MADEL®

EN 15650:2010

FOC-EIS-180 Fire dampers CE

ÅThe fire dampers **FOC-EIS-180** work as a separator between two sectors of fire and ensure the same fire resistance that the structural elements of compartmentalisation, which limits the risk of spreading of fire by interior of the building.

ÅFOC-EIS-180 fire dampers are according with the following standards:

European Test Standard, EN 1366-2
(Fire resistance tests for service installations ï Part 2: Fire dampers)

European Classification Standard, EN 13501-3
(Fire classification of construction products and building elements ï Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers)

European Standard for CE Marking, EN 15650
(Ventilation for buildings. Fire dampers)

European Test Standard, EN 60529:1991
(Degrees of protection provided by enclosures (IP Code))

European Test Standard EN 1751
(Ventilation for buildings ï Air terminal devices ï Aerodynamic testing of dampers and valves)

International Test Standard ISO 10294-4
(Fire resistance tests ï Fire dampers for air distribution systems Part 4: Test of thermal release mechanism)

ÅThe casing is made of galvanised steel, and joined by welding.

ÅThe housing is made from galvanized steel. It has a symmetrical design that allows wall mounting regardless of air flow.

ÅThe blade is made of ceramic material resistant to high temperatures and abrasion.

ÅThese dampers meet the conditions required for the symbol (S) to cold smoke seal.

ÅThe airtightness to the passage of cold smoke is achieved through a joint between the perimeter of the housing and the blade.

ÅFor high temperatures, the damper is equipped with an expanding intumescent seal, forming a paste that prevents the passage of hot air and smoke from one side of the damper to another.

ÅA rubber sealing ring at both ends of the casing ensures an airtightness between the damper and the ducts.

ÅThe operating devices of the dampers is automatic shooting by means of a thermal fuse calibrated at 72 °C to activate the closure when reaches that temperature. Reset is manual except for motorized dampers.

DECLARATION OF PERFORMANCES

DECLARATION OF PERFORMANCE (Nº 0370-CPR-1392) **V01/19**

1. Product and identification name:	*Fire damper ñFOC-EIS-180ò*
2. Name and address of manufacturer:	Madel Air Technical Diffusion S.A, C/ Pont de les Bruixes P-5, P.I. La Gavarra, 08540 CENTELLES (Barcelona)
3. Uses to:	To prevent fire and reduce smoke spreading from one fire compartment to another through the air ductwork system which may penetrate fire separating vertical compartments, according to Standard EN 15650:2010 (annex ZA.1).
4. Assessment of conformity system:	System 1, according to Construction Products Regulation nº 305/2011
5. Certification body:	APPLUS - 0370 Performed tasks: - Determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product; - Initial inspection of the manufacturing plant and of factory production control; - Continuous surveillance, assessment and evaluation of factory production control. System 1 Certification number: 0370 ï CPR ï 1392 Test report: **7286/06, 18/12815-1709, 10/101611-1329, 18/12815-2189, 18/17552-1211, 10/1016611-2699**

6. Performances (EN 15650 :2010):

Essential characteristics					***Performances***
Dimensions	***Type***	***Wall***	***Type of installation***	***Mechanism orientation***	***Class***
Ø200 - 630 mm	Rigid wall	Reinforced concrete wall Ó150 mm	Built-in	0-180º	EI 180 (v_e iź o) S (300Pa)
	Rigid wall	Brick wall Ó150 mm	Built-in	0-180º	EI 180 (v_e iź o) S (300Pa)
	Rigid floor	Reinforced concrete floor Ó200 mm	Built-in	0-180º	EI 180 (v_e iź o) S (500Pa)
Nominal activation conditions/ sensitivity: Sensing element load bearing capacity Sensing element response temperature					Approved
Response delay according to EN 1366-2: Closure time					Approved
Operational reliability according to EN 1366-2 Cycling (opening and closing) on fire test. Cycling (opening and closing) according to Standard for CE Marking					50 cycles é -/MA/ - 300 cycles, é -/MAF/ - 300 cycles, é -/MFSé V/ - 10.200 cycles, é -/MFBé V/ - 10.200 cycles
Durability of response delay according to EN1366-2: Sensing element response temperature and load bearing capacity					Approved
Durability of operational reliability according to 15650: Opening and Closing cycle					Approved

7. The performances of the product identified in point 1, are in line with the declared performance in point 6.
This declaration of performance is issued under the responsibility of the
manufacturer listed in point 2.
Signed for and on behalf of the manufacturer:

Joan Arcarons Alibés **Centelles, 10/01/19**
(Technical Director)

