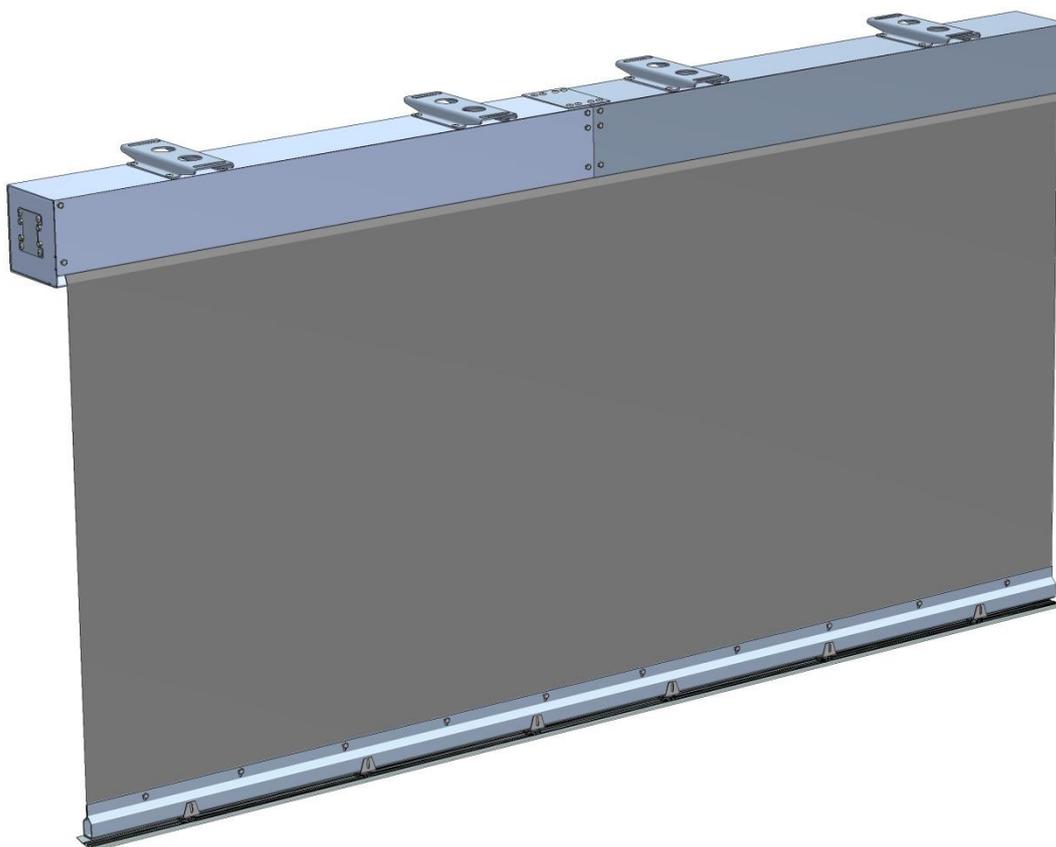


## OPERATION AND MAINTENANCE MANUAL (OMM)

### Automatic rolling curtain mcr PROSMOKE FS



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## 1. INTRODUCTION

The aim of this Operation and Maintenance Manual is to make the user familiar with the intended use, design, operating principle, correct installation and operation of *mcr PROSMOKE FS* automatic rolling curtains. The OMM also contains additional information on the conditions of use, maintenance and warranty of the product.

Complying with the recommendations included in the OMM will ensure proper functioning of the smoke venting systems as well as the safety of their users.

MERCOR SA reserves the right to make changes to the product or to this document without prior notice.

The Operation and Maintenance Manual applies to *mcr PROSMOKE FS* curtains with a limit switch for a smooth adjustment of the upper position (by using the XL40/17M drive supplied by BECKER – Antriebe GmbH), the so-called *mcr PROSMOKE FS* version 2.

## 2. PURPOSE OF THE DEVICE

*mcr PROSMOKE FS* rolling curtains form part of a smoke control system also including other products by MERCOR SA, such as *mcr PROLIGHT* point smoke exhaust vents, *mcr PROLIGHT* system skylights and smoke exhaust vents integrated with continuous rooflights, *mcr 9705* and *mcr 0204* smoke exhaust control units, and others.

*mcr PROSMOKE FS* rolling curtains are used to define smoke zone in the space under the ceiling in smoke and heat gravitational exhaust systems. Fire smoke is collected in the smoke containers, and then is removed by smoke exhaust vents, e.g. *mcr PROLIGHT*. Defining smoke zone in the space under the ceiling, the curtains confine the spread of smoke, prevent it from cooling off and form a smoke layer of a designed thickness, ensuring appropriate conditions for *mcr PROLIGHT* smoke exhaust vents to operate in.

*mcr PROSMOKE FS* smoke curtains have a **CE** certificate of conformity (No. 1396-CPD-0033) with the requirements of the EN 12101-1:2007 standard, issued by a notified certification body No. 1396.

The building designer is responsible for a proper design of the venting system and for the selection of appropriate curtains for a specific application. *mcr PROSMOKE FS* curtains are not intended to be used as smoke control doors. The curtains are fire protection devices. They cannot function as gates or anything similar and they are not designed to be activated/used every day for other purposes.

## 3. DESIGN OF CURTAINS

Rolling curtains consist of a casing, a roller with smoke-tight fabric (with a bottom bar) wound onto it and a drive system (fig. 1).

The casing is composed of two elements – a fixed part and an access cover type K, C, L, K-T (fig. 2, 3).

The roller is mounted inside the casing by means of a bearing unit with a pivot on the one side and on the motor spindle on the other. In specific cases, a second drive system can be applied instead of a bearing unit.

The drive system mounted in the roller consists of a 230 V~ motor, a 24 V~ brake keeping the fabric rolled up, and an additional brake limiting the rate of dropping down.

The smoke-tight fabric has a bottom bar ensuring correct rolling out and rolling up and minimising the risk of bending and lifting the fabric when affected by the pressure of fire gases. The bottom bar may be optionally equipped with a masking element (fig. 5).

The masking element is an 80 mm wide aluminium profile painted to order in any RAL colour.

The smoke-tight fabric used in *mcr PROSMOKE FS* curtains is not trimmed at the edges. Slight edge fraying is natural and does not affect the operation and product quality.

The curtain casing houses the MECU XL control system ensuring correct operation of the curtain.

Single curtains are up to 6 m long. If longer curtains are needed, a proper number of shorter curtains are put together to form a unit of the desired length.

The curtain may be optionally equipped with gap-reducing side guides.

