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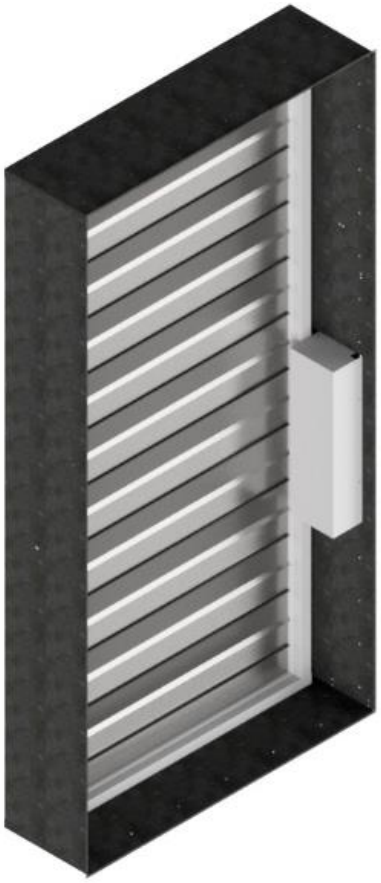
OPERATION AND MAINTENANCE MANUAL (OMM)

Smoke control dampers

mcr WIP LD



Version mcr WIP LD 22.12.29.3

FIRE VENTLIATION SYSTEMS

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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 multi-plane fire dampers type mcr WIP LD. 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 WIP LD 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. It can be used the same in smoke control and natural smoke control systems.

Smoke control dampers for fire ventilation systems the mcr WIP LD /V and for mixed fire ventilation systems the mcr WIP LD /M, have one declaration of performance in accordance with the requirements of law. The marker /V and /M 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 WIP LD has the following fire resistance: EI120(vew i→o) S1000 C10.000 AA multi, depending on the application, method and place of installation of the fire damper.

Execution version

The damper type mcr WIP LD can be made as rectangular dampers.

Dimension the series

The damper type mcr WIP LD are manufactured in the following size ranges:
Width: 300 to 1100 mm
Height: 600 to 2300 mm
Width: 350 mm

In addition to standard dimensions, it is possible to manufacture dampers with intermediate dimensions. The exception are the dampers, the height of which ends with a dimension in the range of 36-54, e.g. 136-154, 236-254. The maximum area of the mcr WIP LD dampers is: 2.53 m2. The minimum area of the dampers is 0.18 m2.

4. DESIGN AND OPERATING PRINCIPLE

Design

The mcr WIP LD dampers consist of a casing with a rectangular cross-section, a movable shut-off partition in the form of blades, rotating around their own axes, and a remotely actuated release and control mechanism, which is located inside the damper. The damper casing is made of galvanized steel sheet or stainless steel sheet. The damper is equipped with a connection flange on one side. On the other, there is the so-called barefoot end. The blades of the damper are made of galvanized steel sheet or of stainless steel. The shutter blades rotate around an axis which is made of steel pins. There is a ventilation gasket on the blades in order to obtain "cold" tightness of the entire damper.

Function

The operating principle and behaviour of the mcr WIP LD dampers depend on their application versions::

■ **Smoke control dampers for fire ventilation systems** – mcr WIP LD

In the normal operating position the dampers are open or close depending on the function. The dampers are closed/ 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.

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.
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.

