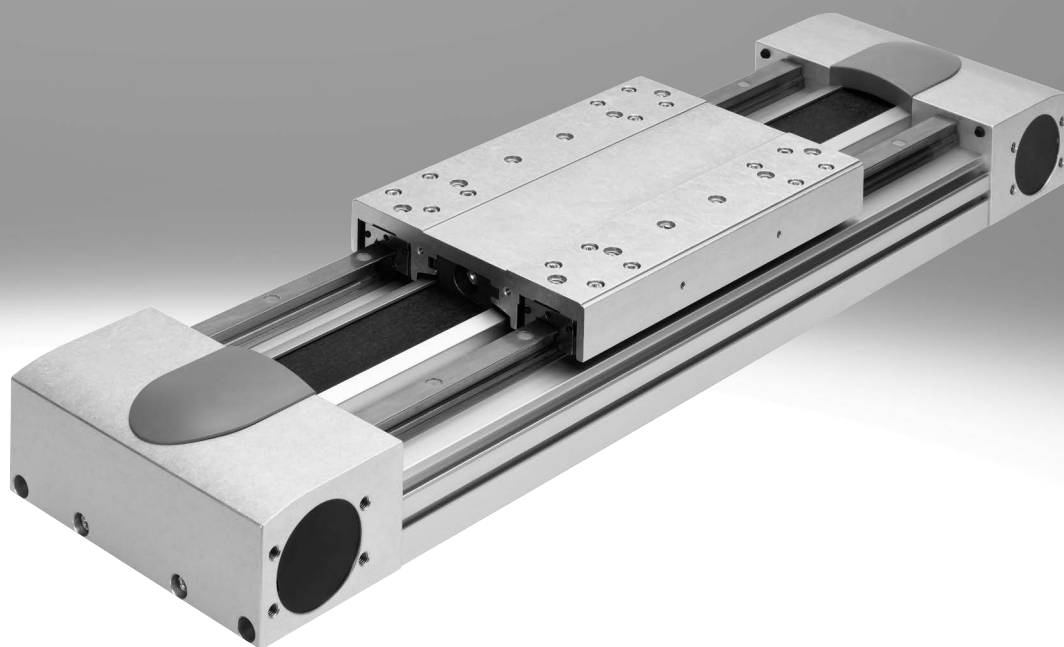


## Toothed belt axes EGC-HD-TB, with heavy-duty guide

**FESTO**



## Selection aid

## Overview of toothed belt and ball screw axes

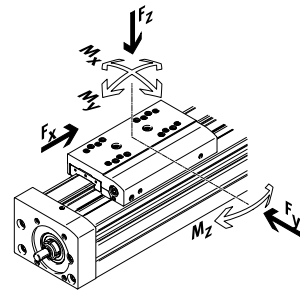
## Toothed belt axes

- Speeds of up to 10 m/s
- Acceleration of up to 50 m/s<sup>2</sup>
- Repetition accuracy of up to ±0.08 mm
- Strokes of up to 8500 mm (longer strokes on request)
- Flexible motor mountings

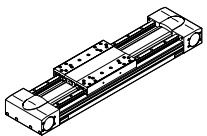
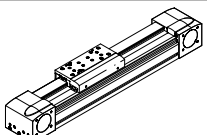
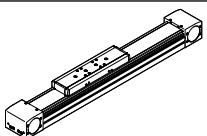
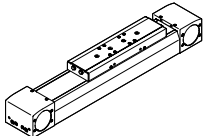
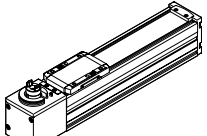
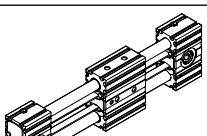
## Ball screw axes

- Speeds of up to 2 m/s
- Acceleration of up to 20 m/s<sup>2</sup>
- Repetition accuracy of up to ±0.003 mm
- Strokes up to 3000 mm

## Coordinate system



## Toothed belt axes

Type	F <sub>x</sub> [N]	v [m/s]	M <sub>x</sub> [Nm]	M <sub>y</sub> [Nm]	M <sub>z</sub> [Nm]	Characteristics
Heavy-duty recirculating ball bearing guide						
EGC-HD-TB						
	450	3	140	275	275	<ul style="list-style-type: none"><li>• Flat drive unit with rigid, closed profile</li><li>• Precision DUO guide rail with high load capacity</li><li>• Ideal as a base axis for linear gantries and cantilever axes</li></ul>
	1000	5	300	500	500	
	1800	5	900	1450	1450	
Recirculating ball bearing guide						
EGC-TB-KF						
	50	3	3.5	10	10	<ul style="list-style-type: none"><li>• Rigid, closed profile</li><li>• Precision guide rail with high load capacity</li><li>• Small drive pinions reduce required driving torque</li><li>• Space-saving position sensing</li></ul>
	100	5	16	132	132	
	350	5	36	228	228	
	800	5	144	680	680	
	2500	5	529	1820	1820	
ELGA-TB-KF						
	350	5	16	132	132	<ul style="list-style-type: none"><li>• Internal guide and toothed belt</li><li>• Precision guide rail with high load capacity</li><li>• Guide and toothed belt protected by cover strip</li><li>• High feed forces</li></ul>
	800	5	36	228	228	
	1300	5	104	680	680	
	2000	5	167	1150	1150	
ELGA-TB-KF-F1						
	260	5	16	132	132	<ul style="list-style-type: none"><li>• Suitable for use in the food zone</li><li>• "Clean look": smooth, easy-to-clean surfaces</li><li>• Internal guide and toothed belt</li><li>• Precision guide rail with high load capacity</li><li>• Guide and toothed belt protected by cover strip</li></ul>
	600	5	36	228	228	
	1000	5	104	680	680	
ELGC-TB-KF						
	75	1.2	5.5	4.7	4.7	<ul style="list-style-type: none"><li>• Internal guide and toothed belt</li><li>• Precision guide rail with high load capacity</li><li>• Guide and toothed belt protected by cover strip</li></ul>
	120	1.5	29.1	31.8	31.8	
	250	1.5	59.8	56.2	56.2	
ELGR-TB						
	50	3	2.5	20	20	<ul style="list-style-type: none"><li>• Cost-optimised rod guide</li><li>• Ready-to-install unit</li><li>• Linear ball bearings with high load capacity for dynamic operation</li></ul>
	100	3	5	40	40	
	350	3	15	124	124	

## Selection aid

## Overview of toothed belt and ball screw axes

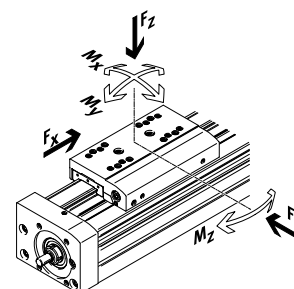
## Toothed belt axes

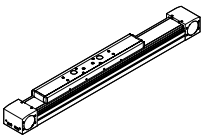
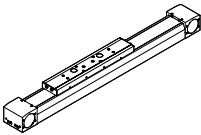
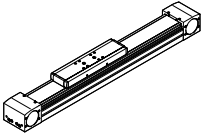
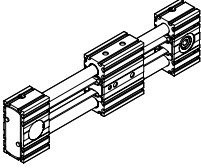
- Speeds of up to 10 m/s
- Acceleration of up to 50 m/s<sup>2</sup>
- Repetition accuracy of up to ±0.08 mm
- Strokes of up to 8500 mm (longer strokes on request)
- Flexible motor mountings

## Ball screw axes

- Speeds of up to 2 m/s
- Acceleration of up to 20 m/s<sup>2</sup>
- Repetition accuracy of up to ±0.003 mm
- Strokes up to 3000 mm

## Coordinate system



Toothed belt axes						
Type	F <sub>x</sub> [N]	v [m/s]	M <sub>x</sub> [Nm]	M <sub>y</sub> [Nm]	M <sub>z</sub> [Nm]	Characteristics
Roller bearing guide						
ELGA-TB-RF						
	350	10	11	40	40	<ul style="list-style-type: none"><li>• Heavy-duty roller bearing guide</li><li>• Guide and toothed belt protected by cover strip</li><li>• Speeds of up to 10 m/s</li><li>• Lower weight than axes with guide rails</li></ul>
	800	10	30	180	180	
	1300	10	100	640	640	
ELGA-TB-RF-F1						
	260	10	8.8	32	32	<ul style="list-style-type: none"><li>• Suitable for use in the food zone</li><li>• "Clean look": smooth, easy-to-clean surfaces</li><li>• Heavy-duty roller bearing guide</li><li>• Guide and toothed belt protected by cover strip</li><li>• Lower weight than axes with guide rails</li></ul>
	600	10	24	144	144	
	1000	10	80	512	512	
Plain-bearing guide						
ELGA-TB-G						
	350	5	5	30	10	<ul style="list-style-type: none"><li>• Guide and toothed belt protected by cover strip</li><li>• For simple handling tasks</li><li>• As a drive component for external guides</li><li>• Insensitive to harsh ambient conditions</li></ul>
	800	5	10	60	20	
	1300	5	120	120	40	
ELGR-TB-GF						
	50	1	1	10	10	<ul style="list-style-type: none"><li>• Cost-optimised rod guide</li><li>• Ready-to-install unit</li><li>• Heavy-duty plain bearings for use in harsh ambient conditions</li></ul>
	100	1	2.5	20	20	
	350	1	1	40	40	

## Selection aid

## Overview of toothed belt and ball screw axes

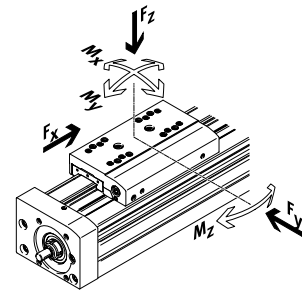
## Toothed belt axes

- Speeds of up to 10 m/s
- Acceleration of up to 50 m/s<sup>2</sup>
- Repetition accuracy of up to ±0.08 mm
- Strokes of up to 8500 mm (longer strokes on request)
- Flexible motor mountings

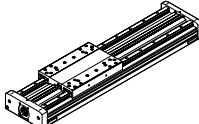
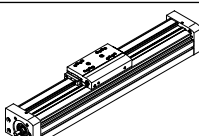
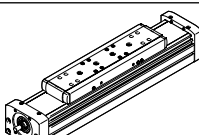
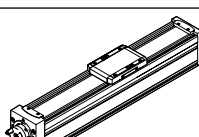
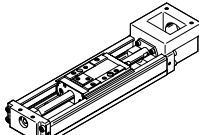
## Ball screw axes

- Speeds of up to 2 m/s
- Acceleration of up to 20 m/s<sup>2</sup>
- Repetition accuracy of up to ±0.003 mm
- Strokes up to 3000 mm

## Coordinate system



## Ball screw axes

Type	F <sub>x</sub> [N]	v [m/s]	M <sub>x</sub> [Nm]	M <sub>y</sub> [Nm]	M <sub>z</sub> [Nm]	Characteristics
Heavy-duty recirculating ball bearing guide						
EGC-HD-BS						
	400	0.5	140	275	275	<ul style="list-style-type: none"><li>• Flat drive unit with rigid, closed profile</li><li>• Precision DUO guide rail with high load capacity</li><li>• Ideal as a base axis for linear gantries and cantilever axes</li></ul>
	650	1.0	300	500	500	
	1500	1.5	900	1450	1450	
Recirculating ball bearing guide						
EGC-BS-KF						
	400	0.5	16	132	132	<ul style="list-style-type: none"><li>• Rigid, closed profile</li><li>• Precision guide rail with high load capacity</li><li>• For the highest requirements in terms of feed force and accuracy</li><li>• Space-saving position sensing</li></ul>
	650	1.0	36	228	228	
	1500	1.5	144	680	680	
	3000	2.0	529	1820	1820	
ELGA-BS-KF						
	650	0.5	16	132	132	<ul style="list-style-type: none"><li>• Internal guide and ball screw</li><li>• Precision guide rail with high load capacity</li><li>• For the highest requirements in terms of feed force and accuracy</li><li>• Guide and ball screw protected by cover strip</li><li>• Space-saving position sensing</li></ul>
	1600	1.0	36	228	228	
	3400	1.5	104	680	680	
	6400	2.0	167	1150	1150	
ELGC-BS-KF						
	40	0.6	1.3	1.1	1.1	<ul style="list-style-type: none"><li>• Internal guide and ball screw</li><li>• Guide and ball screw protected by cover strip</li><li>• Space-saving position sensing</li></ul>
	100	0.6	5.5	4.7	4.7	
	200	0.8	29.1	31.8	31.8	
	350	1.0	59.8	56.2	56.2	
EGSK						
	57	0.33	13	3.7	3.7	<ul style="list-style-type: none"><li>• Ball screw axes with maximum precision, compactness and rigidity</li><li>• Recirculating ball bearing guide and ball screw without caged ball bearings</li><li>• Standard designs in stock</li></ul>
	133	1.10	28.7	9.2	9.2	
	184	0.83	60	20.4	20.4	
	239	1.10	79.5	26	26	
	392	1.48	231	77.3	77.3	

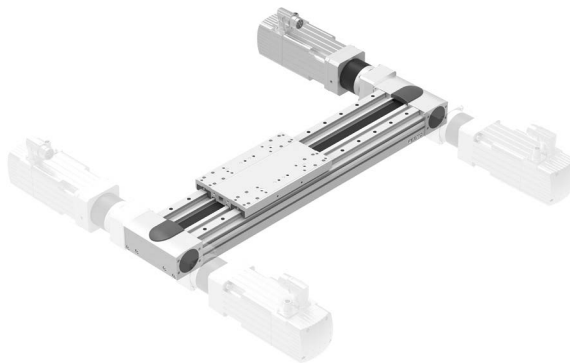
## Key features

### At a glance

- New heavy-duty design for:
  - Maximum loads and torques
  - High feed forces and speeds
  - Long service life
- Precision DUO guide rail with high load capacity
- Ideal as a basic axis for linear gantries and cantilever axes
- Space-saving position sensing with proximity switch in the profile slot is possible
- Toothed belt material can be selected from:
  - Chloroprene rubber for long service life
  - Coated PU with steel reinforcement cords for long service life and resistance to certain cooling lubricants
- Wide range of adaptation options on the drives
- In addition to the technical data, the toothed belt axis impresses with its excellent price/performance ratio

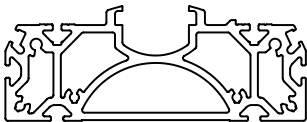
### Flexible motor mounting

The motor position can be freely selected on 4 sides and can be changed at any time.

