Systemy zabezpieczeń przeciwpożarowych
Fire protection systems

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OPERATION AND MAINTENANCE MANUAL

Smoke exhaust vents
mcr ULTRA THERM

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WARNING !

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 CO2 cartridge (see point 6.1.1).

1. INTRODUCTION

This Operation and Maintenance Manual will make the user familiar with the intended use, design, principle of operation, correct assembly and operation of the mcr ULTRA THERM smoke exhaust vents. The documentation also contains additional information on the conditions for use, maintenance and warranty of the product. The Operation and Maintenance Manual applies to:

- mcr ULTRA THERM smoke exhaust vents with PVC base,
- mcr ULTRA THERM smoke exhaust vents with steel folding base,
- mcr ULTRA THERM smoke exhaust vents with welded aluminium base.

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 work associated with the installation, operation, maintenance and servicing of skylights must be carried out in compliance with health and safety rules and using appropriate personal protective equipment, including in particular fall protection equipment. 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

mcr ULTRA THERM smoke exhaust vents are automatic smoke exhaust devices designed for flat and pitched roofs (up to 15°), covered with roofing paper, membrane or PVC foil. The primary function of the mcr ULTRA THERM smoke exhaust vents is to extract smoke, fire gases and heat energy from enclosed spaces (production halls, warehouses, public buildings, etc.) to the outside of the facility, contributing to the protection of life and property by:

- maintaining evacuation routes in minor smoking condition,
- facilitating firefighting and fire action 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, hatches 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 ULTRA THERM smoke exhaust vents are part of a smoke control system which includes other "MERCOR" S.A. products, such as: smoke exhaust vents integrated in continuous rooflights and spot smoke exhaust vents mcr PROLIGHT, smoke curtains mcr PROSMOKE, control units mcr 9705 and mcr 0204 and others.

3. DESIGN

mcr ULTRA THERM smoke exhaust vents and combined smoke exhaust and ventilation vents comprise the following main components:

1. Base - may come in different variants:
   - PVC base - is made of extruded PVC profiles. The profiles are multi-chambered to achieve a low heat transfer coefficient and high rigidity and low weight. The height of the base is between 300 and 700 mm, depending on the order specification. The width of the base profile is 55 mm.

   - Folding steel base - made of galvanised sheet. The steel sheets used in the vents comply with PN-EN 10346:2015-09 for surface type A. The steel base can be supplied in parts (for self-assembly) or already assembled. On such a base, a frame made of PVC extruded profiles is mounted. The total height of the base is 250 - 700 mm depending on the order specification.

   - Welded aluminium base - made of aluminium. The surfaces of the aluminum sheets used comply with the provisions of the PN-EN 485-1 standard. On such a base, a frame made of PVC extruded profiles is mounted. The total height of the base is 250 - 700 mm depending on the order specification.

2. Leaf - made of two PVC extruded profiles. The profiles are multi-chambered to achieve a low heat transfer coefficient. The leaf is reinforced with steel profiles to increase rigidity. The PVC profiles are fitted to a steel profile leaf crossbar, to which the locking mechanism is attached via a console. On one of the longer sides there are hinges connected to the base allowing the leaf to be opened.

3. The leaf filling is available in the following variants:
   - multi-chamber polycarbonate single or double,
   - multi-chamber polycarbonate dome-shaped,
   - double or triple acrylic dome,
   - double or triple dome of solid polycarbonate,
   - mixed filling: flat multi-chamber polycarbonate + dome,
   - ALU sandwich panel (aluminium - thermal insulation - aluminium).

NOTE:
Vents with filling type (PCA10+PCA20) or (PCA16+PCA16) or sandwich panel may <u>only</u> be used on roof pitches >=10° or indoors.

4. Smoke exhaust vents opening system - is executed as a lever mechanism made of steel profiles connected to each other and to an electric actuator, so that the vent leaf opens by an angle of 140° ÷ 160° (depending on the type of opening system and the shape of the base). In mcr ULTRA THERM vents there are three basic types of opening systems:
   - Electrical 24 V, 48 V (smoke exhaust + ventilation),
   - Pneumatic (smoke exhaust only),
   - Pneumatic with additional pneumatic or electric actuator 24 V- or 230 V~ for ventilation.

5. Wind deflectors - mounted to the base of the smoke exhaust vent made of profiled aluminium sheet. mcr ULTRA THERM range includes vents with and without wind deflectors.

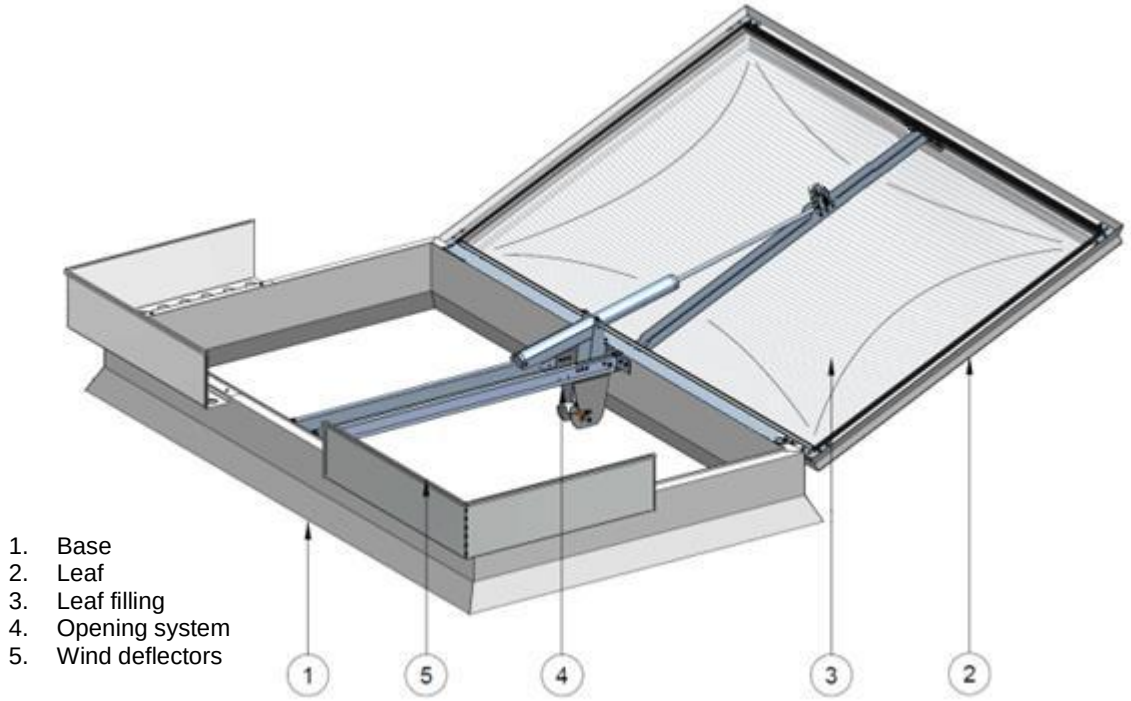


Fig. 1. Design of the mcr ULTRA THERM smoke exhaust vent. (Example with JOFO opening system).

4. SHIPPING AND DELIVERY

mcr ULTRA THERM vents with PVC base can be delivered assembled or in parts. On the other hand, mcr ULTRA THERM vents with metal base (steel folded or aluminium welded) are always delivered in parts. The wind deflectors always are come unassembled. 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.

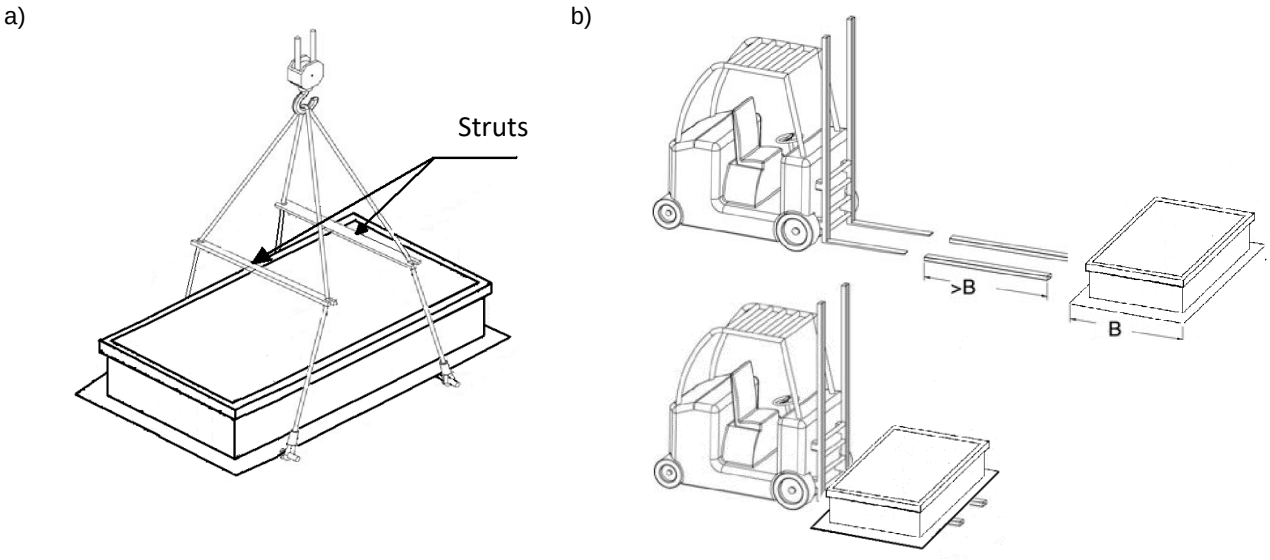


Fig. 2. Transport by crane (a) and by forklift (b).

In case of delivery in parts of the mcr ULTRA THERM smoke exhaust vent with PVC base, standard delivery includes:

1) PVC base,
2) PVC blanking cap,
3) Opening system,
4) Self-drilling sheet metal screws for fixing the opening system (Φ6.3x32,hexagonal head),
5) Leaf,
6) Leaf crossbar (in some cases may already be fitted in the leaf),
7) Sheet metal screws for fixing the leaf crossbar (Φ6.3x60, cylinder head),
8) Hinge strip,
9) Wind deflectors (optional),
10) Self-drilling sheet metal screws for wind deflectors (Φ5.5x32, cylinder head).

NOTE: hinge connectors, opening protection connectors and the labels (quantity corresponding to that of the leaves) are packed on the same pallet as the leaves. They are attached to leaf crossbar of the top leaf.

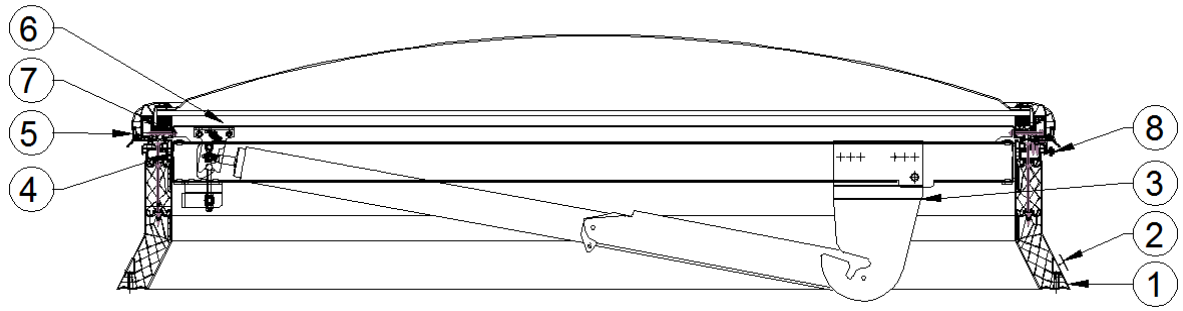


Fig. 2. Section through the mcr ULTRA THERM smoke exhaust vent with PVC base. (Example with JOFO opening system).

In case of delivery in parts of the mcr ULTRA THERM smoke exhaust vent with a folded steel or welded aluminium base, the standard delivery includes:

1) Steel base for assembly or complete aluminium base,
2) PES gasket 40x3 mm,
3) PVC frame,
4) Screws Φ4.8x60 (cylinder head, cross head PH2) + caps for installation of PVC frame,
5) Opening system,
6) Self-drilling sheet metal screws for fixing the opening system (Φ6.3x32,hexagonal head),
7) Leaf,
8) Leaf crossbar (in some cases may already be fitted in the leaf),
9) Sheet metal screws for fixing the leaf crossbar (Φ6.3x60 with cylinder head),
10) Hinge strip,
11) Wind deflectors (optional),
12) Self-drilling sheet metal screws for wind deflectors (Φ5.5x32, cylinder head).

NOTE: hinge connectors, opening protection connectors and the labels (quantity corresponding to that of the leaves) are packed on the same pallet as the leaves. They are attached to leaf crossbar of the top leaf.

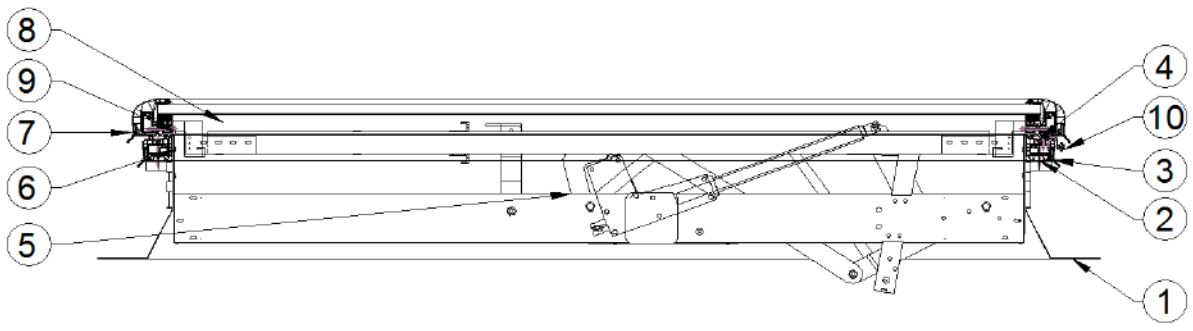


Fig. 3. Section through the mcr ULTRA THERM smoke exhaust vent with steel base. (Example with Actulux Power Single opening system).

5. ASSEMBLY OF DEVICE

The device assembly must be carried out in compliance with all the requisite health and safety precautions, in particular those relating to work at height, using appropriate personal protective equipment.
The vents should be founded on the structural elements of the roof - such as: purlins, trimmers, roof structural sheet, reinforced concrete plinth. Any parts which cause a collision with the vent leaf over its full range of movement shall be removed.
mcr ULTRA THERM vents can be installed on roofs with steel, concrete or wooden structure.
NOTE: the base must have continuous support around its perimeter.

