

1 General Information

1.1 Wireless outputs module «BKV-RK» (hereinafter, the BKV-RK) is designed to supervise executive modules (light and sound annunciators with rated power supply voltage 12 V and current consumption up to 100 mA) by generating control signals (hereinafter, CS) at two outputs.

1.2 BKV-RK is intended for operation as a component of a control panel (hereinafter, CP), supporting «Rielta-Contact-R» wireless two-way data exchange protocol.

1.3 Commands to enable/disable control signals and to assign their period and operation modes (continuous, pulse) are transmitted via wireless communication during regular radio sessions.

1.4 Two frequencies in the 433.05 MHz – 434.79 MHz frequency range are used for wireless signal exchange with the CP: the main frequency and the reserve one. Changeover to the reserve operating frequency proceeds automatically in case of radio-frequency interference on the main one.

1.5 Transmission power does not exceed 10 mW.

1.6 BKV-RK is provided with:

- two outputs for annunciators supervision;
- two inputs for operability control loops of the main and backup power supply hooking up;
- two inputs for plugging of the main and backup power supply control loop;
- case tamper;
- two-color LED indicator.

1.7 BKV-RK is supplied from the external power supply with rated voltage 12 V or CR123A batteries (main, backup and four extra ones) located inside the BKV-RK case. Power supply selection is fulfilled by applying jumpers in correspondent position (See Figure 1).

1.8 BKV-RK ensures periodical control of loops inputs and CS outputs operability. The loop state is estimated by their input circuit resistance values:

- «Norm» state: 4.1 ... 5.7 kΩ;
- «Alarm» state: 0.5 ... 3.6 kΩ or 6.5 ... 11 kΩ;
- «Short Circuit» state: below 110 Ω;
- «Failure» state: exceeding 14 kΩ.

CS outputs «Short Circuit» and «Failure» state operability check is fulfilled by means of reverse-switched diode (See Figure 3 d). Maximum resistance of the hookup wires is 110 Ω.

Output power operability is estimated by control circuits resistance value:

- «Norm» state: below 110 Ω;
- «Failure» state: exceeding 14 kΩ.

1.9 During regular radio sessions «BKV-RK» generates and transmits to CP the following messages via wireless communication:

- «Norm»;
- «Tamper»;
- «Main power supply battery discharge» (MP discharge) - under receiving message about main external power supply failure or under main battery power supply voltage drop below (2.4 ± 0.2) V;
- «Backup power supply battery discharge» (BP discharge) - under receiving message about backup external power supply failure or under extra batteries supply voltage drop below (10 ± 0.2) V;
- «Loop failure» – under short-circuit or disconnection of the loop;
- «Alarm» – at the correspondent resistance values of the loop circuits;
- «Output failure» – means short-circuit of hookup wires between BKV-RK and executive module.

1.10 «BKV-RK» battery life in standby mode*:

- powered by main battery – not less than 36 months;
- powered by backup battery – not less than 2 months.

Extra batteries provide power supply of the hooked executive modules with total current up to 200 mA during the period not less, than 4 hours.

1.11 Radio exchange period (RP) is assigned by the command from CP from the range: 10, 15, 30 sec, 1, 5, 10 min. If necessary, RP can be changed at the next radio session.

1.12 BKV-RK operation modes are displayed by two-color LED indicator (See Table 3).

1.13 BKV-RK is designed to operate continuously around the clock in the closed premises of accommodation and manufacturing facilities.

1.14 «BKV-RK» has immunity to electromagnetic interferences.

* – Under the following conditions: exchange period (RP) not less than 30 sec, radio interference absence, normal climatic parameters.

2 Principal Technical Characteristics

Table 1

Parameter	Value
Rated voltage (Uinput), V	12 (+4 V/-1.8 V)
Consumption current: - in standby mode external power supply provided, not more, mA - in active mode (total output load 200 mA), not more, mA	15 290
Maximal load current at any output, mA	100
Output voltage: - under external power supply - under autonomous power supply, V	Uinput (-0.5 V) 12 V (+1.2/-2.5 V)
Operating temperature, °C	from minus 20 ... +50
Permissible humidity (at 40 °C), %	93
Ambient class	Boreal climate
IP rating	IP20

Table 1 Breakover

Parameter	Value
Dimensions, maximum, mm	170 x 120 x 45
Weight without batteries, maximum, kg	0.2
Average service life, not less, years	10

3 Scope of Delivery

Each BKV-RK unit package contains the items listed in Table 2.

