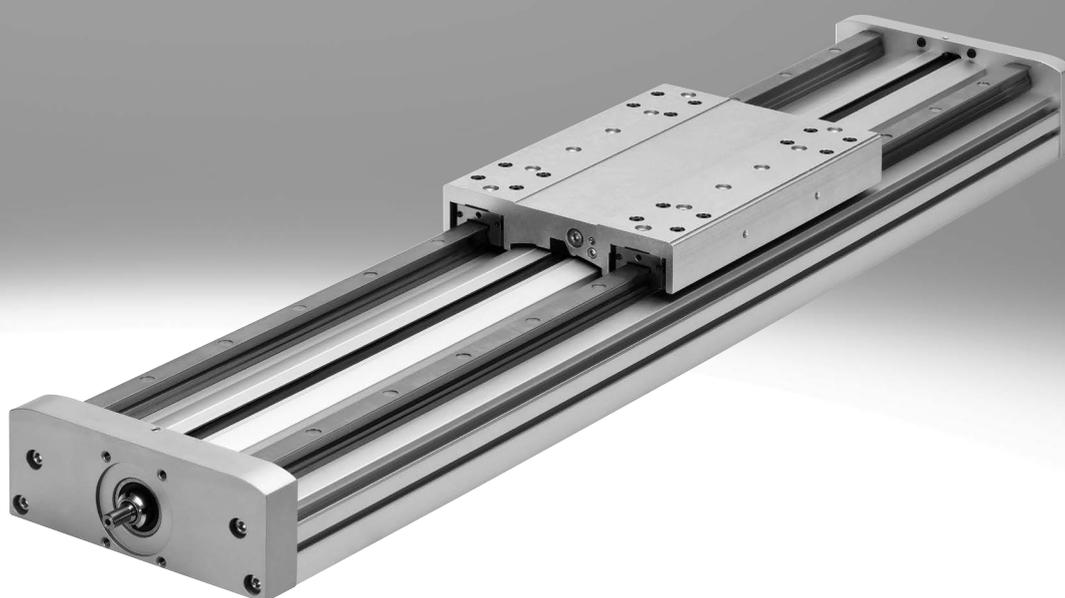


Ball screw axes EGC-HD-BS, with heavy-duty guide

FESTO



Selection aid

Overview of toothed belt and ball screw axes

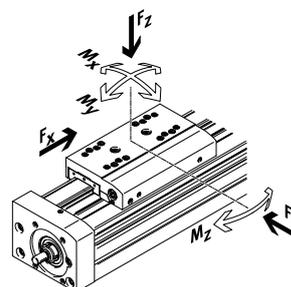
Toothed belt axes

- Speeds of up to 10 m/s
- Acceleration of up to 50 m/s²
- Repetition accuracy of up to ±0.08 mm
- Strokes of up to 8500 mm (longer strokes on request)
- Flexible motor mountings

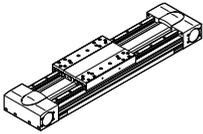
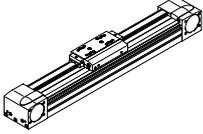
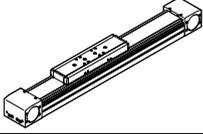
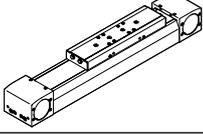
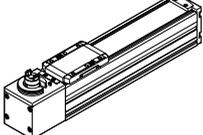
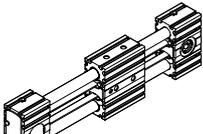
Ball screw axes

- Speeds of up to 2 m/s
- Acceleration of up to 20 m/s²
- Repetition accuracy of up to ±0.003 mm
- Strokes up to 3000 mm

Coordinate system



Toothed belt axes

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

Selection aid

Overview of toothed belt and ball screw axes

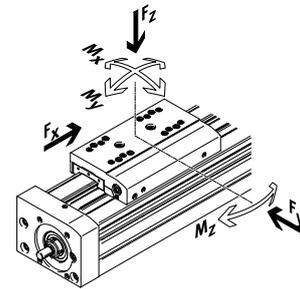
Toothed belt axes

- Speeds of up to 10 m/s
- Acceleration of up to 50 m/s²
- Repetition accuracy of up to ±0.08 mm
- Strokes of up to 8500 mm (longer strokes on request)
- Flexible motor mountings

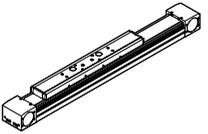
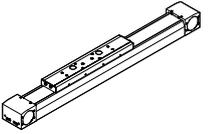
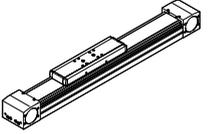
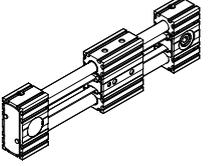
Ball screw axes

- Speeds of up to 2 m/s
- Acceleration of up to 20 m/s²
- Repetition accuracy of up to ±0.003 mm
- Strokes up to 3000 mm

Coordinate system



Toothed belt axes

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

Selection aid

Overview of toothed belt and ball screw axes

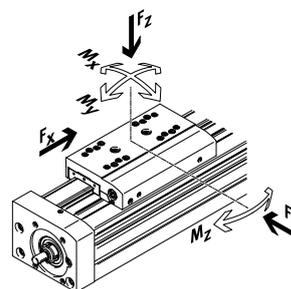
Toothed belt axes

- Speeds of up to 10 m/s
- Acceleration of up to 50 m/s²
- Repetition accuracy of up to ±0.08 mm
- Strokes of up to 8500 mm (longer strokes on request)
- Flexible motor mountings

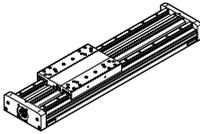
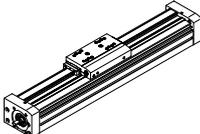
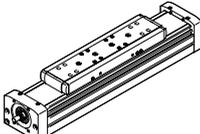
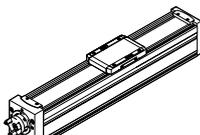
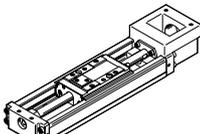
Ball screw axes

- Speeds of up to 2 m/s
- Acceleration of up to 20 m/s²
- Repetition accuracy of up to ±0.003 mm
- Strokes up to 3000 mm

Coordinate system



Ball screw axes

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

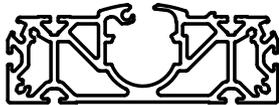
Key features

At a glance

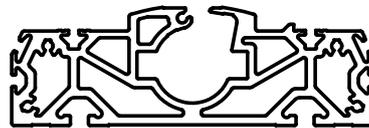
- New heavy-duty design for:
 - Maximum loads and torques
 - High feed forces and speeds
 - Long service life
- Precision DUO guide rail with high load capacity
- Ideal as a basic axis for linear gantries and cantilever axes
- The ball screw axis with integrated ball screw impresses with its high precision and flexible screw pitches
- In addition to its technical data, the ball screw axis also offers an excellent price/performance ratio
- Space-saving position sensing with proximity switch in the profile slot is possible
- Wide range of adaptation options on the drives
- Ball screw support enables maximum travel speed with all stroke lengths

Flat unit with rigid, closed profile

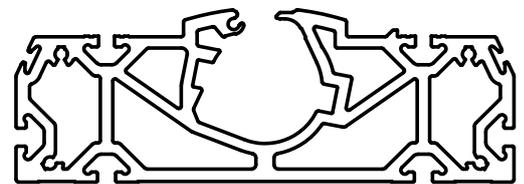
EGC-HD-125



EGC-HD-160

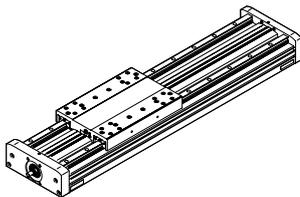


EGC-HD-220

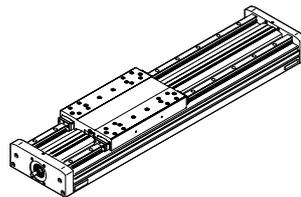


Slide variants

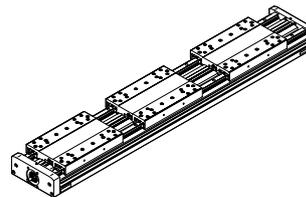
Standard slide



Standard slide, protected



With additional slide

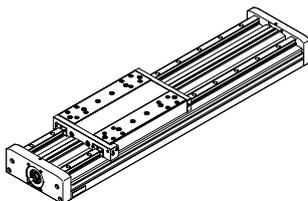


The side on which the label is applied is defined as the front.

Guide options

→ Page 22

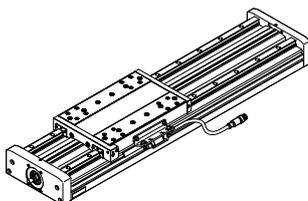
With central lubrication



- The lubrication adapters enable the guide and the ball screw 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

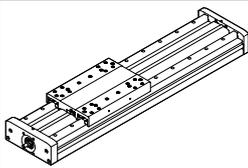


The position of the slide can be sensed directly when using the incremental displacement encoder. This means that all elasticities of the drivetrain can be detected and corrected by the motor controller.