CLASSIFICATION

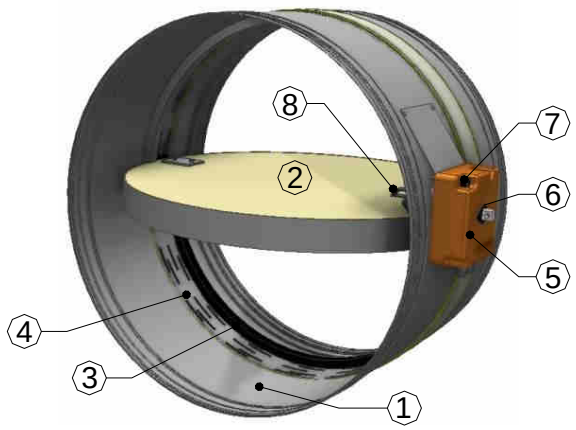
FOC-EIS-180 Circular damper with direct connection to the ducts.

é -MA Manual resetting damper. Is not necessary to open the box device.

é -MFé Damper operated by an actuator with switch off device at 24 or 230V.

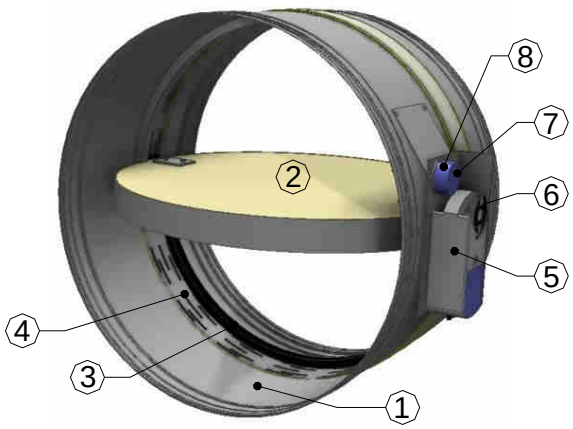
PARTS

FOC-EIS-180-MA



1. Casing
2. Blade
3. Airtightness seal
4. Cold bridging
5. Manual device /MA/
6. Position indicator
7. Test button
8. Thermal fuse 72ºC

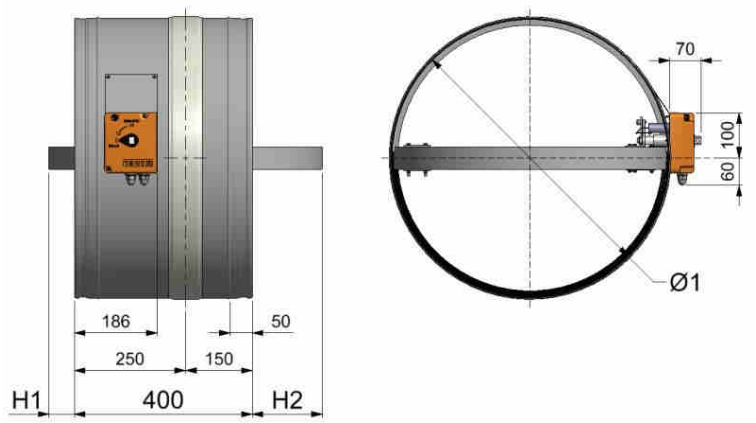
FOC-EIS-180-MFé



1. Casing
2. Blade
3. Airtightness seal
4. Cold bridging
5. Actuator /MFé V/
6. Position indicator
7. Test switch
8. Thermoelectrical fuse 72ºC

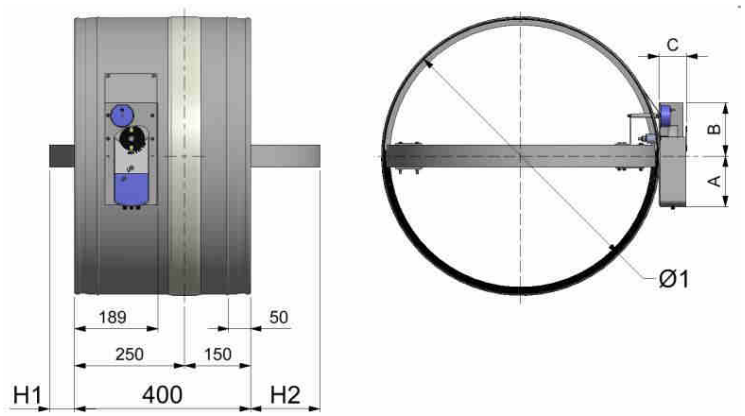
DIMENSIONS

FOC-EIS-180-MA



Dn	Ø1 *(mm)*	H1 *(mm)*	H2 *(mm)*
355	353	-	25
400	398	-	50
500	498	-	100
630	628	60	160

FOC-EIS-180-MFé



Dn	Ø1 *(mm)*	H1 *(mm)*	H2 *(mm)*
355	353	-	25
400	398	-	50
500	498	-	100
630	628	60	160

Ref.	A *(mm)*	B *(mm)*	C *(mm)*
MFS...	155	81	64
MFB...	190	81	57

OPERATING DEVICES

é -/MA/ Manual resetting damper. Automatic shooting by means of a thermal fuse calibrated at 72 °C.