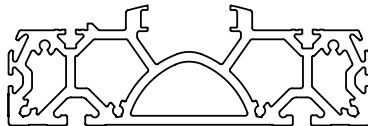


### Flat unit with rigid, closed profile

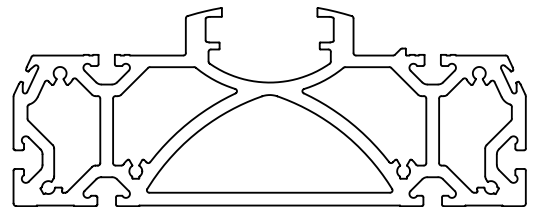
EGC-HD-125



EGC-HD-160



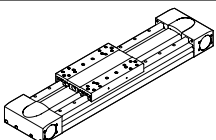
EGC-HD-220



### Characteristic values of the axes

The specifications shown in the table are maximum values.

The precise values for each of the variants can be found in the relevant data sheet in the catalogue.

Version	Size	Working stroke [mm]	Speed [m/s]	Repetition accuracy [mm]	feed force [N]	Guide characteristics				
						Forces and torques				
						F <sub>y</sub> [N]	F <sub>z</sub> [N]	M <sub>x</sub> [Nm]	M <sub>y</sub> [Nm]	M <sub>z</sub> [Nm]
<b>Recirculating ball bearing guide</b>										
	125	50 ... 3000	3	±0.08	450	3650	3650	140	275	275
	160	50 ... 5000	5	±0.08	1000	5600	5600	300	500	500
	220	50 ... 4750	5	±0.1	1800	13000	13000	900	1450	1450

### Note

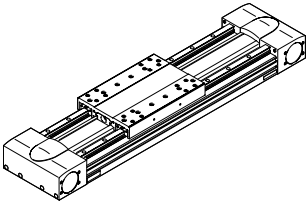
Engineering software  
Electric Motion Sizing  
[www.festo.com/x/electric-motion-sizing](http://www.festo.com/x/electric-motion-sizing)

Toothed belt axes EGC-HD-TB, with heavy-duty guide

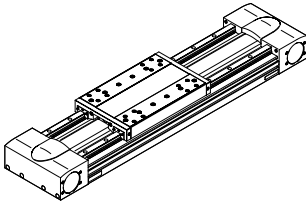
Key features

**Slide variants**

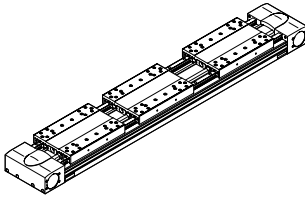
Standard slide



Standard slide, protected



With additional slide

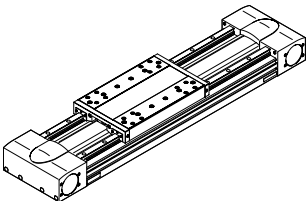


The side on which the label is applied is defined as the front.

**Guide options**

With central lubrication

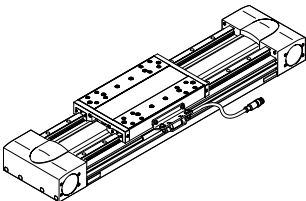
→ Page 19



- The lubrication adapters enable the guide to be permanently lubricated using semi or fully automatic relubrication devices
- The adapters are suitable for oils and greases
- All lubrication connections must be connected

**Displacement encoder**

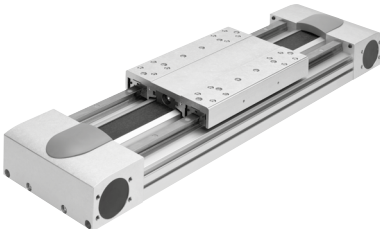
→ Page 12




The position of the slide can be sensed directly when using the incremental displacement encoder. This means that all elasticities of the drivetrain can be detected and corrected by the motor controller.

**Complete system comprising toothed belt axis, motor, motor controller and motor mounting kit**


Toothed belt axis with recirculating ball bearing guide



**Motor**




Servo motor:  
EMMT-AS



Stepper motor:  
EMMB-ST, EMMT-ST  
Gear unit:  
EMGA

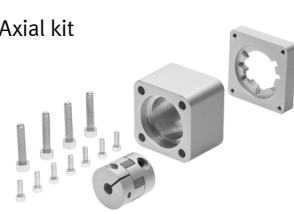
**Servo drives**



Servo drive:  
CMMT-AS  
Servo drive for extra-low voltage:  
CMMT-ST


**Motor mounting kit**

Axial kit



Kit consists of:

- Motor flange
- Coupling housing
- Coupling
- Screws

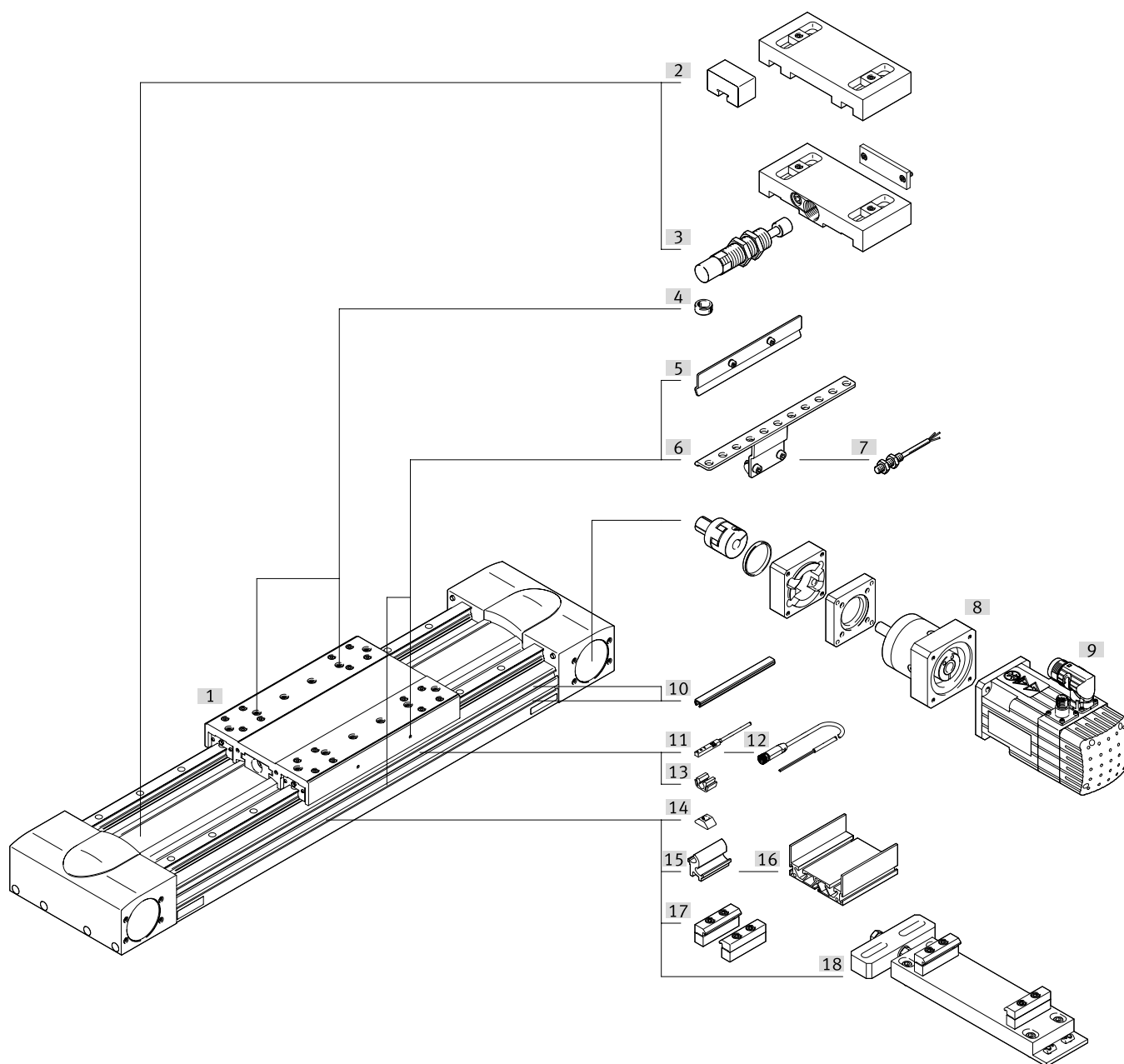
 **Note**

A range of specially adapted complete solutions is available for the toothed belt axis EGC and the motors.

## Type codes

001	Series	
EGC	Electric linear axis	
002	Guide	
HD	Heavy-duty guide	
003	Size	
125	125	
160	160	
220	220	
004	Stroke range [mm]	
...	50 ... 5000	
005	Drive system	
TB	Toothed belt	
006	Stroke reserve [mm]	
...	1 ... 999	
007	Slide	
GK	Standard slide	
GP	Standard slide, protected	
008	Additional slide left	
	None	
KL	Additional slide, standard, left	
009	Additional slide, right	
	None	
KR	Additional slide standard, right	
010	Toothed belt material	
	Chloroprene rubber	
PU2	Coated PU	
011	Lubrication function	
	None	
C	Lubrication adapter	
012	Displacement encoder	
	None	
M1	With displacement encoder, incremental, resolution 2.5 µm	
M2	With displacement encoder, incremental, resolution 10 µm	
013	Displacement encoder attachment position	
	None	
F	Front	
B	Rear	

## Peripherals overview

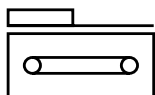








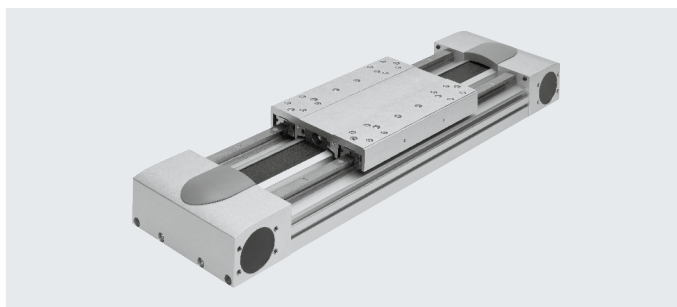
## Peripherals overview

Variants and accessories			
	Type	Description	→ Page/Internet
[1]	Toothed belt axis EGC-HD-TB	Electric drive	10
[2]	Emergency buffer with retaining bracket NPE	For avoiding damage at the end stop in the event of malfunction	32
[3]	Shock absorber with retaining bracket YSRW	For avoiding damage at the end stop in the event of malfunction	32
[4]	Centring pin/sleeve ZBS, ZBH	<ul style="list-style-type: none"><li>• For centring loads and attachments on the slide</li><li>• Included in the scope of delivery:<ul style="list-style-type: none"><li>– For size 125: 2x ZBS-5, 2x ZBH-9</li><li>– For size 160, 220: 2x ZBH-9</li></ul></li></ul>	32
[5]	Switch lug SF-EGC-HD	For sensing the slide position	30
[6]	Sensor bracket HWS-EGC	Adapter for mounting the inductive proximity switches (round design) on the axis	31
[7]	Proximity switch, M8 SIEN	Inductive proximity switch, round design	34
[8]	Axial kit EAMM	For axial motor mounting (comprising coupling, coupling housing and motor flange)	<a href="#">eamm-a</a>
[9]	Motor EMMT	Motors specially matched to the axis, with gear unit, with or without brake	<a href="#">emmt</a>
[10]	Slot cover ABP	For protection against contamination	32
[11]	Proximity switch, T-slot SIES	Inductive proximity switch, for T-slot	33
[12]	Connecting cable NEBA	Via proximity switch	34
[13]	Clip SMBK	For mounting the proximity switch cable in the slot	32
[14]	Slot nut NST	For mounting attachments	32
[15]	Adapter kit DHAM	For mounting the support profile on the axis	33
[16]	Support profile HMIA	For mounting and guiding an energy chain	33
[17]	Profile mounting MUE	For mounting the axis on the profile	28
[18]	Adjusting kit EADC-E16	For mounting the axis on a vertical surface. Once mounted, the axis can be aligned horizontally	29

