

### Installation Guide

#### 1 General Information

Seismic vibration detector “Udar” (hereinafter, the Detector) is designed to detect attempts of premeditated destruction of the following building structures: concrete walls and floors with the thickness not less than 0.12m, brick walls with the thickness not less than 0.15m, wooden structure with the thickness range 20 – 40 mm, plywood with the thickness not less than 4 mm, wood chipboard with the thickness not less than 15 mm, standard metal safes, cabinets and ATMs. Alarm message is generated by the relay contacts opening.

The Detector provides immunity against acoustic noise, accidental impacts on monitored structures and electromagnetic interference.

The Detector generates Alarm messages by the relay contacts opening for the time not less than 2 s followed by the LED indication ( See Table 1).

Table 1

Mode	Description	Contacts ALARM	LED Indicators <sup>1)</sup>		
			Red	Green	Yellow
<u>Messages</u>					
«Norm»	Standby mode	Closed	O	O	O
«Destruction alarm»	Destructive impact on the secured construction	Opened	●	X	X
«Supply voltage alarm»	Supply voltage lowering below 8 V	Opened	●●	X	X
<u>LED Indication</u>					
«Switching ON»	Self-testing after energizing	Opened	●	●	●
«Vibration» <sup>2)</sup>	Vibration of the secured construction	Closed	X	●	X
«Memory» <sup>3)</sup>	Detented LED indication of «Destruction alarm» or «Supply voltage alarm» messages	Closed	●	X	X
«TEST 1» <sup>4)</sup>	LED indication of impact tools group I testing mode	X	X	X	●●
«TEST 2» <sup>4)</sup>	LED indication of impact tools group II testing mode	X	X	X	●●●
«TEST 3» <sup>4)</sup>	LED indication of impact tools group III testing mode	X	X	X	●

Opened – contact is opened; Closed – contact is closed; X – do not affect;  
O – LED is OFF; ● – LED is ON;  
●● – intermittent infrequent (two times per second) blinking;  
●●● – intermittent infrequent (five times per second) blinking.

<sup>1)</sup> – LEDs are switched ON if DIP-switch IND is in ON position;  
<sup>2)</sup> – If the Detector is operating in standby mode, LED indication “Vibration” is switched ON in case of interference or destructive impact on the secured construction (DIP-switch TEST in OFF position) or in case of nothing else but destructive impact of tested tools group (DIP-switch TEST in ON position);  
<sup>3)</sup> – LED is ON till deenergizing the Detector;  
<sup>4)</sup> – Testing mode management is fulfilled by consequent setting DIP-switch “TEST” in ON position and backward (Quit TEST mode).

#### 2 Specifications

Table 2

Parameter	Value
Secures area, not less: - solid concrete, brick or wooden construction,	12 m <sup>2</sup> (circle with radius 2 m)
- metal cabinet, door, ATM upper cabinet,	6 m <sup>2</sup> (maximum removal from the Detector 1.4 m)
- safe, ATM low cabinet	3 m <sup>2</sup> (maximum removal from the Detector 1.4 m)
Nominal supply voltage	12 V
Supply voltage range	9-17 V
Maximum consumption current	25 mA
Detector contacts permissible current	30 mA
Detector contacts permissible voltage	72 V
Sensitivity changing	20±3 dB
Warm-up time, not more than	10 s
Ambient class	Boreal climate (background temperature 15 - 35 °C, relative humidity 25 – 75 %, air-pressure 86-106 kPa)
Operating temperature	from minus 30 to +50 °C
Relative humidity at a temperature +25 °C	90 %
IP rating	IP41
Dimensions, not more	105x45x34 mm
Weight, not more	150 g
Average service life	8 years

#### 3 Design of the Detector

Design of the Detector is shown in Figure 1

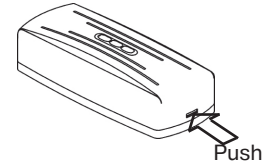
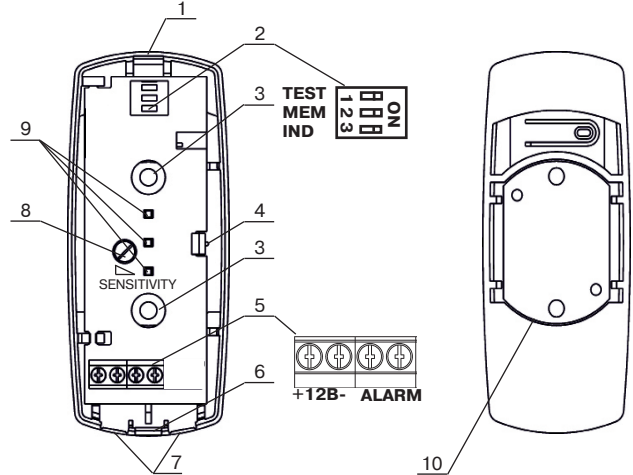


