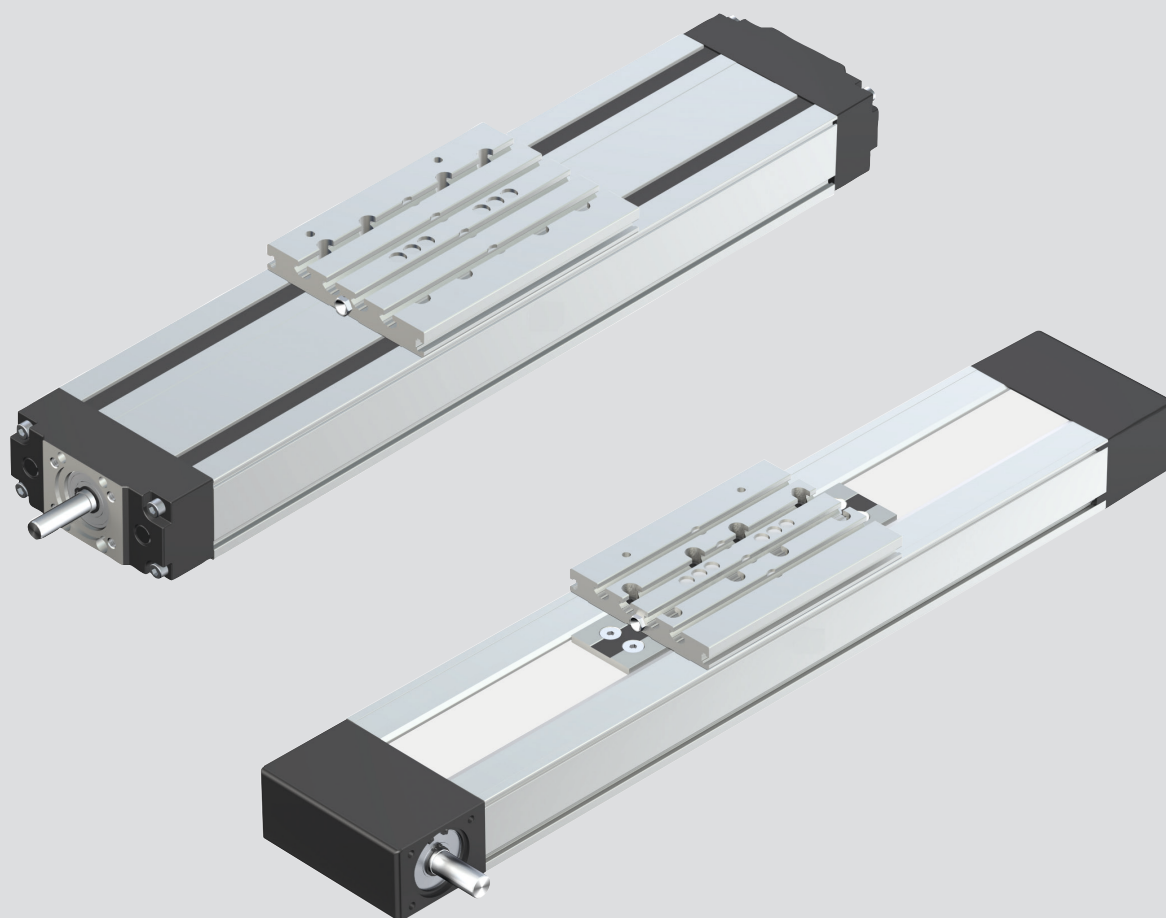


Compact modules CKK/CKR

R320103178/2021-04
(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. It should be noted that our products are subject to a natural process of aging and wear.

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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 these mounting instructions and the safety instructions and information for linear motion systems R320103152

Die vorliegende Anleitung ist in folgenden Sprachen verfügbar.
These instructions are available in the following languages.
Les présentes instructions sont disponibles dans les langues suivantes.
Le presenti istruzioni sono disponibili nelle lingue seguenti.
Las presentes instrucciones están disponibles en los siguientes idiomas.
As presentes instruções estão disponíveis nas seguintes línguas.
本说明书具有下列语言版本。

DE Deutsch (Originaldokumentation)

EN English

FR Français

IT Italiano

ES Español

PT Português

CS Český

ZH 中文

Contents

1	About these mounting instructions.....	4
1.1	Validity of the documentation.....	4
1.2	Required and supplementary documentation	4
1.3	Presentation of information.....	4
2	Overview of attachments	7
3	Fastening customer-built attachment and product to the mounting base.....	8
3.1	Mounting the connection plate.....	8
3.2	Mounting customer-built attachment to the carriage.....	9
3.3	Fastening compact modules to the mounting base	10
4	Switching system	12
4.1	Mounting the socket	13
4.2	Magnetic sensor with free cable end.....	14
4.3	Magnetic sensor with plug.....	16
4.4	Mechanical and proximity switches, cable duct at CKK/CKR-200	17
4.5	Setting the switching points / moving the switches.....	18
5	Motor type / motor identifier	19
6	Drive CKK	20
6.1	Mounting the motor with flange and coupling.....	20
6.2	Mounting the motor with belt side drive	24
7	Drive CKR.....	28
7.1	Overview.....	28
7.2	Mounting the motor / direct mounting (i=1)	29
7.3	Gear attachment CKR-070/-090/-145/-200 (PG090)	30
7.4	Gear attachment CKR-110	30
7.5	Gear attachment CKR-200 (PG120).....	31
7.6	Tensioning the toothed belt (CKR)	32
8	Lubrication	33
8.1	Overview of lubrication versions	33
8.2	Lubricants.....	34
8.3	Lubrication version LSS / LPG	36
8.4	Initial lubrication.....	40
8.5	Relubrication	42
8.6	Relubrication intervals CKK.....	44
8.7	Relubrication intervals CKR.....	46
9	Replacing the seals of the Resist covers at CKK.....	48
9.1	Disassembly	48
9.2	Assembly.....	48
10	Further information.....	50
10.1	Tightening torques.....	50
10.2	Compact module CKR; clamping hub	50
10.3	Operating conditions	50
10.4	Amending chapters	50
11	Service and support.....	50
12	Kits	51
12.1	Overview of CKK.....	51
12.2	Overview of CKR.....	51

1 About these mounting instructions

1.1 Validity of the documentation

This documentation applies to the following products:

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

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 working with the product, be sure to read the mounting instructions "Safety instructions and information for linear motion systems R320103152" completely, especially the chapter "Safety instructions". Further required information to be considered, for example, on: Transport and storage, mounting, electrically connecting the product, commissioning, operation, maintenance and repair, lubrication, disassembly and exchange, disposal etc. can be found in this mounting instruction.
- ▶ 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 and information for linear motion systems	R320103152	Safety instructions and information for linear motion systems
	Compact modules CKK/CKR	R999000479	Catalog
	Rexroth catalogs for drive technology		
	Product data sheet for Dynalub 510	R3102052	
	Safety data sheet for Dynalub 510	R320103160	
	Product data sheet for Dynalub 520	R3102053	
	Safety data sheet for Dynalub 520	R320103161	
	Mounting 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.

1.3.1 Safety instructions in this document

This document contains safety instructions preceding any actions that involve a risk of personal injury or damage to property. The safety precautions described must be adhered to.




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 instruction is not complied with.

Table 2: 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.
NOTE	Property damage: The product or surroundings may be damaged

1.3.2 Symbols

Meaning of the symbols

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

The following symbols indicate information that is not related to safety but makes the documentation easier to understand.

1.3.3 Abbreviations

The following abbreviations are used in this documentation:

Table 3: Abbreviations and definitions

Abbreviation	Unit	Meaning
BASA	(-)	Ball screw assembly
CKK	(-)	Compact module with ball screw assembly
CKR	(-)	Compact module with toothed belt drive
CKx	(-)	CKK and CKR
C_{gw}	(N)	Dynamic load capacity, guideway
C_{bs}	(N)	Dynamic load capacity for ball screw assembly
d_0	(mm)	Nominal diameter of ball screw assembly
DH_{min}	(mm)	Minimum double stroke
f	(Hz)	Frequency
F_{mgw}	(N)	Dynamic equivalent load on bearing of the guideway
F_{mbs}	(N)	Dynamic 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}	(-)	Dynamic 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 Overview of attachments

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

Retrofitting is possible at any time.

The two switching systems cannot be mounted on the same side!

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

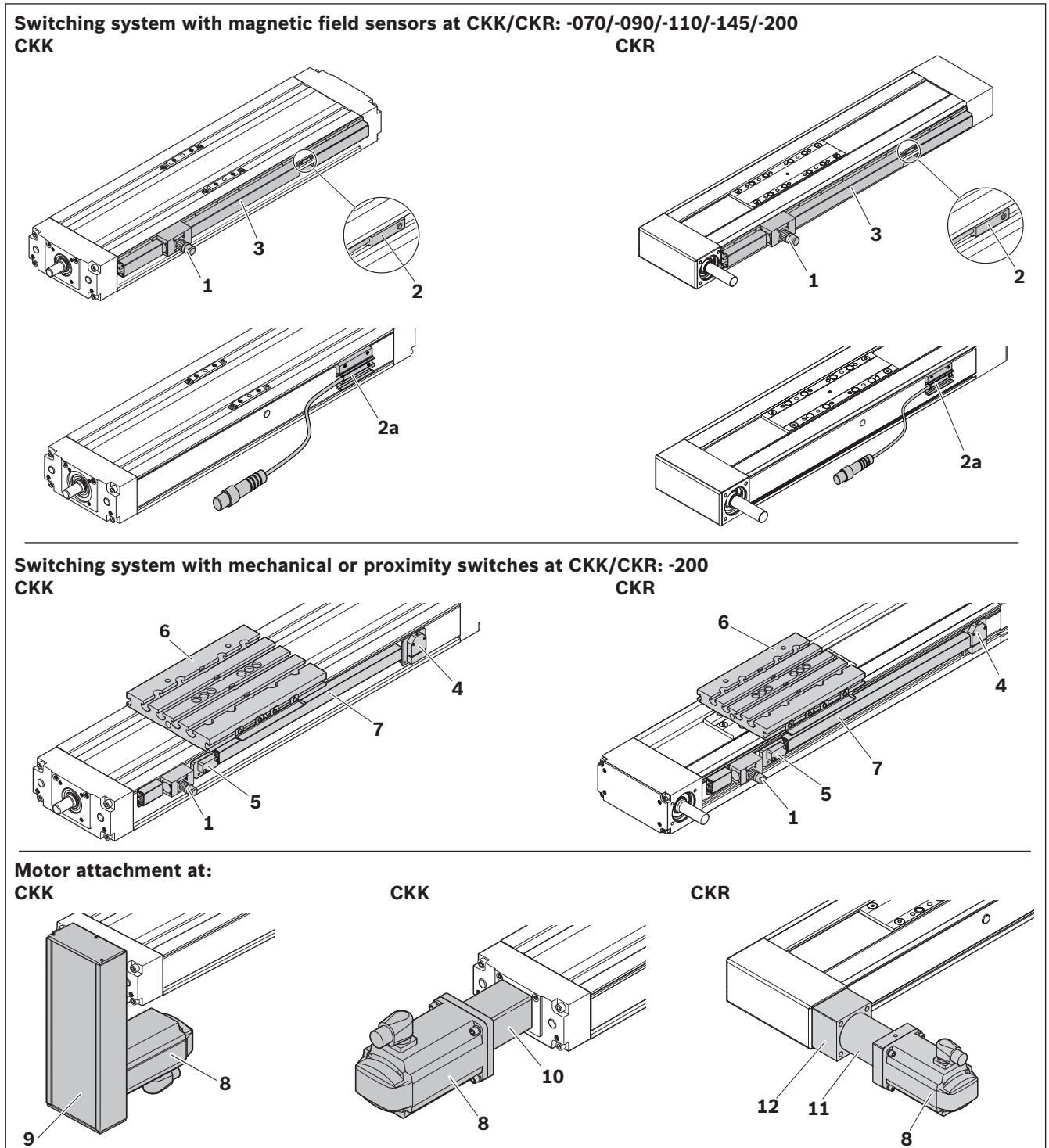


Fig. 1: Overview of attachments

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

3.1 Mounting the connection plate

► Connection plates (1) can be retrofitted at any time for lubrication versions LSS and LPG. Sizes 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 .

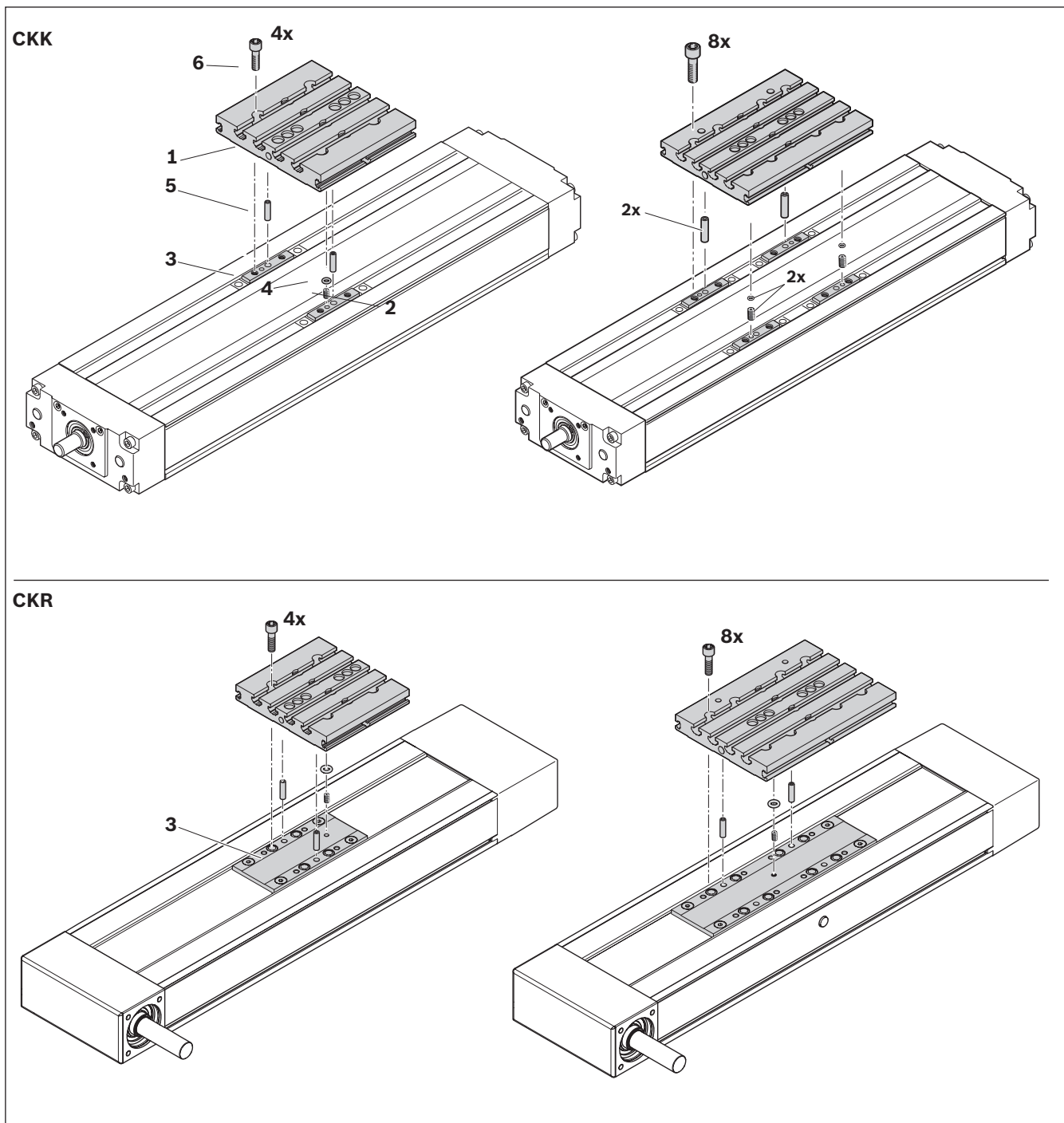


Fig. 2: Mounting the connection plates

3.2 Mounting customer-built attachment to the carriage

- Sliding blocks are easier to position with springs.

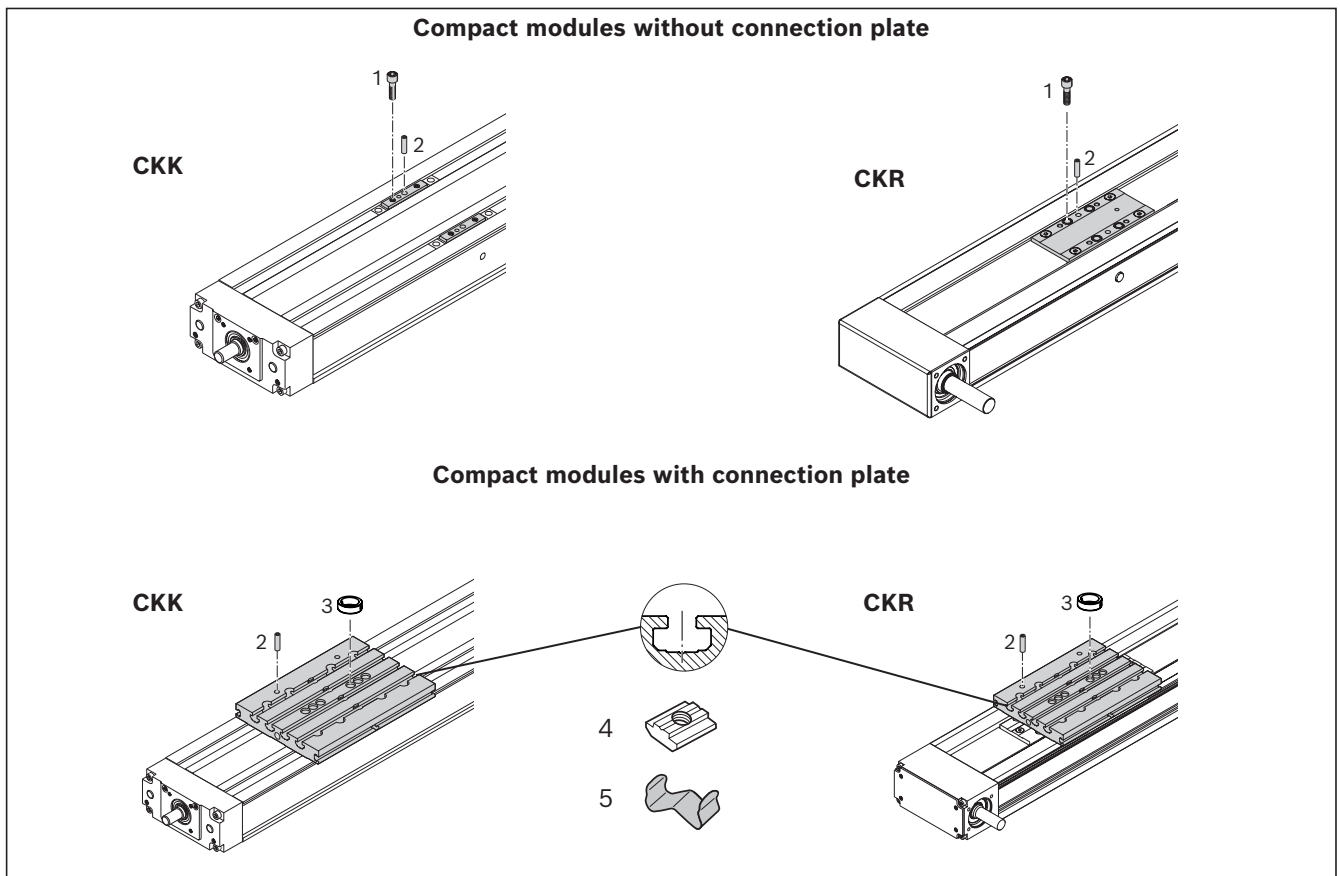


Fig. 3: Mounting the carriage attachments

- 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

3.3 Fastening compact modules to the mounting base

NOTE

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 \Rightarrow \boxtimes Fig.4.
- ▶ Observe specified tightening torques.
- ▶ When fasteniing to the frame, keep a minimum distance of 5 mm from the end blocks (1) \Rightarrow \boxtimes Fig.4.

