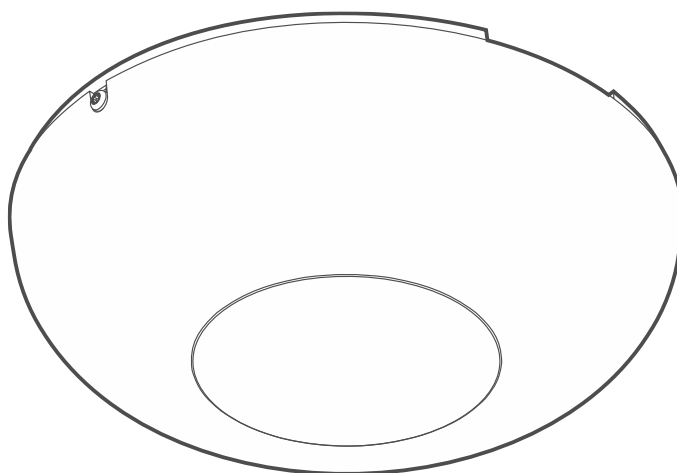


Ceiling dual technology motion detector
with anti-mask (surface mount)

SLIM-S-DUAL-PRO

Firmware version 3.01

EN



CE

slim-s-dual-pro_en 05/26

IMPORTANT

The device should be installed by qualified personnel.

Prior to installation, please read carefully this manual.

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

Description of symbols on the device:



Direct current (DC).



The device meets the requirements of the applicable EU directives.



The device is designed for indoor installation.



The device must not be disposed of with other municipal waste. It should be disposed of in accordance with the existing rules for environment protection (the device was placed on the market after 13 August 2005).

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:
<https://support.satel.pl>

The declaration of conformity may be consulted at www.satel.pl/ce

Signs in this manual



Caution – information on the safety of users, devices, etc.



Note – suggestion or additional information.

CONTENTS

1.	Features	2
2.	Description.....	2
	Operating modes	2
	Tamper protection	3
	Active IR anti-mask.....	3
	Supervision features.....	3
	LED indicator	3
	Remote configuration mode enabling / disabling	4
3.	Electronics module	4
	Terminals.....	5
	DIP-switches.....	5
4.	Installation	6
	Tips for installation.....	6
	Mounting.....	7
5.	Configuring the detector using the buttons / keyfob.....	10
	Description of detector buttons	10
	Description of keyfob buttons	10
	Starting configuration mode.....	11
	Configuring the settings	11
	Restoring factory settings	12
	Ending configuration mode	12
6.	Walk test.....	13
	Separate testing of sensors	13
7.	Specifications	13

The SLIM-S-DUAL-PRO ceiling detector uses infrared and microwaves to detect motion. It is designed for mounting on the surface of the ceiling. This manual applies to the detector with electronics version E.



The detector meets requirements of the EN 50131-2-4 standard for Grade 3.

1. Features

- Motion detection with passive infrared sensor (PIR) and microwave sensor (MW).
- Maximum coverage area (see Fig. 22):
 - $\varnothing$ 6 m / 28 m² – mounted at 2.4 m,
 - $\varnothing$ 10 m / 79 m² – mounted at 3.5 m.
- Digital motion detection algorithm for both sensors.
- Digital temperature compensation.
- Adjustable detection sensitivity of both sensors.
- Capability of separate sensor testing.
- Digital filter of signals received by the microwave sensor ensuring immunity to false alarms caused by the power network and gas-discharge lamps.
- Selectable operation mode: basic or advanced.
- Active IR anti-mask, compliant with EN 50131-2-4 requirements for Grade 3.
- Possibility to configure the detector settings using the OPT-1 keyfob (available in the SATEL product range).
- Built-in end-of-line resistors (2EOL: 2 x 1.1 k Ω / 2 x 4.7 k Ω / 2 x 5.6 k Ω).
- LED indicator:
 - selectable lighting color (7 colors available).
 - indicator enabled / disabled remotely.
- Configuration mode enabled / disabled remotely.
- Supervision of motion detection system.
- Powered by 12 VDC ($\pm$ 15%).
- Supply voltage control.
- Tamper protection against enclosure opening, removal from mounting surface and detector displacement (optionally, after enabling displacement detection).
- Mounted on the surface of the ceiling.

2. Description

Operating modes

Basic – the detector reports alarm when both sensors have detected motion within a time period shorter than 3 seconds.

Advanced – the detector reports alarm when:

- both sensors have detected motion within a time period shorter than 3 second,
- within a time period shorter than 3 seconds, the microwave sensor has detected motion, and the PIR sensor has registered some small changes in its field of view, not sufficient however to recognize them as motion,
- within 15 minutes, the microwave sensor has detected motion 16 times, though the PIR sensor has registered no changes in its field of view.

Tamper protection

Enclosure opening / removal from the mounting surface or detector displacement results in activating the tamper output. The output will remain activated until the end of tamper.



Tamper protection against detector displacement is optional. It only works when the detector displacement detection is enabled (see Configuring the detector using the buttons / keyfob p. 10).

The detector remembers its position at the moment of startup or when the detector configuration mode is ended.

Active IR anti-mask

The active anti-mask feature detects attempts to cover the detector or paint over the lens. The detector emits infrared radiation and measures the amount of radiation received. A change in the level of received infrared radiation activates the anti-mask output and optionally causes the LED indicator to flash. The output will remain on / the indicator will continue flashing as long as the detector detects masking.



The active anti-mask feature meets the EN 50131-2-4 requirements.

When configuring the detector (see *Configuring the detector using the buttons / keyfob p. 10*), you can enable / disable the anti-mask feature.

Anti-mask delay

The detector with factory default settings will report masking if it receives a wrong amount of infrared radiation for 1 second. You can delay the anti-mask activation (see *Configuring the detector using the buttons / keyfob p. 10*). The detector will report masking if it is covered for 60 seconds.



If you delay the anti-mask activation, the detector will not meet the requirements of EN 50131-2-4 for Grade 3.

Supervision features

In the event of the voltage drop below 9 V ($\pm 5\%$) for more than 2 seconds or the motion detection system failure, the detector will indicate a trouble. The trouble is indicated by activating the alarm output and turning on the LED indicator. The signaling continues for the duration of the trouble.

LED indicator

The LED indicator indicates:

- warm-up – flashing alternately different colors for about 30 seconds,
- motion detected by microwave sensor – ON for 3 seconds (default color: green),
- motion detected by PIR sensor – ON for 3 seconds (default color: purple),
- alarm – ON for 2 seconds (default color: blue),
- masking – flashing when the detector is masked (the same color of lighting as in case of alarm),
- trouble – ON for the duration of the trouble (the same color of lighting as in the case of alarm).

You can configure the following LED indicator settings:

- select the color to be used to indicate alarm / masking / trouble,
- enable / disable the signaling of motion detection by microwave and PIR sensors,
- enable / disable the indication of masking.