5.1. ASSEMBLING THE STEEL BASE

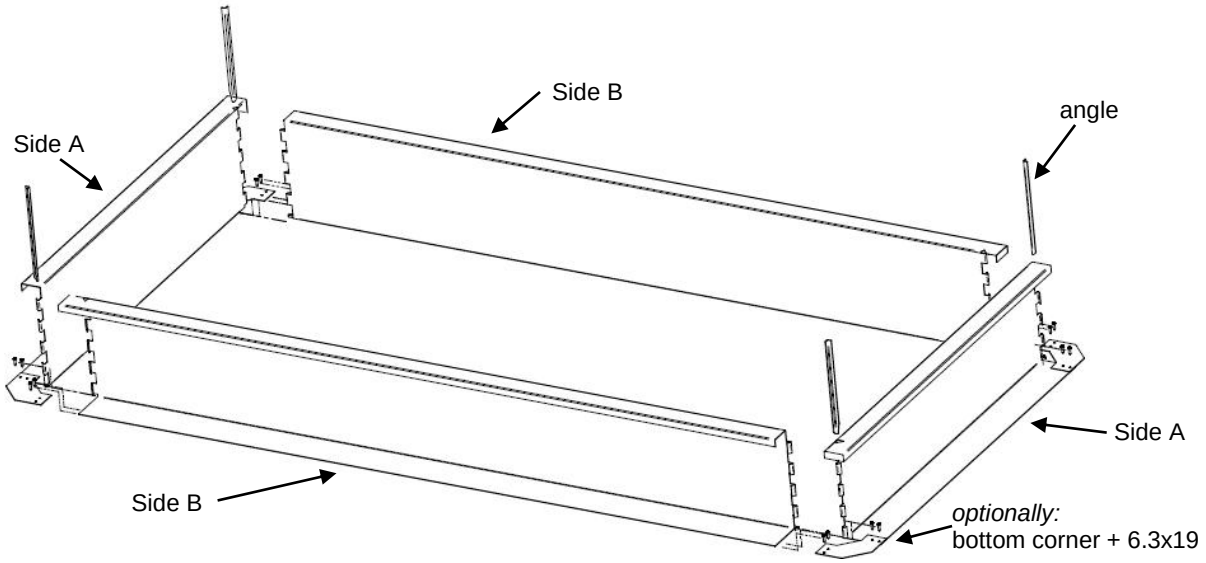


Fig. 4. Folding diagram of the steel base.

Individual sides of the assembled base are connected with each other by special locks located at the edges. Reliability of the connection is guaranteed by the use of a fixing angle, which acts as a bolt.

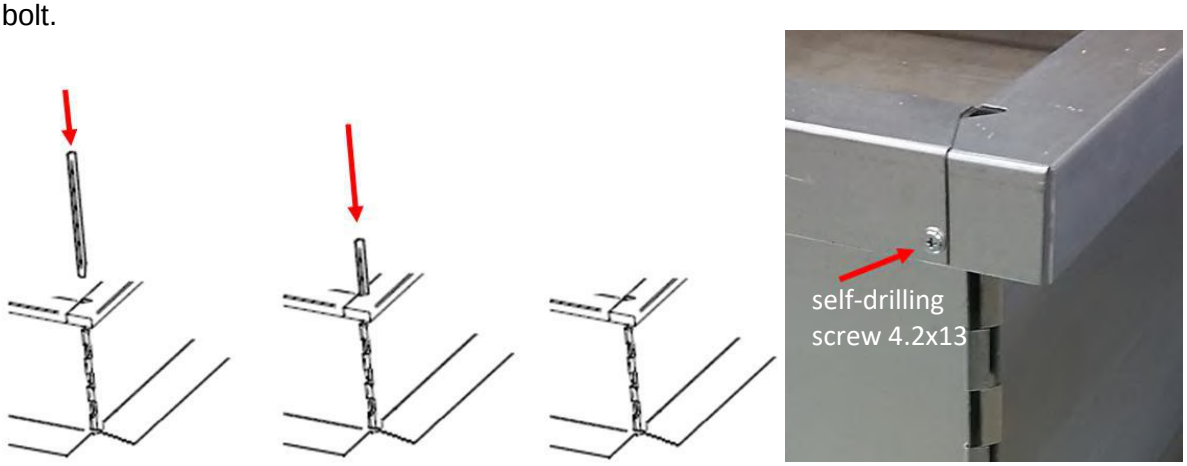


Fig. 5. Base corner assembly details.

The correct assembly of the folding bases should be carried out in the following order:

1) Bring the prepared sides of the base together,
2) Drive the fixing angles into the corners (chamfered side down),
3) Screw in a 4.2x13 self-drilling screw in the corner (as shown in the picture above),
4) It is recommended to place the base on the appropriate place on the roof intended for assembly only when it is put together and stable.

5.2. BASE ASSEMBLY

The base of the device has a projection (shelf) in its lower part for supporting and attaching it to the support structure. For PVC base, use only as many connectors as many mounting holes in the shelf; the manufacturer provides the connectors for fixing the PVC base. For metal bases, use connectors with a maximum spacing of 500 mm - there must be at least 3 connectors on one side of the base. Use ball-headed or round-headed connectors with diameters according to the table below. The manufacturer does not supply connectors for attaching metal bases.

Table 1. Selection of connectors for fixing the vent base to the roof structure.

type of supporting structure	minimum connector diameter
steel	min. Ø5.5 mm
concrete	min. Ø6 mm
wood	min. Ø6 mm

For bases made from PVC profiles, a special 14x30 mm washer (supplied by the manufacturer) must be used beneath the connector head. Place the washers with the longer side parallel to the base edge.

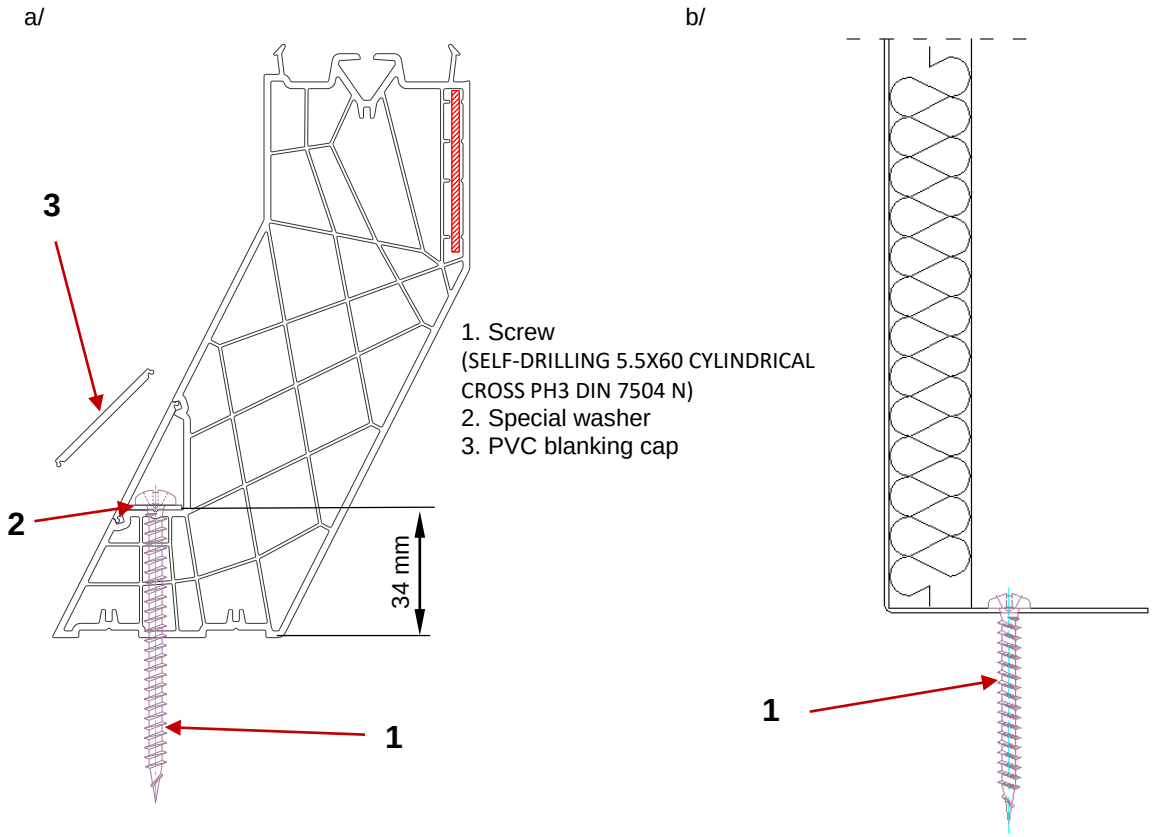


Fig. 6. Assembly of mcr ULTRA THERM base:
(a) PVC base,
(b) steel or aluminium base.

NOTE:

After installing mcr ULTRA THERM, the protective foil must be removed from PVC profiles and acrylic/polycarbonate domes.
If the waterproofing of the skylight base is welded, it is absolutely necessary to use a cover to prevent hot air from affecting the PVC parts.

mcr ULTRA THERM bases are adapted for making flashings with the PVC membrane. For metal bases, the base must be insulated with 50 mm thick thermal insulation before treatment with the PVC membrane. The height of the membrane roll-out is indicated in the figure below.

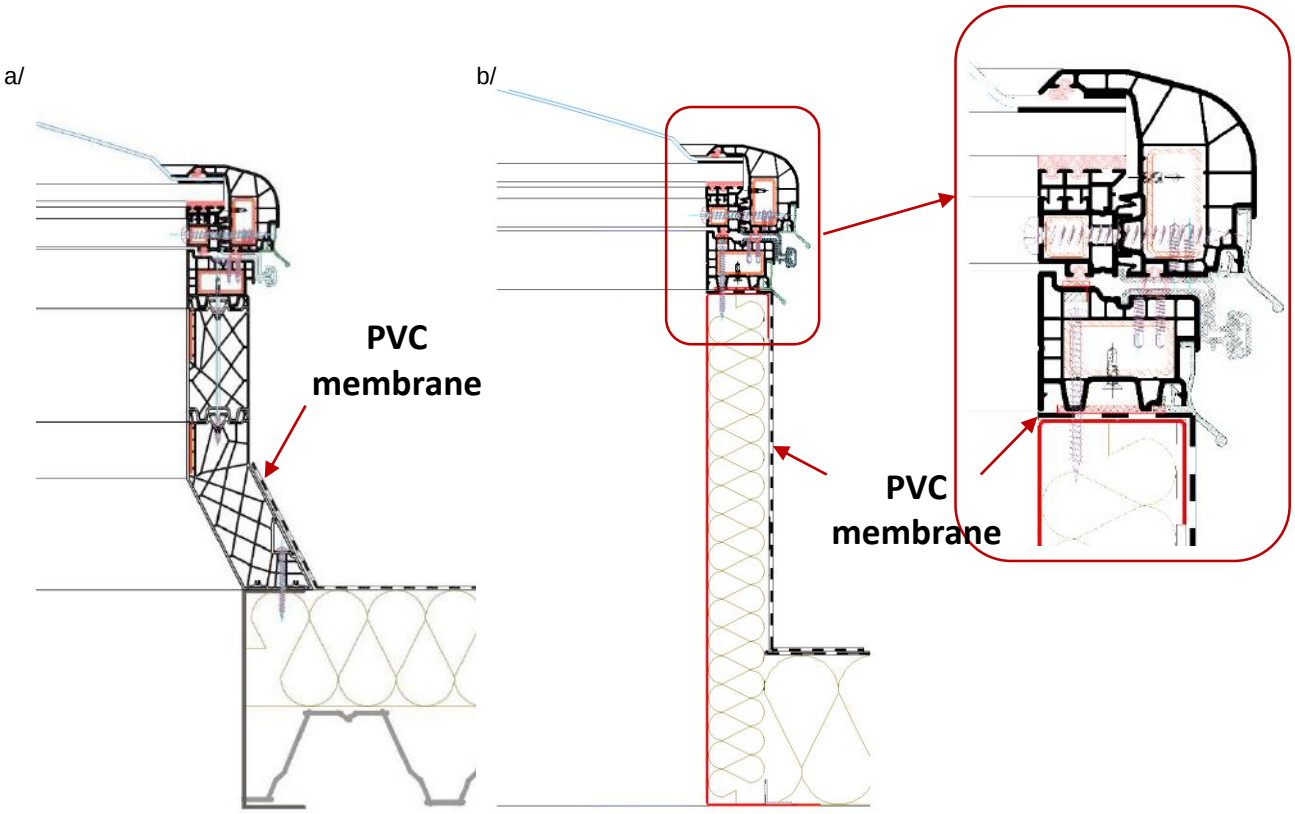


Fig. 7. Membrane roll-out height for PVC base (a) and steel / aluminium base (b).

5.3. FRAME ASSEMBLY

For folded steel or welded aluminium base, the PVC frame must be fitted after treatment with the PVC membrane. First stick a 40x3 mm PES gasket around the perimeter of the base onto the membrane. Join the gasket in the corners as shown below.

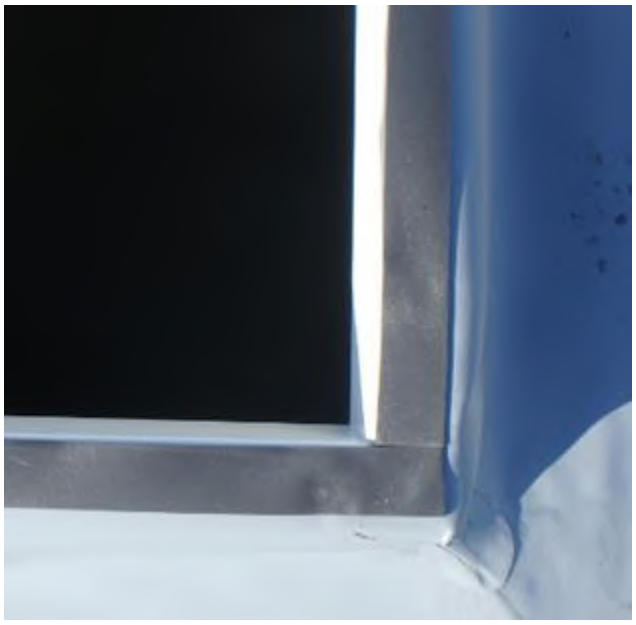


Fig. 8. Joining of the PES gasket in the corners.

Then, place the PVC frame on the PES gasket.

