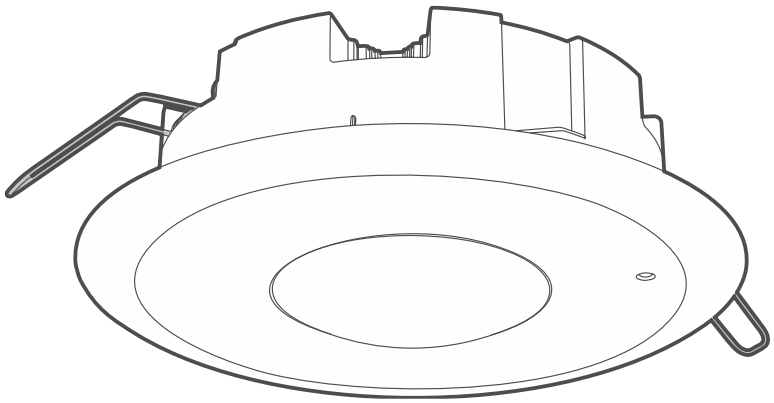
Ceiling dual technology motion detector
with lighting feature (recessed)

SLIM-R-DUAL-LUNA

Firmware version 3.00

EN



CE

slim-r-dual-luna_en 04/26

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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).

CE 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.

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The SLIM-R-DUAL-LUNA ceiling detector uses infrared and microwaves to detect motion. It also provides a lighting feature. It is designed for mounting in a suspended ceiling. This manual applies to the detector with electronics version D.

1. Features

- Motion detection with passive infrared sensor (PIR) and microwave sensor (MW).
- Maximum coverage area (see Fig. 21):
  – ø 6 m / 28 m^2 – mounted at 2.4 m,
  – ø 10 m / 79 m^2 – 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, advanced, PIR or MW.
- 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 kΩ / 2 x 4.7 kΩ / 2 x 5.6 kΩ).
- Lighting feature:
  – possibility to control the lighting remotely,
  – motion-activated lighting.
- 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 (±15%).
- Supply voltage control.
- Tamper protection against opening the detector enclosure.
- Mounted in a suspended ceiling.

2. Description

Operating modes

Basic – both sensors are enabled. The detector reports alarm when both sensors have detected motion within a time period shorter than 3 second.

Advanced – both sensors are enabled. 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 second, 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.

PIR – the microwave sensor is disabled. The detector reports alarm when the infrared sensor detects motion in the protected area.

MW – the infrared sensor is disabled. The detector reports alarm when the microwave sensor detects motion in the protected area.

Tamper protection

Opening the detector enclosure results in activating the tamper output. The output will remain activated until the end of tamper.

Lighting feature

The light sources are white LEDs. The following lighting operation modes are available:

- remote control only – the lighting is ON when the LUNA terminal is connected to common ground (if the LUNA terminal is disconnected from common ground, the lighting is OFF),
- remote control and motion activation – the lighting is ON when the LUNA terminal is connected to common ground, or the detector has detected motion,
- motion activation if the LUNA terminal is connected to common ground – the lighting is ON when the LUNA terminal is connected to common ground and the detector has detected motion (if the LUNA terminal is disconnected from common ground, motion detection will not activate the lighting).

If activated by motion, the lighting remains ON for the time period programmed in the detector. If the lighting is ON and motion is detected, the countdown starts anew.

For description of the lighting feature configuration, see section *Configuring the detector using the buttons / keyfob* p. 11.

Supervision features

In the event of the voltage drop below 9 V (±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),
- 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 / trouble,
- enable / disable the signaling of motion detection by microwave and PIR sensors.

For detailed information, please refer to section *Configuring the detector using the buttons / keyfob* p. 11.

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 switching between detector working parameters

The SENS terminal is provided to allow remote switching between detector working parameters (detector operation mode and sensor sensitivity). The first set of parameters is used when the terminal is disconnected from common ground. The second set of parameters is used when the terminal is connected to common ground.

This makes it possible to change the detector working parameters depending on the state of partition to which the detector is assigned. If the partition is disarmed, the detector can use the set of parameters that will increase the efficiency of lighting activation by motion (maximum sensitivity of sensors) or disable the microwave sensor (PIR operation mode). If the partition is armed, the detector can use the set of parameters that will eliminate false alarms (e.g. lower sensitivity, both sensors enabled, etc.).