For detailed information, please refer to section *Configuring the detector using the buttons / keyfob* p. 10.

Enabling the LED indicator using the DIP-switch

If you enable the LED indicator using the switch (set the 8 switch in ON position – Fig. 8), the indicator will indicate events but it will be impossible to enable / disable the indicator remotely. If you disable the LED indicator using the switch (Fig. 9), it will be possible to enable / disable the indicator remotely.

Enabling / disabling the LED indicator remotely

The LED terminal is provided to allow the LED indicator to be controlled remotely. The LED indicator is enabled when the terminal is connected to common ground. The LED indicator is disabled when the terminal is disconnected from common ground.

You can connect to the terminal an OC type alarm control panel output programmed e.g. as:

- INTEGRA / INTEGRA Plus: *Zone test status* or *BI switch*,
- PERFECTA / VERSA: *Controlled*.

Remote configuration mode enabling / disabling

The SRVC terminal is provided to allow remote configuration mode enabling / disabling. The configuration mode is enabled, when the terminal is connected to the common ground.

You can connect to the terminal an OC type alarm control panel output programmed e.g. as:

- INTEGRA / INTEGRA Plus: *Service mode status* or *BI switch*,
- PERFECTA / VERSA: *Controlled*.

3. Electronics module



Do not remove the electronics board from the plastic cover to avoid damage to the components on the board.

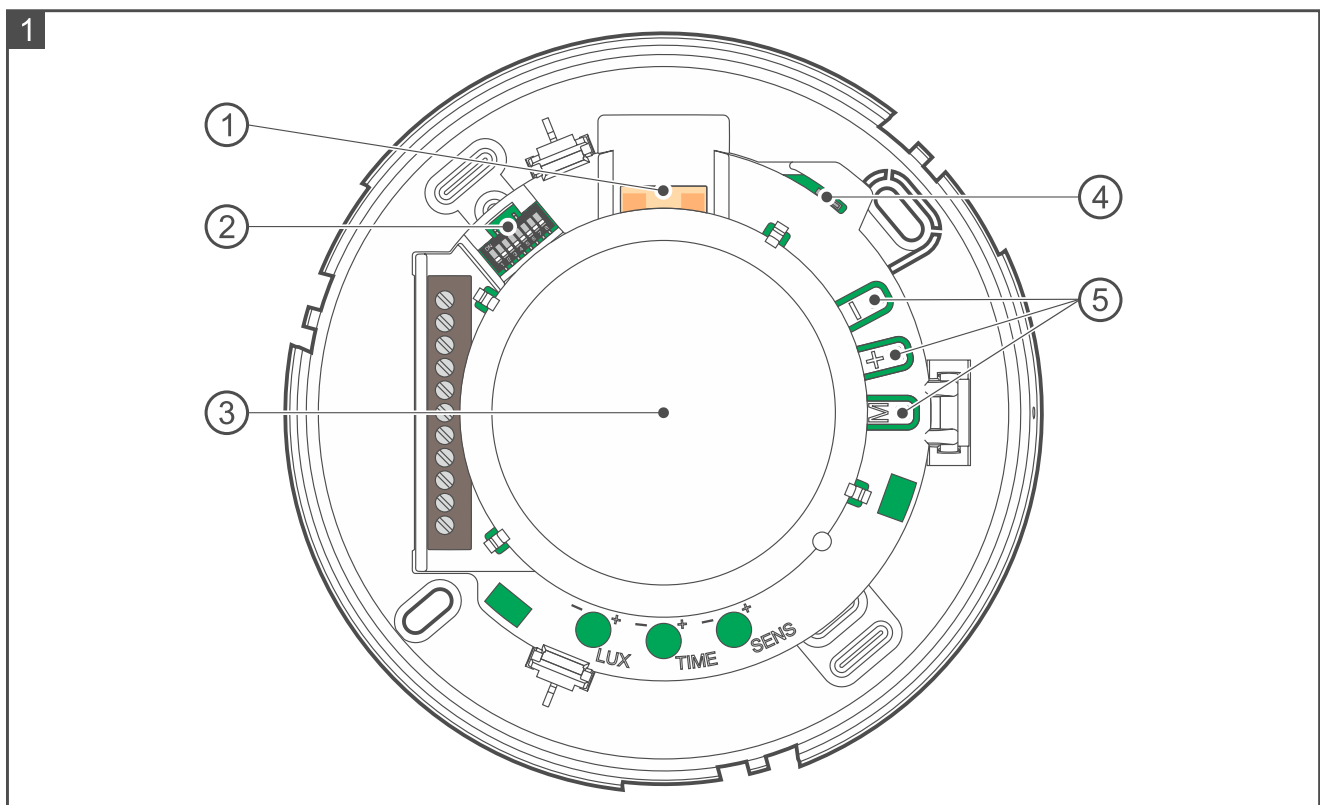
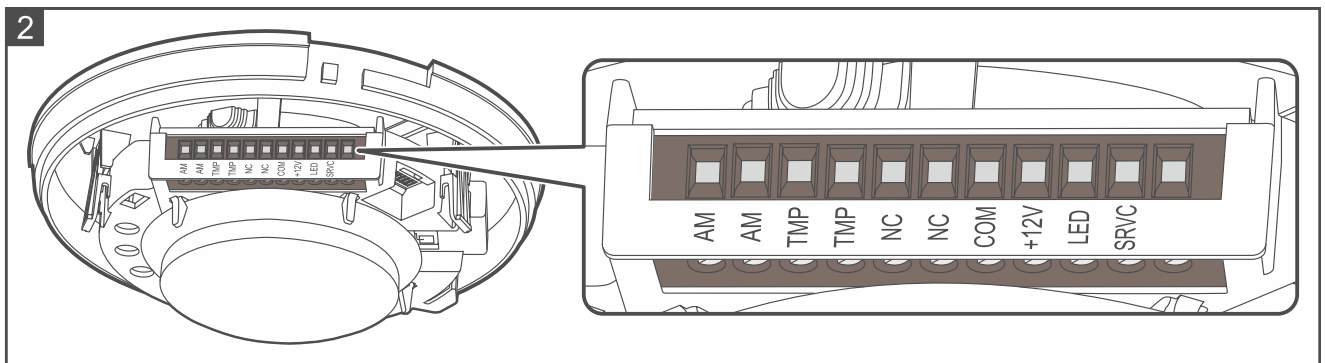


Figure 1 shows the inside of the detector after opening the enclosure.

- ① microwave sensor.
- ② DIP-switches used for configuring the detector (see *DIP-switches* p. 5).
- ③ lens.
- ④ tamper switch activated by cover removal.
- ⑤ buttons used for configuring the detector (see *Configuring the detector using the buttons / keyfob* p. 10).

