

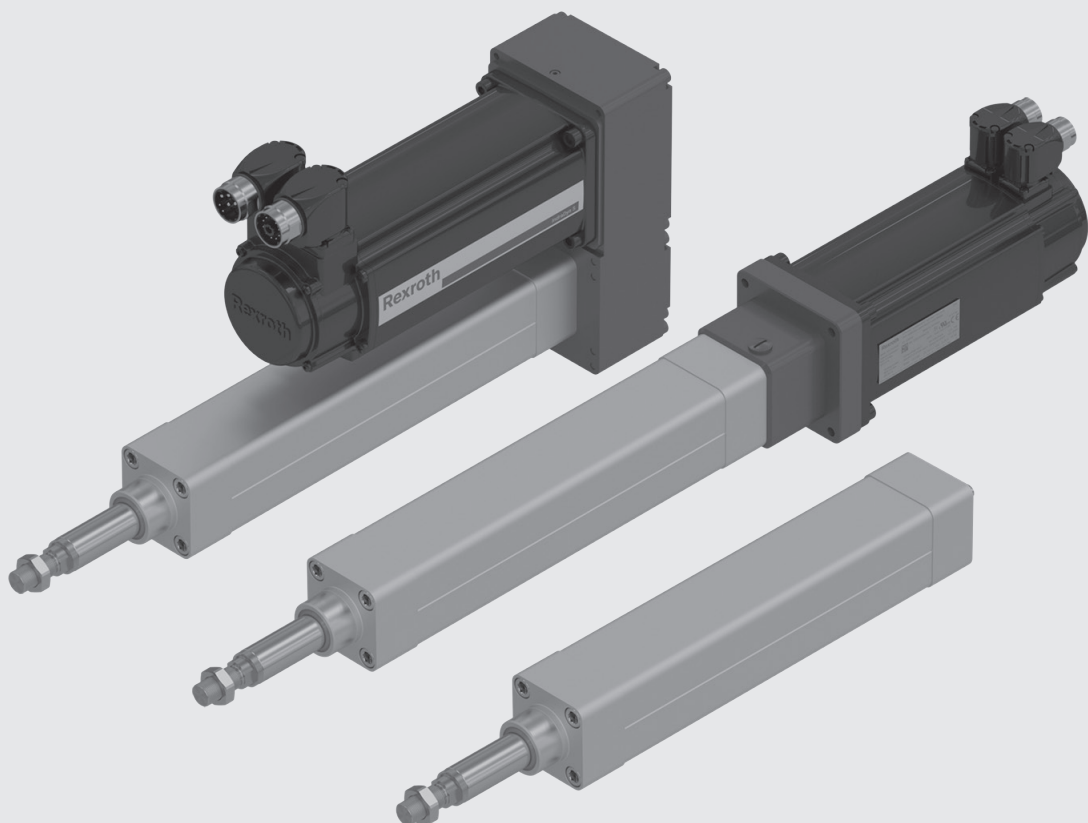
Electromechanical cylinders EMC

R320103102/2021-04
Replaces: 2018-03
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.

© 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 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
ZH	中文

Contents

1	About these instructions	4
2	Safety instructions	6
3	Scope of delivery	6
4	Product description	6
5	Transport and storage	8
6	Assembly	9
7	Start-up	30
9	Operation	35
8	Cleaning and care	35
10	Maintenance and repair	36
11	Removal and replacement	42
12	Disposal	43
13	Technical data	43
14	Operating conditions	43

1 About these instructions

1.1 Validity of the documentation

This documentation applies to the following products:

- Electromechanical cylinders EMC as described in the catalog "Electromechanical Cylinders EMC".

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 these Instructions and the "Safety Instructions for linear motion systems" carefully and completely.

1.2 Required 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	Application	Included in delivery
	Safety instructions for linear motion systems	R320103152	Safety instructions	✓
	Electromechanical cylinders EMC	R999000473	Catalog	
	Safety data sheet for Dynalub 510	R320103160	Safety instructions	
	Product data sheet for Dynalub 510	R310 2052	Catalog	
	Safety data sheet for Dynalub 520	R320103161	Safety instructions	
	Product data sheet for Dynalub 520	R310 2053	Catalog	

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.

► Precautions to avoid hazard.

- 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 avoidance precautions: 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.

Hazard levels 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

EN

1.3.2 Symbols

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

Table 2: 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.	Numbered work steps
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

1.3.3 Abbreviations

The following abbreviations are used in this documentation:

Table 3: Abbreviations and definitions

Abbreviation	Meaning
EMC	Electromechanical cylinders
BASA	Ball screw assembly
LSS	Initial lubrication done at the factory
LCF	Prepared for connection to central lubrication systems with liquid grease
LPG	Corrosion prevention, no initial lubrication
LHG	Initial lubrication with NSF-H1 grease
LFL	Lubricated for service life

2 Safety instructions

The general safety instructions for this product can be found in the documentation "Safety Instructions for linear motion systems", which is also enclosed with the product. You must have read and understood these before handling the product.

3 Scope of delivery

The following is included within the scope of delivery:

- Electromechanical cylinders EMC plus any motors and accessories
- Documents ➡ Table 1 on page 4 that are indicated

3.1 Condition as delivered

- Depends on order

3.2 Accessories

The following accessories are available:

- Fastening elements, switches, motor attachment kit (flange and coupling, belt side drive)
- Force sensor, screw plugs ➡ Fig. 1, Straight connectors



Dimensions and material numbers of the accessories as well as additional fastening accessories
➡ Product catalog.

4 Product description

4.1 Performance description

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

4.2 Device description

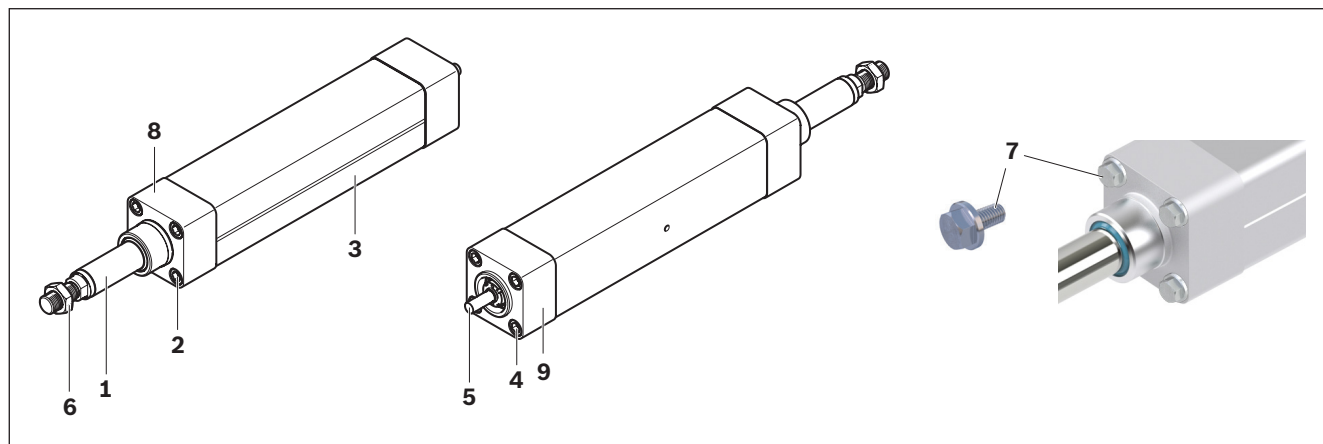


Fig. 1: Components of the electromechanical cylinder EMC

- | | | | |
|---|--|---|----------------------------------|
| 1 | Piston rod (stainless steel) | 6 | Hexagon nut |
| 2 | Hex socket head cap screw on the cover (8) with inner thread for fastening accessories | 7 | Screw plug (accessory) for cover |
| 3 | Housing | 8 | Cover |
| 4 | Hex socket head cap screw on the base (9) with inner thread for fastening accessories, flange or belt side drive | 9 | Bottom |
| 5 | Drive journal | | |

4.3 Identification of the product

- When ordering wear parts, please always state all data given on the nameplate. For further information on the nameplate, see the chapter "Start-up".

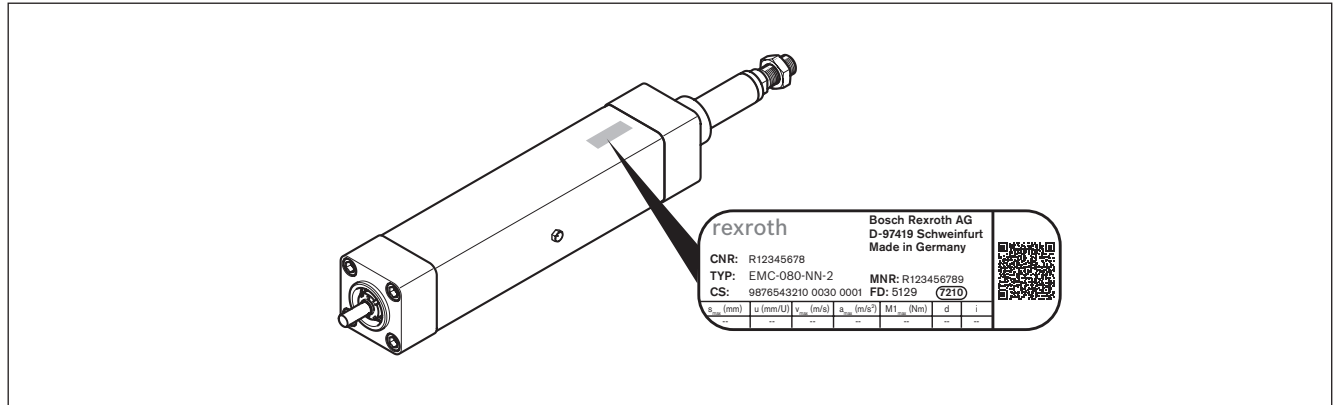


Fig. 2: Nameplate

The nameplate of the product contains the following information:

Table 4: Information on nameplate

MNR	Material number
TYP	Short product name
CS	Customer information
FD	Date of manufacture
7210	Manufacturing location

5 Transport and storage

Take note of the environmental conditions ➡ 14 and product catalogs.

For special environmental conditions, please consult us.

5.1 Transporting the EMC

Electromechanical cylinders are pre-mounted as ready-to-install units.

⚠ WARNING

Risk of product falling due to inadequate load handling equipment!

Death or severe injury.

- ▶ Use only inspected and suitable load handling equipment.
- ▶ Fasten load handling equipment only to the housing or at the designated points.
- ▶ Do not stand under suspended loads.

NOTICE

Risk of damage to motor attachment due to motor vibrations/motor breaking off!

Damage to the product.

- ▶ When transporting the product with mounted motor, always provide support for the motor, or
- ▶ Disassemble the motor prior to transport.

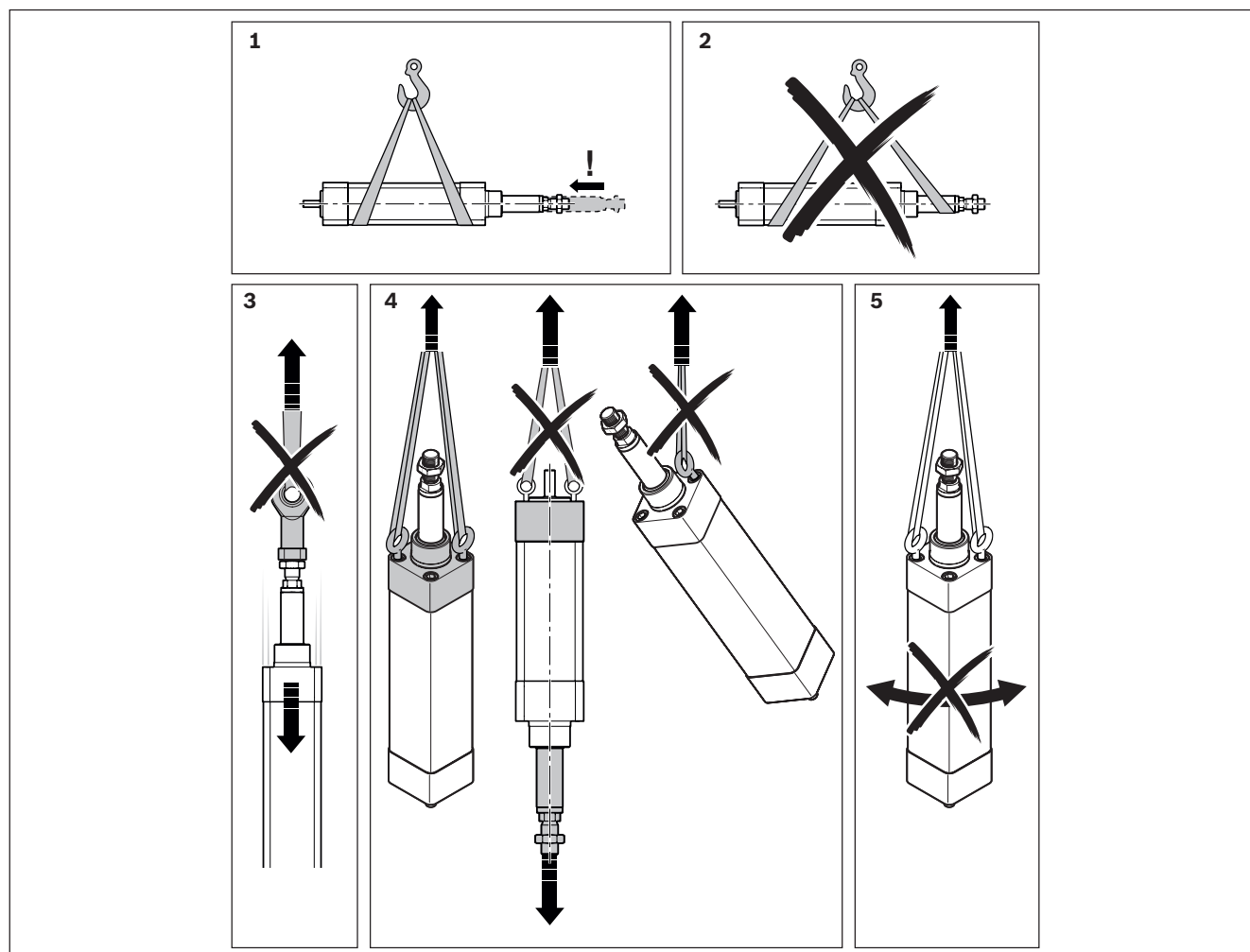


Fig. 3: Transporting the EMC

NOTICE**Risk of damage to the product due to improper transport**

Damage to the product.

- ▶ Retract the piston rod **(1)**.
- ▶ Lift the EMC only by its housing **(2)**.
- ▶ Do not lift the EMC by the piston rod **(3)**. The BASA is not self-locking.
- ▶ Only use eyebolts on the cover of the EMC. Subject these to tensile stress only **(4)**.
- ▶ Prevent the EMC from swinging during lifting operations **(5)**.

1. Before hoisting the EMC, take note of the weight ➡ Product catalog, chapter "Technical data".
2. Hoist the EMC using suitable lifting accessories.

5.2 Storing the EMC

NOTICE**Risk of product corrosion due to incorrect storage!**

Damage to the product.

- ▶ Store the product only in dry, covered areas.
- ▶ Protect the product from humidity and corrosive agents.

6 Assembly

For dimensions and material numbers of the individual components ➡ Product catalog.

WARNING

Risk of product falling if installed vertically or suspended due to lack of protection against falling loads!

