Gear unit size 157 ... 187: max. 0.8 mm (0.031")

Do not tighten the housing legs and mounting flanges against one another and ensure that you comply with the permitted overhung and axial loads!

Secure the gearmotors with bolts of quality 8.8.

Secure the following gearmotors with bolts of quality 10.9:

- RF37, R37F with flange ∅ 120 mm (4.72")
- RF47, R47F with flange ∅ 140 mm (5.51")
- RF57, R57F with flange ∅ 160 mm (6.30")

The oil checking and drain screws and 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 the event of a change of mounting position.

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

Please contact our SEW 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. The material used must have an electrical bleeder resistor < 10^9 Ω. Electrochemical corrosion can occur between various metals, for example, cast iron and high-grade steel. Also install the bolts with plastic washers! Ground the housing additionally – use the grounding bolts on the motor.

Installation in damp locations or in the open

Drives are supplied in corrosion-resistant versions for use in damp areas or in the open air. Repair any damage to the paint work (e.g. on the breather valve).

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

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

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

Exceptions:

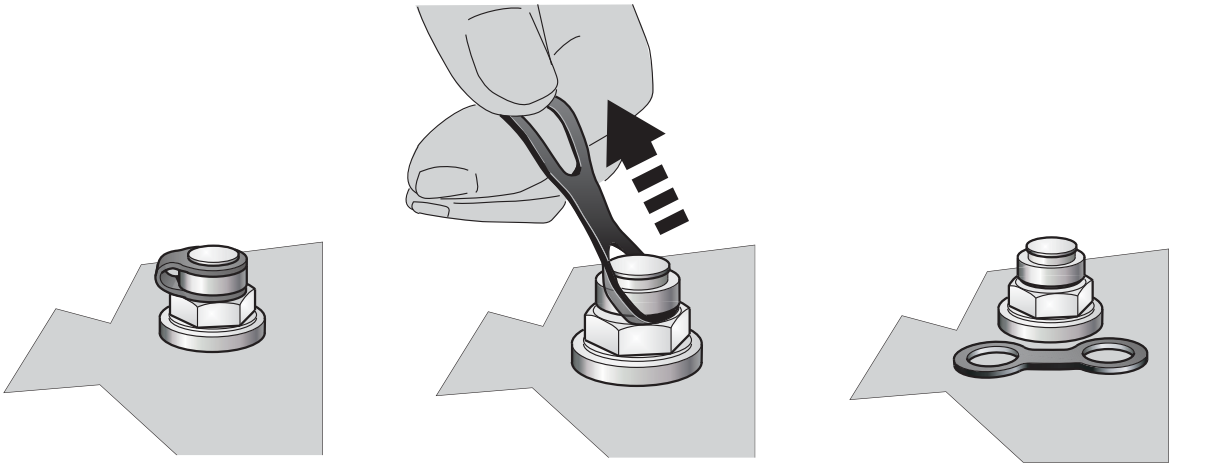
1. SEW supplies the following gear units with a screw plug on the vent hole provided:
   - Gear units for extended storage
   - Pivoted mounting positions, if possible
   - Gear units for mounting on a slant

   The breather valve is supplied with the unit. Before startup, you must install the breather plug in the location specified.
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

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
2. Remove the transport fixture
3. Breather valve activated



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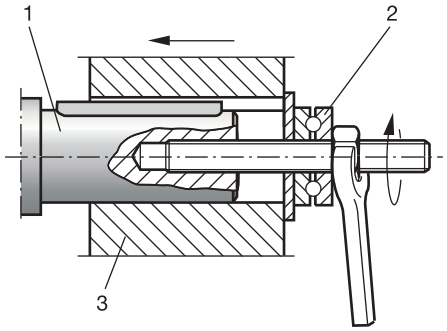
Painting the gear unit

If you paint or respray the drive, ensure that you cover the breather valve and oil seals carefully. Remove the strips of tape after completing the painting work.

4.4 Gear unit with solid shaft

Installing input and output elements

The following figure shows 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.



1) Gear shaft end
2) Thrust bearing
3) Coupling hub

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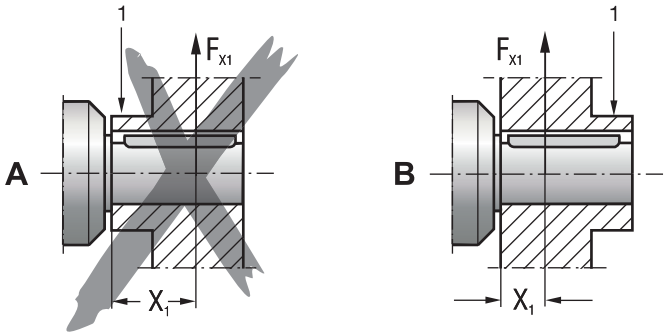
Avoid impermissibly high overhung loads: Install the gear or chain sprocket according to figure **B**.



1 = Hub

A = Unfavorable
B = Correct

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- Only use a mounting device for installing input and output elements. Use the center bore and the thread on the shaft end for positioning.
- **Never drive belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer This will damage the 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 "Gearmotor" or "Explosion-Proof Drives" catalogs for permitted values).

Note:

Assembly is easier if you first apply lubricant to the output element or heat it up briefly to 80 ... 100 °C (176 ... 212°F).

Installing 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

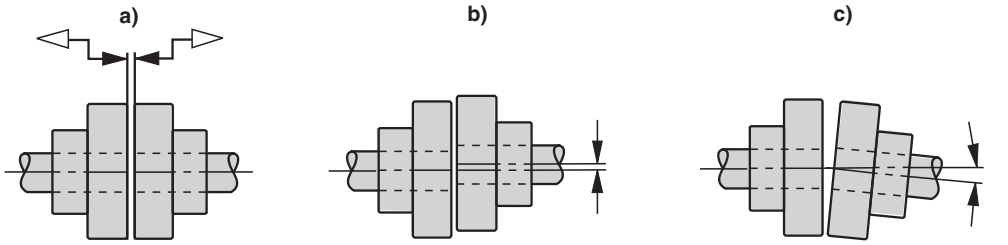

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Figure 7: Clearance and misalignment for coupling installation

Input and output elements such as belt pulleys, couplings, etc. must be protected against contact!

4.5 Torque arms for shaft mounted gear units

Do not place torque arms under strain during installation!

Parallel shaft helical gear units

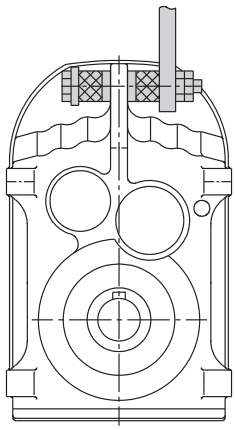

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Figure 8: Torque arm for parallel shaft helical gear units

Helical-bevel gear units

- Secure on each side of torque arm→ (1).
- Install connection end B as a mirror image of A.

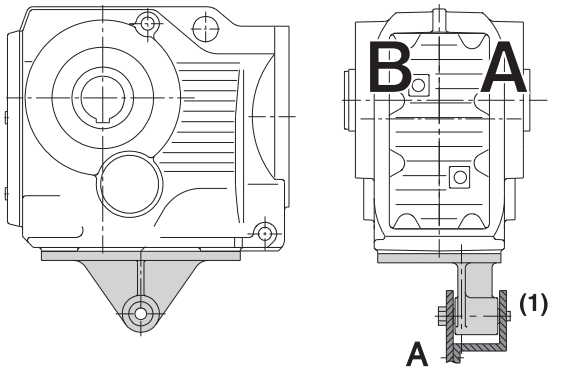

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Figure 9: Torque arm for helical-bevel gear units

Gear unit	Bolts	Tightening torque
KA37	4 × M10 × 25 – 8.8	48 Nm (425 lb-in)
KA47	4 × M10 × 30 – 8.8	48 Nm (425 lb-in)
KA67	4 × M12 × 35 – 8.8	86 Nm (761 lb-in)
KA77	4 × M16 × 40 – 8.8	210 Nm (1858 lb-in)
KA87	4 × M16 × 45 – 8.8	210 Nm (1858 lb-in)
KA97	4 × M20 × 50 – 8.8	410 Nm (3628 lb-in)
KA107	4 × M24 × 60 – 8.8	710 Nm (6283 lb-in)
KA127	4 × M36 × 130 – 8.8	2500 Nm (22125 lb-in)
KA157	4 × M36 × 130 – 8.8	2500 Nm (22152 lb-in)

Helical-worm gear units

- Secure on each side of torque arm → (1).

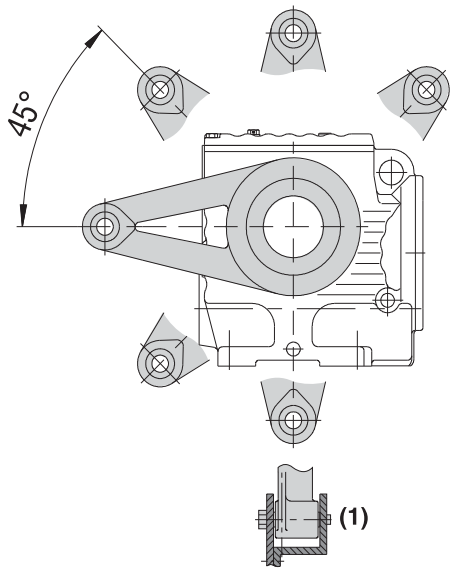


Figure 10: Torque arm for helical-worm gear units

Gear unit	Bolts	Tightening torque
SA37	M6 × 16 – 8.8	11 Nm (97 lb-in)
SA47	M8 × 20 – 8.8	25 Nm (222 lb-in)
SA57	M8 × 20 – 8.8	25 Nm (222 lb-in)
SA67	M12 × 25 – 8.8	86 Nm (761 lb-in)
SA77	M12 × 35 – 8.8	86 Nm (761 lb-in)
SA87	M16 × 35 – 8.8	210 Nm (1858 lb-in)
SA97	M16 × 35 – 8.8	210 Nm (1858 lb-in)

SPIROPLAN® W gear units

- Secure on each side of torque arm → (1)

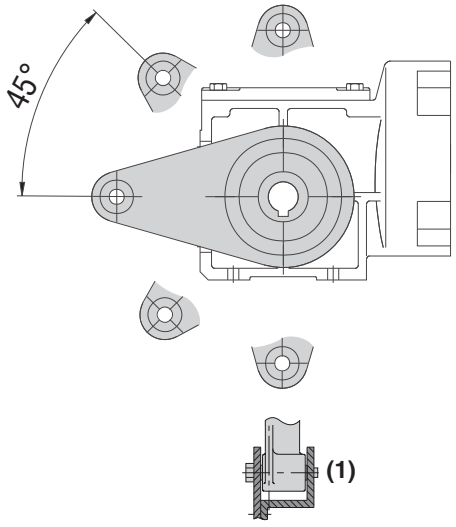


Figure 11: Torque arm for SPIROPLAN® W gear units

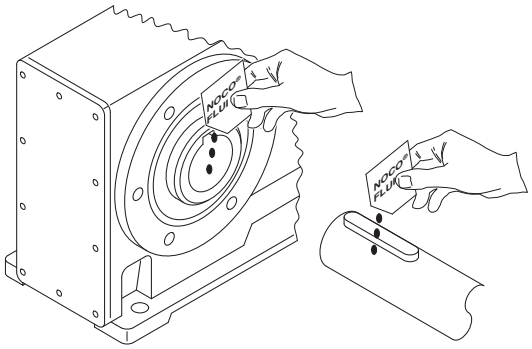
Gear unit	Bolts	Tightening torque
WA10	M6 × 16	11 Nm (97 lb-in)
WA20	M6 × 16	11 Nm (97 lb-in)
WA30	M6 × 16	11 Nm (97 lb-in)

4.6 Mounted gear unit with keyway or splined hollow shaft

For the configuration of customer shafts, please also refer to the design notes in the Gearmotors catalog!

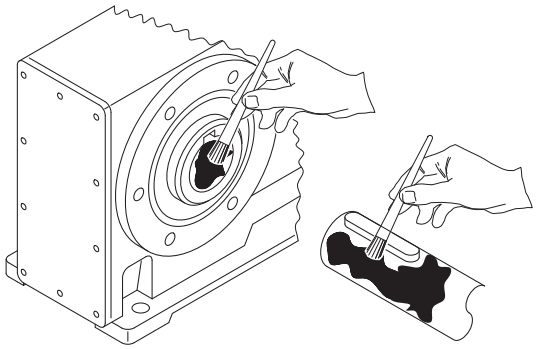
Installation notes

1. Apply NOCO® fluid.



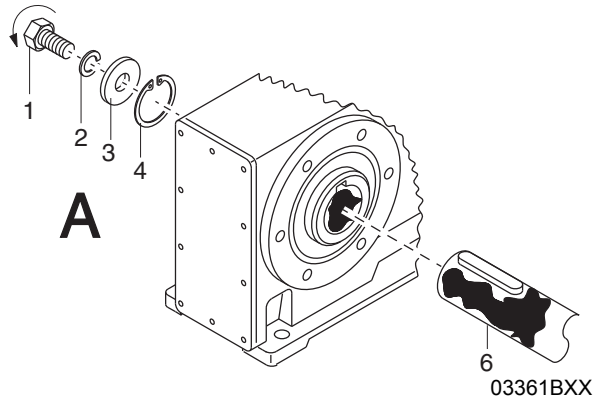
02042BXX

2. Distribute the NOCO® fluid carefully.



02043AXX

3. Install the shaft and secure it axially
   (mounting is facilitated by using a mounting device)
   3A: Mounting with standard scope of delivery

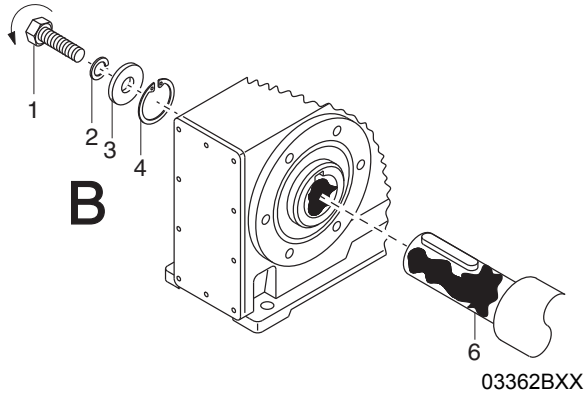


03361BXX

1 Short retaining bolt (standard scope of delivery)
2 Lock washer
3 Washer
4 Circlip
6 Customer shaft

3B: Assembly with SEW-EURODRIVE assembly/disassembly kit (→ page 26)

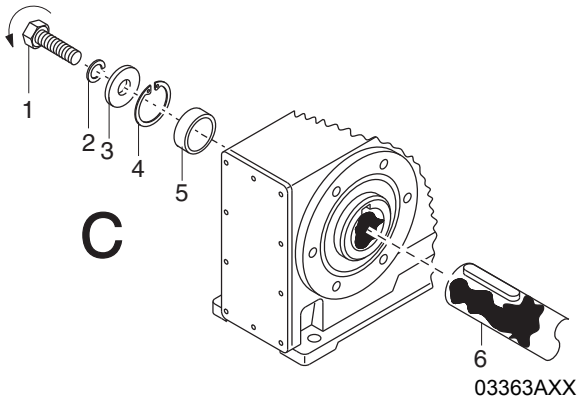
– Customer's shaft **with** contact shoulder



1 Retaining bolt
2 Lock washer
3 Washer
4 Circlip
6 Customer's shaft with contact shoulder

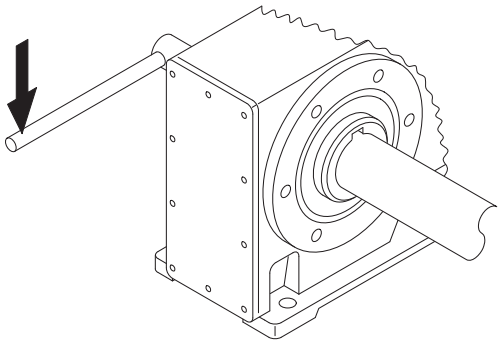
3C: Assembly with SEW-EURODRIVE assembly/disassembly kit (→ page 26)

– Customer's shaft **without** contact shoulder



1 Retaining bolt
2 Lock washer
3 Washer
4 Circlip
5 Spacer
6 Customer's shaft without contact shoulder

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



Bolt	Tightening torque
M5	5 Nm (44 lb-in)
M6	8 Nm (70 lb-in)
M10/12	20 Nm (177 lb-in)
M16	40 Nm (354 lb-in)
M20	80 Nm (708 lb-in)
M24	200 Nm (1770 lb-in)

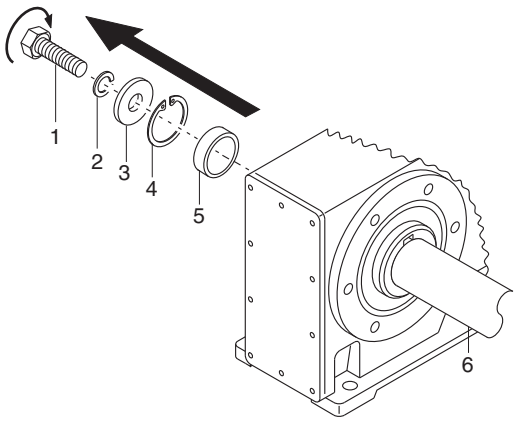
Note:

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

Removal notes

This description is only applicable when the gear unit was assembled using the installation/removal kit from SEW-EURODRIVE(→ page 26) (see the previous description, point 3B or 3C).

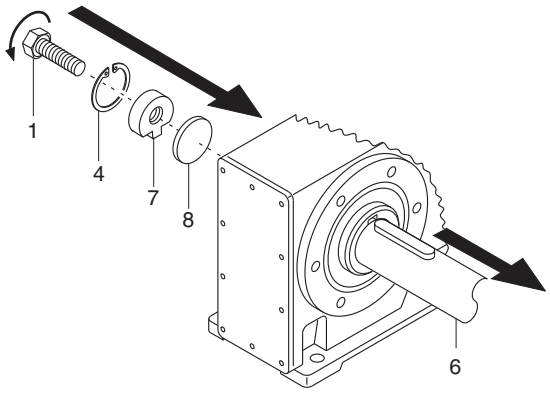
1. Loosen the retaining bolt [1].
2. Remove parts 2 to 4 and, if fitted, spacer 5.



1 Retaining bolt
2 Lock washer
3 Washer
4 Circlip
5 Spacer
6 Customer shaft

03366AXX

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

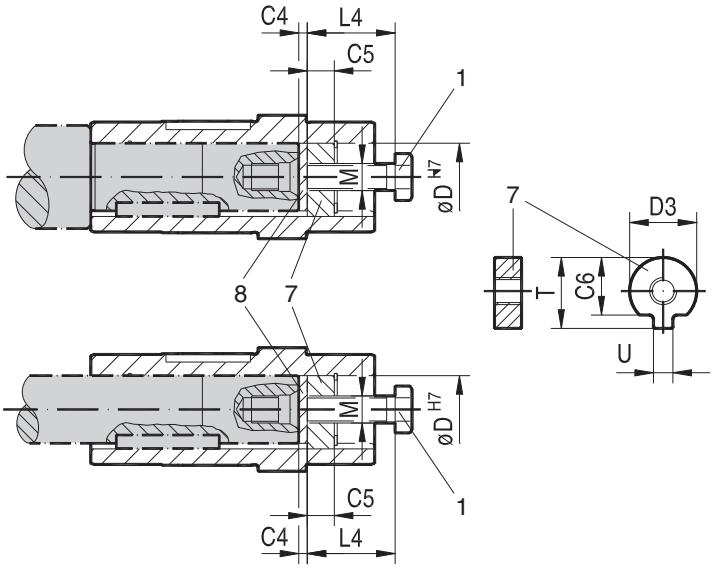


1 Retaining bolt
4 Circlip
6 Customer shaft
7 Fixed nut
8 Forcing washer

03367AXX

SEW installation/removal kit

The SEW-EURODRIVE installation/removal kit can be ordered under the following part number. The kits are currently only available for metric shaft sizes.



