



SEW
EURODRIVE

Assembly and Operating Instructions



Explosion-Proof Gear Units

R..7, F..7, K..7, K..9, S..7, SPIROPLAN® W Series



Table of contents

1	General information.....	6
1.1	About this documentation	6
1.2	Structure of the safety notes	6
1.3	Rights to claim under limited warranty	7
1.4	Exclusion of liability	8
1.5	Product names and trademarks	8
1.6	Copyright notice	8
2	Safety notes	9
2.1	Preliminary information	9
2.2	Safety notes for carrying out work in potentially explosive atmospheres.....	9
2.3	General information	10
2.4	Target group	10
2.5	Designated use	11
2.6	Other applicable documentation	11
2.7	Transportation/storage	12
2.8	Installation	12
2.9	Startup/operation	13
3	Gear unit structure	14
3.1	Basic structure of helical gear units R..07 – R..167	14
3.2	Basic structure of parallel-shaft helical gear units F..27 – F..157	15
3.3	Basic structure of helical-bevel gear units K..19/K..29.....	16
3.4	Basic structure of helical-bevel gear units K..39/K..49.....	17
3.5	Basic structure of helical-bevel gear units K..37 – K..187.....	18
3.6	Basic structure of helical-worm gear units S..37 – S..97	19
3.7	Basic structure of SPIROPLAN® gear units W..10 – W..30	20
3.8	Basic structure of SPIROPLAN® gear units W..37 – W..47	21
3.9	Nameplate/type designation	22
4	Mechanical installation	29
4.1	General information	29
4.2	Gear units and gearmotors in explosion-proof design II2GD and II3GD	30
4.3	Prerequisites for installation.....	31
4.4	Required tools/resources	32
4.5	Installation tolerances	32
4.6	Installing the gear unit.....	33
4.7	Gear unit with solid shaft.....	42
4.8	Torque arms for shaft-mounted gear units.....	44
4.9	Shaft-mounted gear units with keyway or splined hollow shaft.....	50
4.10	Shaft-mounted gear unit with shrink disk	55
4.11	Shaft-mounted gear units with TorqLOC®	58
4.12	Cover	70
4.13	Coupling of AM adapter	71
4.14	AQ. adapter coupling	75
4.15	Adapter with AR slip clutch	78

4.16	AD input shaft assembly	80
4.17	Accessory equipment.....	84
5	Startup	88
5.1	Checklists.....	89
5.2	Inverter-operated gearmotors	91
5.3	Checking the oil level	91
5.4	Pseudo-leakage at shaft seals.....	91
5.5	Measuring surface and oil temperature	92
5.6	Helical-worm gear units and SPIROPLAN® W gear units	93
5.7	Helical/parallel shaft helical/helical-bevel gear units.....	94
5.8	Gear units with backstop.....	94
5.9	Speed monitoring.....	95
5.10	Installation and adjustment of the WEX speed monitor	95
5.11	Installation of the voltage encoder	99
6	Inspection/maintenance.....	101
6.1	General information	101
6.2	Wearing parts.....	103
6.3	Inspection/maintenance intervals.....	104
6.4	Lubricant change intervals.....	105
6.5	Maintenance of AL/AM/AQ./EWH adapter.....	106
6.6	AR adapter maintenance	106
6.7	Maintenance of AR adapter with slip clutch	107
6.8	AD input shaft assembly maintenance.....	112
6.9	Inspection/maintenance for the gear unit.....	113
7	Mounting positions.....	133
7.1	Designation of the mounting positions	133
7.2	Churning losses	134
7.3	Mounting position MX	134
7.4	Universal mounting position M0.....	134
7.5	Mounting positions of SPIROPLAN® gear units	134
7.6	Mounting position sheets	136
8	Technical data.....	170
8.1	Extended storage	170
8.2	Lubricants	172
9	Malfunctions.....	181
9.1	Gear units	182
9.2	Adapters AM/AQ./AL/EWH	183
9.3	AD input shaft assembly	183
9.4	Adapter with AR slip clutch	184
9.5	Service	184
9.6	Waste disposal.....	184
10	Declaration of conformity	185
10.1	Gear units in categories 2G and 2D with AM, AQA, AL, AD, AR adapters.....	185
10.2	Gear units in categories 3G and 3D with AR adapter	186

11	Address list	187
	Index	198

1 General information

1.1 About this documentation

This documentation is an integral part of the product. The documentation is intended for all employees who perform assembly, installation, startup, and service work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation or 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 grading and meaning of the signal words for safety 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 ON EXPLOSION PROTECTION	Important information about explosion protection	Suspension of explosion protection and resulting dangers
INFORMATION	Useful information or tip: Simplifies handling of the drive system.	

1.2.2 Structure of section-related safety notes

Section-related safety notes do not apply to a specific action but to several actions pertaining to one subject. The hazard 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 hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Explanation
	General hazard
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of risk of crushing
	Note on explosion protection
	Warning of automatic restart

1.2.3 Structure of 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.

1.3 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the unit!

1.4 Exclusion of liability

Read the information in this documentation, otherwise safe operation is impossible. You must comply with the information contained in this documentation 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, SEW-EURODRIVE assumes no liability for defects.

1.5 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.6 Copyright notice

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Copyright law prohibits the unauthorized reproduction, modification, distribution, and use of this document, in whole or in part.

2 Safety notes

2.1 Preliminary information

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The user must ensure that the basic safety notes are read and observed. Ensure that persons responsible for the machinery and its operation as well as persons who work on the unit independently 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, please contact SEW-EURODRIVE.

The following safety notes are primarily concerned with the use of the unit described in these operating instructions. If you use other components from SEW-EURODRIVE, also refer to the safety notes for these particular components in the corresponding documentation.

Also observe the additional safety notes provided in the individual chapters of this document.

2.2 Safety notes for carrying out work in potentially explosive atmospheres



▲ WARNING

Explosion hazard.

Severe or fatal injuries.

- Bear in mind that hot, live, or moving parts of machines can lead to explosions in atmospheres with critical gas mixtures or concentrations of dust.

2.3 General information



▲ WARNING

Danger of electric shock, risk of crushing or burns during operation as the motors and gearmotors can have live, bare (in the event of open connectors/terminal boxes) and movable or rotating parts as well as 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 unit
 - All the project planning documents, startup instructions and wiring diagrams related to the drive
 - System-specific regulations and requirements
 - National/regional regulations governing safety and the 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 installation and operation of the unit are correct.

2.4 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 the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately.

All qualified personnel must wear appropriate protective clothing.

2.5 Designated use

The gear units are intended for industrial systems and may only be used in accordance with the information provided in technical documentation of SEW-EURODRIVE and the information given on the nameplate. They meet the requirements set forth in Directive 94/9/EG or 2014/34/EU and comply with the applicable standards and regulations.

The gear units are components for the installation in machines and plants according to the 2006/42/EC Machinery Directive. Within the scope of the Directive, you must not operate the machine in the designated fashion until you have established that the end product complies with Machinery Directive 2006/42/EC.

Optional equipment

In addition to the general installation guidelines, the following regulations in accordance with German operating safety regulations (BetrSichV) or other national regulations must be observed for connecting additional devices:

- EN 13463-1 Non-electrical equipment for use in potentially explosive areas: Part 1 Basics and requirements
- EN 13463-5 Non-electrical equipment for use in potentially explosive areas: Part 5 Protection by constructional safety "c"
- EN 50281-2-1 Electrical operating resources for use in atmospheres containing combustible dust: Part 2-1 Examination processes – processes to determine the minimum ignition temperature of dust
- EN 60079-0 Electrical operating resources for potentially explosive atmospheres: General requirements
- EN 60079-1 for protection type "d"
- EN 60079-7 for protection type "e"
- EN 60079-11 intrinsically safe "i"
- EN 60079-14 Electrical operating resources for potentially explosive atmospheres: Project planning, selection and setup of electrical machinery.
- EN 60079-15 Electrical operating resources for potentially explosive atmospheres: Equipment protection by protection type "n"
- EN 60079-17 potentially explosive atmospheres: Part 17 Testing and maintenance of electrical machinery
- EN 60079-31 Electrical operating resources for use in atmospheres containing combustible dust: Protection through housing "t"
- DIN VDE 105-9 "Operating electrical equipment" or other national regulations
- DIN VDE 0100 "Erection of power installations with rated voltages below 1000 V" or other national regulations

Technical data and information on the permitted conditions are given on the nameplate and in the documentation; they have to be observed under all circumstances.

2.6 Other applicable documentation

Observe the corresponding documentation for all connected devices.

2.7 Transportation/storage

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If necessary postpone motor startup.

Tighten attached lifting eyes securely. The lifting eyes are designed to carry only the weight of the motor/gear unit/gearmotor. Do not apply any additional loads.

The installed lifting eyebolts are in accordance with DIN 580. Observe the loads and regulations specified there. If the motor/gear unit/gearmotor has 2 lifting eye lugs or lifting eyebolts, then you should also use both lifting eye lugs for attaching transport ropes. In this case, the tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

Use suitable, sufficiently rated handling equipment, that can be used for further transport.

In case the motor/gear unit/gearmotor is not installed immediately store it dry, free of dust and not outdoors. Do not store the motor/gearmotor on the fan guard. The motor/gear unit/gearmotor can be stored for up to 9 months without requiring any special measures before startup.

For storage periods longer than 9 months, SEW-EURODRIVE recommends the "extended storage" gear unit/gearmotor type. Gear units in this design are designated with a corresponding label.

For gear units of the "extended storage" design, the following measures are taken:


- A VCI anti-corrosion agent (volatile corrosion inhibitors) is added to the lubricant.

Please note that this VCI anti-corrosion agent is only effective in a temperature range of -25 °C to +50 °C.

To prevent the VCI anti-corrosion agent from evaporating, the gear units must remain tightly sealed until startup.

- The flange contact surfaces and shaft ends are also treated with an anti-corrosion agent.

The gear units come with the oil fill according to the specified mounting position (M1 – M6). Always check the oil level before you take the gear unit into operation.

For extended storage, observe the storage conditions specified in chapter Extended storage (→  170).

2.8 Installation

Ensure that the unit is installed and cooled according to the regulations mentioned in this document.


Protect the unit from excessive strain. Ensure that components are not deformed and that insulation spaces are maintained, particularly during transportation. Electric components must not be mechanically damaged or destroyed.

The following applications are prohibited unless explicitly permitted:

- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in applications that are subject to mechanical vibration and shock loads in excess of the requirements in EN 61800-5-1.

Observe the notes in chapter "Installation".

2.9 Startup/operation

- Check the oil level before startup as described in chapter "Inspection/maintenance" (→  101).
- Check for the correct direction of rotation in **decoupled** state. Listen out for unusual grinding noises as the shaft rotates.
- Secure the key for the test run without output elements. Do not deactivate monitoring and protection devices even for a test run.
- Switch off the gearmotor if in doubt whenever changes occur in relation to normal operation (e.g. increased temperature, noise, vibration). Determine the cause. Contact SEW-EURODRIVE if required.

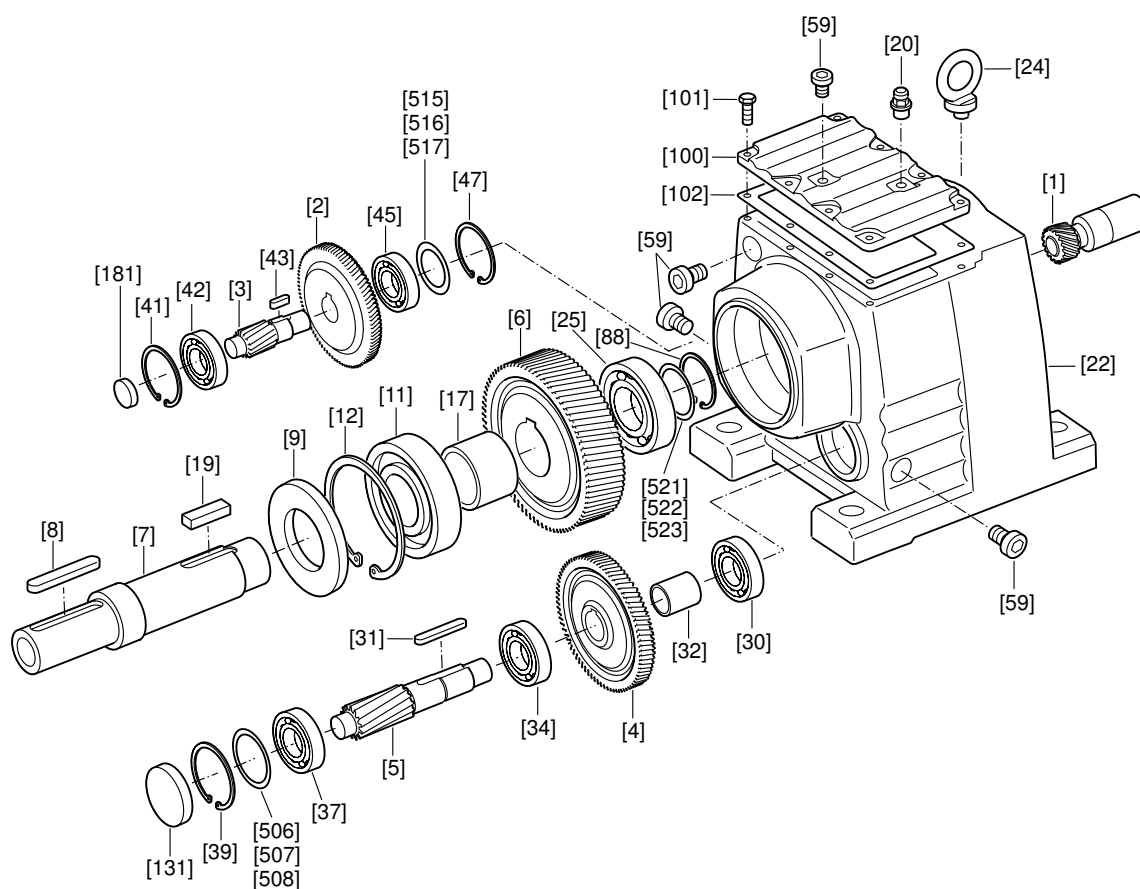
3 Gear unit structure

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.

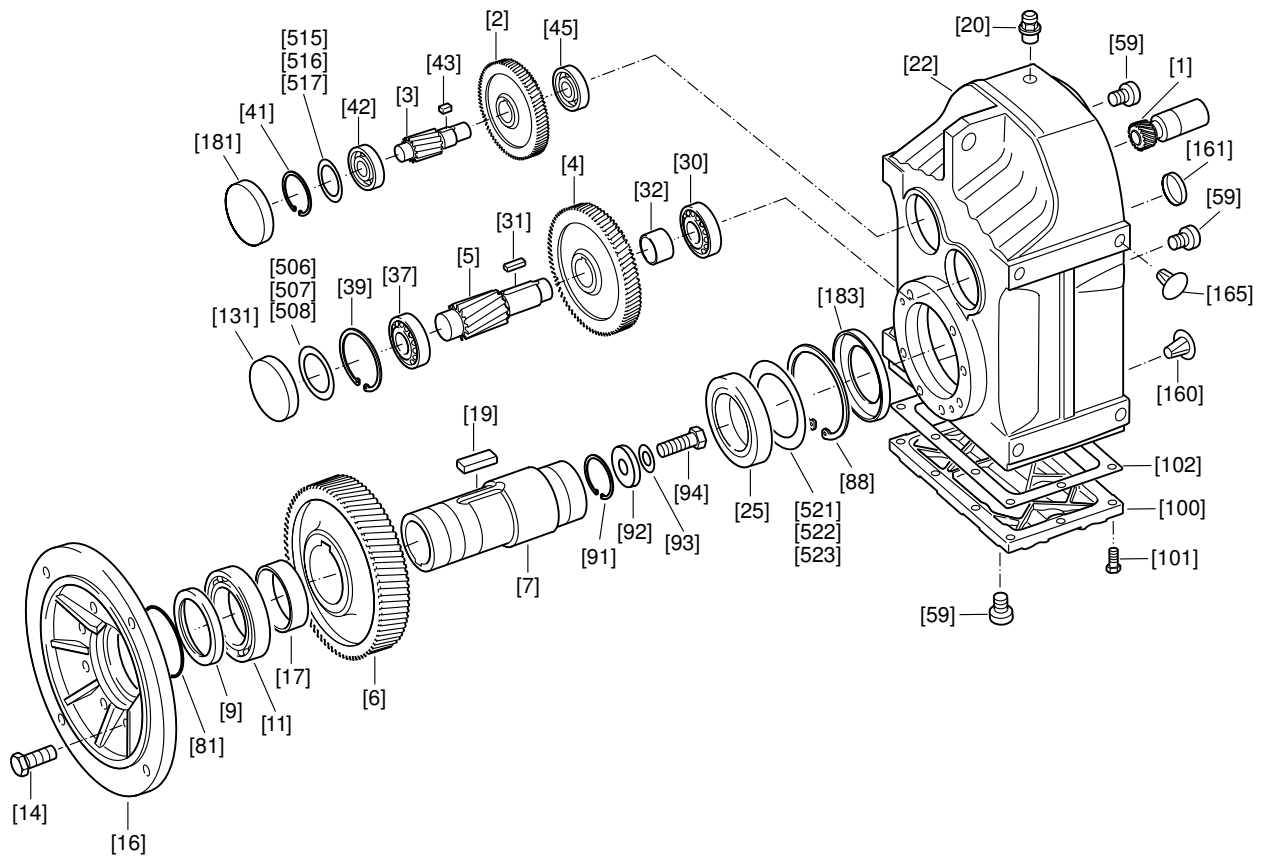
3.1 Basic structure of helical gear units R..07 – R..167



9007199273935243

[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	[37] Rolling bearing	[131] Closing cap	
[12] Retaining ring	[39] Retaining ring	[181] Closing cap	
[17] Spacer tube	[41] Retaining ring	[506] Shim	

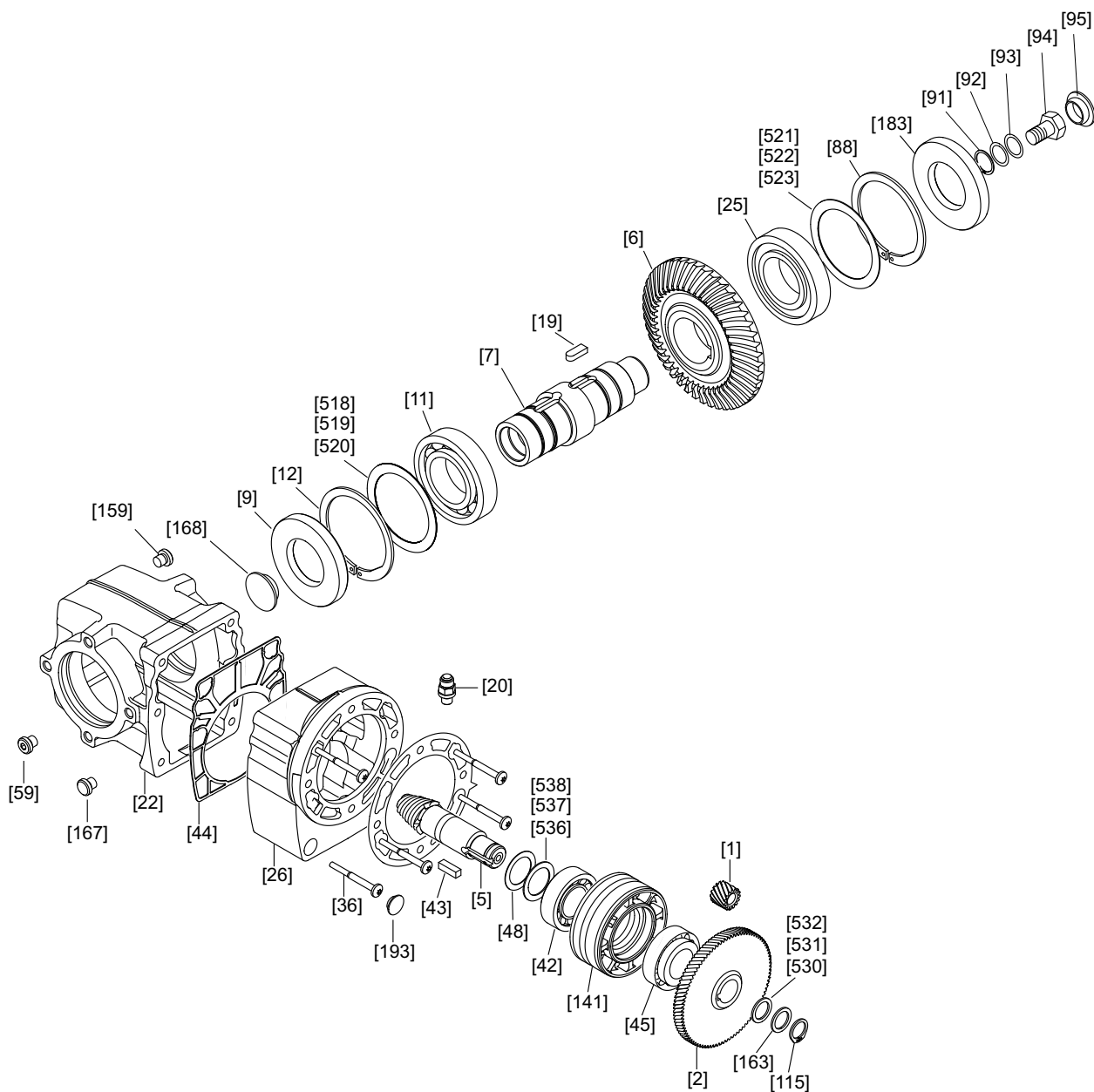
3.2 Basic structure of parallel-shaft helical gear units F..27 – F..157



9007199274039051

[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	[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		

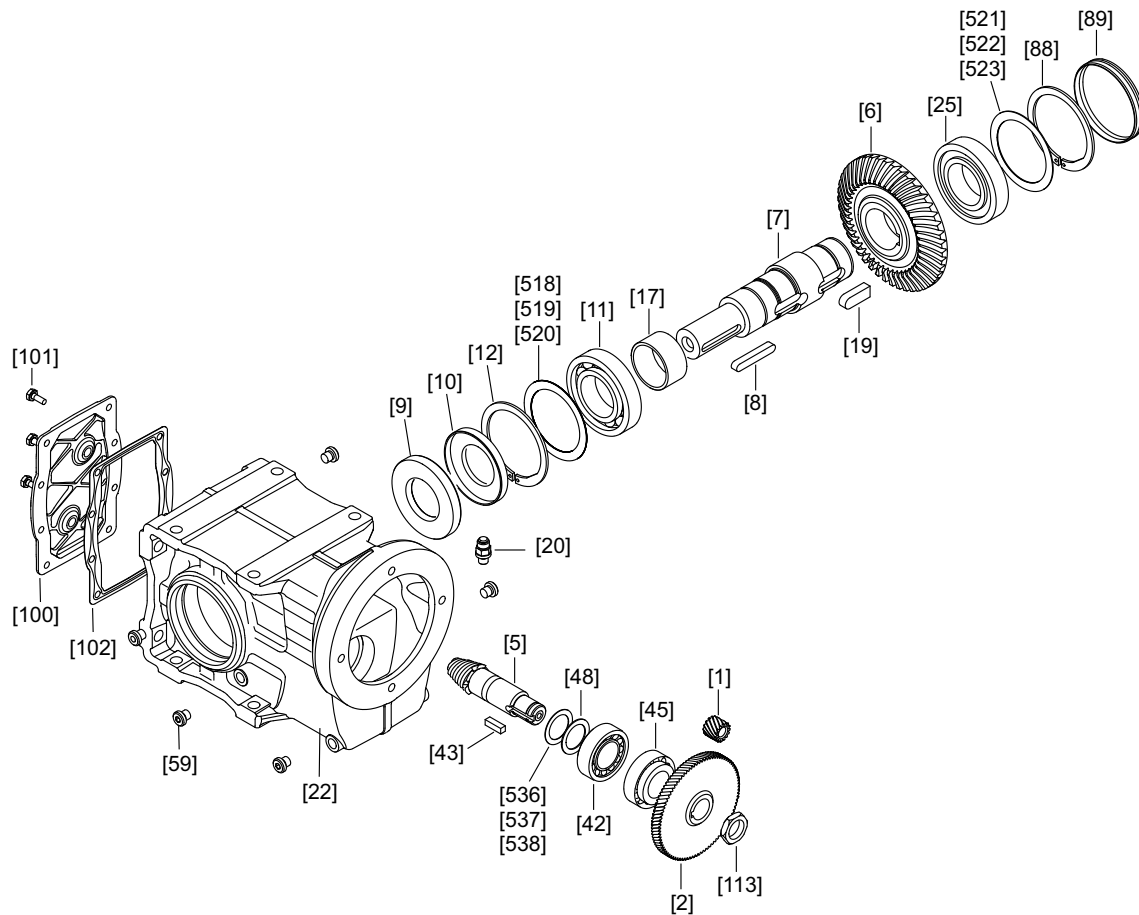
3.3 Basic structure of helical-bevel gear units K..19/K..29



9007206676351499

[1] Pinion	[26] Housing 1. Stage	[94] Hex head screw	[520] Shim
[2] Gear	[36] Stud	[95] Protection cap	[521] Shim
[5] Pinion shaft	[42] Tapered roller bearing	[115] Retaining ring	[522] Shim
[6] Gear	[43] Key	[141] Bushing	[523] Shim
[7] Hollow shaft	[44] Gasket	[159] Closing plug	[530] Shim
[9] Oil seal	[45] Tapered roller bearing	[163] Supporting ring	[531] Shim
[11] Rolling bearing	[50] Bevel gear set	[167] Closing plug	[532] Shim
[12] Retaining ring	[59] Screw plug	[168] Protection cap	[536] Shim
[19] Key	[88] Retaining ring	[183] Oil seal	[537] Shim
[20] Breather valve	[91] Retaining ring	[193] Closing plug	[538] Shim
[22] Gear unit housing	[92] Washer	[518] Shim	
[25] Deep groove ball bearing	[93] Lock washer	[519] Shim	

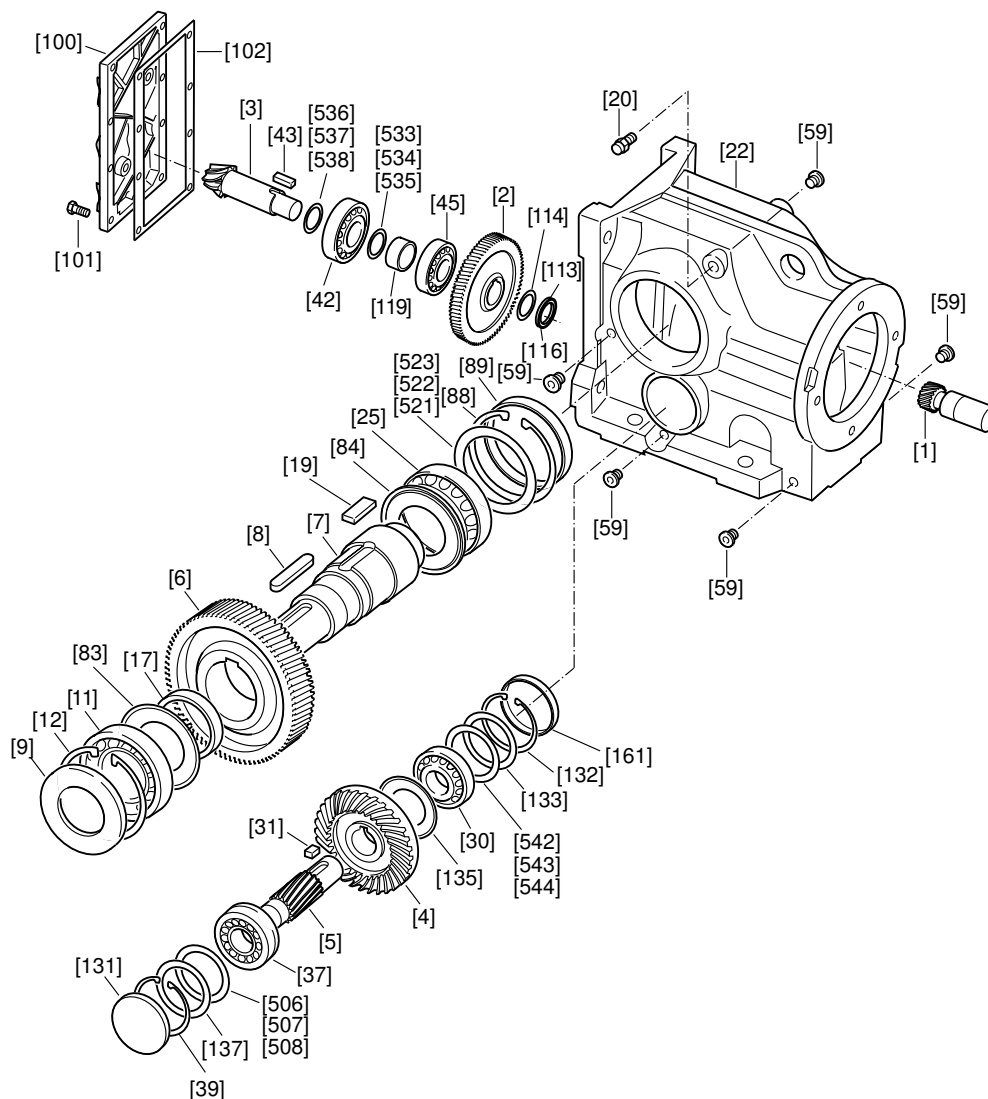
3.4 Basic structure of helical-bevel gear units K..39/K..49



14457456395

[1] Pinion	[12] Retaining ring	[48] Supporting ring	[518] Shim
[2] Gear	[17] Spacer tube	[50] Bevel gear set	[519] Shim
[5] Pinion shaft	[19] Key	[59] Screw plug	[520] Shim
[6] Gear	[20] Breather valve	[88] Retaining ring	[521] Shim
[7] Hollow shaft	[22] Gear unit housing	[89] Closing cap	[522] Shim
[8] Key	[25] Deep groove ball bearing	[100] Inspection cover	[523] Shim
[9] Oil seal	[42] Tapered roller bearing	[101] Hex head screw	[536] Shim
[10] Oil seal	[43] Key	[102] Gasket	[537] Shim
[11] Deep groove ball bearing	[45] Tapered roller bearing	[113] Slotted nut	[538] Shim

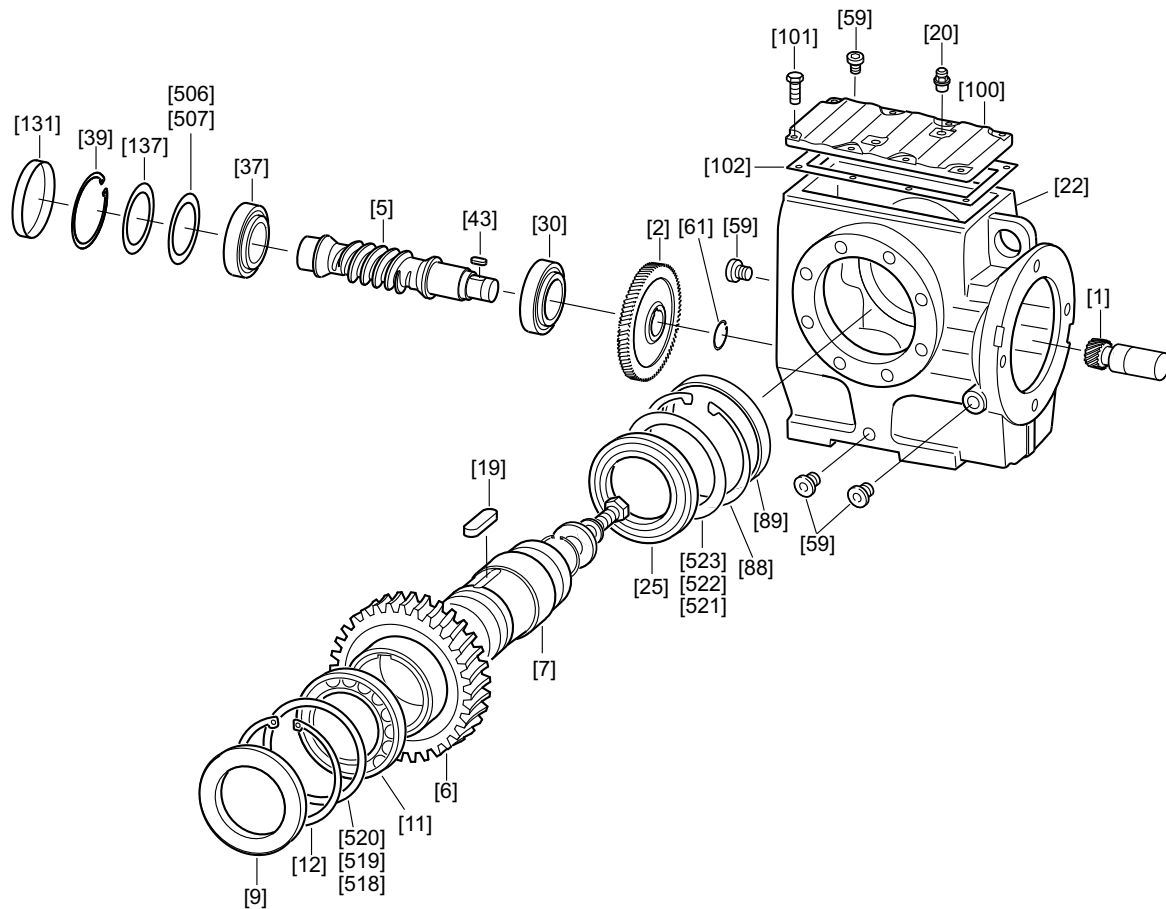
3.5 Basic structure of helical-bevel gear units K..37 – K..187



9007199274042123

[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] Multi-tang washer	[533] Shim
[4] Gear	[37] Rolling bearing	[116] Thread lock	[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	[83] Shield ring	[137] Supporting ring	[543] Shim
[12] Retaining ring	[84] Shield ring	[161] Closing cap	[544] Shim
[17] Spacer tube	[88] Retaining ring	[506] Shim	
[19] Key	[89] Closing cap	[507] Shim	
[20] Breather valve	[100] Inspection cover	[508] Shim	
[22] Gear unit housing	[101] Hex head screw	[521] Shim	

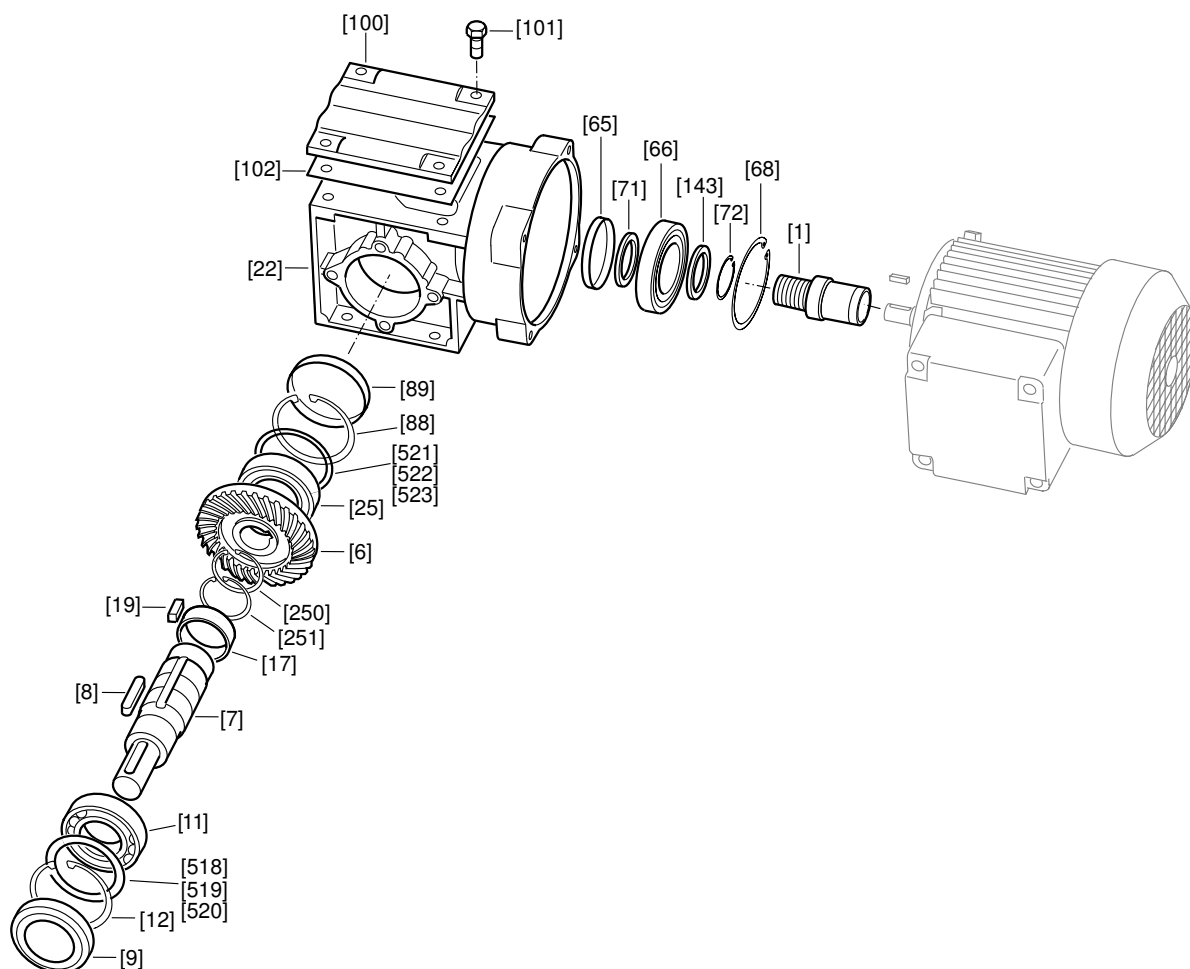
3.6 Basic structure of helical-worm gear units S..37 – S..97



9007199274045195

[1] Pinion	[20] Breather valve	[88] Retaining ring	[518] Shim
[2] Gear	[22] Gear unit housing	[89] Closing cap	[519] Shim
[5] Worm	[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	[43] Key	[137] Supporting ring	
[12] Retaining ring	[59] Screw plug	[506] Shim	
[19] Key	[61] Retaining ring	[507] Shim	

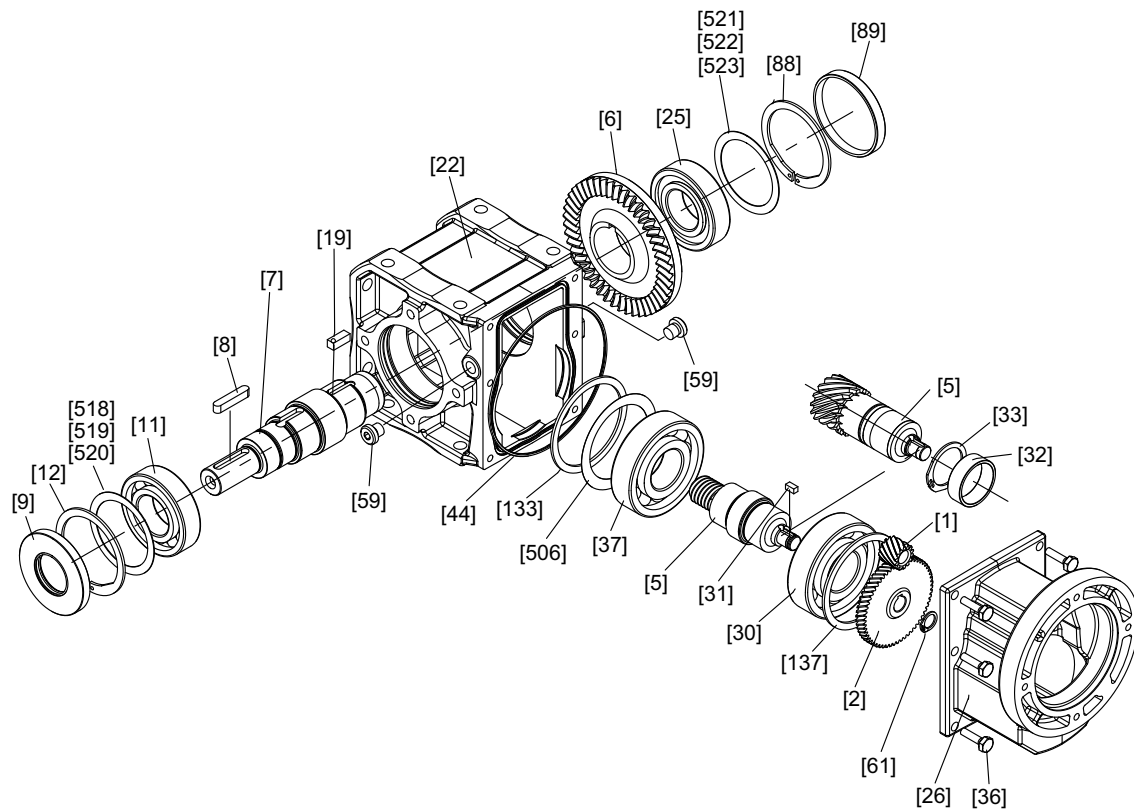
3.7 Basic structure of SPIROPLAN® gear units W..10 – W..30



9007199274048267

[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	[102] Gasket	[522] Shim
[11] Rolling 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	

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



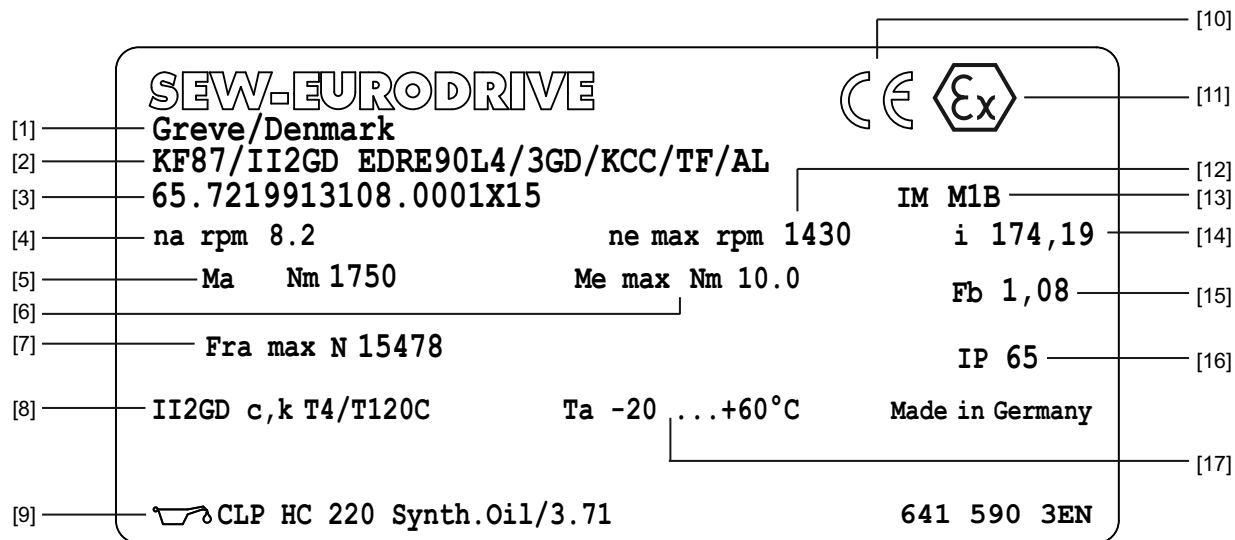
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[1] Pinion	[22] Gear unit housing	[59] Screw plug	[521] Shim
[2] Gear	[25] Deep groove ball bearing	[61] Retaining ring	[522] Shim
[5] Pinion shaft	[26] Housing stage 1	[88] Retaining ring	[523] Shim
[6] Gear	[30] Deep groove ball bearing	[89] Closing 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	

3.9 Nameplate/type designation

3.9.1 Nameplate

The following figure gives an example of a nameplate of an explosion-proof gearmotor:



15118780555

[1]		Address
[2]		Type designation gearmotor
[3]		Serial number
[4]	min ⁻¹	Output speed
[5]	Nm	Output torque
[6]	Nm	Maximum input torque
[7]	N	Maximum overhung load on the output shaft
[8]		Information on Ex protection
[9]		Oil type and oil fill volume
[10]		CE marking
[11]		Ex marking
[12]	min ⁻¹	Maximum input speed
[13]		Information on mounting position
[14]		Gear unit ratio
[15]		Service factor
[16]		Degree of protection
[17]	°C	Permitted ambient temperature

INFORMATION



For ATEX gearmotors, the nameplates of the motor and gear unit must be compared. When you compare the values (e.g. dust or ambient temperature) on the nameplates, the least common multiples determines the overall unit motor + gear unit.

INFORMATION



In some applications, SEW-EURODRIVE gear units/gearmotors must only be operated in compliance with special measures. For these cases, there is a special indication on the nameplate "**II..X**". For further information, refer to chapter Information on special indication X identification (→ 24).

The gear unit designs and options are described in chapter Type designation (→ 26).

EAC marking



On request, the explosion-proof gear units from SEW-EURODRIVE meet the requirements of the technical regulations of the Eurasian Economic customs union (Russia, Kazakhstan, Belarus, and Armenia). The EAC marking on the product certifies the conformity with the safety requirement of the Customs Union.

3.9.2 Information on special indication X identification

INFORMATION






Special operation data are given on the order confirmation and on the nameplate.

In some applications, SEW gear units, motors, or gearmotors must only be operated if special measures are adhered to (e.g. intermittent duty exclusively, reduced output torque etc.). These special measures may be necessary due to various reasons. The customer has been informed about the required special measures on the initial distribution of the gear unit/motor/gearmotor. The customer is obliged to ensure the compliance with these special measures.

Gear units, motors, or gearmotors with special measures are indicated with the special identification "X" on the nameplate (see following figure). The relevant special measure is indicated separately by an "X" combined with a number on the nameplate. The following describes the special measures in detail.

X1: Intermittent duty

SEW-EURODRIVE					
76646 Bruchsal/Germany					
SA87/II2GD EDRE90M4/2GD/KCC					
01.41035906108.0001.14					
na r/min 4.9		ne max r/pm 1420		IM M1A	
Ma	Nm 1500	Me max Nm 7.4		i 288.0	
				Fb 1.5	
Fra max N 30000				IP 65	
[1]	II2GD c,k T4/T120C X		Ta -20 ...+40°C		Made in Germany
[2]	X1/10minDRIVING/5minSTOP				
 CLP HC 460 Synth.Oil/3.8					
					641 590 3

15118778123

[1] Special indication "X"

[2] Special measure X1

In this case, an arrangement has been made with the buyer that the drive may be used only in intermittent duty. The maximum time for operation and pauses are indicated on the nameplate and the order confirmation. Reducing the idling time is not permitted. The operating time may be reduced but not extended. The buyer is obliged to take measures to ensure that the specifications are adhered to.

X2: Drive in combination with an ATEX-compliant oil cooling system provided by the customer

In this case, it was agreed with the buyer that this drive may only be operated in connection with an ATEX compliant oil cooling system on the customer side. On the basis of the required oil bath temperature, the cooling system must provide a certain minimum cooling power at a certain ambient temperature. The oil quantity must be extended by the volume of the cooling circuit to ensure sufficient and permanent lubrication of the gear unit. The buyer is responsible for the assessment of the reliability of the oil cooling system. The buyer of this product is obligated to meet these requirements through appropriate dimensioning and installation of a suitable cooling system.

X3: Special approval for multiple mounting positions

In this case, it was agreed with the buyer that this drive can also be operated in mounting positions other than the one specified in the following quotation text. Pre-requisite is that the breather valve is mounted according to the mounting position.

X4: Customer-supplied output shaft	In this case, it was agreed due to a shaft provided by the customer that in contrast to the specifications in the order confirmation, other customer-specific load data for overhung load, point of force application (in relation to the flange surface, according to a bending moment), axial load and output torque are permitted.
X5: Oil change (summer and winter operation)	In this case, it was agreed with the buyer that the oil must be changed for summer and winter operation.

3.9.3 Type designation

INFORMATION



For a detailed overview of type designations and additional information, refer to the following publications:

- "Explosion-Proof Gearmotors" catalog
- "Explosion-Proof AC Motors" catalog

Example: Helical-bevel gear units in explosion-proof design II2GD

Example: KF87/II2GD		
Series	KF	<ul style="list-style-type: none"> • K = Helical-bevel gear unit • F = Flange-mounted design
Size	87	Size 87
Explosion-proof design	/II2G	Explosion-proof design according to equipment group II: <ul style="list-style-type: none"> • 2G = category 2, explosive gas atmosphere

Below an overview of type designations for R, F, S, K, and W gear units and their options.

