Fire protection systems

Mercor Light&Vent sp. z o.o.
ul. Grzegorza z Sanoka 2
80-408 Gdańsk

tel. (+48) 58 341 42 45

Smoke and heat exhaust windows mcr OSO THERM. Operation and maintenance manual.

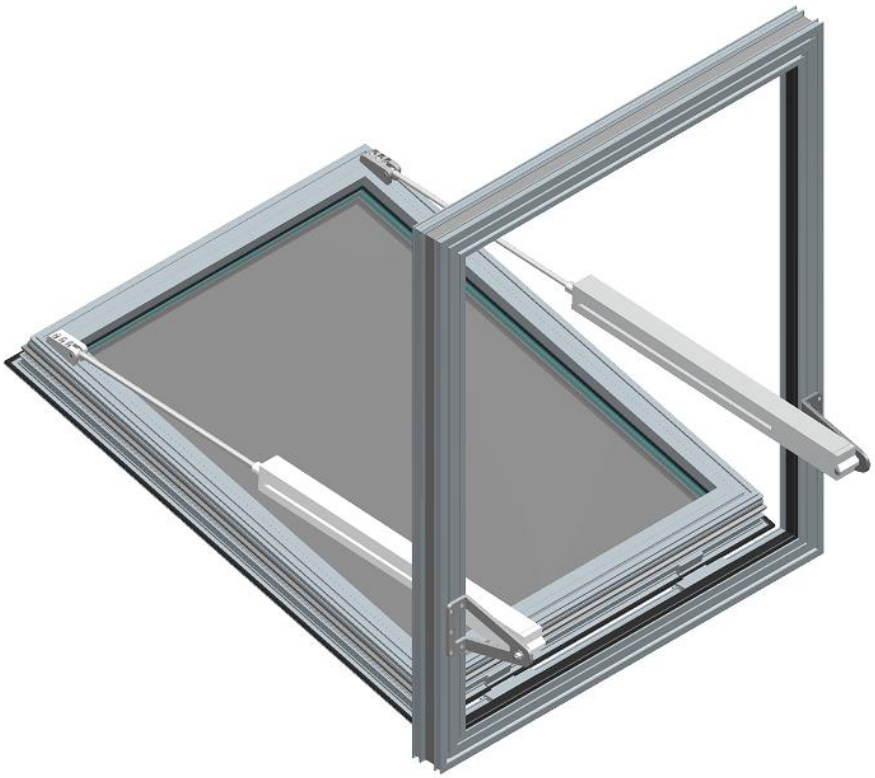


TABLE OF CONTENTS

1. INTRODUCTION

This Operation and Maintenance Manual (OMM) enables users to familiarise themselves with the intended use, design, principle of operation, correct installation and operation of mcr OSO THERM smoke exhaust and air-supply windows. The Manual also includes additional information about operation, maintenance and warranty conditions for the product.
Compliance with the Manual guidelines ensures correct performance of systems in terms of smoke removal and air supply as well as system users' safety.

NOTE
All activities related to installation, operation, maintenance and servicing of windows must be performed in line with applicable OHS rules, using personal protective equipment suitable for a given activity, in particular fall protection measures. Activities performed at heights, i.e. connecting electrical equipment, etc., can be conducted only by appropriately qualified persons.

2. INTENDED USE

mcr OSO THERM smoke exhaust windows are automatic natural smoke exhaust devices. The main function of smoke exhaust windows is to remove smoke, fire vapours and thermal energy from confined spaces (manufacturing facilities, warehouses, public utility buildings, etc.) to the outside of a given building in order to contribute to protection of people and property by:

- ensuring little amount of smoke within escape routes;
- facilitating fire-fighting and fire-extinguishing actions by ensuring only slight amounts of smoke on lower levels;
- ensuring protection of a building structure and equipment;
- limiting damage caused by smoke, hot fire gases and thermal decomposition products.

In particular cases, mcr OSO THERM windows can be used to provide air supply in natural smoke exhaust systems. Additionally, they can be used for ventilation purposes.
With smoke exhaust windows, an Investor is able to, e.g.:

- decrease required fire resistance class of a building;
- expand permissible fire zones;
- extend escape routes.

mcr OSO THERM windows come with the certificate constancy of performance no. 1396-CPR-0128 conforming to the EN 12101-2:2003 standard requirements, issued by the Notified Body no. 1396.

3. DESIGN AND OPERATING PRINCIPLE

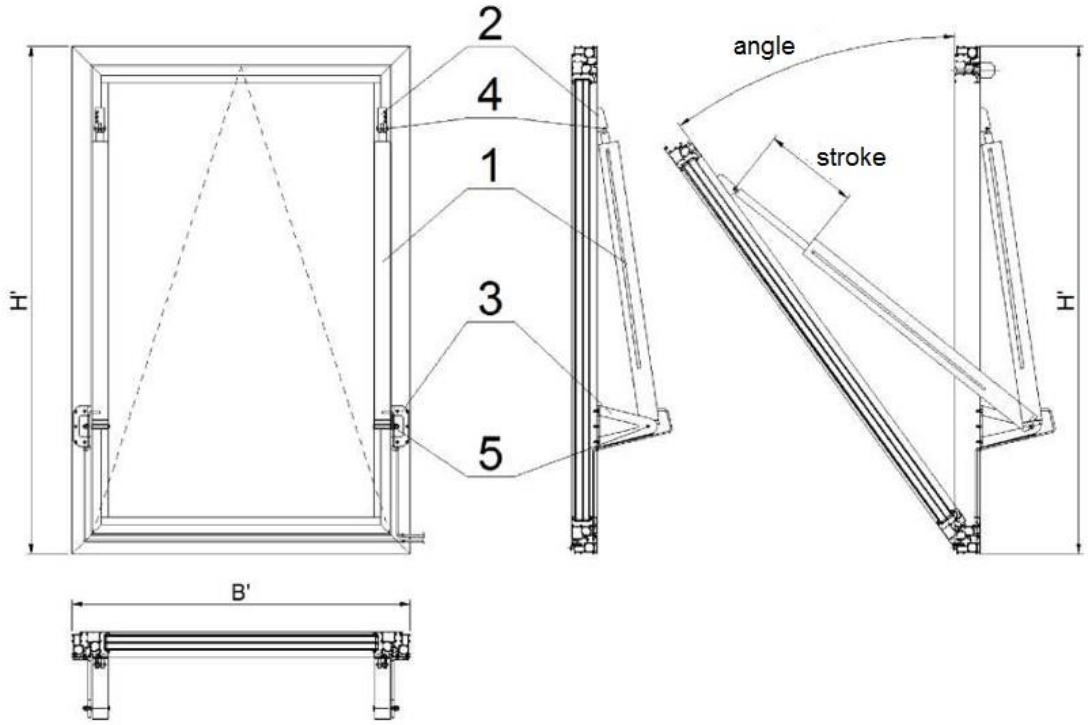
Depending on individual customer's needs, Mercor Light&Vent sp. z o.o offers windows with a smoke-removal (air supply, ventilation) function as well as a broad range of top or bottom, outward or inward opening windows of various dimensions and configurations.

