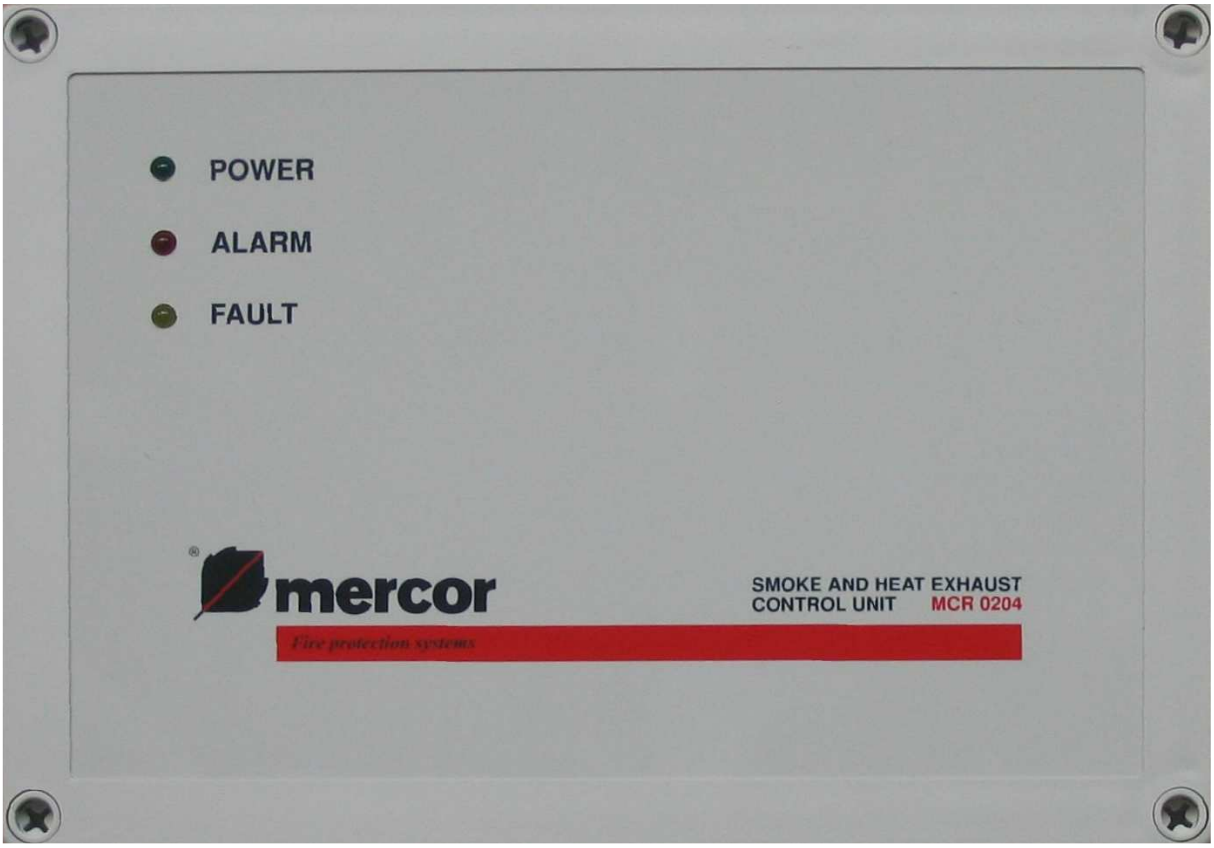
# MCR 0204

## Smoke and Heat Exhaust Control Unit




# Technical and Operating Documentation
# User Instruction Manual

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# 1. USER INFORMATION

Thank you for choosing the MCR 0204 unit. We recommend you to read this User Manual with attention and to apply the recommendations therein. This will ensure smooth and reliable operation of the equipment.

MERCOR SA reserves the right to modify the product or documentation without notice.

We wish to ensure your full satisfaction with our products and we will be glad to provide professional service and assistance to you, should such a need arise.

MERCOR SA

**We recommend that you keep this User Manual inside the unit, so as to be able to access the information quickly, if necessary.**

# 2. INTRODUCTION

The MCR 0204 control unit is used in smoke exhaust systems to control the operation of electrical actuators, and in particular vent actuators in MCR-PROLIGHT and MCR-PROLIGHT+ product range and in other MCR series products which require 24 V= voltage power, used for fire protection purposes.

