



## FBK-EIS-120 Fire dampers CE

“ The fire dampers **FBK-EIS-120** 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.

“ FBK-EIS-120 fire dampers are according with the following standards:

**European Test Standard, EN 1366-2**

*(Fire resistance tests for service installations .  
Part 2: Fire dampers)*

**European Classification Standard, EN 13501-3**

*(Fire classification of construction products and building elements .*

*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 . Air terminal devices .  
Aerodynamic testing of dampers and valves)*

**International Test Standard ISO 10294-4**

*(Fire resistance tests . Fire dampers for air distribution systems  
Part 4: Test of thermal release mechanism)*

**French Standard, NF S 61-937 (part 1/ part 5)**

*(Fire Safety Systems - Operated safety devices )*

“ The casing is made of galvanised steel, and joined by clinching system (cold forming the material).

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

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


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

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

“ For 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.

“ The 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 PERFORMANCE

DECLARATION OF PERFORMANCE (N° 0370-CPR-1375)					V10/18
1. Product and identification name:					Fire damper %BK-EIS-120+
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 n° 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 . CPR . 1375 Test report: 10/1016611-2699 14/8629-947 18/12815-1709 18/17552-1205
6. Performances (EN 15650 :2010):					
<b>Essential characteristics</b>					<b>Performances</b>
<i>Dimensions</i>	<i>Type</i>	<i>Wall</i>	<i>Type of installation</i>	<i>Mechanism orientation</i>	<i>Class</i>
200 x 200 a 1000 x 600	Rigid wall	Brick wall - 150 mm	Built-in	0-180°	EI 120 (V <sub>e</sub> i o) S (300Pa)
<b>Nominal activation conditions/ sensitivity:</b>					
Sensing element load bearing capacity					Approved
Sensing element response temperature					
<b>Response delay according to EN 1366-2:</b>					
Closure time					Approved
<b>Operational reliability according to EN 1366-2</b>					
Cycling (opening and closing) on fire test.					50 cycles
Cycling (opening and closing) according to Standard for CE Marking					δ - /MA/ - 300 cycles, δ - /MAF/ - 300 cycles, δ - /MFSδ V/ - 10.200 cycles, δ - /MFBδ V/ - 10.200 cycles
<b>Durability of response delay according to EN1366-2:</b>					
Sensing element response temperature and load bearing capacity					Approved
<b>Durability of operational reliability according to 15650:</b>					
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 (Technical Director)		Centelles, 22/10/18			

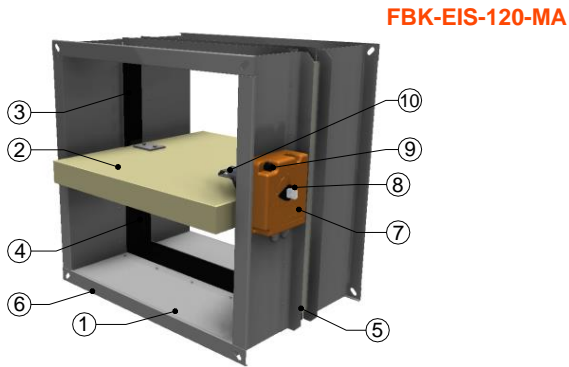
## CLASSIFICATION

**FBK-EIS-120** Rectangular damper 90° angled flange connection to the ducts.

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

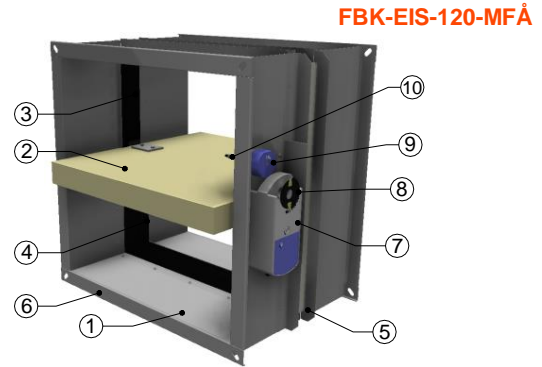
**Å -MFÅ** Damper operated by an actuator with switch off device at 24 or 230V.