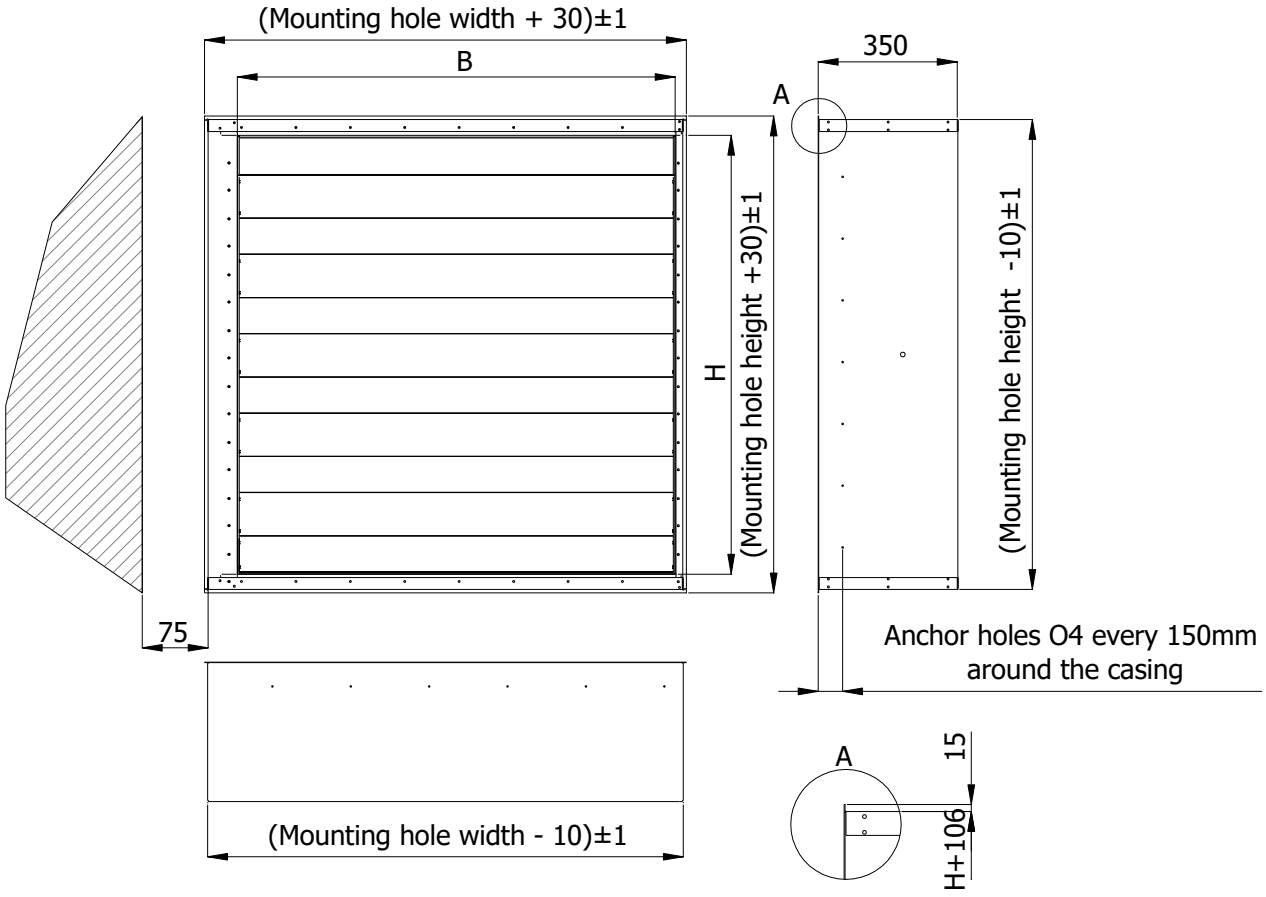
Trigger control gears

The following trigger control gears are available for the mcr WIP LD dampers:

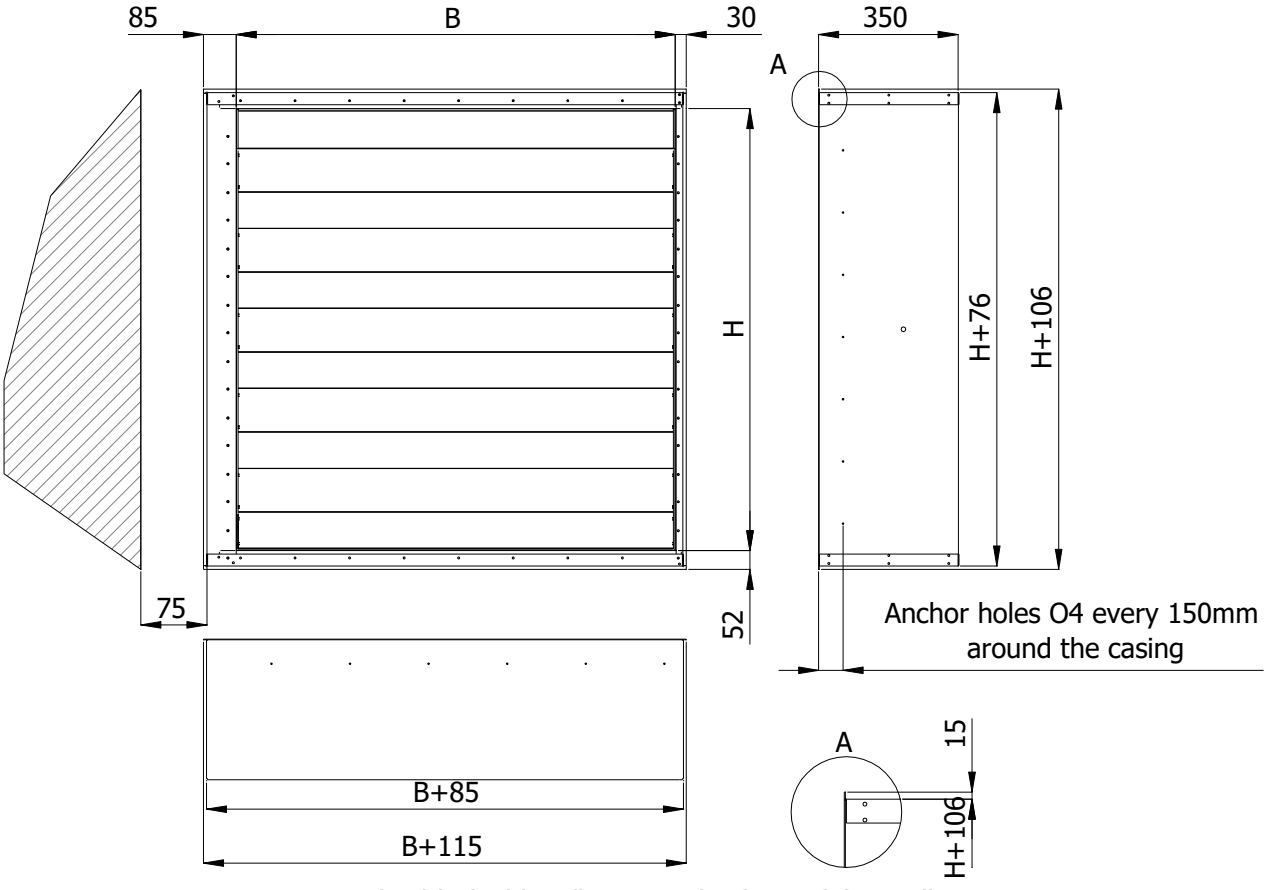
Electric actuator:

- BEE 230
- BEE 24 (-ST)
- BEN 230
- BEN 24 (-ST)
- BE 230
- BE 24 (-ST)