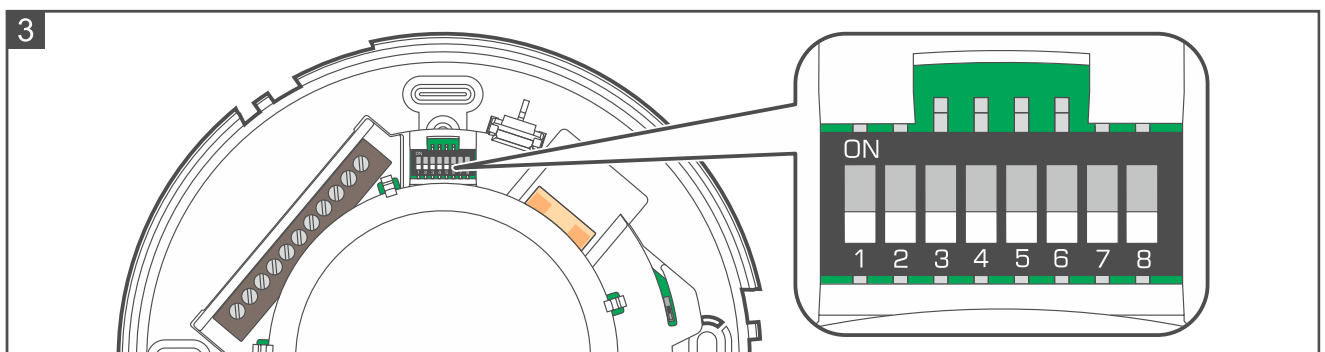
Under the lens there are: PIR sensor (dual element pyrosensor), displacement sensor (accelerometer), LED indicator, LEDs for anti-mask and infrared receiver for configuring the detector using the OPT-1 keyfob. The tamper switch activated by removing the detector from the surface is on the other side of the electronics module.

Terminals



- AM** - anti-mask output (NC relay).
TMP - tamper output (NC relay).
NC - alarm output (NC relay).
COM - common ground.
+12V - power input.
LED - enabling / disabling the LED indicator.
SRVC - enabling / disabling the detector configuration mode.

DIP-switches



Using the DIP-switches, you can:

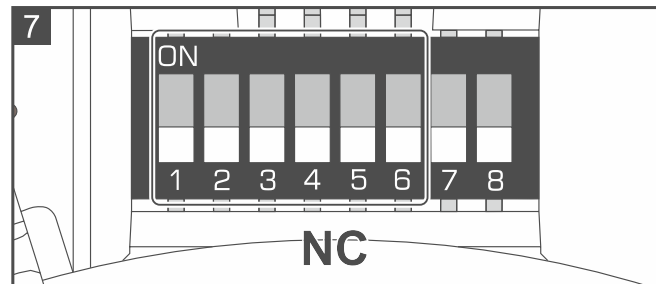
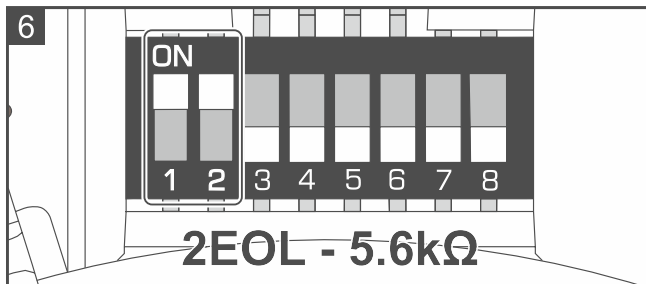
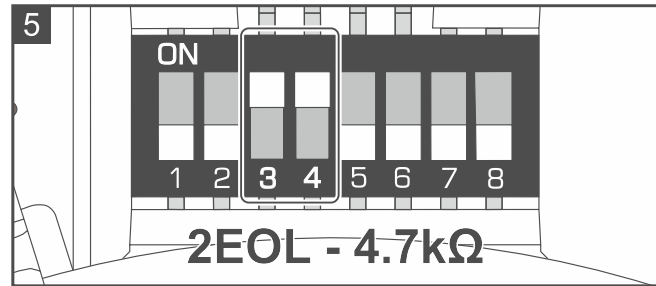
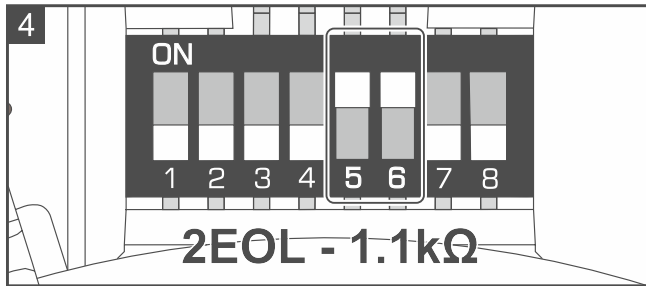
- configure the detector outputs – switches 1...6 (Fig. 4, 5, 6 and 7),
- enable / disable the LED indicator – switch 8 (Fig. 8 and 9).

Configuring the detector outputs

Available settings are shown in the figures:

4...6 – built-in resistors are used – connect the detector outputs as in Fig. 20 and 21,

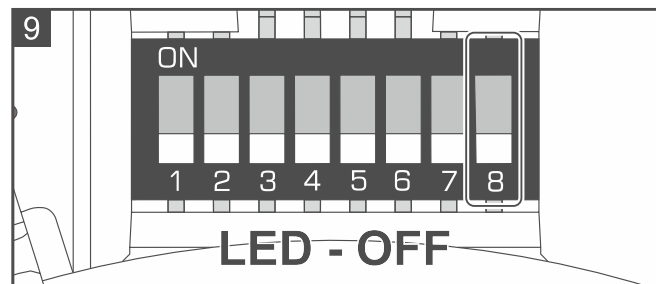
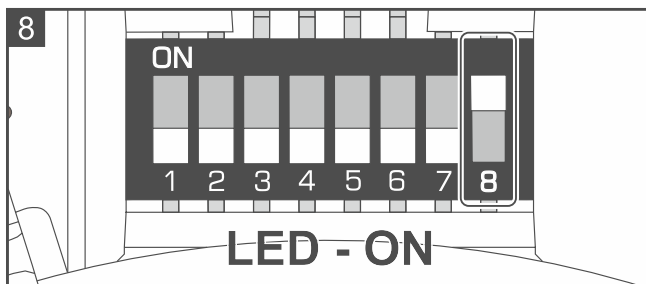
- 7 – built-in resistors are not used – connect the detector outputs as in Fig. 19.



Enabling / disabling the LED indicator

Available settings are shown in the figures:

- 8 – LED indicator is enabled,
9 – LED indicator is disabled.



