Seclue security systems

THE SECURITY TWO-FLANGED DETECTOR
WIREWAVE FOR PERIMETERS

"Sectoria-M250S"
SSSS 22.002-7
"Sectoria-M500S"
SSSS 22.002-9

TC 4372-002-24009810-17

Manufacturer: DOO "Seclue technologies"

INSTALLATION GUIDE AND OPERATION
SSSS 22.002-07/09 Manual

Novi Sad Serbia

CONTENT

1. INTRODUCTION 3

2. PURPOSE 3

3. TECHNICAL DATA 4

4. SCOPE OF DELIVERY 5

5. DEVICE AND OPERATION OF THE ALARM 6

5.1 WORKING PRINCIPLE 6
5.2 THE SENSITIVE ELEMENT 6
5.3 DESCRIPTION OF THE BLOCK DESIGN 7
5.3.1 General information 7
5.3.2 RU construction 8
5.3.3 CU construction 8
5.3.4 Controls and indications 9
5.3.5 The unit connection of cables 9
5.3.6 Detector operating modes 9
5.3.7 Detector operation mode control 9

6. INSTALLATION PROCEDURE 10

6.1 INSTALLATION ON A FENCE 10
6.2 WIRE AND CABLE ENTRY 13
6.3 CONNECTING CABLE LINES 13

8. PREPARING THE DETECTOR FOR OPERATION 14

8.1 CHECKING THE DETECTOR'S POWER SUPPLY 14
8.2 CHECKING THE DETECTOR'S OPERABILITY 14
8.3 DETECTOR LEARNING 15
8.4 THE PROCEDURE FOR LEARNING THE DETECTOR 16
8.5 DETECTOR CHECK 17

9. MAINTENANCE REGULATIONS 17

10. RULES OF STORAGE AND TRANSPORTATION 18

11. TYPICAL MALFUNCTIONS AND METHODS OF THEIR ELIMINATION 18

1. INTRODUCTION

1.1 This manual intended to study the rules of installation and operation of security wire-wave two-flanged detectors premium class for perimeters «Sectoria-M250S», «Sectoria-M500S», TC 4372-002-24009810-17.

1.2 The following designations are accepted in the manual: detector – detector «Sectoria-M…S»; TU – transmitting unit; RU – receiving unit; CU - control unit; CAW – The mounting point for TU and RU on barriers, etc.; SE – sensitive element (WSE – wired sensitive element); UW – upper wire SE; LW – lower wire SE; DZ – detection zone; MK - mounting kit; PSU – power supply unit; RCD – reception and control device; RC - remote control signal.

1.3 The detector is designed to protect long, winding borders and can be installed along the top or bottom of barriers, as well as in open or wooded areas.

1.4 Volumetric DZ (section A, fig. 1.1, fig.1.2, fig.1.3) is formed around a two-wire SE, which repeats all the turns and height differences of the guard line.

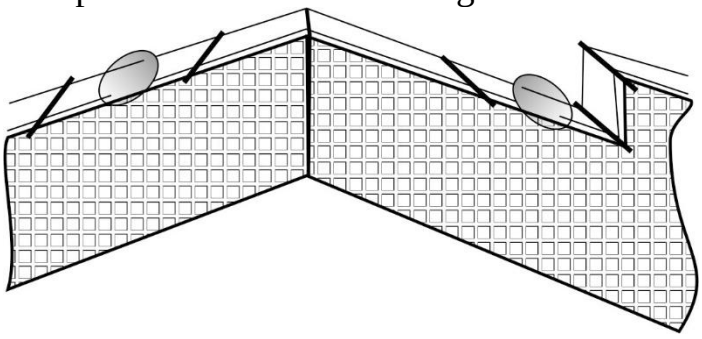


Fig. 1.1

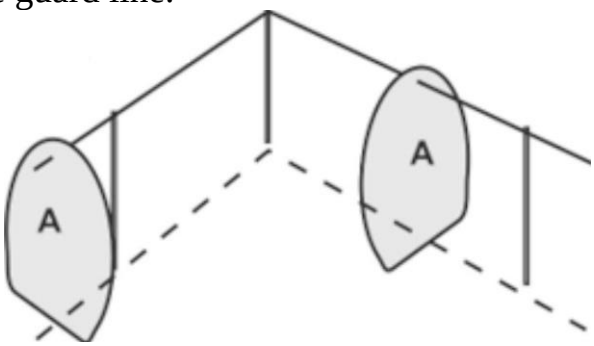


Fig. 1.2

1.5 The detector can be mounted on open rough or flat terrain, with DZ is up to 2 m high (Fig. 1.2), near the canvas (Fig. 1.3) or in the upper part of the defense (Fig. 1.1, Fig. 1.3).

1.6 The detector consists of SE in the form of a two-wire line, dielectric consoles or supports, RU, TU, CU and two or three grounding rods.

1.7 RU of the detector connected to CU, the beginning of the SE (two-wire line) and to the ground.

1.8 TU connected to the end of SE and to the ground.

1.9 CU connected to PSU and the control panel.

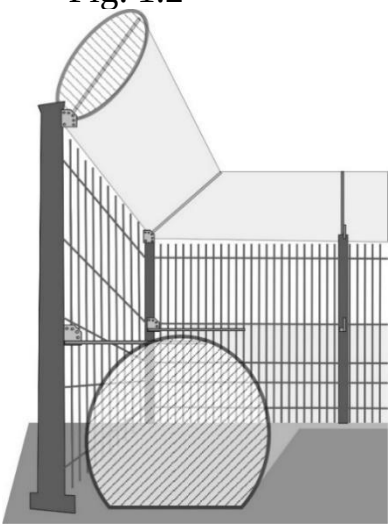


Fig. 1.3

2. PURPOSE

2.1 The detector is universal and can block borders, both on flat and rough terrain. SE repeats the turns and height differences in rough terrain, repeatedly the irregularities of the landscape of the area.

2.2 Depending on the tasks to be solved, SE wires mounting method is selected, and SE can be mounted accordingly:

a) in the upper part of the defense in the form of a "visor" with any angle of inclination (see Fig. 2.1a), UW and LW are fixed on dielectric consoles (WSE1, WSE2), the angle of inclination of which can be quickly changed, while the consoles can made of any isolating material;

b) along the web of the fence (walls of a building or structure) to control a break, a climbing over the fence, while UW is fixed at the ends of the dielectric consoles (WSE3), and LW is either 5-10 cm deep into the ground (see Fig. 2.1b), or fixed on the same dielectric consoles;

c) along the surface of the earth (see Fig. 2.1c), while UW is fixed on dielectric supports (WSE4), and LW is sunk 5-10 cm into the ground. In the case where there are dielectric or electrically conductive pillars on the protected border, UW can be fixed on consoles WSE1...WSE3, which mounted on existing poles.

