

«SH-VT»
Installation Guide
1 General Information

1.1 ATM security vibration and tilt detector «SH-VT» (hereinafter, the Detector) is designed to detect intrusion, burglary and (or) theft attempts to units such as ATMs, safes and other banking means of protection as well as to detect the intentional destruction of building constructions with generation of the alarm message by opening the relay contacts.

1.2 The Detector power supply is provided by a DC power source with a nominal output voltage of 12 V DC.

1.3 The Detector comprises:

- two detection channels:

1) channel for break-in detection (hereinafter, channel 1), which is designed to detect the intentional destruction of the protected construction or the safe (ATM) break-in;

2) channel for detection of protected construction tilt changing for 5° or more (hereinafter, the channel 2), designed to detect the unauthorized movement of safe (ATM) or other separately installed protected construction;

- automatic choosing the algorithm of the microprocessor operation depending on the type of destructive impact, ensuring high detection integrity and functional reliability of the Detector;

- possibility of discrete sensitivity adjustment (detection range) of channel 1;

- LED indication of the Detector status and interference vibrations of the secured construction;

- possibility of the LED indication modes management depending on the security tactics chosen for the object (choosing modes of short-term LED indication or LED indication up to forced reset);

- possibility of the LED indication disabling;

- voltage control;

- control of mechanical contact with the secured construction;

- case tamper control.

1.4 The Detector generates the following messages:

- «Destruction» – by opening VIBR contacts;

- «Tilt» – by opening TILT contacts;

- «Supply voltage alarm» – by opening VIBR and TILT contacts;

- «Case tamper/Wall tamper» – by opening TAMP contacts;

- Operating temperature from – minus 30 up to +50 °C.

1.5 The Detector is designed for continuous, around-the-clock operation.

1.6 The Detector is resistant to electromagnetic interference, single blows delivered to the protected construction.

1.7 The Detector provides possibility of operation mode choice depending on the material of the protected construction as well as possibility of sensitivity step adjustment.

1.8 The Detector generates alarm messages by output contacts opening for the time not less than 2 s and ensures LED status indication (see Table 1).

Table 1

Message	Description	Contacts			Indicators ¹⁾		
		VIBR	TILT	TAMP	Red	Green	Yellow
MESSEGES							
Normal	Standby mode	C	C	X	o	o	o
Vibration alarm	Tool attack on the construction	O	X	X	●	X	X
Destruction	Destructive impact on the secured construction	O	X	X	●	X	X
Tilt alarm	Changing of the secured construction tilt for 5° or more	X	O	X	●●●	X	X
Supply voltage alarm	Supply voltage drop below 8 V	O	O	X	●●	X	X
Case tamper / Wall tamper	Case or wall tampering	X	X	O	X	X	X
LED INDICATION							
Switching on	Self test after energizing	O	O	X	●	●	●
Noise vibration	Vibration of the secured construction	X	X	X	X	●	X
Memory - destruction**)	Constant LED indication - «Destruction»	X	X	X	X	X	●
Memory – Tilt alarm **)	Constant LED indication - «TILT»	X	X	X	X	X	●●●
Memory – Voltage supply alarm**)	Indication Memory – «Voltage supply»	X	X	X	X	X	●●

O – open; C – closed;

o – indicator OFF; ● – indicator ON;

●● – LED flashing (once per second);

●●● – LED flashing (five times per second);

X – has no effect;

¹⁾ – Indicators operate when jumper IND – ON;

** – LED MEM is lighting until supply voltage will be OFF or until DIP-switch MEM will be OFF.

2 Technical Specifications

Table 2

Parameter	Value
Detection Area, m ² , not less than:	
- continuous concrete, brick or wooden surface	12
- steel Cases, Vault Doors, ATM Upper cabinet	6
- safes, ATM low cabinet	3
Minimum detectable tilt of secured construction, deg	5
Overall dimensions, mm, not more than	105 x 45 x 34
Operating voltage, V	9 ... 17
Consumption current, mA, max	25
Warm-up time of the Detector, s, not more than	10
Operating Temperatures, °C	minus 30 ... + 50
Maximum Humidity (25°C), %	90
Permissible carry current, mA	100
Permissible output voltage, V	42
IP rating	IP41
Weight of the Detector, g, max	150
Mean time to failure in standby mode, not less than	60000
Average service life, years	8

The probability of a failure leading to a false alarm of the Detector in standby mode is not more than 0.01 per 1000 hours, which corresponds to the probability of the absence of the specified failure of not less than 0.99 per 1000 hours. The criterion of failure is generation of «Destruction» and/or «Tilt» messages in the absence of impacts on the guarded structure and in the absence of a change in the angle of inclination of the guarded structure.

