

## **Pneumatic sliding dampers AADA, ABDB, CADB & CBDB**

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### **Maintenance manual (EN)**

V1.0-2021

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## 1. Introduction

This manual cannot be reproduced, even partially, without prior written consent by Formula Air Group. Every step of the electro-pneumatic sliding damper range has been deeply analyzed by Formula Air Group in the expected area during the design, construction, and user manual creation. However, it is understood that nothing can replace the experience, training and good sense of those professionals who work with the device.

Ignoring the cautions and warning from the present user manual, using improperly parts or the whole device supplied, using unauthorized spare parts, manipulating the device by non-qualified personnel, violation of any safety norm regarding design, construction and use expected by the supplier, exempt Formula Air Group from all responsibility in case of damages to people or properties.

Formula Air Group does not take any responsibility for the non-observance of the user about the preventive safety measures presented in this user manual.

Failure to comply with the requirements of the user manual or incorrect use of the electro-pneumatic sliding damper during operation can lead to the damage of the electro-pneumatic sliding damper and improper functioning of the electro-pneumatic sliding damper itself. This will result in termination of the warranty on the item and will release the manufacturer from any liability.

### Warranty

Regarding to the device's warranty, see the sales general condition.

### Attention !

All drawings and references contained within this user manual are non-contractual and are subject to change without prior notice at the discretion of the Formula Air Group and its partners.

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### 1.1. How it works

The electro-pneumatic sliding dampers are normally used to shut off or regulate the air flow in duct systems. The dampers are made of electro-galvanized sheet metal, mounted with PEHD and rubber seals to ensure optimum tightness.

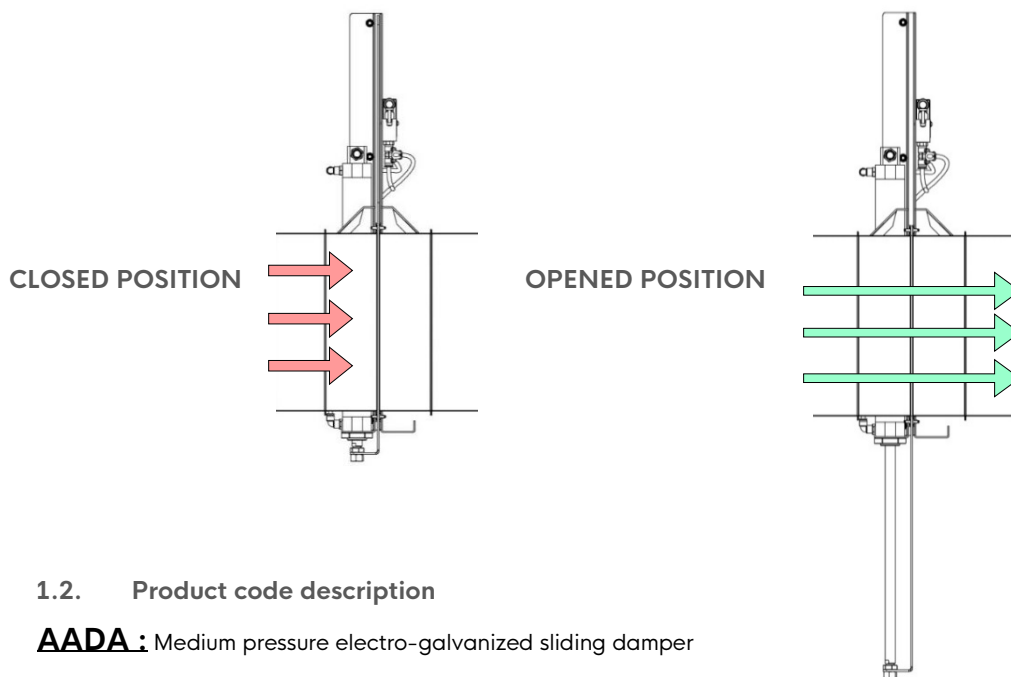
Note that they are meant to be installed within a complete installation needs to comply to :

**2006/42/EU** – Machine Directive

**2014/35/EU** – Low Voltage Equipment Directive

**2014/30/EU** – Electromagnetic Compatibility and Repealing Directive (EMC)

The electro-pneumatic sliding dampers are designed to control the air flow through the ducting system by sliding a sheet metal blade.



