

Stopper cylinders EFSD



# Stopper cylinders EFSD

Key features

## At a glance

- Fast and simple set-up on transfer systems without compressed air
- 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



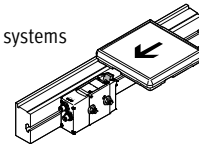
**Control via digital I/O**  
makes commissioning easier

### Integrated sensors

Position sensing  
(stop is retracted or extended)

### Mounting interface

for ease of mounting on transfer systems



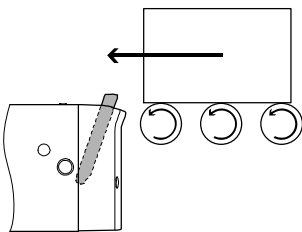
## Electrical actuation

- No separate controller required owing to internal processing logic
- Direct connection to digital I/O of a higher-order controller possible, e.g. terminal CPX
- 24 V DC motor with low power demand
- Saves energy as the motor automatically switches off in the end positions
- Type of connection: 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

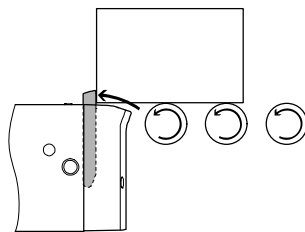
- Adjustable cushioning force, can therefore be ideally adjusted to different loads
- One size in the transfer system for empty and full workpiece carriers
- Simple adjustment of cushioning using setting screw on the top of the device
- The cushioning module works using atmospheric air, making it low-maintenance

## Functional sequence



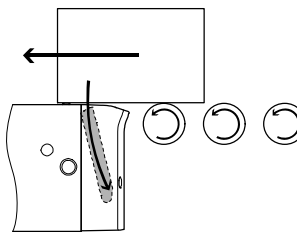
### Position 1 Stopper cylinder is in the initial position

Stop is extended and ready to stop an item of conveyed goods  
(LED status message: closed)



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

The item of conveyed goods is braked by internal cushioning and then held in position  
(LED status message: closed)



### Position 3 Stopper cylinder is in the release position

Stop is retracted and the item of conveyed goods is released  
(LED status message: open)

# Stopper cylinders EFSD

Type codes and peripherals overview

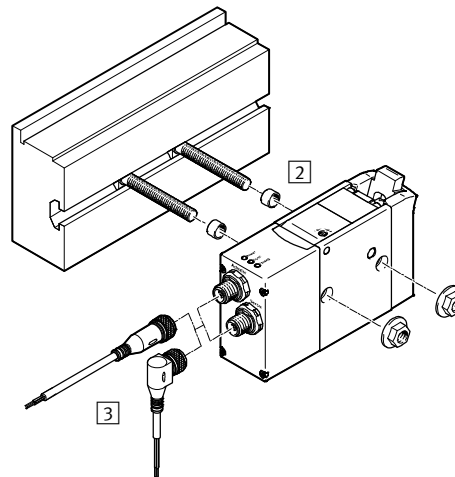
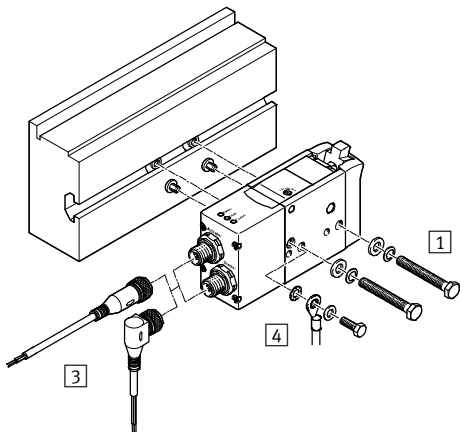
## Type codes

		EFSD	–	50	–	PV	–	M12
<b>Type code</b>								
EFSD	Stopper cylinder							
<b>Size</b>								
<b>Cushioning</b>								
PV	Adjustable							
<b>Electrical connection</b>								
M12								

## Peripherals overview

EFSD-20

EFSD-50/100

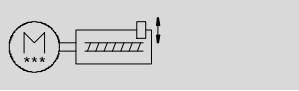


## Accessories

	Description	→ Page/Internet
1	Mounting kit EAHM-E18-K-20	For mounting on a profile with slot 8 8
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 –

# Stopper cylinders EFSD

Technical data



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 lateral force

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. cycle rate [Hz]	0.33		
Max. cable length [m]	30		
Electrical connection, actuator, sensor			
Connection type	Plug connector		
Connection technology	M12x1, A-coded to EN 61076-2-101		
Number of pins/wires	5		

1) During the switch-on process, there is a brief increase in the starting current.

