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SEW EURODRIVE

Assembly and Operating Instructions



User-friendly documentation
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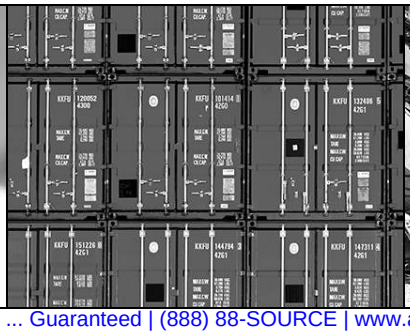
Gear Units
R..7, F..7, K..7, K..9, S..7, SPIROPLAN® W

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1 General Information

1.1 How to use this documentation

The documentation is an integral part of the product and contains important information on operation and service. The documentation is written for all employees who assemble, install, start up, and service this product.

The documentation must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

The following table shows the graduation and meaning of the signal words for safety notes, warnings regarding potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
⚠ **DANGER!**	Imminent hazard	Severe or fatal injuries
⚠ **WARNING!**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION!**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
NOTE	Useful information or tip: Simplifies handling of the drive system.	

1.2.2 Design of the section-related safety notes

Section-related safety notes do not apply to a specific action, but to several actions pertaining to one subject. The symbols used either indicate a general hazard or a specific hazard.

This is the formal structure of a safety note for a specific section:



⚠ SIGNAL WORD!

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.

1.2.3 Design of the embedded safety notes

Embedded safety notes are directly integrated into the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- ⚠ **SIGNAL WORD!** Type and source of hazard.

  Possible consequence(s) if disregarded.

  – Measure(s) to prevent the hazard.

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1.3 Rights to claim under warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Therefore read the documentation before you start working with the unit.

1.4 Content of the documentation

This document contains additional safety-related information and conditions for operation in safety-related applications.

1.5 Exclusion of liability

You must comply with the information contained in this documentation to ensure safe operation and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

1.6 Product names and trademarks

All product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.7 Copyright

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2 Safety Notes

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

2.1 Preliminary information

The following safety notes are primarily concerned with the use of the following components: Gear unit series R..7, F..7, K..7, K..9, S..7, SPIROPLAN® W. If you are using gearmotors, you must also observe the safety notes for motors in the corresponding operating instructions.

Also observe the supplementary safety notes in the individual sections of this documentation.

2.2 General information



⚠ WARNING

Danger of fatal injury or risk of injury during the operation of motors or gearmotors caused by live, bare (in the event of open connectors/terminal boxes) and movable or rotating parts.

Risk of burns caused by hot surfaces

Severe or fatal injuries

- All work related to transport, storage, installation, assembly, connection, startup, maintenance and repair may only be carried out by qualified personnel.
- For transport, storage, installation, assembly, connection, startup, maintenance and repair it is important that you adhere to the information in the following documents:
  - Warning and safety signs on the motor/gearmotor
  - All the project planning documents, startup instructions and wiring diagrams related to the drive
  - System-specific regulations and requirements
  - National/regional regulations governing the safety and prevention of accidents
- Never install damaged products.
- Never operate or energize the unit without the necessary protection covers or housing.
- Use the unit only for its intended purpose.
- Make sure the unit is installed and operated properly.



INFORMATION

In the event of damage caused by transport, submit a complaint to the shipping company immediately.

This documentation provides additional information.

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2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting and servicing of the product who possess the following qualifications:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

Any electronic work may only be performed by adequately qualified electricians. Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting and servicing of the product who possess the following qualifications:

- Training in electrical engineering, e.g. as an electrician, electronics or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

All work in further areas of transportation, storage, operation and waste disposal must only be carried out by persons who are trained appropriately.

All qualified personnel must wear appropriate protective clothing.

2.4 Designated use

The gear unit series R..7, F..7, K..7, K..9, S..7, SPIROPLAN® W is intended for use in industrial systems.

The gear units may only be used according to the specifications in the technical documentation from SEW-EURODRIVE as well as the specifications on the nameplate. They fulfill the applicable standards and regulations.

When installed in machines, startup (i.e. start of designated operation) is prohibited until it is determined that the machine complies with the local laws and directives. In the individual area of application, you must especially observe the Machinery Directive 2006/42/EC as well as the EMC Directive 2004/108/EC. The EMC test specifications EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-6 and EN 61000-6-2 form the basis for this.

Use in potentially explosive atmospheres is prohibited unless specifically designated otherwise.

2.5 Other applicable documentation

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

- "DR.71 – 225, 315 AC Motors" operating instructions for gearmotors
- Operating instructions of any attached options
- "Gear Units" catalog or
- "Gearmotors" catalog

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2.6 Transport/storage

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

Tighten the eyebolts securely. They are designed to carry only the weight of the motor/gearmotor; do not attach any additional loads.

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

Use suitable, sufficiently rated handling equipment if required. Reattach these in the case of further transportation.

Store the motor/gearmotor in a dry, dust-free environment if it is not to be installed straight away. You must not store the motor/gearmotor outdoors or on the fan guard. The motor/gearmotor can be stored for up to 9 months without requiring any special measures before startup.

2.7 Setup



NOTICE

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

Risk of injuries and damage to property.

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

Observe the notes in the "Mechanical Installation" section.

2.8 Startup/operation

Check the oil level before startup as described in chapter Inspection/Maintenance (page 85).

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

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

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

2.9 Inspection/maintenance

Observe the notes in chapter "Inspection/Maintenance".

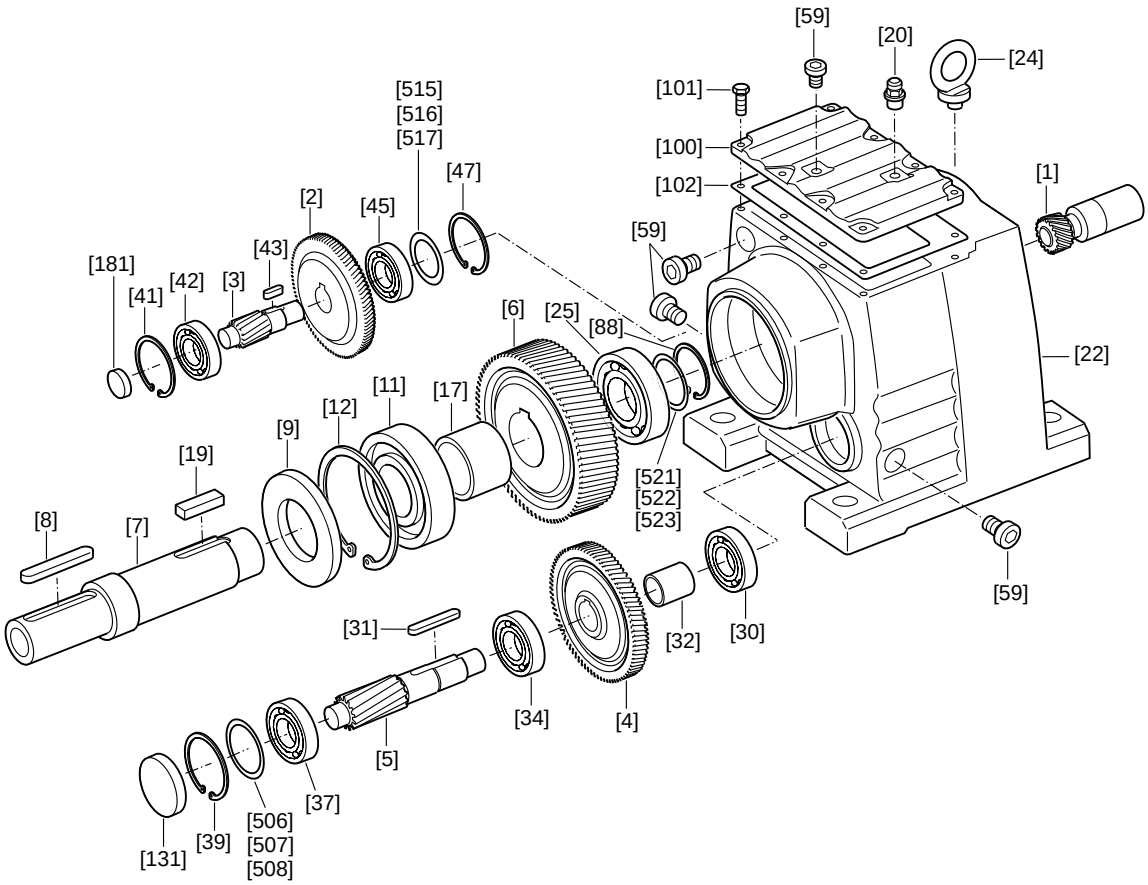
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3 Gear Unit Structure

INFORMATION

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

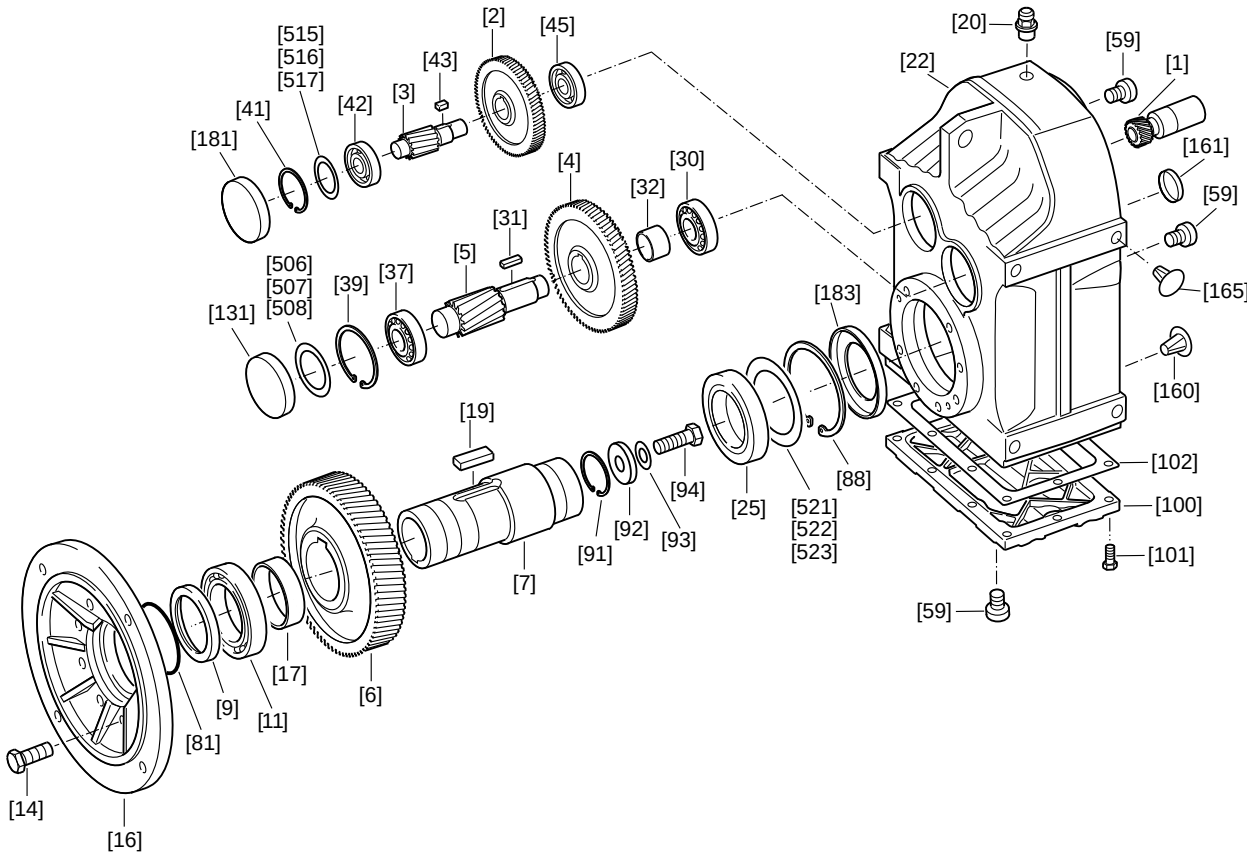


19194251

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

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3.2 Basic structure of parallel-shaft helical gear units

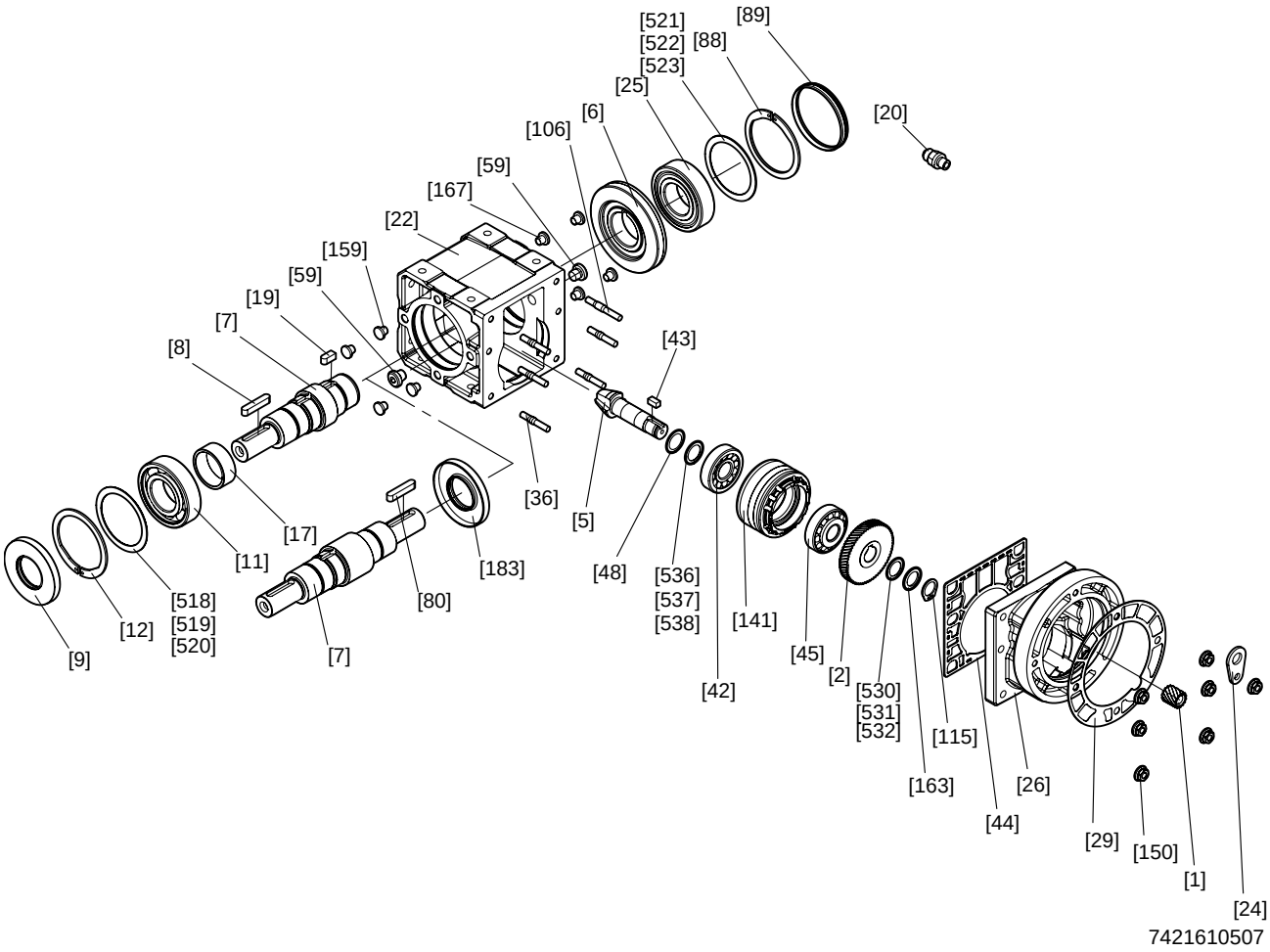


19298059

[1]	Pinion	[22]	Gear unit housing	[91]	Retaining ring	[506]	Shim
[2]	Gear	[25]	Rolling bearing	[92]	Washer	[507]	Shim
[3]	Pinion shaft	[30]	Rolling bearing	[93]	Lock washer	[508]	Shim
[4]	Gear	[31]	Key	[94]	Hex head screw	[515]	Shim
[5]	Pinion shaft	[32]	Spacer tube	[100]	Inspection cover	[516]	Shim
[6]	Gear	[37]	Rolling bearing	[101]	Hex head screw	[517]	Shim
[7]	Hollow shaft	[39]	Retaining ring	[102]	Gasket	[521]	Shim
[9]	Oil seal	[41]	Retaining ring	[131]	Closing cap	[522]	Shim
[11]	Rolling bearing bearing	[42]	Rolling bearing	[160]	Closing plug	[523]	Shim
[14]	Hex head screw	[43]	Key	[161]	Closing cap		
[16]	Output flange	[45]	Rolling bearing	[165]	Closing plug		
[17]	Spacer tube	[59]	Screw plug	[181]	Closing cap		
[19]	Key	[81]	Shield ring	[183]	Oil seal		
[20]	Breather valve	[88]	Retaining ring				

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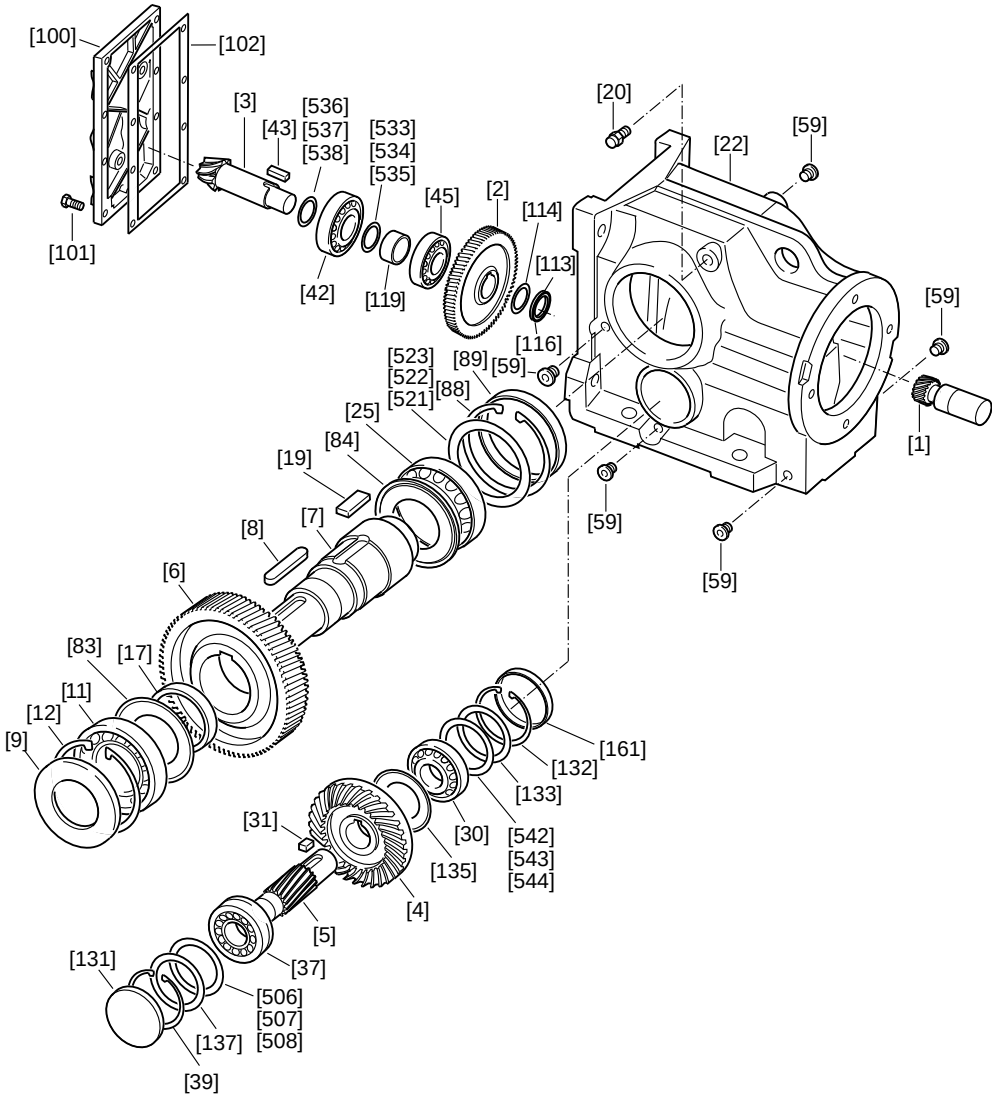
3.3 Basic structure of helical-bevel gear units K..9



[1]	Pinion	[24]	Eyebolt	[80]	Key	[520]	Shim
[2]	Gear	[25]	Deep groove ball bearing	[88]	Retaining ring	[521]	Shim
[5]	Pinion shaft	[26]	Housing stage 1	[89]	Closing cap	[522]	Shim
[6]	Gear	[29]	Gasket	[106]	Stud	[523]	Shim
[7]	Output shaft	[36]	Stud	[115]	Retaining ring	[530]	Shim
[8]	Key	[42]	Tapered roller bearing	[141]	Bushing	[531]	Shim
[9]	Oil seal	[43]	Key	[150]	Hex nut	[532]	Shim
[11]	Deep groove ball bearing	[44]	Gasket	[159]	Closing plug	[536]	Shim
[12]	Retaining ring	[45]	Tapered roller bearing	[163]	Supporting ring	[537]	Shim
[17]	Spacer tube	[48]	Supporting ring (only K..29)	[167]	Closing plug	[538]	Shim
[19]	Key	[59]	Screw plug	[183]	Oil seal		
[20]	Breather valve	[62]	Screw plug	[518]	Shim		
[22]	Gear unit housing	[63]	Thread reduction	[519]	Shim		

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3.4 Basic structure of helical-bevel gear units K..37 – K..187

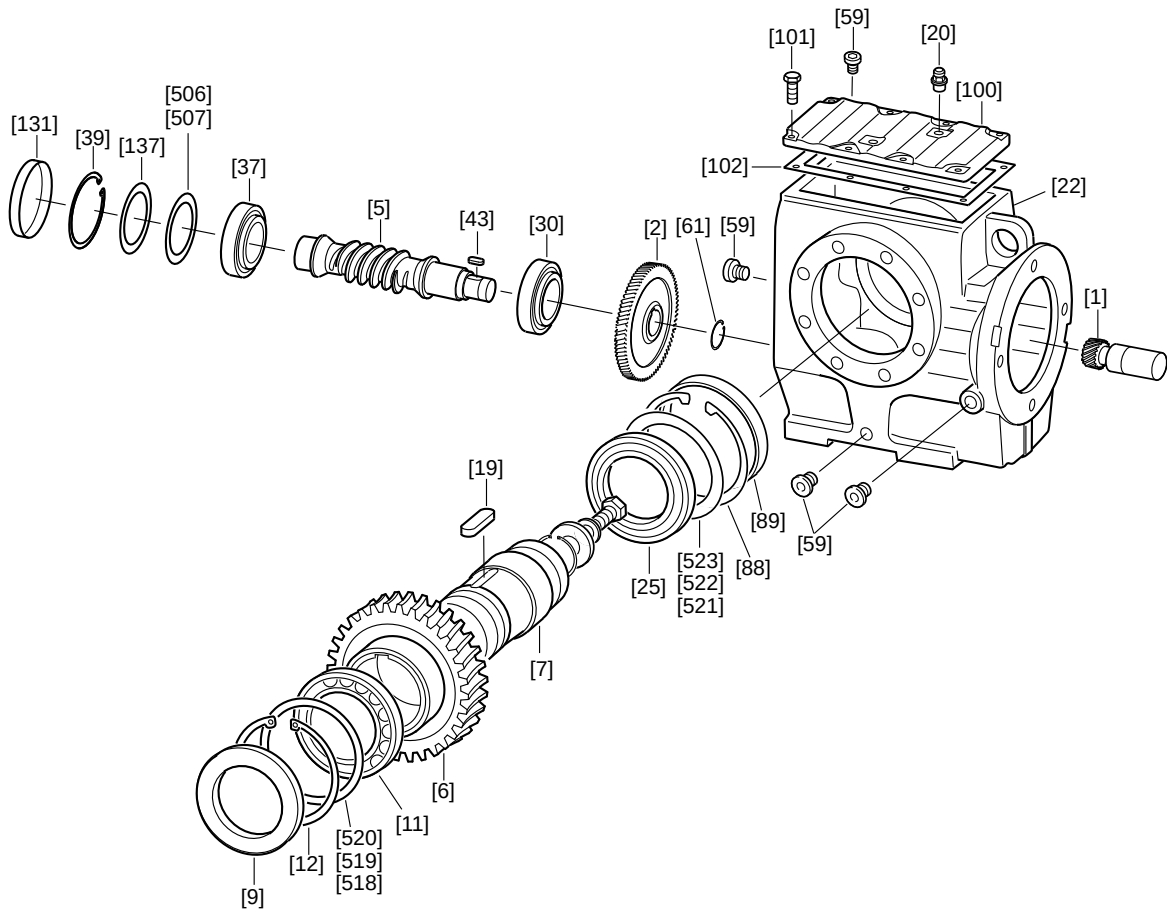


19301131

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

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3.5 Basic structure of helical-worm gear units

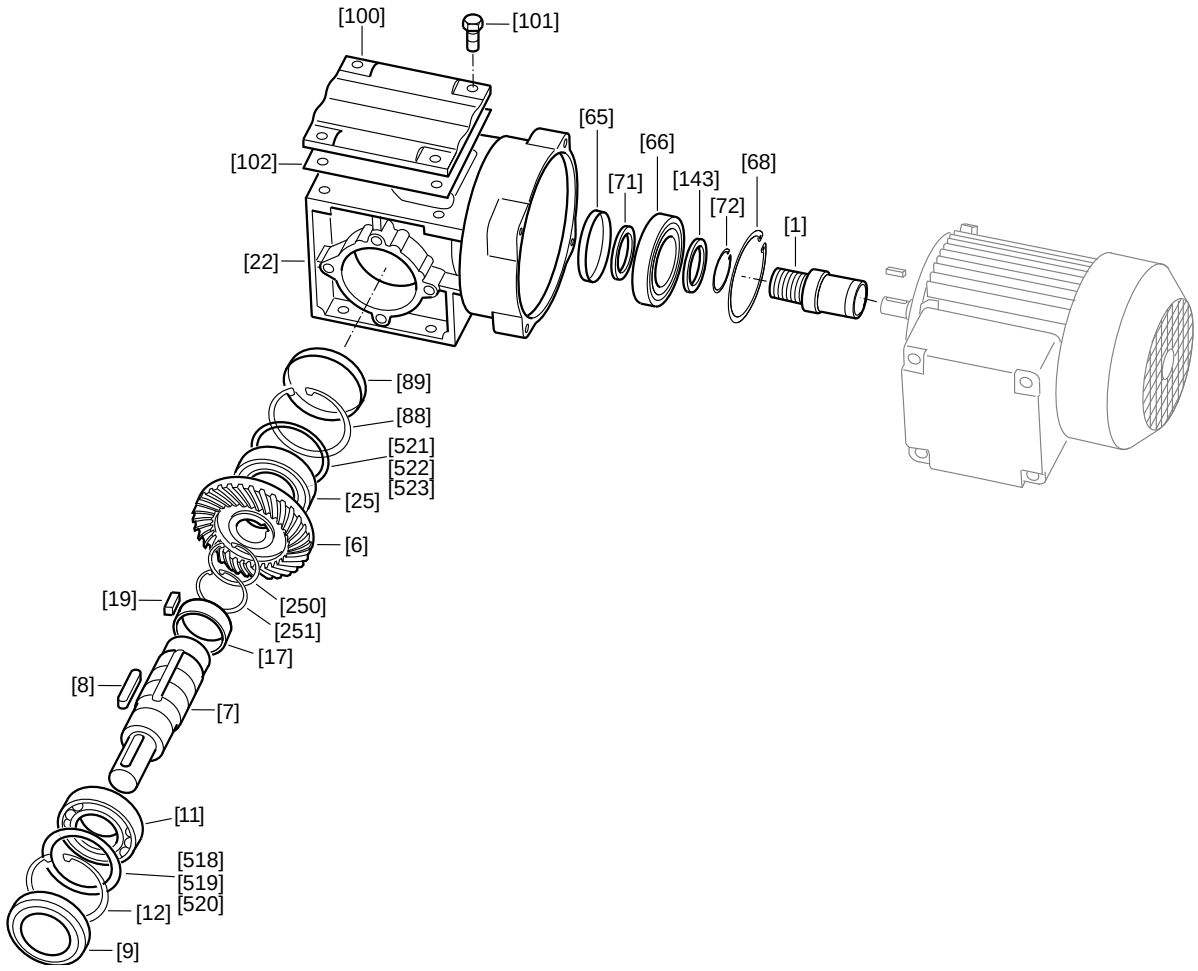


19304203

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

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3.6 Basic structure of SPIROPLAN® gear units W..10 – W..30

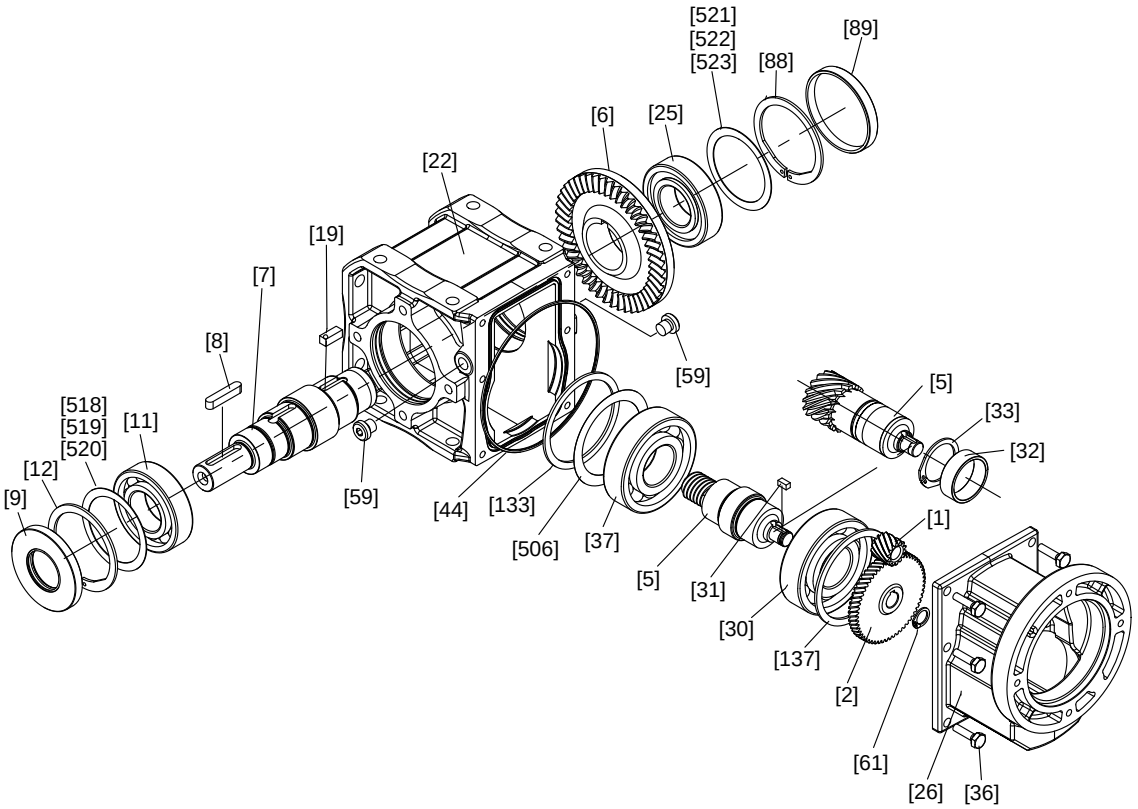


19307275

[1]	Pinion	[19]	Key	[88]	Retaining ring	[518]	Shim
[6]	Gear	[22]	Gear unit housing	[89]	Closing cap	[519]	Shim
[7]	Output shaft	[25]	Rolling bearing	[100]	Inspection cover	[520]	Shim
[8]	Key	[65]	Oil seal	[101]	Hex head screw	[521]	Shim
[9]	Oil seal	[66]	Rolling bearing bearing	[102]	Gasket	[522]	Shim
[11]	Rolling bearing bearing	[68]	Retaining ring	[143]	Supporting ring	[523]	Shim
[12]	Retaining ring	[71]	Supporting ring	[250]	Retaining ring		
[17]	Spacer tube	[72]	Retaining ring	[251]	Retaining ring		

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3.7 Basic structure of SPIROPLAN® gear units W..37 – W..47



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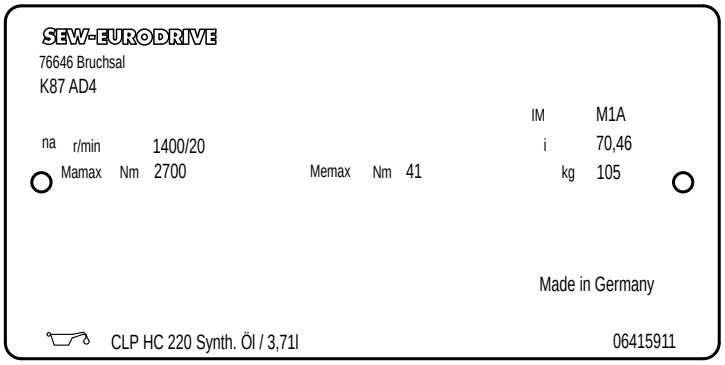
[1]	Pinion	[22]	Gear unit housing	[59]	Screw plug	[521]	Shim
[2]	Gear	[25]	Deep groove ball bearing	[61]	Retaining ring	[522]	Shim
[5]	Pinion shaft	[26]	Housing stage 1	[88]	Retaining ring	[523]	Shim
[6]	Gear	[30]	Deep groove ball bearing	[89]	Closing cap		
[7]	Output shaft	[31]	Key	[133]	Shim		
[8]	Key	[32]	Spacer tube	[137]	Shim		
[9]	Oil seal	[33]	Retaining ring	[506]	Shim		
[11]	Deep groove ball bearing	[36]	Hex head screw	[518]	Shim		
[12]	Retaining ring	[37]	Deep groove ball bearing	[519]	Shim		
[19]	Key	[44]	O-ring	[520]	Shim		

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3.8 Nameplate/type designation

3.8.1 Nameplate

The following figure shows an example of a nameplate for a helical-bevel gear unit with input cover:



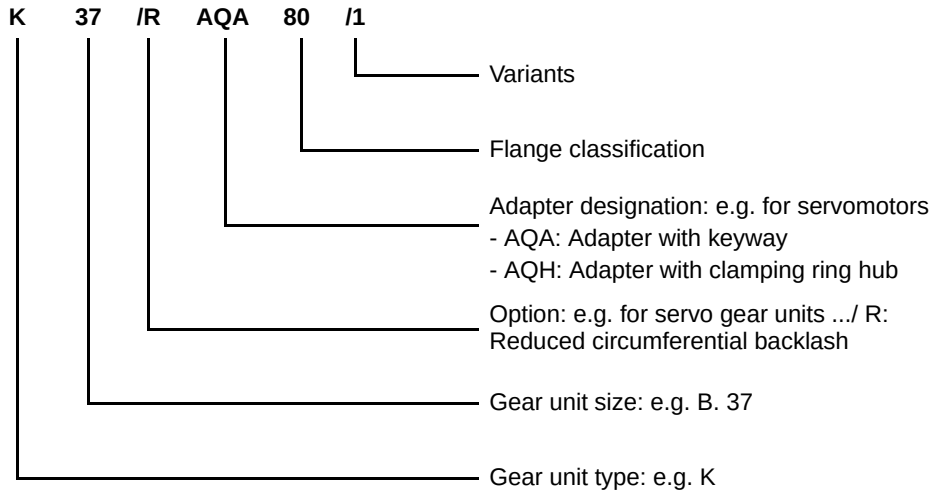
4472018699

n_a	[r/min]	Maximum permitted output speed
M_{amax}	[Nm]	Maximum permitted output torque
M_{emax}	[Nm]	Maximum permitted input torque
i		Gear unit ratio
IM		Mounting position

3.8.2 Type designation

Helical-bevel gear units

A helical-bevel gear unit with AQ adapter has, for example, the following type designation:



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4 Mechanical Installation

4.1 Required tools/resources

- Set of wrenches
- If necessary, torque wrench for:
  - Shrink disks
  - Motor adapter AQH Or EWH
  - Input shaft assembly with centering shoulder
- Mounting device
- Compensation elements (shims, spacing rings)
- Fasteners for input and output elements
- Lubricant (e.g. NOCO® Fluid)
- Bolt locking compound (for input shaft assembly with centering shoulder), e.g. Loctite® 243

Standard parts are not included in the delivery

4.1.1 Installation tolerances

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

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4.2 Installation requirements



⚠ CAUTION

Risk of injury due to protruding gear unit parts.

Minor injuries.

- Keep a sufficient safety distance to the gear unit/gearmotor.



NOTICE

Damage to the gear unit/gearmotor due to improper installation.

Possible damage to property

- Strictly adhere to the notes in this chapter.

Make sure that the following requirements are met before you start installing the unit:

- The drive has not been damaged during transportation or storage.
- The entries on the nameplate of the gearmotor match the voltage supply system.
- When the unit is installed in abrasive ambient conditions, protect the output end oil seals against wear.
- The output shafts and flange surfaces must be completely free from anti-corrosion agents, contamination or similar. Use a commercially available solvent for cleaning. Do not expose the sealing lips of the oil seals to the solvent – damage to the material.
- **For standard drives:**
  - Ambient temperature according to the technical documentation, nameplate and lubricant table in section "Lubricants".
  - No harmful oils, acids, gases, vapors, radiation etc. in the vicinity
- **For special designs:**
  - The drive is designed in accordance with the ambient conditions. Observe the information on the nameplate.
- **For helical-worm/SPIROPLAN® W gear units:**
  - No large external mass moments of inertia which could exert a retrodriving load on the gear unit.
  - Self-locking with η' (retrodriving) < 0.5;

    Calculation : $\eta' = 2 - 1/\eta$
- **For servomotor mounting:**
  - Do not assemble the drive without having ensured that there will be sufficient ventilation after installation to prevent heat build-up.

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4.3 Installing the gear unit



NOTICE

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

Risk of injuries and damage to property.

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



⚠ CAUTION

Improper installation may result in damage to the gear unit or gearmotor.

Possible damage to property.

- Protect the gear unit from direct cold air currents. Condensation may cause water to accumulate in the oil.
- It is important that you observe the notes in this chapter.



⚠ CAUTION

Risk of trapping and crushing due to improper disassembly of heavy components.

Risk of injury.

- Remove the shrink disk properly.
- Work on the gear unit only when the machine is at a standstill. Secure the drive unit against unintentional power-up.

The gear unit or gearmotor is only allowed to be installed in the specified mounting position. Observe the information on the nameplate. SPIROPLAN® gear units of size W10 – W30 are mounting position-independent.

The support structure must have the following features:

- Level
- Vibration damping
- Torsionally rigid

The following table shows the maximally permitted flatness defect for foot- and flange-mounting (guide values based on DIN ISO 1101):

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

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

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Secure gearmotors using quality 8.8 screws.

