POLON-ALFA

AUTOMATIC FIRE EXTINGUISHING CONTROL PANEL

IGNIS 2500

OPERATION & MAINTENANCE MANUAL

ID-E359-001-GB

Edition I

The IGNIS 2500 fire extinguishing control panel, which is the subject of this OMM, meets the essential requirements of the European Parliament as well as the EU Council and European Union directives as the following regulations:

CPR CPR/305/2011 European Parliament and the EU Council Regulation of March 9, 2011 establishing harmonized conditions for marketing of the construction products and repealing Council Directive 89/106/EEC;

LVD 2006/95/EC Electrical equipment designed for use within certain voltage limits Directive ;

EMC 2014/30/EU Electromagnetic compatibility Directive.

The product has received the Certificate of Constancy of Performance, issued by CNBOP-PIB, notified body No. 1438, confirming that the product has the characteristics/technical parameters required by standards PN-EN 12094-1:2006, PN-EN 54-2:2002+A1:2007, PN-EN 54-4:2001+A1:2004+A2:2007.

The possessed features/technical parameters exceeding the requirements of the aforementioned standards and other features/parameters of the product specified in this manual, not specified by the mentioned standards, are confirmed by the Manufacturer.

The product has a Certificate of Approval issued by CNBOP-PIB.

The manufacturer has issued a Declaration of Performance for the product.

The certificate, the Certificate of Approval and the Declaration of Performance are available on the website of www.polon-alfa.pl

Prior to starting assembly and operation, please read the contents of this OMM manual. Failure to follow the recommendations contained in this OMM may prove to be dangerous or result in violation of applicable regulations.

POLON-ALFA shall not be liable for any damages resulting from use that does not comply with this manual.

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PLEASE NOTE! POLON-ALFA reserves the right to introduce changes to this manual.

A worn out product, which is not suitable for further use, should be handed over to one of the points collecting electrical and electronic equipment waste.	

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POLON-ALFA S.A.

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Automatic fire extinguishing control panel

IGNIS-2500

PN-EN 12094-1 PN-EN 54-2, PN-EN 54-4

Essential characteristics of the product	Performance properties	Harmonized technical specification PN-EN 12094-1:2006 chapter
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Structural requirements	Fulfils	5
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Discharge time control	Fulfils	4.21
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General requirements for signalling	Fulfils	5
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Durability of operational reliability: resistance to vibration		

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Essential characteristics of the product	Performance properties	Harmonized standard PN-EN 54-4:2001+A1:2002+A2:2007 chapter
Power supply efficiency		
General requirements	Fulfils	4
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Electromagnetic compatibility (resistance)	Fulfils	9.9
Durability of operational reliability: resistance to moisture		
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Moist solid heat (strength)*)*	Fulfils	9.14
Intended use: Panels for use in gas extinguishing devices installed in buildings, forming a complete and operating installation.		
For technical data, see documentation: ID-E359-001-GB		

1. Introduction

1.1. Documentation content

This Operation and Maintenance Manual (OMM) allows you to familiarise yourself with the purpose, structure and operation of the IGNIS 2500 automatic fire extinguishing control panel. The Operation and Maintenance Manual contains the necessary information for designers, installers and maintenance technicians of IGNIS 2500 control panels. Together with the User Manual, intended for persons on duty directly at the control panel, it constitutes a complete exploitation documentation.

1.2. Intended use of the control panel

The IGNIS 2500 automatic extinguishing control panel is a device designed for use in fixed fire-fighting systems and for the following tasks:

- activating fixed fire extinguishing devices based on the signal received from an automatic detectors or from manual "start extinguishing" buttons,
- signalling a fire detected by the cooperating detectors,
- Control of the fire alarms, safety devices, sealing devices, etc.,
- transmission of information on fire risk or on the implementation of steps in the automatic extinguishing procedure to the monitoring systems.

It can also operate in a multi-zone set, consisting of several control panels and a common extinguishing agent supply.

The control panel works with conventional 30 and 40 series detectors, buttons for manual start, pause, blocking, addition and signalling devices manufactured by POLON-ALFA.

The control panel can also be used as a satellite control unit in larger hierarchical installations. It is designed for continuous operation in the rooms of low level of dust, in the temperature range of -5 °C to 40 °C (environmental class A) and relative humidity of up to 80 % at 40 °C.

1.3. Safety conditions

1.3.1. Protection against electric shock

The IGNIS 2500 automatic extinguishing control panels are classified as protection class I devices and can only be used with additional protection against electric shock such as neutral or protective grounding.

The insulation of the 230 V/50 Hz power network circuits is reinforced and withstands the test voltage of 2800 V, and the insulation of the low-voltage circuits (below 42 V) is resistant to the test voltage of 700 V DC. After connecting the power network cables the network connection must be protected with a factory-provided shield.

1.3.2. Safety of system and equipment

The wiring should be made of wires with the required fire resistance and properly secured when crossing the fire zone boundaries. The required distances of the low-voltage installation from the power and lightning protection systems should be kept in order to avoid unwanted interactions.

Due to the system's resistance to electromagnetic interference, it is recommended to use protective grounding.

Place the backup battery in the control panel at the final stage of installation.

Components of this device are heat sensitive. The maximum ambient temperature should not exceed 40 °C. The space left around should be large enough for air to flow freely. In rooms where device operates the air humidity should not exceed 95 %.

1.3.3. Operation of ionization smoke detectors

1.3.4. In case of cooperation between the control panel and ionization (isotope) detectors, their installation, disassembly and storage may only be performed by an "authorized installer", i.e. an organizational unit which - pursuant to Article 4 of the Atomic Law Act - has a permit from the President of the National Atomic Energy Agency for such activities. Repairs and maintenance

Maintenance work and periodic inspections must be carried out by an authorized personnel of companies authorized or trained by the POLON-ALFA.

All repairs must be made by the manufacturer.

POLON-ALFA shall not be liable for the operation of equipment maintained and repaired by unauthorized personnel.

1.4. Terms

Detection status - operating mode in which the control panel is powered from an electric power source meeting the specified requirements and in which no other operating status is signalled;

Alarm (fire) status - operating mode the control panel enters after receiving and verifying information on fire detection from fire alarm devices;

Alarm of 1st stage - fire alarm without activating the external outputs, signalled by the control panel, initiated by 1 detection line in alarm or before the set delay time for recognizing the hazard;

Alarm of 2nd stage - fire alarm with activation of external outputs, which has been verified using various alarm organization methods, e.g. appearance of an alarm signal from a second detection line or expiry of a set delay time;

Activation status - the control panel state, when the extinguishing control procedure is signalled;

Discharge warning time - the time that will elapse from the moment of starting the extinguishing (extinguishing start) to the moment of releasing the extinguishing agent in order to warn people at risk (time to evacuate);

Discharge status - the state of the control panel, when the discharge of extinguishing agent into the protected room is signalled;

Blocking status - an operation state in which the control panel intentionally blocks receiving signals and triggering alarms from any warning devices or the control panel output and/or transmission path to any components of the fire alarm system forming the alarm system;

Testing status - control panel status, when function checking (testing) is signalled;

Fault status - the condition when the control panel signals a failure of its systems or any element of the alarm system;

Detection line - two-wire line with warning devices connected to it, terminated with a terminating resistor;

Control line - a two-core line connected to the control panel control input for monitoring the status of external fire protection equipment;

Potential line - (signal line) two-wire supervised line connected to the control panel potential output, which activates specific functions in fire protection equipment;

EXTINGUISHING START button - the button used to manually start the automatic extinguishing procedure;

EXTINGUISHING STOP button – The function button that stops(pause) the release of the extinguishing agent which works only during discharge warning (with an active evacuation alarm)

EXTINGUISHING BLOCKADE button - a button for interrupting or blocking the extinguishing procedure in any operating state of the control panel;

ADDITION START button - a button for manual activation of an additional discharge of the extinguishing agent, while the additive can be activated after the main discharge;

Standard configuration - (default settings) a set of data entered into the control panel memory, defining the parameters of functions to be programmed by the user (e.g. transmission delay time, duration of the evacuation alarm);

Fire extinguishing device - a set of tanks with the extinguishing agent, pipelines and nozzles arranged so as to distribute the extinguishing agent in the protected space in a way that allows to obtain the extinguishing concentration;

Manual actuation – actuation, requiring human intervention.

2. Completion of the control panel

Table 2/1 lists the equipment that is supplied with the control panel set.

Table 2/2 lists the accessories that can be ordered separately in the necessary quantities, compatible with the IGNIS 2500 control panel.

Table 2/1 Equipment supplied with the control panel set.

No.	Specification	Number of pcs.
1	IGNIS 2500 fire alarm control panel	1
2	Operation and Maintenance Manual (OMM) ID-E359-001	1*
3	User Manual IO-E359-003	1
4	Warranty book	1
5	Unit package of the control panel	1

*) OMM in a set with the control panel or downloadable from the www.polon-alfa.pl website as a file.

Table 2/2 Accessories for self-ordering

No.	Housing component	Element type
1	Single-zone casing	OM-251
2	Two-zone casing	OM-252
3	Two-zone door with MSS-25 module (to upgrade a single-zone panel to a two-zone panel)	MSS-25 extended module
	Functional module	**Module type**
4	Signalling and operator module	MSO-25
5	Zone signalling module	MSS-25
4	Universal power supply module 24 V/4.5 A	MZU-25
5	Fire extinguishing control module	MSG-25
6	Detection and control module	MKS-60
7	Relay outputs module	MPK-60
8	Potential outputs module	MWS-60
10	Addressable communication module (with POLON 3000 and POLON 6000 systems)	MKA-25
11	Bus module	MGR-64

2.1. Single-zone control panel

2.1.1. Single-zone control panel versions

Table 2.1.1/1 Completion of a single-zone control panel (with a single-zone housing)

Ver.	MSO-25 pcs.	MSG-25 pcs.	MZU-25 pcs.	MKA-25 pcs.	MGR-64 pcs.	MPK-60 pcs.	MWS-60 pcs.	MSO-25 pcs.	Housing E359-1000 PERF.
1*	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**1**
2	1	1	1	1	-	-	-	-	1
3*	**1**	**1**	**1**	**-**	**1**	**-**	**-**	**-**	**2**
4	1	1	1	-	1	1 pc. from MPK-60, MWS-60, MKS modules-60			2
5	1	1	1	-	1	2 pc. from MPK-60, MWS-60, MKS modules-60			2
6	1	1	1	1	1	1 pc. from MPK-60, MWS-60, MKS modules-60			2
7	1	1	1	1	1	2 pcs from MPK-60, MWS-60, MKS-60 modules			2

*) basic versions assembled by the manufacturer, other versions 4, 5, 6, 7 can be completed after ordering additional modules.

Extension of the single-zone control panel

The basic version no. 1 does not include the MGR-64 bus and can be easily upgraded to version 2. The basic version no. 3 includes the MGR-64bus , which allows for easy expansion of the control panel with additional modules - versions no. 4 ÷ 7 (Table 2.1.1/1)

Extension of a single-zone control panel to a two-zone control panel

Basic version no. 3 (with MGR-64 bus) can be extended to a two-zone control panel - versions no. 8 ÷ 13 (Table 2.2.1/1)

Upgrading a single-zone panel to a two-zone panel requires:

- replacement of the control panel door in a single-zone version with a two-zone version, which are offered as **"MSS-25 extended module";**
- mounting the second MSG-25 module.

All versions with the MGR-64 bus allow for the installation of optional modules.

2.2. Two-zone control panel

2.2.1. Two-zone control panel versions

Table 2.2.1/1 Completion of a two-zone control panel (with a two-zone housing)

Ver.	MSO-25 pcs.	MSS-25 pcs.	MSG-25 pcs.	MZU-25 pcs.	MKA-25 pcs.	MGR-64 pcs.	MPK-60 pcs.	MWS-60 pcs.	MKS-60 pcs.	Housing E359-1000 PERF.
8*	**1**	**1**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**3**
9	1	1	2	1	1	1	-	-	-	3
10*	**1**	**1**	**2****	**1**	**-**	**1**	1 pc. from MPK modules-60, MWS-60, MKS-60			**3**
11	1	1	2**	1	-	1	2 pcs. from modules MPK-60, MWS-60,MKS-60			3
12	1	1	2**	1	1	1	1 pc. from MPK-60, MWS-60, MKS-60 modules			3
13	1	1	2**	1	1	1	2 pcs. from MPK-60, MWS-60, MKS-60 modules			3

*) basic versions assembled at the manufacturer, other versions 9, 11, 12, 13 possible to complete after ordering additional modules

*(*) marking of 2 MSG-25 modules in an assembly one above the other

Version 8*, 9 - MSG-25 modules mounted side by side (more convenient method of mounting installation cables), no free space for expansion with additional optional modules. If it is necessary to expand versions 8 *, 9 with optional modules (MPK-60, MWS-60, MKS-60), it is possible to rearrange and connect the second MSG-25 module into a set of modules **), as in the 10 * versions, 11, 12, 13.

Versions 10*, 11, 12, 13 - MSG-25 modules mounted in a package one above the other. Free space allows the control panel to be expanded with any optional modules such as MPK-60, MWS-60, MKS-60 up to 2 pcs.

3. Structure description

3.1. Basic features

- Single-zone or a two-zone fire extinguishing control panel,
- Possibility to create multi-zone sets with the use of several control panels,
- Fire detection,
- Control of fixed fire-fighting systems,
- Messages on the graphic LCD display,
- Displaying countdown delay times,
- Event and alarm memory,
- The ability to configure and read events using a PC,
- Compatibility with 30 and 40 series conventional detectors manufactured by POLON-ALFA,
- Cooperation with addressable systems,
- Operation of up to 20 IGNIS 2500 panels on a POLON 6000 system detection line,
- Up to 6 conventional detection lines in one extinguishing zone,
- Up to 16 control lines,
- Up to 10 supervised equipotential control outputs,
- High flexibility in parameter programming and configuration,
- Emergency power supply - 72 hours,
- Complies with EN-12094-1 standard: PN-EN54-2, PN-EN54-4.

The IGNIS 2500 fire extinguishing control panel in single-zone and two-zone versions can operate independently, where each zone has its own extinguishing agent resource or in multi-zone systems with a common extinguishing agent resource. There is also a possibility to combine up to 4 one-zone or two-zone control panels into a multi-zone set.

In a multi-zone configuration, the control panels can transmit signals to each other that allow:

- activating the output controlling e.g. a common solenoid valve, located in any control panel belonging to the set,
- programming the outputs to release a different amount of extinguishing agent, depending on the size of the zone,
- configuration of automatic blocking of starting extinguishing in other zones, if a discharge has already occurred in one zone.

3.2. Cooperation with fire alarm systems

The IGNIS 2500 has universal potential-free relay outputs, allowing to transmit basic status signals to most fire systems or monitoring stations.

It also has an optional possibility of cooperation with the POLON 6000 addressable system after applying the MKA-25 module. In addition to the detectors, an addressable detection line may contain up to 20 pcs of IGNIS 2500 control panels.

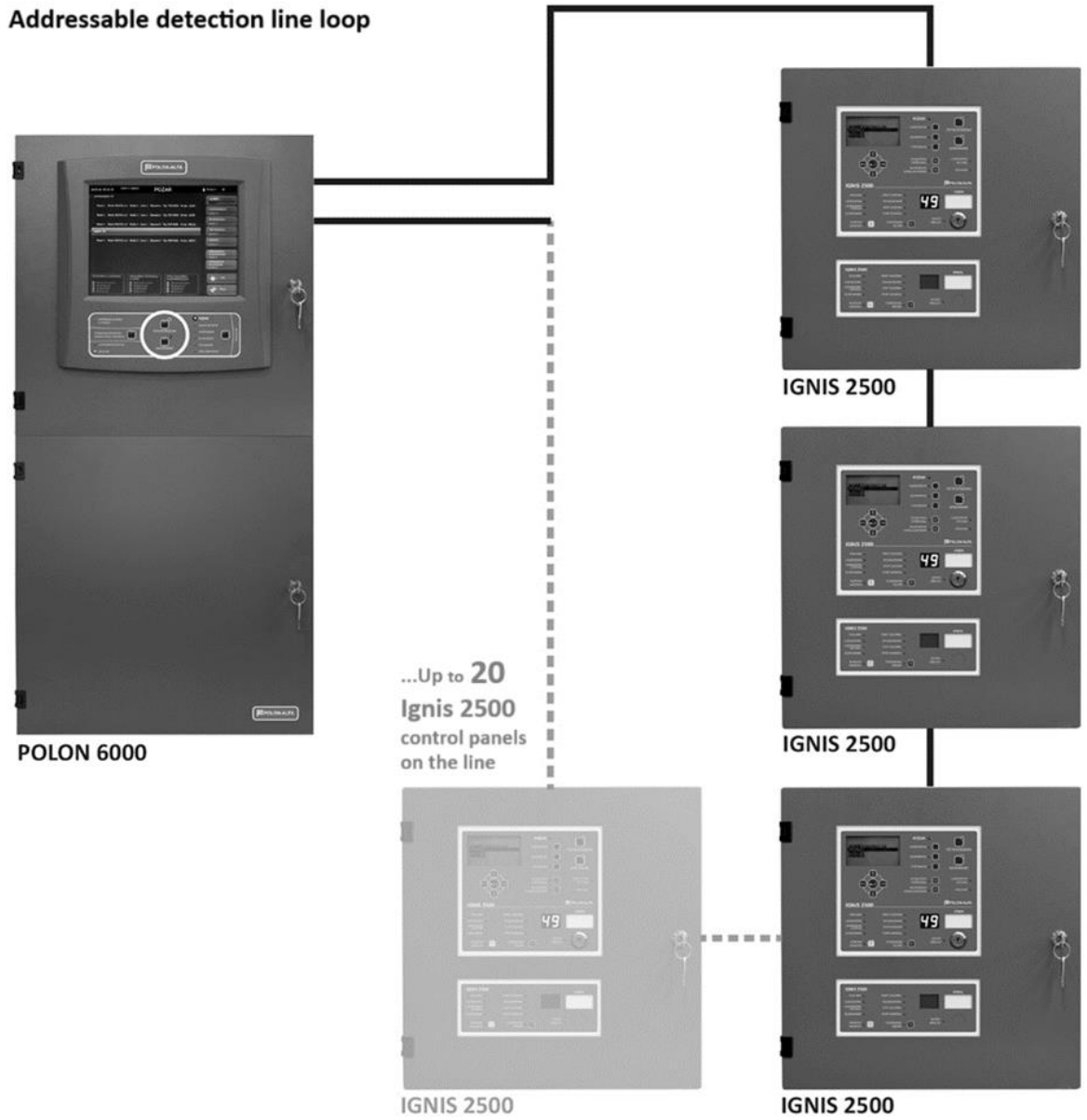

Figure 3.2/1 Control panels in an addressable detection line

The signals transmitted by the addressable detection line between the IGNIS 2500 panel and the POLON 6000 system are described in section 8.4 "Communication Module via Addressable Line MKA-25"

3.3. Housing of a single-zone control panel

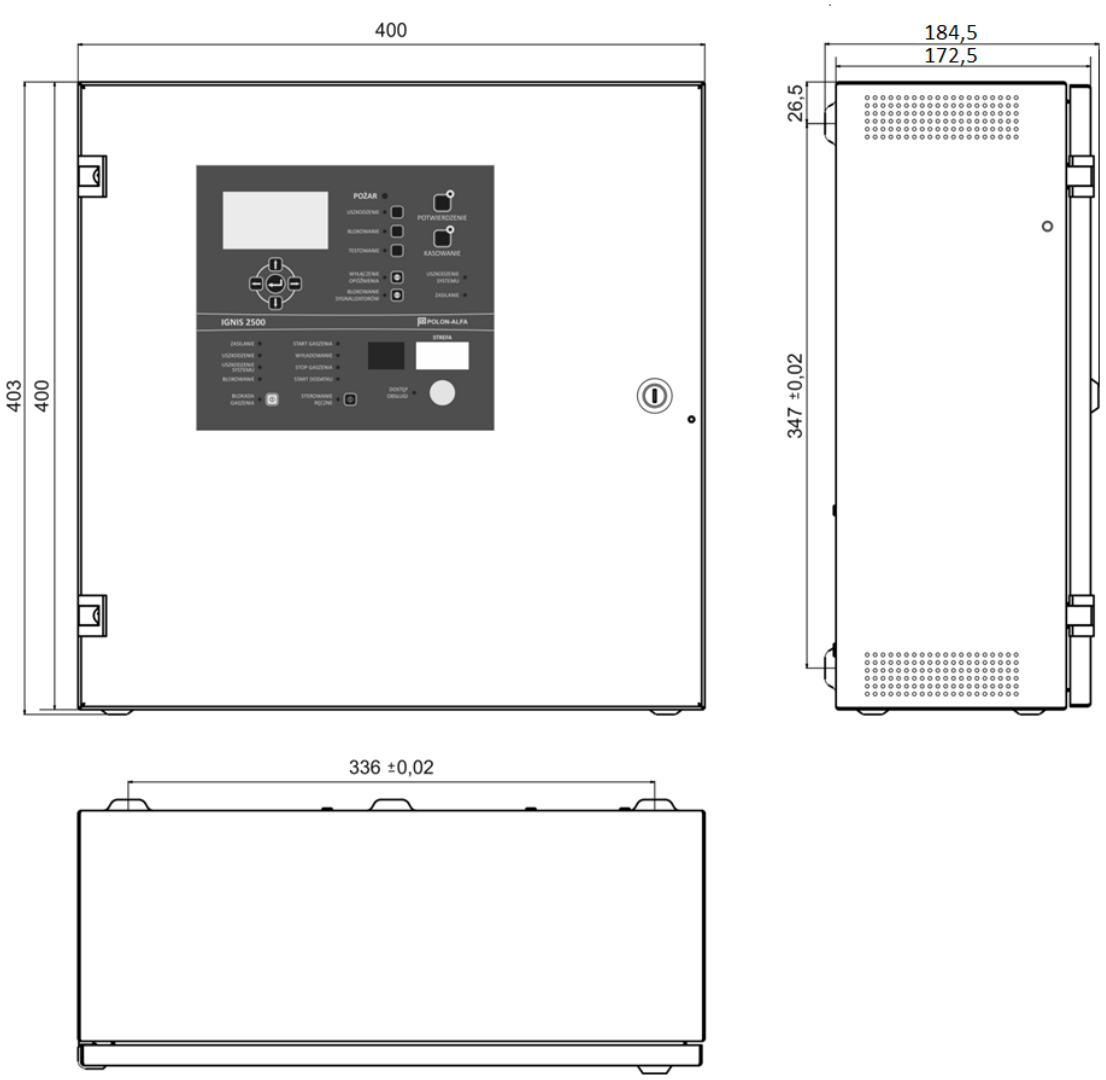

Figure 3.3/1 Dimensions of a single-zone control panel

3.4. Housing of a two-zone control panel

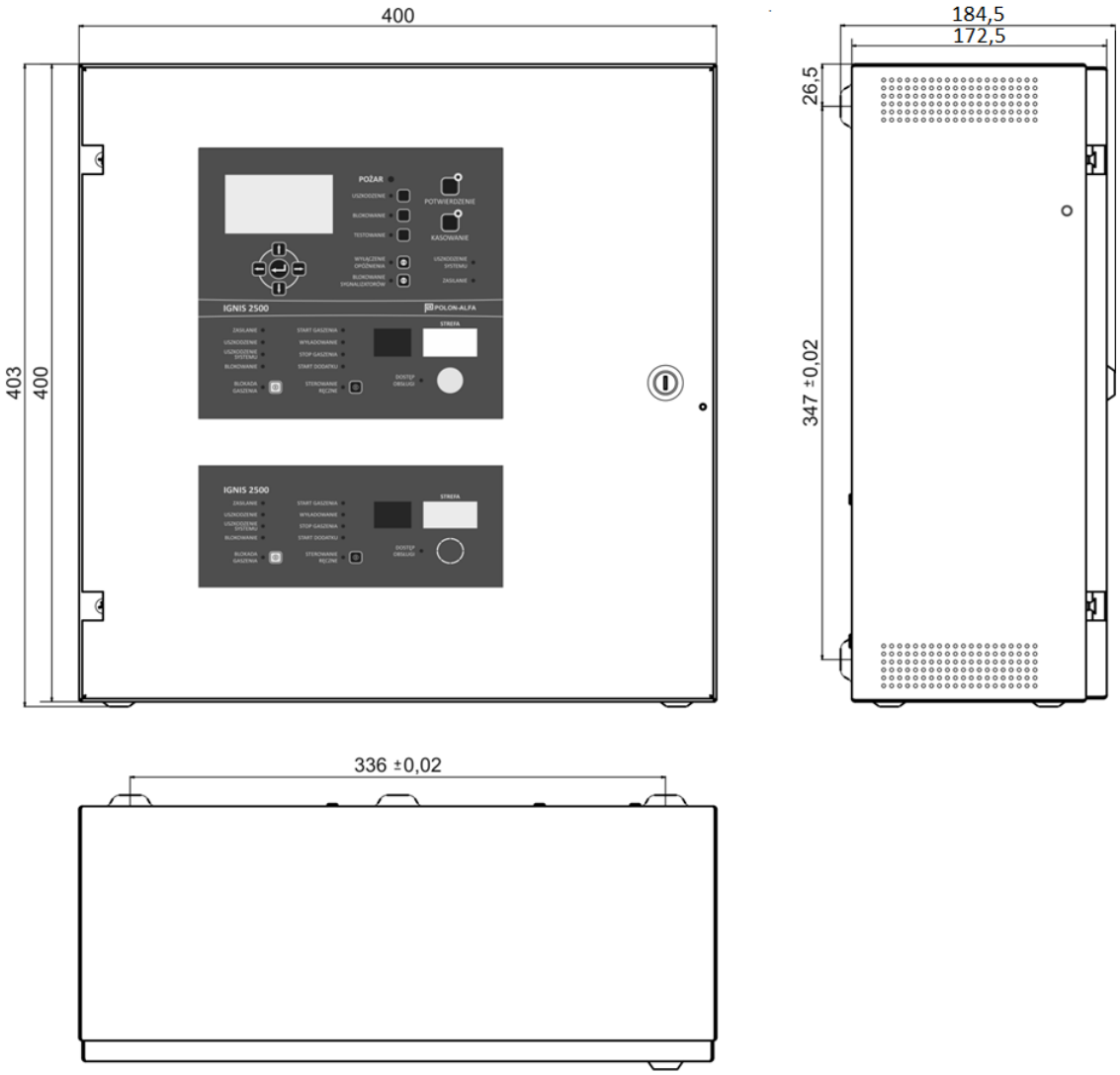

Figure 3.4/1 Dimensions of a two-zone control panel

3.5. The arrangement of modules in the exemplary versions of the IGNIS 2500 control panels

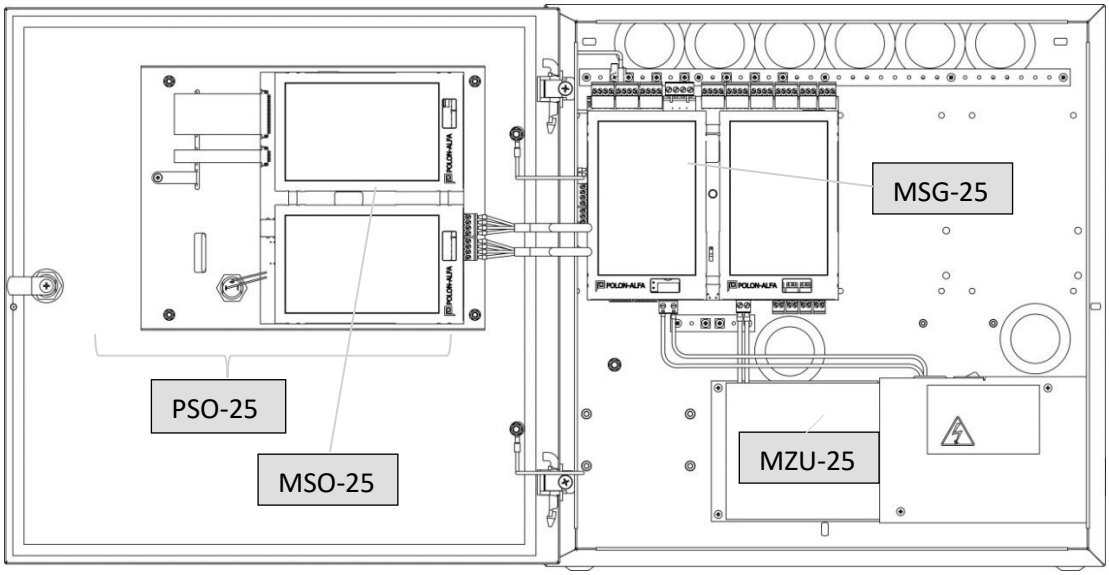

*Figure 3.5/1. Interior view of a single-zone control panel (version 1 * according to table 2.1.1/1)*