Helical gear units

Designation	
RX..	Single-stage foot mounted version
RXF..	Single-stage B5 flange-mounted version
R..	Foot-mounted design
R..F	Foot-mounted and B5 flange-mounted version
RF..	B5 flange-mounted design
RZ..	B14 flange-mounted
RM..	B5 flange-mounted with extended bearing hub

Parallel-shaft helical gear units

Designation	
F..	Foot-mounted design
FA..B	Foot-mounted design and hollow shaft
FH..B	Foot-mounted design and hollow shaft with shrink disk
FV..B	Foot-mounted design and hollow shaft with splined hollow shaft to DIN 5480
FF..	B5 flange-mounted design
FAF..	B5 flange-mounted design and hollow shaft
FHF..	B5 flange-mounted design and hollow shaft with shrink disk
FVF..	B5 flange-mounted design and hollow shaft with splined hollow shaft to DIN 5480

Designation	
FA..	Hollow shaft
FH..	Hollow shaft with shrink disk
FT..	Hollow shaft with TorqLOC® hollow shaft mounting system
FV..	Splined hollow shaft according DIN 5480
FZ..	B14 flange-mounted design
FAZ..	B14 flange-mounted design and hollow shaft
FHZ..	B14 flange-mounted design and hollow shaft with shrink disk
FVZ..	B14 flange-mounted design and hollow shaft with splined hollow shaft to DIN 5480

Helical-bevel gear units

Designation	
K..	Foot-mounted design
KA..B	Foot-mounted design and hollow shaft
KAF..B	B5 flange-mounted design, hollow shaft and foot-mounted design
KF..B	Foot-mounted design, B5 flange-mounted design
KH..B	Foot-mounted design and hollow shaft with shrink disk
KHF..B	B5 flange-mounted design and hollow shaft with shrink disk and foot-mounted design
KV..B	Foot-mounted design and hollow shaft with splined hollow shaft to DIN 5480
KF..	B5 flange-mounted design
KAF..	B5 flange-mounted design and hollow shaft
KHF..	B5 flange-mounted design and hollow shaft with shrink disk
KVF..	B5 flange-mounted design and hollow shaft with splined hollow shaft to DIN 5480
KA..	Hollow shaft
KH..	Hollow shaft with shrink disk
KT..	Hollow shaft with TorqLOC® hollow shaft mounting system
KV..	Splined hollow shaft according DIN 5480
KZ..	B14 flange-mounted design
KAZ..	B14 flange-mounted design and hollow shaft
KHZ..	B14 flange-mounted design and hollow shaft with shrink disk
KVZ..	B14 flange-mounted design and hollow shaft with splined hollow shaft to DIN 5480

Helical-worm gear units

Designation	
S..	Foot-mounted design
SF..	B5 flange-mounted design
SAF..	B5 flange-mounted and hollow shaft
SHF..	B5 flange-mounted design and hollow shaft with shrink disk
SA..	Hollow shaft
SH..	Hollow shaft with shrink disk
ST..	Hollow shaft with TorqLOC® hollow shaft mounting system
SAZ..	B14 flange-mounted design and hollow shaft
SHZ..	B14 flange-mounted and hollow shaft with shrink disk

SPIROPLAN® gear units

Designation	
W..	Foot-mounted design
WF..	Flange-mounted design
WAF..	Flange-mounted version and hollow shaft
WA..	Hollow shaft
WA..B	Foot-mounted version and hollow shaft
WH..B	Foot-mounted version and hollow shaft with shrink disk
WHF..	Flange-mounted and hollow shaft with shrink disk
WH..	Hollow shaft with shrink disk
WT..	Hollow shaft with TorqLOC® hollow shaft mounting system

Options

R, F and K gear units:

Designation	
/R	Reduced backlash

K, S and W gear units:

Designation	
/T	With torque arm

F gear units:

Designation	
/G	With rubber buffer

4 Mechanical installation

4.1 General information



▲ 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 gear unit/gearmotor due to improper installation.

Damage to the gear unit/gearmotor.

- It is important that you observe the notes in this chapter.

NOTICE

Ingression of solvent at the sealing lips of the oil seals when cleaning the input shaft and flange areas from anti-corrosion agent, dirt or the like.

Damage to oil seals.

- Do not let solvent ingress at the oil seals. Use a standard solvent.

INFORMATION



Check the transportation packaging for oil residues. Oil residues could indicate an oil leak. In this case, the lubrication of the gear unit is not guaranteed. This could cause excessive temperature on the surface.

Contact SEW-EURODRIVE if there are oil residues on the gear unit.

INFORMATION



The assembly of gear head units with motors or adapters may be performed by authorized personnel only. Contact SEW-EURODRIVE.

4.2 Gear units and gearmotors in explosion-proof design II2GD and II3GD**INFORMATION**

- Explosion-proof gear units and gearmotors of the R..7, F..7, K..7, K..9, S..7, and SPIROPLAN® W series comply with the design requirements for equipment group II, categories 2G (potentially explosive gas atmosphere) and 2D (potentially explosive dust atmosphere). These units are intended for use in zones 1 and 21.
- The explosion-proof R..7, F..7, K..7, K9, and S..7 series gear units with AR adapter (adapter with slip clutch) comply with equipment group II, category 3G (potentially explosive gas atmosphere) and 3D (potentially explosive dust atmosphere). These units are intended for use in zones 2 and 22.
- Do not operate gear units and gearmotors of the SPIROPLAN® W10.. series in a potentially explosive atmosphere.

4.2.1 Ambient temperature

If no deviating data is given on the nameplate, gear units in explosion-proof design may only be used at ambient temperatures in the range from -20 °C – +40 °C.

If an attached component limits this temperature range, the data on the components nameplate applies.

INFORMATION

Any ambient temperatures deviating from this range are listed on the nameplate.

4.2.2 Temperature class

Mains-operated gear units/gearmotors in category II2G (potentially explosive gas atmosphere) are approved for temperature classes T3 to T6 depending on their speed, reduction ratio and mounting position.

The temperature class of the gear unit is specified on the nameplate.

To define which stand-alone gear units and which 4 or 6-pole gearmotors operated with inverters can be used in an application, contact SEW-EURODRIVE.

4.2.3 Surface temperature

The surface temperature of gear units in category II2D is 120 °C or 140 °C, depending on the speed, reduction ratio and mounting position.

Lower surface temperatures are only approved after consultation with SEW-EURODRIVE and must be indicated on the nameplate. The system operator must guarantee that a possible accumulation of dust will not exceed a maximum thickness of 5 mm, in accordance with EN 50281-1-2.

4.2.4 Degree of protection

The degree of protection for all gear unit versions is IP65 according to EN 60529.

4.2.5 Ambient conditions

The gear unit must be sufficiently ventilated. No external heat generation (e.g. via couplings) must be present.

4.2.6 Output power and output torque

Observe the nominal output torque and the permitted overhung loads.

4.2.7 Special designs

Special designs (e.g. modified output shaft) may only be operated in potentially explosive atmospheres after prior approval by SEW-EURODRIVE.

4.3 Prerequisites for installation

Check that the following conditions have been met:

- The specifications on the nameplate of the gearmotor match the voltage supply system.
- The drive has not been damaged during transportation or storage.
- The oil seals on the output end are protected against wear in abrasive ambient conditions.
- With **standard gear units**, make sure that:
 - The ambient temperature corresponds to the specifications in the technical documentation, the nameplate and the lubricant table in chapter Lubricants (→ 172).
 - No harmful oils, acids, gases, vapors, radiation etc. are present in the environment.
- For **helical-worm gear units and SPIROPLAN® W gear units**, make sure that no high external mass moments of inertia are present that could exert a retrodriving load on the gear unit. In this respect, observe the following formula:

$$\eta' \text{ (retrodriving)} = 2 - 1/\eta$$

Self-locking if $\eta' < 0.5!$
- With **special designs**, make sure that the drive is designed according to the ambient conditions. Observe the information on the nameplate.

4.4 Required tools/resources

The following tools and resources are required for the mechanical installation:

- Wrench
- Torque wrench for:
 - Gear unit mounting
 - Shrink disks
 - Motor adapter AQH or EWH
 - Input shaft assembly with centering shoulder
- Mounting device
- Compensation elements (shims and spacing rings)
- Fasteners for input and output elements
- Lubricant (e.g. NOCO® fluid)
- Threadlocker compound for input cover with centering shoulder (e.g. Loctite® 243)

INFORMATION



Standard parts are not included in the delivery.

4.5 Installation tolerances

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

4.6 Installing the gear unit



▲ WARNING

Risk of explosion due to electric sparks if housing is not additionally grounded.

Fatal and serious injuries.

- Additionally ground the housing. Use grounding screws at the motor.



▲ WARNING

Risk of explosion due to friction that causes electrical charge on the coating.

Fatal and serious injuries.

- Prevent moving parts on the coating from creating electric sparks.



▲ CAUTION

Risk of injury due to improper installation/disassembly

Severe personal injury and damage to property.

- Work on the gear unit only when the machine is not in use.
- Secure the drive unit against unintentional power-up.
- Attach an information sign near the ON switch to warn that the gear unit is being worked on.
- Prevent heavy component parts (e.g. shrink disks) against falling during installation/disassembly.
- It is important that you observe the notes in this chapter.



▲ CAUTION

Risk of injury due to protruding gear unit parts.

Severe injuries

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



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

NOTICE

Damage to gear unit/gearmotor due to cold air currents. Condensed water in the gear unit can cause damage.

Damage to property.

- Protect the gear unit from direct cold air currents.

INFORMATION



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

Mounting position

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 sizes W10-W30 do not depend on a particular mounting position.

Oil fill volume

Check the oil fill depending on the mounting position (for information on the fill quantity refer to the nameplate). Control the oil fill level at this opportunity. See chapter "Inspection/maintenance for the gear unit" (→ 113). The gear units are filled with the required oil quantity 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.

Changing the mounting position

Adjust the lubricant fill volumes and the position of the breather valve accordingly in the event of a change of mounting position. Observe chapter "Mounting positions" (→ 133).

INFORMATION



Do not change the mounting position without prior consultation with SEW-EURODRIVE.

The information on the nameplate is binding. The ATEX EC declaration of conformity and the guarantee no longer apply if the mounting position is changed without prior consultation with SEW-EURODRIVE. Changes to the mounting position must be projected and indicated on the nameplate.

Submounting

The support structure must have the following characteristics:

- 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	Flatness defect
≤ 67	max. 0.4 mm
77 – 107	max. 0.5 mm
137/147	max. 0.7 mm
157 – 187	max. 0.8 mm

Do not twist housing legs and mounting flanges against each other. Observe the permitted overhung and axial forces. Observe chapter "Project Planning" in the Gear unit/gearmotor catalog for calculating the permitted overhung and axial loads.

Strength class of the screws

Always mount gearmotors using screws of strength class 8.8.

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

Gear unit	Flange Ø in mm	Strength class of the screws
RF37/R37F	120	10.9
RF47/R47F	140	
RF57/R57F	160	
FF/FAF77/KF/KAF77	250	
RF147	450	
RF167	550	
RZ37 – RZ87	60ZR – 130ZR	

Corrosion protection for screw connections

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 $< 10^9 \Omega$. Electrochemical corrosion can occur between various metals, for example, cast iron and stainless steel. Also fit the screws with plastic washers. Additionally ground the housing. Use grounding screws on the motor.

4.6.1 Position of the oil level plug, oil drain plug, and breather valve on compound gear units



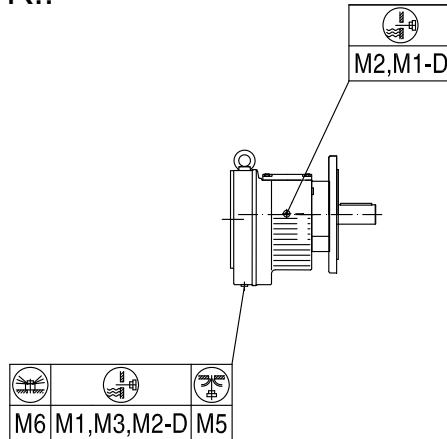
INFORMATION

R../R.. compound gear units in mounting position M1 and S../R.. compound gear units in mounting position M3 have an increased oil level for sufficient lubrication.

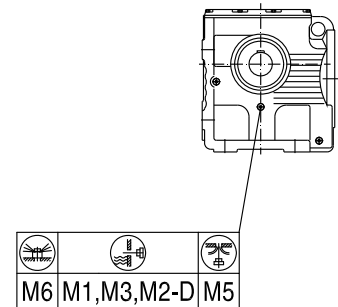
- The oil level plugs are therefore positioned as shown in the following figure.

The following figure shows the use of the screw plug bore of helical and helical-worm gear units of compound gear units:

R..



S..



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Icon	Meaning
	Breather valve
	Oil level plug ¹⁾
	Oil drain plug

1) Does not apply to the 1st gear unit (large gear unit) of compound gear units.

4.6.2 Installation in damp locations or outdoors

NOTICE

Paint can block the breather valve and damage the sealing lips of the oil seals.

Damage to property.

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

Drives are supplied in corrosion-resistant designs with an according surface protection coating for use in damp areas or outdoors.

- Repair any damage to the paint work (e.g. on the breather valve or the lifting eyes).

22162607/EN – 07/2015

- When mounting the motors onto AM, AQ adapters and to AR, AT start-up couplings and slip clutches, seal the flange areas with a suitable sealant (e.g. Loctite® 574).
- In case of setup outdoors, the drives must not be exposed to direct sunlight. Install appropriate protection devices e.g. a cover or a canopy. The protection device must not cause heat build-up.
- The system operator must ensure that no foreign objects (e.g. falling objects or coverings) affect the operation of the gear unit.

4.6.3 Tightening torques for retaining screws

Mount the gearmotors with the following tightening torques:

Screw/nut	Tightening torque $\pm 10\%$ 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 Ø mm	Gear unit	Screw/nut	Tightening torque $\pm 10\%$ Strength class 10.9 Nm
120	RF37	M6	16.5
140	RF37/RF47	M8	40.1
160	RF57	M8	40.1
450	RF147	M20	661
550	RF167	M20	661
60ZR	RZ37	M8	40
70ZR	RZ47	M8	40
80ZR	RZ57	M10	79
95ZR	RZ67	M10	79
110ZR	RZ77	M10	79
130ZR	RZ87	M12	137
250	FF77/KF77/ FAF77/KAF77	M12	137

4.6.4 Gear unit mounting

INFORMATION



If you use the gear unit in flange-mounted design or foot/flange-mounted design with VARIGEAR® variable-speed gear units, use screws of 10.9 quality and suitable washers for flange mounting on customer side.

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

Foot-mounted gear unit

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

Screw	Gear unit type					
	R/R..F	RX	F/FH..B/ FA..B	K/KH..B/KV..B/ KA..B	S	W
M6	07	-	-	19	-	10/20
M8	17/27/37	-	27/37	29	37	30/37/47
M10	-	57	47	37/39/47/49	47/57	-
M12	47/57/67	67	57/67	57/67	67	-
M16	77/87	77/87	77/87	77	77	-
M20	97	97/107	97	87	87	-
M24	107	-	107	97	97	-
M30	137	-	127	107/167	-	-
M36	147/167	-	157	127/157/187	-	-

Gear unit with B14 flange-mounted 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	FZ/FAZ/FHZ/ FVZ	KZ/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 the W30 design mounted directly to a CMP.. motor or mounted via an EWH.. adapter, the thread size is M8.

Gear unit with B5 flange

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

Flange Ø mm	Screw	Gear unit type				
		RF/R..F/RM	FF/FAF/ FHF/FVF	KF/KAF/ KHF/KVF	SF/SAF/SHF	WF/WAF/ WHF
80	M6	-	-	-	-	10
110	M8	-	-	-	-	20
120	M6	07/17/27	-	-	37	10/20/30/37
120	M8	-	-	19	-	-
140	M8	07/17/27/37/47	-	-	-	-
160	M8	07/17/27/37/47	27/37	19/37	37/47	30/37/47
160	M10	-	-	29/39	-	-
200	M10	37/47/57/67	47	29/47	57/67	-
200	M12	-	-	49	-	-
250	M12	57/67/77/87	57/67	57/67	77	-
300	M12	67/77/87	77	77	-	-
350	M16	77/87/97/107	87	87	87	-
450	M16	97/107/137/147	97/107	97/107	97	-
550	M16	107/137/147/167	127	127	-	-
660	M20	147/167	157	157	-	-

4.6.5 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, fluorocarbon rubber forms harmful gases and vapors as well as 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.

4.6.6 Gear unit venting



▲ WARNING

Risk of explosion due to overheated gear unit due to a dirty or dusty breather valve.

Severe or fatal injuries.

- Check the breather valve function regularly and replace it if necessary.
- In case of high dirt and dust load use a breather filter instead of a breather valve.

The following table lists gear units that do not require venting:

Gear unit	Mounting position
R..07	M1/M2/M3/M5/M6
R..17/R..27/F..27	M1/M3/M5/M6
W..10/W..20/W..30	M1– M6
W..37/W..47	M1/M2/M3/M5/M6
K..19/K..29	M1/M2/M3/M5/M6

All other gear units are delivered with a breather valve suitable to the mounting position and activated.

Exceptions:

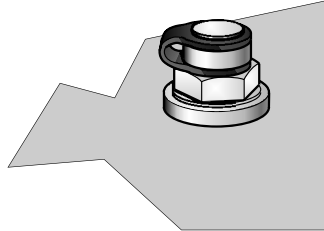
1. The following gear units are delivered with a screw plug on the provided breather hole:
 - Gear unit with pivoted mounting position
 - Gear units for inclined mounting

A breather valve is supplied in a separate plastic bag attached to the gear unit. Before startup, replace the highest screw plug in the terminal box of the motor with the breather valve provided.

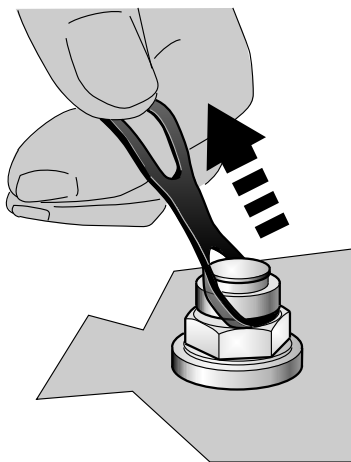
2. For **gear head units** venting on the input end, a breather valve is supplied in a plastic bag.
3. **Enclosed gear units** are delivered without a breather valve.
4. In some countries, the breather valve is installed, but not activated due to possible pressure fluctuations during transport. In such cases the transport protection must be removed. This activates the breather valve (see chapter "Activating the breather valve" (→ 41)).

Activating the breather valve

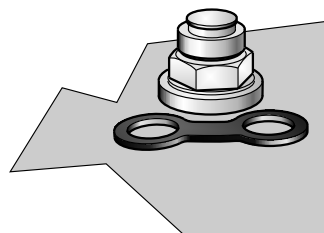
Check whether the breather valve is activated. If the breather valve has not been activated, you must remove the transport protection device from the breather valve before starting up the gear unit!



Breather valve with transport protection



Removing the transport protection



Activated breather valve

4.6.7 Painting the gear unit

NOTICE

Paint can block the breather valve and damage the sealing lips of the oil seals.

Damage to property.

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

4.7 Gear unit with solid shaft**INFORMATION**

If input and output elements are subject to the Directives 94/9/EC or 2014/34/EU, the input and output elements require ATEX approval.

INFORMATION

Only use belts with sufficient electrical leakage resistance $< 10^9 \Omega$.

4.7.1 Assembling input and output elements**NOTICE**

Damage to bearing, housing or shafts due to incorrect mounting

Possible damage to property.

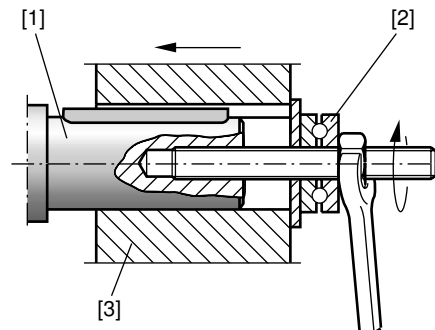
- Only use a mounting device for installing input and output elements (see chapter "Using the mounting device" (→ 43)). Use the threaded centering bore at the shaft end.
- Never force belt pulleys, couplings, pinions, etc. onto the shaft end by hitting them with a hammer.
- During the installation of belt pulleys, make sure the belt is tensioned correctly in accordance with the manufacturer's instructions.
- Make sure the transmission elements are balanced after fitting and do not give rise to any impermissible radial or axial forces. For the approved values, refer to the catalog "Gearmotors" or "Explosion-Proof Drives".

INFORMATION

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

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.

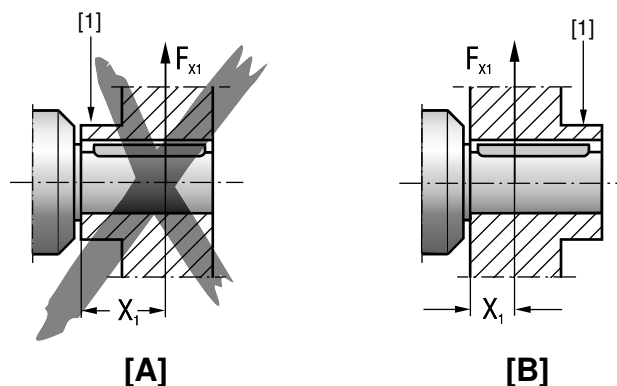


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- | | | | |
|-----|----------------|-----|--------------|
| [1] | Gear shaft end | [3] | Coupling hub |
| [2] | Thrust bearing | | |

Avoiding excessive overhung loads

To avoid high overhung loads, mount gears and sprockets according to figure B.



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- | | | | |
|-----|--------------------|----------|---------------------------|
| [1] | Hub | F_{x1} | Overhung load at point X1 |
| [A] | Incorrect assembly | [B] | Correct assembly |

4.7.2 Mounting of couplings

**▲ CAUTION**

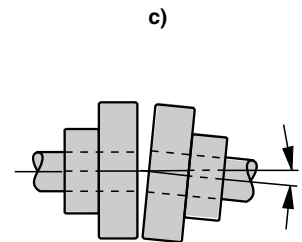
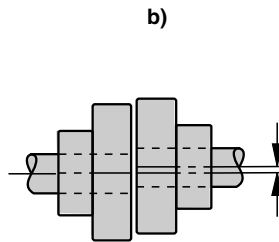
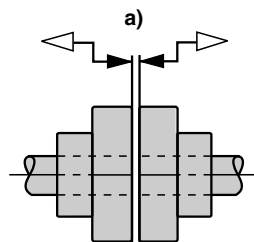
Risk of injury due to moving drive elements, such as belt pulleys or couplings, during operation.

Risk of jamming and crushing.

- Equip the input and output elements with a touch guard.

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

- Maximum and minimum clearance
- Axial misalignment
- Angular misalignment



211395595

4.8 Torque arms for shaft-mounted gear units

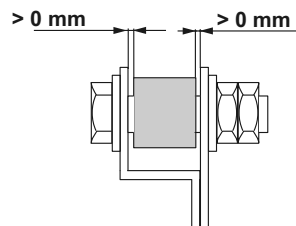
NOTICE

Damage to gear unit due to improper installation.

Damage to the gear unit

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

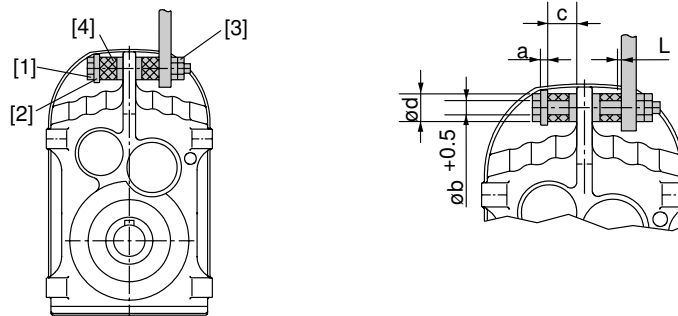
The following figure shows the mounted torque arm without tension:



15226229643

4.8.1 Mounting torque arms for parallel-shaft helical gear units

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



18014398720848395

- | | | | |
|-----|---------------|----|--------------------------------------|
| [1] | Screw | a | Washer width |
| [2] | Washer | b | Rubber buffer inner diameter |
| [3] | Nuts | c | Rubber buffer length in loose state |
| [4] | Rubber buffer | d | Rubber buffer diameter |
| | | ΔL | Rubber buffer preload in loose state |

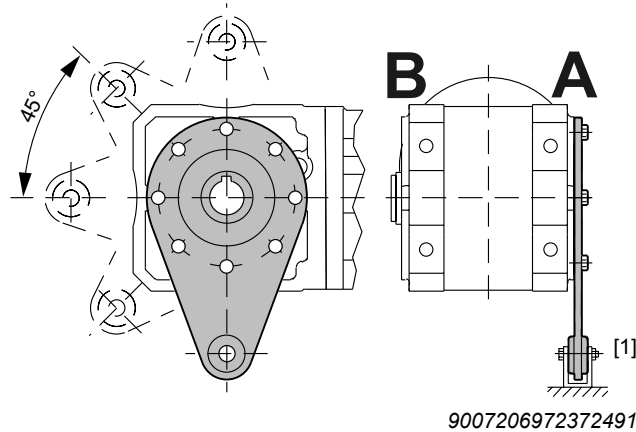
Proceed as follows:

1. Use screws [1] and washers [2] according to the following table.
2. Secure the screw connection with a nut [3].
3. Tighten the screw [1] until the preload "Δ L" of the rubber buffers is reached according to the table:

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

4.8.2 Mounting torque arms for helical-bevel gear unit K..19 – K..49

The following figure shows the torque support for the helical-bevel gear units K..19 – K..49:



[1] Bushing

A Connection side

B Connection side

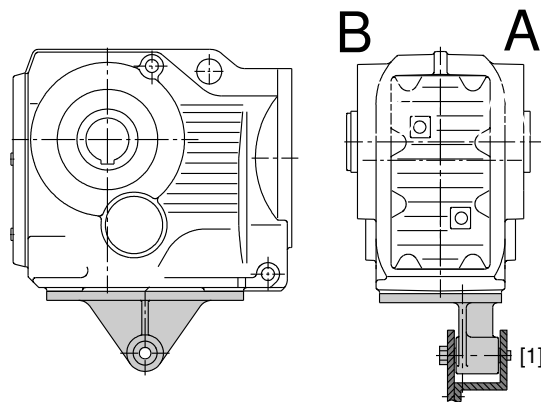
Observe the following points during assembly:

- Apply bearings to both sides of the bushing [1].
- Mount connection side B so that it mirrors side A.
- Use screws and tightening torques according to the following table:

Gear unit	Screws	Tightening torque $\pm 10\%$
		Nm
K..19 /T	4 x M8 x 20 – 8.8	25
K..29 /T	4 x M8 x 22 – 8.8	25
K..39/T	4 x M10 x 30 – 8.8	48
K..49/T	4 x M12 x 35 – 8.8	86

4.8.3 Mounting torque arms for helical-bevel gear unit K..37 – K..157

The following figure shows the torque support for the helical-bevel gear units K..37 – K..157.



9007199466103051

[1] Bushing

A Connection side

B Connection side

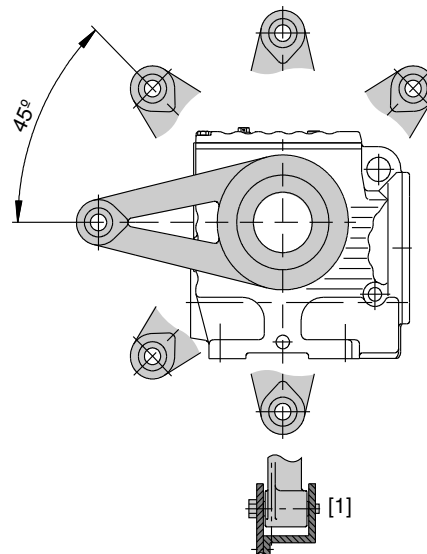
Proceed as follows:

1. Apply bearings to both sides of the bushing [1].
2. Mount connection side B so that it mirrors side A.
3. Use screws and tightening torques according to the following table:

Gear unit	Screws	Tightening torque $\pm 10\%$ Nm
K..37 /T	4 × M10 × 25 – 8.8	48
K..47 /T	4 × M10 × 30 – 8.8	48
K..57 /T	4 × M12 × 35 – 8.8	86
K..67 /T	4 × M12 × 35 – 8.8	86
K..77 /T	4 × M16 × 40 – 8.8	210
K..87 /T	4 × M16 × 40 – 8.8	210
K..97 /T	4 × M20 × 50 – 8.8	410
K..107 /T	4 × M24 × 60 – 8.8	710
K..127 /T	4 × M36 × 130 – 8.8	2500
K..157 /T	4 × M36 × 130 – 8.8	2500

4.8.4 Mounting torque arms for helical-worm gear units

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



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[1] Bushing

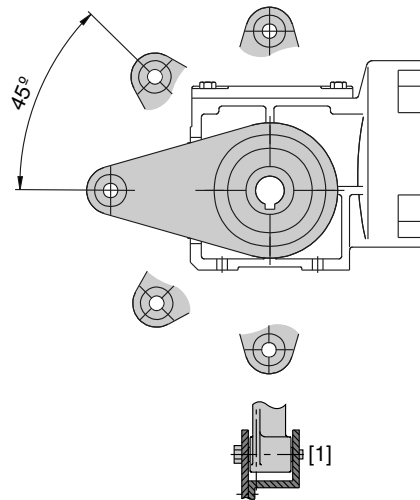
Proceed as follows:

1. Apply bearings to both sides of the bushing [1].
2. Use screws and tightening torques according to the following table:

Gear unit	Screws	Tightening torque $\pm 10\%$ Nm
S..37 /T	4 x M6 x 16 – 8.8	11
S..47 /T	4 x M8 x 25 – 8.8	25
S..57 /T	6 x M8 x 25 – 8.8	25
S..67 /T	4 x M12 x 35 – 8.8	86
S..77 /T	4 x M12 x 35 – 8.8	86
S..87 /T	4 x M16 x 45 – 8.8	210
S..97 /T	4 x M16 x 50 – 8.8	210

4.8.5 Mounting torque arms for SPIROPLAN® W gear units

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



9007199466230539

[1] Bushing

Proceed as follows:

1. Apply bearings to both sides of the bushing [1].
2. Use screws and tightening torques according to the following table:

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

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

INFORMATION

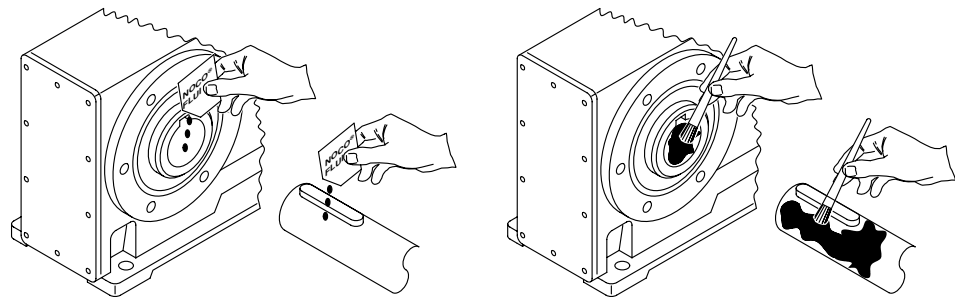


Concerning the design of the customer shaft, please also refer to the design notes in the "Gearmotors" catalog.

4.9.1 Mounting the shaft-mounted gear unit

Proceed as follows:

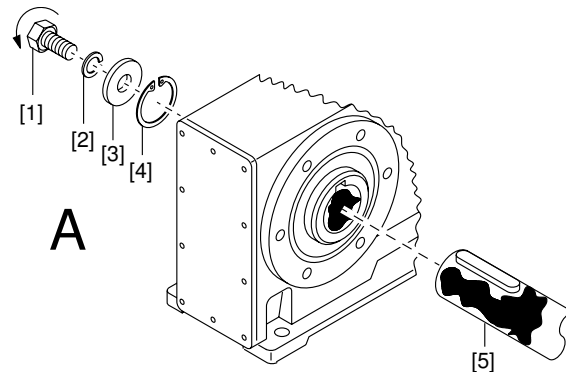
1. Apply NOCO® fluid. Spread carefully.



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2. Install the shaft and secure it axially. For easier mounting, use a mounting device. Following a description of the **3 mounting types**, depending on the scope of delivery.

- **Mount customer shaft (standard scope of delivery)**



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[1] Short retaining screw
(standard scope of delivery)

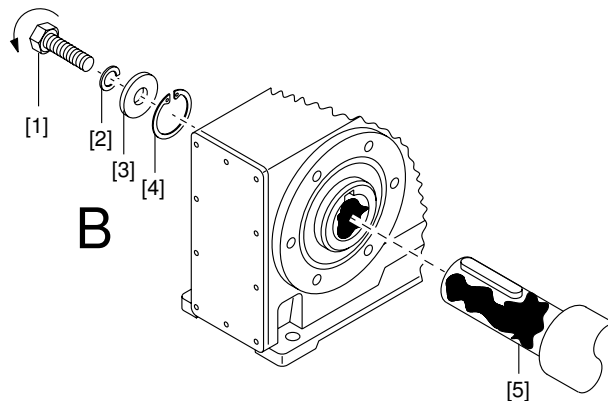
[2] Lock washer

[3] Washer

[4] Retaining ring

[5] Customer shaft

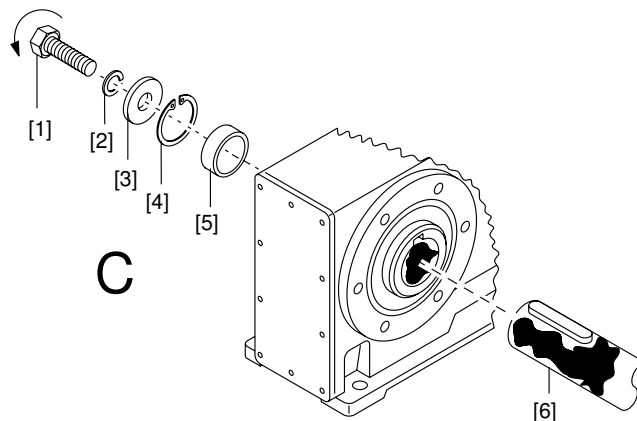
- **Mount customer shaft with contact shoulder using the SEW-EURODRIVE assembly/disassembly kit:**



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

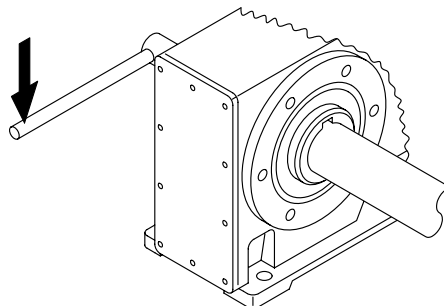
- **Mount customer shaft without contact shoulder using the SEW-EURODRIVE assembly/disassembly kit:**



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

3. Tighten the retaining screw to the appropriate torque. Observe the tightening torques specified in the following table.



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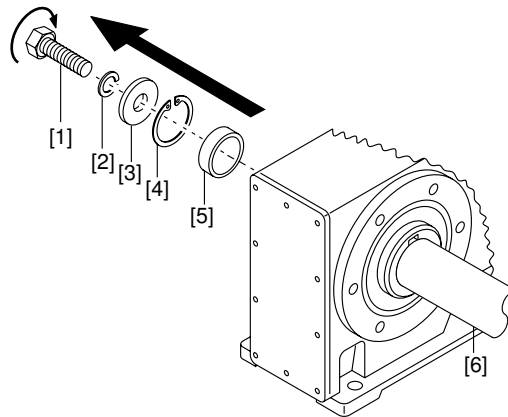
Screw	Tightening torque Nm
M5	5
M6	8
M10/12	20
M16	40
M20	80
M24	200

INFORMATION

To avoid contact corrosion, SEW-EURODRIVE recommends that the customer shaft should be lathed down between the 2 contact surfaces.

4.9.2 Remove the shaft-mounted gear unit

This description is only applicable if the gear unit was assembled using the SEW-EURODRIVE assembly/disassembly kit (see step 2 of "Mounting the shaft-mounted gear unit").



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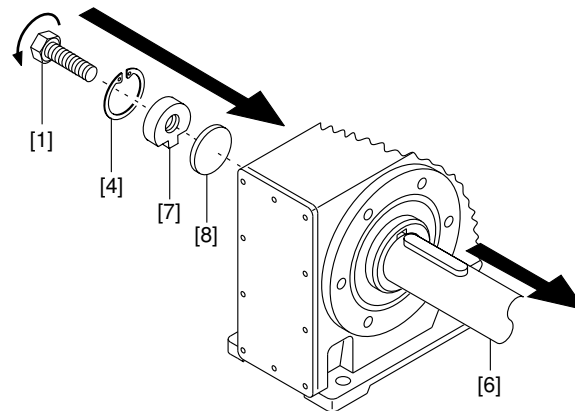
- [1] Retaining screw
- [2] Lock washer
- [3] Washer

- [4] Retaining ring
- [5] Spacer tube
- [6] Customer shaft

Proceed as follows:

1. Loosen the retaining screw [1].
2. Remove parts [2] to [4] and, if applicable, the spacer tube [5].
3. Insert the forcing washer [8] and the fixed nut [7] from the SEW-EURODRIVE assembly/disassembly kit between the customer shaft [6] and the retaining ring [4] (see "SEW-EURODRIVE assembly/disassembly kit" (→ 53)).

4. Re-install the retaining ring [4].
5. Re-install the retaining screw [1]. Press the gear unit off the shaft by tightening the screw.



9007199466270219

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

4.9.3 Assembly/disassembly kit by SEW-EURODRIVE

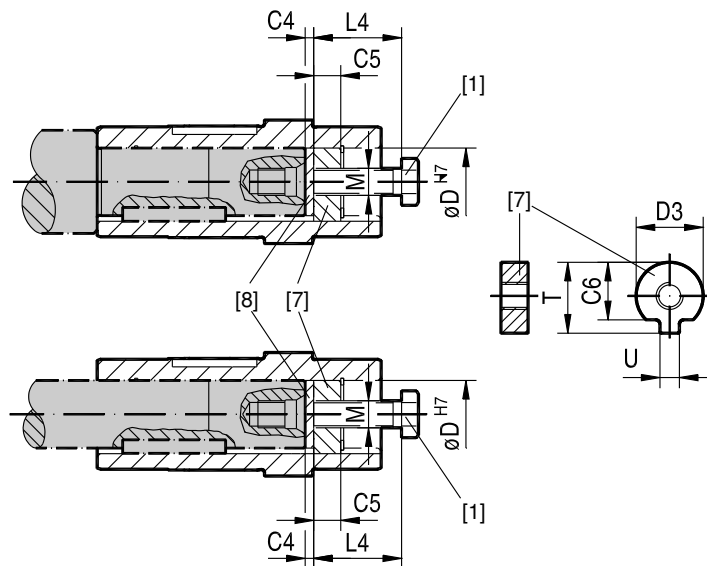
INFORMATION



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

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

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



9007199466272395

[1] Retaining screw

[8] Forcing washer

[7] Locked nut for removal

For the assembly/disassembly kit part numbers necessary to order, refer to the following table:

Gear unit type	D ^{H7} mm	M ¹⁾	C4 mm	C5 mm	C6 mm	U ^{-0.5} mm	T ^{-0.5} mm	D3 ^{-0.5} mm	L4 mm	Part number of the 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
KA..19, SA..37, WA..20, WA..30, WA..37,	20	M6	5	6	15.5	5.5	22.5	19.7	25	643 683 8
FA..27, KA..29, SA..47, WA..47,	25	M10	5	10	20	7.5	28	24.7	35	643 684 6
FA..37, KA..29, KA..37, KA..39, SA..47, SA..57, WA..47	30	M10	5	10	25	7.5	33	29.7	35	643 685 4
FA..47, KA..39, KA..47, KA..49, SA..57	35	M12	5	12	29	9.5	38	34.7	45	643 686 2
FA..57, FA..67, KA..49, KA..57, 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

4.10 Shaft-mounted gear unit with shrink disk

4.10.1 Mounting the shaft-mounted gear unit

NOTICE

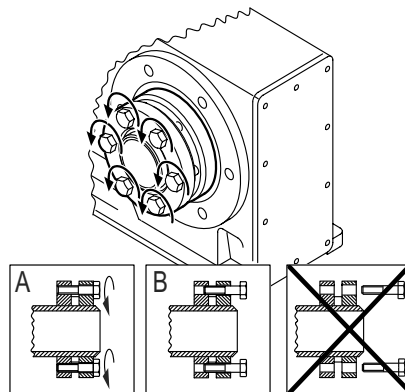
Deformation of the hollow shaft due to tightening the clamping screws without first installing the shaft.

Damages to the hollow shaft.

- Never tighten the screws without the shaft installed.

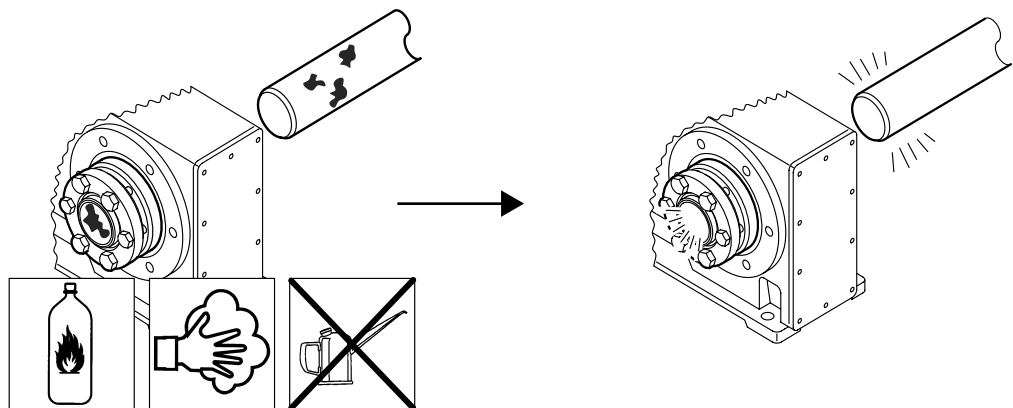
Proceed as follows:

1. Slightly loosen the locking screws. Do not remove the locking screws completely.



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2. Carefully **degrease** the hollow shaft bore and the input shaft using a commercial solvent.



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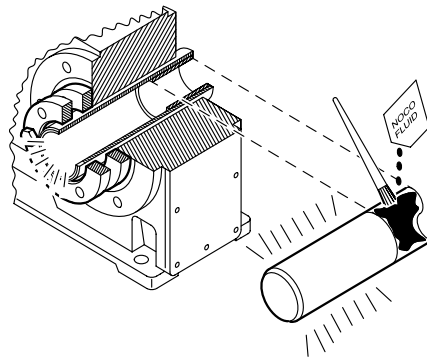
3. Only apply NOCO® fluid to the input shaft around the bushing.

NOTICE

The hollow shaft mounting system is without function if NOCO® fluid is applied directly to the bushing. When the input shaft is installed, NOCO® fluid can get into the clamping area of the shrink disk.

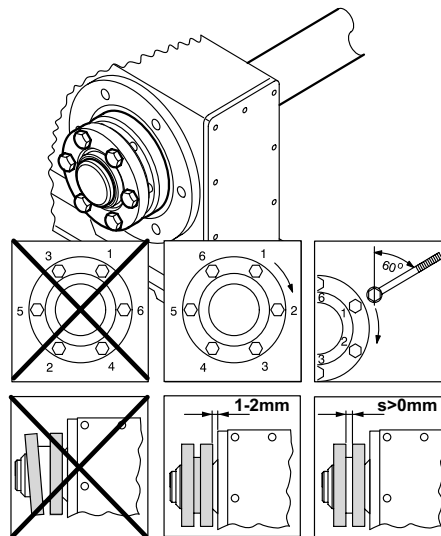
Possible damage to property

- Never apply NOCO® fluid directly to the bushing. The clamping area of the shrink disk must be absolutely free of grease.



9007199466281099

4. Install the input shaft. Proceed as follows:
- Make sure that the outer rings of the shrink disk are plane-parallel.
 - In case of a gear unit housing with shaft shoulder, mount the shrink disk to stop at the shaft shoulder.
 - In case of a gear unit without shaft shoulder, mount the shrink disk with a distance of 1 mm to 2 mm from the gear unit housing.
 - Tighten the clamping screws with the specified tightening torque according to the following table. Tighten the screws in several turns. Tighten screws one after the other, not in diametrically opposite sequence.



211542283

INFORMATION



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

Gear unit type				Clamping screws 10.9 ISO 4014 / ISO 4017	Tightening torque Nm
KH19/29	FH27	SH37	WH37	M5	5
KH37/47/ 57/67/77	FH37/47/ 57/67/77	SH47/57/ 67/77	WH47	M6	12
KH87/97	FH87/97	SH87/97	—	M8	30
KH107	FH107	—	—	M10	59
KH127/157	FH127/157	—	—	M12	100
KH167				M16	250
KH187				M20	470

5. After installation, make sure the remaining gap "s" between the outer rings of the shrink disk is > 0 mm.
6. To prevent corrosion, grease the outside of the hollow shaft around the shrink disk.

4.10.2 Remove the shaft-mounted gear unit

Proceed as follows:

1. To prevent the outer rings from jamming, loosen the clamping screws for a quarter turn, one after the other.
2. Steadily loosen the clamping screws one after the other, but do not remove the clamping screws completely.
3. If rust has formed on the shaft in front of the hub, remove the rust.
4. Remove the shaft or pull the hub off the shaft.
5. Remove the shrink disk from the hub.

4.10.3 Cleaning and lubricating shaft-mounted gear units



INFORMATION

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

Proceed as follows:

1. If the shrink disk is dirty, clean and lubricate the shrink disk.
2. Lubricate the tapered surfaces. Use one of the following solid lubricants:

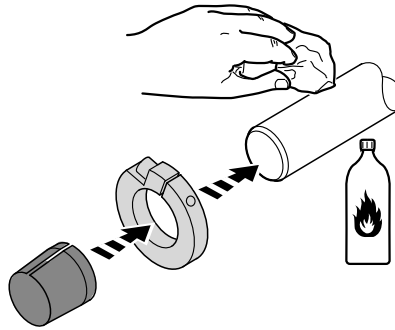
Lubricant (Mo S2)	Sold as
Molykote 321 (lube coat)	Spray
Molykote spray (powder spray)	Spray
Molykote G Rapid	Spray or compound
Aemasol MO 19P	Spray or compound
Aemasol DIO-sétral 57 N (lube coat)	Spray

3. Grease the clamping screws with a multipurpose grease such as Molykote BR 2.

4.11 Shaft-mounted gear units with TorqLOC®**4.11.1 Mounting a customer shaft without contact shoulder**

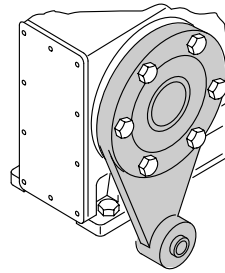
Proceed as follows:

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



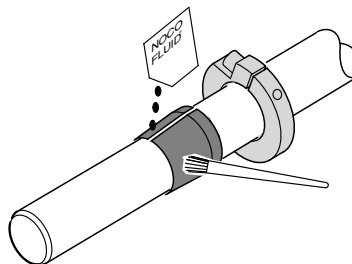
211941003

2. Install the stop ring and the bushing on the customer shaft.
3. Attach the torque arm to the drive unit. Note the information in chapter "Torque arm for shaft-mounted gear units" (→ 44).



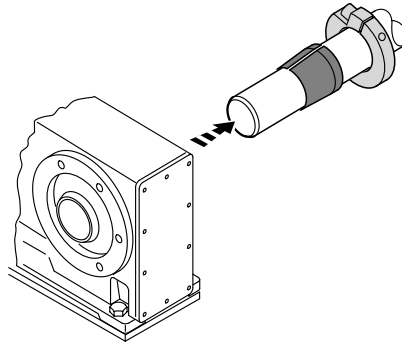
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4. Apply NOCO® fluid to the bushing. Spread carefully.



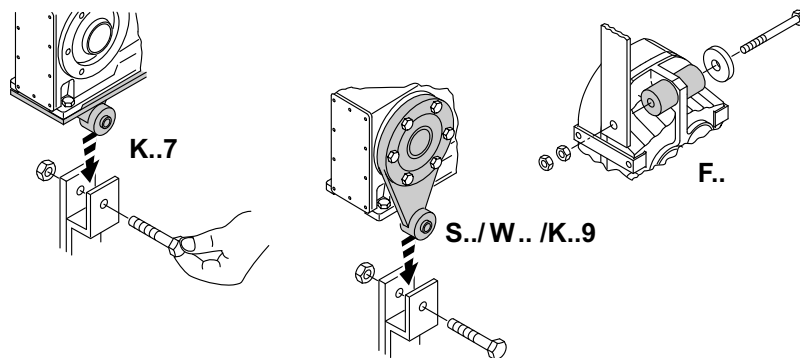
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5. Push the gear unit onto the customer shaft.



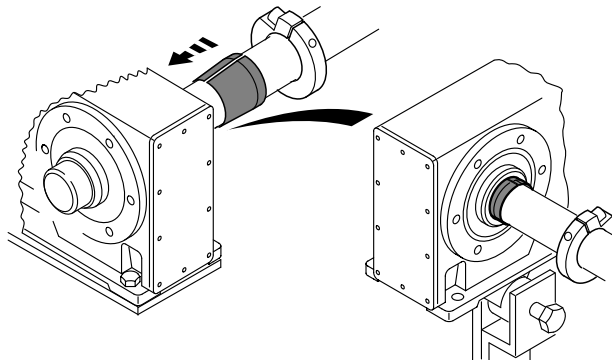
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6. Preassemble the torque arm. Do not firmly tighten the screws.



