



Technical Documentation

The Fire control panel

SCP-03

Rev.02

Before starting installation and operation, read the following instructions.

Failure to follow the instructions contained in this manual may be dangerous or cause damage to the control unit.

SKALMEX Sp. z o.o. is not liable for damages resulting from operating contrary to the following instruction.

The product is not suitable for further operation, should be sent to one of the points dealing with the collection of waste electrical and electronic equipment.

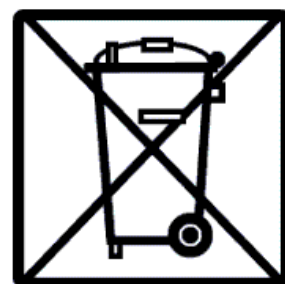


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1. Introduction

1.1 Subject of documentation

The following technical and operational documentation (DTR) allows you to get acquainted with the construction and operation of the smoke removal system control panel and the control of the fire gate or airlock.

DTR contains the necessary information for designers, installers and conservators of SCP-03.

1.2 Intended use of the control unit

SCP-03 control panel is intended for:

- fire signaling detected by sensors, manual call points, manual smoke exhaust buttons and external alarm signals,
- control of fire-fighting devices, (smoke exhaust damper, gate or fire lock),
- fire information transfer to external security systems,
- alarm.

1.3 Protection and safety of use

The smoke removal system control panel and the SCP-03 gate or airlock control are classified as protection class I devices and should only be used if additional electric shock protection is used in the form of connection to the machine's protective terminal, protective conductor (PE) or protective-neutral conductor (PEN).

The installation should be made of wires with appropriate resistance to fire.

Observe the required distances of the low-current installation from the high-current installation and the lightning protection in order to

avoid signal interference that may cause distortions in the control unit.

The maximum ambient temperature should not exceed 75° C. The space left around the control panel should be at least 15 cm.

Maintenance and periodic inspections must be carried out by authorized personnel of companies trained by SKALMEX Sp. z o.o. at least once a year.

All repairs must be carried out by the manufacturer. SKALMEX Sp. z o.o. is not responsible for the operation of equipment maintained and repaired by unauthorized companies.

1.4 Delivery range

- Control panel for smoke extraction and gate or airlock control fire protection SCP-03
- Operation and maintenance documentation Rev.02
- Warranty book
- Single package
- A set of end of line resistors (4k7)
- A set of series resistors (1k)
- Safety diodes for electromagnetic brakes
- 2 pcs batteries (2x2,3Ah)

The scope of delivery does not include sensors, manual call points, manual smoke exhaust buttons and signaling devices.

1.5 Guarantee

1. The warranty period is calculated from the moment the control panel is issued or installed.
2. The condition for recognizing the warranty is performance by SKALMEX Sp. z o.o. or a company authorized by the manufacturer to require periodic system maintenance with a frequency of at least once a year.
3. The warranty period is:
 - 24 months provided that the control panel has been installed by SKALMEX Sp. z o.o. or an authorized company for assembly.
 - 12 months when the assembly is not carried out by the manufacturer or authorized companies.
4. The device loses the warranty as a result:
 - finding damage resulting from incorrect installation or use contrary to the instructions,
 - performing maintenance by companies not authorized by SKALMEX Sp. z o.o.,
 - making repairs or structural changes on their own,
 - damage found as a result of random events.

2. Product description

The smoke removal system control panel the SCP-03 gate or airlock control is designed for use in smoke removal systems and the control of the gate or airlock cutting off hazardous rooms.

The Alarm state can be issued by signals from: sensors, manual smoke exhaust buttons, manual call points, external fire protection systems.

The control panel monitors the line continuity:

- electromagnetic brakes for fire gate engines,
- smoke exhaust damper,
- fire detector,
- manual smoke exhaust button (both set and reset),
- manual call point,
- external SAP fire signal input.

The battery voltage and the presence of the mains supply are also checked, in the event of a power outage there is an automatic, uninterrupted power supply switching to the backup (battery) mode. The battery condition is checked, if the battery resistance is too high (above 1.2 Ohm), the control panel will report an error of battery damage or wear by flashing the Battery diode.

The control panel is signaling of the device status by diodes on the housing cover and has a multiplied output of these signals which can be displayed e.g. in a manual smoke exhaust button.

Basic signaling:

- network (mains operation),
- battery (operation from batteries if it is on, battery damage if it is flashing),
- alarm (control panel alarm status),
- failure (failure status if lit, testing status if flashing).

Additional signaling:

The diodes located on the control panel board indicate the type of error that occurs.