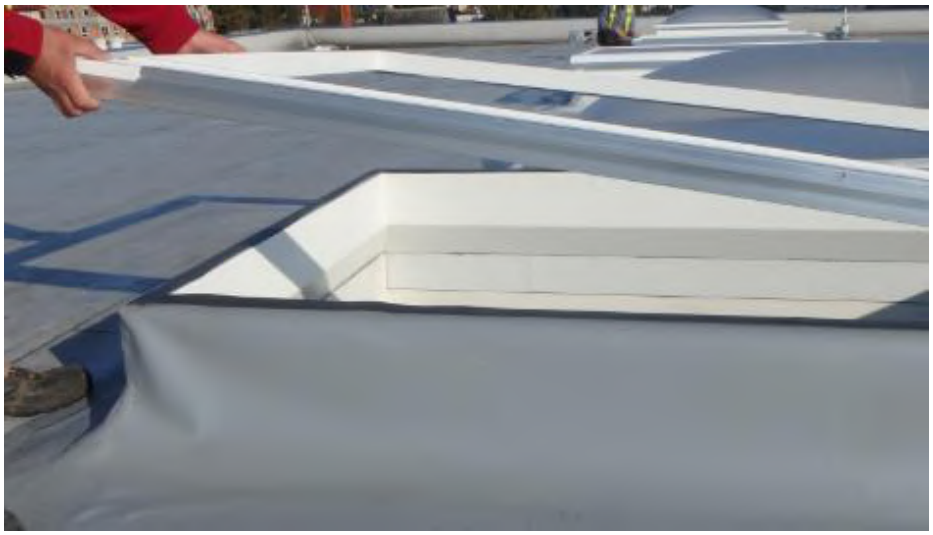


Fig. 9. Laying a PVC frame with a PES gasket.

The properly laid PVC frame should be fixed with 4.8x60 screws to the base as shown in the picture below.

Fig. 10. Mounting of PVC frame to the metal base.

NOTE:
Use only as many screws as there are holes in the frame. The remaining surfaces of the frame are to be intact.

After screwing the frame on, plug the mounting holes as shown in the figure below.

Fig. 11. Installation of caps in the PVC frame.

5.4. ASSEMBLY OF OPENING SYSTEM AND LEAF

NOTE:
For vent with steel or aluminium base
<u>the opening system is to be installed after the PVC frame has been installed.</u>

Chapter 6 shows different types of opening systems, but the way they are assembled is similar. The opening system should be fixed with self-drilling screws 6.3 x 32 to the longer sides of the base. Screw the screws through all the holes in the hook plate.
If there is a single system, it should be located in the axis of symmetry of the vent base.

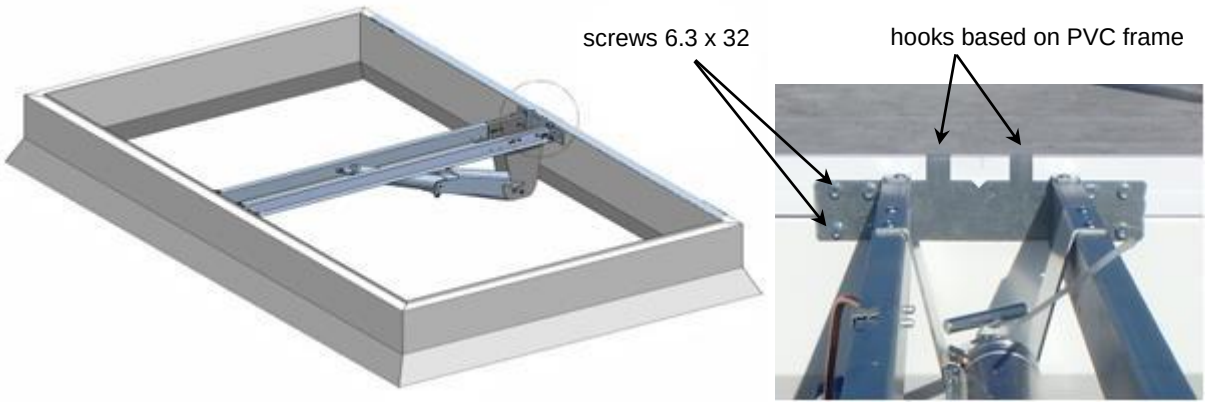


Fig. 12. Assembly of the opening system (Example with JOFO opening system).

If there are two opening systems, they must be mounted as shown in the figure below.

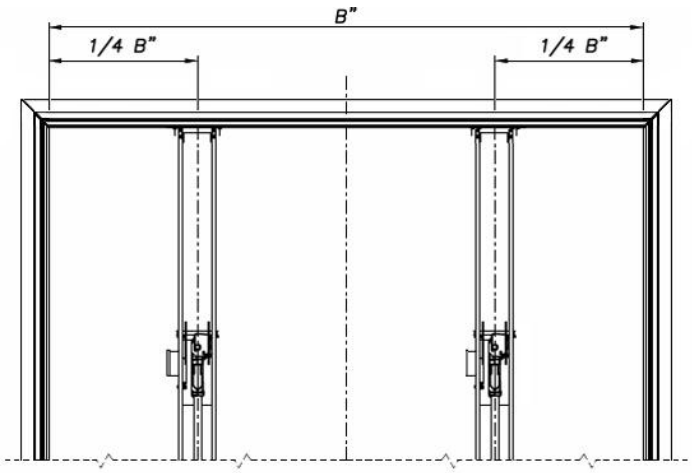


Fig. 13. Position of the opening systems when there are 2 opening systems. (Example with Actulux systems).

For GRASL/K+G opening systems, the crossbar must be set to the correct length by unscrewing the screws, extending the crossbar, screwing in the screws.

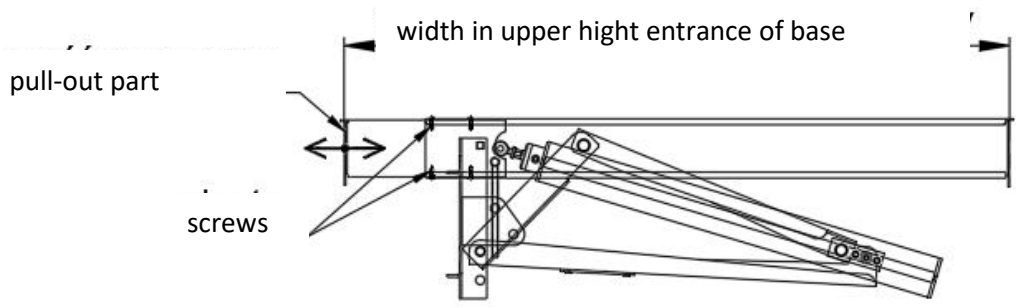


Fig. 14. Length adjustment of the opening system crossbar GRASL/K+G.

Then, install the leaf crossbar to the leaf (if not fitted at the factory). Use sheet metal screws 6.3 x 60. The location of the screws is marked by pre-drilled holes on the inside of the leaf.

Fig. 15. Assembly of the leaf crossbar.

Place and fit the leaf on the PVC frame, making sure that both parts of the hinge are correctly aligned with each other (correct positioning of the hinge is shown in the figure below).

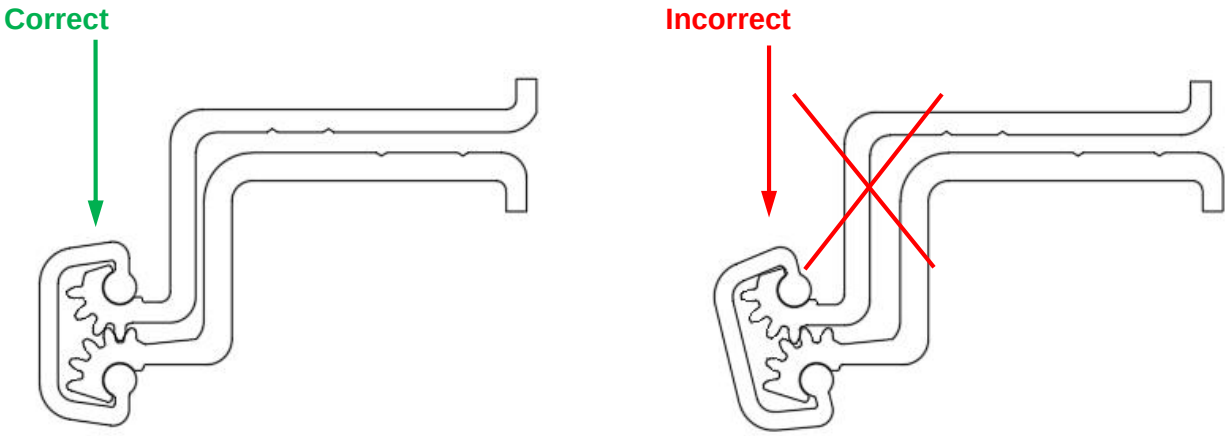


Fig. 16. Hinge positioning.

All parts of the hinge must be lubricated with grease (ŁT-43 included in the delivery) to facilitate the assembly of the connector. Then, slide on the connector as shown in the figures below. It is advisable to drive through a wooden element or with a soft mallet. During the last phase of driving, if there is a great deal of resistance making it difficult to fit the connector, you can move the leaf (open/close) to facilitate mounting.

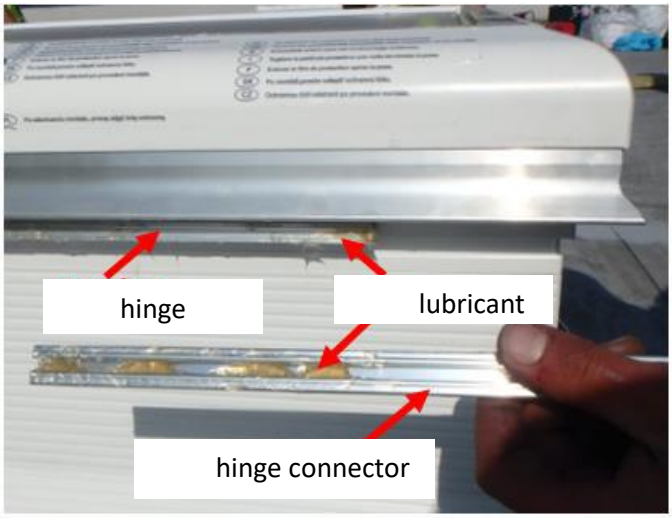


Fig. 17. Hinge lubrication.

Fig. 18. Sliding the connector.

Fig. 19. Driving the connector.

Fig. 20. Hinge with fitted connector.

After mounting the leaf to the base, the opening system of the smoke exhaust vent must be connected to the leaf crossbar.

For the following opening systems: pneumatic JOFO, pneumatic Grasl K+G, electrical Grasl K+G (all systems with hook console):

NOTE: The hook console must first be screwed to the leaf crossbar, if supplied separately.

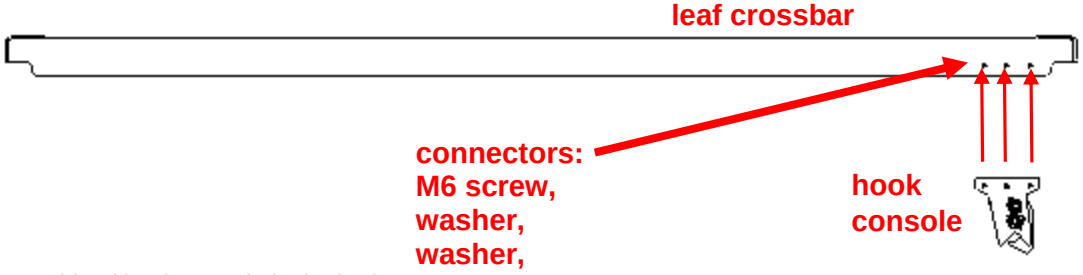


Fig. 21. Assembly of hook console in the leaf crossbar.

Connect the actuator to the hook console mounted in the vent leaf. To do this, remove the pin and pass the pin through the actuator eyebolt and two nylon bushings.

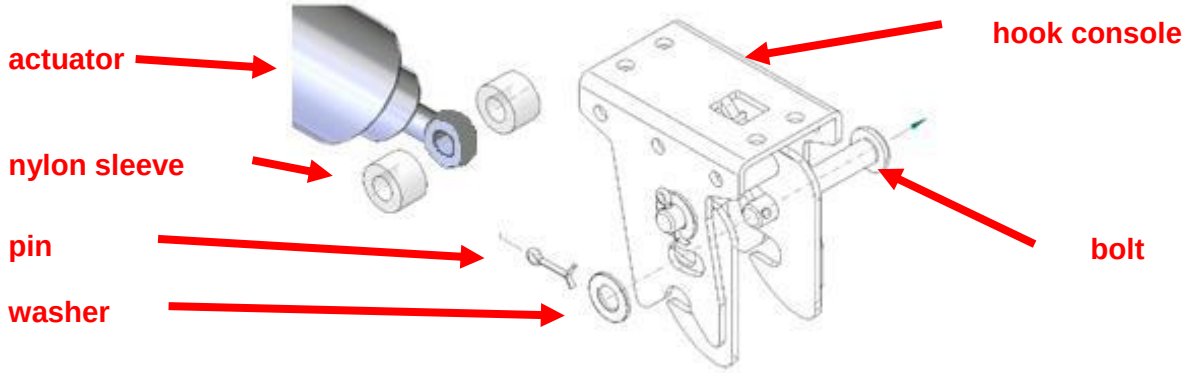


Fig. 22. Details of connecting the actuator to the hook console.

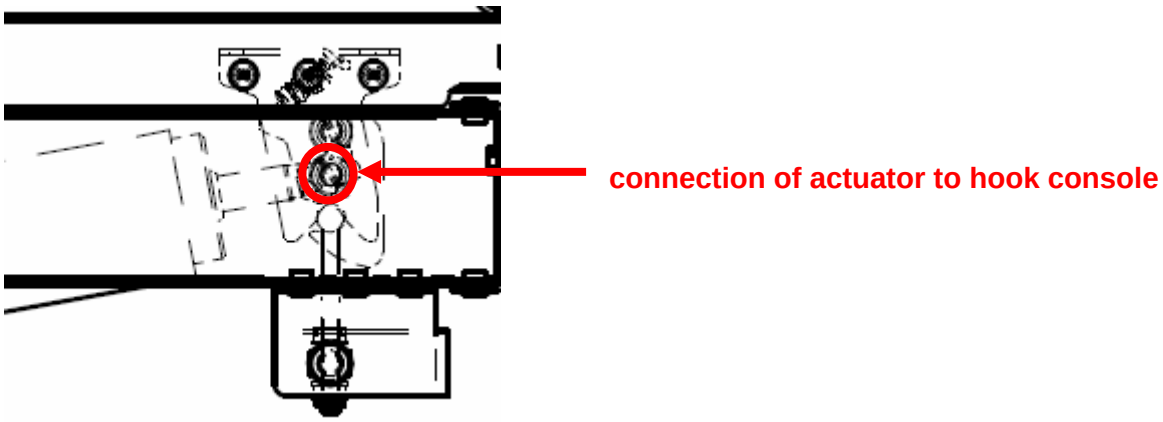


Fig. 23. Connection of the actuator to the leaf crossbar fitted with a hook console (JOFO, GRASL/K+G). The figure shows a hook console closed on a "T" bolt.

