

OPERATION AND MAINTENANCE MANUAL (OMM)

**Fire damper type
mcr FID S**



Version FID S 21.01.05.15

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Technical Manual designations

- ☒ Option available
- ☐ Option unavailable

CAUTION

All previous issues of this Technical Manual expire on the date of issue hereof.
The Technical Manual does not apply to the fire dampers manufactured before its date of issue.

1. INTRODUCTION

The purpose of this operation and maintenance manual is to get the user acquainted with the intended use, design, the principle of operation, correct installation and operation of the product.
The manual also includes additional information about the operating conditions, maintenance and warranty conditions of the product.

2. SUBJECT

This manual concerns the entire group of single-plane fire dampers type mcr FID S/... p/... . Compliance with the Manual guidelines ensures correct functioning of the device in terms of fire protection of rooms as well as safety of the system users.

3. DEVICE INTENDED USE

Application

Single-plane fire dampers type mcr FID S/... p/... (square cross-section) may be used as:

- ☒ shut-off fire dampers – mcr FID S/S p/P
- ☒ shut-off fire dampers for fire ventilation systems – mcr FID S/V p/P
- ☒ shut-off fire dampers for mixed fire ventilation systems – mcr FID S/V-M p/P
- ☒ transfer dampers – mcr FID S/T p/P
- ☐ relief dampers – mcr FID S/T p/P

Single-plane fire dampers type mcr FID S/X p/O (circular) may be used as:

- ☒ shut-off fire dampers – mcr FID S/S p/O
- ☐ shut-off fire dampers for fire ventilation systems – mcr FID S/V p/O
- ☐ shut-off fire dampers for mixed fire ventilation systems – mcr FID S/V-M p/O
- ☐ transfer dampers – mcr FID S/T p/O
- ☐ relief dampers – mcr FID S/T p/O

Caution:

Shut-off fire dampers for fire ventilation systems the mcr FID S/V p/P and fire dampers for mixed fire ventilation systems the mcr FID S/V-M p/P, have one declaration of performance in accordance with the requirements of law.
The marker -M and the word "mixed" used in the document are trademarks used by the manufacturer.
The construction and execution of the above dampers is the same regardless of the commercial mark.

The dampers cannot be operated in systems exposed to dust, except for when they are included in a special, individually developed programme of service and technical inspections.

Fire resistance

The damper type mcr FID S/... p/P has the following fire resistance:

<input type="checkbox"/> EI60S	<input type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G	<input checked="" type="checkbox"/> EI120S	<input checked="" type="checkbox"/> /S	<input checked="" type="checkbox"/> /V	<input checked="" type="checkbox"/> /V-M	<input checked="" type="checkbox"/> /T	<input type="checkbox"/> /G
<input type="checkbox"/> EI60	<input type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G	<input checked="" type="checkbox"/> EI120	<input checked="" type="checkbox"/> /S	<input checked="" type="checkbox"/> /V	<input checked="" type="checkbox"/> /V-M	<input checked="" type="checkbox"/> /T	<input type="checkbox"/> /G
<input type="checkbox"/> E60S	<input type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G	<input checked="" type="checkbox"/> E120S	<input checked="" type="checkbox"/> /S	<input checked="" type="checkbox"/> /V	<input checked="" type="checkbox"/> /V-M	<input checked="" type="checkbox"/> /T	<input type="checkbox"/> /G
<input type="checkbox"/> E60	<input type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G	<input checked="" type="checkbox"/> E120	<input checked="" type="checkbox"/> /S	<input checked="" type="checkbox"/> /V	<input checked="" type="checkbox"/> /V-M	<input checked="" type="checkbox"/> /T	<input type="checkbox"/> /G

The damper type mcr FID S/... p/O has the following fire resistance:

<input type="checkbox"/> EI60S	<input type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G	<input checked="" type="checkbox"/> EI120S	<input checked="" type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G
<input type="checkbox"/> EI60	<input type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G	<input checked="" type="checkbox"/> EI120	<input checked="" type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G
<input type="checkbox"/> E60S	<input type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G	<input checked="" type="checkbox"/> E120S	<input checked="" type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G
<input type="checkbox"/> E60	<input type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G	<input checked="" type="checkbox"/> E120	<input checked="" type="checkbox"/> /S	<input type="checkbox"/> /V	<input type="checkbox"/> /V-M	<input type="checkbox"/> /T	<input type="checkbox"/> /G

depending on application, method and place of installation of the damper.

mcr FID S/... p/... single-plane fire dampers

Form versions

The available mcr FID S/... p/... fire damper form versions include:

- Rectangular dampers – FID S/... p/P
- Rectangular dampers – FID S/... p/P with round connections (diameter range $630 < D < 1000$)
- Round dampers – FID S/... p/O

Dimension type series

mcr FID S/... p/P fire dampers are manufactured in the following size ranges:

- Width: 200 to 1500 mm
- Height: 200 to 1500 mm
- Width: 296 to 390 mm

Aside from the standard dimensions, the fire dampers may also be manufactured in intermediate sizes. The damper casing can be made longer on request. Maximum surface area of type mcr FID S/[S,T,G] p/P dampers: 1.8 m^2 . Maximum surface area of type mcr FID S/V p/P dampers: 1.5 m^2 . Maximum surface area of type mcr FID S/V-M p/P dampers: 1.25 m^2 . The minimum damper surface area is 0.04 m^2 .

The mcr FID S/... p/O fire dampers are manufactured in the following size ranges:

- Diameter: 125 to 630 mm
- Width: 296 to 390 mm

Aside from the standard dimensions, the fire dampers may also be manufactured in intermediate sizes. The damper casing can be made longer on request. Maximum surface area of type mcr FID S/... p/O dampers: 0.31 m^2 . The minimum damper surface area is 0.01 m^2 .

The single dampers in multiple fire damper sets mcr FID S/V p/P and mcr FID S/V-M p/P are produced in the following size ranges:

- Width: 200 to 710mm
- Height: 200 to 1500mm

Aside from the standard dimensions, the fire dampers may also be manufactured in intermediate sizes. Dampers in batteries (sets) may only be installed with a vertical axis of rotation. The damper casing can be made longer on request. The multiple fire dampers sets consists of a minimum of two dampers and a maximum of three dampers assembled together connected by the side B. Fire dampers can be only mounted with a vertical axis of rotation. Release and control mechanisms can be located at the top or bottom of the damper.

4. DESIGN AND OPERATING PRINCIPLE

Design

The mcr FID S/... p/... single-plane fire dampers comprise a casing with a rectangular or circular cross-section (depending on the form version), a moving isolation partition, made of two segments separated by a fire-proof panel, and a trigger control gear which is tripped remotely or automatically by tripping a thermal trigger. The damper casing is made of steel sheet, galvanized steel sheet or stainless steel sheet. The isolation partition is made of a fire-proof panel set in a reinforcement profile made of metal sheet. The inner side of the fire damper casing features a intumescent gasket. There are stop shapes fastened to the inner casing surface and made of steel, galvanized steel or stainless steel sheet, which limit the rotating motion of the isolation partition. The stop shapes are lined with a ventilation-grade seal. The rectangular form version has both ends of the fire damper body with flanged connections, whereas the circular form version features nipple connections ($\varnothing D-2$). The circular form version can also be manufactured with flanged ends.

Function

The operating principle and behaviour of the mcr FID S/... p/... single-plane dampers depend on their application versions:

■ shut-off fire dampers – mcr FID S/S p/P

In the normal operating position the dampers are open. The dampers are closed (to the safety position) as follows:

- automatically, by tripping the thermoelectric trigger
- manually, by pressing the control button on the thermoelectric trigger
- remotely, by tripping an electric axial actuator with a return spring caused by isolation from the supply voltage
- automatically, by tripping the thermal trigger and the driving spring

■ shut-off fire dampers for fire ventilation systems – mcr FID S/V p/P

In the normal operating position the dampers are closed. The dampers are opened (to the safety position) as follows:

mcr FID S/... p/... single-plane fire dampers

- ☒ remotely, by tripping an electric axial actuator without a return spring, as a result of applying the supply voltage to the actuator in the right manner
- ☒ remotely, by tripping the electromagnetic release and a spring as a result of applying the voltage
- ☒ **shut-off fire dampers for mixed fire ventilation systems – mcr FID S/V-M p/P**

In normal operation the dampers are closed or open, depending on the function carried out. The dampers are opened/closed (to the safety position) as follows:

 - ☒ remotely, by tripping the electrical axial actuator without a return spring in order to apply supply voltage to the actuator in the right manner
 - ☒ remotely, by tripping the electromagnetic release and a spring as a result of applying the voltage
- ☒ **transfer fire dampers – mcr FID S/T p/P**

In the normal operating position the dampers are open or closed. The dampers are switched to the safety position as follows:

 - ☒ automatically, by tripping the thermoelectric trigger
 - ☒ manually, by pressing the control button on the thermoelectric trigger
 - ☒ remotely, by tripping an electric axial actuator with a return spring caused by isolation from the supply voltage
 - ☒ automatically, by tripping the thermal trigger and the driving spring
- ☐ **relief fire dampers – mcr FID S/G p/P**

In normal operation the dampers are closed or open, depending on the function carried out. The dampers are opened/closed (to the safety position) as follows:

 - ☐ remotely, by tripping an electric axial actuator with a return spring caused by isolation from the supply voltage. The actuator has no thermoelectric trigger.

The operating principle and behaviour of the mcr FID S/... p/... single-plane dampers depend on their application versions:

- ☒ **shut-off fire dampers – mcr FID S/S p/O**

In the normal operating position the dampers are open. The dampers are closed (to the safety position) as follows:

 - ☒ automatically, by tripping the thermoelectric trigger
 - ☒ manually, by pressing the control button on the thermoelectric trigger
 - ☒ remotely, by tripping an electric axial actuator with a return spring caused by isolation from the supply voltage
 - ☒ automatically, by tripping the thermal trigger and the driving spring
- ☐ **shut-off fire dampers for fire ventilation systems – mcr FID S/V p/O**

In the normal operating position the dampers are closed. The dampers are opened (to the safety position) as follows:

 - ☐ remotely, by tripping an electric axial actuator without a return spring, as a result of applying the supply voltage to the actuator in the right manner
 - ☐ remotely, by tripping the electromagnetic release and a spring as a result of applying the voltage
- ☐ **shut-off fire dampers for mixed fire ventilation systems – mcr FID S/M p/O**

In normal operation the dampers are closed or open, depending on the function carried out. The dampers are opened/closed (to the safety position) as follows:

 - ☐ remotely, by tripping the electrical axial actuator without a return spring in order to apply supply voltage to the actuator in the right manner
 - ☐ remotely, by tripping the electromagnetic release and a spring as a result of applying the voltage
- ☐ **transfer fire dampers – mcr FID S/T p/O**

In the normal operating position the dampers are open or closed. The dampers are switched to the safety position as follows:

 - ☐ automatically, by tripping the thermoelectric trigger
 - ☐ manually, by pressing the control button on the thermoelectric trigger
 - ☐ remotely, by tripping an electric axial actuator with a return spring caused by isolation from the supply voltage
 - ☐ automatically, by tripping the thermal trigger and the driving spring
- ☐ **relief fire dampers – mcr FID S/G p/O**

In normal operation the dampers are closed or open, depending on the function carried out. The dampers are opened/closed (to the safety position) as follows:

 - ☐ remotely, by tripping an electric axial actuator with a return spring caused by isolation from the supply voltage. The actuator has no thermoelectric trigger.

It is possible to manually service check the proper performance of the dampers with electrical actuators by placing a special hex wrench in the socket marked on the actuator and rotating it to set the damper isolating partition in the relevant position. Rotate the wrench slowly, smoothly and carefully. Rotating the wrench too fast or too rapidly may damage the internal actuator gear or the drive transmission system.

mcr FID S/... p/... single-plane fire dampers

It is possible to manually service check the proper performance of the integrated damper with the trigger control gear by pressing the lever on the gear.

The mcr T2 tester is recommended to check the proper performance of dampers with electric actuators.

CAUTION

Never pull directly on the damper isolation partition to open or close the device. This may result in damage of the self-locking driving gear of the damper that is not covered by warranty. It is recommended that the fire damper were opened and closed when the ventilation system is turned off.

Trigger control gears

The following trigger control gears are available for the mcr FID S/... p/... fire dampers:

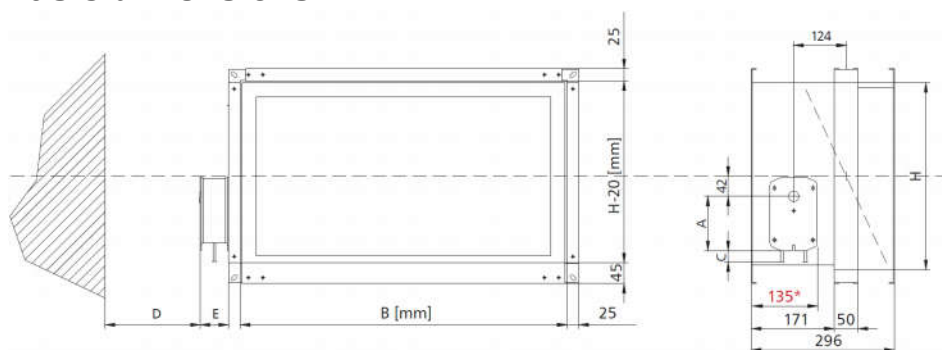
Electric actuator:

BF 230-T	/S	/V	/V-M	/T	/G	BE 230	/S	/V	/V-M	/T	/G
BF 24-T (-ST)	/S	/V	/V-M	/T	/G	BE 24 (-ST)	/S	/V	/V-M	/T	/G
BF 24-T-TL	/S	/V	/V-M	/T	/G	BLE 230	/S	/V	/V-M	/T	/G
BFL 230-T	/S	/V	/V-M	/T	/G	BLE 24 (-ST)	/S	/V	/V-M	/T	/G
BFL 24-T (-ST)	/S	/V	/V-M	/T	/G	EXBF 230	/S	/V	/V-M	/T	/G
BFN 230-T	/S	/V	/V-M	/T	/G	EXBF 24	/S	/V	/V-M	/T	/G
BFN 24-T (-ST)	/S	/V	/V-M	/T	/G	BF 230-TN	/S	/V	/V-M	/T	/G
BF 24-TN (-ST)	/S	/V	/V-M	/T	/G	BF 24-TN-TL	/S	/V	/V-M	/T	/G
BEE 230	/S	/V	/V-M	/T	/G	BEE 24 (-ST)	/S	/V	/V-M	/T	/G
BEN 230	/S	/V	/V-M	/T	/G	BEN 24 (-ST)	/S	/V	/V-M	/T	/G
MF 230-T	/S	/V	/V-M	/T	/G	MF 24-T	/S	/V	/V-M	/T	/G
MLF 230-T	/S	/V	/V-M	/T	/G	MLF 24-T	/S	/V	/V-M	/T	/G