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

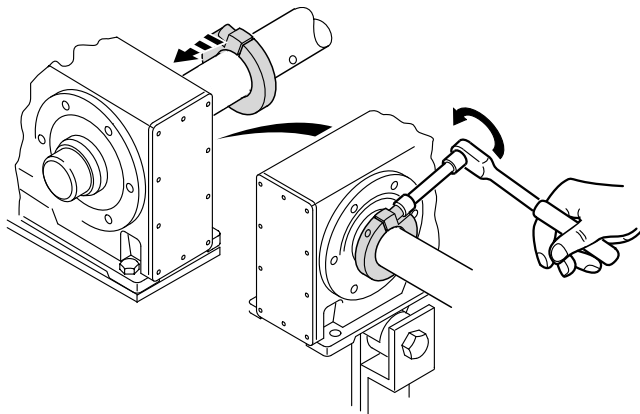


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4 Mechanical installation

Shaft-mounted gear units with TorqLOC®

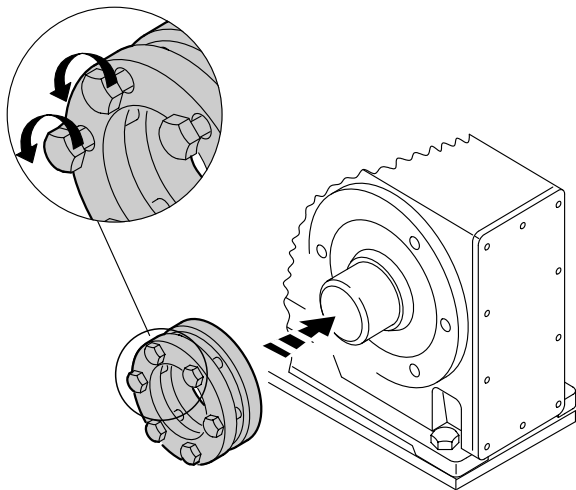
- Secure the bushing with the stop ring. Attach the stop ring to the bushing with the respective tightening torque. Refer to the following table for the suitable tightening torque.



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KT/FT	Type		Tightening torque Nm	
	ST	WT	Standard	Stainless steel
–	37	37	10	10
37	47	47	10	10
39/47	57	–	10	10
49/57/67	67	–	25	25
77	77	–	25	25
87	87	–	25	25
97	97	–	25	25
107	–	–	38	38
127	–	–	65	65
157	–	–	150	150

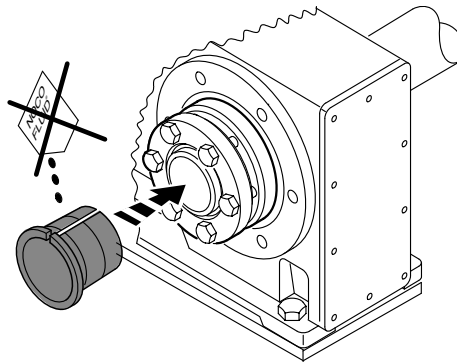
- Make sure that all screws are loosened and slide the shrink disk onto the hollow shaft.



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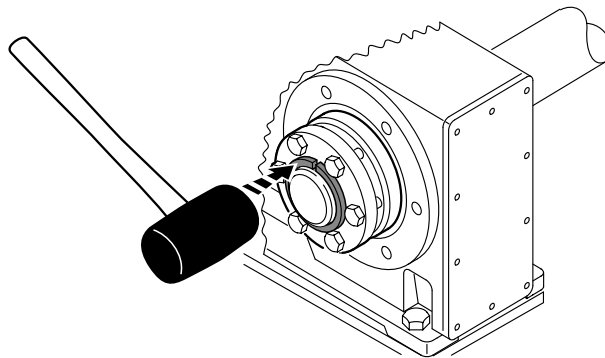
22162607/EN – 07/2015

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



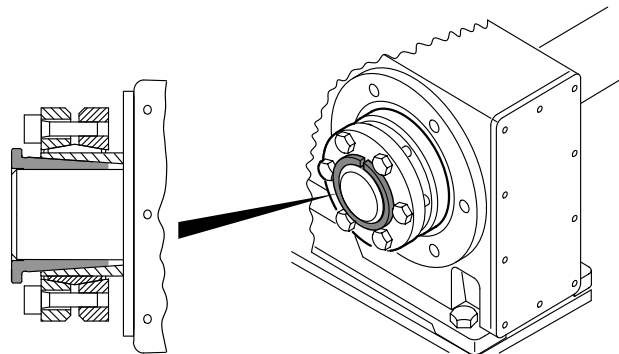
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11. Properly seat the shrink disk.
12. Tap lightly on the flange of the counter bushing to ensure that the socket is fitted securely in the hollow shaft.



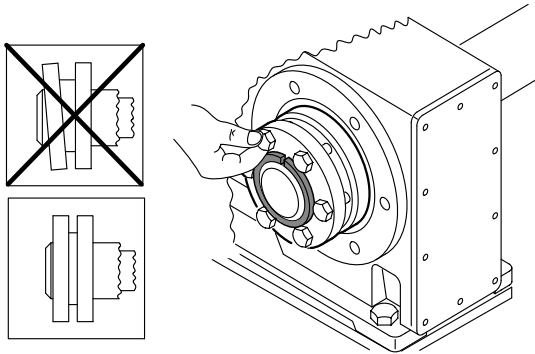
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13. Make sure that the customer shaft is seated in the counter bushing.



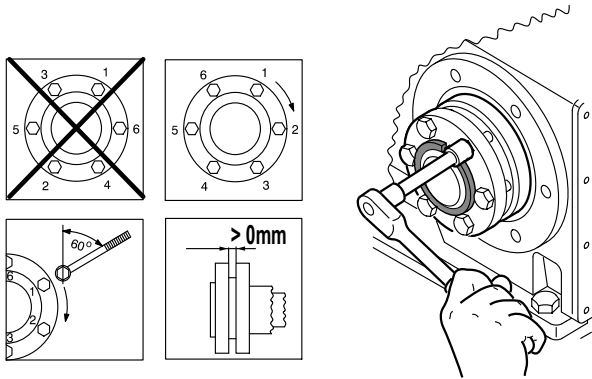
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14. Manually tighten the screws of the shrink disk. Make sure that the outer rings of the shrink disk are plane-parallel.



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15. Tighten the clamping screws with the specified tightening torque according to the following table. Tighten the screws by working round several times from one bolt to the next (not in diametrically opposite sequence).



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INFORMATION

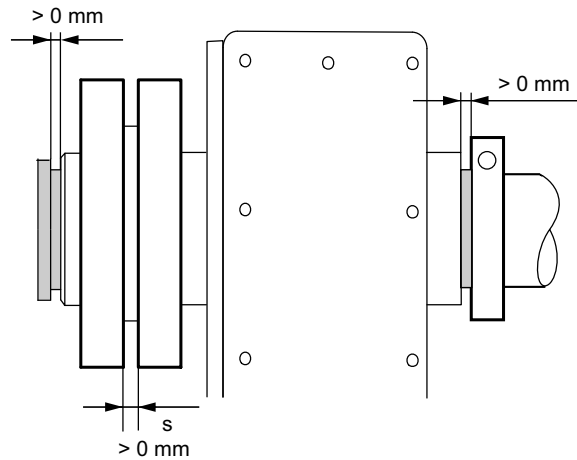


The exact values for the tightening torques are shown on the shrink disk.

Gear unit type				Locking screw ISO 4014/ISO 4017 ISO 4762	Tightening torque Nm	
					Standard	Stainless steel
–	–	ST37	WT37	M5	4	4
KT37	FT37	ST47	WT47	M6	12	12
KT39/47/ 49/57/67	FT47/57/67	ST57/67	–	M6	12	12
KT77/87/97	FT77/87/97	ST77/87/97	–	M8	30	30
KT107	FT107	–	–	M10	59	59
KT127/157	FT127/157	–	–	M12	100	100

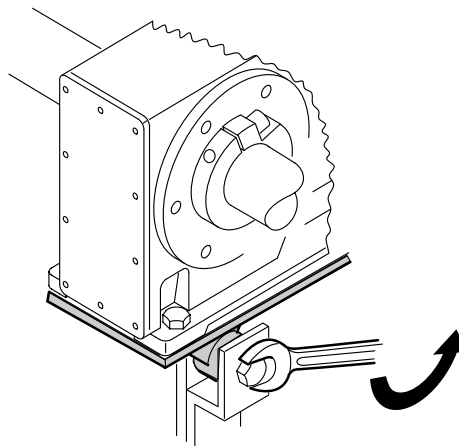
16. After installation, make sure the remaining gap "s" between the outer rings of the shrink disk is > 0 mm.

17. Make sure, that the remaining gap between counter bushing and hollow shaft end, as well as between bushing and stop ring is > 0 mm.



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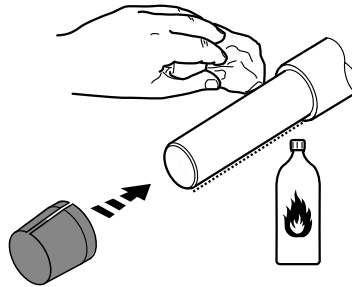
18. Tighten the torque arm. Note the information in chapter "Torque arm for shaft-mounted gear units" (→ 44).



5129142283

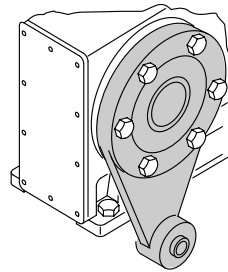
4.11.2 Installation notes for customer shaft with contact shoulder

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



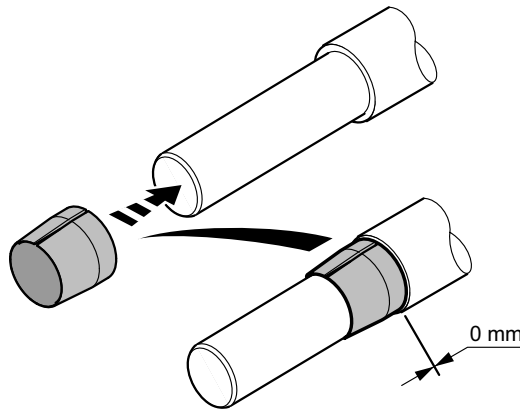
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2. Attach the torque arm to the drive unit. Note the information in chapter "Torque arm for shaft-mounted gear units" (→ 44).



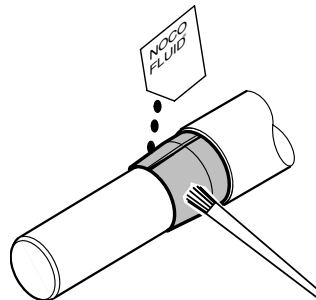
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3. Slide the bushing onto the customer shaft.



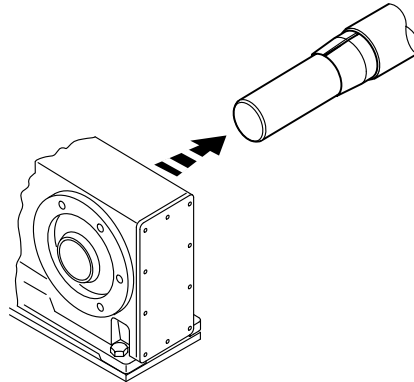
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4. Apply NOCO® fluid to the bushing. Spread carefully.



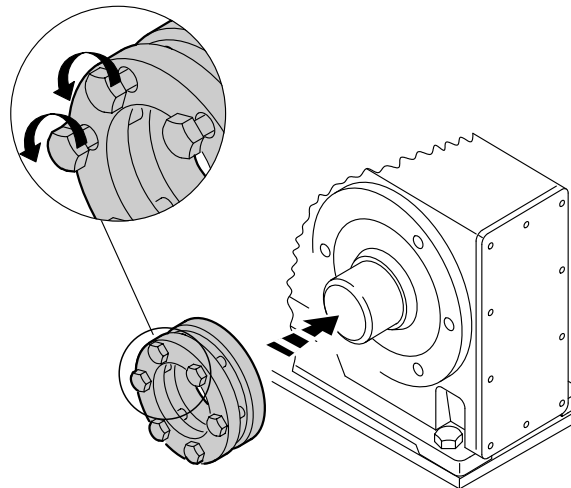
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5. Push the gear unit onto the customer shaft.



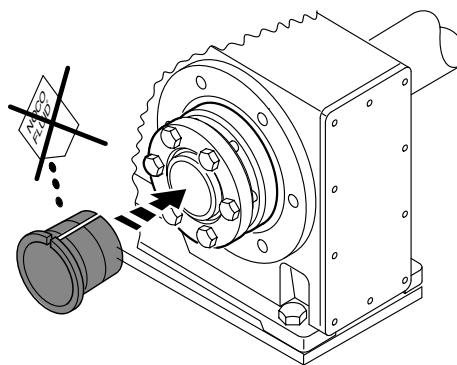
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6. Ensure that all screws have been loosened. Slide the shrink disk onto the hollow shaft.



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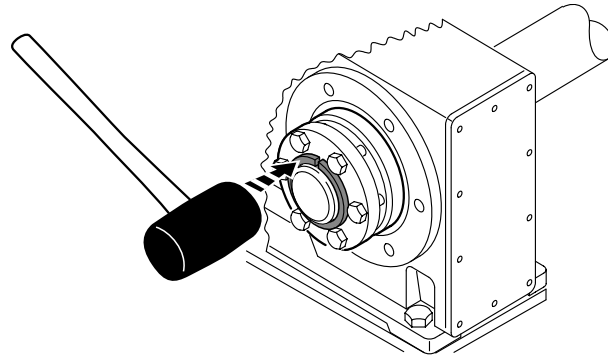
7. Slide the counter bushing onto the customer shaft and into the hollow shaft.



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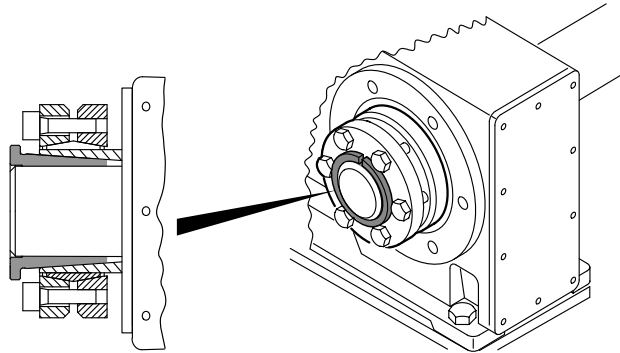
8. Properly seat the shrink disk.

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



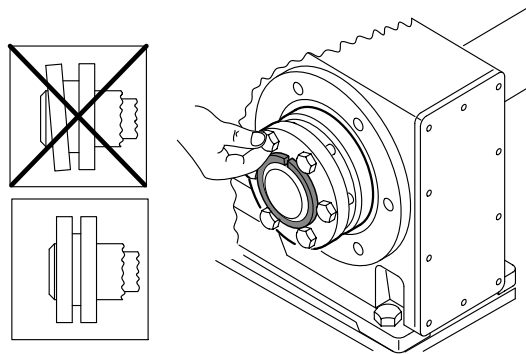
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10. Make sure that the customer shaft is seated in the counter bushing.



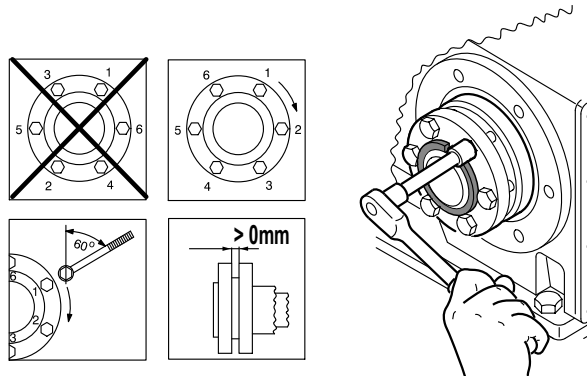
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11. Manually tighten the screws of the shrink disk. Make sure that the outer rings of the shrink disk are plane-parallel.



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12. Tighten the clamping screws with the specified tightening torque according to the following table. Tighten the screws by working round several times from one bolt to the next (not in diametrically opposite sequence).



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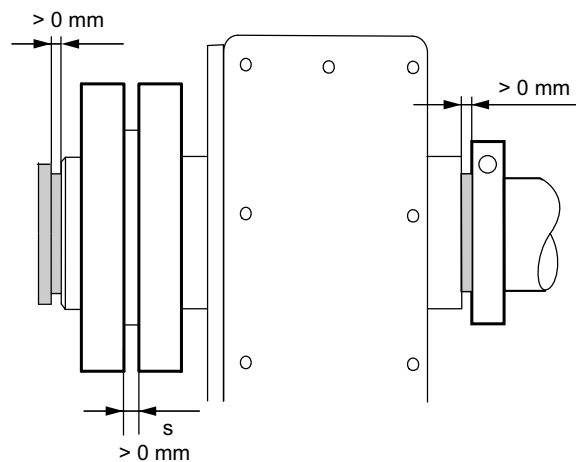
INFORMATION



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

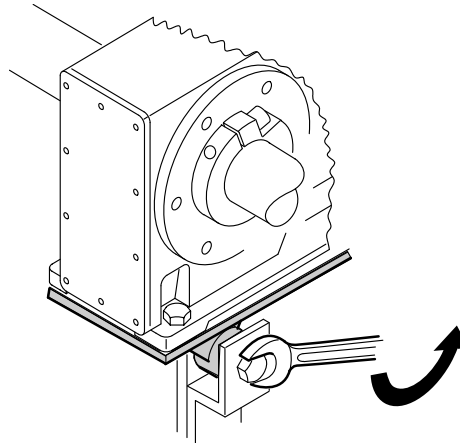
Gear unit type				Locking screw ISO 4014/ISO 4017 ISO 4762	Tightening torque Nm	
					Standard	Stainless steel
–	–	ST37	WT37	M5	4	4
KT37	FT37	ST47	WT47	M6	12	12
KT39/47/ 49/57/67	FT47/57/67	ST57/67	–	M6	12	12
KT77/87/97	FT77/87/97	ST77/87/97	–	M8	30	30
KT107	FT107	–	–	M10	59	59
KT127	FT127	–	–	M12	100	100
KT157	FT157	–	–	M12	100	100

13. After installation, make sure the remaining gap "s" between the outer rings of the shrink disk is > 0 mm.
14. Make sure, that the remaining gap between counter bushing and hollow shaft end, as well as between bushing and stop ring is > 0 mm.



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15. Mount the torque arm and firmly tighten it. Note the information in chapter "Torque arm for shaft-mounted gear units" (→ 44).



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4.11.3 Remove the shaft-mounted gear unit



▲ CAUTION

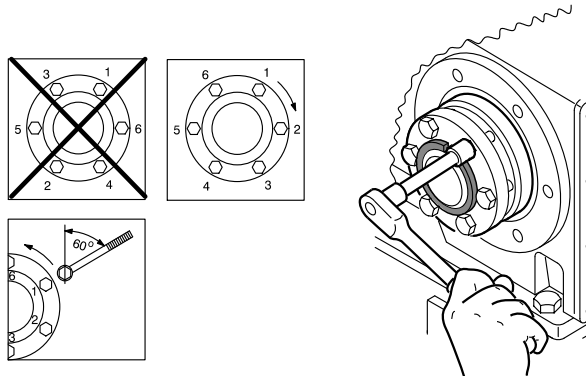
Risk of burns caused by hot surfaces

Severe injuries

- Let the units cool down before working on them.

Proceed as follows:

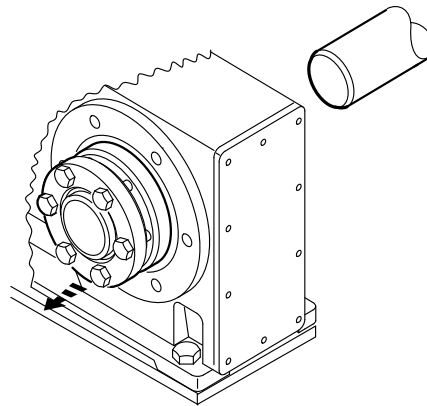
1. To prevent the outer rings from jamming, loosen the clamping screws for a quarter turn, one after the other.



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2. Unscrew the clamping screws evenly one after the other. Do not remove the clamping screws completely.
3. Dismantle the conical steel bushing. If required, use the outer rings as pullers. Proceed 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.

4.11.4 Cleaning and lubricating shaft-mounted gear units

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

- If the shrink disk is dirty, clean and lubricate the shrink disk.
- 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 compound
Aemasol MO 19P	Spray or compound
Aemasol DIO-sétral 57 N (lube coat)	Spray

- Grease the clamping screws with a multipurpose grease such as Molykote BR 2.

4.12 Cover



▲ CAUTION

Risk of injury due to rotating input and output elements during operation.

Risk of jamming and crushing.

- Equip the input and output elements with a touch guard.



INFORMATION

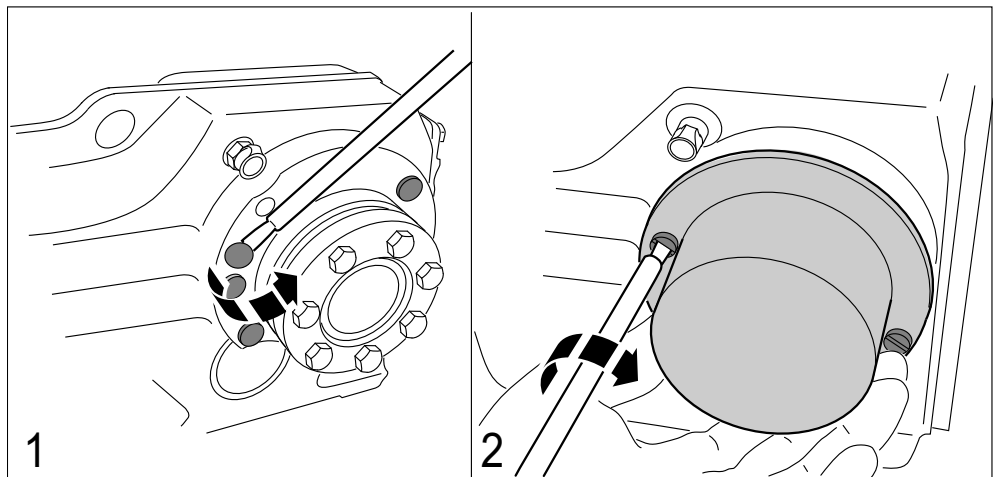
Observe the following points during installation:

- The glued connection between gasket and cover must be flawless.
- The bores of the gasket and the cover must match.

4.12.1 Mounting the fixed cover

Proceed as follows:

1. Remove the plastic plug on the gear unit housing (see figure 1).



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2. Use the delivered screws to mount the cover to the gear unit housing (see figure 2).

4.12.2 Operation without cover

In certain application cases, e.g. with a through-shaft, a cover cannot be installed. The cover is not necessary if the system or unit manufacturer provides corresponding components to guarantee for compliance with the required degree of protection. If this results in additional maintenance, the manufacturer has to describe this in the operating instructions for the system or component.

4.13 Coupling of AM adapter

▲ WARNING



Risk of explosion due to electric sparks when using the spacer tube as assembly aid.

Fatal or serious injuries.

- Do not use the spacer tube as assembly aid but measure the distance.

4.13.1 Mounting the IEC adapter AM63 – 280/NEMA adapter AM56 – 365

NOTICE

Damage to adapter due to ingress of moisture when mounting a motor to the adapter.

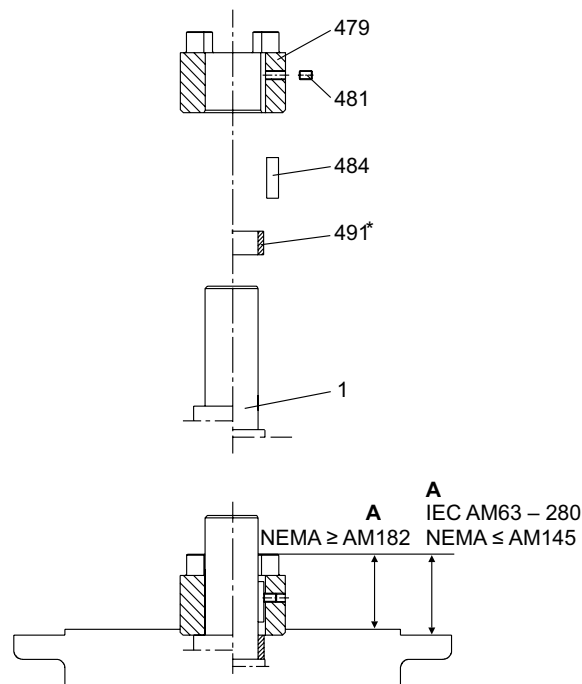
Damage to the adapter

- Seal the adapter with an anaerobic fluid seal.

INFORMATION



To avoid contact corrosion, SEW-EURODRIVE recommends to apply NOCO® fluid to the motor shaft before mounting the coupling half.



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- [1] Motor shaft
[479] Coupling half
[481] Set screw

- [484] Key
[491*] This spacer tube must not be used due to the risk of electric sparks

Proceed as follows:

1. Clean the motor shaft and flange surfaces of the motor and the adapter.

4 Mechanical installation

Coupling of AM adapter

2. Remove the key from the motor shaft. Replace the key from the motor shaft with the supplied key [484] (not AM63 and AM250).
3. Heat the coupling half [479] to approx. 80 °C – 100 °C and push the coupling half onto the motor shaft. Position as follows:
 - IEC adapter AM63 – 225 until stop at motor shaft shoulder.
 - IEC adapter AM250 – 280 to distance "A". The values for the distance "A" are listed in the following table.
 - NEMA adapter to distance "A". The values for the distance "A" are listed in the following table.
4. Secure the key and coupling half using the set screw [481] on the motor shaft. Refer to the following table for the required tightening torque "T_A".
5. Check the position of the coupling half. The values for the distance "A" are listed in the following table.
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

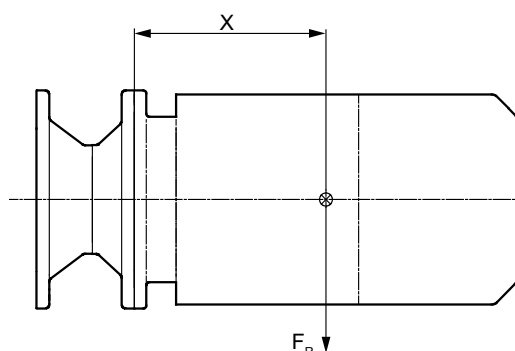
Permitted loads

NOTICE

Damages to gear unit due to impermissibly high loads when mounting a motor.

Damage to gear unit

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



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

F_R Overhung load

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Permitted loads for gear unit series R..7, F..7, K..7, K..9, and S..7:

Adapter type		$x^{1)}$ in mm	$F_R^{1)}$ in N	
IEC	NEMA		IEC adapter	NEMA adapter
AM63/71	AM56	77	530	410
AM80/90	AM143/145	113	420	380
AM100/112	AM182/184	144	2000	1760
AM132 ²⁾	AM213/215 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) As the center of gravity distance x increases, the maximum permitted weight of the attached motor F_{R_max} must be reduced linearly. If this center of gravity distance x is reduced, the maximum permitted weight F_{R_max} cannot be increased.
- 2) Diameter of the adapter output flange: 160 mm

Permitted loads for gear unit series SPIROPLAN® W37 – W47

Adapter type		$x^{1)}$ in mm	$F_R^{1)}$ in N	
IEC	NEMA		IEC adapter	NEMA adapter
AM63/71	AM56	115	140	120
AM80/90	AM143/145	151	270	255

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

4.13.2 AM adapter with AM../RS backstop

Check the direction of rotation of the drive prior to assembly or startup. In case of a wrong direction of rotation, contact SEW-EURODRIVE.

The backstop is maintenance-free in operation. Backstops have a minimum lift-off speed depending on the size (see following table).

NOTICE

If the speed is below the minimum lift-off speed of the drive, the backstop is subject to wear and heats up.

Possible damage to property.

- In nominal operation the lift-off speed of the drive must not drop below the specified minimum.
- During startup or braking, the lift-off speed of the drive may drop below the minimum levels.

Type	Maximum locking torque of the back-stop in Nm	Minimum lift-off speed in min ⁻¹
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

4.13.3 Mounting of third-party motors at AM and AL adapters

If a third-party motor is mounted, the customer must ensure that the permitted weight and the power at the adapter are adhered to according to the operating instructions. For information on the permitted loads, refer to chapter Permitted loads (→ 72).

4.13.4 AM adapter with foot-mounted motor

A foot-mounted motor reduces the loads at the adapter interface. The foot-mounted motor at the adapter must be installed without tensions at the customer construction.

4.14 AQ. adapter coupling



▲ WARNING

Risk of explosion due to electric sparks when using the spacer tube as assembly aid.

Fatal or serious injuries.

- Do not use the spacer tube as assembly aid but measure the distance.

4.14.1 Mount adapter AQA80 – 190 (with keyway)/Adapter AQH80 – 190 (without keyway)

NOTICE

Damage to adapter due to ingress of moisture when mounting a motor to the adapter.

Damage to the adapter

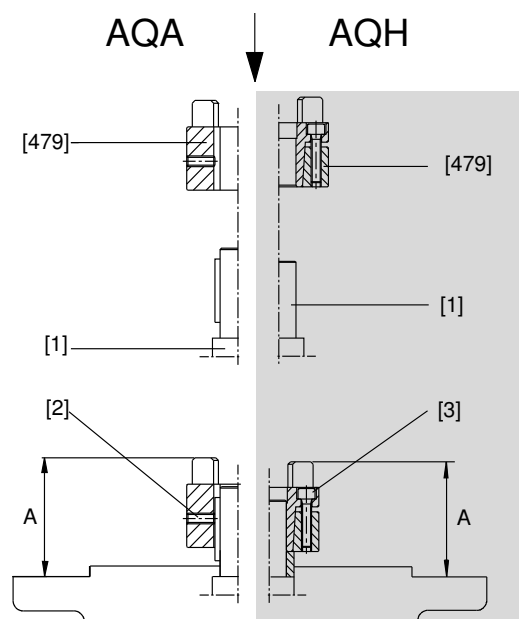
- Seal the adapter with an anaerobic fluid seal.

INFORMATION



For AQA: To avoid contact corrosion, SEW-EURODRIVE recommends to apply NOCO® fluid to the motor shaft before mounting the coupling half.

For AQH: Using NOCO® fluid is not approved.



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- [1] Motor shaft
[2] Lock washer

- [3] Washer
[479] Coupling half

Proceed as follows:

1. Clean the motor shaft and flange surfaces of the motor and the adapter.
2. **Design AQH:** Loosen the screws of the coupling half [479] and loosen the conical connection.

3. **AQA/AQH design:** Heat the coupling half to approx. 80 °C – 100 °C and push the coupling half onto the motor shaft up to distance "A". The values for the distance "A" are listed in the table in chapter "Setting standards and tightening torques (→ 76)".
4. **Design AQH:** Tighten the screws of the coupling half evenly in diametrically opposite sequence, working around several times. The values for the tightening torque "T_A" are listed in the table in chapter "Setting standards and tightening torques (→ 76)".
5. **AQA design:** Secure the coupling half using the set screw (see figure).
6. Check the position of the coupling half. The values for the distance "A" are listed in the table in chapter "Setting standards and tightening torques (→ 76)".
7. Mount the motor onto the adapter, making sure that the claws of the two coupling halves engage in each other.
 - ⇒ The force that must be applied when joining the two coupling halves is dissipated after final assembly, so there is no risk of any axial load being applied to adjacent bearings.

4.14.2 Setting standards and tightening torques

Type	Coupling size	Distance 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

4.14.3 Permitted loads

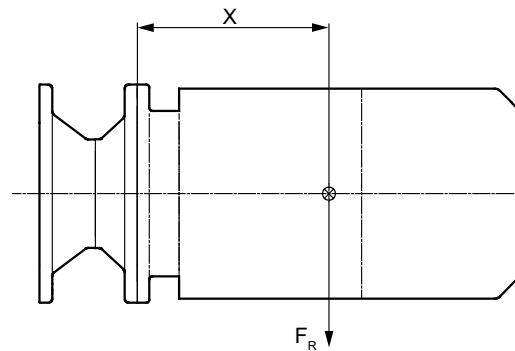
NOTICE

Impermissibly high loads may occur when mounting a motor.

Possible 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:



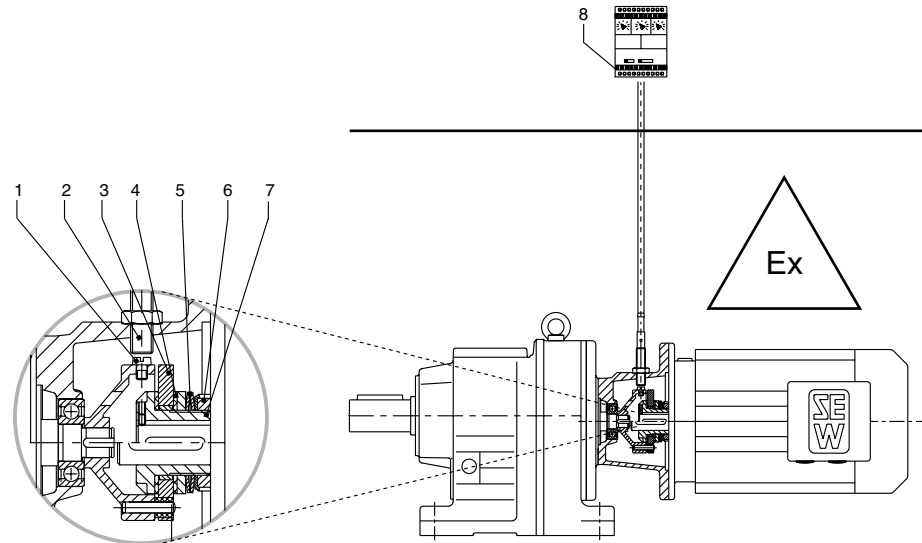
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- ⊗ Motor's center of gravity
 X Distance from adapter flange - motor center
 F_R Overhung load

Type	$x^{1)}$ mm	$F_R^{1)}$ 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; Flange Ø: 160	186	1250
AQ190/3; Flange Ø: 160	186	1150
AQ190/1/2	186	3750
AQ190/3	186	3400

- 1) Maximum load values for connection screws of strength class 8.8. As the center of gravity distance x increases, the maximum permitted weight of the attached motor $F_{R_{max}}$ must be reduced linearly. As the center of gravity distance x decreases, the maximum permitted weight $F_{R_{max}}$ must not be increased.

4.15 Adapter with AR slip clutch



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- | | | |
|---------------------|---------------------|-------------------|
| [1] Trip cam | [4] Friction lining | [7] Friction hub |
| [2] Voltage encoder | [5] Cup spring | [8] Speed monitor |
| [3] Driving disk | [6] Slotted nut | |

Drives with a slip clutch consist of a standard gear unit and a motor/variable-speed gearmotor with an adapter installed between them. This adapter accommodates the slip clutch. In gearmotors with a compound gear unit, the slip clutch may be located between the first and second gear unit.

Via the friction lining [4] of the driving disk [3], the input friction hub [7] with cup springs [5] and slotted nut [6] drives the output coupling plate with connecting pin. The slip torque is set individually according to the drive selection.

The speed of the coupling plate at the output end is picked up by a voltage encoder [2] and passed on to a monitoring unit [8]. Speed monitors and slip monitors are used as monitoring units. You can install them together with contactors, safety devices, etc. on a 35 mm standard rail (according to DIN EN 50 022) in a control cabinet or mounted via 2 bores.

4.15.1 WEX speed monitor

INFORMATION



The speed monitor must be located outside the potentially explosive atmosphere.

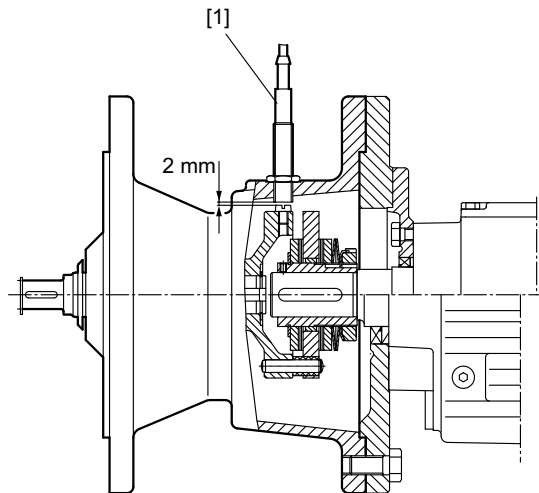
The speed monitor [8] is used for gearmotors with constant speed. The speed monitor is connected to the voltage encoder [2] in the adapter.

4.15.2 Mount voltage encoder

Proceed as follows:

1. Remove the fan guard from the driving motor.
2. Slowly turn the motor and adapter shaft end until you can see a trip cam meaning the head of the cap screw in the tapped hole.

3. Screw in the voltage encoder [1] so deep that it touches the trip cam.



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4. Turn back the voltage encoder [1] by 2 revolutions. It corresponds to a distance of approx. 2 mm.
5. Secure the voltage encoder at the adapter outside using a lock nut.
6. Check to see if the trip cam does not touch the voltage encoder while slowly turning the motor and adapter shaft end.
7. Reinstall the fan guard at the driving motor.

4.15.3 Connecting monitoring devices

INFORMATION



- To prevent interference voltages, do not route the supply lines in multicore cables.
- Use cables with a maximum length of 500 m and a core cross section of 1.5 mm².
- If there is a risk of interference from power current or control cables and if the lines are longer than 10 m, use shielded cables.
- Observe the applicable standards especially in the explosion-proof area.

Proceed as follows:

1. For designs with WEX speed monitor, connect the incremental encoder of the adapter to the speed monitor via a 2-core cable.
 - ⇒ The Incremental encoder supplies 1 pulse/revolution.
2. Connect the speed monitor according to the enclosed wiring diagram.

4.16 AD input shaft assembly

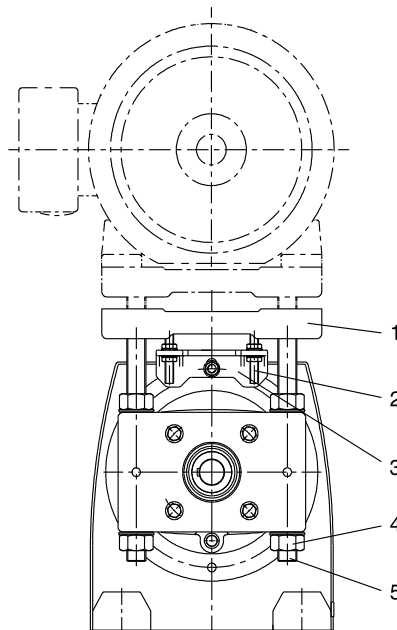
Observe chapter "Mounting the input and output components" (→ 42) when installing input components.

INFORMATION



- Only use belts with sufficient electrical leakage resistance ($< 10^9 \Omega$) between the output shaft end and the motor shaft.
- Prior to installation of the protection cover, a risk analysis performed by the manufacturer of the protection cover must demonstrate that no sources of ignition can occur (such as impact sparks from grinding).

4.16.1 Mounting the cover with motor platform AD../P



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

To mount the motor and to adjust the motor platform proceed as follows:

1. Set the motor platform [1] to the required mounting position by evenly tightening the adjusting nuts [4].
2. If necessary, remove the eyebolt/lifting eye of the helical gear unit to reach the lowest adjustment position. Touch up any damage to the paint work.
3. Align the motor on the motor platform [1], so that the shaft ends are in line. Attach the motor.
4. Mount the drive component onto the input side shaft end and the motor shaft.
5. Align drive component, shaft end and motor shaft. If necessary correct the motor position again.

6. Put on the traction elements (V-belt, chain, etc.) and apply a preload by evenly adjusting the motor platform [1]. Do not stress the motor platform and the columns against each other when doing this.
7. To fasten the threaded columns [5] tighten the nuts [4] that are not used for adjustment.

4.16.2 Special aspects of AD6/P and AD7/P

Proceed as follows:

1. Unscrew the nuts on the threaded bolts [2] before adjustment, to allow the threaded bolts [2] to move axially in the support [3] without restriction.
2. Only tighten the nuts, when the final adjustment position is reached.

INFORMATION

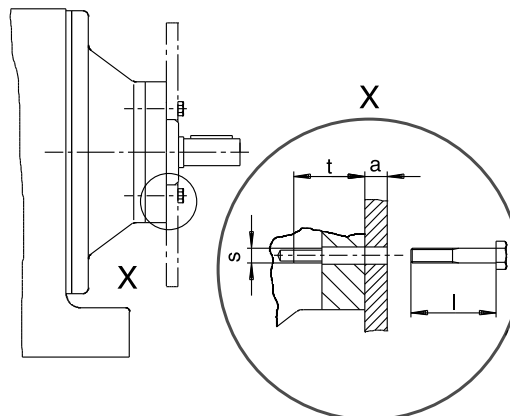


Do not adjust the motor platform [1] via the support [3].

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

Mounting applications on the input shaft assembly with centering shoulder.

1. Prepare screws of a suitable length for attaching the application. The following figure shows the screw length $l = t + a$. **Round off the result to the next smaller standard length.**



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- | | | | |
|---|------------------------------|---|------------------------------|
| a | Thickness of the application | s | Retaining thread (see table) |
| t | Screw-in depth (see table) | | |

2. Remove the retaining screw from the centering shoulder.
3. Clean the contact surface and the centering shoulder.
4. Clean the threads of the new screws and apply a threadlocker compound (e.g. Loctite® 243) to the first few threads.
5. Place the application on the centering shoulder. Tighten the retaining screws with the specified tightening torque " T_A " (see following table).

4 Mechanical installation

AD input shaft assembly

Type	Screw-in depth t mm	Retaining thread	Tightening torque T_A for connection screws of strength class 8.8 Nm
AD2/ZR	25.5	M8	25
AD3/ZR	31.5	M10	48
AD4/ZR	36	M12	86
AD5/ZR	44	M12	86
AD6/ZR	48.5	M16	210
AD7/ZR	49	M20	410
AD8/ZR	42	M12	86

Permitted loads

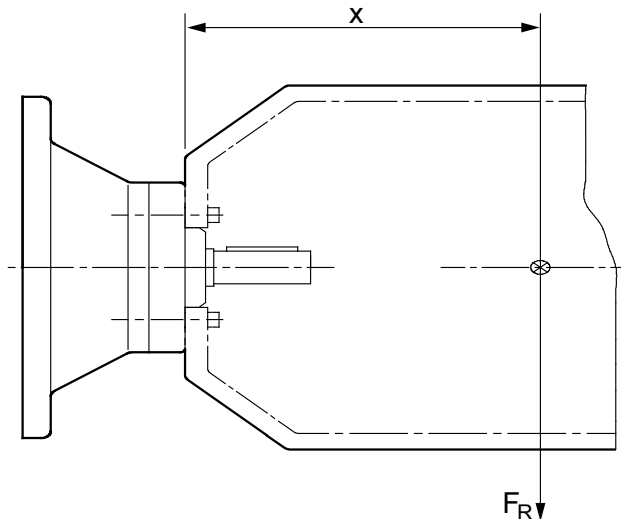
NOTICE

Damage to gear unit due to impermissibly high loads when mounting a motor.

Damage to gear unit

- Note that 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:



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

F_R Overhung load

Type	$x^{(1)}$ mm	$F_R^{(1)}$ N
AD2/ZR	193	330
AD3/ZR	274	1400

22162607/EN – 07/2015

Type	x ¹⁾ mm	F _R ¹⁾ N
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. As the center of gravity distance x increases, the maximum permitted weight of the attached motor $F_{R_{max}}$ must be reduced linearly. As the center of gravity distance x decreases, the maximum permitted weight $F_{R_{max}}$ must not be increased.

2) Diameter of the adapter output flange: 160 mm

4.16.4 Cover with backstop AD../RS

Check the direction of rotation of the drive prior to assembly or startup. In case of a wrong direction of rotation, contact SEW-EURODRIVE.

The backstop is maintenance-free in operation. Backstops have a minimum lift-off speed depending on the size (see following table).

NOTICE

If the speed is below the minimum lift-off speed of the drive, the backstop is subject to wear and heats up.

Possible damage to property.

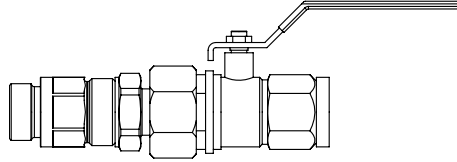
- In nominal operation the lift-off speed of the drive must not drop below the specified minimum.
- During startup or braking, the lift-off speed of the drive may drop below the minimum levels.

Type	Maximum locking torque of the backstop Nm	Minimum lift-off speed 1/min
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

4.17 Accessory equipment

4.17.1 Oil drain valve

The gear unit is equipped with an oil drain plug as standard. An oil drain valve can optionally be installed, that enables attaching a drain pipe for changing the gear unit oil.

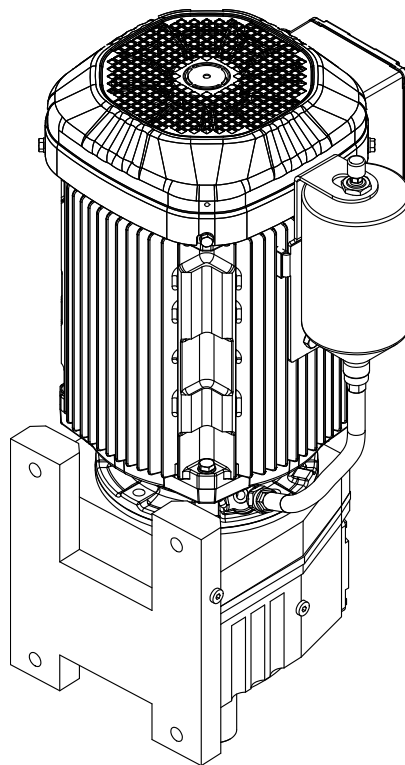


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4.17.2 Oil expansion tank

The oil expansion tank equalizes oil volume fluctuations in the system due to changing temperatures. If the gear unit temperature rises, part of the expanding oil volume can flow into the oil expansion tank. If the gear unit temperature falls again, the oil flows back into the system. Thus the gear unit is completely filled with oil in all operating states.

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



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4.17.3 PT100 screw-in temperature sensor, connection element shape J

INFORMATION

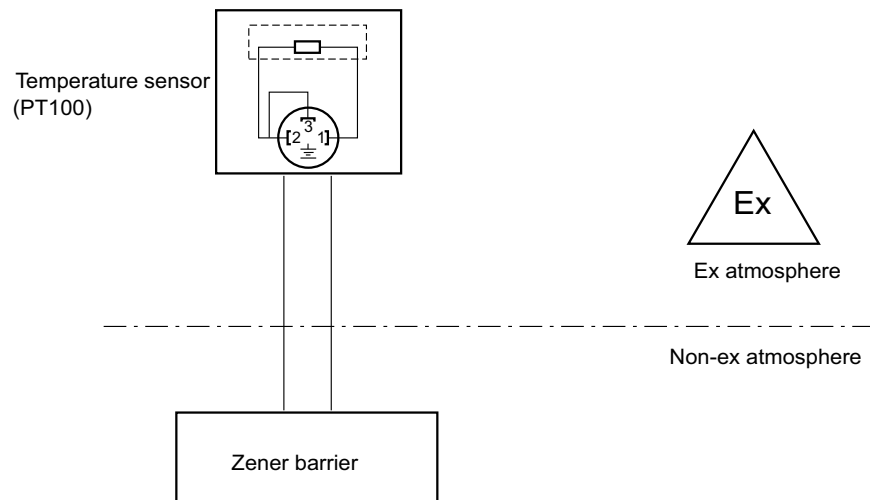


If the oil temperature is < 115 °C, the drive must be switched off.

INFORMATION

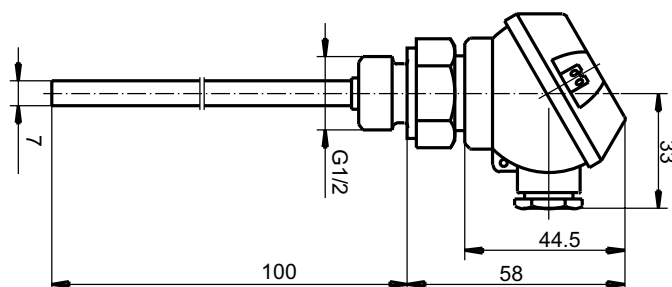


To ensure intrinsically safe wiring, the temperature sensor must be used with a Zener barrier. The current consumption of the Zener barrier enables correct measuring operation. The Zener barrier must be located outside the potentially explosive atmosphere.