03394AXX

Figure 12: SEW-EURODRIVE installation/removal kit

1 Retaining bolt
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	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 bolt

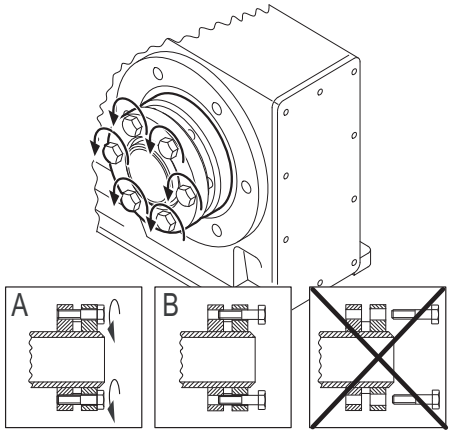
The SEW assembly kit for mounting the customer shaft is a recommendation from SEW-EURODRIVE. You must always check whether this design can compensate the axial loads. In particular applications (e.g. mounting mixer shafts), a different design may have to be used to secure the shaft axially. In these 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 Mounted gear units with shrink disc

Installation notes

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

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



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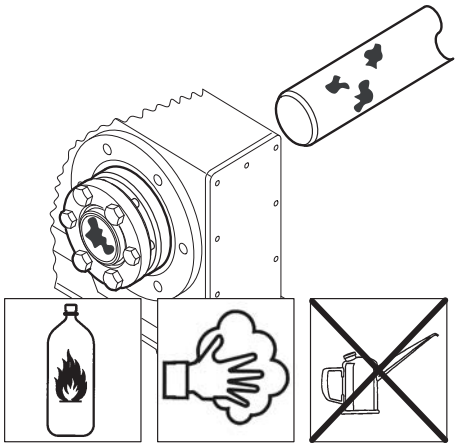
2. Carefully degrease the hollow shaft hole and the input shaft.



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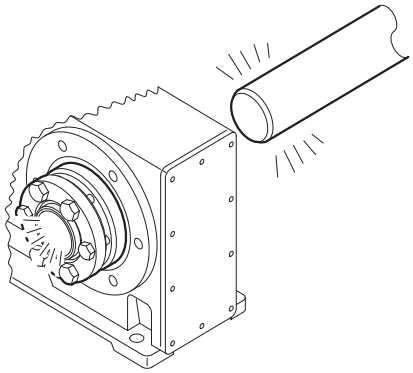
3. Hollow shaft/input shaft after degreasing



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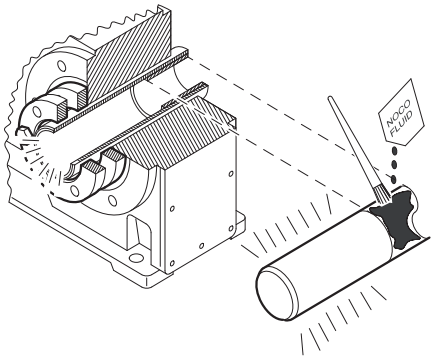
4. Apply NOCO® fluid to the input shaft[1] in the area of the bushing.



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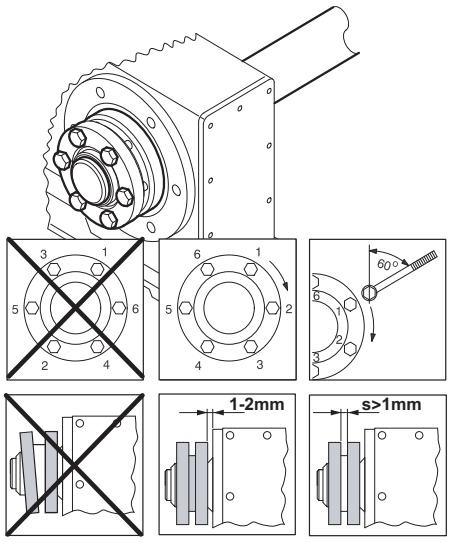
STOP

[1] **It is essential to make sure that the clamping area of the shrink disk is free from grease!**
For this reason, never apply NOCO® fluid directly to the bushing as the paste may be able to get into the clamping area of the shrink disk when the input shaft is put on.

5. Install the input shaft, making sure that the locking collars of the shrink disk are installed in parallel to each other[2)]. For gear unit housing **with a shaft collar**, mount the **shrink disc to the stop on the shaft collar**. For gear unit housing **without a shaft collar**, mount the **shrink disk with a clearance of 1 to 2 mm from the gear unit housing**. Tighten the locking bolts with the torque wrench by working round several times from one bolt to the next (not in diametrically opposite sequence) until the bolts cannot be tightened any more. See the following table for tightening torques.



51096AXX

2)After installation

- There must be a gap s > 1 mm between the locking collars
- Grease the outside of the hollow shaft in the area of the shrink disk to prevent corrosion.

Gear unit type			Bolt	Nm (lb-in)	◁ max.[1)]
		SH37	M5	5 Nm (44 lb-in)	
KH37...77	FH37...77	SH47...77	M6	12 Nm (106 lb-in)	
KH87/97	FH87/97	SH87/97	M8	30 Nm (265 lb-in)	
KH107	FH107		M10	59 Nm (522 lb-in)	60°
KH127/157	FH127		M12	100 Nm (885 lb-in)	
KH167			M16	250 Nm (2212 lb-in)	
KH187			M20	470 Nm (4159 lb-in)	

1) Maximum tightening angle per cycle

Notes on removing the shrink disk

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

Caution!

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

Cleaning and lubricating the shrink disk

There is no need to strip down and re-grease disassembled shrink disks before they are screwed back on.

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

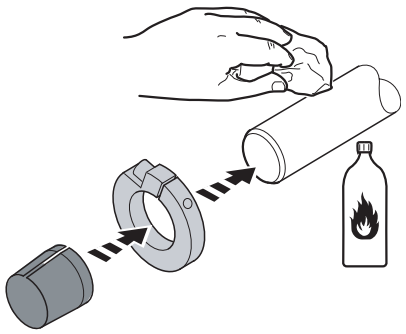
Use one of the following solid lubricants for the tapered surfaces.

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
Aemasol DIO-sétral 57 N (lube coat)	Spray

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

4.8 Mounted gear units with TorqLOC®

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



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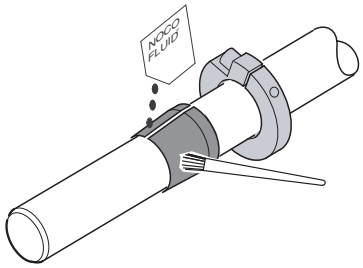
3. Apply NOCO® fluid to the bushing and distribute it carefully.



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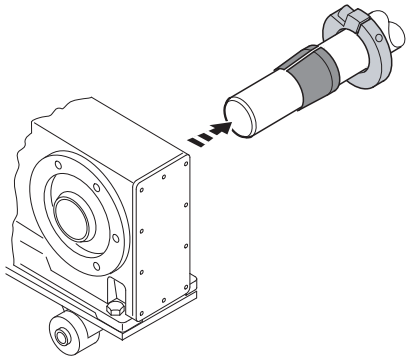
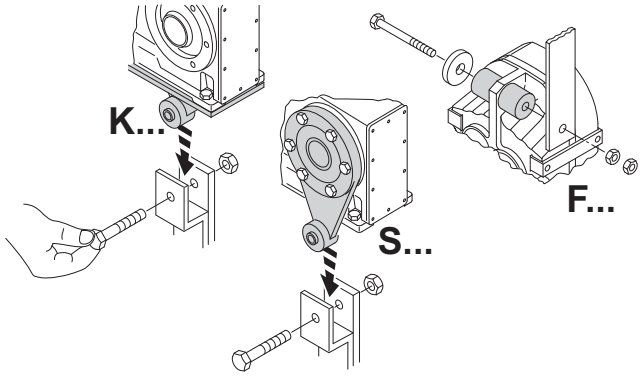
4. Push the gear unit onto the customer shaft.



52091AXX

5. Preassemble the torque arm (do not tighten the bolts). Refer to "Torque arms for shaft mounted gear units" on page 21.



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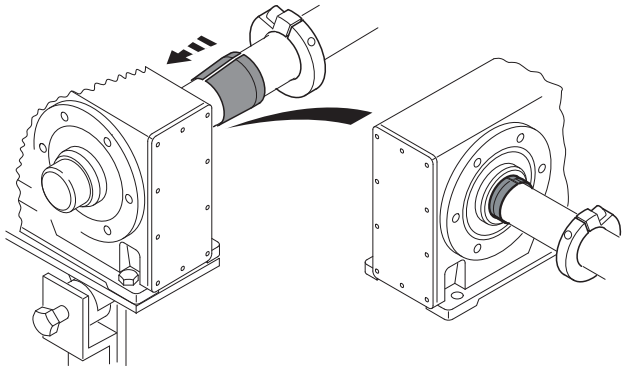
6. Push the bushing onto the gear unit up to the stop.



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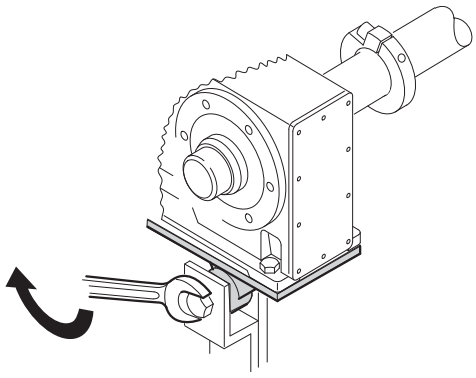
7. Tighten all the retaining bolts for the torque arm. Refer to "Torque arms for shaft mounted gear units" on page 21.



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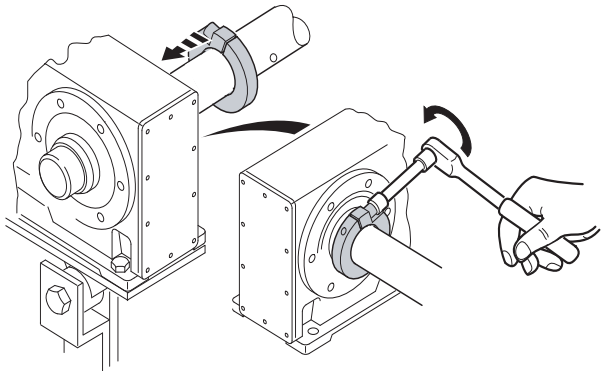
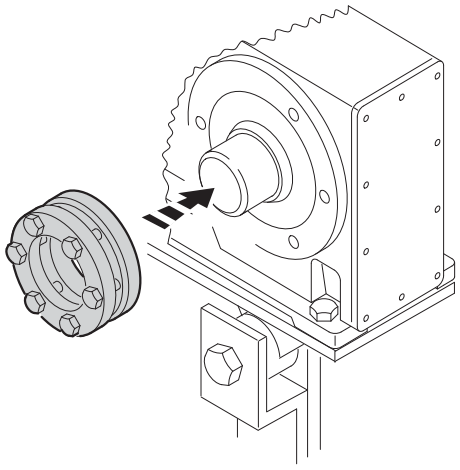
8. Secure the bushing with the split ring. Tighten the split ring on the bushing using the appropriate torque as specified in the following table.



52095AXX

Type		Torque [Nm (lb-in)]	
KT/FT	ST	Steel	Stainless steel
-	37	18 (159)	7.5 (66)
37	47	18 (159)	7.5 (66)
47	57	18 (159)	7.5 (66)
57, 67	67	35 (309)	18 (159)
77	77	35 (309)	18 (159)
87	87	35 (309)	18 (159)
97	97	35 (309)	18 (159)

9. Slide the shrink disk onto the hollow shaft. Ensure that all bolts have been loosened.



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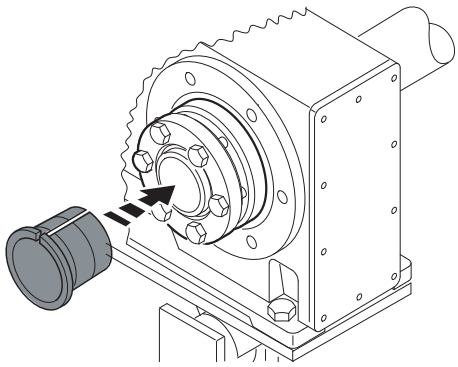
10. Push the counter bushing onto the customer shaft and into the hollow shaft or shrink disk right into the seat.



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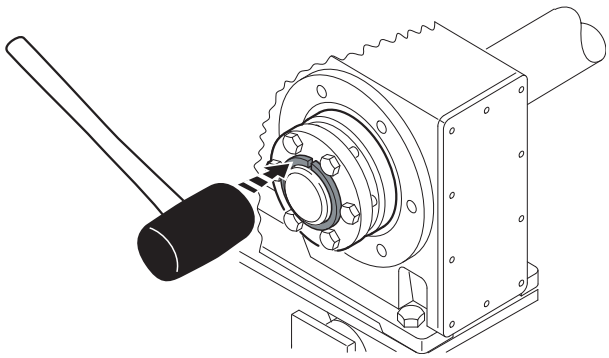
11. Tap lightly on the flange of the counter bushing to ensure that the socket is fitted securely in the hollow shaft.



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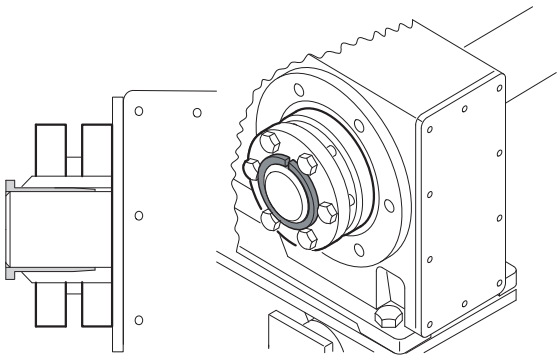
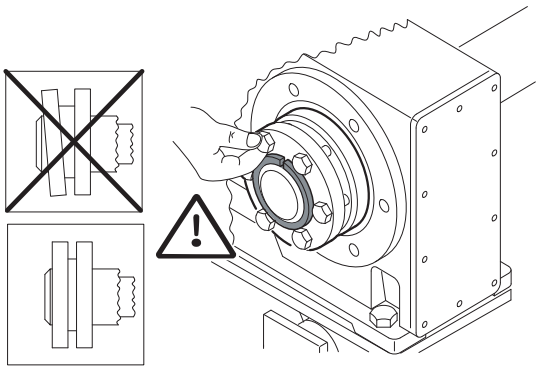
12. Ensure that the customer shaft is fitted in the counter bushing.



53478AXX

13. Tighten the bolts of the shrink disk by hand and ensure that the end rings of the shrink disc are parallel.



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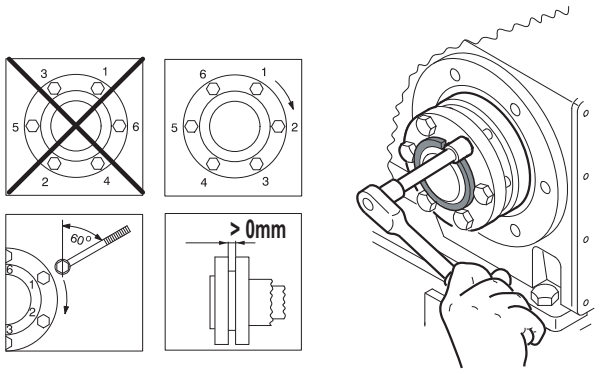
14. Tighten the locking bolts by working round several times from one bolt to the next (not in diametrically opposite sequence). See the table for tightening torques.

After installation, the remaining gap between the outer rings of the shrink discs must be > 0 mm.



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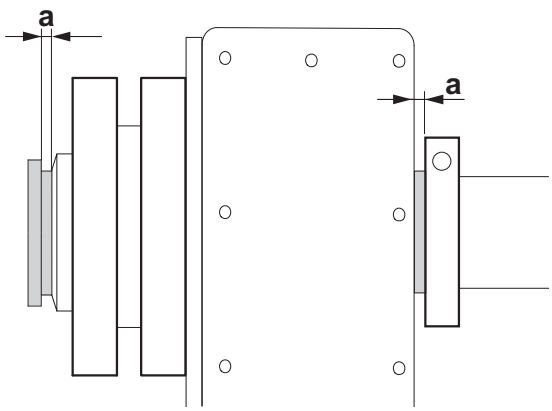
Type		Steel	Stainless steel
KT/FT	ST	Torque [Nm (lb-in)]	
-	37	4.1 (36)	6.8 (60)
37	47	10 (89)	6.8 (60)
47	57	12 (106)	6.8 (60)
57, 67	67	12 (106)	15 (133)
77	77	30 (266)	30 (266)
87	87	30 (266)	50 (443)
97	97	30 (266)	50 (443)

15. The distance between the counter bushing and the hollow shaft end and between the split ring and the clamping ring must not exceed the following values. The following table lists the maximum and minimum gap width.

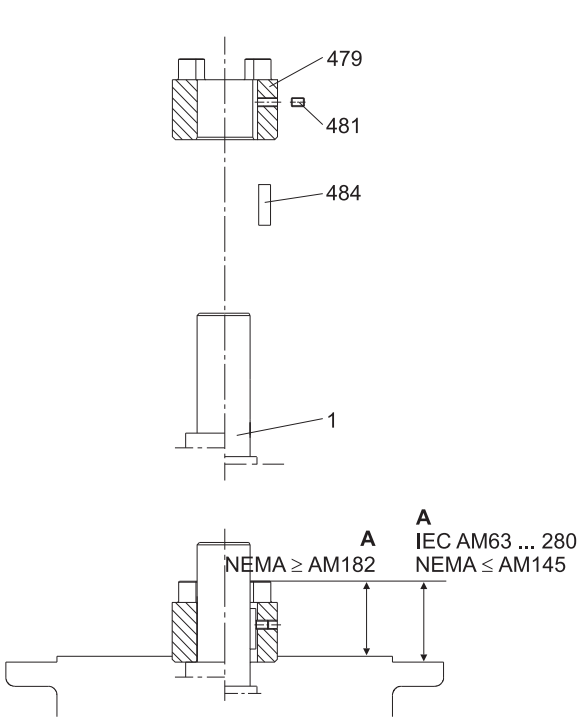


52102AXX

Type		Distance [mm (in)]	
KT/FT	ST	a min.	a max.
-	37	3.3 (0.130)	5.6 (0.220)
37	47	3.3 (0.130)	5.6 (0.220)
47	57	5.0 (0.197)	7.6 (0.299)
57, 67	67	5.0 (0.197)	7.6 (0.299)
77	77	5.0 (0.197)	7.6 (0.299)
87	87	5.8 (0.228)	8.6 (0.339)
97	97	5.8 (0.228)	8.6 (0.339)

4.9 AM adapter coupling

IEC adapter AM63 225 / NEMA adapter AM56 365



1. Clean the motor shaft and flange surfaces of the motor and 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 (176 – 212°F) and push the coupling half onto the motor shaft until stop at motor shaft shoulder (position to point **A** for AM250 / AM280 and NEMA).
4. Secure key and coupling half using set screw (481) and tightening torque T_A on motor shaft according to the table.
5. Check point **A**.
6. Seal the contact surfaces between the adapter and motor using a suitable sealing compound.
7. Mount the motor on the adapter. When doing this, make sure the coupling jaws of the adapter shaft engage the plastic spider.

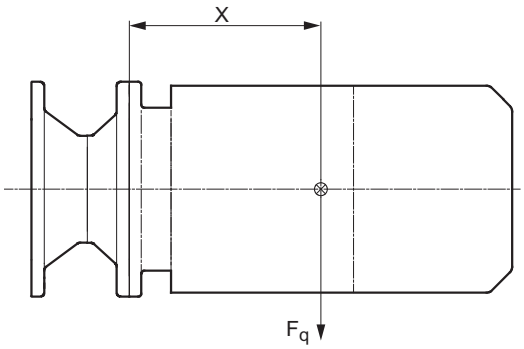
IEC AM	uom	63 / 71	80 / 90	100 / 112	132	160 / 180	200	225	250 / 280
A	mm	24.5	31.5	41.5	54	76	78.5	93.5	139
	in	0.965	1.240	1.634	2.126	2.992	3.091	3.681	5.472
T_A	Nm	1.5	1.5	4.8	4.8	10	17	17	17
	lb-in	13.3	13.3	42.5	42.5	88.5	150	150	150
Thread		M4	M4	M6	M6	M8	M10	M10	M10
NEMA AM	uom	56	143 / 145	182 / 184	213 / 215	254 / 256	284 / 286	324 / 326	364 / 365
A	mm	46	43	55	63.5	78.5	85.5	107	107
	in	1.811	1.693	2.165	2.500	3.091	3.366	4.213	4.213
T_A	Nm	1.5	1.5	4.8	4.8	10	17	17	17
	lb-in	13.3	13.3	42.5	42.5	88.5	150	150	150
Thread		M4	M4	M6	M6	M8	M10	M10	M10

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

When installing a motor onto the adapter, you must use an anaerobic sealant to ensure that moisture cannot penetrate the adapter.

Permitted loads

The load data specified in the following table must not be exceeded when a motor is mounted.



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Adapter type			F_q [1] [N (lb)]	
IEC	NEMA	x [1] [mm (in)]	IEC adapter	NEMA adapter
AM63/71	**AM56**	77 (3.03)	530 (119)	410 (92)
AM80/90	**AM143/145**	113 (4.45)	420 (94)	380 (85)
AM100/112	**AM182/184**	144 (5.67)	2000 (450)	1760 (396)
AM132 [2]	**AM213/215** [2]	186 (7.32)	1600 (360)	1250 (281)
AM132..	**AM213/215**		4700 (1057)	3690 (830)
AM160/180	**AM254/286**	251 (9.88)	4600 (1034)	4340 (976)
AM200/225	**AM324 - AM365**	297 (11.69)	5600 (1259)	5250 (1180)
AM250/280	**-**	390 (15.35)	11200 (2518)	-

1) The maximum permitted weight of the attached motor F_{qmax} must be reduced proportionally as the distance between the adapter flange and the middle of the motor (x) increases. When this distance is reduced, the maximum permitted weight F_{qmax} cannot be increased.