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

- INTEGRA / INTEGRA Plus: *Armed status*,
- PERFECTA / VERSA: *Controlled*.

For description of the detector working parameter configuration, see section *Configuring the detector using the buttons / keyfob* p. 11.

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) tamper switch activated by cover removal.

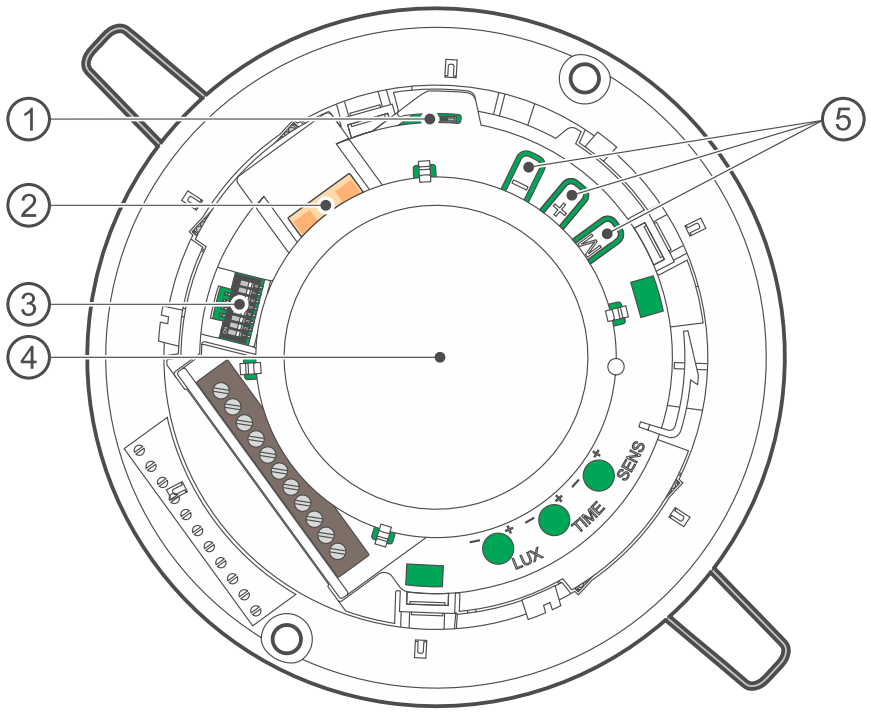
(2) microwave sensor.

(3) DIP-switches used for configuring the detector (see *DIP-switches* p. 6).

(4) lens.

(5) buttons used for configuring the detector (see *Configuring the detector using the buttons / keyfob* p. 11).

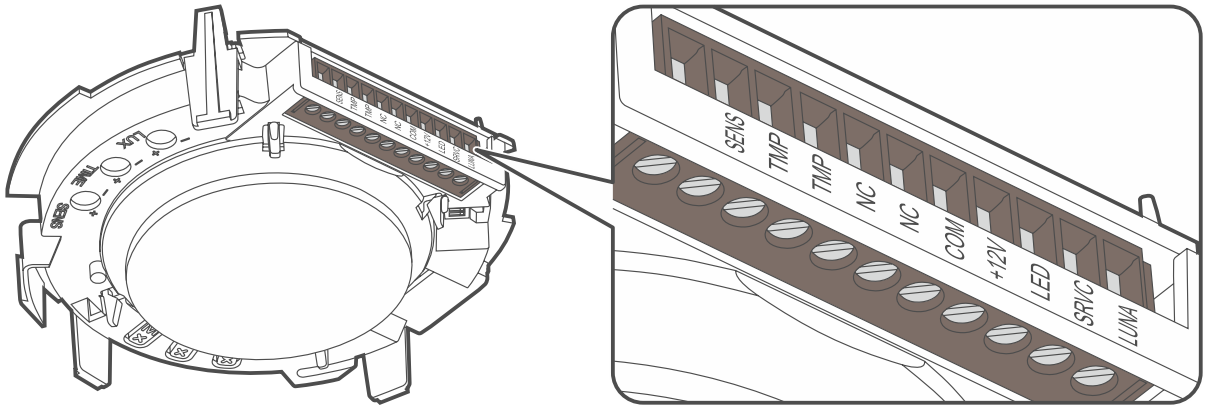
1



Under the lens there are: PIR sensor (dual element pyrosensor), LED indicator, LEDs for lighting and infrared receiver for configuring the detector using the OPT-1 keyfob.

