

# **MICROPROCESSOR BASED ADDRESSABLE CONTROL ELEMENT EKS-6008**

POLON 3000 / POLON 6000 INTERACTIVE FIRE DETECTION AND ALARM SYSTEM

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## **INSTALLATION AND MAINTENANCE MANUAL**

**IK-E379-001-GB**

Edition I



The EKS-6008 control element, which is the subject of this manual, meets the essential requirements of the following regulations of the European Parliament and of the Council (EU) and European Union directives:

- CPR** CPR/305/2011 Regulation (EU) of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of consumer products repealing Council Directive 89/106/EEC;
- LVD** Directive 2014/35/EU relating to electrical equipment intended for use within certain voltage limits;
- EMC** Directive 2014/30/EU relating to electromagnetic compatibility.

The product has been issued by CNBOP-PIB, Notified Body No. 1438, a certificate of constancy of performance confirming the possession of technical features/parameters required by EN 54-18:2005+AC:2007 and EN 54-17:2005+AC:2007.

The Manufacturer's technical features/parameters exceeding the requirements of the listed standards and other features/parameters of the product detailed in this manual unspecified in the listed standards are confirmed by the Manufacturer.

The certificate and the Declaration of Performance are available on the website [www.polon-alfa.com](http://www.polon-alfa.com).

The contents of this manual should be thoroughly read and understood before installation and operation of the device.

Failure to follow the recommendations in this manual may prove dangerous or result in a violation of applicable regulations.

The manufacturer POLON-ALFA is not responsible for damage caused as a result of use inconsistent with these instructions.

A worn-out product, unfit for further use, should be handed over to one of the points dealing with the collection of waste electrical and electronic equipment.



**Note** – The right to make changes is reserved

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## 1. Purpose

The EKS-6008 control element is an addressable device designed for:

- control on activation of automatic safety and fire devices,

The EKS-6008 control element is designed to work in addressable detection lines of POLON 6000 fire alarm control panels.

Device is adapted for indoor and outdoor operation.

The outputs of the EKS-6008 element enable to connect devices which current consumption does not exceed 2 A (inrush current max. 6 A at max. 5 ms).

Note: (NO, COM, NC) means connector terminals at which voltage may occur exceeding the permissible touch voltage, which is dangerous to humans.

The EKS-6008 control element is equipped with 8 outputs.

## 2. Technical specifications

Operating voltage	16.5 ÷ 24.6 V
Current consumption from detection line (in quiescent mode)	< 400 µA
Detection Line Short Circuit Isolator	yes
Configuration of control elements	from the control panel
Number of control outputs	8
Supply voltage of the controlled device	6 ÷ 220 VDC 230 VAC
Relay controlling output	potential-free or supervised contact, changeover, max. current 2 A, max. voltage 230 VAC / 220 VDC, max. power 62,5 VA / 60 W.
Continuity monitoring of the cable connected to the control output	yes (jumper on PCB) off, on
Control output safe state	no change, not triggered, triggered
Current consumption by the continuity control system connected to the control output	< 210 µA (6÷220 VDC) < 440 µA (230 VAC)
Cable entry:	
- detection line cable bushing	2 x M12, cable Ø 3-6.5 mm
- output cable bushing	8 x M16, cable Ø 5-10 mm
Conductor permissible cross-section	up to 2.5 mm <sup>2</sup>
Dimensions	Figure 3.1
Weight	< 1.0 kg
Operating temperature	-40 ÷ +85 °C
Climatic category	40/085/04
Permissible relative humidity	up to 95 % at 40 °C
Electrical strength of insulation	1500 V
Ingress protection	IP 66
Enclosure material and colour	Polycarbonate (PC), Grey

### 3. Design description

The EKS-6008 control element is made in the form of a printed circuit board with set of connectors and electronic components placed in enclosure.

Wall mounting slots are located in the corners of the enclosure.

Cable glands are mounted along the sides of the enclosure base .

M12 gland is used for detection line cable and M16×1.5 gland for output cable.

The housing cover is mounted with four screws to the housing base.

