

Electric cylinder units EPCS-BS

FESTO

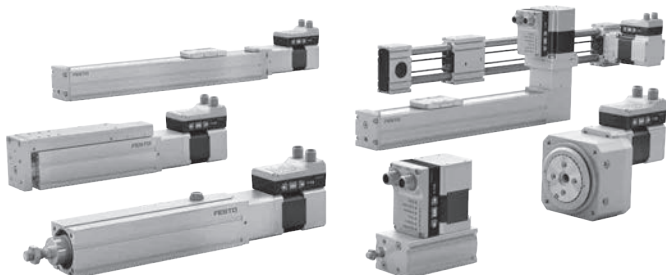


This product is also available as a modular mechanical system
Electric cylinder EPCC



Key features

At a glance Plug and work with the Simplified Motion Series



The simplicity of pneumatics is now combined for the first time with the advantages of electric automation thanks to the Simplified Motion Series. These integrated drives are the perfect solution for all users who are looking for an electric alternative for very simple movement and positioning tasks between two mechanical end positions, but don't want the commissioning process for traditional electric drive systems that can often be quite complex.

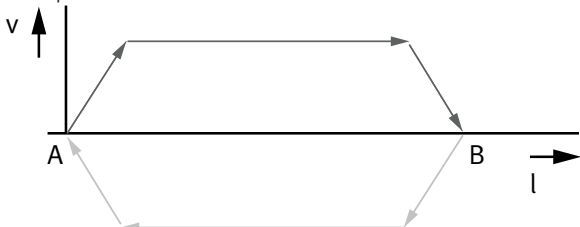
Integrated	Simple	Standardised	Connected
<p>The integrated electronics in the drive are at the core of the Simplified Motion Series.</p>	<p>For commissioning, simply set all relevant parameters directly on the drive:</p> <ul style="list-style-type: none"> • Speed and force • Reference end position and cushioning • Manual operation 	<p>Electrical connection via M12 plug design</p> <ul style="list-style-type: none"> • Power (4-pin): power supply for the motor • Logic (8-pin): control signal, sensor signal and power for the integrated electronics 	<p>Use of extended functions possible via IO-Link:</p> <ul style="list-style-type: none"> • Motion parameters can be set remotely • Copy and backup function for transferring parameters • Read function for extended process parameters

IO-Link

There is no need for any software since operation is simply based on the "plug and work" principle. Digital I/O (DIO) and IO-Link are always automatically included – a product with two types of control as standard.

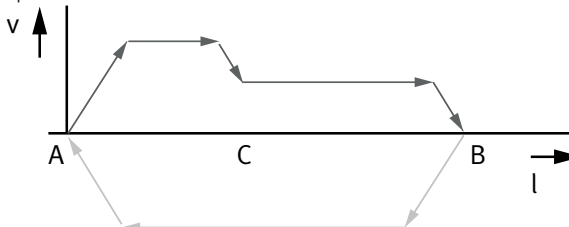
The functions of the Simplified Motion Series

Basic profile for movement between two end positions: with speed control

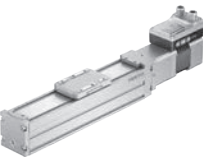

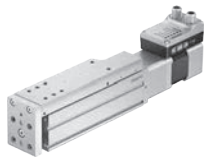
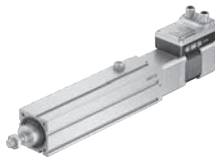
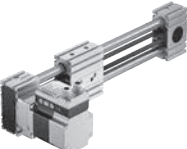




- These drives are designed for simple movements between two end positions.
- Proximity sensors are required in order to implement any intermediate positions.

Extended motion profile for simplified press-fitting and clamping functions: with speed and force control

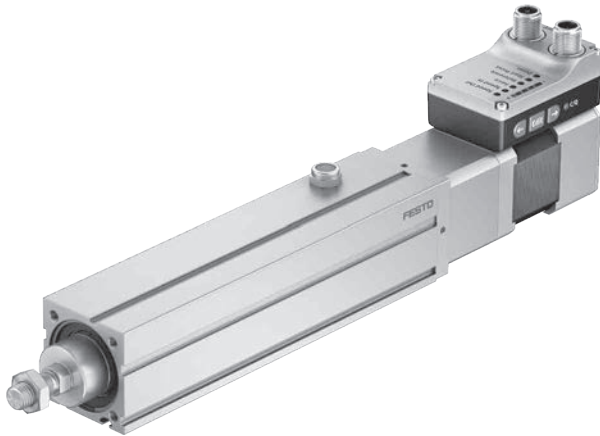


The products in the Simplified Motion Series

<p>Spindle axis unit ELGS-BS-KF</p> 	<p>Toothed belt axis unit ELGS-TB-KF</p> 	<p>Mini slide unit EGSS-BS-KF</p> 	<p>Electric cylinder unit EPCS</p> 
<p>Toothed belt axis unit ELGE</p> 	<p>Rotary drive unit ERMS</p> 	<p>Electric cylinder unit EPCE</p> 	

Key features

At a glance



- Without external servo drive: all the necessary electronic components are combined in the integrated drive
- Two control options integrated as standard: digital I/O and IO-Link
- Complete solution for simple movements between mechanical end positions
- Simplified commissioning: all parameters can be manually set directly on the drive
- No special expertise required for commissioning
- End-position feedback similar to that of a conventional proximity sensor is integrated as standard
- Very high-quality ball screw with low internal friction
- Ideal for precise and quick movement in sorting, distributing or clamping applications

Modular and flexible with motor, motor mounting kit and servo drive

This product is also available as a modular mechanical system as electric cylinder EPCC-BS:



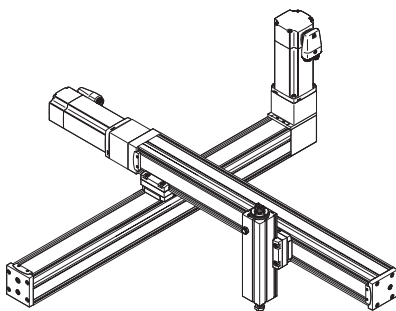
When it comes down to flexibility and adaptability, the compact dimensions and variable combinations are ideal for making optimal use of the installation space.

- Compact: optimum ratio of installation space to working space
- Unique: "one-size-down" mounting system
- Modular: individual combinations with motor, motor mounting kit and servo drive
- Flexible: wide range of mounting options for optimum machine integration

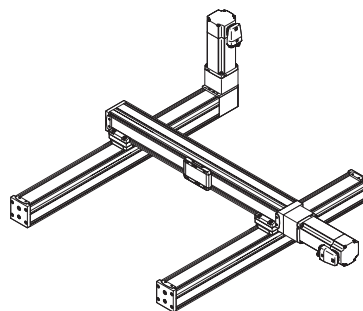
Typical handling systems

For applications where compact dimensions are essential, the axes ELGC can be combined into very space-saving handling systems that are suitable for assembly systems, test and inspection systems, small parts handling, the electronics industry and desktop applications. Combining the very compact linear axes ELGC, mini slide EGSC and electric cylinder EPCC offers an optimum ratio of installation space to working space. These feature a common system approach and platform architecture and the connections are largely adapterless.

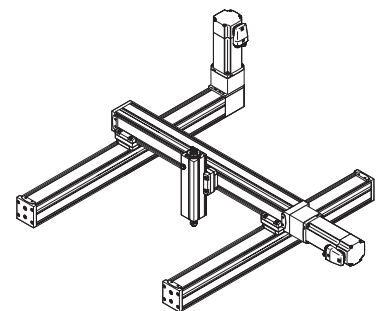
Cantilever system



Planar surface gantry



3-dimensional gantry



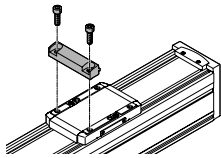
Key features

Combination matrix between axis ELGC/ELGS-TB, ELGC/ELGS-BS, mini slide EGSC/EGSS-BS, electric cylinder EPCC/EPCS-BS and guide axis ELFC

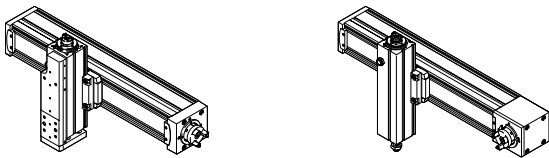
Mounting options with profile mounting and via angle kit

	Size	Assembly axis ELGC-BS/-TB; ELFC; EGSC-BS; EPCC-BS; ELGS-BS/-TB; EGSS-BS, EPCS-BS			
		25	32	45	60
Base axis	32	■	–	–	–
ELGC-BS/-TB; ELFC; ELGS-BS/-TB	45	–	■	–	–
	60	–	–	■	–
	80	–	–	–	■

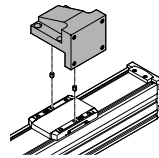
With profile mounting EAHF-L2-...-P-D...



- Mounting option: base axis with one-size-down assembly axis



With angle kit EHAA-D-L2-...-AP



- Mounting option: base axis rotated through 90° with one-size-down assembly axis



Combination matrix between axis ELGC/ELGS-TB, ELGC/ELGS-BS, mini slide EGSC/EGSS-BS, electric cylinder EPCC/EPCS-BS and guide axis ELFC

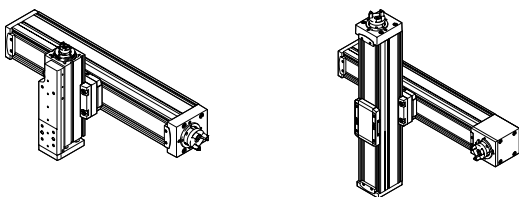
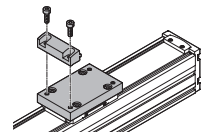
Assembly options with adapter kit or direct mounting

	Size	Assembly axis ELGC-BS/-TB; ELFC; EGSC-BS; EPCC-BS; ELGS-BS/-TB; EGSS-BS, EPCS-BS				
		25	32	45	60	80
Base axis	32	■	–	–	–	–
ELGC-BS/-TB; ELFC; ELGS-BS/-TB	45	–	■	–	–	–
	60	–	–	■	–	–
	80	–	–	–	■	–

	Size	Assembly axis EGSC-BS; EGSS-BS			
		25	32	45	60
Base axis	25	■	–	–	–
EGSC-BS; EGSS-BS	32	–	■	–	–
	45	–	–	■	–
	60	–	–	–	■

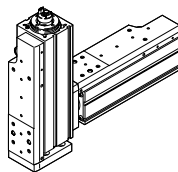
With adapter kit EHAA-D-L2

- Mounting option: base axis with the same size assembly axis
- Mounting option: base axis with height adjustment for one-size-down assembly axis
- When motors are mounted using parallel kits, this may lead to interfering contours. In this case, the adapter plate is required for height compensation



