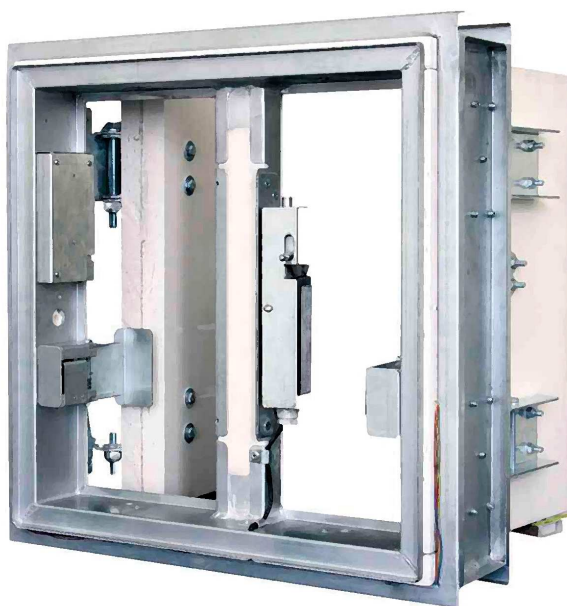


TECHNICAL AND OPERATIONAL DOCUMENTATION

Door type smoke exhaust and air-inlet damper mcr-DOR



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1. INTRODUCTION

The aim of this Technical and Operational Documentation is to acquaint the user with the purpose, construction, principle of operation, correct installation and operation of the product.

The Documentation contains also additional information on operating conditions, maintenance, and terms of guarantee of the product.

The Documentation concerns the entire group of smoke-tight fire dampers of mcr-DOR type for fire ventilation systems (according to prEN 1366-10:2001). Observing the recommendations contained in this Documentation shall ensure correct functioning of the device in the scope of fire protections of rooms, as well as safety of the system users.

2. SUBJECT MATTER OF THE DOCUMENTATION

The subject matter of the present Technical and Operational Documentation are:

- Rectangular fire dampers mcr-DOR/D1 – single-door execution.
- Rectangular fire dampers mcr-DOR/D2 – double-door execution.

NOTE

With issuing the Technical and Operational Documentation validity of all previous versions expires. Technical and Operational Documentation does not relate to dampers Manufactured before its date of issuance.

3. PURPOSE OF THE DEVICE

3.1 Application

The smoke exhaust fire dampers mcr-DOR without thermal trip are designed for embedding in general ventilation systems or smoke exhaust ventilation systems, in a place where these systems pass through building partitions. They may be used as:

- Exhaust fire dampers used for removing smoke and hot gases produced during fire,
- Intake fire dampers providing constant inflow of external air for the purposes of smoke exhaust.

During normal operation of the system, the fire damper baffle is in the closed position. In the case of fire, the fire damper baffle moves to the open position or remains in the closed position.

The damper cannot operate in systems exposed to dusting, unless it is covered by the special custom-made service and maintenance programme.

3.2 Fire Resistance

EIS 120 AA in dynamic conditions

3.3 Execution Versions

Rectangular fire dampers mcr-DOR/D1 – single-door execution.

Rectangular fire dampers mcr-DOR/D2 – double-door execution.

4. CONSTRUCTION AND PRINCIPLE OF OPERATION

4.1 Construction

The cut-off fire dampers mcr-DOR consist of a casing of rectangular cross-section, a movable baffle in the form of door, and a tripping and control mechanism actuated remotely from the central fire signalling system. The fire damper casing consists of two frames made of galvanised steel sheet, between which there is a gypsum board. The fire damper baffle (door) is made of 2x25 mm thick gypsum board. In the case of fire dampers of leaf width exceeding 500 mm, the baffle is additionally reinforced with stiffening channel sections made of galvanised steel sheet.

mcr DOR smoke exhaust fire dampers with doors

A ventilation gasket of cross-section 6x10 mm, pressed down by the closing baffle of the fire damper, is glued to the internal casing frame. A swelling gasket of cross-section 2x20 mm is glued to the external casing frame. The energy stored in the springs, located in the fire damper hinges made of steel sheet, causes the opening of the fire damper baffle. The driving springs are made of spring steel.

