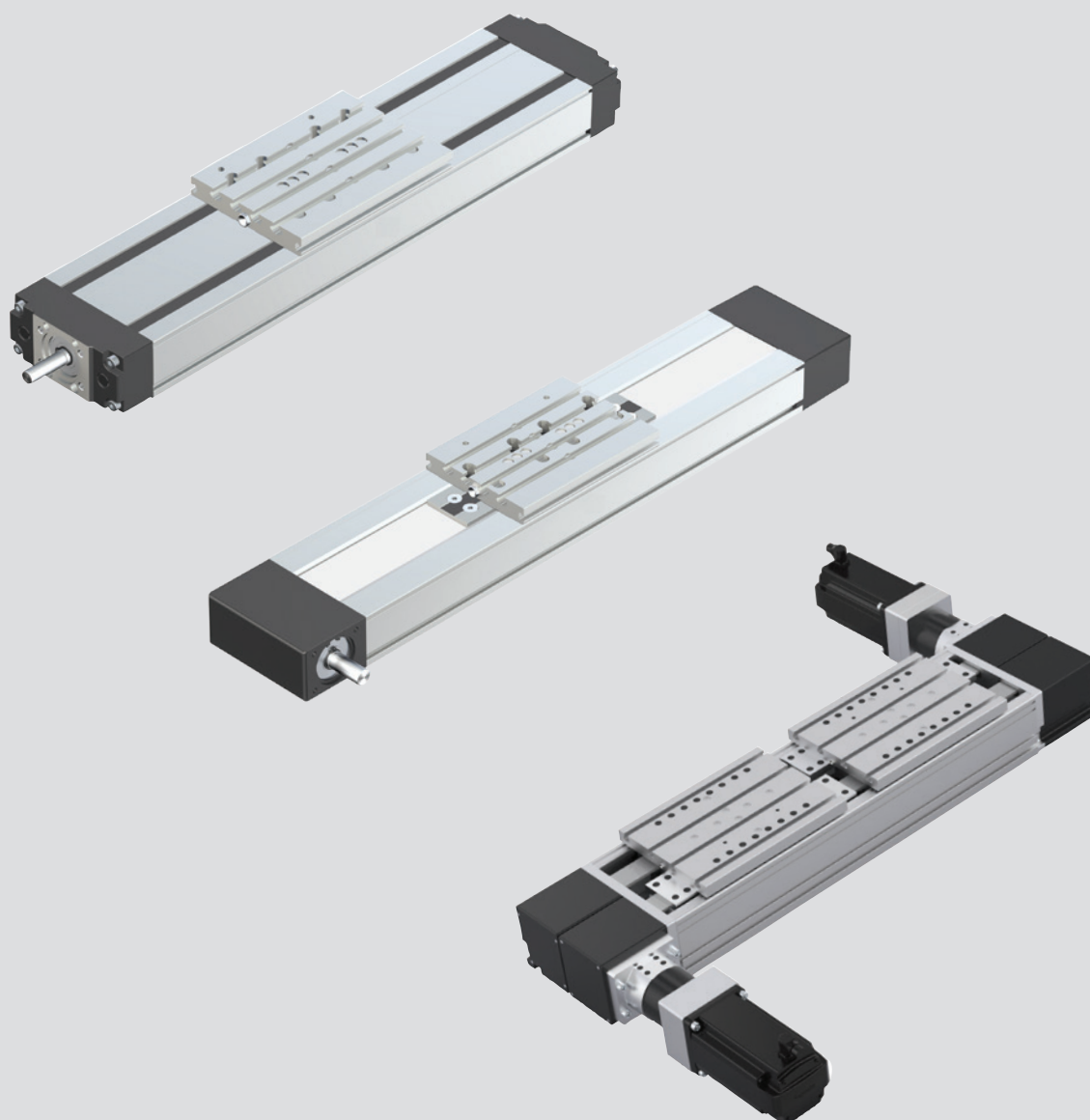


Compact modules CKK/CKR

R320103178/2025-05
(EN)

Instructions

EN



The information provided serves only to describe the product. No statements concerning a certain condition or suitability for a certain purpose can be derived from our information. The information given does not release the user from the obligation of own judgment and verification. Please note that our products are subject to a natural process of wear and aging.

© This document, as well as the data, specifications, and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without our consent.

The title page contains an illustration of a sample configuration. The product as delivered can differ from the illustration.

The original instructions are in German.

Any dissemination of the product must include the "safety instructions for linear axes and electromechanical cylinders R320103152"

This instruction is available in the following languages.
These instructions are available in the following languages.

DE German (original document)

EN English

Contents

1	About these instructions	4
1.1	Validity of the documentation	4
1.2	Required and supplementary documentation	4
1.3	Presentation of information	4
2	Safety instructions.....	6
3	Scope of delivery.....	6
3.1	Condition as delivered	6
3.2	Accessories	6
3.3	Overview of compact modules.....	7
4	Product description.....	7
4.1	Performance description	7
4.2	Attachments overview / device designation.....	8
5	Fastening customer-built attachment and product to the mounting base.....	10
5.1	Mounting the connection plate	10
5.2	Mounting customer-built attachment to the carriage.....	11
5.3	Fastening compact modules to the mounting base.....	12
6	Switching system.....	13
6.1	Mounting the socket	14
6.2	Magnetic sensor with free cable end	15
6.3	Mounting the magnetic sensor with connector.....	16
6.4	Mechanical and proximity switches CKK/CKR-200, cable duct at CKK/CKR-200, -280	18
6.5	Setting the switching points / moving the switches	19
7	CKK drive.....	20
7.1	Mounting the motor with flange and coupling	20
7.2	Mounting the motor with belt side drive.....	24
8	CKR drive.....	28
8.1	Overview of motor/gear attachment	28
8.2	Mounting the motor/direct mounting (i=1).....	29
8.3	Gear/motor attachment CKR-070/-090/-145/-200 (PG090).....	30
8.4	Gear/motor attachment CKR-110.....	31
8.5	Gear/motor attachment CKR-200 (PG120).....	32
8.6	Gear/motor attachment CKR-280.....	33
8.7	Gear/motor attachment CKR-280-DB.....	34
9	Maintenance	36
10	Lubrication	36
10.1	Overview of lubrication versions.....	38
10.2	Lubricants	40
10.3	Lubrication version LSS / LPG	42
10.4	Initial lubrication	46
10.5	Relubrication.....	48
10.6	Relubrication intervals	50
11	Replacing the seals of the Resist covers at CKK.....	52
11.1	Disassembly	52
11.2	Assembly	52
12	Further information	54
12.1	Tightening torques	54
12.2	Compact modules CKR; clamping hub.....	54
12.3	Operating conditions	54
13	Assemblies.....	56
13.1	Overview of CKK	56
13.2	Overview of CKR	57
13.3	Replacing the idler end enclosure, CKR	58
13.4	Tensioning the toothed belt (CKR).....	62
14	Replacing frame or guide rails.....	63
15	Service and support	63

1 About these instructions

1.1 Validity of the documentation

This documentation applies to the following products:

- Compact modules CKK/CKR as described in the catalog "CKK/CKR compact modules"

This documentation is intended for assembly personnel, operators and system owners.

This documentation contains important information for the proper and safe mounting, operation, maintenance and disassembly of the product and for troubleshooting simple errors oneself.

- ▶ Before commencing any work with the product, be sure to read the "Safety instructions for linear axes and electromechanical cylinders R320103152" guide in full.
Further required information to be considered, for example, on: Transport and storage, electrically connecting the product, commissioning, operation, servicing, maintenance and repair, disassembly and exchange, disposal, etc. is provided in the "Information for linear axes and electromechanical cylinders" R320103234 guide.
- ▶ Tightening torques:
If not specified otherwise, apply the tightening torques for screws ➡ 10.1.
Any deviations are marked accordingly.

1.2 Required and supplementary documentation

Documentation which is indicated by the book symbol  must be obtained before handling the product and must be observed:

Table 1: Required documentation

	Title	Document number	Document type
	Safety instructions for linear axes and electromechanical cylinders	R320103152	Safety instructions
	Compact modules CKK/CKR	R999000479	Catalog
	Information for linear axes and electromechanical cylinders	R320103234	Instructions
	Project planning instructions HCS	R911322209	Project planning
	Project planning instructions ctrlX	R911386578	Project planning
	Instruction for initial commissioning	R320103223	Instructions
	Product data sheet for Dynalub 510	R320103198	
	Safety data sheet for Dynalub 510	R320103160	
	Product data sheet for Dynalub 520	R320103199	
	Safety data sheet for Dynalub 520	R320103161	
	Instructions for the other components		

The Rexroth documentation is available for download at www.boschrexroth.com/mediadirectory.



1.3 Presentation of information

To enable users to work rapidly and safely with the product while following these instructions, this documentation uses standardized safety instructions, symbols, terms and definitions, and abbreviations. These are explained in the following sections.

Safety instructions are structured as follows:

 SIGNAL WORD
Type of hazard! Consequences if ignored. ▶ Hazard prevention measure.

- Warning sign: draws attention to the hazard
- Signal word: indicates the severity of the hazard
- Type of hazard: indicates the type or source of hazard
- Consequences: describes the consequences that may occur if precautions to avoid the hazard are not taken
- Hazard prevention measure: indicates how to avoid the hazard

The safety instructions cover the following hazard classes. The hazard class describes the risks involved if the safety instructions are not complied with. In this guide, safety instructions take priority over all instructions that entail a risk of personal injury or damage to property. The safety precautions described must be adhered to.

EN

Hazard classes as per ANSI Z535

Warning sign, signal word	Meaning
 DANGER	Indicates a hazardous situation which will result in death or serious injury if not avoided.
 WARNING	Indicates a hazardous situation which may result in death or serious injury if not avoided.
 CAUTION	Indicates a hazardous situation which may result in minor or moderate injury if not avoided.
NOTICE	Property damage: The product or surroundings may be damaged

1.3.1 Symbols

The following symbols indicate notes which are not related to safety but make the documentation easier to understand.

Meaning of the symbols

Symbol	Meaning
	If this information is not observed, the product will not be optimally used/operated.
	Single, independent work step
1. 2. 3.	Numbered work steps The numbers indicate the sequence of the work steps.
➡ 7	See section 7
➡ ☒ Fig. 7.1	See figure 7.1
	Screw with strength class...
	Tightening torque
μ	Friction factor for screws

1.3.2 Abbreviations

The following abbreviations are used in this documentation:

Table 2: Abbreviations and definitions

Abbreviation	Unit	Meaning
BASA	(-)	Ball screw assembly
CKK	(-)	Compact module with ball screw assembly
CKR	(-)	Compact module with toothed belt drive
CKR-280-DB	(-)	Compact module size 280 with 2 toothed belt drives
CKx	(-)	CKK and CKR
C_{gw}	(N)	Dynamic load capacity, guideway
C_{bs}	(N)	Dynamic load capacity, ball screw assembly
d_0	(mm)	Nominal diameter, ball screw assembly
DH_{min}	(mm)	Minimum double stroke
f	(Hz)	Frequency
F_{mgw}	(N)	Dynamically equivalent load on bearing of the guideway
F_{mbs}	(N)	Dynamically equivalent load on bearing of the ball screw assembly
F_{mgw} / C_{gw}	(-)	Load ratio of the guideway
F_{mbs} / C_{bs}	(-)	Load ratio of the ball screw assembly
F_{mx}	(-)	Dynamically equivalent load on bearing of the guideway or the ball screw assembly
F_{pr}	(N)	Preload force of toothed belt
M	(-)	Motor
LS	(-)	Linear motion system
LSS	(-)	Standard lubrication
LPG	(-)	Preserved
LCF	(-)	Prepared for connection to central lubrication systems for liquid grease
LCO	(-)	Prepared for connection to central lubrication systems for oil
L_w	(-)	Centerline-to-centerline distance between carriages
P	(mm)	Lead of ball screw assembly
TM	(cm ³)	Partial amount
TT	(-)	Carriage

2 Safety instructions

The general safety instructions for this product can be found in the documentation "Safety Instructions for linear motion systems and electromechanical cylinders". You must have read and understood these before handling the product.

3 Scope of delivery

The following is included within the scope of delivery: Compact module, drive (motor and gear unit, installed) if ordered, switch/sensor if ordered.

3.1 Condition as delivered

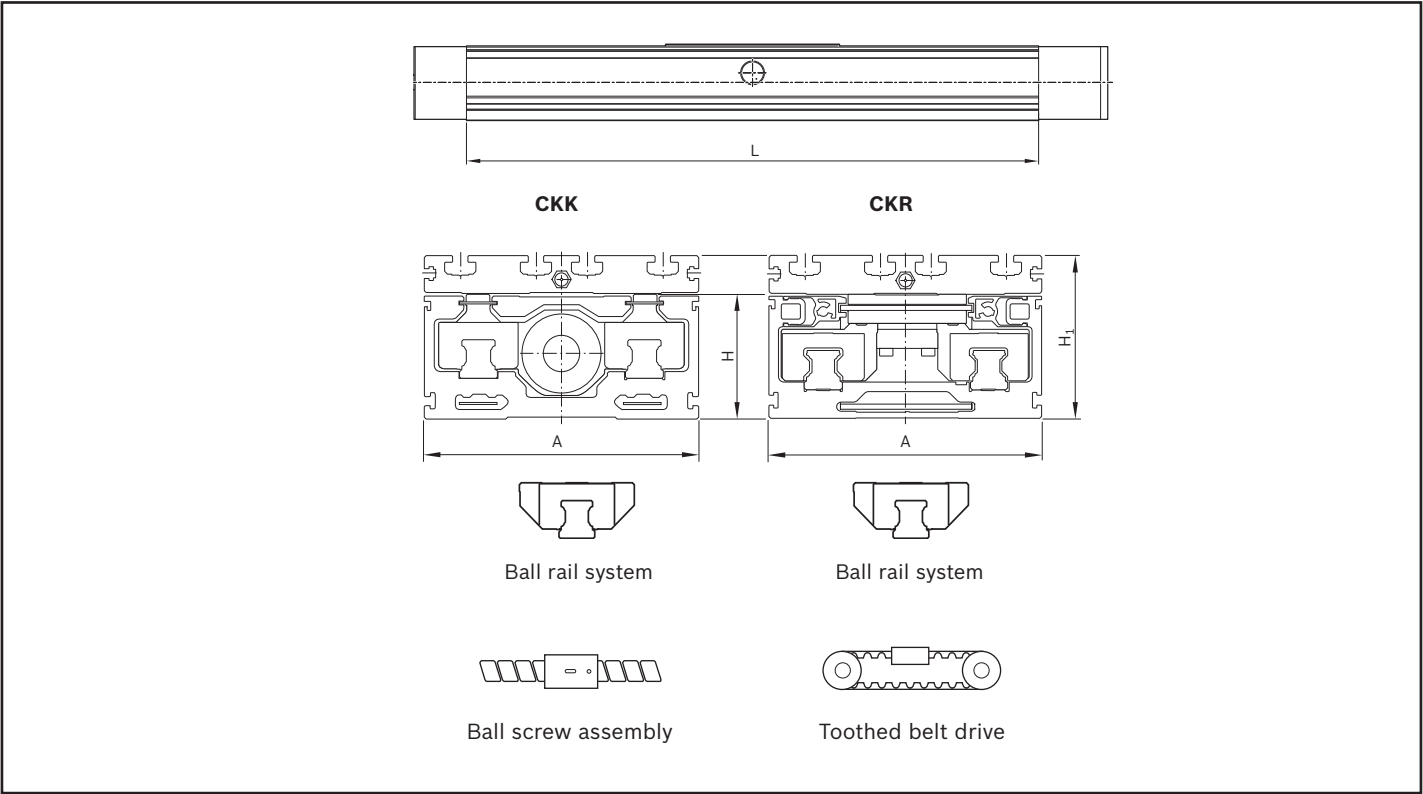
Depending on the order, completely assembled with drive and switching system.

3.2 Accessories

Available accessories: ➡ "Catalog"

Dimensions and material numbers of the accessories as well as additional fastening accessories ➡ "Catalog"

3.3 Overview of compact modules



EN

Type	Size	-070			-090			-110			-145			-200			-280		
		A	H	H ₁	A	H	H ₁	A	H	H ₁	A	H	H ₁	A	H	H ₁	A	H	H ₁
CKK	Dimensions (mm)	70	32	44.5	90	40	56	110	50	66	145	65	85	200	100	127	280	160	190
CKR																			

4 Product description

4.1 Performance description

Please refer to the notes, technical data, dimensions and descriptions of the products in the catalog.

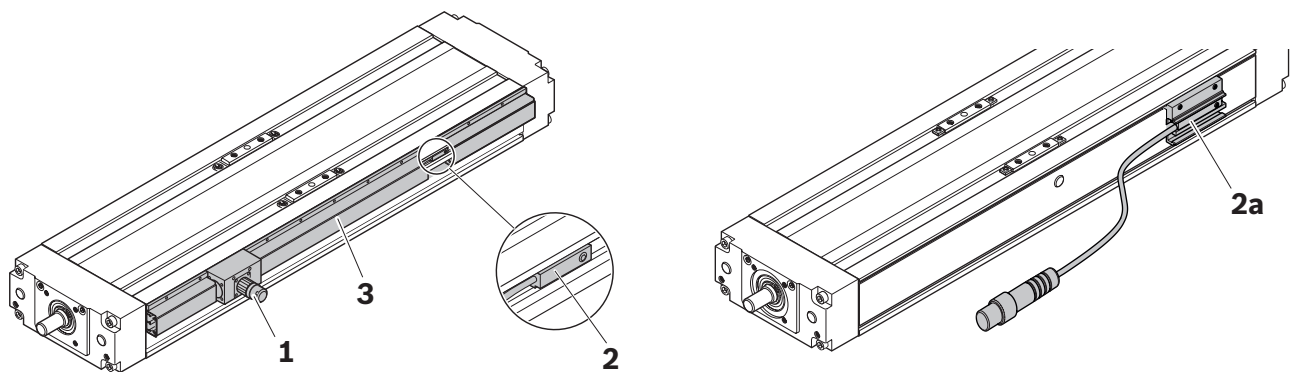
4.2 Attachments overview / device designation

On request, the following components can be assembled ready for use at Bosch Rexroth AG.

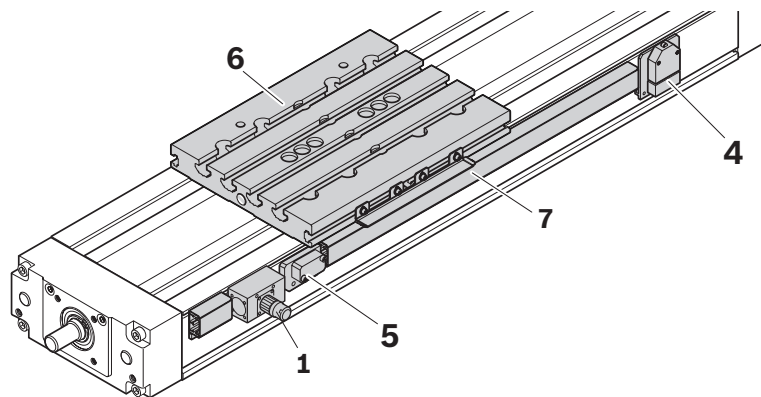
Subsequent mounting is possible at any time.

The switching systems cannot be mounted on the same side!

Switching system with magnetic field sensors at CKK/CKR: -070/-090/-110/-145/-200/-280 CKK



Switching system with mechanical or proximity switches at CKK/CKR: -200 CKK



Motor attachment: CKK

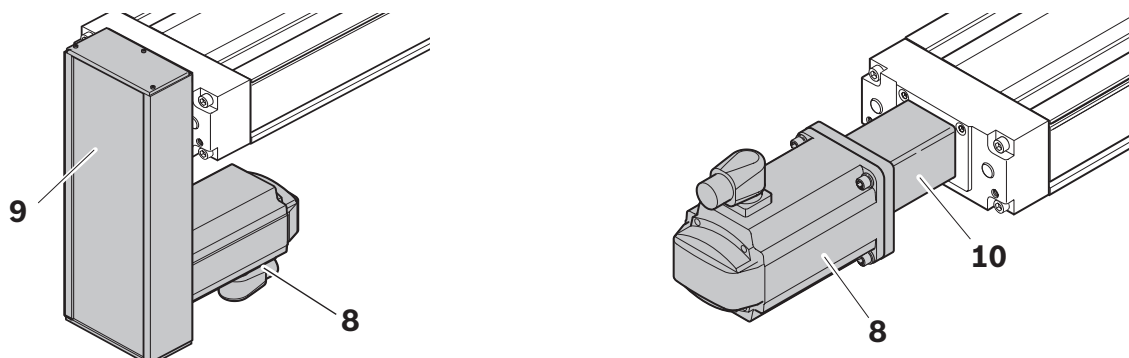
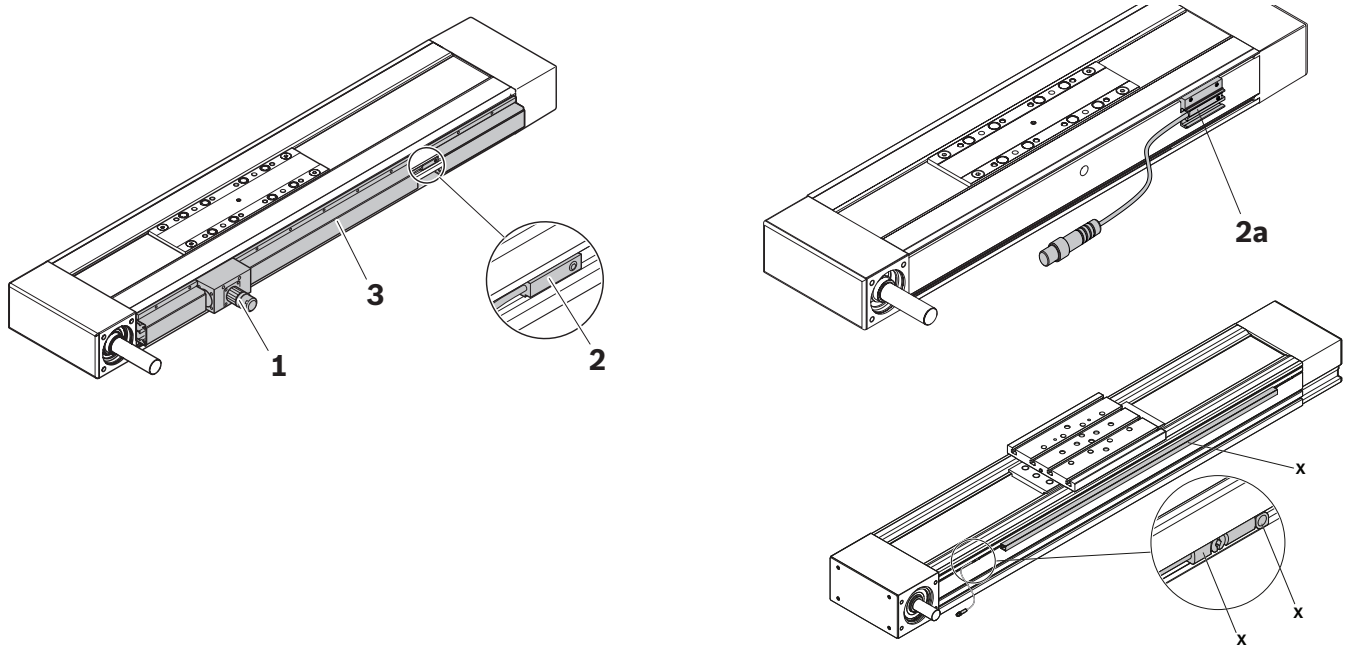
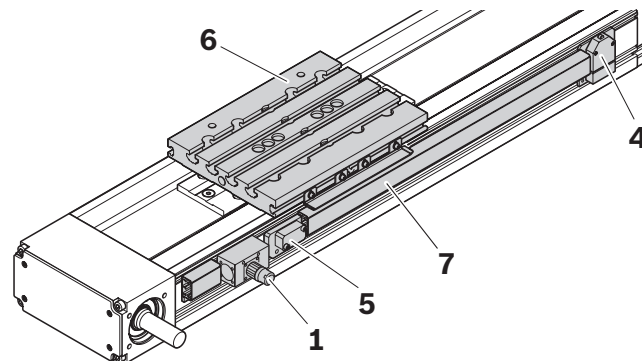
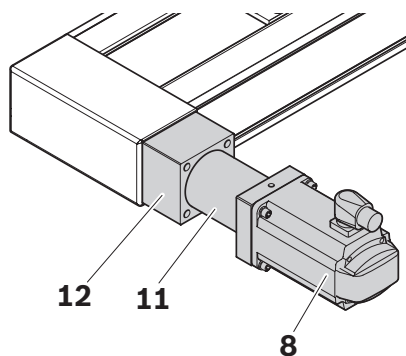
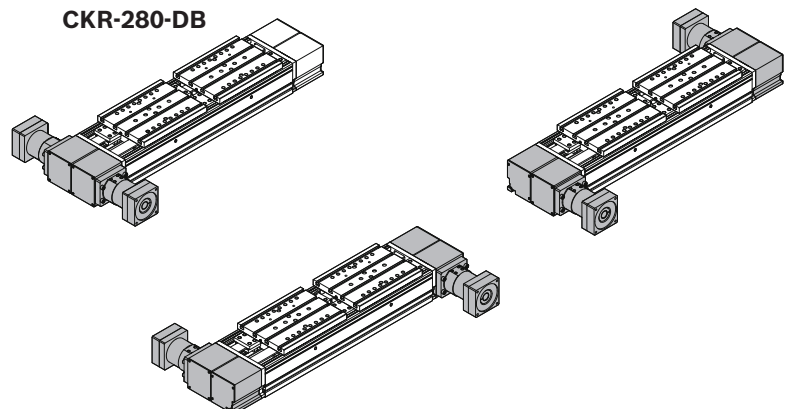


Fig. 1: Overview of attachments

- 1 Socket with connector
- 2 Magnetic sensor;
- 2a Magnetic sensor with connector
- 3 Cable duct
- 4 Mechanical switch
- 5 Proximity switch
- 6 Connection plate
- 7 Cable duct
- 8 Motor
- 9 Belt side drive at CKK
- 10 Flange and coupling at CKK
- 11 Gear reducer at CKR
- 12 Adapter flange

CKR**CKR****CKR****CKR-280-DB**

5 Fastening customer-built attachment and product to the mounting base

5.1 Mounting the connection plate

- ▶ Connection plates (1) can be retrofitted at any time for lubrication versions LSS and LPG. Dimensions and material numbers ➔ Catalog "Compact modules".
 - ▶ In case of relubrication via the connection plate: Fill the connection plate completely with grease before mounting ➔ "Lubrication".
1. Remove the set screws (2) from the carriage (3) and insert the O-ring (4) into the countersink of the connection plate.
 2. Pin the connection plate with the straight pins (5) included.
 3. Tighten the hex socket head cap screws (6) to tightening torque M_A .

