

Stopper cylinders EFSD

FESTO



Key features

At a glance

- Quick and easy to install on transfer systems
- No valves, tubing or compressed air required
- Low noise pollution
- Three sizes for stopping conveyed goods weighing between 0.25 kg and 100 kg

LED indicator

Status and error messages for visual error diagnostics

Cushioning module

with adjustable cushioning



Actuation via digital I/O

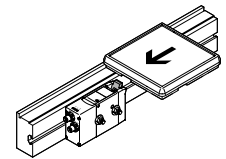
makes commissioning easier

Integrated sensors

for position sensing
(stop retracted or extended)

Mounting interface

for easy mounting on transfer systems



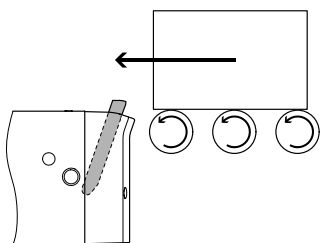
Electrical actuation

- No separate controller required
- Direct connection to digital I/O of a higher-order controller, e.g. terminal CPX
- 24 V DC motor with low power demand
- Saves energy – 24 V DC motor with low power demand
- Type of connection: 2x M12 plug (5-pin) for drive and position sensing
- Sensing of upper and lower position of the stop (extended or retracted) using integrated Hall effect sensors

Adjustable cushioning

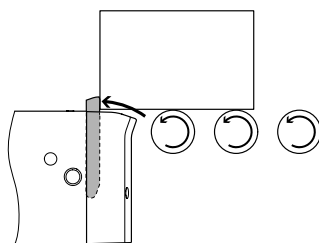
- Cushioning force can be adjusted to different loads
- One size in the transfer system for empty and full workpiece carriers
- Easy to adjust the cushioning using setting screw on the top of the device
- Low-maintenance cushioning (atmospheric air)

Functional sequence



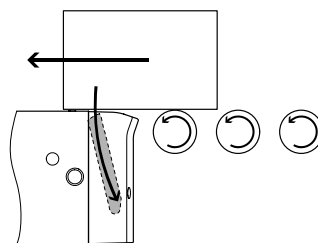
Position 1 Stopper cylinder is in the initial position

The stop is extended and ready to stop a conveyed item
LED status message: closed
Input signal: 0



Position 2 Stopper cylinder is in the holding position

The conveyed item is stopped by internal cushioning and then held in position
LED status message: closed
Input signal: 0



Position 3 Stopper cylinder is in the release position

The stop is retracted and the conveyed item is released
LED status message: open
Input signal: 1

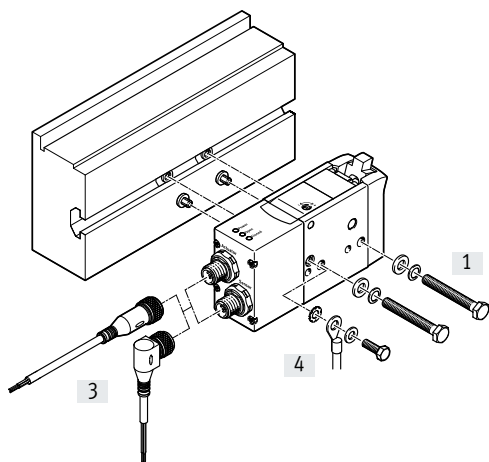
Type codes and peripherals overview

001	Series	
EFSD	Stopper cylinder	
002	Size	
20	20	
50	50	
100	100	

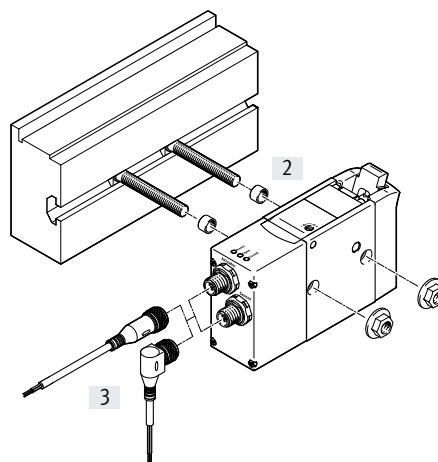
003	Cushioning	
PV	Pneumatic cushioning, adjustable	
004	Electrical connection	
M12	Serial interface M12	