A brief description of the main control panel functionalities:

- Deactivation of the electromagnetic brakes of fire gate motors during an alarm
- Manual gate travel control (up / down)
- Speed control input for fire gate motors disconnecting the 230V AC power supply
- Opening the smoke exhaust damper in the alarm state of the control panel
- Re-opening the damper during an alarm (option)
- Blocking the option of remote alarm reset in the manual smoke exhaust button (option)
- Manual control of the smoke exhaust damper (ventilation)
- Maintenance of ventilation buttons (option)
- Automatic closure of the damper after a set time (ventilation option)
- Automatic damper closing after mains power failure (option)
- Limitation of the damper extension (time adjustable by potentiometer option)
- Automatic closure of the damper caused by a signal from a wind and rain sensor
- Alarm triggered by damage to the sensor line or buttons (option)
- Transfer of alarm and failure signals to external systems using relay contacts
- Activation of the external optical or sound signaling relay during an alarm
- Activation of the door electromagnetic lock relay during alarm
- Manual entry into the testing state by long pressing (10-12s) of the button on the control panel board.
- Deleting the alarm state by briefly pressing the button on the control panel board (<3s)

ATTENTION - All functions related to the alarm state have a higher priority than the other functions of the control unit.

3. Control panel technical data

Control panel type SCP-03

Overall dimensions 260x312x125mm

Total weight <7 kg

IP 42 housing tightness

Environmental class: 2

Operating temperature range:

- 5 ° C ÷ + 50 ° C (Long-term operation)

- 5 ° C ÷ + 75 ° C (Short-term operation max. 2 hours)

Permissible relative humidity of operation 95% at + 40 ° C

Transport temperature range - 20 ° C ÷ + 50 ° C

Supply voltages and output currents:

50 Hz 230 V network + 10 / -15%

Reserve battery 2 x 13.8 V 2x2,3Ah

Voltage supply of external devices stabilized 24 V + 10 / - 10%

Voltage supply of external devices stabilized 24 V +5 / -12%

Permissible current consumption from the external devices power output:

- Stabilized power supply output max <500mA

- Unstable power supply output (signaling) max <400mA current

- Maximum continuous smoke extract damper motor current 4A impulse <2s 8A

- Maximum power supply for 6A fire gate motors at 230VAC

- Maximum electromagnetic brake current of the 600mA fire gate

- Maximum battery resistance 1.2 ohm

Detection lines:

4 lines:

- Conventional sensor, Number of detectors in the detection line ≤ 6
- RPO (Manual smoke exhaust button), Number of manual call points and push buttons on line ≤ 10
- ROP (manual call point)

End resistor in the 4k7 detection line 1% 0.25- 0.6W

End resistor of the smoke damper actuator 4k7 1% 0.25-0.6W

Optional series 1k 1% 0.25-0.6W detection line resistor, some detection devices (e.g. buttons) have this resistor already built-in.

Signaling line:

Signal voltage of 24 V + 10% - 10%

Permissible siren current max <400 mA.

Relay outputs:

- alarm 1 changeover contact 2A 30VDC
- failure 1 changeover contact 2A 30VDC
- multiplied signals of the door motors of the gate x4 pcs 1 changeover contact 8A 250VAC
- output electromagnetic jumper door 1 changeover contact 8A 250VAC

4. Configuration and data reading options

In the SCP-03 control panel, access to configuration elements and enabling the control panel status reading has been divided into 3 levels.

Access level 1 - includes signaling and buttons on the control panel main cover, access is not restricted.

Access level 2 - includes all configuration switches, error reading LEDs and all control panel I / O terminals, access is limited by key lock. Only authorized persons access.

Access level 3 - includes the programming connector of the control panel, access is limited by blocking the ability to read data. Only persons authorized by SKALMEX Sp. z o.o. have access.

Level 1

At this level, 4 LEDs indicating the control panel status are available:

NETWORK (green) - if it is lit, the control panel is powered from 230VAC network

BATTERY (blue) - if lit, the control panel is powered by battery, if the battery is pulsing, the battery is damaged or worn out.

ALARM (red) - if lit, the control panel is in alarm condition

TROUBLE (yellow) - if lit, the control panel has detected a fault. If the control panel is flashing in the testing state.

Gate control buttons (up / down) are also available.

Level 2

At this level are available:

- a) Configuration switches **SW1, SW2, SW3**
- b) **P1** control potentiometers
- c) Diodes for reading errors **D1, D2, D3, D4**
- d) **B1** button
- e) **D5** test diode
- f) **D6** hardware watchdog LED

Ad. a

The first 3 switches are used to set the ventilation time

SW1.1	SW1.2	SW1.3	Minutes
0	0	0	0
1	0	0	6
0	1	0	15
1	1	0	60
0	0	1	90
1	0	1	180
0	1	1	240
1	1	1	360

The time can be shortened by 2 minutes if the dip switch is off **SW2.1**

SW1.4-Inclusion of incomplete opening of the smoke vent

SW2.1-Supporting the ventilation buttons (once briefly pressing the ventilation button causes the smoke exhaust damper to move to the end position).

SW2.2-Blocking the option of external alarm reset caused by the manual smoke exhaust button.

SW2.3- Retry attempt to open the smoke vent during an alarm for 30 minutes in 2 minute cycles.

SW3.1-Automatic closing of the smoke vent damper in the absence of 230V mains supply for more than 10s.

SW3.2-

a) setting the SW3.2 dip in the ON position applies to the SAP signal with the NC output. The connection drawing is on page 33.

b) setting the SW3.2 dip in the OFF position applies to the SAP signal with NO output. The drawing is on page 26.