4. Installation



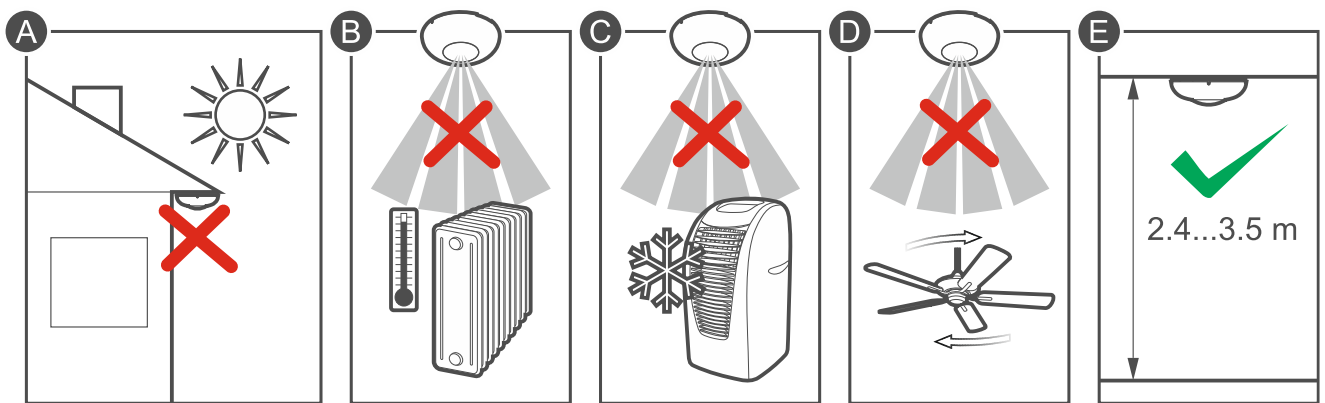
Disconnect power before making any electrical connections.

Tips for installation

- The detector should be installed indoors, in spaces with normal air humidity.
- Do not install the detector outdoors (A).
- Do not point the detector towards heat sources (B), air conditioners (C) or fans (D).
- No object should obstruct the detector's field of view.
- Install the detector on the surface of the ceiling, at a height of 2.4...3.5 m (E).

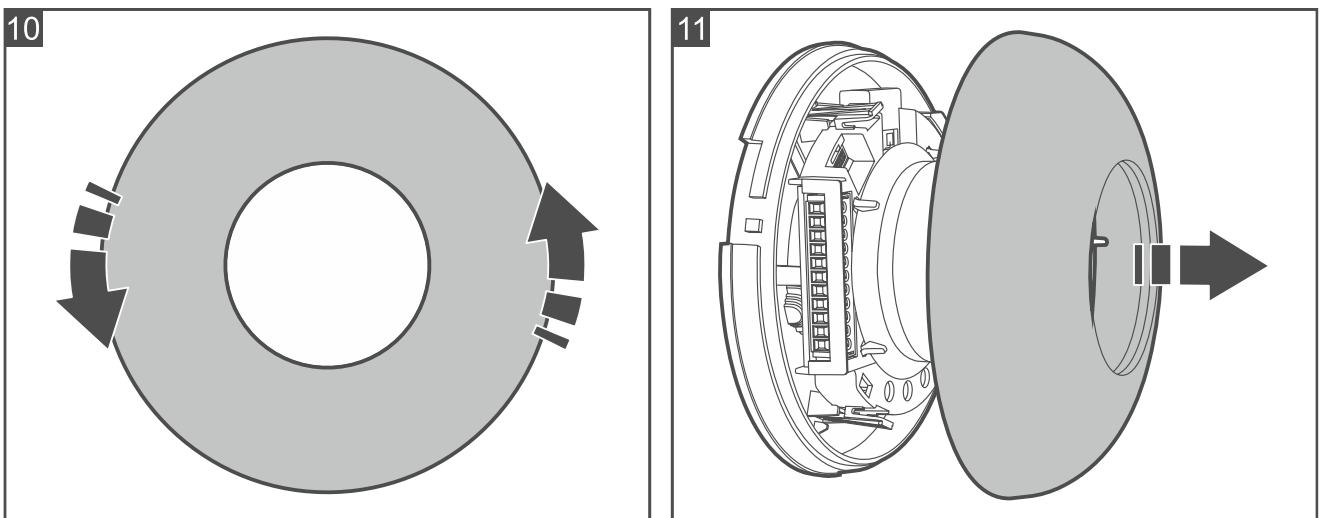


If you want to install the detector at a height other than the recommended, make sure the coverage area of the detector mounted at that height is optimal. The maximum coverage area of the detector mounted at a height of 4.5 m is $\varnothing$ 8 m [50 m²].

