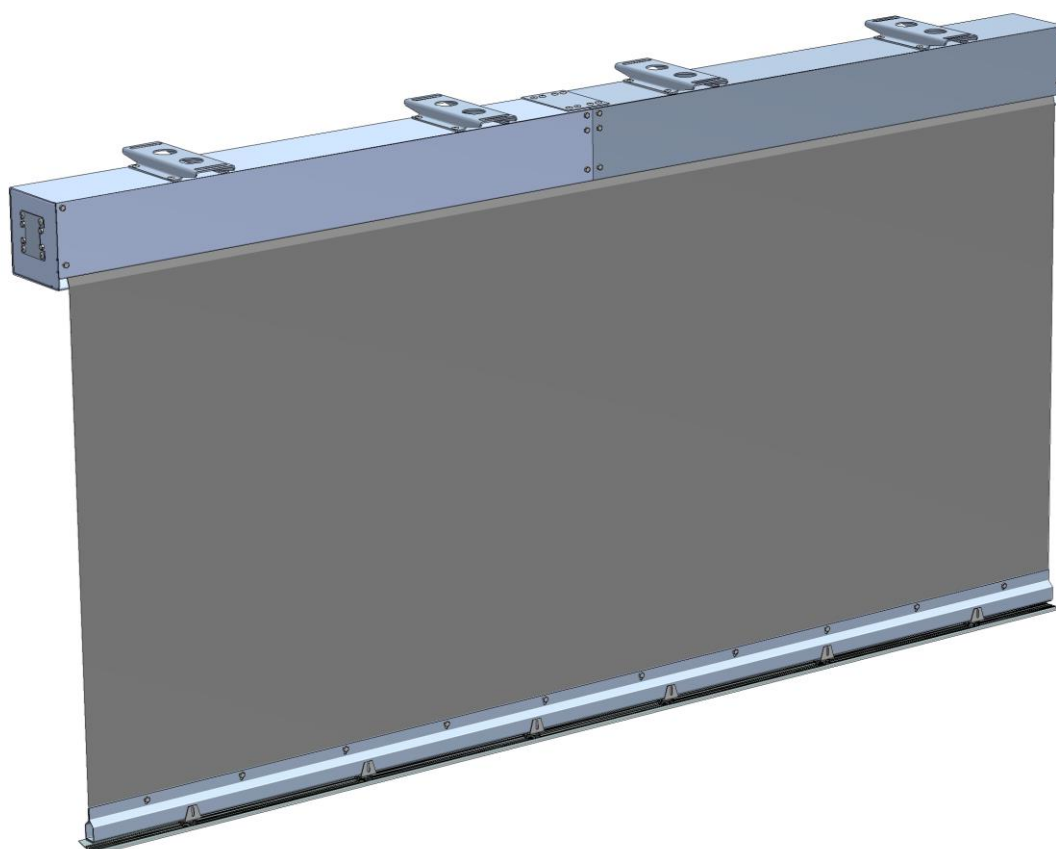


OPERATION AND MAINTENANCE DOCUMENTATION

MCR PROSMOKE CE/CE1 automatic rolling curtain



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1. INTRODUCTION

This operation and maintenance documentation allows the user to become familiar with the purpose, structure, principle of operation, proper installation and operating of *mcr PROSMOKE CE/CE1* automatic rolling curtains. Also, the documentation contains additional information on the conditions of use, maintenance and warranty of the product.

Following the instructions contained in the operation and maintenance documentation will ensure proper operation of the smoke exhaust systems and the safety of the users of the system.

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

The operation and maintenance documentation applies to *mcr PROSMOKE CE/CE1* curtains equipped with end switches for smooth adjustment of the upper and the lower position (by using the R60/8G electric motor manufactured by BECKER – Antriebe GmbH).

2. PURPOSE OF THE DEVICE

mcr PROSMOKE CE/CE1 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 CE/CE1 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.

In standby mode, *mcr PROSMOKE CE/CE1* rolling curtains are concealed in casing, and in case of a fire, they are automatically lowered to the designed height. When the alarm is reset, the curtains can be rolled up again.

mcr PROSMOKE CE/CE1 smoke curtains have certificate of conformity **CE** no. 1396-CPR-0021, meeting the requirements of the EN 12101-1 standard, granted by notified certification body no. 1396. According to the above-mentioned standard, the curtains are classified as ASB2 or ASB4.

It is the designer of the building who is responsible for designing a smoke exhaust system properly and choosing appropriate curtains for a particular application. *Mcr PROSMOKE CE/CE1* curtains are not intended for use as smoke-tight doors. The curtains are fire-protection devices, and as such may not function as gates or the like, and are not designed for daily operation/use for other purposes.

3. STRUCTURE OF THE CURTAINS

Rolling curtains consist of a casing, a roller with smoke-tight fabric rolled up with bottom ballast, and a drive system (**fig. no. 1**).

The casing is a two-piece one, having a fixed part and an inspection cover made as K, C, L, K-T types (**fig. no. 2, 3**).

The roller is mounted inside the casing by means of a bearing assembly with an axle from one side and on the rod of the motor from the other side, and in special cases another drive system can be used instead of the bearing assembly.

The drive system installed in the roller consists of a 24 V~ motor with a built-in brake released electrically.

The smoke-tight fabric has linear bottom ballast, ensuring that it is properly unrolled or rolled up, and minimising its deflection or ascent due to the pressure of fire gases. Optionally, the linear bottom ballast may be equipped with a ballast masking element (**fig. no. 5**).

The masking element is an aluminium profile 80 mm in width, painted in any RAL colour depending on the order.

The smoke-tight material used in *mcr PROSMOKE CE/CE1* curtains is not trimmed at the edges, and it becoming slightly frayed on the edges is a natural process that does not affect the use or the quality of the product.

Single curtains are made with a length of up to 6 m. In order to obtain curtains longer than 6 m, a specific number of curtains of smaller dimensions is joined into assemblies of the required length.

Optionally, the curtain may be equipped with side guides reducing the gaps.

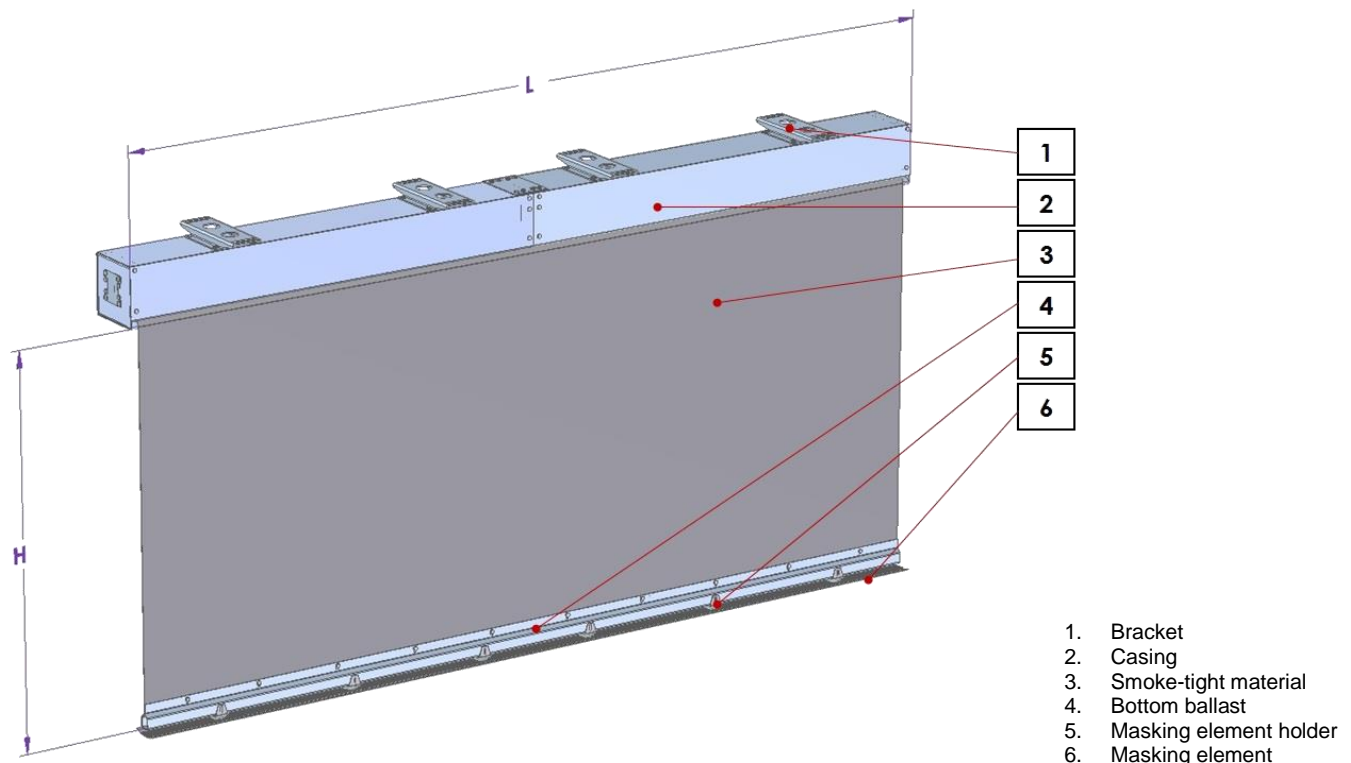


Fig. 1. Structure of the *mcr PROSMOKE CE/CE1* roller curtain.

