

Stopper cylinders EFSD



Stopper cylinders EFSD

Key features

At a glance

- Quick and easy equipping of 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



Control via digital I/O

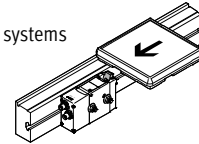
makes commissioning easier

Integrated sensors

for position sensing
(stop is retracted or extended)

Mounting interface

for ease of mounting on transfer systems



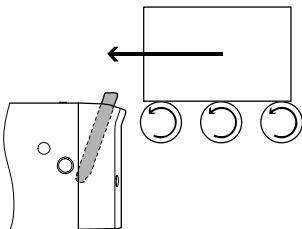
Electrical actuation

- No separate controller required
- 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 – 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
- Simple adjustment of cushioning using setting screw on the top of the device
- Low-maintenance cushioning (atmospheric air)

Functional sequence



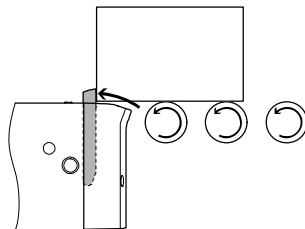
Position 1

Stopper cylinder is in the initial position

Stop is extended and ready to stop an item of conveyed goods

LED status message: closed

Input signal: 0



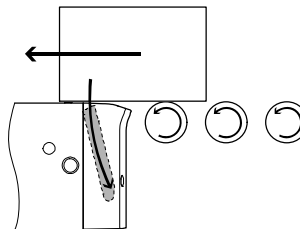
Position 2

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

Input signal: 0



Position 3

Stopper cylinder is in the release position

Stop is retracted and the item of conveyed goods is released

LED status message: open

Input signal: 1

Stopper cylinders EFSD

Type codes and peripherals overview

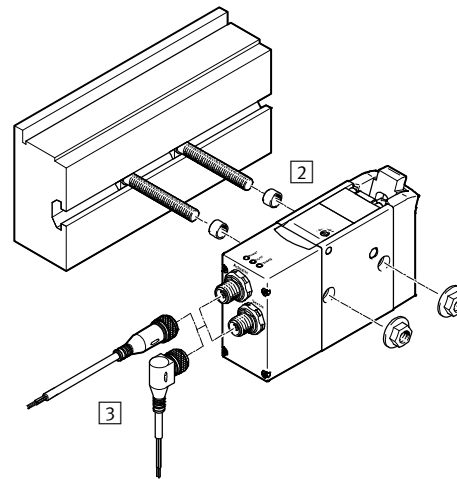
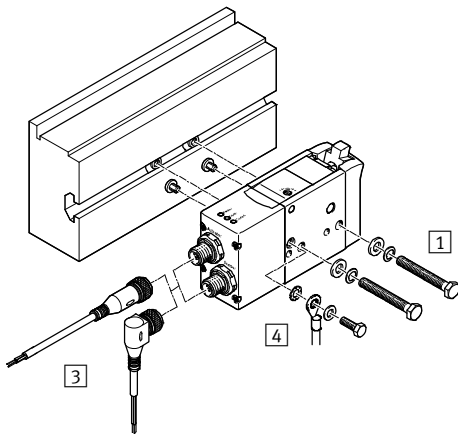
Type codes

EFS		50	PV	M12
Type code				
EFS	Stopper cylinder			
Size				
Cushioning				
PV	Adjustable			
Electrical connection				
M12				

Peripherals overview

EFSD-20

EFSD-50/100

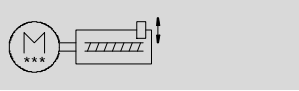


Accessories

	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 -

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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 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 lateral force

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. 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 ¹⁾	1
CE mark (see declaration of conformity) ²⁾	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 → 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.

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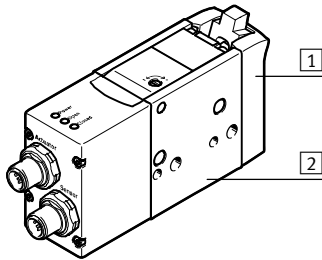
Technical data

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

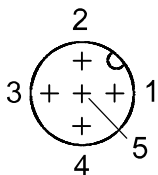
Max. lateral force F during switching operation				
Size		20	50	100
Lateral force	[N]	20	50	100

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 the plug connectors



M12 plug connector (5-pin, A-coded)		
Pin	Pin allocation actuator	Pin allocation sensor
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) ¹⁾	Functional earth (FE) ¹⁾

1) Functional earth must always be connected.