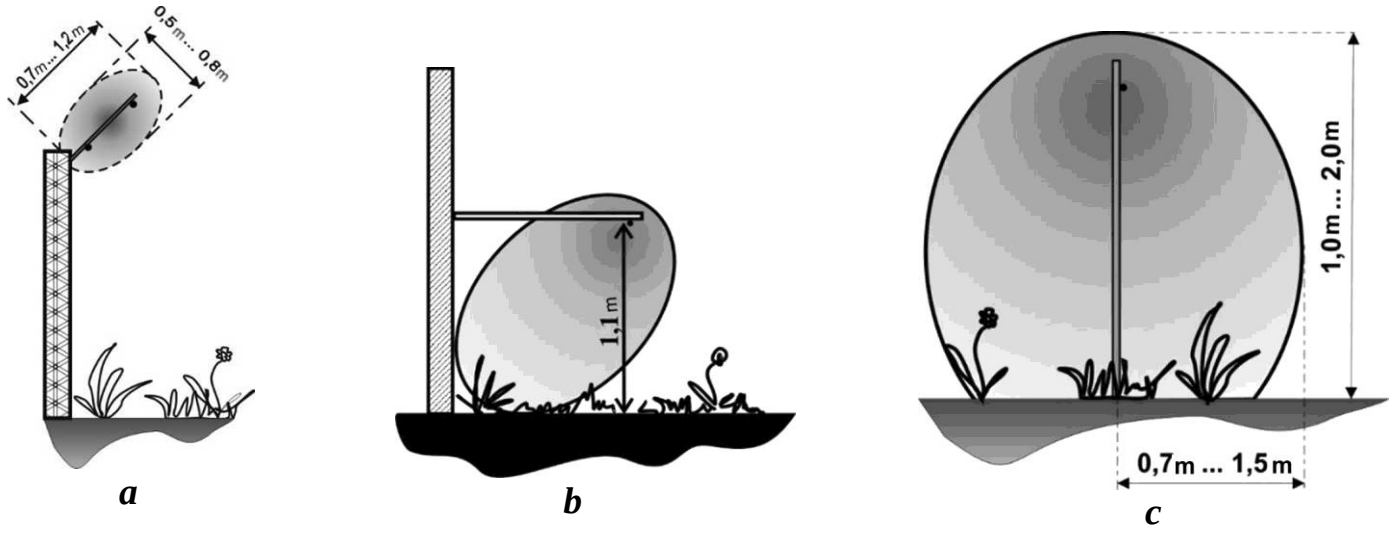


Fig. 2.1

2.3 If necessary, DZ can be included the barbed wire (Fig. 2.2).

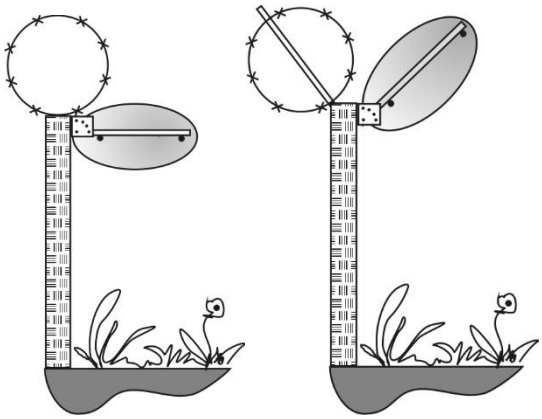


Fig. 2.2

3. TECHNICAL DATA

3.1 The detector provides continuous round-the-clock operation.

3.2 The range of the detector (the length of the detection zone) is from 5 to 250 m [(5 to 250 m) ×2].

3.3 Top-tier circuitry & signal processing. Premium-grade electronics and advanced signal-processing algorithms ensure the highest immunity to induced voltages and electromagnetic interference, while minimizing power consumption for continuous, stable performance. Compact enclosure made of corrosion-resistant metals with IP68 protection. High-grade electronic components rated for extended temperature ranges are combined with multilayer protective coatings using specialized compounds, ensuring exceptional durability and long-term reliability in harsh environments. The detector ensures operability in temperate and cold climates, but at temperatures from minus 50° C to plus 50° C). The maximum limits of the temperature range are from minus 65°C to plus 85° C.

3.4 The detector is powered by a DC source with a rated voltage of 24 V with a permissible voltage range of 10 to 36 V.

3.5 The maximum current consumed by the detector via a DC circuit does not exceed 30 mA, and the maximum power consumed by detector, does not exceed 0.35 watts. However, when turning on the power, it is necessary to take into account the doubled starting current (charging the capacitors and starting the internal power supply).

3.6 The detector provides the ALARM signal to the control circuit for a duration of 5+1 sec. The ALARM signal is formed by changing the resistance value of the output control circuit from a value of less than 35 Om to a value of more than 200 kOm (by opening the "dry" contact group of the output relay). When measuring the resistance value of the output control circuit, the voltage should not exceed 39 V, and the current should be limited to no more than 100 mA.

3.7 The detector provides detection with a probability of at least 0.98 of intruders crossing the zone and issuing an ALARM signal to the control circuit.

3.8 ALARM signals generated by opening the optocoupler at the output of CU. The optocoupler connected to clamps of CU.

3.9 In standby mode, the optorelay is closed and the resistance value on the wires of the output control circuit is 0+30 Om.

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3.10 In the ALARM mode, the resistance value on the wires of the output control circuit is more than 200 kOm.

3.11 The detector provides the formation of an ALARM signal and a corresponding indication on CU in case of intrusion of intruders into the detection zone, breakage or short circuit of the SE wires, when changing the values of the tuning organs.

3.12 The detector provides the formation of a continuous ALARM signal when the power supply voltage is turned off (without indication on the front panel CU).

3.13 It is allowed to generate an ALARM signal when touching the detector blocks, SE and grounding wires with a hand or an electrically conductive object.

3.14 The detector ensures operability near power lines up to 500 kV.

3.15 The detector ensures round-the-clock operation: when exposed to solar radiation; when passing outside the detection area of vehicles; when exposed to electromagnetic interference (voltage pulses in power supply circuits, electric discharges, and other electromagnetic fields); wind speeds up to 40 m/s; exposure to precipitation in the form of rain up to 40 mm/hour; exposure to precipitation in the form of snow up to 40 mm/hour.

3.16 The detector does not generate an alarm signal when: crossing areas by single small birds (no more than 150 mm); movement of a group of people at a distance of at least 1.5 m from the UW SE (for the "visor" installation option) and at a distance of at least 2.5 m from the UW SE (for the "ground" installation option); the movement of vehicles at a distance of at least 2 m from the UW SE (for the "ground" installation option) and at a distance of at least 5 m from the UW SE (for the "surface" installation option).

3.17 The detector does not generate an Alarm signal when single small animals (cat, dog) with a height at the withers of not more than 0.5 m and weighing up to 20 kg are moving in the area: for the "visor" installation option – at a distance of at least 0.8 m from the UW SE; for the surface installation option – at a distance of at least 1.2 m from the UW SE.

3.18 The detector has the possibility of remote monitoring of operability. The remote monitoring signal (constant voltage from the supply range) must be applied to terminals "A" and "B" of CU without observing the polarity for a period of at least 0.3 s. In case of good condition, the detector generates an ALARM signal in response to the DC signal.

3.19 The detector has built-in single-level protection against induced voltage in all external circuits up to 500 m long (250 m for “overhead” lines) connected to the CU terminals during lightning or other electrical discharges. The input circuit protection activated when the input voltage exceeds ~39...40 V. Despite this, if the length of the overhead lines connected to the terminals exceeds 100 m, additional lightning protection devices must be installed.

3.20 Overall dimensions of the housings of RU detector is 130×36×30 mm, TU detector is 112×36×30 mm, CU -150×64×60 mm.

3.21 The weight of the RU and TU, CU blocks are not more than 0.8 kg.

3.22 The service life of the detector units is at least 10 years.

4. SCOPE OF DELIVERY

4.1 Basic detector delivery package:

NAME	Quantity
TU, RU	Two each
Special consoles for RU and TU	Four
CU, Installation Guide	One each

4.2 In addition, the following MKs may be included in the detector package:
The mounting element for TU and RU wires on walls, barriers, etc.

MPW-22-1	SE wire attachment unit for RU and TU	Scope of delivery

"SMP1" wire attachment unit (WAU-01P) is designed to attach one or two SE wires using dielectric poles or tree trunks.

wire attachment unit 15x10x300 mm	Scope of delivery

"SMP2" wire attachment unit (WAU-02P) is designed to attach one or two SE wires along the top of any barriers.

wire attachment unit 15x10x700 mm	Scope of delivery

"SMP3" wire attachment unit (WAU-03P) is designed for attaching one or two SE wires along the surface of any barrier.

WAU-03P/1,2	wire attachment unit 15x10x1200 mm	Scope of delivery
WAU-03P/1,5	wire attachment unit 15x10x1500 mm	scope

"SMP4" wire attachment unit (WAU-04P) is designed to attach one SE wire above the ground surface (in an open area without obstacles or along any obstacles).

Stepson, fiberglass stand (1,5 m)	Scope of delivery

Tensioner for WAU-04P - Tensioning unit at the end or at SE (SE wires) bending point (A rope, a lanyard, and a support pin).
Wired sensitive elements made of insulated and (or) non-insulated wires, the length of the wires is determined at the time of order.
Earthing devices 1,8 m (2 pieces).

5. DEVICE AND OPERATION OF THE ALARM

5.1 Working principle

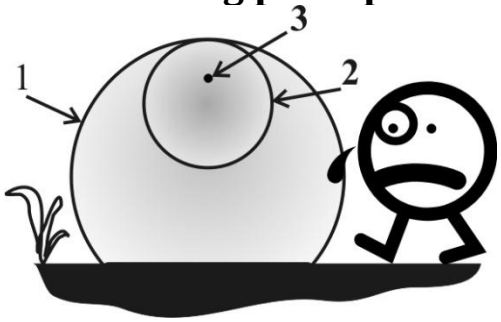


Fig. 5.1

5.1.1 The operation of the alarm based on the detection of a violator by the change of parameters of the electromagnetic field formed around the wired SE.

