TSD-1

Smoke and heat detector

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IMPORTANT

Prior to installation, please read carefully this manual in order to avoid mistakes that can lead to malfunction or even damage to the equipment.

Changes, modifications or repairs not authorized by the manufacturer shall void your rights under the warranty.

SATEL aims to continually improve the quality of its products, which may result in changes in their technical specifications and software. Current information about the changes being introduced is available on our website.
Please visit us at:
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The declaration of conformity may be consulted at www.satel.pl/ce

The following symbols may be used in this manual:

i - note,

⚠   - caution.

The TSD-1 multisensor detector can detect the early stages of fire development when there is some visible smoke and/or temperature rise. This manual applies to the detector with electronics version 1.7 or higher.

1. Features

- Selection of detector operating mode:
  - smoke and heat detection;
  - smoke detection;
  - heat detection.
- EN54-7 compliant visible smoke sensor.
- EN54-5 compliant heat sensor.
- Alarm memory option.
- Selection of alarm output type:
  - NO;
  - NC;
  - 2EOL/NO;
  - 2EOL/NC.
- Configuration of the detector parameters by means of DIP-switches.
- Detection of optical chamber fouling.
- Red LED indicator.

2. Description

Smoke detection

An optical method is used for the detection of visible smoke. When the concentration of smoke in the optical chamber exceeds a given threshold, an alarm is triggered. The smoke sensor operating parameters are modified depending on the temperature changes recorded by the heat sensor (thermistor). The detector automatically compensates for gradual changes in the optical chamber caused by deposition of dust.

Heat detection

The heat sensor operates according to the requirements of Class A1R (EN 54-5). The temperature exceeding 54°C or a too fast temperature rise (see table 1) will trigger an alarm.

Air temperature rise velocity	Lower limit of response time	Upper limit of response time
1°C/min	29 min	40 min 20 s
3°C/min	7 min 13 s	13 min 40 s
5°C/min	4 min 9 s	8 min 20 s
10°C/min	1 min	4 min 20 s
20°C/min	30 s	2 min 20 s
30°C/min	20 s	1 min 40 s

Table 1. Response time limits for the heat sensor.

Alarm signaling

If the event of an alarm, the detector output is activated and the LED lights up.

Alarm memory

If the alarm memory is disabled, the detector will keep signaling the alarm until the alarm cause no longer exists. After the alarm memory is enabled, the detector will keep signaling the alarm until it is reset (power reset).

Alarm output

The detector has a relay output which is activated during an alarm. You can select if the relay contacts are to be open (NO) or closed (NC) in normal state.

When connecting an output to a SATEL control panel, you can use the built-in EOL resistors of the detector (2 x 1.1 kΩ). The control panel's input should be programmed as 2EOL. Removing the detector's cover or cutting off the wires in such configuration will trigger a tamper alarm.

Detection of optical chamber soiling

The detector is monitoring the state of the optical chamber. Deposition of dust in it may lead to malfunctioning of the device. When the optical chamber requires cleaning, this state is indicated by the LED.

LED indicator

Red LED indicates:

- alarm – ON,
- optical chamber soiling – one flash every 30 seconds,
- incorrectly configured settings – flashing.