The electrical MCR 0204 unit may be installed near a smoke exhaust window or in the building supervision room. The unit is supplied with 230 V AC voltage. The working constant voltage is 24 V in output terminals to which the devices of the electrical smoke exhaust control system are connected. The unit is equipped with batteries which ensure system operation for 72 hours after a power outage. After that time a single emergency opening of smoke vents is possible.

The unit has the following features:

- manual alarm release by alarm pushbuttons,
- automatic alarm release by smoke sensors,
- transmitting information about alarm (NO/NC signal),
- transmitting information about defect in the system (NO/NC signal),
- remote alarm reset and vent closing,
- manual opening of smoke vents for ventilation of the building during normal operation without activating the alarm status,
- automatic closing of smoke vents opened for ventilation, in the case of rain or strong wind (when a weather monitoring unit with a wind-rain sensor is installed).

The MCR 0204 unit features visual indicators of its operating status, repeated on alarm pushbuttons, which allows easy identification of alarm status or a system defect.

Smoke exhaust vents which were opened in emergency mode can be closed (cancellation of the alarm) after the cause of the alarm has been removed.

If the smoke exhaust manual pushbutton MCR RPO-1 is connected, this allows remote operation of the unit (defect and alarm signal, remote alarm reset and vent closing after the alarm).

# 3. BASIC INFORMATION ABOUT THE UNIT

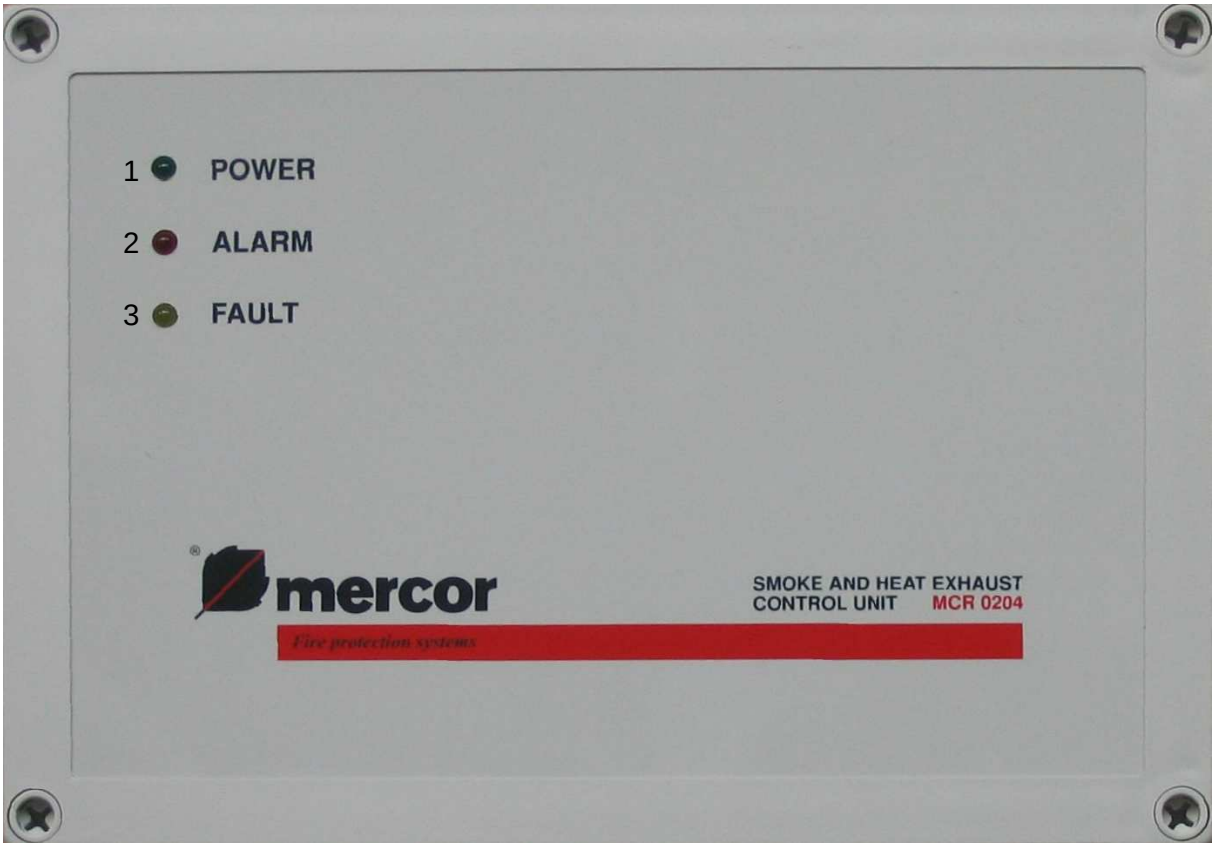


*Fig. 1. Front panel of the unit*

On the front panel there are LED indicators which inform the user about the unit's status.