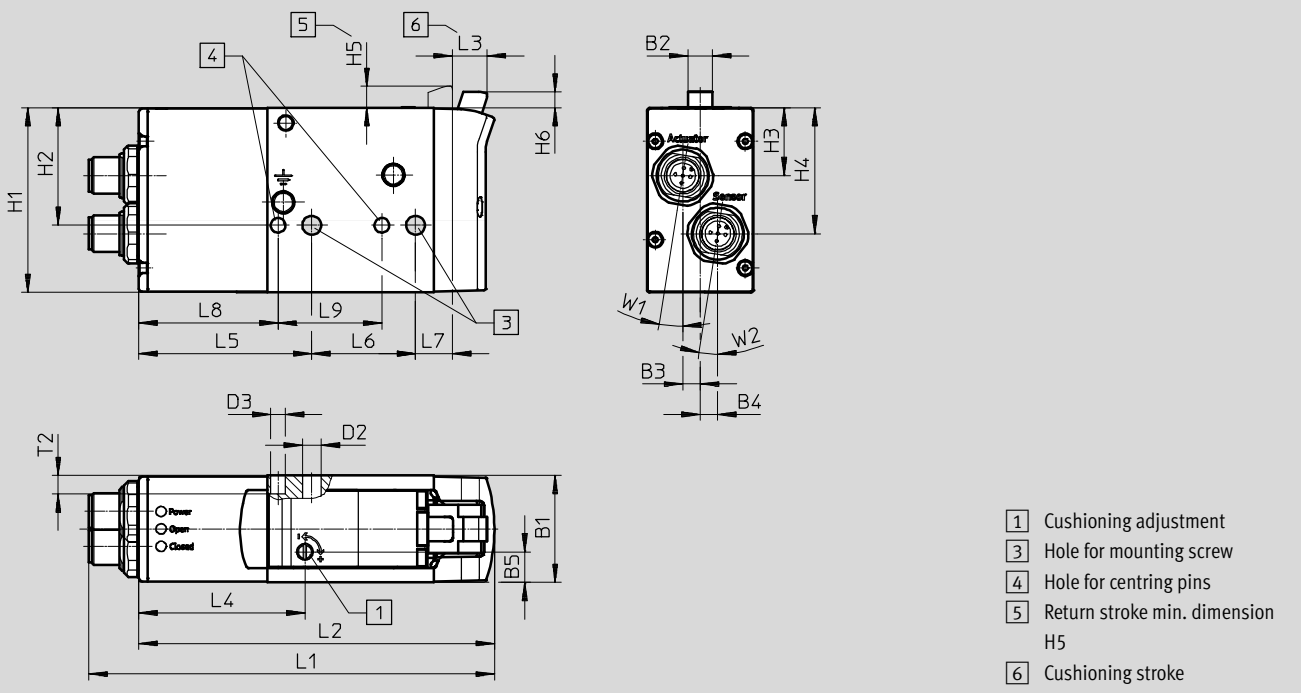
Stopper cylinders EFSD

Technical data

Dimensions

Download CAD data → 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°

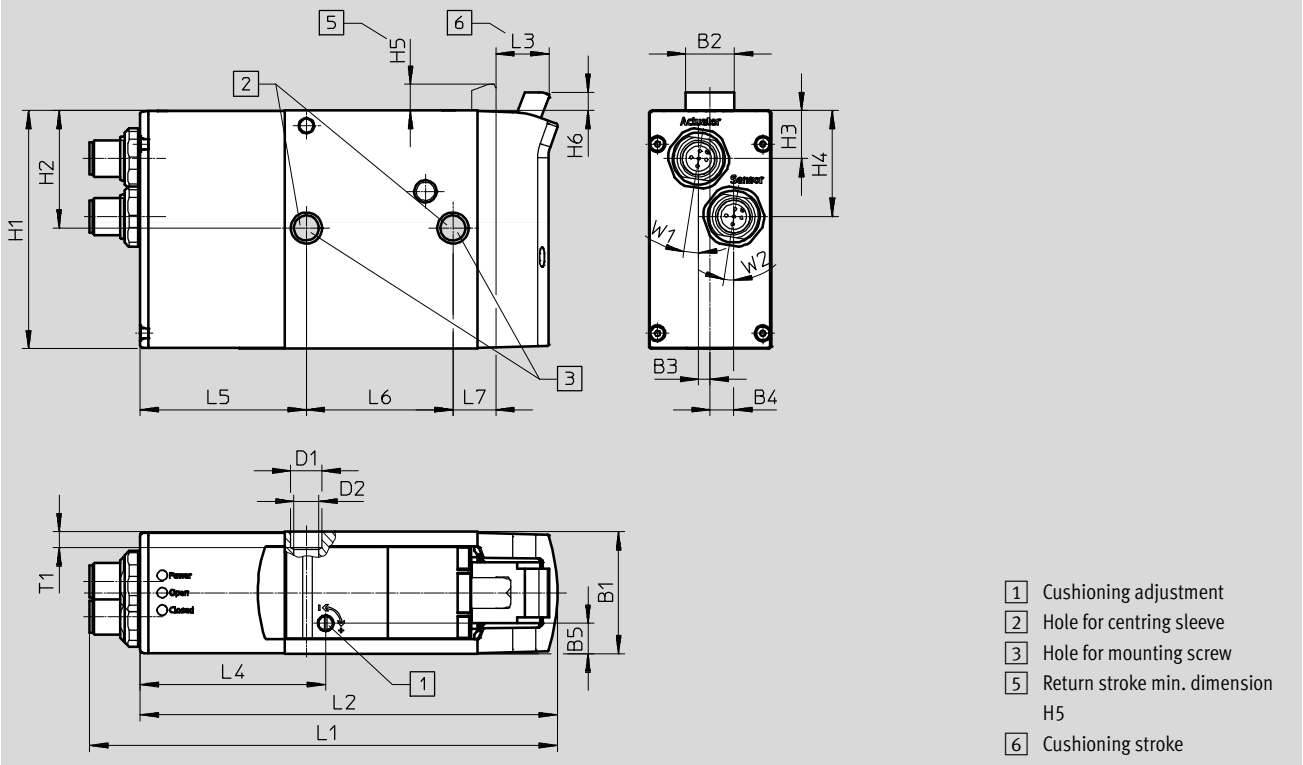
Stopper cylinders EFSD

Technical data

Dimensions

Download CAD data → www.festo.com

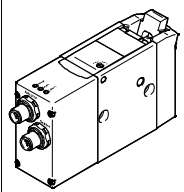
EFSD-50/100-PV-M12



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

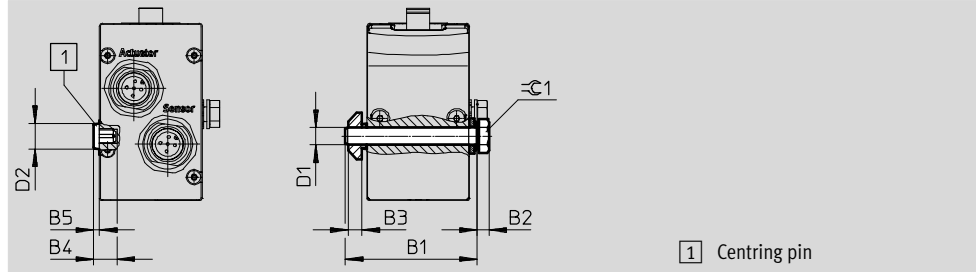
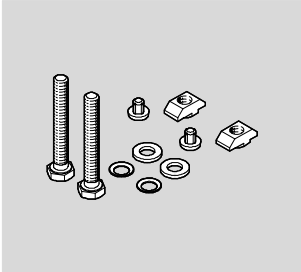
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Accessories

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

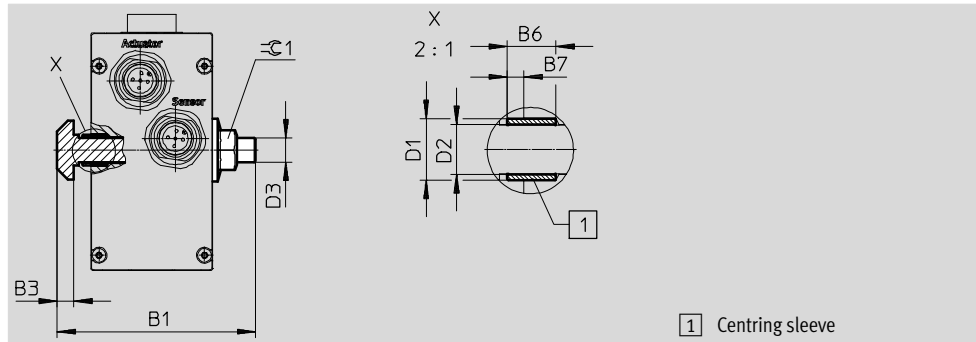
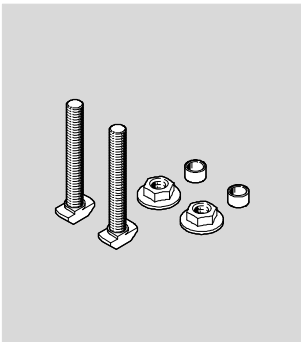


Dimensions and ordering data											
For size	B1	B2	B3	B4	B5	D1	D2	≙C 1	Weight	Part no.	Type code
	+1						∅		[g]		
20	45	4	4.7	7.5	2	M6	8.5	10	34	8058454	EAHM-E18-K-20

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

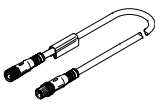
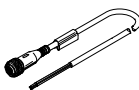
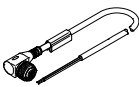


Dimensions and ordering data											
For size	B1	B3	B6	B7	D1	D2	D3	≙C 1	Weight	Part no.	Type code
	+1		-0.1		∅ -0.02	∅ +0.1			[g]		
50, 100 ¹⁾	65	5.5	6.5	1.2	10.1	8.2	M8	13	85	8058455	EAHM-E18-K-50-Z65
50, 100 ²⁾	65	5.5	8	2.7	10.1	8.2	M8	13	85	8058456	EAHM-E18-K-50

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

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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	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

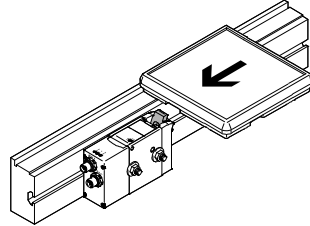
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Technical data

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.