3. Selecting a mounting location

- The detector is designed for indoor installation.
- The detector should be installed in location close to the building / apartment exit (e.g. in the hall, lobby etc. – Fig. 1 and Fig. 2).
- In the typical home or office applications, the detector should be installed on the ceiling, as close as possible to the center of the room, at a distance of at least 0.5 meters from the walls or other objects (Fig. 3).
- Do not install the detector in places with high concentration of dust and/or formation and condensation of water steam.
- Do not install the detector near heaters, cookers, fans or air-conditioner outlets.
- Do not install the detector in places where there is no unobstructed movement of air (e.g. in recesses, niches, etc.).
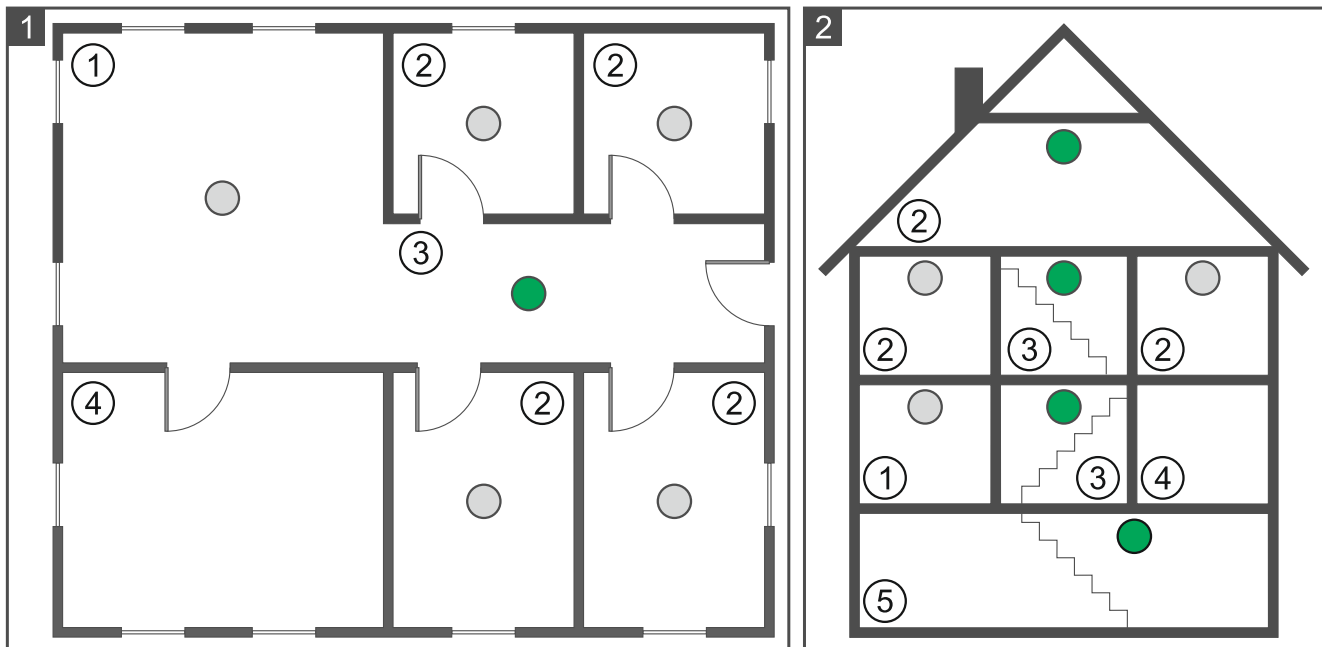
Legend for Figures 1 and 2:

① living room.

② room.

③ hall, lobby, etc.

④ kitchen.

⑤ basement.

⬤ basic location for detector installation.

◯ additional location for detector installation.
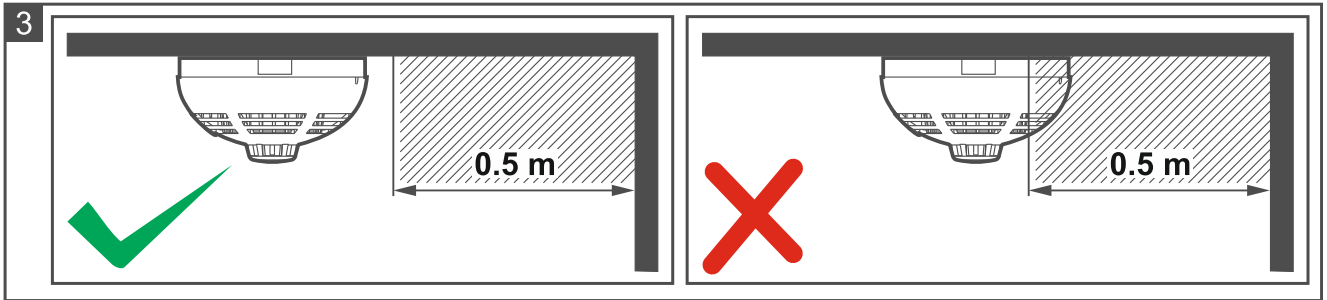
4. Installation

⚠️ **Disconnect power before making any electrical connections.**

1. Remove the plastic dust cap.
2. Turn the cover counter-clockwise (Fig. 8) and remove it (Fig. 9).
3. Using wall plugs (anchors) and screws, secure the enclosure base to the wall. Select wall plugs specifically intended for the mounting surface (different for concrete or brick wall, different for plaster wall, etc.).
4. Using DIP-switches, configure the detector (see: "Configuring the detector").
5. Screw the wires to the corresponding terminals in the enclosure base (see: "Connecting wires").
6. Replace the detector cover and turn it clockwise.
7. If in the premises where the detector is installed, any work is being carried out that may lead to soiling of the optical chamber, put a plastic dust cover on the detector and leave it there until the work is finished.