| No. | Description | Colour | Function |
|---|---|---|---|
| 1 | POWER | green | presence of both sources of supply |
| 2 | ALARM | red | visual alarm notification |
| 3 | FAIL | amber | general system defect/failure signal |

The FAIL LED is blinking when mains voltage 230 V is not present.

The unit's front panel is attached by means of four screws, which can be released using a special screwdriver.


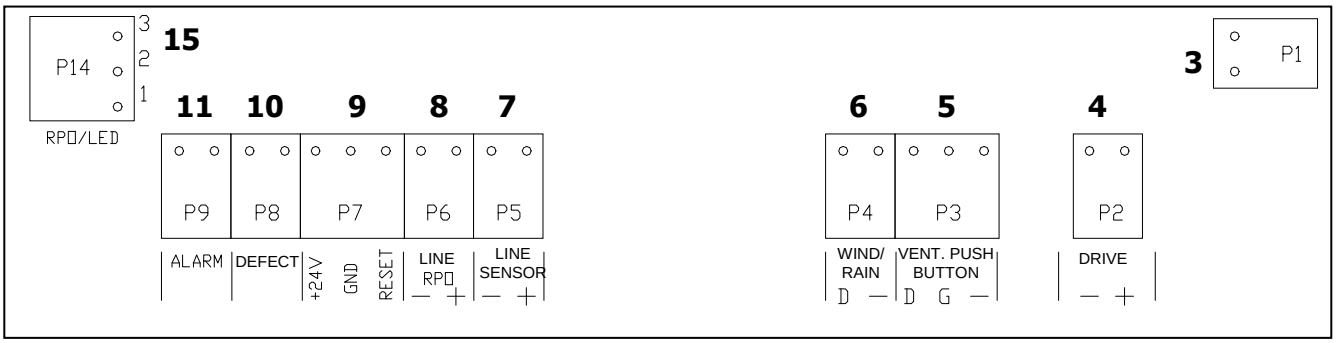


*Fig. 2. View of the unit's interior*

On the unit module's PCB there is a RESET (1) button. It allows to cancel the alarm after the original cause of the alarm has been eliminated. **Press and hold down the button for at least one second !**

In the left part of the unit module's PCB there is a four-position switch SW1 (2), designed to set the opening time for actuators during ventilation. The opening time is the sum of times corresponding to the segments of the SW1 switch which are switched to the ON position.

| Switch position | Time |
|---|---|
| SW1-1 | 12 s |
| SW1-2 | 24 s |
| SW1-3 | 48 s |
| SW1-4 | 96 s |

Note: the default setting SW1-1 through SW1-4 — ON position.

Along the top edge of the module's PCB there are terminal strips which are used for connecting the elements of the system:

| No. | Description | Function |
|---|---|---|
| 3 | P1 | power input 230 V, 50 Hz |
| 4 | P2 | output to actuators (-,+) |
| 5 | P3 | ventilation input (G-top, D-bottom, ⊥ - joint, closing contacts) |
| 6 | P4 | input for wind/rain controls (closing contact) |
| 7 | P5 | sensors line (+,-) |
| 8 | P6 | push-buttons line (+,-) |
| 9 | P7 | auxiliary power/ alarm reset input (+,-, reset) |
| 10 | P8 | defect indication output - relay contact |
| 11 | P9 | alarm indication output - relay contact |
| 15 | P14 | RPO-1 indication output (1, 2, 3) |

Moreover, in the bottom part of the PCB:

| | | |
|---|---|---|
| 12 | P10 | positive end of battery |
| 13 | P11 | negative end of battery |

Fuse on the PCB (14) FS1 - batteries protection (4 A quick).
Fuse on the PCB (16) FS2 - mains line 230 V protection (125 mA quick).

# 4. OPERATION

## 4.1. Normal operation

On the front panel (Fig. 1) the green LED indicator for POWER is on.