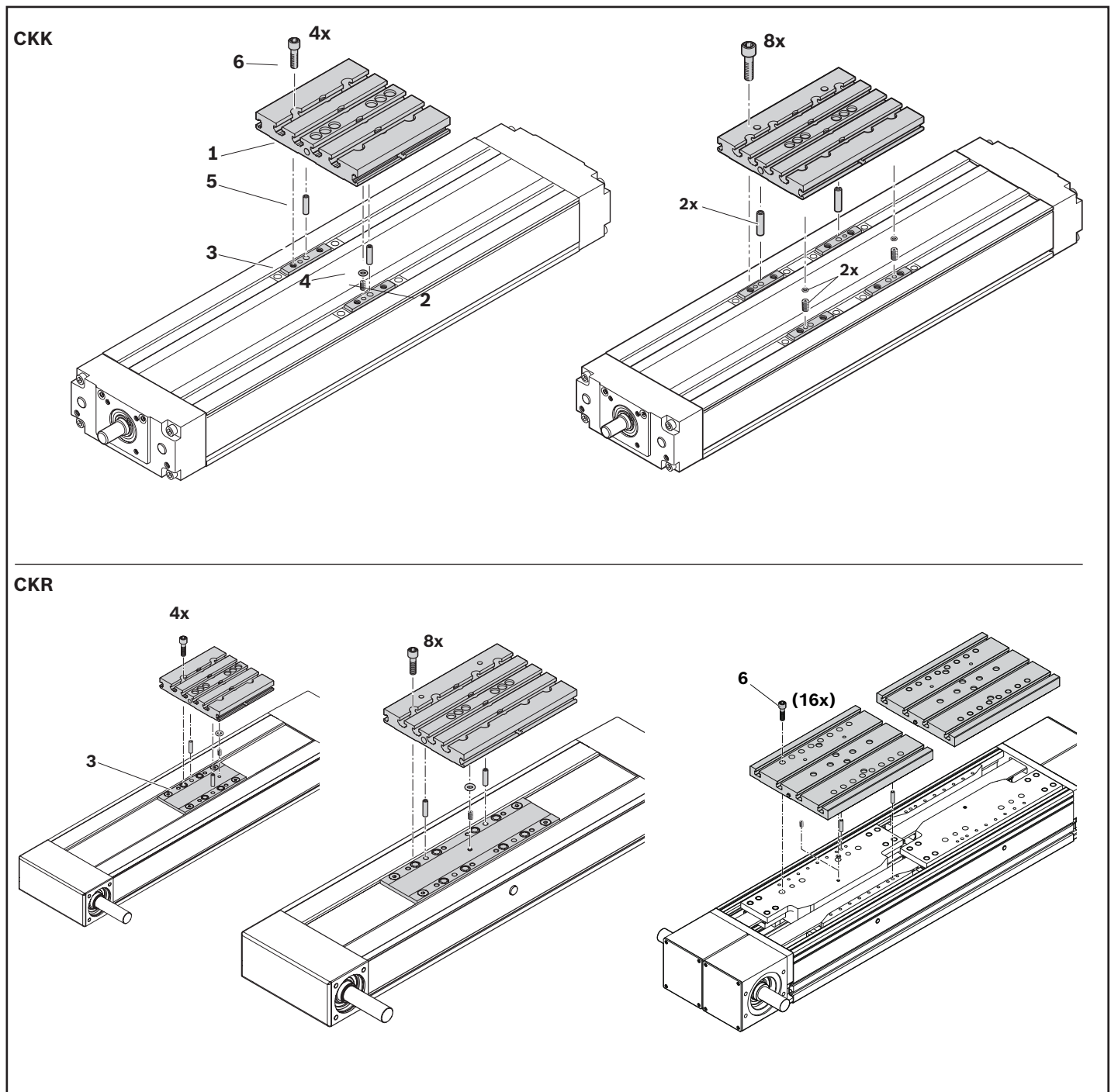


Fig. 2: Mounting the connection plates

5.2 Mounting customer-built attachment to the carriage

► Sliding blocks are easier to position with springs.

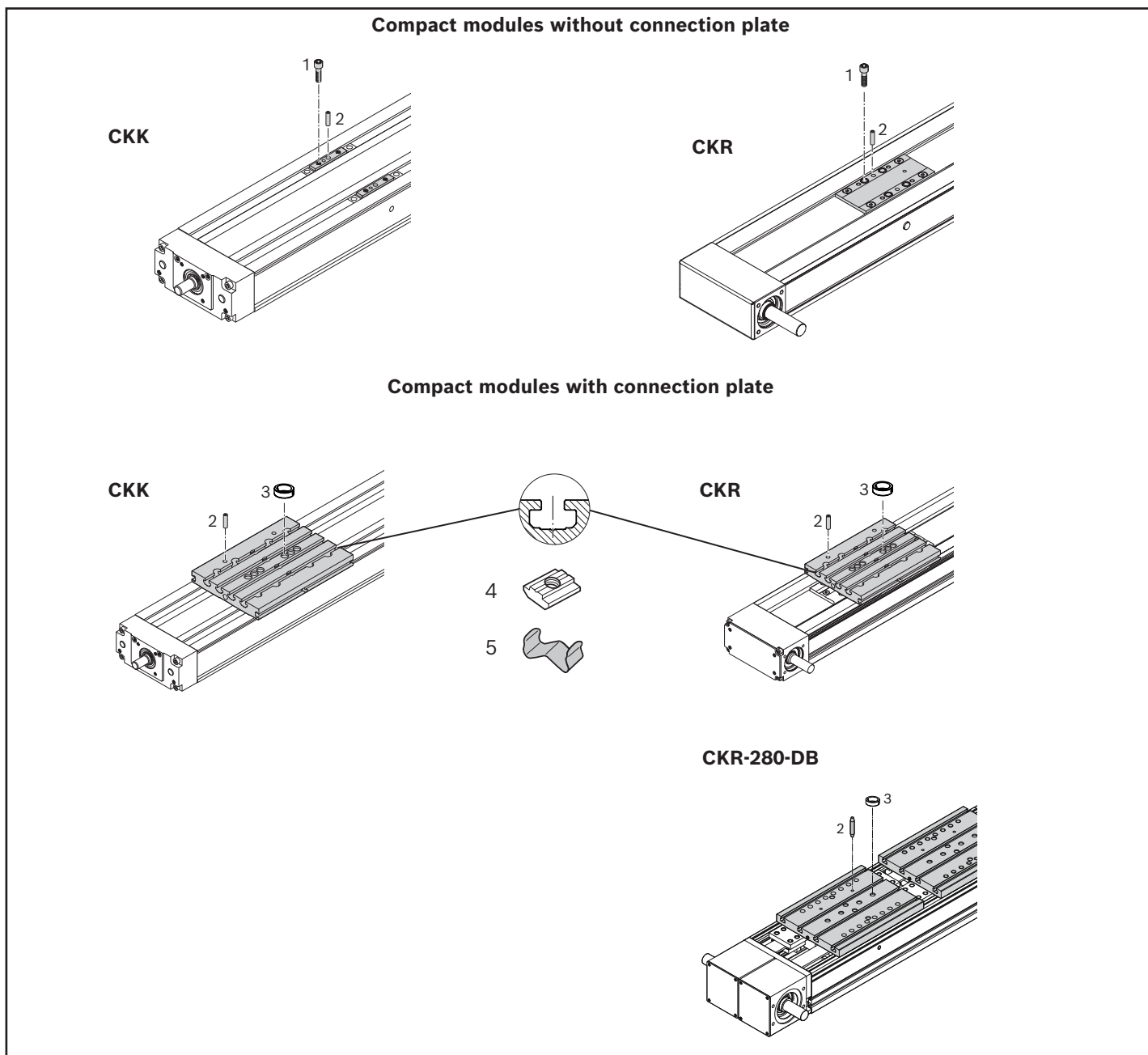


Fig. 3: Mounting the carriage attachments

- 1 Tighten the hex socket head cap screws 8.8 (to tightening torque M_A)
- 2 Straight pins
- 3 Centering rings
- 4 Sliding blocks
- 5 Springs

5.3 Fastening compact modules to the mounting base

NOTICE

Risk of product loosening or experiencing distortive stress due to improper fastening!

Damage to the product.

- Fasten the product using the recommended fastening elements.
- Do not fasten or support the product at the end blocks/cross ties (1). The frame is the load-bearing part. If possible, support it over the entire length. Keep a minimum distance of 5 mm from the end blocks (1) ➔ Fig.4.
- Observe specified tightening torques.

5.3.1 Fastening

- Fasten the frame with clamping fixtures (type 1/type 2/type 3/type 4) to the mounting base.
- For recommended number of clamping fixtures, see 6.3.2. Make sure the clamping fixtures are evenly distributed over the entire length.
- For compact modules with centering holes in the bottom area, use centering rings (2) for better alignment with other linear motion systems and connection elements.
- Dimensions and material numbers of the fastening accessories ➔ Catalog.

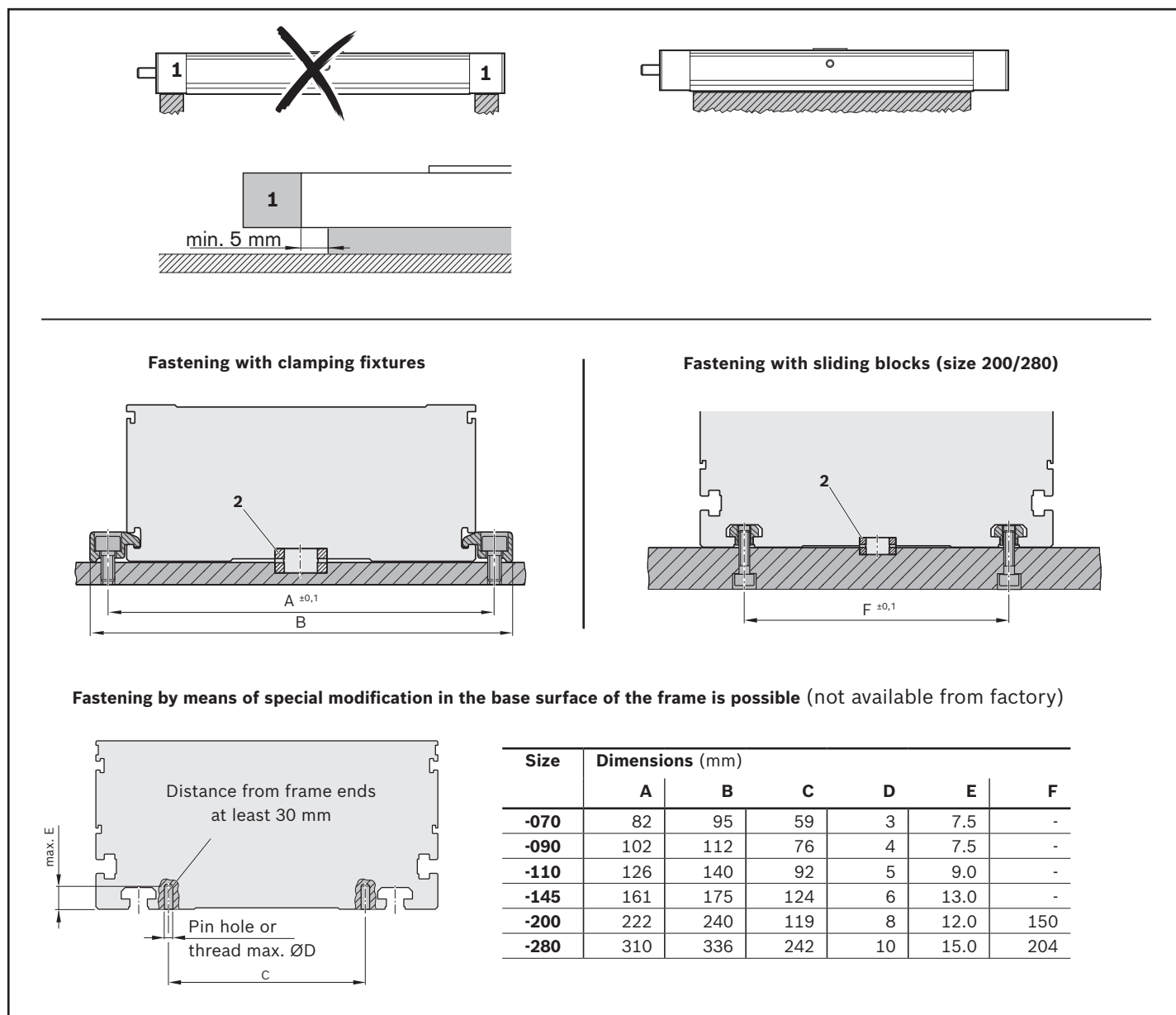


Fig. 4: Fastening

6.3.2 Fastening accessories

Clamping fixtures

Recommended number:

- ▶ Type 1: 6/3¹⁾ pieces per meter and side
- ▶ Type 2: 4 pieces per meter and side
- ▶ Type 3: 3 pieces per meter and side
- ▶ Type 4: 3 pieces per meter and side

¹⁾ For size -070

Sliding blocks

Recommended number:

with 1 thread, 6 pieces per meter and side

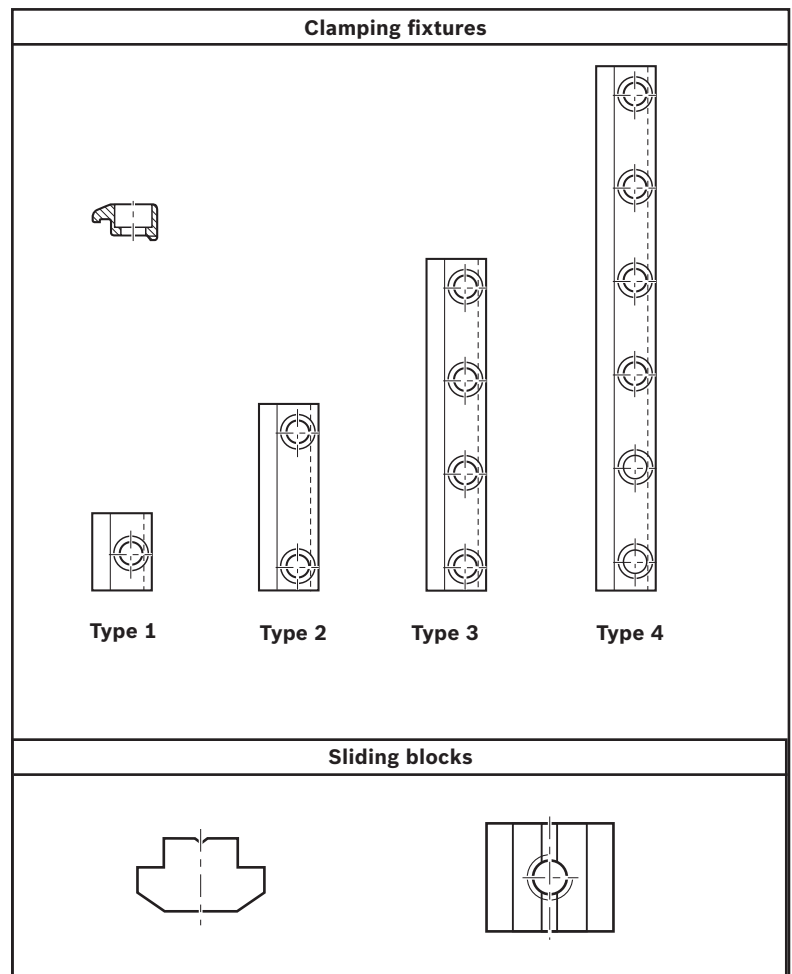


Fig. 5: Fastening accessories

6 Switching system

NOTICE

Risk of collision due to incorrect mounting of the switching system!

Damage to product, adjoining structure and workpieces.

- ▶ Prerequisite for the installation of the switching system is the fastening of the product.
- ▶ Fasten the entire switching system on one side of the product.
- ▶ Move the carriage by hand to check for potential collision with the carriage or a mounted workpiece.

Incorrect mounting of the cable duct!

Damage to the product.

- ▶ Remove the cap(s).

- ▶ Switch and socket can be retrofitted and the switching point can be moved at any time.
Additional accessories and connection diagram ➞ Catalog.

6.1 Mounting the socket

Installation position:

There are various socket and connector mounting possibilities, depending on the requirements.

Fastening the socket to the frame

1. If they are not predrilled, make holes in the seals (2) for the cables.
2. Guide all the cables through compression screw (1), seal (2), socket housing (3) and cork seal (4). Heed the desired connection position (5) for the plug (11) when doing so.
3. Use an O-ring (7) and screw plug (8) to seal the unused opening (6) in the socket housing (3).

Connecting the socket

1. Connect the cable in the flanged socket (9). Make a pin assignment diagram.
2. Tighten the flanged socket (9) with screws (10) in the socket housing (3).
3. Press in the seal (2) with the compression screw (1).
4. Engage the socket in the corresponding slot at the frame and fix in position with set screws.
Size -070/-090/-110/-145: socket in the upper slot (12); size -200: socket in the center slot (13).
5. Solder the cable into the connector (11).

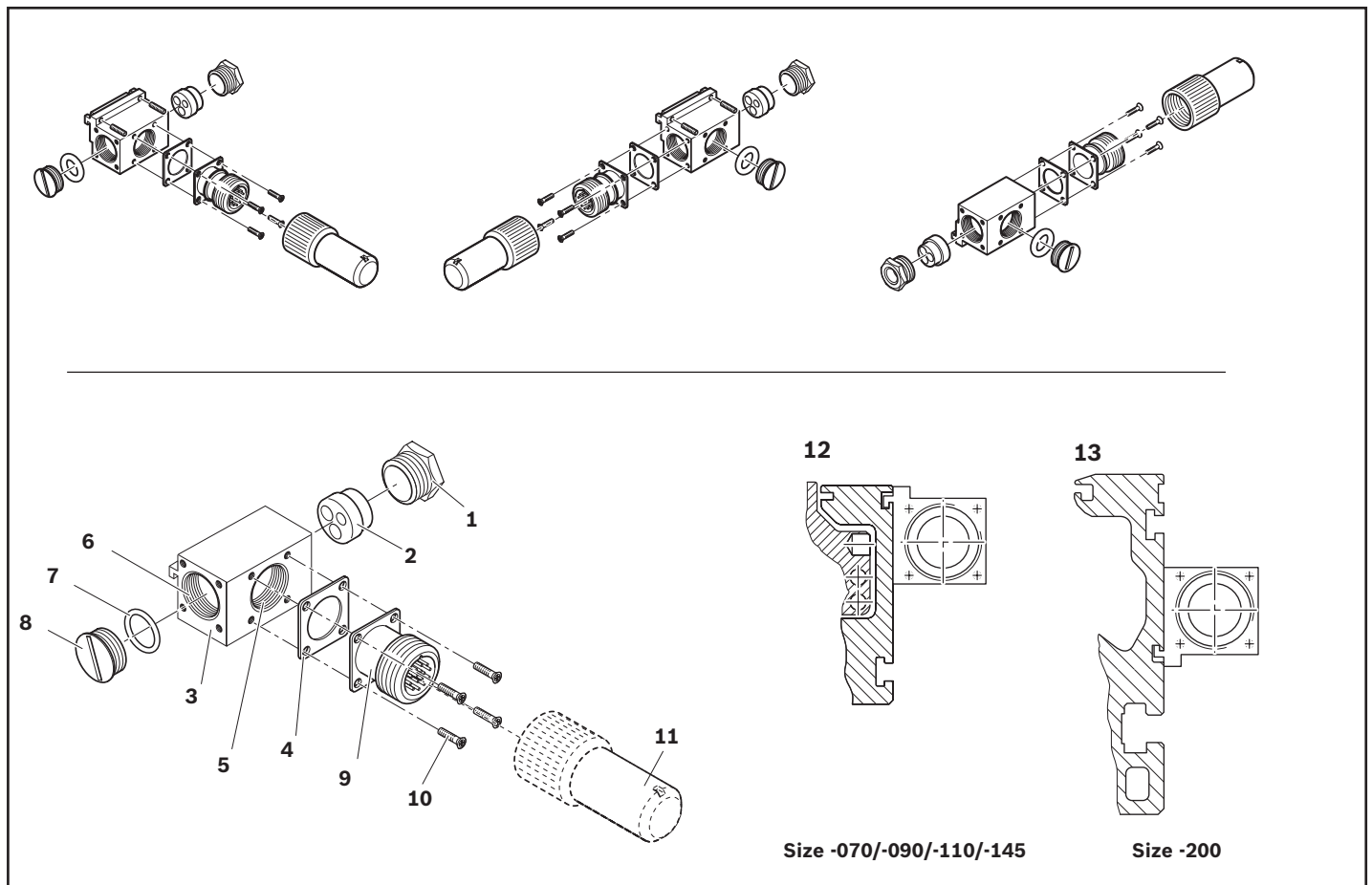


Fig. 6: Mounting the socket

6.2 Magnetic sensor with free cable end

- Switch activation is done by magnets in the carriage.

6.2.1 Mounting the cable duct

- Observe the notes at the beginning of the chapter

1. Measure the length of the cable duct (1), saw off and deburr it.
2. If necessary, make an additional fastening thread M 2.5 (3).
3. Suspend the cable duct without cover (pay attention to the correct position) and secure with the set screws (4) included.

6.2.2 Mounting the magnetic sensor

- Fig. 7 shows CKR; mounting for CKK is identical.

1. Insert the sensor (5) into the cable duct (1) so that the set screw (6) of the sensor (5) points outwards.
2. Set the switching point ➡ 6.5
3. Secure the sensor with the set screw.

EN

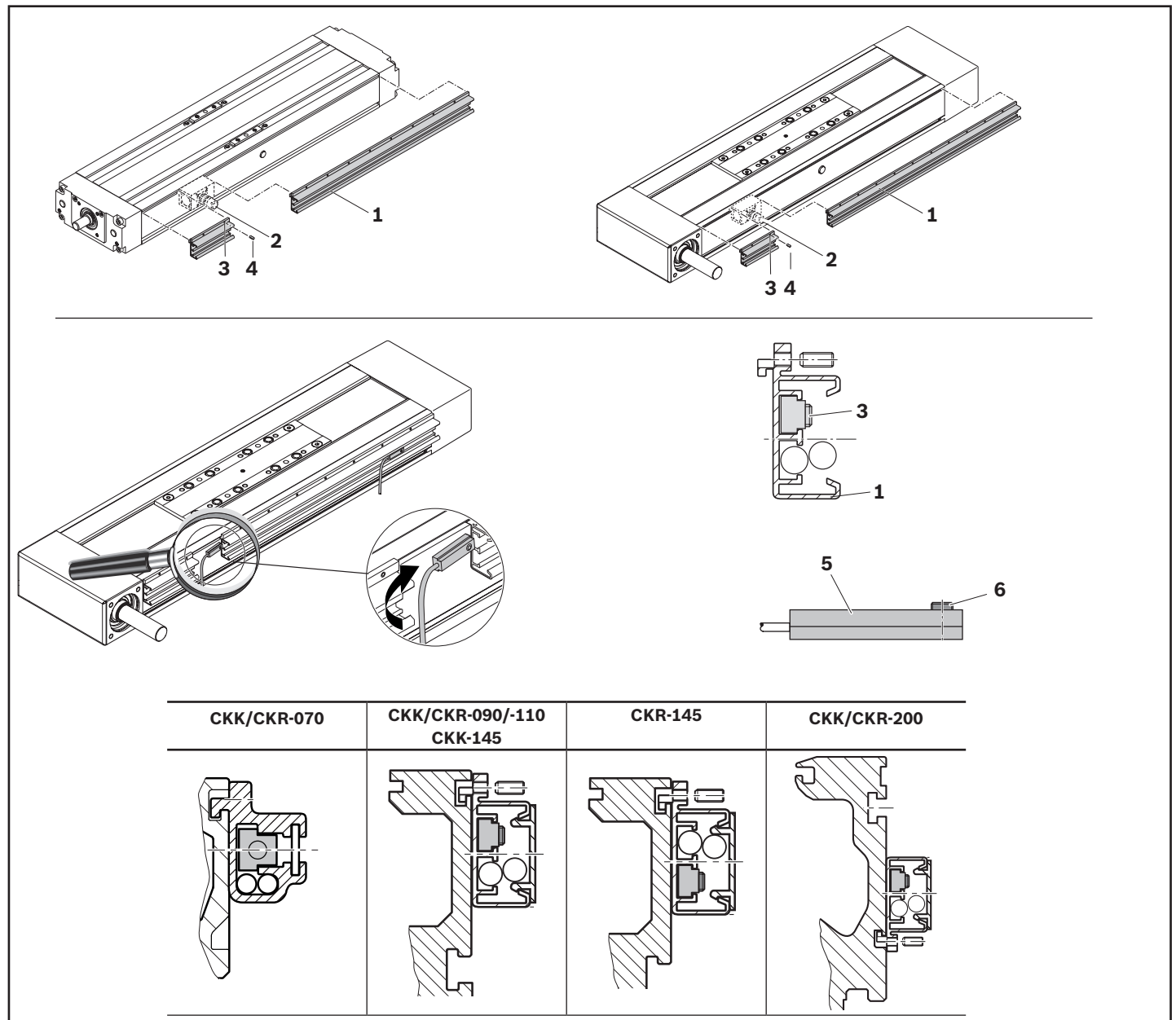


Fig. 7: Mounting the cable duct/magnetic sensor

6.3 Mounting the magnetic sensor with connector

► Switch activation is done by magnets in the carriage. Fig. 8 shows CKK; mounting for CKR is identical.

6.3.1 CKK/CKR: -070/-090/-110/-145/-200

1. A switch mounting plate (2) is required to fasten the sensors (1). The included cable holders (3) can be used for cable fixing.
2. The square nut (2a) with set screw (4) can be used as a positive stop for the sensor (switch activation point when changing sensors).
3. Engage the switch mounting plate (2) in the slot at the compact module and fasten with set screws (5).
4. Push the sensors (1) into the respective slot on the switch mounting plate and secure with the set screw (6).
5. Set the switching point ➡ 6.5

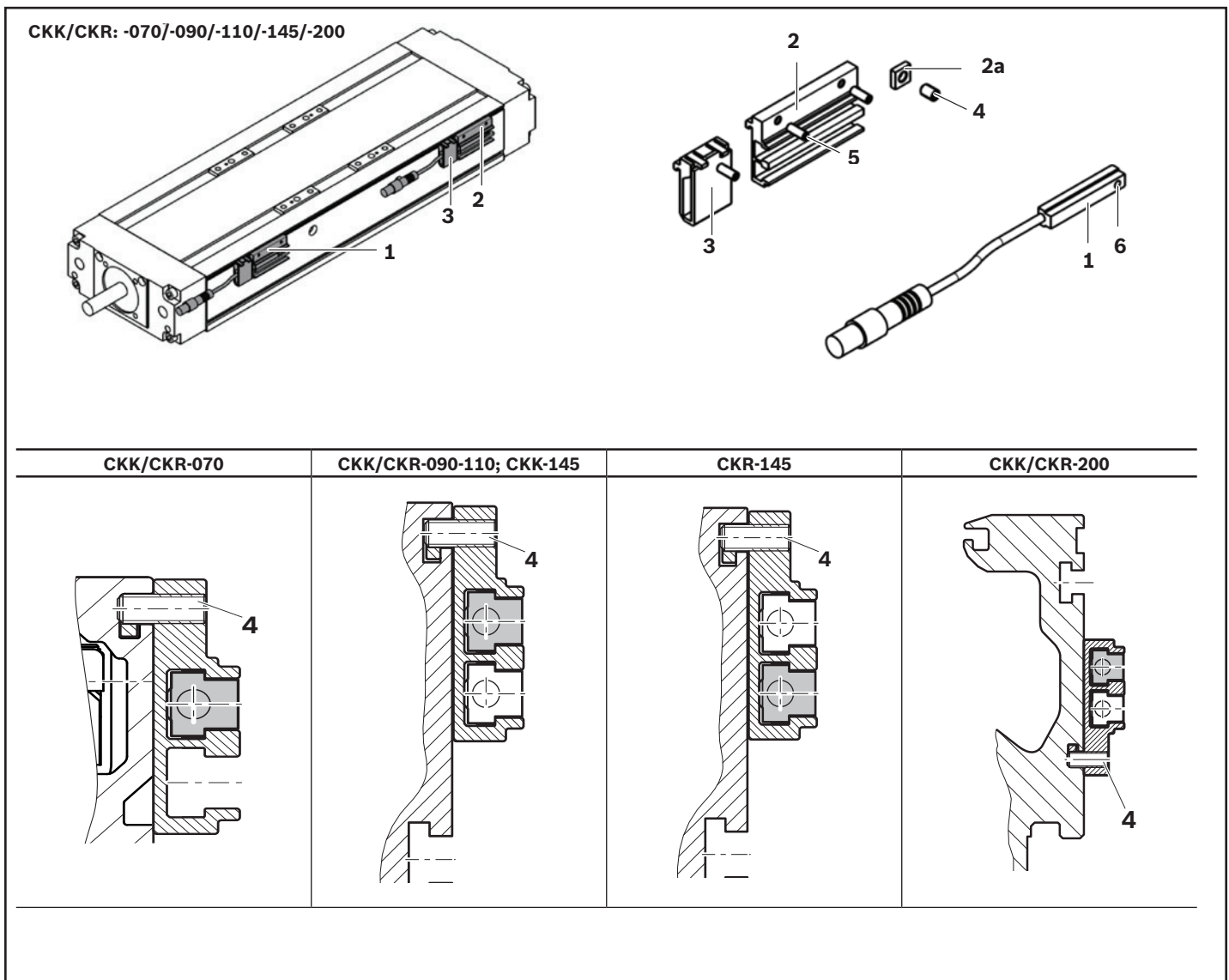
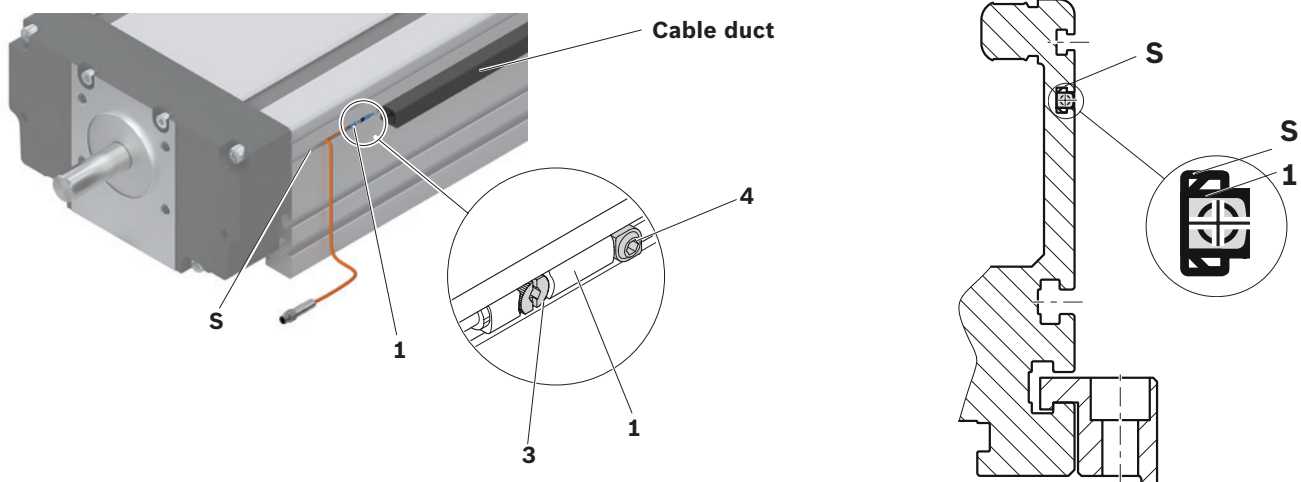


Fig. 8: Mounting the magnetic sensor (CKK/CKR: -070/-090/-110/-145/-200)

6.3.2 CKK/CKR-280

- Position the sensor (1) in the respective slot (S) in the frame and secure it by turning the clamping screw (3). The sliding block (4) is not necessarily required for mounting, it is only required for repeatable mounting of the sensor.