### 1.2. Product code description

**AADA:** Medium pressure electro-galvanized sliding damper

**ABDB:** Medium pressure stainless steel sliding damper

**CADB:** High pressure electro-galvanized sliding damper

**CBDB:** High pressure stainless steel sliding damper

### 1.3. Catalogue options

The standard Pneumatic sliding dampers are available with the following configurations :

- Different solenoid valve models :
  - Electro-pneumatic (standard)
  - Double acting electro-pneumatic
  - Full pneumatic
  - Manual pneumatic with joystick
- Different tensions for the electro-pneumatic versions :
  - 24 V AC
  - 24 V DC
  - 48 V DC
  - 110 V AC
  - 220 V AC
- Other options that can be ordered separately :
  - Reed sensors
  - Cover houses
  - Diameters up to Ø160 with double cylinders
  - Other brand pneumatic components (Festo)

## 2. Technical information

### 2.1. Sliding damper composition

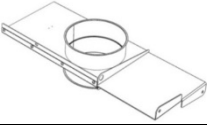

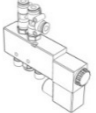
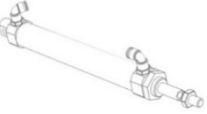
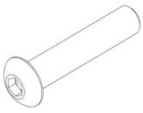





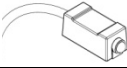

The pneumatic sliding dampers are equipped with one cylinder up to Ø160 but it is designed to fit two cylinders on request when needed. The sliding dampers as of Ø180 and up are equipped with two cylinders as a standard.

An electro-pneumatic solenoid valve is included on every model.

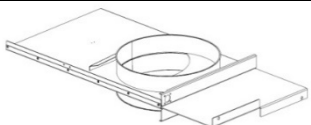

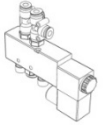

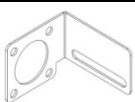
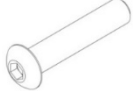


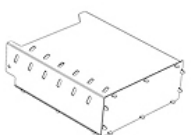

The Cover house is optional to protect the user from the moving parts.

Position detectors are optional as well to indicate the position of the cylinder (and sliding damper blade).

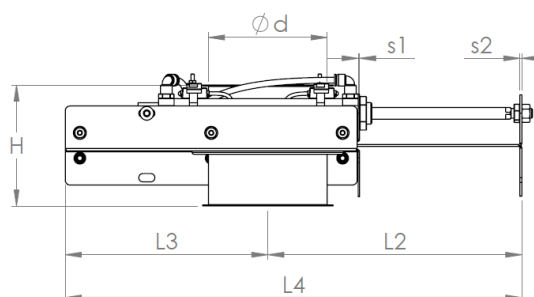
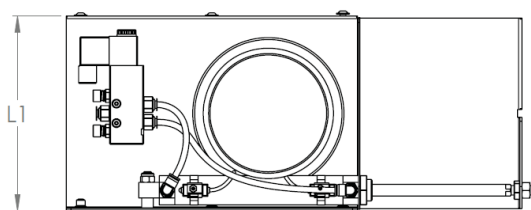
### 2.1.1 For sliding dampers with ROUND cylinders

Picture	Part	Quantity
	Body – ready for – AADS	1
	Solenoid valve with connectors	1 (from Ø80 up to Ø160)
	Solenoid valve with T connectors	1 (from Ø180 up to Ø500)
	Pneumatic cylinder	1 (up to Ø160) or 2 (from Ø180 up to Ø500)
	Bolt M4 x 25	2
	Bolt M8 x 40	1 (up to Ø160) 2 (from Ø180 up to Ø250)
	Bolt M12 x 60	2 (from Ø275 up to Ø500)
	Flat washer for M4	2
	Flat washer for M8	1 (up to Ø160) 2 (from Ø180 up to Ø250)
	Flat washer for M12	2 (from Ø275 up to Ø500)
	Hexagon nut M10	1 (up to Ø160) 2 (from Ø180 up to Ø250)
	Hexagon nut M12	2 (from Ø275 up to Ø500)
	Lock nut M8	1 (up to Ø160) 2 (from Ø180 up to Ø250)
	Lock nut M12	2 (from Ø275 up to Ø500)
	Plastic spacer	1 (up to Ø160) 2 (from Ø180 up to Ø500)
	Air hose	Variable depending on damper size
	Cover house (Optional)	1
	Position sensor (Optional)	Normally 2 per cylinder
	Position sensor strap (Optional)	2 (up to Ø160) 4 (from Ø180 up to Ø500)