5.1.2 The width of DZ ("1", "2" see Fig. 5.1) of each line is regulated within 0.3…2 m ("3" – UW of the detector). It is necessary to remember that with large dimensions of the cross-section of the DZ, swaying under the influence of the wind, vegetation and other moisture -containing or electrically conductive objects may get into it.

5.2 The sensitive element

5.2.1 The width of the DZ ("1", "2" see Fig. 5.1) of each line is regulated within 0.3…2 m ("3" – UW lines of the detector). It is necessary to remember that with large dimensions of the size of the DZ, vegetation and other moisture-containing or electrically conductive objects may get into it swaying under the influence of the wind.

5.2.2 For the ground-level option, UW is located at a height of (1.0…1.8) m from the ground surface, and LW is either buried 5…10 cm under UW or placed at the selected height.

5.2.3 The volumetric DZ is formed around the SE wires, is concentrated along them and has a cross-section in the form of a truncated, depending on the conductivity of the earth, oval. Options for constructing SE and the section of DZ are shown in Fig. 5.2.

5.2.4 If it is necessary to create DZ along a barrier or using existing poles and tree trunks, the SE is mounted using SMP1 (with shortened consoles), SMP2 (standard), and SMP3 (with extended consoles). In this case, the UW SE is mounted on dielectric consoles that are attached to the barrier or poles using appropriate brackets.

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In this case, the UW SE is mounted on dielectric consoles, which are attached to the fence or poles using appropriate brackets.

5.2.5 The bracket design allows you to choose any console angle from 0° to 90° with a resolution of ~22° (Fig. 5.3). The angle of inclination can be easily changed depending on the task at hand and the design of the barrier.

5.2.6 The SE wires are attached to the supports and consoles using clamps and screws.

5.2.7 The LW is laid between TU and RU and is fixed either at the bottom of the console or

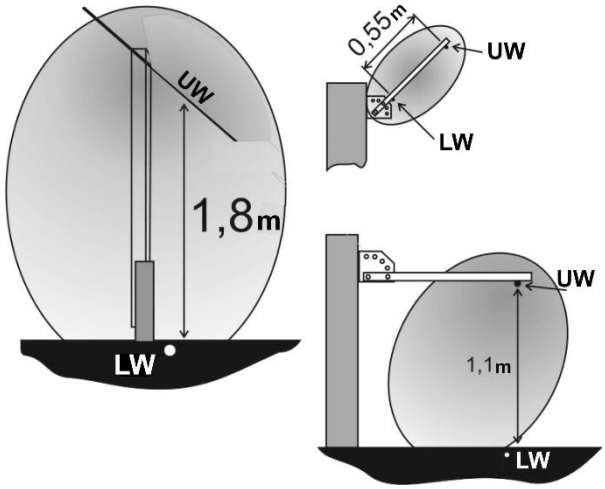
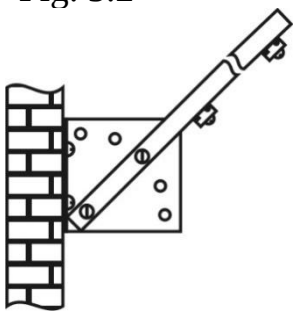


Fig. 5.2

at a selected distance from the ground surface, or it is buried at a depth of 5-10 cm for ground-level placement. The angle of inclination can be easily changed depending on the task at hand and the design of the barrier.


Fig. 5.3

5.2.8 When burying the lower wire, it is necessary to monitor the integrity of its insulating sheath. Violation of the insulating properties of the sheath may lead to complete inoperability of the detector.

5.2.9 UW fixed in the upper part of the supports or consoles in parallel with LW. The maximum sag of the wires in the middle of the span between two adjacent consoles should not exceed 50 mm.

5.2.10 When installing SE on or along an electrically conductive barrier, all electrically conductive elements of the barrier must be securely grounded.

5.3 Description of the block design

5.3.1 General information

5.3.1.1 The transmitting unit (TU, see Figure 5.4) and the receiving unit (RU, see Figure 5.5) have a similar design. The protection rating of the unit housings is IP67. The detector housings are made of aluminum. A sub-unit based on a printed circuit board installed inside the housing. The UW and LW contacts for connecting the UW and LW SE, respectively, and the grounding terminals for TU (RU) are located on the end surfaces of the housings. The UW and LW contacts are protected from foreign meteorological by protective caps. Near the SE upper and lower wire inputs the front surface has the corresponding markings "UW" and "LW".



Fig. 5.4

5.3.1.2 The SE wires are connected to the UW and LW contacts using screws and washers. To prevent moisture from entering the housings, the UW and LW contacts should be oriented towards the ground surface.

5.3.1.3 The TU and RU grounds are connected using an insulated wire with a diameter of 1...2 mm and a special terminal located at the bottom of the housing. The ground wire is clamped with a nut. The plate at the base of the housing allows you to mount TU and RU on various surfaces (fence, wall).

5.3.2 RU construction

5.3.2.1 The RU detector differs from the TU detector in that it has a cable built into the end surface and controls (see Figure 5.5). The chassis is marked with the following symbols: "UW", "LW" - clips for connecting UW and LW SE; ⏚ - ground terminal.