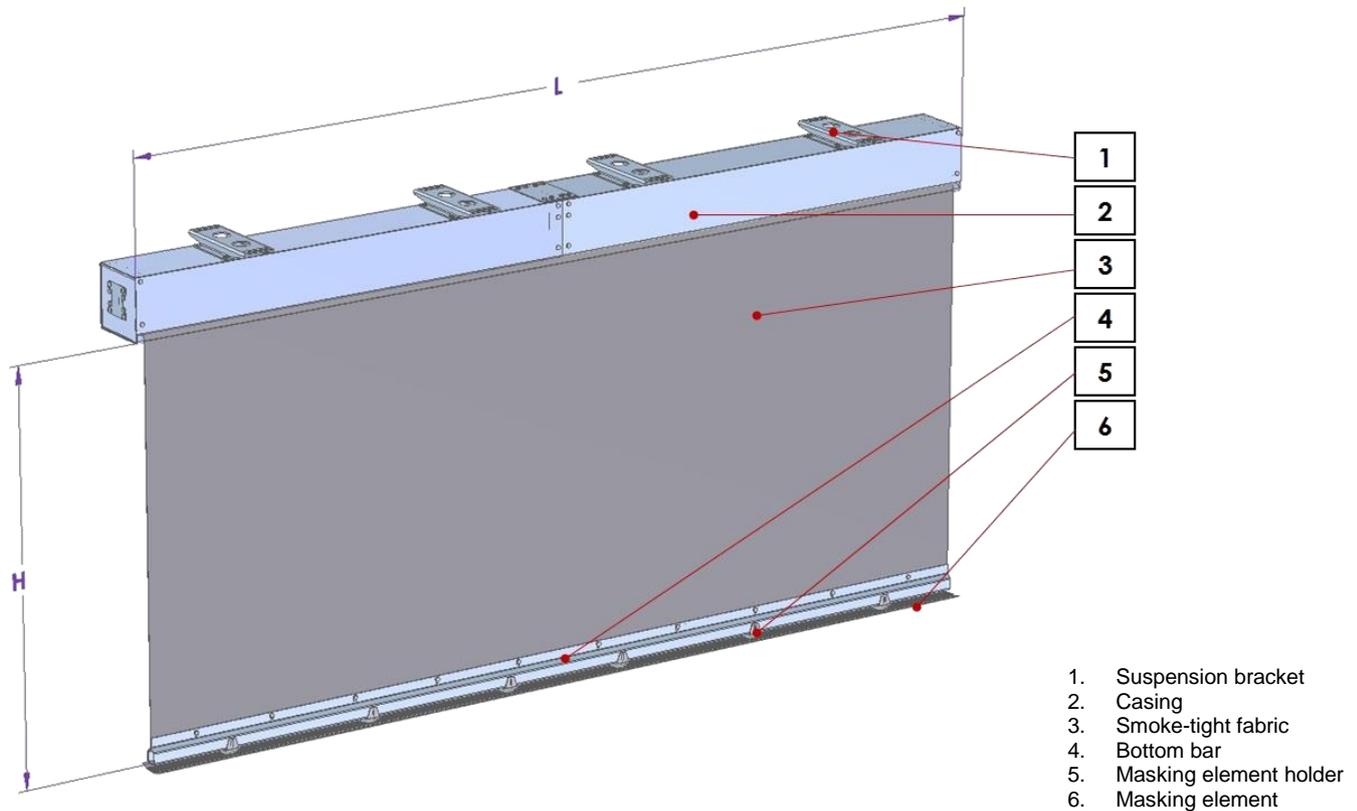
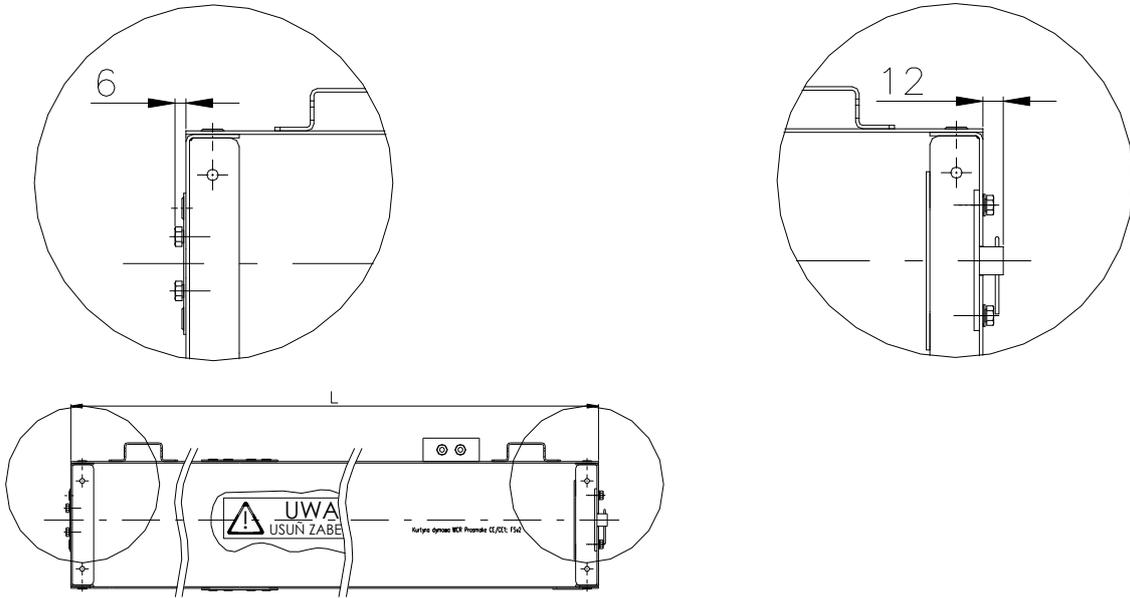


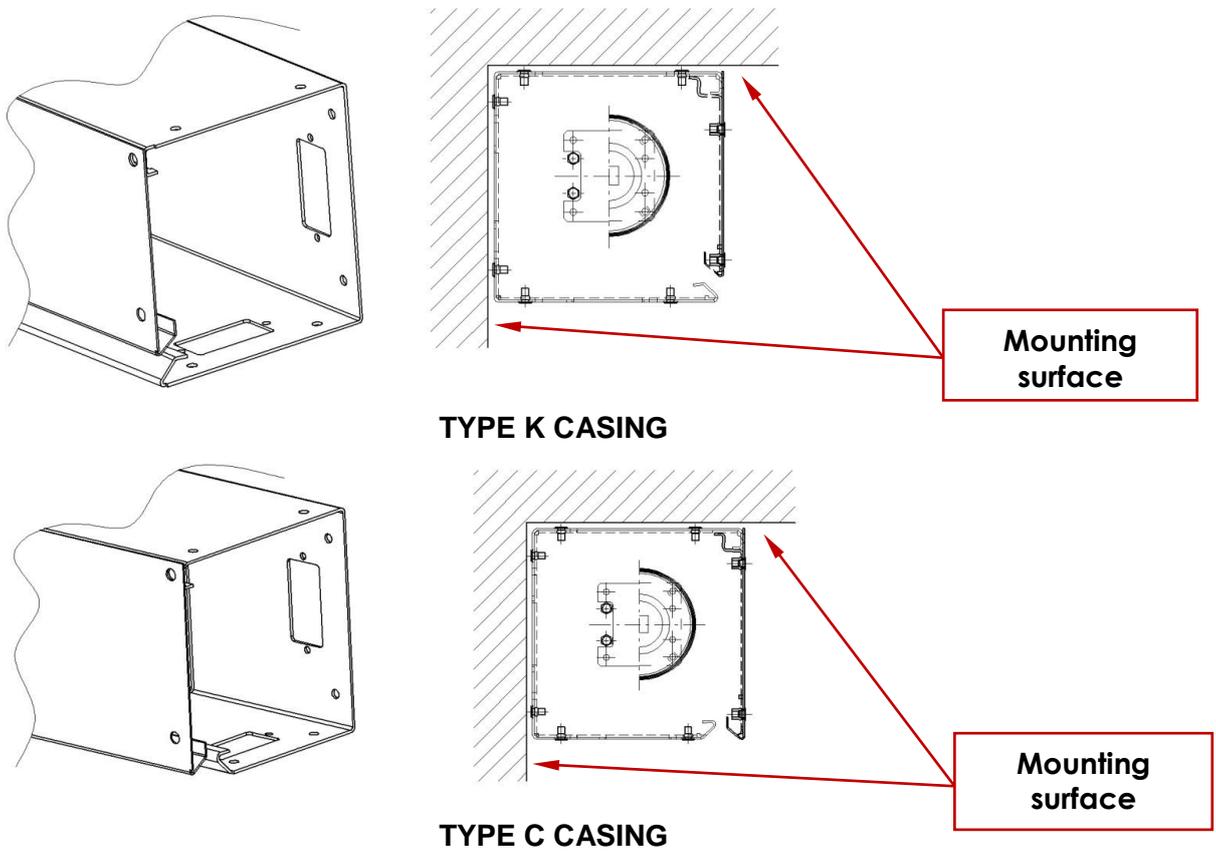
Fig. 1. *mcr PROSMOKE FS* rolling smoke curtain – design

**NOTE**

When planning the curtain installation, the presence of any elements projecting beyond the casing outline should be taken into account:



**Fig. 1.1. Lengths of elements projecting beyond the *mcr PROSMOKE FS* curtain casing outline**



**Fig. 2. Curtain casing types – K, C**

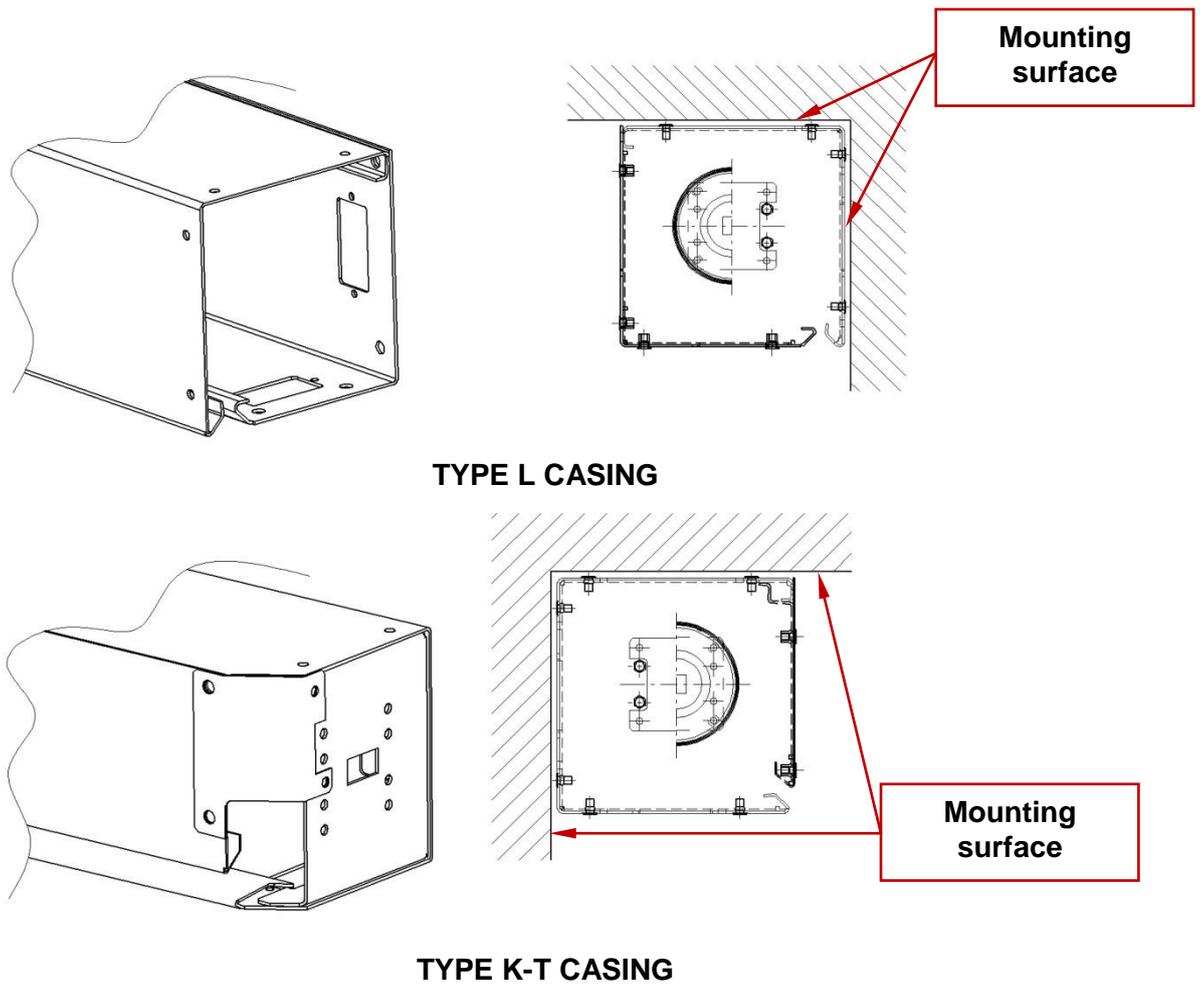
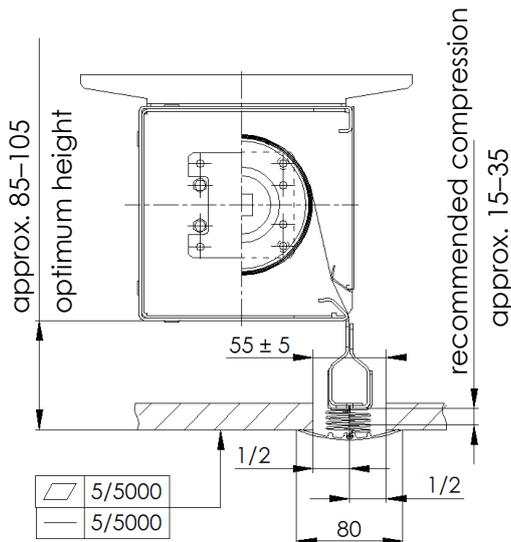
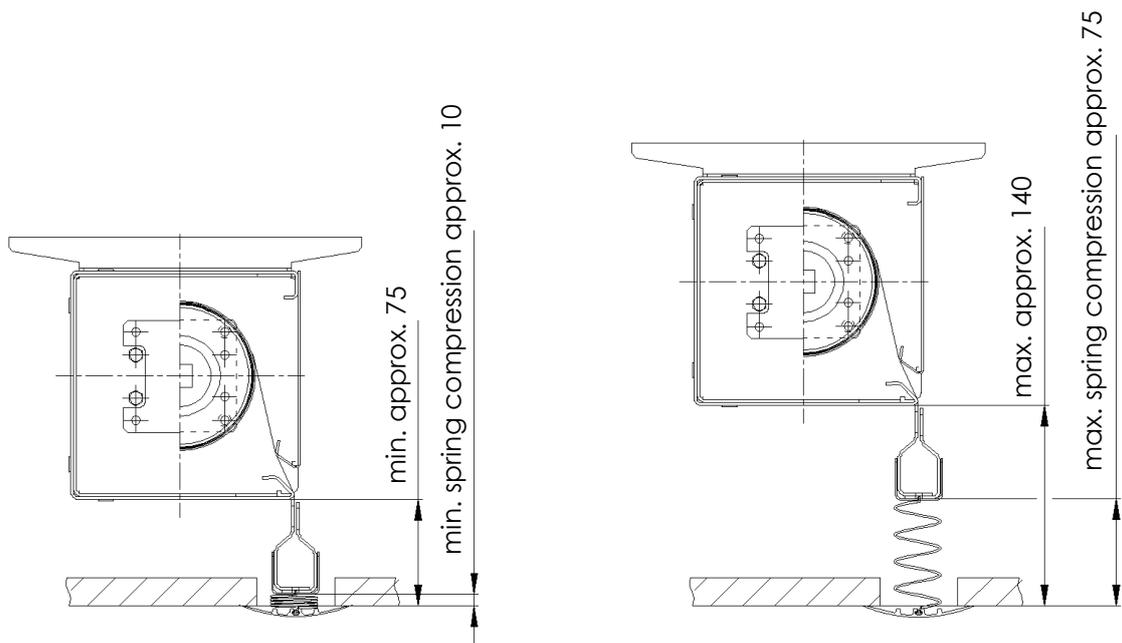


Fig. 3. Curtain casing types – L, K-T



**Note:** ensure straightness and flatness (5 mm/5000 mm) of the drop ceiling surface around the gap

Fig. 4. Recommended position of casings relative to the ceiling. Gap width.



**Note:** Observe the minimum and maximum spring compression values. The distance between the casing and the ceiling is approximate.

**Fig. 5.** The maximum and minimum distance between the casing and the ceiling and the minimum spring compression

## 4. OPERATING PRINCIPLE OF mcr PROSMOKE FS CURTAINS

When in standby mode, mcr *PROSMOKE FS* rolling curtains are hidden in casings. In case of fire, they automatically roll out to the predetermined height.

In order to function properly, a mcr *PROSMOKE FS* rolling curtain must be connected to a mcr 9705-5A or mcr 0204 smoke vent control unit. In order to keep the mcr *PROSMOKE FS* curtain rolled up, a non-interrupted power supply from the mcr 9705 or mcr 0204 smoke vent control unit is required. If the power supply from the control unit to the curtain is interrupted for one of the following reasons:

- alarm signal,
- disconnection or power shortage (including burning out in case of fire) of the circuit connecting the mcr 9705 or mcr 0204 control unit with the MECU XL motor control system,
- failure of 230 V~ power supply to the mcr 9705 or mcr 0204 and discharged control unit batteries – the brake is released and the curtain fabric drops down in a controlled manner to the required height (until it is fully rolled out).

The mcr 9705-5A control unit interacting with the curtain should be set to the door control mode, while the mcr 0204 control unit should be set to the curtain mode.

After the mcr 9705 or mcr 0204 control unit is returned to the standby mode, the curtain fabric rolls up using a 230 V motor. The fabric rolls up until it reaches the height set by the motor limit switch. When it does, the curtain goes into the mode of keeping the fabric rolled up.

## 5. TRANSPORT AND DELIVERY

Curtains are generally supplied pre-assembled. Unloading must be carried out under the supervision of a person authorised by the manufacturer, using generally available means of handling (e.g. forklift trucks, cranes equipped with spreader boom slings) or manually, paying special attention to the protection of curtains against damage.

## 6. INSTALLATION OF CURTAINS

**Do not disassemble and do not disconnect the MECU XL motor control system from the motor.**

**Each curtain model requires a 230 V supply voltage.**

**Curtains should be installed in civil structures in accordance with their respective construction designs, in order to ensure the design gap sizes.**

Curtains should be fixed under the ceiling, to lintels, prepared structures or other building features intended for this purpose as per the construction design. The structural component should be made of concrete or steel. When designing the structural component, the device weight should be taken into account: approx. 200 ÷ 300 N/m, depending on the curtain height. For curtains without brackets, the mounting surface should be vertical or horizontal, with a flatness deviation of up to 5 mm along the curtain length.

Curtains mounted on suspension brackets of more than 0.5 m in length should be strengthened by attaching the casing e.g. to a reinforced concrete wall, a girder, etc. As to multi-modular casings, they should be fastened together as shown in fig. 9 by means of self-drilling screws or rivets not longer than 20 mm, so that uncontrolled movements of casings relative to each other are eliminated.

**Curtain installation should be carried out as follows:**

### Curtains with brackets:

1. Mount M10 or M12 threaded rods of suitable length in the structural component to match the arrangement of brackets (fig. 7).  
To mount the threaded rods, use fasteners suitable for the structural component material (e.g. HK8 HILTI anchors).
2. Screw M10 or M12 nuts onto the rods.
3. Hang the curtain on the rods using a M10 or M12 rough finish washer and a nut with protection cap.
4. Using the nuts, adjust the horizontal position of the curtain casing.
5. Tighten the nuts driven according to item 2, check if the fastenings are secure.
6. Connect the free terminals of MECU XL (fig. 12) to the control device, i.e. the mcr 9705 or mcr 0204 control unit, and to the 230 V power supply. Observe polarity (+ to +, - to -). The mcr 9507 control unit should be set to the door control mode or the mcr 0204 control unit should be set to the curtain control mode.
7. Install the side guides, if ordered, using steel fasteners.
8. Make sure that there are no obstacles under the curtain and check if the curtain rolls out to the desired height and rolls up properly. Adjust the length of the fabric feed, if required (see: Limit switch adjustment – page 9).
9. Check the system operation by triggering the alarm from all available sources.