2) Diameter of the adapter drive flange: 160 mm (6.30 in)

Adapter AM with backstop AM../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.

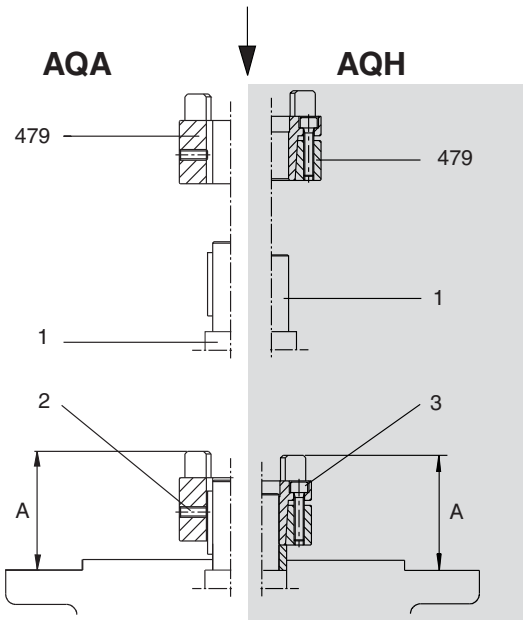
The backstop is maintenance-free in operation, and does not require any further maintenance work.

The backstops have a minimum lift-off speed depending on the size (→ following table). If the minimum lift-off speeds are violated, the backstops are subject to wear, and the resulting friction causes the temperature to increase.

Type	Maximum locking torque of backstop [Nm (lb-in)]	Minimum lift-off speed [rpm]
AM80/90/RS, AM143/145/RS	90 (797)	640
AM100/112/RS, AM182/184/RS	340 (3009)	600
AM132/RS, AM213/215/RS	700 (6195)	550
AM160/180/RS, AM254/286/RS	1200 (10620)	630
AM200/225/RS, AM324-365/RS	1450 (12832)	430

In rated operation, the lift-off speeds must not drop below the minimum values. The lift-off speeds are only permitted to drop below the minimum values during start-up or braking.

4.10 AQ adapter coupling



1 Motor shaft
2 Setscrew
3 Bolt

AQA = With keyway
AQH = Without keyway

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1. Clean the motor shaft and flange surfaces of the motor and adapter.
2. **Type AQH:** Unscrew the bolts of the coupling half (479) and loosen the conical connection.
3. Heat the coupling half 80°C – 100°C (176°F – 212°F) and push it onto the motor shaft.

   Type AQA / AQH: Up to clearance "A" (see table).

4. **Type AQH:** Tighten the bolts on the coupling half in diametrically opposite sequence (work round several times tightening the bolts evenly one after the other) until all bolts reach the tightening torque T_A specified in the table.

   Type AQA: Use a setscrew to secure the coupling half (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.

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.

When installing a motor onto the adapter, you must use an anaerobic sealant to ensure that moisture cannot penetrate the adapter.

Setting dimensions, tightening torques

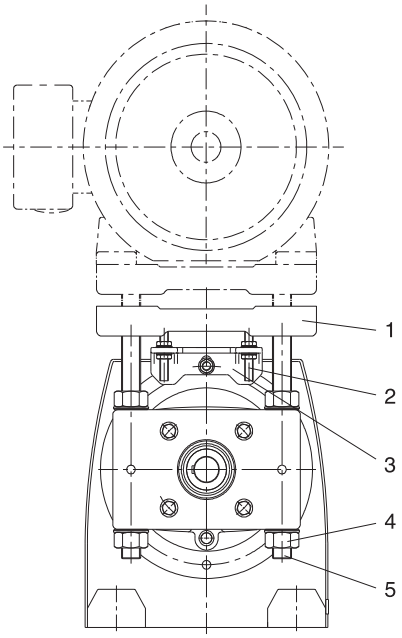
Type	Coupling size	Clearance "A" [mm (in)]	Bolts DIN 912		Tightening torque T_A [Nm (lb-in)]	
			AQA	AQH	AQA	AQH
AQA /AQH 80 /1/2/3	19/24	44.5 (1.75)	M5	M4	2 (17.7)	3 (26.5)
AQA /AQH 100 /1/2		39 (1.54)				
AQA /AQH 100 /3/4		53 (2.09)				
AQA /AQH 115 /1/2		62 (2.44)				
AQA /AQH 115 /3	24/28	62 (2.44)	M5	M5	2 (17.7)	6 (53.1)
AQA /AQH 140 /1/2		62 (2.44)				
AQA /AQH 140 /3	28/38	74.5 (2.93)	M8	M5	10 (88.5)	6 (53.1)
AQA /AQH 190 /1/2		76.5 (3.01)				
AQA /AQH 190 /3	38/45	100 (3.94)	M8	M6	10 (88.5)	10 (88.5)

4.11 AD input shaft assembly

Please refer to Sec. "Installing input and output shafts" for information on 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

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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.

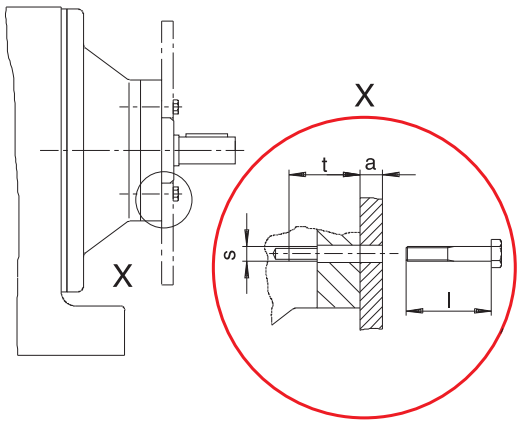
Only AD6/P and AD7/P:

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. 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)

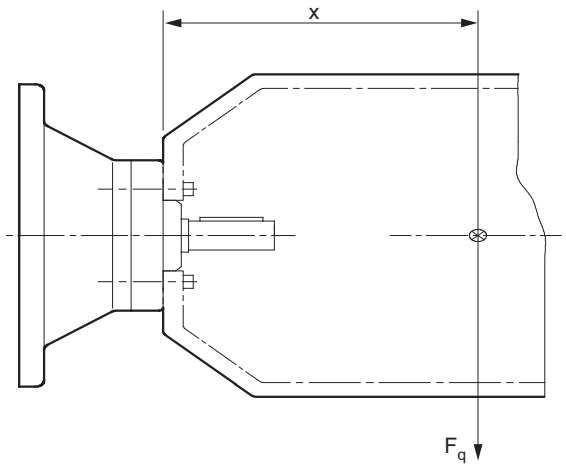
Round down the calculated bolt length to the next smaller standard length.

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 [mm (in)]	Retaining thread s	Tightening torque T_A for connection bolts in strength class 8.8 [Nm (lb-in)]
AD2/ZR	25.5 (1.00)	M8	25 (221)
AD3/ZR	31.5 (1.24)	M10	48 (425)
AD4/ZR	36 (1.42)	M12	86 (761)
AD5/ZR	44 (1.73)	M12	86 (761)
AD6/ZR	48.5 (1.91)	M16	210 (1859)
AD7/ZR	49 (1.93)	M20	410 (3629)
AD8/ZR	42 (1.65)	M12	86 (761)

Permitted loads

The load values specified in the following table must not be exceeded.



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Type	x[1)] [mm (in)]	F_q[1)] [N (lb)]
AD2/ZR	193 (7.60)	330 (74)
AD3/ZR	274 (10.79)	1400 (315)
AD4/ZR[2)]	361 (14.21)	1120 (252)
AD4/ZR		3300 (742)
AD5/ZR	487 (19.17)	3200 (719)
AD6/ZR	567 (22.32)	3900 (877)
AD7/ZR	663 (26.10)	10000 (2248)
AD8/ZR	516 (20.31)	4300 (967)

1) Maximum load values for connection bolts in strength class 8.8. The maximum permitted weight of the attached motor F_{qmax} must be reduced proportionally as the distance between the adapter flange and the middle of the motor (x) increases When this distance is reduced, the F_{qmax} cannot be increased.

2) Diameter of the adapter output flange: 160 mm (6.30 in)

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.

The backstops have a minimum lift-off speed depending on the size (→ following table). If the minimum lift-off speeds are violated, the backstops are subject to wear, and the resulting friction causes the temperature to increase.

Type	Maximum locking torque of backstop [Nm (lb-in)]	Minimum lift-off speed [rpm]
AD2/RS	90 (797)	640
AD3/RS	340 (3009)	600
AD4/RS	700 (6195)	550
AD5/RS	1200 (10620)	630
AD6/RS	1450 (12833)	430
AD7/RS	1450 (12833)	430
AD8/RS	2860 (25311)	430

In rated operation, the lift-off speeds must not drop below the minimum values. The lift-off speeds are only permitted to drop below the minimum values during start-up or braking.

5 Startup

Prior to startup check that the oil level is as specified for the mounting position. The oil checking and drain screws and the breather valves must be freely accessible.

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

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.

Run-in period

SPIROPLAN® and helical-worm gear units require a run-in period of at least 24 hours 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.

No. of starts	Worm		Spiroplan®	
	Power reduction	i range	Power reduction	i range
1 start	ca. 12 %	ca. 50...280	ca. 15 %	approx. 40 ... 75
2 start	ca. 6 %	ca. 20...75	ca. 10 %	ca. 20...30
3 start	ca. 3 %	ca. 20...90	ca. 8 %	ca. 15
4 start	-	-	ca. 8 %	ca. 10
5 start	ca. 3 %	ca. 6...25	ca. 5 %	ca. 8
6 start	ca. 2 %	ca. 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 providing 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 oil and oil level. • Check the seals visually for leakage. • For gear units with a torque arm: Check the rubber buffer and change it, if necessary
• Depending on the operating conditions (see chart below), every 3 years at the latest. • According to oil temperature.	• Change mineral oil.
	• Replace anti-friction bearing grease (recommendation). • Replace oil seal (do not install it in the same track).
• Depending on the operating conditions (see chart below), every 5 years at the latest. • According to oil temperature.	• Change synthetic oil
	• Replace anti-friction bearing grease (recommendation). • Replace oil seal (do not install it in the same track).
• Gear unitsR07, R17, R27, F27 and Spiroplan® are 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

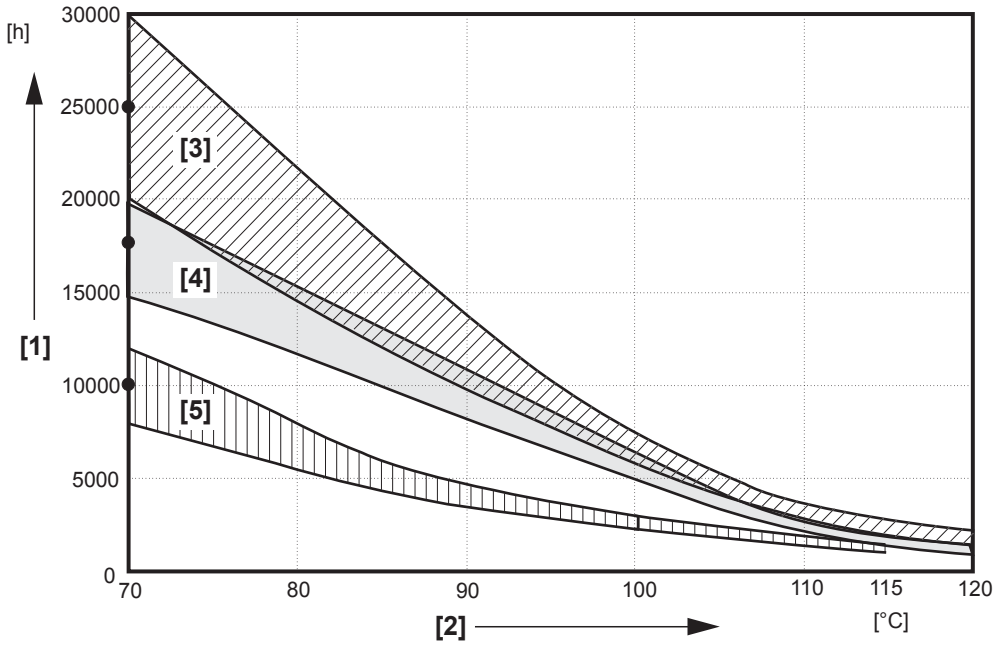

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Figure 13: Oil change intervals for standard gear units under normal environmental conditions

[1] Operating hours
[2] Sustained oil bath temperature
- Average value per oil type at 70 °C

[3] CLP PG
[4] CLP HC / HCE
[5] CLP / HLP / E

6.3 Inspection and maintenance of the gear unit

Do not intermix synthetic lubricants and do not mix synthetic and mineral lubricants together!

The standard lubricant is mineral oil (except for Spiroplan® gear units).

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

Checking the oil level

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

   Wait until the gear unit has cooled off – Danger of burns!
2. Refer to Sec. "Installing the gear unit" when changing the mounting position!
3. For gear units with an oil level plug: Remove the oil level plug, check the fill level and correct it if necessary. Screw the oil level plug back in.

Checking the oil

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

   Wait until the gear unit has cooled off – Danger of burns!
2. Remove a little oil from the oil drain 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 periods".
4. For gear units with an oil level plug: Remove the oil level plug, check the fill level and correct it if necessary. Screw the oil level plug back in.

Changing the oil

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

De-energize the gearmotor and secure it to prevent it from being switched back on inadvertently!

Wait until the gear unit cools down - Danger of burns!

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

With oil drain plug / oil level screw

1. Place a container underneath the oil drain plug
2. Remove the oil level plug, breather plug/breather valve and oil drain plug.
3. Drain all the oil.
4. Screw in the oil drain plug.
5. Pour in new oil of the same type through the vent hole (if changing the oil type, please first contact our customer service). Do not mix synthetic lubricants.
   - Pour in the volume of oil in accordance with the mounting position (see Sec. "Lubricant fill quantities") or as specified on the nameplate.
   - Check at the oil level plug.
6. Screw the oil level plug back in
7. Screw in the breather plug/breather valve.

Without oil drain plug / oil level plug

1. Remove cover plate.
2. Drain the oil through the cover plate opening.
3. Pour in new oil of the same type through the vent hole (if changing the oil type, please first contact our customer service). Do not mix synthetic lubricants.
   – Pour in the volume of oil in accordance with the mounting position (see Sec. "Lubricant fill quantities") or as specified on the nameplate.
4. Check the oil level (→ Sec. "Check oil level for gear units with oil level plug")
5. Attach cover plate (observe the tightening torque and series → Sec. "Check the oil level for gear units without an oil level plug")

Changing the oil seal

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

   Wait until the gear unit has cooled off – Danger of burns!
2. 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.
3. If you use double oil seals, the space has to be filled one-third with grease.

6.4 Inspection / maintenance of AM / AQA adapters

Frequency	What to do?
• Every 3000 machine hours, at least every 6 months	• Check torsional play • Visually check the elastic annular gear • Check the adapter visually for leakage
• After 25000 - 30000 machine hours	• Renew the anti-friction bearing grease • Replace oil seal (do not install it in the same track) • Change the elastic coupling spider

6.5 Inspection / maintenance of AD adapters

Frequency	What to do?
• Every 3000 machine hours, at least every 6 months	• Check running noise for possible bearing damage • Check the adapter visually for leakage
• After 25000 - 30000 machine hours	• Renew the anti-friction bearing grease
	• Change the oil seal

7 Malfunctions

Customer service

Please have the following information to hand if you require the assistance of our customer service:
- Data from the nameplate (complete)
- Nature and extent of the fault
- Time and peripheral circumstances of the fault
- Presumed cause

7.1 Gear unit malfunctions

Problem	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	• Check the oil (see Sec. "Inspection and Maintenance") • Stop the drive, contact customer service
Oil leaking[1)] • 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 leaking from breather valve	A Too much oil B Drive operated in incorrect 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 "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/gearmotor for repair

1) Short-term oil/grease leakage at the oil seal is possible in the run-in phase (24 hours running time).

7.2 AM / AQA / AL adapter malfunctions

Problem	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 occur	A Annular gear wear, short-term torque transfer through metal contact B Bolts to secure hub axially are loose.	A Change the coupling spider B Tighten the bolts
Premature wear in annular gear	A Contact with aggressive fluids / oil; ozone influence; too high ambient temperatures etc, which can cause a change in the physical properties of the annular gear. B Impermissibly high ambient/contact temperature for the annular gear; maximum permitted temperature –20 °C to +80 °C. C Overload	Contact SEW-EURODRIVE customer service

7.3 AD input shaft assembly malfunctions

Problem	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.

8 Mounting Positions

8.1 General information on 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 gearmotor in mounting positions M1 ... M6.

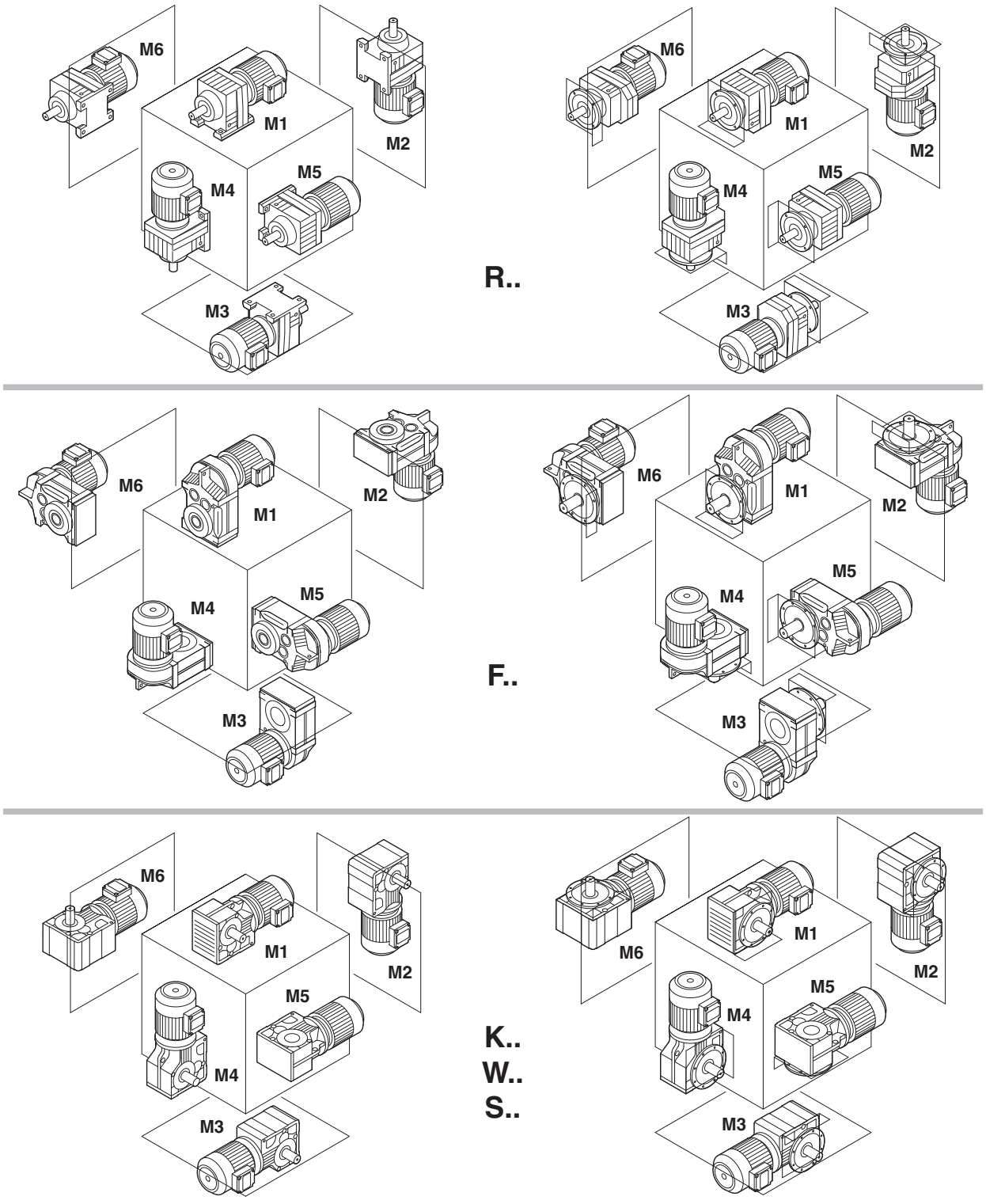


Figure 14: Depiction of mounting positions M1 ... M6

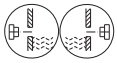
8.2 Key to the mounting position sheets

SPIROPLAN® gearmotors do not depend on any particular mounting position. However, mounting positions M1 to M6 are also shown for SPIROPLAN® gearmotors to assist you in working with this documentation.

