Instructions for Linear Motion Slides

The Drive and Control Company
1. Safety, Cross-References and Symbols 1
1.1 Safety notes and their symbols 1
1.2 Cross-referencing symbols 1
1.3 Symbols 1
2. Linear Motion Slides with Ball Screw Drive - Overview 2
2.1 Type designations 2
2.2 Nameplate data, ordering wear parts 2
2.3 How to order components and publications 2
3. Mounting the Linear Motion Slide with Ball Screw Drive 3
3.1 Mounting the SGK 3
3.2 Mounting the SOK 3
4. Overview of accessories and attachments 4
5. Mounting the switching system 4
5.1 Mounting the trip cam on the carriage 4
5.2 Mounting the profiled base 5
5.3 Mounting the switches 5
5.4 Mounting the socket 6
5.5 Removing the switches 6
5.6 Shifting the switch 6
5.7 Mounting/removing the cable duct 7
6. Mounting the drive 8
6.1 Mounting a motor with motor mount and bellows coupling 8
6.2 Mounting a motor with motor mount and plug coupling 9
6.3 Removing a motor with motor mount 9
6.4 Mounting a motor with side drive and timing belt 10
6.5 Removing a motor with side drive and timing belt 12
7. Maintenance 13
7.1 Lubrication 13
7.2 Lubricating intervals 13
7.3 Lube nipples 14
7.4 Lubricants 14
7.5 Lubricant quantities 14
8. Mounting instructions Assemblies and wear parts 15
8.1 Overview SGK - closed type 15
8.2 Overview SOK - open type 17
8.3 Mounting and removing of bellows on SGK 19
8.4 Mounting and removing of bellows on SOK 20
8.5 Replacing fixed bearings 21
8.6 Replacing floating bearings 24
8.7 Replacing the ball screw drive 25
8.8 Replacing linear bushings, shafts or carriages 26

1. Safety, Cross-References and Symbols
1.1 Safety notes and their symbols

The following symbols are used to identify safety notes:

DANGER !
Risk of coming into contact with power-conducting parts!
Cut off power supply!

WARNING !
Risk of injury!

Caution !
Risk of damaging the linear motion slide or adjacent structures!

1.2 Cross-Referencing Symbols

The symbols below are used to describe repeat or follow-on work operations:

→ 5.7  see Section 5.7

→ 5.7.2  see Fig. 5.7.2
(Fig. 2 in Section 5.7)

F  Note, recommendation

1.3 Symbols

Screw  Friction factor 0.125
Strength class 8.8

Tightening torque
2. Linear Motion Slides with Ball Screw Drive - Overview

2.1 Types

Linear motion slides with ball screw drive are available as closed type (SGK) or open type (SOK) and are supplied completely preassembled. For technical data and dimensions see the Linear Motion Slides catalog.

⚠️ These instructions will help appropriately trained specialists to mount and maintain Rexroth Linear Motion Slides.

2.2 Nameplate data, ordering wear parts

1. Part number of the linear motion slide
2. Serial number
3. Date of manufacture

• When ordering wear parts, please be sure to indicate all of the data on the nameplate.

2.3 How to order components and publications

The catalog supplements these instructions and should be kept handy for easy reference.

• Please order the latest publications from your local Rexroth sales partner.
3. Mounting the linear motion slide with ball screw drive

3.1 Mounting the SGK

⚠ When installing Linear Motion Slides vertically or in an inclined position, prevent carriage and shafts from dropping down!

- Screws to secure the shafts in the end blocks are supplied with the assembly.
- These screws can also be used to fasten the Linear Motion Slide. Depending on the mounting conditions, use longer screws if required. Secure screws against turning loose (e.g., by gluing, clamping coating, etc.).
- Tightening torques → 3.1.2

⚠ Observe permissible shaft inclination in the Linear Bushing (see Linear Motion Slides catalog).

3.2 Mounting the SOK

⚠ When installing Linear Motion Slides vertically or in an inclined position, prevent carriage and shafts from dropping down!

- Use appropriate screws to suit the mounting conditions. Secure screws against turning loose (e.g., by gluing, clamping coating, etc.).
- Use screws to DIN 6912 for bracing rails.
- Dismount bellows, if installed. → 8.4
- For versions with bellows, place bracing rails on the shaft support rails and align them.