## Datasheet



-  Size  
125 ... 220
-  Stroke length  
50 ... 5000 mm
-  [www.festo.com](http://www.festo.com)
-  Repair service

**General technical data**

Size		125	160	220
Design		Electromechanical axis with toothed belt		
Guide		Recirculating ball bearing guide		
Mounting position		Any		
Working stroke	[mm]	50 ... 3000	50 ... 5000	50 ... 4750
Max. feed force $F_x$	[N]	450	1000	1800
Max. no-load torque <sup>1)</sup>	[Nm]	1.1	2.1	4.1
Max. no-load resistance to shifting <sup>1)</sup>	[N]	67.75	105.5	123.8
Max. driving torque	[Nm]	7.2	20	59.58
Max. speed				
EGC -...- GK	[m/s]	3	5	
EGC -...- GP	[m/s]	–	3	
Max. acceleration	[m/s <sup>2</sup> ]	40	50	
Repetition accuracy	[mm]	±0.08		±0.1

1) At 0.2 m/s and toothed belt made of chloroprene rubber

**Operating and environmental conditions**

Ambient temperature	[°C]	–10 ... +60
Degree of protection		IP40
Duty cycle	[%]	100

**Weight [g]**

Size	125	160	220
Basic weight with 0 mm stroke <sup>1)</sup>	4720	9050	25510
Additional weight per 10 mm stroke	73	107	210
Slide			
EGC -...- GK	1218	2571	6317
EGC-...-GK-C	1334	2813	6785
EGC -...- GP	–	2643	6417
Additional slide			
EGC -...- GK	1026	2022	5498
EGC-...-GK-C	1142	2264	5996
EGC -...- GP	–	2134	5598

1) Including slide

## Datasheet

Toothed belt				
Size		125	160	220
Pitch	[mm]	3	5	8
Width	[mm]	30.3	40.0	50.5
Effective diameter	[mm]	32.47	39.79	66.21
Feed constant	[mm/rev]	102	125	208

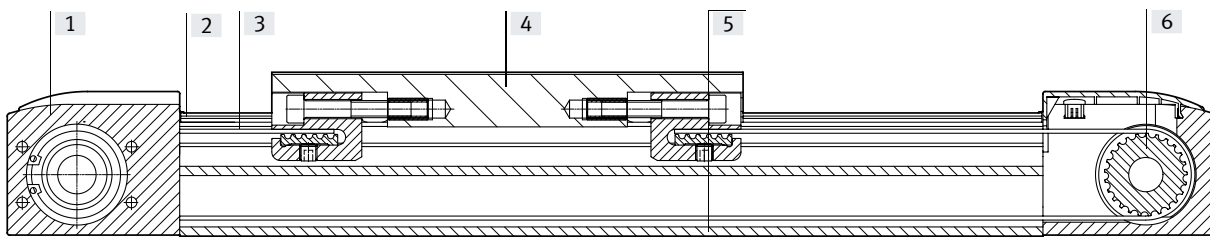
Mass moment of inertia				
Size		125	160	220
$J_0$	[kg cm <sup>2</sup> ]	4.639	14.49	108.99
$J_H$ per metre stroke	[kg cm <sup>2</sup> /m]	0.38	1.267	6.269
$J_L$ per kg payload	[kg cm <sup>2</sup> /Kg]	2.635	3.96	10.96
$J_W$ Additional slide	[kg cm <sup>2</sup> ]	3.3	11.734	80.66

The mass moment of inertia  $J_A$  of the entire axis is calculated as follows:

$$J_A = J_0 + J_W + J_H \times \text{working stroke [m]} + J_L \times m_{\text{payload [kg]}}$$

### Materials

#### Sectional view



Axis		
[1]	Drive cover	Anodised wrought aluminium alloy
[2]	Guide rail	Steel, coated and corrosion-protected
[3]	Toothed belt	
	EGC-...	Polychloroprene or NBR with glass cord and nylon coating
	EGC-...-PU2	Polyurethane with steel cord and nylon cover
[4]	Slide	Anodised wrought aluminium alloy
[5]	Profile	Anodised wrought aluminium alloy
[6]	Toothed belt pulley	High-alloy stainless steel
	Note on materials	RoHS-compliant
		Contains paint-wetting impairment substances

Datasheet

Dimensions → page 25

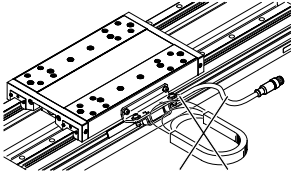
Technical data – Displacement encoder			
Type		EGC-...-M1	EGC-...-M2
Resolution	[μm]	2.5	10
Max. travel speed with displacement encoder	[m/s]	4	4
Encoder signal		5 V TTL; A/A, B/B; reference signal (N/N) cyclically every 5 mm (zero pulse)	
Signal output		Line driver, alternating, resistant to sustained short circuit	
Electrical connection		8-pin plug connector, round design, M12	
Cable length	[mm]	160	
Operating and environmental conditions – Displacement encoder			
Ambient temperature	[°C]	−10 ... +70	
Degree of protection		IP64	
CE marking (see declaration of conformity)		To EU EMC Directive <sup>1)</sup>	

1) For information about the area of use, see the EC declaration of conformity at: [www.festo.com/sp](http://www.festo.com/sp) → Certificates.  
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

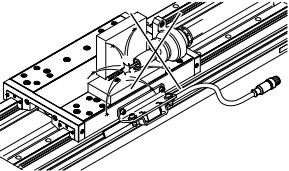
Application note

- 1) The displacement encoder contains paint-wetting impairment substances.
- 2) The toothed belt axis with displacement encoder is not designed for the following application examples:

• Magnetic field



• Welding application

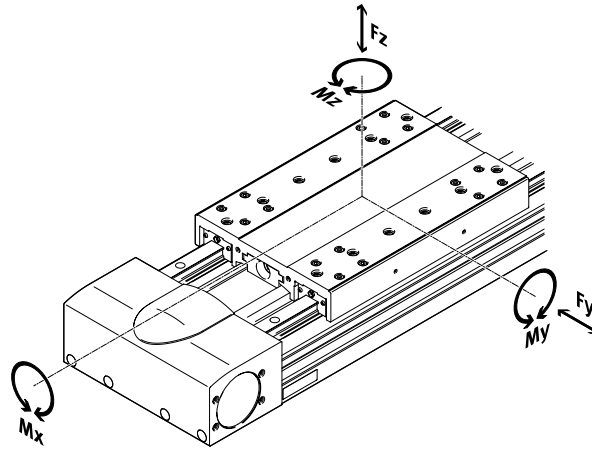


## Datasheet

### Characteristic load values

The indicated forces and torques refer to the slide surface. The point of application of force is the point where the centre of the guide and the longitudinal centre of the slide intersect.

These values must not be exceeded during dynamic operation. Special attention must be paid to the deceleration phase.



#### Max. permissible forces and torques at reference service life

Size		125	160	220
Reference service life	[km]	5000		
$F_{y_{max}}$	[N]	3650	5600	13000
$F_{z_{max}}$	[N]	3650	5600	13000
$M_{x_{max}}$	[Nm]	140	300	900
$M_{y_{max}}$	[Nm]	275	500	1450
$M_{z_{max}}$	[Nm]	275	500	1450



#### Note

For a guide system to have a service life of 5000 km, the load comparison factor must have a value of  $f_v \leq 1$ , based on the maximum permissible forces and torques for a service life of 5000 km.

If the axis is subjected to two or more of the indicated forces and torques simultaneously, the following equation must be satisfied in addition to the indicated maximum loads:

Calculating the load comparison factor:

$$f_v = \frac{|F_{y1}|}{F_{y2}} + \frac{|F_{z1}|}{F_{z2}} + \frac{|M_{x1}|}{M_{x2}} + \frac{|M_{y1}|}{M_{y2}} + \frac{|M_{z1}|}{M_{z2}} \leq 1$$

$F_1/M_1$  = dynamic value

$F_2/M_2$  = maximum value

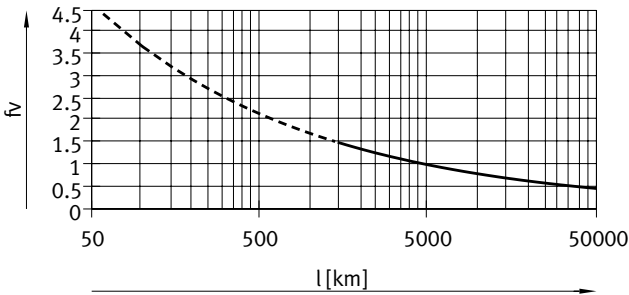
Datasheet

Calculating the service life

The service life of the guide depends on the load. To be able to make a statement as to the service life of the guide, the graph below plots the load comparison factor  $f_v$  against the service life.

Load comparison factor  $f_v$  as a function of service life

Example:  
A user wants to move an X kg load. Using the formula (→ page 13) gives a value of 1.5 for the load comparison factor  $f_v$ . According to the graph, the guide would have a service life of approx. 1500 km. Reducing the acceleration reduces the  $M_z$  and  $M_y$  values. A load comparison factor  $f_v$  of 1 now results in a service life of 5000 km.



Note

Engineering software  
Electric Motion Sizing  
[www.festo.com/x/electric-motion-sizing](http://www.festo.com/x/electric-motion-sizing)

The engineering software can be used to calculate the guide workload for a service life of 5000 km.

$f_v > 1.5$  are only theoretical comparison values for the recirculating ball bearing guide.

Comparison of the characteristic load values for 5000 km with dynamic forces and torques of recirculating ball bearing guides

The characteristic load values of the bearing guides are standardised to ISO and JIS using dynamic and static forces and torques. These forces and torques are based on an expected service life of the guide system of 100 km to ISO or 50 km to JIS.  
As the characteristic load values are dependent on the service life, the maximum permissible forces and torques for a 5000 km service life cannot be compared with the dynamic forces and torques of bearing guides to ISO/JIS.

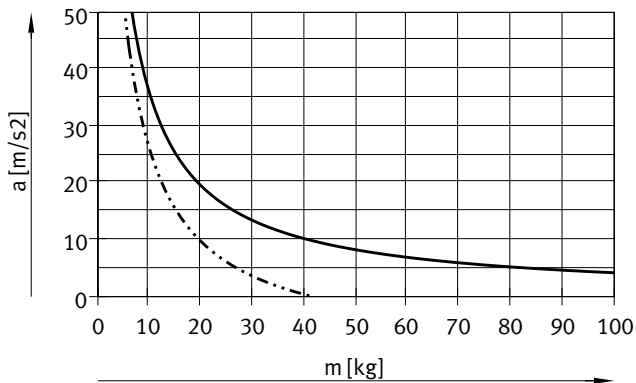
To make it easier to compare the guide capacity of linear axes EGC with bearing guides, the table below lists the theoretically permissible forces and torques for a calculated service life of 100 km. This corresponds to the dynamic forces and torques to ISO.  
These 100 km values have been calculated mathematically and are only to be used for comparing with dynamic forces and torques to ISO. The drives must not be loaded with these characteristic values as this could damage the axes.