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PT100 dimension drawing

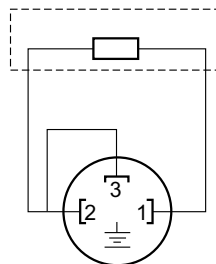


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PT100 technical data

Technical data	Value
Area of application	For monitoring the oil temperature
Operating temperature	-50 °C to 400 °C
Ambient temperature	-40 °C to 100 °C
Thermowell	Stainless steel (1.4571)
Connection element	Shape J, aluminum die-casting, M16x1.5, IP54
Outer thread	G1/2 A-cylindrical according to DIN EN ISO 228
Measuring insert	According to DIN EN 60751 class B in two-wire circuit, without measuring transducer
Manufacturer	JUMO (JUM according to W93DE)
SEW part number	13274171

PT100 connection diagram

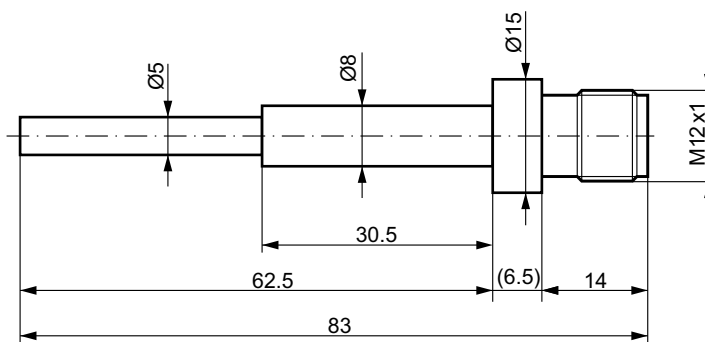


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Contact 1 and 2: Connection of the resistance element

4.17.4 PT1000 temperature sensor

PT1000 dimension drawing



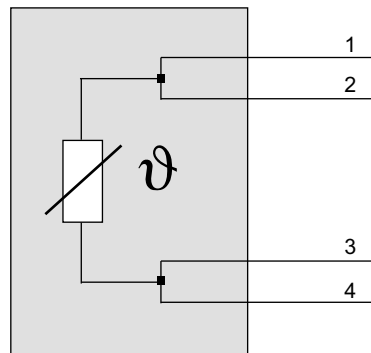
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PT1000 technical data

Technical data	Value
Rod length	62.5 mm
Measuring range	-40 ... 130 °C
Permitted oil temperature	-40 ... 130 °C
Accuracy	± (PT1000 + 0.2 K)
Measuring element	1 x PT1000 to DIN EN 60751, class B, 4-wire connection
Dynamic response T05/T09 (s)	3/8 to DIN EN 60751
Ambient temperature	-25 ... 80 °C
Degree of protection, protection class	IP67; III
Housing materials	V4A (1.4404)
Materials in contact with the medium	V4A (1.4404)
Connection	M12 plug-in connection; gold-plated contacts

22162607/EN – 07/2015

PT1000 connection diagram



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5 Startup

NOTICE

Improper startup may result in damage to the gear unit.

Possible damage to property.

- Observe the following notes.

- Before startup, always check to see 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.
- Observe the maximum and r.m.s values of project planning during startup of gear units with servomotor. The buyer is obliged to make the data available to the end user.
- The most important technical data is provided on the nameplate. Additional data relevant for operation is available in drawings and the order confirmation.
- After having gear unit setup, ensure that all retaining screws are tight.
- Make sure that the alignment 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 oil level monitoring, protect it 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 protection prior to startup.
- Observe the safety notes.

5.1 Checklists

5.1.1 Before startup

This checklist includes all activities that have to be performed **prior to startup** of a gear unit in a potentially explosive atmosphere according to Directive 94/9/EC and 2014/34/EU.

Check prior to startup in potentially explosive atmospheres	Checked	See chapter
Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. It may be necessary to suspend startup. Remove any transportation restraints prior to startup.		2.6
Compare the data on the nameplate of the drive with the specifications for operation in a potentially explosive area on site. <ul style="list-style-type: none"> Equipment group Explosion protection category Temperature class Maximum surface temperature 		3.9 4.2
Have arrangements been made to prevent potentially explosive atmospheres (oils, acids, gases, vapors or radiation) during installation of the gear unit?		
Check if the ambient temperature complies with the specifications (nameplate and order confirmation).		3.9
Have measures been taken to ensure that the gear units are sufficiently ventilated and that they are not heated by an external heat source (e.g. the coupling)? The cooling air must not exceed the maximum ambient temperature designated on the nameplate.		
Does the mounting position correspond to the specifications on the gear unit nameplate? Do not change the mounting position without prior consultation with SEW-EURODRIVE. ATEX approval will become void without prior consultation!		7.0
Does the oil level for the mounting position on the gear unit nameplate correspond to the indicated oil fill quantity?		3.9
Are all oil level plugs, oil drain plugs as well as breather plugs and valves freely accessible?		7.6
Do all input and output elements to be installed have ATEX certification?		
Ensure that the data specified on the nameplate are not exceeded for stand-alone gear units with adapters or input shaft assembly.		3.9
Is the cover mounted properly for gear units with hollow shaft and shrink disk?		4.10
Ensure that no spacer bushing is used as assembly aid during the installation of the AM, AQA coupling.		4.13 4.14
When mounting a motor on the AD input shaft assembly: <ul style="list-style-type: none"> Does the belt have sufficient electrical leakage resistance $< 10^9 \Omega$ between input shaft end and motor shaft? Before mounting a protection cover: Does a risk analysis performed by the manufacturer of the protection cover demonstrate that no sources of ignition can occur (such as impact sparks from grinding)? 		4.16

Check prior to startup in potentially explosive atmospheres	Checked	See chapter
For mains-operated motors: <ul style="list-style-type: none"> Does the data specified on the nameplate of the gear unit and the motor correspond to the ambient conditions at the location where the drive is to be installed? 		3.9
When operating gearmotors with inverter: <ul style="list-style-type: none"> Is the gearmotor approved for inverter operation? Does the parameterization of the inverter prevent the gear unit from being overloaded (see gear unit nameplate)? 		3.9

5.1.2 During startup

This checklist includes all activities that have to be performed **during startup** of a gear unit in a potentially explosive atmosphere according to Directive 94/9/EC and 2014/34/EU.

Check during startup in potentially explosive atmospheres	Checked
Check surface temperature: <ul style="list-style-type: none"> Measure the surface temperature after 3 hours of operation. Do not exceed a temperature difference of 70 K compared to the ambient temperature. At a value > 70 K immediately set the drive to standstill. Contact SEW-EURODRIVE. 	5.4
Lubricant change intervals: <ol style="list-style-type: none"> Measure the oil temperature. Add 10 K to the measured value. Determine the lubricant change interval based on the calculated value. 	5.4 6.4
For gear units with AM adapter or AD input shaft assembly with RS backstop: <ul style="list-style-type: none"> Check if in nominal operation, the lift-off speeds of the backstops does not drop below the minimum values. 	4.13 4.16

5.2 Inverter-operated gearmotors

For gear units with servomotor, the maximum and r.m.s. values of project planning must be observed during startup. The buyer is obliged to make the data available to the user.

5.3 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".

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

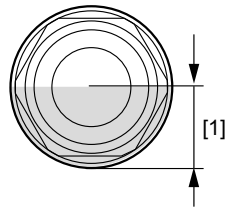
NOTICE

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

Possible damage to the unit.

- Attach a protective device to prevent the oil sight glass from being damaged by mechanical impacts.

1. Observe the notes in chapter "General information (→ 101)".
2. Check the oil level at the oil sight glass according to the following figure:



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[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 (→ 113)".
 - Fill in new oil of the same type through 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".

5.4 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.

5.5 Measuring surface and oil temperature

INFORMATION



The nameplate data on maximum surface temperature is based on measurements at standard ambient conditions and installation altitudes. Even slight changes of these conditions (such as limited installation space) can have a tremendous impact on the temperature.

5.5.1 Measuring the surface temperature

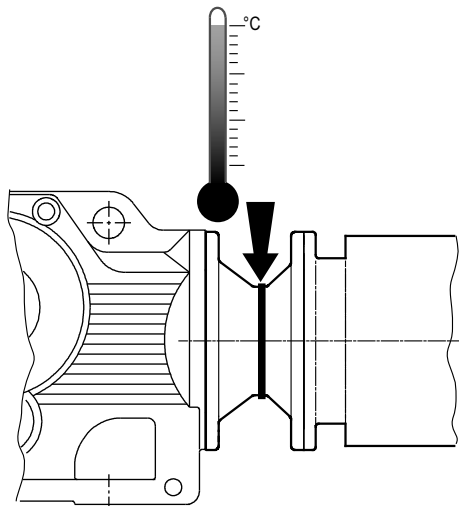
It is absolutely necessary to measure the surface temperature at maximum load during startup of the gear unit. A commercially available thermometer is sufficient for this measurement. Measure the surface temperature at the transition space between gear unit and motor where the position of the terminal box prevents venting by the motor fan. The maximum surface temperature will be reached after approximately 3 hours and **must not exceed a difference value of 70 K** compared to the ambient temperature.

INFORMATION



Stop the drive immediately if the difference exceeds the given value. Contact SEW-EURODRIVE in this case.

For gear units with AM, AQ, AR adapter, or AD input shaft assembly, the surface temperature is measured at the joint between input gear unit flange and customer motor flange (see following picture).



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5.5.2 Measuring the oil temperature

It is necessary to measure the oil temperature to determine the lubricant change intervals set forth in the chapter "Inspection and maintenance" (→ 101). To do so, measure the temperature at the bottom of the gear unit. In gear units with oil drain plug, you will have to measure the temperature at the oil drain plug. Add 10 K to the measured value. Use this temperature value to determine the lubricant change interval.

5.6 Helical-worm gear units and SPIROPLAN® W gear units

5.6.1 Run-in period

SPIROPLAN® and helical-worm gear units require a run-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	About 12 %
2-start	Approx. 20 ... 75	About 6 %
3-start	Approx. 20 ... 90	About 3 %
4-start	-	-
5-start	Approx. 6 ... 25	About 3 %
6-start	Approx. 7 ... 25	About 2 %

SPIROPLAN® gear units

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

5.6.2 Helical-worm gear unit with projecting worm shaft



▲ CAUTION

Risk of injury due to rotating parts.

Injuries

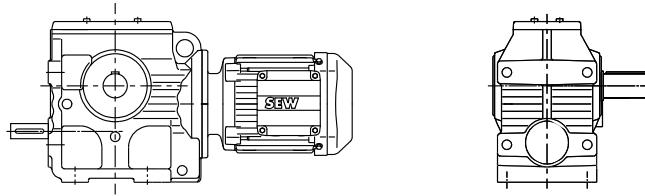
- Before you operate the helical-worm gear unit using the inserted handwheel or the hand crank, de-energize the drive.
- If the handwheel or the hand crank remains attached to the shaft during operation, take appropriate measures to prevent injuries.



INFORMATION

Take appropriate measures to prevent rotating unit parts to come into contact with foreign objects (e.g. install cover). The contact may result in electric sparks.

The following figure shows a helical-worm gearmotor with projecting worm shaft:



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

If the gear units were installed according to chapter "Mechanical installation", no special startup notes must be observed for helical, parallel-shaft helical, and helical-bevel gear units.

5.8 Gear units with backstop

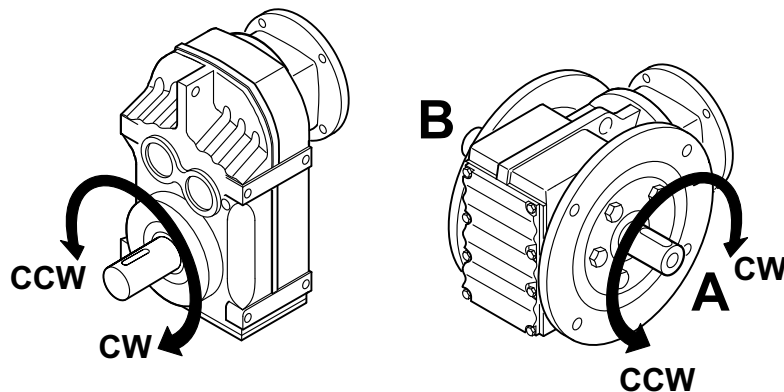
NOTICE

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. Before motor startup, make sure the current supply of the motor for the direction of rotation is connected accordingly.
- For control purposes, operation in blocking direction with half the output torque is permitted once.

The purpose of a backstop is to prevent unwanted directions of rotation. During operation, the backstop permits rotation only in the specified direction.



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The direction of rotation is specified as viewed onto the output shaft (LSS):

- CW rotation
- CCW rotation

The permitted direction of rotation is indicated on the housing.

5.9 Speed monitoring

5.9.1 WEX option standard design

The standard version of the explosion-proof AR adapter features an M12×1 thread for mounting a voltage encoder in the motor flange of the adapter. Speed monitor and voltage encoder are included in the delivery.

5.9.2 Manufacturer's data

Speed monitor in WEX design:

Manufacturer:	Pepperl + Fuchs, Mannheim
Type:	KFU8-UFC-Ex1.D
Auxiliary voltage:	DC 20 - 90 V / AC 48 - 253 V
ATEX certification number	TÜV 99 ATEX 1471

Data of the voltage encoder in WEXA/WEX/IGEX design

Manufacturer:	Pepperl + Fuchs, Mannheim
Type:	NCB2-12GM35-N0 in accordance with DIN 19234 (NAMUR)
Housing:	M12x1
ATEX certification number:	TÜV 99 ATEX 1471

5.10 Installation and adjustment of the WEX speed monitor

1. Read the operating instructions of the speed monitor manufacturer before you begin with the installation!
2. Perform the basic setting of the speed monitor in accordance with the operating instructions of the speed monitor manufacturer.

When the nominal speed of the motor in use is below 5%, the settings must cause the drive to be switched off. Refer to the nameplate for the nominal speed of the driving motor.

The sensor integrated in the adapter generates 1 pulse per revolution of the adapter shaft. If the switching speed of the adapter is too low, i.e. the coupling slips, the driving motor must be disconnected from the supply voltage immediately.

The cause of the problem must be eliminated and the operation of the adapter must be stopped for at least 15 minutes before re-startup. If incorrect operation by the operating personnel cannot be ruled out, this interval should be guaranteed using an automatic restart lockout.

All following installation and setting notes given refer to the speed monitor or voltage encoder in WEX design.

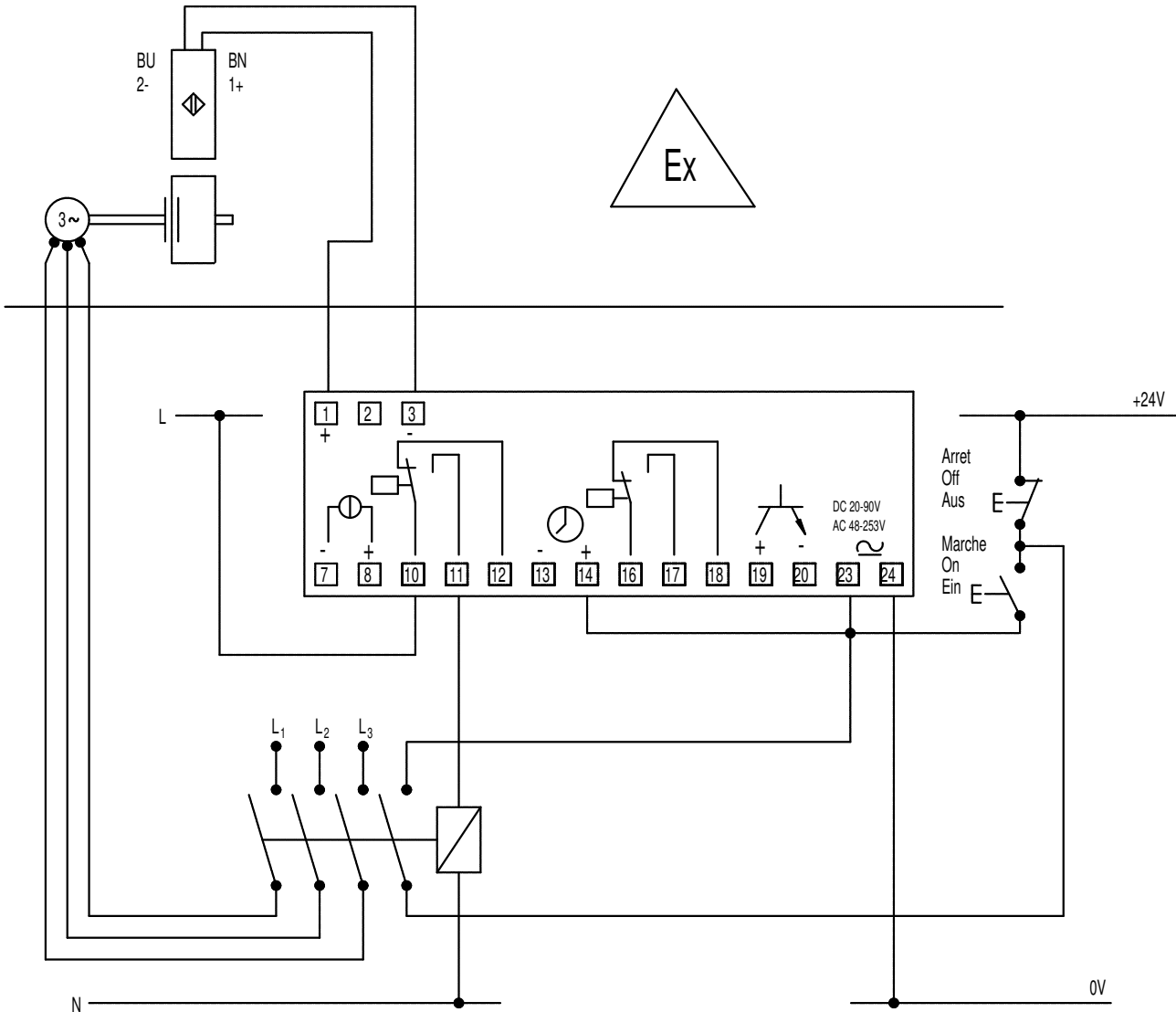
If the installation and setting instructions do not correspond to the speed monitor included in the delivery, perform the installation and startup according to the documentation of the manufacturer.

The speed monitor must be located outside the potentially explosive atmosphere.

5.10.1 Installing and setting the WEXA/WEX speed monitor

Relay 2 can be used for issuing a warning signal or for machine control (terminal assignment 16 – 18).

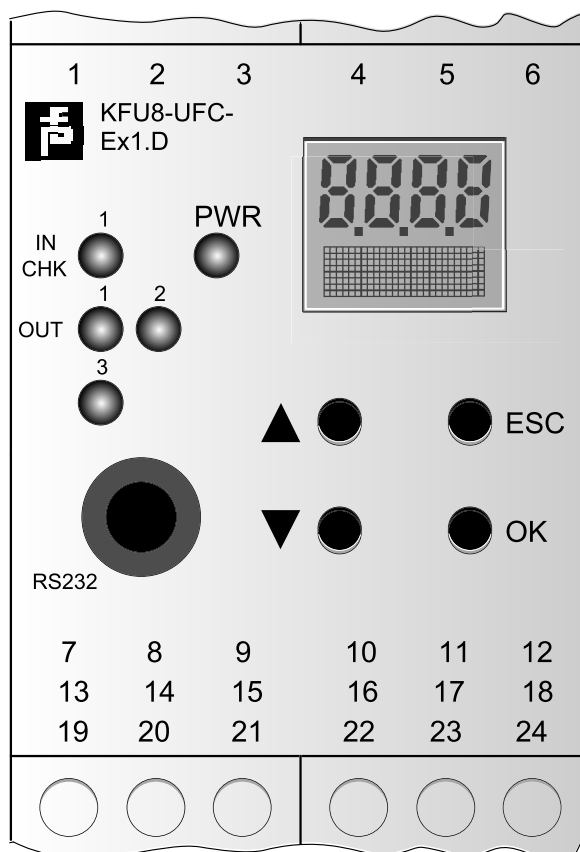
The wiring diagram below shows possible connection of the speed monitor.



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- | | |
|----------------------------------|---------------------------------|
| [1] Sensor + | [14] Startup bypass |
| [3] Sensor - | [23] DC 24 V voltage supply, + |
| [10] Relay 1 (common connection) | [24] DC 24 V voltage supply, - |
| [11] Relay 1 (NO contact) | [19] Serially switched output + |
| [12] Relay 1 (NC contact) | [20] Serially switched output - |

The following figure shows the front of the speed monitor:



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LED in CHK 1 (yellow/red):	Input pulses (flashing yellow in sync), input malfunction (flashing red), and unit malfunction (continuously red)
LED PWR (green):	Voltage
LED OUT 1 (yellow):	Relay 1 active
LED OUT 2 (yellow):	Relay 2 active
LED OUT 3 (yellow):	Transistor active
RS 232:	Serial RS 232 interface for connecting a PC for parameterization and diagnostics of the UFC with PACTware
Display:	For showing measured values and faults and visualization in parameterization mode

INFORMATION

The start bypass time may not exceed 3 seconds. This setting must be carefully performed and verified by a final measuring step.



5.10.2 Installing and setting other speed monitors

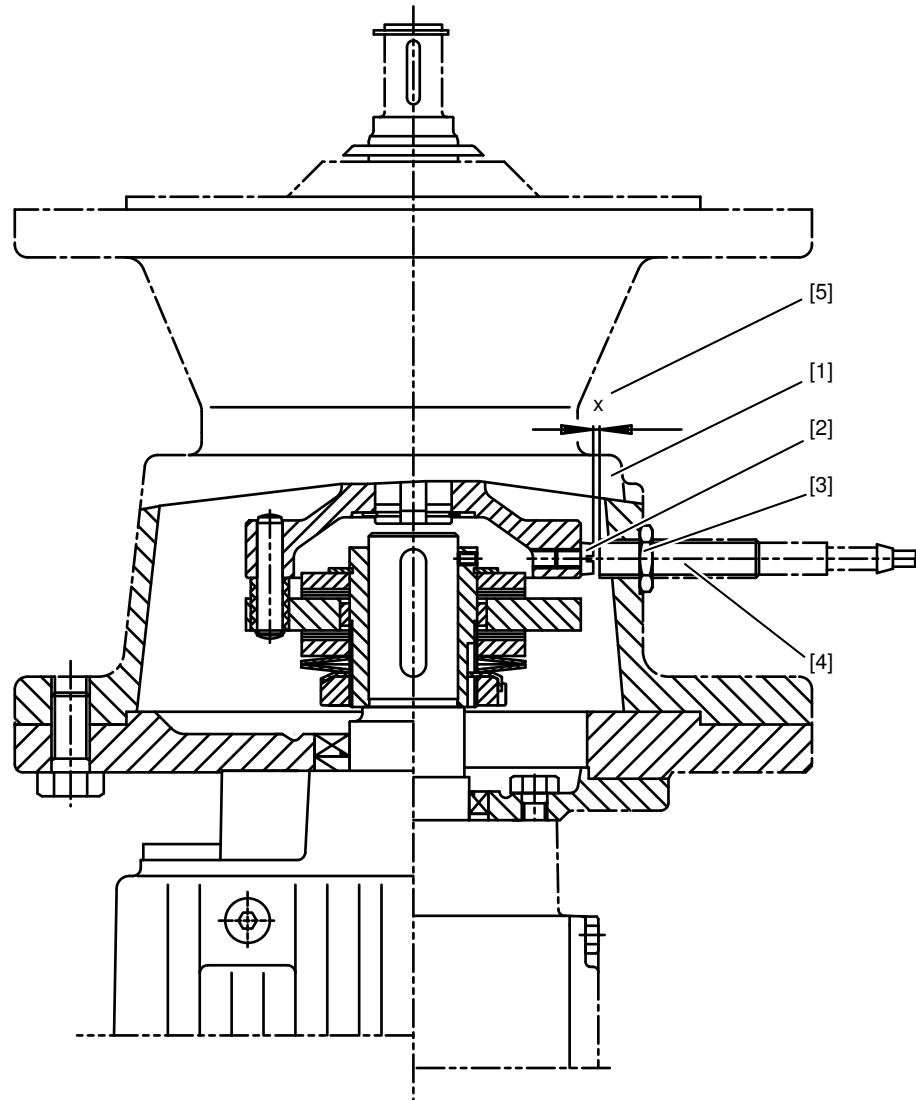
If other speed monitors are used, they must feature an intrinsically safe sensor input (identification color: blue) for evaluation of sensors according to DIN 19234 (NAMUR) and be approved for use of this sensor in potentially explosive atmospheres.

INFORMATION

The voltage encoder (sensor) generally features a blue connection cable and must conform to DIN 19234 (NAMUR). The corresponding inspection number may be attached to the voltage encoder or the connection cable.

5.11 Installation of the voltage encoder

The following figure illustrates the installation of the voltage encoder and the setting of the switching interval x .



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- | | |
|----------------------------------|--------------------------|
| [1] Adapter flange bearing cover | [4] Voltage encoder |
| [2] Screw head | [5] Sensing distance x |
| [3] Lock nut | |

1. Rotate the output shaft of the adapter until the slotted screw head can be seen through the tapped hole in the bearing cover.
2. Voltage encoder:
 - Carefully screw it into the thread in the adapter flange [1] of the variable-speed gear unit until the voltage encoder [5] rests on the screw head [2].
 - Turn the encoder back by 2 turns and secure with the lock nut [3].

The sensing distance is now set to 2 mm. During operation, the voltage encoder supplies 1 pulse per revolution at this sensing distance.

5.11.1 Changing sensing distance x

If no circuit state change occurs at the voltage encoder (LED display) with rotating shaft of the adapter shaft operating with sensing distance $x = 1 \text{ mm}$, the sensing distance can be changed as follows:

1. With **constantly lit LED** [4] of the voltage encoder, turn the voltage encoder a half turn **counterclockwise** at a time and check its function.
2. If the **LED is not lit** [4], turn the voltage encoder **clockwise** by 90 degrees but no more than one time.

▲ CAUTION

A collision with the slotted screw heads may destroy the voltage encoder.

Possible damage to property.

- Do not turn in the voltage encoder by more than half a turn
-

3. If a circuit change still does not occur, check the voltage supply of the voltage encoder using the evaluation electronics (with WEXA/WEX design).

6 Inspection/maintenance

6.1 General information

Observe the following notes regarding inspection/maintenance work at the gear unit:



▲ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before you start working on the unit.
- Prevent the gearmotor from starting up unintentionally for example, by locking the key switch or removing the fuses from the current supply.



▲ WARNING

Risk of injury if preloaded shaft connections are loosened.

Severe or fatal injuries.

- Before releasing any shaft connections, make sure there is no active torsional torque present that could lead to tension within the system.



▲ WARNING

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

Severe 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

Loss of lubricant qualities due to filling of wrong gear unit oil.

Damage to the gear unit

- Do not mix different synthetic lubricants and do not mix synthetic and mineral lubricants.
- As standard lubricant use mineral oil.

NOTICE

Ingression of water at the sealing lip of the oil seal due to cleaning the gear unit with a high-pressure cleaning device.

Damage to oil seals

- Do not clean the variable-speed gear unit with a high-pressure cleaning device.

NOTICE

Damage to gear unit due to ingress of foreign objects during maintenance and inspection work.

Destruction of the gear unit.

- Prevent foreign particles from entering into the gear unit during maintenance and inspection work.
-

NOTICE

Damage to gear unit due to improper inspection and maintenance work.

Damage to the gear unit

- It is important that you observe the notes in this chapter.
-

**INFORMATION**

- Maintain the inspection and maintenance intervals. This is necessary to ensure operational safety.
 - The position of the oil level plug, oil drain plug and the breather valve depends on the mounting position. Refer to the mounting position sheets in chapter "Mounting positions (→ 133)".
 - Perform a safety and functional check following all maintenance and repair work.
-

6.2 Wearing parts

Gearing

If the SEW-EURODRIVE design criteria and the intervals for inspection and maintenance are observed, the gearing components are wear-free after the run-in period. The worm gearing is an exception from this for constructional reasons. The amount of material abrasion on the worm gear tooth flanks varies depending on the operating conditions. The main influencing factors are:

- Speed
- Load
- Operating temperature
- Lubricant (type, viscosity, additives, pollution)
- Operating frequency

For information on the worm gearing service life under certain operating conditions, contact SEW-EURODRIVE.

Rolling bearing

Rolling bearing, adapter and input shaft assembly have a limited service life, even under ideal operating conditions. This nominal bearing service life is a solely statistical value. The actual service life of an individual bearing may deviate greatly from this value. The main influencing factors are:

- Speed
- Equivalent bearing load
- Operating temperature
- Lubricant (type, viscosity, additives, pollution)
- Lubricant supply of the bearing
- Misalignment under operating load

Therefore the rolling bearings must be inspected regularly. Note the respective inspection and maintenance intervals in chapters Inspection/maintenance intervals (→ 104), Lubricant change intervals (→ 105), Maintenance of AL/AM/AQ./EWH adapter (→ 106) and AD input shaft assembly maintenance (→ 112).

For information on the nominal bearing service life under certain operating conditions, contact SEW-EURODRIVE.

Lubricants

Lubricants are subject to aging. Their service life is limited depending on the load conditions.

The service life significantly depends on the oil operating temperature. The dependency of lubricant change intervals and operating temperature is depicted in the figure in chapter Lubricant change intervals (→ 105).

Oil seals

Oil seals are contact seals that are used to seal unit housings at emerging elements, such as shafts, from the environment. Oil seals are wear parts with a service life that is influenced by various factors, such as:

- Shaft speed and circumferential velocity at the sealing lip
- Ambient conditions (temperature, dust, humidity, pressure, chemicals, radiation)
- Lubricant (type, viscosity, additives, pollution)
- Surface quality of the sealing
- Lubricant supply of the sealing
- Oil seal material

**Cam ring/
Coupling ring**

Due to the various influencing factors it is not possible to predict the service life. Therefore the oil seals must be inspected regularly. Note the respective inspection and maintenance intervals in chapters Inspection/maintenance intervals (→ 104), Lubricant change intervals (→ 105), Maintenance of AL/AM/AQ./EWH adapter (→ 106) and AD input shaft assembly maintenance (→ 112).

The couplings used in the AM, AL, AQ. and EWH adapters are designed to be positive, puncture-proof and low-maintenance claw couplings. They have an impact and vibration-absorbing cam ring (AM, EWH) or coupling ring (AQ., AL). The service life of cam ring/coupling ring is influenced by various factors, such as:

- Ambient conditions (temperature, chemicals, radiation)
- Operational conditions (starting frequency, impact characteristics)

Note the respective inspection and maintenance intervals in chapters Maintenance of AL/AM/AQ./EWH adapter (→ 106).

6.3 Inspection/maintenance intervals

The following gear units are lubricated for life:

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

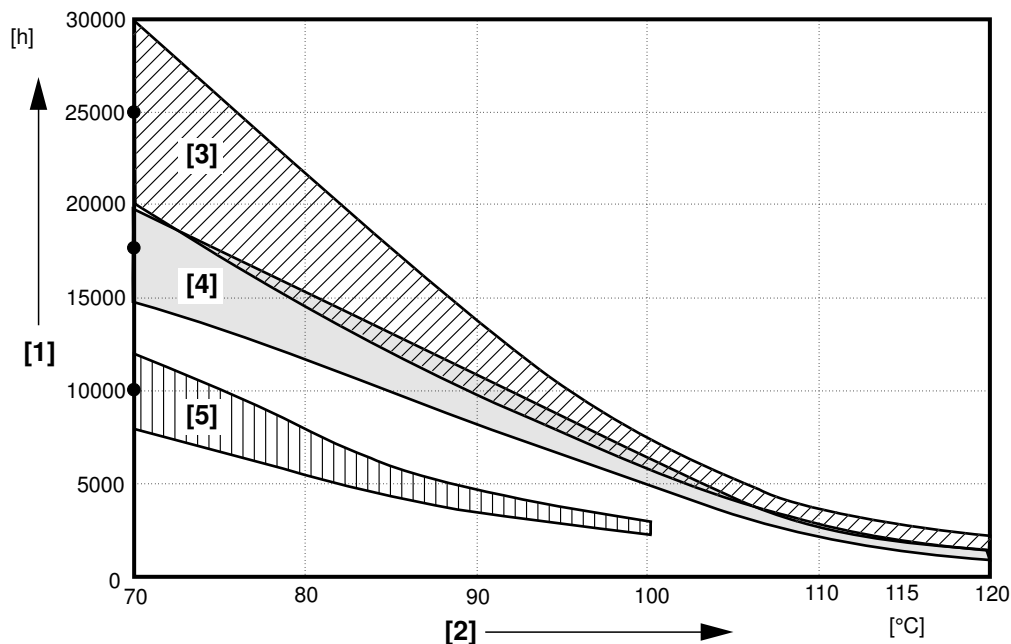
If necessary touch up or renew the surface protection/ corrosion protection coating.

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

Time interval	What to do?
<ul style="list-style-type: none"> • Every 3000 hours of operation, at least every 6 months 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Depending on the operating conditions (see illustration below), every 3 years at the latest • according to oil temperature 	<ul style="list-style-type: none"> • Change mineral oil • Replace rolling bearing grease (recommendation) • Replace oil seal (do not install it in the same track)
<ul style="list-style-type: none"> • Depending on the operating conditions (see illustration below), every 5 years at the latest • according to oil temperature 	<ul style="list-style-type: none"> • Change synthetic oil • Replace rolling bearing grease (recommendation) • Replace oil seal (do not install it in the same track)
<ul style="list-style-type: none"> • Varying (depending on external factors) 	<ul style="list-style-type: none"> • Touch up or renew the surfaces/anticorrosion coating

6.4 Lubricant change intervals

The following image depicts the change intervals for **standard** gear units under normal ambient conditions. In case of special designs under severe/aggressive ambient conditions change the lubricant more frequently.



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- | | |
|---------------------------------------|---|
| [1] Operating hours | [3] CLP PG |
| [2] Sustained oil bath temperature | [4] CLP HC / HCE (food grade lubricants for the food industry) |
| • Average value per oil type at 70 °C | [5] CLP / HLP / E (lubricants made of biodegradable oils for agriculture, forestry, and water management) |

6.5 Maintenance of AL/AM/AQ./EWH adapter

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

Time interval	What to do?
<ul style="list-style-type: none"> Every 3000 hours of operation, at least every 6 months 	<ul style="list-style-type: none"> Check the running noises to detect possible bearing damage. Visually check the adapter for leakage.
<ul style="list-style-type: none"> After 10000 operating hours 	<ul style="list-style-type: none"> Check the rotational clearance. Visual check the cam ring (AM, EWH) or coupling ring (AQ., AL). Change the bearing grease. Change the oil seal. Do not mount it in the same track.

6.6 AR adapter maintenance

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

Time interval	What to do?
<ul style="list-style-type: none"> Every 3000 hours of operation, at least every 6 months 	<ul style="list-style-type: none"> Check the running noises to detect possible bearing damage. Visually check the adapter for leakage.
<ul style="list-style-type: none"> After 25000 – 30000 hours of operation 	<ul style="list-style-type: none"> Change the bearing grease. Change the oil seal. Do not mount it in the same track.

6.7 Maintenance of AR adapter with slip clutch

If you use an adapter with slip clutch, the wear parts are affected by many factors. This is why the inspection intervals are short.

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

Time interval	What to do?	Chapter
<ul style="list-style-type: none"> At least every 3000 hours of operation 	<ul style="list-style-type: none"> Inspect the friction lining and the cup springs. If necessary, replace them. If the slip torque is too low, adjust it accordingly. 	Chapter "Inspecting/replacing the friction lining, adjusting the slip torque (→ 109)".

6.7.1 Inspecting the friction lining

If the friction lining thickness is reduced by more than 50% compared to the original state, replace the friction lining (see "Replacing the friction lining and adjusting the slip torque" (→ 109)).

The following table lists the friction lining thickness in original state:

Adapter type	Friction lining thickness mm
AR71/AR80/AR85/AR90/AR95	2
AR100/AR105/AR112	3
AR132/AR135/AR145/AR160/AR165/AR180/AR185/AR195	4

The following table shows the dimensions of the setting tool:

Adapter type	d mm	l mm	u mm	t _{max} mm
AR71	14	30	5	16.3
AR80/AR85	19	40	6	21.8
AR90/AR95	24	50	8	27.3
AR100/AR105/AR112	28	60	8	31.3
AR132/AR135/AR145	38	80	10	41.3
AR160/AR165	42	110	12	45.3
AR180/AR185/AR195	48		14	51.8

6.7.2 Required tools/resources

- Standard tools
- Spanner wrench
- Hydraulic press
- Mounting/dismantling tool
- Torque wrench

INFORMATION



For the mounting/dismantling tool, observe that the threaded spindle must have the same diameter as the gear unit input shaft.

The following table shows the dimensions of the setting tool:

Adapter type	d mm	l mm	u mm	t _{max} mm
AR71	14	30	5	16.3
AR80/AR85	19	40	6	21.8
AR90/AR95	24	50	8	27.3
AR100/AR105/AR112	28	60	8	31.3
AR132/AR135/AR145	38	80	10	41.3
AR160/AR165	42	110	12	45.3
AR180/AR185/AR195	48		14	51.8

6.7.3 Inspecting/replacing the friction lining, adjusting the slip torque

▲ WARNING



Risk of crushing if the drive starts up unintentionally.
Severe or fatal injuries.

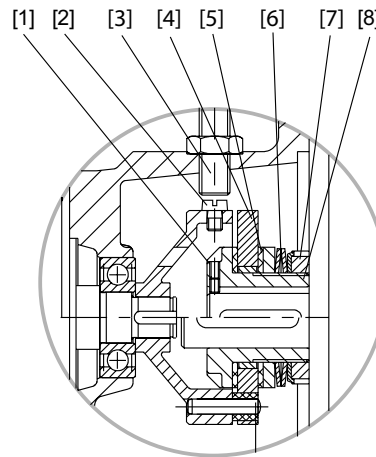
- Before starting the work, de-energize the gearmotor and prevent it from starting up unintentionally for example by locking the key switch or removing the fuses from the current supply.

INFORMATION



It is only possible to check and adjust the slip torque accurately by using a torque wrench with an appropriate connection piece.

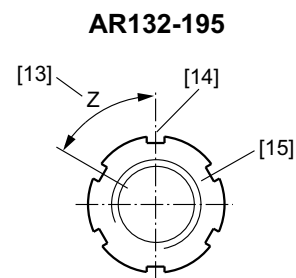
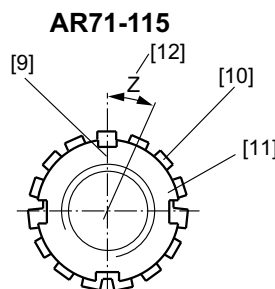
The following figure shows the gear unit with mounted AR adapter with slip clutch:



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- | | |
|-------------------------|---------------------|
| [1] Locking screw | [5] Friction lining |
| [2] Cylinder head screw | [6] Cup spring |
| [3] Proximity switch | [7] Slotted nut |
| [4] Friction disk | [8] Friction hub |

The following figure shows the rough slip torque adjustment:



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- | | |
|--|---|
| [9] Marking | [13] Z number of slots in the slotted nut |
| [10] Lock washer (cam) | [14] Mark on the driving disk |
| [11] Slotted nut | [15] Slotted nut |
| [12] Z Number of cams of the lock washer | |

Proceed as follows:

- ✓ The motor/variable-speed gearmotor is disconnected from the adapter.
- 1. Loosen the locking screw [1] and pull the friction hub [8] from the shaft end.
- 2. Clamp the friction hub [8] in a vise.
- 3. For AR 71 – 115 adapters, proceed as follows:
 - Loosen the lock washer [10].
 - Loosen the slotted nut until you can easily adjust the slip clutch manually.
 - Mark this position of the slotted nut [11].
- 4. For AR 132 – 195 adapters, proceed as follows:
 - Loosen the clamping screw at the slotted nut [15].
 - Loosen the slotted nut until you can easily adjust the slip clutch manually.
 - Mark this position of the driving disk [14].
- 5. Loosen the slotted nut and remove the cup springs [6]. Note the sequence of the cup spring (see "Sequence of the cup springs" (→ 111)).

NOTICE

Destruction of the friction lining surface by lubricants.

- Prevent lubricants from getting on the friction surface.

- 6. Inspect the friction linings [5] (see "Inspecting the friction lining" (→ 107)). Replace them, if they are worn.
- 7. Inspect the cup springs [6]. Replace them, if cup springs are burned out.
- 8. Reassemble the cup springs [6] in the same sequence as you disassembled them.
- 9. Install the slotted nut up to the mark.
- 10. Measure the slip torque and adjust it. Proceed as follows:
 - How to adjust the slip torque using a torque wrench:
 - Connect the torque wrench with the hub bore.
 - Measure the slip torque in both directions of rotation and, if necessary, adjust it via the slotted nut.
 - If you adjust the slip torque using a spanner wrench, you can only roughly set the slip torque. In this case, determine the value "Z" that must be set to achieve the required slip torque based on the following table (see "AR slip torques" (→ 111)). The value "Z" is:
 - For AR 71 – 115 drives, the number of cams of the lock washer starting from the mark.
 - For AR 132 – 195 drives, the number of slots of the slotted nut starting from the mark.
- 11. Secure the slotted nut either with a lock washer or a clamping screw, depending on the adapter type.
- 12. Reassemble the drive in opposite order.

AR slip torques

Adapter type	Cup springs			Setting range Nm	No. of cams or slots "Z"																				
	Num- ber	Thick- ness mm	Fig.1)		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
					Slip torque M _R Nm																				
AR71	4	0.6	1	1.0-2.0						1.0	1.4	1.6	1.8	2.0											
			2	2.1-4.0						2.1	-	2.4	2.6	3.2	3.4	3.8	4.0								
	3	3	4.1-6.0			4.1	5.0	5.8	6.0																
AR80	4	0.6	1	1.0-2.0						1.0	1.4	1.6	2.8	2.0											
			2	2.1-4.0						2.1	-	2.4	2.6	3.2	3.4	3.8	4.0								
	3	3	4.1-6.0			4.1	5.0	5.8	6.0																
	4	0.9	2	6.1-16				6.0	8.0	9.0	10	11	12	13	14	15	16								
AR85 AR90 AR95	4	0.6	2	2.0-4.0				2.0	2.4	3.0	3.6	3.8	4.0												
			3	3	4.1-6.0			4.1	5.0	5.8	6.0														
	4	0.9	2	6.1-16				6.0	8.0	9.0	10	11	12	13	14	15	16								
	2	1.1	3	17-24			16	20	24																
AR100 AR105 AR112 AR115	6	0.7	2	5.0-13						5.0	6.0	8.0	9.0	10	11	12	13								
	2	1.45	2	14-35						14	16	17	18	20	22	23	24	26	27	28	-	30	31	32	35
			3	36-80						36	41	45	48	54	58	60									
AR132S/M AR132M/L AR135 AR145	4	1.5	1	15-32				15	18	22	24	26	-	28	30	32									
			2	33-65				33	40	50	58	67													
			3	66-130	68	100	120	135																	
AR160	4	1.5	1	30-45										32	36	38	40	41	42	40	44	45			
			2	46-85			46	48	60	65	70	75	80	85											
	2	2.7	2	86-200					86	90	110	125	135	150	160	180	190	200							
AR165 AR180 AR185 AR195	4	1.5	1	30-45										32	36	38	40	41	42	44	45				
			2	46-85			40	48	60	65	70	75	80	85											
	2	2.7	2	86-200					86	90	110	125	135	150	160	170	180	190	200						
3			201-300			200	280	300																	

1) For "sequence of cup springs", refer to the table below

Sequence of the cup springs

No.	Meaning	Installation position
1	Double, alternating sequence	()()
2	Alternating sequence	()
3	Aligned sequence))

6.7.4 Replacing the incremental encoder of the adapter



▲ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Before starting the work, de-energize the gearmotor and prevent it from starting up unintentionally for example by locking the key switch or removing the fuses from the current supply.

INFORMATION



Use only genuine spare parts in accordance with the valid spare parts list.

Proceed as follows:

1. Remove the fan guard from the driving motor.
2. Remove the incremental encoder connection.
3. Loosen the lock nut at the incremental encoder and remove the old incremental encoder.
4. Install the new incremental encoder (see "Installing the voltage encoder" (→ 99)).
5. Connect the incremental encoder to the speed/slip monitor.
6. Reinstall the fan guard.

6.8 AD input shaft assembly maintenance

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

Time interval	What to do?
<ul style="list-style-type: none"> • Every 3000 hours of operation, at least every 6 months 	<ul style="list-style-type: none"> • Check the running noises to detect possible bearing damage. • Visually check the adapter for leakage.
<ul style="list-style-type: none"> • After 10000 operating hours 	<ul style="list-style-type: none"> • Change the bearing grease. • Change the oil seal. Do not mount it in the same track.

6.9 Inspection/maintenance for the gear unit

6.9.1 General information

Observe the following notes regarding inspection/maintenance work at the gear unit:



▲ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the gearmotor from the power supply before you start working on the unit.
- Prevent the gearmotor from starting up unintentionally for example, by locking the key switch or removing the fuses from the current supply.



▲ WARNING

Risk of injury if preloaded shaft connections are loosened.

Severe or fatal injuries.

- Before releasing any shaft connections, make sure there is no active torsional torque present that could lead to tension within the system.



▲ WARNING

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

Severe 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

Loss of lubricant qualities due to filling of wrong gear unit oil.

Damage to the gear unit

- Do not mix different synthetic lubricants and do not mix synthetic and mineral lubricants.
- As standard lubricant use mineral oil.

NOTICE

Ingression of water at the sealing lip of the oil seal due to cleaning the gear unit with a high-pressure cleaning device.

Damage to oil seals

- Do not clean the variable-speed gear unit with a high-pressure cleaning device.

NOTICE

Damage to gear unit due to ingress of foreign objects during maintenance and inspection work.

Destruction of the gear unit.

- Prevent foreign particles from entering into the gear unit during maintenance and inspection work.

NOTICE

Damage to gear unit due to improper inspection and maintenance work.

Damage to the gear unit

- It is important that you observe the notes in this chapter.

INFORMATION

- Maintain the inspection and maintenance intervals. This is necessary to ensure operational safety.
- The position of the oil level plug, oil drain plug and the breather valve depends on the mounting position. Refer to the mounting position sheets in chapter "Mounting positions (→ 133)".
- Perform a safety and functional check following all maintenance and repair work.

Components made of elastomers with fluorocarbon rubber**▲ 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.
- Avoid contact with the cooled-down fluorocarbon rubber, as dangerous residue has formed it was heated.

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, fluorocarbon rubber forms harmful gases and vapors as well as residue.

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.

6.9.2 Checking the oil level and changing the oil

The procedure when checking the oil level and changing the oil depends on gear unit type, size and mounting position. Determine the key letter (A, B, C, D or E) in the following table in regard of gear unit type and size. The key letter indicates the procedure for the respective gear unit, that can be found in the second table.

Gear unit type	Size	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..39 / K49	A					
	K..37 – 187	A					
S	S..37	C					
	S..47 – 97	A					
W	W..10 – 30	B					
	W..37 – 47	D			E	D	

Code letter	Chapter "Checking the oil level and changing the oil"	Reference
A:	<ul style="list-style-type: none"> Helical gear units... Parallel-shaft helical gear units... Helical-bevel gear unit ...K..39 / K..49, K..37 – 187 Helical-worm gear units... S..47 – 97 With oil level plug	(→ 117)
B:	<ul style="list-style-type: none"> Helical gear units... Parallel-shaft helical gear units... SPIROPLAN® gear units... Without oil level plug, with cover plate	(→ 120)
C:	<ul style="list-style-type: none"> Helical-worm gear units S..37 Helical-bevel gear units K..19 / K..29 Without oil level plug, without cover plate	(→ 124)
D:	<ul style="list-style-type: none"> SPIROPLAN® W..37 / W..47 In mounting positions M1, M2, M3, M5, M6 with oil level plug	(→ 127)
E:	<ul style="list-style-type: none"> SPIROPLAN® W..37 / W..47... In mounting position M4 without oil level plug and cover plate	(→ 130)

For notes on the mounting positions, refer to chapter "Mounting positions (→  133)".

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.

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

Checking the oil level at the oil level plug



▲ CAUTION

The R../R.. compound gear units in mounting position M1 and S../R.. compound gear units in mounting position M3 require sufficient lubrication. This is why the oil level is increased.

- The installed oil level plugs must not be used.

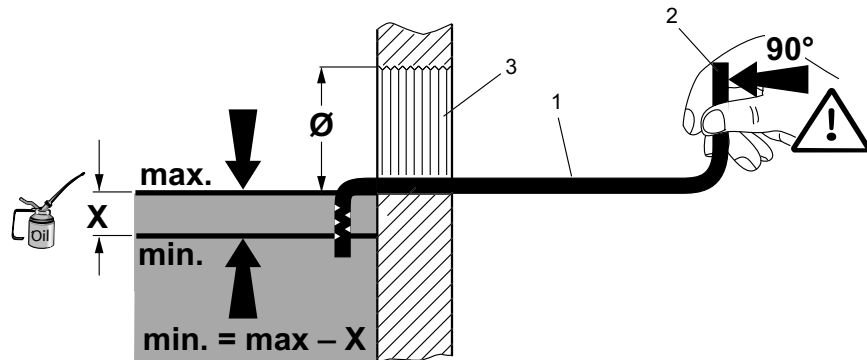
Proceed as follows:

- ✓ The prerequisites for inspection and maintenance work are fulfilled (see "Prerequisites for inspection and maintenance work at the gear unit" (→ 113)).
- 1. Determine the position of the oil level plug and the breather valve using the mounting position sheets (see "Mounting positions" (→ 133)).
- 2. Place a container underneath the oil level plug.
- 3. Slowly remove the oil level plug. Small amounts of oil may leak out.
- 4. Check the fill level at the oil level bore [3] using the oil dipstick [1]. The oil dipstick is enclosed with the operating instructions.



