Wire-Wave Intrusion Sensor
RELIEF-2

User Manual
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Zarechny
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The present user manual contains the information about the wire-wave intrusion sensor RELIEF-2 (below the sensor) and the information necessary for the correct sensor operation (use, transportation, storage and maintenance).

The following abbreviations are used in the User Manual:

Rx– receiver

Tx– transmitter

MK - mounting kit

RC– remote control

LP – linear part

UW- upper wire

LW- lower wire

NC – normally closed

O/T – Operation/Training mode

S – Sensitivity

RCD – receiving-control device

DZ – detection zone

The manufacturer constantly improves the sensor and reserves the right to make changes to its construction, which does not worsen the sensor specifications.

1. DESCRIPTION AND OPERATION

1.1. Sensor Purpose

1.1.1. The purpose of the sensor is to protect different perimeter sites of a difficult relief with height differences and turns, on condition that snow and grass height is up to 1 m (“ground” installation type with the upper wire at the height of 1,8 m).

1.1.2. The sensor detects an intruder crossing the detection zone “at full height” or “bent” (“ground” installation type) and climbing over the fence fabric (“visor” installation type). The detection zone is generated between the upper and lower wires of the linear part. The sensor also registers the disturbance of the protected fence.

1.1.3. The sensor RELIEF-2 has two detection zones and protects two perimeter sites with the ALARM signal generation.

1.1.4. The sensor operates together with control panels, which register relay contact breakings.

1.1.5. The sensor is intended for continuous round-the-clock outdoor operation and is operable at:

- ambient temperature from -40˚up to + 85˚ C;
- relative humidity up to 98% at the temperature of +35˚ C;
- rain, fog, snow;
- solar radiation;
- wind speed up to 20 m/sec and wind gusts speed up to 30 m/sec.

1.2. Specifications

1.2.1. Detection probability is 0,98 minimum.

1.2.2. The length of the linear part at "visor" installation type is from 25 m up to 250 m; at "ground" installation type – from 25 m up to 200 m.

1.2.3. The distance between the linear part wires at "visor" installation type is from 0,7 m up to 1,1 m; at "ground" installation type - from 1,2 m up to 1,8 m.

1.2.4. Time of the sensor availability for operation after supply is ON – 60 sec maximum.

1.2.5. The sensor generates the ALARM signal (relay contacts breaking) when:

- an intruder crosses the detection zone "straight" or "bent" at a speed from 0,1 m/sec up to10 m/sec;
- an intruder climbs over the fence fabric between the linear part wires.

1.2.6. Duration of the ALARM signal (relay contacts breaking) is 3…6 sec. The output relay commutates the voltage up to 50 V at the current up to 0,1 A. The resistance of closed relay contacts 125±25 Ohm.

1.2.7. Time of the sensor availability for operation after the ALARM signal is up to 30 sec maximum.

1.2.8. The sensor does not generate the ALARM signal at:

- movements of people at the distance of 1,5 m minimum from the linear part wires;
- movements of cars at the distance of 2 m minimum from the linear part wires;
- movements of small animals (e.g. a cat, a dog up to 0,5 m high and 20 kg weight).

1.2.9. The sensor is supplied with a VDC source of 10…30 V. The current consumption is up to 90 mA.

1.2.10. The sensor generates the FAULT signal (output relay contacts are open) at:

- breakage of a linear part wire;
- short circuit of the linear part wires;
- insufficient level of the high frequency signal at the Rx input;
- excessive level of the high frequency signal at the Rx input;
- supply voltage drop-out;
- turning on the Rx indication.

1.2.11. All external circuits have the built-in lightning protection.

1.2.12. Sensor weight is up to 2 kg.

1.3. Sensor components

1.3.1. The sensor components are given in Table 1.1.

Table 1.1

Name	Notes
Tx (transmitting unit)	2 pcs.
Rx (receiving unit)	1 pcs.
MK for Rx and Tx fastening:	1 kit

bracket – 2 pcs.; screw – 4 pcs.; male screw M4×55 – 4 pcs.; nut M4 – 4 pcs.; washer – 8 pcs.	
User manual	1 pcs.
Sensor components delivered at the customer's order	
Connector of the linear part wires (non-detachable)	Kit-4 pcs. To restore the linear part in the case of damaging.
Connector of the linear part wires (separable)	Kit-4 pcs. To restore the linear part in the case of damaging. To organize temporal passages in the linear part with the following restoration.
Grounder	Kit-3 pcs.
Mounting kit RELIEF-ST1: bracket – 1 pcs.; dielectric console (fiber-glass plastic) of 0,9 m length – 1pcs.; split pin – 2 pcs., male screw – 2 pcs.; nut – 2 pcs.; washer – 4 pcs.; screw – 2 pcs.	The number of mounting kits depends on the linear part length. For "visor" installation type.
Mounting kit RELIEF-ST2: bracket-1pcs.; dielectric console (glass fiber plastic) of 1,8 m length -1 pcs.; split pin - 1 pcs.; male screw - 2 pcs.; nut - 2 pcs.; washer - 4 pcs.	The number of mounting kits depends on the linear part length. For "ground" installation type.
Wire	The linear part comprises a wire. The length of the wire is indicated at the order.

1.4. Construction and operation

1.4.1. The sensor operation principle is based on the generation of the detection zone between the upper and lower wires of the linear part. Two Tx units are connected to the one Rx unit end of the linear part. It generates an impulse high frequency signal. Rx constantly controls the parameters of an impulse high frequency signal. Any intrusion in the detection zone causes changes of an impulse high frequency signal. These changes are processed in Rx and the ALARM signal is generated.

1.4.2. **ATTENTION! The parameters of an impulse high-frequency signal can change under other influences, such as:**

- the shift of the wires relative to each other (in the case of their sagging);
- swinging tree branches, bushes and grass above 1,0 m; and also their touching with the linear part wires or Rx/Tx units;
- flocks of birds in the detection zone;

- powerful external electromagnetic interferences.

All these influences are considered to be interferences and they should be reduced to the minimum to prevent false alarms.

1.4.3. The following measures provide the reduction of interference influences on the sensor operation:

– algorithm of information processing in Rx;

– fulfillment of guidelines for the sensor correct installation;

– timely maintenance of the sensor.

1.4.4. Operation algorithm of the sensor presupposes its adaptation to the type of a protected site and operation conditions. For this purpose the sensor sensitivity should be adjusted.

If power supply is OFF, the sensor settings are stored in the nonvolatile memory. When power supply is ON, the sensor switches to the operating mode automatically.

1.4.5. For convenience there are LED indicators of the operation modes. To switch on the LED indicators the wire O/T of Rx (blue one) should be connected to the supply "+".

1.4.6. Rx and Tx units are designed in the form of short consoles mounted on the opposite ends of a protective boundary.

1.4.7. The lower and upper wires along the whole protective boundary are fastened with the mounting kit RELIEF-ST1 or RELIEF-ST2. MK consoles are made of dielectric material and fastened with brackets.