### 2.1.2 For sliding dampers with SQUARE cylinders

Picture	Part	Quantity
	Body – ready for – AADS	1
	Solenoid valve with connectors	1 (from Ø80 up to Ø160)
	Solenoid valve with T connectors	1 (from Ø180 up to Ø500)
	Pneumatic cylinder	1 (from Ø80 up to Ø160) Or 2 (from Ø180 up to Ø500)
	Cylinder holder	1 (from Ø80 up to Ø160) Or 2 (from Ø180 up to Ø500)
	Bolt M4 x 25	1 or 2
	Bolt M8 x 40	8 or 16
	Bolt M8 x 20	2 or 4
	Washer for M4	1 or 2
	Washer for M8	10 or 20
	Nut M8	2 or 4
	Nut M16	1 or 2
	Air hose	Variable depending on damper size
	Cover house (Optional)	1
	Position sensor (Optional)	Normally 2 per cylinder

### 2.2. Overall dimensions



Ø	D int.	Edge	L1	L2	L3	L4	H	S1	S2	Kg
50	47	gl	139	173	128	301	245	1.5	2.0	2.4
63	60	gl	139	173	128	301	245	1.5	2.0	2.5
76	73	gl	157	195	150	345	245	1.5	2.0	2.6
80	80	fb	157	195	150	345	125	1.5	2.0	2.6
89	86	gl	177	225	180	405	245	1.5	2.0	2.9
100	100	fb	177	225	180	405	125	1.5	2.0	3.3
102	99	gl	177	225	180	405	245	1.5	2.0	3.7
114	111	gl	201	264	217	482	245	1.5	2.0	3.8
120	120	fb	200	264	217	482	125	1.5	2.0	3.9
125	125	fb	200	264	217	482	125	1.5	2.0	4.2
127	124	gl	200	264	217	182	245	1.5	2.0	4.3
140	140	fb	225	300	255	555	125	1.5	2.0	4.8
150	150	fb	225	300	255	555	125	1.5	2.0	4.8
152	149	gl	225	300	255	555	245	1.5	2.0	4.9
160	160	fb	235	314	270	584	125	1.5	2.0	5.1
180	180	fb	276	378	330	708	125	1.5	2.0	6.9
200	200	fb	276	378	330	708	125	1.5	2.0	7.1
203	200	gl	276	378	330	708	245	1.5	2.0	7.2
225	225	fb	345	452	405	857	165	2.0	3.0	13.3
250	250	fb	370	454	405	859	165	2.0	3.0	13.3
275	275	fb	421	546	513	108	165	2.0	3.0	19.7
300	300	fb	421	546	513	1058	165	2.0	3.0	20.6
315	315	fb	436	546	513	1058	165	2.0	3.0	20.6
350	350	fb	473	607	635	1162	165	2.0	3.0	27.9
400	400	fb	521	682	635	1316	165	2.0	3.0	40.9
450	450	fb	622	770	721	1491	224	3.0	4.0	59.5
500	500	fb	672	845	790	1635	224	3.0	4.0	67.8

### 2.3. Electro-pneumatic solenoid valve details

	Solenoid valve type	Action	Operating pressure	Min. response time	Working T°	N° cylinders
From Ø 80 up to Ø 160	2/5 way - G1/8	Single acting	1.5 - 8.0 kgf/ cm <sup>2</sup>	0.05 s	5 - 60 °C	1
From Ø 180 up to Ø 500						2

## 3. MOUNTING INSTRUCTIONS

### 3.1. Tools needed for mounting

Loctite, Hex screwdrivers, Nut driver, wrenches, screwdrivers and diagonal cutters.

**CAUTION !** The mounting of the sliding damper has to be performed by qualified personnel only. Before starting assembling, check that you have all the parts and the correct tools for mounting.

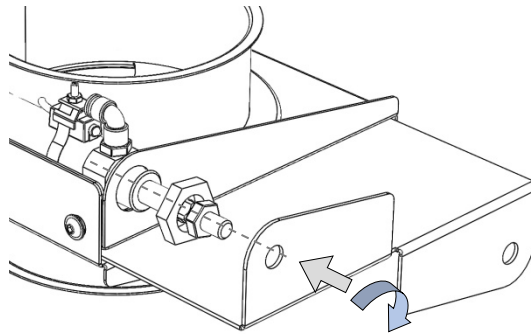
**CAUTION !** Make sure to wear the appropriate protective clothing, gloves, eye protection and masks when needed.