Key features

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]	Max. feed force [N]	Guide characteristics				
						Forces and torques				
						Fy [N]	Fz [N]	Mx [Nm]	My [Nm]	Mz [Nm]
Recirculating ball bearing guide										
	125	50 ... 900	0.5	±0.02	400	3650	3650	140	275	275
	160	50 ... 1900	1	±0.02	650	5600	5600	300	500	500
	220	50 ... 2400	1.5	±0.02	1500	13000	13000	900	1450	1450

 **Note**
Engineering software
Electric Motion Sizing
www.festo.com/x/electric-motion-sizing

Complete system comprising ball screw axis, motor, motor controller and motor mounting kit

Ball screw axis with recirculating ball bearing guide



Motor



Servo motor:
EMMT-AS
Stepper motor:
EMMB-ST, EMMT-ST

Servo drives



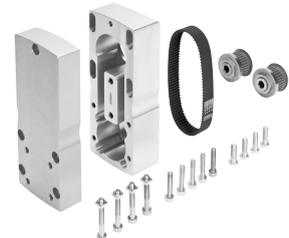
Servo drive:
CMMT-AS
Servo drive for extra-low voltage:
CMMT-ST

Motor mounting kit

Axial kit



Parallel kit

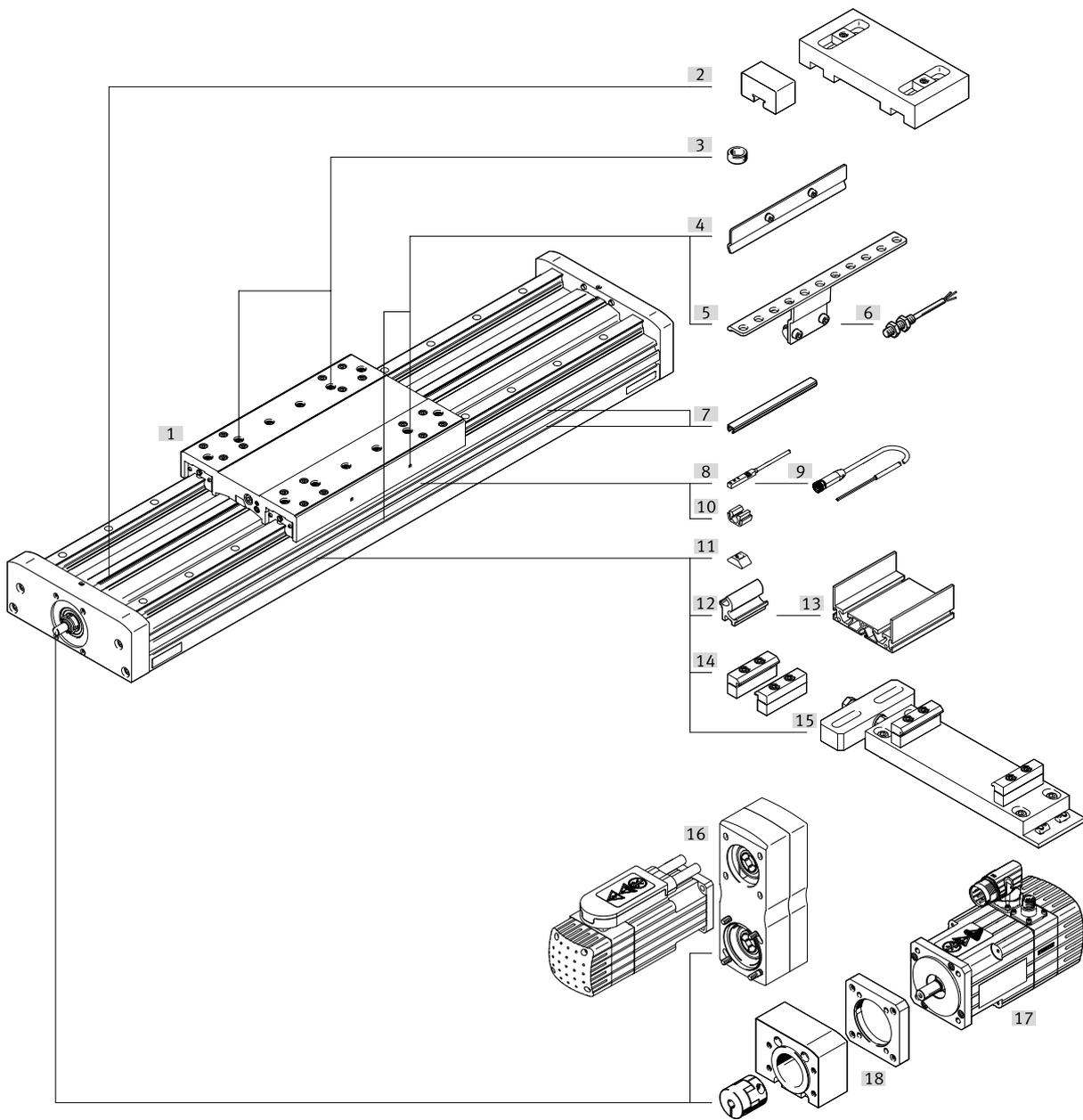


 **Note**
A range of specially adapted complete solutions is available for the ball screw axis EGC and the motors.

Type codes

001	Series	
EGC	Electric linear axis	
002	Size	
125	125	
160	160	
220	220	
003	Stroke range [mm]	
...	50 ... 2400	
004	Drive system	
BS	Ball screw drive	
005	Spindle pitch	
10P	10 mm	
20P	20 mm	
25P	25 mm	
006	Spindle support	
	None	
S	With	
007	Stroke reserve [mm]	
...	0 ... 999	
008	Slide	
GK	Standard slide	
GP	Standard slide, protected	
009	Additional slide left	
	None	
KL	Additional slide, standard, left	
010	Additional slide, right	
	None	
KR	Additional slide standard, right	
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	

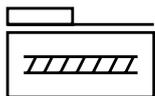
Peripherals overview



Peripherals overview

Variants and accessories		
Type	Description	→ Page/Internet
[1] Ball screw axis EGC-HD-BS	Electric drive	10
[2] Emergency buffer with retaining bracket NPE	For avoiding damage at the end stop in the event of malfunction	36
[3] Centring pin/sleeve ZBS, ZBH	<ul style="list-style-type: none"> • For centring loads and attachments on the slide • Included in the scope of delivery: <ul style="list-style-type: none"> – For size 125: 2x ZBS-5, 2x ZBH-9 – For size 160, 220: 2x ZBH-9 	36
[4] Switch lug SF-EGC-HD	For sensing the slide position	34
[5] Sensor bracket HWS-EGC	Adapter for mounting the inductive proximity switches (round design) on the axis	35
[6] Proximity switch, M8 SIEN	<ul style="list-style-type: none"> • Inductive proximity switch, round design 	38
[7] Slot cover ABP	<ul style="list-style-type: none"> • For protection against contamination 	36
[8] Proximity switch, T-slot SIES	<ul style="list-style-type: none"> • Inductive proximity switch, for T-slot 	37
[9] Connecting cable NEBA	Via proximity switch	38
[10] Clip SMBK	For mounting the proximity switch cable in the slot	36
[11] Slot nut NST	For mounting attachments	36
[12] Adapter kit DHAM	For mounting the support profile on the axis	37
[13] Support profile HMIA	For mounting and guiding an energy chain	37
[14] Profile mounting MUE	For mounting the axis on the profile	32
[15] Adjusting kit EADC-E16	For mounting the axis on a vertical surface. Once mounted, the axis can be aligned horizontally	33
[16] Parallel kit EAMM-U	for parallel motor mounting, mounting only possible upwards or downwards (comprising: housing, clamping sleeve, toothed belt pulley, toothed belt)	eammm-u
[17] Motor EMMT	Motors specially matched to the axis, with or without gear unit, with or without brake	emmt
[18] Axial kit EAMM-A	For axial motor mounting (comprising coupling, coupling housing and motor flange)	eammm-a

Datasheet



-  Size
125 ... 220
-  Stroke length
0 ... 2400 mm
-  www.festo.com
-  Repair service



General technical data

Size	125	160	220
Screw pitch [mm/rev]	10	10	20
Design	Electromechanical axis with ball screw		
Guide	Recirculating ball bearing guide		
Mounting position	Any		
Working stroke [mm]	50 ... 900	50 ... 1900	50 ... 2400
Max. feed force $F_x^{1)}$ [N]	400	650	1500
No-load torque at min. travel speed			
EGC-...- [Nm]	0.3	0.5	0.5
EGC-...-S [Nm]	0.3	0.5	0.5
[m/s]	0.05	0.1	0.1
No-load torque at max. travel speed			
EGC-...- [Nm]	0.45	0.75	0.75
EGC-...-S [Nm]	0.45	0.75	0.75
[m/s]	0.5	0.5	1.0
Max. radial force ²⁾ [N]	220	250	250
Max. rotational speed ³⁾ [rpm]	3000	3000	3000
Max. acceleration [m/s ²]	15		
Repetition accuracy [mm]	±0.02		

1) The feed force affects the service life. (→ Page 15)

2) At the drive shaft

3) Rotational speed and velocity are stroke-dependent

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 ¹⁾	4123	7210	19137
Additional weight per 10 mm stroke	90	138	250
Slide			
EGC -...- GK	1049	2080	5826
EGC -...-GK-C	1189	2352	6374
EGC -...- GP	-	2346	6325
Additional slide			
EGC -...- GK	978	1963	5505
EGC -...-GK-C	1118	2235	6053
EGC -...- GP	-	2035	5584

1) Including slide

Datasheet

Ball screw						
Size		125	160	220		
Diameter	[mm]	12	15	25		
Pitch	[mm/rev]	10	10	20	10	25

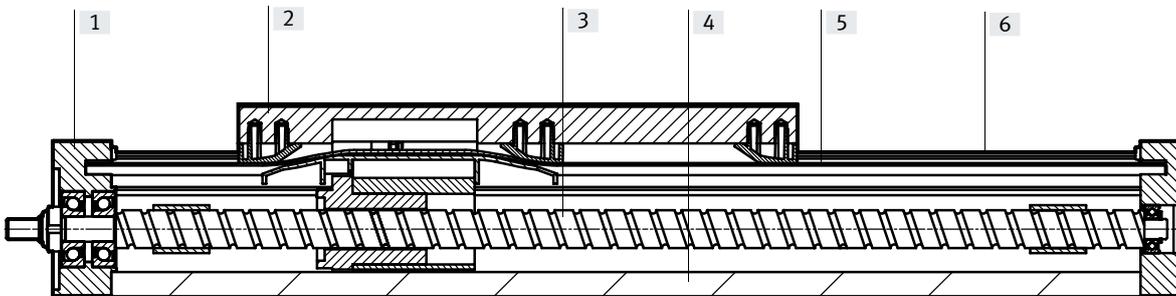
Mass moment of inertia						
Size		125	160	220		
Screw pitch	[mm/rev]	10	10	20	10	25
J_0	[kg mm ²]	6.06	13.94	29.74	106.78	184.26
J_H per metre stroke	[kg mm ² /m]	14.20	34.59	34.59	275.64	275.64
J_L per kg payload	[kg mm ² /Kg]	2.53	2.53	10.13	2.53	15.83
J_W Additional slide	[kg mm ²]	2.25	4.69	18.77	13.20	82.48

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]	Slide	Anodised wrought aluminium alloy
[3]	Ball screw	Steel
[4]	Profile	Anodised wrought aluminium alloy
[5]	Cover strip	Polyurethane
[6]	Guide rail	Steel, coated and corrosion-protected
	Note on materials	RoHS-compliant
		Contains paint-wetting impairment substances

Datasheet

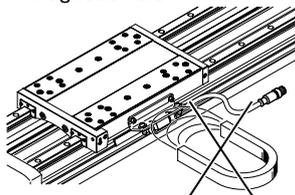
Technical data – Displacement encoder		EGC-...-M1		EGC-...-M2		Dimensions → page 29
Type						
Resolution	[μm]	2.5		10		
Max. travel speed with displacement encoder	[m/s]	4		4		
Encoder signal		5 V TTL; A/A, B/B; reference signal (N/N) cyclically every 5 mm (zero pulse)				
Signal output		Line driver, 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 ¹⁾				

1) For information about the area of use, see the EC declaration of conformity at: 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.

