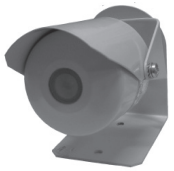
Explosion-proof Fire and Security System «Ladoga-Ex» Modules

«IPP-Ex»

INFRARED FLAME DETECTORS «IPP-Ex»



«IPP-Ex» version 1

Installation Guide

General Information

Infrared flame detectors «IPP-Ex» and «IPP-Ex» version 1 (hereinafter, IPP-Ex) refer to intrinsically safe electric equipment with «ia» level «intrinsically safe electric circuit» explosion protection. They are designed for detecting ignitions accompanied by open flame with subsequent transmission of an alarm message to a BRSS-Ex zone extension module (hereinafter, BRSS-Ex).

IPP-Ex is powered from intrinsically safe sources of BRSS-Ex.

IPP-Ex has 0ExiaIIBT6 X explosion-proof labeling.

Features

- IPP-Ex intrinsic safety parameters conform those of a BRSS-Ex module operating as a component of «Ladoga-A» control panel (hereinafter, CP).
- Two versions of IPP-Ex having different optical arrangement are manufactured.
- IPP-Ex generates a «Fire» signal after detecting the attribute of a fire under control – intermittent electromagnetic emission of a flame or a glowing spot in infrared range from 4 to 5 μm.
- IPP-Ex generates a «Fault» message in case of it's functional failure.
- Messages are sent to a CP via two alarm loops by energizing an optoelectronic relay contacts:

1) by closing AL1 contacts – a «Fire» message;
2) by opening AL2 contacts – a «Fault» message.

- Transmitted messages are displayed by a built-in LED indicator.

Specifications

1 IPP-Ex intrinsically safe electric circuits have the following valid parameters:
- maximum input voltage (U_i) – 16 V;
- maximum input current (I_i) – 150 mA;
- maximum internal capacitance (C_i) – 1000 pF;
- maximum internal inductivity (L_i) – 0.01 mH.

2 Detection angle α:
a) 60° for «IPP-Ex»;
b) 12° for «IPP-Ex» version 1.

3 Maximum IPP-Ex response time is 10 s.

4 Detection range, minimum:
- «IPP-Ex»: 17 m for TP-5 and TP-6 test fire sources;
- «IPP-Ex» version 1: as specified in a Table 1 within space detection angle α = 12°.

Table 1

Test glowing spot	TP-5	TP-6	Kerosene burning area, m^2			Area, S = 0.0225 m^2		
			0.1	0.25	1.0	Kerosene	Alcohol	Heptane
Operation range, m, minimum	60	50	50	60	100	25	25	25

5 The relationship of the fire source stable detection range and optical axis direction changing at α angle to the transmitting source direction (if all other conditions being equal) corresponds to the data from Table 2.

Table 2

β, deg	0	± 15	± 30
Distance at which IPP-Ex operates stably, %	100	87	81

6 Current consumption – maximum 15 mA
7 IPP-Ex 18 technical availability time – maximum 30 s.
8 IPP-Ex dimensions – maximum 110 x 80 x 70 mm.
9 IPP-Ex weight – maximum 0.4 kg.
10 IPP-Ex ensures safe operation on exposure to:
- ambient temperature from minus 40 to +55 °C;
- relative air humidity 93 % at 40 °C temperature;
- 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.

Scope of Delivery

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

Table 3

Name	QNT per version	
		Vers.1
Infrared flame detector «IPP-Ex»	1 pc.	
Infrared flame detector «IPP-Ex» version 1		1 pc.
Screw 3-3x30.016	2 pcs.	2 pcs.
Wall plug NAT 5x25 SORMAT	2 pcs.	2 pcs.
Spanner7812-0372	1 pc.	1 pc.
Infrared flame detector «IPP-Ex». Installation Guide	1 copy	1 copy

Design of the Detector

IPP-Ex is designed as a divisible aluminum case with a deflector fastened to a swivel bracket for installation on a wall, beam, support, fence, etc.

IPP-Ex case consists of a base and a top cover held together by a screw joint with a sealed ring gasket. There are two printed circuit boards (PCB) with electronic components and a cable entry installed on the base. A Fresnel lens («IPP-Ex» version 1) or a protective filter («IPP-Ex») are installed hermetically in the face plane of the cover. There is a ground terminal installed on the bottom of the cover.

