

...-BP



EN 15650:2010

FBK-E1 Fire dampers CE

- The fire dampers **FBK-E1** 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-E1 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. The low thickness of the blade, allows to minimize the pressure loss and the availability of dimensions from 100 x 100 mm.
- 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.
- **...-BP**
It incorporates a solid perimeter frame to facilitate the sealing between the fire damper and support construction.

DECLARATION OF PERFORMANCE

FBK-E1

DECLARATION OF PERFORMANCE (N° 0370-CPR-4715) V02/21

1. Product and identification name:	Fire damper "FBK-E1"
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 – 4715 Test report: 20/23389-1818, 20/22074-470, 21/24140-150

6. Performances (EN 15650 :2010):					
Essential characteristics					Performances
Dimensions	Type	Wall	Type of installation	Mechanism orientation	Class
100 x 100 to 1000 x 600	Rigid wall	Brick wall/ Reinforced concrete ≥ 105 mm	Built-in	0-180°	EI 120 (v _e i↔o) S (500Pa)
	Rigid floor	Reinforced concrete floor ≥ 200 mm	Built-in	0-360°	EI 120 (h _e i↔o) S (500Pa)
Nominal activation conditions/ sensitivity:					
Sensing element load bearing capacity					Approved
Sensing element response temperature					
Response delay according to EN 1366-2:					
Closure time					Approved
Operational reliability according to EN 1366-2					
Cycling (opening and closing) on fire test.					50 cycles
Cycling (opening and closing) according to Standard for CE Marking					... - /MA/ - 300 cycles, ... - /MAF/ - 300 cycles, ... - /MFS...V/ - 10.200 cycles, ... - /MFB...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, 01/02/2021
(Technical Director)

DECLARATION OF PERFORMANCE

FBK-E1-BP

DECLARATION OF PERFORMANCE (N° 0370-CPR-4716)	V02/21
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1. Product and identification name:	Fire damper "FBK-E1-BP"
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 – 4716 Test report: 20/22074-806, 20/22074-605, 21/24140-150

6. Performances (EN 15650 :2010):					
<i>Essential characteristics</i>					<i>Performances</i>
<i>Dimensions</i>	<i>Type</i>	<i>Wall</i>	<i>Type of installation</i>	<i>Mechanism orientation</i>	<i>Class</i>
100 x 100 to 1000 x 600	Rigid wall	Brick wall/ Reinforced concrete ≥ 105 mm	Built-in	0-180°	EI 120 (v _o i↔o) S (500Pa)
	Rigid floor	Reinforced concrete floor ≥ 200 mm	Built-in	0-360°	EI 120 (h _o i↔o) S (500Pa)
Nominal activation conditions/ sensitivity:					
Sensing element load bearing capacity					Approved
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.					50 cycles
Cycling (opening and closing) according to Standard for CE Marking					...- /MA/ - 300 cycles, ...- /MAF/ - 300 cycles, ...- /MFS...V/ - 10.200 cycles, ...- /MFB...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, 01/02/2021
(Technical Director)

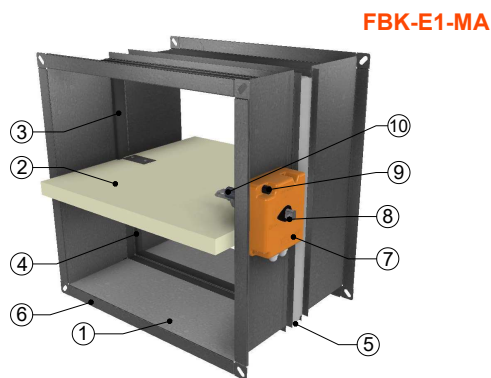
CLASSIFICATION

FBK-E1 Rectangular damper 90° angled flange connection to the ducts.

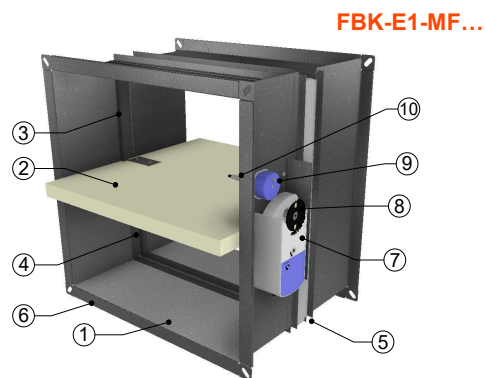
...-MA Manual resetting damper. Is not necessary to open the box device.

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

PARTS



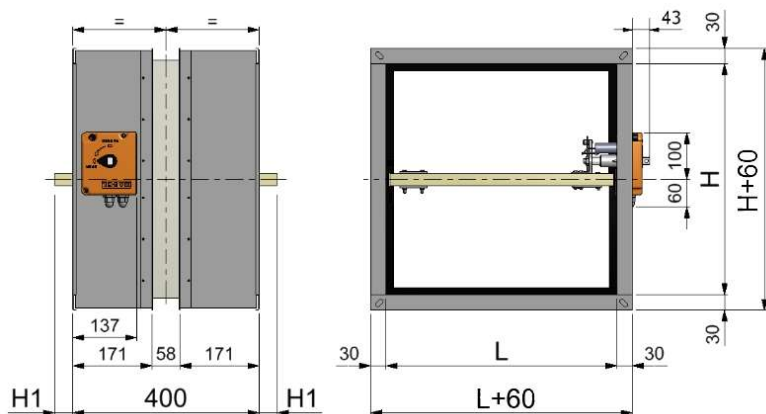
- | | |
|----------------------|--------------------------|
| 1. Casing | 6. 90° angled flange |
| 2. Blade | 7. Operating device /MA/ |
| 3. Airtightness seal | 8. Position indicator |
| 4. Intumescent seal | 9. Test button |
| 5. Perimetral frame | 10. Thermal fuse 72°C |