Spring gear:

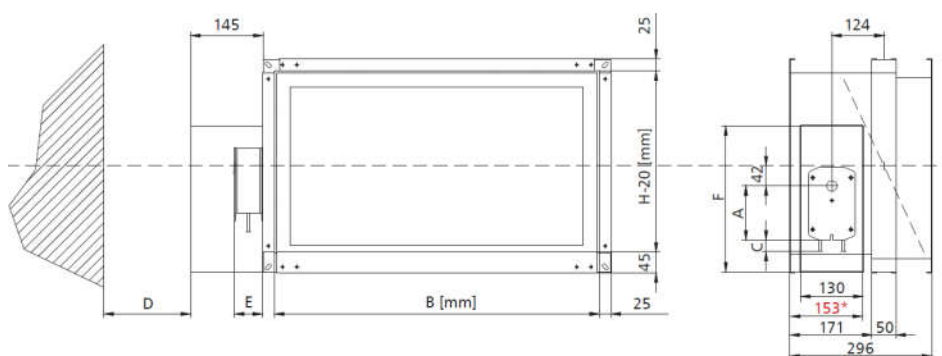
RST	/S	/V	/V-M	/T	/G	RST/KW1/S	/S	/V	/V-M	/T	/G
RST/KW1/24P	/S	/V	/V-M	/T	/G	RST/KW1/24I	/S	/V	/V-M	/T	/G
RST/KW1/230P	/S	/V	/V-M	/T	/G	RST/KW1/230I	/S	/V	/V-M	/T	/G

Basic dimensions



Gear	A	C	D	E
BF	198	10	75	70
BFN	157	30	75	62
BFL	138	30	75	58
BF 24TL-ST	198	10	75	70
EXBF	225	55	75	175
* embedding border				

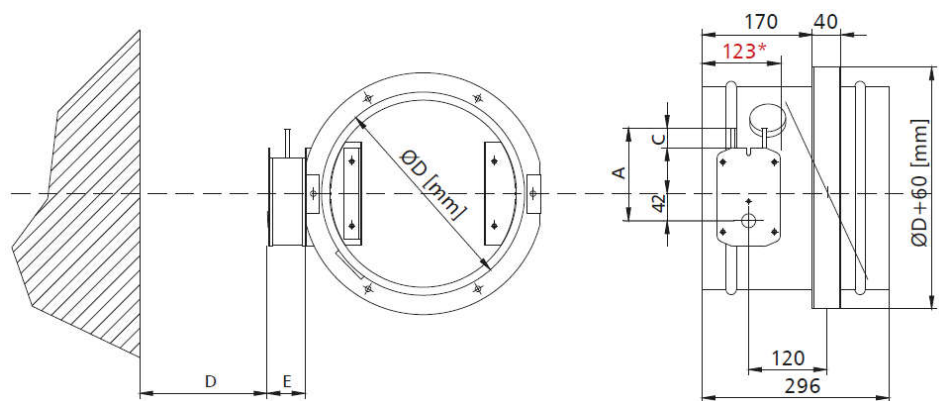
mcr FID S/... p/P fire damper with actuator



Gear	A	C	D	E	F
BE	198	10	75	70	345
BLE	157	30	75	62	305
BEE	149	28	75	52	305
BEN	130	20	75	48	305
* embedding border					

mcr FID S/... p/P fire damper with actuator

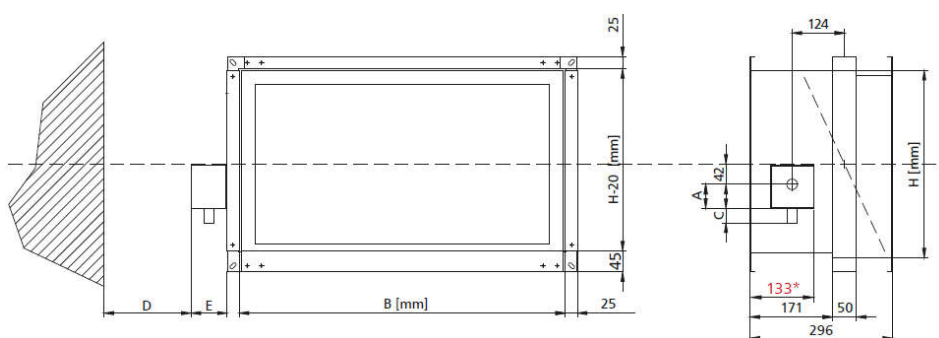
mcr FID S/... p/... single-plane fire dampers



mcr FID S/... p/O fire damper with actuator

Gear	A	C	D	E
BF	198	10	75	50
BFN	157	30	75	42
BFL	138	30	75	38
BF 24TL-ST	198	10	75	50
EXBF	225	55	75	160

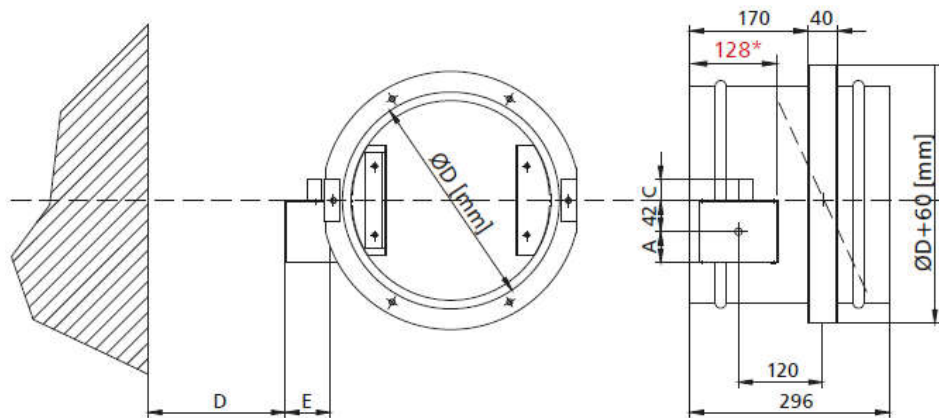
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mcr FID S/... p/P fire damper with RST

Gear	A	C	D	E
RST	50	30	75	75

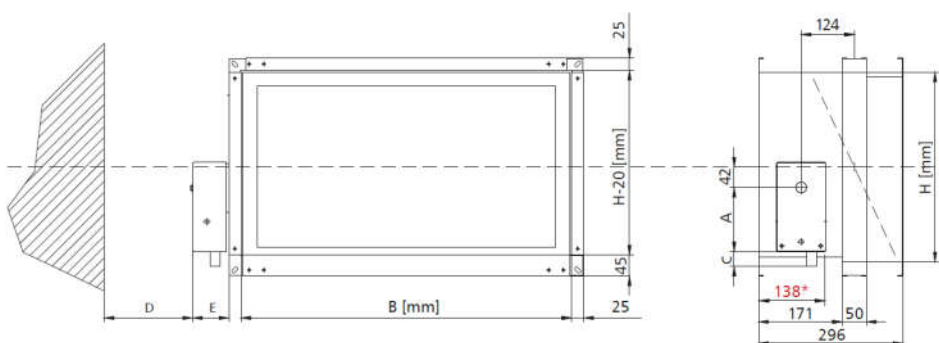
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mcr FID S/... p/O fire damper with RST

Gear	A	C	D	E
RST	40	30	75	55

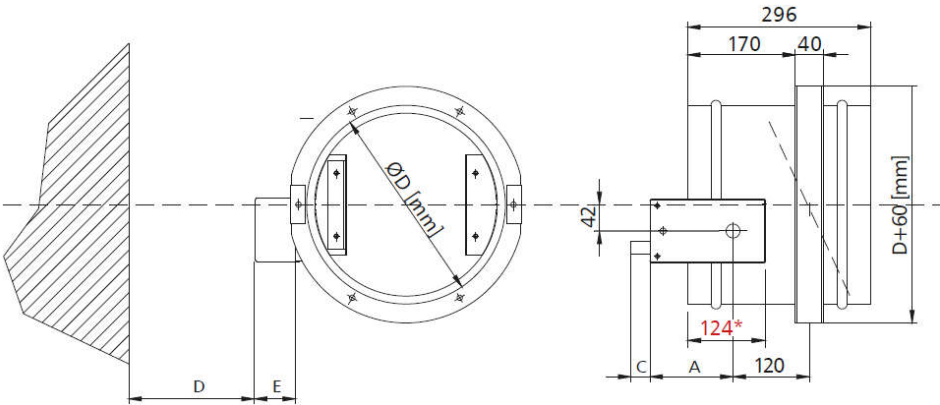
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mcr FID S/... p/P fire damper with RST/KW1

Gear	A	C	D	E
RST/KW1	130	30	75	85

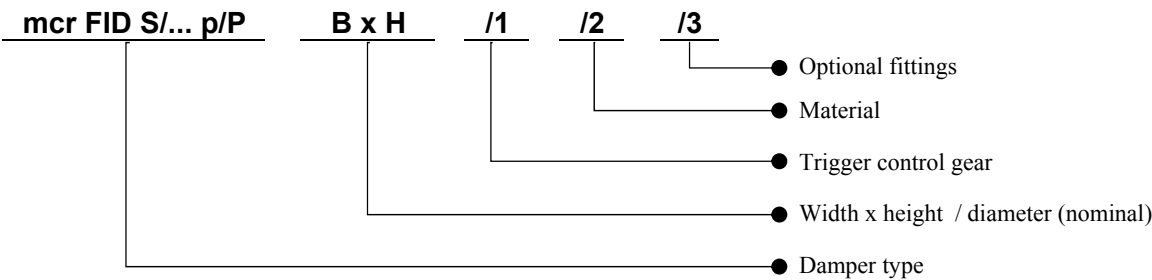
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Gear	A	C	D	E
RST/KW1	130	30	75	65
* embedding border				

mcr FID S/... p/O fire damper with RST/KW1

5. DEVICE IDENTIFICATION



6. DEVICE ASSEMBLY

CAUTION

During the assembly of the damper and installation finish, future access to the device and removal of the trigger control gear must be considered to enable servicing and inspection.

The mcr FID S/... p/P dampers can be installed in the following building partitions (i.e. walls or ceilings):

- masonry and concrete walls min. 110 mm thick
- masonry walls of bricks or blocks min. 110 mm thick
- panel walls min. 125 mm
- floor slabs min. 150 mm thick

Additionally, the dampers can be installed:

- outside of walls*
- in modules (multiple damper sets)**
- in batteries (multiple damper sets)***

*available for the mcr FID S/S p/P and mcr FID S/V p/P damper

** available for the, mcr FID S/S p/P the mcr FID S/V p/P and mcr FID S/V-M p/P damper

***available for the mcr FID S/V p/P and mcr FID S/V-M p/P damper

The mcr FID S/... p/O dampers can be installed in the following building partitions (i.e. walls or ceilings):

- masonry and concrete walls min. 110 mm thick
- masonry walls of bricks or blocks min. 110 mm thick
- panel walls min. 125 mm
- floor slabs min. 150 mm thick

Additionally, the dampers can be installed:

- ☐ outside of walls
- ☐ in modules (multiple damper sets)

The mcr FID S/... p/... fire dampers may also be installed in partitions with a lower class of fire resistance. In this case the damper fire resistance is equal to the partition fire resistance if the smoke tightness is met. When installing the

mcr FID S/... p/... single-plane fire dampers

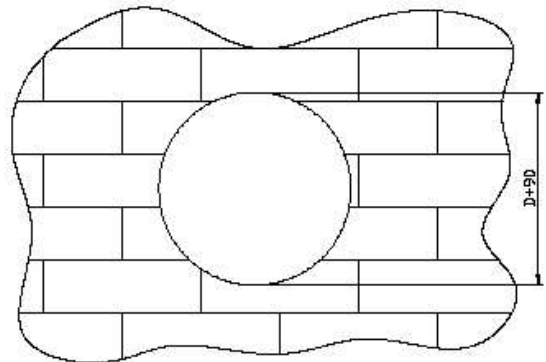
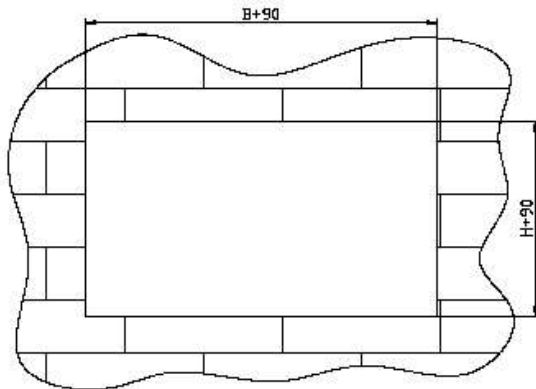
fire damper in a wall the thickness of which is below the required minimum, increase the thickness at the installation location e.g. by adding an extra slab or other suitable construction material around the damper circumference.

6.1. PRE-ASSEMBLY INSPECTION

Each fire damper is factory inspected by the manufacturer prior to packing and shipping. Upon unpacking the delivered fire damper, visually examine it for any damage in transport or casing deformation.

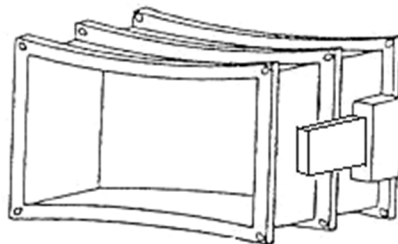
6.2. INSTALLATION OPENING

The minimum dimensions of the installation opening that permits correct installation of the rectangular damper is $(B+90) \times (H+90)$ mm. The minimum dimensions of the installation opening for the circular damper is $(D+90)$ mm.

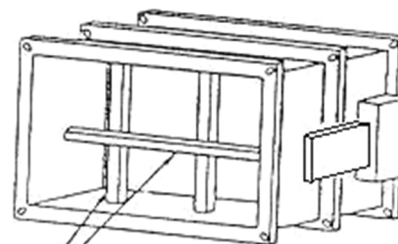


Preparation of the installation opening

6.3. EMBEDDING / FIXING THE DAMPER



WRONG!



Brace with wooden blocks

Protecting the damper against buckling

The mcr FID S/... p/... fire damper will work properly if the isolation partition rotation axis is horizontal. If the fire damper must have the axis in the vertical, state this when ordering. In this case the manufacturer adds optional accessories with keep clearance between the damper body and the partition at the damper bottom. If the fire damper must be installed with the rotation axis vertical when the device has already been delivered on site, follow Section 6.5.

The trigger control gear may be located on the right or on the left hand side of the damper at any direction of air flow.