With direct mounting

- Mounting option: base axis with the same size assembly axis



Type codes

001	Series	
EPCS	Electric cylinder	

002	Drive system	
BS	Ball screw drive	

003	Size	
32	32	
45	45	
60	60	

004	Stroke	
25	25	
50	50	
75	75	
100	100	
125	125	
150	150	
175	175	
200	200	
250	250	
300	300	
350	350	
400	400	
500	500	

005	Spindle pitch	
3P	3 mm	
5P	5 mm	
8P	8 mm	
10P	10 mm	
12P	12 mm	

006	Position sensing	
A	For proximity sensor	

007	Motor type	
ST	Stepper motor ST	

008	Controller	
M	Integrated	

009	Control panel	
H1	Integrated	

010	Bus protocol/activation	
PLK	PNP and IO-Link®	
NLK	NPN and IO-Link®	

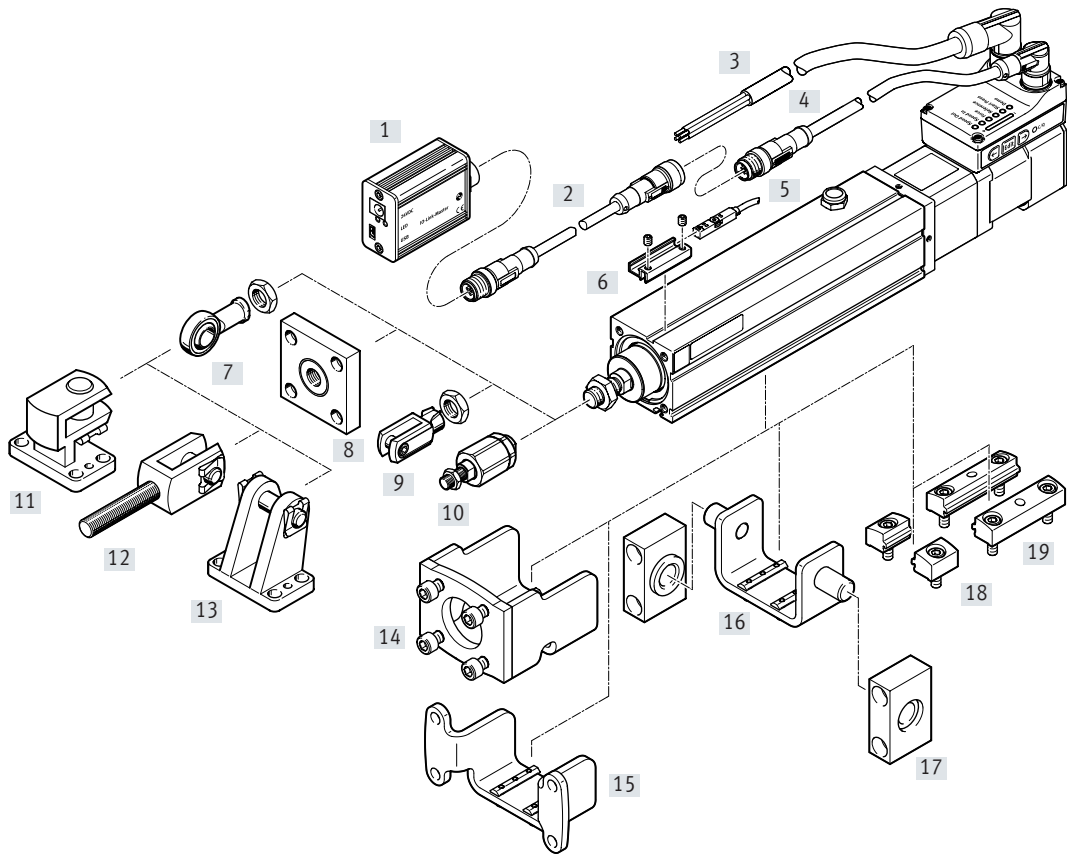
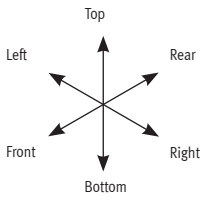
011	End-position sensing	
AA	With integrated end-position sensing	

012	Cable outlet direction	
	Standard	
D	Underneath	
L	Left	
R	Right	

013	Electrical accessories	
	None	
L1	Adapter for operation as IO-Link® device	

014	Operating instructions	
	With operating instructions	
DN	Without operating instructions	

Peripherals overview



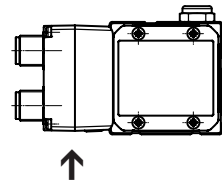
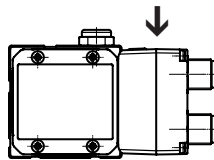
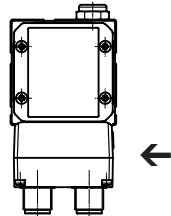
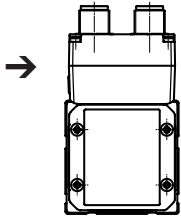
Motor mounting variants

Standard

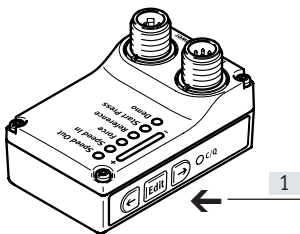
[D] Underneath

[L] Left

[R] Right



Control elements



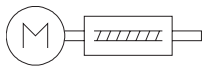
[1] Pushbuttons for parameterisation and control



Peripherals overview

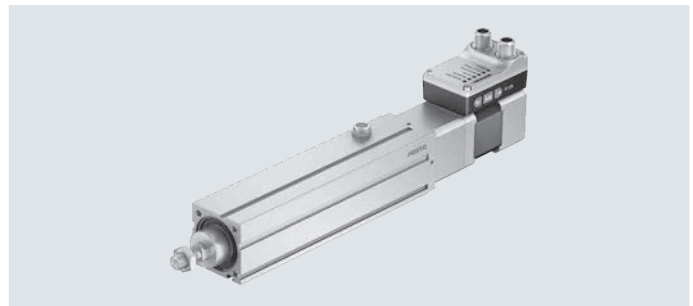
Accessories		
Type/order code	Description	→ Page/Internet
[1] IO-Link master USB CDSU-1	For straightforward use of the electric cylinder unit with IO-Link	31
[2] Adapter NEFC-M12G8	<ul style="list-style-type: none"> • Connection between the motor and the IO-Link master • Only for use with IO-Link Port Class A Master (recommended) 	31
[3] Supply cable NEBL-T12	For connecting load and logic supply	31
[4] Connecting cable NEBC-M12	For connection to a controller	31
[5] Proximity sensors ¹⁾ SMT-8M	Magnetic proximity sensors, for T-slot	30
[6] Sensor bracket ¹⁾ EAPM-L2	For mounting the proximity sensors on the axis. The proximity sensors can only be mounted using the sensor bracket	30
[7] Rod eye SGS/CRSGS	With spherical bearing	29
[8] Coupling piece KSG	For compensating radial deviations	29
[9] Rod clevis SG/CRSG	Permits a swivelling movement of the cylinder in one plane	29
[10] Self-aligning rod coupler FK/CRFK	For compensating radial and angular deviations	29
[11] Right angle clevis foot LQG	For rod eye SGS	29
[12] Rod clevis SGA	For swivel mounting of the cylinder	29
[13] Clevis foot LBG/LBG-...-R3	With parallel motor mounting, for spherical bearing	29
[14] Adapter kit EAHA-P2	<ul style="list-style-type: none"> • For mounting the swivel flange and trunnion flange on the front • Can only be mounted on the rear in conjunction with parallel kit EAMM-U 	27
[15] Flange mounting EAHH-P2	<ul style="list-style-type: none"> • For mounting the electric cylinder via the profile • Position freely selectable along the cylinder length 	26
[16] Swivel mounting EAHS-P2	Position freely selectable along the cylinder length	28
[17] Trunnion support LNZG	For cylinders with trunnion flange mounting	28
[18] Profile mounting EAHF-L2-P-S	For mounting the axis on the side of the profile	24
[19] Profile mounting EAHF-L2-P	<ul style="list-style-type: none"> • For mounting the axis on the side of the profile • The profile mounting can be attached to the mounting surface using the drilled hole in the centre 	25

1) Proximity sensors are optional and only required in order to sense any intermediate positions.

Data sheet



-  Size
32 ... 60
-  Stroke length
25 ... 500 mm



General technical data		32		45		60	
Size							
Design		Electric cylinder with ball screw					
Motor type		Stepper motor					
Protection against rotation/guide		With plain-bearing guide					
Mounting position		Any					
Piston rod thread		M8		M10x1.25		M12x1.25	
Piston rod end		Male thread					
Working stroke	[mm]	25, 50, 75, 100, 125, 150, 175, 200		25, 50, 75, 100, 125, 150, 175, 200, 250, 300		25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 500	
Stroke reserve	[mm]	0					
Max. angle of rotation of the piston rod	[°]	≤ ±1					
Additional functions		Integrated end-position sensing					
		User interface					
Display		LED					
Homing		Positive fixed stop block					
		Negative fixed stop block					
Type of mounting		Via female thread					
		With accessories					
Max. cable length							
Inputs/outputs	[m]	15					
IO-Link operation	[m]	20					

Mechanical data		32		45		60	
Size							
Spindle design		3P	8P	3P	10P	5P	12P
Spindle pitch	[mm/rev]	3	8	3	10	5	12
Spindle diameter	[mm]	8	8	10	10	12	12
Max. payload							
Horizontal	[kg]	24	24	60	40	120	56
Vertical	[kg]	12	9	23	13	46	18
Max. feed force F_x	[N]	150	150	450	250	900	375
Max. radial force ¹⁾	[N]	75	75	180	180	230	230
Max. speed	[m/s]	0.079	0.21	0.074	0.23	0.09	0.22
Speed press	[m/s]	0.01					
Max. acceleration	[m/s ²]	1.5	5	1.5	5	1.5	5
Repetition accuracy	[mm]	±0.02					
Reversing backlash ²⁾	[mm]	≤ 0.1					
Position sensing		Via proximity sensor					
		Via IO-Link					