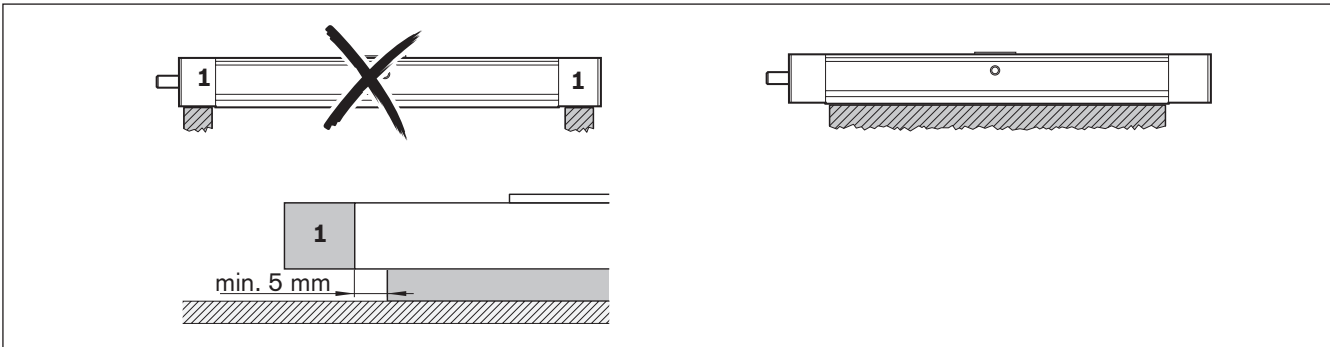


Fig. 4: Fastening on the mounting base

3.3.1 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 3.3.2. 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 (1) for better alignment with other linear motion systems and connection elements.
- ▶ Sizes and material numbers of the fastening accessories \Rightarrow Catalog "Compact modules" R999000479.

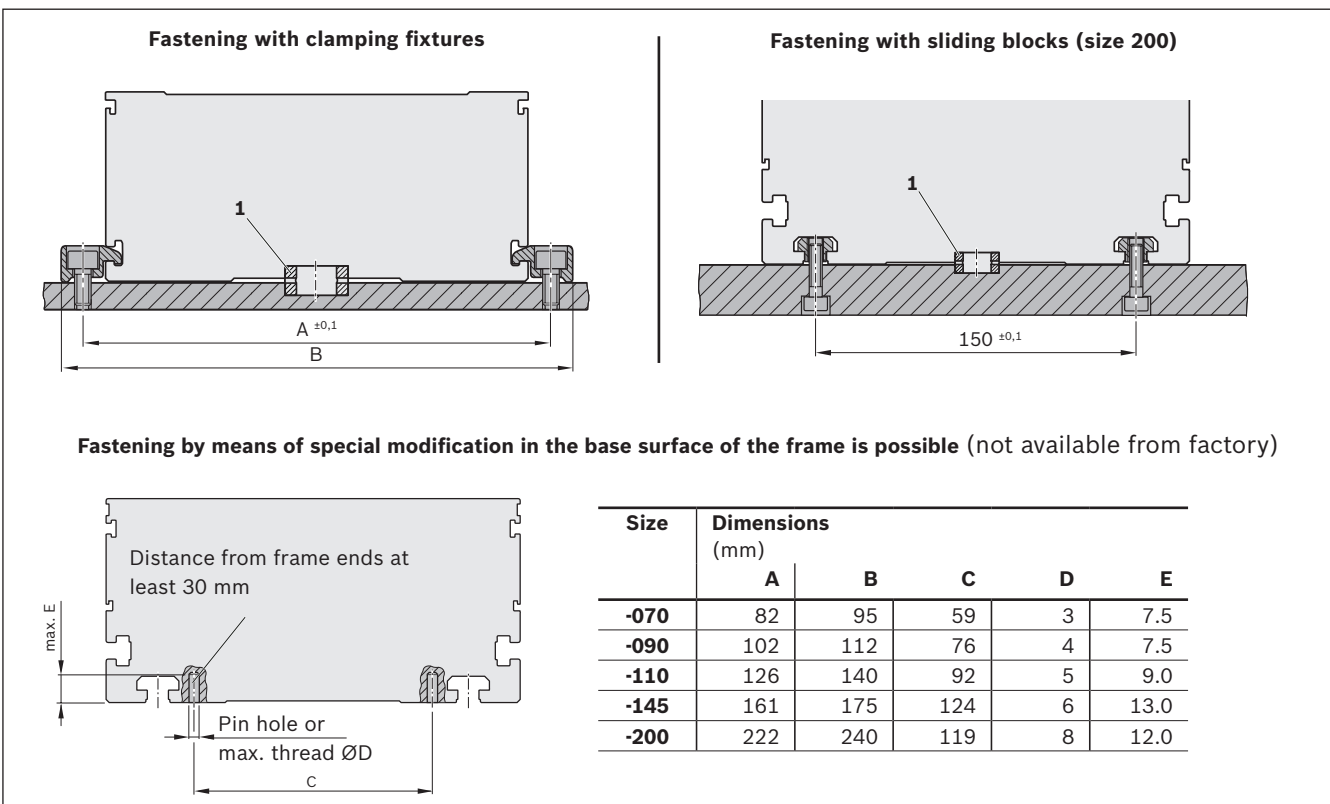


Fig. 5: Fastening

3.3.2 Fastening accessories

Clamping fixtures

Recommended number of clamping fixtures:

- ▶ Type 1: $6/3^{1)}$ 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 of sliding blocks:
with 1 thread, 6 pieces per meter and side

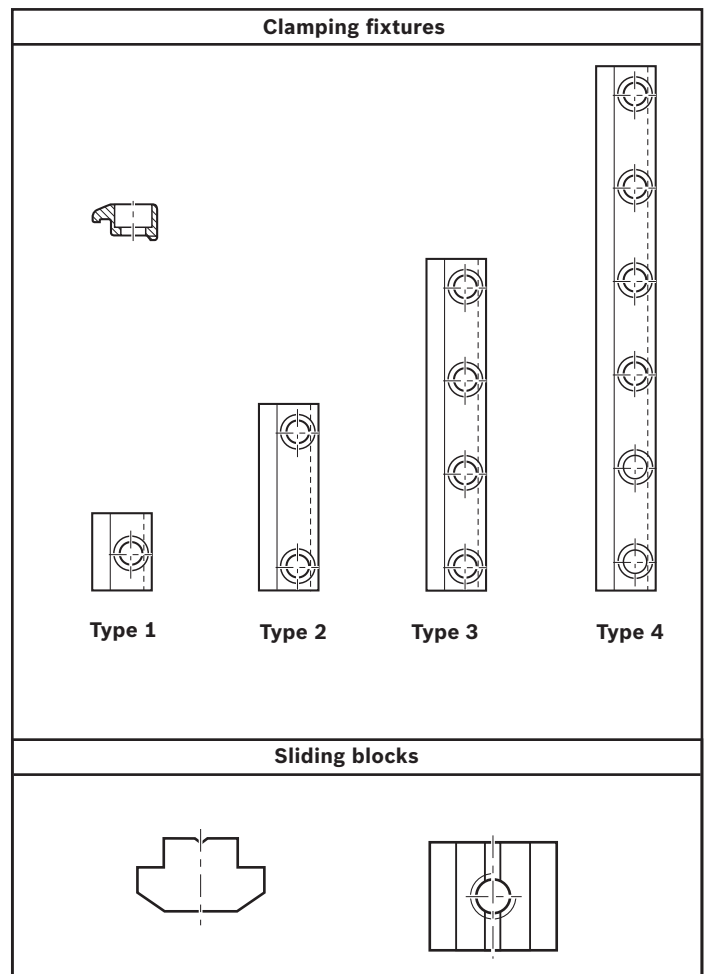


Fig. 6: Fastening accessories

4 Switching system

NOTE

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 mounting hole plug(s).

Lubrication of the product via frame is not assured!

Damage to the product.

- ▶ Fasten the entire switching system on one side of the product to enable lubrication via frame ➡ "Lubrication".

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

4.1 Mounting the socket

Installation position:

There are various socket and plug 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 plug (11).

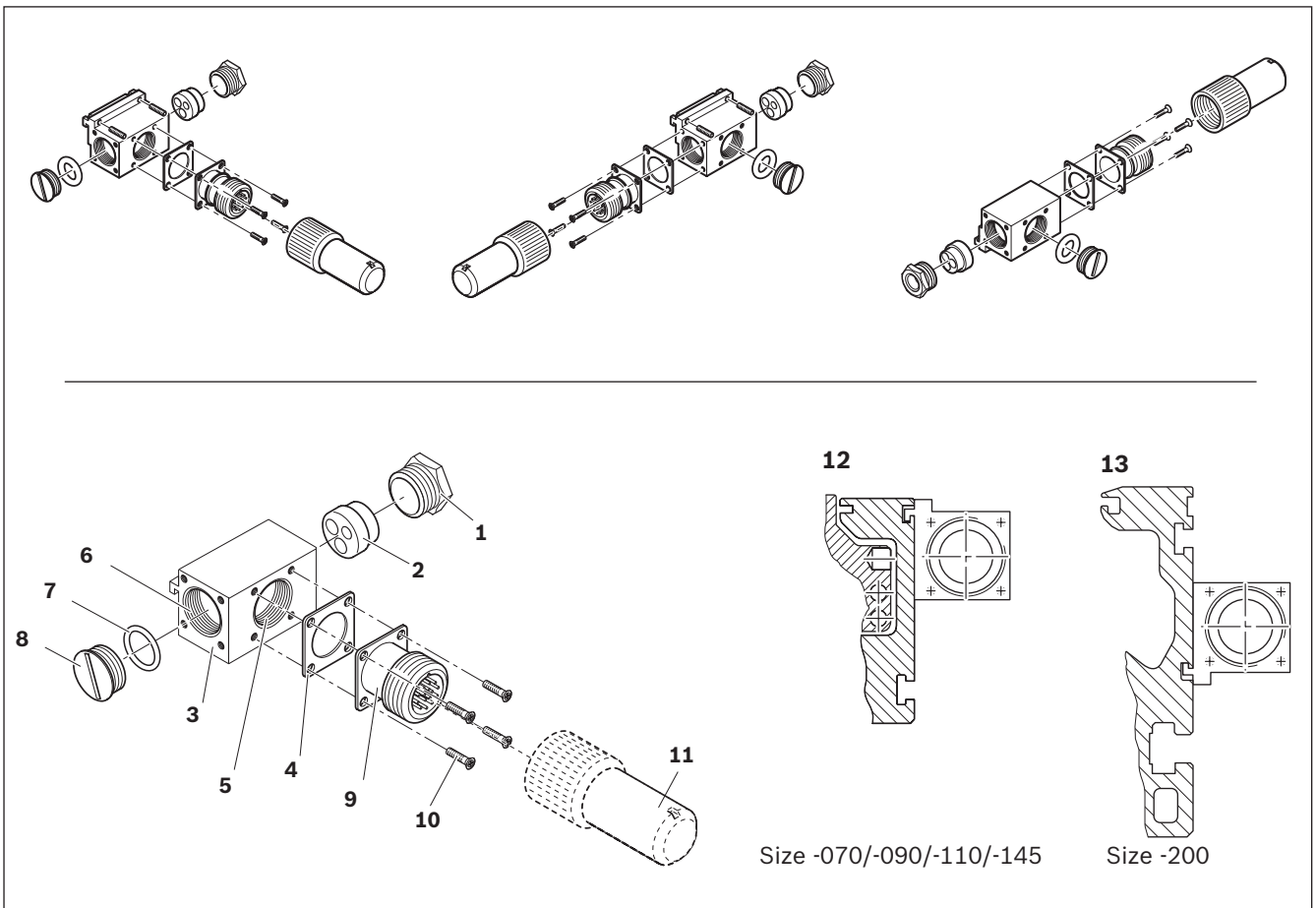


Fig. 7: Mounting the socket

4.2 Magnetic sensor with free cable end

► Switch activation is done by magnets in the carriage.

4.2.1 Mounting the cable duct

► Observe the notes at the beginning of the chapter

1. Measure the length of the cable duct (1).
2. Saw off and deburr the cable duct.
3. If necessary, make an additional fastening thread M 2.5 (3).
4. Suspend the cable duct without cover (pay attention to the correct position → ☒ Fig.8) and secure with the set screws (4) included.

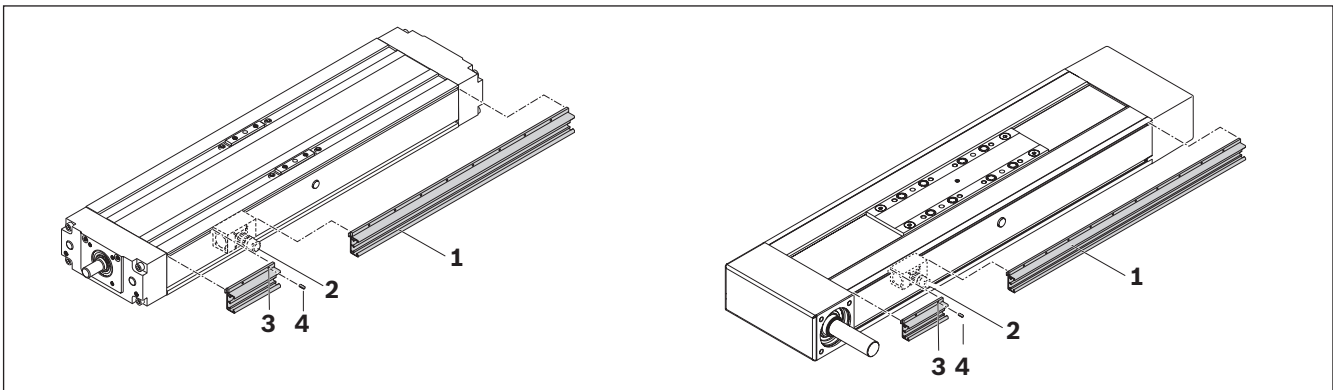


Fig. 8: Mounting the cable duct

4.2.2 Mounting the magnetic sensor

► Fig. 8 shows CKR; mounting for CKK is identical.

1. Insert the sensor (1) into the cable duct (2) so that the set screw (3) of the sensor (1) points outwards.
2. Set the switching point ➡ 4.5
3. Secure the sensor with the set screw.

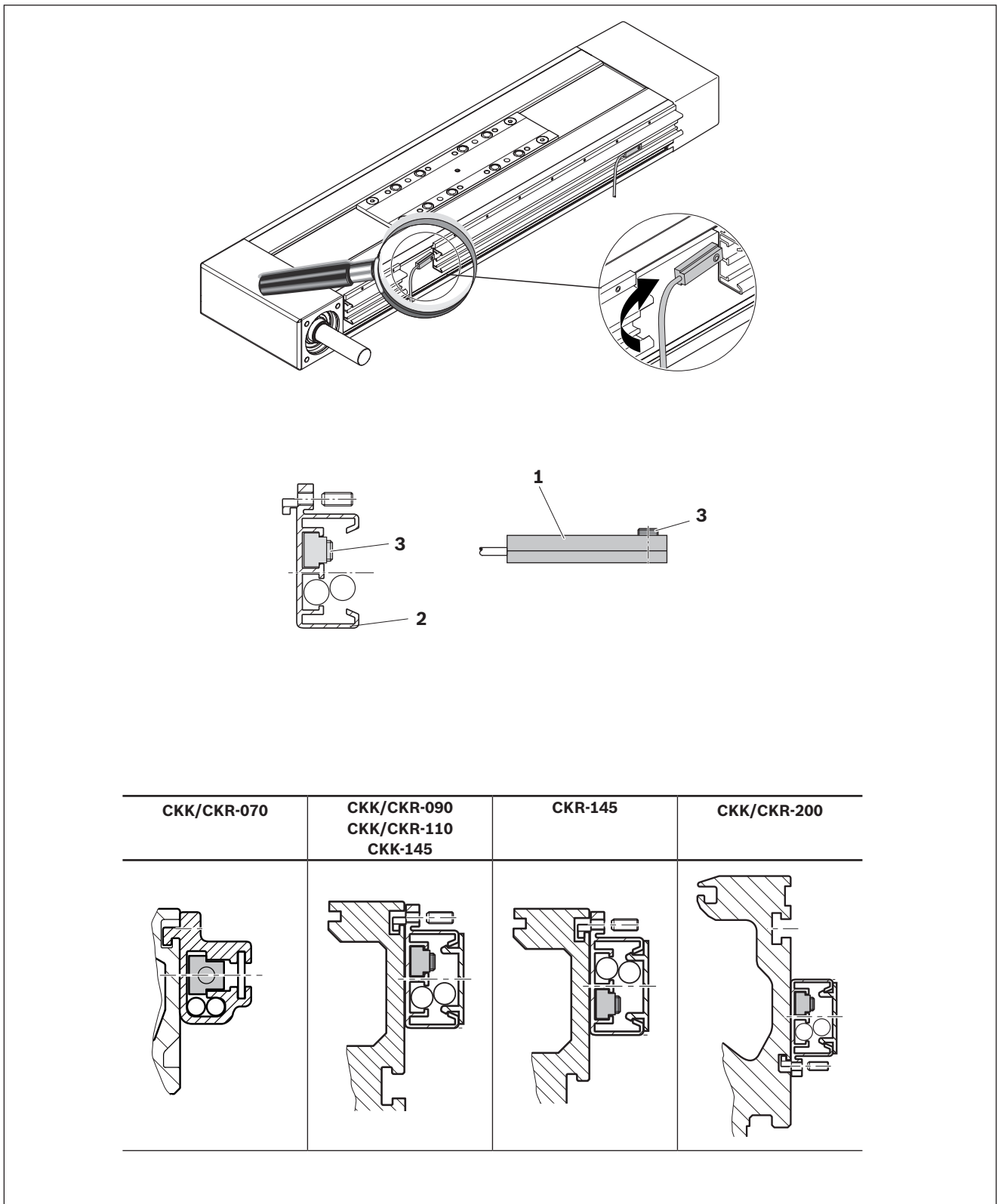


Fig. 9: Mounting the cable duct / magnetic sensor

4.3 Magnetic sensor with plug

► Switch activation is done by magnets in the carriage. Fig. 7 shows CKK; mounting for CKR is identical.

