

## 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

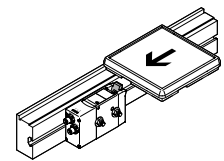
makes commissioning easier

### Integrated sensors

for position sensing  
(stop retracted or extended)

### Mounting interface

for easy mounting on transfer systems



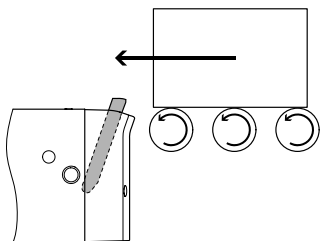
### Electrical actuation

- 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

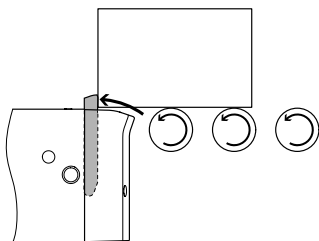


#### Position 1 Stopper cylinder is in the initial position

The stop is extended and ready to stop a conveyed item

LED status message: closed

Input signal: 0

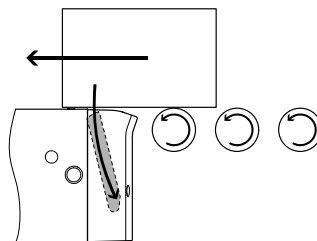


#### Position 2 Stopper cylinder is in the holding position

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

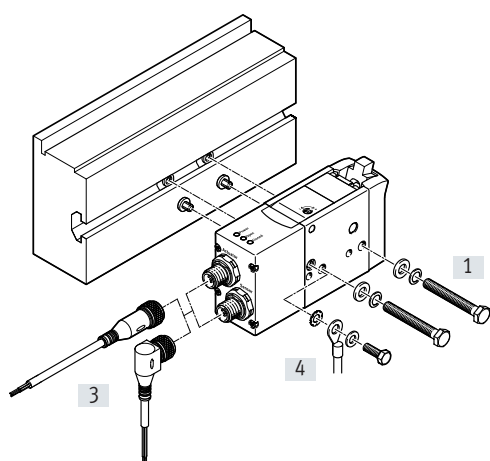
002	Size
20	20
50	50
100	100

003	Cushioning
PV	Pneumatic cushioning, adjustable

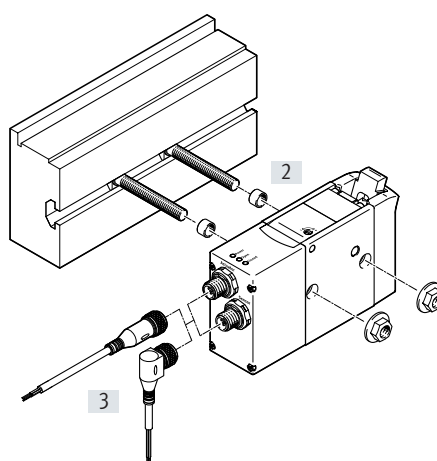
004	Electrical connection
M12	Serial interface M12

## Peripherals overview

EFSD-20

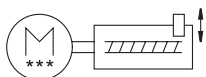


EFSD-50/100



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 <sup>1)</sup> [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 <sup>1)</sup>			
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 <sup>1)</sup>	1
CE marking (see declaration of conformity) <sup>2)</sup>	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](http://www.festo.com/sp) → Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

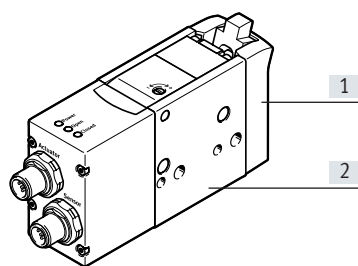
## Data sheet

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 20/50: between conveyed goods and belt system  
 For size 100: between conveyed goods and roller system

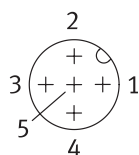
Max. transverse load F during switching operation				
Size		20	50	100
Transverse load	[N]	20	50	100

## 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) <sup>1)</sup>	Functional earth (FE) <sup>1)</sup>

- 1) Functional earth must always be connected.