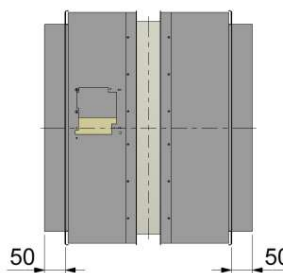
- | | |
|----------------------|--------------------------------|
| 1. Casing | 6. 90° angled flange |
| 2. Blade | 7. Actuator /MF.../ |
| 3. Airtightness seal | 8. Position indicator |
| 4. Intumescent seal | 9. Test switch |
| 5. Perimetral frame | 10. Thermoelectrical fuse 72°C |

DIMENSIONS

FBK-E1-MA

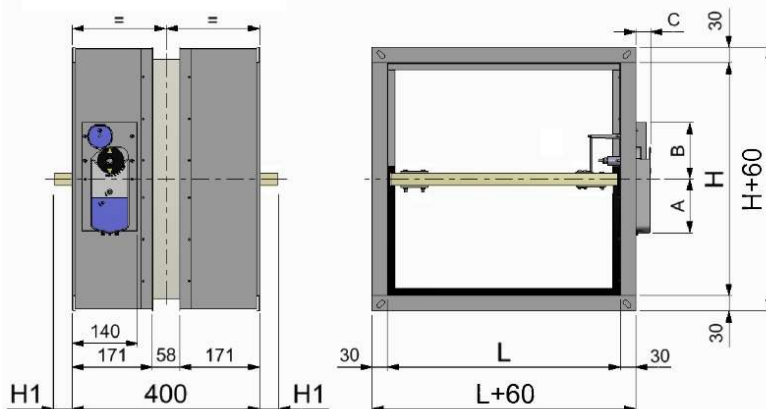


FBK-E1 /CR ...



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-E1-MF...



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

CLASSIFICATION

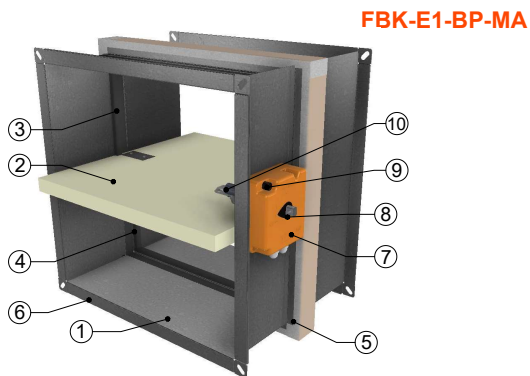
FBK-E1-BP Rectangular damper 90° angled flange connection to the ducts.

It incorporates a solid perimeter frame to facilitate the sealing between the fire damper and support construction.

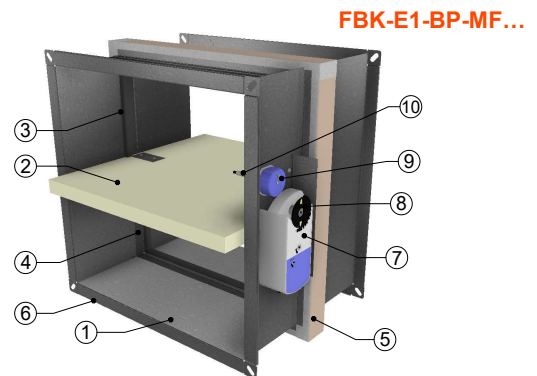
...-MA Manual resetting damper. Is not necessary to open the box device.

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

PARTS



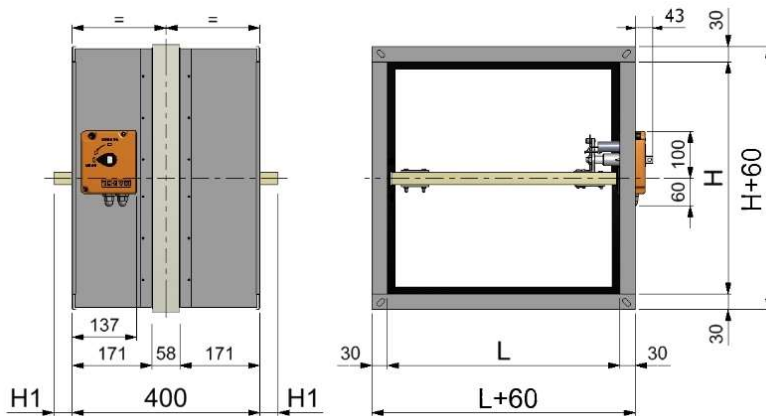
- | | |
|----------------------|--------------------------|
| 1. Casing | 6. 90° angled flange |
| 2. Blade | 7. Operating device /MA/ |
| 3. Airtightness seal | 8. Position indicator |
| 4. Intumescent seal | 9. Test button |
| 5. Perimetral frame | 10. Thermal fuse 72°C |



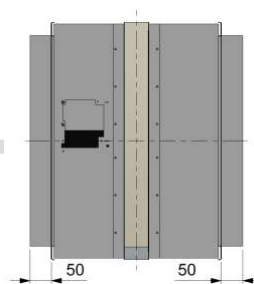
- | | |
|----------------------|--------------------------------|
| 1. Casing | 6. 90° angled flange |
| 2. Blade | 7. Actuator /MF.../ |
| 3. Airtightness seal | 8. Position indicator |
| 4. Intumescent seal | 9. Test switch |
| 5. Perimetral frame | 10. Thermoelectrical fuse 72°C |

DIMENSIONS

FBK-E1-BP-MA

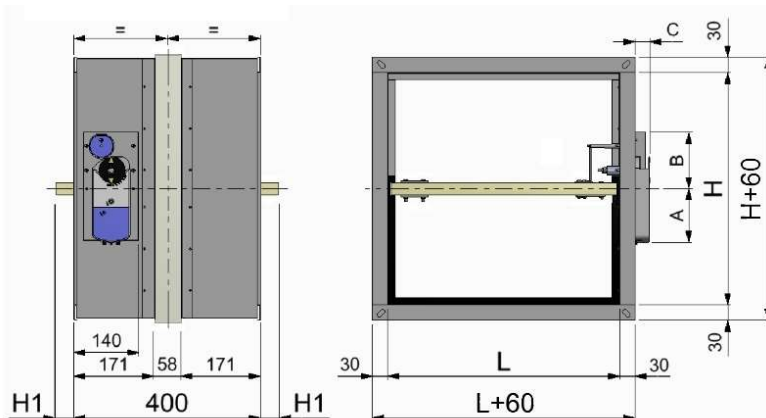


FBK-E1-BP /CR ...



