

«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 valuable protection equipment as well as to detect the intentional destruction of building constructions such as concrete walls and ceilings with material thickness not less than 0.12 m, brick walls of 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 15 mm, 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 (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 to control the LED indication modes depending on the security tactics chosen for the object (choosing modes of short-term LED indication or LED indication prior to forced reset);

- possibility to disable the LED indication;
- control of voltage drop;
- control of mechanical contact with the secured construction;
- case tamper control.

1.4 The Detector generates the following messages:

- «VIBR» – by opening VIBR contacts;
- «Tilt» – by opening TILT contacts;
- «Switching ON» – by opening VIBR and TILT contacts;
- «Tamper/Pullout» – by opening «TAMP» contacts.

1.5 Ambient class of the Detector – Boreal climate: relative humidity 25 – 75 %, air-pressure 86 – 106 kPa, operating temperature range from minus 30 up to + 50 °C.

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

2 Technical Specifications

Table 2

Parameter	Value
Detection Area, m ² , not less than:	
- continuous concrete, brick or wood construction	12
- metal cabinet, door, ATM upper cabinet safes, ATM lower cabinet	6
- safe, ATM lower cabinet	3
Minimum detectable tilt of secured construction, deg	5
Overall dimensions, mm, not more than	101 x 45 x 34
Voltage supply range, V	9 ... 17
Current consumption, mA, not more than:	
- in standby mode at rated voltage	17
- maximum	25
Warm-up time of the Detector, s, not more than	10
Operating temperature range, °C	minus 30 ... + 50
Relative air humidity (at a temperature 25 °C), %, not more than	90
Permissible current through output contacts, mA	100
Permissible voltage at output contacts, V	72
IP rating (case protection against foreign objects 1 mm in diameter (wire, bolts), and protection against vertical droppings)	IP41
Weight of the Detector, g, not more than	150
Average operating time to failure in standby mode, h, not less than	60000
Average service life, years	8

3 Inside View

The Detector layout is shown in Figure 1.

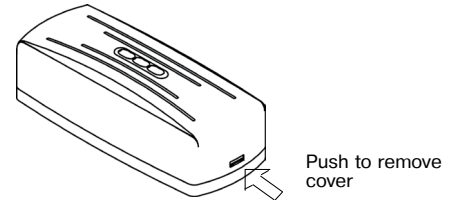
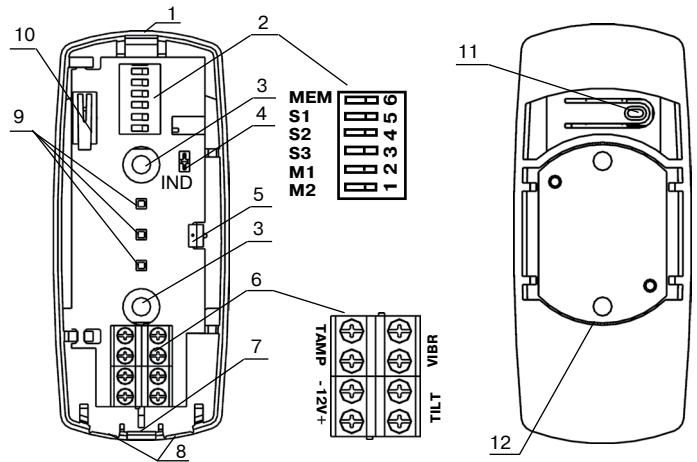


Figure 1 – Detector «SH-VT»

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 – Tamper;
- 11 – Wall tamper;
- 12 – Sensor base.

Figure 2 – the base with the PCB

4 The Detector Mounting

The Detector mounting and sensitivity adjustment is fulfilled with the removed cover. 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 mounted 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 protected construction.

For the Detector mounting on brick or concrete constructions, anchors should be used (supplied). The depth of the openings for fixing the Detector should be sufficient to ensure the anchors full length sunk in the main material of the secured 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.