As a standard, windows are provided with electromechanical spindle or chain actuators.

Actuators are mounted on windows (on window sashes and frames) using steel or aluminium brackets painted with colours matching the window colours.

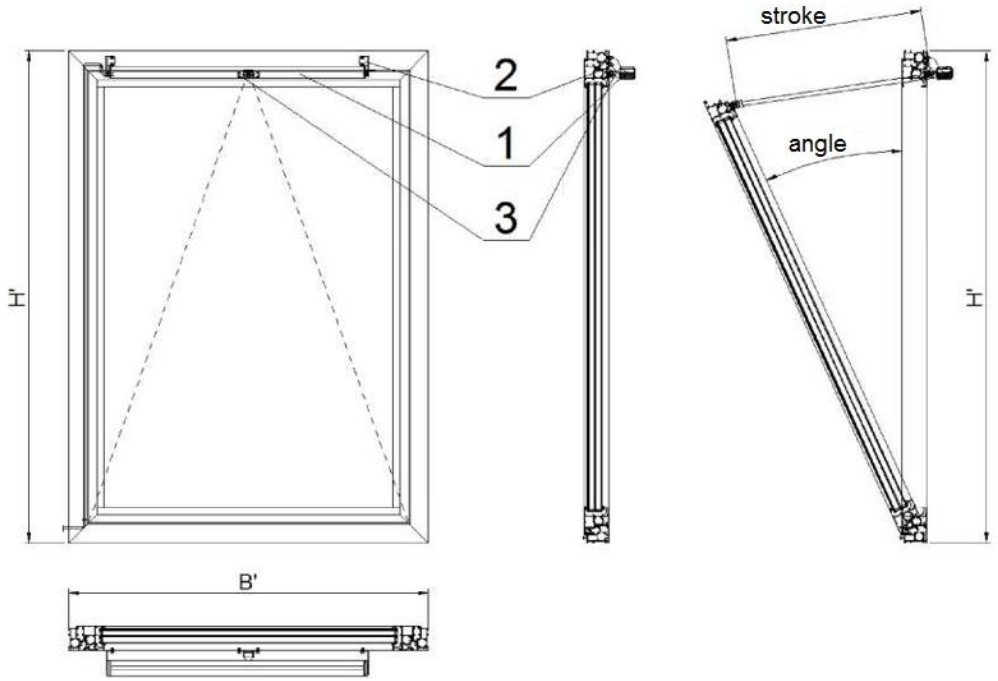
NOTE: within one RAL color, there may be differences in shades of details (e.g. consoles, plugs) mounted on window profiles.

To operate smoke exhaust windows there can be used control units mcr 9705 or mcr 0204 made by Mercor Light&Vent sp. z o.o, including mcr R04xx extension modules. These control units operate the electrical actuators, using signals transferred from connected detectors, buttons and optionally other systems.



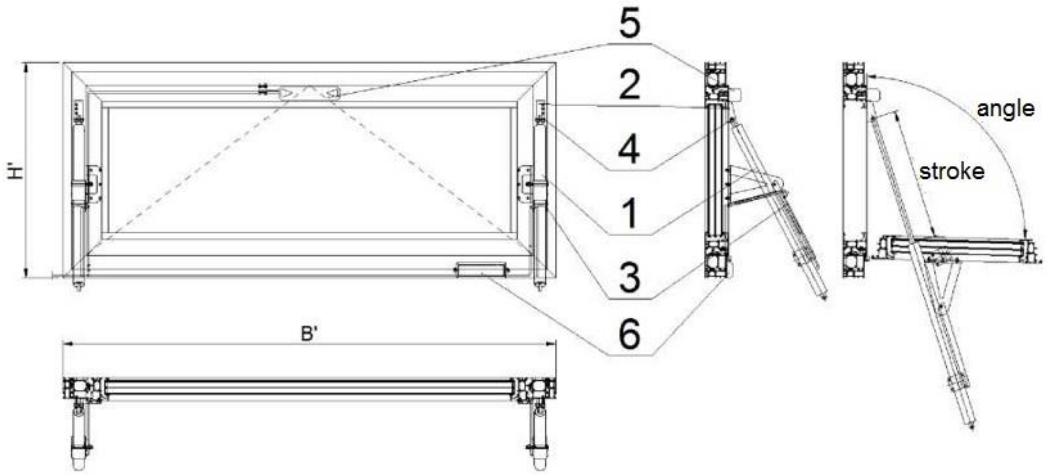
1 - spindle actuators, 2 - upper hold, 3 - lower hold, 4 - upper pin, 5 - lower pin

Fig. 1 View and cross-sections of an example mcr OSO THERM smoke exhaust window opened to the outside, with spindle actuators on sides.