ℹ️ *It is recommended that the dust cap be kept in case of conducting any repair work in the future.*

4.1 Configuring the detector

In order to configure the detector settings, use the DIP-switches shown in Figs 4 and 5.
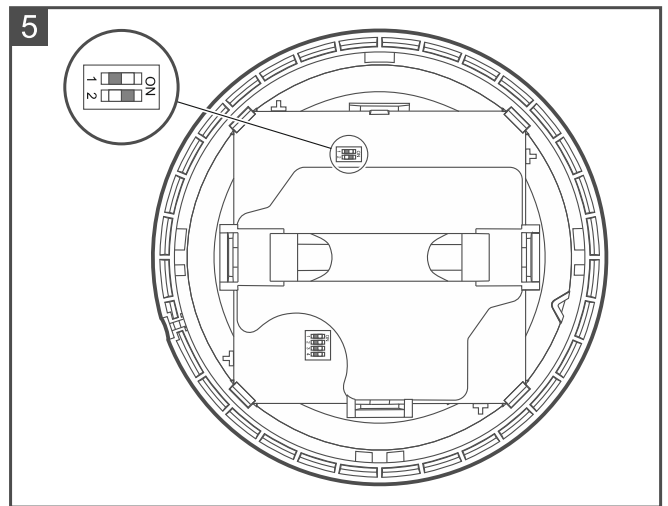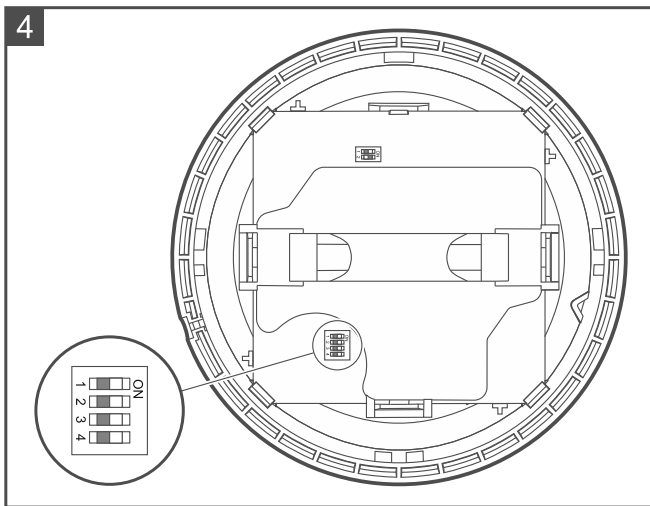
DIP-switch number	Parameter	DIP-switch position	
		OFF	ON
1	relay type	NO	NC
2	alarm memory	disabled	enabled
3	heat detection	disabled	enabled
4	smoke detection	disabled	enabled

Table 2. Configuring the detector operating parameters with the DIP-switches shown in Fig. 4.

i *If you disable smoke detection and heat detection, an error will be indicated by the detector's LED flashing.*

| Output configuration	DIP-switch number	
	1	2
without EOL resistors	OFF	ON
with EOL resistors (2EOL)	ON	OFF

Table 3. Configuring the detector output with the DIP-switches shown in Fig. 5.

4.2 Connecting wires

The terminals located in the enclosure base are designated with numbers:

1 – common ground;

2 and 3 – alarm output;

4 – power input +12 V DC;

5 – additional terminal.