MSO-25 - signalling and operating module

PSO-25 - signalling and operating panel (MSO-25 including foil keypad assembly)

MSG-25 - fire extinguishing control module

MZU-25 - universal power supply module

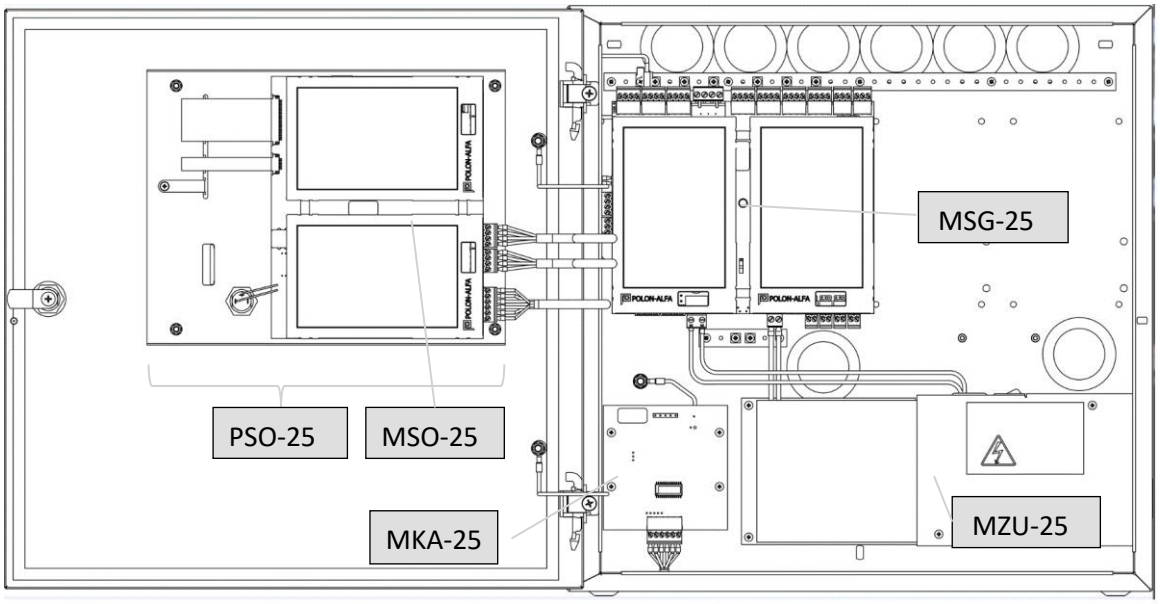

Figure 3.5/2. An example of a single-zone control panel with the MKA module allowing connection to the POLON 6000 system addressable detection line (version 2 according to table 2.1.1 /1)

MSO-25 - signalling and operating module

PSO-25 - signalling and operating panel (MSO-25 including foil keypad assembly)

MSG-25 - fire extinguishing control module

MZU-25 - universal power supply module

MKA-25 - addressable communication module

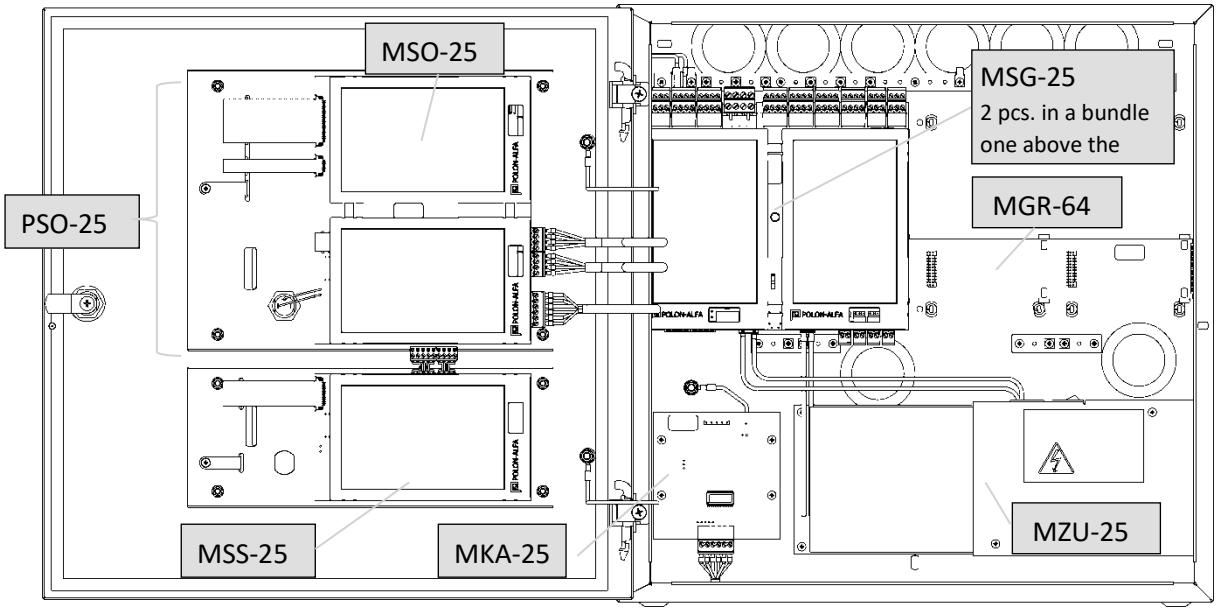

Figure 3.5/3. An example of a two-zone control panel with the MKA-25 module and MGR-64 bus and space for one or two optional modules (option 12, 13) Table 2.2.1 / 1)

MSO-25 - signalling and operating module

PSO-25 - signalling and operating panel (MSO-25 including foil keypad assembly)

MSG-25 - fire extinguishing control module

MZU-25 - universal power supply module

MKA-25 - addressable communication module (enables connection with the addressable line of the POLON 6000 system)

MGR-64 - bus module (enables installation of additional two optional modules)

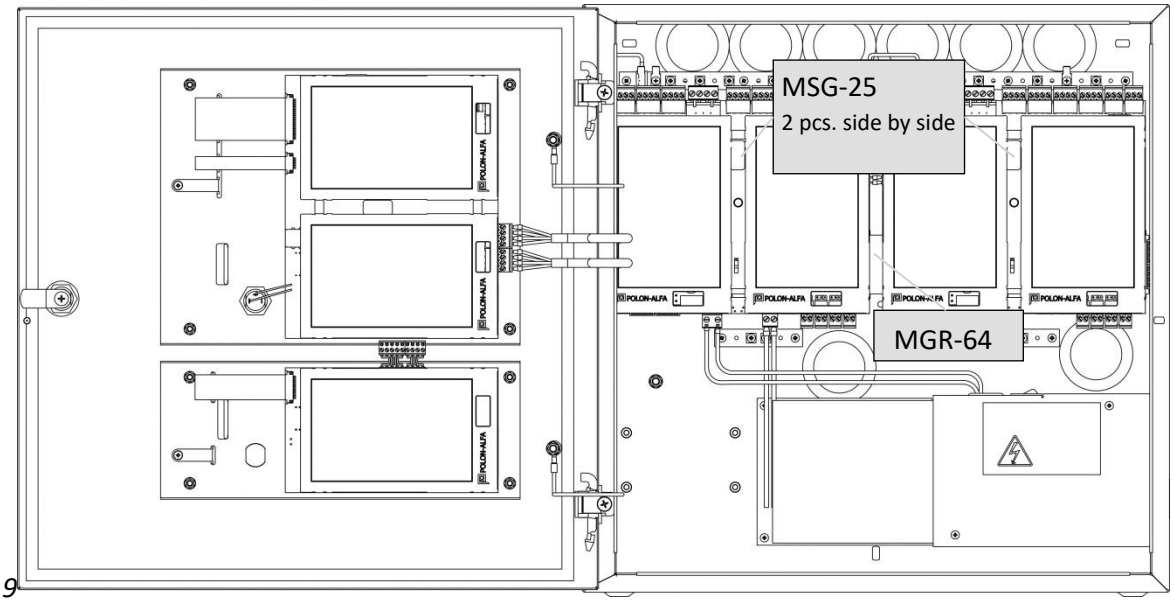

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Figure 3.5/4. An example of a two-zone control panel with two MSG-25 modules arranged next to each other (version 8 according to Table 2.2.1/1)*

3.6. User interface

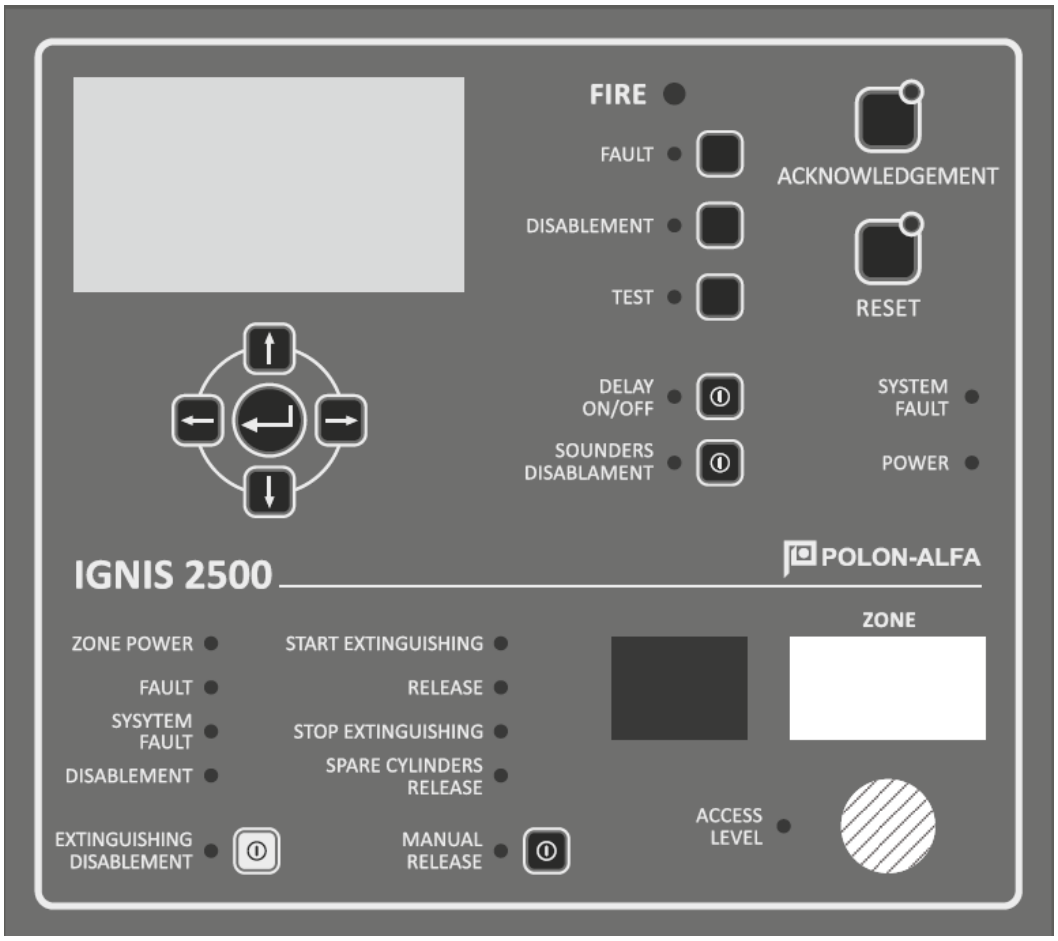


Figure 3.6/1 User interface of a single-zone control panel

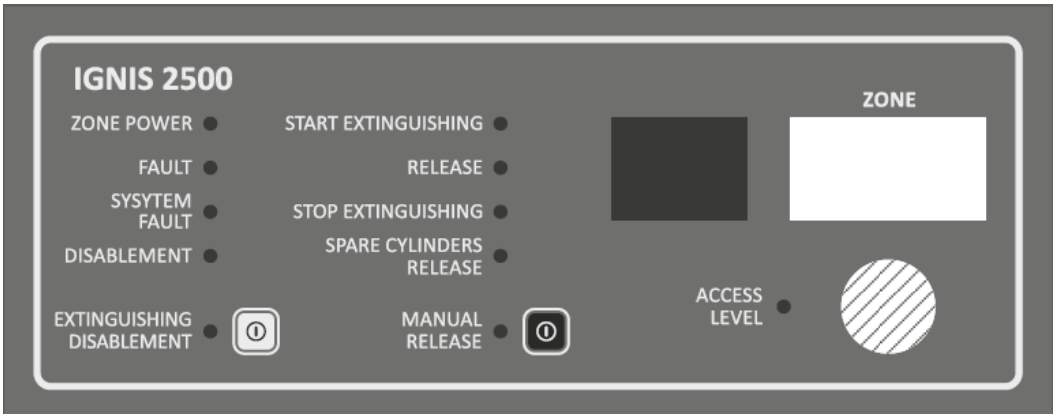


Figure 3.6/2. Additional control panel zone field in a two-zone control panel

Table 3.6/1. Optical signalling and handling elements

No.	Name/colour	Signalling method	Description of the signalled status
1	**FIRE** /red	Intermittent	Fire detection - unconfirmed alarm status
		Continuous	The alarm status after pressing the ACKNOWL-EDGEMENT button
2	**FAULT** /yellow	Continuous	Collective fault indication of at least one circuit or function - fault state
	Button		When pressed, the fault list is displayed on the LCD display; button active from the first access level
3	**BLOCKING** /yellow	Continuous	Collective signalling of blocking at least one in-put/output or function - blocking status
	Button		Displays the blocking menu on the LCD screen; the button is active from the first access level to read blocking.
4	**TESTING** /yellow	Continuous	Collective signalling of testing of at least one circuit or function - testing status
	Button		Displaying the test menu on the LCD screen; button active from the second access level
5	**DELAY OFF** yellow	Continuous	Alarm transmission skipping the programmed delay - one-stage alarm variant.
	Button		Delay off/on; button active from access level 2
6	**BLOCKING ALARM DEVICES /**yellow	Continuous	Disabling all alarm signalling devices (outputs assigned to the alarm signalling group)
		Intermittent	Partial deactivation - in case of more than one output assigned to a group of alarm devices (at

			least one blocked output and at least one unblocked output).
	Button		Quick access to the menu of blocking/unblocking the outputs configured for controlling acoustic signalling devices
7	**ACKNOWLEDGEMENT** /yellow	Continuous	No confirmation of the alarm - T1 time counted down until the ACKNOWLEDGEMENT button is pressed
	Button		Pressing the ACKNOWLEDGEMENT button - receiving a fire alarm by the staff, switches the second stage alarm delay countdown from T1 to T2 time and mutes the acoustic signalling devices; active from the first access level (without switching on the ignition).
8	**RESET** /yellow	Continuous	Signals that the alarm can be reset
	Button		Reset the alarm state; button active from the second access level
9	**SYSTEM FAULT** /yellow		Fault to the microprocessor system or configuration data
10	**POWER /green**	Continuous	Signalling of efficient primary and backup power supply.
		Intermittent	Defective or missing mains or back-up power.
11	LCD DISPLAY		Display of control panel status messages and configuration settings
12	← ↑ ↓ → DIRECTION BUTTONS ↵ Enter		Designed to operate the control panel menu as described in section 5 "Display functions and menu operation"

Table 3.6/2 Optical zone signalling devices

No.	Name/colour	Signalling method	Description
1	**POWER SUPPLY** /green	Continuous	Signalling of efficient primary and backup power supply.
		Intermittent	Defective or missing mains or back-up power.
2	**FAULT** /yellow	Continuous	Collective signalling of failure of at least one circuit or function related to the extinguishing zone
3	**SYSTEM FAULT** /yellow		Fault to the microprocessor system of the zone controller or zone configuration data
4	**BLOCKING** /yellow	Continuous	Collective signalling of blocking of at least one circuit or function - blocking status
5	**EXTINGUISHING BLOCK** /yellow	Continuous	Signalling that the extinguishing block is on
	Button		The button performs the function of switching on or off the extinguishing agent discharge block (or interrupting the flow).
6	**EXTINGUISHING START** /red	Intermittent	Status before activating the extinguishing system (alarming one detection line or alarm from the initiating line in the manual control only mode)
		Continuous	Activation status - start of the automatic extinguishing procedure as a result of alarming at least two interdependent control lines or activation from the initiating line in automatic operation mode or manual activation.
7	**DISCHARGE** /red	Continuous	The status of discharge, or release of extinguishing agent.
8	**EXTINGUISHING STOP** /yellow		State of stopping (pause) the extinguishing after pressing the EXTINGUISHING STOP button. It operates at the stage of warning against the discharge of the extinguishing agent. During signalling, the countdown of the extinguishing agent release delay time is stopped.
9	**ADDITION START /**red	Continuous	Signalling that the discharge of additional extinguishing agent is activated

10	**MANUAL CONTROL** /yellow	Continuous	Signalling of manual control only.
	Button		On/Off button for manual-only control mode.
11	**DIGITAL DISPLAY (2 x 7-segment)**		Displaying the countdown of the time remaining until the extinguishing agent is discharged
12	**ZONE**		A place for inserting a paper sheet with a description of the zone
13	**Key switch (ignition switch)**		Enabling the second access level
14	**SERVICE ACCESS** /yellow	Continuous	Second level of access
		Intermittent	> second access level or opening the panel door

3.7. General principles of menu navigation

Table 3.7/1. Functions of the direction buttons

Button	Function
	Scroll down
	Scroll up
	Move the cursor to the right or enter a sub-menu
	Exit from the sub-menu - entering a higher level
	Entering a sub-menu, moving to the next window or field and confirming changes made in functional or configuration settings.

4. Technical data

Table 4/1 Technical data

General parameters	Overall dimensions L x H x G	400 x 403 x 184.5 mm
	Weight (without batteries)	< 8 kg
	Housing tightness	IP 30
	Operating temperature range	-5 °C ÷ +40 °C
	Environmental class	A
	Permissible operating relative humidity	95 % at 40 °C
	Transport temperature range	-25 °C ÷ +55 °C
Power supply	**Basic power supply** (mains 230 V)	
	Voltage	230 VAC +10 …-15 % – 50 Hz
	Current	<2.1 A.
	Power	100 VA max.
	Backup power supply	
	2 batteries	2 x 12 V, 7 ÷ 18 Ah
	Voltage	24 V
	Charging current in the configuration:	
	- with 2 MSG-25 modules	1.3 A
	- with 1 MSG-25 module	0.65 A
	Signalling too high internal resistance of the batteries	0.7 Ω
	Final discharge voltage	21 V -10 %
	Operating time on reserve power supply. max.*	72 h
	Outputs	
	Voltage	24 V -15 % +20 %
	Current available max.	4.2 A (batteries charged) 3.0 A (batteries being charged)
MSG-25 module	Number of modules	1 ÷ 2
	Current consumption (no load on outputs)	22 mA
Detection lines	Number of lines max.*	6
	The number of line elements per line	32
	Detector supervision current max.	2 mA
	Total line supervision current max.	7 mA
	Terminating resistor	5.6 kΩ
	Line resistance max.	2 x 100 Ω
Monitoring lines	Number of lines max.*	16
	Max. number of buttons EXTINGUISHING START, EXTINGUISHING STOP, EXTINGUISHING BLOCK	32
	Terminating resistor	6.2 kΩ
	Line resistance max.	2 x 100 Ω
Supervised potential outputs	Number of outputs max.*	10
	Current of outputs L7, L8 max.	2 A

	Current of outputs L9 ÷ L16 max. Terminating resistor Line resistance max. Active status voltage	0.7 A 6.2 kΩ 2 x 50 Ω***) 24 V ±20
Potential-free relay outputs	Number of outputs max. Current max. Voltage max.	6 1 A 30 V
External device power supply outputs	Any L9÷L16 output configured as 24V power supply Current max. Output voltage	 0.7 A 24 V ±20 %
Optional modules for expanding the number of inputs and outputs		
MSS-25 module	Zone signalling module for the second extinguishing zone Number of modules Power consumption	 1 24 mA
MKS-60 module (optional)	Number of modules, max.** Current consumption (no load)	2 15 mA
Monitoring lines	Number of lines Terminating resistor Line resistance max.	2 6.2 kΩ 2 x 100 Ω
Supervised potential outputs	Number of outputs Current max. Terminating resistor Active status voltage	2 0.5 A 6.2 kΩ 24 V ±20 %
Potential-free relay outputs	Number of outputs max. Current max.	2 1 A
MWS-60 module (optional)	Number of modules, max.** Current consumption (no load)	2 15 mA
Supervised potential outputs	Number of outputs Current max. Terminating resistor Active status voltage	4 0.5 A 6.2 kΩ 24 V ±20 %
MPK-60 module (optional)	Number of modules, max.** Current consumption (no load)	2 15 mA
Potential-free relay outputs	Number of outputs max. Current max.	4 1 A
MKA-25 module	Communication module with supervisory line of POLON 3000 and POLON 6000 systems Number of modules Power consumption	 1 20 mA
Cooperation with devices		
Interface for connection with a computer	Control panel configuration Readout of events	USB

Types of push buttons installed on control lines Cooperation with fire alarm control panels	– PU-61 - EXTINGUISHING START, – PW-61 - EXTINGUISHING STOP, – PB-61 - EXTINGUISHING BLOCKADE, – PD-61 -ADDITION START. Fire alarm control panels of POLON 3000 and POLON 6000 system (with use of MKA-25 module)	
Types of fire-fighting systems:	– high pressure, – low pressure	
Extinguishing zones	Number of zones Possibility to create multi-zone sets	1 ÷ 2 Yes
Event memory	Number of events	≥ 1000

4.1. Access levels

The control panel provides four levels of access to keypad components:

Access Level 1 is intended for first responders after signalling a fire or damage alarm. In the access level 1, the ACKNOWLEDGEMENT (7), FAULT, BLOCKING (3) - blocking read only, TESTING (4) - limited to testing the control panel signalling elements.

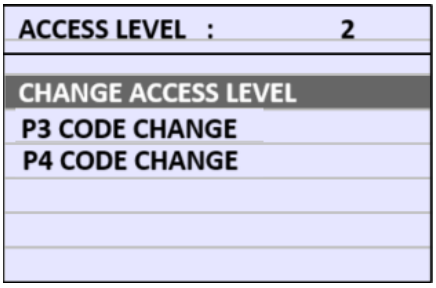
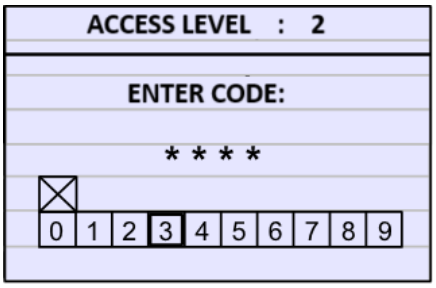
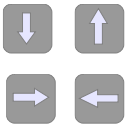
Access level 2 is intended for those particularly responsible for security as well as trained and authorized to operate the panel to a limited extent. Second level access is available via the removable KEY (Table 3.6/2, item 13). When you enable the 2nd access level with the key, all the front panel buttons and functions which do not change the programmed configuration are accessible.

Access level 3 is intended for a trained and authorized personnel to change configuration and maintenance data. Admission to the 3rd access level takes place after enabling the KEY (13) and entering the code. The default (factory) access level 3 code is: 3 3 3 3. The code can be changed to a different/personalized code, set by the user.

Access level 4 intended for persons trained and authorized by the manufacturer to change the factory software and use the service functions. Access level 4 is accessed by entering the access code. The default (factory) access level 4 code is: 4 4 4 4. The default code can be changed to another code, set by the user.

The return to the default (factory) access codes is achieved by momentarily closing the contacts 2-3 of the ZW10 jumper on the MSO-25 controller board (Figure 5.1), with the access code input window open on the LCD display.In order to enter or change the level 3 (P3) or 4 (P4) access code, select the "ACCESS LEVEL" line in the main menu and proceed according to table 4.1/1.

Table 4.1/1 Access codes

No.	Screen	Description of activities	Use of buttons
1		In order to: - to change the access level, select line 1 "CHANGE LEVEL", -to enter your own P3 access code select line 2 "CHANGE P3 CODE", -to enter your own P4 access code, select line 3 "CHANGE P4 CODE",	
		Go to the next window.	
2		Enter the 4 digits of the access code by dialling the displayed digits on the screen. ☒ - deleting the entered digits.	
		Enter the following digits and confirm the code with the button ↵	

4.2. Control panel configuration

The modular structure of the control panel enables optimal adjustment of hardware resources to the needs of the installation. The main modules are distinguished by their high programming capabilities for input/output functionality and their parameters which require configuration.

Adaptation to the needs of configuration settings can be made from the panel located on the control panel door, after entering the 3rd access level, using the information displayed on the LCD display or using a PC, with the "IGNIS 2500 configurator" program installed and connection of the USB port with a typical cable with connectors: type A (computer) and type B (control panel - MSO-25 module).

The program allows to prepare the configuration on PC and send it to the control panel. Furthermore it has a several useful functions, such as reading the configuration existing in the control panel memory, reading faults, setting the date and time, reading the event and alarm log, saving data to a file and printing them.

The new control panel is programmed according to factory settings, the so-called standard configuration, which can always be returned to by reloading it using the control panel menu. Sequence of control panel configuration settings:

1. Adding or removing modules

- before switching on the control panel, set non-repeating addresses in the range 1...8 using SW 1 rotary switches on the modules,
- after turning on the control panel and entering the 3rd access level code, enter the CONFIGURATION sub-menu, select the MODULES +/- line and proceed according to section 4.2.1 "Adding modules".

The numbers of the added modules on the list in the MODULES +/- sub-menu must be consistent with the addresses set on the rotary switches SW 1.

Modules: The power MZU-25 and signalling and operatoring MSO-25 are available individually in each hardware configuration - no declaration is required.

The optional module for addressable communication with the MKA-25 detection line requires only "adding", that is, declaration in any free position in the module adding/removing window - it has no switches for setting the address.

2. Declaration of inputs/outputs

After adding each module a list of available inputs/outputs is generate**d**, which are numbered L1….to L22 accordingly ,left to the right side of the module as maintained by their physical location.

Each input/output can be programmed with the type of line to be operated: e.g. control, detection, potential ..., according to the options displayed in the control panel menu or left as inactive. The unused output/input should be set as inactive, which will result in no fault signalling related to the given input/output. The procedure is described in section 4.2.3.

3. Programming of functions and input/output parameters

After declaring the inputs/outputs, separate lists of input/output types (potential, potential-free, detection lines, monitoring lines) are generated, which should be used to set the appropriate functions and parameters. The undeclared (inactive) input/output will not be visible on the type list. Details of programming functions and I/O parameters are described in the following sub-chapters.