**CKK-280-NN
CKR-280-NN****CKR-280-DB**

For the CKR-280-DB (Compact Module CKR with 2 motor attachments), a switching system (sensor/cable duct) for each drive/carriage must be mounted on each side of the frame.

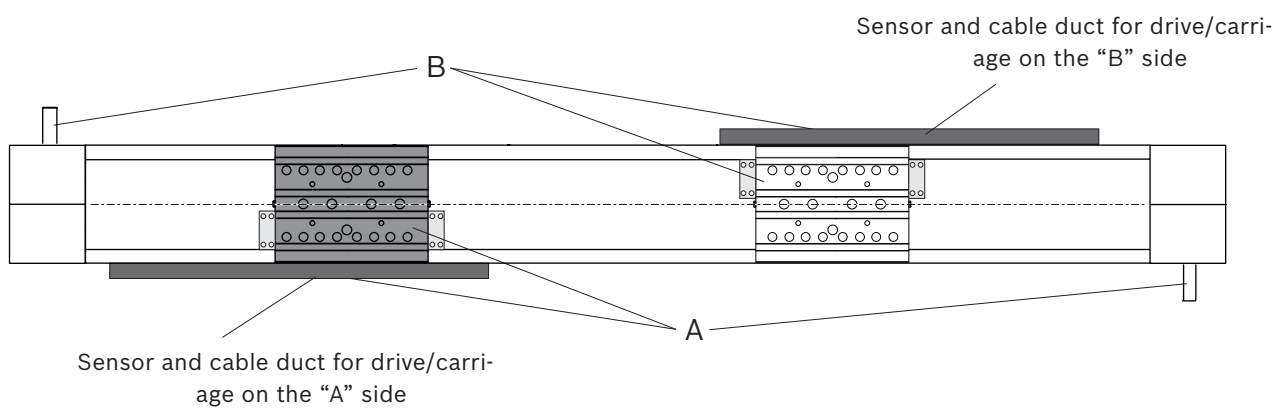


Fig. 9: Mounting the magnetic sensor (CKK/CKR-280)

6.4 Mechanical and proximity switches CKK/CKR-200, cable duct at CKK/CKR-200, -280

- Switch activation is only done via the switching cam using the connection plate. Fig. 10 shows CKR; mounting for CKK is identical.

6.4.1 Mounting the switching cam

- Fasten the switching cam (1) to the connection plate.

6.4.2 Mounting the switching cam to carriage attachments

- Fasten the switching cam to the carriage attachments. Observe the connecting dimensions ➡ Fig. 10.

6.4.3 Mounting the switches

1. Screw the proximity (2) or mechanical (3) switches onto the switch mounting plate (4).
2. Engage the switch mounting plate in the upper slot at the frame and fix in position with set screws (5).
3. Set the switching distances (6) by adjusting the switch and the switching cam.
4. Move the switches into the desired switch activation point
5. Set the switching point ➡ 4.5

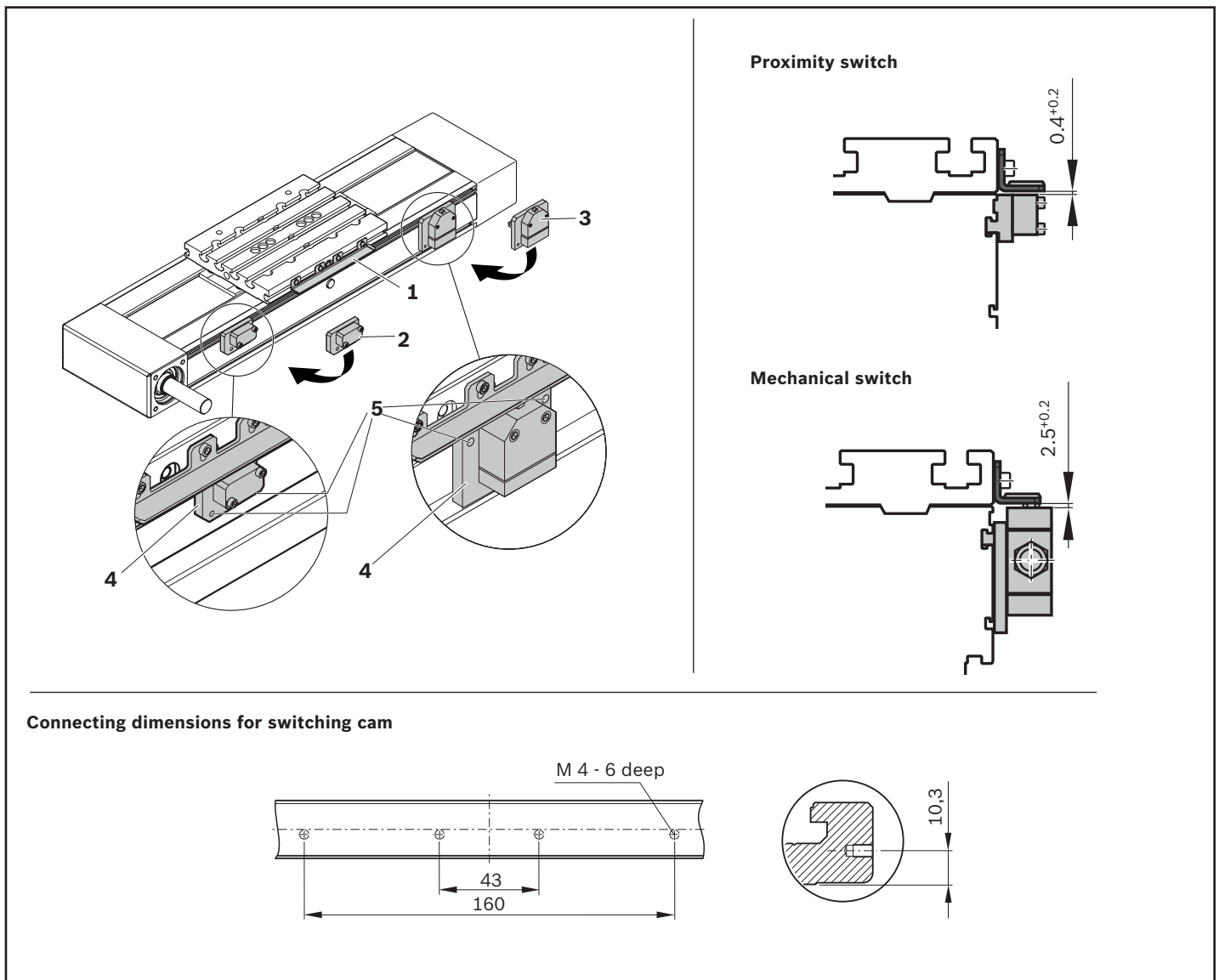


Fig. 10: Mounting of switching system at CKK/CKR-200

6.4.4 Attaching cable duct to frame

1. Measure the required length of the cable duct. Pay attention to the position of the switches and the socket.
2. Saw off and deburr the cable duct.
3. Create a recess to pass the cables through (1).
4. If the existing fastening bores (2) are not sufficient (every 300 mm), make additional M3 fastening bores.
5. Clip the cable duct into the slot at the frame and screw on. Use the M3x8 bolts provided. For greater clearance in the cable duct, use M3x8 set screws.

Inserting the cables

- Cut the cable grommets (3) open according to the cable diameters and insert them. (5 cable grommets included).

Insert and wire the cables.

Mounting the cover strip with no cable duct end cover

6. Measure out, saw off, deburr, install and snap in the cover strip for the cable duct.

EN

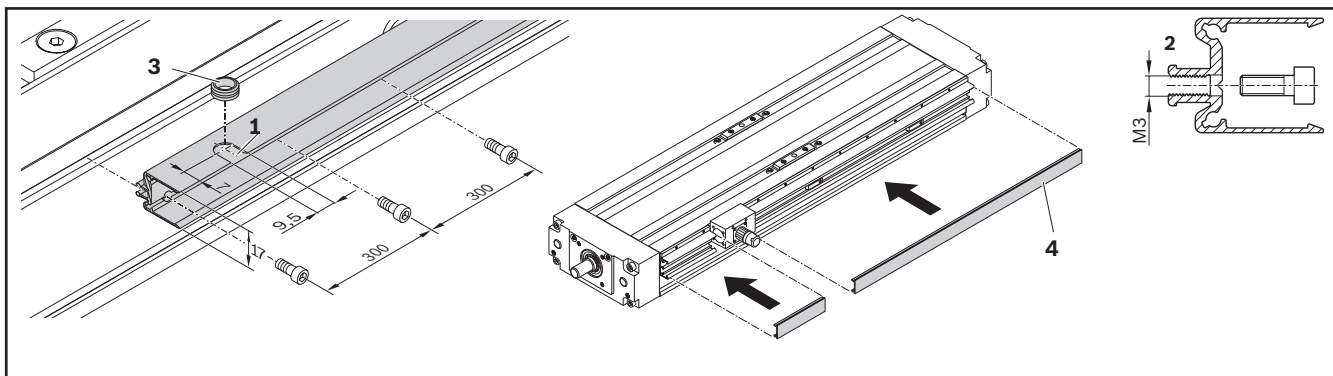


Fig. 11: Mounting the cable duct

6.5 Setting the switching points / moving the switches

6.5.1 Setting the switching points

- The switching points (magnets) are not always located centrally in the carriage.
- Set the switch activation point by moving the switches.
- The cables are potted into the switches. If a switch with a longer cable is required, we recommend a repurchase or using our accessories ► Catalog.

6.5.2 Moving switches

1. Remove the cover (1) from the cable duct (2).
2. Move the switches, set the new switching point, secure the switches with a set screw ► 6.
3. Snap the cover in again.

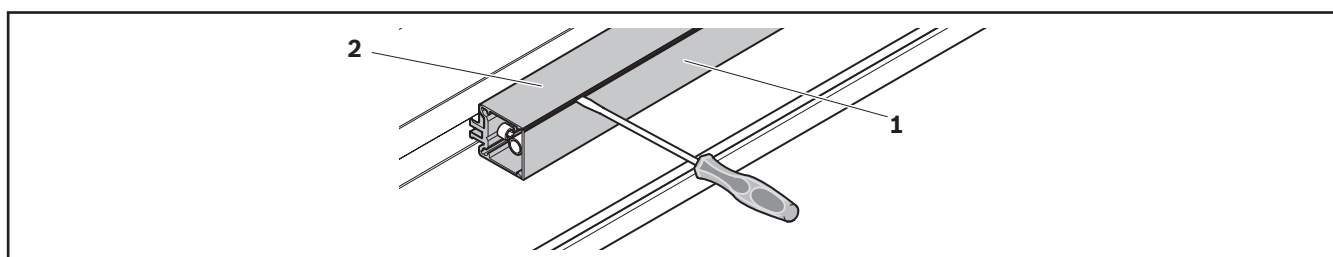


Fig. 12: Removing the cover

7 CKK drive

NOTICE

Risk of excessive torque and rotary speed if limits are not observed!

Avoid tension due to the weight of the motor when mounting the motor!

Damage to the product.

► Observe the specified limits. Technical data and limits ► Catalog.

7.1 Mounting the motor with flange and coupling

7.1.1 CKK-090 / CKK-110

► Observe the notes at the beginning of the chapter

1. Push the flange (1) into the locating feature of the linear motion system (LS) and tighten.
2. Place the coupling halves (5) (elastomer coupling) on the drive journals (2) of the linear motion system (LS) and the motor (M). Set the distances B_2 and C_2 ► Table 3.
3. Tighten the screws on the coupling halves (5) with tightening torque M_{CA} ► Table 3. Tighten the screws on the side of the linear motion system (LS) through the bores in the flange (1).
4. Attach the gear ring (4) to one coupling half (5).
5. Align the motor with one coupling half to match the other one (5). If necessary, release the motor brake or move the carriage (7) so that the motor journal and the coupling turn. Fit the coupling with pressure.
6. Put the motor into the locating feature of the flange and tighten.
7. Mount the caps (6), if available.

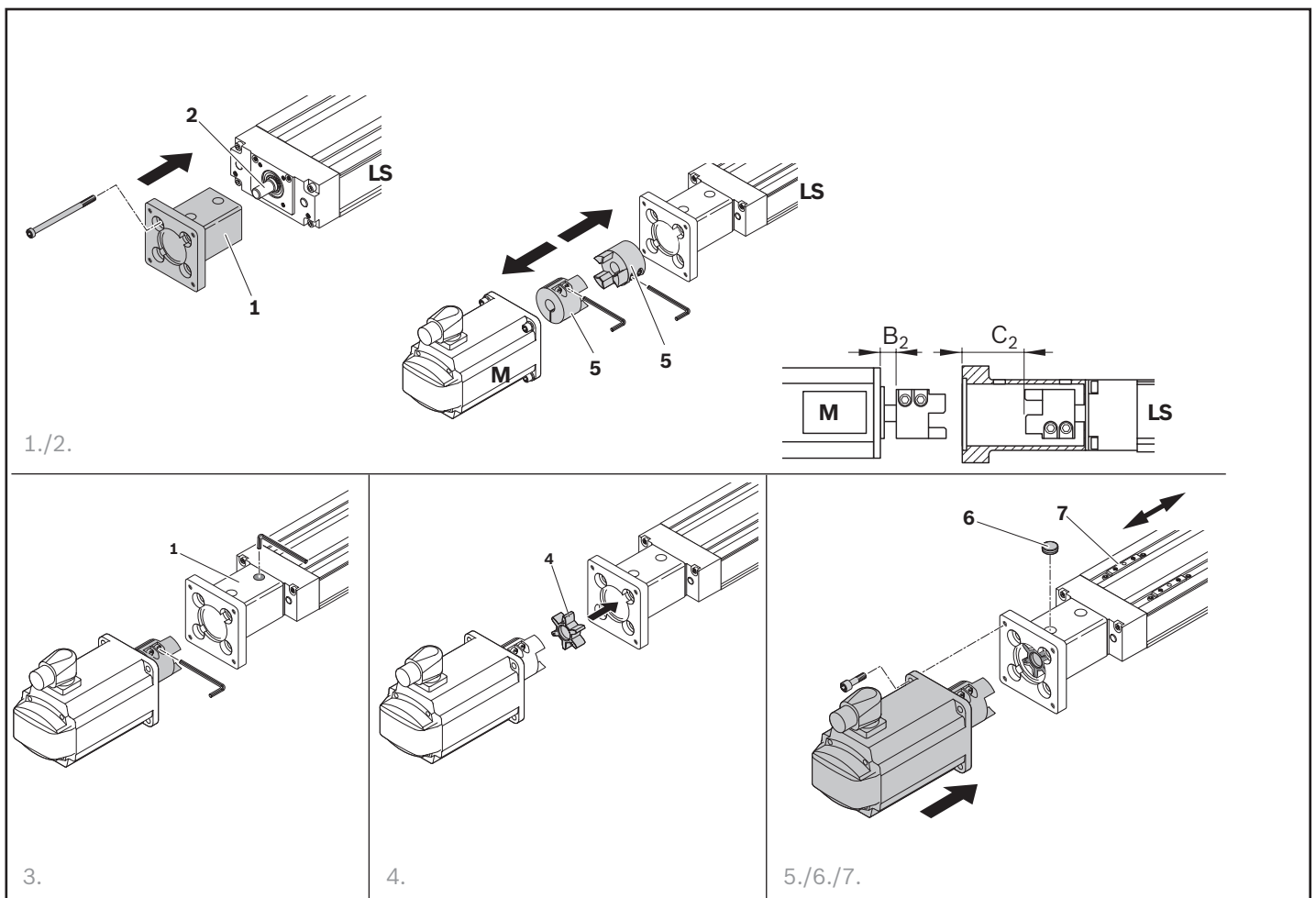
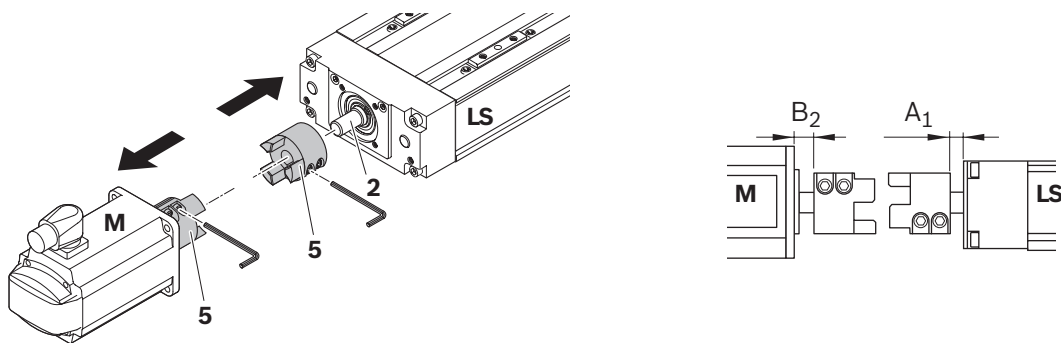


Fig. 13: Motor mounting at CKK-090/-110

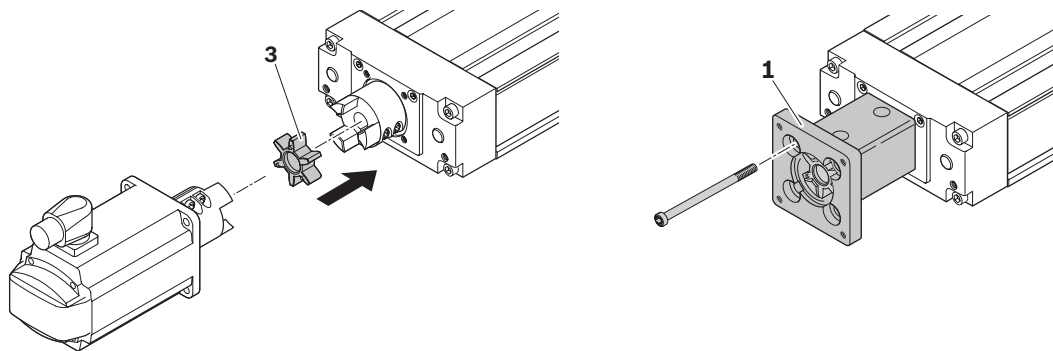
7.1.2 CKK-110 / CKK-145

► Observe the notes at the beginning of the chapter

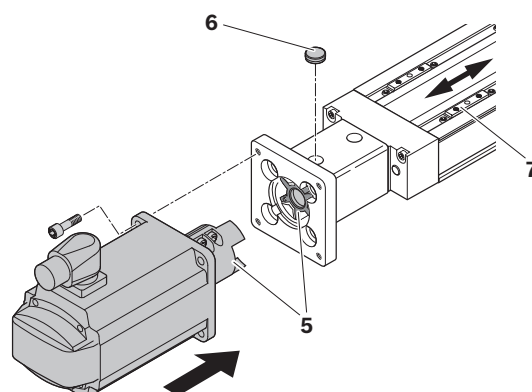
1. Place the coupling halves (5) (elastomer coupling) on the drive journal (2) of the linear motion system (LS) and the motor (M).
2. Set the distances A_1 , B_2 according to table 3.
3. Tighten the screws on the coupling halves with tightening torque M_{cA} → Table 3.
4. Attach the gear ring (3) to one coupling half.
5. Push the flange (1) into the locating feature of the linear motion system and tighten.
6. Align the motor with one coupling half to match the other one (5). If necessary, release the motor brake or move the carriage (7) so that the motor journal and the coupling turn. Fit the coupling with pressure.
7. Put the motor into the locating feature of the flange and tighten.
8. Mount the caps (6), if available.



1./2./3.



4./5.



6./7./8.

Fig. 14: Motor mounting at CKK-110/-145

7.1.3 CKK-070/-200/-280

► Observe the notes at the beginning of the chapter

1. Push the flange (1) into/to the locating feature of the linear motion system (LS) and tighten.
2. Insert the metal bellow coupling (2) into the flange onto the screw journal (3) of the linear motion system (LS).
3. Set dimension A_1 or B_2 ► Table 3.
4. Tighten the screws (4) of the coupling on the side of the linear motion system (LS) through the bores in the flange (1) with tightening torque M_{cA} ► Table 3. If necessary, move the carriage (5) to tighten the screw so that the screw journal and the coupling turn.
5. Push the motor into the locating feature of flange and coupling and fasten with four screws (6).
6. Tighten the screws (4) of the coupling on the side of the motor through the bores in the flange with tightening torque M_{cA} ► Table 3.
7. If necessary, release the motor brake to tighten the second screw and move the carriage (5) so that the motor journal and the coupling turn.
8. Mount the caps (7), if available.

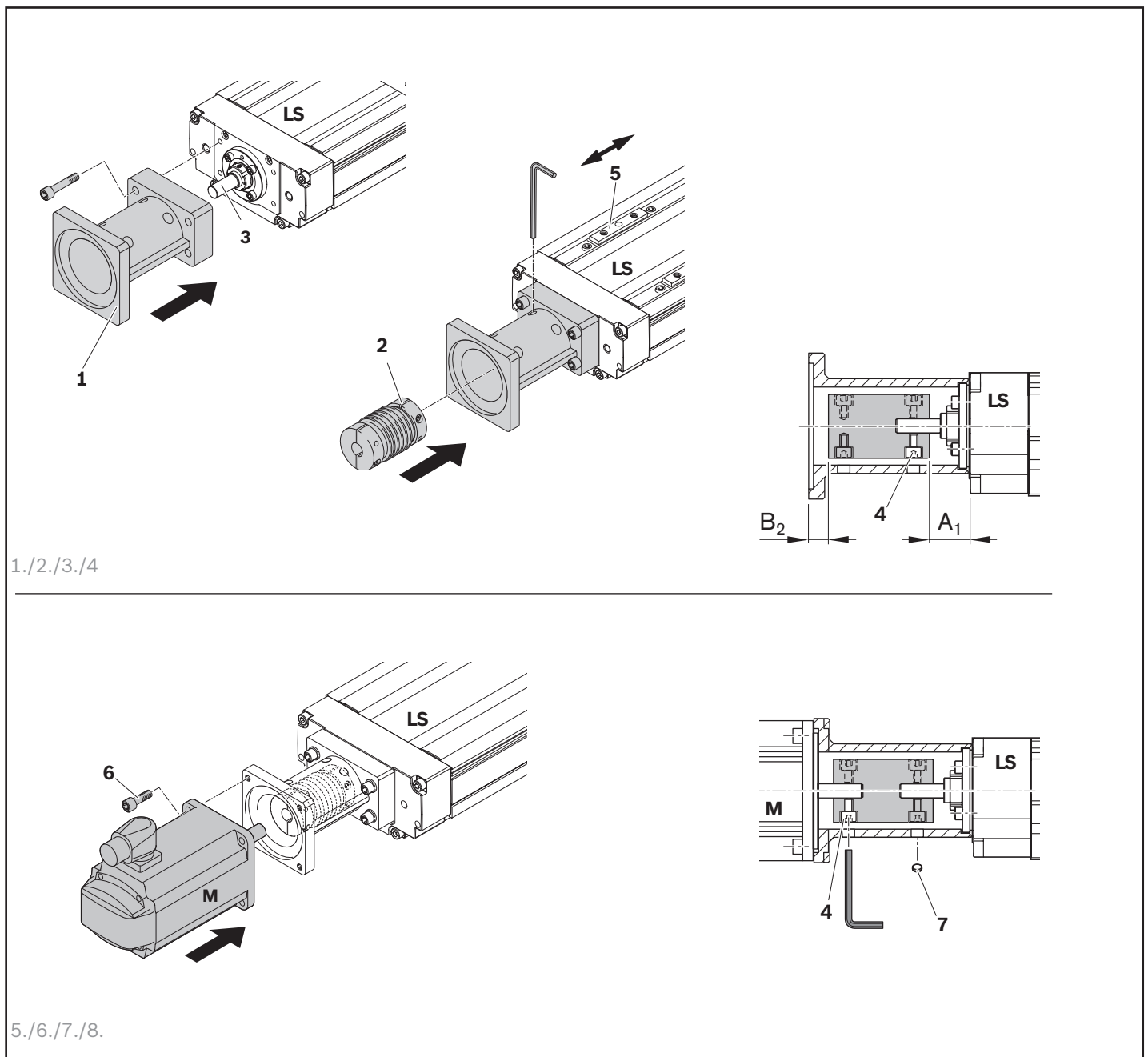


Fig. 15: Motor mounting at CKK-070/-200

Table 3: Dimensions $A_1/B_2/C_2$ for motor mounting with flange and coupling and tightening torque M_{cA}

CKK		Dimensions (mm)			M_{cA} (Nm)	
		$A_1 \pm 0.1$	$B_2 \pm 0.1$	$C_2 \pm 0.1$		
-070	MS2N03-B; MSK030	2.0	5.0	–	M3: 1.7	M4: 3.5
	MSM019	5.0	10.0		M2.5: 1	–
	MSM031B	2.0	5.0		M3: 1.7	M4: 3.5
	08-18-030-2.5-046-M04-007-040	6.0	9.0		M2.5: 1	–
	09-20-040-2.5-063-M05-010-055	2.0	5.0		M3: 1.7	M4: 3.5
-090	MS2N03-B; MSK030	–	4.5	29.5	M4: 2.9	–
	MSM031B		6.0	31.0		
	09-20-040-2.5-063-M05-010-055		4.5	29.5		
	14-30-060-3.0-075-M05-008-072		6.0	31.0		
	14-30-060-3.0-075-M06-008-072		6.0	31.0		
-110	MS2N03-B; MSK030	9.5	5.5	–	M4: 2.9	–
	MS2N03-D	9.5	5.5			
	MS2N04; MSK040	9.5	8.0			
	MSM031C	7.5	4.5			
	MSM041B	–	5.0	32.0	M5: 6.0	M6: 10.5
	09-20-040-2.5-063-M05-010-055	9.0	4.0	–	M4: 2.9	–
	14-30-060-3.0-075-M05-008-072	9.0	8.5			
	14-30-060-3.0-075-M06-008-072	9.0	8.5			
	19-40-080-3.0-100-M06-010-096	–	15.0	42.0	M6: 10.5	
-145	MS2N04; MSK040	13.5	4.3	–	M5: 6.0	M6: 10.5
	MS2N05; MSK050	14.0	15.0			
	MSM041B	14.0	10.0			
	14-30-060-3.0-075-M05-008-072	14.0	5.0			
	14-30-060-3.0-075-M06-008-072	14.0	5.0			
	19-40-080-3.0-100-M06-010-096	14.0	15.0			
-200	MS2N06; MSK060	26.5	17.5	–	M6: 13.0	–
	MSK061	26.5	17.5		M6: 13.0	
	MSK076	25.0	14.0		M8: 30.0	
	MS2N07	25.0	14.0		M8: 30.0	
	24-50-110-3.5-130-M08-010-126	26.5	17.5		M6: 13.0	
	32-58-130-3.5-165-M10-013-155	27.0	19.0		M8: 30.0	
	MS2N07	28.0	18.0	–	M8: 30.0	–
-280	24-50-110-3.5-130-M08-010-126				M6: 13.0	
	32-58-130-3.5-165-M10-013-155				M8: 30.0	

7.2 Mounting the motor with belt side drive

- Observe the notes at the beginning of the chapter

Mounting the housing

1. Screw on the housing (1) of the belt side drive to the linear motion system (LS).

Mounting the first belt pulley

2. Pre-install the belt pulley (2) with flanged wheels, positioned belt and tensioning unit (3) (► 7.2.1) to the screw journal (4).
3. Set distance A ► Table 5.
4. Fasten tensioning unit ► 7.2.1

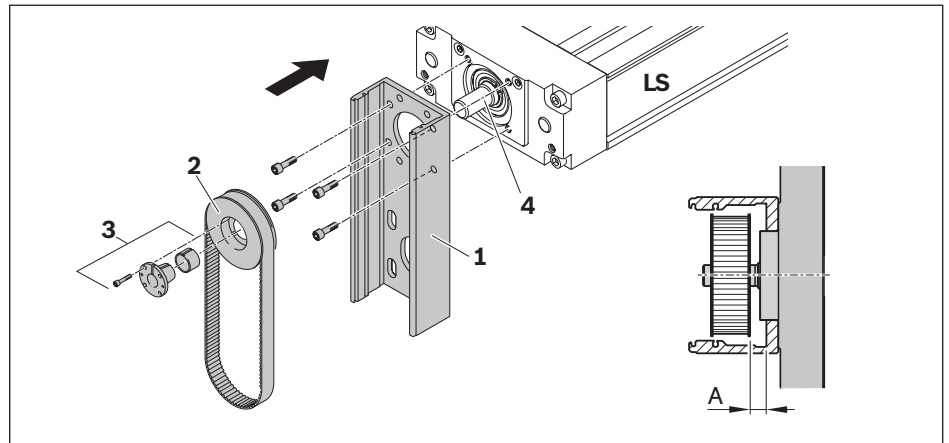


Fig. 16: Mounting the motor with belt side drive

Mounting the support bearing, if available

- Mount the adapter shaft (5) to the belt pulley using screws (6).