Before embedding/fixing, place the damper axially aligned within the partition (the wall or ceiling which separates the fire zones) in the finished installation opening. Level the device and secure in place. Next, actuate the damper isolation partition by hand to verify that the rotation is correct (i.e. there is no collision with the damper casing parts, etc.). Close the damper isolation partition. Install the bracing as shown in the figure. Carefully fill the gap between the damper casing and the wall with a proper mortar formula that ensures proper wall and damper fire resistance, and do not let the mortar get into the damper actuation components (i.e. the trigger control gear, the isolation partition, gaskets and stops). To do this, the fire damper must be covered with plastic film or other suitable material and remain so until the embedding and finishing is done. The damper must remain closed until the mortar has cured. Once the mortar has cured, remove the temporary supports and open and close the fire damper to verify its performance. When installing the fire damper in a panel wall, fill the space between the damper casing and the wall with mineral wool certified for A1 fire protection rating; the mineral wool density and thickness must ensure fire resistance no less than the fire resistance of the wall in which the fire damper is installed. The filled space must additionally be sealed with a proper mortar or putty that has the fire resistance required for the wall.

In order to ensure the fire resistance of the fire separation element, it is mandatory to keep the embedding envelope boundary: the damper isolation partition rotation axis must be within the wall envelope.

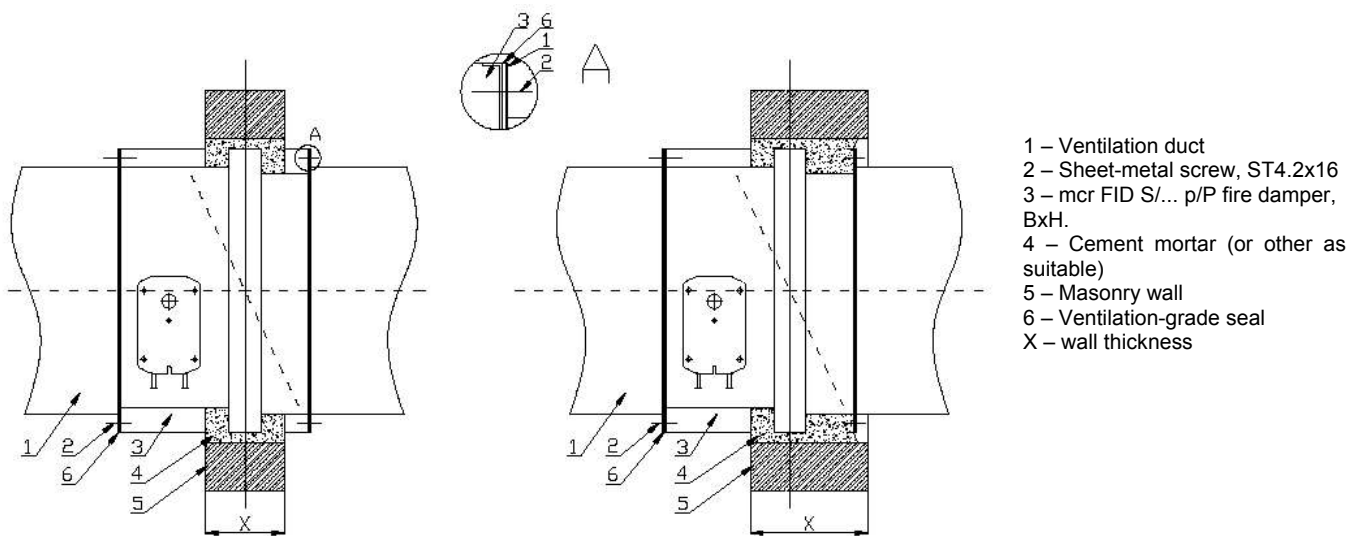
mcr FID S/... p/... single-plane fire dampers

The embedded fire damper must be coaxially connected to the ventilation duct. Protect the fire damper casing from damage, and specifically from straining the casing during the installation process. The fire damper cannot bear the load of the ventilation duct or the ventilation system in which it is installed. Drilling the damper enclosure or driving screws, bolts or other elements that pierce through the casing to the inside of the damper is prohibited. Once connected to the ventilation ducts, re-verify the fire damper performance.

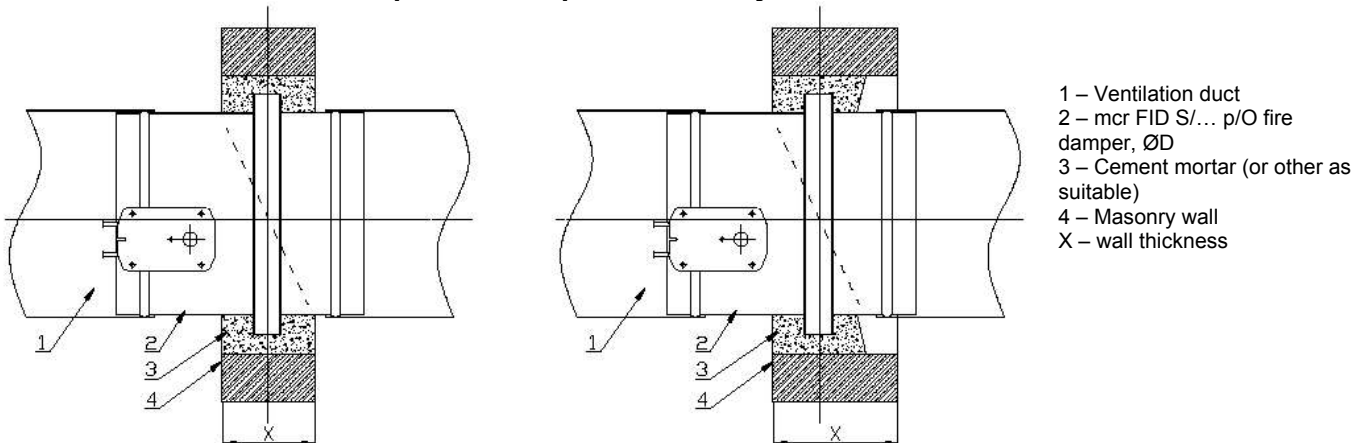
During the installation of the mcr FID S/... p/... fire damper mind specifically that the thermal trigger (a fusible element) must not be damaged or exposed to high temperature (from fire, and welding/soldering equipment), which might trigger it (it is a single use element and not subject to warranty replacement). Do not expose the intumescent gaskets installed in the fire damper casing to high temperature. Swollen gaskets make it impossible to close the damper. With the installation finished, carefully clean the fire damper and make sure that there is no debris which could influence proper performance of the device.

CAUTION

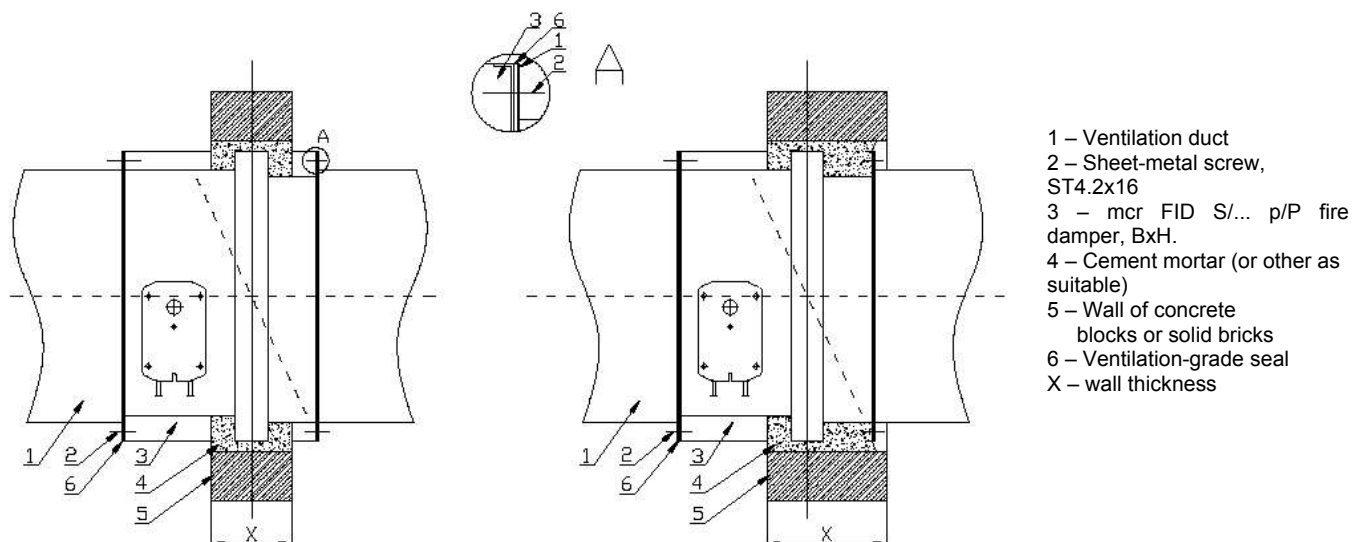
It is crucial to keep the device embedding envelope so that the trigger control gear is outside of the wall envelope and easily accessible.



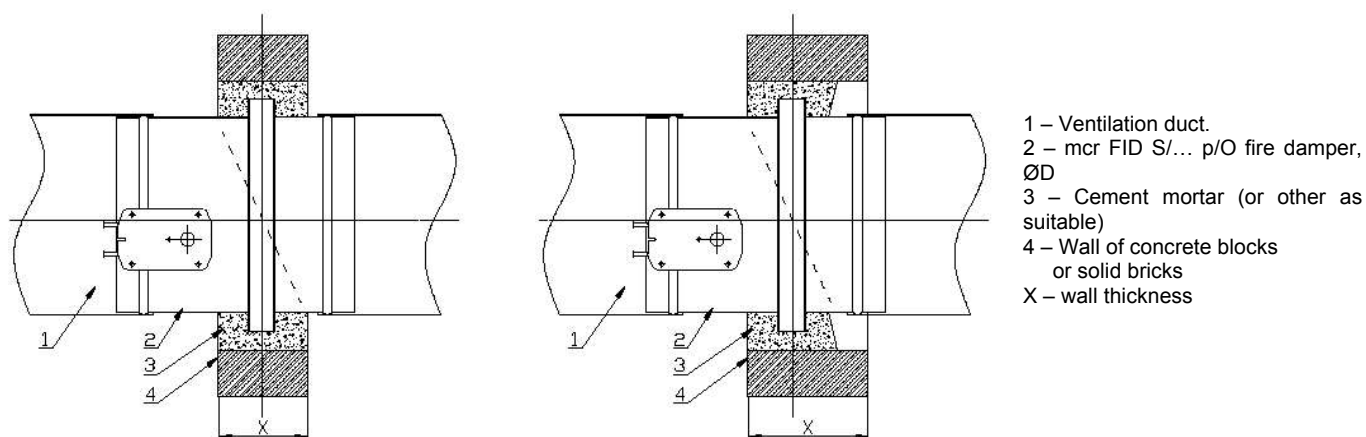
Installation of the mcr FID S/... p/P fire damper in masonry and concrete walls



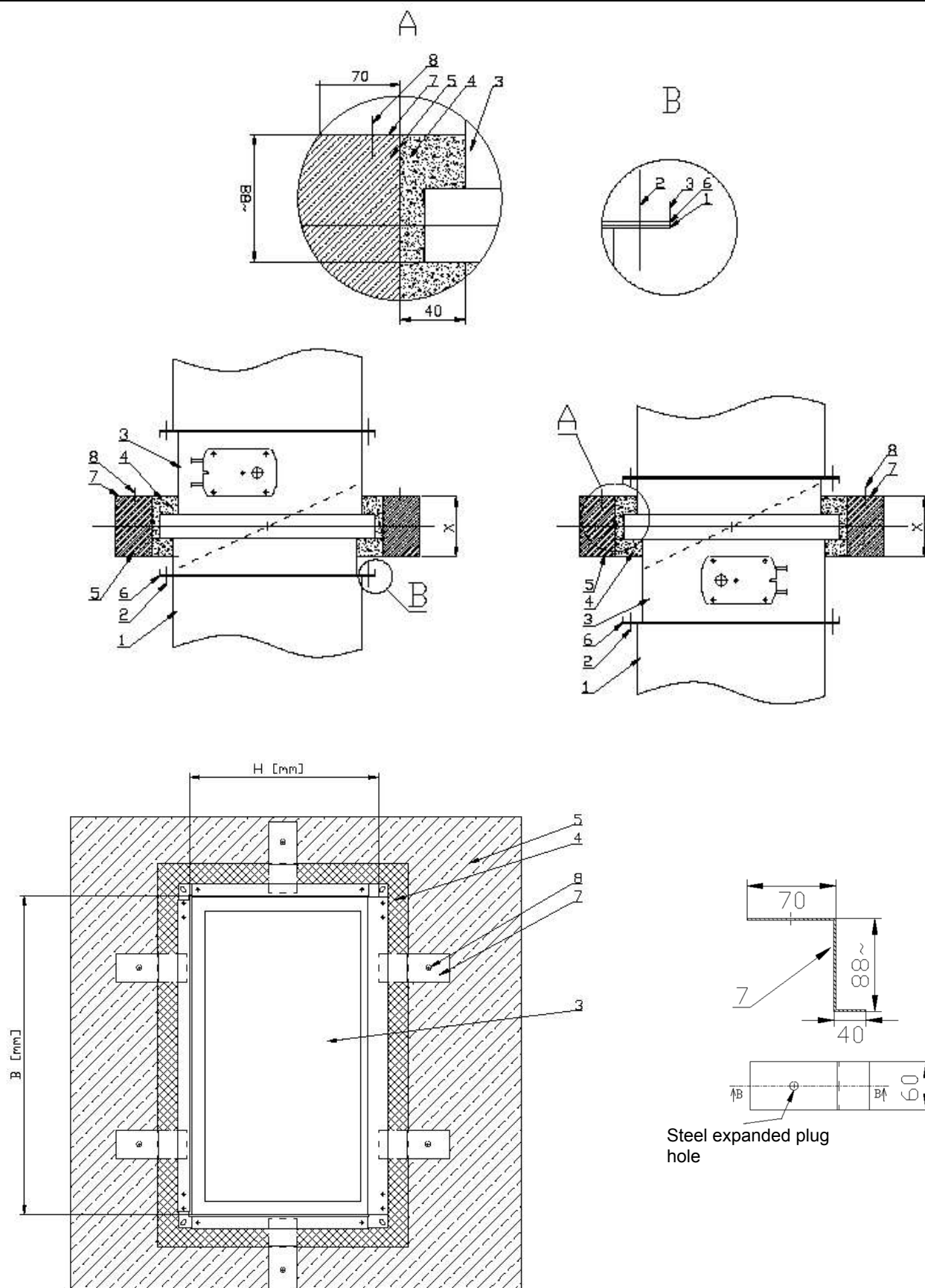
Installation of the mcr FID S/... p/O fire damper in masonry and concrete walls