1.4.8. The sensor is supplied with a DC power source of 10…30 V. The power supply is applied to Rx; Tx is supplied with the linear part wires.

1.4.9. A long protective boundary consisting of several sectors is formed according to fig. 1.1.

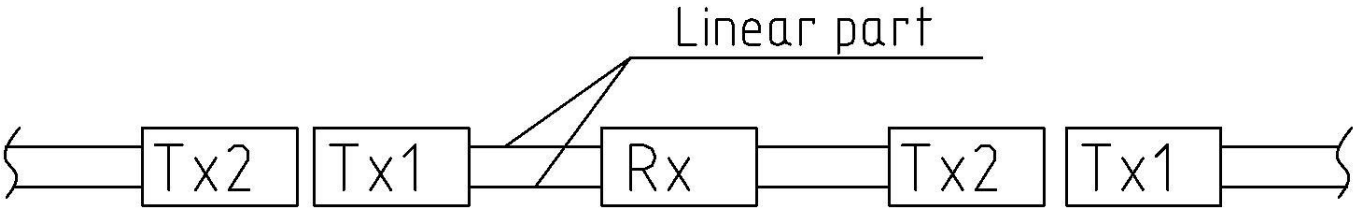


Fig. 1.1 How to form a long protective boundary

ATTENTION! It is necessary to install two Rx or two Tx units near each other. It is forbidden to install Rx next to Tx of an adjacent sector as it may result in false alarms.

1.4.10. Tx or Rx mounting on adjoining protective boundaries (on a brick, reinforced concrete, metal mesh or at "ground" installation type) is shown in fig. 1.2. The distance between Rx and Tx should be 0, 2…0, 3 m.

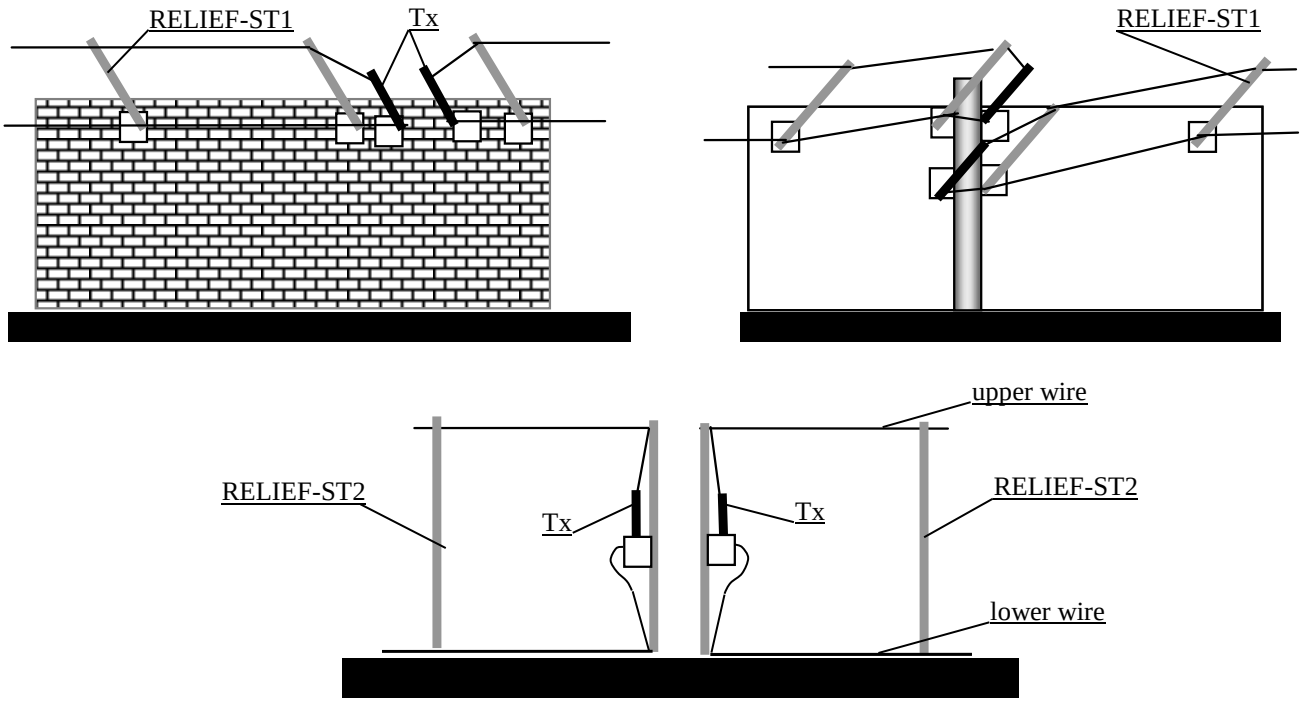


Fig. 1.2 Tx or Rx installation on adjoining sectors
on a fence and "ground" installation type