1. Push the first retaining ring (3) onto the screw journal or adapter shaft to act as a stop.
2. Push the bearing (2) onto the screw journal and fasten with the second retaining ring (1).
3. Install the bearing flange (4) on the bearing and screw to the housing.

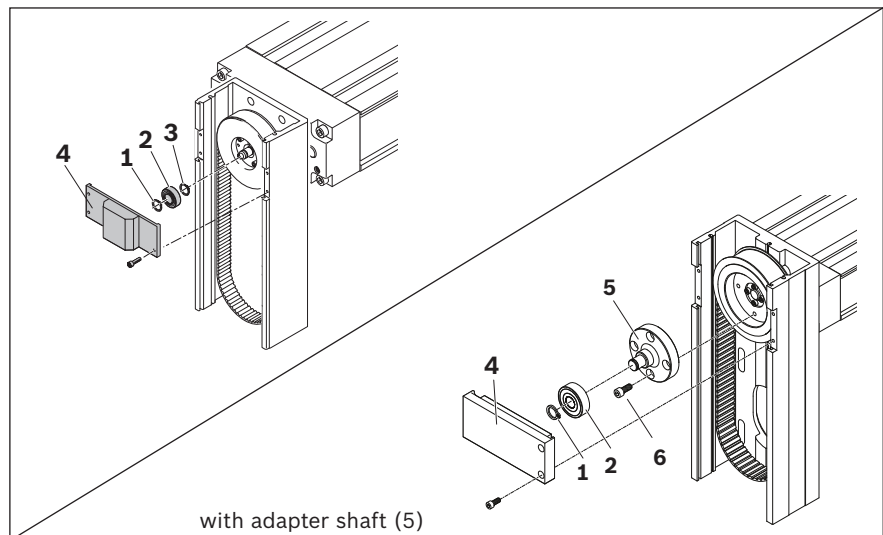


Fig. 17: Mounting the support bearing

Mounting the second belt pulley and the motor at i=1

1. Pre-mount the motor (1) with the two motor bars (2) with screws (3) as close as possible to the linear motion system (LS) to permit problem-free insertion of the motor-side belt pulley (4).
2. Attach the belt pulley and the tensioning unit (5) (► 7.2.1) to the motor journal and insert the toothed belt into the belt pulley.
3. Set distance B ► Table 5.
4. Fasten tensioning unit ► 7.2.1
5. Tension the belt ► 7.2.2.

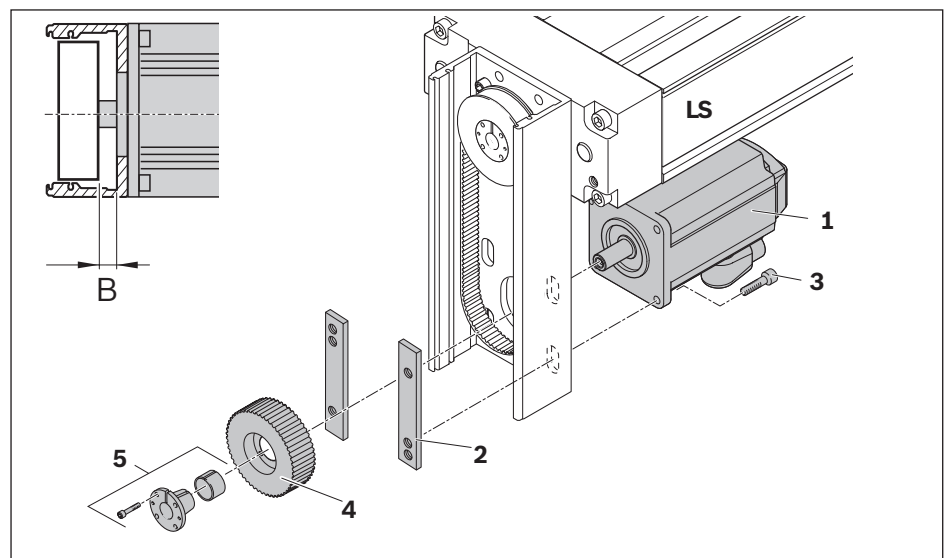


Fig. 18: Mounting the second belt pulley and the motor at i=1

Mounting the second belt pulley and the motor at i=1.5 or i=2

- 1. Attach the belt pulley (1) and the tensioning unit (2) (➡ 7.2.1) to the motor journal.
- 2. Set distance C ➡ Table 5.
- 3. Fasten tensioning unit ➡ 7.2.1
- 4. Pre-mount the motor (5) with the two motor bars (3) with screws (4) as close as possible to the linear motion system (LS) to permit problem-free insertion of the motor-side belt pulley (1).
- 5. Tension the belt ➡ 7.2.2.

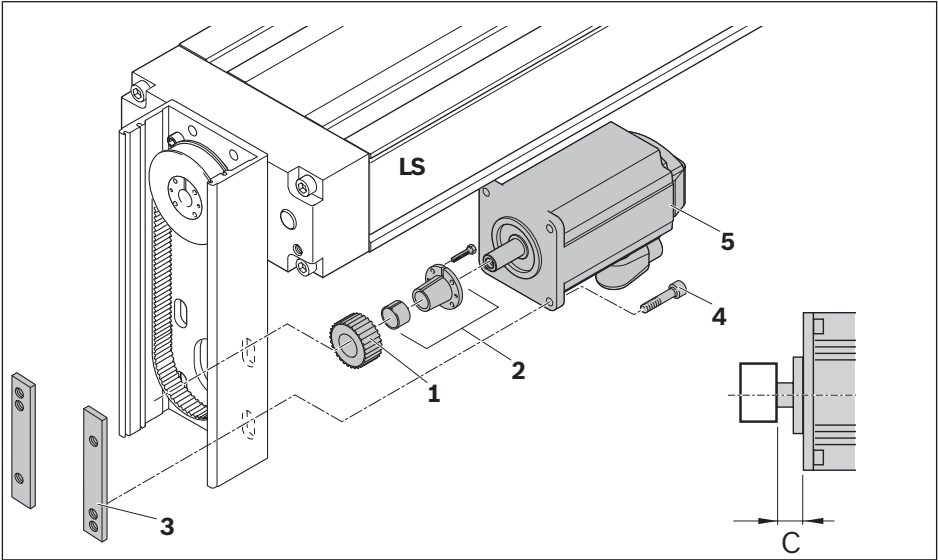


Fig. 19: Mounting the second belt pulley and the motor at i=1.5 or i=2

EN

7.2.1 Fastening the tensioning units

- Lightly oil the tensioning elements.
- Do not use lubricant with MoS₂ additives!
- The tensioning elements must be completely inserted into the bore of the belt pulley.
- Evenly tighten the screws cross-wise in several stages to the tightening torques **M_{A1}** according to table 4.

Type 1 Type 2 Type 3

Table 4: Tightening torques M_{A1}						
$\mu = 0.125$	Type	M2.5	M3	M4	M5	M6
M_{A1} (Nm)	1	–	–	2.9	6.0	10.0
	2	1.2	2.1	4.9	9.7	–
	3	1.2	–	–	–	–

Fig. 20: Fastening the tensioning units

7.2.2 Tensioning the belt

NOTICE

Excessive belt pulley pretensioning can cause the toothed belt to break at the product or the motor!

Damage to the product.

► Observe permissible limits!

1. Screw suitable screws (2) for example through a clamping bar (3) into the two motor bars (1).
2. By tightening the screws (2) evenly, the motor is moved away from the linear motion system (LS) and so the toothed belt is tensioned. Set the belt frequency with a frequency meter (R913057897) in accordance with the manufacturer's specifications and tighten the screws (4) for fastening the motor. The belt frequency is shown on the information sign in the cover and in the guide R320103158.

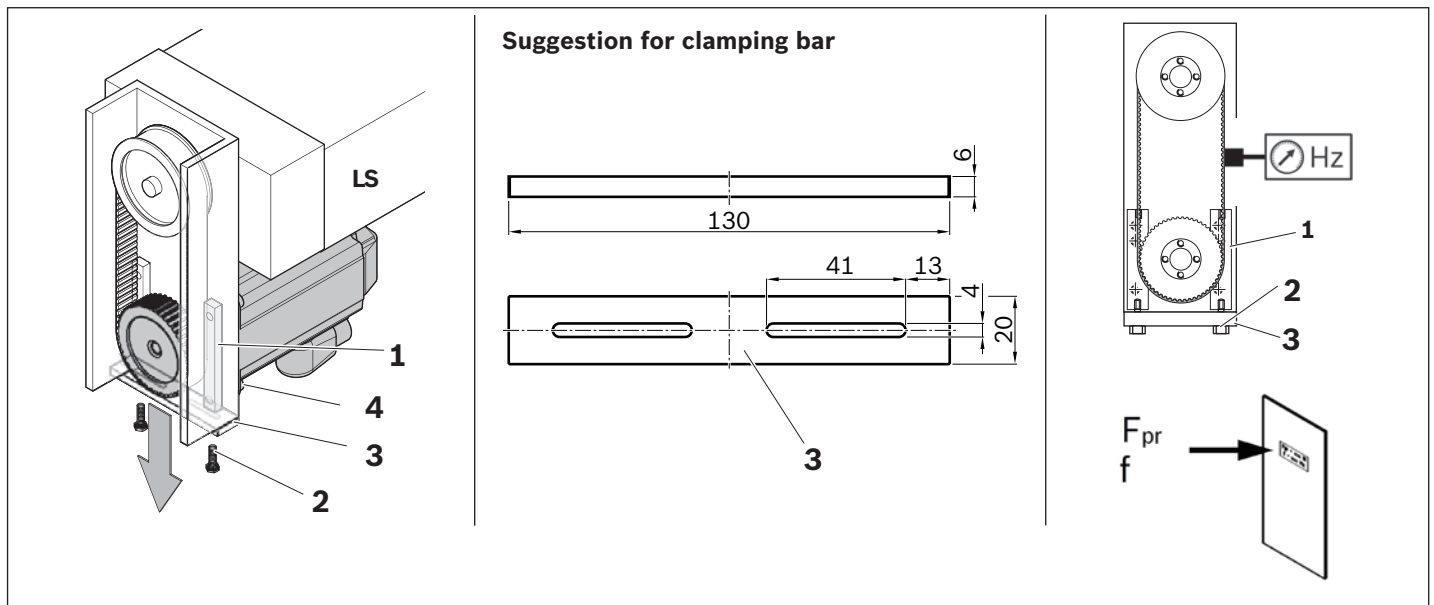


Fig. 21: Tensioning the belt

Fastening the covers of the belt side drive

1. Fastening all covers to the housing of the belt side drive.

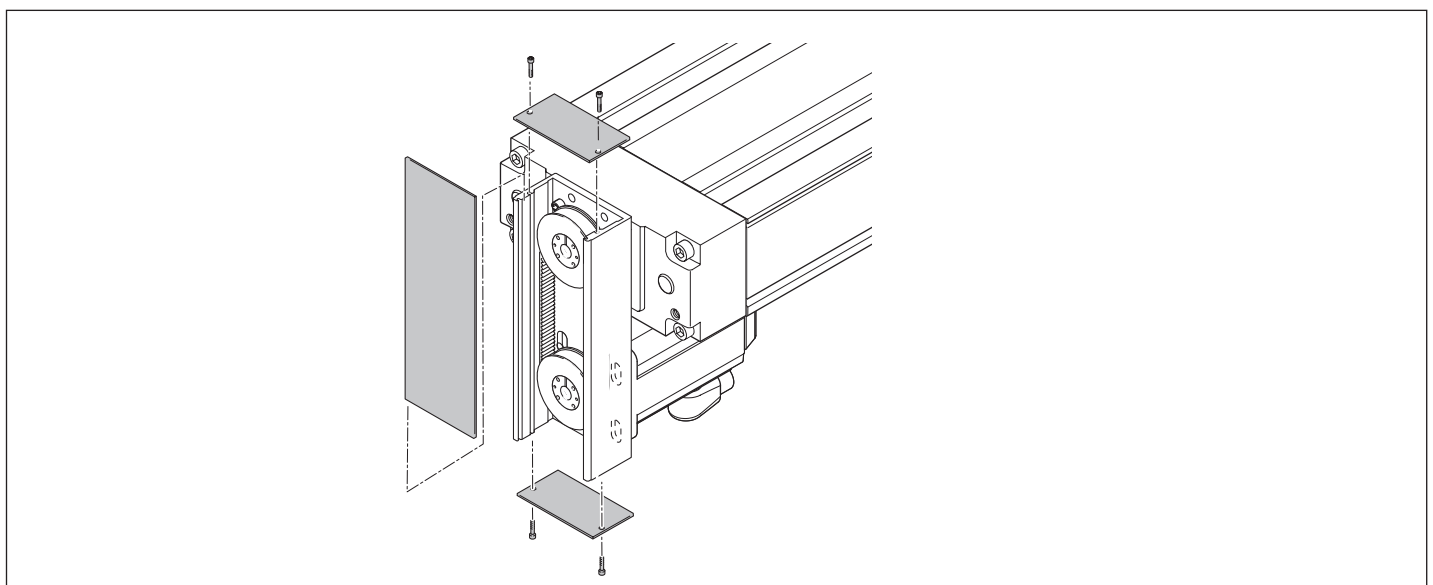


Fig. 22: Fastening the covers of the belt side drive

Table 5: Dimensions A/B/C for motor mounting with belt side drive

CKK		Gear ratio i	Dimensions (mm)		
			A	B	C
-070	MS2N03-B; MSK030	1	7	7	-
		1.5		-	12
	MSM019B	1	5	5	-
		1.5		-	8
	MSM031B	1	7	7	-
		1.5		-	12
	08-18-030-2.5-046-M04-007-040	1	5	7	-
		1.5		-	12
-090	MS2N03-B; MSK030	1	7	7	-
		1.5		-	5
	MSM031B	1		7	-
		1.5		-	5
	09-20-040-2.5-063-M05-010-055	1		7	-
		1.5		-	5
-110	MS2N03-B; MSK030	1	7	7	-
		1.5		-	5
	MS2N04; MSK040	1	10	9	-
		1.5		-	16
	MSM031C	1	7	7	-
		1.5		-	5
	MSM041B	1	10	9	-
		1.5		-	16
	09-20-040-2.5-063-M05-010-055	1	7	7	-
		1.5		-	5
	14-30-060-3.0-075-M05-008-072	1	10	9	-
		1.5		-	16
-145	MS2N04; MSK040	1	10	9	-
		1.5		-	16
	MS2N05; MSK050	1	11	10	-
		2		-	19
	MSK061	1	11	10	-
		2		-	19
	MSM041B	1	10	9	-
		1.5		-	16
	14-30-060-3.0-075-M05-008-072	1	8	9	-
		1.5		-	16
	14-30-060-3.0-075-M05-008-072	2	11	-	17
		1		-	16
-200	MS2N06; MSK060	1	12	10	-
		2		-	19
	MSK061	1	12	10	-
		2		-	19
	19-40-080-3.0-100-M06-010-096	1	12	10	-
		2		-	19
	24-50-110-3.5-130-M08-010-126	1	12	10	-
		2		-	19
-280	MS2N07	1	13	11	-
		2		21	-
	24-50-110-3.5-130-M08-010-126	1		11	-
		2		21	-
	32-58-130-3.5-165-M10-013-155	1		11	-
		2		21	-

8 CKR drive

NOTICE

Risk of excessive torque and rotary speed if limits are not observed!

Damage to the product.

- Observe the specified limits.

Avoid tension due to the weight of the motor when mounting the motor!

Damage to the product.

- Install the motor in a vertical position.

Improper motor mounting!

Damage to the product.

- Grease-free motor journal, clamping hub and sleeve. Clamping hub: screw specification ➔ 12.2

8.1 Overview of motor/gear attachment

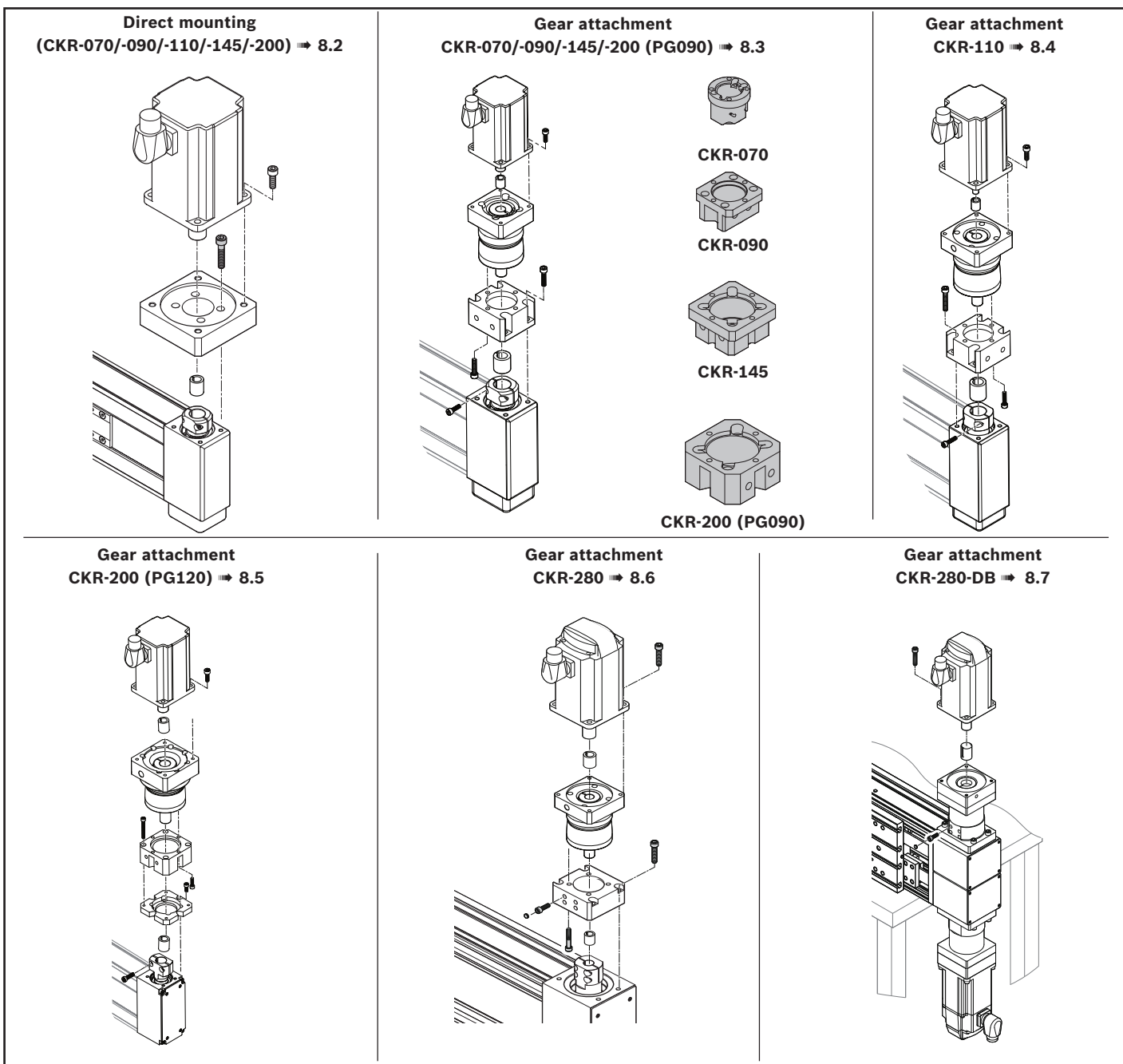
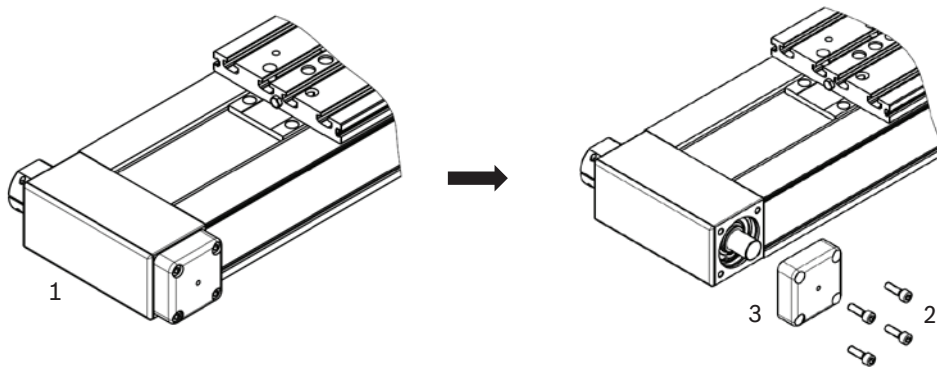


Fig. 23: Overview

Continued overview

- In the version of the end enclosure drive (1) with clamping hub or for gear attachment, a second drive journal is available by removing the screws (2) and the cover (3).



EN

8.2 Mounting the motor/direct mounting (i=1)

- Observe the notes at the beginning of the chapter

1. Turn the linear motion system (1) so that the clamping hub (3) points upwards.
2. If available, insert the sleeve (4) into the clamping hub (3) so that the slots point in the same direction.
3. Fasten the flange (5) with screws (6) to the end enclosure (2).
4. Vertically attach the motor (7) to the flange; the centering is done via the clamping hub. Push the motor journal into the clamping hub (3) until the motor touches the flange (5).
5. Tighten the tensioning screws (9) of the clamping hub through the bores in the flange.
6. Mount the caps (10), if available.
7. Mount the motor to the flange (5) using screws (8).

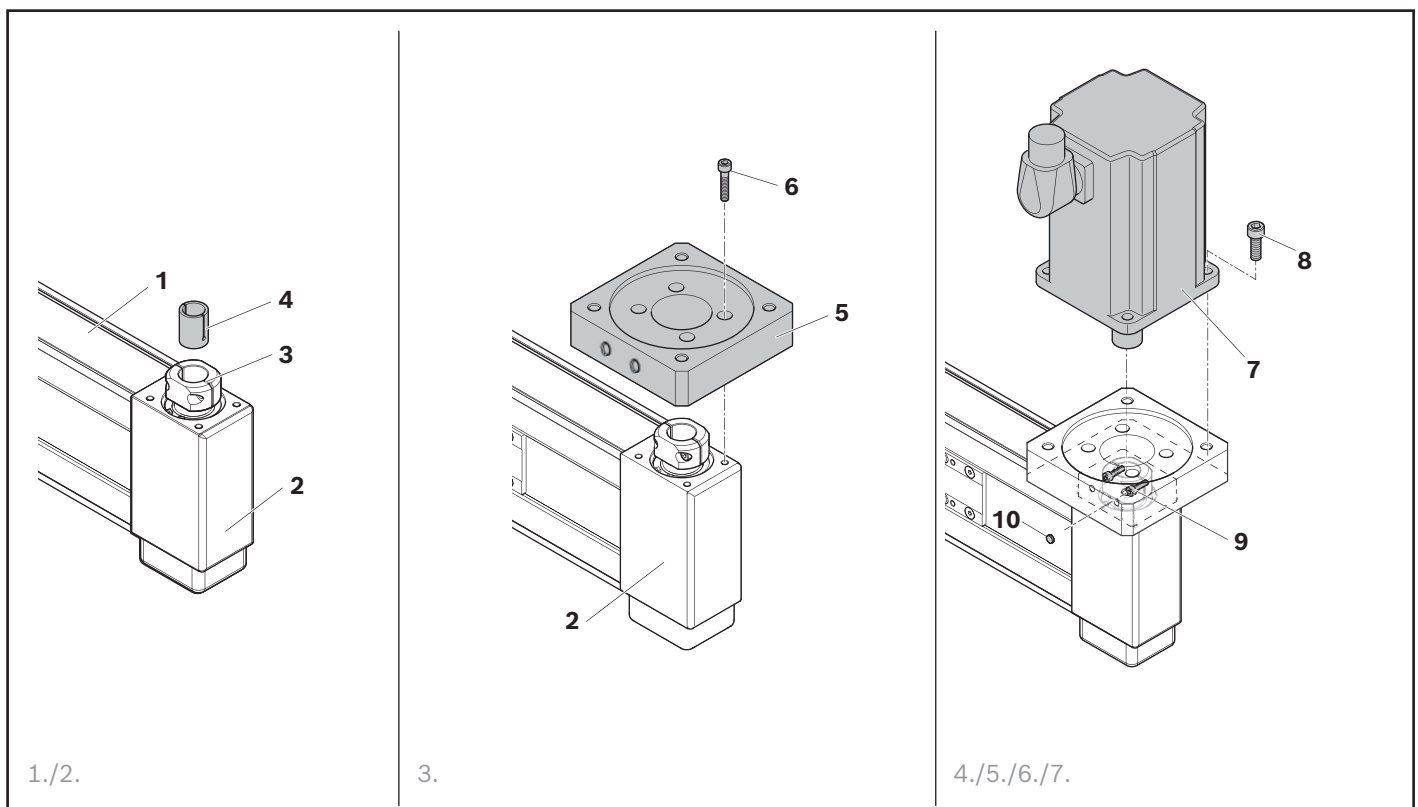


Fig. 24: Mounting the motor/direct mounting i=1

8.3 Gear/motor attachment CKR-070/-090/-145/-200 (PG090)

► Observe the notes at the beginning of the chapter

1. Turn the linear motion system (1) so that the clamping hub (3) points upwards.
2. Fasten the flange (4) with fastening screws (5) to the end enclosure (2).
3. If available, insert the sleeve (7) into the clamping hub (3) so that the slots point in the same direction.
4. Vertically attach the gear unit (6) to the flange (4). Push the gear journal into the clamping hub (3) until the gear unit touches the flange. The centering is done via the clamping hub.
5. Tighten the tensioning screws (8) of the clamping hub through the bores in the flange (4) with $M_{A2} \Rightarrow 12.2$.
6. Fasten the gear unit (6) with fastening screws (9) to the flange (4).
7. Mount the caps (10), if available.
8. Install the motor (11) on the gear (6) using screws (12) ► Observe the enclosed instructions for the gear unit. If available, insert the sleeve (13) into the gear (6) so that the slots point in the same direction.