Important: SPIROPLAN® gearmotors cannot be equipped with breather valves, oil level plugs or drain plugs.

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

Churning losses

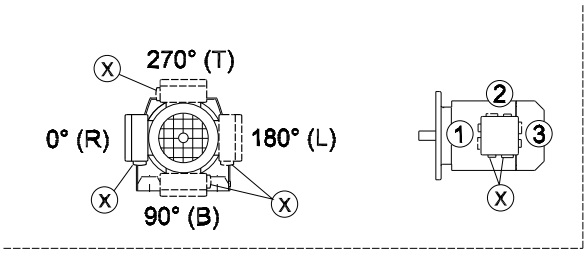
Increased churning losses may arise in some mounting positions. Contact SEW-EURODRIVE in case of the following combinations:

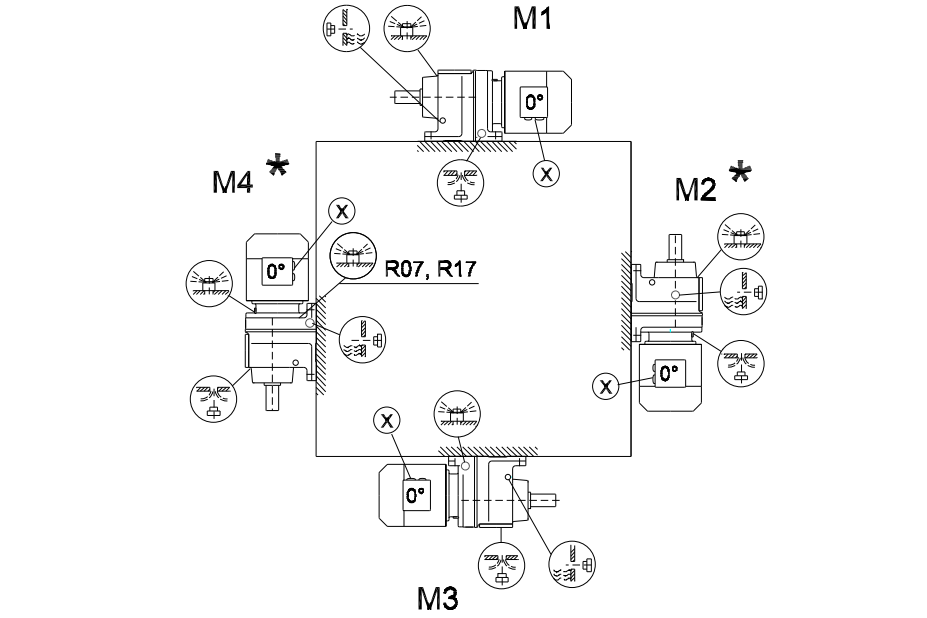
Mounting position	Gear unit type	Gear unit size	Input speed [rpm]
M2, M4	R	97 ... 107	> 2500
		> 107	>1500
M2, M3, M4, M5, M6	F	97 ... 107	> 2500
		> 107	> 1500
	K	77 ... 107	> 2500
		> 107	> 1500
	S	77 ... 97	> 2500

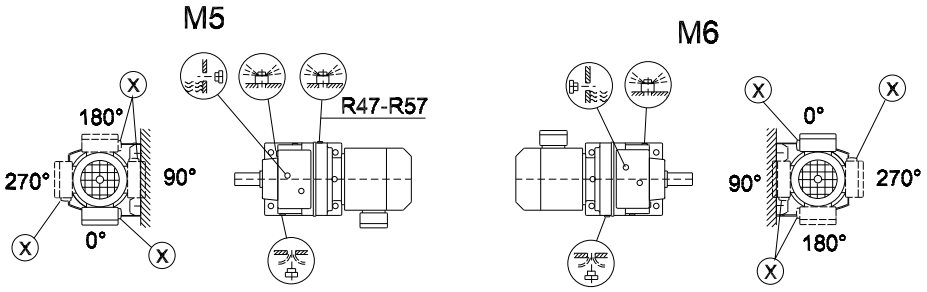
8.3 Mounting positions for R helical gearmotors

R07-R167

04 040 200



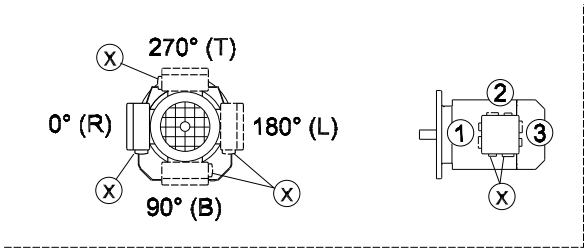




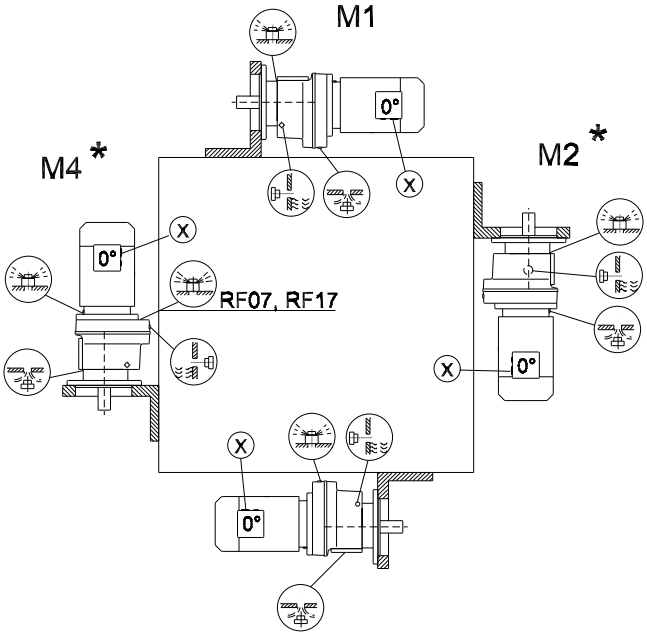
R07		M1, M2 , M3 , M5 , M6
R17, R27		M1, M3 , M5 , M6
R07, R17, R27		
R47, R57		M5

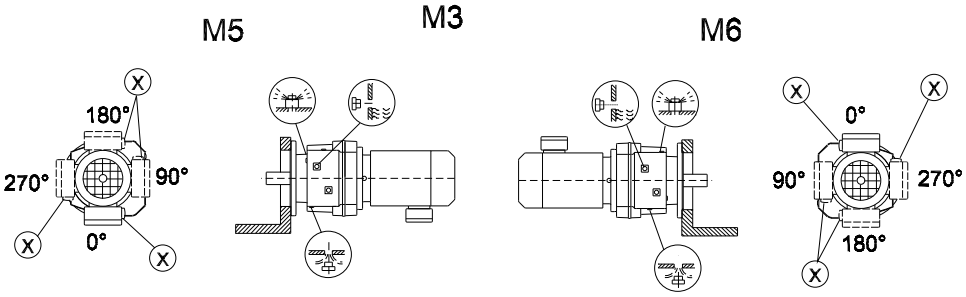
* → page 51

RF07-RF167



04 041 200

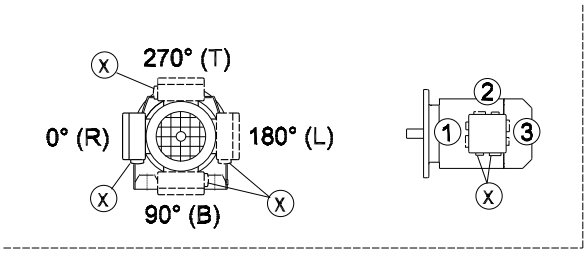




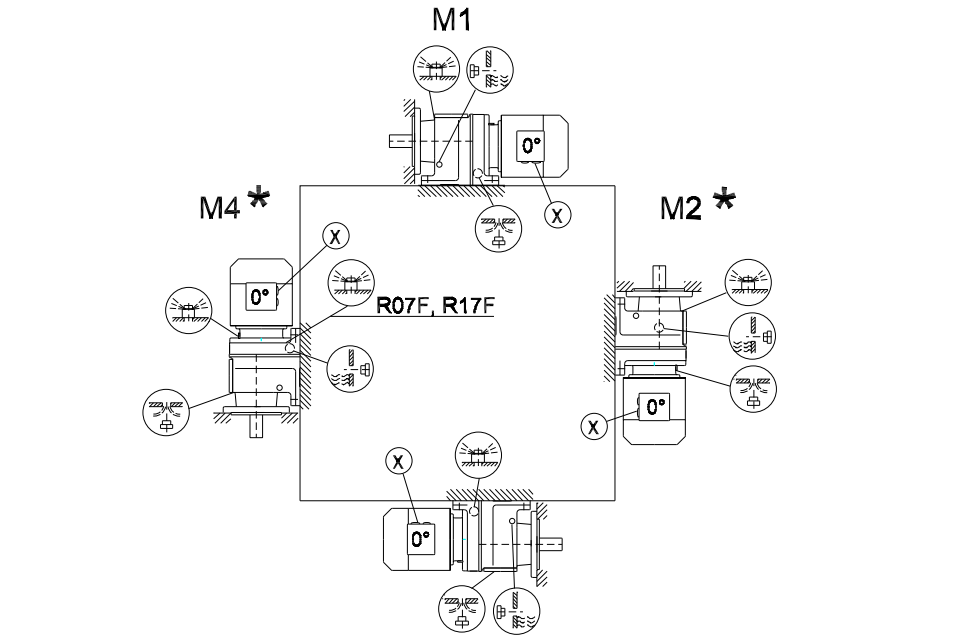
RF07		M1, M2 , M3 , M5 , M6
RF17, RF27		M1, M3 , M5 , M6
RF07, RF17, RF27		
RF47, RF57		M5

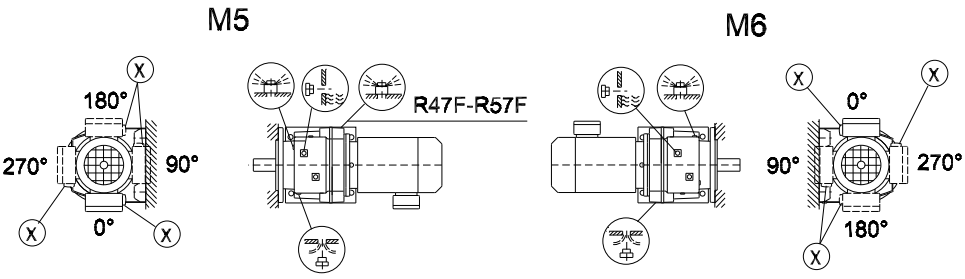
* → page 51

R07F-R87F



04 042 200





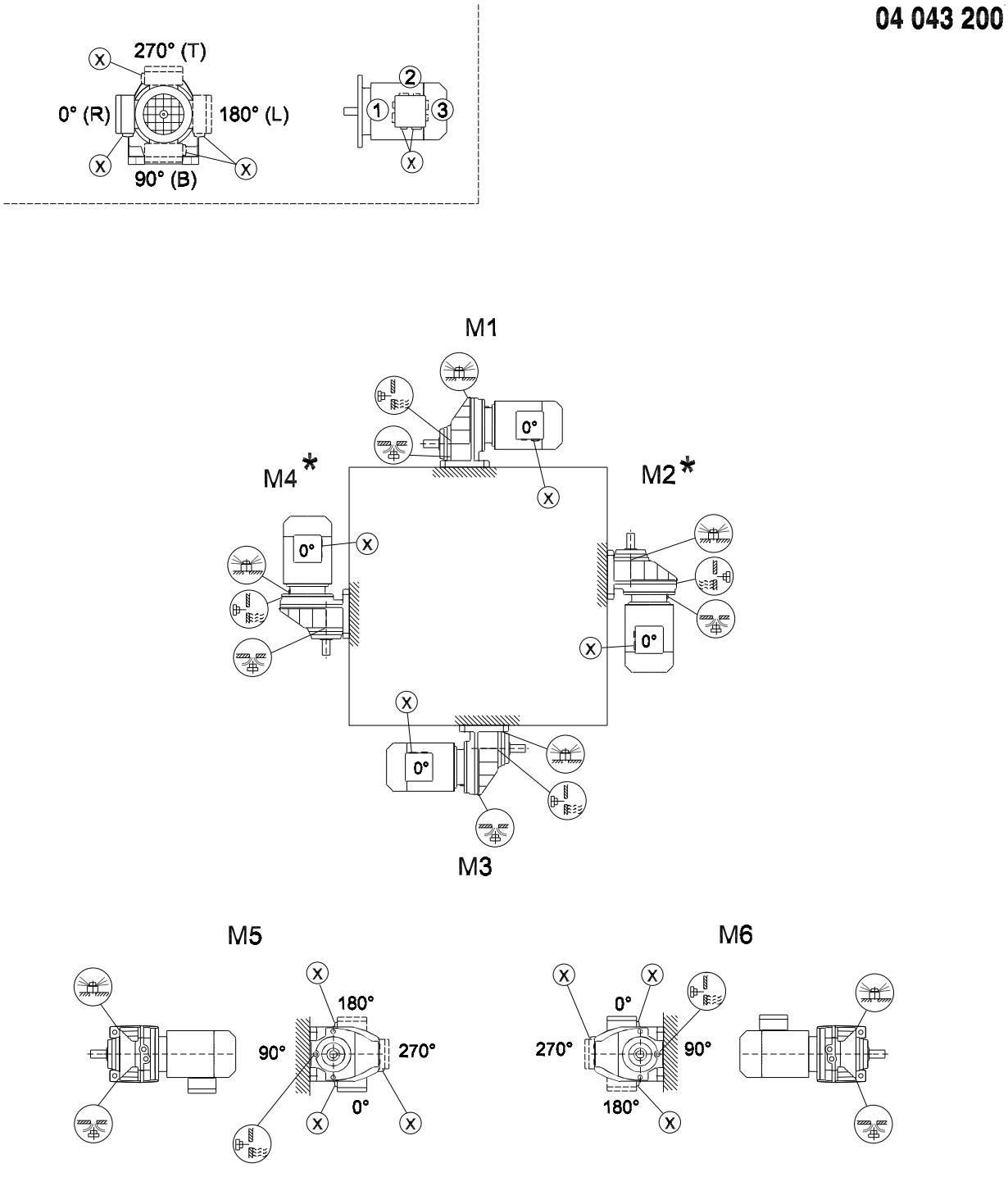
R07F		M1, M2 , M3 , M5 , M6
R17F, R27F		M1, M3 , M5 , M6
R07F, R17F, R27F		
R47F, R57F		M5

* → page 51

Important: See the (i) information in the "Gearmotors" catalog, section "Project Planning for Gear Units/Overhung and axial loads."

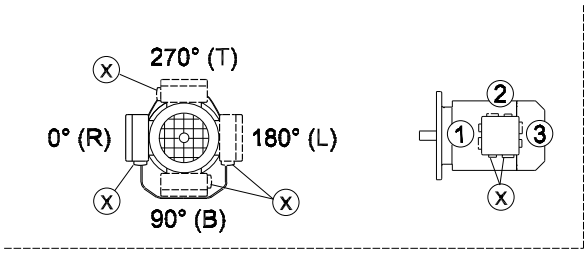
8.4 Mounting positions of RX helical gearmotors