Standard:

- Thermal fuse 72ºC
- Manual test button
- Manual resetting
- Position indicator
- IP42 protection

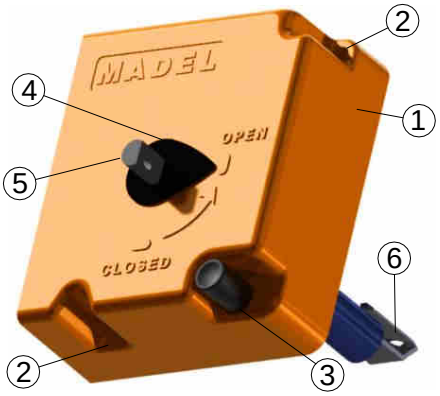


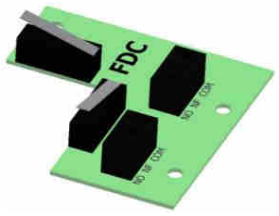
fig. **MA**

1. Plastic command cover
2. Screws for cover attachment
3. Manual test button
4. Position indicator
5. Manual resetting axe.
6. Thermal fuse 72ºC

Optional

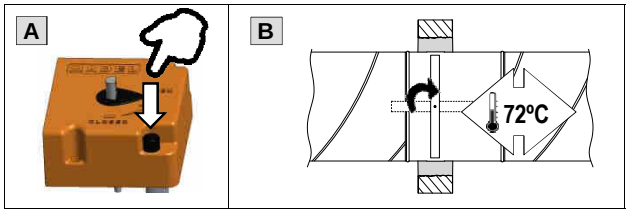
é - /PIF/ Closed switches device

fig. **PIF**



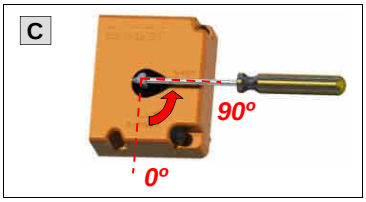
Close (unlocking)

Å **Manual:** Pressing the unlocking button *(A)*
Å **Automatic:** The fusible link reaches 72ºC *(B)*
Å **Remote:** -

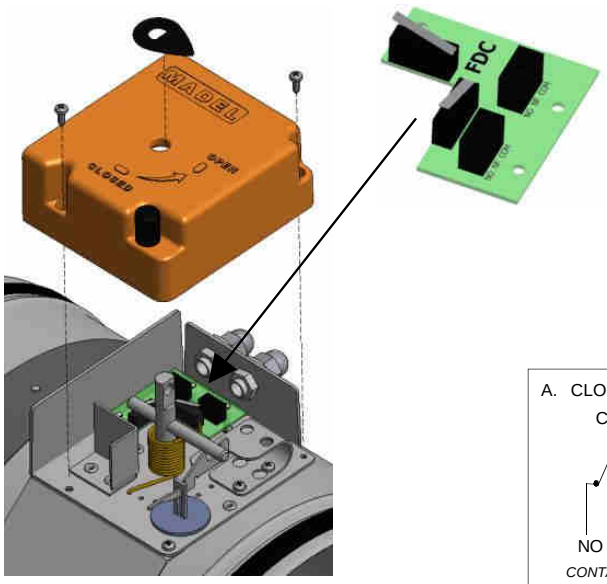


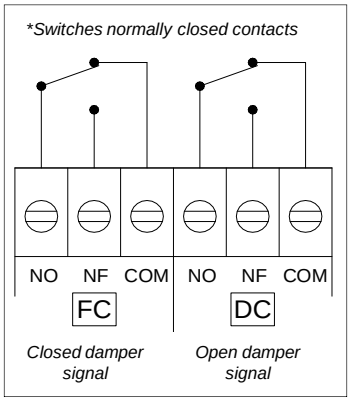
Open (resetting)

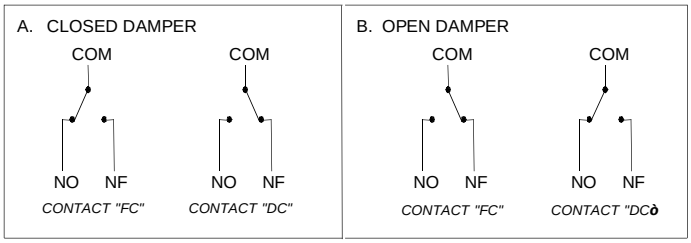
Å **Manual:** Turning counterclockwise 90º the manual resetting axe using a tool with a smaller diameter than 8mm *(C)*
Å **Automatic:** -



Electrical connection







OPERATING DEVICES

é - /MFSé / Damper operated by remote control by means of an actuator with switch off device at 24 or 230V or a thermal fuse calibrated at 72 °C. .