1.5. Construction Description

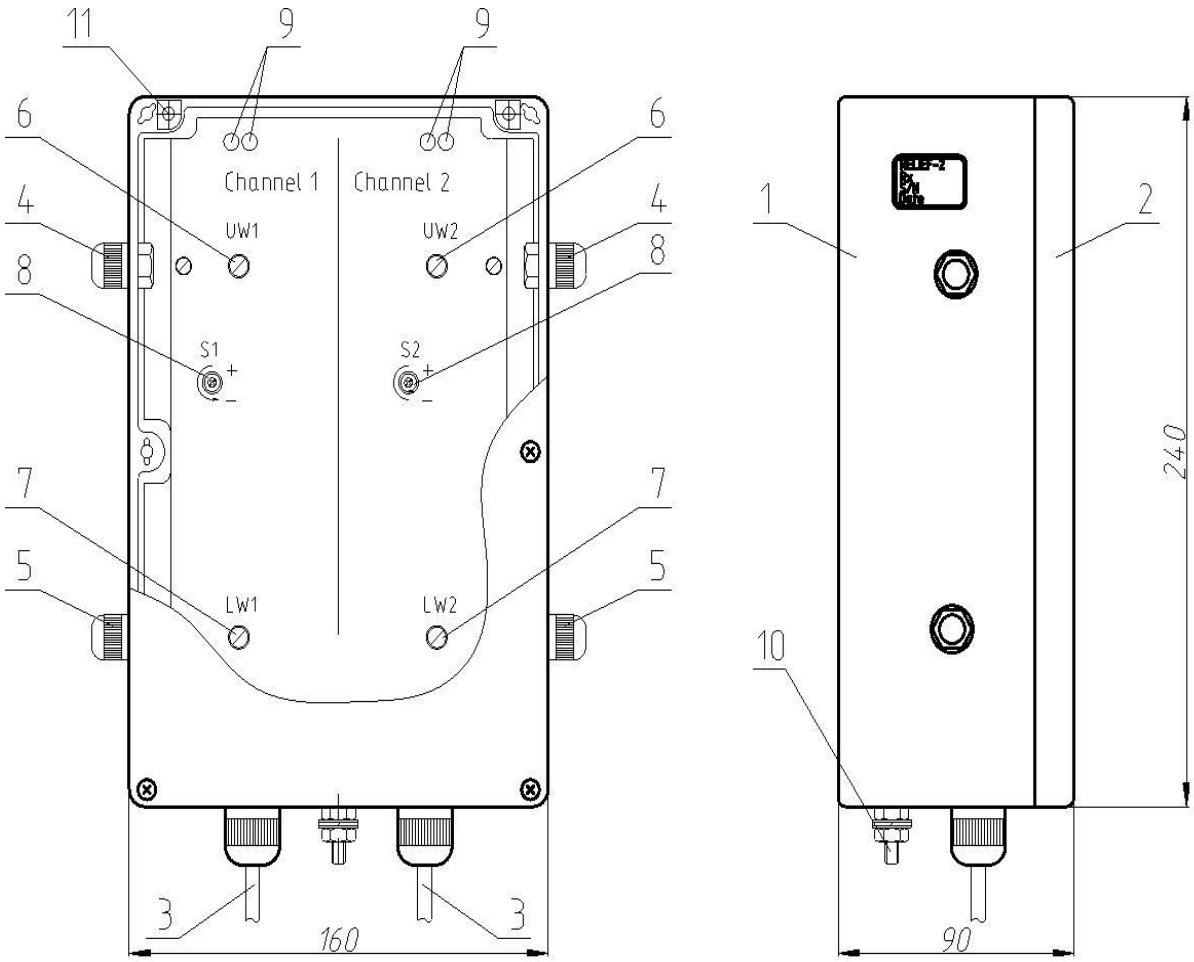
1.5.1. Rx construction is shown in fig. 1.3.

Rx is placed in plastic case 1 with a removable cover 2. On the sides there are holes 11 to fix the unit. On the case underside there are output cables 3 and a ground terminal 10.

On the case sides there are cable glands 4 and 5; and cables unit of the linear part wires.

Inside of the case on a plastic panel, there are following elements, controls and indication ones:

- 2 terminals to connect the upper wires of the linear part 6;
- 2 terminals to connect the lower wires of the linear part 7;
- 2 sensitivity controllers 8;
- 2 two-colored indicators 9.



1 – case; 2 – cover; 3 – output cables; 4 – cable glands for UW of LP;
5 – cable glands for LW of LP; 6 – UW1, UW2 terminals; 7 – LW1, LW2 terminals; 8 – sensitivity controllers; 9 – two-colored indicators; 10 – ground terminal; 11 – holes to fix the unit on the wall.

Fig. 1.3 Rx construction

1.5.2. Tx construction is given in fig.1.4.

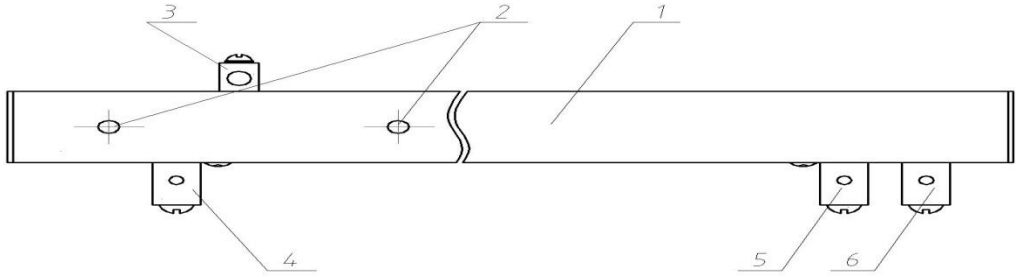


Fig. 1.4 Tx construction

1 – case; 2 – holes to fix the unit to a bracket; 3 – ground terminal; 4 – LW contact; 5 – UW1 terminal; 6 – UW terminal.

Tx 1 is made from metal. On the sides there are holes to fix the unit to a bracket 2. On the upper side there is a ground terminal 3. On the underside there is a terminal marked "LW" 4 to connect the lower wire and two contacts to the upper one marked "UW" 6 – output signal of the maximum power; "UW" 5 – output signal of the reduced power.

On the case sides there are cable glands 4 and 5; and cables unit of the linear part wires. On short perimeter sites the Rx input signal may be excessive. To reduce the signal, it is necessary to connect the Tx upper wire to the contact "UW1".

1.6. Marking

1.6.1. Tx and Rx have the plates with their name, serial number and date of production.

2. APPLICATIONS

2.1. Safety measures

2.1.1. The sensor adjustment should be carried out according to the requirements of this user manual.

2.1.2. The sensor preparation for the operation and its maintenance should be carried out according to the requirements of safety norms.

2.1.3. The sensor installation and maintenance should be performed only by people, who have the permission to work with electrical facilities up to 1000 V.

2.1.4. The linear part wires are mounted and connected only when supply voltage is OFF.

2.1.5. **It is prohibited to carry out works with the sensor during a storm or before a storm.**

2.2. Preparation for the use

2.2.1. Unpack the sensor. Carry out the external examination of the sensor components. On the outer surface there should not be any defects resulted from the transportation and unpacking.

2.2.2. Check the package contents of the sensor according to Table 1.1.

2.3. Requirements to the perimeter site of sensor installation

2.3.1. The minimum distance between the protective boundary and branches of trees, bushes and other moving objects must be 2 m.

2.3.2. The supports and the fence fabric on which the sensor is mounted should be fixed and should not move under the influence of wind.

2.3.3. The distance between the wires of the sensor local part and the wires of high-voltage power transmission lines should be 8 m minimum.

In other case the linear part wires should cross the high-voltage wires at an angle of about 90˚.

2.3.4. The sensor linear part is an antenna that is why powerful radio signal sources (e.g. broadcasting stations, locators and similar equipment) can cause failures of the sensor.

The decision about the sensor use in such situations is made according to the results of sensor trial operation.

2.3.5. The linear part can be turned at the angle of 90° in the horizontal plane and at the angle of 40° in the vertical plane. Each turn at 90° reduces the maximum length of a protective boundary at 10 – 15 m.