4.3.1 Mounting the magnetic sensor

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 with set screw (2a) 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 (4) ⇒ Fig. 10.
4. Push the sensors into the respective slot on the switch mounting plate and secure with the set screw.
5. Set the switching point ⇒ 4.5

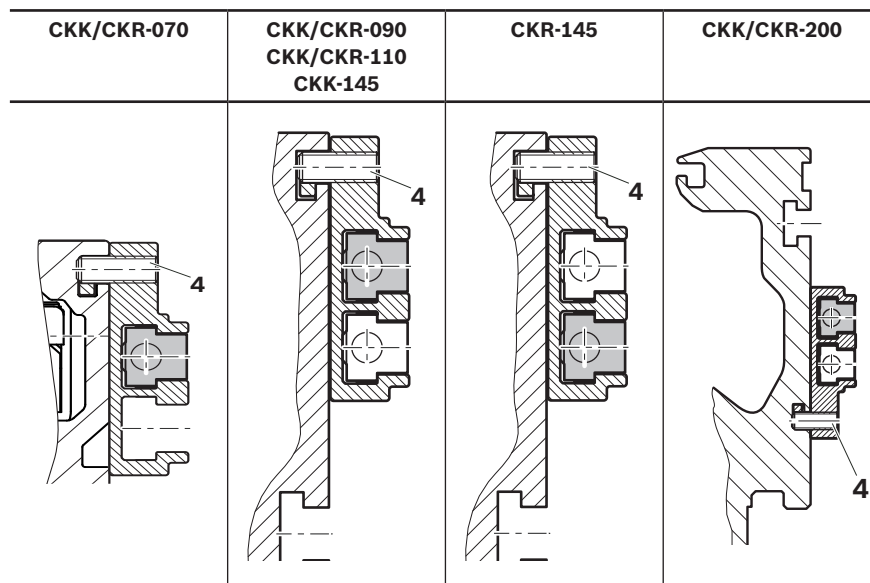
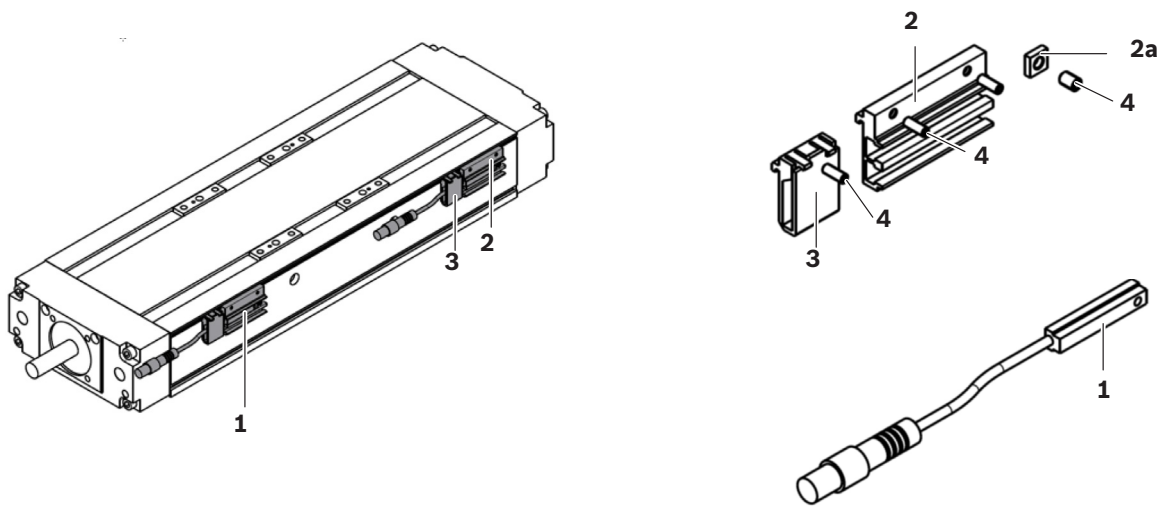


Fig. 10: Mounting the magnetic sensor

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

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

4.4.1 Mounting the switching cam

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

4.4.2 Mounting the switching cam to carriage attachments

- ▶ Fasten the switching cam to the carriage attachments. Observe the mounting dimensions ➡ ☒ Fig. 11.

4.4.3 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

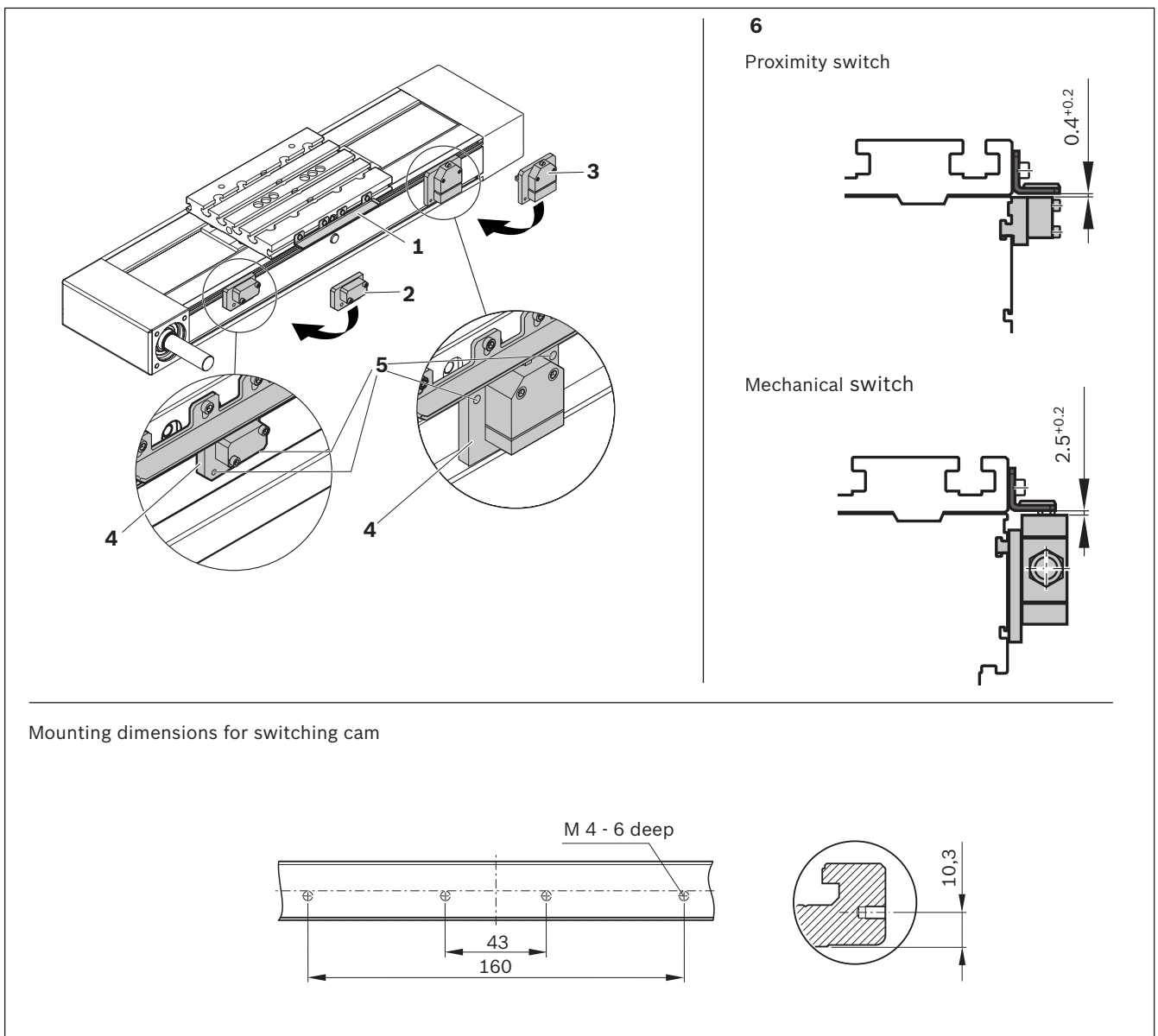


Fig. 11: Mounting of switching system at CKK/CKR-200

4.4.4 Fastening 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 holes (2) are not sufficient (every 300 mm), make additional M3 fastening threads.
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 cables

- ▶ Cut the cable grommets (3) open according to the diameter of the cables 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.

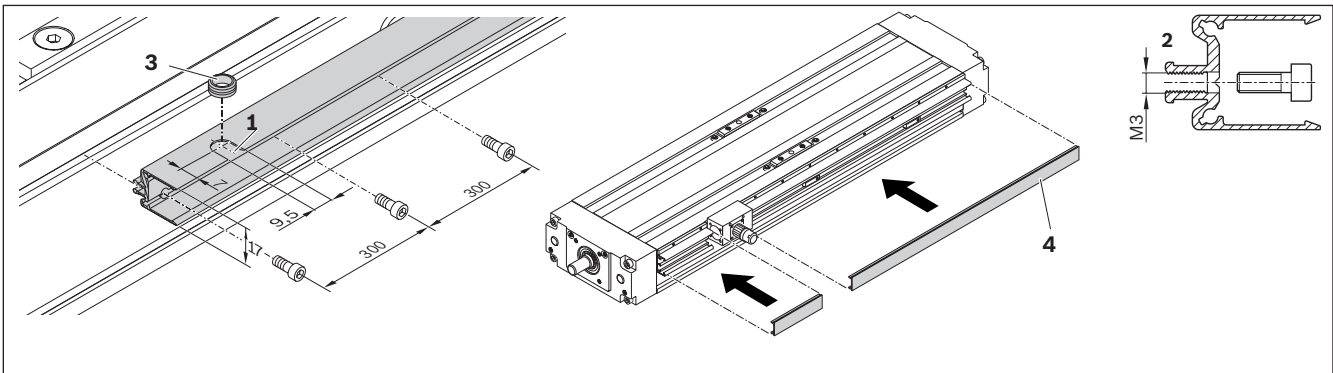


Fig. 12: Mounting the cable duct

4.5 Setting the switching points / moving the switches

CAUTION

Risk of electrical shocks due to contact with live parts (24 V)!

Risk of minor injuries.

- ▶ Before commencing work on any sensors, switch off the power supply and secure it against reactivation.

4.5.1 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.

4.5.2 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 ➔ 4.
3. Snap the cover in again.

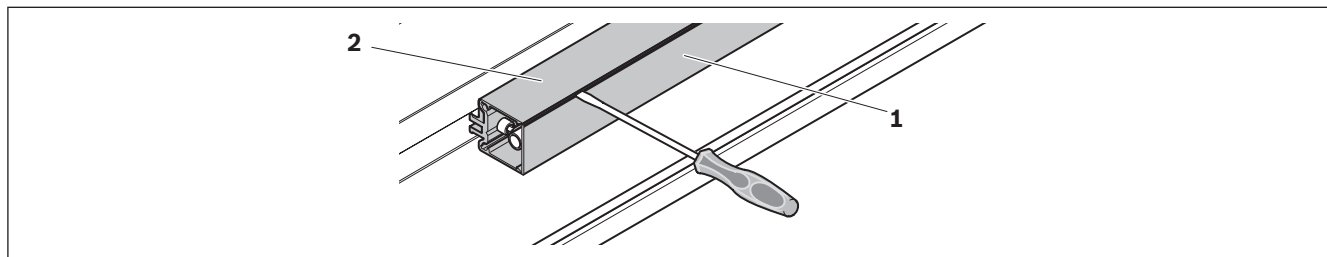


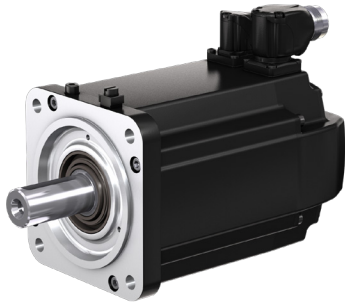
Fig. 13: Removing the cover

5 Motor type / motor identifier

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► The motor type is described by two variants:

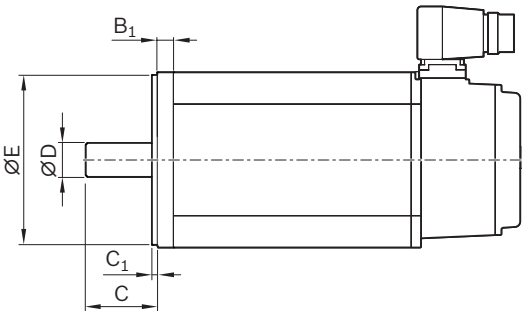
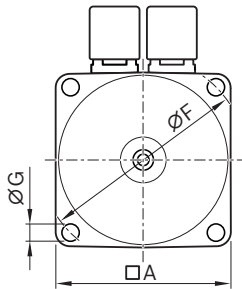
- a) for example, Rexroth MS2N04 motor
- b) motor code describing the connection geometry of the motor, e.g. 14-30-060-3.0-075-M05-008-072



➔ a) MS2N04

➔ b) 14-30-060-3.0-075-M05-008-072

b) motor code

□□	-	□□	-	□□□	-	□□□	-	□□□	-	M	□□	-	□□□	-	□□□
ØD		C		ØE		C ₁		ØF		ØG		B ₁		□A	

Example

1	4	-	3	0	-	0	6	0	-	3	.	0	-	0	7	5	-	M	0	5	-	0	0	8	-	0	7	2
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Fig. 14: Motor type / motor identifier

6 Drive CKK

NOTE

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.

6.1 Mounting the motor with flange and coupling

6.1.1 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 6 .
3. Tighten the screws on the coupling halves (5) with tightening torque M_{CA} ► table 4. 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 mounting hole plugs (6), if available.

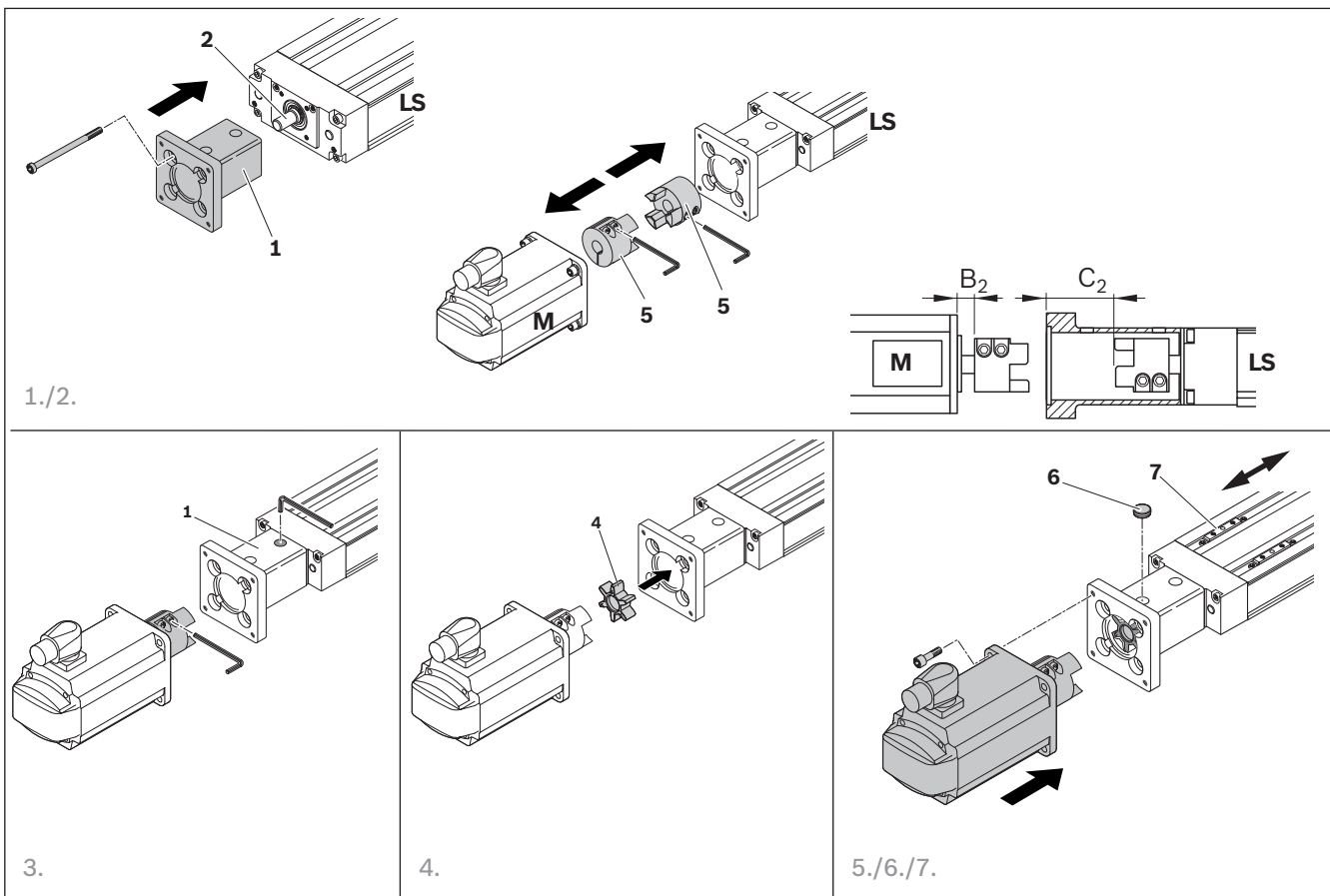


Fig. 15: Motor mounting at CKK-090/-110

6.1.2 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 6.
3. Tighten the screws on the coupling halves with tightening torque M_{CA} → table 4.
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 mounting hole plugs (6), if available.

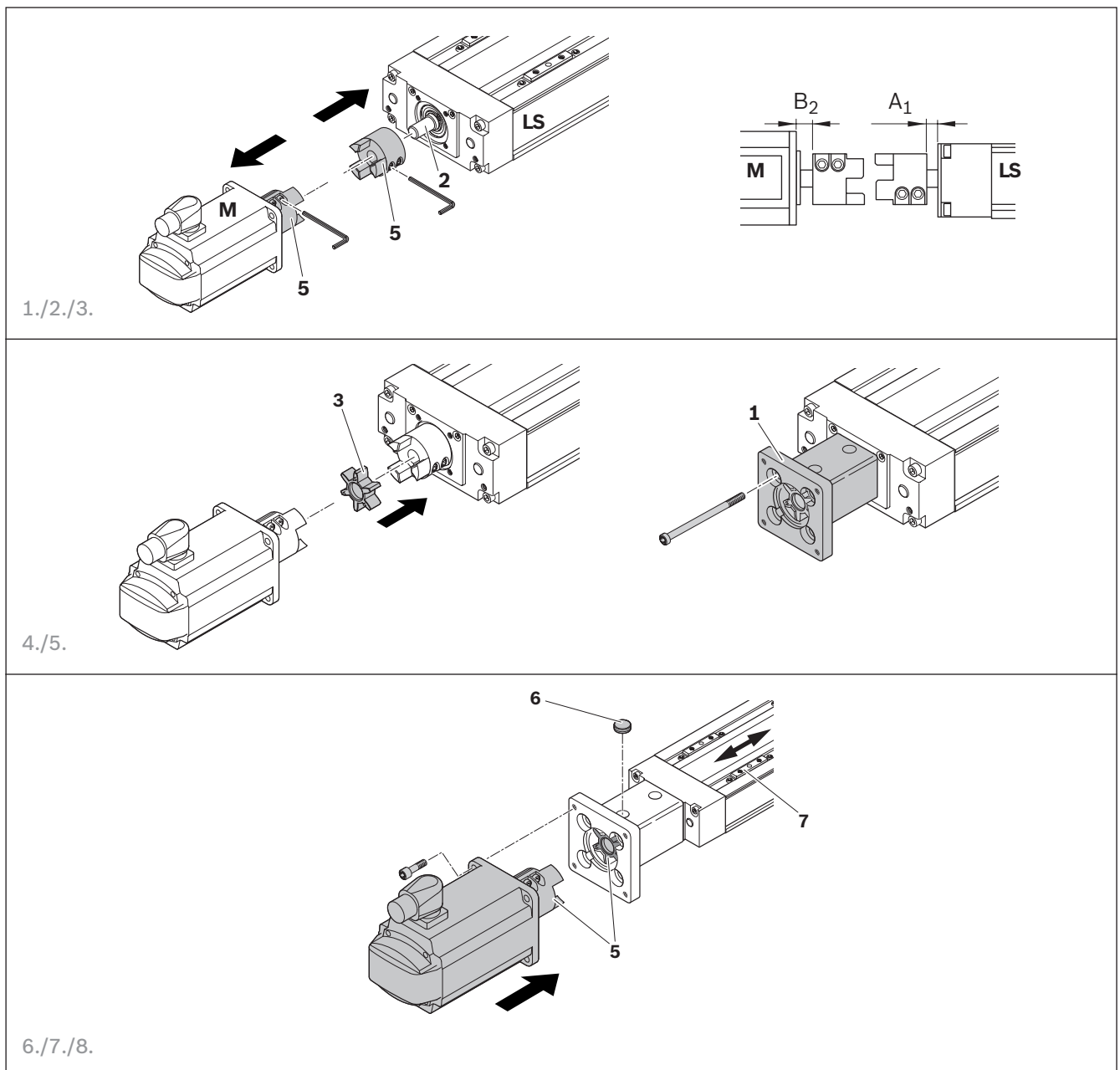


Fig. 16: Motor mounting at CKK-110/-145

6.1.3 CKK-070/-200

► 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 4.
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} according to table 6. 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 6.
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 mounting hole plugs (7), if available.

