

## OPERATION AND MAINTENANCE MANUAL

Spot smoke exhaust vents  
mcr S-THERM type: C, E, NG-A



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### NOTE:

**In pneumatically operated vents, the thermal fuse in the vent is not activated for safety reasons during transport.  
A vent with an unarmed thermal fuse is NOT ready for operation.  
Arm the thermal fuse and screw in the CO<sub>2</sub> cartridge (see chap. 8.1).**

## 1. INTRODUCTION

This operation and maintenance documentation allows the user to get acquainted with the purpose, construction, principle of operation, proper installation and operation of mcr S-THERM C, E, and NG-A smoke exhaust vents and smoke and exhaust vents. The documentation also contains additional information on the conditions of operation, maintenance and product warranty conditions.

Observance of the recommendations contained in this operation and maintenance documentation will ensure proper functioning of the systems with regard to smoke exhausting and/or ventilation as well as safety of the system users.

### **NOTE:**

**All works related to the mounting, operation, maintenance and servicing of the vents should be performed in accordance with the principles of safety and hygiene as well as with the use of appropriate personal protective equipment for a given type of work, including, first of all, the means of protection against falling from a height. Work that involves being at height, connecting electrical equipment, etc., must only be carried out by people with the appropriate qualifications.**

## 2. PURPOSE OF THE PRODUCT

The mcr S-THERM smoke exhaust vents are automatic smoke exhaust devices. The basic function of mcr S-THERM smoke exhaust vents is to vent smoke, fire gases and heat energy to the outside from enclosed spaces (production buildings, warehouses, public buildings, etc.), contributing to the protection of life and property by:

- maintaining evacuation routes in minor smoking condition,
- facilitating firefighting and fire extinguishing by the creation of a bottom layer with little smoke,
- ensuring the protection of the building structure and its equipment,
- reduction of fire damage caused by smoke, hot fire gases and thermal decomposition products.

Smoke exhaust vents can also be used for ventilation, combined smoke exhaust and ventilation and as roof lights.

Thanks to the application of smoke exhaust vents the Investor has the possibility, among others, to:

- reduce the fire resistance class of the building,
- enlarge the permissible fire zones,
- extend escape routes.

mcr S-THERM smoke exhaust vents are part of the smoke control system, which includes other products manufactured by "MERCOR" S.A., such as: smoke exhaust vents in mcr PROLIGHT continuous rooflights and skylights, mcr PROSMOKE smoke exhaust curtains, mcr 9705 and mcr 0204 control units and others.

**mcr S-THERM smoke exhaust vents have the Certificate of Constancy of Performance 1396-CPR-0195 issued by Fires s.r.o., NB 1396, Slovakia confirming that the vents are made in accordance with the requirements contained in EN 12101-2:2003.**

### 3. DESIGN AND OPERATING PRINCIPLE

Depending on the customer's individual requirements, "MERCOR" S.A. offers smoke exhaust vents on straight or slanting bases, in a wide range of opening dimensions and base height. All the steel elements are protected with hot-dip or galvanic zinc coating.

The sheet metal used in our products complies with the PN-EN 10346:2015-09 standard, surface type. The surfaces of the aluminum sheets used comply with the provisions of the PN-EN 485-1 standard.

As standard, the bases are supplied disassembled and without thermal insulation. They are suitable for fitting any type of 50 mm thick insulation.

Smoke exhaust and combined smoke exhaust and ventilation vents mcr S-THERM type: C, E, NG-A consist of the fixed part - base and aluminium frame with thermal insert and movable part - leaf with glazing and the opening system.

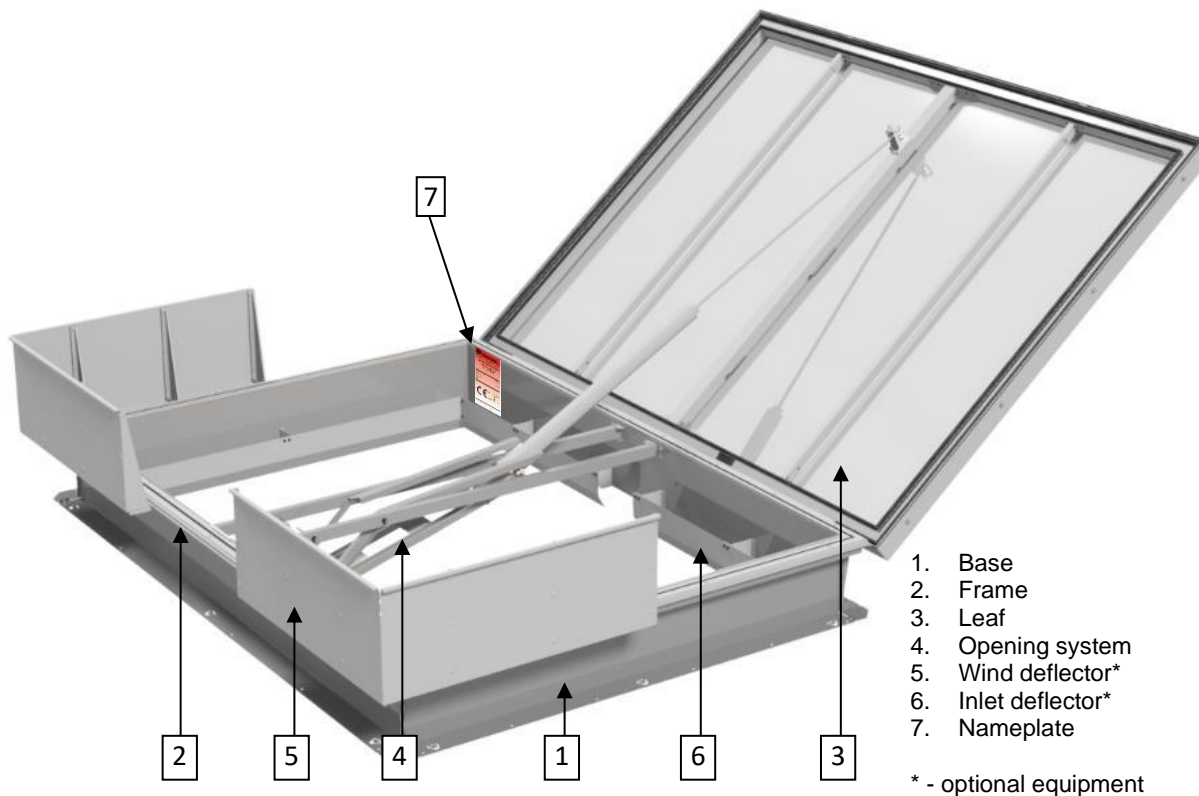


Fig. 1 Design of mcr S-THERM smoke exhaust vent.

The types of openable leaf glazing used are:

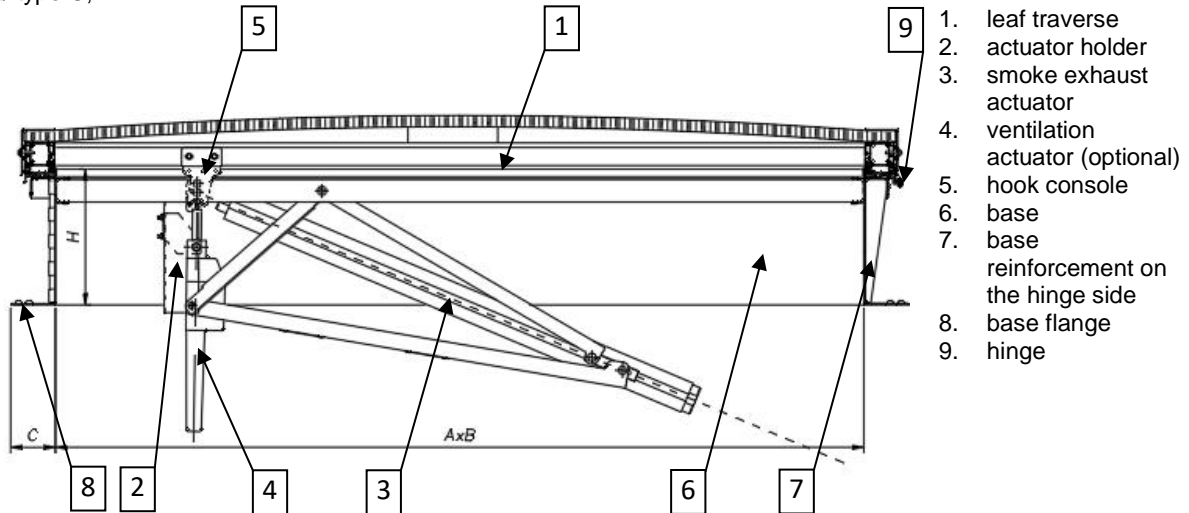
- multi-chamber polycarbonate in thicknesses from 10 to 25 mm, with varying degrees of transparency and with different heat transfer coefficient values,
- multi-chamber polycarbonate of thickness of 10 to 25 mm + single acrylic dome,
- multi-chamber polycarbonate of thickness of 10 to 25 mm + single polycarbonate dome,
- ALU sandwich panel of thickness 20 mm (e.g. aluminium - thermal insulation - aluminium),
- multi-chamber polycarbonate of thickness 16 to 25 mm + envelope cover.

The mcr S-THERM smoke exhaust vents type: C, E, NG-A are offered with the following control systems:

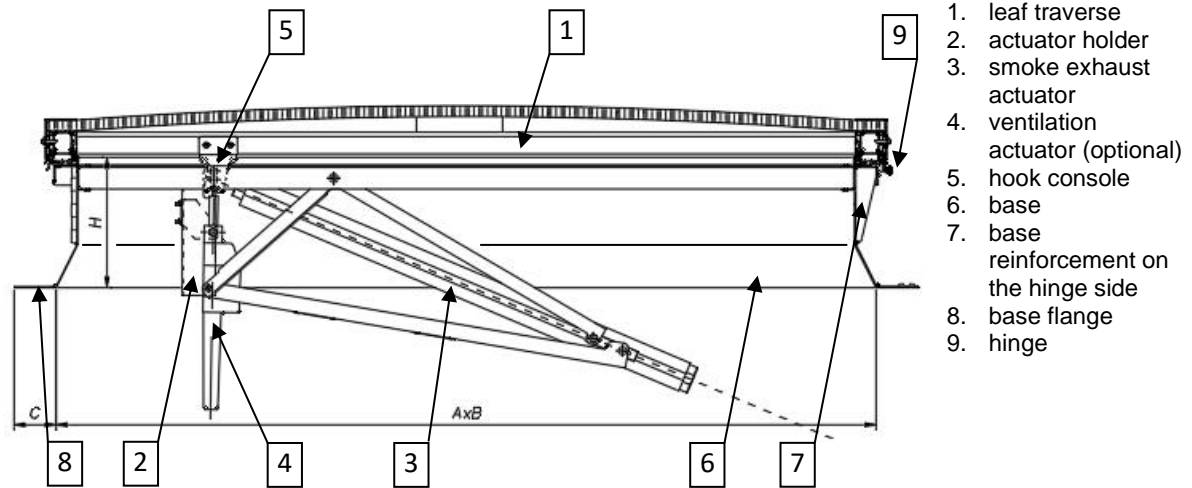
- pneumatic control,
- electric control,
- mechanical control.

Triggering of smoke exhaust and combined smoke exhaust and ventilation vents can be carried out both manually – by the user, as well as automatically via thermal fuses, mcr control units or fire alarm control units.

a/ type C, E



b/ type NG-A



c/ with mechanical control (base type C, E shown on the figure)

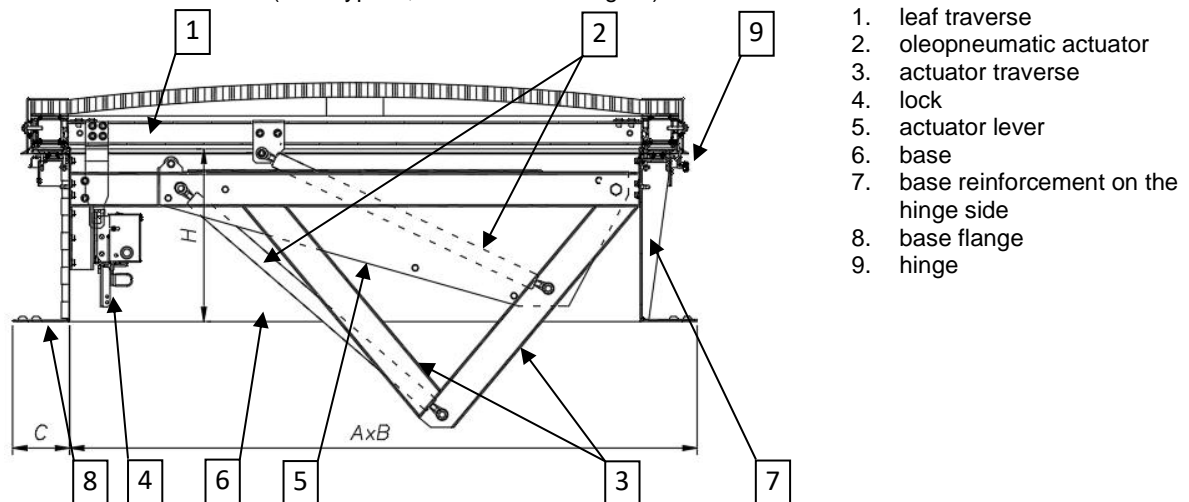


Fig. 2 Cross-section of mcr S-THERM vents (base without insulation).

(a) polycarbonate sheet

(b) polycarbonate sheet and acrylic or polycarbonate dome

(c) ALU sandwich panel

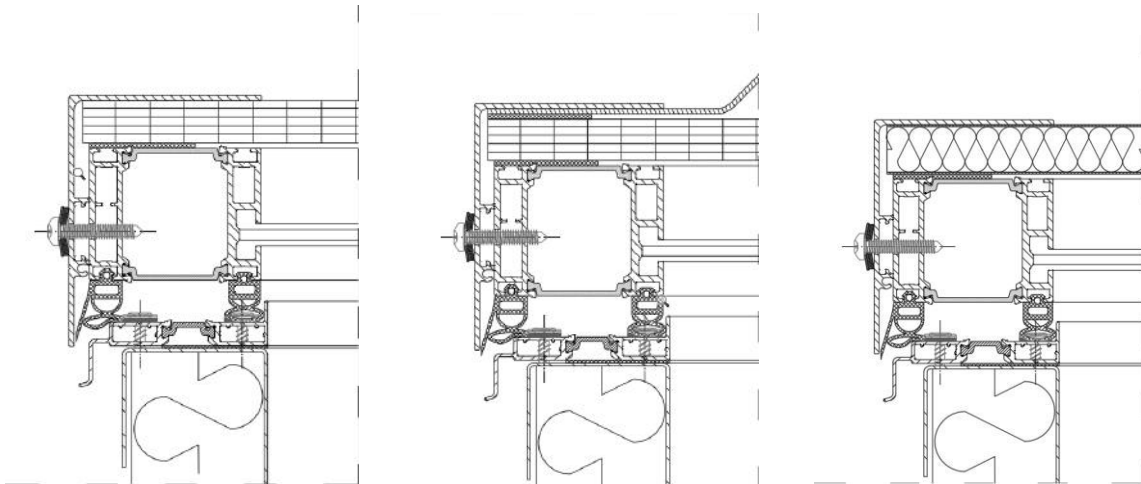


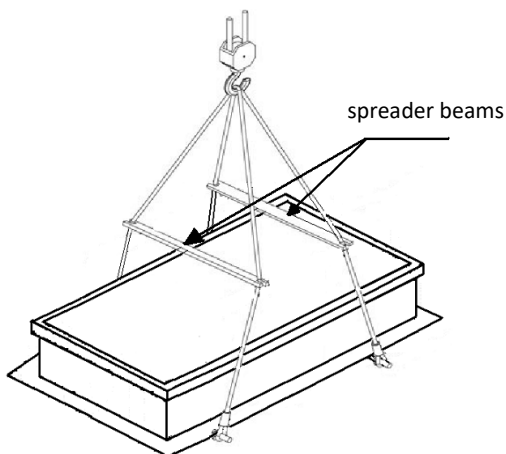
Fig. 3 Typical glazing of mcr S-THERM smoke exhaust vents.

#### 4. SHIPPING AND DELIVERY

The mcr S-THERM vents type C, E, NG-A are delivered in parts; however, in special cases they can be delivered as completely assembled. The wind deflectors are always supplied separately. This is due to the need to protect them from damage during transport and ensure safety on the road.

Unloading should be carried out under the supervision of a person authorised by the manufacturer, using generally available handling equipment or manually, observing the necessary safety rules.

a/)



b/)

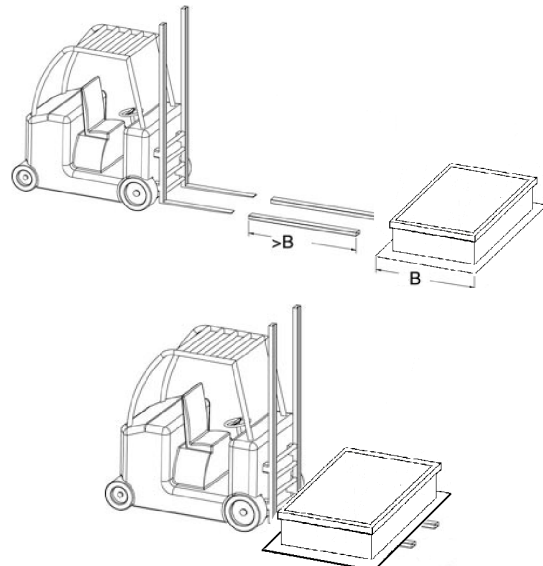


Fig. 4 Transport with crane (a) and with fork lift truck (b).

