

OPTICAL SMOKE DETECTOR DOR-40

INSTALLATION AND MAINTENANCE MANUAL

IK-E288-001GB

II Edition



The DOR-40 smoke detector, 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

EMC 2014/30/UE on electromagnetic compatibility.

The CNBOP-PIB, Notified Body No. 1438 has been issued for the product the national certificate of constancy of performance confirming the possession of technical features/parameters required by EN 54-7-2018

The features/technical parameters above that exceeds the requirements of the aforementioned standards are confirmed by the Manufacturer.


Declaration of Performance has been issued for DOR-40.

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.

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.

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1 PURPOSE

The DOR-40 optical smoke detector is designed for detection of a visible smoke that is concurrent with most fire combustion. It enables a fire detection at a start of its flameless stage when material starts to smoulder, and therefore generally, a long time prior to the appearance of an open flame and a noticeable rise in temperature. The detector is characterised by high resistance against wind, pressure change and steam condensation. It is very sensitive to a visible smoke.

2 TECHNICAL DATA

Operating voltage	12 V ÷ 28 V
Maximum current draw	≤ 60 µA
Alarm current	20 mA
Maximum installation height *)	12 m *)
Maximum supervised area *)	from 60 to 80 m ² *)
Operating temperature range	from - 25 °C to + 55 °C
Allowable relative humidity	up to 95 % at 40 °C
Dimensions (without base)	Ø 115 x 43 mm
Mass (without base)	0.15 kg
Standard colour	white

*) *see the design guidelines*

3 SAFETY CONDITIONS

3.1 Repairs and maintenance

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

Any repair work must be carried out by the manufacturer. POLON-ALFA bears no responsibility for the operation of any apparatus being serviced and 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 the stability of ladders, platforms, lifts, etc.

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

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 for detector base mounting on ceilings.

4 CONSTRUCTION DESCRIPTIONS

The detector mechanical construction is shown in Fig. 1. Its basic element is a detecting optical module consisting of a transmitting infrared diode and photodiode acting as a receiver. They are mounted in a holder in such a way that radiation emitted by the transmitting diode does not reach the other diode directly. The detecting module (holder with diodes) is fastened directly to a printed board that contains all electronic elements and a circuit with a processor that monitors the detector operation. The optical module is protected by a labyrinth, eliminating external light penetration into the module. A metal protective net prevents irruption of small insects or pieces of dirt into the detecting module. The whole structure is placed in a white plastic housing containing a basket, screen and detector cover.

The DOR-40 detector is installed in the G-40 base where detection line wires are connected to.