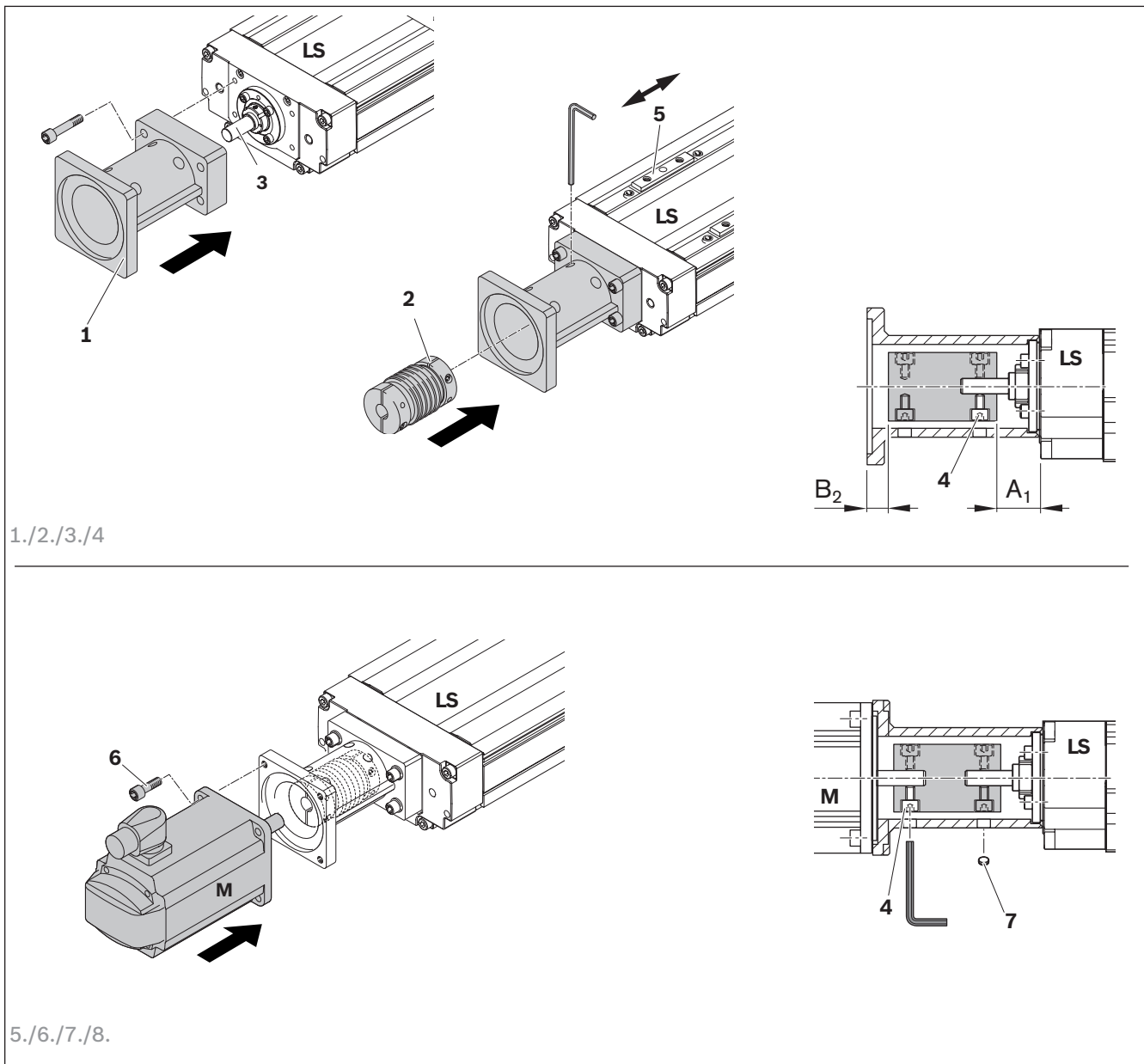



Fig. 17: Motor mounting at CKK-070/-200

Table 4: 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				

6.2 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-mount the belt pulley (2) with flanged wheels, positioned belt and tensioning unit (3) (⇒ 6.2.1) to the screw journal (4).
3. Set distance A ⇒ Table 6.
4. Fasten tensioning unit ⇒ 6.2.1

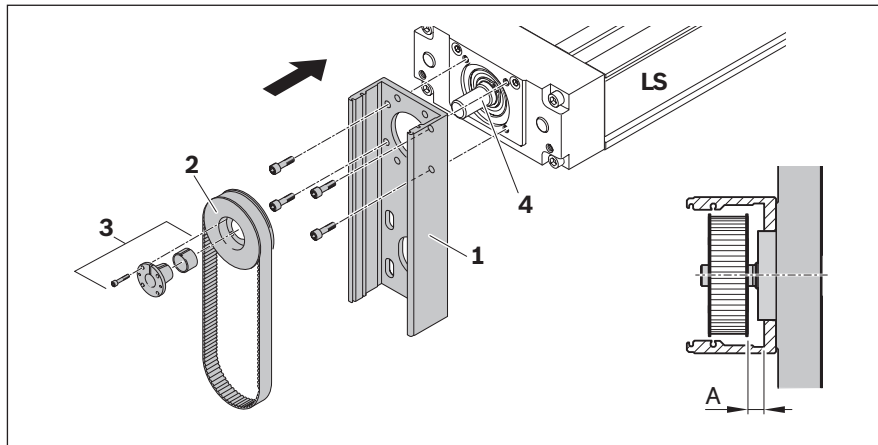


Fig. 18: Mounting the motor with belt side drive

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.

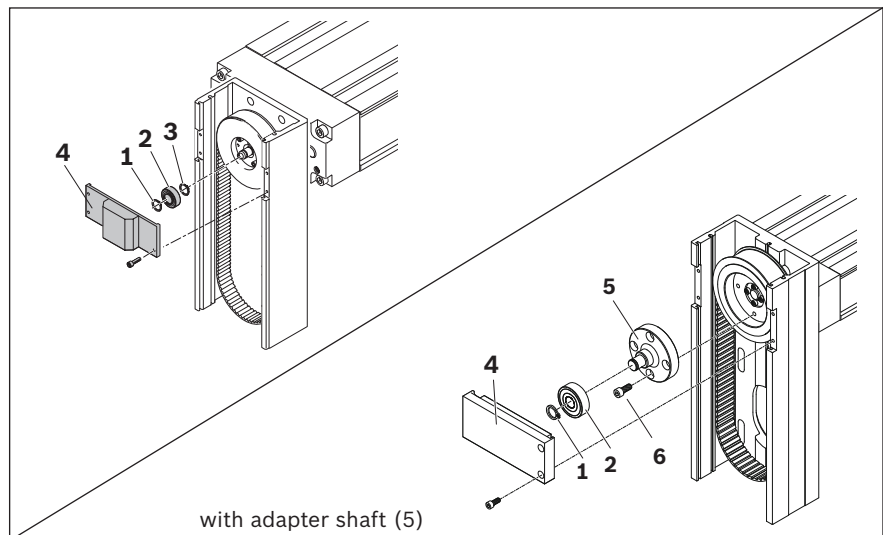


Fig. 19: Mounting the support bearing

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) (⇒ 6.2.1) to the motor journal and insert the toothed belt into the belt pulley.
3. Set distance B ⇒ Table 6.
4. Fasten tensioning unit ⇒ 6.2.1
5. Tension the belt ⇒ 6.2.2.

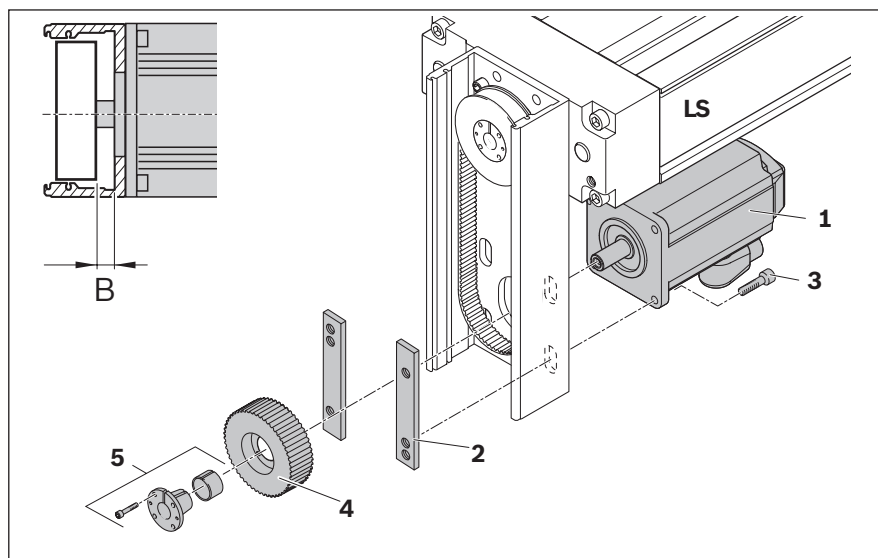


Fig. 20: Mounting the second belt pulley and the motor at $i=1$

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) (⇒ 6.2.1) to the motor journal.
2. Set distance C (⇒ Table 6).
3. Fasten tensioning unit (⇒ 6.2.1)
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 (⇒ 6.2.2).

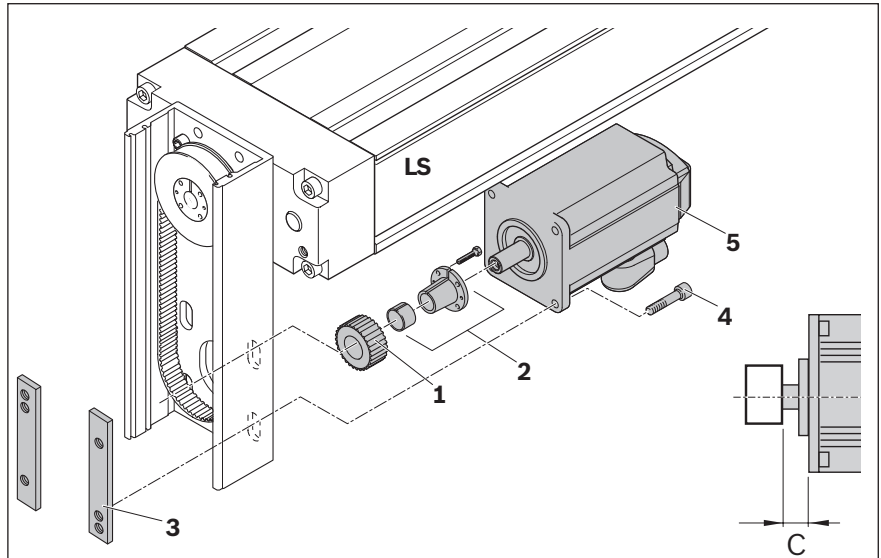


Fig. 21: Mounting the second belt pulley and the motor at $i=1.5$ or $i=2$

EN

6.2.1 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 5.

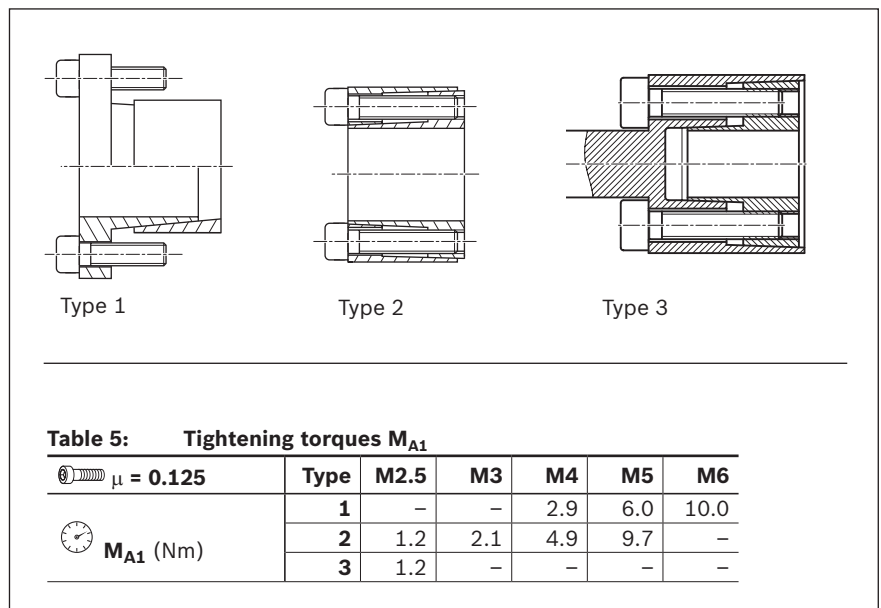


Table 5: Tightening torques M_{A1}



 $\mu = 0.125$	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. 22: Fastening the tensioning units

6.2.2 Tensioning the belt

NOTE

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 mounting instruction R320103158.

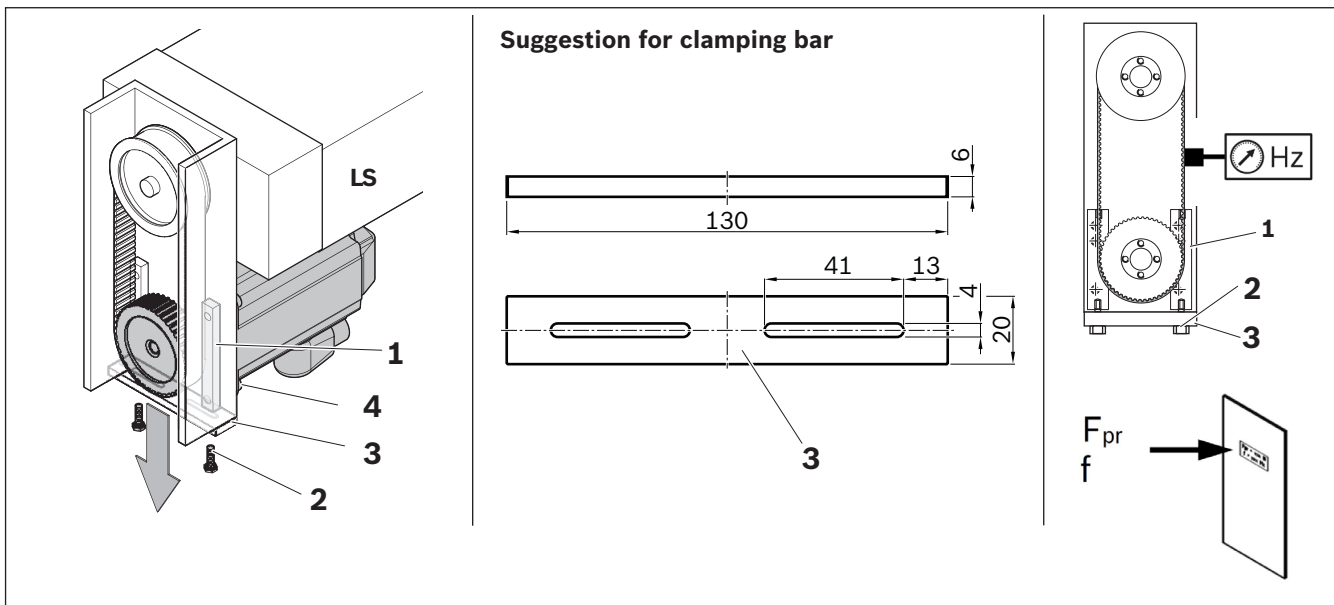


Fig. 23: Tensioning the belt

Fastening the covers of the belt side drive

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

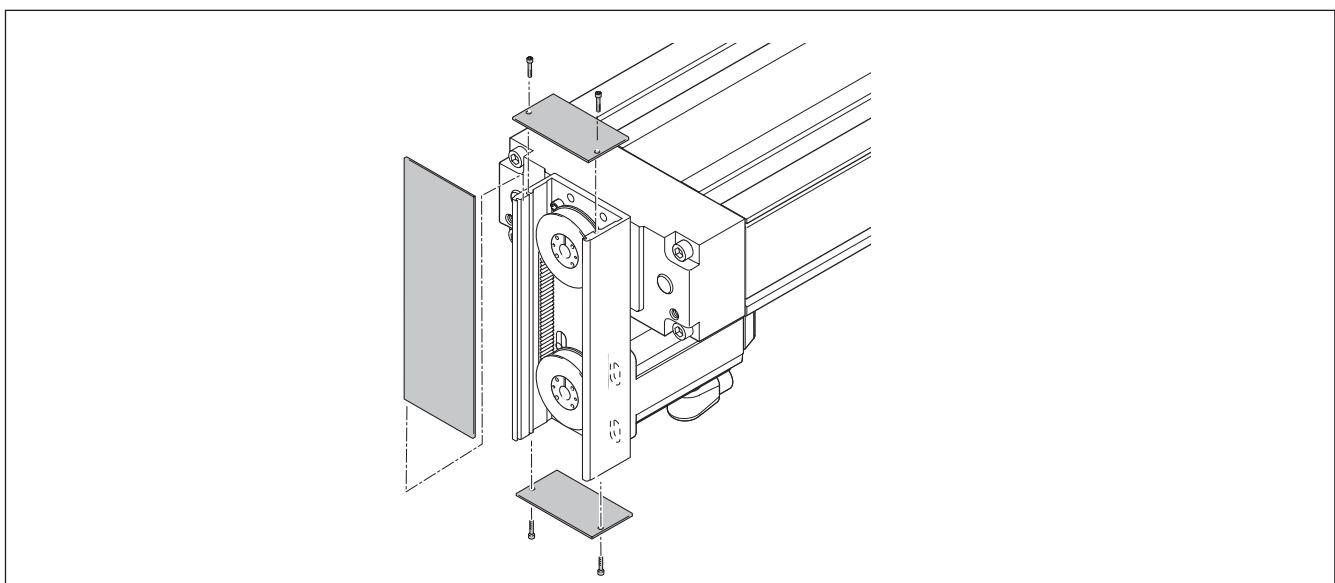



Fig. 24: Fastening the covers of the belt side drive

Table 6: 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	
09-20-040-2.5-063-M05-010-055	1	7	7	-	
	1.5		-	13	
-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	
14-30-060-3.0-075-M06-008-072	1	10	9	-	
	1.5		-	17	
-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		8	-
		2		11	-
	14-30-060-3.0-075-M05-008-072	1	8	9	-
1.5		8		-	
2		11		-	
19-40-080-3.0-100-M06-010-096	1	11	10	-	
	2		11	-	
-200	MS2N06; MSK060	1	12	10	-
		2		12	-
	MSK061	1	12	10	-
		2		12	-
	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

7 Drive CKR

NOTE

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.

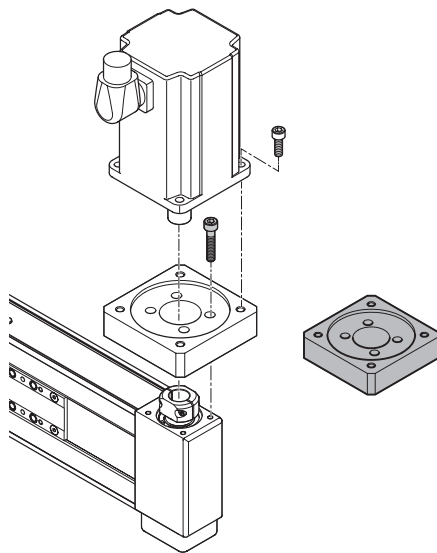
Improper motor mounting!