The leaf of the smoke and ventilation vents is locked by means of a hook console and a "T" bolt installed in the opening system crossbar. The clearance of the vent leaf must be corrected by screwing in the eyebolt or adjusting the "T" bolt. The transom of the "T" bolt should be ~50mm from the top edge of the opening system crossbar. The eye bolt and the "T" bolt must be secured against loosening with a lock nut. When using an additional 230 V~ electric actuator for ventilation in a system with pneumatic actuator or ventilation vents, the T-screw is screwed into the toothed bar or spindle of the 230 V~ electric actuator.

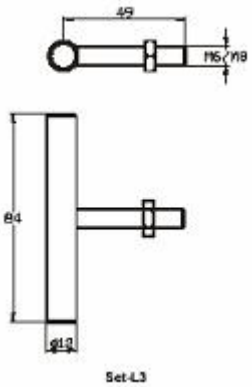


Fig. 24. "T" bolt.

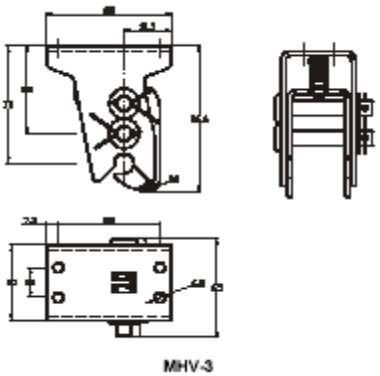


Fig. 25. Hook console.

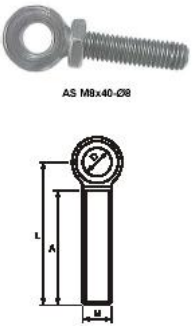


Fig. 26. Eye bolt.

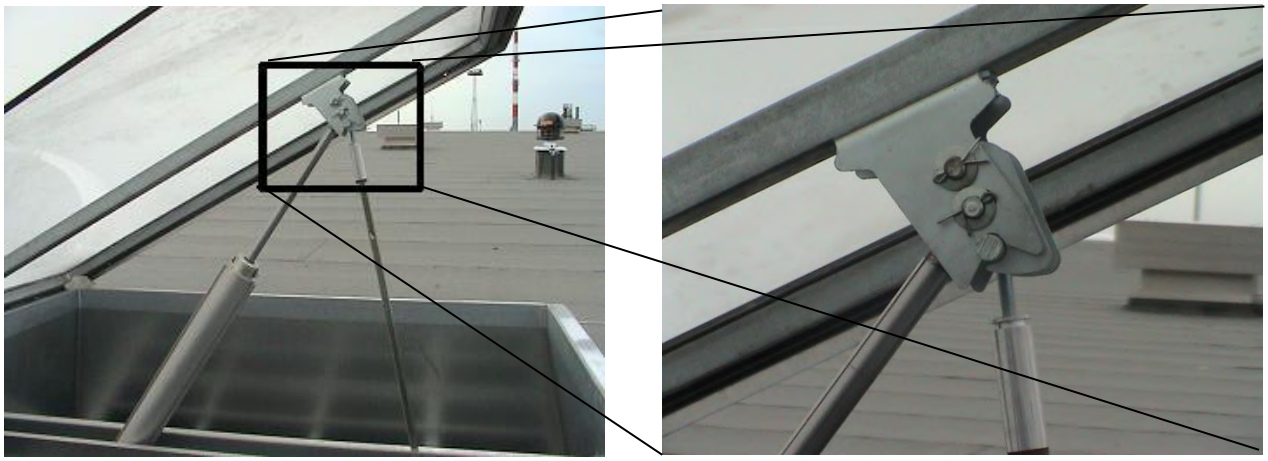


Fig. 27. Connection of actuators to the hook console.

For Actulux electric opening system (without hook console):

Fig. 28. Manually lift the vent leaf and open the mechanism to the crossbar height.

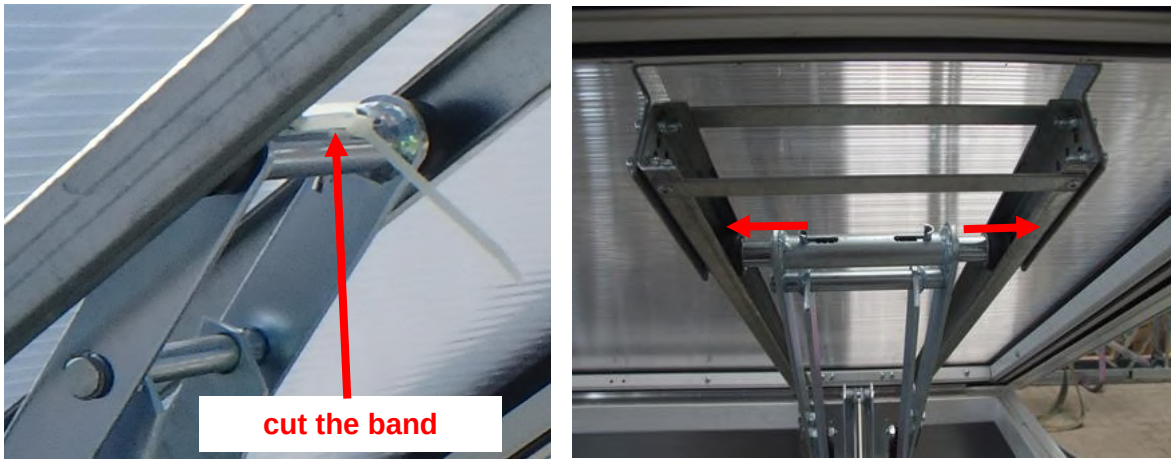


Fig. 29. Connecting of Actulux opening system with leaf crossbar (ACTULUX).

5.4.1. Temporary leaf closure

The vent can be fitted with a so-called temporary leaf closure. It is used to close the leaf when the opening system is not yet fitted or is incomplete (which may be due to the agreed-upon delivery method or service work). The figures below illustrate this solution and how to proceed.

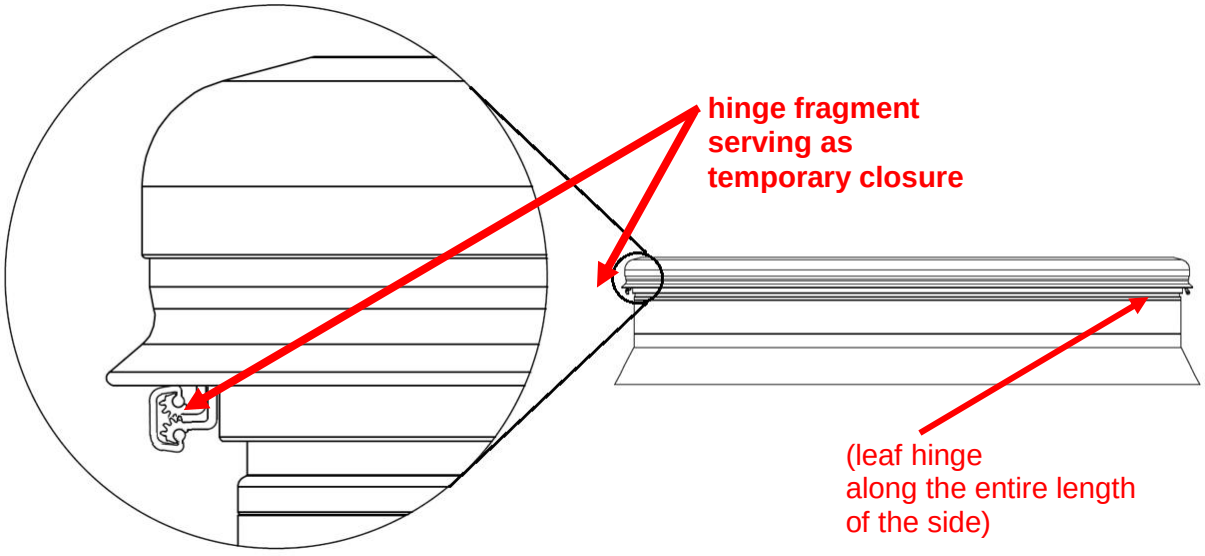


Fig. 30. Temporary leaf closure.

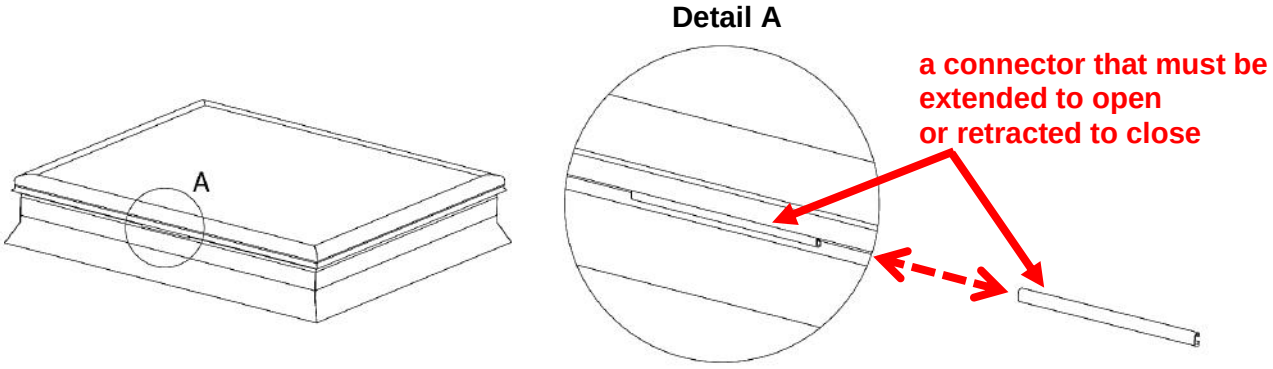


Fig. 31. Opening / closing of the temporary leaf.

5.5. ASSEMBLY OF WIND DEFLECTORS

The wind deflectors are used to increase the active area of smoke vent. The wind deflectors are mounted on the corners. They are supplied unbent. Before installation, they must be bent at the point marked by the oval holes.

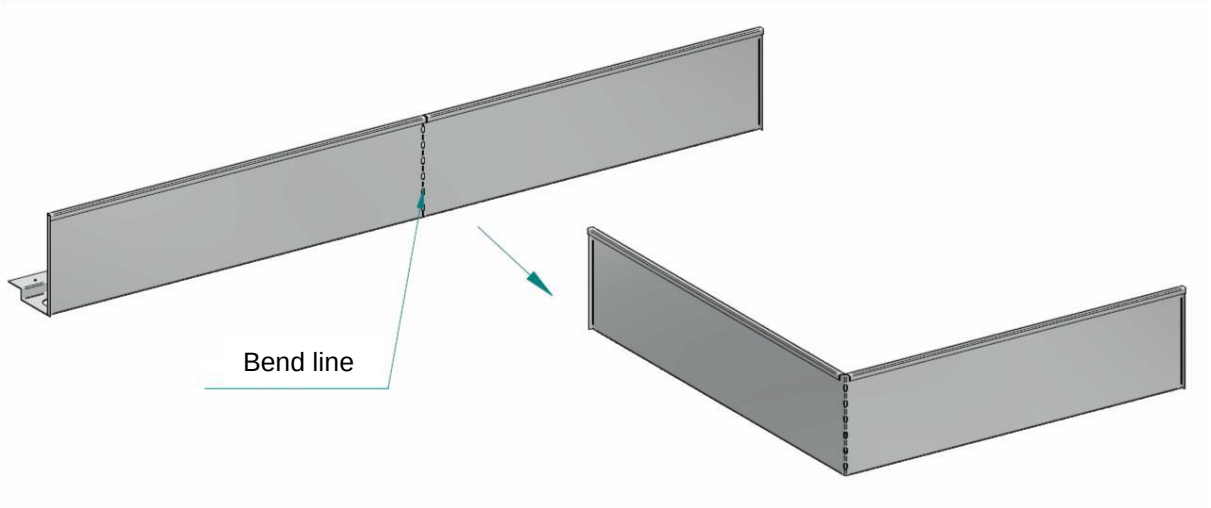


Fig. 32. Bending of wind deflectors.

Mount the prepared wind deflectors into the corners of the vent base on the side opposite the hinges. The sides of the wind deflectors are of different lengths, so follow the rules shown in the diagram below when installing them. Fasten the wind deflectors to the frame using 5.5x32 self-drilling screws (cylindrical cross DIN 7504 N), screwing them through all the Ø6 holes.