Installation of the mcr FID S/... p/P fire damper in concrete block or solid brick walls



Installation of the mcr FID S/... p/O fire damper in concrete block or solid brick walls



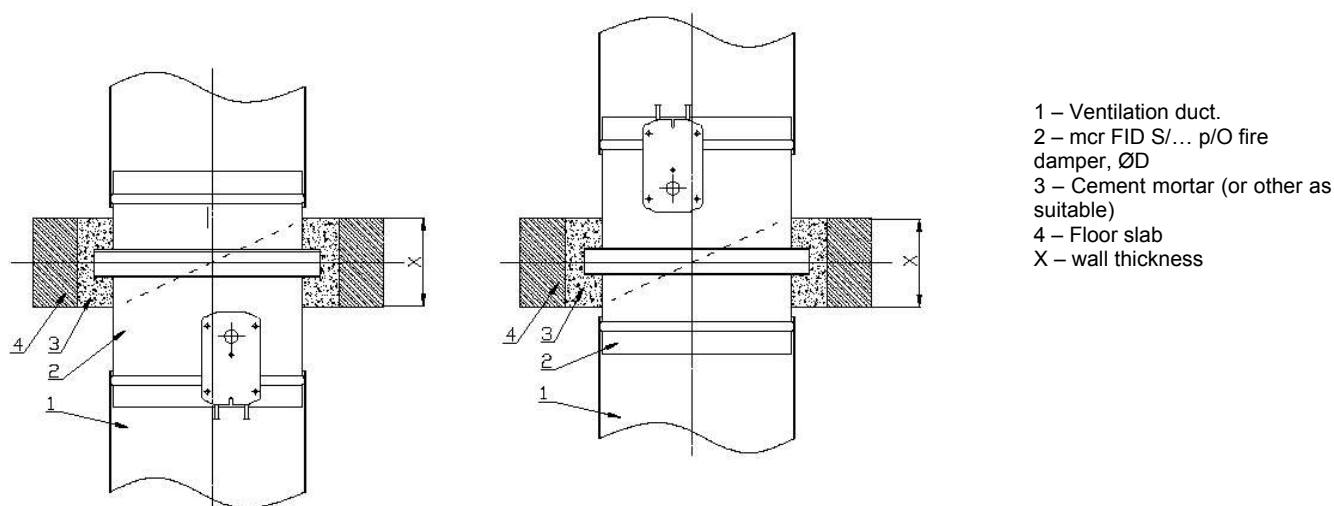
1 – Ventilation duct
2 – Sheet-metal screw, ST4.2x16
3 – mcr FID S/... p/P fire damper, BxH.

4 – Cement mortar (or other as suitable)
5 – Floor slab
6 – High temperature gasket

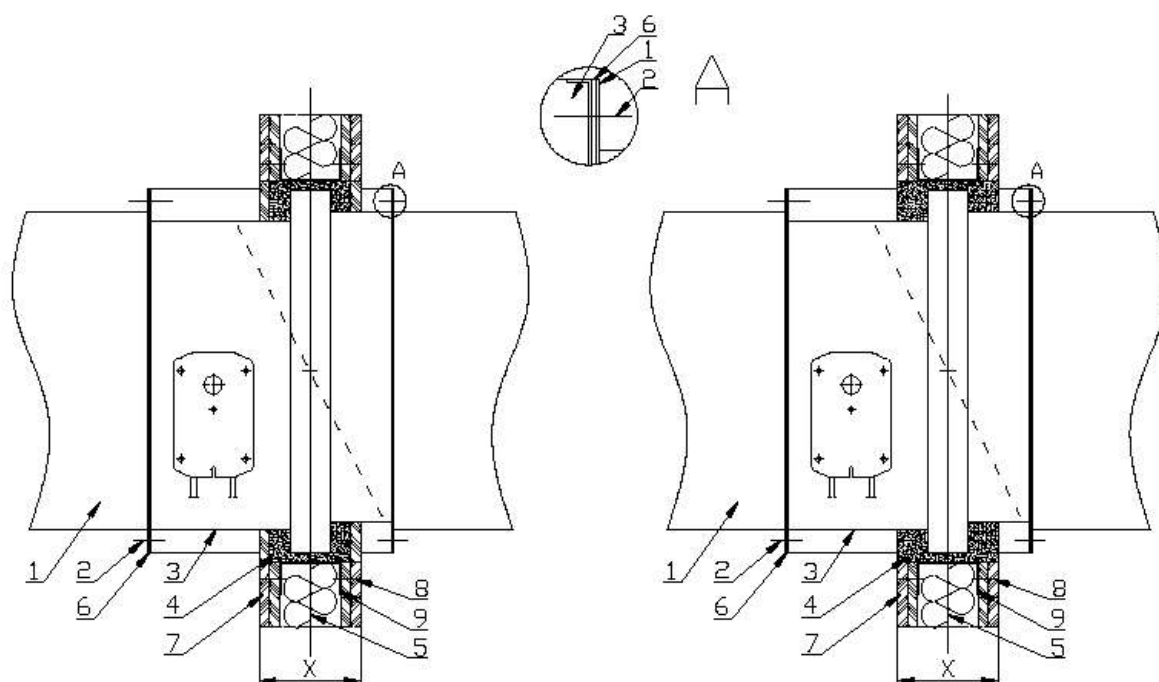
7 – Installation profile
8 – Steel expanded plug
M8 metal screw
X – wall thickness

Installation of the mcr FID S/... p/P fire damper in a floor slab, cont'd

mcr FID S/... p/... single-plane fire dampers

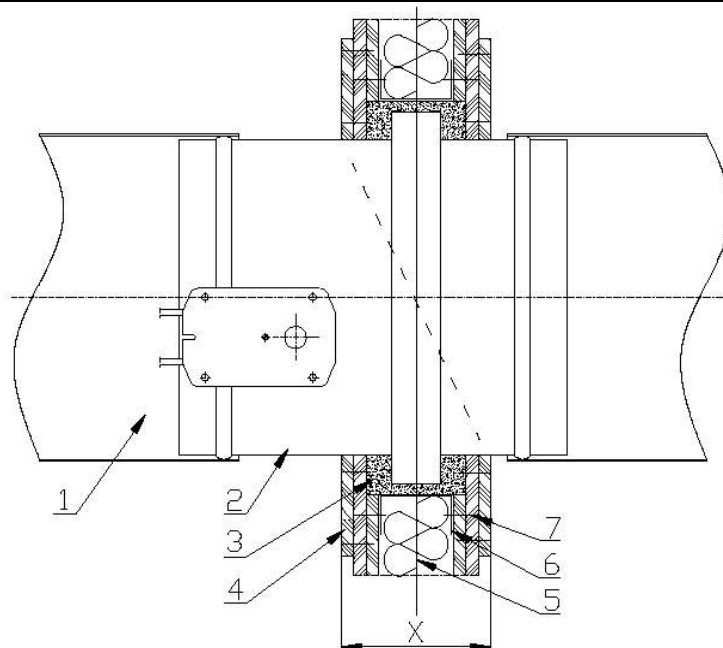


Installation of the mcr FID S/... p/O fire damper in a floor slab



Installation of the mcr FID S/... p/P fire damper in a panel wall

mcr FID S/... p/... single-plane fire dampers

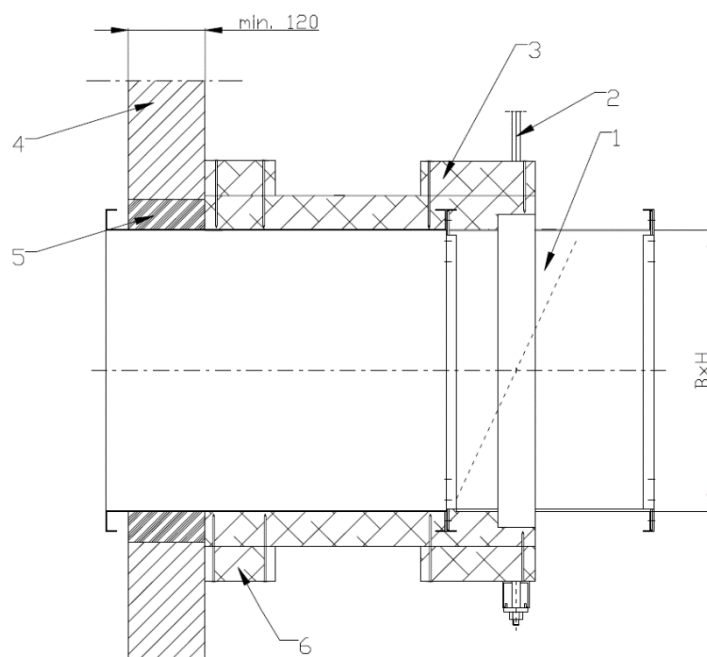


1 – Ventilation duct.
2 – mcr FID S/... p/O fire damper, ØD
3 – E.g. cement mortar.

4 – Panel wall
5 – Mineral wool, min. density = 80 kg/m³.
6 – Structural profile

7 – Screw, ST5.5x35
X – wall thickness

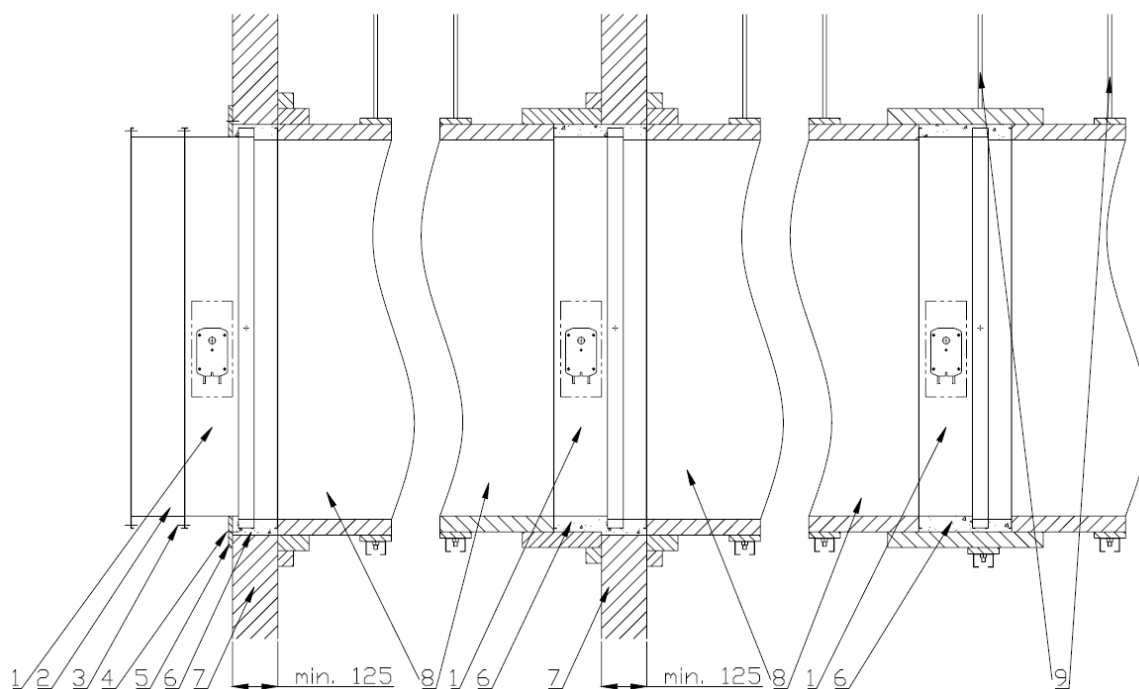
Installation of the mcr FID S/... p/O fire damper in a panel wall



1 – mcr FID S/... p/P fire damper, BxH.
2 – Threaded rod
3 – Fire protective board that provides fire resistance in class EIS 120

4 – solid wall
5 – masonry mortar (or other as suitable)
6 – Fire protective band

Installation of the mcr FID S/... p/P outside of walls

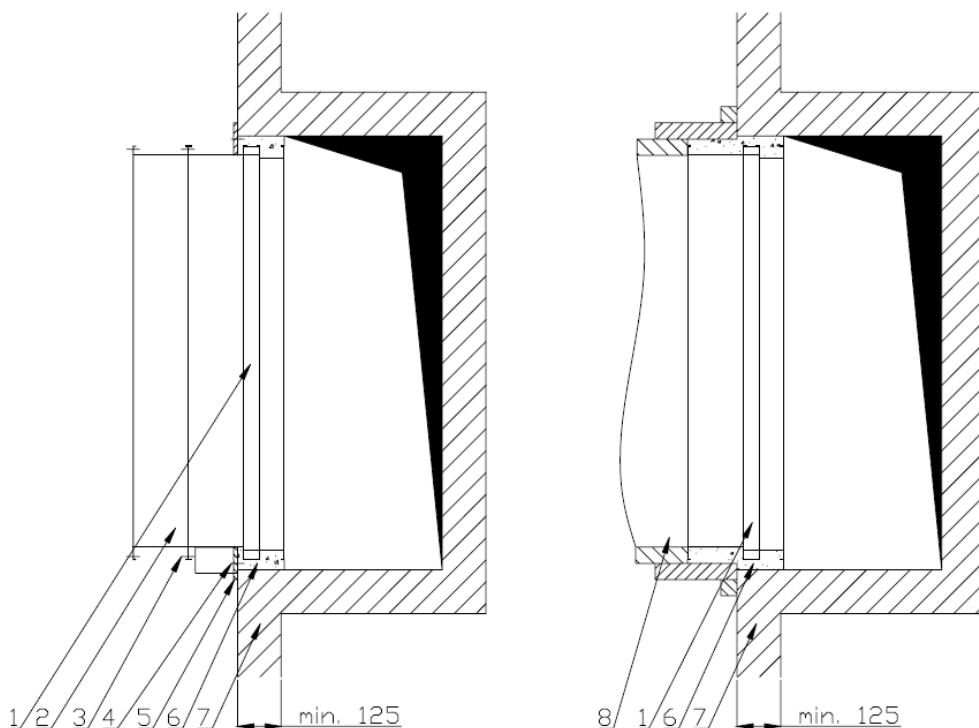


- 1 – mcr FID S/V p/P BxH damper
- 2 – Cover grille with ventilation duct
- 3 – M10 fixing screw

- 4 – M8 dowel
- 5 – Frame from fireproof board 20mm thick
- 6 – Eg gypsum mortar

- 7 – Building partition
- 8 – Smoke extraction duct*
- 9 – Suspension system

Installation of the mcr FID S/V p/P damper in fire ventilation systems (building partitions / horizontal fire ventilation ducts)