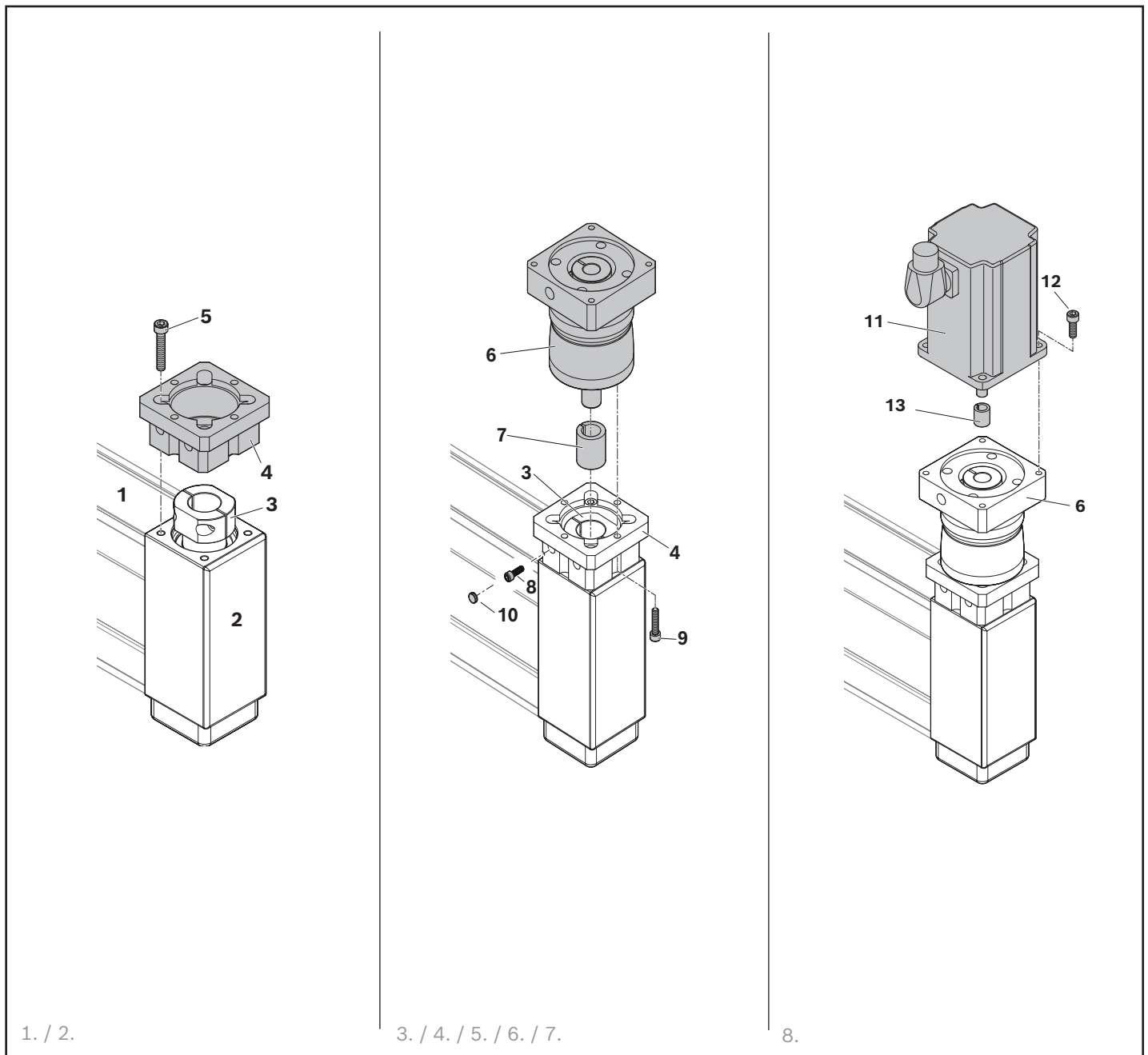


Fig. 25: Gear attachment CKR-070/-090/-145/-200 (PG090)

8.4 Gear/motor attachment CKR-110

- Observe the notes at the beginning of the chapter;
an already mounted flange (4) must be disassembled for the gear mounting on the customer side.
1. Turn the linear motion system (1) so that the clamping hub (3) points upwards.
 2. Fasten the flange (4) with fastening screws (5) to the gear (6).
 3. If available, insert the sleeve (7) into the clamping hub (3) so that the slots point in the same direction.
 4. Vertically attach the gear unit with mounted flange (4a) to the end enclosure (2). Push the gear journal into the clamping hub (3) until the flange touches the end enclosure. The centering is done via the clamping hub.
 5. Tighten the tensioning screws (8) of the clamping hub through the bores in the flange (4) with $M_{A2} \Rightarrow 12.2$.
 6. Fasten the flange (4) with fastening screws (9) to the end enclosure (2).
 7. Mount the caps (10), if available.
 8. Install the motor (11) on the gear (6) using screws (12) ► Observe the enclosed instructions for the gear unit.
If available, insert the sleeve (13) into the gear (6) so that the slots point in the same direction.

EN

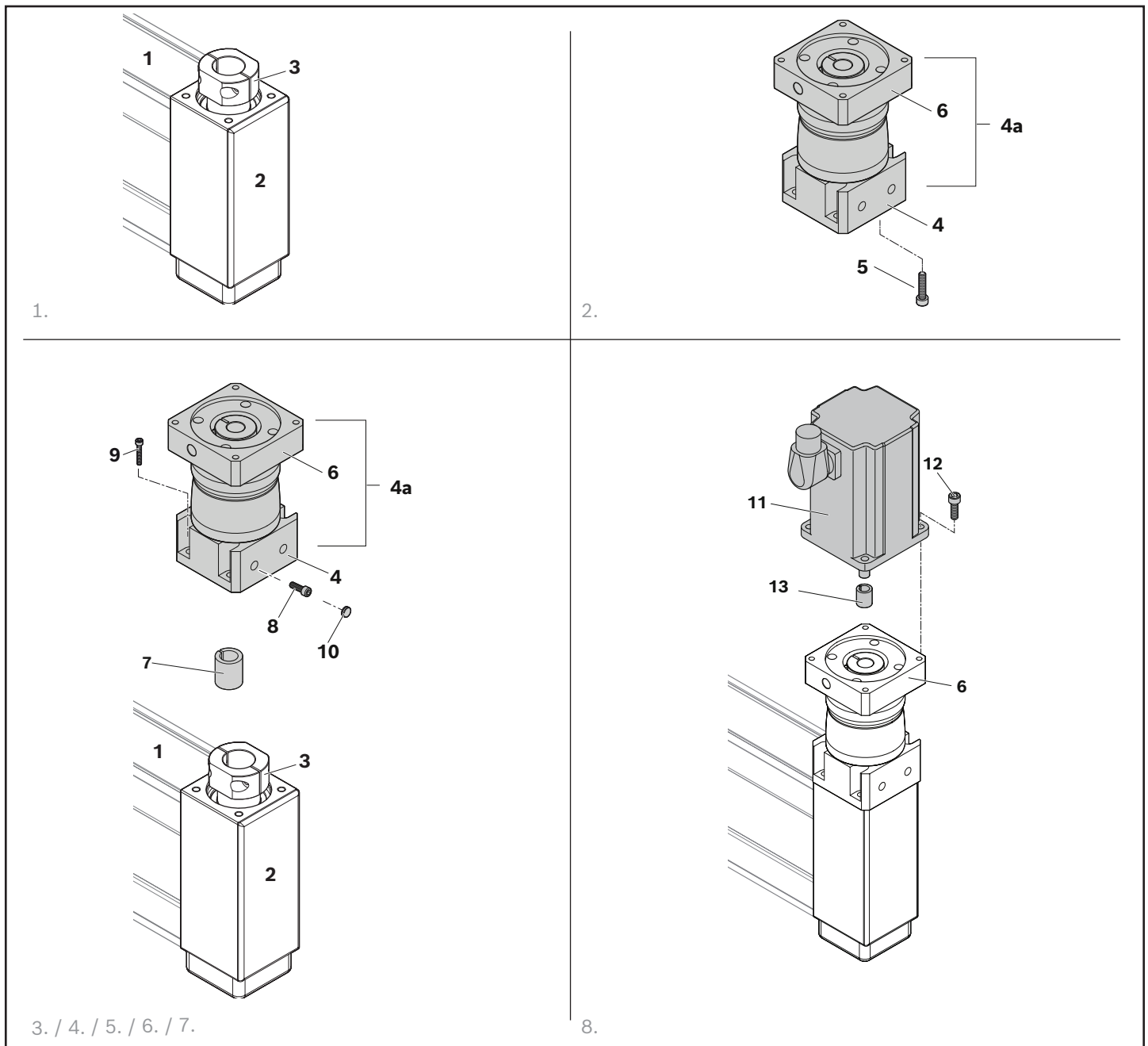


Fig. 26: Gear attachment CKR-110

8.5 Gear/motor attachment CKR-200 (PG120)

► Observe the notes at the beginning of the chapter

1. Turn the linear motion system (1) so that the clamping hub (3) points upwards.
2. Fasten the adapter flange (5) with fastening screws (4) to the end enclosure (2).
3. Fasten the flange (6) with fastening screws (7) to the adapter flange (5).
4. If available, insert the sleeve (8) into the clamping hub (3) so that the slots point in the same direction.
5. Vertically attach the gear unit (9) to the flange (6). Push the gear journal into the clamping hub (3) until the gear unit touches the flange. The centering is done via the clamping hub.
6. Tighten the tensioning screws (10) of the clamping hub through the bores in the flange (6) with $M_{A2} \Rightarrow 12.2$.
7. Fasten the gear unit (9) with fastening screws (11) to the flange (6).
8. Mount the caps (12), if available.
9. Install the motor (13) on the gear (9) using screws (15) ► Observe the enclosed instructions for the gear unit.
If available, insert the sleeve (14) into the gear (6) so that the slots point in the same direction.

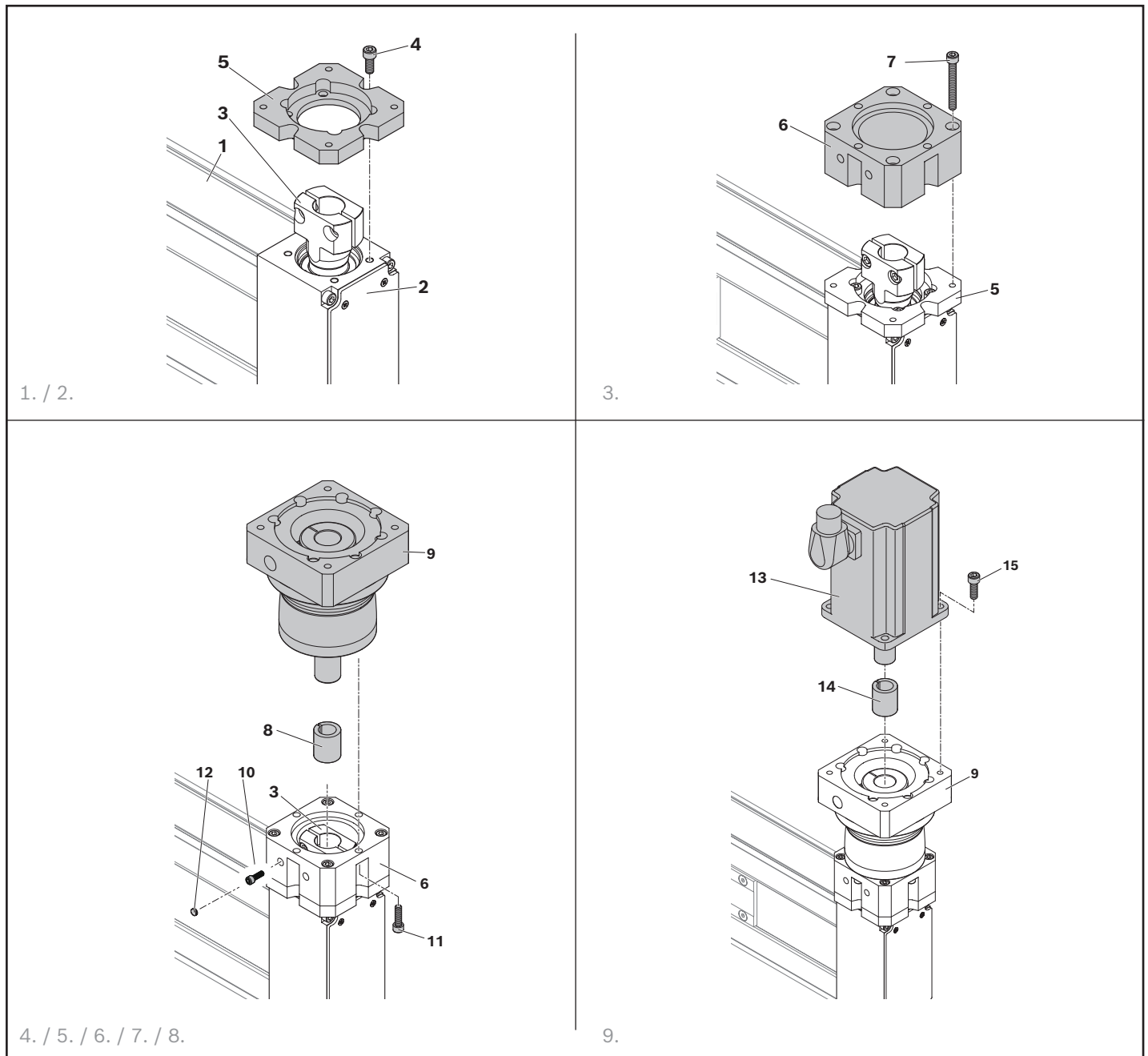


Fig. 27: Gear attachment CKR-200 (PG120)

8.6 Gear/motor attachment CKR-280

- Observe the notes at the beginning of the chapter;
an already mounted flange (4) must be disassembled for the gear mounting on the customer side.
1. Turn the linear motion system (1) so that the clamping hub (3) points upwards.
 2. Fasten the flange (4) with fastening screws (5) to the gear (6).
 3. If available, insert the sleeve (7) into the clamping hub (3) so that the slots point in the same direction.
 4. Vertically attach the gear unit with mounted flange (4a) to the end enclosure (2). Push the gear journal into the clamping hub (3) until the flange touches the end enclosure. The centering is done via the clamping hub.
 5. Preassemble the tensioning screws (8) of the clamping hub through the bores in the flange (4) crosswise, then tighten **with M_{A2}** ➔ 12.2.
 6. Fasten the flange (4) with fastening screws (9) to the end enclosure (2).
 7. Mount the caps (10), if available.
 8. Install the motor (11) on the gear (6) using screws (12) ➔ Observe the enclosed instructions for the gear unit. If available, insert the sleeve (13) into the gear (6) so that the slots point in the same direction.

EN

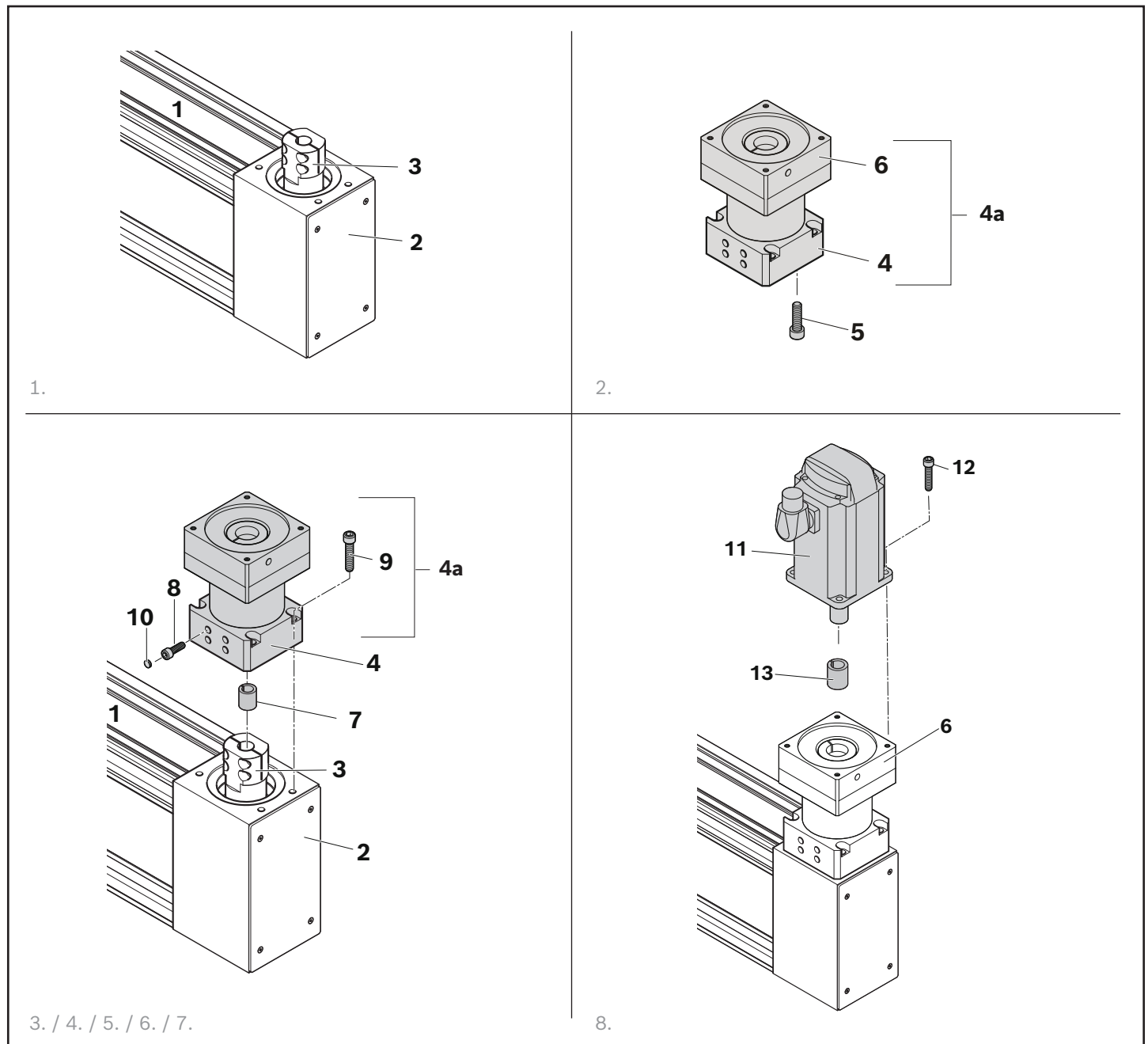


Fig. 28: Gear attachment CKR-280

8.7 Gear/motor attachment CKR-280-DB

- Observe the notes at the beginning of the chapter;
an already mounted flange (4) must be disassembled for the gear mounting on the customer side.

8.7.1 Mounting step first drive

- Mounting steps 1 to 8 for the gear/motor attachment ➡ 8.6.

8.7.2 Mounting steps second drive

1. Rotate the linear system accordingly (support frame ➡ Fig. 28), so that the clamping hub (3) points upwards.
2. Repeat mounting steps 1 to 8 ➡ 8.6.

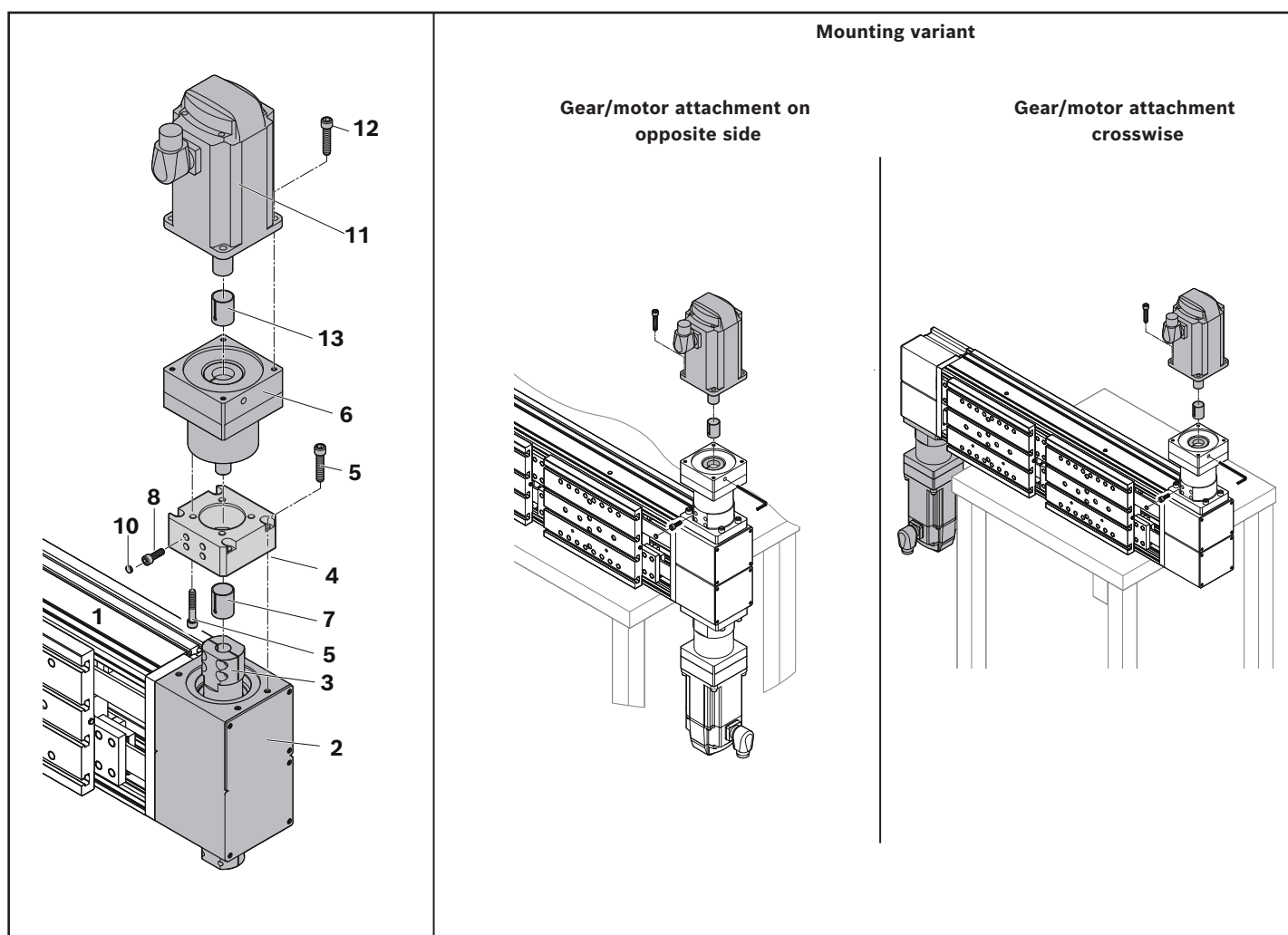


Fig. 29: Gear/motor attachment CKR-280-DB

9 Maintenance



Never perform maintenance on running machines.

Secure the system against restart and unauthorized use during maintenance.

10 Lubrication



- Do not use lubricants with solid particles (e.g. graphite or MoS₂)!
- Using lubricants other than those specified or reduced relubrication intervals may impact performance and result in chemical interaction of the lubricants with the plastics used in the product. Central lubrication systems also need to be able to pump these lubricants.
- For relubrication, it is not possible to switch from grease to oil lubrication and vice-versa.
- If using a central lubrication system, make sure all lines and elements are filled with lubricant all the way to the connection to the consumer (carriage) and that there are no air bubbles.
 - We recommend carrying out initial lubrication (if not already carried out by the manufacturer) separately using a grease gun before connecting to the central lubrication system.
 - The number of pulses are determined according to the partial amounts and the piston distributor size (The pulse count can be calculated as the quotient (rounded to the next whole figure) of the re-lubrication quantity and the smallest permissible piston distributor size (minimum impulse quantity). The lubricating cycle time is the result of dividing the lubrication interval by the determined pulse count).
- If other consumers are connected to the single-line lubrication system, the weakest link in this chain determines the lubrication cycle.
- Lubricant reservoirs should contain an agitator to ensure the lubricant can flow (avoids hardening in the reservoir).
- Rexroth recommends piston distributors by SKF. These should be installed as close as possible to the lube fittings of the carriage. Avoid long lines (no longer than 1 m) and narrow line diameters. Install the lines at a gradient.
- If environmental factors such as contamination, vibrations, impact loads, etc. are present, we recommend shorter relubrication intervals. Even under normal operating conditions, relubrication is required every 2 years due to grease aging.
- Excess lubricant can accumulate inside of the product or flow out and may lead to contamination of the environment.
- Validity under normal operating conditions ! Respective product instructions.

NOTES

Lack of lubrication

Failure to perform basic lubrication will damage the product.

- ▶ Never put a linear motion system into operation without having carried out basic lubrication.
- ▶ In case of products with steel sealing strip, the latter is to be coated with an oil film for each lubrication interval.

Overlubrication

Increased coefficients of friction resulting in increased temperature generation in the ball screw assembly and the ball rail systems.

- ▶ Do not overlubricate the linear motion system

Risk of insufficient lubrication due to use of improper lubricants!

Damage to the product.

- ▶ Use only the recommended lubricants

Risk of property damage due to insufficient lubrication!

Loss of performance and corrosion.

- ▶ Observe the lubrication intervals.

Avoiding pressure peaks due to excessive speed after lubrication

Damage to the product

- ▶ Move slowly (< 0.5 m/s) immediately after lubrication

Performance altered by special operating conditions!

Damage to the product.

- ▶ Before commissioning the product under special operating conditions, please consult Bosch Rexroth AG. This applies especially to environments with glass fiber or wood dust, solvents, extreme temperatures, and for short stroke applications.

⚠ **Linear motion systems with consistency class NLGI 00 initial greasing must not be pre-lubricated with lubricants of consistency class NLGI 2!**

Use of lubricants with H1 approval:

NOTICE

Lubrication of the preserved carriage with H1 lubricant

Loss of H1 approval

- ▶ H1 lubricants or release agents (preservative agents) only have H1 approval if they are separated and unmixed (including at the lubrication point). A blend of two H1 approval lubricants or separating agents does not have H1 approval.

No approval or authorization for use in the food industry

- ▶ Because of the use of H1 lubricants, the products listed under 1.1 do not have authorization or approval for use in the food industry.

Components lubricated at the factory

- ▶ Components lubricated at the factory, such as deep-groove ball bearings, do not use H1 lubricants.

10.1 Overview of lubrication versions

This chapter describes the basic lubrication and relubrication of the linear motion system by the customer, if this has not been done by the manufacturer. The profiled rail system and the ball screw assembly must be lubricated. The basic lubrication of all other components, e.g. deep-groove ball bearings, cover strips, gear units, etc. is done by the manufacturer.

► Before using lubricants, read and observe the appropriate safety data sheets!

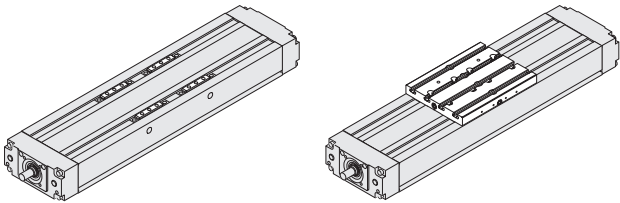
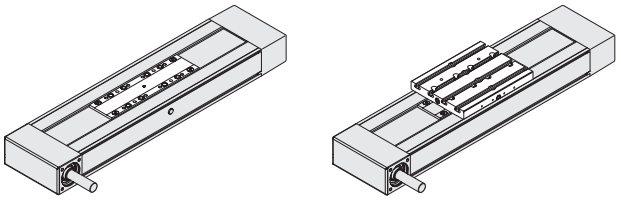
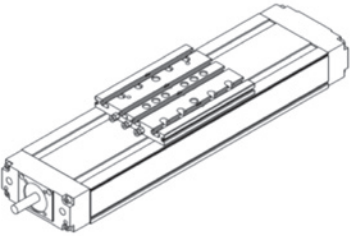
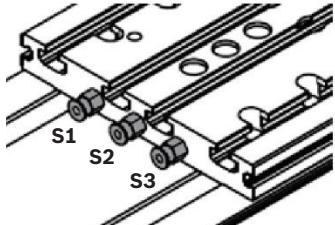
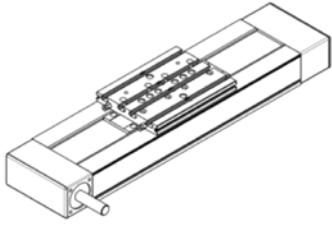
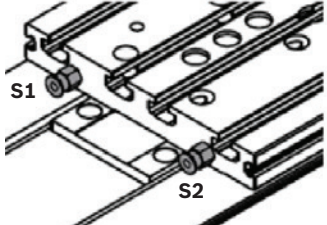
Compact modules CKK Lubrication version LSS, LPG	Compact modules CKR Lubrication version LSS, LPG
► Grease lubrication using manual grease gun via - Frame (lubrication points A1, A2, A3) - Carriage (lubrication point X₁, X₂, X₃, X₄) - Connection plate	► Grease lubrication using manual grease gun via - Frame (lubrication point A1) - Carriage (lubrication point X₁) - Connection plate
 with connection plate	 with connection plate
Lubrication version LCF, LCO	Lubrication version LCF, LCO
► 3 lube fittings ► Prepared for connection to central lubrication systems	► 2 lube fittings ► Prepared for connection to central lubrication systems
 	 
S1 Lube connection, runner block left S2 Lube connection, runner block right S3 Lube connection, BASA ball screw drives	S1 Lube connection, runner block left S2 Lube connection, runner block right

Fig. 30: Lubrication versions

► For further information on lubrication versions, see ➡ following chapters.