Description of LED indicators on the front panel:

| POWER | ALARM | FAIL | UNIT STATUS |
|---|---|---|---|
| | + | | ALARM |
| + | - | - | NORMAL OPERATION |
| - | | + | BATTERY FAILURE |
| - | | B | MAINS FAILURE |
| + | | + | DEFECT |

□ ANY STATUS
\+ ON
\- OFF
B BLINKING

The MCR 0204 control unit is a maintenance-free device. It requires uninterrupted 230 V mains power supply. Should there be power outage caused by mains failure, the installed batteries will ensure 72-hour emergency power supply. **Any power outage exceeding 72 hours can result in permanent damage to the batteries**.

## 4.2. Ventilation of the building

For smoke vents equipped with electrical actuators and the system with ventilation push-buttons, it is possible to open smoke vents for ventilation of the building under normal usage conditions. When you press and hold the push-button (⇑ or ⇓) for at least 1 second, the vent will open or close, respectively.

Pressing the ⇓ button will always cause the smoke exhaust vent to close completely, while the opening time for the ⇑ button depends upon the position of the SW1 switch in the unit module (Fig 2 item 2):

***NOTE!!***

***The ventilation function is inactive when an alarm is on or if there's mains power outage!***

## 4.3. Automatic weather monitoring

If the system is equipped with wind and/or rain sensor and weather monitoring unit, the sensor will block the opening of smoke exhaust vents for ventilation in adverse weather conditions. The wind/rain sensor will automatically close smoke vents (or prevent the vents from being opened by the ventilation push-button) if the wind or atmospheric precipitation is too strong.

*Note!*

1. *In the case of an ALARM signal, smoke vents will open regardless of weather conditions!*

2. *Do not use alarm buttons for ventilation under normal usage conditions!*

## 4.4. Emergency alarm

If the status of the unit is ‘alarm’, the red ALARM LED on the front panel will light up.

Alarm release methods:

**Manual** - break the glass of the smoke exhaust pushbutton and press the button

**Automatic** – depending on the type of sensors, the sensors will be automatically activated when the temperature rises or in smoke conditions.

## 4.5. Deleting the alarm

To delete the alarm status, determine the source of the alarm first. Then remove the cause of the alarm and reset the alarm:

**After alarm release by the pushbutton** (the RPO line), open the pushbutton box, unlock the button using the lever, and delete the alarm using the RESET button inside the casing. The red ALARM LED will go out. The glass also needs to be replaced.

**After alarm release by a smoke sensor** (the sensors line), delete the alarm using the RESET button, either in the RPO pushbutton box or in the control unit. The sensor will not activate the alarm again if there’s no longer excessive smoke/temperature. The red ALARM LED will go out.

**If the cause of the alarm can’t be removed** (for example, when there’s an alarm source failure), disconnect the line corresponding to a particular alarm source. Delete the alarm using the RESET button. The red ALARM LED will go out. **The FAULT LED will light up.**

**In this case CALL THE SERVICE.**

## 4.6. Closing the vents after alarm release.

To close the smoke exhaust vents, first delete the alarm. When you delete the alarm using the MCR RPO-1 button in the casing, the vents will be closed automatically.

After the alarm has been deleted in the control unit, press and hold (for at least 1 second) the ⇓ ventilation button or the RESET button in MCR RPO-1.

## 4.7. Diagnosing defects

Visual signal (Fig. 1) on the unit's front panel informs about a system defect. The signal is repeated in MCR RPO-1.

When only the FAIL LED is on, the batteries have failed. In this case you should check battery connections and the condition of FS1 fuse (see page 6).

When the FAIL (USZKODZENIE) diode blinks, this means that there is no mains power supply. In this case you should check the status of FS2 fuse (see page 6) and the 230 V voltage is present on the unit's terminals.

The default factory settings for the battery voltage control potentiometer must not be changed!

**In case of a system defect CALL THE SERVICE.**

# 5. ASSEMBLY AND START UP

1. Attach the unit near the devices to be controlled by the unit, using appropriate metal connectors selected in accordance with the substrate material. Note: do not drill through the unit's housing — in the case of damage to electronic components caused by dust/debris, any complaint will be disregarded.
2. **Sensors line** - 2 leads (YnTKSY) from P5 terminals.

   End resistor 10 kΩ in the base of the last sensor.

   The maximum number of sensors in accordance with the technical parameters.

3 **Smoke exhaust pushbuttons line (RPO)** - 7 conductors from P6, P7 and P14 terminals. End resistor 10 kΩ in the last pushbutton.

   The maximum number of pushbuttons in accordance with the technical parameters.

