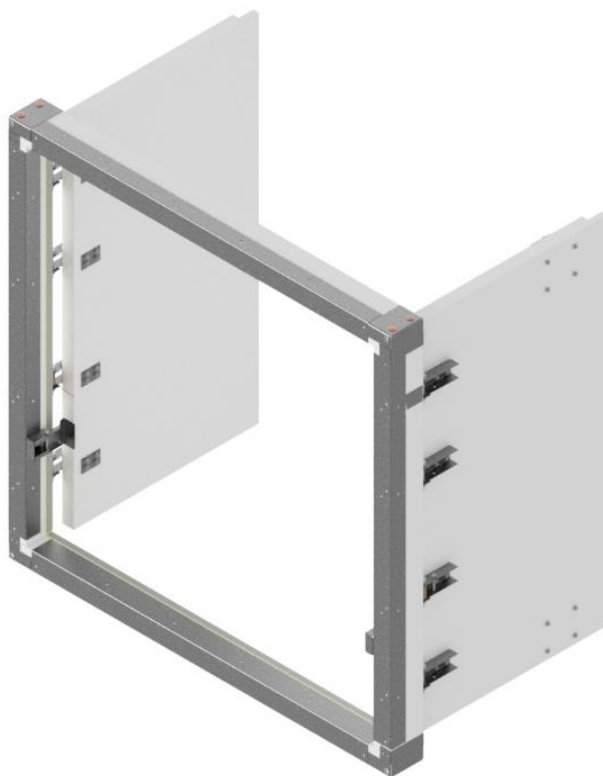


**OPERATION AND  
MAINTENANCE MANUAL  
(OMM)**

**Smoke control dampers  
mcr DOR**



Version mcr DOR 23.07.14.5

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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.

**Before starting the installation and operation of the device, carefully read the contents of this Operation Manual. Failure to follow the instructions in the documentation may lead to dangerous situations, damage to property or health. The manufacturer is not liable for any damage resulting from use that is inconsistent with this documentation.**

## 2. SUBJECT

This manual concerns the entire group of smoke control dampers type mcr DOR. 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

The mcr DOR smoke control dampers for fire ventilation are intended for use in the following types of systems: exhaust systems, aeration systems, relief systems, duct systems, and inert gas extinguishing systems.

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 DOR has the following fire resistance: EI180 ( $v_{ed} i \leftrightarrow o$ ) S1500 C300 AA multi, depending on the application, method and place of installation of the fire damper.

### Execution version

The damper type mcr DOR can be made as rectangular dampers.

### Dimension the series

The damper type mcr WIP LD are manufactured in the following size ranges:

Width: 580 to 1330 mm

Height: 480 to 1330 mm

Width: 110 mm

In addition to standard dimensions, it is possible to manufacture dampers with intermediate dimensions. The maximum area of the mcr DOR dampers is: 1,8 m<sup>2</sup>. The minimum area of the dampers is 0.28 m<sup>2</sup>.

## 4. DESIGN AND OPERATING PRINCIPLE

### Design

mcr DOR smoke door dampers consist of a casing with a rectangular cross-section composed of fire-proof boards, a moving damper blade in the form of two wings and an automatically activated trigger and control mechanism. Special design casing with impregnated fire-proof boards are used in chemically aggressive environments. The damper casing total thickness is 110 mm. The damper blade is made of a fire-proof panel with the total thickness of 40 mm. At the corners and along the entire perimeter of the casing, there are steel reinforcements with a rivet nut system, enabling the installation of masking grilles and frames for connecting steel ventilation ducts.

# mcr DOR smoke control dampers

## Function

The operating principle and behavior of the mcr DOR dampers depend on their application versions::

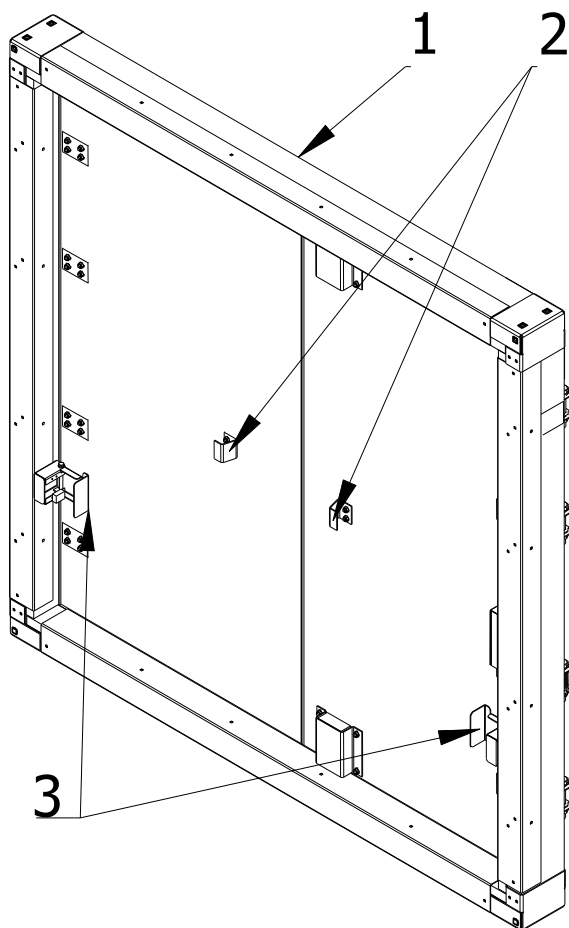
### ■ Smoke control dampers for fire ventilation systems – mcr DOR

In the normal operating position the dampers are closed. The dampers are opened 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.