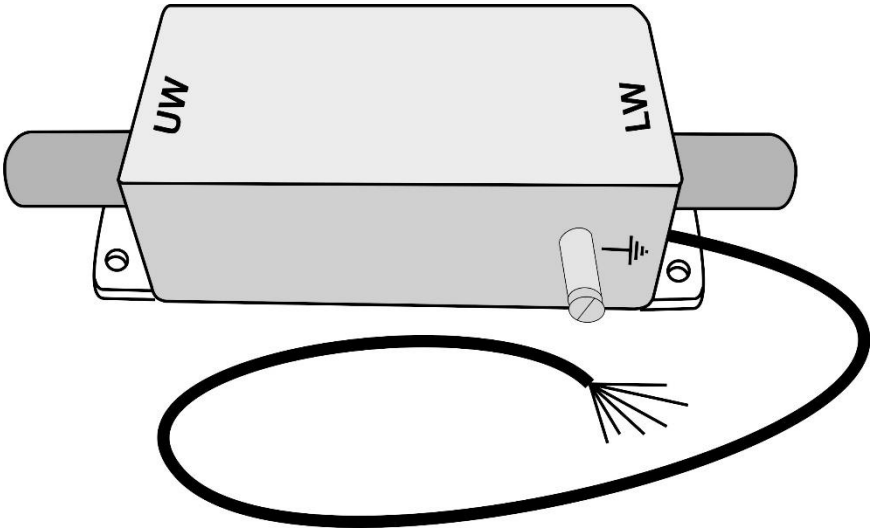


Fig. 5.5

5.3.3 CU construction

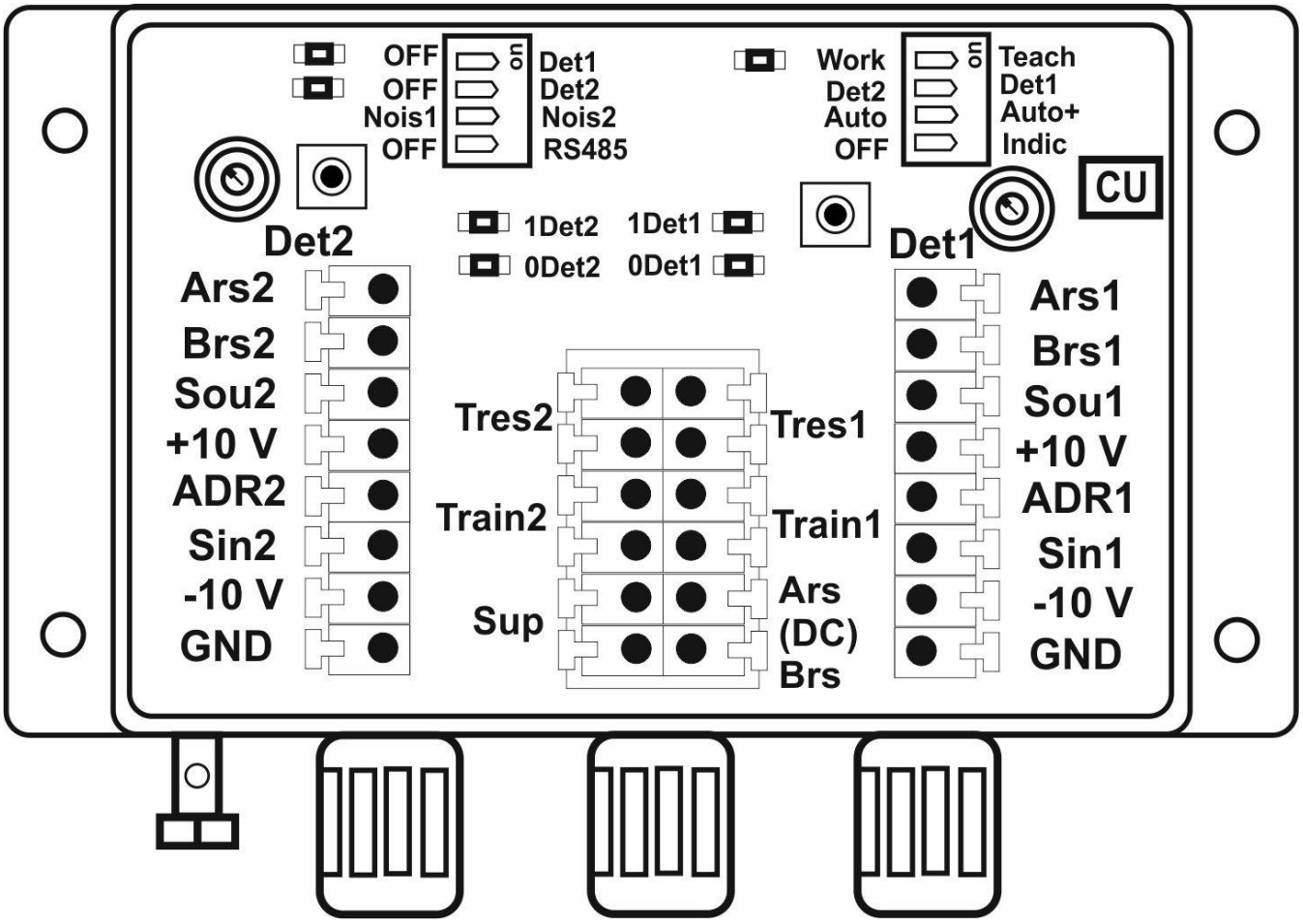


Fig. 5.6

5.3.3.1 The CU block for connecting the RU1 and RU2 with a closed and open cover shown in Fig. 5.6. The protection class of the block housing is IP66. The casing is made of aluminum. A sub-block based on a printed circuit board installed inside the housing. The terminal groups "RU1" and "RU2" designed to connect the built-in harnesses RU1 and RU2 and the seal for external connections are located at the bottom enclosures. The unit covered by a cover, fastened by four screws. Screwless clamps for external connections and a button for monitoring the position of the cover (open/closed) installed on the printed circuit board.

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5.3.4 Controls and indications

5.3.4.1 The control elements include buttons "SB1" and "SB2" controls, and the indication provided by two LED indicators: "HL1" and "HL2".

5.3.4.2 The sensitivity of the detector and maximum speed can be adjusted only by learning by pressing SB1 or SB2 button.

Note. To increase the noise immunity, the maximum speed should be chosen as low as possible, provided that the ALARM signal is reliably generated when the intruder is moving at maximum speed.

5.3.4.4 The indication automatically turned on when the protective cover removed from the RU front panel. The "2" indicator shows that the signal exceeds the noise threshold, the "1" indicator shows that the signal exceeds the set threshold, and the "0" indicator shows that the signal exceeds the maximum value that can trigger an ALARM signal. Note. The ALARM signal generated when the spectral characteristics of the signal match the filter parameters determined by the sensitivity and maximum speed settings (see 5.4.4.2 and 5.4.4.3).

5.3.5 The unit connection of cables

5.3.5.1 The RU1 and RU2 cables connecting to the CU connector socket shown in Fig. 5.7.

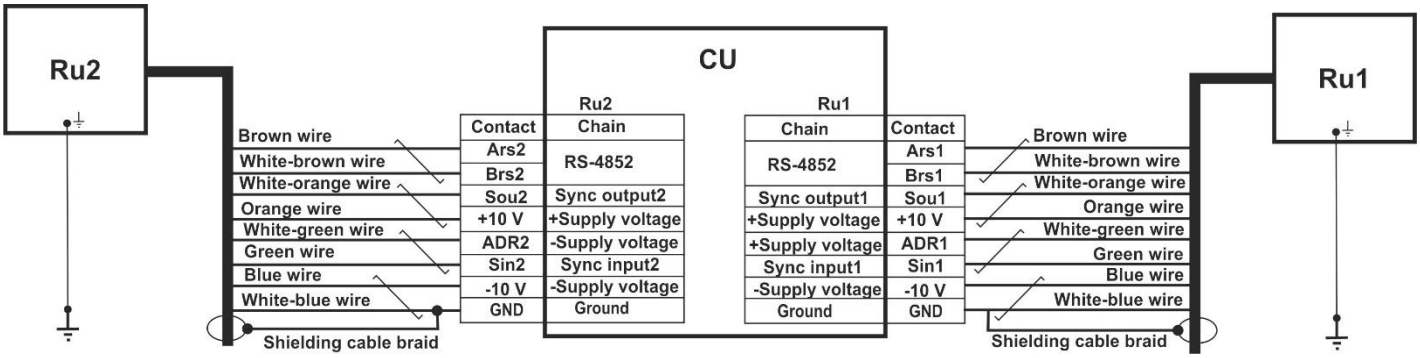


Fig. 5.7

5.3.6 Detector operating modes

5.3.6.1 The detector can be operated in one of three modes:

1) **STANDBY MODE** who monitors the area and issues a mandatory notification when a trespasser of a certain size crosses it.

2) **ADDITIONAL LEARNING** learning, adjusting the sensitivity of the detector, performed when it is necessary to replenish the set of thresholds to exclude insensitivity zones, while preserving the results of previous learning. That is, when there are no false alarms, but the sensitivity in some areas is insufficient.

3) **RELEARNING**, adjusting the sensitivity of the detector performed in the case of a complete replacement of all thresholds when there are false developments due to excessive sensitivity.

5.3.6.2 Sensitivity adjustment performed only through learning and it is necessary to select one of two modes (2 or 3, see 5.3.6.1).

5.3.7 Detector operation mode control

5.3.7.1 Mode control, actually switching from the standby mode (Work) to the corresponding teaching mode (Teach) and back to the standby mode with or without saving the learning results. Control is carried out using the switches (left and right) of CU.

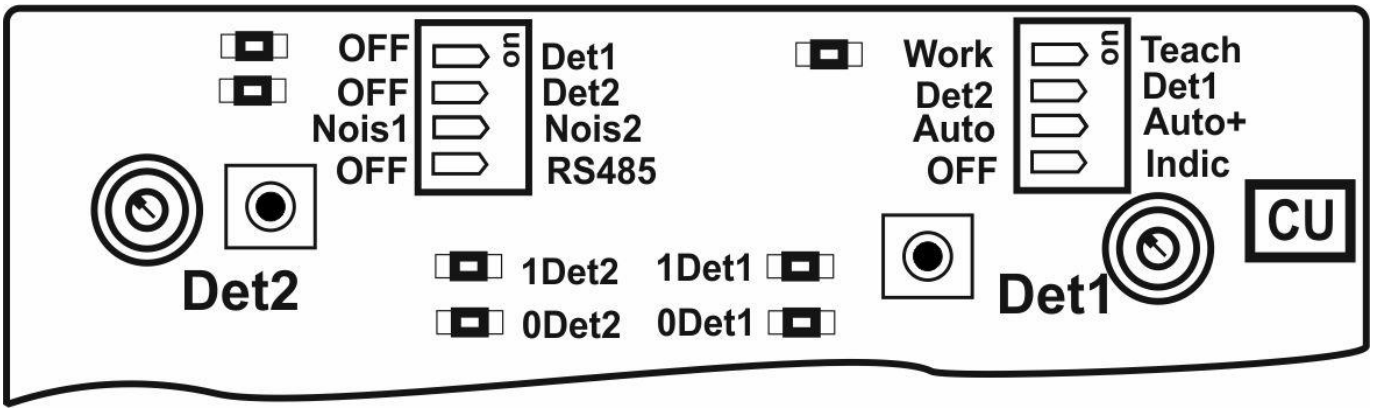


Fig. 5.8

5.3.7.2 To correctly select the detector's learning mode, perform the following actions:

1) Set the "Work – Teach" switch to the "Teach" position;

2) Select the detector flank to be trained "Det1/Det2";

3) Select the learning mode without saving previous learning parameters "Auto" or with saving previous learning parameters "Auto+";

4) Enable the "Indic" indication.