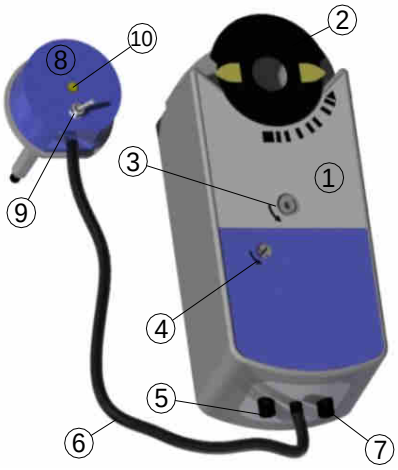


fig. **MFSé V**

Standard:

- Internal and external thermoelectrical fuse 72ºC
- Automatic resetting
- Automatic closing by fuse 72ºC
- Remote closing by interruption of power supply
- Manual test switch
- LED status fusible indicator
- Position damper indicator
- Closed switches
- IP54 Protection

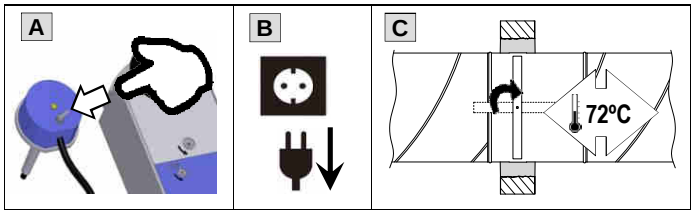
Reference a/size	Torque	Voltage	Consumption	Time Open/ Close
MFS24V	4 Nm	CA 24V CC 24/48V	3,5W (running)/ 2W (stationary)	90s/ 15s
MFS230V	4 Nm	CA 230V	4,5W (running)/ 3,5W (stationary)	90s/ 15s
MFS24V	7 Nm	CA 24V CC 24/48V	3,5W (running)/ 2W (stationary)	90s/ 15s
MFS230V	7 Nm	CA 230V	4,5W (running)/ 3,5W (stationary)	90s/ 15s

Ref.	$Ø_{nominal}$
MFSé	< 500
MFSé	≥ 500

1. Actuator
2. Position damper indicator
3. Manual resetting
4. Manual lock
5. Plug closed switches cable
6. Thermoelectrical fuse cable
7. Power supply cable
8. Thermoelectrical fuse 72ºC
9. Manual test switch
10. LED status fusible indicator

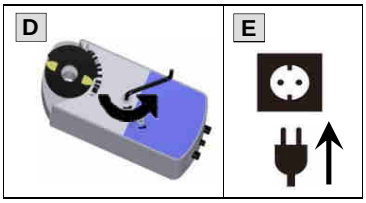
Close (unlocking)

- **Manual:** Pressing the manual test switch *(A)*
- **Remote:** By interrupting the power supply *(B)*
- **Automatic:** The fusible link reaches 72ºC *(C)*



Open (resetting)

- **Manual:** Turning counterclockwise the manual resetting with allen key *(D)*
  To keep the blade open, lock by manual lock
- **Automatic:** By supplying the power supply *(E)*

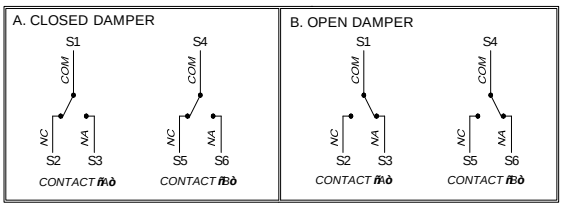


Electrical connection

AUXILIARY SWITCHES CABLE			
MEANING	**Nº**	**COLOR**	
Switch "A" input	S1	grey/ red	
Switch "A" normally-closed contact	S2	grey/ blue	
Switch "A" normally-open contact	S3	grey/ pink	
Switch "B" input	S4	black/ red	
Switch "B" normally-closed contact	S5	black/ blue	
Switch "B" normally-open contact	S6	black/ pink	

