

MICROPROCESSOR BASED ADDRESSABLE MONITORING AND CONTROLLING ELEMENT

EKS-4001

POLON 4000 INTERACTIVE FIRE DETECTION AND ALARM SYSTEM

INSTALLATION AND MAINTENANCE MANUAL

IK-E286-001GB

III G Edition



The EKS-4001 monitoring and controlling element covered by the present manual complies with the requirements of the following European Union Directives:

CPR Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEG;

EMC The electromagnetic compatibility (EMC) Directive 2011/65/EU

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

The features/technical parameters above the exceeds the requirement of the aforementioned standards and other features/parameters specified in this manual that are not specified in the mentioned standards are confirmed by the Manufacturer.


The certificate and the Declaration of Performance can be downloaded from www.polon-alfa.pl web site.

Read the manual carefully before the detector assembling and commissioning.

Any nonconformity with the instructions contained in the manual may be harmful or may cause violation of the law in force

POLON-ALFA bears no responsibility for any damage resulting from usage inconsistent with the manual.



<p>A waste product, unsuitable for further use, shall be passed to a waste electric and electronic equipment collection point.</p>	
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NOTE: The manufacturer reserves the right to change specifications of products at any time without prior notice.

1 PURPOSE

The EKS-4001 monitoring and controlling element is an addressable device designed:

- to control automatic protection and fire-fighting devices,
- to monitor the above mentioned devices actuation,
- to monitor any other equipment.

The EKS-4001 element is intended to operate in loop-shaped detection lines of the POLON 4000 system control panels as an input/output device with one controlling output and two monitoring inputs. The EKS-4001 element is designed for indoor and outdoor operation in the ambient temperature range between -25 °C and +55 °C, and relative humidity up to 95 % at +40 °C.

2 TECHNICAL SPECIFICATIONS

Operation voltage	16.5 V ÷ 24.6 V
Current draw from detection line (in quiescent mode)	< 165 µA
Controlled device power supply voltage	6 V ÷ 30 V
Current draw from power supply unit of controlled device by line continuity monitoring circuit	< 615 µA
Relay controlling output	non-potential switchable contact 2 A/30 V
Tp relay actuation delay time	2 s, 30 s, 60 s, 90 s
Number of monitoring outputs	2
Monitoring lines capacity	≤ 65 nF (ca. 350 m of 1x2x0.8 mm YnTKSY cable)
Monitoring output initiation	NO or NC non-potential contact
Tk elapsing time after which controlled device monitoring starts	no monitoring, 40 s, 70 s, 130 s
Cable routing:	
- for detection line wires	GPA M12 wire gland seal
- for monitoring and controlling wires	GPA M16 wire gland seal
Address range in the loop	1 ÷ 127
Address coding method	programmable from control panel
Admissible relative humidity	up to 95 % at 40 °C
Climate category	25/055/04
EKS module cover plate colour	white
Module <i>dimensions</i>	acc. to Fig. 1.
1xEKS case dimensions	acc. to Fig. 2.
2xEKS case dimensions	acc. to Fig. 3.
4xEKS case dimensions	acc. to Fig. 4.
EKS module mass	60 g
1xEKS case mass	330 g
2xEKS case mass	560 g
4xEKS case mass	870 g
Cases ingress protection	IP 65
Cases colour	grey bottom, transparent cover plate.

3 SAFETY CONDITIONS

3.1 Repairs and maintenance

Any maintenance works or periodic inspections shall be executed by skilled personnel employed by companies authorised and trained by POLON-ALFA.

Any repairs must be carried out by the manufacturer. POLON-ALFA bears no responsibility for the operation of any apparatus being repaired by unauthorised personnel.

3.2 Works at height

Any detector installation works carried out at height must be executed with particular care utilising tools and machinery in good working condition. Special attention shall be given to stability of ladders, elevators, lifts, etc.

Any electric tools shall be used strictly obeying the safety rules stated in instruction manuals by manufacturers.