The Detector provides immunity (does not generate «Destruction» and (or) «Tilt» messages under the following conditions:

a) upon mechanical blow delivery on the secured construction with energy of (1.9 ± 0.1) J, speed of (3.12 ± 0.12) m/s for the distance (0.25 ± 0.05) m from the Detector

b) upon the secured construction tilt changing for not more than 1°.

3 Inside View

The Detector layout is shown in Figure 1.

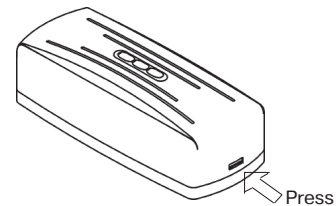
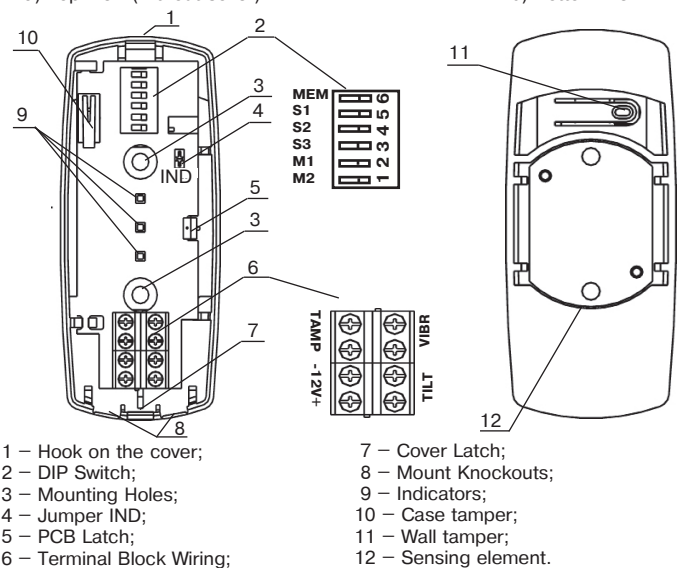


Figure 1 – Detector

The base with the PCB is shown in Figure 2.

a) Top View (without cover)

b) Bottom View



1 – Hook on the cover;

2 – DIP Switch;

3 – Mounting Holes;

4 – Jumper IND;

5 – PCB Latch;

6 – Terminal Block Wiring;

7 – Cover Latch;

8 – Mount Knockouts;

9 – Indicators;

10 – Case tamper;

11 – Wall tamper;

12 – Sensing element.

Figure 2 – The base with the PCB

4 Scope of Delivery

Each Detector unit package contains the items listed in Table 3.

Table 3

Name	QNT
ATM security vibration and tilt detector «SH-VT»	1 pc.
Screw A.M4-6gx40	2 pcs.
Ring plate 4.65F.029	2 pcs.
ATM security vibration and tilt detector «SH-VT». Installation Guide	1 copy
Serial interface module «US-PI»	*

* – supplied optionally

5 The Detector Mounting

Before mounting and adjusting the sensitivity remove the detector cover from the detector base by pressing the latch through the rectangular hole in a cover. (see Fig. 1).

Depending of the secured construction material the Detector can be mounted using screws or wood screws through mounting holes in the base (see Fig.2 pos.3), (the distance between holes centers is 35 mm) or by means of superglue. Very important to have good mechanical contact with solid surfaces of secured construction.

When mounting on brick or concrete use the anchor and screw (set included in the shipment). The depth of the mounting holes should be enough for complete deepening of anchors into the main material of the secured construction without regard to finishing or decorative coatings thickness.

When mounting on steel surface use screws with the nuts M4 through holes or use screws M4 through blind holes with preliminarily cut thread. The metal construction with mounted detector is recommended to be earthed.

When mounting inside ATMs or Deposit Safes use screws M4 or superglue in accordance with supplied manual. Adhesive assembly is also recommended on other metal constructions if there is no possibility for screwed joint.

