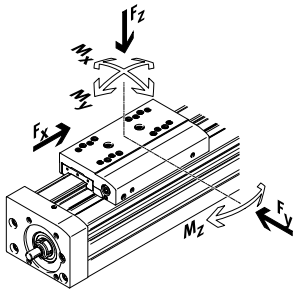
Ball screw axes EGC-HD-BS, with heavy-duty guide

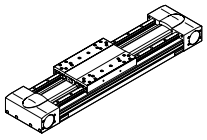
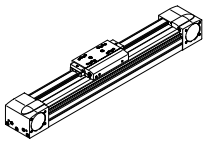
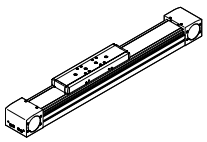
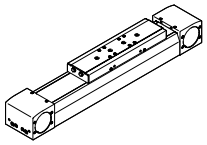
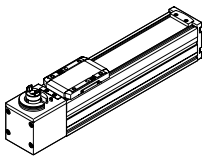
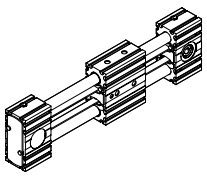
FESTO

Selection aid

Overview of toothed belt and ball screw axes

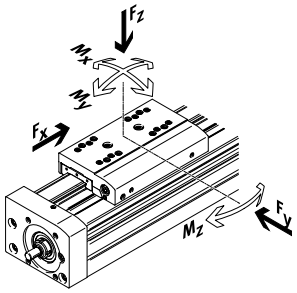
Toothed belt axes	Ball screw axes	Coordinate system
• Speeds of up to 10 m/s • Acceleration of up to 50 m/s² • Repetition accuracy of up to ±0.08 mm • Strokes of up to 8500 mm (longer strokes on request) • Flexible motor mountings	• Speeds of up to 2 m/s • Acceleration of up to 20 m/s² • Repetition accuracy of up to ±0.003 mm • Strokes up to 3000 mm	

Toothed belt axes

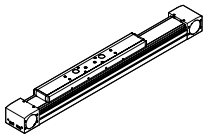
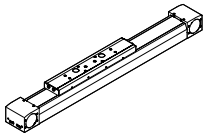
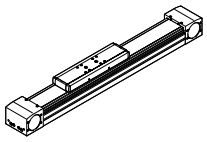
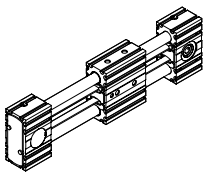
Type	F_x [N]	v [m/s]	Mx [Nm]	My [Nm]	Mz [Nm]	Characteristics
Heavy-duty recirculating ball bearing guide						
EGC-HD-TB						
	450 1000 1800	3 5 5	140 300 900	275 500 1450	275 500 1450	• Flat drive unit with rigid, closed profile • Precision DUO guide rail with high load capacity • Ideal as a base axis 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	• 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	• 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	• 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	• 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	• 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

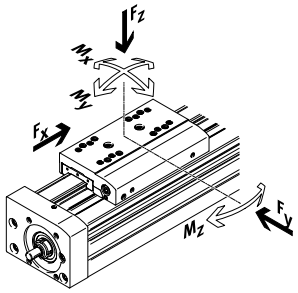
Toothed belt axes	Ball screw axes	Coordinate system
• Speeds of up to 10 m/s • Acceleration of up to 50 m/s² • Repetition accuracy of up to ±0.08 mm • Strokes of up to 8500 mm (longer strokes on request) • Flexible motor mountings	• Speeds of up to 2 m/s • Acceleration of up to 20 m/s² • Repetition accuracy of up to ±0.003 mm • Strokes up to 3000 mm	

Toothed belt axes

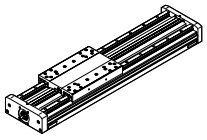
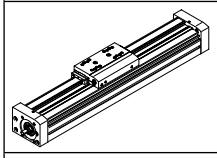
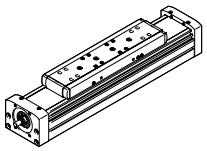
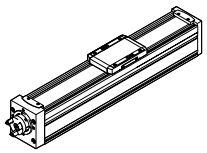
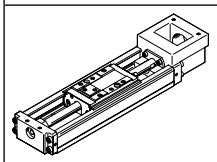
Type	F_x [N]	v [m/s]	Mx [Nm]	My [Nm]	Mz [Nm]	Characteristics
Roller bearing guide						
ELGA-TB-RF						
	350 800 1300	10 10 10	11 30 100	40 180 640	40 180 640	• Heavy-duty roller bearing guide • Guide and toothed belt protected by cover strip • Speeds of up to 10 m/s • Lower weight than axes with guide rails
ELGA-TB-RF-F1						
	260 600 1000	10 10 10	8.8 24 80	32 144 512	32 144 512	• 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	• 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	• 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	Ball screw axes	Coordinate system
• 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	• 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	

Ball screw axes

Type	F_x [N]	v [m/s]	Mx [Nm]	My [Nm]	Mz [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	• 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	• 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	• 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	• 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	• Ball screw axes with maximum precision, compactness and rigidity • Recirculating ball bearing guide and ball screw without caged ball bearings • Standard designs in stock

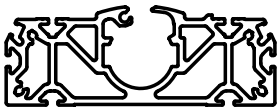
Key features

At a glance

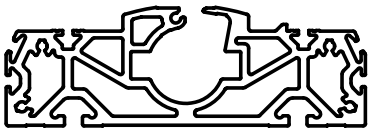
- New heavy-duty design for:
  - Maximum loads and torques
  - High feed forces and speeds
  - Long service life
- Precision DUO guide rail with high load capacity
- Ideal as a basic axis for linear gantries and cantilever axes
- The ball screw axis with integrated ball screw impresses with its high 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

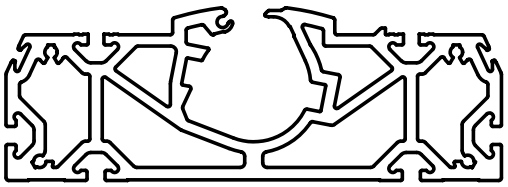
EGC-HD-125



EGC-HD-160

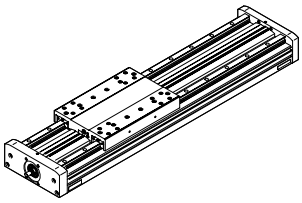


EGC-HD-220

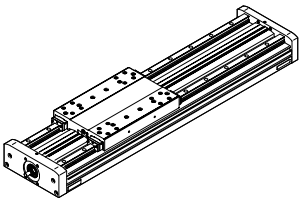


Slide variants

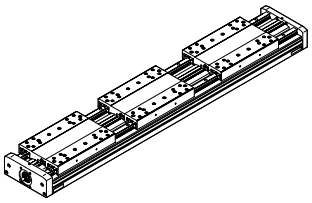
Standard slide



Standard slide, protected



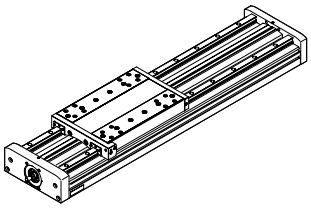
With additional slide



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

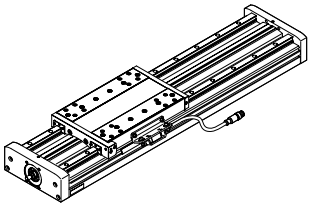
Guide options → Page 22

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

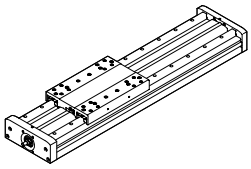


The position of the slide can be sensed directly when using the incremental displacement encoder. This means that all elasticities of the drivetrain can be detected and corrected by the motor controller.

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	Speed	Repetition accuracy	Max. feed force	Guide characteristics				
						Forces and torques				
						Fy	Fz	Mx	My	Mz
		[mm]	[m/s]	[mm]	[N]	[N]	[N]	[Nm]	[Nm]	[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