Operating and environmental conditions	
Ambient temperature [°C]	-10 ... +60
Storage temperature [°C]	-20 ... +60
Relative air humidity	0 ... 95% (non-condensing)
Degree of protection	IP40
Corrosion resistance class CRC <sup>1)</sup>	1
CE mark (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. For dry indoor applications 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 applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com/sp](http://www.festo.com/sp) → Certificates.  
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

# Stopper cylinders EFSD

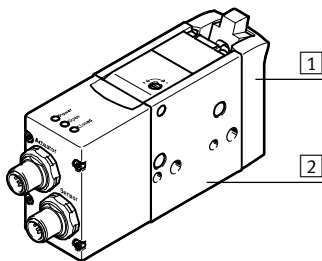
Technical data

Maximum stoppable load 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

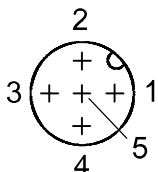
Max. lateral force F during switching operation				
Size		20	50	100
Lateral force	[N]	20	50	100

## 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 plug connector



M12 plug connector (5-pin, A-coded)		
Pin	Actuator connection	Sensor connection
1 brown (BN)	Unused	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.

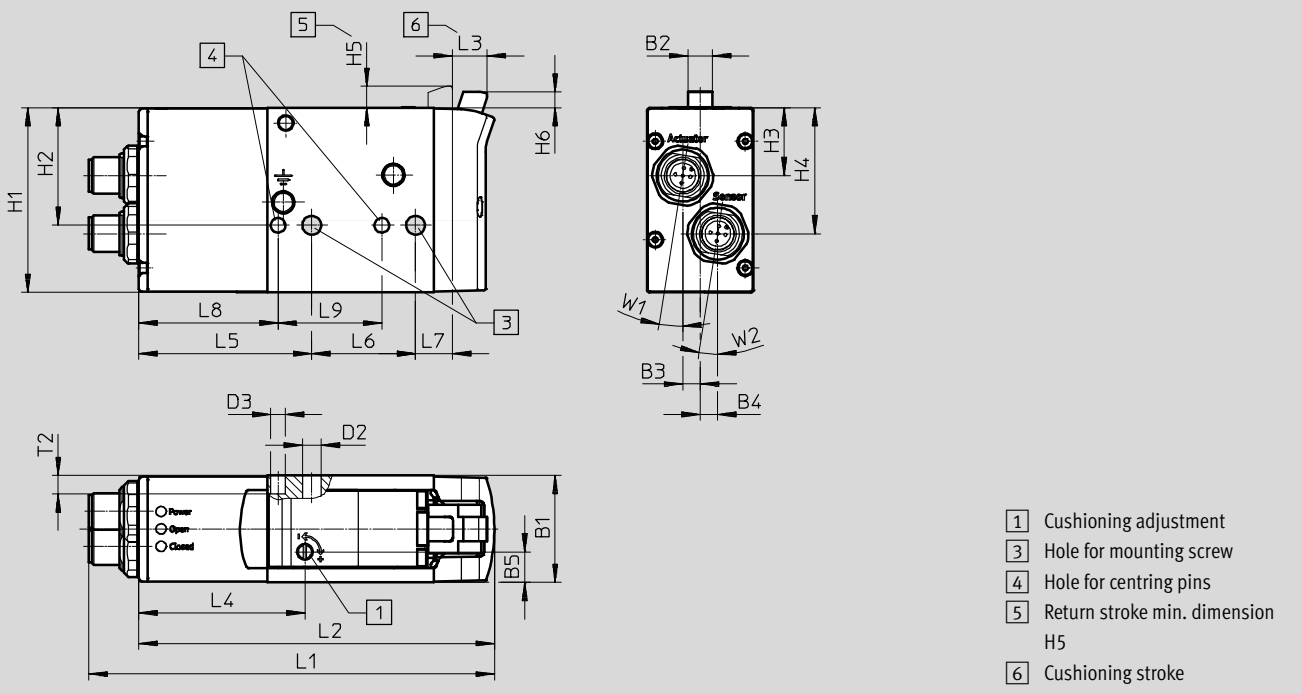
# Stopper cylinders EFSD

Technical data

**Dimensions**

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

EFSD-20-PV-M12



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°

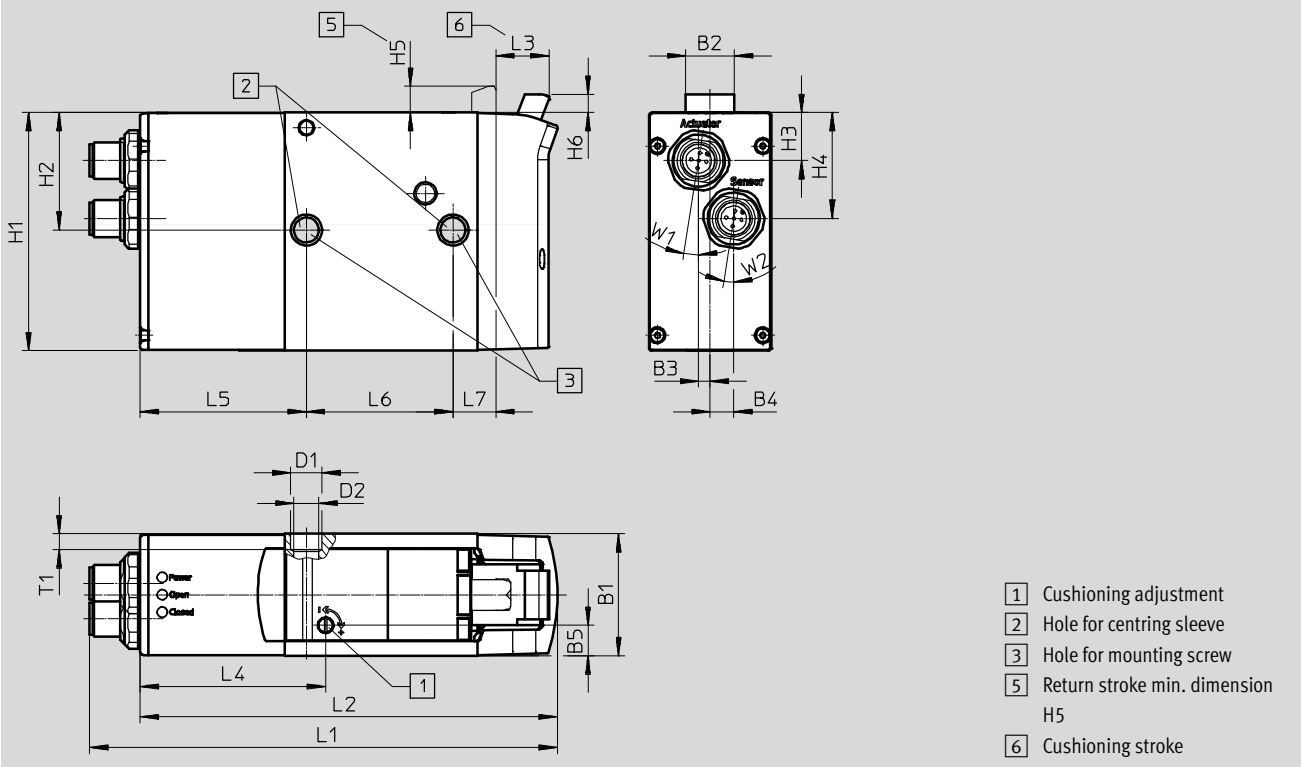
# Stopper cylinders EFSD

Technical data

## Dimensions

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

EFSD-50/100-PV-M12

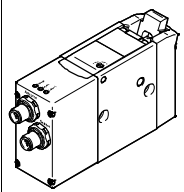


- 1 Cushioning adjustment
- 2 Hole for centring sleeve
- 3 Hole for mounting screw
- 5 Return stroke min. dimension H5
- 6 Cushioning stroke

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 code
	20	2942445	EFSD-20-PV-M12
	50	2942446	EFSD-50-PV-M12
	100	2942447	EFSD-100-PV-M12

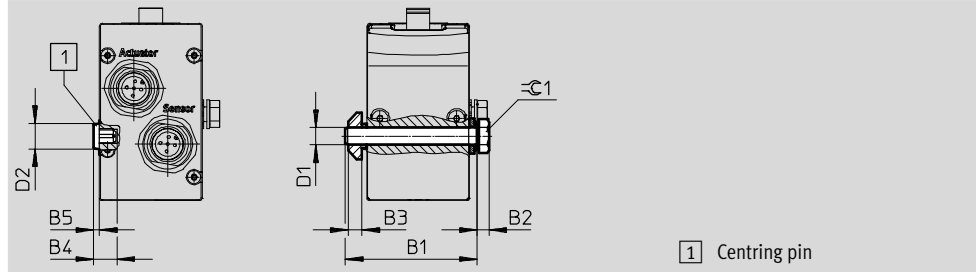
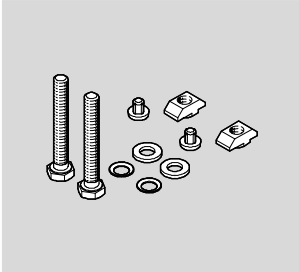
# Stopper cylinders EFSD