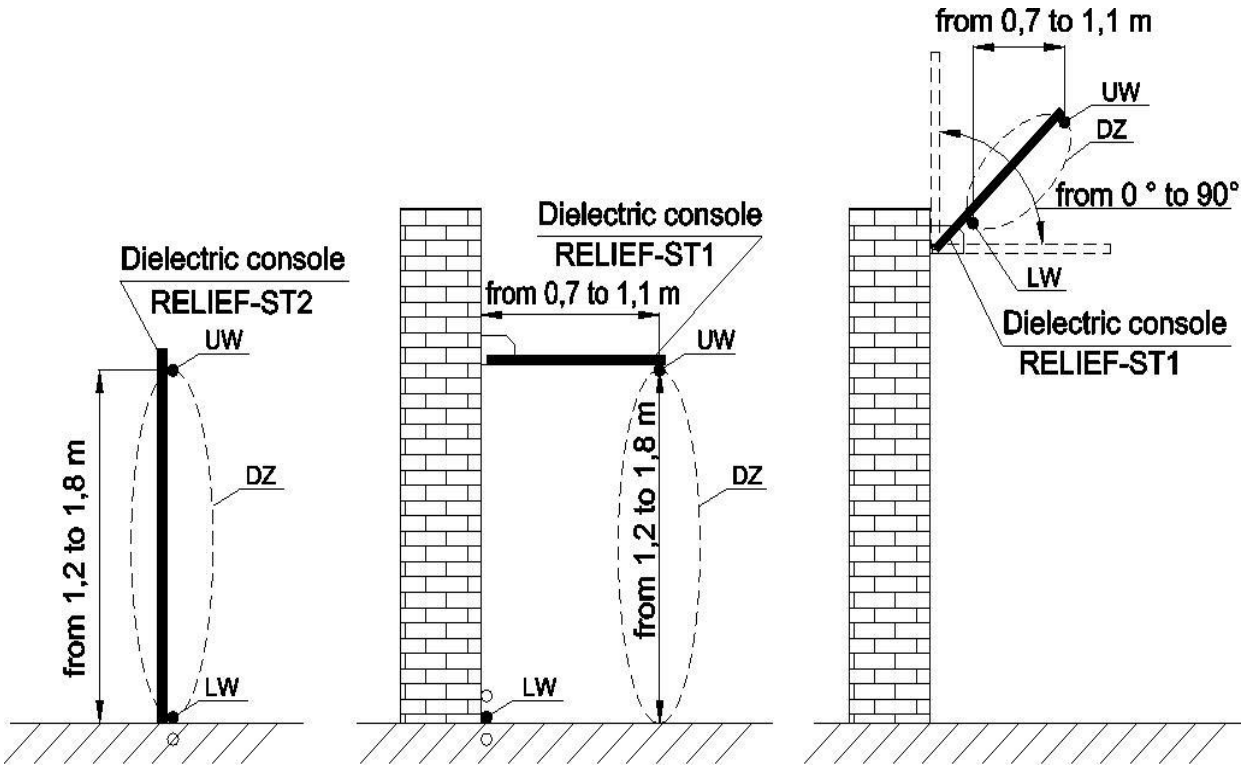
It is recommended to form a protected boundary with four turns at the angle of 90^0 maximum.

2.4. Mounting procedure

2.4.1. Linear part mounting

2.4.1.1. Linear part of the sensor is mounted:

- on the ground (“ground” installation type; see fig.2.1.1) using the mounting kit RELIEF-ST2;
- on the fences, walls (“ground” installation type; see fig.2.1.2) using the mounting kit RELIEF-ST1;
- on the fences, walls, roofs and cornices of buildings (“visor” installation type; see fig.2.1.3) using RELIEF-ST1.



1) 2) 3)

Fig. 2.1 Linear part installation options

Note: The detection zone is shown with a dotted line. Its dimensions depend on the sensitivity level of the sensor.

2.4.1.2. Prepare the linear part wires according to the length of the protected site.

2.4.1.3. Mounting kits RELIEF-ST1 or RELIEF-ST2 should be mounted at a distance of 3…9 m from each other. The distance is determined by wind loadings in the place, where the kits are mounted. If wind is strong and steady, it is possible to reduce the distance between the kits.

If wind is light and rare, it is possible to increase the distance between the kits.

2.4.1.4. Fasten the brackets to the fence fabric or support with screws from the mounting kit. It is permissible to fasten the brackets with the help of bolts, welding and etc.

2.4.1.5. Fasten dielectric consoles on the brackets with screws from the mounting kit.

2.4.1.6. If the linear part turns, the mounting kit and the wires are fixed at the inside or outside angles of the fence according to Fig. 2.2.

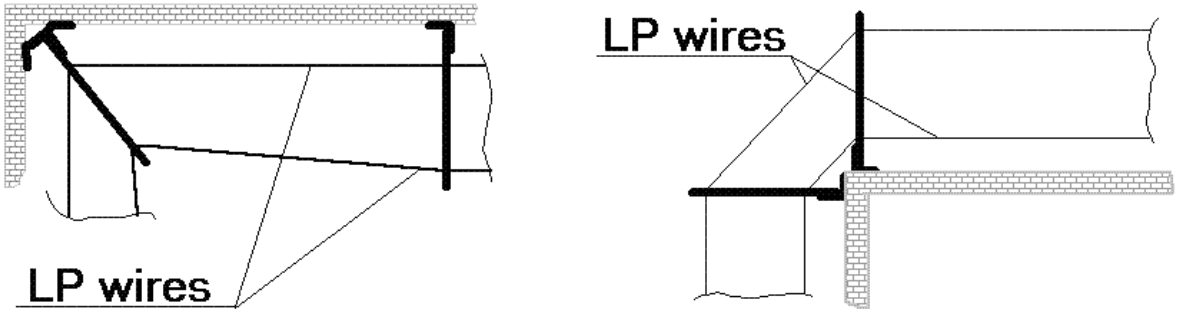


Fig.2.2. Fastening of MK and the wires at the inside and outside angles.

2.4.1.7. In the case of fence height differences the mounting kit and the wires should be fastened according to Fig. 2.3.

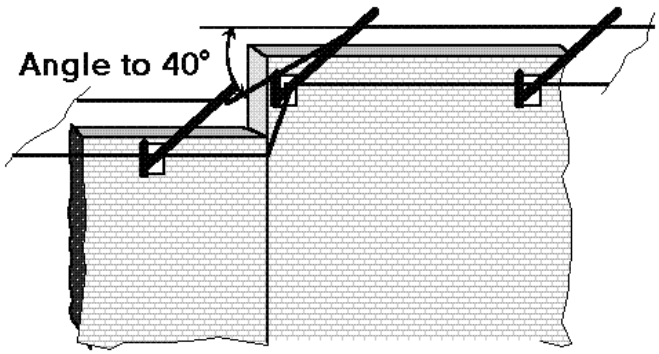


Fig. 2.3 Fastening of the mounting kit and the wires at height differences

2.4.1.8. If the linear part gets vertical position or it goes to the opposite side of the fence, it is necessary to provide the gradual transition using the holes of the MK brackets as it is shown in fig.2.4.