1) At the driving shaft
2) When new

Data sheet

Electrical data			
Size		32	45 60
Motor			
Nominal voltage DC	[V]	24 (±15%)	
Nominal current	[A]	3	3 5.3
Max. current consumption (load)	[A]	3	3 5.3
Max. current consumption (logic)	[mA]	300	
Encoder			
Rotor position encoder		Absolute encoder, single turn	
Rotor position encoder measuring principle		Magnetic	
Rotor position encoder resolution	[bit]	16	
Interfaces			
Size		32	45 60
Parameterisation interface			
IO-Link		Yes	
User interface		Yes	
Digital inputs			
Quantity		2	
Switching logic		PNP	
		NPN	
Characteristics		Not galvanically isolated	
		Configurable	
Specification		Based on IEC 61131-2, type 1	
Operating range	[V]	24	
Digital outputs			
Quantity		2	
Switching logic		PNP	
		NPN	
Rotor position encoder		Absolute encoder, single turn	
Characteristics		Not galvanically isolated	
		Configurable	
Max. current	[mA]	100	

Data sheet

Technical data – IO-Link				
Size		32	45	60
SIO mode support		Yes		
Communication mode		COM3 (230.4 kBd)		
Connection technology		Plug		
Port class		A		
Number of ports		1		
Process data width OUT	[byte]	2		
Process data content OUT	[bit]	1 (Move in)		
	[bit]	1 (Move out)		
	[bit]	1 (Quit Error)		
Process data width IN	[byte]	2		
Process data content IN	[bit]	1 (State Device)		
	[bit]	1 (State Move)		
	[bit]	1 (State in)		
	[bit]	1 (State out)		
Service data content IN	[bit]	32 (Force)		
	[bit]	32 (Position)		
	[bit]	32 (Speed)		
Minimum cycle time	[ms]	1		
Data memory required	[kilobyte]	0.5		
Protocol version		Device V 1.1		

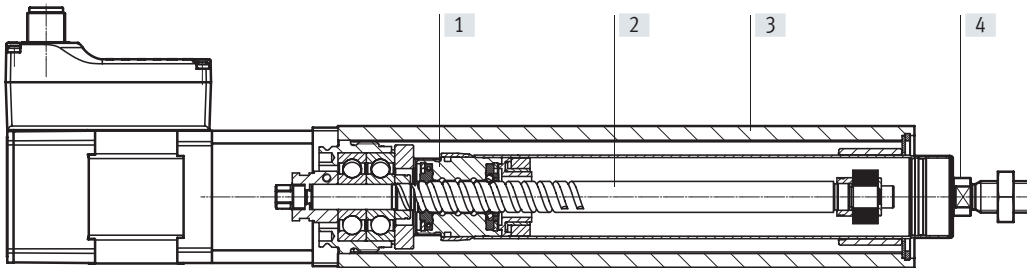
Operating and environmental conditions				
Size		32	45	60
Insulation class		B		
Ambient temperature	[°C]	0 ... +50		
Storage temperature	[°C]	-20 ... +60		
Note on ambient temperature		Above an ambient temperature of 30°C, the power must be reduced by 2% per K		
Temperature monitoring		Switch-off for excessive temperature		
		Integrated precise CMOS temperature sensor with analogue output		
Relative humidity	[%]	0 ... 90 (non-condensing)		
Protection class		III		
Degree of protection		IP40		
Duty cycle	[%]	100		
CE marking		To EU EMC Directive		
		To EU RoHS Directive		
KC mark		KC EMC		
Certification		RCM mark		
Vibration resistance		Transport application test with severity level 1 to FN 942017-4 and EN 61800-2 and EN 61800-5-1		
Shock resistance		Shock test with severity level 1 to FN 942017-5 and EN 61800-2		
Maintenance interval		Lifetime lubrication		

Weight				
Size		32	45	60
Basic weight with 0 mm stroke	[g]	818	1185	2294
Additional weight per 10 mm stroke	[g]	24	41	69
Moving mass at 0 mm stroke	[g]	98	179	305
Additional moving mass per 10 mm stroke	[g]	3.3	4.9	6.5

Data sheet

Materials

Sectional view



Electric cylinder

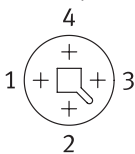
[1]	Spindle nut	Steel
[2]	Spindle	Rolled steel
[3]	Housing	Smooth-anodised wrought aluminium alloy
[4]	Piston rod	High-alloy stainless steel
Note on materials		RoHS-compliant
		Contains paint-wetting impairment substances

Pin allocation

Power supply

Plug

M12x1, 4-pin, T-coded to EN 61076-2-111

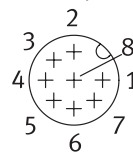


Pin	Function
1	Power voltage supply (24 V DC)
2	Reference potential, power voltage supply (GND)
3	Reserved, do not connect
4	Functional earth (FE)

Logic interface

Plug

M12x1, 8-pin, A-coded to EN 61076-2-101



When used with digital I/O

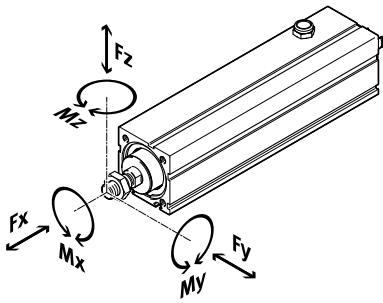
Pin	Function
1	Logic voltage supply (24 V DC)
2	Digital output 1 (State "In")
3	Digital output 2 (State "Out")
4	Reference potential, logic voltage supply (GND)
5	Digital input 1 (Move "In")
6	Digital input 2 (Move "Out")
7	Reserved, do not connect
8	Reference potential, logic voltage supply (GND)

When used with IO-Link

Pin	Function
1	L+ IO-Link power supply (24 V DC)
2	Reserved, do not connect
3	C/Q communication with the IO-Link master
4	L – Reference potential, IO-Link power supply (0 V)
5	Reserved, do not connect
6	Reserved, do not connect
7	Reserved, do not connect
8	L – Reference potential, IO-Link power supply (0 V)

Data sheet

Maximum permissible loads on the piston rod



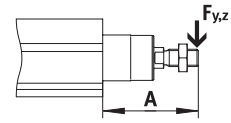
If there are two or more forces and torques simultaneously acting on the piston rod, the following equations must be satisfied:

- $F_1/M_1 = \text{dynamic value}$
- $F_2/M_2 = \text{maximum value}$

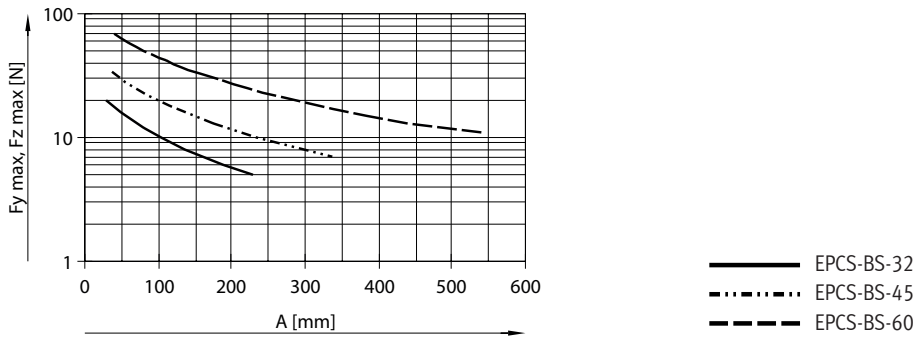
$$f_v = \frac{|F_{y1}|}{F_{y2}} + \frac{|F_{z1}|}{F_{z2}} + \frac{|M_{y1}|}{M_{y2}} + \frac{|M_{z1}|}{M_{z2}} \leq 1$$

$$|Fx| \leq Fx_{max}$$

$$|Mx| \leq Mx_{max}$$



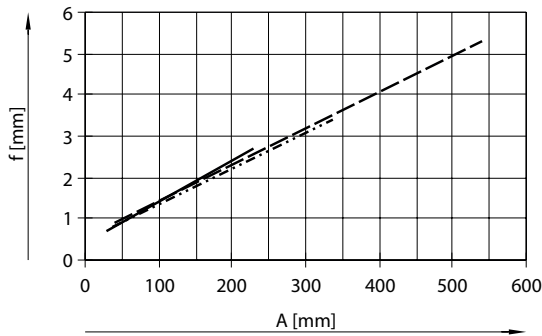
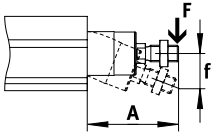
Maximum permissible transverse loads $F_{y,max}$ and $F_{z,max}$ on the piston rod as a function of projection A



Size	32		45		60	
Spindle design	3P	8P	3P	10P	5P	12P
$F_{x,max}$ (static) [N]	150	150	450	450	1000	1000
$M_{x,max}$ [Nm]	0					
$M_{y,max}, M_{z,max}$ [Nm]	1.5		2.9		6.4	

Note
 Engineering software
 PositioningDrives
 → www.festo.com

Data sheet

Piston rod deflection f_2 as a function of projection A and transverse load F

- EPCS-BS-32 ($F_2 = 3.5 \text{ N}$)
- ⋯ EPCS-BS-45 ($F_2 = 4.0 \text{ N}$)
- - - EPCS-BS-60 ($F_2 = 8.0 \text{ N}$)

$$f_1 = \frac{F_1}{F_2} \cdot f_2$$

f_1 = Piston rod deflection caused by transverse load [mm]

F_1 = Transverse load [N]

F_2 = Standardised transverse load [N] (constant load from graph)

f_2 = Piston rod deflection caused by transverse load [N]
(value read from graph)

Example: electric cylinder EPCS-32-50-8P with a transverse load of 7 N
 $F_1 = 7 \text{ N}$ und $F_{\text{standard}} = 3.5 \text{ N}$

Value read from graph for EPCS-32 and projection = 50 mm

$f_2 = 1 \text{ mm}$

Calculation of deflection caused by transverse load:

$$f_1 = \frac{F_1}{F_2} \cdot f_2 = \frac{7 \text{ N}}{3.5 \text{ N}} \cdot 1 \text{ mm} = 2 \text{ mm}$$

Data sheet

Calculating the mean feed force F_{xm} with the electric cylinder EPCS

The peak feed force value must not exceed the maximum feed force within a movement cycle. The peak value is generally achieved in vertical operation during the acceleration phase of the upwards stroke. If the maximum feed force is exceeded, this can increase wear and thus shorten the service life of the ball screw. The maximum speed must likewise not be exceeded:

$$F_x \leq F_{x\max}$$

and

$$V_x \leq V_{x\max}$$

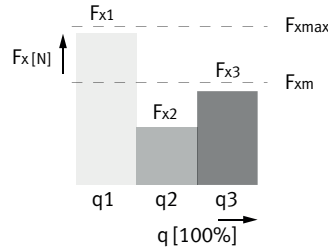
Calculating the mean feed force F_{xm} (to DIN 69051-4)

