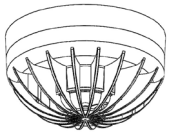
**WIRELESS INDEPENDENT SMOKE DETECTOR**

# «Ladoga PD-RK-A»



## Installation Guide

## 1 General Information

1.1 The wireless independent smoke Detector «Ladoga PD-RK-A» (hereinafter, the Detector) is intended for:
- detecting ignitions accompanied by smoke;
- sound announcement about the fire accident;
- «Fire» message generating and sending within the 433.05 to 434.79 MHz frequency range via two-way communication by the «Rielta-Contact-R» exchange protocol.

Operating principle of the Detector is based on the detection of the optical radiation reflected from smoke particles.

1.2 The Detector is designed for operation as a component of a system, that is operated by any control panel (hereinafter, CP) supporting the «Rielta-Contact-R» wireless exchange protocol or in stand-alone mode without the CP.

1.3 After ignition detection, the Detector generates Fire alarm message and transmit's it to the CP (in case of operation with the CP), switches on light state indication and sound announcement.

1.4 In case of operation in independent mode, Norm state restoration and sound announcement takes place after smoke content reducing lower the threshold.

1.5 In case of operation with a CP, Norm state restoration and sound announcement is executed after smoke content reducing lower the threshold and getting «RESET» command from the CP.

1.6 In case operation with a CP, the Detector provides possibility to switch ON announcement by the relevant command from the CP, as well as to inhibit announcement automatic switching ON when ignition is detected.

1.7 The Detector provides pulse and continues modes of sound announcement. Mode of operation is configured by means of the CP.

1.8 The Detector provides compensation of the optical smoke chamber dust content and controls it's operability.

1.9 Radio signals exchange with the CP is fulfilled via the wireless two-way communication in 433.05 – 434.79 MHz frequency range. The Detector provides automatical switch to a backup operating frequency in case of radio-frequency interference at the main one.

1.10 Transmitter power does not exceed 10 mW.

1.11 The Detector comprises functionality testing module with speed of response not more than 5 s.

1.12 The Detector status is displayed by two built-in LED indicators.

1.13 The Detector controls it's removal from the base.

1.14 The Detector is powered from two galvanic power supply batteries CR123A type with nominal voltage 3 V: the main and backup ones.

1.15 Ignition is detected if at least one battery is in working order.

1.16 During operation in independent mode in case of any battery failure, short sound signal is generated once in 40 s.

1.17 The Detector generates and transmits via wireless communication channel the following messages:
- «Norm» – normal state;
- «Fire alarm» – ignition is detected;
- «Optical smoke chamber dusting» – upon reaching the dust concentration threshold;
- «Failure» – circuit fault or sensitivity drop;
- «Main power-supply low-battery» – if power-supply voltage drops below 2.4 V ± 0.2;
- «Backup power-supply low-battery» – if power-supply voltage drops below 2.4 V ± 0.2;
- «Tamper» – in case of the Detector removal from the base.

1.18 The following rates of radio exchange may be assigned: 10 s, 15 s, 30 s, 60 s, 2 min or 5 min by the command from the CP. Messages about ignition and failures are transmitted immediately.

1.19 The Detector provides safe operation in a standby mode* being powered by:
- main power-supply battery: not less than 5 years;
- backup power-supply battery: not less than 2 months.

1.20 The Detector designed to operate in closed areas continuously around the clock.

## 2 Features

Table1

| Parameter | Value |
|---|---|
| Threshold of sensitivity | 0.16 ± 0.03 dB/m |
| Acoustic pressure level at 1 m distance from the Detector, not less than, not less than | 85 dB |
| Generated sound alarm signals frequency | 2 ... 5 kHz |
| Consumption current in standby mode (without radio exchange), not more than | 20 μA |
| Consumption current in alarm mode and sound announcement, not more than | 100 mA |
| Operating temperature | minus 20 °C +55 °C |

* under conditions of: radio sessions interval of at least 30 s, radio-interference absence and normal climate parameters

Table 1, continuation

| Parameter | Value |
|---|---|
| Permissible humidity (at a temperature 40 °C) | 93 % |
| IP rating | IP30 |
| Dimensions, not more than | Ø 125 x 70 mm |
| Weight, not more | 0.2 kg |
| Average service life | 10 years |

## 3 Scope of Delivery

Each Detector unit package contains the items listed in Table 2.