### 3.2. Mounting the cylinders on the body

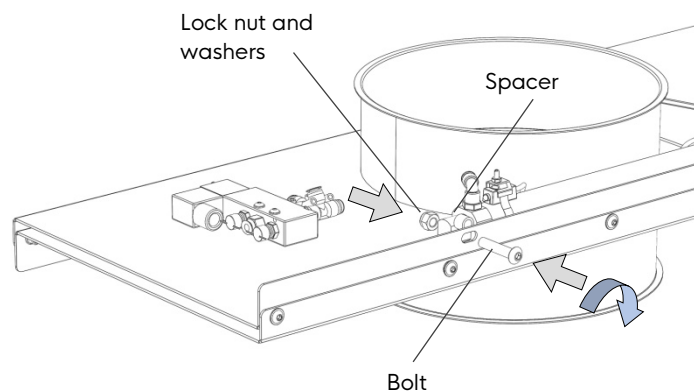
#### 3.2.1 For sliding dampers with ROUND cylinders

**Step 1 :** Insert the head of the cylinder body through the hole in the top of the sliding damper body.

**Step 2 :** Tighten the top of the cylinder with the big counter nut.



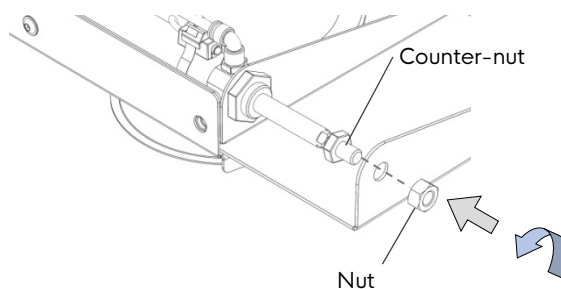
**Step 3 :** Attach the base of the cylinder to the body using nuts, counter-nuts and spacers.



**IMPORTANT :** Make sure that the cylinder is aligned with the body to ensure proper blade movement and avoid premature wear of the components.

**Step 4 :** Pull the sliding damper blade completely out (make sure that the hole in the middle of the blade is aligned with the pipe pieces of the sliding damper body).

**Step 5 :** Pull out the cylinder rod, pass it through the hole at the top of the sliding damper blade, and tighten the two counter nuts using a bit of Loctite.

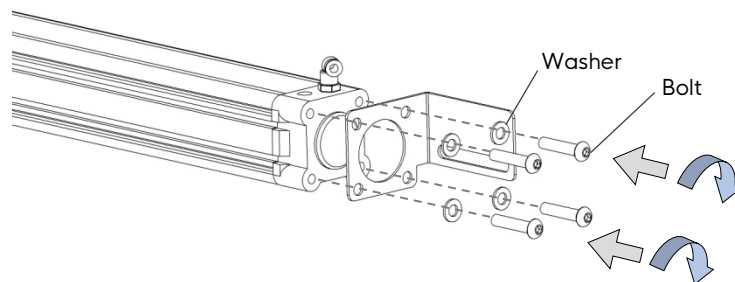




**Step 6 :** Repeat steps 1 to 5 if the sliding damper is equipped with two cylinders.

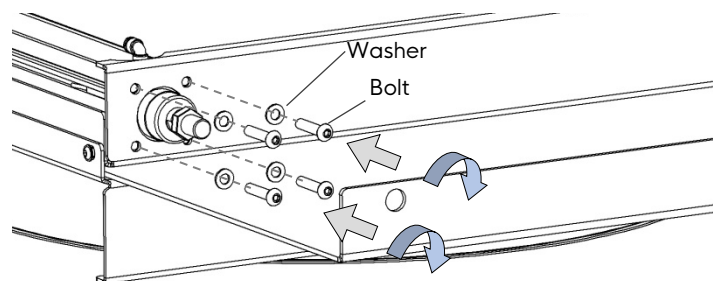
### 3.2.2 For sliding dampers with SQUARE cylinders

