

**SMOKE AND HEAT DETECTOR
WITH G-40S SOCKET, ACOUSTIC SOUNDER
AND SHORT-CIRCUIT ISOLATOR
DUT-3000AD**

POLON 3000 FIRE ALARM SYSTEM

INSTALLATION AND MAINTENANCE MANUAL

IK-E401-001-GB

Change 2



The DUT-3000AD universal smoke and heat detector with an acoustic siren, which is the subject of this instruction, 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 construction products repealing Council Directive 89/106/EEC;

EMC Directive 2014/30/EU on electromagnetic compatibility.

CNBOP-PIB, Notified Body No. 1438, issued a certificate of constancy of performance confirming the possession of technical features/parameters required by the following standards: EN 54-3:2001+A1:2002+A2:2006, EN 54-5:2017+A1:2018, EN 54-7:2018, 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 specified in this manual not specified in the listed standards are confirmed by the Manufacturer.

The product has an approval certificate issued by CNBOP-PIB.

The manufacturer has issued a declaration of performance for the product.

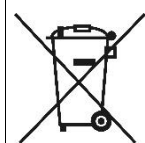
The certificate, the certificate of approval and the declaration of performance are available on the website of **www.polon-alfa.com**

Before starting installation and operation, read the contents of this manual.

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 - Right to make changes

Table of contents

1 INTENDED USE	4
2 TECHNICAL SPECIFICATIONS	4
3 CONSTRUCTION DESCRIPTION	4
4 OPERATION DESCRIPTION	5
5 DETECTOR OPERATING MODES	5
5.1 SMOKE AND HEAT SENSOR SETTINGS.....	5
5.2 OUTPUT SETTINGS.....	6
6 OPERATING AND OPERATING CONDITIONS	7
7 INSTALLING THE DETECTORS	9
8 SAFETY CONDITIONS	10
8.1 Repairs and Maintenance	10
8.2 Working at Height	10
8.3 Protecting your eyes from dust.....	10
9 STORAGE AND TRANSPORTATION	10
9.1 Storage	10
9.2 Transport.....	10

1 INTENDED USE

The DUT-3000AD smoke and heat detector with G-40S socket, acoustic siren and short-circuit isolator is designed to detect the initial stage of fire development, during which smoke appears and/or temperature increases. It is characterized by significant resistance to air movement and pressure changes. The use of a dual smoke detection system and a dual heat detection system ensures increased resistance to false alarms such as water vapour and dust, while maintaining small dimensions and high aesthetics of the detector.

The detectors are equipped with an internal short-circuit isolator and an acoustic signaling device.

DUT-3000AD smoke and heat detectors with G-40S socket, acoustic siren and short-circuit isolator are designed to operate in addressable detection lines of POLON 3000 fire alarm control panels.

2 TECHNICAL SPECIFICATIONS

Operating voltage	16.5V ÷ 24.6V
Current consumption during actuation	≤ 1 mA
Operating Temperature:	
- for modes with the heat sensor on	-10 °C to +50 °C
- for modes with the heat sensor off	-10 °C to +55 °C
Permissible relative humidity	up to 95 % at 40 °C
Dimensions (with socket)	∅115 mm x 56 mm
Number of basic operating modes	7
Ground (without socket)	0.2 kg
Standard detector color	white
Address encoding	programmed from the control panel
Suitability for test fire detection	TF1, TF2, TF3, TF4, TF5, TF6, TF7, TF8, TF9
Sound pattern	4 kHz tone: 0.5 s signal, 0.5 s pause
Maximum acoustic signal level	> 85 dB/m from one direction > 70 dB/m from other directions

The detector should be installed in accordance with the applicable design guidelines.

3 CONSTRUCTION DESCRIPTION

The detector contains two sets of fire detectors: heat and smoke. The heat detector set consists of two thermistors, and the smoke detector set is a special arrangement of coupled diodes: two transmitting and receiving. These diodes are mounted in such a way that the light emitted by the transmitting diodes does not reach the receiving diode directly, and they are protected against interference from external light by a labyrinth. The metal mesh prevents small insects and larger contaminants from entering the smoke detector. The whole is placed in a housing made of white, non-flammable plastic.

4 OPERATION DESCRIPTION

The basis for the operation of the DUT-3000AD smoke detector is the Tyndal principle - scattering light rays on smoke particles. Smoke particles penetrating into the measuring chamber reflect the light emitted by the transmitting diode. The scattered light reaches the photodiode, causing the formation of a photocurrent. The heat penetrating into the detector causes changes in the resistance of the thermistors. Information about fire factors from four detectors is subjected to advanced signal analysis by a microprocessor, which assesses the degree of fire hazard.