3.3 Anti-dusting eye protection

It is obligatory to use protective anti-dusting glasses and masks during the EKS-4001 element installation works that produce high amount of dust, such as hole drilling in walls and ceilings.

4 DESIGN DESCRIPTION

The EKS-4001 monitoring and controlling element (Fig. 1) is a replaceable module in the form of a printed board with electronic circuits, enclosed by a cover, placed in a case furnished with a terminal block. Two illuminating diodes are located on the module cover outer side, on the opposite side – two angle plugs are placed that enable connection of the module with the terminal block in the CUBO S type case. The following case sizes are available: for one, two and four EKS-4001 modules.

The case bases are drilled in the corners to provide openings for wall mounting. Two GPA M12 cable gland seals are located in the case base side wall in order to insert the detection line inputs and outputs. Additionally, two or four (depending on the case type) GPA M16 cable gland seals are provided to introduce the monitoring and controlling wires. A mounting plate with two slots for modules is fixed to the case base. One slot is designed for connection of the detection line input and output wires; the other one – for connection of the monitoring and controlling wires. Screens of the detecting line and monitoring and controlling cables should be connected to the clamps located between the slots. The case cover plate with a rubber seal is fastened to the case base with four plastic screws. Special attention should be given to proper alignment of the lug and opening located diagonally.

5 PRINCIPLES OF OPERATION

Communication between the POLON 4000 system control panel and the EKS-4001 monitoring and controlling element is provided by a two-core addressable detection line. The monitoring and controlling element is equipped with a short circuit isolator. Actuation of a fire-fighting device (e.g. a smoke damper) or signalling device (e.g. a buzzer or optical indicator) is achieved due to the element

relay contacts closing evoked by a command from the control panel. The monitoring and controlling element indicates this condition with red flashes of the LED diode. The alarm reset in the control panel results in the relay contacts return to the initial position. It is possible to disable actuation of the monitoring and controlling element relays in the control panel in two ways:

- system elements disablement, or
- the EKS element disablement.

Both methods are equivalent.

The monitoring and controlling element actuation depends on the actuation variant set in the control panel 'EKS Configuration' menu.

The monitoring and controlling element enables transmission to the control panel of the following conditions occurrence:

- a) activated relay;
- b) technical alarm input 1, input 2 – in case at least one of two EKS element inputs changes its status to the adverse one (depending on the operation mode), information about this event is sent to the control panel. The control panel signals this occurrence as a technical alarm;
- c) short circuit isolator activation;
- d) relay actuation disablement;
- e) relay fault;
- f) short circuits isolation;
- g) EEPROM memory fault – incorrect data saved in the EEPROM memory;
- h) output line continuity fault;
- i) output 1, output 2 line fault – in case a short circuit or break occurs in at least one line connecting The EKS input with the monitored or controlled device, the EKS element sends to the control panel information about a line fault;
- j) output 1, output 2 non-maskable fault - in case at least one input is programmed (operation modes) to monitor the controlled device and this device is activated, and it does not change its status after the elapse of the T_k time defined by the operation mode, the EKS element sends to the control panel information about a non-maskable fault.

The way how the monitoring and controlling element works is determined by the element operation mode. During the system automatic configuration, the default mode settled by the manufacturer is set, i.e. 10000000 in the binary recording (80 in the hexadecimal recording). It means that the EKS monitors the controlled device line continuity; the relay actuation will take place after 2 s, the second input operation way is set at NO, the first input operation way is set at NO, the controlled device actuation is not monitored by the first input and the controlled device actuation is not monitored by the second input.

The monitoring and controlling element operation mode is set with one bite data in which every bit means the element actuation and operation way.

Note:

In case any current draw from the controlled device power supply source is impermissible, it is possible to abandon the line continuity monitoring function. It means that the monitoring circuit does not draw $535 \mu\text{A} \pm 80 \mu\text{A}$ current. For this purpose it is necessary to dismantle the EKS-4001 module, take out the jumper located on the printed board edge near the relay and assembly the module. An alteration in the EKS-4001 operation mode is necessary – it can be achieved by switching off the controlled device line continuity monitoring. The operation mode can be set from the menu in two ways:

- entering the setting in the hexadecimal recording in the Operation mode field;
- selecting the EKS element operation way from the Operation mode submenu.