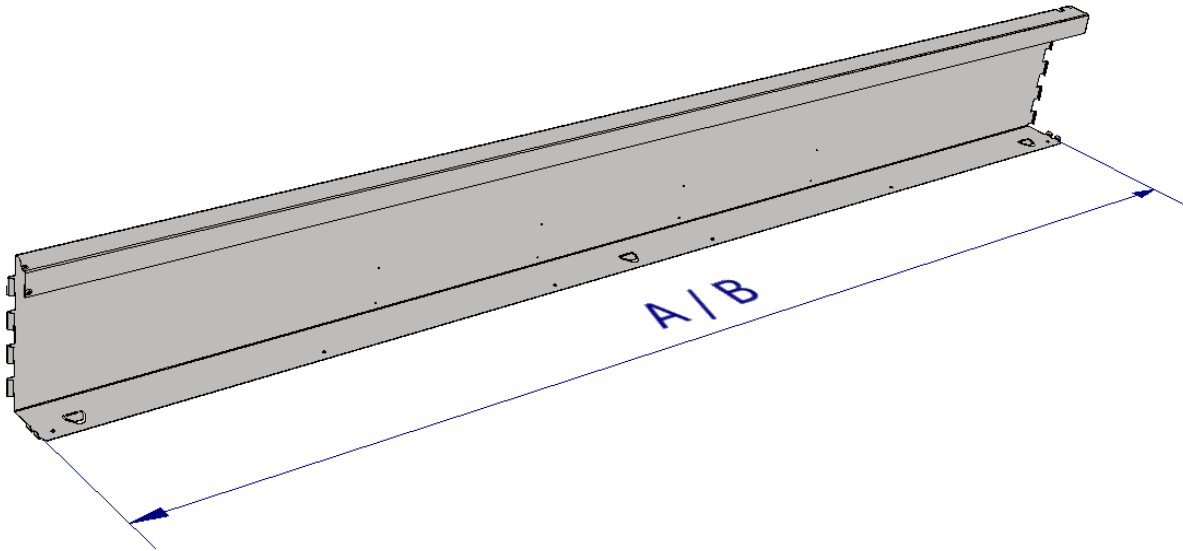
## 5. MOUNTING OF DEVICE

### **NOTE:**

1. After installing the vent, it is essential to remove the protective film from the external aluminium elements of the vent (pressing frames, pressing strip) and from the vent glazing (PCA, sandwich panels, acrylic domes). Keeping the film on may cause permanent discoloration of the parts and make future removal difficult. After removing the film, loosen the self-drilling screws with the 5.5x38 EPDM washer of the pressing frame, remove the residual film from beneath the washers and screw the screws back in.
2. If the vent leaf is not delivered to site completely assembled, special care must be taken when installing the polycarbonate panels. Damage to the film protecting the edges of the polycarbonate plates will cause penetration of dirt into the PCA chambers which voids the warranty.
3. Mounting of the equipment must be carried out in compliance with all the necessary safety rules, in particular relating to work at height or using appropriate personal protective equipment.

### 5.1. Assembling the steel base

The base of the mcr S-THERM vent is delivered in parts and requires self-assembly. Individual sides of the assembled base are connected with each other by special locks located at the edges.



*Fig. 5 Side of the base A - vent width; B - vent length (dimension along the hinge).*

**NOTE:** attaching the first of the sides to the structure before proceeding to assemble the vent simplifies the assembly process and helps in maintaining right angles at the corners. Details of how to attach the base to the structure can be found in chapter 5.2 and 5.3 (page 10).

In case of installation of the mcr S-THERM vent on the roof, the base should be placed in such a way that the vent hinge is located in the lower point - in accordance with the pitch.

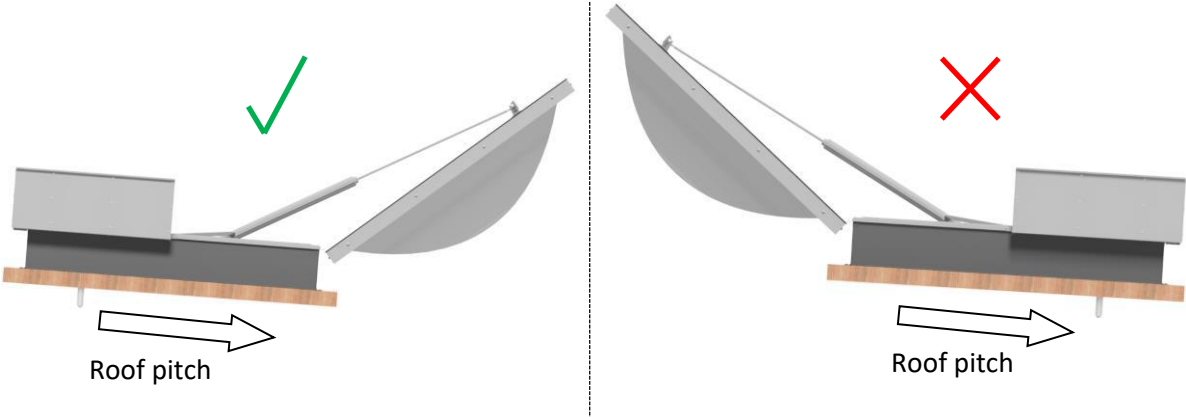


Fig. 6 Mounting of the vent on the roof according to the pitch direction.

The side where the hinge will be located has 4 factory-installed installed reinforcements:

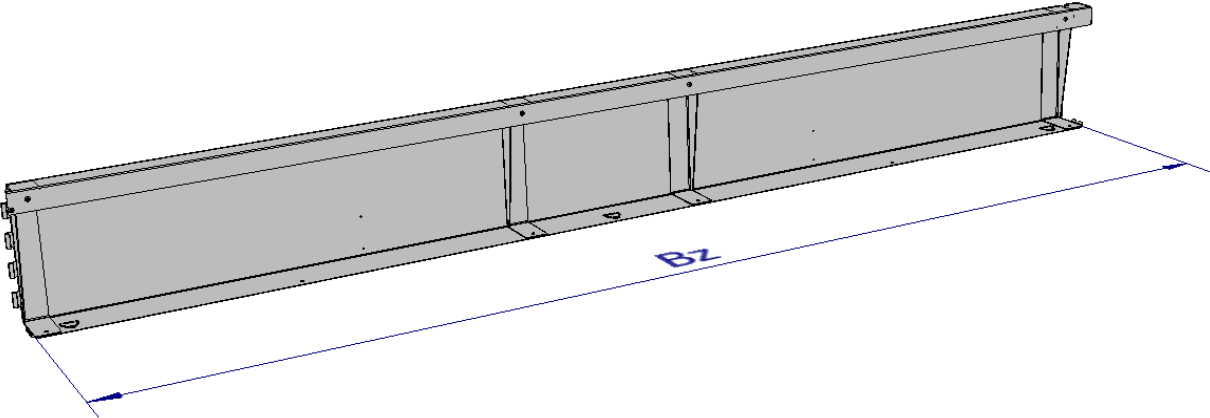


Fig. 7 The so-called "hinge" side of the base.



Once the two sides have been put together, they can be joined using: the corner bracket acting as a lock, the bottom fastener (optional element) and rivets:

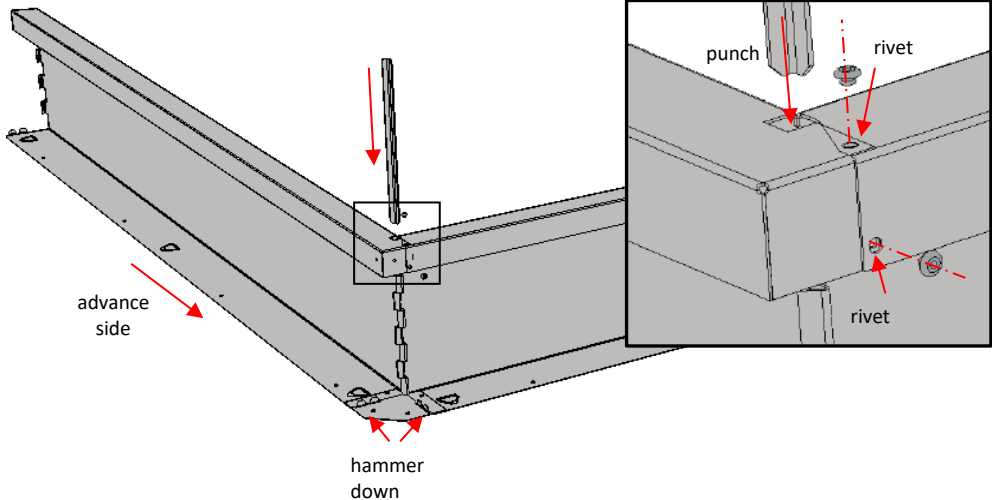


Fig. 8 Joining the sides of the base at the corner.

After assembling the complete base and covering it with insulation, bend the brackets that secure the insulation against displacement, e.g. with a screwdriver:

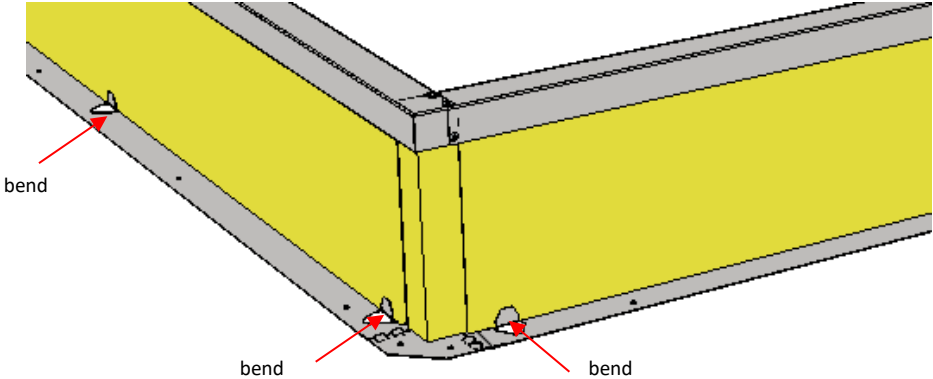


Fig. 9 Securing the insulation of the sides.

## 5.2. Mounting the base to the structure

**NOTE: before attaching all sides to the structure, the lengths of the diagonals and the angles in the corners of the bases must be verified and corrected if necessary!**

Vents should be placed on the structural elements of the roof - such as: purlins, trimmers, roof structure sheet, reinforced concrete plinth.

**NOTE: the base must have continuous support around its entire circumference!**

The vents can be mounted on roofs with steel, concrete or wooden structure. The base of the device has a flange in its lower part for supporting and attaching the vent to the supporting structure. The fasteners should be selected depending on the material of the substructure according to the table below. The fasteners should be installed in pre-drilled holes in the lower flange. The maximum spacing is 50÷55 cm.

Type of supporting structure	Minimum fastener diameter
steel	min. Ø4.8 mm
concrete	min. Ø6 mm
wood	min. Ø6 mm

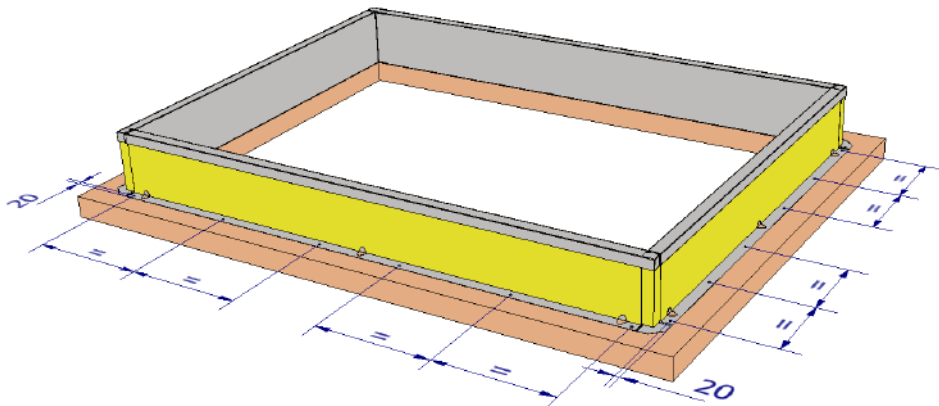


Fig. 10 Foundation of the mcr S-THERM vent on the roof - maximum spacing of the fasteners every 500 ± 50 mm.

On the hinge side, the holes of the reinforcement coincide with the holes of the lower base flange:

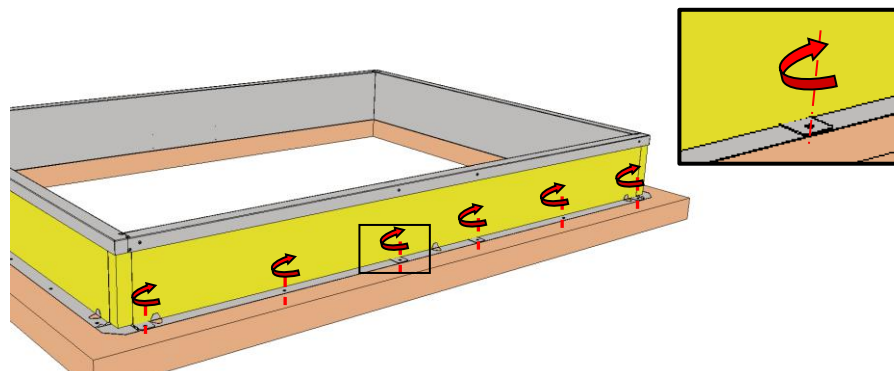


Fig. 11 Mounting points for the hinge side of the base.

### 5.3. Method of positioning the bases

Detail A

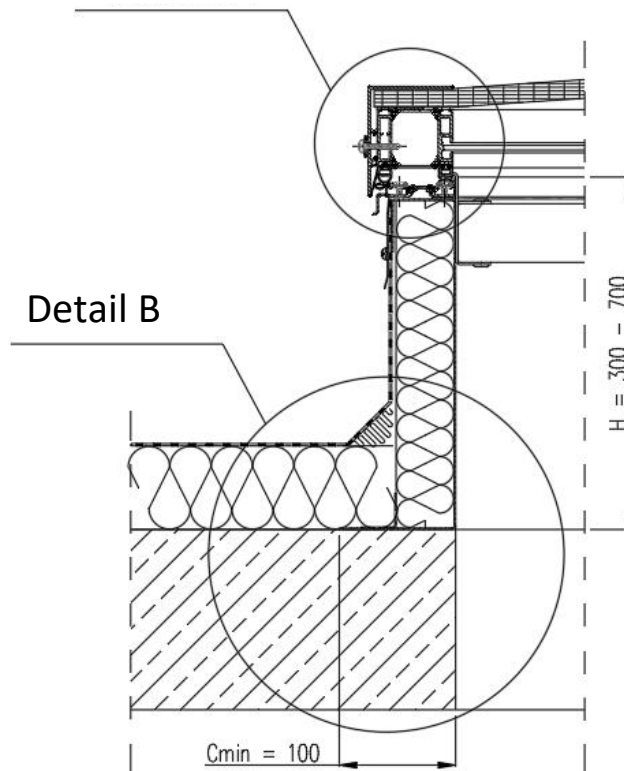
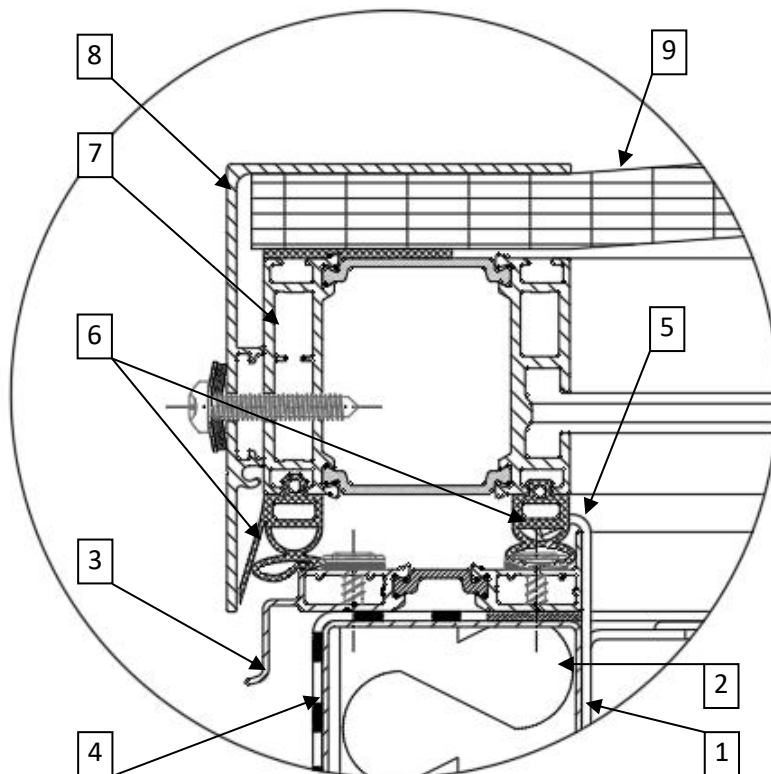


