

«SH-V»

**Installation Guide**

**1 General Information**

Vibration security detector «SH-V» (hereinafter, the Detector) is designed to detect intentional destruction of building constructions such as concrete walls and ceilings of thickness not less than 0.12 m, brick walls with the thickness not less than 0.15 m, wood constructions with material thickness from 20 to 40 mm, constructions made of chip wood boards with material thickness not less than 4 mm, wood chip board constructions with material thickness not less than 15 mm, standard metal safes, cabinets, ATMs with following alarm message generation by the relay contacts opening. The unit also provides immunity to electromagnetic interference, acoustic noises and to single blows delivered to protected construction.

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

Table 1

Name	Description	Contacts		LED Indicators <sup>1)</sup>		
		ALARM	TAMP	RED	GREEN	YELLOW
<b>Messages</b>						
«Norm»	Standby mode	<b>C</b>	<b>X</b>	<b>Off</b>	<b>Off</b>	<b>Off</b>
«Alarm - Destruction»	Destructive impact on the secured construction	<b>O</b>	<b>X</b>	<b>●</b>	<b>X</b>	<b>X</b>
«Power supply malfunction»	Drop of supply voltage below 8 V	<b>O</b>	<b>X</b>	<b>oo</b>	<b>X</b>	<b>X</b>
«Case tamper/pullout»	Detector case tampering or its pullout of the secured construction	<b>X</b>	<b>O</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>LED Indication</b>						
«Switching ON»	The Detector self-testing after energizing	<b>O</b>	<b>X</b>	<b>●</b>	<b>●</b>	<b>●</b>
«Vibration» <sup>2)</sup>	Presence of vibration on the secured construction	<b>C</b>	<b>X</b>	<b>X</b>	<b>●</b>	<b>X</b>
«Memory» <sup>3)</sup>	Latched alarm: «Alarm-Destruction» or «Power supply malfunction» message	<b>C</b>	<b>X</b>	<b>●</b>	<b>X</b>	<b>X</b>
«TEST 1» <sup>4)</sup>	LED indication of impact group I testing mode	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>oo</b>
«TEST 2» <sup>4)</sup>	LED indication of impact group II testing mode	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>ooo</b>
«TEST 3» <sup>4)</sup>	LED indication of impact group III testing mode	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>●</b>

«O» – contact is opened; «C» – contact is closed; «X» – has no effect;  
 «Off» – LED is disabled;  
 «●» – LED is in operation;  
 «●» – intermittent infrequent LED blinking (twice per second);  
 «oo» – intermittent frequent LED blinking (five blinks per second);  
<sup>1)</sup> – indicators operate when switch IND is in ON position;  
<sup>2)</sup> – indication «Vibration» operates in case of interference or destructive impact on the secured construction in standby mode (TEST DIP-switch in OFF position) or under the only impact of testee tools group (TEST DIP-switch in ON position);  
<sup>3)</sup> – LED indication operates until the Detector is de-energized;  
<sup>4)</sup> – Testing mode management is fulfilled by consequent setting TEST DIP-switch to ON position and backward (recovery from testing mode).

**2 Specifications**

Table 2

Parameter	Value
Detection area, not less than: - continuous concrete, brick or wood construction; - metal cabinet, door, ATM upper cabinet; - safe, ATM lower cabinet	12 m <sup>2</sup> 6 m <sup>2</sup> 3 m <sup>2</sup>
Nominal voltage supply	12 V
Power supply, DC	9...17 V
Current consumption, not more than	25 mA
Permissible current through output contacts	30 mA
Permissible voltage at output contacts	72 V
Operating temperature	minus 30 ...+ 50 °C
Relative air humidity (at a temperature +25 °C), not more than	90 %
IP rating	IP41
Dimensions, not more than	105x45x34 mm
Weight, not more than	0,2 kg
Average service life	8 years

**3 The Detector Design**

The Detector layout is shown in Figure 1.