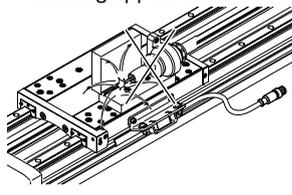
Application note

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

- Magnetic field



- Welding application

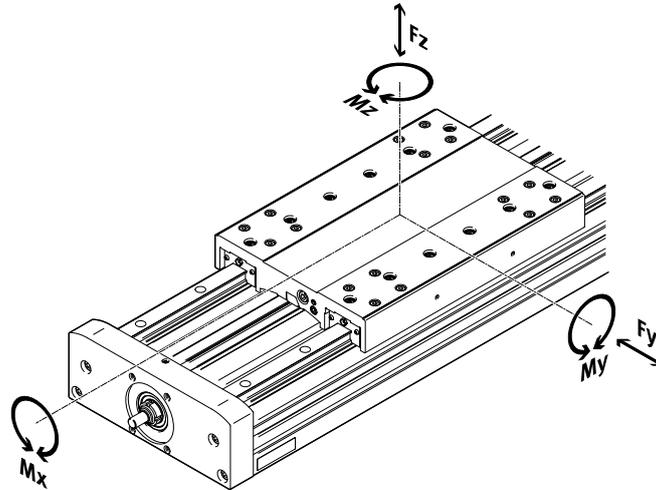


Datasheet

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

Basic load ratings

Size	125	160	220
Screw pitch [mm/rev]	10	10	20
			10
			25
Ball screw			
Dynamic $C_{dyn,KGT}$ [N]	4000	6800	5700
			14100
			12700



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

Service life of the guide

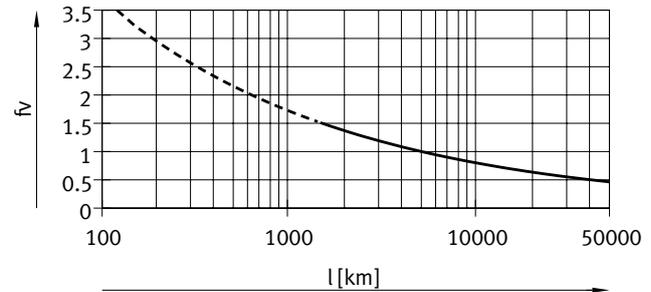
The service life of the guide depends on the load. To be able to make a statement as to the service life of the guide, the graph below plots the load comparison factor f_v against the service life.

These values are only theoretical. You must consult your local Festo contact for a load comparison factor f_v greater than 1.5.

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

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	160	220
$F_{y_{max}}$	[N]	13447	20631	47892
$F_{z_{max}}$	[N]	13447	20631	47892
$M_{x_{max}}$	[Nm]	516	1105	3316
$M_{y_{max}}$	[Nm]	1013	1842	5342
$M_{z_{max}}$	[Nm]	1013	1842	5342

Datasheet

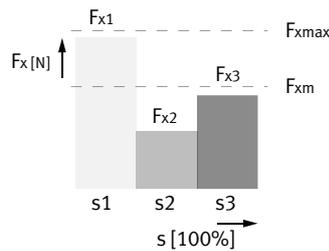
Service life of the ball screw

- The service life of the ball screw axis depends on the service life of the guide (→ Page 14) also depends on that of the screw drive. The operating coefficient plays a considerable role in determining the possible service life. This can be determined with the help of the table (→ page 16)
- The service life ends when the maximum number of switching cycles or maximum running performance has been reached:
 - 5 million switching cycles or 5000 km running performance
- The distance between the foremost and rearmost positions must be at least 2.5 times the screw pitch per travel cycle
- The specifications for the running performance are based on experimentally determined and theoretically calculated data (at room temperature). The running performance that can be achieved in practice can deviate considerably from the specified curves under different parameters

Calculation of the mean feed force F_{xm} with ball screw

$$F_{xm} = \sqrt[3]{\frac{F_{x1}^3 \cdot s_1 + \dots + F_{xn}^3 \cdot s_n}{s_1 + \dots + s_n}}$$

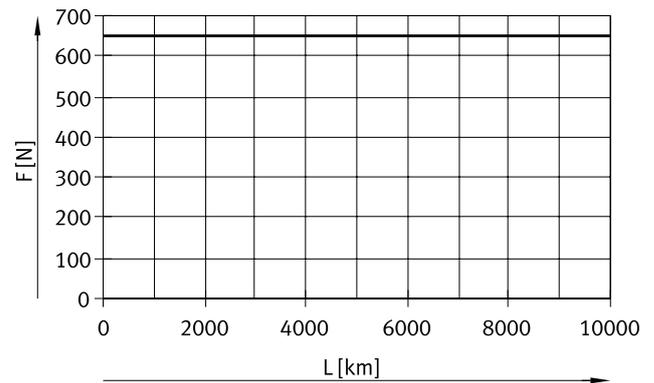
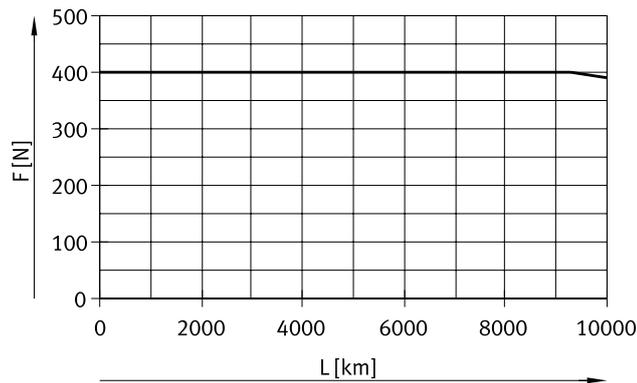
- F_{xm} = Mean feed force
- $F_{x1/n}$ = Feed force of section
- $s_{1/n}$ = Part of movement cycle that is travel



Mean feed force F_{xm} as a function of running performance L, with an operating coefficient f_B of 1.0, at room temperature

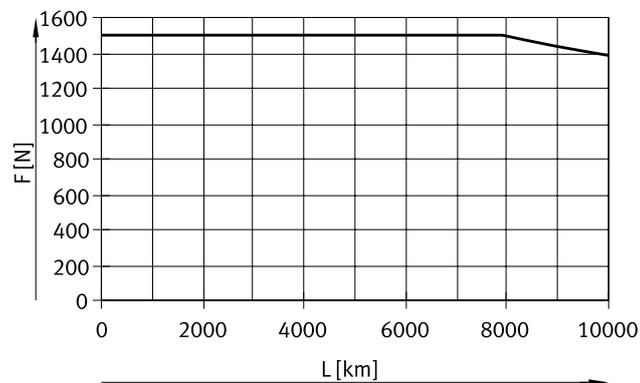
Size 125

Size 160



Datasheet

Mean feed force F_{xm} as a function of running performance L, with an operating coefficient f_B of 1.0, at room temperature
Size 220



Service life taking into account the operating coefficient

$$L_1 = \frac{L}{f_B^3}$$

L_{ist} = Actual service life
 L = Target service life
 (→ diagrams)
 f_B = Operating coefficient

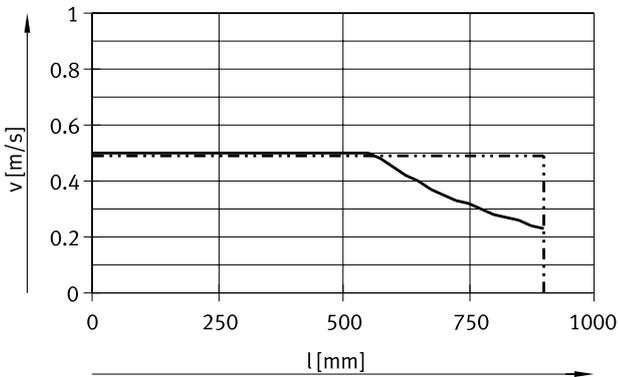
Load ¹⁾	Operating coefficient f_B	Application example
None	1.0 ... 1.2	Measuring machine
Light	1.2 ... 1.4	Handling, robot technology
Medium	1.4 ... 1.6	Press-in operations
High	1.6 ... 2.0	Construction, agriculture

1) Loads caused by impact, temperature, contamination, shock and vibrations

Datasheet

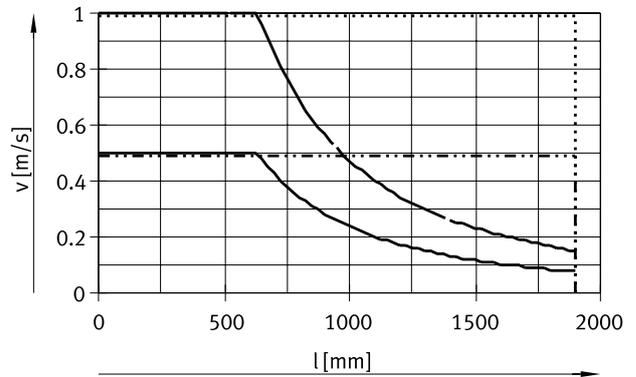
Speed v as a function of working stroke l

Size 125



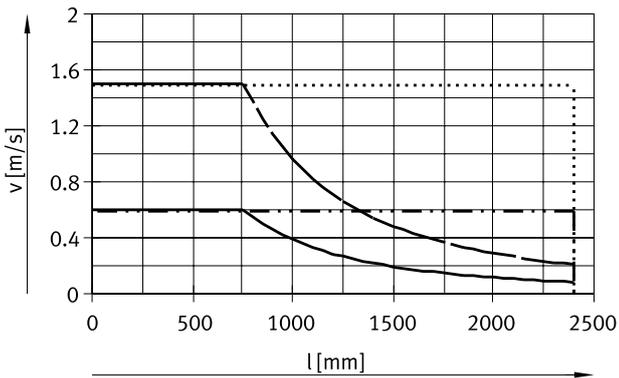
- EGC-HD-10P without ball screw support
- - - EGC-HD-10P with ball screw support