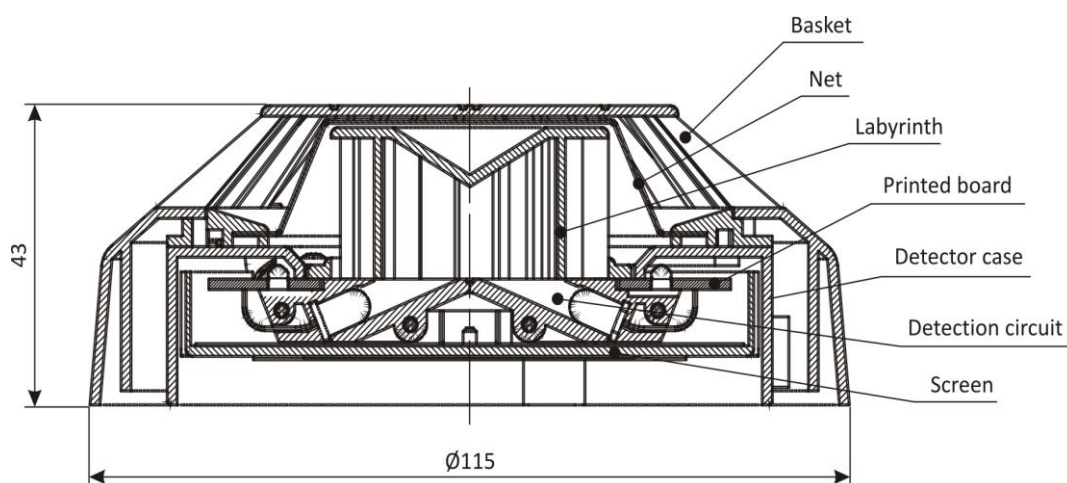


Fig. 1 DOR-40 detector main elements

5 PRINCIPLE OF OPERATION

The DOR-40 device is a Tyndall effect based optical smoke detector – light ray scattering on smoke particles. Its basic element is a detecting optical module consisting of an electroluminescence diode that transmits infrared radiation, and an optical receiving diode. The optical module and surrounding measuring chamber are protected by a labyrinth which is shaped to dump both external light and radiation resulting from internal reflexes of the transmitting diode light. When smoke particles enter the measuring chamber, they reflect the light emitted by the transmitting diode. The reflected light reaches the optical diode producing a photocurrent which is first strengthened and digitally processed, and then analysed by the microprocessor installed inside the detector.

The alarm mode is indicated by pulse red light emitted by a signalling diode installed on the detector casing. The indicator enables fast location of the alarming detector and is helpful in the detector periodic 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.

The DOR-40 detector is equipped with a sensitivity self-regulation digital mechanism that is it maintains a constant sensitivity level during progressing dirt build-up in the measuring chamber. After exceeding a pre-set alarm threshold, the detector transmits an alarm signal to the control panel.

6 OPERATION AND MAINTENANCE CONDITIONS

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

In the time of any repair works, the detector should be taken out or protected with provided-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 DOR-40 optical smoke detector should be subjected to periodical inspection according to the PKN-CEN/TS 54-14:2006 standard, which is executed in order to confirm the detector proper operation and its appropriate interoperation with the control panel. The inspection should be carried out at least every 6 months. The detector operation is tested with a smoke simulator or smoke generator.

The DOR-40 optical smoke detector long-lasting operation may result in dust accumulation inside its internal optical chamber. After exceeding the self-regulation range due to the chamber contamination progress, the detector can trigger the alarm mode. That is why it is crucial to clean the detector optical module: labyrinth and lenses of both diodes – transmitting one and photodiode earlier.

The detector dismantling and assembling is depicted in Fig. 2.

In order to dismantle the detector it is necessary to:

- a) pressing the net long clinch, turn the cover right in the basket until it is taken out;
- b) remove two screws that fix the labyrinth and take the labyrinth out;
- c) perform the necessary cleaning.

A delicate brush as well as vacuum cleaner is recommended for cleaning. 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, its functioning should be tested using a smoke imitator or smoke generator and installed again into the detection line.

In order to assemble the detector, it is necessary to:

- a) fasten the labyrinth with two screws;
- b) place the basket in the reverse position as that shown on the figure;
- c) insert the net into the basket paying attention to its positioning – alignment with the juts;
- d) insert the cover into the basket so that the illuminating diode is placed a little to the right in relation to the glass;
- e) turn the cover to the left.