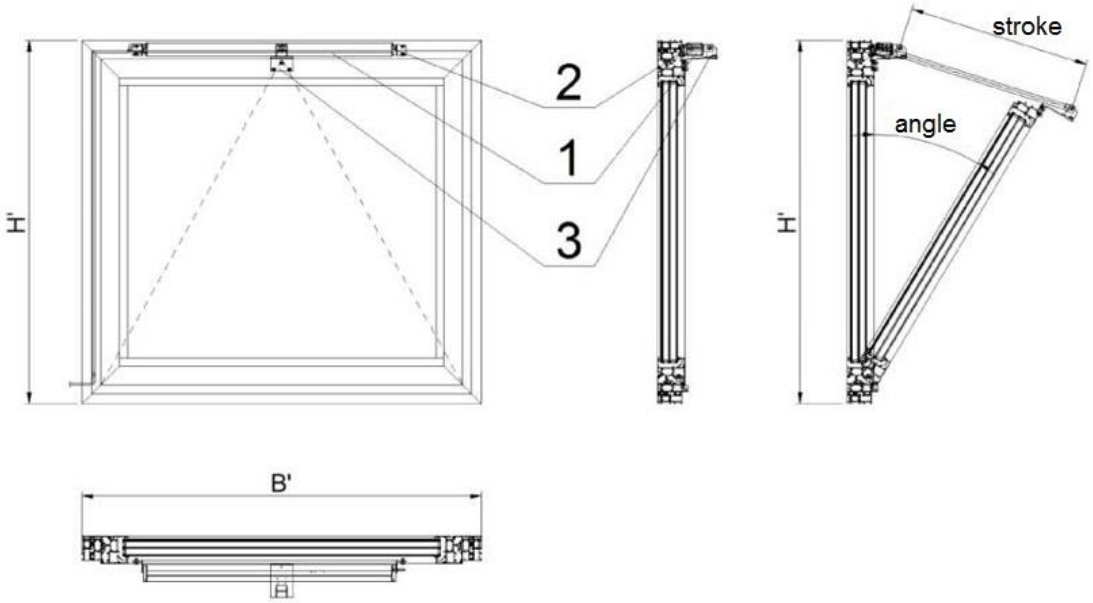
1 - chain actuator, 2 - frame catch, 3 - sash catch

Fig. 2 View and cross-sections of an example mcr OSO THERM smoke exhaust window opening to the outside, with a chain actuator.



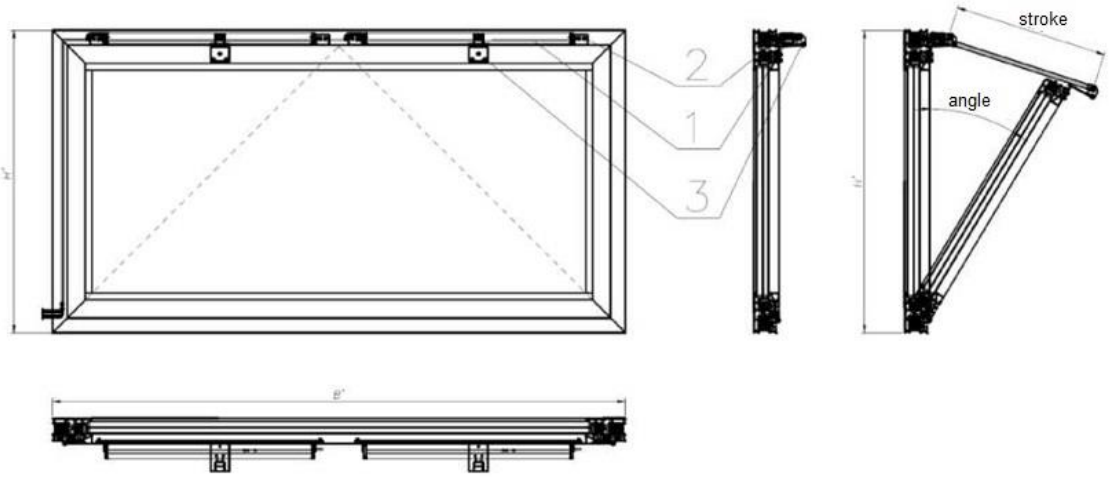
1 - Spindle actuators, 2 - upper hold, 3 - lower hold with catch and pivot point shift clamping ring, 4 - upper pin, 5 - rotational electromagnetic lock, 6 - lock interface

Fig. 3 View and cross-sections of an example mcr OSO THERM smoke exhaust window opening to the inside, with a spindle actuator (shifted pivot point) and lock.



1 - chain actuator, 2 - frame bracket, 3 - window bracket,

Fig. 4 View and cross-sections of an example mcr OSO smoke exhaust window opening to the inside, with a chain actuator.



1 - chain actuator, 2 - frame bracket, 3 - window bracket,

Fig. 5 View and cross-sections of an example mcr OSO smoke exhaust window opening to the inside, with two chain actuators.

4. TRANSPORT AND DELIVERY

Smoke-removal (air-supply, ventilation) windows belonging to the mcr OSO THERM system are delivered fully assembled (with drives, inspected and adjusted).

The unloading operations must be conducted under supervision of a person authorised by the manufacturer, using generally available reloading equipment or manually, ensuring that all applicable OHS regulations are adhered to.

5.INSTALLATION

Windows must be installed according to necessary OHS regulations, in particular those related to working on heights, by means of all required personal protection equipment.

The installation method depends on a site and material type. Installation must be performed in line with manufacturer's requirements and rules of construction art, paying special attention to correct sealing between the window frame and masonry.

5.1. FIXING ALUMINIUM WINDOWS TO BUILDING WALLS

Use dowels (Fig. 6) or anchors (Fig. 7) to fix windows to the wall. Dowels are special expansion bolts used to fix window frames directly to masonry. Anchors are steel plates screwed to frames and masonry using correct fasteners. Anchors make it possible to move a window into a layer of an insulation material. The mounting method should be adjusted to the masonry type, depending on its material, e.g. brick, cellular concrete, silicates, etc. Dowels and anchors (with fasteners) are not delivered with complete window sets.

Fig. 6 Installation using anchors.

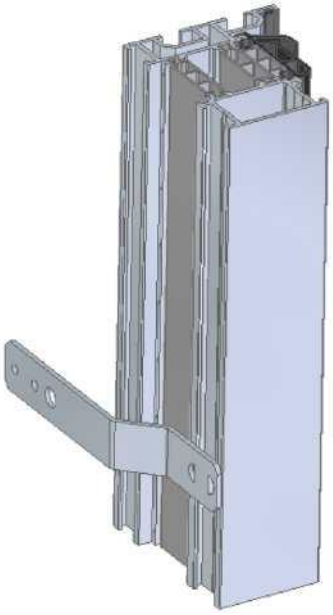


Fig. 7 Installation using dowels.