Max. permissible forces and torques for a theoretical service life of 100 km (from a guide perspective only)			
Size		125	220
$F_{y_{max}}$	[N]	13447	47892
$F_{z_{max}}$	[N]	13447	47892
$M_{x_{max}}$	[Nm]	516	3316
$M_{y_{max}}$	[Nm]	1013	5342
$M_{z_{max}}$	[Nm]	1013	5342

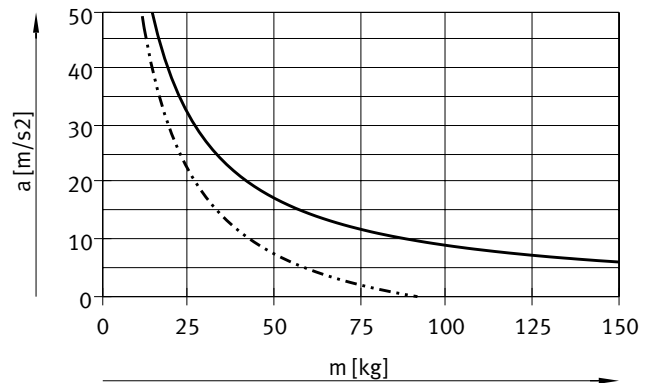
## Datasheet

### Max. acceleration $a$ as a function of payload $m$

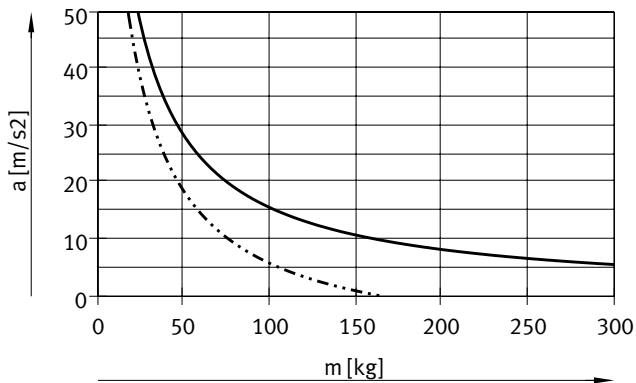
Size 125



Size: 160

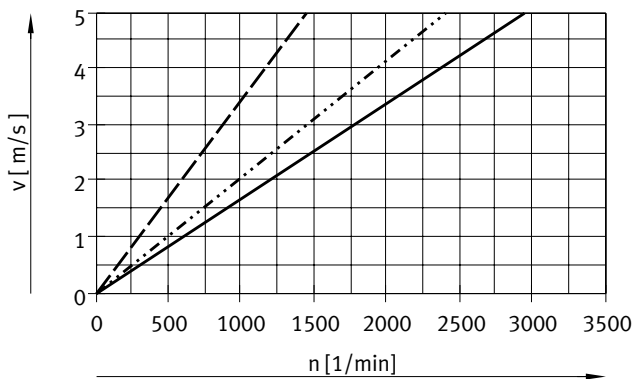


Size 220



— Horizontal installed length  
 - - - Vertical installed length

### Speed $v$ as a function of rotational speed $n$

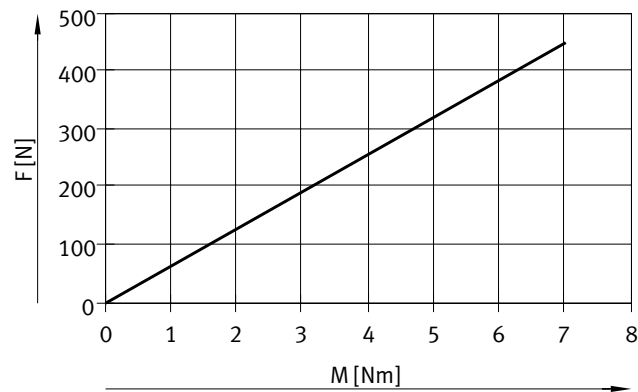


— EGC-HD-125  
 - - - EGC-HD-160  
 - - - EGC-HD-220

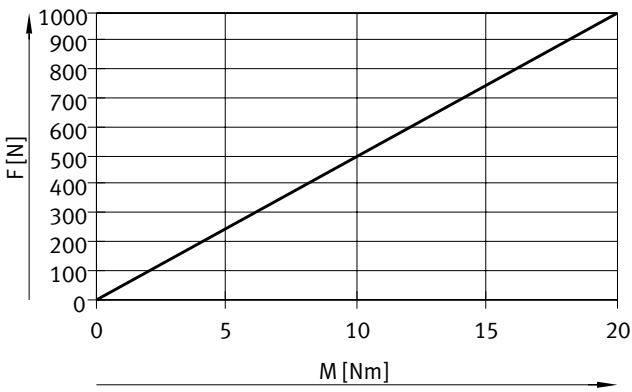
Datasheet

Theoretical feed force F as a function of the input torque M

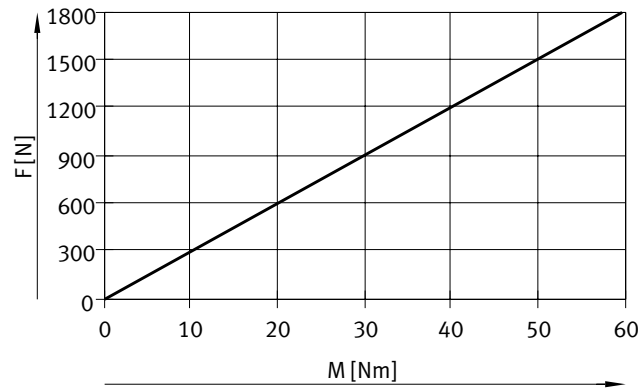
Size: 125



Size: 160



Size 220



Stroke reserve

Stroke length

The selected stroke corresponds in principle to the required working stroke. The variants GK do not have a long-term lubrication unit on the guide. These variants therefore have an additional safety distance between the drive cover and slide that is not designated as part of the working stroke.

Stroke reserve

It is possible to define a safety distance (similar to that for GK) between the drive cover and slide for the variants GP using the "stroke reserve" characteristic in the modular product system. With the variants GK, the stroke reserve and safety distance are added for each end position.

- The stroke reserve length can be freely selected
- The sum of the stroke length and 2x stroke reserve must not exceed the maximum working stroke

Example:

Type:  
EGC-HD-125-500-TB-20H-...  
Working stroke = 500 mm  
2x stroke reserve = 40 mm  
  
Total stroke = 540 mm  
(540 mm = 500 mm + 2x 20 mm)

Size	125	160	220
L = safety distance with GK [mm] (per end position)	12.5	15.5	20



## Datasheet

### Working stroke reduction

For standard slide GK/GP with additional slide KL/KR

- With a toothed belt axis with additional slide [1], the working stroke is reduced by the length of the additional slide L17 and the distance between both slides L18
- If the variant GP is ordered, the additional slide is also protected
- If the variant GK-C is ordered, the additional slide is also supplied with lubrication adapters

L16 = Slide length

L18 = Distance between the two slides

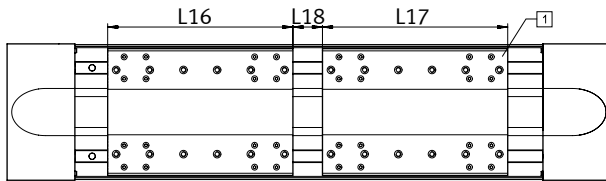
L17 = Additional slide length

### Example:

Typ: EGC-HD-220-1000-TB-...-GP-KL/KR

L18 = 100 mm

Working stroke = 1000 mm - 328 mm - 100 mm = 572 mm



### Dimensions – Additional slide

Size	125	160	220
Variant	GK	GK-C	GP
Length L17 [mm]	202	220	244
	250	302	327.6
			328

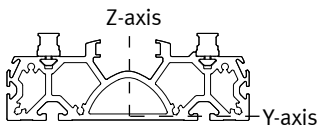
### Working stroke reduction per side

With integrated emergency buffer NPE/shock absorber YSRW with shock absorber retainer EAYH-L2

- With a toothed belt axis, the working stroke is reduced by the total dimension of the emergency buffer/shock absorber and shock absorber retainer.

Size	125	160	220
With emergency buffer [mm]	65	93	98
With shock absorber [mm]	66	94	99

### 2nd moment of area

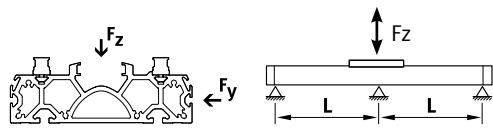


Size	125	160	220
I <sub>y</sub> [mm <sup>4</sup> ]	6.89x10 <sup>5</sup>	12.9x10 <sup>5</sup>	55.8x10 <sup>5</sup>
I <sub>z</sub> [mm <sup>4</sup> ]	40.9x10 <sup>5</sup>	98.9x10 <sup>5</sup>	351x10 <sup>5</sup>

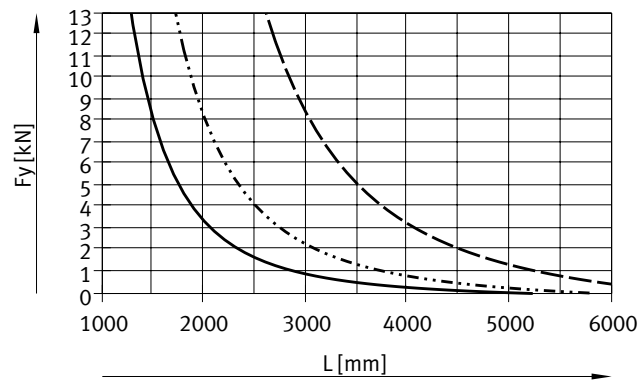
Datasheet

Maximum permissible support span L (without profile mounting) as a function of force F

The axis may need to be supported in order to limit deflection in the case of long strokes.  
The following graphs can be used to determine the maximum permissible support spacing l as a function of force F acting on the axis. The deflection is  $f = 0.5\text{ mm}$ .

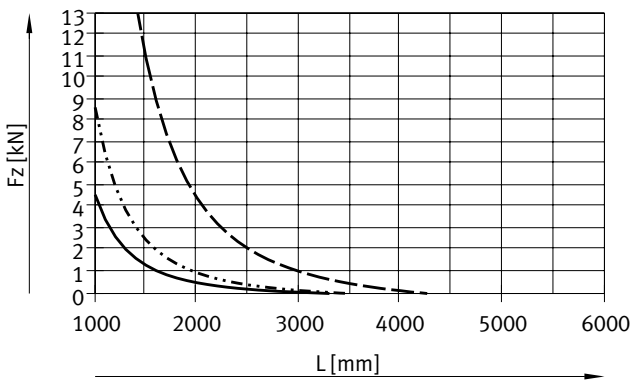


Force  $F_y$



- EGC-HD-125-TB
- EGC-HD-160-TB
- EGC-HD-220-TB

Force  $F_z$



Recommended deflection limits

Adherence to the following deflection limits is recommended so as not to impair the functionality of the axes.  
Greater deformation can result in increased friction, greater wear and reduced service life.

Size	Dynamic deflection (load moves)	Static deflection (stationary load)
125 ... 220	0.05% of the axis length, max. 0.5 mm	0.1% of the axis length

## Datasheet

### Central lubrication

The lubrication adapters enable the guide of the toothed belt axis EGC-HD-TB to be permanently lubricated in applications in humid or wet ambient conditions using semi or fully automatic relubrication devices.

- For size 125, 160, 220
- The modules are suitable for oils and greases.
- The dimensions of the toothed belt axis EGC-HD-TB are the same with and without central lubrication modules.
- There are two connection options on each side
- Can be used in combination with:
  - Standard slide GK
  - Additional slide KL, KR
- Cannot be used in combination with:
  - Standard slide, protected GP

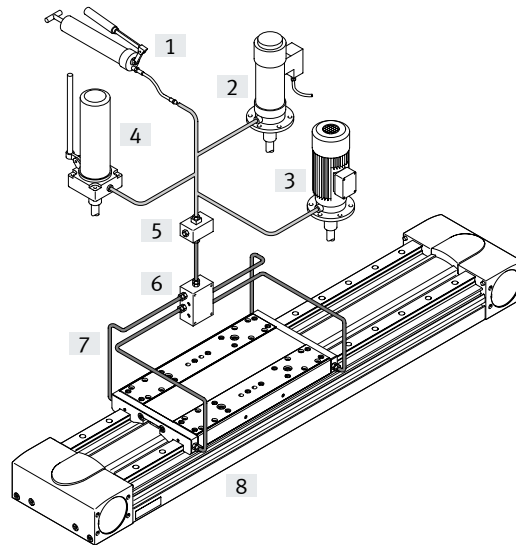
Slide dimensions  
→ page 24

### Design of a central lubrication system

A central lubrication system requires various additional components. The illustration shows different options (using a hand pump, pneumatic container pump or electric container pump) required as a minimum for designing a central lubrication system. Festo does not sell these additional components; however, they can be obtained from the following companies:

- Lincoln
- Bielomatik
- SKF (Vogel)