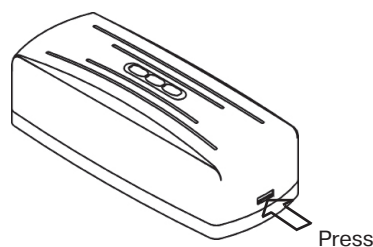
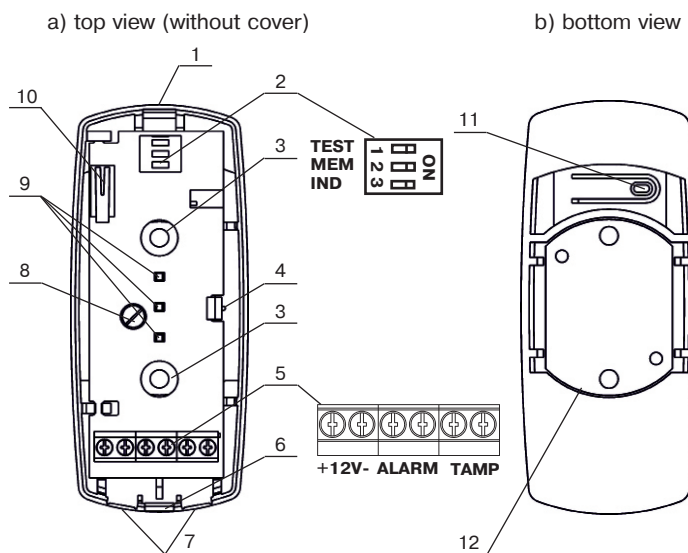


Figure 1

The base with the PCB is shown in Figure 2.



- 1 – hook on the cover;
- 2 – DIP switches;
- 3 – holes for fixing the Detector to the construction;
- 4 – PCB latch;
- 5 – terminal blocks;
- 6 – cover latch;
- 7 – openable holes for wiring;
- 8 – sensitivity controller;
- 9 – indicators;
- 10 – tamper;
- 11 – wall tamper pin;
- 12 – sensing element.

Figure 2 – Base with the PCB

**4 The Detector Mounting**

The Detector mounting and sensitivity adjustment are fulfilled with the removed cover. In order to remove cover, loosen the latch by pressing it through the rectangular opening in the cover (Figure 1).

Depending on type and material of secured construction, the Detector is fastened either by screws through the base openings (see Figure 2, position 3) (the distance between the openings is 35 mm) or by means of superglue. It is very important to ensure firm contact with the surface of the protected construction.

For the Detector mounting on brick or concrete constructions, it should be used anchors (supplied). The depth of the openings for fixing the Detector shall be sufficient to ensure full length deepening anchors in main material of the protected construction, without including the thickness of the finishing and (or) decorative coating. For the Detector mounting on wood construction, it is permissible to use screw nails (self tappers) anchoring them in the main material of the secured construction to a depth of at least 20 mm.

For the Detector mounting on metal construction, it is recommended to use screw connection with nuts (M4) via openings or screw (M4) connection through closed holes with preliminary cut thread. In these conditions it is recommended to ground the metal construction with mounted Detector.

The Detector installation inside safes including lower ATM cabinet should be fulfilled by means of M4 screws or superglue in accordance with instructions for use of superglue given in its supporting documentation or on the package. The glue joint is also recommended for others metal constructions without possibility to fulfill a screw connection.

**5 Connection**

The Detector connection to terminal device (TD) of data transmission system (DTS) or to control panel (CP) should be fulfilled in accordance with connection pattern contained in exploitation documents for DTS TD or CP as per the Detector terminal blocks marking (see Figure 2, position 5). Two openable holes (see Figure 2, position 7) for wiring are provided in the Detector case.

## 6 The Detector Controls

The IND DIP-switch is used for the Detector LED indication switching ON.

The Detector changeover to alarm memory mode is fulfilled by setting DIP-switch MEM to ON position.

DIP-switch TEST is intended for choosing the signal processing algorithm depending on assumed tools impact group.

DIP-switch TEST provides choosing of the Detector operation mode by consequent cycles of its switching over OFF – ON – OFF. The chosen operation mode is displayed by yellow LED indicator (See Table 1).

SENS controller provides step-by-step reducing of the Detector sensitivity in the range  $20 \pm 3$  dB.

## 7 Adjustment Procedure

Remove the case cover and set the IND DIP-switch to ON position.