First shaft support rail:
- Align and screw down the shaft support rail.
- Tightening torques → 3.1.2

Second shaft support rail:
- First step: → 3.2.1
  * Push carriage to one end.
  * Loosely insert one screw.
- Second step: → 3.2.2
  * Push carriage to the other shaft end.
  * Tighten the screw. → 3.1.2
  * To tighten the other screws, slide the carriage close up to them.
- Check that carriage moves easily and, if required, readjust second shaft support rail.
- Mount bellows, if any → 8.4
4. Overview of accessories and attachments

On request, the following components can be ready-mounted by Bosch Rexroth. Retrofitting is also possible at any time.

Switching system
1 Mechanical switch
2 Switching cam
3 Proximity switch
4 Cable duct
5 Socket/plug
6 Profiled base
7 Mounting bracket

→ 5.

Drive
8 Motor mount and coupling
9 Motor
10 Side drive with timing belt

→ 6.

5. Mounting the switching system

5.1 Mounting the switching cam on the carriage.

• Fasten switching cam by means of two countersunk screws.
5.2 Mounting the profiled base

- Cut profiled base (1) to the required length and remove burrs.
- Align the fixed bearing side bracket (2) on the profiled base (1) and screw it down.
- Slide the second bracket (3) loosely onto the profiled base (1).
- Screw first bracket (2) tightly to the fixed bearing end block (4).
- Screw second bracket (3) to the floating bearing end block (5).
- Screw second bracket (3) down on the profiled base (1).

Close adherence to the above sequence allows easy adaptation to the slide's length.

⚠️ In exceptional service conditions (e.g., vibrations, longer strokes) the profiled base must be supported in the vicinity of switches.

5.3 Mounting the switches

Mechanical switches

- Solder cable to the switch.
- Screw switch to the switch mounting plate.
- Fix switch mounting plate on the profiled base by means of square nuts and screws.
- Set switching intervals by adjusting the switches → 5.3.1

⚠️ Negative dimensions C indicate that the switch projects above the top edge of the carriage.

Proximity switches

- Screw switch to the switch mounting plate.
- Attach the switch mounting plate to the profiled base by means of slot blocks and screws
- Set switching intervals by adjusting the switches. → 5.3.2

⚠️ Negative dimensions D indicate that the switch projects above the top edge of the carriage.
5.4 Mounting the socket

- Insert and fasten the socket in the same way as the switches. → 5.3

Two seals are provided for the cable entry into the socket. One seal has predrilled holes for the cables of two mechanical switches and one proximity switch.
- If more or less switches are required, drill the appropriate number of cable holes in the other seal.
- Thread all cables through the compression screw (1), the seal (2), the socket housing (3), and the cork seal (4), taking into account the desired connecting position of the plug (5).
- Close the unused opening (6) in the socket housing (3) using the O-ring (7) and screw plug (8).
- Solder cable into flanged connector (9). Draw a pin allocation diagram.
- Screw the flanged connector (9) onto the socket housing (3) with screws (10).
- Press the seal (2) into the housing and secure with compression screw (1).
- Insert the socket in the profiled base and fix it in place using set screws.
- Mount cable duct. → 5.7
- Solder cable into the plug (11).
- Check the switching circuit function.

⚠️ Before putting the system in motion, check the E-stop switch!

Run the first motion cycles at reduced speed in order to test the limit switches and optimize the interaction of mechanical and electronic components.

5.5 Removing the switches

⚠️ Cut off power supply before undertaking any disassembly work!
- Unsolder cables of mechanical switches.
- Unscrew switch mounting plate.
- Unscrew switches.

5.6 Shifting the switches

⚠️ Cut off power supply!
For major relocations, the cable ducts must be modified or replaced. → 5.7

Proximity switch cables cannot be extended as the cables are potted into the switches. If a proximity switch with a longer cable is needed, the best solution is to buy a new switch.
5.7 Mounting/removing the cable duct

The cable duct accommodates a maximum of two cables for mechanical switches and three cables for proximity switches.

Mounting the cable duct
- Measure length of cable duct.
- Cut cable duct to length and deburr.
- Measure, center-punch and drill holes for the cable exits.
- If there is an insufficient number of pre-drilled mounting holes, drill additional holes in the base of the cable duct (2.5 deep, Ø 3.1).
- Snap cable duct into place in the slot on the profiled base and screw it down fast using the M3 x 8 mm screws provided. For extra space in the cable duct use M3 x 8 mm set screws.
- Cut cable grommets according to cable diameter and insert. Five cable grommets 8624-024-02 are provided.
- Feed in cables and wire up.