### Curtains without brackets:

1. Unscrew the access cover.
2. Remove the roller with fabric, i.e.:
  - a. Remove the pin locking the motor.
  - b. Unscrew the four screws securing the plate protecting the drive.

- c. Unscrew the four screws securing the roller support located on the opposite side of the motor.
- d. Pull out the shaft end with a plug (opposite the motor).
- e. Remove the roller from the casing.
3. Make mounting holes in the casing.
4. Mount the curtain housing using steel fasteners adequate for the substrate material and for the position of the mounting surface (ceiling/wall): fasteners with a joining element of at least Ø10 in diameter are recommended, e.g. M10 (such as HK8 HILTI anchors). Note the length of the fastener inside the casing as it cannot damage the fabric.
5. When the casing has been installed, put the roller with fabric inside. Follow the above steps in reverse order. Make sure that the position of the roller is the same as before removing it.
6. Secure the roller by locking pins at both ends.
7. Install the side guides, if ordered, using steel fasteners.  
Connect the free terminals of MECU XL (**fig. 12**) to the control device, i.e. the mcr 9705 or mcr 0204 control unit, and to the 230 V power supply. Observe polarity (+ to +, - to -). The mcr 9507 control unit should be set to the door control mode (see the OMM of the smoke vent control unit) or the mcr 0204 control unit should be set to the curtain control mode.
8. Make sure that there are no obstacles under the curtain and check if the curtain rolls out to the desired height and rolls up properly. Adjust the length of the fabric feed, if required (see: Limit switch adjustment – page 9).
9. Having checked and adjusted it, close the access cover.
10. Check the system operation by triggering the alarm from all available sources.

#### Curtains with a bottom bar masking element:

Masking elements are supplied separately. They are suitable for installation at the already mounted and adjusted curtains.

1. Before installing the masking element, attach the bracket to a spring which is attached to the masking element by default. The installation takes place on site by putting the spring in the prepared slot in the bracket.
2. The masking element with the bottom bar bracket is to be attached using 4.8 x13 buttonhead self-drilling screws.
3. Restrictions on the use of the masking element with holders (**fig. 4, 5**).

Multi-modular curtains should be installed following the order of modules (first the edge module, then the central one and then the edge one again) and design sizes of material overlaps in the individual modules.

For a group of curtains with a common bottom bar, all curtain modules should be powered by the same source, i.e. by a single mcr 9705 or mcr 0204 control unit. Electrical connections should be as specified in the OMM of the control units.

The installation of a single bottom bar for a group of curtains and/or the masking element should be as specified in a separate manual.

#### **NOTE:**

In the case of curtains longer than 4 m, there is foam padding inside the casing. Make sure to remove it before powering the curtains.

Failure to remove the foam padding **may result in damage to the drive or fabric.**

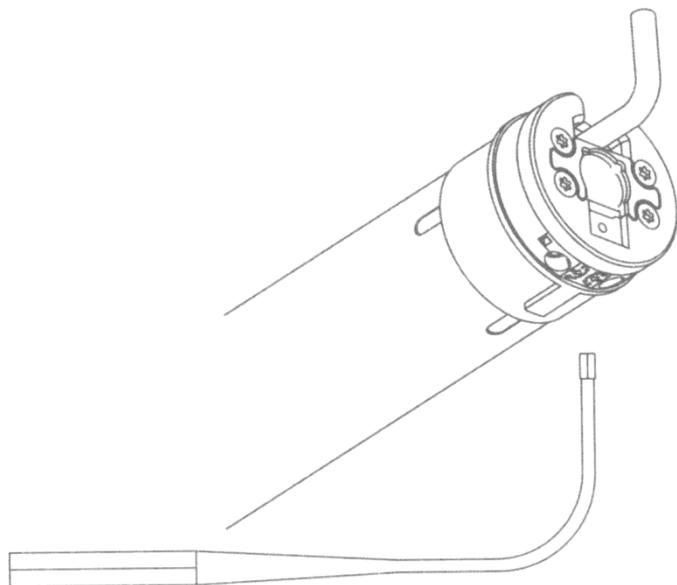
**Number of modules connected to the panels:**

1. Maximum number of modules:  
*mcr PROSMOKE FS* modules in the *mcr 9705* control unit – 12 modules  
*mcr PROSMOKE FS* modules in the *mcr 0204* control unit – 8 modules.  
If a group of curtains with a higher number of modules is necessary, they should be divided into sections or an extension module should be used to power them.
2. The time of keeping the curtain rolled up by the control unit if there is no primary power supply:  
*mcr 0204* – up to 12 hours for 1 pc. (2 pcs. – 6 hours; 3 pcs. – 4 hours, etc.).  
*mcr 0204* – up to 20 hours for 1 pc. (2 pcs. – 10 hours; 3 pcs. – 6.5 hours, etc.).
3. The control unit and each curtain module requires a 230 V power supply.
4. The maximum power of a 230 V motor in a single module is 270 W.

**Limit switch adjustment:**

The *mcr PROSMOKE FS* only has the upper position limit switch. The lower position limit switch is blanked off (photo 1) – the curtain drops until it is fully rolled out.

1. The limit switch is marked with up/down arrows which correspond to the direction of the motor rotation. +/- symbols indicate the change in range.
2. The switch trigger point can be moved as indicated by the arrow by rotating the adjustment screw towards + or in the opposite direction by rotating the adjustment screw towards -.
3. One turn of the adjustment screw changes the rotation of the motor shaft by approx. 10° (which translates into approx. 1 cm of the curtain fabric).
4. To set the limit switch precisely and to check if it functions correctly, trigger the switch, having first changed its setting by reducing the value by at least ¼ turn.



**Fig. 6. Curtain limit switch adjustment**

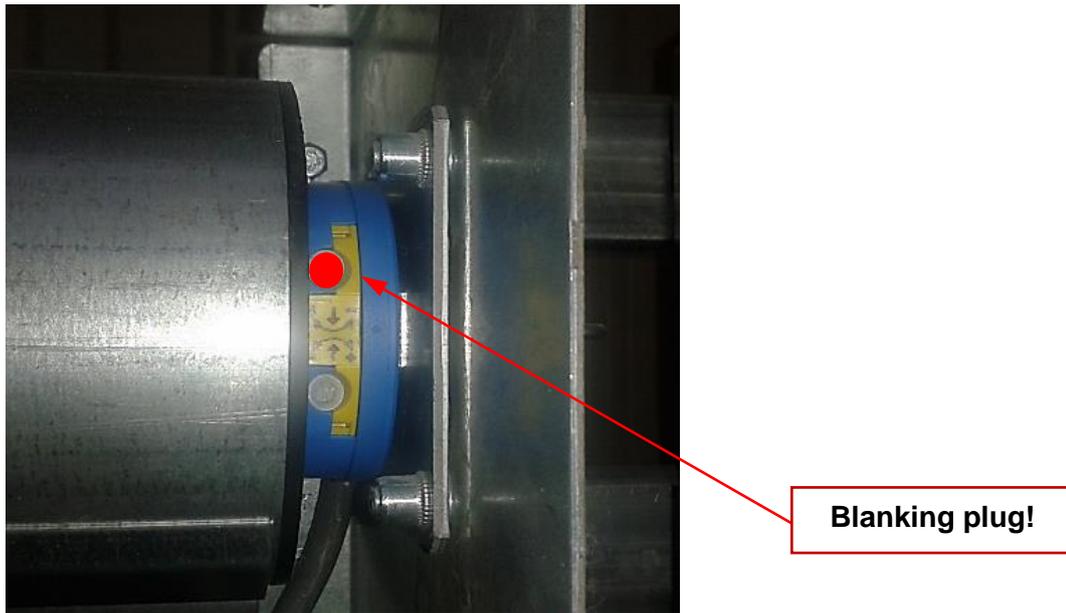
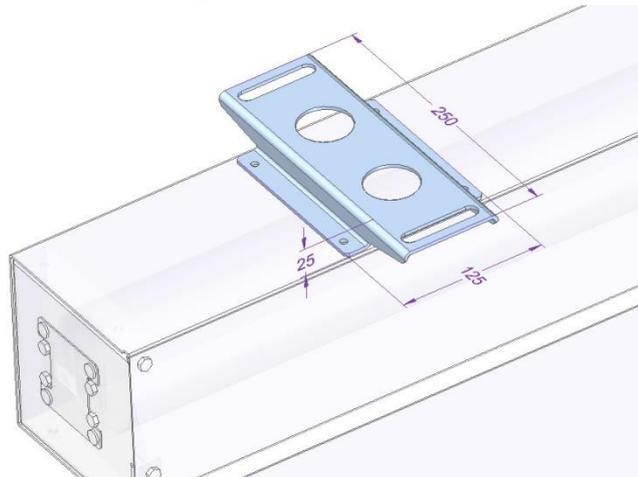
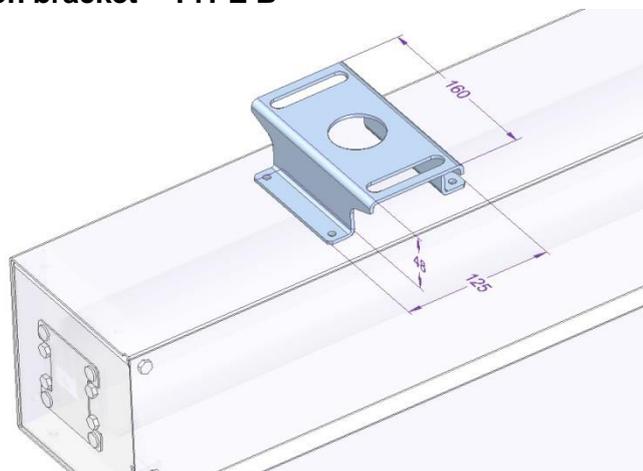