During operation, the continuous feed force may be briefly exceeded up to the maximum feed force. The continuous feed force must, however, be adhered to when averaged over a movement cycle:

$$F_{xm} \leq F_{x\text{continuous}}$$

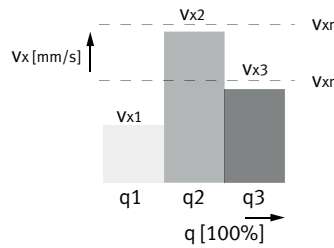
$$F_{xm} = \sqrt[3]{\sum F_x^3 \cdot \frac{v_x}{v_{xm}} \cdot \frac{q}{100}} =$$

$$F_{xm} = \sqrt[3]{F_{x1}^3 \cdot \frac{v_{x1}}{v_{xm}} \cdot \frac{q_1}{100} + F_{x2}^3 \cdot \frac{v_{x2}}{v_{xm}} \cdot \frac{q_2}{100} + F_{x3}^3 \cdot \frac{v_{x3}}{v_{xm}} \cdot \frac{q_3}{100} + \dots}$$



Mean feed speed (to DIN 69051-4)

$$v_{xm} = \sum v_x \cdot \frac{q}{100} = v_{x1} \cdot \frac{q_1}{100} + v_{x2} \cdot \frac{q_2}{100} + v_{x3} \cdot \frac{q_3}{100} + \dots$$



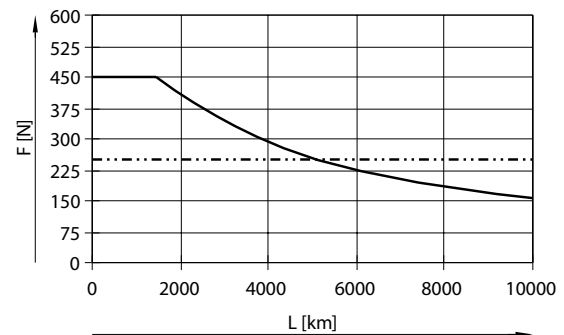
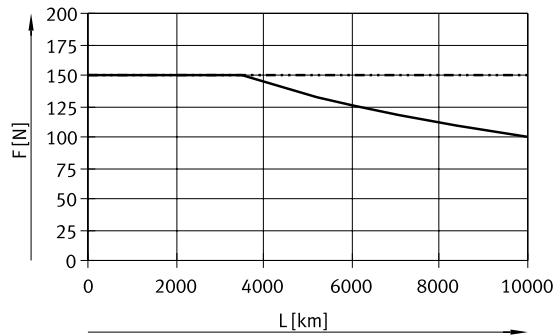
- F_x Feed force
- F_{xm} Mean feed force
- $F_{x\max}$ Max. feed force
- $F_{x\text{continuous}}$ Continuous feed force
- q Time
- v_x Feed speed
- v_{xm} Mean feed speed
- $v_{x\max}$ Max. feed speed

Data sheet

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 32

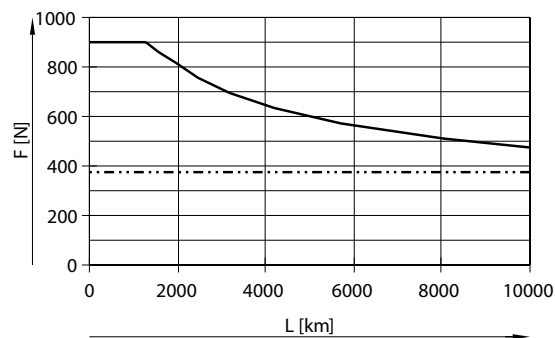
Size 45



— EPCS-BS-32-3P
- - - - - EPCS-BS-32-8P

— EPCS-BS-45-3P
- - - - - EPCS-BS-45-10P

Size 60



— EPCS-BS-60-5P
- - - - - EPCS-BS-60-12P


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

L_1 Actual service life
L Target service life
(→ graphs)
 f_B Operating coefficient

Service life taking into account the operating coefficient

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

1) This refers to loads caused by impact, temperature, contamination, shock and vibrations that affect the cylinder or piston rod.

 Note

The specifications for 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.

Data sheet

Sizing example

Application data:

- Payload: 25 kg
- Mounting position: horizontal
- Stroke: 150 mm
- Max. permissible positioning time: 2 s (one direction)

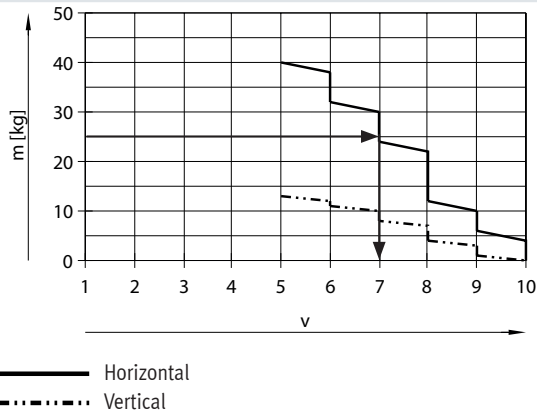
Step 1: Selection of the smallest possible size from the table → page 8

Mechanical data

Size	32			45		60	
Spindle design	3P	8P	3P	10P	5P	12P	
Max. payload							
Horizontal	[kg]	24	24	60	40	120	56
Vertical	[kg]	12	9	23	13	46	18

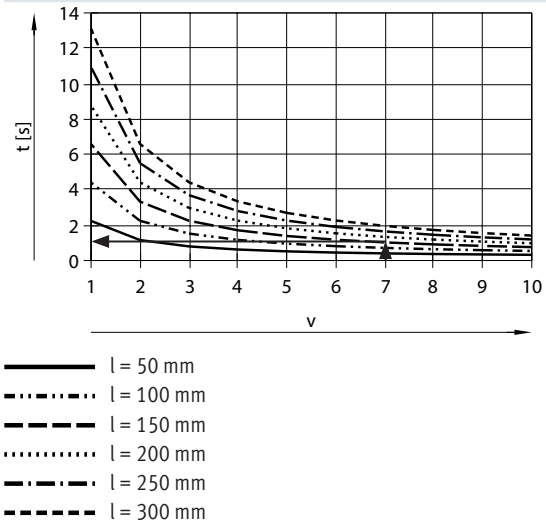
→ Smallest possible size: EPCS-BS-45-10P

Step 2: Selection of max. speed level v for payload m



→ Max. speed level for the payload: level 7

Step 3: Reading off the min. positioning time t for stroke l



→ Min. positioning time for 150 mm at level 7: 1 s

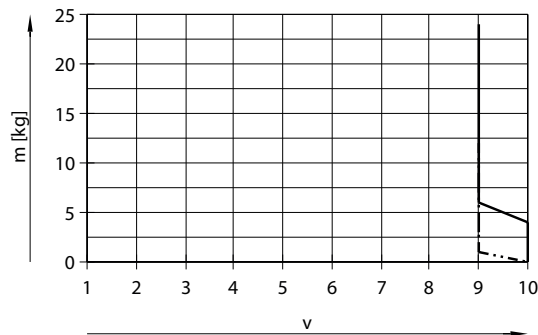
Result

The application can be implemented using EPCS-BS-45-150-10P. A minimum positioning time (one direction) of 1 s is achieved. Longer positioning times can be selected at any time using a lower speed level.

Data sheet

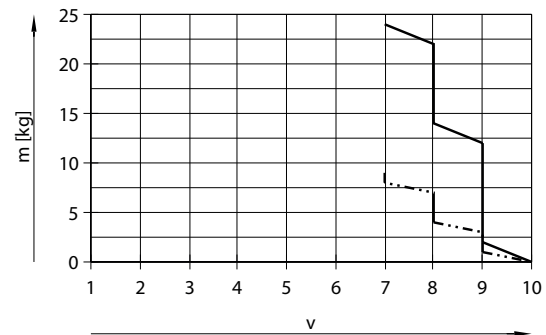
Mass m as a function of speed level v

EPCS-BS-32-3P

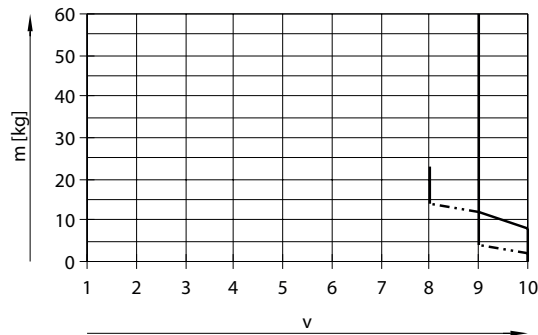


— Horizontal
- - - Vertical

EPCS-BS-32-8P

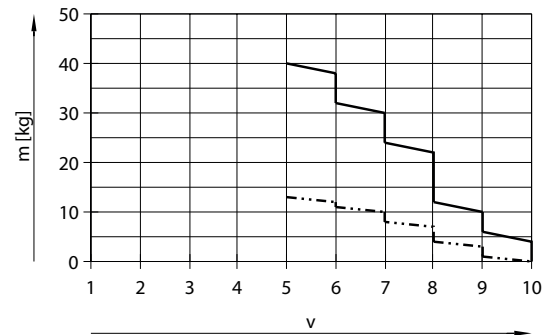


EPCS-BS-45-3P

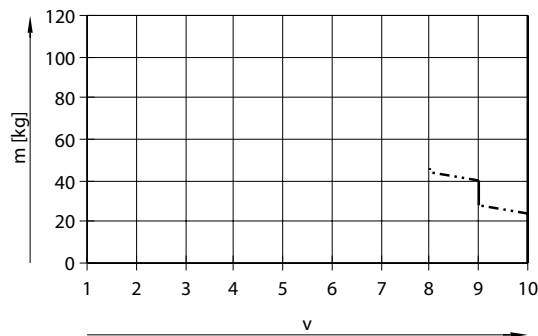


— Horizontal
- - - Vertical

EPCS-BS-45-10P

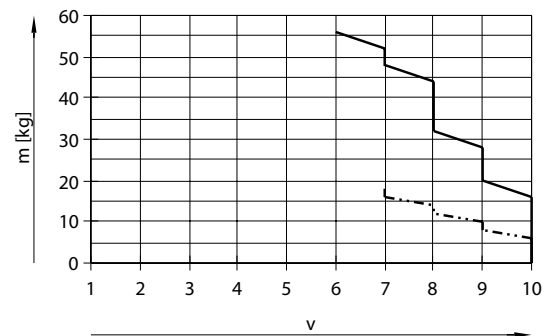



EPCS-BS-60-5P



— Horizontal
- - - Vertical

EPCS-BS-60-12P

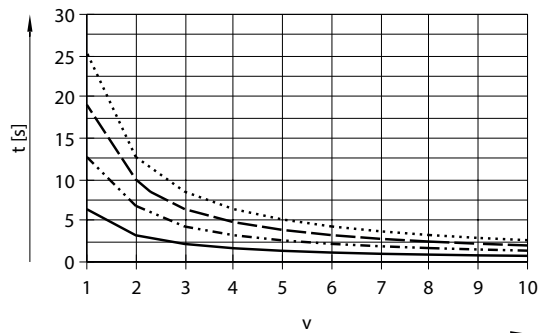


 **Note**
The lines represent the maximum values. The lower speed levels can be set at any time.

Data sheet

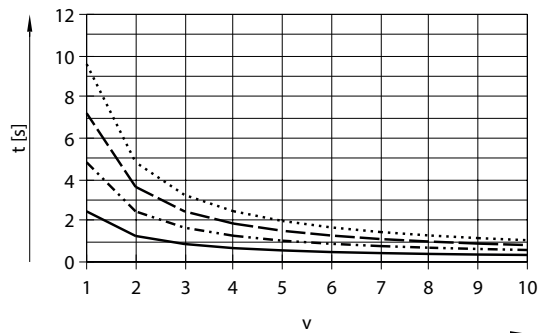
Positioning time t as a function of speed level v and stroke l