Death or severe injury.

- ▶ Secure the product against falling.
- ▶ Do not stand under the product in the hazard zone.

- ▶ Before hoisting the EMC, take note of the weight ➡ Product catalog.

6.1 Installation conditions

Take note of the operating conditions ➔ 14 and product catalogs.

- For special operating conditions, please contact us.

NOTICE

Risk of damage due to improper loads!

Damage to the product.

- Do not place any protruding loads on the product (for maximum values, see product catalog).
- Do not turn the piston rod.
- Do not use the housing for attaching other machine elements to absorb forces.

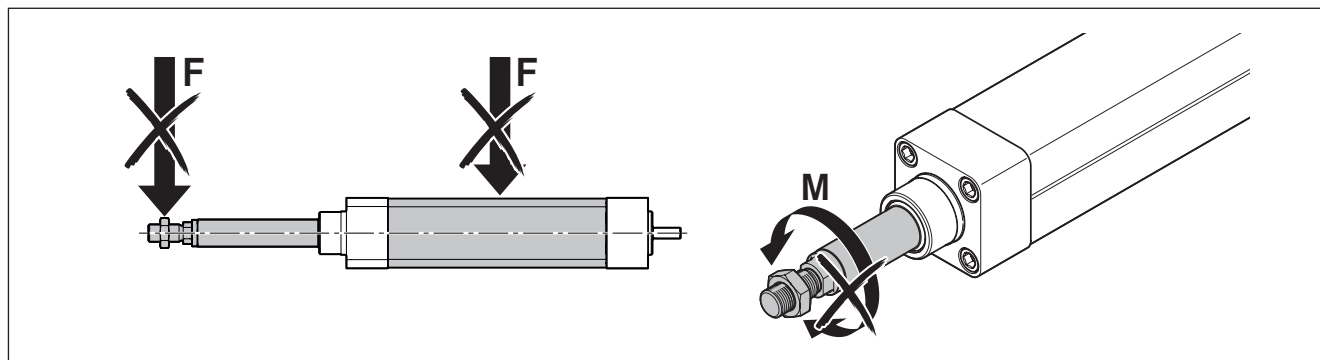


Fig. 4: Non-permissible loads

6.2 Installation position

The EMC can be installed in any position.

⚠ WARNING

Risk of piston rod crashing down in vertical or slanting installations as the unit is not self-locking or risk of damage to mechanics inside the EMC or breakage of toothed belt in case of motor mounting using a belt side drive!

Death or severe injury.

- In vertical or slanting installations, secure the piston rod against falling.
- Do not stand in the fall direction of the piston rod

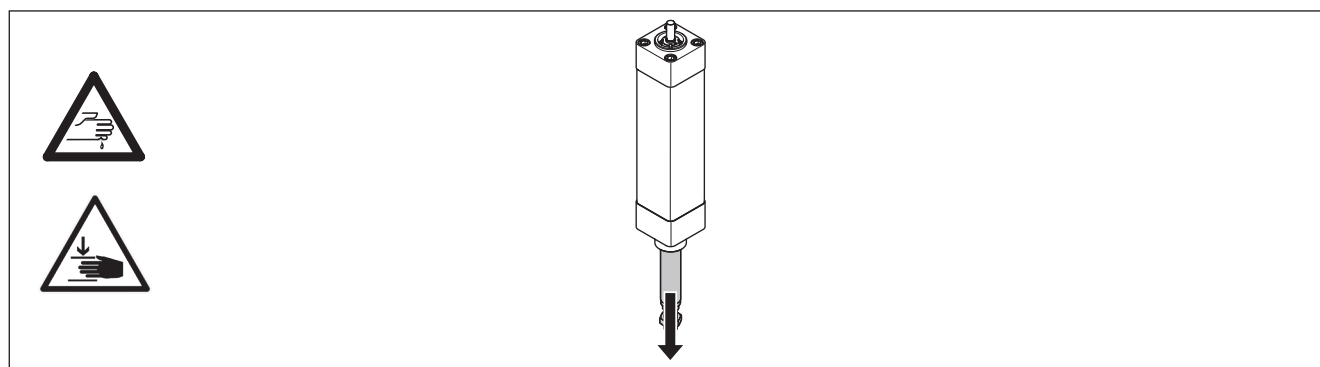


Fig. 5: Dropping of the piston rod

6.3 Required accessories

Required fastening material ➡ product catalog, chapter "Fastening elements".

6.4 Fastening options

- 1 By the cover
- 2 By the belt side drive
- 3 By the base
- 4 By the piston rod end

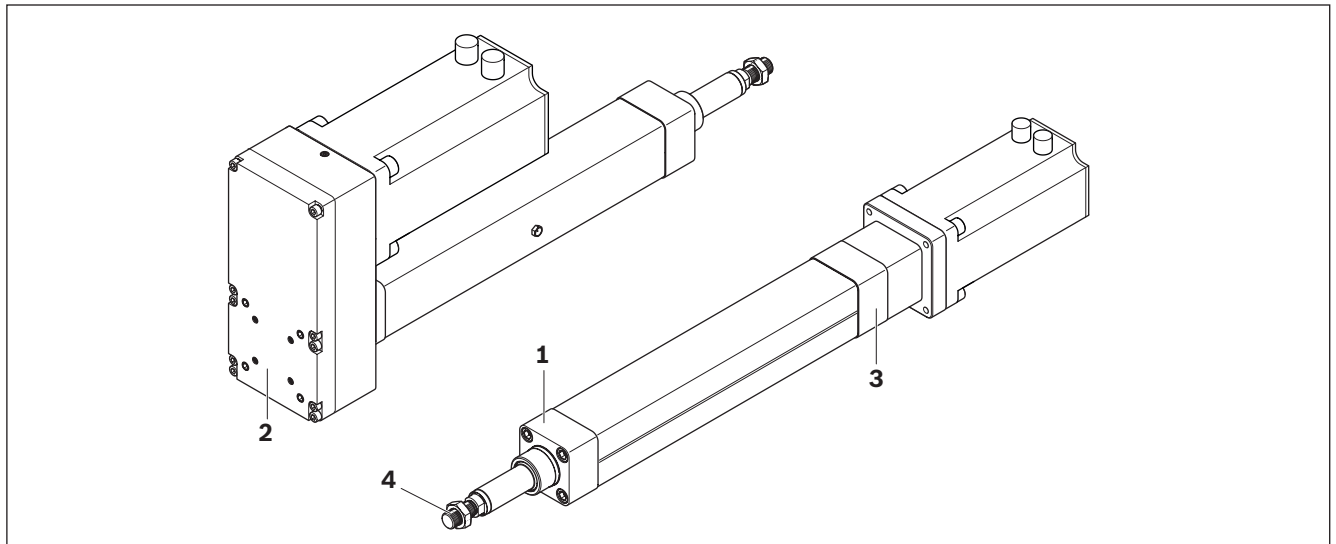
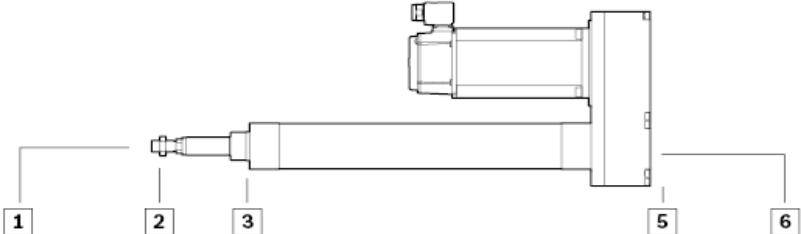
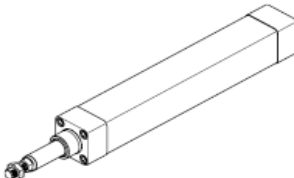
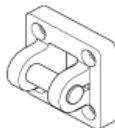
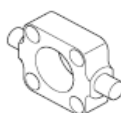
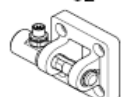
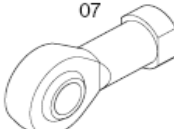
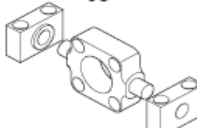
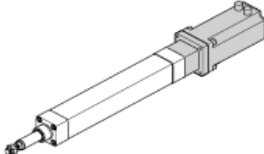
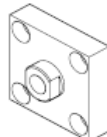
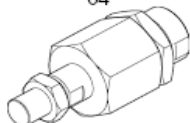
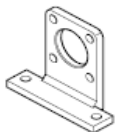
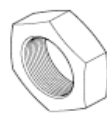
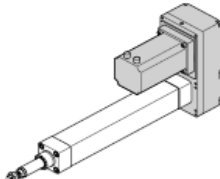
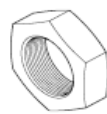
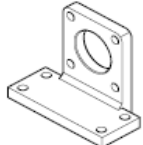
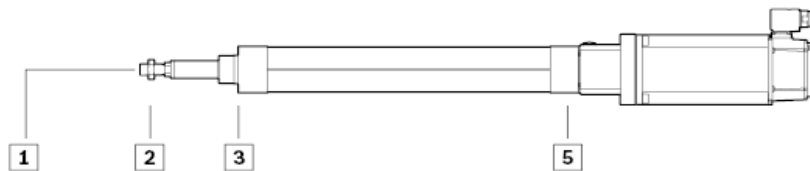


Fig. 6: Fastening options

6.5 Fastening elements

6.5.1 Overview of fastening elements

Befestigungselement											
											
Ausführung		Gruppe									
		1		2		3		4			
		00	ohne	00	ohne	00	ohne	00	ohne		
ohne Flansch OF01		01		01		01 ¹⁾					
		02		07		03 ¹⁾					
		Gabelbefestigung mit Kraftmessbolzen		Edelstahl							
				02		04					
mit Flansch und Kupplung MF01				03		06	EMC-32 - EMC-50				
				04							
				05		EMC-63 - EMC-100XC					
mit Riemenvorgelege RV01 bis RV03				06							
				Edelstahl							

**Ausführung****Gruppe****5****6**

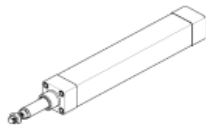
00

ohne

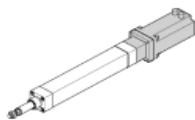
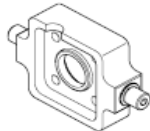
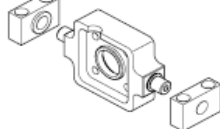
00

ohne

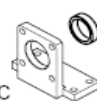
ohne Flansch
OF01



mit Flansch und Kupplung
MF01

01²⁾03²⁾05²⁾

EMC-32 - EMC-50



EMC-63 - EMC-100XC

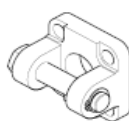
06

EMC-32 - EMC-50



EMC-63 - EMC-100XC

07



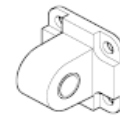
01

EMC-32 - EMC-50



EMC-63 - EMC-100XC

02



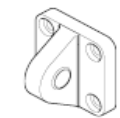
03

EMC-32 - EMC-50



EMC-63 - EMC-100XC

04



10



Gabelbefestigung mit
Kraftmessbolzen

05



6.5.2 Permissible forces for fastening elements

⚠ CAUTION

Some fastening elements are not approved up to the "Maximum permissible axial force of EMC $F_{\max \text{ EMC}}$ ".

Risk of injury.

- Observe the permissible maximum forces $F_{\max}$ for fastening elements in the chapter "Fastening elements" in the product catalog.

$F_{\max \text{ EMC}}$ can be attained with suitably designed customer-built fastening elements.

6.5.3 Mounting the fastening elements

- The EMC is supplied with the fastening elements ordered.
- Fastening elements between EMC and flange/coupling are delivered mounted. All other fastening elements are enclosed loose.
- Fastening elements can also be ordered separately as accessories.

NOTICE

Damage to the mechanical system inside the cylinder due to the initiation of torques to the product.

Damage to the product.

- Do not transfer any torque to the piston rod.
- Counterhold by means of a wrench flat.

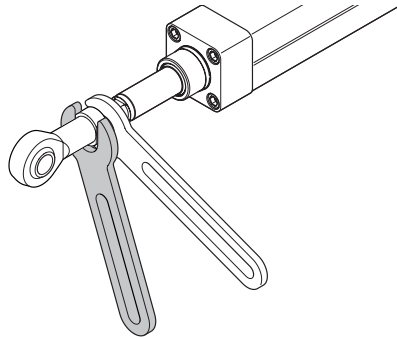


Fig. 8: Mounting the spherical rod end bearing

- Prior to mounting fastening elements on the timing belt side drive, the set screws need to be removed from the housing.
- Observe the **max. permissible screw-in depth** in the housing (see catalog EMC, chapter "Dimension drawing motor attachment with belt side drive")
- Mount the fastening elements as shown in the illustration ► Fig. 9. Tighten the fastening screws evenly, taking care not to exceed the maximum screw-in depth B_G or tightening torque M_A .

Table 5: Tightening torques M_A

EMC	32, 40	50, 63	80, 100	100XC
8.8, $\mu = 0.125$	M6	M8	M10	M12
B_G (mm)	16	16	20	26
M_A (Nm)	9.5	23.0	46.0	80.0

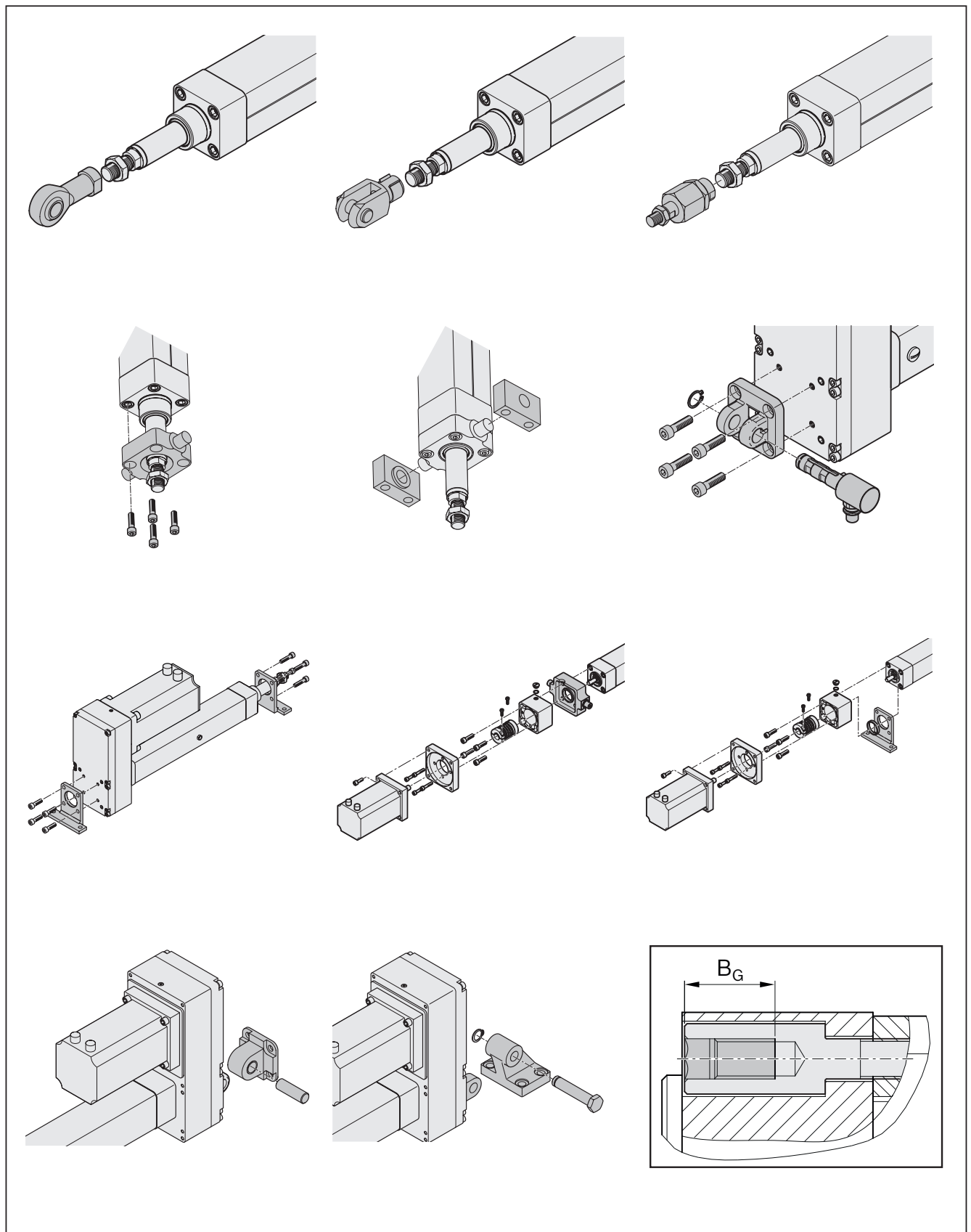


Fig. 9: Overview of fastening elements

6.5.4 Mounting the load measuring pin

The load measuring pin replaces the standard pin. Like the standard pin, it is installed between the spherical rod end bearing and the clevis bracket or in connection with the belt side drive between the swivel bearing and the clevis bracket.