NOTE

While planning the installation of the curtain, allow for the presence of the elements that protrude beyond the outline of the casing:

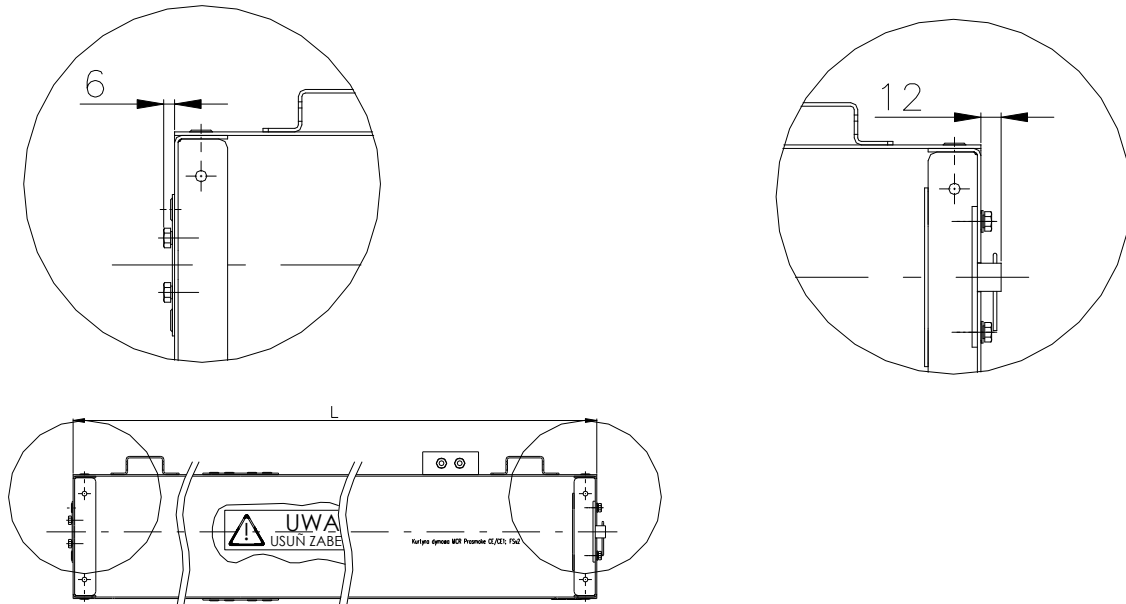
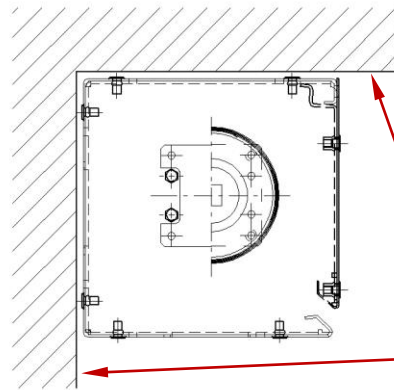
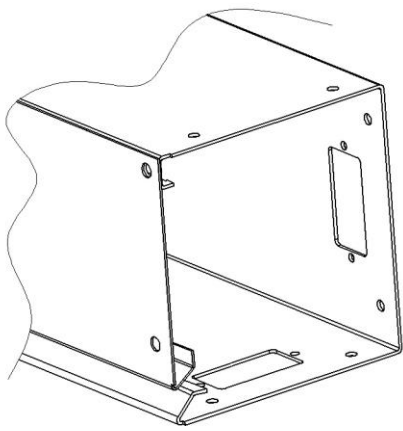
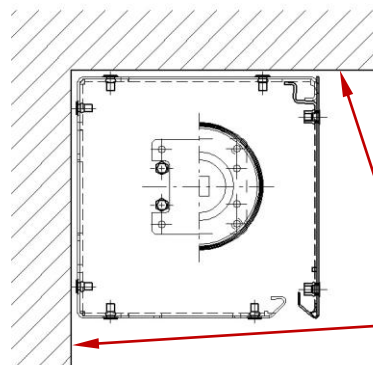
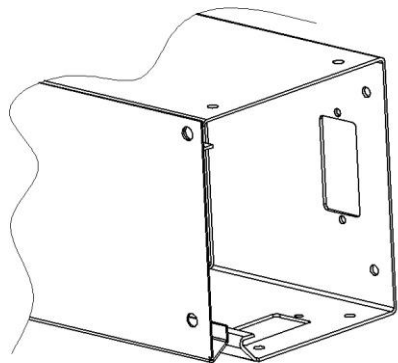


Fig. 2. Length of the elements protruding from the casing of the *mcr PROSMOKE CE/CE1* curtain.



Installation
plane

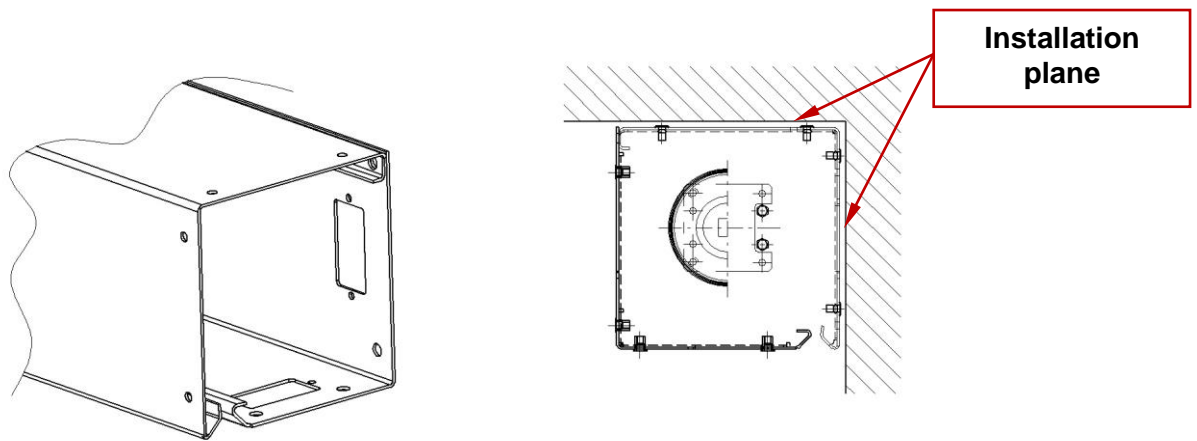
CASING OF THE K TYPE



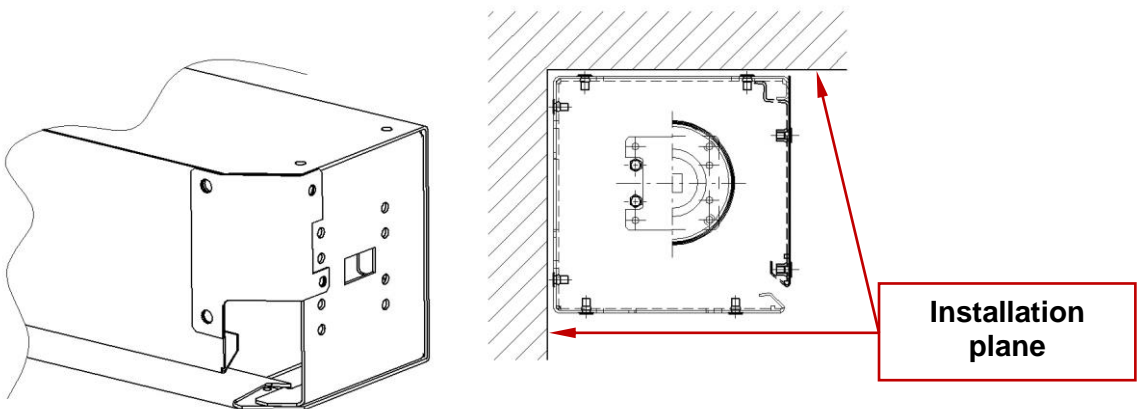
Installation
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CASING OF THE C TYPE