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-E1-BP-MF...



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

OPERATING DEVICES

...-/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

...- /PIF/ Closed switches device

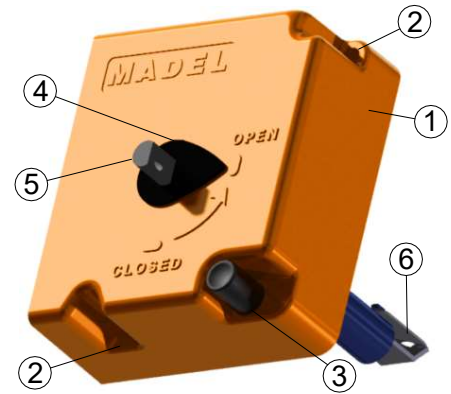
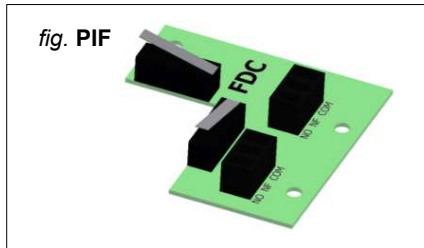
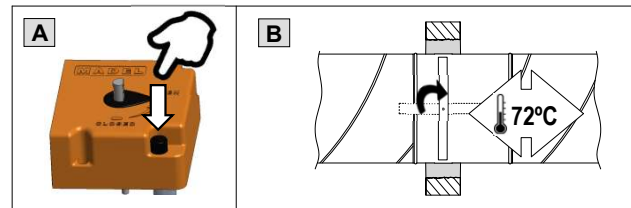


fig. MA

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

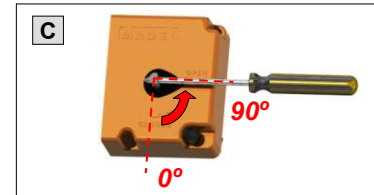
Close (unlocking)

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

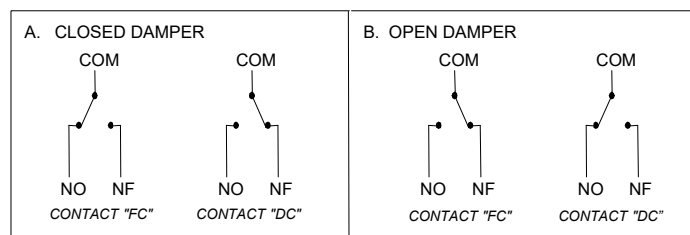
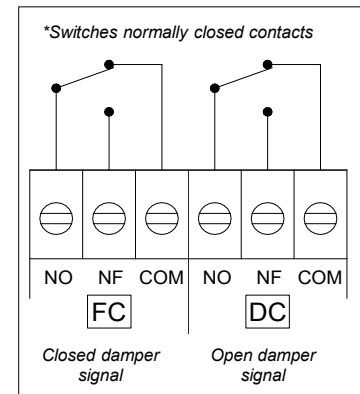
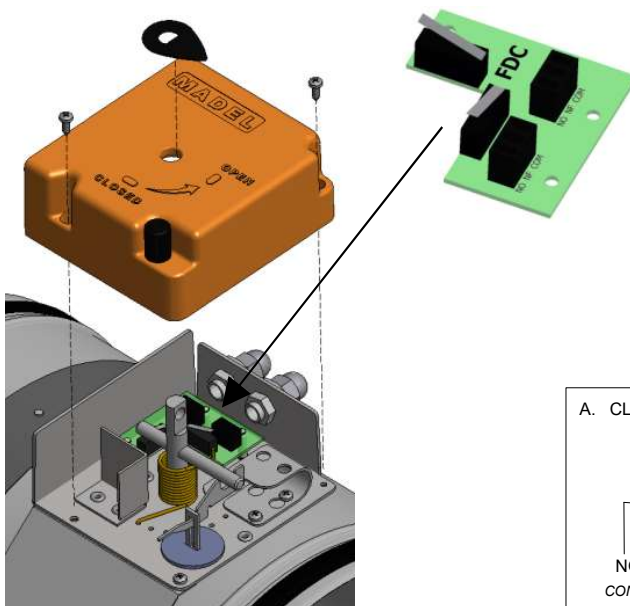


Open (resetting)

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



Electrical connection



OPERATING DEVICES

...- /MFS.../ 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

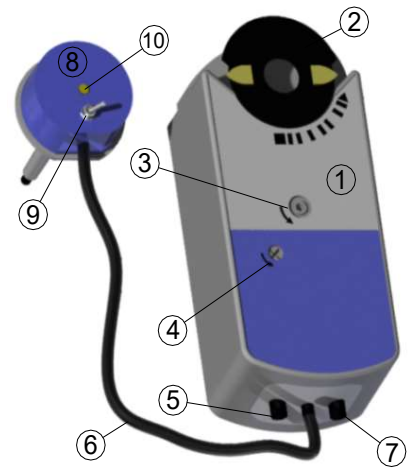


fig. MFS...V

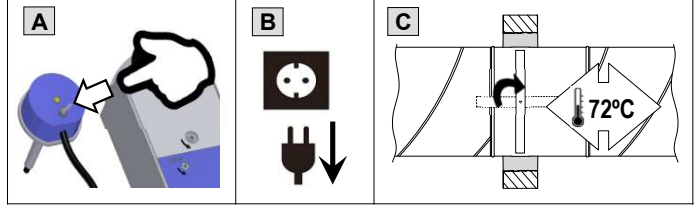
1. Actuator
2. Position damper indicator
3. Manual resetting
4. Manual lock
5. Plug closed switches cable
6. Thermoelectrical fuse cable
7. Power supply cable
8. Thermoelectrical fuse 72°C
9. Manual test switch
10. LED status fusible indicator

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																	

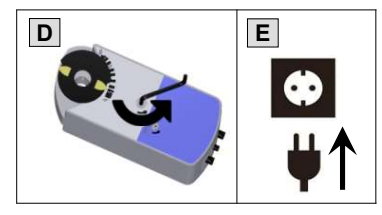
Close (unlocking)