Table 2

Name	QNT
Wireless outputs module «BKV-RK»	1 pc.
Antenna	1 pc.
Screw 3-3x30.016	4 pcs.
Wall plug NAT 5x25 SORMAT	4 pcs.
CR123A power supply battery	6 pcs.
Resistor 5,1 kΩ 0.125 Wt	4 pcs.
Diode 1N4148	2 pcs.
Diode SB360	2 pcs.
Wireless outputs module «BKV-RK». Installation Guide	1 copy

4 Protective Measures

4.1 Fulfilling installation and exploitation of BKV-RK follow customers safety instructions for electric installations.

4.2 All installation operations shall be executed only when BKV-RK is powered OFF with the batteries withdrawn.

5 Design

BKV-RK design with removed cover is shown in Figure 1.

The BKV-RK base (1) is provided with two holes (2) for it's fastening to the mounting surface. The printed circuit board (PCB) (3) comprises the following elements:

- antenna leading-in socket (4);
- backup battery holder (5);
- main battery holder (6);
- two-color LED indicator (7);
- reset contacts (8);
- extra batteries holders (9);
- connecting blocks (10);
- two power supply choosing contacts (11).

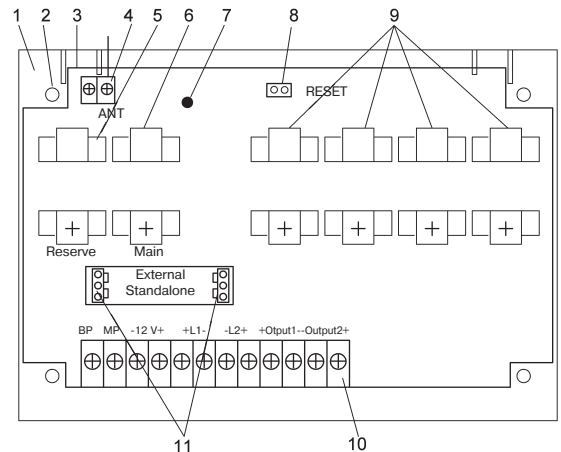


Figure 1 – BKV-RK with removed cover

6 LED Indication

Table 3

BKV-RK Status	LED Indication
«Binding» mode	LED indicator blinking green
«Binding is completed»	Short-term (2 sec) LED indicator lighting red
«Identification» indication	Alternate LED indicator lighting green and red
«Communication Quality Appraising»	See Table 4

7 Switching On and Setting Up

7.1 Remove the cover.

7.2 Install antenna into leading-in socket «ANT».

7.3 Apply jumper to PCB correspondently to the chosen supply method (external or autonomous).

7.4 Prepare the CP for the new device logging («Binding» mode) in accordance with the CP Installation Guide. Only one CP, prepared for binding, should be located in radio coverage zone during BKV-RK logging.

7.5 Fulfill BKV-RK energizing:

- if external power supply is chosen, apply 12 V to «-12 V+» inputs;
- for autonomous power supply use batteries as follows: consequently install first extra batteries, then backup one, and finally the main battery.

7.6 Short-circuit «Reset» contacts on BKV-RK PCB.

7.7 Make sure in alternate LED indicator lighting green (binding mode).

Remove short-circuit by opening contacts (11) (See Figure 1).

7.8 Execute binding procedure in accordance with the CP Installation Guide.

7.9 Wait for short-term LED indicator lighting red.

Note – The binding procedure is limited to 100 sec. To resume the «Binding» mode, repeat operations described in sect. 7.6 – 7.9.

8 Communication Quality Appraising

8.1 Place BKV-RK at the assumed place of installation in a position, which provides vertical antenna orientation.

8.2 Push «Tamper» contacts and hold it for 3 sec or longer.

8.3 Release «Tamper» contacts.

8.4 Appraise the communication quality by LED lighting in accordance with the Table 4.

Note – Four-second delay is possible before indication switching.