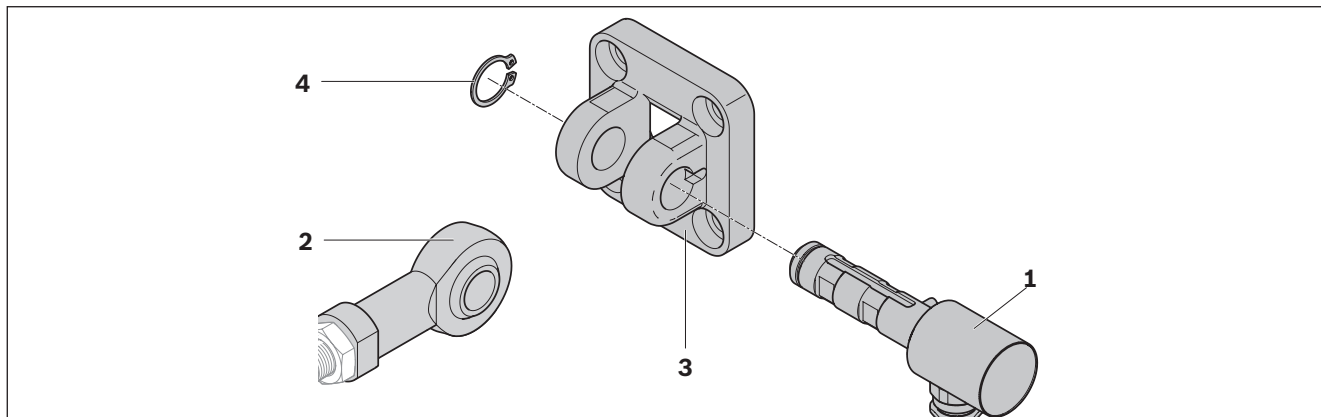


Fig. 10: Force measuring bolt

1. Remove the pin lock (4) on the standard pin.
2. Take out the standard pin.

CAUTION

Functional errors due to incorrect mounting of load measuring pin

Damage to the product

- Push the load measuring pin into the bore by hand.
- Do not use a hammer or press to fit the load measuring pin.

3. Push the load measuring pin (1) by hand between the spherical rod end bearing (2) and the clevis mount (3).
4. Use the included pin lock (4) to secure the load measuring pin (1) axially and against twisting on one side of the clevis mount (3).
5. Align the electrical connection on the load measuring pin according to the application. Polarity of the connection ➡ Fig. 11.

Table 6: Metrological specifications for load measuring pin

Measurement range/inaccuracy	EMC	Measurement range (kN)	Measurement inaccuracy (kN)
	-032	1.3	± 0.007
	-040	5.0	± 0.025
	-050	8.0	± 0.04
	-063	16.0	± 0.08
	-080	22.0	± 0.11
	-100	45.0	± 0.23
	-100XC	56.0	± 0.28
Material	Stainless steel		
Protection class	IP65		
Hardness (load range)	38 HRC		
Mechanical system			
Operating load	150% of MB ¹⁾		
Breaking load	300% of MB		
Accuracy			
Non-linearity	±0.5% of MB		
Repeatability	±0.25% of MB		
Hysteresis	±0.2% of MB		
Temperature drift at zero point	±0.05% of MB/K. ²⁾		
Temperature drift over measurement range	±0.05% of MB/K.		
Compensated temperature	+10 ... +40 °C		
Operating temperature	-20 ... +60 °C		

¹⁾ MB = Measurement range

²⁾ MB/K. = Measurement range per Kelvin

Table 7: Electrical specification for load measuring pin

Output signal	0kN	0±0.03 V
Output signal	MB	-10 ... 10 V ±0.2 V
Power supply voltage		24 V ±2 V
Tare (zero setting function)		7.2 ... 24 V
Current consumption		25 mA (24 V)
Bandwidth		2.5 ±0.2 KHz
Connection		Plug M12x1

Connection cable

Table 8: Technical data, connection cable

Length	5 m
Rated voltage	250 V
Rated current	4 A
Plug outlet	angled
Connection type 1	Female connector M12, 4-pin
Connection type 2	Flying leads
Type of cable	PUR black, shielded
Suitable for drag chains	yes
Cable cross-section	4 x 0.34 mm ²
Cable diameter D	5.9 ±0.2 mm
Static bending radius	>10 x D
Dynamic bending radius	>5 x D
Bending cycles	>2 mil
Ambient temperature, stationary	-25 ... +80 °C
Ambient temperature, in motion	-40 ... +80 °C
Protection class	IP65

EN

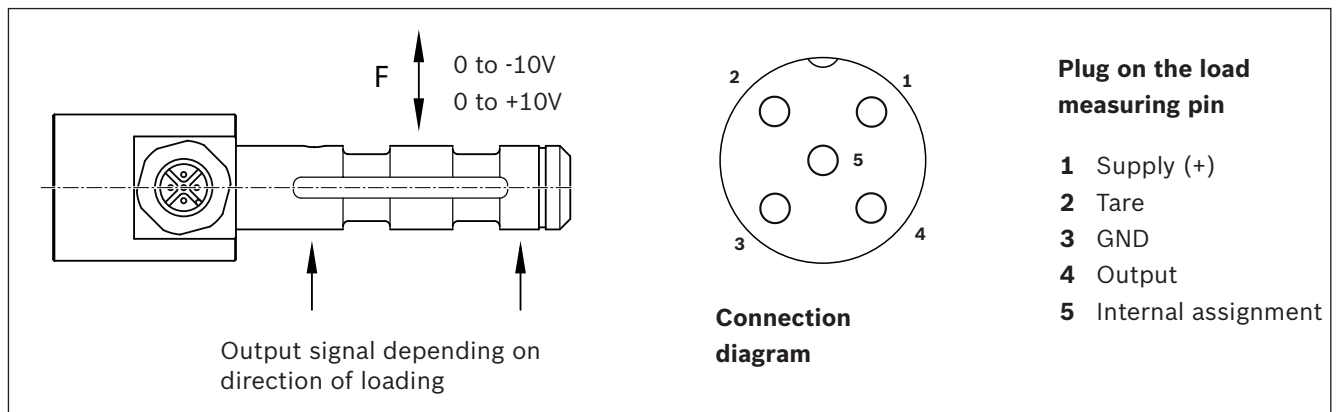


Fig. 11: Connecting the electrical power supply to the load measuring pin

Table 9: Colors, connection cable

Color	Function
brn	Power supply (+)
wht	Tare
blu	GND
blk	Output
–	Internal assignment

6.6 Mounting the EMC

NOTICE

Function failure of product due to incorrect fastening (distortive stress)!

Damage to the product

- Mount the EMC so it is free of distortive stress ➔ Fig. 12.

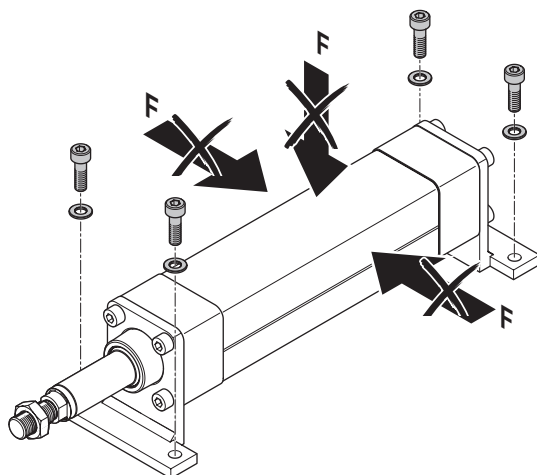


Fig. 12: Distortive stress to cover/base and housing

1. Bring the EMC into position (piston rod extended/retracted). ➔ Air compensation hole 6.6.1
2. Tighten the fastening screws evenly.
Take care not to exceed the maximum permissible tightening torques M_A ➔ Table 20 on page 43.

6.6.1 Air compensation bore (with housing option IP65 and IP65+R)

1. Mount the EMC so that the air compensation bore (1) is not obstructed.
2. If required by the environment, a hose can be connected for the supply of clean air.
3. Alternatively, overpressure (max. 0.2 bar) can be applied as sealing air via the hose (Ø8 mm).

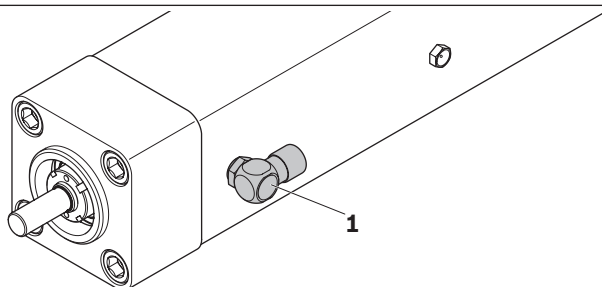


Fig. 13: Air compensation hole

6.7 Mounting the drive

NOTICE

Exceeding of limit values for torque and rotary speed!

Damage to the product.

- Observe the specified limits.

Technical data and maximum values, ➡ Catalog "Electromechanical Cylinders EMC".

The Electromechanical Cylinder EMC has the following drive types:

- Motor (1) with flange and coupling (2)
- Motor (1) with belt side drive (3)

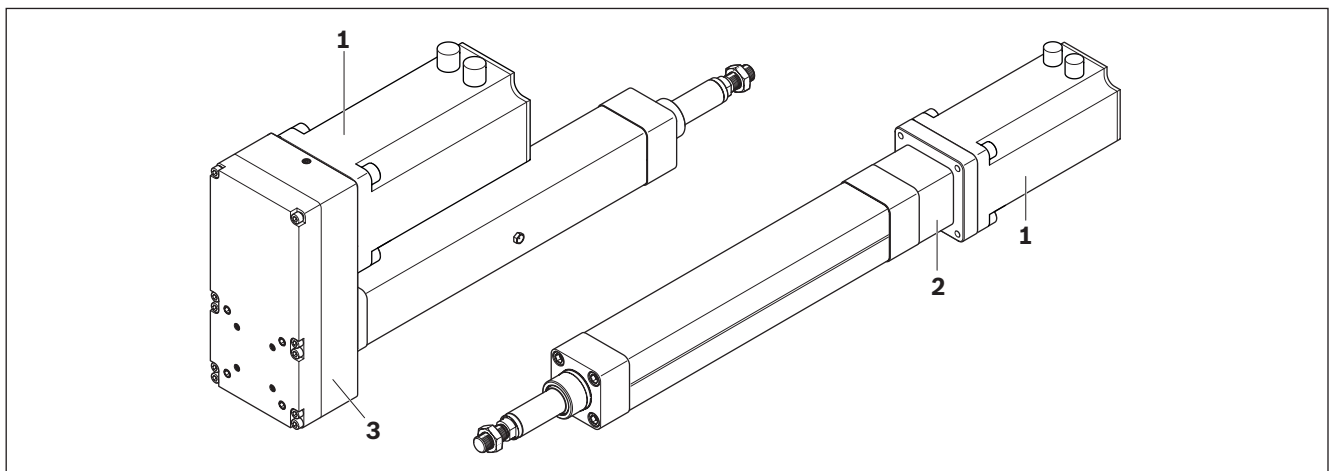


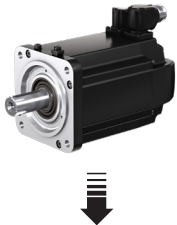
Fig. 14: Drive types

6.7.1 Motor type / motor identifier

- The motor type is described by two variants:

a) Rexroth motor, for example MS2N04

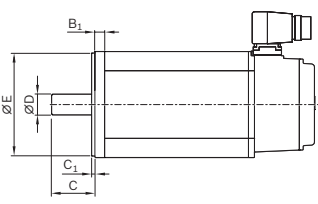
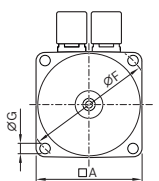
b) Motor code describing the connection geometry of the third-party motor, e.g. 14-30-060-3.0-075-M05-008-072



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		ØA	

Example

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

Fig. 15: Motor type / motor identifier

6.7.2 Mounting the motor with flange and coupling

1. Push the coupling (1) onto the motor's drive journal (6). Observe the distance dimension (B) ➡ Fig. 17/table 13. Clamp the coupling onto the motor journal with the clamping screw (3) to M_{A1} .