Photo 1. Curtain motor limit switches

**Wide suspension bracket – TYPE A**



**Narrow suspension bracket – TYPE B**



### Flat suspension bracket – TYPE C (installation directly to the ceiling only)

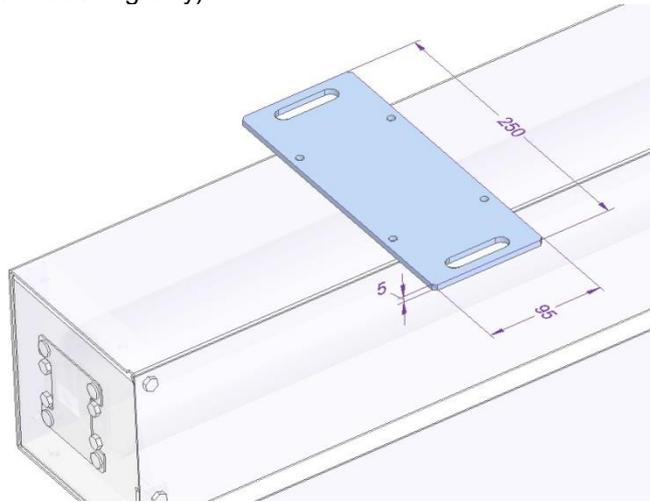


Fig. 7. Suspension bracket types

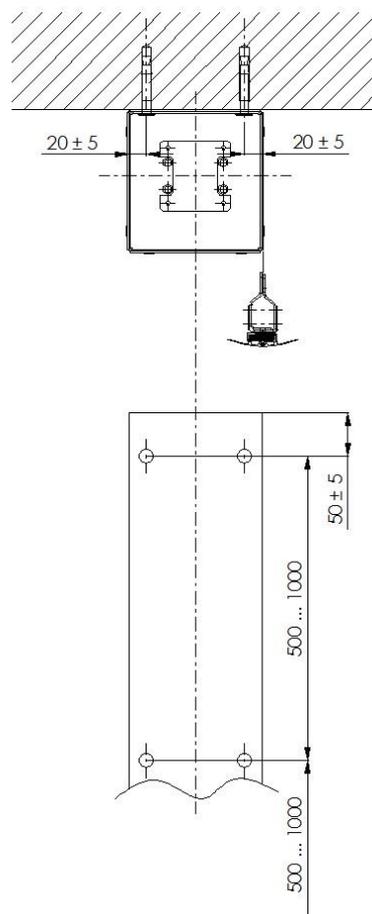


Fig. 8. Installation of a curtain without a suspension bracket

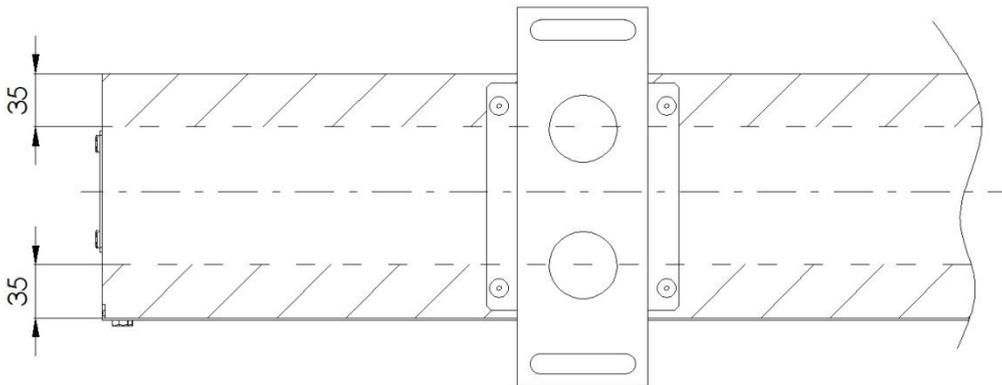


Fig. 9. A spot in the casing designed for connecting curtain modules

**CABLES**

Regular cable 2 x 1.5 mm (2.5 mm)

**NOTE**

In the case of multi-modular curtains, cables of the same length must be used to ensure the same supply voltage drop

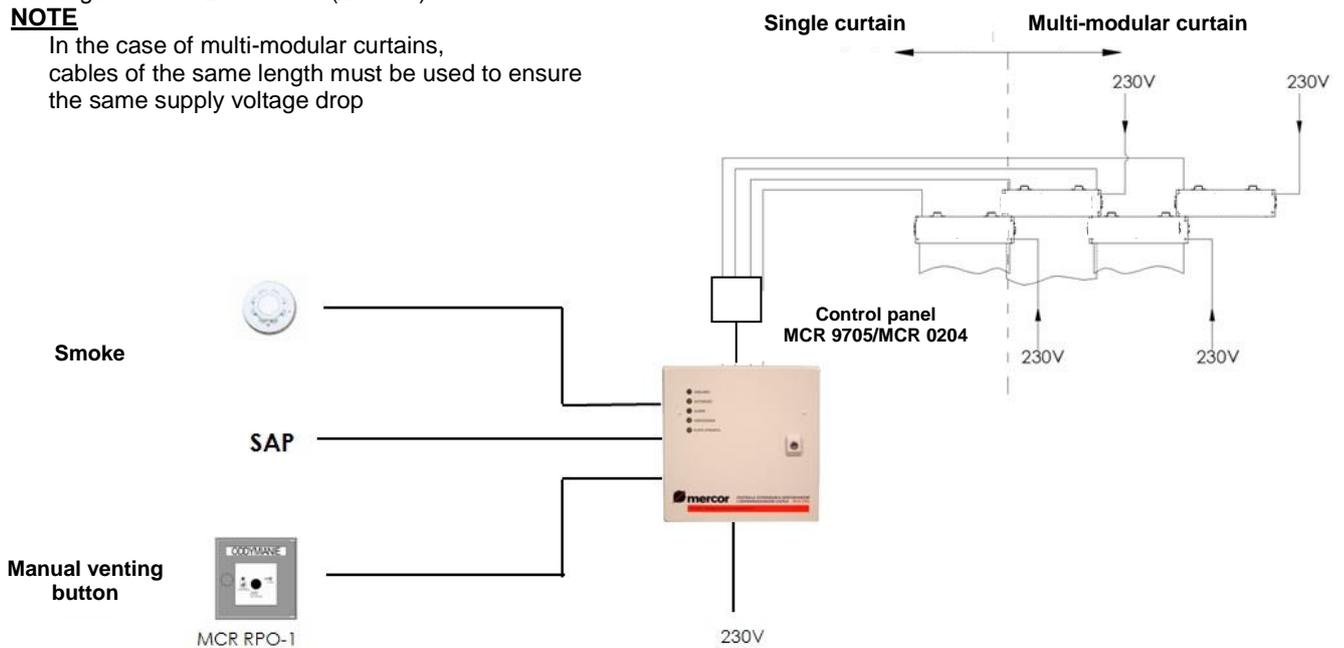
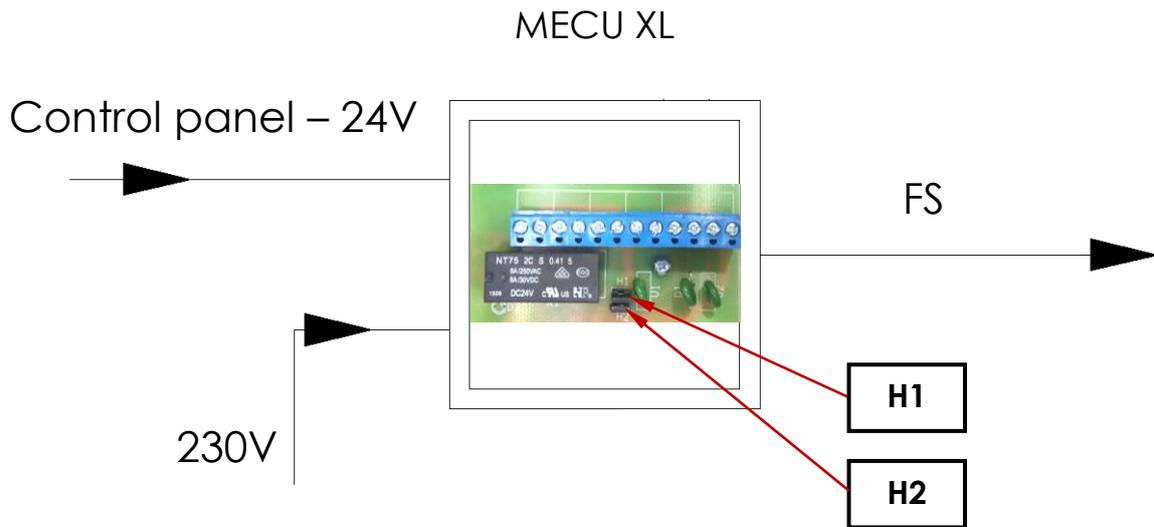