## CAUTION

**Never pull directly on the damper isolation partition to open or close the device. The damper should not be opened before installation in the fixing structure. Doing so may damage the drive mechanism and partition and is not covered by the warranty. To close the damper partition, there are handles located on the partition. Before closing the partition, unlock it. To do this, gently pull the movable blocking element until it is moved to the 90 ° position, then start closing the door by holding the handles. It is recommended that the dampers be opened and closed while the ventilation system remains turned off.**



1. Damper mcr DOR BxH
2. Handles
3. Mechanical locks

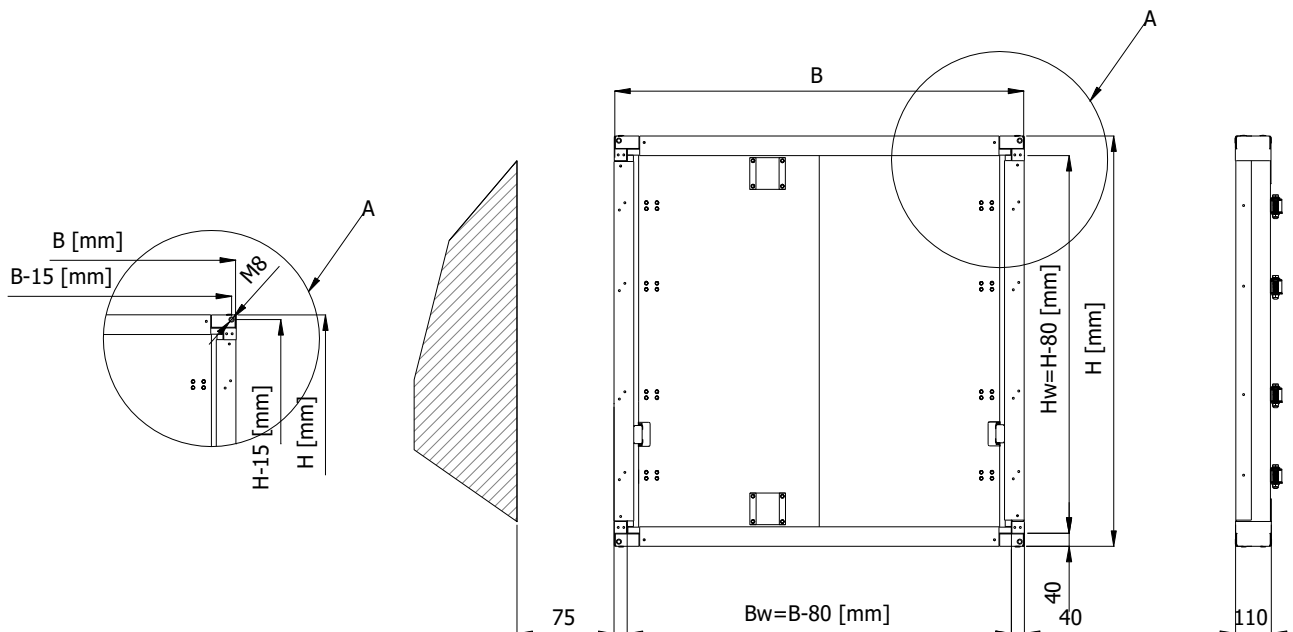
## Handles and mechanical locks.

### Release and control mechanisms

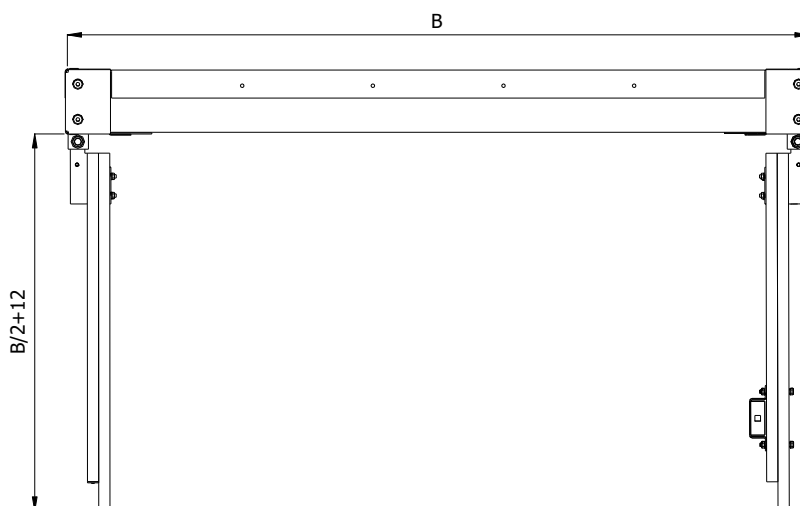
mcr DOR dampers are equipped with a EMxxD-type trigger and control mechanisms. The mechanism is equipped with a special lever-caming system, 24VDC or 230 V AC electromagnetic trigger and drive springs placed directly on the hinges of the damper partitions. After removing or providing the supply voltage, the mechanism is slowed down, causing the device to work.