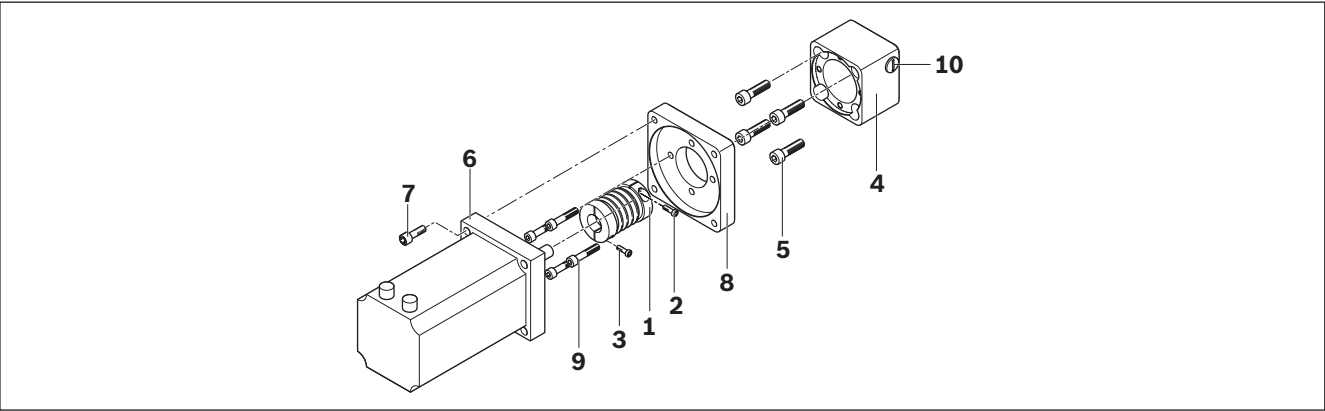


Fig. 16: Mounting the motor with flange and coupling

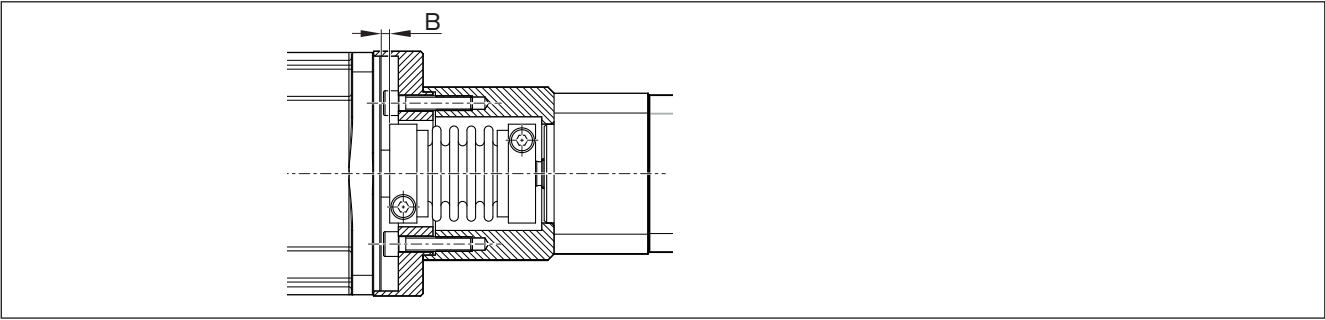


Fig. 17: Adjusting B dimensions

2. Mount the coupling housing (4) on the base of the cylinder using four screws (5). See M_{A2} ➡ Table 12 Pay attention to the alignment of the sealing bore (10).
3. Mount the motor plate (8) using four/six screws (9) on the coupling housing (4). M_{A2} ➡ Table 12.
4. Slide the motor (6) with coupling (1) into the motor plate (8) and the coupling housing (4). Fasten the motor with four screws (7) to the motor plate with M_{A2} . Clamp the coupling with screw (2) on the drive journal of the cylinder to M_{A1} ➡ Table 11
5. Using the sealing plug, seal the coupling housing.

Table 11: M_{A1}

$\mu = 0.125$	M3	M4	M5	M6	M8	M10
M_{A1} (Nm)	1.7	3.5	7.0	12.0	25.0	50.0

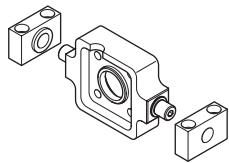
Table 12: M_{A2}

8.8, $\mu = 0.125$	M3	M4	M5	M6	M8	M10	M12
M_{A2} (Nm)	1.3	2.7	5.5	9.5	23.0	46.0	80.0

Table 13: Dimension B for flange and coupling

EMC	Motor type	Dimension B (mm)	
32	MSM019B, MSM031B	3.5	8.0 ¹⁾
	MSK030C, MS2N03B, 09-20-040-2.5-063-M05-010-055	4.0	8.0 ¹⁾
40	MSM031C	3.5	
	MSK030C, MS2N03B, MS2N03D, MSK040C, MS2N04	4.0	
	14-30-060-3.0-075-M06-008-072	3.5	
50	MSM031C, MSM041B	3.5	
	MSK040C, MS2N04	4.0	
	MSK050C, MS2N05, 19-40-080-3.0-100-M06-010-096	3.5	
63	MSM041B	15.5	
	MSK040C, MS2N04	17.5	
	MSK050C, MS2N05, MSK060C, MS2N06, 19-40-080-3.0-100-M06-010-096	15.5	
80	MSK050C, MS2N05, MSK060C, MS2N06	8.5	
	MSK076C	7.5	
	MS2N07	17.5	
	24-50-110-3.5-130-M08-010-126	8.0	
100	MSK060C, MS2N06	9.5	
	MSK071D, MS2N07, MSK076C	8.5	
	32-58-130-3.5-165-M10-013-155	9.0	
100-XC	MSK071E, MS2N07	19.5	
	MSK101D, MS2N10	21.5	
	38-80-180-4.0-215-M12-013-192	19.5	

¹⁾ For version MF01 and fastening element "Option 3 and 5"



Option 3



Option 5

6.7.3 Mounting the motor with belt side drive

i During the mounting, apply threadlocking adhesive to the threads of all screws/bolts that were not coated with threadlocking adhesive on delivery.

The belt side drive can be attached in the following positions:

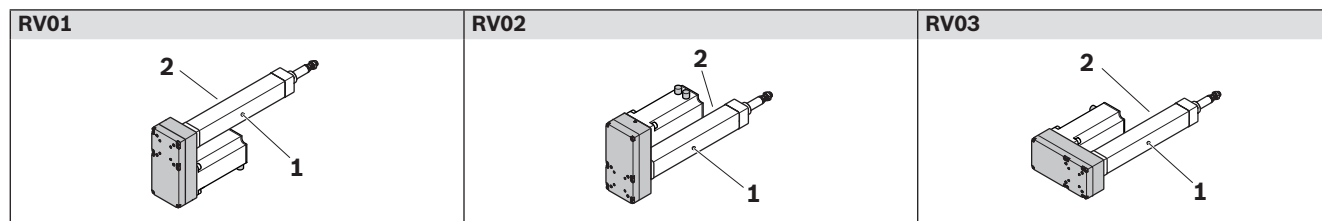


Fig. 18: Mounting orientation for the belt side drive

- 1 Lube connection on EMC
- 2 Slot for sensor profile

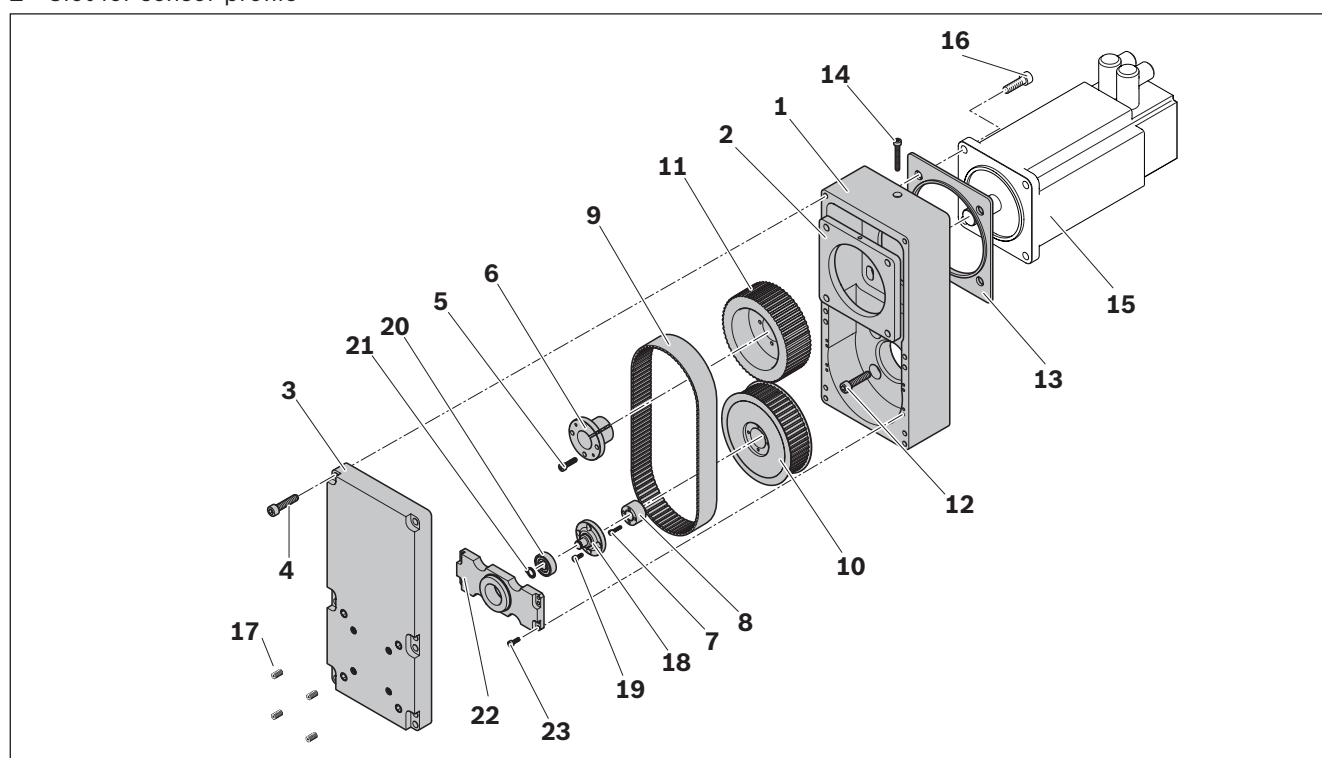


Fig. 19: Motor with belt side drive

Design of the belt side drive for EMC-032 to EMC-100XC

- | | | |
|-----------------------------|--|------------------------------|
| 1 Base plate | 8 Tensioning unit | 14 Hex socket head cap screw |
| 2 Motor plate | 9 Toothed belt | 15 Motor |
| 3 Belt side drive cover | 10 System-side belt pulley | 16 Hex socket head cap screw |
| 4 Hex socket head cap screw | 11 Motor-side belt pulley | 17 Set screw |
| 5 Hex socket head cap screw | 12 Hex socket head cap screw | |
| 6 Tensioning unit | 13 Centering plate (necessary for some motors) | |
| 7 Hex socket head cap screw | | |

Design of the belt side drive for EMC-032 to EMC-050

- | | |
|------------------------------|--|
| 18 Adapter shaft | 21 Retaining ring |
| 19 Hex socket head cap screw | 22 Flange for deep-groove ball bearing |
| 20 Deep-groove ball bearing | 23 Hex socket head cap screw |

Mounting the base plate and system-side belt pulley

1. Screw-fasten the base plate **(1)** of the timing belt side drive to the base of the EMC.
Observe the specified tightening torques ➔ Table 20 on page 43.
2. Push the system-side belt pulley **(10)** with fitted toothed belt **(9)** onto the journal of the EMC.
3. Lightly oil the tensioning elements.

NOTICE

Risk of insufficient lubrication due to use of improper lubricants!

Damage to the product.

- Do not use lubricant with MoS₂ additives!

4. Install the tensioning unit **(8)**. The tensioning elements must be completely inserted into the bore of the belt pulley.

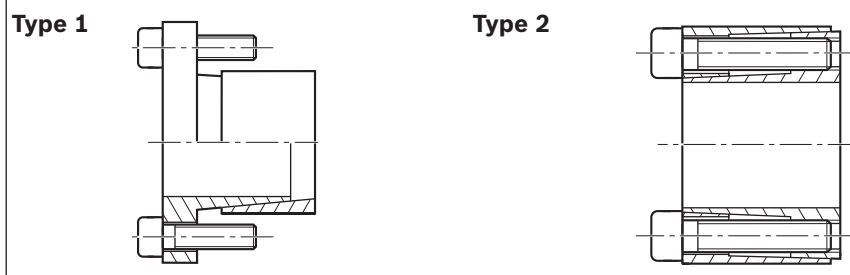


Fig. 20: Tensioning units types 1 and 2

5. Lightly tighten the screws **(7)** at the tensioning unit.

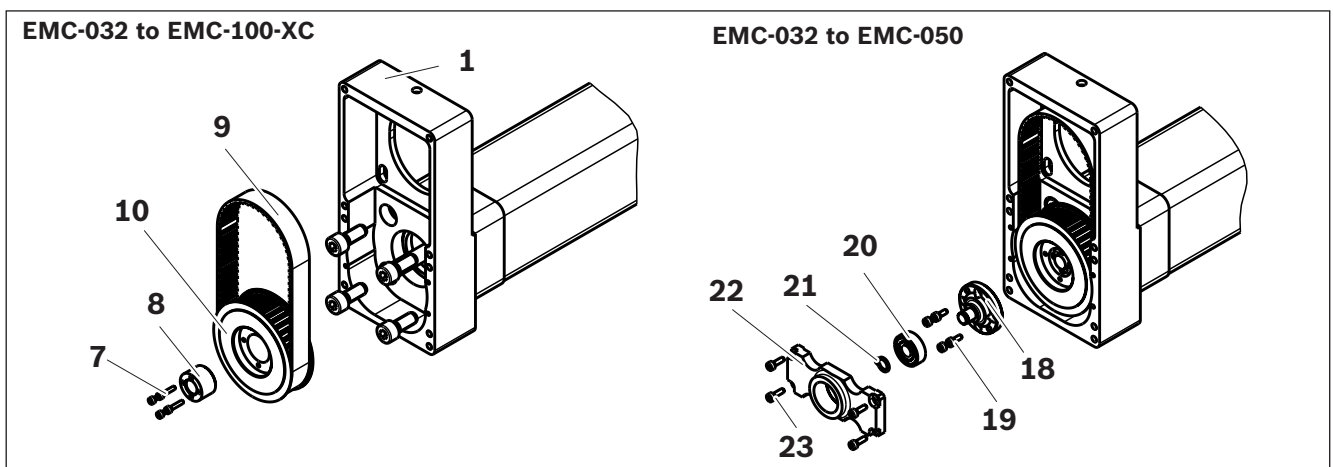


Fig. 21: Mounting system-side belt pulley

6. Set the distance **A** to the base plate **(1)** ➔ Fig. 23, table 15
7. Evenly tighten the screws **(7)** cross-wise in several stages to the specified tightening torques ➔ Table 14

Only for EMC-032 to EMC-050:

8. Mount the adapter shaft **(18)** to the belt pulley **(10)** with the hex socket head cap screws **(18)**.
9. Mount the deep-groove ball bearing **(20)** to the adapter shaft **(18)** and fix with the retaining ring **(21)**.
10. Push the flange **(22)** onto the deep-groove ball bearing **(20)** and fasten to the base plate **(1)** with hex socket head cap screw **(23)**.

Table 14: Tightening torques for tensioning unit screws

 $\mu = 0.125$	Type	M2.5	M3	M4	M5	M6
$\odot M_A$ (Nm)	1	–	–	2.9	6.0	10.0
	2	1.2	2.1	4.9	9.7	16.5

Mounting the second belt pulley and motor, $i = 1$

1. To make sure the second belt pulley **(11)** can be easily inserted, pre-mount the motor as close to the EMC as possible with motor plate, centering plate (if available) and hex socket head cap screws at housing **(1)**.
2. Push the belt pulley **(11)** and tensioning unit **(6)** onto the motor journal.