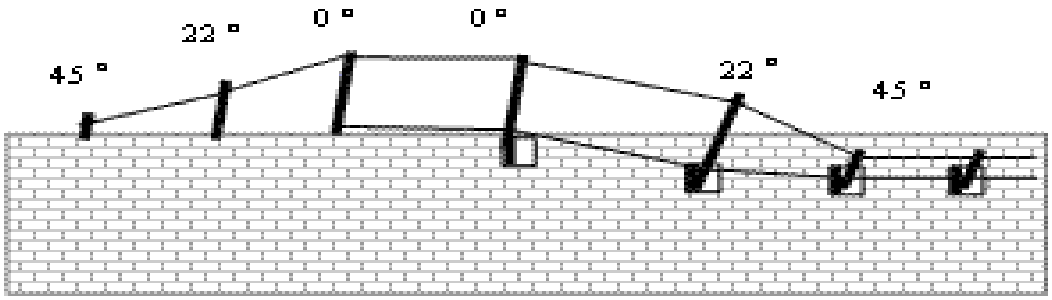


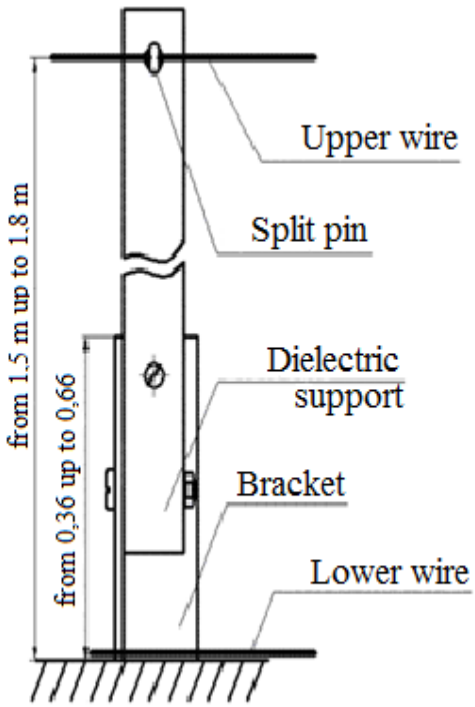
Fig. 2.4 Linear part height differences

2.4.1.9. Fasten the linear part wires on dielectric consoles with split pins from the mounting kit. The split pin is fastened to a dielectric console in that way the pin does not jam the linear part wire and not cut the wire insulation.

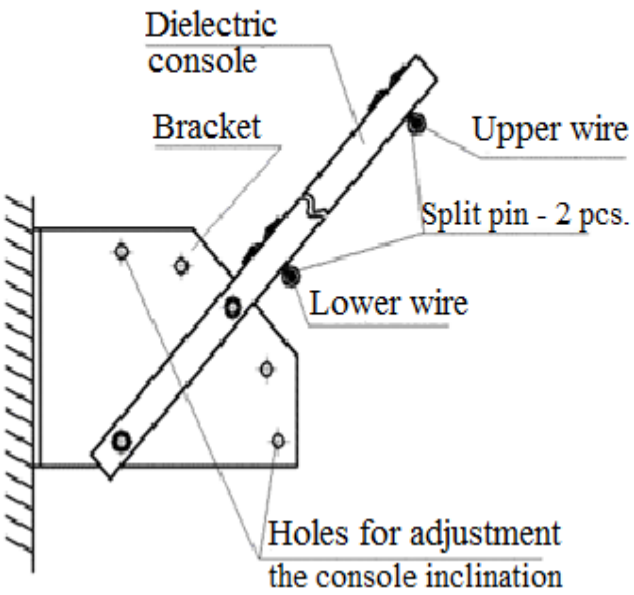
The easy movement of the wires in the split pins provides the uniform tension of the wires along the full linear part length.

It is not necessary to fasten the lower wire to a dielectric console at the "ground" installation type. It is possible to lay the wire along the ground. It is permitted to cover the wire with earth (0,1 m max.) or fasten it above the ground to the fence or consoles. The wire fastening should ensure the integrity of the wire insulation during its installation and operation.

The fastening of the linear part wires for the "ground" and "visor" installation types are shown in Fig. 2.5.



"ground" installation type



"visor" installation type

Fig. 2.5 Fastening of the linear part wires

2.4.1.10. Stretch the linear part wires with the minimum sagging.

2.4.1.11. It is forbidden to wind the upper wire round the dielectric consoles or Tx and Rx.

2.4.1.12. It is necessary to mount counterbalances of fosta nylon or similar cord with the aim to prevent breakages of dielectric consoles while stretching of the LP wires on turns and on the end consoles.

2.4.1.13. Check the wire sagging in some places with a thread and a ruler.

Stretch the thread between adjacent dielectric consoles placing it on the split pins of the LP wires.

Measure the distance between the wire and the thread with a ruler in the middle of the sagging. The wire sagging should be of 5 mm max.

2.4.2. Tx mounting

2.4.2.1. Tx is mounted on the brackets of the mounting kit. It is mounted on the opposite sides of a protective boundary next to the end dielectric consoles at a distance up to 1 m.

2.4.2.2. The brackets are fastened to the fence fabric or support with screws.

It is possible to fix the brackets with bolts, welding or other means.

At the "ground" installation type the brackets should be installed at a distance of 1,2 m minimum from the ground.

2.4.2.3. Fasten Tx to the brackets with screws from the MK for fastening according to Fig. 2.6.

2.4.2.4. Tx should be grounded. Each unit should be connected to its grounder. Metal stubs 1,5 m long can be used as grounders. They should be driven into the ground under the Tx unit.