Damage to the product.

- ▶ Grease-free motor journal, clamping hub and sleeve. Clamping hub: screw specification ⇒ 10.2

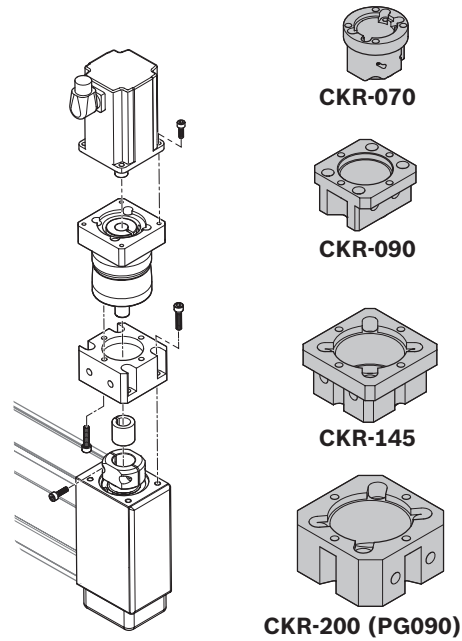
7.1 Overview

Direct mounting ⇒ 6.2 (all sizes)

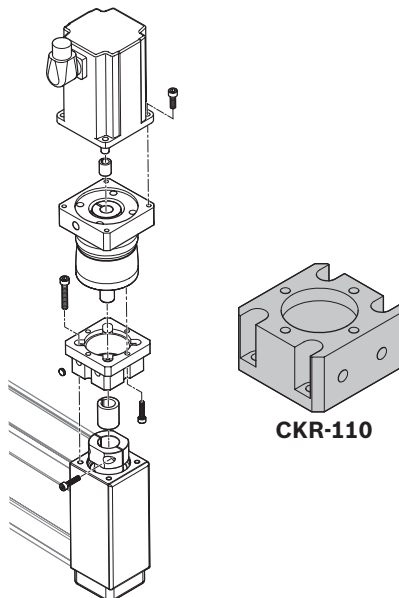


Gear attachment

CKR-070/-090/-145/-200 (PG090) ⇒ 6.3



Gear attachment CKR-110 ⇒ 6.4



Gear attachment CKR-200 (PG120) ⇒ 6.5

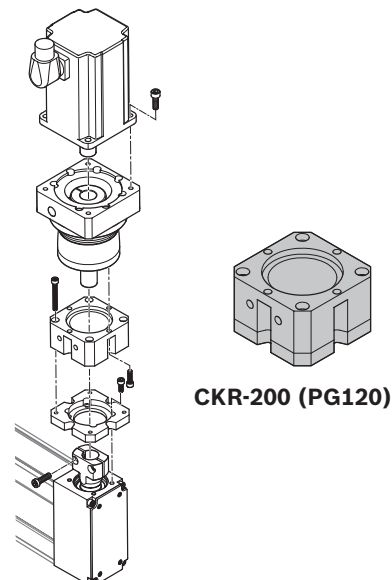
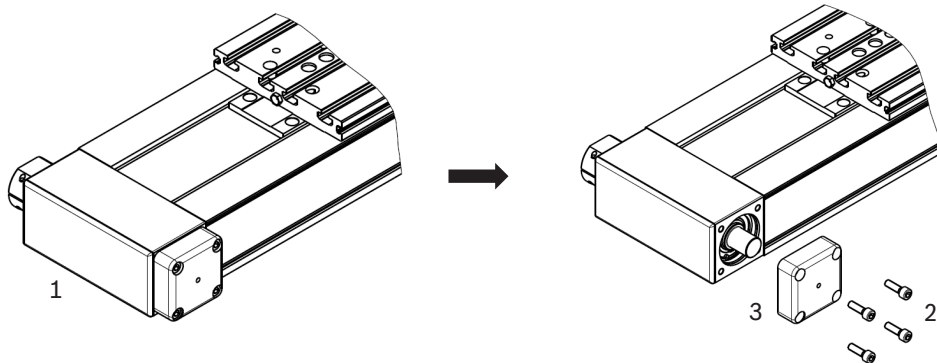


Fig. 25: Overview

Continued overview

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



EN

7.2 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 holes in the flange.
6. Mount the motor to the flange (5) using screws (8).

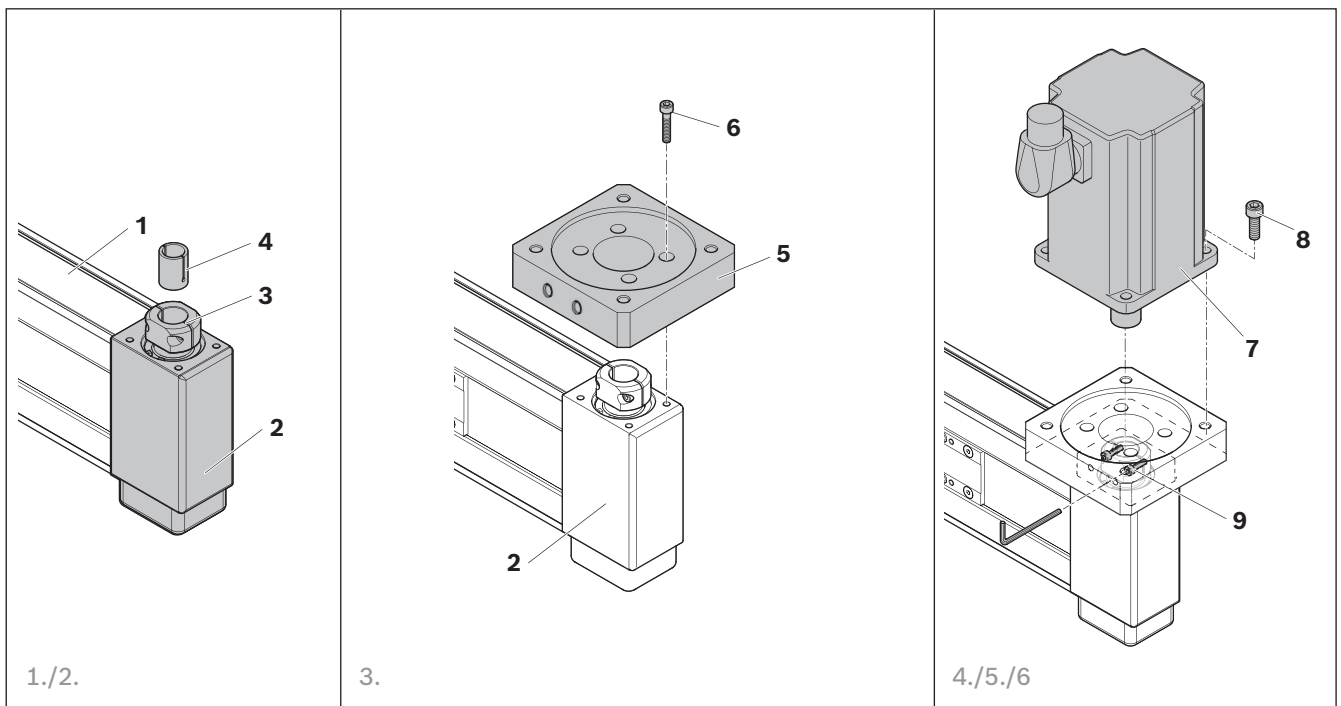


Fig. 26: Mounting the motor / direct mounting i=1

7.3 Gear 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 (8) the tensioning screws of the clamping hub through the bores in the flange (4) with M_{A2} .
6. Fasten the gear unit (6) with fastening screws (10) to the flange (4).
7. Mount the motor (11) onto the gear unit (6) ► See enclosed instructions for the gear unit.
8. Mount the mounting hole plugs (14), if available.

7.4 Gear attachment CKR-110

► Observe the notes at the beginning of the chapter; an already mounted flange (4) must be disassembled for the gearbox 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 (10) to the gear unit (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 (8) the tensioning screws of the clamping hub through the bores in the flange (4) with M_{A2} .
6. Fasten the flange (4) with fastening screws (5) to the end enclosure (2).
7. Mount the motor (11) onto the gear unit (6) ► See enclosed instructions for the gear unit.
8. Mount the mounting hole plugs (14), if available.

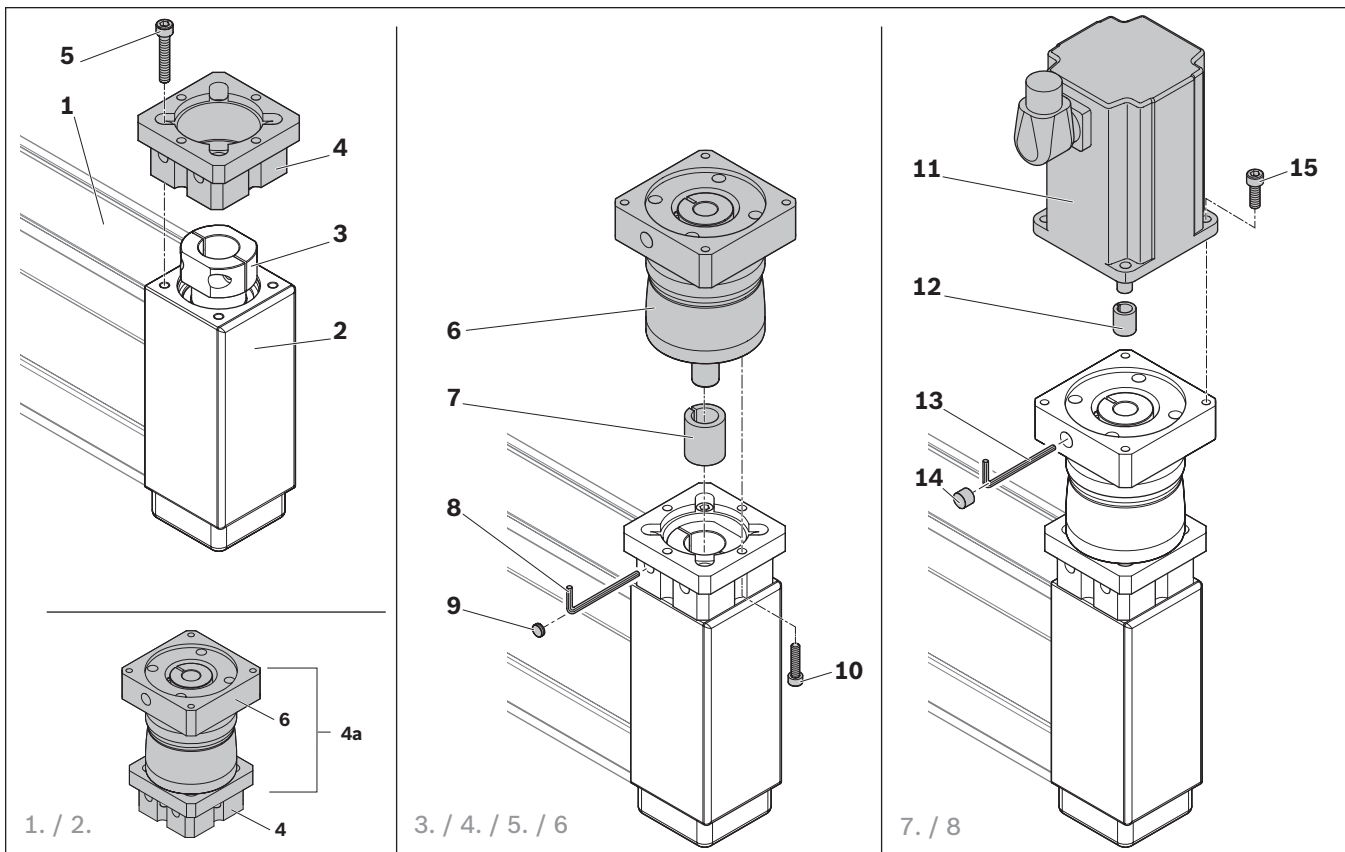


Fig. 27: Gear attachment CKR-070/-090/-110/-145/-200 (PG090)

7.5 Gear 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. Vertically attach the gear unit (8) to the flange (6). Push the gear journal into the clamping hub (3) until the gear unit touches the flange.
5. Tighten (8) the tensioning screws of the clamping hub through the bores in the flange (6) with M_{A2} .
6. Fasten the gear unit (8) with fastening screws (10) to the flange (6).
7. Mount the motor (12) onto the gear unit (8) ► See enclosed instructions for the gear unit.
8. Mount the mounting hole plugs (14), if available.

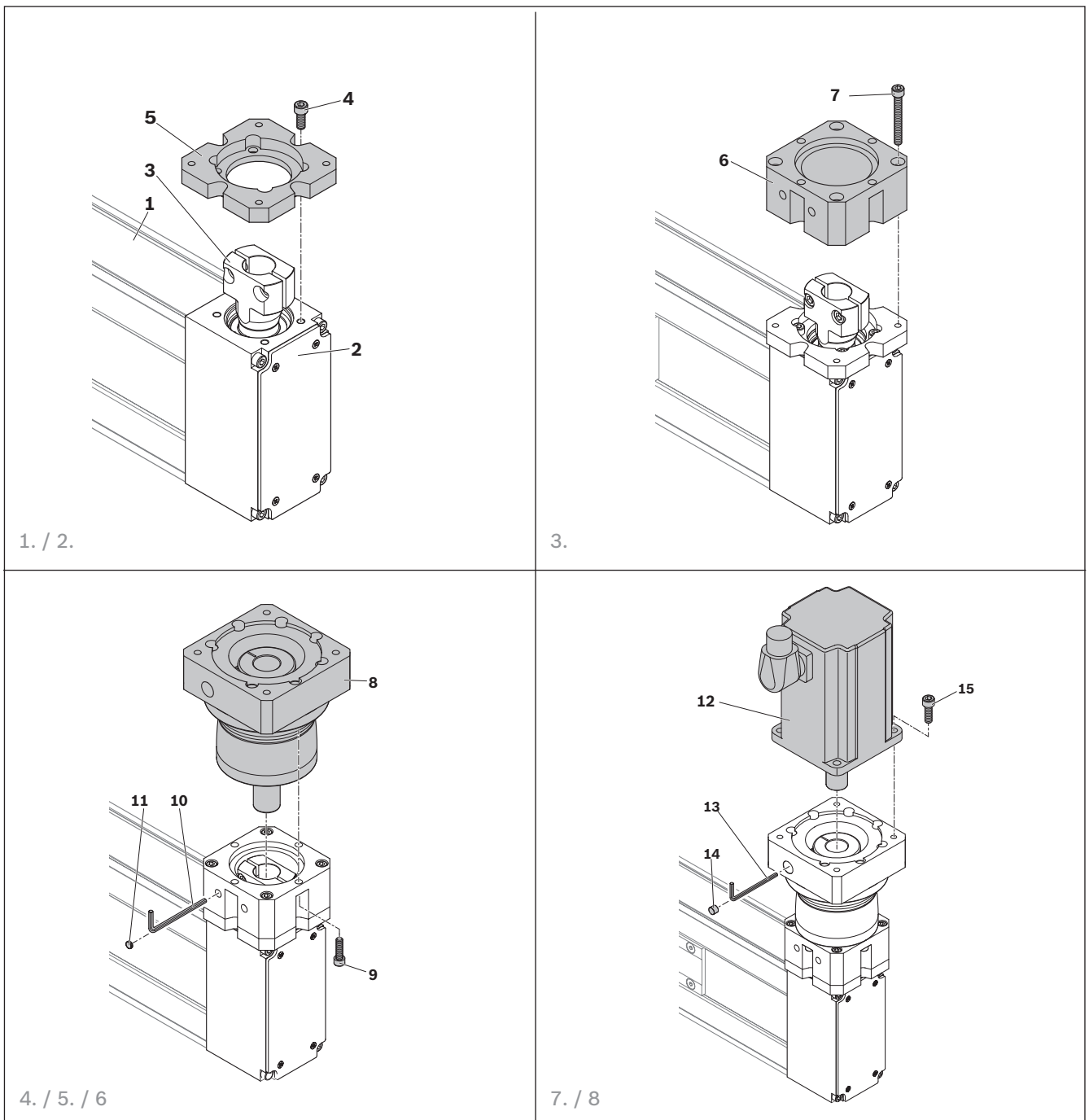


Fig. 28: Gear attachment CKR-200 (PG120)

7.6 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).

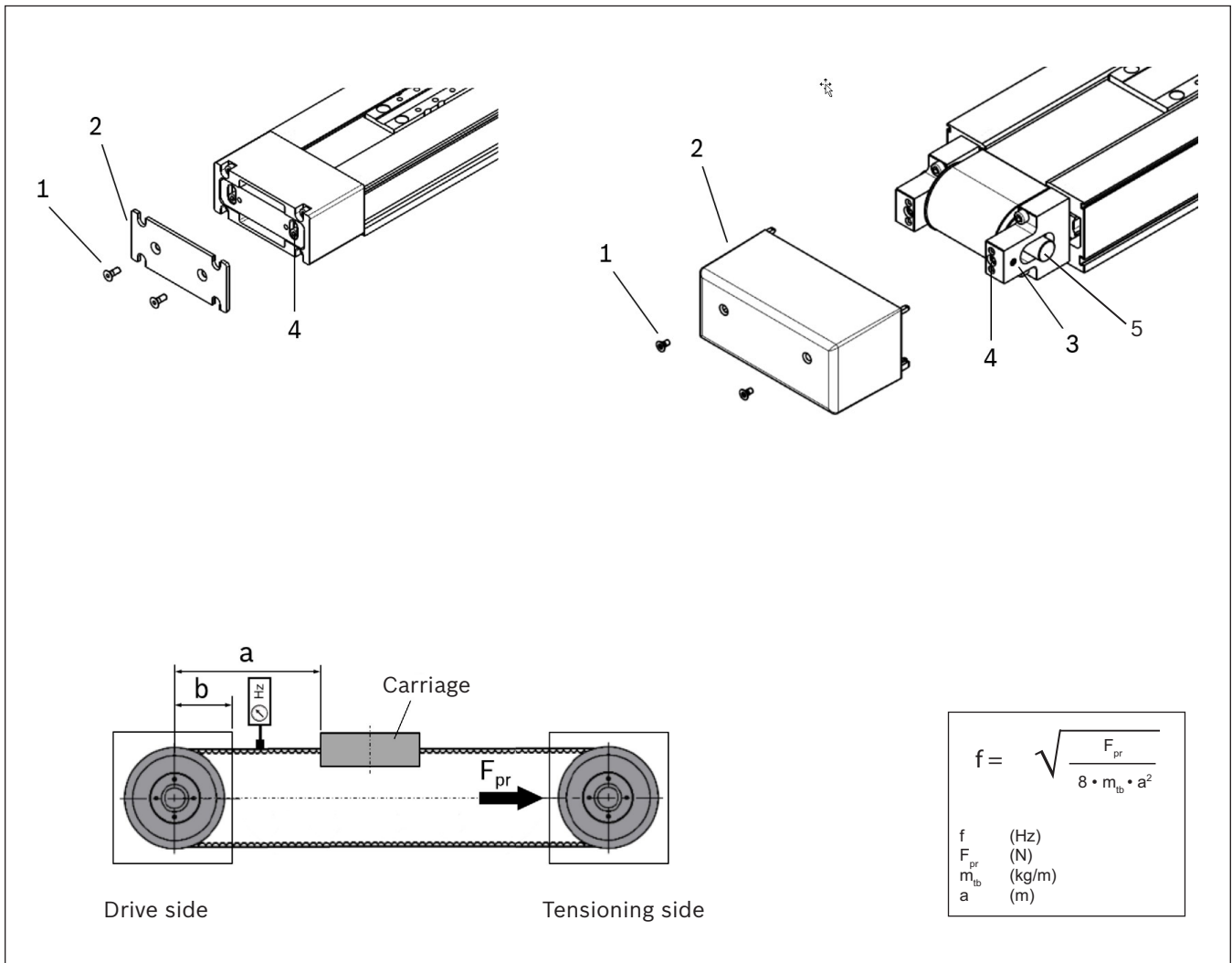


Fig. 29: Tensioning the toothed belt (CKR)

CKR	070	090	110	145	200
b (m)	0.018	0.028	0.033	0.030	0.053
m_{tb} (kg/m)	0.056	0.078	0.178	0.238	0.581
F_{pr} (N)	524	1120	1410	2475	5660

8 Lubrication



WARNING

Never perform maintenance on running machines.