Secure the following gearmotors using quality 10.9 screws:

- RF37, R37F with flange Ø = 120 mm
- RF37, RF47, R47F with flange Ø = 140 mm
- RF57, R57F with flange Ø = 160 mm
- FF, FAF, KF, KAF with flange Ø 250 mm
- and RZ37, RZ47, RZ57, RZ67, RZ77, RZ87

INFORMATION

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

At the same time, also check that the oil fill corresponds to the specifications for the intended mounting position (see chapter "Lubricant fill quantities (page 139)" 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. Observe chapter "Lubricant fill quantities" and chapter "Mounting Positions".

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

Please contact our SEW customer service if you want to change the mounting position of size S47 – S97 helical-worm gear units to mounting position M2 or M3.

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 leakage resistance < 10^9 Ω. Electrochemical corrosion can occur between various metals, for example, cast iron and high-grade steel. Also fit the bolts with plastic washers. Ground the housing additionally – use the grounding bolts on the motor.

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4.3.1 Tightening torques for retaining screws

Mount the gearmotors with the following tightening torques:

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

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

Flange	Gear unit	Bolt/nut	Tightening torque screw / nut Strength class 10.9 [Nm]
120	RF37	M6	14
140	RF37, RF47	M8	35
160	RF57	M8	35
60ZR	RZ37	M8	35
70ZR	RZ47	M8	35
80ZR	RZ57	M10	69
95ZR	RZ67	M10	69
110ZR	RZ77	M12	120
130ZR	RZ87	M12	120
250	FF77, KF77, FAF77, KAF77	M12	120

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4.3.2 Gear unit mounting

INFORMATION

For gear units in foot/flange-mounted design in connection with VARIBLOC® variable-speed gear units, use quality 10.9 bolts and suitable washers for connecting the customer flange.

To improve the friction contact between flange and mounting surface, SEW-EURODRIVE recommends anaerobic gaskets or an anaerobic glue.

Foot-mounted gear units

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

Screw	Gear unit type					
	R / R..F	RX	F / FH..B / FA..B	K / KH..B / KV..B / KA..B	S	W
M6	07			19		10/20
M8	17/27/37		27/37	29	37	30/37/47
M10		57	47	37/47	47/57	
M12	47/57/67	67	57/67	57/67	67	
M16	77/87	77/87	77/87	77	77	
M20	97	97/107	97	87	87	
M24	107		107	97	97	
M30	137		127	107/167		
M36	147/167		157	127/157/187		

Gear units with B14 flange design and/or hollow shaft

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

Screw	Gear unit type				
	RZ	FAZ / FHZ	KAZ / KHZ / KVZ	SA / SAZ / SHZ	WA
M6	07/17/27			37	10/20/30[1)]
M8	37/47	27/37/47	37/47	47/57	37
M10	57/67				47
M12	77/87	57/67/77	57/67/77	67/77	
M16		87/97	87/97	87/97	
M20		107/127	107/127		
M24		157	157		

1) For W30 gear units mounted directly to a CMP motor or mounted via an EWH.. adapter, the thread size is M8.

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Gear units with B5 flange

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

Flange Ø [mm]	Screw	Gear unit type				
		RF / R..F / RM	FF / FAF / FHF	KF / KAF / KHF / KVF	SF / SAF /SHF	WF / WAF
80	M6					10
110	M8					20
120	M6	07/17/27		19	37	10/20/30/37
140	M8	07/17/27/37/47				
160	M8	07/17/27/37/47	27/37	19/29/37	37/47	30/37/47
200	M10	37/47/57/67	47	29/47	57/67	
250	M12	57/67/77/87	57/67	57/67	77	
300	M12	67/77/87	77	77		
350	M16	77/87/97/107	87	87	87	
450	M16	97/107/137/147	97/107	97/107	97	
550	M16	107/137/147/167	127	127		
660	M20	147/167	157	157		

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4.3.3 Installation in damp locations or outdoors

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

When mounting the motors onto AM, AQ adapters and to AR, AT start-up and friction couplings, seal the flange areas with a suitable sealing compound, e.g. Loctite® 574.

Units installed outdoors must be protected from the sun. Suitable protective devices are required, such as covers or roofs. Avoid any heat accumulation. The operator must ensure that foreign objects do not impair the function of the gear unit (e.g. falling objects or coverings).

4.3.4 Gear unit venting

The following gear units do not require venting:

- R..07 in mounting positions M1, M2, M3, M5 and M6
- R..17, R..27 and F..27 in mounting positions M1, M3, M5 and M6
- SPIROPLAN® W..10, W..20, W..30 gear units
- SPIROPLAN® W..37, W..47 gear units in mounting positions M1, M2, M3, M5 and M6
- K..19, K..29 gear units in mounting positions M1, M2, M3, M5 and M6

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 with pivoted mounting positions, if possible
   - Gear units for inclined mounting

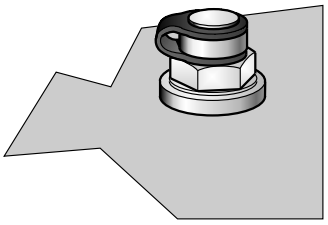
   The breather valve is located in the motor terminal box. Before startup, replace the highest screw plug with the breather valve provided.
2. SEW supplies a breather valve in a plastic bag for **mount-on gear units** requiring venting on the input side.
3. **Enclosed gear units** are supplied without a breather valve.
4. In some countries, the breather valve is installed, but not activated due to possible pressure fluctuations during transport. In these cases, the breather valve must be activated by removing the transport protection as described in chapter "Activating the breather valve".

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Activating the breather valve

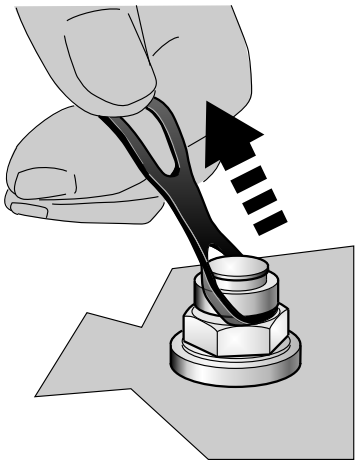
Check whether the breather valve is activated. If the breather valve has not been activated, you must remove the transportation protection device from the breather valve before starting up the gear unit.

1. Breather valve with transportation protection device



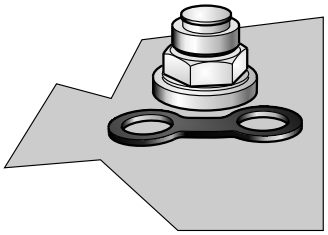
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2. Remove transport fixture



211316875

3. Activated breather valve



211314699

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4.3.5 Painting the gear unit

NOTICE

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

Possible damage to property.

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

4.4 Gear units with solid shaft

4.4.1 Notes on installation

INFORMATION

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

4.4.2 Assembling input and output elements

NOTICE

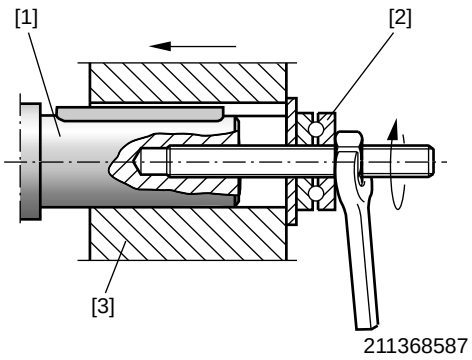
Bearing, hosing or shaft may be damaged due to improper assembly.

Possible damage to property

- Assemble the input and output components only using a mounting device. Use the center bore and the thread on the shaft end for positioning.
- Never force belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer.
- In the case of belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions.
- Power transmission elements should be balanced after fitting and must not give rise to any impermissible radial or axial forces (see the "Gearmotors" or "Explosion-Proof Drives" catalog for permitted values).

Using a mounting device

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

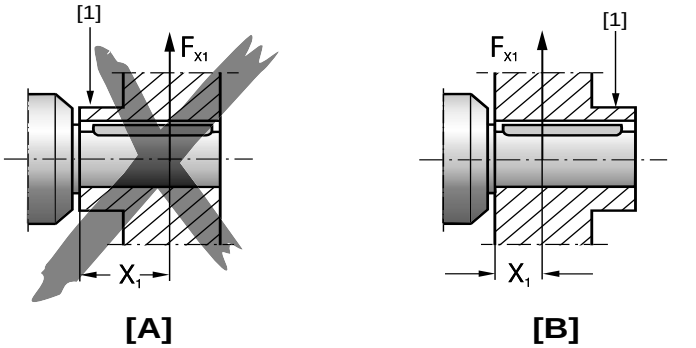


[1] Gear unit shaft end
[2] Thrust bearing
[3] Coupling hub

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Avoiding excessive overhung loads

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



[1] Hub
[A] Unfavorable
[B] Correct

INFORMATION

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

4.4.3 Mounting of couplings

⚠ CAUTION

Risk of injury due to moving drive elements, such as belt pulleys or couplings, during operation.

Risk of jamming and crushing.

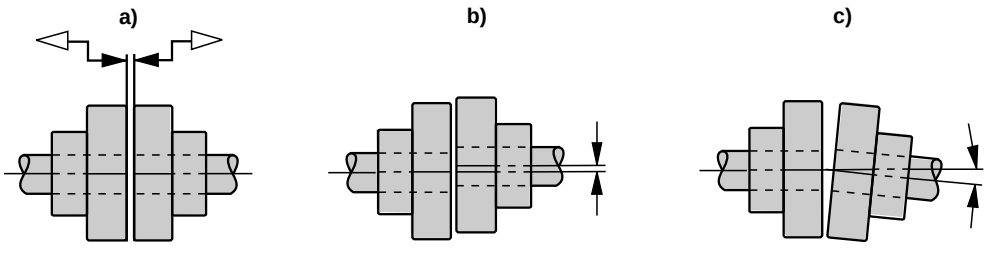
- Cover input and output components with a touch guard.

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

a) Maximum and minimum clearance

b) Axial offset

c) Angular offset



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4.5 Torque arms for shaft-mounted gear units

⚠ NOTICE

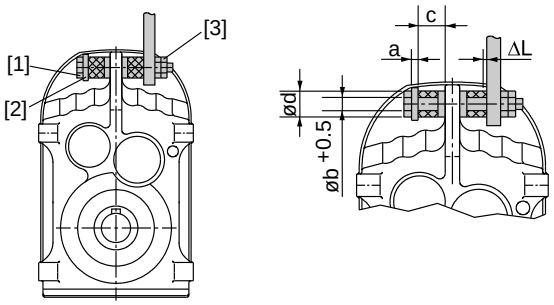
Improper mounting may result in damage to the gear unit.

Possible damage to property.

- Do not place torque arms under strain when mounting.
- Use screws of quality 8.8 to fasten torque arms.

4.5.1 Parallel-shaft helical gear units

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



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

Proceed as follows to mount the rubber buffers:

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

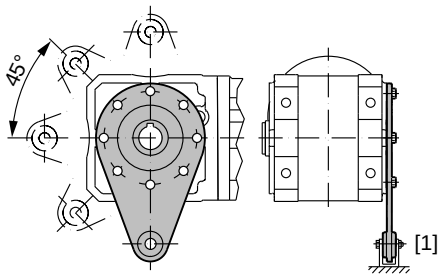
Gear unit	Rubber buffer			Washer width	Δ L (taut)
	Diameter d [mm]	Inner diameter b [mm]	Length (loose) c [mm]	a [mm]	[mm]
F..27 /G	40	12.5	20	5	1
F..37 /G	40	12.5	20	5	1
F..47 /G	40	12.5	20	5	1.5
F..57 /G	40	12.5	20	5	1.5
F..67 /G	40	12.5	20	5	1.5
F..77 /G	60	21.0	30	10	1.5
F..87 /G	60	21.0	30	10	1.5
F..97 /G	80	25.0	40	12	2
F..107 /G	80	25.0	40	12	2
F..127 /G	100	32.0	60	15	3
F..157 /G	120	32.0	60	15	3

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4.5.2 Helical-bevel gear units K..19 – 29

The following figure shows the torque arm for helical-bevel gear units KA19 – 29.

- Apply bearings to both sides of the bushing [1].
- Mount connection side B so that it mirrors A.



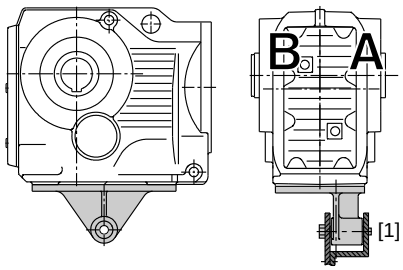
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Gear unit	Screws	Tightening torque
K..19 /T	4 x M8 × 22 – 8.8	25 Nm
K..29 /T	4 x M8 × 22 – 8.8	25 Nm

4.5.3 Helical-bevel gear units K..37 – 157

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

- Apply bearings to both sides of the bushing [1].
- Mount connection side B so that it mirrors A.



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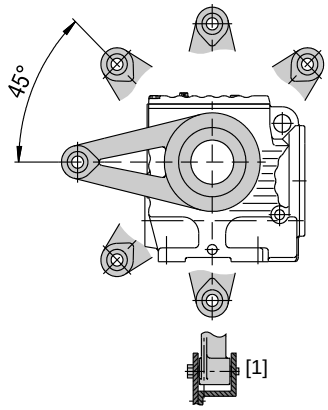
Gear unit	Screws	Tightening torque
K..37 /T	4 × M10 × 25 – 8.8	48 Nm
K..47 /T	4 × M10 × 30 – 8.8	48 Nm
K..67 /T	4 × M12 × 35 – 8.8	86 Nm
K..77 /T	4 × M16 × 40 – 8.8	210 Nm
K..87 /T	4 × M16 × 45 – 8.8	210 Nm
K..97 /T	4 × M20 × 50 – 8.8	410 Nm
K..107 /T	4 × M24 × 60 – 8.8	710 Nm
K..127 /T	4 × M36 × 130 – 8.8	2.500 Nm
K..157 /T	4 × M36 × 130 – 8.8	2.500 Nm

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4.5.4 Helical-worm gear units

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

- Apply bearings to both sides of the bushing [1].



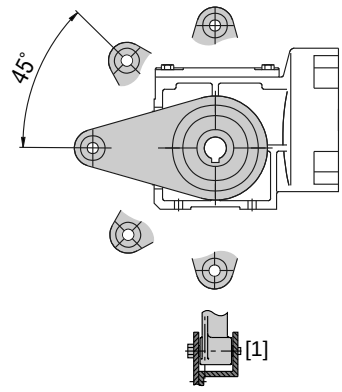
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Gear unit	Screws	Tightening torque
S..37 /T	4 x M6 × 16 – 8.8	11 Nm
S..47 /T	4 x M8 × 20 – 8.8	25 Nm
S..57 /T	6 x M8 × 20 – 8.8	25 Nm
S..67 /T	4 x M12 × 25 – 8.8	86 Nm
S..77 /T	8 x M12 × 35 – 8.8	86 Nm
S..87 /T	8 x M16 × 35 – 8.8	210 Nm
S..97 /T	8 x M16 × 35 – 8.8	210 Nm

4.5.5 SPIROPLAN® W gear units

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

- Apply bearings to both sides of the bushing [1].



211489547

Gear unit	Screws	Tightening torque Nm
W..10 /T	4 x M6 × 16 - 8.8	11
W..20 /T	4 x M6 × 16 - 8.8	11
W..30 /T	4 x M6 × 16 - 8.8	11
W..37 /T	4 x M8 × 20 - 8.8	25
W..47 /T	4 x M10 × 25 - 8.8	48

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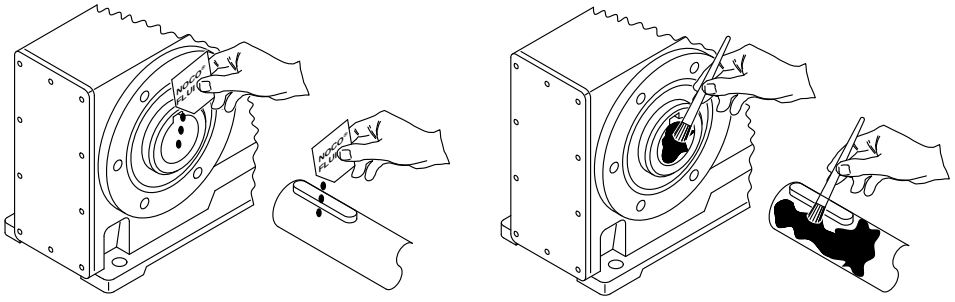
4.6 Shaft-mounted gear units with keyway or splined hollow shaft

INFORMATION

Concerning the configuration of the customer shaft, please also refer to the design notes in the gearmotors catalog.

4.6.1 Installation notes

1. Apply NOCO® fluid and thoroughly spread it.



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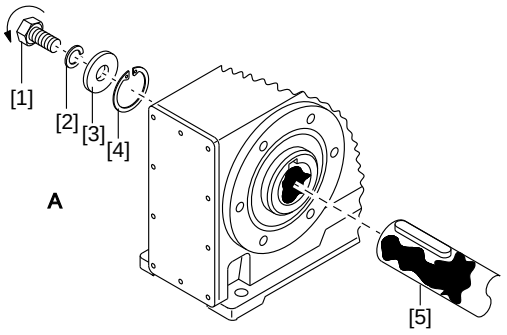
2. Install the shaft and secure it axially

   (installation is facilitated by using a mounting device).

   Following a description of the three mounting types:

   - 2A: Standard scope of delivery
   - 2B: Installation/removal kit for customer shaft with contact shoulder
   - 2C: Installation/removal kit for customer shaft without contact shoulder

2A: Installation with standard scope of delivery



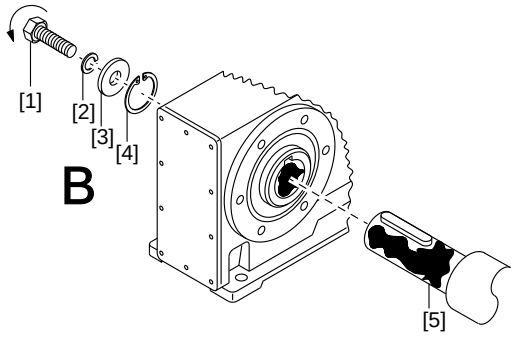
211518347

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

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2B: Installation with SEW-EURODRIVE installation and removal kit (page 37)

– Customer shaft **with** contact shoulder

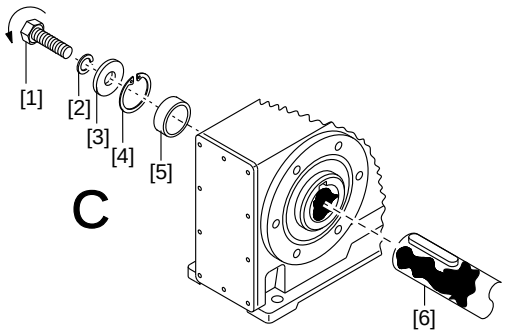


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[1] Retaining screw
[2] Lock washer
[3] Washer
[4] Retaining ring
[5] Customer shaft with contact shoulder

2C: Installation with SEW-EURODRIVE installation and removal kit (page 37)

– Customer shaft **without** contact shoulder

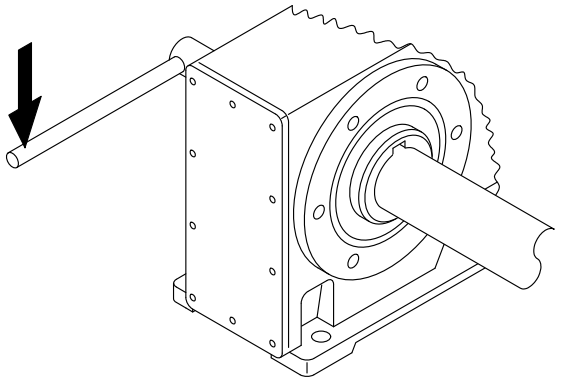


211522699

[1] Retaining screw
[2] Lock washer
[3] Washer
[4] Retaining ring
[5] Spacer
[6] Customer shaft without contact shoulder

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



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

INFORMATION

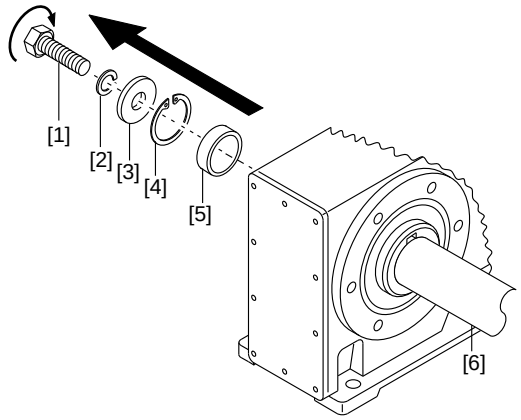
To avoid contact corrosion, we recommend that the customer shaft should additionally be lathed down between the 2 contact surfaces.

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4.6.2 Information about disassembly

This description is only applicable when the gear unit was assembled using the installatio/removal kit (page 37) from SEW-EURODRIVE. Observe section "Installation notes (page 32)", 2B or 2C.

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



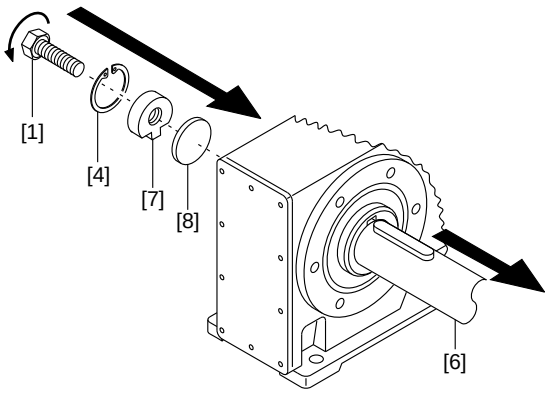
211527051

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

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

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



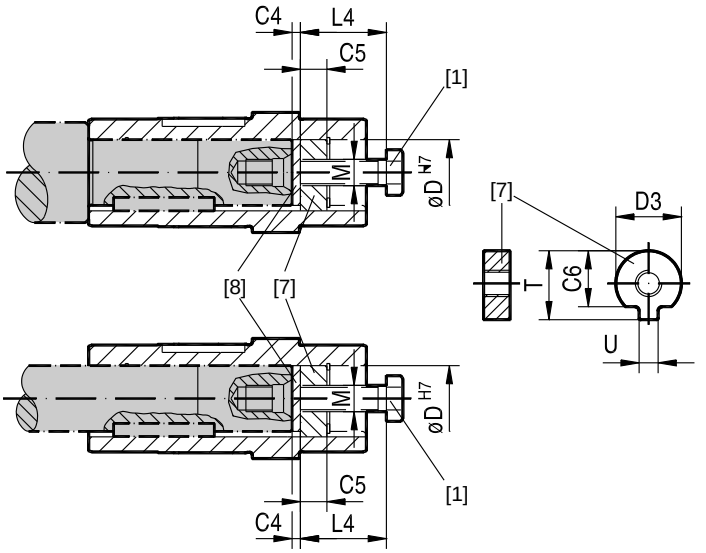
211529227

[1] Retaining screw
[4] Retaining ring
[6] Customer shaft
[7] Fixed nut
[8] Forcing disk

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4.6.3 SEW installation and removal kit

The SEW-EURODRIVE installation/removal kit can be ordered by quoting its part number.



211531403

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

Type	D^{H7} [mm]	M[1)]	C4 [mm]	C5 [mm]	C6 [mm]	$U^{-0.5}$ [mm]	$T^{-0.5}$ [mm]	$D3^{-0.5}$ [mm]	L4 [mm]	Part number of installation/ removal kit
WA..10	16	M5	5	5	12	4.5	18	15.7	50	643 712 5
WA..20	18	M6	5	6	13.5	5.5	20.5	17.7	25	643 682 X
WA..20, WA..30, SA..37, WA..37, KA..19	20	M6	5	6	15.5	5.5	22.5	19.7	25	643 683 8
FA..27, SA..47, WA..47, KA..29	25	M10	5	10	20	7.5	28	24.7	35	643 684 6
FA..37, KA..37, SA..47, SA..57, WA..47, KA..29	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	80	M20	5	20	75.5	21.5	85	79.7	70	106 8211 2
FA..107, KA..107, SA..97	90	M24	5	20	80	24.5	95	89.7	70	643 692 7
FA..127, KA..127	100	M24	5	20	89	27.5	106	99.7	70	643 693 5
FA..157, KA..157	120	M24	5	20	107	31	127	119.7	70	643 694 3

1) Retaining screw

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INFORMATION

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

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4.7 Shaft-mounted gear units with shrink disk

4.7.1 Assembly notes

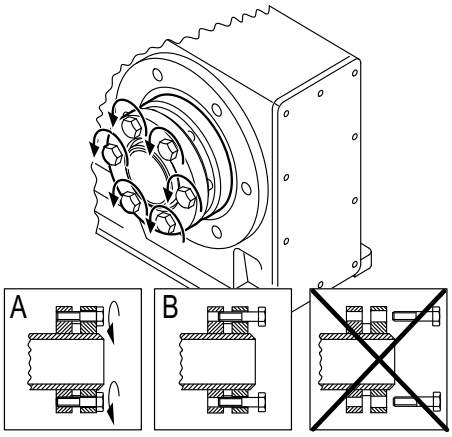
NOTICE

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

Possible damage to property

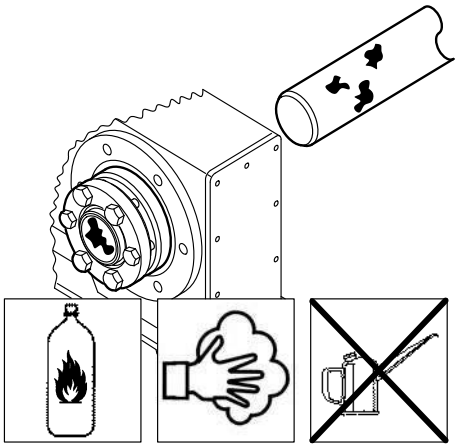
- Only tighten the locking screws with the shaft installed.

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



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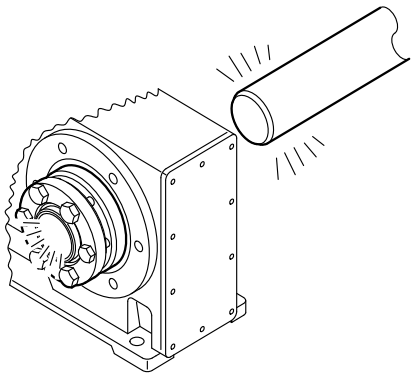
2. Carefully degrease the hollow shaft hole and the input shaft using a commercially available solvent.



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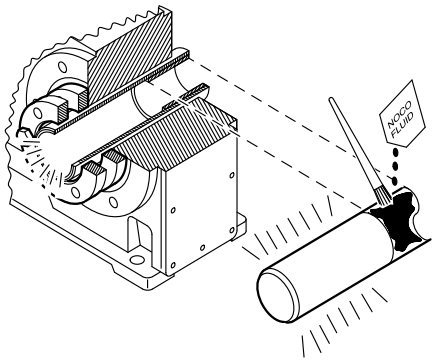
3. Hollow shaft/input shaft after degreasing.



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

   It is essential to make sure that the clamping area of the shrink disk is free from grease. Never apply NOCO® fluid directly to the bushing. This is because the paste may be able to get into the clamping area of the shrink disk when the input shaft is put on.



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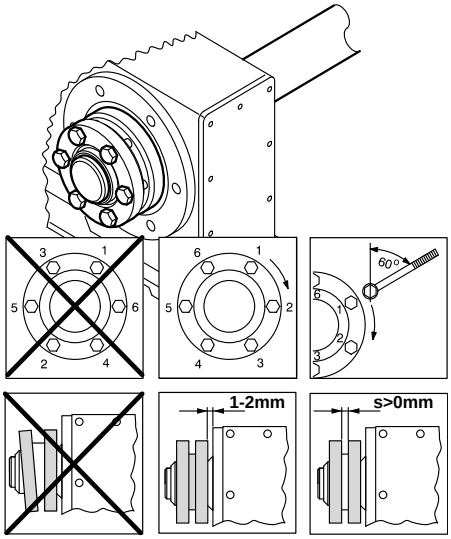
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5. Install the input shaft.
   - Make sure that the locking collars of the shrink disk are installed in parallel to each other.
   - For gear unit housings with shaft shoulder:

     Mount the shrink disk onto the stop on the shaft shoulder.
   - For gear unit housings without shaft shoulder:

     Install the shrink disk with a 1 to 2 mm distance from the gear unit housing.
   - Tighten the locking screws by working round with the torque wrench several times from one screw to the next (not in diametrically opposite sequence).

     The exact values for the tightening torques are shown on the shrink disk.



211542283

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

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4.7.2 Removal notes

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

4.7.3 Cleaning and lubrication

There is no need to dismantle removed shrink disks before re-installing them.

Clean and lubricate the shrink disk if it is dirty.

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

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

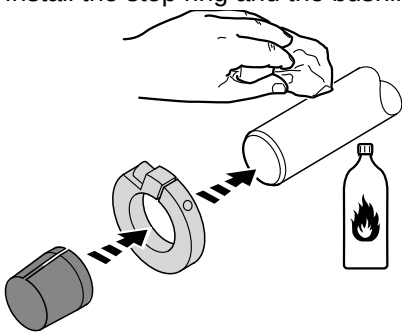
Grease the locking screws with a multipurpose grease such as Molykote BR 2 or similar.

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4.8 Shaft-mounted gear units with TorqLOC®

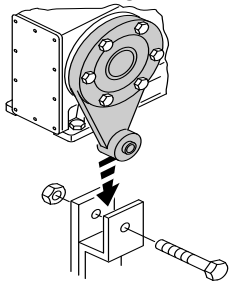
4.8.1 Installation notes for customer shaft without contact shoulder

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



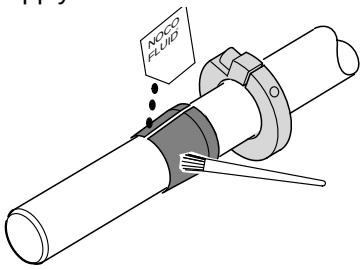
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3. Mount the torque arm to the drive unit, observe chapter "Torque arms for shaft-mounted gear units" (page 29).



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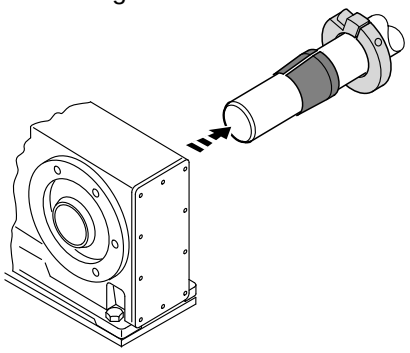
4. Apply NOCO® fluid on the bushing and spread it thoroughly.



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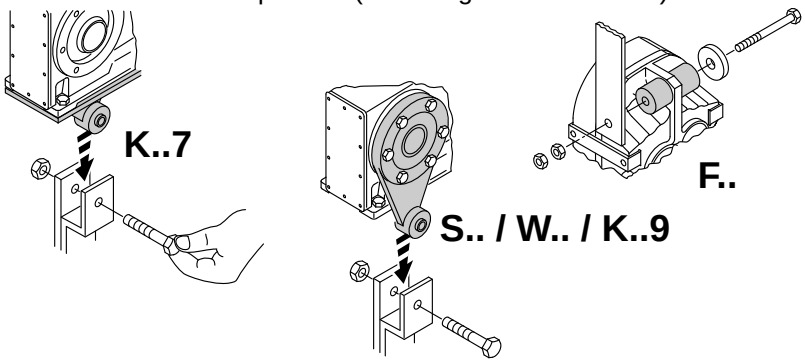
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5. Push the gear unit onto the customer shaft.



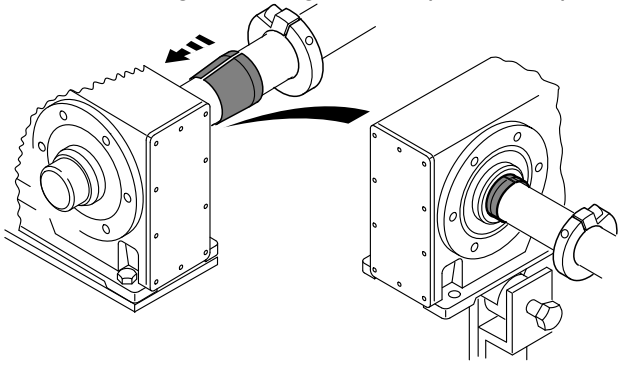
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6. Preassemble the torque arm (do not tighten the screws).



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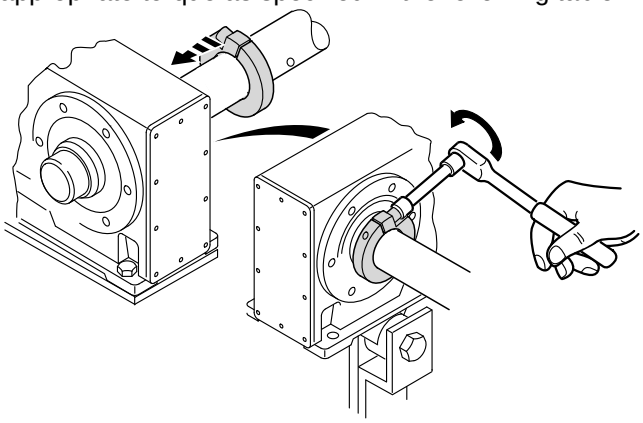
7. Push the busing onto the gear unit up to the stop.



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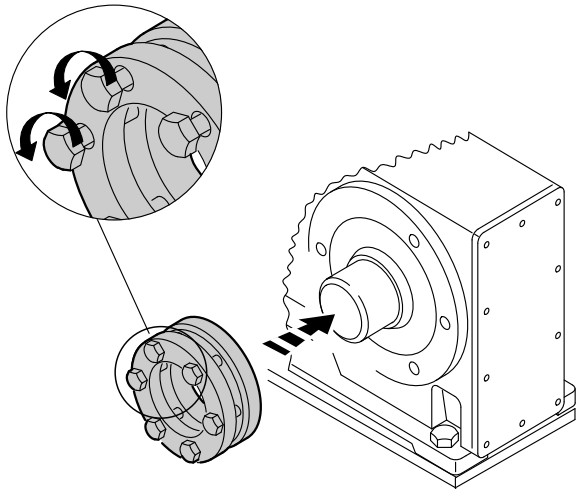
8. Secure the bushing with the stop ring. Tighten the split ring on the bushing using the appropriate torque as specified in the following table:



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Type		Nickel-plated [Standard]	Stainless steel
KT / FT	ST / WT	Torque in Nm	
-	37	18	7.5
37	47	18	7.5
47	57	18	7.5
57, 67	67	35	18
77	77	35	18
87	87	35	18
97	97	35	18
107	–	38	38
127	–	65	65
157	–	150	150

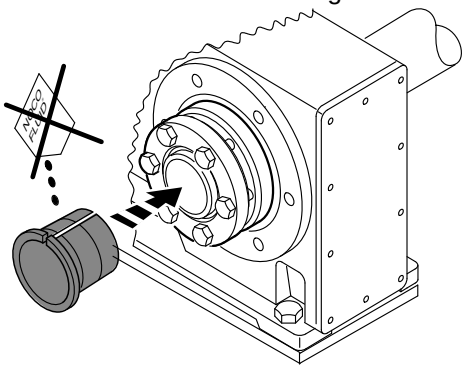
9. Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.



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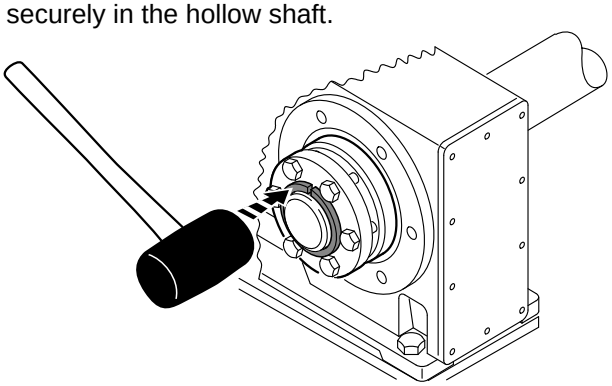
10. Slide the counter bushing onto the customer shaft and into the hollow shaft



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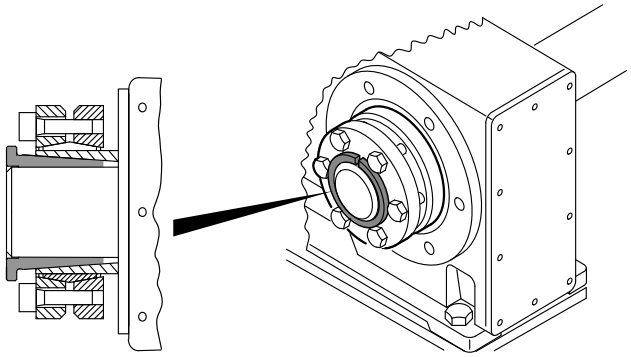
11. until the shrink disk is properly seated.

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



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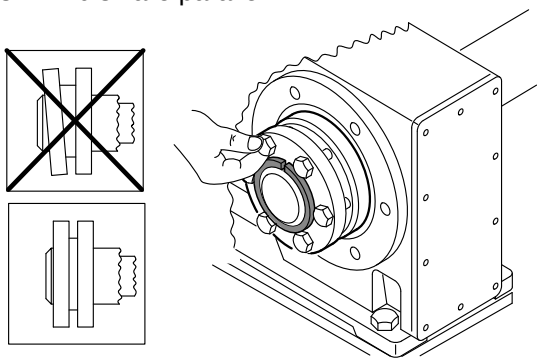
13. Make sure that the customer shaft is seated in the counter bushing.



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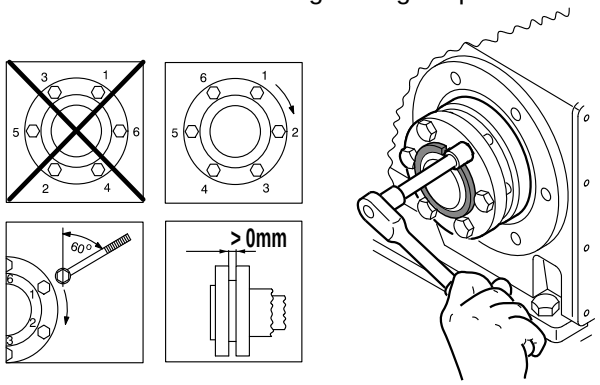
14. Manually tighten the screws of the shrink disk and ensure that the outer rings of the shrink disk are parallel.



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15. Tighten the locking bolts by working round several times from one bolt to the next (not in diametrically opposite sequence).