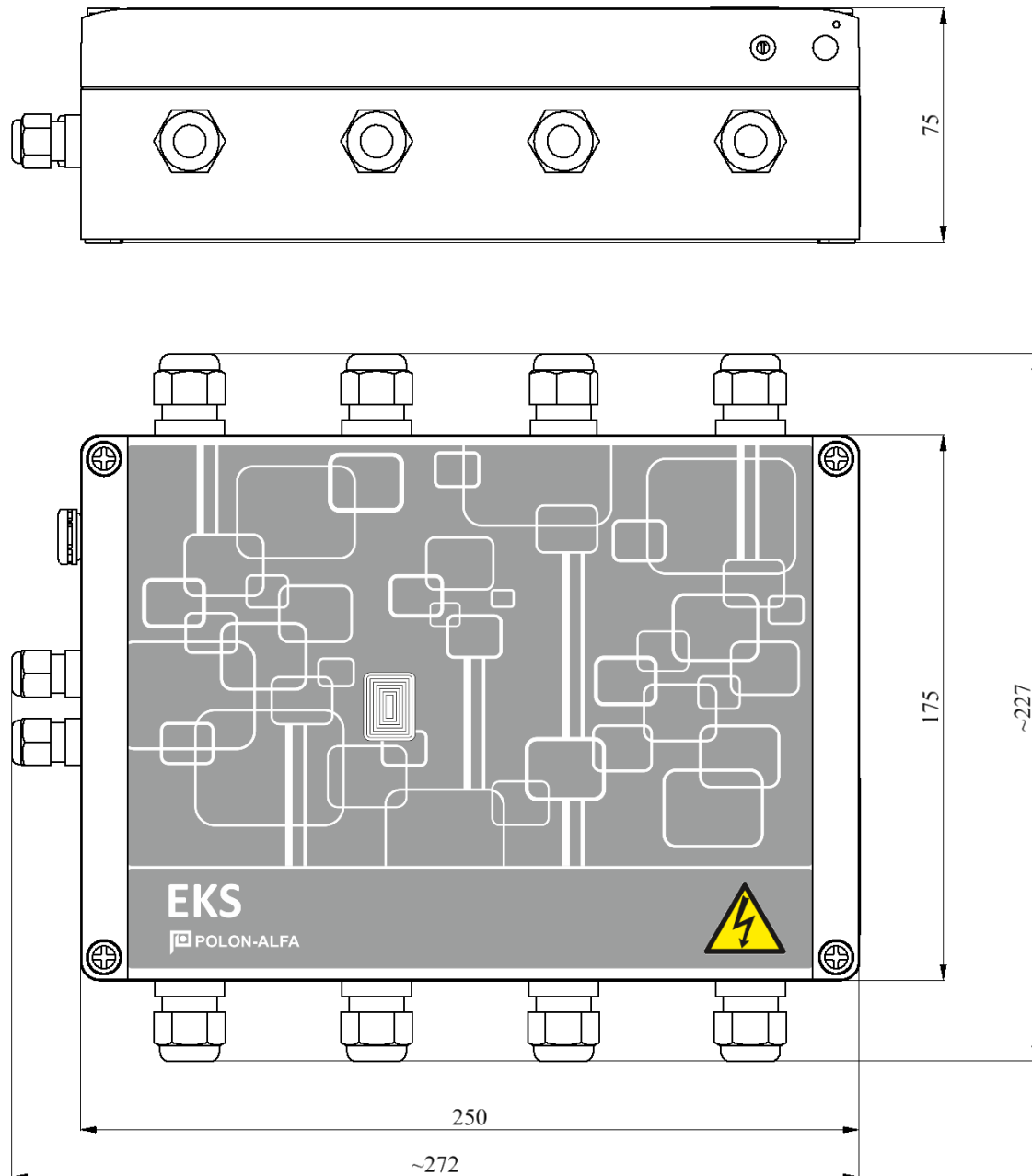


Figure 3.1 EKS-6008 Dimensions

## 4. Principles of operation

Communication between the POLON 6000 control panel and the EKS-6008 control element is carried out through addressable two-wire detection line. A unique, fully digital communication protocol enables transferring any information from the panel to the control element and from the element to the control panel. The fire protection device (e.g. smoke damper) or fire signaling device (e.g. sounder, light signal) is activated after switching the relay contacts in the control element on a command from the control panel. The relay contacts return to the initial position also upon a command from the control panel. The control element allows the following information to be transmitted to the control panel:

- saving the address,
- reading the address,
- saving the operating mode,
- reading the operating mode,
- task for outputs according to mask,
- start of group outputs,
- stop of group outputs,
- fault of the control output connection wire: if interruption occurs,
- setting the control output safe state: If no power supply,
- relay fault reporting,
- short circuit isolation,
- location (report from the TEST button),
- non-volatile memory corruption (erroneous data stored in non-volatile memory).

The way in which the EKS-6008 control element is to operate and behave is determined by the operating modes of the individual outputs. After the automatic configuration of the POLON 3000 or POLON 6000 control panels, the control outputs are inactive. It is possible to set the operating modes for individual control outputs with a control output in an active state.

### Note:

All EKS-6008 board labelling is shown in Figure: 4.1.

Jumpers marked as ON<sub>n</sub>, OFF<sub>n</sub> are used to enable or disable the continuity monitoring of the cable connected to the n<sup>th</sup> control output.

In order to monitoring the continuity of the cable connected to the control output 1, the monitoring must be turned on from the control panel additionally with the jumper at the connector assembly on the edge of the board near the relay set to position **ON1**. This will result in additional current consumption from an external power source supplying the controlled device through the cable continuity control system connected to the control output.

An example of connecting devices to the control element is shown in Figure: 7.1.

The control element is equipped with an internal short-circuit isolator that separates the operational part of the detection line from the adjacent compact part, which enables its undisturbed operation.

The active state coming from the element alarm input is indicated with a flashing red LED located between the detection line terminal block and the IN input terminal block. The indicator is designed to quickly locate the alarming element and help with periodical functional check of the element. Fault and short-circuit states of the short-circuit insulator are indicated with flashing yellow LED.

Jumpers marked as HI<sub>x</sub>, LO<sub>x</sub> determine the low power supply level of IN HV outputs and inputs.

Full configuration of the control element requires the location of these jumpers to be determined. For example, if we decide to control the continuity of the cable connected to output 1, the jumper should be set in **ON1** position, and the controlled device is powered with e.g. 230 VAC, the jumper should be set to HI1, which corresponds to a low state of about 75 V. When the controlled device is powered with e.g. 48 VDC, the jumper should be set to LO1, which corresponds to a low state of about 3 V.

The same rules apply to IN HV inputs.

If the IN HV outputs or inputs are not used, the position of corresponding jumpers is not relevant.