Note

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

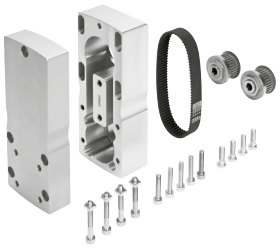
Servo drives

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

Motor mounting kit

Axial kit

Parallel kit



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	

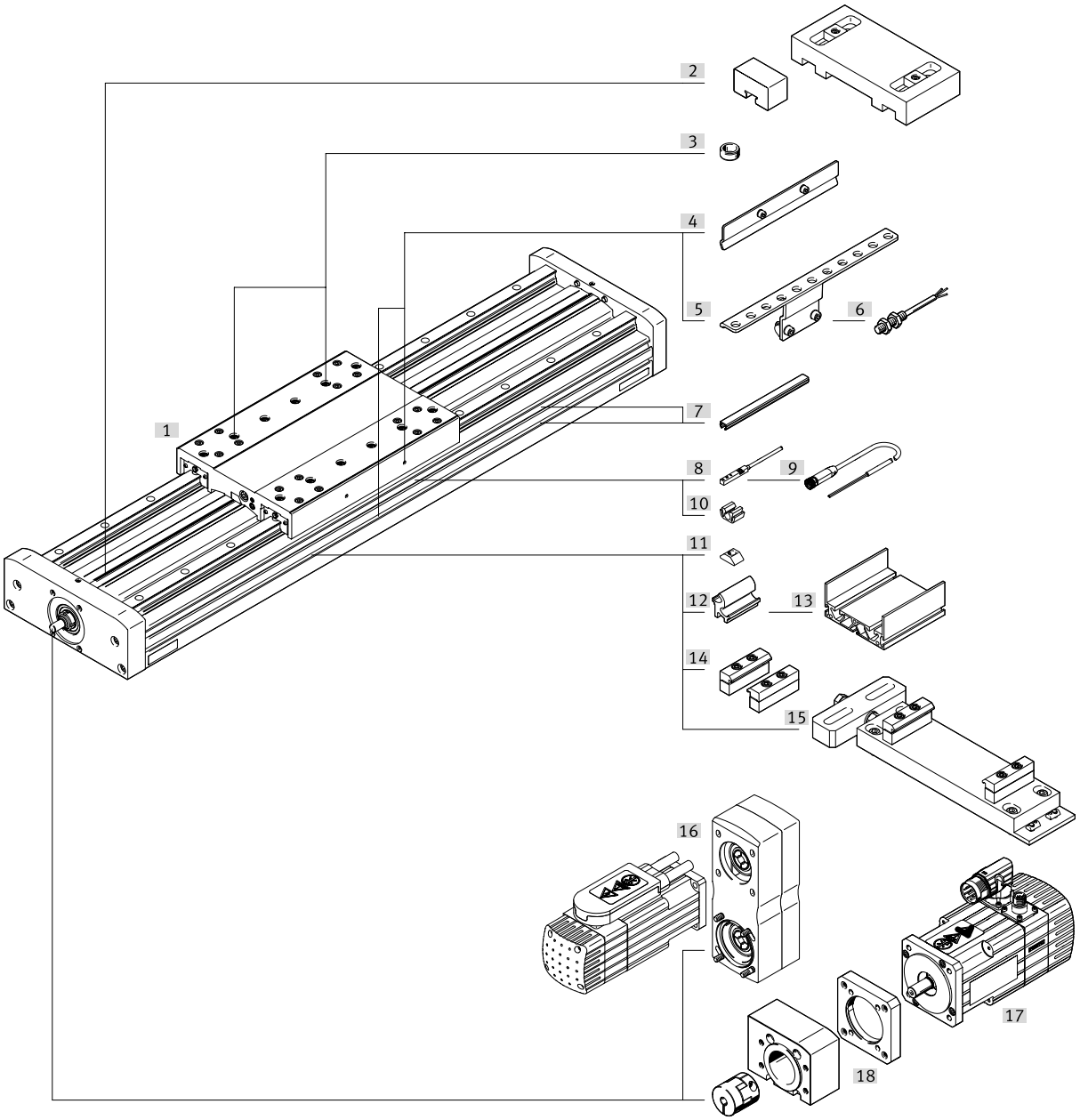
010	Additional slide, right	
	None	
KR	Additional slide standard, right	

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

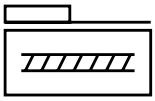


Peripherals overview

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	• For centring loads and attachments on the slide • Included in the scope of delivery: – 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	• Inductive proximity switch, round design	38
[7]	Slot cover ABP	• For protection against contamination	36
[8]	Proximity switch, T-slot SIES	• 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)	eamm-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)	eamm-a

Datasheet

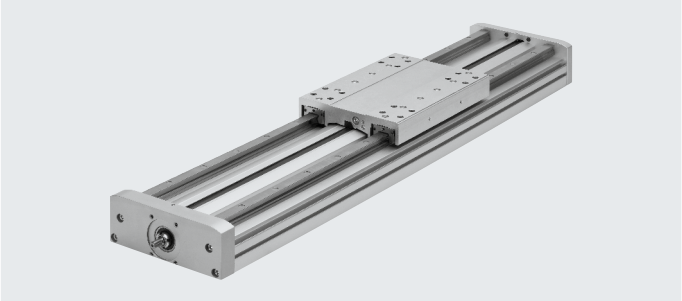


Size
125 ... 220

Stroke length
0 ... 2400 mm

www.festo.com

Repair service



General technical data						
Size		125	160		220	
Screw pitch	[mm/rev]	10	10	20	10	25
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	1.5	1.5
EGC-...-S	[Nm]	0.3	0.5	0.5	1.5	1.5
	[m/s]	0.05	0.1	0.1	0.2	0.2
No-load torque at max. travel speed						
EGC-...-	[Nm]	0.45	0.75	0.75	2.25	2.25
EGC-...-S	[Nm]	0.45	0.75	0.75	2.25	2.25
	[m/s]	0.5	0.5	1.0	0.6	1.5
Max. radial force[2]	[N]	220	250	250	500	500
Max. rotational speed[3]	[rpm]	3000	3000	3000	3600	3600
Max. acceleration	[m/s²]	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

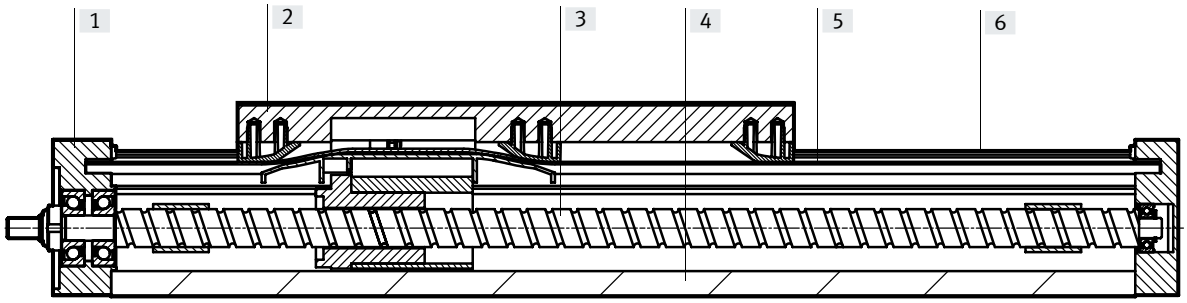
Mass moment of inertia						
Size		125	160		220	
Screw pitch	[mm/rev]	10	10	20	10	25
J_O	[kg mm^2]	6.06	13.94	29.74	106.78	184.26
J_H per metre stroke	[kg mm^2/m]	14.20	34.59	34.59	275.64	275.64
J_L per kg payload	[kg mm^2/Kg]	2.53	2.53	10.13	2.53	15.83
J_W Additional slide	[kg mm^2]	2.25	4.69	18.77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

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

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

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			Dimensions → page 29
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	

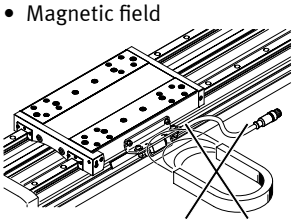
Operating and environmental conditions – Displacement encoder		
Ambient temperature	[°C]	–10 ... +70
Degree of protection		IP64
CE marking (see declaration of conformity)		To EU EMC Directive[1])

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.

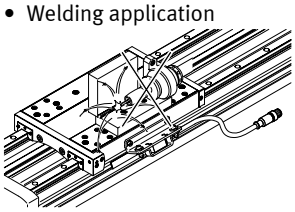
Application note

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



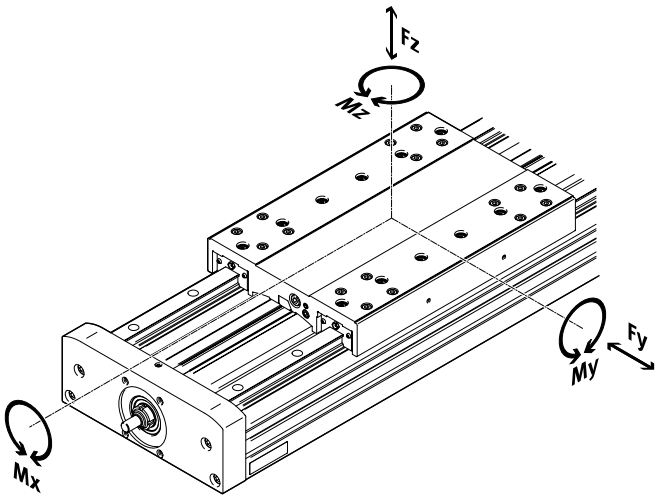
- Welding application



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		
$Fy_{max.}$	[N]	3650	5600	13000
Fz_{max}	[N]	3650	5600	13000
$Mx_{max.}$	[Nm]	140	300	900
$My_{max.}$	[Nm]	275	500	1450
$Mz_{max.}$	[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 fv ≤ 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

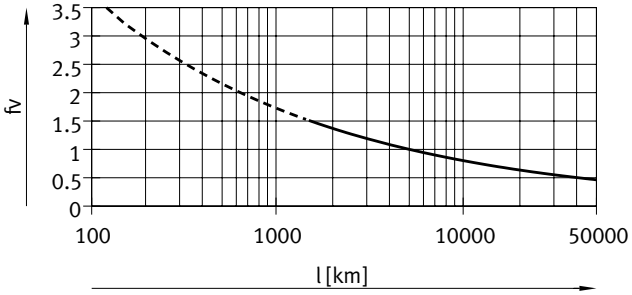
Service life of the guide

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 fv against the service life.