Secure the system against restart and unauthorized use during maintenance.

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.

8.1 Overview of lubrication versions

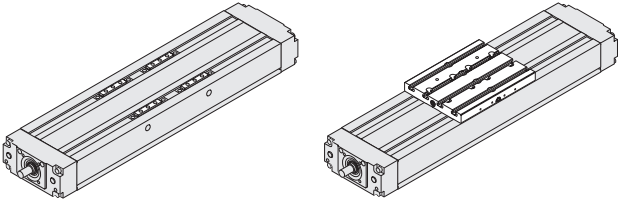
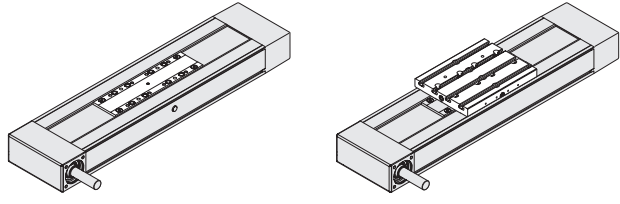
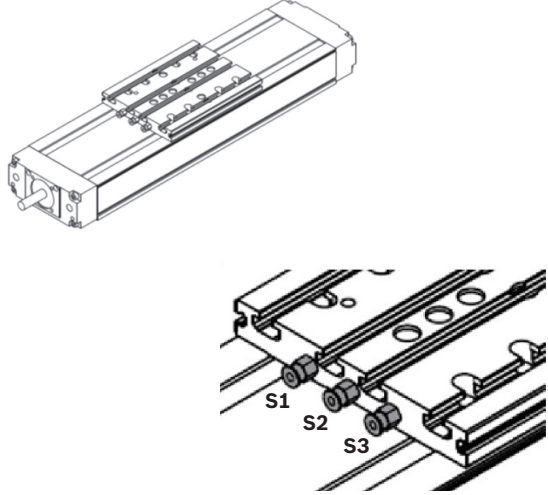
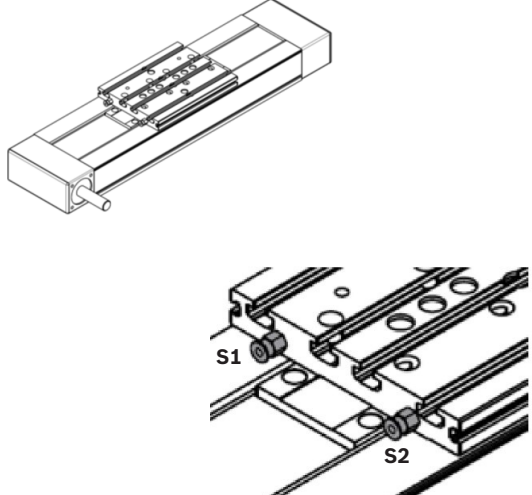
<p>Compact modules CKR Lubrication version LSS, LPG</p> <p>▶ Grease lubrication with manual grease gun via frame, carriage or via connection plate</p>  <p>with connection plate</p>	<p>Compact modules CKK Lubrication version LSS, LPG</p> <p>▶ Grease lubrication with manual grease gun via frame, carriage or via connection plate</p>  <p>with connection plate</p>
<p>Lubrication version LCF, LCO</p> <p>▶ 3 lube fittings</p> <p>▶ Prepared for connection to central lubrication systems</p>  <p>S1 Lube connection, runner block left S2 Lube connection, runner block right S3 Lube connection, ball screw assembly (BASA)</p>	<p>Lubrication version LCF, LCO</p> <p>▶ 2 lube fittings</p> <p>▶ Prepared for connection to central lubrication systems</p>  <p>S1 Lube connection, runner block left S2 Lube connection, runner block right</p>

Fig. 30: Lubrication versions

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

8.2 Lubricants

Table 7: Lubricants

Lubrication version	LSS		LPG	
Size	CKx-110, -145, -200	CKx-070, -090	CKx-110, -145, -200	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	<ul style="list-style-type: none"> • Good water resistance • Corrosion protection • Temperature range: -20 to +80 °C 		<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Tribol GR 100-2 PD • Elkalub GLS 135/N2 	<ul style="list-style-type: none"> • Tribol GR 100-00 PD • Elkalub GLS 135/N00 	<ul style="list-style-type: none"> • Tribol GR 100-2 PD • Elkalub GLS 135/N2 • Tribol GR 100-00 PD • Elkalub GLS 135/N00 • Dynalub 520 	<ul style="list-style-type: none"> • Tribol GR 100-00 PD • Elkalub GLS 135/N00
Alternative lubricants with H1 approval	-	-	<ul style="list-style-type: none"> • Berulub FG H2 SL • Cassida Grease EPS2 • VP 874 	<ul style="list-style-type: none"> • 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)	-
	-	-
	<ul style="list-style-type: none"> • only via single-line piston distributor system • smallest permissible piston distributor size: CKx-090, -110, -145, -200: 0.2 cm³ 	<ul style="list-style-type: none"> • 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)
	<ul style="list-style-type: none"> • Good water resistance • Corrosion protection • Temperature range: -20 to +80 °C 	<ul style="list-style-type: none"> • 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 (400 g cartridge)	-
	R3416 042 00 (5 kg bucket)	-
	<ul style="list-style-type: none"> • Tribol GR 100-00 PD • Elkalub GLS 135/N00 	<ul style="list-style-type: none"> • Special demulsifying oil CLP or CGLP as per DIN 51517-3 for machine bed tracks and tool guides
	-	-

8.3 Lubrication version LSS / LPG

8.3.1 Position of the lube ports 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 (→ Table 8) to the center of the frame L/2.

Nozzle pipes with matching lube nozzles (1) can be ordered under option no. R345503106.

Further information → Catalog.

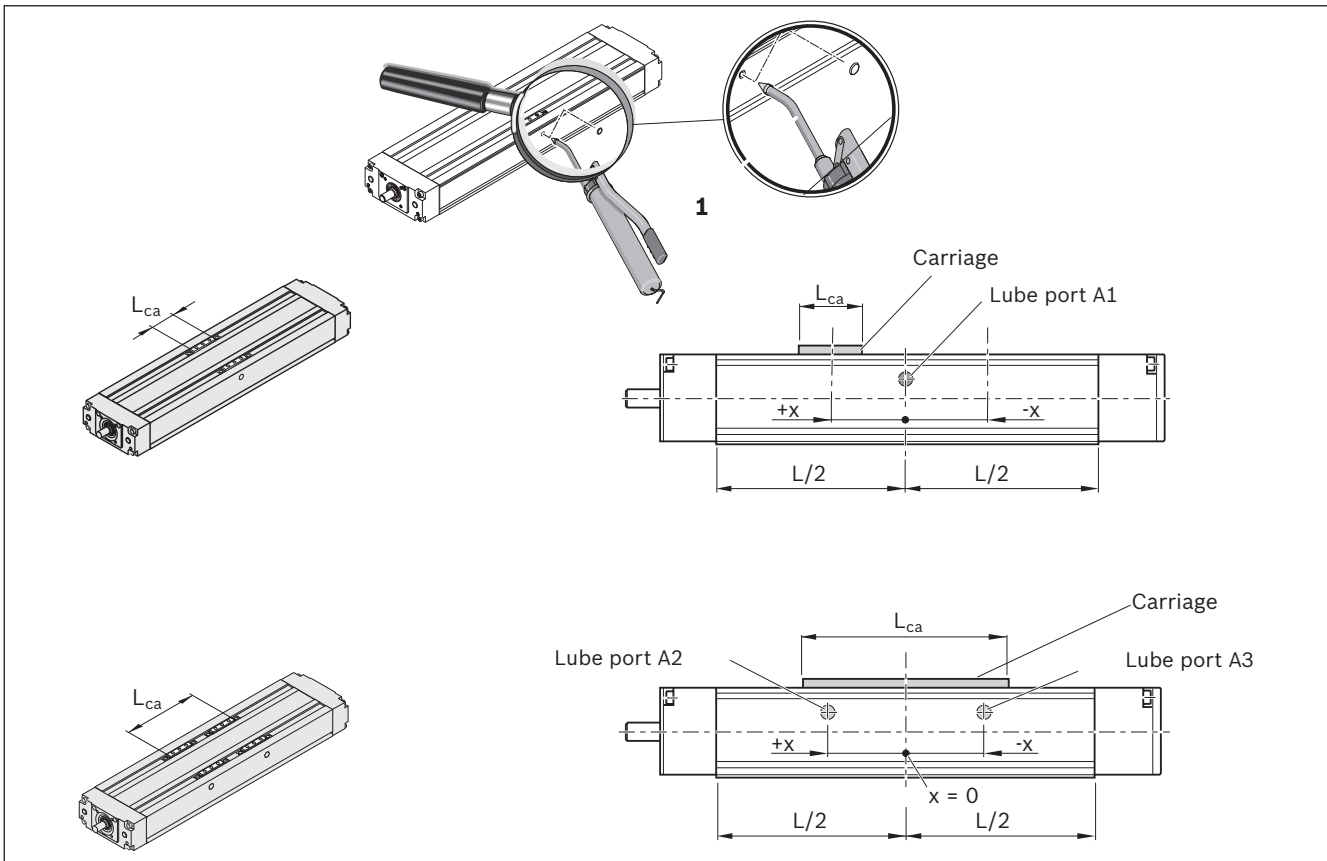


Fig. 31: Position of the lube ports in the frame (CKK)



Compare the carriage version with Fig. 31 and see Table 8 for the position of the lube ports.

Table 8: Position of the lube ports in the frame (CKK)

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

8.3.2 Position of the lube ports 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 distance X (► Table 9) to the center of the frame $L/2$.

Nozzle pipes with matching lube nozzles (1) can be ordered under option no. R345503106.

Further information ► Catalog.

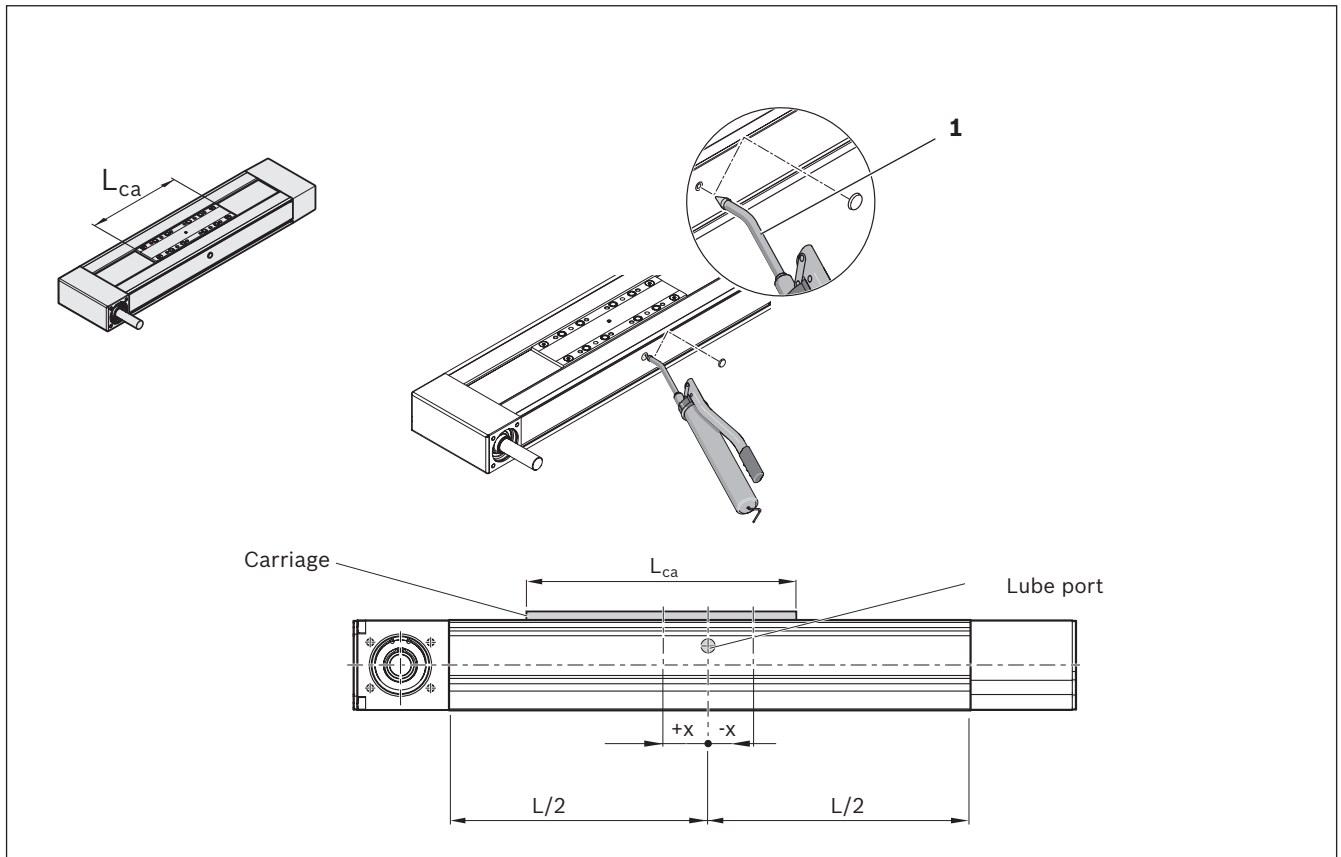


Fig. 32: Position of the lube ports in the frame (CKR)

Table 9: Position of the lube ports in the frame (CKR)

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

8.3.3 Position of the lube ports in the carriage (CKK)

Lube fittings for carriage attachments for lubrication versions LSS/LPG

The lube fittings are sealed with (a) set screw(s) in the factory before shipment. To use the lube fittings, remove the set screw(s) for S₁ or S₂. See drawing and table for mounting dimensions and O-rings.

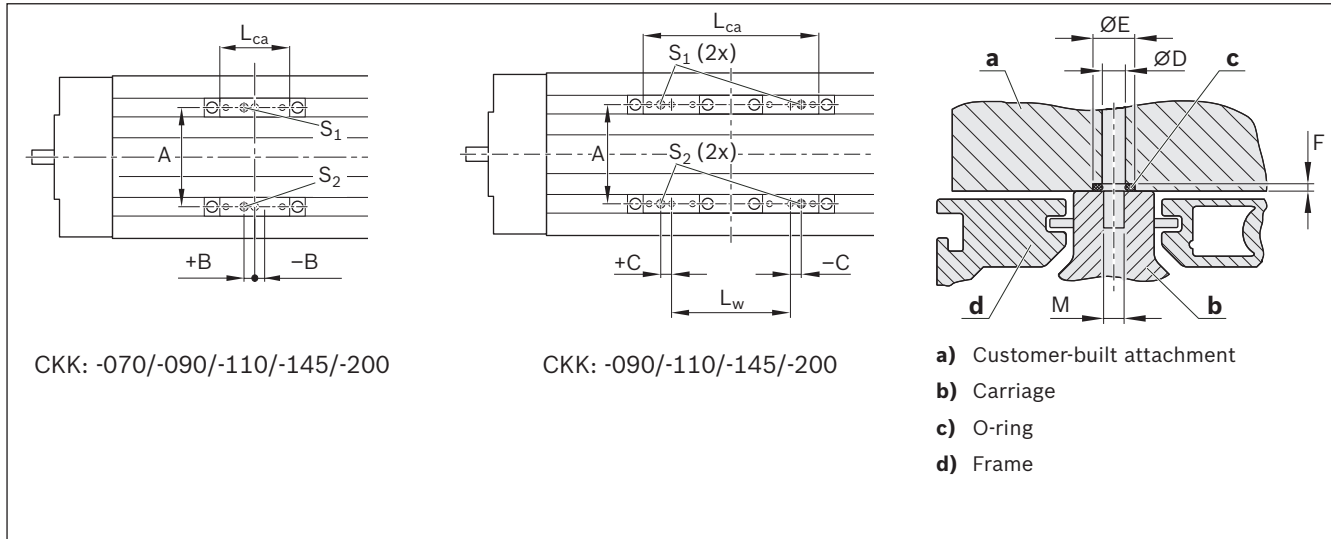


Fig. 33: Position of the lube ports in the carriage (CKK)

Table 10: Position of the lube ports in the carriage

CKK	Carriage length L _{ca} (mm)	Centerline-to-centerline distance carriages L _w (mm)	Dimensions (mm)							O-Ring acc. to DIN 3771	
			A	B	C	Ø D ±0.2	Ø 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						

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

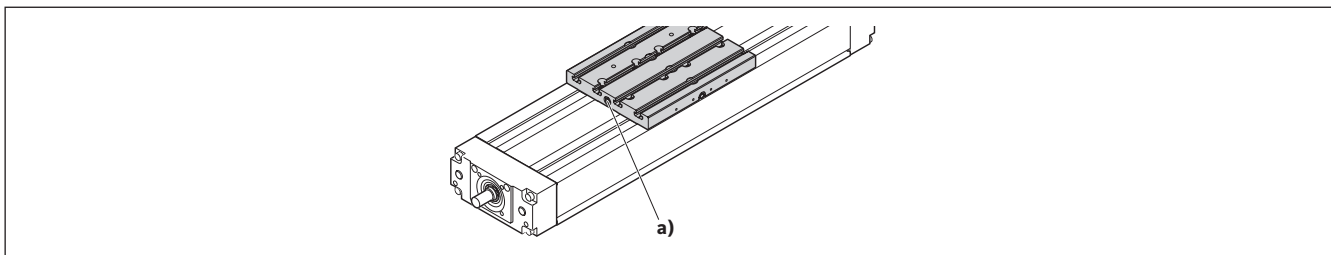


Fig. 34: Position of the lube ports in the connection plate (CKK)

a) There are funnel-type lube nipples on both front sides 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: Funnel-type lube nipple AM8 x 1;

8.3.5 Position of the 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 S_1 has to be removed. See the table for mounting dimensions and O-rings.