### 7.1 Control of interference level in the place of the Detector installation

Select maximum value of sensitivity by turning sensitivity controller clockwise until it stops.

Energize the Detector, assure of LED indication «Switching ON» activation, followed by «NORM» message generation.

Presence of «Vibration» LED indication in standby mode (under absence of impacts, described in Table 4) displays too high level of interference on the protected object. If it is possible, eliminate the source of interference.

### 7.2 The Detector sensitivity adjustment

Choose one of testing modes by consequent DIP-switch transfer to OFF- ON position and the reverse. Control result of each cycle by yellow LED lighting. Mode I is displayed by infrequent blinks, mode II – by frequent blinks, mode III – by continuous lighting.

Select minimum value of sensitivity by turning sensitivity controller counter clockwise until it stops. Set MEM DIP-switch in ON position.

At the boundary of the protected area, apply a simulating impact (see Table 3). If the «Alarm-Destruction» message is generated (see Table 1), the sensitivity adjustment can be considered completed. In the absence of the message – perform a step-by-step sensitivity increase until simulating impact is followed by «Alarm-Destruction» message generation.

At adjusted sensitivity level the Detector should not generate a «Vibration» indication in the absence of any effects on the protected construction.

After adjustment fulfillment, it is necessary to set TEST DIP-switch to OFF position, IND and MEM and DIP-switches - to the positions corresponding to the security tactics chosen for the object.

Table 3

Type of protected construction	Procedure of a simulating impact applying and detector sensitivity adjustment	Supplementary technical data
Metal cabinet, door, ATM upper and lower cabinet, safe	Apply a steel plate to the surface of the protected construction at the outermost point of the controlled area. Drill several holes in the plate to a depth of 2...3 mm. For each drilling, observe the LED indication «Vibration», and after the third one – the LED indication «Alarm-Destruction».	Cordless drill. Drilling tool $\varnothing$ – (4±0.5) mm, the time of one drilling is not less than 10 s. Pause between drillings is not more than 10 s. Testing mode I.
		Electric drill, Drilling tool $\varnothing$ – (4±0.5) mm, the time of one drilling is not less than 10 s. Pause between drillings is not more than 10 s. Testing mode II.
Wood construction, chip wood board	Fix a timber at the outermost point of the protected surface and make a few cuts in it by a wood handsaw to a depth of 2...3 cm. For each sawing, observe the LED indication «Vibration», and after the third one – the LED indication «Alarm-Destruction».	Recommended dimensions of timber – 50x50x300 mm, the handsaw tooth pitch is 5...10 mm, the duration of one sawing is not less than 3 s. Pause between sawings is not more than 10 s. Testing mode II.
Concrete or brick construction	Apply a plate of textolite or similar material to the construction at the outermost point of the protected surface. Deliver a few blows on the plate with a force simulating a destructive effect. After each blow, observe the LED indication «Vibration», and after the third one – the LED indication «Alarm-Destruction».	Recommended dimensions of plate are 150x150x10 mm, weight of a hammer – (0.5±0.1) kg, pause between blows is not more than 10 s. Testing mode III.

## 8 Scope of Delivery

Each Detector unit package contains items listed in Table 4.

Table 4

Name	QNT
Seismic vibration detector «SH-V»	1 pc.
Screw A.M4-6gx40.48.016 DIN 84	2 pcs.
Anchor Sormat 72204 MSA-4x17	2 pcs.
Lockwasher DIN 127	2 pcs.
Seismic vibration detector «SH-V» Installation Guide	1 copy

## 9 Manufacturer's Guarantees

9.1 The Manufacturer guarantees conformity of the Detector to the requirements of these Specifications provided the transportation, storage, installation and operation conditions are observed.

9.2 The guaranteed storage term of the Detector is 63 months since the date of manufacture.

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

9.3 If non-conformity of the Detector to requirements of these Specifications is detected during the guaranteed period if rules of operation are observed, it shall be replaced free of charge by the Manufacturer.

## 10 Packing Certificate

10.1 Seismic vibration detector «SH-V» 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.

Packing date \_\_\_\_\_  
month, year