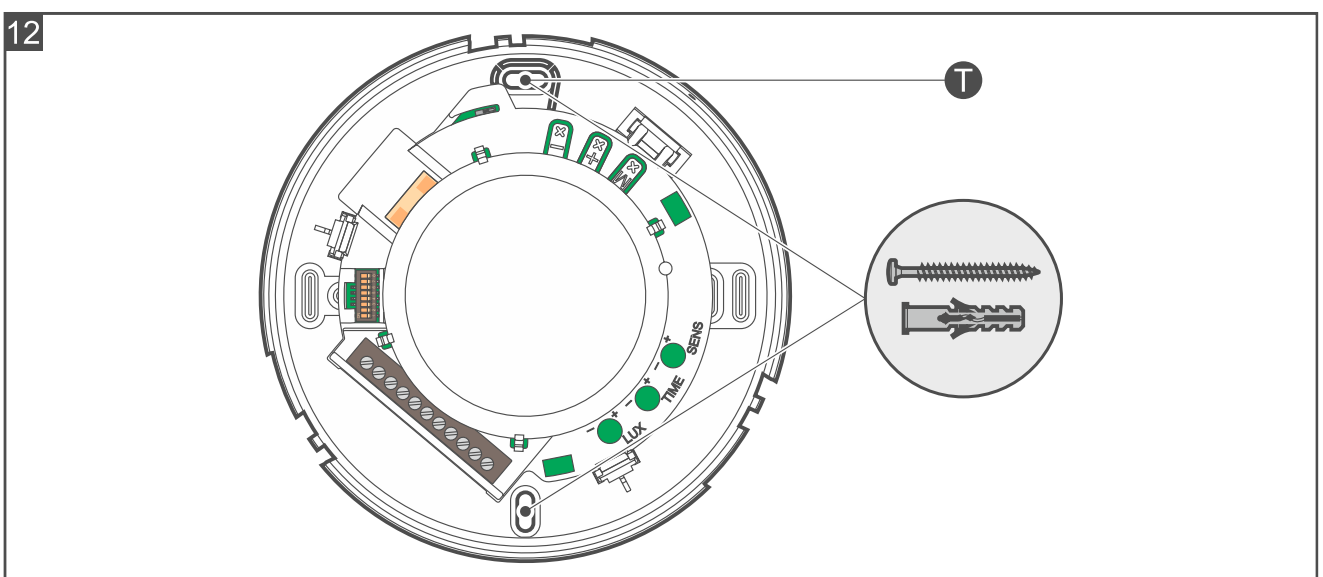


Mounting

1. Turn the enclosure cover counter-clockwise (Fig. 10) and remove it (Fig. 11).



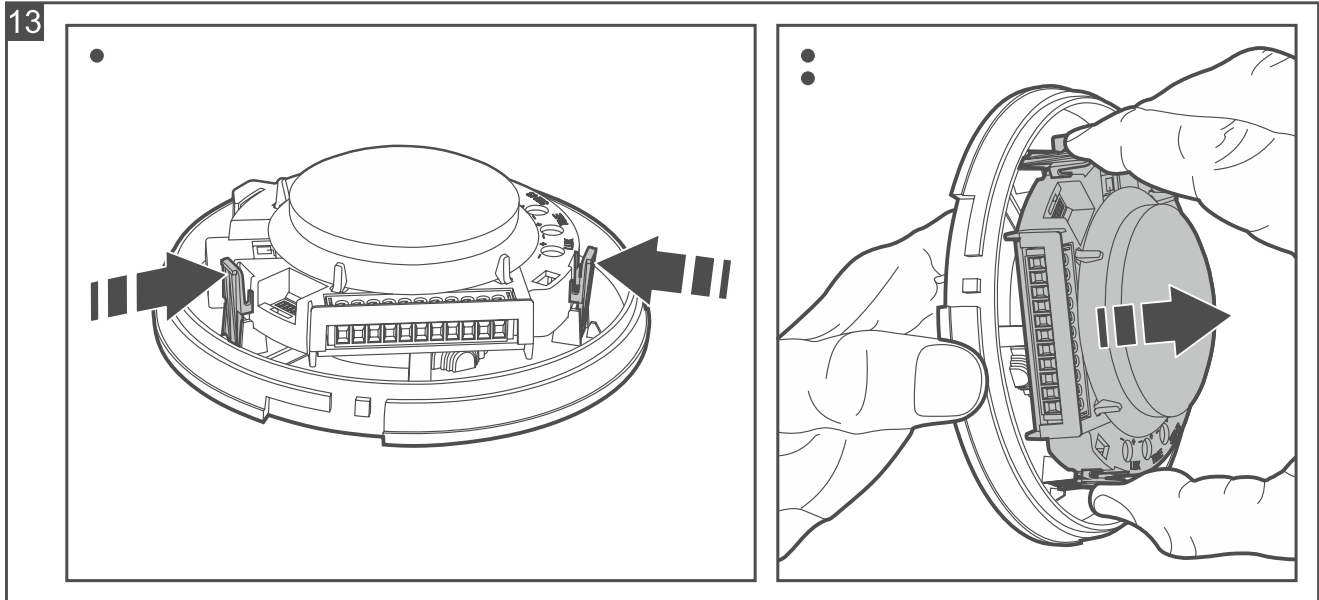
2. Configure the detector using the DIP-switches (see *DIP-switches* p. 5).
3. Place the enclosure base against the ceiling and mark the location of the mounting holes (Fig. 12).



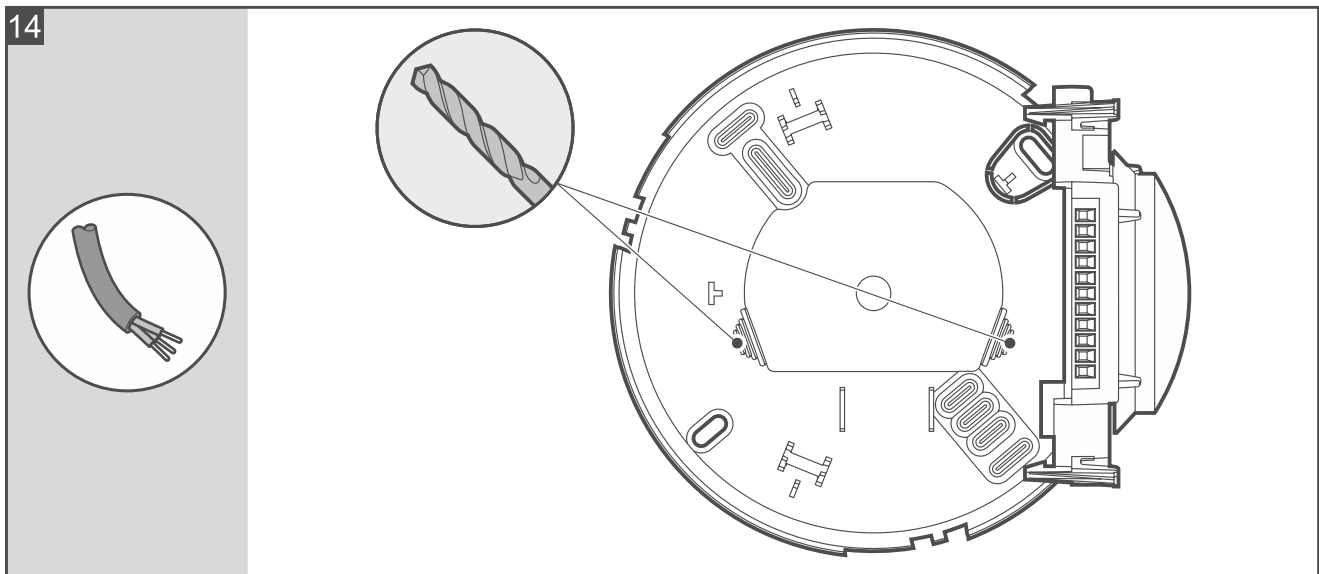
In order for the detector to detect removal from the surface, fasten the screw in the place marked as **T** in Fig. 12. The detector must detect removal from the surface if it is to meet the requirements of Standard EN 50131 for Grade 3.

Figure 15 shows the places where additional mounting holes can be made. They are visible after you lift up the electronics module (see Fig. 13).