Table 1

Message	Description	Contacts			Indicators ¹⁾		
		VIBR	TILT	TAMP	Red	Green	Yellow
Normal	Standby mode	C	C	X	o	o	o
Vibration alarm	Tool attack on the construction	O	X	X	●	X	X
Tilt alarm	Changing of the tilt	X	O	X	●●●	X	X
Supply voltage alarm	Supply voltage lowering below 8 V	O	O	X	●●	X	X
Cover tamper Wall tamper	Cover tamper or the wall tamper disable	X	X	O	X	X	X
Switch on	Self test after voltage supply ON	O	O	X	●	●	●
Noise vibration	Noise vibration	X	X	X	X	●	X
Memory – Vibr alarm ²⁾	Indication Memory – VIBR	X	X	X	X	X	●
Memory – Tilt alarm ²⁾	Indication Memory – TILT	X	X	X	X	X	●●●
Memory – Voltage supply alarm ²⁾	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.

²⁾ – LED MEM is lighting until supply voltage will be OFF or until DIP-switch MEM will be OFF.

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 «Henkel» in accordance with instructions for use of superglue supplied in it's 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 6). Two openable holes (see Figure 2, position 8) 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 M1 and M2 DIP-switches are intended for choosing the signal processing algorithm depending on material of secured construction (see Table 3).

Table 3

Material	Position	
	M1	M2
Metal constructions (Safes, Vaults, Vaults Doors and other objects with a solid metal surfaces)	OFF	OFF
Brick or Concrete	ON	OFF
Wooden Surface	OFF	ON
ATMs	ON	ON

DIP-switches S1, S2, S3 are intended for adjustment of the Detector sensitivity (see Table 4).

Table 4

DIP-switch Position			Sensitivity
S1	S2	S3	
ON	ON	ON	<div style="text-align: center;"> <p>Maximum</p> <p>Minimum</p> </div>
OFF	ON	ON	
ON	OFF	ON	
OFF	OFF	ON	
ON	ON	OFF	
OFF	ON	OFF	
ON	OFF	OFF	
OFF	OFF	OFF	
ON	ON	ON	
OFF	OFF	OFF	

7 Adjustment Procedure

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

Set the switches M1 and M2 to the position corresponding to the material of the protected construction (see Table 3).

Set the switches 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 4 display too high level of interference at the protected object. If possible, eliminate the source of interference.

Set the switch MEM to ON position, switches 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 5). 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 4) 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 IND and MEM switches in accordance with the security tactics chosen for the object.

Table 4

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 «Destruction».	Drill diameter – (4.5 ± 0.5) mm, the time of one drilling is not less than 3 s. Pause between drillings is not more than 10 s
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 «Destruction».	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 LED indication «Destruction».	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

8 User-operating mode

The User-operating mode, activated by DIP-switches (see Table 3), is designed to adapt the Detector to a severe interference conditions on a secured object by means of individual sensitivity adjustment with regard to different types of attacks.

In this mode sensitivity adjustment is carried out by means of a personal computer (PC). The Detector is connected to the PC via the serial interface module «US-PI» (supplied optionally).

The procedure of the Detector adjustment in User-operating mode is listed in the «US-PI» accompanying documents.

9 Scope of Delivery

9.1 Each Detector unit package contains the items listed in Table 6.

Table 6

Name	QNT
Atm security vibration and tilt detector «SH-VT»	1 pc.
Screw A.M4-6gx40.48.016 DIN 84	2 pcs.
Anchor Sormat 72204 MSA 4x17	2 pcs.
Washer DIN 127	2 pcs.
Glue (Loctite Super Glue, Henkel)	1 pc.
Installation Guide	1 copy
Serial interface module «US-PI»	*

*) – supplied optionally

10 Manufacturer's Guarantees

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

10.2 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.

10.3 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.

11 Packing Certificate

Atm security vibration and tilt detector «SH-VT» has been manufactured in compliance with the active technical documentation and classified as fit for operation and packed by «RIELTA» JSC.

Packing date _____ month, year