These values are only theoretical. You must consult your local Festo contact for a load comparison factor fv 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 Mz and My 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
$Fy_{max.}$	[N]	13447	20631	47892
$Fz_{max.}$	[N]	13447	20631	47892
$Mx_{max.}$	[Nm]	516	1105	3316
$My_{max.}$	[Nm]	1013	1842	5342
$Mz_{max.}$	[Nm]	1013	1842	5342

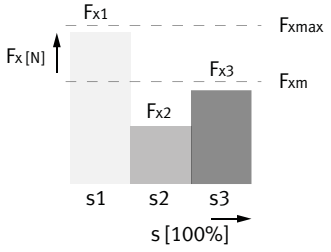
Datasheet

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

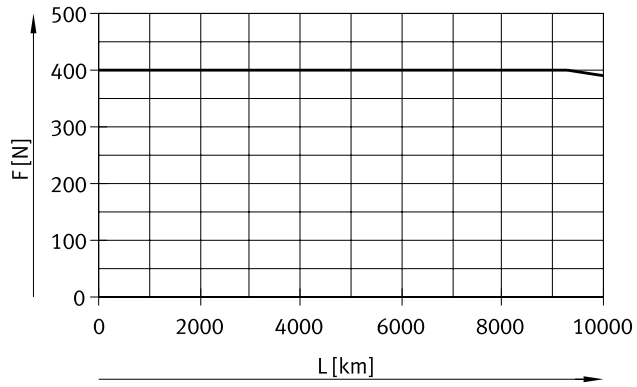
$$F_{xm} = \sqrt[3]{\frac{F_{x1}^3 \cdot s_1 + \ ... \ + F_n^3 \cdot s_n}{s_1 + \ ... \ + s_n}}$$



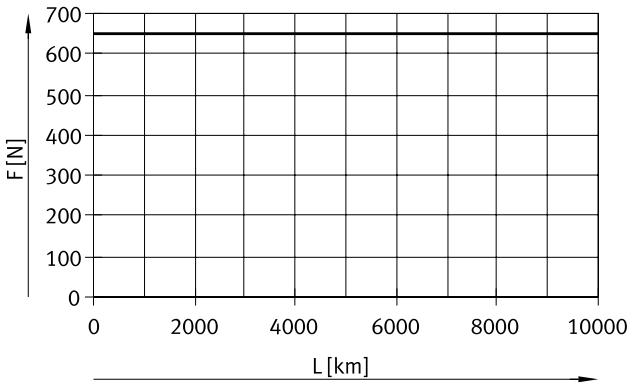
F_{xm} = Mean feed force
$F_{x1/n}$ = Feed force of section
$s_{1/n}$ = Part of movement cycle that is travel

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

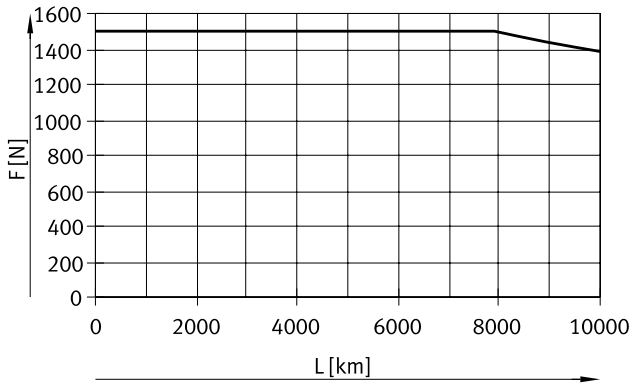


Size 160



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

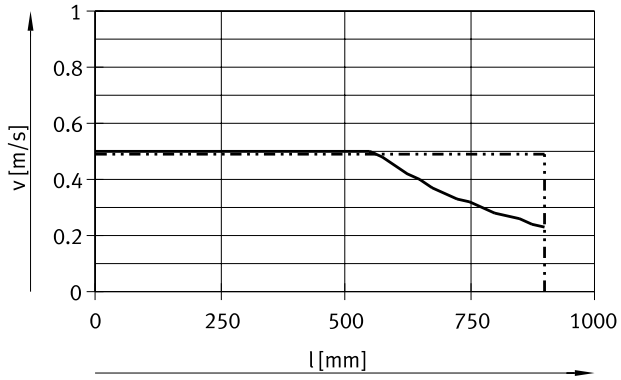
Load[1)]	Operating coefficient f_B	Application example
None	1.0 ... 1.2	Measuring machine
Light	1.2 ... 1.4	Handling, robot technology
Medium	1.4 ... 1.6	Press-in operations
High	1.6 ... 2.0	Construction, agriculture

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

Datasheet

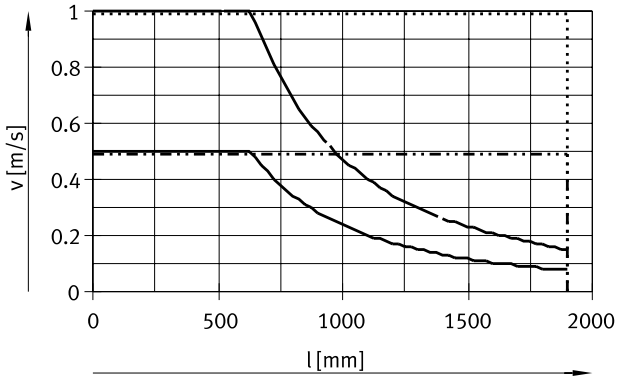
Speed v as a function of working stroke l

Size 125



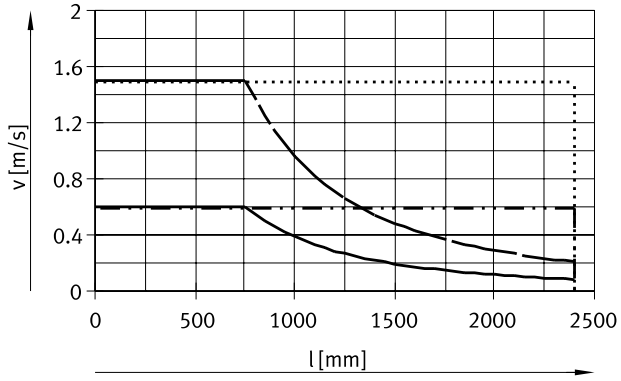
EGC-HD-10P without ball screw support
EGC-HD-10P with ball screw support

Size 160



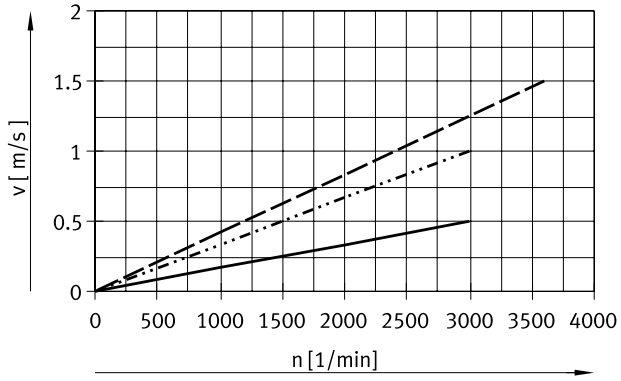
EGC-HD-10P without ball screw support
EGC-HD-10P with ball screw support
EGC-HD-20P without ball screw support
EGC-HD-20P with ball screw support

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

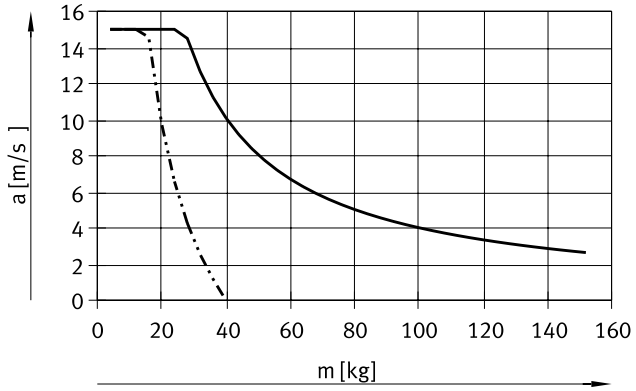
Rotational speed is stroke-dependent.
Note the maximum rotational speed.