The fixing method should consider dilatation from aluminium structure, i.e. an installation gap (10÷20 mm). Profiles should be fixed through the inside of the frame to an internal face of a building wall. Only this method ensures thermal insulation of aluminium structures. The location of windows in window openings depends on the internal reveal shape (with or without an external reveal) and wall type (single-layer, multi-layer, with external thermal insulation) - see Fig. 8, 9 and 10.

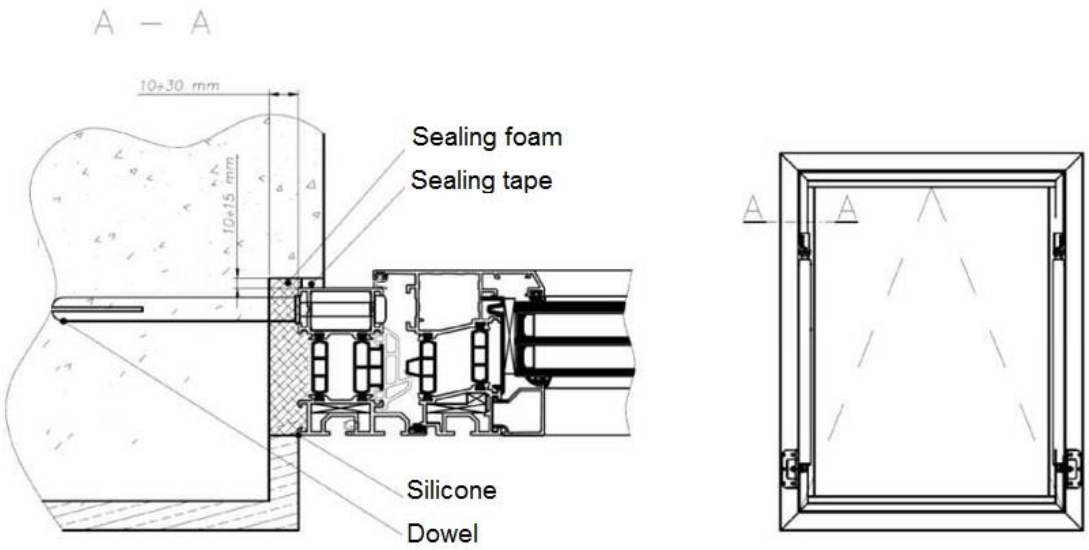


Fig. 8 Window in wall with external reveal.

The gap width between a window frame and building wall (from 10 to 20 mm) should take into account both dimensional deviations of windows and frames as well as deformations resulting from external condition impact, e.g. temperature variations (∆t).

Depending on a colour, the aluminium profile elongation values are:

- light colours - 1.2 mm/m
- dark colours - 1.3 mm/m

For window openings with an external reveal, it is necessary to maintain a 10÷15 mm gap between the frame profile face and external reveal (masonry). The gap must be filled with an elastic and waterproof material.

Provide at least two fixing points on each side. A fixing point should be located at the height of each hinge.

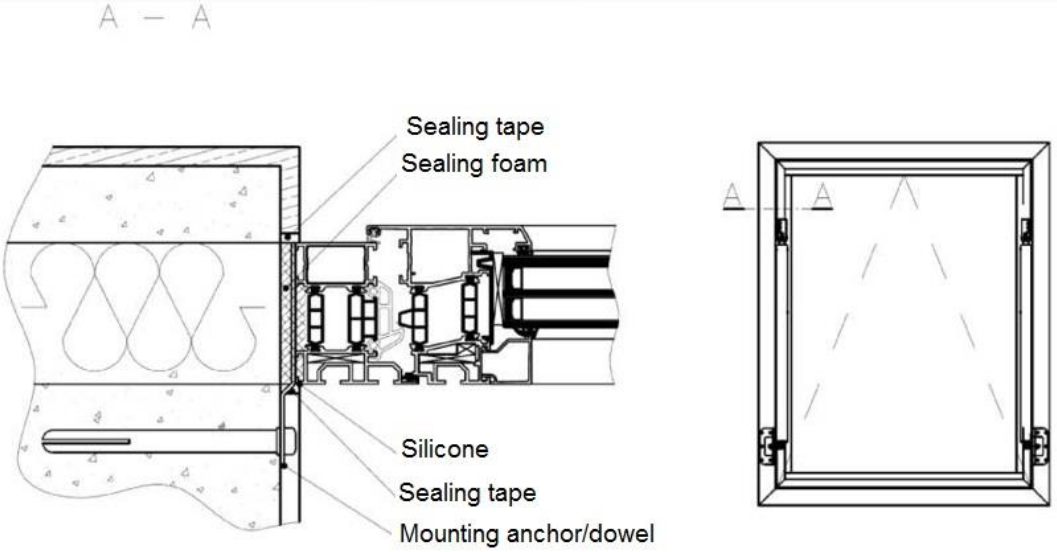


Fig. 9 Window in three-layer wall.

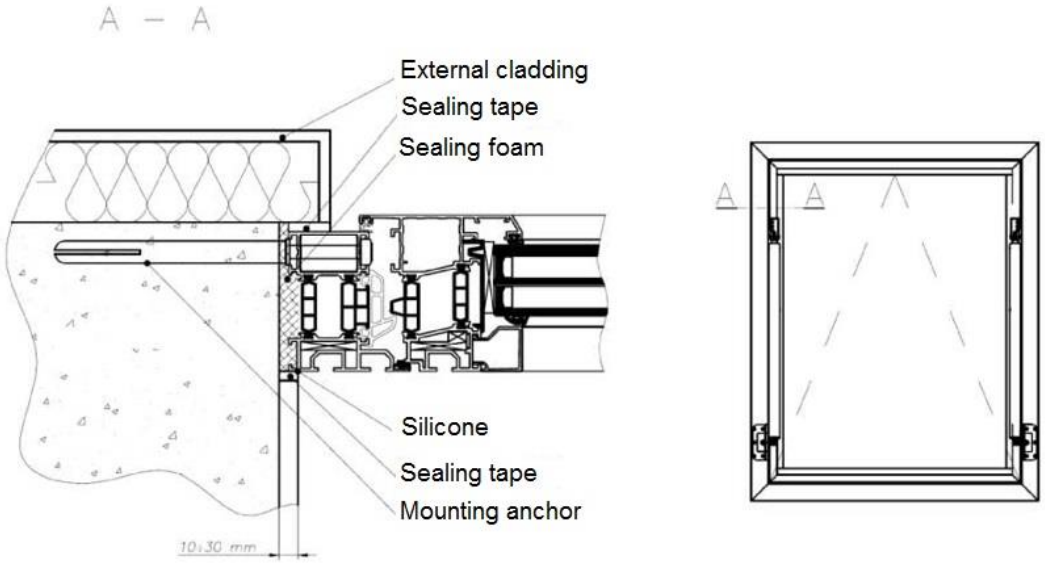


Fig. 10 Window in wall with external thermal insulation.

