Astra-516 (Volumetric Lens)

Optic-Electronic PIR Motion Detector

Operating Manual

The present operation manual is intended for studying operation principle, running conditions and maintenance of PIR motion detector Astra-516 (hereinafter “detector”) (Figure 1).

The manufacturer reserves the right to make alteration regarding refinement of the product without prior notification. All changes will be imported into new edition of the operation manual.

1 Function

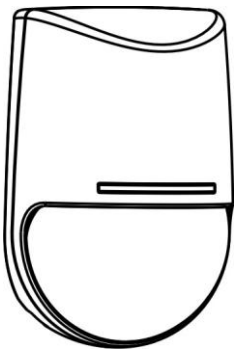


Fig. 1

Detector is intended to detect unauthorized access into closed protected area, and to generate an alarm notification by opening of sygnaling relay contacts.
Power supply of detector is performed from any direct current source with nominal voltage 12V and pulsation amplitude not exceeding 0,1V.

2 Operating Principle

Operation principle is based on registration of changes in thermal emission flux occurring on crossing by a man of detection zone consisting of sensitive zones. Each sensitive zone consists of two elementary sensitive zones (Fig. 2).
The sensitive zones are formed by a Fresnel lens and a bi-areal pyroelectric sensor.
An electric signal from the pyroelectric sensor is sent to a microcontroller which – in accordance with a preset operation algorithm – generates an “Alarm” notification by opening optoelectronic relay circuit.

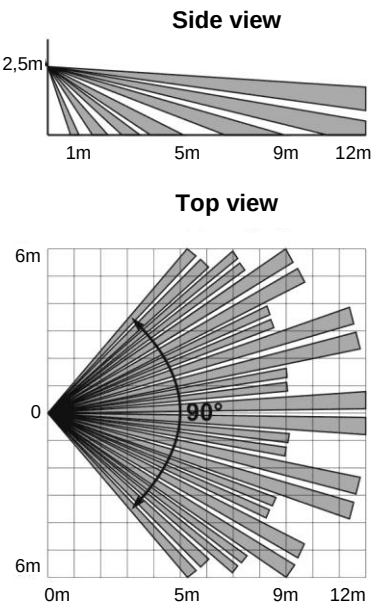


Fig. 2

3 Specifications

Technical Parameters of Optical Channel

Intrusion detection range, m, min..... 12
Detection area angle (in horizontal plane), °.....90
Movement speed detection range, m/s..... from 0.3 up to 3.0
Resistance to ambient light, lx, min 6500
Recommended installation height, m.....from 2.2 up to 2.5

General Technical Parameters

Power supply voltage, V ..... from 8 up to 15
Current consumption in standby mode and in “Alarm” mode, mA, max 12
Permissible current through relay contacts, A, max..... 0.08
Permissible voltage on relay contacts, V, max..... 100
Resistance of circuit connected to alarm loop in standby mode, Ohm..... from 6 up to 8
Overall dimensions, mm, max..... 106.5×72×51.5
Weight, kg, max 0.08

Operating Conditions

Temperature range, °C ..... from -30 up to +50
Relative air humidity, % .....up to 95 at +35 °C
no moisture condensation

4 Delivery Set

PIR motion detector Astra-516…… 1pcs
Bracket..... 1 pcs.
Screw 2.9x25 (or 2-3x30)..... 2 pcs.
Dowel 5x25 ..... 2 pcs.
Sealing material ..... 1 pcs.
User Instruction..... 1 copy.