Fig. 3. Types of the curtain casings – K, C

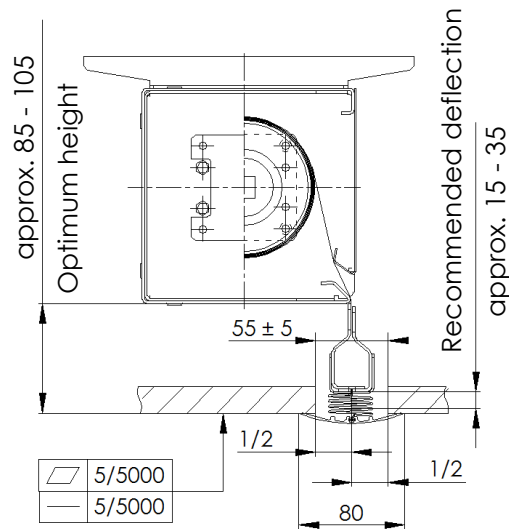


CASING OF THE L TYPE



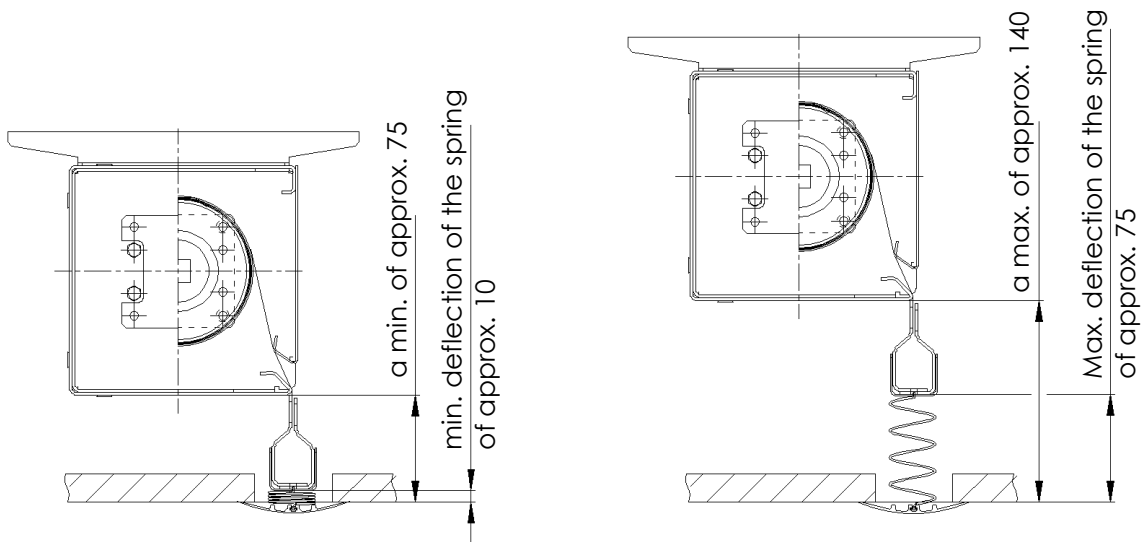
CASING OF THE K-T TYPES

Fig. 4. Types of the curtain casings – L, K-T



Note: Keep the rectilinearly and the flatness of the surface of suspended ceiling near the gap of 5 mm / 5000 mm

Fig. 5. Recommended position of the casings in relation to the ceiling. The width of the gap



Note: Keep the minimum and the maximum deflection of the spring. The dimension between the casing and the ceiling is approximate.

Fig. 6. Maximum and minimum distance between the casing and the ceiling, and maximum and minimum deflection of the spring of the masking element

4. PRINCIPLE OF OPERATION OF *mcr PROSMOKE CE/CE1* CURTAINS

On standby, *mcr PROSMOKE CE/CE1* rolling curtains are concealed in the casings, and in case of a fire they are automatically lowered to the designed height.

The *mcr PROSMOKE CE/CE1* rolling curtain must be connected to the *mcr 9705-5A/8A* smoke exhaust control unit (optimally with *mcr R0424/48* expansion modules) in order to operate properly.

To be left rolled up, the *mcr PROSMOKE CE/CE1* curtain does not need constant power supply from the *mcr 9705* smoke exhaust control unit. When power is supplied from the control unit due to a fire signal, the curtain is unrolled to the position to which the bottom limit switch is set.

After restoring the stand-by state of the *mcr 9705* control unit, the fabric of the curtain is rolled up by the 24 V motor. The fabric is rolled up to the height to which the upper limit switch is set, and the curtain goes into the state of keeping the fabric rolled up.

5. TRANSPORT AND DELIVERY

Curtains are delivered assembled. The unloading should be carried out when supervised by a person authorised by the manufacturer, using widely available reloading means (e.g. forklift trucks, cranes equipped with slings with crossbars) or manually while special care is exercised to protect the curtains from damage.

6. INSTALLATION OF CURTAINS

Curtains should be installed in a building in accordance with the design so that the dimensions of the gaps are retained.

Curtains should be fitted under the ceiling and to the lintels, prepared constructions or other elements of the building that are designed for that purpose. The bearing element should be made of reinforced concrete or steel. Depending on the height of the curtain, the design of the bearing element must allow for the weight of the device, approx. 200 ÷ 300 N/mb. In the case of the curtains without the installation handles, the mounting plane should be vertical or horizontal, with a flatness deviation of up to 5 mm along the length of the curtain.

The curtains installed with suspension fitting, of a length of more than 0.5 m, should be stiffened by fixing the casing e.g. to a reinforced concrete wall, girder, etc. With multi-module curtains, the casing should be fastened together by means of self-drilling screws or rivets of a length less than 20 mm so as to eliminate uncontrolled movement of the casing in relation to each other.

Install the curtain in the following order:

Curtains equipped with installation handles:

1. In the bearing element, mount threaded rods M10 or M12 of a proper length so that they will correspond to the arrangement of the installation handles (**fig. no. 7**). To fix the threaded rods, use fasteners suitable for the material of the bearing element (e.g. anchors HK8 HILTI).
2. Screw the M10 or M12 nuts onto the rods
3. Suspend the curtain from the rods, using a rough finish washer M10 or M12 and a lock washer
4. Adjust the horizontal position of the casing of the curtain, using the nuts.

OPERATION AND MAINTENANCE DOCUMENTATION

5. Tighten the nuts screwed according to point 2 and check that the connections are firm.
6. Connect the motor of the curtain to the *mcr 9705* control unit or the *R042-K* or *mcr R0448-K* extension module according to the diagram contained in the operation and maintenance documentation of control unit or the module.
7. Install the side guides, if included in the order, by means of the steel fasteners.
8. Check that there are no obstructions under the curtain and the curtain unrolls to the required height and is rolled up correctly. If necessary, adjust the length of the extension of the fabric (see "Adjustment of the limit switch", p. 11)).
9. Check the operation of the system by triggering the alarm from all the available sources.

Curtains not equipped with installation handles:

1. Unscrew the inspection cover
2. Remove the roller with the fabric, i.e..
 - a. Remove the locking cotter
 - b. Unscrew the four screws securing the plate locking the motor
 - c. Unscrew the four screws securing the roller support on the opposite side of the motor.
 - d. Pull out the roller by the side on which is the plug (on the opposite side of the motor)).
 - e. Remove the roller from the casing.
3. Make mounting openings in the casing.
4. Mount the curtain casing with steel fasteners, suitable for the substrate material and the position of the installation plane (ceiling/wall): fasteners with a minimum diameter of the connecting element of Ø10 are recommended, e.g. M10, (e.g. anchors HK8 HILTI). Note the length of the inner fastener of the casing: it may not impinge on the fabric.
5. Put the roller with the fabric into the mounted casing; carry out the installation according to the above points, but in reverse order, and in the position as before the removal.
6. Secure the roller by means of the locking cotter at both ends.
7. Fit the side guides, if included in the order, by means of steel fasteners.
8. Connect the motor of the curtain to the *mcr 9705* control unit or the *mcr R042-K* or *mcr R0448-K* extension module according to the diagram contained in the operation and maintenance documentation of the control unit or the module.
9. In the case of a curtain of more than 4 m, it is necessary to remove the transport sponges inside the curtain, in the middle part of the module, between the drum and the casing.
10. Check that there are no obstructions under the curtain and the curtain unrolls to the required height and is rolled up correctly. If necessary, adjust the length of the extension of the fabric (see "Adjustment of the limit switch", p. 11)).
11. After the check and adjustment, close the inspection cover.
12. Check the operation of the system by triggering the alarm from all the available sources.