Main Menu:

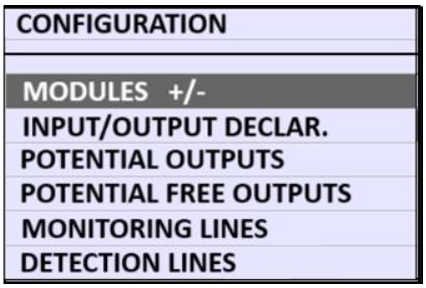
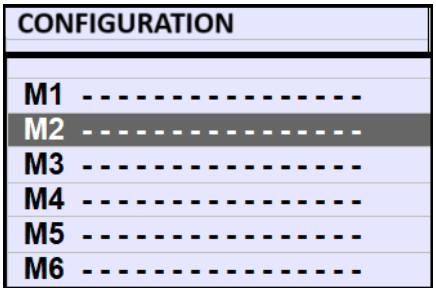
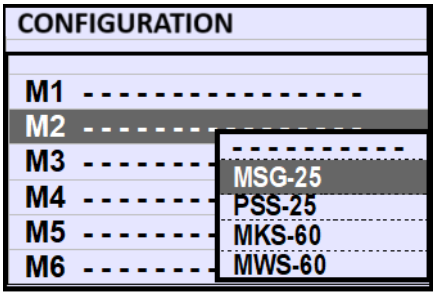
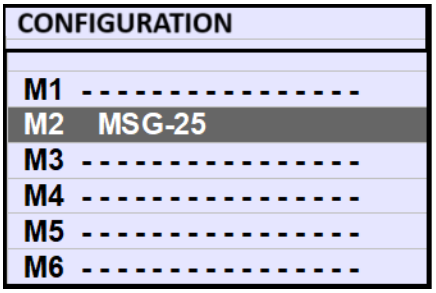
FAULT ↵ displaying a list of faults (damages)
BLOCKING ↵ displaying a list of blocked I/O
TESTING ↵ displaying a list of tested I/O
EVENTS ↵ viewing the list of events
ALARM MEMORY ↵ displaying events triggering the alarm state (alarm counter)
CONFIGURATION ↵ displaying the configuration sub-menu
DATE, TIME ↵ menu display: setting date time
ACCESS LEVEL ↵ window for entering and changing access codes
MEMORY CLEARING ↵ window for clearing the event log
SERVICE ↵ service information

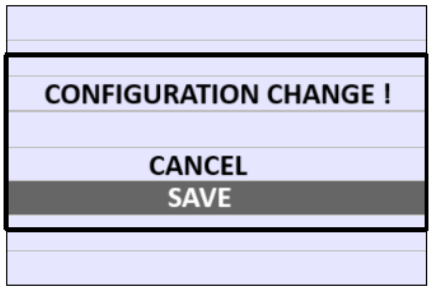
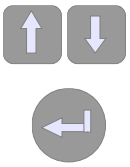
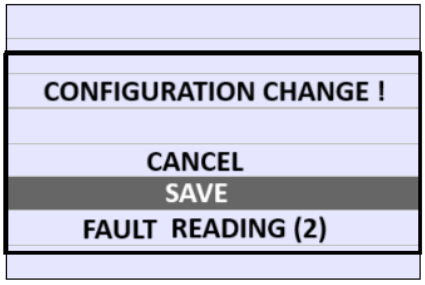
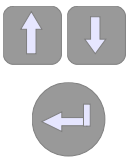
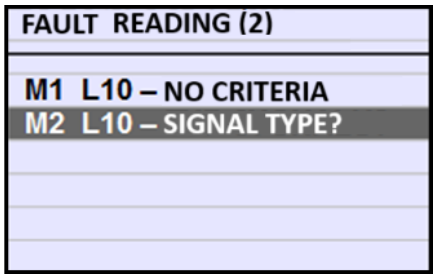
Configuration sub-menu:

MODULES +/- ↵ window for adding/removing modules
DECLAR. IN/OUT ↵ I/O declaration window for the selected module
POTENTIAL OUTPUT ↵ potential outputs configuration window
POTENTIAL-FREE OUTPUT ↵ potential-free outputs configuration window
CONTROL LINES ↵ configuration window (of inputs) of control lines
DETECTION LINES ↵ configuration window (of inputs) of detection lines
ZONE DECLARATION ↵ window for assigning lines to a zone number
DELAY DECLARATION ↵ window for programming delay times
SIGNALS ↵ configuration window of alarm devices operation
STANDARD CONFIG. ↵ default settings window
DISCHARGE CONFIG. ↵ discharge configuration window for designated zones
LINE COINCIDENCES ↵ window for programming the coincidences of detection lines
SYSTEM SETTINGS ↵ LCD contrast settings, clock correction, language selection window
PROGR./CONFIG.VERSIONS ↵ window for reading the program version and configuration settings

4.2.1. Adding modules

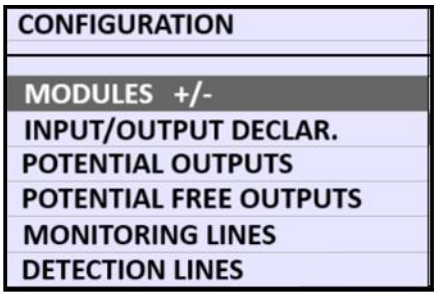
Table 4.2.1/1 Adding modules

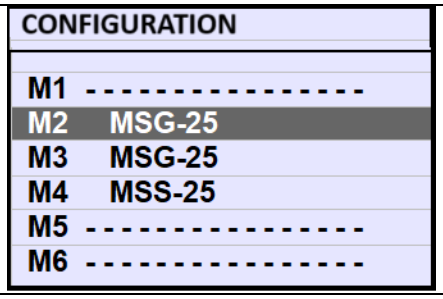
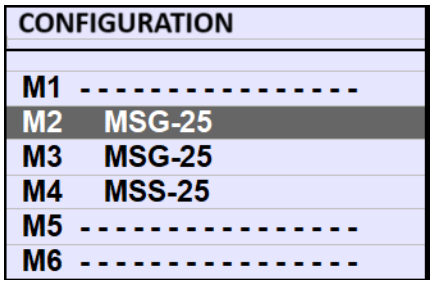
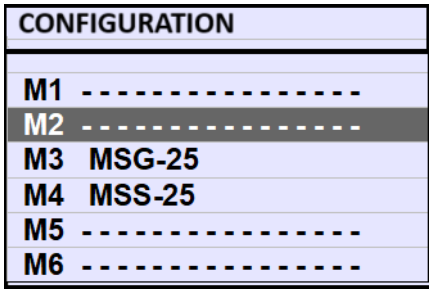
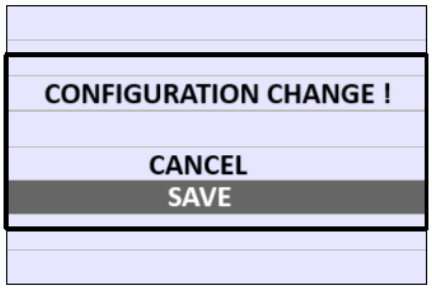
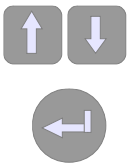
No.	Screen	Description of activities	Use of buttons
1		Select the MODULES +/- line.	
		Go to the next window.	
2		Select the module number from the displayed list. The module number (in this example =2) is the address set on the module board using the switches SW 1.	
		Go to next window	
3		Select the module type (e.g. MSG-25) from the small window.	
		Confirm adding the module.	
4		MSG-25 module #2 has been added. M2 (#2) is the address used for communication between modules. The number "2" should be set on the SW 1 switch located on the PCB of the added module. The modules must have different addresses.	
		Return to the main menu.	

5		After exiting the settings window to a higher menu level, the control panel checks whether the configuration has been changed. In the case of any changes made to the control panel configuration, a window appears which allows to save them to memory or cancel them (return to the previous configuration settings).	
6		Before saving the configuration changes, the control panel checks if the entire configuration is correct. If missing or incorrect settings are detected, the panel prepares a list of errors and displays an additional "reading errors" message. The number of errors detected is given in brackets. Before saving the new configuration, you can select the last line and use the "enter" button to display the created list.	
7		The figure shows a sample list. M1 L10 - error related to the L10 I/O of the M1 module (with address No. 1), NO CRITERIA. - no output activation criterion set, M2 L10 - error regarding the L10 I/O of the M2 module (with address no. 2), SIGNAL TYPE? - means an undeclared type of an output signal (e.g. continuous, cyclic).	

4.2.2. Removing modules

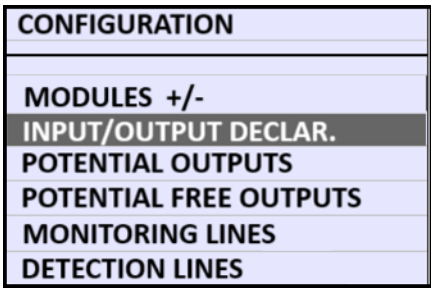
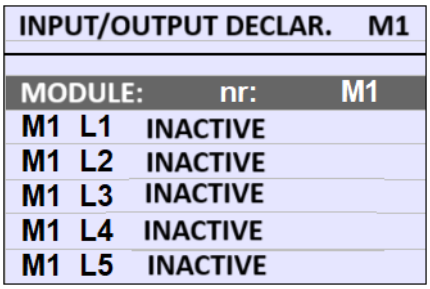
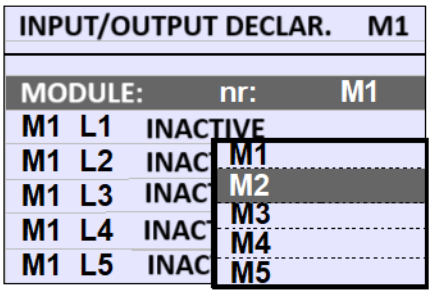
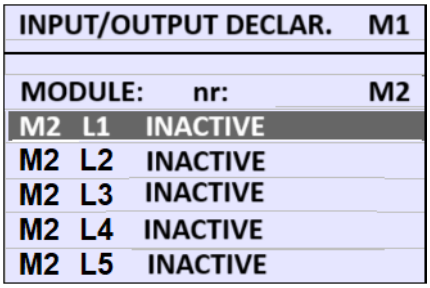
Table 4.2.2/1 Removing modules

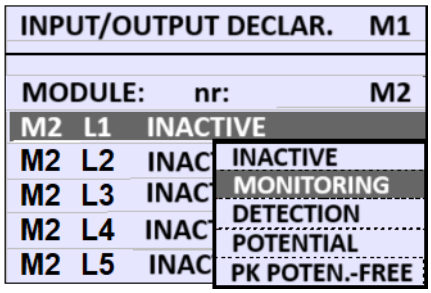
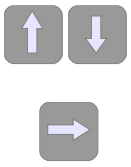
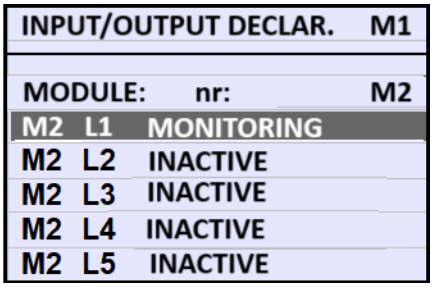
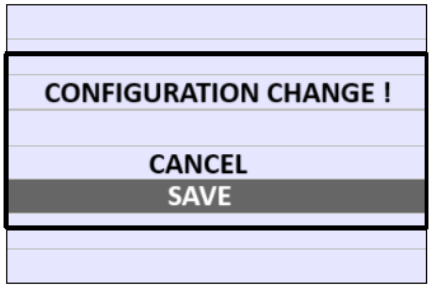
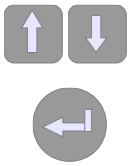
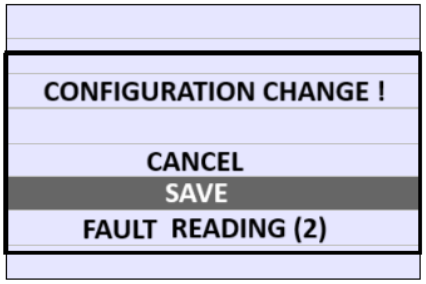
No.	Screen	Description of activities	Use of buttons
1		Select the MODULES +/- line.	
		Go to the next window.	
2 2		Select a module from the displayed list.	

		Go to next window	
3		To delete a module in the small window, select the first line "- - - - - - - - - "	
		Confirm removing the module.	
4		MSG-25 module #2 has been removed.	
		Return to the main menu	
5		After exiting the settings window to a higher menu level, the control panel checks whether the configuration has been changed. In case of any changes made to the control panel configuration, a window appears which allows to save or discard them(return to the previous configuration settings).	

4.2.3. Declaration of inputs/outputs

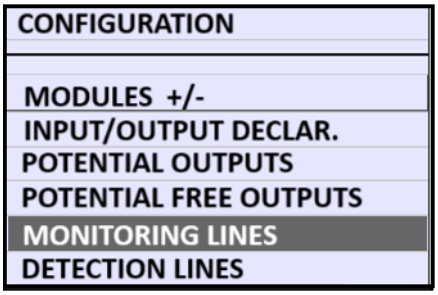
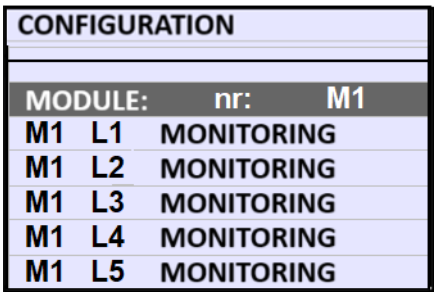
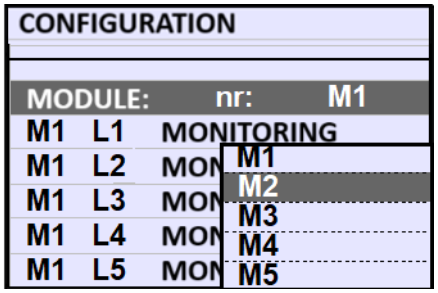
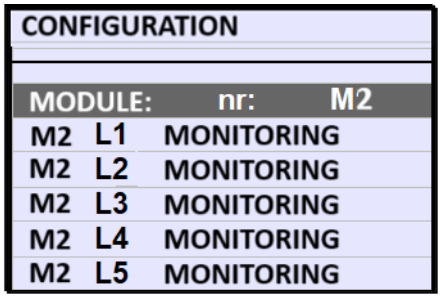
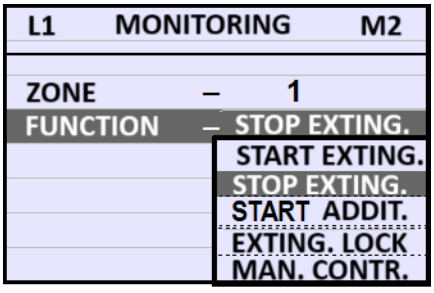
Table 4.2.3/1 Declaration of inputs/outputs

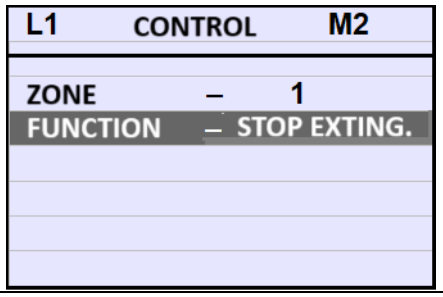
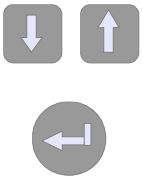
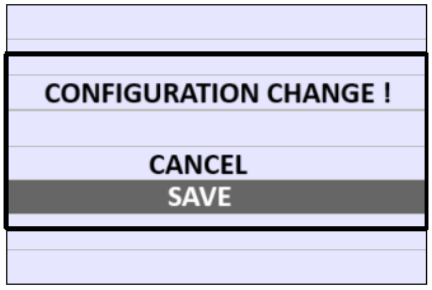
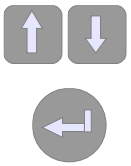
No.	Screen	Description of activities	Use of buttons
1		Select I/O DECLARATION. For the unique identification of the I/O, the module number (M1, M2, M3…) and the I/O number (L1, L2, L3…) are required.	
		Go to next window	
2		**Determine the number of the configured I/O module**. To change module, select the first line.	
		Go to next window	
3		In the small window, select the correct module number (e.g., module #2).	
		Confirm module number	
4		Select the I/O No. (L1...L22) for configuration.	
		Go to next window	

5		Select the I/O type in the small window. Possible options: L1...L6 - inactive/LK L7...L10 - inactive/LK/LP/24V L11...L16 - inactive/LK/Lpoten./ Ldetection/24 V L17...L22 inactive /PK potential-free	
		Approve change	
6		Configure the other I/Os of the module in the same way.	
		Return to the main menu	
7		After exiting the settings window to a higher menu level, the control panel checks whether the configuration has been changed. In case of any changes made to the control panel configuration, a window appears which allows to save or cancel changes (return to previous configuration settings).	
8		The detected errors window will be displayed if the necessary parameters for activated I/Os are not configured. After reading the error list, save the configuration of the activated I/Os and complete the missing settings.	

4.2.4. Configuration of control lines

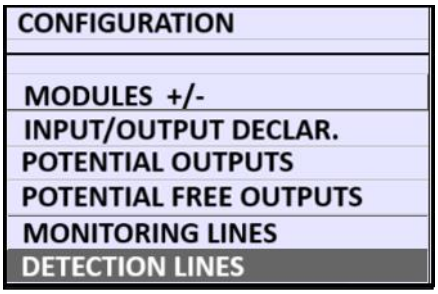
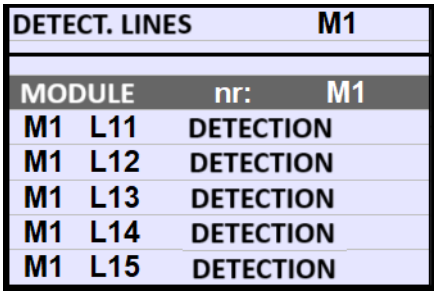
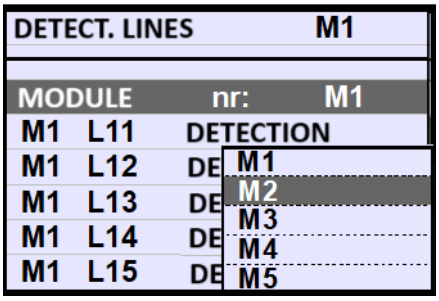
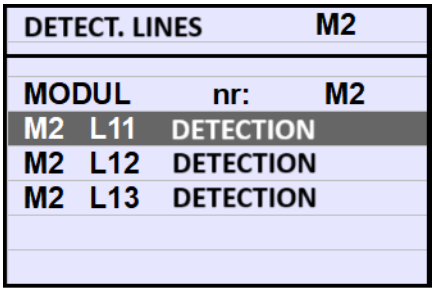
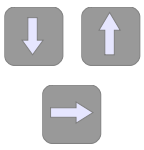
Table 4.2.4./1 Configuration of control lines

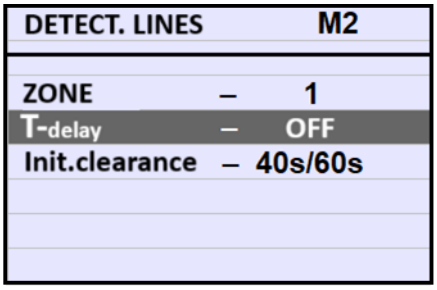
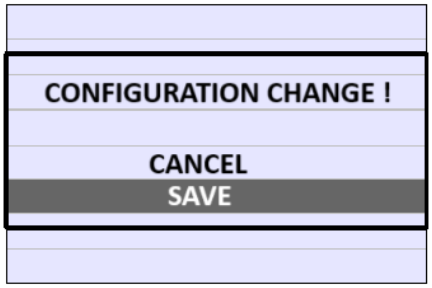
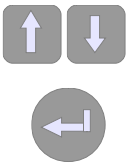
No.	Screen	Description of activities	Use of buttons
1		Select monitoring lines	
		Go to the next window	
2		Determine the MSG-25 module number of the monitoring line you are configuring. To change module, select the first line.	
		Go to the next window	
3		Select the correct module number (e.g., module #2) from the small windows list.	
		Confirm module number	
4		Select the monitoring line to be configured	
		Go to the next window	
5		Select a parameter in order to change its value or function.	
		Go to the next window	

6		Select and confirm the change	
7		After exiting the settings window to a higher menu level, the control panel checks whether the configuration has been changed. In case of any changes made to the control panel configuration, a window appears which allows you to save or cancel those changes (return to the previous configuration settings).	

4.2.5. Configuration of detection lines

Table 4.2.5 / 1 Configuration of detection lines

No.	Screen	Description of activities	Use of buttons
1		Select detection line(s)	
		Go to the next window	
2		Determine the MSG-25 module number of the detection line being configured. Select the first line to change the module	
		Go to the next window	
3		Select the correct module number (e.g., module #2) from the small windows list.	
		Confirm module number	
4		Select the detection line to be configured	
		Go to the next window	
5		Delay Off means that an alarm from this line will trigger a 2nd stage alarm without counting down the T1 or T2 delay.	

		Delay On will cause a level 1 alarm to sound during the T1 or T2 countdown. 40s / 60s - initial reset on with time parameters 40s/60s, which causes automatic reset of the detector after 40cs and a stand by for a repeated alarm - 60 s. Other options to choose from: – 0s/60s – 40s/60s – 40s/8min – initial reset disabled	
		Approve change	
6		After exiting the settings window to a higher menu level, the control panel checks whether the configuration has been changed. In case of any changes made to the control panel configuration, a window appears which allows you to save or cancel those changes. (return to the previous configuration settings).	

4.2.6. Configuration of detection lines coincidence

Select detection lines coincidence from the “CONFIGURATION” menu. Program the coincidence groups using the arrow marked button and the “enter” button. An "X" indicates a detection line belonging to a group. Up to any three coincidence groups can be programmed. The display shows "X" on three lines. Each row refers to one group of coincidence.

The number of detection lines available in the coincidence configuration window depends on previously performed I/O declaration. Lines configured in the coincidence window should be on the same MSG-25 module.

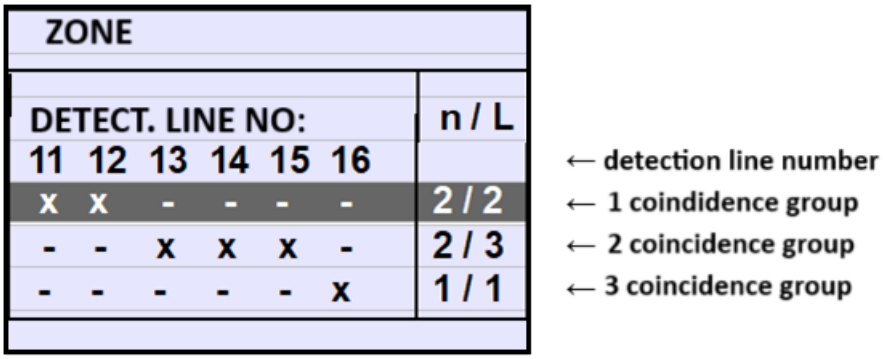


Figure 4.2.6/1 Line coincidence programming window

n- The minimum number of detection lines in the alarm state meeting the coincidence condition, **programmable in the range of 0 ÷ 3**;

L - number of detection lines that belong to the coincidence group, **programmable in the range of 0 ÷ 6**;

X - An indication mark that defines a detection line number being assigned to one of the three coincidence groups.

Detection lines can be freely configured in 1, 2 or 3 groups. The fulfilment of the coincidence in the group causes the second stage alarm status (after the set delay countdown).

Figure 4.2.6/1 shows an example coincidence configuration window :

1st group - detection lines no. 11, 12 in coincidence **2/2**, means two lines in an alarm state from two zones belonging to a group.

2nd group - detection lines no. 13, 14, 15 in coincidence **2/3** (2 out of 3 lines) means two lines in an alarm state from two lines belonging to a group.

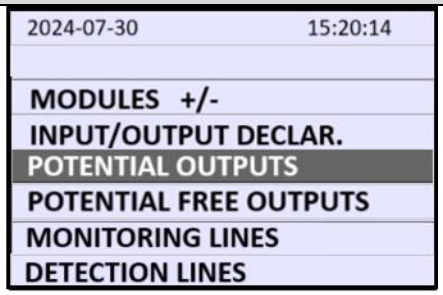
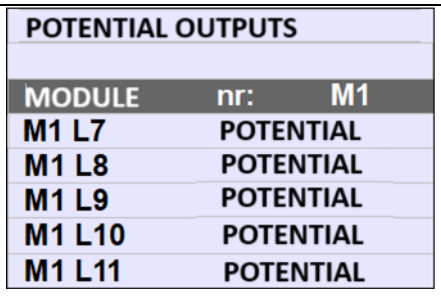
3rd group - detection line no. 16 in a coincidence **1/1** (1 out of 1 zone) means one line in the alarm state from the group to which one line belongs - as a special case, where one line can trigger a second stage alarm and start the extinguishing procedure.

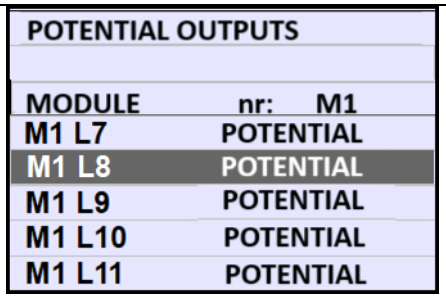
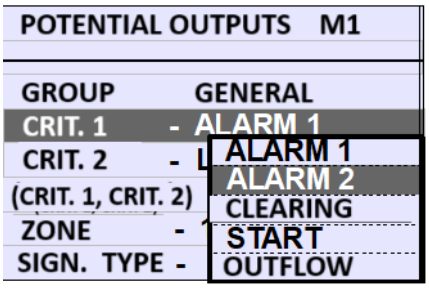
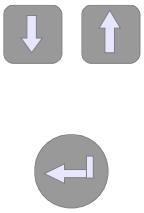
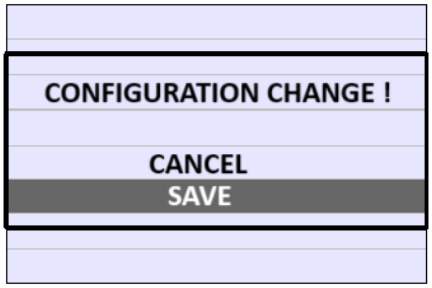
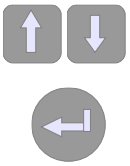
Settings n/L e.g. 0/1.0/2… trigger a fire alarm, but does not start the extinguishing procedure.

The coincidence will be fulfilled if the number of lines in the alarm state is at least equal to the number "n".

4.2.7. Configuration of potential outputs

Table 4.2.7/1 Configuration of potential outputs

No.	Screen	Description of activities	Use of buttons
1		Select potential outputs	
		Go to the next window	
2		Determine the MSG-25 module number of the detection line being configured. To change the module, select the first line.	
		Go to the next window Select the correct module number from the small windows list .	

<table>
<tr><td rowspan="2">3</td><td rowspan="2"> 
</td><td>Select the potential line number</td><td>  </td></tr>
<tr><td>Go to the next window</td><td>  </td></tr>
<tr><td>4</td><td> 
</td><td>By selecting the successive parameters (GROUP, CRITERION 1, CRITERION 2,...), configure the output by declaring the appropriate data displayed in the small window.
The initial saving of the setting selected from the small window is made by pressing the middle "enter" button
The functions and parameters of the potential outputs are described in section 7.3.1 "Potential lines"</td><td>  </td></tr>
<tr><td>6</td><td> 
</td><td>After exiting the settings window to a higher menu level, the control panel checks whether the configuration has been changed.
In the case of any changes made to the control panel configuration, a window appears which allows you to save or cancel those changes.(return to the previous configuration settings).</td><td>  </td></tr>
</table>

4.2.8. Configuration of potential-free outputs

Proceed as when programming the potential outputs.