ACTUATOR 230VCA			
MEANING	**Nº**	**COLOR**	
Line 230VCA	3	Brown	
Neutral	4	Blue	

ACTUATOR 24VCA/24é 48VCC			
MEANING	**Nº**	**COLOR**	
System potential 24VCA/ 24é 48VCC	1	red	
System neutral	2	black	



ÅFixed switching points at 5º and 80º

ÅÅFixed switching point at 5º to contact ñAò

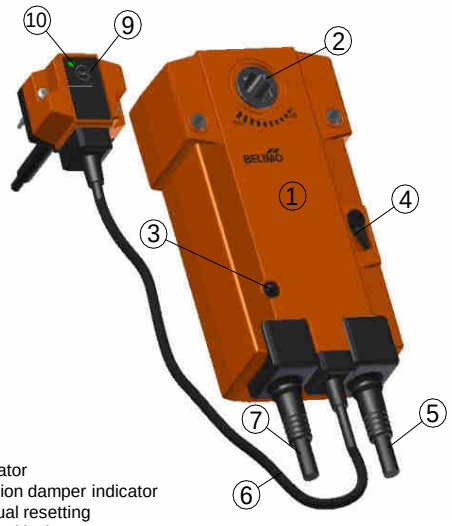
ÅÅFixed switching point at 80º to contact ñBò

OPERATING DEVICES

é - /MFBé / Damper operated by remote control by means of an actuator with switch off device at 24 or 230V or a thermal fuse calibrated at 72 °C. .

Standard:

- Internal and external thermoelectrical fuse 72ºC
- Automatic resetting
- Automatic closing by fuse 72ºC
- Remote closing by interruption of power supply
- Manual test switch
- LED status fusible indicator
- Position damper indicator
- Closed switches
- IP54 Protection



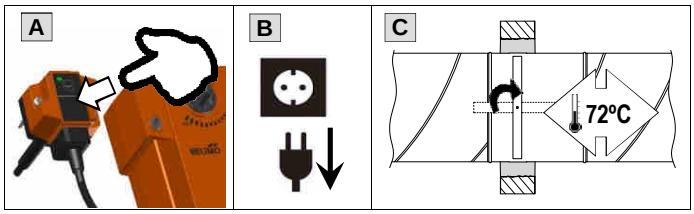
1. Actuator
2. Position damper indicator
3. Manual resetting
4. Manual lock
5. Plug closed switches cable
6. Thermoelectrical fuse cable
7. Power supply cable
8. Thermoelectrical fuse 72ºC
9. Manual test button
10. LED status fusible indicator

fig. **MFBé V**

Reference a/size	Torque	Voltage	Consumption	Time Open/ Close
MFB24V	9 Nm	CA 24V/ CC 24/48V	4W (running)/ 1,4W (stationary)	60s/ 20s
MFB230V	9 Nm	CA 230V	4,5W (running)/ 3,5W (stationary)	60s/ 20s

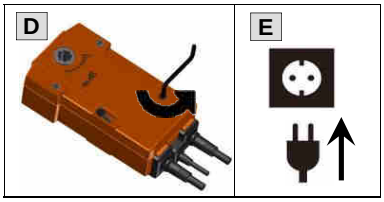
Close (unlocking)

Å **Manual:** Pressing the manual test switch *(A)*
Å **Remote:** By interrupting the power supply *(B)*
Å **Automatic:** The fusible link reaches 72ºC *(C)*



Open (resetting)

Å **Manual:** Turning counterclockwise the manual resetting with allen key *(D)*
To keep the blade open, lock by manual lock
Å **Automatic:** By supplying the power supply *(E)*

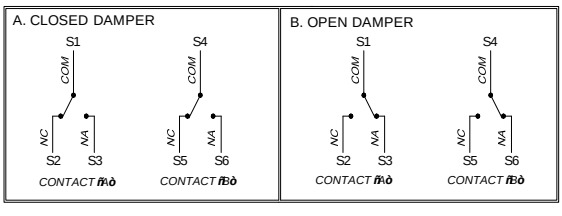


Electrical connection

MEANING	Nº	BFL/ BFN		BF	
Switch "A" input	S1	Violet		White	
Switch "A" normally-closed contact	S2	Red		White	
Switch "A" normally-open contact	S3	White		White	
Switch "B" input	S4	Orange		White	
Switch "B" normally-closed contact	S5	Pink		White	
Switch "B" normally-open contact	S6	Grey		White	

ACTUATOR 24VCA/24é 48VCC			
MEANING	**Nº**	**COLOR**	
Neutral	1	Black	
System potential 24VCA/ 24é 48VCC	2	Red	

ACTUATOR 230VCA			
MEANING	**Nº**	**COLOR**	
Neutral	1	Blue	
Line 230VCA	2	Brown	



ÅFixed switching points at 5º and 80º
ÅÅFixed switching point at 5º to contact ñAò
ÅÅFixed switching point at 80º to contact ñBò