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

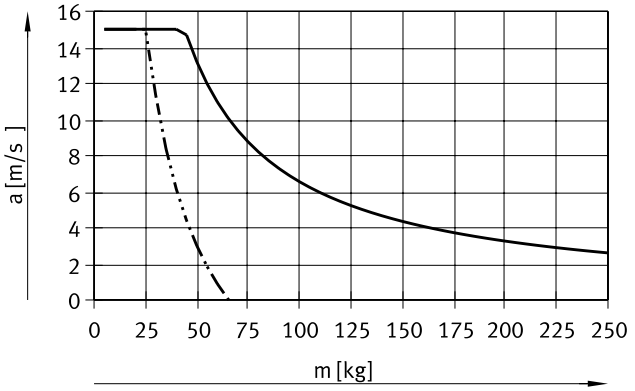
Datasheet

Max. acceleration a as a function of payload m

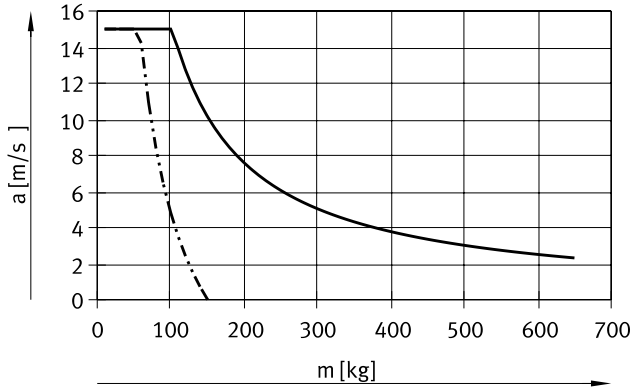
Size 125



Size: 160



Size 220

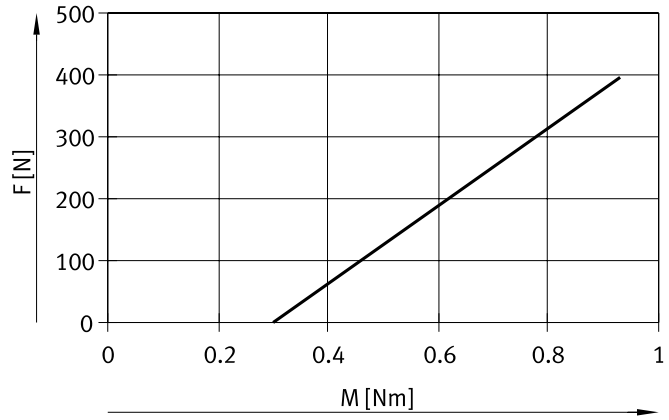


Horizontal mounting position
Vertical mounting position

Datasheet

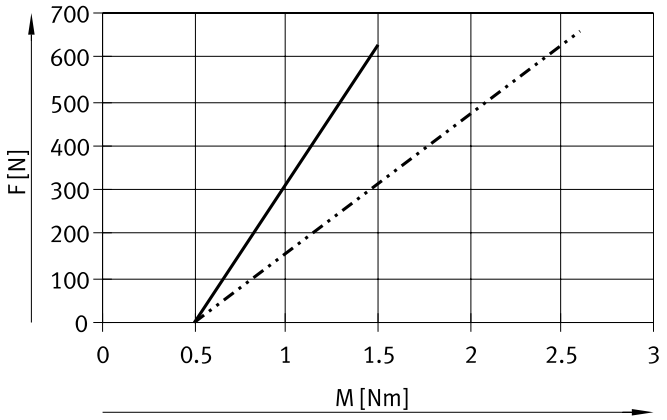
Theoretical feed force F as a function of the input torque M

Size: 125



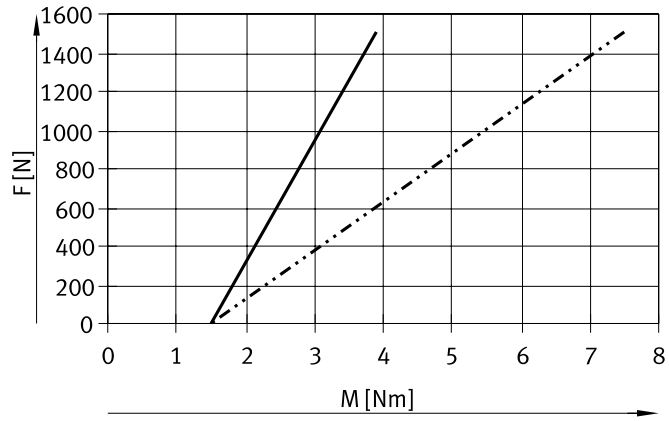
EGC-HD-10P

Size 160



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

Size 220



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

Datasheet

Stroke reserve

Stroke length Stroke reserve

The selected stroke corresponds in principle to the required working stroke. The variant GK does 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.

If a safety distance (similar to GK) between the drive cover and slide is required for the variant GP, this can be defined using the modular product system via the "stroke reserve" feature. 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-220-500-BS-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 (per end position)	[mm]	12.5	15.5	20

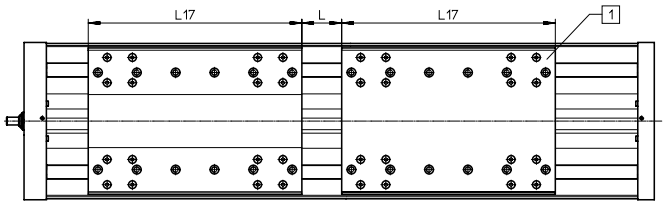
Working stroke reduction

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

- In the case of a ball screw axis with additional slide, the working stroke is reduced by the length of the additional slide L17 and the distance between the two 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

L17 = Slide length
L17 = Additional slide length

L = Distance between the two slides
[1] Additional slide



Example:
Typ: EGC-HD-220-1000-BS-...-GP-KL/KR
L = 100 mm

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

Dimensions – Additional slide

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

Working stroke reduction per side

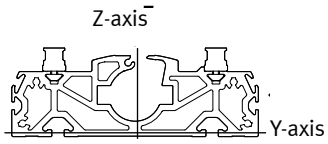
With integrated emergency buffer NPE with retaining bracket EAYH-L2

- With a ball screw axis, the working stroke is reduced by the total dimension of the emergency buffer and holder.

Size		125	160	220
With emergency buffer	[mm]	65	93	98

Datasheet

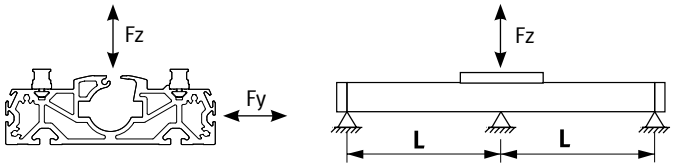
Second moment of area



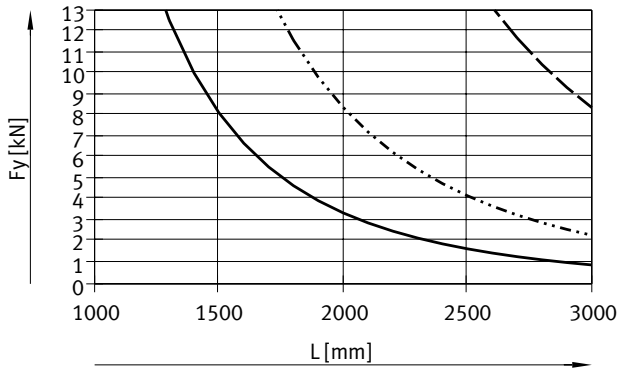
Size		125	160	220
Iy	[mm⁴]	7.15x10⁵	13.5x10⁵	55.7x10⁵
Iz	[mm⁴]	41.1x10⁵	101x10⁵	352x10⁵

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

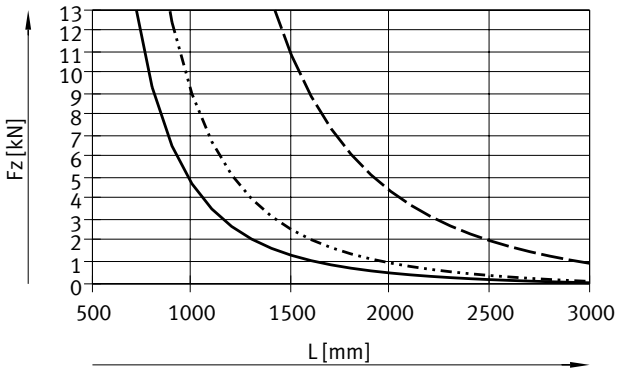
The axis may need to be supported in order to limit deflection in the case of long strokes.
The following graphs can be used to determine the maximum permissible support spacing l as a function of force F acting on the axis.
The deflection is f = 0.5 mm.