- **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)

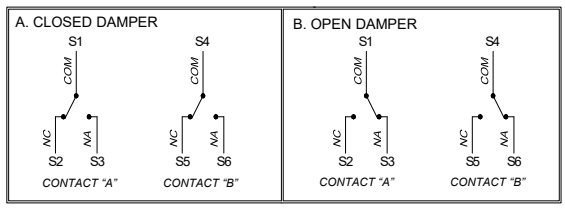


Electrical connection

AUXILIARY SWITCHES CABLE		
MEANING	N°	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	N°	COLOR
Line 230VCA	3	Brown
Neutral	4	Blue

ACTUATOR 24VCA/24...48VCC		
MEANING	N°	COLOR
System potential 24VCA/ 24...48VCC	1	red
System neutral	2	black



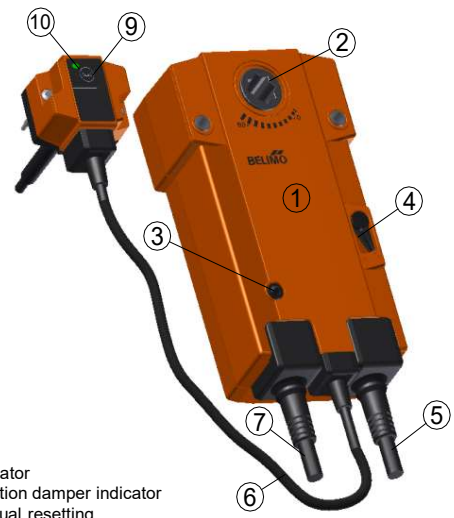
- Fixed switching points at 5° and 80°
 - Fixed switching point at 5° to contact "A"
 - Fixed switching point at 80° to contact "B"

OPERATING DEVICES

...- /MFB.../ 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



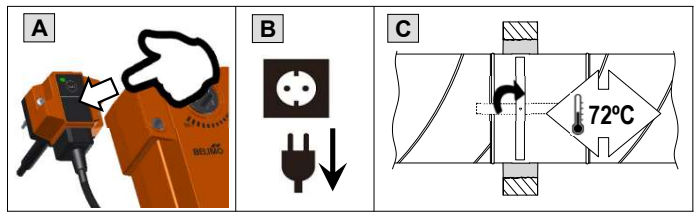
1. Actuator
2. Position damper indicator
3. Manual resetting
4. Manual lock
5. Plug closed switches cable
6. Thermoelectrical fuse cable
7. Power supply cable
8. Thermoelectrical fuse 72°C
9. Manual test button
10. LED status fusible indicator

fig. MFB...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

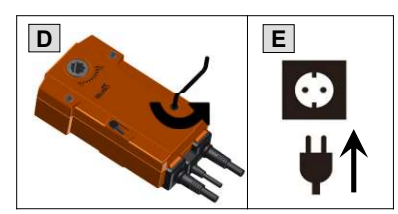
Close (unlocking)

- **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)

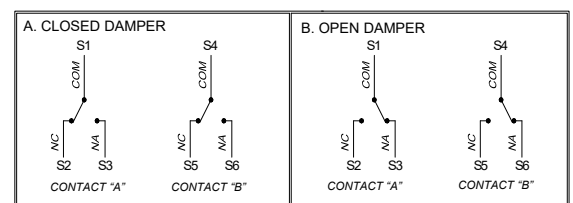


Electrical connection

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

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

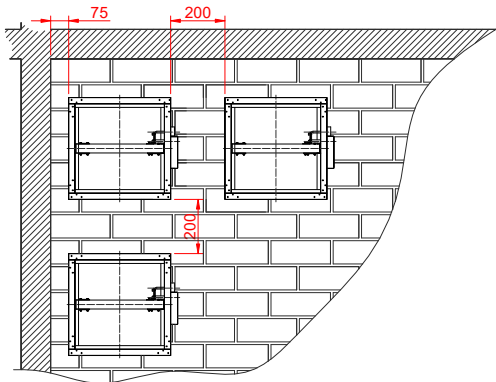
STORAGE AND HANDLING

- 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*)

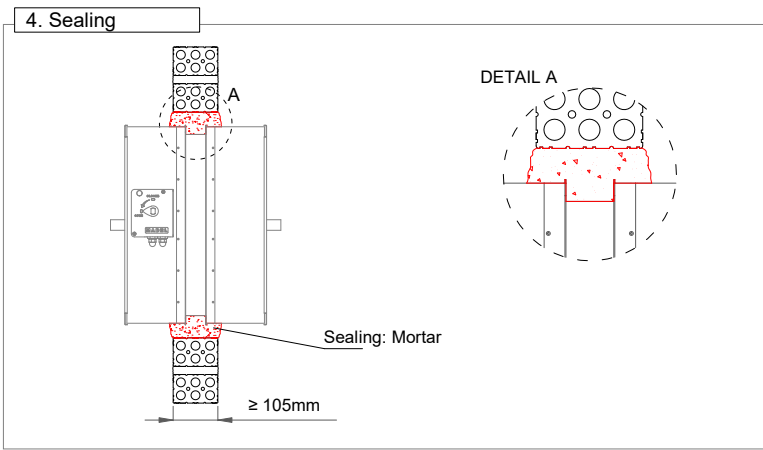
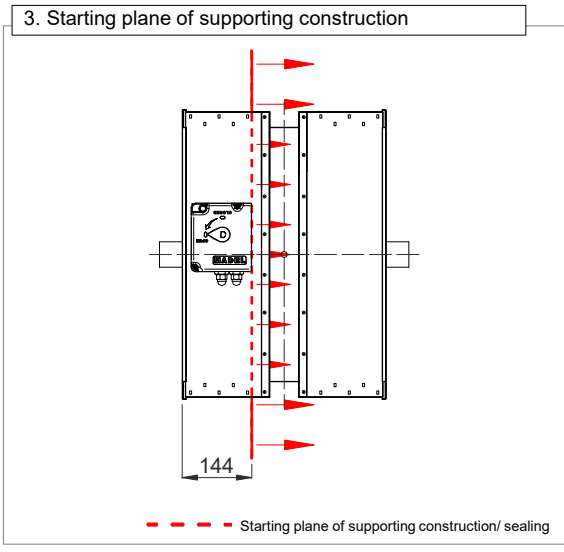
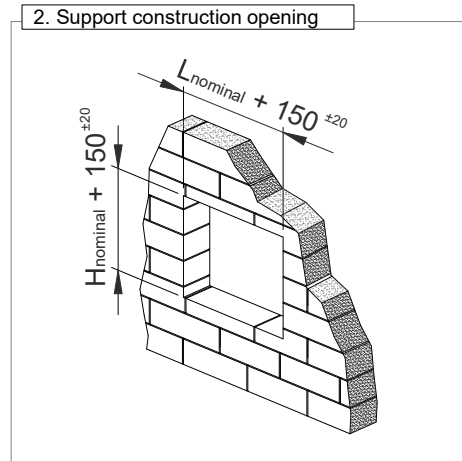
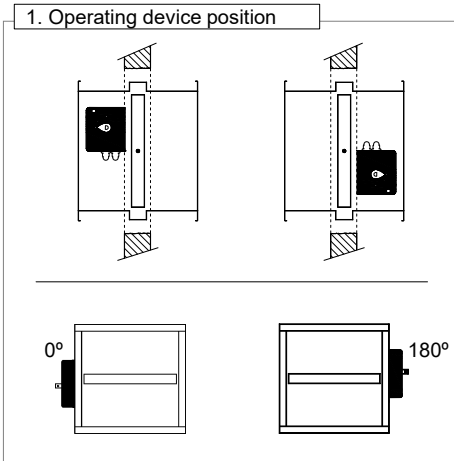