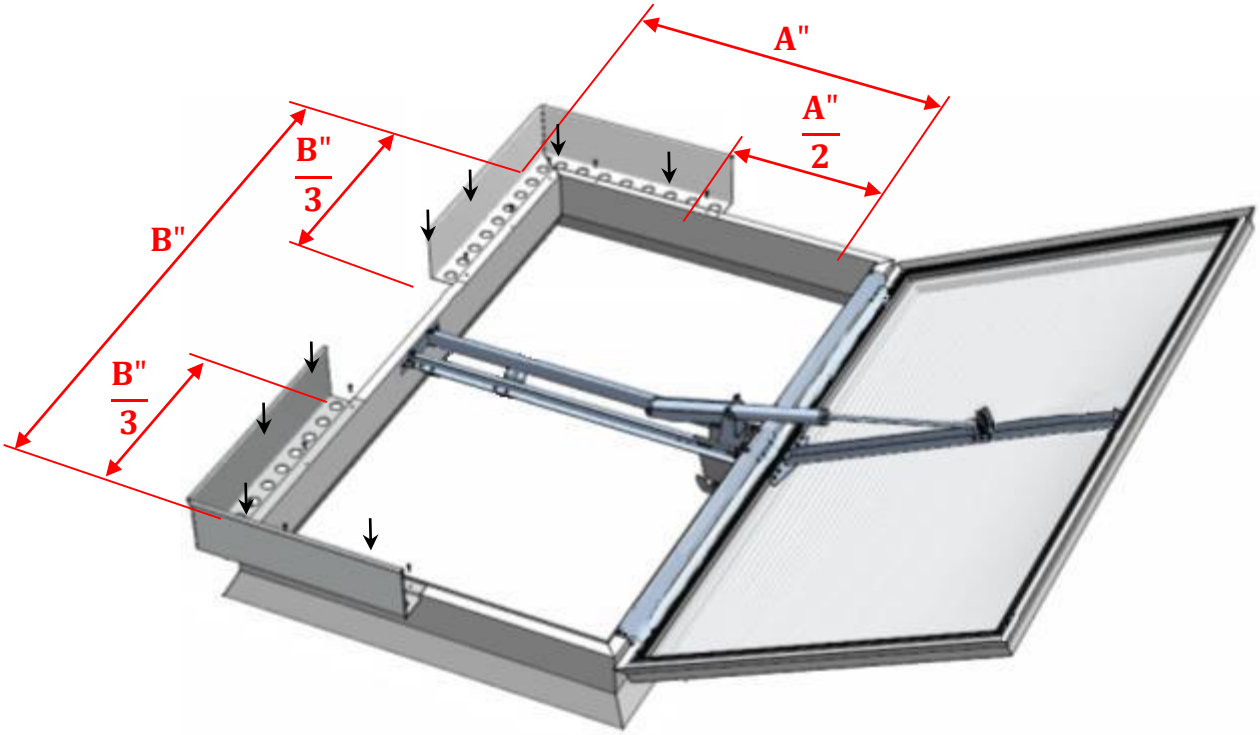
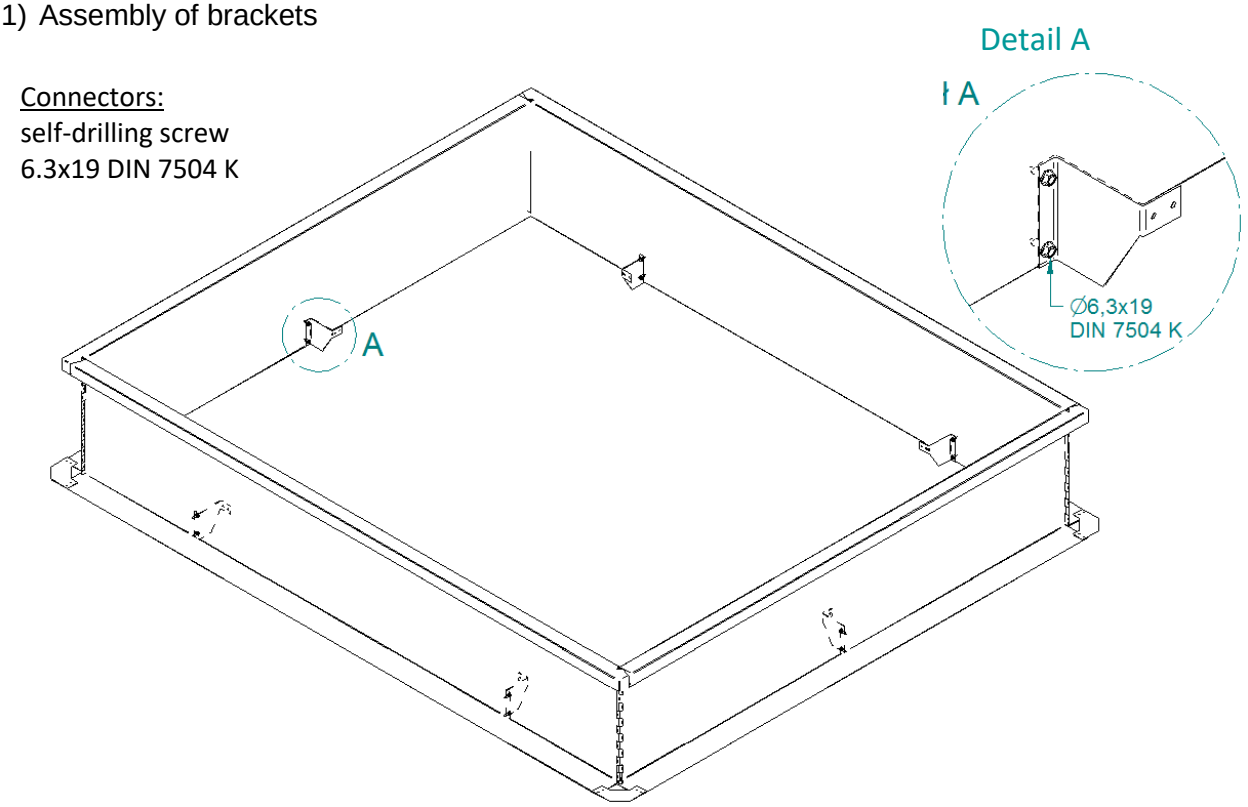


Fig. 33. Assembly of wind deflectors.

5.6. ASSEMBLY OF INLET DEFLECTOR

The inlet deflector is an optional extra and serves to increase the active area of smoke vents with a straight base. The assembly should be carried out step by step according to the following figures.

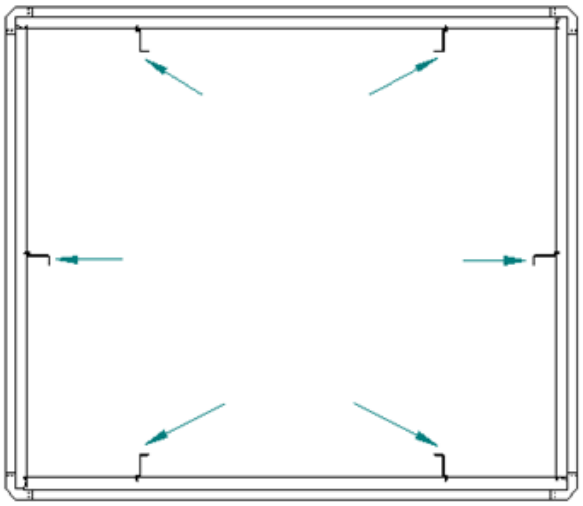
1) Assembly of brackets



NOTE: There are starter holes in the base for mounting brackets.

Top view:

Standard:



If in side B the inlet deflector is split:

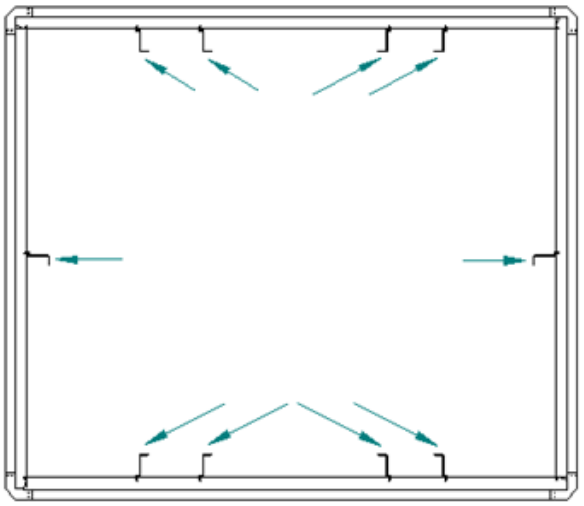


Fig. 34. Assembly of the inlet deflector brackets.

2) Assembly of the inlet deflector elements in sides A

Connectors:
- screw M6x12 DIN 967
- self-locking nut M6 DIN 985

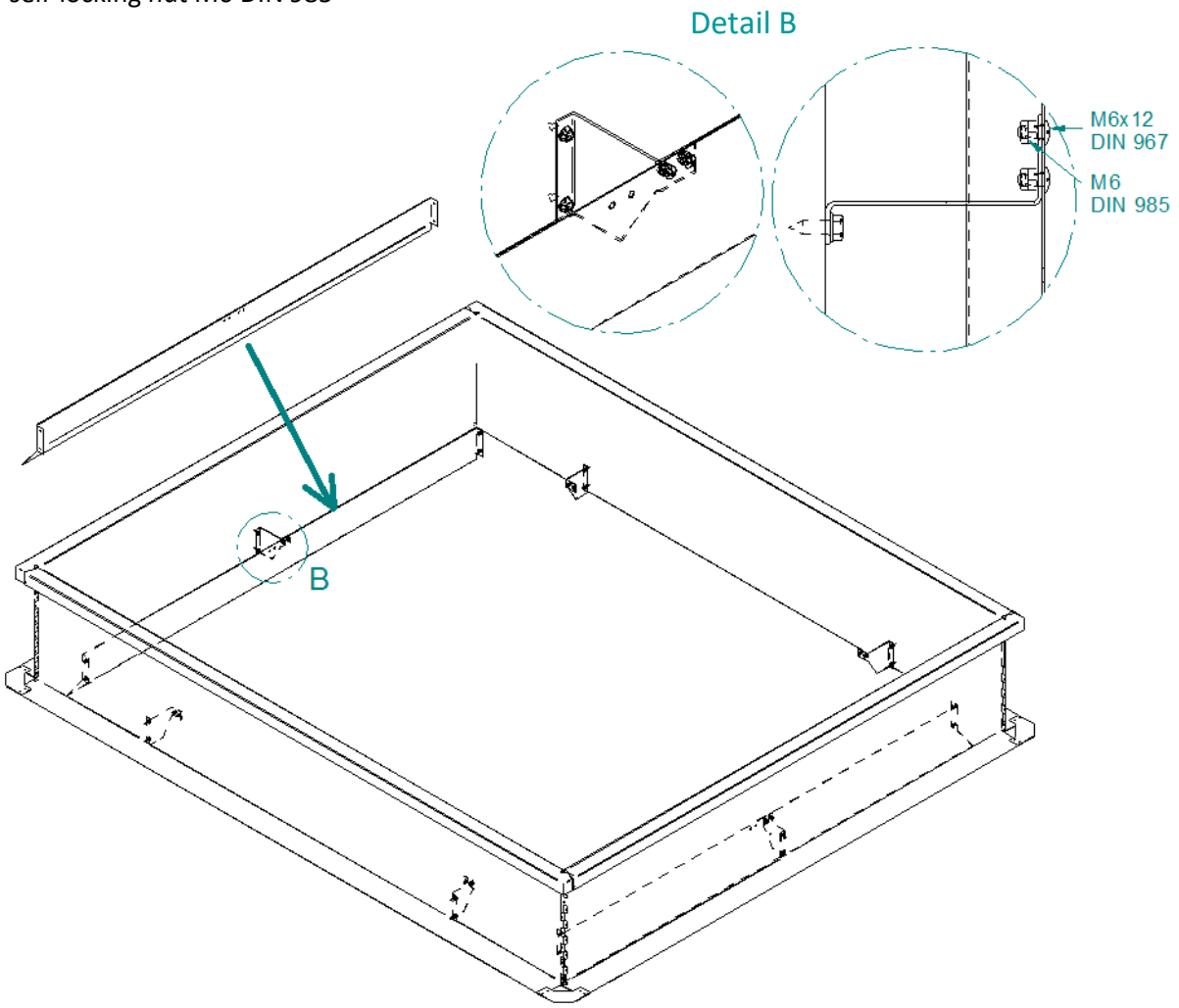


Fig. 35. Assembly of inlet deflector elements in sides A.

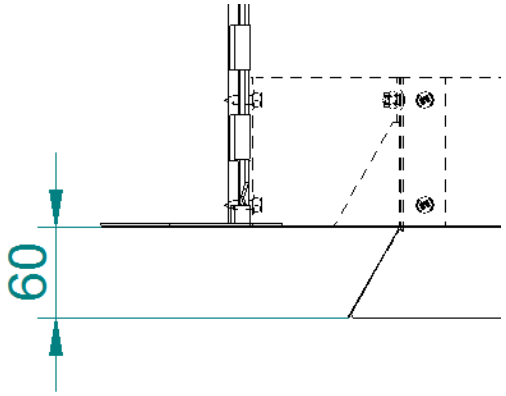
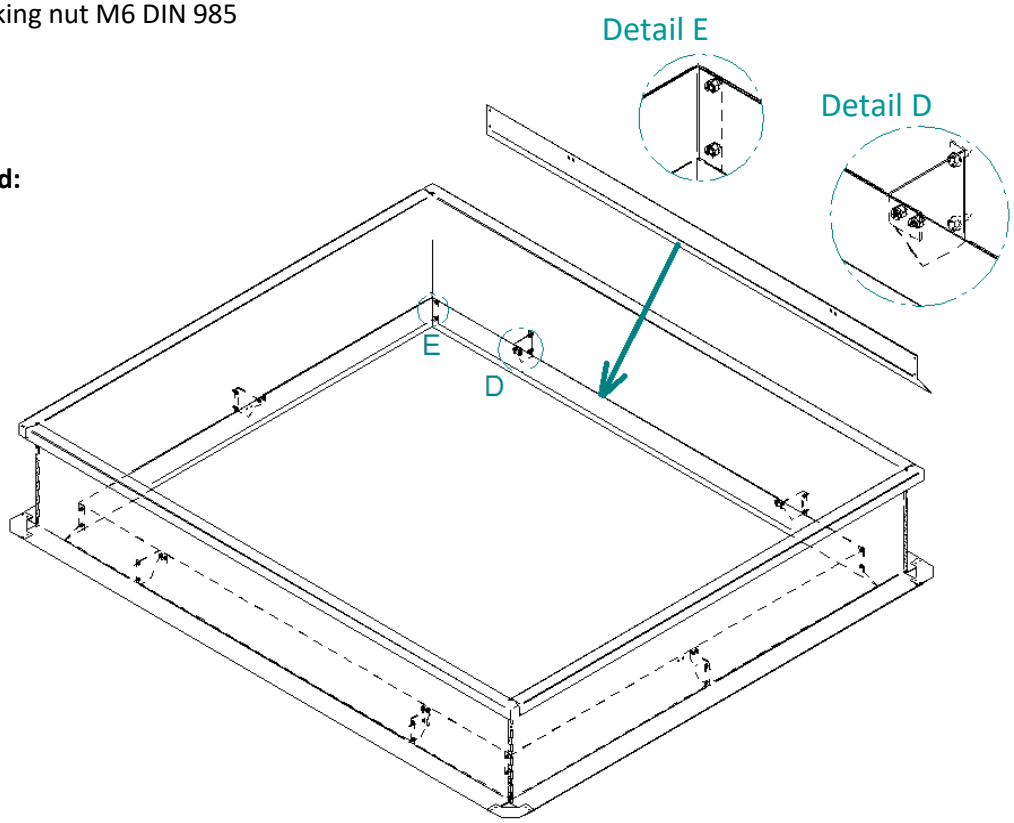


Fig. 36. The bottom edge of the inlet deflector should be 60 mm below the bottom surface of the base.