**Step 1 :** Screw the cylinder support to the base of the cylinder with the washers and bolts.

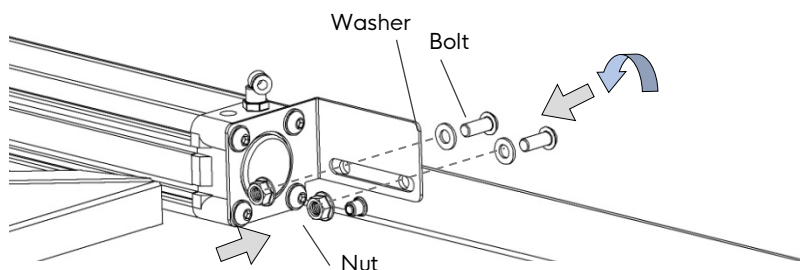


**Step 2 :** Insert the head of the cylinder through the hole in the top of the sliding damper body.

**Step 3 :** Screw the head of the cylinder body to the sliding damper body with washers and bolts.

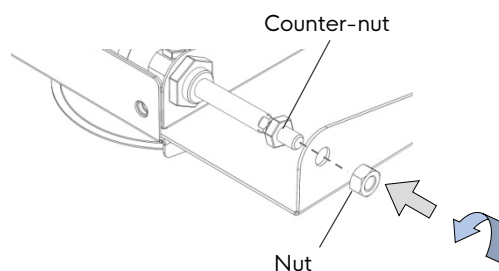


**Step 4 :** Secure the cylinder support to the damper body using bolts, washers and nuts.



**Step 5 :** Pull the sliding damper blade completely out (make sure that the hole in the middle of the blade is aligned with the pipe pieces of the sliding damper body).

**Step 6 :** Pull out the cylinder rod, pass it through the hole at the top of the sliding damper blade, and tighten the two counter-nuts using a bit of Loctite.



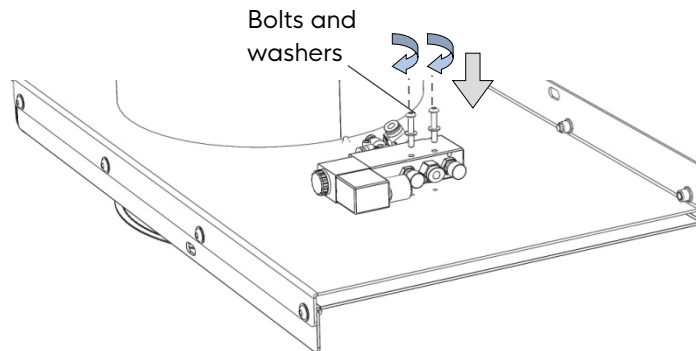
**Step 7 :** Repeat steps 1 to 6 if the sliding damper is equipped with two cylinders.

### 3.3. Mounting the solenoid valve on the Sliding damper body

#### 3.3.1 Mounting the solenoid valve on the sliding damper body

**Step 1 :** Place the solenoid valve over the threaded holes on the sliding damper body.

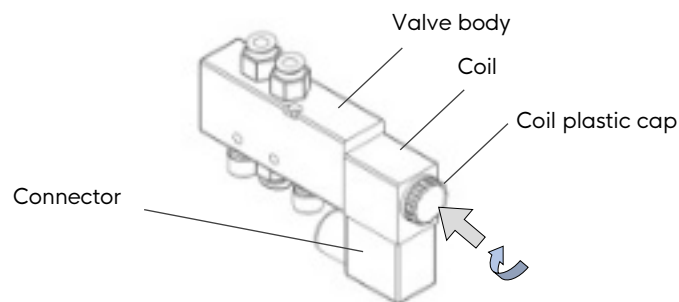
**Step 2 :** Screw the solenoid valve to the body with Hex-screws and washers.



#### 3.3.2 Mounting the coil and connector on the solenoid valve

**CAUTION !** Make sure that all electrical connections have been disconnected.

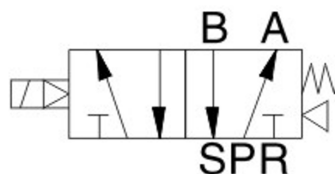
**Step 1 :** Unscrew the plastic cap on the head of the solenoid valve, slide the coil over the coil shaft, and tighten the plastic cap to hold the coil in place.



**Step 2 :** connect the connector on the coil by sliding it over the three prongs of the coil and lock it in place with the screw on the top of the connector.