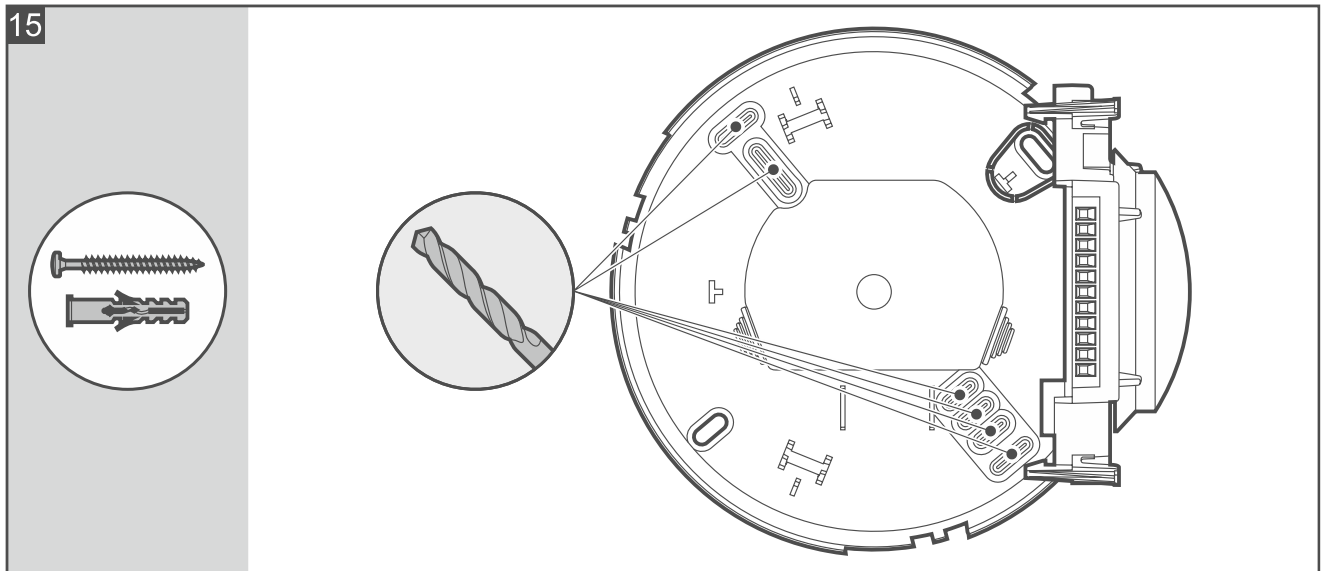
4. Drill the holes in the ceiling for wall plugs (anchors). The wall plugs provided with the detector are intended for concrete or brick. For other types of surface (drywall, styrofoam), use other appropriately selected wall plugs.
5. Press the catches and lift up the electronics module (Fig. 13).



6. Make the opening for a cable in the enclosure base (Fig. 14).



7. Run the cable inside the detector enclosure.
8. Secure the enclosure base to the ceiling with screws (Fig. 12 and 15).
9. Screw the wires to the detector terminals.
10. Press the electronics module down onto the base to lock it in place.
11. Power on the detector. The LED indicator will be flashing alternately different colors for 30 seconds to indicate the detector warm-up.
12. Once the LED indicator stops flashing, configure the remaining detector settings (see *Configuring the detector using the buttons / keyfob* p. 10).

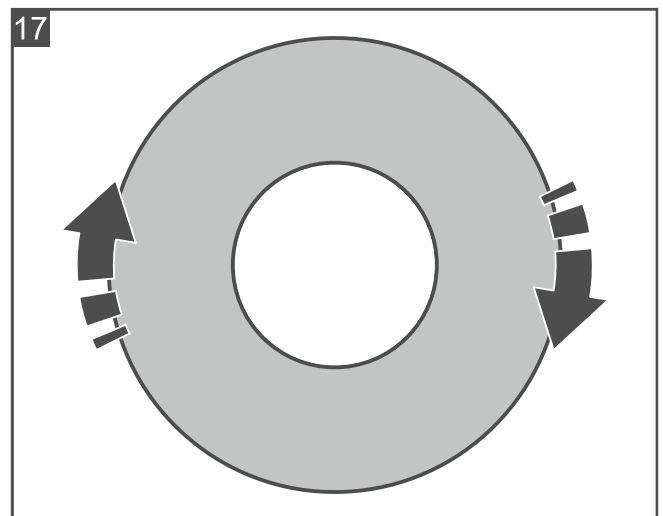
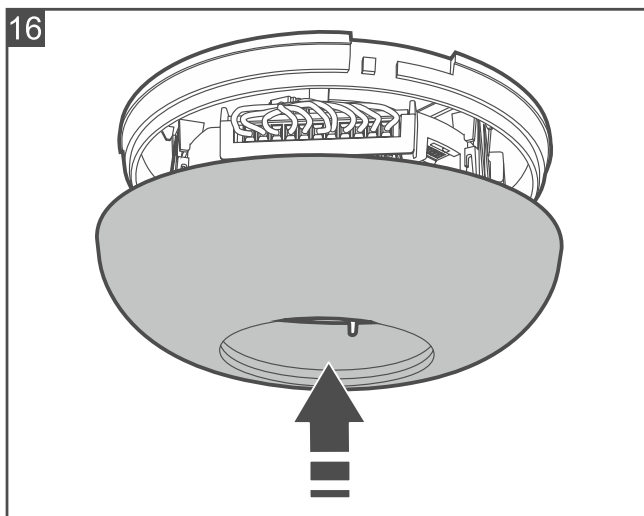


13. Place the enclosure cover in the base (Fig. 16). Note the position of the cover locking screw holes.

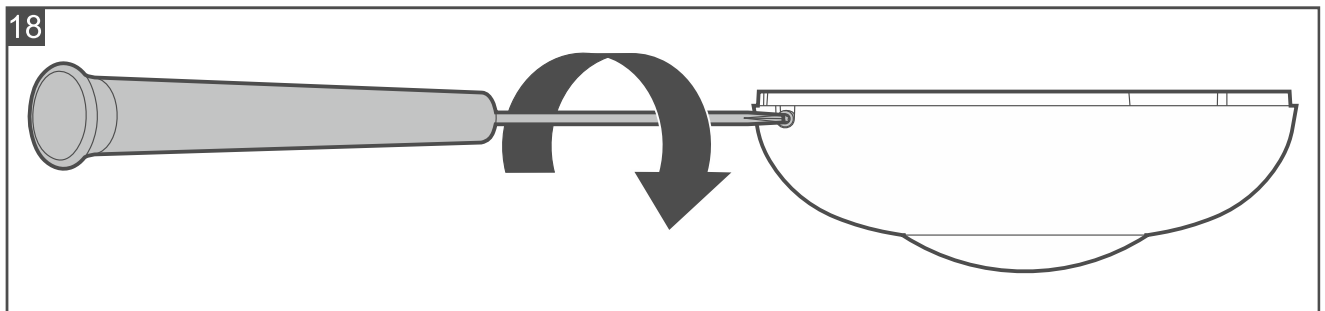
14. Turn the cover clockwise until you feel resistance (Fig. 17).

