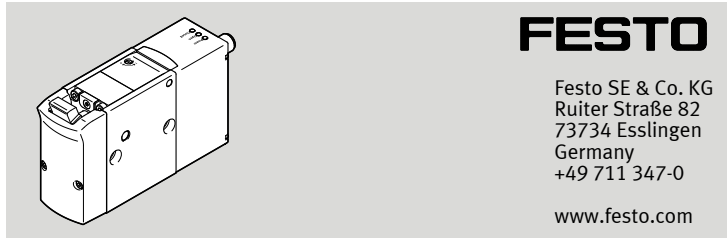


# Stopper cylinder EFSD



Instructions - Operation

8061883  
2017-06  
[8061885]



Translation of the original instructions

## 1 Further applicable documents

All available documents for the product → [www.festo.com/pk](http://www.festo.com/pk).

## 2 Safety

### 2.1 General safety informations

- Observe labelling on the product.
- Prior to mounting, installation and maintenance work: Switch off power supply and secure it from being switched back on.
- Store the product in a cool, dry, UV-protected and corrosion-protected environment. Ensure that storage times are kept to a minimum.
- Comply with the handling specifications for electrostatically sensitive devices.
- Observe tightening torques. Unless otherwise specified, the tolerance is  $\pm 20\%$ .

### 2.2 Intended use

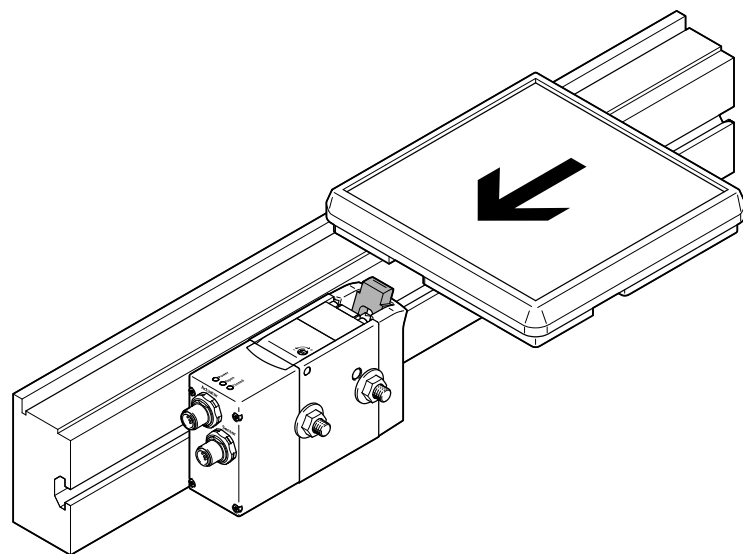


Fig. 1

The EFSD electric stopper cylinder is intended for use in stopping the transported material.

This product can generate high frequency interference, which may make it necessary to implement interference suppression measures in residential areas.

### 2.3 Training of specialised personnel

Installation, commissioning, maintenance and disassembly should only be conducted by qualified personnel.

The qualified personnel must be familiar with installation of electrical control systems.

## 3 Further information

- Accessories → [www.festo.com/catalogue](http://www.festo.com/catalogue).
- Spare parts → [www.festo.com/spareparts](http://www.festo.com/spareparts).

## 4 Service

Contact your regional Festo contact person if you have technical questions → [www.festo.com](http://www.festo.com).

## 4.1 Function

The electric stopper cylinder isolates/stops transported material in transfer systems. Cushioning over a stop is done through an air cushion. Retraction of the stop (release of transported material) and the position inquiry are done electrically.

There are 3 positions:

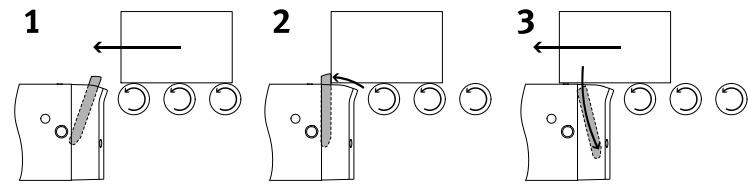
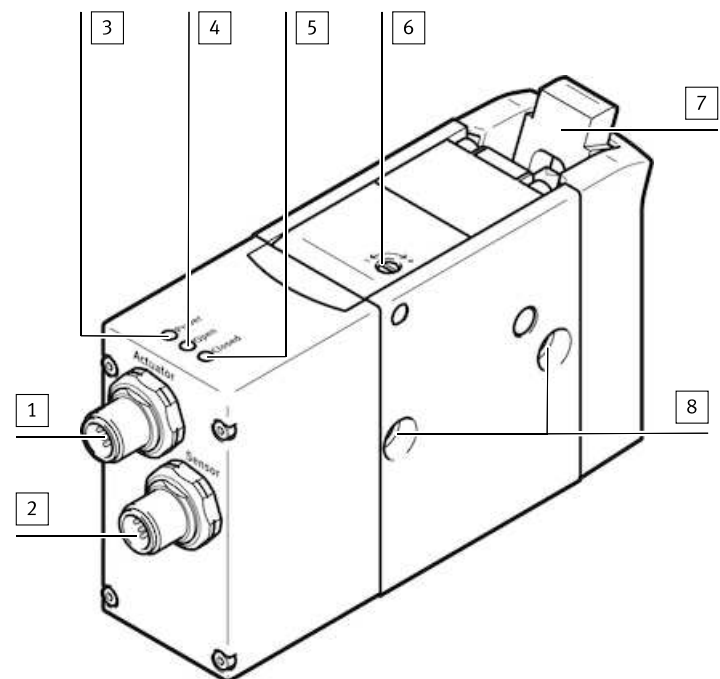


Fig. 2

- Position 1:  
Stopper cylinder closed in initial position (closed):  
Stop is extended and located in the initial position. The stopper cylinder is ready to stop a transported material.
- Position 2:  
Stopper cylinder closed in stop position (closed):  
The stopper cylinder travels to the stop and moves the stop from the initial position into the stop position. This causes the transported material to be braked and then stopped through internal dampening.
- Position 3:  
Stopper cylinder opened (open):  
Stop retracts and releases the transported material.

## 4.2 Configuration



- |  |                                       |
|--|---------------------------------------|
| 1 Electrical connection (actuator), M12 plug (5-pin) | 5 LED display (closed): stop extended |
| 2 Electrical connection (sensor), M12 plug (5-pin)   | 6 Cushioning setting                  |
| 3 LED display (power): operating status              | 7 Stop                                |
| 4 LED display (open): stop retracted                 | 8 Mounting interface                  |

Fig. 3

## 5 Installation

### Requirements

- Do not modify the screws and threaded pins. Exception: Immediate demand for modification in this instruction manual.
- Install product without tension or distortion. Evenness of the mounting surface must be maintained within 0.1 mm.