**NOTE :** it is easier to first connect the electrical wiring of the connector before placing it on the coil.

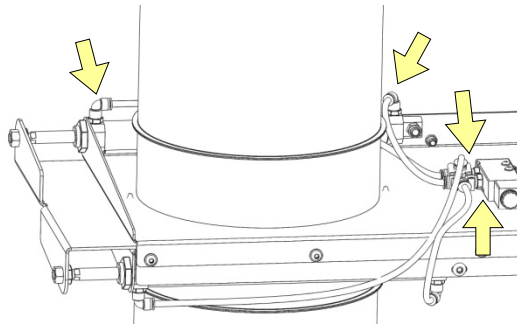
#### 3.3.3 Connection of electro-pneumatic solenoid valve



### 3.4. Compressed air connection

**CAUTION !** Make sure that the air supply and all electrical connections have been disconnected.

**Step 1 :** Take a compressed air hose size 4/6 mm. Push the hose in one of the cylinder swivel elbows, and connected to the air hose connector on the electro-pneumatic solenoid valve.



**Step 2 :** Repeat for the other side of the cylinder. Then repeat to the other cylinder (if there is a second cylinder on the damper).

**Step 3 :** Connect the air hose supply to the male stud connection on the other side of the electro-pneumatic solenoid valve (the side with the two regulators).

**CAUTION !** We recommend using 6 Bar compressed air. DO NOT EXCEED 8 Bar !!

### 3.5. Mounting the reed sensors on the cylinders (optional)

#### 3.5.1 Mounting the reed sensors on the ROUND cylinder (optional)

**Step 1 :** place reed sensor strap around the cylinder body, place the reed sensor inside it.

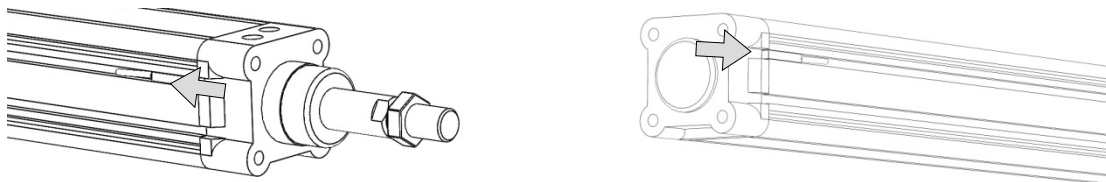
**Step 2 :** Tighten the small screw on the head of the strap to hold it in place in the desired position.



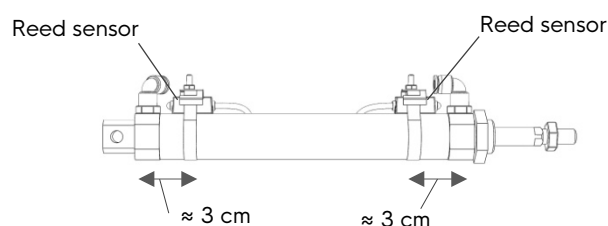
#### 3.5.2 Mounting the reed sensors on the SQUARE cylinder (optional)

**Step 1 :** Slide the reed sensor in the slits along the side of the cylinder.

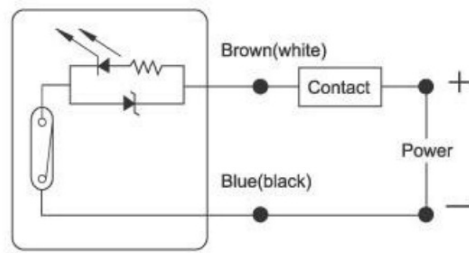
**Step 2 :** Tighten the small screw on the reed sensor body to hold it in place at the desired position.



**NOTE :** To ensure proper functioning, make sure that the reed sensors are placed at maximum 3 cm from the edges of the cylinder body.