4.2.9. Declaration of zones

The control panel enables assigning any zone to any input/output.

For a single-zone control panel, select the same zone number for all outputs.

For a two-zone control panel, set the zone numbers for zones/outputs according to the descriptions in zone fields on the control panel door. It is recommended that the inputs/outputs in one module are assigned to the same zone. The possible module failure will not affect the operation of another zone.

In order to change the zone number, select the "CONFIGURATION" line in the main menu then the "ZONE DECLARATION" line, go to the next window ("enter"), in which the correct module number is to be determined .

Next select the line number, then using the “enter” button go to the small window to select the correct zone. The change will be selected after pressing the "enter" key again, and the saving will take place after going up a menu level, similarly to the configuration of other parameters.

4.2.10. Programming delays

In order to program delays, In the main menu select the "CONFIGURATION" line then the "DELAY DECLARATION". In the first line of the Delay programming window, select the zone number for which the T 1, T 2, T-Evacuation time parameters will be set.

Programmable delay times:

T 1 - 2nd stage alarm delay time without confirmation of 1st stage alarm within the range of 0 ... 10 min.

T 2 - 2nd stage alarm delay time after confirmation of 1st stage alarm in the range of 0… 10 min.

Delays T1 and T2 are automatically reset if a zone for which the delay was turned off during configuration enters the alarm state in a given zone.

$T_{evacuation}$ - extinguishing agent discharge delay time after starting the extinguishing procedure in the range of 0… 1 min.

Cancelling block - adjustable time of blocking the possibility of resetting the alarm state (to achieve complete extinguishing agent discharge) in the range of 0...30 min.

Delay times are common for all inputs/outputs belonging to the same zone.

Different delay times can be programmed for each zone.

Changes to the time parameter settings can be saved or cancelled as in case of any other configuration changes.

4.2.11. Configuration recommendations

In order to comply with PN-EN 12094-1 standard when configuring the two-zone control panel necessary is to avoid declaring inputs/outputs belonging to different zones on one MSG-25 module, therefore in case of a single module failure only one zone will be disabled.

Considering the limited capacity of the control panel power supply it isnecessary to check whether the resultant current load of all outputs that will be activated at the same time will not exceed the maximum allowable current of the power supply.

Set unused inputs/outputs as inactive with no terminating resistors connected.

4.2.12. Standard configuration

Using the standard configuration option allows for quick configuration of the control panel modules by entering "predetermined" default parameters.

The parameters set by the default can be corrected by adapting to the requirements of the project therefore obtaining the expected configuration in a shorter time

In order to enter the standard configuration in the main menu (after entering the 3rd access level) select the "CONFIGURATION" line, and then the "STANDARD CONFIG." line in the sub-menu. After

entering the sub-menu, the list of installed modules is displayed. By selecting the module with the button ↵ configuration options are available, adequate for the selected module type shown in Table 4.2.12/1. Each of the modules are configured separately with an option to select the zone number to which the I/O will be assigned.

Furthermore it is possible to select the number of detection lines (2,4 or 6) for the MSG-25 module. The MSO-25 module stores general parameters in its memory, e.g. delay times T1, T2, T evacuation, which can be entered independently for each zone.

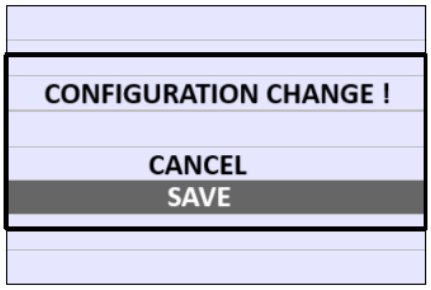
Table 4.2.12/1 Standard configuration options

Module type	Configuration option	Parameters
MSO-25	S1- T1,T2... S2- T1,T2.. RESET PARAM.	-configuration of time parameters for zone 1 (S1) -configuration of time parameters for zone 2 (S2) -reset all parameters, reset times Adjustable parameters for S1- or S2-: – *T 1 - 30 s* – *T 2 - 1.5 min.* – *T evacuation - 60 s Reset block - 0 min.* – *Discharge to > 1 zone - not blocked* – *Signalling of discharge state based on the signal from EZ* – *Coincidence of detection lines set in pairs L11, L12, L13, L14, L15, L16; n / L = 2/2 - number of pairs depending on the figure of an active detection lines configured in the MSG-25 module,* – *Automatic reactivation of alarm devices after silencing - un-blocked*
MSG-25	S1-2xLD... S2-2xLD... S1-4xLD... S2-4xLD... S1-6xLD... S2-6xLD... RESET PARAM.	-configuration of I/O. with 2 detection lines; zone 1 -configuration of I/O. with 2 detection lines; zone 2 -configuration of I/O. with 4 detection lines; zone 1 -configuration of I/O. with 4 detection lines; zone 2 -configuration of I/O. with 6 detection lines; zone 1 -configuration of I/O. with 6 detection lines; zone 2 -reset all settings - all I/O inactive Adjustable parameters: – *L1 - monitoring line with the EXTINGUISHING START function,* – *L2 - monitoring line with the EXTINGUISHING STOP function,* – *L3 - monitoring line with the OUTFLOW CONTROL function, delay of 10 s.* – *L4 - monitoring line with PRESSURE/WEIGHT control function, delay 0 s.* – *L5 - inactive,* – *L6 - inactive,* – *L7- potential line with EZ criterion; 1 pulse-4 s, no delay,* – *L8 - potential line with criteria ALARM 2st.; continuous signal, no delay,* – *L9 - potential line with criteria EXTINGUISHING START; cyclical 1s/1s, no delays,*

		– *L10 - potential line with criteria DISCHARGE; cyclic 1s/1s, no delay,* – *L11,L12 detection lines; L13÷L16 inactive - for option* S1/S2 2xLD.., – *L11÷L14 detection lines; L15,L16 inactive - for options* S1/S2-4xLD.., – *L11÷L16 security lines; - for options* S1/S2-6xLD..., *Delay and initial reset are disabled for all detection lines.* – *L17 - potential-free output PK1; FAULT criterion; continuous signal; without delay,* – *L18 - potential-free output PK2; criterion ALARM 1st stage; continuous signal; no delay,* – *L19 - PK3 potential-free output; criterion ALARM 2nd stage; continuous signal; no delay,* – *L20 - potential-free output PK4; PRESSURE / WEIGHT criterion; continuous signal; no delay,* – *L21 - PK5 inactive,* – *L22 - PK6 inactive.*
MKS-60	S1-L1..L6 S2-L1..L6 RESET PARAM.	- 6 I/O configuration - 2 PK, 2 monitoring lines, 2 potential lines; zone 1 - 6 I/O configuration - 2 PK, 2 monitoring lines, 2 potential lines; zone 2 - reset all settings - all I/O inactive Adjustable parameters: – *L1 - output potential-free relay with the criterion ALARM 1st.; continuous signal; no delay,* – *L2 -output potential-free relay with the criterion ALARM 2st; continuous signal; no delay,* – *L3 - monitoring line with MANUAL CONTROL function,* – *L4 - monitoring line with the NON-ELECTRICAL BLOCK function,* – *L5 - potential output with DISCHARGE criterion; signal continuous; no delay,* – *L6 - potential output with PRESSURE/WEIGHT Criterion; signal continuous; no delay.*
MPK-60	S1-L1..L4 S2-L1..L4 RESET PARAM.	- configuration 4 potential-free relay output -PK; zone 1, - configuration 4 potential-free relay output -PK; zone 2, - reset all settings - all outputs inactive Adjustable parameters: – *L1 potential-free relay output with 1-st. ALARM criterion; continuous signal; no delay,* – *L2 potential-free relay output with 2-st. ALARM criterion; continuous signal; no delay,* – *L3 potential-free relay output with EXTING. START criterion; continuous signal; no delay,* – *L4 potential-free relay outputs with DISCHARGE criterion; continuous signal; no delay,*
MWS-60	S1-L1..L4	- configuration 4 potential outputs; zone 1,

	S2-L1..L4 RESET PARAM.	- configuration 4 potential outputs; zone 2, - reset all settings - all outputs inactive Adjustable parameters: – *L1* - potential output *with ALARM-1st. criterion; cyclic signal; 1s/1s,* – *L2* - potential output *with ALARM-2st. criterion; cyclic signal; 1s/1s,* – *L3* - potential output *with EXTING. START criterion; cyclic signal; 1s/1s,* – *L4 - potential output with DISCHARGE criterion; continuous signal; no delay*
MSS-25	---------	– not configurable
MKA-25	---------	– not configurable

After entering the standard configuration and exiting the sub-menu a window to save or cancel introduced change will appear.



4.2.13. Event memory and alarm memory

The control panel is equipped with an event memory. Significant data is recorded and saved by the control panel with a time and date occurrance.

Events during which the control panel enters the fire alarm mode are saved separately. This feature is often referred to as the alarm counter. Reading the event and alarm memory is possible at the 2nd or higher access level after selecting the "EVENTS" or "ALARM MEMORY" line in the main menu. The "EVENTS" window contains all the events that have occurred including alarms. In the event reading window (Figure 4.2.13/1), the first two lines show the date, time and data related to the selected event name.

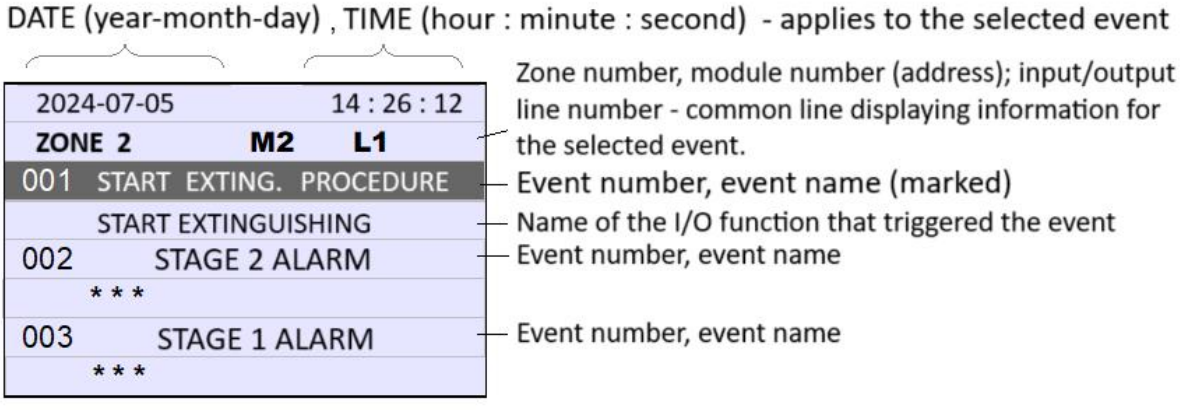


Figure 4.2.13/1 Event reading window

The events are displayed chronologically. Event number 001 is the "youngest", most recently stored event. there are 3 events on the screen that can be moved with the arrow buttons to read “older” events. The upper part of the screen always displays the "younger" event and the lower part displays the "older" event. Exiting the event memory readout and re-entering always sets the screen to the 3 most recently stored events.

Erasing an event memory and the alarm memory independently requires entering 3rd or the 4th access level then selecting the MEMORY CLEARING option from the main menu and following the instructions on the screen.

Using the “IGNIS 2500 Configurator” program installed on a PC is a convenient way to read and store events data.

The program can be downloaded from the manufacturer's website www.polon-alfa.com. Minimum hardware requirements of the program:

- operating system: Microsoft Windows Vista, Windows 7, Windows 8, Windows 10,

- disk space: approx. 2 GB.

Connecting the computer to the control panel requires the use of a USB cable of an A-B type

(the standard pinter type) .

The control panel’s USB connector is located on the MSO-25 module accessible by opening the door.

4.2.14. System settings

Selecting "system settings" from the main menu enables:

- adjusting the contrast of the LCD display,

- calibration of the clock with an accuracy of ± 0.1 s per day,

- enabling/disabling automatic summer/winter time change,

- selecting the language version of the displayed messages.

Figure 4.2.14/1 shows how to enter the "system settings" sub-menu from the main menu and a view of the window that allows you to speed up or delay the panel clock. In the presented window, the clock was accelerated by 0.3 s/day compared to the previous setting.

Confirmation of the change takes place after exiting the submenu and automatic eappearance of the

"CONFIGURATION CHANGE! SAVE/CANCEL" as with other configuration changes.

Changing other system settings is done in a similar manner.

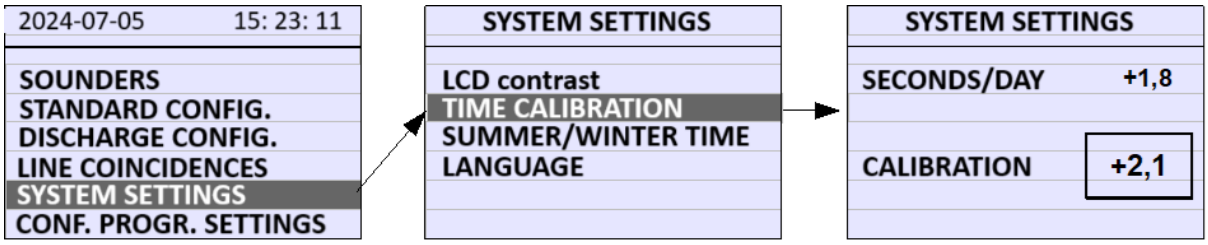


Figure 4.2.14/1 Example of clock calibration

4.3. Fault reading

The faults can be read after pressing the "FAULT" button on the control panel keypad or selecting the "fault" line after entering the main menu on the control panel LCD display. The fault window also appears automatically when a fault condition occurs.

4.4. Blocking

The control panel allows each input and output to be blocked/unblocked using the LCD display menu (Table 4.4/2). Changes to blocking can only be made after access level 2 or higher. At access level 1 only reading of the blocking is possible.

The outputs can be blocked individually or in groups. It is possible to block outputs assigned to groups in classification :

- "alarm transmission" - a group of outputs to alarm signal transmission devices,
- "discharge transmission" - a group of discharge signal transmission outputs,
- "signallers" - a group of outputs controlling alarm and warning devices,
- "safety devices" - a group of outputs that control safety devices.

Outputs not assigned to the above groups are included in the general group by default. Outputs assigned to a general group can only be blocked individually. The BLOCKING ALARM button, located on the control panel door, allows to quickly enter the "ALARM DEVICES" window and to block/unblock the selected alarm device subgroup. Blocking the group of ALARM DEVICES is signalled by lighting a lamp next to the button. Intermittent lighting of the lamp occurs in the case of partial blocking of the

group (e.g. one of the two outputs belonging to the group). Blocking alarm devices is further described in section blocking alarm devices.

Group blocking is independent of individual blocking i.e. the output blocked individually cannot be unblocked for the group and the output blocked for the group cannot be unblocked individually. The outputs blocked by group or individually are displayed in the menu with the designation "X". The outputs that are blocked by groups are displayed individually in the menu with the designation "XX".

Table 4.4./1 Blocking

Output group name		Menu on the control panel LCD display	Button BLOCKING OF ALARM DEVICES
1	GENERAL	Individual I/O blocking only	-
2	ALARM TRANSMISSION	Group or individual blocking	-
3	DISCHARGE TRANSMISSION	Group or individual blocking	-
4	ALARM DEVICES (WARNING ALARM DEVICES)	Group or individual blocking	Enables quick access to blocking a group of alarm devices
5	SAFETY DEVICES	Group or individual blocking	-
6	TRANSMISSION MKA-25	Blocking transmission to POLON 6000	-

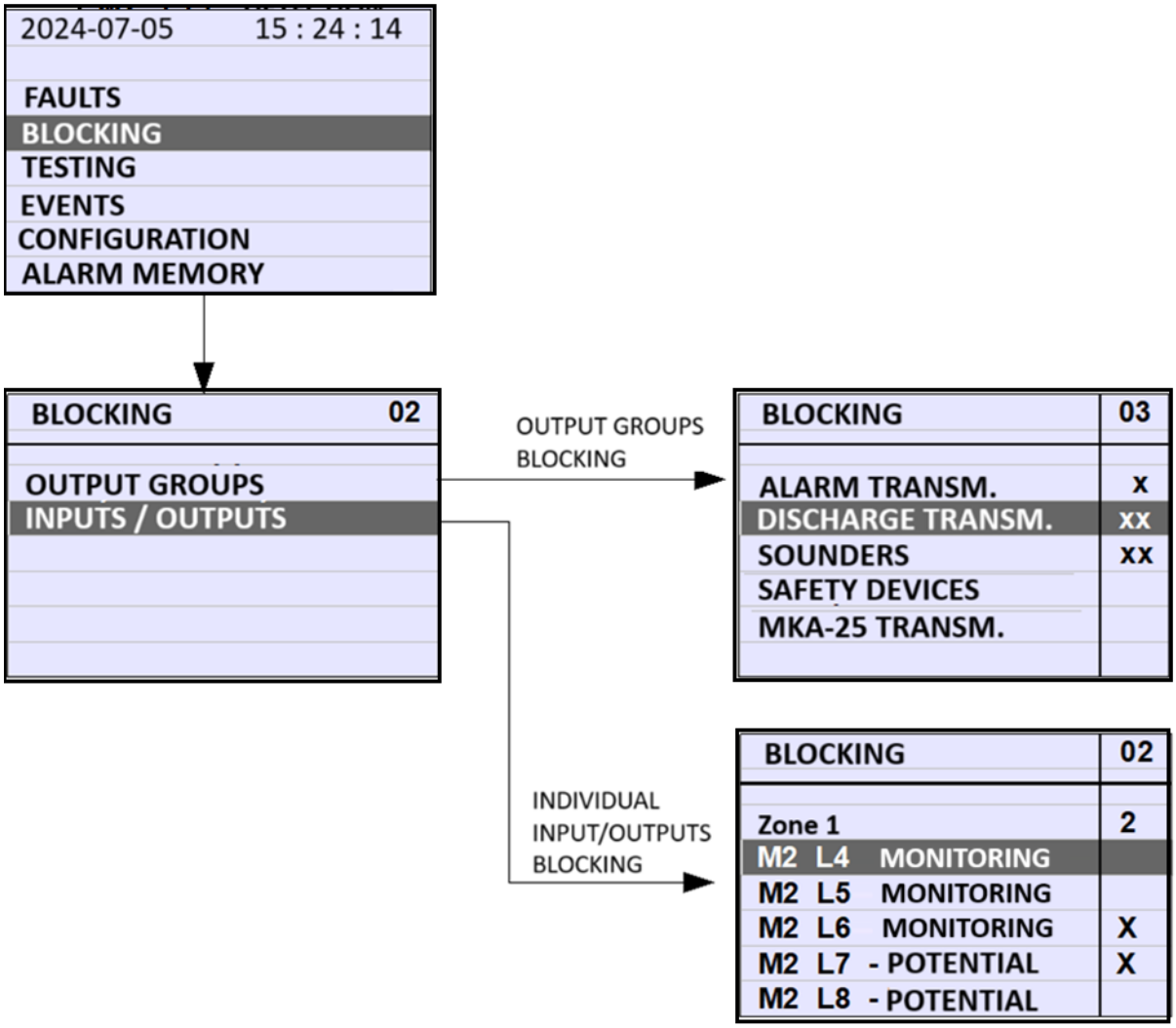
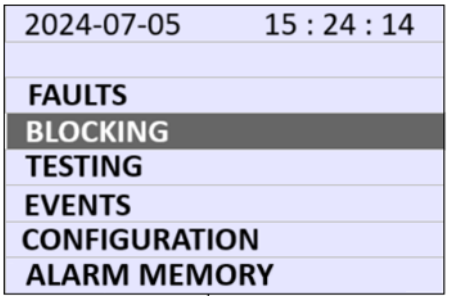
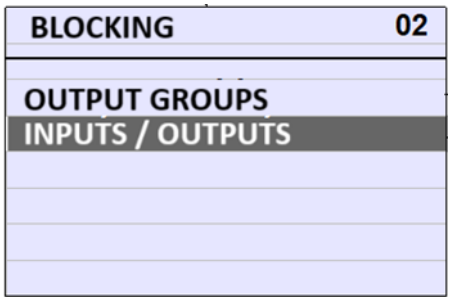
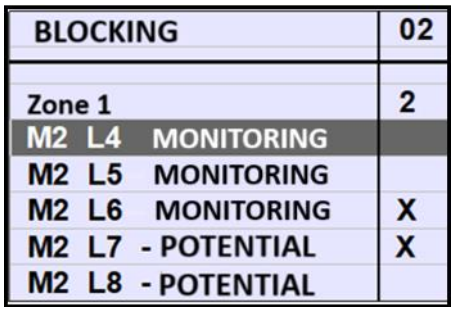


Figure 4.4/1 Blocking

Table 4.4/2 Blocking

No.	Screen	Description of activities	Use of buttons
1		Select "BLOCKING"	
		Go to the next window	
		Select group blocking "OUTPUT GROUPS" or single blocking "IN-PUTS/OUTPUTS"	

		Go to the next window	
2		Select the line to switch to the blocking state.	
		Use the middle "enter" button to put the selected line into the blocking state. The bypassed inputs / outputs will be marked with an "X". The number of blocked lines is displayed on the upper right corner of the display.. The number of blocked lines in the zone - in a row zone selection. Pressing the "enter" key again cancels the blocking state of the selected line.	

4.4.1. Extinguishing blockade

The extinguishing blockade prevents the discharge of extinguishing agent by blocking the control of the output (or outputs) given the EZ criterion (solenoid valve).

Lighting of the LED lamp next to the button indicates that the extinguishing block is on. The extinguishing blockade can be activated by means of a button on the control panel or an external button on a control line, which has been assigned the "extinguishing blockade" function.

The extinguishing blockade is also activated automatically in the following cases:

- no alarm output configured for a given extinguishing zone,
- failure of the output assigned to a group of alarm devices for a given extinguishing zone,
- blocking alarm devices for a given extinguishing zone,
- fault of the STOP control line (if declared in the configuration),
- fault of the EXTINGUISHING BLOCK control line (if declared in the configuration),
- after a discharge in one zone when the option of blocking the discharge to more than 1 zone has been set (for a 2-zone control panel) opening the control panel door, if the ZW 9 jumper is set in position 2-3 on the MSO module,
- system fault in a given zone or communication with modules disturbed.

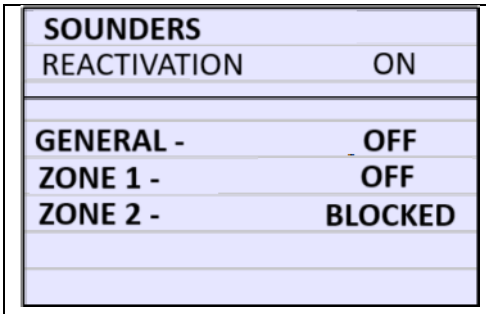
Attempting to disable the extinguishing block with the button on the control panel will not be effective if one of the above causes occurs. The reasons for the extinguishing block are displayed momentarily on the screen after pressing the button.

You can also view the reasons for the extinguishing block by entering the BLOCKING menu, in the INPUTS/OUTPUTS option, selecting the EXTINGUISHING BLOCKADE line and pressing the "enter" button.

4.4.2. Blocking alarm devices

Operation of the function "blocking alarm devices" requires assigning outputs intended for controlling alarm devices to the group "alarm devices" during configuration. Activation of the BLOCKING ALARM DEVICES button located on the control panel door will display the window Figure 4.4.2/1, where by means of the ↑ ↓ buttons it is possible to select a subgroup of alarm devices in order to:

- block/unblock during detection state,
- mute/activate or unblock during an alarm, using the "enter" button ↵.



REACTIVATION ON - automatically reactivates the alarm devices when a new alarm occurs (if previously silenced.)

REACTIVATION OFF – when silenced a new alarm does not restart the alarm devices.

GENERAL - status of alarm devices assigned to zone 1 and zone 2 (zone 1+2)

ZONE 1 - for alarm devices assigned to zone 1 only.

ZONE 2 - for alarm devices assigned to zone 2 only.

Figure 4.4.2/1 Blocking alarm devices

For a single-zone control panel, a subgroup of alarm devices: GENERAL, ZONE 1, ZONE 2 are not present as all alarm devices are assigned to zone 1.

For a two-zone control panel, the "ALARM DEVICES" group can be divided into 3 subdivisions:

- outputs assigned to zone 1 and zone 2 (zone 1+2), "general"- activated when an alarm occurs in any zone,
- outputs assigned to zone 1 - activated when the alarm applies only to zone 1,
- outputs assigned to zone 2 - activated when the alarm applies only to zone 2.

In the detection state, the alarm devices can be:

- disabled - in the alarm state they automatically switch to the "enabled" state,

blocked - in the alarm state the sirens will not be switched on automatically.In the alarming state, the alarm devices can be:

- enabled (automatically, if they are not blocked in the detection mode),
- silenced (manually) - another alarm re-activates alarm devices, provided that the "reactivation" option has been enabled,
- blocked.

By blocking the zone alarm devices in the detection status, assigned to zone 1 (zone 2), the extinguishing blocking is automatically disabled in the zone, where the alarm devices (evacuation or warning alarm devices) have been blocked.

Blocking the general alarm devices (assigned to zone 1+2) does not trigger the extinguishing blockade.

4.5. Testing

The testing mode facilitates checking the correct operation of the zones, outputs, as well as the circuits and devices cooperating with the control panel in the system. It also allows you to check the efficiency of all LED optical indicators on the control panel. The method of putting the control panel into the testing mode is presented in Table 4.5/1.

The control panel signals the testing mode with the collective TESTING lamp after entering at least one zone or output into the testing mode. The LCD display shows information about the enabled test(s) and the sum of the inputs/outputs in the testing state. **Exiting the testing mode is not automatic - it requires manual deactivation of the testing mode**.

Required access levels:

- testing inputs (control and detection lines) - level 2,
- output testing - level 3.

Testing of detection lines

An alarm from detectors or other fire warning devices on a detection line that is in the testing mode does not trigger a fire alarm and does not activate the control panel outputs. The control panel signals only the acceptance of the test alarm and saves the event in memory. After tens of seconds it automatically resets the test alarm in the detection line.

Testing of monitoring lines

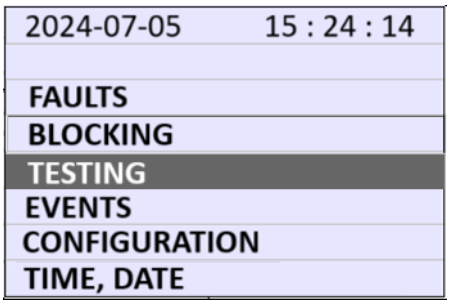
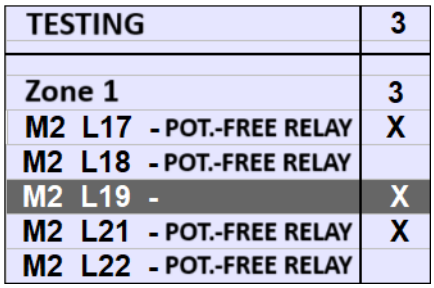
Entering any monitoring line into testing status allows to check its active status without triggering other control panel statuses, e.g. accepting the signal of START EXTINGUISHING button activation will not cause the fire extinguishing procedure to trigger.

The forcing of an active mode on a monitoring line during testing mode is saved to the event data memory.