## PARTS



**FBK-EIS-120-MA**

- |                      |                          |
|----------------------|--------------------------|
| 1. Casing            | 6. 90° angled flange     |
| 2. Blade             | 7. Operating device /MA/ |
| 3. Airtightness seal | 8. Position indicator    |
| 4. Intumescent seal  | 9. Test button           |
| 5. Perimetral frame  | 10. Thermal fuse 72°C    |

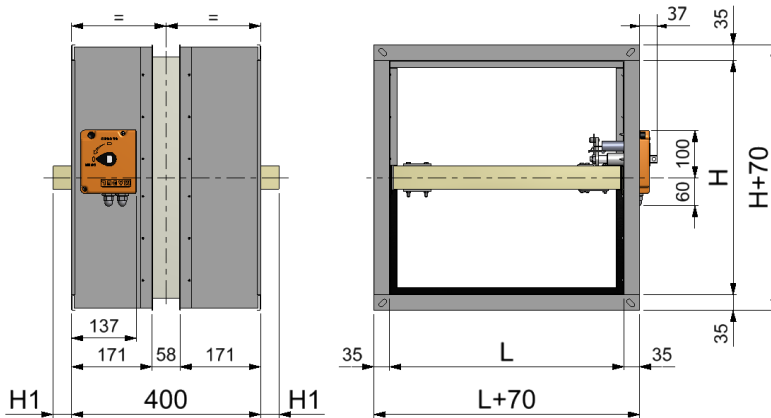


**FBK-EIS-120-MFÅ**

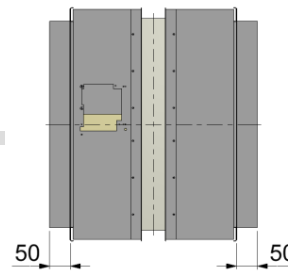
- |                      |                                |
|----------------------|--------------------------------|
| 1. Casing            | 6. 90° angled flange           |
| 2. Blade             | 7. Actuator /MFö /             |
| 3. Airtightness seal | 8. Position indicator          |
| 4. Intumescent seal  | 9. Test switch                 |
| 5. Perimetral frame  | 10. Thermoelectrical fuse 72°C |

## DIMENSIONS

### FBK-EIS-120-MA

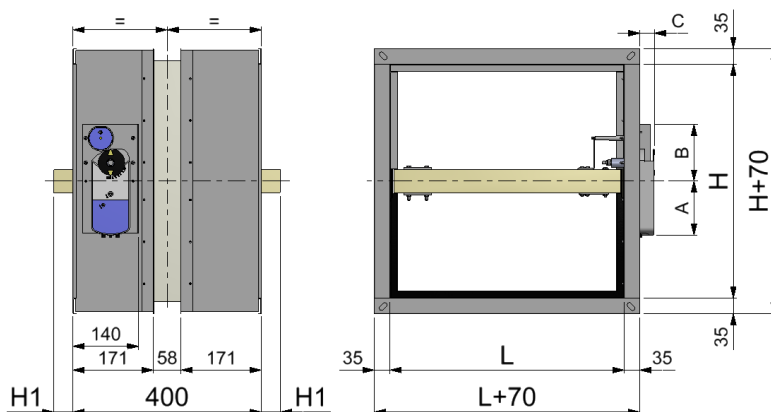


### FBK-EIS-120 /CR Å



L (mm)	H (mm)	H1 (mm)
200	200	-
250	250	-
300	300	-
350	350	-
400	400	-
450	450	25
500	500	50
550	550	75
600	600	100
700		
800		
900		
1000		

