

OPERATION AND MAINTENANCE MANUAL mcr LAM vents

mcr LAM louvered natural smoke & heat exhaust ventilators
mcr LAM louvers for daily ventilation

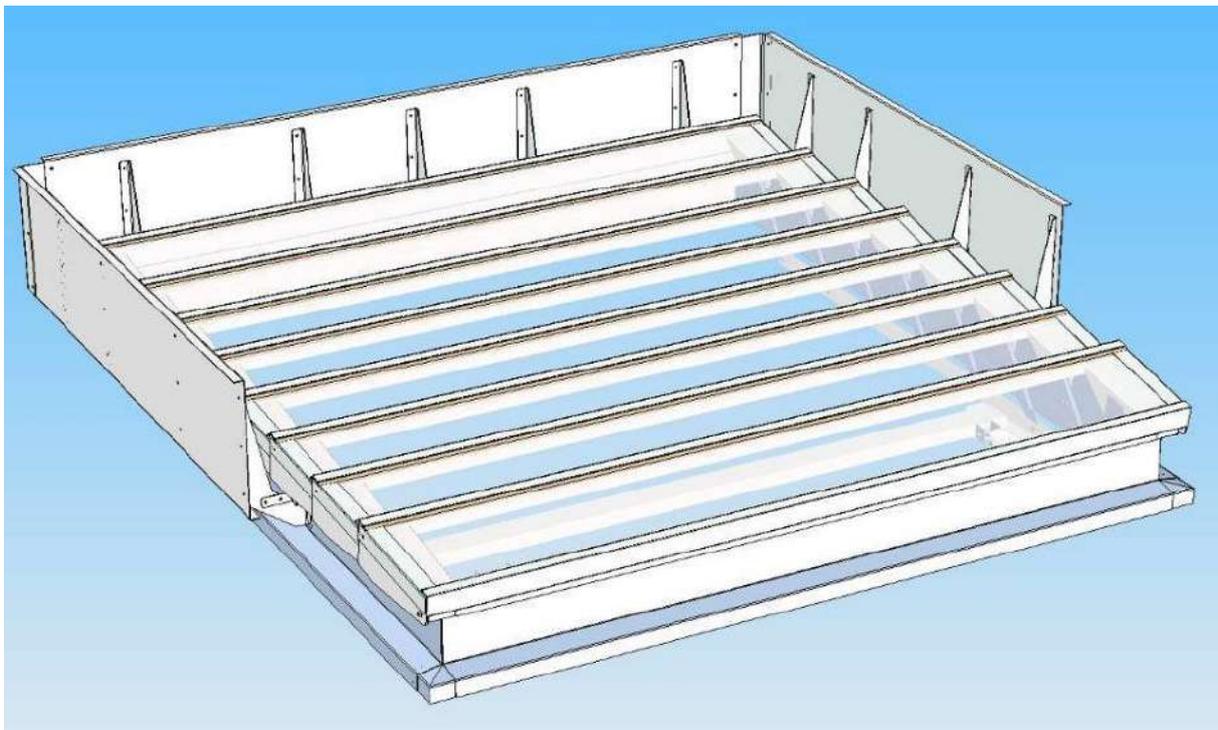


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IMPORTANT !

For safety reasons, the thermal release valve in pneumatically actuated units is not enabled at the factory.

Do not use the unit without prior enabling the thermal release valve.

**Enable the thermal release valve and screw in the CO₂ bottle.
(Sec. 9.1).**

1 Introduction

The present Operation and Maintenance Manual (OMM) is a source of practical data on the purpose, design, operating principles, good assembling practices, and support of mcr LAM louvered smoke exhaust ventilators. Furthermore, the OMM contains additional information on the conditions of operations, maintenance, and product warranty prerequisites. Consistency with the recommendations contained in this document is a prerequisite for regular operations of the systems which are designed for smoke exhaust and/or daily ventilation systems, as well for user safety.

ATTENTION

All work connected with the installation, operation, maintenance and servicing of the vents must be carried out in accordance with the principles of health and safety and the use of personal protective equipment appropriate to the type of work involved, including, above all, fall protection equipment. Work connected with staying at height, connecting electrical devices, etc., may only be performed by persons holding the appropriate qualifications.

2 Intended use

mcr LAM louvered vents are automatic opening smoke release devices. Their primary function is to evacuate the products of fire including smoke, fumes and heat from the interior spaces (for example in production and warehousing facilities, public buildings, etc.) to protect human life and property by:

- reducing to the minimum the amount of smoke in the escape routes,
- facilitating the fire-suppression process and operations by creating near the floor a layer containing little smoke,
- protecting the building structure and the furniture, fixtures and equipment,
- limiting the damage caused by smoke, hot fumes and thermal decomposition products.

Smoke vents can also be used for natural ventilation only, or both for smoke exhaust and natural ventilation and can be installed on the building roof to admit natural light.

After deciding to provide the smoke vents in the premises the Owner can enjoy the following benefits:

- lowered hazard class of the building,
- increased maximum fire zone area,
- increased maximum permitted length of escape routes,

mcr LAM louvered vents comply with the requirements of EN 12101-2:2003, as confirmed by the **CE** Certificate of Conformity No. 1396-CPR-0032, issued by the notified body No. 1396. Compliance of mcr LAM louvered vents with the ITB's Technical Approval No. ITB-KOT-2020/1330 edition 1 is confirmed by the Certificate of Conformity No. ITB-2461/W.

mcr LAM smoke exhaust vents are part of the overall MERCOR smoke exhaust system, which includes also smoke vents mcr PROLIGHT, mcr ULTRA THERM, mcr S-THERM, smoke vents integrated in mcr PROLIGHT continuous rooflights, mcr PROSMOKE smoke curtains, MCR9705 and MCR0204 control units, and other products of this kind.

3 Design and principle of operation

MERCOR's louvered vents, mounted on rectangular base assemblies, suit a wide range of structural opening sizes. All the steel components are zinc coated in hot-dip or electro-galvanising process.

Steel, zinc coated sheet used for vent elements is compatible with EN 10346:2015-09 standard for type A areas.

The surfaces of the aluminium sheets used comply with the provisions of the PN-EN 485-1 standard.

The upper part of the base assembly is available in insulated and non-insulated option and the lower part – the roof curb (used in vents higher than 20 cm) is always uninsulated.

Blades types:

- transparent: 16 mm thick or 25 mm thick multi-wall polycarbonate panels of varying transparency and thermal conductivity,
- blind: two layers of aluminium sheet separated by an air void or insulating material.

mcr LAM louvered vents come with the following types of actuators:

- electrical, 24 V DC,
- pneumatic – powered by CO₂ (smoke exhaust function) or by compressed air (daily ventilation function),
- electrical 230V AC (daily ventilation only).

Only pneumatically operated mcr LAM smoke vents are equipped with flow control valves with thermal release valve (including thermal fuse).

mcr LAM smoke exhaust vents for roof assembly are equipped in wind deflectors (tripartite) - fig. 2.

The louvered vents may be operated locally - manually or automatically by thermal release valves (in the case of smoke vents) or remotely by an MCR smoke control panel or fire alarm control panel.

Figure 1. mcr LAM louvered vent

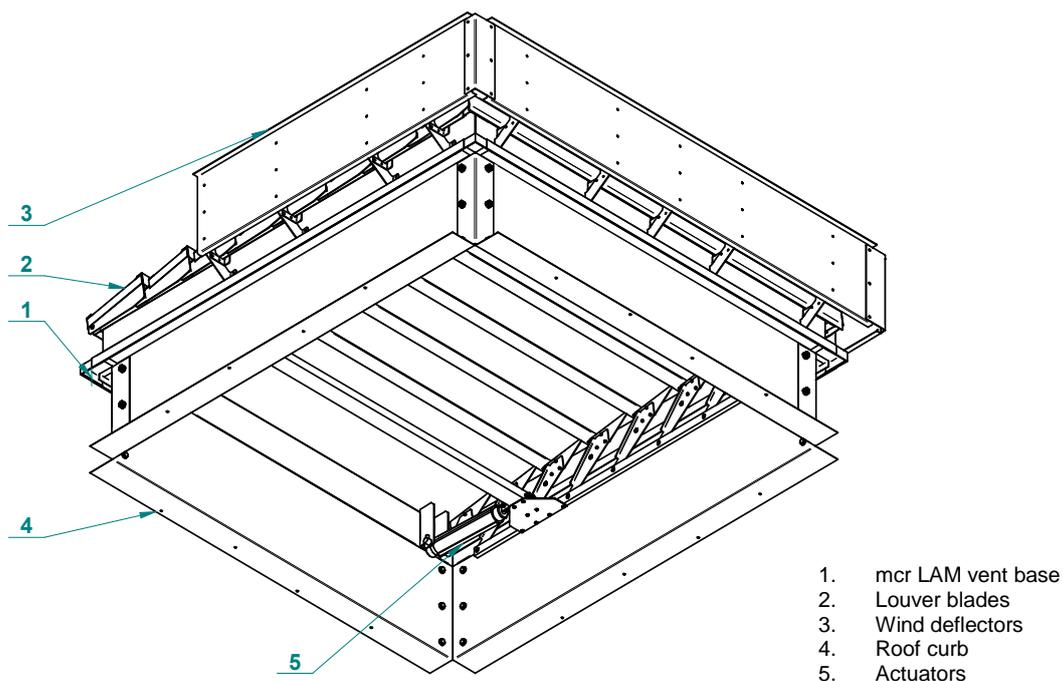
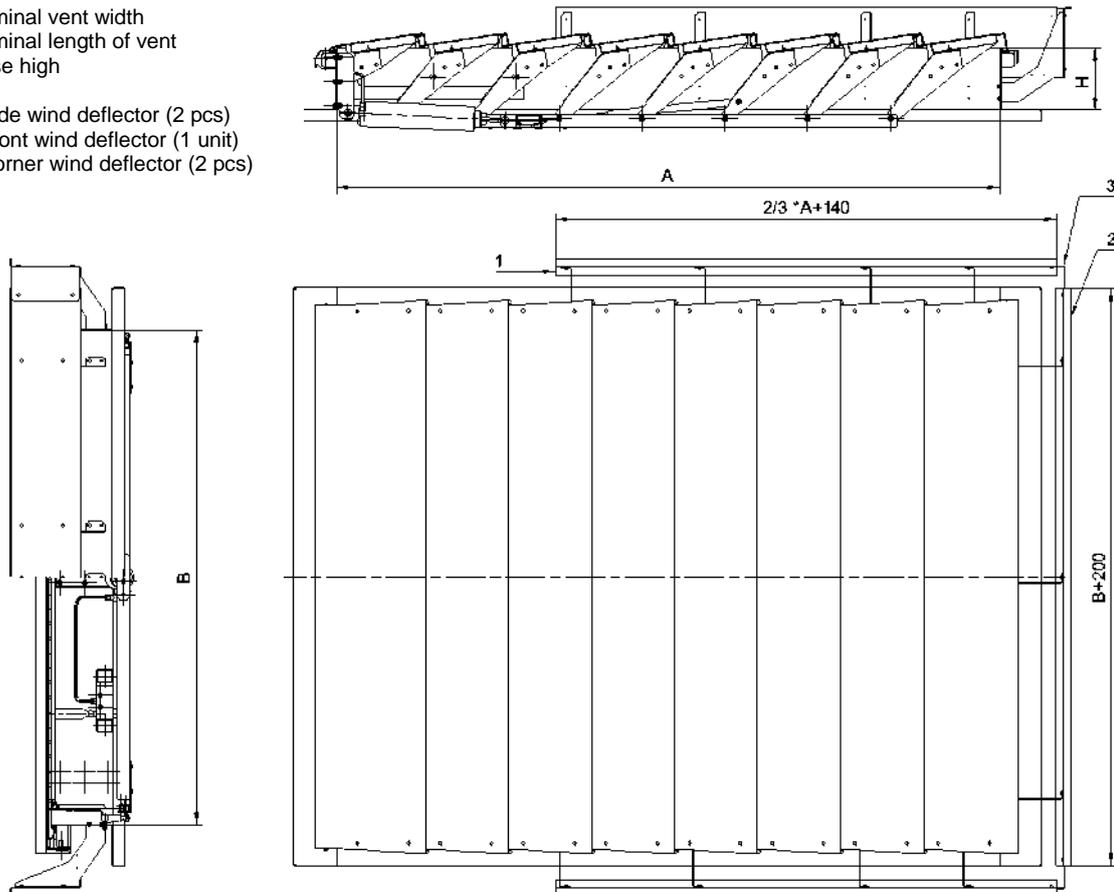