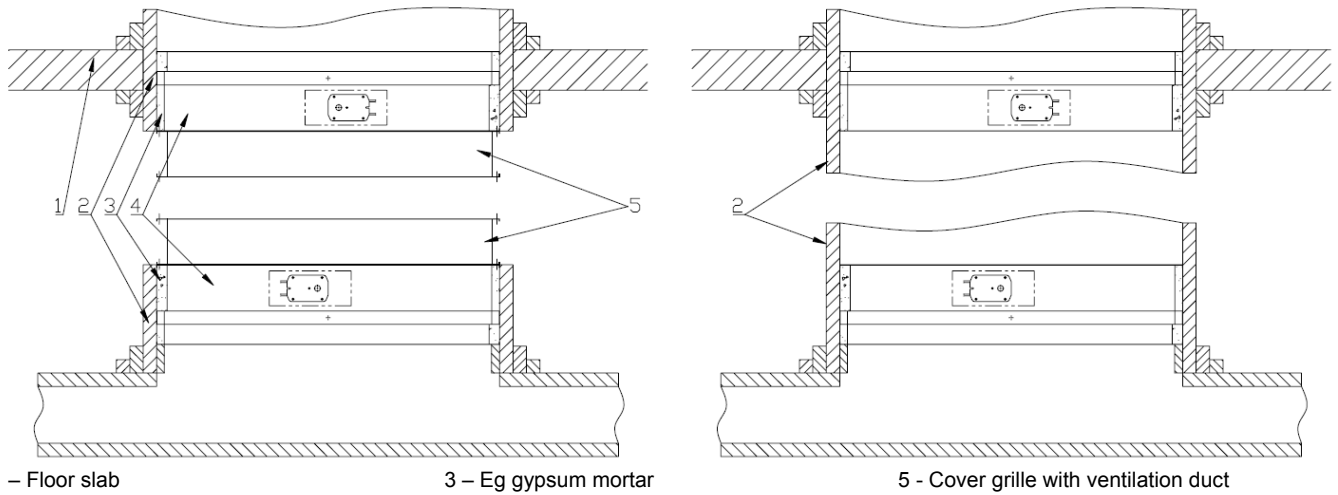
- 1 – mcr FID S/V p/P BxH damper
- 2 – Cover grille
- 3 – M10 fixing screw

- 4 – M8 dowel
- 5 – Frame from fireproof board 20mm thick
- 6 – Eg gypsum mortar

- 7 – Building partition
- 8 – Smoke extraction duct*

Installation of the mcr FID S/V p/P damper in fire ventilation systems (building shafts for fire ventilation)

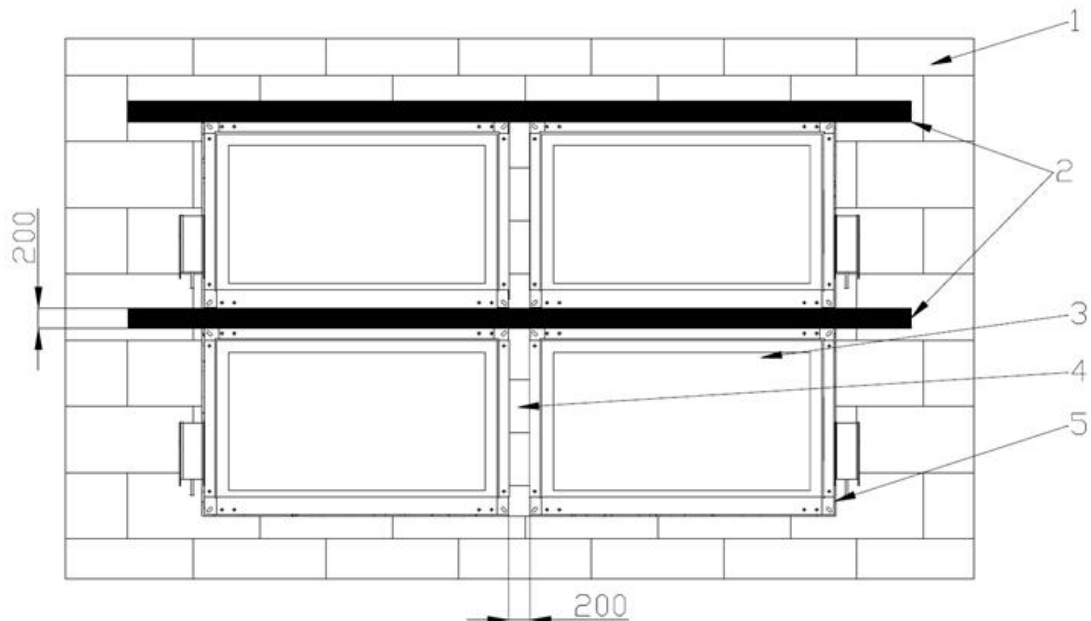
mcr FID S/... p/... single-plane fire dampers



Installation of the mcr FID S / V p / P damper in fire ventilation systems (building partitions / vertical fire ventilation ducts)

CAUTION

* Smoke extraction duct should be made in accordance with the duct manufacturer's guidelines. The ducts must have adequate fire resistance in accordance with the fire resistance provided for the entire solution. Seal all connections between the damper and the ducts with appropriate mortar / glue / gaskets, ensuring fire resistance. The shut-off damper in vertical position fire ventilation systems may be mounted across the horizontal smoke extract duct or on the sides of the horizontal smoke extract duct or on the surface of any side of the vertical smoke extract duct.

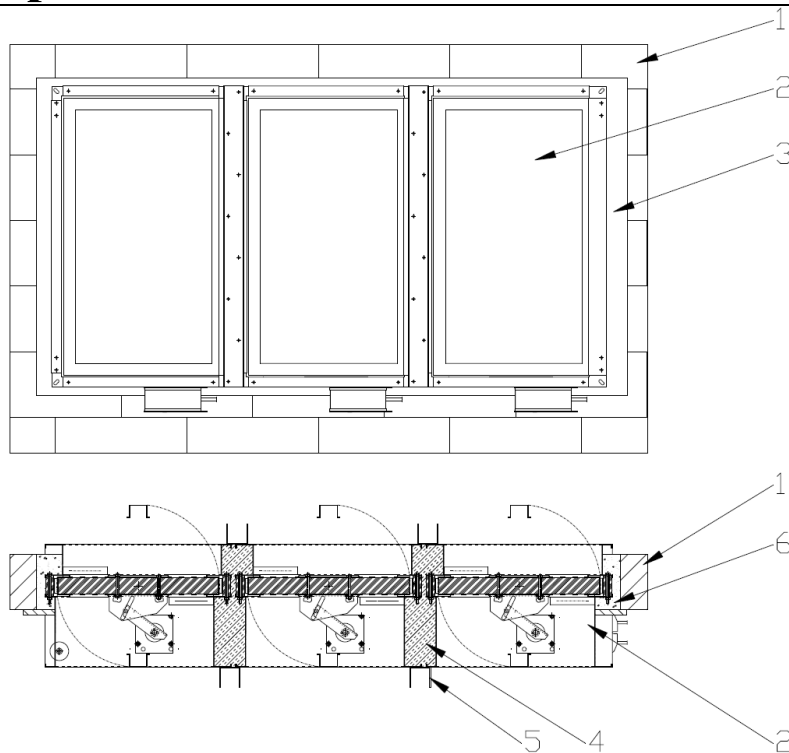


- 1 – e.g. a masonry wall
- 2 – A building element with fire resistance equal or higher to the building envelope resistance
- 3 – mcr FID S/... p/P fire damper, BxH.
- 4 – A building element with fire resistance equal or higher to the building envelope resistance. For example, a brick wall.
- 5 – e.g. mortar

Installation of the mcr FID S/... p/P fire damper as a module (multiple damper set of 4 dampers)

Other configurations of the mcr FID S /... p/P dampers modules can be made, consisting of two or more dampers, while maintaining the minimum distances between the dampers according to the drawing above

mcr FID S/... p/... single-plane fire dampers

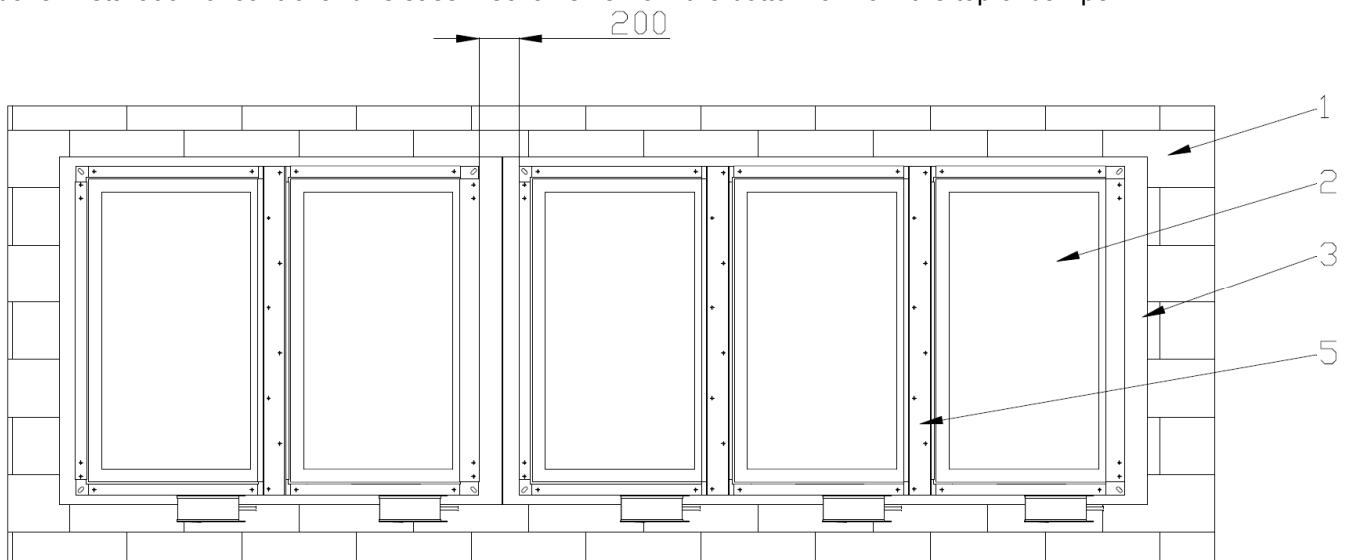


- 1 – e.g. a masonry wall
- 2 – mcr FID S/V p/P or mcr FID S/V-M BxH.
- 3 – fire protective band from GKF boards, width min. 50mm

- 4 – mineral wool with density min. 100kg/m³
- 5 – angle U50, thickness 2mm, fastened with St4,6 screws, alternating every 100mm
- 6 – e.g. mortar

Installation of the FID S/V p/P or mcr FID S/V-M p/P fire damper in batteries consisting 3 single dampers.

Seal the connections with fireproof silicone. Other configurations of mcr FID S/V p/P and mcr FID S/V-M p/P fire dampers sets can be made, consisting of two or three dampers, while maintaining assembly rules acc. Drawing above. Installation of control and release mechanisms from the bottom or from the top of damper.



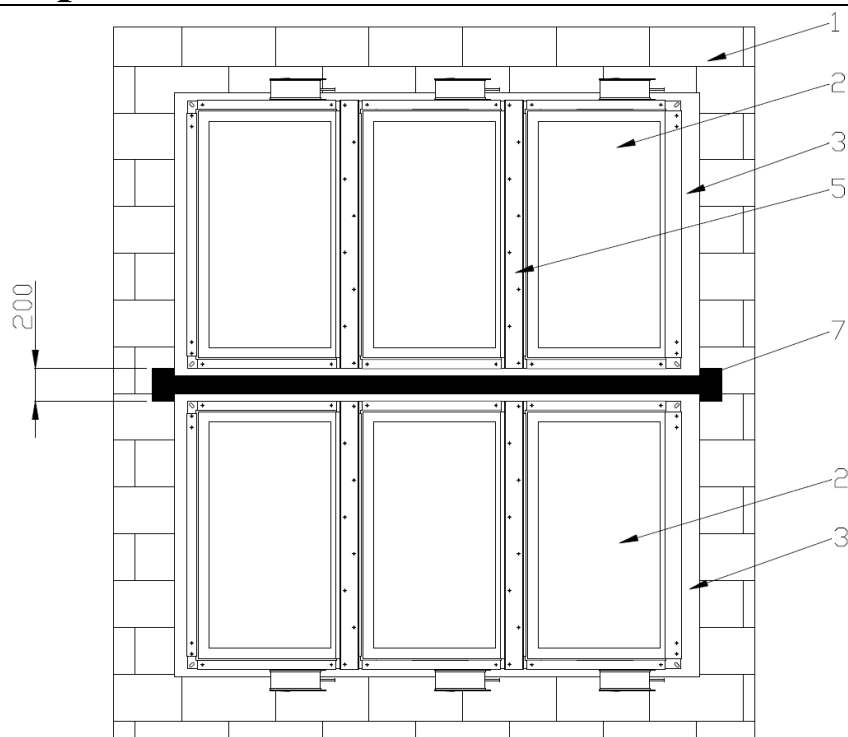
- 1 – e.g. a masonry wall
- 2 – mcr FID S/V p/P or mcr FID S/V-M BxH.
- 3 – fire protective band from GKF boards, width min. 50mm

- 5 – angle U50, thickness 2mm, fastened with St4,6 screws, alternating every 100mm

Modular installation of the mcr FID S/V p/P or mcr FID S/V-M p/P fire damper in 2 batteries (multiple damper set) of 2 and 3 single dampers

Seal the connections with fireproof silicone. Other configurations of mcr FID S/V p/P and mcr FID S/V-M p/P fire dampers sets can be made, consisting of two or three dampers, while maintaining assembly rules acc. Drawing above. Installation of control and release mechanisms from the bottom or from the top of damper.