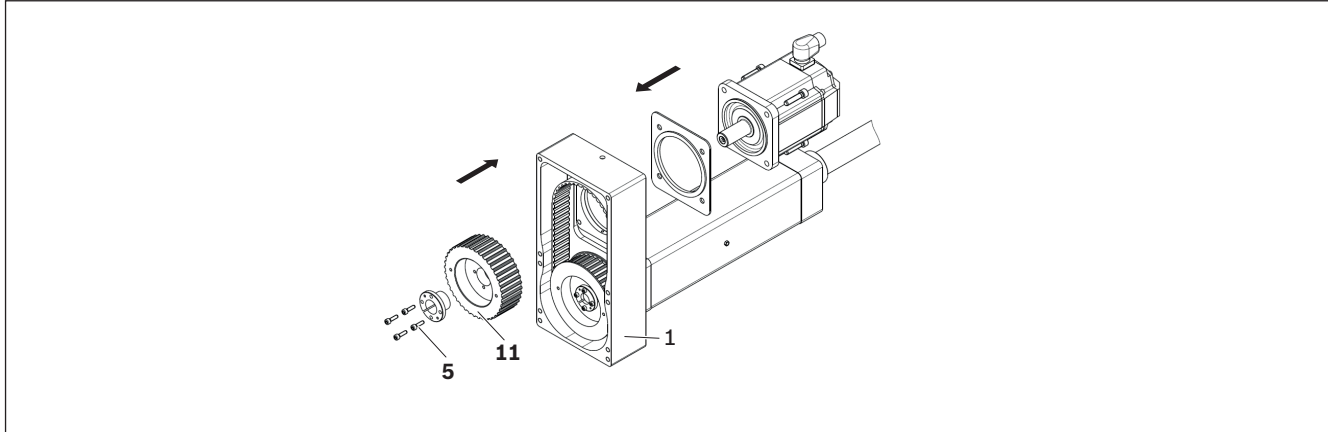


Fig. 22: Mounting the motor and motor-side belt pulley, $i = 1$

3. Set the distance **B** to the base plate **(1)** ➔ Fig. 24, table 15.
4. Tighten the screws **(5)** at the tensioning unit **(6)** to the specified tightening torque ➔ Table 14 on page 23
5. Insert the belt pulley into the belt.
6. Centrally align the toothed belt on the belt pulley

Mounting the second belt pulley and motor, $i = 1.5$ and 2

1. Attach the belt pulley **(11)** and tensioning unit type 1 **(12)** for $i = 2$ and type 2 **(13)** for $i = 1.5$ to the motor journal. Lightly tighten the screws **(8)**.
Exception EMC40 with MSM031C: Attach the belt pulley **(11)** to the motor journal.

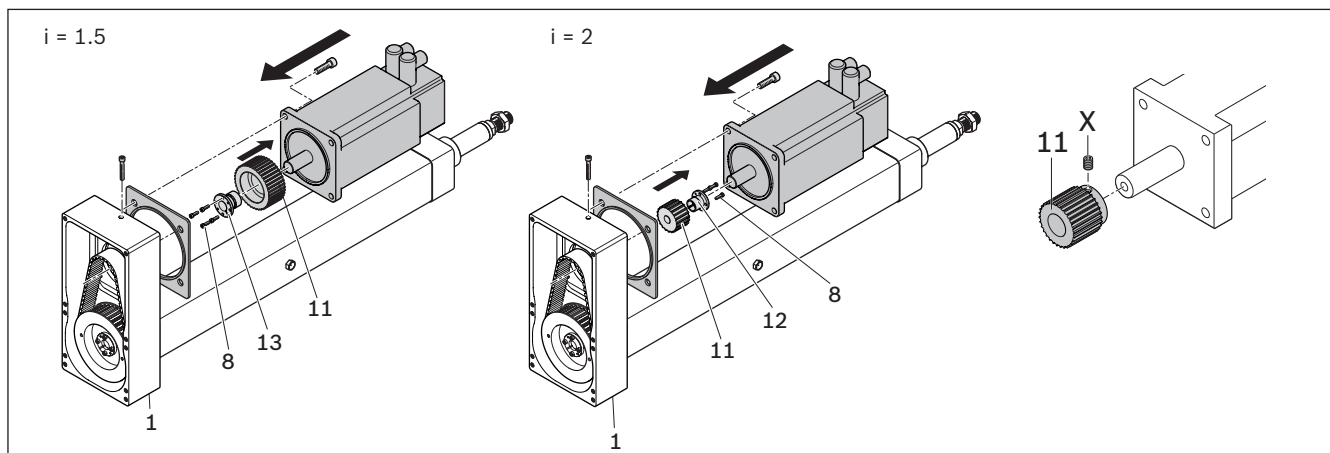


Fig. 23: Mounting the motor and motor-side belt pulley, $i = 1.5$ and $i = 2$

2. Set distance **C** ➔ Fig. 23, table 15
3. Tighten the screws at the tensioning unit **(8)** to the specified tightening torque ➔ Table 14 on page 23
Exception EMC-040 with motor MSM031C: Tighten the belt pulley **(11)** with set screw **(X)** onto the motor journal to a tightening torque of 5.5 Nm
4. To make sure the second belt pulley **(11)** can be easily inserted, pre-mount the motor as close to the EMC as possible with motor plate (if available), centering plate and hex socket head cap screws at housing **(1)**.
5. Insert the belt pulley into the belt.
6. Centrally align the toothed belt on the belt pulley

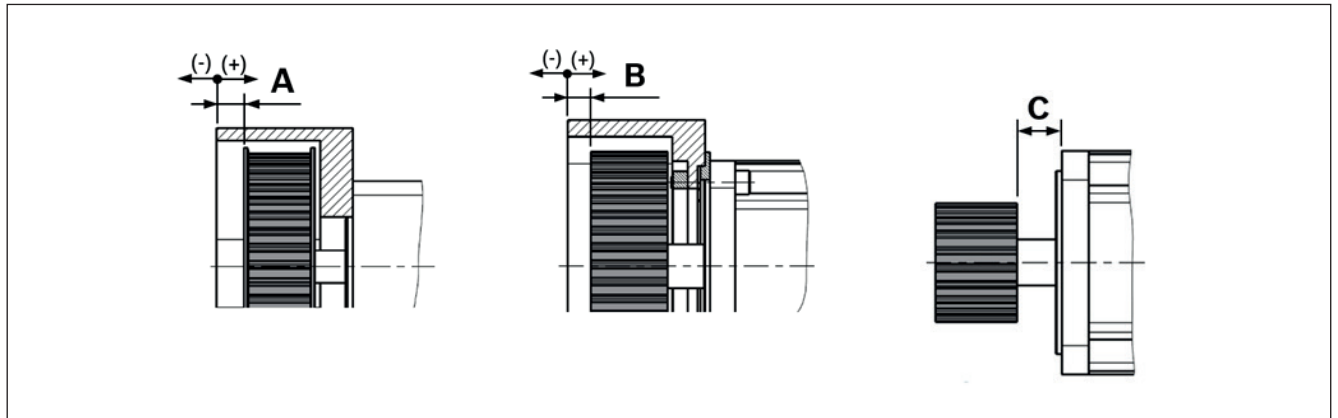


Fig. 24: Distance dimensions A / B / C

Table 15: Distance dimensions A / B / C

EMC		(mm)		
		A	B	C
032	MSM019	0.5	0.3	–
	MSM031B	0.5	0.5	–
	MS2N03-B	0.5	0.5	–
	09-20-040-2.5-063-M05-010-055	0.5	0.5	–
040	MSM031C	0.5	0.5	–
		0.5	–	14.0
	MS2N03-B	0.5	0.5	–
		0.5	–	12.0
	MS2N04	1.5	1.5	–
		1.5	–	14.0
050	14-30-060-3.0-075-M06-008-072	1.5	1.5	–
		1.5	–	14.0
	MSM031C	1.5	1.0	–
		1.5	–	15.0
	MSM041B	1.5	1.0	–
		1.5	–	18.0
063	MS2N04	1.5	1.5	–
		1.5	–	14.0
	MS2N05	4.5	3.5	–
		4.5	–	–
	19-40-080-3.0-100-M06-010-096	4.5	3.5	–
		4.5	–	–

080	MS2N05	0.0	-1.5	–
		0.0	–	19.5
	MSK060	15.0	12.5	–
		15.0	–	23.0
	MS2N06	15.0	12.5	–
		15.0	–	23.0
100	24-50-110-3.5-130-M08-010-126	15.0	12.5	–
		15.0	–	23.0
	MSK076	15.0	12.5	–
		15.0	–	13.5
	MS2N07	15.0	12.5	–
		15.0	–	23.0
100-XC	MSK060	14.0	12.5	–
		14.0	–	23.0
	MS2N06	14.0	12.5	–
		14.0	–	23.0
	24-50-110-3.5-130-M08-010-126	14.0	12.5	–
		14.0	–	23.0
100-XC	MSK076	-4.0	-5.5	–
		-4.0	–	26.5
	32-58-130-3.5-165-M10-013-155	-4.0	-5.5	–
		-4.0	–	23.5
	MS2N07	-6.5	-6.5	–
		-6.5	–	29.5
100-XC	MS2N10	-6.5	-6.5	–
		-6.5	–	30.5
	38-80-180-4.0-215-M12-013-192	-6.5	-6.5	–
		-6.5	–	30.5

Pre-tensioning the toothed 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 the adjusting screw **(14)** through the housing **(1)** into the motor plate **(2)**.
2. Adjust the belt frequency using a frequency gauge (R913057897) and adjusting screw **(14)** according to table of the inside of the cover.
3. Tighten the screws **(16)** for the motor in the motor plate **(2)** to the specified tightening torque. Table 20 on page 43.
4. Check the belt frequency and adjust again if necessary.
5. Screw-fasten the cover **(3)** of the belt side drive to the base plate **(1)**.
6. Screw the set screws flush into the cover **(3)**.

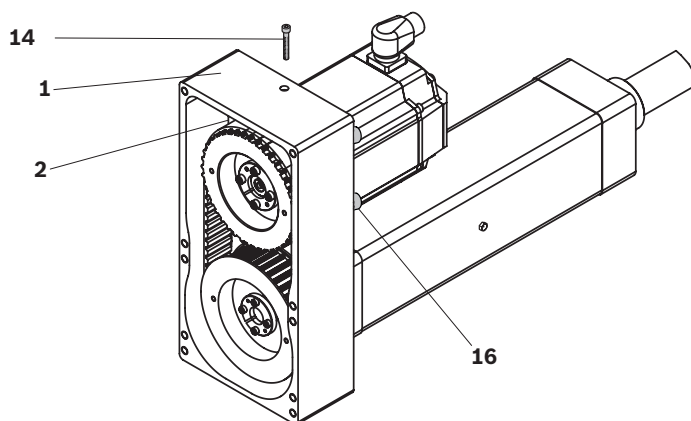


Fig. 25: Pre-tensioning the toothed belt

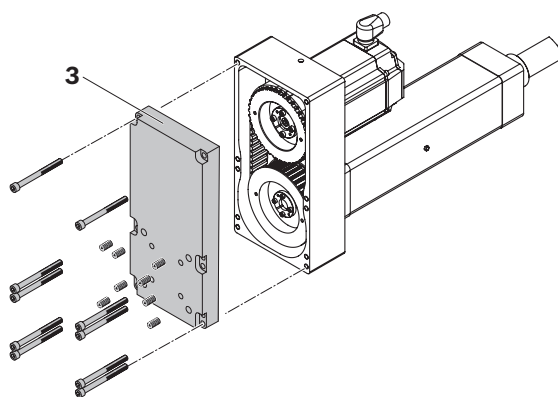


Fig. 26: Mounting the cover

7. Perform a functional check.

6.8 Mounting the switching system

NOTICE

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

Damage to product, adjoining structure and workpieces.

- The entire switching system must be fastened on the designated side of the product.



At the customer, sensor profile **(1)**, retaining clip **(2)** and switch **(10)** (magnetic field sensors) need to be mounted. The required magnet **(11)** is factory-fitted.

6.8.1 Mounting the sensor profile

1. Align the sensor profile **(1)** with the guide edge **(7)** in the longitudinal slot **(6)** in the protective profile. Align the sensor profile between base **(8)** and cover **(9)**.
2. Arrange the included retaining clips **(2)** uniformly along the sensor profile.
3. Clamp the retaining clips with clamping screws **(3/5)** (tightening torque 1.9 Nm) to the protective profile.
4. Fix the sensor profile against the protective profile using clamping screws **(4)**.
5. Check the sensor profile for secure fitting.

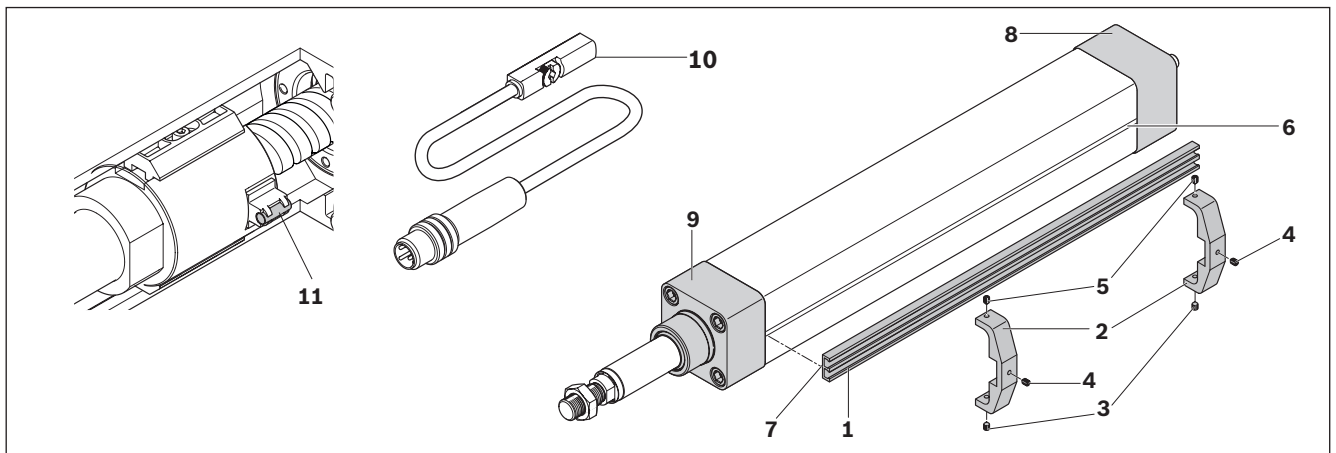


Fig. 27: Mounting the switching system

6.8.2 Mounting the switches



Switches can be inserted into either or both of the two T-slots.

1. Insert the switches (magnetic field sensors) in the T-slot of the sensor profile **(1)** in such a way that the clamping screws **(12)** point outwards ➔ Fig. 28.
2. Move the switches into the desired switch activation point
Take care to ensure that the active zone of the switch is between $L_{0\ 1Mag}$ and $L_{smax\ 1Mag}$. ➔ Fig. 29 on page 28 and Table 16 on page 28.