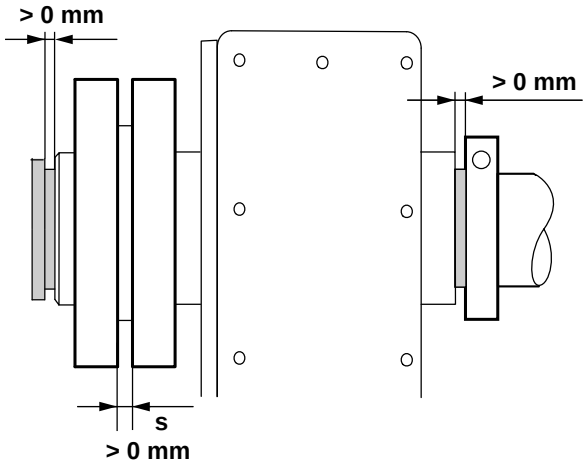
    The exact values for the tightening torques are shown on the shrink disk.



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16. After installation, make sure the remaining gap between the outer rings is > 0 mm.

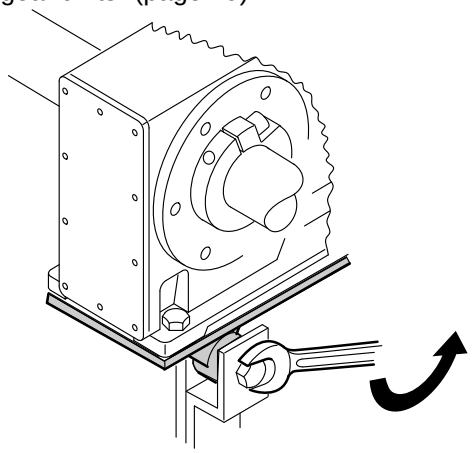
17. The remaining gap between counter bushing and hollow shaft end as well as bushing and stop ring must be > 0 mm.



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18. Securely tighten the torque arm; observe chapter "Torque arm for shaft-mounted gear units" (page 29).

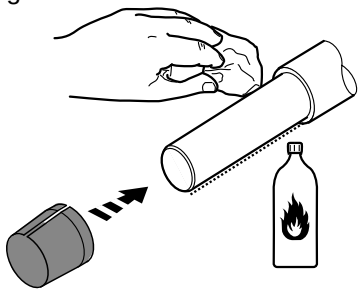


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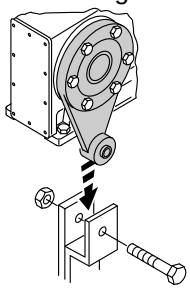
4.8.2 Installation notes for customer shaft with contact shoulder

1. Clean the customer shaft and the inside of the hollow shaft. Ensure that all traces of grease or oil are removed.



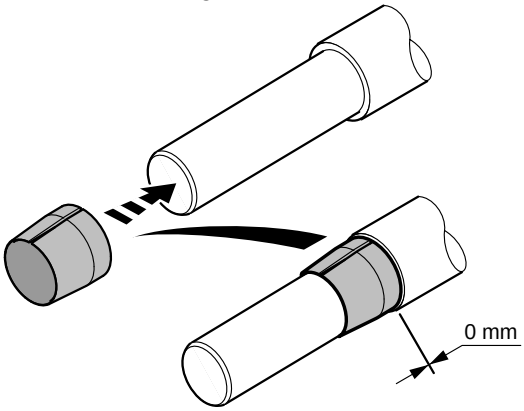
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2. Mount the torque arm to the drive unit, observe chapter "Torque arms for shaft-mounted gear units" (page 29).



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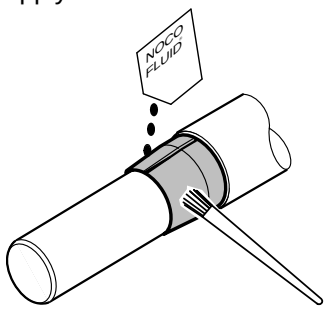
3. Slide the bushing onto the customer shaft.



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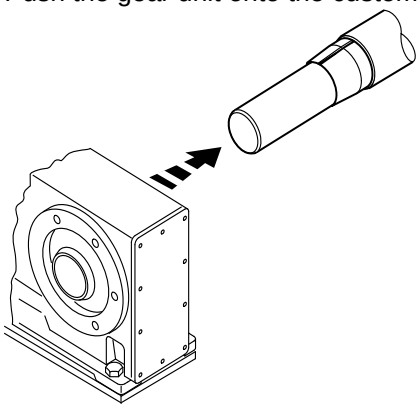
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4. Apply NOCO® fluid on the bushing and spread it thoroughly.



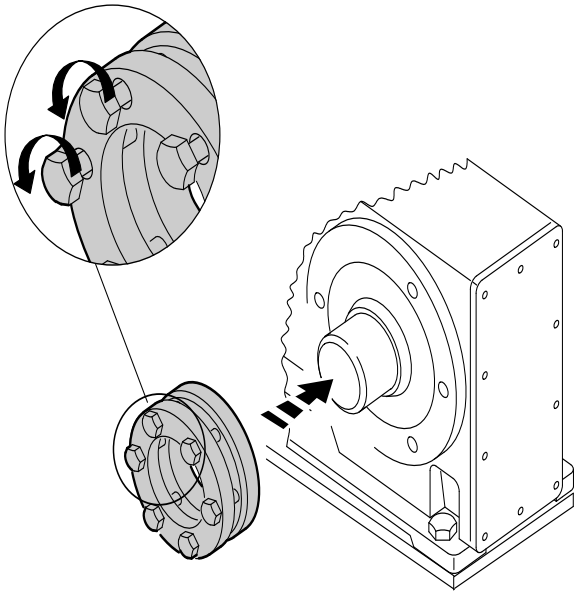
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5. Push the gear unit onto the customer shaft.



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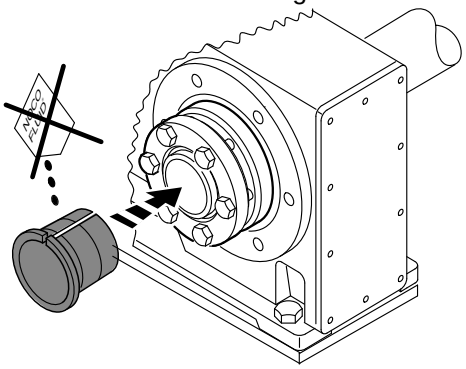
6. Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.



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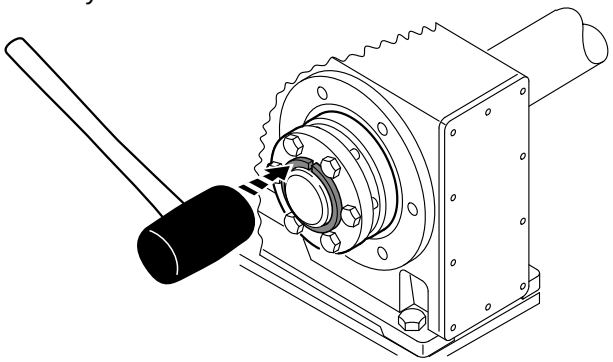
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7. Slide the counter bushing onto the customer shaft and into the hollow shaft



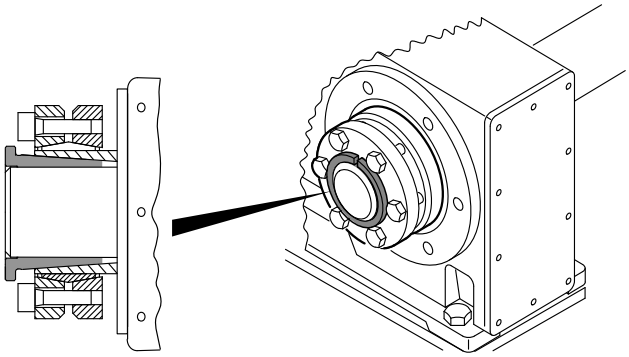
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8. until the shrink disk is properly seated.
9. Tap lightly on the flange of the counter bushing to ensure that the socket is fitted securely in the hollow shaft.



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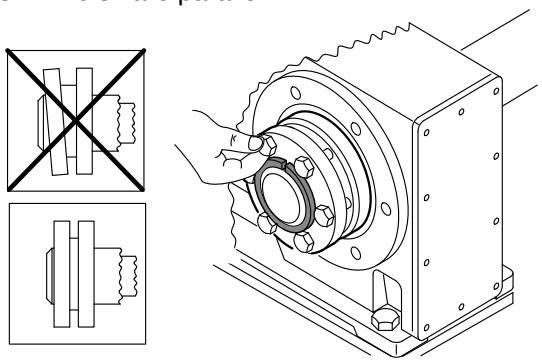
10. Make sure that the customer shaft is seated in the counter bushing.



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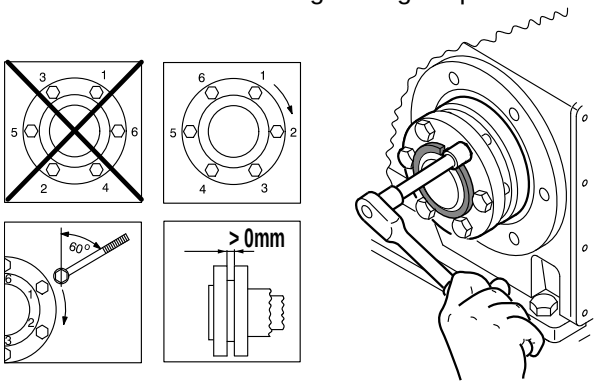
11. Manually tighten the screws of the shrink disk and ensure that the outer rings of the shrink disk are parallel.



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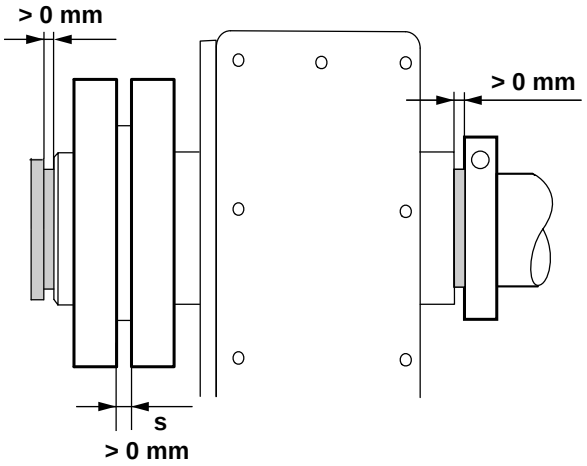
12. Tighten the locking bolts by working round several times from one bolt to the next (not in diametrically opposite sequence).

    The exact values for the tightening torques are shown on the shrink disk.



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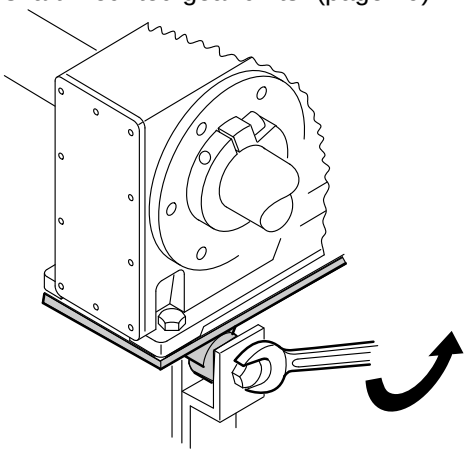
13. After installation, make sure the remaining gap between the outer rings is > 0 mm.
14. The remaining gap between counter bushing and hollow shaft end must be > 0 mm.



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15. Mount the torque arm and tighten it securely; observe chapter "Torque arms for shaft-mounted gear units" (page 29).



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4.8.3 Removal notes



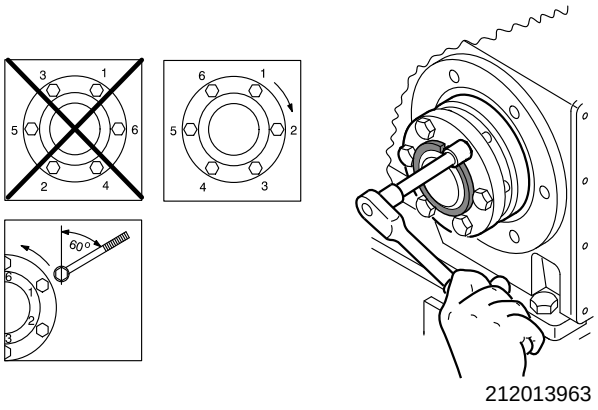
⚠ CAUTION

Burns caused by hot surfaces.

Severe injuries.

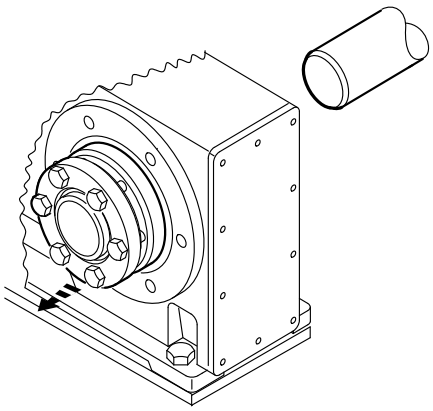
- Let the units cool down before touching them.

1. Loosen the locking screws one after the other by a quarter rotation to avoid tilting the outer rings.



212013963

2. Unscrew the locking bolts evenly one after the other.
   Do not remove the locking screws completely.
3. Dismantle the conical steel bushing.
   If required, use the outer rings as pullers as follows:
   - Remove all the locking screws.
   - Screw the respective number of screws in the tapped holes of the shrink disk.
   - Support the inner ring against the gear unit housing.
   - Pull off the conical steel bushing by tightening the screws.
4. Remove the gear unit from the shaft.



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5. Remove the shrink disk from the hub.

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4.8.4 Cleaning and lubrication

There is no need to dismantle removed shrink disks before re-installing them.

Clean and lubricate the shrink disk if it is dirty.

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

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

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

4.9 Installing the protective cover



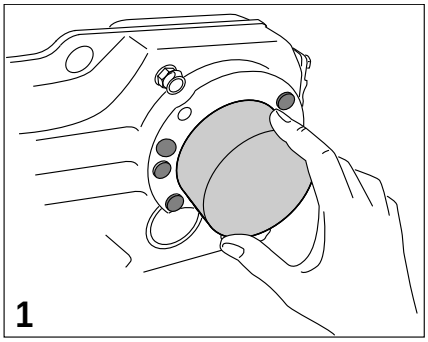
⚠ CAUTION

During operation, output components are in fast motion.

Risk of jamming and crushing.

- Disconnect the motor from the power supply before starting work and safeguard it against accidental startup.
- Cover input and output components with a touch guard.

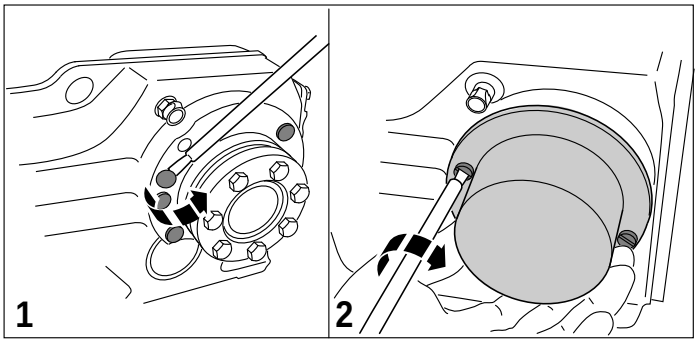
4.9.1 Installing the rotating cover



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

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4.9.2 Installing the fixed cover



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

4.9.3 Installation without cover

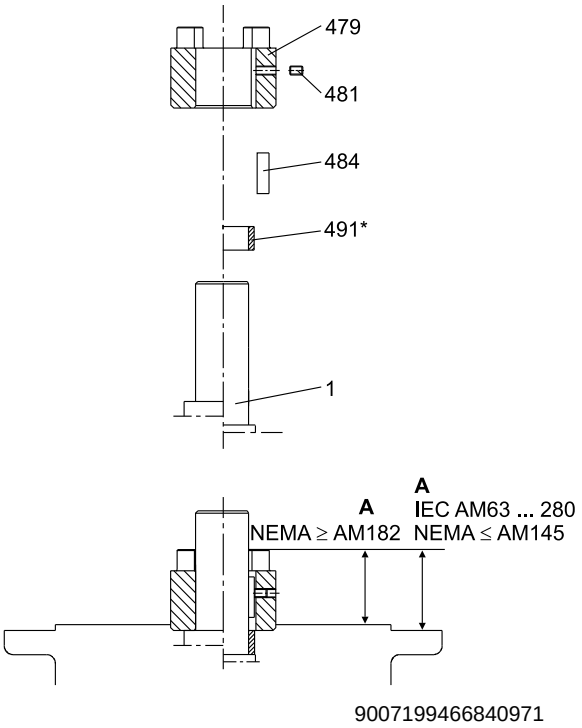
In certain individual cases (e.g. through-shaft), you cannot install the cover. In such cases, the cover is not necessary if the system or unit manufacturer provides corresponding components to guarantee compliance with the required degree of protection.

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

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4.10 Coupling of AM adapters

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



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

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

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

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



NOTE

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



⚠ CAUTION

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

Possible damage to property

- Seal adapter with anaerobic fluid seal.

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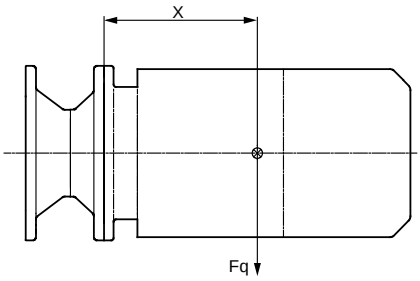
4.10.2 Permitted loads

⚠ CAUTION

Impermissibly high loads may occur when mounting a motor.

Potential damage to property

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



18513419

Gear unit series R..7, F..7, K..7, K..9, and S..7:

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

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

Gear unit series SPIROPLAN® W37 – W47:

Adapter type			F_q [1] [N]	
IEC	NEMA	x [1] [mm]	IEC adapter	NEMA adapter
AM63/71	**AM56**	115	140	120
AM80/90	**AM143/145**	151	270	255

1) The maximum permitted weight of the attached motor F_{qmax} must be reduced linearly as the center of gravity distance x increases. If this distance is reduced, the maximum permitted weight F_{qmax} cannot be increased.

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4.10.3 AM adapter with AM../RS backstop

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

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

.



⚠ CAUTION

If the actual speed level is below the minimum lift-off speed level, the backstops are subject to wear and the resulting friction causes the temperature to increase.

Possible damage to property

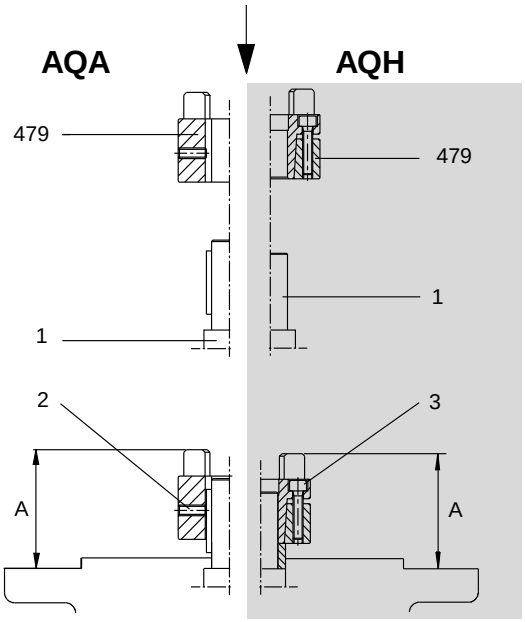
- In rated operation, the lift-off speeds must not drop below the minimum values.
- During startup or braking, the lift-off speeds may drop below the minimum levels.

Type	Maximum locking torque of the backstop [Nm]	Minimum lift-off speed [rpm]
AM80/90/RS, AM143/145/RS	65	820
AM100/112/RS, AM182/184/RS	425	620
AM132/RS, AM213/215/RS	850	530
AM160/180/RS, AM254/286/RS	1450	480
AM200/225/RS, AM324-365/RS	1950	450
AM250/280/RS	1950	450

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4.11 AQ. adapter coupling

4.11.1 AQA80 - 190 adapter / AQH80 - 190 adapter



212114955

1 Motor shaft
2 Set screw
3 Screw

AQA = With keyway
AQH = Without keyway

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

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

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

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

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

   Mount the motor onto the adapter, making sure that the claws of the two coupling halves engage in each other. The insertion 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.

INFORMATION

Only for AQA, not permitted for AQH: To avoid contact corrosion, we recommend applying NOCO® fluid to the motor shaft before mounting the coupling half.

⚠ CAUTION

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

Possible damage to property

- Seal adapter with anaerobic fluid seal.

4.11.2 Setting dimensions / tightening torques

Type	Coupling size	Clearance "A" [mm]	Screws		Tightening torque T_A [Nm]	
			AQA	AQH	AQA	AQH
AQA /AQH 80 /1 /2 /3	19	44.5	M5	6 x M4	2	4.1
AQA /AQH 100 /1 /2		39				
AQA /AQH 100 /3 /4		53				
AQA /AQH 115 /1 /2		62				
AQA /AQH 115 /3	24	62	M5	4 x M5	2	8.5
AQA /AQH 140 /1 /2		62				
AQA /AQH 140 /3 /4	28	74.5	M8	8 x M5	10	8.5
AQA /AQH 160 /1		74.5				
AQA /AQH 190 /1 /2		76.5				
AQA /AQH 190 /3	38	100	M8	8 x M6	10	14

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4.11.3 Permitted loads

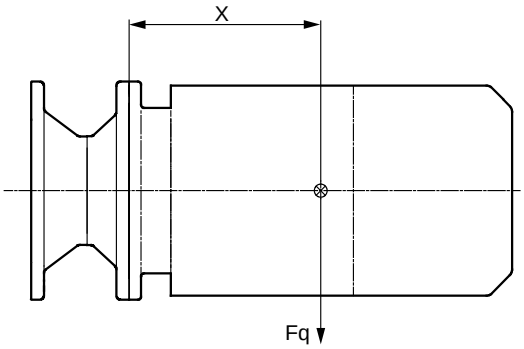
⚠ CAUTION

Impermissibly high loads may occur when mounting a motor.

Potential damage to property

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

The following figure shows the permitted force application points for the permitted maximum weights:



18513419

⊗ Motor's center of gravity
X Distance from adapter flange to the middle of the motor
Fq Overhung load

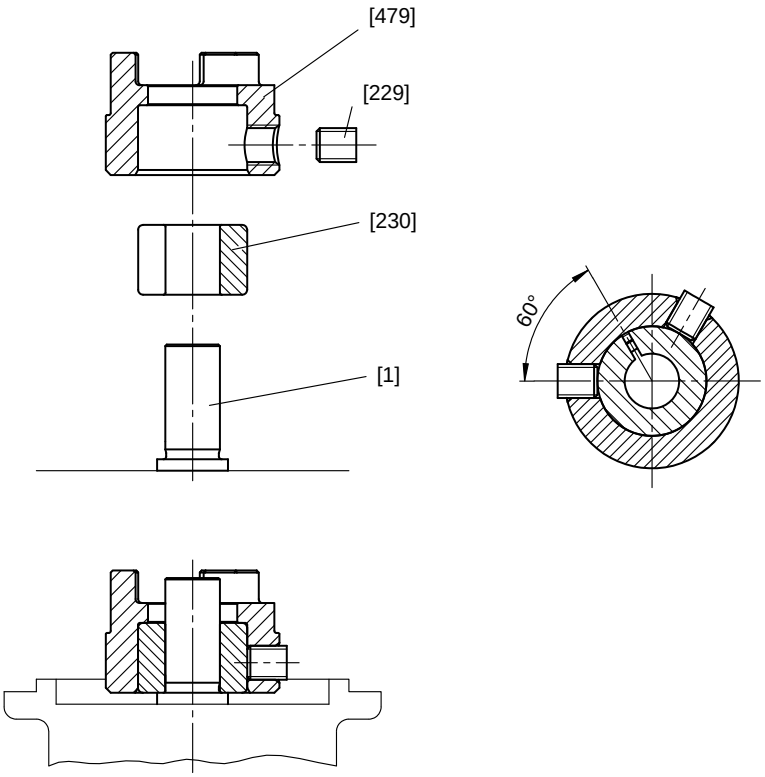
Type	x[1)] [mm]	F_q[1)] [N]
AQ80	77	370
AQ100/1/2	113	350
AQ100/3/4	113	315
AQ115	113	300
AQ140/1/2	144	1550
AQ140/3	144	1450
AQ160	144	1450
AQ190/1/2; Ø flange: 160	186	1250
AQ190/3; Ø flange: 160	186	1150
AQ190/1/2	186	3750
AQ190/3	186	3400

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

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4.12 EWH adapters

4.12.1 Adapter EWH01 – 03



[1] Motor shaft
[229] Clamping screws
[230] Motor shaft sleeve
[479] Coupling half

1. Clean and de-grease the hollow shaft hole of the coupling half [479], the motor shaft sleeve [230], and the motor shaft [1].
2. Insert the motor shaft sleeve [230] into the coupling half [479] so that the slot of the motor shaft sleeve [230] is at a 60° angle to the two clamping screws [229].
3. Push the coupling half [479] until it reaches the shoulder of the motor shaft.
4. Tighten the clamping screws [229] one after the other with a suitable torque wrench, first to 25% of the tightening torque specified in the following table.
5. Then, tighten the two clamping screws [229] to the full, specified tightening torque.

Adapter type	Motor shaft diameter in mm	Number of clamping screws	Tightening torque of the clamping screw in Nm	Wrench size in mm
EWH01	9	2	5.6	3
EWH01	11	2	10	4
EWH02	11; 14; 16	2	10	4
EWH03	11; 14; 16	2	10	4

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4.12.2 Permitted loads

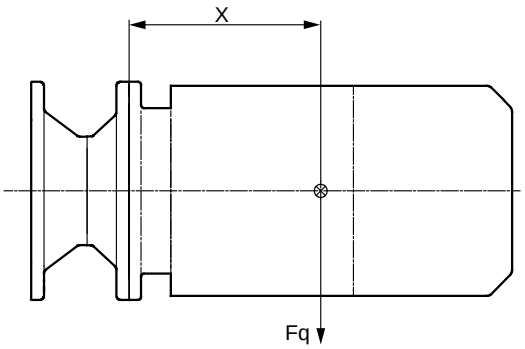
⚠ CAUTION

Impermissibly high loads may occur when mounting a motor.

Potential damage to property

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

The following figure shows the permitted force application points for the permitted maximum weights:



18513419

⊗ Motor's center of gravity
X Distance from adapter flange to the middle of the motor
Fq Overhung load

Type	$x^{1)}$ [mm]	$F_q{}^{1)}$ [N]
EWH01	113	40
EWH02	120	56
EWH03	120	56

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

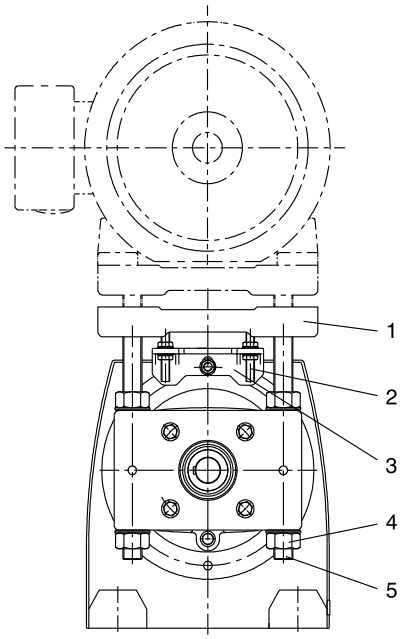
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4.13 AD input shaft assembly

Observe section "Assembling the input and output components" (page 27) when installing input components.

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

Mounting the motor and adjusting the motor mounting platform.



212119307

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

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

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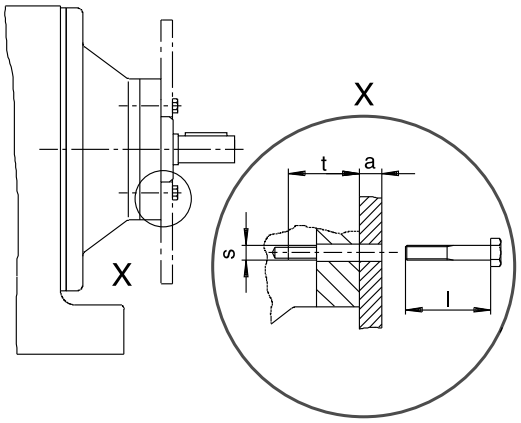
4.13.2 Only AD6/P and AD7/P

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

4.13.3 AD../ZR input shaft assembly with centering shoulder

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 screw length to the next smaller standard length.

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

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

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

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Permitted loads

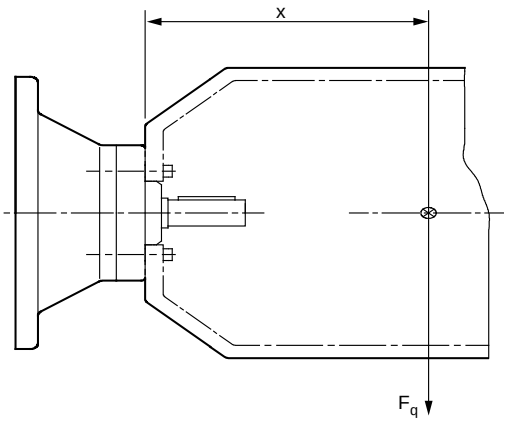
⚠ NOTICE

Impermissibly high loads may occur when mounting a motor.

Potential damage to property

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

The following figure shows the permitted force application points for the permitted maximum weights:



212123659

⊗ Motor's center of gravity
X Distance from adapter flange to the middle of the motor
Fq Overhung load

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

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

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4.13.4 AD../RS – cover with backstop

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

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



⚠ NOTICE

If the actual speed level is below the minimum lift-off speed level, the backstops are subject to wear, and the resulting friction causes the temperature to increase.

Possible damage to property

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

Type	Maximum locking torque of the backstop [Nm]	Minimum lift-off speed [rpm]
AD2/RS	65	820
AD3/RS	425	620
AD4/RS	850	530
AD5/RS	1450	480
AD6/RS	1950	450
AD7/RS	1950	450
AD8/RS	1950	450

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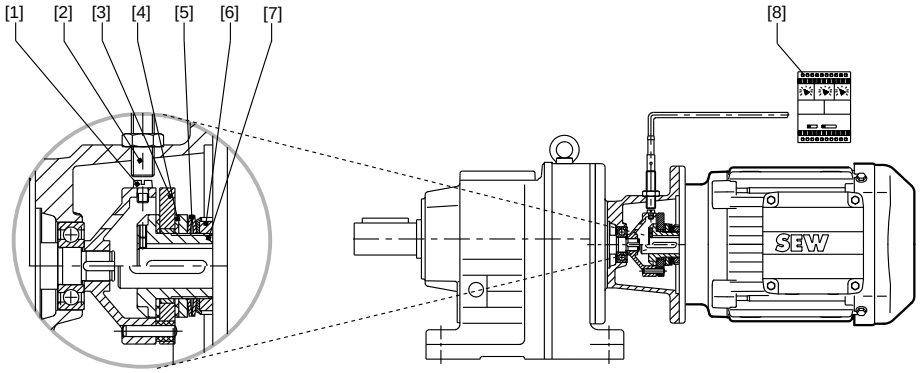
4.14 Accessory equipment

4.14.1 AR.. and AT.. centrifugal and friction couplings

AR.. friction coupling

Drives with a friction coupling consist of a standard gear unit and motor/variable speed gearmotor with an adapter installed between them. This adapter accommodates the friction coupling. In gearmotors with a multi-stage gear unit, the friction coupling may be located between the first and second gear units. On delivery, the slip torque is set individually according to the drive specifications.

The following figure shows a drive with friction coupling and W: speed monitor



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[1]	Trigger cam	[4]	Friction lining	[7]	Slip hub
[2]	Encoder	[5]	Spring washer	[8]	Speed monitor
[3]	Driving disk	[6]	Slotted nut		

W speed monitor:

The speed monitor is used with constant-speed gearmotors and is connected to the encoder in the adapter.

WS slip monitor:

The slip monitor is used with the following components:

- Speed-controlled motors with speed sensor
- VARIBLOC® variable speed gear units

INFORMATION

For detailed information about the AR.. coupling, refer to the "Centrifugal and Friction Couplings AR.. and AT.." operating instructions, part number 17036011/EN.

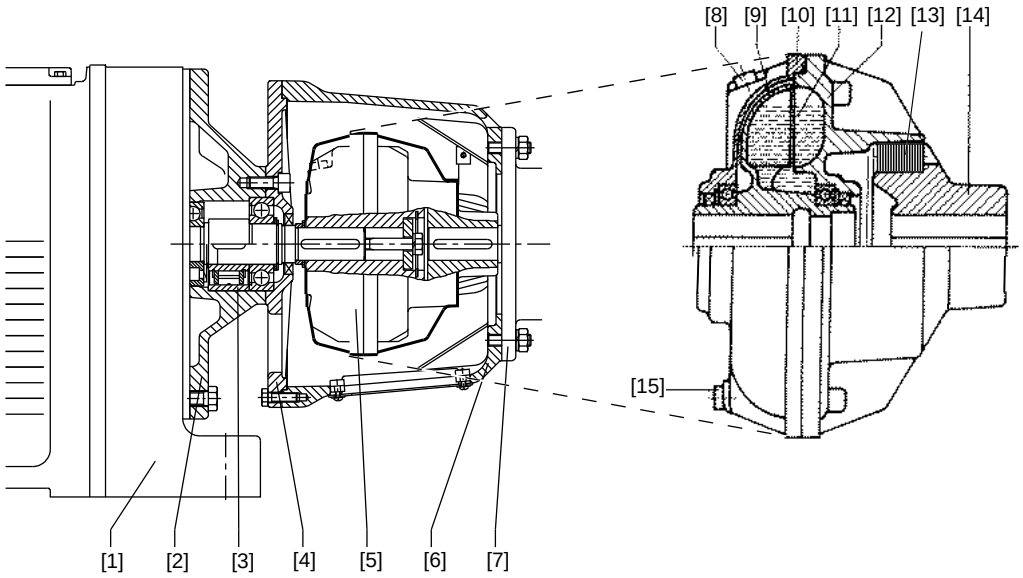
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AT.. hydraulic centrifugal coupling

Hydraulic centrifugal couplings are fluid couplings based on the Föttinger principle. They consist of 2 hinged hemispheres with blades separated by a tight gap.

The applied torque is transmitted by the inertial force of the streaming fluid. This fluid circulates within a closed circuit, between the pump wheel (primary side) [12] on the driving shaft (motor shaft) and the turbine wheel (secondary side) [9] on the driven shaft (gear unit input shaft).

The following figure shows the structure of a drive with hydraulic centrifugal coupling:



1901143691

[1]	Gear unit	[6]	Extended housing complete	[11]	Operating fluid (hydraulic oil)
[2]	Basic flange complete	[7]	Motor	[12]	Pump wheel
[3]	Backstop (optional)	[8]	Filler plug	[13]	Elastic components
[4]	Intermediate flange	[9]	Turbine wheel	[14]	Flexible connecting coupling
[5]	Hydraulic centrifugal coupling	[10]	Coupling half	[15]	Fusible screw plug

INFORMATION

For detailed information about the AT.. coupling, refer to the "Centrifugal and Friction Couplings AR.. and AT.." operating instructions, part number 17036011/EN.

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4.14.2 Diagnostic units DUV and DUO

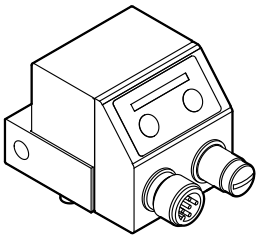
DUV diagnostic unit

The DUV30A diagnostic unit evaluates vibration signals using frequency analysis methods. A micromechanical acceleration sensor is used in the unit. Data can be recorded, processed and evaluated locally without any expert knowledge.

The DUV30A diagnostic unit is suitable for early recognition of rolling element bearing damage or unbalance. The continuous monitoring function represents a reliable and cost-effective solution compared to intermittent methods.

The DUV30A has been designed as a combined sensor that can be used as normal- or slow-speed unit. The only difference is the measuring time in the firmware and the resulting frequency range.

The following figure shows the DUV30A diagnostic unit:



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INFORMATION

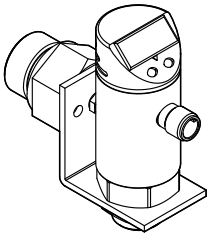
You find more information about the evaluation unit in the "DUV30A Diagnostic Unit" manual, part number 16710010/EN.

DUO diagnostic unit

DUO10A comprises a diagnostic unit and a temperature sensor. The temperature sensor (PT100 or PT1000 resistance sensor) is positioned in the gear unit oil to record the oil's temperature. The diagnostic unit uses the oil temperature values to calculate the remaining service life of the oil.

The diagnostic unit records the gear unit temperature continuously and calculates the remaining service life for the selected oil type immediately. For this purpose, the diagnostic unit must be supplied with a 24 V voltage supply. Times when the diagnostic unit is switched off are not included in the forecast.

The following figure shows the DUO10A diagnostic unit:



4719800843

INFORMATION

You find more information on the evaluation unit in the "DUV30A Diagnostic Unit" manual, part number 11473428/EN.

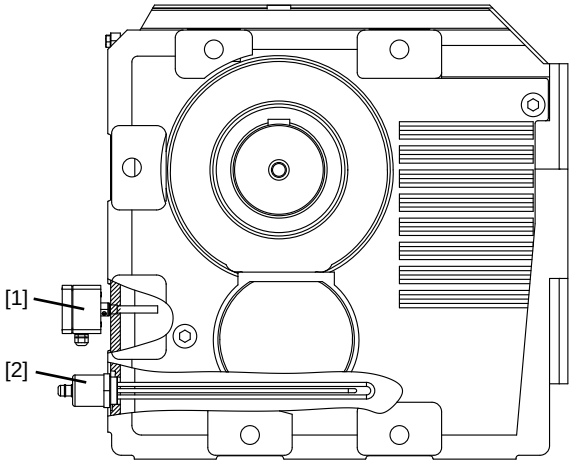
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4.14.3 Gear unit heater for gear unit series R..7, F..7, and K..7

Oil heating can be required in order to allow for a smooth startup in the event of a cold start at low ambient temperatures. An oil heater is available with external or integrated thermostat depending on the gear unit design.

The heater is screwed into the gear unit housing and is controlled via a thermostat. The limit temperature of the heater, below which the oil must be heated, is set depending on the respective lubricant.

The following figure shows a gear unit with heater and external thermostat:



2060553483

[1] Thermostat
[2] Heater

INFORMATION

For detailed information about the gear unit heater, refer to the "Gear Unit Series R..7, F..7, and K..7 – Gear Unit Heater" addendum to the operating instructions, part number 16840410/EN.

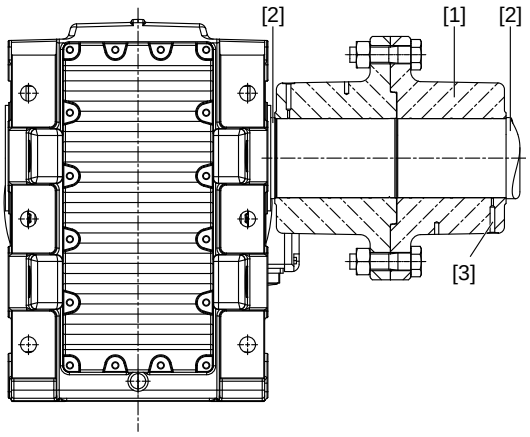
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4.14.4 Flange coupling

Flange couplings [1] are rigid couplings for connecting 2 shafts [2].

