POLON-ALFA

DOT-40
MULTI-SENSOR
SMOKE AND HEAT DETECTOR

INSTALLATION AND MAINTENANCE MANUAL

IK-E324-001GB

ID Edition

CE

The DOT-40 multi-sensor smoke and heat detector, covered by this manual, complies with the requirements of the following European Union directives:

CPD 89/106/EWG - on construction goods;
EMC 2004/108/WE - on electromagnetic compatibility.

The DOT-40 detector has been approved with the EC Certificate of Conformity No. 1438/CPD/0089, 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 the PN-EN 54-5:2003 and PN-EN 54-7:2004 standards.
The certificate can be downloaded from www.polon-alfa.pl

CE **1438**
Polon-Alfa Spółka z ograniczoną odpowiedzialnością Sp. k. Glinki 155 Street, PL 85-861 Bydgoszcz 07 1438/CPD/0089
EN 54-5 **EN 54-7** **DOT-40 multi-sensor smoke and heat detector** (operating using scattered light and heat sensor, conventional, detachable) Application – fire security
Technical data – IK-E324-001GB manual

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.	

NOTE: The manufacturer reserves the right to change specifications of products at any time without a prior notice.

1 PURPOSE

The DOT-40 conventional multi-sensor smoke and heat detector is designed for detection of a fire initial phase when a smoke occurs and/or temperature rise may be observed. The detector is characterised by a high resistance level against wind movement and pressure change. It is especially suitable in fire protection of garages.

The DOT-40 multi-sensor addressable detectors are intended to operate in conventional detection lines of the IGNIS 1000 fire detecting and alarm system or in side lines of the POLON 4000 system behind appropriate adapters. As far as electrical parameters are concerned, the DOT-40 detector is compatible with other elements of the 30 and 40 model range.

2 TECHNICAL SPECIFICATIONS

Operating voltage	12 V ÷ 28 V
Maximum current draw	≤ 60 µA
Alarm current	20 mA
Maximum installation height *)	
- for smoke detector	11 m
- for heat detector	8 m
Maximum supervised area *)	
- for smoke detector	from 60 to 80 m²
- for heat detector	40 m²
Operating temperature	from -25 °C to +50 °C
Allowable relative humidity	up to 95 % at 40 °C
Dimensions (without base)	Ø 115 mm x 59,5 mm
Number of basic operation modes	3
Mass (without base)	0.15 kg
Standard colour	white
Operation mode coding method	mechanical (jumper)
Test fire detection suitability	TF1, TF2, TF3, TF4, TF5, TF6, TF8.

**) 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 DOT-40 detector mechanical design is shown in Fig. 1. The device is equipped with two sensors that detect two fire factors: heat and smoke. Heat is detected by a temperature-sensitive resistor (thermistor) whereas smoke is detected by a special optical module consisting of a light transmitting diode and a receiving one. The diodes are mounted in such a way that the light emitted by the transmitting diode does not reach the other diode directly; a labyrinth protects the diodes from external light interference. A metal protective net prevents the detector from irruption of small insects or pieces of dirt. The whole structure is placed in a white plastic housing. The DOR-40 detector is installed in the G-40 base where detecting line wires are connected to.

5 PRINCIPLE OF OPERATION

The DOT-40 detector smoke sensor operation basis is Tyndall effect – light ray scattering on smoke particles. When smoke particles penetrate the measuring chamber, they reflect the light emitted by the transmitting diode. The reflected light reaches the optical diode producing photocurrent. Additionally, the heat entering the detector evokes the thermistor resistance change.

Information about fire factors delivered by both sensors are thoroughly analysed by the microprocessor that evaluates a fire hazard level and makes a decision about the detector actuation.

Communication between the fire alarm control panel and the DOT-40 detectors is provided through a two-wire detection line.

The detector operation controlling microprocessor monitors correctness of its basic circuits operation and, in case an irregularity is found, delivers relevant information to the control panel.

The DOT-40 detector is a two-state device with a digital self-regulation mechanism, i.e. it maintains constant sensitivity during the measurement chamber contamination progress. That is why it can operate for a longer period before a cleaning necessity is signalled.

An alarm mode is indicated with a steady red light emitted by an illuminating diode installed in the detector casing. The indicator enables fast location of the activated detector and is helpful in periodic detector inspections. In case the 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.