Mounting a cable duct lid without side cover
- Measure cable duct lid, cut to length and deburr.
- Snap lid into place.

Mounting a cable duct lid with side cover
- Measure cable duct lid.
- Allow 18 mm for each side cover.
- Cut lid to length and deburr.
- Remove tabs in the bending area and at the end.
- Bend lid and snap it into place.

Removing the cable duct
- Widen lid at the end with a screwdriver.
- Lift lid and tilt it out.
- Take out the cables.
- Unscrew and remove the mounting screws.
- Pry the cable duct out of the profiled base slot with a screwdriver.
6. Mounting the drive

6.1 Mounting a motor with motor mount and bellows coupling

⚠️ The maximum torque and speed of the motor must not exceed the permissible limits of the Linear Motion Slide!

- Screw the motor mount to the linear motion slide. 
  Tightening torques 6.1.2
- Ease the coupling into the motor mount and onto the drive journal of the Linear Motion Slide until a mounting screw on the coupling becomes accessible through the hole in the motor mount.

- Tighten the coupling mounting screws on the side facing the Linear Motion Slide. Tightening torques 6.1.3

- To tighten the second screw, it may be necessary to turn the ball screw drive or shift the carriage so that the ball screw drive turns. 6.1.4

- Insert the motor into the centering hole of the motor mount and coupling and fix it in place with four screws.
  Tightening torques 6.1.2
- Tighten the mounting screws of the coupling on the side facing the motor.
  Tightening torques 6.1.3
- To tighten the second screw, it may be necessary to release the brake on the motor, turn the ball screw drive so that the ball screw drive turns.

⚠️ Before putting the system in motion, check the E-stop switch!

Run the first motion cycles at reduced speed in order to test the limit switches and optimize the interaction of mechanical and electronic components.
6.2 Mounting a motor with motor mount and plug coupling

- Slide the coupling halves onto the drive journals of the Linear Motion Slide and the motor.
- Adjust distances A and B according to the table below.

<table>
<thead>
<tr>
<th>Size</th>
<th>A ± 0,1 (mm)</th>
<th>B ± 0,1 (mm)</th>
<th>$M_\alpha$ (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-85,16-100</td>
<td>6,1</td>
<td>6,1</td>
<td>0,76</td>
</tr>
<tr>
<td>40-230,50-280</td>
<td>15,8</td>
<td>21,7</td>
<td>10,5</td>
</tr>
</tbody>
</table>

- Tighten screws on the coupling halves with tightening torque $M_\alpha$.
- Slide the sprocket onto one coupling half.
- Slide motor mount into the Linear Motion Slides centering hole and screw it into place. Tightening torque 6.2.2
- Align motor and one coupling half with the other coupling half and firmly plug them together.
- Align the motor with the motor mount centering hole, slide it into centering hole and screw it in place. Tightening torques 6.2.2

⚠️ Before putting the system in motion, check the E-stop switch!

Run the first motion cycles at reduced speed in order to test the limit switches and optimize the interaction of mechanical and electronic components.

6.3 Removing a motor with motor mount

⚠️ When installing Linear Motion Slides vertically or in an inclined position, prevent carriage and shafts from dropping down!

⚡ Cut off power supply!

- For motors with bellows coupling only: unscrew the coupling mounting screws on the motor side.
- Unscrew and remove the motor from the motor mount.
6.4 Mounting a motor with side drive and timing belt

⚠️ The maximum torque and speed of the motor must not exceed the permissible limits of the Linear Motion Slide!

Mounting the housing
• Screw the housing of the side drive with timing belt to the Linear Motion Slide. Tightening torques for screws M6: 9.5 Nm, for screws M8: 23 Nm.