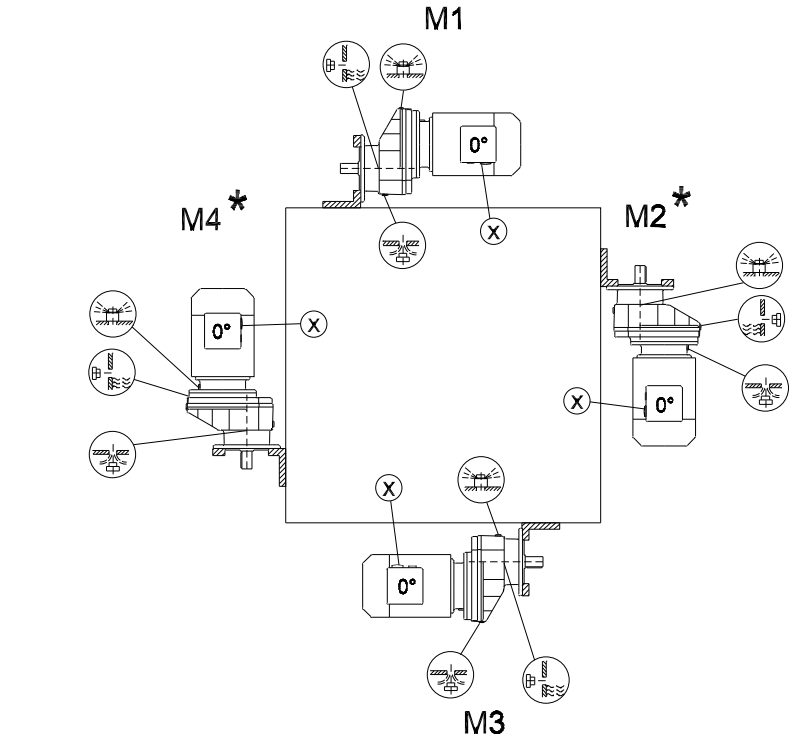
RX57-RX107

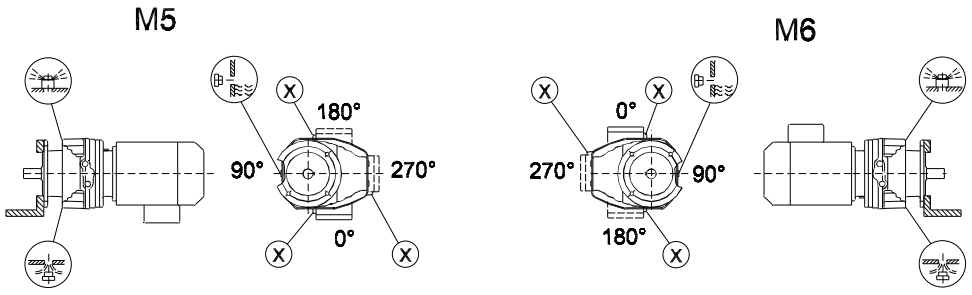


* → page 51

RXF57 - RXF107



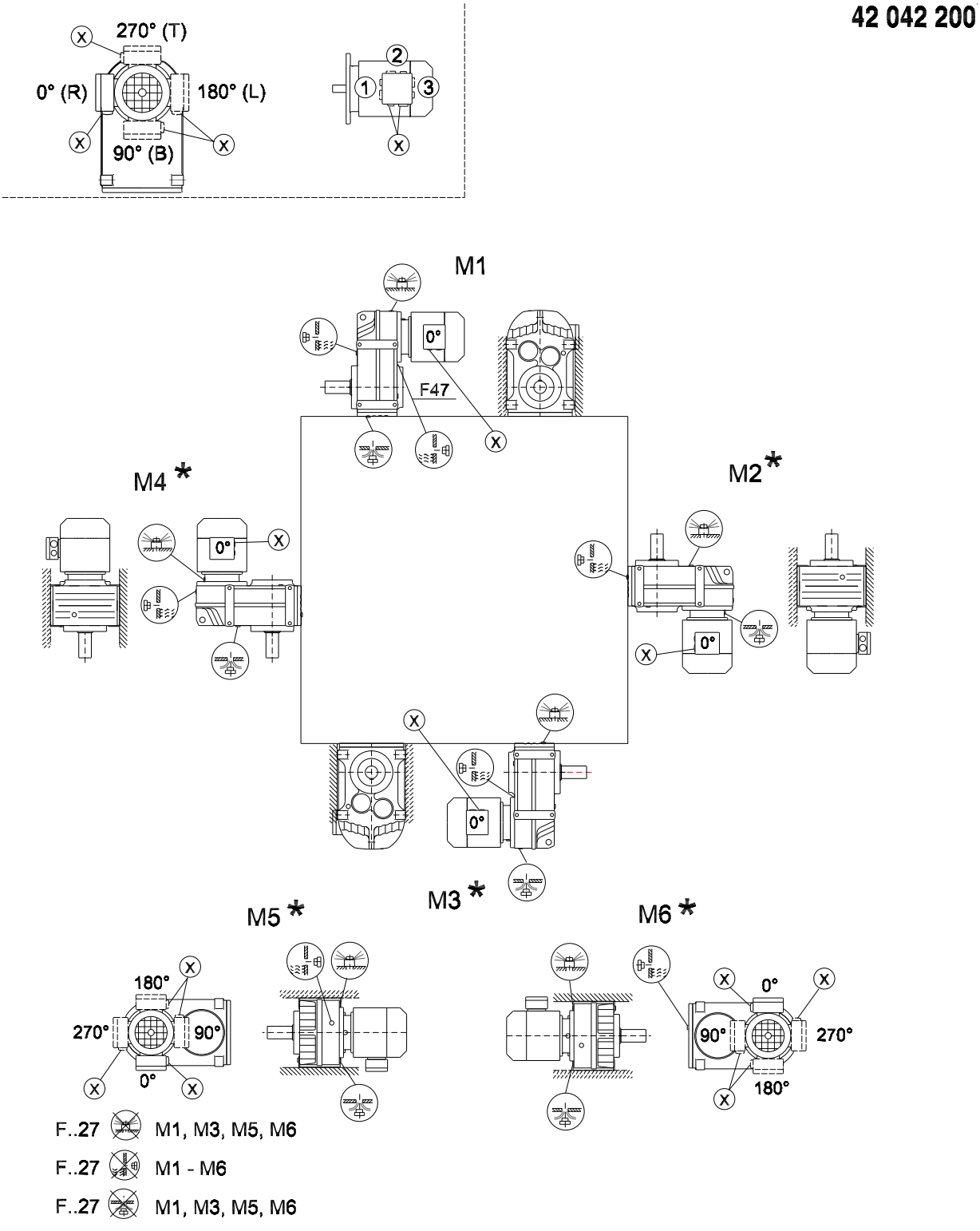




* → page 51

8.5 Mounting positions for parallel shaft helical gearmotors

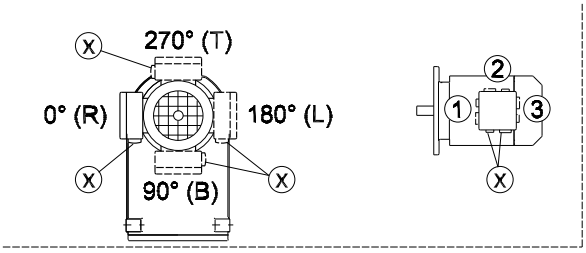
F/FA..B/FH27B-157B, FV27B-107B

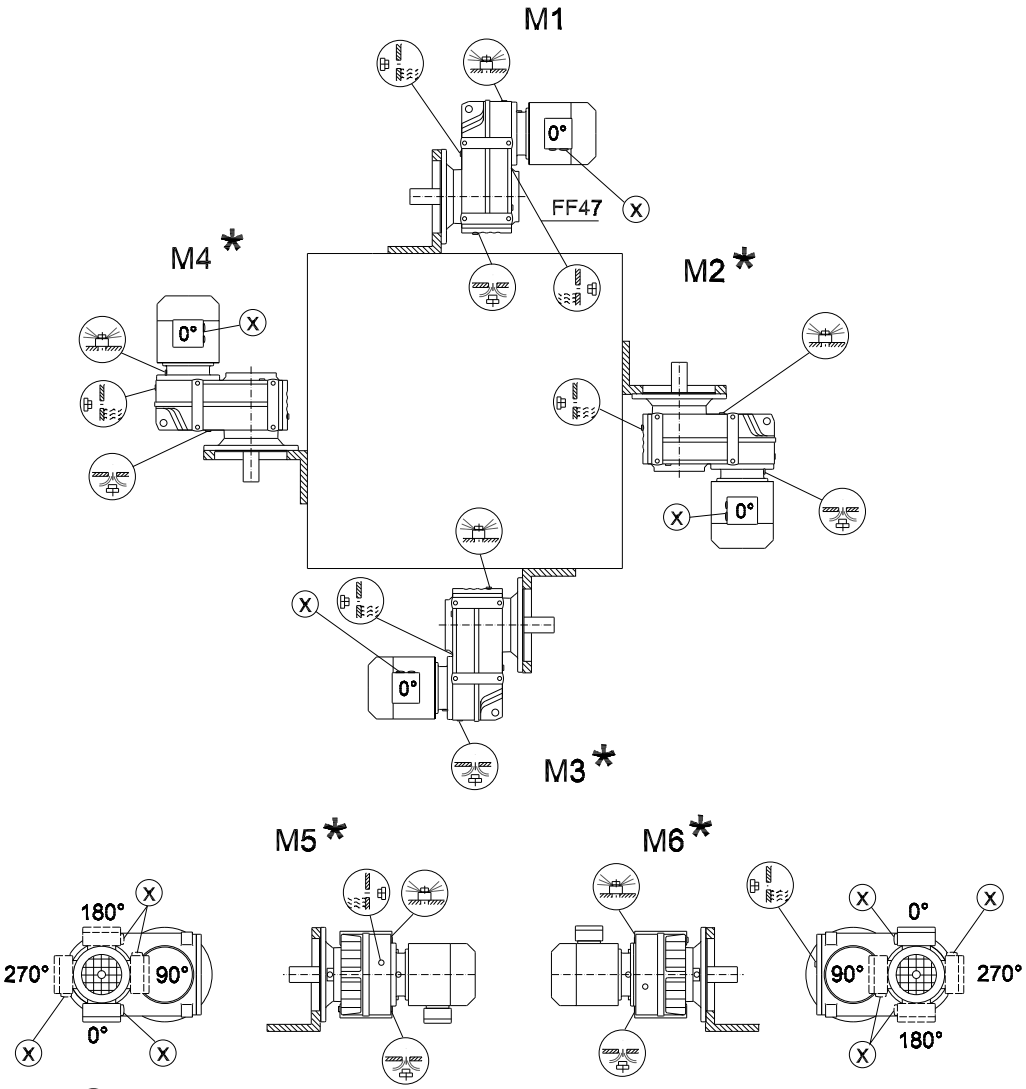


* → page 51

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

42 043 200





F..27 M1, M3, M5, M6

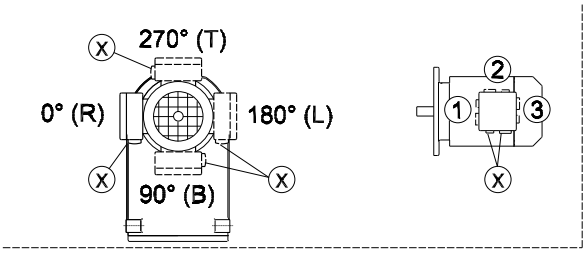
F..27 M1 - M6

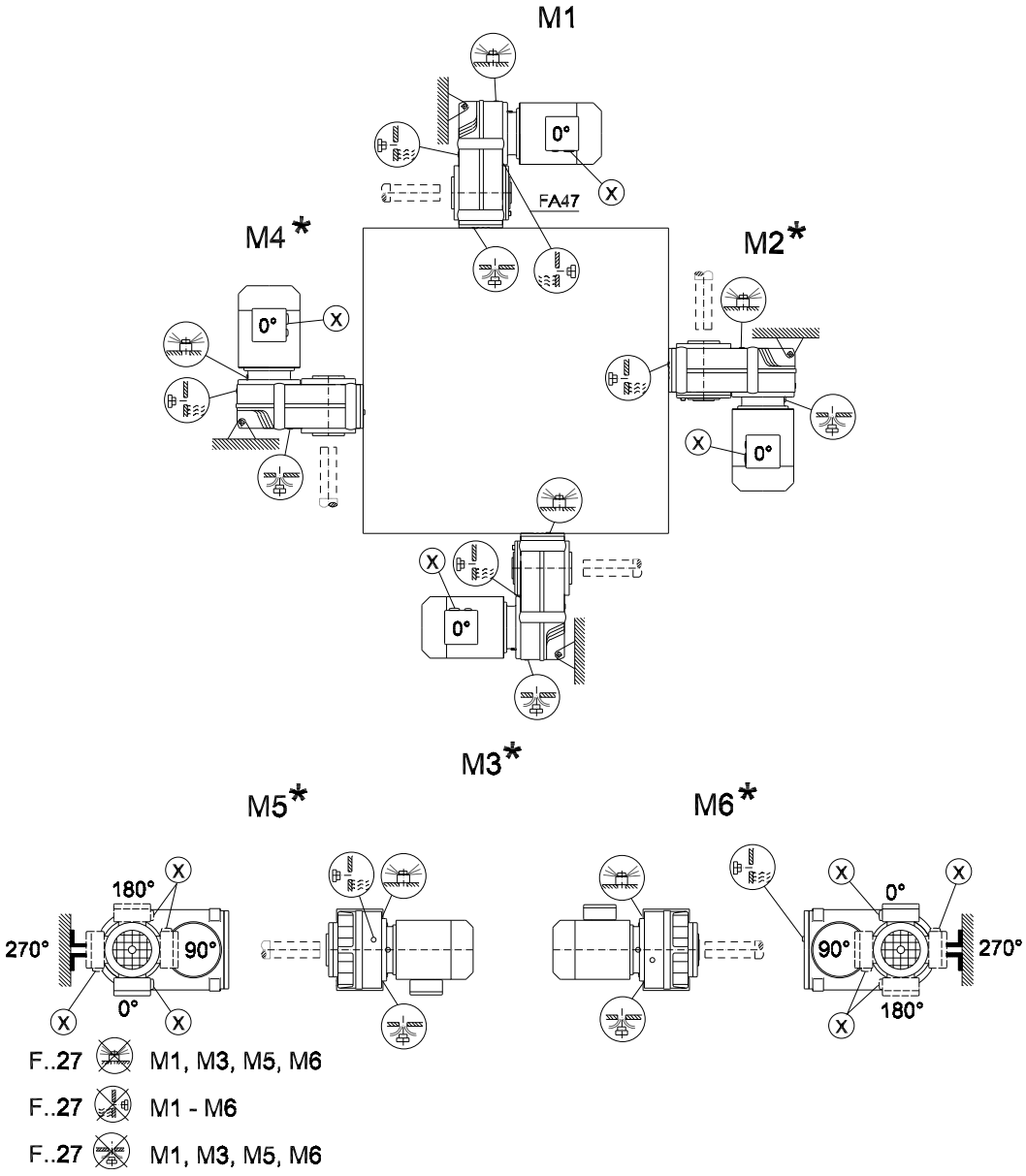
F..27 M1, M3, M5, M6

* → page 51

FA/FH27-157, FV27-107, FT37-97

42 044 200





F..27 M1, M3, M5, M6

F..27 M1 - M6

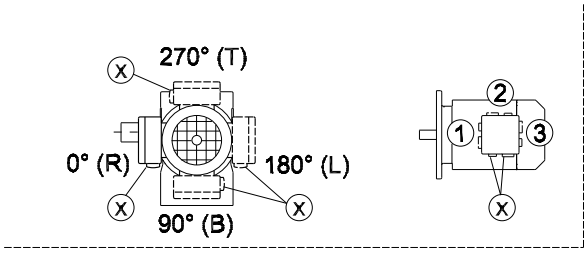
F..27 M1, M3, M5, M6

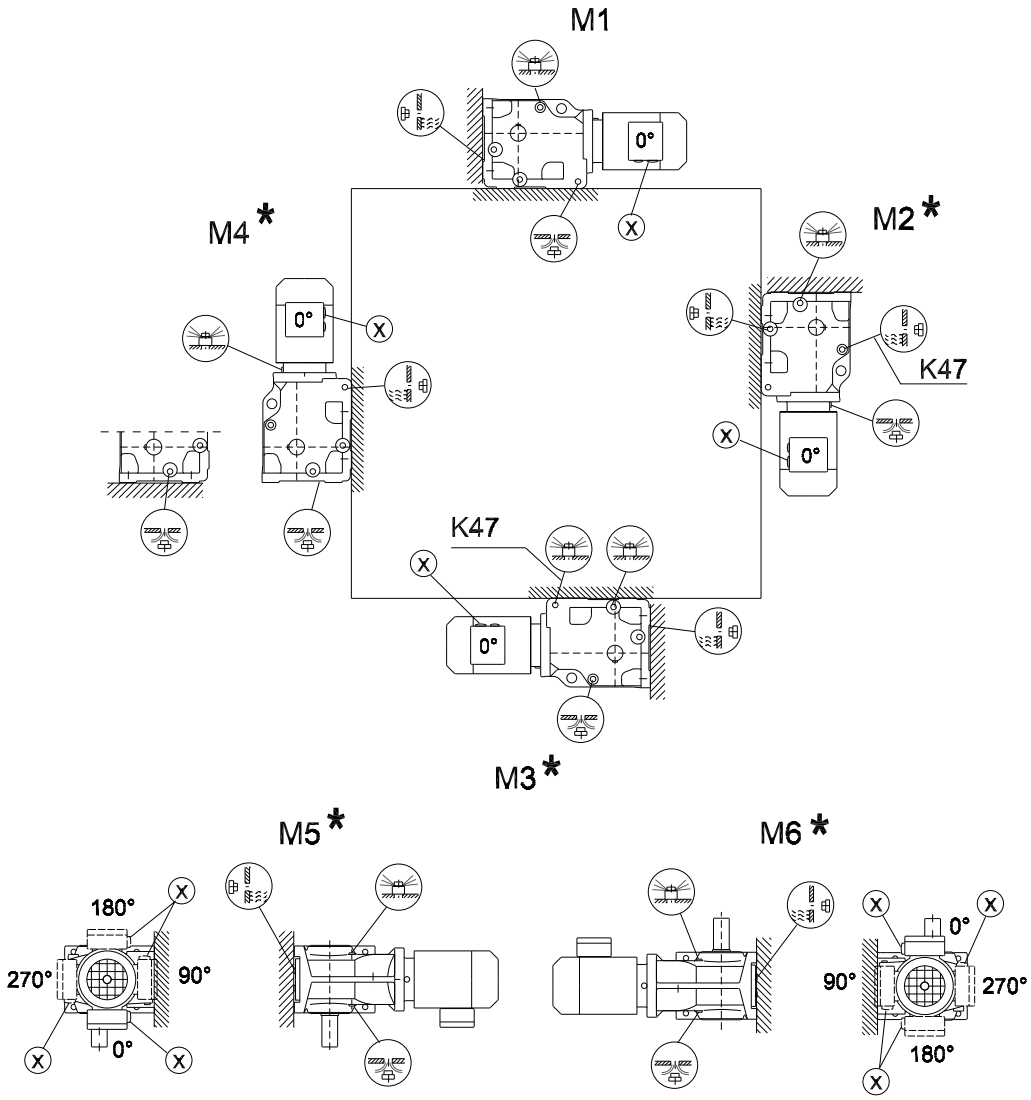
* → page 51

8.6 Mounting positions for helical-bevel gearmotors

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

34 025 200



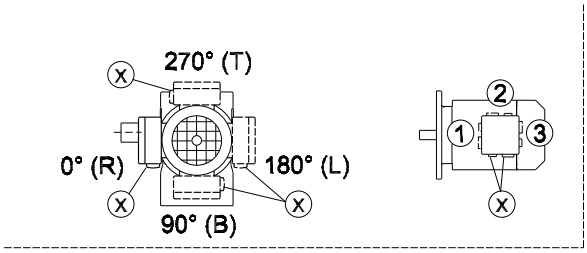


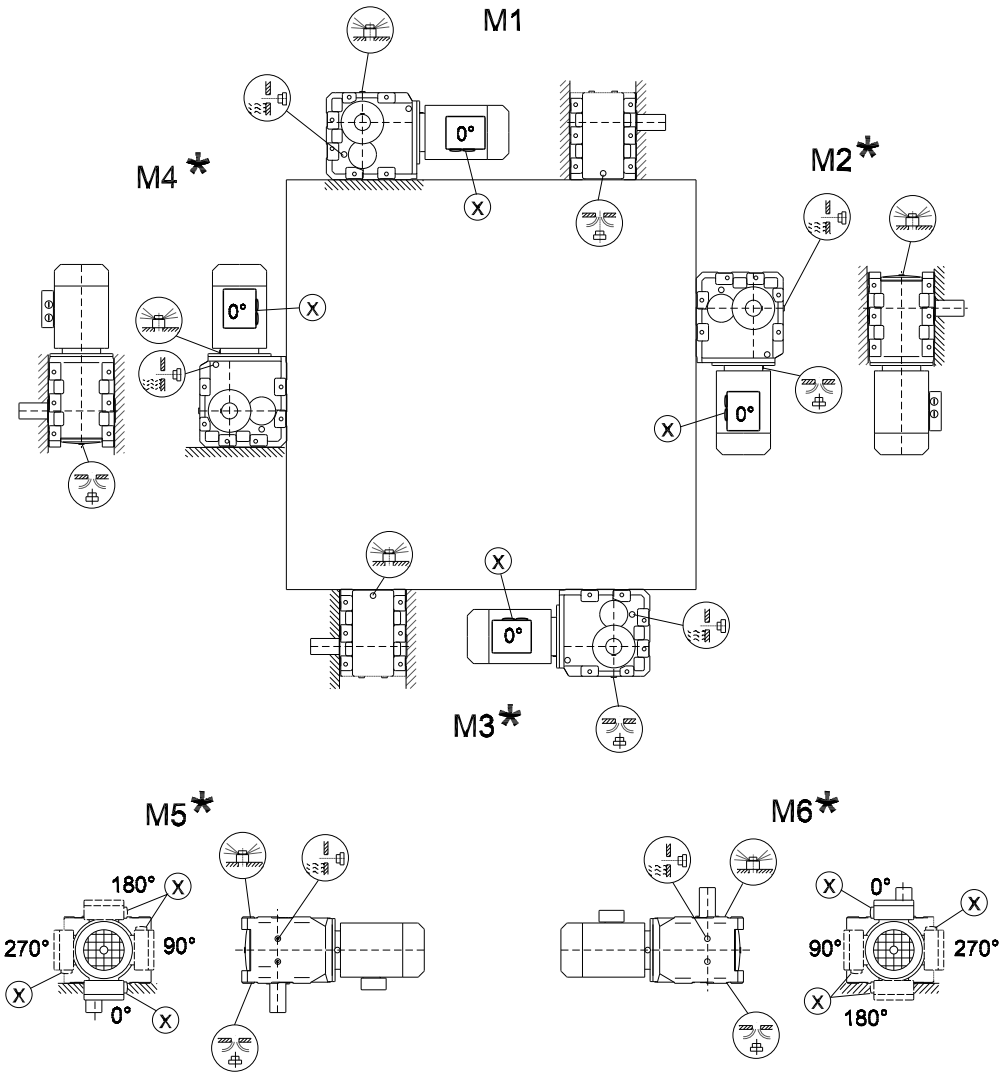
* → page 51

Important: See the (i) information in the "Gearmotors" catalog, section "Project Planning for Gear Units/Overhung and axial loads."

K167-187, KH167B-187B

34 026 200



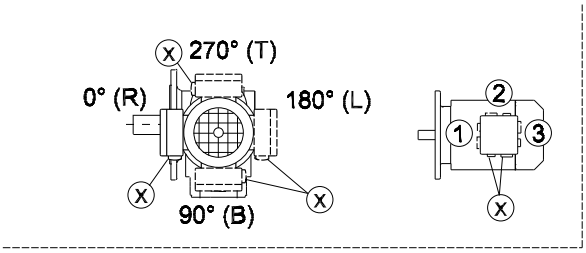


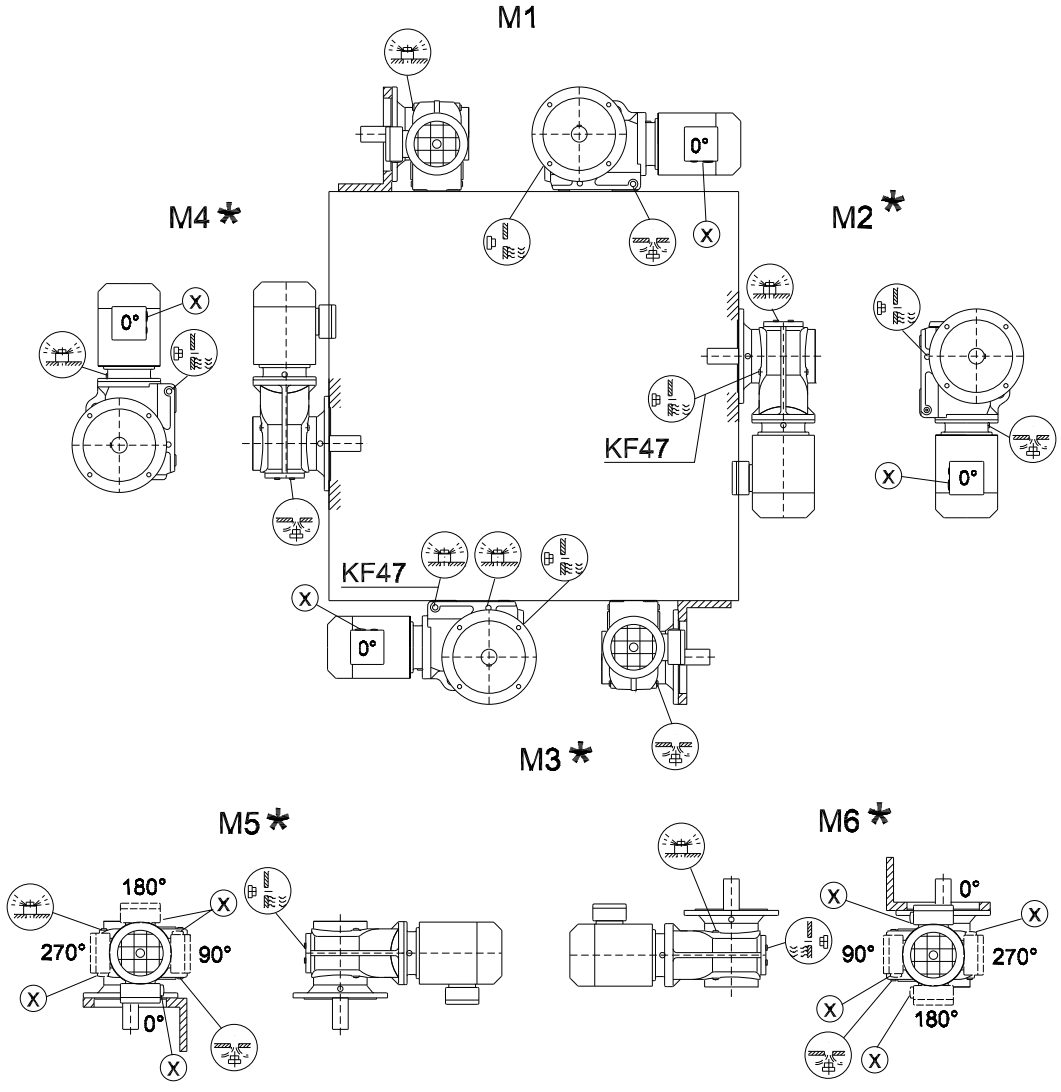
* → page 51

Important: See the (i) information in the "Gearmotors" catalog, section "Project Planning for Gear Units/Overhung and axial loads."