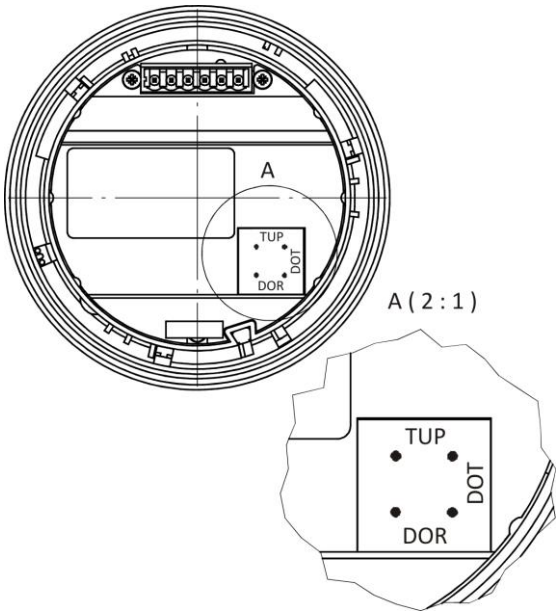

Fig. 1 Operating mode programmer

6 DETECTOR OPERATION MODES

Detector is furnished with three basic operation modes (Fig. 1) that enable the best adjustment of its characteristics to given operation environment:

- DOT mode - equivalent to operation of two detectors, ensuring suitability as a smoke DOR detector and a heat detector TUP in A1 class;
- DOR mode - equivalent to operation of a smoke DOR-40 detector only;
- TUP mode - equivalent to operation of a heat TUP-40 detector only.

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.

The DOT-40 multi-sensor detector should be subjected to periodical inspections according to PKN-CEN/TS 54-14:2006 standard, which are executed in order to confirm the detector proper operation and its appropriate interoperation with the control panel. The inspections should be carried out at least once in 6 months.

The smoke sensor operation should be tested using a smoke simulator (emitting no heat) and afterwards the heat sensor should be tested using a heat imitator (generating no smoke).

The DOT-40 detector long-lasting operation may result in dust accumulation inside its smoke sensor. After exceeding the self-regulation range due to the smoke sensor contamination progress, the

detector can trigger an alarm mode. That is why it is crucial to clean the detector labyrinth periodically.

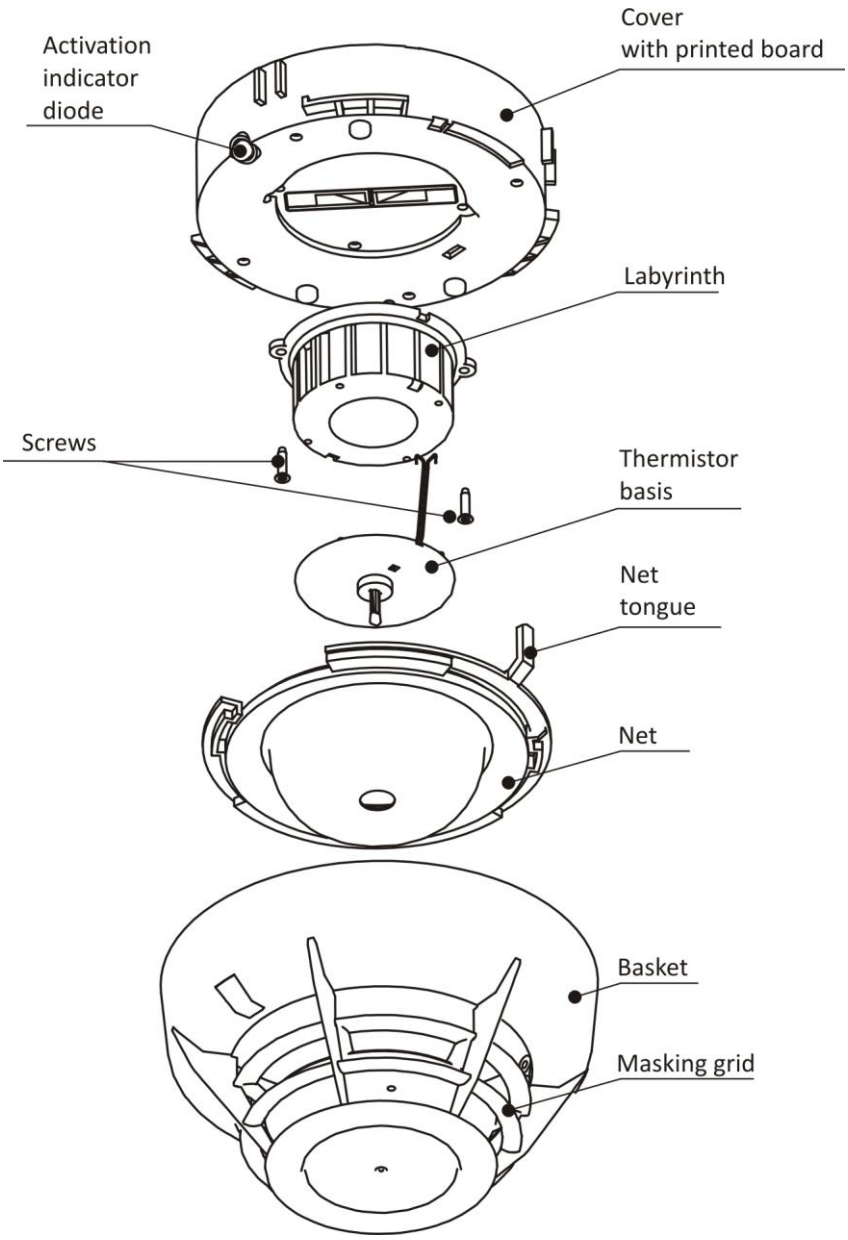

Fig. 2 Detector elements after dismantling

The detector dismantling and assembling is depicted in Fig. 1. In order to dismantle the detector it is necessary to:

a) pressing the net long tongue, turn the cover right in the basket until it is taken out;
b) remove and bend aside the thermistor basis from the labyrinth;
c) unfasten two screws that fix the labyrinth and take the labyrinth out;
d) perform the necessary cleaning.

A delicate brush as well as vacuum cleaner are recommended for cleaning works. Compressed air can be possibly used. It is permitted to wash the labyrinth with warm water with addition of washing-up liquid. No damp patches should remain on the labyrinth internal surfaces after washing and drying.

After cleaning, the detector should be assembled. In order to do it, it is necessary to:

a) fasten the labyrinth with two screws;
b) locate the thermistor basis placing the thermistor leads into the labyrinth notches;
c) lay down the basket in the position as shown on the figure;
d) insert the masking grid into the basket paying attention to its positioning – alignment with the juts;
e) insert the net into the basket paying attention to positioning – alignment with the juts;
f) insert the cover into the basket so that the activation indicator diode is placed a little to the right in relation to the glass;
g) turn the cover to the left.

The detector should be checked after assembling using a smoke simulator (emitting no heat) and a heat imitator (generating no smoke) and afterwards installed in the detection line.

Note: In case the cleaning does not produce the required result, it is necessary to send the detector to the manufacturer for repair.

7 DETECTOR INSTALLATION

The DOT-40 detectors are installed (height, arrangement) according to the guidelines settled by the PKN-CEN/TS 54-14:2006 standard. They are mounted in premises where a smoke and a temperature rise may occur when a fire starts to develop.
The detectors are installed in the 40 model range bases. The detection line connection is presented in the G-40 base Installation and Maintenance Manual. An additional optical alarm signal of a detector or a group of detectors can be obtained by connecting the WZ-31 alarm indicator.
Alarm system cables are routed in accordance with the regulations obligatory for low voltage (below 42 V) systems.

Note: The detectors should not be installed in corrosive atmosphere that contains caustic gases and vapours as well as dust. Steam condensation on detectors is impermissible.

8 STORAGE AND TRANSPORTATION

8.1 Storage

The DOT-40 detectors should be kept in closed premises free of 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 detectors should not be exposed to direct sunlight or heat from heating equipment.

The detectors storage period in transportation packing should not exceed 6 months.

8.2 Transportation

The DOT-40 detectors 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.

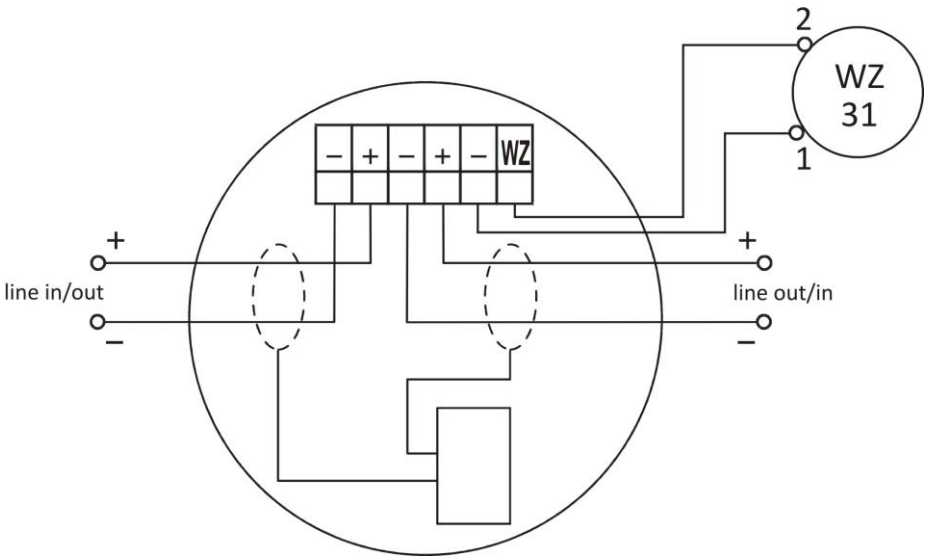

Fig. 2 Clamps of base interoperating with DOT-40 plug

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