3) Assembly of inlet deflector elements in sides B

Connectors:
- screw M6x12 DIN 967
- self-locking nut M6 DIN 985

Standard:



If in side B the inlet deflector is split:

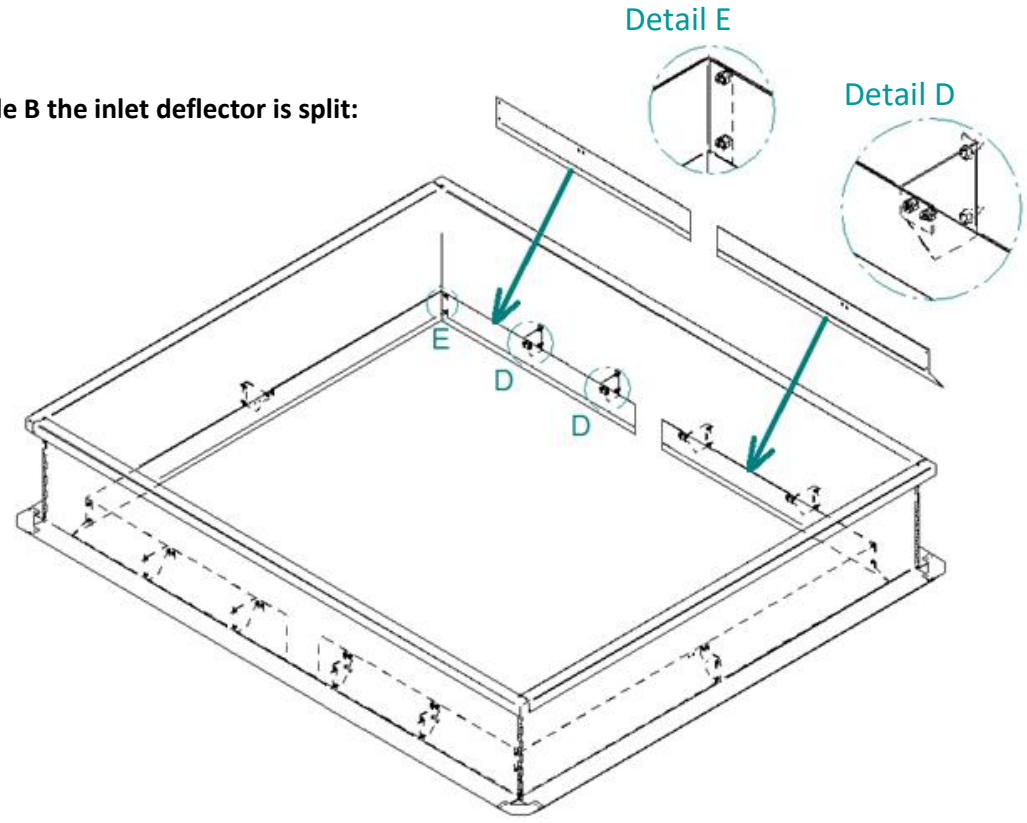
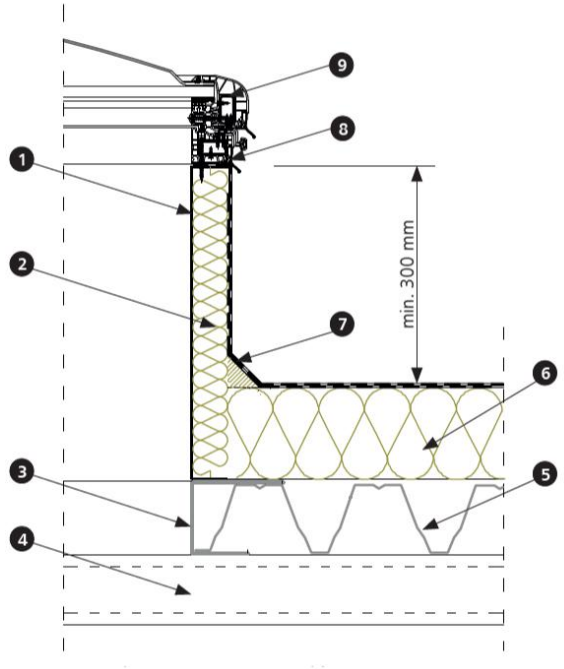
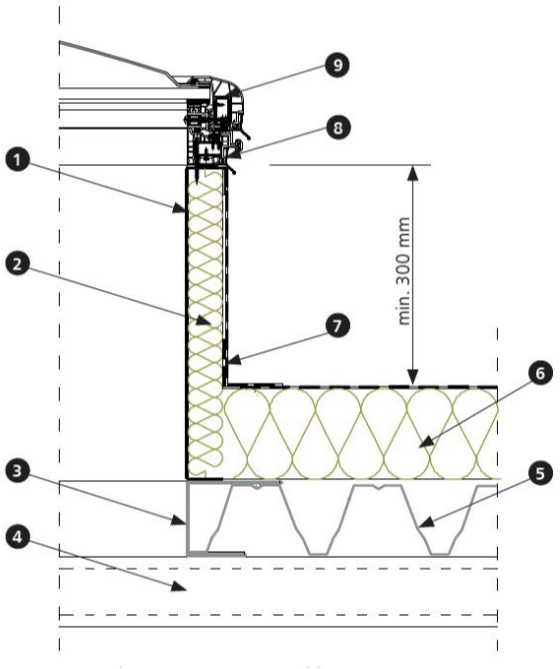


Fig. 37. Assembly of inlet deflector elements in sides B.

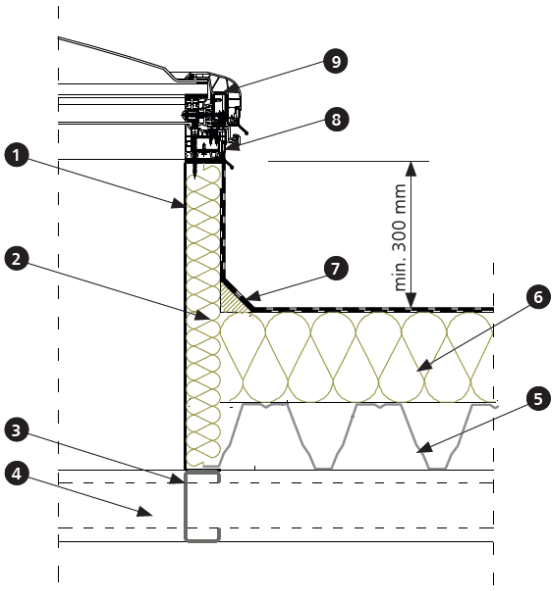
5.7. INSTALLATION OF SMOKE VENTS



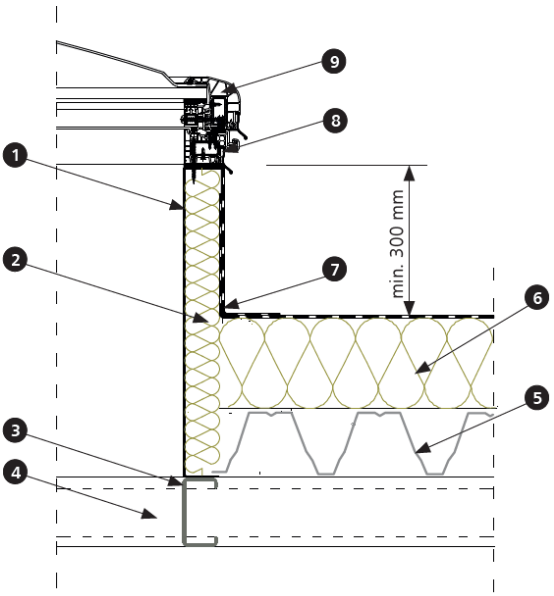
1 – smoke vent steel base
2 – thermal insulation of base
3 – steel support structure for e.g. purlins, trimmers
4 – roof purlin
5 – trapezoidal sheet
6 – roof thermal insulation
7 – roofing paper
8 – smoke vent PVC frame
9 – smoke vent leaf



1 – smoke vent steel base
2 – thermal insulation of base
3 – steel support structure for e.g. purlins, trimmers
4 – roof purlin
5 – trapezoidal sheet
6 – roof thermal insulation
7 – PVC membrane
8 – smoke vent PVC frame
9 – smoke vent leaf



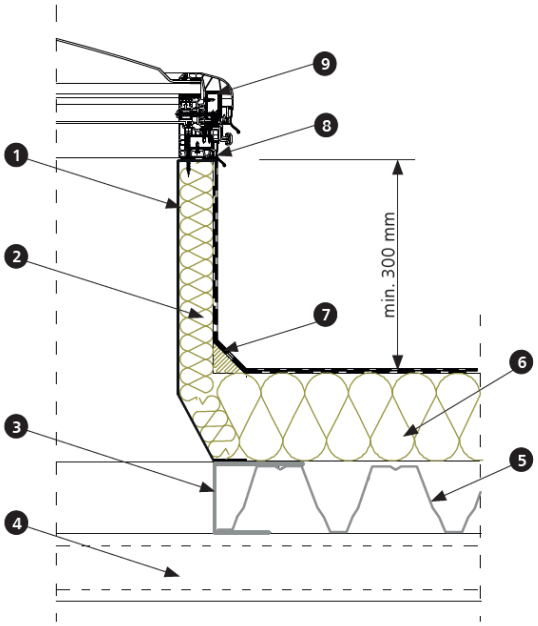
1 – smoke vent steel base
2 – thermal insulation of base
3 – steel support structure for e.g. purlins, trimmers
4 – roof purlin
5 – trapezoidal sheet
6 – roof thermal insulation
7 – roofing paper
8 – smoke vent PVC frame
9 – smoke vent leaf



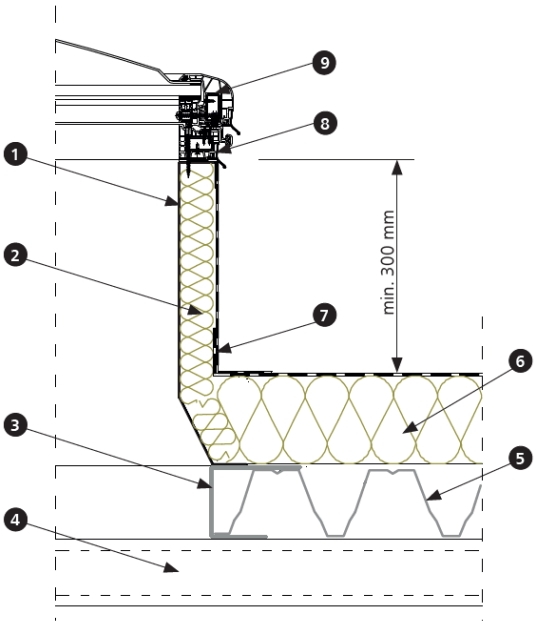
1 – smoke vent steel base
2 – thermal insulation of base
3 – steel support structure for e.g. purlins, trimmers
4 – roof purlin
5 – trapezoidal sheet
6 – roof thermal insulation
7 – PVC membrane
8 – smoke vent PVC frame
9 – smoke vent leaf

Fig. 38. Smoke vent with straight steel base mounted on a steel structure roof (various variants).

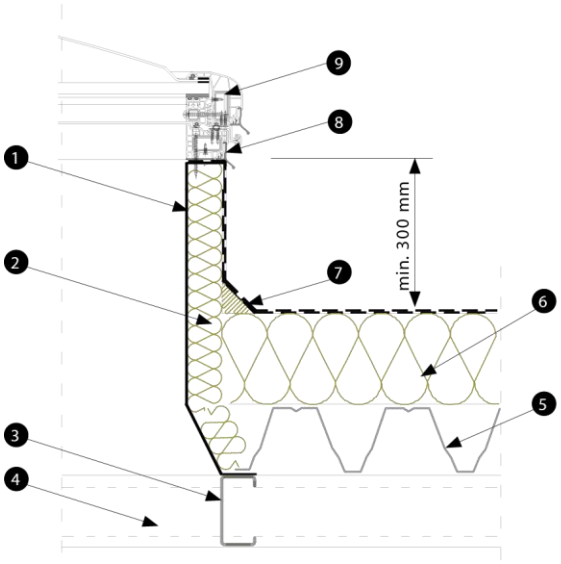
NOTE: It is possible to seat the vent on an existing plinth without using the dedicated base (item 1) in the same way as shown above, but the plinth directly below the frame must be 55 $^{0}_{-5}$ mm wide. The connectors used to attach the frame to the plinth must then be selected according to the plinth material.



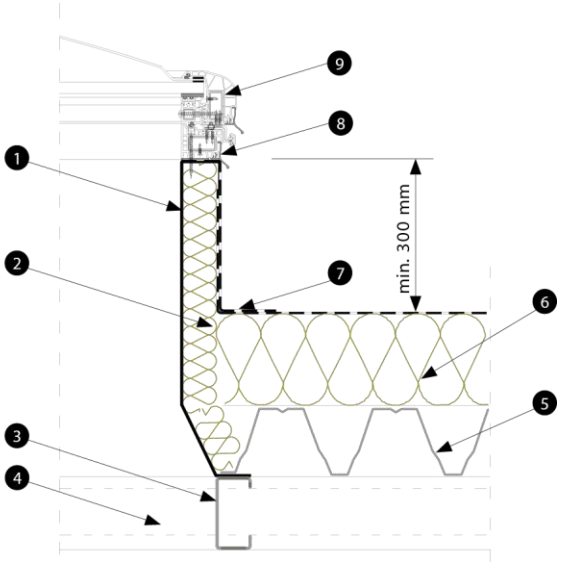
1 – smoke vent steel base
2 – thermal insulation of base
3 – steel support structure for e.g. purlins, trimmers
4 – roof purlin
5 – trapezoidal sheet
6 – roof thermal insulation
7 – roofing paper
8 – smoke vent PVC frame
9 – smoke vent leaf



1 – smoke vent steel base
2 – thermal insulation of base
3 – steel support structure for e.g. purlins, trimmers
4 – roof purlin
5 – trapezoidal sheet
6 – roof thermal insulation
7 – PVC membrane
8 – smoke vent PVC frame
9 – smoke vent leaf

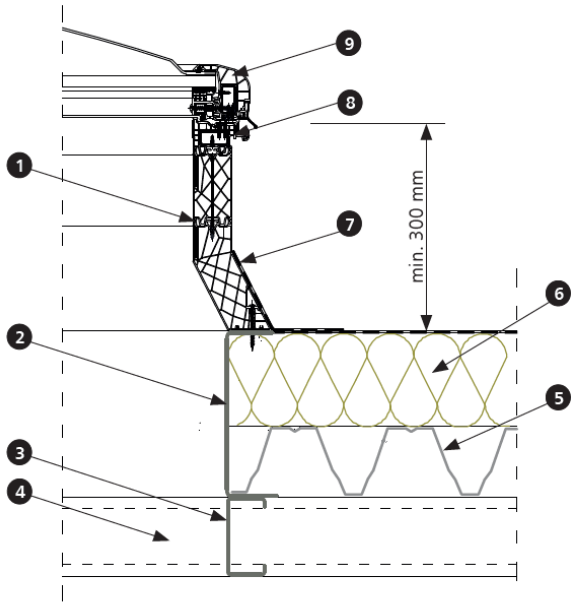


1 - smoke vent steel base
2 - thermal insulation of base
3 - steel support structure for e.g. purlins, trimmers
4 - roof purlin
5 - trapezoidal sheet
6 - roof thermal insulation
7 - roofing paper
8 - smoke vent PVC frame
9 - smoke vent leaf



1 - smoke vent steel base
2 - thermal insulation of base
3 - steel support structure for e.g. purlins, trimmers
4 - roof purlin
5 - trapezoidal sheet
6 - roof thermal insulation
7 - PVC membrane
8 - smoke vent PVC frame
9 - smoke vent leaf

Fig. 39. Smoke vent with skew steel base mounted on a steel-framed roof (various variants).