4.2 Operation

The fire dampers mcr-DOR are closed in the normal position. The movement of the fire dampers to the safety (open) position takes place:

- manually through pressing the manual release push button located on the tripping and control mechanism MERCOR of EM24D type,
- remotely through operation of the electromagnetic trip (tripping and control mechanism MERCOR of EM24D type).

The fire dampers with the tripping and control mechanism of EM24D type are opening in result of applying voltage (current impulse max. 10s. applied twice), in effect of operation of driving springs located on the fire damper baffle. The fire dampers are closed again after removing the supply voltage from the mechanism terminals and after setting the fire damper baffle manually in the stand-by position. After each launch of the lock the contact surfaces of the electromagnet shall be cleaned with a sandpaper.

NOTE

Under no circumstances one should not directly pull the dampers' baffle in order to open or close it. Such action may cause damage of the device self-braking drive mechanics and is not a subject of guarantee.

4.3 Driving and Tripping Systems

The driving system for the fire dampers mcr-DOR is the tripping and control mechanism MERCOR of EM24D type equipped with special lever and cam system, 24V DC electromagnetic trip (controlled by current impulse) and driving springs located directly on the hinges of the fire damper baffle. After cutting-off or supplying voltage the lock release follows which results in tripping of the device.

In the case of D1 fire damper this is one or two springs, depending on the device dimensions.

In the case of D2 fire damper this are two or four springs, respectively. D1 dampers normally open only to the right side.

Versions of control-release mechanisms and wiring diagrams are presented in section 6.5.

4.4 Dimensions

The smoke-exhaust fire dampers of mcr-DOR type are manufactured in the following dimensions:

- D1 series – single-leaf fire damper; dimensions B x H from 200x300 mm to 750x1150 mm, or B_z x H_z from 306 x 406 to 856 x 1256 mm,
- D2 series – double-leaf fire damper; dimensions B x H from 400x300 mm to 1150x1250 mm, or B_z x H_z from 506 x 406 to 1256 x 1356 mm.

Besides the standard dimensions, it is possible to execute fire dampers of intermediate dimensions to the exactness of 1 mm.