EPCS-BS-32-3P



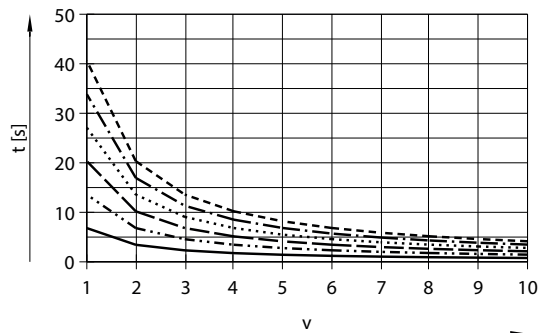
- $l = 50$ mm
- $l = 100$ mm
- - - $l = 150$ mm
- · - · $l = 200$ mm

EPCS-BS-32-8P



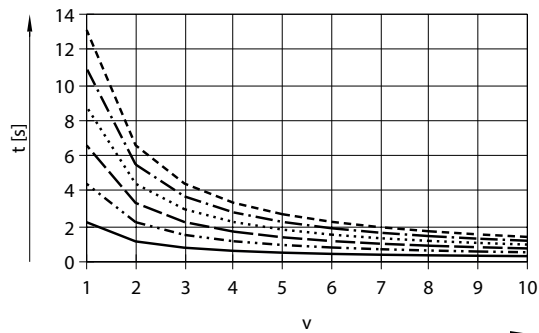
- $l = 50$ mm
- $l = 100$ mm
- - - $l = 150$ mm
- · - · $l = 200$ mm

EPCS-BS-45-3P



- $l = 50$ mm
- $l = 100$ mm
- - - $l = 150$ mm
- · - · $l = 200$ mm
- - - - $l = 250$ mm
- · - · - · $l = 300$ mm

EPCS-BS-45-10P

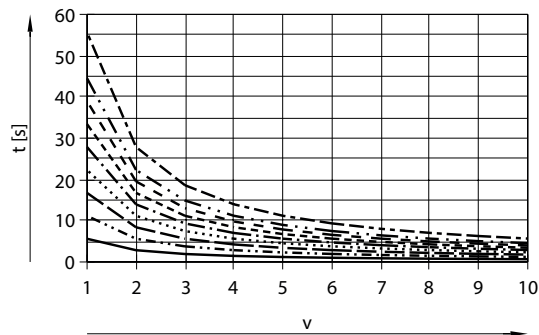


- $l = 50$ mm
- $l = 100$ mm
- - - $l = 150$ mm
- · - · $l = 200$ mm
- - - - $l = 250$ mm
- · - · - · $l = 300$ mm

Data sheet

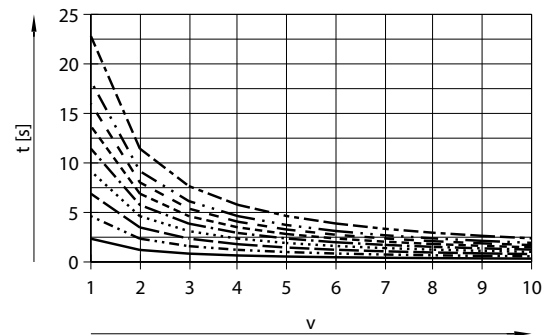
Positioning time t as a function of speed level v and stroke l

EPCS-BS-60-5P



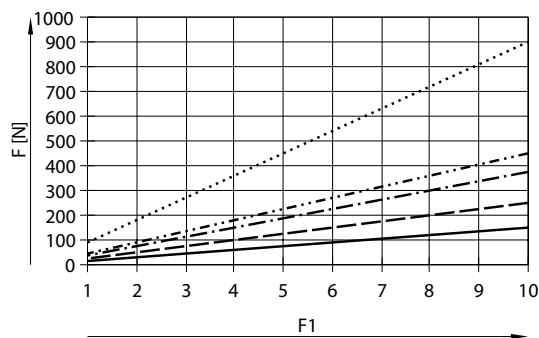
- $l = 50$ mm
- · - · - $l = 100$ mm
- - - $l = 150$ mm
- · · · · $l = 200$ mm
- · - · - $l = 250$ mm
- - - $l = 300$ mm
- - - $l = 350$ mm
- · - · - $l = 400$ mm
- · - · - $l = 500$ mm

EPCS-BS-60-12P



- $l = 50$ mm
- · - · - $l = 100$ mm
- - - $l = 150$ mm
- · · · · $l = 200$ mm
- · - · - $l = 250$ mm
- - - $l = 300$ mm
- - - $l = 350$ mm
- · - · - $l = 400$ mm
- · - · - $l = 500$ mm

Feed force F as a function of force level F_1

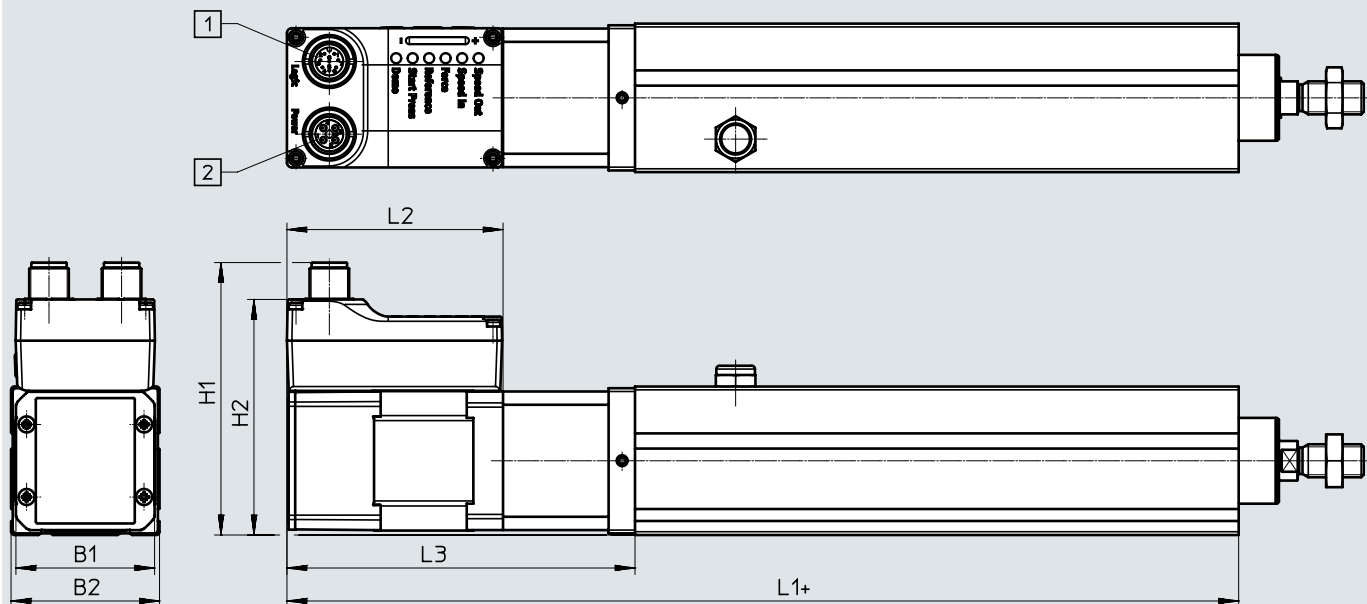


- EPCS-BS-32-3P/-8P
- · - · - EPCS-BS-45-3P
- - - EPCS-BS-45-10P
- · · · · EPCS-BS-60-5P
- · - · - EPCS-BS-60-12P

Data sheet

Dimensions – With motor

Download CAD data → www.festo.com



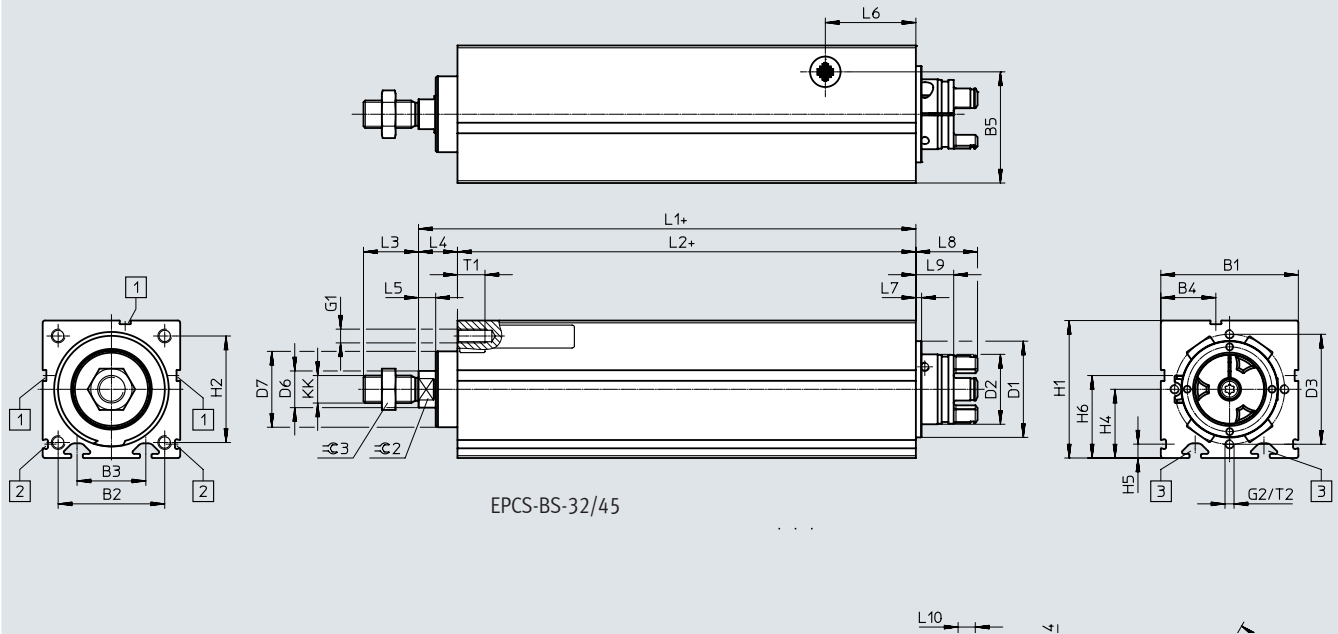
- [1] Connecting cable NEBC-M12
- [2] Supply cable NEBL-T12
- + plus stroke length