Peripherals overview

EFSD-20

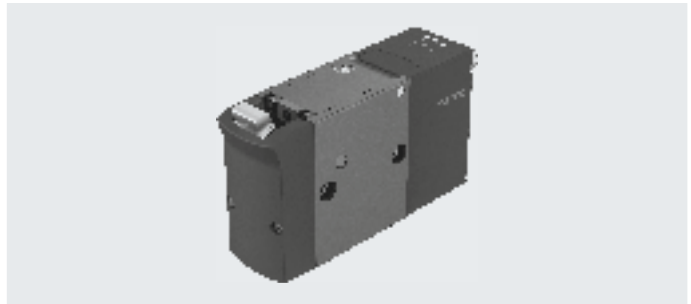
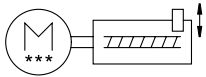


EFSD-50/100



Accessories	Description	→ Page/Internet
[1] Mounting kit EAHM-E18-K-20	For mounting on a profile with slot 8	3
[2] Mounting kit EAHM-E18-K-50	For mounting on a profile with slot 10 and web width of approx. 6 mm	8
Mounting kit EAHM-E18-K-50-Z65	For mounting on a profile with slot 10 and web width of approx. 3.7 mm	8
[3] Connecting cable NEBU	For connection to a controller	9
[4] Earthing kit	For size 20, electrostatic influences may cause malfunctions. Therefore, an earthing kit is included in the scope of delivery of the stopper cylinder	-

Data sheet



General technical data			
Size	20	50	100
Design	Electric stopper cylinder		
Ready status indication	LED		
Cushioning length [mm]	11.5	17.5	18.2
Retracting/extending time			
Max. time for retracting ¹⁾ [s]	0.1	0.15	0.3
Max. time for extending [s]	0.1	0.15	0.2
Position sensing	Via integrated Hall effect sensor		
Type of mounting	Via mounting kit		
Mounting position	Any		
Product weight [g]	420	800	985

1) Without transverse load

Electrical data			
Size	20	50	100
Motor type	Stepper motor		
Power supply [V DC]	24 ±15%		
Max. current consumption ¹⁾			
Actuator [A]	1.9	1.2	1.4
Sensor [A]	0.3		
Max. switching frequency [Hz]	0.33		
Max. line length [m]	30		
Electrical connection, actuator, sensor			
Connection type	Plug		
Connection technology	M12x1, A-coded to EN 61076-2-101		
Number of pins/wires	5		

1) During the switch-on process, there is briefly a larger starting current.

Operating and environmental conditions		
Ambient temperature [°C]	-10 ... +60	
Storage temperature [°C]	-20 ... +60	
Relative humidity	0 ... 95% (non-condensing)	
Degree of protection	IP40	
Corrosion resistance CRC ¹⁾	1	
CE marking (see declaration of conformity) ²⁾	To EU-EMC Directive	

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

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

2) 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.

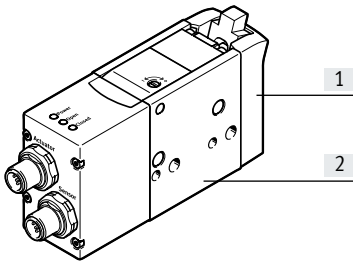
Data sheet

Maximum load to be stopped at conveying speed v_f				
Size		20	50	100
Conveying speed v_f				
6 m/min	[kg]	0.25 ... 20	1 ... 50	3 ... 100
9 m/min	[kg]	0.25 ... 10	1 ... 35	3 ... 70
12 m/min	[kg]	0.25 ... 7	1 ... 30	3 ... 60
18 m/min	[kg]	0.25 ... 3.5	1 ... 18	3 ... 50
24 m/min	[kg]	0.25 ... 2.5	1 ... 12	3 ... 45
30 m/min	[kg]	0.25 ... 2	1 ... 8	3 ... 30
36 m/min	[kg]	0.25 ... 1	1 ... 5	3 ... 20
For friction coefficient $\mu^{1)}$		0.1	0.1	0.07

1) For size 2 0/50: between conveyed goods and belt system
 For size 100: between conveyed goods and roller system

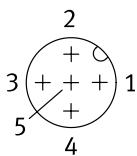
Max. transverse load F during switching operation				
Size		20	50	100
Transverse load	[N]	20	50	100

Materials



Stopper cylinder	
[1] Cover	PA reinforced
[2] Housing	Hard anodised wrought aluminium alloy
- Piston rod	High-alloy stainless steel
Screws	Coated steel
Seals	NBR
Note on materials	RoHS-compliant
	Contains paint-wetting impairment substances