## Mount product

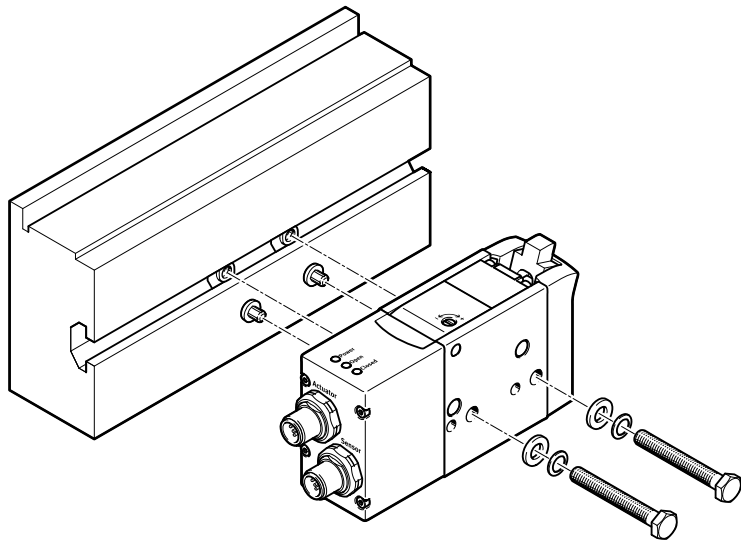


Fig. 4  
EFSD-20

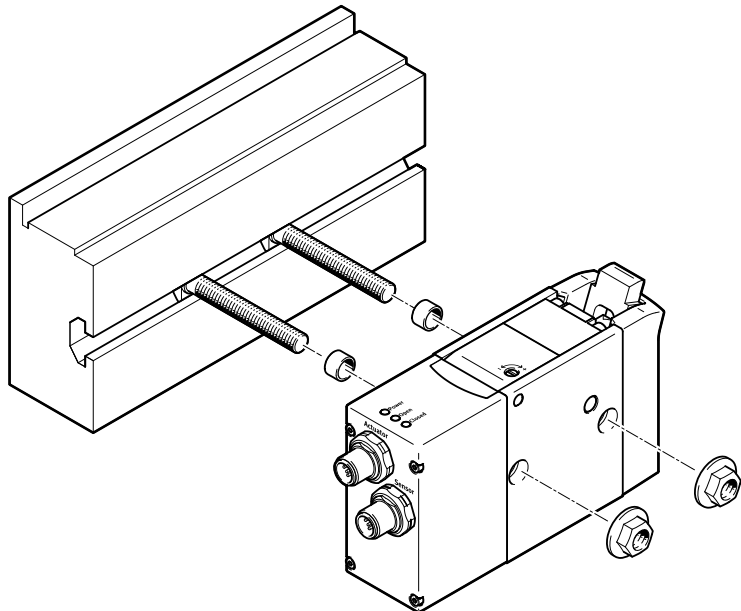


Fig. 5  
EFSD-50/100

1. Position the stopper cylinder so that its operating elements are accessible (e.g. cushioning setting).
2. Fasten stopper cylinder (e.g. with fastening kit → [www.festo.com/catalogue](http://www.festo.com/catalogue)).
3. Evenly tighten screws/nuts.

Size	20	50	100
Screw/nut	M6	M8	
Centring hole [mm]	4.8 ± 0.05	10.2 (+ 0.07 / - 0.05)	
Tightening torque [Nm]	10	15	

Tab. 1

## 6 Installation

### 6.1 Electrical installation

#### ⚠ WARNING!

Risk of injury due to electric shock.

- For the electric power supply, use only PELV circuits that ensure a reliable electric disconnection from the mains network.
- Observe IEC 60204-1/EN 60204-1.

1 Electrical connection (actuator)

2 Electrical connection (sensor)

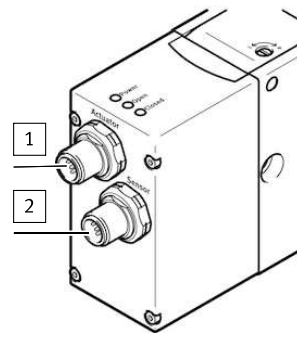


Fig. 6

1. Switch off power to the controller. It is not sufficient just to cancel the enable signal.
2. Safeguard the controller from being switched on again unintentionally.
3. Use permitted connecting cables. Frequently, an unscreened cable guide is sufficient for the 24 V signals. Screened control lines must be used in areas with strong interference.
4. Connect stopper cylinder to the controller at the ports 1 and 2 → Tab. 2. Tightening torque: 0.3 Nm.

M12 plug (5-pin, A-coded)	Pin <sup>1)</sup>	Port 1 (actuator)	Port 2 (sensor)
	1 (BN) brown	Unused	Supply voltage +24 V DC
	2 (WH) white	Input	Output 1 open
	3 (BU) blue	0 V	0 V
	4 (BK) black	Supply voltage +24 V DC	Output 2 closed
	5 (GY) grey	Functional earth (FE) <sup>2)</sup>	Functional earth (FE) <sup>2)</sup>

1) Wire colour with use of connecting cables according to accessories → [www.festo.com/catalogue](http://www.festo.com/catalogue)

2) Functional earth must always be connected.

Tab. 2

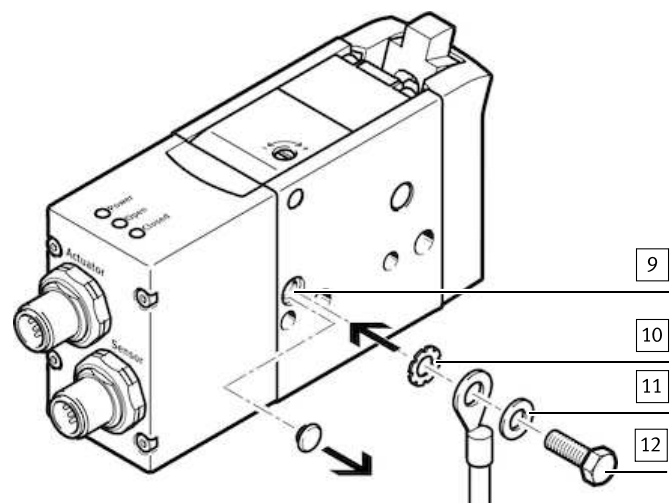
#### 6.1.1 Earthing

For use of the EFSD-20:

##### NOTICE!

Malfunction due to electrostatic influence.