mcr FID S/... p/... single-plane fire dampers

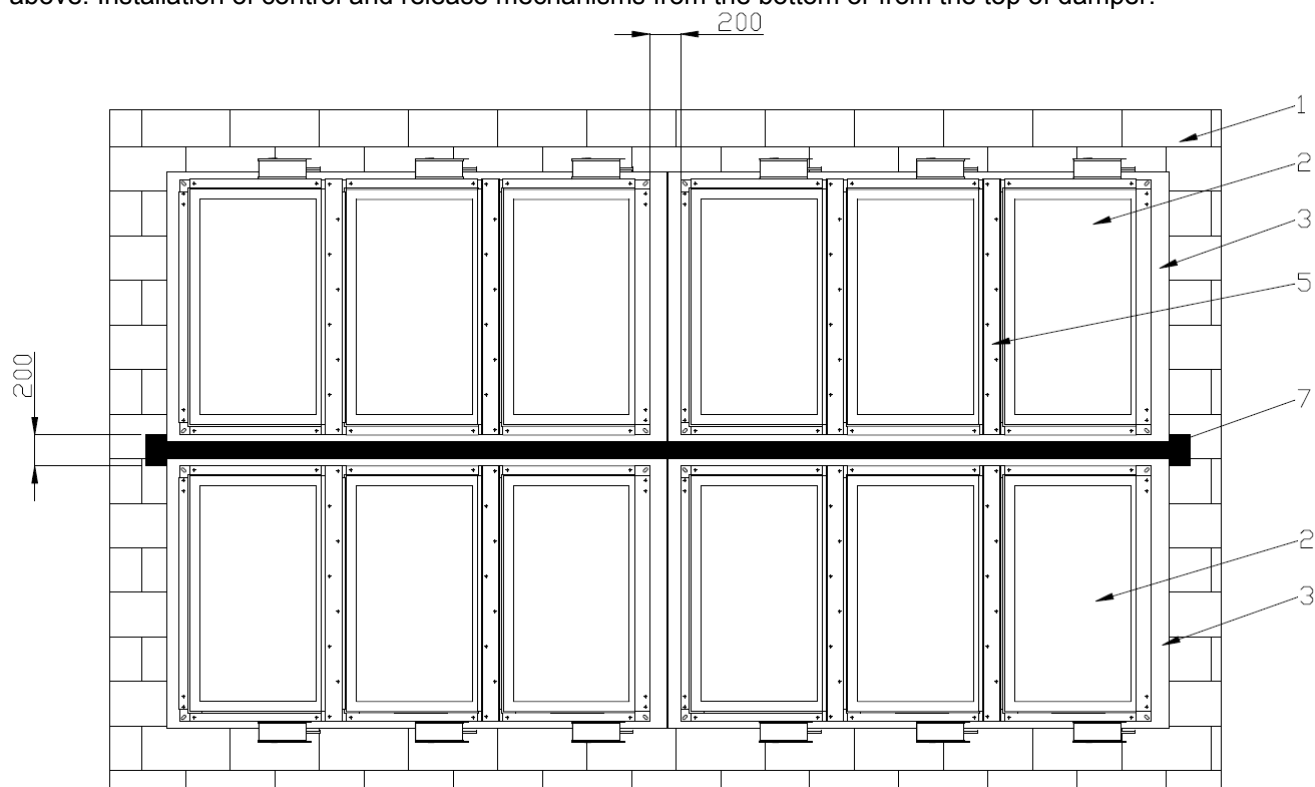


- 1 – e.g. a masonry wall
- 2 – mcr FID S/V p/P or mcr FID S/V-M BxH.
- 3 – fire protective band from GKF boards, width min. 50mm

- 5 – angle U50, thickness 2mm, fastened with St4,6 screws, alternating every 100mm
- 7 – a building element with fire resistance equal or higher to the building envelope resistance

Modular installation of the mcr FID S/V p/P or mcr FID S/V-M p/P fire damper in 2 batteries (multiple damper set)

Seal the connections with fireproof silicone. Other configurations of mcr FID S/V p/P and mcr FID S/V-M p/P fire dampers sets can be made, consisting of two or three dampers, while maintaining assembly rules acc. Drawing above. Installation of control and release mechanisms from the bottom or from the top of damper.



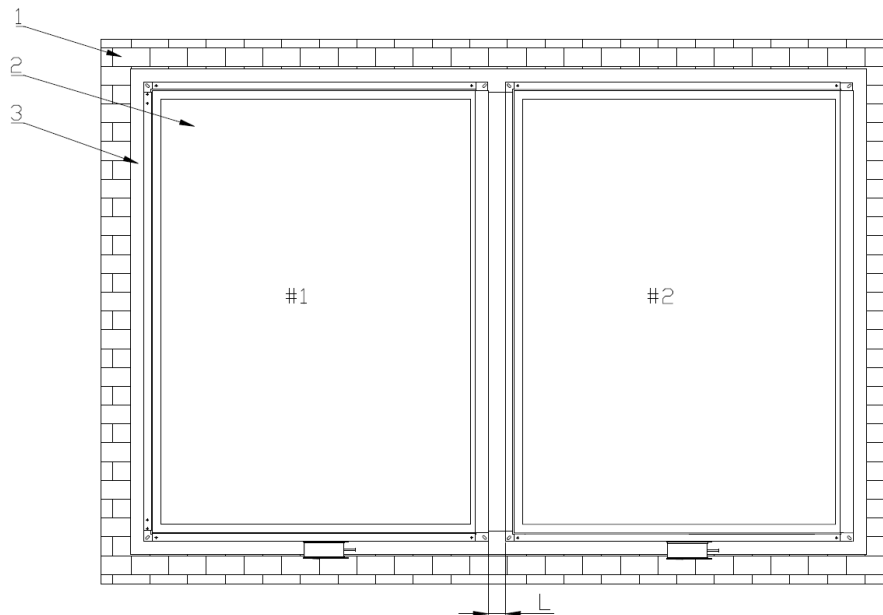
- 1 – e.g. a masonry wall
- 2 – mcr FID S/V p/P or mcr FID S/V-M BxH.
- 3 – Fire protective band from GKF boards, width min. 50mm

- 5 – angle U50, thickness 2mm, fastened with St4,6 screws, alternating every 100mm
- 7 – a building element with fire resistance equal or higher to the building envelope resistance

Modular installation of the mcr FID S/V p/P or mcr FID S/V-M p/P fire damper in 4 batteries (multiple damper set)

mcr FID S/... p/... single-plane fire dampers

Seal the connections with fireproof silicone. Other configurations of mcr FID S/V p/P and mcr FID S/V-M p/P fire dampers sets can be made, consisting of two or three dampers, while maintaining assembly rules acc. Drawing above. Installation of control and release mechanisms from the bottom or from the top of damper.



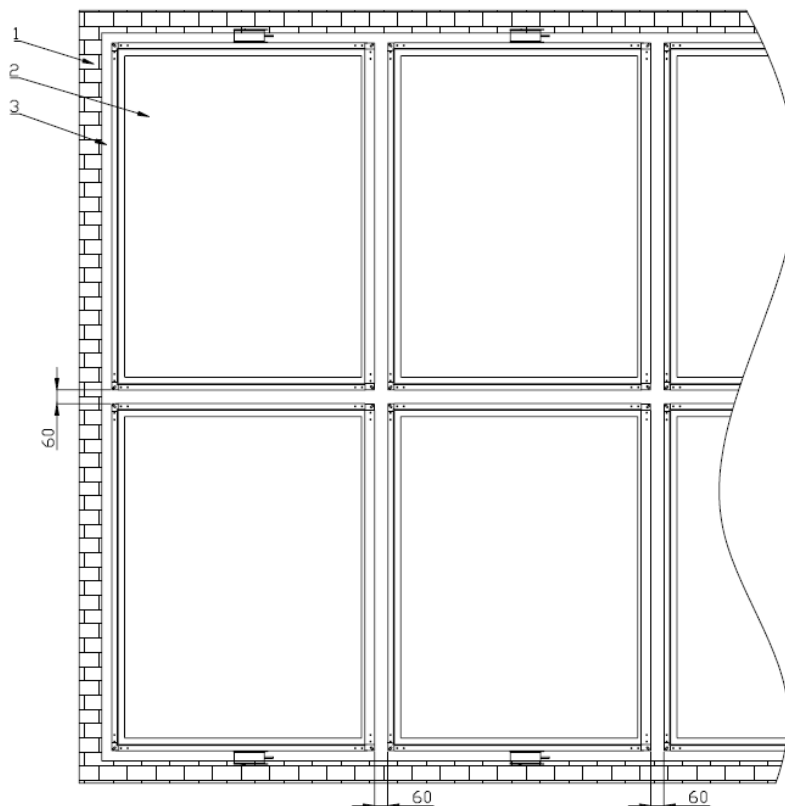
1 – e.g. a masonry wall

2 – damper mcr FID S/S p/P BxH.

3 – fire protective band from GKF boards, width min. 50mm

Modular installation of the mcr FID S/V p/P damper consisting of two or more dampers

Configurations consisting of two or more mcr FID S/S p/P fire dampers with maximum dimensions of a single fire damper BxH: 1500x1105 mm are allowed, while maintaining the installation rules according to the figure above. Installation of power and control mechanisms from the bottom or top of the damper. Joints should be sealed with fire-retardant silicone.



1 – e.g. a masonry wall

2 – damper mcr FID S/S p/P BxH.

3 – fire protective band from GKF boards, width min. 50mm

Modular installation of the mcr FID S/V p/P damper consisting of two or more dampers

Configurations consisting of two or more mcr FID S/S p/P fire dampers with maximum dimensions of a single fire damper BxH: 1500x1105 mm are allowed, while maintaining the installation rules according to the figure above. Installation of power and control mechanisms from the bottom or top of the damper. Joints should be sealed with fire-retardant silicone.

mcr FID S/... p/... single-plane fire dampers

6.4. ELECTRICAL CONNECTIONS

With the fire damper properly installed and embedded connect the electrical system wiring to the fire damper, if the device features controls or other parts that require electric power supply. The following shows the connection diagrams and basic electrical data for the trigger control gears supplied with the mcr FID S/... p/... fire dampers.

Electric actuators – electrical specification

Actuator type	Location of the damper isolation partition
<ul style="list-style-type: none"> - Belimo BFL series - Belimo BFN series - Belimo BF series - Mercor MLF series - Mercor MF series 	Open isolation partition – actuator indication: 90 Closed isolation partition – actuator indication: 0
<ul style="list-style-type: none"> - Belimo serii BE - Belimo serii BLE - Belimo serii BEE - Belimo serii BEN 	Open isolation partition – actuator indication: 0 Closed isolation partition – actuator indication: 90

Technical specifications	BF 24, BF24-T, BF24-TN, MF 24T	BF230, BF230-T, BF230-TN, MF 230T
Power supply	AC 24V 50/60Hz DC 24V	AC 220-240V 50/60 Hz
Power demand:		
- for spring tensioning	7 W	8,5 W
- for spring holding	2 W	3 W
Sizing (apparent power)	10 VA	11 VA
Appliance class	III	II
Ingress protection rating	IP 54	IP 54
Auxiliary circuit breaker:	2xSPDT 6 (3) A, 250V	2xSPDT 3 A, 250V~
- activation position [degrees]	5°, 80°	5°, 80°
Torque:		
- motor	18 Nm	18 Nm
- spring	12 Nm	12 Nm
Cable connection:		
- motor (L = 0.9 m)	2x0,75 mm ²	2x0,75 mm ²
- auxiliary circuit breaker	6x0,75 mm ²	6x0,75 mm ²
Movement time: (0-90°)		
- motor	120 s	120 s
- return spring	16 s	16 s
Operating temperature range	- 30 ...+50°C	- 30 ...+50°C
Sound pressure level:		
- motor	max 45 dB (A)	max 45 dB (A)
- spring	~ 63 dB (A)	~ 63 dB (A)

Technical specifications	BE24, BE24-ST	BE230	BLE24, BLE24-ST	BLE230
Power supply	AC 24V 50/60Hz DC 24 V	AC 220-240V 50/60 Hz	AC 24V 50/60Hz DC 24V	AC 220-240V 50/60 Hz
Power demand:				
- for spring tensioning	12 W	8 W	7.5 W	5 W
- for spring holding	0,5W	0,5 W	0,5 W	1 W
Sizing (apparent power)	18 VA	15 VA	9 VA	12 VA
Appliance class	III	II	III	II
Ingress protection rating	IP 54	IP 54	IP 54	IP 54
Auxiliary circuit breaker:	2xSPDT 6(3) A, 250V	2xSPDT 6(3) A, 250V	2xSPDT 3A, AC 250V	2xSPDT 3A, AC 250V
- activation position [degrees]	3°, 87°	3°, 87°	3°, 87°	3°, 87°
Torque:				
- motor	40 Nm	40 Nm	15 Nm	15 Nm
- locking	50 Nm	50 Nm	20 Nm	20 Nm
Cable connection:				
- motor (L = 0.9 m)	3x0,75 mm ²	3x0,75 mm ²	3x0,75 mm ²	3x0,75 mm ²
- auxiliary circuit breaker	6x0,75 mm ²	6x0,75 mm ²	6x0,75 mm ²	6x0,75 mm ²
Movement time: (0-90°)				
- motor	60s	60 s	30 s	30 s
Operating temperature range	- 30 ...+50°C	- 30 ...+50°C	- 30 ...+50°C	- 30 ...+50°C
Sound pressure level:				
- motor	max 62 dB (A)	max 62 dB (A)	max 62 dB (A)	max 62 dB (A)

Technical specifications	BEE24, BEE24-ST	BEE230	BEN24, BEN24-ST	BEN230
Power supply	AC 24V 50/60Hz DC 24 V	AC 220-240V 50/60 Hz	AC 24V 50/60Hz DC 24V	AC 220-240V 50/60 Hz
Power demand:				

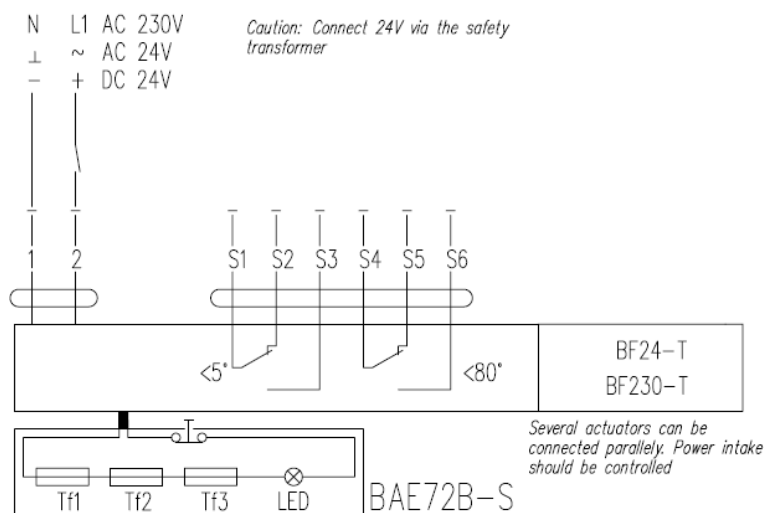
mcr FID S/... p/... single-plane fire dampers