Force Fy



Force Fz



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

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

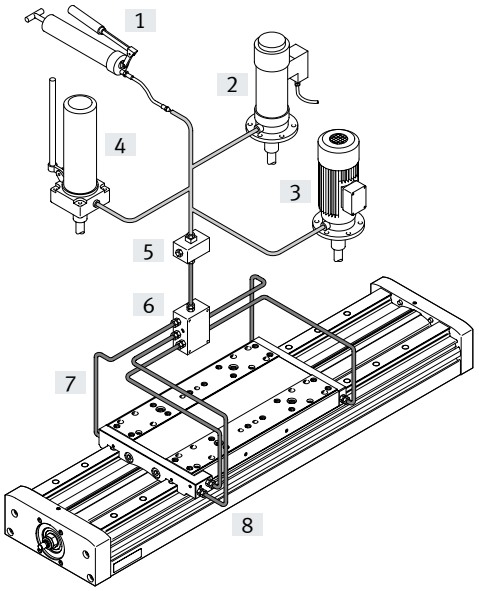
Slide dimensions
→ page 28

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)

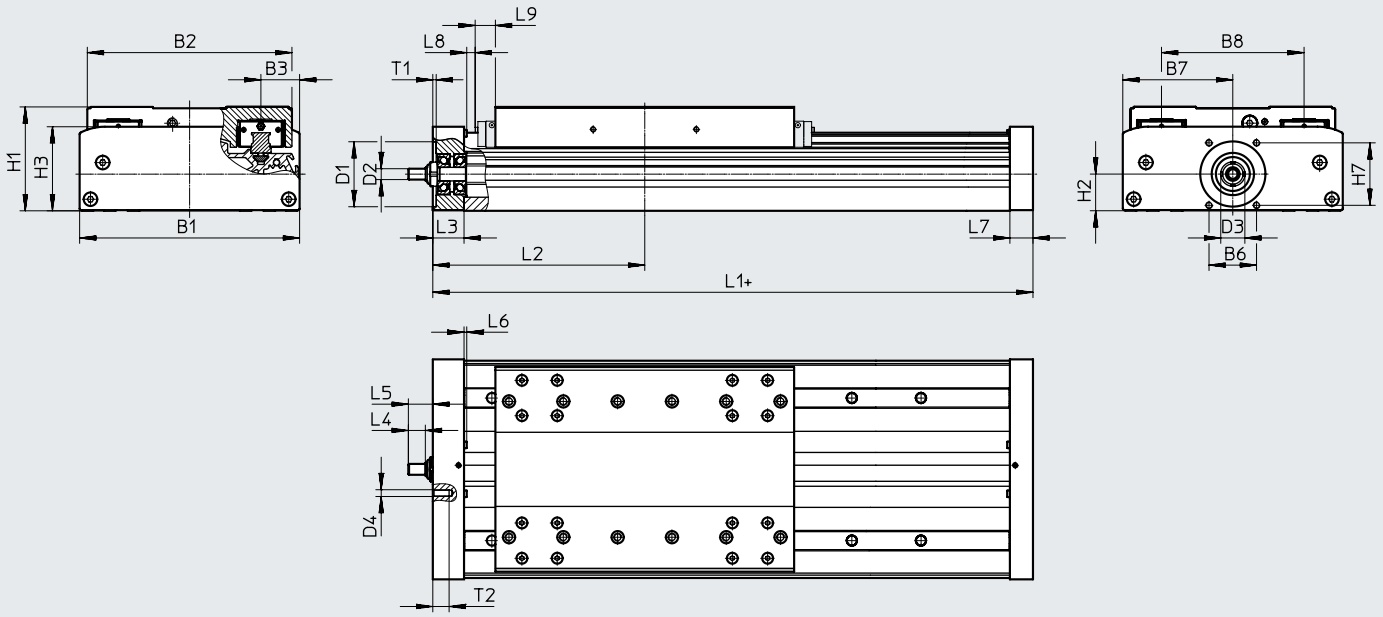
Festo recommends these companies because they can supply all the necessary components.



[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 ø H7	D2 ø 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

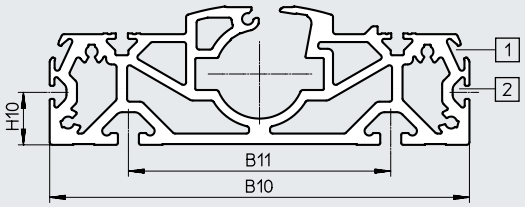
Size	L5	L6	L7	L8	L9	T1	T2
125	14	1.8	16	2	–	2.5	12
160	18	2	17	0.55	14.9	2.5	12
220	25.5	2	30	2	18	3	15

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



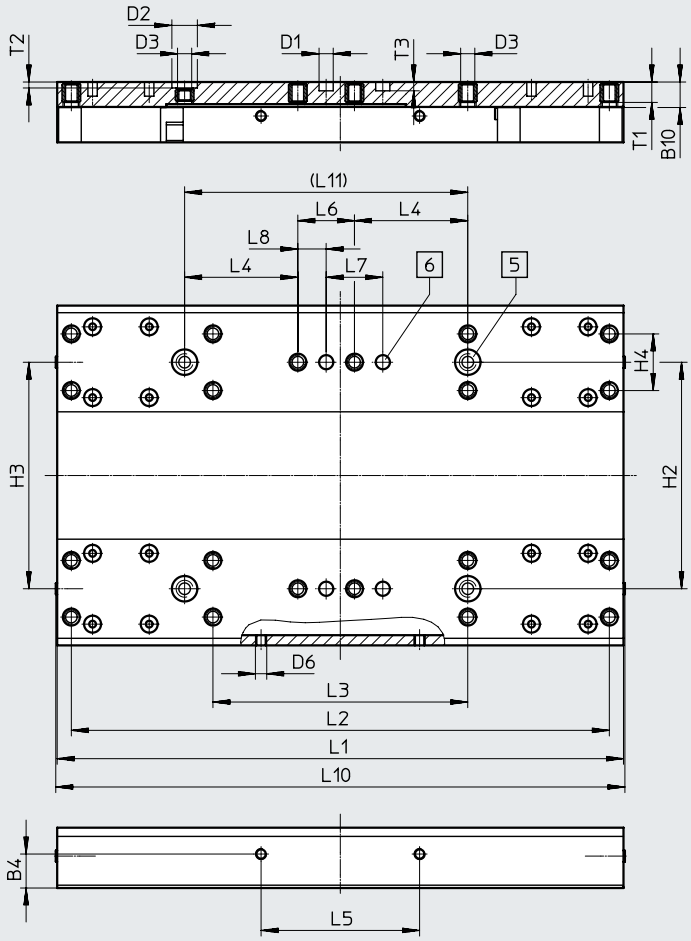
[1] Sensor slot for proximity switch
[2] Mounting slot for slot nut

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	D2	D3	D6	H2	H3	H4	L1	L2	L3
	±0.1		ø H7	ø H7			±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

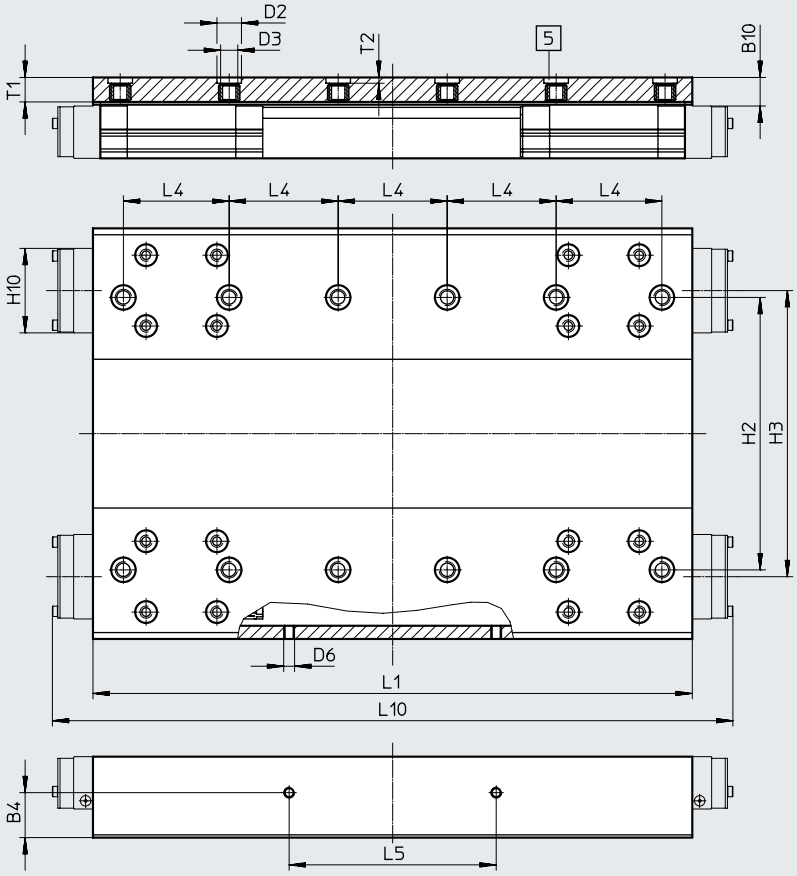
Size	L4	L5	L6	L7	L8	L10	L11	T1	T2	T3
	±0.1	±0.2	±0.1	±0.03	±0.1		±0.03		+0.1	+0.1
125	40	56	20	20	10	202	100	7.8	2.1	3.1

Datasheet

Dimensions Download CAD data ➔ www.festo.com

GK – Standard slide / GP – Standard slide, protected

Size 160



[5] Drilled hole for centring sleeve ZBH

Size	B4 ±0.1	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 ±0.1	L4 ±0.03	L5 ±0.1	L10*	T1	T2 +0.1
160	31	220	40	76	250	9	2.1