Testing the outputs

Testing the outputs allows forcing control any of the potential or potential-free output. Before activating the output test, ensure the actual output actuation (applying 24 V voltage or switching the relay's contacts) will not cause any undesirable effects. Setting the "x" mark by the name of the output in the test window activates the output in accordance with the previously performed configuration. In case of activating the potential outputs on the MSG-25 module, the active state is signalled by LED diodes at the L7… L16 connectors.

Table 4.5/1 Testing

No.	Screen	Description of activities	Use of buttons
1		Select the "TESTING" line	
		Go to the next window	
2		Mark the line to be put into testing state	
		Use the middle "enter" button to switch the highlighted line to the test state. Inputs/outputs (lines) in the testing state will be marked with an "X". The number of total lines tested is displayed in the upper right corner of the display. The number of tested lines in the zone - in the zone selection line. Pressing the "enter" key again cancels the testing status of the selected line. Outputs testing is possible after entering the code of the 3rd access level and additional confirmation in the window which appears.	

5. MSO-25 signalling and operating module

MSO-25 module is responsible for user interface operation, it controls buttons, optical indicators, display, it is also the main operation managing controller of other modules.
In case of the two-zone control panel version, the module works redundantly with the MSS module-25.

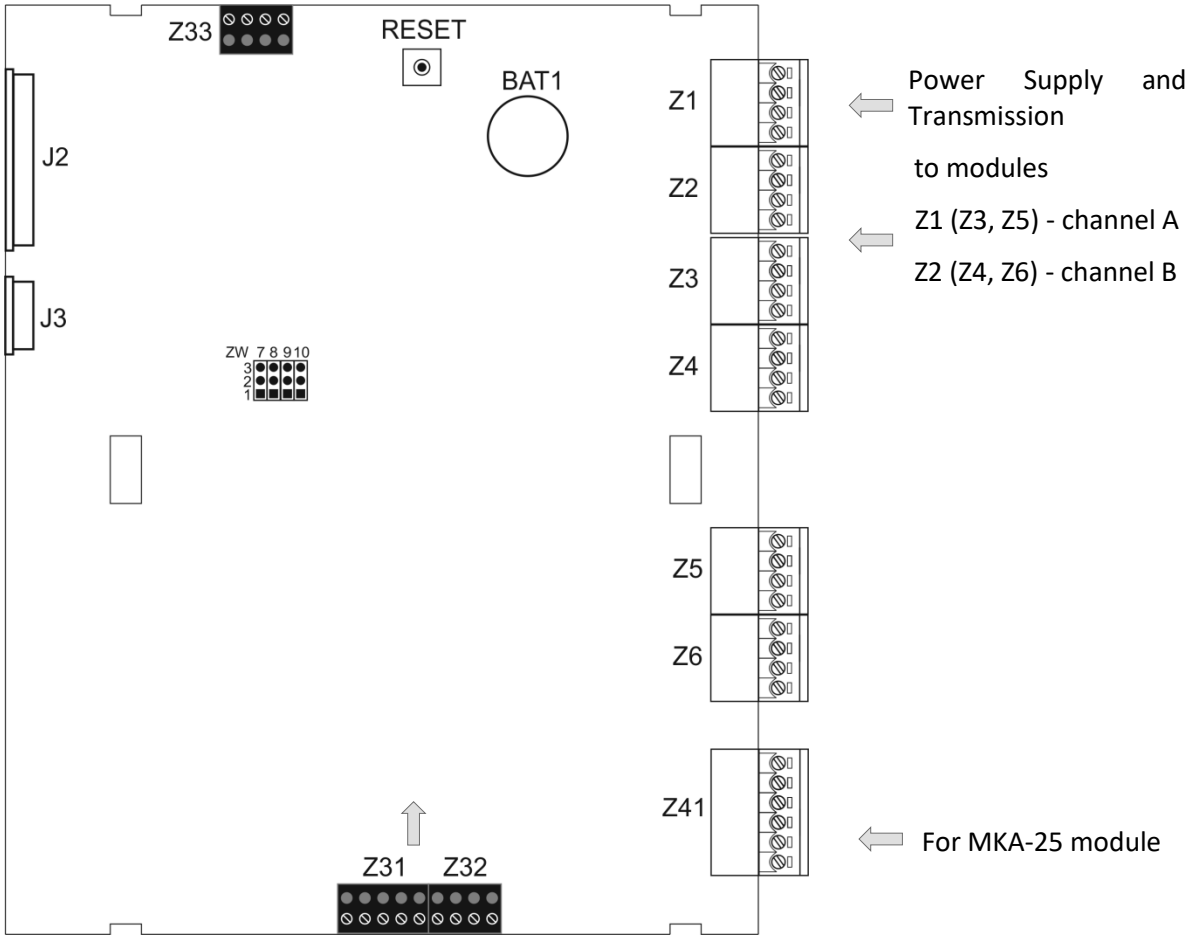


Figure 5/1 View of the MSO-25 module board

ZW jumper functions:

ZW 9 - position 1-2 - opening the door activates the fire extinguishing block
- position 2-3 - opening the door does not affect extinguishing block

ZW 10 - position 1-2 - normal operation position
- position 2-3 - restoring default access codes

ZW 8 - setting the type of LCD display (contrast change)

ZW 7 - not used

BAT 1 - battery to support the clock during power failure

Z 33 - connector for testing in the production process

J 2, J foil keyboard connectors

6. MSS-25 zone signalling module

The MSS-25 module is installed only in two-zone versions of the control panel. Together with the control panel door it is also offered as the**"MSS-25 extended module**". It enables the expansion of the control panel one-zone to two-zone version.

The module controls the field of optical indicators and buttons of the second zone. It cooperates with the MSO-25 module, providing control redundancy in case of an accident to one of the modules.

7. Fire extinguishing control module MSG-25

7.1. General description of inputs and outputs of the module

The MSG-25 module (Figure 7.1/1) is equipped with the following programmable inputs and outputs for connecting installation cables:

- 6 relay outputs PK1 ÷ PK6 potential free, universal, adapted to switching of voltages up to 30 V and loads up to 1 A with a circuit continuity check system,
- 6 control line inputs L1÷L6,
- 2 potential outputs L7, L8 24 V/2 A with the possibility of reprogramming the operating mode to the inputs of control lines,
- 2 potential outputs L9, L10 24 V/0.7 A with the possibility of reprogramming the operating mode to the inputs of the control lines or as a power source for external devices 24 V (max. 0.7 A),
- 6 inputs of conventional detection lines with the possibility of reprogramming the operating mode to potential outputs of 24 V/0.7 A or monitoring line inputs, in addition, each of these outputs can be configured as a source of power for external 24 V devices (max. 0.7 A).

The maximum load current for the potential outputs applies to a continuous resistive load. When switching on a load that consumes a short-time increased surge current, the values of max. 1.4 A for 0.7 A outputs (L9÷L16) and max. 6 A for 2 A outputs (L7, L8) until the thermal current limitation is tripped ought to be adopted. Switch-on pulse energy must not exceed 3 J (Joules), not for all outputs simultaneously.

In addition, the module has the following connectors for internal connections of the control panel:

- power supply and data transmission to the MSO-25 module (on the control panel door),
- connection to MGR-64 bus,
- power supply and data transmission to the second MSG-25 module,
- 24 V power supply from the MZU-25 module,
- 2 connectors for a 24 V battery bank (2x12 V) coupling.

The module also includes a system monitoring the condition and charging of 24 V (2x12 V) batteries.

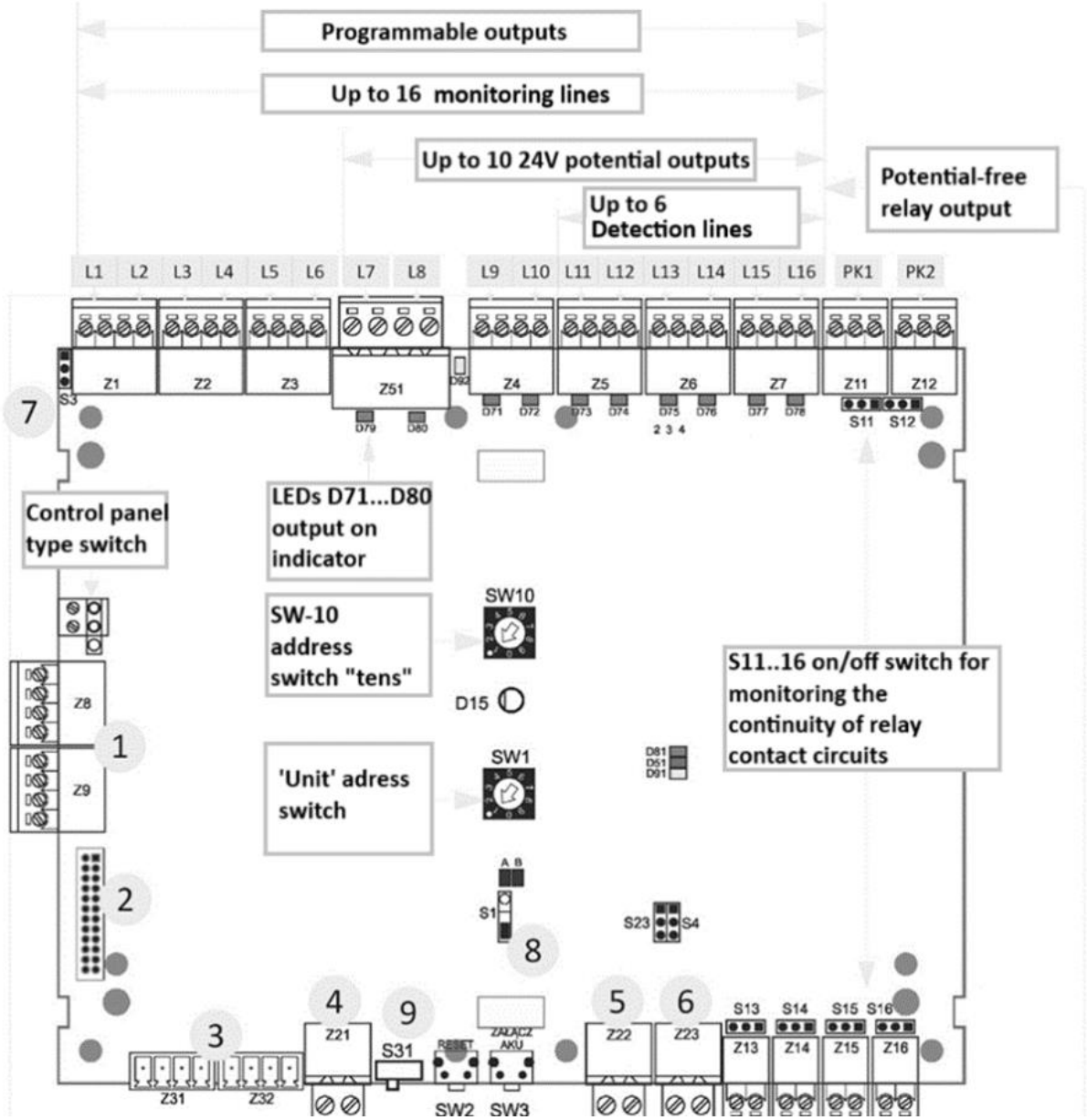


Figure7.1/1 MSG-25 module

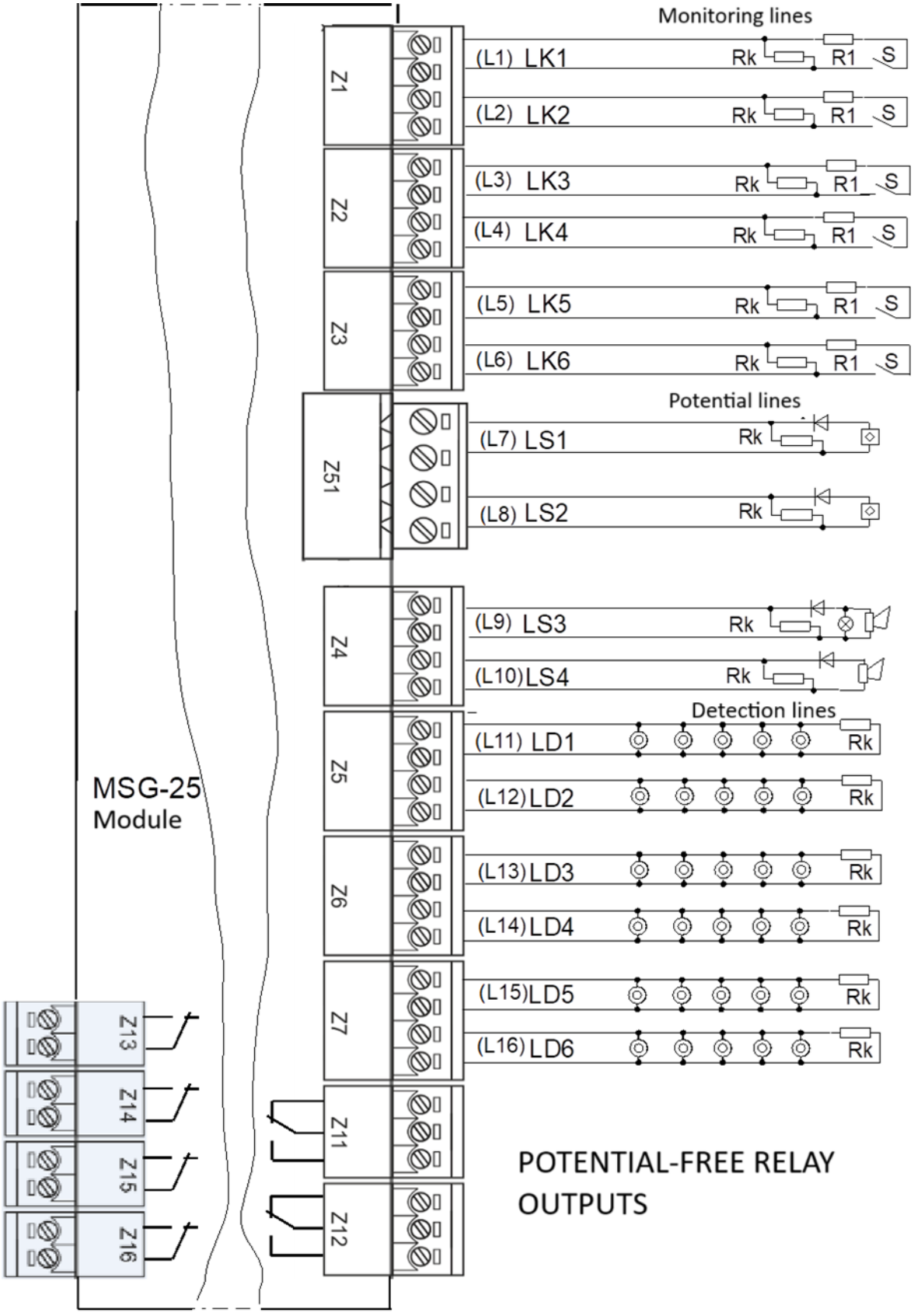


Figure 7.1/2 Outputs/inputs of the MSG-25 module

7.2. Monitoring lines

Monitoring inputs are used to supervise devices connected to the control panel by analysing the status of control lines.

L1 ÷ L6 - dedicated inputs of the module intended for connecting the lines used for condition monitoring of external devices.

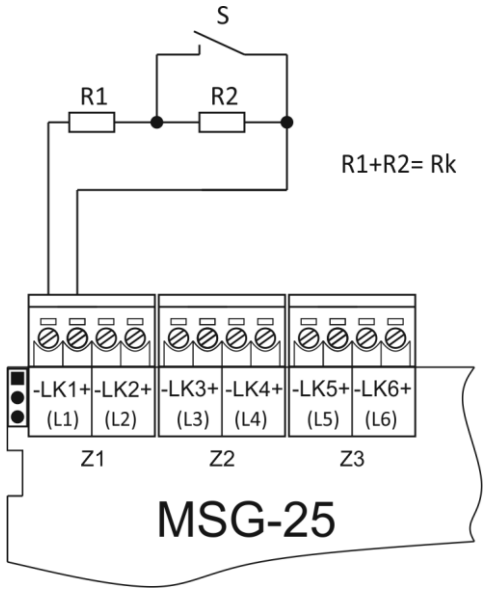
L7 ÷ L16 - outputs with the option to configure the operating mode as control lines.

The operating state of the line depends on the resistance value seen from the LK terminals. The ways of using the monitoring inputs are shown in Fig. 7.2/1.

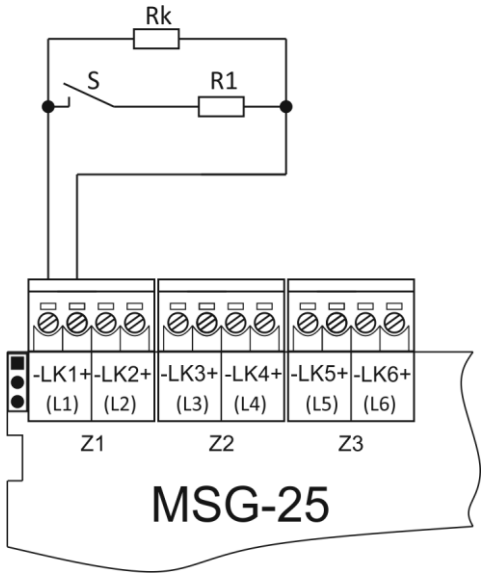
Table 7.2/1 Operating status of control lines

Operating status	Resistance of the monitoring line circuit
Line break (fault status)	>25 kΩ
Detection status	6.2 kΩ
Active status X	2 kΩ
Active status Y	470 ÷ 750 Ω
Line short circuit (fault status)	250 Ω

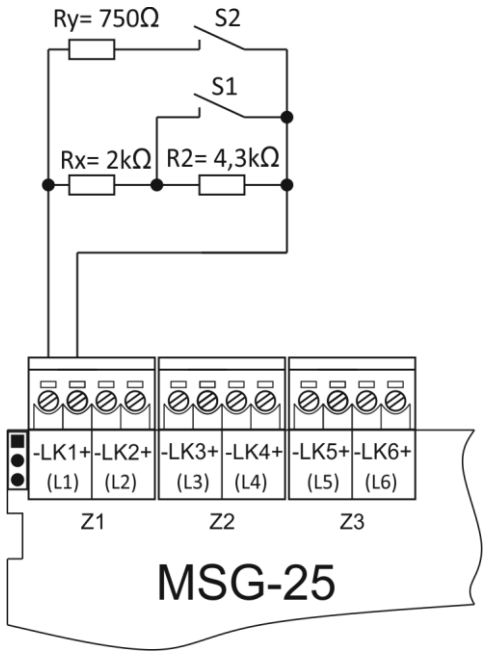
Basic ways of using control lines



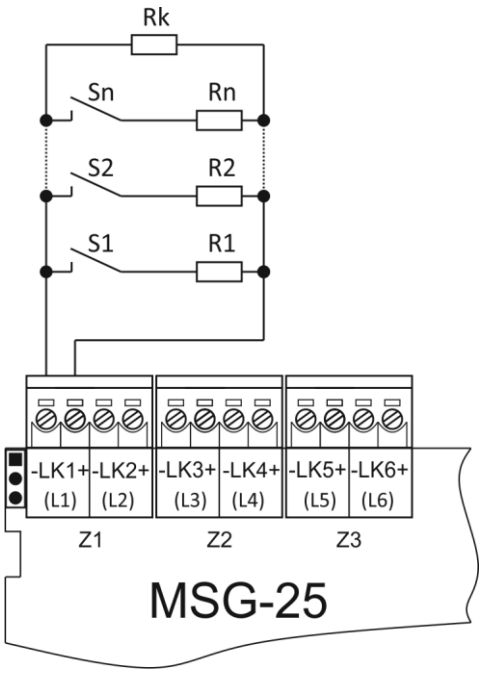
1 way of connecting a control line to the *MSG-25* module inputs
R1=2 kΩ (or 750 Ω for "Y" active status)
R2=4.3 kΩ
Rk=R1+R2=6.3 kΩ



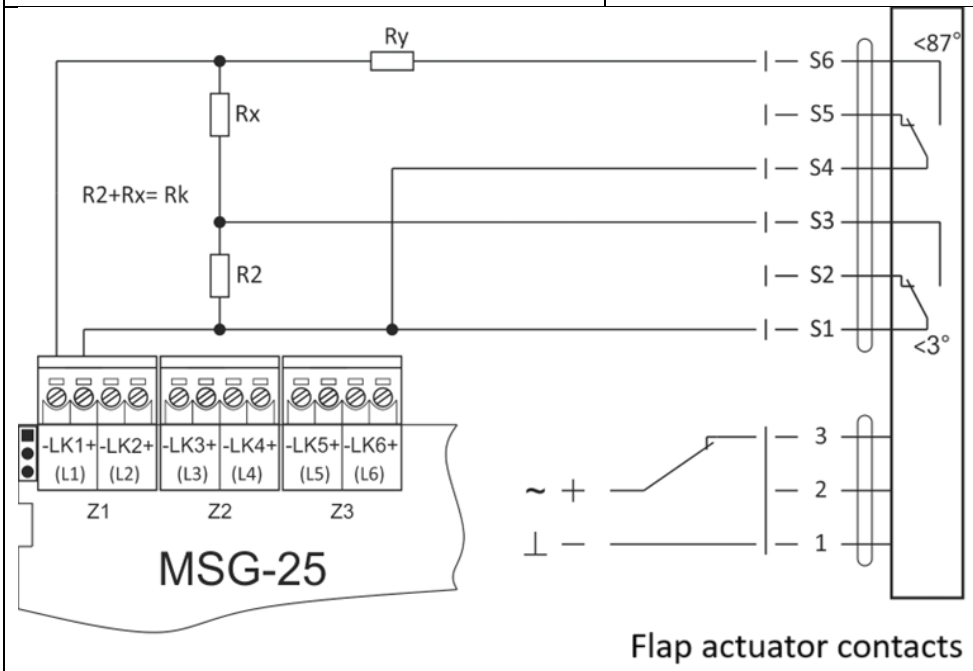
2 way of connecting the control line to the MSG-25 module inputs
R1=2 kΩ
Rk=6.2 kΩ



Control line in binary mode
Rx=2 kΩ
Ry=750 Ω
R2=4.3 kΩ
Rk=Rx+R2=6.3 kΩ
The two-state mode allows you to control two active states: state X and state Y.



Connection of a greater number of devices with a contact element S, e.g. buttons START EXTINGUISHING, STOP EXTINGUISHING, BLOCKADE EXTINGUISHING, etc. The terminating resistor Rk = 6.2 kΩ should be connected to the last device at the end of the LK line.



Example of using the two-state monitoring line mode to supervise the status of external devices, e.g. the position of the room decompression damper. An incorrect position can be indicated as a failure of an external devices.

Figure7.2/1 Ways of using control inputs

7.2.1. Monitoring line functions

Monitoring lines are necessary to supervise the status of devices cooperating with the control panel. Each monitoring line connected to MSG-25 module can be assigned a different task e.g.: monitoring of START EXTINGUISHING buttons, gas pressure monitoring, monitoring of BLOCK EXTINGUISHING, etc. In this way it is possible to provide adequate control panel response depending on the function assigned to a given monitoring line. All monitoring lines are supervised - a fault in the form of a break or short circuit is detected and signalled acoustically and optically by the control panel. Table 7.2.1/1 presents the functions that can be assigned to the monitoring lines of the MSG-25 and MKS modules-60.

Table 7.2.1/1 Functions of monitoring lines of MSG-25 (MKS-60) module

No.	MONITORING LINE FUNCTION and the designation in the control panel menu	Description of the monitoring line functions and application
1	EXTERNAL DEVICES "EXTERNAL DEVICE"	The monitoring line is intended for monitoring of activation of external devices, e.g. fire dampers in defined states of control panel operation (e.g. during 1st alarm, 2st. alarm, extinguishing activation, discharge). The operation of the line can be programmed as single state "X state" or binary "state X" and "state Y". The two-state operation can be used to monitoring of devices with two limit switches, e.g. fire dampers. If the fire scenario provides for the damper to be closed in the state of, for example, a 2nd stage alarm, the lack of proper operation, i.e. the lack of the "X" and "Y" states, will be signalled by the control panel as a damage of external devices. When configuring the monitoring line, it is possible to set an independent delay time for the occurrence of the "X" and "Y" states and the control panel state in which the monitoring takes place. An exemplary diagram of the use of a line operating in binary mode is shown in Fig. 7.2/1
2 *	EXTINGUISHING BLOCKADE "EXTINGUISHING BLOCKADE"	The line is used to connect external EXTINGUISHING BLOCKADE buttons. The active state of the line (pressing the button) blocks the activation of extinguishing both during detection and after starting the extinguishing procedure during the initial countdown of the "T-evacuation" time. The same extinguishing block state can be triggered by pressing the button on the control panel door. Releasing the blockade requires reset the active state on the monitoring line and unlocking with the button on the panel door (if the blockade was also enabled with this button). The extinguishing blockade status is indicated by lighting of a yellow diode next to the EXTINGUISHING BLOCKADE button on the control panel door.
3	MANUAL CONTROL (ONLY) "MANUAL CONTROL"	Enables remote switching of the control panel operation mode: - the active state of the control line forces the MANUAL CONTROL mode, - the zone detection state causes the control panel to return to the AUTOMATIC (and manual) mode, provided that the control panel has not been switched to the manual mode by means of the button on the control panel door.

		The manual mode is signalled by the lighting of the yellow LED next to the button on the control panel door.
4*	ADDITION START "ADDITION START"	The line is used to connect the ADDITION START buttons - starting the reserve extinguishing agent resource (continuation of the extinguishing procedure) in the same zone. The active state of the line will activate the output programmed as ADDITION, provided that the control panel is in the discharge state, i.e. after the main extinguishing agent resource is released. Triggering the active state of the line in the detection state of the control panel does not trigger the output.
5*	EXTINGUISHING STOP “EXTINGUISHING STOP"	This line is used to connect the EXTINGUISHING STOP buttons - the active state of the line, triggered by pressing the EXTINGUISHING STOP push-button, stops the countdown of the “$T_{evacuation}$” time. The hold is effective for the amount of time the button is "held" in an active state. During the time before starting the extinguishing procedure and after releasing the extinguishing agent, the EXTINGUISHING STOP function does not cause any operation. Releasing the EXTINGUISHING STOP button will restart the countdown from the beginning.
6*	EXTINGUISHING START "EXTINGUISHING START"	The line is used to connect the EXTINGUISHING START push buttons - the active state of the line triggered by pressing the button starts activates the extinguishing procedure and starts the countdown of the "$T_{-evacuation}$” time.
7	EXTINGUISHING AGENT DISCHARGE MONITORING. "LK. DISCHARGE"	The active state of the line indicates the actual discharge of extinguishing agent. The line is connected with the contact that reacts to the outflow of the extinguishing agent, located at the bank of the extinguishing agent cylinder. During the extinguishing operation, the solenoid valve actuation should initiate the discharge of extinguishing agent. No appearance of the active state of the line (after the set delay time) causes the appearance of a fault message.
8	EXTERNAL ALARM INPUT "EXTERNAL ALARM."	It is used to receive an external alarm signal that triggers the extinguishing procedure. The signal may come from another fire alarm system and is treated as a reliable alarm signal from an automatic call points (detectors) working in coincidence. The operation of the line differs depending on the control panel operating mode: - in automatic (and manual) mode, it starts the extinguishing procedure, - in manual mode (only), it starts the alarm signalling without the extinguishing procedure activation. The zone can be configured with delay on, then the 2nd stage alarm will be preceded by the 1st stage alarm until the T1 time (or T2 time after the alarm confirmation) is counted down.
9	PRESSURE / WEIGHT MONITORING “PRESSURE/WEIGHT"	The active state of the line signals a failure caused by a drop in pressure or weight of the extinguishing agent. The line can be connected to a contact coupled to a pressure gauge or scale which changes its state if a loss of extinguishing agent occurs during the detection of the control panel.