Size 160



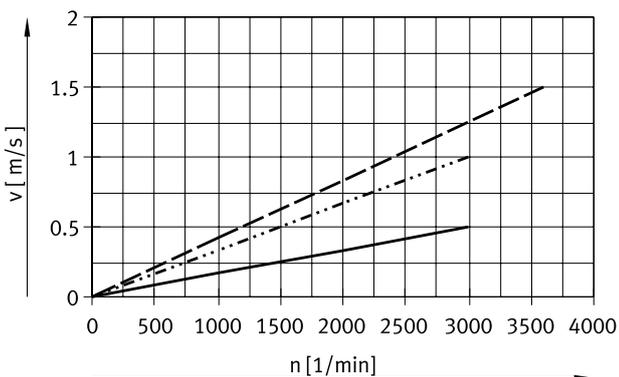
- EGC-HD-10P without ball screw support
- · · EGC-HD-10P with ball screw support
- - - EGC-HD-20P without ball screw support
- · - EGC-HD-20P with ball screw support

Size 220



- EGC-HD-10P without ball screw support
- · · EGC-HD-10P with ball screw support
- - - EGC-HD-25P without ball screw support
- · - EGC-HD-25P with ball screw support

Speed v as a function of rotational speed n



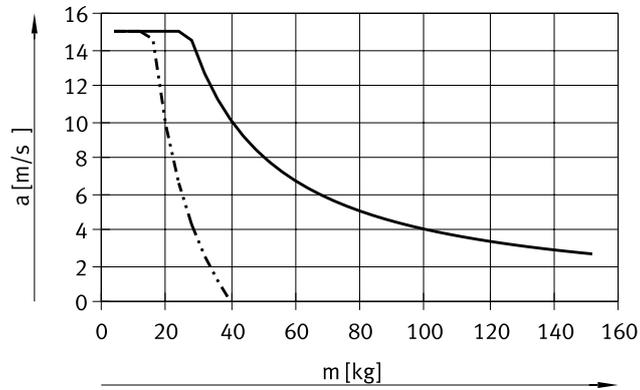
 **Note**
Rotational speed is stroke-dependent.
Note the maximum rotational speed.

- EGC-HD-125/160/220-10P
- · · EGC-HD-160-20P
- - - EGC-HD-220-25P

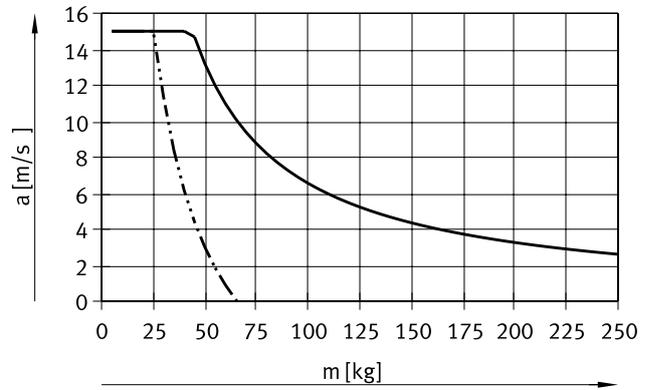
Datasheet

Max. acceleration a as a function of payload m

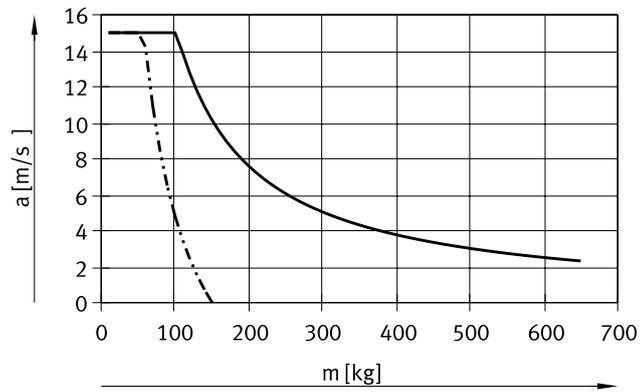
Size 125



Size: 160



Size 220

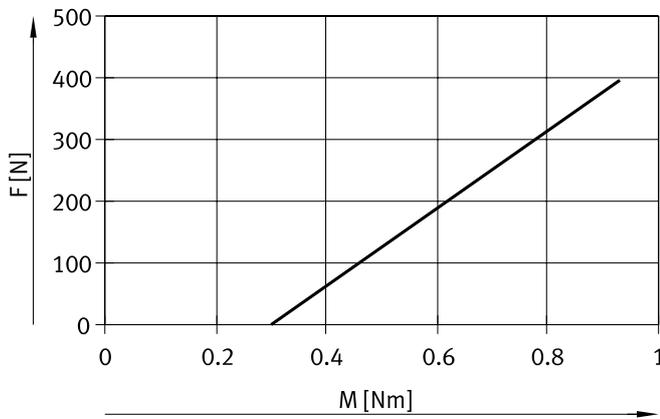


— Horizontal mounting position
 - - - Vertical mounting position

Datasheet

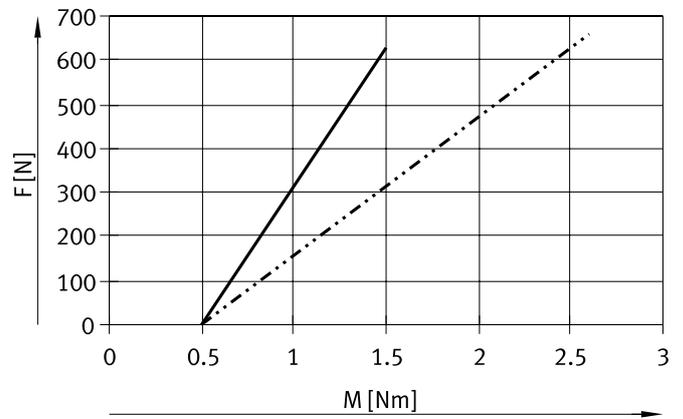
Theoretical feed force F as a function of the input torque M

Size: 125



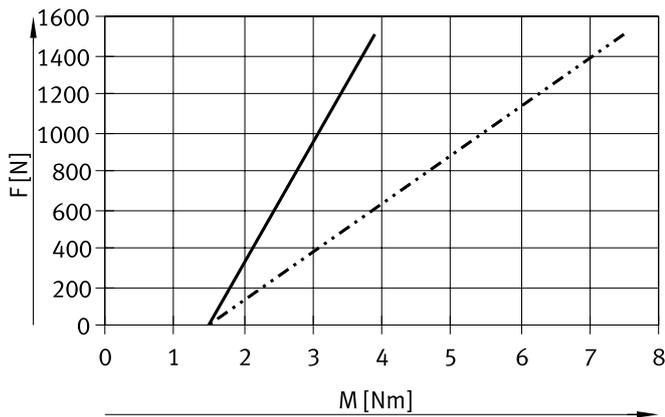
— EGC-HD-10P

Size 160



— EGC-HD-160-10P
 - - - EGC-HD-160-20P

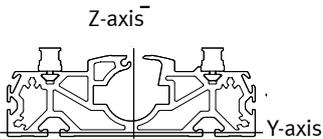
Size 220



— EGC-HD-220-10P
 - - - EGC-HD-220-25P

Datasheet

Second moment of area

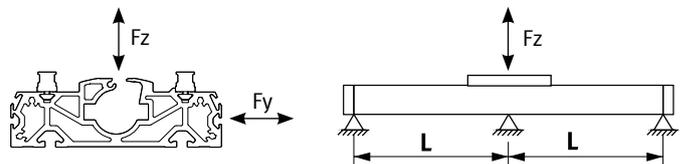


Size		125	160	220
I_y	[mm ⁴]	7.15×10^5	13.5×10^5	55.7×10^5
I_z	[mm ⁴]	41.1×10^5	101×10^5	352×10^5

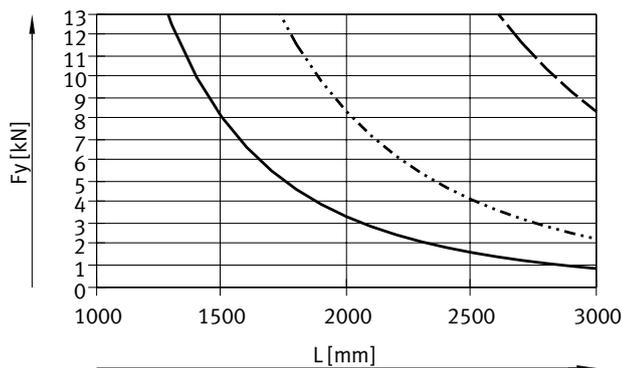
Maximum permissible support span L (without profile mounting) as a function of force F

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 $f = 0.5$ mm.

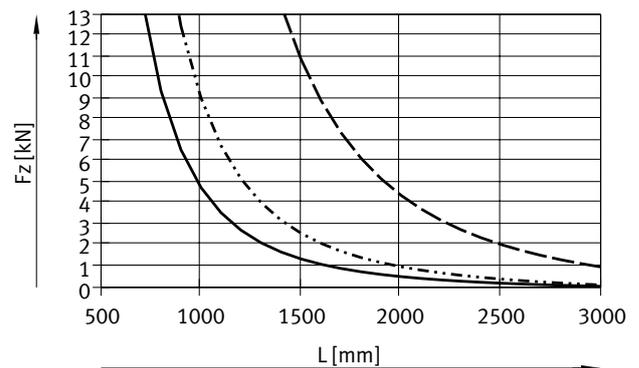


Force F_y



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

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 and the screw of the ball screw axis EGC-HD-BS 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 ball screw axis EGC-HD-BS are the same with and without central lubrication modules.
- The central lubrication system is connected by means of the three connections at the front and the two at the rear
- Can be used in combination with:
 - Standard slide GK
 - Additional slide KL, KR
- Cannot be used in combination with:
 - Standard slide, protected GP

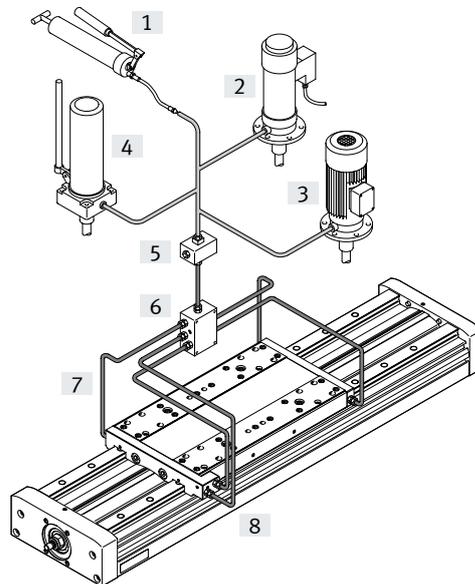
Slide dimensions
→ page 28

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.