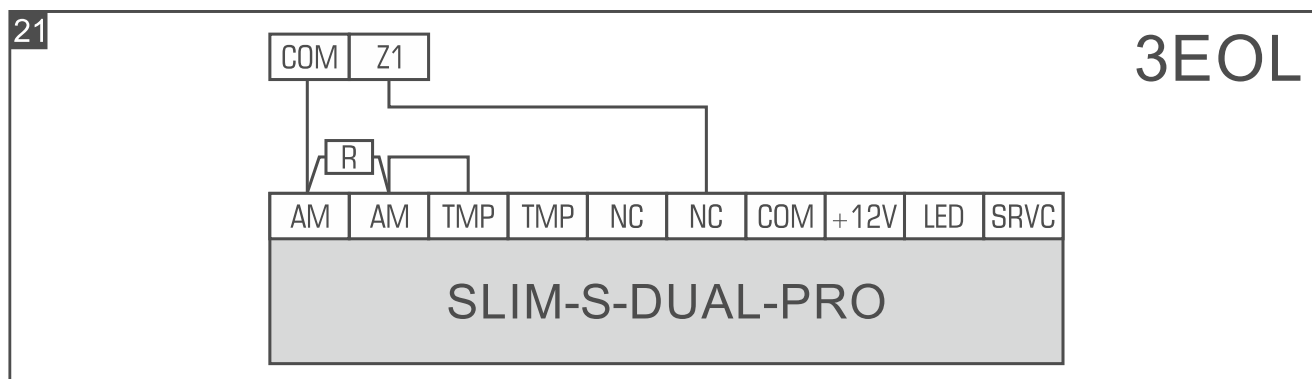
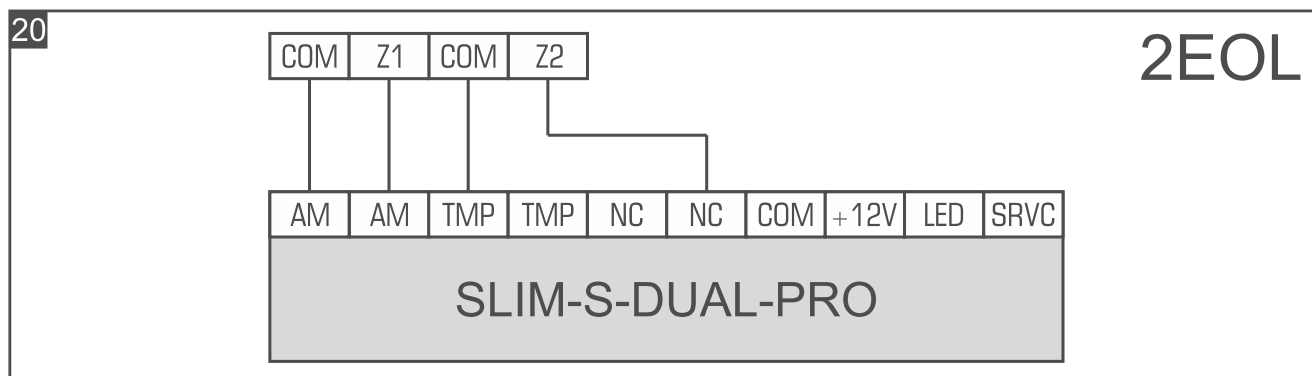
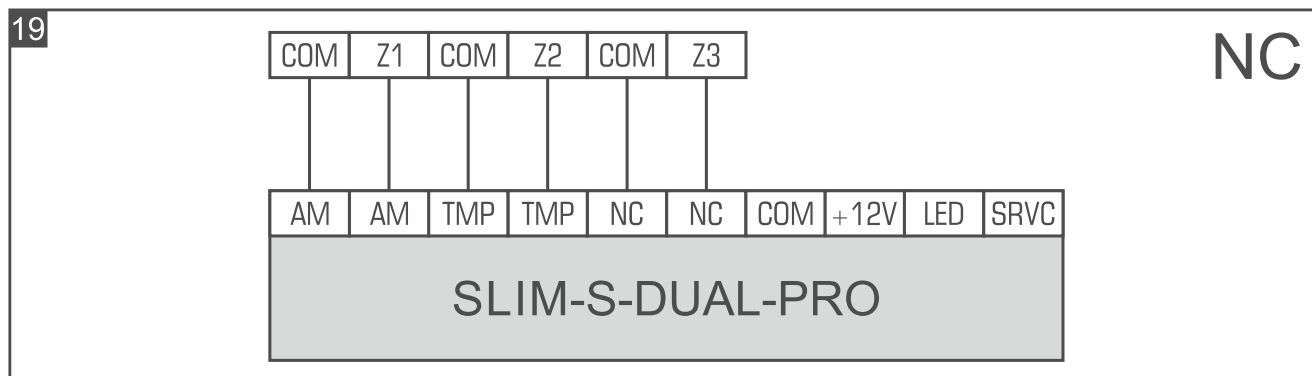


After closing the enclosure, the detector analyzes the environment in which it has been installed and adjusts the anti-mask system working parameters to it (for 30 seconds). During that time, no object should be located within 1 m of the detector unless the object is intended to remain there.



15. Lock the cover in place with a screw (Fig. 18). The screw is in the bag provided with the detector. Use a Torx T6H screwdriver.





5. Configuring the detector using the buttons / keyfob

To configure the detector, you can use the buttons on the electronics module or the OPT-1 keyfob.



The OPT-1 keyfob is available in SATEL product range.

Description of detector buttons

- M** - starting configuration mode / ending configuration mode / running a function / saving changes and exiting a function.
- +** - next function / next value.
- - previous function / previous value.

Description of keyfob buttons

- ▲** - running a function / saving changes and exiting a function.
- - next function / next value.
- - previous function / previous value.

Starting configuration mode

Press **M** for 3 seconds or connect the SRVC terminal to common ground. The LED indicator will start flashing red.

Configuring the settings

1. Use the detector button (+ / −) or the keyfob button (○ / ●) to find the function you want to run. The number of flashes of the LED indicator is the function number (see table 1).
2. Press **M** or the ▲ keyfob button to run the function. The LED indicator will start flashing green. The number of flashes is the currently set value (see table 1).
3. Use the detector button (+ / −) or the keyfob button (○ / ●) to set a new value.
4. Press **M** or the ▲ keyfob button to save changes and exit the function. The LED indicator will start flashing red to indicate that you returned to the list of functions.

Function number	Description of function
1	Setting the PIR sensor sensitivity You can program from 1 to 16 (1 - minimum; 16 – maximum). By default: 8 . When the function is running, the LED indicator indicates that the PIR sensor has detected motion: it is ON in red for 2 seconds. This enables the PIR sensor coverage area to be tested for the selected sensitivity.
2	Setting the MW sensor sensitivity You can program from 1 to 16 (1 - minimum; 16 – maximum). By default: 8 . When the function is running, the LED indicator indicates that the MW sensor has detected motion: it is ON in red for 2 seconds. This enables the MW sensor coverage area to be tested for the selected sensitivity.
3	Selecting the operating mode You can program 1 (basic) or 2 (advanced). By default: 1 (basic).
4	Setting the LED indicator light color for indicating motion detection by the PIR sensor You can program from 1 to 8 (1-7 – color; 8 – no light). By default: 4 (purple). The LED indicator shows the selected color (for 2 seconds).
5	Setting the LED indicator light color for indicating motion detection by the MW sensor You can program from 1 to 8 (1-7 – color; 8 – no light). By default: 2 (green). The LED indicator shows the selected color (for 2 seconds).