- The minimum distance between fire dampers and construction elements will be 75mm.
- The minimum distance between fire dampers will be 200mm.

INSTALLATION

- RIGID WALL

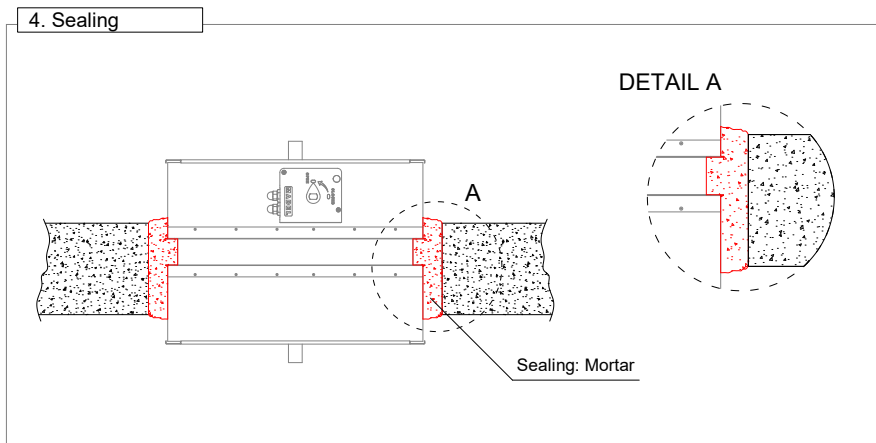
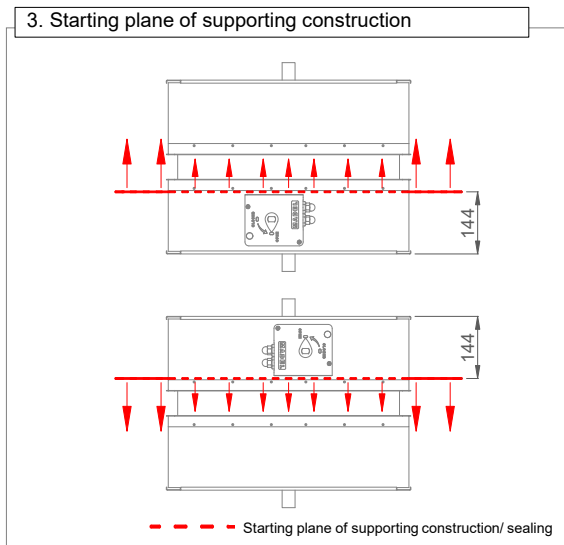
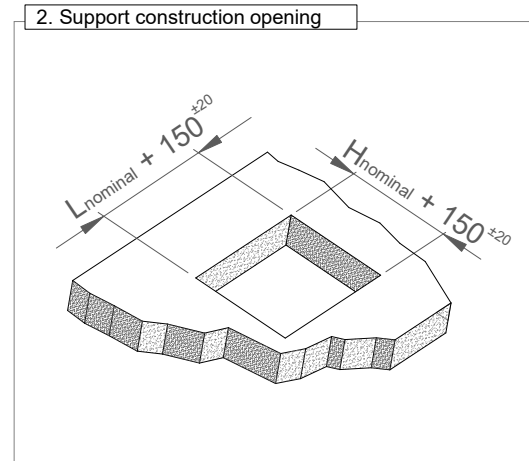
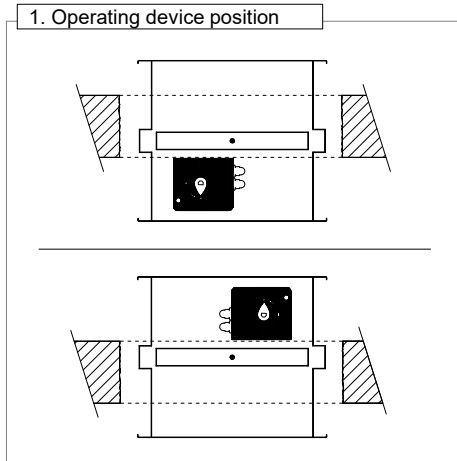
Dimensions	Supporting construction		Sealing	Classification
100 x 100 to 1000 x 600	Rigid wall	Brick wall $\geq 105\text{mm}$	Mortar	EI120 (v_e i \leftrightarrow o) S (500Pa)
	Rigid wall	Reinforced concrete $\geq 105\text{mm}$	Mortar	EI120 (v_e i \leftrightarrow o) S (500Pa)