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

34 027 200

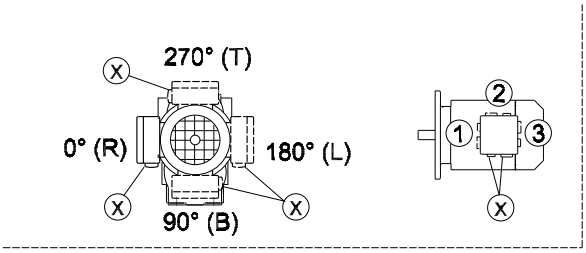


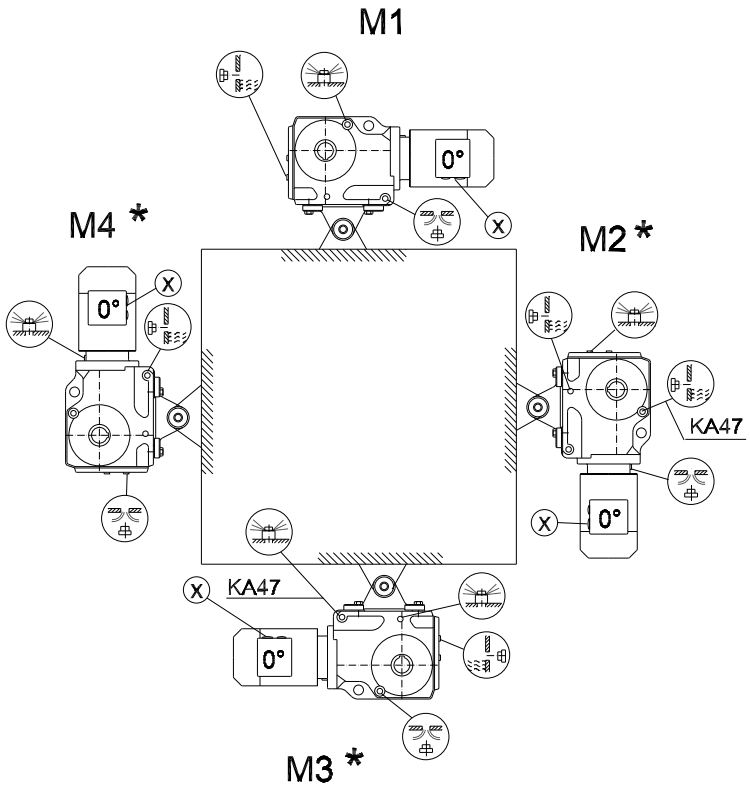


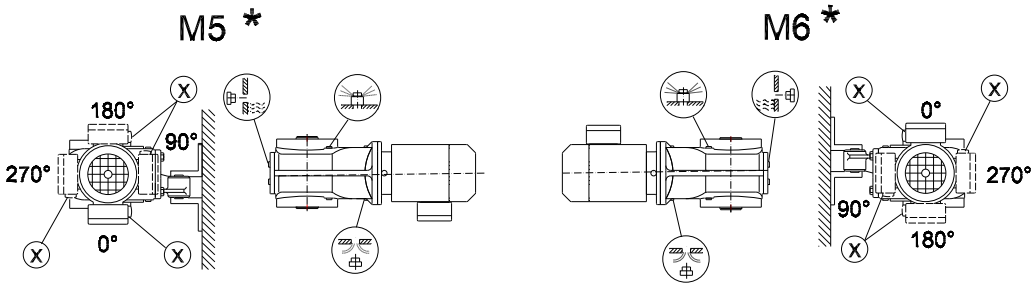
* → page 51

KA/KH37-157, KV37-107, KT37-97

39 025 200



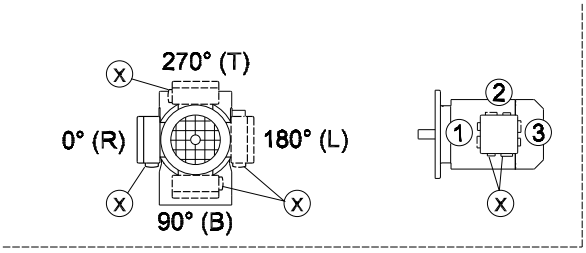


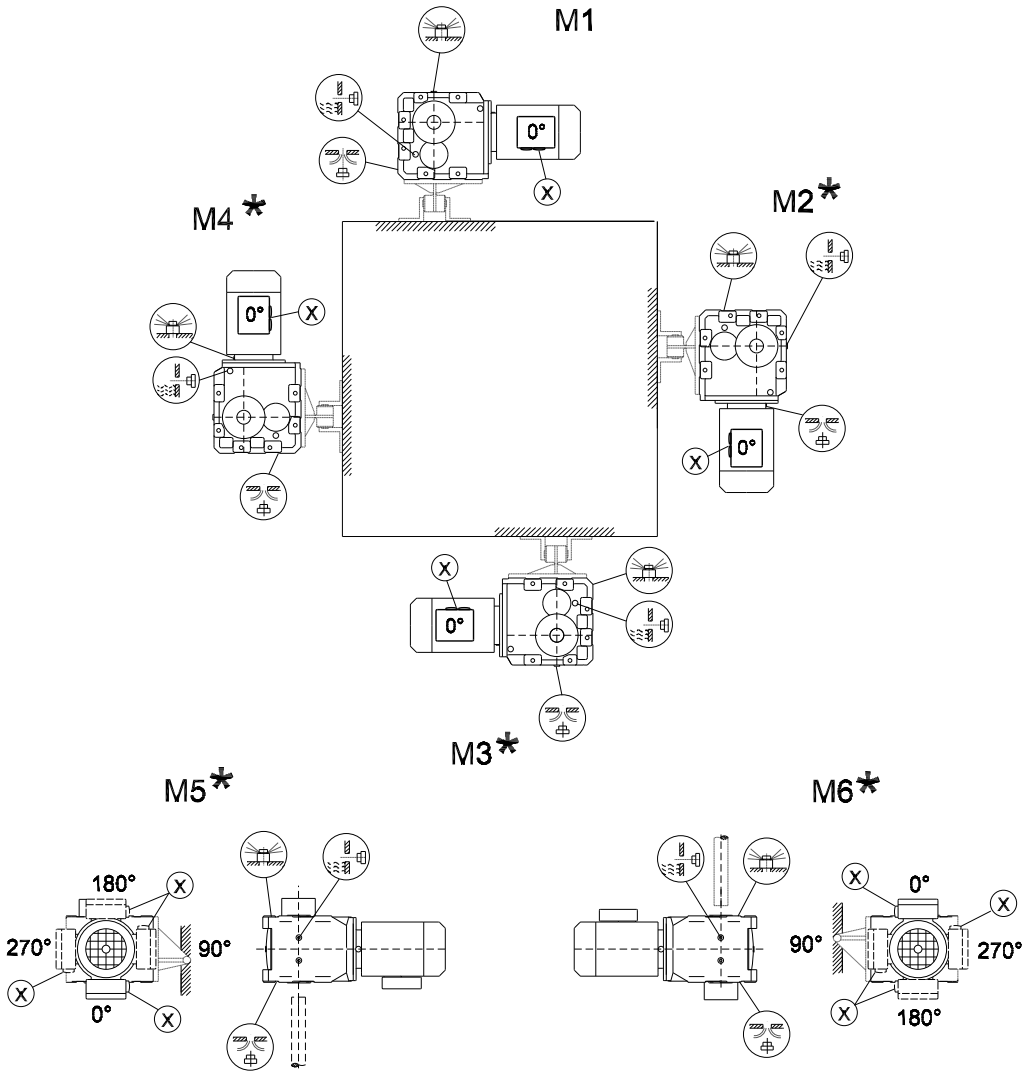


* → page 51

KH167-187

39 026 200

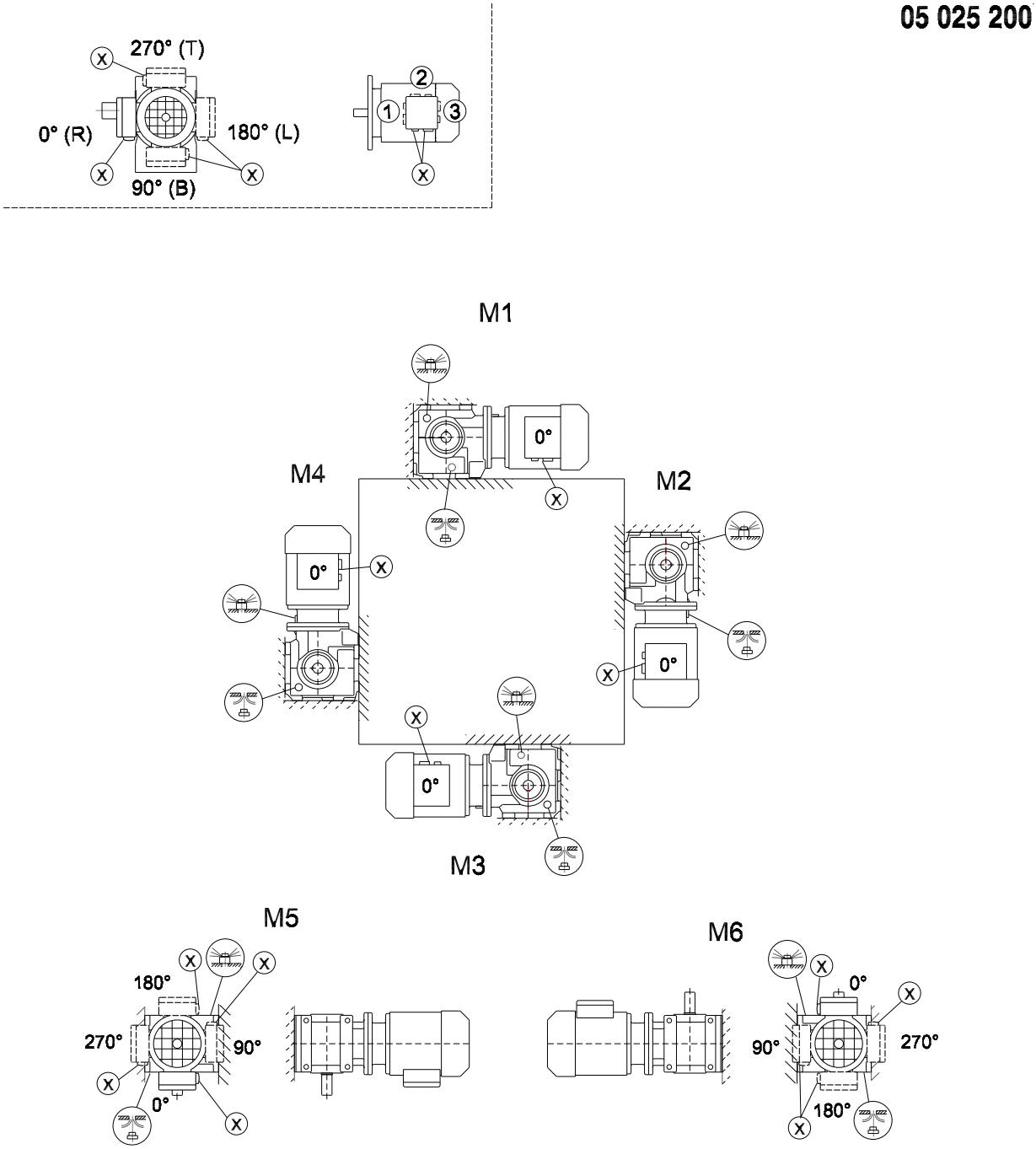




* → page 51

8.7 Mounting positions for helical-worm gearmotors

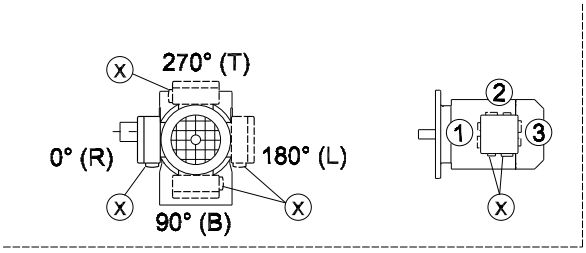
S37

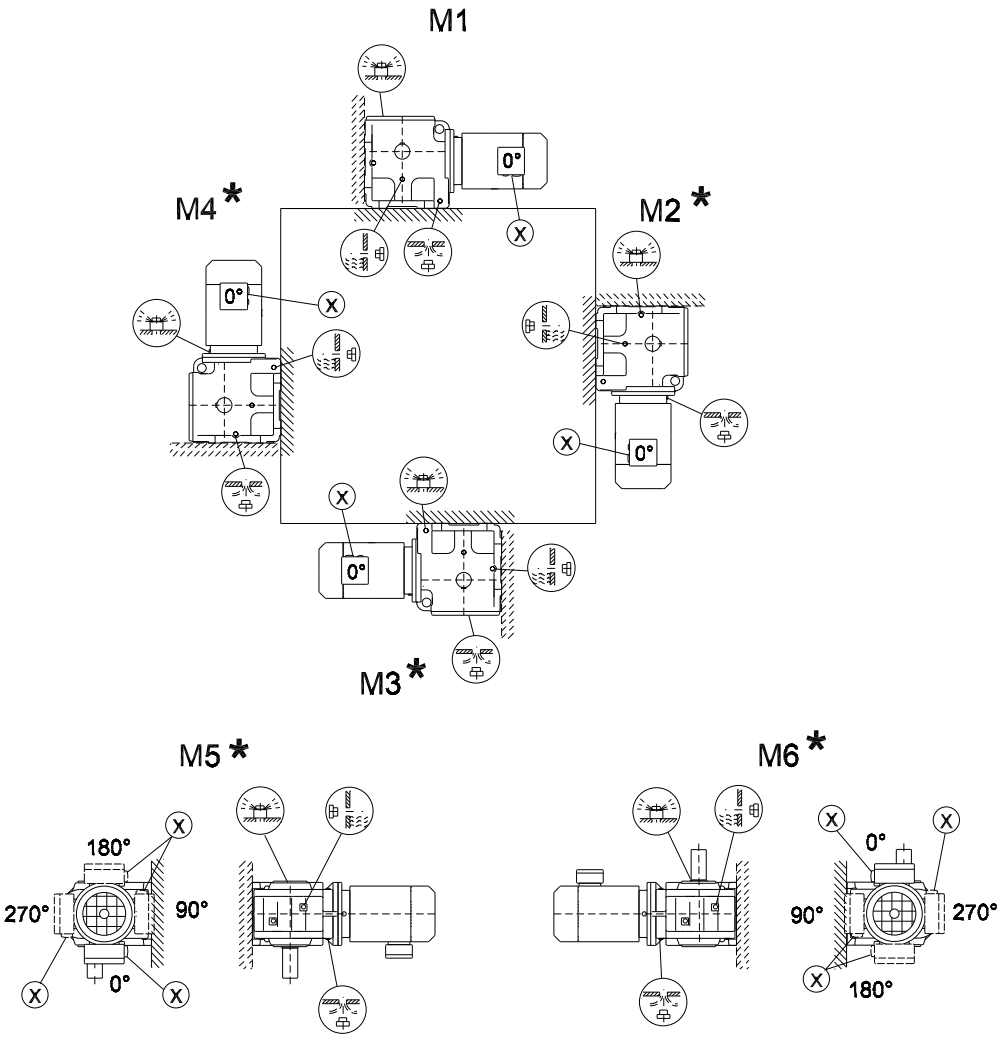


Important: See the information in the "Gearmotors" catalog, section "Project Planning for Gear Units/Overhung and axial loads."

S47 - S97

05 026 200



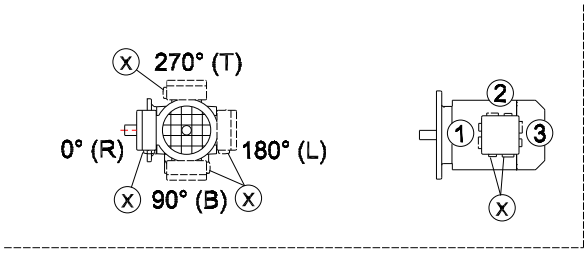


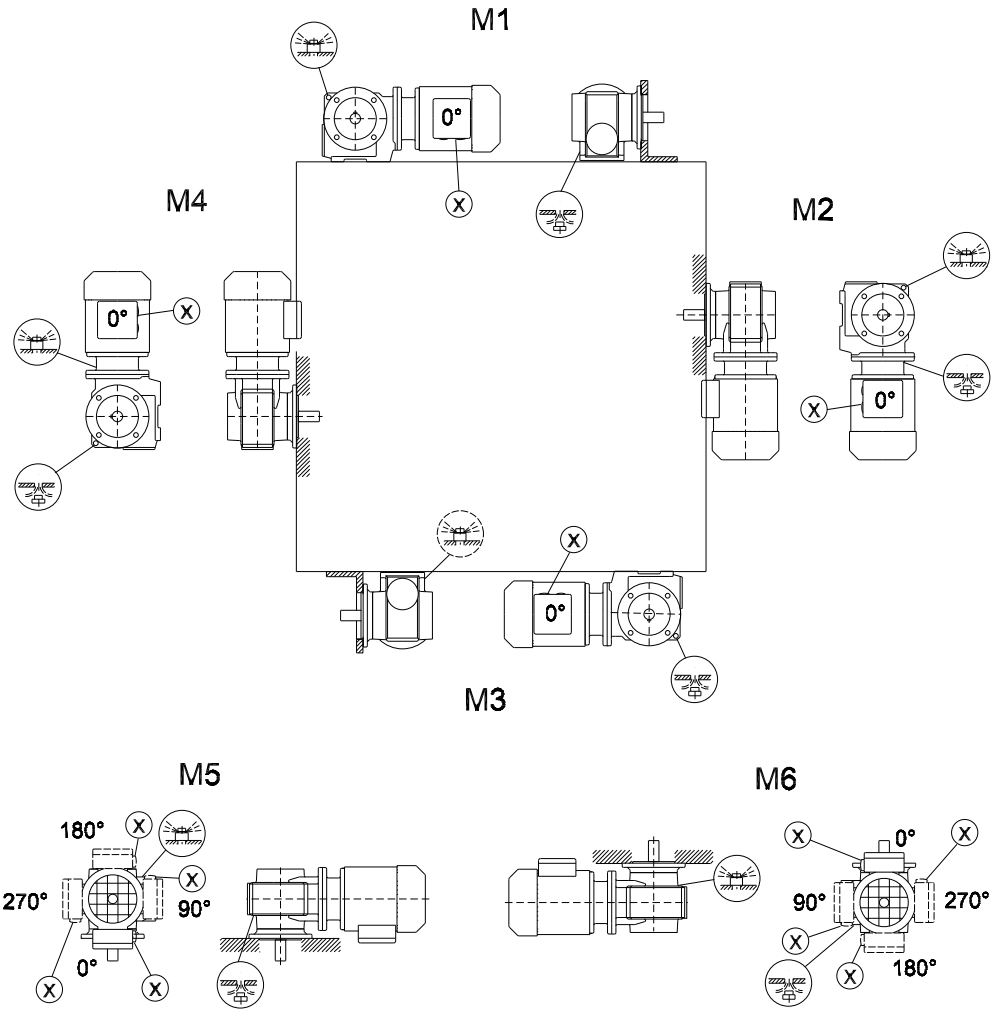
* → page 51

Important: See the ⓘ information in the "Gearmotors" catalog, section "Project Planning for Gear Units/Overhung and axial loads."