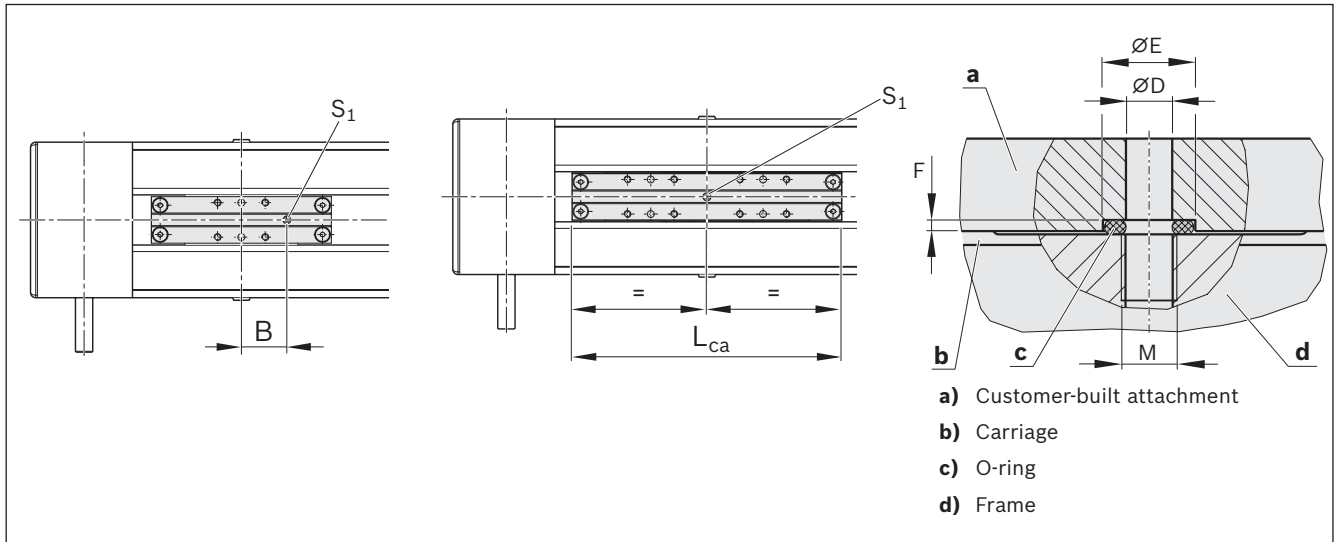


Fig. 35: Position of the lube ports in the carriage (CKR)

Table 11: 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						

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

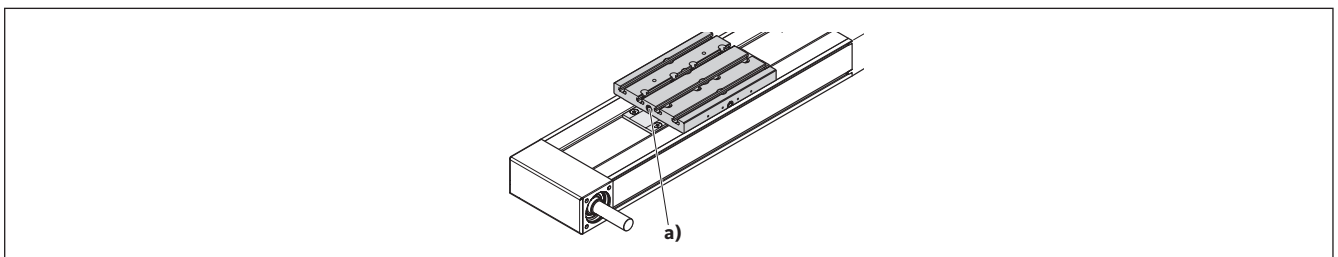


Fig. 36: Position of the lube ports in the connection plate (CKR)

a) There are funnel-type lube nipples on both front sides 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: Funnel-type lube nipple AM8 x 1;

8.4 Initial lubrication

- ▶ Pay attention to the notes on lubrication ➡ Mounting instructions for the R320103152 "Lubrication" chapter
- ▶ Overview of lubrication versions ➡ 8.1
- ▶ Lubricants ➡ 8.2
- ▶ Note the operating conditions ➡ 10.3

8.4.1 LPG

Initial lubrication

Initial lubrication can optionally be implemented via lube ports in the frame, carriage attachments as well as the connection plate. For carriages with connection plate, lubrication takes place exclusively via the connection plate.

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.

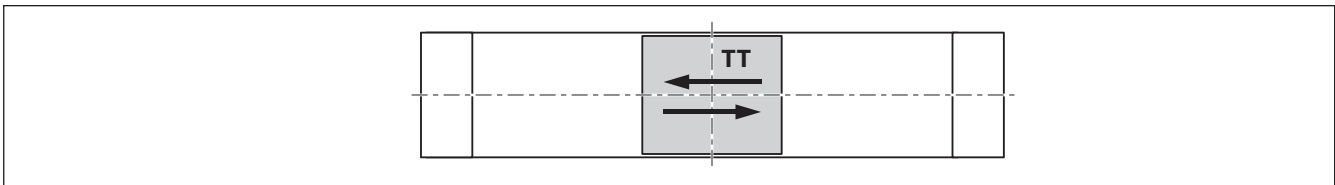


Table 12: Initial lubrication amount CKK

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 / 8x5	A1 ($L_{ca} = 32$ mm)	1.7	0.3	A1 ($L_{ca} = 73$ mm)	2.8	0.4	4.1	0.4
-090-NN-1	80	12x2	A1	1.5	0.5	A3 A6	1.3	0.4	5.9	0.9
		12x5	A2	1.6	0.6		1.3	0.4	6.0	1.0
		12x10		1.6	0.6		1.3	0.4	6.0	1.0
-110-NN-1	100	16x5	A1	3.7	1.4	A3	3.2	0.9	10.9	2.3
		16x10	A2	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	5.2	2.5	A3	4.5	1.8	18.0	4.3
		20x20		5.7	3.0		4.5	1.8	18.5	4.8
		20x40		5.7	3.0		4.5	1.8	18.5	4.8
		25x10		5.7	3.0		4.5	1.8	18.5	4.8
-200-NN-1	160	32x5	A1 A2	13.9	4.1	A3	12.5	2.7	42.7	6.8
		32x10		14.5	4.7		12.5	2.7	43.3	7.4
		32x20		14.8	5.0		12.5	2.7	43.6	7.7
		32x32		16.1	6.3		12.5	2.7	44.9	9.0

Table 13: 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

8.4.2 LCF

Table 14: Initial lubrication CKK/CKR

CKK/CKR	Minimum impulse quantity ¹⁾ (cm ³)	Initial lubrication amount Lube connection (cm ³)		
		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)

8.4.3 LCO

Table 15: Initial lubrication CKK/CKR

CKK/CKR	Minimum impulse quantity ¹⁾ (cm ³)	Initial lubrication amount Lube connection (cm ³)		
		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).

8.5 Relubrication

- ▶ Pay attention to the notes on lubrication ⇒ Mounting instructions for the R320103152 "Lubrication" chapter
- ▶ Overview of lubrication versions ⇒ 8.1
- ▶ Lubricants ⇒ 8.2
- ▶ Relubrication intervals ⇒ 8.6 / 8.7
- ▶ Note the operating conditions ⇒ 10.3
- ▶ 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.

8.5.1 LSS / LPG

Table 16: Relubrication quantity CKK

CKK	BASA $d_o \times P$ (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	(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	0.6	A3	0.3	0.9
	12x5		0.6		0.3	0.9
	12x10	A2	0.6		0.3	0.9
-110-NN-1	16x5	A1	1.4	A3	0.8	2.2
	16x10		1.6		0.8	2.4
	16x16	A2	1.7		0.8	2.5
-145-NN-1	20x5	A1	2.3	A3	1.3	3.6
	20x20		3.6		1.3	4.9
	20x40	A2	3.3		1.3	4.6
	25x10		3.1		1.3	4.4
-200-NN-1	32x5	A1	4.6	A3	2.6	7.2
	32x10		5.4		2.6	8.0
	32x20	A2	5.8		2.6	8.4
	32x32		7.6		2.6	10.2

Table 17: Relubrication quantity CKR

CKR	Carriage Connection plate		
	without	with	Lubrication quantity (cm ³)
	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

8.5.2 LCF

Table 18: 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).

8.5.3 LCO

Table 19: 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).

8.6 Relubrication intervals CKK

Relubrication interval:

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

► Relubrication interval of guideway and ball screw assembly (BASA) according to diagram.

Load ratios (F_m/C) to be observed separately for guideway (F_{mgw}/C_{gw}) and BASA (F_{mbs}/C_{bs})

► Determining the load ratio and technical data ➡ Product catalog

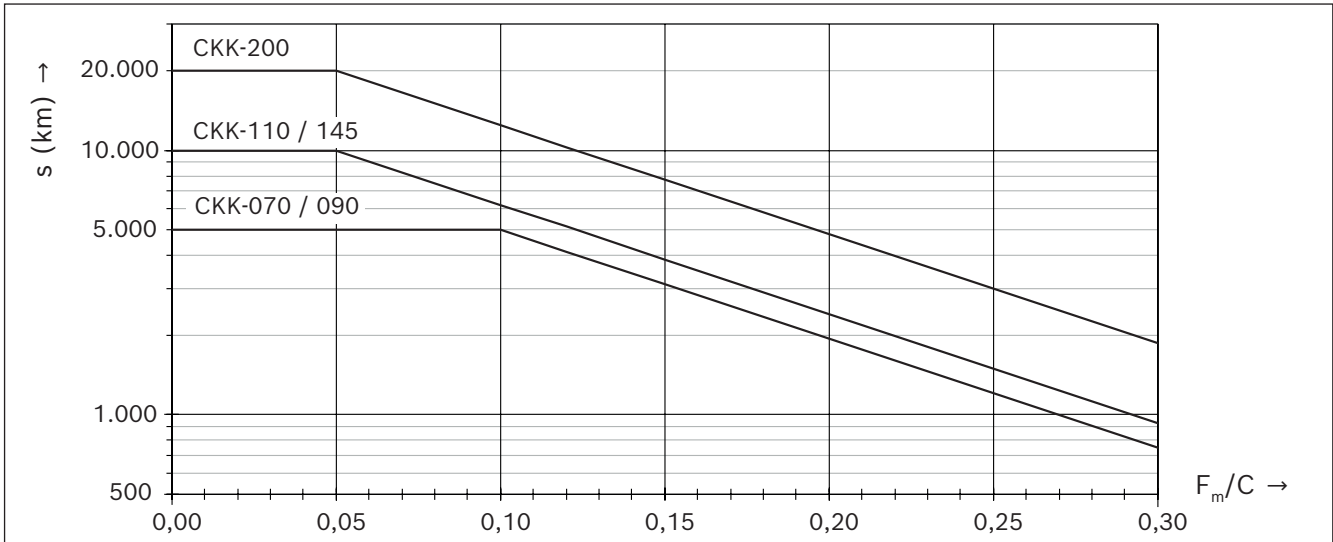


Fig. 37: Guideway; lubrication versions LSS / LPG (LPG with standard lubrication)

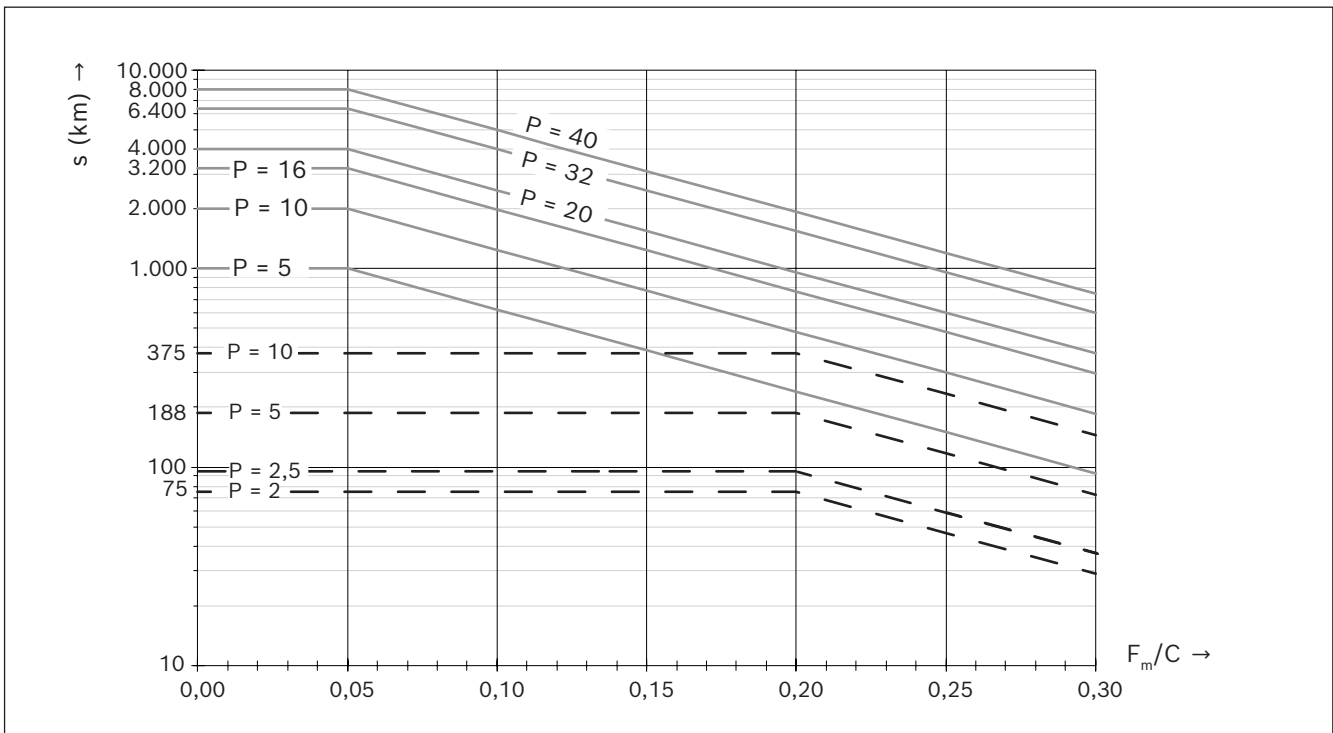


Fig. 38: BASA; lubrication versions LSS / LPG (LPG with standard lubrication)

— — CKK-070/090
 — — CKK-110/145/200

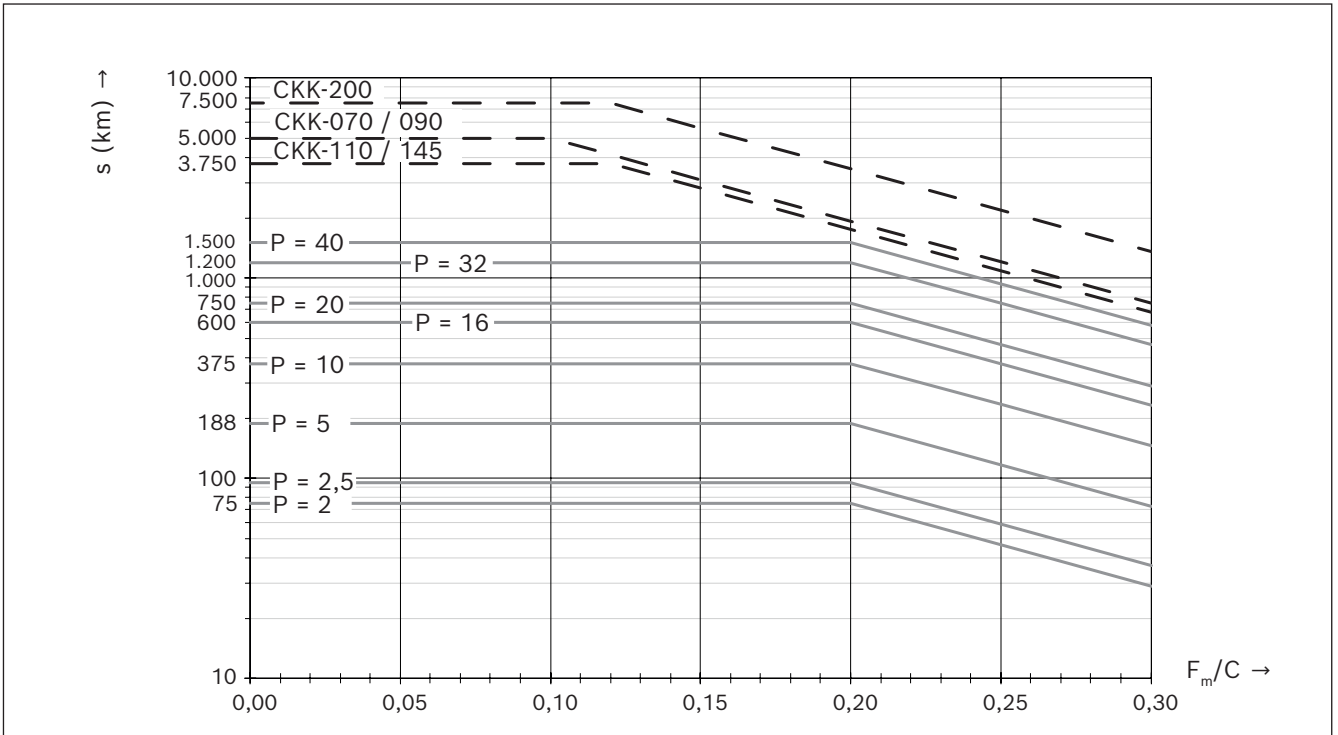


Fig. 39: Guideway and BASA; lubrication versions LCF

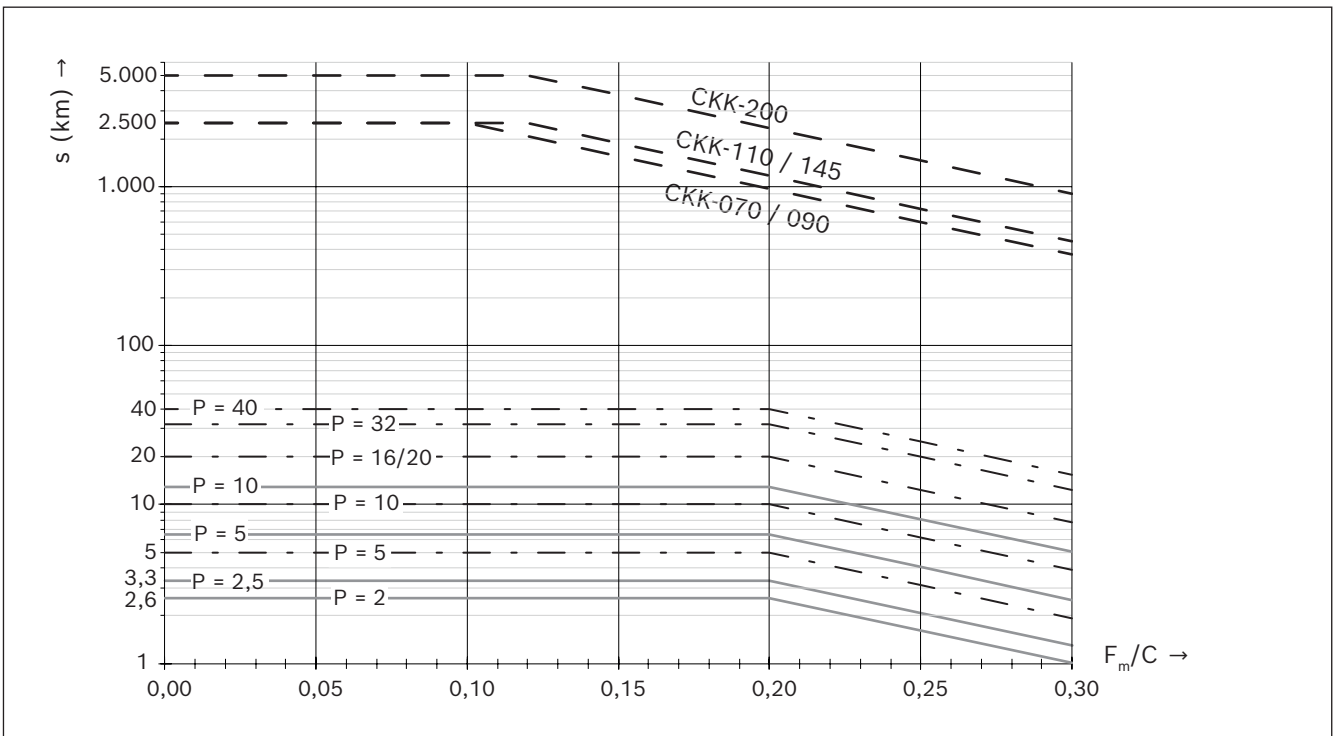
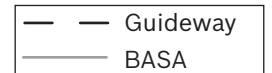
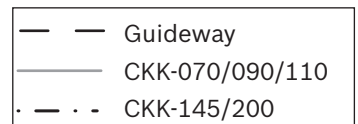


Fig. 40: Guideway and BASA; lubrication versions LCO



8.7 Relubrication intervals CKR

Relubrication interval:

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

- ▶ Relubrication interval of guideway acc. to diagram
- ▶ Relubrication is required every two years due to grease aging.