Figure 1

The base with the printed circuit board (PCB) is shown in Figure 2

a) Top view without cover

b) Bottom view



Где:

- 1 – Hook on the cover;
- 2 – DIP Switch;
- 3 – Mounting Holes;
- 4 – PCB Latch;
- 5 – Terminal Block;
- 6 – Cover Latch;
- 7 – Openable holes for wiring;
- 8 – Sensitivity corrector;
- 9 – LED indicators;
- 10 – Vibration sensor.

Figure 2 - Base with the PCB

#### 4 The Detector Mounting

The Detector mounting and sensitivity adjustment is fulfilled uncovered. To remove the cover it is necessary to loosen the latch by pushing it through the rectangularly shaped opening (Figure 1)

Depending on the type and material of the secured surface, mounting of the Detector is fulfilled by male screws and framing nails through the holes (See Figure 2, position 3) in the base (a distance between the holes is 35 mm) or by means of glue. It is important that the installed Detector should have firm contact with the surface of the secured construction.

For the Detector mounting on the brick or concrete construction metal rockbolt (it is forbidden to mount the Detector on plastic wall plug). The depth of the holes for the Detector mounting should be enough to provide full-length entry of rockbolts in basic material of the secured construction without regard to the thickness of the decorative or (and) finish coating. For mounting the Detector on wooden constructions, it is possible to use screws (self tappers) with entry in the basic material of the secured construction at a depth not less than 20 mm.

For mounting of the Detector on metal constructions it is recommended to ground it. Use connection by screws with nuts M4 via openings or tap screws M4 through openable holes. If openable holes are used, in advance tap a thread by cutting.

The Detector mounting in a safe or ATM low cabinet is recommended to fulfill by means of screws M4 or super glue in accordance with its manual or recommendations on its package. Glue joint is permissible for other metal constructions, where screw joint appliance is impossible.

#### 5 Connection

Connection of the Detector to the control panel (hereinafter, the CP) should be realized in accordance with connection pattern contained in CP instruction manuals in accordance with the Detector terminal blocks designation (see Figure 2, position 5). Two openable holes in the Detector case are provided for wiring (See Figure 2, position 7).

#### 6 The Detector Controls

DIP-switch IND is used for LED indication switching on. Setting DIP-switch MEM to ON position turns the Detector to alarm memory mode.

DIP-switch TEST changes modes of a vibration sensor signal processing in accordance with the presumed impact tools group.

TEST modes are changing cyclically after each setting DIP-switch TEST in ON position. Chosen mode is displayed by yellow LED indicator. (See Table 1).

Sensitivity regulator component SENS (See Figure 2, position 8) provides smooth sensitivity decrease in the range (20 ± 3) dB from it's maximum value.

#### 7 Adjustment

Open the Detector cover, set DIP-switch IND in ON position.

##### 7.1 Noise level control in the place of installation

Adjust maximum sensitivity level by turning sensitivity regulator component clockwise manner until tight

Energize the Detector, make sure in “Switching ON” indication availability with further “NORM” message generation.

Under absence of the impacts listed in Table 3, "Vibration" indication lighting in standby mode is the evidence of too high interference level at the secured object. Eliminate the source of interference, if it is possible.

#### 7.2 Sensitivity adjustment

Choose one of the testing modes by consequent setting DIP-switch TEST from OFF to ON position and return. The result is displayed by yellow LED indicator lighting. Testing mode I is depicted by seldom LED blinking, mode II – by frequent blinking, mode three – by continuous lighting.

Adjust minimum sensitivity level by turning sensitivity regulator component counterclockwise until tight

Set DIP-switch MEM in ON position.

Deliver an imitating impact on the border of the monitored surface (see Table 2). In case of «Destruction alarm» message generation (see Table 1), sensitivity adjustment may be considered finished.