5) Select the noise reduction mode: standard "Nois1" or enhanced "Nois2";

6) Using the variable rotary control "Det1" or "Det2", select the expected width of DZ (the recommended initial position is the middle of the adjustment range);

7) Press the button "Det1" or "Det2" corresponding to the selected flange and hold it until the corresponding indicator "0Det1" or "0Det2" comes on. After releasing the button, the indicator "0Det1"/"0Det2" will turn off. If you do not release the button but continue holding it until the corresponding indicator "1Det1" or "1Det2" comes on, after 4–5 seconds the "0Det1"/"0Det2" indicator will turn off and the "1Det1"/"1Det2" indicator will turn on. After releasing the "Det1"/"Det2" button, the "1Det1"/"1Det2" indicator will turn off and the detector will revert to the previous settings. If you do not release the "Det1"/"Det2" button and continue holding it until the corresponding pair of indicators ("0Det1" and "1Det1") or ("0Det2" and "1Det2") turns on, after 4–5 seconds the "1Det1"/"1Det2" indicator will turn off and the pairs of indicators ("0Det1" and "1Det1") or ("0Det2" and "1Det2") will turn on. After releasing the "Det1"/"Det2" button, the indicators ("0Det1" and "1Det1") or ("0Det2" and "1Det2") will turn off, and the detector will revert to the factory settings.

6. INSTALLATION PROCEDURE

6.1 Installation on a fence

6.1.1 Before carrying out design and installation work, it is necessary to mentally imagine how DZ will be adjacent to the barrier and form a controlled line. Passing through internal or external corners, height differences, or moving from one side of the barrier to the other, for example, when "circumventing" a building wall, is carried out in accordance with Fig. 6.1... Fig. 6.4. It is necessary to ensure smooth connections between the SE segments by selecting the installation locations and angles of the consoles. It should also be noted that a large number of SE "kinks" or UW proximity to conductive barriers significantly increases signal loss and reduces the maximum allowable length of the protected area.

6.1.2 Clear the barrier and the area around the DZ of construction debris and wires, remove obstructing grass, shrubs, and tree branches, and secure extraneous wires and cables that are swaying in the wind.

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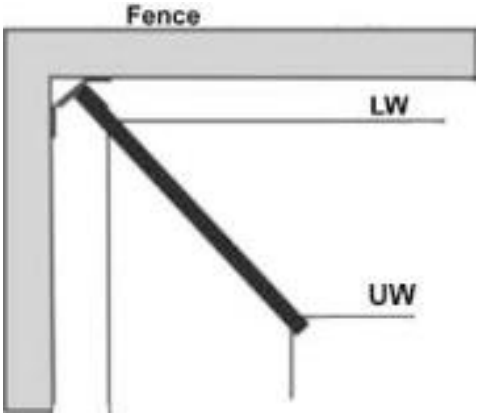


Fig. 6.1

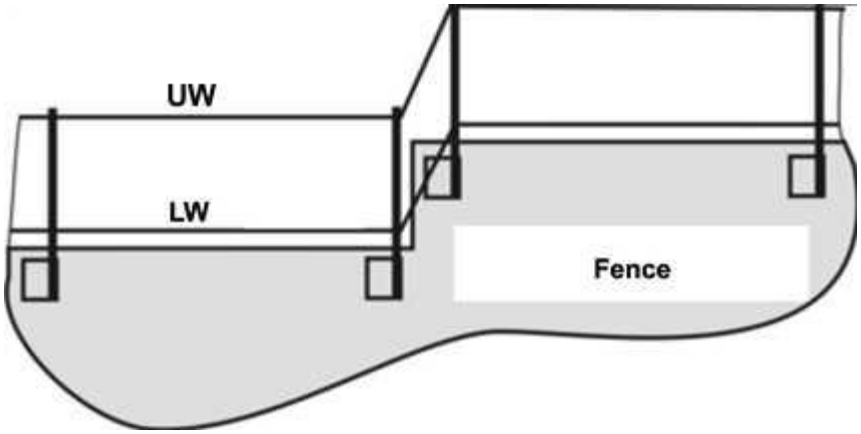


Fig. 6.2

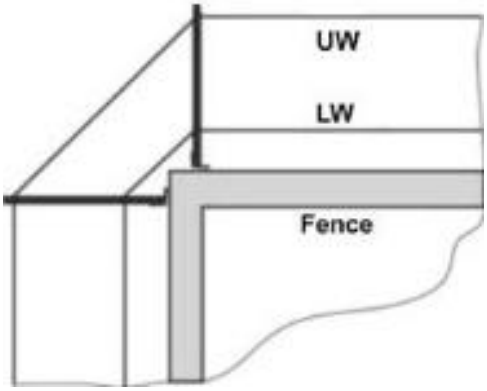


Fig. 6.3

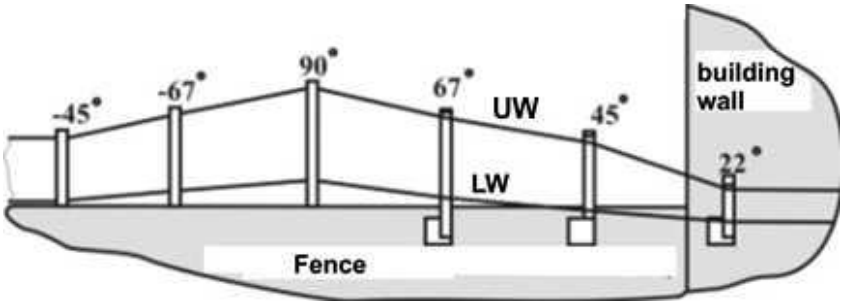


Fig. 6.4

6.1.3 Install the brackets with dielectric consoles from the MK2 mounting kit on the fence with an interval of ~ 3...5 meters. Attach the brackets 1 to the guard 3 using screws, bolts, or other fasteners 2 according to Figure 6.5. Install the dielectric console 4 on the bracket 1. Attach the bottom wire LW 6 to the bottom of the console 4 using a clamp and screw 7. Also attach the UW 8 to the top of the console 4.

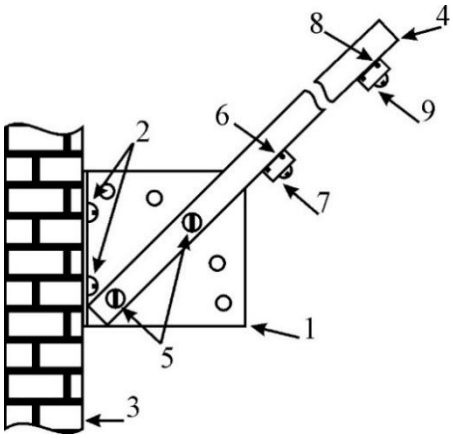


Fig. 6.5

6.1.4 Use the screws to secure TU and RU to special consoles at opposite ends of the alarm system in the area near the attachment points UW and LW on the end consoles, orienting them with the inputs UW and LW to the corresponding wires and making it convenient to connect SE wires.

Figure 6.6 shows the mounting of the RU unit (TU) 1 to the special console 2. Using two screws 3 with washers. Attach RU (TU) 1 to the special console 2. Fix RU (TU) 1 using screws 3 with washers to the special console 2. Fix RU (TU) 1 in such a way that it is located under the console 2 (from the ground). Secure UW and LW with clamps 4, screws 5 with washers and nuts 6 with washers. Install the special console bracket under MK2 end console. Attach bracket 1 to barrier 2 using screws, bolts, and other fasteners 3 in accordance with Figure 6.6. Install dielectric console 2 on bracket 1. Attach upper wire 5 and lower wire 6 to console 2 using clamps 4 and screws 5.

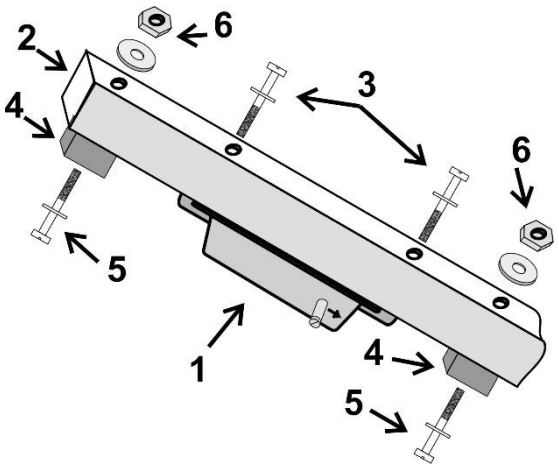


Fig. 6.6

6.1.5 Install the detector in accordance with Fig. 6.7 and Fig. 6.8, taking into account the above recommendations.

6.1.6 Connect adjacent RU to the same grounding device (Fig. 6.7).

6.1.7 Connect each TU to its own grounding device, the distance between which should be at least 1 m (Fig. 6.8). The grounding wires are laid non-parallel to each other along the surface of the fence (wall) up to the grounding wire itself. Use an insulated copper wire with a diameter of at least 0.5 mm as the grounding wire.