# mcr DOR smoke control dampers

## Basic dimensions

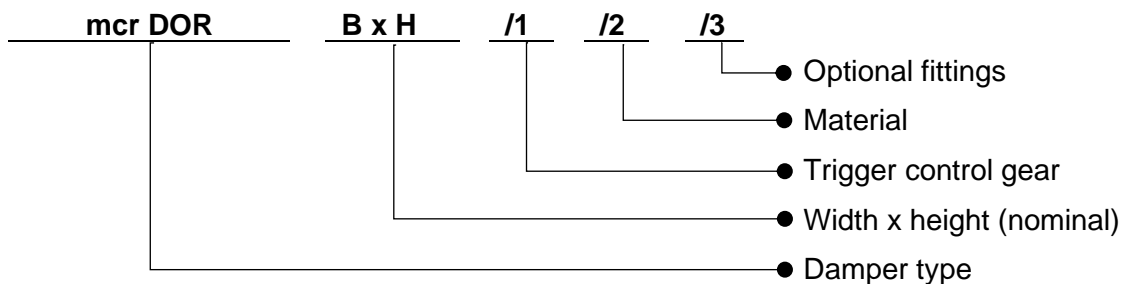


mcr DOR damper in closed position.



mcr DOR damper in open position.

## 5. DEVICE IDENTIFICATION



All exact trade markings of devices are available in the Technical Catalog.

## 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..

Damper type mcr WIP LD can be installed in the following building partitions:

- walls / shafts made of wood with the thickness required for fire resistance
- walls / shafts made of concrete with the thickness required for fire resistance
- walls / shafts made of bricks or blocks with the thickness required for fire resistance
- walls / shafts made of boards with the thickness required for fire resistance
- ceilings with the thickness required for fire resistance

Additionally, the dampers can be installed:

- outside the partitions (walls)
- in modules (sets)
- in batteries (sets)

The mcr DOR dampers can also be installed in partitions with a lower fire resistance class. In the case of such installation, the fire dampers have the fire resistance equal to the fire resistance of the partition, while maintaining the smoke tightness criterion

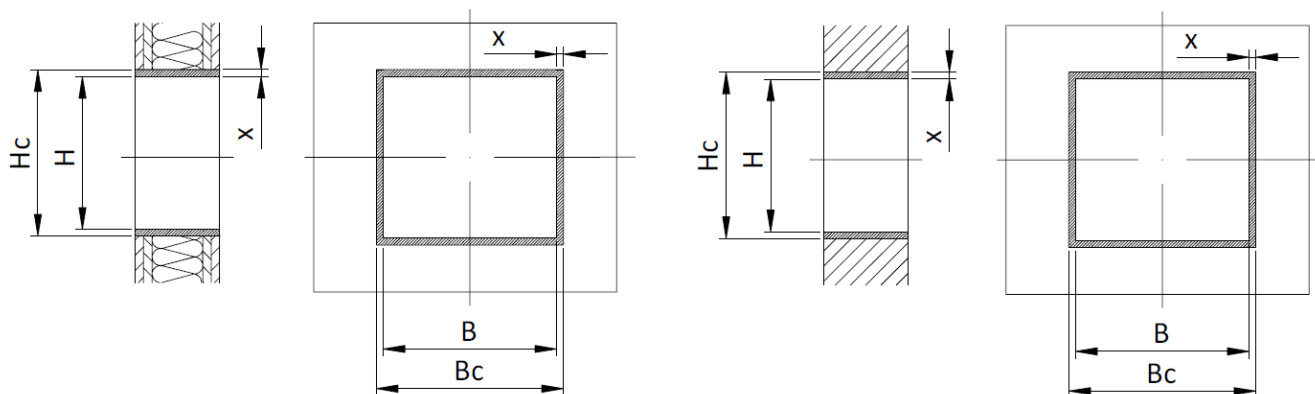
### 6.1. PRE-ASSEMBLY INSPECTION

Each damper is inspected by the manufacturer before packing and transporting. After unpacking at the customer's place, a visual inspection should be carried out for possible deformation of the casing or damage to the damper during transport.

### 6.2. INSTALATION OPENING

The minimum size of the opening enabling correct installation of the damper, depending on the installation method and type construction

■ Installation in the wall of a shaft in accordance with EN1366-8 and EN1366-9:



for the thickness of the shaft wall  $\geq 110\text{mm}$

$$H_c = H + 10$$

$$B_c = B + 10$$

# mcr DOR smoke control dampers

for the thickness of the shaft wall <110mm

$$H_c = H + 10 + 2X + L$$

$$B_c = B + 10 + 2X + L$$

Gdzie:

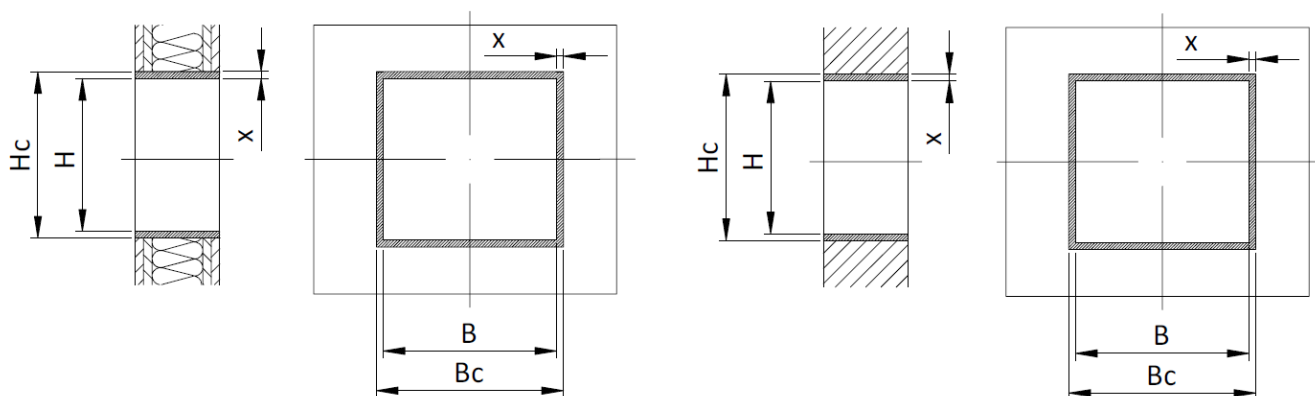
X = thickness of the used fire-resistant board band,

10 - mounting distance (5 mm per side) between the damper and the band,

L – assembly distance between the band and the wall/shaft, resulting from the assembly technology,

The thickness of the band used depends on the resistance to be obtained for the fire separation (shaft walls).