5 Structure

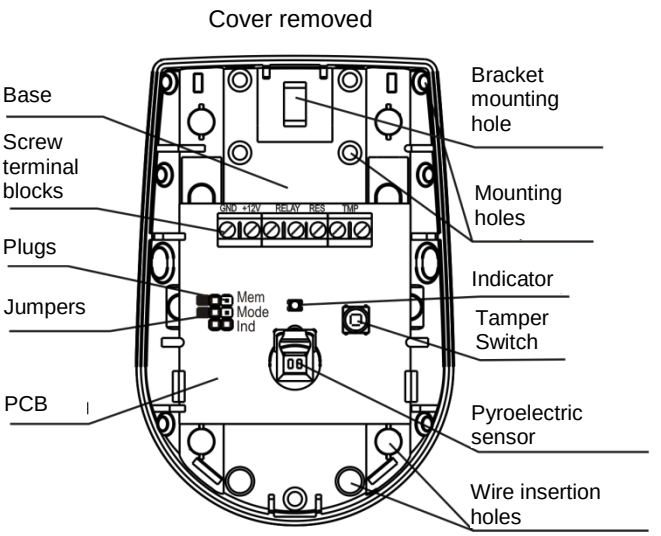


Fig. 3

Structurally, the detector is designed as a unit consisting of a base and a removable cover. The unit houses a printed circuit board with radio elements and screw terminal blocks for external connections (Fig. 3).
Mounted on PCB is an indicator used for detector operability supervision.
The pyroelectric sensor is equipped with a cap.

WARNING! It is prohibited to operate the detector without the cap.

The spherical lens provides for the distortion-free detection zone and forms the short-range detection zone.

6 Information Capacity

Table 1 – Notifications to Indicator and Relay

Notification type	Indicator	Relay
Starting of detector stand-by mode	Flashes **once per 1 s** after powering up. Duration – up to **60 s**	For up to **60 s**
Norm	Not lit	
Alarm	Lights up **once for 4 s** at detection of man movement in detection zone (when indication is enabled)	For **4 s**
Alarm in "Alarm memory" mode	**Fig. 4**	For **4 s**
Alarm during TEST-pass	Lights up **once for 2 s** at detection of man movement in detection zone (when indication is enabled)	For **2 s**
Failure	Keeps lighting until failure elimination	until failure elimination
Tampering	Not lit	TMP relay is open
"⌐¬" –relay is closed, "⌐ ¬" –relay is open,		

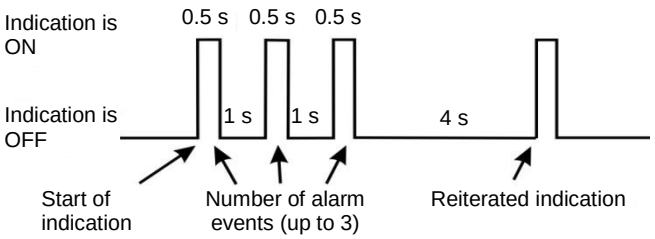


Fig. 4

7 Operating Modes

Table 2 – Operating modes and settings

Operating mode	Plug	Jumper position
"Alarm memory" ON "Alarm memory" OFF	**Mem**	+ –
High detectability Normal detectability	**Mode**	+ –
Indication ON Indication OFF	**Ind**	+ –
TEST-pass (switches ON for 8 min)	**Ind**	For a short moment (for 2-3s) change jumper position on the plug **Ind** during starting of detector operating mode
"+" - jumper is installed on both plug pins "–" - jumper is removed (or installed on one plug pin)		

- **The "Alarm memory" mode** allows registering the fact and number of zone violations in prortected area, and is reflected in corresponding notification .

The mode is activated in 1 minute after installation of **Mem** plug or in 1 min. after starting of detector stand-by mode with jumper installed previously on **Mem** plug. "Alarm" notification is indicated in 1 min. after violation of protected area. To switch the mode off and reset indication, remove jumper from **Mem** plug or switch power off.

- **TEST-pass** allows revealing precise location of sensitive zones formed by the lens. On expiry of 8 min the detector automatically starts its stand-by mode.

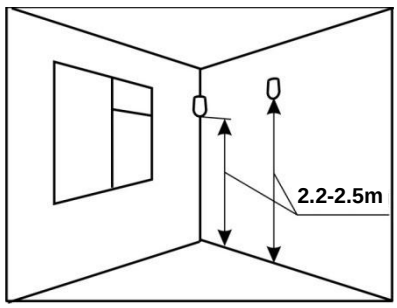
8 Installation and Pre-starting Procedure

8.1 Works on installation, mounting, maintenance and operation of detector should be performed by only qualified persons.

8.2 After transportation in conditions differing from those of operation keep detector unpacked under supposed operation conditions for at least 4 hours.