4. **Actuators line** - 2 leads (feature PH30, for example HLGs), from P2 terminals. The end terminal in the last assembly box. The maximum number of actuators in accordance with the technical parameters.
5. **Ventilation** - pushbuttons for ventilation (manual flap control, upwards, downwards) – 3 leads (YTKSY or YDY) from P3 terminals. It is possible to connect several push-buttons in parallel.

   It is possible to combine units into ventilation sections. To do this, connect in parallel the ventilation terminals P3 in all units of the section: G-top, D-bottom, ground-joint. Connect the automatic weather control unit to any single unit within the section, to P4 terminals.

   If the automatic weather control unit is to be connected unit to more than one ventilation section, then we connect individual units in parallel. Important! - you have to connect left P4 terminals on the left to one line, and the ones on the right to the other line - do not cross!

6. **Automatic weather monitoring unit** for closing the vents in the case of a strong wind/ heavy rain - 2 leads (YTKSY or YDY) from P4 terminals.
7. **Auxiliary voltage** - P7 terminal. The auxiliary voltage output P7 is short-circuit resistant and may carry a load of maximum two relays.
8. **No-voltage output NC (or NO) for information about alarm** – 2 leads (YnTKSY) from P9 terminals. The jumper H1 allows to select NC output (default) or NO output.
9. **No-voltage output NC (or NO) for information about defect** – 2 leads (YnTKSY) from P8 terminals. The jumper H2 allows to select NC output (default) or NO output.
10. **Mains 230 V, 50 Hz** should be connected to the terminal strip P1 on the unit module's PCB. The power supply for the unit should be separate (units only on the mains line), properly protected by means of an overload circuit breaker in the switching station.

    Do not protect the line by means of a GFCI (RCCB) circuit breaker.
11. **24 V power supply from batteries** (P10, P11). The batteries should be connected in series, taking polarity into account.
12. **Start-up**. Before switching on the power supply, check if the leads are connected properly.
    Note: the leads should be placed and connected in accordance with relevant standards and basic rules for wiring.
    In a correctly operating unit the POWER LED indicator is on.
    In order to check the operation of ventilation, the weather monitoring unit should be disconnected. The weather monitoring unit blocks ventilation for several minutes after the wind has ceased, and in the case of rain the sensor needs to get dry, which takes even more time.