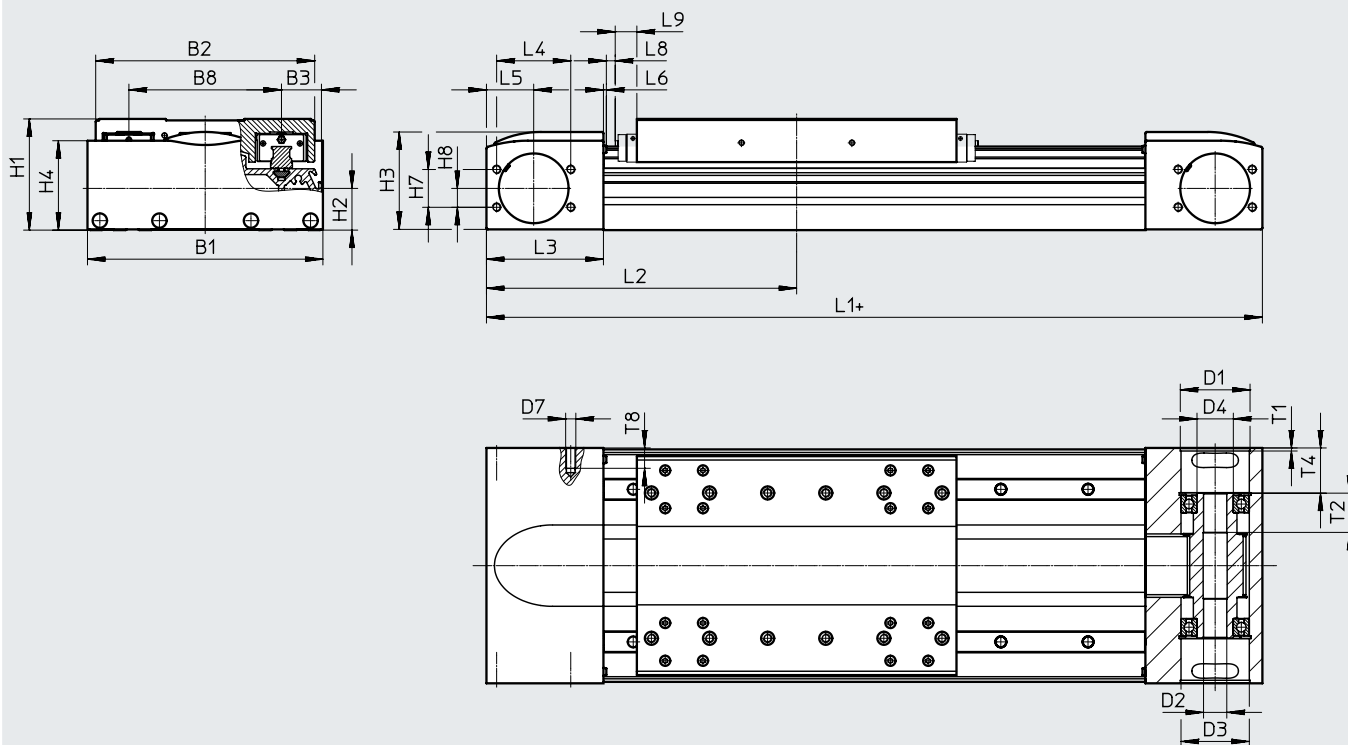
Festo recommends these companies because they can supply all the necessary components.



- [1] Hand pump
- [2] Pneumatic container pump
- [3] Electric container pump
- [4] Manually operated container pump
- [5] Nipple block
- [6] Distributor block
- [7] Tubing or piping
- [8] Fittings

## Datasheet

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

+ = plus stroke length + 2x stroke reserve

L9 With GP: dimension for long-term lubrication unit → page 16

Size	B1	B2	B3	B8	D1 Ø H7	D2 Ø H7	D3 Ø	D4 Ø	D7
125	124	120	21	80	43	16	42	25	M6
160	162	150.7	27.5	105	48	16	47	25	M6
220	224	204.2	40	140	80	23	75	45	M8

Size	H1	H2	H3	H4	H7	H8	L1	L2 min.	L3
125	64	26.1	55.8	50.8	24	12	346	173	57.5
160	76.5	28.7	67.5	61.5	26	13	417	208.5	80.5
220	111.5	45.2	98	91.1	59	27	576	288	115

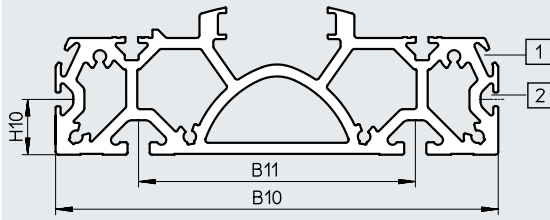
Size	L4	L5	L6	L8	L9	T1	T2	T4	T8
125	46	27.5	1.8	2	–	2.1	27	23.65	13
160	51	32.5	2	0.55	14.9	3.1	27	31.1	14
220	76	50	2	2	18	3.1	29.5	47.5	16

# Datasheet

## Dimensions

[Download CAD data → www.festo.com](http://www.festo.com)

### Profile

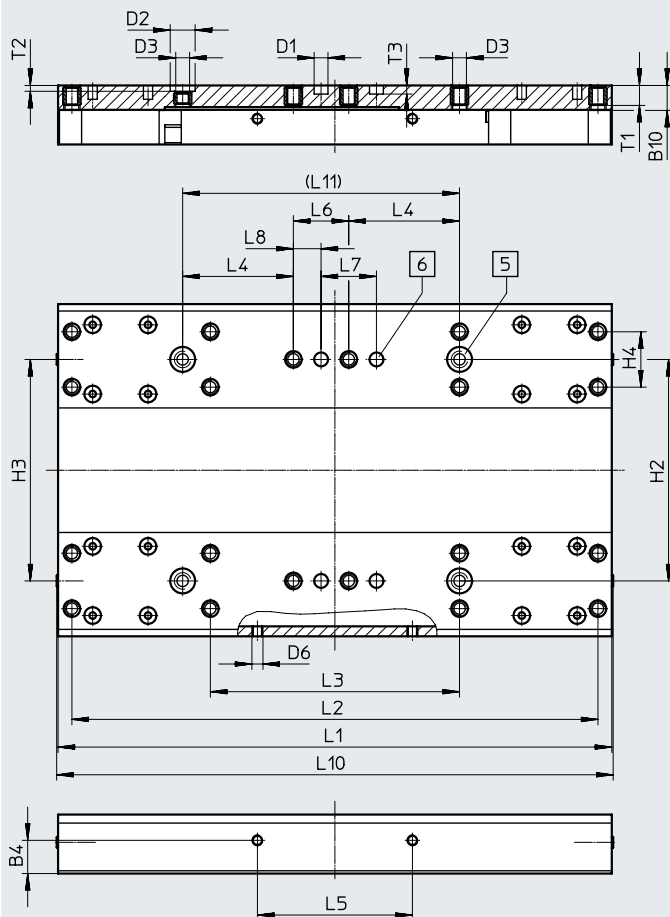


- [1] Sensor slot for proximity switch  
[2] Mounting slot for slot nut

Size	B10	B11	H10
125	122	80	20
160	160	100	20
220	220	140	20

### GK – Standard slide

#### Size 125



- [5] Drilled hole for centring sleeve  
ZBH  
[6] Drilled hole for centring pin ZBS

Size	B4	B10	D1 Ø H7	D2 Ø H7	D3	D6	H2	H3	H4	L1	L2	L3
	±0.1						±0.03	±0.05	±0.1	±0.1	±0.2	±0.1
125	12	9	5	9	M5	M4	80	80	20	200	190	90

Size	L4	L5	L6	L7	L8	L10	L11	T1	T2	T3
	±0.1	±0.2	±0.1	±0.03	±0.1		±0.03		±0.1	±0.1
125	40	56	20	20	10	202	100	7.8	2.1	3.1

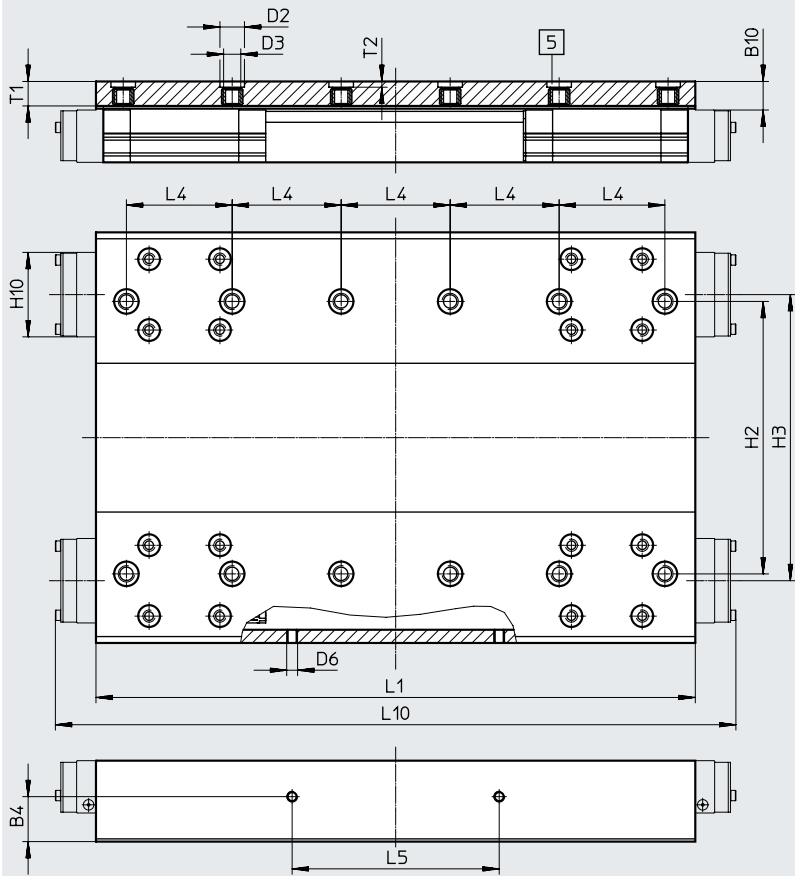
Datasheet

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

GK – Standard slide / GP – Standard slide, protected

Size 160



[5] Drilled hole for centring sleeve  
ZBH

Size	B4	B10*	D2 Ø H7	D3	D6	H2 ±0.03	H3 ±0.05
160	16.5	10.5	9	M6	M4	100	105

Size	H10*	L1	L4	L5	L10*	T1	T2
		±0.1	±0.03	±0.1			+0.1
160	31	220	40	76	250	9	2.1

\* Protected version

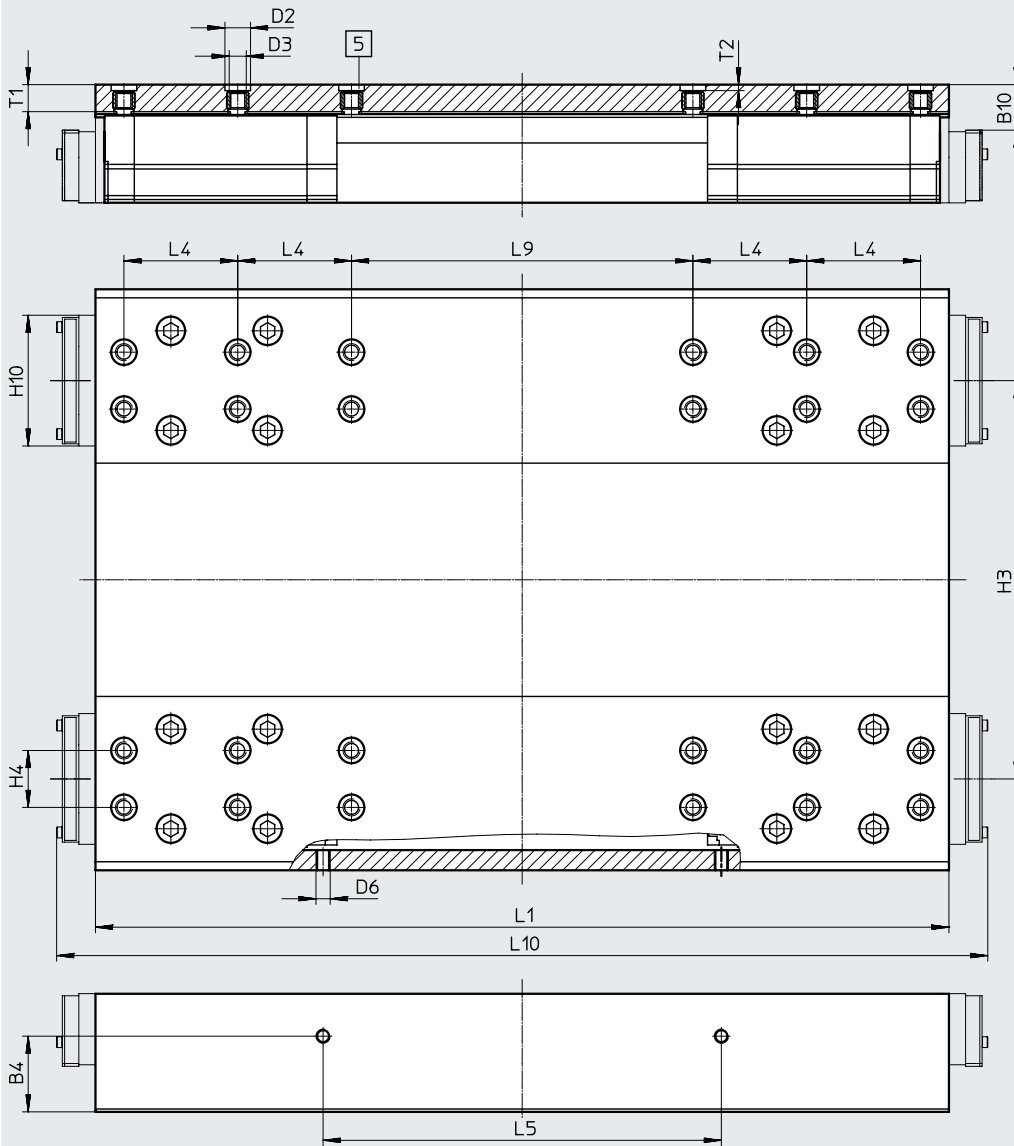
# Datasheet

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

GK – Standard slide / GP – Standard slide, protected

Size 220



[5] Drilled hole for centring sleeve ZBH

Size	B4	B10*	D2 Ø H7	D3	D6	H3	H4	H10*
220	±0.1 26.6	16	9	M6	M5	±0.05 140	±0.03 20	45.95

Size	L1	L4	L5	L9	L10*	T1	T2
220	±0.1 302	±0.03 40	±0.1 140	±0.03 120	328	9.5	+0.1 2.1