They are suitable for operation in both directions of rotation, but cannot compensate any shaft misalignments.

Torque between shaft and coupling is transmitted via a cylindrical interference fit. The two coupling halves are mounted together at their flanges. The couplings are equipped with several disassembly bores [3] for removing the interference fit hydraulically.



18014402706266635

[1] Flange coupling
[2] Customer and gear unit shaft
[3] Disassembly bores

INFORMATION

For detailed information about the flange coupling, refer to the "Gear Unit Series R..7, F..7, K..7, S..7, and SPIROPLAN® W – Flange Coupling" addendum to the operating instructions, part number 19318413/EN.

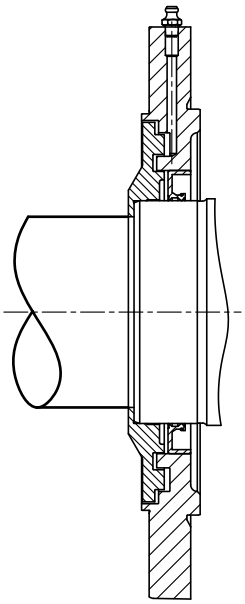
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4.14.5 Regreasing the labyrinth seal

Output shaft

The following figure shows an example of a regreasable radial labyrinth seal (taconite).

- Single oil seal with radial labyrinth seal
- Used in **very dusty** environments with abrasive particles



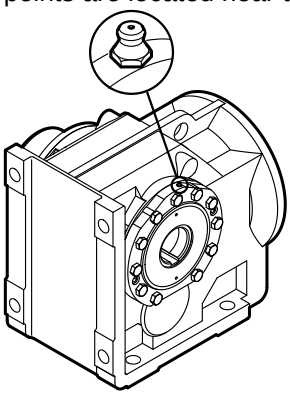
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INFORMATION

Make sure that the gear unit shaft is rotating during the regreasing process.

Position of greasing points

Regreasable sealing systems are usually equipped with taper greasing nipples according to DIN 71412 A. Regreasing must be carried out at regular intervals. The greasing points are located near the output shaft, see following figure:



4986644747

Refilling grease

Regreasable sealing systems can be refilled with lubricating grease. Use moderate pressure to force grease into each lubrication point until new grease leaks out of the sealing gap.

Used grease, including contaminants and sand, is in this way pressed out of the sealing gap.

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INFORMATION

Immediately remove the old grease that leaked out.

Inspection and maintenance intervals

Observe the following inspection and maintenance intervals for the regreasing of labyrinth seals:

Time interval	What to do?
Every 3000 operating hours, at least every 6 months	Fill regreasable sealing systems with grease.

Technical data

Sealing and rolling bearing grease

The table shows the greases recommended by SEW-EURODRIVE for an operating temperature of -40 °C to +80 °C.

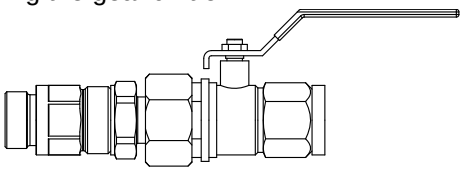
Manufacturer	Grease
Fuchs	Renolit CX TOM 15 OEM
Aral	Aral Eural Grease EP2
Aral	Aral Aralube BAB EP2

NOTE

If a customer wants to use a grease that is not listed in the above table, the customer has to make sure that it is suitable for the intended application.

4.14.6 Oil drain valve

The gear unit is equipped with an oil drain plug as standard. An oil drain valve may be provided as option. This valve allows for a drain pipe to be easily attached when changing the gear unit oil.



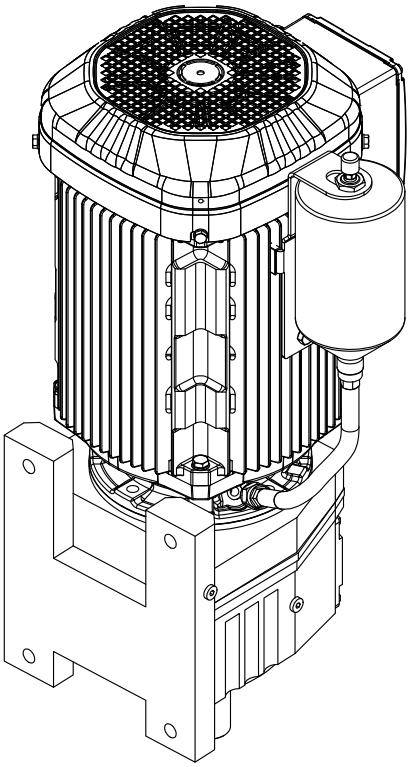
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4.14.7 Oil expansion tank

The oil expansion tank is to compensate for oil volume variations in the system caused by temperature fluctuations. When the gear unit temperature increases, the expansion tank absorbs some of the increasing oil volume and feeds it back to the gear unit as the temperature goes down. As a result, the gear unit is always completely filled with oil.

The figure shows an example of a gearmotor in mounting position M4:



4986667147

4.14.8 Oil-air cooler for splash lubrication /OAC

If the thermal rating of the naturally cooled gear unit is not sufficient, an oil-air cooling system can be used.

The cooling system is delivered without electrical wiring and piping as a complete unit on a base frame for separate installation.

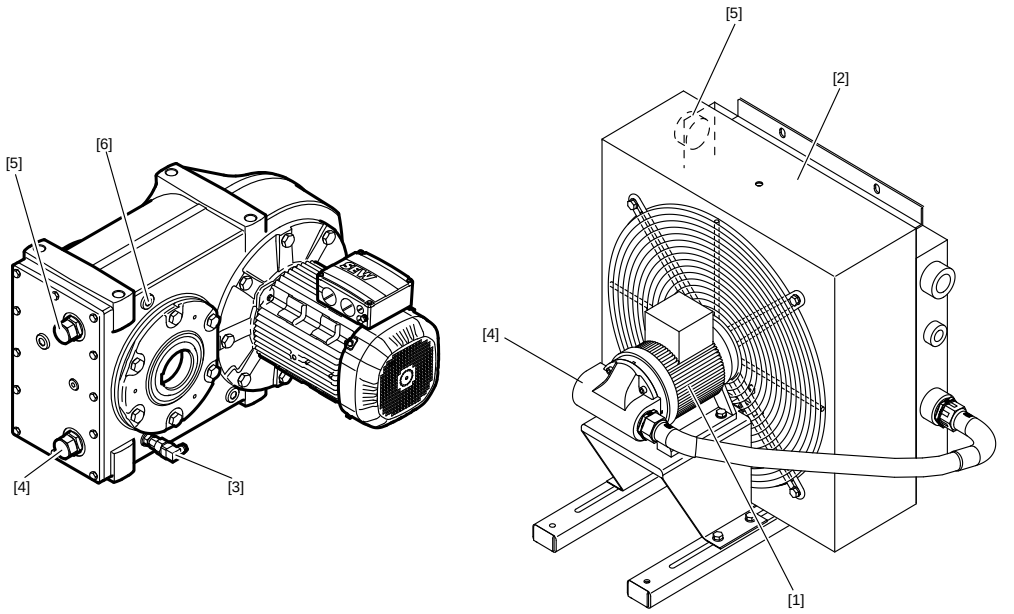
The standard scope of delivery of the cooling system includes:

- Pump with directly mounted asynchronous motor
- Oil-air heat exchanger
- Temperature switch with 2 switching points

SEW-EURODRIVE uses oil-air cooling systems for standard gear units in sizes OAC 005 and OAC 010.

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The following figure shows an example of a standard parallel-shaft helical gear unit next to an oil-air cooler.



8981051403

[1] Motor for pump and fan
[2] Oil-air heat exchanger
[3] Temperature switch with two switching points
[4] Suction pipe connections
[5] Pressure pipe connections
[6] Option: Oil expansion tank connection

INFORMATION

For more information on the cooling system, refer to the addendum to the operating instructions "Type R..7, F..7, K..7, K..9, S..7 and SPIROPLAN® Gear Units: Oil-air cooler for splash lubrication /OAC".

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5 Startup



⚠ CAUTION

Improper startup may result in damage to the gear unit.

Possible damage to property.

- Note the following:

- Before startup, check that the oil level is correct. Refer to the unit's nameplate for lubricant fill quantities.
- The oil checking and drain screws and the breather valves must be freely accessible.
- The most important technical data is provided on the nameplate. Additional data relevant for operation is available in drawings and the order confirmation.
- Ensure that all retaining screws are tight after the gear unit has been installed.
- Make sure that the orientation has not changed after tightening the mounting elements.
- Prior to startup, ensure that rotating shafts as well as couplings are equipped with suitable protective covers.
- If an oil sight glass is used for checking the oil level, ensure that it is protected against damage.
- It is essential that there is no open fire or risk of sparks when working on the gear unit.
- Protect the gear unit from falling objects.
- Remove transport fixtures prior to startup.
- Adhere to the safety notes in the individual chapters.

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5.1 Checking the oil level

Before startup, make sure that the oil level corresponds to the mounting position. Observe section "Checking the oil level and changing the oil" (page 89).

If the gear unit is equipped with an oil sight glass, you can also determine the oil level at the oil sight glass.

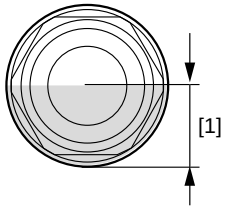
NOTICE

Damage to the gear unit due to oil leaking from the oil sight glass.

Possible damage to the unit.

- Attach a suitable protective device to exclude damage to the oil sight glass as a result from shock or blows.

1. Observe the notes in chapter "Preliminary work regarding inspection/maintenance".
2. Check the oil level at the oil sight glass according to the following figure:



4158756363

[1] The oil level must be within this range

3. Proceed as follows if the oil level is too low:
   - Open the respective oil fill plug, see chapter "Inspection/maintenance for the gear unit".
   - Fill in new oil of the same type via the oil fill plug up to the mark.
   - Screw in the oil fill plug.

Before startup, make sure that the oil level corresponds to the mounting position. Observe section "Checking the oil level and changing the oil" (page 89).

5.2 Pseudo-leakage at shaft seals

Due to their operating principle, seals between moving surfaces at shaft passages cannot be completely tight, as a lubricant film must form during operation. The lubricant film between shaft and sealing lip keeps the development of heat and wear on the sealing system to a minimum and ensures the intended service life. The optimum sealing properties are only achieved after the run-in phase.

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5.3 Helical-worm and SPIROPLAN® W gear units

5.3.1 Run-in period

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

Helical-worm gear units

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

SPIROPLAN® gear units

W10 / W20 / W30		**W37 / W47**	
i range	**η reduction**	**i range**	**η reduction**
approx. 35 ... 75	approx. 15%		
approx. 20 ... 35	approx. 10%		
approx. 10 ... 20	approx. 8%	approx. 30...70	approx. 8%
approx. 8	approx. 5%	approx. 10 ... 30	approx. 5%
approx. 6	approx. 3%	approx. 3...10	approx. 3%

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

No special startup instructions are required for helical, parallel-shaft helical and helical-bevel gear units providing the gear units have been installed in accordance with chapter "Mechanical Installation" (page 18).

5.5 Gear units with backstop

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

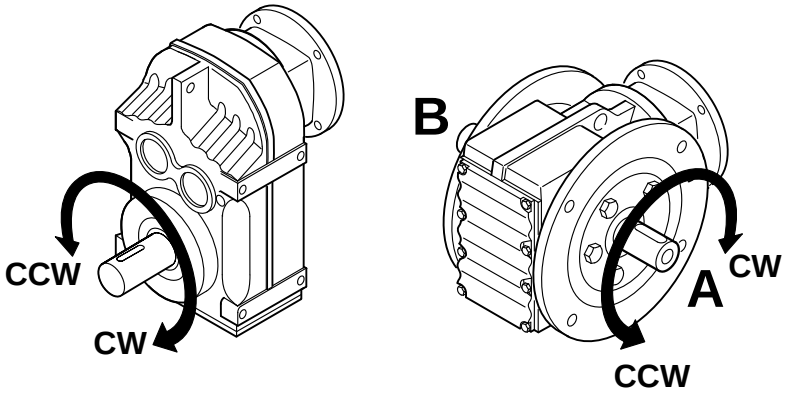


⚠ NOTICE

Operating the motor in the blocking direction could destroy the backstop.

Possible damage to property

- Do not start up the motor in the blocking direction. Be sure that the motor power supply is correctly connected so that the motor rotates in the required direction.
- The backstop can be operated in blocking direction with half the output torque once for control purposes.



659173899

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

- Clockwise (CW)
- Counterclockwise (CCW)

The permitted direction of rotation is indicated on the housing.

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5.6 Components made of elastomers with fluorocarbon rubber

Under normal operating conditions and at temperatures up to 200 °C, fluorocarbon rubber is very stable and safe. However, when heated to more than 300 °C, e.g. by fire or the flame of a cutting torch, it forms harmful gases and vapors as well as harmful residue.



⚠ CAUTION

Health risk due to dangerous gases, vapors, and residue created by heating fluorocarbon rubber to > 200 °C.

Damage to health.

- Make sure that components made of fluorocarbon rubber are not exposed to temperatures > 200 °C. Remove the components, if necessary.
- Avoid inhaling fluorocarbon rubber gases and vapors as well as skin and eye contact at all costs.
- Avoid contact with the cooled-down fluorocarbon rubber, as dangerous residue has formed it was heated.

The following components of R..7, F..7, K..7, K..9, S..7, and SPIROPLAN® W gear units can contain elastomers made of fluorocarbon rubber.

- Oil seals
- Breather valve
- Screw plugs

The user is responsible for safe handling during the service life including eco-friendly disposal.

SEW-EURODRIVE is not responsible for damage caused by improper handling.

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6 Inspection/Maintenance

The following gear units are lubricated for life:

- Helical gear units R07, R17, R27
- Parallel-shaft helical gear units F27
- SPIROPLAN® gear units

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

6.1 Preliminary work regarding gear unit inspection/maintenance

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



⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before starting work and protect it against unintentional re-start.



⚠ WARNING

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

Severe injuries.

- Let the gear unit cool down before you begin with your work.
- Only remove the oil level and oil drain plug very carefully.



NOTICE

Filling the wrong oil may result in significantly different lubricant characteristics.

Potential damage to property

- Do not mix different synthetic lubricants and do not mix synthetic with mineral lubricants.
- Mineral oil is used as standard lubricant.



NOTICE

Improper maintenance may result in damage to the gear unit.

Possible damage to property.

- Observe the notes in this chapter.



INFORMATION

The position of the oil level plug, oil drain plug and the breather valve depends on the mounting position. Refer to the diagrams of the mounting positions. See section "Mounting positions (page 104)".

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- Strict adherence to the inspection and maintenance intervals is absolutely necessary to ensure safe working conditions.
- Before releasing shaft connections, make sure that there are no active torsional moments present (tensions within the system).
- Prevent foreign bodies from entering the gear unit during maintenance and inspection work.
- Do not clean the gear unit with a high-pressure cleaning system as water might enter the gear unit and the seals might be damaged.
- Perform safety and function tests following all maintenance and repair work.

6.2 Inspection/maintenance intervals

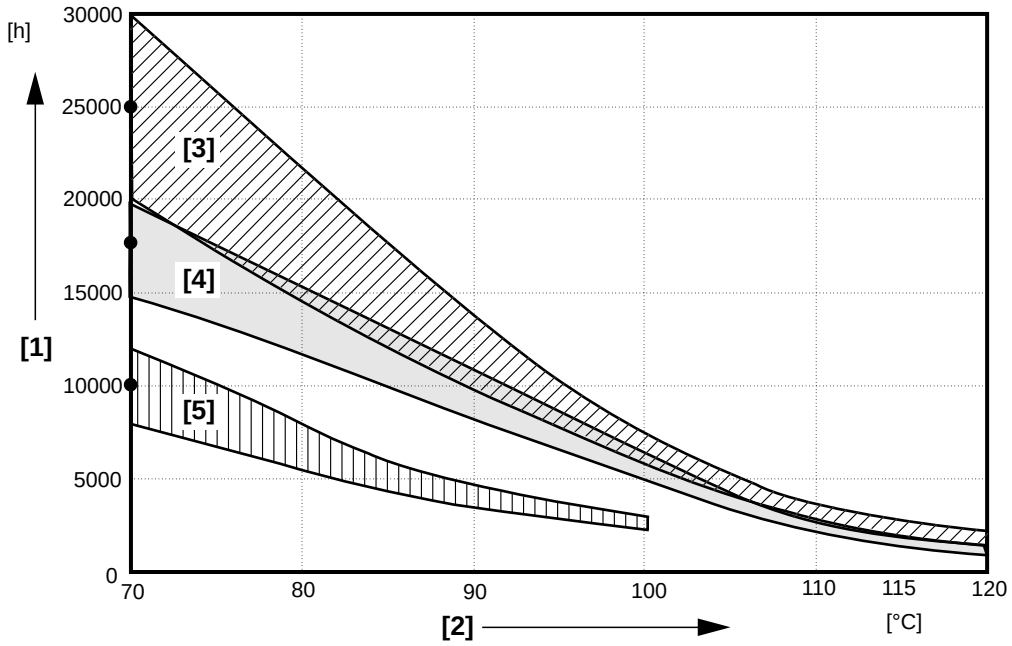
The following table lists the obligatory intervals and the corresponding measures:

Time interval	What to do?
• Every 3,000 hours of operation, at least every 6 months	• Check oil and oil level • Check running noise for possible bearing damage • Visual inspection of the seals for leakage • For gear units with a torque arm: Check and replace the rubber buffers, if necessary
• Depending on the operating conditions (see illustration below), every 3 years at the latest • according to oil temperature	• Change mineral oil
	• Replace rolling bearing grease (recommendation) • Replace oil seal (do not install it in the same track)
• Depending on the operating conditions (see illustration below), every 5 years at the latest • according to oil temperature	• Change synthetic oil
	• Replace rolling bearing grease (recommendation) • Replace oil seal (do not install it in the same track)
• Varying (depending on external factors)	• Touch up or renew the surface/anticorrosion coating

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6.3 Lubricant change intervals

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



[1] Operating hours

[2] Sustained oil bath temperature

- Average value per oil type at 70 °C

[3] CLP PG

[4] CLP HC / HCE

[5] CLP / HLP / E

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6.4 Inspection/maintenance for the AL / AM / AQ. / EWH adapter

The following table lists the obligatory intervals and the corresponding measures:

Time interval	What to do?
• Every 3 000 hours of operation, at least every 6 months	• Check running noise for possible bearing damage • Visually check the adapter for leakage
• After 10 000 hours of operation	• Check torsional play • Visually check the elastic annular gear
• After 25 000 - 30 000 hours of operation	• Renew the rolling bearing grease • Replace oil seal (do not install it in the same track) • Change the elastic annular gear

6.5 Inspection/maintenance for the AD input shaft assembly

The following table lists the obligatory intervals and the corresponding measures:

Time interval	What to do?
• Every 3 000 hours of operation, at least every 6 months	• Check running noise for possible bearing damage • Visually check the adapter for leakage
• After 25 000 - 30 000 hours of operation	• Renew the rolling bearing grease
	• Replace the oil seal

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6.6 Inspection/maintenance for the gear unit

6.6.1 Checking the oil level and changing the oil

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

- Gear unit type
- Size
- Mounting position

Observe the references to the respective sections as well as the following table. Refer to chapter "Mounting Positions (page 104)" for notes on the mounting positions. You cannot check the oil level of gear units in pivoted mounting position. The gear units are delivered with the correct oil level. Observe the designations and fill quantities on the nameplate if you have to change the oil.

Code letter	Chapter "Checking the oil level and changing the oil"	Reference
A:	• Helical gear units... • Parallel-shaft helical gear units... • Helical-bevel gear units...K..37 – 187 • Helical-worm gear units... S..47 – 97 **With oil level plug**	(page 90)
B:	• Helical gear units... • Parallel-shaft helical gear units... • SPIROPLAN® gear units... **Without oil level plug, with cover plate**	(page 92)
C:	• Helical-worm gear units S..37 • Helical-bevel gear units K..19 / K..29 **Without oil level plug and cover plate**	(page 96)
D:	• SPIROPLAN® W..37 / W..47 **In mounting positions M1, M2, M3, M5, M6 with oil level plug**	(page 99)
E:	• SPIROPLAN® W..37 / W..47... **In M4 mounting position without oil level plug and cover plate**	(page 101)

Series	Gear unit	Code letter for chapter "Checking the oil level and changing the oil"					
		M1	M2	M3	M4	M5	M6
R	**R..07 – 27**	B					
	R..37 / R..67	A					
	R..47 / R..57	A				B	A
	R..77 – 167	A					
	RX..57– 107	A					
F	**F..27**	B					
	F..37 – 157	A					
K	**K..19 / K..29**	C					
K	**K..37 – 187**	A					
S	**S..37**	C					
	S..47 – 97	A					
W	**W..10 – 30**	B					
	W..37 – 47	D			E	D	

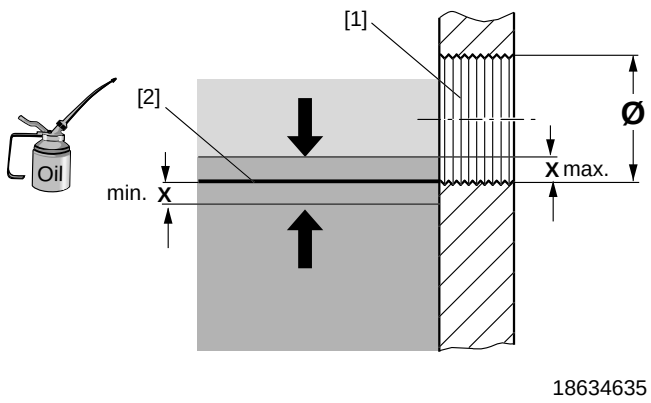
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6.6.2 A: Helical, parallel-shaft helical, helical-bevel and helical-worm gear units with oil level plug

Checking the oil level via oil level plug

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Determine the position of the oil level plug and the breather valve using the mounting position sheets. See chapter "Mounting positions" (page 104).
3. Place a container underneath the oil level plug.
4. Slowly remove the oil level plug. Small amounts of oil may leak out as the permitted maximum oil level is higher than the lower edge of the oil level bore.
5. Check the oil level according to the following figure and the corresponding table.



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

Oil level bore Ø	Min and max fill level = x [mm]
M10 x 1	1.5
M12 x 1.5	2
M22 x 1.5	3
M33 x 2	4
M42 x 2	5

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

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Checking the oil via oil drain plug

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Determine the position of the oil drain plug using the mounting position sheets. See chapter "Mounting Positions" (page 104).
3. Remove a little oil from the oil drain plug.
4. Check the oil consistency.
   - Viscosity
   - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (page 86).
5. Check the oil level. See previous section.

Changing the oil via oil drain plug and breather valve



⚠ WARNING

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

Serious injuries

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Determine the position of the oil drain plug, the oil level plug and the breather valve using the mounting position sheets. See chapter "Mounting Positions" (page 104).
3. Place a container underneath the oil drain plug.
4. Remove the oil level plug, the breather valve and the oil drain plug.
5. Drain all of the oil.
6. Re-insert the oil drain plug.
7. Fill in new oil of the same type via the vent hole (otherwise consult the customer service). Do not mix different synthetic lubricants.
   - Observe the oil fill quantities according to the specifications on the nameplate or according to the mounting position. See chapter "Lubricant fill quantities" (page 136).
   - Check the oil level at the oil level plug.
8. Re-insert the oil level plug and the breather valve.

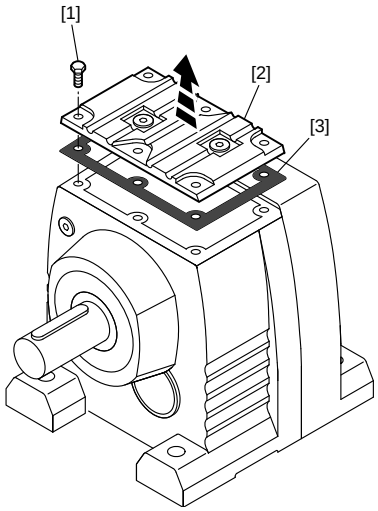
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6.6.3 B: Helical, parallel-shaft helical, SPIROPLAN® gear units without oil level plug with cover plate

Checking the oil level via cover plate

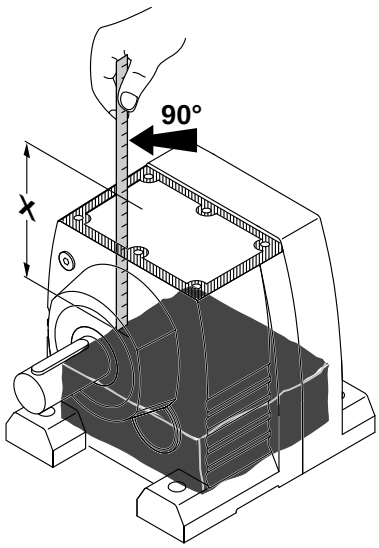
For gear units without oil level bore, the oil level is checked via the cover plate opening. Proceed as follows:

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. For the cover plate to be on top, you have to set up the gear unit in the following mounting position.
   - R07 - R57 in M1 mounting position
   - F27 in M3 mounting position
   - W10 - W30 in M1 mounting position
3. Loosen the screws [1] of the cover plate [2] and remove the cover plate [2] and the corresponding gasket [3] (see following figure).



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



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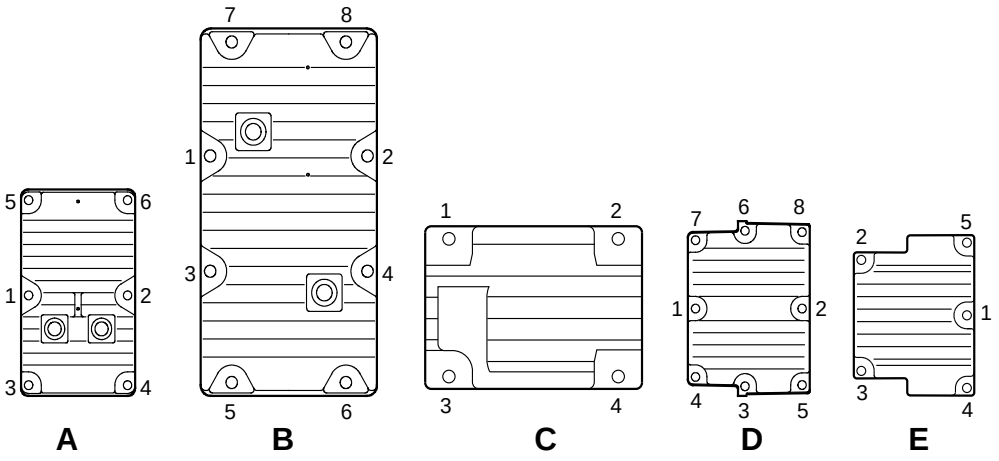
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5. Compare the determined value "x" to the max. distance (depending on the mounting position) between the oil level and the sealing surface of the gear unit housing as specified in the following table. Adjust the fill level if required.

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

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6. Close the gear unit after the oil level check:
   - Re-attach the gasket of the cover plate. Make sure that the sealing surfaces are clean and dry.
   - Screw on the cover plate. Tighten the cover screws with the rated tightening torque according to the following table from the inside to the outside in the order illustrated in the figure. Repeat the tightening procedure until the screws are properly tightened. To prevent the cover plate from being damaged, use only impulse drivers or torque wrenches (no impact screwdrivers).



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

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Checking the oil via cover plate

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Open the cover plate of the gear unit according to section "Checking the oil via the cover plate" (page 92).
3. Take an oil sample via the cover plate opening.
4. Check the oil consistency.
   - Viscosity
   - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (page 86).
5. Check the oil level. See section "Checking the oil level via the cover plate" (page 92).
6. Screw on the cover plate. Observe the order and the tightening torques according to section "Checking the oil level via the cover plate" (page 92)

Changing the oil via cover plate



⚠ WARNING

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

Serious injuries

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Open the cover plate of the gear unit according to chapter "Checking the oil level via the cover plate".
3. Completely drain the oil into a container via the cover plate opening.
4. Fill in new oil of the same type via the cover plate opening (otherwise consult customer service). Do not mix different synthetic lubricants.
   - Pour in the oil in accordance with the mounting position or as specified on the nameplate. See chapter "Lubricant fill quantities" (page 136).
5. Check the oil level.
6. Screw on the cover plate. Observe the order and the tightening torques according to chapter "Checking the oil level via the cover plate" (page 92).

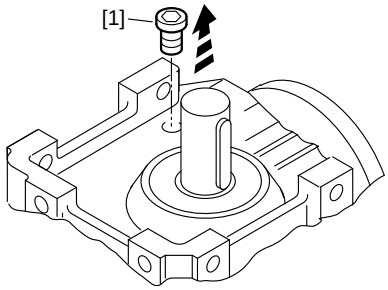
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6.6.4 C: Helical-worm gear units S..37 and helical-bevel gear units K..19/K..29 without oil level plug and cover plate

Checking the oil level via screw plug

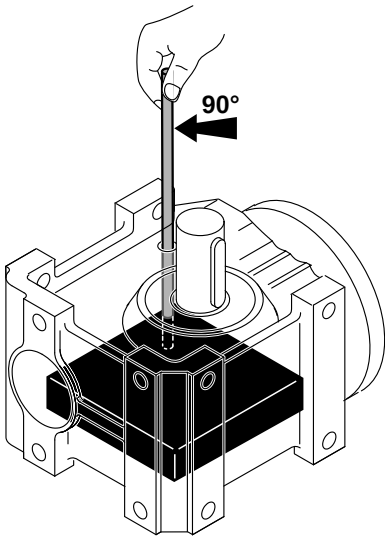
The gear units S..37, K..19, and K..29 are not equipped with an oil level plug or a cover plate. This is why the oil level is checked via the control bore.

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Set up the gear unit in M5 or M6 mounting position, i.e. control bore always on top.
3. Remove the screw plug [1] (see following figure).



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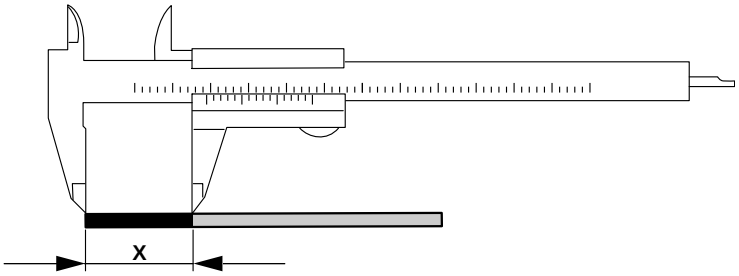
4. Insert the dipstick vertically via the control bore all the way to the bottom of the gear unit housing. Pull out the dipstick vertically (see following figure).



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



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

Gear unit type	Oil level = wetted section x [mm] of the dipstick Mounting position					
	M1	M2	M3	M4	M5	M6
K..19	35 ± 1	35 ± 1	35 ± 1	38 ± 1	35 ± 1	35 ± 1
KF..29	54 ± 1	54 ± 1	54 ± 1	64 ± 1	54 ± 1	54 ± 1
K/KA/KH/ KAF/KHF29	48 ± 1	48 ± 1	48 ± 1	58 ± 1	48 ± 1	48 ± 1
S..37	10 ± 1	24 ± 1	34 ± 1	37 ± 1	24 ± 1	24 ± 1

7. Re-insert and tighten the screw plug.

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Checking the oil via screw plug

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Open the cover plate of the gear unit according to section "Checking the oil level via screw plug".
3. Take an oil sample via the screw plug bore.
4. Check the oil consistency.
   - Viscosity
   - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (page 86).
5. Check the oil level. See previous section.
6. Re-insert and tighten the screw plug.

Changing the oil via screw plug



⚠ WARNING

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

Serious injuries

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Open the cover plate of the gear unit according to section "Checking the oil level via screw plug".
3. Completely drain the oil via the screw plug bore.
4. Fill in new oil of the same type via the control bore (otherwise consult customer service). Do not mix different synthetic lubricants.
   - Observe the oil fill quantities according to the specifications on the nameplate or according to the mounting position. Observe section "Lubricant fill quantities" (page 137).
5. Check the oil level.
6. Re-insert and tighten the screw plug.

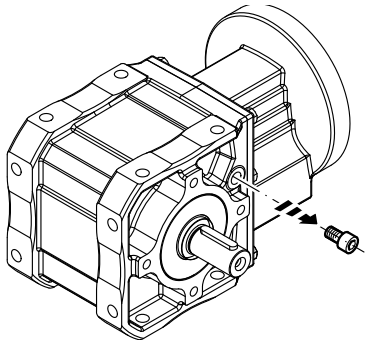
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6.6.5 D: SPIROPLAN® W..37 / W..47 in mounting positions M1, M2, M3, M5, M6 with oil level plug

Checking the oil level via oil level plug

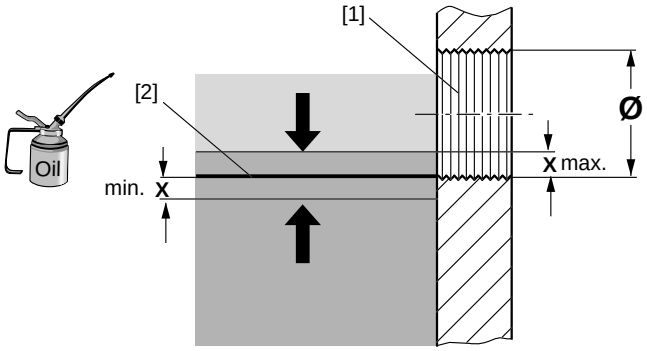
Proceed as follows to check the oil level of the gear unit:

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Set up the gear unit in M1 mounting position.
3. Slowly remove the oil level plug (see following figure). Small amounts of oil may leak out.



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



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

Oil level bore Ø	Min and max fill level = x [mm]
M10 x 1	1.5

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

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Checking the oil via oil level plug

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Remove a little oil at the oil level plug.
3. Check the oil consistency.
   - Viscosity
   - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (page 86).
4. Check the oil level. See previous section.

Changing the oil via oil level plug



⚠ WARNING

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

Serious injuries

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting Positions" (page 104).
3. Place a container underneath the oil level plug.
4. Remove the oil level plugs on the A and B side of the gear unit.
5. Drain all of the oil.
6. Re-insert the lower oil level plug.
7. Fill in new oil of the same type via the upper oil level plug bore (otherwise consult customer service). Do not mix different synthetic lubricants.
   - Observe the oil fill quantities according to the specifications on the nameplate or according to the mounting position. See chapter "Lubricant fill quantities" (page 136).
   - Check the oil level according to chapter "Checking the oil level via oil level plug".
8. Re-insert the upper oil level plug.

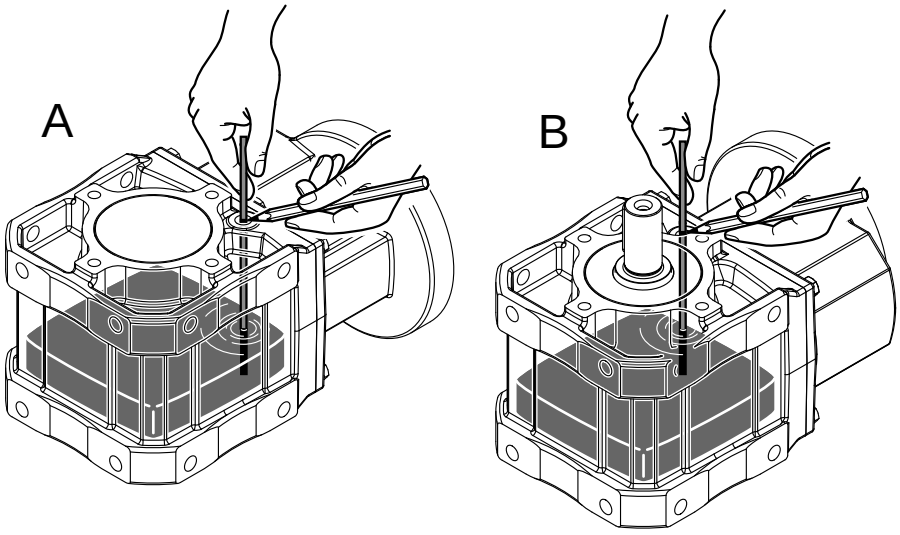
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6.6.6 E: SPIROPLAN® W..37 / W..47 in mounting position M4 without oil level plug and cover plate

Checking the oil level via screw plug

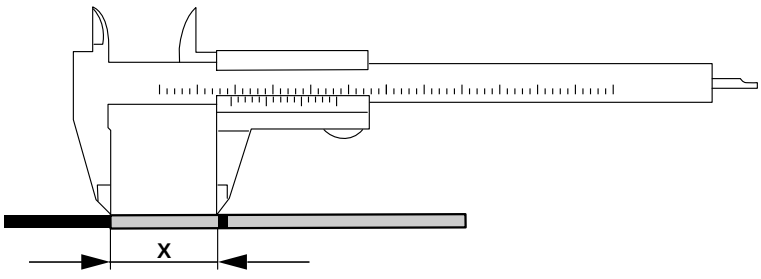
The W37/W47 gear units are not equipped with an oil level plug or a cover plate. This is why the oil level is checked via the control bore.

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Set up the gear unit in M5 or M6 mounting position.
3. Remove the screw plug.
4. Insert the dipstick vertically via the control bore all the way to the bottom of the gear unit housing. Mark the point on the dipstick where it exits the gear unit. Pull out the dipstick vertically (see following figure).



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



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

Gear unit type	Oil level = wetted section x [mm] of the dipstick Mounting position during the check	
	M5 Lying on the A side	M6 Lying on the B side
W37 in M4 mounting position	37 ± 1	29 ± 1
W47 in M4 mounting position	41 ± 1	30 ± 1

7. Re-insert and tighten the screw plug.

Checking the oil via screw plug

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

1. Observe the notes in chapter "Preliminary work regarding gear unit inspection/maintenance" (page 85).
2. Remove a little oil at the oil screw plug.
3. Check the oil consistency.
   - Viscosity
   - If you can see that the oil is heavily contaminated, we recommend that you change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (page 86).
4. Check the oil level. See previous section.

Changing the oil via screw plug



⚠ WARNING

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

Serious injuries

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

1. Observe the notes in section "Preliminary work regarding gear unit inspection/maintenance".
2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting Positions".
3. Place a container underneath the screw plug.
4. Remove the screw plugs on the A and B side of the gear unit.
5. Drain all of the oil.

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

6.6.7 Replacing the oil seal



⚠ NOTICE

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

Possible damage to property.

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

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

6.6.8 Painting the gear unit



⚠ NOTICE

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

Possible damage to property.