Terminals

2



To access the terminals for connecting the wires, remove the electronics module from the base (Fig. 12 and 13).

SENS - switching between detector working parameters (operation mode and sensor sensitivity).

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.

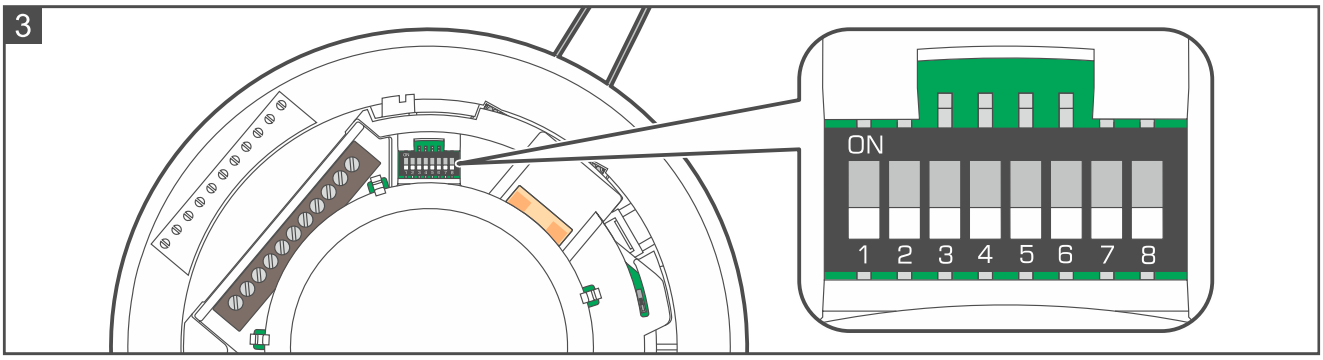
LUNA - LED lighting control.

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).

3



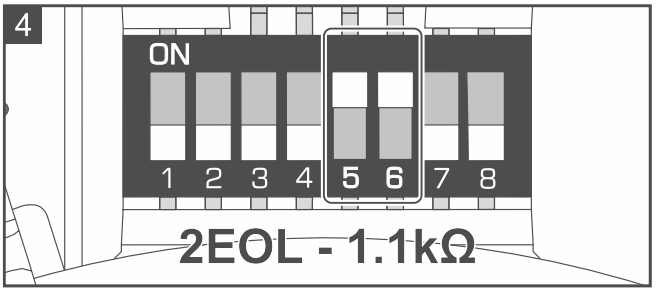
Configuring the detector outputs

Available settings are shown in the figures:

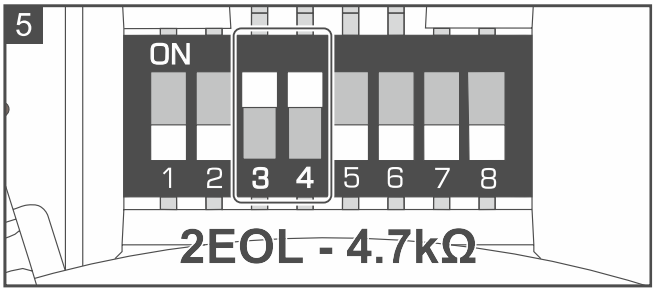
4...6 – built-in resistors are used – connect the detector outputs as in Fig. 20,