Mounting the first belt pulley
• Push the belt pulley with flanged wheels, mounted toothed belt and clamping assembly as a complete shaft-hub connection onto the journal of the Linear Motion Slide.
• Adjust distance A to the housing.
  Sizes 25-160, 30-180: A = 9.5 mm
  Sizes 40-230, 50-280: A = 11 mm

Mounting clamping assembly type 1
• Lightly oil the clamping elements.
  ⚠️ Do not use oil containing MoS₂ additives!
  • Push on the clamping assembly, tighten screws slightly, align the hub.
  • Tighten screws evenly, crosswise in several steps. Tightening torques → 6.4.2

Mounting clamping assembly type 2
• Lightly oil the clamping elements.
  ⚠️ Do not use oil containing MoS₂ additives!
  • Push on the clamping assembly until the elements are completely contained within the belt pulley hole.
  • Tighten screws evenly, crosswise in several steps. Tightening torques → 6.4.2

Mount additional bearing, if provided, to support the ball screw drive journal
• Mount first circlip as a stopper at the ball screw end.
  Push bearing (1) manually onto the ball screw end and secure with second circlip.
• Carefully push the bearing flange (2) onto the bearing and screw it in place on the housing.
• Tightening torque = 1.3 Nm.
Mounting the second belt pulley and motor for $i = 1$

- To allow easy threading of the second belt pulley, the motor should be pre-assembled as close as possible to the Linear Motion Slide.
- Push belt pulley and clamping assembly onto the motor journal.
- Adjust distance $B$ to the housing
- Mount clamping assembly.→ 6.4.2
- Loosen mounting screws.
- Screw the appropriate screws in both motor mounting fixtures (1) into the thread (2) provided for belt pretensioning.

**F** The pretensioning force $F$ depends on the size of the Linear Motion Slide, the motor and the belt pulleys as well as on the torque. The pretensioning values are indicated on the inner side of the gear cover. If the side drive with timing belt is not in horizontal position during mounting, the dead weight of the motor must be taken into account!

- Pull the motor away from the Linear Motion Slide with pretensioning force $F$ and screw in the mounting screws. Tightening torques → 6.4.4

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

- Push belt pulley and clamping assembly onto the motor journal.
- Adjust distance $C$ to the housing
- Mount clamping assembly.→ 6.4.2
- To allow easy threading of the second belt pulley, the motor should be pre-assembled as close as possible to the linear motion slide.
- Do not tighten the motor mounting screws.
- Screw the appropriate screws in both motor mounting fixtures (1) into the thread (2) provided for belt pretensioning.

**F** The pretensioning force $F$ depends on the size of the Linear Motion Slide, the motor and the belt pulleys as well as on the torque. The pretensioning values are indicated on the inner side of the gear cover. If the side drive with timing belt is not in horizontal position during mounting, the dead weight of the motor must be taken into account!

- Pull the motor away from the Linear Motion Slide with pretensioning force $F$ and screw in the mounting screws. Tightening torques → 6.4.5
6.5 Removing a motor with side drive and timing belt

If the Linear Motion Slide is installed vertically or in an inclined position, prevent the carriage and the shafts from dropping down!

Cut off power supply!

- Remove the housing cover.

The toothed belt is pretensioned. Be careful when loosening the motor mounting screws.

- Push the motor as close as possible to the Linear Motion Slide.
- If the gear wheels are of identical size, loosen the lower clamping assembly. Extractor threads are provided in the clamping assemblies to facilitate their removal.
- Unscrew and remove the motor mounting screws and remove the motor.

When dismantling the side drive with timing belt proceed as appropriate for the respective mounting variant.

Completion of the mounting procedure

- Attach all covers to the housing of the side drive with timing belt.

Before putting the system in motion, check the E-stop switch!

Run the first motion cycles at reduced speed in order to test the limit switches and optimize the interaction of mechanical and electronic components.
7. Maintenance

7.1 Lubrication

Due to the initial lubrication carried out in-factory prior to shipment, the only maintenance work needed is in-service lubrication of the Linear Bushings and the Precision Ball Screw Assembly to suit the operating conditions.

The fixed and floating bearings of the ball screw drive have been greased for life and will not require in-service lubrication under normal circumstances.