### FBK-EIS-120-MFÅ



Ref.	A (mm)	B (mm)	C (mm)
MFS...	115	121	32
MFB...	150	121	25

## OPERATING DEVICES

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

### Standard:

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

### Optional

**Å - /PIF/** Closed switches device

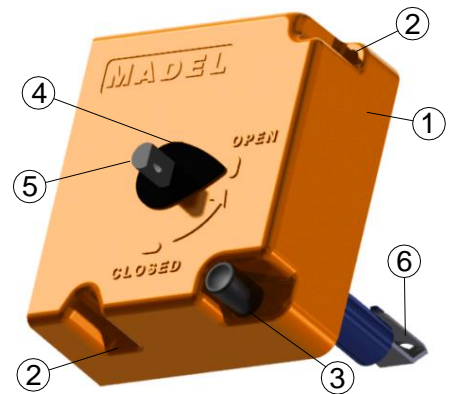
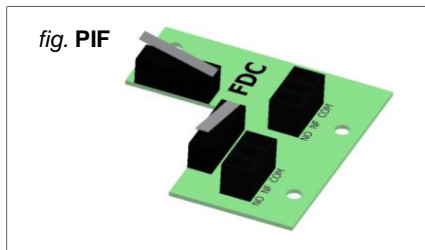
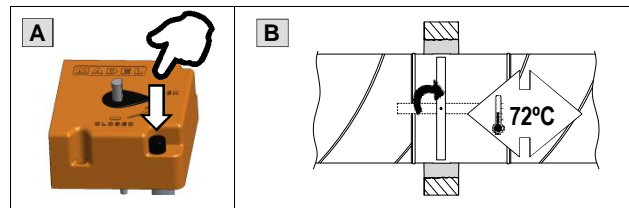


fig. MA

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

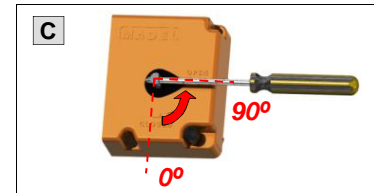
### Close (unlocking)

- ~ **Manual:** Pressing the unlocking button (A)
- ~ **Automatic:** The fusible link reaches 72°C (B)
- ~ **Remote:** -

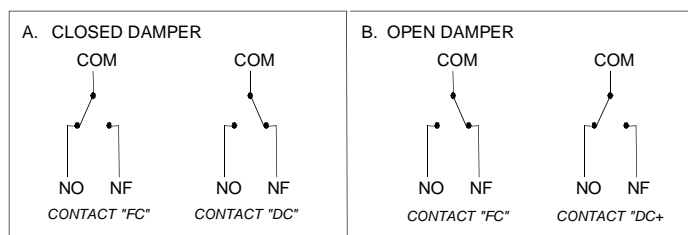
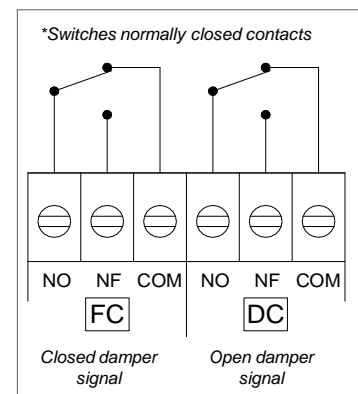
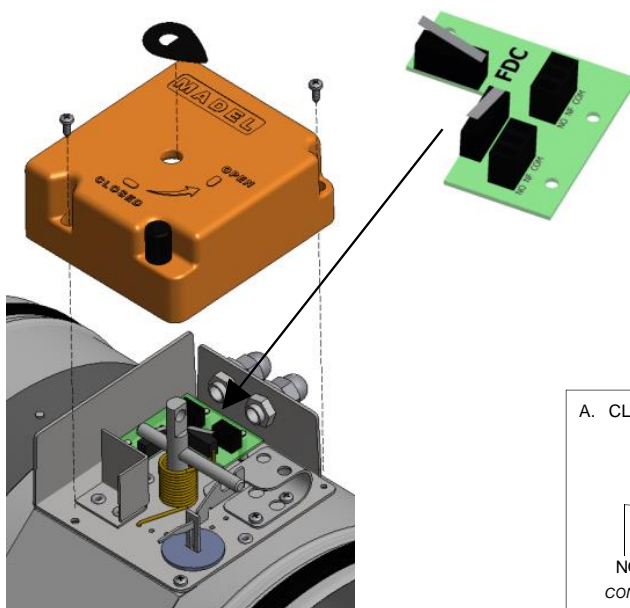


### Open (resetting)

- ~ **Manual:** Turning counterclockwise 90° the manual resetting axle using a tool with a smaller diameter than 8mm (C)
- ~ **Automatic:** -



### Electrical connection



**OPERATING DEVICES**

**Å - /MFSÅ /** 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 72°C
- Automatic resetting
- Automatic closing by fuse 72°C
- Remote closing by interruption of power supply
- Manual test switch
- LED status fusible indicator
- Position damper indicator
- Closed switches
- IP54 Protection