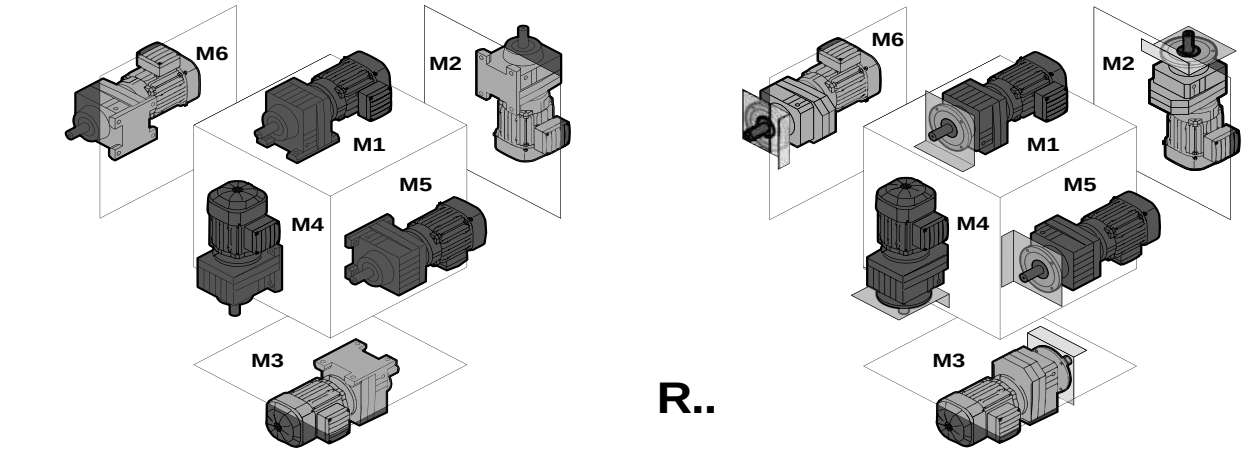
- Thoroughly cover the breather valves and the sealing lip of the oil seals with strips prior to painting.
- Remove the strips after painting.

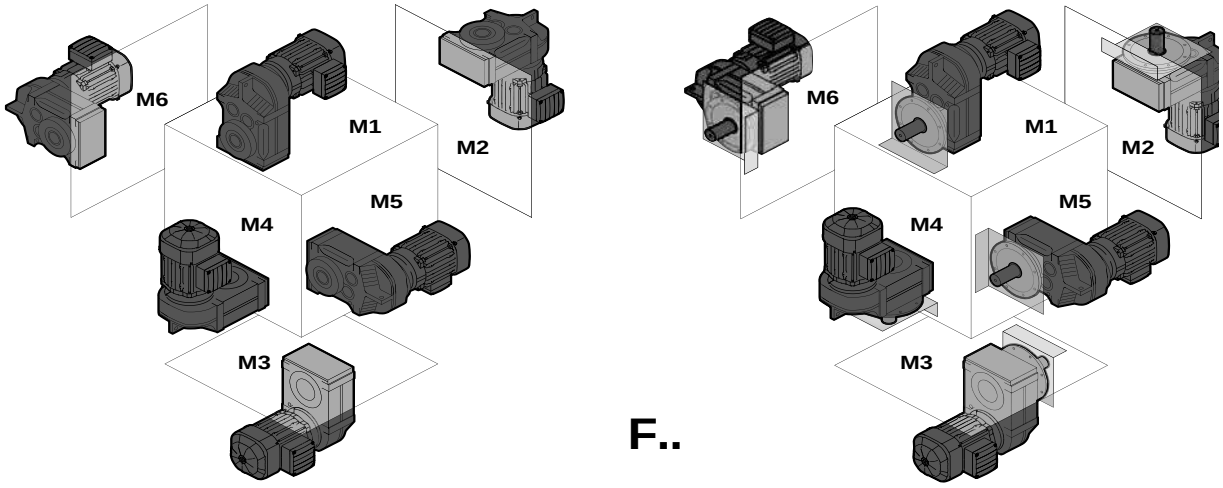
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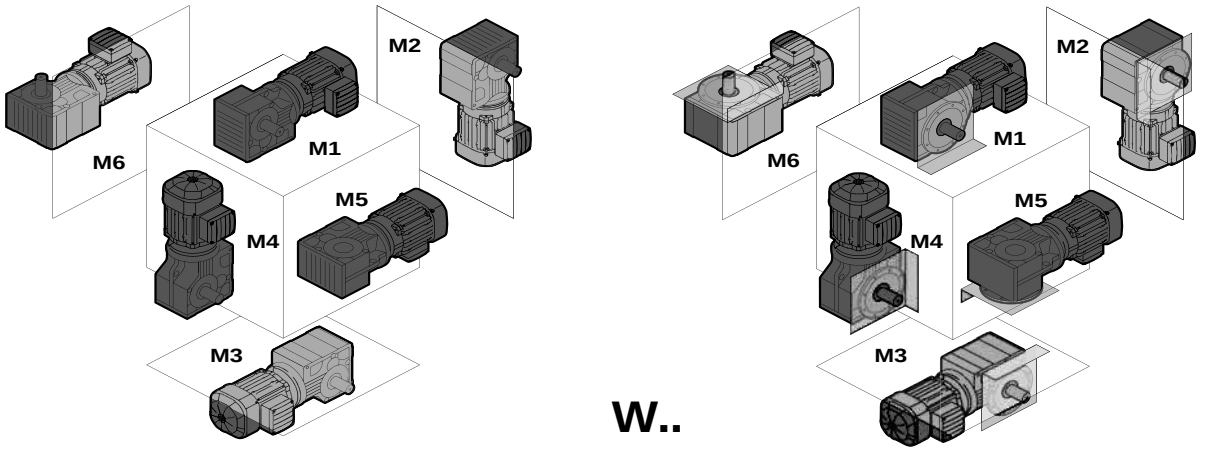
7 Mounting Positions

7.1 Designation of the mounting positions

SEW differentiates between six mounting positions, M1 – M6. The following figure shows the spatial orientation of the gearmotor in mounting positions M1 – M6.







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7.2 Churning losses

* → Page XX

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

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

7.3 Mounting position MX

Mounting position MX is available for all gear units of the R..7, F..7, K..7, K..9, S..7 and SPIROPLAN® W series.

For mounting position MX, the gear units are delivered with the maximally possible amount of oil and sealed with oil screw plugs. A breather valve is included with each drive. The customer will have to adjust the oil quantity to the proper level depending on the final mounting position in which the gear unit will be operated. Customers will also have to mount the enclosed breather valve at the proper location depending on the mounting position, see mounting position sheets.

The correct oil level must be checked according to chapter "Checking the oil level and changing the oil" (page 89).

7.4 Universal mounting position M0

SPIROPLAN® W10 – W30 gearmotors can be ordered with M0 universal mounting position as an option. Gear units with mounting position M0 are filled with the standard amount of oil.

These gear units are entirely enclosed due to their small size. They can therefore be designed without breather valve. Customers can use the gear unit universally in every mounting position (M1 – M6) without having to take any measures prior to startup.

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7.5 Mounting positions of SPIROPLAN® gear units

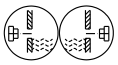
INFORMATION

SPIROPLAN® gearmotors are not dependent on the mounting position, except for W37 – W47 in M4 mounting position. However, mounting positions M1 to M6 are also shown for SPIROPLAN® gearmotors for a complete overview.

Notice: SPIROPLAN® gearmotors of sizes W10 – W30 cannot be equipped with breather valves, oil level plugs or drain plugs.

7.6 Key

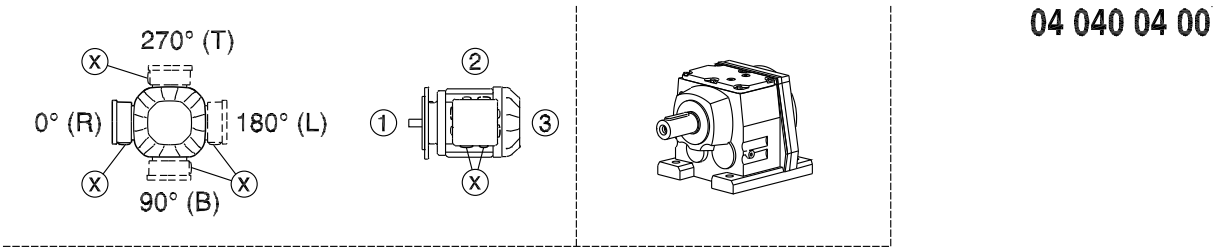
The following table shows the symbols used in the mounting position sheets and what they mean:

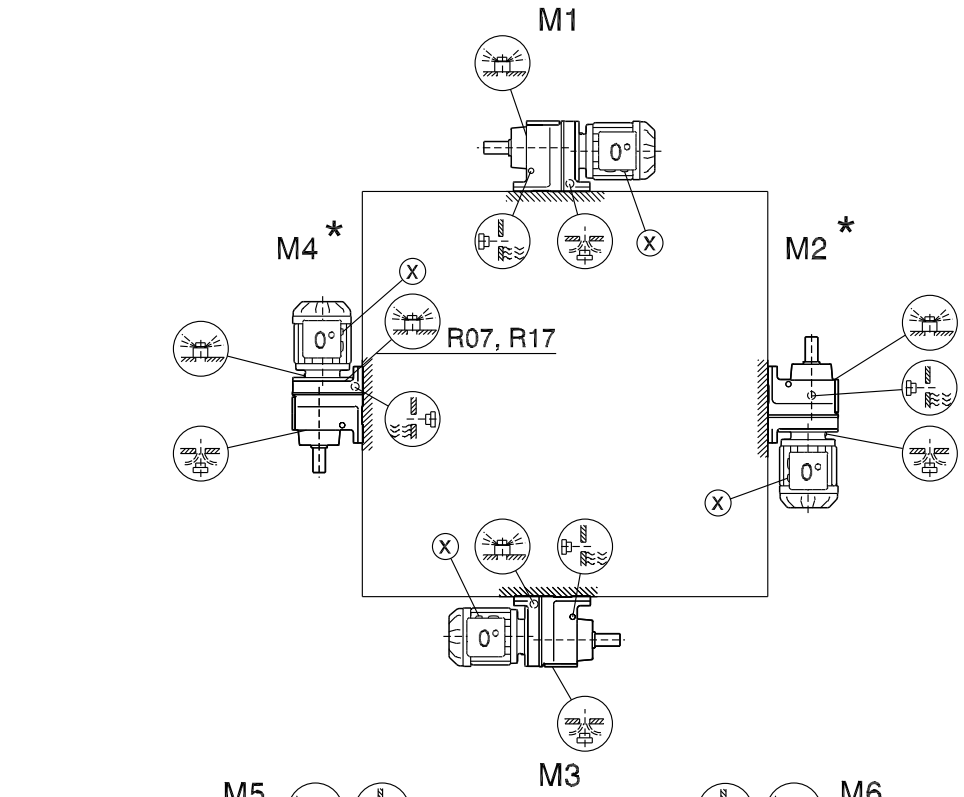
Symbol	Meaning
	Breather valve
	Oil level plug
	Oil drain plug

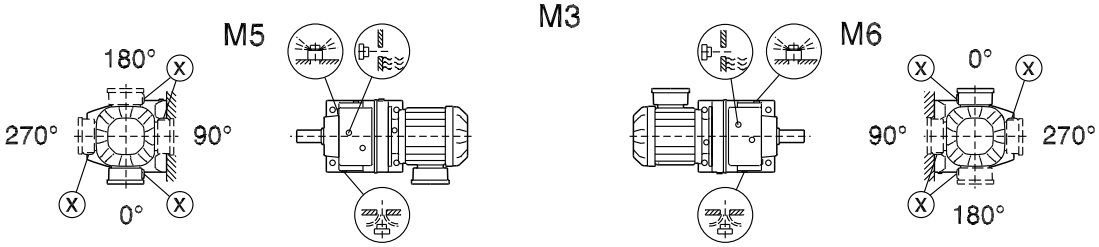
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7.7 Helical gearmotors R

7.7.1 R07 – R167





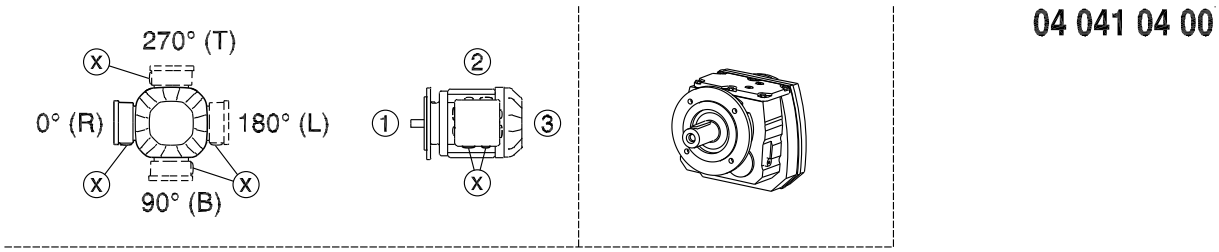


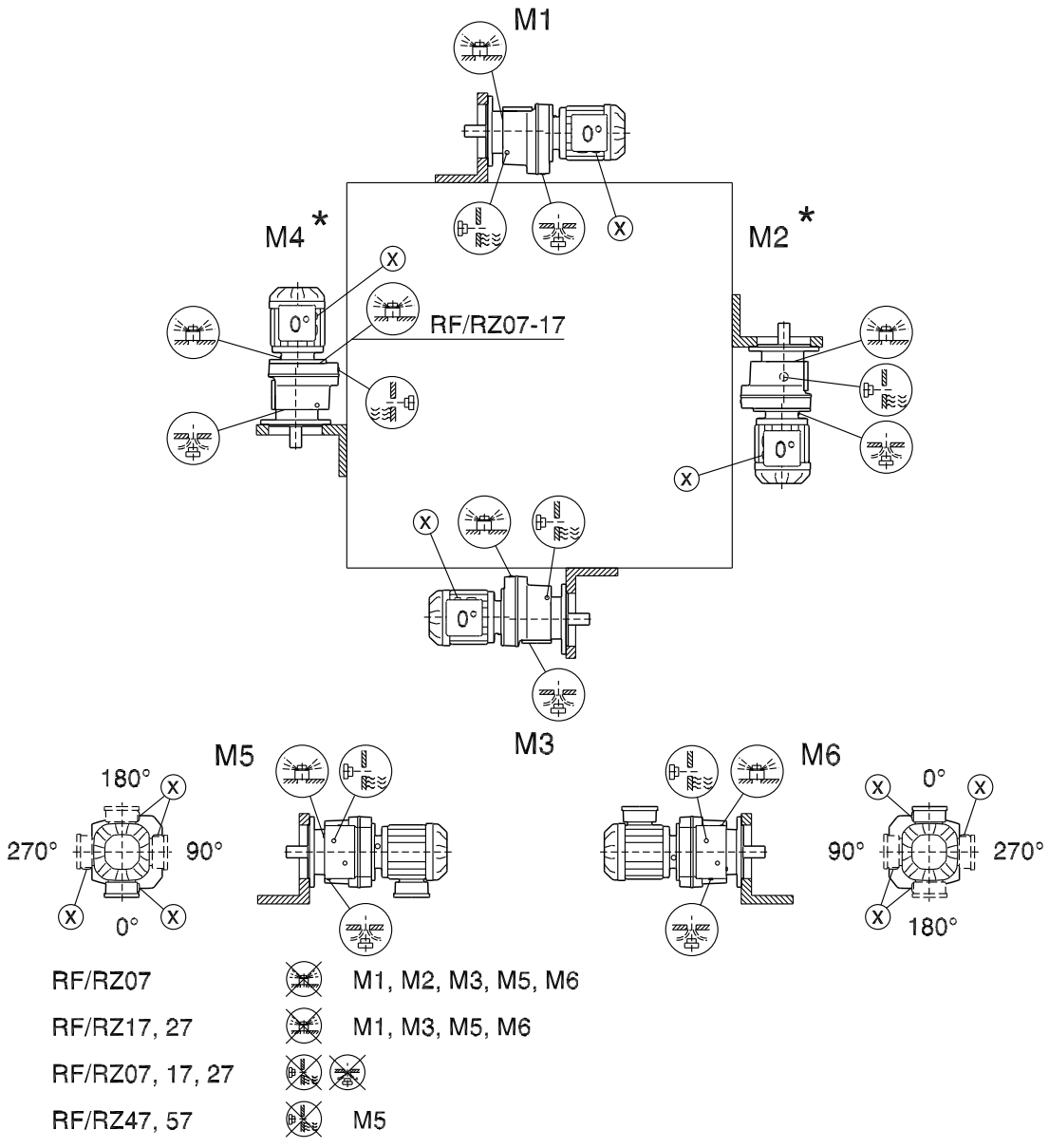
R07	⊗	M1, M2, M3, M5, M6
R17, R27	⊗	M1, M3, M5, M6
R07, R17, R27	⊗ ⊗	
R47, R57	⊗	M5

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7.7.2 RF07 – RF167, RZ07 – RZ87

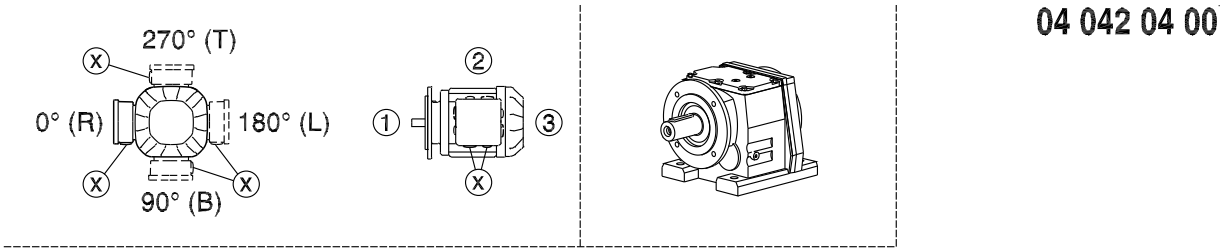


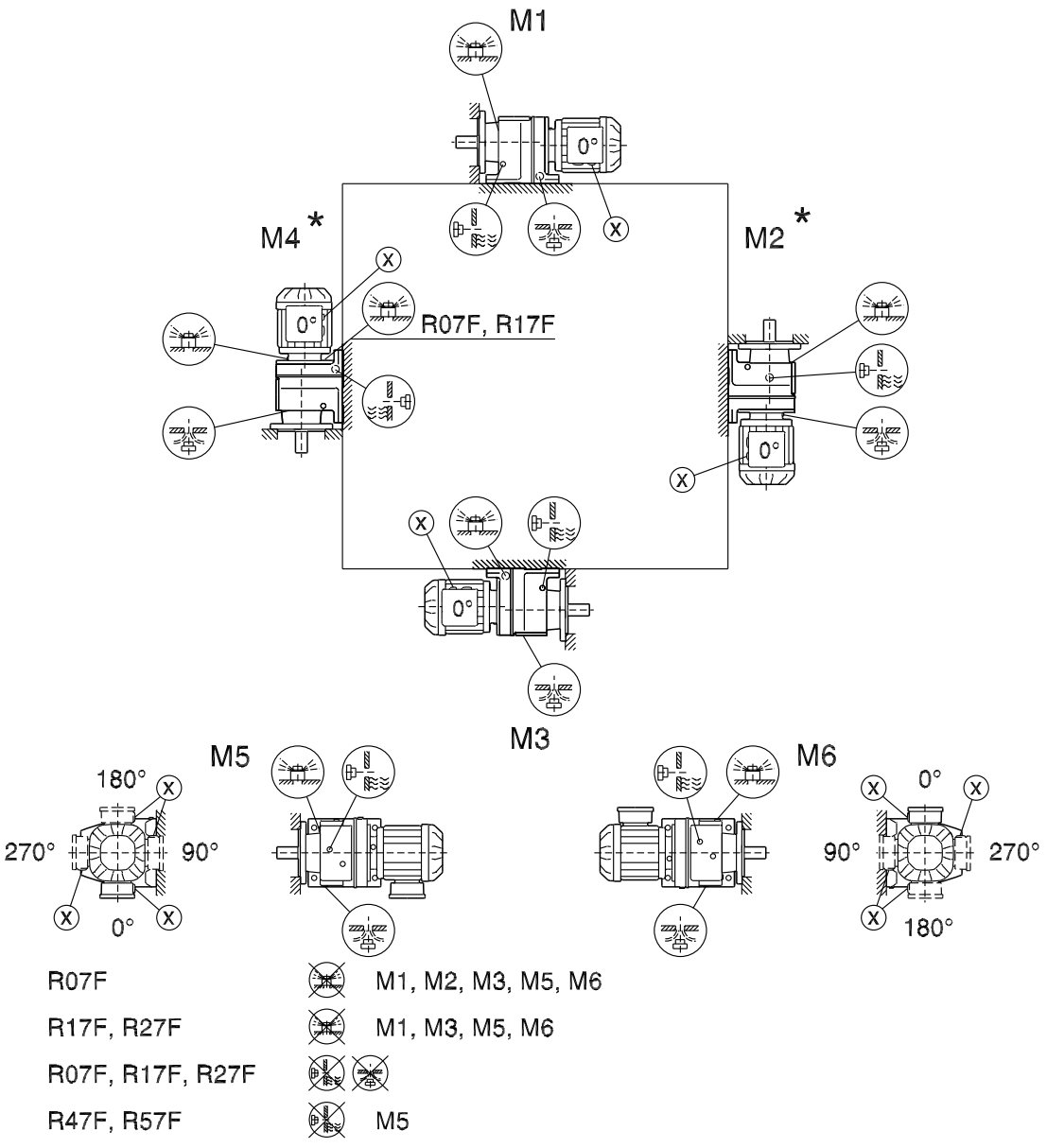


* → (page 105)

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7.7.3 R07F – R87F





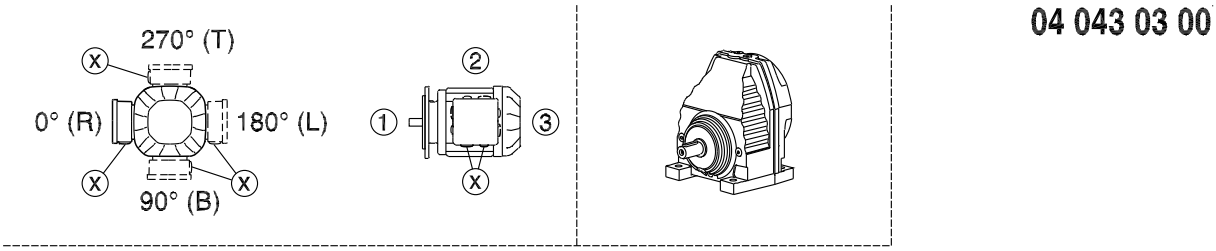
R07F	M1, M2, M3, M5, M6
R17F, R27F	M1, M3, M5, M6
R07F, R17F, R27F	
R47F, R57F	M5

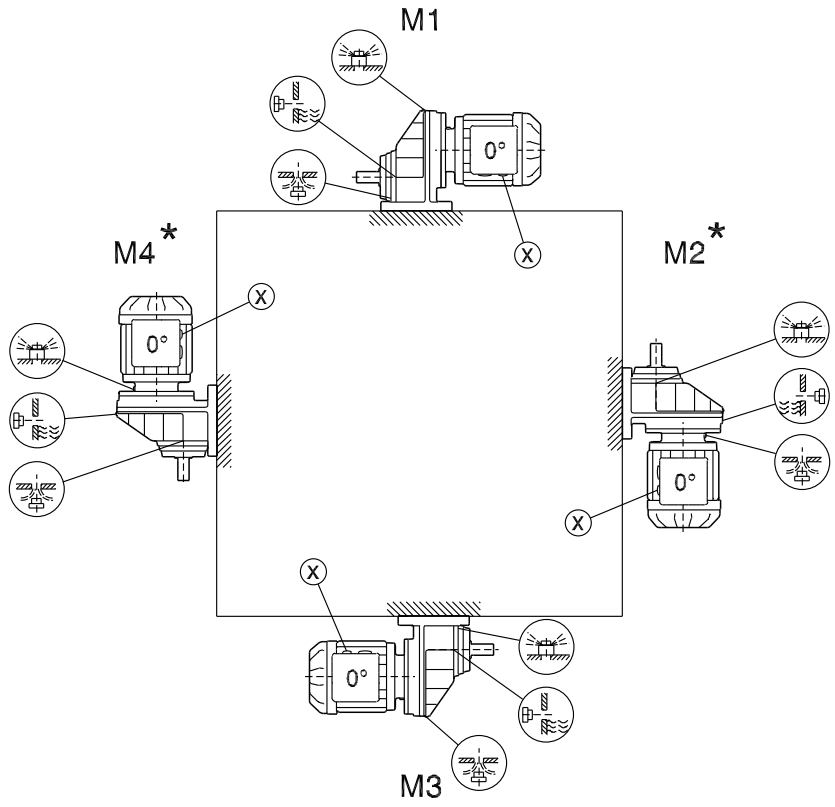
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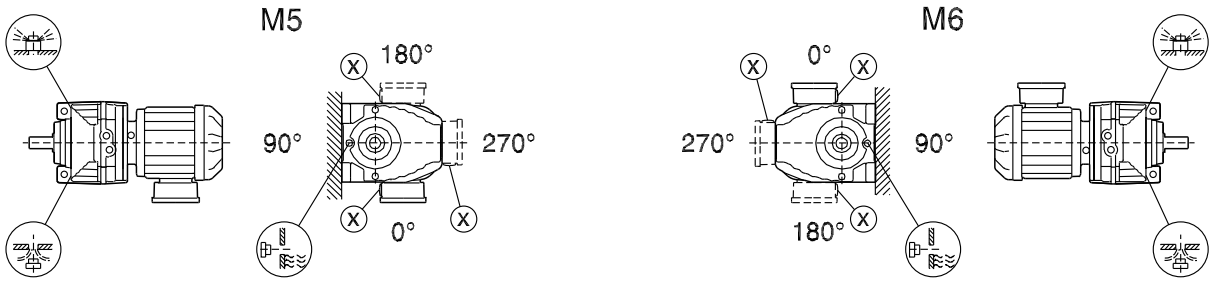
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7.8 Helical gearmotors RX

7.8.1 RX57 – RX107



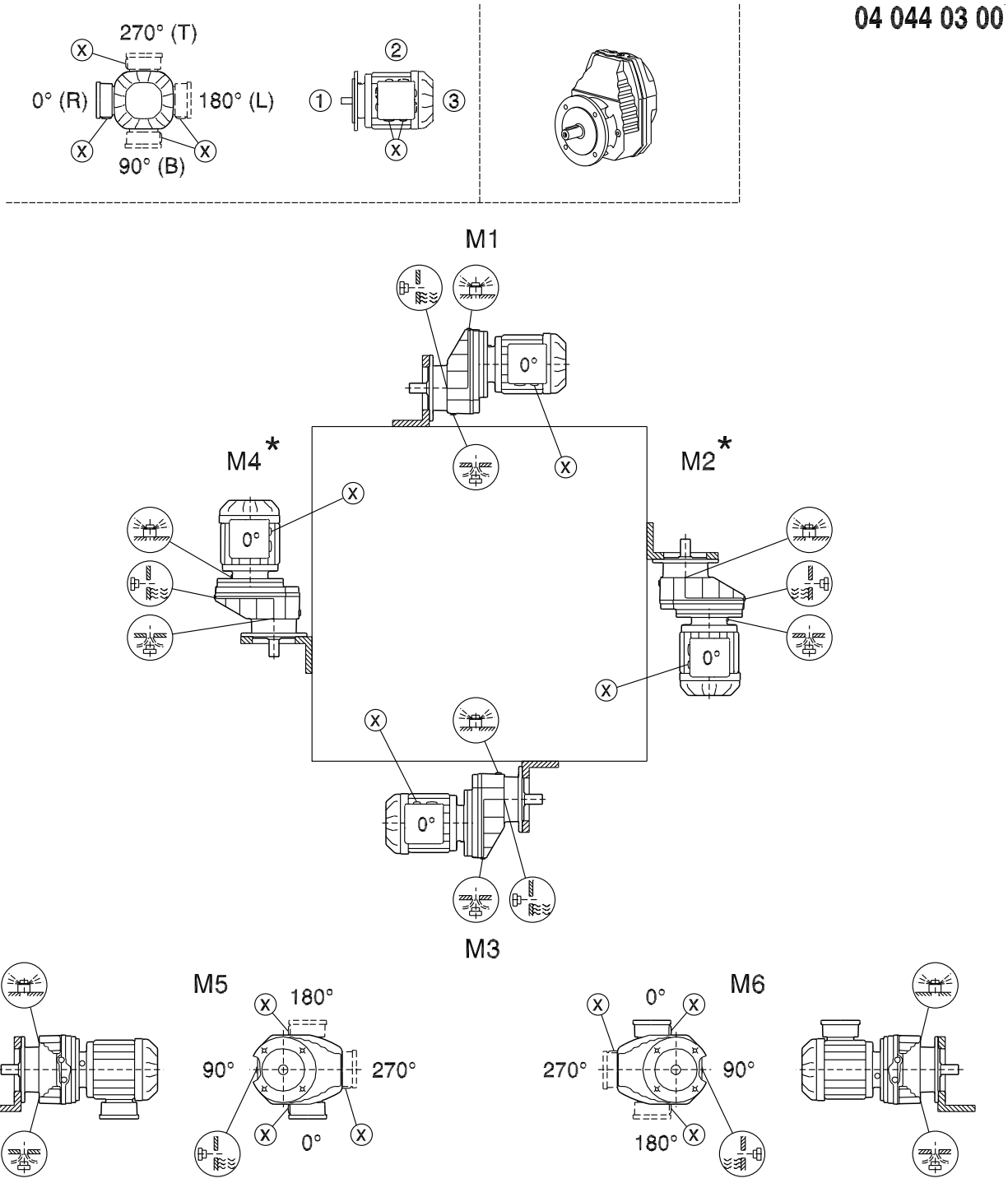




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7.8.2 RXF57 – RXF107

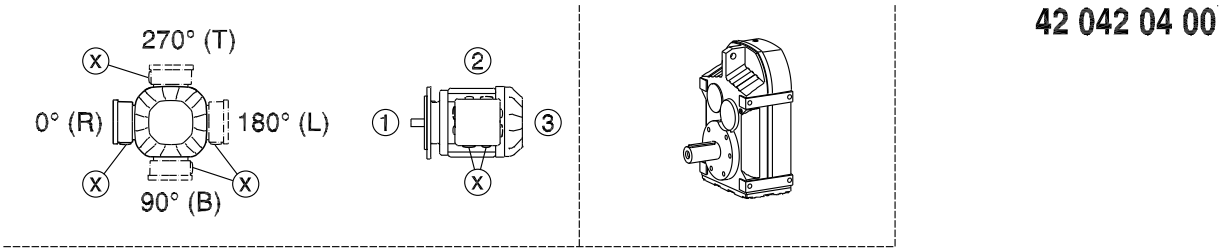


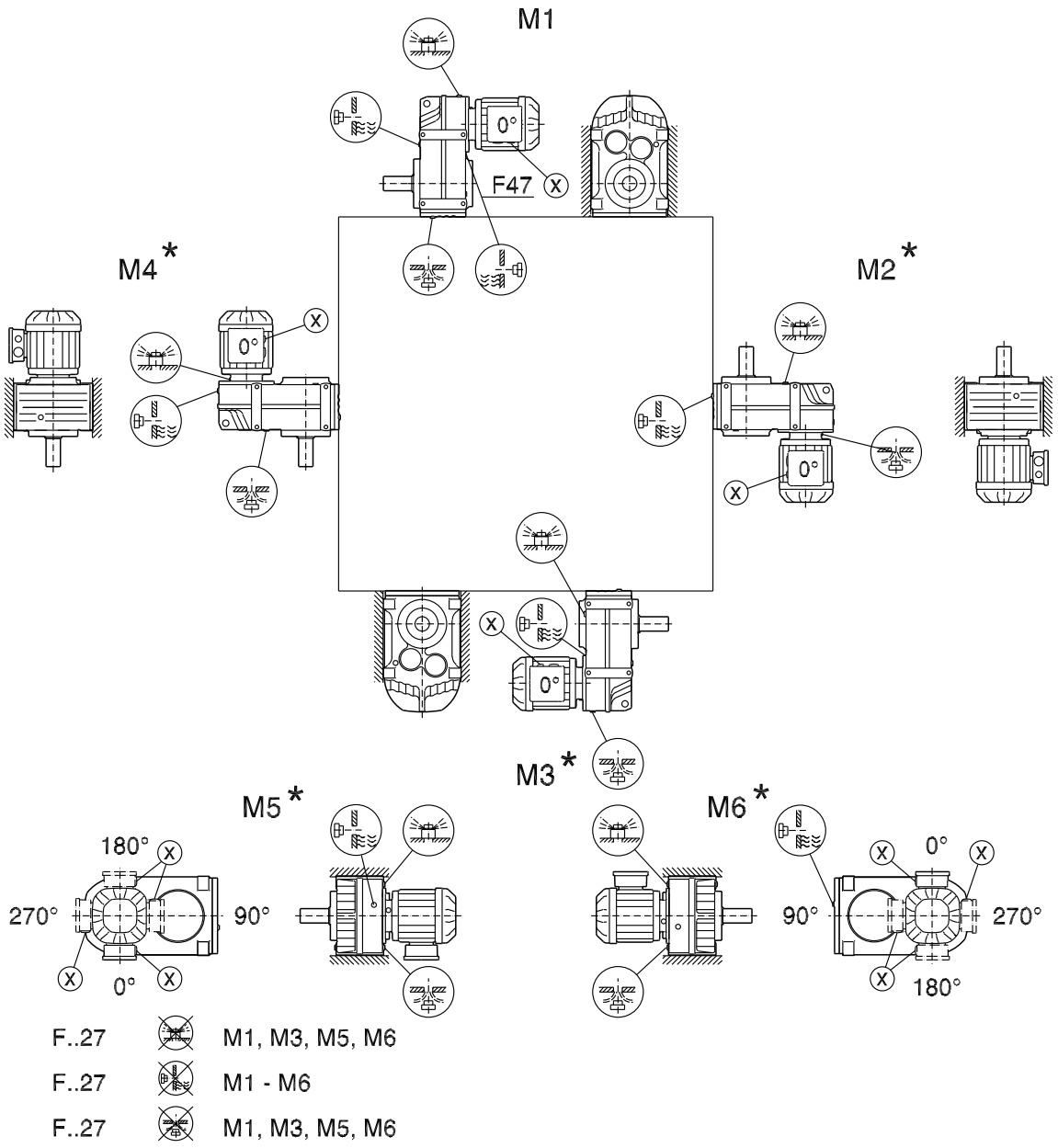
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7.9 Parallel-shaft helical gearmotors F

7.9.1 F27 – F157 / FA27B – F157B / FH27B – FH157B / FV27B – FV107B





F..27 M1, M3, M5, M6

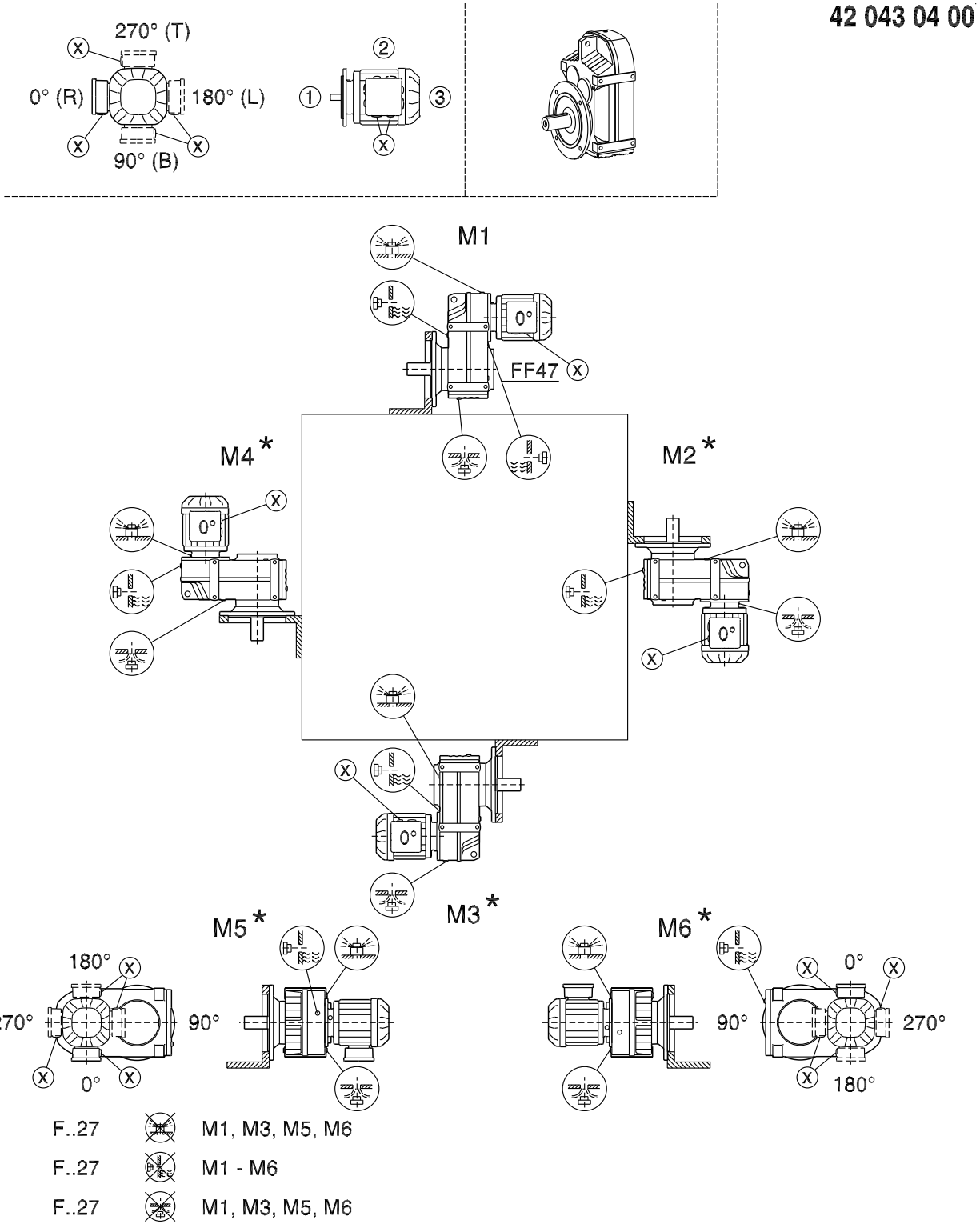
F..27 M1 - M6

F..27 M1, M3, M5, M6

* → (page 105)