<table>
<thead>
<tr>
<th>Normal operating conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Load</th>
<th>Travel speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; C/2</td>
<td>&lt; 1 m/s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 … 85</td>
<td>&gt; 65 mm</td>
</tr>
<tr>
<td>16 … 100</td>
<td>&gt; 70 mm</td>
</tr>
<tr>
<td>20 … 130</td>
<td>&gt; 95 mm</td>
</tr>
<tr>
<td>25 … 160</td>
<td>&gt; 135 mm</td>
</tr>
<tr>
<td>30 … 180</td>
<td>&gt; 170 mm</td>
</tr>
<tr>
<td>40 … 230</td>
<td>&gt; 190 mm</td>
</tr>
<tr>
<td>50 … 280</td>
<td>&gt; 250 mm</td>
</tr>
</tbody>
</table>

For ball screw drive maximum speed: 2500 min⁻¹

7.2 Lubricating intervals

Normal operating conditions, see Table.

Under special operating conditions (e.g. special configuration, presence of dust, solvents, etc.) the lubrication intervals must be adjusted to suit the specific application.

- Clean shafts if necessary.

Recommend lubrication intervals

Every 1 to 3 \(10^5\) m of travel or every 500 operating hours, whichever is reached first.

7.2.2
7.3 Lube nipples

- For convenience, lube nipples are provided on either side of the carriage. It is sufficient to lubricate from one side only.
- In the open version SOK, the lubricant must be applied through one S2 and one S3 nipple each (see figure).

<table>
<thead>
<tr>
<th>Size</th>
<th>Lube nipple</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-85</td>
<td>S1 S2 S3</td>
</tr>
<tr>
<td>25-160</td>
<td>DIN 3405 AM 6</td>
</tr>
<tr>
<td>50-280</td>
<td>DIN 3405 AM 8x1</td>
</tr>
</tbody>
</table>

7.4 Lubricants

⚠️ The one-point lubrication of Linear Motion Slides SGK is designed for grease lubrication only!

⚠️ Do not use greases containing solid particles (e.g., graphite and MoS₂)!

We recommend the following:
- lithium base grease KP2K (DIN 51825)
- consistency class NLGI 2 (DIN 51818)

7.5 Lubricant quantity

per lube interval, see table

- When lubricating with a hand press, weigh out the quantity of grease per stroke.
8. Mounting instructions - Assemblies and wear parts

8.1 Overview SGK - closed type

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>Torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3</td>
<td>1.2</td>
</tr>
<tr>
<td>M4</td>
<td>2.7</td>
</tr>
<tr>
<td>M5</td>
<td>5.5</td>
</tr>
<tr>
<td>M6</td>
<td>9.5</td>
</tr>
<tr>
<td>M8</td>
<td>23</td>
</tr>
<tr>
<td>M10</td>
<td>46</td>
</tr>
<tr>
<td>M12</td>
<td>80</td>
</tr>
<tr>
<td>M14</td>
<td>123</td>
</tr>
<tr>
<td>M16</td>
<td>194</td>
</tr>
<tr>
<td>Item no.</td>
<td>Component</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>AS Bellows WP Bellows</td>
</tr>
<tr>
<td>2</td>
<td>AS Fixed bearing Fixed bearing end block WP Angular-contact ball bearing</td>
</tr>
<tr>
<td>3</td>
<td>AS Floating bearing Floating bearing end block WP Deep-groove ball bearing</td>
</tr>
<tr>
<td>4</td>
<td>AS Ball screw drive (BSD)</td>
</tr>
<tr>
<td>5</td>
<td>AS Carriage</td>
</tr>
<tr>
<td>6</td>
<td>Shafts</td>
</tr>
</tbody>
</table>

⚠️ Separate lists can be requested from Deutsche Star for wear parts.
8.2 Overview SOK - open type
<table>
<thead>
<tr>
<th>Item no.</th>
<th>Component</th>
</tr>
</thead>
</table>
| 1       | **AS** Bellows  
WP Bellows                                                                 |
| 2       | **AS** Fixed bearing  
WP Fixed bearing end block  
WP Angular-contact ball bearing                                             |
| 3       | **AS** Floating bearing  
WP Floating bearing end block  
WP Deep-groove ball bearing                                                   |
| 4       | **AS** Ball screw drive (BSD)                                            |
| 5       | **AS** Carriage                                                          |
| 6       | Shafts                                                                   |

**Note:** Separate lists can be requested from Bosch Rexroth for wear parts.
8.3 Removing/mounting the bellows on the SGK

Removing the bellows assembly

1. Cut off power supply before undertaking any disassembly work!
2. If the Linear motion assembly is installed vertically or in an inclined position, prevent the carriage and the shafts from dropping down!