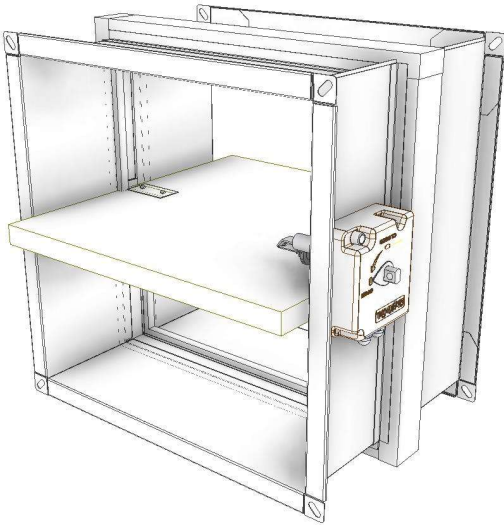
INSTALLATION

- RIGID FLOOR

Dimensions	Supporting construction		Sealing	Classification
100 x 100 to 1000 x 600	Rigid floor	Reinforced concrete $\geq 150\text{mm}$	Mortar	EI120 ($h_o \leftrightarrow o$) S (500Pa)



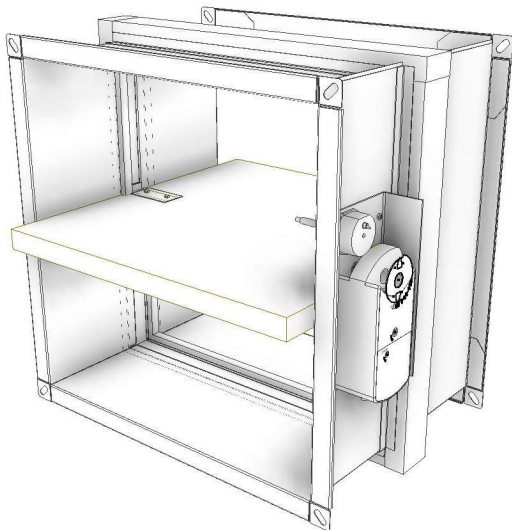
SPECIFICATION TEXT



FBK-E1 (example)

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-E1-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**.



FBK-E1-BP (example)

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-E1-BP-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-E1-.... - /CR - H - MA - /PIF/ dim. L x H

1
 2
 3
 4
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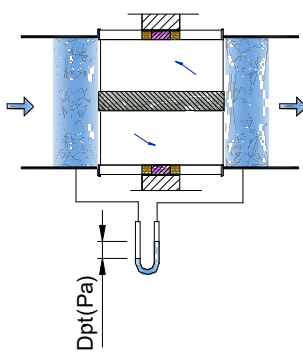
- | | |
|---|---|
| <p>1. Product</p> <ul style="list-style-type: none"> - FBK-E1 With hollow perimeter frame - FBK-E1-BP With solid perimeter frame (60mm) <p>2. Operating device</p> <ul style="list-style-type: none"> - (90° angled frame) <i>(by default)</i> - /CR/ (50mm straight flange) <p>3. Orientation</p> <ul style="list-style-type: none"> - H (Blade axe parallel to the smaller size) <i>(by default)</i> - V (Blade axe parallel to the higher size) | <p>4. Operating device</p> <ul style="list-style-type: none"> - MA (Manual) - MFS (Siemens actuator) - MFB (Belimo actuator) <p>5. Accessories</p> <ul style="list-style-type: none"> - /PIF/ (Open-closed switches device) <p>6. Dimensions (mm)</p> <ul style="list-style-type: none"> - L (Length of the base) - H (Height of the operating device side) |
|---|---|

TECHNICAL DATA

FREE AREA FOR THE AIR PASS (m²)