The monitoring and controlling element is furnished with two inputs that react to non-potential contacts switching on and off. The control panel indicates this change as a technical alarm. For the

monitoring and controlling element proper operation it necessary to connect resistors in accordance with Fig. 5. Any input lines closing or opening is detected by the monitoring and controlling element and signalled by the control panel as an input line default. The EKS-4001 monitoring and controlling element proper connection is shown in Fig. 5.

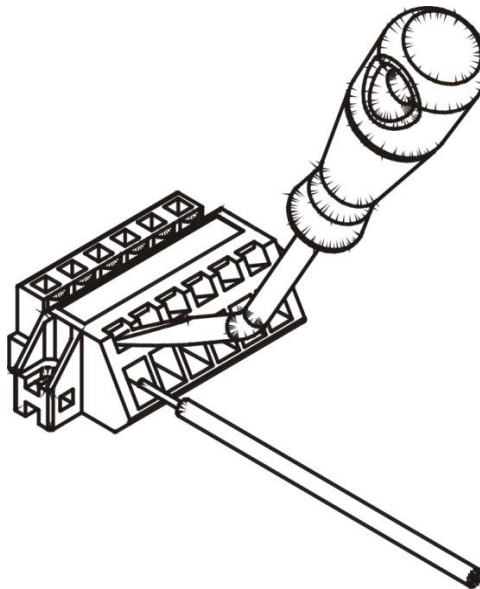
6 INSTALLATION

The monitoring and controlling elements are recommended to be installed in the controlled devices vicinity. The monitoring and controlling elements cases should me mounted on walls and ceilings fastening four screws through the openings in the corners. It is advised to take the modules out when the case is mounted and use screws with $\varnothing 6$ expansion anchor bolts.

The installation wires should be introduced through cable gland seals. The detection line conductors – YnTKSYekw 1 x 2 x 0.8 wire is recommended – should be introduced through two smaller GPA M12 cable gland seals, whereas monitoring and controlling conductors - 3 x 2 x 0.8 wire is recommended – should be routed through bigger GPA M16 cable gland seals.

It is important that the cable gland seals are properly sealed and unused gland seals are plugged (all cable gland seals are plugged by default).

For installation wires connection a screw driver use is recommended, its operation part should be pushed in as far as it goes (see below figure) into the connector smaller hole. Then the wire should be inserted into the bigger hole and the screw driver should be taken off. It is advised to use a short, bended WAGO type screw driver (3.5 x 0.5 mm, cat. No. 210-258) that is available for purchase at POLON-ALFA). The wires connection should be done pursuantly to the descriptions on the connector. Wires screens should be twisted together and fasten with the screw with washer placed between the slots on the mounting plate.



7 SERVICING AND MAINTENANCE

The monitoring and controlling element unfailing operation depends on maintaining appropriate operating conditions, proper installation and periodic inspections performance. The periodic inspections should be carried out at least once per six months by a person who knows the element operation to such an extent that allows revealing its malfunctions. The inspection consists in the element functioning checking in an acting detection installation.

Note: The inspections must be executed with special care. It is obligatory to inform proper persons in the case of any trial actuation of executing devices.

8 PACKING AND TRANSPORTATION

The EKS-4001 monitoring and controlling elements are packed into individual packages and then put into bulk containers of 10 pcs. The EKS-4001 elements should be kept in closed rooms free of any caustic gases and vapours at the temperature between +0 °C and +40 °C, and relative humidity not exceeding 80 % at +35 °C. In the time of storing, the elements should not be exposed to either direct sunlight or heat from heating equipment. The EKS-4001 elements storage period in transportation packing should not exceed 6 months.