\* Protected version

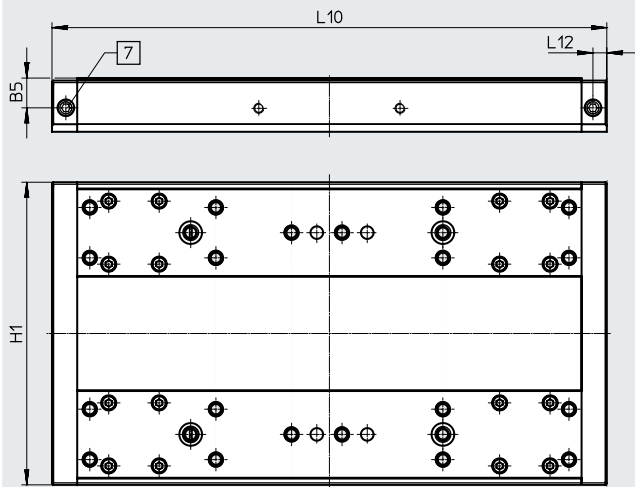
Datasheet

Dimensions

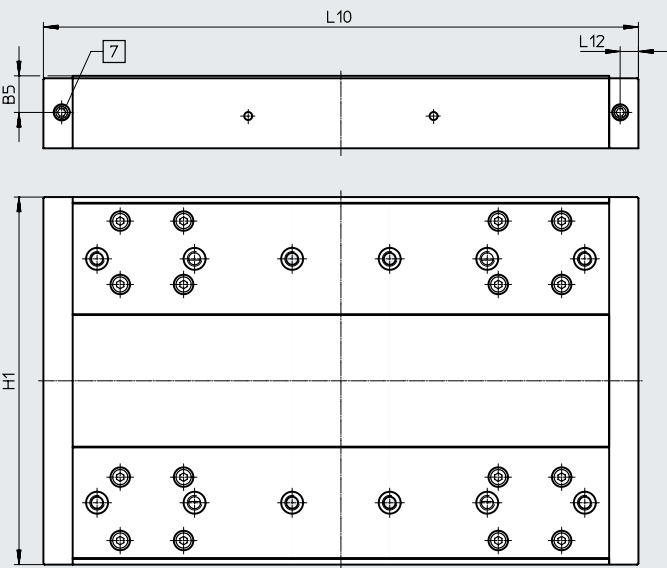
Download CAD data → [www.festo.com](http://www.festo.com)

GK-C – Standard slide with lubrication adapter

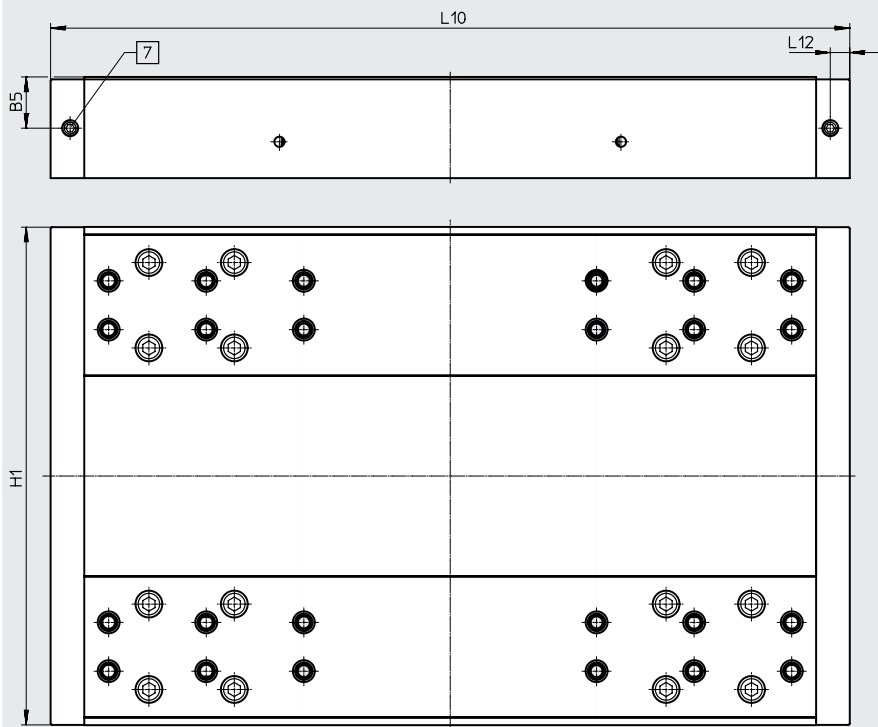
Size 125



Size: 160



Size 220



[7] Lubricating hole for lubrication adapter M6 threaded connection, 7 mm deep

Size	B5	H1	L10	L12
125	11.8	120	220	5.5
160	15	150.7	244	7.5
220	21	204	327.6	8

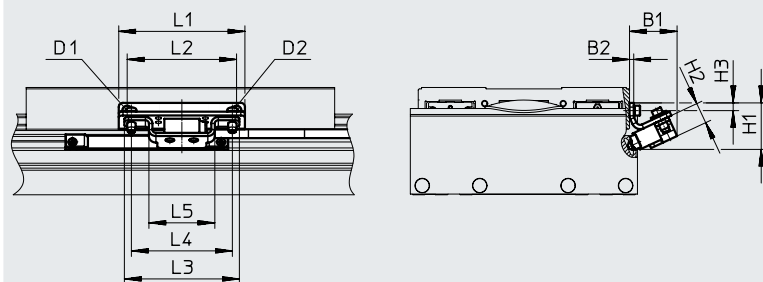


## Datasheet

### Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

M1/M2 – With incremental displacement encoder



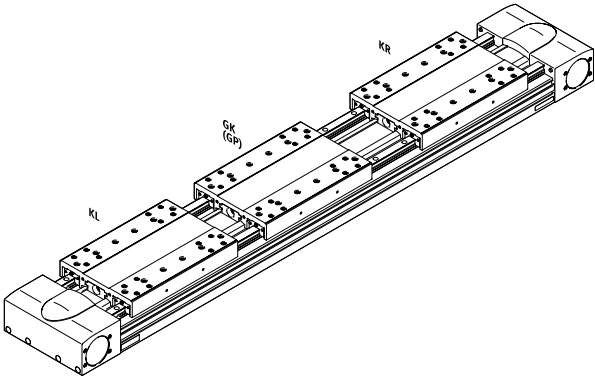
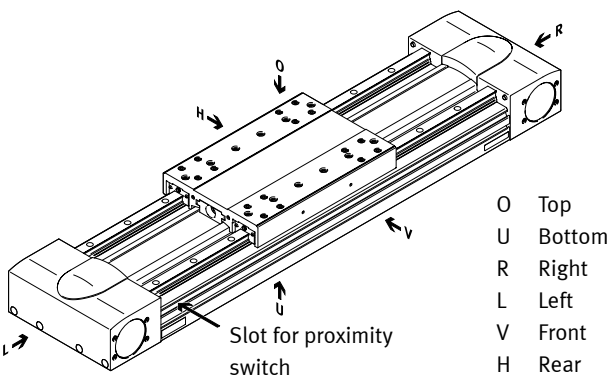
Encoder cable  
(Connection to motor controller/  
safety system) → page 34

Size	B1	B2	D1	D2	H1	H2
125	30.4	3	M4x8	M4x14	28.3	15
160	33.9	3	M4x8	M4x14	33.2	15
220	35.7	3	M5x10	M4x14	40.9	15

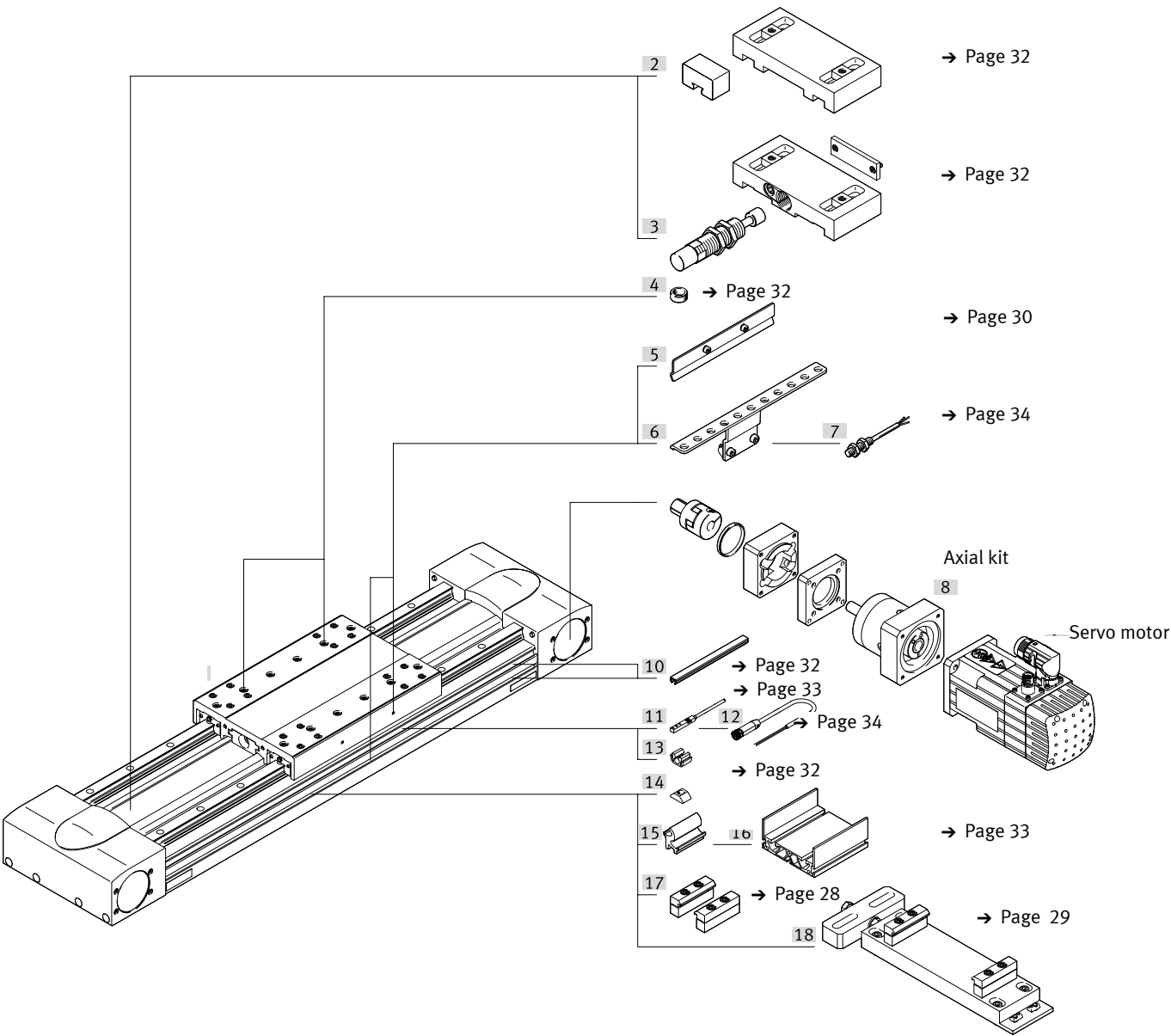
Size	H3	L1	L2	L3	L4	L5
125	5	108.5	56	82	72	47
160	5.5	90	76	82	72	47
220	7.5	170	140	82	72	47

Ordering data – Modular product system

Orientation guide



Accessories



## Ordering data – Modular product system

Ordering table											
Size	125		160		220		Condi- tions	Code		Enter code	
Module no.	556823		556824		556825						
Design	Linear axis							EGC		EGC	
Guide	Heavy-duty guide							-HD		-HD	
Size	125		160		220			-...		-...	
Stroke length	[mm]	50 ... 3000		50 ... 5000		50 ... 4750	[1]	-...		-...	
Function	Toothed belt							-TB		-TB	
Stroke reserve	[mm]	0 ... 999 (0 = no stroke reserve)						[1]	-...H		
Slide	Standard slide							-GK			
	–		Standard slide, protected					-GP			
Additional slide	Left	Additional slide, standard, left					[2]	-KL			
	Right	Additional slide, standard, right					[2]	-KR			
Toothed belt material	Chloroprene rubber										
	Coated PU							-PU2			
Lubrication function	None										
	Lubrication adapter							-C			
Measurement system	None										
	With displacement encoder, incremental, 2.5 µm							-M1			
	With displacement encoder, incremental, 10 µm							-M2			
Displacement encoder attach- ment position	None										
	Rear						[3]	-B			
	Front						[3]	-F			

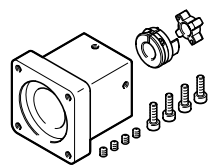
[1] -... The sum of nominal stroke and 2x stroke reserve must not exceed the maximum stroke length.