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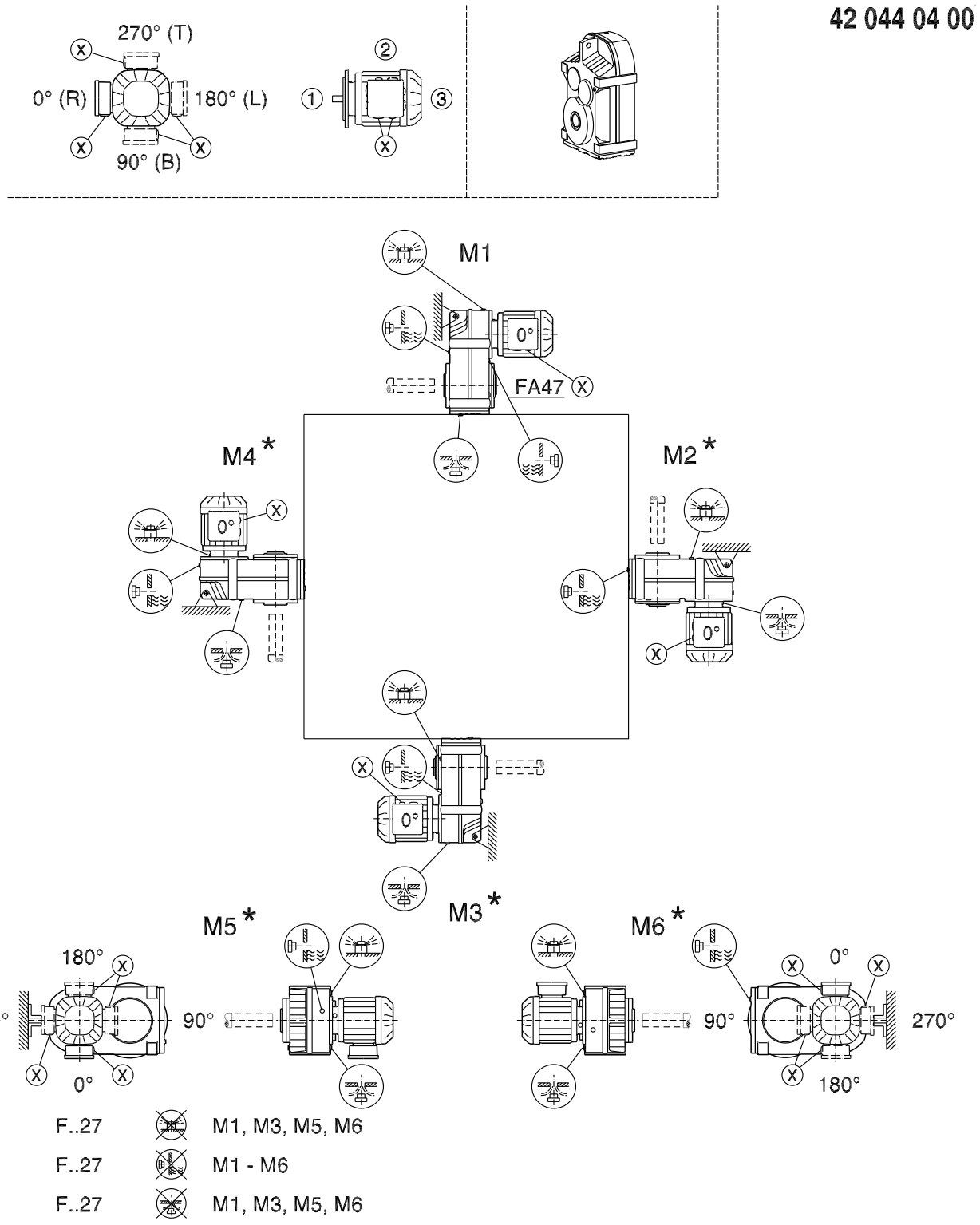
7.9.2 FF27 – FF157 / FAF27 – FAF157 / FHF27 – FHF157 / FAZ27 – FAZ157 / FHZ27 – FHZ157 / FVF27 – FVF107 / FVZ27 – FVZ107



* → (page 105)

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7.9.3 FA27 – FA157 / FH27 – FH157 / FV27 – FV107 / FT37 – FT157

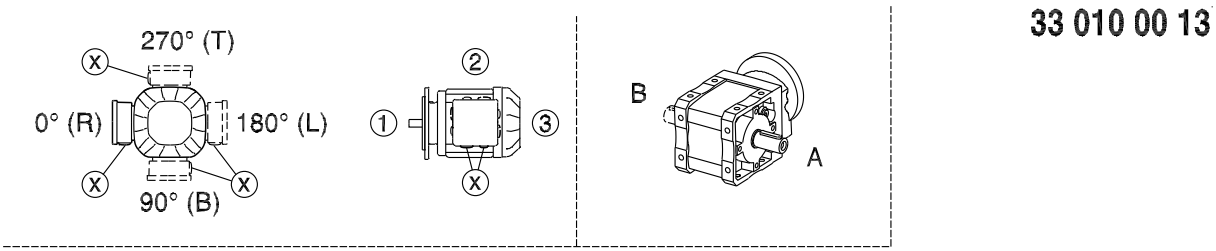


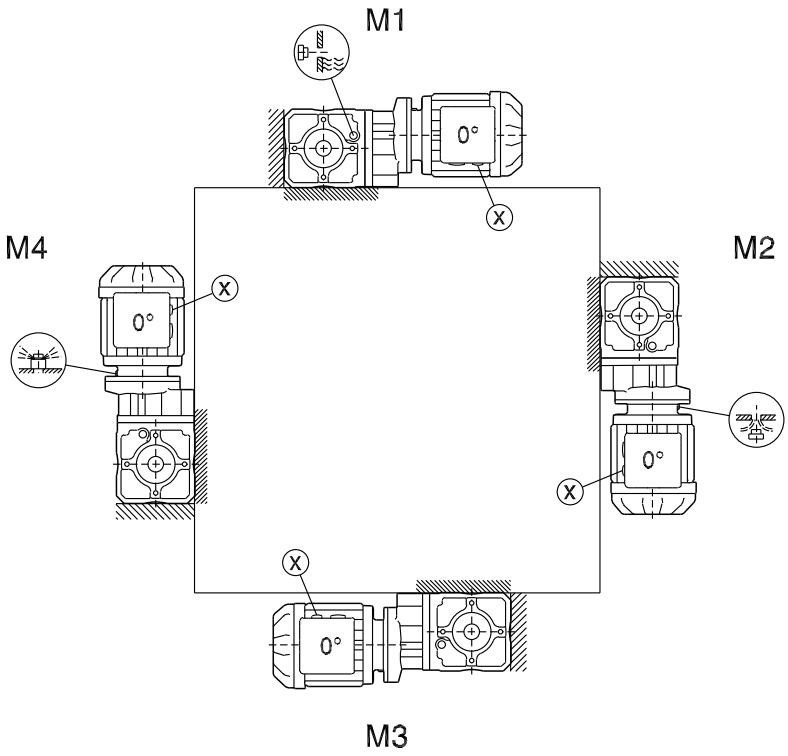
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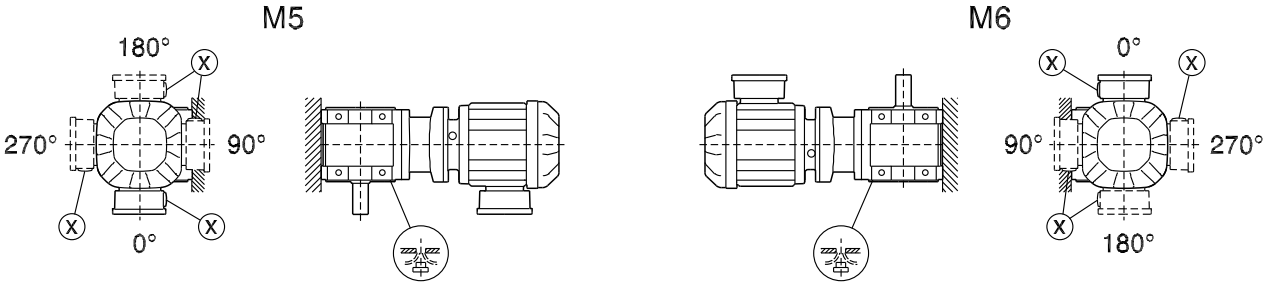
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7.10 Helical-bevel gearmotors K

7.10.1 K19 – K29 / KA19B – KA29B / KH19B – KH29B





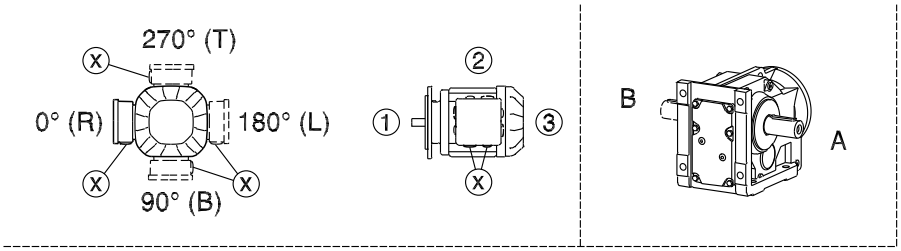


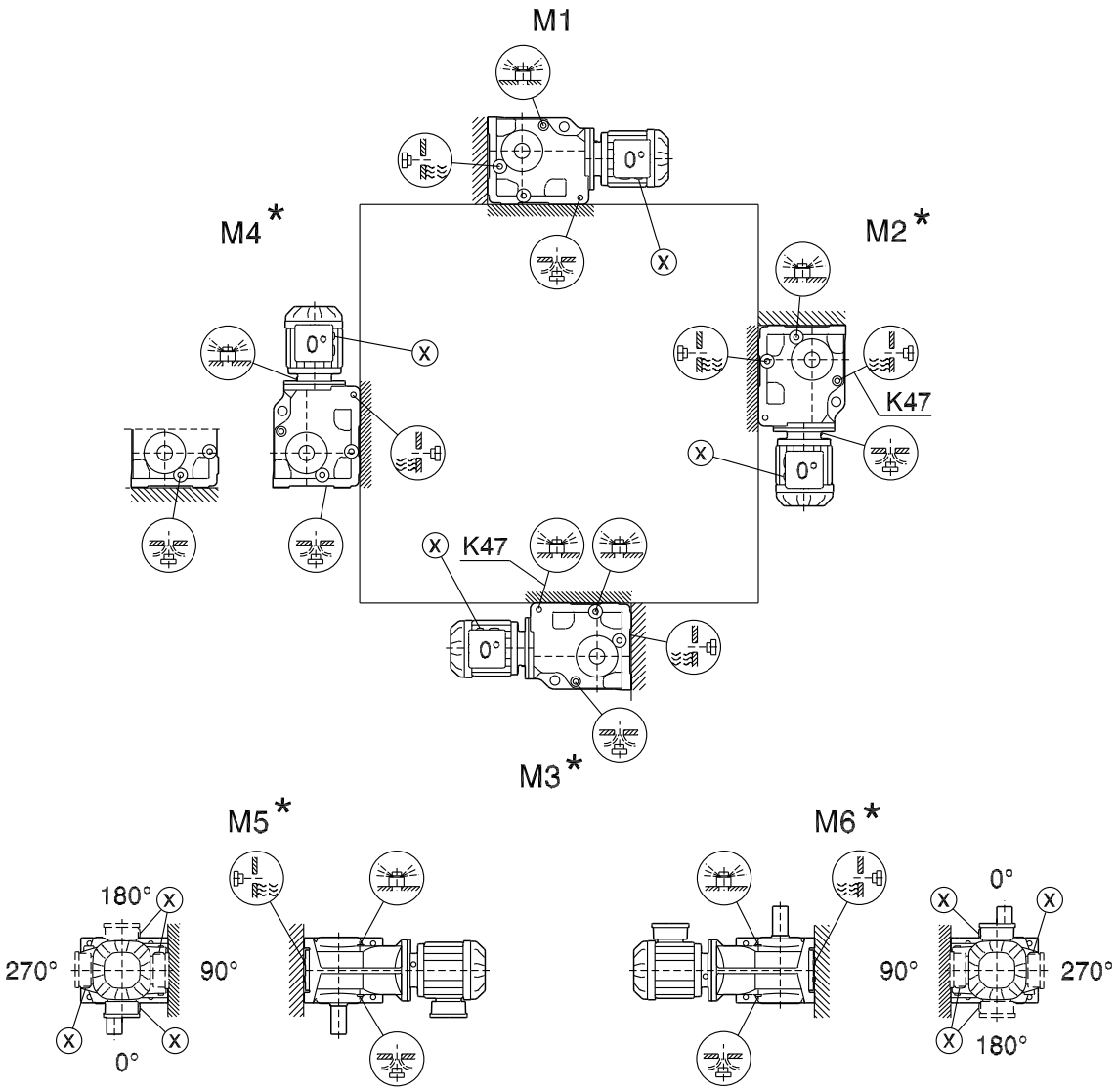
* → (page 105)

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7.10.2 K37 – K157 / KA37B – KA157B / KH37B – KH157B / KV37B – KV107B

34 025 04 00

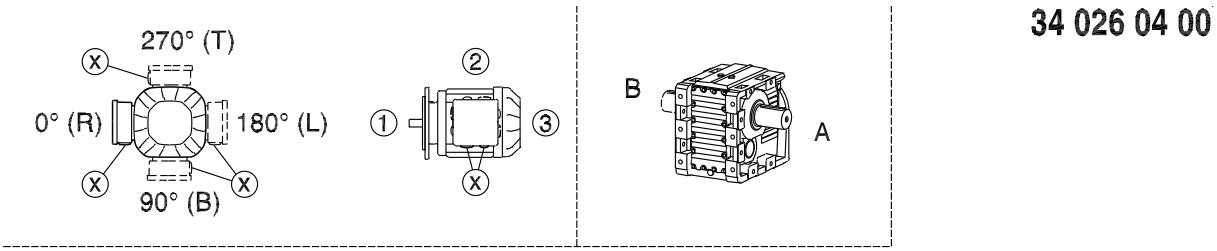


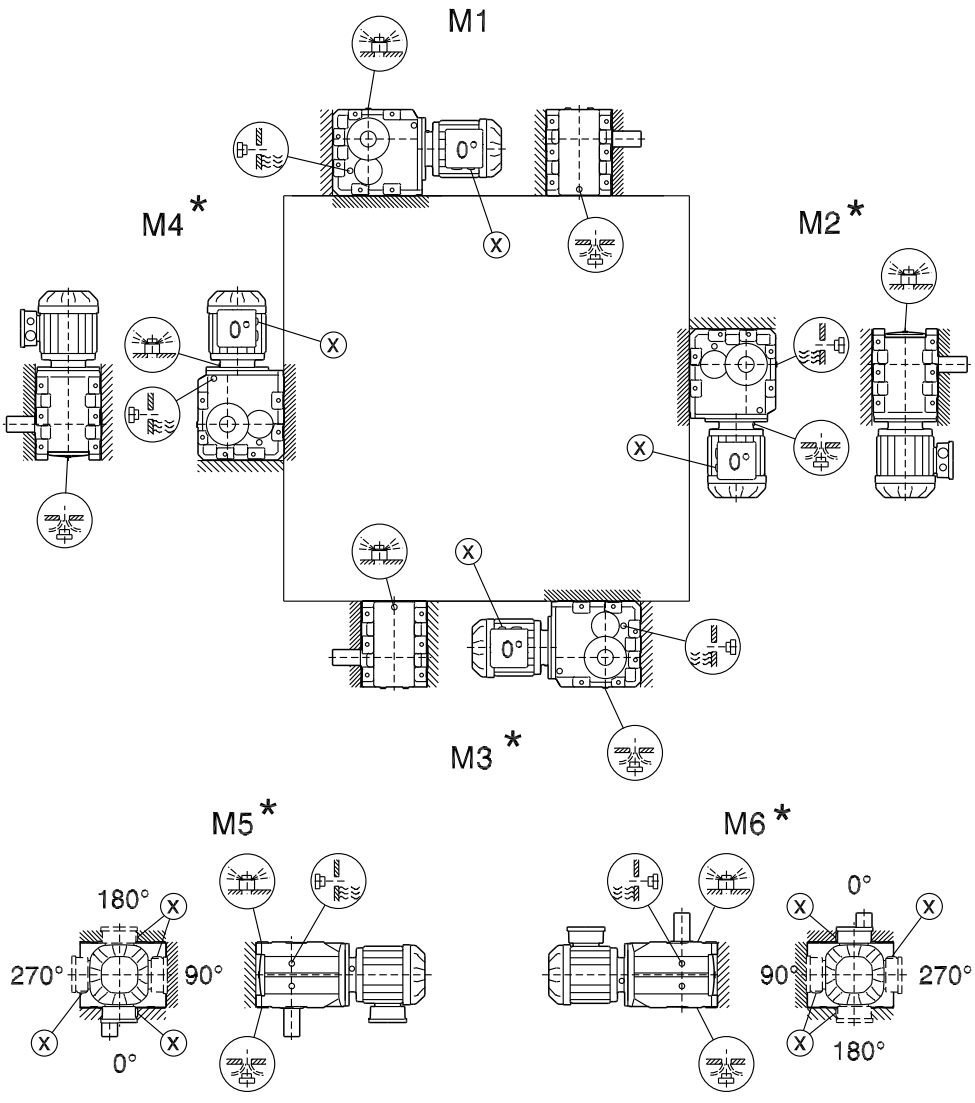


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7.10.3 K167 – K187 / KH167B – KH187B

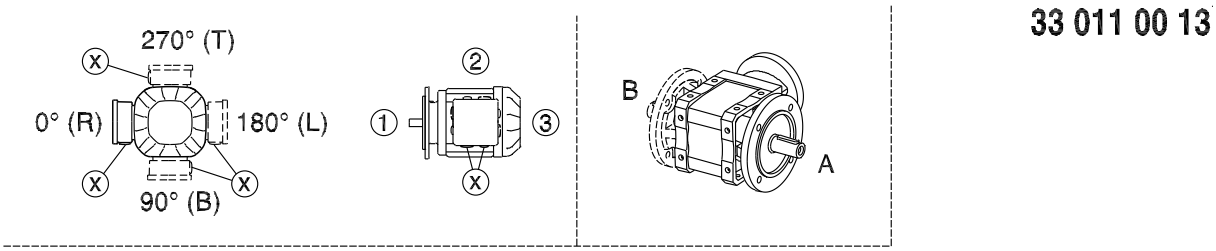


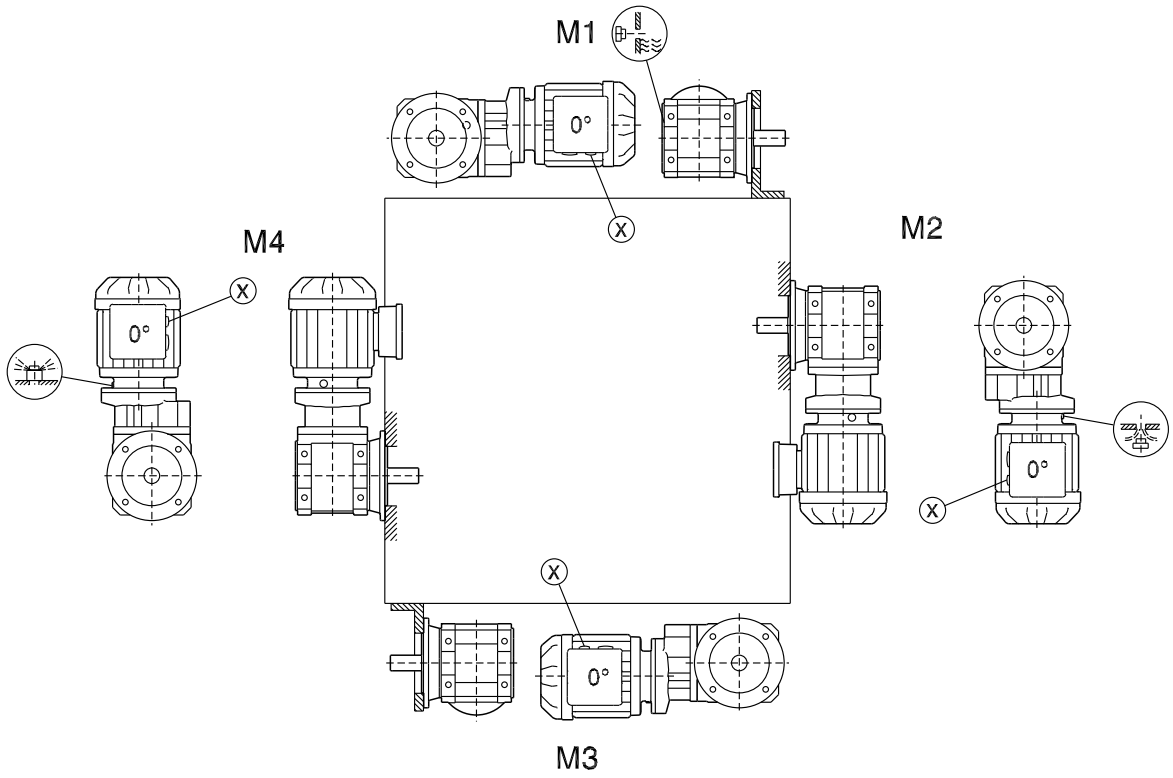


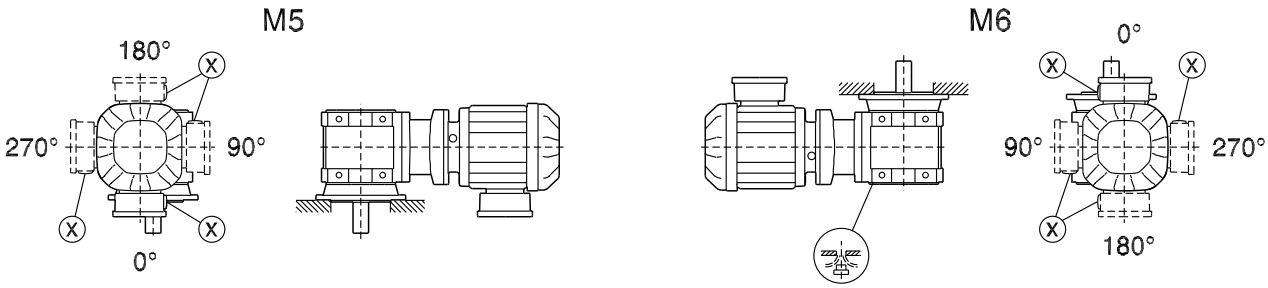
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7.10.4 KF19B – 29B / KAF19B – KAF29B / KHF19B – KHF29B



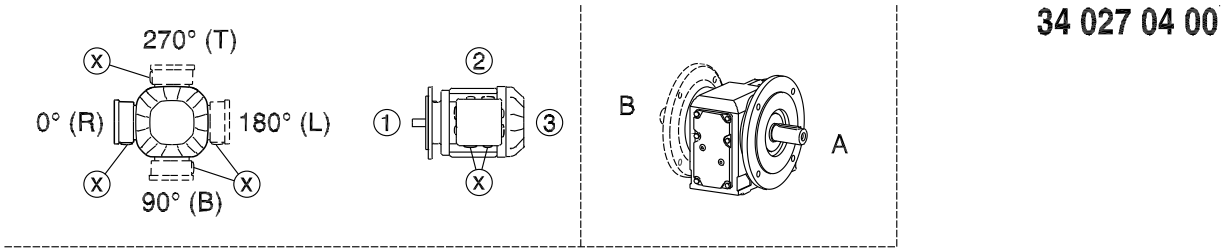


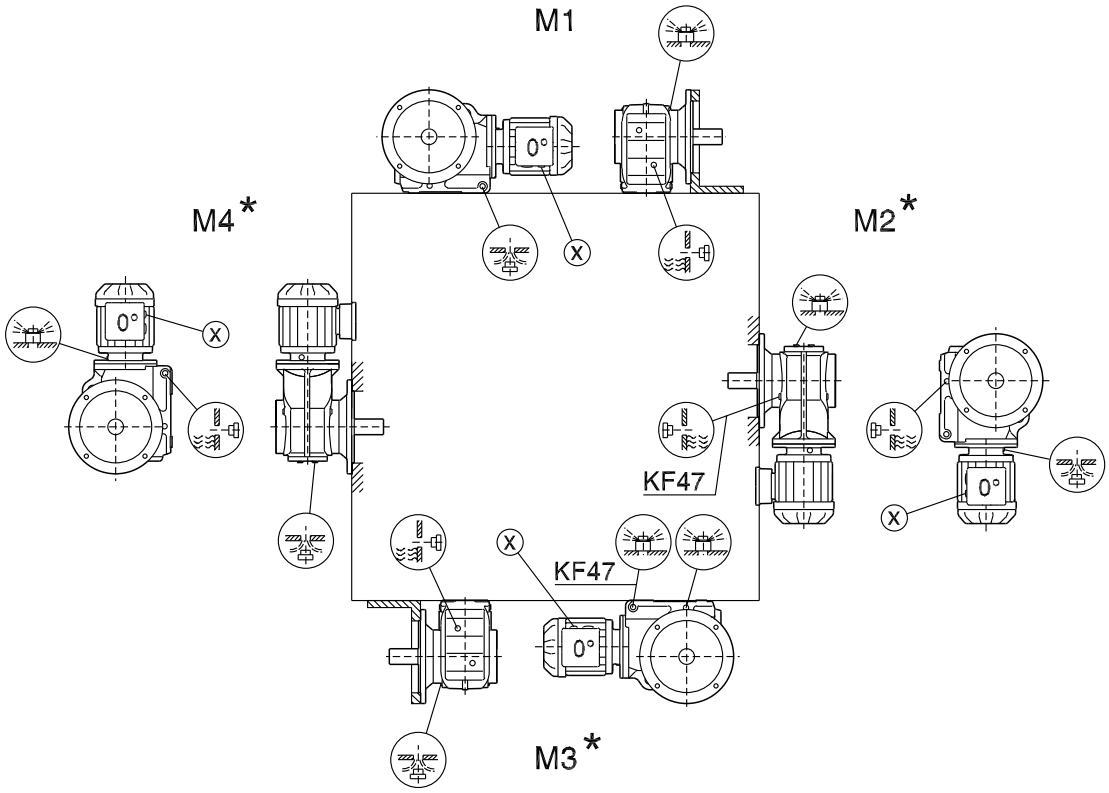


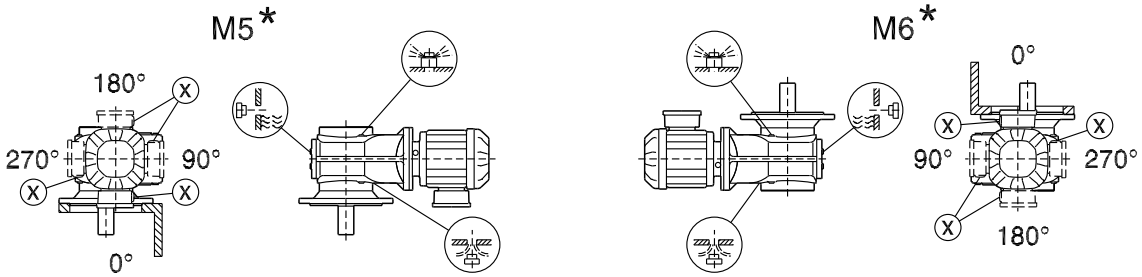
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7.10.5 KF37 – KF157 / KAF37 – KAF157 / KHF37 – KHF157 / KAZ37 – KAZ157 / KHZ37 – KHZ157 / KVF37 – KVF107 / KVZ37 – KVZ107



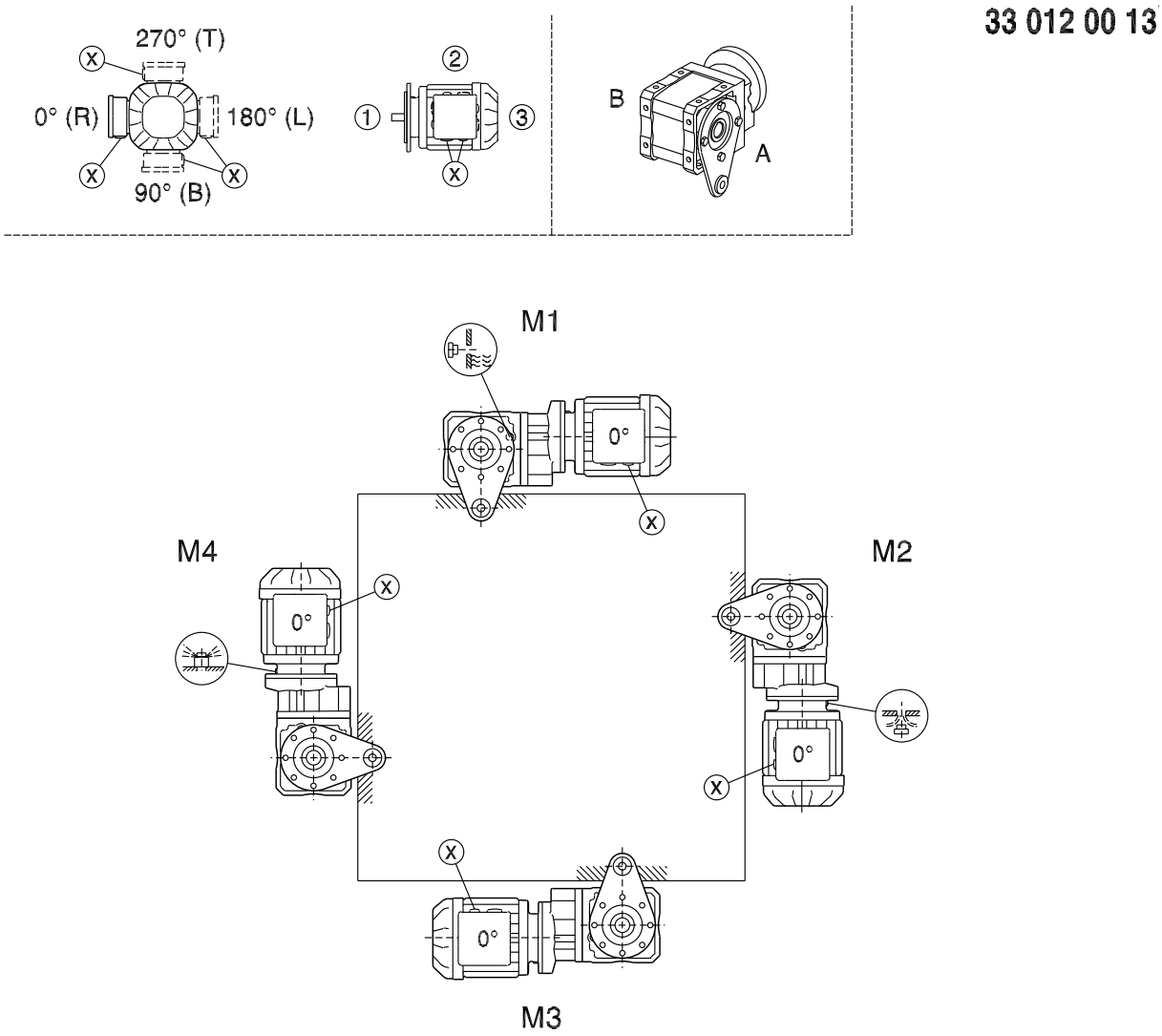




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7.10.6 KA19B – KA29B / KH19B – KH29B

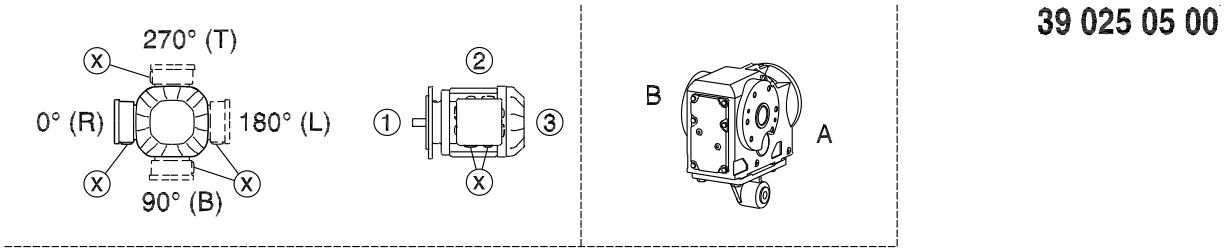


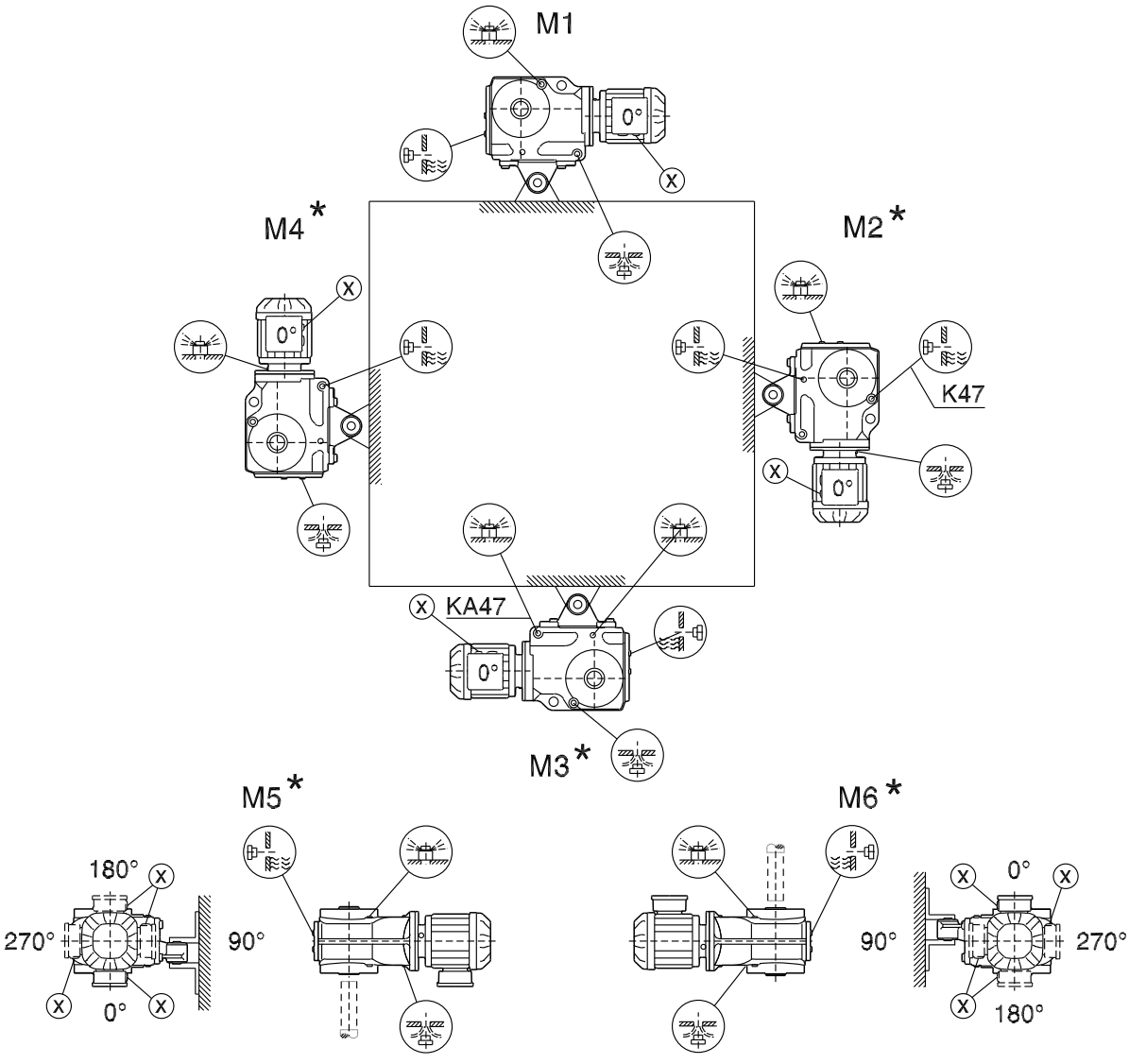
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7.10.7 KA37 – KA157 / KH37 – KH157 / KV37 – KV107 / KT37 – KT97