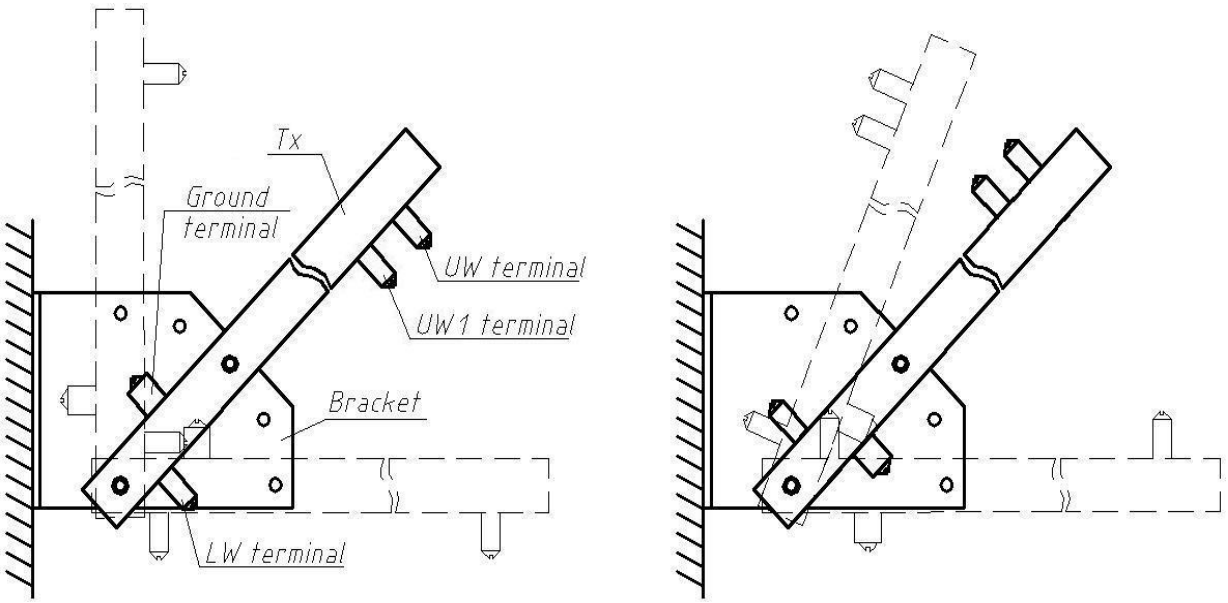


Fig.2.6 Tx mounting

2.4.2.5. Connect grounding conductors to the ground terminals “ ⏚ ” located on Tx. It is recommended to apply sealant on the ground terminal to enhance corrosion resistance.

Grounding conductors should be made of copper or steel galvanized wire, braid or other cables with the section 2,5 mm minimum.

Lay the grounding conductors along the shortest route from Rx and Tx to the grounders. Fasten them reliably with buckles to exclude swinging of the conductors.

Do not connect other devices to the grounders.

Do not use neutral conductor runs, braids and grounders of electrical machines as sensor grounders.

2.4.2.6. Strip the wire ends of insulation. Connect the LP wires to the UW and LW contacts on Tx.

It is recommended to apply sealant on the places of wires connection to enhance corrosion resistance.

2.4.2.7. To prevent the swinging of the linear part wires next to the Rx and Tx units, it is necessary to fasten the wires on the end dielectric consoles with the dielectric buckle and the insulating-tape.

2.4.3. Rx mounting

2.4.3.1. Rx is mounted on the place of the sites junction at the height 1,5 m minimum marking the surface beforehand in according to fig.2.7.

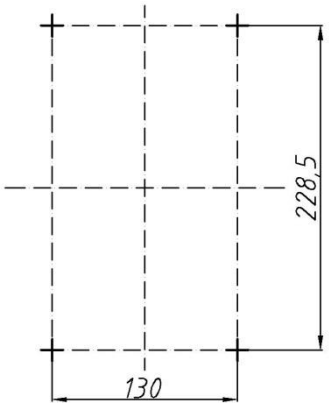


Fig.2.7 Marking for the Rx mounting

2.4.3.2 Install a junction box with at least 12 contacts in the place of Rx mounting. A junction box is intended for switching of the output cable with main cables and supply lines.

2.4.3.3 Rx should be grounded. Each unit should be connected to its grounder. Metal stubs 1,5m long can be used as grounders. They should be driven into the ground under the Rx unit.

2.4.3.4 Connect the linear part wires to the terminals UW1 and LW1 of one channel and to the terminals UW2 and LW2 of the other one through the corresponding cable glands.

2.5. Preparation for the operation

2.5.1. Connect the Rx output cable to the contacts of a junction box according to the markings and Fig. 2.8.

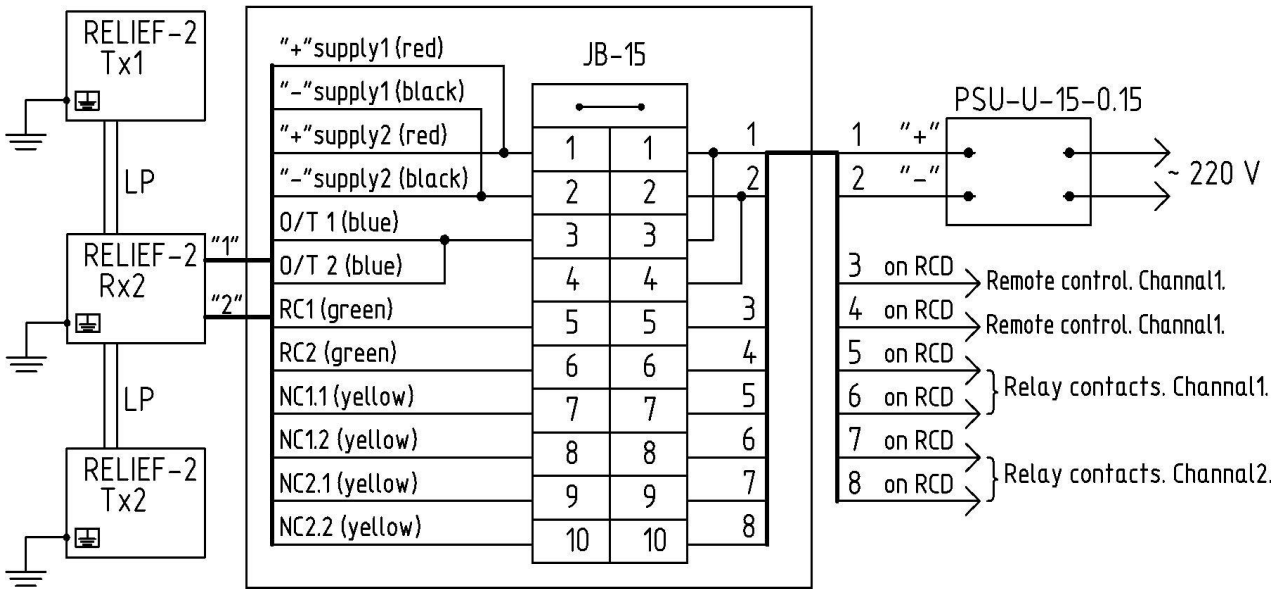


Fig.2.8 Sensor connection to a junction box (the indicator is switched ON)

2.5.2. Fasten the Rx output cable with buckles, binding and etc. to prevent its swinging.

2.6 Switching ON and the sensor operation

2.6.1. Switch ON the sensor power supply.

2.6.2. In 1 minute maximum the indicator on Rx must switch on. The indicator displays sensor operability and the state of the linear part. The modes of the indicator are given in Table 2.1.

Table 2.1

Indicator signal	Sensorcondition	Fault	Note
Red and blue glowing (by turn)	Norm		
Pulse blue glowing	Fault	High high-frequency signal level	see part 2.8.
Continuous blue glowing	Fault	Low high-frequency signal level	see part 2.8.

Pulse red glowing	Fault	Linear part wires closing	see part 2.8.
Continuous red glowing	Fault	Linear part wires breakage	see part 2.8.

If the sensor is connected correctly, the indicator glows red and blue by turn.

Other options of glowing indicate a fault. Fault types and means of fault removal are given in Part 2.8.

Correct sensor faults following the instructions of Part 2.8 till the sensor glows red and blue by turn.

Output relay contacts should be open, when the indicator is ON (the resistance between the wires “NC” “NC” of the output cable – 100 kOhm min.)

