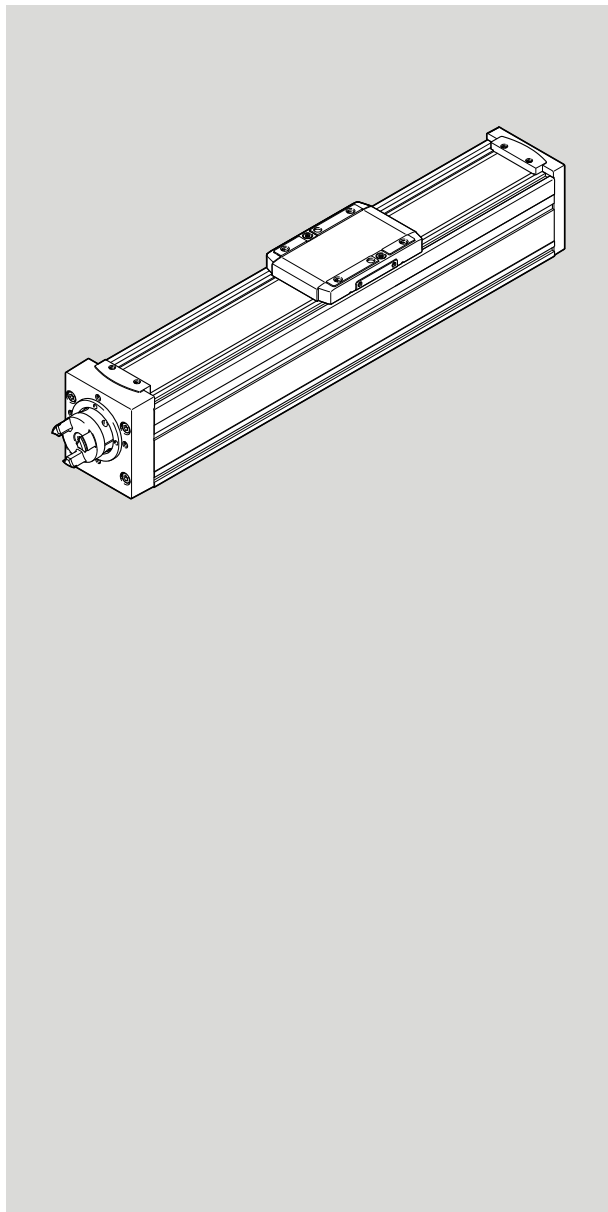


# ELGC-BS-KF

Spindle axis



# FESTO

Instructions | Operating



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2018-08c  
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Translation of the original instructions

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# 1 Further applicable documents

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All available documents for the product → [www.festo.com/pk](http://www.festo.com/pk).

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## 2 Safety

### 2.1 Safety instructions

- Observe labelling on the product.
- Prior to assembly, installation and maintenance work: Switch off power supply, ensure that it is off and secure it against being switched back on.
- Store the product in a cool, dry, UV-protected and corrosion-protected environment. Ensure that storage times are kept to a minimum.
- Observe tightening torques. Unless otherwise specified, the tolerance is  $\pm 20\%$ .

### 2.2 Intended use

The axis is intended to be used for positioning payloads in combination with tools or as a drive when external guides are used. The axis is approved for the slide operating mode → Fig.1.



Fig. 1 Slide mode

### 2.3 Training of specialised personnel

Installation, commissioning, maintenance and disassembly should only be conducted by qualified personnel.

The qualified personnel must be familiar with installation of electrical control systems.

## 3 Further information

- Accessories → [www.festo.com/catalogue](http://www.festo.com/catalogue).
- Spare parts → [www.festo.com/spareparts](http://www.festo.com/spareparts).