Basic dimensions

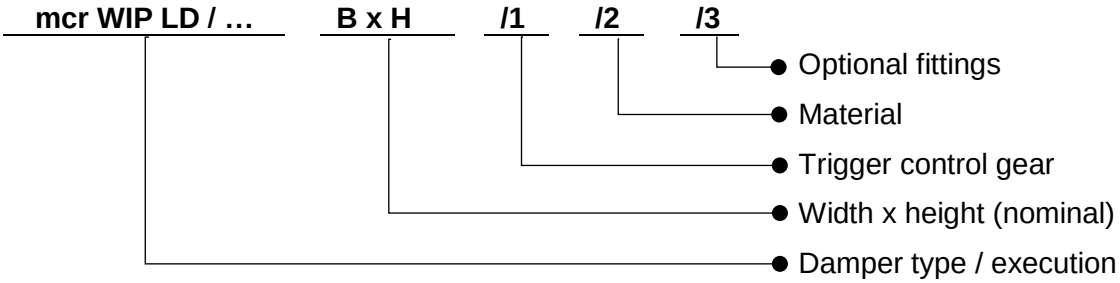


embedded with a flange to the face of the wall



embedded with a flange to the face of the wall

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 - concrete with a thickness of 125 [mm]
- walls / shafts made of bricks or blocks with a thickness of 125 [mm]
- walls / shafts made of boards with a thickness of 125 [mm]
- ceilings with a thickness of 150 [mm]

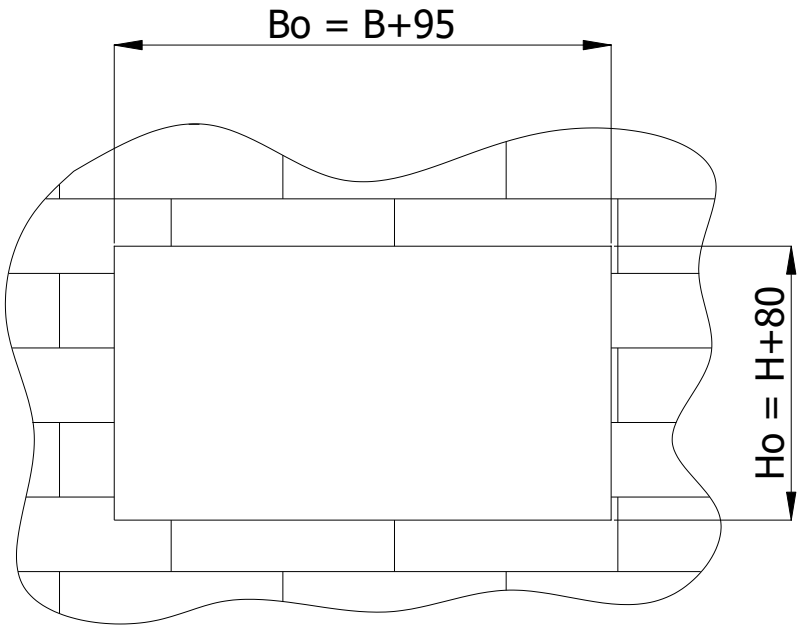
The mcr WIP LD dampers can also be installed in partitions with a lower fire resistance class. In the case of such installation, the fire dampers have the fire resistance equal to the fire resistance of the partition, while maintaining the smoke tightness criterion. When installing a damper in a given type of wall, the thickness of which is less than required, locally, e.g. by installing an additional board or other construction element, increase its thickness around the perimeter of the installed damper.

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. Check that the damper opens and closes properly.

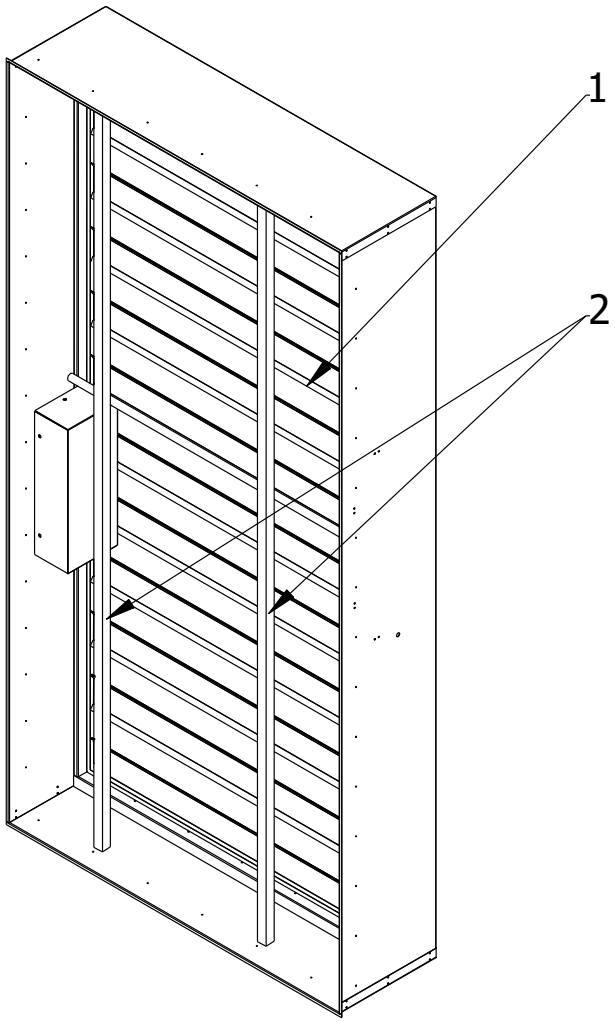
6.2. INSTALATION OPENING

Bo = (B+95) mm
Ho = (H+80) mm



Preparation of the installation opening.

