

ADC-4001M ADAPTER

POLON 4000 and POLON 6000 INTERACTIVE FIRE DETECTION AND ALARM SYSTEM

INSTALLATION AND MAINTENANCE MANUAL

IK-E323-001GB

Edition III A

CE




The ADC-4001M adapter, covered by this 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
2004/108/WE - on electromagnetic compatibility.


The ADC-4001M adapter has been approved with the EC Certificate of Conformity No. 1438/CPD/0069, issued by the Scientific and Research Centre for Fire Protection (CNBOP) Józefów, Poland, an EU notified authority No. 1438, confirming its compliance with the requirements of PN-EN 54-18: 2005 standard.

The certificate can be downloaded from www.polon-alfa.pl web site.

 1438
Polon-Alfa Spółka z ograniczoną odpowiedzialnością Sp. k. Glinki 155 Street, PL 85-861 Bydgoszcz 06 1438/CPD/0069
EN 54-18 ADC-4001M adapter Addressable alarm signal input element, detachable.
Technical data - IK-E323-001GB manual.

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.

The manufacturer, POLON-ALFA shall not bear responsibility for any harms resulted from the unit application discordantly to the requirements of this instruction.

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

1 PURPOSE

The ADC-4001M adapter is an addressable element that enables connection of a branch detection line comprising non-addressable devices to a loop-shaped addressable line of the POLON 4000 fire detection and alarm system control panel.

The following non-addressable devices can be installed in a two-wire branch line:

- manual call points and 30 and 40 model range fire detectors, including the DOP-40 beam smoke detector, as well as intrinsically safe fire detectors;
- fire detectors manufactured by other producers, equipped with non-potential NO contacts and an alarm resistor, e.g. flame detectors manufactured by Det-Tronix;
- monitoring and alarming valves (equipped with non-potential NO contacts and an alarm resistor) of sprinkling systems, etc.

The elements that are installed in a branch line are assigned with a common address, determined by the ADC-4001M adapter's address and their activation evokes a fire alarm at the control panel. The adapter is equipped with a short circuit isolator.

The ADC-4001M adapter is intended for wall or ceiling mounting using the G-40 base.

2 TECHNICAL SPECIFICATIONS

Operation voltage (from detection loop)	16.5 V – 246 V
Current drawn from detection loop	from 0.5 mA to 16 mA depending on operation mode
Maximum branch line resistance	2 x 25 Ω
Operation temperature	from -25 °C to +55 °C
Admissible relative humidity	up to 95 % at 40 °C
Ingress protection rating	IP 40
Dimensions (without base)	\varnothing 115x43 mm
Mass	130 g
Casing colour	white
Mounting base	G-40

3 SAFETY CONDITIONS

3.1 Repairs and maintenance

Any maintenance works and periodic inspection shall be executed by skilled personnel employed by companies being 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 adapter 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 the stability of ladders, platforms, etc.

Any electric tool shall be used strictly obeying the safety rules specified in the manufacturer manuals.

3.3 Anti-dusting eye protection

It is obligatory to use protective anti-dusting glasses and masks during the device installation works that produce high amount of dust, such as hole drilling for detector base mounting on ceilings.

4 DESIGN DESCRIPTION

The ADC-4001M adapter is placed in a casing similar to those of 40 model range detectors, however the casing is not ribbed – the upper part is entirely closed. A cover is fitted to the casing and a two-colour diode is located from the front side. The adapter is mounted in the G-40 installation base, where also installation wires and cables screens are fixed to.

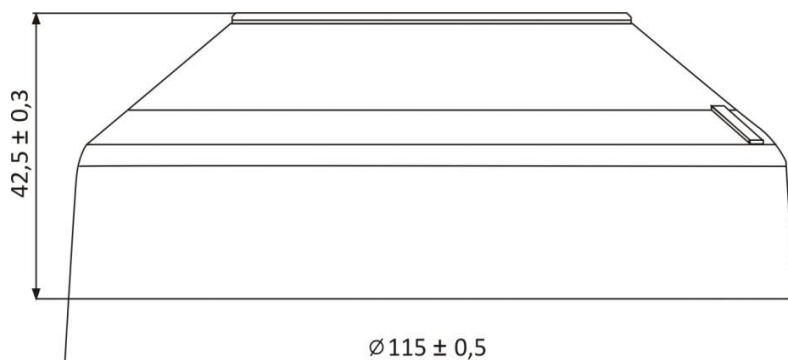


Fig.1 ADC-4001M adapter

5 OPERATION DESCRIPTION

The ADC-4001M adapter is an addressable device operating in a loop-shaped detection line that monitors two-stage detectors installed in its branch line. All line elements, installed in the branch line, possess a common address determined by the adapter.