Ad. b

P1-Potentiometer for adjusting the time of incomplete opening of the smoke exhaust damper.

(For a correct re-counting of the smoke flap opening time, a minimum interval of 8 minutes should be maintained between successive incomplete openings).

Ad. c

LEDs indicating what kind of error occurs, If more than one error occurs simultaneously, the LEDs change state at intervals of about 4s, displaying the next error (1-indicates that the LED is on).

If only the failure diode on the housing is lit and no diode indicating the type of error is lit, then the main power supply failure occurs.

Error code				The type of error
D1	D2	D3	D4	
0	0	0	0	No errors
1	0	0	0	Damage to the engine brake line or fuse 1
0	1	0	0	Damage to the engine brake line or fuse 2
1	1	0	0	Short circuit in the fire alarm system signal input line
0	0	1	0	Short circuit in the fire alarm system signal input line
1	0	1	0	Short circuit in the fire sensor line
0	1	1	0	A break in the fire sensor line
1	1	1	0	Short circuit in the RESET line of the manual smoke exhaust button
0	0	0	1	A break in the RESET line of the manual smoke exhaust button
1	0	0	1	Short circuit of the manual smoke exhaust button in the SET line
0	1	0	1	A break in the SET line of the manual smoke exhaust button
1	1	0	1	Short circuit in manual call point
0	0	1	1	A break in the manual call point line
1	0	1	1	Blown fuse or damaged mosfet in the smoke damper motor line
0	1	1	1	A break in the smoke damper engine line
1	1	1	1	Battery error, voltage too low or too high. In conjunction with the blue LED on the front panel flashing, the battery is damaged or disconnected.

Ad. d

The B1 button is used for:

- Deleting the alarm condition by pressing briefly (<3s)
- Entering the control panel testing state by long-pressing the button (10-12s)
- Pressed for 5 seconds when connecting the control unit to the power supply, it turns off or on the signaling of brake errors. Switching off will be signaled by blinking of all four error LEDs (D1-D4) and switching on by blinking of one LED (D1).

This option is useful when the motors we connect do not have brakes or only a smoke exhaust damper is connected.

Ad. e

The test LED blinks every second during the control panel normal operation.

Ad. f

The D6 diode signals the processor reset with a hardware monitoring system.

5. Description of control panel operating states

5.1 Smoke alarm status

The smoke exhaust alarm condition can be triggered only by the signal of the manual smoke exhaust button.

Deletion is possible by:

- Pressing the B1 button on the control panel board
- Pressing the reset button on the manual button unless the option of remote alarm reset by switch SW2.2 has been blocked in the control panel

During the smoke exhaust alarm status, the control panel does not respond to manual control of the smoke exhaust flap and other signals that may disturb correct operation in the alarm state, the red diode with the signature "ALARM" lights continuously on the front panel. The gate buttons work unchanged.

The smoke vent is opened.

Also included is a relay responsible for transmitting the alarm signal to external devices, output for an external acoustic and / or light signaling device and an additional relay that can be used for the door electromagnetic lock.

There is an option to try again to open the smoke damper for 30 minutes in 2-minute opening and waiting cycles.

Enabling this option is possible with the configuration switch SW2.3.

5.2 Main alarm status

The main alarm condition can be triggered by signals:

- With fire detectors
- Manual call point
- External SAP input
- Damage to the detector or fire warning line if this option has been enabled with the SW3.2 configuration switch
- Deleting is possible only by pressing the B1 button on the control panel board.

During the main alarm condition, the control panel does not respond to manual control of the smoke exhaust damper and the fire gate, as well as other signals that may interfere with proper operation in the alarm state, the red LED with the signature "ALARM" lights continuously on the front panel.

The brakes of the gate or fire dam are turned off, the smoke vent is opened.

Also included is a relay responsible for transmitting the alarm signal to external devices, output for an external acoustic and / or light signaling device and an additional relay that can be used for the door electromagnetic lock.

There is an option to try again to open the smoke damper for 30 minutes in 2-minute opening and waiting cycles.

Enabling this option is possible with the configuration switch SW2.3.

5.3 Supervision status

In the supervised state, the control panel checks all input signals awaiting the appearance of the signal associated with the alarm.

In this state, all functions of manual control of the smoke exhaust damper and the fire gate or airlock are available.

Only the green "NETWORK" LED should light up on the control panel cover or if the control panel has switched to battery power, the LED with the "BATTERY" signature will light up.

5.4 Testing status

Entering the testing state is possible by prolonged pressing (10-12s) of the B1 button, the LED with the signature "TROUBLE" flashes on the control panel cover.

Exit from this state is done by briefly pressing the B1 button.

The following functions are performed in the testing state:

- Multiple switching on and off of all LEDs in the control panel for checking their operation.
- After a few seconds, simulating an alarm condition for checking the correctness of the control panel response.