■ Installation in the wall of any shaft with fire resistance or any fire separation wall:



$$H_c = H + 10 + 2X + L$$

$$B_c = B + 10 + 2X + L$$

gdzie

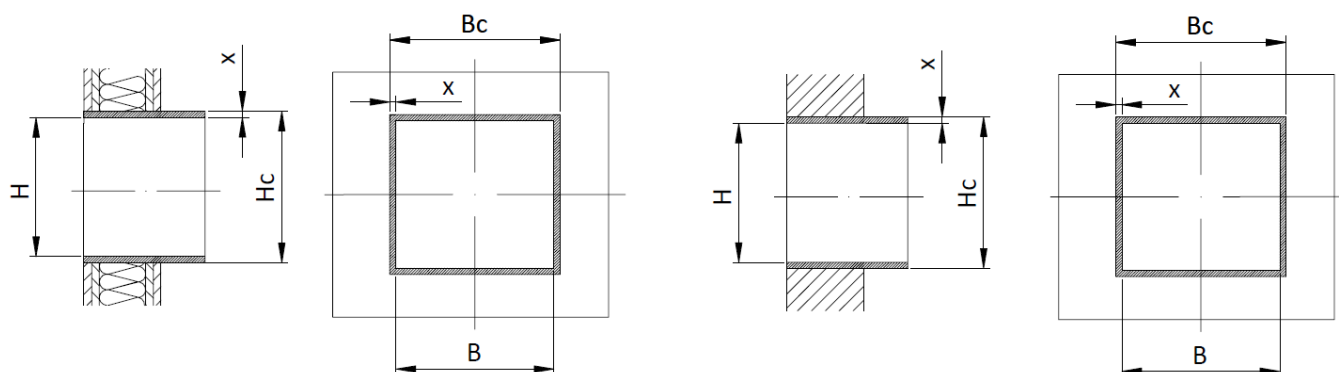
X = thickness of the used fire-resistant board band,

10 - mounting distance (5 mm per side) between the damper and the band,

L – assembly distance between the band and the wall/shaft, resulting from the assembly technology,

The thickness of the band used depends on the resistance to be obtained for the fire separation (shaft walls).

■ Installation in the duct in accordance with EN1366-8 and EN1366-9, passing through the wall:



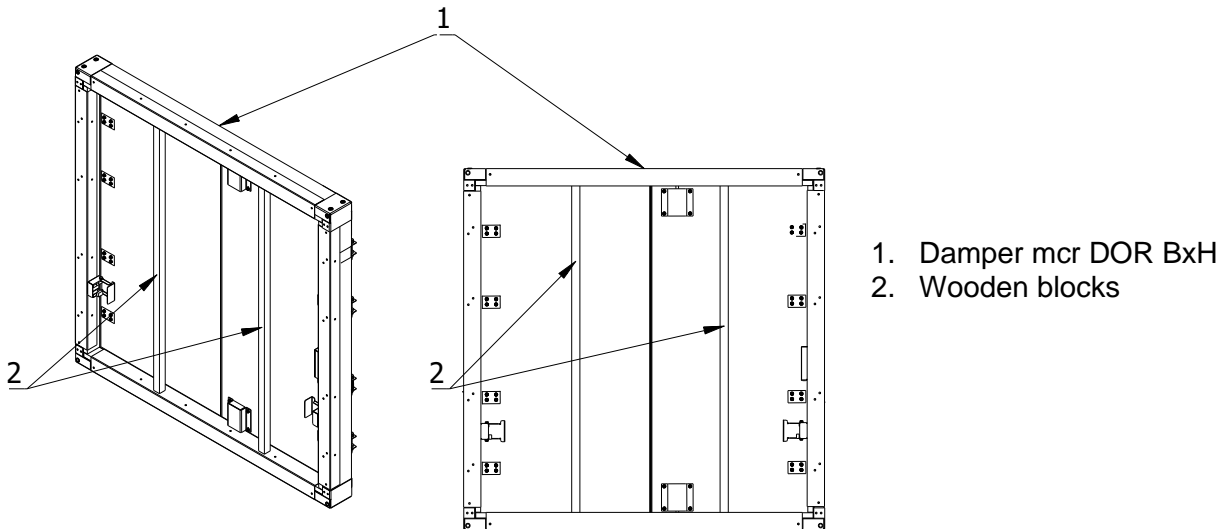
$$H_c = H + 10 + 2X$$

gdzie

X = thickness of the used fire-resistant board band,

10 - installation distance (5 mm per side) between the damper and the net dimension of the duct. The thickness of the duct wall depends on the manufacturer of the solution.

## 6.3. EMBEDDING / FIXING THE DAMPER



### Protecting the damper against buckling.

The proper operation of the mc DOR damper is maintained when the axis of the partition is along the horizontal axis. The trigger and control mechanism can be located on the right or left side of the damper and in any direction of air flow.

The structural opening for the damper varies depending on the type of wall or shaft. Before fitting the damper, the opening for installation should be properly prepared, in accordance with the drawings included in the operation and maintenance manual.