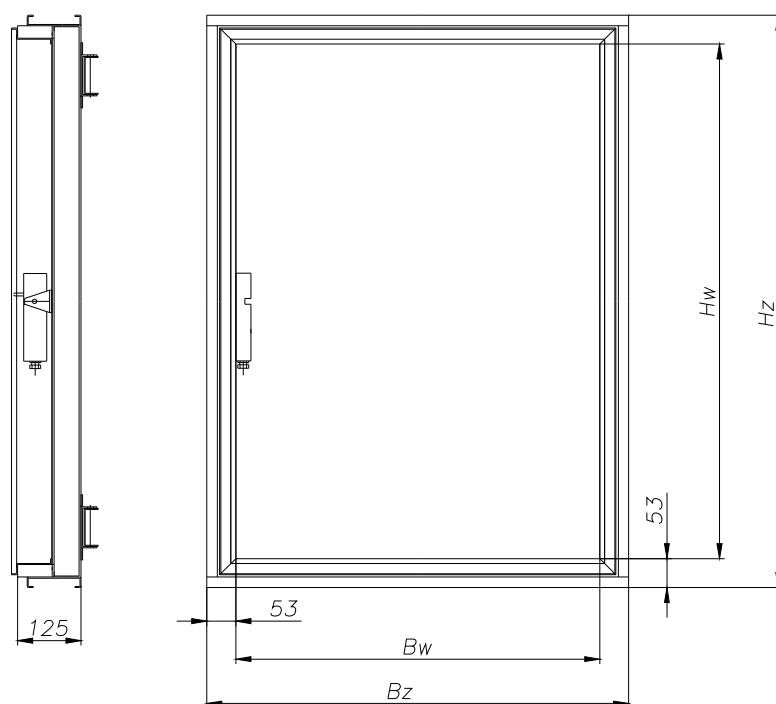


Figure 1. Fire damper mcr DOR / D1

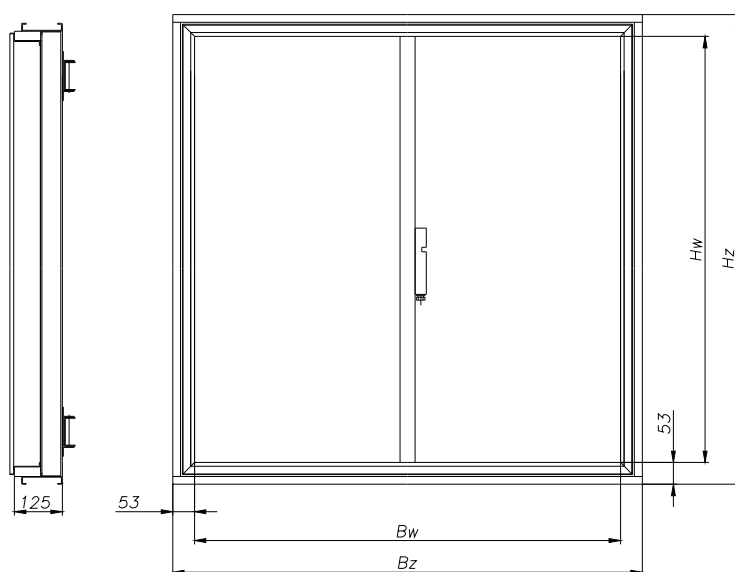


Figure 2. Fire damper mcr-DOR / D2

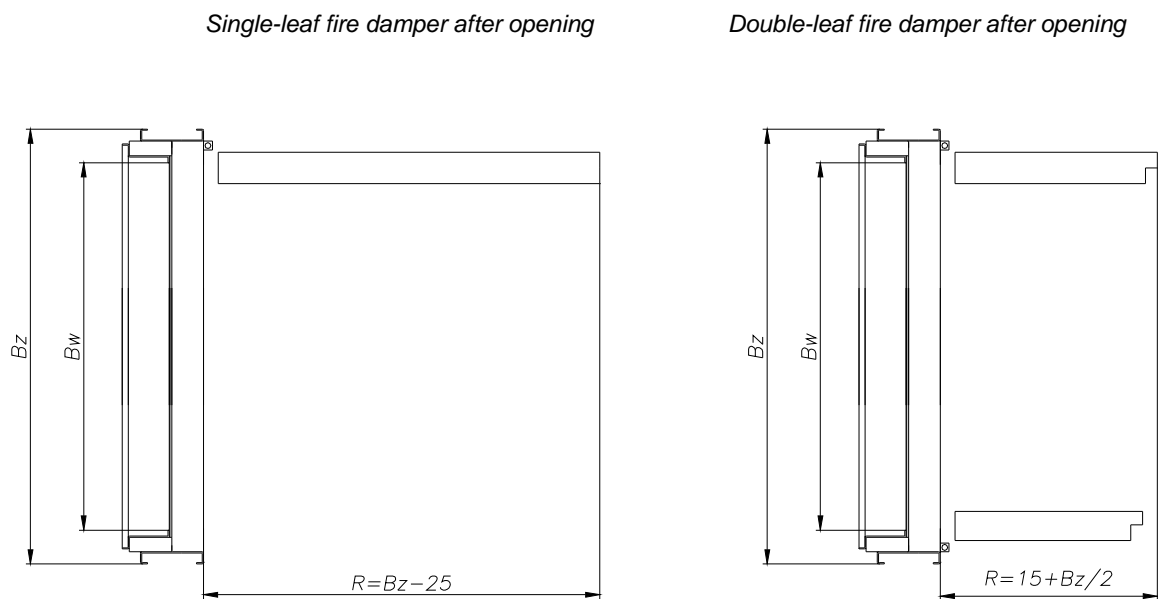


Figure 3. Fire dampers mcr-DOR after opening the baffle

5. DESIGNATION OF THE FIRE DAMPER

mcr-DOR/D1	/	400 (width) x 400 (height)	/	EM	/	MP	
							Additional equipment
							Tripping and control mechanism
							Gross opening dimensions
							Fire damper type

Type:
mcr-DOR/D1 – single-door rectangular fire damper
mcr-DOR/D2 – double-door rectangular fire damper