## 4 Service

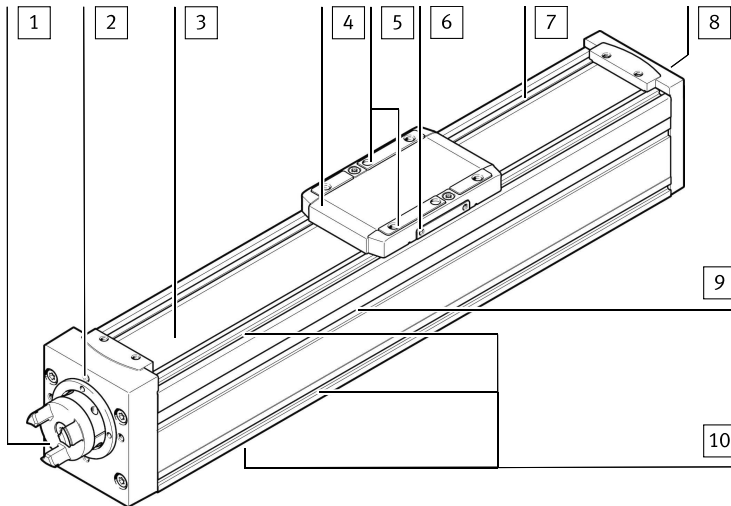
Contact your regional Festo contact person if you have technical questions → [www.festo.com](http://www.festo.com).

## 5 Product overview

### 5.1 Function

A rotating ball screw drive converts the rotation of a motor into straight-line motion. As a result, the slide moves backwards and forwards. The slide is ball-bearing guided. The reference position of the slide can be determined using proximity sensors (→ 7.4 Mounting accessories) or by homing a fixed stop (motor-side end position).

### 5.2 Product design



- |   |   |    |                                 |
|---|---|----|---------------------------------|
| 1 | Drive hub                                       | 6  | Thread for accessories          |
| 2 | Interface for motor mounting kit                | 7  | Profile housing with ball guide |
| 3 | Cover strip                                     | 8  | Sealing air connection          |
| 4 | Slide   | 9  | Slot for sensor bracket         |
| 5 | Thread/centring holes for attachment components | 10 | Slots for attachment            |

Fig. 2 Product design ELGC-BS-KF

## 6 Transport

### NOTICE!

#### Unexpected and unbraked movement of components

- Secure moving components for transport.

---

- Take product weight into account → 13 Technical data.

## 7 Mounting

### 7.1 Preparation

- Unscrew screws and threaded pins only when requested.
- Select the motor and motor mounting kit from Festo → [www.festo.com/catalogue](http://www.festo.com/catalogue).  
When using other motors: observe the limit values for forces, torques and speeds  
→ 13 Technical data.
- When mounting the motor: follow the instruction manual for the motor mounting kit.
- In case of large or heavy motors: support the axis-motor combination so that it is free from tension.
- Connect motor cables only after the axis is mounted.

#### NOTICE!

The reference position is lost when the motor is dismantled (e.g. when turning the motor around).

- Start homing → 8 Commissioning.

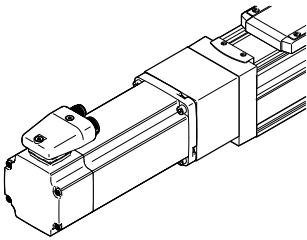


Fig. 3

#### CAUTION!

**For vertical or slanted mounting position: when power is off, moving parts can travel or fall uncontrolled into the lower end position.**

Injury due to impacts or crushing.

- Bring moving parts of the product into a safe end position or secure them against falling.
- Place the product in such a way that the operating elements can be reached (e.g. belt reverser).
- Install product without tension or distortion.
- Secure the product to a mounting surface. Evenness: 0.05 % of the stroke length, but max. 0.5 mm.

For gantry applications, attention must also be paid to parallel alignment or product height when aligning the axes.

For additional information, contact your local Festo Service.

## 7.2 Mounting

1. Select mounting components → [www.festo.com/catalogue](http://www.festo.com/catalogue).
2. To prevent collisions, mount the mounting components outside the positioning range.
3. Attach the axis to the profile (e.g. with profile mounting EAHF-L2).
4. Tighten the screws.

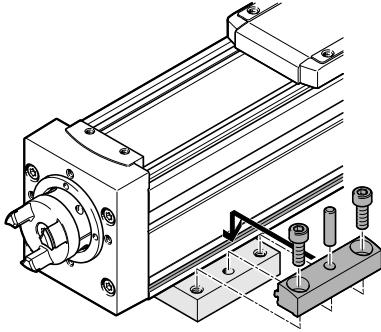


Fig. 4

## 7.3 Attachment

### Requirements

#### NOTICE!

A warped attachment component bends the slide and shortens the service life of the guide.