The fixing points should be located around window frame, according to the diagram shown in Fig. 11. The distance of fixing to corners, posts and bolts should be 100÷150 mm, and the distance between two fixing points must not exceed 600 mm.

While fixing windows, ensure the mechanical connections made by means of fasteners are solid, and polyurethane foam is not used as a fixing material, but as sealing and insulation of connections.

Moreover, the following recommendations should be observed during installation:

- Do not use hammer drills (except for making holes in concrete).
- While drilling window frames, use drills longer than the frame height.
- Protect windows with a tape during installation.
- Choose a correct dowel length and diameter (adjusted to transferred loads and internal reveal material).
- Maintain a minimum distance from masonry edges so as to avoid chipping.
- Screw bolts into window frames evenly and carefully to avoid tensions and deformations.
- Use supporting and distancing wedges to position a window correctly and retain an installation gap around the structural opening. Wedges made of hard wood or a ceramic material should be located providing that, before installation, a window can deform freely without bending or warping (see Fig 16 for locations of a minimum number of supporting wedges for windows of various types).
- Fill the installation gap between a window frame and internal reveal masonry correctly, using an insulating and sealing material. Apply the material in line with manufacturer's recommendations.
- Use polyurethane foams, silicone compounds or impregnated sealing tapes to seal the gap between a window frame and internal reveal. While applying polyurethane foam, ensure the gap is filled precisely and avoid window frame deformations. The foam must be protected (covered) against UV radiation and weather conditions.
- After an insulating material (polyurethane foam) dries completely, remove an excess material using a sharp knife, flush with the window frame edge.
- Perform finishing and masking operations on the joint between a window and masonry, i.e. plaster on the external and internal side. After plasterwork dries completely in the contact point with a window frame, provide finishing sealing on the external side, using natural silicone.

- Install window sills.
- The external plaster layer or window sill must not cover the water drain holes located in the lower window frame profile.

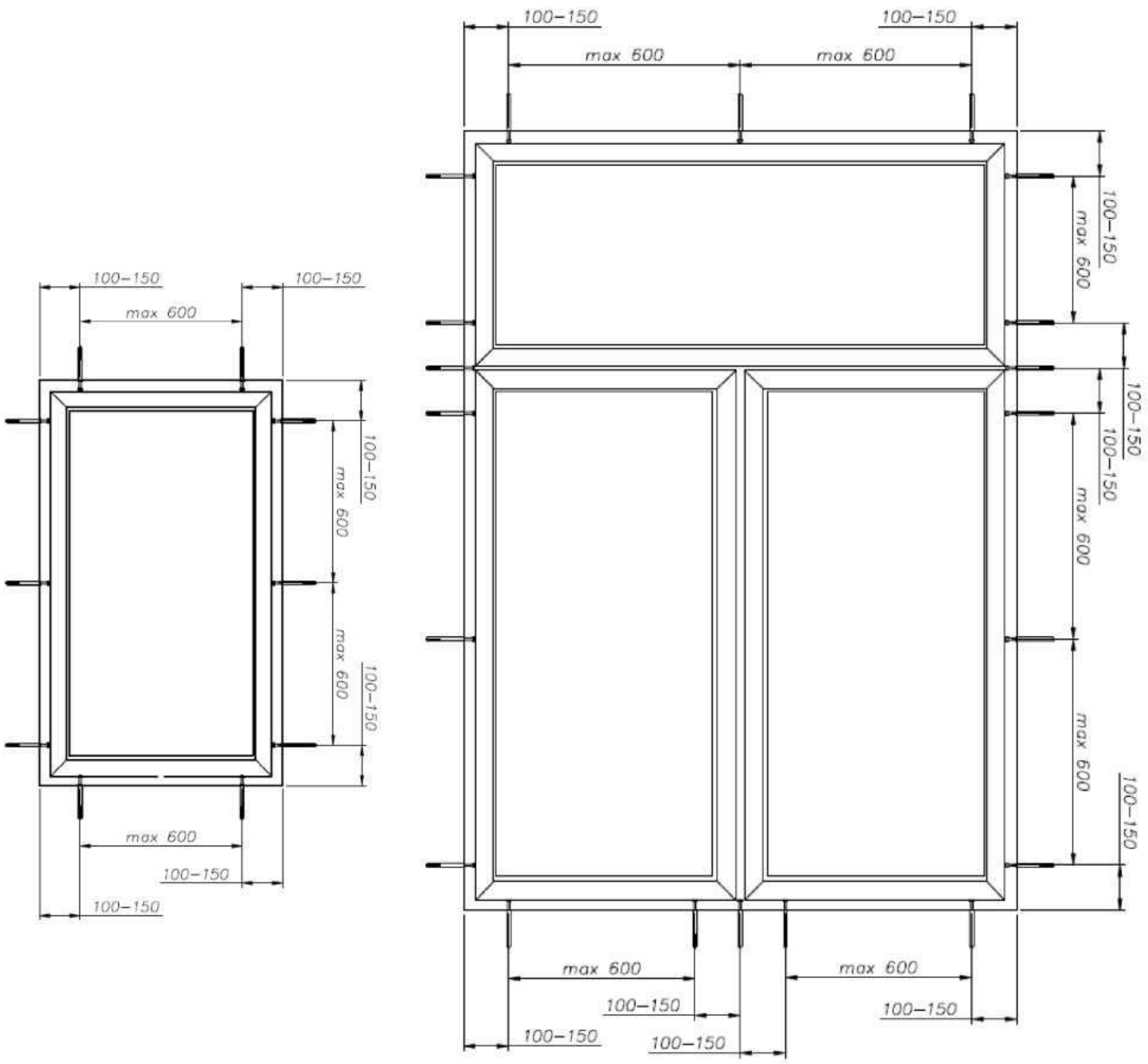


Fig. 11 Method of placing anchors or dowels.