GENERAL POINTS

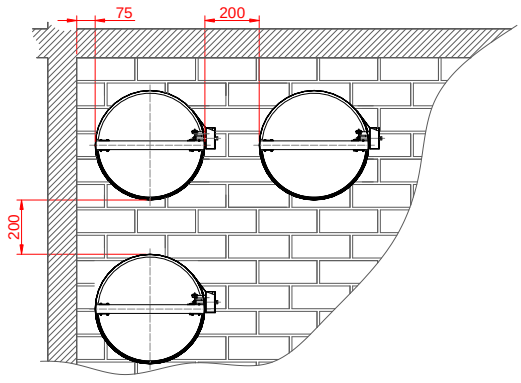
STORAGE AND HANDLING

- Avoid to store outdoor.
- Avoid the contact with liquids.
- Avoid impacts.
- Not to put loads on the blade.
- Not to use the fire damper for a different purpose to which it has been designed.
- Use the operating device for open/ close the damper, never through the blade.

SUPPORTING CONSTRUCTION AND INSTALLATION

- The MADEL fire dampers are classified for the supporting constructions described in this manual or similar supporting constructions with a same or superior fire resistance (more thickness/ density or number of boards *(according to EN 1366-2).*
- Any variation in supporting construction as described in the previous point, different sealing or type of installation regarding this document, the fire damper will not comply the classification.
- Install the fire damper with the blade closed and avoid excessive pressures in its casing.
- Avoid to project materials to the interior of the tunnel.
- Avoid vibrations in the installation.
- Check the opening and closing after the installation.

MINIMAL DISTANCES *(a/ European Standard EN 1366-2)*



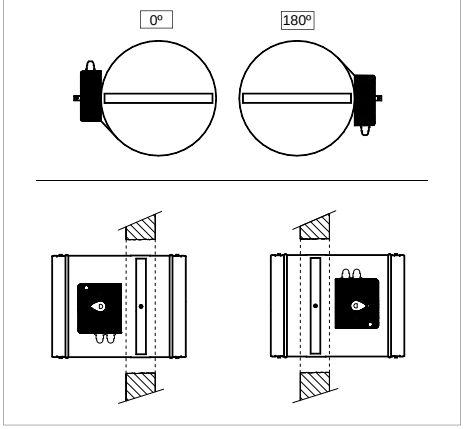
- The minimum distance between fire dampers and construction elements will be 75mm.
- The minimum distance between fire dampers will be 200mm.

INSTALLATION

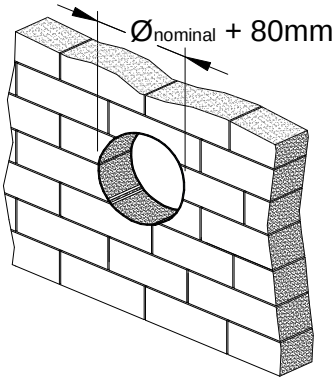
- RIGID WALL

Dimensions	Supporting construction		Sealing	Classification
Ø200 to Ø630	Rigid wall	Brick wall Ó150mm	Mortar	EI180 (v_e iź o) S (300Pa)

