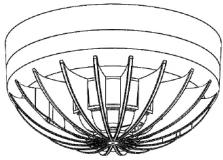




**Explosion-proof Fire and Security System «Ladoga-Ex» Modules**



**COMBINED SMOKE AND HEAT DETECTOR**

**«IPDT-Ex»**

**Installation Guide**

**1 General Information**

Combined smoke and heat detector «IPDT-Ex» (hereinafter, IPDT-Ex) is an item of intrinsically safe electric equipment with «ia» level «intrinsically safe electric circuit» explosion protection. The detector is designed for detecting ignitions accompanied by smoke and/or temperature rise with subsequent transmission of a fire alarm message to the BRSS-Ex zone extension module (hereinafter, BRSS-Ex).

**2 Principal Parameters and Characteristics**

- 2.1 IPDT-Ex has **0Ex ia IIC T6 Ga X** explosion proof labeling.
- 2.2 Intrinsically safe electric circuits of IPDT-Ex have the following valid parameters:
  - maximum input voltage ( $U_i$ ) – 16 V;
  - maximum input current ( $I_i$ ) – 65 mA;
  - maximum internal capacitance ( $C_i$ ) – 1000 pF;
  - maximum internal inductivity ( $L_i$ ) – 0.01 mH.
- 2.3 Nominal voltage supply ( $U_{nom}$ ) – 12 V.
- 2.4 IPDT-Ex current consumption in standby mode – maximum 100  $\mu$ A. IPDT-Ex operation in standby mode is displayed by built-in LED indicators single-shot blinks with 5 sec period.
- 2.5 IPDT-Ex generates fire alarm message by internal resistance step decrease in direct polarity. The message is followed by built-in indicators lighting.
- 2.6 IPDT-Ex continues generating response signal after its exposure to combustion products finishes. Fire alarm message reset is fulfilled by deenergizing the IPDT-Ex for the time 2 s or more..
- 2.7 IPDT-Ex sensitivity corresponds to smoke content with transmission optical density 0.14 dB/m. IPDT-Ex sensitivity value remains constant in any detector and does not depend on the following conditions:
  - the IPDT-Ex number of responses (repeatability);
  - the influence of air flow;
  - the IPDT-Ex orientation respective to the air flow direction;
  - power supply voltage.
- 2.8 The IPDT-Ex speed of response is not more than 5 sec.
- 2.9 IPDT-Ex compensates optical chamber dustiness. After reaching the limit of dustiness inside the protected area, IPDT-Ex generates malfunction message followed by built-in LED indicators blinking with 1.25 sec interval.
- 2.10 Temperature response class in combined mode is A1R. The IPDT-Ex provides possibility to shut off one of fire criterion analyses and choosing temperature response class (A1R/A3R), while the dustiness analysis is off-stream.

Table 1

IPDT-Ex Mode of Operation	DIP-switches position			Response temperature, °C	
	1	2	3	minimum	maximum
Smoke + Heat (A1R)	OFF	OFF	OFF	54	65
Smoke	ON	OFF	OFF	-	-
Heat (A1R)	ON	ON	OFF	54	65
Heat (A3R)	ON	ON	ON	64	76

2.11 Time of response at a temperature rising over 25 °C.

Table 2

Raise of temperature speed, °C/min	Response time, sec	
	minimum	maximum
5	120	500
10	60	242
20	30	130
30	20	100

- 2.12 IPDT-Ex controls continuity of a temperature measurement circuit and generates malfunction signal in case of it's fault.
- 2.13 Ambient class – Boreal climate (background temperature 15 – 35 °C, relative humidity 25 – 75 %, air-pressure 86 – 106 kPa).
- 2.14 IPDT-Ex design provides IP rating – IP20.
- 2.15 IPDT-Ex ensures safe operation under the following conditions:
  - background artificial or natural illumination influence value not less than 12 000 lk;
  - ambient temperature in the range minus 30 ... +55 °C in «Smoke+Heat(A1R)» and «Smoke» modes;
  - ambient temperature in the range minus 40 ... +75 °C in «Heat

- (A1R)» and «Heat (A3R)» modes;
  - relative humidity 93 % at a temperature +40 °C;
  - impact of sinusoidal vibration with acceleration of 0.5 g within the frequency range 10 ... 150 Hz;
  - impact of the straight mechanical blow delivered with the energy 1.9 J.
- 2.16 IPDT-Ex is resistant to electromagnetic interference.
- 2.17 IPDT-Ex dimensions are not more than  $\varnothing$  125 x 70 mm.
- 2.18 Weight – not more than 0.2 kg.
- 2.19 IPDT-Ex is designed for continuous operation around the clock.
- 2.20 Mean time to failure is not less than 60 000 h.
- 2.21 Average service – not less than 10 years.

**3 Scope of Delivery**

Each IPDT-Ex unit package contains items listed in Table 3.

Table 3

Name	QNT
Combined smoke and heat detector «IPDT-Ex»	1 pc.
Screw 3-3x40.016	2 pcs.
Wall plug NAT 5x25 SORMAT	2 pcs.
Combined smoke and heat detector «IPDT-Ex». Installation Guide	1 copy

**4 Installation**

- 4.1 Choosing a place for Installation of the Detector.
  - 4.1.1 The installation place of IPDT-Ex must be in agreement with specification requirements.
  - 4.1.2 The places for installation of the detectors must satisfy the following conditions:
    - exclude the possibility of moistening the detector with water and water ingress the installation surface side;
    - minimum vibration of structural units;
    - minimum lighting;
    - maximum distance from sources of electromagnetic interference and infrared radiation (space heaters);
    - ease of IPDT-Ex installation, testing and removal.
- 4.2 IPDT-Ex Installation and functional check.
  - 4.2.1 The detector is connected to an alarm loop with the help of a base into which it is fitted (hereinafter, the base).
  - 4.2.2 Install the IPDT-Ex base horizontally at a chosen IPDT-Ex installation place and fasten it by screws.
  - 4.2.3 Connect input wires to the IPDT-Ex base terminals in accordance with the diagram (Figure 1). Maximum electrical conductor cross-section area is 0.75 mm<sup>2</sup>.