NOTICE

For the measurement, make sure that the auxiliary clip (2) of the oil dipstick (1) always points up vertically.



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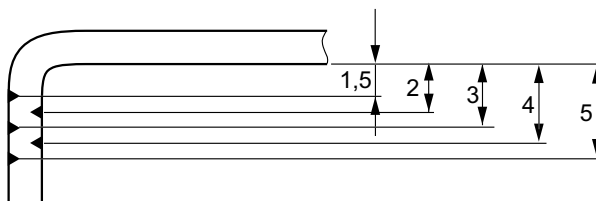
Max. fill level (max.): Lower edge of the oil level bore

Minimum fill level (min.): The minimum fill level depends on the diameter of the oil level bore and is determined using the oil dipstick.

The minimum fill level corresponds to the mark on the oil dipstick.

Ø oil level bore	Minimum fill level: Mark X at the oil dipstick (see following figure) mm
M10 × 1	1.5
M12 × 1.5	2
M22 × 1.5	3

Ø oil level bore	Minimum fill level: Mark X at the oil dipstick (see following figure)
	mm
M33 × 2	4
M42 × 2	5



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- If the oil level is too low, remove the breather valve and refill oil of the same type (if necessary, contact SEW-EURODRIVE) through the vent hole.
- Re-insert the breather valve and the oil level plug.

Checking the oil via the oil drain plug

Proceed as follows to check the gear unit oil:

- Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
- Determine the position of the oil drain plug using the mounting position sheets. See chapter "Mounting positions" (→ 133).
- Remove a little oil from the oil drain plug.
- Check the oil consistency:
 - Viscosity
 - If you can see that the oil is heavily contaminated, SEW-EURODRIVE recommends to change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 104).
- Check the oil level. See chapter "Checking the oil level at the oil level plug" (→ 117).

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



▲ WARNING

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

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.

- Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
- 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" (→ 133).
- Place a container underneath the oil drain plug.

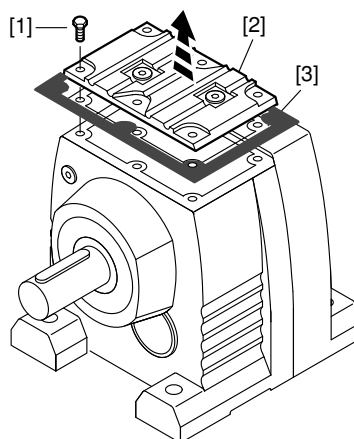
4. Remove the oil level plug, the breather valve and the oil drain plug.
5. Drain the oil completely.
6. Re-insert the oil drain plug.
7. Fill in fresh oil of the same type (contact SEW-EURODRIVE if necessary) via the breather bore. Do not mix different synthetic lubricant.
 - Observe the oil quantity according to the specifications on the nameplate or according to the mounting position. See chapter "Lubricant fill quantities".
 - Check the oil level at the oil level plug.
8. Re-insert the oil level plug and the breather valve.

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

Checking the oil level via the cover plate

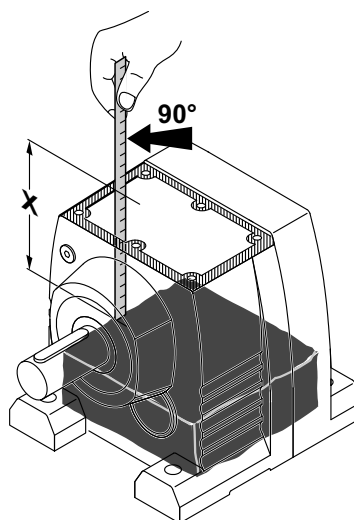
For gear units without oil level bore, the oil level is checked via the cover plate opening. Proceed as follows:

1. Observe the notes in section "Information on gear unit inspection/maintenance" (→ 113).
2. To position the cover plate on the top, place 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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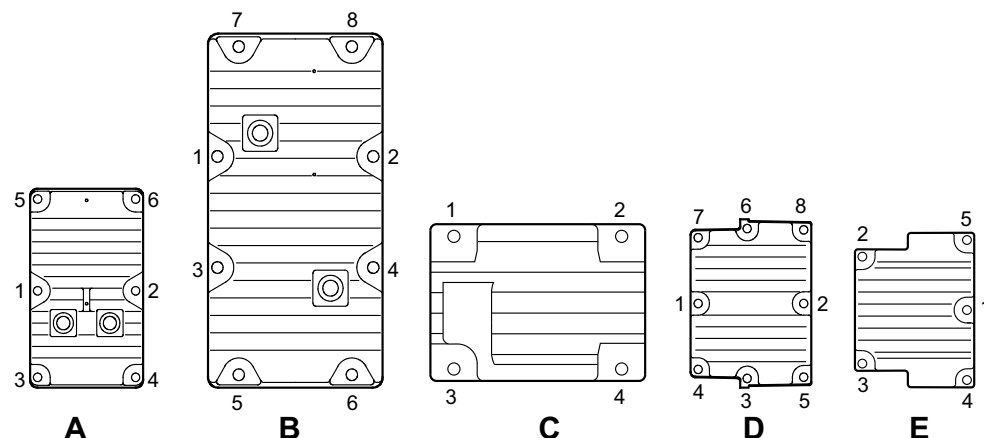
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5. Compare the determined value "x" to the max. distance between oil level and sealing surface of the gear unit housing specified in the following table. Adjust the fill level if required.

Gear unit type		Max. distance x in 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
		Irrespective of mounting position					
W10		12 ± 1					
W20		19 ± 1					
W30		31 ± 1					

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 plate screw connections working from the inside to the outside. Tighten the cover plate screw connections in the sequence depicted in the following figure. Tighten the cover plate screw connections with the specified tightening torque according to the following table. Repeat the tightening procedure until the screws are properly tightened. To avoid damaging the cover plate, use only impulse wrenches or torque wrenches. Do not use impact screwdrivers.



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Gear unit type	Figure	Retaining thread	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			

Checking the oil via cover plate

Proceed as follows to check the gear unit oil:

1. Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
2. Open the cover plate of the gear unit according to chapter "Checking the oil level via the cover plate" (→ 120).
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, SEW-EURODRIVE recommends to change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 113).

5. Check the oil level. See chapter "Checking the oil level via the cover plate" (→ 120).
6. Screw on the cover plate. Observe the order and the tightening torques according to section "Checking the oil level via the cover plate".

Changing the oil via the cover plate



▲ WARNING

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

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.
1. Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
 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 fresh oil of the same type (contact SEW-EURODRIVE if necessary) via the cover plate. Do not mix different synthetic lubricants.
 - Fill in the oil as specified on the nameplate or the order confirmation.
 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 (→ 120)".

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

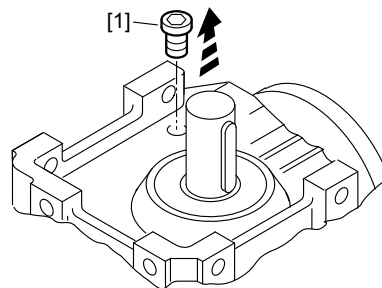
Checking the oil level via screw plug

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 "Information on gear unit inspection/maintenance" (→ 113).
2. Place the gear unit in the mounting position stated in the following table. Thus the control bore always points upwards.

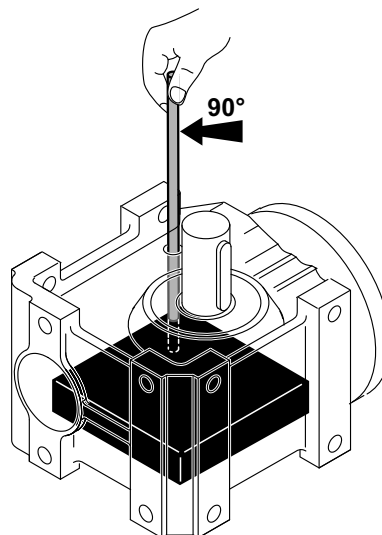
Gear unit	Mounting position
S..37	M5/M6
K19/29	M6

3. Remove the screw plug [1] as shown in the following figure.



18655371

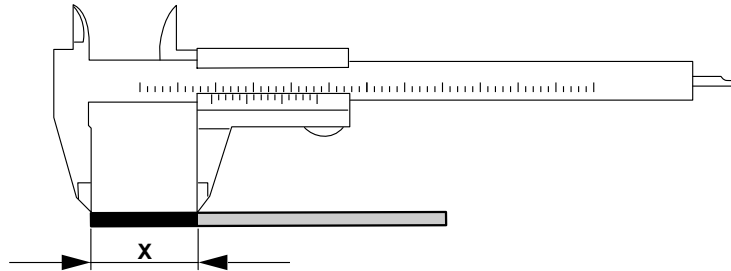
4. Insert the dipstick vertically via the control bore all the way to the bottom of the gear unit housing. Vertically pull the dipstick out of the control bore, as shown in the following figure.



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22162607/EN – 07/2015

- Determine the size of the section "x" of the dipstick covered with lubricant using a slide-gauge as depicted in the following figure.



18661771

- 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	33 ± 1	33 ± 1	33 ± 1	35 ± 1	33 ± 1	33 ± 1
K..29	50 ± 1	50 ± 1	50 ± 1	63 ± 1	50 ± 1	50 ± 1
S..37	10 ± 1	24 ± 1	34 ± 1	37 ± 1	24 ± 1	24 ± 1

- Re-insert and tighten the screw plug.

Checking the oil via the screw plug

- Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
- Open the screw plug of the gear unit according to chapter "Checking the oil level via screw plug (→ 124)".
- Take an oil sample via the screw plug bore.
- Check the oil consistency.
 - Viscosity
 - If you can see that the oil is heavily contaminated, SEW-EURODRIVE recommends to change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 104).
- Check the oil level. See chapter "Checking the oil level via screw plug (→ 124)".
- Re-insert and tighten the screw plug.

Changing the oil via the screw plug



▲ WARNING

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

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.

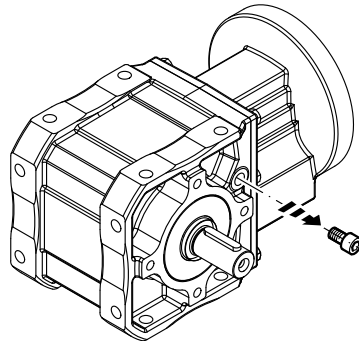
1. Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
2. Open the screw plug of the gear unit according to chapter "Checking the oil level via screw plug".
3. Completely drain the oil via the screw plug bore.
4. Fill in fresh oil of the same type (contact SEW-EURODRIVE if necessary) via the control bore. Do not mix different synthetic lubricants.
 - Observe the oil quantity specified on the nameplate or according to the mounting position. Observe chapter "Lubricant fill quantities".
5. Check the oil level.
6. Re-insert and tighten the screw plug.

6.9.6 D: SPIROPLAN® W37/W47 in mounting positions M1, M2, M3, M5, M6 with oil level plug

Checking the oil level at the oil level plug

Proceed as follows:

- ✓ The prerequisites for inspection and maintenance work are fulfilled (see "Prerequisites for inspection and maintenance work at the gear unit" (→ 113)).
- 1. Set up the gear unit in M1 mounting position (see "Mounting positions" (→ 133)).
- 2. Place a container underneath the oil level plug.
- 3. Slowly remove the oil level plug. Small amounts of oil may leak out.



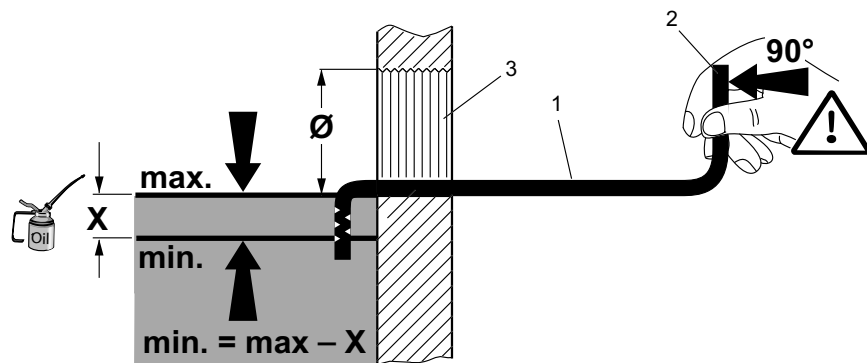
787235211

- 4. Check the fill level at the oil level bore [3] using the oil dipstick [1]. The oil dipstick is enclosed with the operating instructions.

NOTICE



For the measurement, make sure that the auxiliary clip (2) of the oil dipstick (1) always points up vertically.



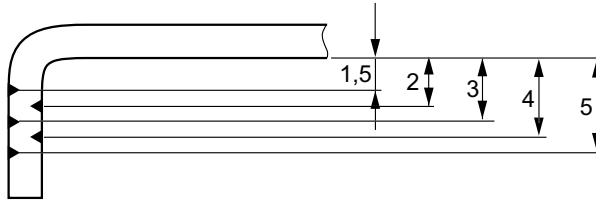
18634635

Max. fill level (max.): Lower edge of the oil level bore

Minimum fill level (min.): The minimum fill level depends on the diameter of the oil level bore and is determined using the oil dipstick.

The minimum fill level corresponds to the mark on the oil dipstick.

Ø oil level bore	Minimum fill level: Mark X at the oil dipstick (see following figure) mm
M10 × 1	1.5



9007199273378699

5. If the oil level is too low, fill in new oil via the oil level bore until the oil level reaches the lower edge of the bore.
6. Screw in the oil level plug again.

Checking the oil level at the oil level plug

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

1. Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
2. Remove some oil at the oil level plug.
3. Check the oil consistency.
 - Viscosity
 - If you can see that the oil is heavily contaminated, SEW-EURODRIVE recommends to change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 104).
4. Check the oil level. See previous chapter.

Changing the oil at the oil level plug



▲ WARNING

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

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.
1. Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
 2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting positions" (→ 133).
 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 the oil completely.
 6. Re-insert the lower oil level plug.
 7. Fill in new oil of the same type (contact SEW-EURODRIVE if necessary) via the upper oil level plug. Do not mix different synthetic lubricants.
 - Observe the oil quantity 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 oil level plug".

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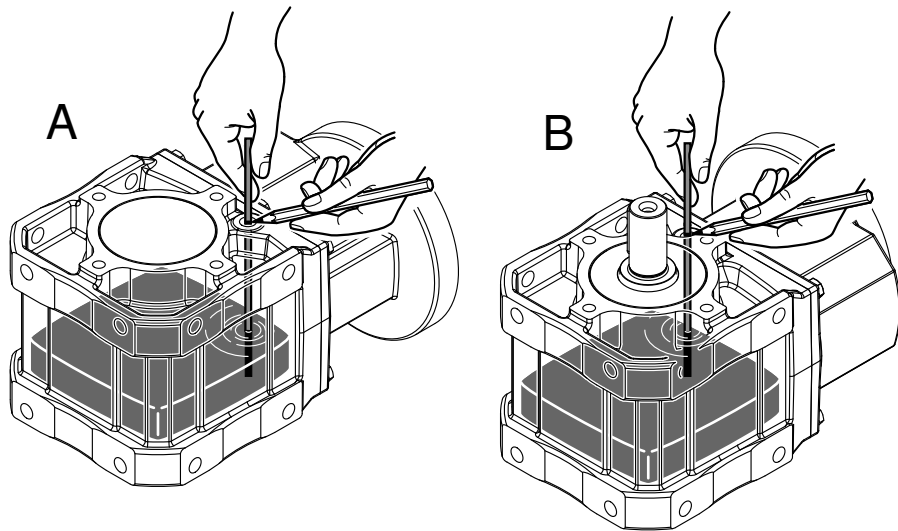
8. Re-insert the upper oil level plug.

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

Checking the oil level via screw plug

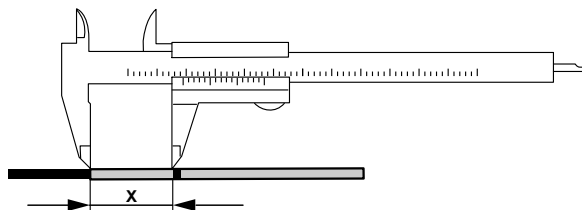
The W37 / W47 gear units are not equipped with an oil level plug or a cover plate. This is why the oil level is checked via the control bore.

1. Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting positions" (→ 133).
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 check	
	M5 Lying on the A-side	M6 Lying on the B-side
W37 in M4 mounting position	37 ± 1	29 ± 1

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

7. Re-insert and tighten the screw plug.

Checking the oil via the screw plug

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

1. Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
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, SEW-EURODRIVE recommends to change the oil even if this is outside the service intervals specified in "Inspection and maintenance intervals" (→ 104).
4. Check the oil level. See previous chapter.

Changing the oil via the screw plug



▲ WARNING

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

Severe injuries.

- Let the gear unit cool down before you start working on it. Due to the better flowability, the gear unit oil should still be warm so that the gear unit can be drained best.

1. Observe the notes in chapter "Information on gear unit inspection/maintenance" (→ 113).
2. Set up the gear unit in M5 or M6 mounting position. See chapter "Mounting positions" (→ 133).
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 the oil completely.
6. Re-insert the lower screw plug.
7. Fill in fresh oil of the same type (contact SEW-EURODRIVE if necessary) via the upper screw plug. Do not mix different synthetic lubricants.
 - For the required oil quantity, refer to the nameplate or chapter "Lubricant fill quantities".
 - Check the oil level according to chapter "Checking the oil level via oil level plug".
8. Re-insert the upper screw plug.

6.9.8 Replacing the oil seal**NOTICE**

Damage to oil seal when mounted below 0 °C.

Damage to oil seal.

- Store oil seals at ambient temperatures over 0 °C.
 - If necessary, heat the oil seal before mounting it.
-

Proceed as follows:

1. Ensure that there is a sufficient grease reservoir between the dust lip and sealing lip, depending on the gear unit design.
2. If you use double oil seals, the space has to be filled with grease for one third.

6.9.9 Painting the gear unit**NOTICE**

Paint can block the breather valve and damage the sealing lips of the oil seals.

Damage to property.

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

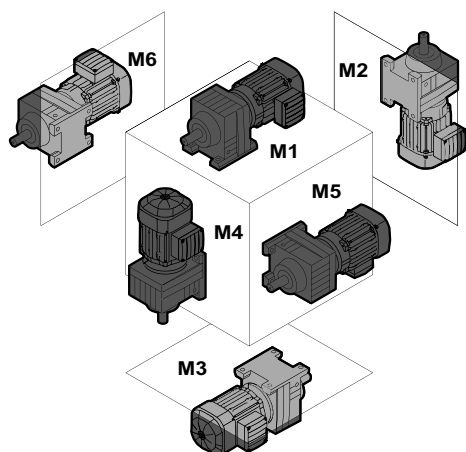
6.9.10 Clean the gear unit**INFORMATION**

When cleaning the gear unit, do not use materials or procedures (e.g. compressed air) that result in processes causing electrical charge on the coating.

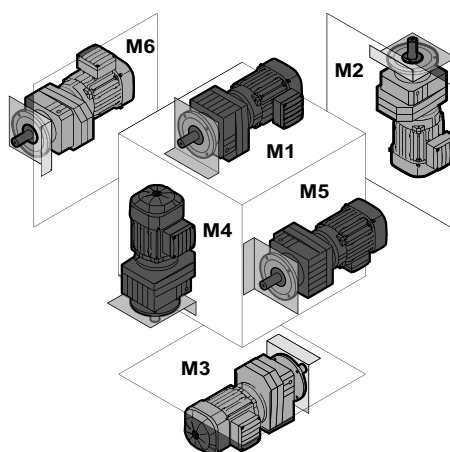
7 Mounting positions

7.1 Designation of the mounting positions

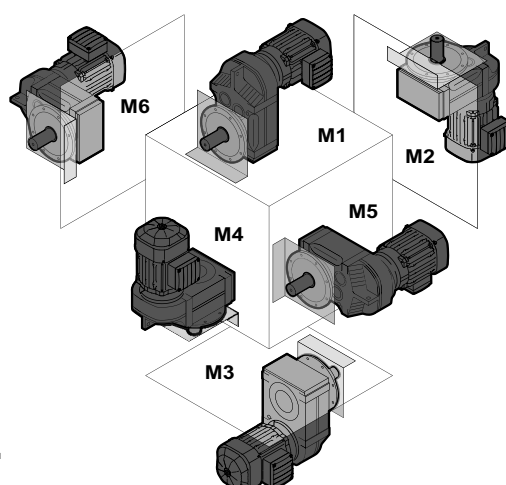
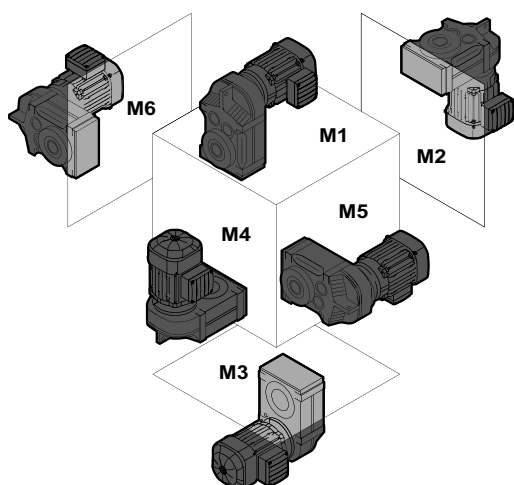
SEW-EURODRIVE distinguishes between the gear unit mounting positions M1 – M6. The following figure shows the gearmotor in the 6 mounting positions:



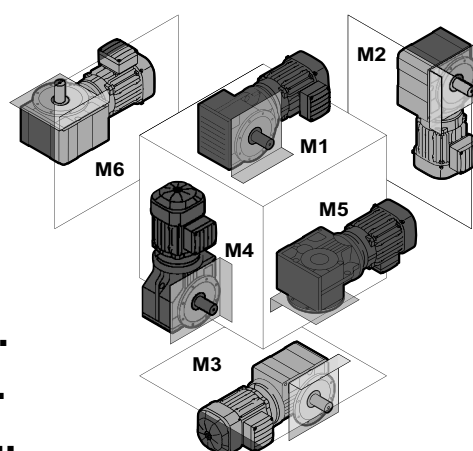
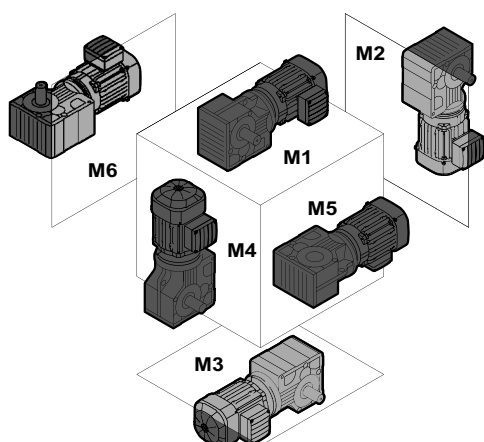
R..



F..



K..
S..
W..



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7.2 Churning losses



*(→  XY)


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 1/min
M2, M4	R	97 ... 107	> 2500
		> 107	> 1500
M2, M3, M4, M5, M6	F	97 ... 107	> 2500
		> 107	> 1500
	K	77 ... 107	> 2500
		> 107	> 1500
	S	77 ... 97	> 2500

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 oil fill volume must be adapted according to the mounting position of the gear unit (see chapter Lubricant fill quantities (→  175)). Customers will also have to mount the enclosed breather valve at the proper location depending on the mounting position (see chapter "Mounting position sheets (→  136)").

Check for the correct oil level, as described in chapter Checking the oil level and changing the oil (→  115).

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 oil quantity.

These gear units are entirely enclosed due to their small size and have no breather valve. Customers can use the gear unit universally in every mounting position (M1 – M6) without having to take any measures prior to startup.

7.5 Mounting positions of SPIROPLAN® gear units



NOTICE

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




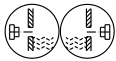

INFORMATION

SPIROPLAN® gearmotors are independent 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.

7.6 Mounting position sheets

7.6.1 Key

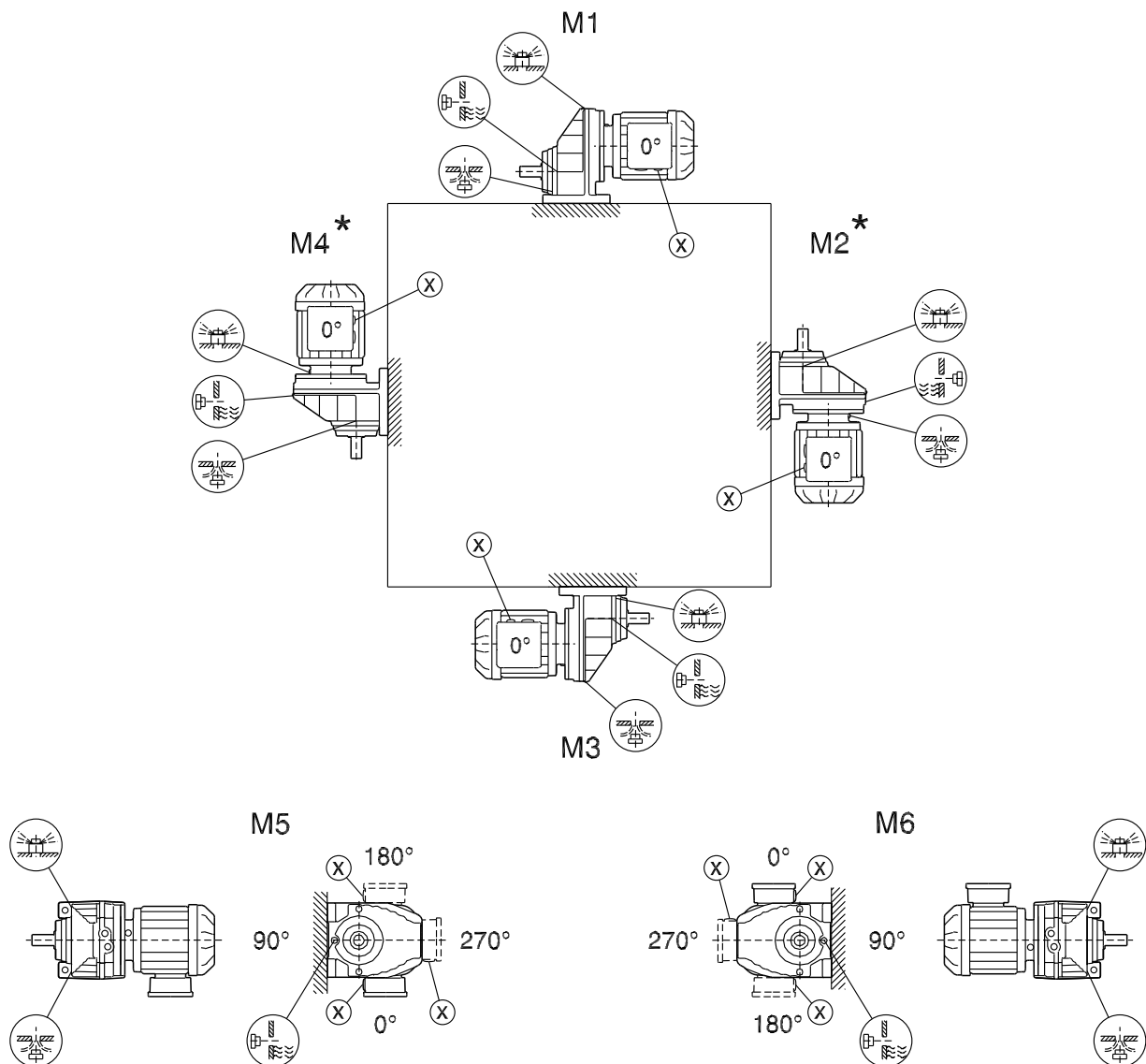
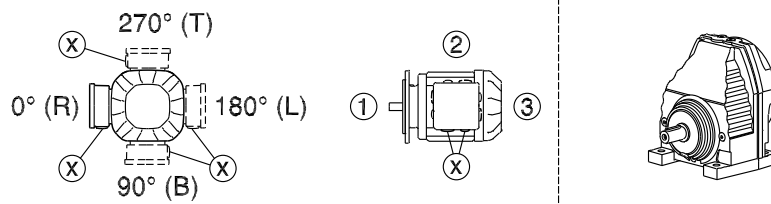
The following table shows the symbols used in the mounting position sheets and what they mean:

Icon	Meaning
	Breather valve
	Oil level plug
	Oil drain plug

7.6.2 Mounting positions of helical gearmotors

RX57-RX107

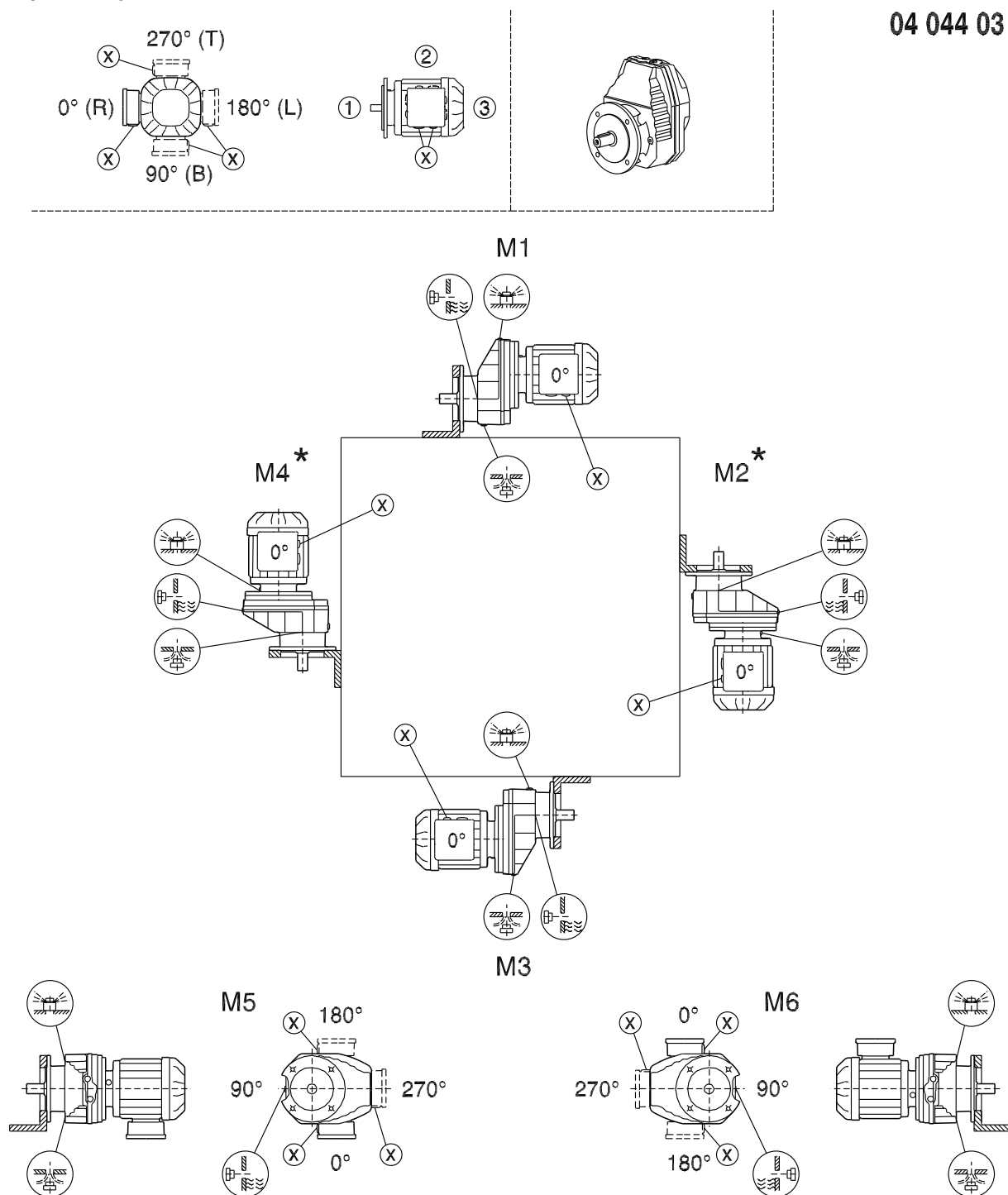
04 043 03 00



* (→ 134)

RXF57-RXF107

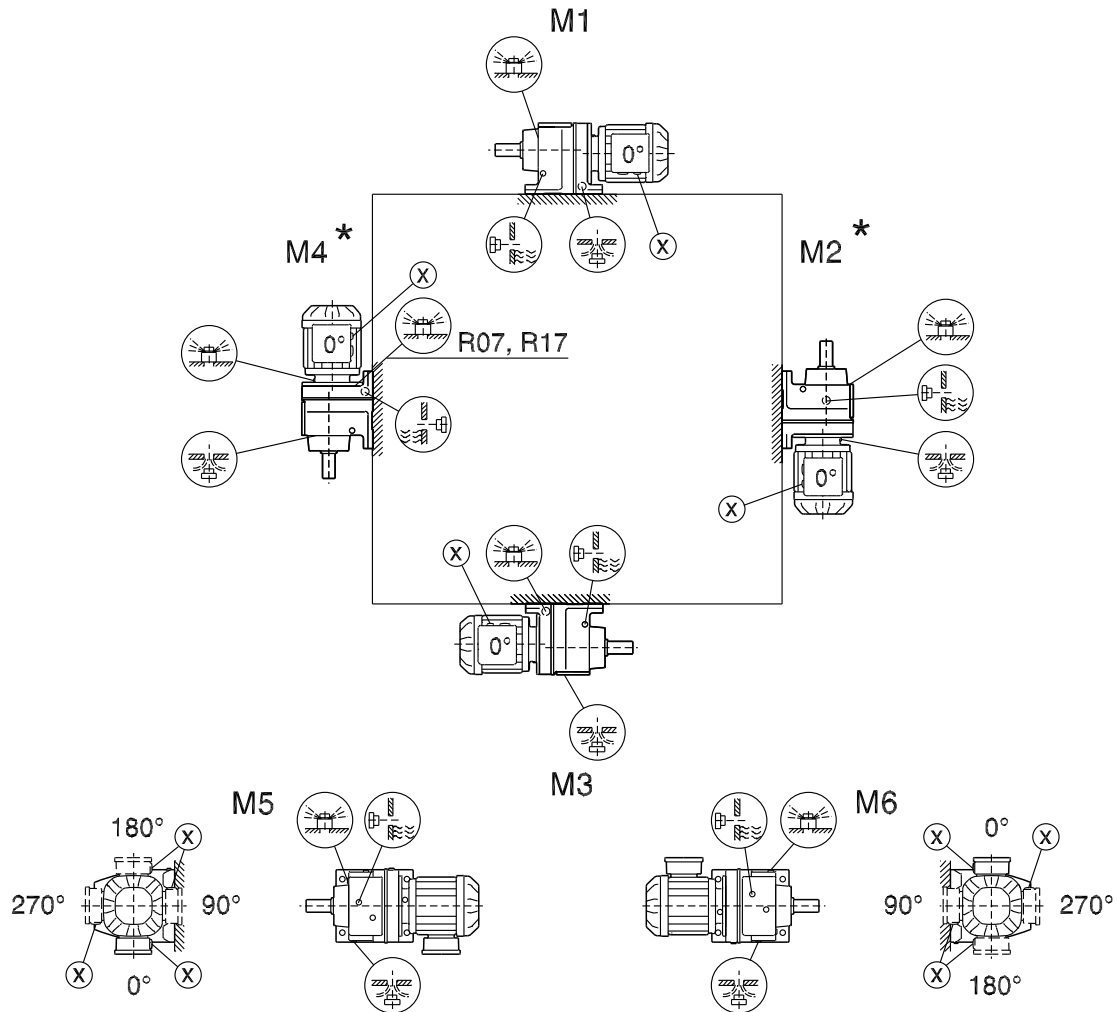
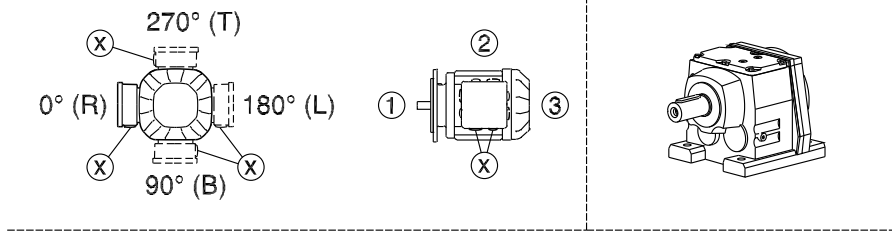
04 044 03 00



* (→ 134)

R07-R167

04 040 04 00

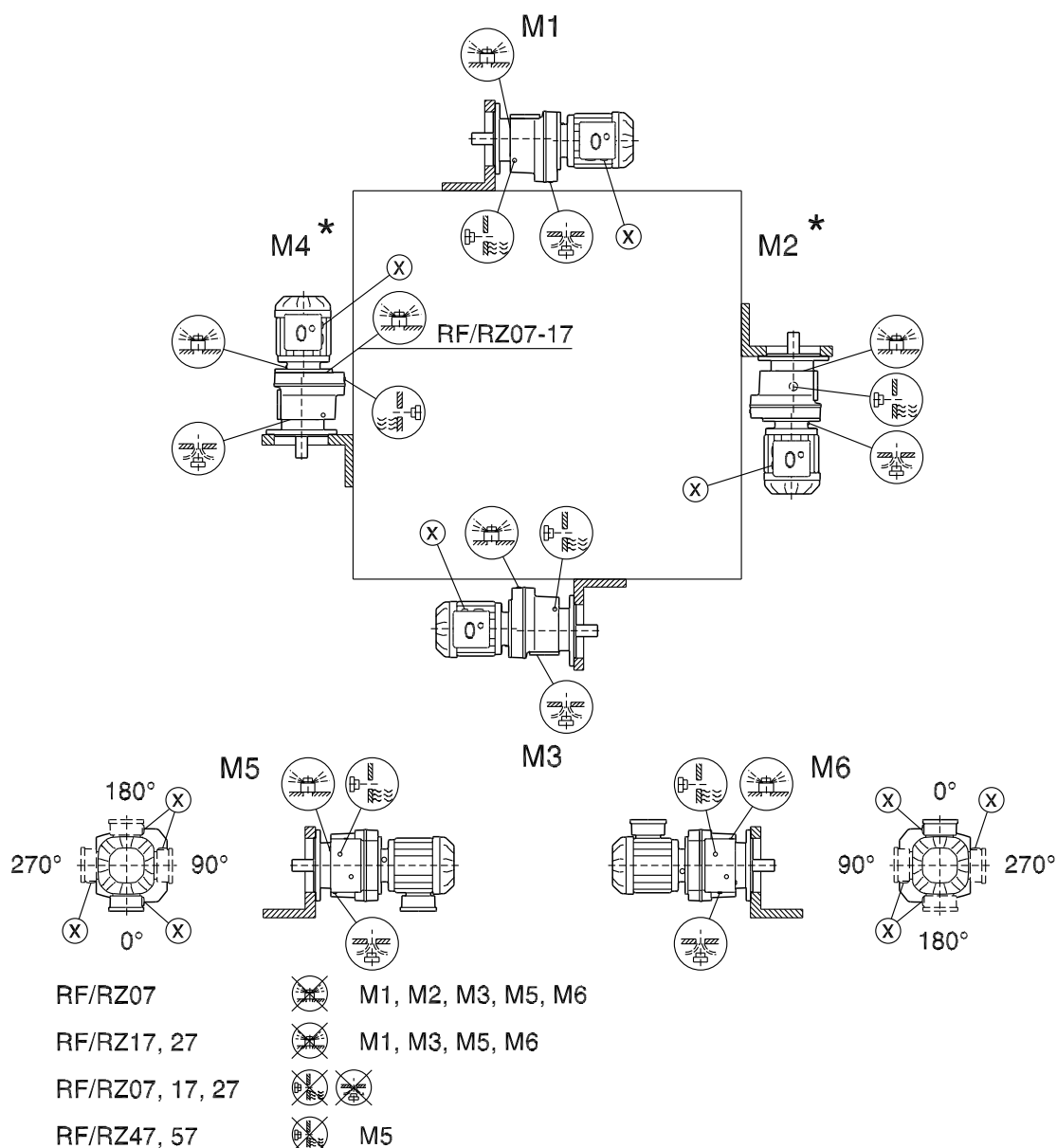
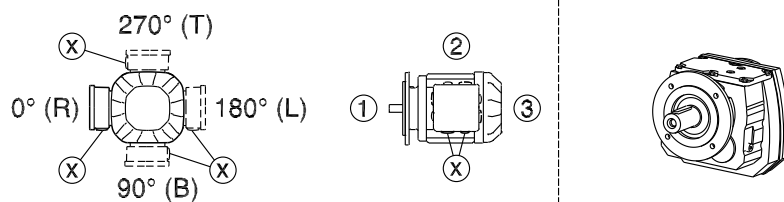


R07	M1, M2, M3, M5, M6
R17, R27	M1, M3, M5, M6
R07, R17, R27	
R47, R57	M5

* (→ 134)

RF07-RF167, RZ07-RZ87

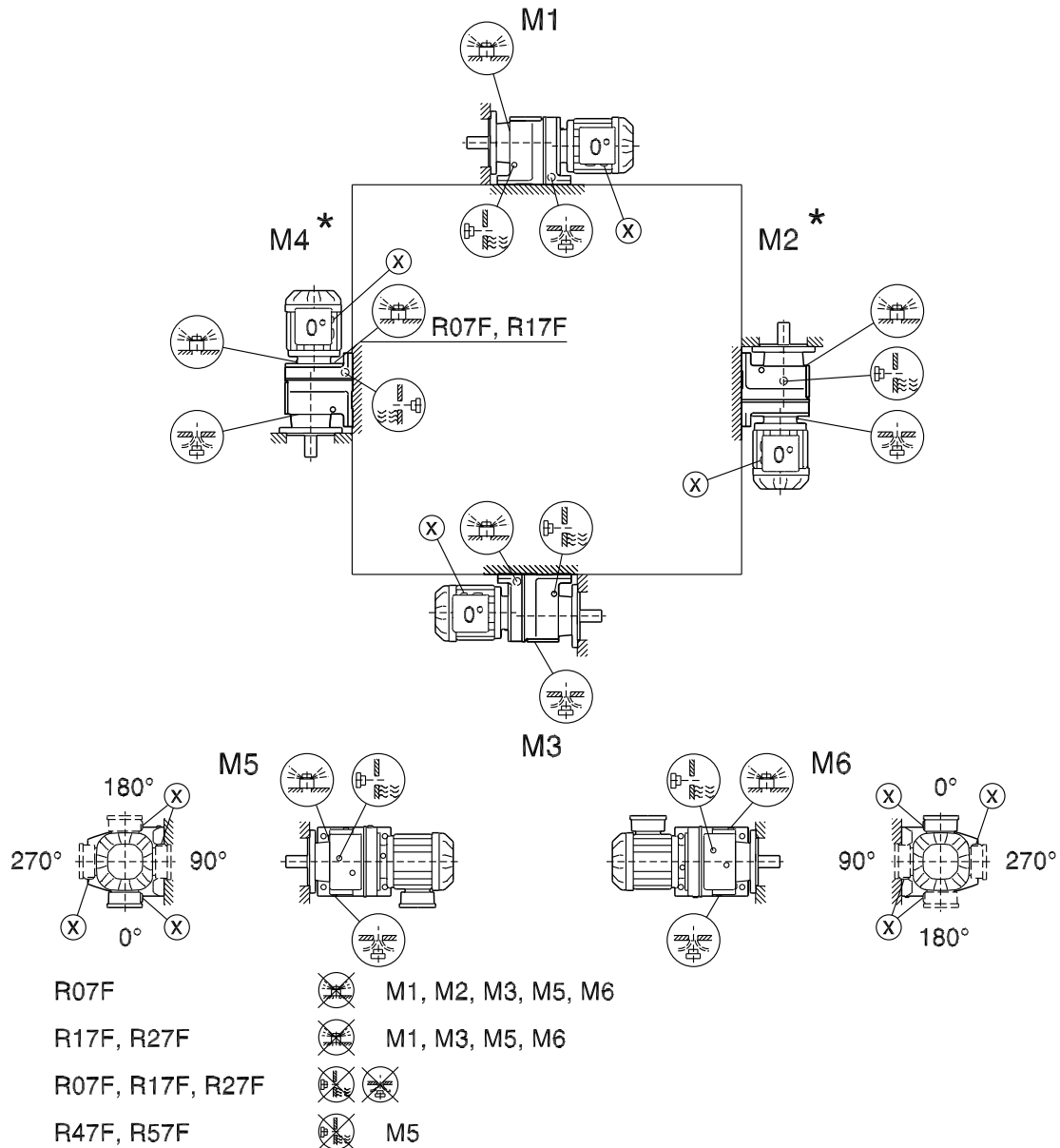
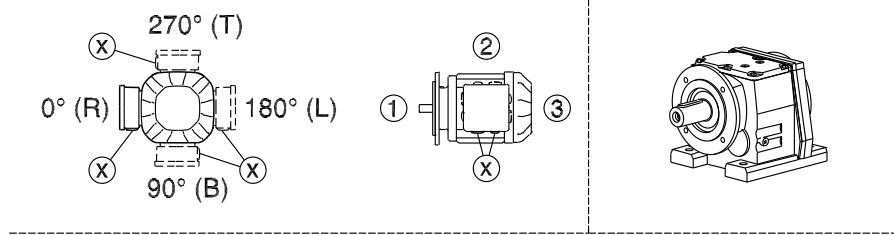
04 041 04 00



* (→ 134)

R07F-R87F

04 042 04 00

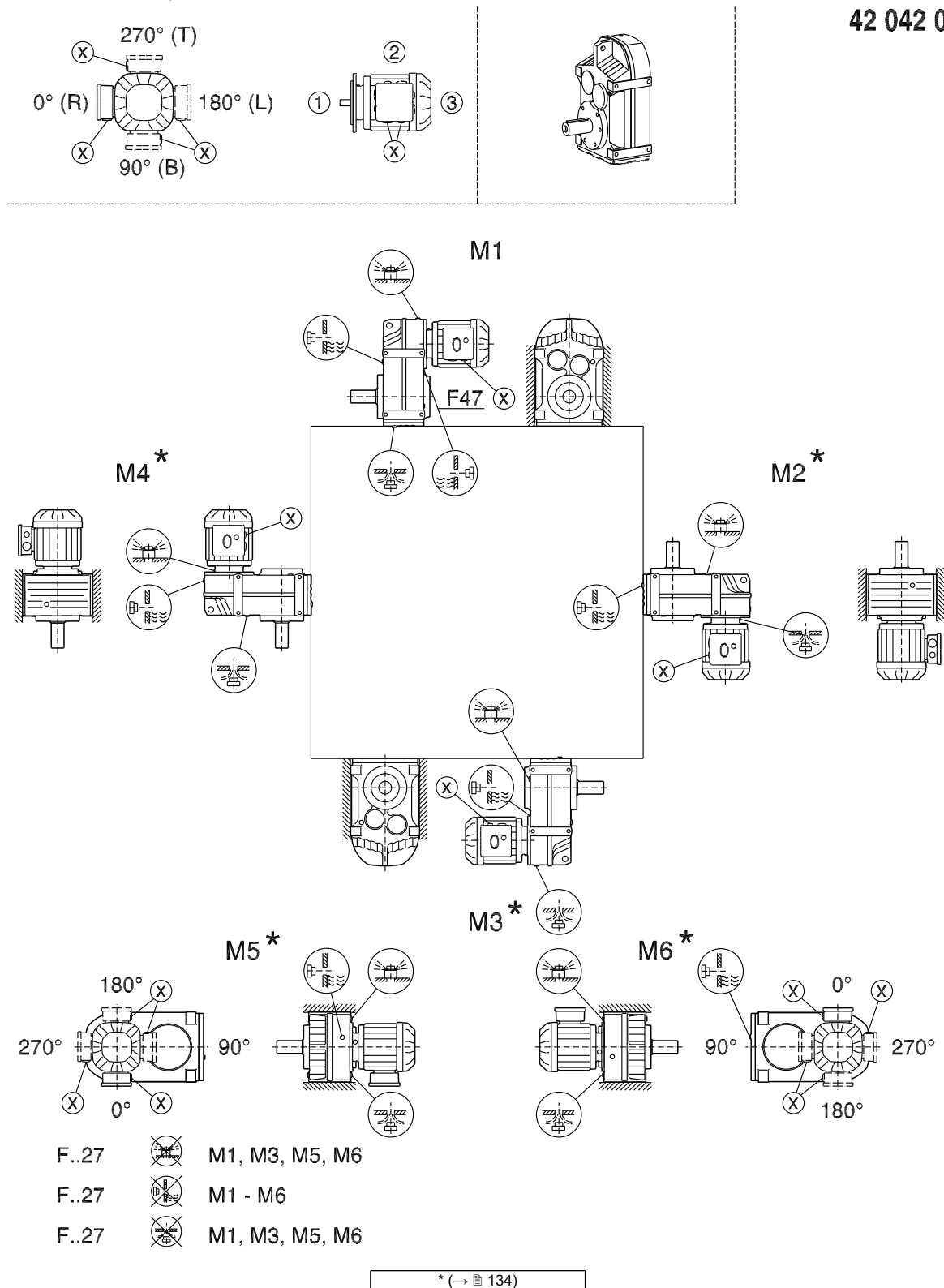


* (→ 134)