- for spring tensioning	2,5 W	3,5 W	3 W	4 W
- for spring holding	0,1W	0,4 W	0,1 W	0,4 W
Sizing (apparent power)	5 VA	6 VA	6 VA	7 VA
Appliance class	III	II	III	II
Ingress protection rating	IP 54	IP 54	IP 54	IP 54
Auxiliary circuit breaker:	2xSPDT 3A AC 250V	2xSPDT 3A AC 250V	2xSPDT 3A, AC 250V	2xSPDT 3A, AC 250V
- activation position [degrees]	5°, 80°	5°, 80°	5°, 80°	5°, 80°
Torque:				
- motor	25 Nm	25 Nm	15 Nm	15 Nm
Cable connection:				
- motor (L = 0.9 m)	3x0,75 mm ²	3x0,75 mm ²	3x0,75 mm ²	3x0,75 mm ²
- auxiliary circuit breaker	6x0,75 mm ²	6x0,75 mm ²	6x0,75 mm ²	6x0,75 mm ²
Movement time: (0-90°)				
- motor	60s	60 s	30 s	30 s
Operating temperature range	- 30 ...+55°C	- 30 ...+55°C	- 30 ...+55°C	- 30 ...+55°C
Sound pressure level:				
- motor	max 58 dB (A)	max 58 dB (A)	max 58 dB (A)	max 58 dB (A)

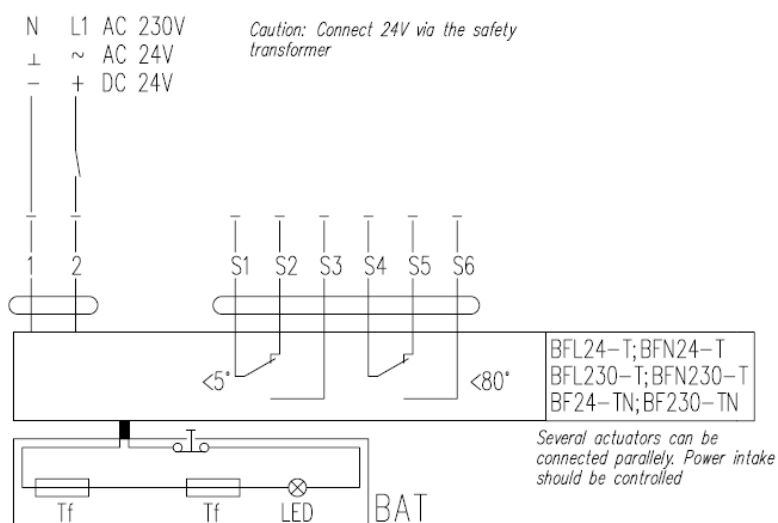
Technical data	BFL24, BFL24-T	BFL230, BFL230-T	BFN24, BFN24-T	BFN230, BFN230-T
Power supply	AC 24 V 50/60 Hz DC 24 V	AC 220–240 V 50/60 Hz	AC 24 V 50/60 Hz DC 24 V	AC 220-240V 50/60 Hz
Power demand:				
– when putting the spring under tension	2.5 W	3,5 W	4 W	5 W
– when in standby	0.7 W	1.1 W	1.4 W	2.1 W
Apparent power	4 VA	6.5 VA	6 VA	10 VA
Protection class	III	II	III	II
IP rating	IP 54	IP 54	IP 54	IP 54
auxiliary switch:	2 x PDT 3(0.5) A AC 250V	2 x PDT 3(0.5) A AC 250V	2 x SPDT 3(0.5) A, 250 V	2 x SPDT 3(0.5) A, 250 V
– activation point [degrees]	5°, 80°	5°, 80°	5°, 80°	5°, 80°
Torque:				
- motor	4 Nm	4 Nm	9 Nm	9 Nm
- spring	3 Nm	3 Nm	7 Nm	7 Nm
Wire connection:				
– motor (length: 0.9 m)	2 x 0.75 mm ²	2 x 0.75 mm ²	2 x 0.75 mm ²	2 x 0.75 mm ²
– auxiliary switch	6 x 0.75 mm ²	6 x 0.75 mm ²	6 x 0.75 mm ²	6 x 0.75 mm ²
Movement time (0–90°):				
- motor	60 s	60	60 s	60 s
- return spring	≈ 20 s	≈ 20 s	≈ 20 s	≈ 20 s
Working temperature range	–30 ...+55°C	–30 ...+55°C	–30 ...+55°C	–30 ...+55°C
Sound pressure level:				
- motor	max 43 dB (A)	max 43 dB (A)	max 55 dB (A)	max 55 dB (A)
- spring	~ 62 dB (A)	~ 62 dB (A)	~ 67 dB (A)	~ 67 dB (A)

Technical specifications	MLF 24T	MLF 230T
Power supply	AC 24V 50/60Hz DC 24 V	AC 220-240V 50/60 Hz
Power demand:		
- for spring tensioning	5 W	5 W
- for spring holding	2.5 W	3 W
Sizing (apparent power)	7 VA	7 VA
Appliance class	III	II
Ingress protection rating	IP 54	IP 54
Auxiliary circuit breaker:	2xSPDT 6 (1.5)A AC 250V	2xSPDT 6 (1.5)A AC 250V
- activation position [degrees]	5°, 80°	5°, 80°
Torque:		
- motor	4 Nm	4 Nm
- spring	4 Nm	4 Nm
Cable connection:		
- motor (L = 0.9 m)	2x0.75 mm ²	2x0.75 mm ²
- auxiliary circuit breaker	6x0.75 mm ²	6x0.75 mm ²
Movement time: (0-90°)		
- motor	40-75 s	40-75 s
- return spring	≈20s	≈20s
Operating temperature range	- 30 ...+50°C	- 30 ...+50°C
Sound pressure level:		
- motor	max. 45 dB (A)	max. 45 dB (A)
- spring	~ 62 dB (A)	~ 62 dB (A)

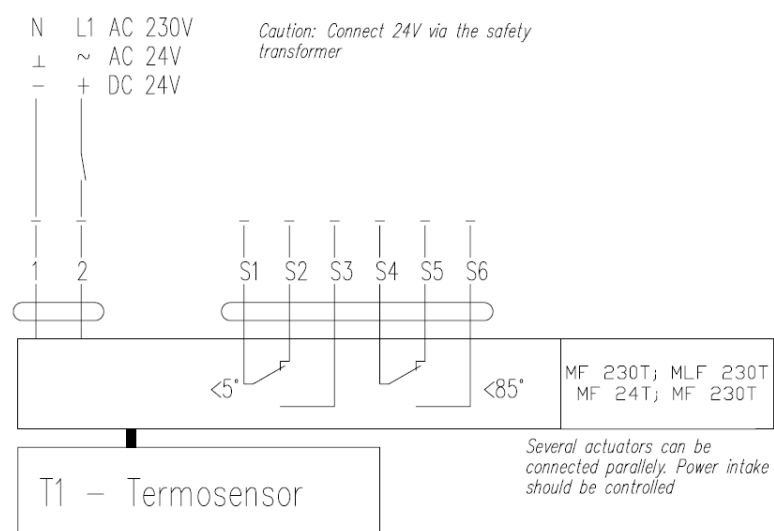
mcr FID S/... p/... single-plane fire dampers



Connection diagram for the BF24-T and BF230-T actuators

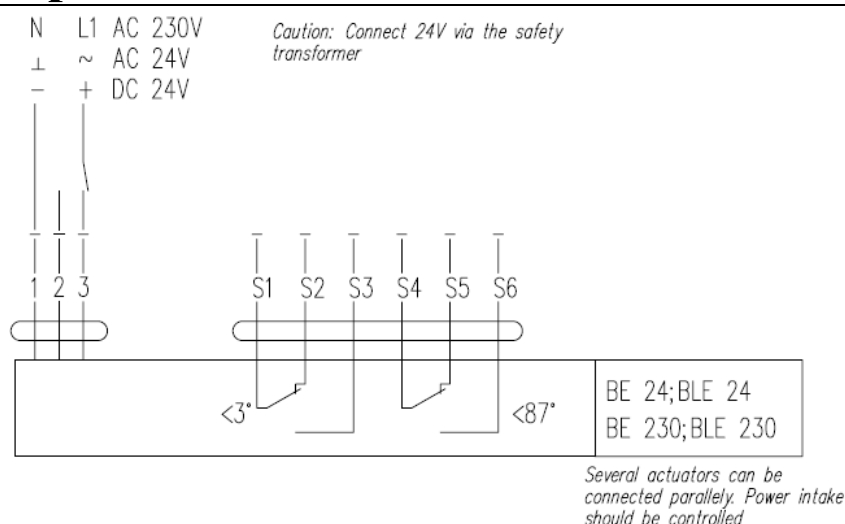


Connection diagram for the BFL24-T, BFL230-T, BFN24-T, BFN230-T, BF24-TN and BF230-TN actuators

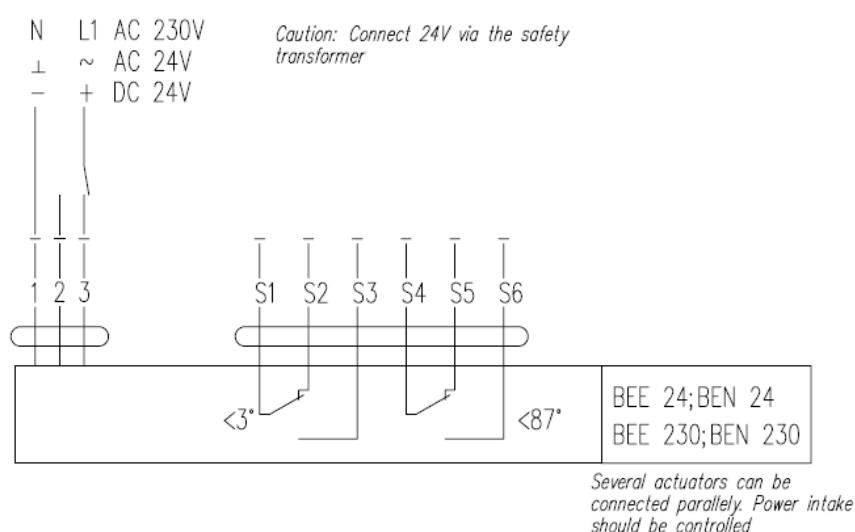


Connection diagram for the MLF 24T, MLF 230T, MF 24T, MF 230T

mcr FID S/... p/... single-plane fire dampers



Connection diagram for the BE24, BLE24, BE230 and BLE230 actuators



Connection diagram for the BEE24, BEN24, BEE230 and BEN230 actuators

Note:

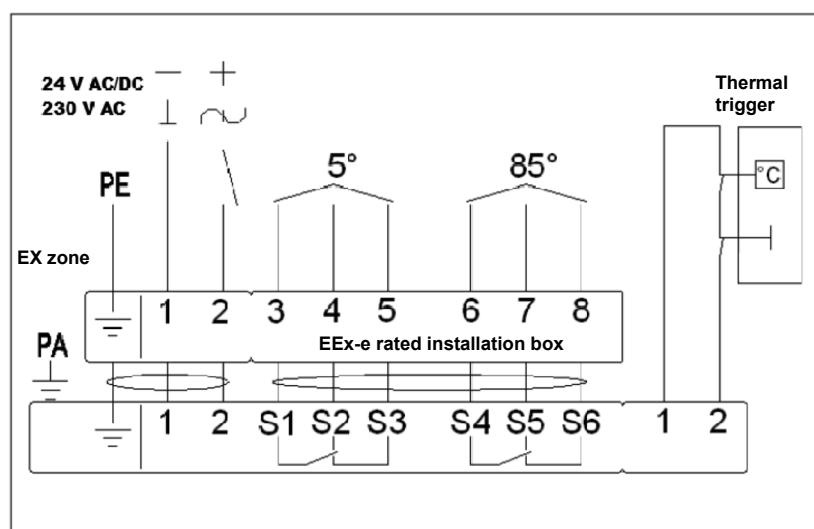
The BE and BLE actuator operating control requires a three-wire system. The actuator sense of rotation is switched by applying the supply voltage to terminal 2 or 3, depending on the desired sense.

The location of the limit switches for all types of actuators is shown for the position without voltage.

For proper operation of a device equipped with electrical actuators, it is recommended that the rated voltage housed tolerance of $24V \pm 10\%$ or $230V \pm 10\%$. Power supply devices other than listed above may cause malfunction and will not be covered by the warranty conditions.

EXBF actuators

Technical specifications	EXBF 24	EXBF 230
Zone	1, 2, 21, 22	
ATEX classification	II 2 GD EEx d IIC T6	
Power supply	24 V AC $\pm 20\%$ 50/60 Hz / 24 VDC-10/+20%	230 V AC $\pm 14\%$ 50/60 Hz
Power demand:		
- for spring tensioning	7 W	8 W
- for spring holding	2 W	3 W
Sizing (apparent power)	10 VA	12.5 VA
Ingress protection rating	IP 66	IP 66
Auxiliary circuit breaker:	2 x SPDT 6A (3) max 250 V AC	2 x SPDT 6A (3) max 250 V AC
- activation position	5°, 80°	5°, 80°
Torque:		
- motor	18 Nm	18 Nm
- spring	12 Nm	12 Nm
Movement time: (90°)		
- motor	150 s	150 s
- return spring	$\approx 20s$	$\approx 20s$
Ambient temperature	- 20 ... +50°C	- 20 ... +50°C



Connection diagram for the EXBF actuators

Caution:

For proper operation of a device equipped with electrical actuators, it is recommended that the rated voltage housed tolerance of 24V±10% or 230V±10%. Power supply devices other than listed above may cause malfunction and will not be covered by the warranty conditions.

RST/KW1 trigger control gear

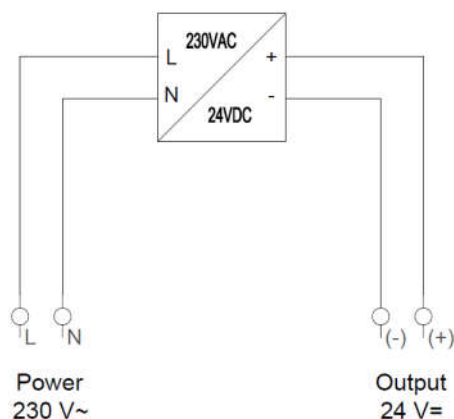
The RST/KW1/S version has the limit switches installed in the gear itself. The electrical connections shall be made by connecting the properly labelled conductors to the electrical system. A fusible trigger is installed in the gear. The dampers with the RST/KW1/230I, RST/KW1/230P mechanisms, are supplied with the RST/KW1/24... triggering and control mechanism, together with the 230/24V transformer module type MP230/24. For the trigger and control mechanism of the "impulse" type damper, adequate power must be provided to ensure that the control signal is supplied to the device in the event of fire.