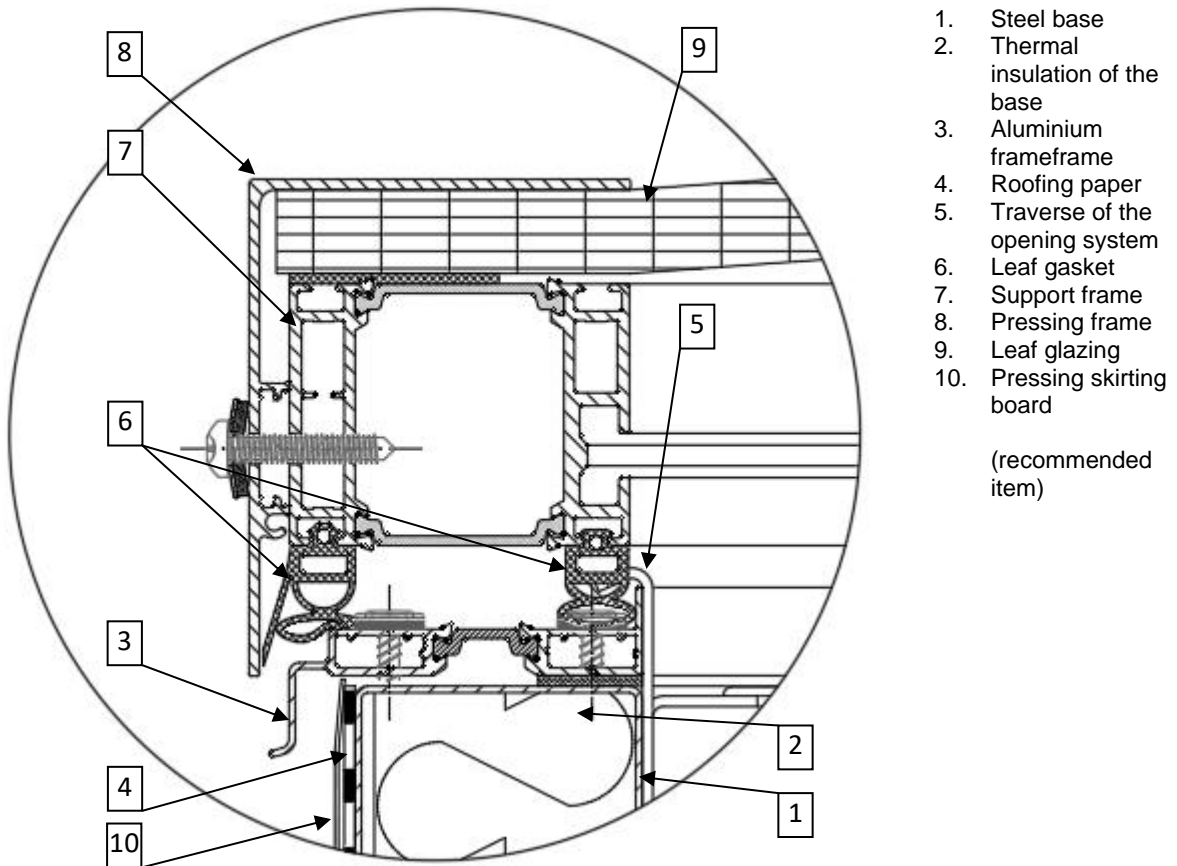
Fig. 12 Positioning of the steel base on the roof (detail B) and the method of rolling up the roofing felt or membrane (detail A)

detail A



1. Steel base
2. Thermal insulation of the base
3. Aluminium frame
4. Roofing membrane
5. Traverse of the opening system
6. Leaf gasket
7. Support frame
8. Pressing frame
9. Leaf glazing

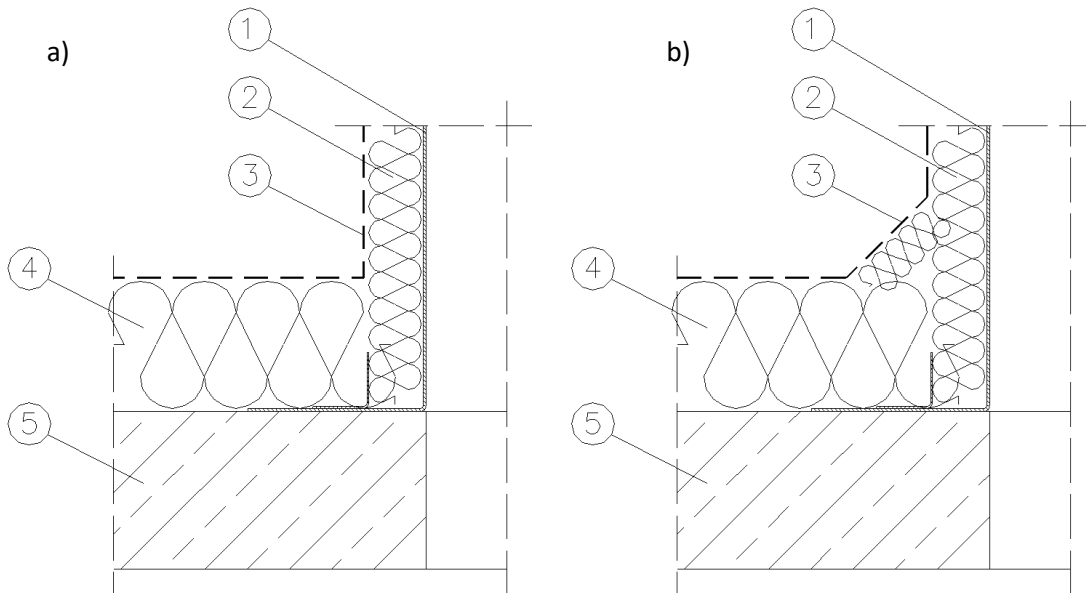
Fig. 13 Method of rolling up the roofing membrane onto the base (detail A)



1. Steel base
  2. Thermal insulation of the base
  3. Aluminium frame
  4. Roofing paper
  5. Traverse of the opening system
  6. Leaf gasket
  7. Support frame
  8. Pressing frame
  9. Leaf glazing
  10. Pressing skirting board
- (recommended item)

Fig. 14 Method of rolling up the roofing felt on the base drip (detail A)

detail B



1. Steel base of vent
2. Thermal insulation of the base
3. Membrane or roofing felt flashing
4. Roof thermal insulation
5. Reinforced concrete slab

Fig. 15 Steel base on a reinforced concrete slab (a - membrane flashing, b - roofing felt flashing)

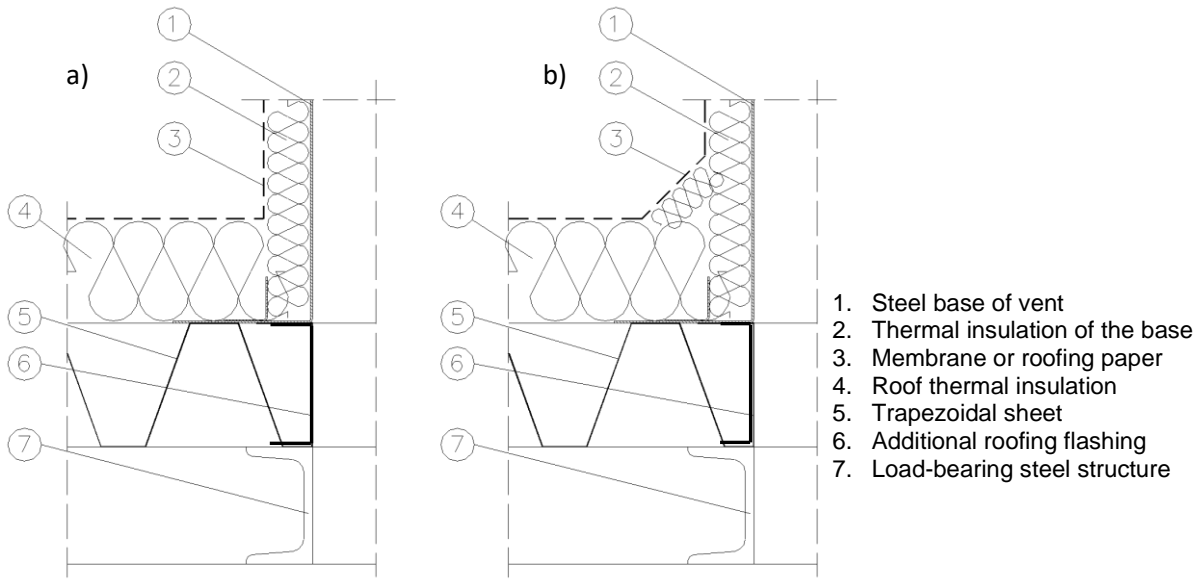


Fig. 16 Steel base on steel structure (a - membrane flashing, b - felt flashing)

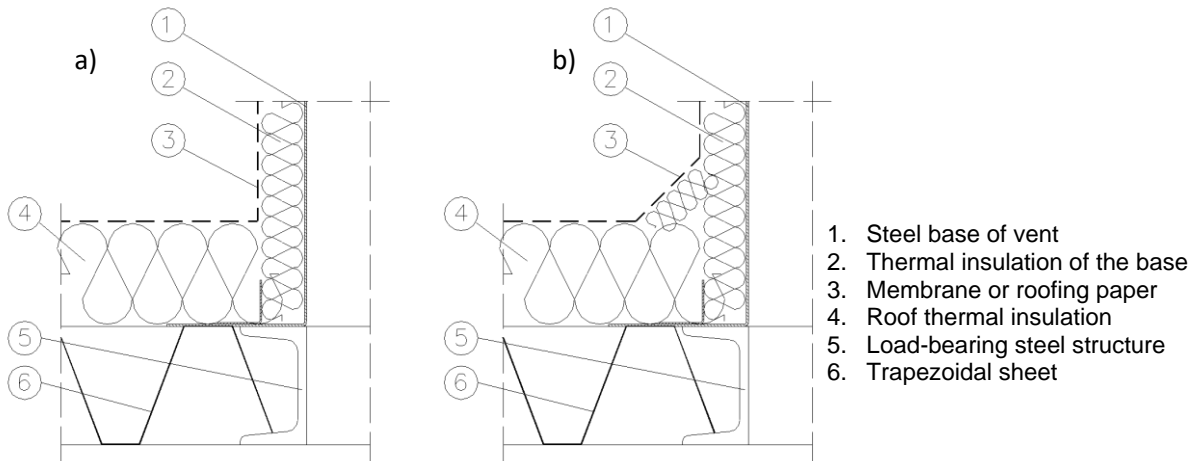


Fig. 17 Steel base on steel structure (a - membrane flashing, b - felt flashing)

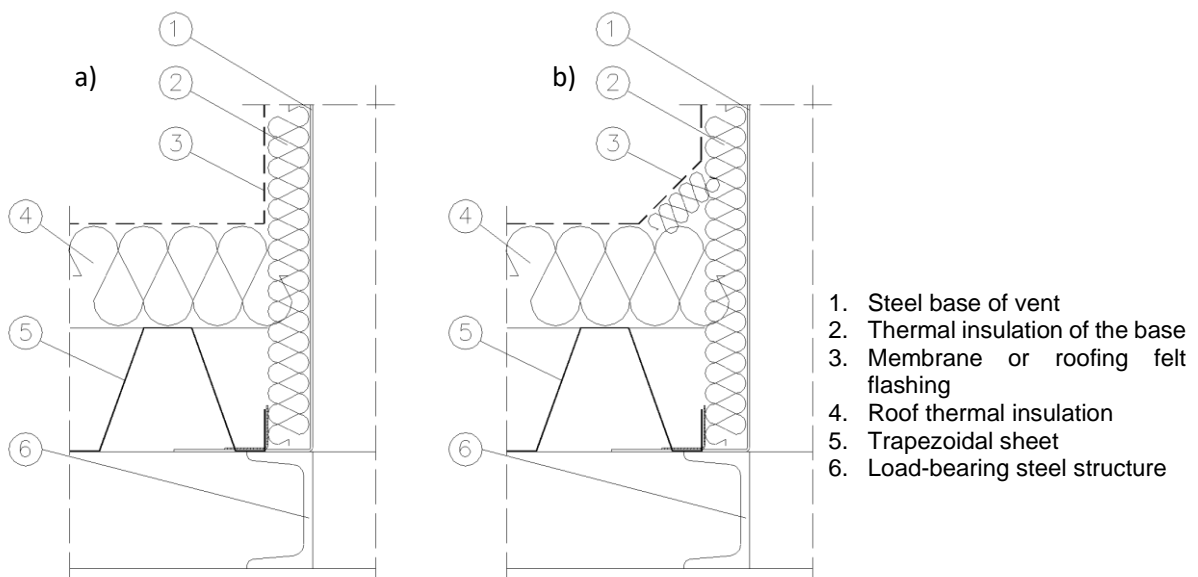


Fig. 18 Steel base on steel structure (a - membrane flashing, b - felt flashing)

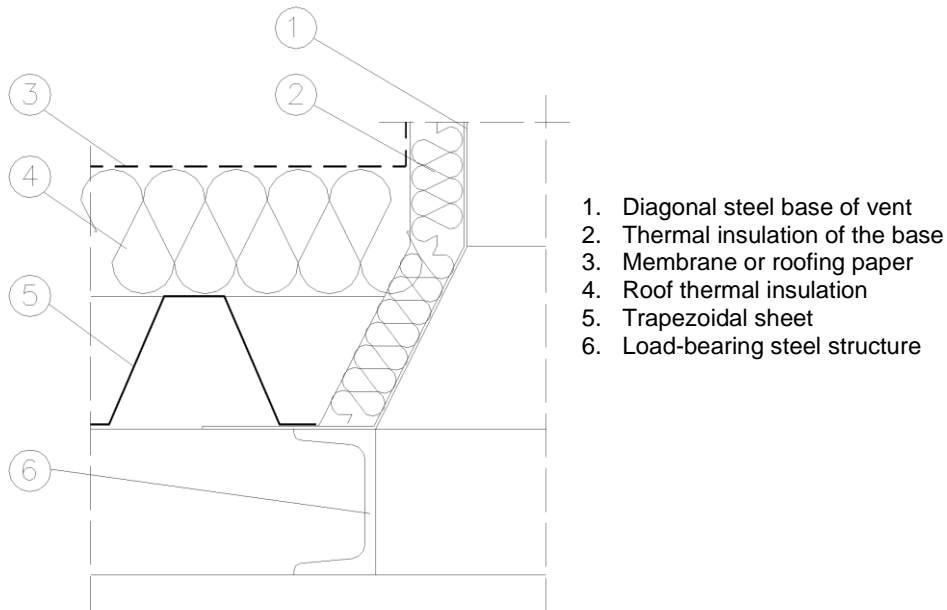


Fig. 19 Diagonal steel base on steel structure.

#### 5.4. Mounting of soft body impact safety nets for an impact energy of 1200 J

Safety nets with impact energy up to 1200 J are optional. However, when only the base of the vent is installed on the roof (e.g. in connection with dividing the works into stages), it is obligatory to take care of safety considerations and protect its entire clear opening with a set of nets mounted on the base through appropriate consoles.

**NOTE: never leave bases with unprotected clear opening on the roof!**

The correct protection of the full length of the base consists of:

1. Standard nets - fixed  
(protect the space between the opening system and the sides of the base)
2. Temporary net - removable  
(protects the centreportion of the clear opening until the frame and opening system are installed).

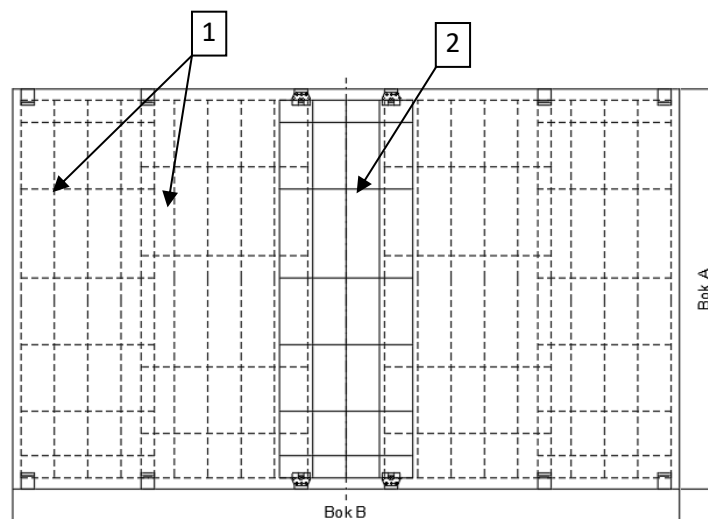


Fig. 20 Folding base protected by nets along its entire length.

For a correct installation of the nets, please use Table HO.20.01868, where the spacing (L1, L2 and Ld - only for split grids) of the consoles that fix the standard grids to the B sides of the base are marked. In the initial phase of installation, each console should be fixed to the base using a single self-drilling screw 6.3x19:

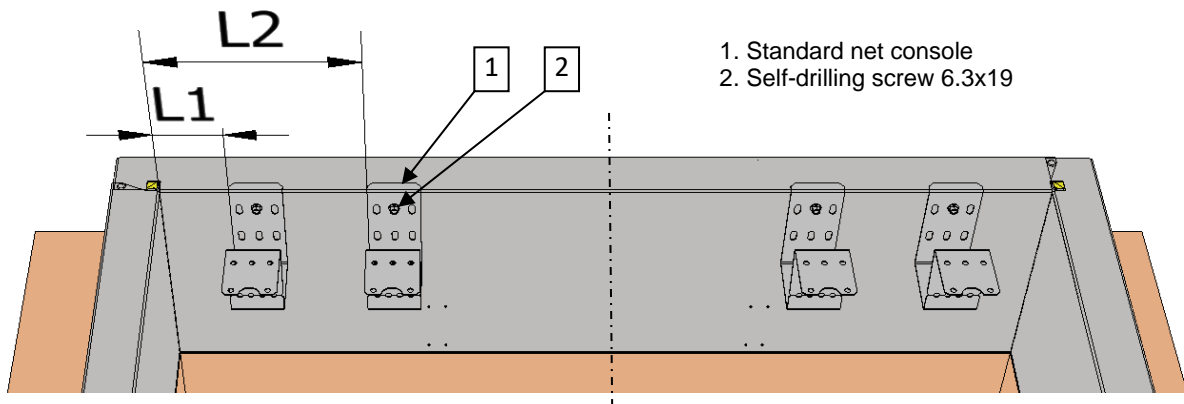


Fig. 21 Standard net consoles attached to one of the B sides of the base.