5.5 Failure status

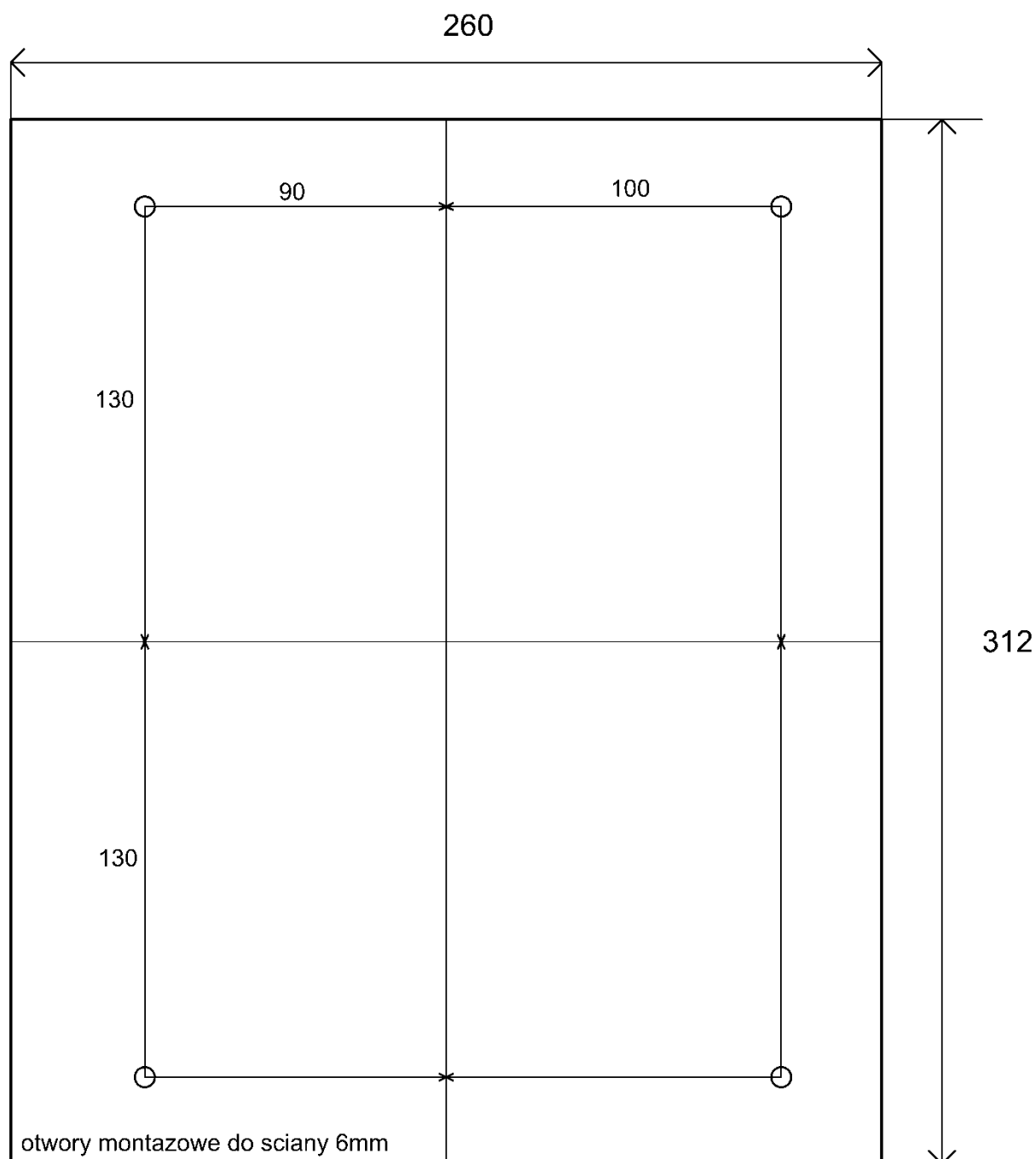
Entering this state is carried out automatically after detecting an error on one of the lines checked, the diode with the signature "TROUBLE" on the control panel cover and the diodes (D1, D2, D3, D4) on the panel cover display the error number.

This condition does not affect the control panel operation.

The failure condition disappears automatically when no error occurs. The failure condition can also be caused by damage to the battery, in which case the battery LED will additionally flash.

6. Installation of the control panel

The device is installed using 4 wall plugs of a size not less than 6 mm. The location of the mounting holes is shown in the figure below.



Wiring installation

Detection lines should be routed in accordance with applicable cable routing rules. The lines should not be installed along high lines, they must be continuous, terminated with line resistors (4k7). In most ROP, RPO buttons, the above resistor is already mounted, if it is not mounted after pressing the manual call point button, we will receive a failure signal instead of an alarm. In this case, the above-mentioned resistor should be added in series with the contact, which is supplied with the control panel. Before connecting cables to the control panel, make sure that the polarity of the cables has not been changed. It is recommended to use certified cables with a minimum diameter of 0.8mm for making detection lines. Pay attention to the continuity of the shielding cable to eliminate the effects of interference. The cables are fit into the switchboard from below through cable inlets.