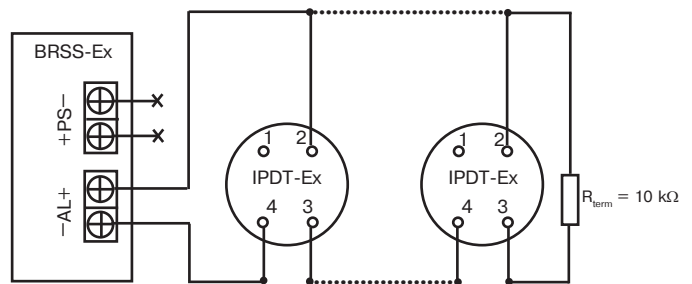


Figure 1 – Recommended connection pattern of IPDT-Ex to BRSS-Ex (the number of IPDT-Ex connected to a single BRSS-Ex loop should not exceed 10)

- 4.2.4 IPDT-Ex maximum current value in the «Fire» state is 3.5 mA; therefore, the detector may be connected to a fire alarm loop without a current-limiting resistor. When it is necessary to reduce operating current, a current-limiting resistor must be connected to the IPDT-Ex in series.
- 4.2.5 Install the IPDT-Ex into the base and reliably fasten it to the base by it's turning clockwise as far as it will go.
- 4.2.6 Energize the BRSS-Ex. The IPDT-Ex will start operating in standby mode, make sure, that it's built-in indicators are displaying standby operation mode.
- 4.2.7 To ensure operational control:
  - Put a magnet between second and third fins from the built-in LED at the label side for 10 sec or more. IPDT-Ex should generate fire alarm message and transmit it to BRSS-Ex, displaying it by built-in LED lighting;
  - Remove the magnet. IPDT-Ex will return to a standby mode;
  - Insert a reflector into the IPDT-Ex through a hole in the center of the optical chamber (a needle or a paper clip having about 1 mm in diameter). The detector must transmit a «Fire» alarm signal to the BRSS-Ex with the delay not more than 5 sec; it's operation must be displayed by continuous lighting of the built-in LED indicators;
  - After the reflector is removed from the optical chamber, the «Fire» signal should continue.

**Note** – In case the IPDT-Ex LED indicator does not blink in standby mode after energizing and does not operate after inserting a magnet, check the base and the IPDT-Ex contacts reliability.

4.2.8 Reset the «Fire» signal by deenergizing the IPDT-Ex for a period of time not less than 2 sec.

4.2.9 Reenergize the loop to which the detector is connected. The built-in indicators should display standby mode. IPDT-Ex is ready for operation.

**Attention!** The IPDT-Ex must be cleaned with a vacuum cleaner or blown with air at 0.5 – 2 kg/cm<sup>2</sup> pressure regularly (at least half-yearly). After blowing, check the IPDT-Ex operation as per Cls. 4.2.6 – 4.2.9.

4.2.10 Contacts «3» and «4» contacts are connected to each other inside the IPDT-Ex, providing the BRSS-Ex to diagnose the «Open loop» state in case at least one IPDT-Ex is disconnected from the fire alarm loop.

## 5 Protective Measures

5.1 Exploitation of the IPDT-Ex should be fulfilled in accordance with rules of technical exploitation and protective measures for electricity-generating equipment.

5.2 Fulfill the IPDT-Ex installation only with the external power switched off.

## 6 Manufacturer's Guarantees

6.1 The manufacturer guarantees conformity of the IPDT-Ex to the specifications provided the transportation, storage, installation and operation conditions are observed.

6.2 The guaranteed shelf life of an IPDT-Ex is 42 months since the date of manufacture. The guaranteed useful life is 36 months since the day of putting into operation within the guaranteed shelf life.

6.3 An IPDT-Ex that is found non-conforming to the requirements of specifications should be repaired by the manufacturer, provided the transportation, storage conditions, as well as installation and operation rules have been complied with.

## 7 Transportation and Storage

7.1 An IPDT-Ex in original transportation package may be transported by any means of transportation in closed vehicles (railway wagons, closed motor vehicles, sealed and heated airplane compartments, vessel holds, etc.) over all distances.

When transporting IPDT-Ex, the rules and regulations applicable to various means of transportation must be adhered.

7.2 Storage premises must not contain any current-conducting dust, acid and alkali fumes, as well as corrosive gases or those destroying insulation.

7.3 Maximum shelf life of IPDT-Ex in transportation package is three years; whereupon the transportation package must be dry and clean.

## 8 Packing Certificate

Combined smoke and heat detector «IPDT-Ex» has been manufactured in compliance with the active technical documentation and classified as fit for operation and packed by «Development and Production Enterprise RIELTA» LLC.

Packing date \_\_\_\_\_  
month, year

## 9 Claims

In case an IPDT-Ex is found non-complying to the specifications, or in case of a breakdown during the guarantee period, the IPDT-Ex must be returned to the manufacturer with the datasheet attached.