After a window is fixed in the opening, check if:

- it is correctly positioned vertically and horizontally;
- window diagonals are equal;
- a line of windows is on the same level;
- dowels or anchors are properly fixed;
- drainage hole caps have been installed.

After initial sealing is provided, remove supporting and distancing wedges (seal and insulate their fixing spots) and check the window for correct functioning. After installation is completed and the internal reveal is finished, remove the profile protection tape (leaving it for too long may result in leaving traces of an adhesive on protected surfaces).

Next, the drainage holes caps must be installed.

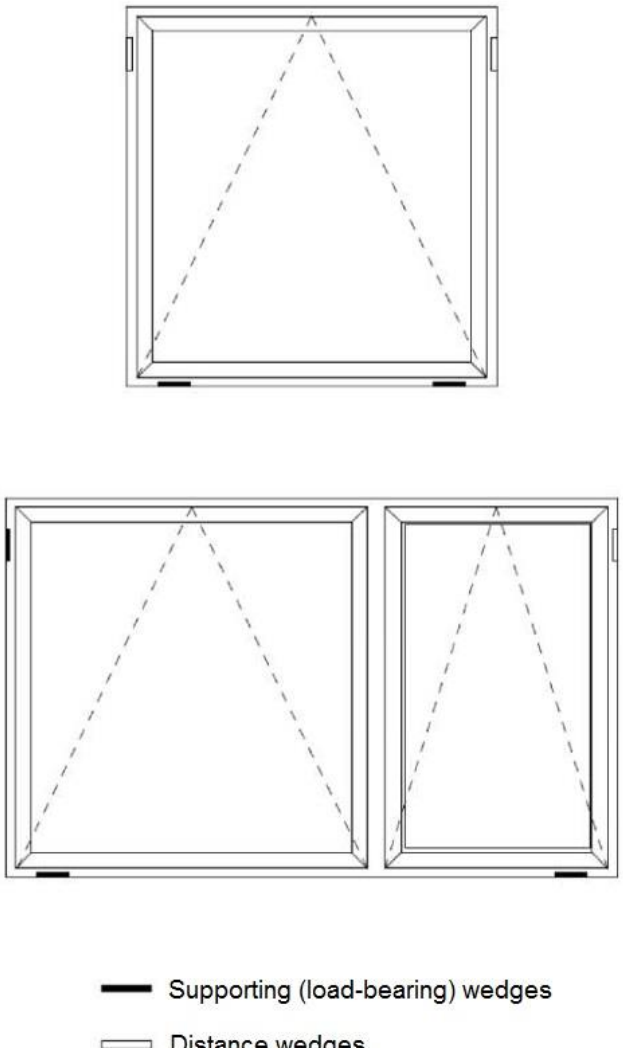


Fig. 12 Location of minimum number of supporting and distancing wedges.

The shape of the holes and caps, along with their locations, is shown below for outward-opening and inward-opening windows.

Fig. 13 Location and shape of drainage holes – inward-opening window.

Fig. 14 Installed drainage holes caps along with their orientation and front/back view – inward-opening window.

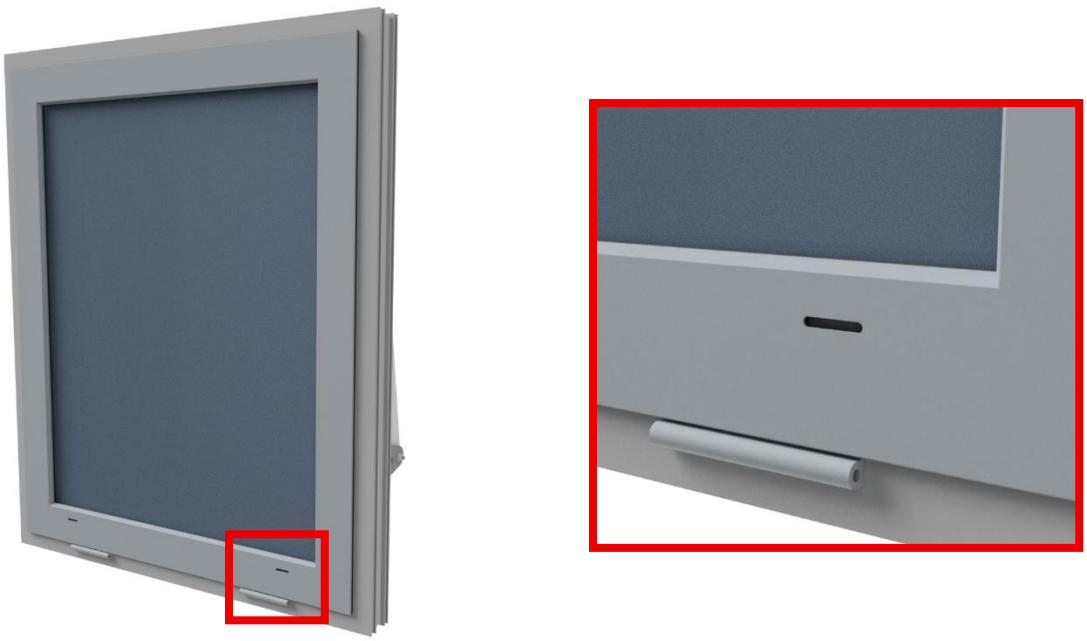


Fig. 15 Location and shape of drainage holes – outward-opening window.

Fig. 16 Installed drainage holes caps along with their orientation and front/back view – outward-opening window.

5.2. ELECTRICAL CONTROL

Method of connecting Sxx, Gxx actuators (polarity of conductors):

brown conductor - blue conductor +	spindle extends	brown conductor + blue conductor -	spindle retracts

Method of connecting HCV- chain drives (polarity of conductors):

red conductor - blue conductor +	} chain extends	red conductor + blue conductor -	} chain retracts

To provide control and power supply for electrical actuators operating mcr OSO windows and skylight vents, Mercor Light&Vent sp. z o.o mcr 9705 or mcr 0204 control units for smoke removal and ventilation with mcr R04xx extension modules can be used. See Fig. 17 and 18 for a connection diagram.

ATTENTION: it is unacceptable to control and supply the mcr OSO THERM system with a device that does not provide min. 1 second break in power supply to the actuator line between changes in the direction of movement of the actuator (between changes in the output voltage polarity on the actuator line)!