It is recommended to insert the detection lines as far as possible from each other from the 230VAC cable supplying the control panel as well as the cables of the gate motors and fire damper. A diode connected to the control panel should be mounted directly on the gate's electromagnetic brake terminals, which additionally protects the control panel against over-voltages if the connector is accidentally pulled out during the control panel operation.

The diode should be mounted:

Terminal No. 4 - Cathode

Terminal No. 5 – Anode

Particular attention should be paid to connecting the smoke exhaust damper, the clamps do not have a specific polarity because it changes depending on the direction of flap travel. After connecting the smoke exhaust damper cables, trigger an alarm and check if the damper starts to open.

Otherwise, you must swap the cables with each other. The last operation is the installation in parallel with the damper wires of the end of line resistor (4k7), as close as possible to the smoke exhaust damper. The way of connecting the ventilation buttons and manual

control of the fire gate is the same, the active state of the input is during a short to GND, do not connect these inputs to any other voltages. To the output of information LEDs, connect the LEDs with anode (+) to the appropriate output (network, alarm or failure), connect the cathode (-) of all LEDs together and connect to the GND terminal. The supply voltage for additional LEDs is 24VDC.

7. Configuration and commissioning

Recommended actions before switching on the control panel:

- checking the wiring system for short circuits or breaks,
- checking the polarity (+, -) of the wires with the markings in the control panel,
- checking for the presence of terminal resistors (4k7) at the ends of the lines and at the unused control panel inputs,
- checking the presence of a safety diode at the solenoid brake terminals (terminals 4.5),
- configuring the implemented functionalities with switches on the control panel board,
- if necessary, remove the tin jumper located behind the "MOTOR CONTROL" connector, and connect to the connector a device for controlling the speed of opening the fire gate, which may interrupt the power supply circuit of the relays controlling the up / down gate travel.

Recommended actions after switching on the control panel:

- in the event of fault status signaling, read the error codes
- remove any possible damages so that the control panel signals the supervision status and no damage;
- test the control panels including testing status
- check that the control panel is behaving correctly in the alarm state,
- check the operation of other external devices connected to the control panel (weather detector, acoustic and / or sound signaling device).

After switching on the control panel, you should not:

- Change settings with configuration switches
- Screw and unscrew the wires
- Remove and insert plugs with cables connected to the headquarters

8. Manual control

8.1 Fire gate or lock

Manual control of the fire gate is done using the up / down buttons on the control panel front panel. They have a lock that prevents the gate from moving up and down at the same time. When pressing the drive button up or down, the electromagnetic brake is released first, then 230VAC power is supplied to the gate motor. When the control panel receives a signal from the appropriate limit switch input (24VDC power loss at a given input), the motor 230VAC power supply is turned off and the electromagnetic brake is applied.

8.2 Smoke exhaust flap

Manual control of the smoke exhaust damper can be done by means of ventilation buttons, it is possible to open and close it. The SW2.1 configuration switch can be selected with the option to support ventilation buttons, i.e. if it has been activated once, the button is pressed once and the smoke exhaust flap moves to the end position (time of maximum opening length is set to about 2 min). Pressing the button opposite to the current direction stops the flaps. The signal has priority over manual control alarm and then weather input. After a power outage, the option of manual ventilation is blocked, which returns when the power supply returns.

Weather input

When the signal from the weather input is received (short circuit to gnd), the control panel automatically closes the smoke exhaust damper. Re-opening it is possible only manually and turning off (except for the alarm condition) after the signal loss at the weather input.

Smoke damper closing in the absence of 230V power supply

When the above option is selected with the SW3.1 configuration switch, when the control panel power is off for more than 10s the smoke vent will be closed automatically. After the return of the mains supply, the damper will not open automatically, it can only be re-opened manually.

Incomplete opening of the smoke vent

This option can be enabled with the SW1.4 configuration switch, it is active only if the support for ventilation buttons (SW2.1) is also enabled. The opening time is set by the P1 potentiometer, the range of available times is from 0-50s. After incomplete opening of the smoke vent, you should wait a minimum of 8 minutes before re-opening again. Not waiting a certain time will cause a difference in the opening time compared to the set time (time may be shortened).