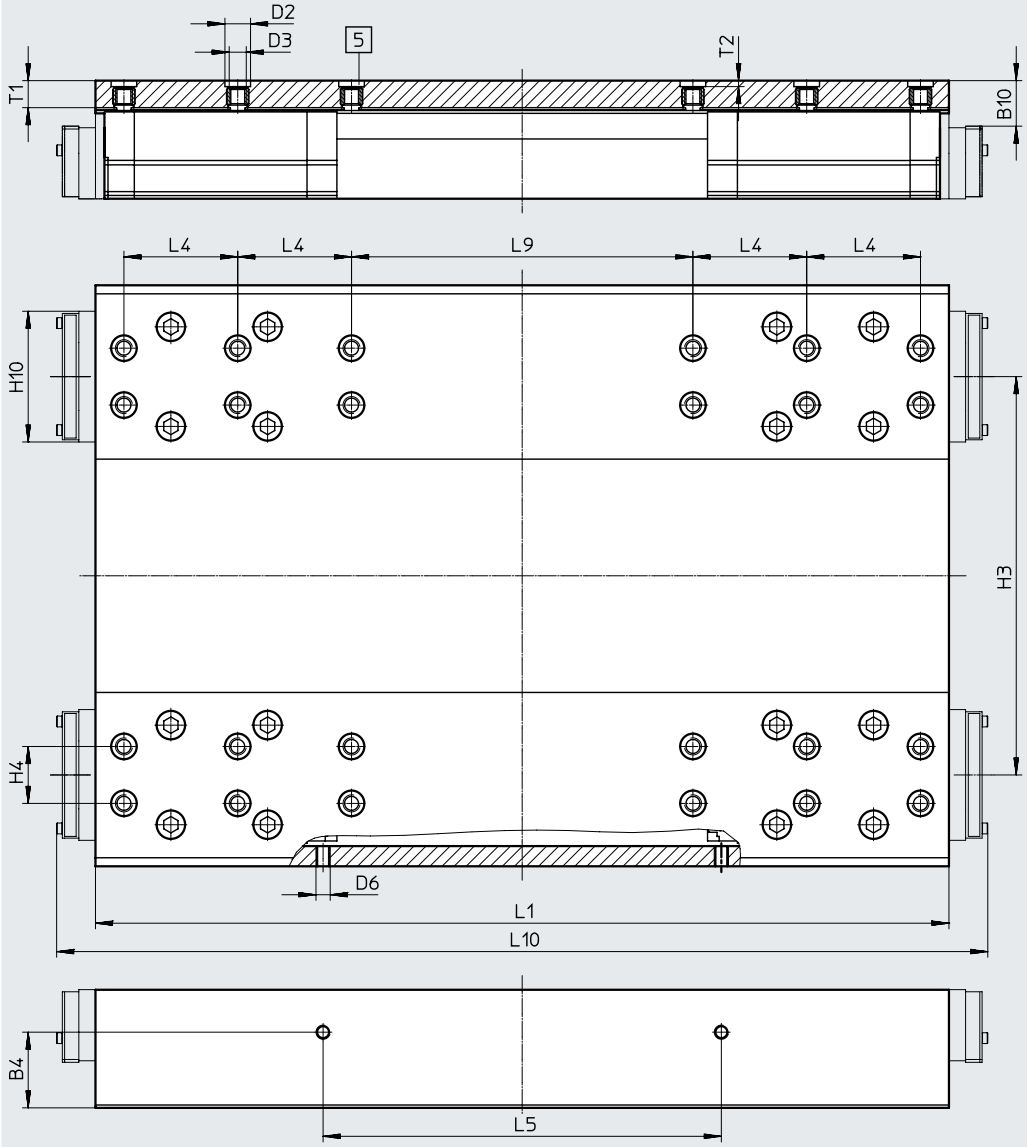
* Protected version

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 ø	D3	D6	H3	H4	H10*
	±0.1		H7			±0.05	±0.03	
220	26.6	16	9	M6	M5	140	20	45.95

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

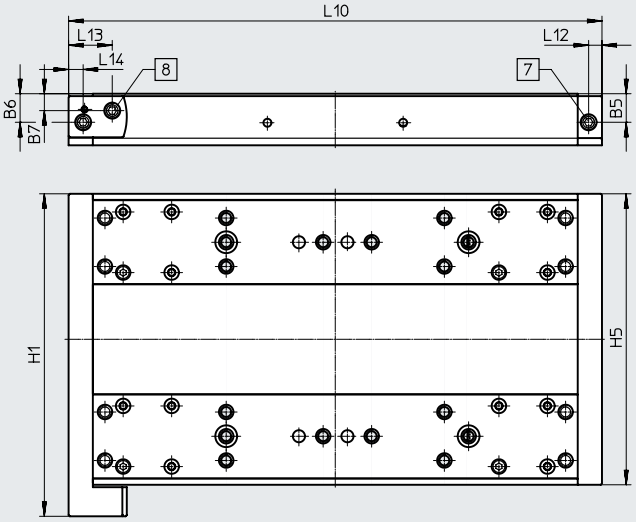
* Protected version

Datasheet

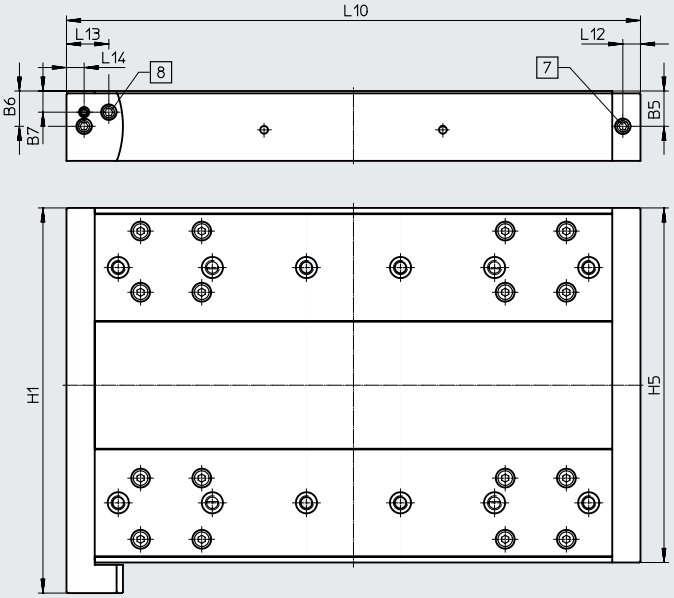
Dimensions Download CAD data ➔ www.festo.com

GK-C – Standard slide with lubrication adapter

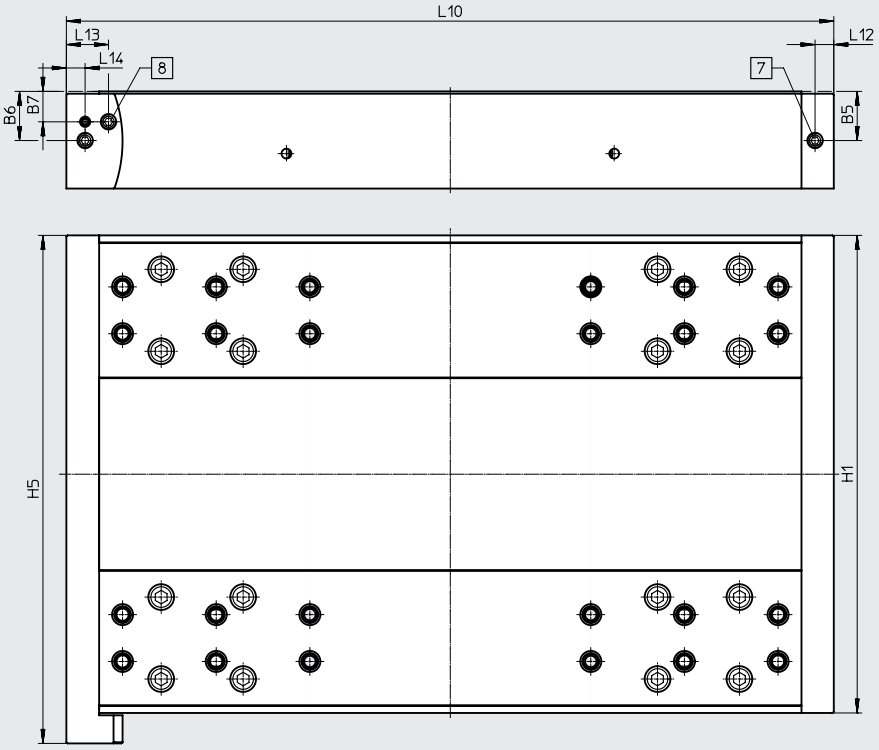
Size 125



Size: 160



Size 220



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

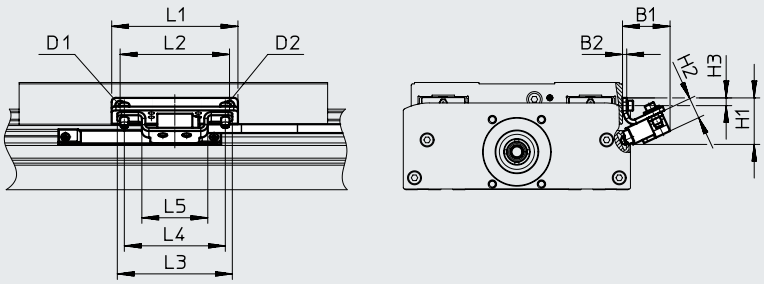
[8] Lubricating hole for threaded connection M6 for the screw, 7 mm deep