∅	B1	B2	H1	H2	L1	L2	L3
[mm]							
32	42.3	32	81.1	69.9	175.5	65.5	105.5
45	42.3	45	82.6	71.4	188.5	65.5	105.5
60	56.6	60	97.3	86.1	216.5	73.5	116.5

Data sheet

Dimensions – Mechanical system

Download CAD data → www.festo.com



- [1] For sensor bracket
- [2] For profile mounting
- [3] For slot nut mounting
- + plus stroke length

Size	B1	B2	B3	B4	B5	D1 ∅	D2 ∅	D3 ∅	D4 ∅
	±0.15								
32	32	24	16	8.1	25.5	25	15.5	–	2
45	45	32.5	24	16.5	35	32	16.3	–	3
60	60	46.5	30	24	48.5	42	30.5	48	–

Size	D5 ∅	D6 ∅	D7 ∅	G1	G2	H1 ±0.15	H2	H3	H4
32	31	10	21.3	M4	–	34	24	4.7	–
45	41	12	26.5	M5	–	45	32.5	6.3	–
60	–	16	33.6	M6	M4	60	46.5	7.3	30

Size	H5	H6	KK	L1	L2	L3	L4	L5	L6
		±0.15							
32	4.9	26	M8	82.9	70	16	12.9	5.2	24.2
45	6.1	28.5	M10x1.25	99.9	83	20	16.9	5.7	30.5
60	6.1	36	M12x1.25	116	100	24	16	7.5	39.5

Size	L7	L8	L9	L10	T1	T2	W1	∠G1	∠G2	∠G3
32	6	19.9	14.5	2.5	8	–	60°	6	9	13
45	6	19.9	14.5	3	10	–	60°	12	10	16
60	2.5	26.9	16.5	–	12	10	–	15	13	18

Data sheet

Ordering data

EPCS-BS-32

Stroke [mm]	Part no.	Type
Spindle pitch 3 mm/rev		
50	8118267	EPCS-BS-32-50-3P-A-ST-M-H1-PLK-AA
100	8118268	EPCS-BS-32-100-3P-A-ST-M-H1-PLK-AA
150	8118269	EPCS-BS-32-150-3P-A-ST-M-H1-PLK-AA
200	8118270	EPCS-BS-32-200-3P-A-ST-M-H1-PLK-AA

Stroke [mm]	Part no.	Type
Spindle pitch 8 mm/rev		
50	8118271	EPCS-BS-32-50-8P-A-ST-M-H1-PLK-AA
100	8118272	EPCS-BS-32-100-8P-A-ST-M-H1-PLK-AA
150	8118273	EPCS-BS-32-150-8P-A-ST-M-H1-PLK-AA
200	8118274	EPCS-BS-32-200-8P-A-ST-M-H1-PLK-AA

EPCS-BS-45

Stroke [mm]	Part no.	Type
Spindle pitch 3 mm/rev		
50	8118275	EPCS-BS-45-50-3P-A-ST-M-H1-PLK-AA
100	8118276	EPCS-BS-45-100-3P-A-ST-M-H1-PLK-AA
150	8118277	EPCS-BS-45-150-3P-A-ST-M-H1-PLK-AA
200	8118278	EPCS-BS-45-200-3P-A-ST-M-H1-PLK-AA
250	8118279	EPCS-BS-45-250-3P-A-ST-M-H1-PLK-AA
300	8118280	EPCS-BS-45-300-3P-A-ST-M-H1-PLK-AA

Stroke [mm]	Part no.	Type
Spindle pitch 10 mm/rev		
50	8118281	EPCS-BS-45-50-10P-A-ST-M-H1-PLK-AA
100	8118282	EPCS-BS-45-100-10P-A-ST-M-H1-PLK-AA
150	8118283	EPCS-BS-45-150-10P-A-ST-M-H1-PLK-AA
200	8118284	EPCS-BS-45-200-10P-A-ST-M-H1-PLK-AA
250	8118285	EPCS-BS-45-250-10P-A-ST-M-H1-PLK-AA
300	8118286	EPCS-BS-45-300-10P-A-ST-M-H1-PLK-AA

EPCS-BS-60

Stroke [mm]	Part no.	Type
Spindle pitch 5 mm/rev		
50	8118287	EPCS-BS-60-50-5P-A-ST-M-H1-PLK-AA
100	8118288	EPCS-BS-60-100-5P-A-ST-M-H1-PLK-AA
150	8118289	EPCS-BS-60-150-5P-A-ST-M-H1-PLK-AA
200	8118290	EPCS-BS-60-200-5P-A-ST-M-H1-PLK-AA
250	8118291	EPCS-BS-60-250-5P-A-ST-M-H1-PLK-AA
300	8118292	EPCS-BS-60-300-5P-A-ST-M-H1-PLK-AA
350	8118293	EPCS-BS-60-350-5P-A-ST-M-H1-PLK-AA
400	8118294	EPCS-BS-60-400-5P-A-ST-M-H1-PLK-AA
500	8118295	EPCS-BS-60-500-5P-A-ST-M-H1-PLK-AA

Stroke [mm]	Part no.	Type
Spindle pitch 12 mm/rev		
50	8118296	EPCS-BS-60-50-12P-A-ST-M-H1-PLK-AA
100	8118297	EPCS-BS-60-100-12P-A-ST-M-H1-PLK-AA
150	8118298	EPCS-BS-60-150-12P-A-ST-M-H1-PLK-AA
200	8118299	EPCS-BS-60-200-12P-A-ST-M-H1-PLK-AA
250	8118300	EPCS-BS-60-250-12P-A-ST-M-H1-PLK-AA
300	8118301	EPCS-BS-60-300-12P-A-ST-M-H1-PLK-AA
350	8118302	EPCS-BS-60-350-12P-A-ST-M-H1-PLK-AA
400	8118303	EPCS-BS-60-400-12P-A-ST-M-H1-PLK-AA
500	8118304	EPCS-BS-60-500-12P-A-ST-M-H1-PLK-AA

Ordering data – Modular product system

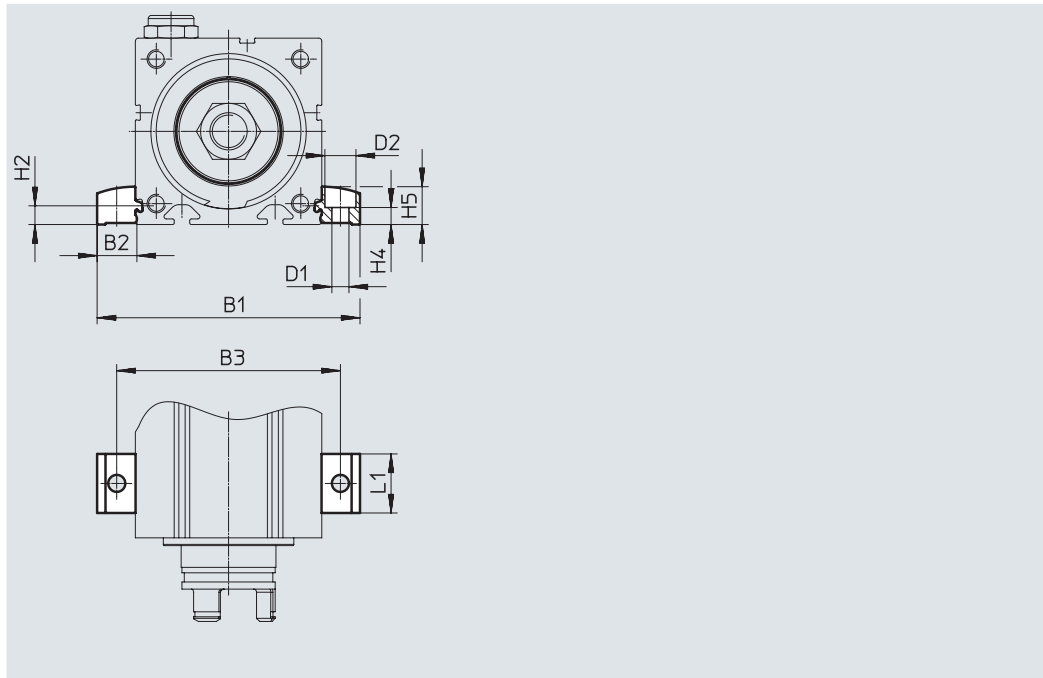
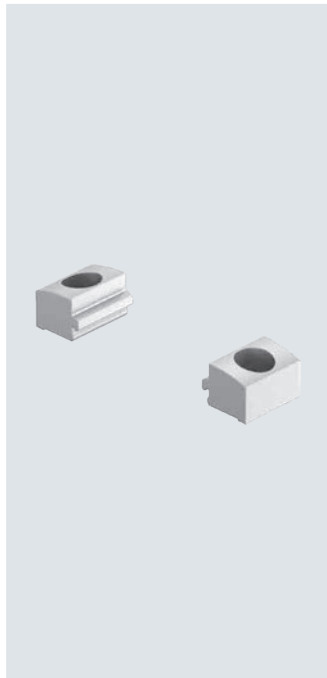
Ordering table						
Size	32	45	60	Conditions	Code	Enter code
Module no.	8118264	8118265	8118266			
Series	EPCS				EPCS	EPCS
Drive type	Ball screw				-BS	-BS
Size	32	45	60		-...	
Stroke [mm]	25, 50, 75, 100, 125, 150, 175, 200	25, 50, 75, 100, 125, 150, 175, 200, 250, 300	25, 50, 75, 100, 125, 150, 200, 250, 300, 350, 400, 500		-...	
Spindle pitch [mm]	3	3	-		-...P	
	-	-	5			
	8	-	-			
	-	10	-			
	-	-	12			
Position sensing	Via proximity sensor				-A	-A
Motor type	Stepper motor ST				-ST	-ST
Controller	Integrated				-M	-M
Control panel	Integrated				-H1	-H1
Bus protocol/actuation	NPN and IO-Link				-NLK	
	PNP and IO-Link				-PLK	
End-position detection	With integrated end-position sensing				-AA	-AA
Cable outlet direction	Standard					
	Left				-L	
	Underneath				-D	
	Right				-R	
Electrical accessories	None					
	Adapter for operation as IO device				+L1	
Operating instructions	With operating instructions					
	Without operating instructions				DN	