10.2 Lubricants

Table 6: Lubricants

Lubrication version	LSS		LPG		
Size	CKx-110, -145, -200, -280	CKx-070, -090	CKx-110, -145, -200, -280	CKx-070, -090	
Basic lubrication	Dynalub 510	Dynalub 520	Preserved, basic lubrication required		
Consistency class	NLGI 2 (DIN 51818)	NLGI 00 (DIN51818)	-		
Marking	KP2K-20 (DIN 51825)	GP00K-20 (DIN 51826)	-		
Lubrication with grease gun	yes	yes	yes		
Prepared for connection to central lubrication systems	-	-	-		
Recommended lubricants	Dynalub 510 (grease lubricant) (NLGI2 DIN 51818)	Dynalub 520 (liquid grease) (NLGI00 DIN 51818)	Dynalub 510 (grease lubricant) (NLGI2 DIN 51818)	Dynalub 520 (liquid grease) (NLGI00 DIN 51818)	
Features	• Good water resistance • Corrosion protection • Temperature range: -20 to +80 °C		• Good water resistance • Corrosion protection • Temperature range: -20 to +80 °C		
Material numbers	R3416 037 00 (400 g cartridge)	R3416 043 00 (400 g cartridge)	R3416 037 00 (400 g cartridge)	R3416 043 00 (400 g cartridge)	
	R3416 035 00 (25 kg container)	R3416 042 00 (5 kg bucket)	R3416 035 00 (25 kg container)	R3416 042 00 (5 kg bucket)	
Alternative lubricants	• Tribol GR 100-2 PD • Elkalub GLS 135/N2	• Tribol GR 100-00 PD • Elkalub GLS 135/N00	• Tribol GR 100-2 PD • Elkalub GLS 135/N2 • Tribol GR 100-00 PD • Elkalub GLS 135/N00 • Dynalub 520	• Tribol GR 100-00 PD • Elkalub GLS 135/N00	
Alternative lubricants with H1 approval	-	-	• Berulub FG H2 SL • Cassida Grease EPS2 • VP 874	• Berulub FB 34-00 • Elkalub GLS 367/N00	

	LCF	LCO
	CKx-090, -110, -145, -200	CKx-090, -110, -145, -200
	Basic lubrication required	Basic lubrication required
	NLGI 00 (DIN51818)	-
	GP00K-20 (DIN 51826)	-
	-	-
	• only via single-line piston distributor system • smallest permissible piston distributor size: CKx-090, -110, -145, -200: 0.2 cm³	• only via single-line piston distributor system • smallest permissible piston distributor size: CKx-090, -110: 0.2 cm³; CKx-145: 0.4 cm³; CKx-200: 0.6 cm³
	Dynalub 520 (liquid grease) (NLGI00 DIN 51818)	Shell Tonna S3 M220 (lubricant oil)
	• Good water resistance • Corrosion protection • Temperature range: -20 to +80 °C	• Special demulsifying oil CLP or CGLP as per DIN 51517-3 for machine bed tracks and tool guides • A blend of highly refined mineral base oils and additives • Can be used even when mixed with significant quantities of metalworking fluids
	R3416 043 00 (cartridge 400 g)	-
	R3416 042 00 (5 kg bucket)	-
	• Tribol GR 100-00 PD • Elkalub GLS 135/N00	• Special demulsifying oil CLP or CGLP as per DIN 51517-3 for machine bed tracks and tool guides
	-	-

10.3 Lubrication version LSS / LPG

10.3.1 Lube ports/lubrication points in the frame (CKK)

In the version without connection plate, on each side of the frame of the compact modules, there are bores through which the lube nipples of the carriage can be accessed. Lubrication of all lube nipples from one side is sufficient. For lubrication, move the center of the carriage at distance X according to the table to the center of the frame L/2. Nozzle pipes with matching lube nozzles (1) can be ordered under order number R345503106. Further information ➡ Catalog.

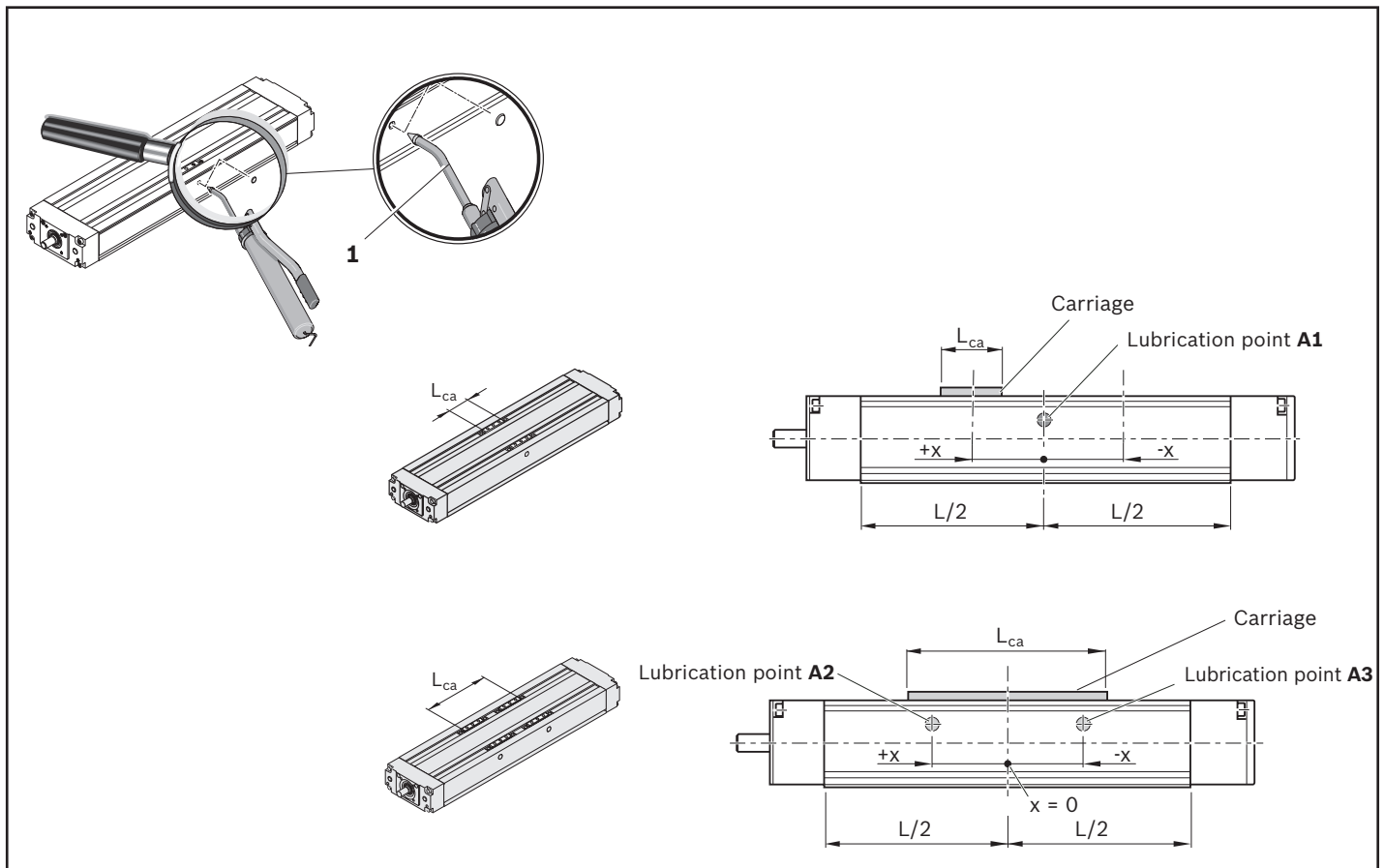


Fig. 31: Position of the lube ports/lubrication points in the frame (CKK)



Compare the carriage version with Fig. 33 and see Table 9 for the position of the lube ports.

Table 7: Position of the lube ports/lubrication points in the frame (CKK)

CKK	Carriage without connection plate L_{ca} (mm)	Lubrication points / lube ports		Distance x (mm)	Lube nipple
			Number / Page		
-070-NN-1	32	A1	1	12.5	DIN 3405-D 3
	73	A1		0.0	
-090-NN-1	35	A1	1	0.0	
	100	A2+A3	2	0.0	
	variable	A2+A3	2	0.0	
-110-NN-1	39	A1	1	-6.5	
	124	A2+A3	2	0.0	
	variable	A2+A3	2	0.0	
-145-NN-1	49	A1	1	-7.0	
	149	A2+A3	2	0.0	
	variable	A2+A3	2	0.0	
-200-NN-1	79.5	A1	1	15.0	DIN 3405-A M8x1
	254.5	A2+A3	2	0.0	
	variable	A2+A3	2	0.0	
-280-NN-1	330	A2+A3	2	0.0	DIN 3405-A M8x1
	variable	A2+A3	2	0.0	

10.3.2 Lube ports/lubrication points in the frame (CKR)

In the version without connection plate, on each side of the frame of the compact modules, there are bores through which the lube nipples of the carriage can be accessed. Lubrication of all lube nipples from one side is sufficient. For lubrication, move the center of the carriage at the distance according to the table to the center of the frame $L/2$.

Nozzle pipes with matching lube nozzle (1) can be ordered under order number R345503106.

Further information ➡ Catalog.

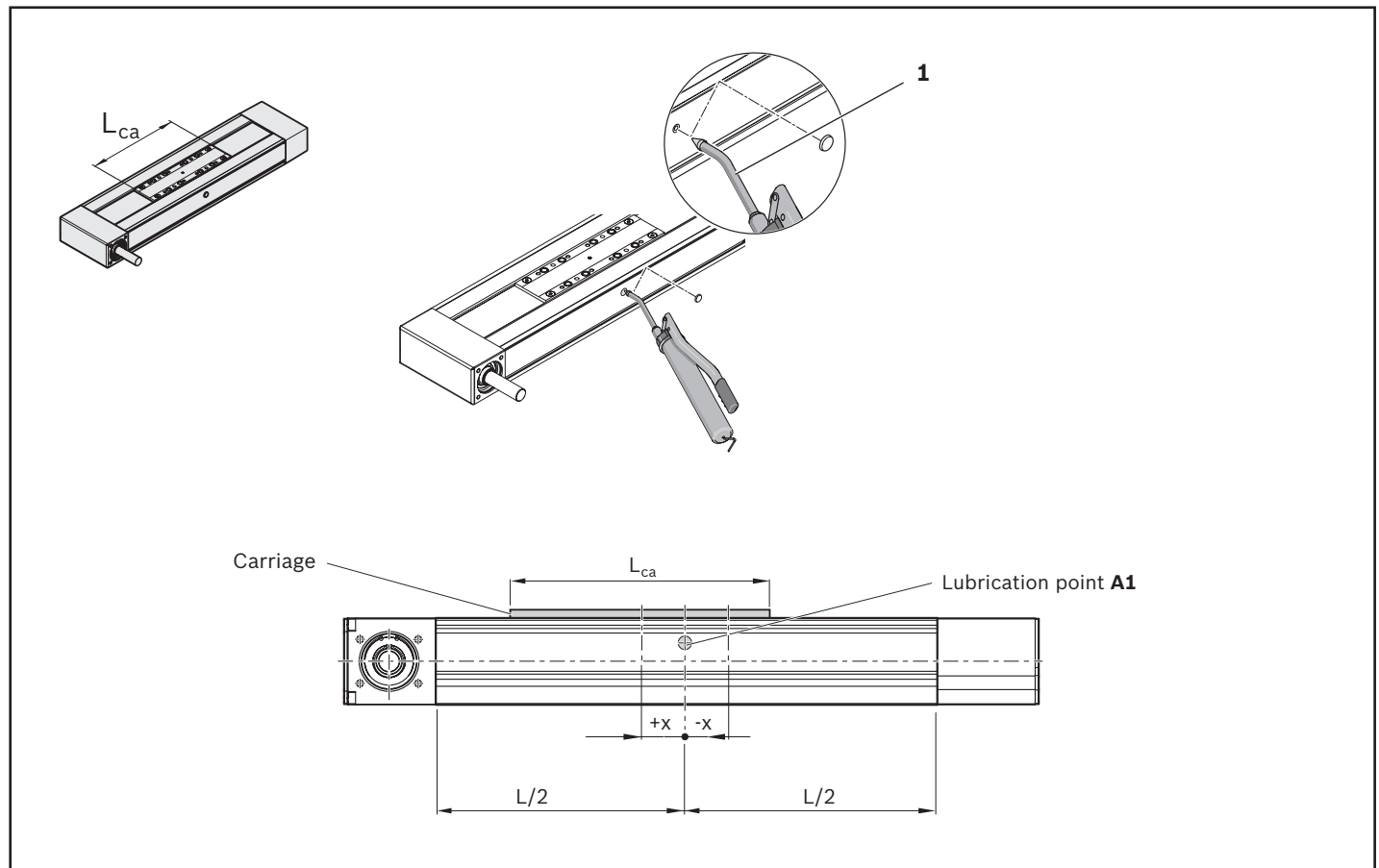


Fig. 32: Position of the lube ports/lubrication points in the frame (CKR)

Table 8: Position of the lube ports/lubrication points in the frame (CKR)

CKR	Carriage without connection plate	Distance		Lube nipple
		L_{ca} (mm)	x (mm)	
-070-NN-1		80	0.0	DIN 3405-D 4
		108	-5.0	
-090-NN-1		102	0.0	DIN 3405-A M6
		156	0.0	
-110-NN-1		170	41.5	DIN 3405-A M8x1
		215	0.0	
-145-NN-1		180	50.0	DIN 3405-A M8x1
		240	0.0	
-200-NN-1		265	59.0	DIN 3405-A M8x1
		405	0.0	
-280-NN-1		485	0.0	DIN 3405-A M8x1

10.3.4 Lube ports in the carriage (CKK)

Lube fittings for carriage attachments for lubrication versions LSS/LPG

Lubrication from one side is sufficient. The lube fittings are sealed with a set screw in the factory before shipment. Depending on the carriage version, the set screw(s) X_1/X_3 or X_2/X_4 must be removed to use the lube ports. See drawing and table for connecting dimensions and O-rings.

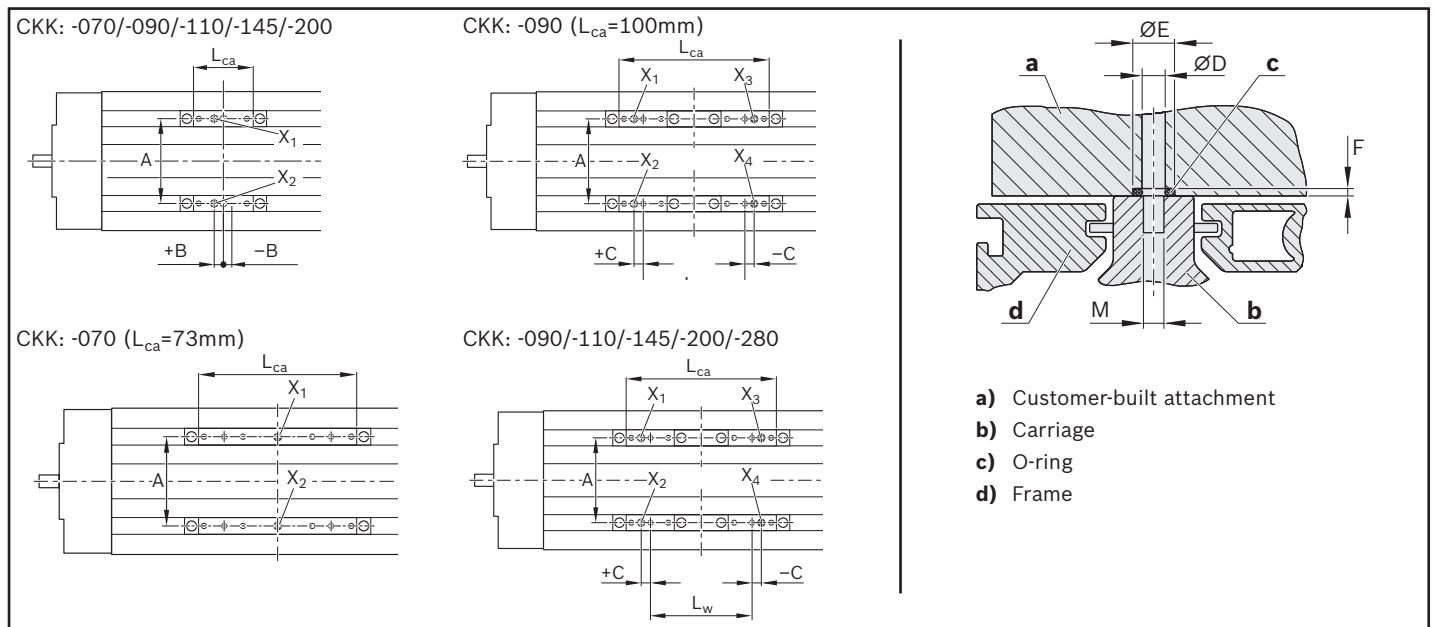


Fig. 33: Position of the lube ports in the carriage (CKK)

Table 9: Position of the lube ports in the carriage

CKK	Carriage length L_{ca} (mm)	Centerline-to-centerline distance of carriages L_w (mm)	Dimensions (mm)							O-Ring acc. to DIN 3771	
			A	B	C	$\varnothing D$ ± 0.2	$\varnothing E$ ± 0.2	F ± 0.2	M	Size	Material number
-070-NN-1	32.0	-	40	-5.0	-	2.5	5.0	0.6	M3	3 x 1.0	R341111801
	73.0	-		0.0	-						
-090-NN-1	35.0	-	54	6.0	-	3.0	6.2	1.0	M3	3 x 1.5	R341100101
	100.0	-		-	6.0						
	variable	variable		-	6.0						
-110-NN-1	39.0	-	66	6.5	-	3.0	6.2	1.0	M3	3 x 1.5	R341100101
	124.0	85		-	6.5						
	variable	variable		-	6.5						
-145-NN-1	49.0	-	88	7.0	-	3.0	6.2	1.0	M3	3 x 1.5	R341100101
	149.0	100		-	7.0						
	variable	variable		-	7.0						
-200-NN-1	79.5	-	130	-15.0	-	5.0	9.0	1.0	M4	5 x 1.5	R341110801
	254.5	175		-	15.0						
	variable	variable		-	15.0						
-280-NN-1	330	200	180	-	-	5.0	9.0	1.0	M5	5 x 1.5	R341110801
	variable	variable		-	26						

10.3.3 Position of the lube ports in the connection plate (CKK)

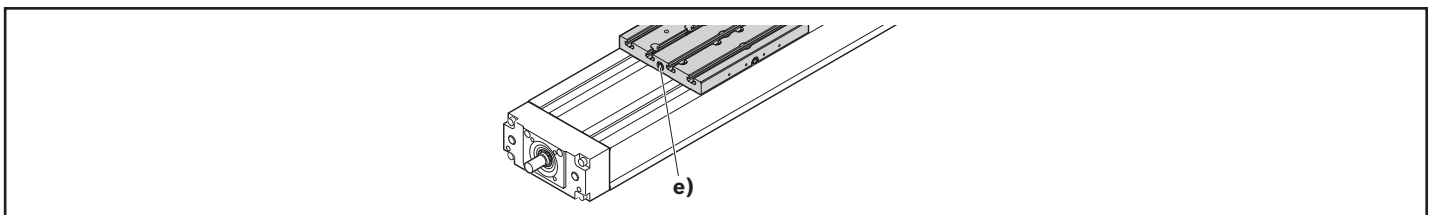


Fig. 34: Position of the lube ports in the connection plate (CKK)

e) There are funnel-type lube nipples on both end faces of the connection plate. They are required for the central lubrication of the ball screw assembly and ball rail system with grease gun. Lubrication from one side is sufficient. The connection plates differ in appearance in the representation.

CKK-070: Funnel-type lube nipple DIN 3405-D4; CKK-090, -110, -145, -200, -280: Funnel-type lube nipple AM8 x 1;

10.3.6 Lube ports in the carriage (CKR)

Lube fittings for carriage attachments for lubrication versions LSS/LPG

The lube fittings are sealed with a set screw in the factory before shipment. To use the lube connection, the set screw X_1 has to be removed. See drawing and table for connecting dimensions and O-rings.

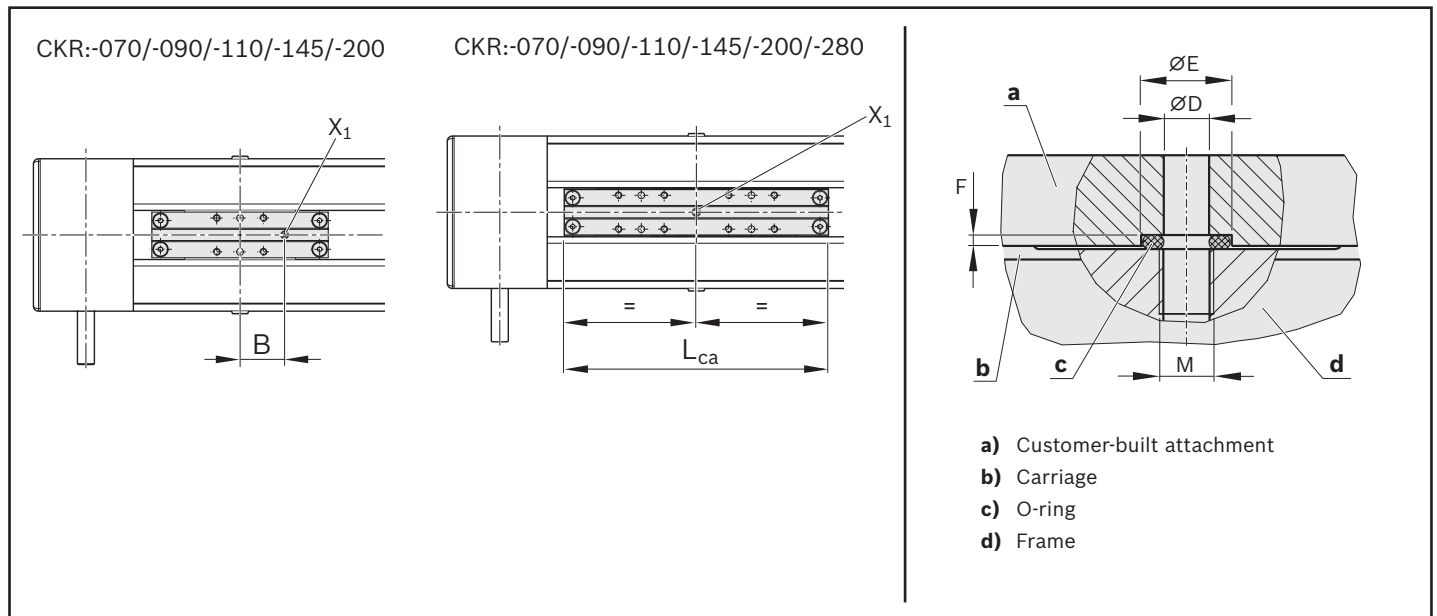


Fig. 35: Position of the lube ports in the carriage (CKR)

Table 10: Position of the lube ports in the carriage

CKR	Carriage length L_{ca} (mm)	Dimensions (mm)					O-Ring acc. to DIN 3771	
		B	$\varnothing D$ ± 0.2	$\varnothing E$ ± 0.2	F $+0.2$	M	Size	Material number
-070-NN-1	80	0.0	2.5	6.0	0.6	M3	3 x 1.5	R341100101
	108							
-090-NN-1	102	0.0	3.0	10.0	1.7	M4	4 x 2.5	R341111901
	156							
-110-NN-1	170	41.5	5.0	10.0	1.2	M6	5 x 2	R341110901
	215	0.0						
-145-NN-1	180	50.0	5.0	10.0	1.2	M6	5 x 2	R341110901
	240	0.0						
-200-NN-1	265	59.0	6.0	12.2	1.0	M8	8 x 2	R341100801
	465	0.0						
-280-NN-1	485	0.0	8.5	13.0	1.5	M8	8 x 2	R341100801

10.3.5 Position of the lube ports in the connection plate (CKR)

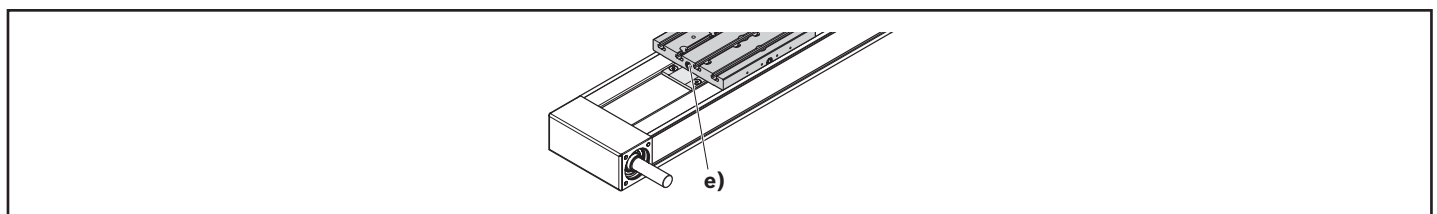


Fig. 36: Position of the lube ports in the connection plate (CKR)

e) There are funnel-type lube nipples on both end faces of the connection plate. They are required for the central lubrication of the ball rail system with grease gun. Lubrication from one side is sufficient.

The connection plates differ in appearance in the representation.

CKR-070: Funnel-type lube nipple DIN 3405-D4; CKR-090, -110, -145, -200, -280: Funnel-type lube nipple AM8 x 1;

10.4 Initial lubrication

- Pay attention to the information notes on lubrication ➡ 10
- Overview of lubrication versions ➡ 12.1
- Lubricants ➡ 12.2
- Note the operating conditions ➡ 14.3

10.4.1 LPG

Initial lubrication

Lubrication points:

- In the frame: Lubrication points **A1/A2/A3**
- For carriage attachments: Lubrication points **X₁/X₃** or **X₂/X₄**
- With connection plate: only lubrication point **e)**

For the ideal distribution of the lubricant in the ball rail system as well as the ball screw assembly, the basic lubrication takes place in three partial amounts. After each lubrication with a partial amount (TM), the carriage (TT) of the linear axis is moved with three double strokes (DH). The double stroke (DH) should be larger than 3 times the carriage length (L_{ca}) and at least the minimum double stroke DH_{min} .

Procedure:

1. Pre-lubricate the compact module with partial amount 1 (TM1) by slowly applying pressure to the grease gun.
2. Move the carriage three times with the double stroke (DH) at a slow travel speed (<0.5 m/s).
3. Pre-lubricate the compact module with partial amount 2 (TM2) by slowly applying pressure to the grease gun.
4. Repeat steps 2 and 3.

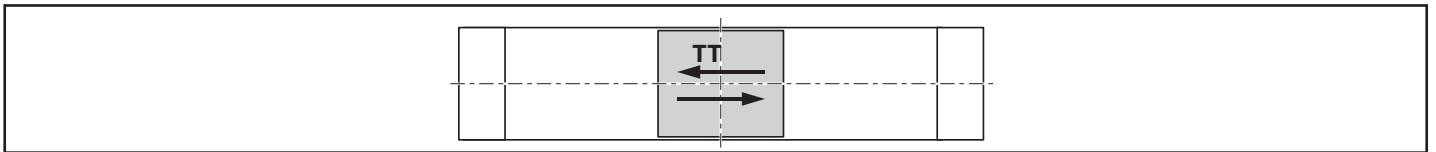


Table 11: Initial lubrication amount CKK

CKK	DH_{min} (mm)	BASA $d_o \times P$ (mm)	Carriage Connection plate							
			without				with			
			Lubrication point	TM1 (cm ³)	TM2 (cm ³)	Lubrication point	TM1 (cm ³)	TM2 (cm ³)	TM1 (cm ³)	TM2 (cm ³)
-070-NN-1	80	8x2.5	A1, X ₁ /X ₂ ($L_{ca} = 32$ mm)	1.7	0.4	—	—	—	5.2	0.4
		8x5	A1, X ₁ /X ₂ ($L_{ca} = 73$ mm)	3.7						
-090-NN-1	80	12x2	A1, A2, X ₁ /X ₂	2.4	0.6	A3, X ₃ /X ₄	1.9	0.4	4.2	1.0
		12x5								
		12x10								
-110-NN-1	100	16x5	A1, A2, X ₁ /X ₂	3.7	1.4	A3, X ₃ /X ₄	3.2	0.9	10.9	2.3
		16x10		3.8	1.5		3.2	0.9	11.0	2.4
		16x16		3.9	1.6		3.2	0.9	11.1	2.5
-145-NN-1	120	20x5	A1, A2, X ₁ /X ₂	5.2	2.5	A3, X ₃ /X ₄	4.5	1.8	18.0	4.3
		20x20		5.7	3.0				18.5	4.8
		20x40		5.7	3.0				18.5	4.8
		25x10		5.7	3.0				18.5	4.8
-200-NN-1	160	32x5	A1, A2, X ₁ /X ₂	13.9	4.1	A3, X ₃ /X ₄	12.5	2.7	42.7	6.8
		32x10		14.5	4.7				43.3	7.4
		32x20		14.8	5.0				43.6	7.7
		32x32		16.1	6.3				44.9	9.0
-280-NN-1		40x5	A1, A2, X ₁ /X ₂	28.6	6.4	—	27.6	4.4	76.2	11.0
		40x10		29.2	7.0				76.8	11.0
		40x20		29.5	7.3				77.1	12.0
		40x40		36.4	14.0				84.0	19.0

Table 12: Initial lubrication quantity CKR

CKR	DH _{min} (mm)	Carriage Connection plate					
		without			with		
		L _{ca} (mm)	TM1 (cm ³)	TM2 (cm ³)	L _{ca} (mm)	TM1 (cm ³)	TM2 (cm ³)
-070-NN-1	80	108	1.9	0.3	95	2.9	0.3
-090-NN-1	80	156	5.0	0.7	125	8.0	0.7
-110-NN-1	100	215	3.4	1.8	155	7.1	1.8
-145-NN-1	120	240	5.5	3.5	190	12.9	3.5
-200-NN-1	160	405	14.0	5.3	305	25.8	5.3
-280-NN-1	210	485	24.9	8.8	375	39.3	8.8
-280-DB-1 ¹⁾	210	—			375	39.3	8.8

¹⁾ Lubricate both carriages with the appropriate initial lubrication quantity

10.4.3 LCF

Table 13: Initial lubrication CKK/CKR

CKK/CKR	Minimum impulse quantity ¹⁾ (cm ³)	Initial lubrication quantity (cm ³)		
		Lube connection		
		S1	S2	S3
CKK-090-NN-1	0.2	1.1	1.7	0.8
CKK-110-NN-1		2.2	3.2	1.4
CKK-145-NN-1		3.6	5.2	2.2
CKK-200-NN-1		8.2	9.2	5.2
CKR-090-NN-1	0.2	1.3	1.3	—
CKR-110-NN-1		2.7	2.7	—
CKR-145-NN-1		4.1	4.1	—
CKR-200-NN-1		9.2	9.2	—

¹⁾ Smallest permissible piston distributor size (minimum impulse quantity) per connection for liquid grease of the grade NLGI 00 (cm³)

10.4.2 LCO

Table 14: Initial lubrication CKK/CKR

CKK/CKR	Minimum impulse quantity ¹⁾ (cm ³)	Initial lubrication quantity (cm ³)		
		Lube connection		
		S1	S2	S3
CKK-090-NN-1	0.2	0.8	1.4	0.8
CKK-110-NN-1	0.2	2.0	3.0	1.2
CKK-145-NN-1	0.4	3.4	5.0	2.0
CKK-200-NN-1	0.6	9.0	8.0	5.0
CKR-090-NN-1	0.2	1.0	1.0	—
CKR-110-NN-1	0.2	2.6	2.6	—
CKR-145-NN-1	0.4	4.0	4.0	—
CKR-200-NN-1	0.6	9.0	9.0	—

¹⁾ Smallest permissible piston distributor size (minimum impulse quantity) per connection for oil lubrication (viscosity 220 m²/s).