Accessories

**Mounting kit**  
**EAHM-E18-K-20**

For mounting on a profile with slot 8

Materials:  
Slot nuts, screws: Galvanised steel  
Centring pins: Plastic  
Contains paint-wetting impairment substances  
RoHS-compliant

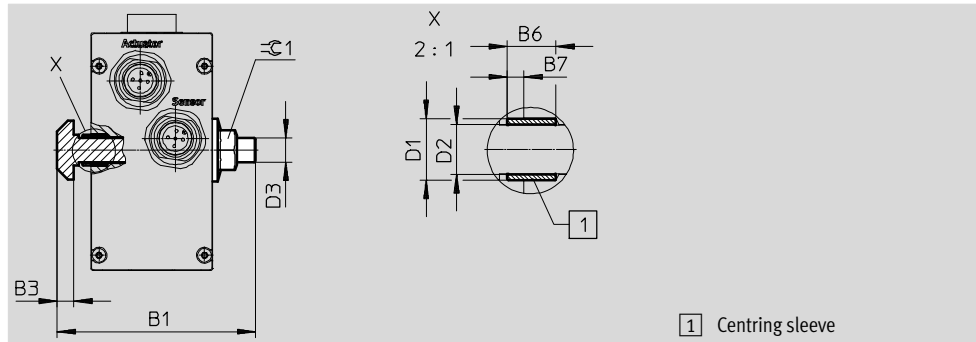
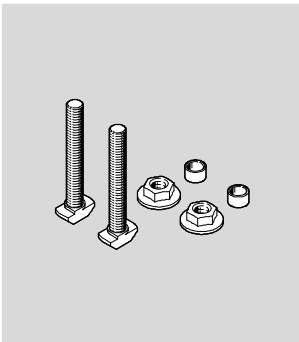


Dimensions and ordering data											
For size	B1	B2	B3	B4	B5	D1	D2	≙C 1	Weight	Part no.	Type code
	+1						∅		[g]		
20	45	4	4.7	7.5	2	M6	8.5	10	34	<b>8058454</b>	<b>EAHM-E18-K-20</b>

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

For mounting on a profile with slot 10

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



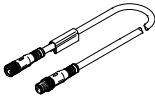
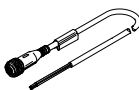
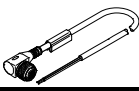
Dimensions and ordering data											
For size	B1	B3	B6	B7	D1	D2	D3	≙C 1	Weight	Part no.	Type code
	+1		-0.1		∅	∅			[g]		
50, 100 <sup>1)</sup>	65	5.5	6.5	1.2	10.1	8.2	M8	13	85	<b>8058455</b>	<b>EAHM-E18-K-50-Z65</b>
50, 100 <sup>2)</sup>	65	5.5	8	2.7	10.1	8.2	M8	13	85	<b>8058456</b>	<b>EAHM-E18-K-50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

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



## Stopper cylinders EFSD

Accessories

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

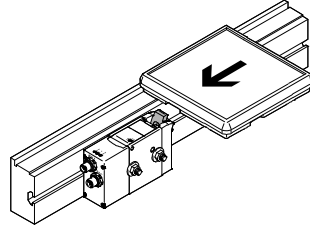
# Stopper cylinders EFSD

Technical data

## 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

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

Conclusion:

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

Maximum stoppable load 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 lateral force

In the case of EFSD50, the maximum lateral force is 50 N (→ page 5, table at top).

Max. lateral force $F$ during switching operation				
Size		20	50	100
Lateral force	[N]	20	50	100

Lateral force  $F_Q =$  Frictional force  $F_{fric}$

$$\begin{aligned}
 F_{fric} &= \mu \times m \times g \\
 &= 0.1 \times 25 \text{ kg} \times 9.81 \text{ m/s}^2 \\
 &= \text{approx. } 25 \text{ N}
 \end{aligned}$$

Conclusion:

This means that a lateral force of 25 N is permissible.