Automatic ventilation option

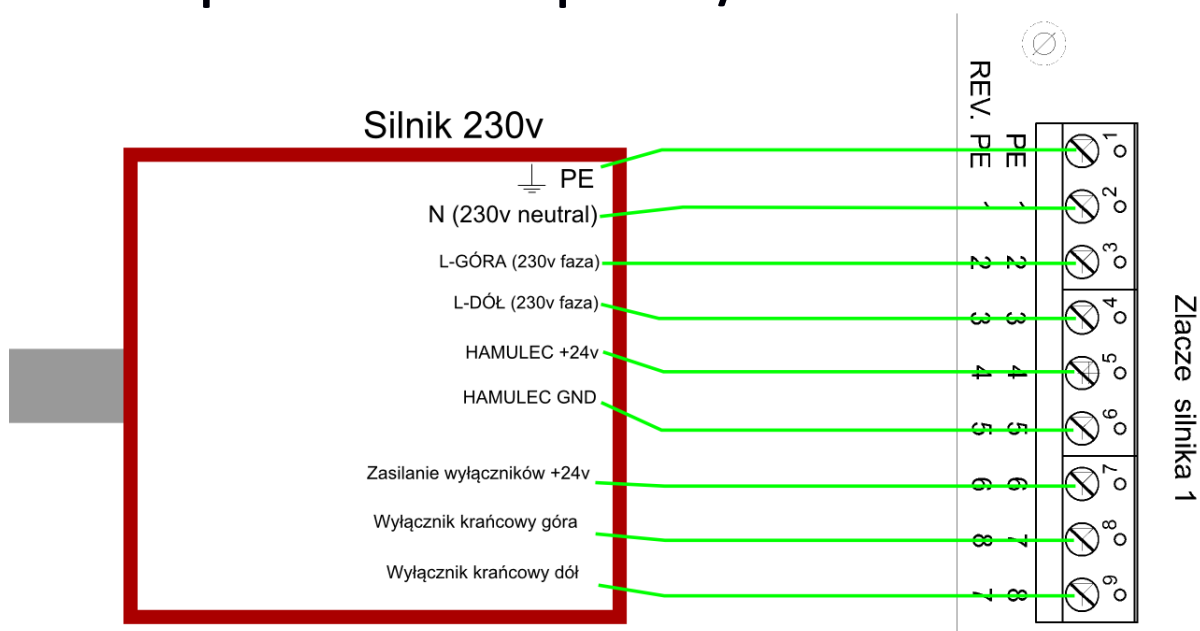
Option enabling ventilation for a specified time, it is activated by setting the time with the SW1.1, SW1.2, SW1.3 configuration switches.

When the set time is set, the manual opening of the smoke vent damper begins the countdown of time until the smoke vent damper closes automatically.

Pressing the open button again resets the time and the countdown starts from the beginning, pressing the close button during the countdown stops the time.

Return to counting is possible again after pressing the open button.

9. Description of control panel I / O terminals



There are two identical motor connectors on the board for connecting 230v motors integrated with the brakes.

PE - protective conductor

1. N - neutral cable of 230v network

2. L-UP - phase conductor, when voltage occurs on it, the motor will rotate in the "up" direction

3. L-DOWN - phase conductor, when voltage occurs on it, the motor will rotate in the "down" direction

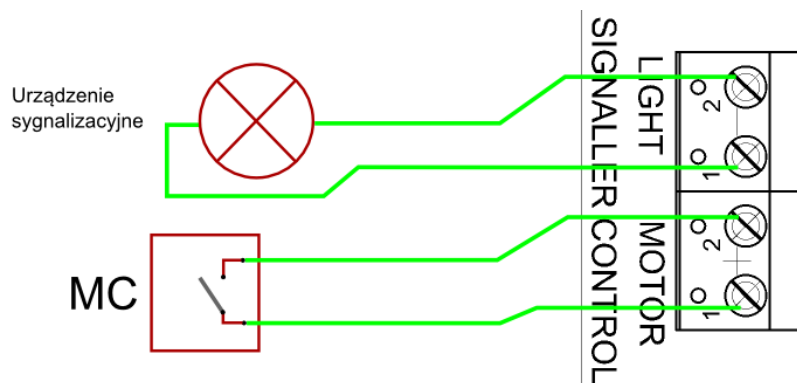
4. BRAKE + 24V - brake supply cable

5. GND BRAKE – 24V brake ground cable

6. power supply for circuit breakers 24V

7. Limit switch up - limit switch signals

8. Limit switch down - limit switch signals

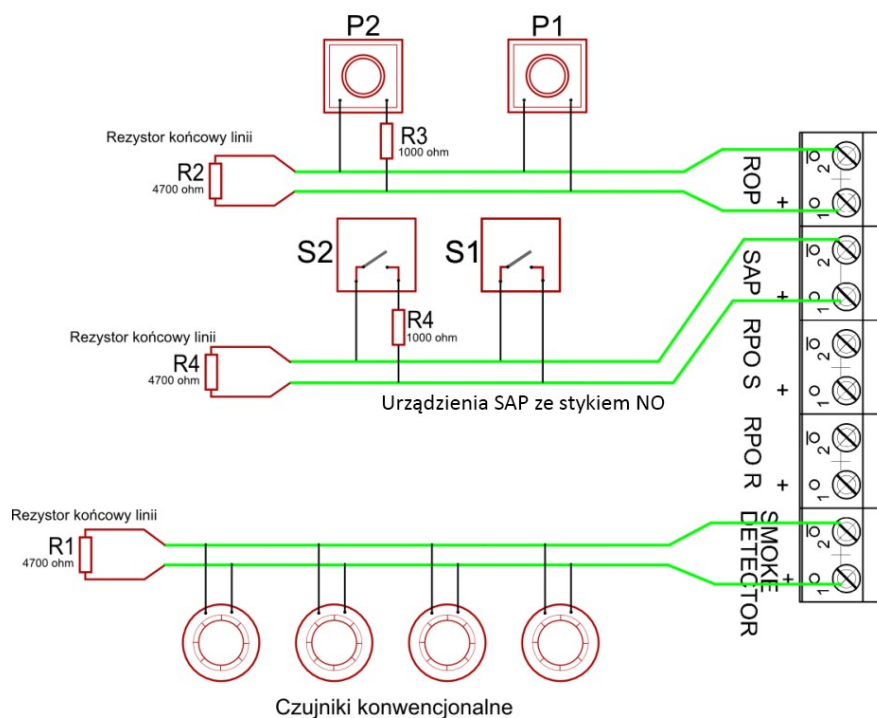


24VDC signaling device output, e.g. bulb or other, which turns on during an alarm.