Pin allocation of the connector plug



M12 plug (5-pin, A-coded)		
Pin	Actuator connection	Sensor connection
1 brown (BN)	Not assigned	Supply voltage +24 V DC
2 white (WH)	Input	Output 1 (open)
3 blue (BU)	0 V	0 V
4 black (BK)	Supply voltage +24 V DC	Output 2 (closed)
5 grey (GY)	Functional earth (FE) ¹⁾	Functional earth (FE) ¹⁾

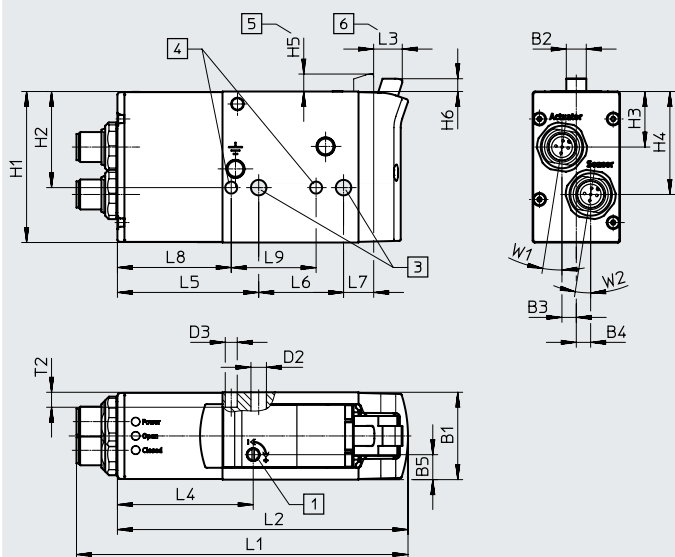
1) Functional earth must always be connected.

Data sheet

Dimensions

Download CAD data → www.festo.com

EFSD-20-PV-M12



- [1] Cushioning adjustment
- [3] Drilled hole for retaining screw
- [4] Drilled hole for centring pins
- [5] Return stroke min. dimension H5
- [6] Cushioning stroke

Size	B1	B2	B3	B4	B5	D2	D3	H1	H2	H3	H4	H5
	±0.05		±0.4	±0.4	±0.25	∅ +0.1/-0.05	∅ ±0.05		±0.15	±0.5	±0.5	±0.55
20	35	8	5.75	5.75	7.5	6.2	4.8	60.5	38.5	22.25	41.25	7

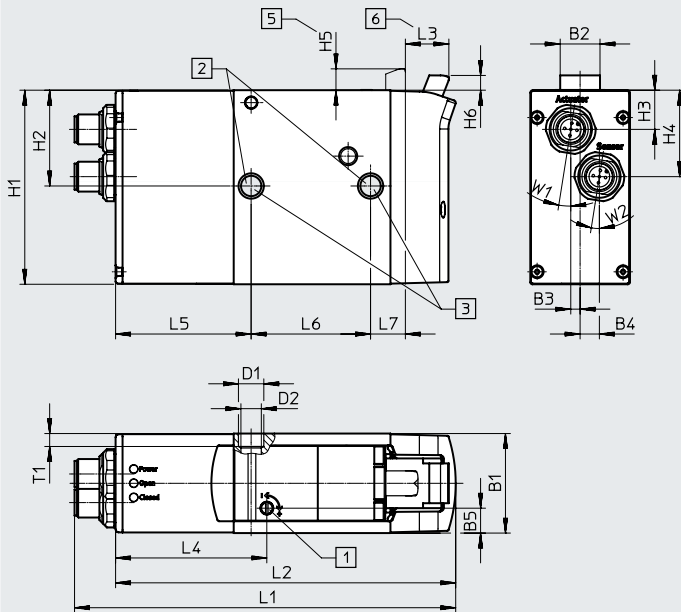
Size	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	T2	W1	W2
	±0.55	±1	±0.5	+0.5/-1	±0.5		±0.1	±0.5		±0.1	±0.2		
20	5.1	132.8	116.4	11.5	54.4	56.6	34	12	45.6	34	6	9°	9°

Data sheet

Dimensions

Download CAD data → www.festo.com

EFSD-50/100-PV-M12

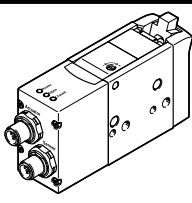


- [1] Cushioning adjustment
- [2] Drilled hole for centring sleeve
- [3] Drilled hole for retaining screw
- [5] Return stroke min. dimension H5
- [6] Cushioning stroke