39 025 05 00

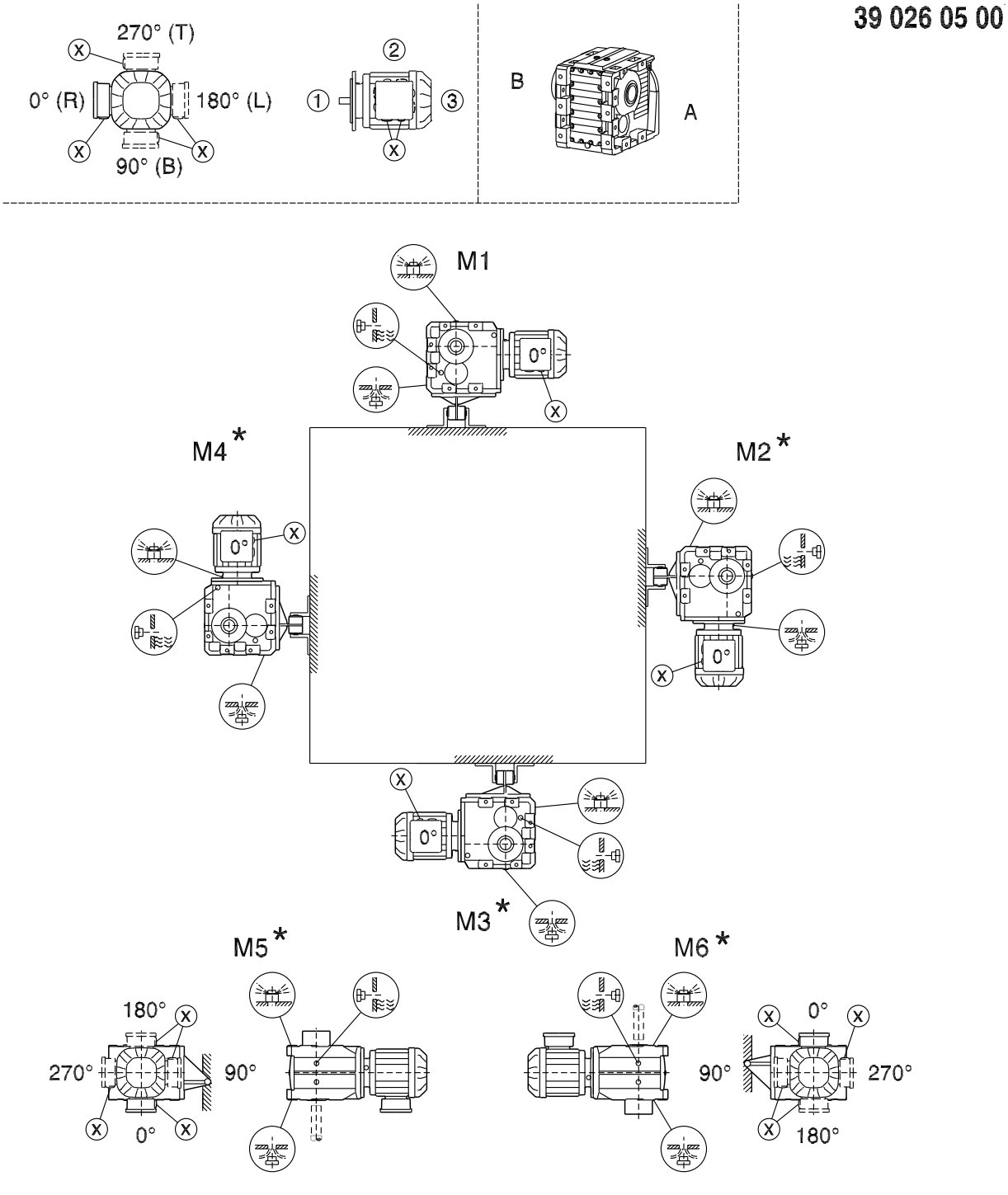




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7.10.8 KH167 – KH187

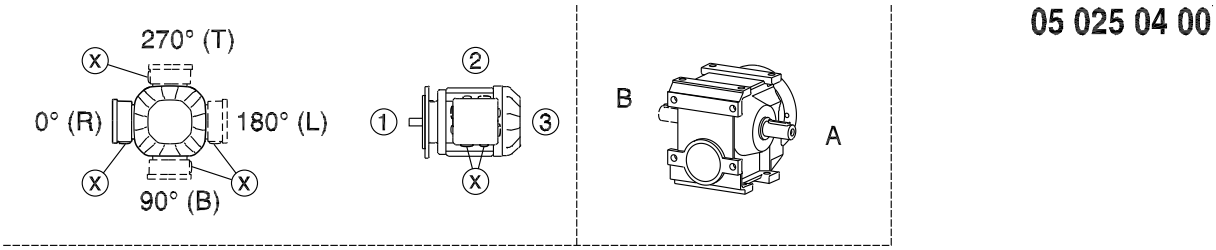


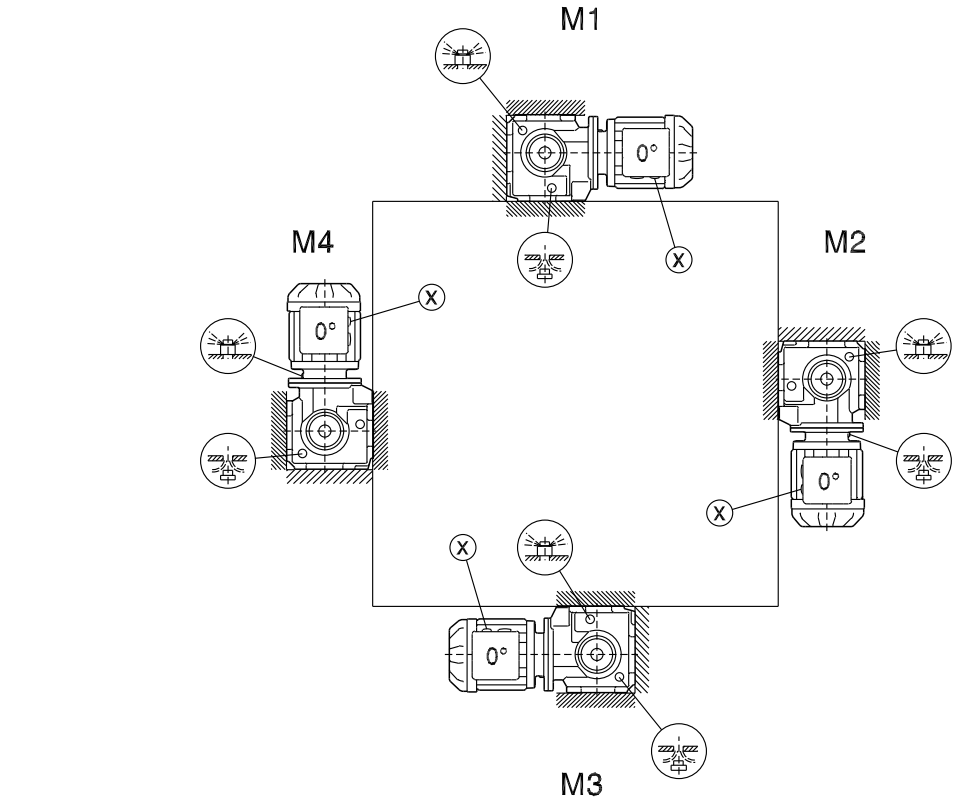
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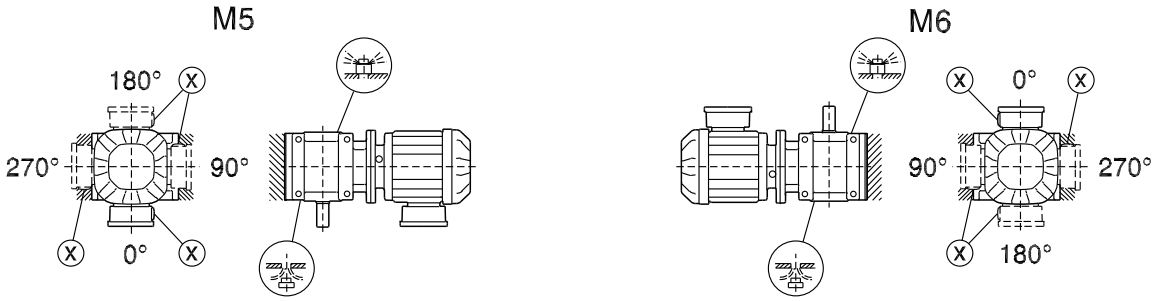
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7.11 Helical-worm gearmotors S

7.11.1 S37

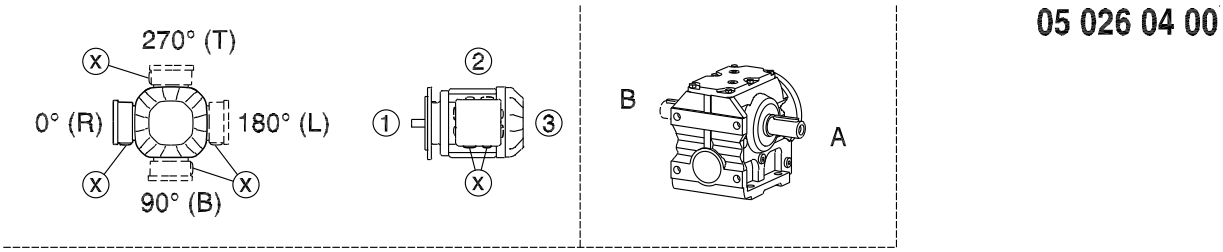


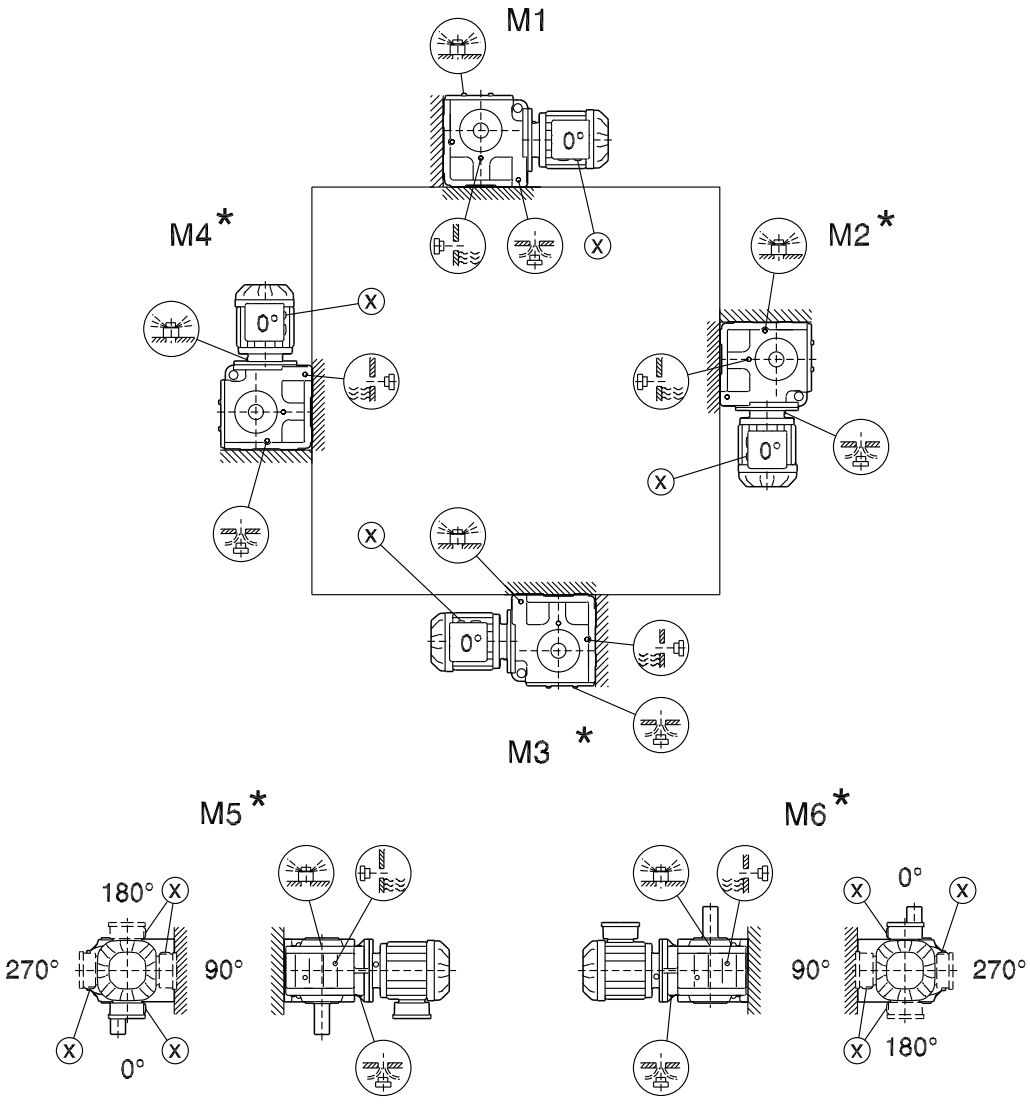




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7.11.2 S47 – S97

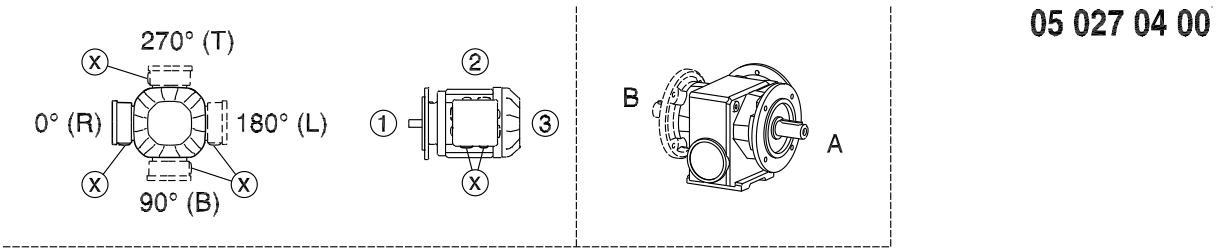


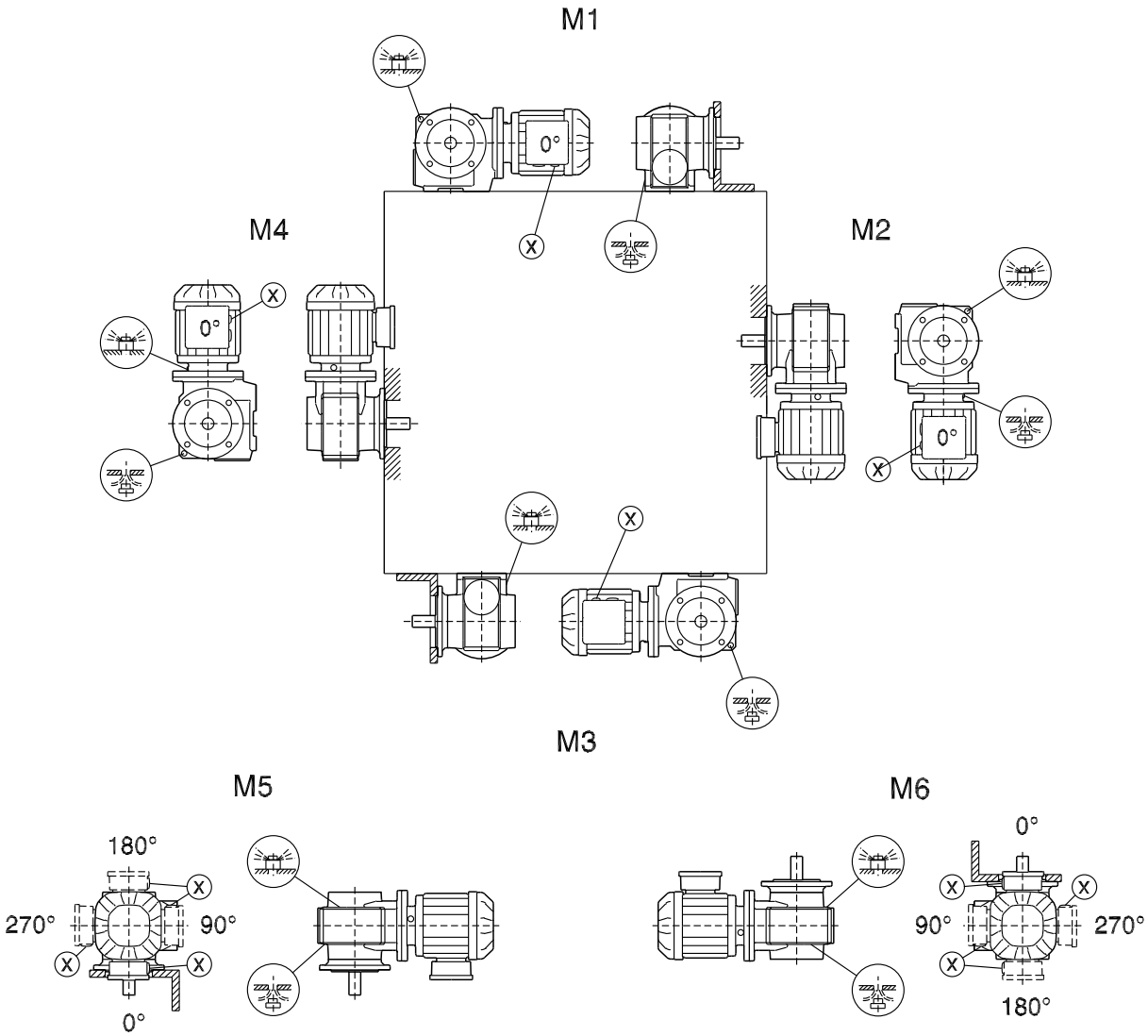


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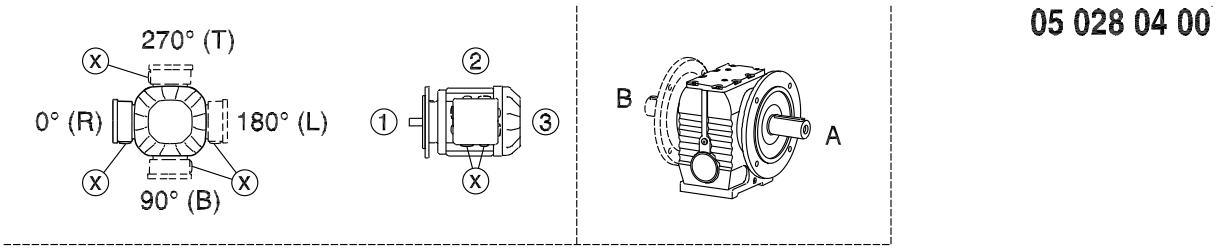
7.11.3 SF37 / SAF37 / SHF37

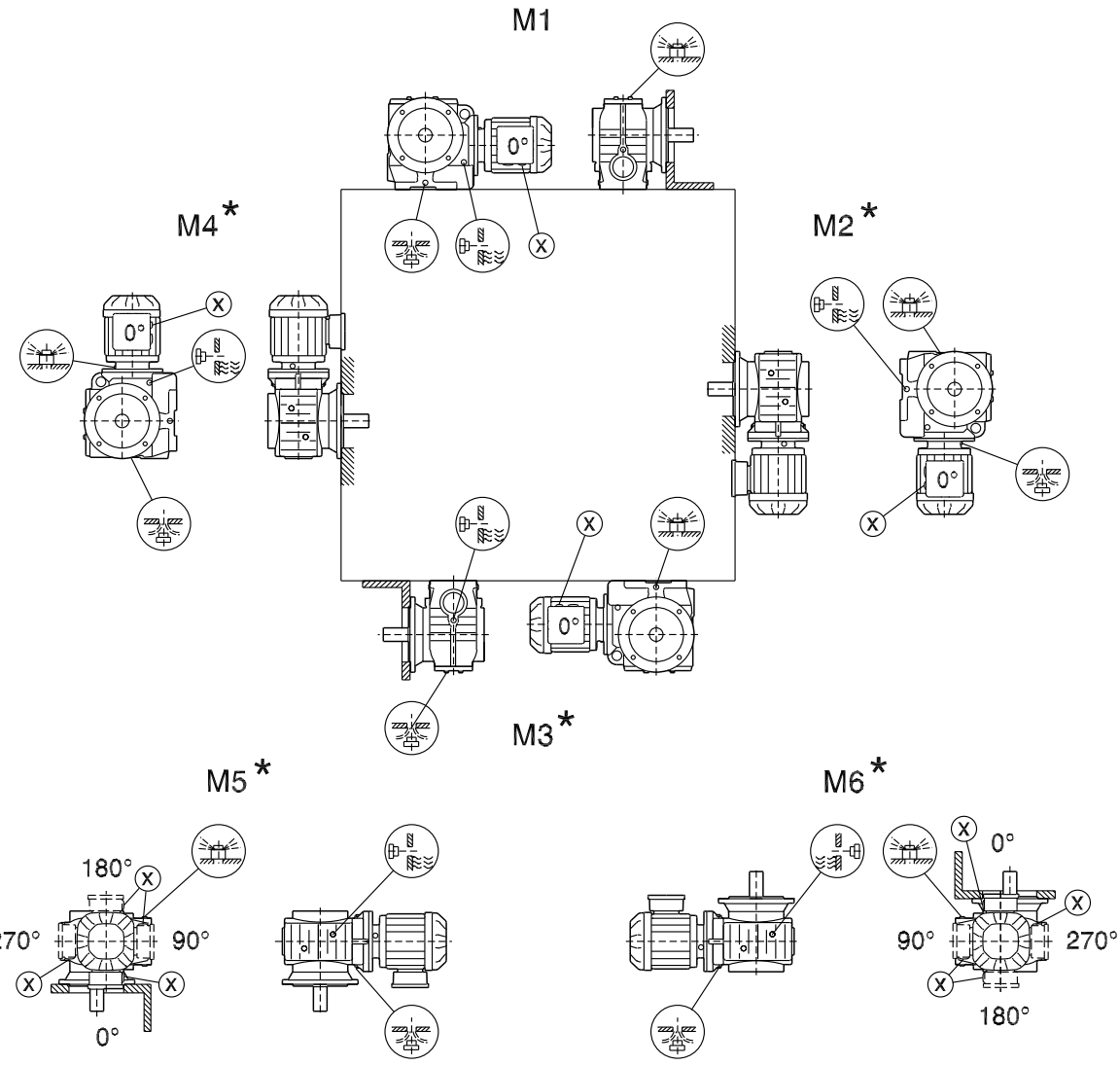




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7.11.4 SF47 – SF97 / SAF47 – SAF97 / SHF47 – SHF97 / SAZ47 – SAZ97 / SHZ47 – SHZ97

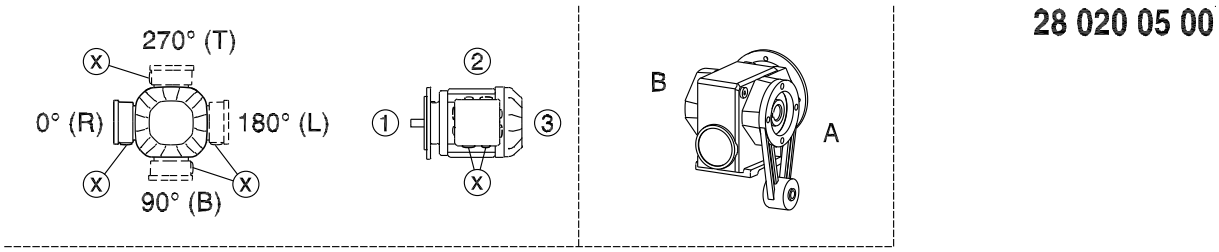


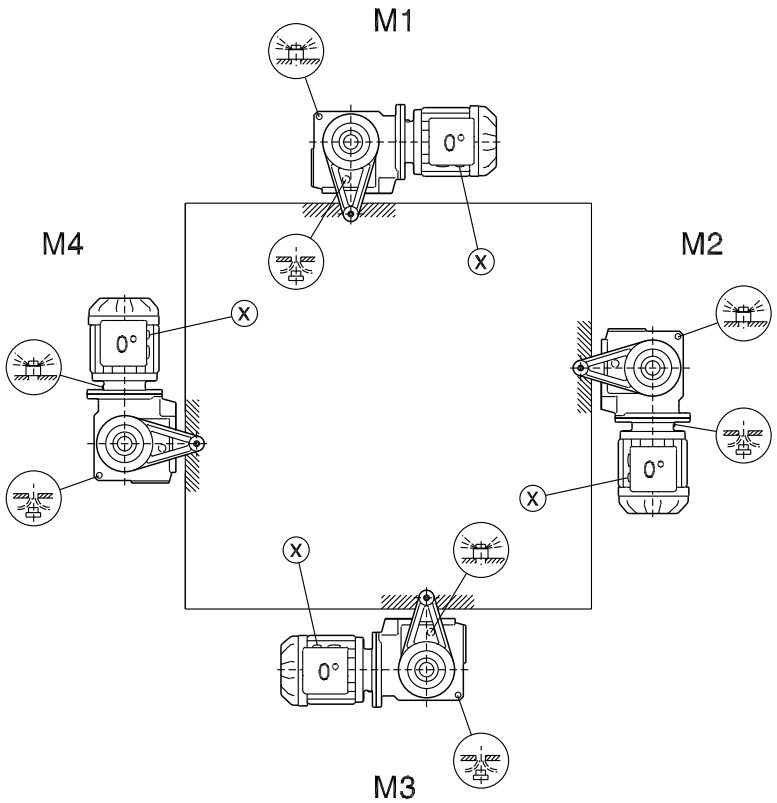


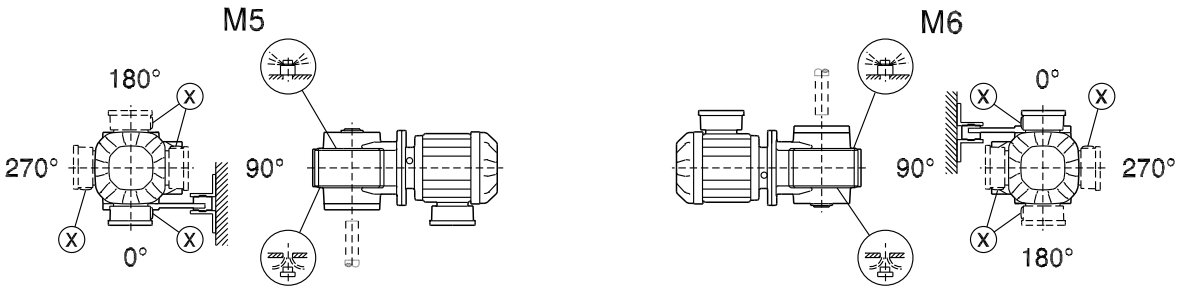
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7.11.5 SA37 / SH37 / ST37

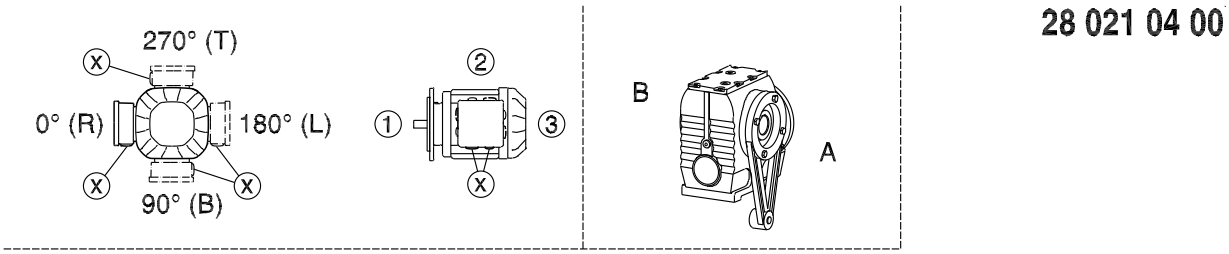


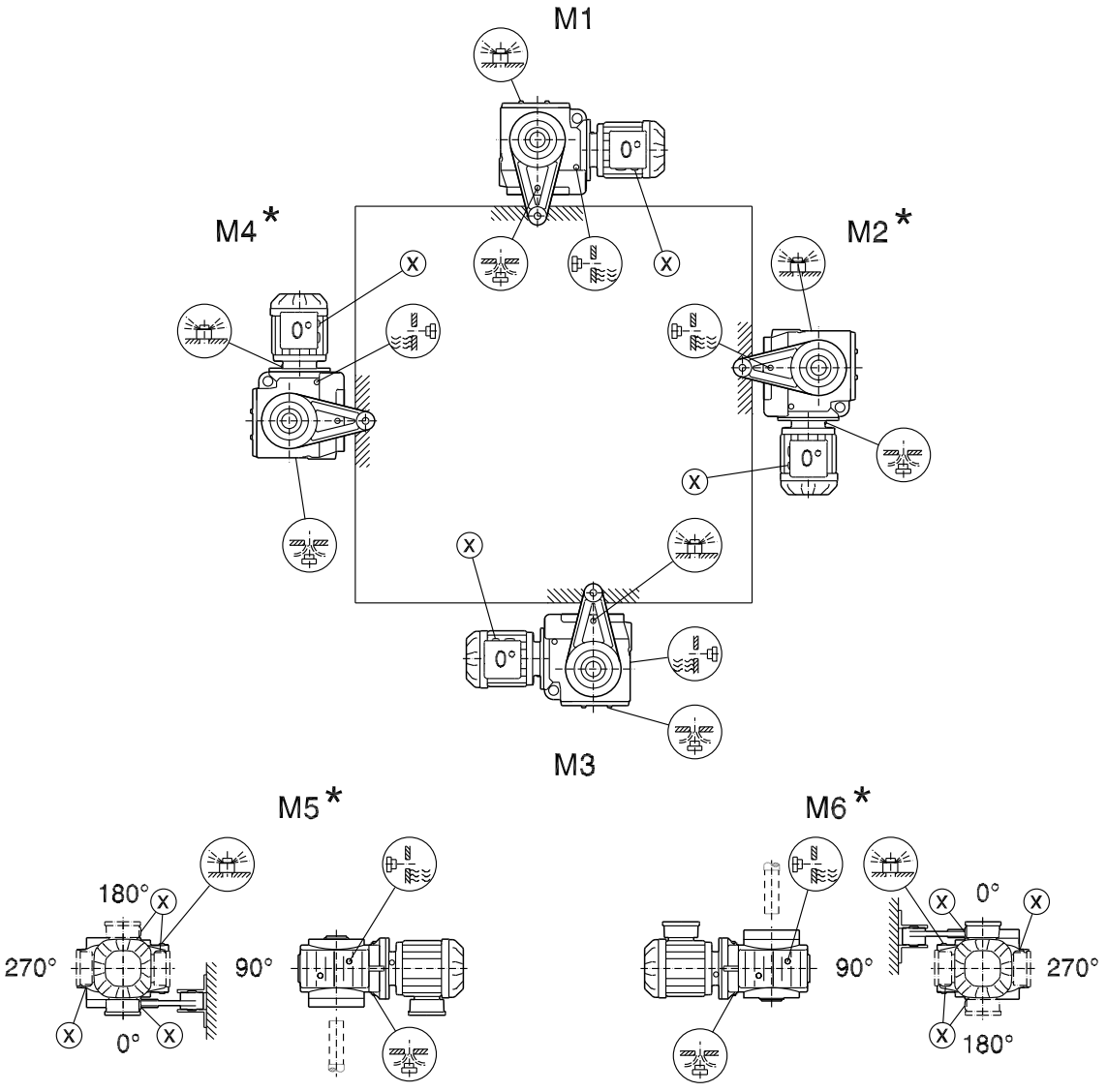




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7.11.6 SA47 – SA97 / SH47 – SH97 / ST47 – ST97



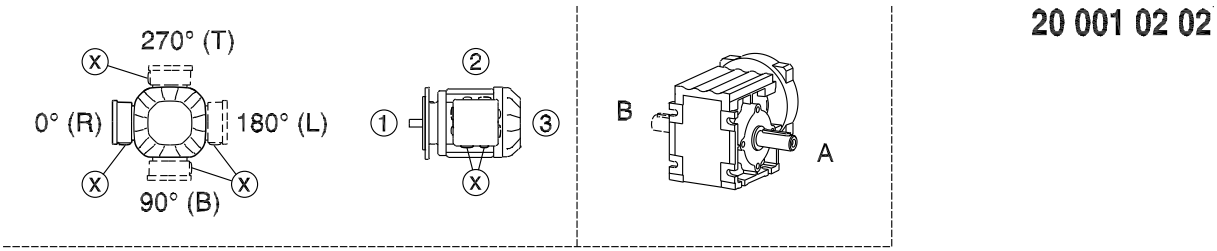


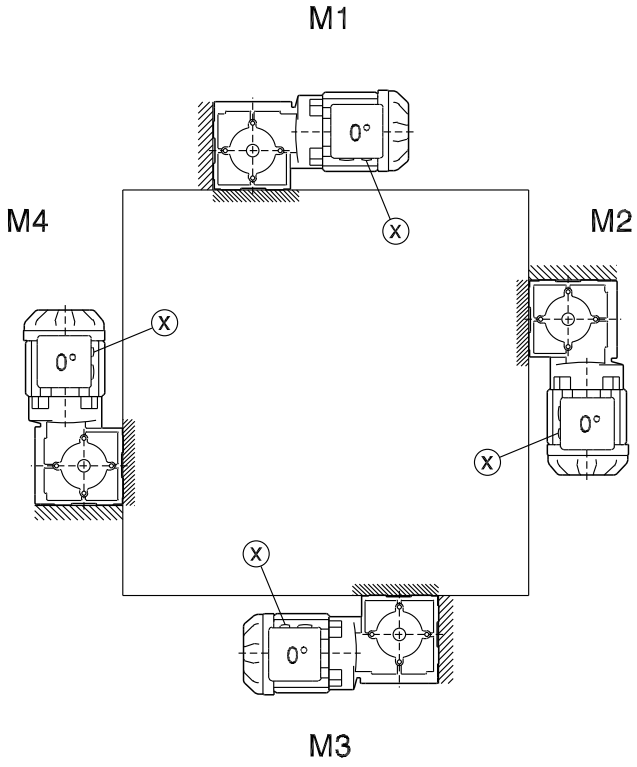
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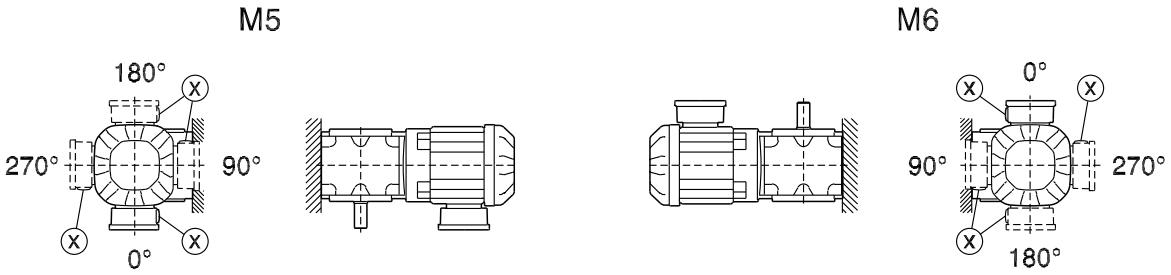
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7.12 SPIROPLAN® W gearmotors

7.12.1 W10 – W30

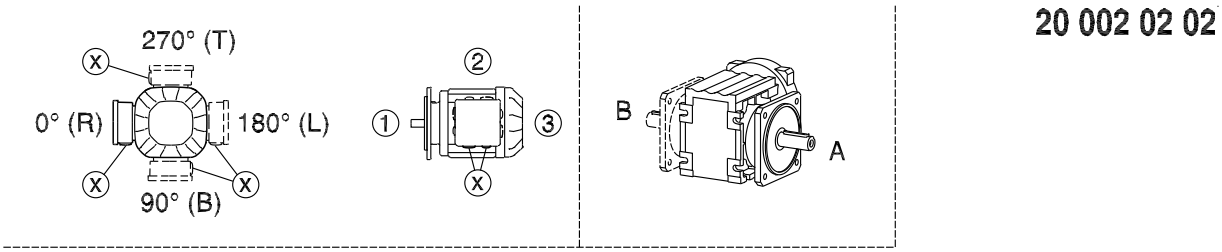


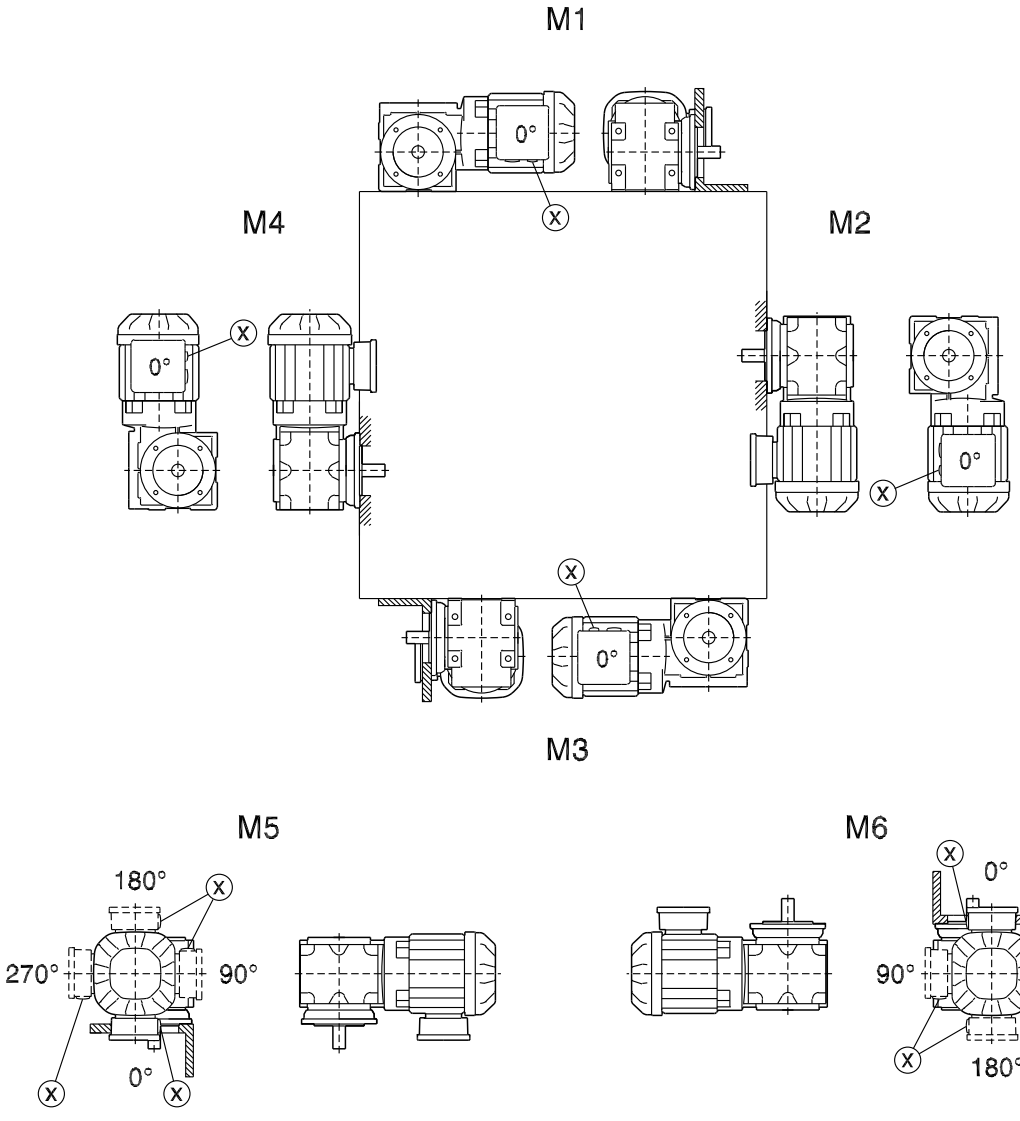




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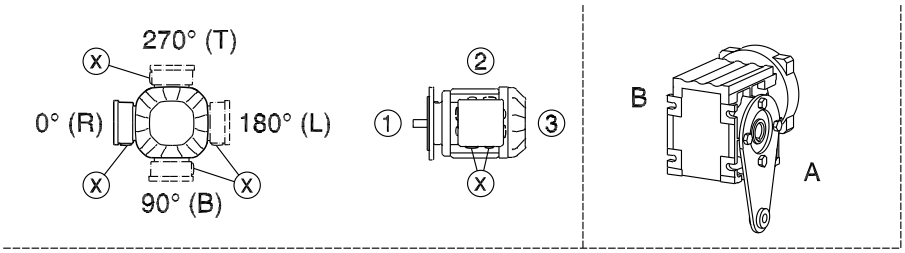
7.12.2 WF10 – WF30 / WAF10 – WAF30