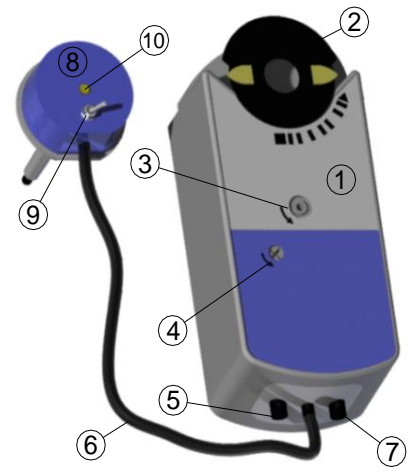


fig. MFSÅ V

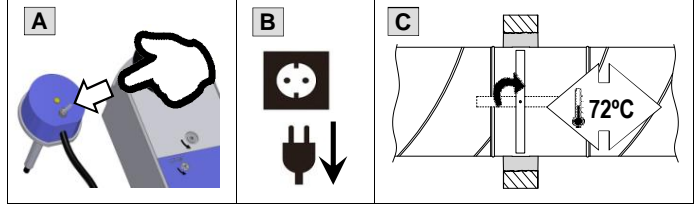
1. Actuator
2. Position damper indicator
3. Manual resetting
4. Manual lock
5. Plug closed switches cable
6. Thermoelectrical fuse 72°C
7. Power supply cable
8. Thermoelectrical fuse 72°C
9. Manual test switch
10. LED status fusible indicator

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

H	L																
	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
200																	
250																	
300																	
350																	
400																	
450																	
500																	
550																	
600																	

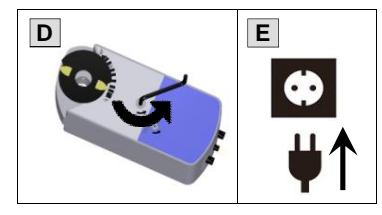
**Close (unlocking)**

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

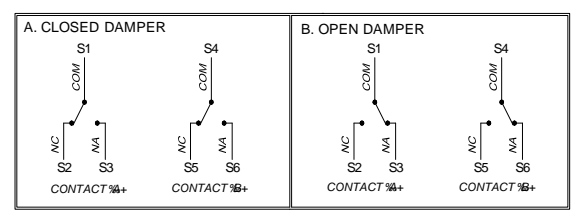


**Electrical connection**

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/24Å 48VCC		
MEANING	Nº	COLOR
System potential 24VCA/ 24Å 48VCC	1	red
System neutral	2	black



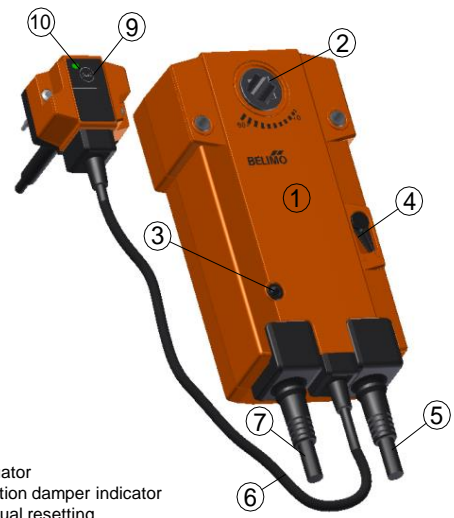
~ Fixed switching points at 5° and 80°  
 ~ Fixed switching point at 5° to contact %A+  
 ~ Fixed switching point at 80° to contact %B+

**OPERATING DEVICES**

**Å - /MFBÅ /** 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 72°C
- Automatic resetting
- Automatic closing by fuse 72°C
- Remote closing by interruption of power supply
- Manual test switch
- LED status fusible indicator
- Position damper indicator
- Closed switches
- IP54 Protection