10	NON-ELECTRIC BLOCKING POSITION "NON-ELECTRIC BLOCK."	The line is intended to supervise a mechanical blocking device used to block the start of extinguishing during e.g. maintenance works. The mechanical blocking device may have a lever for setting an "open or "closed" position. The monitoring line enables signalling of the device position. The active state of the line causes signalling of the state of blocking the extinguishing zone in the control panel.
11	ALARM RESET "ALARM RESET"	The function enables remote resetting of the alarm state of the control panel by triggering the active state of the monitoring line, e.g. by means of relay contacts of another fire protection system control panel.
12	Actuation of the common solenoid valve "EZ-(SV)COMMON"	The function is intended to be used in a multi-zone configuration with more than one IGNIS 2500 control panel and a common extinguishing agent resource. It enables: - sending the signal to activate the output from another control panel. - blocking the activation signal to other extinguishing zones, if the discharge has already occurred in one extinguishing zone. The active state of the control line triggers the output programmed with *criterion 1* "EZ", criterion *2* "EZ-COMMON " and set to sum *(criterion 1, criterion* 2). In case of setting the mathematical product (*criterion 1, criterion 2*) the output will be activated if both criteria occur simultaneously. (See table7.3.1/1) criterion 4)

***) Please note:** Functions No. 2, 4, 5, 6 are only applicable to MSG-25 modules. Control lines of additional optional modules of type MKS-60 cannot cooperate with push-buttons designed for operation of functions no. 2, 4, 5, 6

7.3. Outputs - potential and potential-free lines

Programmable parameters:

1. GROUP - a group of outputs e.g. alarm and security devices,
2. CRITER. 1 - criterion 1 of the output control, e.g. 1st stage alarm, according to table 7.3.1 / 1 ,
3. CRITER. 2 - criterion 2 of the output control, e.g. L12 detection zone, according to table 7.3.1/1 ,
4. (CR.1, CR.2) SUM or PRODUCT - creating a logical relationship between criteria 1 and 2,
5. ZONE - zone in which the selection criterion has been met: zone 1 zone 2, zone 1 + 2,
6. SIGNAL TYPE - e.g. continuous, cyclical . acc. to table 7.3.1/2,
7. T-on - according to the table 7.3.1/2,
8. T-off - according to the table 7.3.1/2,
9. T-pulse - according to table 7.3.1/2,
10. T-interr. - according to table 7.3.1/2,
11. N-pulse - according to table 7.3.1/2,
12. CONTROL LN. - for potential-free outputs, optional switching on the circuit continuity control.

The control panel enables the creation of the following potential and potential-free output groups:

- General,
- Alarm devices,

- Alarm transmission,
- Discharge transmission,
- Safety devices.

Outputs assigned to a general group can only be blocked and unblocked individually.

Outputs assigned to the groups of "transmission alarm", "discharge transmission" can be blocked and unblocked simultaneously (in groups) using the panel menu on the LCD display. Moreover, during the alarming the activation of the outputs, assigned to these groups, causes the appearance of a relevant message on the LCD screen.

The outputs assigned to the "alarm devices" group can be blocked/unblocked simultaneously by means of the ALARM DEVICES BLOCKING button on the control panel door (or selecting the “alarm device” from the menu on the LCD screen). For details on blocking the outputs, see the section on "Blocking".

7.3.1. Potential lines

When active the potential outputs provide 24 V DC voltage from the control panel's internal power supply or batteries. Each output has an independent current limitation to protect against overload.

The lines connected to the control panel potential outputs are used to control devices such as: electro-valves, fire dampers, alarm signalling devices, fans, etc. All potential outputs of the MSG-25 module are equipped with a control system that enables detection of a break or short circuit in the connected circuit. A voltage signal of the opposite polarity (+,-) to that in the active state of the output was used to check the performance of the circuit in the detection state. Therefore, in the control circuit it is necessary to use a diode connected in the opposite direction to the control voltage and the terminating resistor Rk. The current and voltage parameters of the diode used should be adjusted to the power of the controlled device. In an active state of the output the lines are monitored for the possible overload or a short-circuit.

The method of connecting the lines to potential outputs is shown in Table 7.3.1/3. All potential outputs are programmable. Each output can be assigned a criterion according to table 7.3.1/1. Fulfilment of the criterion (occurrence of a specific state, event) causes activation of the output. Two criteria "Crit. 1" and "Crit. 2" are assigned to each output. It is possible to select one of the criteria or to program a simple logic in the form of sum or product of criterion 1 and criterion 2. When the output is activated, the voltage of 24 V appears either continuously or pulsed in accordance with the programmed signal type and parameters according to table 7.3.1/2.

Table 7.3.1/1 Actuation criteria for potential and potential-free outputs (relays)

No.	Designation in the control panel menu	Description of the output control criterion	Notes
	CRIT.1	**CRITERION 1**	
1	ALARM 1	Alarm state of the 1st stage of the control panel.	Alarm state - description in Section 9.2
2	ALARM 2	Control panel stage 2 alarm condition:	
3	EXTING. START	Start the extinguishing procedure:	

4	EZ	Ending the countdown of the delay until the release of the "T-evacuation" extinguishing agent:	Controlling of the solenoid valve that triggers the extinguishing agent
4	DISCHARGE	The discharge state of the control panel is established on the basis of switching on the "EZ" output or on the confirmation of the extinguishing agent outflow through the LK line controlling the outflow, depending on the configuration.	**Please note**: blocking the output with the DISCHARGE criterion does not block the release of the extinguishing agent.
5	OUTFLOW	An active state of the LK control line which has been assigned the function of "extinguishing agent outflow control" marked as LK. OUTFLOW	Actual confirmation of the discharge condition.
6	ADDITION DISCHARGE	The active state of the LK ADDITION control line, which was triggered after the triggering of the extinguishing agent basic stock during the signalling of the discharge state.	Pressing the "ADDITION" button installed on the LK line
7	MANUAL CONTROL	Activation of the "manual control" operating mode by means of the "MANUAL CONTROL" button on the control panel or by triggering the active status of the LK control line, which has been assigned MANUAL CONTROL:	
8	EXTINGUISHING STOP	An active state of the LK control line to which the function of EXTINGUISHING STOP was assigned while counting down the delay until the extinguishing agent is released:	Pressing the "EXTINGUISHING STOP" button installed on the LK line - stopping the countdown of the T-evacuation time.
9	EXTINGUISHING BLOCKADE	Active state of the LK control zone, which has been assigned the EXTING. BLOCK function or the "EXTINGUISHING BLOCKADE" button on the control panel door:	Activation of the EXTINGUISHING BLOCKADE button installed on the LK line
10	NON-ELECT. BLOCK	An active state of the LK control line, which has been assigned the NON-ELECT. BLOCK-function	
11	FAULT	State in which at least 1 fault (damage) has been detected (general damage state): Potential-free outputs with set criterion FAULT; zone no. - "no zone": - PK2..PK6 - without contact circuit control - PK1 * - with the contact circuit control on/off option	Recommended output PK1 - enables transferring the state of complete power failure and checking the continuity of the circuit connected to the PK1 contacts. Zone setting: -no zone (--------)
12	RESETTING	Resetting (clearing) the fire alarm status of the control panel	

13	PRES-SURE/WEIGHT	An active state of the LK monitoring line to which the function of PRESSURE / WEIGHT was assigned	
	CRIT.2	**CRITERION 2**	
1.	L11 LD-alarm	L11 detection line alarm status	
2.	L12 LD-alarm	L12 detection line alarm status	
3.	L13 LD-alarm	L13 detection line alarm status	
4.	L14 LD-alarm	L14 detection line alarm status	
5.	L15 LD-alarm	L15 detection line alarm status	
6.	L16 LD-alarm	L16 detection line alarm status	
7.	LK-EZ COM-MON	An active state of the control line that has been assigned the LK EZ COMMONfunction . This function is intended to release a common resource of the extinguishing agent to the zone supervised by another control panel	Required configuration: criterion 1 - EZ and criterion 2 - LK EZ COM-MON (crit.1, crit.2) TOTAL

*)**Please note:** Relay PK1 of MSG-25 module (with set of changeover contacts N0, COM, NC) for FAULT criterion works in reverse i.e. state of fault (damage) causes release of relay and lack of damage causes activation of relay. The remaining relay outputs and potential outputs act directly, i.e. the fault condition causes activation.

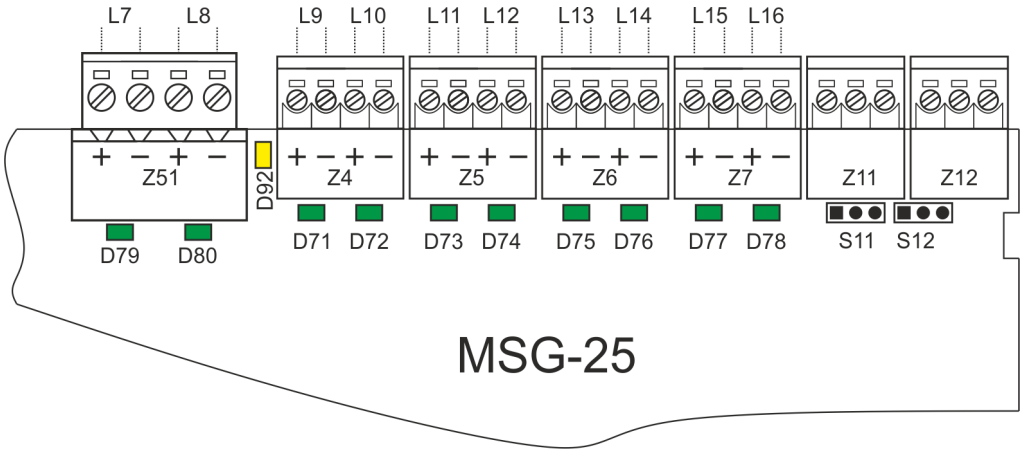
Table 7.3.1/2 Output activation modes

No.	Signal type of switched output	Tripping delay time (activation)	Delay time of activation	Pulse duration	Duration of break	Number of pulses
		T-on	T-off	T-imp	T-interr.	N-imp
		0...99 min. [every 1 s]	0...99 min. [every 1 s]	0...99 min. [every 1 s]	0...99 min. [every 1 s]	0...99
1	Continuous	O	O	-	-	-
2	1 pulse	O	-	O	-	-
3	Cyclical	O	o	O	O	-
4	Cyclical-finished	O	-	O	O	O

O - time available in a given mode

Table 7.3.1/3 Potential outputs

Description of using potential outputs of the MSG-25 module



All potential outputs L7...L16 supervised - adapted to detect circuit break or short circuit.

Parameters of the outputs in the controlled state:

L7, L8 - 24 V, 2 A (max.),

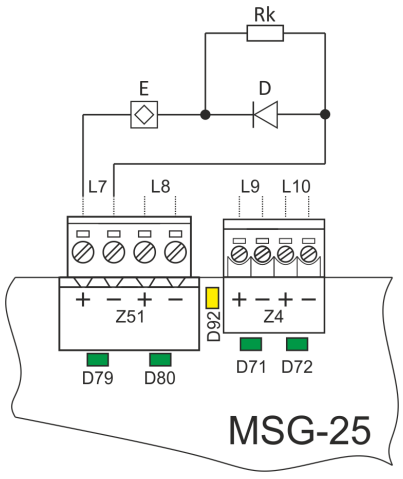
L9, L10 - 24 V, 0.7 A (max.).

L11… L16 - by default, the detection line inputs can be configured (each of the outputs independently) as a universal potential output 24 V/0.7 A, e.g. for controlling alarm devices, at the cost of reducing the number of detection lines.

The figure shows the polarities of the outputs (±) in the detection state (device off). The control voltage causes a current flow (max. 2 mA) through the terminating resistor Rk = 6.2 kΩ at the end of each line. In the actuation state (output on), the voltage is 24V, with the opposite polarity than shown in the figure.

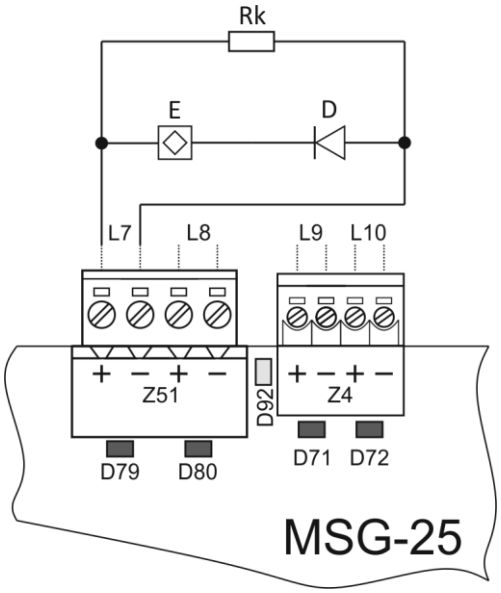
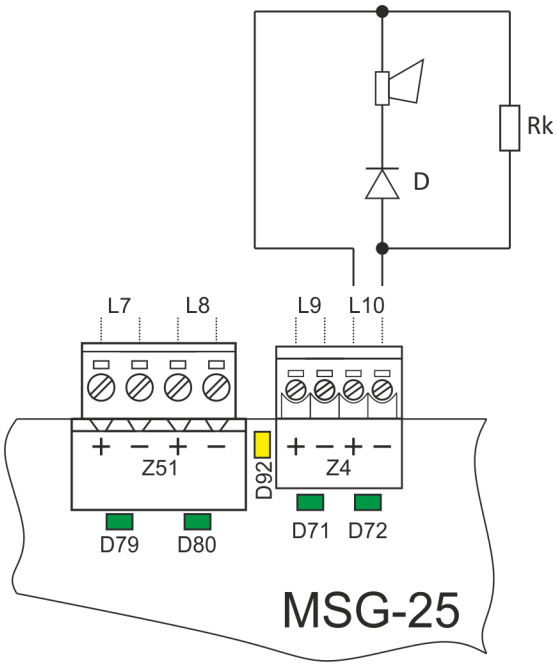
The LEDs D71… D80 serve as an auxiliary indicator of the output activation.

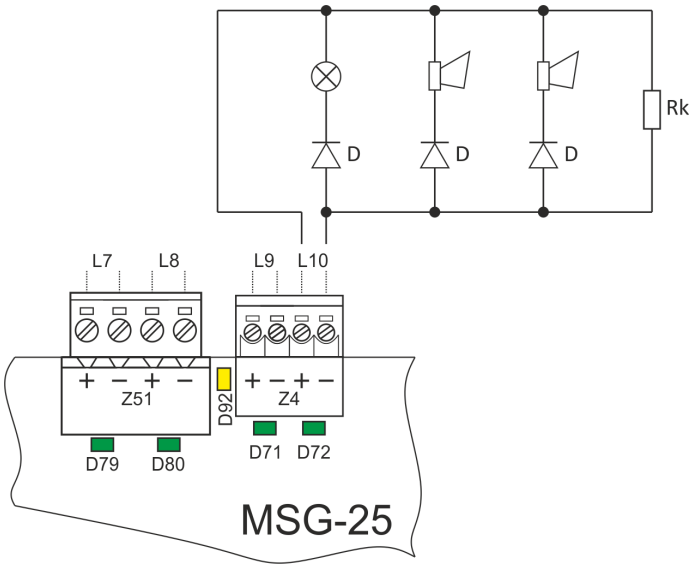
Each of the L7...L16 outputs can be configured as a control line with any function in accordance with Table 7.2.1/1



Connecting a solenoid valve with resistance <100 Ω.
In the actuated state, the supplied voltage of 24 V is polarized inversely than the (+) and (-) markings in the drawing. In the detection state, the (+) and (-) markings are consistent with the drawing. The control current (<2 mA) flows through the solenoid valve coil E and terminating resistor Rk.

D - rectifying diode selected so that max. conduction current (IF) is greater than max. load current, e.g.:
1N4001...1N4008 - 1 A, 100 V..1200 V
1N5401...1N5408 - 3 A, 100 V..1000 V

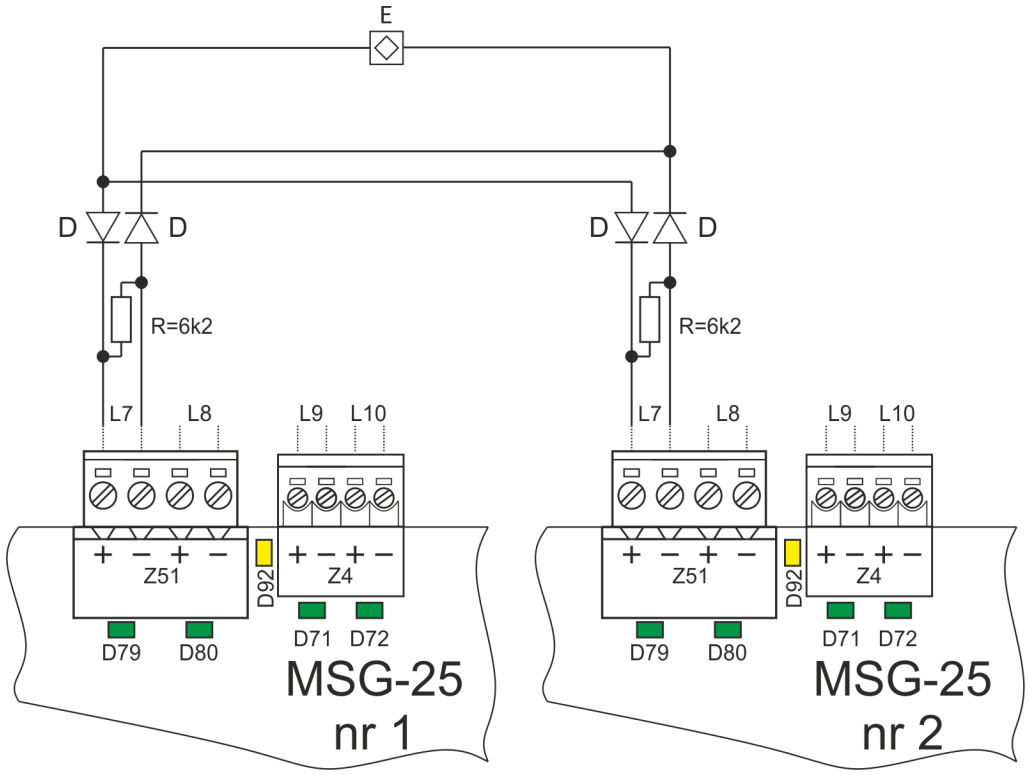
	**Connecting a solenoid valve of any resistance.** In the controlled state the applied voltage 24 V is polarized inversely to the markings (+) and (-) on the drawing. In the detection state the markings (+)and (-) are as shown in the drawing. The control current (<2 mA) flows only through the terminating resistor Rk. D - rectifying diode selected so that max. conduction current (IF) is greater than max. load current, e.g.: 1N4001...1N4008 - 1 A, 100 V..1200 V 1N5401...1N5408 - 3 A, 100 V..1000 V
	**Connecting 1 alarm device to a potential output.** In the controlled state the applied voltage 24 V is polarized inversely to the markings (+) and (-) on the drawing. In the detection state the markings (+)and (-) are as shown in the drawing. The control current (<2 mA) flows only through the terminating resistor Rk. D - rectifying diode selected so that max. conduction current (IF) is greater than max. load current, e.g.: 1N4001...1N4008 - 1 A, 100 V..1200 V 1N5401...1N5408 - 3 A, 100 V..1000 V



Connecting more alarm devices to a potential output.

In the controlled state the applied voltage 24 V is polarized inversely to the markings (+) and (-) on the drawing. In the detection state the markings (+)and (-) are as shown in the drawing. The control current (<2 mA) flows only through the terminating resistor Rk.

D - rectifying diode selected so that max. conduction current (IF) is greater than max. load current, e.g.:
1N4001...1N4008 - 1 A, 100 V..1200 V
1N5401...1N5408 - 3 A, 100 V..1000 V



E - solenoid valve
D - diode (parameters adjusted to the power of the solenoid valve, e.g. 1N4001 ... 1N4008 - 1 A, 1N5401...1N5408 - 3 A)
R - terminating resistor
The diagram shows how to provide redundancy of "common" solenoid valve control in multi-zone installations. In such a system, the failure of one output does not deprive the E solenoid valve the possibility of controlling it. Any potential outputs can be connected in the presented manner. Terminal resistors and diodes should be installed at the solenoid valve.

7.3.2. Potential-free outputs

Potential-free outputs - outputs connected with the PK1 ... PK6 relay contacts, galvanically isolated from the control panel circuits, led to the Z11 ... Z16 connectors on the MSO-25 module, shown in Figure 7.2/1. All relay outputs are programmable. The operation of each relay can be independently programmed. Table 7.3.1/1 shows the actuation criteria for a potential-free outputs. Each output can be assigned a specific mode of operation, i.e. one of the functions described in the above-mentioned table and the mode of operation according to table 7.3.1/2. Each output has its own circuit continuity monitoring system connected to the contacts - the connection diagram is presented in Table 7.3.2/1.

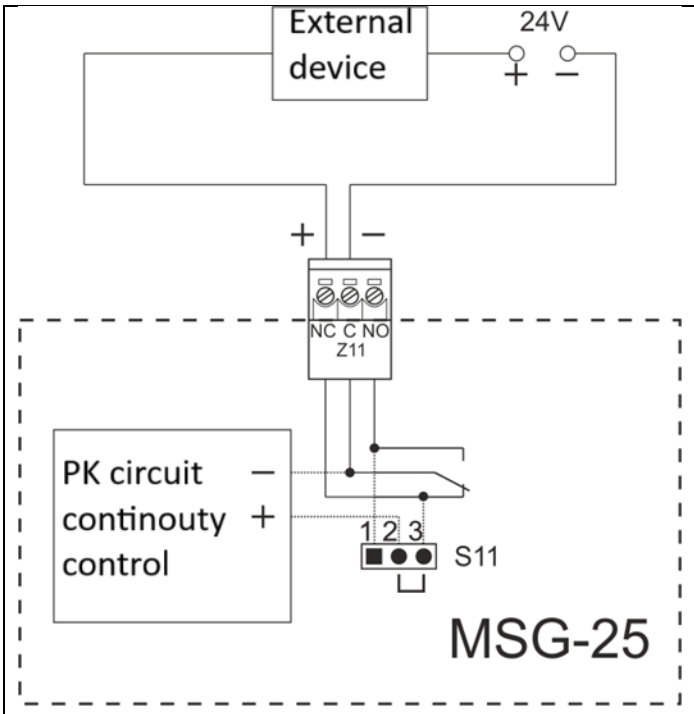
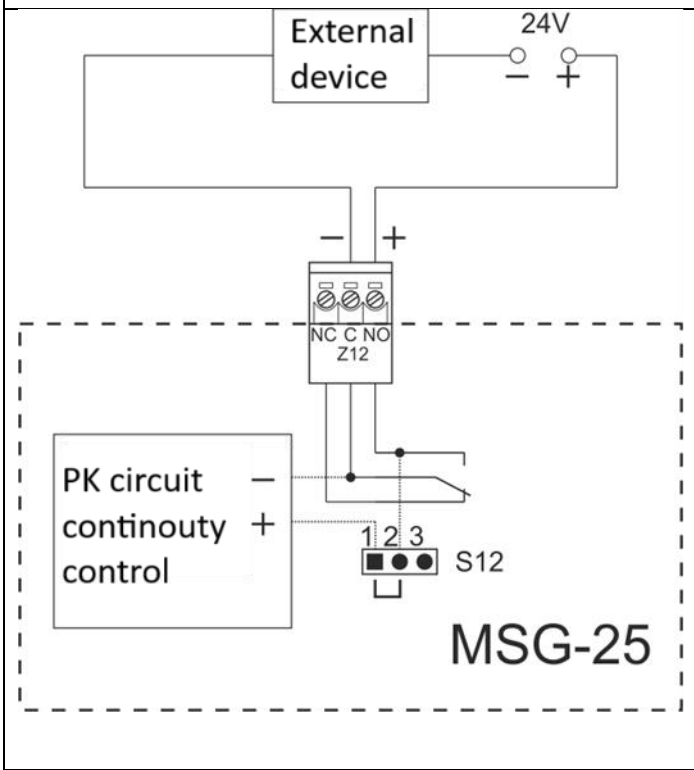
The continuity monitoring system can be turned on or off by means of the S11 ... S16 jumpers located at the Z11..Z16 connectors. Disabling monitoring also requires setting the "monitoring disabled" option in the control panel menu for potential-free outputs as otherwise a fault will be signalled. Activation of the continuity monitoring causes a limited current consumption from the external circuit connected to the contacts, to the value of approx. 0.6 mA. The value of this current is monitored by a circuit galvanically isolated from the control panel systems. No flow of this current is interpreted as a failure (no continuity of the circuit).

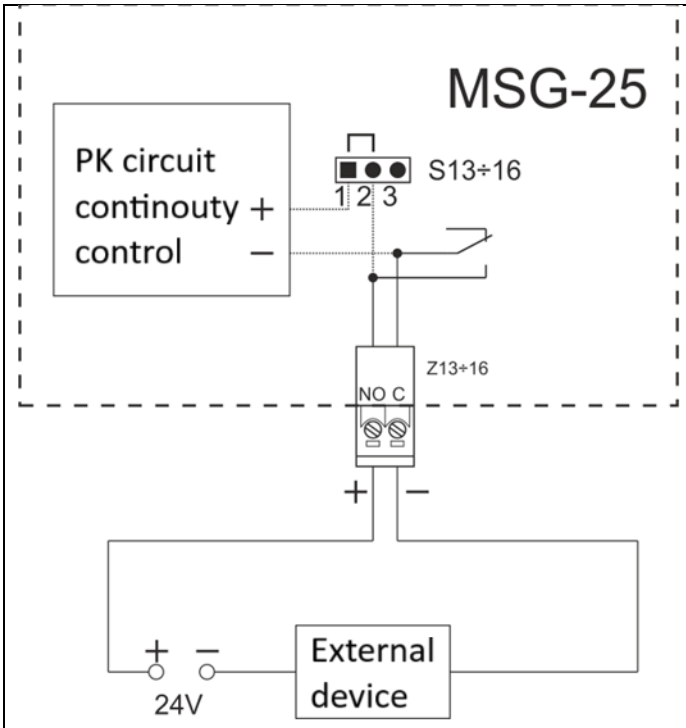
Please note: The assigned control criterion "general fault" for the PK1 relay causes the opposite effect, i.e.:

- in the fault state, the relay is released (enables signalling of power failure),
- the relay is energized in the no fault condition.

For the PK1 relay with the programmed "general fault" criterion and the circuit continuity monitoring turned on (the Z11 jumper, exceptionally in position 2-3), the circuit continuity failure may not be signalled by the control panel in case of simultaneous occurrence of other faults.

Table 7.3.2/1 Potential-free outputs

	An exemplary diagram of PK1 relay connections with the actuation criterion from **general fault** and an active continuity control function by setting the jumper S11 exceptionally **in position 2-3** - opposite to the other control criteria. The continuity monitoring system uses the external supply voltage of the device connected to the relay contacts, which requires attention to the correct polarity (+, -). The PK1 contact position shown in the figure is in the state of the control panel power supply failure (or when at least one fault occurs). The PK circuit continuity control is active in the absence of other faults.
	The figure shows the connection diagram of the external device for the PK2 relay with the enabled circuit continuity control function, the S12 jumper in position 1-2. The operation of the external circuit continuity control depends on the external voltage and requires polarity (+,-) as shown.



