WIRELESS TEMPERATURE DETECTOR

«Celsius-1-RK»

Installation Guide

1 General information

1.1 Wireless temperature detector «Celsius-1-RK» (hereinafter, the Detector) is designed to monitor the air temperature and transfer numerical values via wireless two-way communication channel within 433.05 - 434.79 MHz frequency range by the «Rielta-Contact-R» wireless two-way communication protocol to control pane (hereinafter, the CP).

1.2 The Detector operates within 433.05 ... 434.79 MHz frequency range. Radiated power of a transmitter does not exceed 10 mW.

1.3 Two frequencies: the main and the reserve one are used for the wireless signal exchange with the CP. The detector switches to reserve frequency automatically.

1.4 The Detector is powered by a single power-supply battery CR123A type.

1.5 The Detector status is indicated by red and green LED indicators.

1.6 The preset limits of air temperature range: the lower minus 55 ℃, the upper +125 ℃ are stored in nonvolatile memory and may be changed by the relevant command from the CP. If the air temperature exceeds the controlled range, an «Alarm» notification is generated.

1.7 The Detector generates and provides transmission of the following messages:
- «Norm» − the temperature is within the preset range;
- «Alarm» − the temperature exceeds the set range by 0.5 ℃ or more;
- «Tamper» − case or wall tampering;
- «Power-supply low-battery» − under voltage supply drop by > 2.2$_{-0.2}$ V.

1.8 The Detector is designed for continuous and uninterrupted operation.

1.9 The Detector is not a measuring instrument.

2 Features

Table 1

Features	Value
IP rating	IP30
Dimensions, max	97 x 25 x 22 mm
Weight, max	50 g
The operation duration of the Detector powered by one battery under normal climate conditions and specified broadcast period 60 sec, minimum	36 months
Battery life, not less	8 years
Operational conditions	
Operating temperature	minus 20 ... +55 ℃
Measurement error, not more	±1.0 ℃
Permissible relative humidity at +25 ℃, max	98 %

3 Scope of Delivery

Table 2

| Name	QNT.
Wireless temperature detector «Celsius-1-RK»	1 pc.
Screw 3-3x30.016	2 pcs.
CR123A battery	1 pc.*
Wireless temperature detector «Celsius-RK». Installation Guide	1 copy
* Installed	

4 The Detector Construction

The Detector consists of a cover and a base with printed circuit board (1).

The printed circuit board (hereinafter, PCB) contains:
- built-in signal processing unit (2);
- «RESET» contacts (3);
- tamper switch (4);
- battery holder (5);
- battery (6) with insulator (7);
- red and green LED indicators (8);
- antenna (10).

The board is fixed in the base of the case by a latch (9). There are openable fixing holes (11) in the base.
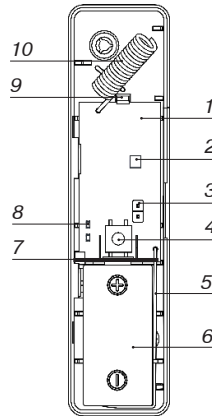
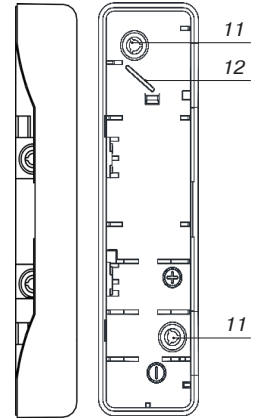**a) the base with PCB**   **b) the base**

Figure 1 − Design of the Detector

5 Indication

The Detector has the following indication modes:
- «Binding» procedure LED indication (procedure of logging in the CP);
- LED indication of the mode «Identification» is switched on by sending relevant command from CP and remains active during 15 min or until the case is opened;

Indication modes are listed in the Table 3.

Table 3

The Detector Mode	Indication	Note
«Binding» mode	LED blinking green with 1 sec period	The Detector logging in the CP
End of «Binding» mode	LED lighting red for 2 − 3 sec	
«Alarm» mode	LED blinking red with 8 sec period	With the enclosure closed
«Identification»	Alternate LED red and green blinking	on command from the CP
Radio communication quality appraisal	See sect. «Radio communication quality appraisal»	
«Normal»	Indication is off	

6 Binding with the CP

«Binding» mode is used for logging the Detector in the CP and service information exchange.

