

"MERCOR" S.A. ul. Grzegorza z Sanoka 2, 80-408 GDAŃSK, Polska tel. (+48 58) 341 42 45, fax (+48 58) 341 39 85 e-mail: mercor@mercor.com.pl www.mercor.com.pl

Systemy zabezpieczeń przeciwpożarowych Fire protection systems

Technical and Operating Documentation

User Instruction Manual



mcr 0204 Smoke and Heat Exhaust Control Unit



Table of Contents

1.	USER INFORMATION	2
2.	INTRODUCTION	3
3.	BASIC INFORMATION ABOUT THE UNIT	4
4.	OPERATION	6
5.	ASSEMBLY AND START UP	8
6.	INSTRUCTION MANUAL FOR CHECKING CONNECTION AND PERFORMANCE OF THE MCR 0204 CONTROL UNIT	9
7.	TYPICAL CONNECTION DIAGRAMS	11
8.	SERVICE AND MAINTENANCE	12
9.	WARRANTY TERMS AND CONDITIONS	12
10.	TECHNICAL SPECIFICATIONS	14
11.	DECLARATION OF PERFORMANCE	15
12.	THE CERTIFICATE OF CONSTANCY OF PERFORMANCE	16

We recommend keeping this Instruction Manual inside the control unit, so that the information is always available when required!

1. USER INFORMATION

The mcr 0204 control unit meets the requirements of the National Technical Assessment **CNBOP-PIB-KOT-2017/0014-1009 issue 2** and the essential requirements of EU directives:

- 2014/35/EU (LVD) regarding electrical equipment provided for use within certain voltage limits;
- > 2014/30/EU (EMC) regarding electromagnetic compatibility.

RELATED DOCUMENTS:

 European certification of constancy of performance of construction products CNBOP-PIB No.1438-CPR-0583 and The Declaration of Performance No. 092/HO/2018 of 07/03/2018 confirming the compliance of the power supply with the requirements of EN 12101-10: 2007.



- EU Declaration of Conformity No. 087/HO/2018 dated 07/03/2018.

The above documents can be downloaded from the "MERCOR" S.A company website - <u>www.mercor.com.pl</u>

Thank you for choosing the mcr 0204 control 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" S.A 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" S.A.

Electrical and electronic equipment should be disposed of and collected separately.

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 install diode).

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 diode 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	yellow	general system defect/failure signal

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

The front panel of unit is attached by means of six 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) pushbutton. 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.

No. Description Function Ρ1 power input 230 V, 50 Hz 3 4 P2 output to actuators (-,+) 5 Ρ3 ventilation input (G-top, D-bottom, \perp - joint, closing contacts) 6 P4 input for wind/rain controls (closing contact) 7 Ρ5 sensors line (+,-) 8 P6 push-buttons line (+,-) 9 Ρ7 auxiliary power/ alarm reset input (+,-, reset) 10 P8 defect indication output - relay contact 11 Ρ9 alarm indication output - relay contact 15 P14 RPO-1 indication output (1, 2, 3)

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

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 diode indicator for POWER is on. Description of diode indicators on the front panel:

POWER	ALARM	FAIL	UNIT STATUS		
	+		ALARM		ANY STATUS
+	-	-	NORMAL OPERATION	+	ON
-		+	BATTERY FAILURE	-	OFF
-		В	MAINS FAILURE	В	BLINKING
+		+	DEFECT		

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 (\uparrow or \downarrow) for at least 1 second, the vent will open or close, respectively.

Pressing the \Downarrow button will always cause the smoke exhaust vent to close completely, while the opening time for the \Uparrow 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!

In the case of an ALARM signal, smoke vents will open regardless of weather conditions!
 Do not use emergency pushbutton for ventilation under normal usage conditions!

4.4 Emergency alarm

If the status of the unit is 'alarm', the red ALARM diode on the front panel will light up. Alarm release methods:

Manual - break the glass of the emergency 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 its cause and reset the alarm:

Alarm indicated by the pushbutton (the RPO line) - open emergency pushbutton housing, unlock the button using the lever and delete the alarm using RESET button inside the housing. The red ALARM diode will go out. The glass also needs to be replaced.