Tripping and control mechanisms:
EM24D – tripping and control mechanism supplied and actuated electromagnetically by applying the supply voltage (current pulse)

Additional equipment:
WK1d – single limit switch – signalling the fire damper baffle closed state.
WK2d – set of two limit switches – signalling the fire damper baffle closed and open state.
MP - MP230/24 - 230 V to 24 V converting module

6. INSTALLATION OF THE DEVICE

NOTE
During the installation of the damper and finishing work, subsequent access to the device and the disassembly for servicing have to be taken into account.

mcr DOR smoke exhaust fire dampers with doors

The smoke exhaust fire dampers mcr-DOR/D1 and mcr-DOR/D2 feature the EIS 120 AA fire resistance class in the case of mounting in concrete partitions of thickness at least 110 mm.

The smoke exhaust fire dampers mcr-DOR/D1 and mcr-DOR/D2 feature the EIS 120 AA fire resistance class in the case of mounting in brickwork partitions of thickness at least 120 mm.

The smoke exhaust fire dampers mcr-DOR/D1 and mcr-DOR/D2 feature the EIS 120 AA fire resistance class in the case of mounting in casings and on self-supporting fire ventilation ducts of thickness corresponding to the required resistance class of the fire dampers.

6.1. PRE-INSTALLATION INSPECTION

Each fire damper is inspected before packing and shipment by the manufacturer. After unpacking at the recipient, perform visual inspection to check if the casing has not been deformed and whether the fire damper has not been damaged during transport.

6.2. INSTALLATION OPENING

The minimum size of the opening permitting correct installation of the rectangular fire damper in brickwork and concrete walls is $(B_z+40) \times (H_z+40)$ mm. For self-supporting ducts the size of the installation opening is $(B_z+20) \times (H_z+20)$ mm.

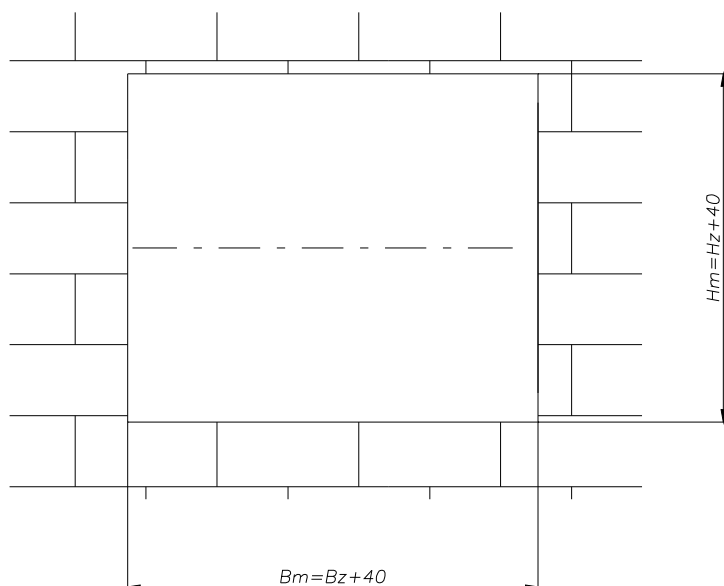


Figure 4. Preparing installation opening in brickwork and concrete walls.