8.3 Selection of Installation Place

8.3.1 Recommended mounting height



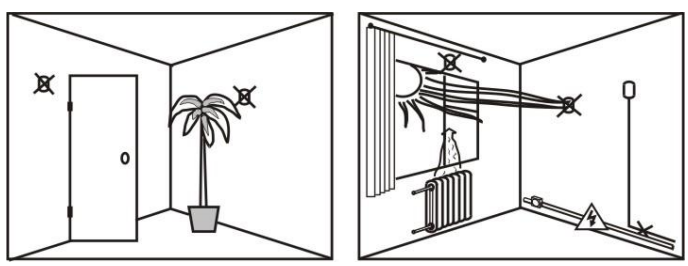
8.3.2 In capital buildings it is recommended to install detector on a bearing wall.

8.3.3 In light metalwork buildings one should avoid to install detector directly on the wall, it is recommended to install detector on bearing carriers.

8.3.4 Wires of signaling zones and power supply circuits should be located far from power cables.

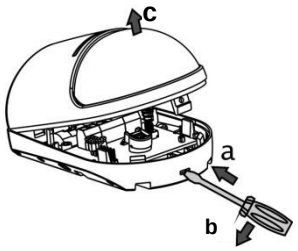
8.3.5 It is recommended to close all doors, air-vents, switch off fans, air-conditioners and other sources of intense air flows in the room during protection period.

8.3.6 Non-recommended mounting locations

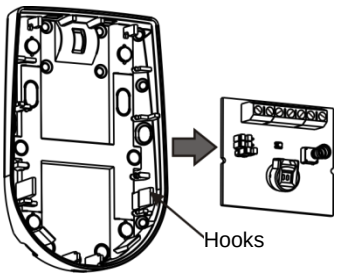


8.4 Installation Procedure

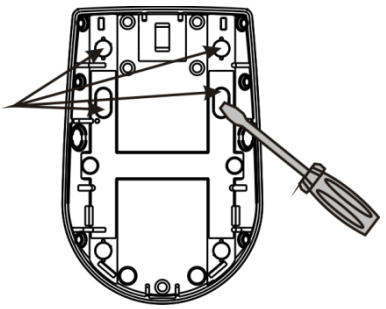
Step-1
Push out cover lock from base slot.
Remove cover



Step-2
Unbend hooks of the base.
Remove PCB

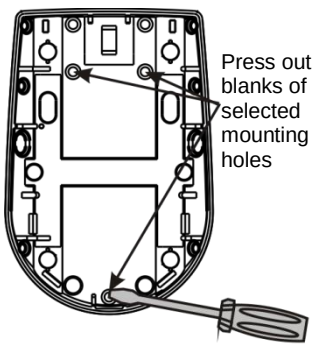


Step-3
Press out blanks of selected wire insertion holes

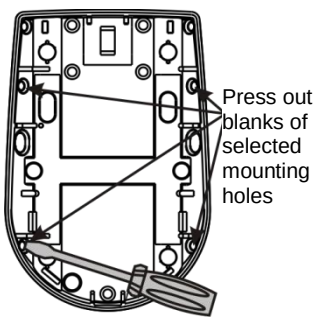


Step-4 Choose mounting option: **a, b** or **c**

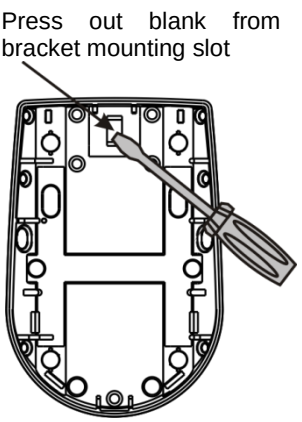
Step-5a
WALL-MOUNTED



Step-5b
CORNER-MOUNTED

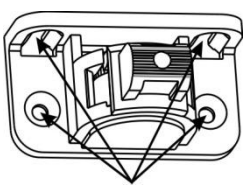


Step-5c
BRACKET-MOUNTED

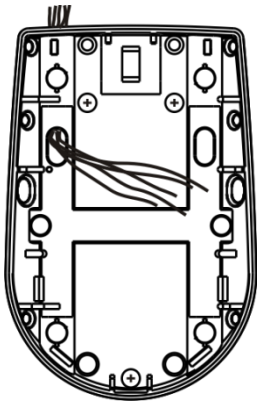


Step-6a,b
Make marking on the wall at the required height applying the base to installation surface.
Detector base should be positioned strictly as per figure of the step 3