Alarm indicated by a smoke sensor (the sensors line) - delete the alarm using the RESET button, either in the RPO emergency pushbutton housing or in the control unit. The sensor will not activate the alarm again if there's no longer excessive smoke/temperature. The red ALARM diode 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 diode will go out. The FAULT diode will light up.

In this case CALL THE SERVICE!

4.6 Closing the vents after alarm release

To close the smoke exhaust vents, delete the alarm first. When you delete the alarm by using RESET button placed in mcr RPO-1 emergency pushbutton casing, the vents will be closed automatically.

If the alarm was deleted using control unit, press and hold (for at least 1 second) the \Downarrow 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 emergency pushbutton.

When only the FAIL diode 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 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 <u>must not</u> be changed!

In case of a system defect CALL THE SERVICE!

5. ASSEMBLY AND START UP

1. Mount the unit near the devices which are meant 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. <u>Sensors line</u> - 2 leads (YnTKSY) from P5 terminals.

End resistor 10 k Ω in the base of the last sensor.

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

3. <u>Emergency pushbuttons line (RPO)</u> - 7 conductors from P6, P7 and P14 terminals. End resistor 10 k Ω in the last pushbutton.

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

4. <u>Actuators line</u> - 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. <u>Ventilation</u> - pushbuttons for ventilation (manual vent 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. <u>Automatic weather monitoring unit</u> for closing the vents in the case of a strong wind/ heavy rain - 2 leads (YTKSY or YDY) from P4 terminals.

7. <u>Auxiliary voltage</u> - P7 terminal. The auxiliary voltage output P7 is short-circuit resistant and may carry a load of maximum two relays.

8. <u>No-voltage output NC (or NO) for information about alarm</u> – 2 leads (YnTKSY) from P9 terminals. The jumper H1 allows to select NC output (default) or NO output.

9. <u>No-voltage output NC (or NO) for information about defect</u> – 2 leads (YnTKSY) from P8 terminals. The jumper H2 allows to select NC output (default) or NO output.

10. <u>Main supply 230 V, 50 Hz</u> 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. <u>**24 V power supply from batteries**</u> (P10, P11). The batteries should be connected in series, taking polarity into account.

12. <u>Start-up</u>. Before switching on the power supply, check if the leads are connected properly.

<u>Note</u>: the leads should be placed and connected in accordance with relevant standards and basic rules for wiring.

In a correctly operating unit the POWER diode 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.

<u>Note</u>: in order to connect the unit you should use leads which satisfy the requirements of current regulations.

6. INSTRUCTION MANUAL FOR CHECKING CONNECTION AND PERFORMANCE OF THE MCR 0204 CONTROL UNIT

For reasons of operational safety and reliability of the fire protection system, after installing the control panel, check the device by following instructions.

- 1. Check the correctness and reliability of connection of all cables (main power, input and output lines, line continuity resistors) in accordance with Operation Manual and the installation design.
- 2. Check the value of the power supply voltage of the control unit it should be 230 V $^{+10\%}_{-15\%}$, 50 Hz.
- 3. Perform the control panel start-up in accordance with the Operation Manual (chapter 5).
- 4. Check whether the control panel remains in the normal operating state (chapter 4.1).
- 5. After min. 12 hours of charging the batteries, check the voltage at the battery terminals. The measurement must be carried out in the normal operating state (chapter 4.1). The voltage at the battery terminals should be in the range of $26.5 \div 28$ V =.
- 6. Check the correctness of fault detection by the control unit (paragraph 4.7): damage to the RPO button line (e.g. take out the last detector from the socket), damage to the RPO button line (e.g. to open the RPO line, P6 terminal), damage to the actuator lines (e.g. open the actuators line, the control panel in mode smoke exhaust), power supply damage (e.g. 230 V disconnect), battery detection (e.g. disconnect the batteries). Tests should be performed in a normal operating state for any potential damage. In each test case, the fault condition should be detected and signalled on the front panel of the control unit, on the service panel for selected faults, by means of the mcr RPO-1 emergency pushbutton (if connected) and on the fault indication output (by ohmmeter control).
- 7. Check whether the control panel is correctly detecting alarms. Check all connected alarm sources:
 - a) alarm from the RPO line (press the mcr RPO-1 emergency pushbutton),
 - b) alarm from the detector line (activate the detector),
 - c) alarm from the external alarm line (activate external device or open the line).