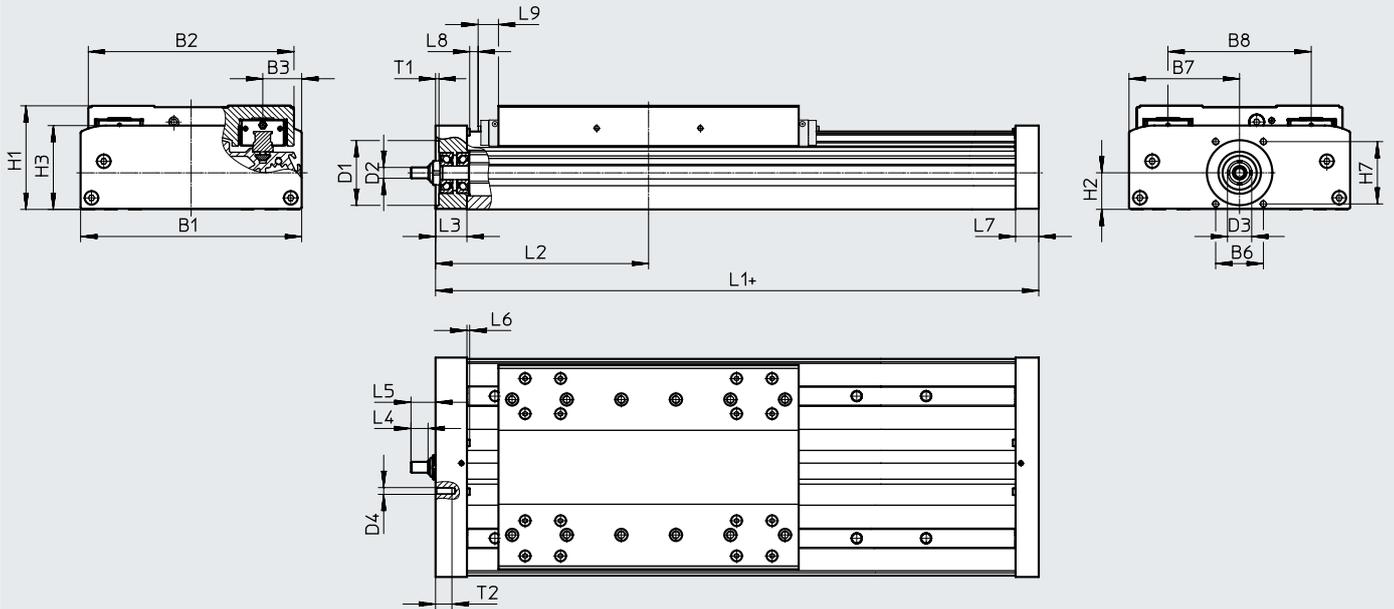


- [1] Hand pump
- [2] Pneumatic container pump
- [3] Electric container pump
- [4] Manually operated container pump
- [5] Nipple block
- [6] Distributor block
- [7] Tubing or piping
- [8] Fittings

Datasheet

Dimensions

Download CAD data → www.festo.com



+ = plus stroke length + 2x stroke reserve

L9 With GP: dimension for long-term lubrication unit → page 20

Size	B1	B2	B3	B6	B7	B8	D1 ∅ H7	D2 ∅ h6
125	124	120	21	29	62	80	38	6
160	162	150.7	27.5	35	81	105	48	8
220	224	204.2	40	64	112	140	62	12

Size	D3	D4	H1	H2	H3	H7	L3	L4
125	15	M5	64	22.5	50.4	36	21	8
160	18	M5	76.5	27	62	46	23	12.5
220	28	M6	111.5	42.5	91	54	33	17.5

Size	L5	L6	L7	L8	L9	T1	T2
125	14	1.8	16	2	–	2.5	12
160	18	2	17	0.55	14.9	2.5	12
220	25.5	2	30	2	18	3	15

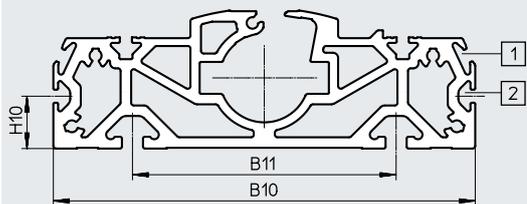
Size	Stroke	L1	L2 min.
125	≤900	268	136.5
160	<1377	296	151.3
	≥1377	336	171
220	<1604	409	206
	≥1604	469	236

Datasheet

Dimensions

Download CAD data → www.festo.com

Profile



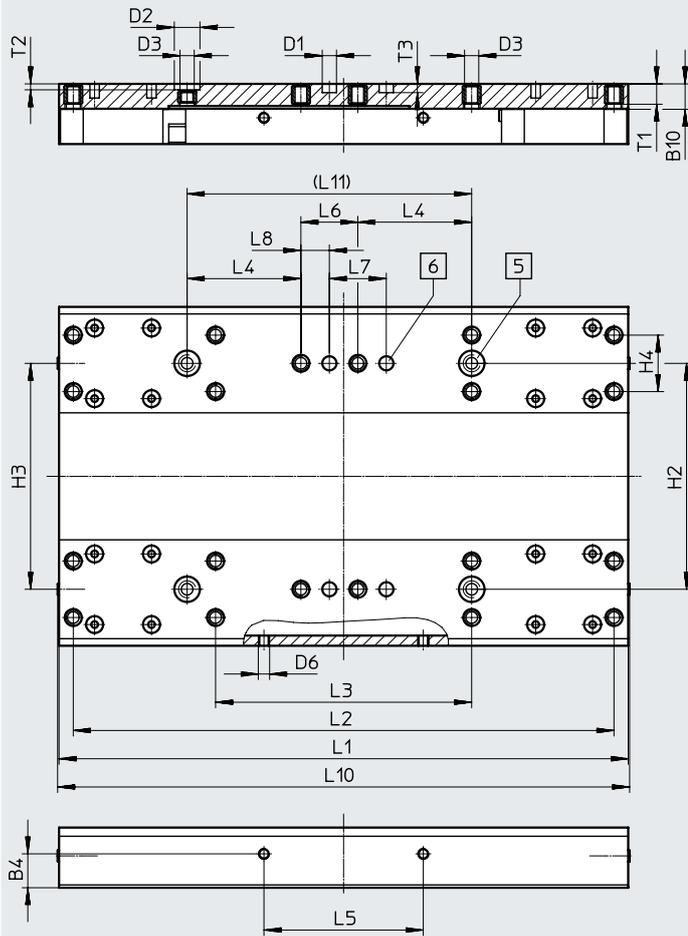
- [1] Sensor slot for proximity switch
- [2] Mounting slot for slot nut