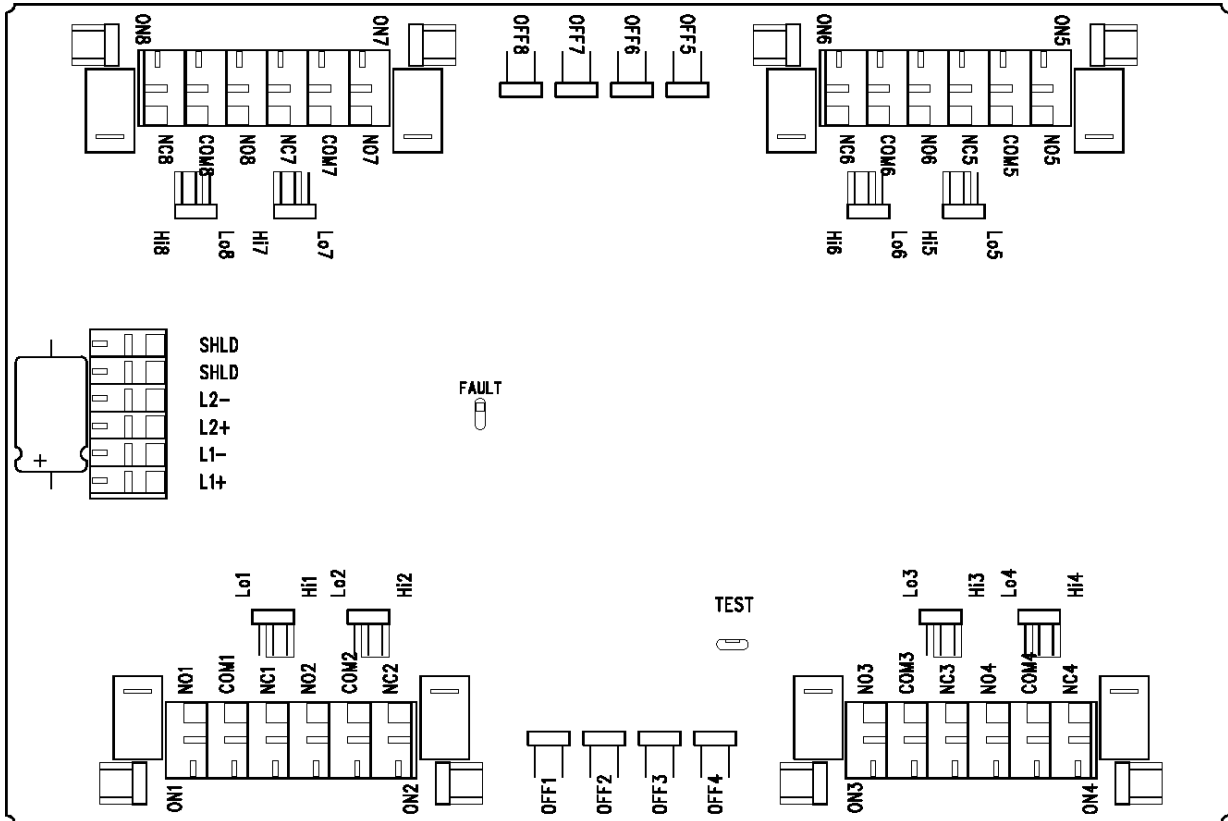


Figure 4.1 EKS-6008 PCB labelling

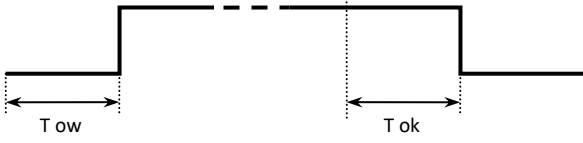

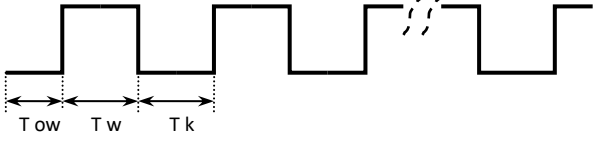
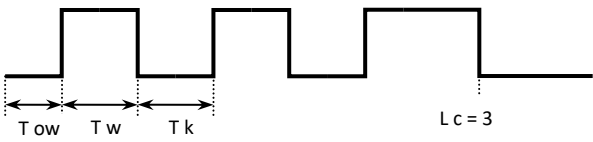
## 5. Operating modes of the control element

Depending on the type of operation of the control output, its mode of operation should be defined.

- a) Operating mode of the control output drive mode - (continuous, timed, pulse, pulse finite)
- b) Time parameters:
  - Power-on delay time (0 ÷ 120 sec every 2 sec or 120 ÷ 1250 sec every 10 sec)
  - Switch-off delay time (0 ÷ 120 sec every 2 sec or 120 ÷ 1250 sec interval 10 sec)
  - Drive time (0 ÷ 120 s every 2 s or 120 ÷ 1250 s every 10 s)
  - Timeout (0 ÷ 120 s every 2 seconds or 120 ÷ 1250 s every 10 seconds)
- c) Safe state of the relay:
  - Yes (undriven, driven)
  - No (no change)
- d) Continuity control of the cable connected to the control output – (Yes, No)
- e) Group number - (0, 65535)
- f) Number of cycles (0 ÷ 255)



