SEISMIC VIBRATION SENSOR

«SH-V»

Installation Guide

General information

The seismic sensor SH-V is designed to detect attempts to destroy concrete walls and floors, brick walls, wooden structures, plywood, compound glass, armoured glass, standard metal safes, metal cabinets and ATMs.

The unit provides immunity against acoustic noise, accidental impacts on monitored structures, prolonged vibration produced by transportation facilities, lifts, ventilation systems, and water supply systems. The unit also provides immunity to electromagnetic interferences, electrostatic discharges and supply voltage dips.

Energized form A (NC) alarm relay.

Main features

- Versatile types of monitoring:
  - entire indoor surfaces or specific areas;
  - basic part of an object surface (fig. 3);
  - a full-size surface of an object (fig. 4), including adjacent structures (fig. 5).
- Possibility to be mounted singly or in groups.
- Automatically selected algorithm of microprocessor operation according to the impact types and instruments.
- Tamper output.
- LED indication of sensor status and protected object vibration.
- Selectable LED indication modes of alarm memory.
- Disabling of LED indication if required.
- Three test modes to ensure proper sensitivity adjustment.

Principal specifications

Alarm period	not less than 2 sec
Warm-up period	not more than 10 sec
Supply voltage	9-17 V DC
Current consumption	not more than 25 mA
Operating temperature	minus 30...+50°C
Size	105x45x35 mm
Weight	0.2 kg

Mounting

Sensor mounting examples are shown of fig. 3-11, where A1 = sensor, L = radius (range) of detection;

L<=1.9 m; L1<=3/4L; L2+L3 <=2.0 m.

Mounting on a brick wall or on a concrete structure

To install the sensor on a brick wall, drill into the wall two holes 5 mm in diameter and 40 mm in depth, not counting the thickness of any decorative coating (which must not exceed 15 mm). Insert (factory-supplied) brass anchor into the hole until the stop and fix the sensor in position by means of (factory-supplied) screw.

Mounting on a wooden structure

To install the sensor on a wooden structure (fig. 6,8,9), drill two holes (2,5±0,2) mm in diameter and (25±2) mm in depth in the structure to be monitored, not counting the thickness of any decorative coating, which must not exceed 10 mm. Then, fix the sensor by means of the (factory-supplied) wood screws.

Mounting on a control unit of a bank automatic teller machine (ATM), or on any metal cabinet surface

To install the sensor on a surface of an ATM control unit (to protect its front panel against vandalism) (fig.10) or on any metal cabinet surface, drill two holes on a lateral surface of sufficient thickness to accept at least two M4 threads, then cut an M4 tap and thereafter fix the sensor in position by means of M4 screws.

Mounting on a money holding unit of a bank automatic teller machine (ATM) or on an armoured safe

To install the sensor on a surface of an ATM money holding unit (fig. 9) or on a surface of an armoured safe (fig. 7) it is necessary to remove decorative coatings over an area sufficient for the sensor installation. Then the sensor must be glued to the surface by means of appropriate glue.

Mounting the sensor for monitoring of hollow glass blocks

Mounting can be carried out in either of two ways:

- Directly adjacent to the glass blocks to be monitored (fig. 11a). In this case, the factory-supplied sensor mounting fixtures are well suited to for installation into the cement joints between glass blocks, just as in mounting the sensor on a brick or concrete structure.
- On a brick, concrete or metallic structure adjacent to a monitored object (fig.11b). In this case, mounting should be carried out according to the appropriate procedure described above.

Mounting of the sensor for monitoring of shielding glasses

In this case, the sensor is mounted either on the frame of the monitored glass, or on a brick, concrete or metallic structure adjacent to the monitored glass, according to the appropriate procedure described above.

Wiring of the sensor

Wiring diagrams are shown on fig. 1 and fig. 2, where A1= sensor; G1 = power supply unit; R1, R2 = EOL resistors; Z1, Z2 = signal loops.

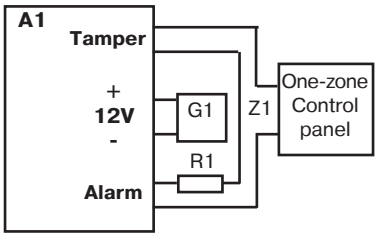

Fig. 1. Wiring diagram of the sensor with combined "Alarm" and "Tamper" signals.

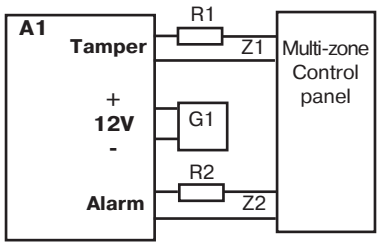

Fig. 2. Wiring diagram of the sensor with separated "Alarm" and "Tamper" signals.

Switches

Preparation of the sensor for adjustment is performed by means of switches "1", "2" and "3" (table 1).