Accessories

Profile mounting EAHF-L2-...-P-S

Material:
Anodised wrought aluminium alloy
RoHS-compliant

- For mounting the cylinder on the side of the profile



Dimensions and ordering data

For size	B1	B2	B3	D1 ∅ H13	D2 ∅ H13	H2
32	51.4	9.7	42	4.5	8	4.9
45	70.6	12.8	58	5.5	10	6.1
60	85.6	12.8	73	5.5	10	6.1

For size	H4 ±0.1	H5	L1	Weight [g]	Part no.	Type
32	4.2	9	19	4	5183153	EAHF-L2-25-P-S
45	5.5	12.2	19	6	5184133	EAHF-L2-45-P-S
60	5.5	12.2	19	6	5184133	EAHF-L2-45-P-S

Accessories

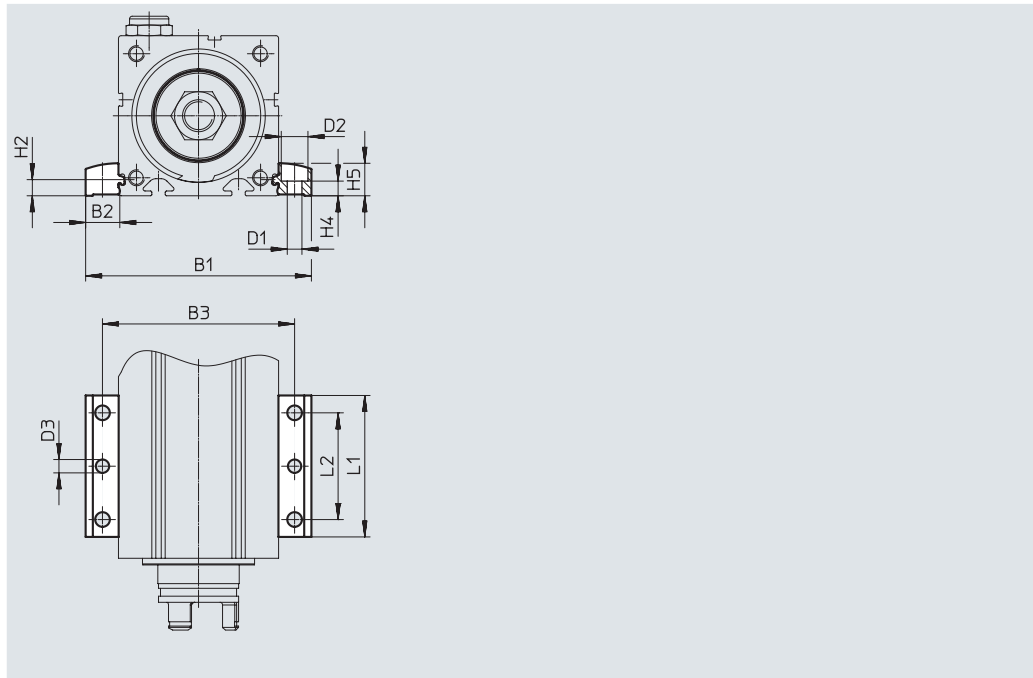
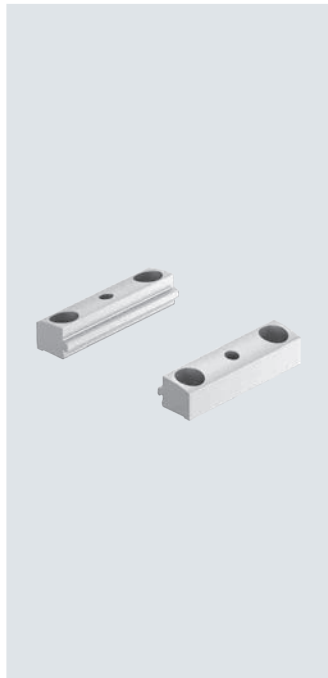
Profile mounting EAHF-L2-...-P

Material:

Anodised wrought aluminium alloy

RoHS-compliant

- For mounting the cylinder on the side of the profile.
The profile mounting can be attached to the mounting surface using the drilled hole in the centre



Dimensions and ordering data

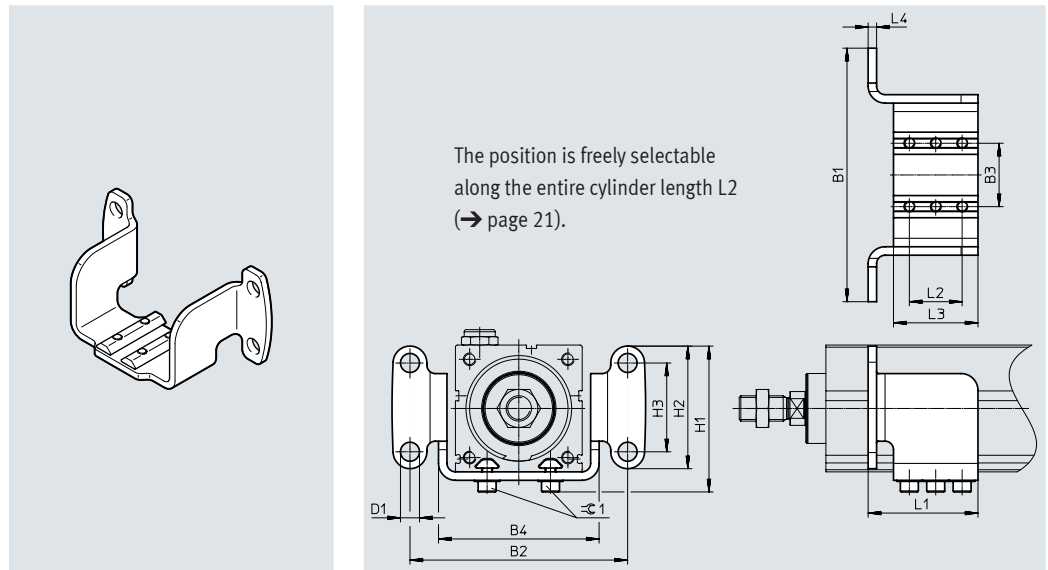
For size	B1	B2	B3	D1 ∅ H13	D2 ∅ H13	D3 ∅	H2
32	51.4	9.7	42	4.5	8	4	4.9
45	70.6	12.8	58	5.5	10	5	6.1
60	85.6	12.8	73	5.5	10	5	6.1

For size	H4 ±0.1	H5	L1	L2	Weight [g]	Part no.	Type
32	4.2	9	53	40	19	4835684	EAHF-L2-25-P
45	5.5	12.2	53	40	35	4835728	EAHF-L2-45-P
60	5.5	12.2	53	40	35	4835728	EAHF-L2-45-P

Accessories

Flange mounting EAHH

Material:
Galvanised steel
RoHS-compliant



Dimensions and ordering data

For size	B1	B2	B3 ±0.1	B4	D1 ∅	H1	H2	H3	L1
32	70	58	16	42	5.5	39	31	20	38
45	100	85	24	61	6.6	54.5	48	35	42
60	120	103	30	76	9	69	58	42	52

For size	L2	L3	L4	≅G1	CRC ¹⁾	Weight [g]	Part no.	Type
32	20	30	2.5	2.5	1	80	5126157	EAHH-P2-32
45	20	30	4	2.5	1	185	5126669	EAHH-P2-45
60	25	40	4	4	1	320	5127005	EAHH-P2-60

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

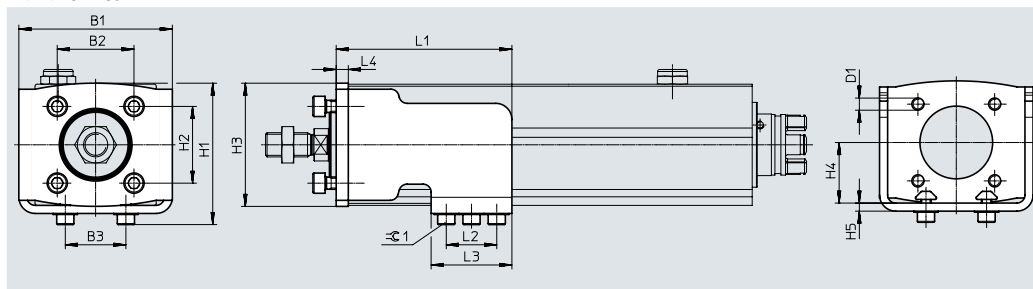
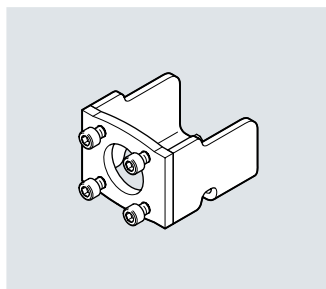
Accessories

Adapter kit EAHA

Material:

Galvanised steel

RoHS-compliant



Dimensions and ordering data

For size	B1	B2	B3	D1	H1	H2	H3	H4	H5
		±0.2	±0.1			±0.2			
32	53	22	16	M5	42	22	37	18	2.5
45	61	32.5	24	M6	54	32.5	49	22.5	4
60	76	38	30	M6	69.5	38	61	30	4

For size	L1	L2	L3	L4	≅1	CRC ¹⁾	Weight [g]	Part no.	Type
32	64	20	30	4	2.5	1	165	5173020	EAHA-P2-32
45	68	20	30	6	2.5	1	340	5172353	EAHA-P2-45
60	87	25	40	6	4	1	560	5173082	EAHA-P2-60

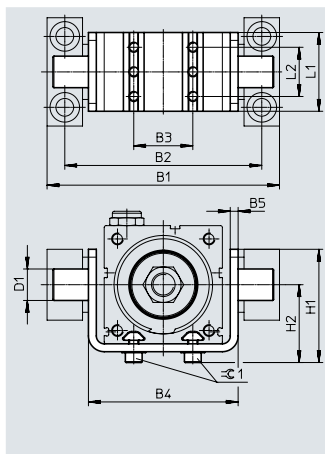
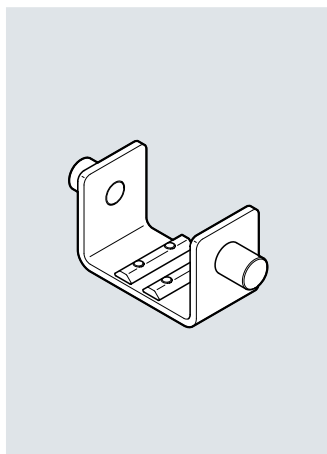
1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Accessories

Swivel mounting EAHS

Material:
Galvanised steel
RoHS-compliant



The position is freely selectable along the entire cylinder length L2 (→ page 21).