Curtains equipped with the masking element of the bottom ballast:

Masking elements are delivered separately, adapted to be fitted to the already installed and adjusted curtains in the facility.

1. Before fitting the masking element, attach the handle to the spring which is factory fixed to the masking element. The installation is carried out in the facility by sticking the spring into the seat in the handle.
2. The masking element with the handle is mounted onto the bottom ballast by means of self-drilling screws 4.8x13 with oval countersunk heads.
3. Limitations of using a masking element with holders (**fig. 4, 5**).

While installing multi-module curtains, follow the order of the modules (outermost module, inner modules, and again outermost module) and the designed values of the materials of particular modules overlapping each other.

With an assembly of curtains operating with common bottom ballast, all the modules of the curtain should be energised by one source: by single *mcr 9705* control units or *mcr R0424(48)-K* expansion modules. The electrical connection must be made according to the operation and maintenance documentation of the control units or the modules.

Install the bottom ballast of a single curtain assembly and/or a bottom ballast masking element in accordance with separate documentation.

NOTE:

In curtains of more than 4 m in length, inside the casing are inserted transport sponges, which must be removed before connecting power supply to the curtains.

If not removed, the sponges may damage the motor and the fabric.

Number of curtain modules connected to the control unit and the expansion modules:

1. Maximum number of the curtain modules:
 - *mcr PROSMOKE CE/CE1* for the *mcr 9705-5A control unit* – 2 modules, a max length of 3.99 m
 - *mcr PROSMOKE CE/CE1* for the *mcr 9705-8A control unit* – 2 modules, a length of 4 m to 6 m
 - *mcr PROSMOKE CE/CE1* for the *mcr R0424-K extension module* – 4 modules, a max length of 3.99 m
 - *mcr PROSMOKE CE/CE1* for the *mcr R0424-K extension module* – 5 modules, a length of 4 m to 6 m
 - *mcr PROSMOKE CE/CE1* for the *mcr R0448-K extension module* – 8 modules, a max length of 3.99 m
 - *mcr PROSMOKE CE/CE1* for the *mcr R0448-K extension module* – 10 modules, a length of 4 m to 6 m

In case of the necessity of using a set of curtains out of a larger number of modules than specified above, divide them into sections.

2. Each control unit and each extension module should be provided with 230 V power supply.

Adjustment of the limit switches:

1. A limit switch is marked with up/down arrows, corresponding to the rotation direction of the motor, the marks +/- indicating the change in the range.
2. The point of triggering the switch may be shifted in the direction of an arrow by rotating the adjustment screw in the + direction or in the opposite direction in relation to the arrow by rotating the control screw in the - direction.
3. One rotation of the adjustment screw causes a change in rotation of the motor shaft of approx. 10° (corresponding to a travel of approx. 1 cm of the curtain fabric).
4. In order to precisely set the limit switch and check its operation, approach the switch, having turned back the screw by at least $\frac{1}{4}$ of a rotation.

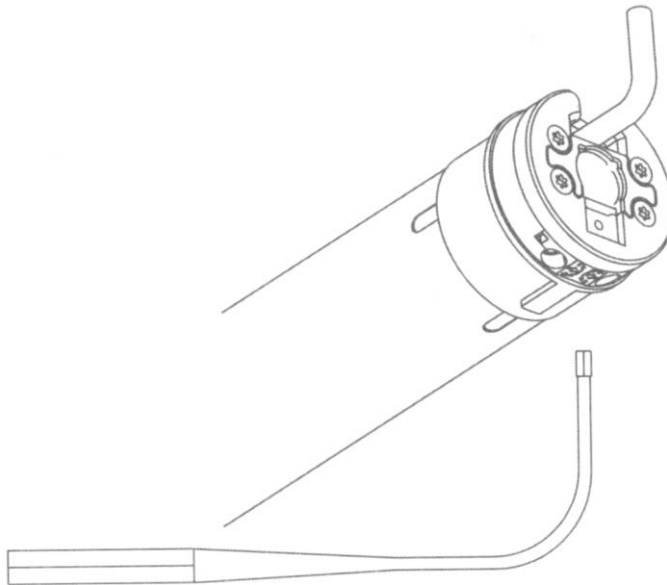
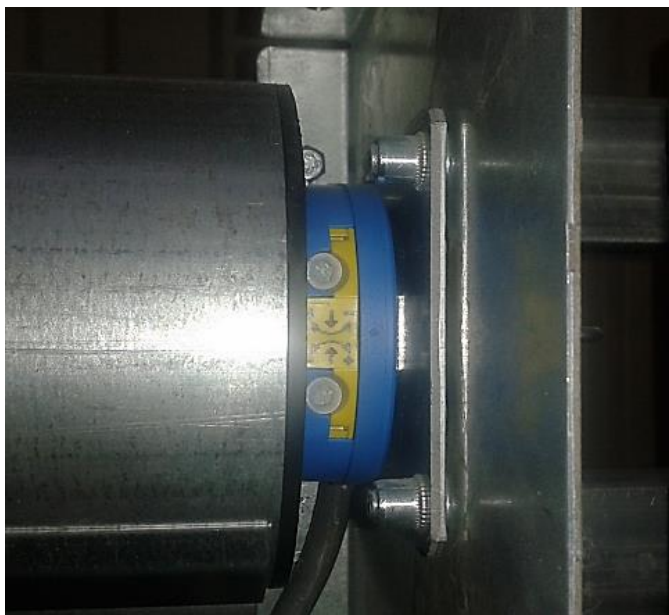
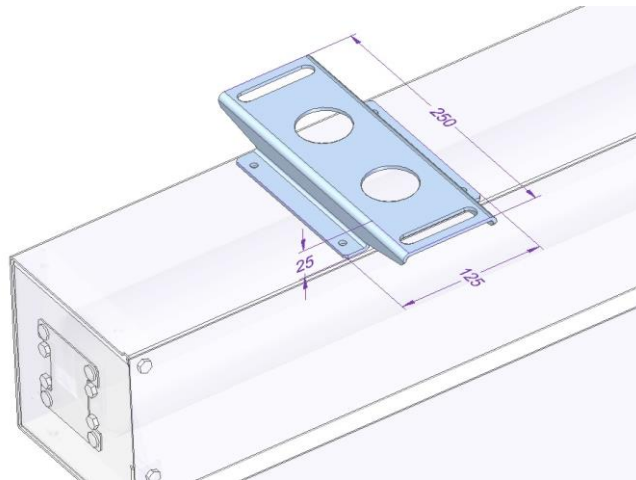
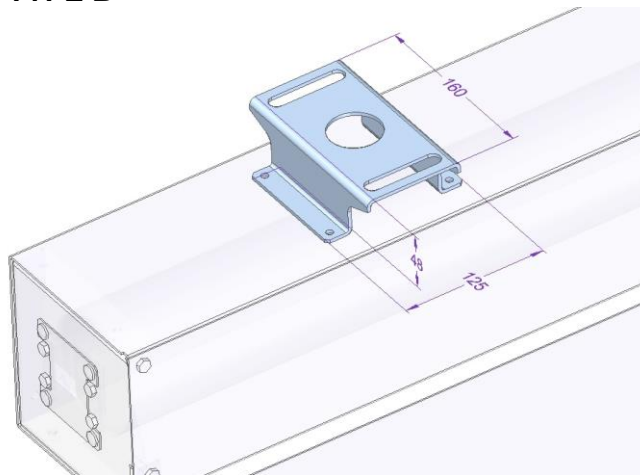
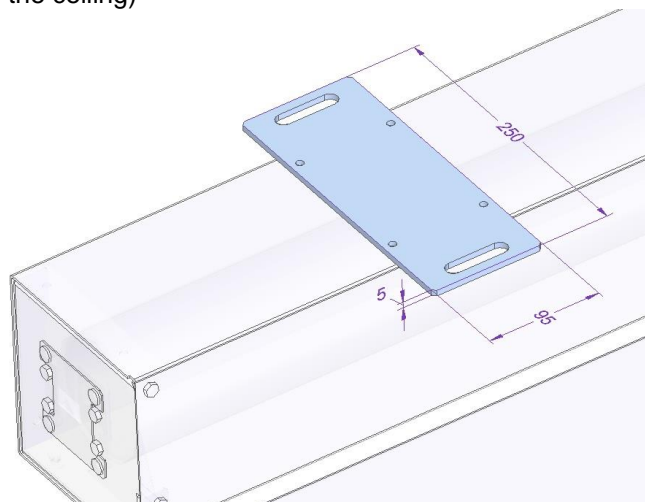


Fig. 7. Adjustment of the limit switch.