- Remove the motor. \( \rightarrow 6.3 \) or \( 6.5 \)
- Unscrew the bellows mounting frame from the carriage and the end blocks.
- Remove the floating bearing assembly. \( \rightarrow 8.6 \)
- Pull off the bellows on the floating bearing side.

⚠️ Do not tear the bellows!
Remove the fixed bearing assembly. \( \rightarrow 8.5 \)
Pull off the bellows on the fixed bearing side.

⚠️ Do not tear the bellows!

Remove inner frame (1) and outer frame (2)

- Remove the screws.
- Pull the inner frame (1) out of bellows.
- Count the folds of the old bellows and cut the new bellows to the appropriate length.

Mounting the inner frame (1) and the outer frame (2)

- Insert the inner frame (1) into the bellows. The edges of the inner frame must be lodged behind the first complete fold in the bellows. The outer edges of the inner frame (1) must be completely hidden.
- Center the inner frame (1).
- If the linear motion slide is installed horizontally or in an inclined position, arrange the bellows so that the glued joint is on the underside.
- Align the outer frame (2) with the mounting holes on the carriage. If necessary, turn the outer frame over.
- Screw the outer frame (2) to the inner frame (1).

Mounting the bellows assembly

- Slide on the bellows assembly.
- Mount the floating bearing assembly. \( \rightarrow 6.6 \)
- Mount the fixed bearing assembly. \( \rightarrow 6.5 \)
- Align the bellows assembly with the carriage, the floating bearing and the fixed bearing and screw it into place.
- Tightening torques \( \rightarrow 8.1 \)
- Mount the motor. \( \rightarrow 6.1, 6.2 \) or \( 6.4 \)
8.4 Removing/mounting the bellows on the SOK

Removing the bellows assembly

⚠️ Cut off power supply before undertaking any disassembly work!

⚠️ If the Linear motion assembly is installed vertically or in an inclined position, prevent the carriage and the shafts from dropping down!

- Unscrew the bellows mounting frame from the carriage and the end block.

- Grip the bellows at one corner and pull upward on one side. This will twist the folds in bellows, allowing it to be eased off over the shafts.

Removing the inner frame (1) and outer frame (2)

- Remove the screws.
- Pull the inner frame (1) out of bellows.
- Count the folds of the old bellows and cut the new bellows to the appropriate length.

Mounting the inner frame (1) and outer frame (2)

- Position the inner frame (1) in the first or last fold of the bellows so that it will clamp fast one bellows reinforcing rib on mounting.
- Align the bellows and the inner frame (1) with the outer frame (2).
- Screw the outer frame (2) to the inner frame (1).

Mounting the bellows assembly

- Fit one side of the bellows assembly all along one shaft.
  One by one, angle the ribs of the other bellows side down and snap them into place on the second shaft.
- Align the bellows assembly with the carriage, the floating bearing and the fixed bearing and screw it into place.
  Tightening torques ➔ 8.2
8.5 Replacing fixed bearings

Removing the end block with the fixed bearing

活泼

Cut off power supply before undertaking any disassembly work!

活泼

If the Linear Motion Slide is installed vertically or in an inclined position, prevent the carriage and the shafts from dropping down!

活泼

If the fixed bearing is damaged, the complete assembly must be replaced.

* Move carriage to central position.
* Remove the motor → 6.3 or 6.5
* Unscrew the bellows from the fixed bearing end block → 8.3 or 8.4
* Loosen the set screws (1) in the slotted nut.

活泼

Use a tool with plastic jaws!

* Hold the screw with this tool.
* Unscrew the slotted nut (2).
* Detach the socket head cap screws (3).
* Support the ball screw drive and the shafts.
* Carefully pull the end block with the fixed bearing off the ball screw drive and the shafts. Avoid tilting!

Removing a fixed bearing (angular contact ball bearing) up to size 30-180

活泼

Mount plastic jaws on the vise.

* Clamp the end block.
* The threaded ring is secured with Loctite 638 adhesive.
* Heat up the threaded ring with a hot air blower until the adhesive melts, allowing the threaded ring to be removed.
* Unscrew and remove the threaded ring with a face spanner.

* Place the end block on a recessed support, with the recess positioned below the fixed bearing.
* Carefully push out the fixed bearing.