Figure 2: Main dimensions of the louvre vent. Elements of the three-sided wind deflector of louvre vent.

A - Nominal vent width
 B - Nominal length of vent
 H - Base high

1. Side wind deflector (2 pcs)
2. Front wind deflector (1 unit)
3. Corner wind deflector (2 pcs)

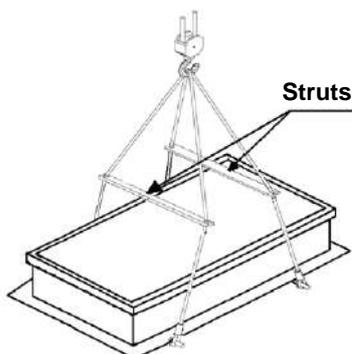


4 Shipment and delivery

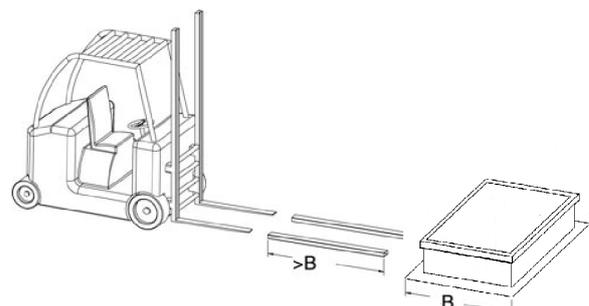
mcr LAM louvered vents are supplied factory assembled, except for additional external flashings, higher base assemblies, etc. which, if required, come separately. The roof curbs, i.e. additional base assemblies, always come separately. The reason is to protect the different components from damage during transport and avoid road safety hazards. The vents can be unloaded manually or by means of universal loading equipment in the presence of a person authorised by the manufacturer.

Figure 3. Handling by means of hoist (a) or a forklift truck (b)

a/



b/



5 Installation

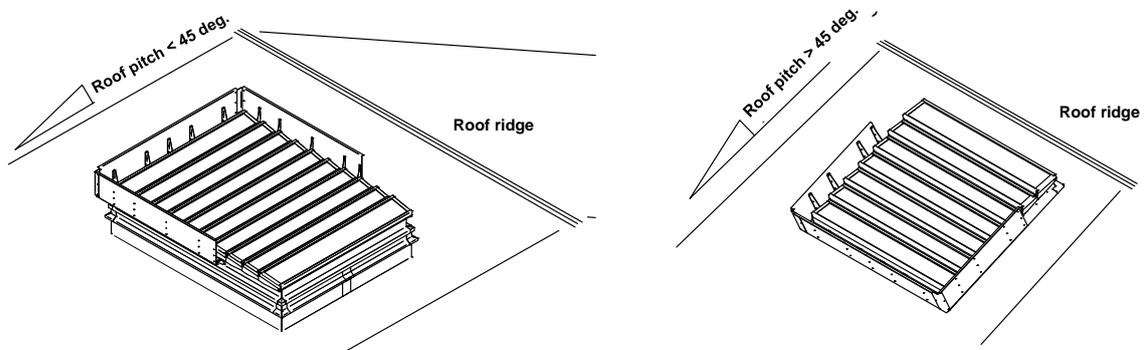
5.1 General information

mcr LAM louvered vents are designed for installation on the roof (smoke exhaust function) or in the walls (smoke exhaust and air inlet function).

Roof vents need to be supported by the roof structure components, such as purlins, trimmers, metal decking, curbs, etc. If the roof pitch is less than 45° the vent should be oriented with the louver blades running perpendicular to the roof ridge and for greater pitches the louver blades should preferably run parallel to the roof ridge (tilt up to open configuration).

In case of setting a vent on existing plinth with horizontal mounting plain, it is recommended to prepare vent prop with $1 \dots 3^\circ$ drop along louvered vent's blade.

Figure 4. Recommended spatial orientation of mcr LAM vent in relation to the roof ridge.



mcr LAM louvered vents can be mounted on steel, concrete or timber roofs. The additional lower base, the roof curb, features a ledge at its bottom to support and secure the vent to the supporting structure. The fasteners should be appropriate to the supporting structure material (steel, concrete, timber) and not smaller than 6 mm in diameter. The intervals between fasteners should not be greater than 50÷60 cm.

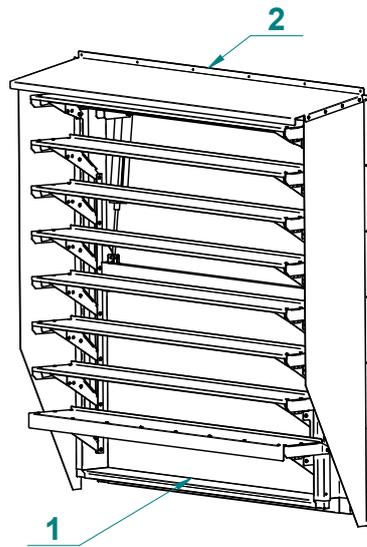
The vent bases are suitable for roofing flashings with roofing paper, PVC membrane or sheet metal.

When installed in walls, the louver blades should be positioned horizontally. In this configuration the louver blades are tilted up to open. The vents in the walls are to be fitted to the structural elements so that the blades are aligned horizontally. Direction of blade opening upwards. Depending on the material of the wall elements (steel, concrete, wood), select appropriate connectors (min. diameter 6 mm). The fasteners should be installed with a maximum spacing of 50÷60 cm.

5.2 Rain shields

The use of a rain shields for wall-mounted vents depend on the depth of the vent's foundation in the wall, but in most cases a rain shield is recommended.

Figure 5. Mounting position of mcr LAM vent installed in a wall.



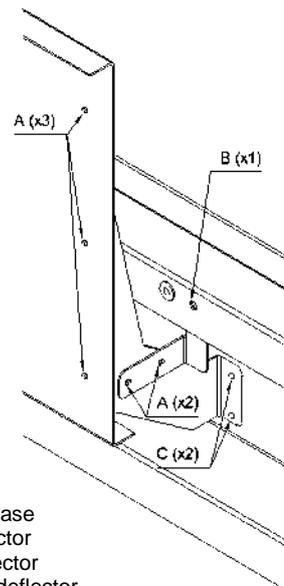
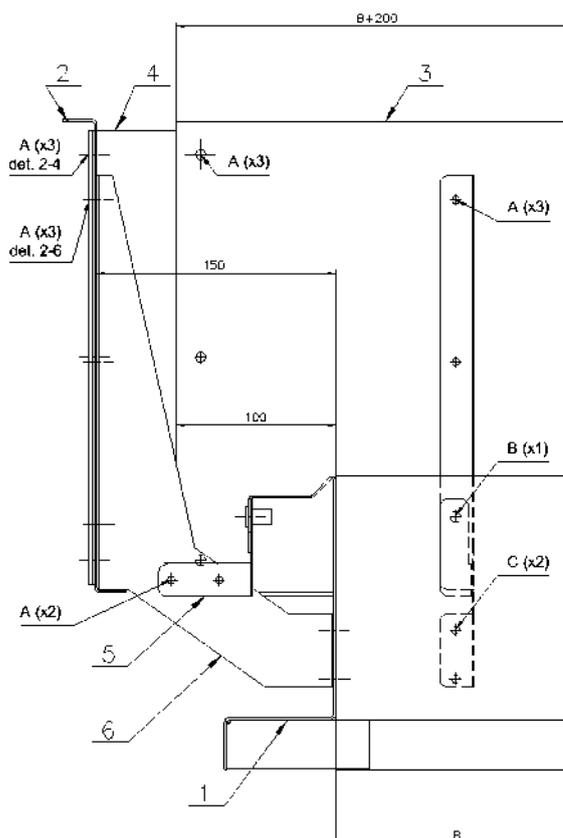
- 1. Louvered vent
- 2. Rain shields (optional)

5.3 Wind deflectors

Exceptionally mcr LAM louvered vents meant for roof installation might be delivered without wind deflectors factory fitted. In such case, install wind deflector following the directions included in the figure below, using base connector. Mounting holes are prepared.

Attention: detail no. 5 is delivered in particular cases (for example no isolated vent base or high wind deflector).