### Opening without additional band.

The damper should be placed axially in the prepared structural opening, leveled and immobilized. Install expansion elements as shown in the above-mentioned drawing. The gap between the damper casing and the opening should be tightly filled with e.g. mineral wool, with A1 non-flammability class confirmed by a certificate and with a density and thickness ensuring fire resistance not lower than the resistance of the wall or shaft in which the damper is installed. The filled space should be additionally sealed with a suitable mortar or filler mass having the fire resistance required for the wall or shaft. Particular attention should be paid to prevent the mortar from getting on the damper actuators (release and control mechanism, partition, seals, limiters).

### Opening with additional band.

The band should be anchored in the opening and the space between the wall or shaft and the band should be sealed with a suitable mortar. The damper should be placed axially in the hole prepared in this way. Then level the device and immobilize it. Install expansion elements as shown in the above-mentioned drawing. The gap between the damper casing and the trim should be carefully filled with a suitable mortar ensuring fire resistance of the wall and damper, paying particular attention to prevent it from getting on the damper's actuators (release and control mechanism, partition, seals, limiters).

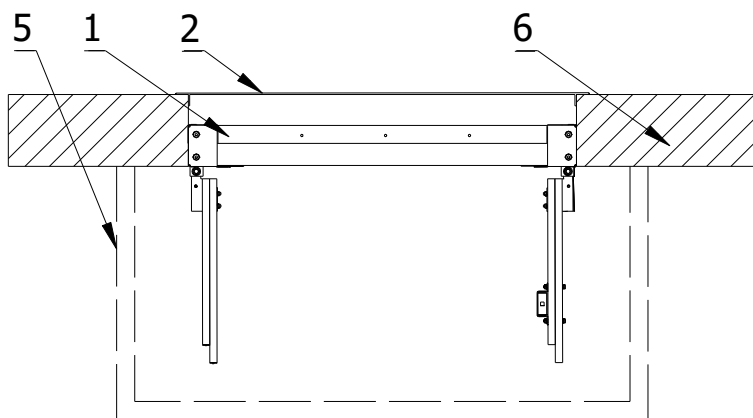
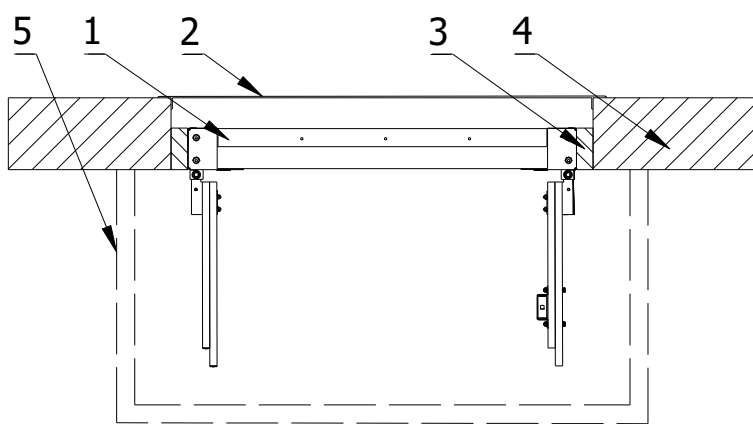
In order to protect the damper actuators against damage during assembly, the damper must be absolutely protected with foil or other covering material before the assembly, until the bricklaying and finishing works are completed. **The partition must remain closed until the mortar sets.** After the mortar has set, remove the brackets and open and close the hatch again in order to check its correct operation.



## mcr DOR smoke control dampers

Connecting the inserted damper to the ventilation duct must be made in co-coaxial. When installing the damper in the partition, the damper body can not be damaged, and in particular to the formation of stresses. The damper cannot be a support element of the duct or a ventilation installation on which it is installed. It is unacceptable to drill the flap housing in any places, screwed screws, screws and other elements passing through the housing (these elements can block the operation of the partition and damage the release and control mechanism). Places for drilling the housing for anchoring for the fastening structure are marked (holes in the metal housing). Before anchoring, drill the body with a drill. After connecting the ventilation duct, check the correct operation of the damper again. When installing mcr DOR dampers, do not expose swelling seals installed in the housing to high temperatures. The detachment of the seals prevents the damper from closing. After completing the installation, clean the damper thoroughly and make sure that the remains of debris did not remain in it that could affect the correct operation of the damper.

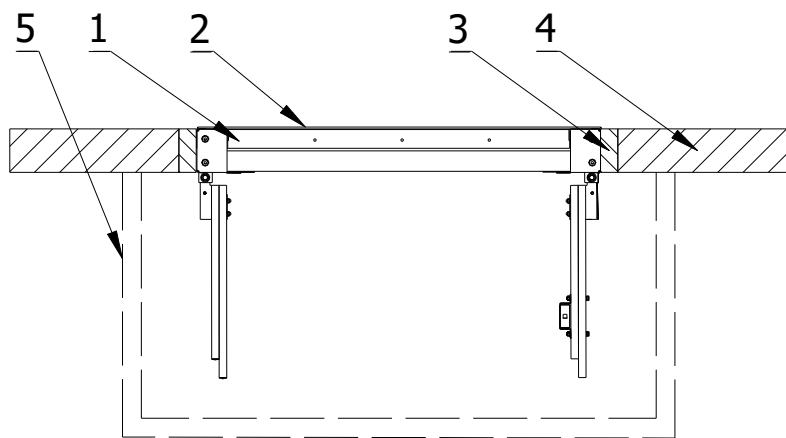
In order to protect the damper partition against mechanical damage when opening, in the event of a collision of the partition with the walls of the shaft, the contact surfaces should be secured with an additional bumper.