Switch	Designation
1	Test mode ON/OFF; Setting of test mode type by successive turning the switch from OFF to ON
2	Alarm memory ON/OFF
3	LED indication ON/OFF

Switch "1" works on a "ring principle", i.e:

- switching it ON once corresponds to setting the first type of test mode;
- switching it ON twice corresponds to setting the second type of test mode;
- switching it ON three times corresponds to setting the third type of test mode;
- the next switching OFF cancels the test mode.

Note: The unit automatically cancels the test mode after 6 min.

LED Indications

Three LEDs at the front of the unit are used to indicate its status.

Green LED indicates vibration; the indication is ON when the sensor detects vibration of the monitored surface.

Red LED indicates alarm. The indication is ON in case of alarm for not less than 2 seconds if the alarm memory is OFF. If the alarm memory is ON then the red LED indication is ON in case of alarm, until the unit is unpowered.

The yellow LED is used only in test mode, to indicate the sensitivity level setting. The first level: intermittent, infrequent flashing (2 flashes per sec), the second level: intermittent, frequent flashing (10 flashes per sec) , the third level: continuous light.

Preparation for sensor adjustment

Set switches «2» and «3» in ON position and turn the R4 control clockwise to the stop (max sensitivity).

Apply power to the sensor. All the three LED indicators will light momentarily, and, if everything is OK, then go dark.

A lighted Green LED indicates a relatively high level of interference due to vibration in the monitored structure. Take action to reduce interference.

A lighted Red LED intermittently for more than 2 seconds indicates that there is a power supply malfunction – supplied voltage is smaller than permissible for the sensor. Correct the malfunction.

A «Norm» signal is accompanied by normal closing of relay contacts.

Set the sensor for minimum sensitivity by turning the R4 control counter-clockwise to the stop.

Adjustment when the sensor is mounted on an armoured safe, metal cabinet or door, on a standard safe

- Set the unit for test mode I. To do this set «1» switch to its ON position (OFF->ON). Slow flashing of the yellow LED indicates the correct setting.
- Attach a steel plate to a safe outside surface at a place the most distant from the sensor.
- To produce test signals, drill holes in the plate 2-3 mm in depth. Increase the sensitivity of the sensor (by means of the R4 control) up to the level

at which the green LED lights after each drilling, and the red LED lights after drilling three times (In that case, an «Alarm» signal should be generated).

Adjustment when the sensor is mounted on a wooden or plywood structure

- Set the unit for test mode level II. To do this set «1» switch to its ON position twice.(OFF->ON->OFF->ON) Frequent flashing of the yellow LED indicates the correct setting.
- Set a timber beam or plank on an edge of monitored area. To produce test signals, make several saw-cuts into the wood. Sawing must consist of three cycles, each with increased destruction of material. Increase the sensitivity of the sensor (by means of the R4 control) up to the level at which the green LED lights after each sawing and the red LED lights after three cycles of sawing. (In that case, an «Alarm» signal should be generated.)

Adjustment when the sensor is mounted on a brick or concrete building structure or for anti-vandal protection of ATM front surface

- Set the unit for test mode III. To do this set «1» switch to its ON position three times(OFF->ON->OFF->ON-.OFF->ON). The Yellow LED must be continuously lighted.
- Place a “textolite” or laminate plate against the structure at any location near an edge of the monitored area.
- To produce test signals, strike the plate more then once with a hammer. Increase the sensitivity of the sensor (by means of the sensitivity control) up to the level at which the green LED lights after each strike and the red LED lights after three strikes (In that case, an «Alarm» signal should be generated).

Warranty

Manufacturer warrants its product for 5 years from the date stamp control on the product. The unit will be replaced if failures or malfunctions of this product occur during warranty period.

For purchasing the products please contact

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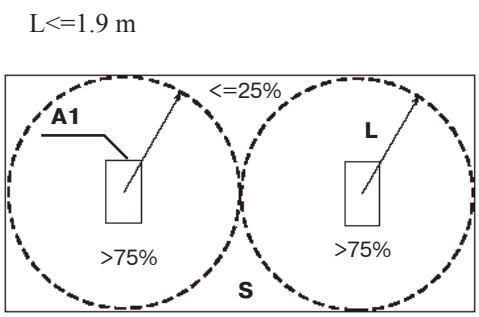