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

Datasheet

GK – Standard slide

Size 125



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

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

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

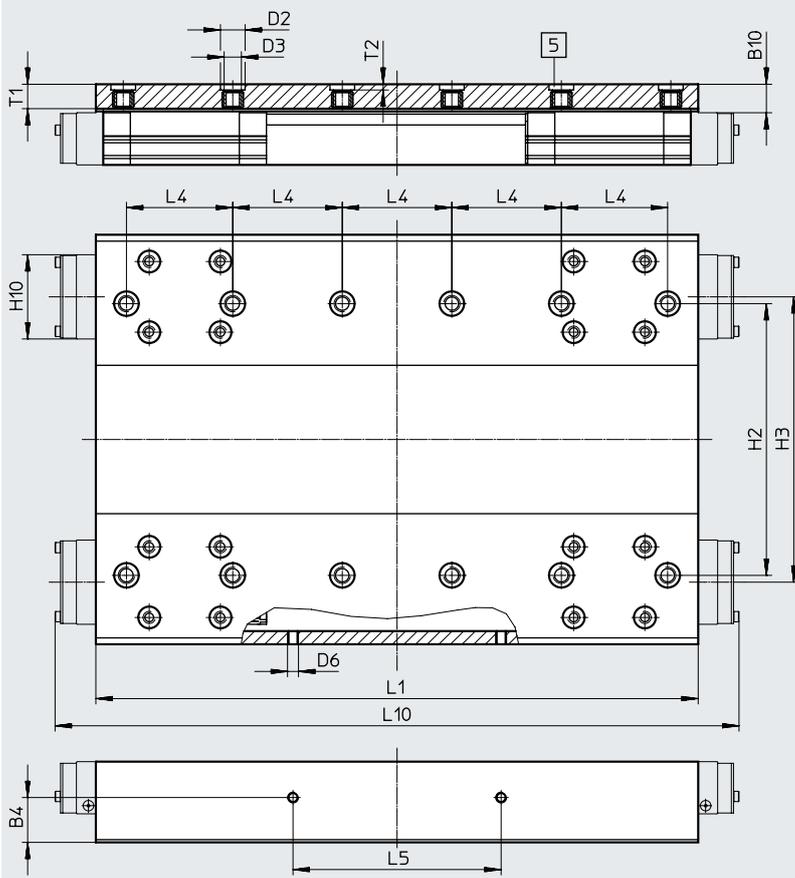
Datasheet

Dimensions

Download CAD data → www.festo.com

GK – Standard slide / GP – Standard slide, protected

Size 160



[5] Drilled hole for centring sleeve ZBH

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

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

* Protected version

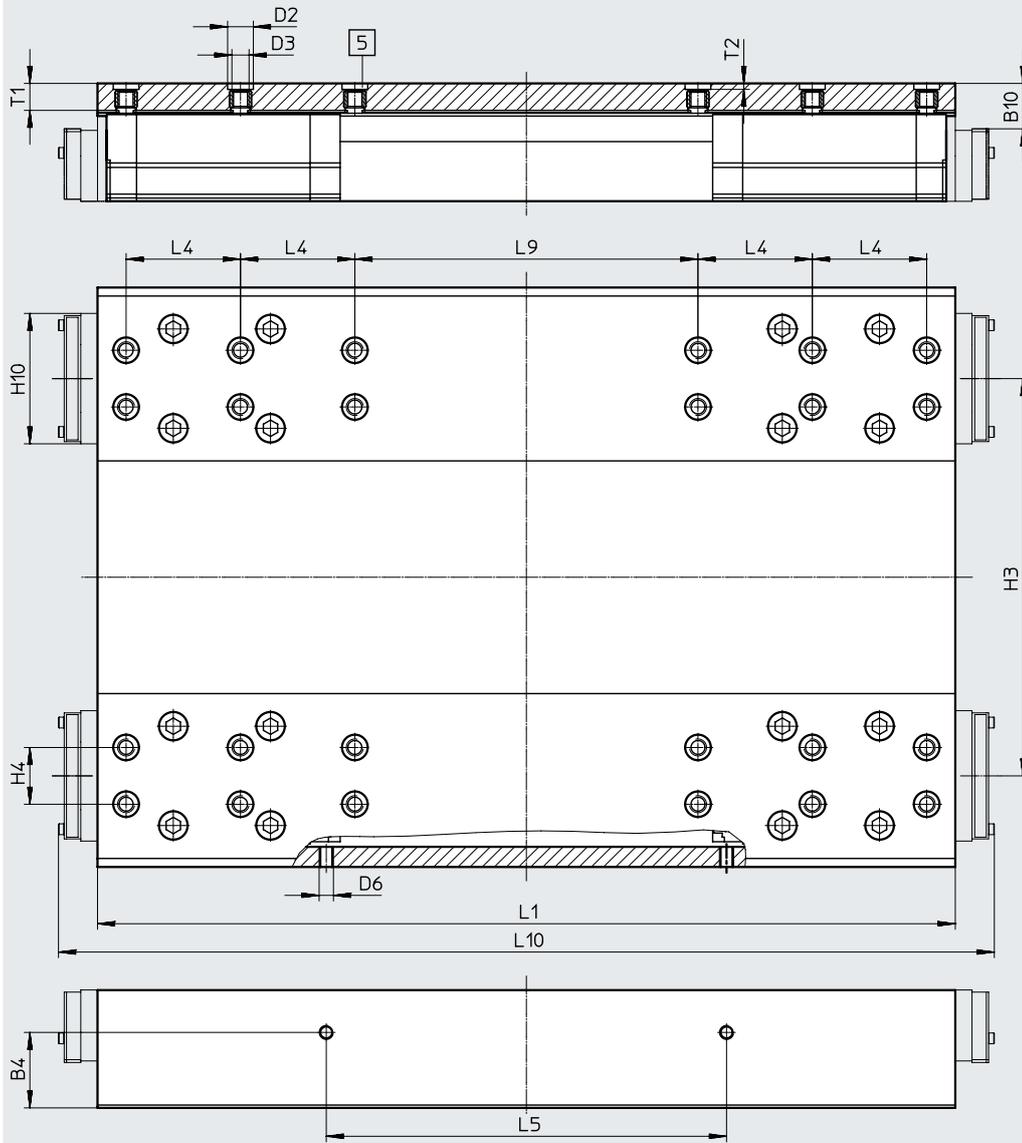
Datasheet

Dimensions

Download CAD data → www.festo.com

GK – Standard slide / GP – Standard slide, protected

Size 220



[5] Drilled hole for centring sleeve ZBH

Size	B4	B10*	D2 ∅ 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

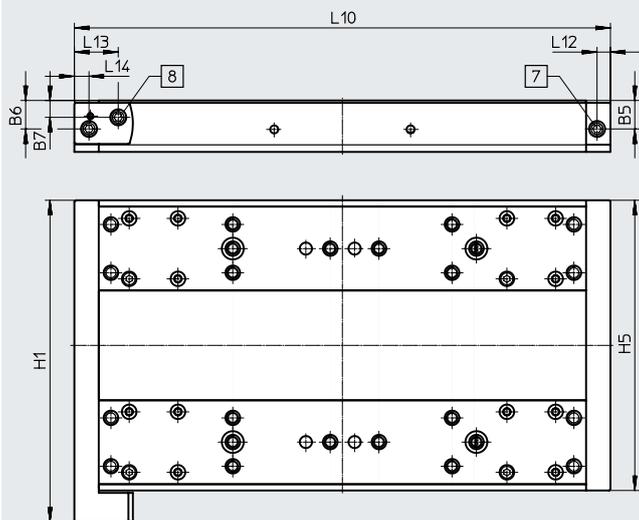
Datasheet

Dimensions

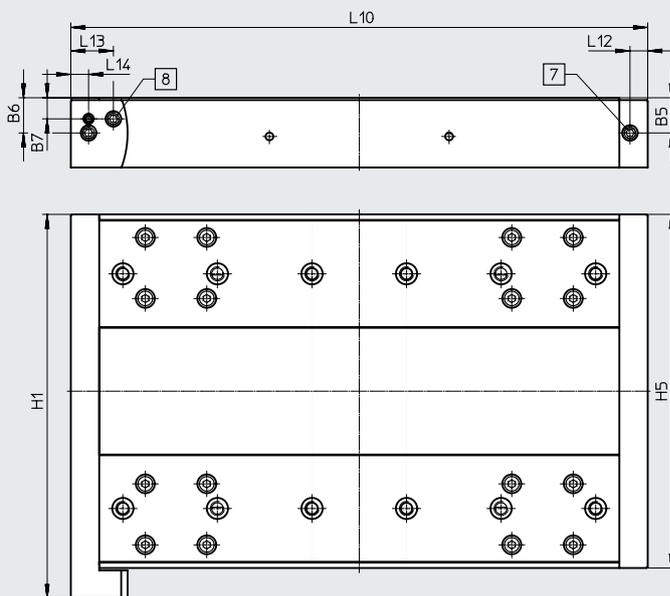
Download CAD data → www.festo.com

GK-C – Standard slide with lubrication adapter

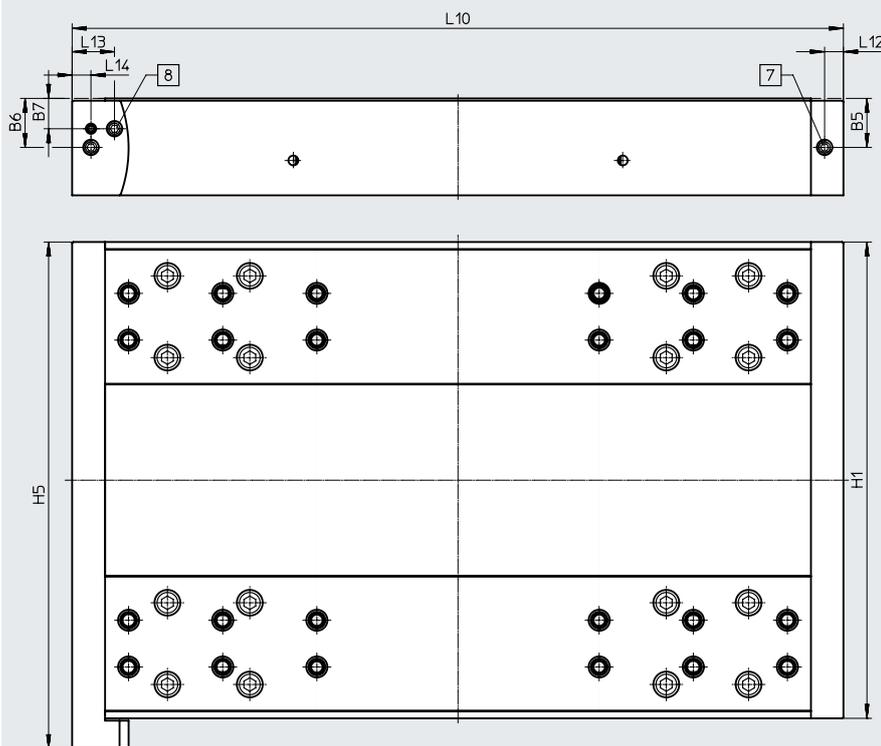
Size 125



Size: 160



Size 220



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

[8] Lubricating hole for threaded connection M6 for the screw, 7 mm deep

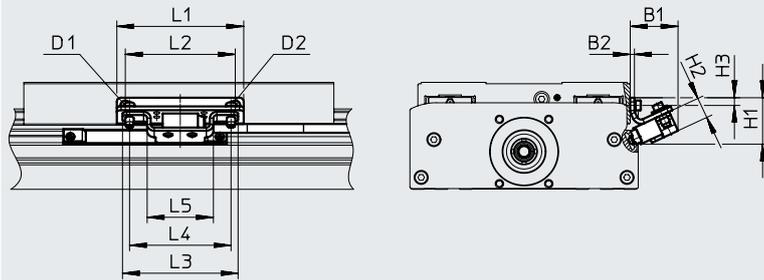
Size	B5	B6	B7	H1	H5	L10	L12	L13	L14
125	11.8	11.8	7	120	133	220	5.5	18	6
160	15	15	9	150.7	163.7	244	7.5	18	7.5
220	21	21	13	204	217	327.6	8	18	8

Datasheet

Dimensions

Download CAD data → www.festo.com

M1/M2 – With incremental displacement encoder



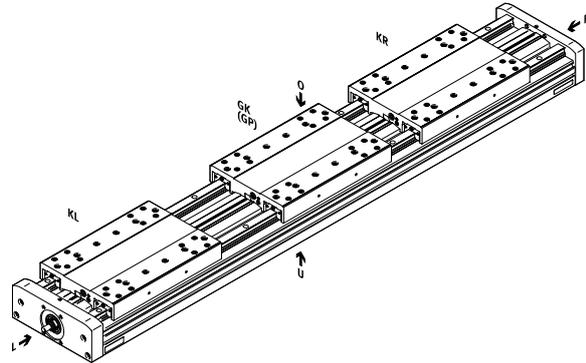
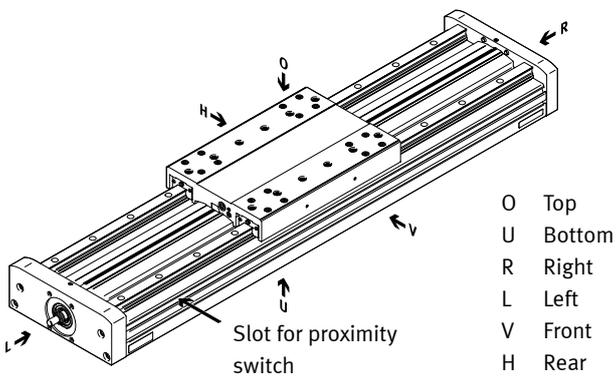
Encoder cable
(Connection to motor controller/
safety system) → page 38