[2] KL, KR If the protected slide variant (GP) is selected, the additional slide (KL, KR) is also protected.  
If the slide with lubrication adapter (GK-C) is selected, then the additional slide (KL, KR) is also supplied with lubrication adapter

[3] B, F Mandatory in combination with (measurement system) M1, M2  
Only in combination with (measurement system) M1, M2

Accessories

Permitted axis/motor combinations for axial kits



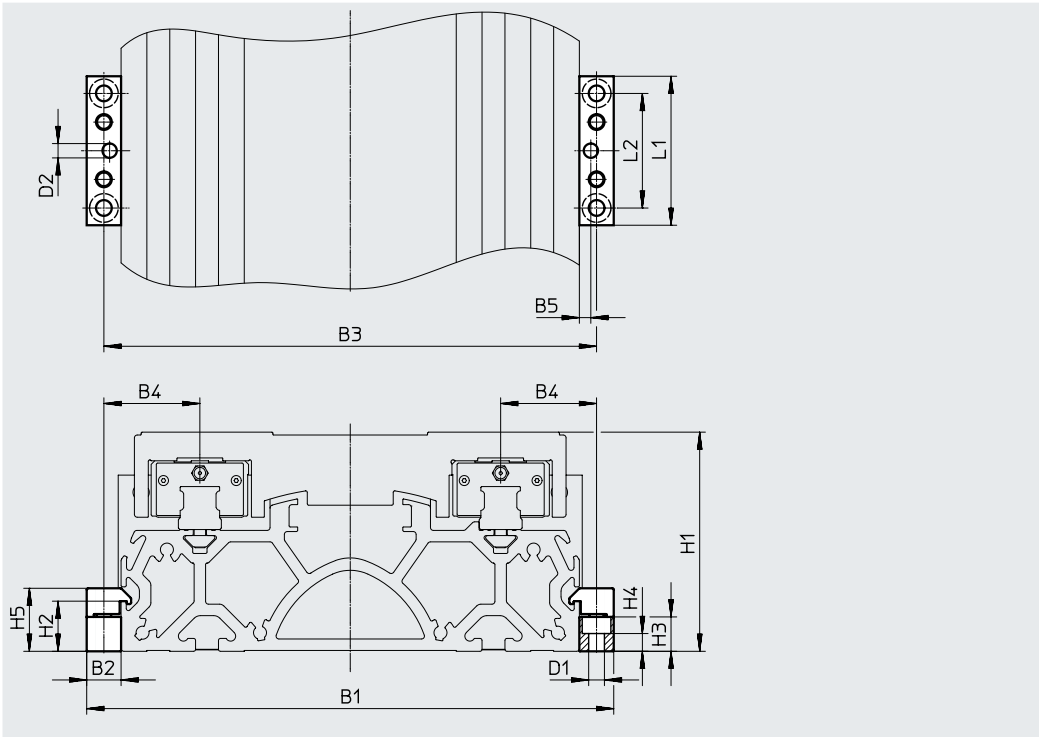
Under the following links you will find all information about:

- Axis/motor combinations
- Permitted third-party motors
- Technical data
- Dimensions

For axial kits → Internet: [eammm-a](http://eammm-a)

Profile mounting MUE

Material:  
Anodised aluminium  
RoHS-compliant



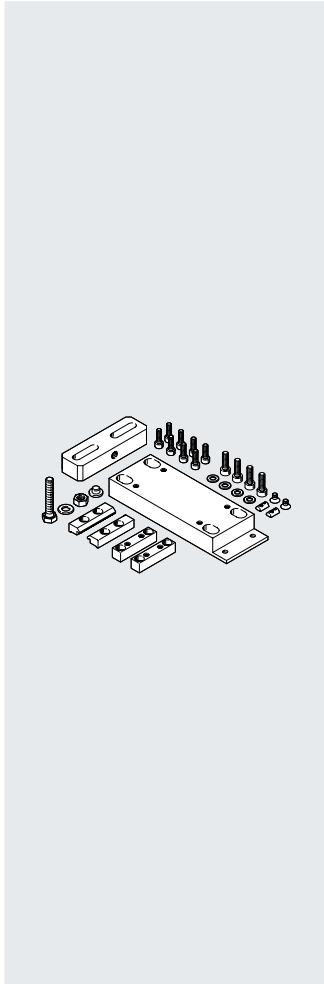
Dimensions and ordering data									
For size	B1	B2	B3	B4	B5	D1 ø	D2 ø H7	H1	H2
125	146	12	134	27	4	5.5	5	64	17.5
160	184	12	172	33.5	4	5.5	5	76.5	17.5
220	258	19	239	49.5	4	9	5	111.5	16

For size	H3	H4	H5	L1	L2	Weight [g]	Part no.	Type
125	12	6.2	22	52	40	80	558043	MUE-70/80
160	12	6.2	22	52	40	80	558043	MUE-70/80
220	14	5.5	29.5	90	40	290	558044	MUE-120/185

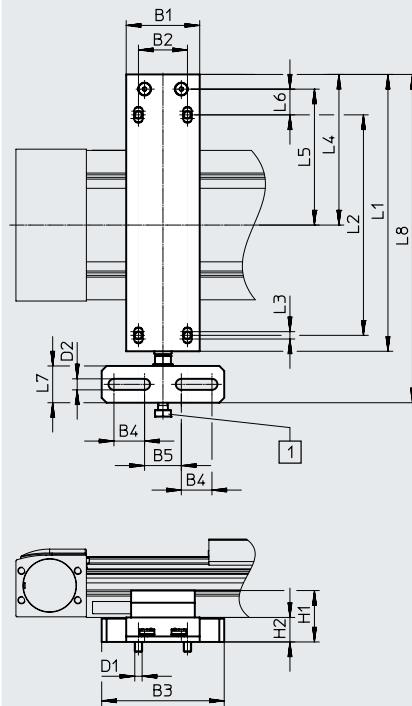
## Accessories

### Adjusting kit EADC-E16

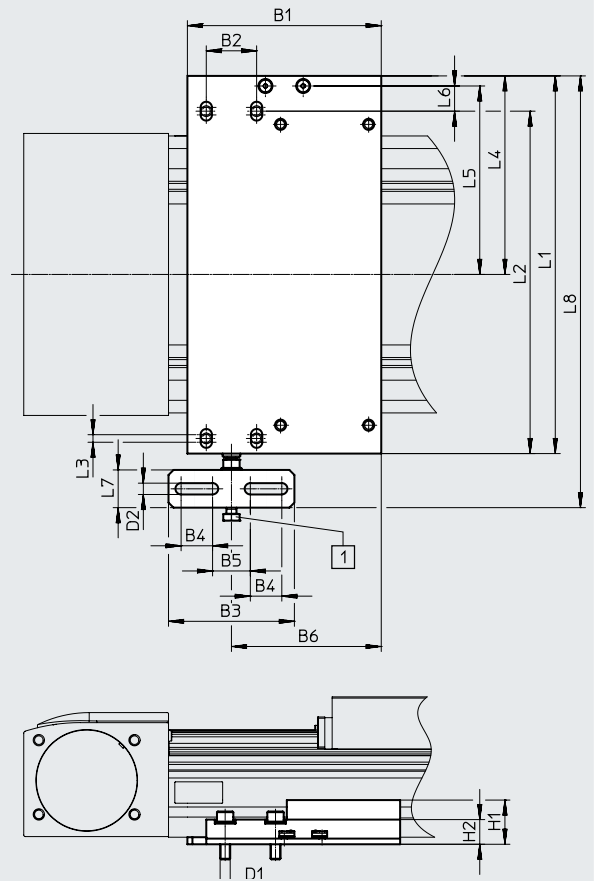
Material:  
Wrought aluminium alloy  
RoHS-compliant



Size 125, 160



Size: 220



[1] Screw M8

#### Dimensions and ordering data

For size	B1	B2	B3	B4	B5	B6	D1	D2	H1	H2	L1	L2
125	60	40	100	25	30	–	M6	9	42	20	226	180
160	60	40	100	25	30	–	M6	9	44	22	266	220
220	154	40	100	25	30	119	M8	9	35.1	19.6	300	260

For size	L3	L4	L5	L6	L7	L8	Weight [g]	Part no.	Type
125	6	123	111	21	30	308	974	8047580	EADC-E16-125-E14
160	6	143	131	21	30	343	1189	8047581	EADC-E16-160-E14
220	6	157.7	149.7	20	30	343	1500	8047582	EADC-E16-220-E14

## Accessories

**Shock absorber retainer, retaining bracket EAYH**

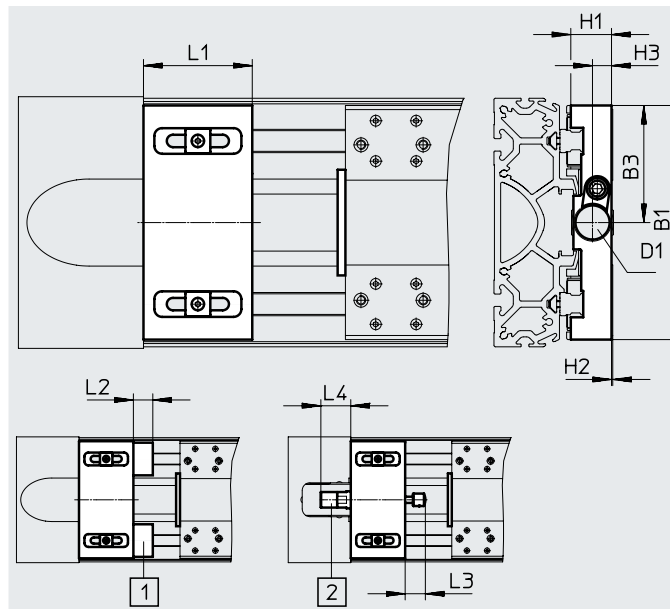
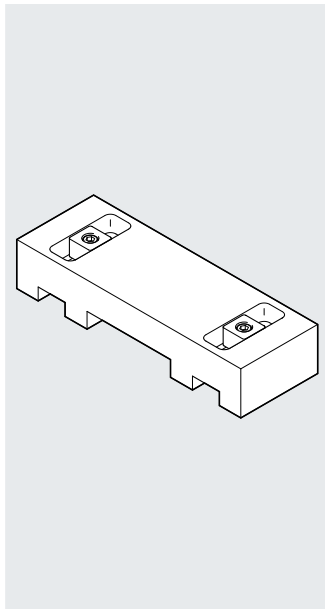
Emergency buffer NPE → page 32

Shock absorber YSRW → page 32

Material:

Anodised aluminium

RoHS-compliant

**Cannot be used in combination with the variants GP or C.**

[1] Emergency buffer NPE

[2] Shock absorber YSRW

**Dimensions and ordering data**

For size	B1	B3	D1	H1	H2	H3	L1	L2	L3	L4 min.	Weight [g]	Part no.	Type
<b>Shock absorber retainer</b>													
125	120	60	M16x1	19.8	0.4	9.7	50	–	20	36	286	<b>1653251</b>	<b>EAYH-L2-125</b>
160	150.7	75.3	M22x1.5	26.2	0.8	12.3	70	–	26	38.5	622	<b>1653250</b>	<b>EAYH-L2-160</b>
220	204	102	M26x1.5	38.7	0.1	15	70	–	34	63.5	1218	<b>1653253</b>	<b>EAYH-L2-220</b>
<b>Retaining bracket for emergency buffer</b>													
125	120	–	–	19.8	0.4	–	50	17	–	–	260	<b>1662803</b>	<b>EAYH-L2-125-N</b>
160	150.7	–	–	26.2	0.8	–	70	25	–	–	617	<b>1669259</b>	<b>EAYH-L2-160-N</b>
220	204	–	–	38.7	0.1	–	70	30	–	–	1195	<b>1669260</b>	<b>EAYH-L2-220-N</b>