Figure 6: Installation details of the wind deflector supplied separately.

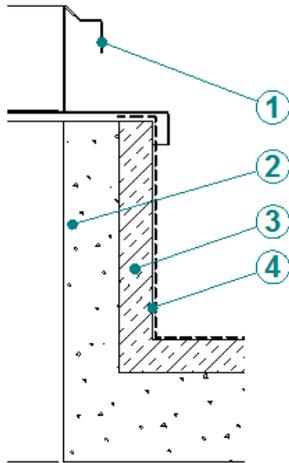


- 1. mcr LAM vent base
- 2. Side wind deflector
- 3. Front wind deflector
- 4. Corner of wind deflector
- 5. Console 1 of wind deflector
- 6. Console 2 of wind deflector

- A: ISO 15977 ϕ 4.8x12 Al/St rivet (may be C)
- B: ISO 15977 ϕ 6.4x12 Al/St rivet
- C: ISO 15973 ϕ 4.8x12 Al/St rivet (sealed)

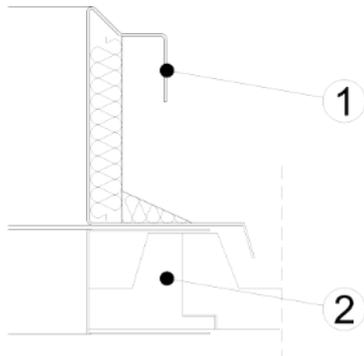
6 Roof installation examples

Figure 7. mcr LAM vent mounted on a concrete base.



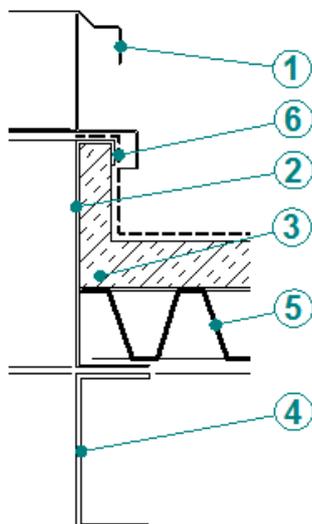
1. Base of mcr LAM vent
2. Concrete curb
3. Concrete curb insulation
4. Waterproofing barrier

Figure 8. mcr LAM vent installed on a panel roofing system.



1. Base of mcr LAM vent
2. Roofing panel

Figure 9. mcr LAM vent with roof curb mounted on steel structure.

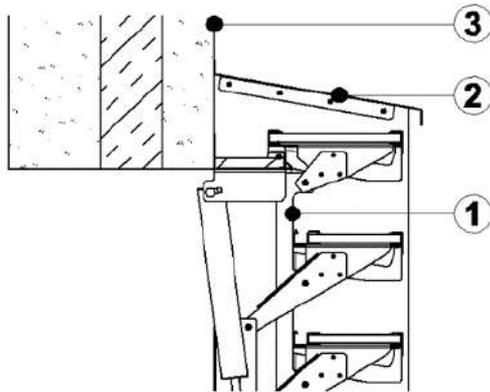


1. Base of mcr LAM vent
2. Roof curb
3. Thermal insulation
4. Steel roof frame
5. Sheet metal decking
6. Waterproofing barrier

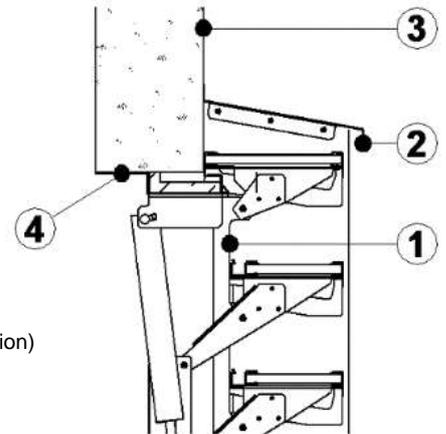
7 Wall installation examples

Figure 10. mcr LAM vent mounted in a wall

a/ attached directly to the wall surface

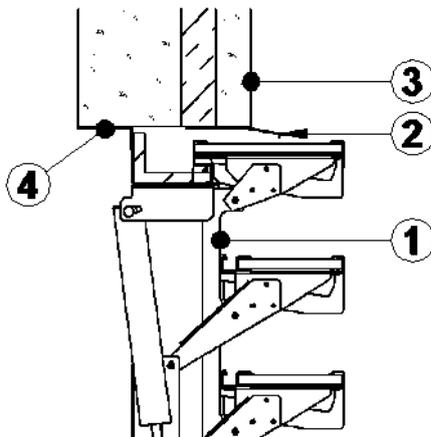


b/ attached using additional elements (option 1)

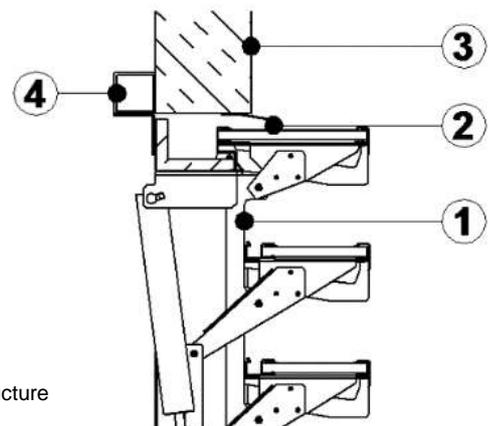


1. mcr LAM vent
2. Rain shield (MERCOR product supplied as an option)
3. Wall or facade
4. Support bracket

c/ in a wall opening, without additional elements (option 2)



d/ attached to the steel frame of the wall



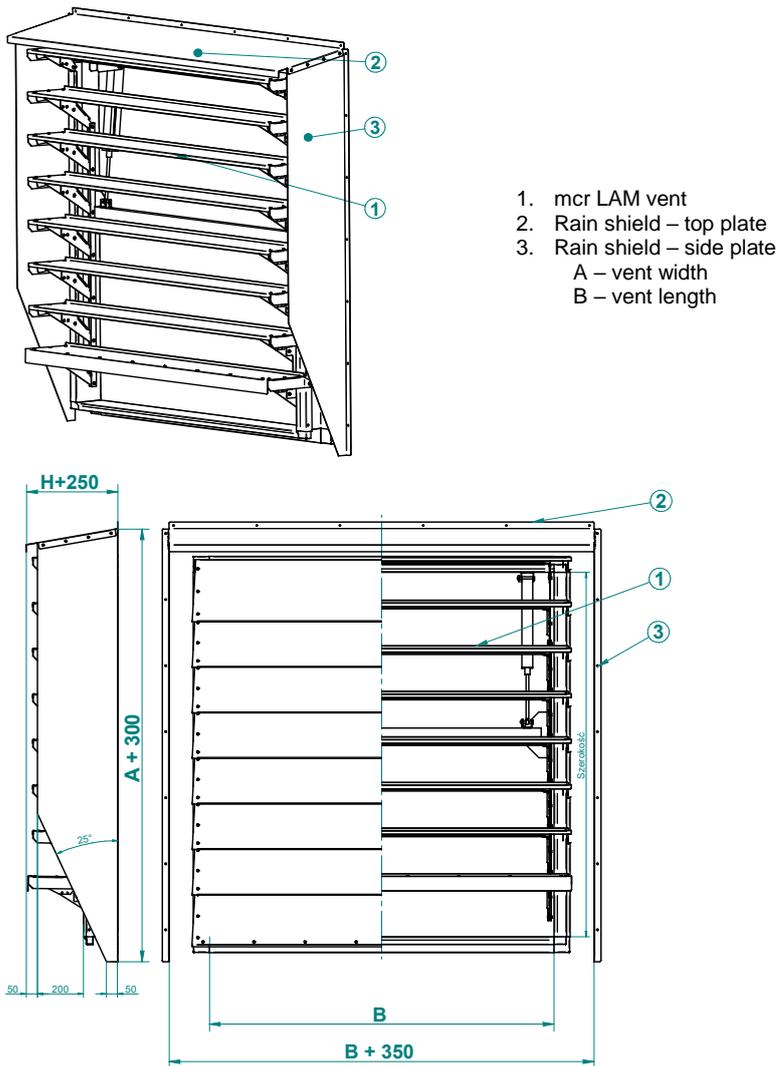
1. mcr LAM vent
2. Drip cap
3. Wall or facade
4. Support bracket or structure

The mounting and fitting details depend on the wall construction and should be determined before installation.

Vents installed in walls should be fitted with rain shields. The rain shields are attached to the vent once it has been mounted in the wall. Use fasteners adequate to the wall type, 4.0..4.5 mm in diameter. For fixing the shields to the wall use the pre-drilled mounting holes. The gap between the rain shields and the wall should be filled with the supplied PES 5x20 gasket or butyl tape or a silicone sealant.

With the rain shield in place, the assembly is not as yet weatherproof. To make it fully weatherproof, the joint between the base and the wall surface must be sealed.

Figure 11. mcr LAM vent with rain shields



8 Limit switches

mcr LAM vent can be fitted with limit switches to indicate:

- fully open position
- fully open position or any mid-position
- fully open, fully closed or any mid-position.

Fully open position is indicated by COMEPI AP3T71W20 limit switch.

Figure 12. COMEPI AP3T71W20



Fully open closed or any mid-position is indicated by COMEPI AP3T38W20 limit switch.

Figure 13. COMEPI AP3T38W20



The limit switches fitted on mcr LAM louvered vents are factory pre-set. These limit switches might get misadjusted during transport and then the adjustment procedure described in the manual Connection and Adjustment of COMEPI limit switches in mcr LAM units should be followed.

9 Control

The control systems to open and close the vent blades are an indispensable part of mcr LAM louvered vents. Smoke exhaust control or smoke exhaust and ventilation control systems can be employed in this function. Two type of smoke exhaust control systems are available, each comprising a different set of components:

- pneumatic,
- electric.

9.1 Pneumatic control

mcr LAM louvered vents enable the following use of pneumatic opening system:

C1 – The system used in vents with smoke exhaust and ventilation options only. Blades opening occurs as a result of valve activating (mcr LAM) or broadcasting a pneumatic signal from external system (mcr LAM). After opening (regardless the source) vent blades remain permanently open. Closing the vent is conducted manually from the roof. Device doesn't include pneumatic installation to plug in pneumatic close off signal, only one pneumatic wire is required to perform remote signal.