- Use an attachment component with an even surface. Evenness:  $t = 0.01 \text{ mm}$

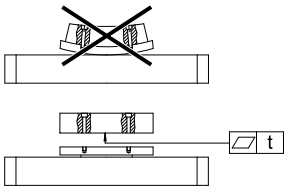


Fig. 5 Use an even attachment component

1. Position the attachment component.  
Keep the tilt moment resulting from the force (parallel to the axis of movement) and lever arm as small as possible.
2. Avoid collisions of the mounting part and payload with other attachments.

**Mounting**

1. Fasten the attachment to the slide with screws and centring sleeves.
2. Observe the maximum screw-in depth D and tightening torque.

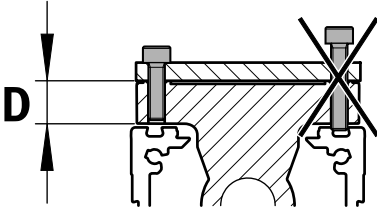


Fig. 6 Screw-in depth D

Size		32	45	60	80
Screw		M3	M4	M5	M6
Screw-in depth D	[mm]	4 ... 5	6 ... 7.5	8.5 ... 10	11 ... 14
Tightening torque	[Nm]	1.2	2.9	5.9	9.9
Centring H7	[mm]	∅ 2	∅ 4	∅ 5	∅ 7

Tab. 1

For attachment components with their own guide:

- Adjust the guide and axis so that they are exactly parallel or use a connection that permits tolerance compensation. In this way, the guide is not overloaded.

**7.4 Mounting accessories**

To protect the end positions against uncontrolled overtravel:

- Check the necessity of proximity sensors (hardware limit switches).

If proximity sensors are used as limit switches:

- Preferably use proximity sensors with normally closed function.  
This protects against excess travel beyond the end position, if the proximity sensor cable is broken.

If proximity sensors are used as reference switches:

- Use proximity sensors that correspond to the input of the controller being used.  
In case of inductive proximity sensors: use a switch lug → Assembly instructions of the accessories.



### Proximity sensor mounting

- Use the proximity sensor with sensor bracket [A] in the slot [9] → Assembly instructions of the accessories.

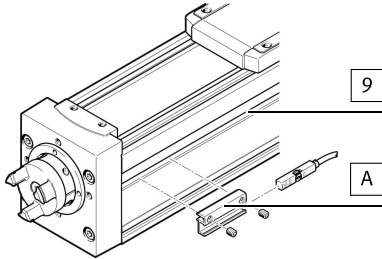


Fig. 7

### Prevention of contamination

- Connect sealing air. To do so, remove the sealing element [8] from the housing and connect the compressed air/vacuum.

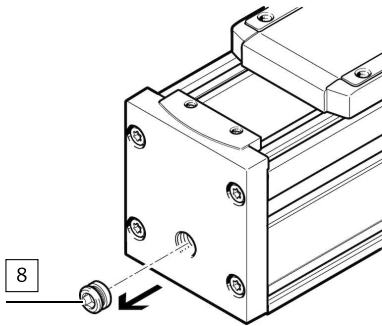


Fig. 8

## 8 Commissioning

### ⚠ WARNING!

#### Risk of injury due to unexpected movement of components.

- Protect the positioning range from unwanted intervention.
- Keep foreign objects out of the positioning range.
- Perform commissioning with low dynamic response.

**NOTICE!**

Incorrect set values for the braking ramp in STOP statuses (e.g. EMERGENCY OFF, Quick Stop) result in an overloading of the spindle axis and can destroy it or drastically reduce its service life.

- Check the settings for all braking ramps in the controller or the higher-order control system (deceleration values and jerk).
  - Adjust delay values (braking delay, delay times) in such a way that the maximum driving torque, acceleration or maximum feed force is not exceeded. In the process, take the following into consideration:
    - Travel speed
    - Moving mass
    - Mounting position
  - When designing the spindle axis, use the Festo engineering software PositioningDrives  
→ [www.festo.com](http://www.festo.com).
- 

**NOTICE!**

Block-shaped acceleration profiles (without jerk limitation) cause high peaks in the drive force that can lead to an overloading of the drive. Due to overshooting effects, positions outside of the permissible range may also occur. A jerk-limited acceleration specification reduces vibrations in the entire system and has a positive effect on stress in the mechanical system.