Fig. 17 Connection diagram for spindle actuators, without a lock.

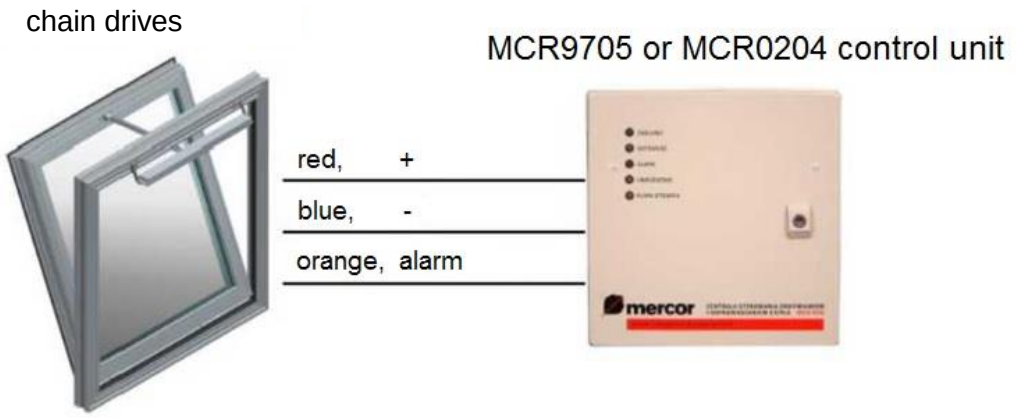


Fig. 18 Connection diagram for chain drives.

See Fig. 19 for a method of connecting two HCVx actuators.

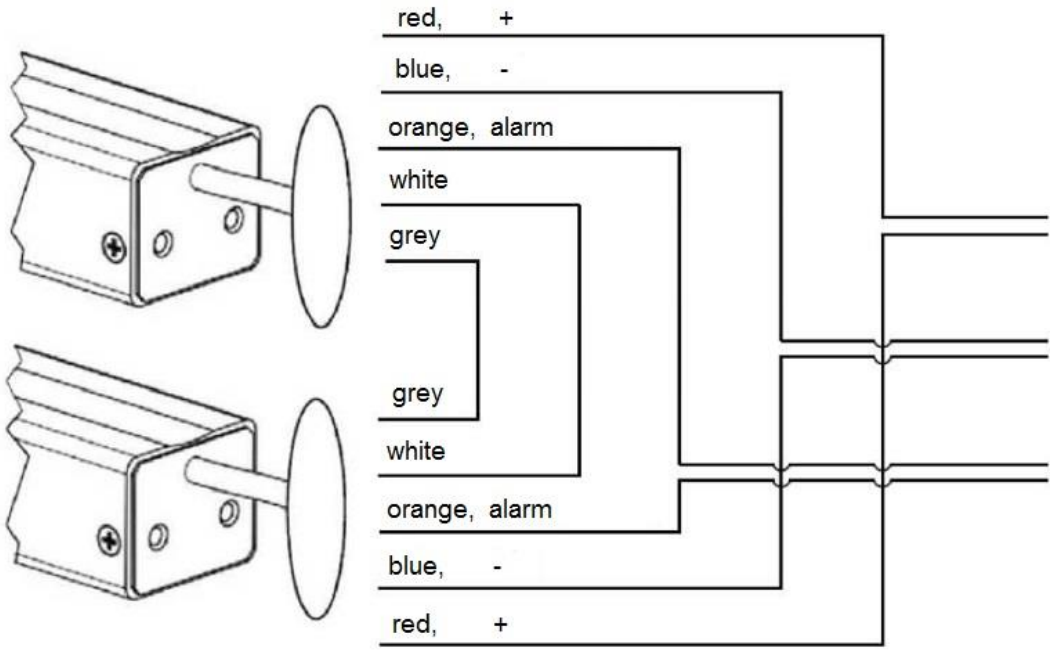


Fig. 19 Diagram for connecting HCV actuators in a tandem.

For windows equipped with a set comprising the FRA 11 BSY lock, reed relay and mcr IR2 lock interface, use the connection diagram from Fig. 20.