Otherwise fulfill smooth sensitivity increase till the level, at which the Detector generates «Destruction alarm» message under imitating impact.

If sensitivity level is adjusted, the Detector should not display "Vibration" by its LED indicators under absence of impacts on monitored structure (see Table 3)

After sensitivity is adjusted set DIP-switch TEST to OFF position and DIP-switches IND and MEM in positions relevant to security tactics chosen for the secured object.

Table 3

Secured structure type	Method of the simulative impact delivery during the Detector sensitivity adjustment	Additional technical data
Metal cabinet, door, upper or lower ATM cabinet, safe	Enclose a steel plate to the monitored structure at its most distant point. Drill several holes 2-3 mm deep. At every drilling cycle assure oneself of the LED indication lighting, after the third one - "Destruction alarm" message generation.	Cordless drill with a drill tool $\varnothing$ (4 ± 0.5) mm, Drilling cycle duration is not less than 10 s. Duration of a pause between drilling cycles is not more than 10 s. Testing mode I.  Electric drill with a drill tool $\varnothing$ (4 ± 0.5) mm, Drilling cycle duration is not less than 10 s. Duration of a pause between drilling cycles is not more than 10 s. Testing mode II.
Wooden structure, particleboard	Set a cant timber at the boundary of monitored area, fulfill several saw-cuts 2-3 mm deep into the wood. At every saw-cut cycle assure oneself of the LED indication lighting, after the third one - "Destruction alarm" message generation	Cant timber dimensions – not less than 50x50x300 mm, saw teeth pitch - 5–10 mm, hammer weight – (0.5 ± 0.1) kg, Sawing cycle duration is not less than 3 s. Duration of a pause between sawing cycles is not more than 10 s. Testing mode II.
Brick or Concrete Building Structure	Place a textolite or laminate plate on the structure at any location near a boundary of the monitored area. Deliver several strikes to the plate with a hammer. The power of the strike should simulate destructive impact. After every strike assure oneself of the LED indication lighting, after the third one - "Destruction alarm" message generation.	Recommended plate dimensions – 150x150x10mm, hammer weight – (0.5 ± 0.1) kg, duration of a pause between strikes is not more than 10 s. Testing mode III.

Table 4

Impact groups	Tool types		
	Tool category	Tools specifications	Tools examples
I	A	Hand cutting tool	Hand braces, hand-operated drills
	B	Thermic cutting tool	Flame-cutting, arc-cutting, equipment
II	A	Hand cutting tool	Saws, metal files
	A	Electric non-impact	Electric drills
	B	Electric rotary tool	Electric hammer drills, perforators
III	A	Impact tool	Hammers, sledgehammers, wrenching irons, splitting axes, pick axes
	B	Electric impact tool	Electric threshing machines
	B	Electric cutting and grinding tools	Electric circular cutoff saws

## 8 Scope of Delivery

Each Detector unit package contains items listed in Table 5

Таблица 5

Name	QNT
Seismic vibration detector «Udar»	1 pc.
Seismic vibration detector «Udar». Installation Guide	1 copy

## 9 Storage and Transportation

9.1 The Detectors in their original packing may be shipped by any transport means in covered vehicles (in railway, cars, trucks, sealed heated compartments of aircraft, ship cargo holds, etc). The Detector is resistant to:

- transport jolting with the acceleration 30 m/sec<sup>2</sup> with impact frequency from 10 to 120 impacts/sec or 15000 impacts with the same acceleration;
- the ambient temperature - 50 ... +50 °C;
- relative air humidity (95 ± 3) % at the ambient temperature +35 °C.

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

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

## 10 Manufacturer's Guarantees

10.1 The Manufacturer guarantees conformity of the Detector to its Technical Specifications if conditions of transportation, storage, assembling and operation are observed. The guaranteed storage period is 63 months since the date of manufacturing the Detector.

10.2 The guaranteed period of operation is 60 months since the date of commissioning within the storage period guaranteed.

10.3 The Detectors that are found to non-conforming to their Technical Requirements shall be repaired by the Manufacturer, provided that the installation and operation rules have been complied with.

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

## 11 Acceptance and Packing Certificate

Seismic vibration detector «Udar»,

serial number \_\_\_\_\_,

has been manufactured in compliance with the active technical documentation and classified as fit for operation and packed by «Development and Production Enterprise RIELTA » LLC.

Person in charge of acceptance and packing

QC representative \_\_\_\_\_ day, year, month