    **Note:** in order to connect the unit you should use leads which satisfy the requirements of current regulations.

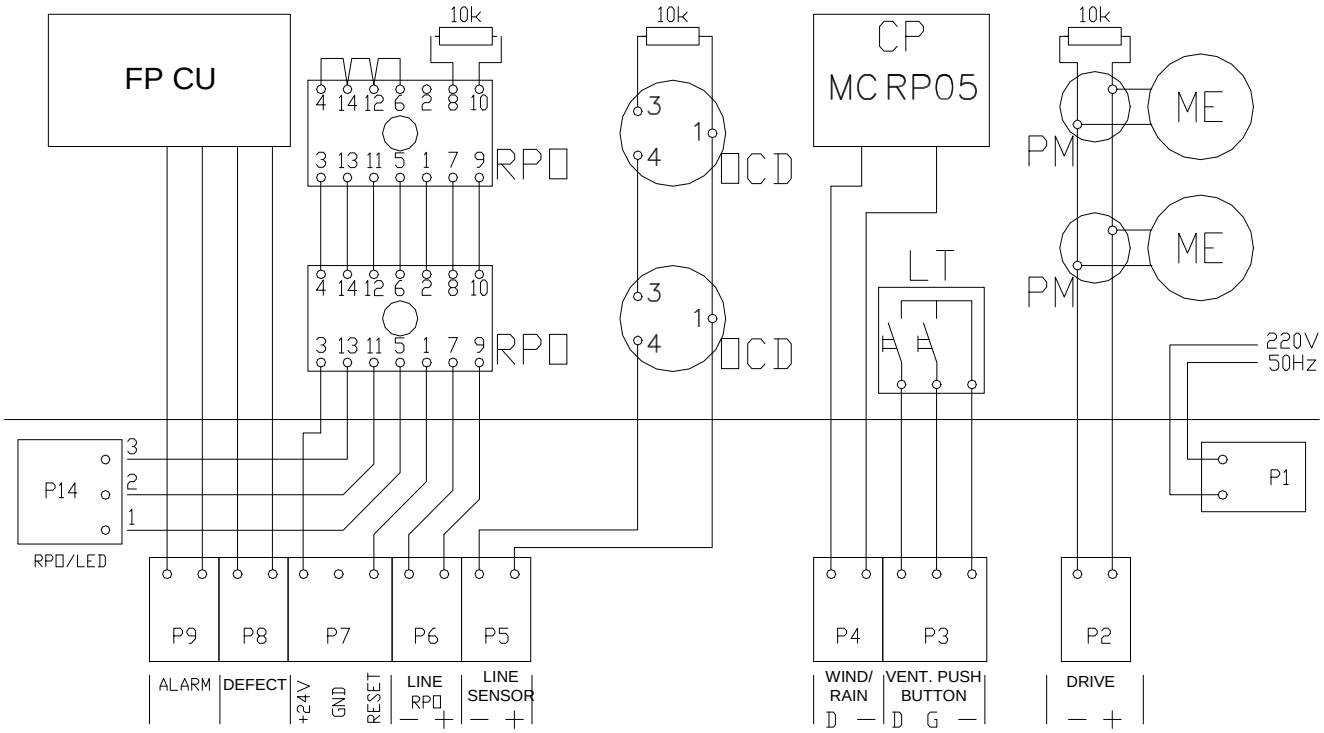


*Fig. 3 Typical configuration of smoke exhaust system with MCR 0204 unit.*

FP CU - fire protection control unit
OCD - optical smoke sensor (KL731)
RPO - smoke exhaust manual push-button MCR RPO-1
PM - assembly box
ME - electrical actuator
CP – weather control unit MCRP054
LT - ventilation push-button

Note: Not all the elements of the system (in particular the connection with fire protection control unit and weather monitoring unit) must be present in the smoke exhaust system.

# 6. WARRANTY TERMS AND CONDITIONS.

1. MERCOR 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 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 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 ($A_4$)). 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;
   - 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.
7. Each defect under guarantee should be reported to a local representative of MERCOR 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 SA,
   - Maintenance or periodic servicing are not done in due time or are performed by unauthorized persons or a service center not authorized by MERCOR, 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 has no warranty obligations.

# 7. MAINTENANCE

1. The equipment should undergo regular servicing every 6 months during the whole period of its operation.
2. The servicing should be conducted by companies with proper authorization of MERCOR or its local representative.

Please contact a local representative of MERCOR for information about maintenance.

# 8. Technical specifications

| **Item** | **Value** |
|---|---|
| Power supply voltage - basic | 230 V (+10%, -15%) 50 Hz |
| Rated power | 10 VA |
| Output voltage (power supply for actuators) | 24 V=, max. 4A |
| Stand-by power supply | 2 batteries HP2-12 (12 V, 2 Ah) connected in series or similar |
| Charging voltage for set of batteries | 27.5 V ± 0.2 V at 20ºC |
| Working temperature range | -10ºC ÷ 55ºC |
| Maximum number of sensors:<br>- Hochiki Europe Ltd., Polon Alfa ZUD, Apollo Fire Detect. Ltd., Pittway Technologica SP.A<br>- GE Security, Alarmcom AG | <br><br>10 pcs.<br>8 pcs. |
| Maximum number of push-buttons of type:<br>MCR RPO-1<br>ROP | <br>4 pcs.<br>10 pcs. |
| Maximum number of actuators – depending upon consumed current, for example for the type:<br>MCR L<br>MCR L K05x<br>MCR L KT10x or MCR L KR10x<br>MCR L KR20x<br>MCR W 08x or G08x<br>MCR W 10x or G10x<br>MCR W 20x or G20x<br>MCR W 26x or G26x<br>MCR W 40x or G40x<br>x - any letter of the alphabet<br>Other types depending upon consumed current (max. 4 A) | <br><br>1 pcs.<br>8 pcs.<br>4 pcs.<br>2 pcs.<br>5 pcs.<br>4 pcs.<br>2 pcs.<br>1 pc.<br>1 pc. |
| Maximum diameter of leads entering the unit | 1.5 $mm^2$ |
| Operation time without mains voltage, in READY mode | minimum 72 hours |
| Load for relay outputs | max. 100 mA, 24 V |
| Protection level for housing | IP 54 |
| Insulation grade | II |
| Dimensions (H x W x D) | 255 x 180 x 100 mm |

* After this time the unit may open actuators once and indicate alarm for 30 minutes.
** Larger diameters are permissible for the actuators line, provided that the cable ends with pin a pin connector with the diameter of up to 1.5 mm.