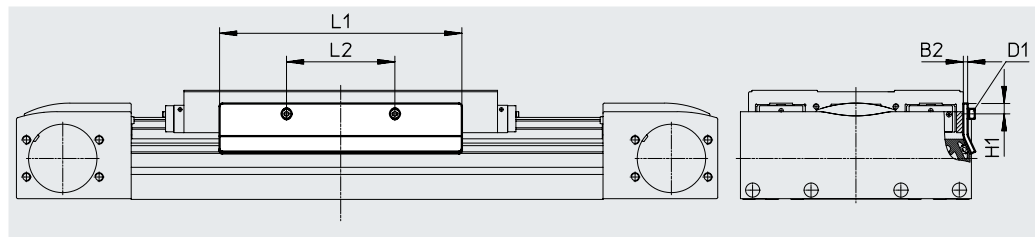
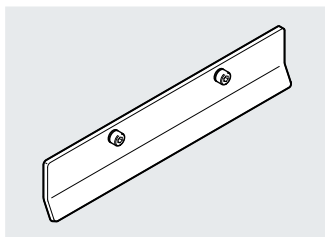
**Switch lug SF-EGC-HD-1**

For sensing via proximity switch SIES-8M

Material:

Galvanised steel

RoHS-compliant

**Dimensions and ordering data**

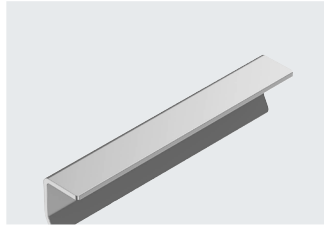
For size	B2	D1	H1	L1	L2	Weight [g]	Part no.	Type
125	2	M4x8	7.8	150	56	70	<b>570027</b>	<b>SF-EGC-HD-1-125</b>
160	3	M4x8	7.3	170	76	160	<b>1645872</b>	<b>SF-EGC-HD-1-160</b>
220	3	M5x10	11.5	250	140	310	<b>1645866</b>	<b>SF-EGC-HD-1-220</b>

## Accessories

### Switch lug SF-EGC-HD-2

For sensing via proximity sensor  
SIEN-M8B or SIES-8M

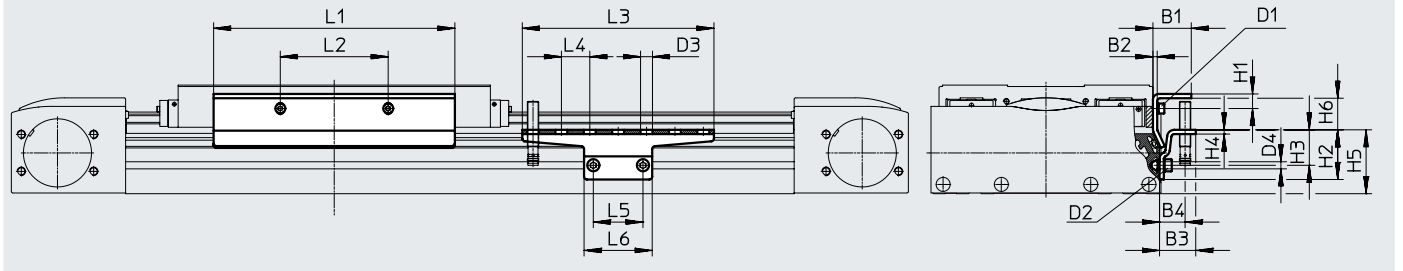
Material:  
Galvanised steel  
RoHS-compliant



### Sensor bracket HWS-EGC

For proximity switch SIEN-M8B

Material:  
Galvanised steel  
RoHS-compliant



#### Dimensions and ordering data

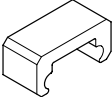
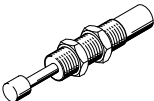


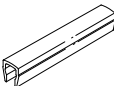
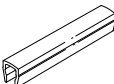

For size	B1	B2	B3	B4	D1	D2	D3 Ø	D4 Ø	H1	H2
125	24	2	25.5	18	M4x8	M5x8	8.4	5.2	9	35
160	27	3	25.5	18	M4x8	M5x8	8.4	5.2	10.3	35
220	31	3	25.5	18	M5x10	M5x14	8.4	5.2	11.5	65

For size	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
125	25	3	45	14	150	56	135	20	35	48
160	25	3	45	22.2	170	76	135	20	35	48
220	55	3	75	18.4	250	140	215	20	35	48

For size	Weight [g]	Part no.	Type
Switch lug			
125	122	570030	SF-EGC-HD-2-125
160	261	1645865	SF-EGC-HD-2-160
220	430	1645868	SF-EGC-HD-2-220

For size	Weight [g]	Part no.	Type
Sensor bracket			
125	110	558057	HWS-EGC-M5
160	110	558057	HWS-EGC-M5
220	217	570365	HWS-EGC-M8-B

## Accessories

Ordering data		For size	Description	Part no.	Type	PU <sup>1)</sup>
Emergency buffer NPE						
	125	Use in combination with retaining bracket EAYH	1662475	NPE-125	1	
	160		1672593	NPE-160		
	220		1672598	NPE-220		
Shock absorber YSRW						
	125	Use in combination with shock absorber retainer EAYH	191196	YSRW-12-20	1	
	160		191197	YSRW-16-26		
	220		191198	YSRW-20-34		
Datasheets → Internet: ysrw						
Slot nut NST						
	125, 160 <sup>2)</sup>	For mounting slot	150914	NST-5-M5	1	
			8047843	NST-5-M5-10	10	
			8047878	NST-5-M5-50	50	
	160 <sup>3)</sup> , 220	For mounting slot	150915	NST-8-M6	1	
			8047868	NST-8-M6-10	10	
			8047869	NST-8-M6-50	50	
Centring pin/sleeve ZBS/ZBH						
	125	For slide	150928	ZBS-5	10	
	125, 160, 220		8137184	ZBH-9-B		
Slot cover ABP						
	125, 160 <sup>2)</sup>	For mounting slot Every 0.5 m	151681	ABP-5	2	
	160 <sup>3)</sup> , 220		151682	ABP-8		
Slot cover ABP-S						
	125, 160, 220	For sensor slot Every 0.5 m	563360	ABP-5-S1	2	
Clip SMBK						
	125, 160, 220	For sensor slot, for mounting the proximity switch cables	534254	SMBK-8	10	

1) Packaging unit

2) For mounting slot at side.

3) For mounting slot underneath



## Accessories

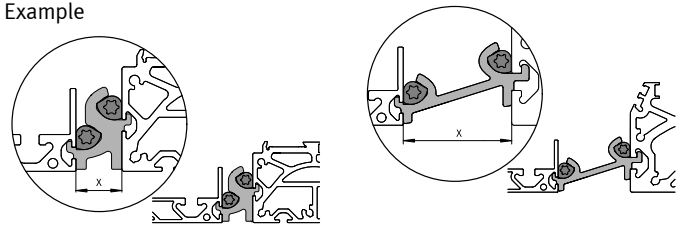
### Mounting options between axis and support profile

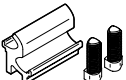
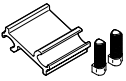
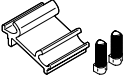
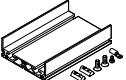
Depending on the adapter kit, the spacing between the axis and the support profile is:

$x = 20 \text{ mm}$  or  $50 \text{ mm}$

The support profile must be mounted using at least 2 adapter kits. For longer strokes, an adapter kit must be used every 500 mm.

Example


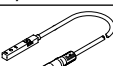


Ordering data					
	For size	Description	Part no.	Type	PU <sup>1)</sup>
Adapter kit DHAM					
	160	<ul style="list-style-type: none"><li>• For mounting the support profile on the axis</li><li>• Spacing between axis and profile is 20 mm</li></ul>	562241	DHAM-ME-N1-CL	1
	220		562242	DHAM-ME-N2-CL	
	125, 160	<ul style="list-style-type: none"><li>• For mounting the support profile on the axis</li><li>• Spacing between axis and profile is 50 mm</li></ul>	574560	DHAM-ME-N1-50-CL	
	220		574561	DHAM-ME-N2-50-CL	
Support profile HMIA					
	70 ... 120	<ul style="list-style-type: none"><li>• For guiding an energy chain</li></ul>	539379	HMIA-E07-	1









1) Packaging unit

### Ordering data – Proximity switches for T-slot, inductive



Datasheets → Internet: sies


	Type of mounting	Electrical connection	Switching output	Cable length [m]	Part no.	Type
N/O						
	Inserted in the slot from above, flush with the cylinder profile	Cable, 3-core	PNP	7.5	551386	SIES-8M-PS-24V-K-7.5-OE
		Plug M8x1, 3-pin		0.3	551387	SIES-8M-PS-24V-K-0.3-M8D
		Cable, 3-core	NPN	7.5	551396	SIES-8M-NS-24V-K-7.5-OE
		Plug M8x1, 3-pin		0.3	551397	SIES-8M-NS-24V-K-0.3-M8D
N/C						
	Inserted in the slot from above, flush with the cylinder profile	Cable, 3-core	PNP	7.5	551391	SIES-8M-PO-24V-K-7.5-OE
		Plug M8x1, 3-pin		0.3	551392	SIES-8M-PO-24V-K-0.3-M8D
		Cable, 3-core	NPN	7.5	551401	SIES-8M-NO-24V-K-7.5-OE
		Plug M8x1, 3-pin		0.3	551402	SIES-8M-NO-24V-K-0.3-M8D

## Accessories


Ordering data – Proximity switch M8 (round design), inductive <sup>1)</sup>						Datasheets → Internet: sien
	Electrical connection	LED	Switching output	Cable length [m]	Part no.	Type
N/O						
	Cable, 3-core		PNP	2.5	150386	SIEN-M8B-PS-K-L
			NPN	2.5	150384	SIEN-M8B-NS-K-L
	Plug M8x1, 3-pin		PNP	–	150387	SIEN-M8B-PS-S-L
			NPN	–	150385	SIEN-M8B-NS-S-L
N/C						
	Cable, 3-core		PNP	2.5	150390	SIEN-M8B-PO-K-L
			NPN	2.5	150388	SIEN-M8B-NO-K-L
	Plug M8x1, 3-pin		PNP	–	150391	SIEN-M8B-PO-S-L
			NPN	–	150389	SIEN-M8B-NO-S-L

1) The proximity switches M8 (round design), inductive, cannot be combined with the central lubrication variant -C.

Ordering data – Connecting cables							Datasheets → Internet: neba
	Electrical connection 1, connection technology	Electrical connection 1, cable outlet	Electrical connection 2, connection technology	Electrical connection 2, number of pins/cores	Cable length [m]	Part no.	Type
	M8x1 A-coded to EN 61076-2-104	Straight	Open end	3	2.5	<b>8078223</b>	<b>NEBA-M8G3-U-2.5-N-LE3</b>
					5.0	<b>8078224</b>	<b>NEBA-M8G3-U-5-N-LE3</b>
	M8x1 A-coded to EN 61076-2-104	Angled	Open end	3	2.5	<b>8078230</b>	<b>NEBA-M8W3-U-2.5-N-LE3</b>
					5.0	<b>8078231</b>	<b>NEBA-M8W3-U-5-N-LE3</b>

Ordering data – Encoder cables for displacement encoder system, EGC-...-M1/-M2							Datasheets → Internet: nebm
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type		
	Displacement encoder EGC-...-M1/-M2	Motor controllers CMMP-AS and CMMT-AS	5.0	<b>1599105</b>	<b>NEBM-M12G8-E-5-S1G9-V3</b>		
			10	<b>1599106</b>	<b>NEBM-M12G8-E-10-S1G9-V3</b>		
			15	<b>1599107</b>	<b>NEBM-M12G8-E-15-S1G9-V3</b>		
			χ <sup>1)</sup>	<b>1599108</b>	<b>NEBM-M12G8-E-...-S1G9-V3</b>		

1) Max. cable length: 25 m.

Ordering data – Adapter			
	Description	Part no.	Type
	Required in combination with the servo drive CMMT-AS as adapter between encoder cable NEBM-M12G8-...-V3 and interface X3 (position encoder 2)	<b>8106112</b>	<b>NEFM-S1G9-K-0.5-R3G8</b>