6 Connection

Connection of the Detector to the terminal module of a data transmission system or a control panel should be fulfilled in accordance with the operating instructions for a terminal module of the control panel or data transmission system with account for connecting blocks designation (See Fig.2 pos.6). Two openable holes for wires entry inside the Detector case are available. (See Fig.2 pos.8).

7 The Detector Control Elements

Jumper IND is used for LED indication switching ON.

DIP-switches M1 and M2 are used for processing algorithm selection in accordance with material of the secured construction (see Table 4).

Table 4

Material of secured construction	DIP-switches position	
	M1	M2
Safe (metal construction, cabinet, vault, door, lattice or other objects with metal surfaces)	OFF	OFF
Concrete or brick	ON	OFF
Wood	OFF	ON
ATM	ON	ON

DIP-switches S1, S2, S3 are intended for adjustment of the Detector sensitivity (see Table 5).

Table 5

DIP-switches			Sensitivity
S1	S2	S3	
ON	ON	ON	<p>Maximum</p> <p>↑</p> <p>Minimum</p>
OFF	ON	ON	
ON	OFF	ON	
OFF	OFF	ON	
ON	ON	OFF	
OFF	ON	OFF	
ON	OFF	OFF	
OFF	OFF	OFF	
OFF	OFF	OFF	

8 Adjustment Procedure

Remove the case cover and set the jumper IND to ON position.

Set the DIPs M1 and M2 to the position corresponding to the material of the protected construction (see Table 5).

Set DIPs S1, S2, S3 to the position ON, ON, ON (maximum sensitivity).

Switch on the power supply and check the LED indication for «Power ON» and «Norm» modes. Presence of the LED indication «Vibration» in standby mode with absence of the effects listed in Table 7 display too high level of interference at the protected object. If possible, eliminate the source of interference.

Set the DIP-switch MEM to ON position, DIPs S1, S2, S3 – to ON, OFF, OFF positions (minimum sensitivity level).

At the boundary of the protected area, apply a simulating impact corresponding to the type of the protected construction (see Table 6). If «Destruction» message is generated and followed by «Memory-destruction» LED indication switching ON (see Table 1), the sensitivity adjustment is considered to be completed.

In the absence of the message «Destruction» – perform a step-by-step sensitivity increase (see Table 5) until «Destruction» message is generated after simulating impacts.

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

After adjustment fulfillment, it is necessary to set the jumper IND and DIP-switch MEM in accordance with the security tactics chosen for the object.

Table 6

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 message «Destruction» generation.	<p>Cordless drill with drilling tool diameter – (4.0 ± 0.5) mm, the time of one drilling is not less than 10 s. Pause between drillings is not more than 10 s.</p> <p>Electric droll with drilling tool diameter – (4.0 ± 0.5) mm, the time of one drilling is not less than 10 s. Pause between drillings is not more than 10 s.</p>
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 message «Destruction» generation.	Recommended dimensions of timber – 50 x 50 x 300 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.
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 message «Destruction» generation.	Recommended dimensions of plate are 150 x 150 x 10 mm, weight of a hammer – (0.5 ± 0.1) kg, pause duration between blows is not more than 10 s

9 User-operating mode

The user mode, which is activated by means of DIP-switches (see table 3), is meant to adapt the detector to high interference environment at the secured object by separately adjusting sensitivity to various types of destructive influences.

In this mode, sensitivity is adjusted using a personal computer connected to the detector through the serial interface module «US-PI» (supplied by RIELTA JSC optionally).

The procedure for the detector adjustment in user mode is given in the accompanying documentation on «US-PI».

10 Storage and Transportation

10.1 During the transportation the Detector in the package withstands:

- transport jolting with acceleration up to 30 m/sec² at impacts frequency range from 10 to 120 per minute or 15.000 impacts with the same acceleration;
- ambient temperature from minus 50 to plus 50 °C;
- relative air humidity up to 100 % at temperature plus 25 °C.

10.2 The Detector in original package may be transported by any means of transportation in closed vehicles over any distances in compliance with the existing shipping rules concerning the respective means of transportation.

10.3 After transportation under the conditions different to exploitation conditions the Detector shall be ready for operation after a maximum of six hours.

10.4 The storage package shall be free from silica gel.

11 Manufacturer's Guarantees

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

11.2 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.

11.3 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.

12 Packing Certificate

Passive infrared detector «SH-VT» manufactured in accordance with current technical documentation is classified as fit for operation and is packed by «Development and Production Enterprise RIELTA» LLC.

Packing date _____
month, year