The EKS-4001 monitoring and controlling elements should be carried in closed transport means spaces, in packing that meets the requirements of transportation regulations in force. The temperature during transportation should not be lower than -40 °C and higher than +70 °C, and relative humidity should not be higher than 95% at + 45 °C or 80% at +70 °C.

9 ORDERING PROCEDURE

The following data should be included in the EKS-4001 element order:

- | | |
|---|----------|
| - EKS-4001 monitoring and controlling element | - x pcs |
| - 1xEKS case | - x pcs |
| - 2xEKS case | - x pcs |
| - 4xEKS case | - x pcs. |

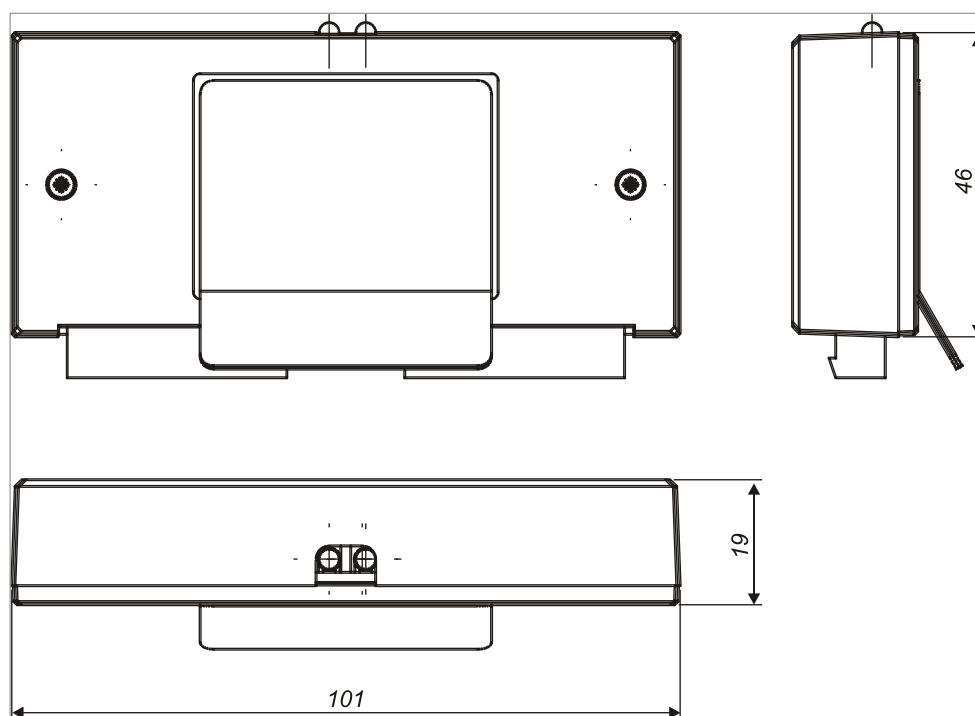


Fig. 1 EKS-4001 module design and overall dimensions

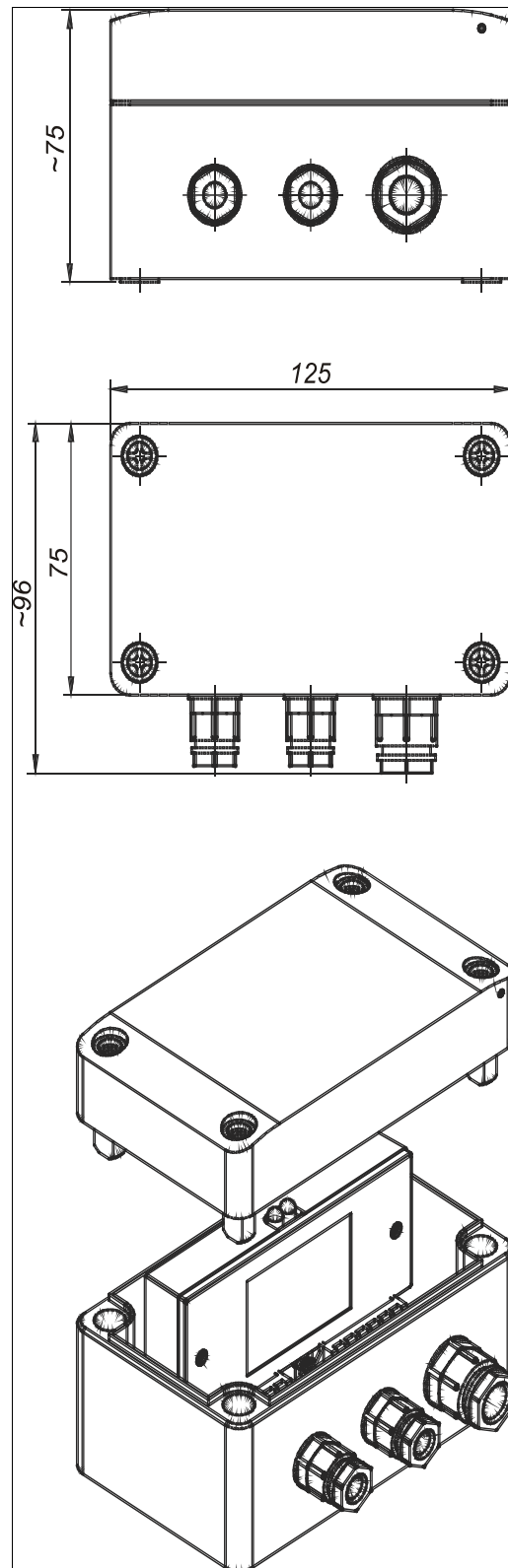


Fig. 2 1xEKS case dimensions

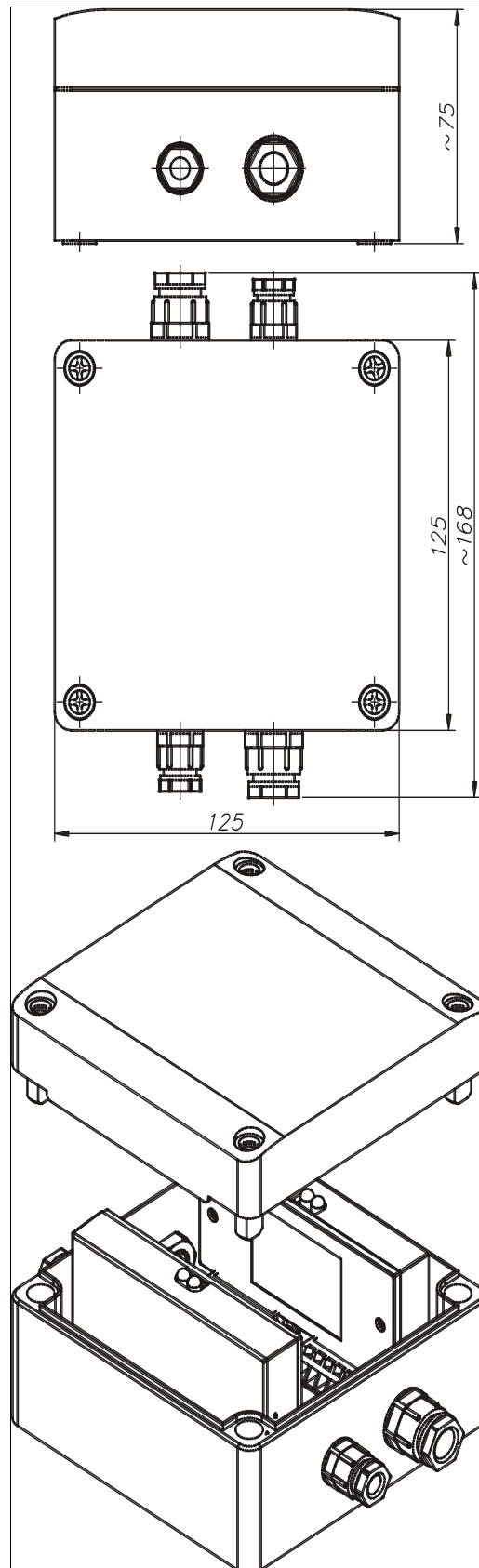


Fig. 3 2xEKS case dimensions

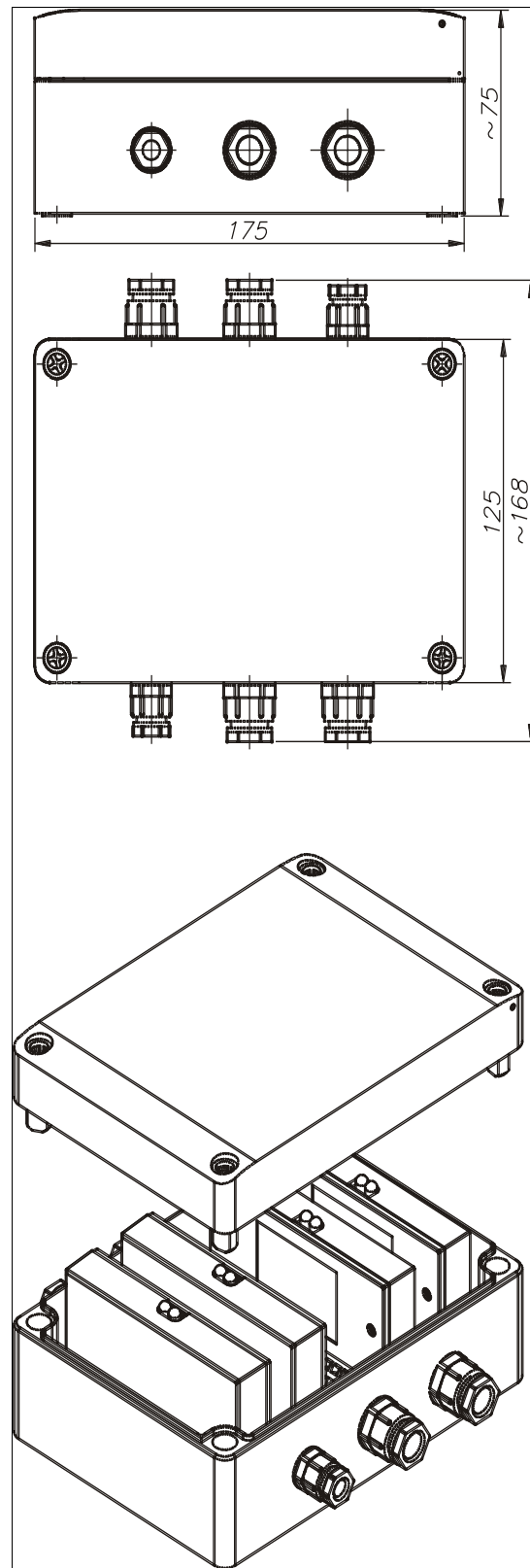