Size	B1	B2	B3	B4	B5	D1 ∅	D2 ∅	H1	H2	H3	H4	H5
	±0.05		±0.4	±0.4	±0.25	+0.07/-0.05	+0.1/-0.05		±0.15	±0.5	±0.5	±0.55
50	40	16	3.75	7.75	10	10.2	8.2	78	38.5	15.75	34.75	8.6
100	44	16	5.4	8.7	11.5	10.2	8.2	78	38.5	14	29.4	8.6

Size	H6	L1	L2	L3	L4	L5	L6	L7	T1	W1	W2
	±0.55	±1.1	±0.5	+0.5/-1	±0.5		±0.1		+0.1/-0.05		
50	6	153.2	136.7	17.5	60.8	54.5	48	14 ±0.5	5.2	9°	9°
100	6.3	163.7	147.2	18.2	67.3	58	52	13.8 ±0.6	5.2	9°	9°

Ordering data

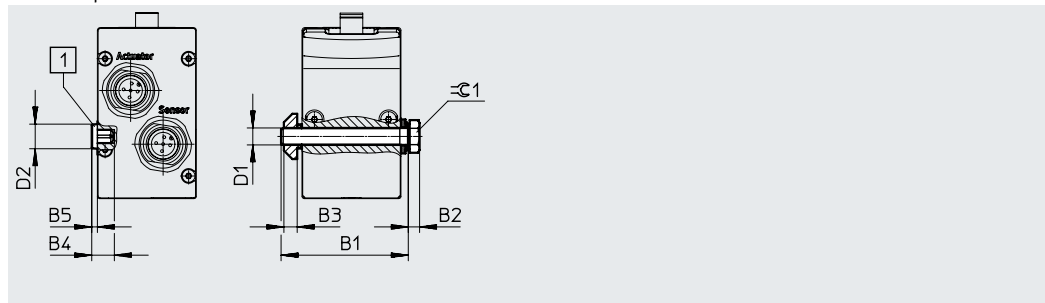
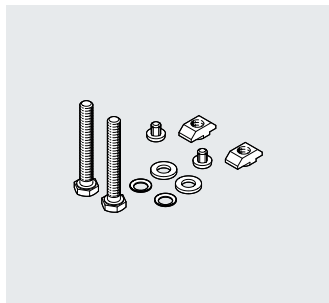
	Size	Part no.	Type
	20	2942445	EFSD-20-PV-M12
	50	2942446	EFSD-50-PV-M12
	100	2942447	EFSD-100-PV-M12

Accessories

Mounting kit EAHM-E18-K-20

For mounting on a profile with slot 8

Material:
Slot nuts, screws: galvanised steel
Centring pins: plastic
Contains paint-wetting impairment substances
RoHS-compliant

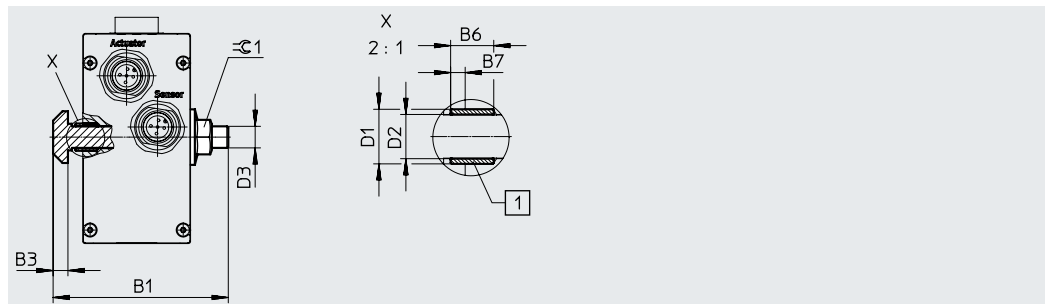
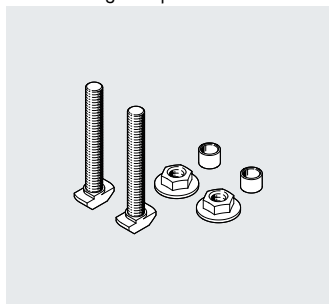


Dimensions and ordering data											
For size	B1	B2	B3	B4	B5	D1	D2 \varnothing	± 0.1	Weight [g]	Part no.	Type
20	45	4	4.7	7.5	2	M6	8.5	10	34	8058454	EAHM-E18-K-20