C2 – The system used in vents to exhaust smoke or ventilation and daily aeration. Opening vent blades occurs as a result of valve activating (mcr LAM) or broadcasting a pneumatic signal from external system (mcr LAM). Afterwards (regardless tge source), vent blades remain permanently open. Closing the vent might be conducted remotely with a pneumatic closing signal or manually from the roof. It is required to use separate pneumatic wires for opening signal and closing signal. C2 system is additionally used when the vent function as a daily ventilation.

C3 – The system used when remote control is required for daily ventilation (or ventilation and smoke exhaust) through one pneumatic wire. Vent opens for ventilation after serving low coefficient pressure on pneumatic actuator (from ventilation installation) and remains open as long as the pressure is served. After cancelling the pressure in electric installation vent blades are closing through embedded gas springs. Adding high coefficient pressure on pneumatic actuator (after triggering valve or pneumatic installation), vent opens to smoke exhaust and stays permanently open. C3 system closing procedure enclosed below.

Depending on the system configuration it may be necessary to connect additional pneumatic lines to the vent (e.g. copper/steel tube connecting to the alarm box including bottles).

Threaded connections of pipe unions with valves, actuators, etc. are sealed by applying appropriate chemical agents, such as Loctite 243 (recommended) or PTFE thread seal tape. To seal the connection with Loctite 243 apply a few (2-3) drops on the tread surface. After the connection has been tightened, the applied Loctite 243 will set, thus protecting the connection from uncontrolled loosening (important for connections of actuators). It is impossible to loosen a union protected in this way other than by means of hand tools.

Figure 14. Method of installation of elastic air tubes.

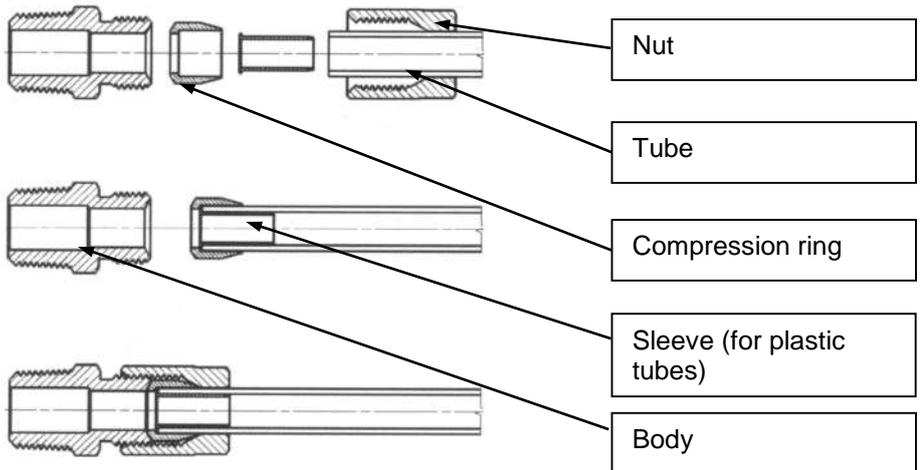
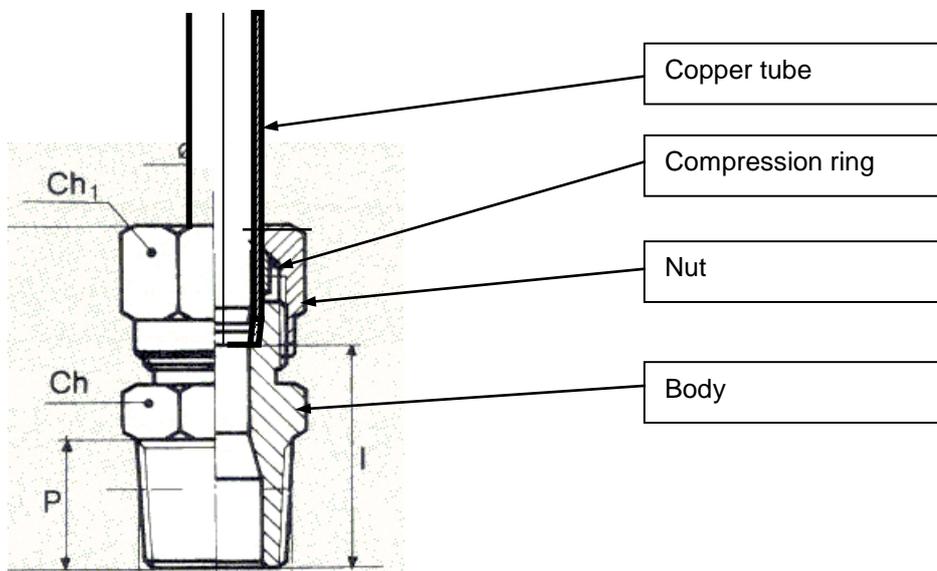


Figure 15. Connection of union with a copper/steel air tube.



IMPORTANT: For safety reasons, the thermal release valve fitted in the vent is not engaged before shipping. Therefore, the valve must be engaged once the vent has been installed on the roof.

Enabling the thermal release valve

- remove all plastic plugs from fittings or threaded holes immediately before commissioning
- check if the **tension spring of the puncture assembly (1)** is unscrewed and, if not, unscrew it by hand until it would not turn any more,
- fit the **thermo bulb (2)** in the gas flow regulator, with the pointed tip towards the body, tighten the bulb press screw by hand,
- insert the **valve slider (4)**,
- manually tighten the piercing assembly spring by turning the tension screw (1) until it would not turn any more,
- check if the piercing needle is withdrawn and if there is a seal in the bottle seat,
- screw in the **CO₂ bottle (3)** by hand.

Figure 16. Thermal release valve

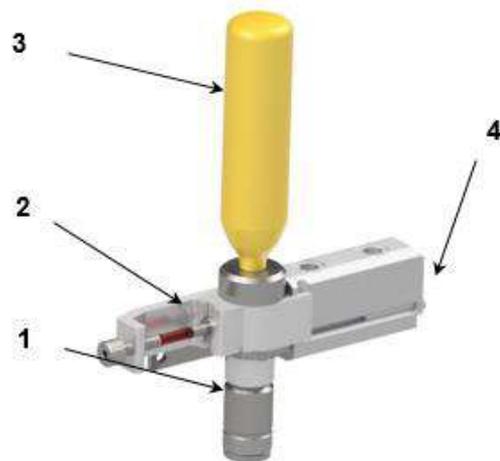
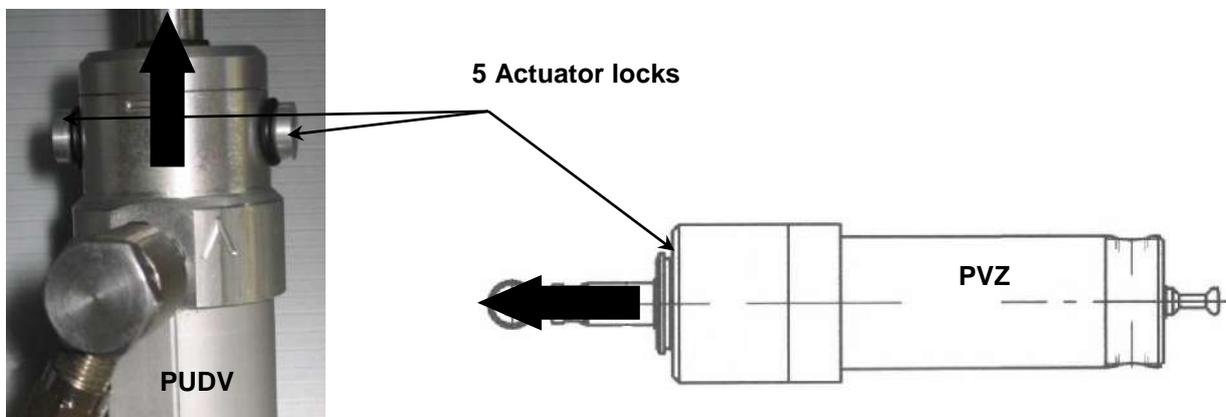


Figure 17. Pneumatic actuator – lock releasing direction.



The following two types of pneumatic actuators are used:

1. Powered by CO₂ (smoke exhaust) or by compressed air (natural ventilation) – for opening and closing. Types of control: C1 – only opening by CO₂ (closing vents by hand), C2 – opening and closing by CO₂.
2. Powered by CO₂ (smoke exhaust) or by compressed air (natural ventilation) – for opening only, closed manually from the roof level (in case of alarm mode) or by a gas spring (natural ventilation function). Types of control: C3.

The pneumatic actuator for smoke exhaust features integral locks, which prevent opening of the louver blades when the vent is idle or closing them when it has been opened in the emergency mode (to extract smoke) – see figure 17.

Closing of pneumatically operated vents after emergency opening – for systems without remote closing function (**C1**):

1. Release CO₂: unscrew the bottle from the thermal release valve or alarm box (Warning 1: high pressure! unscrew slowly! Warning 2: the CO₂ bottle may frost over).
2. Release the actuator locks (5) by lifting them in the motion direction of the actuator (shown by arrow in Figure 14 Pneumatic actuator – lock release direction).
3. Tilt down the louver blades.
4. Check closing status.
5. Fit a new CO₂ bottle in the thermal release valve or in the alarm box.
6. The thermal fuse (thermo bulb) should be replaced if needed (2).

Closing of vents fitted with a pneumatic actuator and a gas spring after emergency opening – for systems without remote closing function with ventilation box (**C3**):

1. Release CO₂: unscrew the bottle from the thermal release valve or alarm box (Warning 1: high pressure! unscrew slowly! Warning 2: the CO₂ bottle may frost over).
2. Move the ventilation box valve lever to the vent opening position.
3. After ca. 5 sec. move the ventilation box valve lever to the vent closing position.
4. Fit a new CO₂ bottle in the thermal release valve or in the alarm box.
5. The thermo bulb (alcohol filled glass bulb) should be replaced if needed (2).

Method of closing a vent with a pneumatic actuator after an alarm opening for systems with remote closing function (**C2**): remove the medium (bleed) from the part of the pneumatic system responsible for opening, then supply CO₂ or compressed air to the pneumatic line "closing".

9.2 Electric control

9.2.1. Louvered smoke vents

The vent opening/ closing system, based on 24 V DC electric actuator, used for smoke exhaust, is pre-installed at the factory. This control system is called E1.

