

PUO-40 AND PUO-40Ex

ULTRAVIOLET FLAME DETECTORS

INSTALLATION and MAINTENANCE MANUAL

IK-E368-001GB

2 Edition



PUO-40 and PUO-40Ex flame detectors which are the subject of this manual, meets the essential requirements of the following European Parliament and Council (EU) regulations and European Union directives:

CPR CPR/305/2011 The European Parliament and the Council (EU) regulation of March 9, 2011 stipulating harmonized conditions for placing construction products on the market and repealing Council Directive 89/106/EEC;

EMC Directive 2014/30/EU concerning electromagnetic compatibility;

ATEX Directive 2014/34/EU on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

CNBOP-PIB, notified body No. 1438, issued performance features constancy certificate confirming the products technical features/parameters required by EN 54-10:2005+A1:2006 standards.

Features/technical parameters exceeding the requirements of the mentioned standards and other product features/parameters provided in this manual and not specified by the mentioned standards are confirmed by the Manufacturer.

The manufacturer issued a declaration of performance for the products.

The certificate, and Declaration of Performance are available on the website www.polon-alfa.pl

Central Mining Institute, a Notified Body No. 1453 in EU issued for PUO-40Ex flame detector EU type examination certificate: KDB 21ATEX004.

The manufacturer has issued an EU declaration of conformity for the product.

Read this manual before installation and operation.

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 bears no responsibility for any damage resulting from usage inconsistent with the manual.

The waste product, unsuitable for further use, shall be passed to the nearest point of collection of waste electric and electronic equipment collection point.



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

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1 PURPOSE

The PUO-40 and PUO-40Ex flame detectors are designed for detection of flame resulting from a fire hazard in zones where in normal conditions no flame related processes take place and no direct sunlight operates on the detector's body.

The PUO-40Ex intrinsically safe detector must be connected to a detection line only through a **intrinsically safe protective barrier or separator of $U_o \leq 28 \text{ V}$, $I_o \leq 99 \text{ mA}$ parameters.**

2 TECHNICAL SPECIFICATIONS

Operating voltage	from 9 V up to 28 V
Max quiescent current	300 μA
Alarm current (at 20V)	20 mA
Sensitivity (acc. to EN 54-10)	1 class (25 m)
Angle of view	110 °
Operating temperature range	- 10 °C ÷ + 55 °C
Casing ingress protection	IP 44
Relative humidity	up to 93 % at 40 °C
Mass	235 g (PUO-40), 280 g (PUO-40Ex)
IECEx classification (only for PUO-40Ex)	II 2G Ex ib IIC T6 Gb

3 INTRINSIC SAFETY PARAMETERS

Supply line marginal parameters:

Maximum input voltage	U_i	28 V
Maximum input current (amperage)	I_i	93 mA
Maximum input power	P_i	0,66 W
Maximum inner capacity	C_i	0*
Maximum inner inductance	L_i	0*
Maximum outer capacity	C_o	83 nF**
Maximum outer inductance	L_o	2,5 mH**

Detector – alarm indicator connecting line parameters:

Maximum outer voltage	U_o	28 V
Maximum outer current (amperage)	I_o	40 mA
Maximum outer power	P_o	0,4 W
Maximum output capacity	C_o	78 nF
Maximum output inductance	L_o	0.5mH

* *negligible parameters*

** *represents the sum of capacity and inductance resulting from the length of cables that may be connected to the detector*

Intrinsically safe barrier or separator parameters:

Maximum output voltage	U_o	$\leq 28 \text{ V}$
Maximum output current (amperage)	I_o	$\leq 93 \text{ mA}$
Maximum output power	P_o	$\leq 0,66 \text{ W}$
Minimum outer capacity	C_o	$\geq 83 \text{ nF}$
Minimum outer inductance	L_o	$\geq 2,5 \text{ mH}$

Connecting cable example (YnTKSY):

Core diameter	mm	0,8	1,0
Single core resistance	Ω/km	37,5	24
Pair of cores capacity	nF/Km	120	120
Inductance	mH/km	0,7	0,7

Note:

The total line capacity and line inductance as well as total inner inductance of the detectors installed behind an intrinsically safe barrier of separator must not exceed the level of 83 nF and 2.5 mH. As a result every single PUO-40Ex detector requires an individual intrinsically safe barrier of separator.