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

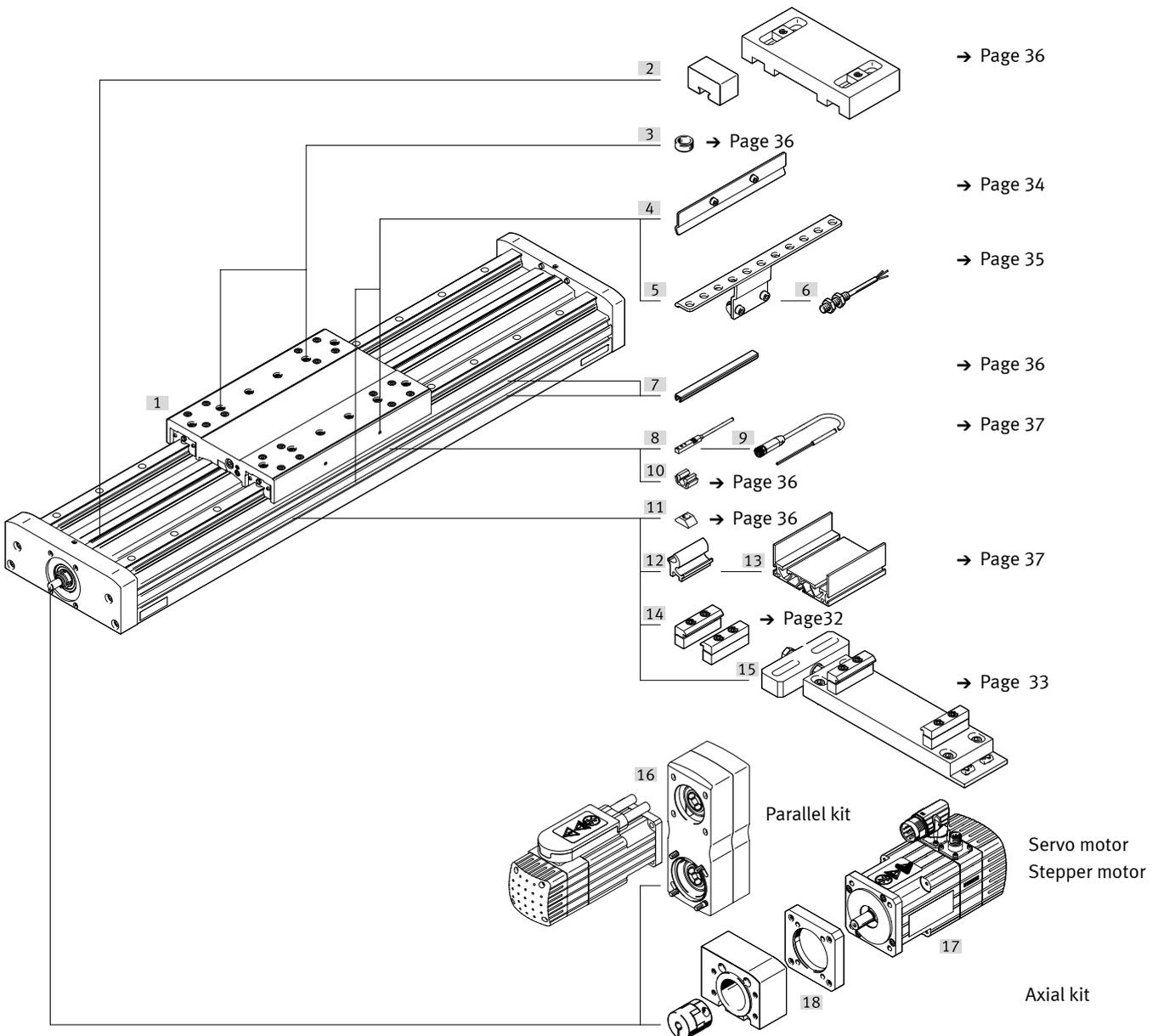
Size	H3	L1	L2	L3	L4	L5
125	5	108.5	56	82	72	47
160	5.5	90	76	82	72	47
220	7.5	170	140	82	72	47

Ordering data – Modular product system

Orientation guide



Accessories



Ordering data – Modular product system

Ordering table							Enter code
Size		125	160	220	Conditions	Code	
Module no.		556819	556820	556821			
Design		Linear axis				EGC	EGC
Guide		Heavy-duty guide				-HD	-HD
Size		125	160	220		-...	-...
Stroke length (without stroke reserve)	Standard [mm]	100, 200, 300, 400, 500, 600, 700, 900	100, 200, 300, 400, 500, 600, 700, 800, 900, 1300, 1400, 1700, 1900	100, 200, 300, 400, 500, 700, 800, 900, 1300, 1400, 1900, 2400	[1]	-...	-...
	Variable [mm]	50 ... 880	50 ... 1880	50 ... 2380			
Function		Ball screw				-BS	-BS
Screw pitch		10	10	10		-10P	
		-	20	-		-20P	
		-	-	25		-25P	
Ball screw support		None					
		With ball screw support			[3]	-S	
		> 605 mm	> 680 mm	> 783 mm			
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	
Lubrication function		None					
		Lubrication adapter			[4]	-C	
Measurement system		None					
		With displacement encoder, incremental, 2.5 µm				-M1	
		With displacement encoder, incremental, 10 µm				-M2	
Displacement encoder attachment position		None					
		Rear				-B	
		Advanced				-F	

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

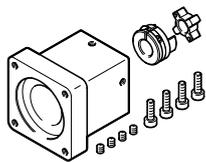
[3] S Only available at or above the specified strokes.

[4] C Not in combination with GP

[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

Accessories

Permitted axis/motor combinations for axial and parallel 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: eamm-a

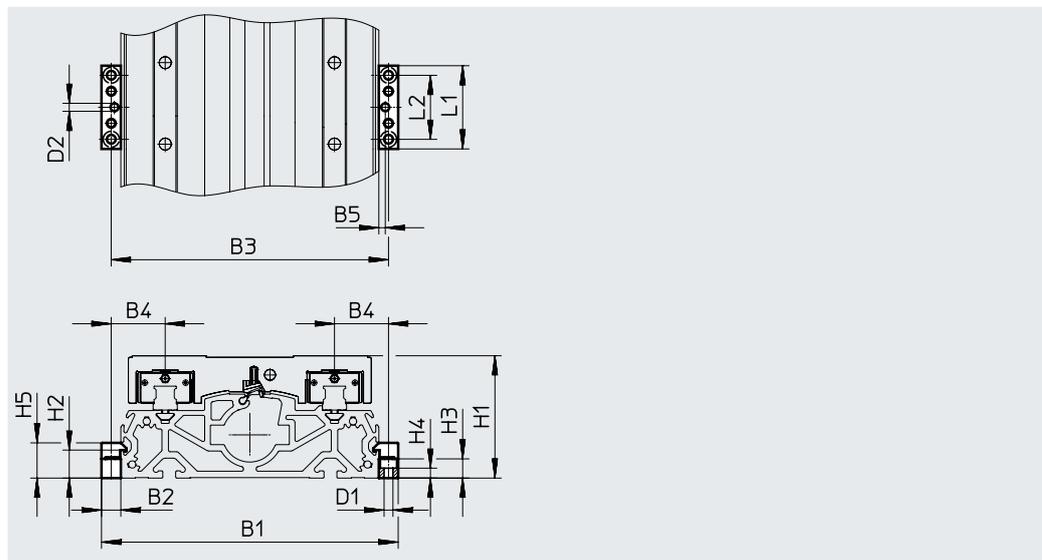
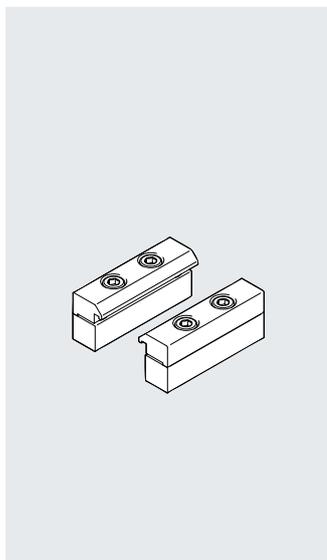
For parallel kits → Internet: eamm-u

Profile mounting MUE

Material:

Anodised aluminium

RoHS-compliant



Dimensions and ordering data

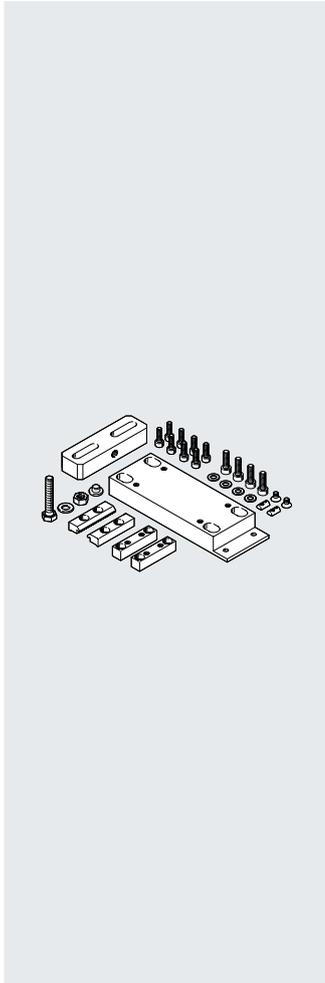
For size	B1	B2	B3	B4	B5	D1 ∅	D2 ∅ H7	H1	H2
125	146	12	134	27	4	5.5	5	64	17.5
160	184	12	172	33.5	4	5.5	5	76.5	17.5
220	258	19	239	49.5	4	9	5	111.5	16