A fire signal induced by a detector installed in the branch line is transmitted via the adapter to the control panel whereas it is signalled in the adapter with red flashing diode light.

A branch line fault (short circuit or break) is also transmitted to the control panel; in this case the diode flashes with yellow light. Any branch line fault does not have any impact on the detection line.

The adapter is equipped with internal short circuit isolator that cuts off the efficient part of the addressable detection loop. The isolator, after revealing a voltage decrease on its contacts, resulting from a short circuit in the detection line, cuts off the shorted section. The short circuit separation is signalled with yellow diode flashings and appropriate information is passed to the control panel.

The adapter operates in six working modes. A proper mode shall be declared at the control panel. The mode selection is provided in order to optimise the adapter current consumption adjusting it to particular needs (see Table 1).

Table 1

ADC working mode	Addressable loop current drawn by ADC	Admissible quiescent current of branch line detectors	Ra alarming resistor	Rk branch line end-of-line resistor
1	6.8 mA	1.0 mA	1 kΩ	13 kΩ
2	16 mA	2.0 mA	1 kΩ	5.6 kΩ
3	2.5 mA	150 uA	1 kΩ	47 kΩ
4	0.5 mA	-	8.2 kΩ	13 kΩ
5	2.2 mA	-	-	-
6	1.33 mA	300 uA	1 kΩ	33 kΩ

The entire current consumption by the adapter, regardless its state and the number of elements installed in the branch line, is constant for a given operation mode.

Mode „1” - enables installation of up to 10 two-state detectors.

Mode „2” - the number of detectors installed in the branch line cannot exceed 20.

Mode „3” - enables installation of 1 - 2 two-state detectors.

Mode „4” - mode provided for interoperation with devices (e.g. monitoring-alarming valves of sprinkling systems) that are equipped with non-potential NO contacts. An alarm is activated by connecting to the branch line through an 8.2 kΩ resistor contact.

Mode „5” - mode intended exclusively for DOP-40 beam smoke detector connection (without an end-of-line resistor – the detector jumper set in ADC-1 position).

Mode „6” - mode provided especially for interoperation with 40 model range detectors of low voltage power supply. It enables installation of up to 5 40 model range detectors manufactured after June 15th, 2002 (date stated in a warranty certificate).

Detailed information regarding designing rules of detection lines with the ADC-4001M adapters installed in is contained in the POLON 4000 system control panel manuals.

6 POLON 4000 INTRINSICALLY SAFE DETECTION LINES

The POLON 4000 intrinsically safe detection lines can be routed only as branch lines behind the ADC-4001M adapters using intrinsically safe separators manufactured by STAHL:

- one-channel type 9167/13-11-00s;
- two-channel type 9167/23-11-00s.

Maximum adapter branch line resistance shall not exceed 2 x 25 Ω (including both sections: before and behind the separator).

The ADC-4001M adapter operation mode should be assorted suitably to a type and number of intrinsically safe detectors or manual call points installed in an intrinsically safe line (see Table 2).

Table 2

ADC working mode	Addressable loop current drawn by ADC	Admissible quiescent current of detectors in branch line behind separator	Ra alarm resistor of manual call point	Intrinsically safe line EOL resistor
1	6.8 mA	0.5 mA	1 k Ω	13 k Ω
2	16 mA	1.0 mA	1 k Ω	5.6 k Ω
3	2.5 mA	0.1 mA	1 k Ω	47 k Ω

As an example, for currently manufactured DIO-37Ex, TUN 38Ex, PUO-35Ex and DUR-40Ex detectors:

Mode „1” – enables installation behind the intrinsically safe separator:

- 8 pcs. DUR-40Ex intrinsically safe smoke detectors, or
- 4 pcs. TUN –38Ex intrinsically safe heat detectors (KDB certificate limitation), or
- 1 pce. PUO-35Ex intrinsically safe flame detector (KDB certificate limitation).