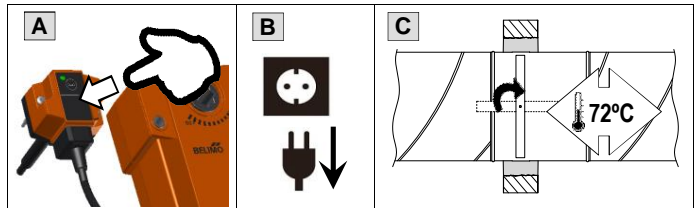
1. Actuator
2. Position damper indicator
3. Manual resetting
4. Manual lock
5. Plug closed switches cable
6. Thermoelectrical fuse cable
7. Power supply cable
8. Thermoelectrical fuse 72°C
9. Manual test button
10. LED status fusible indicator

fig. MFBÅ 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

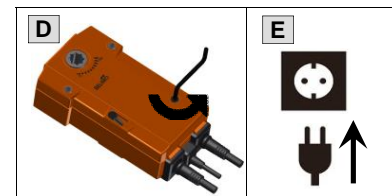
**Close (unlocking)**

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

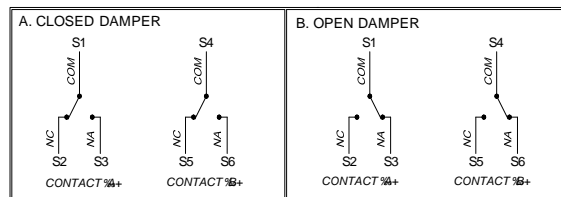


**Electrical connection**

MEANING	N°	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/24Å 48VCC			
MEANING	N°	COLOR	
Neutral	1	Black	
System potential 24VCA/ 24Å 48VCC	2	Red	

ACTUATOR 230VCA			
MEANING	N°	COLOR	
Neutral	1	Blue	
Line 230VCA	2	Brown	



~ Fixed switching points at 5° and 80°

~ Fixed switching point at 5° to contact %A+

~ Fixed switching point at 80° to contact %B+



## GENERAL POINTS

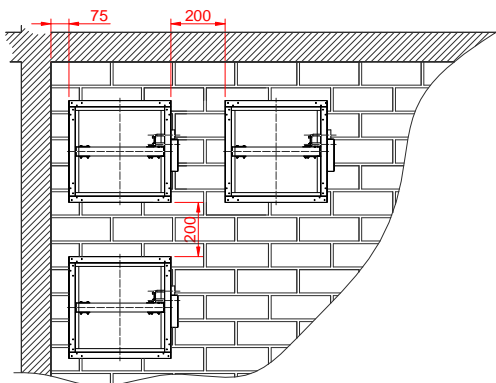
### STORAGE AND HANDLING

- ~ 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's 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.
- ~ The inner dimension of the air ducts can not be smaller than inside dimension of the damper.

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

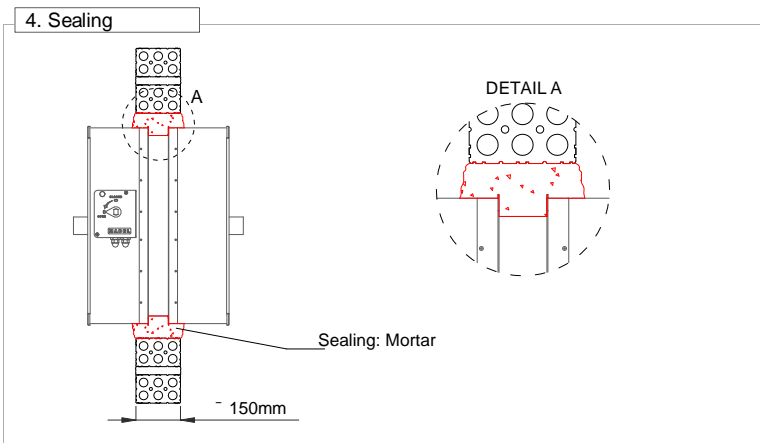
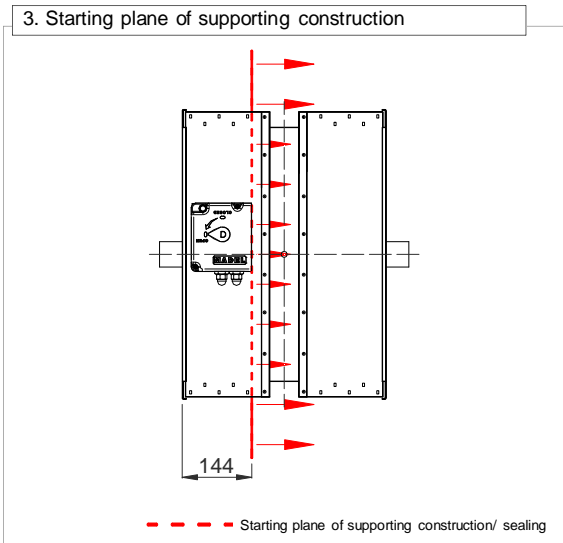
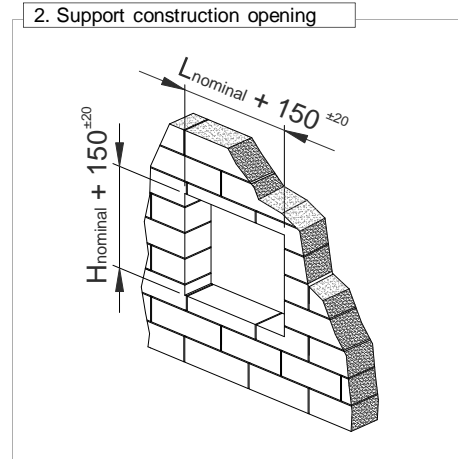
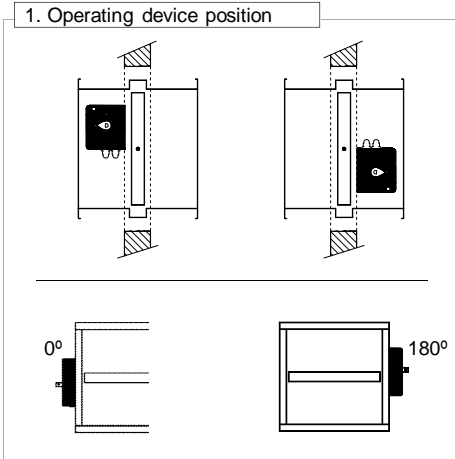