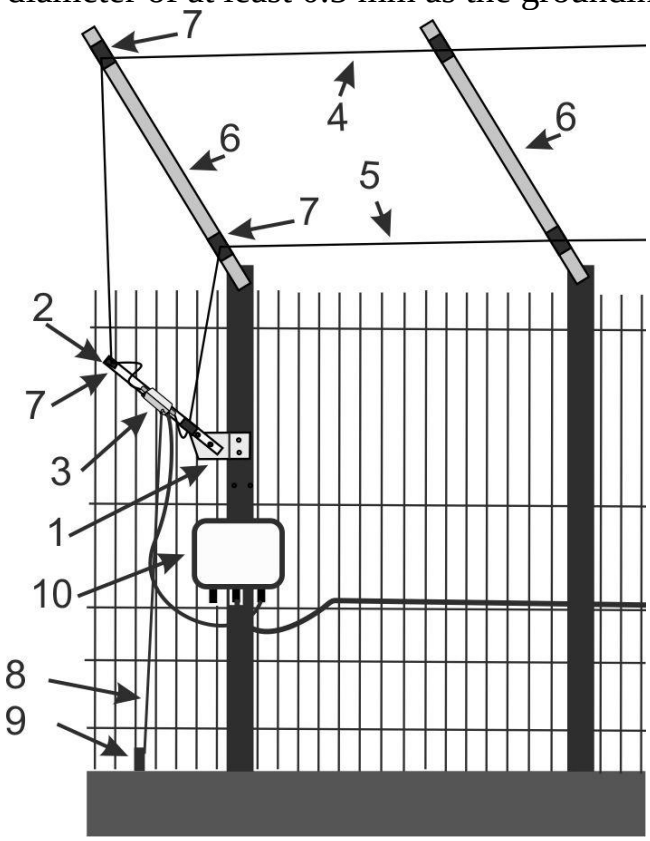


Fig. 6.7a

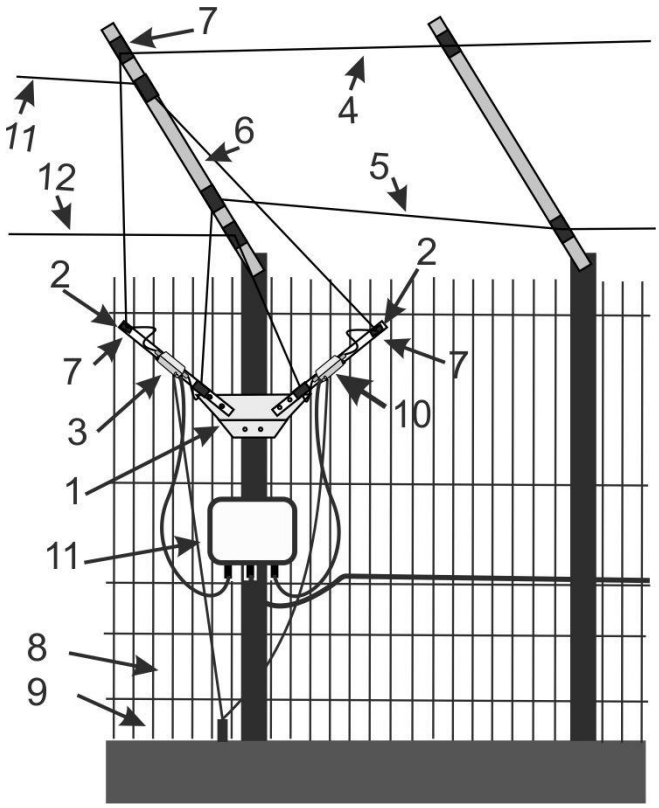


Fig. 6.7b

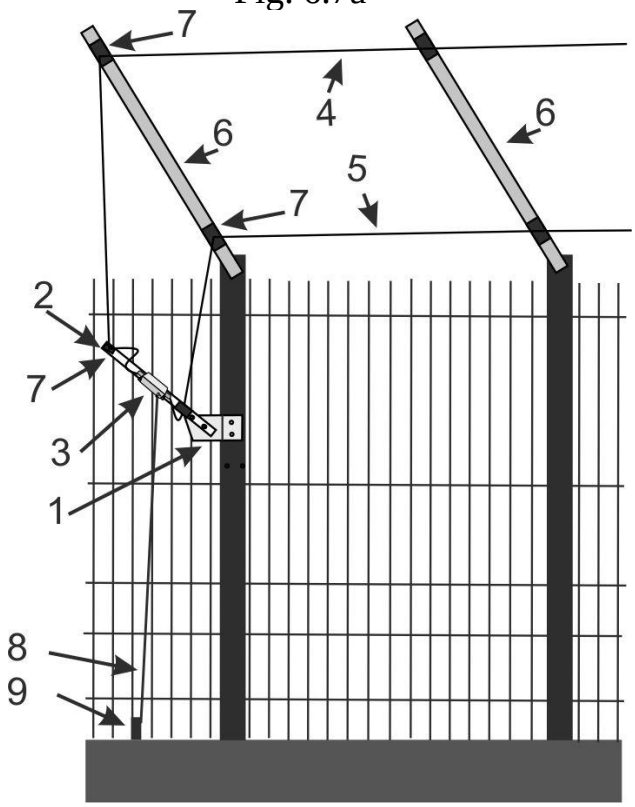


Fig. 6.8a

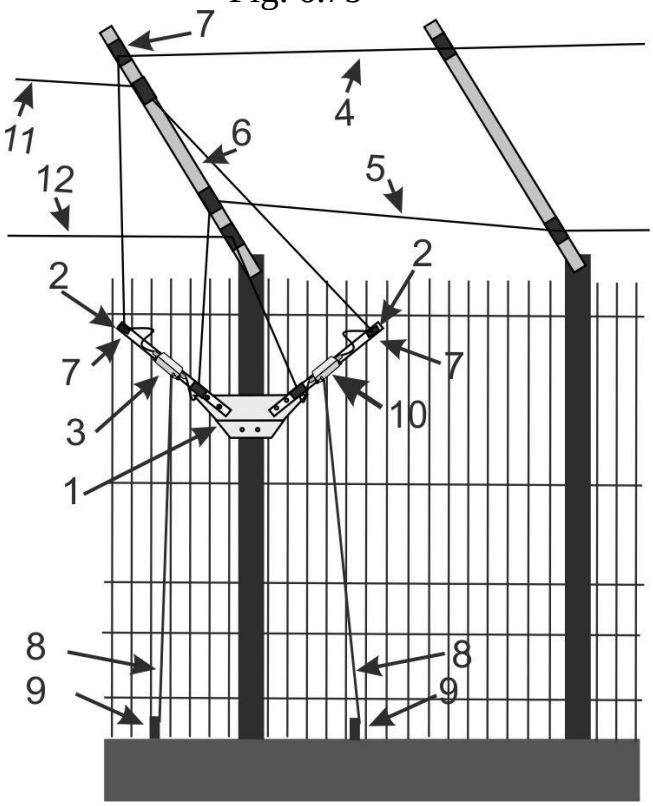


Fig. 6.8b

DOO "SECLUE TECHNOLOGIES"

6.1.8 LW and UW is selected as insulated (SE-1 or SE-3) or uninsulated (SE-2). If UW and LW are selected as uninsulated, care must be taken to ensure that they do not touch the different objects.

6.1.9 Install grounding pins with a resistance of no more than 30 Ω under RU and each TU and connect them to the grounding terminals of the units.

6.1.10 Start fixing UW with the middle of the section. Fix the UW at the top of the console, pull it simultaneously in opposite directions with a force of 5…6 kg, and fix it at the top of the adjacent dielectric consoles with screws. Pull and fix the UW in opposite directions.

6.1.11 The LW is mounted depending on the selected ЗО conslearnts and maintenance strategy. Fix the LW at the bottom of the console parallel to the UW. When laying the LW in the ground, it should be buried in the ground to a depth of ~5...10 cm and is protected by a plastic corrugated sleeve to prevent damage.

6.1.12 The preparation and connection of the UW and LW to the TU (RU) contacts must be carried out in accordance with Section 6.2.1.