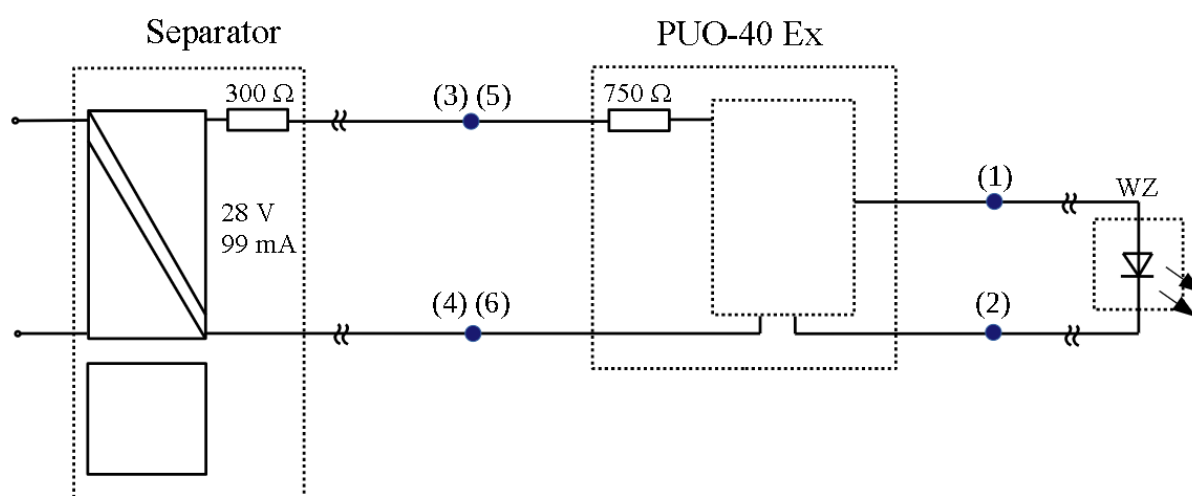


Fig. 3.1 PUO-40Ex detector connection with the use of a separator

4 USE CONDITIONS

The detector is designed to be used in conditions where the ambient temperature is $-10\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$. In potentially explosive atmospheres, the PUO-40Ex detector can be used in accordance with the EU-type certificate KDB 21ATEX004, issued by the Central Mining Institute, notified body no. 1453 in the EU.

4.1 Repairs and maintenance

Any maintenance works or periodic inspection 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.

4.2 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.

4.3 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.

5 CONSTRUCTION AND OPERATION PRINCIPLE

The detector casing is made of plastic highly resistant to damages that occur during operation period.

The shape and dimensions are shown in Fig. 2.

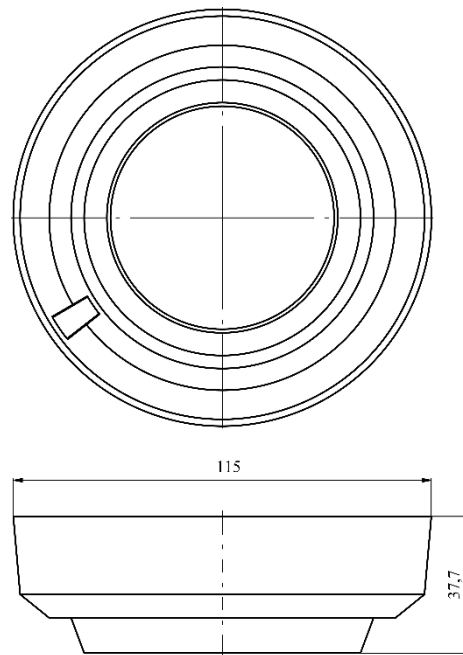


Fig. 5.2 The shape and dimensions of PUO-40 and PUO-40Ex flame detectors

An electronic module mounted on two printed boards is installed inside the casing.

Connecting sockets are so designed that the detectors can be installed in '40' model range bases.