Communication between the POLON 3000 control panel and the DUT-3000AD detectors takes place via an addressable, two-wire detection line. The unique, fully digital communication protocol enables the transmission of any information from the control panel to the detector and from the detector to the control panel, e.g. assessment of the ambient condition (smoke, temperature), the tendency of its change and the current analogue temperature value and smoke density.

The microprocessor controlling the operation of the detector controls the correct operation of its basic systems and in the event of any irregularities, it transmits the relevant information to the control panel.

The DUT-3000AD detector is an analog detector with a digital self-regulation mechanism, i.e. it maintains constant sensitivity when the measuring chamber becomes dirty. After exceeding the assumed threshold (technical alarm threshold), the detector sends information to the control panel about partial contamination of the measuring chamber in order to inform the service services about the need to take appropriate action.

The detector is equipped with an internal short-circuit isolator, which cuts off the operational part of the detection line from the adjacent compact part, which enables further uninterrupted operation of the detector.

The detector alarm status is signaled by an impulse, red light of two diodes located on opposite sides of the detector housing. The indicator allows for quick location of the alarming detector and is an aid in periodic checking of the detector's operation. If the detector is poorly visible or installed in a hard-to-reach place, an additional optical tripping indicator can be attached to it, installed in an accessible and visible place.

The fault, technical alarm and short-circuit isolator activation states are signaled by yellow flashes of the LED.

5 DETECTOR OPERATING MODES

Configuring the detector's operating mode includes smoke and heat sensor settings and WZ output settings. In addition, it is possible to control the integrated acoustic siren regardless of the detector status.

5.1 SMOKE AND HEAT SENSOR SETTINGS

The detector has several operating modes (in addition to the alarm variants in the control panel) that allow the user to best match its characteristics to work in a specific environment:

Smoke Detector Selection (at least 1 must be selected):

- OUV smoke sensor: YES/NO
- Smoke detector Oir : YES/NO
- 2xTA1R HEAT SENSOR: YES/NO

Interaction:

- **Independent sensors (0)** - sensors work independently (OR function)
- **Interdependent sensors (1)** – increasing the fire agent on one sensor sensitizes the other sensor and accelerates fire detection,
- **Coincidence sensors (2)** - sensors operate in coincidence (AND function), in order for the detector to signal an alarm, the alarm threshold must be exceeded for two sensors of different fire factors, i.e. for smoke and heat; the mode used to increase resistance to false alarms,

Sensitivity:

- Normal
- increased by 20 %
- reduced by 20 %
- reduced by 40 %

Damage and technical alarms of switched off sensors are not transmitted to the control panel.

Depending on the sensors activated, the suitability of the detector for fire detection is specified in the table below.

Mode	Sensor Enabled			Interaction			Suitability for fire detection								
	OUV	OIR	2 x TA1R	Lack	Interdependence	Coincidence	TF1	TF2	TF3	TF4	TF5	TF6	TF7	TF8	TF9
71	x	x	x		x		+++	++	++	+++	+++	++	+++	+++	+++
67	x	x			x		+++	++	++	+++	+++		+++	+++	+++
4			x	x								++			
7	x	x	x	x			++	++	+++	+++	+++		+++	+++	+++
1	x						++	++	+++	+++	+++		+++	+++	+++
2		x						+	++	+++	+++		+++	+++	++
135	x	x	x			x	+				+				

5.2 OUTPUT SETTINGS

In addition, an additional output is configured: an acoustic siren or a multiplied WZ operation indicator . **A single tripping indicator connected between the detector's GZ output and the "minus" of the detection line always flashes in the same way as the red LED in the detector.**

Output Working Mode:

- **as in the 4000 system** – the mode is intended only for a single indicator of the WZ operation (Fig.7.1). It is possible to control the siren with a group address regardless of the detector status,
- **duplication of the red LED flash** – the multiplied indicator of the WZ activation (Fig.6.2) flashes like a red LED in the alarm detector, **the acoustic siren is switched off and cannot be controlled,**
- **independent of the alarm** - the multiplied indicator of the GIN operation (Fig.6.2) is a controlled output with a declared group address. **The sounder is off and cannot be controlled.**

6 OPERATING AND OPERATING CONDITIONS

During operation, the detectors should not be allowed to form dew and frost on the surface of the detector and should be protected against excessive contamination with dust.