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

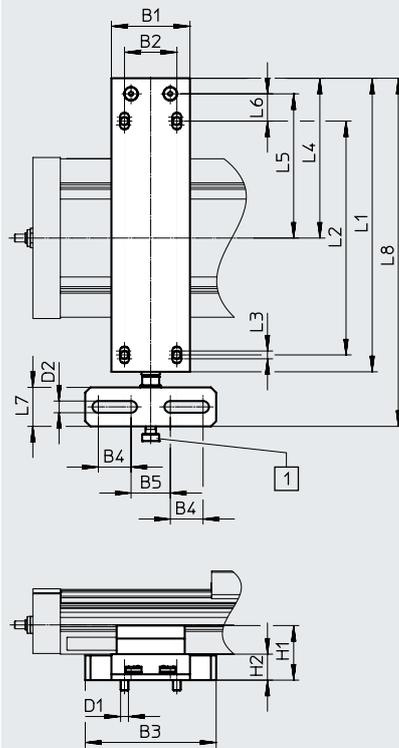
Accessories

Adjusting kit EADC-E16

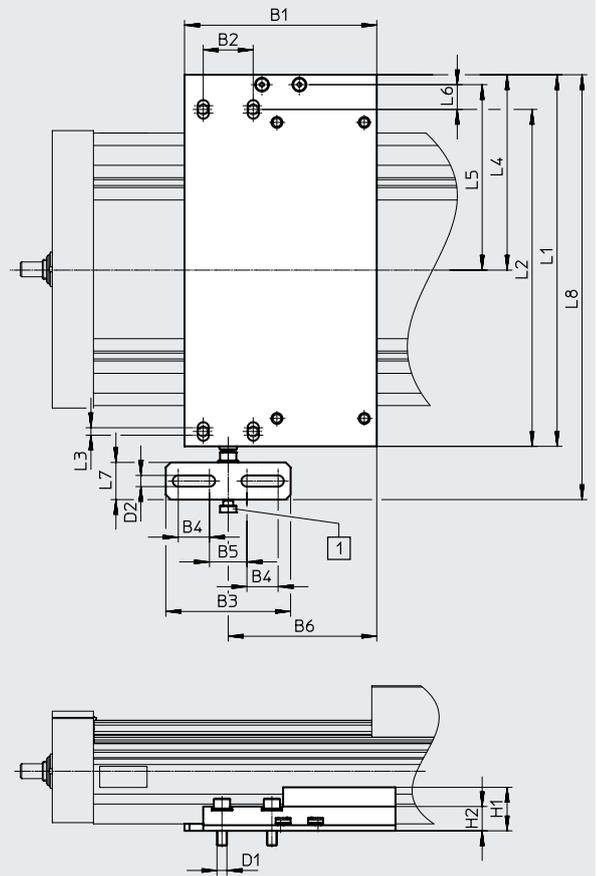
Material:
Wrought aluminium alloy
RoHS-compliant



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

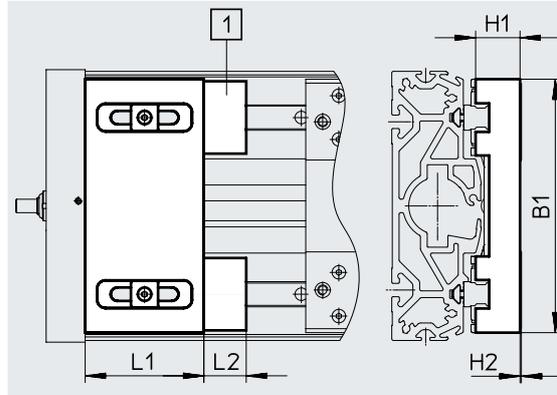
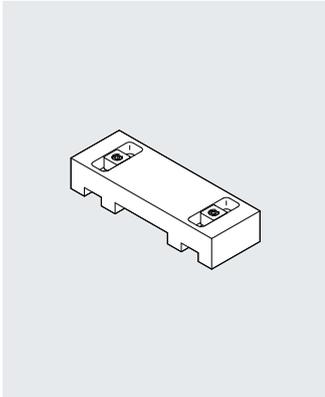
Accessories

Retaining bracket EAYH

Emergency buffer NPE → page 36

Material:
Anodised aluminium
RoHS-compliant

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



[1] Emergency buffer NPE

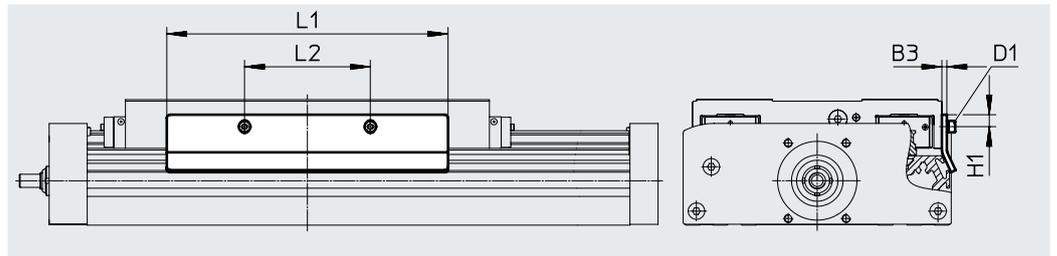
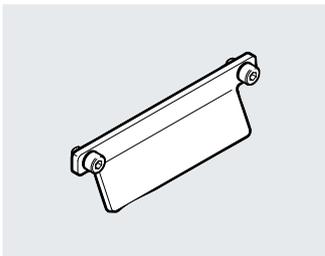
Dimensions and ordering data

For size	B1	H1	H2	L1	L2	Weight [g]	Part no.	Type
125	120	19.8	0.4	50	17	260	1662803	EAYH-L2-125-N
160	150.7	26.2	0.8	70	25	617	1669259	EAYH-L2-160-N
220	204	38.7	0.1	70	30	1195	1669260	EAYH-L2-220-N

Switch lug SF-EGC-HD-1

For sensing via proximity switch SIES-8M

Material:
Galvanised steel
RoHS-compliant



Dimensions and ordering data

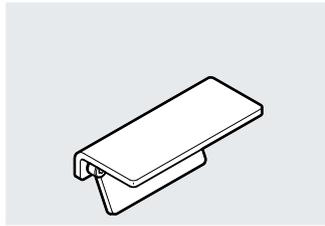
For size	B3	D1	H1	L1	L2	Weight [g]	Part no.	Type
125	2	M4x8	7.8	150	56	70	570027	SF-EGC-HD-1-125
160	3	M4x8	7.3	170	76	160	1645872	SF-EGC-HD-1-160
220	3	M5x10	11.5	250	140	310	1645866	SF-EGC-HD-1-220

Accessories

Switch lug SF-EGC-HD-2

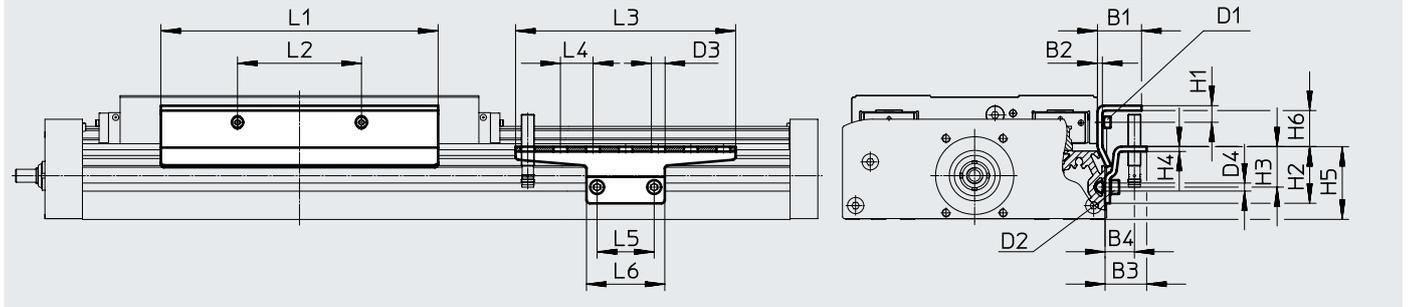
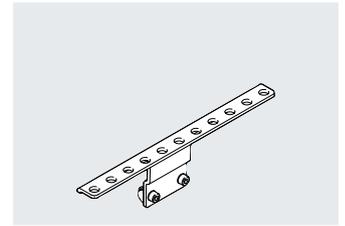
for sensing with proximity sensor
SIEN-M8B or SIES-8M

Material:
Galvanised steel
RoHS-compliant



Sensor bracket HWS-EGC

For proximity switch SIEN-M8B
Material:
Galvanised steel
RoHS-compliant



Dimensions and ordering data

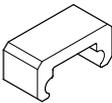
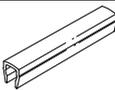
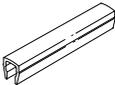
For size	B1	B2	B3	B4	D1	D2	D3 ø	D4 ø	H1	H2
125	24	2	25.5	18	M4x8	M5x8	8.4	5.2	9	35
160	27	3	25.5	18	M4x8	M5x8	8.4	5.2	10.3	35
220	31	3	25.5	18	M5x10	M5x14	8.4	5.2	11.5	65

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 ¹⁾
Emergency buffer NPE					
	125	Use in conjunction with retainer EAYH	1662475	NPE-125	1
	160		1672593	NPE-160	
	220		★ 1672598	NPE-220	
Slot nut NST					
	125, 160 ²⁾	For mounting slot	150914	NST-5-M5	1
			8047843	NST-5-M5-10	10
			8047878	NST-5-M5-50	50
	160 ³⁾ , 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 ²⁾	For mounting slot Every 0.5 m	151681	ABP-5	2
	160 ³⁾ , 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

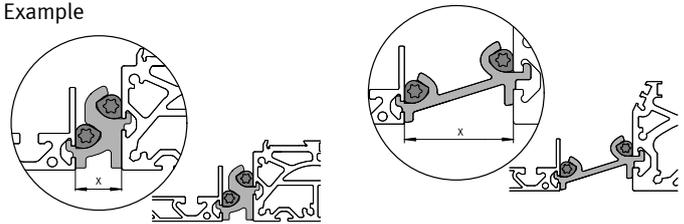
Accessories

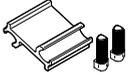
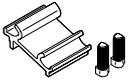
Mounting options between axis and support profile

Depending on the adapter kit, the spacing between the axis and the support profile is:
 $x = 20 \text{ mm}$ or 50 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 ¹⁾
Adapter kit DHAM					
	160	<ul style="list-style-type: none"> For mounting the support profile on the axis Spacing between axis and profile is 20 mm 	562241	DHAM-ME-N1-CL	1
	220		562242	DHAM-ME-N2-CL	
	125, 160	<ul style="list-style-type: none"> For mounting the support profile on the axis Spacing between axis and profile is 50 mm 	574560	DHAM-ME-N1-50-CL	
	220		574561	DHAM-ME-N2-50-CL	
Support profile HMIA					
	125 ... 220	<ul style="list-style-type: none"> For guiding an energy chain 	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 – Näherungsschalter Proximity switch M8 (round design), inductive ¹⁾							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	8078223	NEBA-M8G3-U-2.5-N-LE3
					5.0	8078224	NEBA-M8G3-U-5-N-LE3
	M8x1 A-coded to EN 61076-2-104	Angled	Open end	3	2.5	8078230	NEBA-M8W3-U-2.5-N-LE3
					5.0	8078231	NEBA-M8W3-U-5-N-LE3

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	1599105	NEBM-M12G8-E-5-S1G9-V3	
			10	1599106	NEBM-M12G8-E-10-S1G9-V3	
			15	1599107	NEBM-M12G8-E-15-S1G9-V3	
			X ¹⁾	1599108	NEBM-M12G8-E-...-S1G9-V3	

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)	8106112	NEFM-S1G9-K-0.5-R3G8