Step-6c
Make marking on the wall at the required height applying the bracket to installation surface.
Mount the bracket on a wall or on the ceiling

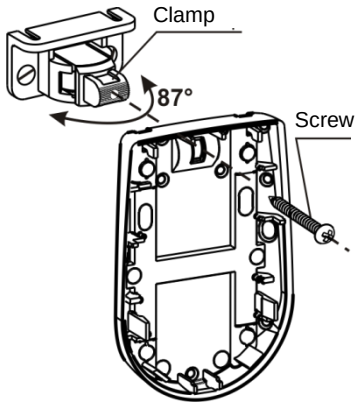


Step-7a,b
Lead wires from power supply source and signaling zones through wire insertion hole on the base.
Fix the base on the wall or in the corner



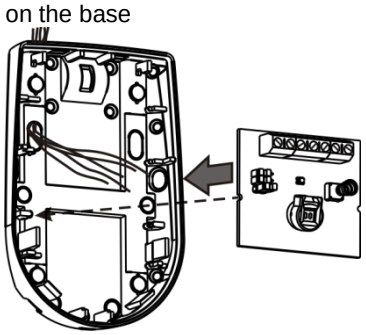
Proceed to step 9

Step-7c
Superpose bracket clamp with base slot of the detector. Drive a screw partially into the bracket clamp from the inside of the detector base.
Position the detector as required and tighten the screw. **The bracket provides for detector rotation for 87º in horizontal plane**



Step-8
Lead wires from power supply source and signaling zones through wire insertion hole on the base

Step-9
Place the printed circuit board back into the base, match the PCB slots with guides on the base. Press on the PCB until it clicks in position



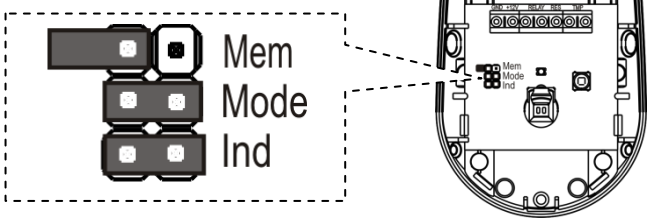
Step-10 Connect wires to detector terminals.



A reserve terminal (**RES**) is provided for connection of a terminal resistor

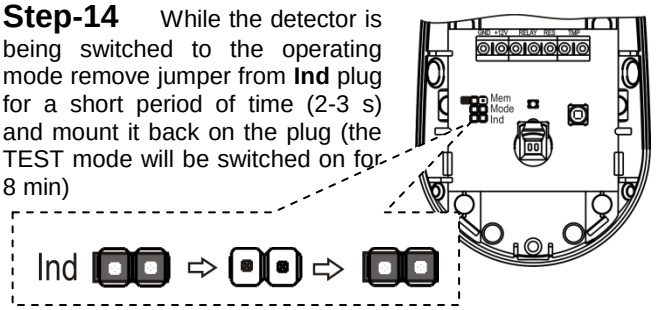
Step-11
Seal all holes in the base with a sealing material supplied to protect the detector from ingress of air currents and insects

Step-12
Remove jumper from **Mem** plug.
Mount jumpers on **Mode** and **Ind** plugs



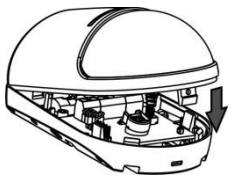
Step-13
Turn the detector ON; the indicator blinks **once per 1 s** for no longer than 60 s – it means the detector is being switched to the operating mode

Step-14 While the detector is being switched to the operating mode remove jumper from **Ind** plug for a short period of time (2-3 s) and mount it back on the plug (the TEST mode will be switched on for 8 min)

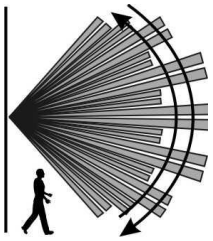


Step-15

Install detector cover on its place (until a click)



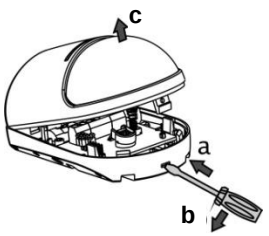
Step-16 Make a **TEST-pass** through a protected area with speed of **0.3** m/s to determine locations of sensitive zones. Stop at the moment of detection (the LED lights up for 2 sec), mark this position, then make a step back and continue moving. Repeat the **TEST pass** in the opposite direction.