Mode „2” - enables installation behind the intrinsically safe separator:

- 10 pcs. DUR-40Ex intrinsically safe smoke detectors (system limitation).

Mode „3” - enables installation behind the intrinsically safe separator:

- 1 pce. TUN –38Ex intrinsically safe heat detector, or
- 1 pce. PUO-35Ex intrinsically safe flame detector, or
- 1 pce. DUR-40Ex intrinsically safe smoke detector, or
- up to 10 pcs. intrinsically safe manual call points, equipped with a 1 k Ω alarm resistor (system limitation).

NOTE: A branch line short circuit behind an intrinsically safe separator is signalled as a fire alarm. A line short circuit between a separator and an adapter is signalled as a fault.

The separator should be installed in a safe zone, directly behind an endangered zone. An intrinsically safe line behind a separator should be routed using an intrinsically safe unshielded cable.

In the case of intrinsically safe manual call points, the adapter should be declared as an immediate alarming device (2nd stage alarm) and should be appropriately assigned in the control panel.

7 INSTALLATION

7.1 Installation place and fastening

The ADC-4001M adapter is designed for wall or ceiling mounting, inside premises, using the G-40 base.

The base should be fastened to a ceiling with two screws and expansion anchor bolts ($\varnothing 6$ recommended). It is advised to drill the bolt holes using a pattern of 127 mm hole spacing. Improper hole spacing may result in the base deformation when the screws are strongly tightened. It may cause difficulties in inserting the adapter into the base.

7.2. Wire inserting

Wires should be introduced into the G-40 base through an opening in the back of the base. In case of surface (on-plaster) wire routing, the base side wall should be cut off or narrowed with a file.

Notes:

1. No other elements can be installed in a branch adapter line that contains manual call points.
2. It is forbidden to use an alarm variant with reset for adapters that beam smoke detectors are connected to.
3. It is forbidden to use an alarm variant with reset for adapters that manual call points are connected to.

7.3 Wire connecting

The way of detection line connection is described in the G-40 base Installation and Maintenance Manual. Fig. 2 shows how to connect a detection line and the ADC-4001M adapter. The adapter 'positive' power supply can be connected to any contact marked with '+' sign. It is recommended to connect the adapter to loop-shaped addressable lines but it can be installed also in a radial line or a loop-shaped branch line. The branch line 'positive' wire should be connected to the base contact marked with 'WZ' sign. Screens of the wires should be twisted and inserted into the additional connector (the connector should be squeezed with fingers); then the connector should be placed between the guides in the base rectangular hollow.

8 SERVICING AND MAINTENANCE

The ADC-4001M adapter unfailing operation depends on ensuring proper operation conditions, appropriate assembly execution and systematic periodical inspection. The periodical checks should be carried out at least once a year by a person who knows the device operation principle and is able to reveal irregularities of its functioning. The detector inspection consists in evoking an alarm in a branch adapter line and checking whether an alarm signal is transmitted to the control panel.

Properly operating adapters, subjected to systematic periodical inspections do not require any other maintenance works.

9 PACKING, TRANSPORTATION, STORAGE

The ADC-4001M adapters are packed into bulk packages. An installation and maintenance manual is inserted into the bulk package.

The adaptors in factory packing should be carried out in closed spaces using usual land or marine transport means. The devices should be secured from strong shakes and ambient temperature below – 40 °C and above +70 °C.

The ADC-4001M adapters should be stored in closed premises that are free of corrosive gases or vapours, at ambient temperature from +5 °C to +40 °C and relative humidity between 40 % and 80 %, away from heating devices. The storage period should not exceed 24 months.