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



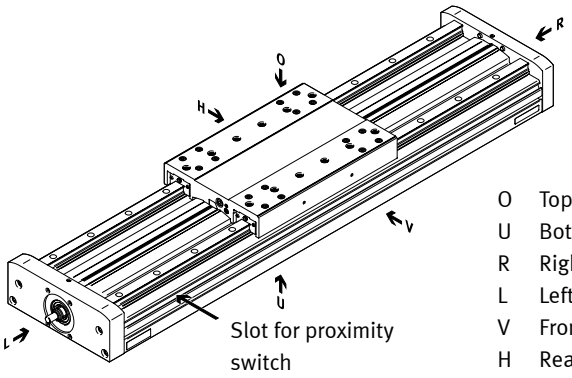
Encoder cable
(Connection to motor controller/ safety system) ➔ page 38

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

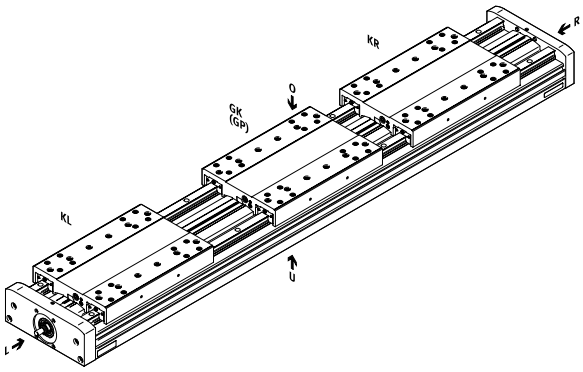
Size	H3	L1	L2	L3	L4	L5
125	5	108.5	56	82	72	47
160	5.5	90	76	82	72	47
220	7.5	170	140	82	72	47

Ordering data – Modular product system

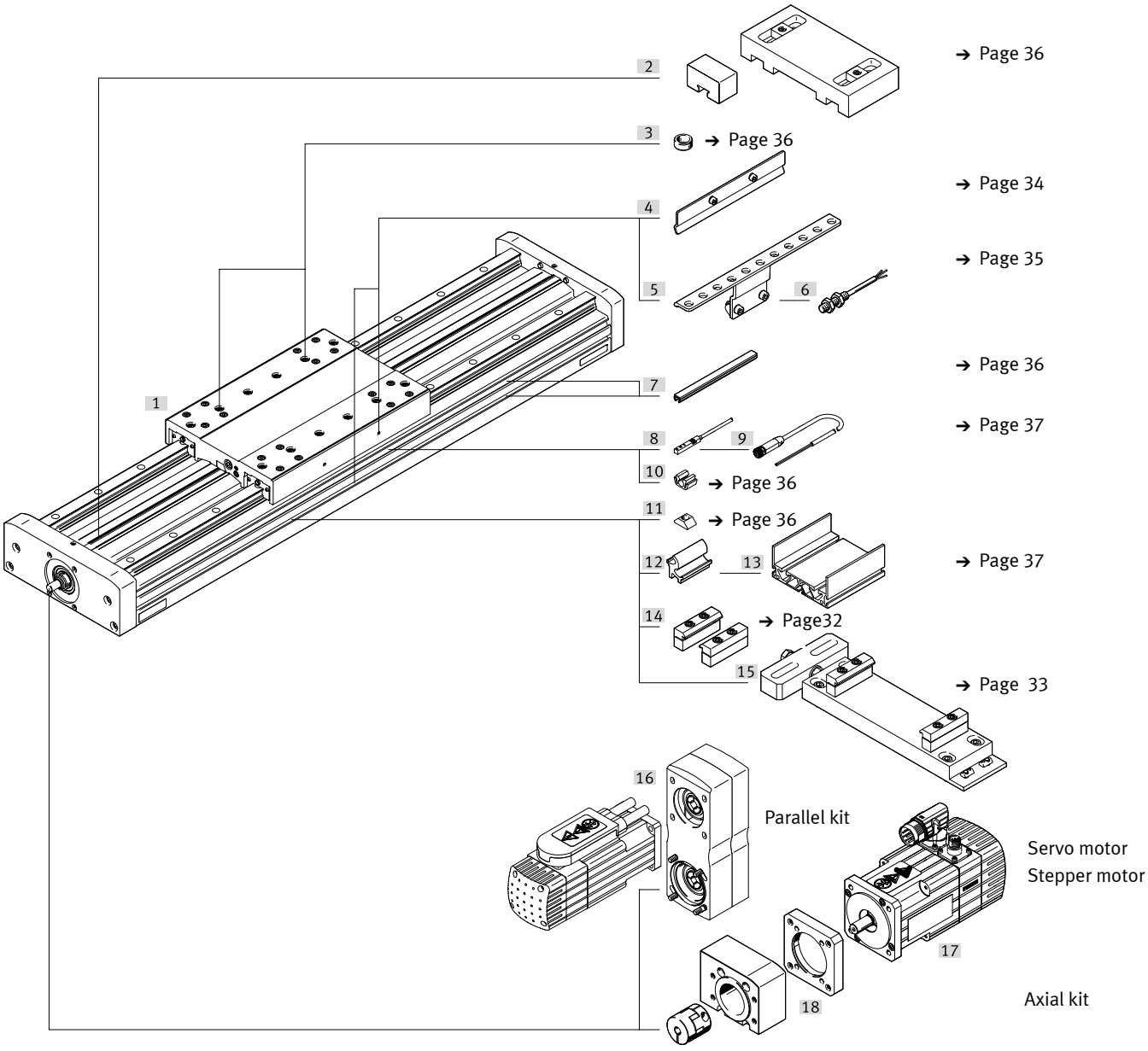
Orientation guide



O Top
U Bottom
R Right
L Left
V Front
H Rear



Accessories



Ordering data – Modular product system

Ordering table

Size			125	160	220	Conditions	Code	Enter 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, 600, 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.

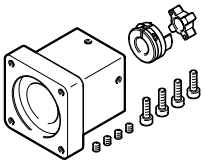
[2] KL, KR If the protected slide variant (GP) is selected, the additional slide (KL, KR) is also protected. If the slide with lubrication adapter (GK-C) is selected, then the additional slide (KL, KR) is also supplied with lubrication adapter

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

[4] C Not in combination with GP

Accessories

Permitted axis/motor combinations for axial and parallel kits

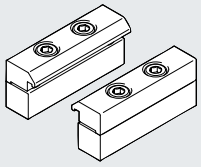


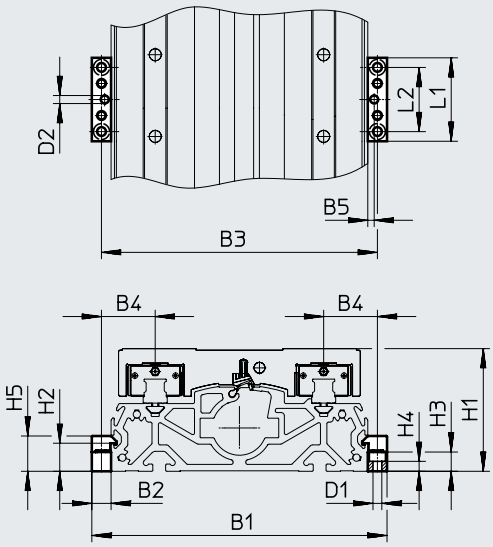
Under the following links you will find all information about:
- Axis/motor combinations
- Permitted third-party motors
- Technical data
- Dimensions

For axial kits ➔ Internet: eamm-a
For parallel kits ➔ Internet: eamm-u

Profile mounting MUE

Material:
Anodised aluminium
RoHS-compliant





Dimensions and ordering data

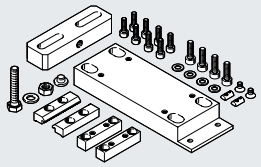
For size	B1	B2	B3	B4	B5	D1 ø	D2 ø H7	H1	H2
125	146	12	134	27	4	5.5	5	64	17.5
160	184	12	172	33.5	4	5.5	5	76.5	17.5
220	258	19	239	49.5	4	9	5	111.5	16

