

TOP-40

MULTI-SENSOR HEAT AND FLAME DETECTOR

Installation and maintenance manual

IK-E319-001GB

IB Edition



The TOP-40 multi-sensor heat and flame detector, covered by this manual, complies with the requirements of the AT-0109-0074/2006 Technical Approval issued by the Scientific and Research Centre for Fire Protection (CNBOP) and the following European Union directive:

EMC 2004/108/WE - on electromagnetic compatibility.


The TOP-40 detector has been approved with the EC Certificate of Conformity No. 2309/2006 + appendix A1 certifying the detector compliance with the conditions of the Technical Approval that meets the PN-EN 54-5:2003 and PN-EN 54-10:2005 standards requirements.

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

Read the manual carefully before the detector mounting and activation.

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

POLON-ALFA shall not bear responsibility for any harm resulted from the unit application discordantly to the requirements of this manual.

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 specifications of products at any time without a prior notice.

1 PURPOSE

The TOP-40 multi-sensor smoke and heat detector is designed for detection and indication of a fire which is characterised by a flame and/or temperature rise. Application of two sensors reacting to temperature and infrared radiation increases significantly its immunity against disruptions and minimises false alarm occurrence possibility. The detector sensibility and suitability for certain test fire detection is higher when compared with a heat detector and smoke detector.

The TOP-40 detectors are intended to interoperate with conventional control panels or to be installed in side lines of addressable control panels manufactured by Polon-Alfa. The device is designed to operate in the temperature range between – 20 °C and + 50 °C (maximum temperature in the quiescent mode).

The detector meets the requirements of the PN-EN 54-5:2003 concerning the A1R class and PN-EN 54-10:2005 concerning the class 2.

2 TECHNICAL SPECIFICATIONS

Quiescent voltage	9 V ÷ 28 V
Quiescent current	≤ 90 µA
Alarm current	20 mA
Minimum operation temperature level	- 20 °C
Allowable relative humidity	≤ 95 % at 40 °C
Detector class (acc. to PN-EN 54-5:2003)	A1R
Detector class (acc. to PN-EN 54-10:2005)	Class 2 (17 m)
Flame sensor view angle	60°
Flame sensor bandwidth	infrared 4.35 µm CO ₂ spectral line
Static actuation temperature	from 54 °C to 65 °C
Typical operating temperature	25 °C
Mass (without base)	0.2 kg
Dimensions without base	Ø 115 x 60 mm
Dimensions with G-40 base	Ø 115 x 71 mm
Maximum installation height *)	7.5 m
Maximum supervised area *)	
- for heat sensor	30 m ²
- for flame sensor	60 m ²
Ingress protection	IP 44
Standard colour	white

*) see PKN-CEN/TS 54-14:2006 design guidelines

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 detector installation works that produce high amount of dust, such as hole drilling in ceilings.

4 DESIGN DESCRIPTIONS

The device detecting circuits consists of two sensors that react to two fire factors: heat and flame. They are placed centrally: one above the other. The sensors are protected against a mechanical damage by a window, basket and body. The detector construction and outer shape allow for fire factors easy influence on the detection circuit. The whole structure is placed in a white plastic housing. The TOP-40 detector is installed in the G-40 base where detecting line wires are connected to. The detector mechanical design is shown in Fig. 1.

5 PRINCIPLE OF OPERATION

The heat sensor is a thermistor, which reacts to the temperature rise which occurs in a fire initial phase. The flame sensor is a Pyro Element especially sensitive to 4.35 μm (so called CO₂ spectral line) wavelength.

A fire factor detection of by the flame sensor entails the temperature path sensitivity increase. Both sensors constitute the detecting circuit whose information about fire factors are subjected to extensive signal analysis carried out by a microprocessor that controls the detector operation and evaluates a fire hazard. In case a pre-set increase value or the fire hazard threshold is exceeded, the detector electronic system transmits an alarm signal to the fire alarm control panel. Such an alarm signal can be evoked also due to a detection circuit fault. The detector is furnished with an optical indicator that is lit in the alarm mode. It enables fast location of the actuated detector and is helpful in periodic detector inspections. In case a detector is hardly visible or is installed in a difficult-to-reach space, an additional optical alarm indicator (WZ-31) may be connected in an accessible and visible place.