Wiring diagram of Gxx actuator (polarity of conductors):

Brown +	}	Rod is withdrawn (vent		Brown –	}	Rod is extended (vent
Blue –		closes)		Blue +		opens)

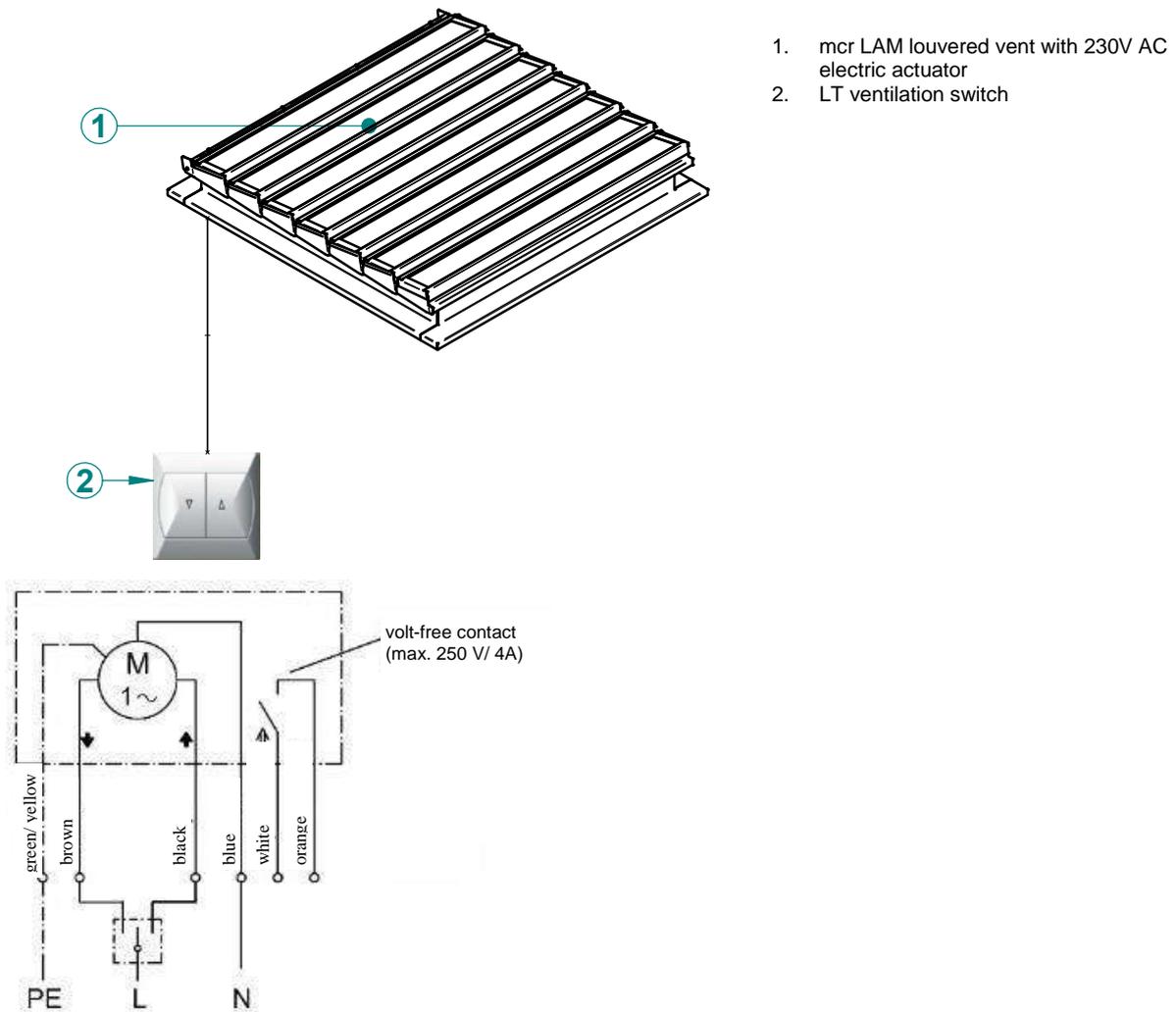
mcr9705, mcr0204 smoke exhaust and daily ventilation control units with mcrR0424 and/or mcrR0448 extension modules are used to supply electricity and control the MCR-W actuators fitted in mcr LAM louvered vents.

9.2.2. Louvres for daily ventilation

The vent opening/ closing system, based on 230 V AC electric actuator, used for daily ventilation, is pre-installed at the factory. The control system is called E2.

Below is the wiring diagram for connection of the actuator to the mains, via LT (or equivalent) ventilation switch.

Figure 18. Wiring diagram for connection of 230 V AC louvered vent actuator (type control E2).



9.3 Use of louvered smoke vents for daily ventilation

The ventilation function is realized in louvre vents by means of actuators used to open the vents for smoke extraction.

Louvre vents with C2 or C3 control can be used for ventilation.

In order to use the mcr LAM vents with the C2 control for the ventilation function, the pneumatic system must be equipped with the PLZ or LUK ventilation boxes (with a two-circuit priority valve, e.g. VVAZ, when the vents are opened for smoke exhaust by the alarm boxes) and the vents must be equipped with the TAVZ type thermal release.

In order to use the mcr LAM vents with C3 control for ventilation functions, the pneumatic system must be equipped with special ventilation boxes (with a single-circuit priority valve, e.g.

VVZ, when the vents are opened for smoke removal by alarm boxes) intended for cooperation with a single-circuit pneumatic system. The pressure used for ventilation in C3 systems should not exceed 0.5 MPa (5 bar).

Figure 19. Pneumatic diagram showing connection of mcr LAM louvered vent equipped with a pneumatic actuator (type control C2) with the alarm and ventilation boxes.

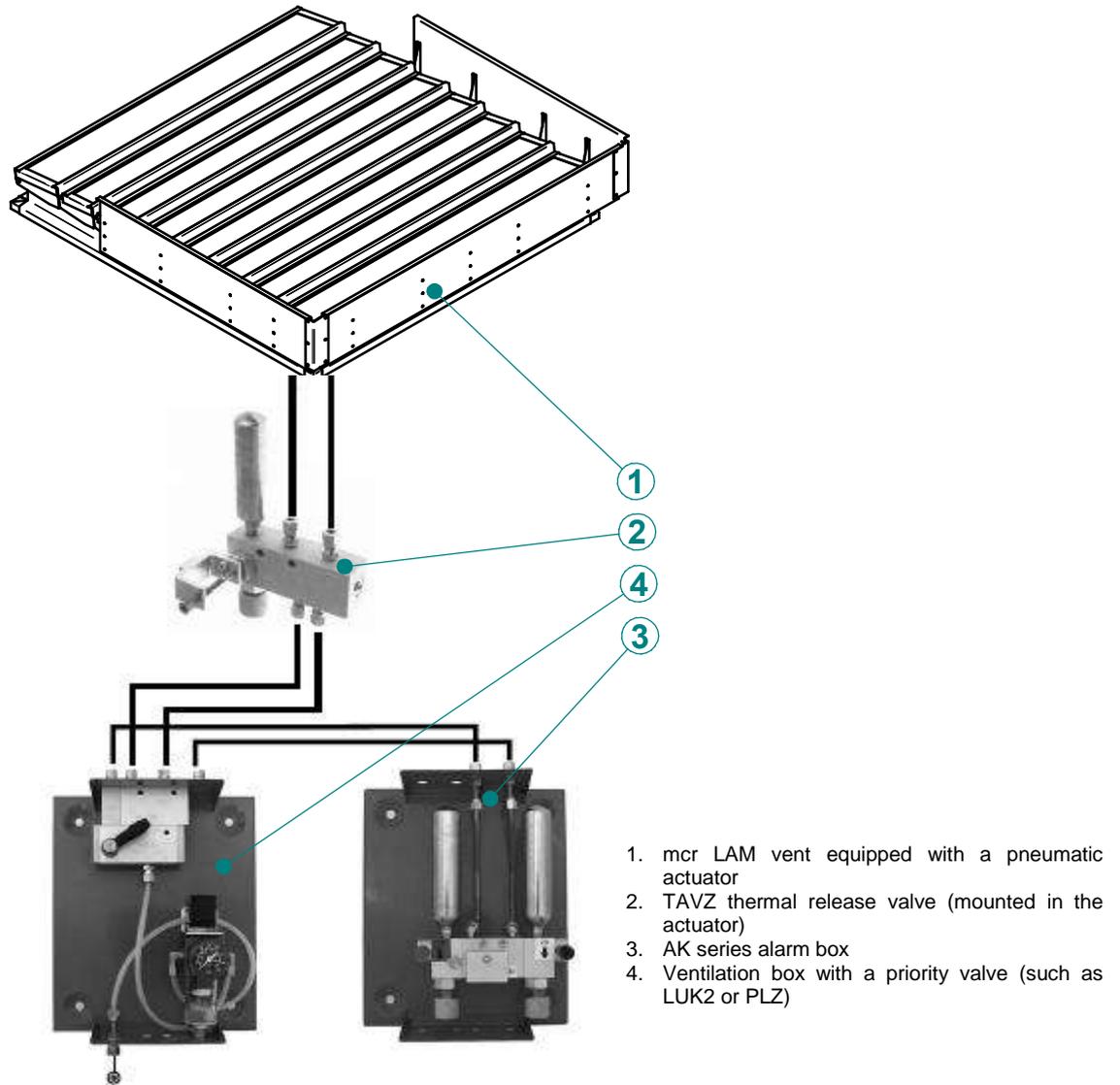
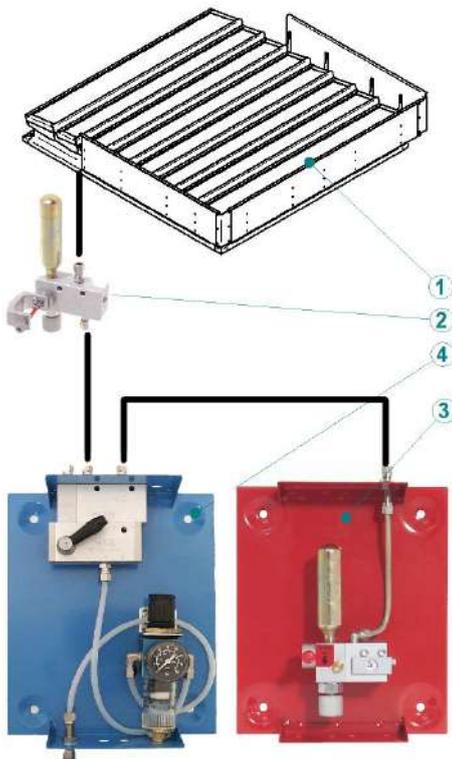
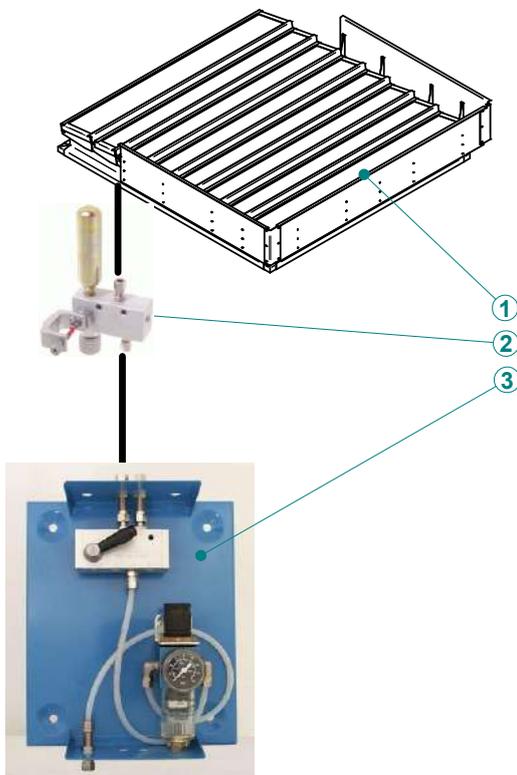