The next step is to place a safety net over the consoles and then close the consoles and attach it to the base using the rest of the available mounting holes (5 pcs.):

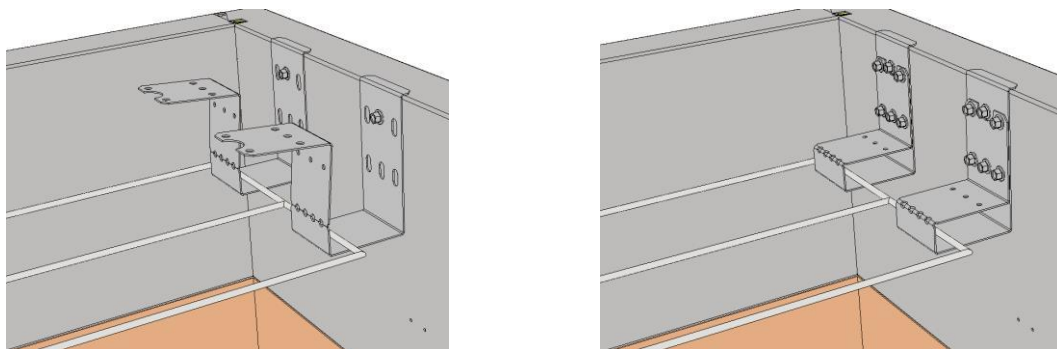


Fig. 22 Mounting the standard net on the consoles.

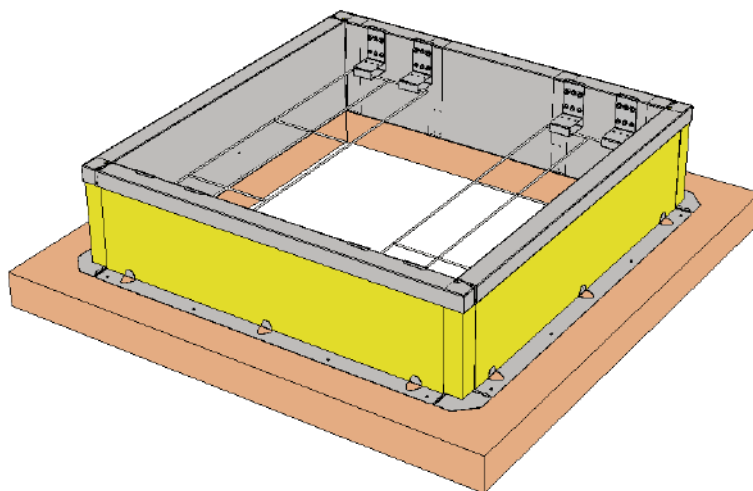


Fig. 23 Folding base with standard nets mounted (not fully secured).

Once the base is secured with standard nets, you can proceed to the next step, which is the installation of so-called temporary net.

The installation process of the temporary net should begin by attaching the temporary net console to each of the centre consoles with a single 6.3x19 self-drilling screw:

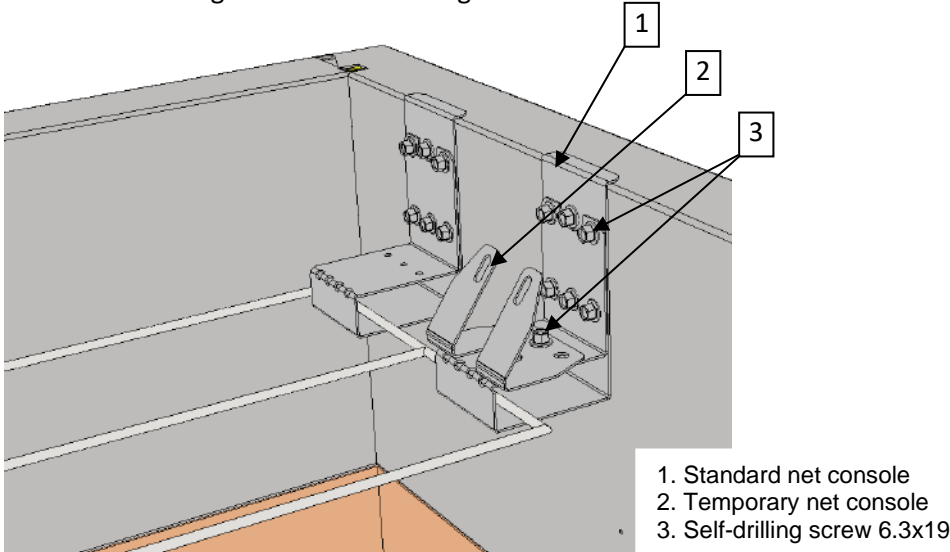


Fig. 24 Temporary net console attached to the standard net console.

Then apply the temporary net to the temporary consoles, close the temporary net consoles and attach each console to the standard console with two more 6.3x19 self-drilling screws:

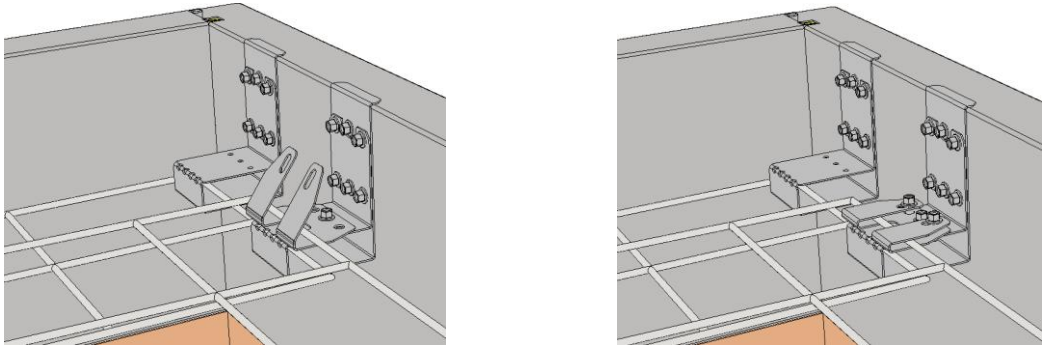


Fig. 25 Mounting the temporary net on the consoles.

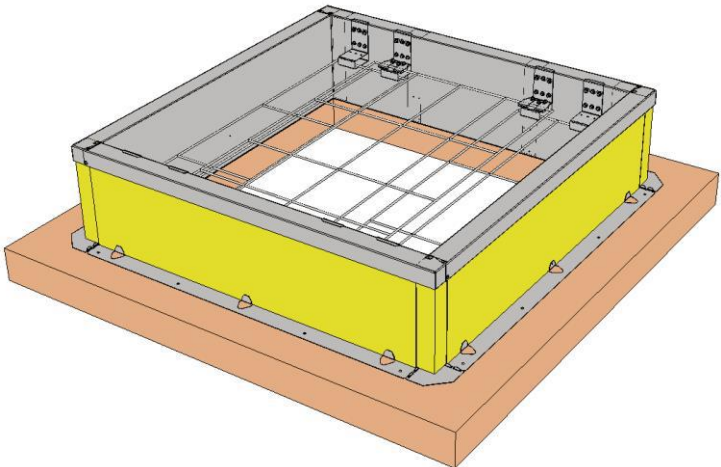


Fig. 26 Folding base fully protected with standard nets and a temporary net.

**NOTE: Before mounting the opening system, remove the temporary net and temporary consoles by following the steps described above in reverse order!**



### 5.5. Mounting the frame to the base

After the base has been placed, insulated and protected with roofing paper or membrane, put the frame with a PES 20x5 (factory mounted) gasket on top of it. Make sure that the hinge side of the frame is on the hinge side (with reinforcements) of the base:

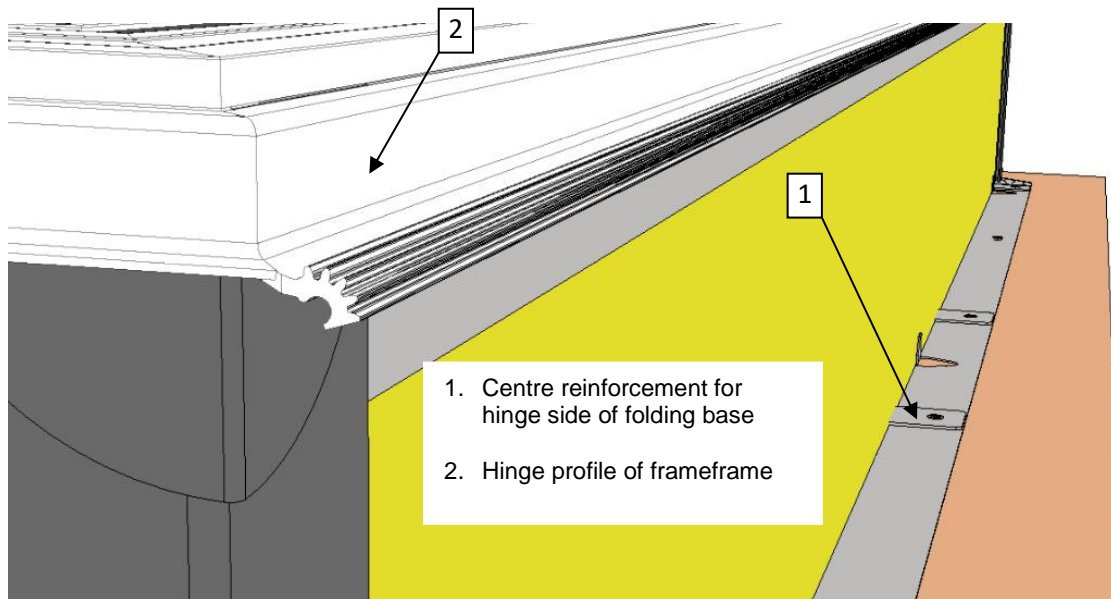


Fig. 27 FrameFrame correctly positioned on base (view without roofing paper/membrane on hinged side).

Before screwing the frame to the base, pay particular attention to its correct position. **Especially on the hinge side, the frame must not enter the clear opening of the vent!**

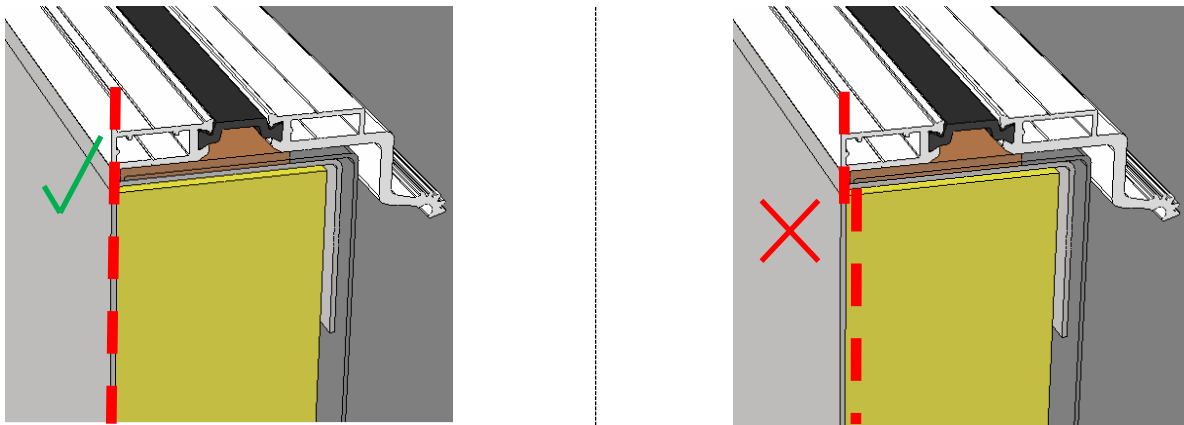
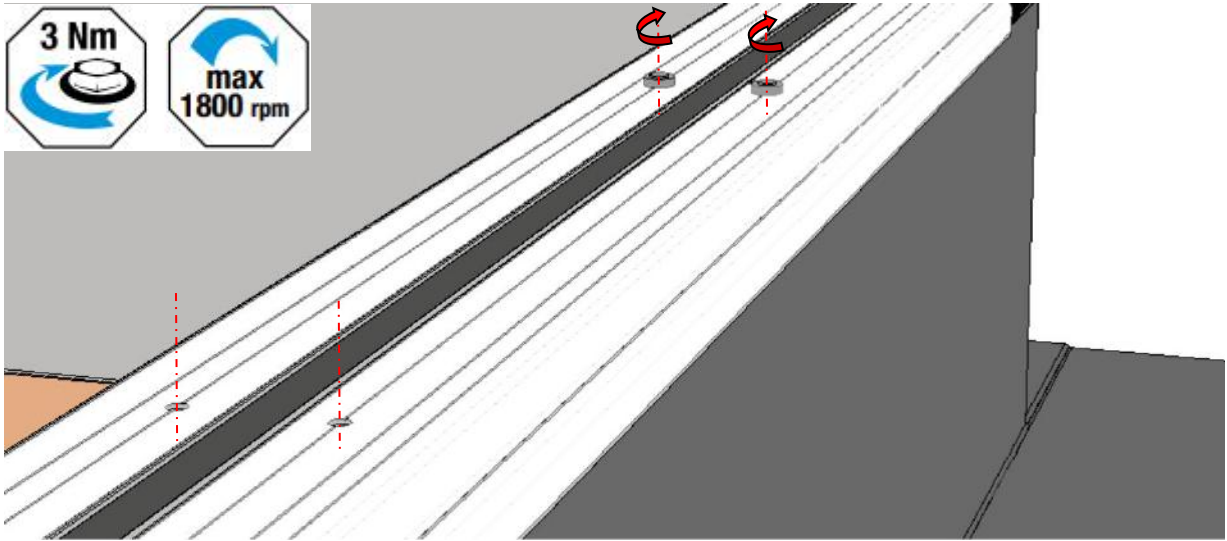


Fig. 28 Example of correct (left) and incorrect (right) placement of the frame on the base.

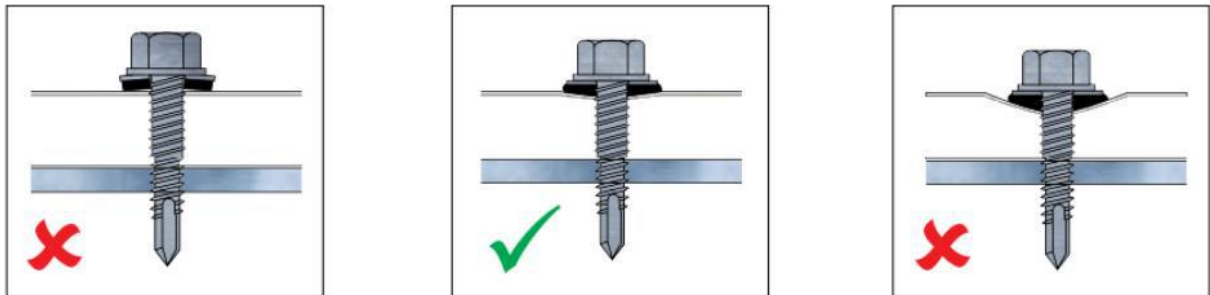
The frame should be screwed to the base using 4.8x35 TORX pan head self-drilling screws and EPDM washer. Use the pre-drilled holes in the frame for this purpose.

**NOTE: when assembling the frameframer, pay special attention to the correct setting of your power screwdriver parameters!**



*Fig. 29 Mounting the frame to the base and correct installation parameters.*

**NOTE: Only a properly tightened washer guarantees a tight connection!**

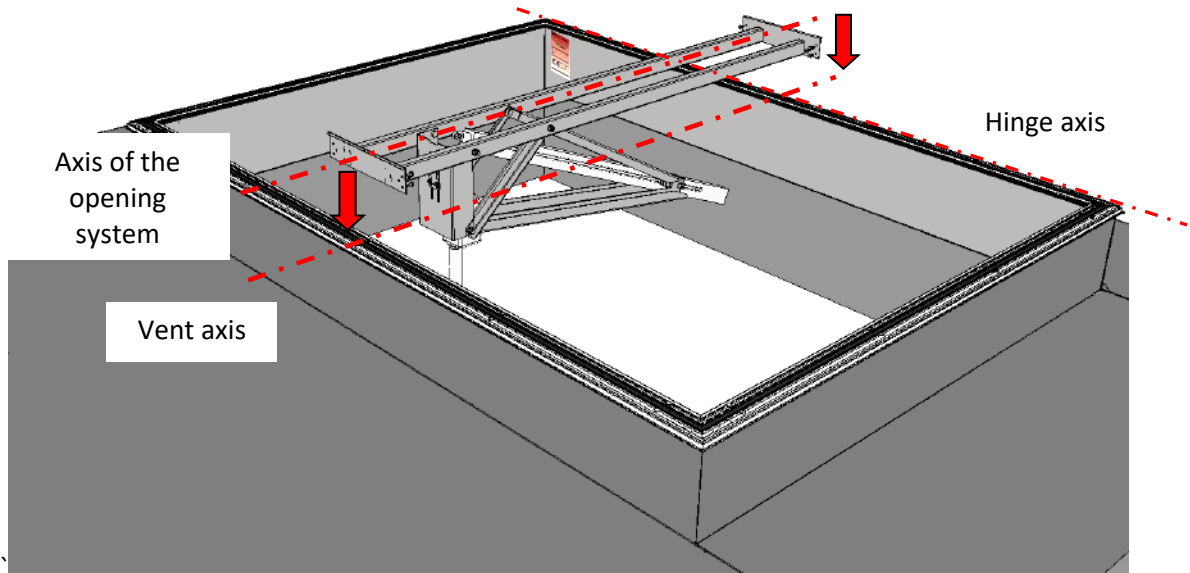


*Fig. 30 Examples of an incorrectly and correctly tightened screw.*

## 5.6. Assembly of the opening system

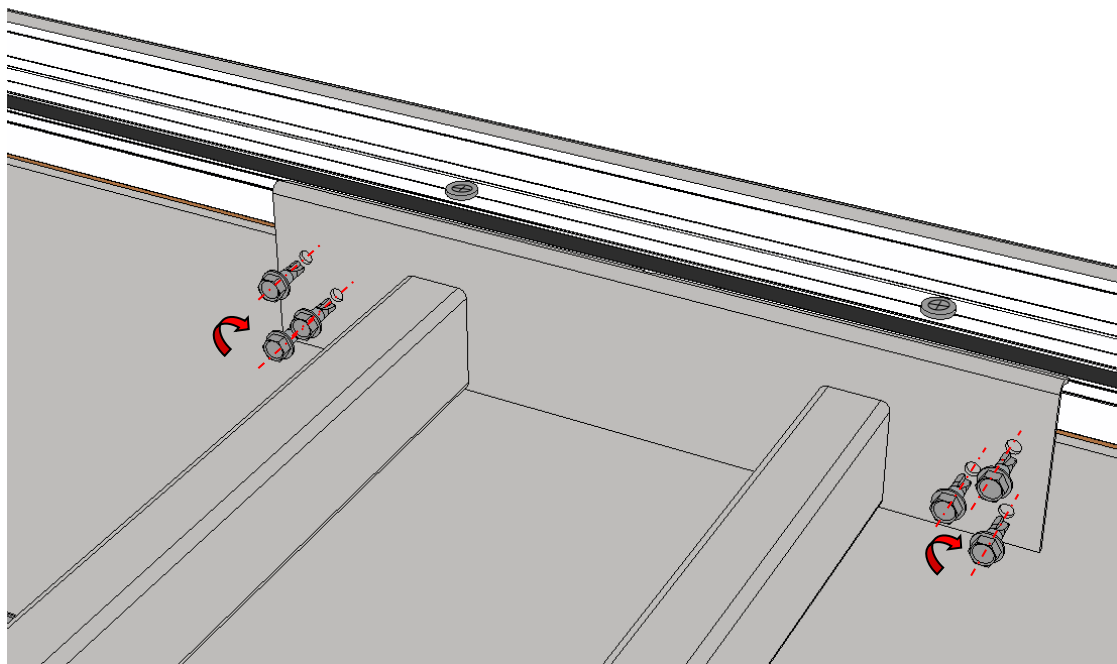
**NOTE:** Before installing the opening system, the temporary net (if already installed) and the temporary consoles must be removed in reverse order to the steps described on page 16.