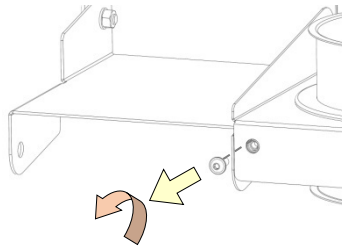


### 3.5.3 Electrical connection of the reed sensor

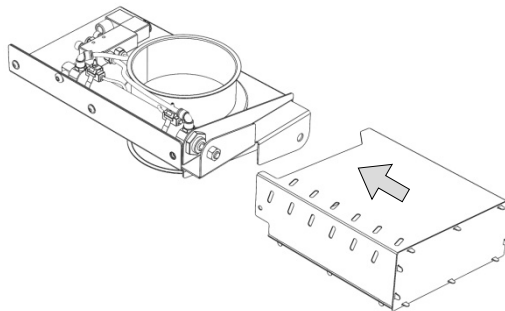


### 3.6. Mounting the cover house on the sliding damper body (optional)

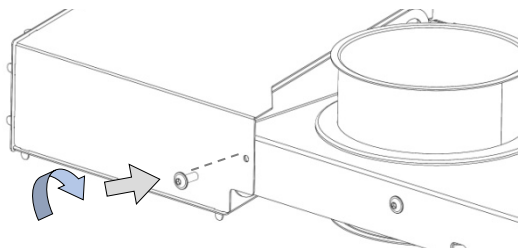
**Step 1 :** Unscrew the bolt from the damper body where the cover house goes.



**Step 2 :** Slide the cover over the sliding damper body.

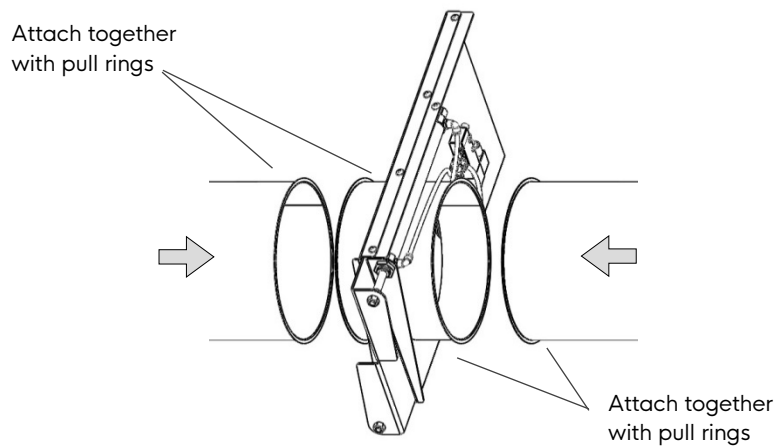


**Step 3 :** Use the bolt unscrewed in Step 1 to attach it to the sliding damper.



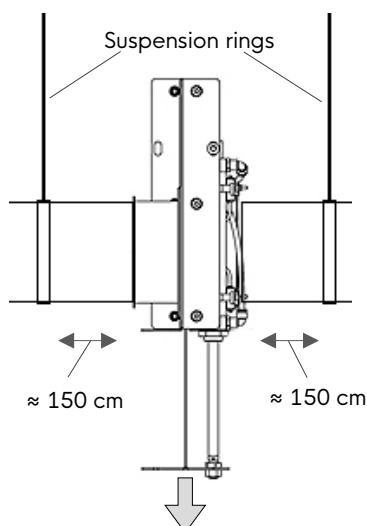
### 3.7. Placing the sliding damper in an installation

**Step 1 :** Attach the sliding damper to the ducting, using suitable rings. Seals can be added to the rings for extra air-tightness.



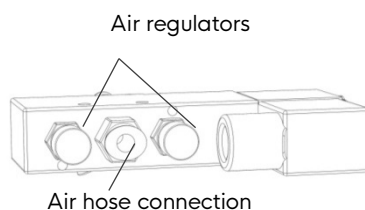
**IMPORTANT:** Make sure to use adequate support on the pipes on either side of the sliding damper to reduce pressure on the sliding damper body and blade.

Recommended mounting in horizontal ducting is to have the blade open downwards, and have the sliding damper body supported with suspension rings at most at 150 mm from either side of the sliding damper edges.



**Step 2:** Connect the compressed air hose and the electrical power to the solenoid valve.

**Step 3:** Adjust the opening and closing speed of the sliding damper by turning the screw on the air regulators, on the side of the solenoid valve.



**NOTE:** only use oil and water free, dry compressed air for proper functioning.

## 4. Maintenance, spare parts and troubleshooting

The installation, connection, start-up and maintenance of the sliding damper has to be performed by qualified personnel only.

### 4.1. Precautions for proper use

**CAUTION!** It is strictly forbidden to work on the electro-pneumatic sliding damper while the installation is running.

During maintenance keep the system disconnected and all the electrical equipment turned off.

### 4.2. Maintenance

All electro-pneumatic components are maintenance free during the life cycle of the product.