The figure shows the connection diagram of the external device for the PK3… PK6 relays (N.O. contacts only) with the circuit continuity control function turned on - S13… 16 jumpers in position 1-2, respectively.

The operation of the external circuit continuity control system depends on the external voltage and requires the polarity (+, -) as shown in the fig.

7.3.3. An example of using control panels in a multi-zone system

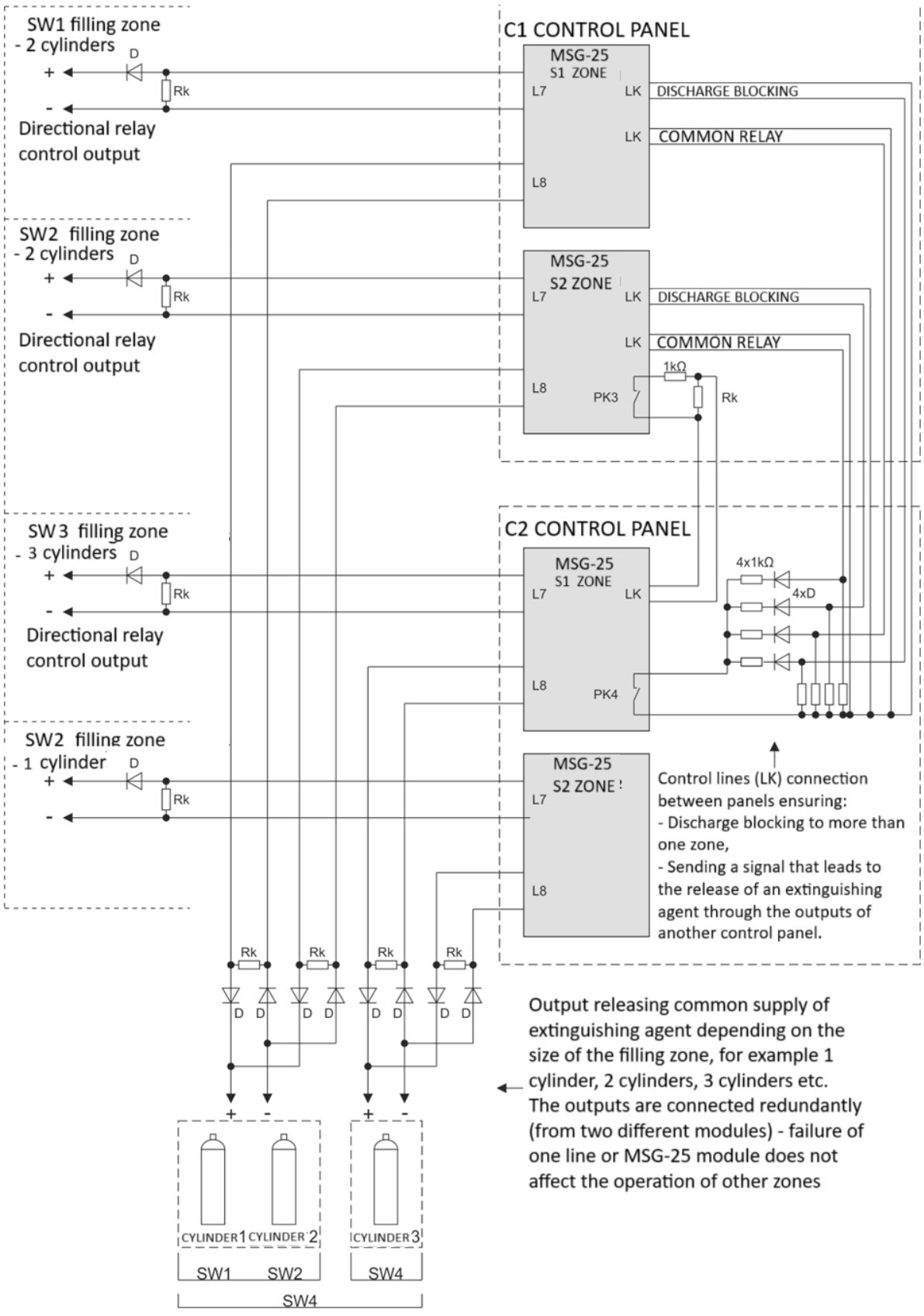


Figure 7.3.3/1 Example of connection of two control panels in a multi-zone system

Figure 7.3.3/1 illustrates the scheme of using the two double-zone control panels in a 4-zone system with a shared extinguishing agent supply and different volume of extinguishing agent filling zones.

For the sake of clarity, the diagram does not show typical connections of detection lines, signalling devices, monitoring lines, etc., focusing on the configuration of outputs that control the release of the extinguishing agent.

For example, the following assumptions were made:

- common stock of extinguishing agent,
- 4 zones of filling with the required amount of extinguishing agent (1 and 2 zones - 2 cylinders, 3 zones - 3 cylinders, 4 zones - 1 cylinder),
- fault (damage) in one zone does not affect the operation of other zones,
- the extinguishing agent should be directed to one zone only - automatic discharging to more than 1 zone,
- blocking the discharge to more than 1 zone to maintain the proper concentration of the common extinguishing agent.

Table 7.3.3/1 shows the most important configuration parameters of the outputs meeting the above assumptions.

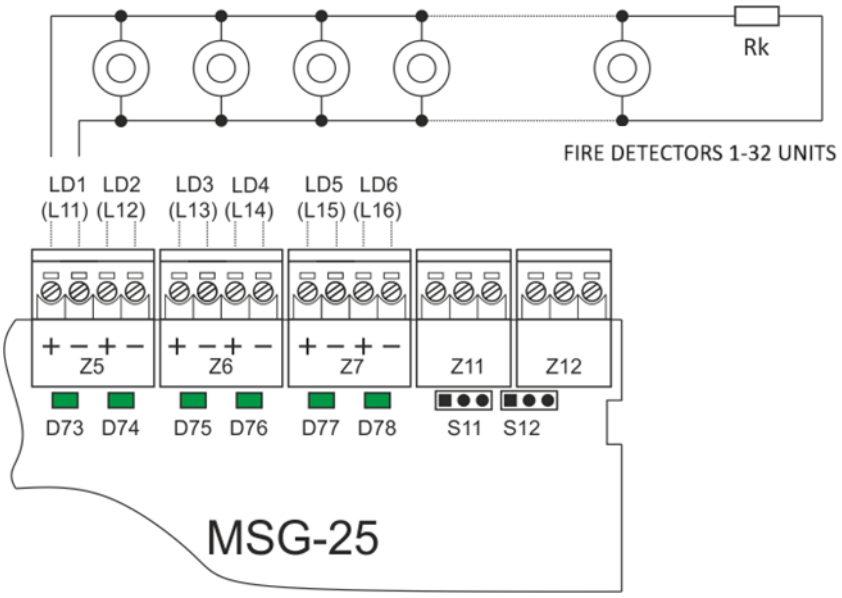
Table 7.3.3/1 Output configuration for Figure 7.3.3/1

Filling zone number	**FIRE EXTRINGUISHING RESOURCE REQUIREMENTS ...**	**Control output**	**Criterion 1 CRIT.1**	**Criterion 2 CRIT.2**	**Logic (CRIT.1, CRIT2)**	**Zone No. (IN CONTROL PANEL)**
ZONE SW1	CYLINDER 1 + CYLINDER 2	**Control Panel C1** MSG-25 No. 1 - L8 or MSG-25 No2 -L8	EZ EZ	LK EZ COMMON LK EZ COMMON	TOTAL TOTAL	S1+2 S1+2
ZONE SW2	CYLINDER 1 + CYLINDER 2	**Control Panel C1** MSG-25 No2 -L8 or MSG-25 No1 -L8	EZ EZ	LK EZ COMMON LK EZ COMMON	TOTAL TOTAL	S1+2 S1+2
ZONE SW3	CYLINDER 1 + CYLINDER 2 + CYLINDER 3	**Control Panel C2** MSG-25 No. 1 - L8 or MSG-25 No2 -L8 **Control Panel C2** MSG-25 No1 -L8 MSG-25 No2 -L8	EZ EZ EZ EZ	LK EZ COMMON LK EZ COMMON --- ---	TOTAL TOTAL --- ---	S1+2 S1+2 S1 S2

ZONE SW4	CYLINDER 1	**Control Panel C2** MSG-25 No2 -L8	EZ	---	---	S2
ZONE SW1	EZ - directional	**Control Panel C1** MSG-25 No1 -L7	EZ	---	---	S1
ZONE SW2	EZ - directional	**Control Panel C1** MSG-25 No2 -L7	EZ	---	---	S2
ZONE SW3	EZ - directional	**Control Panel C2** MSG-25 No1 -L7	EZ	---	---	S1
ZONE SW4	EZ - directional	**Control Panel C2** MSG-25 No1 -L7	EZ	---	---	S2
Auxiliary potential-fee output PK3 forcing active state on LK - EXTINGUISHING BLOCK		**Control Panel C1** MSG-25 No2 - PK3	EZ	---	---	S1+2
Auxiliary potential-fee output PK4 forcing active state on LK - EXTINGUISHING BLOCK and LK -EZ COMMON		**Control Panel C2** MSG-25 No2 - PK3	EZ	---	---	S1+2

7.4. Detection lines

Table 7.4/1 Detection lines

Connection of detection lines to the zones L11...L16
Inputs L11÷L16 are used for connecting a conventional detection lines. Each detection line can contain 1÷32 line elements. The terminal resistor Rk = 5.6 Ω must be connected at the last element of the detection line. Ensure that the lines are connected correctly (±) during installation. Unused L11 ÷ L16 inputs, after reconfiguration, can serve as detection control lines, potential lines or supply external devices with +24 V voltage or remain inactive.   

8. Optional modules

In case of an insufficient number of inputs/outputs, which the basic MSG-25 module is equipped with, it is possible to extend them by using an additional optional modules. All optional modules, with the exception of the MKA-25 module, have identical dimensions and are designed to be mounted on the MGR-64 bus (Figure 3.4/4). The space in the housing, in addition to the basic MSG-25 modules, allows the installation of one or two optional modules, type: MPK-60, MWS-60 or MKS-60.

The control panel in the basic version with one or two zones is not equipped with the MGR-64 bus, and the MSG modules-25 are connected directly with flexible wires to the MSO-25 driver module.

In order to mount additional modules, it is required to:

- mount the MGR-64 bus on the rear panel of the housing ,
- mount the MSG-25 modules and optional modules on the bus (connection via connector) and the plugs embedded in the housing,
- connect the MSO-25 controller to the bus with flexible cables.

The modules can be mounted anywhere on the main line. Each module must have a different address set on the rotary switch in the range 1...8 and declared during the control panel configuration.

The MKA-25 module has a special place for installation in the lower part of the housing (Figure 3.4/3). It is attached to the housing with a 4 screws. The module has a two connectors, one of which is marked with +L, -L, +P, -L, E, and is used for connection with the addressable detection line of the POLON 6000 system, and the second connector with a special bundle of flexible wires should be connected with the MSO-25 controller.

The yellow-green wire that all modules are equipped with should be connected to the control panel housing.

8.1. MPK-60 relay output module (potential-free)

The MPK-60 module is equipped with a 4 programmable universal relay outputs intended to transmit status or control external devices. It has a potential-free bistable relays with NC, C, NO changeover contacts. Each relay output contains a continuity check which can be turned on/off using jumpers S1, S2, S3, S4.

The load capacity of the relay outputs is 1 A. The output programming options are compliant with tables 7.3.1/1 and 7.3.1/2.

The module number (address) is set by means of two 10-position switches "x10" and "X1".

Name	Description
1 PK1-NC 2 PK1-C 3 PK1-NO 4 PK2-NC 5 PK2-C 6 PK2-NO 7 PK3-NC 8 PK3-C 9 PK3-NO 10 PK4-NC 11 PK4-C 12 PK4-NO	Potential-free relay outputs with activation possibility of continuity control function of the circuit connected to the relay contacts
S1, S2, S3, S4	On/Off jumpers for PK outputs circuit continuity control system
x10 x1	Rotary switches setting the two-digit module number: x10 - tens, x1 - units.

Figure 8.1/1 Signal output module

8.2. Signal output module (potential)

The MWS-60 module enables the control of alarm devices. It is equipped with 4 potential outputs containing a detection circuit to detect interruption, short-circuit and overload of the connected lines.

The load capacity of the outputs is 0.5 A/ 30 V. The outputs programming capabilities are in accordance with tables 7.3.1/1 and 7.3.1/2. The module number (address) is set by means of two 10-position switches "x10" and "X1".

Name		Description
1 2 3 4 5 6 7 8	-LS1 +LS1 -LS2 +LS2 -LS3 +LS3 -LS4 +LS4	Supervised potential outputs (signal lines)
x10 x1		Rotary switches setting the two-digit module number: x10 - tens, x1 - units.

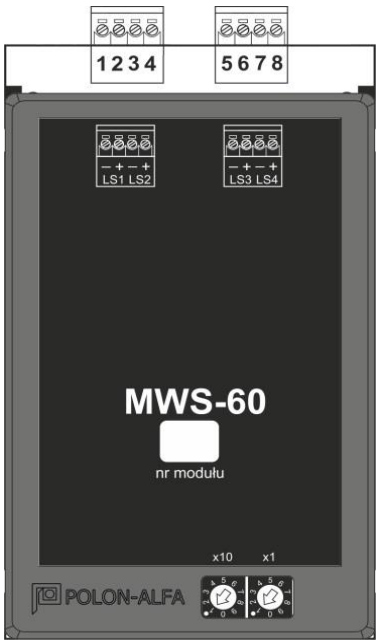


Figure 8.2/1 Signal output module

8.3. MKS-60 monitoring and control module

The MKS-60 module is equipped with the following outputs/inputs:

- 2 bistable potential-free relay outputs with load capacity 1 A/ 30V,

- 2 potential outputs with a load capacity of 0.5 A,

- 2 control line inputs.

The output programming options are as shown in Tables 7.3.1/1 and 7.3.1/2. The inputs working as control lines can perform functions compliant with Table 7.2.1/1, except for the functions of the buttons marked *).

Each relay output includes a continuity check that can be turned on/off using the S1, S2 jumpers. The potential outputs are equipped with a detection circuit to detect interruption, short circuit and overload of the connected lines. The module number (address) is set by means of 2 switches of 10-positions "x10" and "x1".

Name		Description
1 2 3 4 5 6	PK1-NC PK1-C PK1-NO PK2-NC PK2-C PK2-NO	Potential-free relay outputs
7 8 9 10	-LK1 +LK1 -LK2 +LK2	Control line inputs
11 12 13 14	-LS1 +LS1 -LS2 +LS2	Potential outputs, supervised (signal lines)
S1, S2		On/Off jumpers for PK outputs circuit continuity control system

Figure 8.3/1 MKS-60 monitoring and control module

8.4. Communication module via the MKA-25 addressable line

The MKA-25 module is an interface that enables the IGNIS 2500 control panel to be connected to an addressable detection line of the POLON 6000 system.

Cooperation with the POLON 6000 system, after programming the appropriate alarm variants, allows the use of detectors on the system's addressable lines in the automatic fire extinguishing zones supervised by the IGNIS 2500 control panel. The MKA-25 interface also enables detailed monitoring of the IGNIS 2500 control panel status in the POLON 6000 system.

Installation of the MKA-25 module with connections should be made with the control panel switched off. The method of connecting the MKA-25 optional module is shown in Figure 8.4/1.

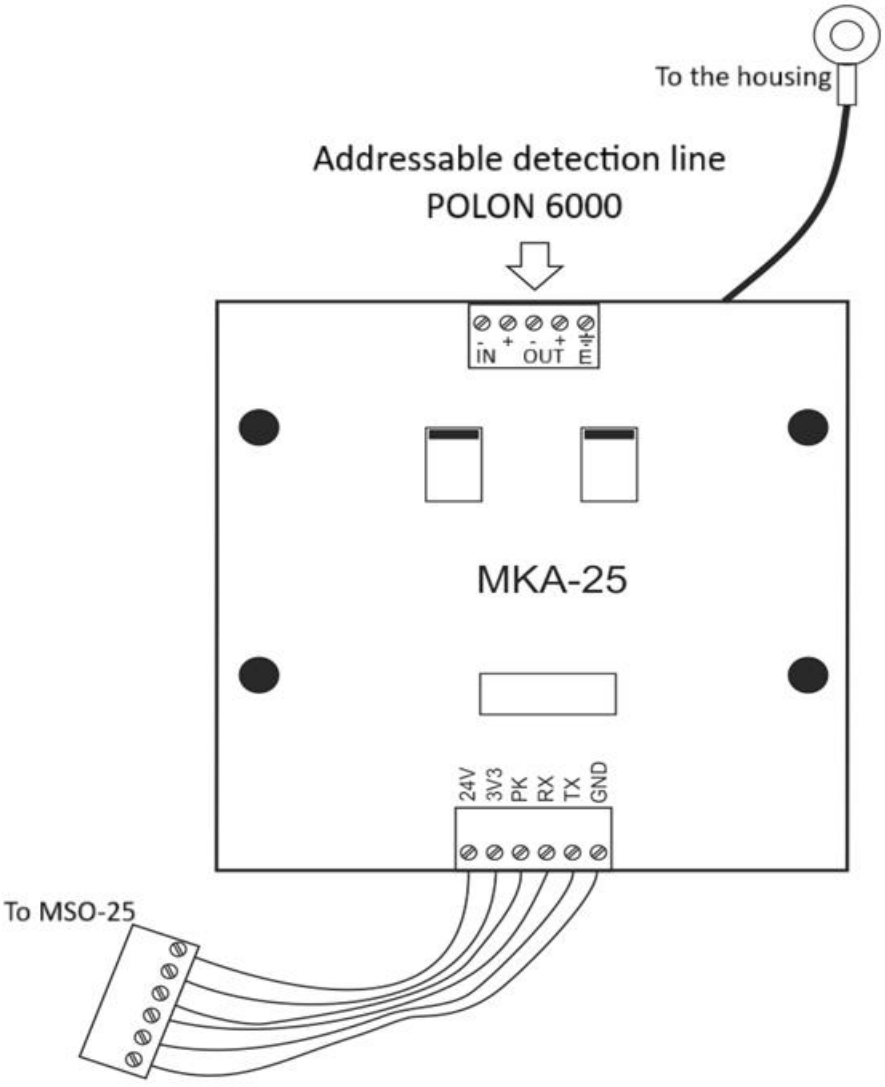


Figure 8.4/1 MKA-25 module

The MKA-25 module enables the transmission of the following control signals from the POLON 6000 system to the IGNIS 2500 control panel:

- alarm signal initiating the extinguishing procedure in zone 1,
- alarm signal initiating extinguishing procedure in zone 2 (for a two-zone system),
- remote alarm confirmation,
- remote alarm reset,
- remote activation of extinguishing block in zone 1,
- remote activation of extinguishing block in zone 2 (concerns dual-zone version).

Monitoring the status of the IGNIS 2500 control panel via the addressable line of the POLON 6000 system, depending on the configuration, enables the reception of:

zone 1 alarm states (or zones 1 and 2 in the case of a two-zone control panel)

- 1st stage alarm,
- 2nd stage alarm,
- starting the extinguishing procedure,
- discharge,

- active state and fault state separately from each L1 ... L16 line of MSG-25 modules,
- no continuity of the PK1… PK6 contacts circuits (total damage) from each MSG-25 module,
- actuation status, failure status of each output from any 2 optional modules MKS-60, MWS-60, MPK-60,
- manual control activation status, zone 1 extinguishing blockade (or zones 1 and 2 in case of a two-zone control panel), alarm delay on/off, access level on/off (ignition key position),
- information about the type of modules installed in the IGNIS 2500 control panel,
- fault status (total damage), which is signalled in the POLON 6000 control panel together with other faults detected in the entire system as general faults.

Activation of the transmission by the MKA-25 module requires supplementing the configuration:

- in the IGNIS 2500 control panel - adding the MKA-25 module according to point 4.2.1.,
- in the POLON 6000 system - adding the IGNIS 2500 control panel as a line element and activating (selected or all) signals that can be sent through the addressable line.

9. Basic states of the control panel

9.1. Detection status

In the detection mode, on the front board in the zone panel (or in each of the zone fields in the case of the 2-zone version) of the control panel, only the green POWER diode is lit, which indicates that the power supply is turned on. The yellow lamp may also be on, informing about switching to the manual mode. All the control panel relays are inactive, except for the PK1 relay in the MSG module-25, which is dedicated to transmit information about a general fault, also in the event of a complete power failure.

9.2. Alarm status

The part of the control panel responsible for signalling the fire hazard enables one- or two-stage alarm organization, i.e. it allows to delay the operation of outputs to fire alarm transmission devices so that the fire alarm can be verified by the staff.

Operation of outputs (relays) activated in the alarming state is configurable within wide limits, which enables creating various alarm variants. In the two-stage variant, the alarm occurring during the threat verification until the alarm signal transmission relays are activated is called the 1st stage alarm. After the delay for alarm verification has elapsed, the 2nd stage alarm is activated. In order to reduce the probability of false alarms, it is possible to set the detection lines coincidence and initial alarm reset in several variants (subsections 4.2.5 and 4.2.6).

9.2.1. Alarming in manual control mode

The manual control mode (only) is signalled by the lighting of the yellow diode next to the MANUAL CONTROL button.

Table 9.2.1/1 Alarming in manual control mode

STATUS	Calling method	Conditions
1st stage alarm	1. Alarm status of at least one detection line working in a coincidence group, provided that n <L, where: n - number of zones in the alarm state, L - minimum number of zones in the alarm state meeting the condition of a coincidence causing a 2nd stage alarm	No fulfilled coincidence of detection lines.
	2. The coincidence of the detection lines is fulfilled, but T1 or T2 time has not yet been counted down.	The 2nd stage alarm delay enabled. T1, T2 > 0 (The 1st stage alarm until delay countdown)
	3. Active state of a control line configured as an external alarm input until the T1 or T2 delay counts down.	Alarm delays of the 2nd st. alarm are enabled. T1, T2 > 0

		(The 1st stage alarm until delay countdown)
2nd stage alarm	Alarming the required number of detection lines working in a coincidence (n ≥ L condition is fulfilled) and counting the T1 or T2 delay time, if the delay was non-zero and enabled.	T1 = 0, T2 = 0 or signalling of switching off delays in the form of a lit indicator next to the "DELAY OFF"
Start of procedure of extinguishing (START (EXTINGUISHING)	As a result of manual operation using the START EXTINGUISHING button	- no extinguishing block on - no failure of the extinguishing stop control line - no failure of the "extinguishing block" control line - a configured and unblocked group of outputs to trigger the alarm devices.
DISCHARGE	1. Programmed delay time countdown – $T_{evacuation}$ or the appearance of the active state on the monitoring line with the "LK.OUTFLOW" function set (outflow control)	$T_{evacuation} = 0$ The discharge state is established on the basis of the output triggering the extinguishing agent "Ez"
	2. Active state of the control line with set "LK.OUTFLOW" function (discharge monitoring)	The discharge status is established on the basis of receiving the signal from the "LK.OUTFLOW" control line (discharge control) confirming the release of the extinguishing agent.

9.2.2. Alarming in automatic (and manual) control mode

The automatic (and manual) control mode is signalled by the fact that the yellow light next to the MANUAL CONTROL button is off.

Table 9.2.2/1 Alarming in automatic (and manual) control mode

STATUS	Triggering method	Conditions
1st stage alarm	1. Alarm status of at least one detection line working in a coincidence group, provided that n <L, where: n - number of zones in the alarm state, L - minimum number of zones in the alarm state meeting the condition of a coincidence causing a 2nd stage alarm	No fulfilled coincidence of detection lines.
	2. The coincidence of the detection lines is fulfilled, but T1 or T2 time has not yet been counted down.	The 2nd stage alarm delay enabled. T1, T2 > 0

		(The 1st stage alarm until delay countdown)
	3. Active state of a control line configured as an external alarm input until the T1 or T2 delay counts down.	Alarm delays of the 2nd st. alarm are enabled. T1, T2 > 0 (The 1st stage alarm until delay countdown)
2nd stage alarm and initiating the extinguishing procedure	1. Alarming the required number of detection lines working in a coincidence (n ≥ L condition is fulfilled) and counting the T1 or T2 delay time, if the delay was non-zero and enabled. 2. As a result of manual operation using the START EXTINGUISHING button. 3. Active state of a control line configured as an external alarm input	- no extinguishing block on - no failure of the extinguishing stop control line - no failure of the "extinguishing block" control line - a configured and unblocked group of outputs to trigger the alarm devices.
Discharge	Programmed delay time countdown – $T\text{-}_{evacuation}$ or the appearance of the active state on the monitoring line with the "LK.OUTFLOW" function set (flow control)	$T\text{-}_{evacuation} = 0$ The discharge state is established on the basis of the output triggering the extinguishing agent "Ez"
	Active state of the control line with set "LK.OUTFLOW" function (discharge monitoring)	The discharge status is established on the basis of receiving the signal from the "LK.OUTFLOW" control line (discharge control) confirming the release of the extinguishing agent.

1st stage alarm can be triggered by the control panel as a result of actuation of automatic fire warning devices on at least one detection line without meeting the condition of the programmed coincidence. If the coincidence is fulfilled, the 1st stage alarm is still signalled until the delay is counted down (if programmed). During this time close cooperation between the fire system and properly trained personnel is required to locate and remove the hazard.

Signalling during the 1st stage alarm:

- in the zone field, the red EXTINGUISHING START indicator lights up with intermittent light in the alarm mode,
- the alarm optical indicator with description FIRE flashes in the main control panel field (when confirmed, it lights steadily),
- a window with information on the type and number of alarms appears on the LCD display,
- an internal acoustic signalling device is activated,
- the outputs programmed to operate from the 1st stage alarm are activated,
- It is possible to mute the sound signalling.

2nd stage alarm repeats operation of internal and external siren (the repeated operation of the external siren depends on the configuration).

Signalling during the 2nd stage alarm:

- Signalling as during the 1st stage alarm state. Additionally, the outputs programmed to operate from the 2nd stage alarm are activated and the LCD display changes accordingly.

The figure shows a sample window displayed on the LCD screen during an alarm condition.

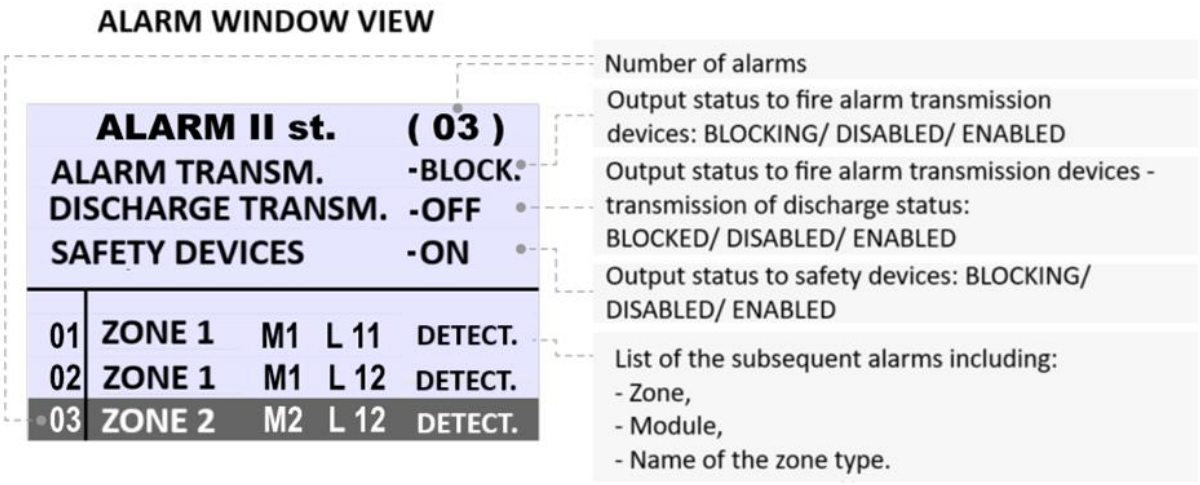


Figure 9.2.2/1 Alarm status window

MANUAL CONTROL (only) mode

Extinguishing can be started in manual mode only, by means of manual buttons connected to the "start extinguishing" line. The detector lines triggers only the 1st or 2nd stage alarm without starting the extinguishing procedure.