Pic. 1. Limit switches of the curtain engine (upper and lower position)

Wide bracket – TYPE A**Narrow bracket – TYPE B****Flat bracket – TYPE C**
(fixed only directly to the ceiling)**Fig. 8. Types of brackets**

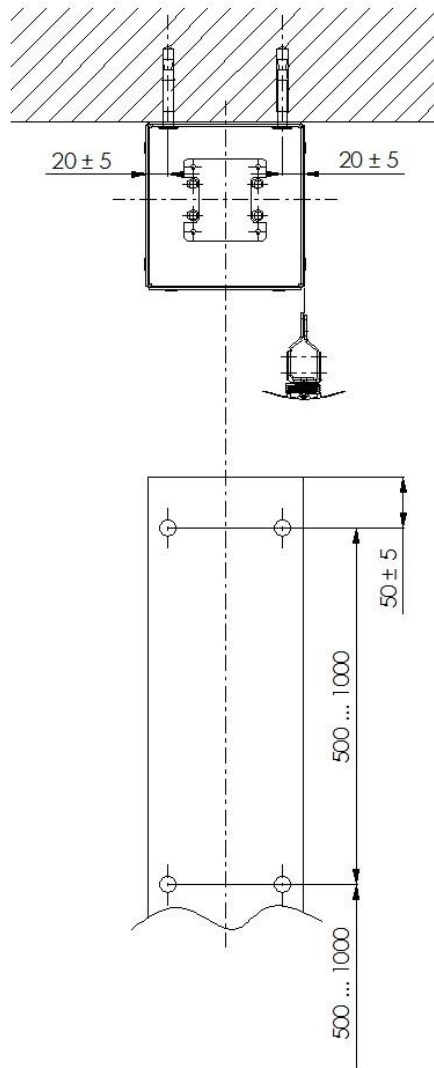


Fig. 9. Installation of a curtain without a bracket

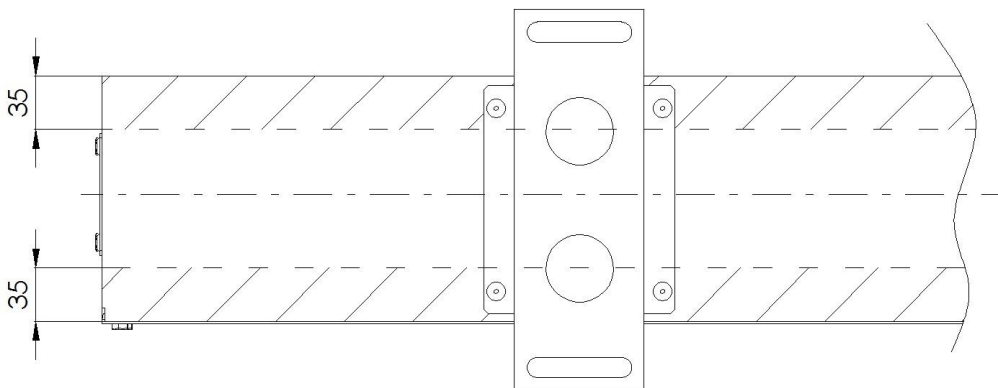


Fig. 10. Place on the casing intended for joining the curtain modules

Recommended cables:

Curtain CE – HDGs/HLGs/HTKSH 4x1.5 (2.5) PH30

NOTE:

With multi-module curtains, use cables of the same length in order to ensure a uniform drop in the supply voltage.

Diagram of a multi-module curtain

NOTE:

Each curtain module must have its own supply cable

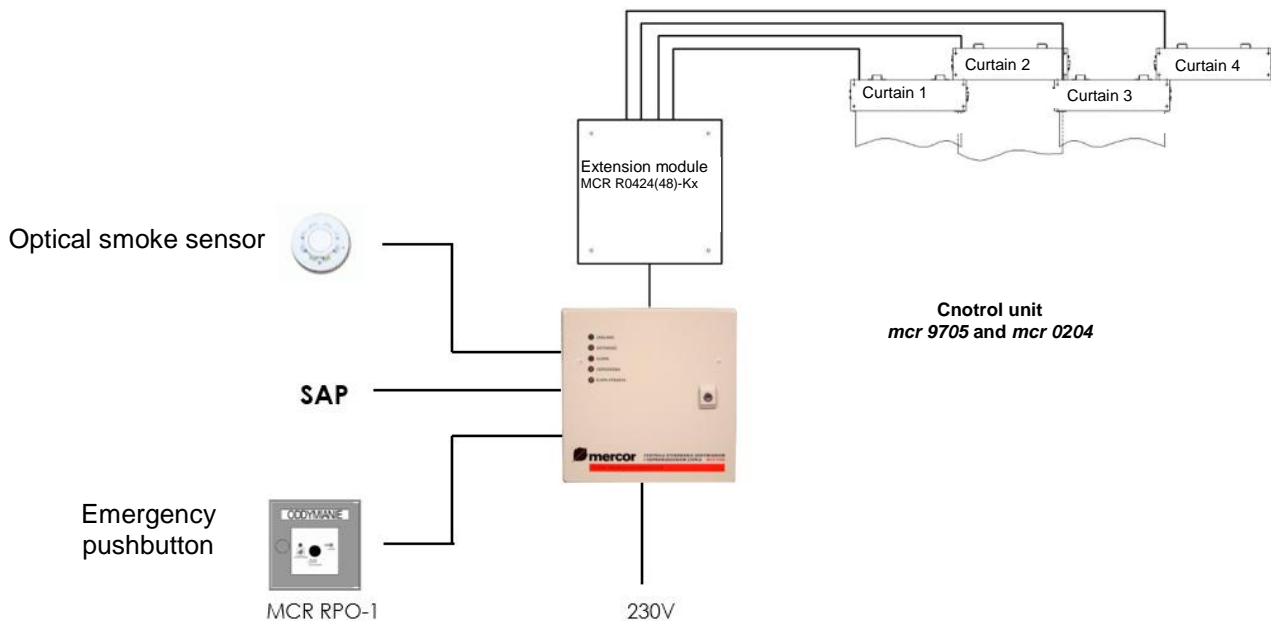
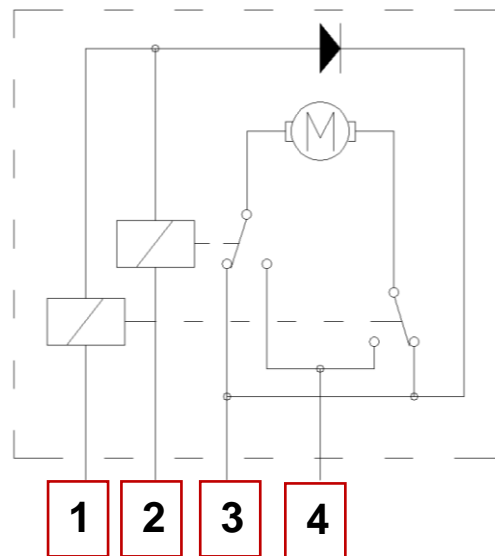


Fig. 11. Schematic diagram of the connections of a curtain with common bottom ballast



Description of the cable terminals inside MECU XL

- | | |
|-----|----------------------------------|
| 1 - | Control contact 1 |
| 2 - | Control contact 2 |
| 3 - | 0 V (earth or – of power supply) |
| 4 - | +24 V= |

The direction of rotation is changed by feeding +24 V to contact 1 OR contact 2.