The detectors react to UV flame radiation with a wavelength at ~ 200 nm. The detectors are resistant to all sources of artificial light, which do not contain UV radiation.

6 SERVICING INSTRUCTIONS

The detectors are required to pass periodic examinations to prove that the detector operates properly and interoperates with the fire control panel properly.

The actuation test may be carried out using a lighter or match flame.

PUO-40 detectors should be installed in such a manner that eliminates direct sunlight to fall directly on the sensor.

7 MAINTENANCE AND REPAIRS

Maintenance activities are limited to periodic checks, operation inspections and – if necessary – dust or other dirt removal from the detector's body or glass cover (PUO-40Ex). It should be done using pure ethyl alcohol.

It is critical to remember that the detector's sensitivity depends on cleanness of its glass parts. Dirt or dust accumulated in those places may result in the detector's sensitivity deterioration or even malfunction.

Note:

When checking detectors installed in explosion hazardous zones it is obligatory to obey regulations that apply to such dangerous spaces.

8 DETECTORS INSTALLATION

PUO-40/40Ex detectors are installed according to selected design guidelines in '40' model range bases. The detection line connection is shown in Fig. 3 and in the G-40 base installation and maintenance manual. Additional optical signalling of a single detector or a group of detectors can be obtained by connecting the WZ-31 alarm indicator. The alarm system cables are installed in accordance with the regulations in force for low-voltage installations (below 42 V).

ATTENTION – It is not allowed to install detectors in the corrosion atmosphere containing gases and corrosive vapors or dust. Vapor condensation in the detector is not allowed.

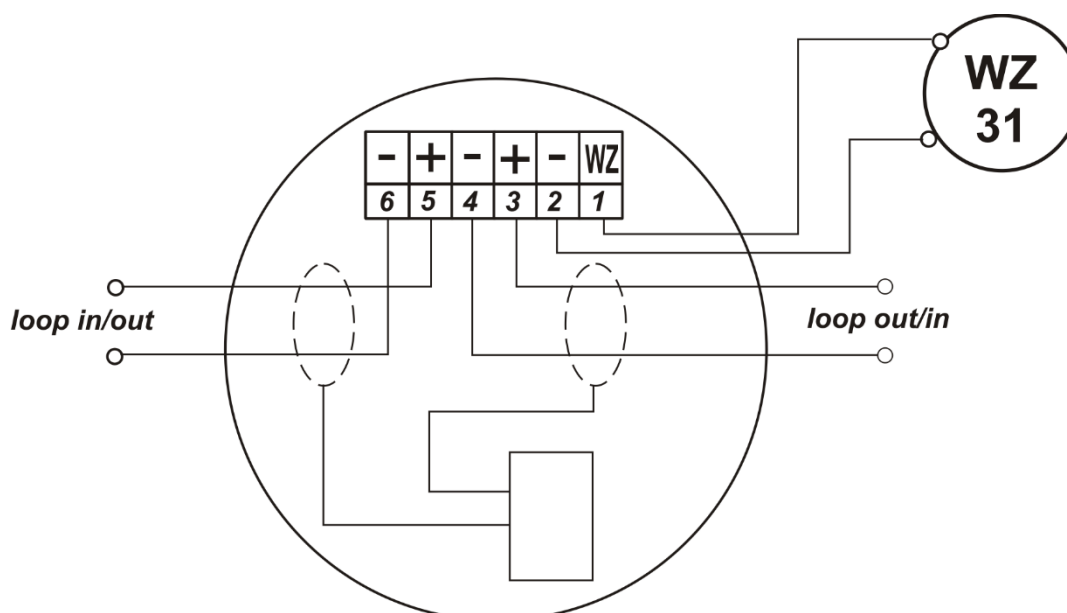


Fig. 8.3 Detection line connection

9 STORAGE AND TRANSPORTATION

The PUO-40 and PUO-40Ex detectors must be kept in individual packages in closed rooms free of acid or alkaline vapours and volatile compounds of sulphur at the temperature between -10 °C and +55 °C and relative humidity up to 80 %.

The detectors can be carried in transport packages with any transport means provided the transport instructions given on their packing are observed and they are properly protected from any mechanical damage.

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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