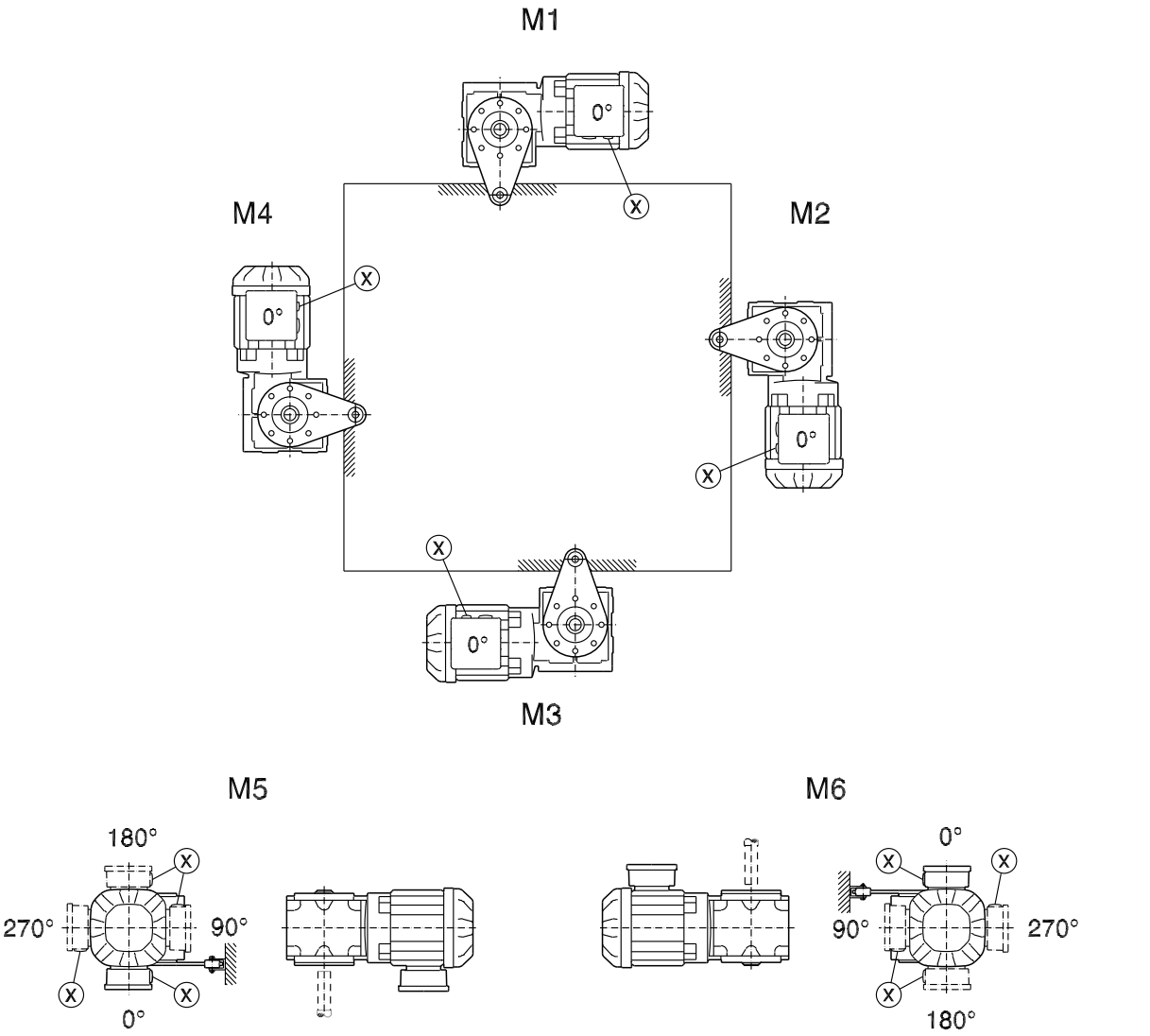




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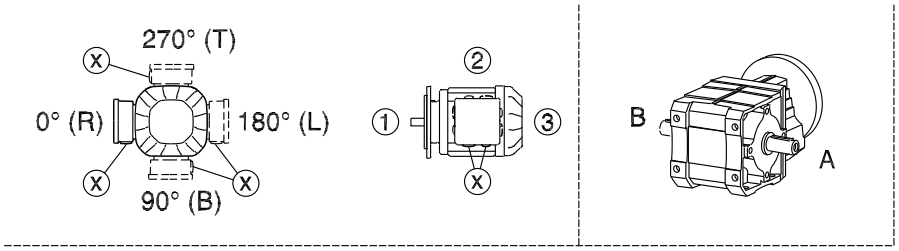
7.12.3 WA10 – WA30





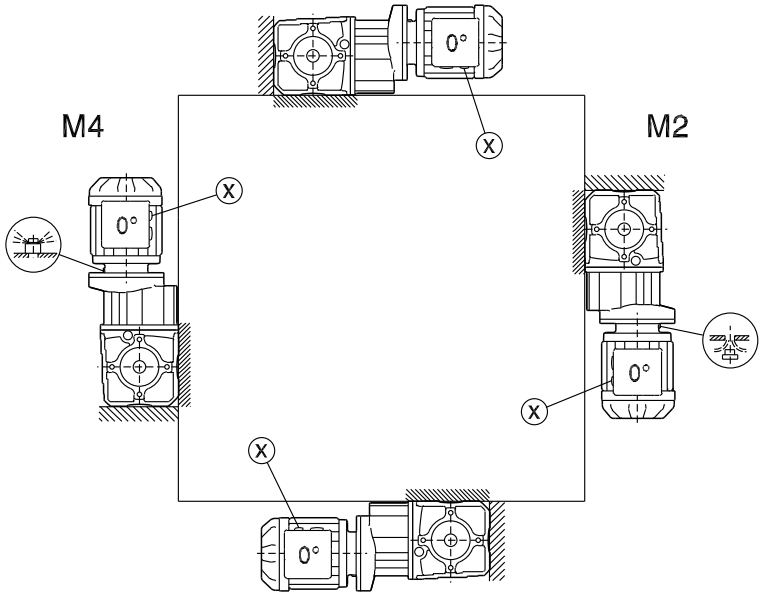
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7.12.4 W37 – W47 / WA37B – WA47B / WH37B – WH47B



20 012 02 07

M1

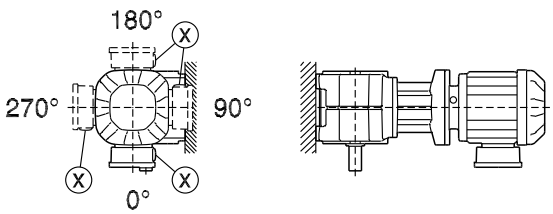


M4

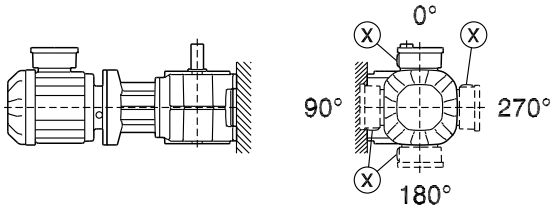
M2

M3

M5

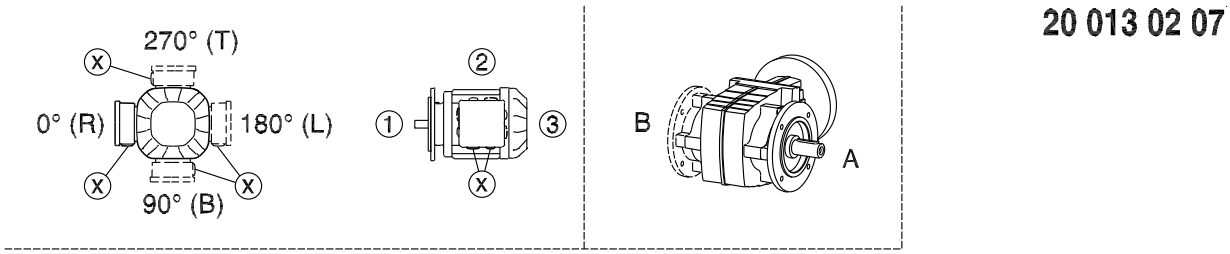


M6

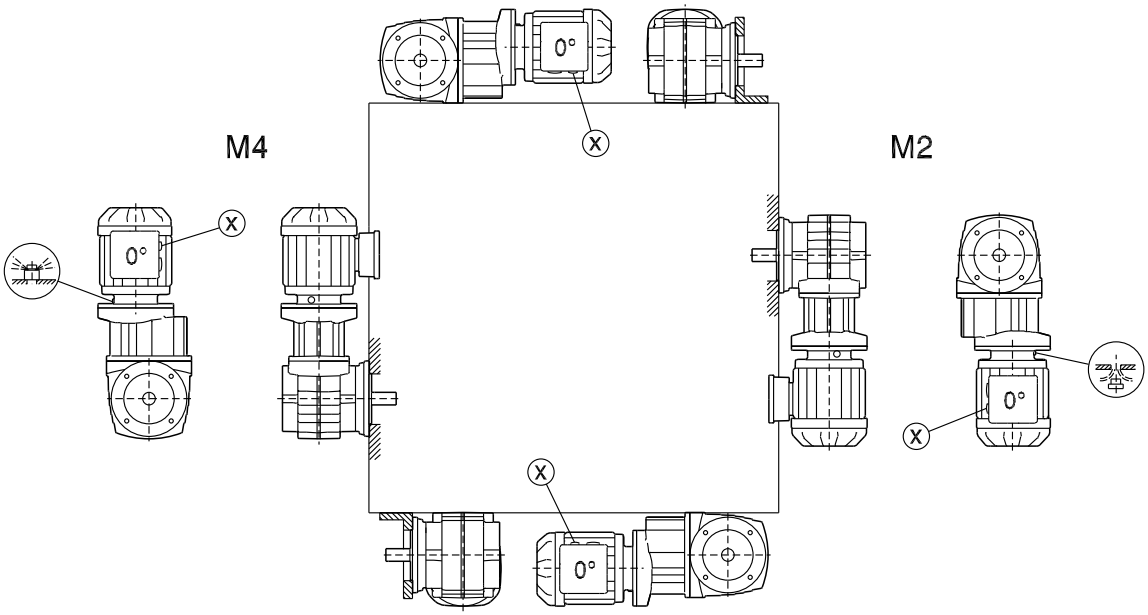


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7.12.5 WF37 – WF47 / WAF37 – WAF47 / WHF37 – WHF47



M1

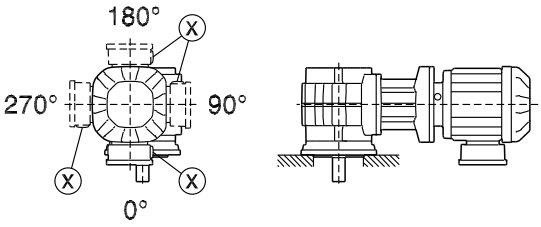


M4

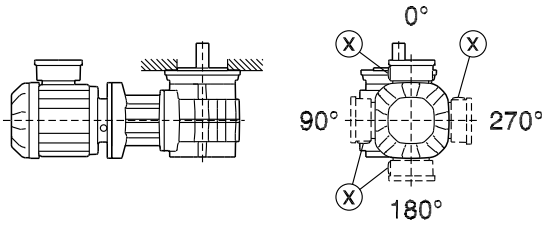
M2

M3

M5

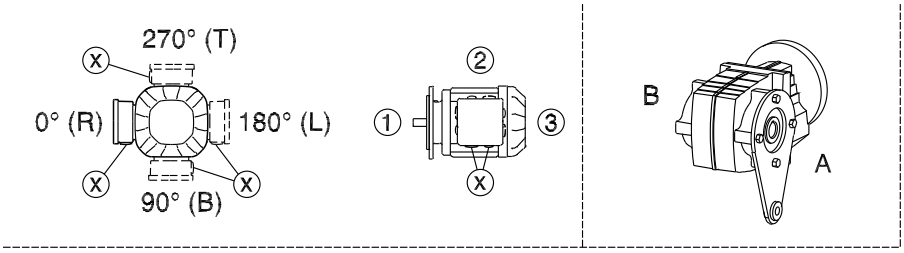


M6

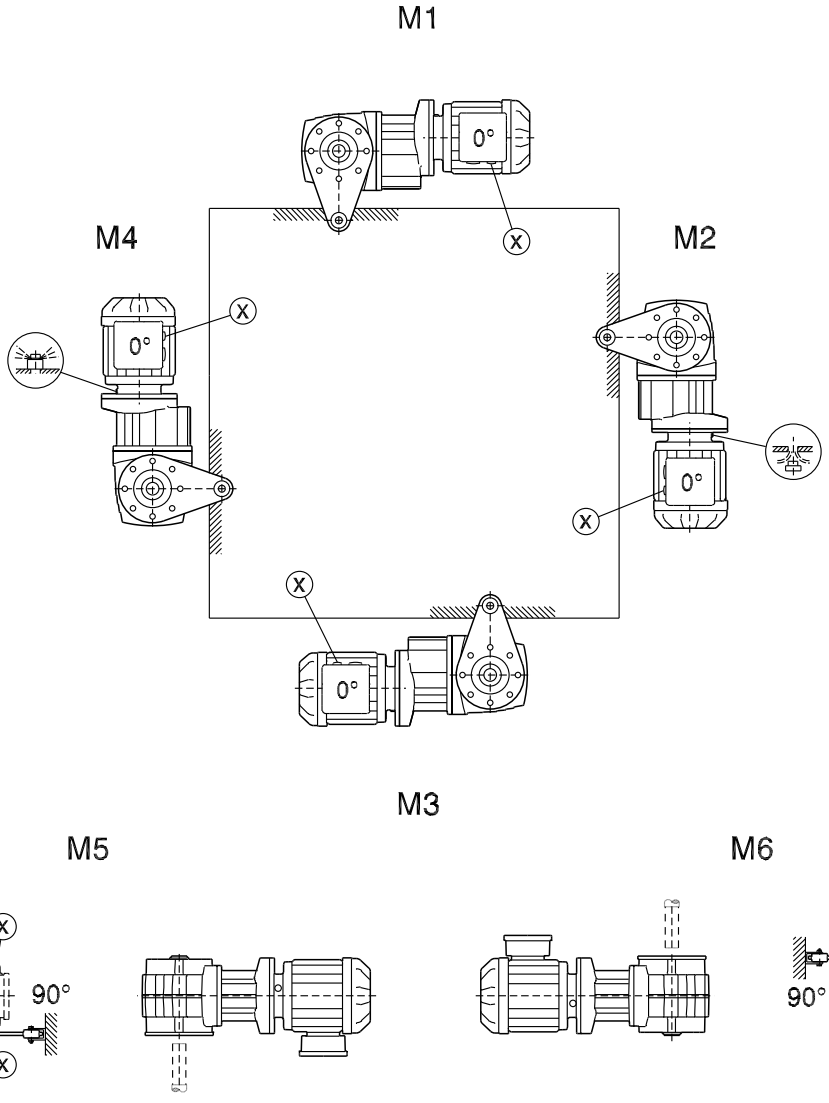


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7.12.6 WA37 – WA47 / WH37 – WH47 / WT37 – WT47



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8 Technical Data

8.1 Extended storage

INFORMATION

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

The lubricant of those gear units is then mixed with a VCI anti-corrosion agent (volatile corrosion inhibitors). Please note that this VCI anti-corrosion agent is only effective in a temperature range of -25 °C to +50 °C. The flange contact surfaces and shaft ends are also treated with an anti-corrosion agent.

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

8.1.1 Storage conditions

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

The gear units come with the oil fill according to the specified mounting position (M1 – M6). Check the oil level before you start operating the gear unit for the first time.

Climate zone	Packaging[1)]	Storage[2)]	Storage duration
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap.	Under roof, protected against rain and snow, no shock loads.	Up to 3 years with regular checks of the packaging and moisture indicator (rel. humidity < 50%).
	Open	Under roof and enclosed at constant temperature and atmospheric humidity (5°C < ϑ < 60°C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No aggressive vapors, no shocks.	2 years or more with regular inspections. Check for cleanness and mechanical damage during 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 and shocks.	Up to 3 years with regular checks of the packaging and moisture indicator (rel. humidity < 50%).
	Open	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No aggressive vapors, no shocks. Protected against insect damage.	2 years or more with regular inspections. Check for cleanness and mechanical damage during the inspection. Check corrosion protection.

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

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

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8.2 Lubricants

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific gear unit and mounting position. The mounting position (M1 – M6, see chapter "Mounting positions") must be specified with the order. You must adapt the lubricant fill in case of any subsequent changes made to the mounting position, see chapter "Lubricant fill quantities"

8.2.1 Bearing greases

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

	Ambient temperature	Manufacturer	Type
Gear unit rolling bearings	-40 °C to +80 °C	Fuchs	Renolit CX-TOM 15
	-40 °C to +80 °C	Klüber	Petamo GHY 133 N
	-40 °C to +40 °C	Castrol	Oberen FS 2
	-20 °C to +40 °C	Fuchs	Plantogel 2S



INFORMATION

The following grease quantities are required:

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

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8.2.2 Lubricant table

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

Key to the lubricant table

Abbreviations used, meaning of shading and notes:

CLP PG	= Polyglycol (W gear units, conforms to USDA-H1)
CLP HC	= Synthetic hydrocarbons
E	= Ester oil (water hazard classification 1)
HCE	= Synthetic hydrocarbons + ester oil (USDA - H1 certification)
HLP	= Hydraulic oil
	= Synthetic lubricant (= synthetic-based roller bearing grease)

1)	Helical-worm gear units with PG oil: please consult SEW-EURODRIVE
2)	Special lubricant for SPIROPLAN® gear units only
3)	Use SEW $f_B \geq 1.2$
4)	Observe the critical starting behavior at low temperatures.
5)	Low-viscosity grease
6)	Ambient temperature
7)	Grease
	Lubricant for the food industry (food grade oil)
	Biodegradable oil (lubricant for agriculture, forestry, and water management)

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Lubricant table

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	6) °C	DIN (ISO)	ISO.NLGI	Mobil®	Shell	bp		TEXACO	Castrol Tribol	Castrol Optimol	FUCHS	TOTAL
R... K..37-187 (HK...) F...	Standard -15 +40	CLP (CC)	VG 220	Mobilgear 600 XP 220	Shell Omala S2 G 220	BP Energol GR-XP 220	Klüberoil GEM 1-220 N	Meropa 220	Tribol 1100/220	Optigear BM 220	Renolin CLP 220	Carter EP 220
	-20 +80	CLP PG	VG 220	Mobil Glygoyle 220	Shell Omala S4 WE 220	BP Enersyn SG-XP 220	Klübersynth GH 6-220	Synlube CLP 220	Tribol 800/220	Optiflex A 220	Renolin PG 220	Carter SY 220
	-20 +60	CLP HC	VG 220	Mobil SHC 630	Shell Omala S4 GX 220		Klübersynth GEM 4-220 N	Pinnacle EP 220	Tribol 1510/220	Optigear Synthetic X 220	Renolin Unisyn CLP 220	Carter SH 220
	4) -40 +40	CLP HC	VG 150	Mobil SHC 629	Shell Omala S4 GX 150		Klübersynth GEM 4-150 N	Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	-20 +25	CLP (CC)	VG 150	Mobilgear 600 XP 150	Shell Omala S2 G 150	BP Energol GR-XP 150	Klüberoil GEM 1-150 N	Meropa 150	Tribol 1100/150	Optigear BM 100	Renolin CLP 150	Carter EP 150
	-40 +20	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68						Renolin Unisyn CLP 68	
	-40 +0	CLP HC	VG 32	Mobil SHC 624			Klüber-Summit HySyn FG-32	Cetus PAO 46		Optilleb HY 32	Renolin Unisyn OL 32	Dacnis SH 32
K..19 - K..29	Standard -20 +60	CLP PG	VG 460				Klübersynth GH 6-460					
	-20 +60	H1 PG	VG 460				Klübersynth UH1 6-460					
S...(HS...)	Standard 0 +40	CLP (CC)	VG 680	Mobilgear 600 XP 680	Shell Omala S2 G 680	BP Energol GR-XP 680	Klüberoil GEM 1-680 N	Meropa 680	Tribol 1100/680	Optigear BM 680	Renolin SEW 680	Carter EP 680
	1) -20 +80	CLP PG	VG 680	Mobil Glygoyle 680	Shell Omala S4 WE 680	BP Enersyn SG-XP 680	Klübersynth GH 6-680	Synlube CLP 680	Tribol 800/680	Optiflex A 680	Renolin PG 680	
	-20 +60	CLP HC	VG 460	Mobil SHC 634	Shell Omala S4 GX 460		Klübersynth GEM 4-460 N	Pinnacle EP 460		Optigear Synthetic X 460	Renolin Unisyn CLP 460	Carter SH 460
	4) -40 +30	CLP HC	VG 150	Mobil SHC 629	Shell Omala S4 GX 150		Klübersynth GEM 4-150 N	Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	-20 +10	CLP (CC)	VG 150	Mobilgear 600 XP 150	Shell Omala S2 G 150	BP Energol GR-XP 150	Klüberoil GEM 1-150 N	Meropa 150	Tribol 1100/150	Optigear BM 150	Renolin CLP 150	Carter EP 150
	1) -20 +40	CLP PG	VG 220	Mobil Glygoyle 220	Shell Omala S4 WE 220	BP Enersyn SG-XP 220	Klübersynth GH 6-220	Synlube CLP 220	Tribol 800/220	Optiflex A 220	Renolin PG 220	Carter SY 220
	-40 +20	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68						Renolin Unisyn CLP 68	
	-40 0	CLP HC	VG 32	Mobil SHC 624			Klüber-Summit HySyn FG-32	Cetus PAO 46		Alphasyn T32	Renolin Unisyn OL 32	Dacnis SH 32
R.. K..37-187 / HK.. F.. S.. / HS..	-10 +40	CLPHC NSF H1	VG 460				Klüberoil 4UH1-460 N			Optileb GT 460	Cassida Fluid GL 460	
	-20 +30		VG 220				Klüberoil 4UH1-220 N			Optileb GT 220	Cassida Fluid GL 220	
	-40 0		VG 68				Klüberoil 4UH1-68 N			Optileb HY 68	Cassida Fluid HF 68	
	-20 +40	E	VG 460				Klüberbio CA2-460				Plantogear 460 S	
W...(HW...)	Standard -20 +40	SEW PG	VG 460				Klüber SEW HT-460-5					
	4) -40 +10	API GL5	SAE 75W90 (~VG 100)	Mobil Synth Gear Oil 75 W90								
	3) -20 +60	H1 PG	VG 460				Klübersynth UH1 6-460					
PS.F..	Standard -20 +80	CLP PG	VG 220				Klübersynth GH 6-220					
	-20 +60	H1 PG	VG 460				Klübersynth UH1 6-460					
	-40 0	CLP HC	VG 32	Mobil SHC 624								
PS.C..	Standard -10 +40	CLP (CC)	VG 220	Mobilgear 600 XP 220								
	5) -20 +40	DIN 51 818	NLGI 00	Mobillux EP 004								
	-20 +40	DIN 51 818	NLGI 1				Klübersynth UH1 14-151					
	-40 0	CLP HC	VG 32	Mobil SHC 624								
BS.F..	Standard -20 +60	CLP PG	VG 220				Klübersynth GH 6-220					
	-20 +60	H1 PG	VG 460				Klübersynth UH1 6-460					

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8.2.3 Lubricant fill quantities

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

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

Helical (R) gear units

R.., R..F

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

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

RF..

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

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

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RX..

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

RXF..

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

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Parallel-shaft helical (F) gear units

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.60	3.50	2.10	3.50	2.80	2.90
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.9	7.3	4.30	8.0	6.0	6.3
F..87	10.8	13.0	7.7	13.8	10.8	11.0
F..97	18.5	22.5	12.6	25.2	18.5	20.0
F..107	24.5	32.0	19.5	37.5	27.0	27.0
F..127	40.5	54.5	34.0	61.0	46.3	47.0
F..157	69.0	104.0	63.0	105.0	86.0	78.0

FF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
FF27	0.60	0.80	0.65	0.70	0.60	0.60
FF37	1.00	1.25	0.70	1.30	1.00	1.10
FF47	1.60	1.85	1.10	1.90	1.50	1.70
FF57	2.80	3.50	2.10	3.70	2.90	3.00
FF67	2.70	3.80	1.90	3.80	2.90	3.20
FF77	5.9	7.3	4.30	8.1	6.0	6.3
FF87	10.8	13.2	7.8	14.1	11.0	11.2
FF97	19.0	22.5	12.6	25.6	18.9	20.5
FF107	25.5	32.0	19.5	38.5	27.5	28.0
FF127	41.5	55.5	34.0	63.0	46.3	49.0
FF157	72.0	105.0	64.0	106.0	87.0	79.0

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.70	3.50	2.10	3.40	2.90	3.00
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.9	7.3	4.30	8.0	6.0	6.3
F..87	10.8	13.0	7.7	13.8	10.8	11.0
F..97	18.5	22.5	12.6	25.2	18.5	20.0
F..107	24.5	32.0	19.5	37.5	27.0	27.0
F..127	39.0	54.5	34.0	61.0	45.0	46.5
F..157	68.0	103.0	62.0	104.0	85.0	79.5

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Helical-bevel (K) gear units

INFORMATION

All K..9 gear units have a universal mounting position and are filled with the same quantity of oil in the same variant and mounting position, except for M4.

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19	0.35	0.35	0.35	0.38	0.35	0.35
K..29	0.65	0.65	0.65	0.8	0.65	0.65
K..37	0.50	1.00	1.00	1.25	0.95	0.95
K..47	0.80	1.30	1.50	2.00	1.60	1.60
K..57	1.10	2.20	2.20	2.80	2.30	2.10
K..67	1.10	2.40	2.60	3.45	2.60	2.60
K..77	2.20	4.10	4.40	5.8	4.20	4.40
K..87	3.70	8.0	8.7	10.9	8.0	8.0
K..97	7.0	14.0	15.7	20.0	15.7	15.5
K..107	10.0	21.0	25.5	33.5	24.0	24.0
K..127	21.0	41.5	44.0	54.0	40.0	41.0
K..157	31.0	62.0	65.0	90.0	58.0	62.0
K..167	33.0	95.0	105.0	123.0	85.0	84.0
K..187	53.0	152.0	167.0	200	143.0	143.0

KF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF19	0.35	0.35	0.35	0.38	0.35	0.35
KF29	0.75	0.75	0.75	0.9	0.75	0.75
KF37	0.50	1.10	1.10	1.50	1.00	1.00
KF47	0.80	1.30	1.70	2.20	1.60	1.60
KF57	1.20	2.20	2.40	3.15	2.50	2.30
KF67	1.10	2.40	2.80	3.70	2.70	2.70
KF77	2.10	4.10	4.40	5.9	4.50	4.50
KF87	3.70	8.2	9.0	11.9	8.4	8.4
KF97	7.0	14.7	17.3	21.5	15.7	16.5
KF107	10.0	21.8	25.8	35.1	25.2	25.2
KF127	21.0	41.5	46.0	55.0	41.0	41.0
KF157	31.0	66.0	69.0	92.0	62.0	62.0

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19	0.35	0.35	0.35	0.38	0.35	0.35
K..29	0.65	0.65	0.65	0.8	0.65	0.65
K..37	0.50	1.00	1.00	1.40	1.00	1.00
K..47	0.80	1.30	1.60	2.15	1.60	1.60
K..57	1.20	2.20	2.40	3.15	2.70	2.40
K..67	1.10	2.40	2.70	3.70	2.60	2.60
K..77	2.10	4.10	4.60	5.9	4.40	4.40
K..87	3.70	8.2	8.8	11.1	8.0	8.0

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Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..97	7.0	14.7	15.7	20.0	15.7	15.7
K..107	10.0	20.5	24.0	32.4	24.0	24.0
K..127	21.0	41.5	43.0	52.0	40.0	40.0
K..157	31.0	66.0	67.0	87.0	62.0	62.0
K..167	33.0	95.0	105.0	123.0	85.0	84.0
K..187	53.0	152.0	167.0	200	143.0	143.0

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Helical-worm (S) gear units

S

Gear unit	Fill quantity in liters					
	M1	M2	M3[1)]	M4	M5	M6
S..37	0.25	0.40	0.50	0.55	0.40	0.40
S..47	0.35	0.80	0.70/0.90	1.00	0.80	0.80
S..57	0.50	1.20	1.00/1.20	1.45	1.30	1.30
S..67	1.00	2.00	2.20/3.10	3.10	2.60	2.60
S..77	1.90	4.20	3.70/5.4	5.9	4.40	4.40
S..87	3.30	8.1	6.9/10.4	11.3	8.4	8.4
S..97	6.8	15.0	13.4/18.0	21.8	17.0	17.0

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

SF..

Gear unit	Fill quantity in liters					
	M1	M2	M3[1)]	M4	M5	M6
SF37	0.25	0.40	0.50	0.55	0.40	0.40
SF47	0.40	0.90	0.90/1.05	1.05	1.00	1.00
SF57	0.50	1.20	1.00/1.50	1.55	1.40	1.40
SF67	1.00	2.20	2.30/3.00	3.20	2.70	2.70
SF77	1.90	4.10	3.90/5.8	6.5	4.90	4.90
SF87	3.80	8.0	7.1/10.1	12.0	9.1	9.1
SF97	7.4	15.0	13.8/18.8	22.6	18.0	18.0

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

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

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

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

SPIROPLAN® (W) gear units

The fill quantity of SPIROPLAN® gear units W..10 to W..30 does not vary, irrespective of their mounting position. Only the fill quantity of SPIROPLAN® gear units W..37 and W..47 in mounting position M4 is different from that of other mounting positions.

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
W..10	0.16					
W..20	0.24					
W..30	0.40					
W..37	0.50			0.70	0.50	
W..47	0.90			1.40	0.90	
WF47	0.90			1.55	0.90	
WA47	0.80			1.40	0.80	

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9 Malfunctions



⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the motor before you start working on the unit.
- Secure the motor against unintended power-up.



⚠ CAUTION

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

Serious injuries

- Let the gear unit cool down before you start working on it.
- Carefully remove the oil level plug and the oil drain plug.



⚠ NOTICE

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

Possible damage to property.

- SEW drives may only be repaired by qualified personnel who are familiar with the technical rules for industrial safety and health.
- Only qualified specialists are permitted to separate the drive from the motor.
- Consult SEW-EURODRIVE customer service.

9.1 Gear units

Malfunction	Possible cause	Remedy
Unusual, regular running noise	Meshing/grinding noise: Bearing damage	Check the oil →see "Inspection/maintenance for the gear unit" (page 89), change bearings.
	Knocking noise: Irregularity in the gearing	Contact customer service.
Unusual, irregular running noise	Foreign bodies in the oil	• Check the oil →see "Inspection/maintenance for the gear unit" (page 89), • Stop the drive, contact customer service
Oil leaking • From the inspection cover • From the motor flange • From the motor oil seal • From the gear unit flange • At output-end oil seal[1)]	Rubber gasket on the inspection cover leaking	Tighten the screws on the inspection cover and observe the gear unit If oil still leaks: Contact customer service.
	Gasket defective.	Contact customer service.
	Gear unit not ventilated	Vent the gear unit → see "Mounting Positions" (page 104).
Moisture film • around the dust lip of the oil seal • with small trickle on the bottom end of the oil seal in new drives during the run-in phase[2)]	Function-related pseudo-leakage	There is no fault. Remove with soft, lint-free cloth and keep monitoring it. If oil leaks out after more than 168 hours of operation, contact the customer service.
Drop formation and dripping even after the run-in phase on the output end oil seal	Oil seal defective.	Check the sealing system [2)]Contact customer service, if necessary

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Malfunction	Possible cause	Remedy
Oil leaking from breather valve	Too much oil	Correct the oil fill quantity →see "Inspection/maintenance for the gear unit" (page 89),
	Function-related oil mist	There is no fault.
	Drive installed in incorrect mounting position	• Properly adjust the breather valve → see "Mounting Positions (page 104)" • Correct the oil level →see "Inspection/maintenance for the gear unit" (page 89),
	Frequent cold starts (oil foams) and/or high oil level	Use an oil expansion tank
Output shaft does not turn although the motor is running or the input shaft is rotated	Shaft-hub connection in the 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 (168 hours running time).

2) During the run-in phase, the sealing lip grinds on the shaft and produces a path with a smoothed surface. Once the run-in phase has been completed, the prerequisites for proper functioning of the seal are fulfilled.

9.2 Adapters AM / AQ. / AL / EWH

Malfunction	Possible cause	Remedy
Unusual, regular running noise	Meshing/grinding noise: Bearing damage	Contact SEW-EURODRIVE customer service
Oil leaking	Gasket defective.	Contact SEW-EURODRIVE customer service
Output shaft does not turn although the motor is running or the input shaft is rotated	Shaft-hub connection in the gear unit or the adapter interrupted.	Send the gear unit to SEW-EURODRIVE for repair
Change in running noise and/or vibrations	Ring gear wear, short-term torque transmission through metal contact	Change the ring gear
	Screws to secure hub axially are loose	Tighten the screws
Premature wear in ring gear	• Contact with aggressive fluids/oils; ozone influence; excessive ambient temperatures, etc. that can change the physical properties of the annular gear. • Impermissibly high ambient/contact temperature for the annular gear; maximum permitted temperature: -20 °C to +80 °C • Overload	Contact SEW-EURODRIVE customer service

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9.3 AD input shaft assembly

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

9.4 Customer service

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

- Nameplate data (complete)
- Nature and extent of the problem
- Time the failure occurred and any accompanying circumstances
- Presumed cause

A digital photograph if possible

9.5 Disposal

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

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

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10 Address list

Germany			
Headquarters **Production** **Sales**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Service Competence Center	**Mechanics / Mechatronics**	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
	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 Technology Center	**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
	Drive Service Hotline / 24 Hour Service		+49 800 SEWHELP +49 800 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-USOCOME 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
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20

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France			
	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	**Algiers**	REDUCOM Sarl 16, rue des Frères Zaghnoune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 info@reducom-dz.com http://www.reducom-dz.com

Argentina			
Assembly **Sales**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

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://www.sew-eurodrive.at sew@sew-eurodrive.at

Belarus			
Sales	**Minsk**	SEW-EURODRIVE BY RybalkoStr. 26 BY-220033 Minsk	Tel.+375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by

Belgium			
Assembly **Sales** **Service**	**Brussels**	**SEW-EURODRIVE n.v./s.a.** Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	**Industrial Gears**	**SEW-EURODRIVE n.v./s.a.** Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be

Brazil			
Production **Sales** **Service**	**São Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 152 - Rodovia Presidente Dutra Km 208 Guarulhos - 07251-250 - SP SAT - SEW ATENDE - 0800 7700496	Tel. +55 11 2489-9133 Fax +55 11 2480-3328 http://www.sew-eurodrive.com.br sew@sew.com.br

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Address list

Brazil			
Assembly **Sales** **Service**	**Rio Claro**	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
	Indaiatuba	SEW-EURODRIVE Brasil Ltda. Estrada Municipal Jose Rubim, 205 Rodovia Santos Dumont Km 49 13347-510 - Indaiatuba / SP	Tel. +55 19 3835-8000 sew@sew.com.br

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 33 431137 Fax +237 33 431137 electrojemba@yahoo.fr

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago**	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 25323273 info@sew-eurodrive.cn http://www.sew-eurodrive.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn

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China			
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@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 sew@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. Zeleni dol 10 HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr

Czech Republic			
Sales **Assembly** **Service**	**Hostivice**	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
	Drive Service Hotline / 24 Hour Service	HOT-LINE +420 800 739 739 (800 SEW SEW)	**Servis:** Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Copenhagen**	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 EI 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

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Finland			
Assembly **Sales** **Service**	**Hollola**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Service	**Hollola**	SEW-EURODRIVE OY Keskikankaantie 21 FIN-15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Production **Assembly**	**Karkkila**	SEW Industrial Gears Oy Valurinkatu 6, PL 8 FI-03600 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911

Greece			
Sales	**Athens**	Christ. Boznos & Son S.A. 12, K. 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 36902200 Fax +852 36902211 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 http://www.sew-eurodrive.hu office@sew-eurodrive.hu

India			
Registered Office **Assembly** **Sales** **Service**	**Vadodara**	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200, +91 265 2831086 Fax +91 265 3045300, +91 265 2831087 http://www.seweurodriveindia.com salesvadodara@seweurodrivein-dia.com

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India			
Assembly **Sales** **Service**	**Chennai**	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@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 http://www.alperton.ie

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

Italy			
Assembly **Sales** **Service**	**Solaro**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 980 999 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Société Industrielle & Commerciale pour l'Afrique 165, Boulevard de Marseille 26 BP 1173 Abidjan 26	Tel. +225 21 25 79 44 Fax +225 21 25 88 28 sicamot@aviso.ci

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 373855 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp

Kazakhstan			
Sales	**Almaty**	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz

Kenya			
Sales	**Nairobi**	Barico Maintenances Ltd Kamutaga Place Commercial Street Industrial Area P.O.BOX 52217 - 00200 Nairobi	Tel. +254 20 6537094/5 Fax +254 20 6537096 info@barico.co.ke

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com info@alas-kuul.com

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Lebanon			
Sales Lebanon	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
		After Sales Service	service@medrives.com
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		After Sales Service	service@medrives.com

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

Mongolia			
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Morocco			
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Namibia			
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Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl

New Zealand			
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	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

Nigeria			
Sales	**Lagos**	EISNL Engineering Solutions and Drives Ltd Plot 9, Block A, Ikeja Industrial Estate (Ogba Scheme) Adeniyi Jones St. End Off ACME Road, Ogba, Ikeja, Lagos Nigeria	Tel. +234 (0)1 217 4332 team.sew@eisnl.com http://www.eisnl.com

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Pakistan			
Sales	**Karachi**	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk

Paraguay			
Sales	**Fernando de la Mora**	SEW-EURODRIVE PARAGUAY S.R.L De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sew-py@sew-eurodrive.com.py

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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			
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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			
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Russia			
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Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn http://www.senemeca.com
Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV sprat SRB-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
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
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	Cape Town	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 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

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	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

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Swaziland			
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Tunisia			
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Turkey			
Assembly **Sales** **Service**	**Kocaeli-Gebze**	SEW-EURODRİVE Sistemleri San. Ve TIC. Ltd. Sti Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90-262-9991000-04 Fax +90-262-9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Ukraine			
Assembly **Sales** **Service**	**Dnipropetrovsk**	ООО «СЕВ-Евродрайв» ул.Рабочая, 23-В, офис 409 49008 Днепропетровск	Тел. +380 56 370 3211 Факс. +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
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Sales **Service**	**Sharjah**	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae
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Assembly **Sales** **Service**	**Northeast Region**	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
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com

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	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
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Venezuela			
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Vietnam			
Sales	**Ho Chi Minh City**	**All sectors except harbor and offshore:** Nam Trung Co., Ltd 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn truongtantam@namtrung.com.vn khanh-nguyen@namtrung.com.vn
		Harbor and offshore: DUC VIET INT LTD Industrial Trading and Engineering Services A75/6B/12 Bach Dang Street, Ward 02, Tan Binh District, 70000 Ho Chi Minh City	Tel. +84 8 62969 609 Fax +84 8 62938 842 totien@ducvietint.com
	Hanoi	Nam Trung Co., Ltd R.205B Tung Duc Building 22 Lang ha Street Dong Da District, Hanoi City	Tel. +84 4 37730342 Fax +84 4 37762445 namtrunghn@hn.vnn.vn

Zambia			
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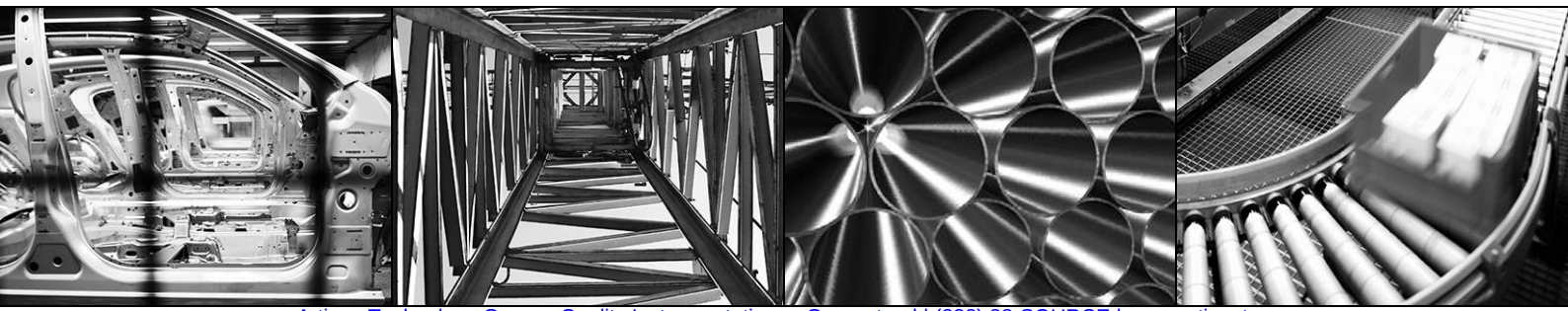
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