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

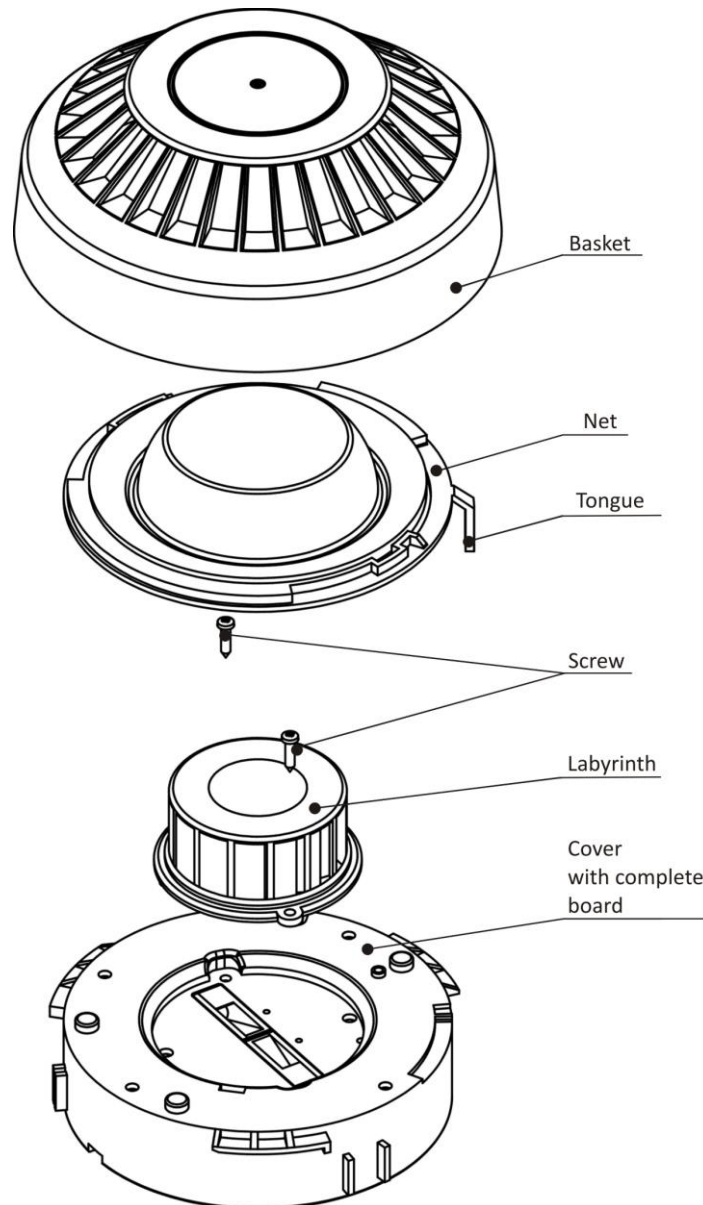


Fig.2 Detector elements after dismantling

7 DETECTOR INSTALLATION

The DOR-40 detectors are installed (height, arrangement) according to the guidelines settled by the Scientific and Research Centre for Fire Protection. They are mounted in premises where the working equipment or stored materials may emit a visible smoke when a fire occurs. In case it is difficult to determine the most probable fire factor (smoke type) that is likely to occur in the first fire development phase, special tests should be carried out (at a designing stage) using various type detectors or mixed protection (e. g. with optical and ionisation detectors) should be applied.

The detectors are installed in the 40 model range bases. The detection line connection is presented in Fig. 3 and 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 DOR-40 detectors must be stored in closed rooms free of any caustic gases and vapours, at ambient temperature between 0 °C and +40 °C and relative humidity not exceeding 80 % at + 35 °C.

The detectors shall not be exposed to direct sunlight or heat emitted by heaters.

The storage period of the detectors in transport package should not exceed 6 months.

8.2 Transportation

The DOR-40 detectors should be carried in closed spaces of transport means in proper packing that meet appropriate transport regulations. Transport temperature shall not be lower than - 40 °C and higher than + 70 °C; relative humidity shall not exceed 95% at + 45 °C or 80 % at + 70 °C.

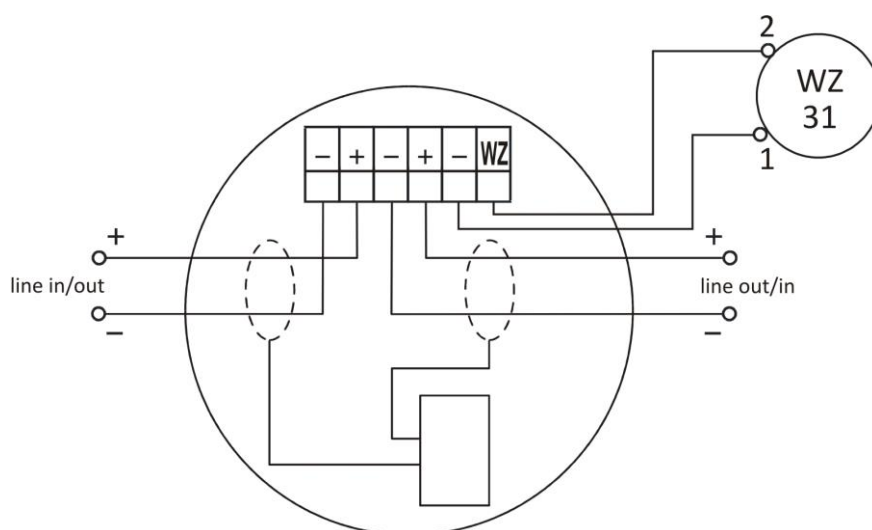


Fig. 3 Clamps of base interoperating with DOR-40 plug



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