Tests should be performed in the normal operating state independently for each connected alarm source. In any case, the alarm condition should be detected and signaled by the control unit (chapter 4.4) on the front panel, on the service panel with the diode of the proper alarm source, with the diode of the mcr RPO-1 (if connected) and on the alarm signal output (ohmmeter control), and all connected fire devices controlled by the control panel should be controlled.

- 8. If applicable, check that the daily ventilating function (chapter 5, item 5).
- 9. Check whether the control unit remains in the normal operating state after all tests have been performed (chapter 4.1).
- 10. The control panel can be put into operation if all tests have been completed correctly. Only an efficient and properly connected control unit can work in fire protection systems. In the event that at least one result of the above tests is not correct, the control panel cannot be used in security systems and should be restored for proper operation.

After checking the above points, make a record in all fields of the table below.

Date of control	Result: Working/not working	Name and surname	Name of enterprise:	"MERCOR" S.A's authorization no:

7. TYPICAL CONNECTION DIAGRAMS



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

FP CU - fire protection control unit OCD - optical smoke sensor (KL731) RPO - mcr RPO-1 emergency pushbutton PM - assembly box ME - electrical actuator CP – weather control unit mcr P054 LT - ventilation push-button

<u>Note</u>: 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.

8. SERVICE AND MAINTENANCE

The technical condition of fire protection devices installed in the facility is of key importance to ensure the safety of users of this facility. The guarantee of reliable operation of the devices can only be obtained by providing regular and professional service care.

"MERCOR" S.A. they should be subjected to periodical technical inspections and maintenance operations every six 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 having valid authorization for the service of devices "MERCOR" S.A. The service carried out in accordance with the above recommendations is one of the basic conditions of preservation of rights arising from the guarantee and the obligation of the users / owners or managers of the resulting facilities from the law.

The obligation to carry out service inspections of fire-fighting equipment results from the provisions of the Ordinance of the Minister of Interior and Administration of June 7, 2010 on fire protection of buildings, other construction objects and areas (Journal of Laws of 2010 No. 109, item 719). In order to be able to perform activities included in the scope of service inspections, as well as service and warranty activities such as visual inspection or repair, it is necessary to provide physical access to the devices.

It is recommended to perform those check-ups in between of inspections:

1. Checking the status of signaling of control diodes.

2. Checking the condition of electrical connections paying special attention to looseness and mechanical damage.

In matters related to technical inspections, maintenance and repairs of devices, you can contact representatives of "MERCOR" S.A., tel. 58/341 42 45 during operating hours 8 - 16 (Mon-Fri), e-mail: <u>serwis@mercor.com.pl</u>.

9. 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 6.
- 3. "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.
- 4. Liability under the Guarantee covers only defects resulting from causes inherent in the equipment sold.
- 5. 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.
- 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" S.A. 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" S.A. immediately, i.e. within 7 days of its discovery.
- 8. Applications can be made by phone at +48/ 58 341 42 45, by email to <u>claim@mercor.com.pl</u> or by sending a letter to: "MERCOR" S.A. 80-408 Gdańsk, Grzegorza z Sanoka 2.
- 9. The Buyer/Guarantee Holder is responsible for proper operation and maintenance of the equipment and for regular (min. twice a year) servicing.
- 10. 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.
- 11. Moreover, in the cases specified in par. 10, "MERCOR" S.A. has no warranty obligations.

As regards matters not regulated by these "Warranty terms and conditions", relevant regulations in the Civil Code, and in particular Art. 577-581 shall apply.