Table 4 – Communication quality appraising LED indication

LED Indication		Communication Quality Appraisal	Recommendations
Color	Mode		
Green	Three blinks	Excellent	Install BKV-RK 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	

*) – «Ladoga BRSS-RK-RTR» or «Ladoga BRSS-RK-RTR», ver. 1

9 «BKV-RK» External Plugging

Connecting blocks for BKV-RK plugging is shown in Figure 2.

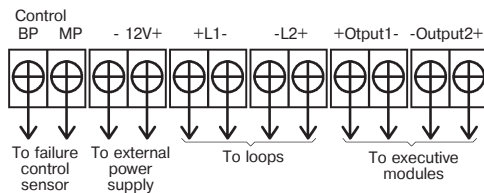


Figure 2 – Connecting blocks for external modules plugging

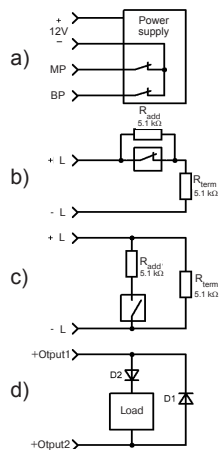


Figure 3 – Connection diagram of external devices

Relay contacts of external power supply operability control should be plugged to the relevant BKV-RK input: operability of the backup power supply – to «BP» input and the main one – to «MP» input. The second wire from these relays should be plugged to connecting block «-12 V+».

Under absence of «failure outputs» at the CP, close «MP», «BP», «-12 V+» together.

Loop terminal (EOL) resistor (R_{term}) and additional resistors (R_{add}) provide BKV-RK a possibility to control the loop operability.

Diode D1 (1N4148) in the connection diagram provides BKV-RK a possibility to control short-circuit and connection wires breakage. Diode D2 (SB360) ensures control of the communication bus, preventing reversed polarity voltage supply. Minus (cathode) of the diodes is designated by a stripe on their cases.

10 Installation

10.1 Install BKV-RK at the place, where communication quality is appraised as «Good» or «Excellent» (See Sect. 8).

10.2 It is not recommended to install «BKV-RK» at the following places:

- at massive metal constructions and nearer 1 m from them;
- nearer than 1 m from electrical power cables, as well as from water or gas pipes;
- near the source of radio interferences;
- inside metal constructions.

10.3 Run the power lines far enough from electrical power cables. Install BKV-RK in a position, which provides vertical antenna orientation.

11 Operation in Autonomous Power Supply Mode

11.1 BKV-RK energizing and de-energizing is fulfilled by installation and removal of the main and reserve power supply battery.

11.2 Under the main power battery discharge, BKV-RK changes over to the backup power supply. In the backup power supply battery absence, «BKV-RK» is inoperative.

11.3 In case of any power supply battery discharge, all batteries should be renewed.

11.4 All batteries installed should be of the same type. Install the main battery after all the others.

11.5 If you are planning to switch off the CP for a long time, disable BKV-RK likewise.

12 Storage and Transportation

12.1 The «BKV-RK» in their original packing may be shipped by any transport means in closed vehicles over any distances in compliance with the existing shipping rules concerning the respective means of transportation.

12.2 The storage premises should not contain any current-conducting dust, acid and alkali fumes, or corrosive or destroying insulation gases.

12.3 BKV-RK should be stored without installed power supply batteries.

13. Manufacturer's Guarantees

13.1 The manufacturer guarantees conformity of the BKV-RK to it's Technical Specifications provided that the transportation, storage, installation and operation conditions are observed.

13.2 The guaranteed shelf life of the «BKV-RK» is 63 months since the date of manufacture.

13.3 The guaranteed useful life is 60 months since the day of putting into operation within the guaranteed shelf life.

13.4 The «BKV-RK» that is found non-conforming to the Technical Specifications 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.

14 Acceptance and Packing Certificate

Wireless outputs module «BKV-RK»,

batch number _____,

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

Person in charge of acceptance and packing

QC representative _____
month, year