The opening system must be placed in the axis of the smoke exhaust vent:



*Fig. 31 Mounting the opening system in the vent axis.*

After placing the opening system on the frame, fix it to the base with self-drilling screws 6.3x32:

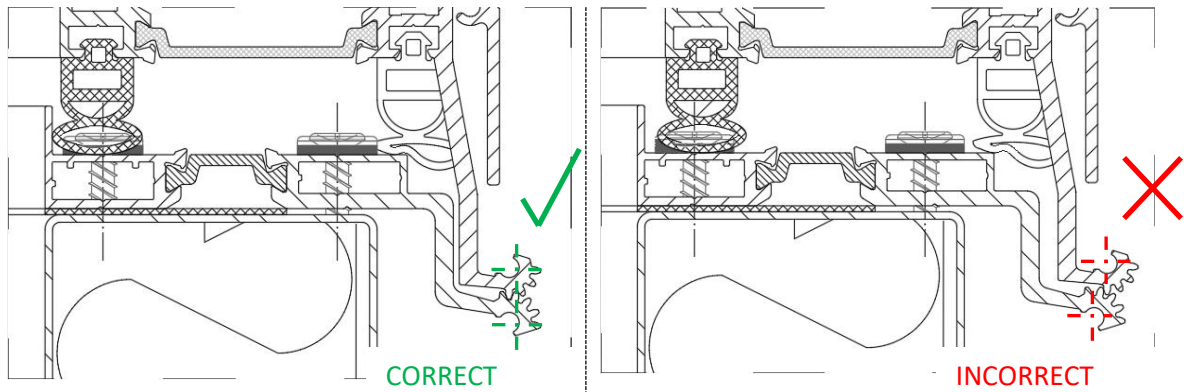


*Fig. 32 Fastening the opening system traverse to the vent base.*

## 5.7. Mounting of leaf

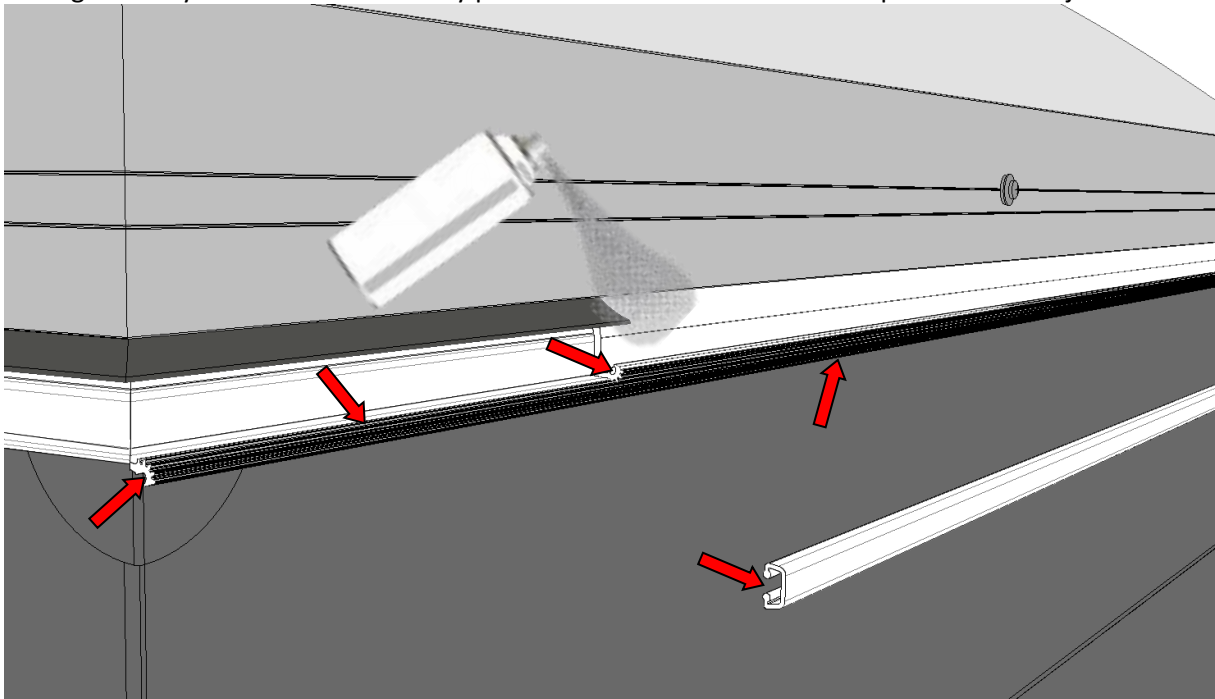
**NOTE: any elements that may cause a collision with the vent leaf in its full range of motion should be removed before installation!**

Place the leaf on the base frame symmetrically, taking care that the hinge elements are correctly positioned. The correct position of the hinge elements in relation to each other is shown in the figure below:



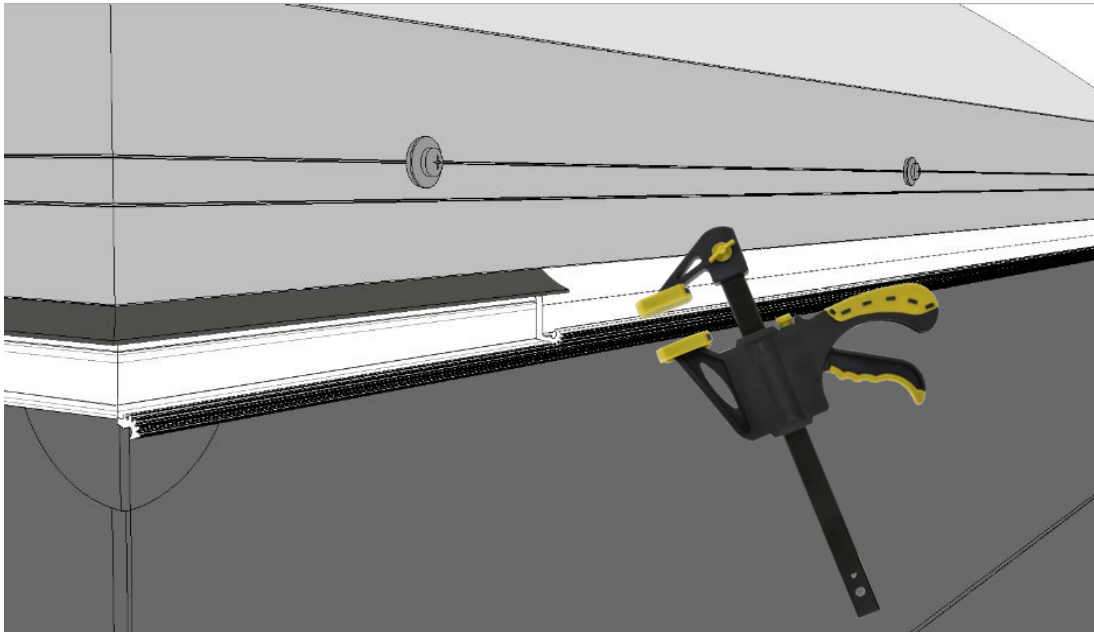
*Fig. 33 Correct (left) and incorrect (right) positioning of the hinge profiles.*

Before mounting the insert, apply grease (e.g. so-called white grease) on the hinge elements, which will significantly facilitate the assembly process and ensure trouble-free operation of the joint:



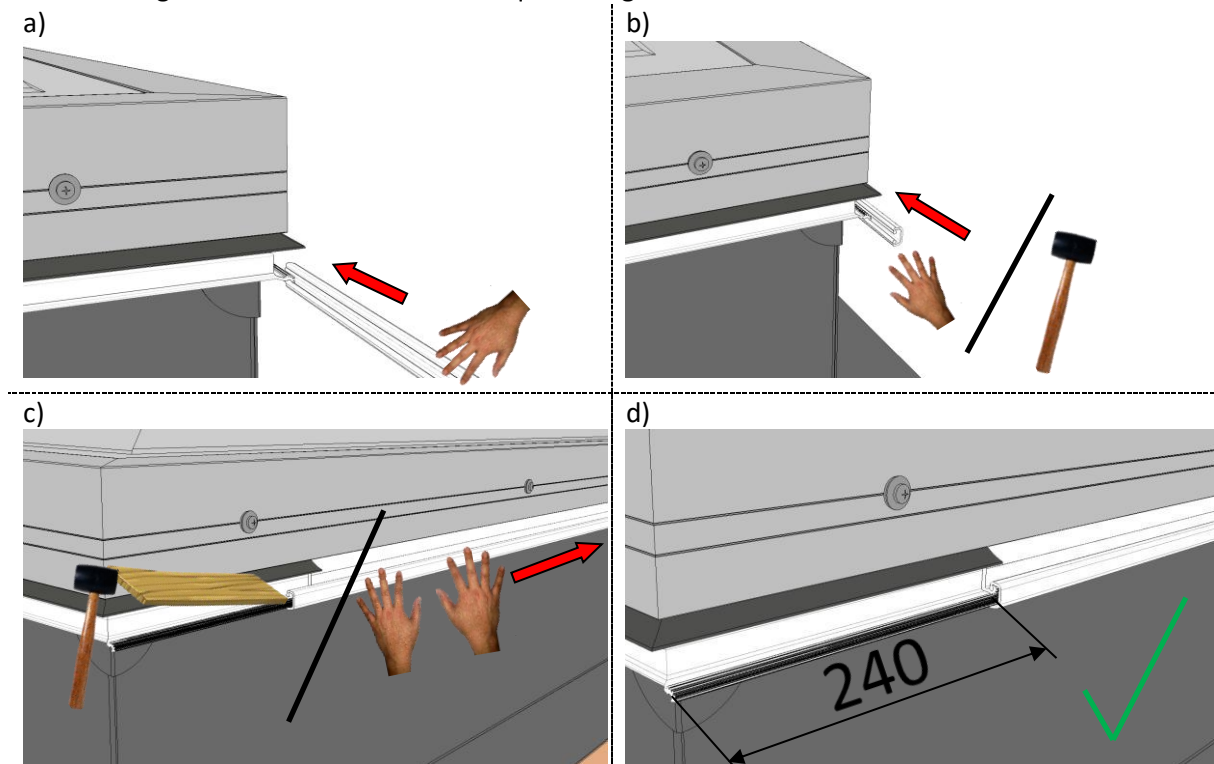
*Fig. 34 Application of grease to the hinge profiles.*

Correctly prepared elements can be assembled without tools; however, in case of trouble with applying the insert, the assembly can be facilitated by gently squeezing both parts of the hinge using, for example, a **carpenter clamp grip with plastic tips**:



*Fig. 35 Squeezing the two parts of the hinge facilitates application of the insert.*

The following illustrations show the subsequent stages of installation:



*Fig. 36 Individual steps for mounting the hinge fastener.*

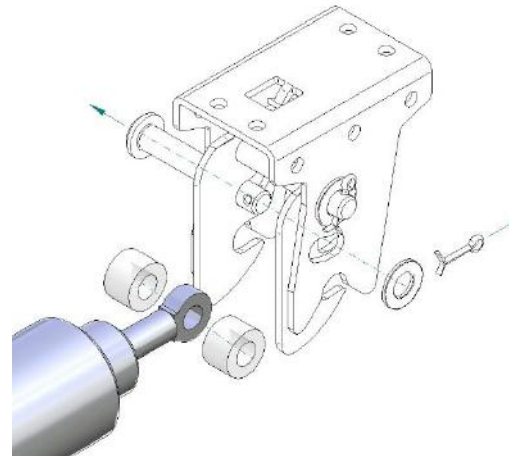
**NOTE:**  
The insert must be flush with the leaf hinge profile!

### 5.8. Fastening the opening system to the leaf

Connect the actuator to the hook console mounted in the vent leaf.

To do so, remove the pin and pull the lower pin out of the hook console.

Perform the installation process in reverse order, forcing the pin additionally through the two nylon bushings and the actuator eyebolt.



*Fig. 37 Connecting the actuator to the hook console.*

Then, depending on the type of control, connect the system to the installation according to chapter 8 and make the adjustment according to chap. 7.

### 5.9. Mounting of the leaf glazing

It may happen that the dome glazing, e.g. for logistical reasons, is delivered separately. In such case, the domes should be fitted to the vent leaf on site, preferably after the vent has been assembled, as follows:

1. remove the pressing frame (unscrew sheet metal screws 5.5x32 with EPDM washers);
2. check the condition of the PES gasket on the support frame (clean it of dust);
3. separate the polycarbonate sheet from the dome with the supplied PES gasket - glue around the perimeter (see figure below);
4. insert the pressing frame;
5. screw in screws 5.5x32 with EPDM washer, while pressing the frame from above.

The multi-chamber polycarbonate glazing is supplied pre-assembled.

Replacement of the glazing, if any, should be made by reversing the steps described in points 1 - 5 above. If the glazing is replaced again, it may be necessary to replace the standard screws with larger ones (e.g. 6.3x32).

If the pressing frame comes loose, loosen the fixing screws slightly and then screw them in one by one while pressing the frame from above.

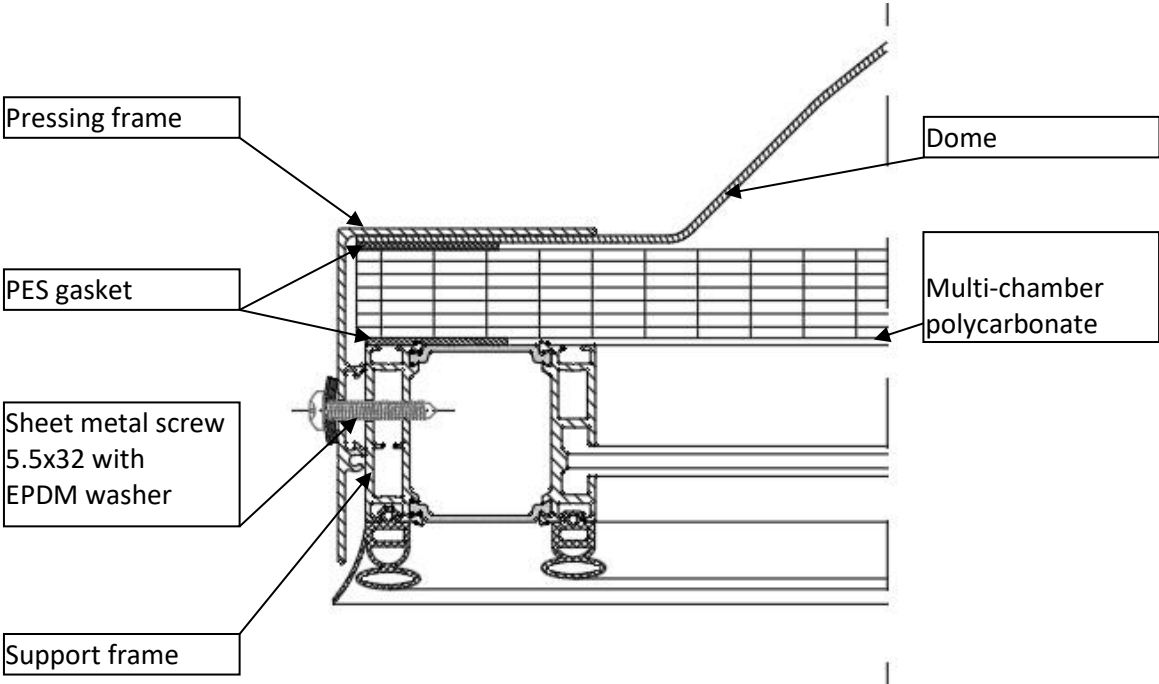


Fig. 38 Flap leaf cross-section - PES gasket between glazing and on the leaf supporting frame.

## 6. WIND DEFLECTORS AND INLET DEFLECTORS

### 6.1. Wind deflectors

Wind deflectors are used to increase the active surface of smoke exhaust vents. In the standard version they are made of aluminium sheet.

Wind deflectors are delivered in bulk - arranged on a pallet for convenient storage and transportation. Before being fixed to the vent they require manual bending in the corner (the place requiring bending has rectangular notches serving this purpose).