7.6.3 Mounting positions of parallel-shaft helical gearmotors

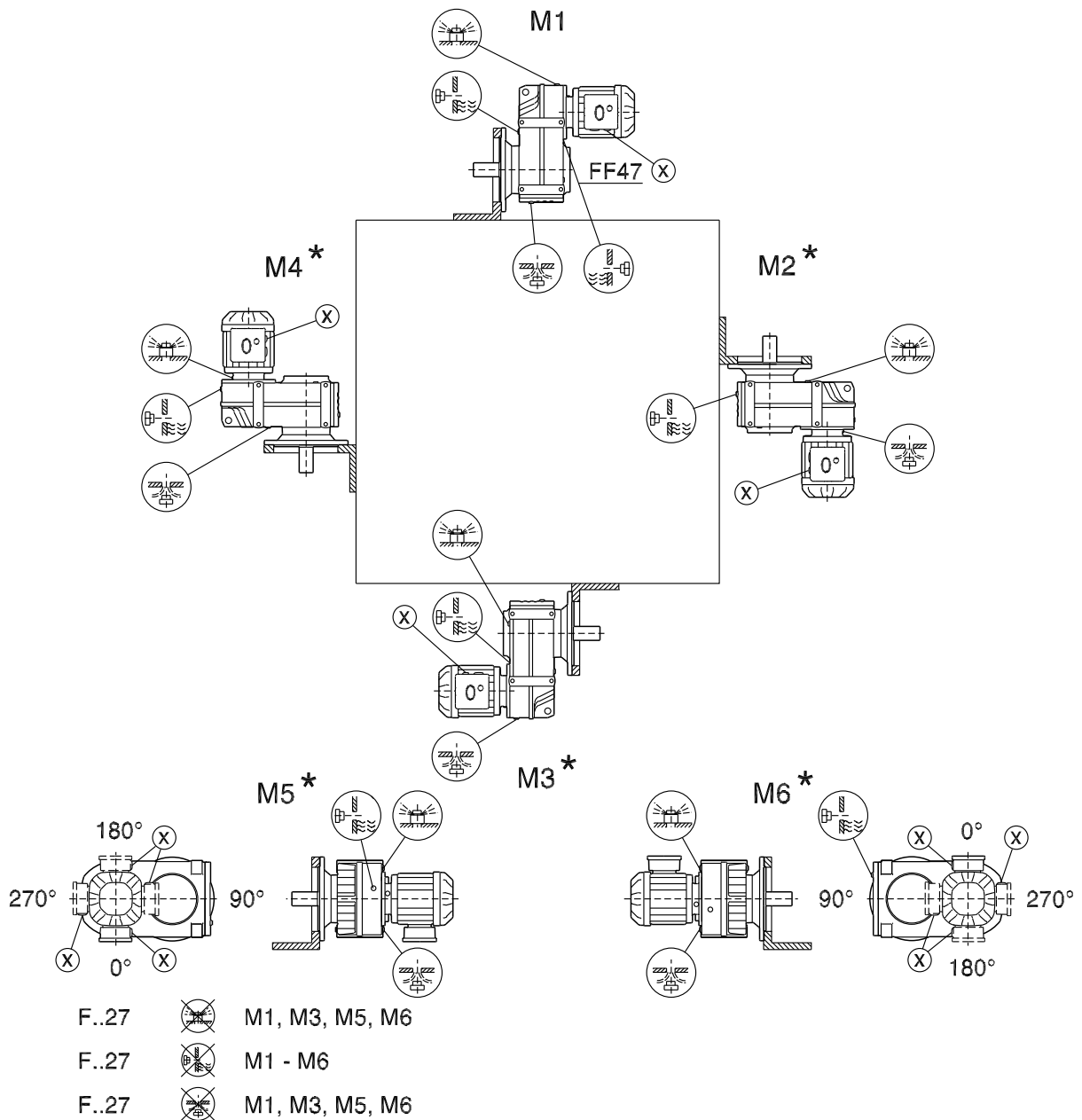
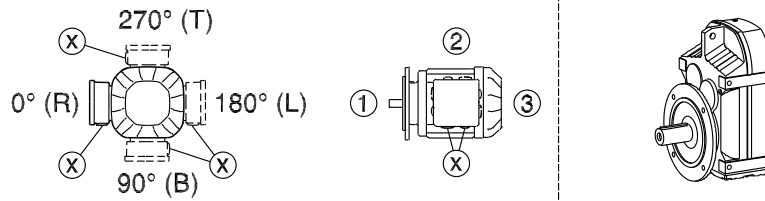
F/FA..B/FH27B-157B, FV27B-107B

42 042 04 00



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

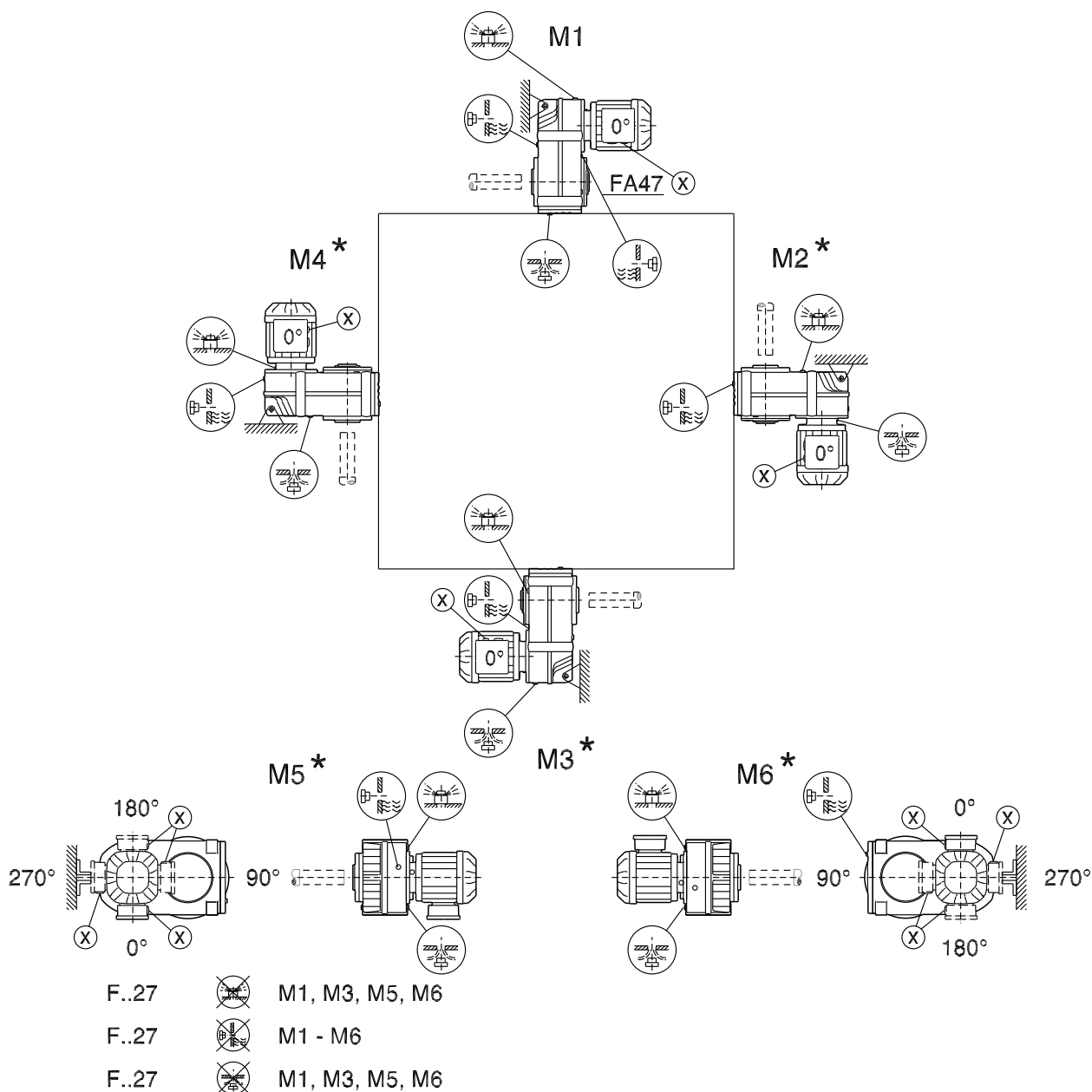
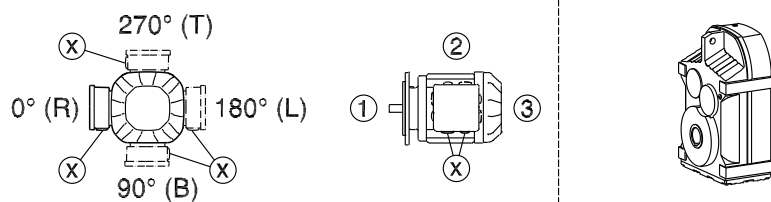
42 043 04 00



* (→ 134)

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

42 044 04 00

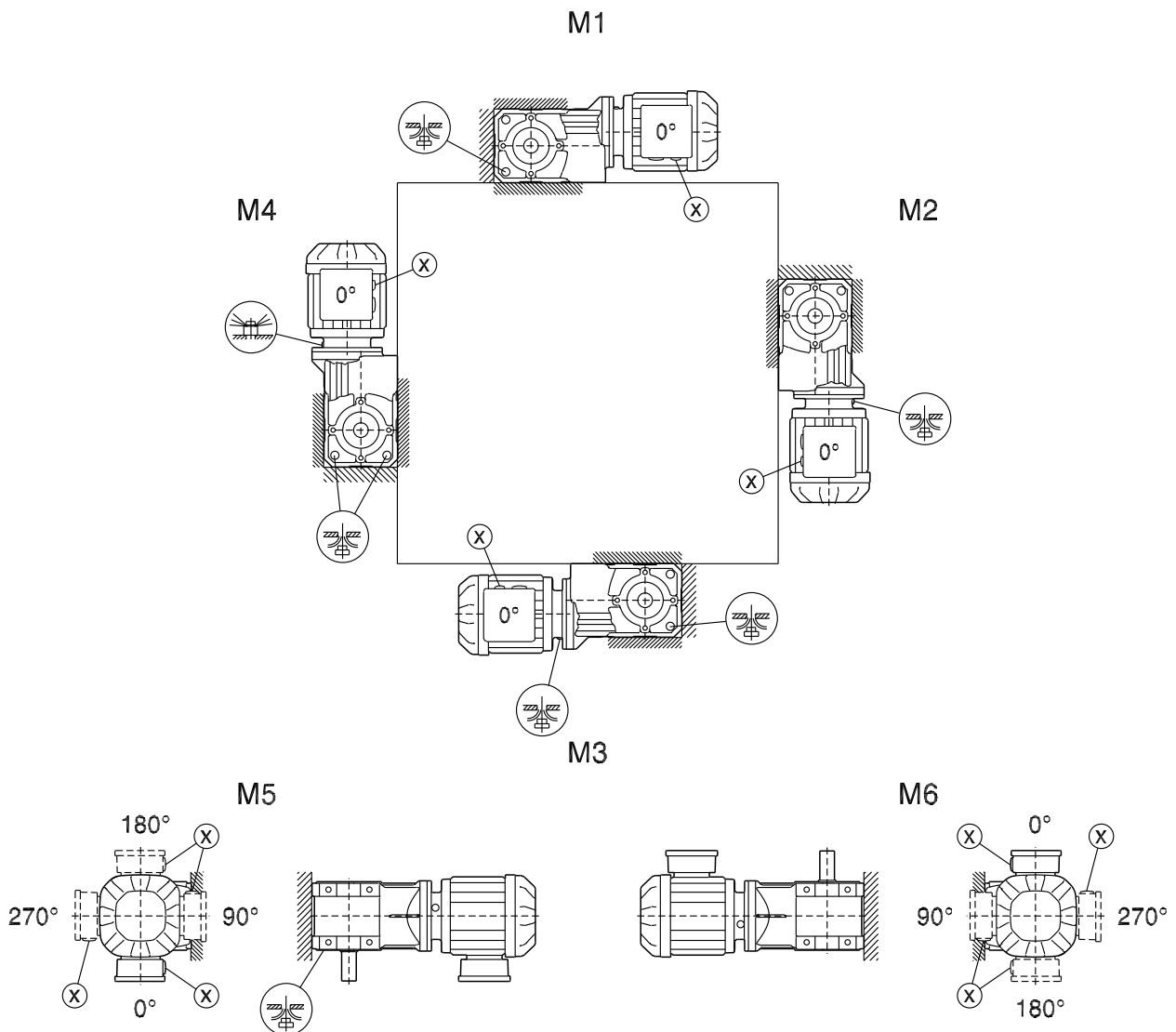
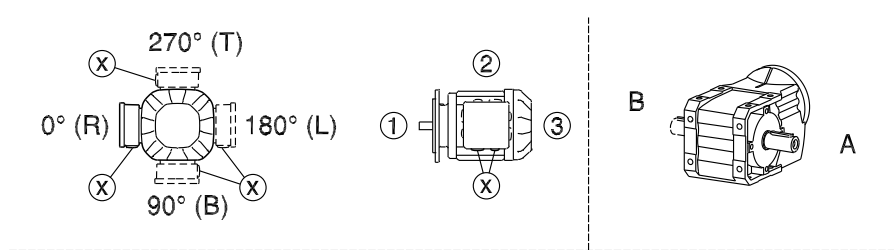


* (→ 134)

7.6.4 Mounting positions of helical-bevel gearmotors

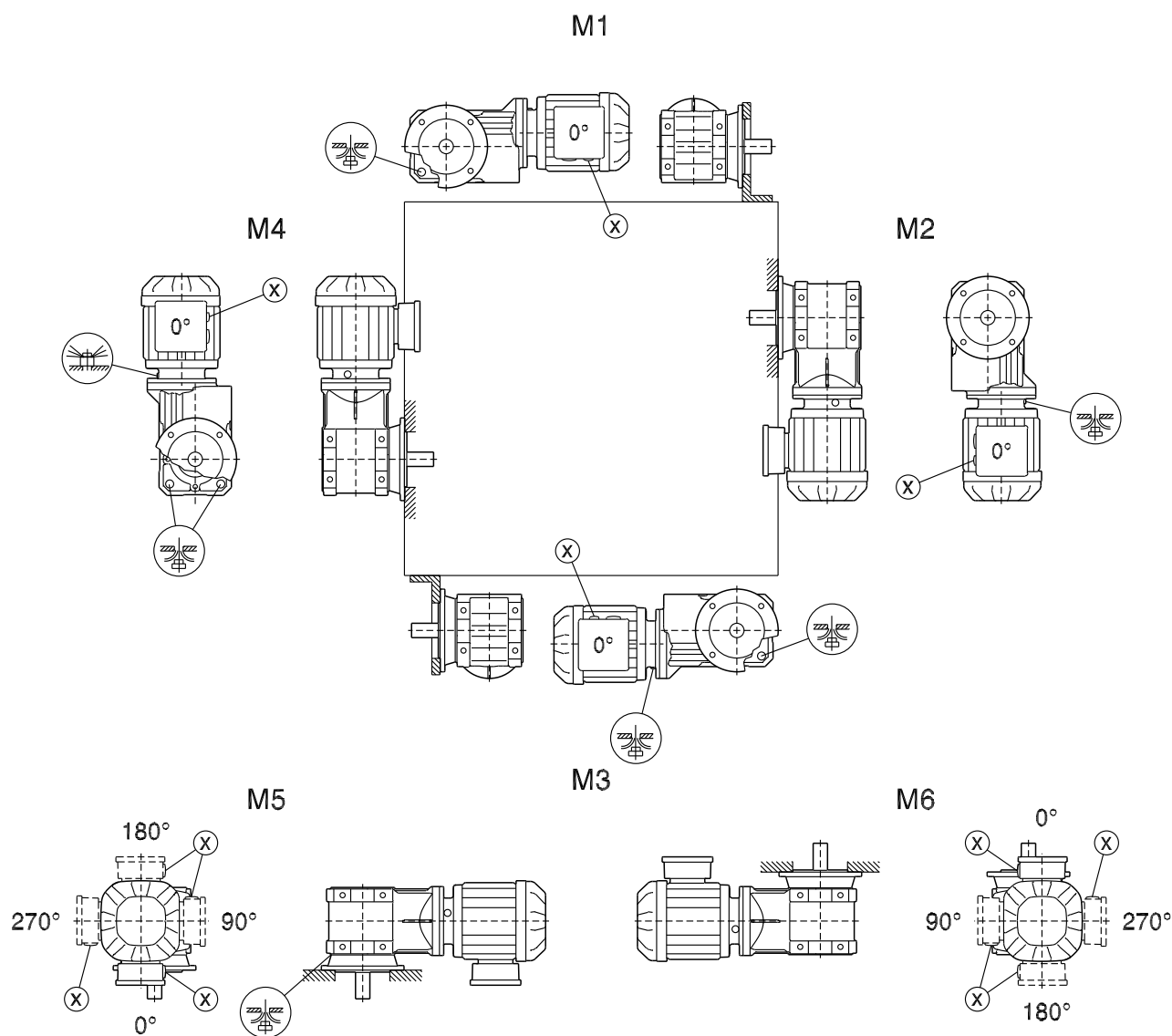
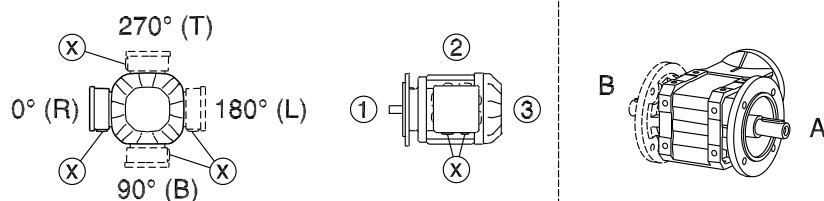
K/KA..B/KH19B-29B

33 023 00 15



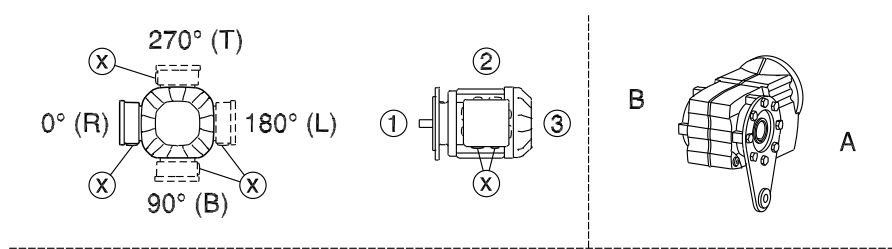
KF..B/KAF..B/KHF19B-29B

33 024 00 15

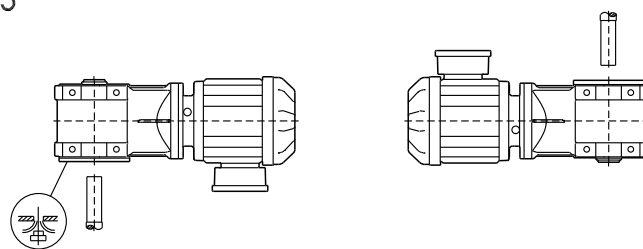
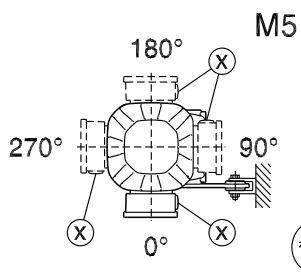
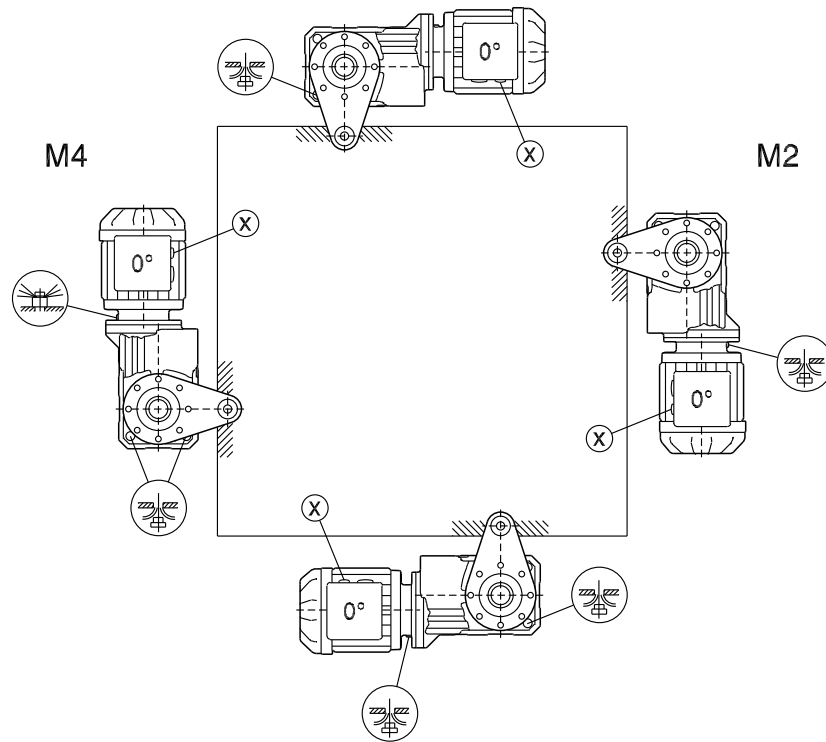


KA..B/KH19B-29B

33 025 00 15

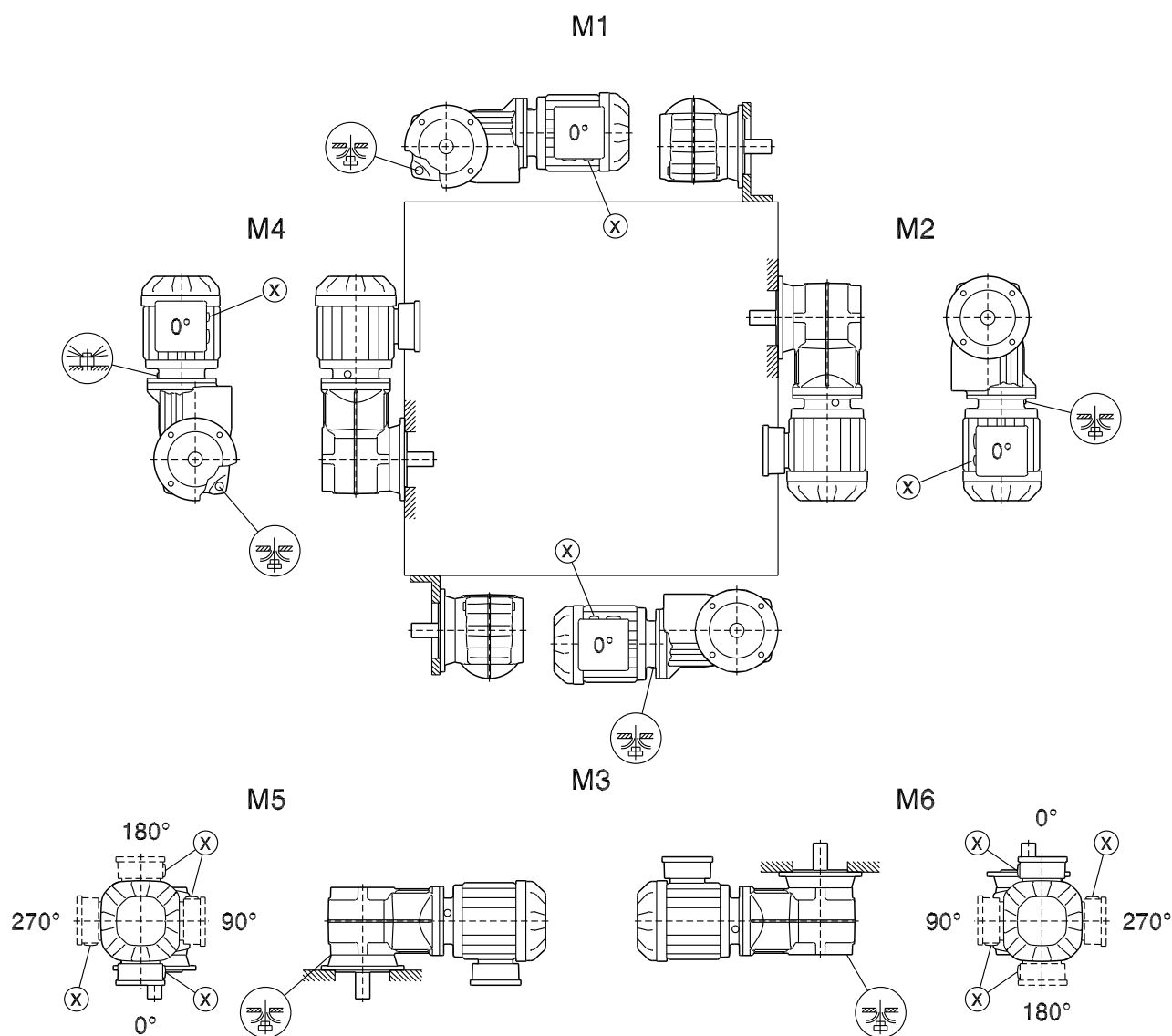
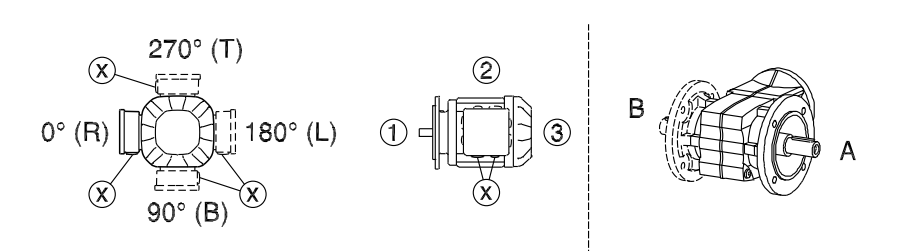


M1



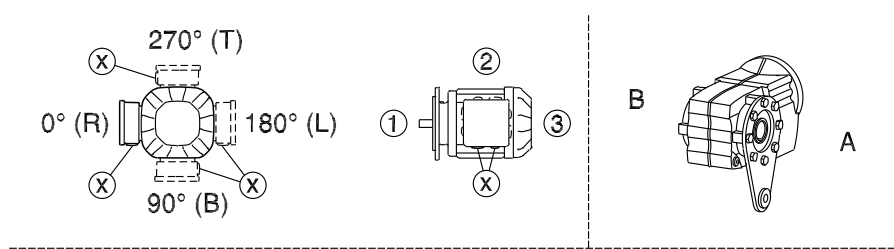
KF/KAF/KHF19-29

33 026 00 15

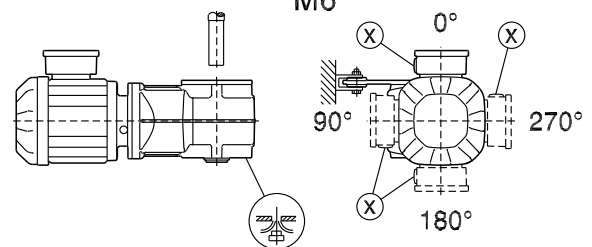
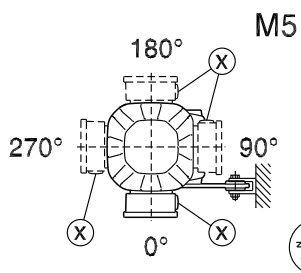
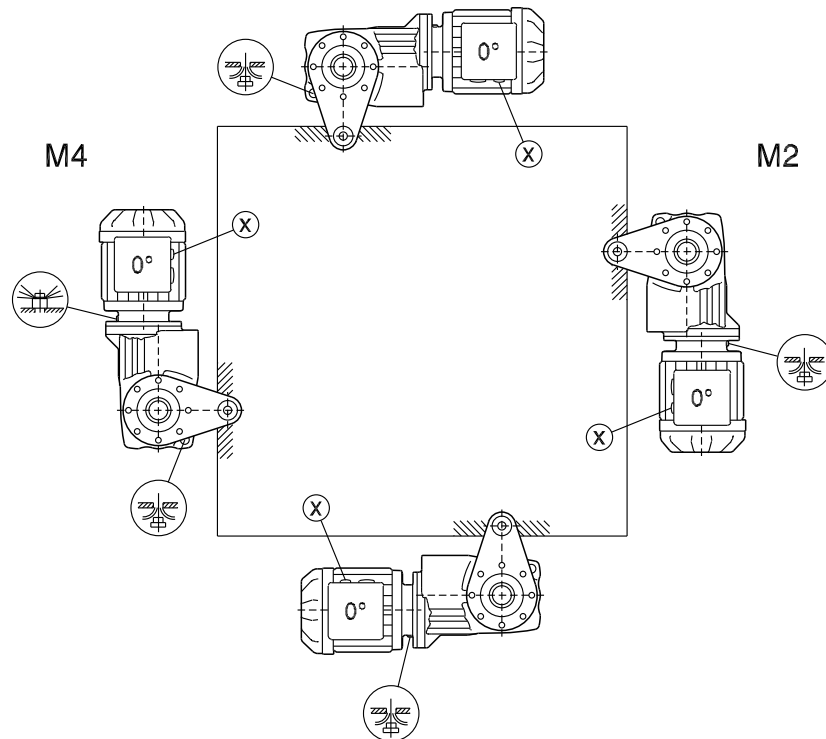


KA/KH19-29

33 027 00 15

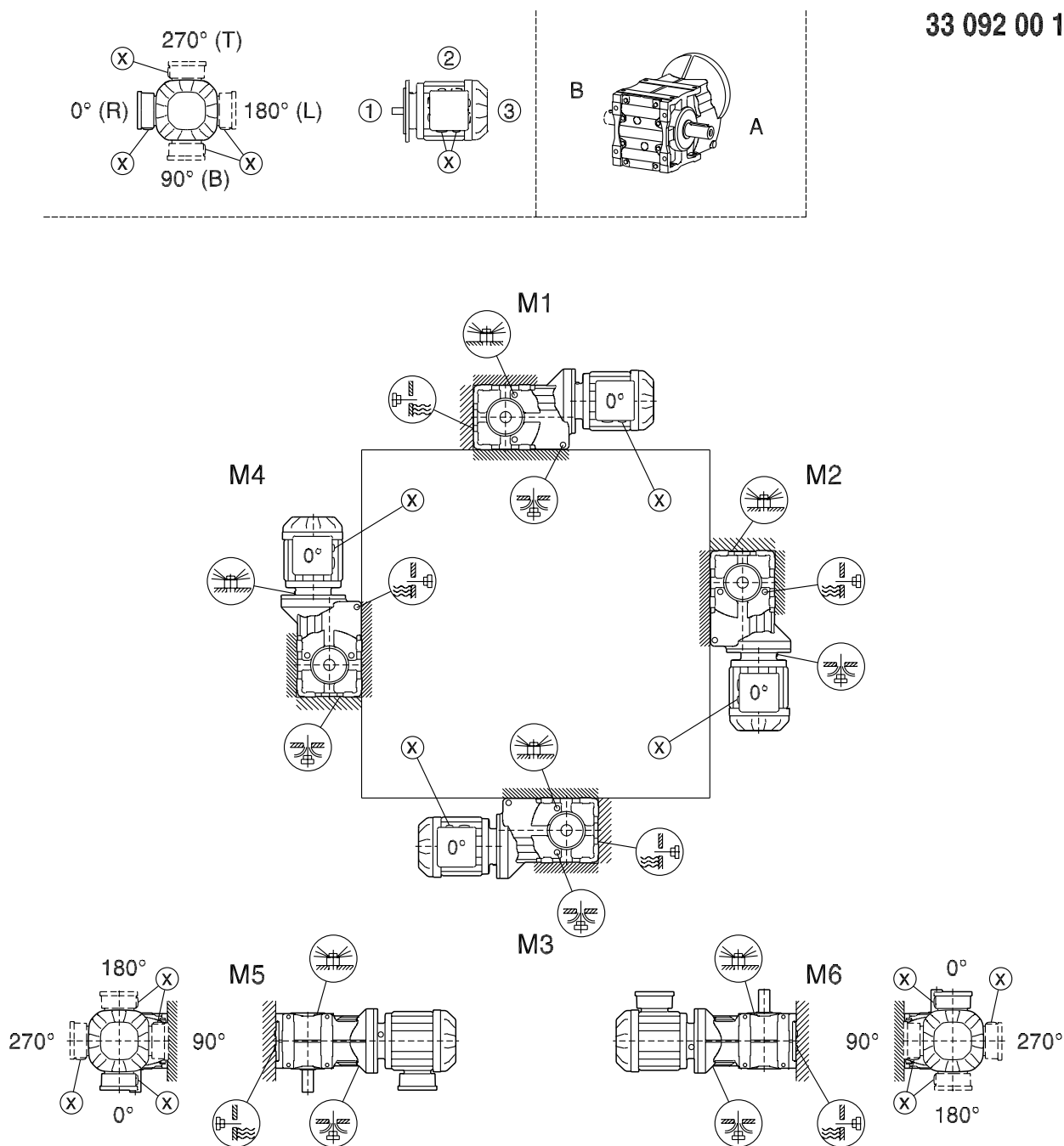


M1






K39-49

33 092 00 14

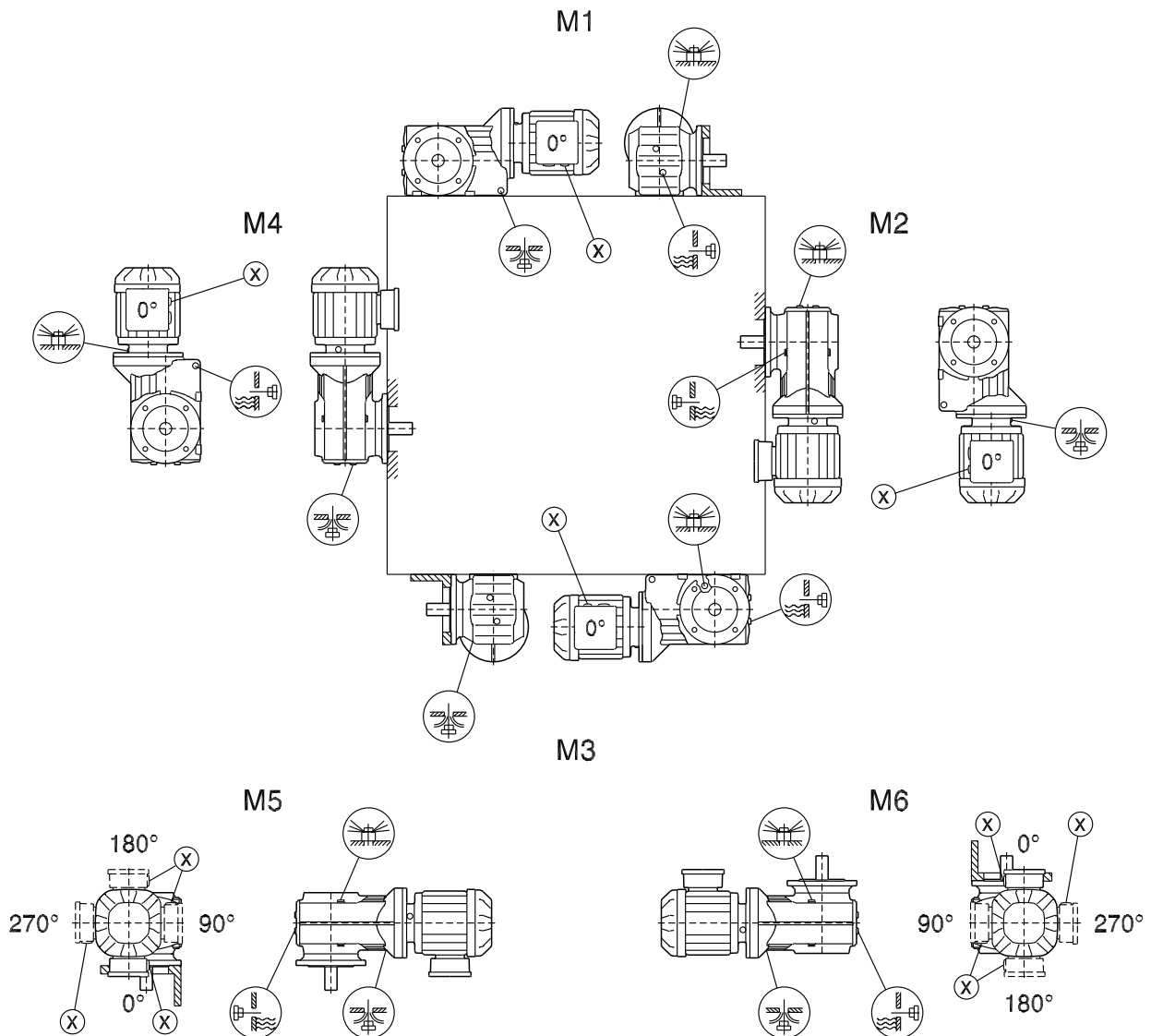
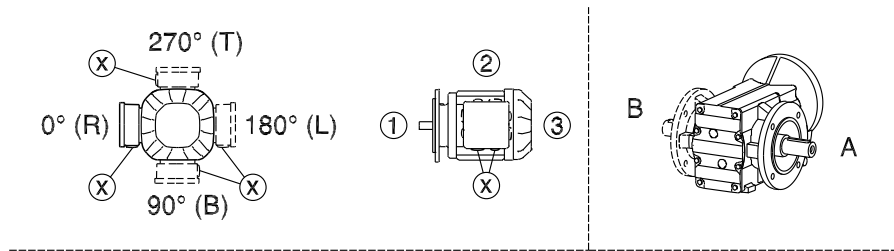


For front-end mounting:

-  M2
-  M1, M3, M5, M6
-  M4

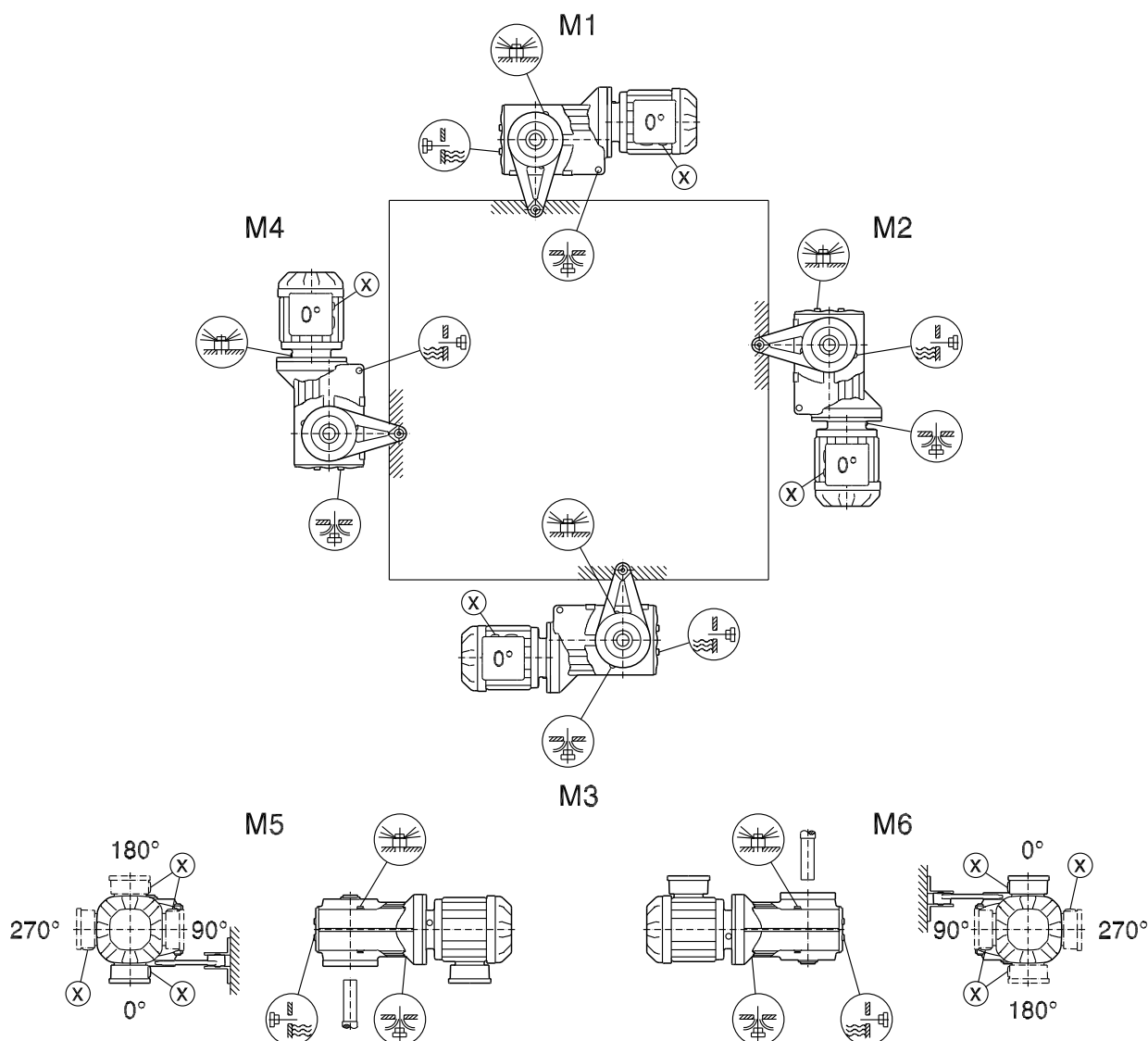
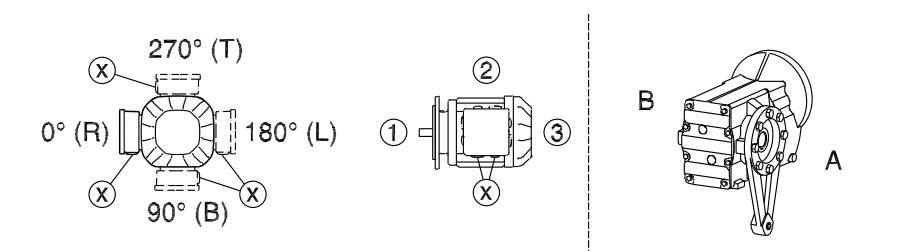
KF/KAF39-49

33 093 00 14



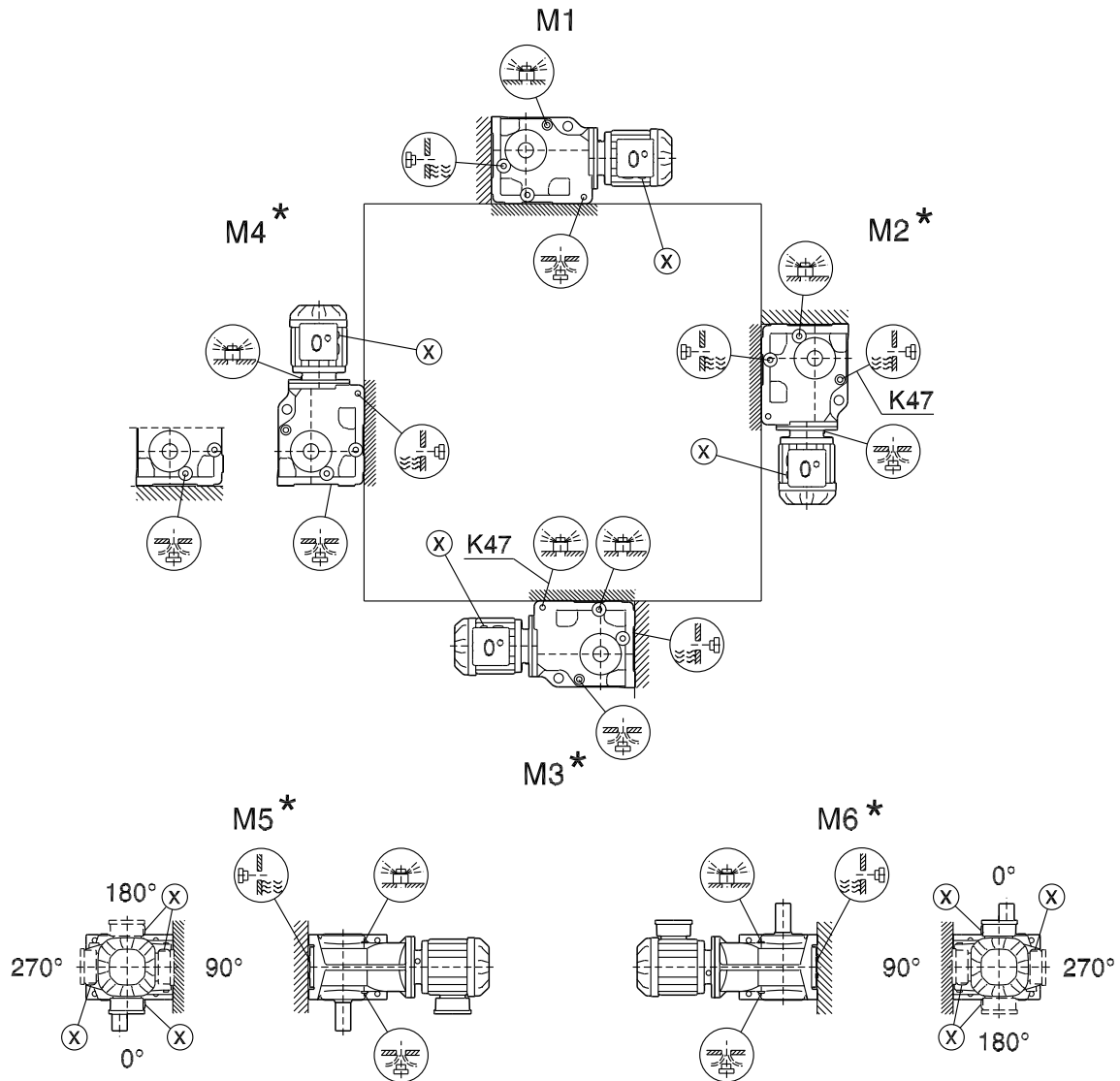
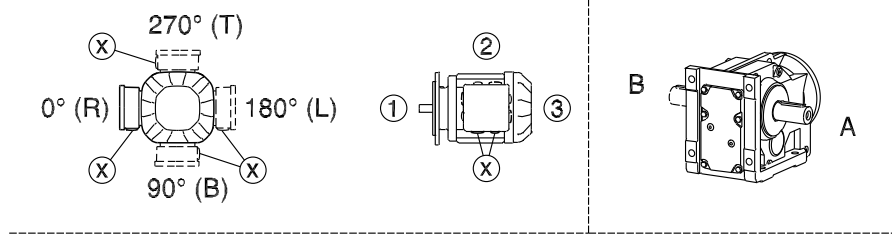
KA/KT39-49

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

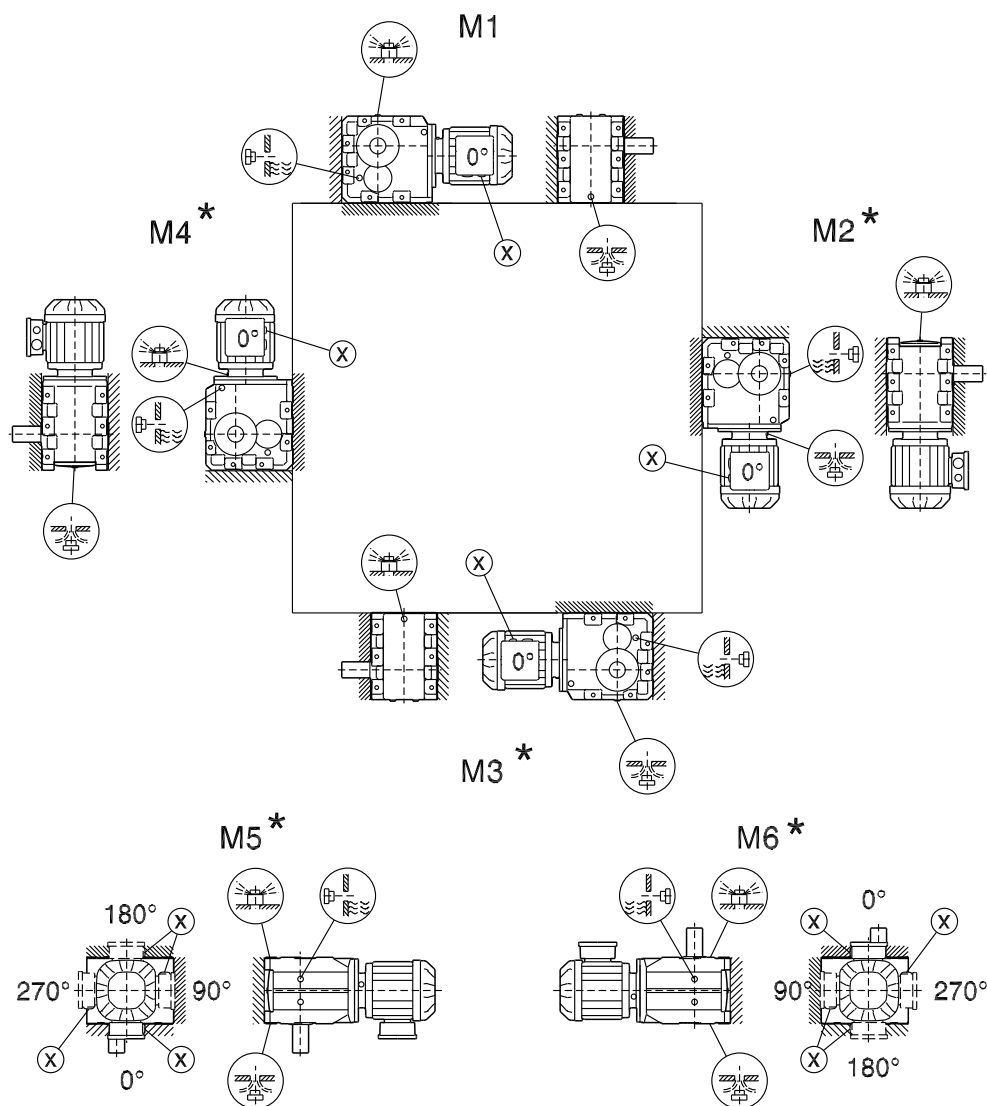
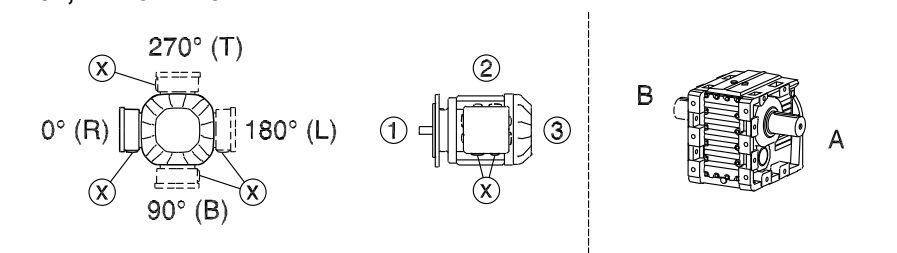
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* (→ 134)