- Check the controller settings and adapt if necessary (e.g. jerk limitation, smoothing of the acceleration profile).
- 

**NOTICE!**

Axes of the same design may demonstrate different running noises depending on the respective component.

The following factors may also influence this issue:

- Parameterisation
  - Operating mode
  - Type of mounting
  - Installation situation (e.g. rigidity of the foundation, vibration behaviour, resonance frequencies)
-

Procedure	Purpose	Note
1. Control travel	Determining the approach direction of the motor	Even with identical control, motors of the same design can turn in opposite directions due to different wiring.
2. Homing	Comparison of real situation to the image of the controller	Homing takes place: <ul style="list-style-type: none"> <li>– towards the reference switch</li> <li>– towards the motor-side end stop. Comply with maximum impact energy → Tab. 3.</li> </ul> Observe additional information → Operating instructions of the drive system.
3. Test run	Checking the overall behaviour	Check the following requirements: <ul style="list-style-type: none"> <li>– The slide moves through the intended positioning cycle completely.</li> <li>– Slide stops as soon as a limit switch is reached.</li> </ul> After a successful test run, the axis is ready for operation.

Tab. 2

Size		32	45	60	80
Max. impact energy <sup>1)</sup>	[10 <sup>-3</sup> J]	0.25	0.5	1.0	2.0

1) max. Speed of homing for all sizes: 0.01 m/s

Tab. 3

## 9 Service

### WARNING!

#### Unexpected movement of components.

Injury due to impacts or crushing.

- Before working on the product, switch off the control and secure it to prevent it from being switched back on accidentally.

#### Checking wear

- Regularly check the reversing backlash of the slide for spindle nut wear. The wear on the ball screw will lead to increased noise in the long term and eventually cause the ball screw drive to block or the spindle nut to break. The maximum permissible reversing backlash is 0.2 mm.

#### Checking the cover strip

- Check the cover strip after every 2000 km of operating distance. Waves on the cover strip are a sign of wear on the belt reversal device.

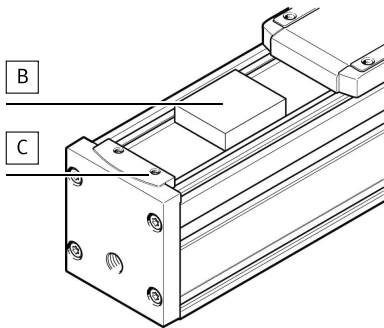


Fig. 9

Whenever waves form, retighten cover strip on both sides:

1. Loosen the screws [C] → Fig.9.
2. Push the cover strip into the cover.
3. Tighten cover strip with a clamping element [B] → Fig.9.  
Clamping element → [www.festo.com/catalogue](http://www.festo.com/catalogue).
4. Tighten the screws. Tightening torque: size 32/45: 0.2 Nm; size 60/80: 0.8 Nm.

If the cover strip can no longer be retensioned:

- Replace belt reversal devices and covering → [www.festo.com/spareparts](http://www.festo.com/spareparts).

## 9.1 Cleaning

Do not clean the guide elements (e.g. guide rails).

- Clean the outside of the product with a soft cloth. Do not use aggressive cleaning agents.