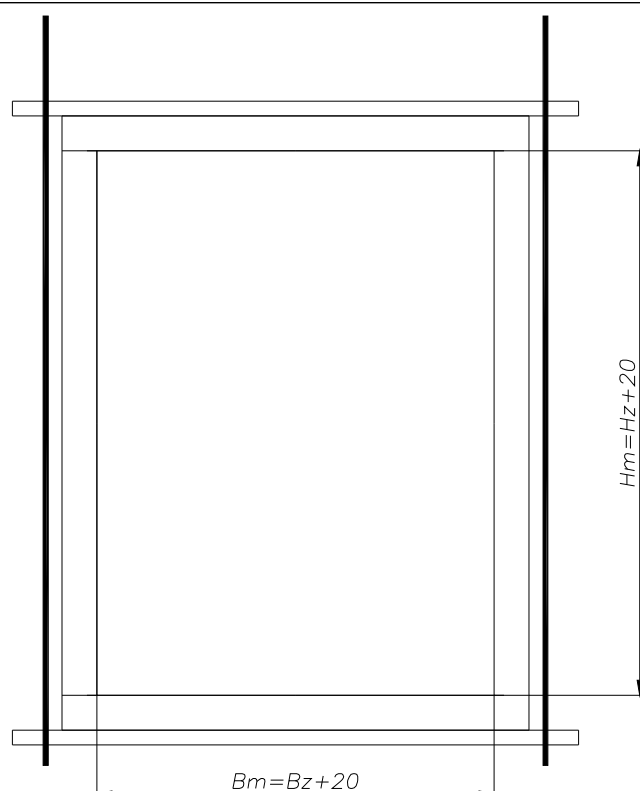


Figure 5. Preparing installation opening in self supporting ducts.

6.3. EMBEDDING

Before embedding, the fire damper should be placed axially in the partition (wall) constituting the fire zone division. It is highly important to take special care of the correct position of the damper placed in the gap and to follow the descriptions placed on the damper housing showing top and bottom of the device. Release mechanism must be placed in a way which will enable access to the manual release button without problems.

Damper placed in an opening prepared beforehand, shall be leveled and fixed. After these operations, the fire damper baffle should be operated manually to check if it is operating correctly (does not knock against casing elements). After manual checking of the fire damper operation, close its baffle. This baffle must remain closed until the mortar sets. Then install the strutting elements and fix the device using masonry mortar, carefully preventing the mortar, glue and paint from getting onto the operating elements of the fire damper (tripping and control mechanism, baffle, gaskets, limiters).

For this purpose, before installation absolutely protect the fire damper with protective film or other covering material until the masonry and finishing work is completed. After the concrete mortar sets, remove the brackets and again open and close the fire damper to check if its baffle is operating correctly. In order to ensure the fire resistance of the fire separation element, unconditionally observe the embedding limit – the axis of operation of the fire damper must not be located outside the wall. Departure from the above mentioned rule means installing of the fire damper outside the wall (case described in sub-section 6.4.).

Connection of the embedded fire damper to the ventilation duct must be executed coaxially. During installation of the fire damper in the partition, a damage of the fire damper body, and in particular any stresses in the body, must not be allowed. The fire damper must not constitute a „supporting element” of the ventilation system or duct on which it is installed. It is not allowed to drill through the fire damper casing in arbitrary places, drive in bolts, screws, or other elements passing through the casing to the inside of the fire damper (these elements might block the operation of the baffle and damage the driving elements of the fire damper). The places for drilling the casing are marked (holes in the sheet metal casing). After connecting the ventilation duct, check again if the fire damper operation is correct. During installation of the fire dampers mcr-DOR, do not expose the swelling gaskets installed in the fire damper casing to high temperature. Expanding of gaskets prevents closing of the damper. After finishing mounting, thoroughly clean and assure that no rubble leftovers are left. It could have an influence of proper operation of the damper.