Fig. 10. Schematic diagram of the curtain connections with a common bottom bar

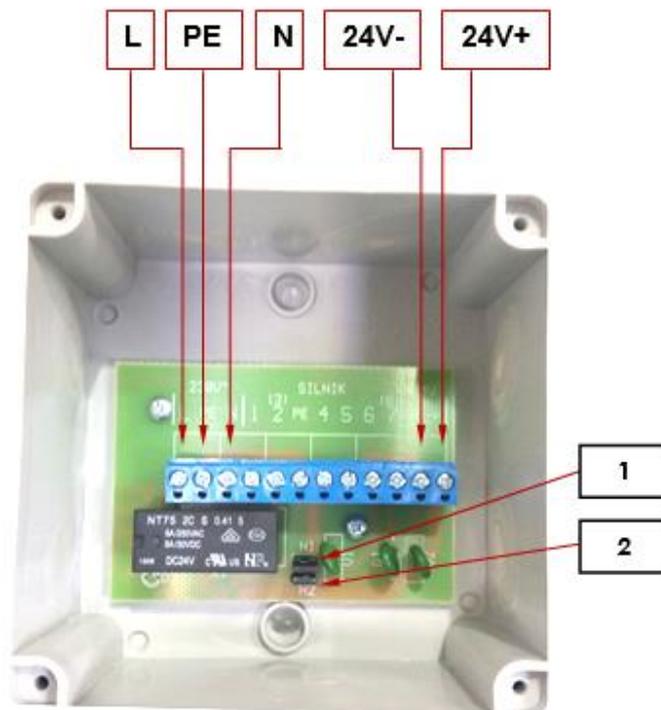


H1 – Removal of the jumper disconnects the brake  
 H2 - Removal of the jumper disconnects rolling up the curtain

Important:

To roll the curtain down to the intermediate position, remove the jumper H2, then temporarily remove the jumper H1, until the curtain descends to the desired position. The installation of the H2 jumper causes the curtain to roll up.

**Fig. 11. MECU XL service functions ( jumpers)**



1. H1 jumper – removal releases the brake 24V – curtain descent

- H2 jumper – removal cuts off power supply 230V, prevent curtain roll up

#### Description of wire terminals inside MECU XL

1, 2, 3, 4, 5, 6, 7, 8, PE	Numbers of motor wires
230 V~ L	
230 V~ PE	Mains
230 V~ N	
24 V –	MCR 9705/MCR 0204 control panel – P8 and
P11 terminals	
24 V +	(brake control) – <u>pay attention to polarity!</u>

Fig. 12. MECU XL connections

#### NOTICE:

- Any decorative or covering elements (e.g. drop ceilings, wall lining) installed later on must not prevent the curtain from dropping freely and must not block possible access to the curtain mechanisms.
- In the case of fixing curtains with masking elements to a drop ceiling, proper gaps and tolerances should be ensured (**fig. 4, 5**), matching a given curtain width.
- Do not disconnect the MECU motor control system from the motor!  
Disconnection or damage to the connection between the MECU system and the motor may result in the rolling out of the fabric. If disconnection is necessary, the curtain should be protected against rolling out.

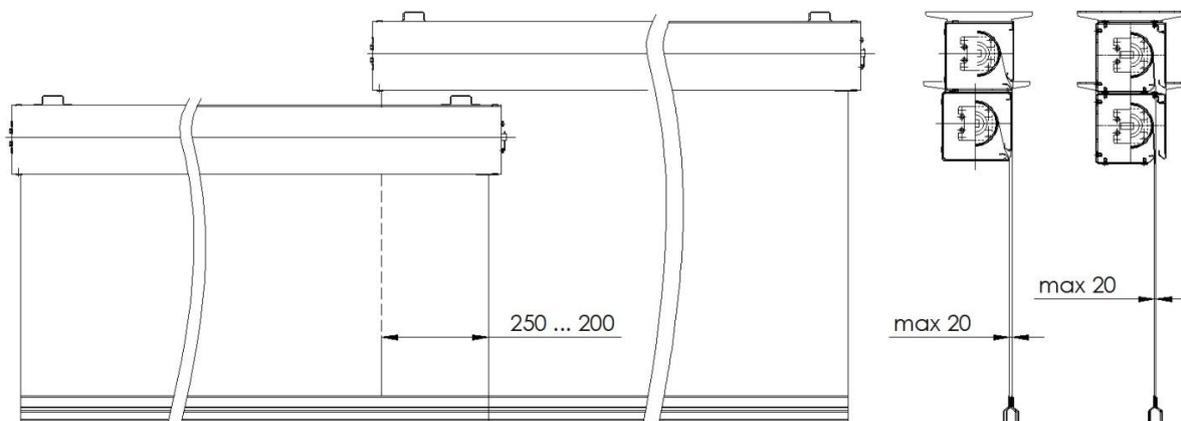
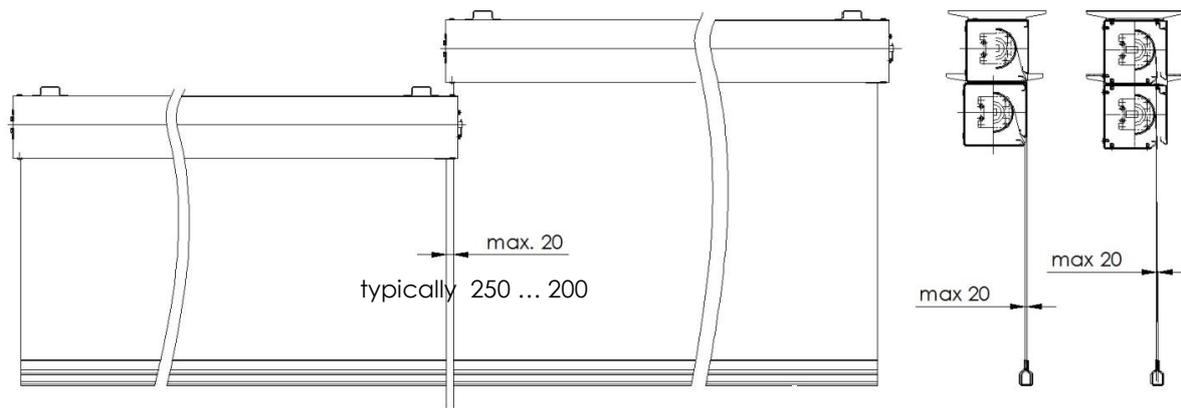
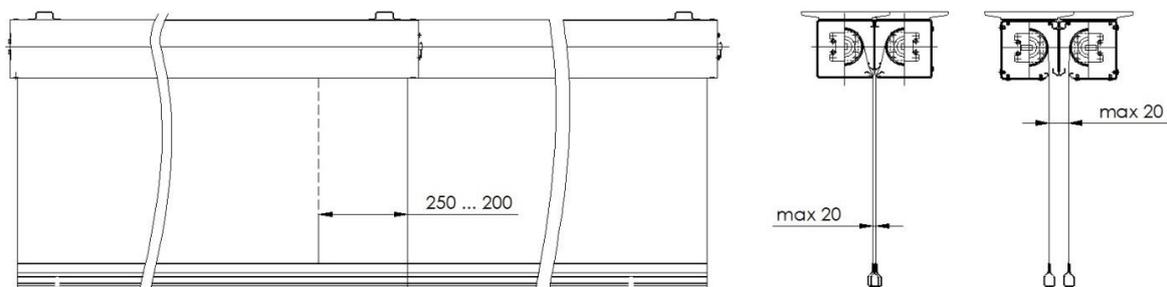