K167-187, KH167B-187B

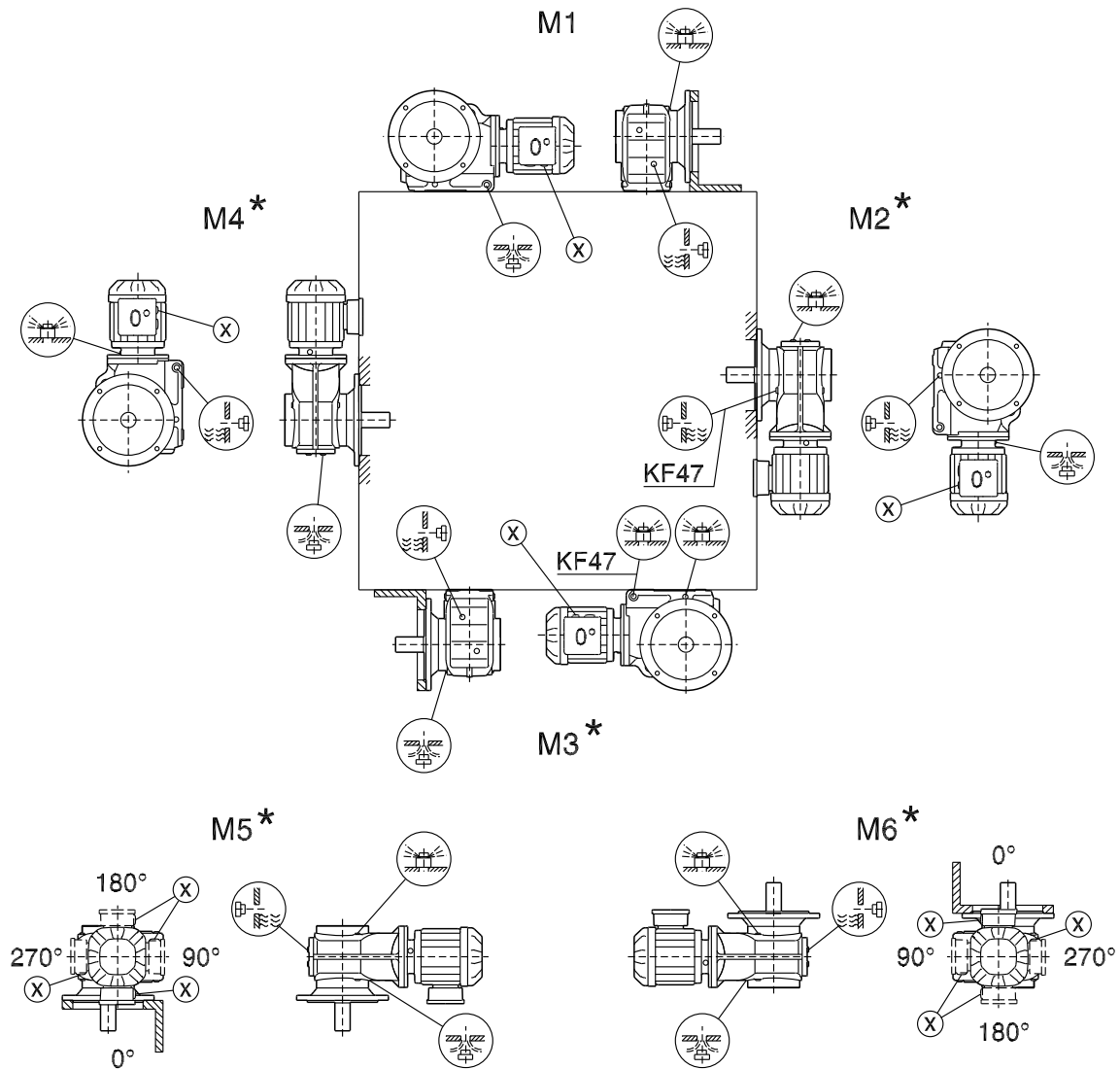
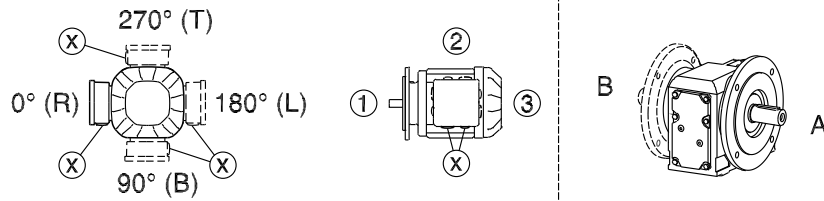
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* (→ 134)

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

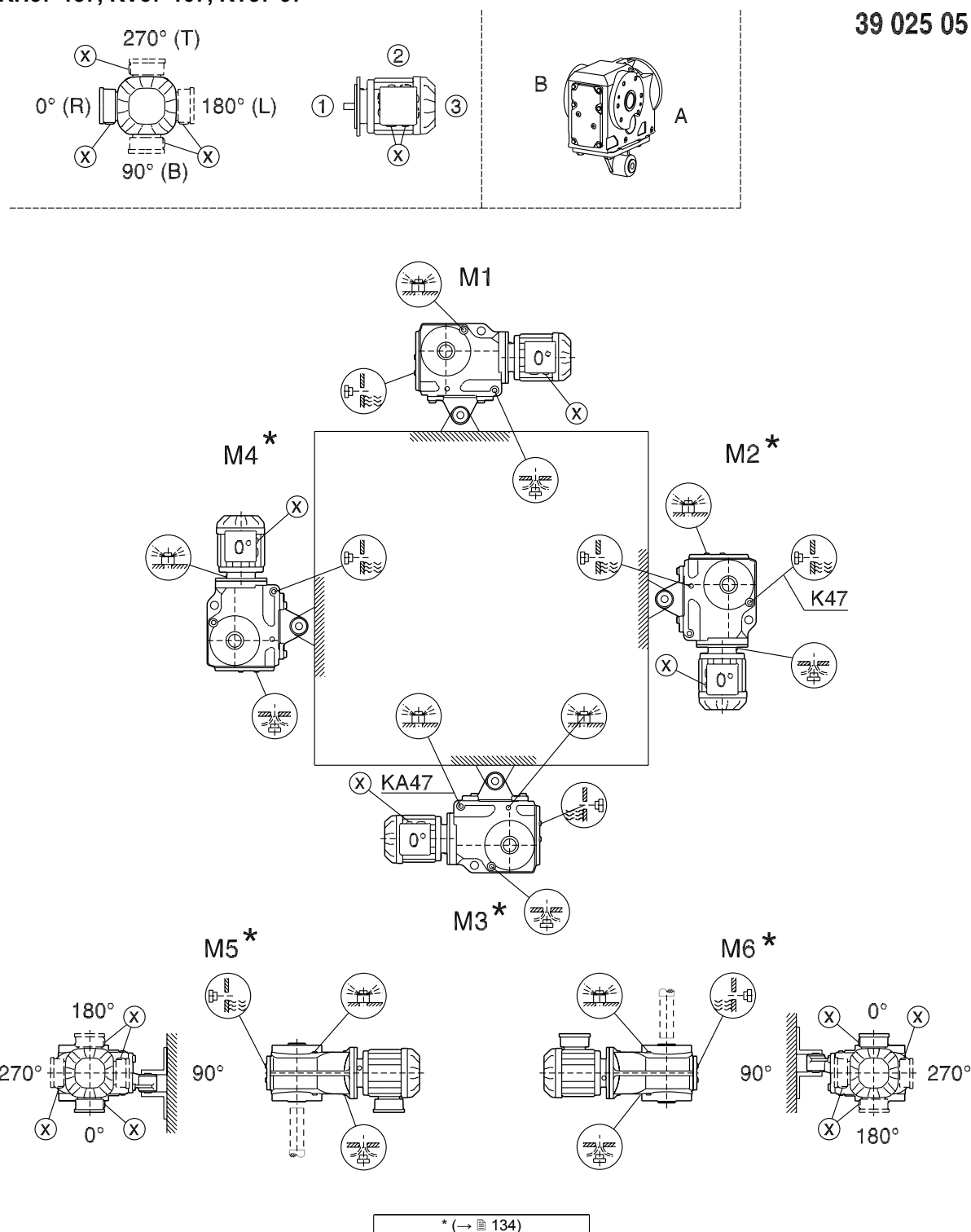
34 027 04 00



* (→ 134)

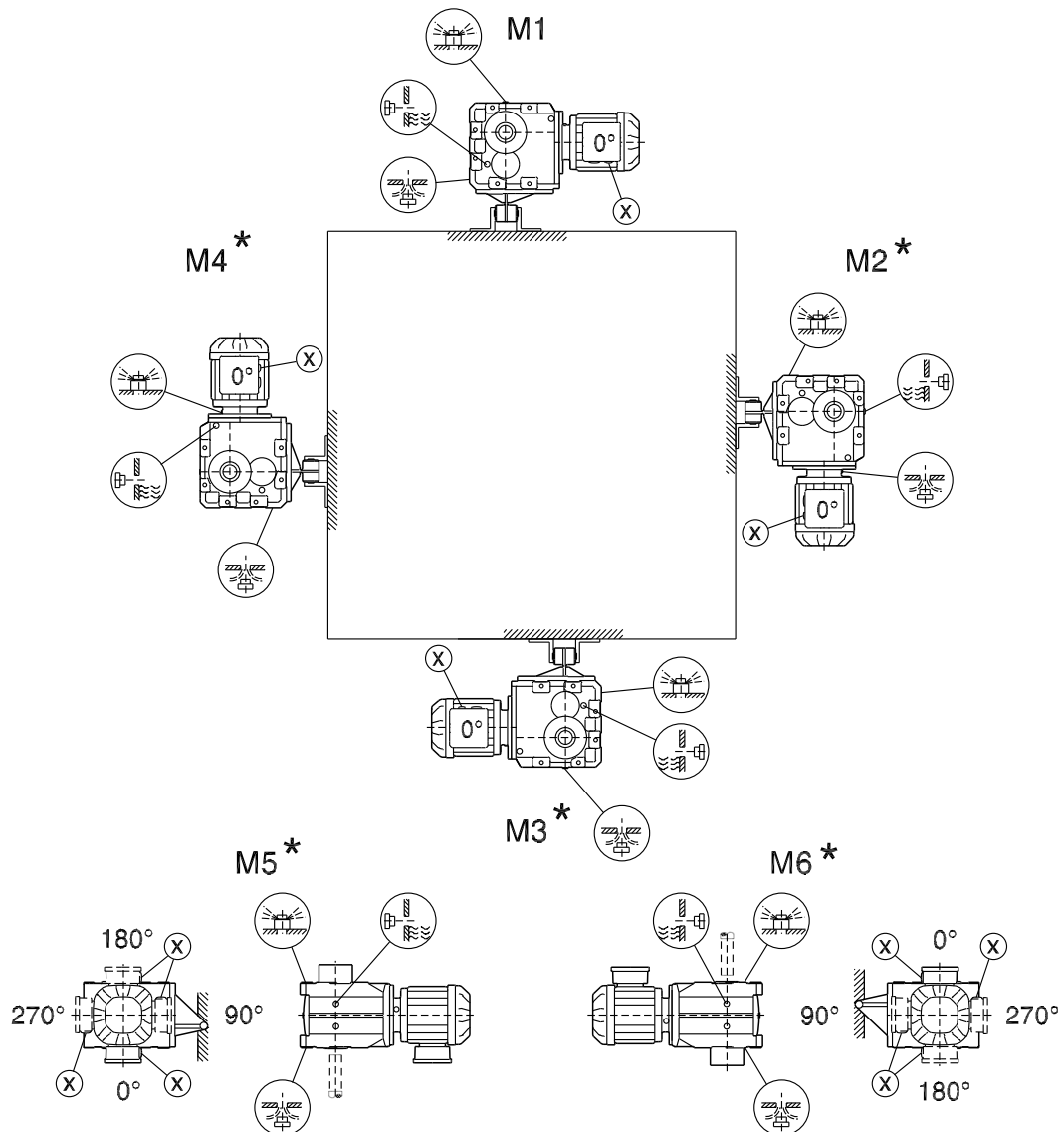
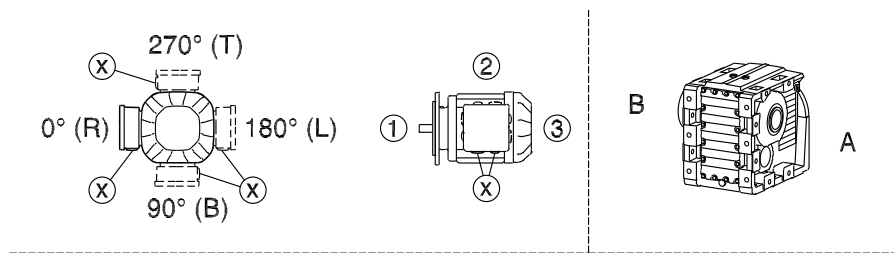
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KH167-187

39 026 05 00

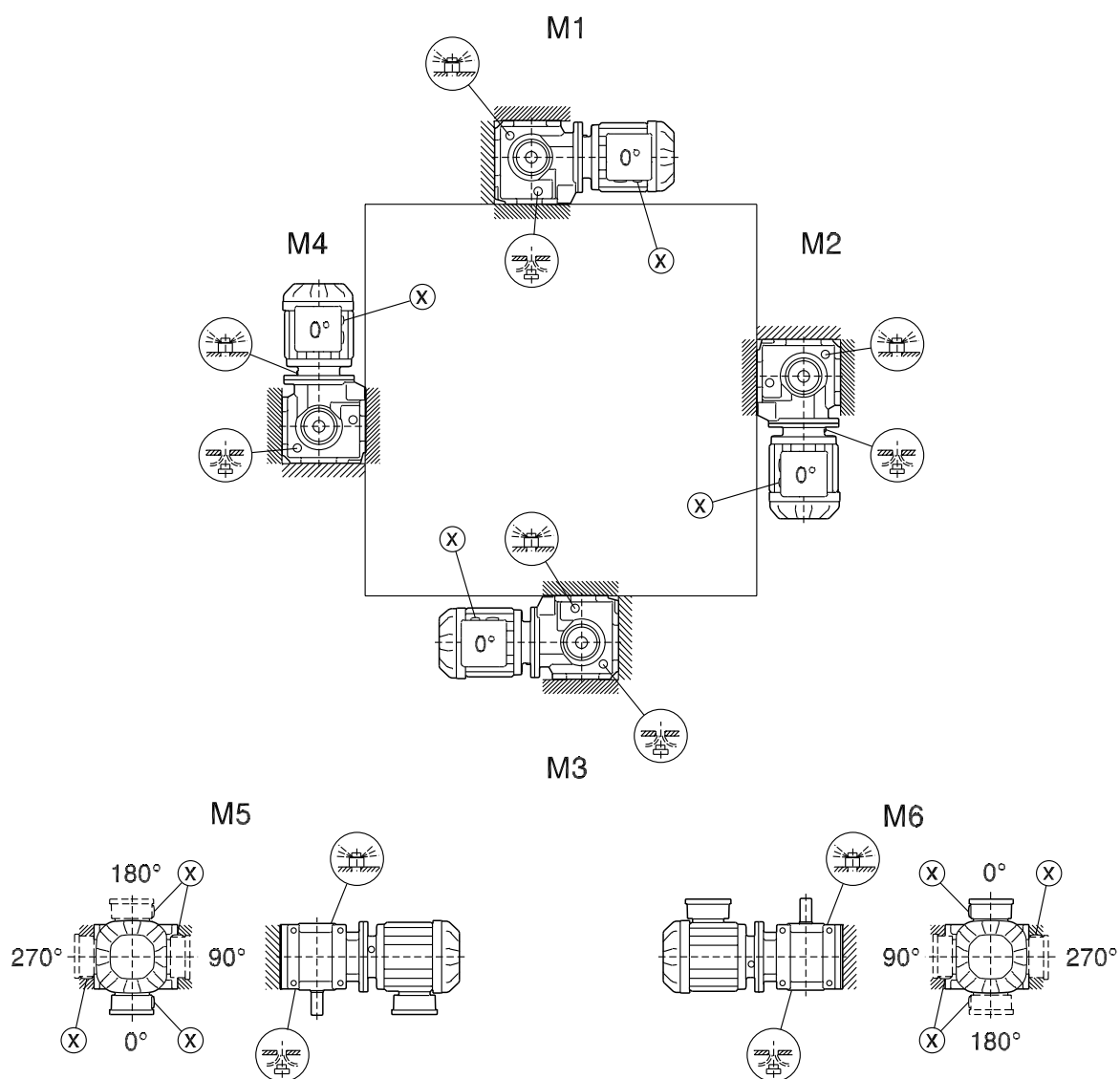
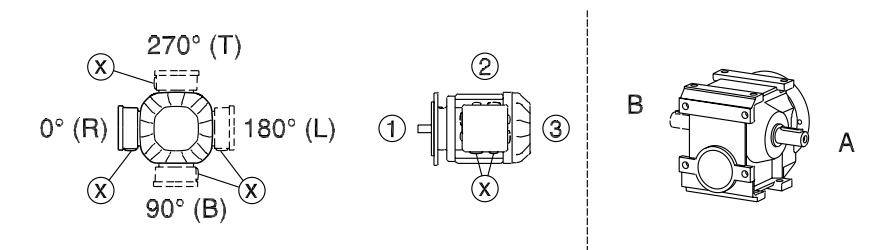


* (→ 134)

7.6.5 Mounting positions of helical-worm gearmotors

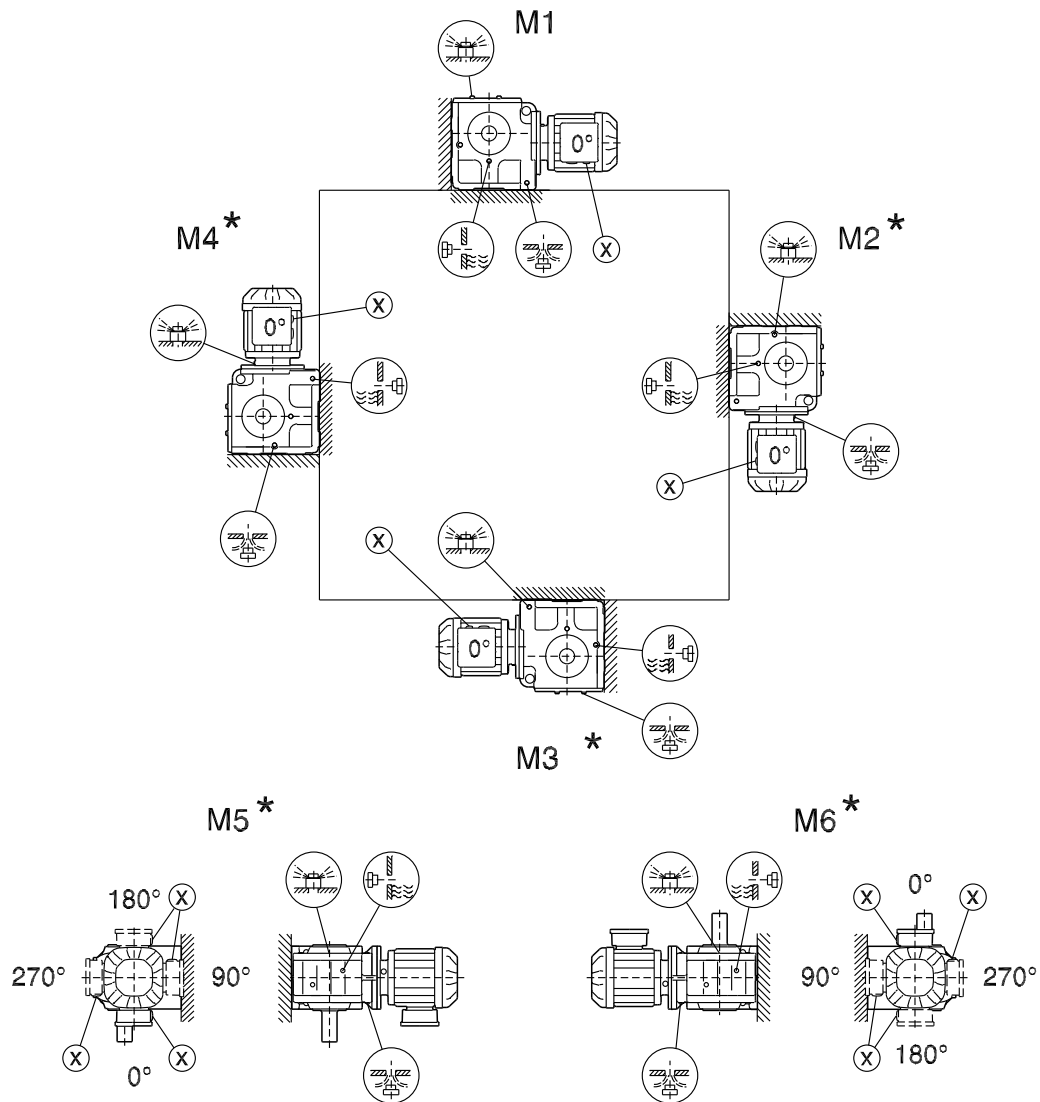
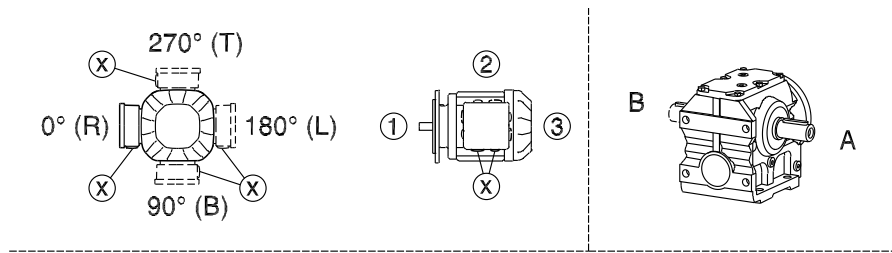
S37

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S47-S97

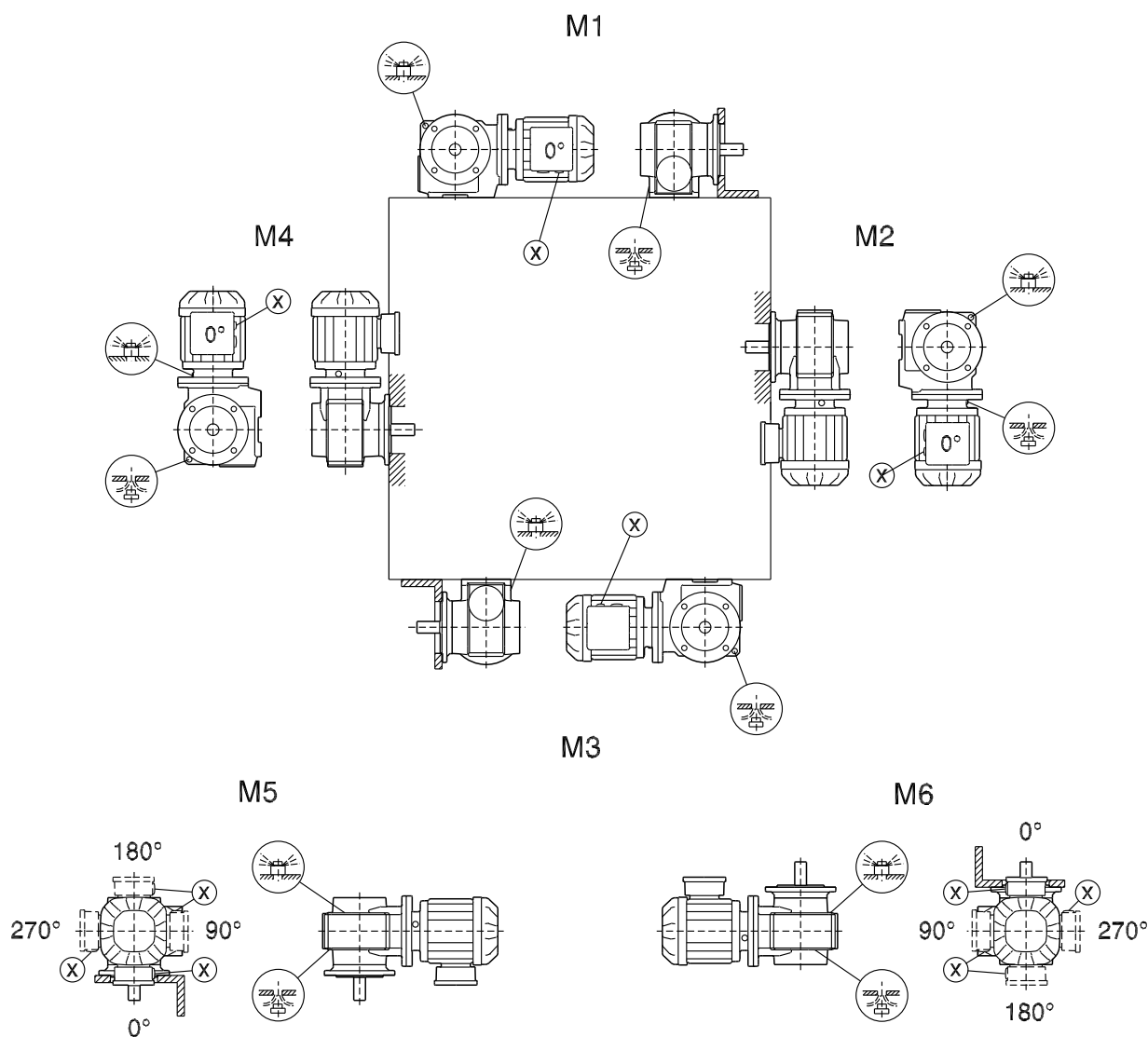
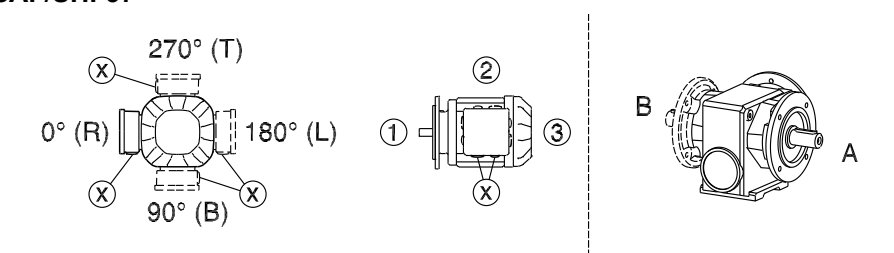
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* (→ 134)

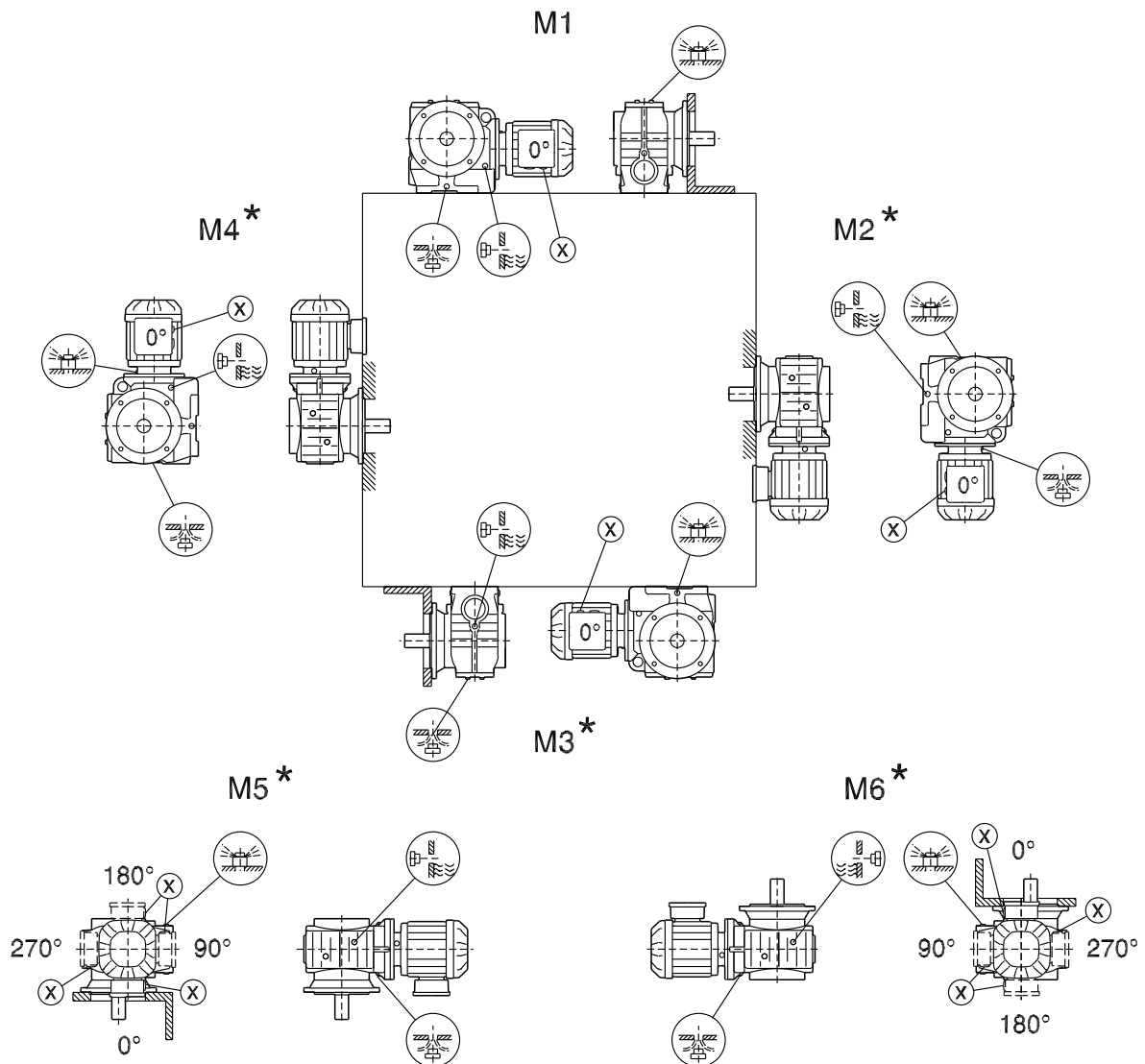
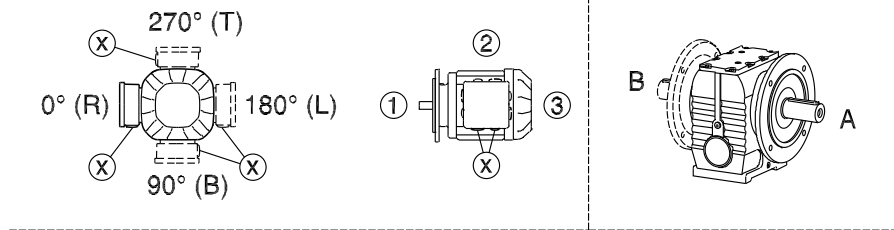
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SF/SAF/SHF/SAZ/SHZ47-97

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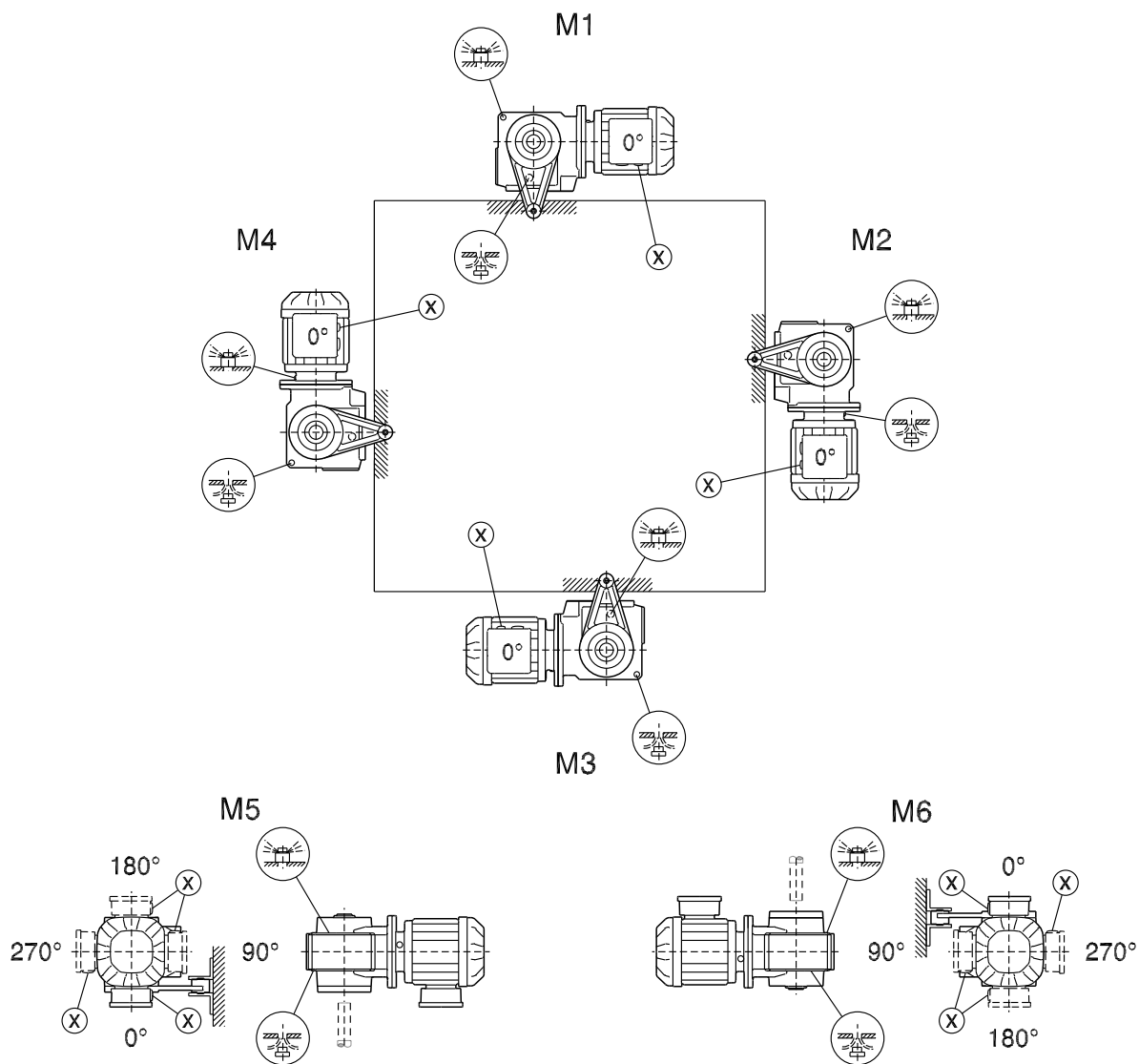
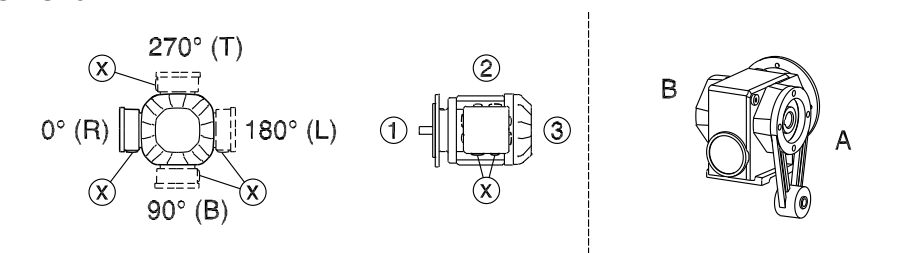
* (→ 134)

7 Mounting positions

Mounting position sheets

SA/SH/ST37

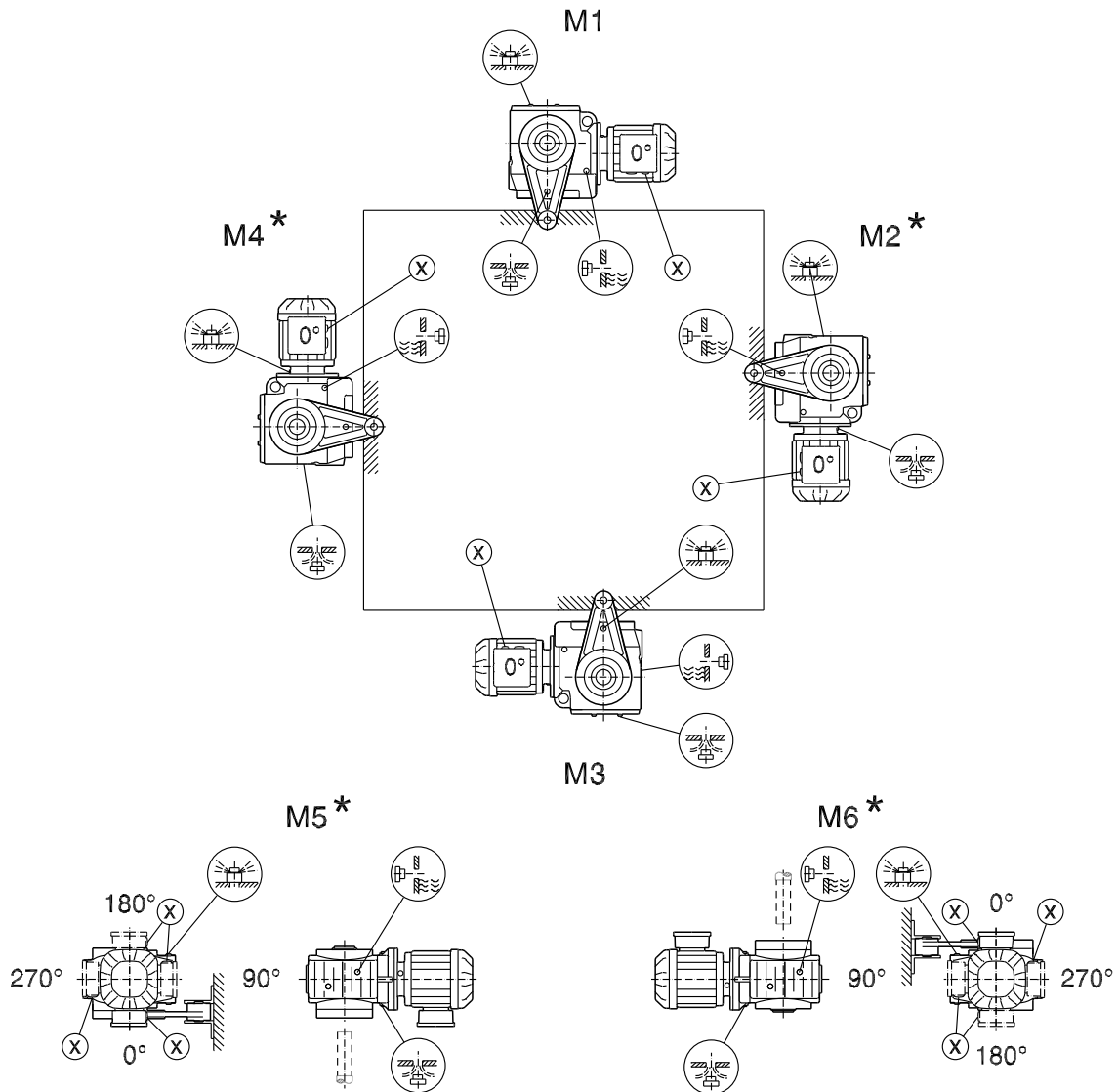
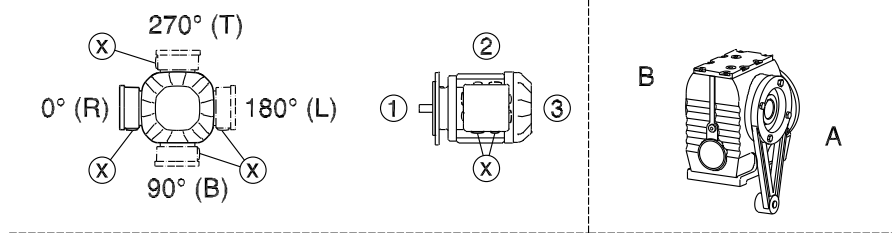
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22162607/EN – 07/2015

SA/SH/ST47-97

28 021 04 00

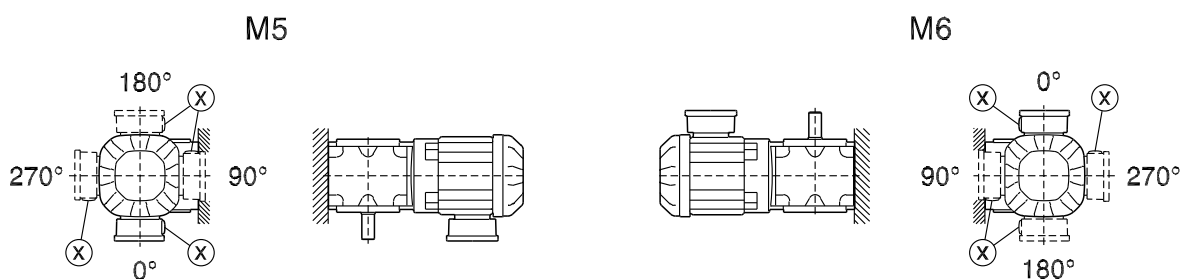
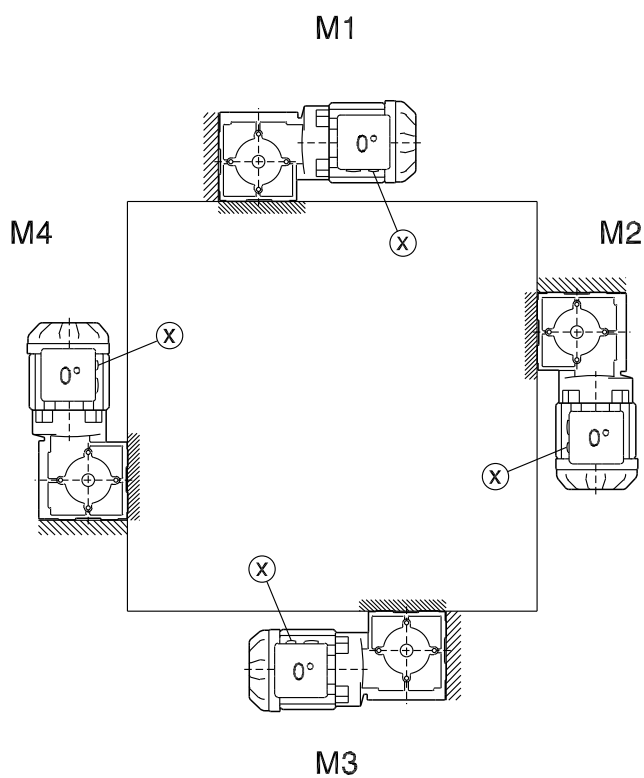
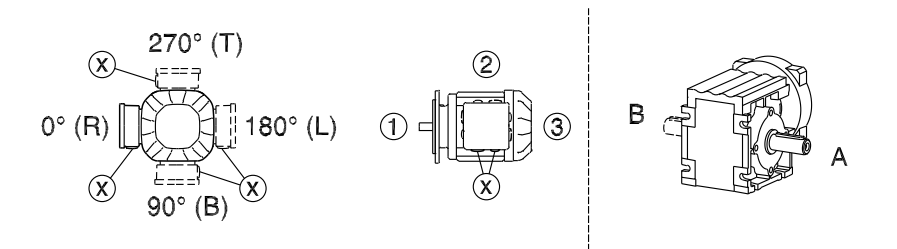


* (→ 134)

7.6.6 Mounting positions of SPIROPLAN® gearmotors

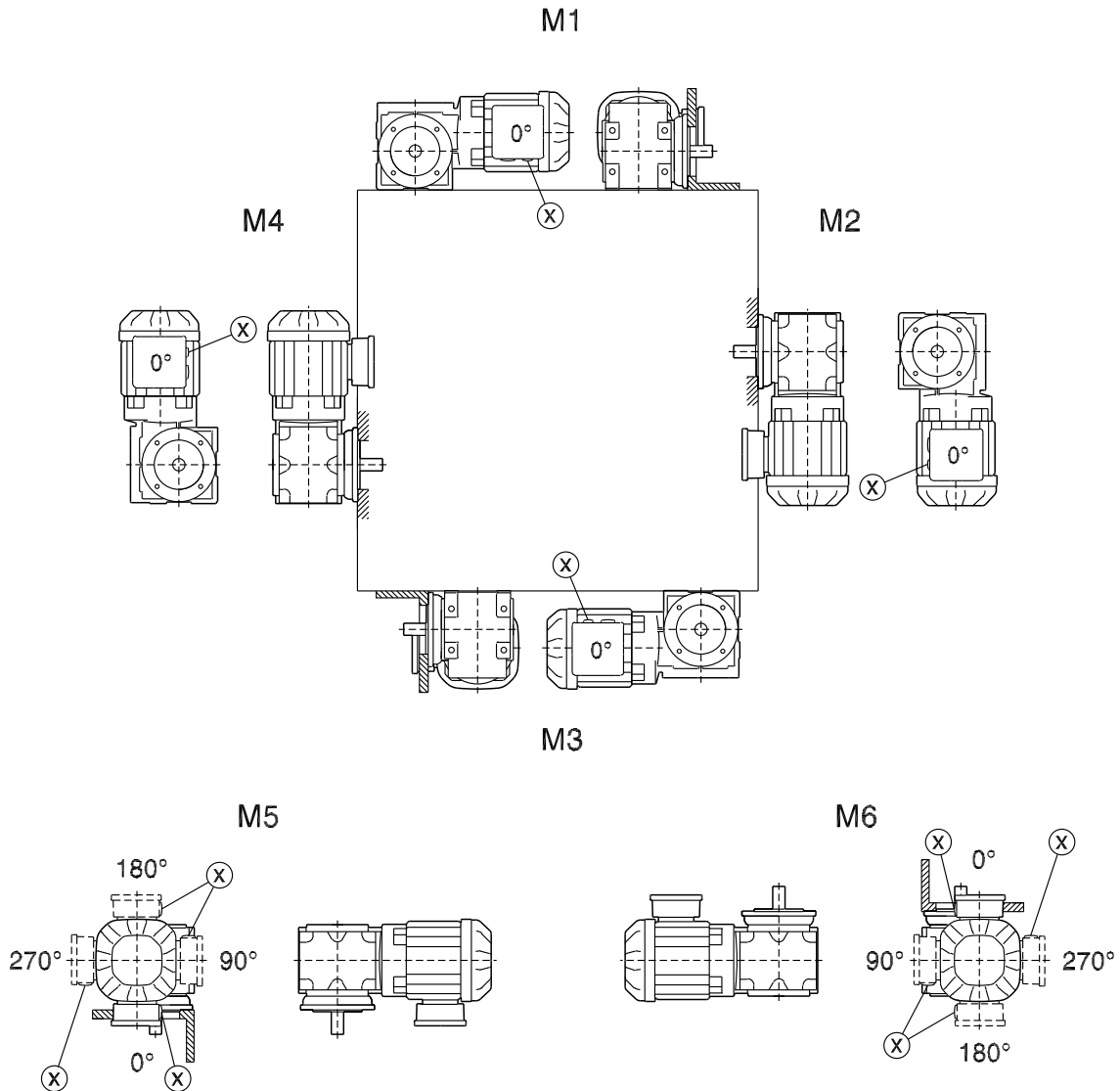
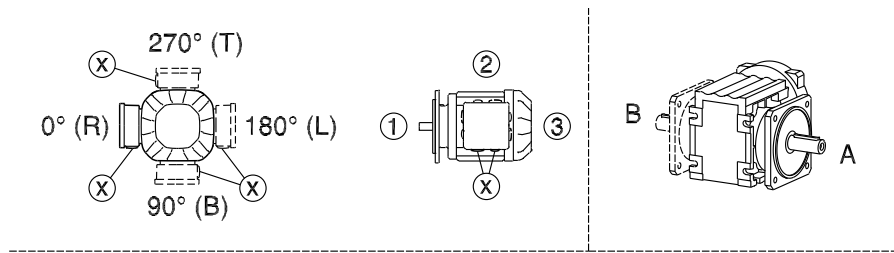
W10-30