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**

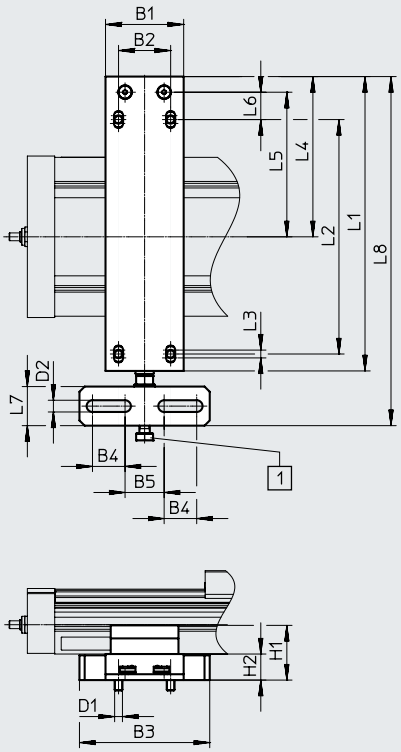
Accessories

Adjusting kit EADC-E16

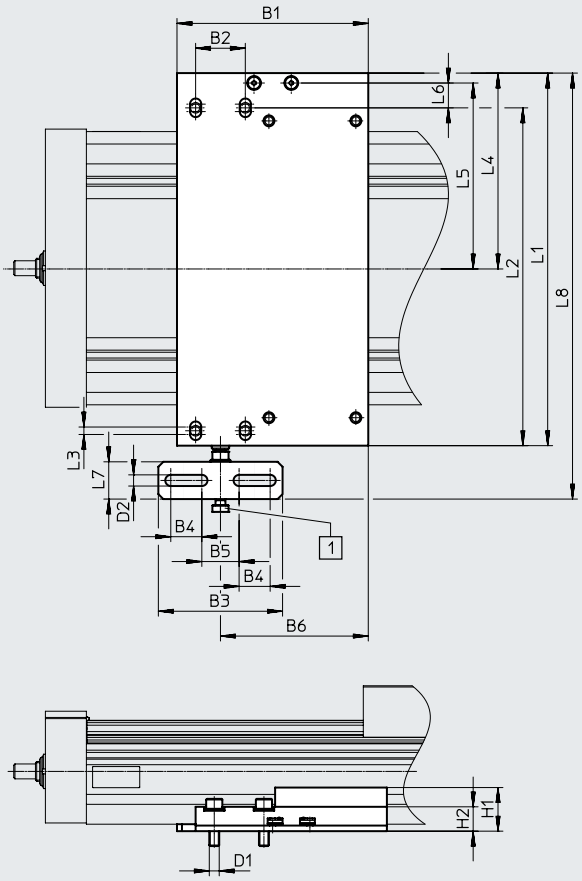
Material:
Wrought aluminium alloy
RoHs-compliant



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

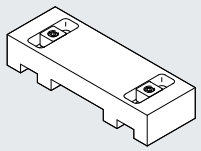
For size	L3	L4	L5	L6	L7	L8	Weight [g]	Part no.	Type
125	6	123	111	21	30	308	974	**8047580**	**EADC-E16-125-E14**
160	6	143	131	21	30	343	1189	**8047581**	**EADC-E16-160-E14**
220	6	157.7	149.7	20	30	343	1500	**8047582**	**EADC-E16-220-E14**

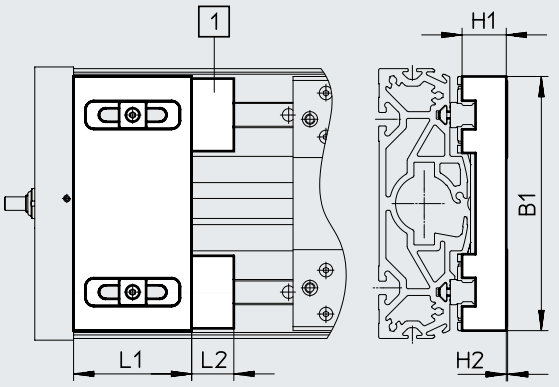
Accessories

Retaining bracket EAYH
Emergency buffer NPE → page 36

Material:
Anodised aluminium
RoHS-compliant

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





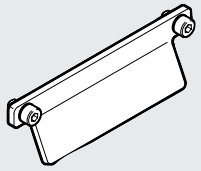
[1] Emergency buffer NPE

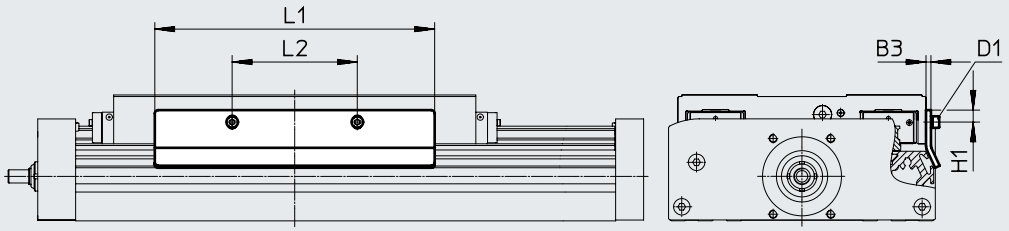
Dimensions and ordering data

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





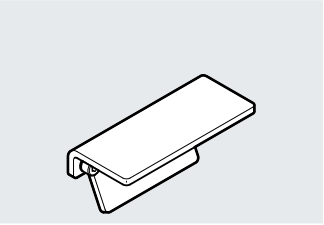
Dimensions and ordering data

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**

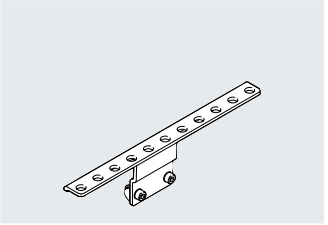
Accessories

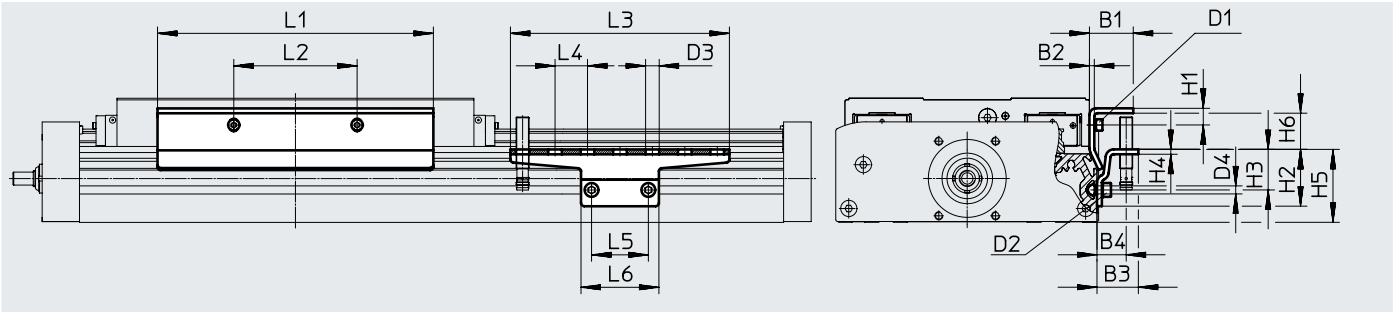
Switch lug SF-EGC-HD-2
for sensing with proximity sensor SIEN-M8B or SIES-8M

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

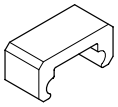
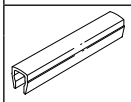
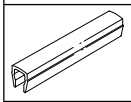
For size	H3	H4	H5	H6	L1	L2	L3	L4	L5	L6
125	25	3	45	14	150	56	135	20	35	48
160	25	3	45	22.2	170	76	135	20	35	48
220	55	3	75	18.4	250	140	215	20	35	48

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

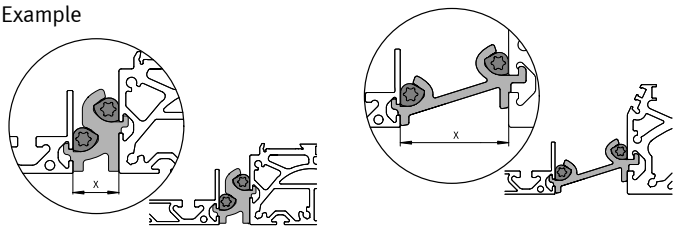
Accessories

Mounting options between axis and support profile

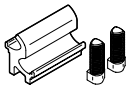
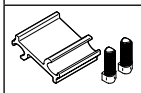
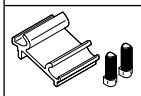
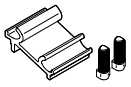
Depending on the adapter kit, the spacing between the axis and the support profile is:
x = 20 mm or 50 mm

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



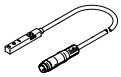
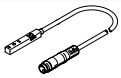
Ordering data

	For size	Description	Part no.	Type	PU[1]
Adapter kit DHAM					
	160	• 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	• 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	• For guiding an energy chain	**539379**	**HMIA-E07-**	1

1) Packaging unit

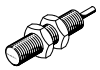
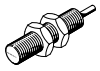
Ordering data – Proximity switches for T-slot, inductive

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**

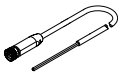
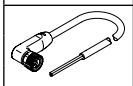
Accessories

Ordering data – Näherungsschalter Proximity switch M8 (round design), inductive[1)] Datasheets → Internet: sien

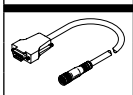
	Electrical connection	LED	Switching output	Cable length [m]	Part no.	Type
N/O						
	Cable, 3-core	■	PNP	2.5	**150386**	**SIEN-M8B-PS-K-L**
			NPN	2.5	**150384**	**SIEN-M8B-NS-K-L**
	Plug M8x1, 3-pin	■	PNP	–	**150387**	**SIEN-M8B-PS-S-L**
			NPN	–	**150385**	**SIEN-M8B-NS-S-L**
N/C						
	Cable, 3-core	■	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

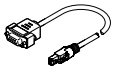
	Electrical connection 1, connection technology	Electrical connection 1, cable outlet	Electrical connection 2, connection technology	Electrical connection 2, number of pins/ cores	Cable length [m]	Part no.	Type
	M8x1 A-coded to EN 61076-2-104	Straight	Open end	3	2.5	**8078223**	**NEBA-M8G3-U-2.5-N-LE3**
					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**