	RST/KW1/S	RST/KW1/24I	RST/KW1/24P	RST/KW1/24I +MP230/24	RST/KW1/24I +MP230/24
Supply voltage	X	24 V – 48 V DC	24 V – 48 V DC	230V AC	230V AC
Power consumption	X	3.5 W	1.6 W	4.5 W	2.5 W
Holding force	X	12 daN	12 daN	12 daN	12 daN
Thermal trigger trip point	72°C +2°C				
WK1d / WK2d limit switch	NO/NC (switching contact) 5A, 230V AC				
Switch trigger	3°, 87° – tolerance: +/- 2°				
Limit switch operating temperature	-25 ...+85°C				
Electrical connection	X	- release: cable 0.6 m, 2x0.5 mm ² - limit switch: cable 0.6 m, 6x0.5 mm ²			

Rotation angle	92°				
Movement time	Max. 2s - spring				
Sense of rotation	CCW				
Gear weight	1.2 kg	1.4 kg	1.4 kg	1.5 kg	1.5 kg

KW1 gear power supply:	WK1 limit switch	WK2 limit switch
Wire number: 1-2	Wire number: 3-4 – NO (normally open) Wire color: green / gray	Wire number: 6-7 – NO (normally open) Wire color: brown / pink
	Wire number: 4-5 – NC (normally closed) Wire color: gray / blue	Wire number: 7-8 – NC (normally closed) Wire color: pink / yellow

-MP 230/24



Connection diagram for transformer module type MP230/24

Caution! - The location of the limit switches is shown for the fire damper in the safety position

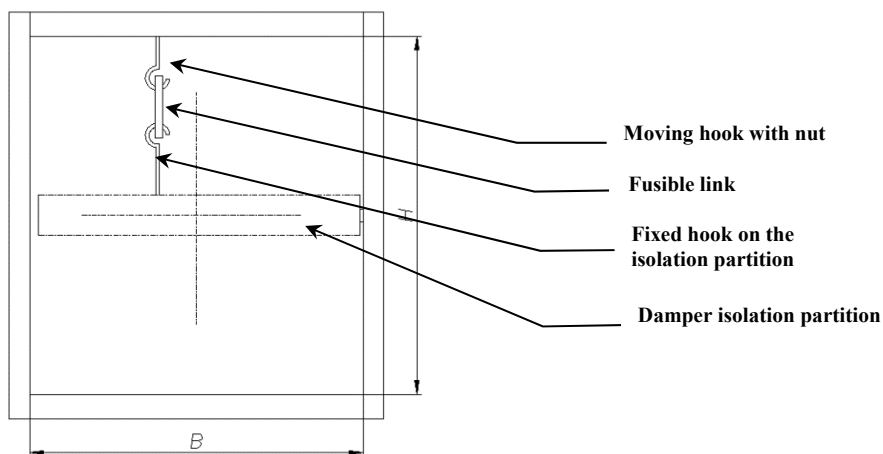
For proper operation of a device equipped with electrical actuators, it is recommended that the rated voltage housed tolerance of $24V \pm 2\%$ or $230V \pm 2\%$. Power supply devices other than listed above may cause malfunction and will not be covered by the warranty conditions.

RST trigger control gear

In the RST version the limit switches are independent units installed inside the fire damper casing. The fusible release is located on the damper isolation partition. The driving spring is installed on the damper isolation partition.

Installation of the RST fusible release:

- Switch the fire damper isolation partition open
- Install the fusible link on the hooks attached to the fire damper casing and the isolation partition
- Tighten the nut to lock the hook on the fire damper casing



Caution

The drawing is indicative only and applies both to the rectangular and circular form versions.

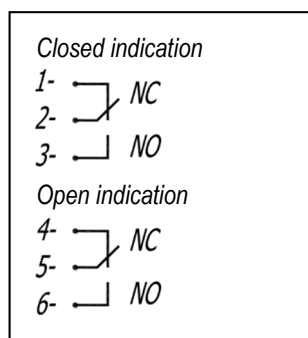
Independent limit switches – RST version

WK1 – single switch – indicates that the fire damper is closed.

WK2 – tandem of switches – indicates that the fire damper is closed or open.

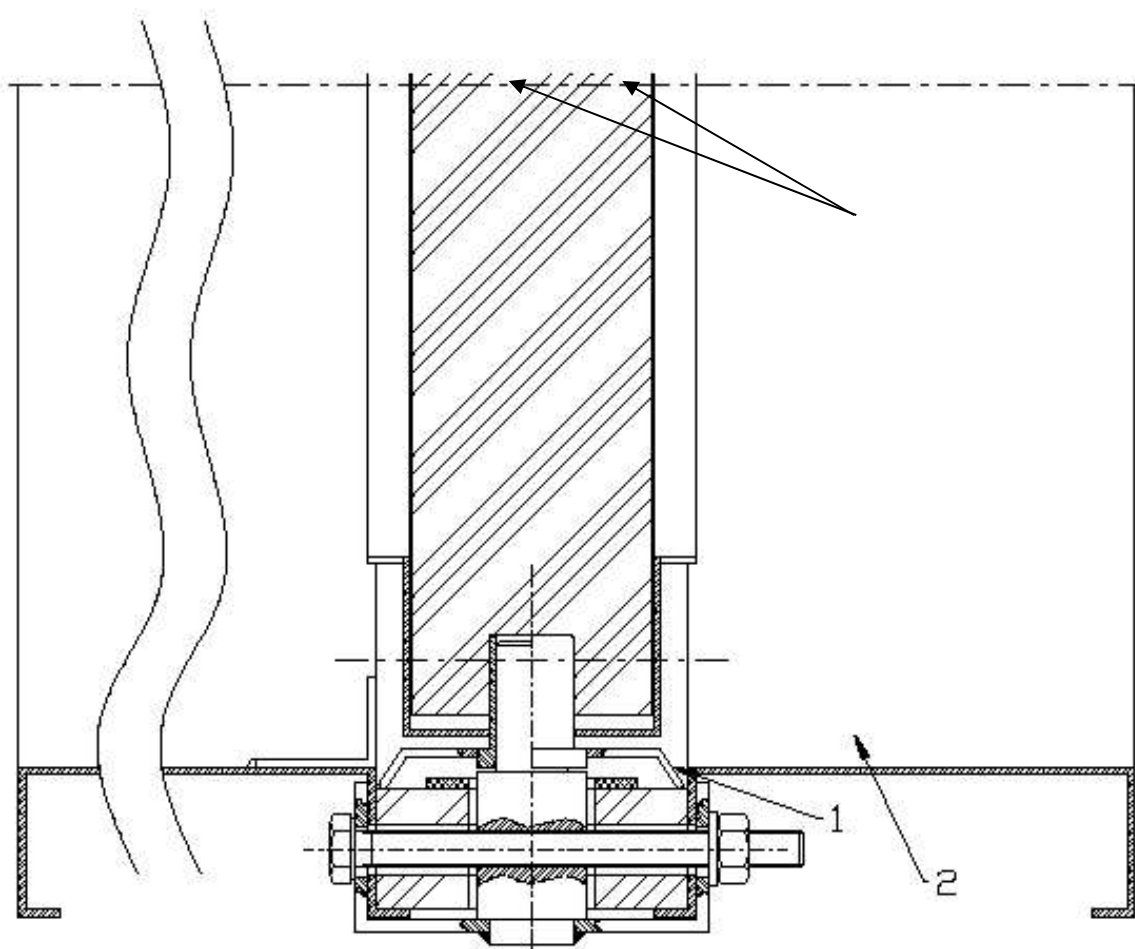
Switch technical specifications

WK1 and WK2 limit switch	1xNO/1xNC SPDT (switching contact) 5A, 230V AC
Limit switch operating temperature	-25 ... +85°C
Body	Plastic



-3

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1 - Spacer

3 – mcr FID S/... p/... fire damper

Spacer between the isolation partition and the casing – installation location

Caution:

The manufacturer shall not be liable for any damage due to improper or inconsistent execution of the above.

7. TRANSPORT & STORAGE CONDITIONS

The valves are packed in cardboard boxes. Valves' collective packages are protected against damage with foil or other covering material. The valves may be transported by any means of transport, provided that they are protected against the effects of weather conditions. Valves located on the means of transport should be secured against

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changing their position during transport. Before installing the valve, perform a visual inspection of each of them. Do not carry the valve by grasping the connecting cable or put the device on the trigger and control mechanism. Do not hit or drop the valve. When carrying and installing the valve, rest the valve on the sides or body edges.

The valves should be stored in closed rooms that provide protection against external weather conditions. If the valve is stored on the ground, it should be placed on securing washers in order to protect the damper against damage.

Storage should take place in rooms where:

- there is no access to dust, gases, caustic vapors and other aggressive chemical vapors that can destroy insulating elements and structural elements;
- the flaps are not affected by direct sunlight and UV radiation;
- maximum relative humidity does not exceed 80% at the temperature of + 20 °C;
- the ambient temperature is between - 20 °C and + 40 °C;
- there are no vibrations.

8. MAINTENANCE AND SERVICING

The equipment from Mercor SA requires periodic technical inspection and maintenance at least every 12 months throughout its operating life, i.e. during the warranty and post-warranty period. Inspection and maintenance may only be carried out by the manufacturer or contractors authorised by MERCOR SA to service its products.

Regular service inspections of fire protection equipment is mandatory in Poland according to § 3 Section 3 of the Polish Regulation of the Ministry of the Interior and Administration of 7 June 2010 on the fire protection of buildings, other structures and areas (Polish Journal of Laws, Year 2010, No. 109 Item 719).

Do these recommended actions in the inspection intervals:

- Check the electrical connections, especially for all mechanical damage.
- Inspections of the condition of the supply voltage for the devices, which allowed the following tolerances:
 - 24V±10% for electric actuators
 - 24V±2% for electromagnetic release mechanism
 - 230V ±10% for electric actuators
 - 230V±2% for electromagnetic release mechanism
- Check the equipment casing, especially for all mechanical damage.
- Check for any obstructions to proper performance of the equipment.

To facilitate the activities under service inspection, servicing and warranty claim response, e.g. visual inspection or repairs, the equipment user/operator shall provide physical access to the equipment by removing thermal insulation, suspended ceiling, and other installations, as required and applicable to warrant unobstructed access.

Inspection ports, e.g. type mcr KRW are recommended for equipment installed in ducts.

In the case of roof mounted equipment, provide access to the area (via ladders or elevated platforms).

Refer all matters related to technical inspection, maintenance and servicing of this equipment to the Mercor SA Service Department, serwis@mercors.com.pl, tel. +48 58 341 42 45 ext. 170, fax: +48 58 341 39 85, from 8 AM to 4 PM (Mo-Fri).

9. WARRANTY TERMS & CONDITIONS

1. "MERCOR" SA grants 12 months of warranty for the equipment quality from the date of purchase, unless the sales contract states otherwise.
2. Submit each warranty claim to "MERCOR" SA in 7 days from the date of discovery of a warranty eligible defect
3. Submit warranty claims by calling at: tel. +48 58 341 42 45, by fax: +48 58 341 39 85, by e-mail: reklamacje@mercors.com.pl or by traditional mail: "MERCOR" SA, ul. Grzegorza z Sanoka 2, 80-408 Gdańsk, Poland.
4. If physical defects of equipment are found during the warranty period, "MERCOR" SA warrants and represents to remove them in shortest possible time from serving the written warranty claim with the proof of purchase or sales contract, subject to Item 10.
5. "MERCOR" SA has the right to extend the time of repair if the defect removal is complicated or requires purchase of custom components or spare parts.
6. The warranty liability only covers all defects arising from causes present in the equipment at the date of sale.
7. Defects caused by improper operation or otherwise as listed in Item 10 herein, the buyer / warranty beneficiary will be charged with the costs of their removal.

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8. Condition for rectifying defects is that the applicant makes the site/localisation where devices are installed available, in particular, ensuring: the lift in the case of devices mounted at a height above 3m, free access to the rooms where the devices were installed and necessary revisions, dismantling thermal insulation, disassembling suspended ceilings, disassembling other installations, if they prevent free access to the device.
9. If the device can not be repaired at the place of its installation, "MERCOR" SA reserves the necessity of its disassembly, possible delivery to the address indicated by "MERCOR" SA and re-assembly. The cost of this operation lies with the buyer / holder of the guarantee.
10. The warranty does not cover:
 - Any damage or failure of the equipment caused by improper operation, tampering, failure to conduct periodic technical inspection and/or maintenance established in the Operating and Maintenance Manual, section "SERVICING AND MAINTENANCE".
 - Any damage beyond reasonable control of "MERCOR" SA, and specifically: caused by force majeure, such as torrential rainfall, flooding, hurricanes, inundation, lightning strike, power grid overvoltage, explosion, hail, collision with aircraft, fire, avalanche, landslide and indirect damage due to those causes. Torrential rainfall is understood as any rainfall with the effectiveness factor of 4 or higher in accordance with the definition of the Polish Institute of Meteorology and Water Management - National Research Institute (IMGW-PIB). If the effectiveness factor value specified in the preceding sentence cannot be reasonably established, the actual condition and extent of damage shall be considered at the site of their origin as the action of torrential rain. Hurricane is understood as any wind with a minimum speed of 17.5 m/s (and damage shall be recognised as caused by hurricanes if the effects of such weather phenomenon has been found in the direct vicinity of the damaged property).
 - Damage due to failure to immediately report any defect found.
 - Deterioration in the quality of coatings due to natural weathering/ageing.
 - Defects caused by abrasive or aggressive cleaning agents.
 - Damage caused by aggressive external influence, specifically chemical or biological in nature, or when the origin of which is related to the production processing or activity carried out within the facility protected by the equipment or in its direct vicinity.
 - Wearing parts and consumables (e.g. gaskets/seals), unless they have defects of workmanship and/or material.
 - Damage caused by improper transport, handling, unloading and/or storage of the equipment.
 - Damage caused by installation of the equipment in violation of this Operating and Maintenance Manual and/or good construction practice.
 - The equipment and/or parts thereof with removed or damaged nameplate (rating plate) and/or warranty seals.
11. The buyer/warranty rights holder is required to operate the equipment properly and carry out technical inspection and maintenance in accordance with the section "MAINTENANCE AND SERVICING" in the following Operating and Maintenance Manual.
12. This warranty shall be made immediately void and null if:
 - The buyer/warranty rights holder modifies the product design without prior authorisation from "MERCOR" SA.
 - Periodic technical inspection and/or maintenance is not carried out per schedule and/or is carried out by unauthorised personnel or service providers not authorised to do so by "MERCOR" SA and/or the equipment has not been properly operated.
 - Unauthorised personnel attempts any intervention in the product outside of the normal operation and maintenance of this equipment.
13. Any circumstances listed in Item 10 will relieve "MERCOR" SA from the obligation of surety.

The relevant provisions of the Polish Civil Code shall apply to all matters not regulated in these Warranty Terms & Conditions.