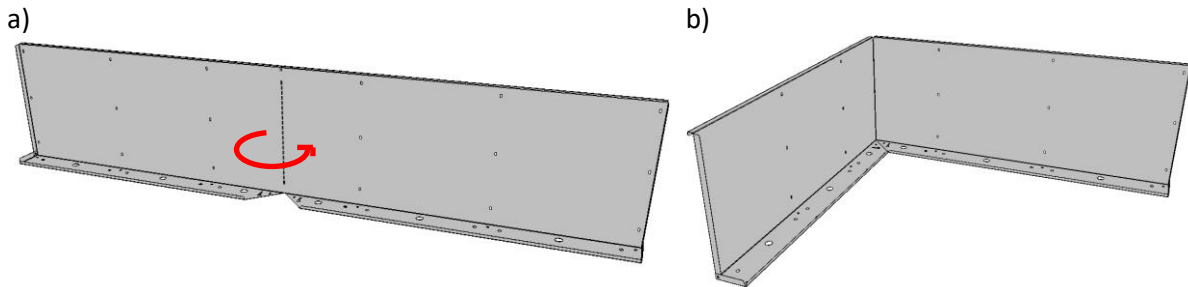


Fig. 39 Preparing the wind deflector for installation (a). Wind deflector ready for installation (b).

Wind deflectors and mounting brackets are to be connected only with **Ø4.8x10 mm alu/steel rivets with enlarged heads for a wide range of joining thicknesses (3.0 - 6.0 mm)**.

The only permissible alternative is a set comprising: M5 bolt  $L_{min} = 30$  (DIN933) + 2x washers Ø5.3/15 (e.g. DIN9021) + self-locking nut M5 (DIN985).

The brackets to which the wind deflectors are to be mounted are attached to the frame at the factory.

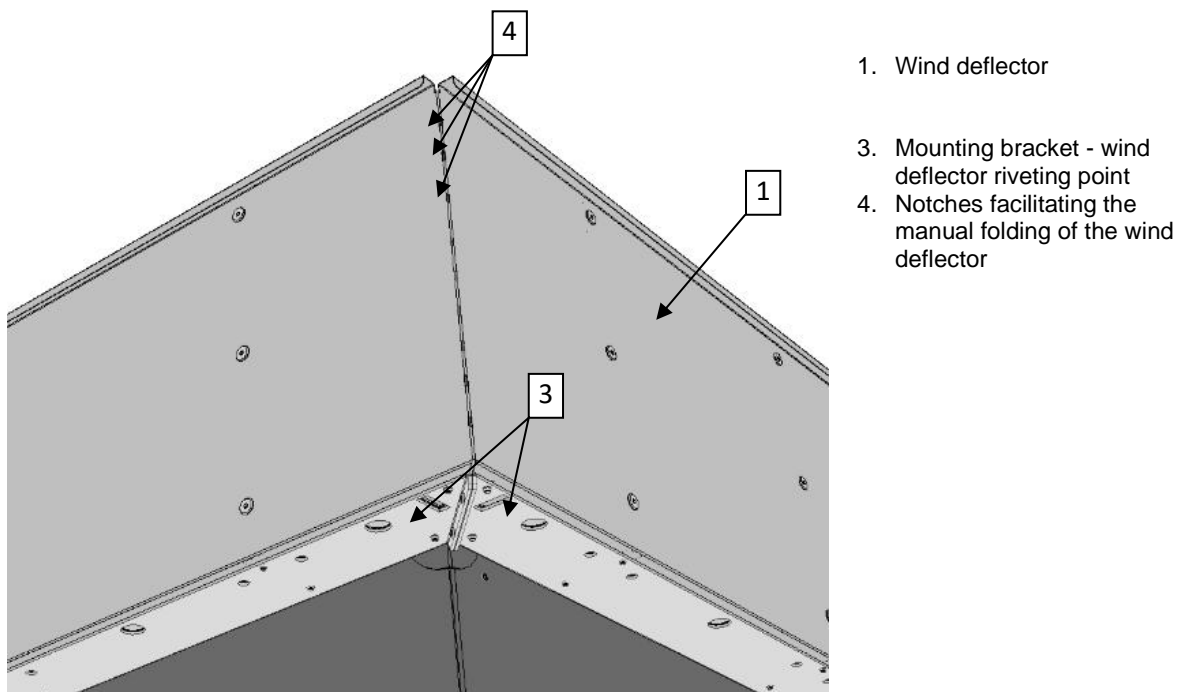
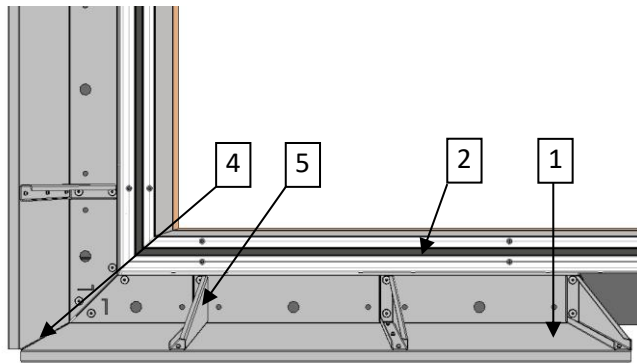


Fig. 40 Mounting the wind deflector to the vent frame - view from below.

The wind deflectors can be additionally equipped with stiffening ribs. The ribs are attached to the vertical wall of the wind deflector at the factory.





1. Wind deflector
2. Smoke exhaust vent base with frame
4. Notches facilitating the manual folding of the wind deflector
5. Stiffening rib (in selected sizes)

Fig. 41 Mounting the wind deflector to the vent base - view from inside the vent

For ease of installation, the following identification symbols have been applied to the individual wind deflectors:

"L" - on the left wind deflector and "P" on the right wind deflector.

The wind deflector can be identified by looking at the front of the vent - facing the side where there are no hinges:

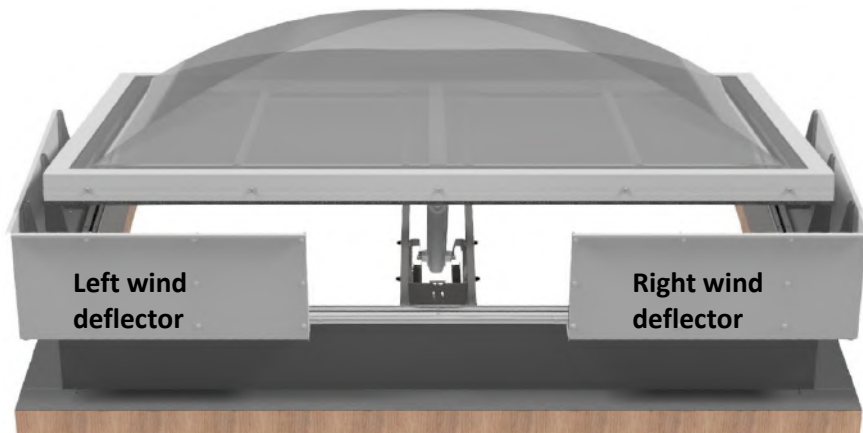


Fig. 42 Wind deflectors mounted on the vent - view from the front.

The markings are located in the corners and are best visible from the top:

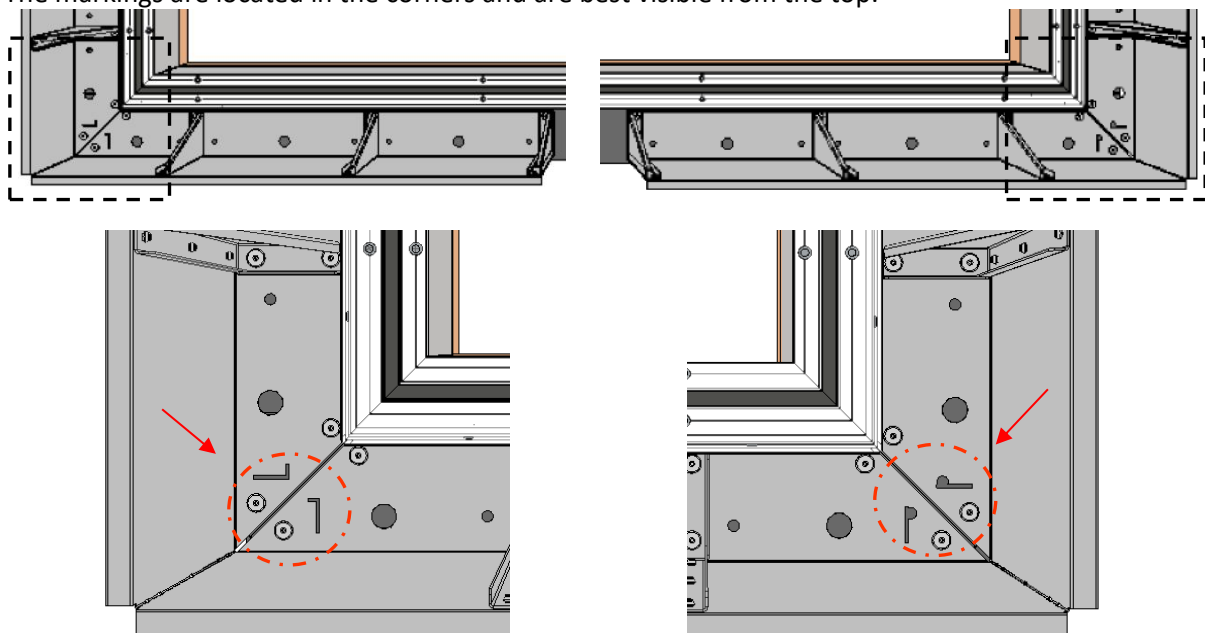


Fig. 43 "L" and "P" markings visible at corners of wind deflectors.

## 6.2. Inlet deflector

The inlet deflector is used to increase the effective aerodynamic efficiency of vent types C and E, i.e. the smoke exhaust area. The inlet deflector is mounted at the bottom of the vent base. It is made of galvanized steel sheet, or alternatively aluminium sheet, and can be painted in any RAL colour.

For bulk-shipped inlet deflectors, which are to be installed on site, the mounting brackets (3) are to be fastened to the sides of the vent base at the pre-drilled points using self-drilling screws 6.3x19 (DIN 7504K). Connect the inlet deflector sides (1) and (2) with the mounting brackets (3) and with each other in the corners using a set comprising: metric screw M6x12 (DIN 967) + self-locking nut M6 (DIN 985).

The inlet deflector can be pre-mounted in the vent in the transport position. Then, after installing the vent, the inlet deflector must be fixed in the operating position:

- loosen the screws in the mounting brackets on side A of the inlet deflector (in place of the prepared  $\text{Ø}6.5$  mm holes);
- unscrew the screws in the mounting brackets on side B of the vent (in place of the prepared slotted holes);
- lower the inlet deflector to the working position - according to the prepared holes;
- tighten the fixing bolts (use only nuts with locking).

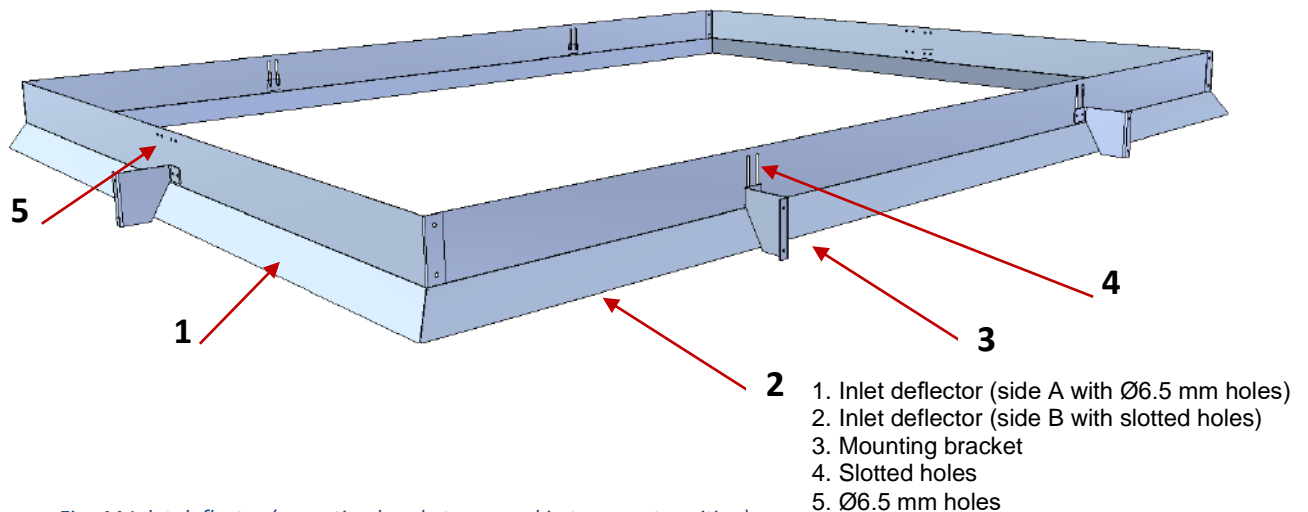


Fig. 44 Inlet deflector (mounting brackets secured in transport position).

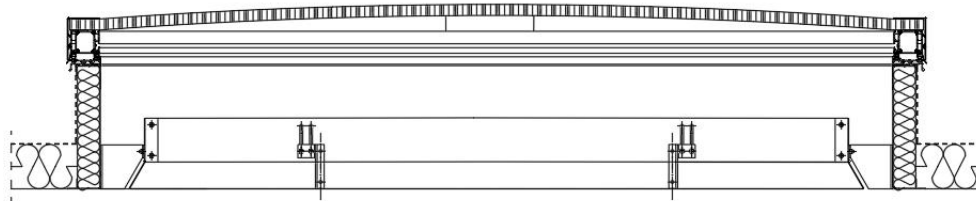


Fig. 45 Inlet deflector in transport position (hidden in vent).

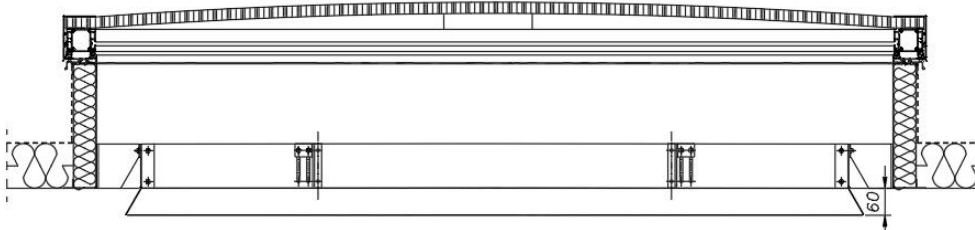


Fig. 46 Inlet deflector in operating position.

## 7. FLAP LEAF ADJUSTMENT

### (HOOK CONSOLE, EYEBOLTS AND 'T' BOLTS)

The vent leaf is connected to the actuator via a hook console. The hook console is locked to the T-bolt. The pneumatic and electric spindle actuators are connected to the hook console by an eyebolt that is screwed into the piston rod/spindle of the actuator. The play in the vent leaf can be adjusted by screwing in an eyebolt or adjusting a T-bolt. The eyebolt or T-bolt should be secured against loosening by a counter-nut. When using an additional 230 V~ electric actuator for ventilation in a system with pneumatic actuator, the T-screw is screwed into the toothed bar or spindle of the 230 V~ electric actuator.

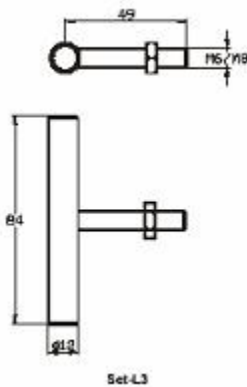


Fig. 47 T-screw.

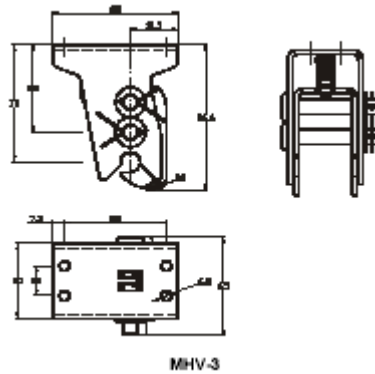


Fig. 48 Hook console.

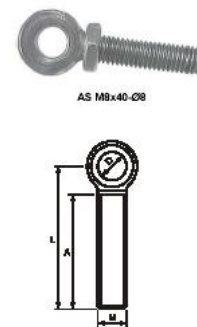


Fig. 49 Eyebolt.

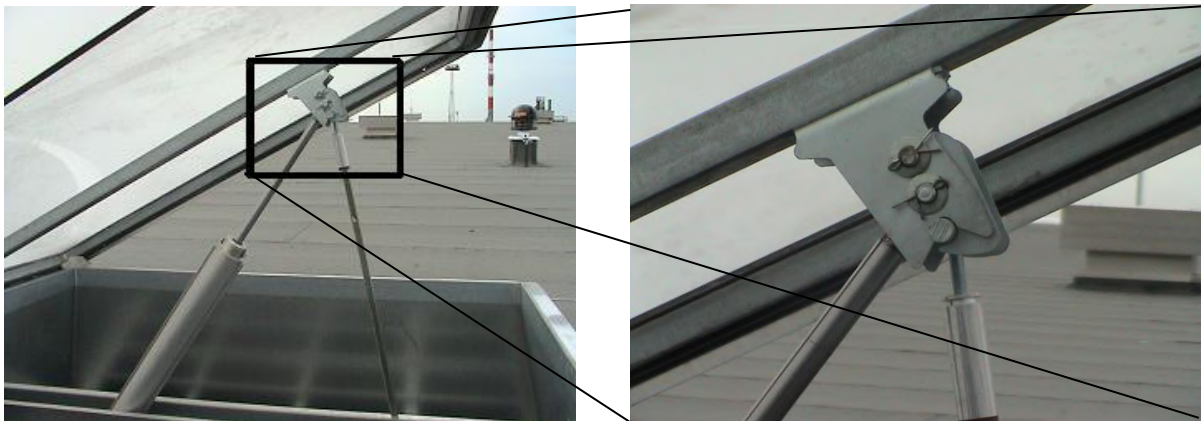


Fig. 50 Connection of the actuator to the hook console.