Table 2

| Name | QNT |
|---|---|
| Wireless independent smoke Detector «Ladoga PD-RK-A» | 1 pc. |
| Screw 3-3x30.016 | 2 pcs. |
| Wall plug NAT 5x25 SORMAT | 2 pcs. |
| CR123A lithium power-supply battery | 2 pcs. |
| Wireless independent smoke Detector «Ladoga PD-RK-A». Installation Guide | 1 copy |

## 4 Design of the Detector

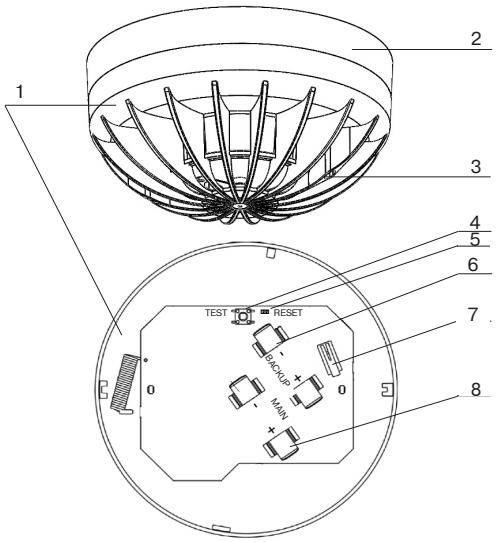



Figure 1

The Detector outside view is shown in Figure 1.
The Detector comprises:
- case with optical smoke chamber (1);
- base (2);
- two LED indicators (3);
- main power supply battery (8);
- backup power supply battery (6);
- operability control button «TEST» (4);
- pin contacts «RESET» (5);
- tamper (removal from the base control) (7).

## 5 LED Indication

The Detector displays it's state in accordance with Table 3.

Table 3

| Detector Status | Indication | Notes |
|---|---|---|
| «Binding» | Green LED indicator blinks intermittentl | |
| «Binding completed» | Single-shot (2 s) green LED lighting | |
| «Fire» | Red LED indicator blinks intermittently at 1 Hz frequency | |
| «Norm» | Green LED blinks once per 15 s | |
| «Dusting» | Red LED blinks once per 15 s | Independent operation |
| «Power supply failure» | Red LED switching on once per 15 s and sound signal – once per 30 s | Operation with the CP |
| No communication with the CP | Red LED indicator blinks once per 15 s | Operation with the CP |
| Communication quality appraisal «Excellent» | Three blinks of green LED | Operation with the CP |
| Communication quality appraisal «Good» | Two blinks of green LED | Operation with the CP |
| Communication quality appraisal «Communication established» | One blink of green LED | Operation with the CP |
| Communication quality appraisal «No communication» | Four blinks of green LED | Operation with the CP |

## 6 Switching ON and Setting Up

Generally operational sequence consists of the following steps:
- binding (logging) the Detector with the CP;
- choosing place of installation;
- operability testing;
- installation.

## 7 Binding with the CP

7.1 Prepare the CP for the new device logging in («Binding» mode) in accordance with the CP Manual. In the Detector radio-coverage zone only one CP prepared for binding procedure should be located.

7.2 Remove the Detector from the base rotating it counter clockwise.

7.3 Install first the backup power supply battery, and after the main one into the holders, located on the PCB (if the battery is installed by manufacturer, remove an isolator).

7.4 Close «RESET» contacts on the PCB by any metal object and hold it until «Binding» indication switches on.

7.5 Fulfill binding. After a successful binding with the CP, the red LED indicator blinks shortly.

**Note** – The time during which the Detector operates in the «Binding» mode is limited to 100 s. To repeat binding procedure, repeat Cls. 7.3 – 7.5.

## 8 Standalone Mode

To provide the Detector operation independently without CP, act as follows:
- remove the Detector from the base rotating it counter clockwise.
- remove the isolating plates between «+» contacts and battery holders primarily from backup, and then from main power supply batteries.
- close «RESET» pin contacts on the PCB by any metal object and hold it until «Binding» indication switches on.
- wait for approximately 100 s till the end of binding mode without binding with the CP.