Observe load ratio (F_{mgw} / C_{gw})

- ▶ Determining the load ratio and technical data → Product catalog

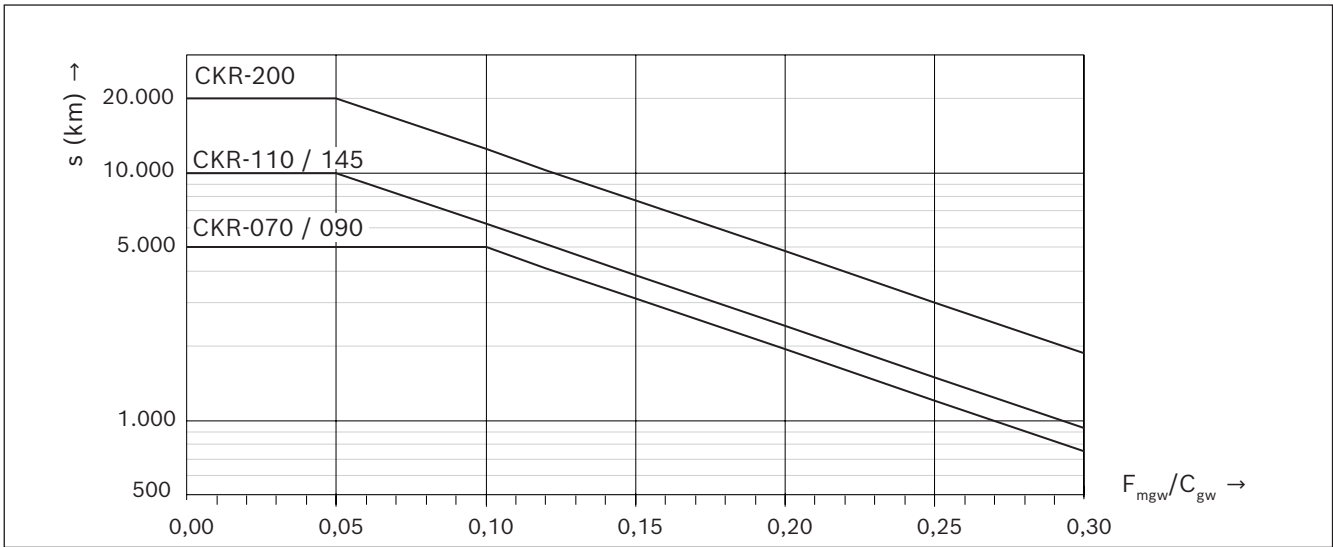


Fig. 41: Guideway; lubrication versions LSS and LPG (LPG with standard lubrication)

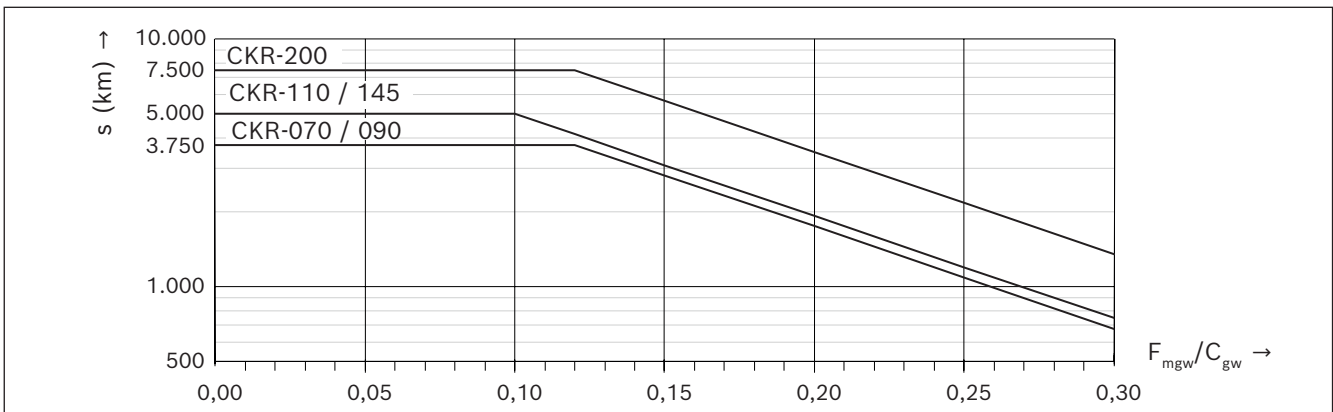


Fig. 42: Guideway; lubrication version LCF

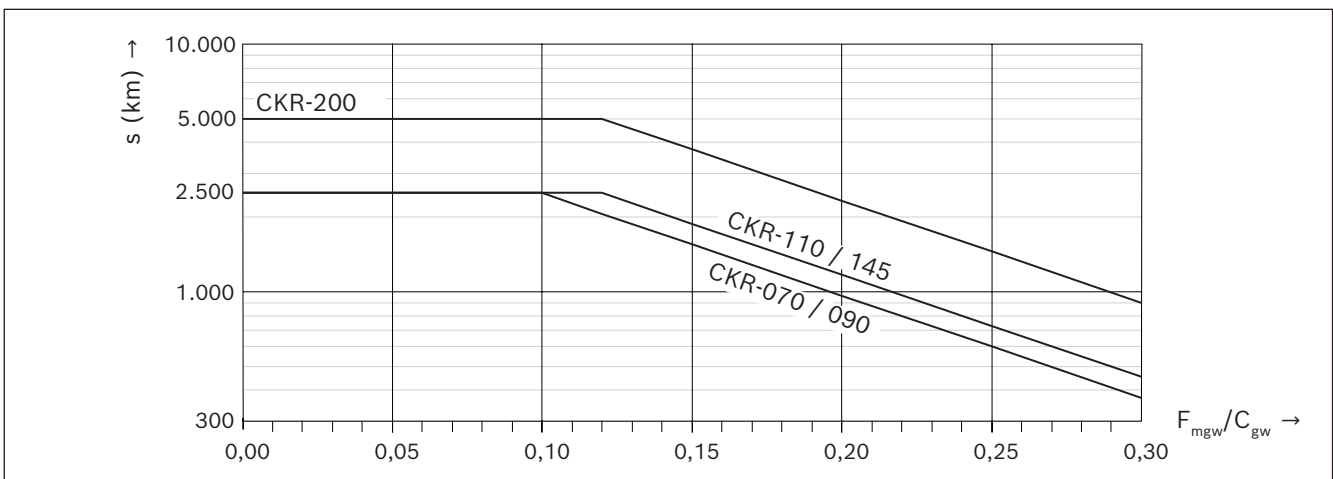


Fig. 43: Guideway; lubrication version LCO

9 Replacing the seals of the Resist covers at CKK

9.1 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. 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).

9.2 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 (item 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 fixing 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 number seal	Length calculation
CKK-110, -145	R039662039	L + 30 mm
CKK-200	R039662040	L + 30 mm

L= length of cover plate (2)

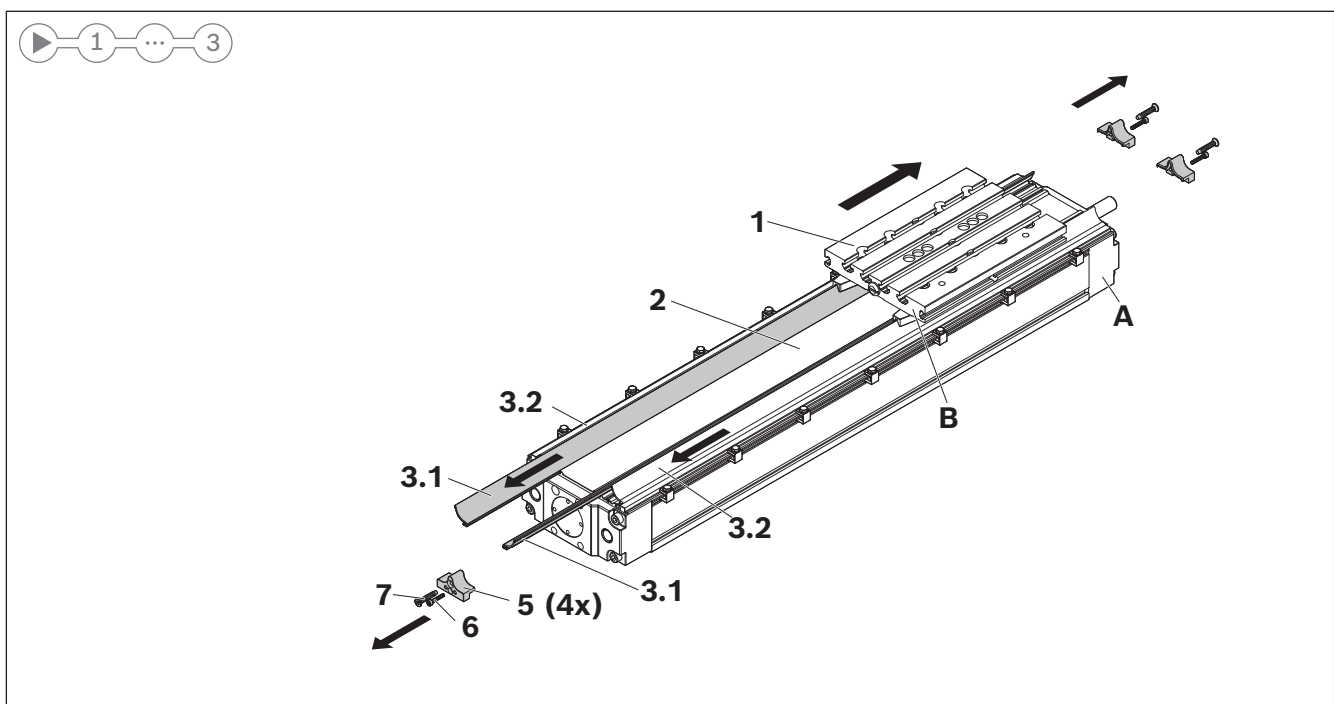
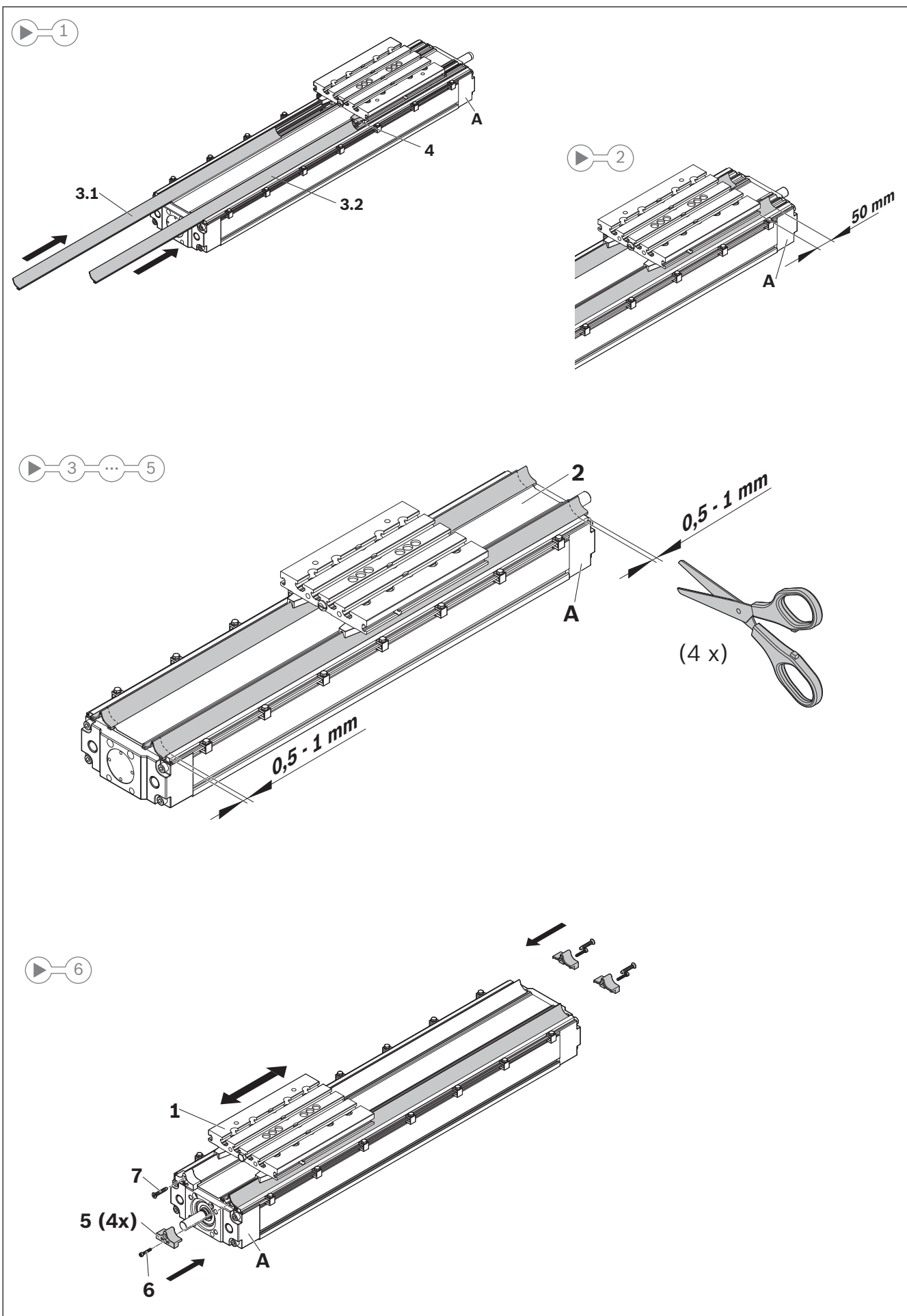


Fig. 44: Removing the sealing profiles



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Fig. 45: Mounting the sealing profiles

10 Further information

10.1 Tightening torques


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

Table 22: 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 \odot 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 \odot 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 \odot M_A (Nm)	0.29	0.6	1.25	2.1	4.8	9.5	16.5	40	80	137	218	333	653	1125

10.2 Compact module CKR; clamping hub

Table 23: Tightening torques of the screws in the clamping hubs

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

10.3 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 24: 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, Catalog CKK/CKR
Soiling	Not permissible
	Short-term temperature stability of the seal up to 300 °C
With "Resist" cover	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.

10.4 Amending chapters

- ▶ For example: For product description, transport and storage, mounting, electrically connecting the product, commissioning, operation, maintenance and repair, disassembly and exchange, disposal, technical data etc. ➡ See instructions R320103152.

11 Service and support

- ▶ When ordering spare parts, please specify all the data on the nameplate.
- ▶ To order spare parts, please contact your local sales partner of Bosch Rexroth AG. You can find this on the Internet under www.boschrexroth.com/contact

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

Phone: +49 (0) 9352 40 50 60

E-mail: servicelt@boschrexroth.de

Return address:

Bosch Rexroth AG

SERVICE

Röntgenstraße 5

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12 Kits

12.1 Overview of CKK

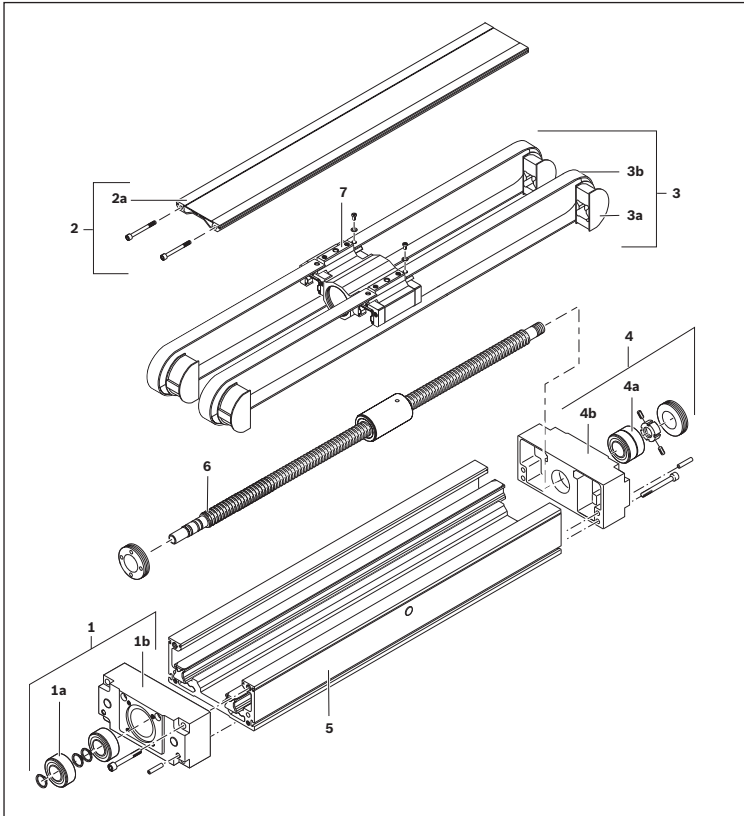


Fig. 46: Overview of CKK

Position	Component
1	Floating bearing
1a	Deep-groove ball bearing
1b	Floating bearing end-plate
2	Cover
2a	Aluminum cover
3	Gap-type seal
3a	Diversion component
3b	Strip PU
4	Fixed bearing
4a	Angular-contact ball bearing
4b	Fixed bearing end block
5	Frame with guide rails
6	Ball screw assembly (BASA)
7	Carriage

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12.2 Overview of CKR

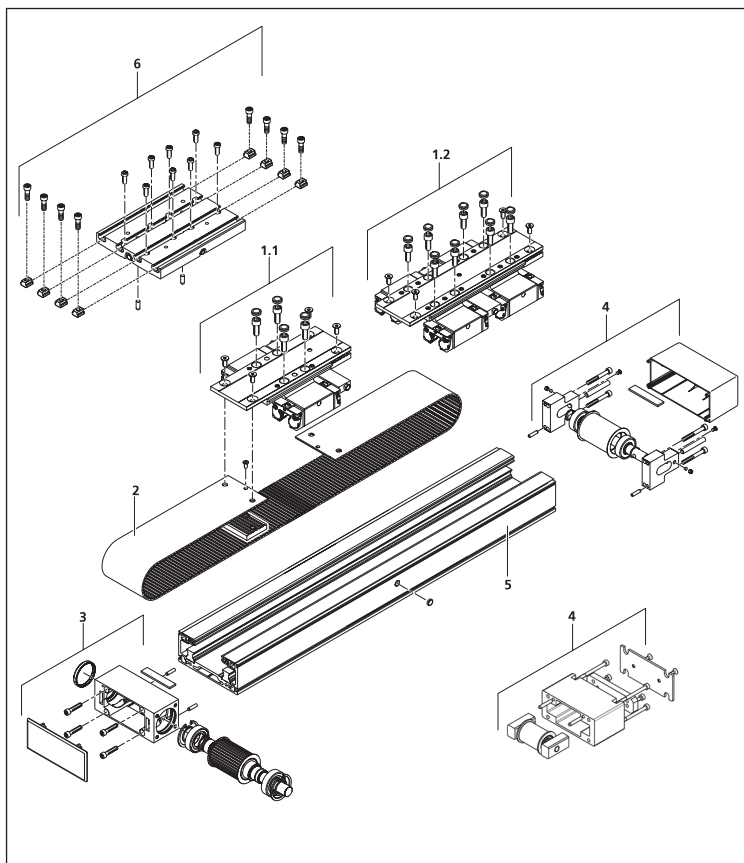


Fig. 47: Overview of CKR

Position	Component
1.1	Short carriage
1.2	Long carriage
2	Toothed belt
3	Drive end enclosure
4	Idler end enclosure
5	Frame with guide rails
6	Connection plate

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Subject to modifications