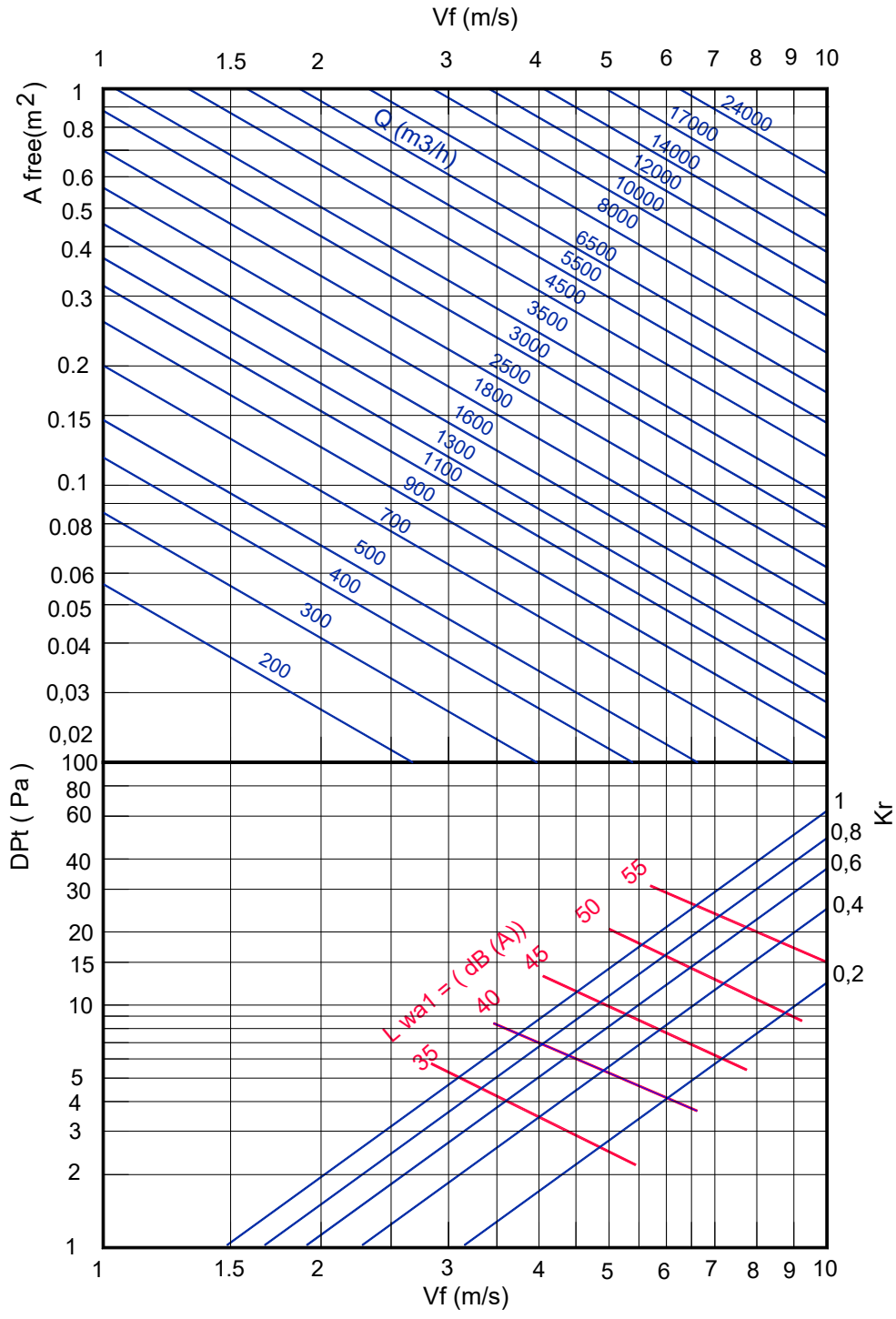
H \ L		100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
		100	Afree	0,004	0,007	0,009	0,012	0,014	0,017	0,019	0,022	0,024	0,027	0,029	0,032	0,034	0,037	0,039	0,042	0,044
Kr	1,07		1,073	1,075	1,003	0,93	0,925	0,92	0,908	0,895	0,885	0,875	0,87	0,865	0,86	0,855	0,85	0,845	0,838	0,83
Kf	-24		-22,9	-21,8	-19,6	-17,5	-16,5	-15,5	-14,8	-14	-12,9	-11,8	-11	-10,3	-9,88	-9,5	-9,13	-8,75	-8,38	-8
150	Afree	0,008	0,013	0,018	0,023	0,028	0,033	0,038	0,043	0,048	0,053	0,058	0,063	0,068	0,073	0,078	0,083	0,088	0,093	0,098
	Kr	1,07	1,073	1,075	1,003	0,93	0,925	0,92	0,908	0,895	0,885	0,875	0,87	0,865	0,86	0,855	0,85	0,845	0,838	0,83
	Kf	-24	-22,9	-21,8	-19,6	-17,5	-16,5	-15,5	-14,8	-14	-12,9	-11,8	-11	-10,3	-9,88	-9,5	-9,13	-8,75	-8,38	-8
200	Afree	0,012	0,02	0,027	0,035	0,042	0,05	0,057	0,065	0,072	0,08	0,087	0,095	0,102	0,11	0,117	0,125	0,132	0,14	0,147
	Kr	1,07	1,073	1,075	1,003	0,93	0,925	0,92	0,908	0,895	0,885	0,875	0,87	0,865	0,86	0,855	0,85	0,845	0,838	0,83
	Kf	-24	-22,9	-21,8	-19,6	-17,5	-16,5	-15,5	-14,8	-14	-12,9	-11,8	-11	-10,3	-9,88	-9,5	-9,13	-8,75	-8,38	-8
250	Afree	0,016	0,026	0,036	0,046	0,056	0,066	0,076	0,086	0,096	0,106	0,116	0,126	0,136	0,146	0,156	0,166	0,176	0,186	0,196
	Kr	0,938	0,935	0,933	0,884	0,835	0,819	0,803	0,786	0,77	0,76	0,75	0,745	0,74	0,734	0,728	0,723	0,718	0,711	0,705
	Kf	-21	-20,3	-19,5	-17,4	-15,3	-14,1	-13	-12,2	-11,4	-10,4	-9,5	-8,81	-8,13	-7,69	-7,25	-6,75	-6,25	-5,88	-5,5
300	Afree	0,02	0,033	0,045	0,058	0,07	0,083	0,095	0,108	0,12	0,133	0,145	0,158	0,17	0,183	0,195	0,208	0,22	0,233	0,245
	Kr	0,805	0,798	0,79	0,765	0,74	0,713	0,685	0,665	0,645	0,635	0,625	0,62	0,615	0,608	0,6	0,595	0,59	0,585	0,58
	Kf	-18	-17,6	-17,3	-15,1	-13	-11,8	-10,5	-9,63	-8,75	-8	-7,25	-6,63	-6	-5,5	-5	-4,38	-3,75	-3,38	-3
350	Afree	0,024	0,039	0,054	0,069	0,084	0,099	0,114	0,129	0,144	0,159	0,174	0,189	0,204	0,219	0,234	0,249	0,264	0,279	0,294
	Kr	0,77	0,761	0,753	0,725	0,698	0,669	0,64	0,619	0,598	0,588	0,578	0,574	0,57	0,558	0,545	0,54	0,535	0,53	0,525
	Kf	-18	-16,9	-15,9	-13,8	-11,8	-10,8	-9,75	-8,63	-7,5	-6,56	-5,63	-5,13	-4,63	-4,13	-3,63	-3	-2,38	-2,06	-1,75
400	Afree	0,028	0,046	0,063	0,081	0,098	0,116	0,133	0,151	0,168	0,186	0,203	0,221	0,238	0,256	0,273	0,291	0,308	0,326	0,343
	Kr	0,735	0,725	0,715	0,685	0,655	0,625	0,595	0,573	0,55	0,54	0,53	0,528	0,525	0,508	0,49	0,485	0,48	0,475	0,47
	Kf	-18	-16,3	-14,5	-12,5	-10,5	-9,75	-9	-7,63	-6,25	-5,13	-4	-3,63	-3,25	-2,75	-2,25	-1,63	-1	-0,75	-0,5
450	Afree	0,032	0,052	0,072	0,092	0,112	0,132	0,152	0,172	0,192	0,212	0,232	0,252	0,272	0,292	0,312	0,332	0,352	0,372	0,392
	Kr	0,705	0,699	0,693	0,656	0,62	0,589	0,558	0,538	0,518	0,504	0,49	0,486	0,483	0,468	0,453	0,449	0,445	0,44	0,435
	Kf	-17	-15,1	-13,1	-11,3	-9,5	-8,5	-7,5	-6,19	-4,88	-3,94	-3	-2,5	-2	-1,63	-1,25	-0,69	-0,13	0,438	1
500	Afree	0,036	0,059	0,081	0,104	0,126	0,149	0,171	0,194	0,216	0,239	0,261	0,284	0,306	0,329	0,351	0,374	0,396	0,419	0,441
	Kr	0,675	0,673	0,67	0,628	0,585	0,553	0,52	0,503	0,485	0,468	0,45	0,445	0,44	0,428	0,415	0,413	0,41	0,405	0,4
	Kf	-16	-13,9	-11,8	-10,1	-8,5	-7,25	-6	-4,75	-3,5	-2,75	-2	-1,38	-0,75	-0,5	-0,25	0,25	0,75	1,625	2,5
550	Afree	0,04	0,065	0,09	0,115	0,14	0,165	0,19	0,215	0,24	0,265	0,29	0,315	0,34	0,365	0,39	0,415	0,44	0,465	0,49
	Kr	0,665	0,658	0,65	0,605	0,56	0,528	0,495	0,475	0,455	0,44	0,425	0,416	0,408	0,399	0,39	0,388	0,385	0,379	0,373
	Kf	-15,4	-13,2	-11	-9,25	-7,5	-6,13	-4,75	-3,81	-2,88	-2	-1,13	-0,5	0,125	0,5	0,875	1,375	1,875	2,563	3,25
600	Afree	0,044	0,072	0,099	0,127	0,154	0,182	0,209	0,237	0,264	0,292	0,319	0,347	0,374	0,402	0,429	0,457	0,484	0,512	0,539
	Kr	0,655	0,643	0,63	0,583	0,535	0,503	0,47	0,448	0,425	0,413	0,4	0,388	0,375	0,37	0,365	0,363	0,36	0,353	0,345
	Kf	-14,8	-12,5	-10,3	-8,38	-6,5	-5	-3,5	-2,88	-2,25	-1,25	-0,25	0,375	1	1,5	2	2,5	3	3,5	4