2.6.3. Switch off the sensor supply.

2.6.4. Disconnect the wire O/T (blue one) of the Rx output cable from the power “+” and connect to the power “-“(see Fig. 2.9) and supply the sensor.

Control the sensitivity adjustment (ALARM signal generation) using the control panel or a device for the resistance measurement, connected between the wires “NC1.1”, “NC1.2” for one perimeter site and “NC2.1”, “NC2.2” for the other one of the Rx output cables.

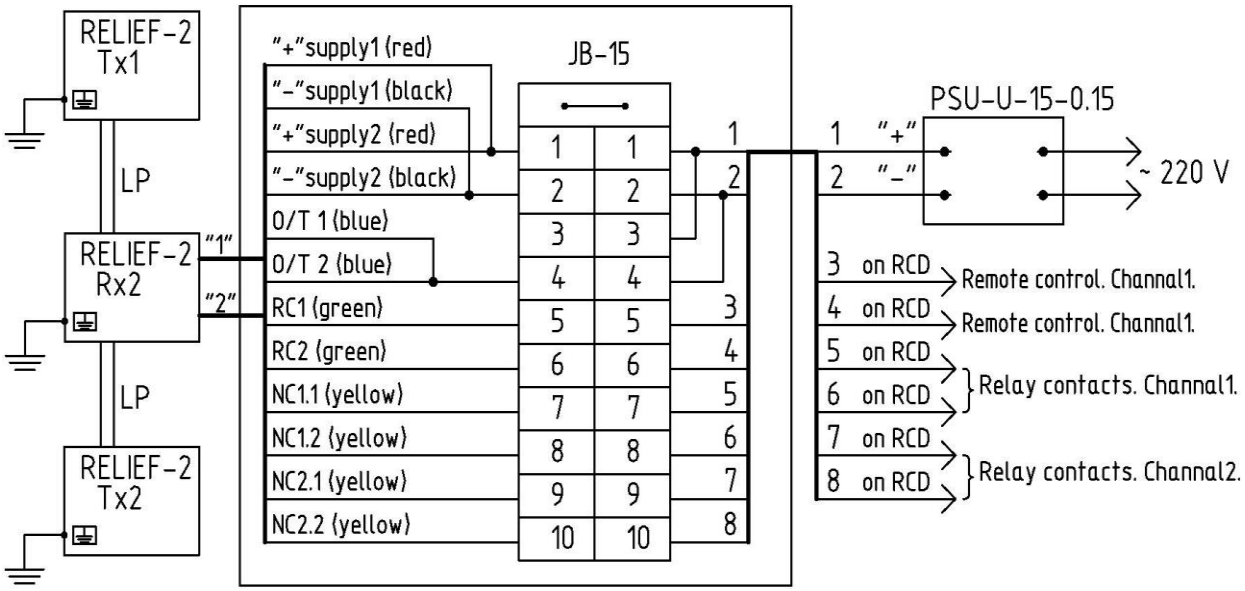


Fig.2.9 Sensor connection to the junction box in the sensitivity adjustment mode (the indicator is off)

2.6.5. Set the minimum sensitivity with the controller “S1” and “S2” turning it counterclockwise against stop. Do not do control passages in the detection zone for 1…2 minutes.

The tuner should be at a distance of 2-3 m minimum from the linear part wires and the Rx and Tx units. The resistance between the wires “NC” “NC” of the output cable must be (100±25) Ohm.

2.6.6. Do control passages in any site of the detection zone checking the generation of the ALARM signal (breaking of output relay contacts).

At “visor” installation type the operator simulates an intrusion as it is shown in Fig. 2.10, using a wooden ladder.

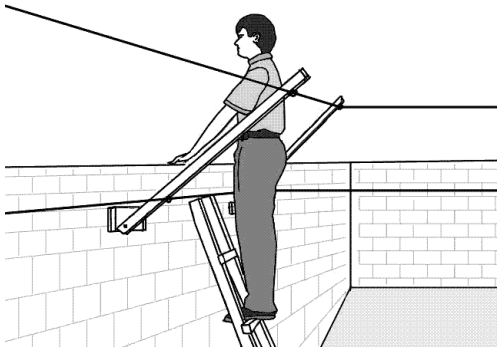
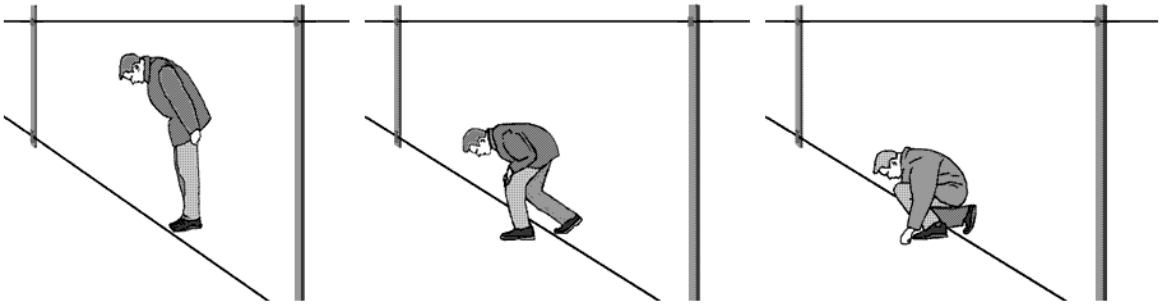


Fig. 2.10 Simulation of an intrusion at “visor” installation type

At “ground” installation type the operator simulates an intrusion as it is shown in Fig. 2.11. The position of the operator relative to the upper wire defines the sensitivity level.



1) 2) 3)

1) position for low sensitivity setting;
2) position for medium sensitivity setting;
3) position for high sensitivity setting.

Fig. 2.11 Simulation of an intrusion at the “ground” installation type

2.6.7. If there is no ALARM signal, increase the sensitivity level, turning the controller “S” clockwise (one scale division).

2.6.8. Do a control passage in the detection zone.

2.6.9. If there is no ALARM signal, follow the instructions of 2.6.7, 2.6.8 till the ALARM signal is generated.

2.6.10. Do the simulations of an intrusion in some places along the whole length of the protected site and pay attention to the generation of the ALARM signal every time. If necessary adjust the sensor sensitivity turning the controller “S”.

2.6.11. After the sensitivity adjustment is done, close the controller "S" with a plug. Disconnect the O/T1 and O/T2 wire from the power "-"and do not connect it. Close the sensor cover. The adjustment is finished.

2.6.12. After the sensitivity adjustment is finished, check the sensor operability doing control passages along the whole length of the protected site.
Test the sensor operability during 3…5 days.
If during testing there are false alarms or faults, re-adjust the sensor sensitivity as described above.