The following table shows how the control element is configured depending on the type of operation of the control output:

Control output operation type	Time parameters to be defined
<p>Disabled</p>	<p>-</p>
<p>Continuous</p> 	<p>Triggering Mode                      Triggering delay time - <math>T_{ow}</math>                      Reset delay time - <math>T_{ok}</math></p>
<p>Time</p> 	<p>Control Mode                      Turn-on delay time - <math>T_{ow}</math>                      Actuation time - <math>T_w</math></p>
<p>Pulse</p> 	<p>Control Mode                      Turn-on delay time - <math>T_{ow}</math>                      Actuation time - <math>T_w</math>                      Break time - <math>T_k</math></p>
<p>Pulse finite</p> 	<p>Control Mode                      Turn-on delay time - <math>T_{ow}</math>                      Actuation time - <math>T_w</math>                      Break time - <math>T_k</math>                      Number of cycles - <math>L_c</math></p>

## 6. Operating and service conditions

The control element unfailing operation depends on maintaining appropriate operating conditions, correct installation and regular periodic inspections. The inspection is carried out in order to determine the proper operation of the element and its correct cooperation with the control panel. The inspection should be carried out at least every 12 months by a person who knows the operation of the element to the extent that it is able to recognize any operation irregularities. The test consists in verifying the functions of the element in an operating alarm system.

Note:

Inspections should be carried out with special caution. Interested persons shall be notified if a test run of actuators is to take place during the test.

**For any renovation work, protect the controls from being painted with masking tape. Elements damaged during painting and renovation works due to the fault of the persons conducting these works (e.g. painted casing, glued with paint, ...) are not subject to warranty repairs.**

The control element is equipped with a "TEST" button, which allows you to test the communication of this element with the control panel and determine its location in the facility. After pressing the "TEST" button and holding it for about 2 seconds, the element starts flashing a yellow LED, which means proper communication with the control panel.

To press the "TEST" button, insert the screwdriver into the hole to a depth of not less than 4 mm and move it in the direction marked with an arrow until you feel a "click". The tip of the screwdriver should not be larger than 4x1 mm. The method of pressing the TEST button is shown in Figure: 6.1.