During any repair work, the detector should be removed or protected with a cover provided for this purpose. Covers can be obtained from the installer or purchased from the manufacturer. If the detector is removed, the socket should be protected against painting with painter's tape. Detectors damaged during painting and renovation works due to the fault of the persons carrying out these works (e.g. painted detector housing, mesh covered with paint, ...) are not subject to warranty repairs.

During operation, the DUT-3000AD optical smoke detector should be subjected to periodic inspection in accordance with CEN/TS 54-14:2018, which is carried out in order to determine the proper operation of the detector and its correct cooperation with the control panel.

Checking the operation of a smoke detector can be carried out using a smoke imitator (not producing heat) and then a heat detector using a temperature imitator (not producing smoke).

The detector is equipped with a magnetic field sensor, which allows you to test the detector's communication with the control panel and determine its location in the facility using a service kit. After the tester head is placed on it, the detector starts flashing a yellow LED, which means proper communication with the control panel.

Long-term operation of the DUT-3000AD detector may cause dust to accumulate inside the smoke detector. After exceeding the self-regulation range, as a result of progressive contamination of the smoke detector, the detector enters the state of technical alarm, sending information to the control panel about excessive dirt. The control panel signals the need to clean the detector's optics: the labyrinth, the holder, the lenses of the transmitting diodes and the photodiode. Servicing should be done as soon as possible to prevent false alarms.

The method of mounting and dismounting the detector is shown in Figs. 6.1 and 6.2. To disassemble the detector, you need to:

- a) press the catch (Fig. 6.1) and turn the guard in the basket clockwise until the guard is removed;
- b) remove the net from the maze;
- c) pull up and take out the maze;
- d) carry out the necessary cleaning.

It is recommended to use a gentle brush and a vacuum cleaner for cleaning, or compressed air. It is allowed to wash the maze with warm water and dishwashing liquid. After washing and drying, no stains can remain on the inner surfaces of the maze. When installing the detector, be careful not to bend the thermistor legs.

After cleaning, the detector should be reassembled. To do this:

- a) place the maze in the guides and press it into a perceptible jump;
- b) put a net on the maze;
- c) insert the cover into the basket so that the tripping indicator LED is slightly to the right of the glass;
- d) Turn the cover to the left.

After assembly, the detector should be checked using a smoke imitator (not producing heat), and then using a temperature imitator (not producing smoke) and reinstalled in the detection line.

NOTE - If cleaning does not give the desired result, the detector should be sent to the manufacturer for repair.