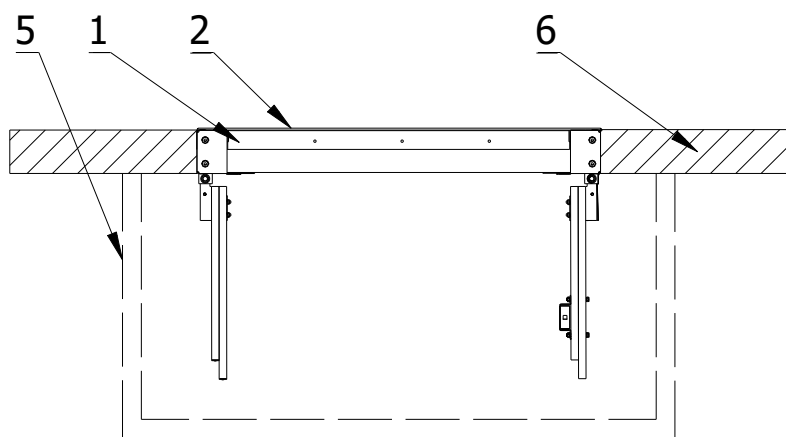
1. Damper mcr DOR BxH
2. Masking grille MWD (option)
3. A strip of fire-proof board along the entire length of the BxH side\*
4. Shaft wall
5. Vertical fire ventilation shaft
6. Wall of a shaft compliant with EN1366-8 or EN1366-9\*

**Damper installation in shaft walls >110 mm.**

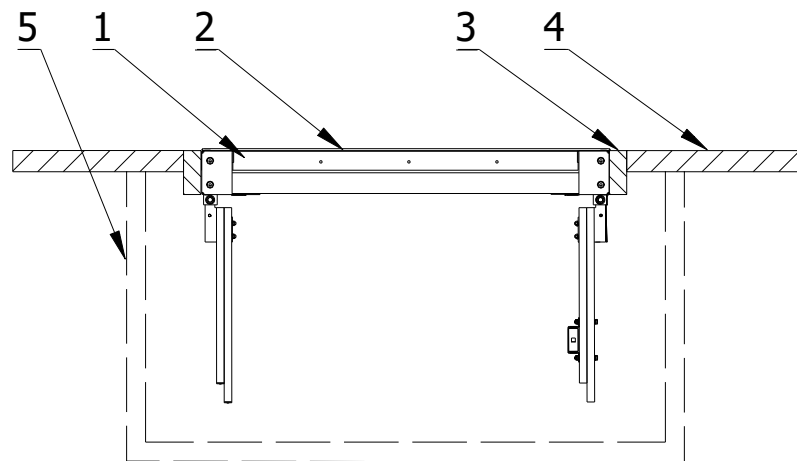
# mcr DOR smoke control dampers



1. Damper mcr DOR BxH
2. Masking grille MWD (option)
3. A strip of fire-proof board along the entire length of the BxH side\*
4. Shaft wall
5. Vertical fire ventilation shaft
6. Wall of a shaft compliant with EN1366-8 or EN1366-9\*

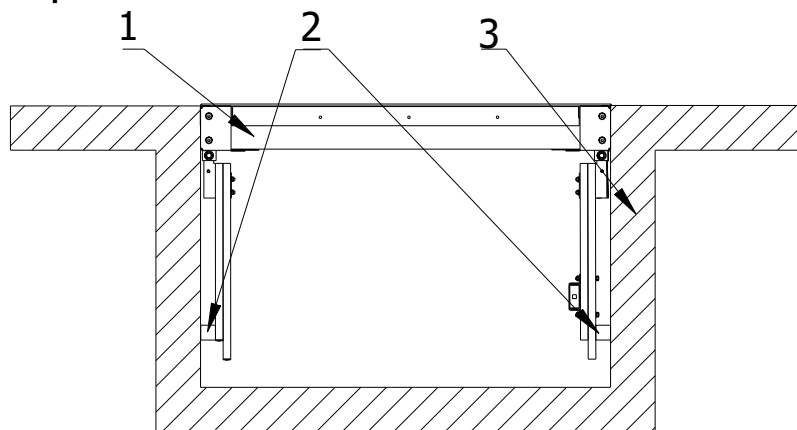


**Damper installation in shafts with a thickness of 110 mm.**



1. Damper mcr DOR BxH
2. Masking grille MWD (option)
3. A strip of fire-proof board along the entire length of the BxH side\*
4. Wall of a shaft compliant with EN1366-8 or EN1366-9\*
5. Vertical fire ventilation shaft

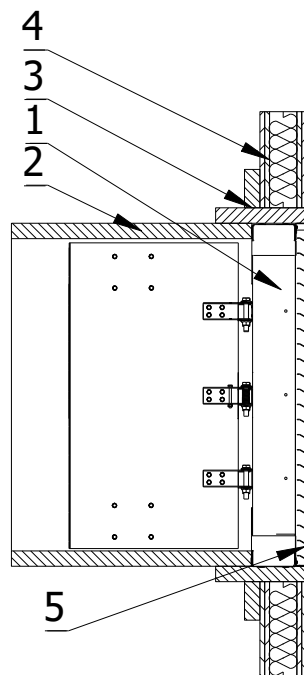
**Damper installation in shafts with a thickness <110 mm.**