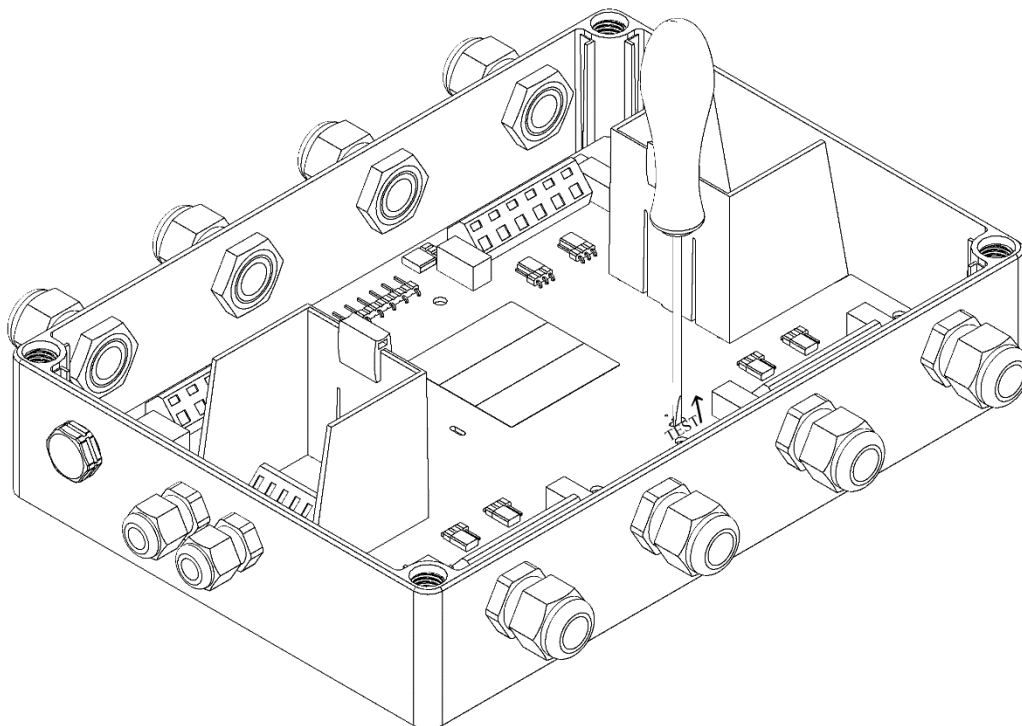


Figure 6.1 TEST button – switch on method

## 7. Installation

The EKS-6008 control elements are recommended to be installed on the detection line in the vicinity of the controlled devices.

The elements can operate in loop, loop with straight branches or in radial detection lines of POLON 3000 or POLON 6000 control panels (see the Installation and Maintenance Manual of control panels).

An example of the EKS-6008 connection method (8 outputs) is shown in Figure: 7.1.

Attach the control enclosures to walls or ceilings by screwing them with four screws through the holes in the corners. Screws with  $\Phi$  6 wall plugs are recommended. Installation cables should be entered through cable entries.

The detection line should be entered through the cable entry plate M12 for a cable diameter  $\Phi$  3÷6.5 mm. The exit should be entered through the cable entry plate M16 for a cable diameter  $\Phi$  5÷10 mm.

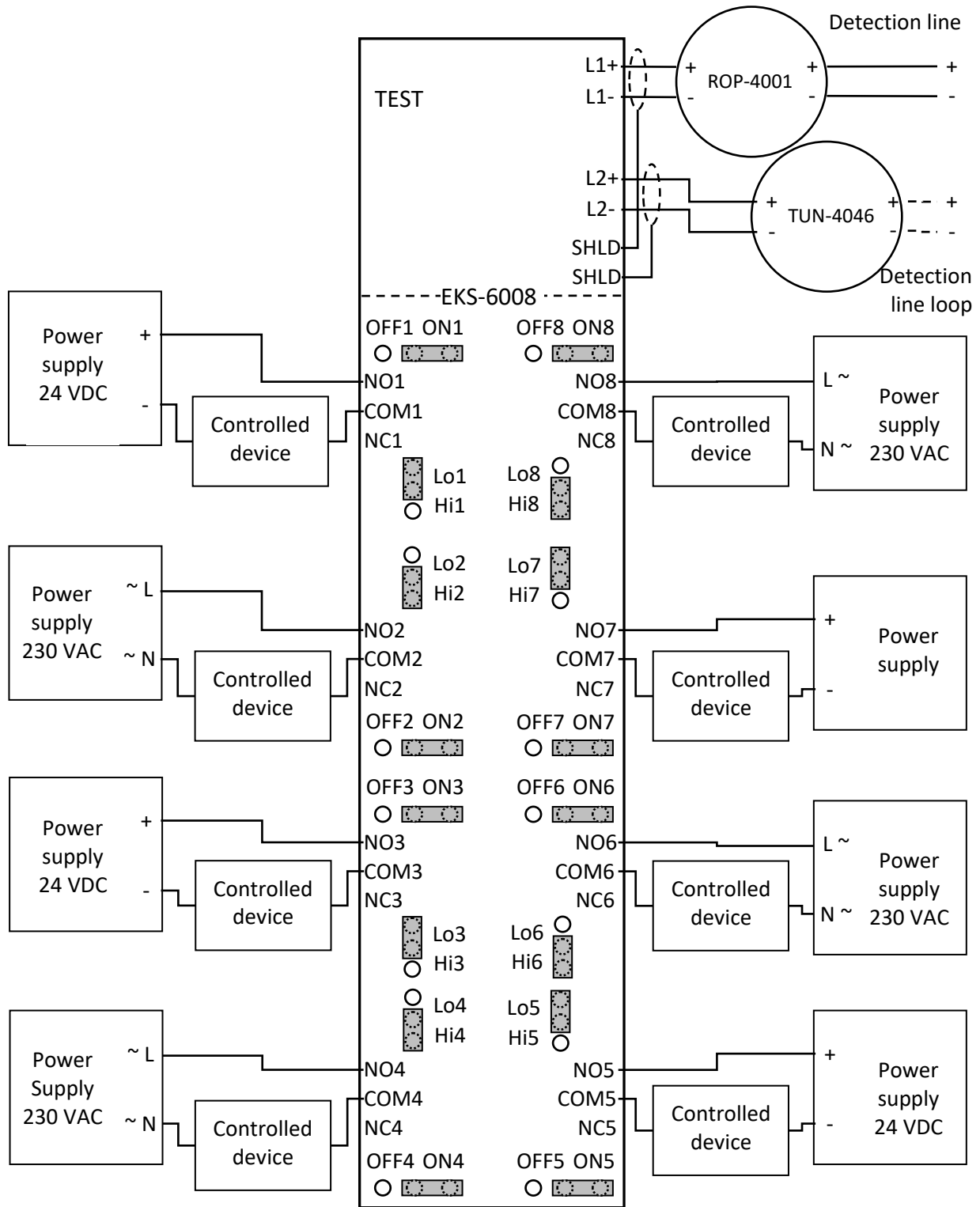
When inserting cables into the enclosure, it is important to pay attention to their proper sealing in cable grommets and plugging unused entries.