活泼

Do not reinstall any used bearings!
Removing a fixed bearing (angular contact ball bearing) size 40-230 and over

- Clamp the end block
- Unscrew the socket head cap screws.
- Lever out the fixed bearing. Do not tilt the bearing.
- A bearing can be internally worn or damaged without this being detectable from the outside. Do not reuse defective bearings!

Mounting a fixed bearing (angular contact ball bearing) up to size 30-180

- Turn over the end block and place it on a flat support.
- Carefully push the new fixed bearing into the end block up to the stop. Do not tilt it nor press on the bearing inner race!
- Apply Loctite 638 adhesive to the threaded ring and screw it tight.

<table>
<thead>
<tr>
<th>SGK/ SOK</th>
<th>Threaded ring</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-85</td>
<td>M26x1,5</td>
<td>7 Nm</td>
</tr>
<tr>
<td>16-100</td>
<td>M26x1,5</td>
<td>7 Nm</td>
</tr>
<tr>
<td>20-130</td>
<td>M36x1,5</td>
<td>19 Nm</td>
</tr>
<tr>
<td>25-160</td>
<td>M45x1,5</td>
<td>28 Nm</td>
</tr>
<tr>
<td>30-180</td>
<td>M45x1,5</td>
<td>28 Nm</td>
</tr>
</tbody>
</table>

Mounting of a fixed bearing (angular contact ball bearing) size 40-230 and over

- Turn over the end block and place it on a flat support.
- Carefully push the new fixed bearing into the end block up to the stop. Do not tilt it nor press on the bearing inner race!
- Use new self-locking cylinder head cap screws of strength class 8.8
- Tighten screws crosswise.
- Tightening torque: 9.5 Nm.
Mounting the end block with fixed bearing

- Push the end block with the fixed bearing onto the screw of the ball screw drive and the shafts.

⚠️ Use tool with plastic jaws!
- Hold the screw by means of this tool.
- Tighten the slotted nut to triple the specified torque (1), unscrew it and retighten it to the specified torque. This preloads the fixed bearing.
- Fix the slotted nut in place with two set screws (2).

### Thread and tightening torque $M_a$

<table>
<thead>
<tr>
<th>Thread and tightening torque $M_a$</th>
<th>Slotted nut</th>
<th>Set screw</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGK/ SOK</td>
<td>Mₘₐ</td>
<td>Mₘₐ</td>
</tr>
<tr>
<td>12-85</td>
<td>Mₘₐ</td>
<td>Mₘₐ</td>
</tr>
<tr>
<td>16-100</td>
<td>Mₘₐ</td>
<td>Mₘₐ</td>
</tr>
<tr>
<td>20-130</td>
<td>Mₘₐ</td>
<td>Mₘₐ</td>
</tr>
<tr>
<td>25-160</td>
<td>Mₘₐ</td>
<td>Mₘₐ</td>
</tr>
<tr>
<td>30-180</td>
<td>Mₘₐ</td>
<td>Mₘₐ</td>
</tr>
<tr>
<td>40-230</td>
<td>Mₘₐ</td>
<td>Mₘₐ</td>
</tr>
<tr>
<td>50-280</td>
<td>Mₘₐ</td>
<td>Mₘₐ</td>
</tr>
</tbody>
</table>

Align the end block with the shafts or the shaft support rails.

⚠️ Socket head cap screws must already be inserted in the end block mounting holes beside the shafts.
- Tighten the socket head cap screws. Tightening torques → 8.1 or 8.2
- Screw the bellows to the end block. → 8.3 or 8.4
- Mount the motor. → 6.1, 6.2 or 6.4
8.6 Replacing the floating bearing

Removing the floating bearing

⚠️ Cut off the power supply before undertaking any disassembly work!

⚠️ If the Linear Motion Slide is installed vertically or in an inclined position, prevent the carriage and the shafts from dropping down!

⚠️ If the floating bearing is damaged, the complete assembly must be replaced.

- Unscrew the bellows from the floating bearing end block. → 8.3 or 8.4
- Move the carriage to the center of the Linear Motion Slide.
- Remove the mounting screws from the floating bearing end block.

⚠️ For closed type (SGK), place supports under the shafts and the screw.

- Carefully pull off the floating bearing end block. The bearing remains on the ball screw end.
- Remove the circlip.
- Pull off the bearing.

Mounting the floating bearing

⚠️ Do not oil the bearing and the screw end in order otherwise the bearings might slip when the system is in operation!