## 10 Fault clearance

Fault description	Cause	Remedy
Squeaking noises, vibrations or the axis is not running smoothly.	Coupling spacing is wrong.	Observe the permissible coupling spacings → Instruction manual for motor mounting kit.
	Tensions	<ul style="list-style-type: none"> <li>– Install axis without tension. Observe the evenness of the mounting surface → 7.1 Preparation.</li> <li>– Change the arrangement of the attachment element/useful load.</li> <li>– Align axis so it is exactly parallel to the second axis.</li> </ul>
	Controller is set incorrectly.	Change the parameters (e.g. controller data).
Vibrations on the carriage	Operation at the resonance point of the axis.	<ul style="list-style-type: none"> <li>– Change the travel speed.</li> <li>– Change the acceleration.</li> <li>– Reinforce the axis mounting.</li> <li>– Change the useful load geometry.</li> </ul>
The swing-out time of the profile is too long.	The resonant frequency from the profile and useful load are too low	<ul style="list-style-type: none"> <li>– Reinforce the axis mounting.</li> <li>– Change the useful load geometry.</li> </ul>
Slide does not move.	Coupling spins.	Check the mounting of the shaft-hub connection → Assembly instructions of the motor mounting kit.
	Loads too high.	Reduce load mass/torques.
	Retaining screws on tool are too long.	Observe the screw-in depth → 7.3 Attachment.
The reversing backlash is too large (→ 9 Service).	Wear	Replace axis → <a href="http://www.festo.com/catalogue">www.festo.com/catalogue</a> .

Fault description	Cause	Remedy
The idling torque increases.	Wear	Replace axis → <a href="http://www.festo.com/catalogue">www.festo.com/catalogue</a> .
Slide travels over end position.	Proximity sensor does not switch.	Check proximity sensor, connections and controller.
Cover strip has waves or aluminium wear on axis.	Wear on belt reversal device	<ul style="list-style-type: none"> <li>– Retension cover strip → 9 Service.</li> <li>– Replace the belt reversal device → <a href="http://www.festo.com/spareparts">www.festo.com/spareparts</a>.</li> </ul>

Tab. 4

## 11 Disassembly

### WARNING!

#### Unexpected movement of components.

Injury due to impacts or crushing.

- Before working on the product, switch off the control and secure it to prevent it from being switched back on accidentally.

1. Observe transport information → 6 Transport.
2. Remove motor cables and mounting components.  
Information about spare parts and accessories → [www.festo.com/spareparts](http://www.festo.com/spareparts).

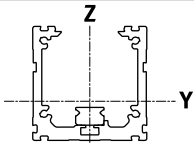
## 12 Disposal

### ENVIRONMENT!

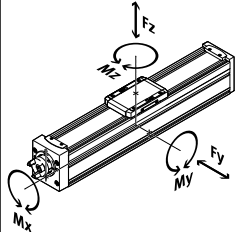
Send the packaging and product for environmentally sound recycling in accordance with the current regulations → [www.festo.com/sp](http://www.festo.com/sp).

## 13 Technical data

### 13.1 Technical data, mechanical

Sizes <sup>1)</sup>		32	45	60	80
Spindle pitch	[mm/re- v]	8	10	12	16
Design		Electromechanical axis with ball screw drive			
Guide		Recirculating ball bearing guide			
Mounting position		Any			
Max. feed force $F_x$	[N]	40	100	200	350
Max. no-load driving torque <sup>2)</sup>	[Nm]	0.04	0.12	0.25	0.40
Max. rotational speed	[1/min]	4500	3600	4000	3750
Max. speed	[m/s]	0.6		0.8	1
Max. acceleration	[m/s <sup>2</sup> ]	15			
Repetition accuracy	[mm]	± 0.015		± 0.01	
Reversing backlash (new)	[mm]	< 0.15			
Reversing backlash (limit value)		(→ 9 Service)			
Feed constant	[mm/re- v]	8	10	12	16
Ambient temperature	[°C]	0 ... +50			
Storage temperature	[°C]	-20 ... +60			
Degree of protection		IP40			
2nd degree of surface torque					
$I_y$	[mm <sup>4</sup> ]	$38 \times 10^3$	$140 \times 10^3$	$441 \times 10^3$	$1.37 \times 10^6$
$I_z$	[mm <sup>4</sup> ]	$45 \times 10^3$	$170 \times 10^3$	$542 \times 10^3$	$1.66 \times 10^6$
Max. permitted forces on the slide <sup>1)</sup>					
$F_y$	[N]	150	300	600	900
$F_z$	[N]	300	600	1800	2700

Technical data

Sizes <sup>1)</sup>		32	45	60	80
Spindle pitch	[mm/re-v]	8	10	12	16
<b>Max. permitted torques on the slide<sup>1)</sup></b>					
$M_x$	[Nm]	1.3	5.5	29.1	59.8
$M_y = M_z$	[Nm]	1.1	4.7	31.8	56.2
					

1) The PositioningDrives engineering software is available for sizing tasks → [www.festo.com/sp](http://www.festo.com/sp).