SF/SAF/SHF37

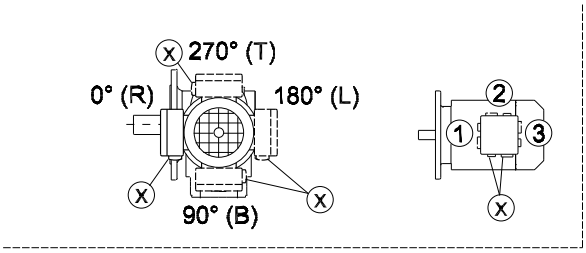
05 027 200

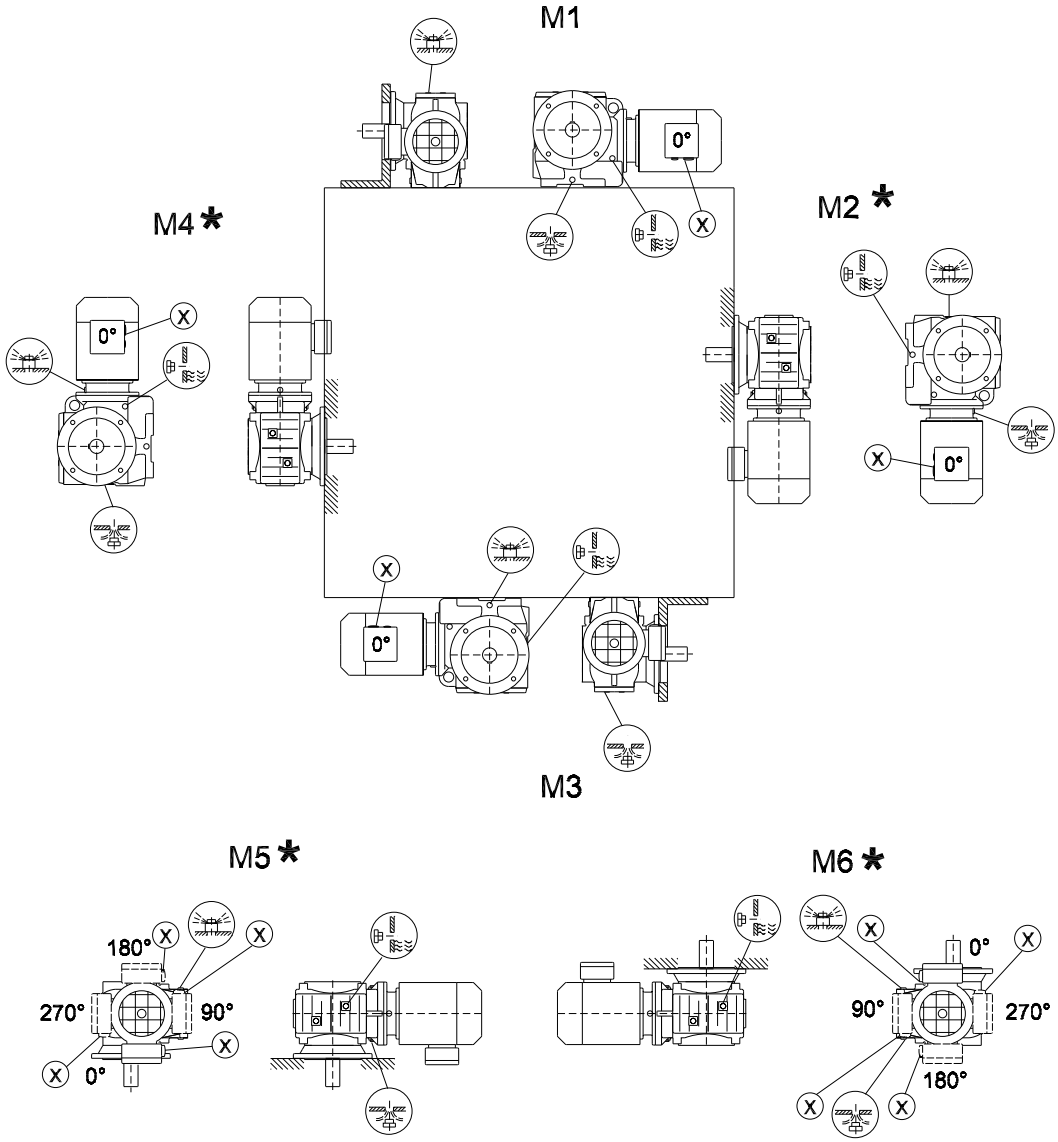




SF/SAF/SHF/SAZ/SHZ47-97

05 028 200

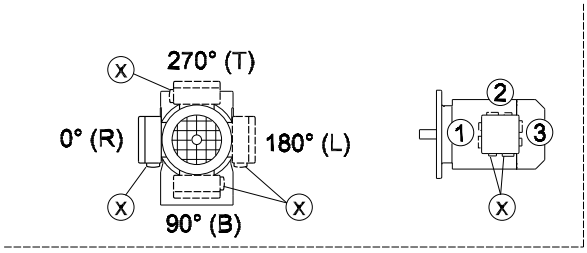


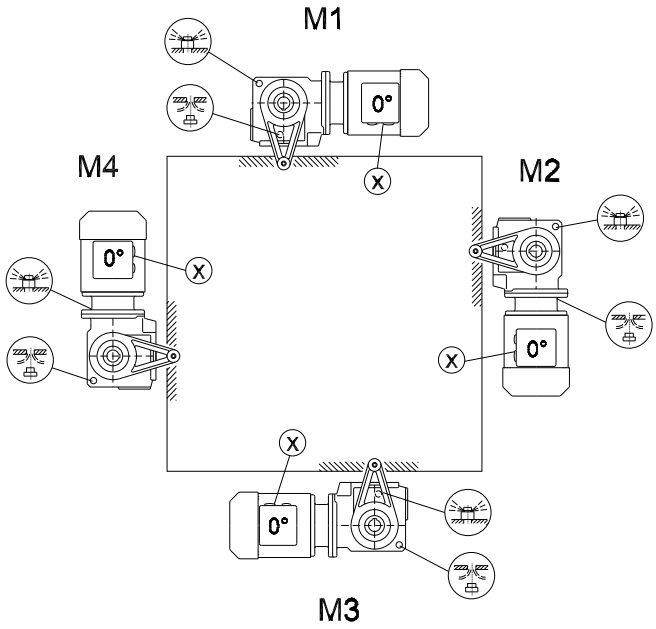


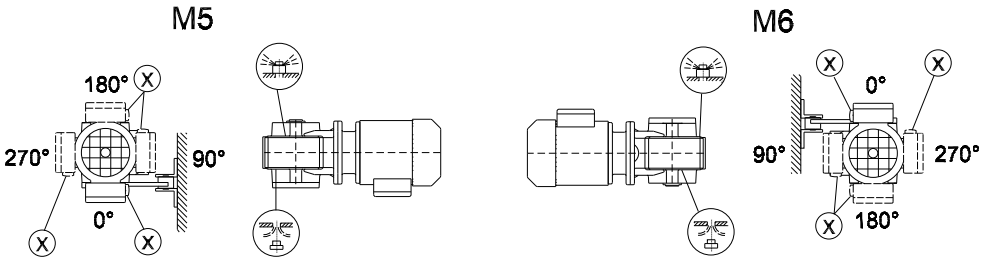
* → page 51

SA/SH/ST37

28 020 200

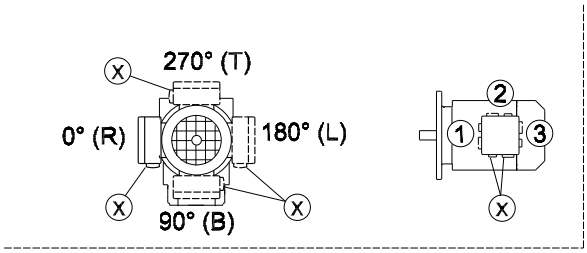


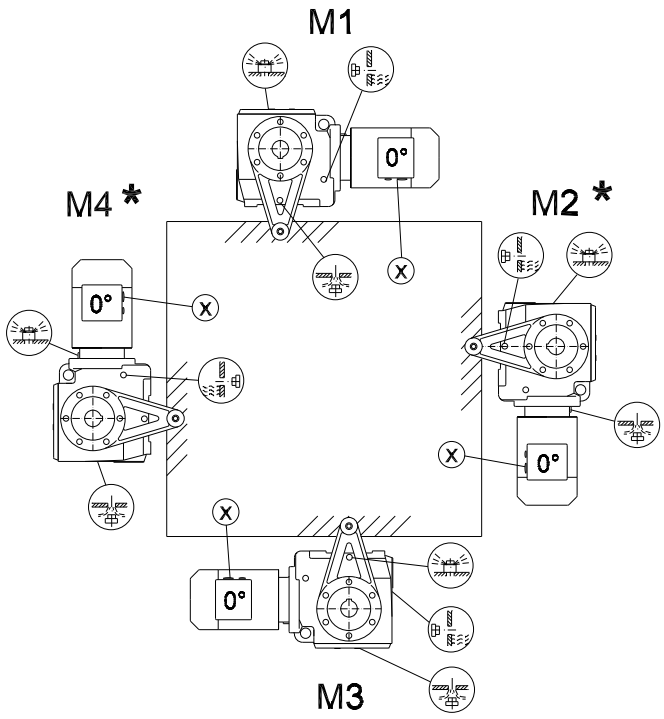


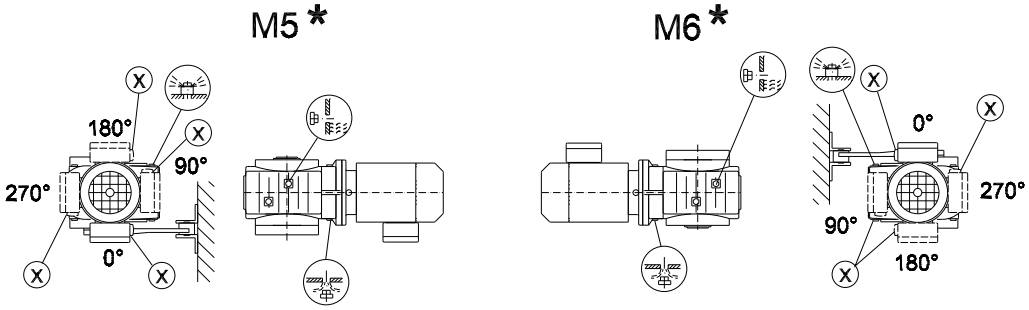


SA/SH/ST47-97

28 021 200







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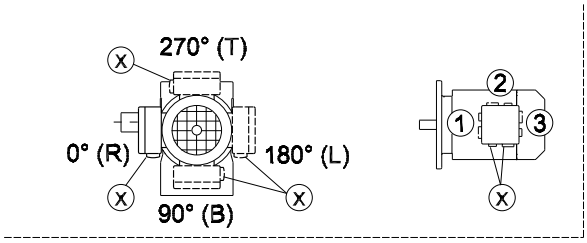
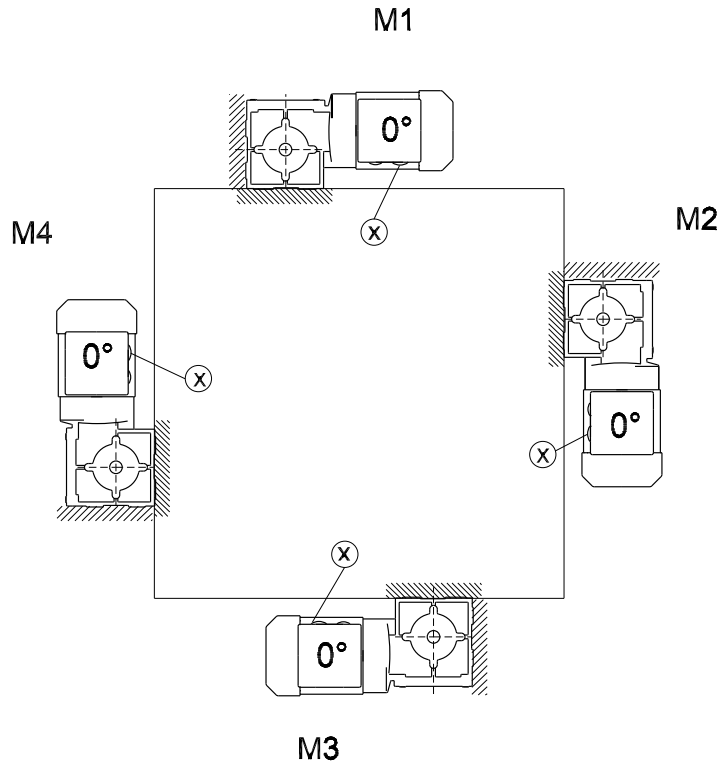
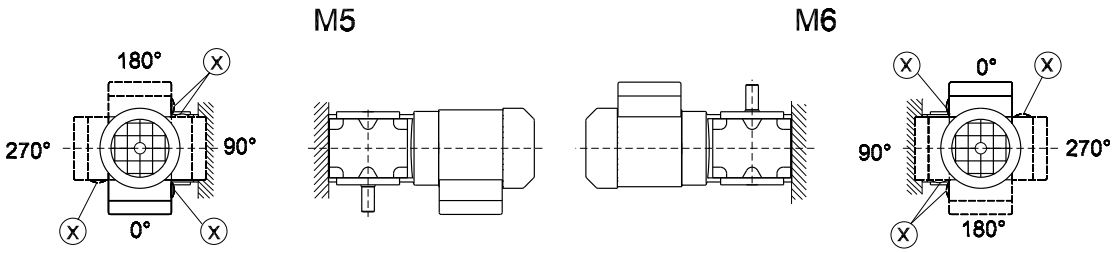
8.8 Mounting positions for SPIROPLAN® W gearmotors

W10-30

20 001 002

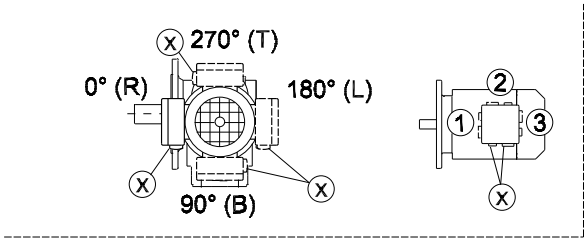


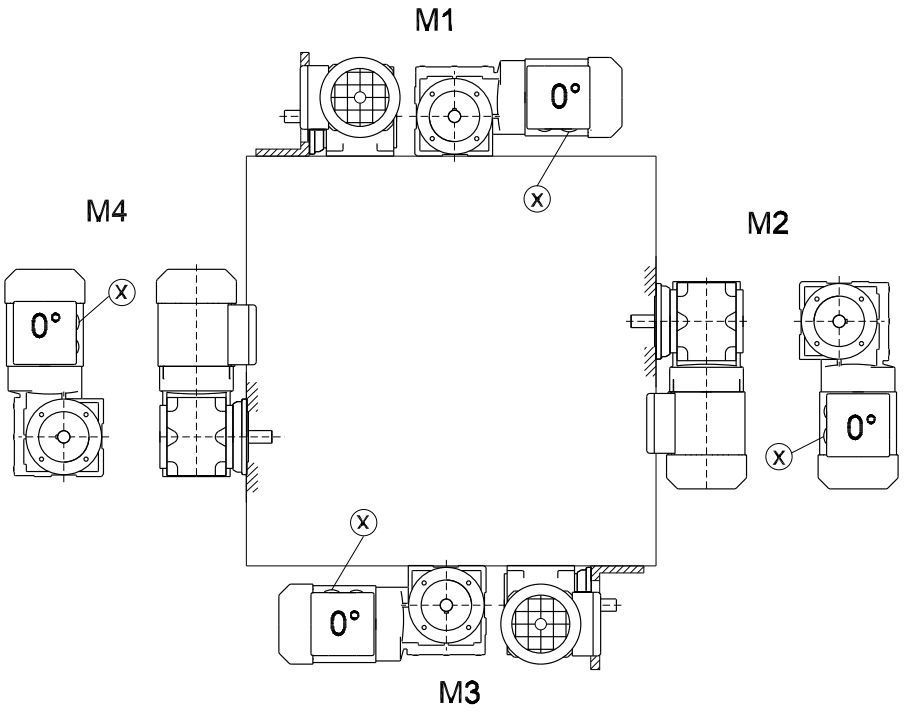


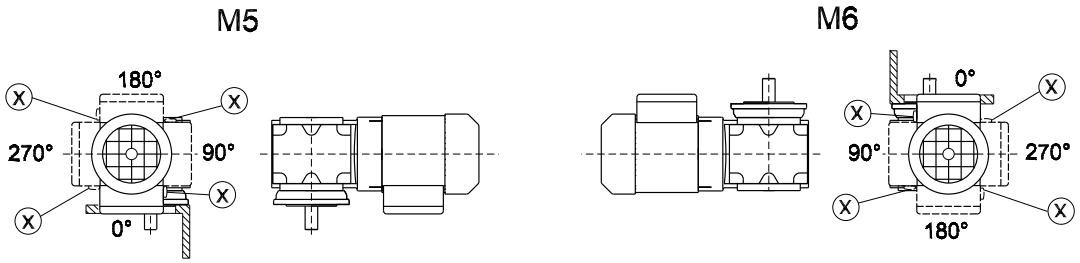


WF/WAF10-30

20 002 002

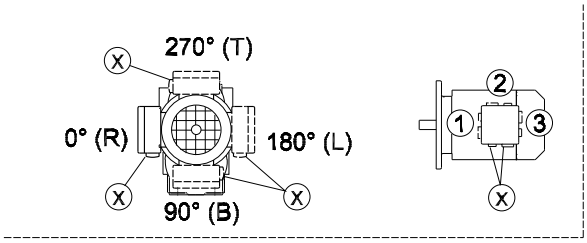


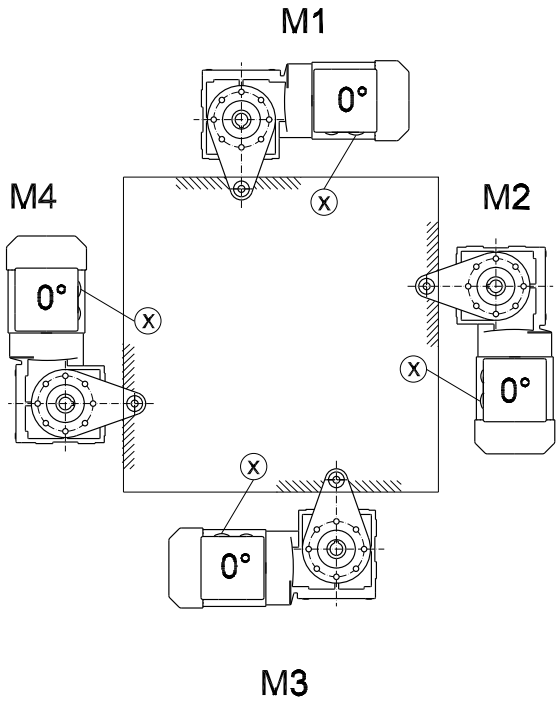


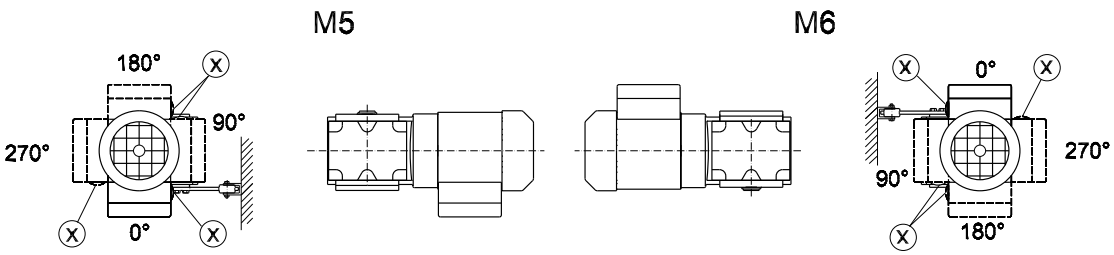


WA10-30

20 003 002







9 Lubricants

General information

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific 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).

9.1 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, NSF cerfitied H1)
CLP HC	= Synthetic hydrocarbons
E	= Ester oil (water hazard class 1 (German regulation))
HCE	= Synthetic hydrocarbons + ester oil (NSF certified H1)
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-Eurodrive
2)	Special lubricant for Spiroplan® gear units only
3)	SEW $f_B \geq 1.2$ required
4)	Pay attention to critical starting behavior at low temperatures!
5)	Ambient temperature
	Lubricant for the food industry (food grade 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	-20 °C ... +60°C	Mobil	Mobilux EP2
	-40 °C ... +60 °C	Mobil	Mobiltemp SHC 100
Anti-friction bearing in motor[1)2)]	-20 °C ... +80 °C	Esso	Polyrex EM
	+20 °C ... +100 °C	Klüber	Barrierta L55/2
	-40 °C ... +60 °C	Kyodo Yushi	Multemp SRL[3)]
Special greases for anti-friction bearings in gear units:			
	-35 °C ... +40 °C	Shell	Shell Cassida Grease EPS 2
	-25 °C ... +40 °C	Klüber	Klübersynth UH1 14-222
	-40 °C ... +40 °C	Klüber	Klüberbio M 72-82

1) The motor anti-friction bearings are covered on both sides and cannot be regreased.