Motor Control input - optional input for an overspeed prevention device. To use them, solder the tin jumper next to the connector.

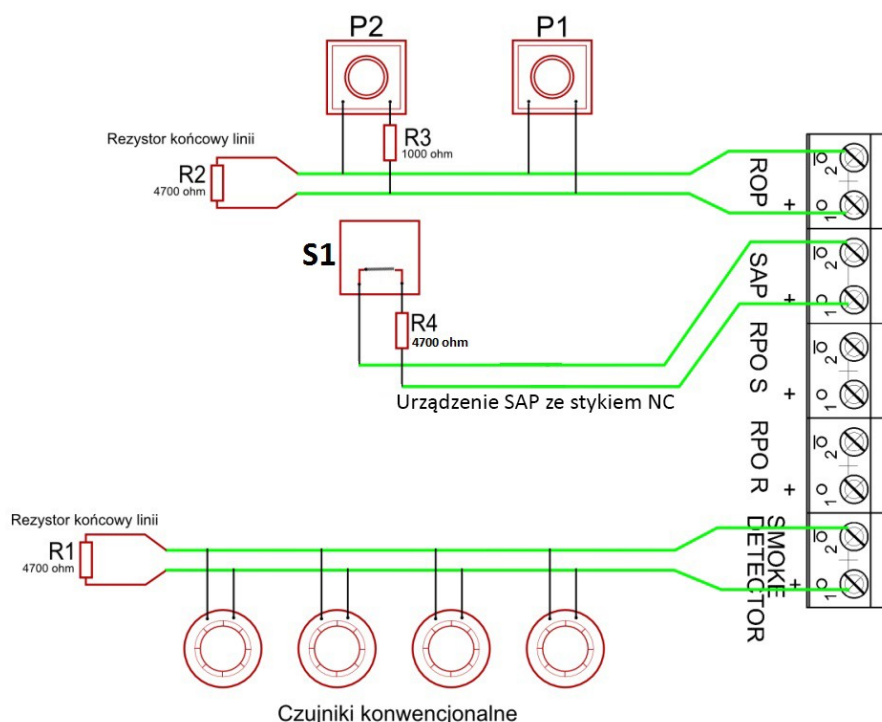
Solution for Fire Control devices with NO contact.

Set SW3 dip SW3.2 to OFF position on switch.



Solution for Fire Control devices with NC contact.

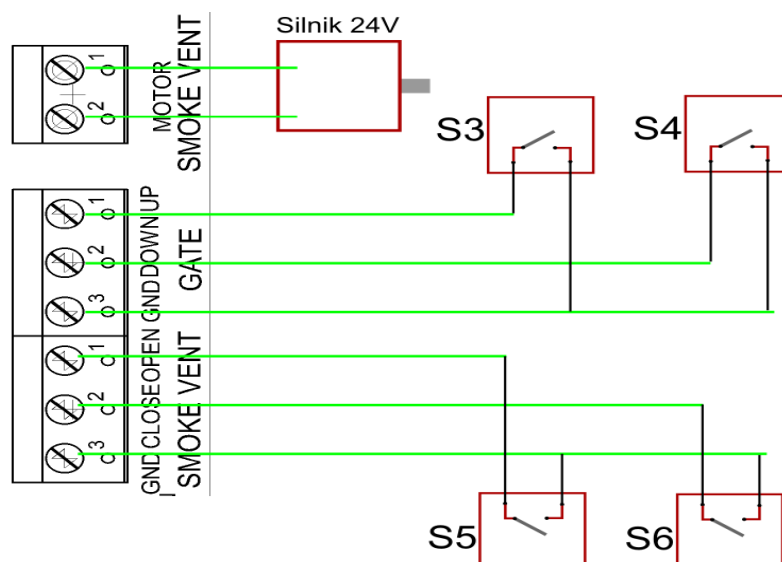
Set SW3 dip SW3.2 to ON position on switch.



ROP - manual call point input, i.e. the alarm button. Several such buttons can be connected in parallel. There are two types of buttons, one with a built-in 1000 Ohm resistor (P1 in the figure), the other without (P2 in the figure), in the absence of a built-in resistor, such resistor (R3 in the figure) should be connected in series with the button as shown. At the end of the line, connect a 4700ohm resistor (R2).

RPO Set and RPO Reset - inputs for connecting the manual smoke exhaust button and the optional reset signal. The connection is analogous to the ROP signal.