- ~ The minimum distance between fire dampers and construction elements will be 75mm.
- ~ The minimum distance between fire dampers will be 200mm.

# INSTALLATION

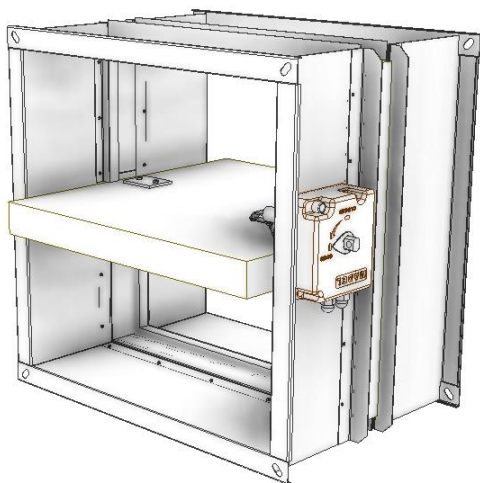
## - RIGID WALL

Dimensions	Supporting construction		Sealing	Classification
200 x 200 to 1000 x 600	Rigid wall	Brick wall ~ 150mm	Mortar	EI120 (v_e i o) S (300Pa)
200 x 200 to 1000 x 600	Rigid wall	Reinforced concrete ~ 150mm	Mortar	EI120 (v_e i o) S (300Pa)





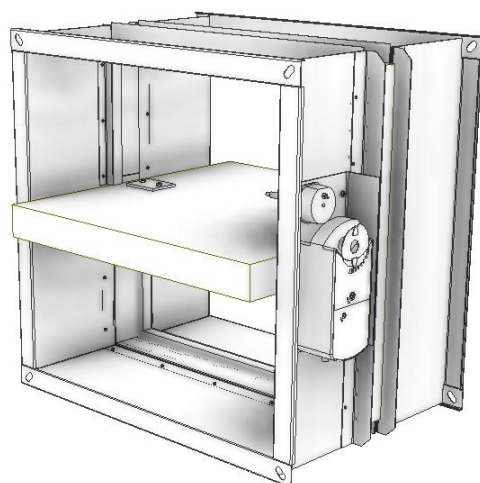
## SPECIFICATION TEXT



(Manual)

Supply and mounting of rectangular fire damper classed EIS-120 in accordance to the European Standard *EN 13501-3* and certified CE according to *EN 15650*, series **FBK-EIS-120-MA dim. 500 x 300** Operated by means of a manual operating device. Built in galvanized steel and refractory material. Thermal fusible link at 72°C. 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 rectangular fire damper classed EIS-120 in accordance to the European Standard *EN 13501-3* and certified CE according to *EN 15650*, series **FBK-EIS-120-MFS230V dim. 500 x 300** Operated by means of a motorized operating device. Built in galvanized steel and refractory material. Thermoelectric fusible at 72°C. An expanding joint together an air-tightness joint, as much prevent the propagation of smoke to high as to low temperature.