10.TECHNICAL SPECIFICATIONS

Item	Value
Central type	conventional
Power supply voltage - basic	230 V (-15%, +10%) 50 Hz
Rated power	100 VA
Output voltage (power supply for actuators)	24 V=, max. 4 A
Stand-by power supply	2 batteries HP2-12 (12 V, 2
	Ah) or similar connected in
	series max. 2,3 Ah
Charging voltage for set of batteries	27.5 V ± 0.2 V at 20ºC
Working temperature range	-5ºC ÷ 40ºC
Maximum number of sensors in line:	15 pcs.*
Maximum number of push-buttons of type:	_
mcr RPO-1	4 pcs.
	10 pcs.
Maximum number of actuators – depending upon consumed	
Current, for example for the type:	1 pcc
	4 psc.
MCRW 08x or G08x or SG08x or S08x	5 psc.
MCRW 10x or G10x or SG10x or S10x	4 psc.
MCRW 13x or G13x or SG13x	3 psc.
MCRW 16x or G16x or SG16x	2 psc.
MCRW 20x or G20x or SG20x	2 psc.
MCRW 26x or G26x or SG26x	1 psc.
MCRW 40x or G40x or SG40x	1 psc.
x - any letter of the alphabet	
Other types depending upon consumed current (max. 4 A)	
Rated wire size	2.5 mm ² **
Operation time without mains voltage, in READY mode	minimum 72 hours***
Load for relay outputs	max. 100 mA, 24 V
Environmental class acc. to KOT	1
Environmental class acc. to EN 12101-10	1
Functionality class	A
Protection level for housing	IP 54
Insulation grade	11
Dimensions (H x W x D)	230 x 300 x 86 mm

* In standby mode, the current consumption of 1 sensor cannot exceed 80 μ A!

** Larger diameters are permissible for the actuators line, provided that the cable ends with pin with the diameter of that pin up to 2.5 mm².

*** After this time the unit may open actuators once and indicate alarm for 30 minutes.

11.DECLARATION OF PERFORMANCE

	Declaration	of Perfo	ormance
	Declaration n	o.: DWU 08	8/HO/2018
1. Unique identification code of the product-type		Control panel	for smoke exhaust and ventilation type mcr 0204
2. Intended use or uses of the construction produc	t	Fire safety – P systems	ower supply equipment to be used in smoke and heat control
3. Name and contact address of the manufacturer Name and contact address of the production pla	nt	"MERCOR" 5. GAL – Stanisła	A., ul. Grzegorza z Sanoka 2, 80-408 Gdańsk, Polska rw Chamski, ul. Polna 11, 80-209 Tuchom, Polska
4. Name and contact address of the authorised rep	resentative	-	
5. System(-s) of assessment and verification of con	stancy of performance	1	
6a. Harmonised standard		EN 12101-10:	2005+AC-2007
Name and identification number of the notified	body	Centrum Naul	kowo-Badawcze Ochrony Przeciwpożarowej, 1438
6b. European Technical Assessment		-	
Name and identification number of the Technic	al Assessment Body		
7. Declared performance:	100 - 160 160 160 160 160 160 160 160 160 160		
Essential characteristics of the product	EN 12101-10:2005 Clause	5+AC:2007	Performance
	Operational n	ellability	
Functions	6		Pass; $I_{maxs} = 2 A_{\nu} I_{maxs} = 4 A$
Material, design and manufacture	7		Pass; IP 54, Environmental class I
	Operating parameters	in fire condition	15
General provisions Power sypply source – general provisions	4.1		Pass; Functional class A
and the second se	Response	time	
General provisions	4.1		Pass
Power sypply source – general provisions	5.2.1		Not applicable
Power supply from reserve source (batttery)	6.2.2		Pass, Standby mode without main source of power supply = min. 72 h
Power supply from reserve source (generator)	6.3.1		Not applicable
8. Specific Technical Documentation			
he performance of the product identified above is i ccordance to regulation no. (EU) 305/2011 on sole	n conformity with the d responsibility of the ma	leclared perform nufacturer spec	nance. This declaration of performance has been issued in ified above.
igned for and on behalf of the manufacturer by:			Jarosław Rompca Director of Smoke and Heat Exhaust Department
<u>Gdańsk, 07.03.2018</u> (Place and date of issue]			(Signature)

12.THE CERTIFICATE OF CONSTANCY OF PERFORMANCE