Shown in Figs 6 and 7 are examples of how the detector can be connected to the control panel (OUTx – power output; COM – common ground; Zx – zone programmed as fire; Zy – zone programmed as tamper). In the example shown in Fig. 7, the additional terminal is used to connect the tamper circuit (the interruption of which will trigger a tamper alarm).
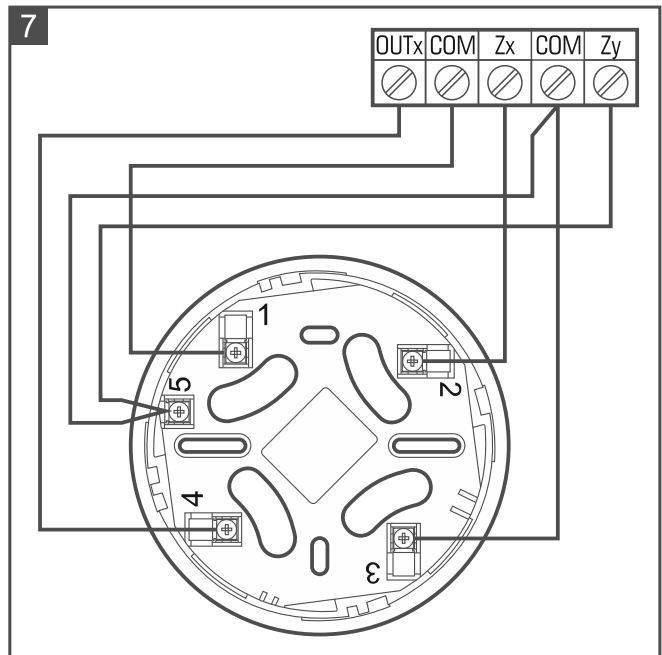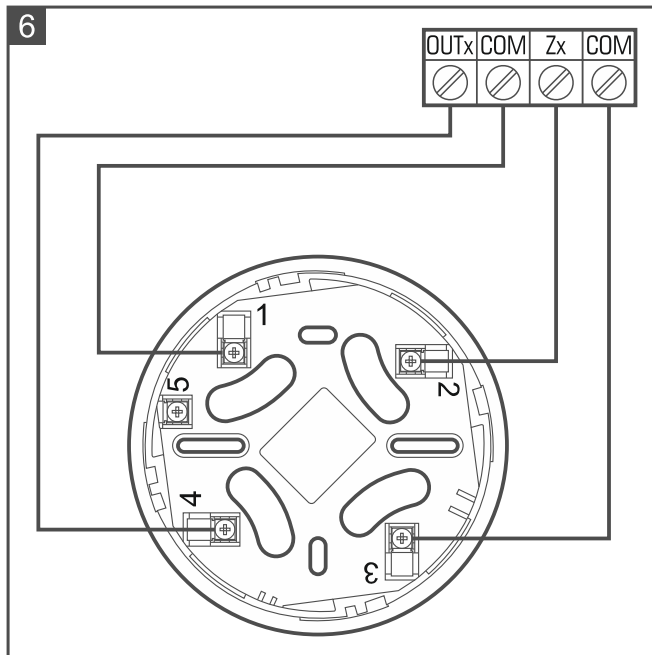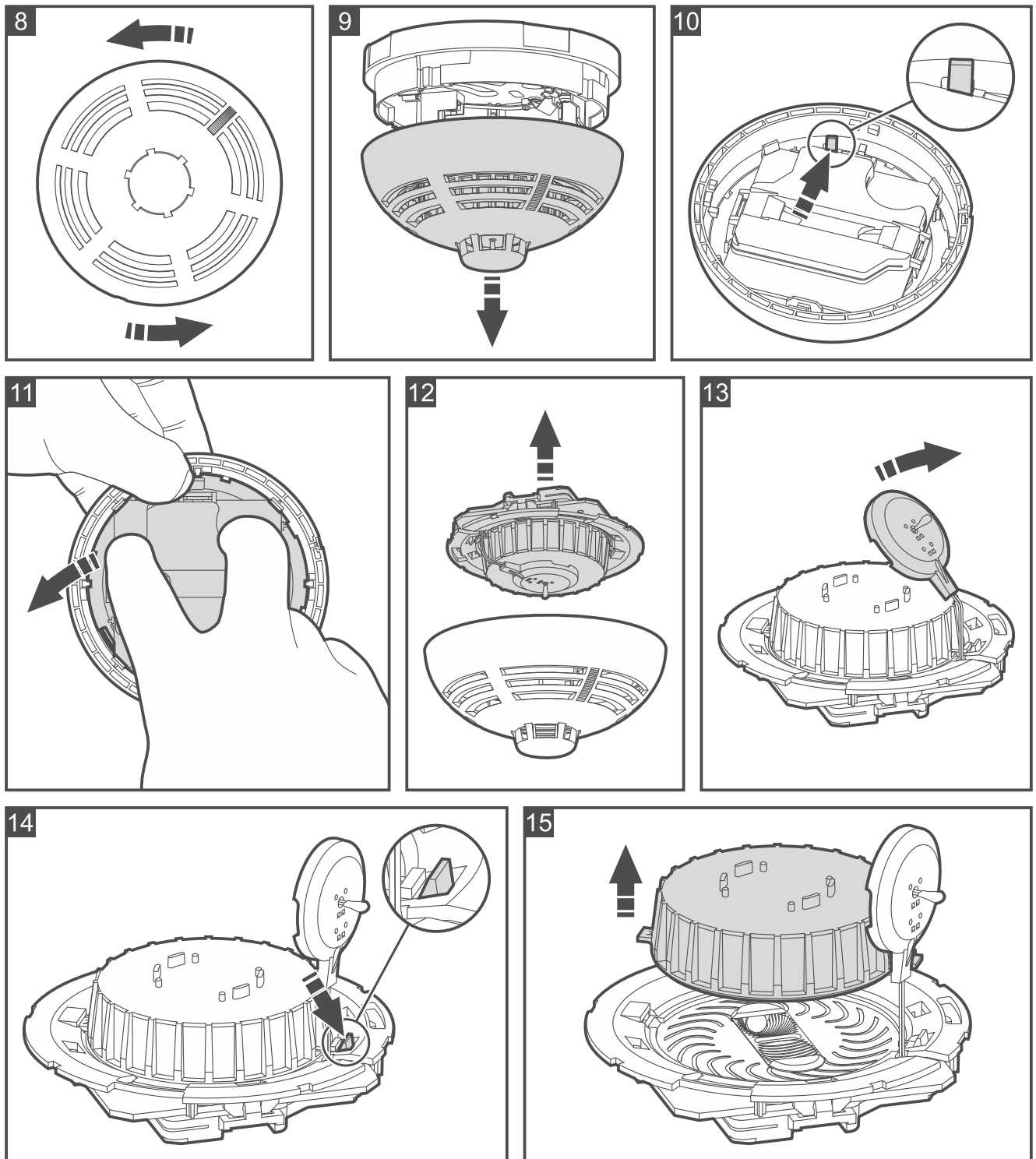
5. Maintenance