6.1.13 When laying SE wires to adjacent TU, it is necessary to ensure the least capacitive coupling between them. To do this, avoid their parallel or close location (in case of wind, the wires should not approach by less than 100 mm) and achieve a projection of their intersection close to the perpendicular. Each TU is grounded to its own grounding device.

6.2 Wire and cable entry

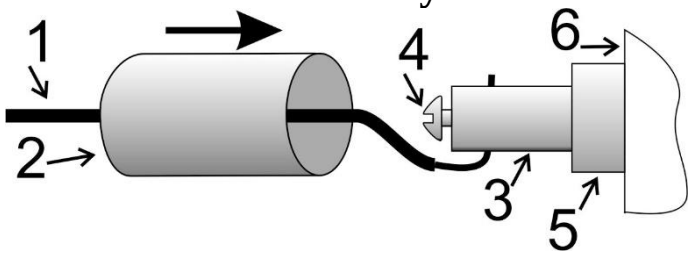


Fig. 6.9

6.2.1 Prepare and connect UW and LW to TU and RU, following Fig.6.9. Release the end of UW (LW) 1 by 10 mm from the insulating layer and twist the cores. Remove the protective cap 2. Pass the wire 1 inside the protective cap 2 through the hole in it. Release the side hole in terminal 3 by unscrewing the clamping screw 4 a few turns. Insert the twisted part of wire 1 into the side opening of terminal 3. Fix the wire 1 in terminal 3 with screw 4, apply the lubricant the installed connection UW and LW, the screws and washers used to attach UW and LW, and put the protective cap 2, as shown in the figure, on the bushing 5 all the way (to the end wall of the unit 6).

6.2.2 Insert the integrated RU cable into CU and secure the integrated RU cable. Insert the remaining cables into the switching compartment of CU in the same way and connect them to the screwless terminals.

6.3 Connecting cable lines

6.3.1 In accordance with the electrical diagram of the project and the diagram in Figure 6.10, connect the conductors of the communication cable to the corresponding terminals of the RCD and PSU, and to the terminal contacts “CU” located in CU. Insert the control resistor Rs required for the RCD into the “Tres1” terminals. Connect a pair of control wires from the corresponding terminals of the selected RCD channel to the “Learn1” terminals of CU. If the “Learn1” circuit is controlled without a control resistor (a jumper in the “Tres1” terminals), the current must be limited to a value not exceeding 100 mA (instead of a jumper in the “Tres1” terminals, you can install a current limiter). Connect the power supply output to the two “SUP” terminals.

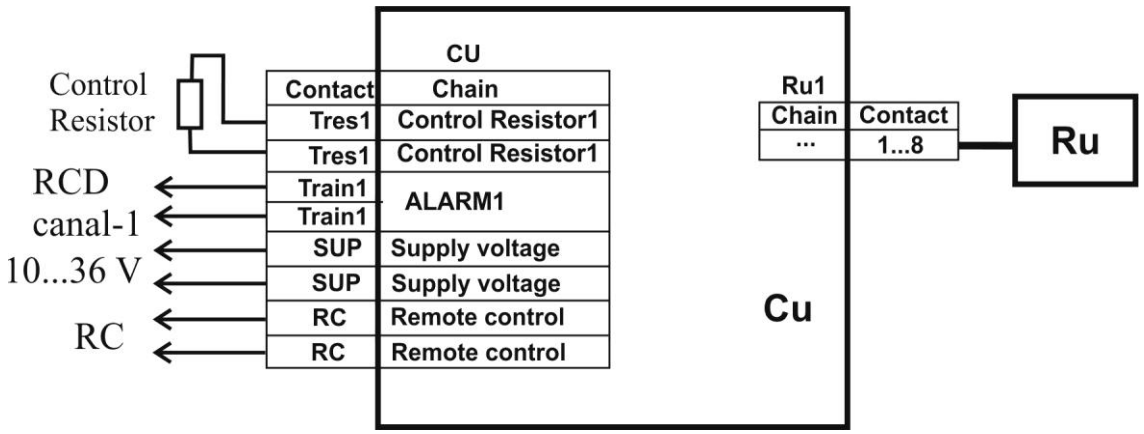


Fig. 6.10

6.3.2 If RU1 and RU2 are connected to a common CU, the connection should be made in accordance with Figure 6.11.

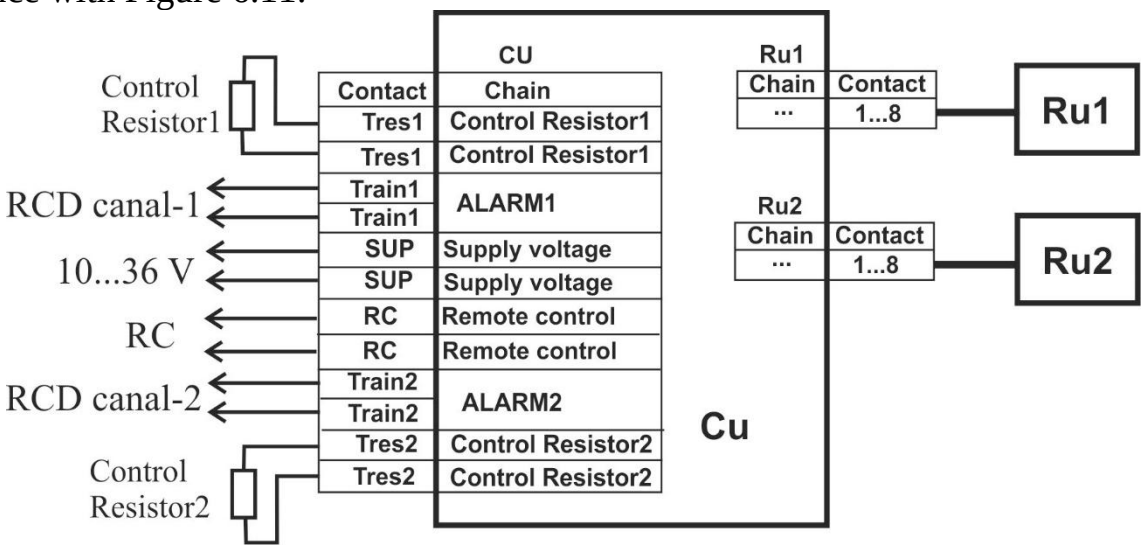


Fig. 6.11

Notes. 1) To connect the cable wires, press the contact lever, insert the conductive core into the opened contact hole, and release the lever; 2) Install the control resistor necessary for RCD into the terminals of the RC and monitor the terminals of Tres, while the value of control resistor is determined by the resistance required to maintain the STANDBY MODE of the receiving and monitoring device; 3) The cross-section diameter of the wires connected to the terminals should not exceed 2.5 mm.

6.3.4 Insert the grounding wire into the contact hole of the grounding terminal and fix it with a bolt.

8. PREPARING THE DETECTOR FOR OPERATION

8.1 Checking the detector's power supply

8.1.1 Open the protective cover CU.

8.1.2 Apply the supply voltage to the terminals "SUP" CU, and the indicators must turn on and off again. "HL1" ("HL2").

8.2 Checking the detector's operability

8.2.1 The operators should be positioned within line of sight, one at CU and the other at a distance of 5 m from the SE (starting position).

8.2.2 The CU operator must select the learning mode, following the instructions in clause 5.3.6, and enable the selected mode. To do this, press (see Fig. 8.1) and hold the corresponding

DOO "SECLUE TECHNOLOGIES"

“Control…” button until the indicator lights up for the first time (additional LEARNING) or the second time (RELEARNING), then release the button, wait until the indicator corresponding to the selected flange stops glowing, and give the command to the first operator to move in the direction of the CE wires.

8.2.3 If the indicator continues to flash or glow for more than 5 minutes after the mode is activated, identify and remove any sources of interference (secure movable foreign objects, mow the grass, etc.).

8.2.4 The first operator should slowly (0.3...0.5 m/sec) approach the line of DZ in the "standing" position (see Fig. 9.1), until the "LED1" indicator ("LED2") is "reliably" turned on without "jumping", the second operator should command STOP to the first operator. Mark the DZ boundary on this segment of the boundary.

8.2.5 Repeat clause 8.2.4 on various cuts of the line in the "standing", "crouching" and "squatting" positions.



Fig. 8.1

8.3 Detector learning

8.3.1 The operator near CU should turn on the learning mode, following paragraphs 5.3.7.

Notes. This detector does not have the option of manual adjustment and indication due to the large number (more than 16) of threshold values and can only be adjusted in semi-automatic mode. When one operator crosses DZ, another operator briefly presses the «Det1» or «Det2» button on CU, recording the required moment when the detector is triggered. The correctness of the adjustment is verified using test passes in the standby mode. Before adjusting the detector, it is necessary to mentally visualize the volumetric zone and identify possible distortions caused by various obstacles along the controlled boundary. Find out how to cross DZ. For example, a detector setup diagram is provided, with a zone located above the ground surface and free of obstacles.