Figure 20. Pneumatic diagram showing connection of mcr LAM vent (type control C3).



1. mcr LAM vent with a pneumatic actuator and gas spring
2. TAVZ thermal release valve (mounted in the vent)
3. AK series alarm box
4. Ventilation box with a priority valve (such as LUK2 or PLZ)

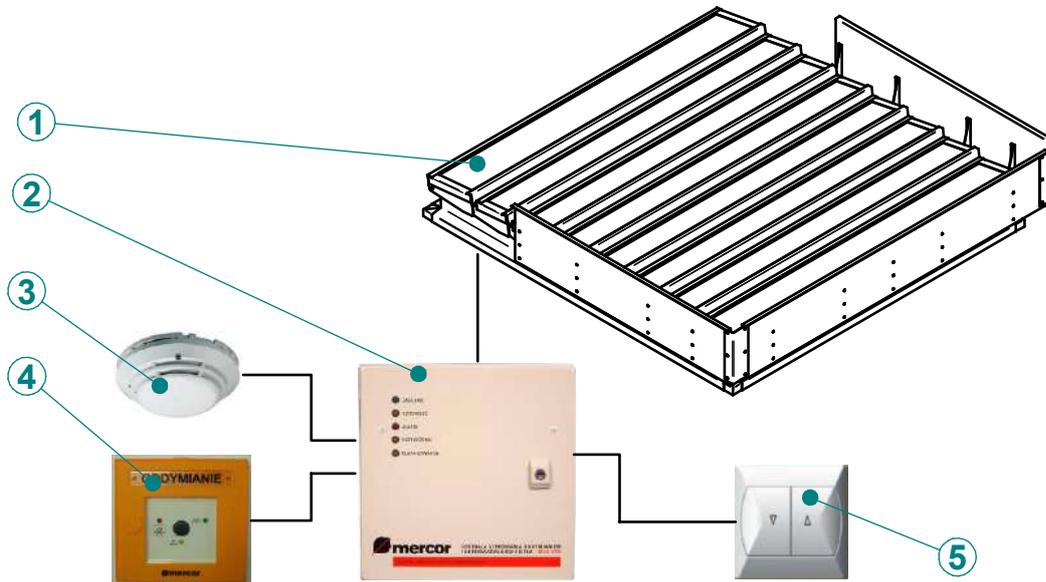
Figure 21. Pneumatic diagram showing connection of mcr LAM vent equipped with a pneumatic actuator and gas spring (type control C3) with alarm and ventilation boxes.



1. mcr LAM vent equipped with a pneumatic actuator and gas spring
2. TAVZ thermal release valve (mounted in the vent)
3. Ventilation box (such as LUK2 or PLZ)

In order to use vents equipped with 24 V electric actuator for daily ventilation it is necessary to connect the LT ventilation switch to the control unit in accordance with the wiring diagram included in the control unit Operation and Maintenance Manual (OMM).

Figure 22. Idea diagram showing connection of mcr LAM vent fequipped with 24 V electric actuator (type control E1) to enable its use for daily ventilation.



1. mcr LAM vent equipped with 24 V actuator
2. Control unit
3. Optical smoke detector
4. RPO-1 emergency pushbutton
5. LT ventilation switch

A control unit with integrated wind/rain module is recommended, such as MCRP054, in order to close the vents during strong wind or rain, thus protecting the property and the vents from damage. The control unit must be connected according to the wiring diagram included in the Operation and Maintenance Manual (OMM).

10 Maintenance and inspections

The user of MERCOR S.A. equipment **shall ensure periodic inspection** and maintenance **every six months** throughout the whole period of operation, both during and after the warranty period.

Therefore, adequate means of access must be provided to enable carrying out periodic inspections, maintenance and warranty repairs of the equipment concerned. The equipment installed on the roof must be accessible by adequate means of access (ladder or lift).

In addition, between the successive inspections it is recommended to:

1. Check the electrical lines, paying particular attention to any mechanical damage.
2. Check the pneumatic lines, focusing on mechanical damage, paying particular attention to any mechanical damage, leak and slack.
3. Check the hook brackets (verify if they are fully closed and not blocked).
4. Check if the leaf hold frame is securely fixed and the seals about the leaf infill.
5. Periodically clean the domes, polycarbonate panels. use a sponge or soft cloth and lukewarm water with some amount of a typical, mild household cleaner. Do not scrub the panels with brushes or sharp utensils. Do not use abrasives, strong alkaline substances, solvents, etc. If unsure, try the cleaner on a sample or small area of the product.
6. Due to natural environmental processes, water vapour may condensate inside the cells of polycarbonate panels. A mist forms in most cases and clearly seen drops can also appear if humidity is really high. Subject to ensuring diffusion of air between the cells and the outside environment the levels of humidity will equalise and the above-described visual effects should disappear.

Condensation of water vapour does not compromise the service life of the material or the quality of the product.

NOTE:

Do not use ice melt salts on roofs where there are mcr LAM louvered vents. Salt can discolour or even damage the polycarbonate panels, acrylic domes or aluminium sections. Note that the resulting damage is not covered by the warranty.

11 Warranty terms and conditions

1. "MERCOR" S.A. grants a 12-month quality guarantee for equipment, starting from the date of purchase, unless the agreement provides otherwise.
2. Each defect under guarantee should be reported to a local representative of "MERCOR" S.A. immediately, i.e. within 7 days of its discovery.
3. Applications can be made by phone at +48/ 58 341 42 45, by email to claim@mercor.com.pl or by sending a letter to: "MERCOR" S.A., Grzegorza z Sanoka 2, 80-408 Gdańsk, Poland.
4. If during the term of guarantee any physical defects of the equipment become evident, "MERCOR" S.A. shall remove them within 21 days of the written notification, subject to paragraph 5.
5. "MERCOR" S.A. reserves the right to lengthen the repair time in the event of complicated repairs or those that require non-standard sub-assemblies [elements] or spare parts to be purchased.
6. Liability under the Guarantee covers only defects resulting from causes inherent in the equipment sold.
7. In the event of defects resulting from inappropriate operation of the equipment or due to other reasons stated in par. 8, the Buyer/ Guarantee Holder shall bear the costs of their removal.

8. In accordance with the generally accepted practice, the guarantee does not cover:
 - damages and breakdowns of the equipment due to inappropriate operation, user's interference, lack of maintenance or periodic servicing;
 - equipment damages resulting from causes other than those that MERCOR is responsible for, in particular: acts of God such as torrential rainfall, flood, hurricane, flooding, stroke of thunder, overvoltage in the mains, explosion, hail, fall of aircraft, fire, avalanche, landslide and secondary damages due to the above-listed causes. Torrential rain is defined as rain with an efficiency index of at least 4 (or 5 in Chomicz scale or torrential rain grade IV (A₄)). Should it be impossible to determine the index mentioned in the previous sentence, the actual condition and the degree of damage at the place of its origin proving that it is the consequence of torrential rain will be considered. Hurricane is defined as wind blowing at the speed of at least 17,5 m/s (damages are deemed to have been caused by hurricane if the effects of hurricane have been found in the immediate neighborhood);
 - damages due to failure to immediately report the defect discovered;
 - worsened quality of coating due to the natural ageing process (fading, oxidation);
 - defects due to using abrasive or aggressive cleaning products;
 - damages due to aggressive external factors, especially chemical and biological ones.
 - parts liable to natural wear and tear during operation (e.g. seals) unless a manufacturing fault has occurred;
 - damages due to improper transport, unloading and storage of the device;
 - damages due to installation inconsistent with the OMM and the rules of good construction practice;
 - ingress of dust, particles or solids with the effective grain size below 50 µm into the polycarbonate sheet chambers;
 - condensation in the polycarbonate sheet chambers.
9. Guarantee and warranty is void in the following cases:
 - The Buyer/Guarantee Holder makes design modifications on his own without consulting "MERCOR" S.A.,
 - Maintenance or periodic servicing are not done in due time or are performed by unauthorized persons or a service center not authorized by "MERCOR" S.A., or the equipment is operated in the wrong way,
 - Any interference of unauthorized persons – except activities connected with normal operation of the equipment.
10. The Buyer/Guarantee Holder is responsible for proper operation and maintenance of the equipment and for regular (min. twice a year) servicing according to service and maintenance instructions included in OMM.

SERVICING INSPECTIONS:

1. Devices should be subject to periodical servicing inspections every 6 months during the entire period of their operation.
2. The servicing inspections should be performed by companies having adequate authorization of "MERCOR" SA.
3. On issues related to service please contact a local representative of "MERCOR" S.A.