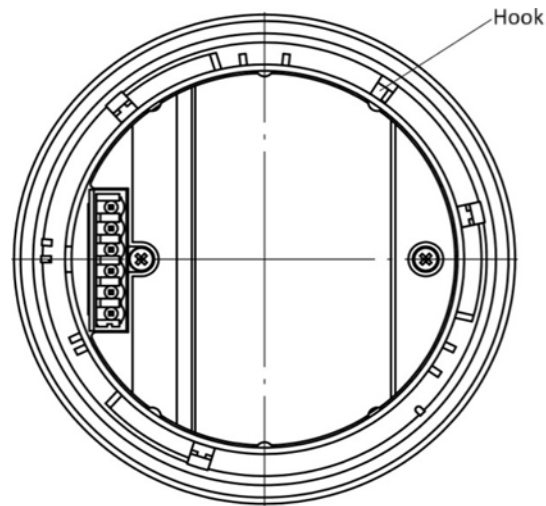


Fig. 6.1 View of the detector from below

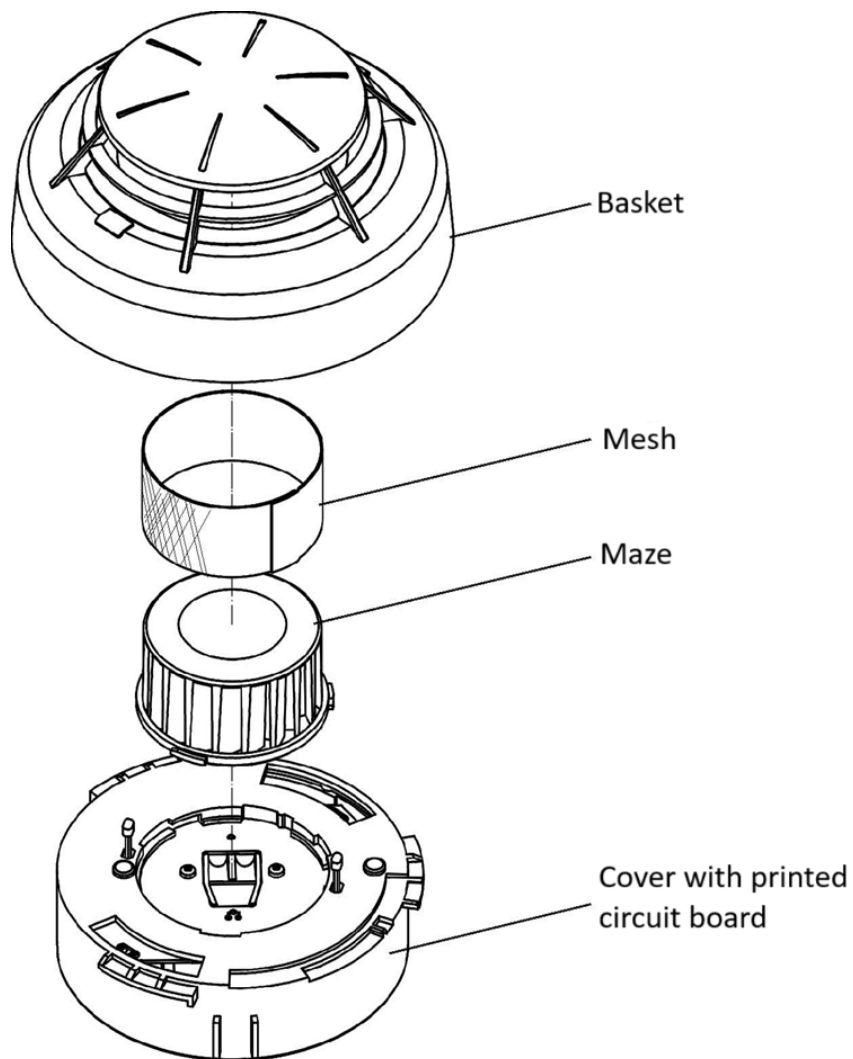


Fig. 6.2 Detector components after disassembly

7 INSTALLING THE DETECTORS

The detectors are installed (height, arrangement) in accordance with the selected design guidelines. Detectors are installed in rooms where equipment and accumulated materials will emit visible smoke when a fire occurs. If it is difficult to determine the most likely fire factor (type of smoke) that may arise in the first phase of fire development, appropriate tests should be carried out (at the design stage) using several types of detectors or mixed protection should be adopted, e.g. with optical and ionization detectors.

When placing the socket, use the directional characteristics of the sounder contained in the detector against the background of the socket (Fig. 9.2.1 at the end of the manual), so that the loudest sound is directed in the desired direction.

The detectors can operate in loop, loop with straight branches or in radial detection lines of the POLON 3000 control panels (see the Technical and Operational Documentation of the POLON 3000 control panel).

The detectors are installed in G-40S sockets. The method of connecting the detection line is shown in the installation and maintenance manual of the G-40S socket. Additional optical signaling of a single detector or a group of detectors can be obtained by attaching the WZ-31 tripping indicator:

- **standard configuration of the tripping indicator,]**

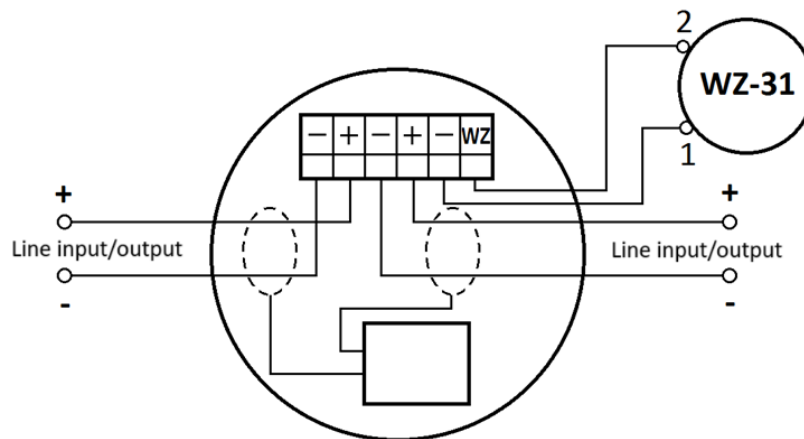


Fig.7.1 Wiring diagram used for a single tripping indicator.