1. Damper mcr DOR BxH
2. Mechanical bumper
3. Shaft wall

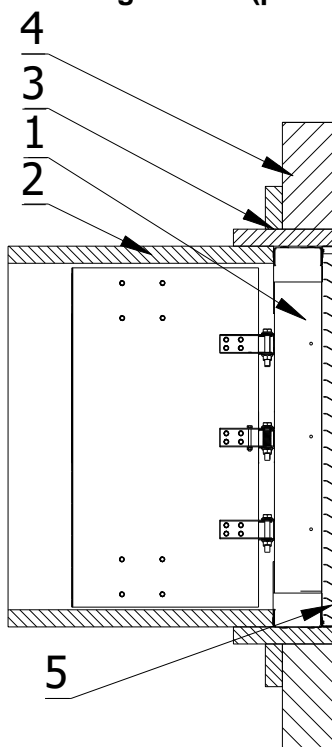
# mcr DOR smoke control dampers

Installation of protection elements against mechanical damage to the mcr DOR damper.



1. Damper mcr DOR BxH
2. Multi-compartment smoke extract duct – e.g. made of fire-proof boards\*
3. A strip of fire-proof board along the entire length of the BxH side\*
4. Cardboard wall
5. Masking grille MWD (opiton)

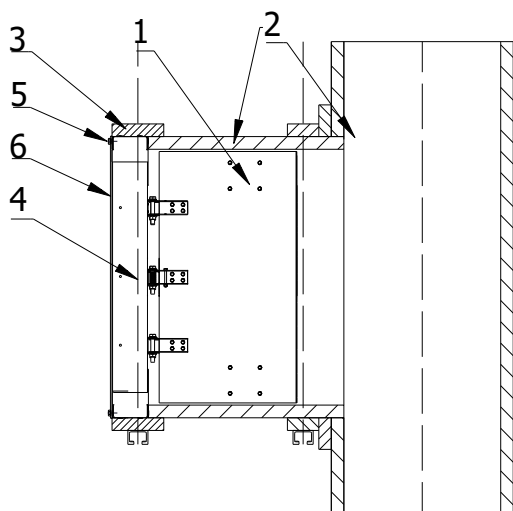
Damper installation in light walls (plasterboard) with a multi-compartment horizontal ducts.



1. Damper mcr DOR BxH
2. Multi-compartment smoke extract duct – e.g. made of fire-proof boards\*
3. A strip of fire-proof board along the entire length of the BxH side\*
4. Solid wall
5. Masking grille MWD (opiton)

Damper installation in solid walls with a multi-compartment horizontal ducts

# mcr DOR smoke control dampers



1. Damper mcr DOR BxH
2. Multi-compartment smoke extract duct – e.g. made of fire-proof boards\*
3. A strip of fire-proof board along the entire length of the BxH side\*
4. Installation hangers system
5. M10 x 20 bolt
6. Masking grille MWD (option)

## Damper installation in a multi-compartment horizontal ducts

### CAUTION

Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper and the ducts with the appropriate mortar/glue/gaskets, ensuring that the fire resistance rating is maintained. The smoke control damper in vertical fire ventilation systems may be installed 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. A masking grille may terminate the system.

## 6.4. ELECTRICAL CONNECTION

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 DOR dampers.

Dampers with a "impulse" type controlling mechanism open as a result of the voltage (current pulse min. 5s twice), as a result of propulsion springs affecting the damper partition. The dampers are closed after removing the power supply voltage from the mechanism clamps and manually set the dampers partition to the close position.

Dampers with a "break" type controlling mechanism open as a result of a break of the voltage, as a result of propulsion springs affecting the damper partition. The dampers are closed after manually set the dampers partition to the close position, then supplying the supply voltage.

As part of the service, after starting the release and control mechanism, clean the electromagnets contact surfaces should be cleaned.

### Release and control mechanism EM24xxD

	EM24D-I	EM24D-P	EM230D-I	EM230D-P	MP230/24
Rated voltage	24V DC	24V DC	230V AC	230V AC	230V AC
Power intake	3,5W	1,6W	4VA	5,5VA	2W
Connection	Terminal block 10x2,5mm <sup>2</sup>		Terminal block 10x2,5mm <sup>2</sup>		Terminal block 4x0,5mm <sup>2</sup>
Output voltage	X	X	X	X	24V DC stabilized

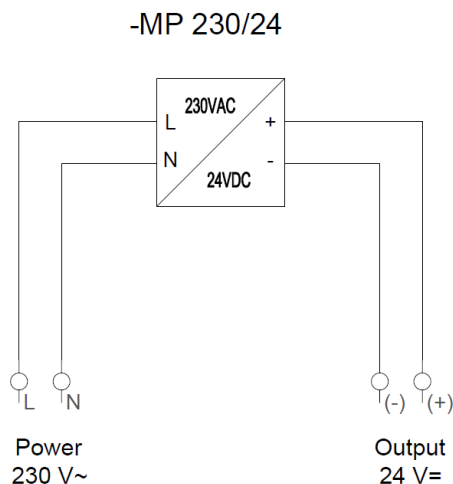
For a triggering and control mechanism of the damper, should be provided with adequate power supply, guaranteeing the control of the control signal or voltage to the device in the event of a fire. The electrical

# mcr DOR smoke control dampers

connection should be made accurately according to the attached scheme and in accordance with the instructions presented in point 6.4 of this documentation. It should be made by a person with confirmed electrical qualifications, in accordance with applicable regulations. All dampers service works should only be carried out after disconnecting the device from the power supply.

## CAUTION

For proper work of the device, it is recommended that the rated voltage housed tolerance of **24V±2% or 230V±2%**. Power supply devices other than listed above may cause malfunction and will not be covered by the warranty conditions.