## 9 Installing the Detector

When choosing the place of installation for the Detector, take into account the fact that the Detector refers to fire Detectors with operability control and therefore, only a single Detector may be installed in the monitored premise.

All other conditions being equal, the location chosen for the installation of the Detector should meet the following requirements:
- prevention of water ingress from the front side and the base side;
- minimum vibrations of building structures;
- minimum illumination;
- maximum distance from sources of electromagnetic interference and infrared radiation (heating units);
- maximum convenience of installation, checking and removal of the Detector.

Transmission quality may differ from premise to premise; therefore, it is advisable to apprise a communication quality before the Detector is finally installed.

## 10 Communication Quality Appraisal

10.1 Bring the Detector to the assumed place of installation.

10.2 Press the arm of sensing element, ensuring control of the Detector removal from the base.

10.3 The Detector displays the quality of communication by LED indication as per Table 4.

Table 4 Communication quality appraisal results

| LED Indication | | Communication Quality Appraisal | Recommendations |
|---|---|---|---|
| Color | Mode | | |
| Green | Three blinks | Excellent | Install the Detector at this place |
| Green | Two blinks | Good | |
| Green | One blink | Communication established | Choose another place for installation or use a repeater |
| Red | Series of blinks | No communication | |

## 11 Operability Test

Press the operability test button and hold it during not less than 5 s, until the Detector switches «Fire» LED indication and sound signal. Make sure that «Fire» alarm message at correspondent zone is received.

Feed testing spray into the optical smoke chamber opening. In case of operation with the CP in order to restart the Detector, «Arming» command by the wirelwss two-way communication «Rielta-Contact-R» protocol from the CP is required.

## 12 Installation

12.1 Choose the Detector location, where the quality of communication is appraised «excellent» or «good» and carry out marking for it's mounting. Use the base for marking. (See Figure 1).

12.2 Install the base at the chosen place and fasten it by 2 screws.

12.3 Insert the Detector into the base and fix it by turning clockwise.

## 13 Maintenance

The operability of the Detector should be checked at least annually.

The Detector should be cleaned from dust if the Detector generates «Fault» or «Optical Smoke Chamber Dustiness» message. For this purpose, sweep the optical system of the Detector by air under 0.3 – 0.5 kg/cm$^2$ pressure.

Technical maintenance rate for optical smoke chamber dustiness prevention depends on the operating conditions and statistical data. It is recommended to provide services of all detectors logged in the fire alarm system periodically.

In case of any battery discharge, both batteries should be replaced with a new one.

**Attention!** It is forbidden to remove and disassemble optical smoke chamber.

## 14 Storage and Transportation

14.1 The Detector in original package without power supply batteries is resistant to:

a) transport jolting with the acceleration of 30 m/sec$^2$ with impact frequency rate from 10 to 120 impacts/sec or 15000 impacts with the same acceleration;

b) the ambient temperature from minus 50 ... +50 °C;

c) relative air humidity (95 ± 3) % at the ambient temperature +35 °C.

14.2 The Detectors in original package may be transported by any transport facility in closed vehicles over any distances in compliance with the existing shipping rules concerning the respective means of transport.

14.3 After transportation under the conditions different to exploitation conditions, the Detector shall be ready to operate after a maximum of six hours.

## 15 Manufacturer's Guarantees

15.1 The manufacturer guarantees conformity of the Detector to the Technical Specifications requirements provided the transportation, storage, installation and operation conditions are observed.

15.2 The guaranteed shelf life of the Detector is 42 months since the date of manufacture.

15.3 The guaranteed useful life is 36 months since the day of putting into operation within the guaranteed shelf life.

15.4 The Detectors that are found non-conforming to the Technical Specifications requirements shall be repaired by the manufacturer, provided the installation and operation rules have been complied with.

**Note** – Warranty obligations are not applied to the power supply batteries.

## 16 Packing Certificate

Wireless independent smoke Detector «Ladoga PD-RK-A» has been manufactured in compliance with the active technical documentation, classified as fit for operation and packed by «RIELTA» JSC.

Packing date _____
month, year

Rev. 3 of 18.04.2018
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v.2

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