10.5 Relubrication

Lubrication points:

- In the frame: lubrication points **A1/A2/A3**
- For carriage attachments: lubrication points **X₁/X₃** or **X₂/X₄**
- With connection plate: only lubrication point **e)**

- Pay attention to the information notes on lubrication ➡ 10
- Overview of lubrication versions ➡ 12.1
- Lubricants ➡ 12.2
- Relubrication intervals ➡ 12.6 / 12.7
- Note the operating conditions ➡ 14.3
- Use of Dynalub 520 (NLGI 00) instead of Dynalub 510 (NLGI 2): The relubrication interval is 75% of the standard relubrication interval.
- Linear motion systems with standard lubrication 520 (NLGI 00) must not be pre-lubricated with 510 (NLGI 2)!
- Use of lubricants with H1 approval:
First relubrication takes place after 20 km. Use 50% of the standard relubrication interval as a guideline value for other relubrication intervals.
- Relubrication is required every two years due to grease aging.

10.5.1 LSS / LPG

Table 15: Relubrication quantity CKK

CKK	BASA d _o x P (mm)	Carriage Connection plate				
		without		with		
		Lubrication point	Lubrication quantity (cm ³)	Lubrication point	Lubrication quantity (cm ³)	Lubrication quantity (cm ³)
-070-NN-1	8x2.5	A1, X1/X2	(L _{ca} = 32 mm) 0.5	—	—	(L _{ca} = 60 mm) 0.5
	8x5		(L _{ca} = 73 mm) 0.8	—	—	(L _{ca} = 95 mm) 0.8
-090-NN-1	12x2	A1, A2, X ₁ /X ₂	0.6	A3, X ₃ /X ₄	0.3	0.9
	12x5		0.6		0.3	0.9
	12x10		0.6		0.3	0.9
-110-NN-1	16x5	A1, A2, X ₁ /X ₂	1.4	A3, X ₃ /X ₄	0.8	2.2
	16x10		1.6		0.8	2.4
	16x16		1.7		0.8	2.5
-145-NN-1	20x5	A1, A2, X ₁ /X ₂	2.3	A3, X ₃ /X ₄	1.3	3.6
	20x20		3.6		1.3	4.9
	20x40		3.3		1.3	4.6
	25x10		3.1		1.3	4.4
-200-NN-1	32x5	A1, A2, X ₁ /X ₂	4.6	A3, X ₃ /X ₄	2.6	7.2
	32x10		5.4		2.6	8.0
	32x20		5.8		2.6	8.4
	32x32		7.6		2.6	10.2
-280-NN-1	40x5	A1, A2, X ₁ /X ₂	6.4	—	4.4	10.8
	40x10		7.0		4.4	11.4
	40x20		7.3		4.4	11.7
	40x40		14.0		4.4	18.6

Table 16: Relubrication quantity CKR

CKR	Carriage Connection plate		Lubrication quantity (cm ³)
	without	with	
	L _{ca} (mm)	L _{ca} (mm)	
-070-NN-1	80	60	0.15
	108	95	0.30
-090-NN-1	102	60	0.30
	156	125	0.60
-110-NN-1	170	110	0.80
	215	155	1.50
-145-NN-1	180	125	1.40
	240	190	2.70
-200-NN-1	265	190	2.70
	405	305	5.50
-280-NN-1	485	375	8.80
-280-DB-1 ¹⁾	–	375	8.80

¹⁾ Lubricate both carriages with the appropriate initial lubrication quantity

EN

10.5.2 LCF

Table 17: Relubrication quantity CKK/CKR (LCF)

CKK/CKR	Guideway Relubrication quantity per lube connection S1+S2 (cm ³)	BASA (CKK)	
		d _o x P (mm)	Lubrication quantity Lube connection S3 (cm ³)
-090-NN-1	0.4	12 x 2	0.2
		12 x 5	0.4
		12 x 10	0.4
-110-NN-1	0.9	16 x 5	0.7
		16 x 10	0.9
		16 x 16	1.0
-145-NN-1	1.5	20 x 5	1.0
		25 x 10	1.9
		20 x 20	1.9
		20 x 40	1.8
-200-NN-1	3.0	32 x 5	2.2
		32 x 10	3.2
		32 x 20	3.6
		32 x 32	5.6

- ▶ Straight connector, for plastic tubes and metal pipes with a diameter of 4 mm.
Relubricate each lube connection with the indicated relubrication quantity after reaching the travel distance (relubrication interval).

10.5.3 LCO

Table 18: Relubrication quantity CKK/CKR

CKK/CKR	Guideway Relubrication quantity per lube connection S1+S2 (cm ³)	BASA (CKK)	
		d _o x P (mm)	Lubrication quantity Lube connection S3 (cm ³)
-090-NN-1	0.4	12 x 2 / 12 x 5 / 12 x 10	0.3
-110-NN-1	0.9	16 x 5 / 16 x 10 / 16 x 16	0.3
-145-NN-1	1.5	20 x 5 / 25 x 10 / 20 x 20 / 20 x 40	0.6
-200-NN-1	2.1	32 x 5 / 32 x 10 / 32 x 20 / 32 x 32	0.6

- ▶ Straight connector, for plastic tubes and metal pipes with a diameter of 4 mm.
Relubricate each lube connection with the indicated relubrication quantity after reaching the travel distance (relubrication interval).

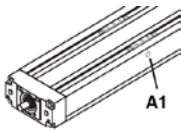
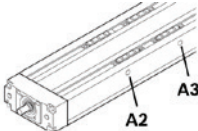
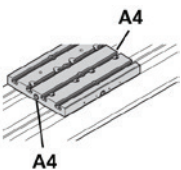
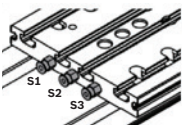
10.6 Relubrication intervals

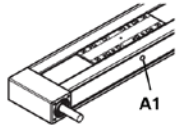
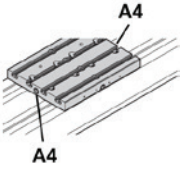
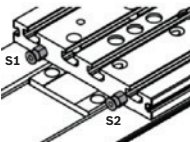
Relubrication interval:

Relubricate each lube connection with the indicated relubrication quantity after reaching the travel distance (s).

- Relubrication interval of guideway and BASA ball screw drives according to table.
- Relubrication is required every two years due to grease aging.

Table 19: Relubrication intervals

CKK: LPG with standard lubrication							
Lubrication points			Lubrication interval (km) for lubrication version F _m /C ≤ 0.12				
	CKK	BASA	LSS / LPG	LCF		LCO	
		d _o x P (mm)			Guideway	BASA	Guideway
   	-070-NN-1	8x2.5	195	—	—	—	—
		8x5	385	—	—	—	—
	-090-NN-1	12x2	155	4,135	155	2,065	3
		12x5	385	4,135	385	2,065	7
		12x10	770	4,135	770	2,065	13
	-110-NN-1	16x5	515	3,750	385	2,500	7
		16x10	1,030	3,750	770	2,500	13
		16x16	1,645	3,750	1,235	2,500	21
	-145-NN-1	20x5	515	3,750	385	2,500	5
		20x20	2,055	3,750	1,545	2,500	20
		20x40	4,115	3,750	3,085	2,500	40
		25x10	1,030	3,750	770	2,500	10
	-200-NN-1	32x5	515	7,500	385	5,000	5
		32x10	1,030	7,500	770	5,000	10
		32x20	2,055	7,500	1,545	5,000	20
		32x32	3,290	7,500	2,470	5,000	32
	-280-NN-1	40x5	515	—	—	—	—
		40x10	1,030	—	—	—	—
		40x20	2,055	—	—	—	—
		40x40	4,115	—	—	—	—

CKR: LPG with standard lubrication							
Lubrication points			Lubrication interval (km) for lubrication version F _m /C ≤ 0.12				
	CKR		LSS / LPG	LCF	LCO		
						A1 / A4	S1 / S2
  	-070-NN-1	—	4,135	4,135	—	—	
	-090-NN-1		4,135	4,135	2,065		
	-110-NN-1		5,145	3,750	2,500		
	-145-NN-1		5,145	3,750	2,500		
	-200-NN-1		10,285	7,500	5,000		
	-280-NN-1		10,285	7,500	5,000		

11 Replacing the seals of the Resist covers at CKK

11.1 Disassembly

1. Move the carriage (1) to the end position of the drive side (A).
2. Pull off the 4 strip fixings (5) by removing the screws (6, 7).
3. Now remove the seals (3) in longitudinal direction on the side (B) opposite to the carriage (1). Start with the inner seals (3.1), then the external seals (3.2).

11.2 Assembly

1. First pull in the external seals (3.2) up to the carriage (1) and thread into the outer track of the belt guide (4). Afterwards, pull in the inner seals (3.1) and insert into the inner track of the belt guide (4). Make sure that the inner seal is above the outer one.
2. Move the carriage (1) until the seals (3) project approx. 50 mm on the opposite side of the carriage. Make sure that the seals are closed again by the rear belt guides (4).
3. Tighten the seals over the entire length of the cover plate (2).
4. Move the carriage (1) over the entire travel range so that the seals (3) can align.
5. The seals can now be shortened until they are standing back per side of max. 0.5 to 1 mm opposite the end face of the cover plate (2), align the respective position to the end again if necessary.
6. Insert the seals into the strip fixing (5). Fasten the strip fixings to the cover plate using the hex socket head cap screws (6). Fix the seals with the countersunk screws (7) until the head of the screw is in contact.

Seal length calculation

Size	Material numbers seal	Length calculation
CKK-110, -145	R039662039	$L + 30 \text{ mm}$
CKK-200	R039662040	$L + 30 \text{ mm}$

L = length of cover plate (2)

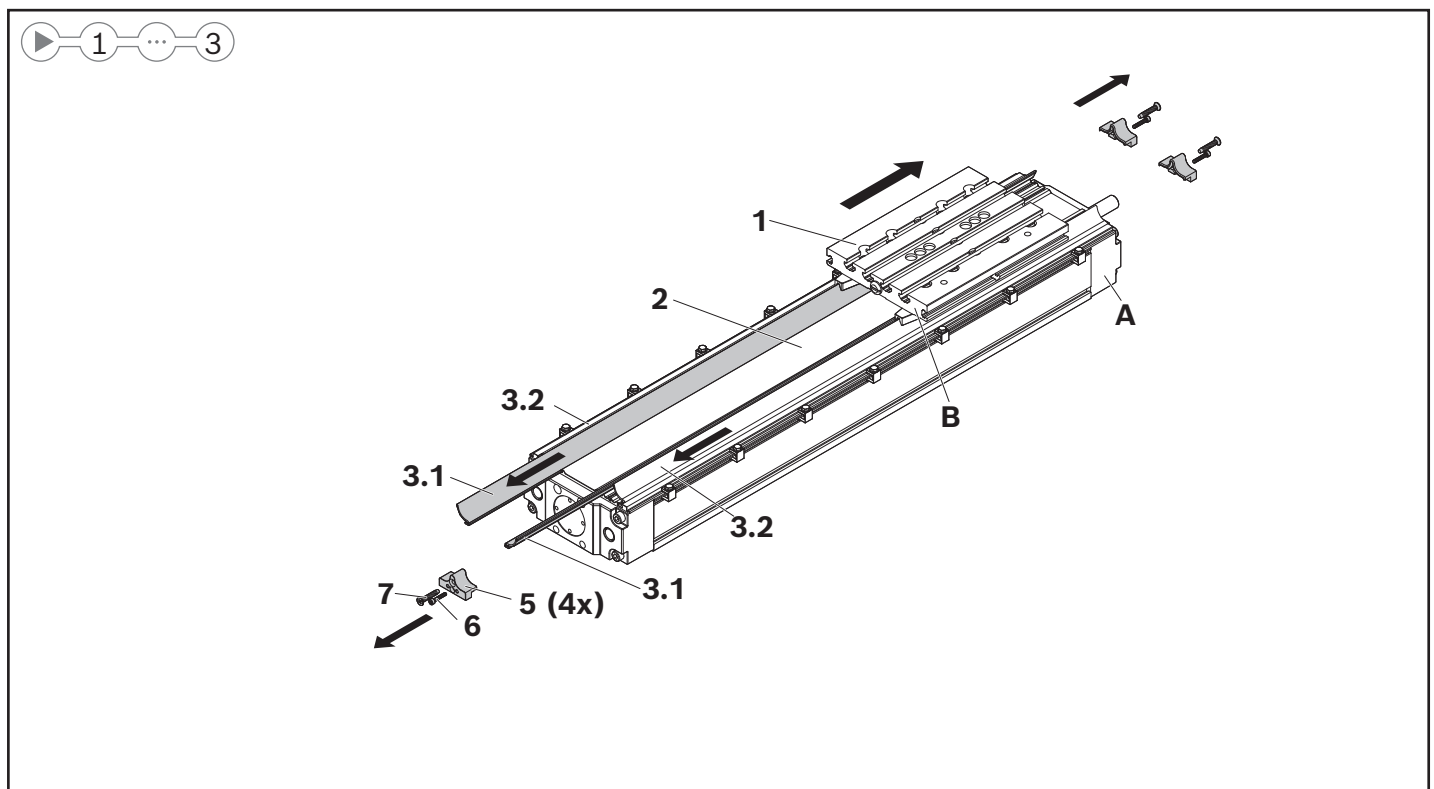


Fig. 37: Removing the sealing profiles

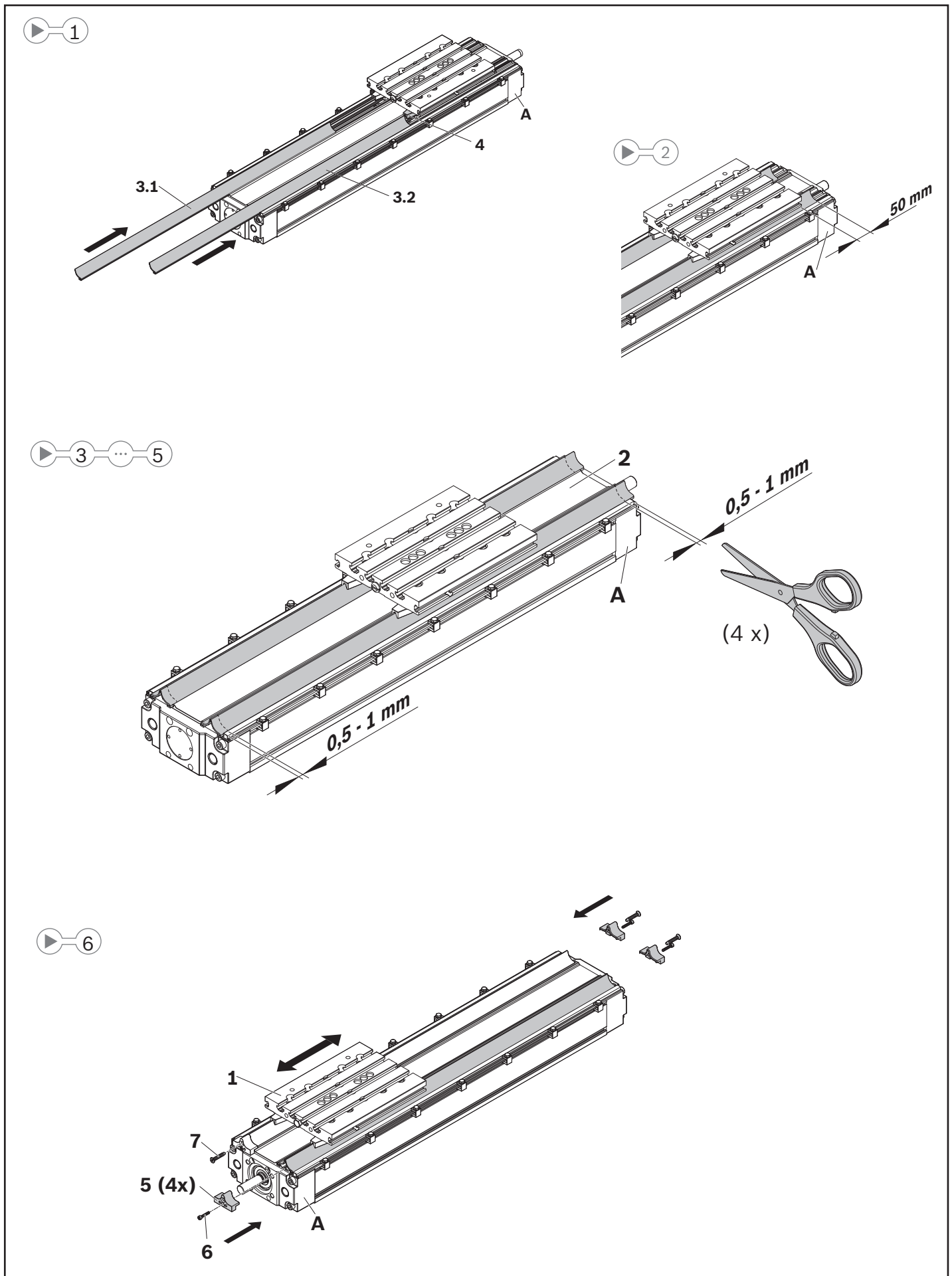


Fig. 38: Mounting the sealing profiles

12 Further information

12.1 Tightening torques

We use screws in the 8.8 strength class as standard. Any deviations are marked accordingly.

Table 20: Tightening torques

 $\mu = 0.125$	Hex socket head cap screws according to ISO 4762, DIN 6912 and DIN 7984													
	M1.6	M2	M2.5	M3	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24
Width across flats	1.50	1.5	2.00	2.5	3.0	4.0	5.0	6	8	10	12	14	17	19
8.8 $\varnothing M_A$ (Nm)	0.17	0.4	0.70	1.3	2.7	5.5	9.5	23	46	80	127	194	392	675
10.9 $\varnothing M_A$ (Nm)	0.24	0.5	1.00	1.8	4.0	8.1	14.0	34	68	116	186	285	558	960
12.9 $\varnothing M_A$ (Nm)	0.29	0.6	1.25	2.1	4.8	9.5	16.5	40	80	137	218	333	653	1125

12.2 Compact modules CKR; clamping hub

Table 21: Tightening torques of the screws in the clamping hubs

 $\mu = 0.125$	M2.5	M4	M4	M5	M10
$\varnothing M_{A2}$ (Nm)	1.25	2.7	4.8	9.5	46

12.3 Operating conditions

For normal operating conditions, see table.

► Checking the operating conditions.

⚠ For special operating conditions, please contact us, especially for: Glass fiber dust, wood dust, solvents and short stroke, etc.

Table 22: Operating conditions

Ambient temperature with Bosch Rexroth servo motor	0 °C ... 40 °C, above 40 °C loss of performance
Ambient temperature for mechanical system (no dropping below dew point)	-10 °C ... 60 °C
Travel range $s_{min}^{1)}$	See "Technical data" tables, CKK/CKR catalog
Soiling	Not permissible
With "Resist" cover	Short-term temperature stability of the seal up to 300 °C
	Suitable for: - Dry chip impact with broken chips of aluminum - Component handling during welding application

¹⁾ Minimum travel range to ensure a reliable lubrication distribution.

13 Assemblies

13.1 Overview of CKK

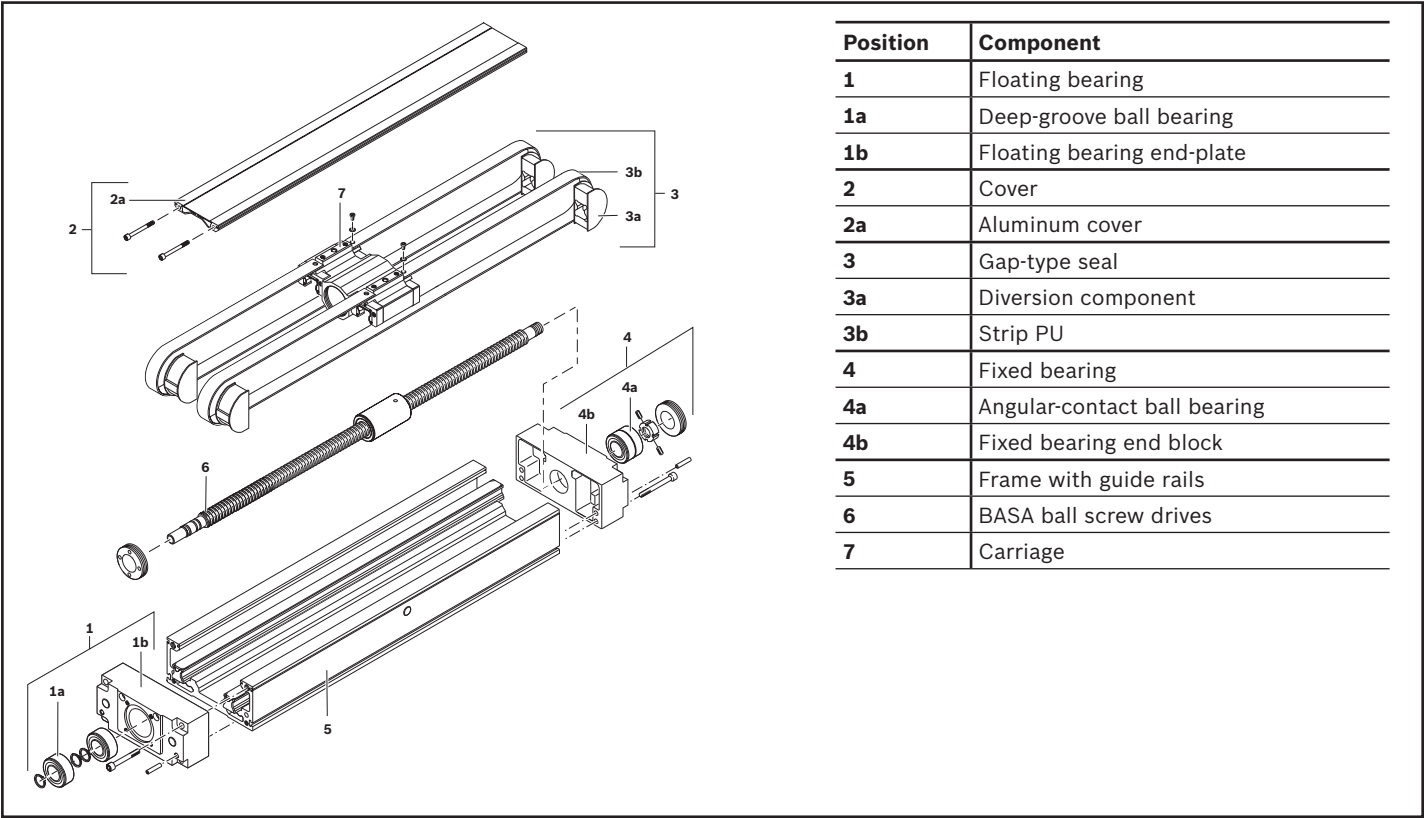
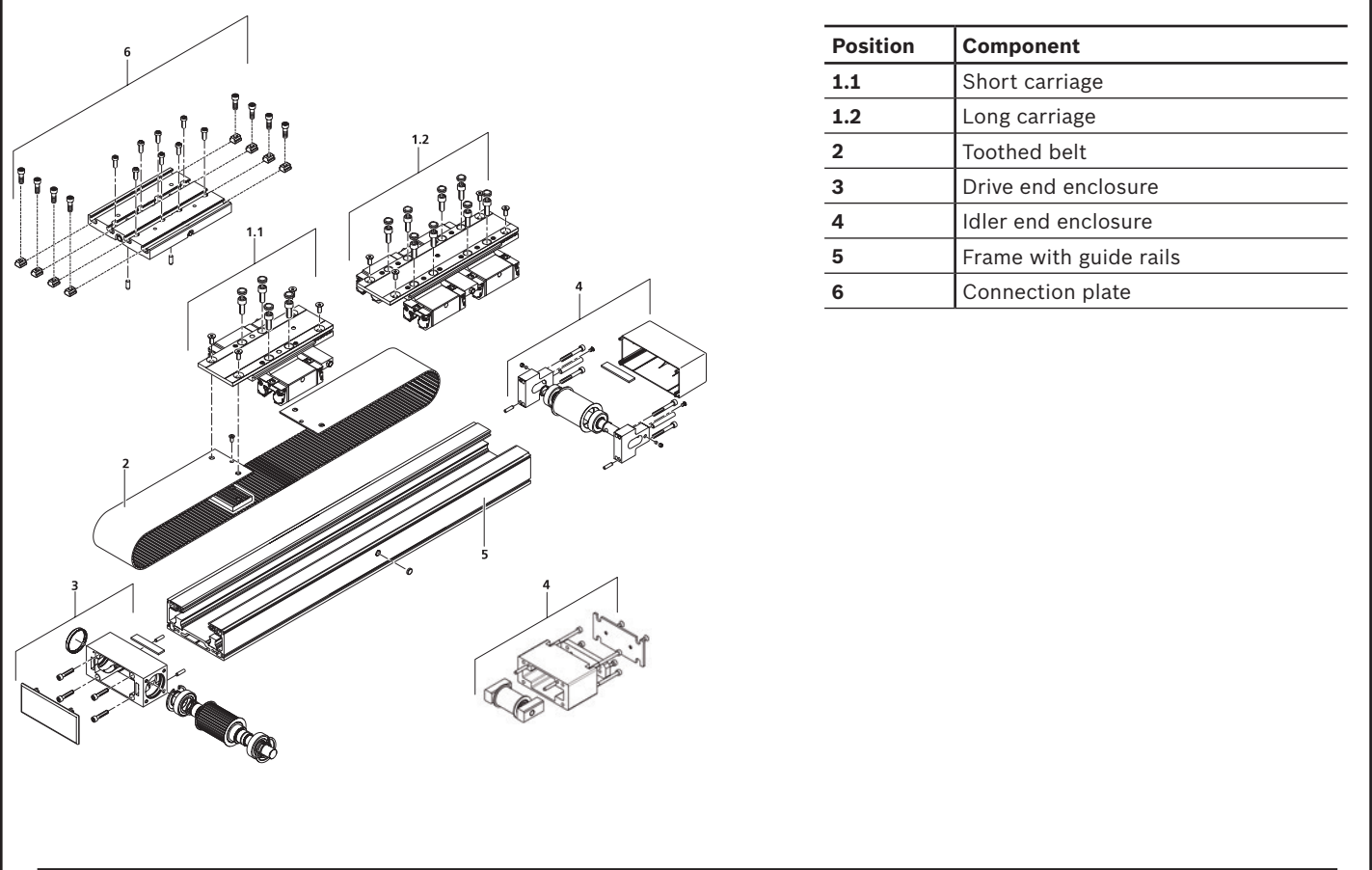


Fig. 39: Overview of CKK

13.2 Overview of CKR



CKR-280-DB

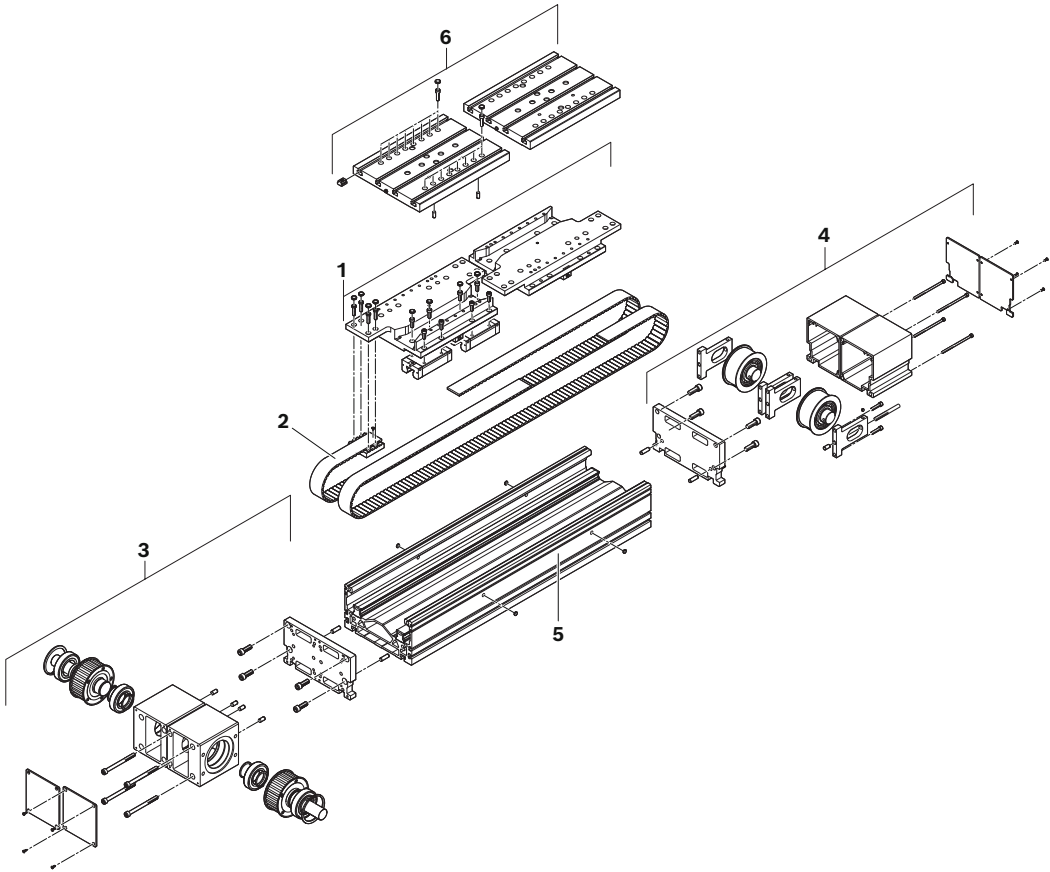


Fig. 40: Overview of CKR

13.3 Replacing the idler end enclosure, CKR

13.3.1 CKR -070

 End enclosures are supplied as complete assemblies.