6.3. EMBEDDING / FIXING THE DAMPER



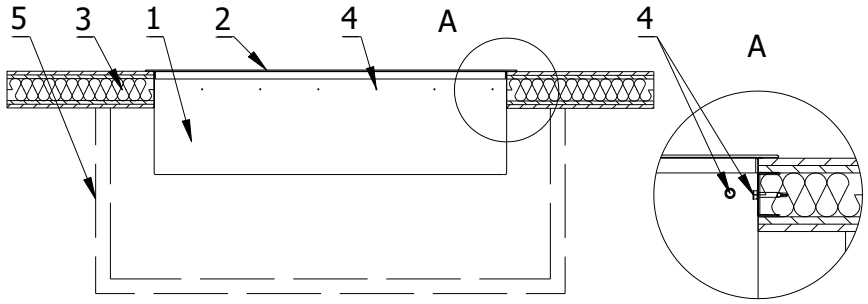
1. Damper mcr WIP LD
2. Wooden blocks

Protecting the damper against buckling.

The mcr WIP LD damper will work properly if the isolation partition rotation axis is horizontal. 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.

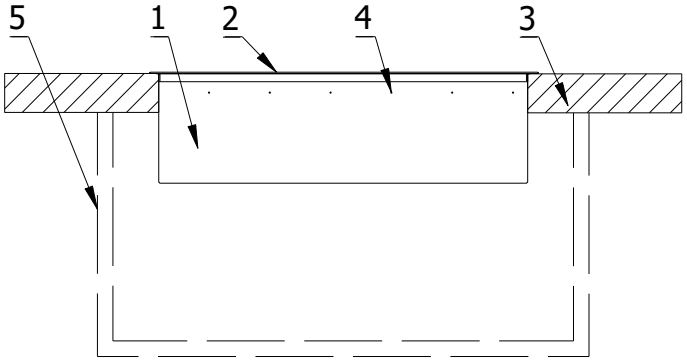
Before embedding/fixing, place the damper axially aligned within the partition (the wall or ceiling which separates the fire zones) in the finished installation opening. Level the device and secure in place. Next, actuate the damper isolation partition by hand to verify that the rotation is correct (i.e. 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 sealing that ensures proper wall and damper fire resistance, and do not let the sealing 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 sealing has cured. Once the sealing 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 sealing or putty that has the fire resistance required for the wall.

The connection of the embedded damper to the ventilation duct must be made coaxially. During the installation of the damper, the damper body must not be damaged, and in particular, it must not be stressed. The damper cannot constitute a "supporting element" of the duct or ventilation system on which it is installed. It is forbidden to drill through the damper housing, screw in screws, bolts and other elements passing through the housing to the damper's center in any place. The places used to drill through the casing for anchoring to the fastening structure are marked (holes in the metal casing). After connecting the ventilation duct, check the damper operation again.



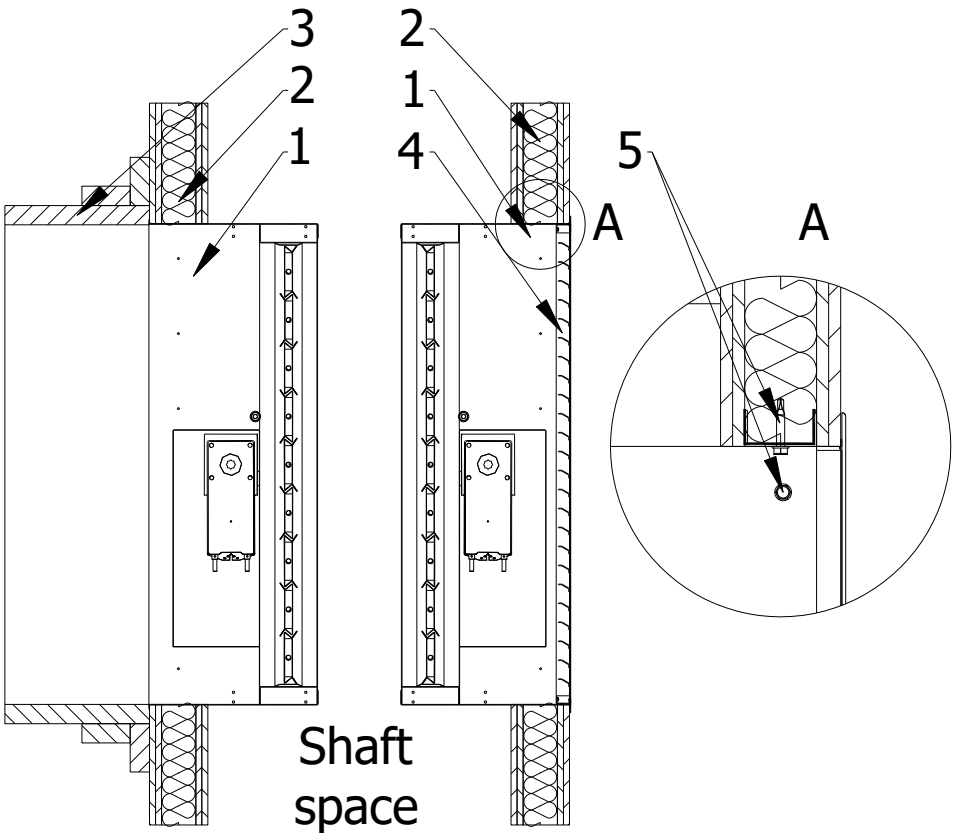
1. Damper mcr WIP LD BxH
2. Masking grille MWS (option)
3. Cardboard wall of shaft
4. Anchor
5. Vertical fire ventilation shaft

Damper installation in light walls (plasterboard).