Other conditions:

1. As regards matters not regulated by these "Warranty terms and conditions", the law applicable is Polish law.
2. Any disputes that may arise in connection with the "Warranty terms and conditions" shall be settled through negotiations between the Parties. This provision is not an arbitration clause.
3. If the Parties fail to reach an agreement by negotiation, any disputes arising from or related to the contract shall be settled by the Polish court competent for the seat of the Seller.

12 Certificate of conformity

 Reg. No. 041/P-007	NOTIFIED BODY No. 1396 Osloboditeľov 282, 059 35 Batizovce, Slovakia tel. +421 52 7752298 fax. +421 52 7881412 http://www.fires.sk	 The Experts on Fire Safety
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Certificate of constancy of performance

1396 – CPR – 0032

In compliance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product

**Natural smoke and heat exhaust ventilator
louver-type MCR LAM**

having the performances and used in conditions given by initial type testing report No. C1396/08/0042/5003/SC issued by FIRES, s.r.o., NB 1396, Slovakia, on 26. 05. 2009,
produced by

MERCOR SA
ul. Grzegorza z Sanoka 2, 80-408 Gdansk, Poland

and produced in the manufacturing plant

MERCOR SA
**Zakład Produkcyjny, ul. Kwarцова 3A, Ciepłowo, 83-031 Łęgowo
Poland**

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

EN 12101-2: 2003

under system 1 for the performances set out in this certificate are applied and that
the construction product fulfils all the prescribed requirements for these performances.

This certificate was first issued on 26. 05. 2009 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard, used to assess the performance of the declared essential characteristics, do not change, and the construction product, and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the product certification body.

Batizovce, 14. 11. 2014


NOTIFIKOVANÁ OSOBA 1396
FIRES
The Experts on Fire Safety
NOTIFIED BODY 1396
-1-


Ing. Mária Gašperová
Head of Product Certification Body

064273 FIRES 136a/C-29/07/2014-E

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13 Certificate of compliance

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دولة الإمارات العربية المتحدة
وزارة الداخلية
القيادة العامة للدفاع المدني
لجنة اعتماد المختبرات العالمية
وبيوت الخبرة ومعاهد التدريب

Date: 5th of August 2020

CERTIFICATE OF COMPLIANCE

This certificate of compliance validates the following			
TEST REPORT NUMBER <small>'Assessment Reports' are not acceptable</small>	C1396/08/0042/5003/SC FIRES-JR-091-17-NURE, ed.3 I1396/20/0024/14/4003 FIRES-AT-014-10-NUNE edition 2 issued on 27.10.2016 FIRES-AT-007-12-NUNE edition 3 issued on 27.02.2019	CERTIFICATE NUMBER	FIRES/2020/005
DATE OF ISSUE	26. 05. 2009 30. 04. 2020	DATE OF ISSUE	05. 08. 2020
DATE OF EXPIRY	05.04.2023	DATE OF EXPIRY	05.04.2023
Manufacturer details			
NAME OF FACTORY/ MANUFACTURER	"MERCOR" S.A.	NAME OF THE BRAND	Natural smoke and heat exhaust ventilator, louver-type mcr LAM
FACTORY ADDRESS / REGION <small>(STREET / TOWN / CITY / COUNTRY)</small>	ul. Grzegorza z Sanoka 2, 80-408 Gdansk, Poland	MODEL / NO	mcr LAM
WEBSITE	www.mercor.com.pl	LOGO ON THE PRODUCT	
TEL	+48 58 3414245	EMAIL	mercors@mercors.com.pl B.Adkonis@mercors.com.pl

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Product Details From Test Report	Reference Test Report page NO	
<p>DESCRIPTION OF THE PRODUCT (TECHNICAL DETAILS FROM TEST REPORT, SUCH AS ACTUAL FIRE RATINGS/DIMENSIONS/THICKNESS/ SENSITIVITY ETC)</p>	<p>Natural smoke and heat exhaust ventilator, louver-type MCR LAM mounted on flat roof or into the wall.</p> <p>Dimensions – from 0,5 m length x 0,8 m width up to 2,5 m length x 3,8 m width Open position - 90° from horizontal</p> <p>Material – steel or aluminium upstand / mineral wool or PS/PUR insulation / polycarbonate or aluminium blades</p> <p>Shape of upstand – upright maximum 500 mm height made of steel or aluminium sheet can be insulated from outside (by either mineral wool or PS/PUR boards) or not</p> <p>Blades – <u>Variant 1:</u> frame of aluminium profiles filled with multi-wall polycarbonate <u>Variant 2:</u> polystyrene encapsulated by aluminium sheet Maximum thickness of blades: 25 mm</p> <p>Control system (either 1 or 2 depending on SL classification):</p> <p><u>1. Pneumatic system:</u></p> <ul style="list-style-type: none"> - type PUDV 40-190, PUDV 50-190 (produced by K+G GmbH, Germany), - type PVZ 40-01-190, PVZ 50-01-0190 (produced by JOFO Pneumatic GmbH, Germany) or - type P50/12-180-380-10-ZSV-BB10-1x12/6 (produced by K+G Pneumatic GmbH, Germany) used together with 2 gas springs ø 8 mm, type 2500150VD8 2913 (manufacturer: Berthold Marx, France). <p><u>2. Electric system:</u></p> <ul style="list-style-type: none"> - type MCR-W = type G (produced by K+G Pneumatik GmbH, Germany), 24V <p>Way of operating</p> <ul style="list-style-type: none"> - Type C1 - Automatic opening by means of PUDV/ PVZ - Manual closing - Type C2 - Automatic opening by means of PUDV/ PVZ - Automatic closing by means of PUDV/ PVZ - Type E1 - Automatic opening by means of MCR-W - Automatic closing by means of MCR-W - Type C3 - Automatic opening by means of P50/12 - Closing by gas springs <p>Wind deflectors – aluminium deflectors fitted to three sides of product</p> <p>Control jet – alternative usage of 300mm high steel/aluminium control jet</p>	<p>C1396/08/0042/ 5003/SC</p> <p>FIRES-JR-091-17- NURE Edition 3</p> <p>I1396/20/0024/14/ 4003</p>
<p>TEST STANDARD (SUCH AS ASTM/BS EN/ DN ETC)</p>	<p>EN 12101-2: 2003 - Smoke and heat control systems. Specification for natural smoke and heat exhaust ventilators</p> <p>* This standard specifies requirements and test methods for natural smoke and heat exhaust ventilators which are intended to be installed as a component of a natural smoke and exhaust ventilation system</p>	
<p>TEST DESCRIPTION</p>	<p>EN 12101-2: 2003</p> <p>Annex B - Determination of the aerodynamic free area (Effectiveness of smoke/hot gas extraction (aerodynamic free area)) Annex C - Test method for reliability (Test method for operational reliability and response time) Annex D - Test method for opening under load Annex E - Test method for low ambient temperature Annex F - Test methods for wind load (Test method for stability under wind load) Annex G - Test method for heat exposure (Test method for resistance to heat)</p>	

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<p>SPECIFICATION OF TEST SPECIMEN</p>	<p>Specimen tested acc. to EN 12101-2, Annex C, D, E, F, G:</p> <ul style="list-style-type: none"> • MCR LAM (3 x 2) m with pneum. drive PVZ 40/1-01-190 • MCR LAM (3 x 2) m with electric drive MCR W26F-190 • MCR LAM (2 x 2) m with pneum. drive PUDV 50/12-190-10-12/6 • MCR LAM (3 x 1,6) m with pneum. drive PVZ 50-01-190 • MCR LAM (2,2 x 1,4) m with electric. drive MCR W10A-190 • MCR LAM (3 x 2) m with electric drive MCR W26F-190 • MCR LAM (3 x 2,5) m equipped with 2 electric drives MCR W13A-190 • MCR LAM (3 x 2,5) m with 2 pneum. drives PVZ 50 - 01 - 190 • MCR LAM (3 x 2,5) m with pneum. drive P50/12-180-380-10-ZSV-BB10-1x12/6 • MCR LAM (3,8 x 2,5) m with 2 electric. drives 13A • MCR LAM (3,8 x 2,5) m with 2 x pneum. drives P50/12-180-380 • MCR LAM (2,4 x 1,5) m with 1 x PUDV 40 or 1 x P50/12 • MCR LAM (2,4 x 1,5) m with 1 x MCR-W • MCR LAM (3,8 x 2,5) m with 2 x P50/12 +55 g CO₂ <p>Specimen tested acc. to EN 12101-2, Annex B (MCR LAM with 350 mm upright upstand, with wind deflectors)</p> <ul style="list-style-type: none"> • MCR LAM (1,2 x 2) m • MCR LAM (2,2 x 1) m • MCR LAM (1 x 1,4) m • MCR LAM (0,8 x 0,5) m • MCR LAM (0,8 x 1,3) m • MCR LAM (3 x 2,2) m made in scale (1:3) • MCR LAM (1,6 x 2,5) m made in scale (1:2) • MCR LAM (3,8 x 2,5) m made in scale (1:2.5) <p>(MCR LAM with 350 mm upright upstand, with wind deflectors, with control jet)</p> <ul style="list-style-type: none"> • MCR LAM (1 x 1,4) m • MCR LAM (1,2 x 2,0) m • MCR LAM (2,2 x 1,0) m • MCR LAM (0,8 x 0,5) m • MCR LAM (3 x 2) m made in scale (1:3) • MCR LAM (3 x 2,2) m made in scale (1:2) 	<p>FIRES-JR-091-17-NURE Edition 3 issued by FIRES, s.r.o. on 03. 12. 2019 valid until 05. 04. 2023</p> <p>FIRES-AT-014-10-NUNE Edition 2 issued on 27. 10. 2016</p> <p>FIRES-AT-007-12-NUNE Edition 3 issued on 27. 02. 2019</p>
<p>TEST RESULT (SUCH AS PASSED CRITERIA ___/ COMPLIED TO ___/ DURATION ___/OBSERVATION ___/ ETC)</p>	<p>1. Nominal activation conditions/ sensitivity: Ventilator shall be fitted with automatic initiation device. The ventilator is provided with an opening mechanism with energy within the ventilator and/or with an external energy source. Ventilator type B – ventilator able to be opened into its fire open position and close remotely</p> <p>2. Response delay: Product is opened to its fire open position not more than 60 seconds after actuation without damage.</p> <p>3. Operational reliability:</p> <p>✓ Reliability RESULTS: Class Re 300 or Re 1000 (depending on the product variant) 10 000 cycles of opening and closing for daily ventilation</p> <p>✓ Wind load RESULTS: Class WL 1500 or WL 3000 Classification WL 3000 is valid for MCR LAM with maximum dimensions (2400 x 1500) mm (width x length); Classification WL 4000 is valid for MCR LAM with maximum dimensions (2400 x 1000) mm (width x length);</p> <p>Natural frequency of vibration is higher than 10 Hz with logarithmic decrement of damping greater than 0,1 - PASSED</p>	<p>C1396/08/0042/5003/SC</p> <p>FIRES-JR-091-17-NURE Edition 3 (page no. 6 – 10)</p>