6 INSTALLATION

The detector bases should be connected in accordance with the diagram presented in the G-40 base manual or the control panel Operation and Maintenance Documentation. When all bases are linked, the control panel or a power supply device should be switched on in order to check the circuit proper operation. Each detector must be inspected individually. In case an alarm is evoked in the control panel or in a supplying and alarming device, it is necessary to stop the detector warning and reset the alarm with a proper push button in the control panel or short interruption in the detector power supply circuit.

Simultaneous alarm evoking in more than three detectors installed in one line can additionally result in a fault indication (a line short circuit).

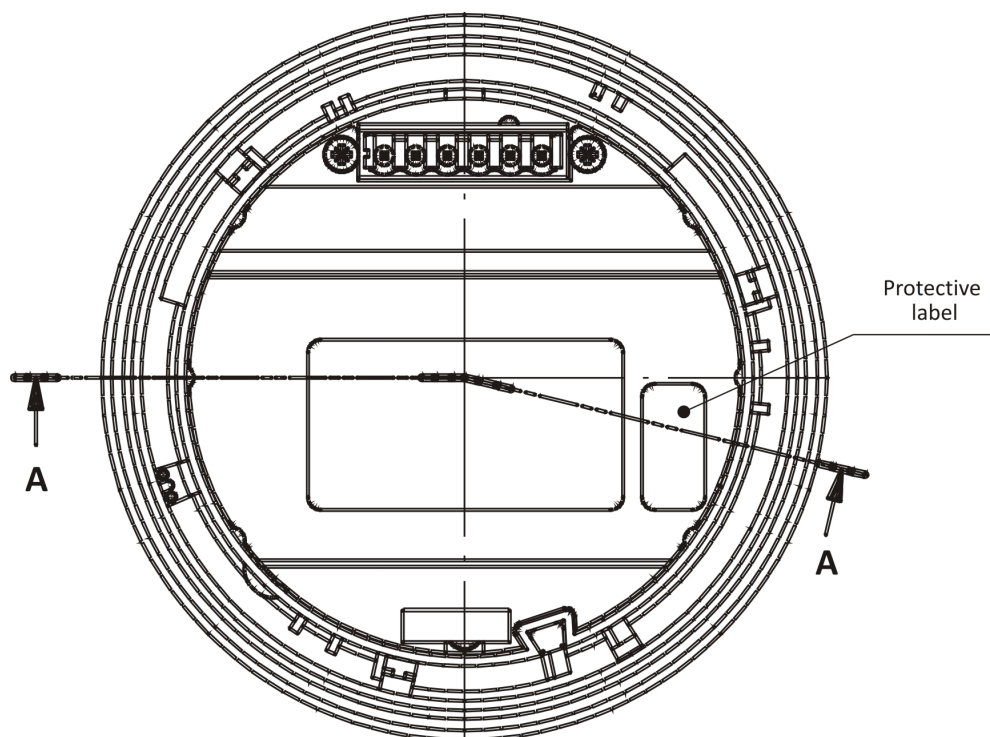


Fig. 1 TOP-40 detector design

7 OPERATION AND SERVICING CONDITIONS

During the detectors operation it is obligatory to avoid creation of a dew or rime on the detector surface as well as to protect against excessive contamination with dust.

For the period of repair works, the detector should be taken out or protected with appropriate for this purpose cover. Such a cover can be obtained from an installer or purchased from the manufacturer. In case the detector is taken out, its base should be protected against being painted utilising a painting tape. Detectors which are damaged during painting and renovation works due to a fault of the persons executing such works (e.g. painted detector casing, stuck-with-paint net, etc.) are not subject to warranty repairs.

During the operation life, the TOP-40 detector should be subjected to periodical inspection at least once per year in order to confirm the detector proper operation and its appropriate interoperation with the control panel. In case a detector is installed in heavy dusted place, such inspections should be performed more often. During periodical inspections it is necessary to remove a possible dust layer, spider-web and other detection circuit contamination.