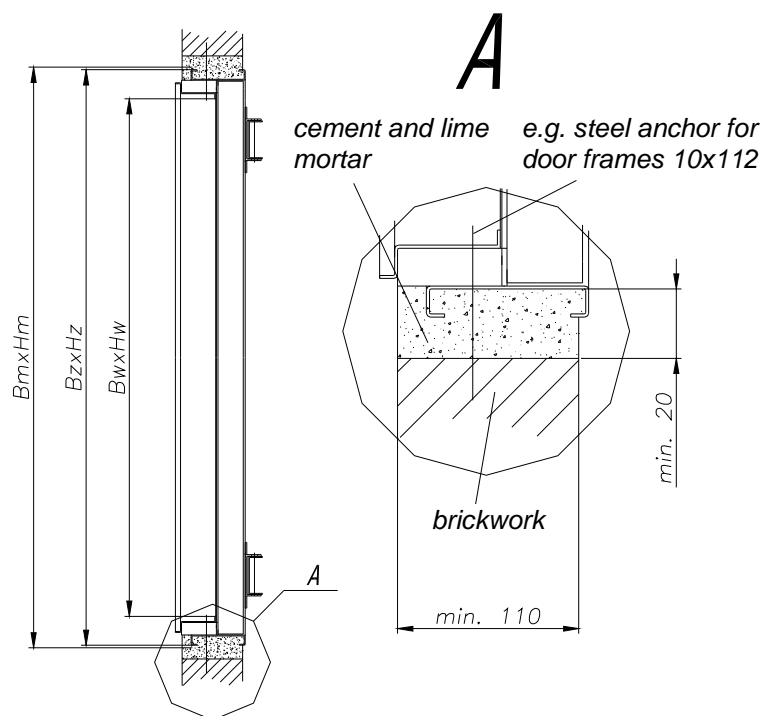


Figure 6. Fire damper mcr-DOR – installation in brickwork and concrete walls.

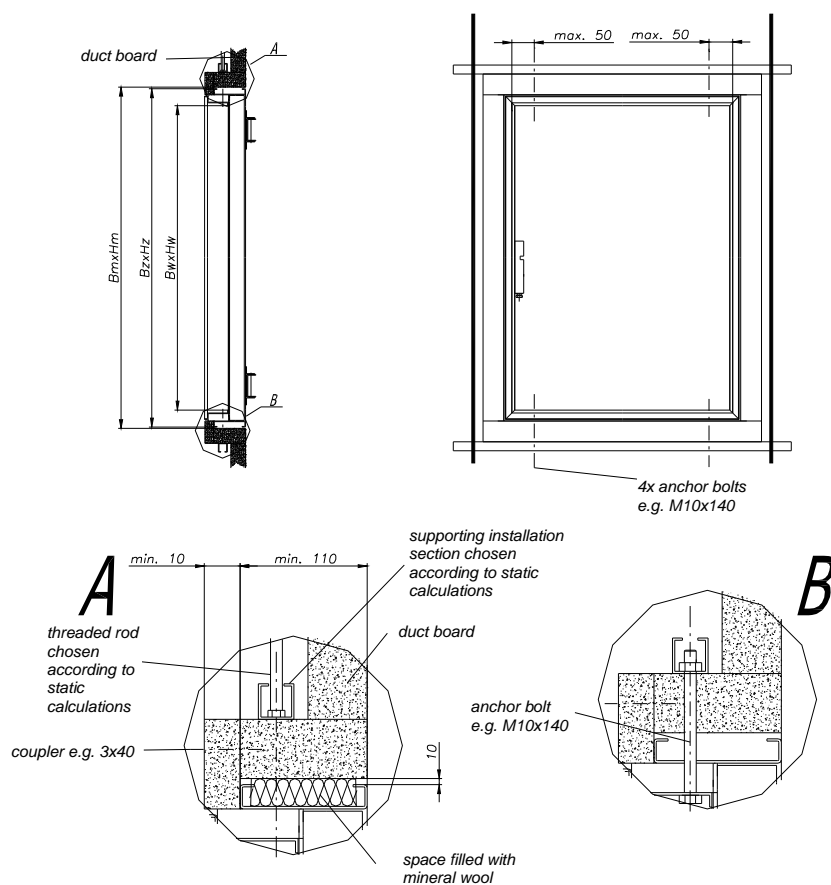


Figure 7. Fire damper mcr-DOR – installation on self-supporting ducts.

6.4. INSTALATION OUTSIDE THE WALL

Installation of the fire damper outside the wall is analogous to the installation presented in figure 7 on the self-supporting duct. In order to install the fire damper outside the partition, attach to the partition a horizontal section of a self-supporting duct prepared beforehand, and embed the fire damper in the above mentioned duct, keeping all requirements specified in figure 7 depicting the installation of the fire damper in self-supporting ducts.

6.5. ELECTRICAL CONNECTIONS

After correct embedding of the fire damper, if it has control or other elements that require electrical system connection, conductors of this system should be adequately connected to the fire damper. Presented below are connection diagrams and basic electrical data of the tripping and control mechanisms delivered with the fire dampers mcr DOR.

Mechanism EM24D

The mechanism EM24D is designed for serving the fire dampers operating in fire ventilation (smoke exhaust) systems. After applying or removing the supply voltage, the mechanism blockade is released, causing the operation of the device. The mechanism is not provided with a driving (return) spring (it is closed manually).