2.7. Remote control of the sensor operation

2.7.1. The sensor has the remote control option.

2.7.2. To check the sensor operability, it is necessary to generate the remote control signal of 10…30 V for 3…10 sec on the wires "RC1"and "RC2" of the Rx output cable using the switch or control panel.
When the remote control signal stops, the sensor must generate the ALARM signal. This confirms the sensor operability.

2.7.3. If another DC source is used for the remote control signal generation (and not that one, from which the sensor is supplied), it is necessary to join the power "-"of DC sources.

2.8. Troubleshooting guide

2.8.1. The main faults caused by incorrect mounting, operation and the methods of their repair are given in Table 2.2.

2.8.2. It is necessary to connect the sensor as shown in Fig. 2.8 to identify the fault cause with the help of the LED indicator.

Table 2.2

Fault	Possible cause	Solution
1. The LED indicator does not glow.	No power supply.	1. Check the correctness of the output cable connection. 2. Check the sensor power supply.
2. The LED indicator glows in the pulse mode.	1. No contact in the points of the LP wires connection;	Restore the contact, connect the wires to the units according to item 2.4.2.9, 2.4.2.10.
	2. The LP wire (or both wires) is broken.	Restore the integrity of the LP wires with the help of connectors (Table 1.1), soldering or replacing the wires.
	3. Sensor malfunctioning.	Replace with an operable sensor.

3. The LED indicator glows red continuously.	1. Closing the LP wires.	1. Check the integrity of the LP wires insulation. 2. Check the correctness of connections of the wires to the Tx terminals.
	2. Sensor malfunctioning.	Replace with an operable sensor.
4. The LED indicator glows blue continuously.	The signal level is low.	Decrease the LP length.
5. The LED indicator glows blue in the pulse mode.	The signal level is high.	1. Increase the LP length. 2. Connect the LP upper wire to the contact “UW1” on Tx.
6. Reduced detectability of the sensor.	Low sensitivity caused by changed operating conditions.	Adjust the sensor sensitivity according to item 2.6.
7. Generation of false alarm signals.	1.Problem with connection of the LP wires to Tx and Rx.	Check the connections of the LP wires. Protect the places of the connection with sealant.
	2. Problem with connection of the grounding conductors.	Check the connection of the grounding conductors and restore the connection to the units and the grounders.
	3. Swinging of the Rx and (or) Tx ground wires.	Fix the ground wires with dielectric buckles, insulation tape or in other similar way.
	4. Swinging of the Rx output cable under the influence of the wind.	Fix the Rx output cable with dielectric buckles, insulation tape or in other similar way.
	5. Sagging of one or both LP wires.	Stretch the LP wires according to item 2.4.1.
	6. Moving objects or vegetation at a distance less than 2 m from the linear part, Rx and Tx.	Fix or remove the objects and vegetation.

	7. High sensor sensitivity caused by changed operating conditions.	Adjust the sensor sensitivity according to item 2.6.

ATTENTION! Correct faults only when the sensor power supply is OFF.

2.8.3. After the faults are corrected, switch ON the sensor power supply. If it is necessary, adjust the sensor according to item 2. 6.

3. MAINTENANCE

3.1. General instructions.

3.1.1. Maintenance means the control of the sensor technical state and its operation.

3.1.2. Timely and complete maintenance during the sensor operation is one of the important conditions for the sensor operability.

3.1.3. The sensor maintenance presupposes the fulfillment of preventive works according to the requirements given in this user manual twice a year: at frosts (daily average temperature is lower than - 5°C) and after snow melting (daily average temperature is higher than +10°C).

3.1.4. During storage the sensor maintenance is not performed.

3.1.5. During maintenance it is necessary to perform all the works specified in this user manual and correct the faults.

3.1.6. The maintenance works:

1) check of the protective boundary state against the requirements of items 2.1.1, 2.1.2;
2) external examination of Tx and Rx;
3) check of the LP wires and their tension;
4) check of the quality and integrity of electric contacts and grounders;
5) check of the sensor sensitivity and its adjustment if necessary.

Note: After natural disasters (heavy snowfalls, hurricanes, heavy showers, etc.), it is recommended to perform unplanned maintenance of the sensor.

3.2. Maintenance procedure

3.2.1. Maintenance procedure:

1) do the external examination of the sensor and decide whether it is necessary to cut off tree branches and bushes at a distance less than 2 m from the nearest LP wire, Rx and Tx; whether it is necessary to remove moving objects (especially metal ones);
2) fix the sections of the fence if necessary;

3) check the LP wires state and their tension;
4) check the LP wires fixation and connection;
5) check the integrity and fixation of the dielectric consoles;
6) check the integrity of the dielectric supports;
7) check the fixation of Rx and Tx;
8) check the state of grounders and ground conductors, their connection to Tx and Rx;
9) do control passages in the detection zone and adjust the sensor according to item 2.6. if necessary.

4. STORAGE AND TRANSPORTATION

4.1. The sensor must be stored in the package of the manufacturer according to the requirements of the storage in non-heated premises. So indoors with natural ventilation without regulating ambient conditions artificially where temperature and humidity change is less than outdoor (e.g. stone, concrete, metal storages with heat insulation). Moisture condensation on the premises sides and sensors cases should not be present.

4.2. Packaged sensors can be transported by any transport (if by air transport – in pressurized modules) if they are transported in covered cars, holds or covered bodies without any distance limits.
Package the boxes to exclude their moving and fall during some pushes or blows.

5. WARRANTY

5.1. The manufacturer guarantees that the sensor corresponds to the requirements of the Document Part Number 4372 – 43071246 – 059 if the user follows the requirements of transportation, storage and operation specified in this user manual.

5.2. Warranty period is 18 months since the date of sale by the manufacturer.

5.3. Warranty does not cover sensors with mechanical failures and sensors which are out of order because of natural disasters (lightning, fires or floods).

5.4. Mean lifetime is 8 years.

5.5. Don’t hesitate to send your claims by address:

JSC OKHRANNAYA TECHNIKA
P.O. box 45
442960 Zarechny, Penza region
RUSSIA
Tel: +7 8412 655316
Fax: +7 8412 655316
E-mail: info@forteza-eu.com

6. ACCEPTANCE CERTIFICATE

6.1.1. The sensor RELIEF-2, serial number _____ meets the performance specifications of the Document Part Number 4372 – 43071246 – 059 and is considered as operable.

Date of issue "____"_____ 20___.

Quality department _____/_____

7. PACKAGE CERTIFICATE

7.1. The sensor RELIEF-2, serial number _____, is packed by the manufacturer according to the requirements of the design documentation.

Date of packing "____"_____ 20__.

Packed by _____/_____

CONTACT

Manufacturer: ZAO OKHRANNAYA TECHNIKA

Postal address: P.O. box 45
442960 Zarechny, Penza region
RUSSIA
Tel: +7 8412 655316
Fax: +7 8412 655316
E-mail: info@forteza-eu.com
Website: www.FORTEA-EU.COM