In order to prove the detector proper operation, it is necessary to:

- check the measuring path with the heat sensor. It can be done using a service tool (heat imitator),
- check the measuring path with the flame sensor. It can be done using a service tool (flame imitator).

During the flame test, the detector should be taken out from its base; the service jumper shown in Fig. 2 and placed under a protective label should be switched over (from the position marked with a continuous line to the dotted position). Afterwards the detector should be located again in its base. At that time the device operates in a mode of two independent sensors: flame and heat, and is ready for testing. When the inspection is finished, the service jumper should be positioned again in the place marked with a continuous line.

Note:

In case the detector is installed in a difficult-to-reach space and its removal from the base is difficult, it is possible to execute the detector flame sensor test in another way. For that purpose, it is necessary to disconnect the power supply of the detection line where the TOP-40 detectors are installed, wait for 1 minute and switch the detection line power on again. For the first 2 minutes from the line actuation the detectors are in the mode of independent sensors operation and it is possible to check the flame sensor individually.

A faulty detector should be sent to the manufacturer for repair.

During renovation and painting works the detectors must be protected against a damage and contamination.

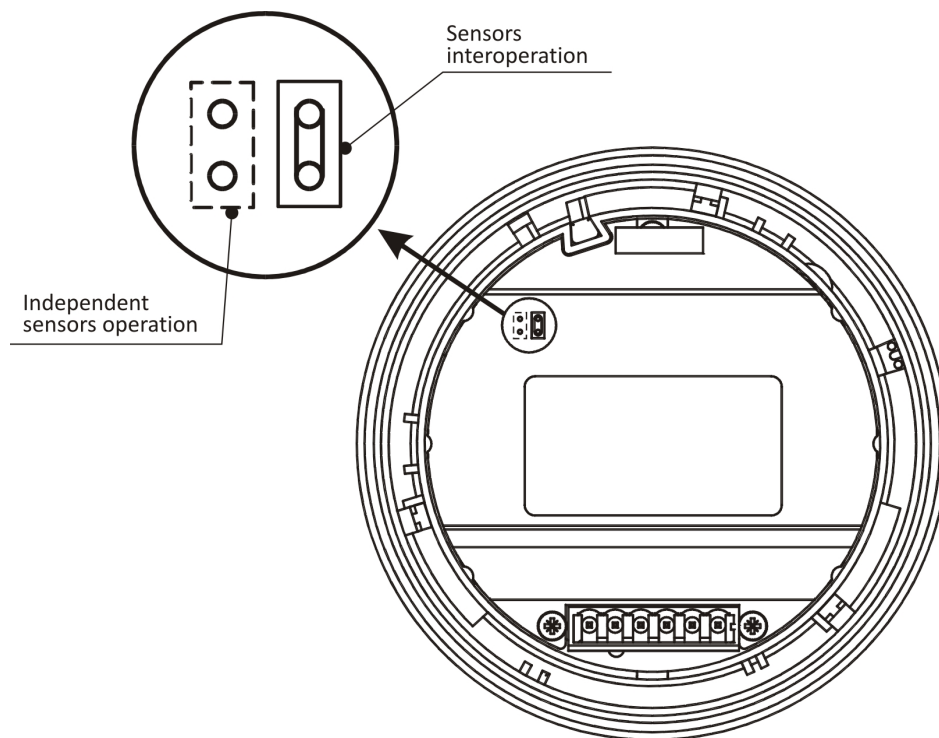


Fig. 2 TOP-40 detector service jumper

8 STORAGE AND TRANSPORTATION

8.1 Storage

The TOP-40 detectors should be kept in individual packages in closed premises at the temperature between +5 °C and +35 °C, and relative humidity not exceeding 80 % at +35 °C. The detectors enclosure should be free of volatile sulphur compounds, acid and alkaline vapours.

The devices should be stored at least 1.5 m from heating equipment.

8.2 Transportation

The TOP-40 detectors should be carried in any transport means, however, meeting the requirements marked on the packages and protecting them against possible mechanical damage. It is forbidden to transport the devices in temperatures lower than - 40 °C and higher than + 70 °C (at 80 % humidity) and relative humidity higher than 95% at + 40 °C.