Mounting kit EAHM-E18-K-50-Z65 EAHM-E18-K-50

For mounting on a profile with slot 10

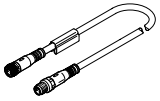
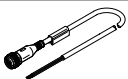
Material:
Galvanised steel
Contains paint-wetting impairment substances
RoHS-compliant



Dimensions and ordering data											
For size	B1	B3	B6	B7	D1 \varnothing	D2 \varnothing	D3	± 0.1	Weight [g]	Part no.	Type
50, 100 ¹⁾	65	5.5	6.5	1.2	10.1	8.2	M8	13	85	8058455	EAHM-E18-K-50-Z65
50, 100 ²⁾	65	5.5	8	2.7	10.1	8.2	M8	13	85	8058456	EAHM-E18-K-50

1) For a profile with web width of approx. 3.7 mm
2) For a profile with web width of approx. 6 mm

Accessories

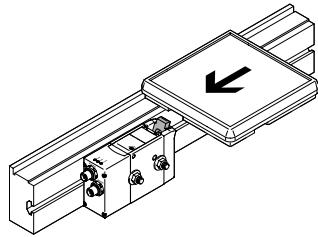
Ordering data – Connecting cable NEBU-M12					
	Outlet direction	Cable characteristic	Cable length [m]	Part no.	Type
Socket, 5-pin, M12 – plug, 5-pin, M12					
	Straight – angled	Standard	0.5	8003617	NEBU-M12G5-K-0.5-M12W5
	Straight – angled		2	8003618	NEBU-M12G5-K-2-M12W5
	Angled – angled		0.5	570733	NEBU-M12W5-K-0.5-M12W5
	Angled – angled		2	570734	NEBU-M12W5-K-2-M12W5
	Straight – angled	Suitable for energy chains	5	574321	NEBU-M12G5-E-5-Q8N-M12G5
			7.5	574322	NEBU-M12G5-E-7.5-Q8N-M12G5
10			574323	NEBU-M12G5-E-10-Q8N-M12G5	
Socket, 5-pin, M12 – open cable end, 5-wire					
	Straight	Standard	2.5	541330	NEBU-M12G5-K-2.5-LE5
			5	541331	NEBU-M12G5-K-5-LE5
			10	554038	NEBU-M12G5-K-10-LE5
Angled	2.5		567843	NEBU-M12W5-K-2.5-LE5	
	5		567844	NEBU-M12W5-K-5-LE5	

Data sheet

Selection aid

Stopping conveyed goods

The stopper cylinder is used to brake a conveyed item.



Example

Given:

Friction coefficient $\mu = 0.1$

Conveying speed $v = 12 \text{ m/min}$

Conveyed goods m with workpiece carrier = 25 kg

Selection: stopper cylinder EFSD-50

1. Checking the permissible load

At a conveying speed of 12 m/min, the maximum permissible load is 30 kg (page 5, table at top).

Result:

This means that the total load of 25 kg for the conveyed goods is permissible.

Maximum load to be stopped at conveying speed v_f				
Size		20	50	100
Conveying speed v_f				
6 m/min	[kg]	0.25 ... 20	1 ... 50	3 ... 100
9 m/min	[kg]	0.25 ... 10	1 ... 35	3 ... 70
12 m/min	[kg]	0.25 ... 7	1 ... 30	3 ... 60
18 m/min	[kg]	0.25 ... 3.5	1 ... 18	3 ... 50
24 m/min	[kg]	0.25 ... 2.5	1 ... 12	3 ... 45
30 m/min	[kg]	0.25 ... 2	1 ... 8	3 ... 30
36 m/min	[kg]	0.25 ... 1	1 ... 5	3 ... 20
For friction coefficient μ^1		0.1	0.1	0.07

1) For size 2 0/50: between conveyed goods and belt system
For size 100: between conveyed goods and roller system

2. Checking the permissible transverse load

In the case of EFSD50, the maximum transverse load is 50 N (page 5, table at top).

Max. transverse load F during switching operation				
Size		20	50	100
Transverse load	[N]	20	50	100

Transverse load $F_q =$

friction force F_{friction}

$$F_{\text{friction}} = \mu \times m \times g$$

$$= 0.1 \times 25 \text{ kg} \times 9.81 \text{ m/s}^2$$

$$= \text{approx. } 25 \text{ N}$$

Result:

This means that a transverse load of 25 N is permissible.