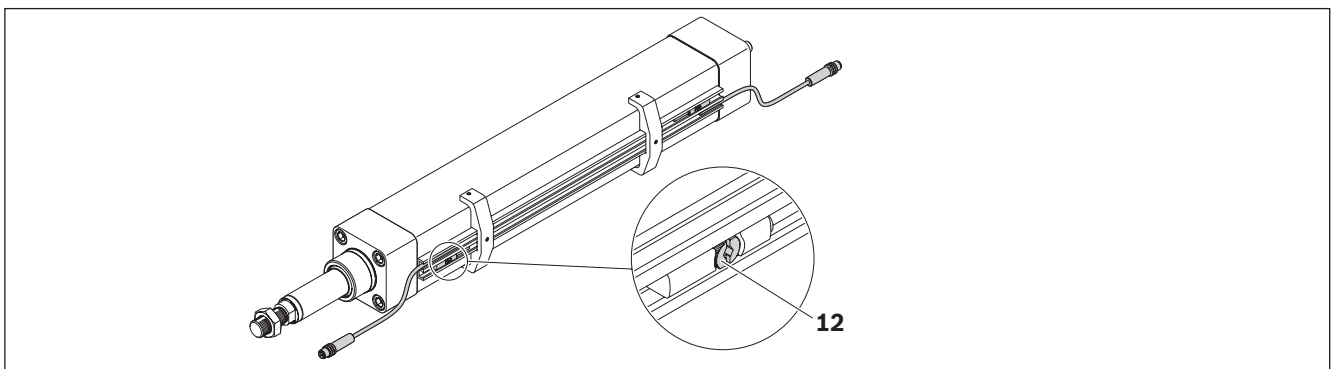


Fig. 28: Mounting the switches

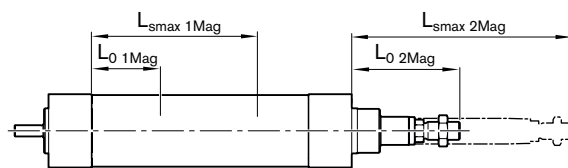


Fig. 29: Setting the switching points

Table 16: Setting the switching points

EMC	BASA size $d_0 \times P$ (mm)	Dimensions (mm)			
		At travel range 0 mm		At travel range s_{max} mm	
		$L_{0\ 1Mag}$	$L_{0\ 2Mag}$	$L_{smax\ 1Mag}$	$L_{smax\ 2Mag}$
32	12x5	12.00	55.00	$12.0 + s_{max}$	$55.0 + s_{max}$
	12x10	12.00	55.00	$12.0 + s_{max}$	$55.0 + s_{max}$
40	16x5	12.00	61.50	$12.0 + s_{max}$	$61.5 + s_{max}$
	16x10	12.00	61.50	$12.0 + s_{max}$	$61.5 + s_{max}$
	16x16	12.00	61.50	$12.0 + s_{max}$	$61.5 + s_{max}$
50	20x5	12.00	76.50	$12.0 + s_{max}$	$76.5 + s_{max}$
	20x10	12.00	76.50	$12.0 + s_{max}$	$76.5 + s_{max}$
	20x20	12.00	76.50	$12.0 + s_{max}$	$76.5 + s_{max}$
63	25x5	12.00	76.50	$12.0 + s_{max}$	$76.5 + s_{max}$
	25x10	12.00	76.50	$12.0 + s_{max}$	$76.5 + s_{max}$
	25x25	12.00	76.50	$12.0 + s_{max}$	$76.5 + s_{max}$
80	32x5	11.00	94.50	$11.0 + s_{max}$	$94.5 + s_{max}$
	32x10	11.00	94.50	$11.0 + s_{max}$	$94.5 + s_{max}$
	32x20	11.00	94.50	$11.0 + s_{max}$	$94.5 + s_{max}$
	32x32	11.00	94.50	$11.0 + s_{max}$	$94.5 + s_{max}$
100	40x5	10.50	99.00	$10.5 + s_{max}$	$99.0 + s_{max}$
	40x10	10.50	99.00	$10.5 + s_{max}$	$99.0 + s_{max}$
	40x20	10.50	99.00	$10.5 + s_{max}$	$99.0 + s_{max}$
	40x40	10.50	99.00	$10.5 + s_{max}$	$99.0 + s_{max}$
100XC	50x10	11.50	144.00	$11.5 + s_{max}$	$144.0 + s_{max}$
	50x20	11.50	144.00	$11.5 + s_{max}$	$144.0 + s_{max}$



The dimensions in the table indicate the position of the magnet as a function of the maximum travel range s_{max} .

- Fix by rotating the clamping screw **(12)** ➡ Fig. 28 on page 27 Secure. Tighten the screw by hand and check the switch is secure.

6.8.3 Connecting the switches

1. Connect the switches as illustrated in the drawing.
2. After connection, allow the cylinder to travel slowly while you check the switching points. Adjust if necessary.

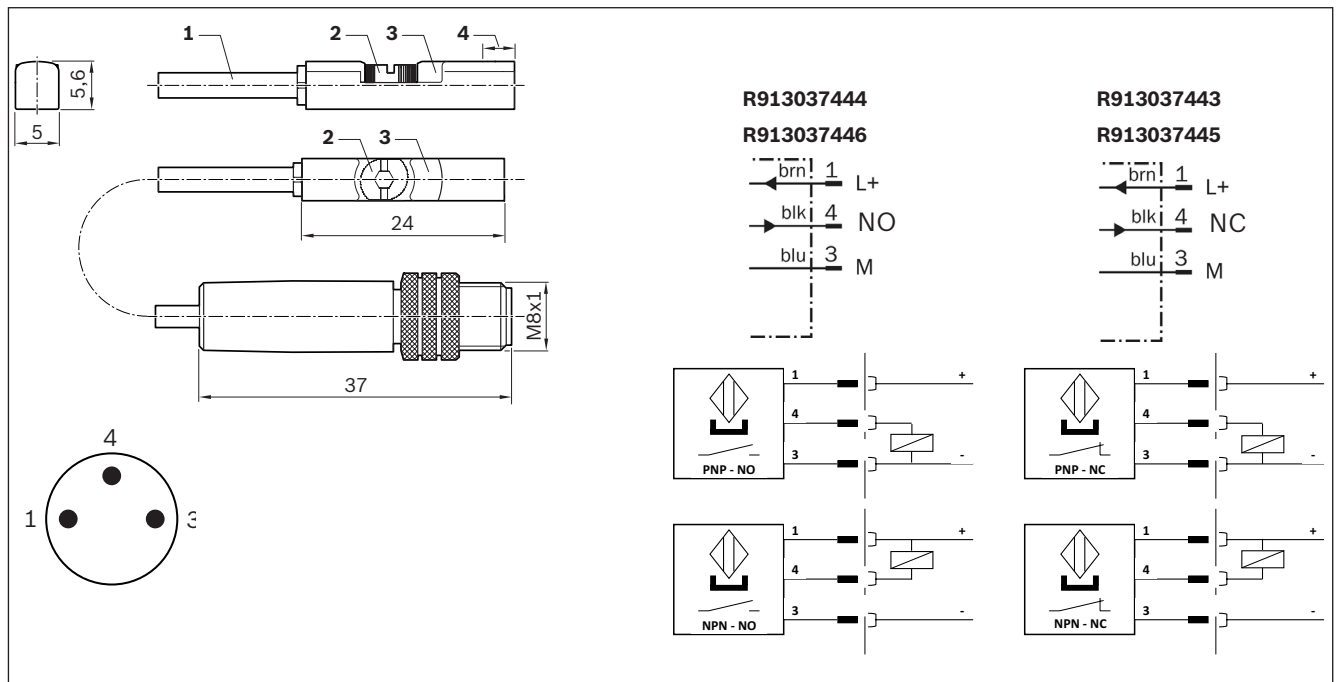


Fig. 30: Connecting the switches

- 1 Connection
- 2 Clamping screw
- 3 LED display
- 4 Position of sensor element: 2.0 mm

NOTICE

Collision of BASA nut with cover or base!

Damage to product, adjoining structure and workpieces.

- Do not exceed the positions specified in Table 16 on page 28



For further technical data relating to the switches ➡ Product catalog.

6.8.4 Connecting the electrical power supply to the EMC

⚠ WARNING

Risk of electric shock due to contact with live parts!

Death or severe injury.

- ▶ Before working on the electrical equipment, switch off the power supply and secure it against being switched on again.
- ▶ Follow the safety instructions given in the documentation for the controller used.

1. Switch off the voltage supply to the relevant parts of the system.
2. Connect the electrical components to the EMC as illustrated in the drawing.

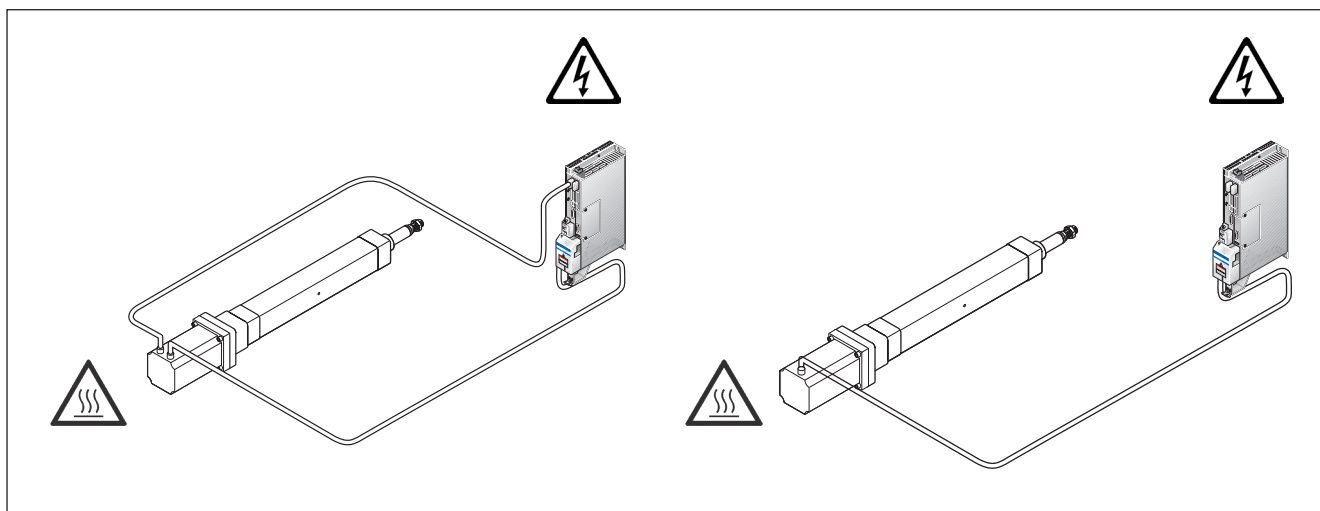


Fig. 31: Connecting the electrical power supply to the EMC

- ▶ Please note the information on electromagnetic compatibility.
- ▶ Observe the information in the latest print documentation ➡ Table 1 on page 4
- ▶ Follow the instructions given in the documentation for the controller used ➡ Table 1 on page 4.

7 Start-up

⚠ WARNING

Risk of injury due to moving parts!

Crushing.

- ▶ Do not reach into moving parts while the system is in operation.
- ▶ Do not stand in the hazard zone in front of the piston rod.
- ▶ Make sure that no one is in the hazard zone before start-up.

NOTICE**Risk of liquid or humidity penetration due to insufficient impermeability!**

Motor damage, short circuit.

- ▶ Before start-up, make sure all plug-and-socket connections have been correctly plugged in.
- ▶ Before start-up, make sure all seals and plug-and-socket connections are tight.

- ▶ Do not start up the product until it has been verified that the end product (for example a machine or system) into which the Rexroth product has been installed complies with the country-specific requirements, safety regulations and standards for the application.
- ▶ Perform start-up at low rotary speeds and torques.

NOTICE**Risk of collisions due to overshooting end positions!**

Damage to the product.

- ▶ Do not allow the product to collide with a stop.
- ▶ If required by the application, the BASA nut may be moved to a specific stop in the end position for referencing. Approaching the rear end position with the following parameters:
 - Maximum travel speed: 10 mm/s
 - Maximum force: 5% of $F_{\max \text{ EMC}}$
- ▶ Do not exceed the max. travel range $s_{\max}$ of the EMC.
- ▶ In all installation orientations, make sure there is a sufficient safety margin (excess travel s_e) on two sides of the stroke.

Lack of lubrication!

Failure to perform basic lubrication will lead to damage to the product (LPG version).

- ▶ Never start up product without basic lubrication.

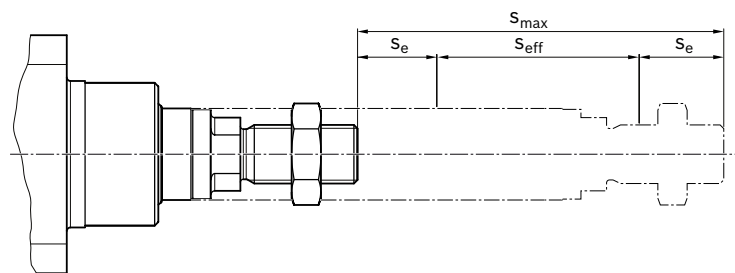


Fig. 32: **Excess travel s_e of EMC**



Excess travel must be greater than braking distance. The acceleration travel can be adopted as the guideline value for the braking distance.

7.1 Nameplate with parameters for easy start-up

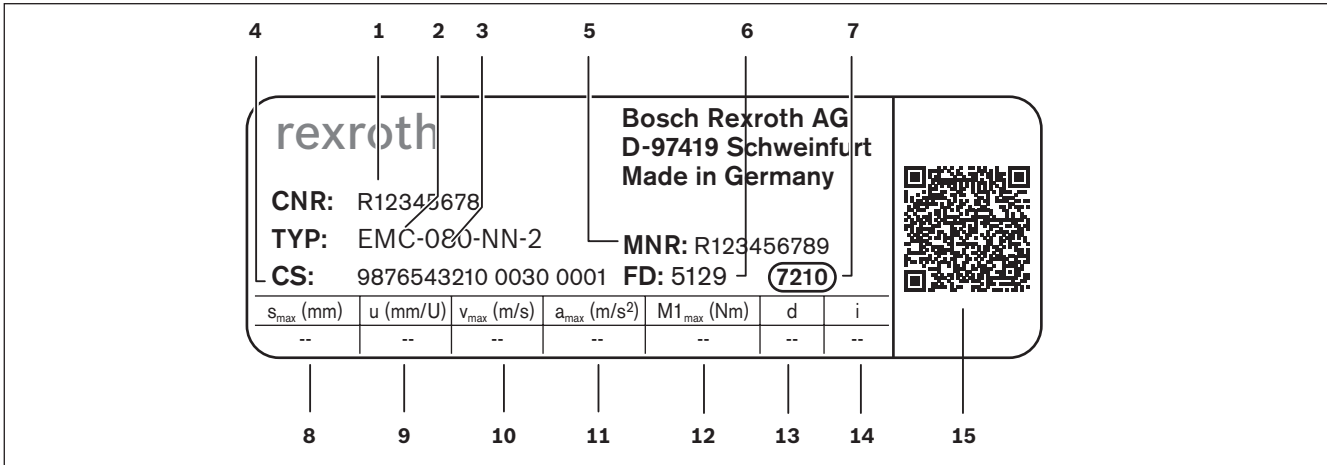


Fig. 33: EMC nameplate

- 1

Customer's material number

2

Short product name

3

Size

4

Customer information

5

Material number

6

Date of manufacture

7

Manufacturing location

8

s_{max} – max. travel range (mm)

9

u – lead constant without motor attachment (mm/rev)
- 10

v_{max} – max. speed (m/s)

11

a_{max} – max. acceleration (m/s²)

12

$M1_{max}$ – max. drive torque at motor journal (Nm)

13

d – direction of rotation of the motor for travel in positive direction

14

i – gear ratio

15

QR code (for start-up)

The values specified describe the mechanical limit values of the product for installation case I.
(See product catalog)

Limits values for the included fastening elements and application-related installation cases are not taken into account here.

7.2 Checking the operating conditions

- ▶ Take note of the permitted ambient temperature, load, rotary speed, linear travel speed and maximum travel range of the EMC ➡ 14 and the catalog "Electromechanical Cylinders EMC".
- ▶ For special operating conditions, please contact us.

7.3 Initial start-up

1. Make sure that the travel area is unobstructed. The piston rod is fully retracted on delivery.

NOTICE

Risk of collisions due to overshooting end positions!

Damage to the product.