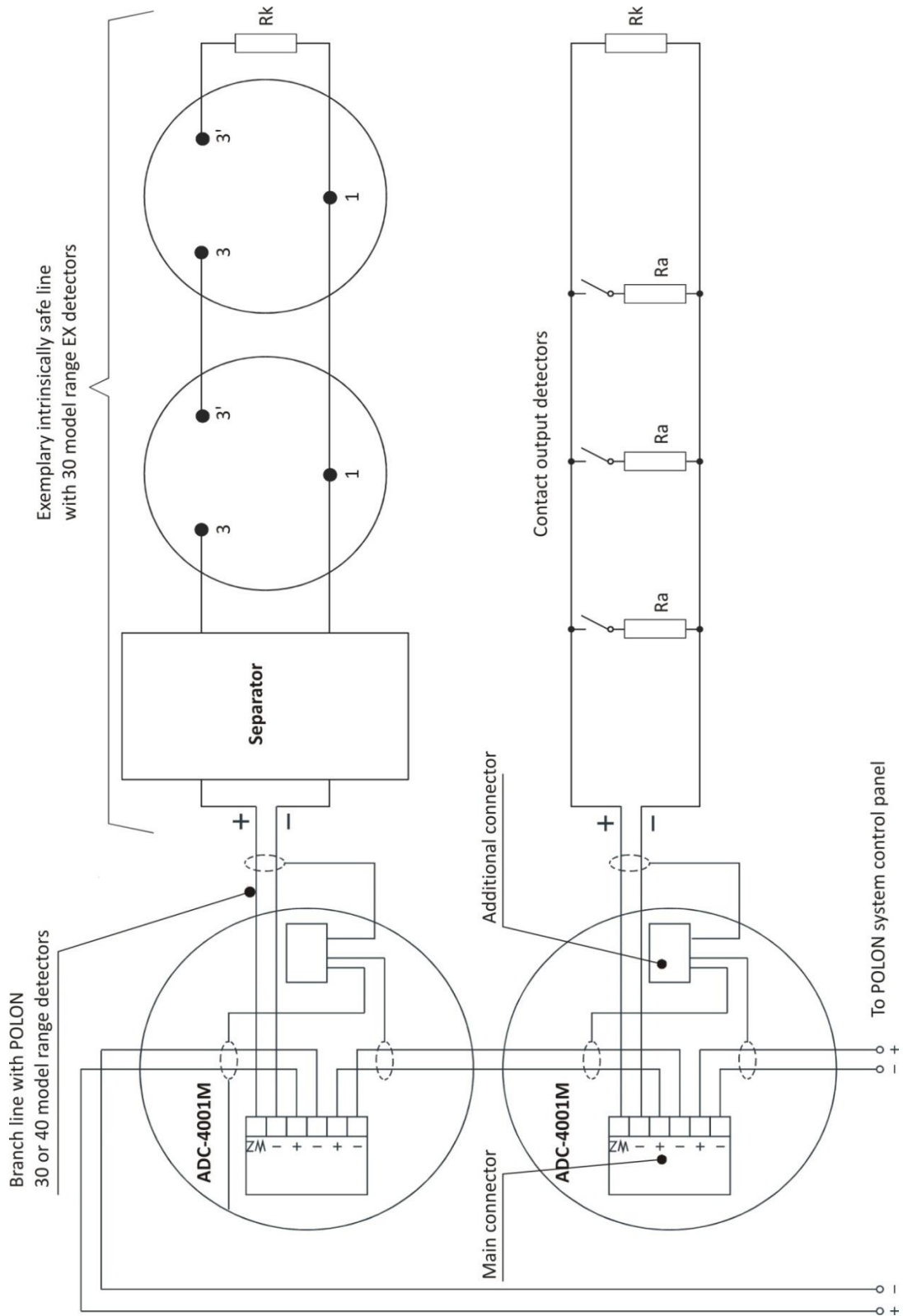


Fig. 2 ADC-4001M adapter exemplary connection into addressable detection line with exemplary adapter branch line connection



POLON-ALFA S.A.

POLAND 85-861 Bydgoszcz, ul. Glinki 155 | www.polon-alfa.pl
EXPORT DEP. phone no. +48 52 36 39 278, email: export@polon-alfa.pl
SERVICE DEP. phone no. +48 52 36 39 390, email: serwis@polon-alfa.pl