Fig. 12. Connecting the motor

NOTE:

- Decorative elements and shields (e.g. suspended ceilings, wall facing) that are installed later may not interfere with the curtain being lowered freely or with access to the mechanisms of the curtain.
- If curtains are installed together with covering profiles in the suspended ceiling, retain gaps and tolerances (**fig. 4, 5**) appropriate for the corresponding width of a curtain.
- Curtains should be controlled and powered directly by the *mcr 9705* control unit intended for curtains or by an assembly of devices consisting of the *mcr 9705* or *mcr 0204* control unit with the *mcr R0424-K* or *mcr R0448-K* expansion module.
- With regard to the *mcr PROSMOKE CE/CE1* curtains operating in a group and connected by common bottom ballast, all modules of such a curtain should be powered and controlled by one source, the *mcr R0424-Kx* expansion module. X is the number of module outputs powering the curtains.

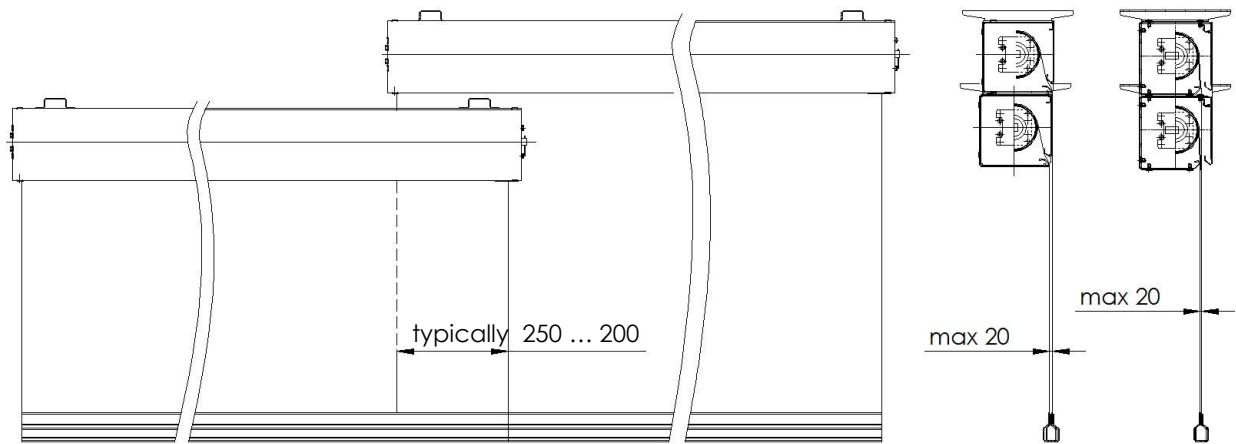


Fig. 13. Typical sizes of gaps in the traverse direction with the curtain modules arranged vertically and with the fabric overlapping.

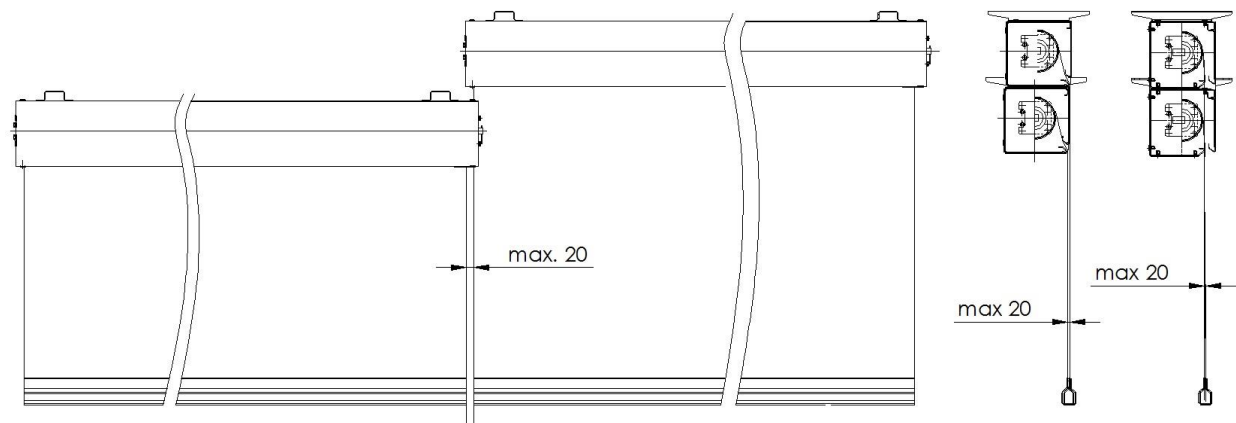


Fig. 14. Typical sizes of gaps in the traverse direction with the curtain modules arranged vertically and without the fabric overlapping

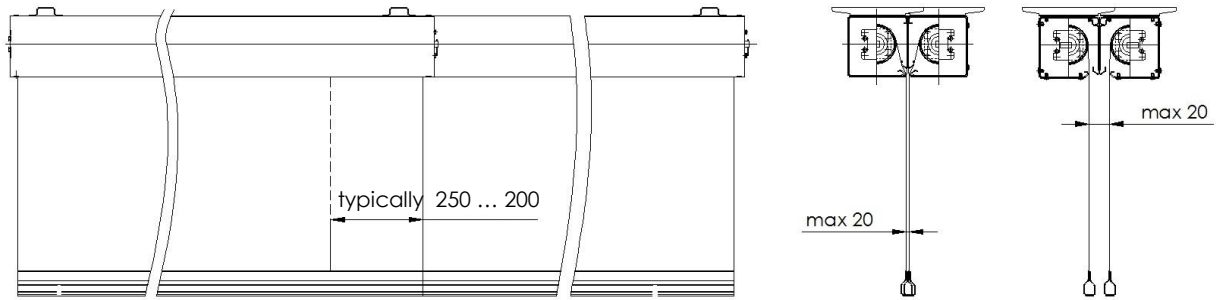


Fig. 15. Typical sizes of gaps in the traverse direction with the curtain modules with the K, C and L casings abutting, and with the fabric overlapping.

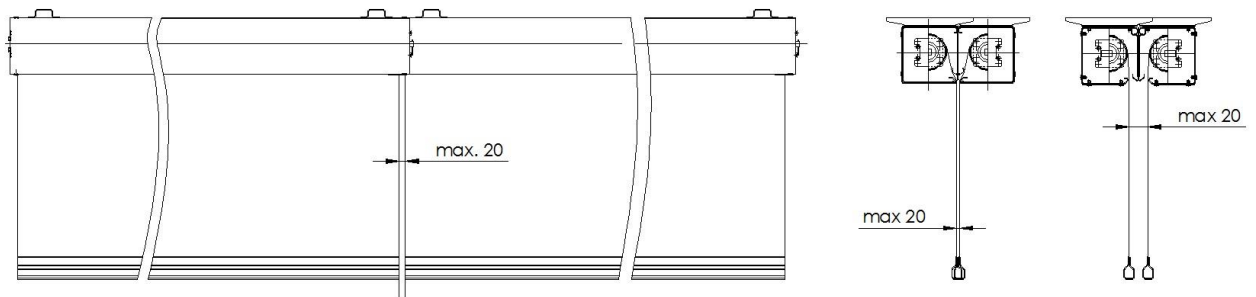


Fig. 16. Typical sizes of gaps in the traverse direction with the curtain modules with the K, C and L casings abutting, and without the fabric overlapping

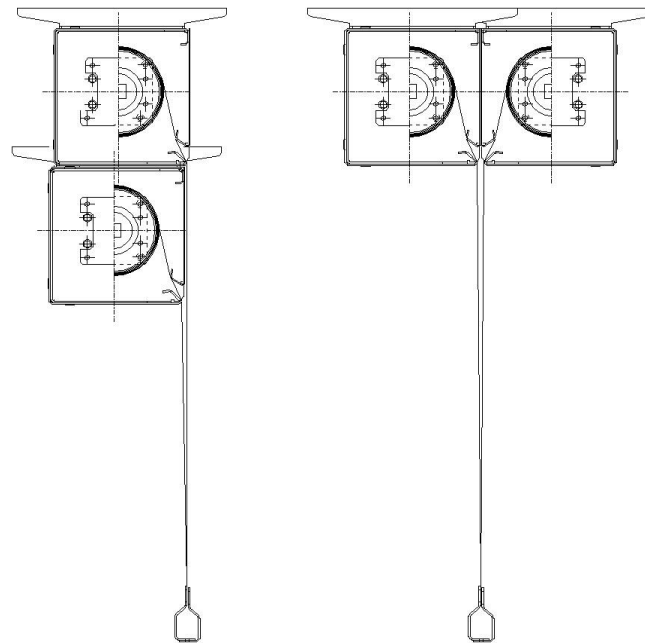


Fig. 17. Reduction of the gaps of a curtain assembly by common bottom ballast, with the K type casings arranged vertically and horizontally.