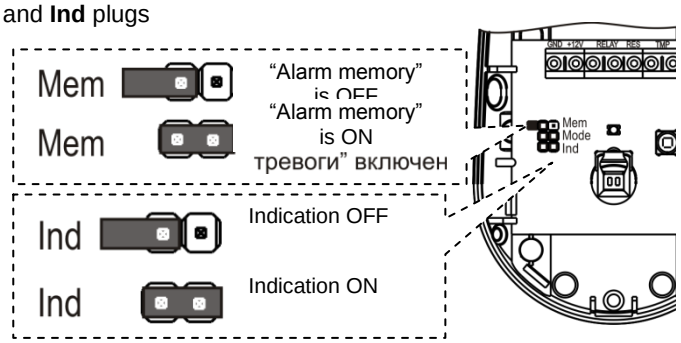
Sensitive zones formed by the lens are located between marked locations

Step-17

Push out cover lock from base slot.
Remove cover

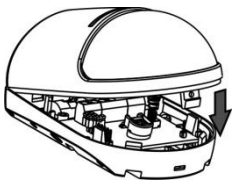


Step-18 Depending on a selected operating mode, install jumpers on **Mem** and **Ind** plugs



Step-19

Install detector cover on its place (until a click)



Step-20 When testing an alarm system at the initial operation period (1-2 weeks) in case of issuing false «Alarm» notifications, connected with the peculiarities of the protected premises, remove jumper from **Mode** plug



8.5 To provide for reliable operation of the alarm system it is recommended to **test and maintain** the detector **at least once a month.**
Testing should be carried out as follows:

- make a pass through the detection zone;
- make sure "Alarm" notification on the control panel and, if indication is enabled, on the detector indicator (lights up once for 4 s for each movement) is appeared.

Maintenance should be carried out as follows:

- inspect integrity of the detector body, reliability of contacts and mounting, clean the detector from any dirt accumulated.

9 Labeling

The following data are shown on the label glued to the body:
- detector abbreviated designation;
- firmware version;
- month and year of manufacture (last two digits);
- certification mark;
- bar code, duplicating textual data.

10 EC Conformity Declarations

This product is in conformity with the provisions of:
EMC 89/336/EEC
EN 61000-6-3:2005 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
EN 50130-4/1995 + A1:1998 + A2:2003 + Corrig. 2003 Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems
EN 60950-1: 2001+A11:2004+Corrig.2004 Safety of information technology equipment

11 Recycling

The detector does not pose any life or health risk to individuals or to the environment. Once its service life is complete, the detector may be utilized with no special environment protection measures.

12 Manufacturer Warranties

12.1 Quality Management System meets provisions of ISO 9001-2011.
12.2 The manufacturer guarantees the compliance of the detector to specifications if the user observes required conditions of transportation, storage, installation and operation.
12.3 The storage warranty period is 5 years and 6 months from the date of manufacture.
12.4 The operation warranty period is 5 years from the date of putting into operation but no longer than 5 years 6 months from the date of manufacturing.
12.5 The manufacturer shall repair or replace a faulty detector during the warranty period.
12.6 The warranty becomes void if:
- the user does not follow guidelines of the operating manual;
- the detector is mechanically damaged;
- the detector is repaired by a party other than the Manufacturer.

12.7 The warranty covers the detector only. All equipment manufactured by other parties and used with the detector is covered by its respective warranty.
The manufacturer bears no responsibility for death, injury, property damage or other incidental or premeditated loss based on user's statement that the detector failed to implement its function.

Warranty service and technical support:
TEKO-TD

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Fax: +7 (843) 261-58-08
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