$$Lwa = Lw1 + Kf$$



TECHNICAL DATA

FREE VELOCITY, PRESSURE DROP AND SOUND POWER LEVEL





Notified Body No. 0370

CERTIFICATE

No.

0370-CPR-4715

CERTIFICATE OF CONSTANCY OF PERFORMANCE

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product:

VENTILATION FOR BUILDINGS. FIRE DAMPERS

PRODUCT RANGE: **FBK-E1 / FBK-E1-BP**

Place on the market under the name of:

MADEL AIR TECHNICAL DIFFUSION, S.A.

C/ PONT DE LES BRUIXES, P-5 – P.I. LA GAVARRA
08540 CENTELLES (BARCELONA) SPAIN

And produced in the manufacturing plant:

C/ PONT DE LES BRUIXES, P-5 - P.I. LA GAVARRA & C/ PURGATORI, 16 – P.I. LA GAVARRA
08540 CENTELLES (BARCELONA) SPAIN

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 15650:2010

under system 1 are applied and that **the product fulfils all the prescribed requirements set out above.**

This certificate was first issued on 5th February 2021 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard, used to assess the performance of the declared characteristics, do not change, and the product, and the manufacturing conditions in the plant are not modified significantly.

The monitoring assessment will be done before 31st July 2021

Bellaterra, 5th February 2021


LGAI Technological Center, S.A.

Xavier Ruiz Peña
Managing Director, Product Conformity B.U.

This document is not valid without its technical annex; whose number coincides with that of the certificate.

You can check the validity of this certificate on our website: www.appluslaboratories.com/certified_products



0370-CPR-4715

CERTIFIED PERFORMANCES

Essential characteristics	Clauses in this European Standard	Mandated level(s) or class(es)
Nominal activation conditions/sensitivity: - sensing element load bearing capacity - sensing element response temperature Response delay (response time): - closure time	4.2.1.2	PASS
	4.2.1.2.2 4.2.1.2.3 4.2.2.2	PASS
Operational reliability: - cycling	4.3.1, a)	50 Cycles
Fire resistance:		
- integrity	4.1.1, a)	EI 120 (ho ve i ↔ o) S
- insulation	4.1.1, b)	EI 120 (ho ve i ↔ o) S
- smoke leakage - mechanical stability (under E)	4.1.1, c)	EI 120 (ho ve i ↔ o) S
	4.1.1, a)	EI 120 (ho ve i ↔ o) S
- maintenance of the cross section (under E)	4.1.1, a)	EI 120 (ho ve i ↔ o) S
Durability of response delay: - sensing element response to temperature and load bearing capacity	4.2.1.2.2 & 4.2.1.2.3	PASS
Durability of operational reliability: - open and closing cycle tests	4.3.3.2	NPD

PASS; NPD = No Performance Determined; NA = Not Applicable

0370-CPR-4715

PRODUCT

- Rectangular range dimensions from 100 x 100 mm up to 1000x600 mm.
- The dampers can be installed on:
 - Vertical installation: rigid supporting with at least 105 mm thickness and density of 1450 kg/m³
 - Horizontal installation: concrete slab with at least 150 mm thickness and density of 2305 kg/m³
- Actuators allowed for the damper:
 - Manual acting
 - Evolving manual acting "MAF"
 - Servomotors SIEMENS:
 - GRA326.1E/T10
 - GRA126.1E/T10
 - GNA326.1E/MD
 - GNA126.1E/MD
 - GGA326.1E/MD
 - GGA126.1E/MD
 - Servomotors BELIMO
 - BFN230-T
 - FBN24-T
 - BF230-T
 - BF24-T
 - BFL230-T
 - BFL24-T

The complete technical data of the certified range **FBK-E1 / FBK-E1-BP** are detailed in the technical file and the range report nº 17/13738-1905 M2.