#### 4.2.1 Periodic maintenance of the sliding damper

In order to ensure proper functioning and long life of the product, regular maintenance must be carried out.

Maintenance must always be carried out according to the instructions in the manual.

Make sure that the bolts are all tight, that the air hose and electrical cable are intact and that no leakage is detected.

### 4.3. Replacing spare parts

If needed, some parts of the damper can be replaced : seals, pneumatic cylinders, air hose, electro-pneumatic solenoid valve, cover house and reed sensors.

**CAUTION!** Before any manipulation, make sure that the installation is stopped and that all compressed air and electrical connections are disconnected.

**NOTE:** all electrical manipulations should be performed by qualified personnel only.

#### 4.3.1 Replacing the pneumatic cylinder

Reverse, then repeat steps described in point 3.2 and 3.4.

#### 4.3.2 Replacing the electro-pneumatic solenoid valve

Reverse, then repeat steps described in point 3.3 and 3.4.

#### 4.3.3 Replacing the air hoses

Reverse, then repeat steps described in point 3.4

#### 4.3.4 Replacing the reed sensors

Reverse, then repeat steps described in point 3.5.

#### 4.3.5 Replacing the cover house

Reverse, then repeat steps described in point 3.6.

#### 4.4. Troubleshooting

Failure	Possible causes	Proposed solutions
No electrical reaction but there is compressed air	<ul style="list-style-type: none"><li>No current</li><li>Inverse or wrong wiring</li><li>Connector electrical overload</li></ul>	<ul style="list-style-type: none"><li>Make sure there is nominal current (point 3.3)</li><li>Refer to the wiring diagram (point 3.3)</li><li>Replace the connector (point 3.3)</li></ul>
Blade doesn't open although there is electricity	<ul style="list-style-type: none"><li>No compressed air</li><li>Not enough compressed air pressure</li></ul>	<ul style="list-style-type: none"><li>Make sure there is compressed air (point 3.3)</li><li>Make sure to have +/- 6 Bar</li></ul>
Blade doesn't open although there is electricity and compressed air	<ul style="list-style-type: none"><li>Blade doesn't slide in line with the body</li><li>Foreign object blocking the blade</li><li>Body and seals exert too much pressure on blade</li></ul>	<ul style="list-style-type: none"><li>Something is pulling the blade sideways ((point 3.2)</li><li>Remove foreign object</li><li>Check the seals and body space</li></ul>
Compressed air leakage	<ul style="list-style-type: none"><li>Air hose is not correctly inserted in connections</li><li>Air hose is cracked or deteriorated</li><li>Threaded components are loose</li></ul>	<ul style="list-style-type: none"><li>Pull hose out and re-insert (point 3.4)</li><li>Replace air hose</li><li>Tighten threaded components</li></ul>
Blade opens too fast / too slow	<ul style="list-style-type: none"><li>Air regulators are not tuned to desired position</li></ul>	<ul style="list-style-type: none"><li>Turn the air regulators to desired airflow (point 3.7)</li></ul>

## 5. Dismantling and recycling

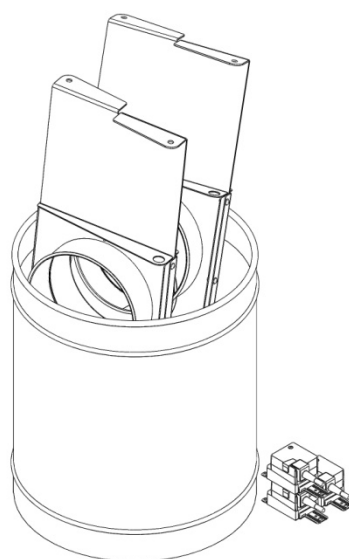
When dismantling a unit, be sure to keep in mind the following important information:

- As the unit is dismantled, set aside all still functioning parts to re-use them on another unit.
- You should always separate the different materials depending on their type: iron, rubber, oils, greases, etc...
- Recyclable parts must be disposed of in the appropriate containers or brought to a local recycling company.

The rubbish must be collected in special containers with appropriate labels and disposed of in compliance with the national laws and/or local legislations in force.

### **CAUTION !**

It is strictly forbidden to dispose of toxic wastes in municipal sewerage and drain systems. This concerns all oils, greases, and other toxic materials in liquid or solid form.



## 6. Maintenance log

date	description





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