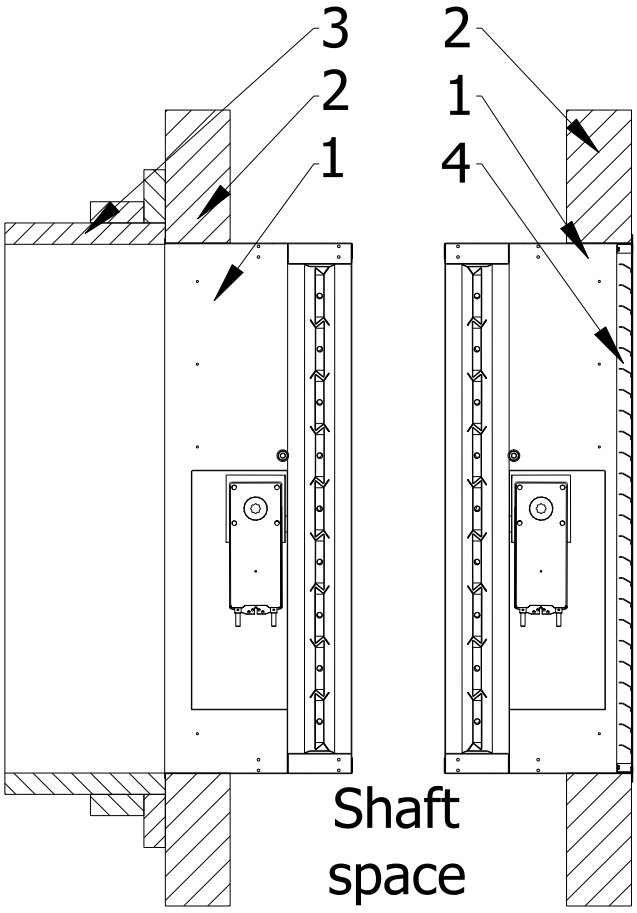
1. Damper mcr WIP LD BxH
2. Masking grille MWS (option)
3. Solid wall of shaft
4. Anchor
5. Vertical fire ventilation shaft

Damper installation in solid walls.



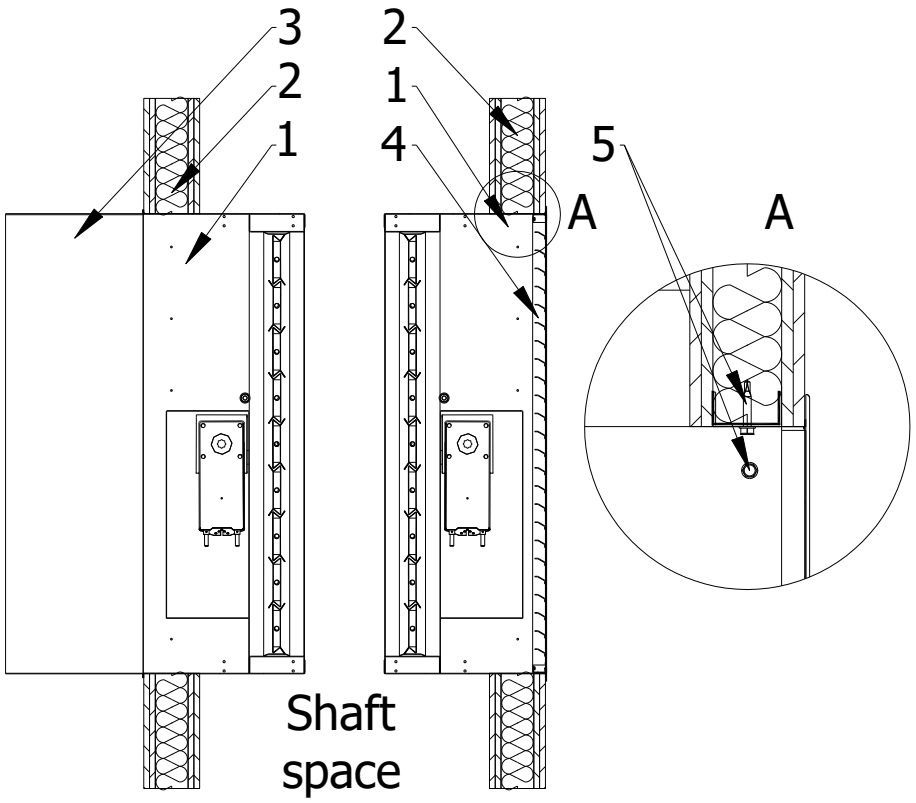
1. Damper mcr WIP LD BxH
2. Cardboard wall
3. Multi-compartment smoke extract duct – e.g. made of fire-proof boards
4. Masking grille MWS (opiton)
5. Anchor