IPP-Ex communicates with BRSS-Ex via a cable. The cable is passed through the cable entry in the bottom of the case. Correspondence of signals to cable color is listed in Table 4.

Table 4

Cable insulation color	Signal	Power voltage
White Red	-12 V +12 V	Power supply voltage Power supply voltage
Green Brown (black)	Fire (AL1) Fire (AL1)	Close when flame is detected
Blue Yellow	Fault (AL2) Fault (AL2)	Open when a fault is detected or in case of a power fail

The «SENS» potentiometer «Threshold» (R14) is installed on IPP-Ex PCB and is used for adjusting the IPP-Ex sensitivity by setting the number N_i of threshold crossings within a preset time interval «t». In hazardous premises with high rate of fire spread this interval must be as short as possible, in premises where fire sources are possible «t» interval value is set to the maximum.

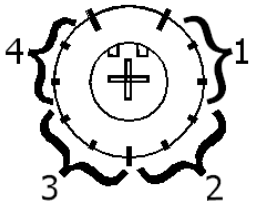


Figure 1

For most industrial premises, the recommended length of the interval is 2 or 4 s.

The positions of the potentiometer slider in the process of sensitivity adjustment are shown in Figure 1.

Dependence of sensitivity on the potentiometer slider position is shown in Table 5.

Table 5

Potentiometer Slider Position	Sensitivity	
	1 s	N_i
1	8	16
2	4	8
3	2	4
4	1	3

LED Indication

The detector is equipped with a LED indicator for displaying the following messages:
- «Fire» – continuous lighting for 5 s;
- «Fault» – blinking for 0.5 s with 1 s period;
- «Norm» – blinking for 0.5 s with 5 s period.

Installation of the Detector

IPP-Ex operation zone is determined by a cone with a space angle and a spherical base, therefore, when installing the detector, take into account the relation between operation range and angle β specified in Table 2.

Choose the IPP-Ex installation place with regard for the layout of premises. IPP-Ex detection zone must include possible fire sources. Whereupon there must be no open flame devices in the IPP-Ex detection zone: gas burners, space heaters, heating coils, etc.

Protect IPP-Ex lens from direct sunlight.

Detector Adjustment

Connect the IPP-Ex in accordance with chosen connection diagram.

Before adjustment, loosen the case fastening screws and unscrew the top cover.

Energize the IPP-Ex and measure power supply voltage at «+12 V» power terminals. It's value must be within 8 – 16 V limits. The IPP-Ex is available upon the expiry of 30 s.

Choose and set the detector sensitivity with the «SENS» potentiometer in conformity with Figure 1 and Table 5. When sensitivity is being set, the LED indicator blinks depending on the position of the potentiometer slider.

Test the IPP-Ex operation by open flame exposure (e.g., a gas cigarette lighter). Light and stifle the cigarette lighter placing it within the IPP-Ex coverage zone at 1-meter distance from the top cover not less than six times for 5 s, whereupon the LED indicator should light permanently during 5 s, and the control panel (CP) should receive a «Fire» message.

Adjust the IPP-Ex position towards potential fire sources. Ensure the maximum possible coverage of the premise space by the IPP-Ex detection zone.

Tighten the case screws, tighten the cable entry nut. Ground the ground screw on the bottom of IPP-Ex. Screw the top cover, take care not to damage the sealed gasket.

It is advisable to perform a function test at least bi-annually.

In case of false alarms, make sure there are no sources of infrared radiation in the coverage zone.

Note – In case it is impossible to use open flame onsite, it is recommended to use a special test lamp.

Manufacturer's Guarantees

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

The guaranteed shelf life of an IPP-Ex is 24 months since the date of manufacture. The guaranteed useful life is 18 months since the day of putting into operation within the guaranteed shelf life.

An IPP-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.

Transportation and Storage

An IPP-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 IPP-Ex, the rules and regulations applicable to various means of transportation must be adhered.

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

Packing Certificate

Infrared flame detector:

☐ «IPP-Ex»,

☐ «IPP-Ex» version 1,

has been manufactured in compliance with the active technical documentation and classified as fit for operation and packed by «RIELTA» JSC.

Packing date _____
month, year

Claims

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

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Made in Russia

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