Connection diagram for transformer module type MP230/24

## Independent sets of limit switches.

Limit switch WK1 oraz WK2 1xNO/1xNC SPDT

Limit switches	1xNO/1xNC SPDT 5A, 230V AC
The operating temperature	-25 ...+85°C
Housing	Plastic

## Power supply:

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

### Limit switch WK1– damper closed:

Terminal number: 6-5 – type NO

Terminal number: 4-5 – type NC

### Limit switch WK2 – damper opened:

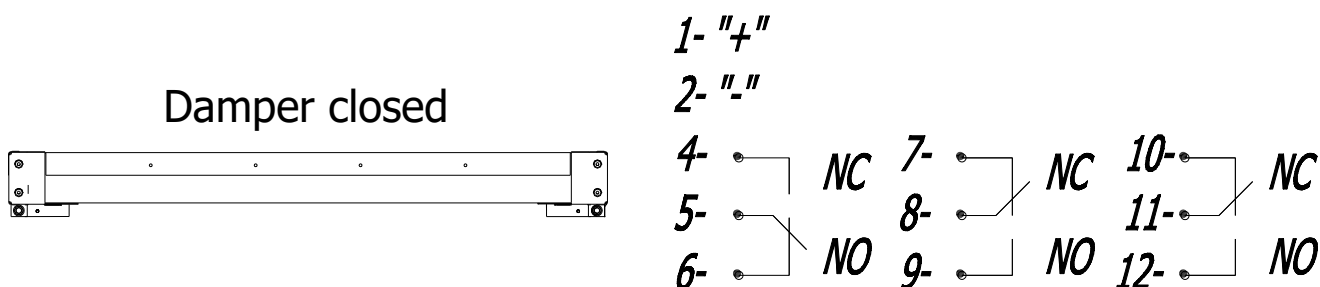
Terminal number: 9-8 – type NO

Terminal number: 7-8 – type NC

### Limit switch WK2 - damper opened:

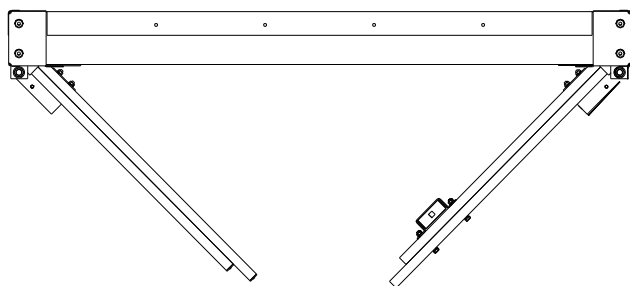
Terminal number: 12-11 – type NO

Terminal number: 10-11 – type NC



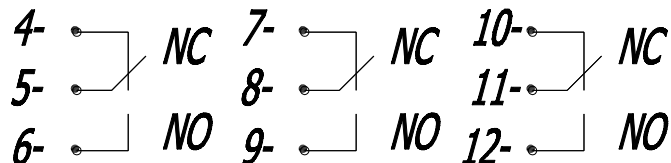
# mcr DOR smoke control dampers

## Transition



1- "+"

2- "-"



## Damper opened



1- "+"

2- "-"

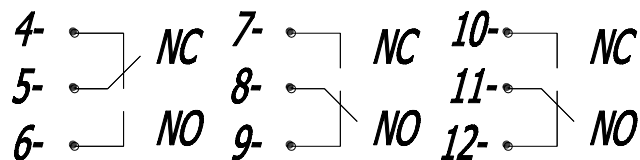


Diagram of electrical connections of the WK1 and WK2 limit switches

### CAUTION

For proper work of the device with the limit switches, 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.

In the case of damper working in particularly difficult conditions once every 3 months, a review should be carried out including cleaning the electromagnetic surface and checking the confidence in hold.

## 7. TRANSPORT & STORAGE CONDITIONS

Fire dampers are packaged in cardboard boxes or placed on pallets. Dampers are protected against damage by film or another covering material. Damper transport may take place using any means of transport, provided they are protected against weather factors. Dampers placed on means of transport should be secured against shifting of position during transport. Before installing dampers, control each of them visually. Do not move the damper by holding by the connection cable or put a device on a release and control mechanism. Do not hit or drop the damper. When moving and installing, support the damper on the sides or edges of the body.

Dampers should be stored in closed rooms that provide protection against external weather conditions. In the case dampers are stored on the ground, place them on protection pads in order to protect them 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 dampers 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](mailto: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](mailto: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.
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:

## mcr DOR smoke control dampers

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- 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. If the devices are used in the above-mentioned places, they should be additionally and independently protected against factors prevailing in the place of their work.
  - 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.*



# mcr DOR smoke control dampers

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2434

**MERCOR S.A. and 380-470**

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2434-CPR-0246

PN-EN 12101-8:2012 (EN 12101-8:2011)  
Smoke control damper – multi and single zone

**mcr DOR**

<b>Nominal activation conditions/sensitivity:</b> - Closing/opening during the test and the right time	Automatic activation – positive result
<b>Response time:</b> - Closure time	Automatic activation – positive result
<b>Reliability:</b>	300 cycles - positive result
<b>Fire resistance:</b> - Integrity E - Insulation I - Smoke leakage S - Mechanical stability (E category) - Maintenance of the cross section (E category)	EI 180 (v <sub>ed</sub> i< -- >o)S 1500C <sub>300</sub> AA multi
<b>Durability:</b> - time delay - maintenance of certainly operation	positive result positive result