- Earth product at the earth terminal.



9 Earth terminal

10 Toothed disc

11 Disc

12 M5 hexagon head screw

Fig. 7

1. Remove the screw plug.
2. Connect an earthing cable to the earth terminal 9. The earthing elements are included in the scope of delivery. The earthing cable is not included in the scope of delivery. Connect the cable lug of the earthing cable between the disc 11 and the toothed disc 10. Tightening torque of the hexagon head screw 12: 5 Nm.

- Connect the other end of the earthing cable to the earthing point.

## 7 Commissioning

### ⚠ WARNING!

- Risk of injury due to unexpected movement of components.
- Protect the positioning range from unwanted intervention.
  - Keep foreign objects out of the positioning range.

Input	Description
0	Extend stop
1	Retract stop

Tab. 3

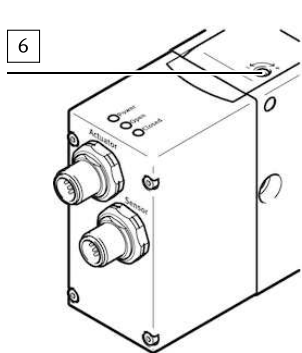
Output 1	Output 2	LED Open (yellow)	LED Closed (yellow)	Description
0	1	Off	Lights up	Stop is extended
1	0	Lights up	Off	Stop is retracted

Tab. 4

- Switch on the supply voltage.
  - The "Power" LED lights up green. Depending on the position of the stop, the LED "Open" or LED "Closed" lights up yellow.
- Extend stop by creating a 0-signal at the input of the port **1** → Tab. 2.
  - The LED "Closed" lights up yellow.
  - The switching status at output 1 of the port **2** is a 0-signal.
  - The switching status at output 2 of the port **2** is a 1-signal.
- Travel with transported material into the stop position.
  - The stop is pushed into the stop position.
  - The LED "Closed" continues to light up yellow.
- Retract stop by creating a 1-signal at the input of the port **1**.
  - The transported material is released. The LED "Open" lights up yellow.
  - The switching status at output 1 of the port **2** is a 1-signal.
  - The switching status at output 2 of the port **2** is a 0-signal.
- Execute a test run. In doing so, check whether the stop moves through the intended positioning cycle completely. If necessary, correct the cushioning setting.

After a successful test run, the stopper cylinder is ready for operation.

### Cushioning setting



**6** Cushioning setting

Fig. 8

- Turn screw for cushioning setting **6**:
  - Clockwise (+) = increase in cushioning force
  - Anti-clockwise (-) = decrease in cushioning force
  - The stop should reach the end position safely. Observe the maximum load to be stopped dependent on the transport speed → 12 Technical data.

## 8 Operation

### ⚠ WARNING!

Risk of injury from touching hot surfaces. Contact with housing can cause burn injuries. This can frighten people and cause them to act in an unpredictable manner. This can lead to other forms of secondary damage.

- Avoid unconscious touching of the housing.
- Inform operating and maintenance staff about the possible hazards.
- Before maintenance work: Let the drive cool down to room temperature.

### ⚠ WARNING!

- Risk of injury due to unexpected movement of components.
- Protect the positioning range from unwanted intervention.
  - Keep foreign objects out of the positioning range.

## 9 Cleaning

- Clean the outside of the product with a soft cloth. Do not use aggressive cleaning agents.

## 10 Malfunctions

### 10.1 Diagnostics

LED		Meaning
	Power lights up green	Actuator supply voltage at the port <b>1</b> pin 4 is 24 V DC ±15 % → Tab. 2.
	Power flashes green (4 Hz)	Actuator supply voltage at the port <b>1</b> pin 4 is outside the valid range.
	Power off	Power supply is switched off.
	- Power flashes green (1 Hz) - Open / Closed off	The stop has not reached the end position. Note: The stopper cylinder conducts 3 attempts to reach the end position. After that, the LED display occurs.