8.3.2 The operator must position themselves outside the controlled zone at a distance of at least 5 m from SE wires (initial position).

8.3.3 The operator located near CU must wait until «0Det1» and «1Det1» («0Det2») and «1Det2») indicators go out or start “flashing” briefly, and then give the command to the operator to cross DZ.

8.3.4 The operator must cross the DZ line while standing as quickly as possible (Fig. 8.1). When the central line is reached, the operator stops, and the operator standing next to CU briefly presses the button and releases it after 1 second. A four-fold uniform glow of «0Det1» («0Det2») indicator after releasing the button means that the threshold value has been reached. If there is no uniform glow after releasing the button, this means that the threshold value has not been reached, for example, due to proximity to a noise signal or pressing the button for too short a time. The operator located near DZ must immediately leave the controlled area after the operator located near CU presses the button and move to a distance of at least 5 meters from the SE wires.

8.3.5 Repeat points 8.3.2... 8.3.4 on different sections of the track in different positions (“standing”, “bending”, “squatting”), provided that the operator must cross DZ. After each crossing, the operator must return to the starting position and move along the boundary at a distance of at least 5 m from the marking lines.

8.3.6 For the “visor” variant of DZ crossing, carry out points 8.3.2...8.3.5 in any way between the SE wires, provided that the operator’s body must cross DZ. Each time the operator’s center of gravity is between the SE wires, the operator standing next to CU briefly presses and releases the button.

8.3.7 After training the detector, move the “Work/Teach” slider of the switch to the “Work” position; intermittent flashing of the indicator eight times when the button is released means that the data has been saved.

*Note. If for some reason you do not need to save the training results (the selected threshold values), hold the button down until the indicator lights up for the third time.

8.4 The procedure for learning the detector

8.4.1. Make sure that there are no people or animals at a distance of 5 m from the SE wires. Stand at CU in such a way that you can see the glow of the indicators and be able to press the "Det1 (Det2)" buttons on the front panel CU. Wait 3-5 minutes.

Notes: Between the operator's approaches to SE, pause for 2-3 minutes, remaining in the starting position. If the control unit is close to DZ, the control unit operator must constantly (without releasing) press the button "Det1 (Det2)" and not move at the moment of training, so as not to affect the formation of the signal. Attention! Setting the detection range too wide may result in false alarms!

8.4.2 Switch the sensor to “Teach” mode (performed when the thresholds are completely replaced, the sensitivity of the sensor is reduced or increased) or “Teach+” (performed when thresholds are added or the sensitivity of the detector is increased) see point 5.3.7.

8.4.3 After switching off (stopping the glow) * of “0Det1/0Det2” and “1Det1/1Det2” indicators, give the command to the operator located next to SE to cross DZ in any direction in the "standing", "bending" or "crouching" position (for the version with a visor — between the wires of SE in any way), with a pause of 2-3 minutes. When DZ centerline is reached, the operator must stop, and the operator next to CU must briefly (for 1 second) press the "Det1/Det2" button and release it. After each release of the button, the corresponding indicator “0Det1/0Det2” should methodically "blink" 4 times (intermittently light up). After pressing the button, the operator at SE must immediately move away from the conditional centerline by a distance of at least 5 m (return to the "starting position"). If you hold down the button until the corresponding indicator “1Det1/1Det2” is turned on for the first time (RESET1 mode), the detector will reset the last settings. If you hold down the button until the corresponding indicator “1Det1/1Det2” is turned on for the second time (RESET2 mode), the detector will reset all settings and switch to factory settings. At the end of the training, turn the "Work/Teach" switch to the "Work" position, while the corresponding "1Det1/1Det2" indicator should methodically "flash" 8 times and the learning results are recorded in the detector's memory, after which the detector switches to standby mode.

*Note: It is impractical for the operator to move his hand from the body or button of the device during training, so as not to introduce additional noise and distortion into the settings. It is allowed to briefly turn on ("blink") the indicator in the LEARNING mode. If the indicator is turned on frequently, the operator should move away from the SE wires at a distance of more than 5 m, observe the indicators and do not move for several minutes. The "Det1 (Det2)" indicator should not flash spontaneously. If the indicator turns on frequently, identify and eliminate the source of the interference.

8.4.4 In case of frequent flashing of the "0Det1/0Det2" and "1Det1/1Det2" indicators, switch the "Nois1/Nois2" switch of the left switch to the "Nois2" position during teaching, this will help significantly reduce the effect of interference on the detector operation.

DOO “SECLUE TECHNOLOGIES”

8.4.5 If it is necessary to increase or decrease the sensitivity of the detector, turn the axis of the "Det1 (Det2)" control clockwise to increase sensitivity, or counterclockwise to decrease sensitivity. At the same time, the signal processing and filtering set during the detector training will remain the same.

8.4.6 Before closing the CU cover, the "OFF/Indic" switch must be switched to the "OFF" position.

The detector is in standby mode.

8.5 Detector check

8.5.1 The operator near SE must cross the line in any places and in various positions ("standing", "bending", "squatting"), provided that the DZ line is necessarily crossed. After each activation of the alarm indication, the operator should immediately move away from the conditional centerline at a distance of at least 5 m.

8.5.2 The operator near CU should monitor the formation of ALARM signals and mark the distances from the operator to UP at the moment the ALARM signal appears.

8.5.3 The operator near SE must cross the controlled boundary. Between the operator's approaches to SE, pause 2-3 minutes in the starting position.

8.5.4 The operator should attempt to overcome DZ at intervals of 2...3 minutes. in various places along the line of DZ. After each crossing, the operator should immediately leave the controlled area, and the operator near CU should be fixing by the intermittent glow of the corresponding indicator.

8.5.5 For the ground-level variant without a barrier, determine the width of the zone, and for this, give the operator a command to cross the line in the "standing" position. When the alarm is turned on, stop the operator, the distance from the operator to UP should not exceed 0.75 m (for the width of the zone = 2 m). If the measured distance is more than 0.75 m, relearn the detector.

8.5.6 Close the lid of CU and controlling the detector's operability by watching the alarm signals using the RCD.

8.5.7 In case of false alarms of the detector, change the setting of the corresponding flank and perform a check and a control run of the detector.

9. MAINTENANCE REGULATIONS

9.1 Maintenance of the detector provides for the planned semi-annual performance of a complex of preventive work in the following scope: external inspection of the detector; checking the condition of the SE wires; checking the mounting and connection elements of the SE; checking the operability of the detector.

9.2 Methods of carrying out maintenance operations.

9.2.1 Upon external inspection, check: whether the protective covers RU and CB are tightly closed; no discoloration, traces of corrosion; no gusts and cuts on the wires SE and connecting cables; no sagging of the SE wires more than 50 mm and no ice on the SE wires; reliable mounting of detector blocks, SE wires and grounding.

9.2.2 To check the detector's operability, the operators should be positioned within line of sight, one at RU and the other at SE in the initial position. The operator must overcome obstacles at various points of the guard line and return to the starting position. The operator at RU should record the alarm signal. Overcome after (2…3) m. In alarm mode, the corresponding indicator lights intermittently on the front panel of RU.

9.2.3 Check the secure fastening of the mounting brackets of the SE elements and the fastening of the wires to the dielectric consoles and contacts UW and LW, if necessary, secure them.

9.2.4 Check the condition of the SE wires and connecting cables.

9.3 Routine maintenance requires: an ampere-voltmeter; screwdrivers; keys; pliers; wire cutters; ladder.

10. RULES OF STORAGE AND TRANSPORTATION

10.1 The detector must be stored in the manufacturer's packaging.

10.2 The detector must be transported in its original packaging.

11. TYPICAL MALFUNCTIONS AND METHODS OF THEIR ELIMINATION

Manifestation	Probable cause	Method of elimination
1. The indicators do not turn on on the CU panel	a) There is no supply voltage b) the cables are incorrectly connected	a) Fix the faulty cables b) check the correct connection
2. An ALARM is continuously issued	a) the upper or lower wire is broken or "shorted" of these wires; b) the total length of the SE is greater or less than specified in clause 3.2.	a) restore the integrity of the SE wires b) bring the length of the SE in accordance with the instructions in section 3.2

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