Fig.3 Monitoring a basic part of an object

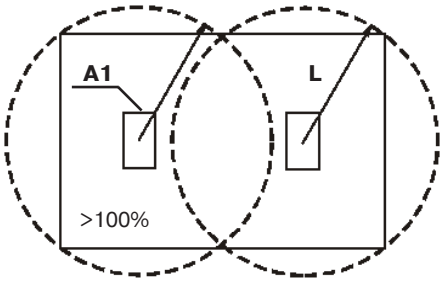

Fig.4 Total monitoring of an object

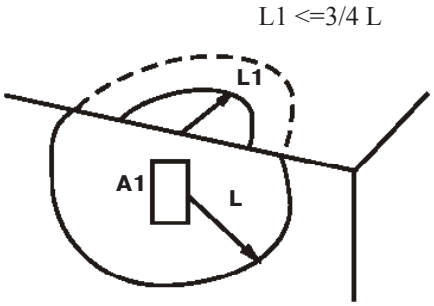

Fig.5 Monitoring an adjacent structure

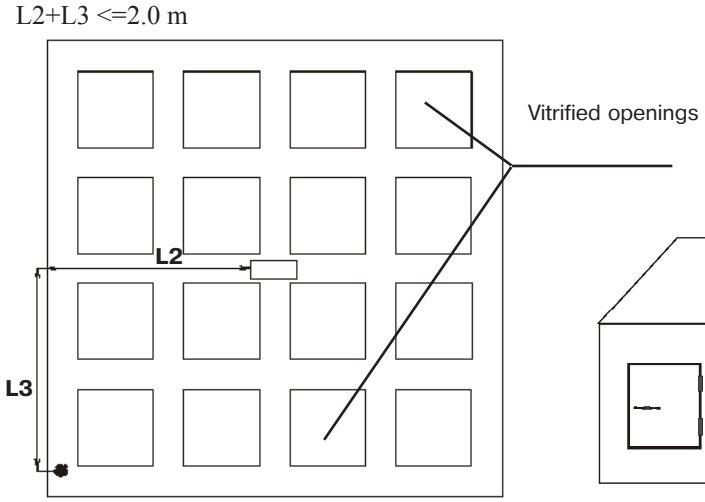

Fig.6 Monitoring a window frame

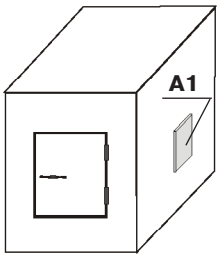

Fig.7 Monitoring a safe

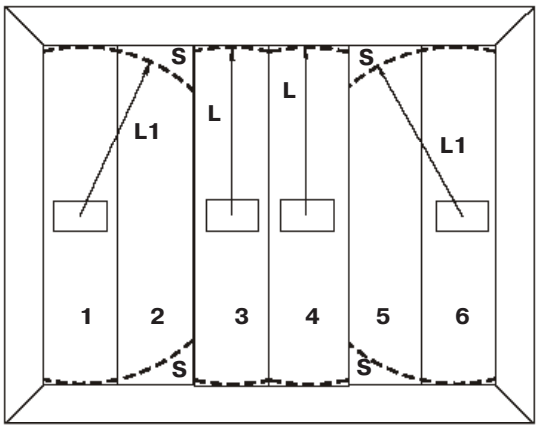

Fig. 8 Monitoring a multi-segment structure

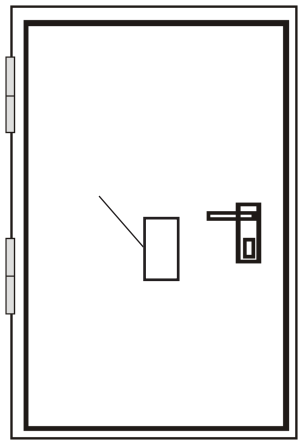

Fig.9 Monitoring a hollow wooden door

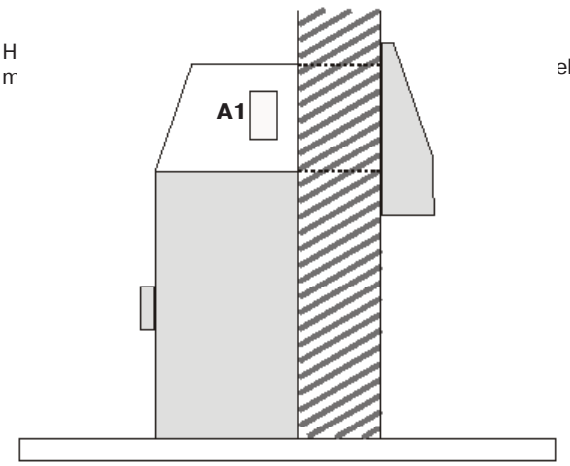

Fig.10 Monitoring an automatic bank teller machine (ATM or bankomat)

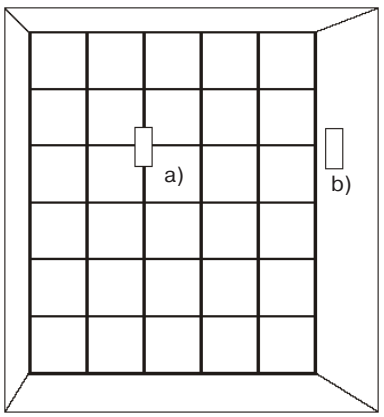

Fig.11 Monitoring glass blocks