- ▶ Do not exceed the max. travel range of the EMC.
- ▶ For all installation positions, comply with the safety distance (excess travel) on two sides.
- ▶ Before start-up, check the direction of rotation for retracting/extending the piston rod.
- ▶ Only allow the piston rod to travel very slowly.
- ▶ Make sure that the travel area is unobstructed.

EN

2. To extend the piston rod, turn the drive journal of the EMC counterclockwise. It is best to turn the drive journal by hand. If the piston rod is extended using the motor, use only a low motor speed.

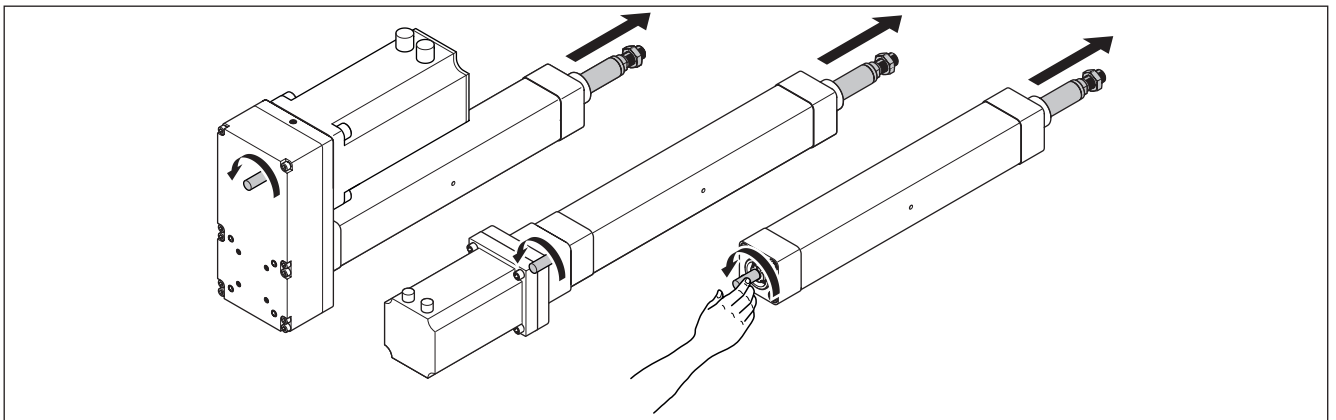


Fig. 34: Extending the piston rod

7.4 Recommissioning after removal

- ▶ When starting up the unit again, proceed as described in the chapter "Initial start-up".

7.5 Test run, running in

⚠ CAUTION

Motor becomes very hot during operation!

Risk of burns.

- ▶ During running in or operation, do not touch the motor or only when wearing suitable protective equipment (e.g. heat-resistant gloves).
- ▶ Only start up the product after running successful tests under simulated production conditions.
- ▶ Move at low speed over the entire travel range. While doing so, be sure to check the settings and the function of the limit switches.
- ▶ If necessary, optimize the interaction of the mechanical equipment and the electronics.

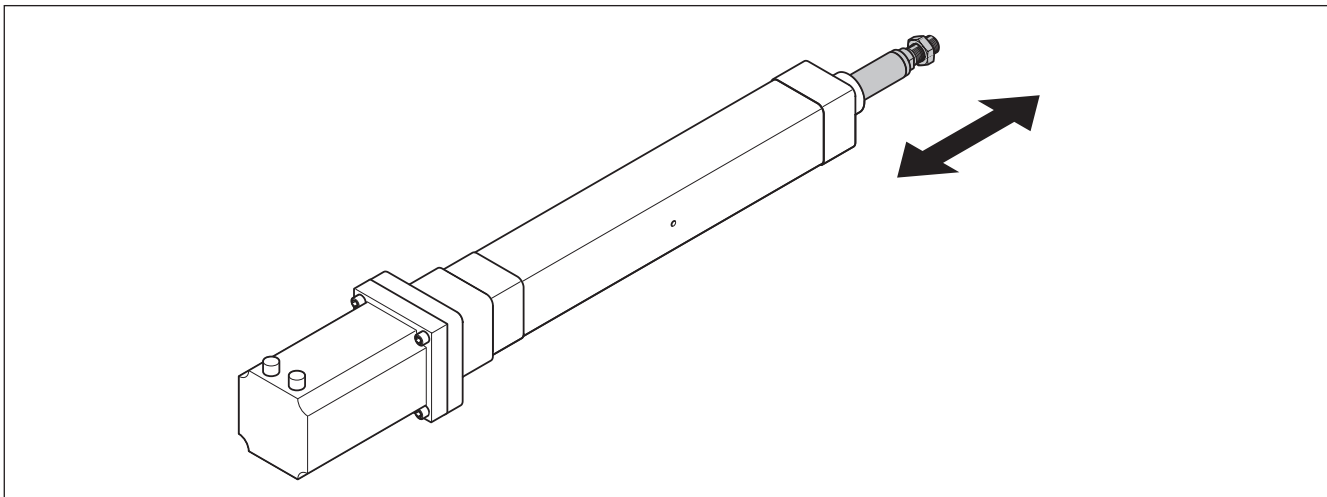


Fig. 35: Extending and retracting the EMC

9 Operation

WARNING

Risk of electric shock due to contact with live parts!

Death or severe injury.

- ▶ Before working on the electrical equipment, switch off the power supply and secure it against being switched on again.

Risk of injury due to moving parts (e.g. piston rod)!

Crushing.

- ▶ Do not reach into moving parts while the system is in operation.
- ▶ Do not stand in the hazard zone in front of the piston rod.
- ▶ Make sure that no one is in the hazard zone before start-up.

CAUTION

Motor becomes very hot during operation!

Risk of burns.

- ▶ During operation, do not touch the motor or only when wearing suitable protective equipment (e.g. heat-resistant gloves).

EN

NOTICE

Risk of motor overheating when overloaded!

Risk of fire.

- ▶ During operation, be sure to comply with technical data such as load capacities, torques, maximum rotary speeds, motor data, etc. ➔ Product catalog.

Risk of collisions due to overshooting end positions!

Damage to the product.

- ▶ Do not allow the product to collide with a stop.
- ▶ Observe the max. travel range s_{max} of the product.
- ▶ In all installation orientations, make sure there is a sufficient safety margin (excess travel s_e) on two sides of the stroke.

Lubricant may escape!

Environmental contamination.

- ▶ Take suitable precautions to collect any leaking lubricant and dispose of it properly.
(Due to the stroke movement of the piston rod, a certain amount of lubricant may be discharged).

8 Cleaning and care

NOTICE

Risk of damage due to improper cleaning, e.g. use of solvents and high-pressure jets!

Degradation of gaskets and functional failure of the product.

- ▶ Do not use high-pressure cleaning equipment.
- ▶ For cleaning, use only water and, if necessary, a mild detergent.

- ▶ Before cleaning, seal all holes with suitable protective caps/devices.
- ▶ Check that all seals and locks of plug connections are fitted tightly to ensure that no moisture can penetrate the product during cleaning.

10 Maintenance and repair

Maintenance is restricted to lubrication of the ball screw assembly using a conventional manual grease gun or for lubrication option LCF with a central lubrication system with semi-fluid grease. Basic lubrication is carried out by the manufacturer. Initial lubrication is only necessary for lubrication option LPG. For lubrication option LFL, relubrication is not required.

Nozzle pipes for the manual grease gun with a suitable mouth piece can be ordered under material number R345503044.

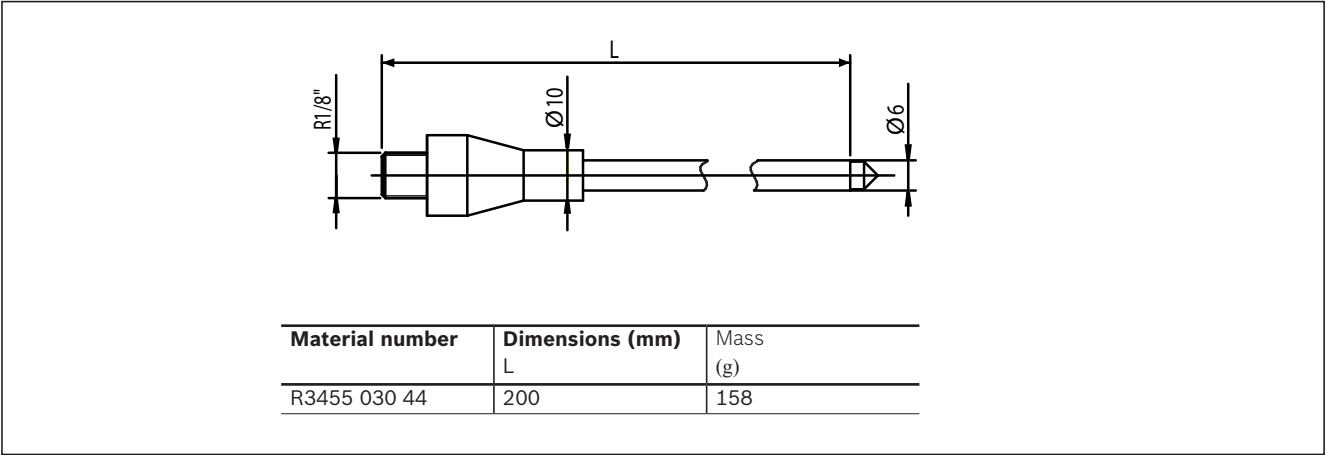


Fig. 36: Nozzle pipe

10.1 Lubrication

- The following options are possible on delivery:
- LSS: Initial lubrication in the factory with Dynalub 510
 - LCF: Initial lubrication in the factory with Dynalub 520, prepared for connection to central lubrication system with semi-fluid grease
 - LPG: Preserved, not initially lubricated (initial lubrication with double the relubrication quantity required!)
 - LHG: Initial lubrication in factory with NSF-H1 grease
 - LFL: Lubricated for service life

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

NOTICE

Lack of lubrication!

Failure to perform basic lubrication will lead to damage to the product (LPG version).

► Never start up product without basic lubrication.

Risk of property damage due to insufficient lubrication!

Loss of performance and corrosion.

► Lubricate the product every two years or when the specified travel range has been covered – whichever limit is reached first.

Performance altered by special operating conditions!

Damage to the product.

► Before starting up 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.

NOTICE**Overlubrication!**

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

- ▶ Do not significantly overlubricate the product.

Risk of insufficient lubrication due to use of wrong lubricants

- ▶ Use only the recommended lubricants.
- ▶ Do not use lubricants containing solid particles (e.g. graphite or MoS₂)!
- ▶ Only use lubricants of one type.

Lubricant may escape!

Environmental contamination.

- ▶ Take suitable precautions to collect any escaping lubricant and dispose of it in the proper way.

Avoiding pressure peaks due to excessive speed after lubrication!

Damage to the product.

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

- ▶ 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 and there are no trapped air bubbles.
- ▶ Rexroth recommends the pump tank or supply tank for the lubricant be equipped with an agitator in order to ensure that the lubricant keeps flowing (preventing funnel formation in the tank).
- ▶ Rexroth recommends piston distributors by SKF. These should be installed as close as possible to the EMC lube connection. Long lines and small line diameters should be avoided, and the lines should be laid on an upward slant. Install the lines at a gradient.
- ▶ The number of pulses results from the relubrication quantity and the piston distributor size.

10.1.1 Lubricating the EMC

NOTICE

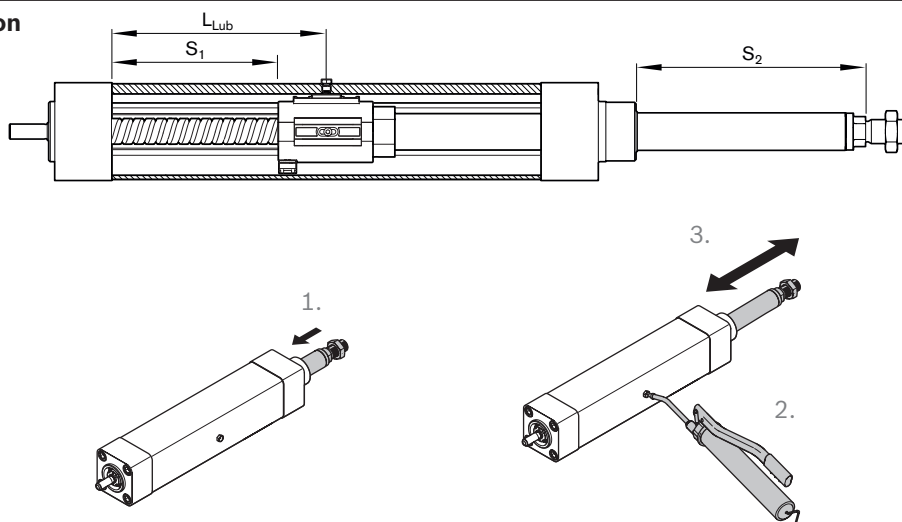
Damage due to incorrect parameters when approaching the rear end position!

Damage to the product.

- Approaching the rear end position with the following parameters. Maximum travel speed: 10 mm/s
Maximum force: 5% of $F_{\max \text{ EMC}}$

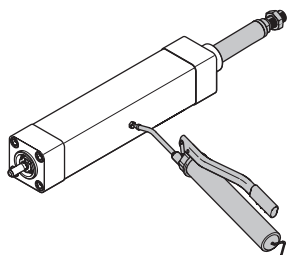
1. In order to reach lubrication position L_{Lub} , move the piston rod to stroke position S_2 . For this purpose, move S_1 from Table 17 on page 39 the rear end position. ► Fig. 37.
2. For lubrication options LSS, LPG and LHG, grease the ball screw assembly via the lube nipple. For lubrication option LCF, replace the funnel-type lube nipple with the enclosed port for the central lubrication system and grease it ► Fig. 37. Apply the full relubrication quantity in one go. For lubrication option LFL, relubrication is not required.
3. Extend and retract the piston rod over its entire travel range for three full cycles.