The detector should be subjected to regular checks for correct functioning. The periodic checks should be carried out at least every 6 months.

6. Cleaning the optical chamber

It is recommended that you have the optical chamber cleaned at least once a year. Cleaning the chamber is necessary when the LED indicates fouling of the chamber (one flash every 30 seconds).

1. Turn the cover counter-clockwise (Fig. 8) and remove it (Fig. 9).
2. Pull the release lever to unlock the electronics module and turn it counter-clockwise (Fig. 10 and 11).
3. Remove the electronics module with the optical chamber (Fig. 12).
4. Remove the plastic element with the thermistor from the optical chamber cover (Fig. 13).

5. Release the mounting catch (Fig. 14) and remove the optical chamber cover (Fig. 15).
6. Using a soft brush or compressed air, clean the labyrinth in the cover and the base of the optical chamber, paying attention to the recesses where the LEDs are installed.
7. Replace the optical chamber cover.
8. Replace the plastic element with the thermistor on the optical chamber.
9. Secure the electronics module with the optical chamber in the cover and turn it clockwise.
10. Replace the detector cover and turn it clockwise.

7. Specifications

Supply voltage	12 VDC ±15%
Standby current consumption	0.25 mA
Maximum current consumption	24 mA
Alarm output (relay, resistive load)	40 mA / 16 V DC
Class according to EN 54-5 (heat sensor)	A1R
Static response temperature	54°C
Environmental class according to EN50130-5	II
Operating temperature range	-10°C...+55°C
Maximum humidity	93±3%
Enclosure dimensions	ø108 x 61 mm
Weight	164 g

The TSD-1 smoke and heat detector conforms to the essential requirements of the EU Regulations and Directives:

CPR 305/2011 Regulation of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing the Council Directive 89/106/EEC on construction products;

EMC 2014/30/UE Electromagnetic Compatibility Directive.

The CNBOP-PIB Certification Body in Józefów issued the Certificate of Constancy of Performance 1438-CPR-0687 for the construction product TSD-1 smoke and heat detector, confirming its compliance with the requirements of EN 54-5:2000+A1:2002 and EN 54-7:2000+A1:2002+A2:2006.

The Certificate and the Declaration of Performance can be downloaded from the **www.satel.pl** website.

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1438-CPR-0687

DOP/CPR/0687

EN 54-5

EN 54-7

TSD-1 conventional spot type multisensor heat and smoke detector, operating on light scattering principle, fixed temperature / rate-of-rise, for fire alarm systems used in buildings.

Declaration of Performance DOP/CPR/0687

Application – fire safety.

Technical specifications – please refer to this manual.