- **multiple tripping indicator connected to the power plus:**

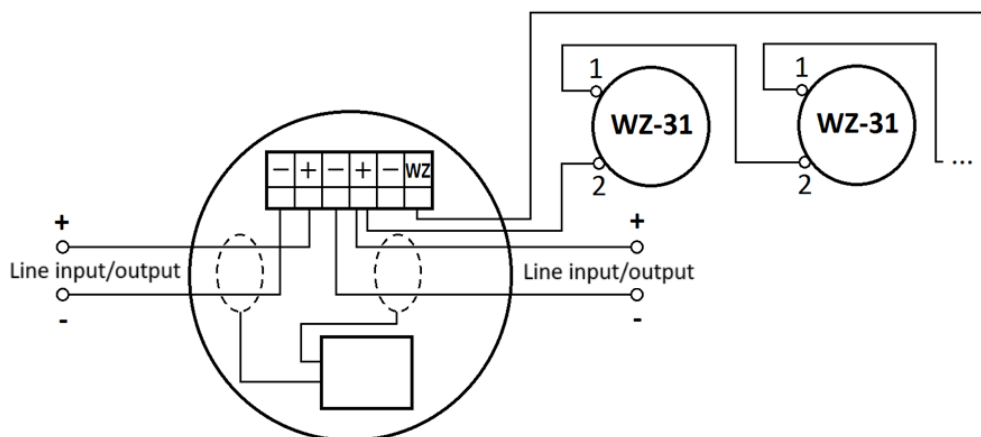


Fig.7.2 Wiring diagram used for multiple tripping indicator. **It is possible to connect 2 to 5 tripping indicators.**

The wires of the alarm system should be laid in accordance with the regulations applicable to low-voltage installations (below 42 V).

NOTE - The detectors should not be installed in rooms with a corrosive atmosphere, containing corrosive gases and vapours as well as dust. Condensation of water vapour on the detectors is unacceptable.

8 SAFETY CONDITIONS

8.1 Repairs and Maintenance

Maintenance works and periodic inspections must be carried out by authorized personnel of companies authorized or trained 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 Working at Height

Work at height related to the installation of detectors should be carried out with special caution with the use of functional equipment and tools.

Particular 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 Protecting your eyes from dust

When working that generates a lot of dust, especially when drilling holes in ceilings, safety goggles and dust masks should be used to attach detector sockets.

9 STORAGE AND TRANSPORTATION

9.1 Storage

DUT-3000AD detectors should be stored in enclosed spaces where there are no caustic vapours and gases, the temperature is in the range of 0 °C to +40 °C, and the relative humidity does not exceed 80 % at a temperature of +35 °C.

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

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

9.2 Transport

DUT-3000AD detectors should be transported in confined spaces of means of transport, in packaging that meets the requirements of applicable transport regulations. The temperature during transport should not be lower than -40 °C and above +70 °C, and the relative humidity should not exceed 95 % at +45 °C or 80 % at +70 °C.

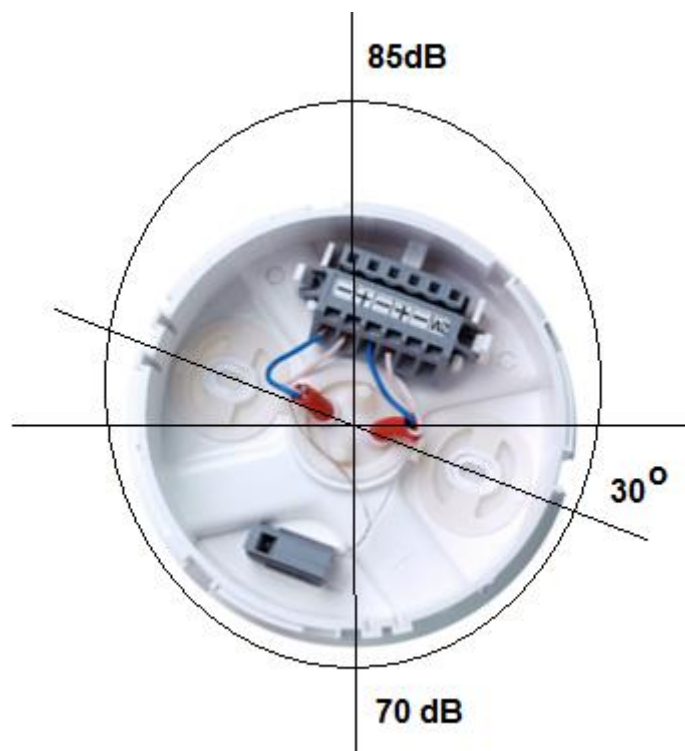


Fig. 9.2.1 Directional characteristics of the siren contained in the detector against the background of the socket.



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