Manufacturer **MADEL**.

## CODIFICATION

**FBK-EIS-120 - /CR - H - MA - /PIF/ dim. L x H**

1     
 2     
 3     
 4     
 5     
 6

- |  |  |
|--|--|
| <p>1. Product</p> <p>2. Operating device</p> <p style="margin-left: 20px;">- (90° angled frame) (by default)</p> <p style="margin-left: 20px;">- /CR/ (50mm straight flange)</p> <p>3. Orientation</p> <p style="margin-left: 20px;">- H (Blade axe parallel to the smaller size) (by default)</p> <p style="margin-left: 20px;">- V (Blade axe parallel to the higher size)</p> | <p>4. Operating device</p> <p style="margin-left: 20px;">- MA (Manual)</p> <p style="margin-left: 20px;">- MFS (Siemens actuator)</p> <p style="margin-left: 20px;">- MFB (Belimo actuator)</p> <p>5. Accessories</p> <p style="margin-left: 20px;">- /PIF/ (Open-closed switches device)</p> <p>6. Dimensions (mm)</p> <p style="margin-left: 20px;">- L (Length of the base)</p> <p style="margin-left: 20px;">- H (Height of the operating device side)</p> |
|--|--|

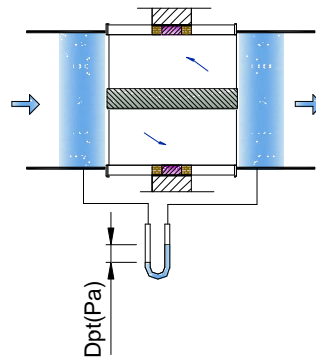
**TECHNICAL DATA**

**FBK-EIS-120**

**FREE AREA FOR THE AIR PASS (m<sup>2</sup>)**

L H											
	100	200	300	400	500	600	700	800	900	1000	
200	Afree	0,007	0,019	0,03	0,042	0,053	0,065	0,077	0,088	0,1	0,111
	Kr	1,070	1,075	0,930	0,920	0,895	0,875	0,865	0,855	0,845	0,830
	Kf	-24	-21,75	-17,5	-15,5	-14	-11,75	-10,25	-9,5	-8,75	-8
300	Afree	0,013	0,035	0,056	0,078	0,099	0,121	0,143	0,164	0,186	0,207
	Kr	0,805	0,790	0,740	0,685	0,645	0,625	0,615	0,6	0,59	0,58
	Kf	-18	-17,25	-13	-10,5	-8,75	-7,25	-6	-5	-3,75	-3
400	Afree	0,019	0,051	0,082	0,114	0,145	0,177	0,209	0,240	0,270	0,303
	Kr	0,735	0,715	0,655	0,595	0,550	0,530	0,525	0,490	0,480	0,470
	Kf	-18	-14,5	-10,5	-9	-6,25	-4	-3,25	-2,25	-1	-0,5
500	Afree	0,025	0,067	0,108	0,150	0,191	0,233	0,275	0,316	0,358	0,399
	Kr	0,675	0,670	0,585	0,520	0,485	0,450	0,440	0,415	0,410	0,4
	Kf	-16	-11,75	-8,5	-6	-3,5	-2	-0,75	-0,25	0,75	2,5
600	Afree	0,031	0,083	0,134	0,186	0,237	0,289	0,341	0,392	0,444	0,495
	Kr	0,655	0,630	0,535	0,470	0,425	0,4	0,375	0,365	0,360	0,345
	Kf	-14,75	-10,25	-6,5	-3,5	-2,25	-0,25	1	2	3	4

$Lwa = Lwa1 + Kf$



**TECHNICAL DATA**

**FBK-EIS-120**

FREE VELOCITY, PRESSURE DROP AND SOUND POWER LEVEL