AUTOMATIC AND MANUAL CONTROL mode

In this operating mode, an alarm on detection lines, after meeting the condition of the programmed coincidence and counting down the set delay time, triggers the 2nd stage alarming mode and starts the extinguishing procedure.

Stages of the automatic fire extinguishing procedure performed by the control panel:

1. Status before activation

The state before activation occurs, when the control panel signals the 1st stage alarm, but the detection lines coincidence condition has not been met or the 2nd stage alarm delay time (T1, T2) has not been counted down.

2. Extinguishing start (activation status)

At this stage the programmed evacuation time is counted down, allowing the room to be evacuated before the extinguishing agent is released. The control panel signals the 2nd stage alarm and countdown of the T-evacuation time on the additional 7-segment display. The outputs programmed to act upon the occurrence of the "start extinguishing" criterion are activated. During the countdown of T-evacuation time the EXTINGUISHING STOP button function is active. Activating it by pressing the button stops (pause) the automatic extinguishing procedure. The state of stopping the extinguishing is signalled by switching on the yellow STOP lamp and changing the signal controlling the alarm devices by extending the pause time in relation to the pulse duration. The EXTINGUISHING STOP button stops the extinguishing signal and interrupts the countdown of the evacuation time.

The button does not have a latch - it only maintains a paused state when pressed. Releasing the button causes the extinguishing procedure to be resumed and the programmed evacuation time countdown from the beginning - the EXTINGUISHING STOP button operation is carried out in accordance with the requirements of the PN-EN 12094-1 standard according to sequence b).

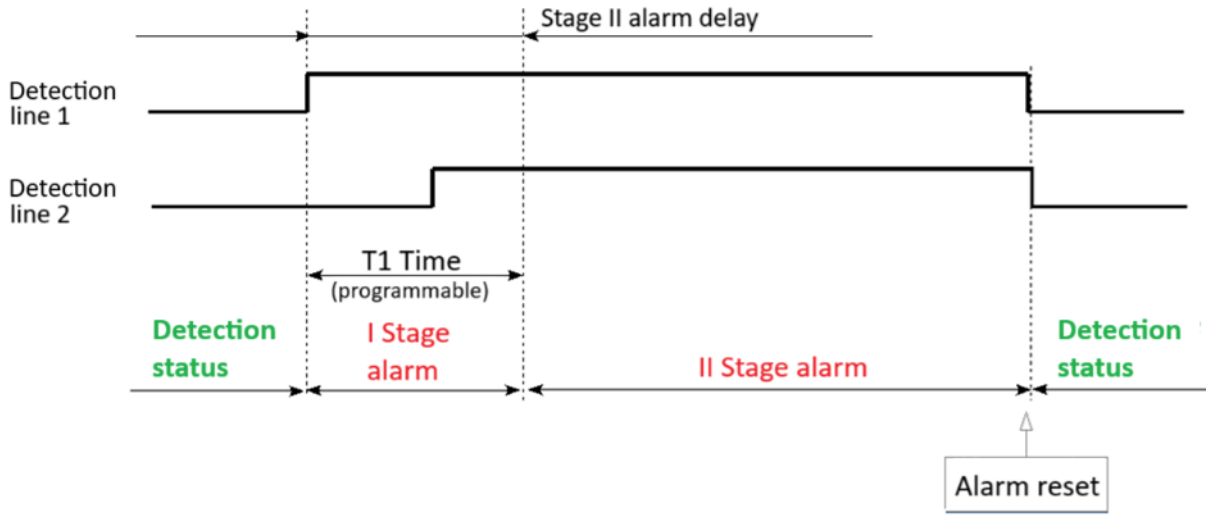
3. Discharge status

After the pre-warning time has elapsed, the extinguishing agent is released due to the actuation of the control outputs. First, the output for releasing the basic extinguishing agent resource is activated. The output, which triggers additional extinguishing agent resources, can only be activated with a manual push button after the primary resource triggering pulse has ended. In the discharge state, the control panel turns on the output that controls the warning signallers installed before entering the extinguishing zone. On the front panel, the red DISCHARGE diode signals with a steady light. The control panel enables, by means of programmable outputs, to switch off the ventilation, close e.g. fire dampers in order to airtight the room and to maintain the appropriate concentration of the extinguishing agent in the given time.

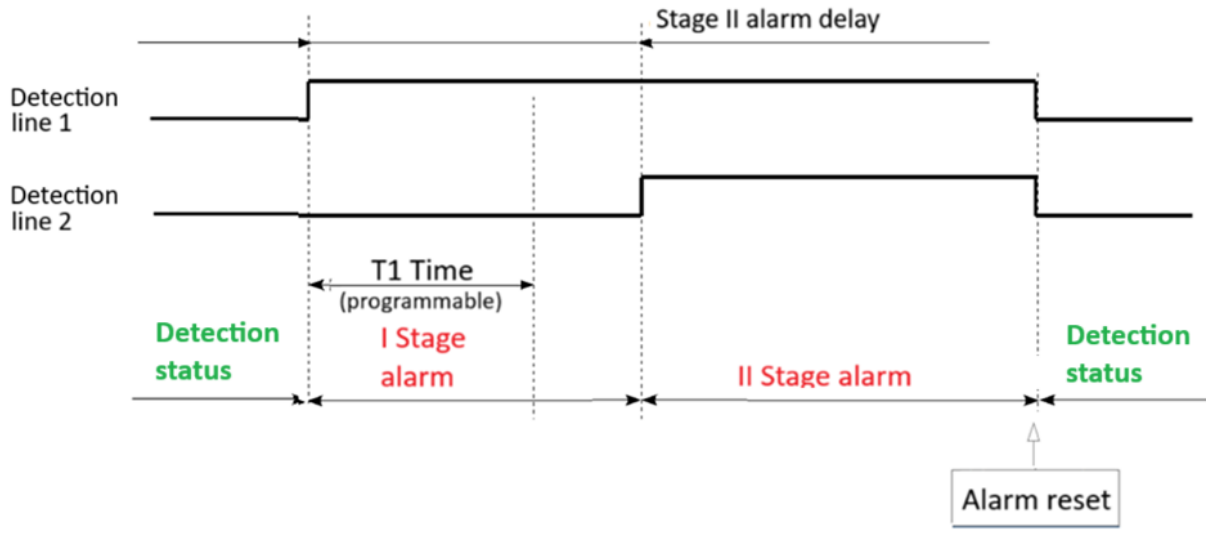
9.3. Diagrams of alarming and extinguishing states

9.3.1. Alarm of coincident detection lines in manual control only mode

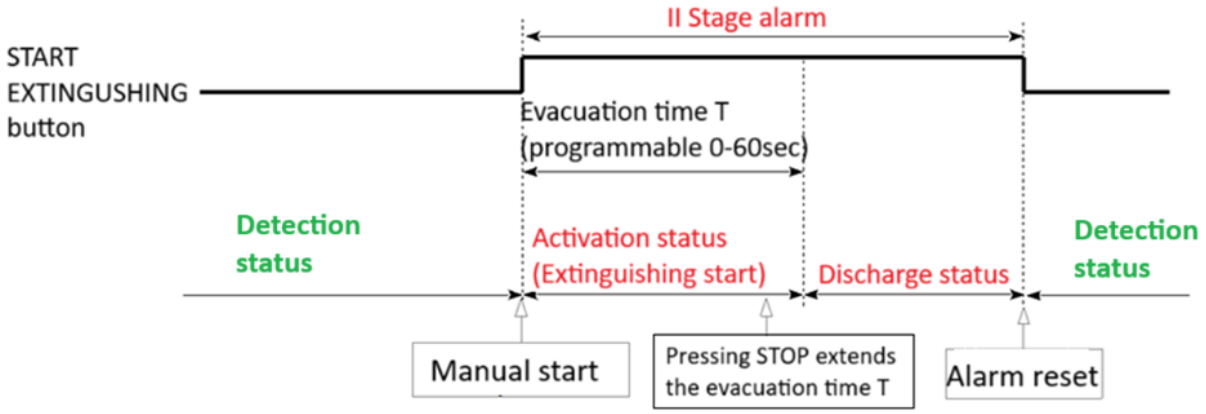
The second stage alarm is signalled always after the T1 delay time (or T2 delay after confirmation), despite the met the line coincidence.



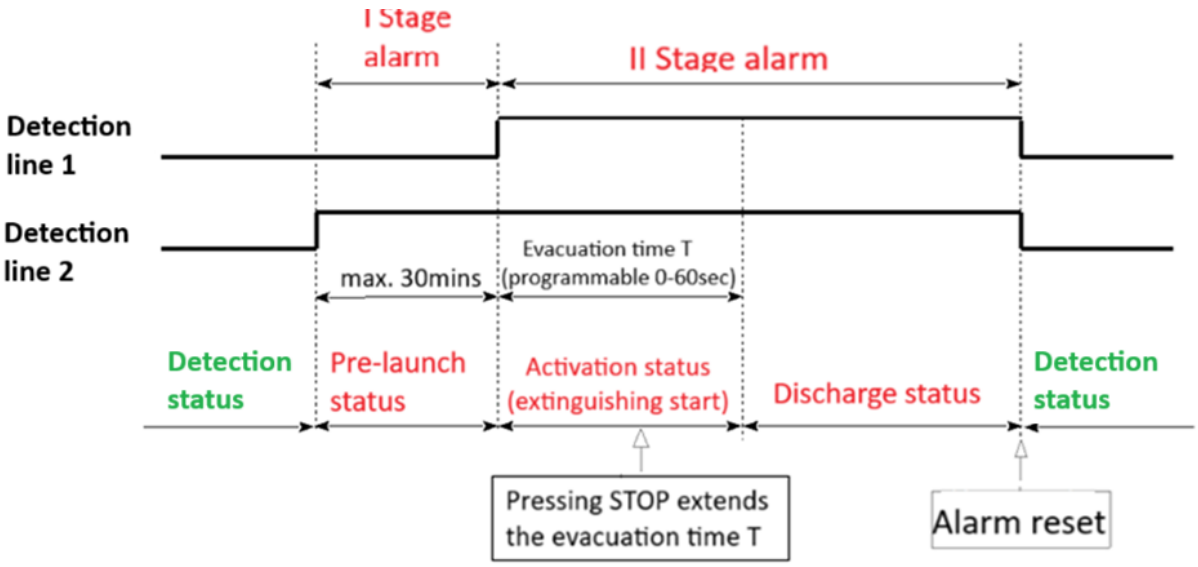
Signalling of the second level alarm occurs after occurrence of the alarm on the second line, provided that the time T1 is counted down in advance (or T2 after acknowledgement).

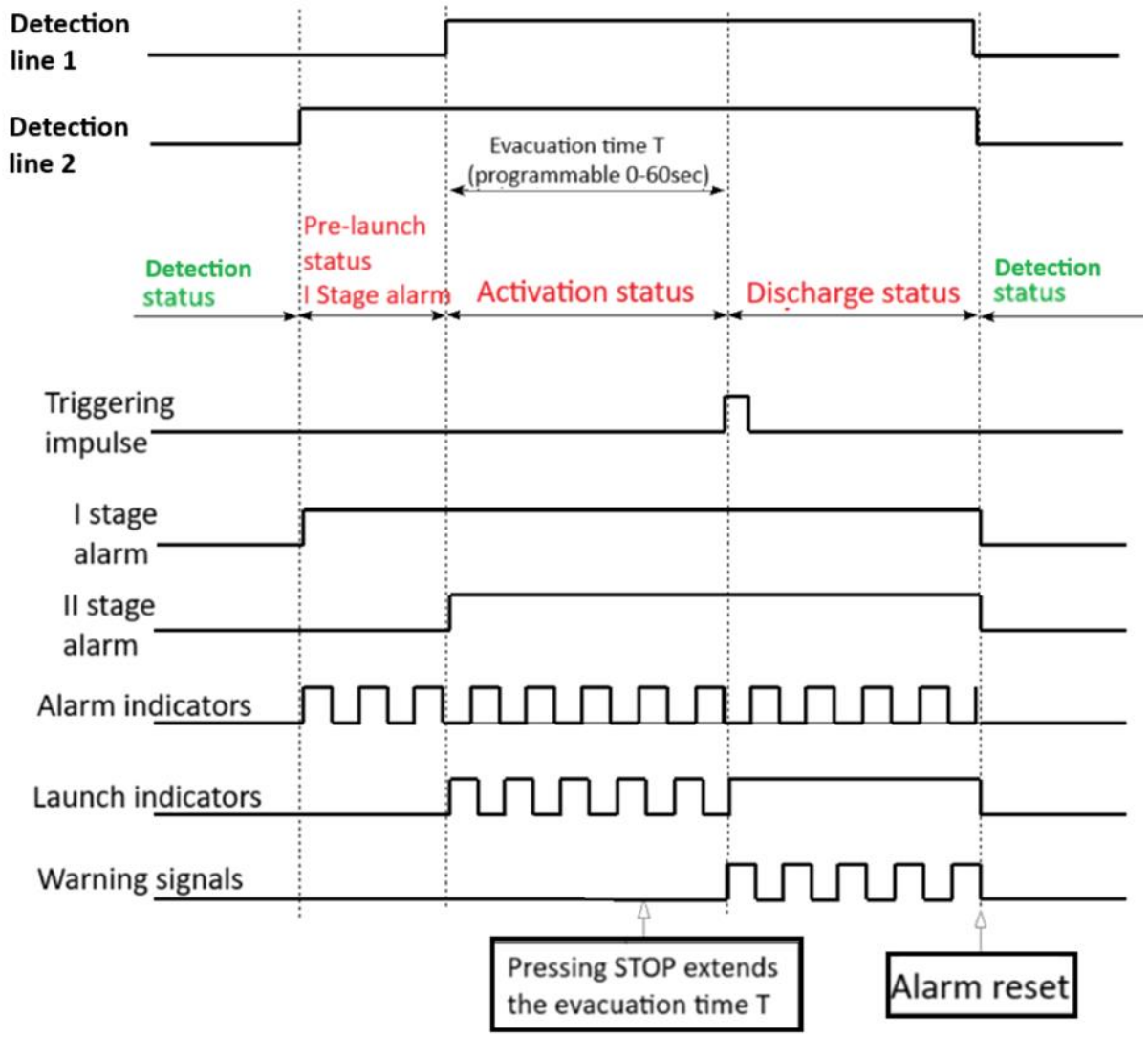


9.3.2. Manual activation with the EXTINGUISHING START button



9.3.3. Starting the extinguishing in automatic mode





10. Power supply

Basic power supply

The main power supply for the control panel is the 230 V/50 Hz power network. The control panel power supply as well as buffering or charging of the attached battery bank is ensured by the internal power supply, generating constant voltage of 24 V. The control panel power supply allows the consumption of current up to 4.5 A. It should be connected to the MSG-25 module. For multiple modules, the MSG-25 should be connected to the module with the lowest address.

At the installation design stage, it should be checked that the total current to be taken from the control panel power supply does not exceed the above-mentioned value. When checking, it is necessary to take into account the sum of all currents taken simultaneously from the control panel terminals, including the control panel power supply current. You should also pay attention to the permissible current values of the individual outputs.

In case of using a greater number of e.g. alarm devices and exceeding the acceptable current value, an external power supply should be taken into consideration.

Backup power supply

In case of mains voltage failure, the control panel backup power supply is provided by a battery bank with the rated voltage of 24 V and capacity of 7 ÷ 18 Ah. Switching from the main power supply to the reserve supply takes place automatically, without causing interruption of the power supply.

The operating time of a battery-powered control panel without the main power supply can reach 72 hours in the detection state and additionally 0.5 hour in the alarm state, depending on the hardware configuration and connected loads.

The power consumption of the control panel for a given configuration should be estimated in order to calculate the battery capacity and the required time of operation on the backup power supply.

The accumulator battery is charged automatically by the charging device integrated with the MSG-25 module. The charging current is limited to approx. 0.65 A for a single-zone panel or 1.3 A for a control panel equipped with two MSG-25 modules. These modules are equipped with two connectors for connecting the batteries. Regardless of the number of MSG-25 modules used, the batteries should be connected to one output. When using two MSG-25 modules, the outputs should be connected in parallel to double the charging current. The battery connection diagrams are shown in Figures 10/1 and 10/2.

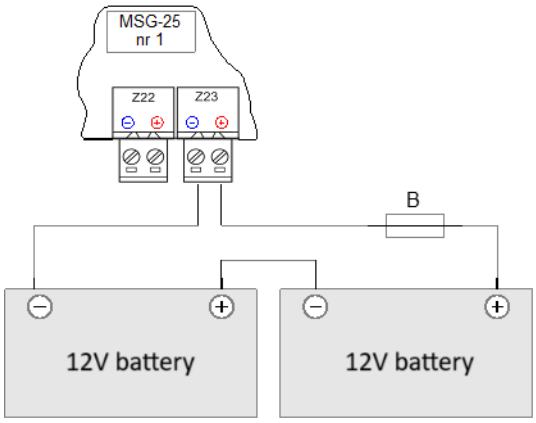


Figure 10/1 Connecting batteries with one MSG-25 module

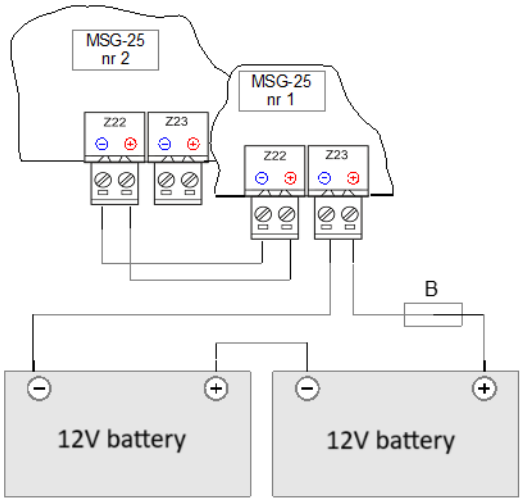


Figure 10/2 Connecting batteries with two MSG-25 modules

When fully charged, the value of the charging current is close to zero, and the buffering voltage should be approx. 27.3 V at a temperature of <25 °C (value automatically set when switching to buffer state). In order to extend the efficiency of the batteries, automatic adjustment of the buffering voltage depending on the temperature inside the control panel was applied. The overall performance of the battery as well as the charging device is continuously monitored and damage is indicated. The battery is considered faulty (by the control panel internal control system) when the internal resistance of the battery increases and exceeds 0.7 Ω.

The assembly, operation and disposal of batteries should be carried out in accordance with the instructions of the battery manufacturer. It is compulsory to recycle these batteries in accordance with applicable legal regulations.

Automatic power off. When the control panel is operated only from the battery bank - it causes gradual, natural reduction of the supply voltage. Decrease of reserve supply voltage to approx. 22 V is signalled acoustically. Further decrease of the battery bank voltage and reaching the final discharge

voltage of approx. 21 V will automatically turn off the control panel. When the main power supply returns, the control panel is automatically switched on. If the 230 V power supply is lost and a charged battery pack is connected, the control panel is started by pressing the SW3 button "ACTIVATE BAT." available on the MSG module board - Fig. 7.1/1.

10.1. Control panel mounting

The control panel should be mounted on the wall with three expansion bolts with a diameter of at least 8 mm. The arrangement of the control panel fastening holes is shown in Figure 10.1/1. Mounting is possible with the batteries removed.

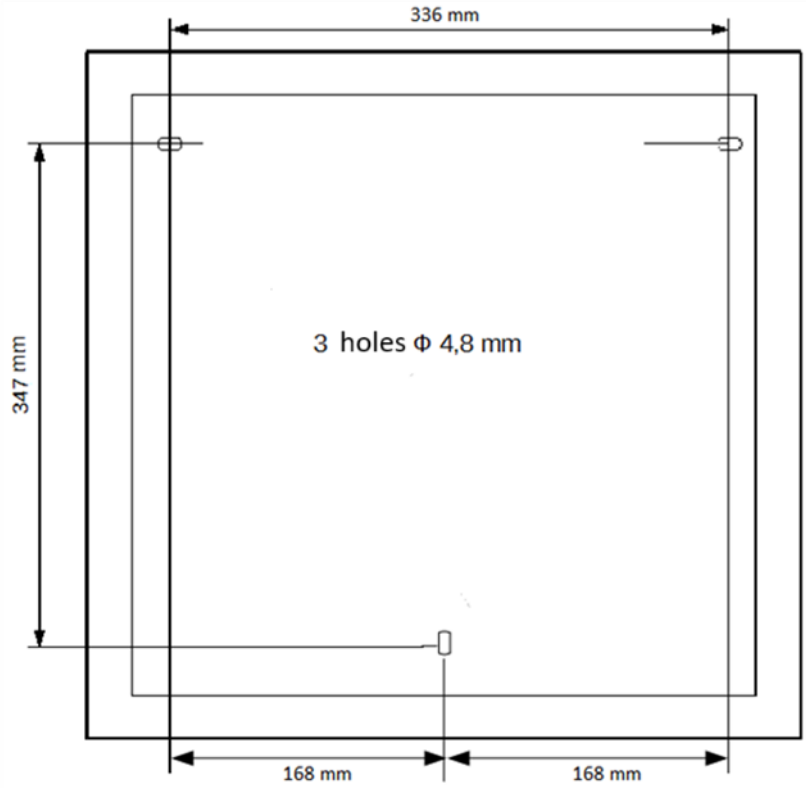


Figure 10.1/1 Mounting the control panel

10.2. Connection terminals for input and output circuits, hard-wired installation

The control panel is equipped with a set of connection terminals for connecting the wires of the alarm system, fire extinguishing system, external devices and the power supply. These terminals allow the connection of wires with a maximum cross-section of 1.5 mm2 or 2.5 mm2 for the L7 and L8 outputs.

The view of the connection terminals is shown in the module description.

Lines connected to the control panel terminal blocks should be routed in accordance with the rules adopted in telecommunications. They can be placed on the wall, under plaster, in the ground or as an overhead line. Detection lines must be continuous, ended with termination resistors. Lines cannot be installed along high power cables.

The installation wires can enter the control panel from a plug-in or surface-mounted installation. They are introduced by the shortest route (without length reserves), through the round cable grommets in the rear wall of the control panel, separately mains, separately low-voltage cables. The ends of unused cables should not be introduced into the control panel.

Mains power. For connecting 230 V/50 Hz mains and protective wire there are L, N and PE mains terminals in MZU-25 power supply module, protected by cover against accidental contact. It is recommended to use 2.5 mm^2 cross-section for the protective conductor.

Detection lines. Two pairs of terminals with marked polarity are used to connect the detection lines. It is recommended that the detection lines be conducted with a shielded cable with CNBOP certificate, e.g. YnTKSYekw 1 x 2 x 0.8.

Input and output detection and control lines. They should be made with a shielded cable, similar to the detection lines. During installation, ensure that the terminals are connected correctly in accordance with the polarity.

In the vicinity of module connectors and cable grommets coming out of the control panel, on the rear wall of the casing, there are rails intended for connecting shielding wires to the metal casing of the control panel.

11. Operation of the control panel in the event of a system failure

The control panel has a number of software and hardware safeguards in the event of a failure. The operation of all modules containing the microprocessor is supervised. In case of damage to the main controller (MSO-25), redundancy was applied, i.e. the control would be taken over by the second controller (MSS-25) so that the key functions of the system were performed. And vice versa - damage to the zone controller (MSS-25) results in taking over its tasks by the main controller (MSO-25). All panel configuration settings are stored in both controllers and any change is immediately synchronized. Due to the redundant operation of the controllers in a two-zone control panel, a system failure does not disable more than 1 zone from protection.

Signalling and operation of the control panel in the event of a system failure:

- an independent microprocessor detection system triggers a continuous signal through the acoustic signalling device in the controller, which has failed - it is possible to mute the signalling device by means of a sliding switch located on the controller board inside the control panel;
- the controller signalling a system fault by means of an optical indicator and an acoustic signal does not send control signals to line systems;
- supervision of the damaged zone is taken over by a second controller with its own acoustic signalling device;
- in the event of an alarm, the extinguishing procedure is carried out with compulsory signalling;
- failure of the MSS-25 zone controller (second zone) does not affect proper functioning of the first zone, and vice versa;
- If the system controlling the keypad of the first zone is damaged, the "cancel" and "confirmation" buttons may not function, then in the emergency mode it is possible to confirm and cancel the alarm by pressing the "manual control" button (approx. 4 seconds) on the second zone keypad.

12. Instructions for commissioning and checking the correct operation of the control panel after installation

Work to be done before commissioning

- installation of low-voltage lines: detection, inspection, control and 24 V power supply lines as well as supply of 230 V mains according to the design,
- installation of devices in detection lines, inspection and control lines, etc.,
- installation of the control panel,
- setting the control panel power switch on the power module to the "off" position,
- connection to the connectors of low-voltage lines entering the control panel,
- connecting the mains power to the L, N, PE terminals in the power module - CAUTION! Dangerous voltage!,
- making paper inserts with the description of zones and placing them in the zone fields on the control panel door,
- preparation of a list of linear elements with a description of the location.

Checking the electrical connections

- checking the correct position of configuration jumpers in the control panel modules,
- checking the correct connection of the line wires to the control panel connectors, paying attention to the polarity +, -,
- checking the connection of terminating resistors in the last sockets of the supervised lines (detection, control, potential),
- checking the correctness of connection of separating diodes in potential lines,
- installation of batteries,
- serial connection of two 12 V batteries with attention paid to the consistency of polarity markings +, - on the connector and battery terminals.

Start-up

- during the initial start-up of the control panel, disconnect the potential lines controlling external devices such as solenoid valves, alarm signalling devices, monitoring outputs, etc. by pulling out (disconnecting) the connectors in the control panel modules,
- switch on the control panel by means of the mains switch on the power supply module,
- perform software configuration of the control panel: declare modules, program inputs and outputs types, their operating modes, alarming variants, time parameters and set the control panel real time clock,
- read the faults detected by the control panel and remove any installation errors,
- test the optical indicators of the front board,
- perform an initial check of the line operation: detection - by triggering the alarm state, control - by activating or simulating possible states of supervised devices,
- check the correctness of activation of the potential outputs that control the actuating devices by observing the control LEDs on the module PCB (printed circuit board) at each potential line connector or by measuring the voltage at the output before and after activation,

- perform a test of correct operation of the output blocking function,
- perform a test of all line elements (detectors, MCP (manual call point), START, STOP buttons, signalling devices and other devices connected to the system), paying attention to the compliance of the location of the elements with the description in the zone area,
- after all faults have been eliminated and the system is in the ready state, connect the terminals of the disconnected potential lines one after the other for the time of the initial commissioning,
- check the operation of actuating devices cooperating with the control panel,
- check the operation of the alarm signal transmission and damage to the monitoring devices,
- change the default access codes to user codes (if necessary).

After starting the system, it is recommended to check and, if necessary, set the current date and time, and clear the event log.

The works can be considered completed when the above-mentioned activities have been performed and all the system devices are functioning properly and the control panel is operating in the detection mode (without signalling any faults or disablements) - the system can be handed over to the user.

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