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



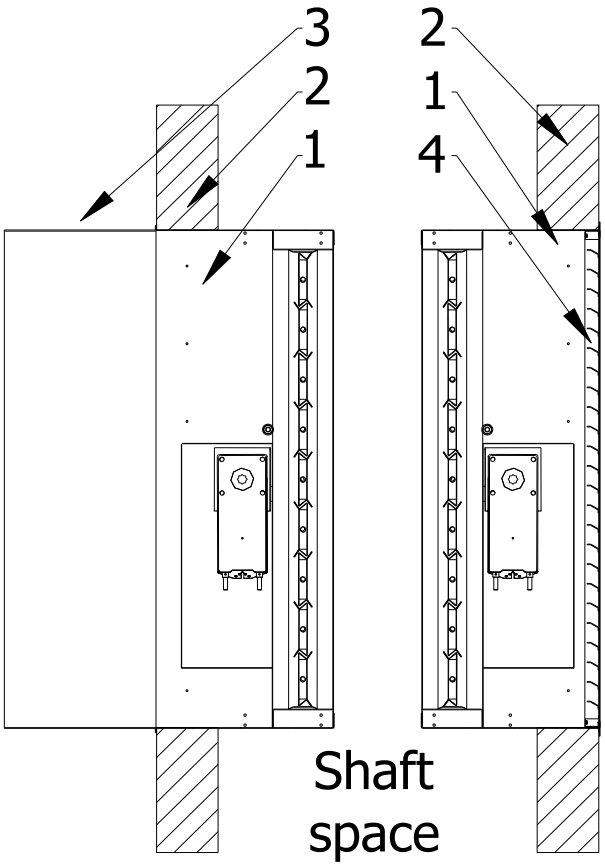
1. Damper mcr WIP LD BxH
2. Solid wall
3. Multi-compartment smoke extract duct – e.g. made of fire-proof boards
4. Masking grille MWS (opiton)

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



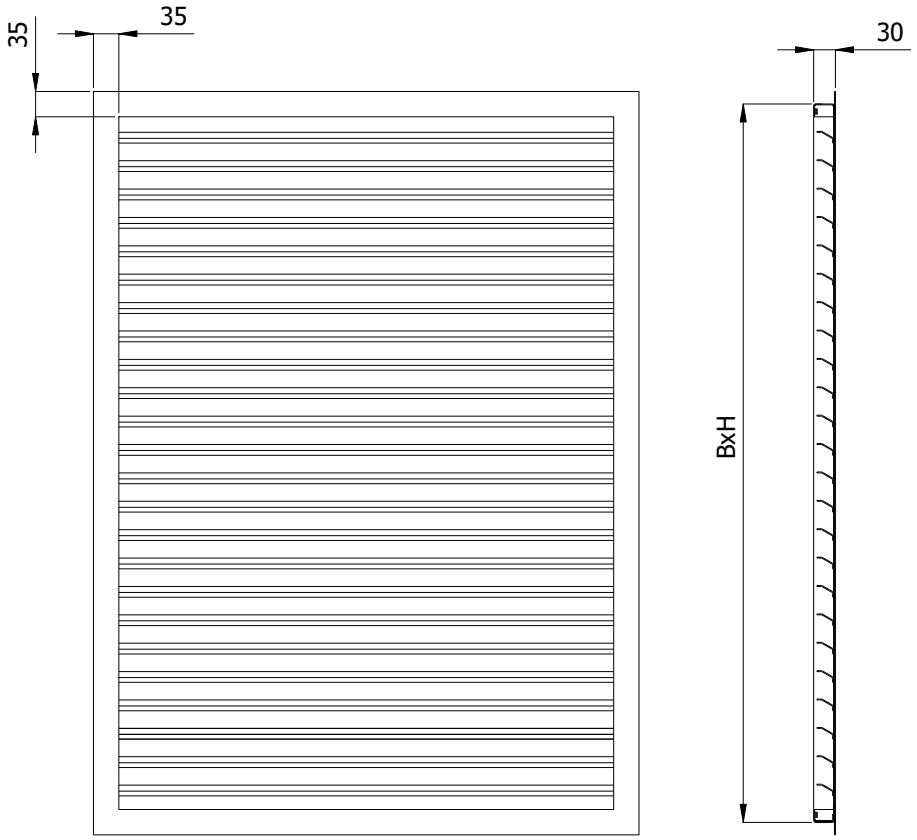
1. Damper mcr WIP LD BxH
2. Cardboard wall
3. Single-compartment smoke extract duct – e.g. made of steel
4. Masking grille MWS (opiton)
5. Anchor

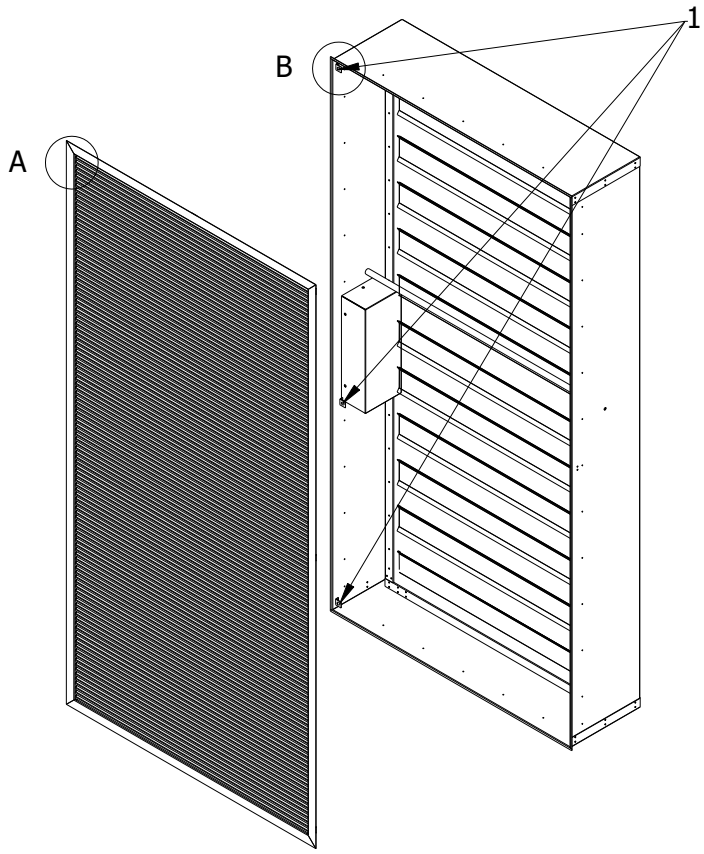
Damper installation in light walls (plasterboard) with a single-compartment horizontal ducts and grille.