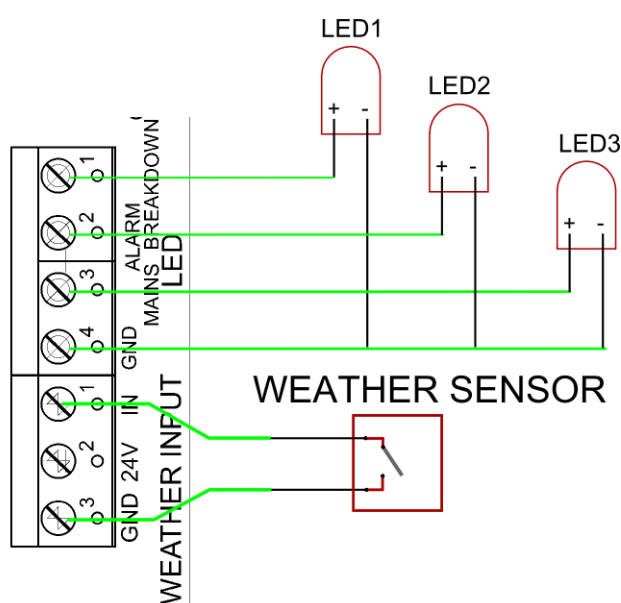
SMOKE DETECTOR - input for conventional sensors, e.g. smoke detectors. You can connect up to 6 smoke detectors on one line. At the end of the line, connect a 4700ohm terminating resistor.



SMOKE VENT MOTOR - 24VDC smoke damper motor.

SMOKE VENT - buttons for manually opening (S5) and closing (S6) smoke flaps.

GATE - buttons for manually opening (S3) and closing (S4) the gate.



LED - signaling diode outputs: breakdown (failure, LED1), ALARM (LED2), MAINS (power supply, LED3).

WEATHER INPUT - weather sensor input, the input also contains 24V voltage for sensors that need power

There are also relay connectors on the board. The load capacity of each relay is a maximum of 8A at 230V

Each connector has 3 signals:

NO - Normal Open - after switching on, the relay contains this signal with a COM signal

NC - Normal Connected - signal shorted to COM signal with the relay turned off, after switching on the signals are opened

COM - common signal

List of relay outputs:

ENDSTOP UP (motor 1) - signal from the upper limit switch for motor 1

ENDSTOP DOWN (motor 1) - signal from the lower limit switch for motor 1

ENDSTOP UP (engine 2) - signal from the upper limit switch for engine 2

ENDSTOP DOWN (motor 2) - signal from the lower limit switch for motor 2

BREAKDOWN - failure

ALARM - alarm

HOLDERS - ventilation jumper relay, switching the relay on should release the jumper catch and thus open it

10. Maintenance and replacement of fuses

Fire alarm systems should be permanently maintained efficient, so they require regular maintenance. The facility user is obliged to ensure maintenance of the installation by qualified company or the control panel manufacturer. Maintenance consists of periodic testing and removal of any defects. The maintenance technician should carefully read the control panel user manual. He should know the operation principle of the control panel and devices cooperating with it. The maintenance technician should have full knowledge of the object in which the system is installed. If ionizing smoke detectors are used in the installations, the conservator must have the appropriate permission to install and maintain such detectors. Replacement of fuses may only be carried out by authorized personnel, replacement fuses should be replaced with new ones with the same parameters.

Periodic examinations

Periodic testing consists in checking the operation of the control panel, detectors and fire buttons installed on the detection lines. Checking the operation of the fire gate and smoke damper, signaling devices and the correctness of signal transmission to external devices and systems.

The scope of periodic tests includes:

- testing all signal lamps
- testing all detectors and manual call points
- installed on detection lines
- assessment of the technical condition of detectors (soiling level) and manual call points
- cleaning or replacement with a new one if necessary
- checking the operation of external signaling
- performing alarm simulation after prior agreement and informing all persons within the zone in which the alarm simulation is being carried out
- checking the battery condition - in accordance with the relevant manufacturer's instructions

Frequency of testing

According to the regulations, periodic examinations should be carried out at least once a year. However, the owner of the installation, in consultation with the designer and conservator, can increase the number of inspections carried out per year.

11. Packaging, storage, transport

Package

The control panel is placed in a packaging limiting the possibility of damage during transport.

The packaging contains the following data:

- The manufacturer's name
- Headquarters name and model

In addition, the packaging has the following inscriptions:

"Protect against falling", "top of load", "protect against moisture"

Storage

The control panel should be stored in rooms at a temperature of $0 \div 40^{\circ}\text{C}$ and a relative humidity of not more than 70%. In case of longer storage, the control panel should be connected to the power supply every 3 months and its correct functioning checked. During storage, the control panel should not be exposed to thermal radiation, corrosive gases and vapors.

Transporting

Air handling units in packaging should be transported in closed containers or holds, taking into account transport instructions given on the packaging. The units must also be protected against sudden shocks and ambient temperatures outside the range from -20°C to $+50^{\circ}\text{C}$.