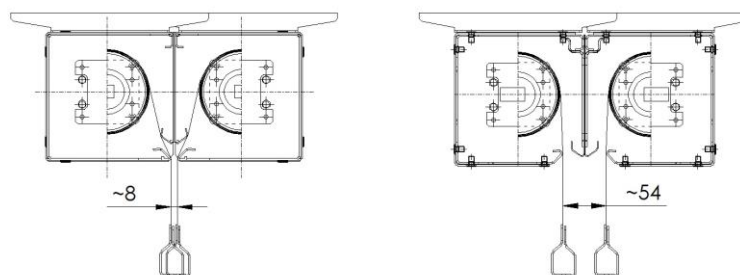
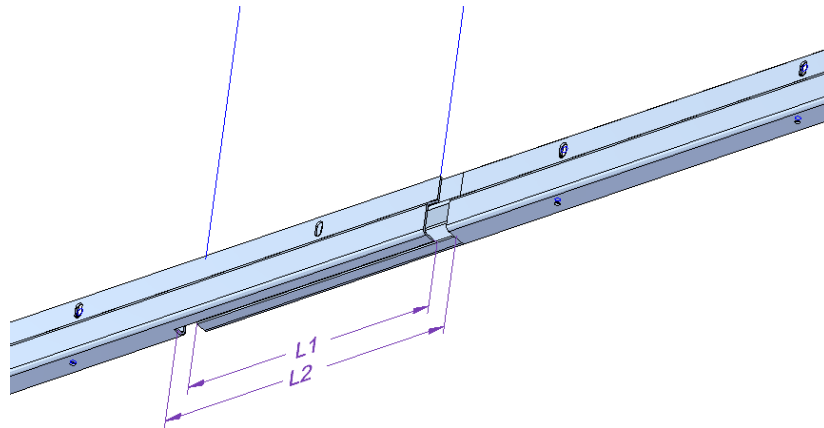


Fig. 18. Typical sizes of gaps in the traverse direction, with the curtains with the K, C and L type casing abutting

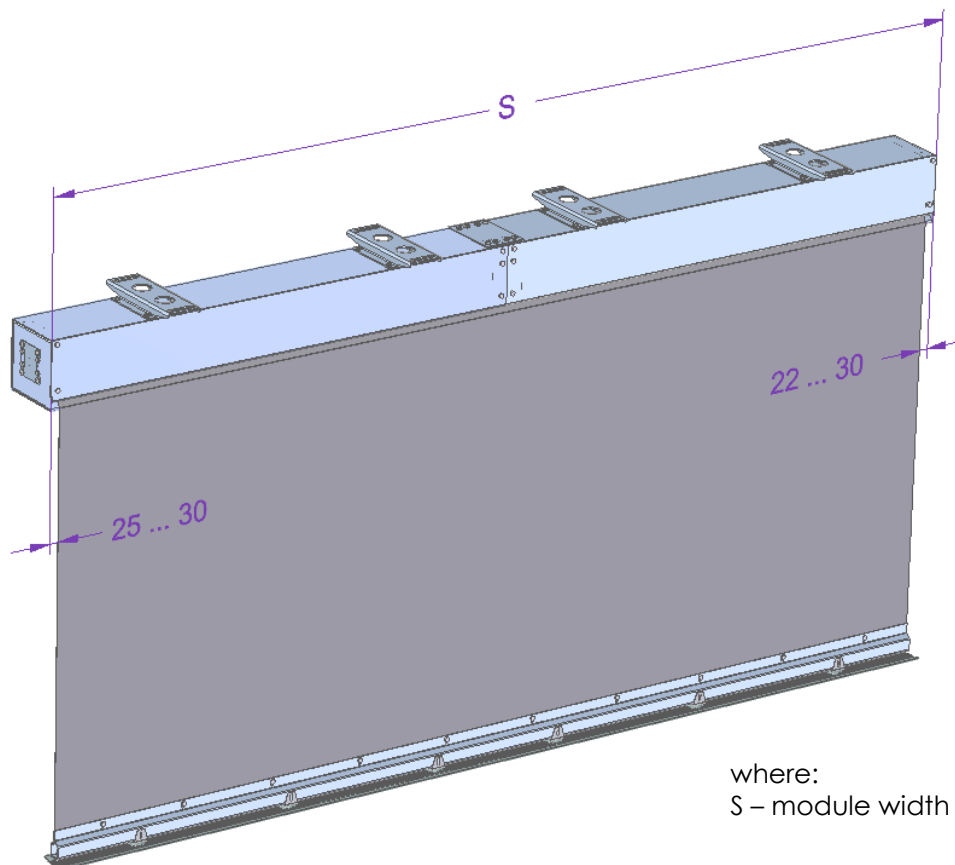


where :

L1 – fabric overlap

L2 – bottom ballast overlap

Fig. 19. Bottom ballast overlapping, with the curtains not connected by common bottom ballast.



where:

S – module width

Fig. 20. Sizes of gaps in the longitudinal direction of *mcr PROSMOKE CE/CE1* curtain.

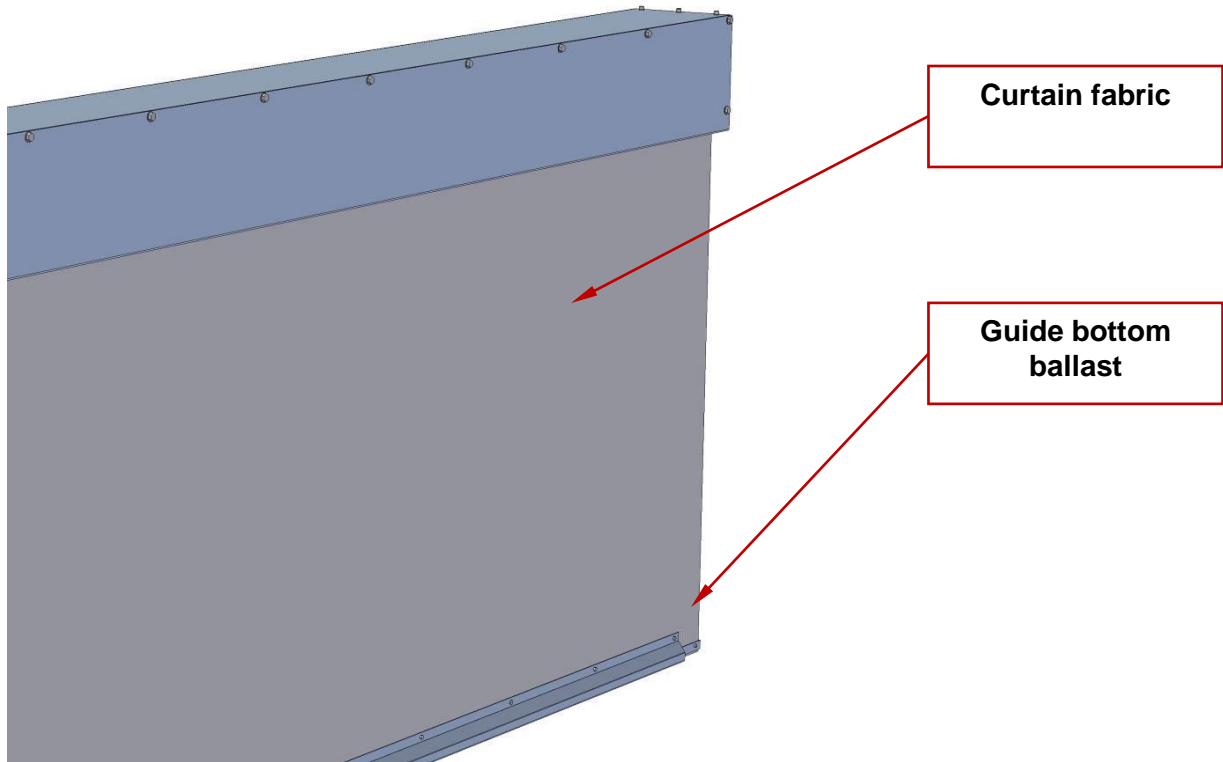


Fig. 21. Curtain ready to have side guides fitted.