- Push the floating bearing onto the ball screw end and secure with a circlip.
- Carefully push the end block onto the floating bearing and the shafts.

⚠️ Socket head cap screws must already be inserted in the end block mounting holes beside the shafts.

- Tighten the socket head cap screws.
- Tightening torques → 8.1 or 8.2
- Remove the supports from under the shafts and the ball screw.
- Screw the bellows to the end block. → 8.3 or 8.4
8.7 Replacing the Ball Screw Drive (BSD)

Removing the Ball Screw Drive

⚠️ Cut off the power supply before undertaking any disassembly work!

⚠️ If the Linear Motion Slide is installed vertically or in an inclined position, prevent the carriage and the shafts from dropping down!

⚠️ The ball screw drive may only be replaced complete with the nut. Removing the nut will result in balls being lost and, after remounting of this nut, in destruction of the ball screw drive.

• Remove the motor with motor mount or side drive and timing belt. \(\rightarrow\) 6.3 or 6.5
• Remove the end block with the fixed bearing. \(\rightarrow\) 8.5
• Remove the end block with the floating bearing. \(\rightarrow\) 8.6
• Remove the bellows. \(\rightarrow\) 8.3 or 8.4
• For the SGK version, pull the shafts out of the carriage and lay them aside.

⚠️ Pronounced deflection of the ball screw can cause permanent deformation! Long screws (approx. 1500 mm and more) should be gripped at several points or suspended on supports.

• For the SOK version, remove the carriage with the ball screw drive from the shafts and shaft support rails.

⚠️ Mount plastic jaws on the vise.

⚠️ Do not clamp the SOK carriage too tightly in the vise otherwise you may deform it!

• Grip the ball screw on either side of the carriage and carefully lift it up.
• Clamp the carriage with ball screw in the vise.

The threaded ring is secured by Loctite 638 adhesive.

• Heat the screwed ring with a hot air blower until the adhesive starts to run and the screwed ring can be loosened.
• Unscrew and remove the threaded ring with a face spanner.
• Prepare V-blocks to support the ball screw, leaving sufficient space between them for the nut.
• Carefully pull out the ball screw with nut from the carriage and set it down on the V-blocks.

⚠️ Do not rest the nut of the ball screw drive on the supports!
Mounting the ball screw drive

⚠ Pronounced deflection of the ball screw can cause permanent deformation! Long screws (approx. 1500 mm and more) should be gripped at several points or suspended on supports.

• Insert the ball screw drive nut, lube hole (1) first, with the key (2) into the keyway (3) of the carriage. Avoid tilting.

⚠ If the ball screw drive nut is not inserted with the lube hole (1) first, it will be impossible to lubricate the ball screw drive in service.

• Carefully insert the nut with the screw up to the stop. Avoid any impacts.
• Apply Loctite 638 adhesive to the threaded ring and screw it tight using a face spanner.

<table>
<thead>
<tr>
<th>Threaded ring tightening torques:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M18x1</td>
<td>2 Nm</td>
<td></td>
</tr>
<tr>
<td>M26x1,5</td>
<td>7 Nm</td>
<td></td>
</tr>
<tr>
<td>M36x1,5</td>
<td>19 Nm</td>
<td></td>
</tr>
<tr>
<td>M40x1,5</td>
<td>23 Nm</td>
<td></td>
</tr>
<tr>
<td>M58x1,5</td>
<td>55 Nm</td>
<td></td>
</tr>
</tbody>
</table>

• For the SGK version, insert the shafts into the carriage. Avoid tilting.
• For the SOK version, grip the ball screw on either side of the carriage and carefully lift it up. Push the carriage with the ball screw drive onto the shafts and the shaft support rails.
• Do not tilt.
• Slip on the bellows.
• Mount the end block with the floating bearing. ➔ 8.6
• Mount the end block with the fixed bearing. ➔ 8.5
• Mount the bellows. ➔ 8.3 or 8.4
• Mount the motor with motor mount or side drive with timing belt. ➔ 6.1, 6.2 or 6.4

8.8 Replacing Linear Bushings, Shafts or a Carriage

To guarantee the accuracy of the Linear Motion Slide after replacement of linear bushings, shafts or the carriage, we recommend that you send in the complete Linear Motion Slide to Bosch Rexroth Corporation.