## 8. CONTROL

The operation of smoke and combined smoke exhaust and ventilation vents is based on devices used to open and close them. These devices constitute the control system for smoke exhaust or smoke exhaust and ventilation. The smoke ventilation control system, depending on the type of devices used in it, can be made as:

- pneumatic,
- electric,
- mechanic.

Depending on the control method, mcr S-THERM vents are equipped with pneumatic actuators with thermal fuses or electric actuators and additionally with electric actuators to control gravitational ventilation.

If the control fails and the vent leaf cannot be closed, contact the service department immediately (see chap. 11).

If the leaf has to be closed immediately: disconnect the immobilised actuator from the leaf (e.g. by removing the eyebolt from the hook console or removing the eyebolt from the actuator, or disconnecting actuator E from the mounting console), then close the leaf and secure it against opening.

### 8.1. Pneumatic control

Depending on the system configuration, additional pneumatic tubing may need to be connected to the vent (e.g. copper/steel tubing to the alarm box with cartridges).

Threaded connections of screw connections with valves, actuators, etc., are sealed with suitable chemicals, e.g. Loctite 243 (recommended) or Teflon tape, by wrapping it around the thread. For Loctite 243, apply several (2-3) drops of Loctite 243 to the thread to be sealed. Once the threaded connection has been screwed together, Loctite 243 sets, sealing the joint and preventing uncontrolled loosening (important for actuator connections). The unscrewing of such a secured screw connection is only possible with hand tools.

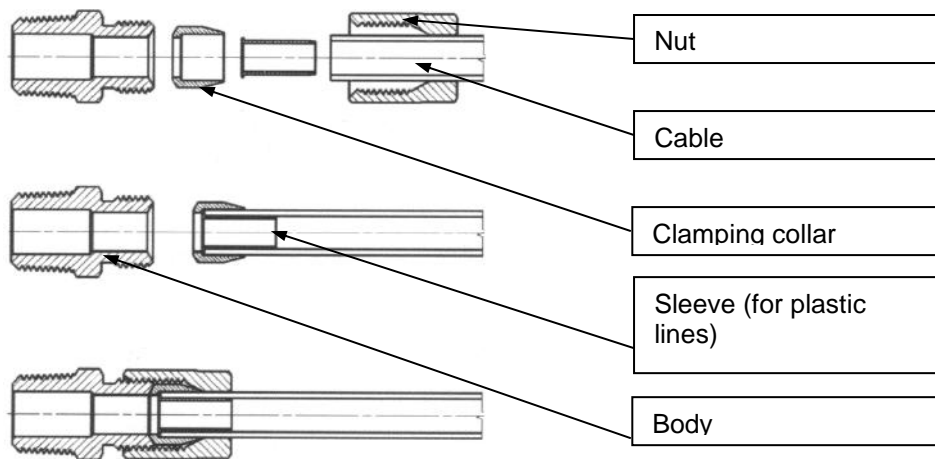


Fig. 51 Method of installing the flexible pneumatic lines.

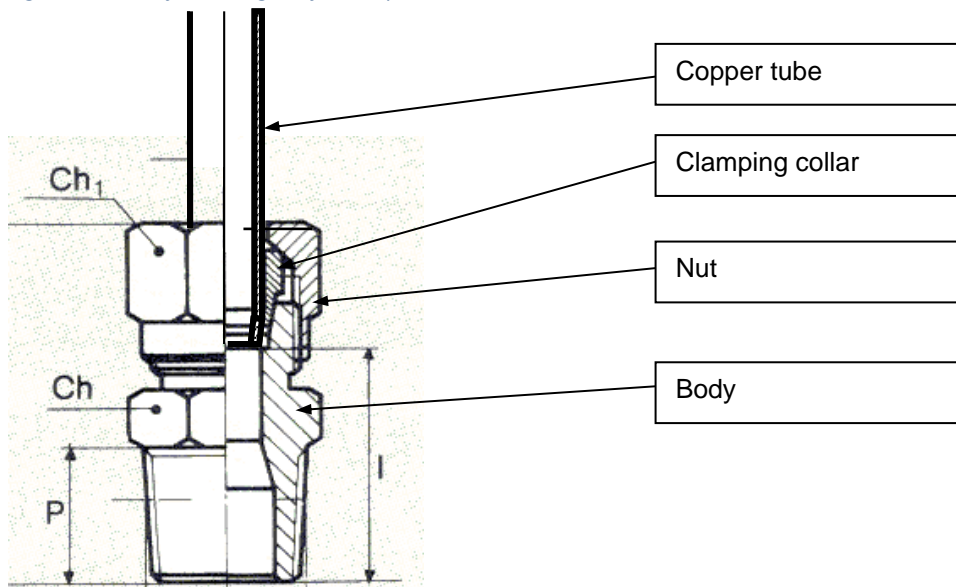


Fig. 52 Connection of the screw connection to the copper/steel pipe.

**NOTE:**

For safety reasons during transport, the thermal fuse in the vent is not armed. After installation of the vent (including flashing) on the roof, any possible play in the vent leaf must be eliminated and the thermal fuse armed.

Arming the thermal fuse:

- check if **pin spring** tensioning screw (1) is unscrewed; if not, it should be unscrewed by hand till the stop,
- install the **alcohol ampoule** (2) in the seat of the gas regulator with the pointed end towards the body; tighten the clamping screw of the ampoule by hand
- slide in the **valve slide** (4),
- tighten the pin spring with the screw (1) as far as it will go - manually,
- check that the cartridge pin is retracted, and that a seal is present in the cartridge seat,
- manually screw in the **CO<sub>2</sub> cartridge** (3).

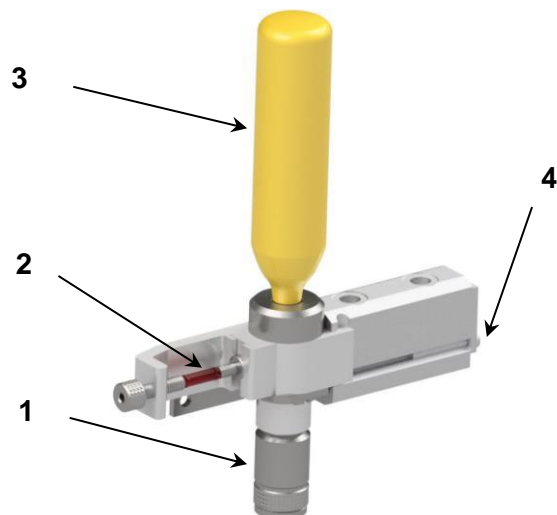


Fig. 53 Thermal fuse (TAVZ 3 shown as example).

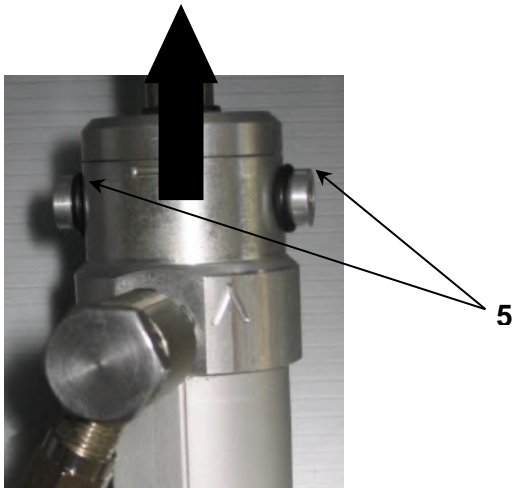


Fig. 54 PUAV pneumatic actuator - lock release direction.

Pneumatic actuators for smoke exhaust purposes are equipped with an internal lock which prevents closing of the fully opened vent leaf. Method of closing the vent leaves after an alarm opening for systems without remote closing function:

- Release the CO<sub>2</sub> from the system by unscrewing the cartridge from the thermal fuse or alarm box (**note: there is high pressure in the system - unscrew slowly; note: the cartridge may give a frostbite**).
- Release the **actuator locks (5)** by lifting them in the direction of the actuator movement (in accordance with the arrow on Fig. 54).
- Lower the vent leaf.
- Confirm the leaf is closed.
- Insert a new CO<sub>2</sub> cartridge in the thermal fuse or alarm box.
- If necessary, replace the thermal fuse (alcohol ampoule (2)).

## 8.2. Electric control

The leaf opening control system using a 24 V= electric actuator for smoke exhaust is delivered ready for installation in the vent. Adaptation to operation consists in hanging the catch plates of the traverse on the frame and connecting them with a set of self-drilling screws to the base. The coupling of the actuator to the leaf consists of connecting the eyebolt of the electric actuator to the pin of the hook console and adjusting it appropriately so that the console snaps securely onto the T-bolt, while at the same time the electric actuator is turned off when the vent is closed by a limit switch rather than an overload switch.

Connection of Gxx (mcr-W) / SGxx (mcr-WSG) actuator (polarity of conductors):

brown cable +	} spindle retracts	brown cable -	} spindle extends
blue cable -		blue cable +	

For controlling and supplying electric actuators Gxx (mcr W) / SGxx (mcr WSG) of mcr S-THERM vents, smoke exhaust and ventilation control units mcr 9705, mcr 0204 and extension modules mcr R0424 and/or mcr R0448 should be used.

**It is recommended that the vent leaf opening for ventilation with a 24 V actuator does not exceed 30°, which corresponds to an opening time of approx. 20 seconds.**

## 8.3. Ventilation function

The ventilation function can be implemented in 2 primary ways:

- using pneumatic actuators with an appropriate installation,
- using an additional electric actuator supplied with 230 V~ (see figure below).

For transport reasons, the electric ventilation actuator is usually not installed at the factory. It must be installed in the console of the opening system using LB 18-2-SL13 bushing and M5x16 bolts (for E4-xxx-230 actuator) or ST 12-1/8 bolt (for Exxx-230 actuator) or threaded pins (JMBB actuators) supplied with the actuator. It is recommended that screws be secured against loosening with Loctite 243 or similar. The actuator shall be provided with a T-bolt to be mounted in place of the eyebolt. The hook console should be snapped onto the T-bolt.

It is recommended to use an automatic weather control unit in the ventilation control system, e.g. mcr P054, for closing any open vents in situations of strong wind or rain for the purpose of protecting property and the vents structure from damage.

Wiring diagram for ventilation electric actuator 230 VAC

a/ The E4-xxx-230 V actuator has two circuits:

- service - movement direction control (black/brown-blue wires),
- signal (wires: 2 x white; actuator opening signal - voltage free contact).



Fig. 55 Ventilation control actuator (type E4-xxx-230).



Fig. 56 Bushing LB 18-2-SL13-2xM5x16.

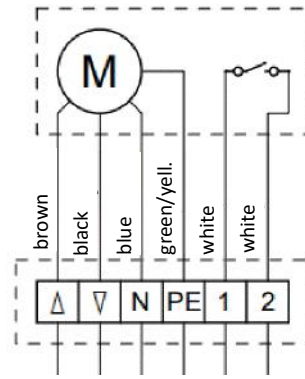


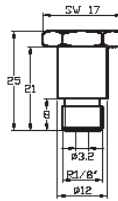
Fig. 57 Actuator E4-xxx-230.

b/ The actuator E xxx - 230 V has two circuits:

- service - movement direction control (black/brown-blue wires),
- signal (wires: 2 x white; actuator opening signal - voltage free contact).



Fig. 58 Ventilation control actuator (type Exxx-230).



ST 12-1/8  
Fig. 59 Screw ST 12-1/8.

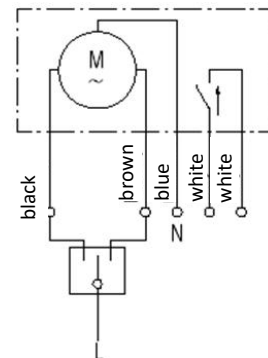


Fig. 60 Actuator Exx-230.

c/ Actuator JMBB-500-300-LA has two circuits:

- service - movement direction control (brown/black1 - blue wires),
- signal (wires: black2/black3; actuator opening signal - dry contact).

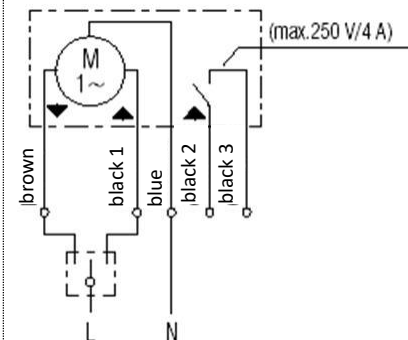


Fig. 61 Actuator JMBB-500-300-LA.

## 8.4. Mechanic control

The mechanic control system consists of a lock and oleopneumatic actuators (gas springs) connected by a lever to the traverse in the base and to the leaf.

There are 3 types of lock:

- 1) Standard (without electromagnet).
- 2) With electromagnet releasing in response to electrical impulse (current flow).
- 3) With electromagnet releasing in response to power failure.

Fig. 63 shows the lock in the standard version (a) and with the electromagnet version (b).

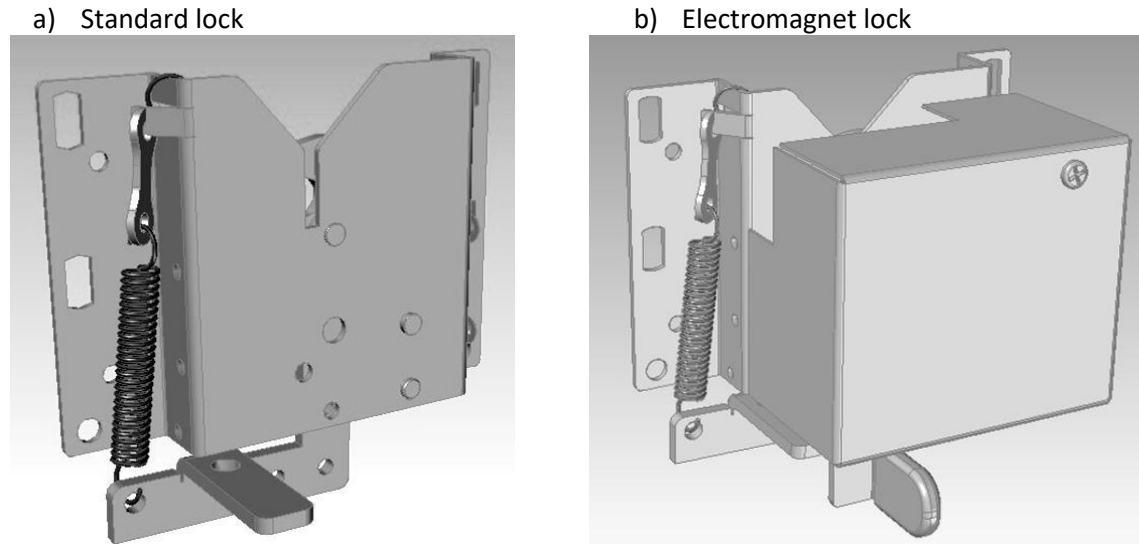


Fig. 62 Types of locks for mechanic controls.

The standard and electromagnetic locks can be easily distinguished by the presence (for electromagnetic lock) or absence (for standard lock) of housing. On the other hand, the type of lock with an electromagnet can be determined by the power of the electromagnet:

- 1) Power 3.5 W - electromagnet releasing in response to electric impulse (current flow)
- 2) Power 1.6 W - electromagnet releasing in response to power failure

Read the electromagnet power from the rating sticker.

### 8.4.1. Methods of opening the lock

A vent with mechanic control system can be opened in 3 different ways, depending on the order:

- 1) Automatically, when the flux melts.
- 2) By opening the electromagnet.
- 3) By hand, with a rope.

The above opening methods are shown in Fig 64.



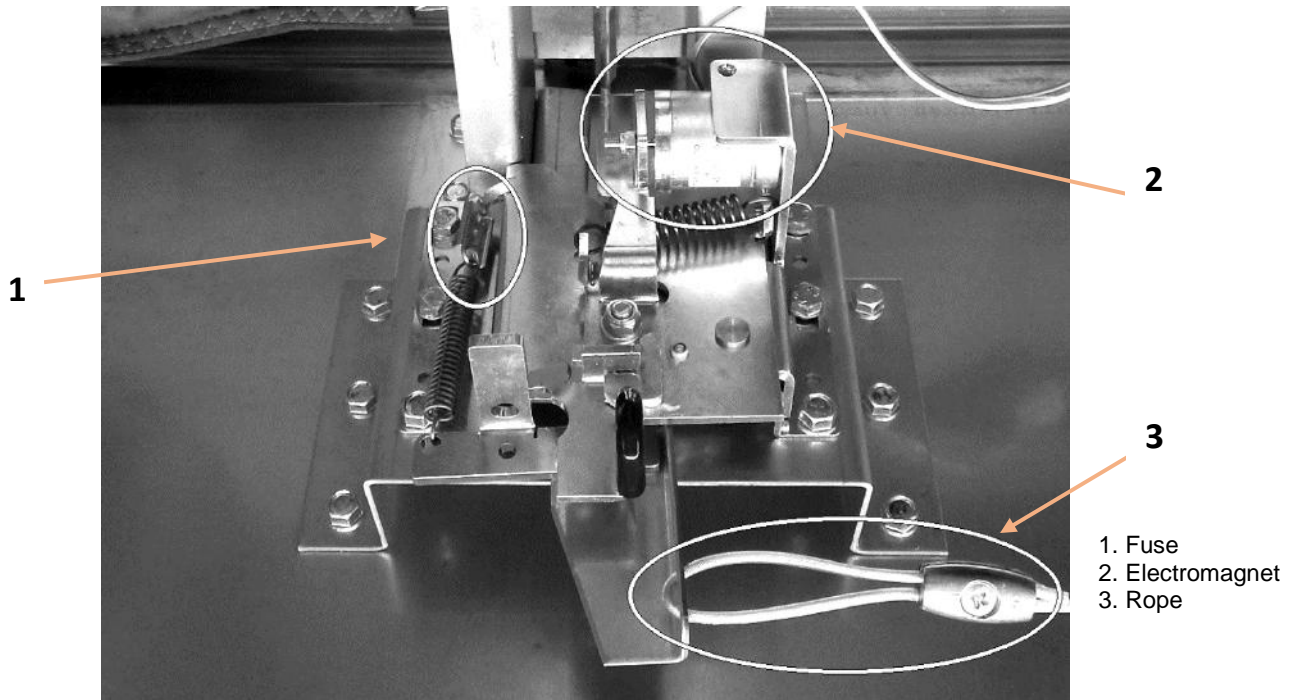


Fig. 63 Methods of opening the lock.