Fig. 4 4xEKS case dimensions

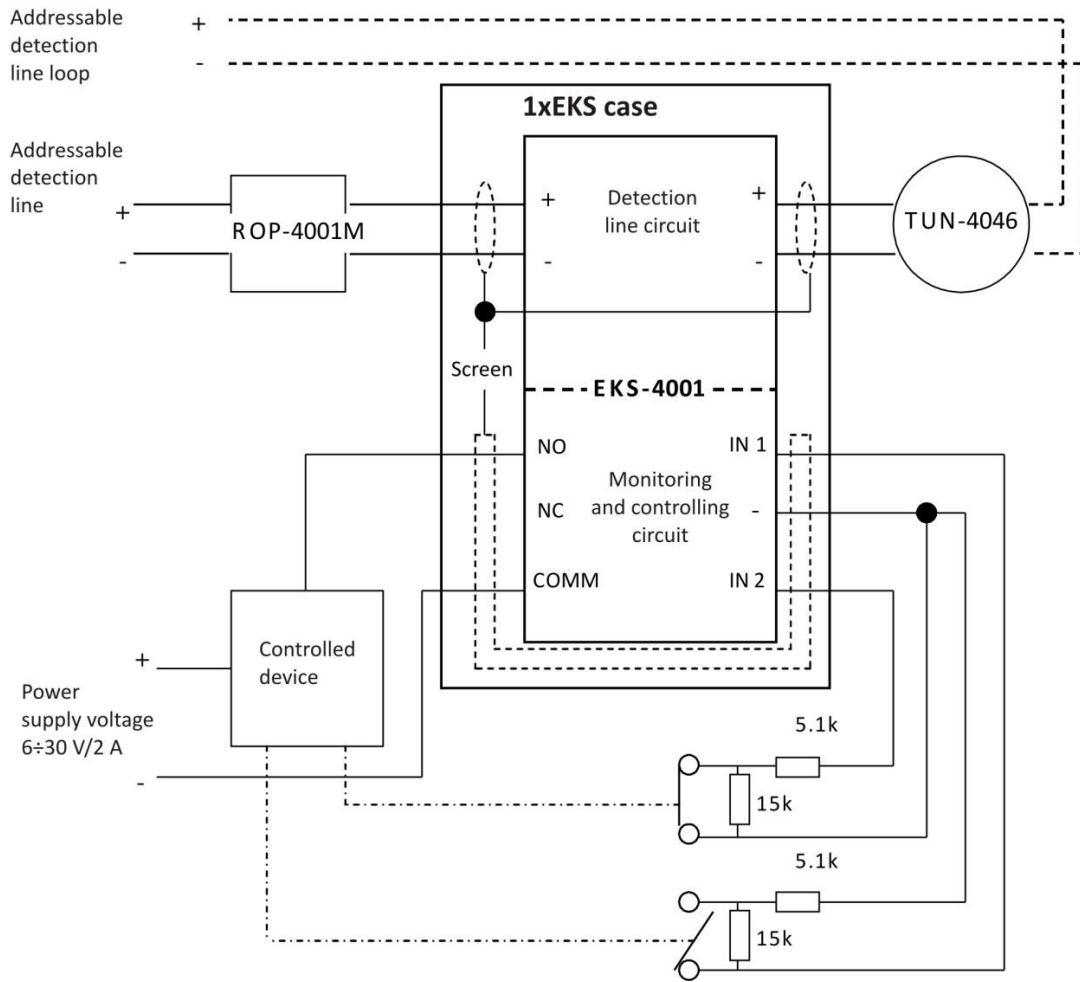


Fig. 5 Exemplary diagram of EKS-4001 element (in 1xEKS case) connection in detection line

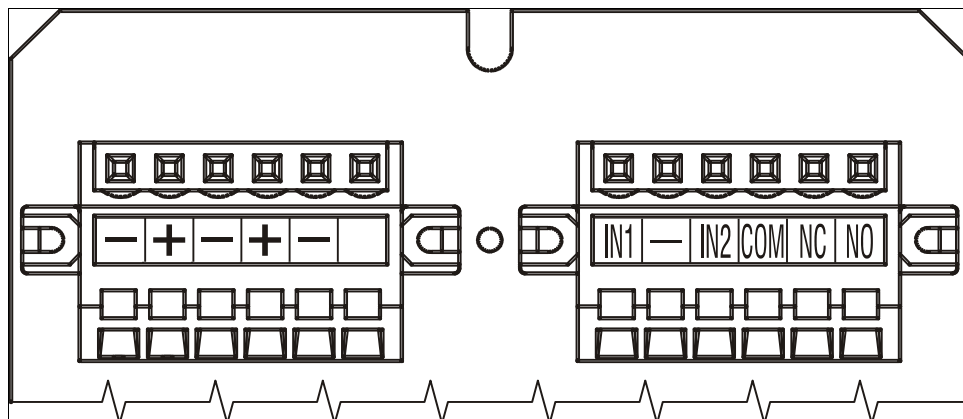


Fig. 6 EKS case connection terminals view



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