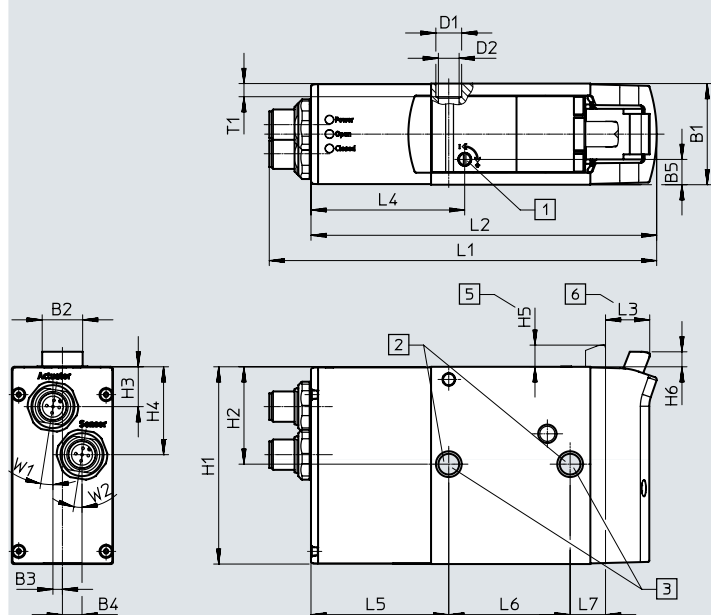


## Data sheet

## Dimensions

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

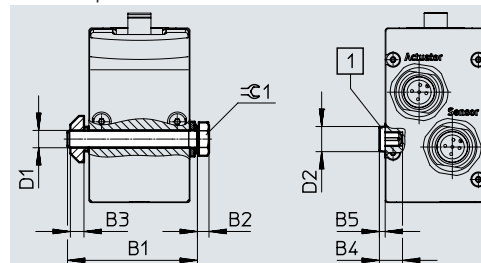
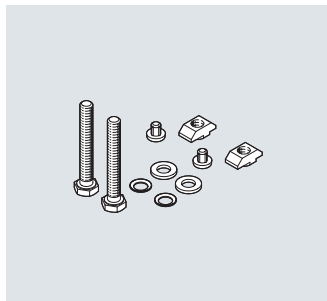
Material:

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	±1	Weight	Part no.	Type
	+1						∅		[g]		
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

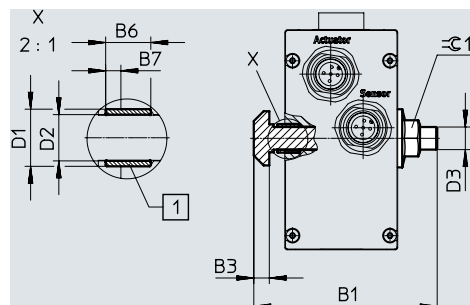
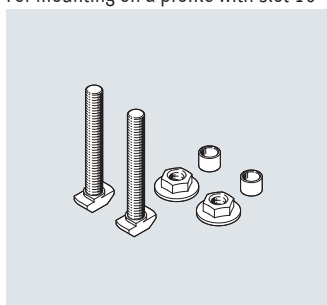
For mounting on a profile with slot 10

Material:

Galvanised steel

Contains paint-wetting impairment substances

RoHS-compliant



## Dimensions and ordering data

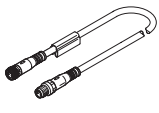
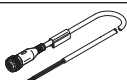
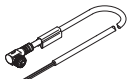
For size	B1	B3	B6	B7	D1	D2	D3	±1	Weight	Part no.	Type
	+1		-0.1		∅ -0.02	∅ +0.1			[g]		
50, 100 <sup>1)</sup>	65	5.5	6.5	1.2	10.1	8.2	M8	13	85	8058455	EAHM-E18-K-50-Z65
50, 100 <sup>2)</sup>	65	5.5	8	2.7	10.1	8.2	M8	13	85	8058456	EAHM-E18-K-50

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

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



## Accessories

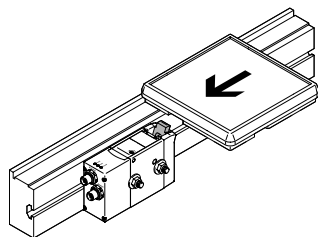
Ordering data – Connecting cable NEBU-M12						
	Outlet direction	Cable characteristic	Cable length [m]	Part no.	Type	
Socket, 5-pin, M12 – plug, 5-pin, M12						
	Straight – angled	Standard	0.5	8003617	NEBU-M12G5-K-0.5-M12W5	
	Straight – angled		2	8003618	NEBU-M12G5-K-2-M12W5	
	Angled – angled		0.5	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 $\mu^1$	0.1	0.1	0.07

1) For size 20/50: 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  $F_{\text{friction}}$

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

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

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

Result:

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

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**1 Festo Inc.**  
5300 Explorer Drive  
Mississauga, ON L4W 5G4  
Canada

**Festo Customer Interaction Center**  
Tel: 1 877 463 3786  
Fax: 1 877 393 3786  
Email: customer.service.ca@festo.com



**2 Festo Pneumatic**  
Av. Ceylán 3,  
Col. Tequesquináhuac  
54020 Tlalnepantla,  
Estado de México

**Multinational Contact Center**  
01 800 337 8669  
ventas.mexico@festo.com




**3 Festo Corporation**  
1377 Motor Parkway  
Suite 310  
Islandia, NY 11749

**Festo Customer Interaction Center**  
1 800 993 3786  
1 800 963 3786  
customer.service.us@festo.com



**4 Regional Service Center**  
7777 Columbia Road  
Mason, OH 45040

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