6.1 Prepare the CP in accordance with CP Installation Guide.

6.2 Observing the polarity, insert the battery into the holder (5) or remove the insulator.

6.3 Periodical LED indicator blinking green is evidence of «Binding» mode.

6.4 In case of mentioned above LED indication absence, short-circuit «RESET» terminals (3) for 2 − 3 s.

6.5 Successful binding procedure complying is indicated by LED indicator lighting red.

6.6 The time limit for the binding process of the Detector is 100 sec. To restart the binding procedure, short-circuit «RESET» (3) terminals for 2 − 3 s.

7 Communication Quality Appraisal

For appraising the possibility of the Detector operation in the particular place, it is necessary:
- Place the Detector in the intended place of installation;
- Push and release the tamper switch.

After case tamper releasing the Detector generates case tamper alarm message, transmits it via radio communication channel and represents communication quality with CP by LED indication in accordance with the Table 4.

Table 4

LED Indication		Radio communication quality appraisal	Recommendations
Color	**Mode**		
Green	Three blinks	Excellent	Install the Detector on this place
Green	Two blinks	Good	Install the Detector on this place
Green	One blink	Communication established	Choose another place for installation or use the «Ladoga-RK» system repeater
Red	Four blinks	No communication	Choose another place for installation or use the «Ladoga-RK» system repeater

8 Installation

To install the detector, remove the cover and the printed circuit board. The cover is fixed on the base by the latches.

To remove the PCB, release the latch (9) (Fig. 1a) in the base.

Prepare holes for mounting the Detector.

For marking the holes, the Detector base can be used. The Detector base can be used for marking.

Fasten the base with screws.

Install the circuit board, battery.

Install the cover.

Attention! Antenna should be installed into the holder (12).

Antenna installation outside of a holder essentially reduces radio communications range.
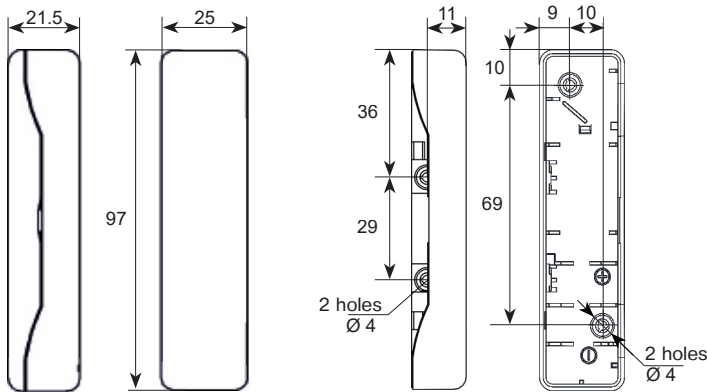
9 Overall dimensions

Figure 2 – Overall dimensions

10 Storage and Transportation

10.1 The Detectors are transported without power supply battery. The Detector in their original packaging are resistant to:

- transport jolting with the acceleration up to 30 m/sec² at impact frequency range from 10 to 120 per minute or 15 000 strikes;
- ambient temperature range minus 50 ... +50 °C;
- relative air humidity (95 ± 3) % at a temperature +35 °C.

10.2 The Detector in original package may be transported by any means of transportation in closed vehicles over any distances in compliance with the existing shipping rules concerning the respective means of transportation.

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

10.4 The storage room shall be free from current-conducting dust, acid vapors, alkali and gases that cause corrosion and destroy insulation.

11 Manufacturer's Guarantees

11.1 The Manufacturer guarantees conformity of the Detector to the requirements of specification provided that conditions of transportation, storage, assembling and operation are observed.

The guaranteed storage period is 27 months since the date of manufacturing the Detector.

11.2 The guaranteed period of operation is 24 months since the date of commissioning within the storage period guaranteed.

11.3 If non-conformity of the Detector to technical requirements is detected during the guaranteed period provided that rules of operation are observed it shall be repaired by the Manufacturer.

Note − The guaranteed period for the Detectors isn't applied to the power supply batteries.

12 Acceptance and Packing Certificate

Wireless temperature detector «Celsius-1-RK» has been manufactured in compliance with the active technical documentation, classified as fit for operation and packed by «Development and Production Enterprise RIELTA» LLC.

Packing date _____
month, year