Dimensions and ordering data

For size	B1	B2	B3 ±0.1	B4	B5	D1 ∅ e9	H1
32	68	57	16	42	2.5	8	32
45	98	83	24	62	4	12	44.5
60	118	100	30	76	4	16	57

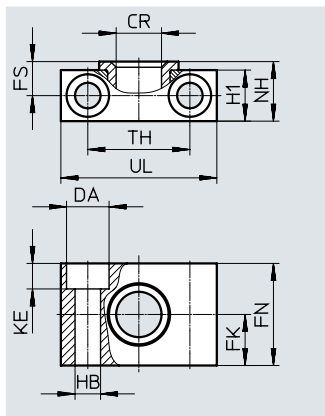
For size	H2	L1	L2	∅G1	CRC ¹⁾	Weight [g]	Part no.	Type
32	23.5	30	20	2.5	1	75	5125041	EAHS-P2-32
45	29.5	30	20	2.5	1	165	5125167	EAHS-P2-45
60	39	40	25	4	1	305	5125281	EAHS-P2-60

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Trunnion support LNZG

Material:
Trunnion support: Anodised aluminium
Plain bearing: Plastic
Copper/PTFE-free
RoHS-compliant



Dimensions and ordering data

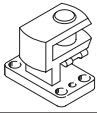

For size	CR ∅	DA ∅	FK ∅ ±0.1	FN	FS	H1	HB ∅ H13	KE	NH	TH ±0.2	UL	CRC ¹⁾	Weight [g]	Part no.	Type
32	8	8	10	20	7.5	11	4.5	4.6	13	20	30	2	26	1434912	LNZG-16
45	12	11	15	30	10.5	15	6.6	6.8	18	32	46	2	83	32959	LNZG-32
60	16	15	18	36	12	18	9	9	21	36	55	2	129	32960	LNZG-40/50

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

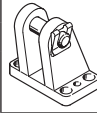
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Accessories



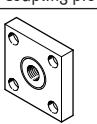
Ordering data – Mounting components

Designation	For size	Part no.	Type
Right angle clevis foot LQG			
	45	31768	LQG-32
	60	31769	LQG-40
Clevis foot LBN			
	32	6059	LBN-20/25
	45	195860	LBN-32
	60	195861	LBN-40



Data sheets → Internet: clevis foot

Designation	For size	Part no.	Type
Clevis foot LBG			
	45	31761	LBG-32
	60	31762	LBG-40

Ordering data – Piston rod attachments

Designation	For size	Part no.	Type
Rod eye SGS			
	32	9255	SGS-M8
	45	9261	SGS-M10x1.25
	60	9262	SGS-M12x1.25
Self-aligning rod coupler FK			
	32	2062	FK-M8
	45	6140	FK-M10x1.25
	60	6141	FK-M12x1.25
Coupling piece KSG			
	45	32963	KSG-M10x1.25
	60	32964	KSG-M12x1.25

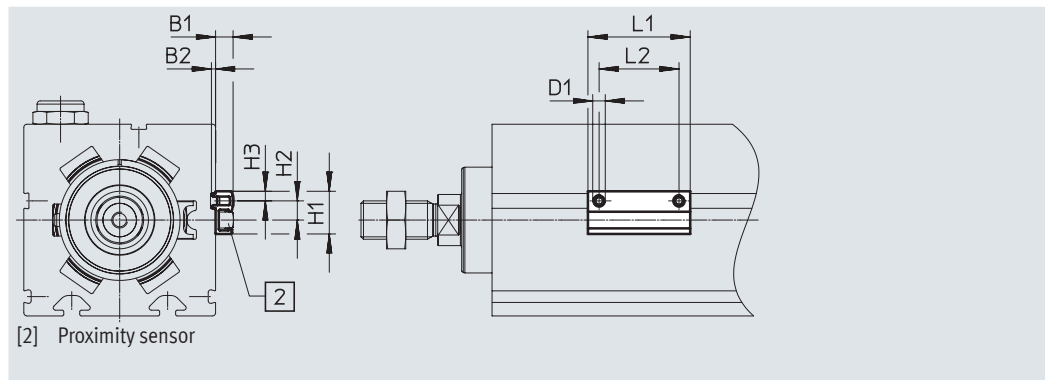
Data sheets → Internet: piston rod attachment

Designation	For size	Part no.	Type
Rod clevis SG			
	32	3111	SG-M8
	45	6144	SG-M10x1.25
	60	6145	SG-M12x1.25
Rod clevis SGA			
	45	32954	SGA-M10x1.25
	60	10767	SGA-M12x1.25

Accessories

Sensor bracket EAPM-L2

Material:
Anodised wrought aluminium alloy
RoHS-compliant





Dimensions and ordering data						
For size	B1	B2	D1	H1	H2	
32, 45, 60	5.5	1.3	M4	13.4	6	
For size	H3	L1	L2	Weight [g]	Part no.	Type
32, 45, 60	3	32	25	4	4759852	EAPM-L2-SH

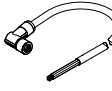
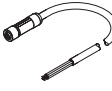
Ordering data – Proximity sensors for T-slot, magneto-resistive							Data sheets → Internet: smt
	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part no.	Type	
N/O contact							
	Insertable in the slot from above, flush with the cylinder profile, short design	PNP	Cable, 3-wire	2.5	574335	SMT-8M-A-PS-24V-E-2.5-OE	
			Plug M8x1, 3-pin	0.3	574334	SMT-8M-A-PS-24V-E-0.3-M8D	
		NPN	Cable, 3-wire	2.5	574338	SMT-8M-A-NS-24V-E-2,5-OE	
			Plug M8x1, 3-pin	0.3	574339	SMT-8M-A-NS-24V-E-0,3-M8D	
N/C contact							
	Insertable in the slot from above, flush with the cylinder profile, short design	PNP	Cable, 3-wire	7.5	574340	SMT-8M-A-PO-24V-E-7.5-OE	
				2.5	8138000	SMT-8M-A-NO-24V-E-2,5-OE	
		NPN		7.5	8138001	SMT-8M-A-NO-24V-E-7,5-OE	


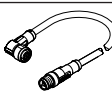
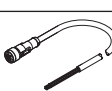
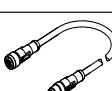
Ordering data – Connecting cables						Data sheets → Internet: nebu
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type	
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541333	NEBU-M8G3-K-2.5-LE3	
			5	541334	NEBU-M8G3-K-5-LE3	
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3	
			5	541341	NEBU-M8W3-K-5-LE3	

Accessories

Ordering data – IO-Link master USB					Data sheets → Internet: cdsu
	Description	Cable length [m]	Part no.	Type	
	<ul style="list-style-type: none"> For using the unit with IO-Link An external power supply plug is additionally required (not included in the scope of delivery) 	0.3	8091509	CDSU-1	

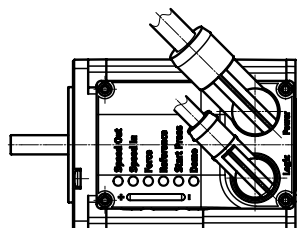
Ordering data – Adapter					Data sheets → Internet: nefc
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Straight socket, M12x1, 8-pin	<ul style="list-style-type: none"> Straight plug, M12x1, 5-pin Only for use with IO-Link Port Class A Master (recommended) 	0.3	8080777	NEFC-M12G8-0.3-M12G5-LK

Ordering data – Supply cables					Data sheets → Internet: nebl
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Angled socket, M12x1, 4-pin	Cable, open end, 4-wire	2	8080778	NEBL-T12W4-E-2-N-LE4
			5	8080779	NEBL-T12W4-E-5-N-LE4
			10	8080780	NEBL-T12W4-E-10-N-LE4
			15	8080781	NEBL-T12W4-E-15-N-LE4
	Straight socket, M12x1, 4-pin	Cable, open end, 4-wire	2	8080790	NEBL-T12G4-E-2-N-LE4
			5	8080791	NEBL-T12G4-E-5-N-LE4
			10	8080792	NEBL-T12G4-E-10-N-LE4
			15	8080793	NEBL-T12G4-E-15-N-LE4

Ordering data – Connecting cables					Data sheets → Internet: nebc
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Angled socket, M12x1, 8-pin	Cable, open end, 8-wire	2	8094476	NEBC-M12W8-E-2-N-B-LE8
			5	8094478	NEBC-M12W8-E-5-N-B-LE8
			10	8094481	NEBC-M12W8-E-10-N-B-LE8
			15	8094479	NEBC-M12W8-E-15-N-B-LE8
	Straight socket, M12x1, 8-pin	Cable, open end, 8-wire	2	8080786	NEBC-M12W8-E-2-N-M12G8
			5	8080787	NEBC-M12W8-E-5-N-M12G8
			10	8080788	NEBC-M12W8-E-10-N-M12G8
			15	8080789	NEBC-M12W8-E-15-N-M12G8
	Straight socket, M12x1, 8-pin	Cable, open end, 8-wire	2	8094480	NEBC-M12G8-E-2-N-B-LE8
			5	8094477	NEBC-M12G8-E-5-N-B-LE8
			10	8094482	NEBC-M12G8-E-10-N-B-LE8
			15	8094475	NEBC-M12G8-E-15-N-B-LE8
	Straight plug, M12x1, 8-pin	Cable, open end, 8-wire	2	8080782	NEBC-M12G8-E-2-N-M12G8
			5	8080783	NEBC-M12G8-E-5-N-M12G8
			10	8080784	NEBC-M12G8-E-10-N-M12G8
			15	8080785	NEBC-M12G8-E-15-N-M12G8

Note

The angled cables are positioned at a 45° angle to the axis.



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