Lubrication position

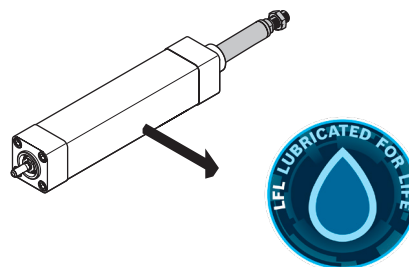


Lubrication options

LSS / LPG / LHG



LFL



LCF

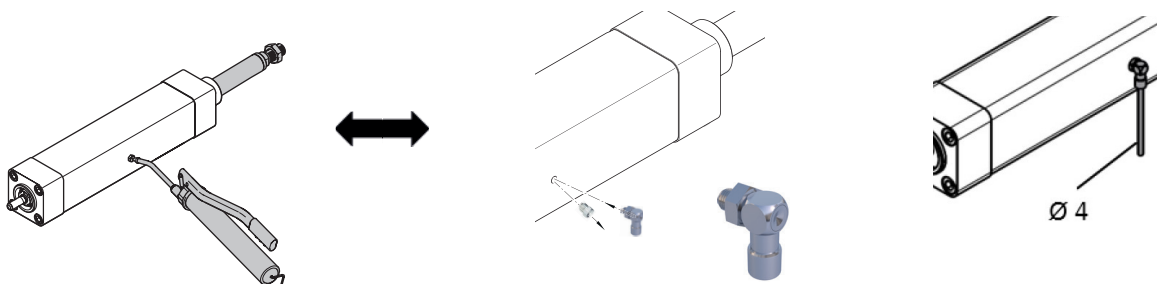


Fig. 37: Lubrication position / options

Table 17: Lubrication positions

EMC	Dimensions (mm)		L _{Lub}	S ₁	S ₂
	P				
32	5	36.0	+ s _{max} /2	21.5	+ s _{max} /2
	10	38.0	+ s _{max} /2	18.5	+ s _{max} /2
40	5	35.5	+ s _{max} /2	16.1	+ s _{max} /2
	10	40.0	+ s _{max} /2	17.5	+ s _{max} /2
	16	48.0	+ s _{max} /2	15.0	+ s _{max} /2
50	5	33.0	+ s _{max} /2	10.0	+ s _{max} /2
	10	42.5	+ s _{max} /2	10.0	+ s _{max} /2
	20	52.0	+ s _{max} /2	10.0	+ s _{max} /2
63	5	35.0	+ s _{max} /2	10.0	+ s _{max} /2
	10	44.5	+ s _{max} /2	10.0	+ s _{max} /2
	25	60.5	+ s _{max} /2	10.0	+ s _{max} /2
80	5	37.0	+ s _{max} /2	10.0	+ s _{max} /2
	10	49.0	+ s _{max} /2	7.5	+ s _{max} /2
	20	53.0	+ s _{max} /2	7.5	+ s _{max} /2
	32	70.5	+ s _{max} /2	7.5	+ s _{max} /2
100	5	36.0	+ s _{max} /2	7.9	+ s _{max} /2
	10	43.0	+ s _{max} /2	10.5	+ s _{max} /2
	20	52.0	+ s _{max} /2	4.5	+ s _{max} /2
	40	79.5	+ s _{max} /2	4.5	+ s _{max} /2
100XC	10	66.5	+ s _{max} /2	15.3	+ s _{max} /2
	20	77.5	+ s _{max} /2	18.4	+ s _{max} /2

P Lead for BASA (mm)

s_{max} Maximum travel range of the EMC (see nameplate) (mm)

Table 18: Lubricants

Lubrication option	Rexroth lubricant		Can also be used
	Grease	Material number	
LSS	Dynalub 510 (NLGI 2)	R341603700	– Elkalub GLS 135 / N2 (Chemie-Technik) – Tribol GR 100-2 PD (Castrol)
LCF	Dynalub 520 (NLGI 00)	R341604300	– Elkalub GLS 135 / N00 (Chemie-Technik) – Tribol GR 100-00 PD (Castrol)
LPG	Dynalub 510 (NLGI 2)	R341603700	– Elkalub GLS 135 / N2 (Chemie-Technik) – Castrol Longtime PD 2 (Castrol)
	Dynalub 520 (NLGI 00)	R341604300	– Elkalub GLS 135 / N00 (Chemie-Technik) – Castrol Longtime PD 00 (Castrol)
	Berulub FG-H2SL (NLGI 2), H1 grease	R341604600	– VP 874, NLGI 2 (Chemie-Technik) – Cassida Grease EPS2, NGLI 2 (Bremer & Leguil)
LHG	Berulub FG-H2SL (NLGI 2), H1 grease	R341604600	–

► Only one kind of the lubricants must be used. Mixing different types of grease is prohibited.

10.1.2 Lubrication with H1 grease

Ball screw assembly and other components are initially lubricated with NSF-H1 lubricant.

Even when using an H1 lubricant, the EMC is only conditionally suitable for use in the foodstuff industry.

H1 lubricants or separating agents (anti-corrosion agents) only have H1 approval if they are available with grade purity in an unmixed state. A blend of two H1 approval lubricants or separating agents does not have H1 approval.

Owing to the preservation used for the ball screw assembly, the H1 lubricant in the EMC does not have grade purity.

10.1.3 Initial lubrication LPG

NOTICE

Lack of lubrication!

Failure to perform basic lubrication will lead to damage to the product (LPG version).

- ▶ Never start up the electromechanical cylinder without basic lubrication.

This applies to the following conditions:

- No exposure to media
 - Ambient temperature: $T = 10 - 40\text{ }^{\circ}\text{C}$
 - Normal operating conditions
 - No short stroke (travel range $< s_{\min}$)
- ▶ With short stroke (travel range $< s_{\min}$): Halve the relubrication interval and relubrication quantity (only valid for distances $> 2 \times P$). For distances $< 2 \times P$ please contact Bosch Rexroth.
- ▶ Use of lubricants with H1 approval (e.g. Berulub FG-H2SL):
First relubrication takes place after 20 km. The subsequent relubrication intervals according to schedule

Initial lubrication

- 1 Set to lubrication position
- 2 Lubricate according to table 19 **Lubricants** ➡ Table 19
- 3 Extend and retract the piston rod over its entire travel range for three full cycles.
- 4 Repeat steps 1 to 3.

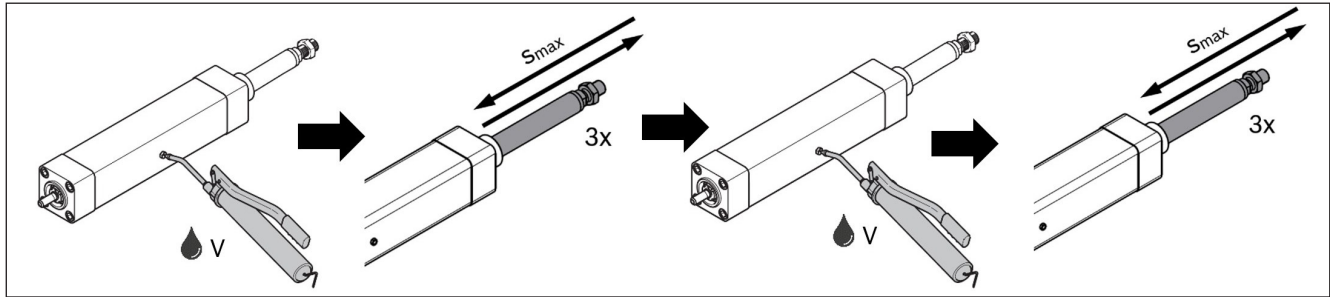


Fig. 38: Initial lubrication LPG

Table 19: Lubrication/relubrication quantities

EMC	Lubrication/relubrication quantities V (cm ³)						
	Lead P (mm)						
	5	10	16	20	25	32	40
32	0.4	0.4	–	–	–	–	–
40	0.8	1.1	1.5	–	–	–	–
50	1.2	1.9	–	3.0	–	–	–
63	1.9	2.3	–	–	4.2	–	–
80	2.7	3.8	–	4.3	–	6.7	–
100	3.7	8.2	–	10.6	–	–	17.5
100-XC	–	13.2	–	12.4	–	–	–

10.1.4 Lubrication/relubrication interval

- If the specified travel range s is completed, or after no more than two years, whichever is reached first.
- To ensure the lubricant is evenly distributed, the quantity of grease specified per lubrication interval is to be applied.

- 1 Set to lubrication position
- 2 Re-lubricate according to table 19
- 3 Extend and retract the piston rod over its entire travel range for three full cycles.

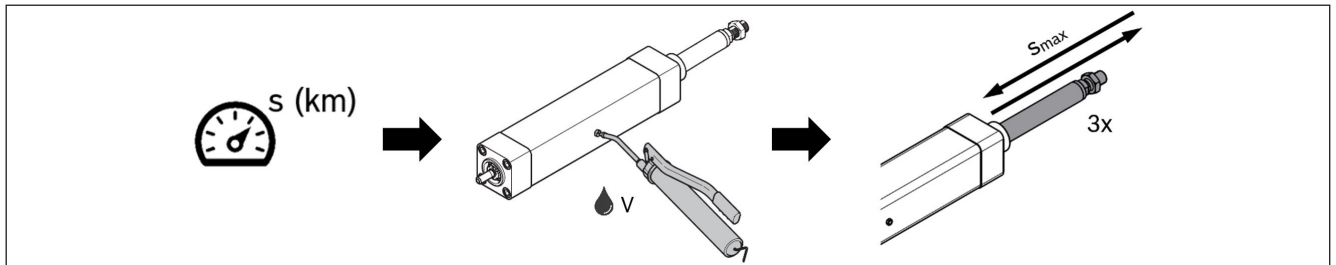


Fig. 39: Relubrication

EN

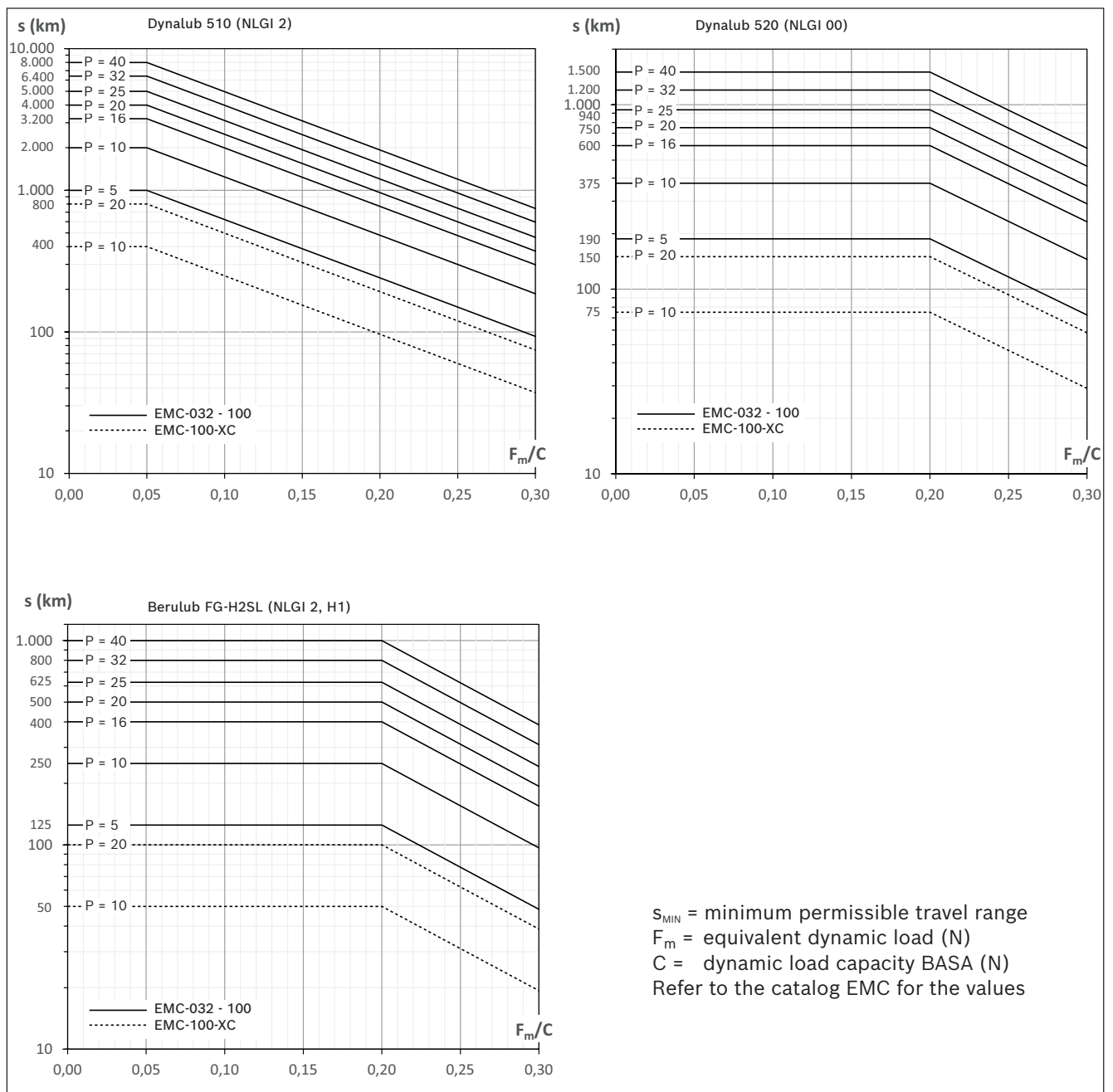


Fig. 40: Relubrication intervals

Relubrication with the LCF option:

The pulse count can be calculated as the quotient (rounded to the next whole figure) of the relubrication quantity and the piston distributor size.

Example:

EMC-040-NN-2 with BASA 16x10

F_m/C : 0.1

Lubrication interval: 375 km

Relubrication quantity: 1.1 cm³

Piston distributor size: 0.2 cm³

$$\text{Number of pulses: } \frac{\text{Relubrication quantity}}{\text{Piston distributor size}} = \frac{1.1 \text{ cm}^3}{0.2 \text{ cm}^3} = 6$$

11 Removal and replacement

To ensure the accuracy of the EMC after replacement of assemblies, sub-assemblies may only be dismantled and replaced by Rexroth.

The only exceptions to this rule are the work steps described in this chapter .

11.1 Disassembling the drive

WARNING

Risk of electric shock due to contact with live parts!

Death or severe injury.

- ▶ Before working on the electrical equipment, switch off the power supply and secure it against being switched on again.

Risk of piston rod crashing down in vertical or slanting installations as the unit is not self-locking!

Death or severe injury.

- ▶ If the product is mounted vertically or on a slant, secure the piston rod against dropping before loosening the fastening screws.
- ▶ Do not stand in line with the direction of travel of the piston rod.

11.1.1 Disassembling the motor with flange and coupling

Disassembly is carried out in reverse order

11.1.2 Disassembling motor and belt side drive

CAUTION

Uncontrolled motion of the pre-tensioned toothed belt when loosening the screws!

Risk of injury.

- ▶ Take care when unscrewing the fastening screws on the motor.

Disassembly is carried out in reverse order

12 Disposal

The EMC contains a number of different materials: aluminum, steel, plastics, grease and possibly electronic components.

NOTICE

Environmentally hazardous materials can pollute the environment if not disposed of properly.

Environmental pollution.

- ▶ Collect any leaking lubricant and dispose of it properly.
- ▶ The product and its components must be recycled correctly and in compliance with all applicable national and international guidelines and regulations.

13 Technical data

Technical data ➡ Catalog "Electromechanical Cylinders EMC".

EN

13.1 Tightening torques

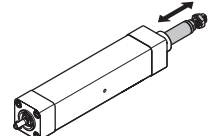
We use screws in the 8.8 strength class as standard. Any deviations are marked accordingly.

Table 20: **Tightening torques**

	$\mu = 0.125$	M2	M2.5	M3	M4	M5	M6	M8	M10	M12	M14	M16
 8.8	$\odot M_A$ (Nm)	0.4	0.7	1.3	2.7	5.5	9.5	23	46	80	127	194
		–	0.4	0.8	1.9	3.5	5.5	9.5	23	46	–	–

14 Operating conditions

Table 21: **Normal operating conditions**

Ambient temperature	Cylinder mechanics: -10 °C ... 50 °C	 9
	Cylinder with Rexroth servo motor: 0 °C ... 40 °C, loss of performance at 40 °C or higher	
Travel speed	max. 1.6 m/s	 v
Maximum travel	1500 mm	
Min. travel range	> s_{min} , see catalog	

14.1 Service and support

- ▶ When ordering spare parts, please specify all the data on the nameplate ➡ Fig. 2 on page 7.
- ▶ To order spare parts, please contact your local Bosch Rexroth sales partner. 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
97424 Schweinfurt

Bosch Rexroth AG
Ernst-Sachs-Straße 100
97424 Schweinfurt,
Germany
www.boschrexroth.com

**Find your local contact person
here:**

www.boschrexroth.com/contact



Subject to technical modifications

Printed in Germany
R320103102/2021-04