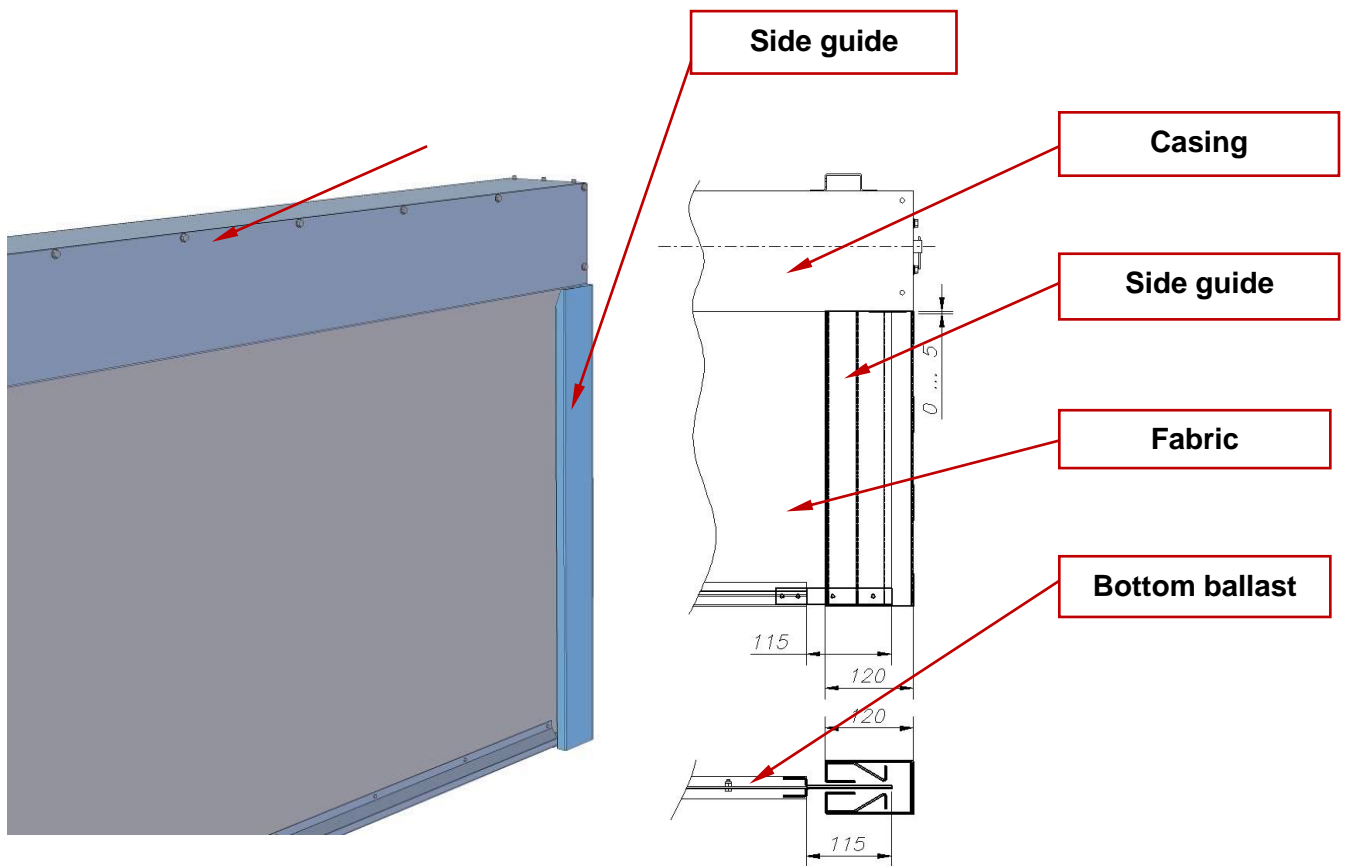


Fig. 22. Method of installing side guides.

7. OPERATING

In order to lower the curtains, turn on the alarm in the curtain control unit (*mcr 9705* and *mcr 0204*).

To lift the curtains after the alarm, cancel the alarm signal and delete the alarm state in the control unit (see the operation and maintenance documentation of the *mcr 9705* or *mcr 0204* control units).

Mcr PROSMOKE rolling curtains, like *mcr PROLIGHT* smoke exhaust vents controlled electrically, need electric energy to operate (to be raised or lowered). *Mcr 9705* and *mcr 0204* control units ensure the standby state of the system for 72 h and that the system can be activated at least once after that time in case of lack of the basic power supply 230 V~. At that time, the basic power supply must be restored lest the batteries should become excessively low and damaged.

8. SERVICE AND MAINTENANCE

The devices manufactured by Mercor SA should be **periodically serviced** and maintained every 6 months during the whole service life, i.e. in the warranty period, as well as after the warranty period. Servicing and maintenance should be carried out by the **manufacturer** or by companies authorised to service MERCOR SA devices.

The obligation related to regular service checks of fire protection devices follows from § 3, sec. 3 of the Regulation of the Minister of Internal Affairs and Administration of 7 June 2010 on fire protection of buildings, and other construction facilities and areas (Journal of Laws, 2010 no. 109, item 719).

In order to make it possible to carry out the activities of service checks as well as service and warranty activities, such as visual inspection and repairs, it is necessary that **devices are physically accessible**. The user is obliged to provide access to curtains and the possibility of removing inspection covers to conduct periodic service checks.

Between checks the following should be carried out:

1. Check the main power supply of the control units. The *mcr 9705* control unit should signal “standby” and “power supply”. The *MCR 0204* control unit should signal “power supply”.
2. Visually check the curtain and make sure that there are no obstructions on the walls, in the side guides, in the gap in the ceiling, etc. that could prevent a curtain from being unrolled properly.
3. Trigger the alarm signal and check that the curtain unrolls to the intended height.
4. Delete the alarm signal and check that the curtain is rolled up correctly and completely.

As regards technical inspections, maintenance and service of the devices, please contact a representative of the servicing department of Mercor SA at the telephone number 00 48 58 341 42 45 ext. 174 or the fax number 0048 58 341 39 85 at 8 am – 4 pm (Mon through Fri).

9. WARRANTY AND SERVICE 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 (A₄)). Should it be impossible to determine the index mentioned in the previous sentence, the actual condition and the degree of damage at the place of its origin proving that it is the consequence of torrential rain will be considered. Hurricane is defined as wind blowing at the speed of at least 17.5 m/s (damages are deemed to have been caused by hurricane if the effects of hurricane have been found in the immediate neighborhood);
 - damages due to failure to immediately report the defect discovered;
 - worsened quality of coating due to the natural ageing process (fading, oxidation);
 - defects due to using abrasive or aggressive cleaning products;
 - 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 local representative of "MERCOR" S.A.

10. CERTIFICATE

 Reg. No. 041/P-007	NOTIFIED BODY No. 1396 Osloboditeľov 282, 059 35 Batizovce, Slovakia tel. +421 52 7752298 - fax. +421 52 7881412 - http://www.fires.sk	 The Experts on Fire Safety
<p>Certificate of constancy of performance</p> <p>1396 - CPR – 0021</p> <p>In compliance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product</p> <p>AUTOMATIC SMOKE BARRIERS (ASB2, ABS 4); MCR PROSMOKE CE AND MCR PROSMOKE CE 1</p> <p>having the performances and used in conditions given by initial type testing report No.: C1396/08/0015/5004/SC, issued by FIRES s.r.o., NB 1396, Slovakia, on 23. 07. 2008 amended by an actual report of continuous surveillance,</p> <p>produced by</p> <p>MERCOR SA ul. Grzegorza z Sanoka 2, 80-408 Gdańsk, Poland</p> <p>and produced in the manufacturing plant</p> <p>MERCOR SA Zakład Produkcyjny, ul. Kvarcowa 3A, Ciepłowo, 83 031 Łęgowo, Poland</p> <p>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</p> <p>EN 12101-1: 2005, EN 12101-1:2005/A1: 2006</p> <p>under system 1 are applied and that the product fulfils all the prescribed requirements set out above.</p> <p>This certificate was first issued on 23rd July 2008 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.</p>		
Batizovce, 13. 03. 2014 055557		 Ing. Mária Gašperová Head of Certification body

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