#### 8.4.2. Preparing the lock for operation

The vent is delivered to the customer with the lock secured with a tie strap - applies only to locks equipped with an electromagnet. See Fig. 65 for the method and location of protection.

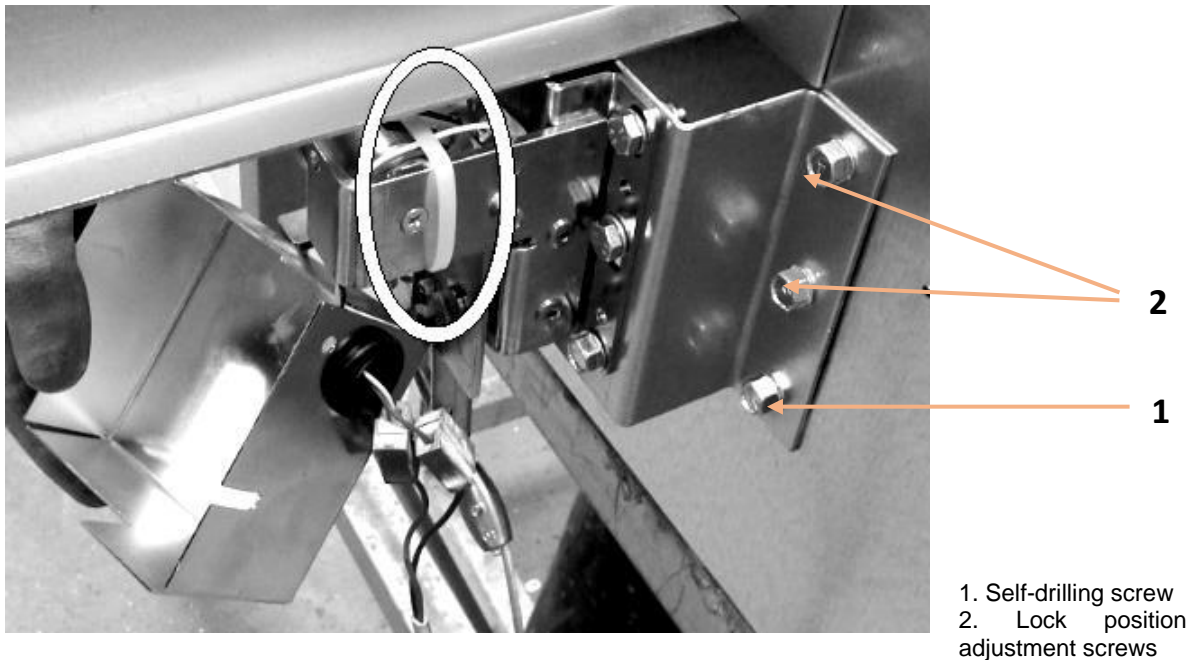


Fig. 64 Lock secured with tie strap.

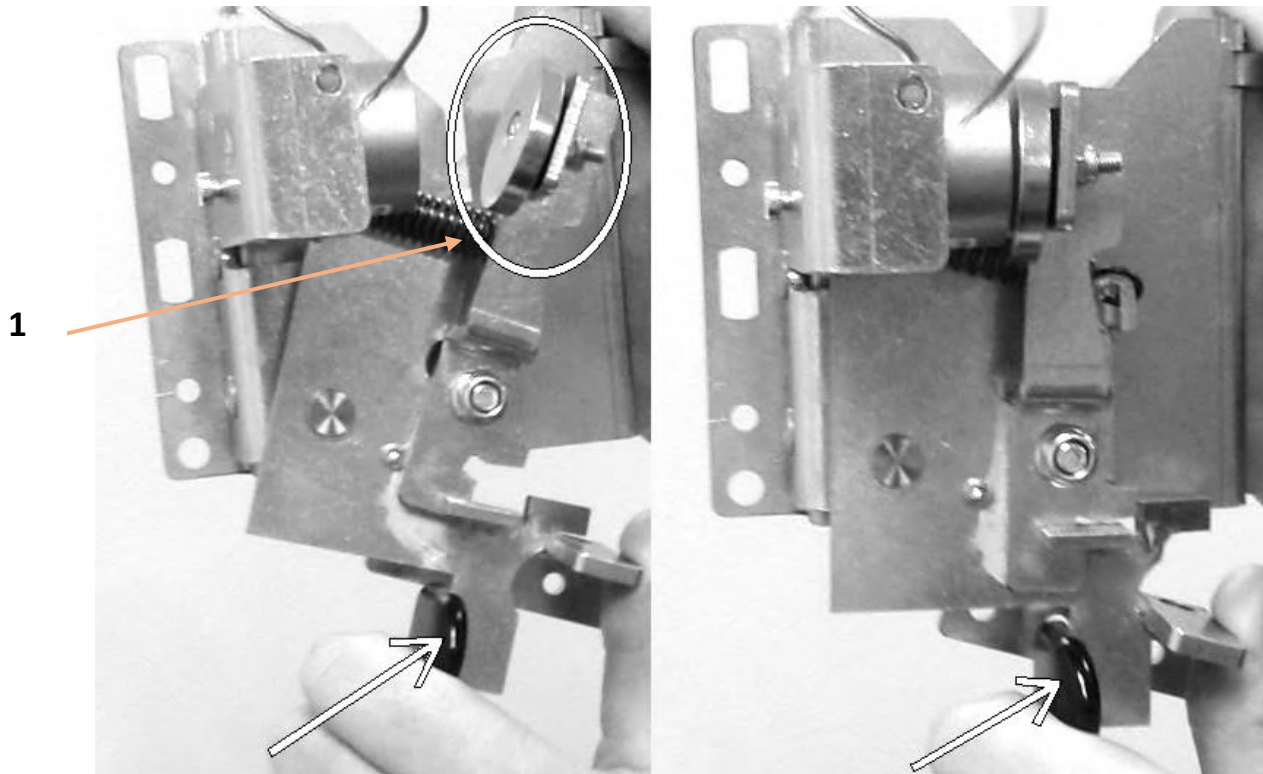
After installing the vent in its final location and before using it, the lock must be released from its shipping protection. To do this, first remove the lock housing by loosening the bolts holding the housing on. Releasing the lock consists in cutting the tie strap and removing it. The cutting of the tie strap is shown in Fig. 66. Once this is done, put the lock housing back on and tighten the bolts that secure the housing.



*Fig. 65 Cutting the tie strap to release the lock.*

If the lock is equipped with an electromagnet, it must also be connected and prepared for operation. Observe the following points:

- 1) After connecting the electromagnet to the power wires, arrange them in such a way that there is no collision of these wires with moving parts of the lock - the full range of movement of the mechanisms must be taken into account.
- 2) For electromagnets triggered by power failure - first turn the power on and only then close the jumper; the method of closing is shown in Fig. 67 - the jumper is item "1".
- 3) For electromagnets triggered by an electric impulse (current flow), after step 1 close the jumper as shown in Fig. 67.
- 4) Close the vent leaf. Make sure that the lock "nut" (round piece) is open as shown in Fig. 68a - the "nut" is item 2. When the vent is closed, there should be a characteristic "engaging" sound of the lock. If the locking process was done correctly, the lock "nut" should be closed as in Fig. 68b.

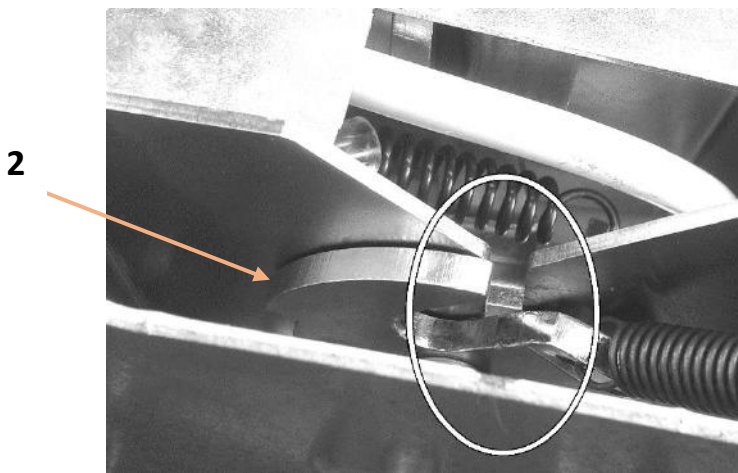


1. Electromagnetic jumper

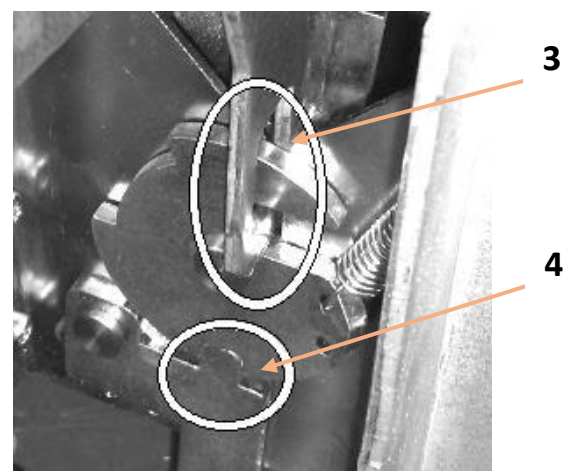
Fig. 66 Closing the lock jumper.

a) Lock "nut" open

b) Lock "nut" closed



2. Lock "nut"



3. Closed catch

4. Lock lever in closed position

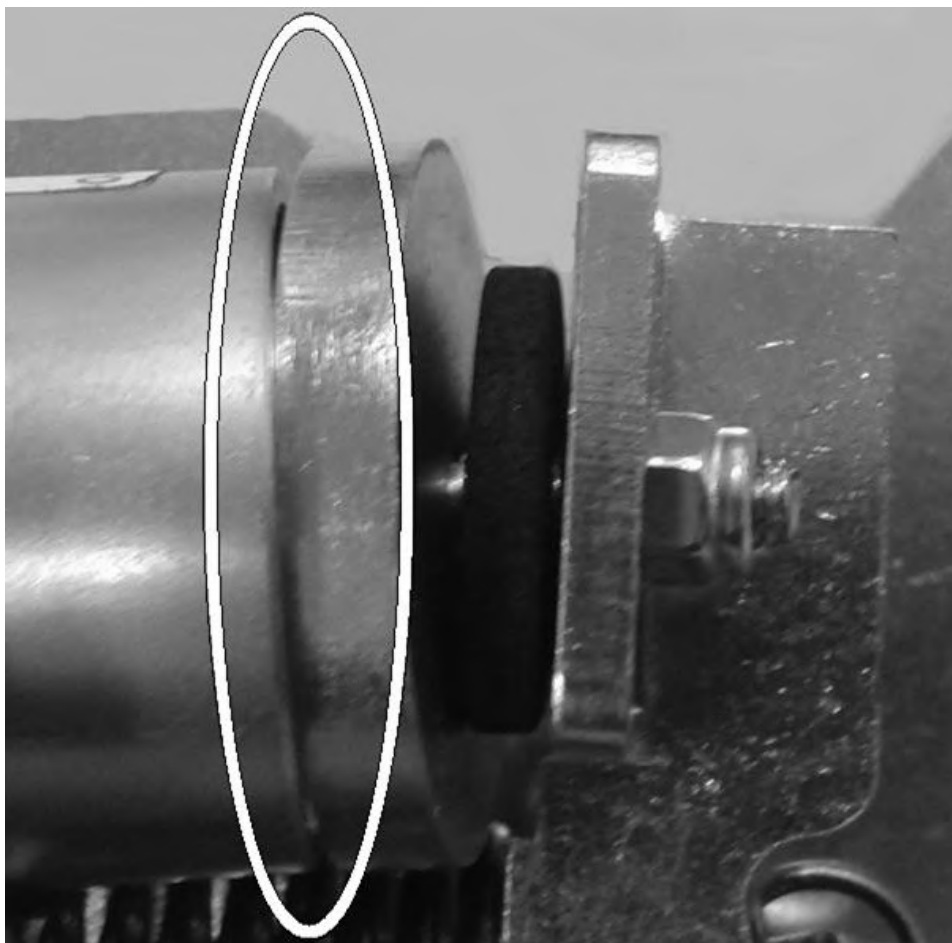
Fig. 67 Lock before and after closing.

### 8.4.3. Lock adjustment

The lock is adjusted by determining the height at which it is mounted. The screws which fix the lock and at the same time are responsible for the adjustment are presented on Fig. 65 - marked with the number "2". Adjustment can be made within a range of approximately 5 mm. After the height adjustment (if required), tighten the screws and secure the lock against unintentional movement by means of the self-drilling counter-screw - item 1 on Fig. 65.

Another option to adjust the lock is to adjust the electromagnet jumper mounting. When the jumper is closed, it should touch the electromagnet with its entire surface. If the situation as shown in Fig. 69 occurs, when the jumper does not close completely, it should be adjusted so that the electromagnet and jumper surfaces are parallel to each other when closed.

If the lock is not working properly, the cause may be that it is not properly adjusted. In such case, carry out the above adjustment steps.



*Fig. 68 Solenoid jumper incorrectly adjusted.*

## 9. INITIAL START-UP

After completing the works described in points from 4 to 8 (type and number of operations depends on the product configuration), connecting the actuator to the power source and tidying up the space around the vent, you may proceed to a trial run and the first full opening of the leaf.

To do so:

- a) **For electric control** - trigger an alarm from the RPO-1 emergency pushbutton, smoke detector or fire alarm system (SAP, SSP).
- b) **For pneumatic control** - trigger the alarm from pneumatic alarm box type AK or fire alarm system (SAP, SSP).

Regardless of the opening system used, it is imperative to:

- 1) Measure the time to open the vent leaf to the smoke exhaust position.  
The correct leaf opening time should be up to 60 s.
- 2) Measure the opening angle of the vent leaf to the smoke position.  
The correct opening angle for smoke exhaust should be at least 140°.
- 3) Verify the presence of the product nameplate at the location shown in Fig. 70.

If the hold-open time is exceeded or the hold-open angle is too small, verify the type of leaf glazing and actuator installed against the specifications on the nameplate, and:

- a) **For electric control** - measure voltage value of actuator supply line.
- b) **For pneumatic control** - verify the value of supply pressure or the size of CO<sub>2</sub> cartridge used.

If necessary, contact the Service Department of "MERCOR" S.A.



Fig. 69 Location of the nameplate.

## 10. SERVICING AND MAINTENANCE

"MERCOR" S.A. equipment should be subjected to **periodical technical inspections** and maintenance activities **every 6 months** during the entire period of operation, i.e. during the warranty period as well as after the warranty period. Inspections and maintenance should be carried out **by the manufacturer** or by companies authorized to service "MERCOR" S.A. devices.

**Physical access to the equipment** is required to perform maintenance as well as service and warranty activities such as inspections or repairs. If equipment is mounted on the roof, it must also be possible to access the roof (ladder or hoist).

It is advised to perform the following between inspections:

1. Check the condition of electrical connections, paying particular attention to mechanical damage.
2. Check the condition of pneumatic connections, paying particular attention to mechanical damage.
3. Check the hook consoles (for full closing and no blockage).
4. Check whether the pressing frame holding the leaf glazing is securely fixed and the gaskets adhere to the glazing.
5. Periodically clean the dome/polycarbonate panel surfaces: use a sponge or soft cloth and lukewarm water with mild household cleaners. The panels must not be scrubbed with brushes or sharp objects. Abrasives, strong alkalis, solvents, etc. must not be used. In case of doubt, test the agent on a sample or small area.

Due to natural processes in the atmosphere, condensation may occur in the chambers of polycarbonate panels. This is usually manifested by the appearance of a mist or, in the case of severe dampness, by clear drips. If diffusion air exchange is ensured between the air inside the chambers and the outside air, after some time the moisture content in both areas will equalize and the visual effects described above will disappear.

**Condensation does not affect the life of the material or the quality of the product.**

### **NOTE:**

It is forbidden to use salt to remove snow from roofs on which mcr S-THERM smoke exhaust vents are installed - it may cause discoloration and damage to polycarbonate plates, acrylic domes or aluminium profiles. Damage to the vents caused in this way does not constitute grounds for complaint.

In matters related to technical inspections, maintenance and servicing of the equipment, please contact the local representatives of "MERCOR" S.A. or Service Department at phone: 58/ 341 42 45ext1998 a.m. - 4 p.m., e-mail: claim@mercor.com.pl.

## 11. WARRANTY TERMS

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](mailto: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. 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<sub>4</sub>)). 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 CONSTANCY OF PERFORMANCE



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



### Certificate of constancy of performance

**1396-CPR-0195**

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

#### **Single - flap natural smoke and heat exhaust ventilator type mcr S-THERM**

designed to move smoke and hot gasses out of construction works naturally under conditions of fire, used in compliance with Assessment and verification of constancy of performance No. C1396/20/0027/4003/SC (issued by FIRES, s.r.o., Notified Body 1396 on 05.03.2021). The product is

placed on the market under the name or trade mark of

**„MERCOR“ S.A.  
ul. Grzegorza z Sanoka 2, 80-408 Gdańsk, Poland**

and produced in the manufacturing plant

**„MERCOR“ S.A.  
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 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 05.03.2021 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.

Batizovce 05.03.2021



Ing. Henrieta Lapková  
Head of Product Certification Body

124948

FIRES 136a/C-31/01/2017-E