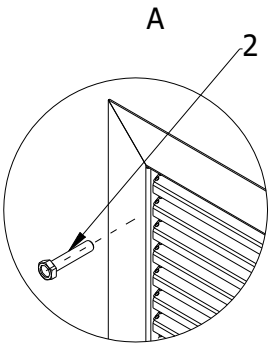


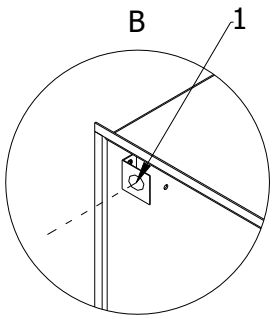
1. Damper mcr WIP LD BxH
2. Solid wall
3. Single-compartment smoke extract duct – e.g. made of steel
4. Masking grille MWS (opiton)

Damper installation in solid walls with a single-compartment horizontal ducts and grille.









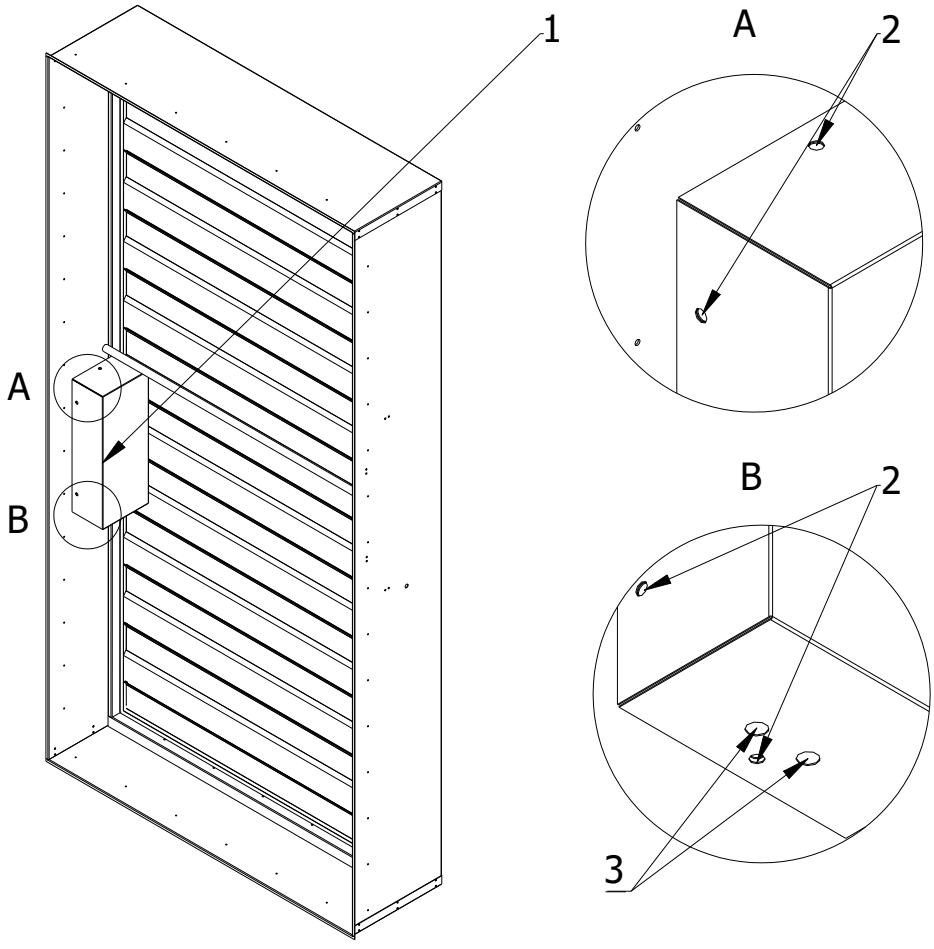
1. Mounting bracket
2. Fixing screw

In order to install the grille to the damper, guide the screws through the blades of the grille to the mounting bracket. Mounting brackets are located around the entire internal sides of the damper casing.
The MWS cover grille can be delivered as a system grate by the damper manufacturer. The solution of system masking grilles is dedicated in particular to utility spaces with high architectural and utility requirements. With wall thicknesses greater than 125mm, you can use system grilles and non-system grilles mounted directly to the wall.

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 WIP LD dampers.

The actuator is located inside the damper in a metal casing. For electrical connection the actuator, drill a hole of the appropriate diameter in the damper housing. Be careful not to block the damper blades. Then, insert the electric wires inside the damper. For electrical connection, open the housing by unscrewing the screws. The cables should be inserted through the electrical holes shown in the figure below.