Tab. 5

### 10.2 Fault clearance

Fault description	Cause	Remedy
Stop does not move.	Tensions	Install the product so it is free of tension; maintain evenness of the bearing surface → 5 Installation.
	Wear	Send product to Festo for repair.
Stop does not retract.	No power supply	Check the supply voltage.
	Lateral force is too high.	Reduce load.
	Lateral force is too high.	Select a larger stopper cylinder.
Stop does not travel into the stop position.	Cushioning setting too high.	Reduce cushioning force on the cushioning setting <b>6</b> → 7 Commissioning.
	Transported material load too low.	Increase load.
	Dirt in the range of motion of the stop.	Clean range of motion of the stop.
Stop travels hard into the stop position.	Cushioning setting too low.	Increase cushioning force on the cushioning setting <b>6</b> → 7 Commissioning.
	Conveyor speed too high.	Reduce speed
	Cushioning performance too low.	Select a larger stopper cylinder.
Stop does not extend.	Transported material is above the stop.	Transported material continues to travel.
	No power supply.	Check the supply voltage.

Tab. 6

### 10.3 Repair

Send product to the Festo repair service for repair.

## 11 Recycling

### ♻ ENVIRONMENT!

Dispose of the packaging and product according to the valid provisions of environmentally sound recycling → [www.festo.com/sp](http://www.festo.com/sp).

## 12 Technical data

Size <sup>1)</sup>	20	50	100
Design	Electric stopper cylinder		
Mounting position <sup>1)</sup>	Any		
Maximum stoppable load at transport speed $v_F$			
- $V_F = 6$ m/min [kg]	0.25 ... 20	1 ... 50	3 ... 100
- $V_F = 9$ m/min [kg]	0.25 ... 10	1 ... 35	3 ... 70
- $V_F = 12$ m/min [kg]	0.25 ... 7	1 ... 30	3 ... 60
- $V_F = 18$ m/min [kg]	0.25 ... 3.5	1 ... 18	3 ... 50
- $V_F = 24$ m/min [kg]	0.25 ... 2.5	1 ... 12	3 ... 45
- $V_F = 30$ m/min [kg]	0.25 ... 2	1 ... 8	3 ... 30
- $V_F = 36$ m/min [kg]	0.25 ... 1	1 ... 5	3 ... 20
- Friction coefficient $\mu$	0.1 between transported material and belt system		0.07 between transported material and roller system
Cushioning length [mm]	11.5	17.5	18.2
Max. lateral force [N]	20	50	100
Max. time for retracting <sup>2)</sup> [s]	0.1	0.15	0.3
Max. time for extending [s]	0.1	0.15	0.2
Max. cycle rate [Hz]	0.33		
Ambient temperature [°C]	-10 ... +60		
Storage temperature [°C]	-20 ... +60		
Degree of protection	IP40		
Power supply [V DC]	24 ± 15 %		
Max. current consumption <sup>3)</sup> (actuator) [A]	1.9	1.2	1.4
Max. current consumption (sensor) [A]	0.3		
Max. cable length [m]	30		
Digital inputs			
Switching logic	PNP		
Switching level [V]	> 19 (1-signal) < 8 (0-signal)		
Digital outputs			
Max. output current per switching output [mA]	30		
Switching logic	PNP		
Voltage drop [V]	< 1 (1-signal)		
Short circuit protection	No		
CE marking (→ declaration of conformity) → <a href="http://www.festo.com/sp">www.festo.com/sp</a>	in accordance with EU EMC Directive <sup>4)</sup>		
Weight [g]	420	800	985
Note on materials	PWIS <sup>5)</sup> -containing substances		
Materials			
Housing	Wrought aluminium alloy, hard-anodised		
Cover	PA reinforced		
Piston rod	High-alloy stainless steel		
Screws, stop	Coated steel		
Glide element, blanking plug	PE		
Fibre-optic cables	PC		
Plug connector	CuZn, nickel-plated (pin contacts: gold-plated)		
Seals	NBR		

1) Stopper is intended for use in transfer systems. The technical specifications apply for the horizontal direction or movement in which the stopper is aligned lying flat or standing.

2) without lateral force

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

4) This product can generate high frequency interference, which may make it necessary to implement interference suppression measures in residential areas.

5) PWIS - paint-wetting impairment substances

Tab. 7