Versions:

- EM24D-I – mechanism supplied with voltage 24V DC – release with a current impulse (applying the supply voltage)
- EM24D-P – mechanism supplied with voltage 24V DC – release with a current brake

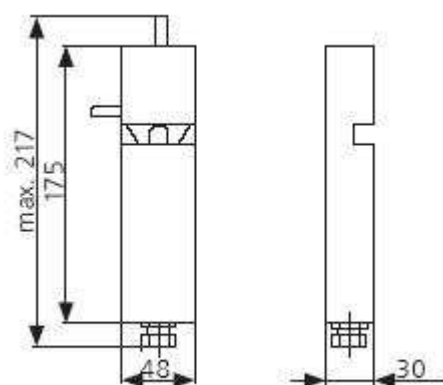


Figure 8. Control release mechanism EM24D.

Note

The mechanism EM24-D can co-operate with the element MP230/24. In the case of using the element MP230/24, the fire dampers can be supplied (controlled) with voltage 230V AC.



Figure 9 Converting module MP230/24

Electrical data of the mechanism

	EM24D-I	EM24D-P	MP230/24
Supply voltage	24V DC		230V AC
Power consumption	3.5W		4.5W
Holding force	---		X
Electrical connection	Terminal strip 10x2.5 mm ²		Terminal strip 4x0.5 mm ²
Output voltage	X		24V DC stabilised

Independent limit switches

Limit switch WK1d and WK2d	1xNO/1xNC SPDT (change-over contact) 2A, 230V AC
Operation temperature of limit switches	-25 ...+85°C
Casing	Plastic

Power supply for the mechanism:

Terminal number: 1-2 („+” – terminal no. 1, „-” – terminal no. 2)

Limit switch WK1d – fire damper closing

Terminal number: 6-5 – NO type (normal position: open)

Terminal number: 4-5 – NC type (normal position: closed)

Limit switch WK2d – fire damper opening

Terminal number: 8-9 – NO type (normal position: open)

Terminal number: 8-7 – NC type (normal position: closed)

Note:

Position of the limit switches of the mechanism are specified for the safety position of the fire damper.

mcr DOR smoke exhaust fire dampers with doors

Note:

On stand-by position (damper closed) follows an overload of switch signaling damper closing (contact 5-6 is shorted).

6.6. ARMING AND PERIODICAL CONTROL INSTRUCTION OF THE EM24-D MECHANISM _

Note:

After each opening of the damper the contact surfaces of the electromagnet shall be cleaned.

In case of releasing the magnetic keeper (e.g. during performing periodic controls) one shall execute the following steps:

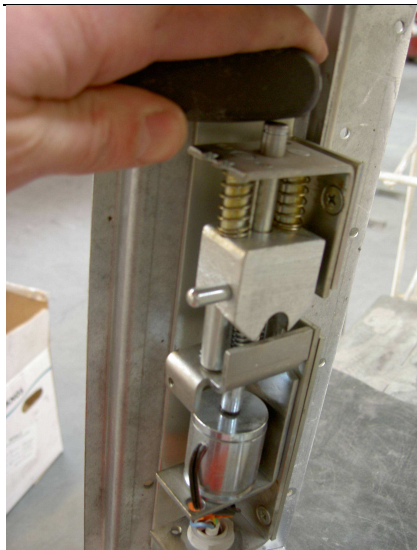


1. Take off the housing of the release lock.



2. Neatly clean magnetic keeper and plate (by removing any contaminations, and in case of difficult to remove sediment by grinding with a fine sandpaper).

mcr DOR smoke exhaust fire dampers with doors



3. Tighten the electromagnetic keeper to the plate in a way that both surfaces will strictly adhere to each itself.



4. Softy tap the lock (in order to ensure whether the magnetic keeper and plate are strongly connected).



5. Close damper leafs, put on the housing of the lock.

NOTE:

In case when the magnetic keeper releases during tapping or soft struggling by the leaf one shall renew cleaning of magnetic keeper and plate.

mcr DOR smoke exhaust fire dampers with doors

Periodical mechanism control includes:



1. Clean the interior of the damper from any contamination.



2. By softly struggling the handle check a sure grip of the electromagnet.



3. By pressing the lock lever open the damper (with the other hand keep the damper leafs securing it against sudden movement and hit); close damper leafs.