1. Actuator housing
2. Fastening screws
3. Cable glands

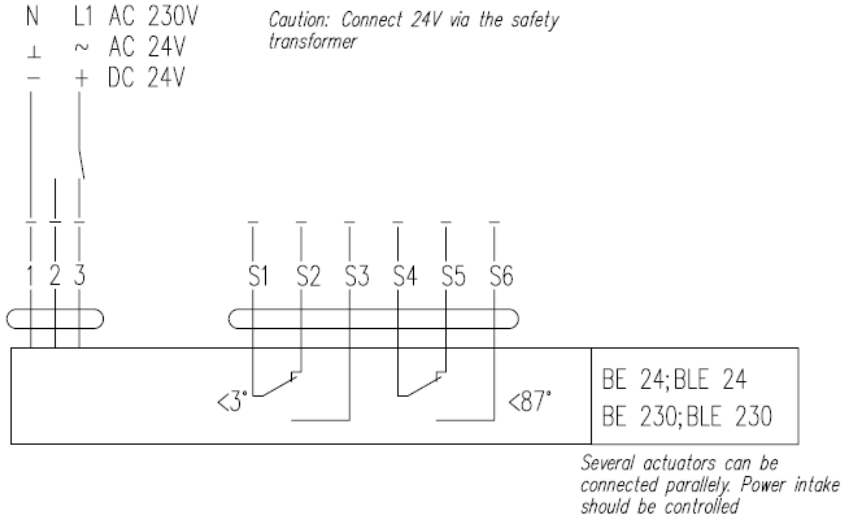
Electric actuators – electrical specification

Actuator type	Location of the damper isolation partition
- Belimo serii BE - Belimo serii BEE - Belimo serii BEN	Open isolation partition – actuator indication: 0 Closed isolation partition – actuator indication: 90

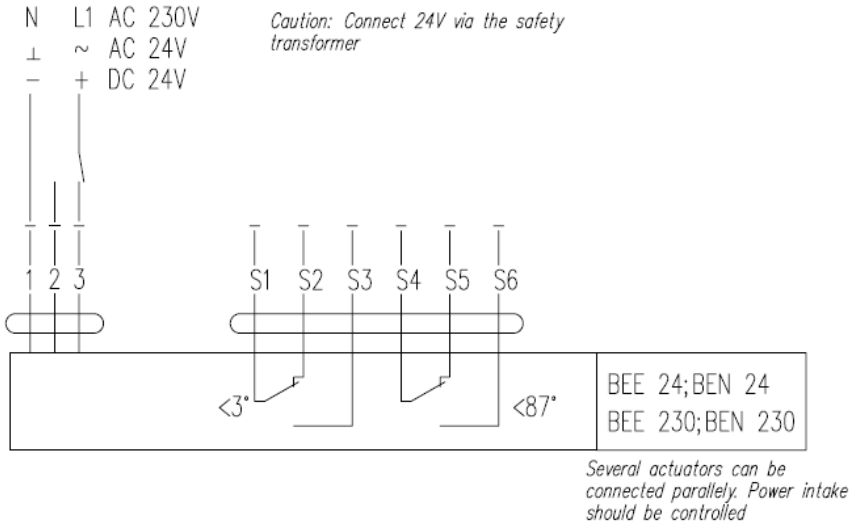
Technical specifications	BE24, BE24-ST	BE230
Power supply	AC 24V 50/60Hz DC 24 V	AC 220-240V 50/60 Hz
Power demand: - for spring tensioning - for spring holding	12 W 0,5W	8 W 0,5 W
Sizing (apparent power)	18 VA	15 VA
Appliance class	III	II
Ingress protection rating	IP 54	IP 54
Auxiliary circuit breaker:	2xSPDT 6(3) A, 250V	2xSPDT 6(3) A, 250V
- activation position [degrees]	3°, 87°	3°, 87°
Torque: - motor - locking	40 Nm 50 Nm	40 Nm 50 Nm
Cable connection:		
- motor (L = 0.9 m)	3x0,75 mm2	3x0,75 mm2
- auxiliary circuit breaker	6x0,75 mm2	6x0,75 mm2
Movement time: (0-90°)	60s	60 s
- motor		
Operating temperature range	- 30 ...+50°C	- 30 ...+50°C
Sound pressure level:		
- motor	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: - for spring tensioning - for spring holding	2,5 W 0,1W	3,5 W 0,4 W	3 W 0,1 W	4 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 mm2	3x0,75 mm2	3x0,75 mm2	3x0,75 mm2
- auxiliary circuit breaker	6x0,75 mm2	6x0,75 mm2	6x0,75 mm2	6x0,75 mm2

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)



Connection diagram for the BE24, BE230 actuators



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

Note:
The BE, BEE and BEE 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±10% or 230V±10%. Power supply devices other than listed above may cause malfunction and will not be covered by the warranty conditions.

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 ºC;
- the ambient temperature is between - 20 ºC and + 40 ºC;
- 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@mercor.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@mercor.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:
    - 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.

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MERCOR S.A. and 380-470

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2434-CPR-0240

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

mcr WIP LD

Nominal activation conditions/sensitivity: - Closing/opening during the test and the right time	Automatic activation – positive result
Response time: - Closure time	Automatic activation – positive result
Reliability:	10 000 cykles - positive result
Fire resistance: - Integrity E - Insulation I - Smoke leakage S - Mechanical stability (E kategory) - Maintenance of the cross section (E kategory)	EI 120 (v_{ew} i -- >o)S 1000C $_{10000}$ AAmulti
Durability: - time delay - maintenance of certainly operation	 positive result positive result