When connecting installation cables, use a screwdriver, the working part of which should be pressed all the way into the smaller hole of the connector, then insert the cable into the larger hole and pull out the screwdriver. It is recommended to use a short bent screwdriver 3.5x0.5 mm, cat. no. WAGO 210-258b (purchase from POLON-ALFA). Connect the wires as described on the connectors.

Connect the detection line shields to the fields marked SHLD.

The wires of the alarm system should be laid in accordance with the regulations applicable to low-voltage electrical installations.

Control elements installation is not recommended in rooms with a corrosive atmosphere, containing gases and caustic vapours as well as dust. The EKS-6008 controls are equipped with a "Pressure equalization element", especially useful when mounted outdoors.



Rysunek 7.1 EKS-6008 connection diagram

## 8. Safety conditions

### 8.1. Repairs and maintenance

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

All repairs must be carried out by the manufacturer.

POLON-ALFA is not responsible for the operation of equipment maintained and repaired by unauthorized personnel.

### 8.2. Works at height

Work at height related to the installation of control elements should be carried out with special care and the use of functional equipment and tools. Special attention should be paid to the stability of ladders, lifts, etc.

Power tools must be used in accordance with the conditions of their safe operation specified in the relevant manufacturer's instructions.

### 8.3. Anti-dusting eye protection

During work that generates a large amount of dust, especially when drilling holes in ceilings to attach the bases of the control element housing, safety goggles and dust masks should be used.

### 8.4. Protection against electric shock

When installing the control elements the relevant national regulations for low-voltage electrical installations must be followed. All work can only be performed by authorized persons.

If the system uses a voltage higher than the permissible touch voltage, this voltage must be switched off before opening the enclosure cover.

Detection line screens must be close fixed with the connectors without unnecessary excess.

Strip the remaining wires at the appropriate length so that only the insulated part is available when inserted into the connectors. This will reduce accidental short circuits between wires

## 9. Storage and transport

### 9.1. Storage

The EKS-6080 control elements should be stored in enclosed spaces where no caustic vapours and gases are present, the temperature between 0 °C to +40 °C, and the relative humidity does not exceed 80 % at a temperature of +35 °C.

During storage, the components should not be exposed to direct sunlight or heat from heating devices.

The shelf life of the components in the transport packaging should not exceed 12 months.

### 9.2. Transport

The EKS-6080 control elements must be transported in confined spaces of means of transport, in packaging that meets the requirements of the applicable transport regulations.

The temperature during transport should not be lower than -40 °C and above +55 °C, and the relative humidity should not exceed 95 % at +45 °C.



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