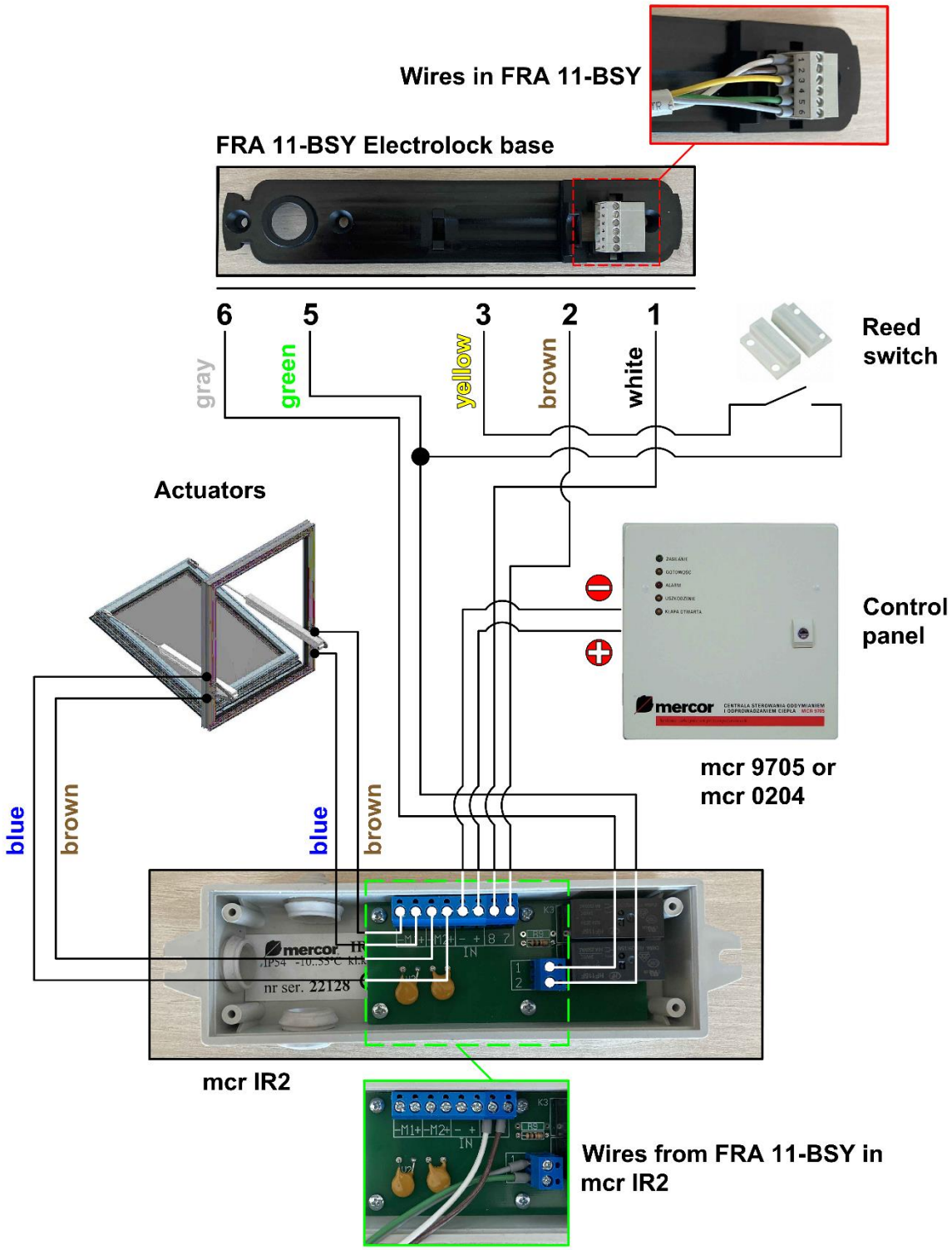


Fig. 20 Connection diagram with a lock and Gxx or Sxx drives.

6. SERVICING AND MAINTENANCE

Equipment from Mercor Light&Vent sp. z o.o. requires **periodic technical inspections** and maintenance **every 6 months** throughout its operating life, i.e. during the warranty and post-warranty period. Inspections and maintenance activities can only be carried out by **the manufacturer** or contractors authorised by Mercor Light&Vent sp. z o.o. to service its products.

In order to perform operations included in the scope of service inspections as well as servicing and warranty-related activities such as visual inspections or repairs, **physical access to equipment is required.** In the case of roof mounted equipment, provide access to the area (via ladders or elevated platforms).

These recommended actions should be taken in the inspection intervals:

1. Check the electrical connections, especially for all mechanical damage.
2. Check actuator handle fixing points for play and damage.
3. Check if a sash frame adheres tightly to a window frame, within the entire circuit, after closing.
4. Clean all movable elements.
5. Periodically clean profiles and glazing.

Both anodised and powder-coated aluminium requires regular maintenance. In less densely populated rural and urban areas (less content of aggressive substances in the air) it is sufficient to clean aluminium elements 2 times a year. In densely populated urban areas, in industrial districts or at the seaside, aluminium structures should be cleaned 4 times a year. Metalwork elements not exposed to rain require more frequent cleaning than elements exposed to rain. Use water with a mild detergent for cleaning. After washing a structure, it must be precisely rinsed with clean water and wiped dry with cloth. Car body washing products are a perfect solution for window element care and maintenance. The Cosmoklar cleaning and care cream by Weiss can also be used. Removers for aluminium, e.g. Cosmofen 60 by Weiss, can also be used to clean aluminium structures.

In order to conceal deep scratches or other paint coat damage, spray paints (for metals) in pressurised cans can be used (colours according to the RAL palette).

As regards matters related with technical inspections, maintenance and equipment service, contact the local representatives of Mercor Light&Vent sp. z o.o., at +48 58 341 42 45, extension 177, from 8 a.m. to 4 p.m. (Monday - Friday) or at serwis@mercor.com.pl.

7.WARRANTY AND SERVICING

1. Mercor Light&Vent sp. z o.o. 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 Light&Vent sp. z o.o. 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 Light&Vent sp. z o.o., Grzegorza z Sanoka 2, 80-408 Gdańsk, Poland.
4. If during the term of guarantee any physical defects of the equipment become evident, Mercor Light&Vent sp. z o.o. shall remove them as soon as possible, subject to paragraph 5.
5. Mercor Light&Vent sp. z o.o. 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. 6, 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 (A_4)). 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 Light&Vent sp. z o.o.,
   - Maintenance or periodic servicing are not done in due time or are performed by unauthorized persons or a service center not authorized by Mercor Light&Vent sp. z o.o., 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 Light&Vent sp. z o.o.
3. On issues related to service please contact a local representative of Mercor Light&Vent sp. z o.o.

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.

8. CERTIFICATE CPR

SNAS
Reg. No. 041/P-007

NOTIFIED BODY 1396
Osloboditeľov 282, 059 35 Batizovce, Slovakia
Tel.+421 52 285 1611, www.fires.sk

FIRES
The Experts on Fire Safety

Certificate of constancy of performance

1396-CPR-0128

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, type mcr OSO THERM

designed to move smoke and hot gases out of construction works naturally under condition of fire Assessment and verification of constancy of performance and conditions of product use are defined in document No. C1396/17/0013/4003/SC (issued by FIRES, s.r.o., Batizovce, NB1396, on 25. 07. 2017) and reports of continuous surveillances of factory production control, carried out during the validity of the certificate. The product is

placed on the market under the name or trade mark of the manufacturer

Mercor Light&Vent sp. z o.o.
ul. Grzegorza z Sanoka 2, 80-408 Gdańsk, Poland

and produced in the manufacturing plant

Mercor Light&Vent sp. z o.o.
ul. Kwarcowa 3A, Cieplewo, 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 performance set out in this certificate are applied and that the factory production control conducted by the manufacturer is assessed to ensure the

constancy of performance of the construction product.

This certificate was first issued on 25. 07. 2017 and will remain valid as long as neither the harmonized standard, the construction product, the AVCP methods nor the manufacturing conditions in the plant are modified significantly, unless suspended or withdrawn by the notified product certification body.

Representative of Notified Body

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

In Batizovce, on 28. 06. 2025

Ing. Štefan Rástocký
Head of Product Certification Body

173678

FIRES 136a/C-23/10/2024-E

Fig. 21 Copy of the certificate.