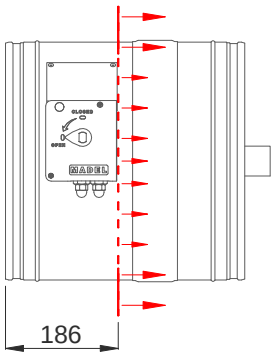
1. Operating device position



2. Support construction opening

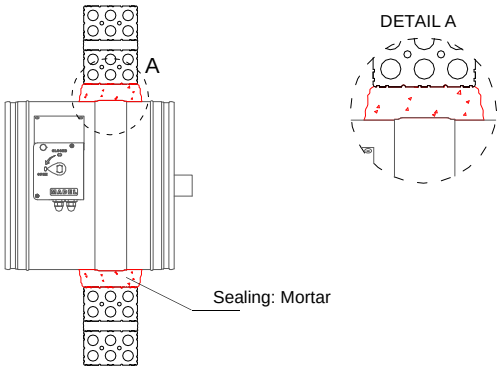


3. Starting plane of supporting construction



Starting plane of supporting construction/ sealing

4. Sealing

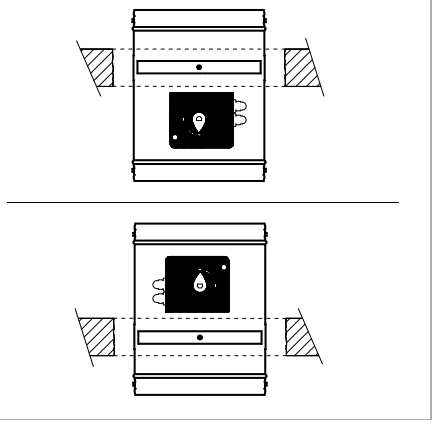


INSTALLATION

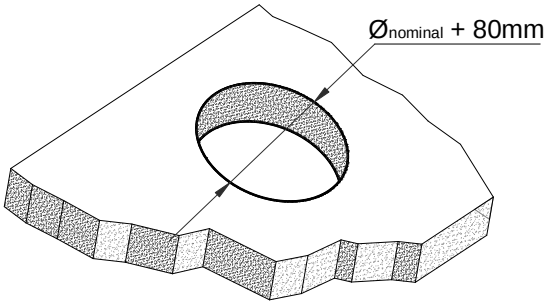
- RIGID FLOOR

Dimensions	Supporting construction		Sealing	Classification
Ø200 to Ø630	Rigid floor	Reinforced concrete Ó200mm	Mortar	EI 180 (h_o iź o) S (300Pa)

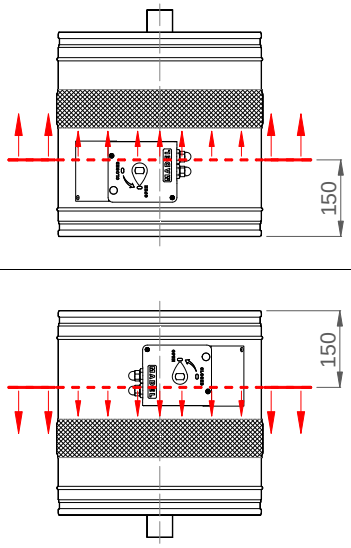
1. Operating device position



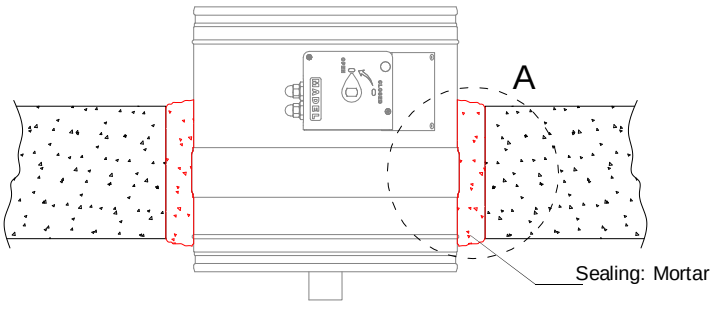
2. Support construction opening



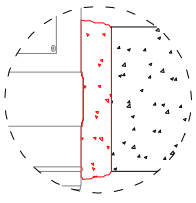
3. Starting plane of supporting construction



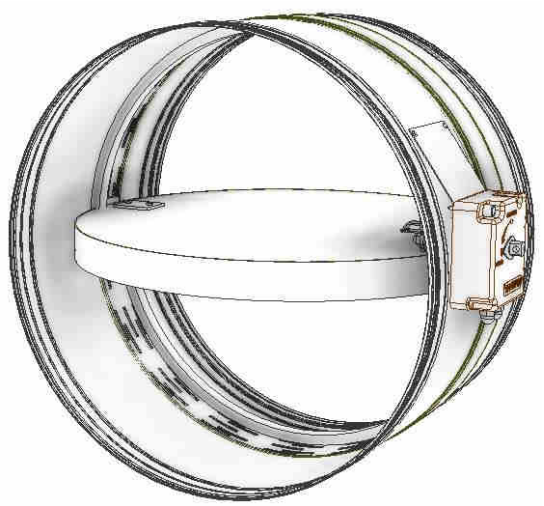
4. Sealing



DETAIL A



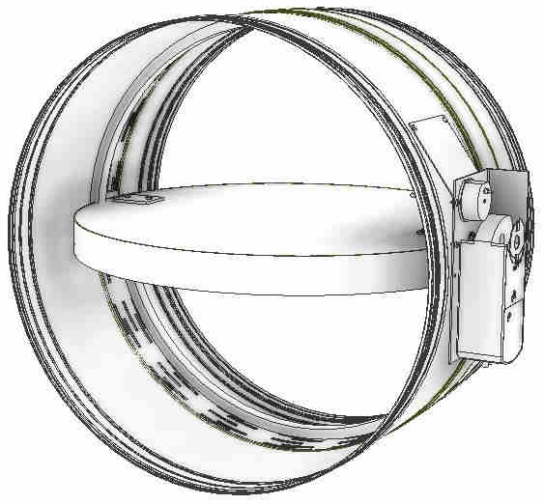
SPECIFICATION TEXT



(Manual)

Supply and mounting of circular fire damper classed EIS-180 in accordance to the European Standard *EN 13501-3* and certified CE according to *EN 15650,* series **FOC-EIS-180-MA diam. 500**.
Operated by means of a manual operating device.
Built in galvanized steel and refractory material.
Thermal fusible link at 72ºC. An expanding joint together an air-tightness joint, as much prevent the propagation of smoke to high as to low temperature.