 Switch off the power supply!

 Before relieving the tension on the toothed belt, read the chapter "Tensioning the toothed belt".

Detaching the toothed belt from the carriage

1. Remove the screws (1) from the carriage and the clamping piece (2).
2. Move the carriage until the end of the toothed belt is freely accessible.
3. Unscrew the clamping piece (2) from the toothed belt and take it out of the frame.

Removing the end enclosure

1. Unscrew the four hex socket head cap screws (3) in the end enclosure
2. Pull off the end enclosure (4) together with the belt pulley (6) and the tensioning plate (5).
3. Pull the toothed belt out of the end enclosure.
4. Unscrew the tensioning plate (5) and remove the belt pulley (6).

Mounting the end enclosure

1. Carefully push the end enclosure (4) without the belt pulley (6) onto the frame as far as it will go, using the two straight pins as locators for alignment.
2. Fasten the end enclosure to the frame with four hex socket head cap screws.
3. Push the belt pulley (6) with tensioning plates into the end enclosure.
4. Slide the toothed belt into the end enclosure and around the belt pulley.
5. Fasten the clamping piece to the toothed belt end and insert it into the belt guide slots.
6. Fasten the toothed belt to the underside of the carriage.
7. Mount the tensioning plate.
8. Tension the toothed belt. ➡ 13.4.
9. Fasten the cover (7) to the end enclosure.

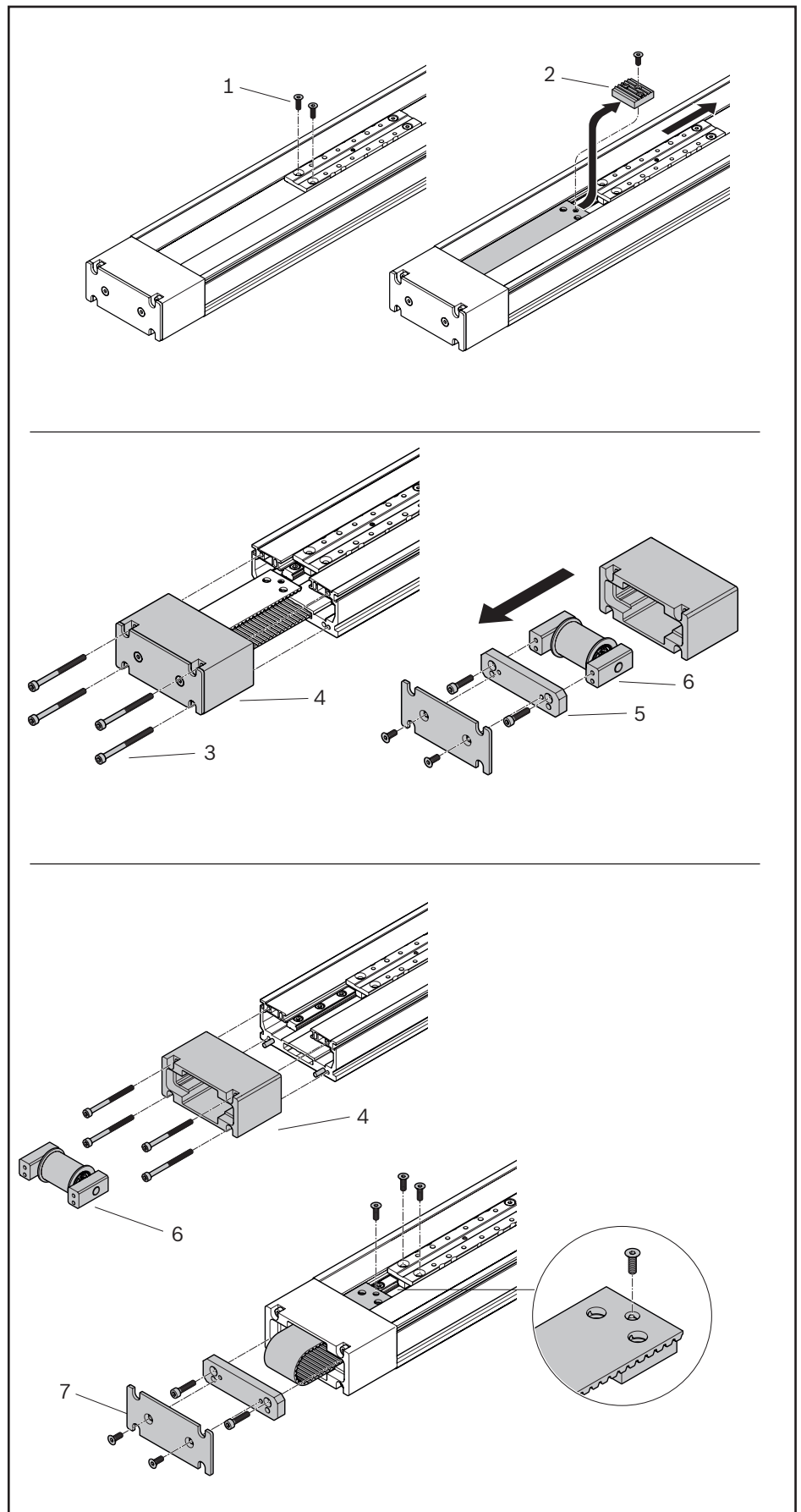


Fig. 41: Replacing the idler end enclosure CKR-070

13.3.2 CKR -090, -110, -145, -200, -280

 End enclosures are supplied as complete assemblies.

 Switch off the power supply!

 Before relieving the tension on the toothed belt, read the chapter "Tensioning the toothed belt".

1. Insert the axis with belt pulley (9) into the two tensioning mounts (1). Make sure that the side threads (2) on the mounts face outward.
2. Using straight pins (3), align the tension mounts with the frame, push them down and screw down with two hex socket head cap screws (5) each.
3. Attach the second clamping piece (4) to the toothed belt.
4. Wrap the toothed belt around the belt pulley and push it into the belt guide.
5. Fix the toothed belt to the carriage using two countersunk screws (7).
6. Tension the toothed belt using the tensioning set screws (6) in the tension mounts.
7. Lock the tensioning set screws using the set screws at the side.
8. Position the end cover on the end enclosure and screw down using two countersunk screws (8).

CKR -200:

- Push on the idler end enclosure and screw down with four countersunk screws.
- Use four countersunk screws also to fix the end cover in place.

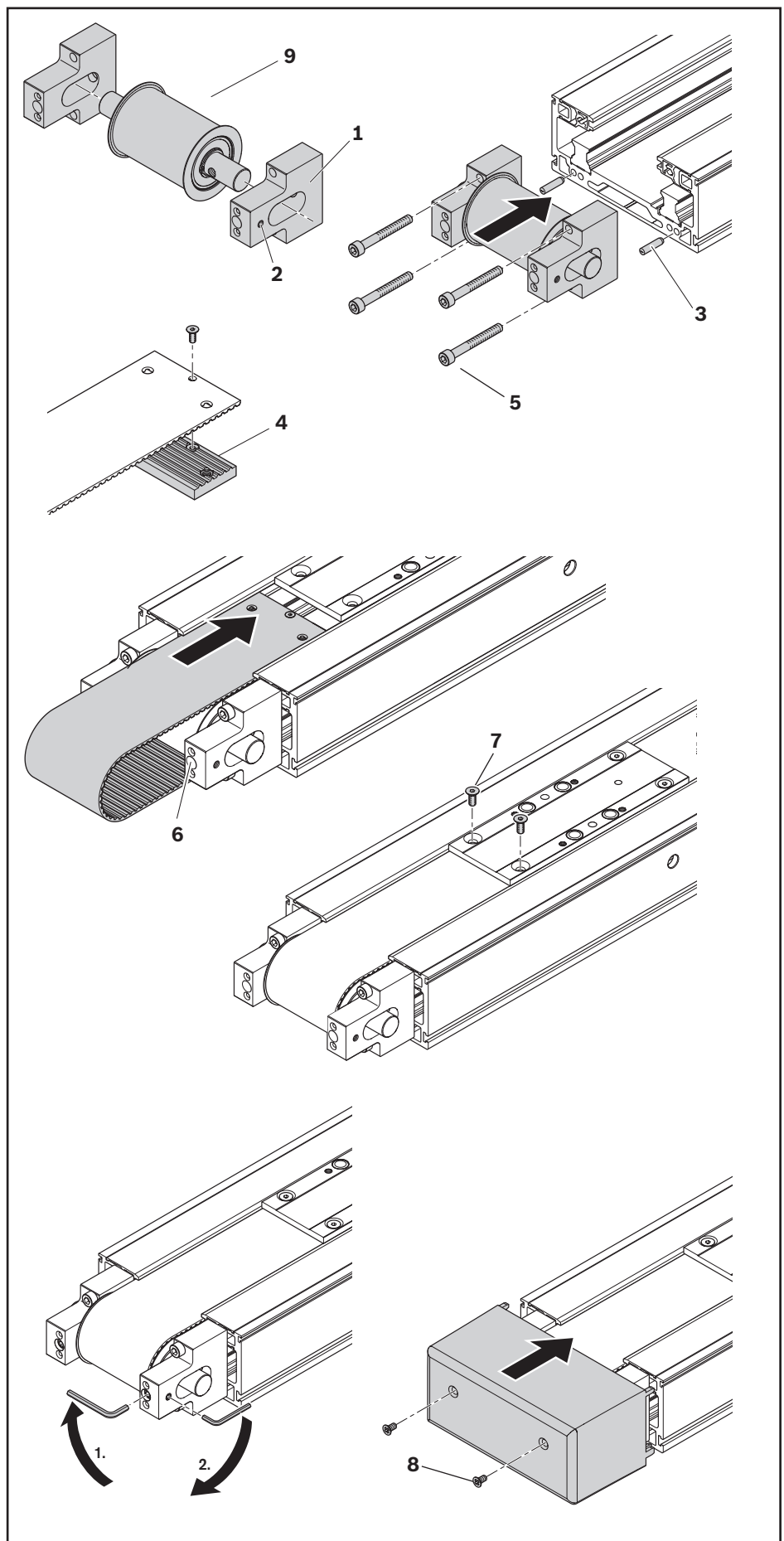


Fig. 42: Replacing the idler end enclosure CKR -090, -110, -145, -200, -280

13.3.3 Replacing the carriage

- 1. The toothed belt is fixed to the carriage with two screws. Unfasten these and remove the belt.
- 2. Pull the carriage off the guide rails.
- 3. Push on the new carriage.
- 4. Use two (new) countersunk screws to fasten the toothed belt to one end of the new carriage.

⚠ When attaching the belt, make sure that the switching magnet and the lube nipples point in the direction away from the drive end.

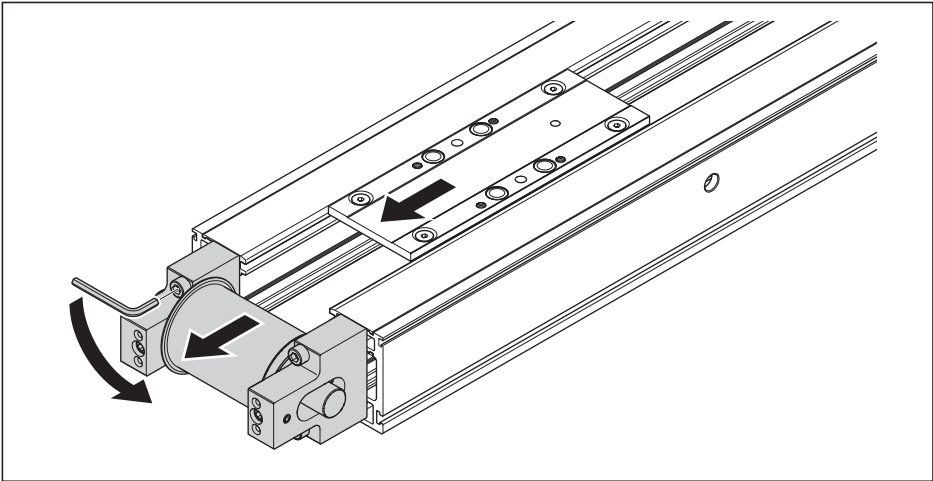


Fig. 43: Replacing the carriage

13.3.4 Replacing the toothed belt

- Follow the instructions as given in the chapters "Replacing the carriage" and "Replacing the idler end enclosure". In this case, discard the old toothed belt and fasten the new toothed belt to the old carriage.

👉 The length of the toothed belt must be a multiple of X.

Length calculation of the toothed belt

Example:

CKR 9-70, short carriage, L= 500 mm, X¹⁾ = 3

$L_R = (2 \cdot L + 88) \text{ mm.}$
 $L_R = (2 \cdot 500 + 88) \text{ mm} = 1088 \text{ mm.}$
 $1088 \text{ mm} / 3 = 362.67 \text{ ---> round to a multiple of 3} = 363 \text{ mm.}$
 $363 \cdot 3 = 1089 \text{ mm} = \text{length of the toothed belt.}$

CKR	Carriage / Carriage / Mesa / Mesa	Formula / Formula / Fórmula / Fórmula	Toothed belt pitch / Toothed belt pitch / Partición de la correa dentada / Passo da correia dentada
9-70	short / short / corta / curta	$L_R = (2 \cdot L + 88) \text{ mm}$	X = 3
	long / long / larga / longa	$L_R = (2 \cdot L + 60) \text{ mm}$	
12-90	short / short / corta / curta	$L_R = (2 \cdot L + 84) \text{ mm}$	X = 5
	long / long / larga / longa	$L_R = (2 \cdot L + 30) \text{ mm}$	
15-110	short / short / corta / curta	$L_R = (2 \cdot L + 134) \text{ mm}$	
	long / long / larga / longa	$L_R = (2 \cdot L + 89) \text{ mm}$	
20-145	short / short / corta / curta	$L_R = (2 \cdot L + 175) \text{ mm}$	X = 10
	long / long / larga / longa	$L_R = (2 \cdot L + 115) \text{ mm}$	
25-200	short / short / larga / curta	$L_R = (2 \cdot L + 330) \text{ mm}$	
	long / long / long / longa	$L_R = (2 \cdot L + 190) \text{ mm}$	
$L_R =$ Length of the toothed belt / Length of the toothed belt / Longitud de la correa dentada / Comprimento da correia dentada $L =$ Length of frame / Length of the frame / Longitud del cuerpo principal / Comprimento do corpo principal $X =$ Toothed belt pitch / Toothed belt pitch / Partición de la correa dentada / Passo da correia dentada			

13.3.5 Replacing the drive end enclosure

 End enclosures are supplied as complete assemblies.

 Switch off the power supply!

 Before relieving the tension on the toothed belt, read the chapter "Tensioning the toothed belt".

 Before removing the end enclosure, relieve the tension on the toothed belt.

1. Remove the cover, if present.
2. Remove the four hex socket head cap screws (2).
3. Remove the clamping piece (1) from the toothed belt.
4. Carefully pull off the end enclosure.
5. Insert the toothed belt in the new end enclosure.
6. Re-attach the clamping piece to the toothed belt and slide the toothed belt into the belt guide.
7. Using straight pins (3), align the end enclosure with the frame and push it home. Screw it down with four hex socket head cap screws (2).
8. Re-attach the toothed belt to the carriage using the clamping piece.
9. Start up the toothed belt, following the instructions given in the "Tensioning the toothed belt" chapter.
10. Fasten the new cover (if present) to the end enclosure.

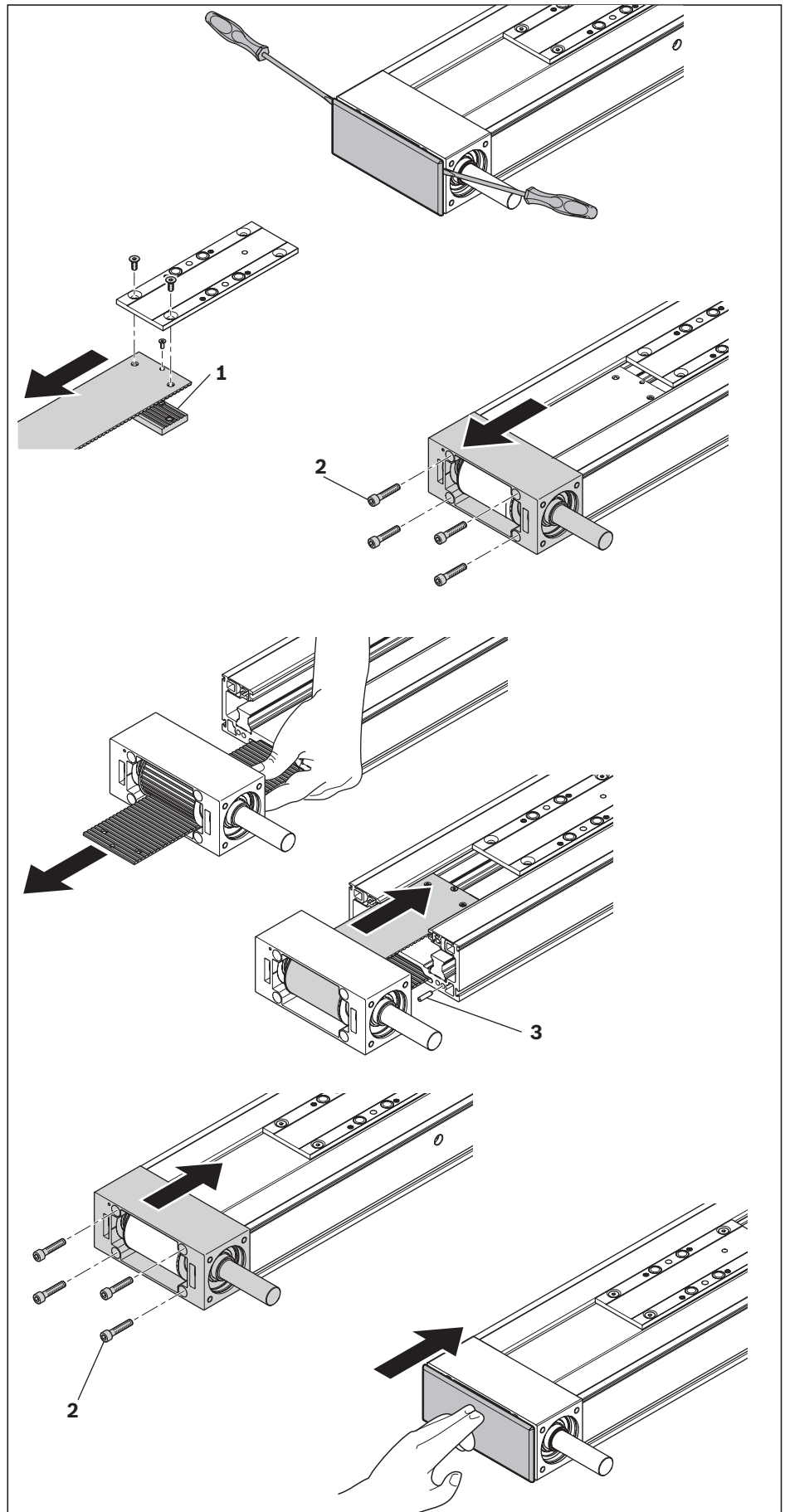


Fig. 44: Replacing the drive end enclosure

13.4 Tensioning the toothed belt (CKR)

1. Remove screws (1) and cover (2) from the linear axis
2. Loosen the set screw (3) (except CKR-070)
3. Tightening the tensioning elements (4) generates the preload in the toothed belt. Apply the preload force F_{pr} with the frequency meter by adjusting the frequency f according to the manufacturer's specifications.
4. The distance a should be between 0.2 m and 0.5 m.
5. The parallelism of the axis (5) to the frame of max. 0.1 mm must be observed.
6. Push the carriage several times back and forth to test the run of the toothed belt on the tension wheel. The toothed belt must not rest against the flanged wheels of the tension wheel (setting via tensioning elements (4)).
7. Tighten set screws (3) (except CKR-070).
8. Mount the cover (2) with the screws (1).

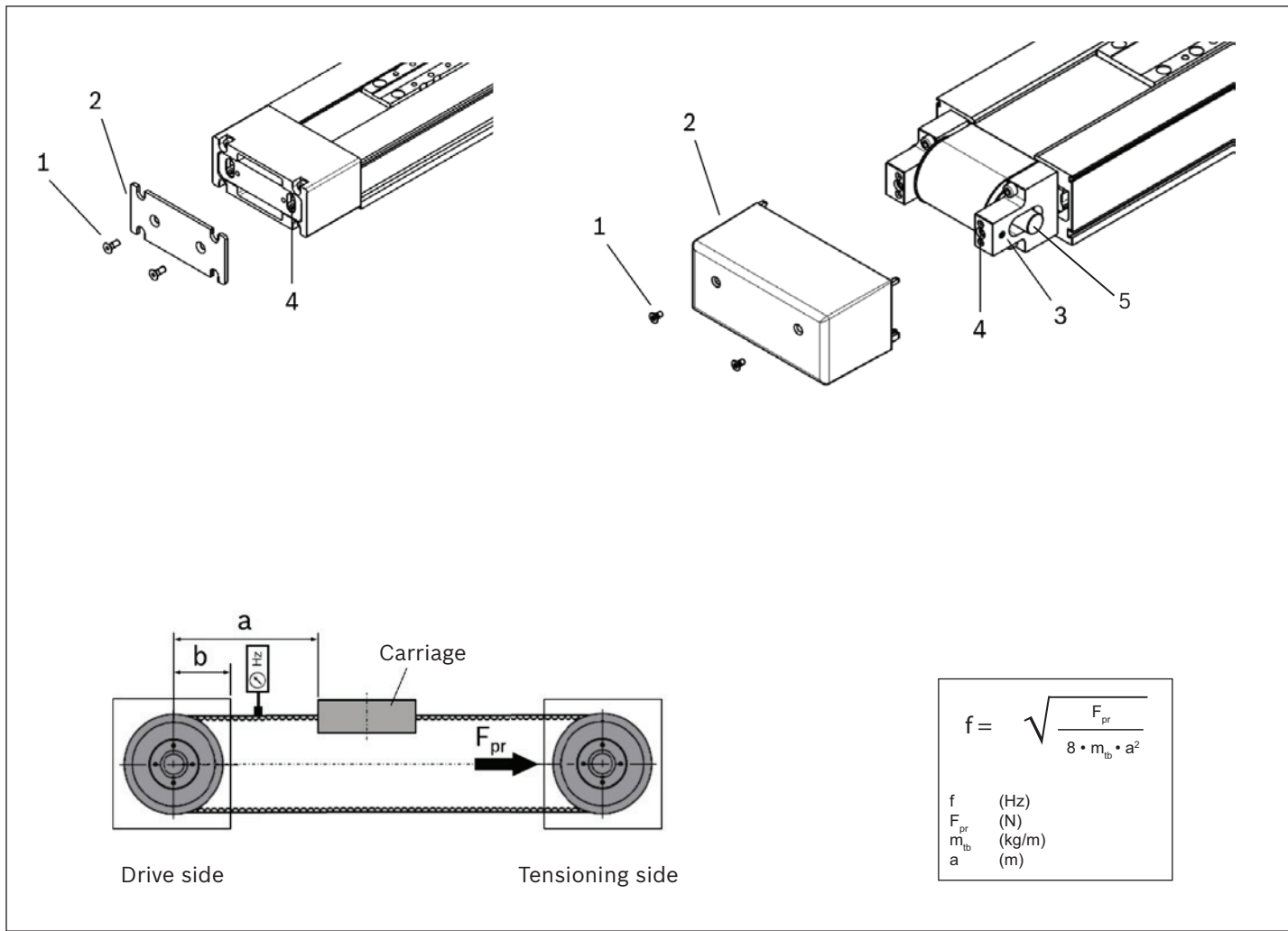


Fig. 45: Tensioning the toothed belt (CKR)

Table 23: Tensioning the toothed belt

CKR	070	090	110	145	200	280 Single-belt version	280-DB Two-belt version
b (m)	0.018	0.028	0.033	0.030	0.053	0.076	0.102
m_{tb} (kg/m)	0.056	0.078	0.178	0.238	0.581	0.839	0.500
F_{pr} (N)	524	1,120	1410	2475	5660	9735	8092

14 Replacing frame or guide rails

 To ensure the accuracy of the compact modules after replacement, we recommend that you return the complete compact module to Bosch Rexroth.

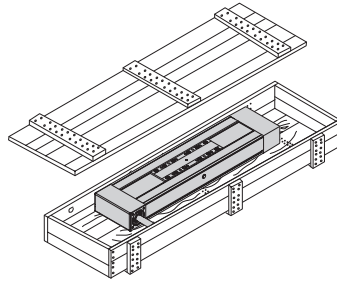


Fig. 46: Replacing frame or guide rails

EN

15 Service and support

- ▶ When ordering spare parts, please specify all the data on the name plate.
- ▶ To order spare parts, please contact your local Bosch Rexroth AG regional center.
To find it, visit www.boschrexroth.com/contact

In urgent cases, our Bosch Rexroth Customer Service help desk & hotline staff will be happy to assist you in any way they can.

Phone: +49 (0) 9352 40 50 60

E-mail: Service@boschrexroth.de

Return address:

Bosch Rexroth AG

SERVICE

Röntgenstraße 5

97424 Schweinfurt

Bosch Rexroth AG
Ernst-Sachs-Straße 100
97424 Schweinfurt, Germany
Tel. +49 9721 937-0
Fax +49 9721 937-275
www.boschrexroth.com

Subject to modifications