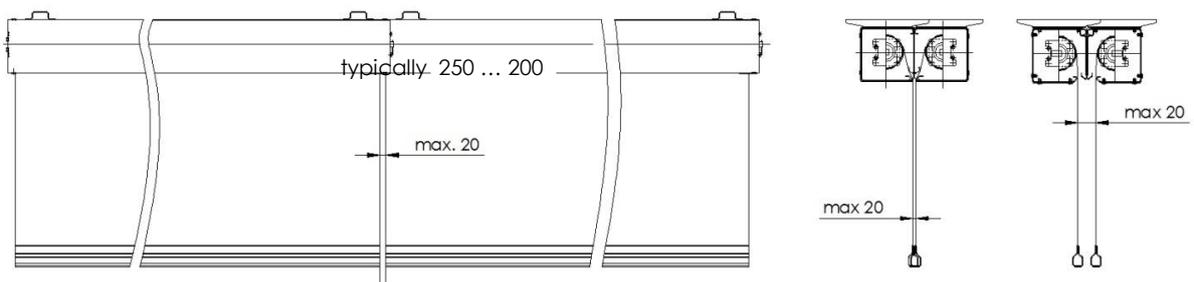
Fig. 13. Typical gap sizes in the transverse direction in the case of vertical arrangement of curtain modules with fabrics overlapping



**Fig. 14. Typical gap sizes in the transverse direction in the case of vertical arrangement of curtain modules without fabrics overlapping**



**Fig. 15. Typical gap sizes in the transverse direction in the case of butt arrangement of curtain modules with type K, C and L casings and with fabrics overlapping**



**Fig. 16. Typical gap sizes in the transverse direction in the case of butt arrangement of curtain modules with type K, C and L casings and without fabrics overlapping**

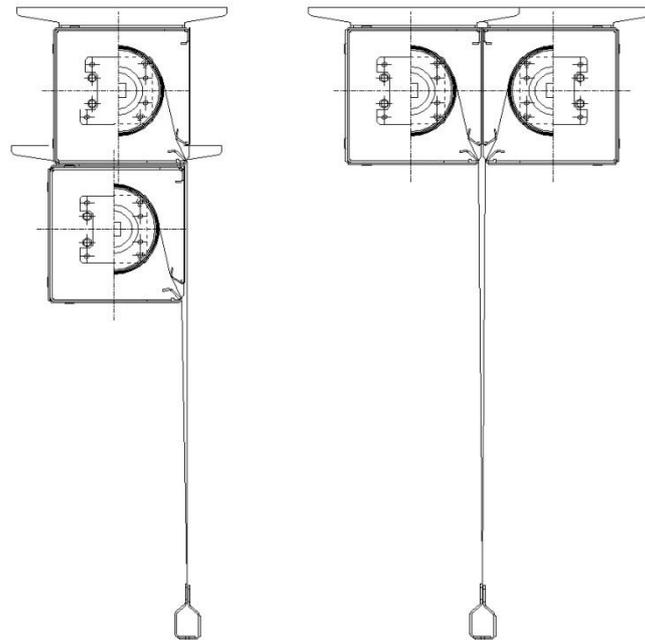


Fig. 17. Reduction in gaps in a group of curtains by using a common bottom bar – type F casings arranged vertically and horizontally

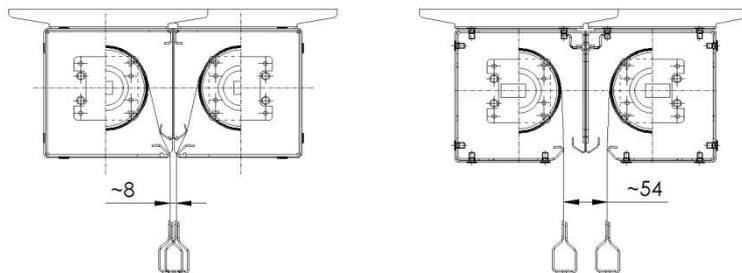
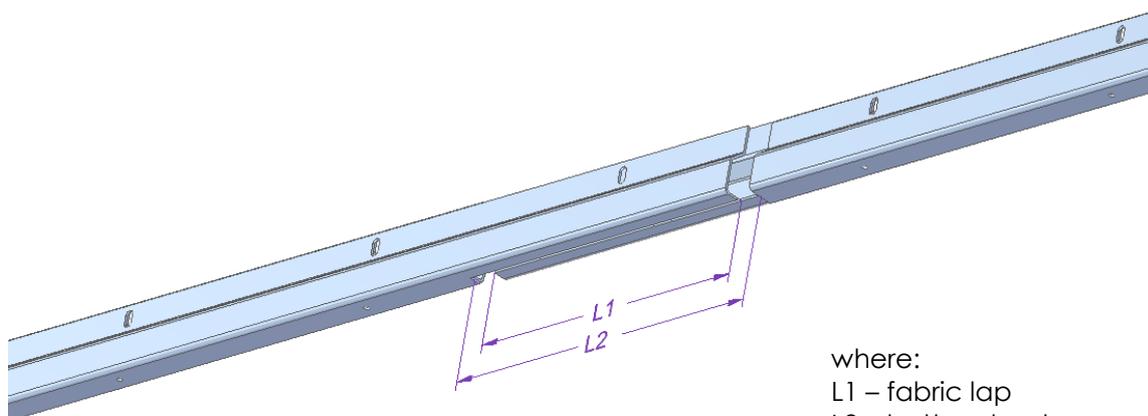


Fig. 18. Typical gap sizes in the transverse direction in the case of butt arrangement of curtains, type K, C and L casings



where:  
 L1 – fabric lap  
 L2 – bottom bar lap

Fig. 19. Overlapping bottom bar – no connection of curtains by means of a common bottom bar

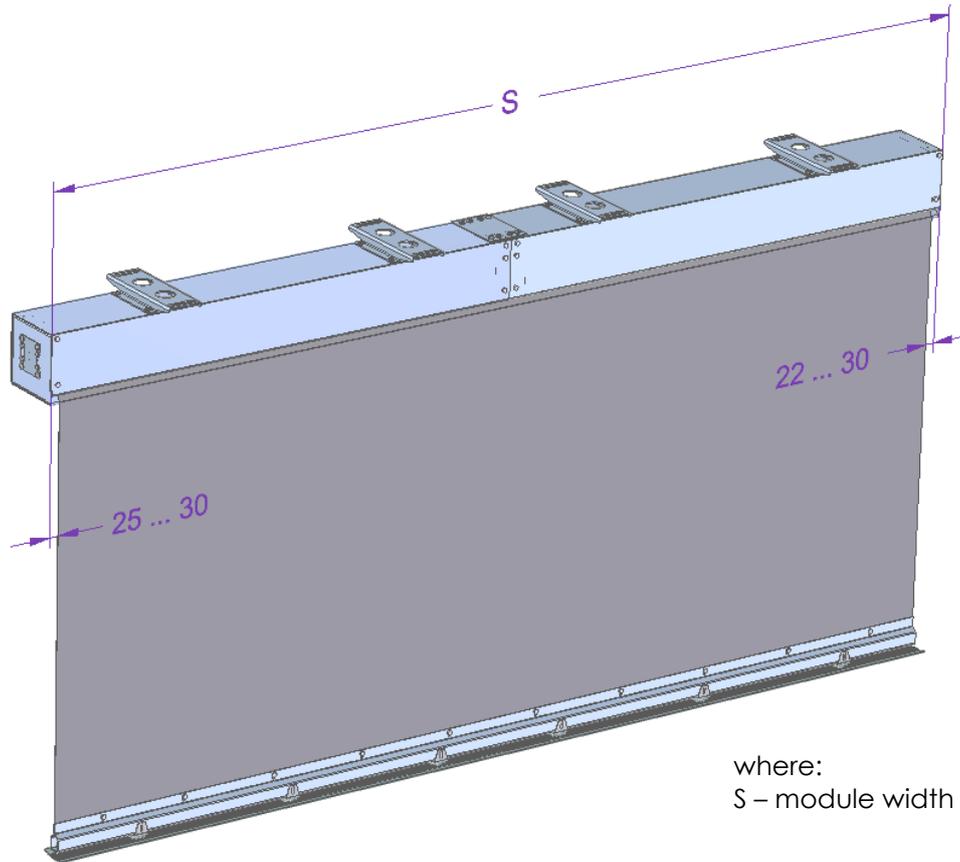
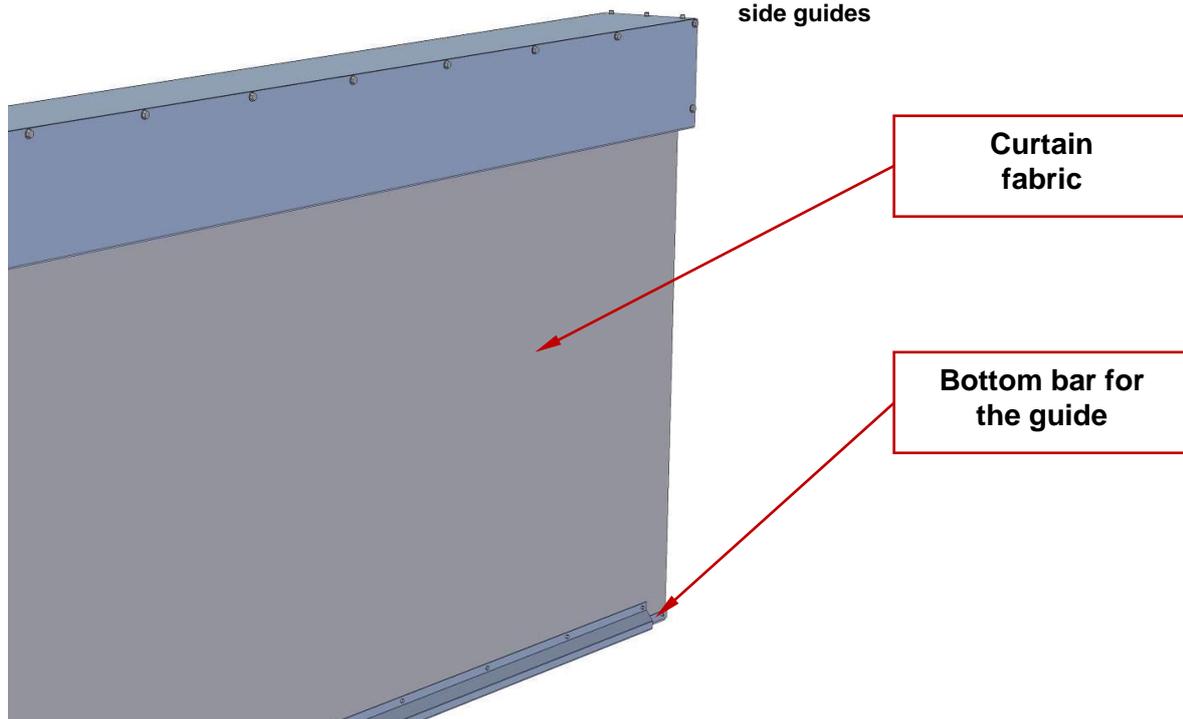