Manufacturer **MADEL**.



(Motorized)

Supply and mounting of circular fire damper classed EIS-180 in accordance to the European Standard *EN 13501-3* and certified CE according to *EN 15650,* series **FOC-EIS-180-MFS230V diam. 500**.
Operated by means of a motorized operating device.
Built in galvanized steel and refractory material.
Thermoelectric fusible at 72ºC. An expanding joint together an air-tightness joint, as much prevent the propagation of smoke to high as to low temperature.

Manufacturer **MADEL**.

CODIFICATION

FOC-EIS-180 - MA - /PIF/ diamé é

1 2 3 4

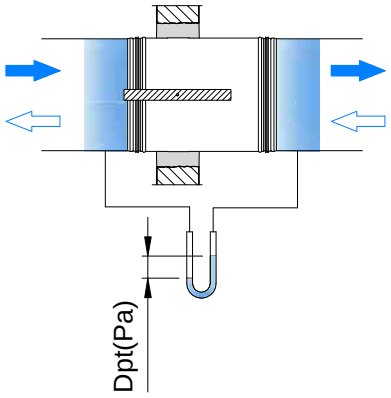
1. Product
2. Operating device
   - **MA** (Manual)
   - **MFS** (Siemens actuator)
   - **MFB** (Belimo actuator)
3. Accessories
   - **/PIF/** (Open-closed swtiches device)
4. Nominal diameter (mm)

TECHNICAL DATA

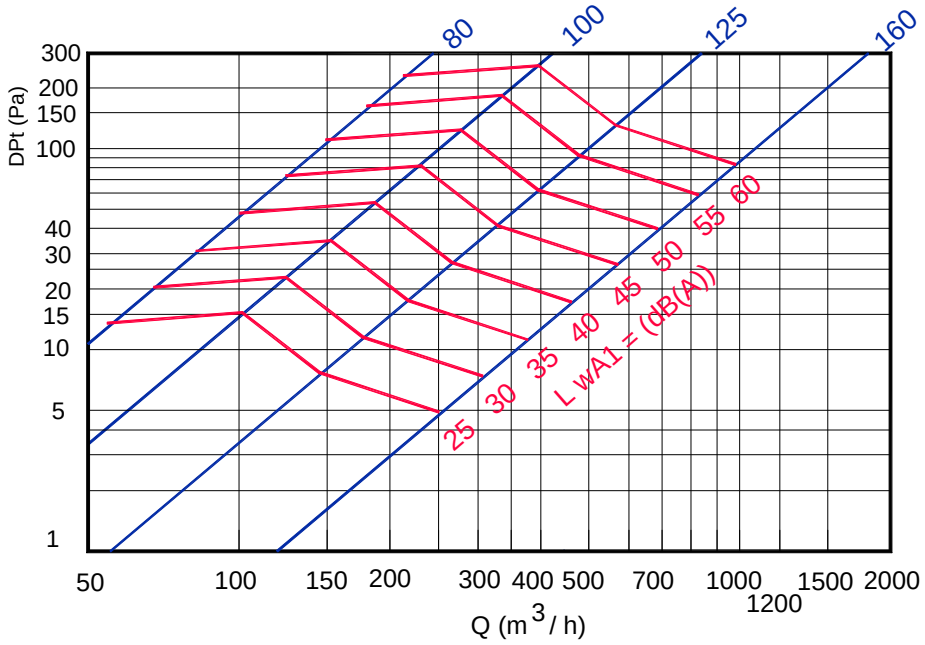
FOC-EIS-180

FREE AREA FOR THE AIR PASS

FOC	A k m^2	Qmin m^3/h	Qmax m^3/h
80	0.0005	54	126
100	0.0078	85	196
125	0.0122	130	307
160	0.020	216	504
200	0.031	330	780
250	0.049	529	1234
315	0.0779	840	1960
355	0.0989	1068	2492
400	0.125	1350	3150
500	0.196	2117	4940
630	0.312	3369	7862



PRESSURE DROP AND SOUND POWER LEVEL



TECHNICAL DATA

FOC-EIS-180

PRESSURE DROP AND SOUND POWER LEVEL