1 – smoke vent multi-chamber PVC base
2 – smoke vent base supporting structure
3 – steel support structure for e.g. purlins, trimmers
4 – roof purlin
5 – trapezoidal sheet
6 – roof thermal insulation
7 – PVC membrane
8 – smoke vent PVC frame
9 – smoke vent leaf

Fig. 40. Vent with skew PVC base mounted on a steel-framed roof.

Fig. 41. Vent with skew PVC base set on a reinforced concrete plinth.

In case of smoke vent mounting on a sloping roof, the base should be positioned in such a way that the vent hinges are located at the lower point of the roof.

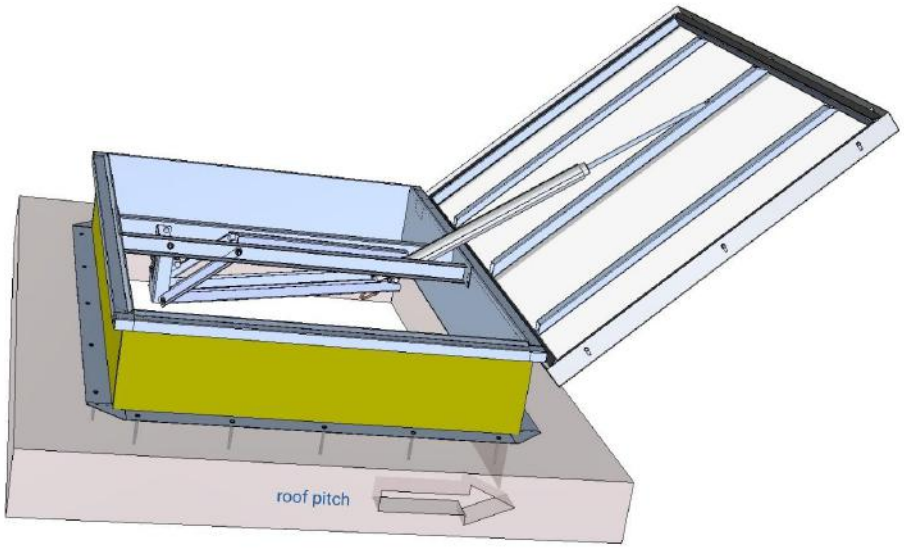


Fig. 42. Assembly of smoke exhaust vent on a sloping roof (the vent opens in the direction of the slope).

NOTE:
Once the vent has been fitted, it is necessary to:
• Check that the hook console correctly closes on the T-bolt (as shown in fig. 15), preventing the leaf from opening from the outside.
• Remove the protective foil from the external vent components (leaf, wind deflectors).

6. CONTROL

In mcr ULTRA THERM smoke exhaust vents there are 4 types of opening systems:
1) PNEUMATIC - JOFO,
2) PNEUMATIC - GRASL/K+G,
3) ELECTRICAL - ACTULUX,
4) ELECTRICAL - GRASL/K+G.

The following figure summarises the cross-sections of all types of opening systems to help the user identify the type. The following subsections provide key information on the various opening systems.

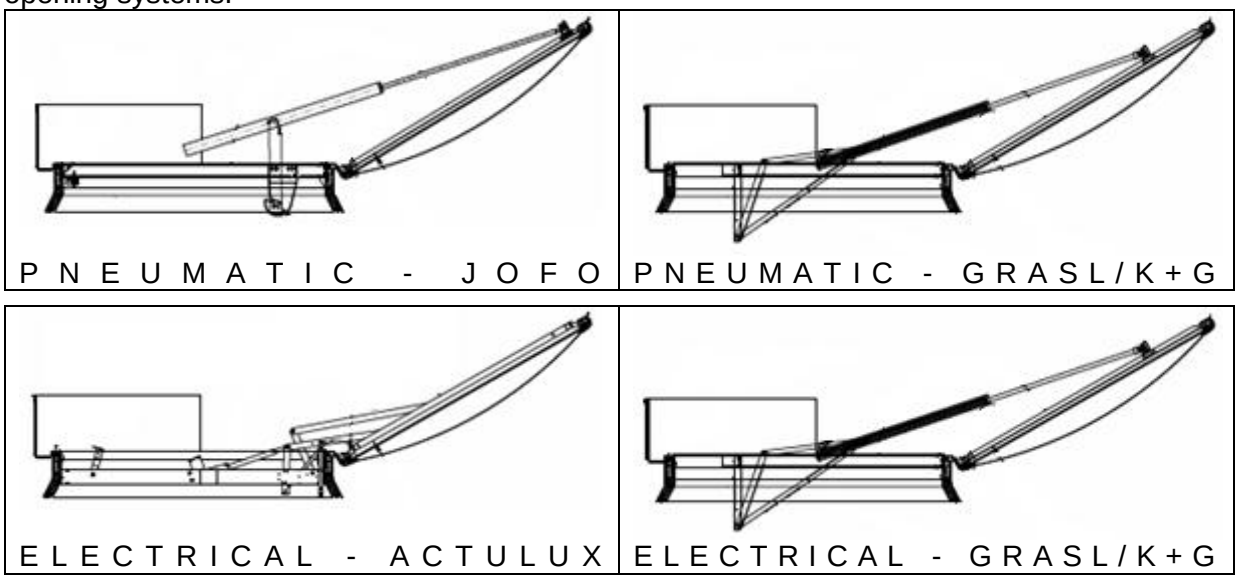


Fig. 43. Comparison of types of opening systems.

6.1. PNEUMATIC CONTROL

The smoke exhaust vents are equipped with a pneumatic system for opening in the event of fire. The smoke and ventilation vents, on the other hand, are equipped with a pneumatic and electric system (the pneumatic part is responsible for smoke removal, and the electric part is responsible for ventilation). Both vent types come with a thermal fuse.

NOTE:
For safety reasons during transport, the thermal fuse in the vent is not armed. Once the vent has been completed with the flashing on the roof, the thermal fuse should be armed.

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).

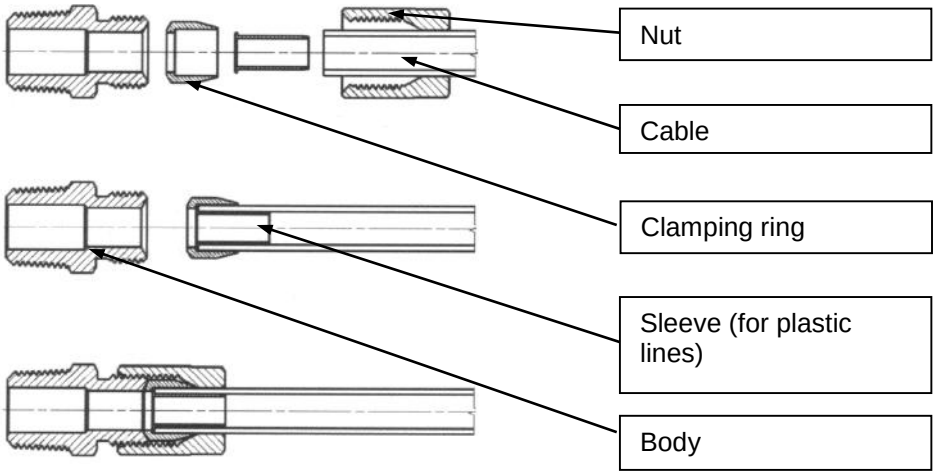


Fig. 44. Method of assembling flexible pneumatic system hoses.

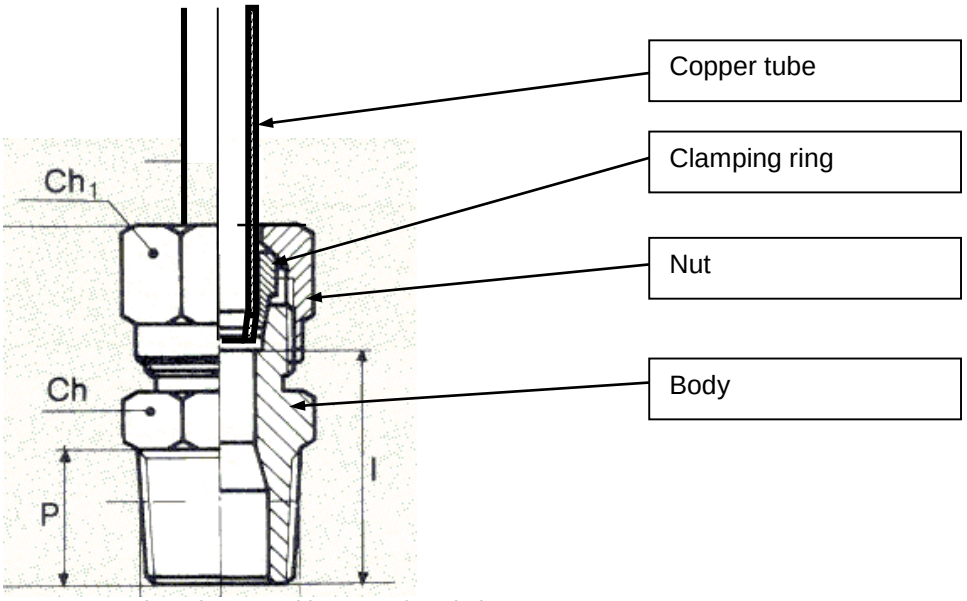


Fig. 45. Connection of screw with copper/steel pipe.

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 of the connector (important for actuator connections). The unscrewing of such a secured screw connection is only possible with hand tools.

6.1.1. Arming the thermal fuse:

- Screw the tension screw (1) into the thermal fuse cartridge seat (2) (figure below).

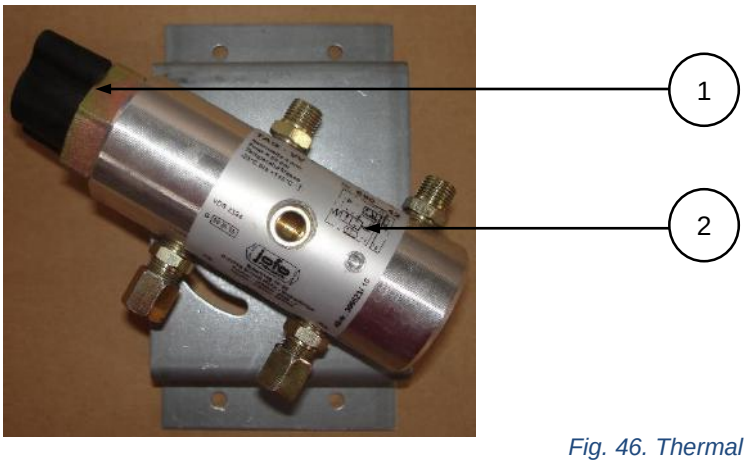


Fig. 46. Thermal fuse before arming.

- Fit the alcohol ampoule (3) into the ampoule body (4) (figure below on the left), then manually screw in the thermal fuse (figure below on the right).

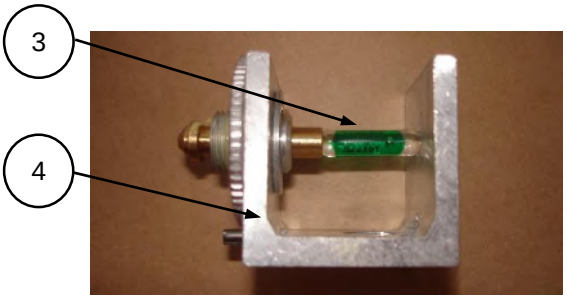


Fig. 47. Body with ampoule.

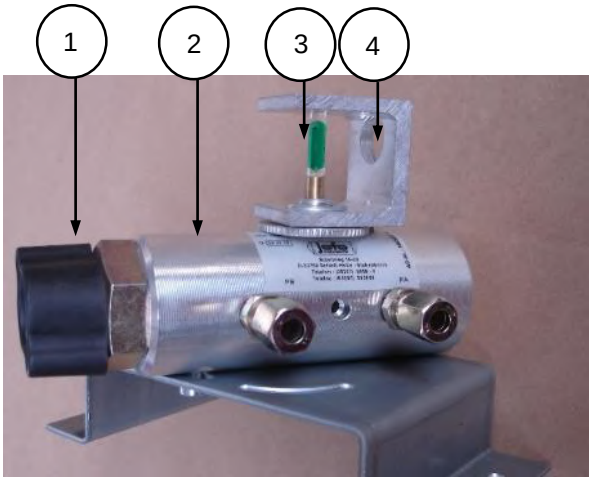


Fig. 48. Thermal fuse with mounted ampoule.

- Remove the tension screw from the cartridge seat and check that the cartridge firing pin is in the down position,
- Manually screw in the CO_2 cartridge (5).

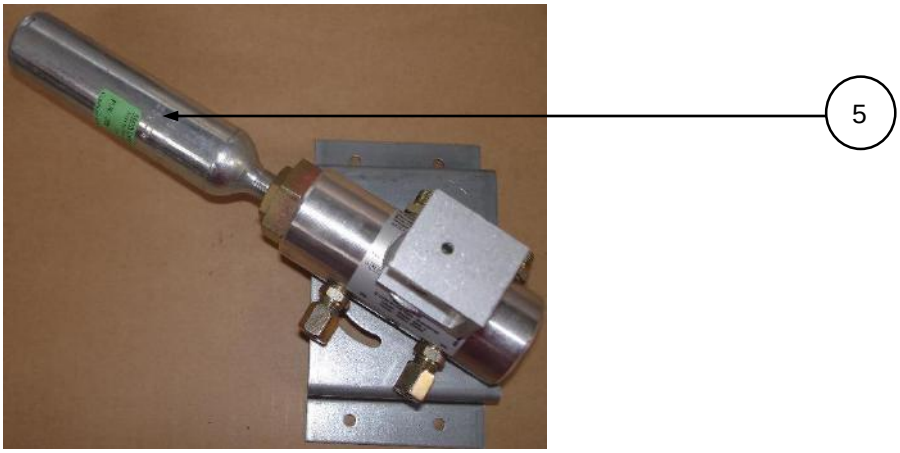


Fig. 49. Armed thermal fuse with alcohol ampoule and cartridge.