Function number	Description of function
6	Setting the LED indicator light color for indicating alarm / masking / trouble You can program from 1 to 7 (1-7 – color). By default: 3 (blue). The LED indicator shows the selected color (for 2 seconds).
7	Setting the anti-mask delay You can program 1 (1 s) or 2 (60 s). By default: 1 (1 s).
8	Enabling / disabling the indication of masking You can program 1 (indication disabled) or 2 (indication enabled). By default: 2 (enabled).
9	Enabling / disabling the active IR anti-mask You can program 1 (enabled) or 2 (disabled). By default: 1 (enabled).
10	Enabling / disabling the detector displacement detection You can program 1 (enabled) or 2 (disabled). By default: 2 (disabled).

Table 1



When setting the sensitivity of the MW sensor, keep in mind that microwaves can penetrate e.g. glass, plaster walls, non-metal doors, etc.

The color of LED indicator light has an impact on the current consumption by the detector. The red, green and blue colors ensure the lowest current consumption. Selecting other colors will increase the current consumption by as much as several milliamperes.

The indication of masking is working even when the LED indicator is disabled (the 8 DIP-switch is in OFF position (Fig. 9) and the LED terminal is disconnected from common ground).

Restoring factory settings

To restore the detector factory settings, press and hold **-** and **+** for 3 seconds in the configuration mode.

Ending configuration mode

Press **M** for 3 seconds or disconnect the SRVC terminal from common ground.

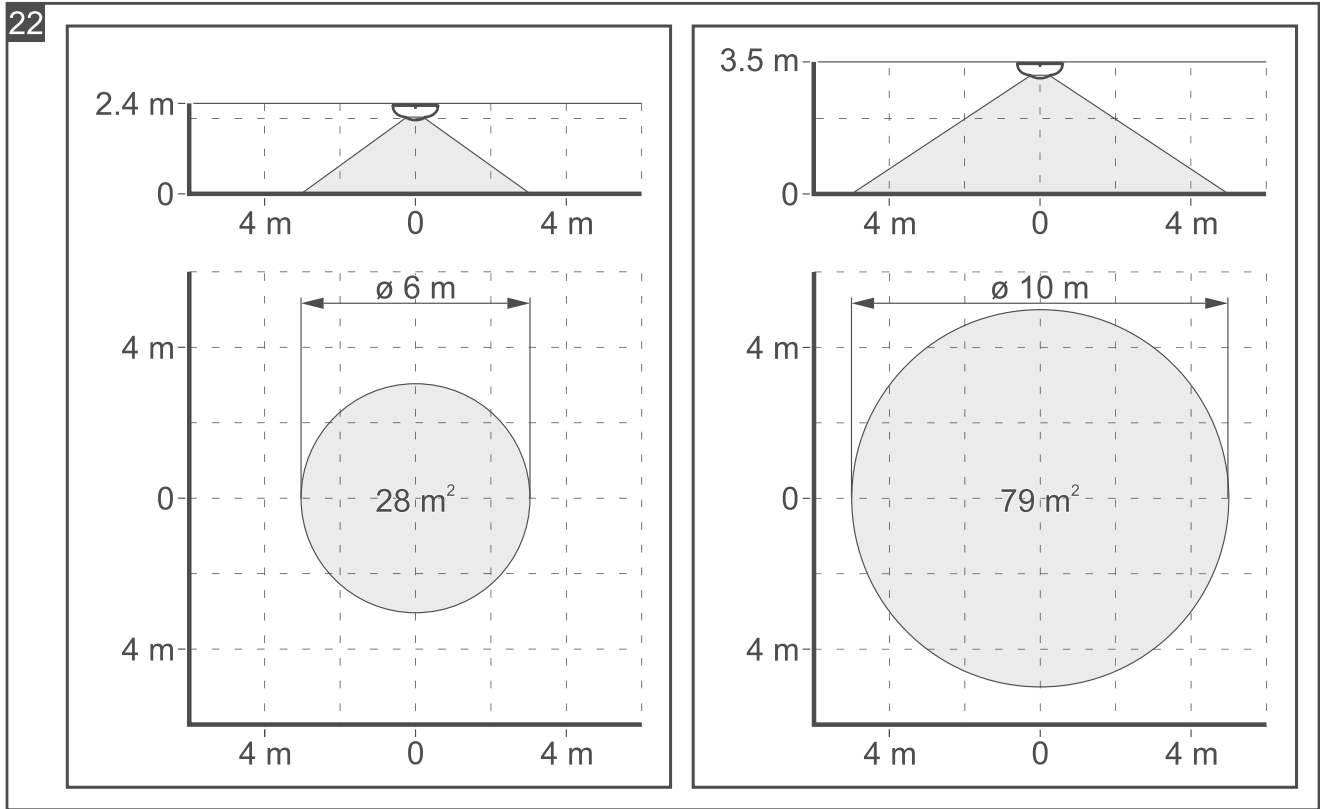


If the configuration mode was started using the M button, it will be turned off automatically 20 minutes after the last operation performed by the user.

6. Walk test

i | The LED indicator should be enabled during the walk test (see LED indicator p. 3).

Check if moving within the detector coverage area will make the LED indicator turn ON. Figure 22 shows the maximum coverage area of the detector.



Separate testing of sensors

If you wish to test the sensors separately, you can do so when configuring sensitivity of the given sensor (see *Configuring the detector using the buttons / keyfob*).

1. Run the sensor sensitivity configuring function.
2. Make sure that moving within the coverage area will make the LED indicator turn on red.
3. If necessary, change the sensitivity of the sensors.

i | If opening the detector enclosure is required for changing the sensitivity, remember that after closing the enclosure, the detector analyzes the environment and adjusts the anti-mask system working parameters to it (for 30 seconds). During that time, no object should be located within 1 m of the detector unless the object is intended to remain there.

7. Specifications

Supply voltage	12 VDC ±15%
Standby current consumption	18 mA
Maximum current consumption	50 mA
EOL resistors	2 x 1.1 kΩ / 2 x 4.7 kΩ / 2 x 5.6 kΩ
Outputs	
alarm (NC relay, resistive load)	40 mA / 24 VDC
anti-mask (NC relay, resistive load)	40 mA / 24 VDC

tamper (NC relay, resistive load)	40 mA / 24 VDC
Relay contact resistance	
alarm output.....	26 Ω
anti-mask output	26 Ω
tamper output.....	26 Ω
Microwave frequency	24.125 GHz
Detectable speed	0.2...3 m/s
Alarm signaling period.....	2 s
Warm-up period	30 s
Recommended installation height	2.4...3.5 m
Maximum coverage area	
mounted at 2.4 m	ø 6 m [28 m ²]
mounted at 3.5 m	ø 10 m [79 m ²]
Security grade according to EN 50131-2-4	Grade 3
Compliance with standards	EN 50131-1, EN 50131-2-4, EN 50130-4, EN 50130-5
Environmental class according to EN 50130-5	II
Operating temperature range	-10°C...+55°C
Maximum humidity	93±3%
Dimensions	ø 120 x 37 mm
Weight.....	117 g

5 year warranty from date of manufacture