20 001 02 02



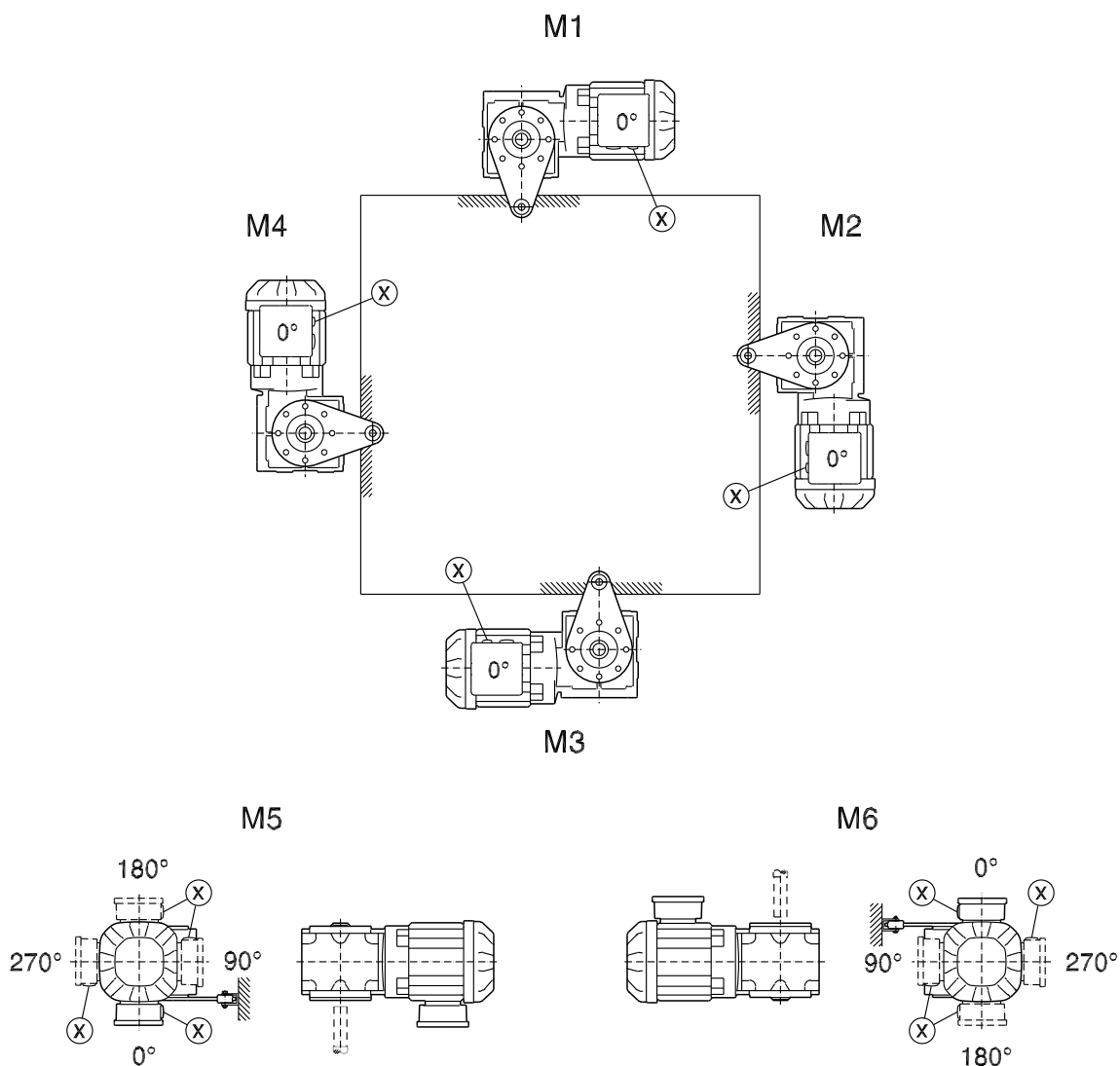
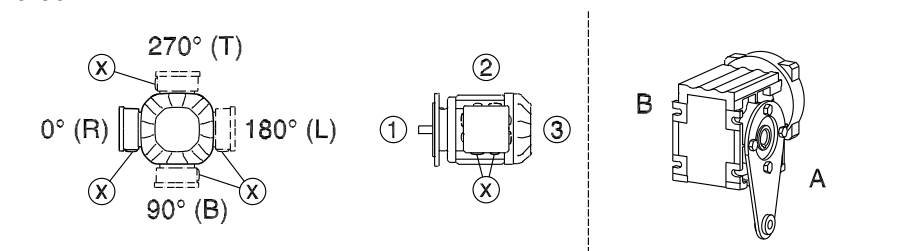
WF10-30

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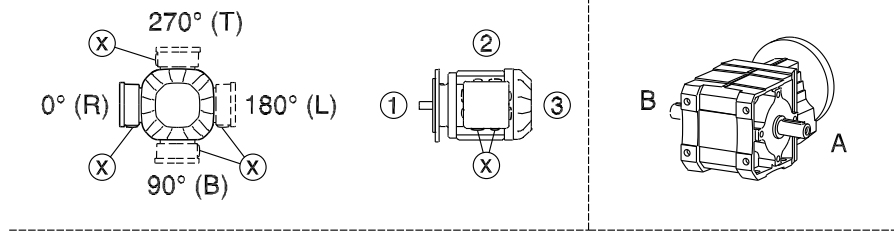
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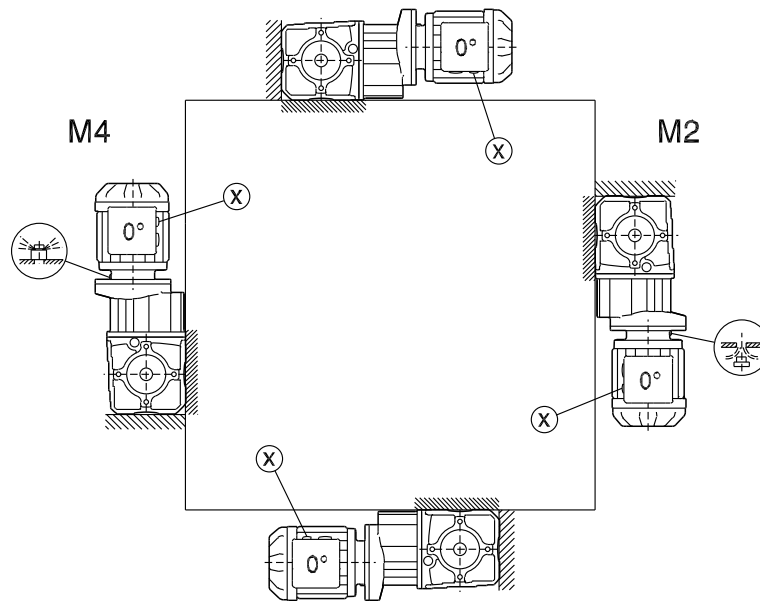


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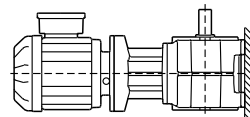
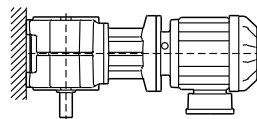
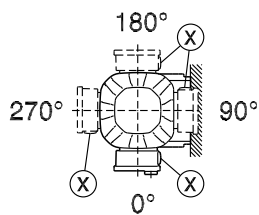


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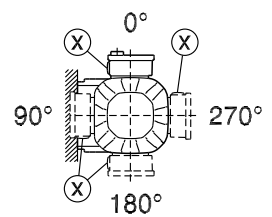


M3

M5

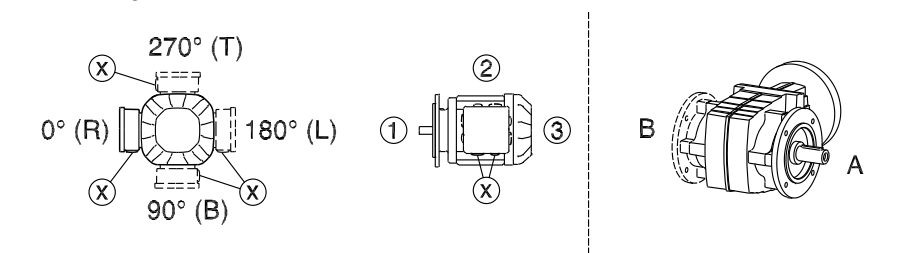


M6

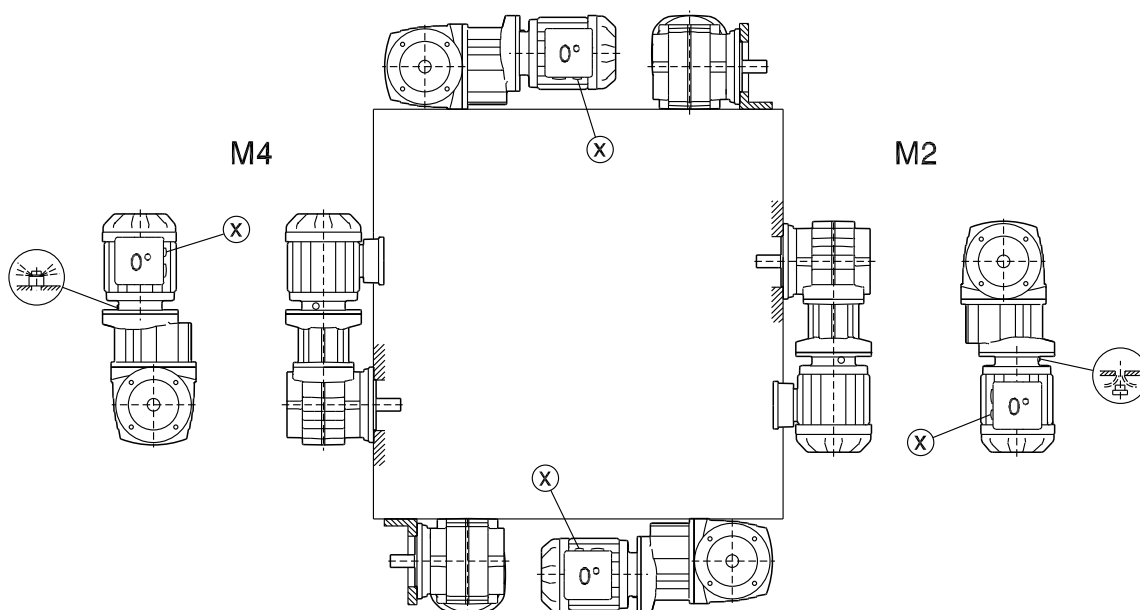


WF/WAF/WHF37-47

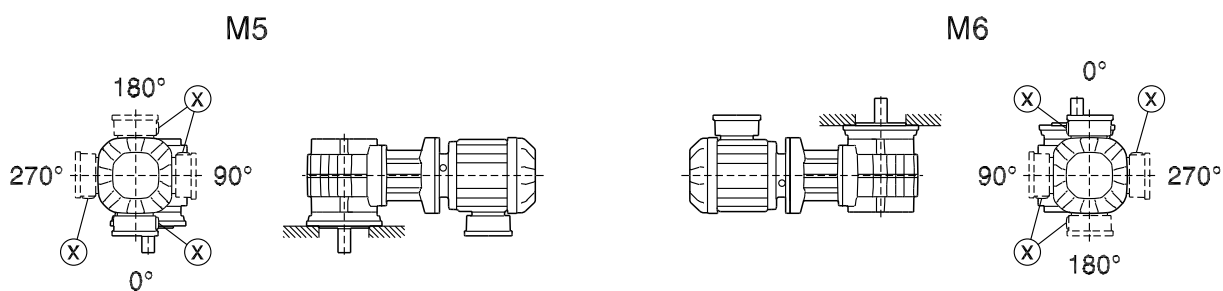
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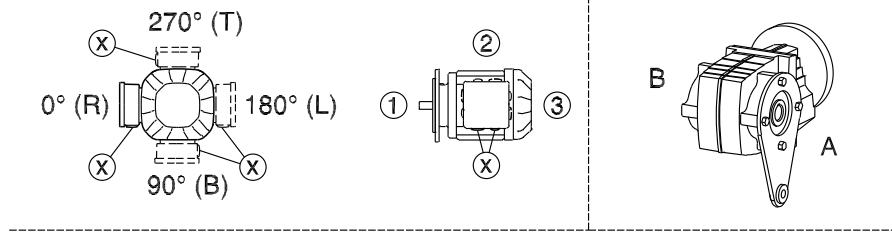
M3



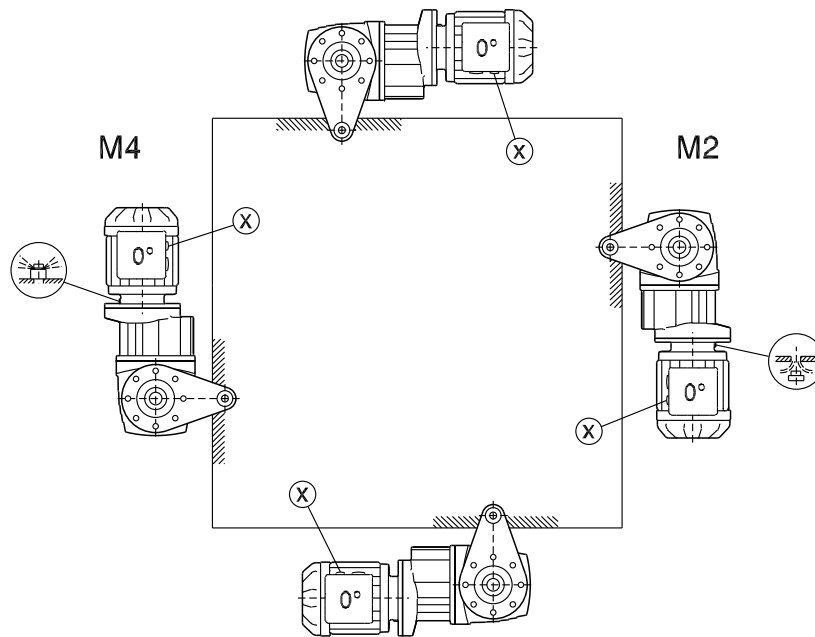
22162607/EN – 07/2015

WA/WH/WT37-47

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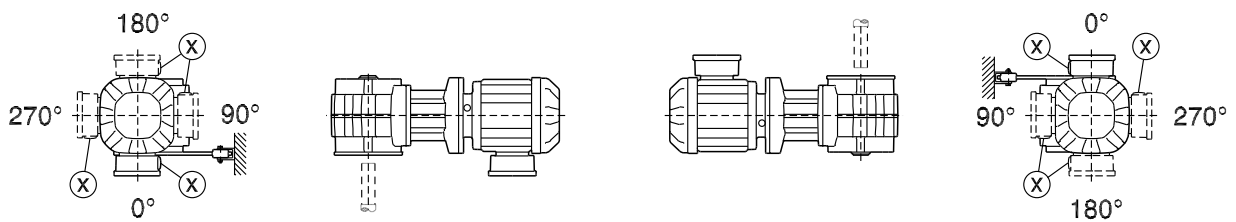
M1



M3

M5

M6



8 Technical data

8.1 Extended storage

INFORMATION



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

INFORMATION



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

For gear units of the "extended storage" design, the following measures are taken:

- A VCI anti-corrosion agent (volatile corrosion inhibitors) is added to the lubricant.
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

Climate zone	Packaging ¹⁾	Storage ²⁾	Storage duration
Temperate (Europe, USA, Canada, China and Russia, ex- cluding tropical zones)	Packed in containers, with desiccant and moisture indicator sealed in the plastic wrap.	Under roof, protected against rain and snow, shock-free.	Up to 3 years with regular checks on the packaging and moisture in- dicator (relative atmospheric hu- midity < 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 ag- gressive vapors, no shocks.	2 years or more with regular in- spections. Check for cleanness and mechanical damage during the inspection. Check corrosion protection.

Climate zone	Packaging ¹⁾	Storage ²⁾	Storage duration
Tropical (Asia, Africa, Central and South America, Australia, New Zealand and 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 on the packaging and moisture indicator (relative atmospheric 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.

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 decisive factor is the mounting position M1 – M6 specified when ordering the drive (see chapter Mounting positions (→ 133)). If you change the mounting position later, you must adapt the lubricant fill quantity accordingly.



INFORMATION



Contact SEW-EURODRIVE regarding a subsequent change of the mounting position. ATEX approval will become void without prior consultation.

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 filling at the same time as changing the oil.

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



Synthetic-based bearing grease



Lubricant for the food industry (food grade oil)



Biodegradable oil (lubricant for agriculture, forestry, and water management)



The following grease quantities are required:

- For fast-running bearings (gear unit input side)
Fill the cavities between the rolling elements one third full with grease.
- For slow-running bearings (gear unit output side)
Fill the cavities between the rolling elements 2 thirds full with grease.

8.2.2 Lubricant table for explosion-proof gear units








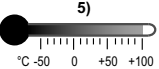
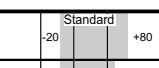
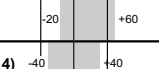
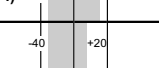
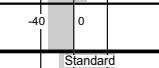
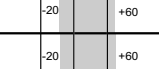
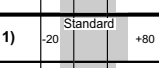
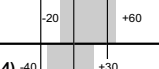
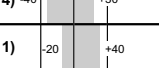
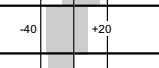
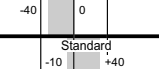
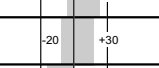
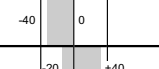
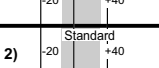
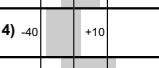
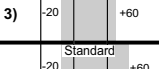
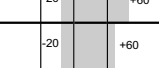
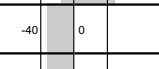
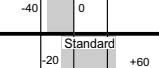
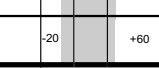


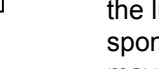
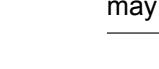


Key

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

Abbreviation/ icon	Meaning
	Synthetic-based lubricant
CLP PG	Polyglycol (W gear units, conform to USDA-H1)
CLP HC	Synthetic hydrocarbons
E	Ester oil (water hazard classification 1 (German regulation: WKG 1))
HCE	Synthetic hydrocarbons + ester oil (USDA H1 certification)
HLP	Hydraulic oil
	Lubricant for the food industry (food-grade oil)
	Biodegradable oil (lubricant for agriculture, forestry, and water management)

Lubricant table

017680700

	5)		ISO, SAE NLGI	Mobil®						
R...		CLP PG	VG 220	Mobil Glygoyle 220	Shell Omala S4 WE 220	Klübersynth GH 6-220	Synlube CLP 220	Optigear Synthetic 800/220	Renolin PG 220	Carter SY 220
K...		CLP HC	VG 220	Mobil SHC 630	Shell Omala S4 GX 220	Klübersynth GEM 4-220 N	Pinnacle EP 220	Optigear Synthetic X 220	Renolin Unisyn CLP 220	Carter SH 220
F...		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
		CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68				Renolin Unisyn CLP 68	
		CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32	Cetus PAO 46	Optileb HY 32	Renolin Unisyn OL 32	Dacnis SH 32
K..19 - K..49		CLP PG	VG 460			Klübersynth GH 6-460				
		H1 PG	VG 460			Klübersynth UH1 6-460				
S...(HS...)		CLP PG	VG 680	Mobil Glygoyle 680	Shell Omala S4 WE 680	Klübersynth GH 6-680	Synlube CLP 680	Optigear Synthetic 800/680	Renolin PG 680	Carter SH 460
		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 150
		CLP HC	VG 150	Mobil SHC 639	Shell Omala S4 GX 150	Klübersynth GEM 4-150 N	Pinnacle EP 150	Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SY 220
		CLP PG	VG 220	Mobil Glygoyle 220	Shell Omala S4 WE 220	Klübersynth GH 6-220	Synlube CLP 220	Optigear Synthetic 800/220	Renolin PG 220	
		CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68				Renolin Unisyn CLP 68	
		CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32	Cetus PAO 46	Alphasyn T 32	Renolin Unisyn OL 32	Dacnis SH 32
R.. K37 -187 / HK.. F.. S.. / HS..			VG 460			Klüberoil 4UH1-460N		Optileb GT 460	Cassida Fluid GL 460	
		CLP PG NSF H1	VG 220			Klüberoil 4UH1-220N		Optileb GT 220	Cassida Fluid GL 220	
			VG 68			Klüberoil 4UH1-68N		Optileb HY 68	Cassida Fluid HF 68	
		E	VG 460			Klüberbio CA2-460			Plantogear 460S	
W...(HW...)		SEW *	VG 460			Klüber SEW HT-460-5				
		API GL5	SAE 75W90 (~VG 100)	Mobil Synth Gear Oil 75 W90						
		H1 PG	VG 460			Klübersynth UH1 6-460				
PS.F..		CLP PG	VG 220			Klübersynth GH-6-220				
		H1 PG	VG 460			Klübersynth UH1 6-460				
		CLP HC	VG 32	Mobil SHC 624						
		CLP HC	VG 32	Mobil SHC 624						
BS.F..		CLP PG	VG 220			Klübersynth GH 6-220				
		H1 PG	VG 460			Klübersynth UH1 6-460				

INFORMATION



This lubricant recommendation in no way represents a guarantee as to the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of their product. Thus the lubricant table is not binding. It may be necessary to contact SEW-EURODRIVE.

22162607/EN – 07/2015

8.2.3 Lubricant fill quantities

INFORMATION



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

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

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

RF.., RZ..

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

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

RX..

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

RXF..

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

Parallel-shaft helical (F) gear units

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

Gear units	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	
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	
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 units	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
FF27	0.60	0.80	0.65	0.70	0.60	
FF37	1.00	1.25	0.70	1.30	1.00	
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.., FZ.., FHZ.., FVF.., FVZ.., FT..

Gear units	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	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	
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

Helical-bevel (K) gear units

INFORMATION



All K..9 gear units have a universal mounting position, which means that K..9 gear units of the same design are filled with the same oil quantity independent of the mounting position. An exception to this is the M4 mounting position.

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19	0.40			0.45	0.40	
K..29	0.70			0.85	0.70	
K..39	0.90	1.70	1.55	2.15	1.55	1.30
K..49	1.70	3.40	2.80	4.20	3.15	2.80
K..37	0.50	1.00		1.25	0.95	
K..47	0.80	1.30	1.50	2.00	1.60	
K..57	1.10	2.20		2.80	2.30	2.10
K..67	1.10	2.40	2.60	3.45	2.60	
K..77	2.20	4.10	4.40	5.80	4.20	4.40
K..87	3.70	8.0	8.70	10.90	8.0	
K..97	7.0	14.0	15.70	20.0	15.70	15.50
K..107	10.0	21.0	25.50	33.50	24.0	
K..127	21.0	41.50	44.0	54.0	40.0	41.0
K..157	31.0	65.0	68.0	90.0	62.0	63.0
K..167	33.0	97.0	109.0	127.0	89.0	86.0
K..187	53.0	156.0	174.0	207.0	150.0	147.0

KF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF19	0.40			0.45	0.40	
KF29	0.70			0.85	0.70	
KF39	0.90	1.70	1.55	2.15	1.55	1.30
KF49	1.70	3.40	2.80	4.20	3.15	2.80
KF37	0.50	1.10		1.50	1.00	
KF47	0.80	1.30	1.70	2.20	1.60	
KF57	1.20	2.20	2.40	3.15	2.50	2.30
KF67	1.10	2.40	2.80	3.70	2.70	
KF77	2.10	4.10	4.40	5.90	4.50	

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF87	3.70	8.20	9.0	11.90	8.40	
KF97	7.0	14.70	17.30	21.50	15.70	16.50
KF107	10.0	21.80	25.80	35.10	25.20	
KF127	21.0	41.50	46.0	55.0	41.0	
KF157	31.0	66.0	69.0	92.0	62.0	63.0

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19	0.40			0.45	0.40	
K..29	0.70			0.85	0.70	
K..39	0.90	1.70	1.55	2.15	1.55	1.30
K..49	1.70	3.40	2.80	4.20	3.15	2.8
K..37	0.50	1.00		1.40	1.00	
K..47	0.80	1.30	1.60	2.15	1.60	
K..57	1.20	2.20	2.40	3.15	2.70	2.40
K..67	1.10	2.40	2.70	3.70	2.60	
K..77	2.10	4.10	4.60	5.90	4.40	
K..87	3.70	8.20	8.80	11.10	8.0	
K..97	7.0	14.70	15.70	20.0	15.70	
K..107	10.0	20.50	24.0	32.40	24.0	
K..127	21.0	41.50	43.0	52.0	40.0	
K..157	31.0	65.0	68.0	90.0	62.0	63.0
K..167	33.0	97.0	109.0	127.0	89.0	86.0
K..187	53.0	156.0	174.0	207.0	150.0	147.0

Helical-worm (S) gear units

S..

Gear unit	Fill quantity in liters					
	M1	M2	M3 ¹⁾	M4	M5	M6
S37	0.25	0.40	0.50	0.55	0.40	
S47	0.35	0.80	0.70/0.90	1.00	0.80	
S57	0.50	1.20	1.00/1.20	1.45	1.30	
S67	1.00	2.00	2.20/3.10	3.10	2.60	2.60
S77	1.90	4.20	3.70/5.4	5.9	4.40	
S87	3.30	8.1	6.9/10.4	11.3	8.4	
S97	6.8	15.0	13.4/18.0	21.8	17.0	

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

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	
SF47	0.40	0.90	0.90/1.05	1.05	1.00	
SF57	0.50	1.20	1.00/1.50	1.55	1.40	
SF67	1.00	2.20	2.30/3.00	3.20	2.70	
SF77	1.90	4.10	3.90/5.8	6.5	4.90	
SF87	3.80	8.0	7.1/10.1	12.0	9.1	
SF97	7.4	15.0	13.8/18.8	22.6	18.0	

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

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

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

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

SPIROPLAN® (W) gear units



INFORMATION

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

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

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

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

WF..

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

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

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

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.

Severe 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

Damage to gear unit/gearmotor due to improper operation.

Damage to the gear unit/gearmotor.

- Repair works at SEW-EURODRIVE gear units may only be performed by qualified personnel. In the context of this documentation, qualified personnel are persons who are familiar with the "Technical regulations on operating safety" (TRBS).
- Drive and motor may only be disconnected by qualified personnel.
- Contact SEW-EURODRIVE.

9.1 Gear units

Fault	Possible cause	Measure
Unusual, regular running noise	<ul style="list-style-type: none"> Meshing/grinding noise: Bearing damage Knocking noise: Irregularity in the gearing Deformation of the housing upon tightening Noise generated by insufficient stiffness of the gear unit foundation 	<ul style="list-style-type: none"> Check oil consistency, change bearings Consult SEW-EURODRIVE Check the gear unit mounting for possible deformation and correct if necessary Reinforce the gear unit foundation
Unusual, irregular running noises	<ul style="list-style-type: none"> Foreign objects in the oil 	<ul style="list-style-type: none"> Checking the oil consistency Stop the drive, contact SEW-EURODRIVE
Oil leaking from inspection cover	<ul style="list-style-type: none"> Seal of the inspection cover leaking 	<ul style="list-style-type: none"> Tighten the screws of the inspection cover and observe the gear unit. Contact SEW-EURODRIVE if oil is still leaking.
	<ul style="list-style-type: none"> Seal defective 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
Small amounts of oil leak from the oil seal during run-in phase.	<ul style="list-style-type: none"> Function-related pseudo-leakage 	<ul style="list-style-type: none"> There is no fault. Remove with soft, lint-free cloth and keep monitoring it.
Film of moisture around the dust lip of the oil seal	<ul style="list-style-type: none"> Function-related pseudo-leakage 	<ul style="list-style-type: none"> There is no fault. Remove with soft, lint-free cloth and keep monitoring it.
Oil leaking from the oil seal.	<ul style="list-style-type: none"> Oil seal leaking/defective 	<ul style="list-style-type: none"> Check sealing system. It may be necessary to contact SEW-EURODRIVE.
Oil leaking from motor (e.g. terminal box or fan)	<ul style="list-style-type: none"> Too much oil 	<ul style="list-style-type: none"> Check oil level, correct if necessary
	<ul style="list-style-type: none"> Gear unit not ventilated 	<ul style="list-style-type: none"> Vent gear unit
	<ul style="list-style-type: none"> Oil seal leaking/defective 	<ul style="list-style-type: none"> Check sealing system. It may be necessary to contact SEW-EURODRIVE.
Oil leaking from flange	<ul style="list-style-type: none"> Flange gasket leaking/defective 	<ul style="list-style-type: none"> Check sealing system. It may be necessary to contact SEW-EURODRIVE.
	<ul style="list-style-type: none"> Too much oil 	<ul style="list-style-type: none"> Check oil level, correct if necessary
	<ul style="list-style-type: none"> Gear unit not ventilated 	<ul style="list-style-type: none"> Vent gear unit
Oil leaking from breather valve.	<ul style="list-style-type: none"> Too much oil. 	<ul style="list-style-type: none"> Check oil quantity, correct if necessary
	<ul style="list-style-type: none"> Function-related oil mist 	<ul style="list-style-type: none"> There is no fault.
	<ul style="list-style-type: none"> Drive not installed in proper mounting position. 	<ul style="list-style-type: none"> Install breather valve correctly and adjust the oil level.
	<ul style="list-style-type: none"> Frequent cold starts (oil foaming) and/or high oil level. 	<ul style="list-style-type: none"> Install oil expansion tank.

Fault	Possible cause	Measure
Output shaft does not turn although the motor is running or the input shaft is rotated.	<ul style="list-style-type: none"> Shaft-hub connection in the gear unit interrupted. 	<ul style="list-style-type: none"> Send in the gear unit/gearmotor for repair

9.2 Adapters AM/AQ./AL/EWH

Fault	Possible cause	Measure
Unusual, regular running noise	<ul style="list-style-type: none"> Meshing/grinding noise: Bearing damage 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
Oil leaking.	<ul style="list-style-type: none"> Seal defective 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
Output shaft does not turn although the motor is running or the input shaft is rotated.	<ul style="list-style-type: none"> Shaft-hub connection in the gear unit interrupted. 	<ul style="list-style-type: none"> Send in the gear unit/gearmotor for repair.
Change in running noise and/or vibrations	<ul style="list-style-type: none"> Ring gear wear, short-term torque transmission through metal contact 	<ul style="list-style-type: none"> Change the ring gear.
	<ul style="list-style-type: none"> Screws to secure hub axially are loose 	<ul style="list-style-type: none"> Tighten the screws
Premature wear in girth gear	<ul style="list-style-type: none"> Contact with aggressive fluids/oils; ozone influence; excessive ambient temperatures, etc. that can change the physical properties of the ring gear. 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
	<ul style="list-style-type: none"> Impermissibly high ambient/contact temperature for the girth gear; maximum permitted temperature: -20 °C to +80 °C. 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
	<ul style="list-style-type: none"> Overload 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.

9.3 AD input shaft assembly

Fault	Possible cause	Measure
Unusual, regular running noise.	<ul style="list-style-type: none"> Meshing/grinding noise: Bearing damage. 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
Oil is leaking.	<ul style="list-style-type: none"> Seal defective. 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
Output shaft does not turn although the input shaft is rotated.	<ul style="list-style-type: none"> Shaft-hub connection in gear unit or cover interrupted. 	<ul style="list-style-type: none"> Send the gear unit to SEW-EURODRIVE for repair.

9.4 Adapter with AR slip clutch

Fault	Possible cause	Measure
Unusual, regular running noise	<ul style="list-style-type: none"> Meshing/grinding noise: Bearing damage 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
Oil leaking.	<ul style="list-style-type: none"> Seal defective 	<ul style="list-style-type: none"> Contact SEW-EURODRIVE.
Evaluation unit display empty.	<ul style="list-style-type: none"> Incremental encoder of adapter is defective. 	<ul style="list-style-type: none"> Measure input pulses and replace incremental encoder of adapter if necessary
	<ul style="list-style-type: none"> Friction lining worn. 	<ul style="list-style-type: none"> Inspect friction lining / cup springs and replace if necessary
Slip torque is not reached.	<ul style="list-style-type: none"> Friction lining worn. Cup springs burned out or installed incorrectly after maintenance. 	<ul style="list-style-type: none"> Inspect friction lining / cup springs and replace if necessary

9.5 Service

If you require customer service, include the following information:

- Nameplate data (complete)
- Nature and extent of the problem
- Time the failure occurred and any accompanying circumstances
- Presumed cause
- A digital picture of the failure, if possible

9.6 Waste disposal

Dispose gear units in accordance with the material structure and the regulations in force:

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

10 Declaration of conformity

10.1 Gear units in categories 2G and 2D with AM, AQA, AL, AD, AR adapters

EC Declaration of Conformity

Translation of the original text

SEW
EURODRIVE

900610310



SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the

Gear units of the series

R..
 F..
 K..
 S..
 W..

with mount-on components of the series

AM
 AQA
 AL
 AD
 AR

variant

/II2GD

Category

2G
 2D

Designation

II 2GD c,k T3/T200°C or
 II 2GD c,k T3/T200°C X
 II 2GD c,k IIB T3/T200°C or
 II 2GD c,k IIB T3/T200°C X
 II 2GD c,k T4/T120°C or
 II 2GD c,k T4/T120°C X
 II 2GD c,k IIB T4/T120°C or
 II 2GD c,k IIB T4/T120°C X
 II 2GD c,k T5/T100°C or
 II 2GD c,k T5/T100°C X
 II 2GD c,k IIB T5/T100°C or
 II 2GD c,k IIB T5/T100°C X
 II 2GD c,k T6/T85°C or
 II 2GD c,k T6/T85°C X
 II 2GD c,k IIB T6/T85°C or
 II 2GD c,k IIB T6/T85°C X

are in conformity with

ATEX Directive

94/9/EC

2)

Applied harmonized standards:

EN 13463-1:2009
 EN 13463-5:2011
 EN 13463-8:2003
 EN 60529:2000

2) SEW-EURODRIVE lodges the documents required by 94/9/EC, appendix VIII, with the notified body: FSA
 GmbH, EU ID No.: 0588

Bruchsal 23.07.2014

Place

Date

Johann Soder
 Managing Director Technology

a) b)

a) Authorized representative for issuing this declaration on behalf of the manufacturer

b) Authorized representative for compiling the technical documents with same address as manufacturer

10.2 Gear units in categories 3G and 3D with AR adapter

EC Declaration of Conformity

Translation of the original text

SEW
EURODRIVE

900580310

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the



Gear units of the series

R..
F..
K..
S..
W..

with mount-on components of the series

AR

variant

/II3GD

Category

3G
3D

Designation

II 3GD c,k T3/T200°C or
II 3GD c,k T3/T200°C X
II 3GD c,k IIB T3/T200°C or
II 3GD c,k IIB T3/T200°C X

are in conformity with

ATEX Directive

94/9/EC

Applied harmonized standards:

EN 13463-1:2009
EN 13463-5:2011
EN 13463-8:2003
EN 60529:2000

Bruchsal 23.07.2014

Place

Date

Johann Soder
Managing Director Technology

a) b)

a) Authorized representative for issuing this declaration on behalf of the manufacturer

b) Authorized representative for compiling the technical documents with same address as manufacturer

22162607/EN – 07/2015

11 Address list

Algeria			
Sales	Algiers	REDUCOM Sarl 16, rue des Frères Zaghroune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 http://www.reducom-dz.com info@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 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
Australia			
Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
Austria			
Assembly Sales Service	Vienna	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
Bangladesh			
Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
Belarus			
Sales	Minsk	Foreign Enterprise Industrial Components Rybalko Str. 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. Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49 Indaiatuba – 13347-510 – SP	Tel. +55 19 3835-8000 sew@sew.com.br
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
Bulgaria			
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Cameroon

is supported by Germany.

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

Chile

Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMP RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
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China

Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 http://www.sew-eurodrive.cn info@sew-eurodrive.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 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
	Taiyuan	SEW-EURODRIVE (Taiyuan) Co., Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@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
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Colombia

Assembly Sales Service	Bogota	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
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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			
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	Drive Service Hotline / 24 Hour Service	+420 800 739 739 (800 SEW SEW)	Service Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz
Denmark			
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Egypt			
Sales Service	Cairo	Copam Egypt for Engineering & Agencies 33 El Hegaz ST Heliopolis, Cairo	Tel. +20 222566299 Fax +20 2 22594-757 http://www.copam-egypt.com copam@copam-egypt.com
Estonia			
Sales	Tallin	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee veiko.soots@alas-kuul.ee
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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
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Production	Forbach	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW-USOCOME 1 rue de Bruxelles F-67670 Mommenheim	Tel. +33 3 88 37 48 48
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France

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Gabon

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Germany

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	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Cen- ter	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dankritzer Weg 1 D-08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 D-12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 D-67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 D-66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
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	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 D-97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
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	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
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyi út 13. H-1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
Iceland			
Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 IS-104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 http://www.varmaverk.is vov@vov.is
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 Fax +91 265 3045300 http://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
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
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35301400 salespune@seweurodriveindia.com
Indonesia			
Sales	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari Jl.Pantai Indah Selatan, Komplek Sentra In- dustri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.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 http://www.alperton.ie info@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 79 97 81 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 21 21 81 05 Fax +225 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.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 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp hamamatsu@sew-eurodrive.co.jp
Kazakhstan			
Sales	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	SEW-EURODRIVE LLP Representative office in Mongolia Suite 407, Tushig Centre Seoul street 23, Sukhbaatar district, Ulaanbaatar 14250	Tel. +976-77109997 Fax +976-77109997 http://www.sew-eurodrive.mn sew@sew-eurodrive.mn
Kenya			
is supported by Tanzania.			
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
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
Sales / Jordan / Kuwait / Saudi Ara- bia / Syria	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com

Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
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.lu info@sew-eurodrive.be
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Madagascar			
Sales	Antananarivo	Ocean Trade BP21bis. Andraharo Antananarivo 101 Madagascar	Tel. +261 20 2330303 Fax +261 20 2330330 oceantrabp@moov.mg
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexiko			
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			
Technical Office	Ulaanbaatar	SEW-EURODRIVE LLP Representative office in Mongolia Suite 407, Tushig Centre Seoul street 23, Sukhbaatar district, Ulaanbaatar 14250	Tel. +976-77109997 Fax +976-77109997 http://www.sew-eurodrive.mn sew@sew-eurodrive.mn
Morocco			
Sales Service	Mohammedia	SEW-EURODRIVE SARL 2 bis, Rue Al Jahid 28810 Mohammedia	Tel. +212 523 32 27 80/81 Fax +212 523 32 27 89 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
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			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz

New Zealand			
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram 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	Tel. +234 1 217 4332 http://www.eisnl.com team.sew@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			
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Index

A

AD input shaft assembly.....	80
Adapter	
AM.....	71
AQ.....	75
Adjustment in mounting position	34
AM adapter	
Foot-mounted motor.....	74
Mounting of third-party motors	74
Permitted load	74
Ambient conditions	39, 114
Amount of oil	175
AQ adapter	
Permitted loads	76
Setting standards and tightening torques.....	76
AQ. adapter coupling.....	75

B

Backstop.....	94
Bearing greases	172
Breather valve	34
Compound gear unit.....	36

C

Change in mounting position	34
Checking the oil.....	115
Checking the oil level	91, 115
At the breather plug.....	124
At the breather plug.....	130
At the cover plate	120
At the oil level plug	127
At the oil level plug.	128, 131
Checklists	89
Compound gear unit	
Breather valve	36
Oil drain plug	36
Oil level plug.....	36
Screw plug bore	36
Copyright notice	8
Coupling of AM adapter.....	71
Cover, installation	70
Customer service	184

D

Designated use	11
----------------------	----

E

Efficiency	93
Elastomers	39, 114
Embedded safety notes.....	7
Exclusion of liability	8
Extended storage	170

F

Failure	
Running noise	182, 183, 184
Failures.....	181
Features	84
Flatness defect	34
Fluorocarbon rubber	39, 114

G

Gaskets	91
Gear head unit.....	29
Gear unit	
Cleaning	132
Explosion-proof design II2GD	30
Explosion-proof design II3GD	30
Installing	33
with solid shaft.....	42
Gear unit mounting	38
Strength class.....	35
Gear unit painting	41, 132
Gear unit structure.....	14
Helical gear units.....	14
Helical-bevel gear units K..7.....	18
Helical-bevel gear units K..9.....	16, 17
Helical-worm gear units.....	19
Parallel-shaft helical gear units	15
SPIROPLAN® gear units W..10 – W..30.....	20
SPIROPLAN® gear units W..37 – W..47.....	21
Gear unit venting	40
Grease filling	172

H

Helical gear units.....	14
Type designation	26

Helical gearmotors	
Mounting positions	137
Helical-bevel gear units	16, 17
Type designation	27
Helical-bevel gear units K..7	18
Helical-bevel gearmotors	
Mounting positions	145
Helical-worm gear unit	
Type designation	28
Helical-worm gear units	19
Helical-worm gearmotors	
Mounting positions	158

I

Incremental encoder	
Installation	99
Input and output elements	
High overhung loads	43
Mounting	42
Using a mounting device	43
Inspection	101
Inspection intervals	
Gear unit	104
Inspection work	
AD Input shaft assembly	112
AL/AM/AQ./EWH adapter	106
AR adapter	106
Checking the oil	115
Checking the oil level	115
Gear unit	113
Oil change	115
Installation	
Couplings	44
Input and output elements	42
Installation tolerances	32

L

Leakage	91
Lubricant	
Determining change intervals	105
Lubricant change intervals	105
Lubricant fill quantities	175

M

M0 universal mounting position	134
Maintenance	101

Maintenance intervals	
Gear unit	104
Maintenance works	
AD Input shaft assembly	112
AL/AM/AQ./EWH adapter	106
AR adapter	106
Checking the oil	115
Checking the oil level	115
Gear unit	113
Oil change	115
Malfunctions	181
AD Input shaft assembly	183
Adapters AM/AQ. /AL/EWH	183
Gear unit	182
Mounting position	
M0	134
MX	134
Mounting position sheets	133
Mounting positions	133
Designation	133
For SPIROPLAN® gear units	134
Helical gearmotors	137
Helical-bevel gearmotors	145
Helical-worm gearmotors	158
Icons	136
Key	136
Parallel-shaft helical gearmotors	142
SPIROPLAN® gearmotors	164
MX mounting position	134

N

Nameplate	22, 24
Notes	
Designation in the documentation	6

O

Oil change	115
Oil drain plug	
Compound gear unit	36
Oil drain valve	84
Oil expansion tank	84
Oil level plug	
Compound gear unit	36
Oil sight glass	91
Oil temperature	92
Optional equipment	84

Options	84	SPIROPLAN® gear units W..10 – W..30	20
Type designation	28	SPIROPLAN® gear units W..37 – W..47	21
P		SPIROPLAN® gearmotors	
Parallel-shaft helical gear units	15	Mounting positions	164
Type designation	26	Strength class	
Parallel-shaft helical gearmotors		Gear unit mounting	35
Mounting positions	142	Structure	
Product names	8	Helical gear units	14
Protective cover, installation	70	Helical-bevel gear units K..7	18
Pseudo-leakage	91	Helical-bevel gear units K..9	16, 17
PT100	84	Helical-worm gear units	19
PT100 temperature sensor		Parallel-shaft helical gear units	15
Dimensions	85	SPIROPLAN® gear units W..10 – W..30	20
Electrical connection	86	SPIROPLAN® gear units W..37 – W..47	21
R		Surface temperature	92
Repair	181, 184	T	
Resources	32	Technical data	170
Rights to claim under limited warranty	7	Test list	89
Run-in period	93	Tightening torques	37
S		Tools	32
Safety notes		TorqLOC®	58
Designation in the documentation	6	Torque arms	44
Preliminary information	9	Torque arms for shaft-mounted gear units	44
Structure of embedded	7	Helical-bevel gear units K..37 – K..157	47
Structure of the section-related	6	Helical-worm gear units	48
Transport	12	Parallel-shaft helical gear units	45
Screw plug bore		SPIROPLAN® W gear units	49
Compound gear unit	36	Trademarks	8
Section-related safety notes	6	Transport	12
Service	184	Type designation	22, 26
Shaft-mounted gear units	44	Helical gear units	26
Keyway	50	Helical-bevel gear units	27
Shrink disk	55	Helical-worm gear unit	28
Splined hollow shaft	50	Options	28
TorqLOC®	58	Parallel-shaft helical gear units	26
Signal words in the safety notes	6	SPIROPLAN® gear unit	28
Solid shaft		U	
Gear unit with	42	Universal mounting position M0	134
Speed monitor, WEX	95	Using a mounting device	43
SPIROPLAN® gear unit		V	
Type designation	28	Ventilation	40
SPIROPLAN® gear units		Venting	40
Mounting positions	134	Voltage encoder	99

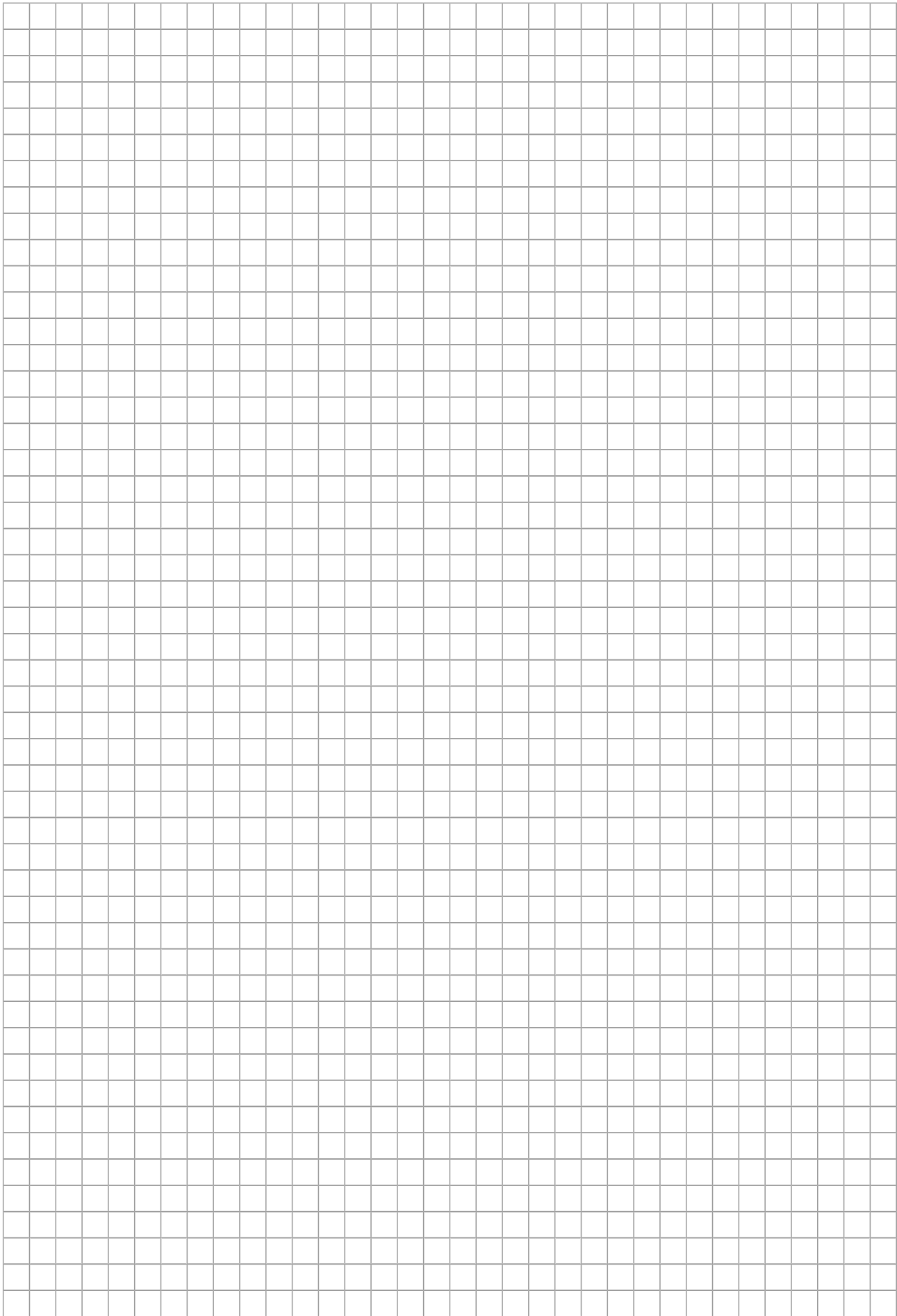
W

Waste disposal	184
WEX speed monitor	78, 95

WEX, speed monitor	78
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X

X identification	24
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