NOTE:
For safety reasons during transport, the thermal fuse in the vent is not armed. Once the vent has been completed with the flashing on the roof, the thermal fuse should be armed.

6.1.2. Closing the vent

To close the vent leaf:
- release compressed gas from the actuator and the pneumatic system by unscrewing the cartridges from the alarm or thermal fuse boxes,
- if necessary, arm the thermal cycler as described in paragraph 6.2 above,
- manually lift the leaf and turn until it is completely closed.

NOTE:
1. Do not manipulate any parts of the opening mechanism when the leaf is closed.
2. The opening system unlocks automatically when the leaf is closed.
3. Failure to follow the instructions for closing the vent may result in damage to the opening system.

6.1.3. Ventilation function and ventilation vents

The ventilation function is realised by using an additional electric actuator supplied with 230 V~ (figure below).
The actuator is fitted with a T-bolt through which it connects to the hook console.
It is recommended to use in the ventilation control system an automatic weather control unit, e.g. mcrP054, for closing open vents in case of strong wind or rain in order to protect the user's property and the vents construction from damage.

The actuator type Exxx-230 has two circuits:
• service - movement direction control (black/brown-blue wires),
• signal (wires: 2 x white; indicates actuator open
- dry contact).

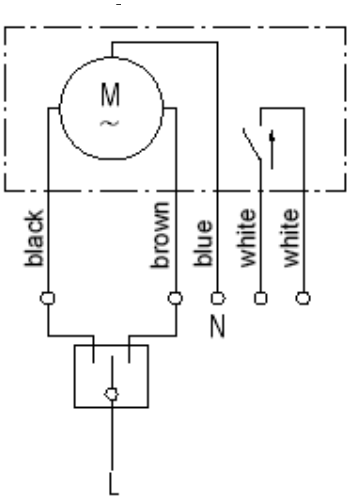


Fig. 50. Wiring diagram for ventilation electric actuator 230 VAC.

6.2. ELECTRICAL CONTROL 24 V / 48 V

6.2.1 ACTULUX electrical control

Among the Actulux opening systems, there are two basic types:

- Actulux Power Mini (2.5A-24 V / 1.25A-48 V),
- Actulux Power Single (4.0A-24 V / 2.0A-48 V).

These are shown in the figures below respectively. They can occur singly or in tandem.

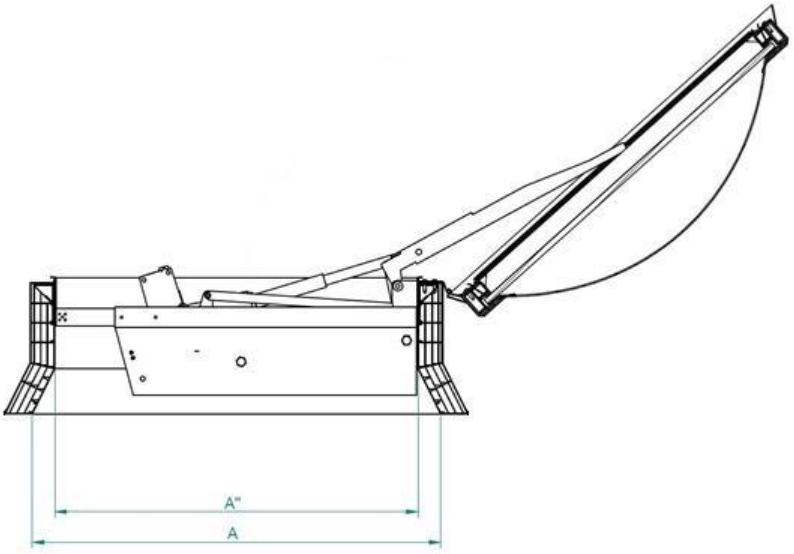


Fig. 51. Actulux Power Mini opening system.

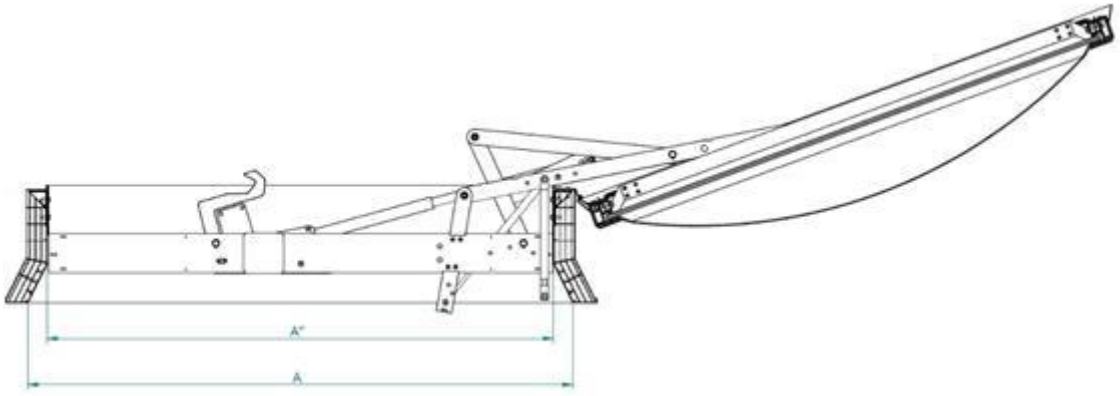


Fig. 52. Actulux Power Single opening system.

For Actulux systems, the power supply must be connected via the "LIP" module, factory fitted on the opening system. The permissible range of variation of the supply voltage in Actulux systems is +/- 15%.

Method of connecting the control system (polarity of wires) according to the figure below:

terminal "1" +
terminal "2" - } vent opens

terminal "1" -
terminal "2" + } vent closes

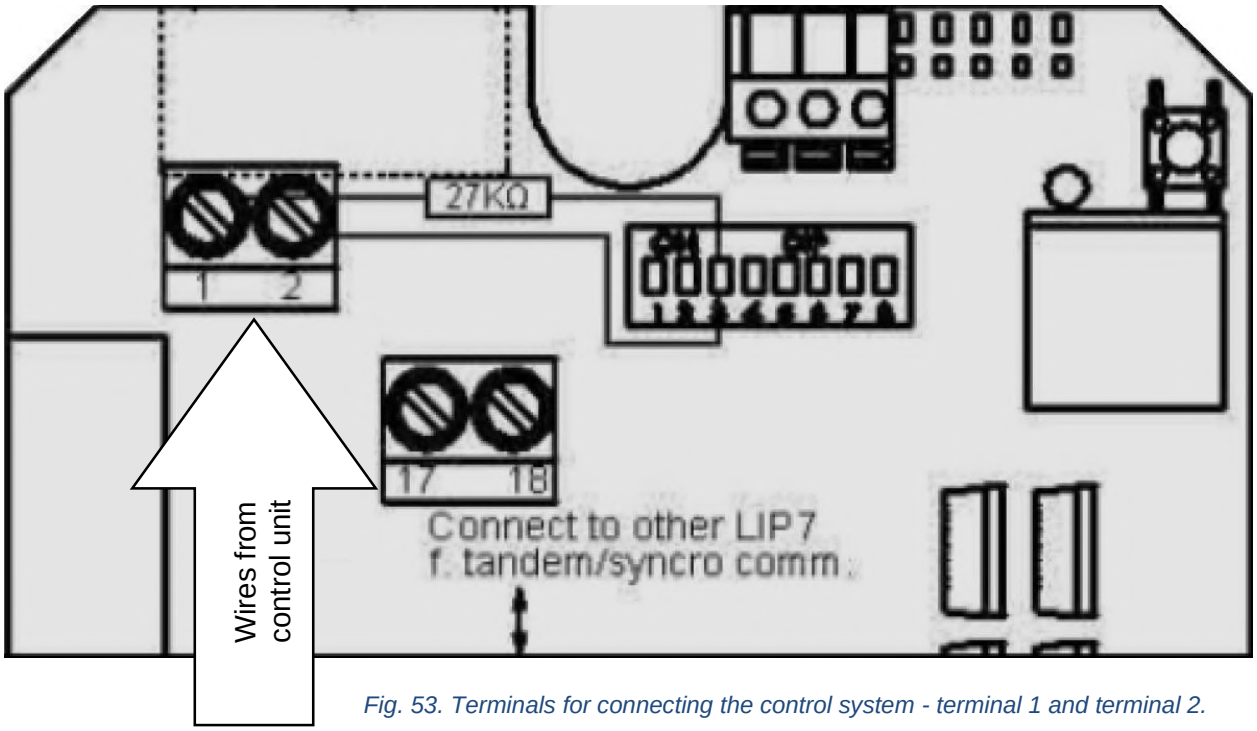


Fig. 53. Terminals for connecting the control system - terminal 1 and terminal 2.

6.2.2 Electric control GRASL/K+G

Among the GRASL/K+G opening systems, we distinguish the types shown in the table below. They can occur singly or in tandem.

Table 2. Types of GRASL/K+G opening systems and their technical details.

system type GRASL/K+G	actuator type	current consumption		DIP switch settings in the AM5 module			
		[A] – 24 V	[A] – 48 V	DIP1	DIP2	DIP3	DIP4
BG1.64	SG20M	2.0	(24V only)	-	-	-	-
BG2.64-E.G.	SG1CP	4.0	2.0	OFF	ON	OFF	ON
BG2.64-C.L.	SG1CN	8.0	4.0	OFF	OFF	OFF	OFF
BG3.64-E.G.	SG1CR	4.0	2.0	OFF	ON	OFF	ON
BG3.64-C.L.	SG1CP	8.0	4.0	OFF	OFF	OFF	OFF
BG4.64-E.G.	SG1CW	4.0	2.0	OFF	ON	OFF	ON
BG4.64-C.L.	SG1CR	8.0	4.0	OFF	OFF	OFF	OFF

In GRASL/K+G systems, the power supply must be connected via the "AM5" module, mounted on the opening system. (The exception is BG1.64, where this module is not present)

Fig. 54. Electric actuator with AM5.

NOTE:
The AM5 module defines the current consumption - via the appropriate DIP switch settings. The current consumption of the complete system is different from that indicated on the nameplate of the actuator itself.
Before commissioning, check that the DIP switch settings on the AM5 module are compatible with the opening system type (see table above).

The power supply cable should be selected so that the voltage drop between the power supply and the AM5 module reaches a maximum of 6.25% of the nominal voltage.

Method of connecting the control system (polarity of wires) according to the figure below:

terminal "1" +
terminal "2" - } vent opens

terminal "1" -
terminal "2" + } vent closes

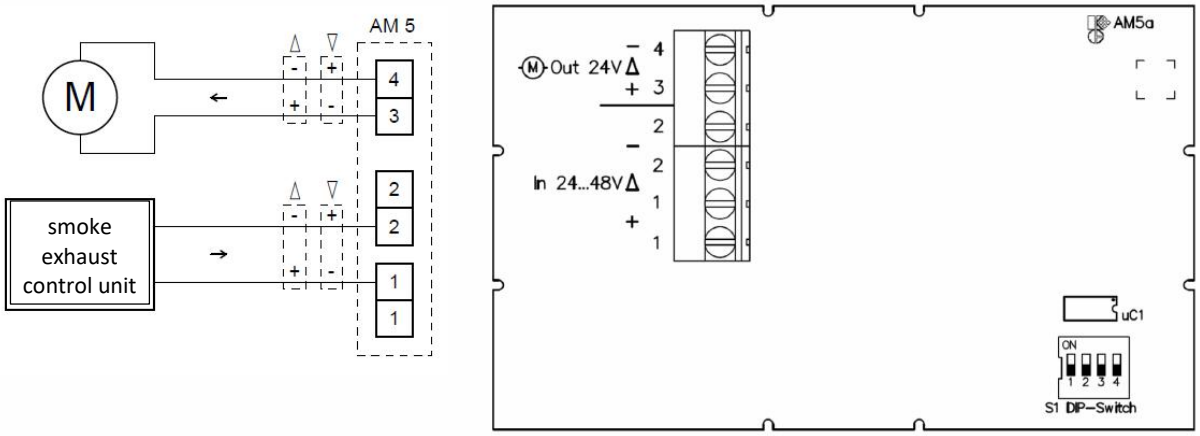


Fig. 55. Wiring diagram, tentative diagram of opening system with AM5 module.

6.2.3 Final notes concerning the electrical control

The mcr 9705, mcr 0204 smoke and ventilation control units and the mcr R0424 and/or mcr R0448 extension modules should be used to control and power the electrical system of the vent opening system.
It is recommended that the vent leaf opening for ventilation with a 24 V / 48 V actuator does not exceed 30°, which corresponds to an opening time of approx. 20 seconds.

7. SERVICE AND MAINTENANCE OF EQUIPMENT

“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).

The following user actions are recommended between inspections:

1. Checking the condition of the actuator consoles (for secure fastening)
2. Periodic cleaning of dome/filling panel surfaces: use a sponge or soft cloth and lukewarm water with mild household cleaners. The plates 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.
3. 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 ULTRA THERM smoke exhaust vents are installed - it may cause discoloration and damage to polycarbonate plates, acrylic domes or aluminium profiles. Damage to the mcr ULTRA THERM 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 Service Department at +48 58 341 42 45 ext. 173, 175, 177 or fax number +48 58 58 341 39 85 between 8 a.m. and 4 p.m. (Mon-Fri).

8. 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 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_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” 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.

9. CERTIFICATE

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-0126

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 ULTRA THERM

designed to move smoke and hot gases out of construction works naturally under condition of fire, used in compliance with Assessment and verification of constancy of performance No. C1396/17/0016/4003/SC (issued by FIRES, s.r.o., Notified Body 1396 on 27.06.2017) amended by an actual continuous surveillance report. 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. Kwarcowa 3A, Cieplewo, 83-031 Łegowo, 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 27.06.2017 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.

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

Batizovce, 03.05.2021

Ing. Henrieta Lapková
Head of Product Certification Body

124987

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

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Fig. 56. Copy of CPR certificate.