Fig. 20. Lengths of gaps in the longitudinal direction of *mcr PROSMOKE FS* curtains

Fig. 21. Curtain ready to be fitted with side guides



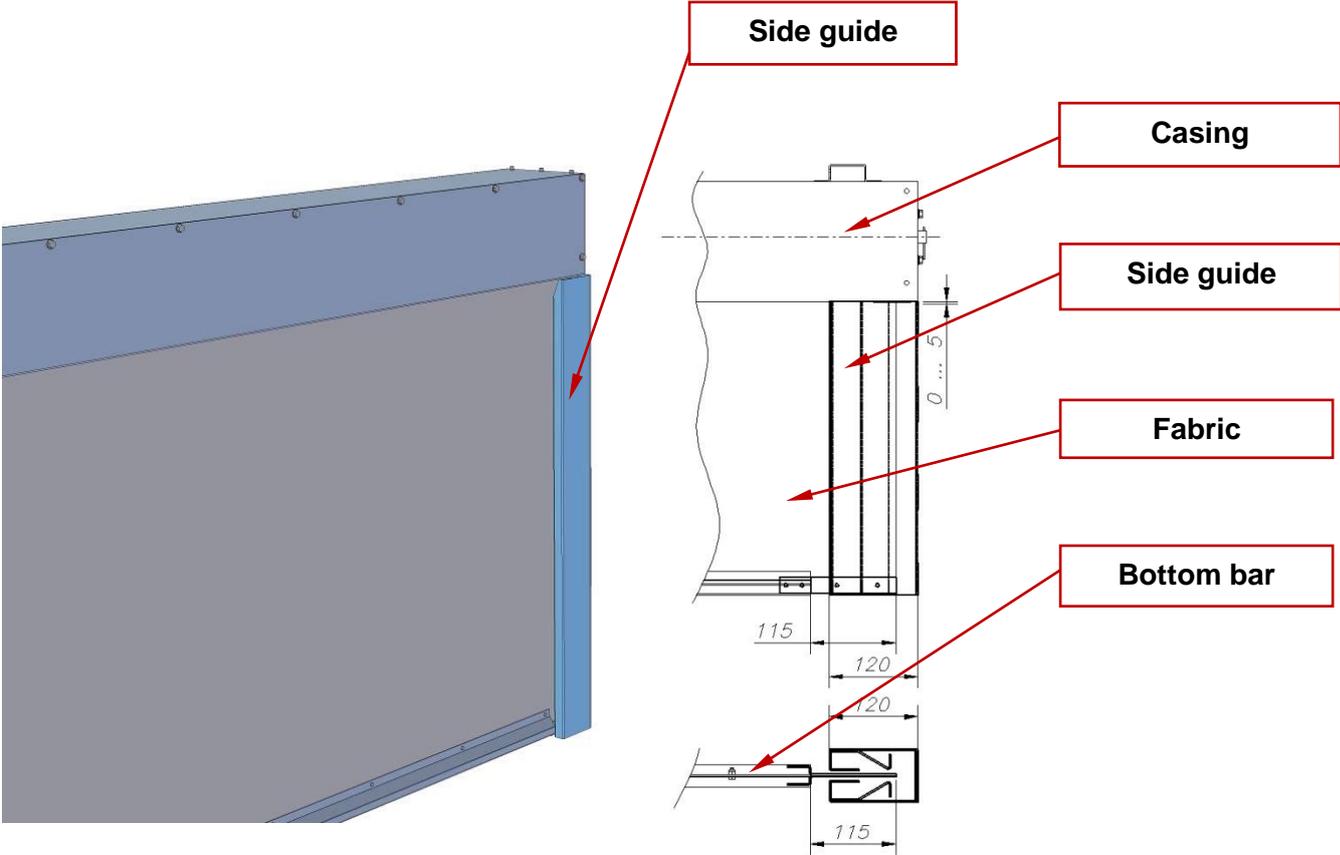


Fig. 22. Method of installing side guides

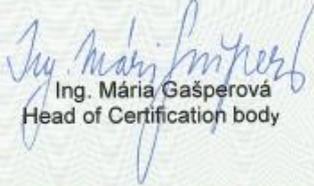
## 7. WARRANTY TERMS AND CONDITIONS

1. "MERCOR" S.A. grants a 12-month quality guarantee for equipment, starting from the date of purchase, unless the agreement provides otherwise.
2. 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.
3. 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.
4. Liability under the Guarantee covers only defects resulting from causes inherent in the equipment sold.
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. 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;
  - parts liable to natural wear and tear during operation (e.g. seals) unless a manufacturing fault has occurred;
  - damages due to aggressive external factors, especially chemical and biological ones;
  - 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.
7. Each defect under guarantee should be reported to a local representative of "MERCOR" S.A. immediately, i.e. within 7 days of its discovery.
8. The Buyer/Guarantee Holder is responsible for proper operation and maintenance of the equipment and for regular (min. twice a year) servicing.
9. The Guarantee shall expire forthwith if:
  - 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. Moreover, in the cases specified in par. 9, "MERCOR" S.A. has no warranty obligations.

### 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.

## 8. CERTIFICATE

 Reg. No. 041/P-007	NOTIFIED BODY No. 1396 Osloboditeľov 282, 059 35 Batizovce, Slovakia tel. +421 52 7752298 fax. +421 52 7881402 http://www.fires.sk	 The Experts on Fire Safety
<b>Certificate of constancy of performance</b>		
<b>1396 - CPR – 0033</b>		
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		
<b>ACTIVE SMOKE BARRIERS (ASB1, ABS 3); MCR PROSMOKE FS CE</b>		
having the performances and used in conditions given by initial type testing report No.: C1396/09/0001/5004/SC issued by FIRES s.r.o., NB 1396, Slovakia on 10. 06. 2009 amended by an actual report of continuous surveillance,		
produced by		
<b>MERCOR SA</b>		
<b>ul. Grzegorza z Sanoka 2, 80-408 Gdańsk, Poland</b>		
and produced in the manufacturing plant		
<b>MERCOR SA</b>		
<b>Zakład Produkcyjny, ul. Kwarcowa 3A, Ciepłowo, 83 031 Łęgowo, Poland</b>		
This certificate attests that all provisions concerning the assessment and verification of constancy of performance and the performances described in Annex ZA of the standard		
<b>EN 12101-1: 2005, EN 12101-1:2005/A1: 2006</b>		
under system 1 are applied and that the product fulfils all the prescribed requirements set out above.		
This certificate was first issued on 10 <sup>th</sup> June 2009 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonized standard, used to assess the performance of the declared characteristics, do not change, and the product, and the manufacturing conditions in the plant are not modified significantly.		
Batizovce, 13. 03. 2014	 NOTIFIKOVANÁ OSOBA 1396 The Experts on Fire Safety NOTIFIED BODY 1396	 Ing. Mária Gašperová Head of Certification body
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