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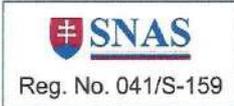
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 وزارة الداخلية
 القيادة العامة للدفاع المدني
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	<p>✓ Effectiveness of smoke/hot gas extraction - aerodynamic free area RESULTS A_s from 0,24 [m²] up to 6,175 [m²] for NSHEV used in compliance with report FIRES-AT-007-12-AUNE, ed.3 A_s from 0,23 [m²] up to 4,88 [m²] for NSHEV used in compliance with report FIRES-AT-014-10-AUNE, ed.2</p> <p>✓ Fire resistance - mechanical stability: RESULT: Class B 300 The ventilator was tested to 300°C with a total test time of 30 minutes and the throat area of the ventilator was not reduced by more than 10% of the initial throat area</p> <p>✓ Opening under load – Snow load RESULT: Class SL 0 for wall installation Class SL 250 – SL 2000 (depending on product variant) for roof installation</p> <p>✓ Opening under low ambient temperature RESULT: class T (00) or class T (-25) T (-25) is valid for NSHEV, louver-type MCR LAM fitted with: - electric actuator(s), type MCR-W (K+G Pneumatik GmbH, D); - pneumatic cylinder(s), type P50/12 (K+G Pneumatik GmbH, D); - pneumatic cylinder(s), type PUDV (K+G GmbH, Germany) or type PVZ (JOFO Pneumatic GmbH) on condition that SL-classification is reduced</p> <p>✓ Reaction to fire RESULT: Class E acc. to EN 13501-1 or NPD (i.e. no performance determined)</p>	<p>FIRES-AT-007-12-AUNE, ed.3 FIRES-AT-014-10-AUNE, ed.2</p> <p>FIRES-JR-091-17-NURE Edition 3 (page no. 6 – 10)</p>
<p>PRODUCT APPLICATION GUIDELINE (END USE) (CLEARLY STATE THE END USE WITH SPECIFIC APPLICATION, SUCH AS EXACT FIRE RATING/TO BE INSTALLED IN ___/TO BE CONNECTED AT ___/TO BE CONNECTED WITH ___/ETC ALONG WITH ANY WARNINGS SUCH AS NOT TO BE USED IN ___/NOT TO BE INSTALLED AT ___/ NOT TO BE INSTALLED WITH ___ ETC.</p>	<ul style="list-style-type: none"> - product is used as a smoke and heat exhaust ventilator (acc. to EN 12101-2) which has provision to allow its use for comfort ventilation; - product can be mounted on flat roof or into the wall; - roof mounted ventilator shall be fitted with wind deflectors and depending on discharge coefficient C_d shall be equipped or not with control jet; - in case of wall-mounted NSHEV, product is installed in sufficient numbers and positions, to ensure that there is a large enough area of natural ventilation to satisfy the recommendations of CEN/TR 12101-5: 2005, paragraph 6.6 for all possible wind directions. These ventilators should be able to open or close automatically under the control of wind direction sensors or wind pressure measurements at the natural ventilators. - fire open position of blades is 90°; - aerodynamic free area of the product shall be determined in compliance with test report FIRES-AT-007-12-AUNE, ed.3 of 27.02.2019 and FIRES-AT-014-10-AUNE, ed.2 of 27.10.2016; - to ensure the natural smoke and heat exhaust ventilator opens in the event of a fire, it is fitted with one or more of automatic initiation devices. Any automatic initiation or release device shall be within NSHEV and shall be exposed to the hot gas entering the closed NSHEV. In some specific design cases where it is suitable to initiate the NSHEV manually only, the NSHEV may be installed without an automatic initiation device. - The NSHEV shall be provided with an opening mechanism with energy within the ventilator (e.g. electrical power supply) and/or with an external energy source. For the external links the manufacturer of the NSHEV shall specify the operating requirements for the initiation device and the opening mechanism, e.g. voltage, energy. - If the NSHEV is intended to operate with an external energy source it shall be equipped with inputs and/or outputs to allow connection of the NSHEV to the control panel and power supplies in accordance with EN 12101-10. - Other requirements and EU directives, not affecting the fitness for intended use may be applicable to a construction product falling within the scope of standard EN 12101-2. 	

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Laboratory and Certification body details			
NAME OF CERTIFICATION BODY	FIRES, s.r.o., Accredited Product Certification Body	NAME OF TEST FACILITY	FIRES, s.r.o., Testing laboratory
CERTIFICATION BODY ADDRESS / REGION <small>(STREET / TOWN / CITY / COUNTRY)</small>	Osloboditeľov 282, 059 35 Batizovce, Slovakia	TEST FACILITY ADDRESS / REGION <small>(STREET / TOWN / CITY / COUNTRY)</small>	Osloboditeľov 282, 059 35 Batizovce, Slovakia
WEBSITE	www.fires.sk	WEBSITE	www.fires.sk
TEL	+421 52 285 1611	TEL	+421 52 285 1611
EMAIL	lapkova@fires.sk	EMAIL	rastocky@fires.sk
ACCREDITED BY <small>(NAME OF ACCREDITATION BODY WHICH ISSUED ACCREDITATION TO THE CERTIFICATION BODY, ALONG WITH WEBSITE)</small>	SNAS (Slovak national accreditation body) www.snas.sk	ACCREDITED BY <small>(NAME OF ACCREDITATION BODY WHICH ISSUED ACCREDITATION TO THE LABORATORY, ALONG WITH WEBSITE)</small>	SNAS (Slovak national accreditation body) www.snas.sk
AS PER <small>(STANDARD TO WHICH THE CERTIFICATION BODY IS ACCREDITED TO)</small>	STN EN ISO/IEC 17065: 2012	AS PER <small>(STANDARD TO WHICH YOUR ORGANIZATION IS ACCREDITED TO)</small>	STN EN ISO/IEC 17025:2005
VALIDITY <small>(EXPIRY DATE OF CERTIFICATION BODY ACCREDITATION)</small>	03.07.2021	VALIDITY <small>(EXPIRY DATE OF LABORATORY ACCREDITATION)</small>	13.12.2020
REFERENCE NUMBER: <small>(CERTIFICATION BODY ACCREDITATION REFERENCE NUMBER TO VERIFY ON THE ACCREDITOR'S WEBSITE)</small>	P-007	REFERENCE NUMBER: <small>(THE LABORATORY ACCREDITATION REFERENCE NUMBER TO VERIFY ON THE ACCREDITOR'S WEBSITE)</small>	S-159
CERTIFICATION MARK	  		

(ENDORSEMENT) TO BE SIGNED BY MANUFACTURER			
NAME OF MANUFACTURER'S SIGNATORY	Jakub Lipiński	SIGNATURE	 PIERWSZY WICEDZIEK ZARZĄDU DYREKTOR FINANSOWY Jakub Lipiński
EMAIL / TEL	mercor@mercor.com.pl	FACTORY OFFICIAL SEAL	
NOTES: I Undertake that all data and information provided are genuine and accurate			

لجنة اعتماد المختبرات العالمية وبيوت الخبرة ومعاهد التدريب 5

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وبيوت الخبرة ومعاهد التدريب

(ENDORSEMENT) TO BE SIGNED BY CERTIFICATION BODY			
NAME OF CERTIFICATION BODY SIGNATORY	Ing. Henrieta Lapková	SIGNATURE	
EMAIL / TEL	+421 52 285 16 21 lapkova@fires.sk	CERTIFICATION BODY OFFICIAL SEAL	
NOTES: I Undertake that all data and information provided are genuine and accurate			

ATTACHMENTS:

- COPY OF 'LABELS' NO. 00863 – 00882 ISSUED BY CERTIFICATION BODY



Certificate No.: FIRES/2020/005
Producer: „MERCOR“ S.A., Gdańsk, Poland
Type of product: NSHEV, type mcr LAM
Fire resistance: B 300
Identification No.: 00863

www.fires.sk

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دولة الامارات العربية المتحدة
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لجنة اعتماد المختبرات العالمية
وبيوت الخبرة ومعاهد التدريب

• COPY OF CERTIFICATE OF CONSTANCY OF PERFORMANCE ISSUED BY CERTIFICATION BODY
(ACTUAL)

 SNAS Reg. No. 041/P-007	NOTIFIED BODY No. 1396 Oskobediteľov 282, 059 35 Batizovce, Slovakia tel: +421 75229 61 4212761 633 http://www.fires.sk	 FIRES The Experts on Fire Safety
<p>Certificate of constancy of performance</p> <p>1396 – CPR – 0032</p> <p>In compliance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product</p> <p>Natural smoke and heat exhaust ventilator louver-type MCR LAM</p> <p>having the performances and used in conditions given by initial type testing report No. C1396/08/0042/5003/SC issued by FIRES, s.r.o., NB 1396, Slovakia, on 26. 05. 2009. produced by</p> <p>MERCOR SA ul. Grzegorza z Sanoka 2, 80-408 Gdansk, Poland</p> <p>and produced in the manufacturing plant</p> <p>MERCOR SA Zakład Produkcyjny, ul. Kwarцова 3A, Ciepłewo, 83-031 Łęgowo Poland</p> <p>This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard</p> <p>EN 12101-2: 2003</p> <p>under system 1 for the performances set out in this certificate are applied and that the construction product fulfils all the prescribed requirements for these performances.</p> <p>This certificate was first issued on 26. 05. 2009 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard, used to assess the performance of the declared essential characteristics, do not change, and the construction product, and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the product certification body.</p> <p>Batizovce, 14. 11. 2014</p> <p style="text-align: right;">  Ing. Mária Gašperová Head of Product Certification Body </p> <p style="text-align: left;">064273 FIRES 1396/C-29/07/2014-E</p>		

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