2) measured at max. speed.

Tab. 5 General data

Size		32	45	60	80
Note on materials		Contains materials that include PWIS <sup>1)</sup>			
<b>Materials</b>					
Cover		Aluminium, lacquered			
Profile		Anodised aluminium			
Slide		Aluminium			
Guide, screws, ball bearings, spindles, cover strip		Steel			
Coverings		PA			
Belt reversal		POM			
<b>Weight</b>					
Zero stroke length	[kg]	0.30	0.73	1.70	2.95
Per metre of stroke	[kg]	1.8	3.6	5.1	8.8

1) PWIS = paint-wetting impairment substances

Tab. 6 Materials and weight



### 13.2 Technical data, characteristic curves

Speed  $v$  and working stroke  $l$

ELGC-BS-KF-32

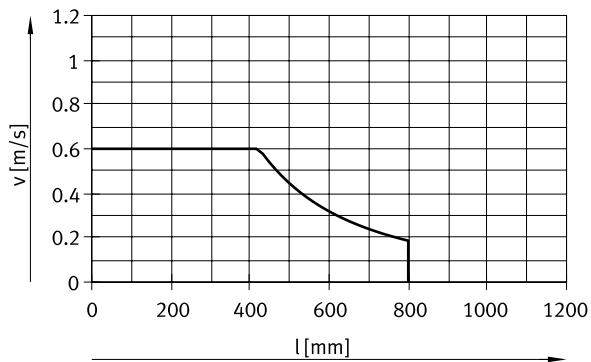


Fig. 10 ELGC-BS-KF-32

ELGC-BS-KF-45

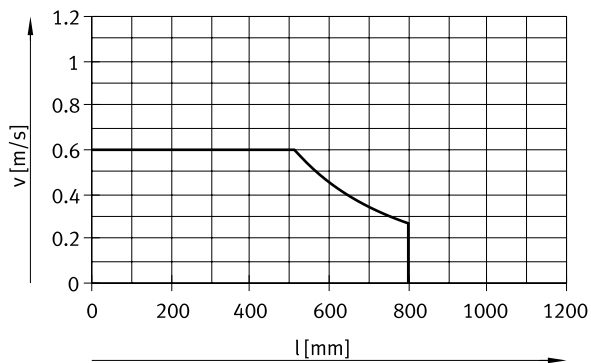


Fig. 11 ELGC-BS-KF-45

Technical data

ELGC-BS-KF-60

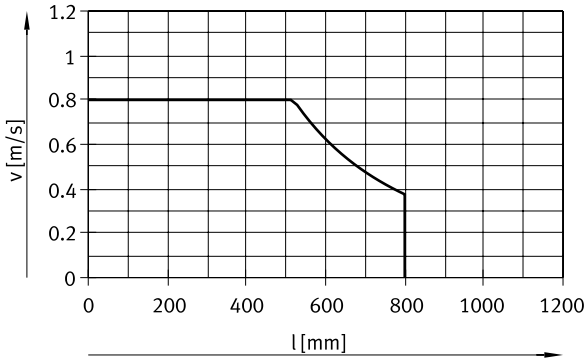


Fig. 12 ELGC-BS-KF-60

ELGC-BS-KF-80

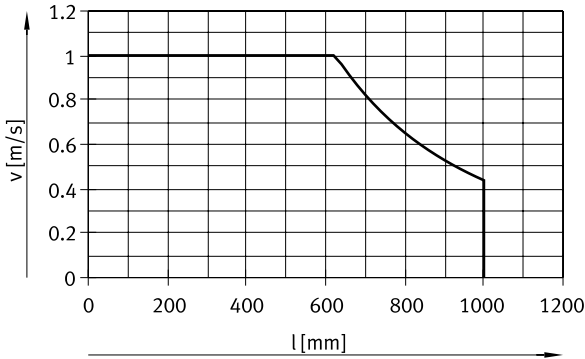


Fig. 13 ELGC-BS-KF-80



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