NOTE:

In case of automatic release of the electromagnet repeat steps related to cleaning of the magnetic keeper and plate and then check again its proper functioning.

mcr DOR smoke exhaust fire dampers with doors

In case of dampers working in especially difficult environment once every three months one shall make a control including cleaning of the damper surface and checking strength of connection of the electromagnet.

7. HANDLING AND STORAGE CONDITIONS

The fire dampers MCR DOR are packed in cartons or placed on pallets. The fire dampers are protected against damage using protective film or other covering material. The fire dampers may be transported using any means of transport, provided that they are protected against weather conditions. Fire dampers placed on means of transport should be protected against changing the position during transport. After each transport, each fire damper should be visually inspected. The fire damper must not be carried while holding it by the connection cable, and the device must not be placed on the tripping and control mechanism. The fire damper must not be hit or dropped. During carrying and installation, attention should be paid to the fire damper baffle.

The fire dampers should be stacked in no more than 2 layers vertically, in closed rooms ensuring protection against external weather conditions. In the case of storing of the fire dampers on the ground, they should be placed on protective pads in order to protect the fire dampers against deformation and damage.

8. MAINTENANCE AND SERVICE

In order to ensure the correct and uninterrupted operation, the fire damper should be inspected and actuated on a regular basis. The fire damper Manufacturer requires service inspections of the device to be performed every six months. Every inspection of the fire damper should be recorded in a standard report and entered in a service book of a building. The service inspection should be performed by the fire damper Manufacturer or by a company authorised by the Manufacturer to perform services and maintenance. A facility administrator (who contracts services or guarantee work) is obliged to provide free access to the device, e.g. free space necessary for the disassembly of the fire damper, suspended ceilings and other installations, if they prevent access to the device, etc.

9. GUARANTEE TERMS AND CONDITIONS

1. The Manufacturer provides a guarantee for the delivered product for 12 months the date of the product receipt (the date of signing the stock issue confirmation), unless the guarantee period is specified in a separate contract.
2. Any faults revealed during the guarantee period that prevent the correct operation of the product shall be rectified by the Manufacturer after reporting the defect in writing within a deadline set by the Manufacturer during a site call. Remedial work shall start at the latest within 4 working days since the date of reporting.
3. The repair of a defect will be provided only if the Manufacturer is provided with complete access to the installation site (e.g. free space necessary for the disassembly of the fire damper, suspended ceilings and other installations, if they prevent access to the device, etc.).
4. The guarantee is extended by the period from reporting the fault to finishing the guarantee repair.
5. If any faults preventing the further correct operation of the product are found in the product, the Manufacturer shall replace the faulty product with an operative product with no financial consequences to the purchaser.
6. The Manufacturer disclaims the guarantee and any other obligations under the guarantee if:
 - a) the product has mechanical damage caused by:
 - the improper transport or unloading unless the transport has been provided by the Manufacturer,
 - the improper installation (non-compliant with this Documentation and the good building practice) with own forces of the purchaser,
 - the improper operation of the product that does not comply with its application

mcr DOR smoke exhaust fire dampers with doors

- the supply of the product with voltage other than specified in the rated plate of the control-release mechanism
 - b) defects arise as a result of the improper storage of the product
 - c) the purchaser/user has introduced structural modifications on their own, in particular: disassembly of an electromagnetic release mechanism, tampering with the drive mechanism of the product,
 - d) the installation of the product has been performed by the purchaser on their own, not in compliance with the Documentation
 - e) defects arise as a result of the maintenance of the product not in compliance with the Documentation
 - f) a rating plate of the product is removed
 - g) guarantee seals installed on the product are removed or damaged
 - h) regular maintenance of the product is not performed within the timetable and according to the guidelines given by the Manufacturer
 - i) the fire damper is actuated automatically due to exceeding the maximum operating temperature
8. During the complaint procedure for the product, the Manufacturer deducts the equivalent of the parts missing or damaged through the purchaser's/user's fault and the cost of their replacement.