2) Greases providing equivalent performance are acceptable

3) Recommended for continuous operation at ambient temperature below 0°C, example in a cold storage.

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 at gear unit output end): Fill the cavities between the rolling elements two thirds full with grease.

Lubricant table

01 805 09 92US

	5) °C	DIN (ISO)	ISO,NLGI	ExxonMobil	Shell	Klüber	ARAL	bp	Tribol	TEXACO	Optimol	FUCHS	TOTAL
R...	Standard -10 +40	CLP(CC)	VG 220	Mobilgear 600XP 220	Shell Omala 220	Klüberoil GEM 1-220 N	Aral Degol BG 220	BP Energol GR-XP 220	Tribol 1100/220	Meropa 220	Optigear BM 220	Renolin CLP 220	Carter EP 220
	-25 +80	CLP PG	VG 220	Mobil Glygoyle 30	Shell Tivela S 220	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220	Tribol 800/220	Synlube CLP 220	Optiflex A 220		Carter SY 220
K...(HK...)	4) -40 +80	CLP HC	VG 220	Mobil SHC 630	Shell Omala HD 220	Klübersynth GEM 4-220 N	Aral Degol PAS 220		Tribol 1510/220	Pinnacle EP 220	Optigear Synthetic A 220	Renolin Unisyn CLP 220	
	4) -40 +40		VG 150	Mobil SHC 629	Shell Omala HD 150	Klübersynth GEM 4-150 N				Pinnacle EP 150			Carter SH 150
F...	-20 +25	CLP (CC)	VG 150 VG 100	Mobilgear 600XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150	Carter EP 100
	-30 +10	HLP (HM)	VG 68-46 VG 32	Mobil D.T.E. 13M	Shell Tellus T 32	Klüberoil GEM 1-68 N	Aral Degol BG 46		Tribol 1100/68	Rando EP Ashless 46	Optigear 32	Renolin B 46 HVI	Equivis ZS 46
	4) -40 +10	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32				Cetus PAO 46			Dacnis SH 32
	4) -40 -20	HLP (HM)	VG 22 VG 15	Mobil D.T.E. 11M	Shell Tellus T 15	Isoflex MT 30 ROT		BP Energol HLP-HM 15		Rando HDZ 15			Equivis ZS 15
S...(HS...)	Standard 0 +40	CLP (CC)	VG 680	Mobilgear 600XP 680	Shell Omala 680	Klüberoil GEM 1-680 N	Aral Degol BG 680	BP Energol GR-XP 680	Tribol 1100/680	Meropa 680	Optigear BM 680	Renolin CLP 680	Carter EP 680
	-20 +60	CLP PG	VG 680 1)		Shell Tivela S 680	Klübersynth GH 6-680		BP Enersyn SG-XP 680	Tribol 800/680	Synlube CLP 680			
	4) -30 +80	CLP HC	VG 460	Mobil SHC 634	Shell Omala HD 460	Klübersynth GEM 4-460 N				Pinnacle EP 460			
	4) -40 +10		VG 150	Mobil SHC 629	Shell Omala HD 150	Klübersynth GEM 4-150 N				Pinnacle EP 150			Carter SH 150
	-20 +10	CLP (CC)	VG 150 VG 100	Mobilgear 600XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150	Carter EP 100
	-25 +20	CLP PG	VG 220 1)	Mobil Glygoyle 30	Shell Tivela S 220	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220	Tribol 800/220	Synlube CLP 220	Optiflex A 220		Carter SY 220
	4) -40 0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32				Cetus PAO 46			Dacnis SH 32
R...,K...(HK...), F...,S...(HS...)	Standard -20 +40	CLP PG	VG 460 1)			Klübersynth UH1 6-460							
	4) -30 +40	HCE	VG 460		Shell Cassida Fluid GL 460	Klüberoil 4UH1-460 N	Aral Eural Gear 460				Optileb GT 460		
	-20 +40	E	VG 460			Klüberbio CA2-460	Aral Degol BAB 460				Optisynt BS 460		
W...(HW...)	Standard -20 +40	SEW PG	VG 460 2)			Klüber SEW HT-460-5							
	4) -40 +10	API GL5	SAE 75W90 (~VG 100)	Mobilube SHC 75 W90-LS									
	-20 +40	CLP PG	VG 460 3)			Klübersynth UH1 6-460							

9.2 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

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	2.10	1.70	1.70
R67/R67F	1.10/2.30	2.60/3.50	2.80	3.20	1.80	2.00
R77/R77F	1.20/3.00	3.80/4.10	3.60	4.10	2.50	3.40
R87/R87F	2.30/6.0	6.7/8.2	7.2	7.7	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
Gear unit type RF.. / RM..	**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	2.00	1.70	1.70
RF/RM67	1.20/2.50	2.70/3.60	2.70	2.60	1.90	2.10
RF/RM77	1.20/2.60	3.80/4.10	3.30	4.10	2.40	3.00
RF/RM87	2.40/6.0	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	52.0	42.0	42.0
RF/RM167	26.0/70.0	82.0	78.0	88.0	65.0	71.0

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	2.60	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
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	2.40	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 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	0.65	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 type	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.., FHF.., FVF.., FAZ.., FHZ.., FVZ..:

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	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 type	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	1.20	2.30	2.50	2.80	2.60	2.40
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 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	2.20	1.60	1.60
KF57	1.30	2.30	2.70	3.15	2.90	2.70
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..:

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	2.15	1.60	1.60
K..57	1.30	2.30	2.70	3.15	2.90	2.70
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
KH167	33.0	95.0	105.0	123.0	85.0	84.0
KH187	53.0	152.0	167.0	200	143.0	143.0

Spiroplan® (W) gear units

The fill quantity of Spiroplan® gear units does not vary, irrespective of 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	.50	1.20	1.00/1.20	1.45	1.30	1.30
S67	1.00	2.00	2.20/3.10	3.10	2.60	2.60
S77	1.90	4.20	3.70/5.4	5.9	4.40	4.40
S87	3.30	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 larger 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	0.90/1.05	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.., 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	2.00	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.

10 Appendix

10.1 Index of changes

The following additions and changes have been made compared to the previous edition of the "Explosion-Proof Gear Units R..7, F..7, K..7, S..7, SPIROPLAN® W" (publication number: 1055520x, edition 11/2002) operating instructions:

General additions and corrections.

Mechanical installation

- Installing the gear unit: Data on flatness error
- Installing torque arms for mounted gear units: Data on retaining bolts
- Mounted gear units with shrink disks: Information on assembly / removal has been added
- Mounted gear units with TorqLOC®
- AM adapter coupling: Point A

Inspection and maintenance

- Lubricant change intervals

General

Manual adapted for US market.

11 Index

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		Jeff Robinson 17443 Harley Woods Drive Bowling Green, OH 43402	Tel. 419 823-0920 Fax 419 823-0950 jrobinson@seweurodrive.com
		Automotive Technical Sales Center 51183 West Pontiac Trail Wixom, MI 48393	Tel. 248 668-0404 Fax 248 668-9363
		District Sales Representative L.H. Flaherty Company Larry Flaherty / Denny Duimstra 1577 Jefferson, S.E. Grand Rapids, MI 49507	Tel. 616 245-9266 / 800 878-0081 Fax 616 241-0954
	Minnesota	Andy Semelis 154 147th Street Deer Park, WI 54007	Tel. 715 248-4892 Fax 715 248-7890 asemelis@seweurodrive.com
	Mississippi	Sheldon Anderson 4949 Stumberg Lane #117 Baton Rouge, LA 70816	Tel. 225 223-6440 Fax 225 223-6447 sanderson@seweurodrive.com
		Russell Mook 2501 Golden Pond Lane Spring Hill, TN 37174	Tel. 931 486-3242 Fax 931 486-1281 rmook@seweurodrive.com
	Missouri	Gregory R. Tucker 3618 Coffee Tree Court St. Louis, MO 63129	Tel. 314 845-6128 Fax 314 845-6129 Mobile 314 973-7060 gtucker@seweurodrive.com
		Greg White 7634 Bell Road Shawnee, KS 66217	Tel. 913 310-0399 Fax 913 310-0323 gwhite@seweurodrive.com

USA			
District Sales Offices (Cont.)	**Montana**	Duwayne Hogan 3622 Hillcrest Drive Coeur d'Alene, ID 83815	Tel. 208 667-0414 dhogan@seweurodrive.com
	Nebraska	Mike Marksbury 3510 Lindenwood Street Sioux City, IA 51104	Tel. 712 255-3662 Fax 712 258-9299 mmarksbury@seweurodrive.com
	Nevada	Rick A. Burdick 3942 Canyon Terrace Yorba Linda, CA 92886	Tel./Fax 714 970-6197 rburdick@seweurodrive.com
		Michael Haskins 7750 Chisamore Ranch Lane Vacaville, CA 95688	Tel./Fax 707 453-1550 mhaskins@seweurodrive.com
	New Hampshire	Kevin Molloy 84 Pear Tree Lane Newmarket, NH 03857	Tel. 603 659-3361 Fax 603 659-3365 kmolloy@seweurodrive.com
	New Jersey	Edward McLaughlin 7 Ridgeview Lane Port Jervis, NY 12771	Tel. 845 856-8811 Fax 845 856-8844 emclaughlin@seweurodrive.com
		Edward Tucker 806 Front Street Glendora, NJ 08029	Tel. 856 939-2535 Fax 856 939 2114 etucker@seweurodrive.com
	New Mexico	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. 510 487-3560 Fax 510 487-6381 cshayward@seweurodrive.com
	New York	Art Conner 6273 Pine Cone Ct. Clarence Center, NY 14032	Tel. 716 741-7728 Fax 716 568-8441 aconner@seweurodrive.com
		Richard Maggio 38 Roe Street Melville, NY 11747	Tel. 631 549-8750 Fax 631 351-0872 rmaggio@seweurodrive.com
		Edward McLaughlin 7 Ridgeview Lane Port Jervis, NY 12771	Tel. 845 856-8811 Fax 845 856-8844 emclaughlin@seweurodrive.com
		Peter T. Schmitt 4627 Slippery Rock Manlius, NY 13104	Tel. 315 682-5369 Fax 315 682-3556 pschmitt@seweurodrive.com
	North Carolina	Brent Craft 4004 Smithfield Road Greensboro, NC 27406	Tel. 336 674-5361 Tax 336 674-1290 bcraft@seweurodrive.com
		Jack F. Jung 117 N. Brackenbury Lane Charlotte, NC 28270	Tel. 704 362-2674 Fax 704 362-2961 jjung@seweurodrive.com
	North Dakota	Mike Marksbury 3510 Lindenwood Street Sioux City, IA 51104	Tel. 712 255-3662 Fax 712 258-9299 mmarksbury@seweurodrive.com
	Ohio	Lowell Bishop 4080 Bayberry Court Columbus, OH 43220	Tel. 614 538-0880 Fax 614 538-0889 lbishop@seweurodrive.com
		Guy Borchers 82 Countryside Drive N. Troy, OH 45373	Tel. 937 339-1333 Fax 937 339-1140 gborchers@seweurodrive.com
		John Herstine 248 Plain Street PO Box 82 Magnolia, OH 44643	Tel. 330 866-2544 Fax 330 886-2553 jherstine@seweurodrive.com
		Mike Kushman 20610 Sugar Ridge Lane Lawrenceburg, IN 47025	Tel. 812 537-9318 Fax 812 537-4268 mkushman@seweurodrive.com

USA			
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	Oklahoma	Louis Brankel 3301 S. 139th E. Avenue Tulsa, OK 74134	Tel. 918 437-4370 Fax 918 437-4390 lbrankel@seweurodrive.com
	Oregon	Michael S. Johnson 15804 N.E. 160 Ct. Brush Prairie, WA 98606	Tel./Fax 360 256-1785 mjohnson@seweurodrive.com
	Pennsylvania	Scott Bansky 1213 Milton Street Pittsburgh, PA 15218	Tel. 412 243-9040 Fax 412 243-9041 sbansky@seweurodrive.com
		Mark Betzer 17 West Main Street Canton, PA 17724	Tel. 570 673-3443 Fax 570 673-3552 mbetzer@seweurodrive.com
		Paul E. Decker 245 Washington Street Red Hill, PA 18076	Tel. 215 679-5638 Fax 215 679-6281 pdecker@seweurodrive.com
		John Shoop 4 Crestview Court Milton, PA 17847	Tel. 570 713-1593 Fax 570 713-1595 jshoop@seweurodrive.com
	Rhode Island	Kevin Molloy 84 Pear Tree Lane Newmarket, NH 03857	Tel. 603 659-3361 Fax 603 659-3365 kmolloy@seweurodrive.com
	South Carolina	Bill Kinard 20 Wrenwood Court Greer, SC 29651	Tel. 864 288-2725 Fax 864 288-3573 bkinard@seweurodrive.com
	South Dakota	Mike Marksbury 3510 Lindenwood Street Sioux City, IA 51104	Tel. 712 255-3662 Fax 712 258-9299 mmarksbury@seweurodrive.com
	Tennessee	Russell Mook 2501 Golden Pond Lane Spring Hill, TN 37174	Tel. 931 486-3242 Fax 931 486-1281 rmook@seweurodrive.com
	Texas	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. 510 487-3560 Fax 510 487-6381 cshayward@seweurodrive.com
		John Hill 956 Benchmark Trail Belton, TX 76513	Tel. 254 939-0033 Fax 254 939-0040 jhill@seweurodrive.com
		Ed Lockett 1402 Trails Edge Drive Conway, AR 72032	Tel. 501 336-8620 Fax 501 327-8579 elockett@seweurodrive.com
		Kyle M. Sandy 3804 Southwestern Blvd. Dallas, TX 75225	Tel. 214 696-5595 Fax 214 696-0242 ksandy@seweurodrive.com
		Stewart Sappington 13519 Fawcett Houston, TX 77069	Tel. 281 893-2377 Fax 281 893-1554 ssappington@seweurodrive.com
		Mike Stewart 2903 Shadwell Lane Mesquite, TX 75149	Tel. 972 289-7996 Fax 972 288-3549 mstewart@seweurodrive.com
	Utah	Steven Jacobson 5520 S. 225 E. Ogden, UT 84405	Tel. 801 612-9558 Fax 801 612-9561 sjacobson@seweurodrive.com
	Vermont	Kevin Molloy 84 Pear Tree Lane Newmarket, NH 03857	Tel. 603 659-3361 Fax 603 659-3365 kmolloy@seweurodrive.com

USA			
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		Mike Nojaim 13606 Winterberry Ridge Road Midlothian, VA 23112	Tel. 804 744-2179 Fax 757 282-5800 mnojaim@seweurodrive.com
		Edward Tucker 806 Front Street Glendora, NJ 08029	Tel. 856 939-2535 Fax 856 939 2114 etucker@seweurodrive.com
	Washington	William A. Aschenbrenner 4132 B Place N.W. Suite 200 Auburn, WA 98001	Tel. 253 333-8517 Fax 253 333-8518 baschenbrenner@seweurodrive.com
		Duwayne Hogan 3622 Hillcrest Drive Coeur d'Alene, ID 83815	Tel. 208 667-0414 dhogan@seweurodrive.com
		Michael S. Johnson 15804 N.E. 160 Ct. Brush Prairie, WA 98606	Tel./Fax 360 256-1785 mjohnson@seweurodrive.com
	West Virginia	Lowell Bishop 4080 Bayberry Court Columbus, OH 43220	Tel. 614 538-0880 Fax 614 538-0889 lbishop@seweurodrive.com
		Todd Bauer 35 Kenwood Drive Verona, VA 24482	Tel. 540 248-2420 Fax 540 248-2430 tbauer@seweurodrive.com
		John Herstine 248 Plain Street PO Box 82 Magnolia, OH 44643	Tel. 330 866-2544 Fax 330 886-2553 jherstine@seweurodrive.com
	Wisconsin	Frank Carr 1171 W. Cecil Street Neenah, WI 54956	Tel. 920 751-3871 Fax 920 751-0107 fcarr@seweurodrive.com
		John Hohnstein 10505 Hawks Haven Road Cedar Rapids, IA 52411	Tel. 319 378-1642 Fax 319 378-5585 jhohnstein@seweurodrive.com
		Andy Semelis 154 147th Street Deer Park, WI 54007	Tel. 715 248-4892 Fax 715 248-7890 asemelis@seweurodrive.com
		Walter Sturgeon 17065 El Dorado Drive Brookfield, WI 53005	Tel. 262 790-9715 Fax 262 790-9716 Mobile 414 418-9993 wsturgeon@seweurodrive.com
	Wyoming	Robert Stevenson 604 Alpine Road Dillon, CO 80435	Tel./Fax 970 513-4482 rstevenson@seweurodrive.com
		Steven Jacobson 5520 S. 225 E. Ogden, UT 84405	Tel. 801 612-9558 Fax 801 612-9561 sjacobson@seweurodrive.com
		Duwayne Hogan 3622 Hillcrest Drive Coeur d'Alene, ID 83815	Tel. 208 667-0414 dhogan@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

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 Competence 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

Germany			
	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 Dänkritzer 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**	**Haguenau**	SEW-USOCOME 48-54, route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.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 Zaghnoun 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

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 RybalkoStr. 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

Brazil			
Production **Sales** **Service**	**Sao Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 50 Caixa Postal: 201-07111-970 Guarulhos/SP - Cep.: 07251-250	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 P. R. China	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 P. R. China	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 P. R. China	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@net.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 Libreville	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			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 2 7960477 + 79604654 Fax +852 2 7959129 contact@sew-eurodrive.hk

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 office@sew-eurodrive.hu

India			
Assembly **Sales** **Service**	**Baroda**	SEW-EURODRIVE India Pvt. Ltd. Plot No. 4, Gidc Por Ramangamdi • Baroda - 391 243 Gujarat	Tel. +91 265 2831086 Fax +91 265 2831087 http://www.seweurodriveindia.com mdoffice@seweurodriveindia.com

Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 office@liraz-handasa.co.il

Italy			
Assembly **Sales** **Service**	**Milano**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Ste industrielle et commerciale pour l'Afrique 165, Bld de Marseille B.P. 2323, Abidjan 08	Tel. +225 2579-44 Fax +225 2584-36

Japan			
Assembly **Sales** **Service**	**Iwata**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp

Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master@sew-korea.co.kr
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 7139253 Fax +371 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 4947-86 +961 1 4982-72 +961 3 2745-39 Fax +961 1 4949-71 gacar@beirut.com

Lithuania			
Sales	**Alytus**	UAB Irseva Naujoji 19 LT-62175 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brüssel**	CARON-VECTOR S.A. Avenue Eiffel 5 B-1300 Wavre	Tel. +32 10 231-311 Fax +32 10 231-336 http://www.sew-eurodrive.lu info@caron-vector.be

Malaysia			
Assembly **Sales** **Service**	**Johore**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my

Mexico			
Assembly **Sales** **Service**	**Queretaro**	SEW-EURODRIVE MEXIKO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Queretaro C.P. 76220 Queretaro, Mexico	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	Afit 5, rue Emir Abdelkader MA 20300 Casablanca	Tel. +212 22618372 Fax +212 22618351 ali.alami@premium.net.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 241-020 Fax +47 69 241-040 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 67710-90 Fax +48 42 67710-99 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucureşti**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 849 47-70 Fax +221 849 47-71 senemeca@sentoo.sn

Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 dipar@yubc.net

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-83554 Bratislava	Tel. +421 2 49595201 Fax +421 2 49595200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. ul. Vojtecha Spanyola 33 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-97411 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za dross@sew.co.za
	Capetown	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 dswanepoel@sew.co.za

South Africa			
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaceo Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 dtait@sew.co.za

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442-00 Fax +46 36 3442-80 http://www.sew-eurodrive.se info@sew-eurodrive.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chonburi**	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service 5, Rue El Houdaibiah 1000 Tunis	Tel. +216 71 4340-64 + 71 4320-29 Fax +216 71 4329-76 tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 164 3838014/15 Fax +90 216 3055867 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

Ukraine			
Sales **Service**	**Dnepropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

USA			
Production **Assembly** **Sales** **Service**	**Greenville**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manuf. +1 864 439-9948 Fax Ass. +1 864 439-0566 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. +1 510 487-3560 Fax +1 510 487-6381 cshayward@seweurodrive.com

USA			
	Philadelphia/PA	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Dayton	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 440-3799 cstroy@seweurodrive.com
	Dallas	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 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. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net

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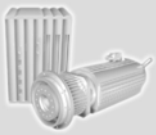

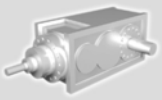

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