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

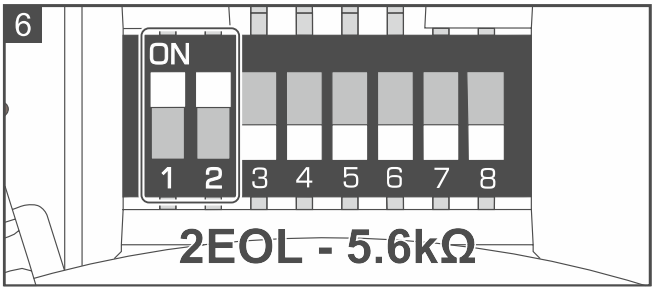
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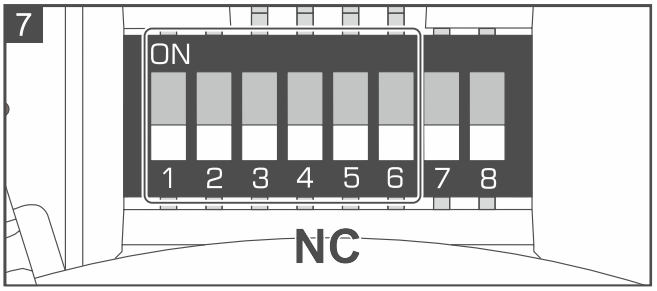
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6



7



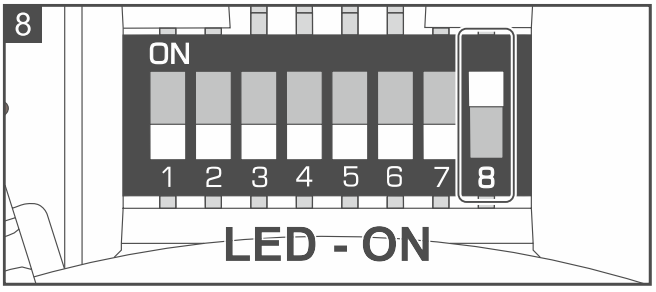
Enabling / disabling the LED indicator

Available settings are shown in the figures:

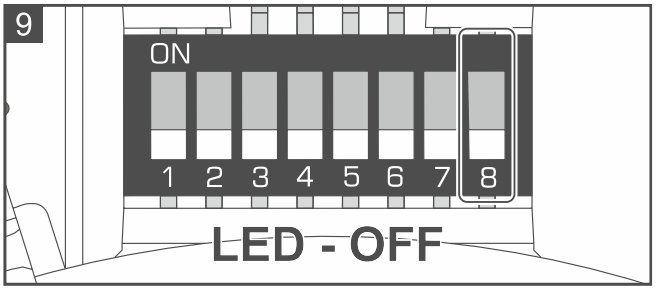
8 – LED indicator is enabled,

9 – LED indicator is disabled.

8



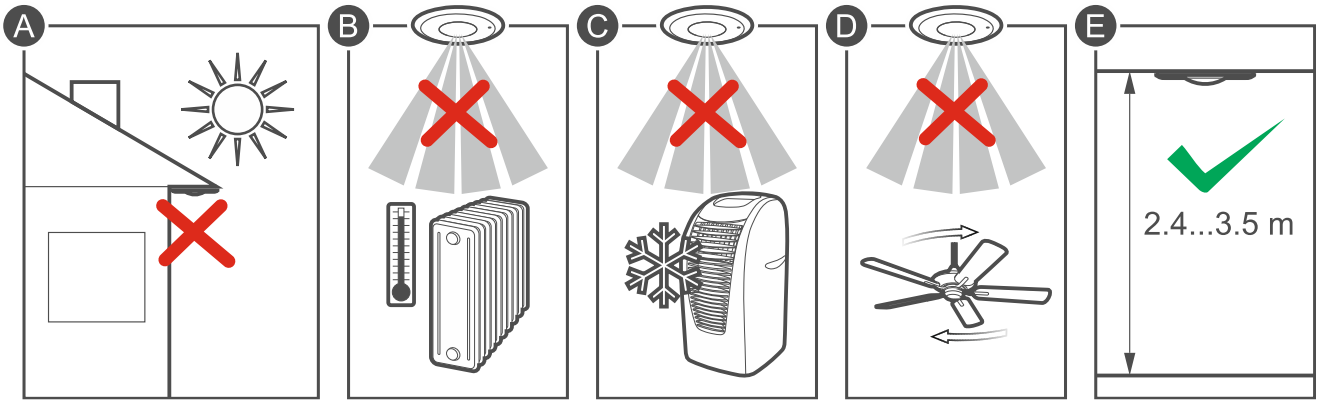
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4. Installation

Disconnect power before making any electrical connections.

Tips for installation



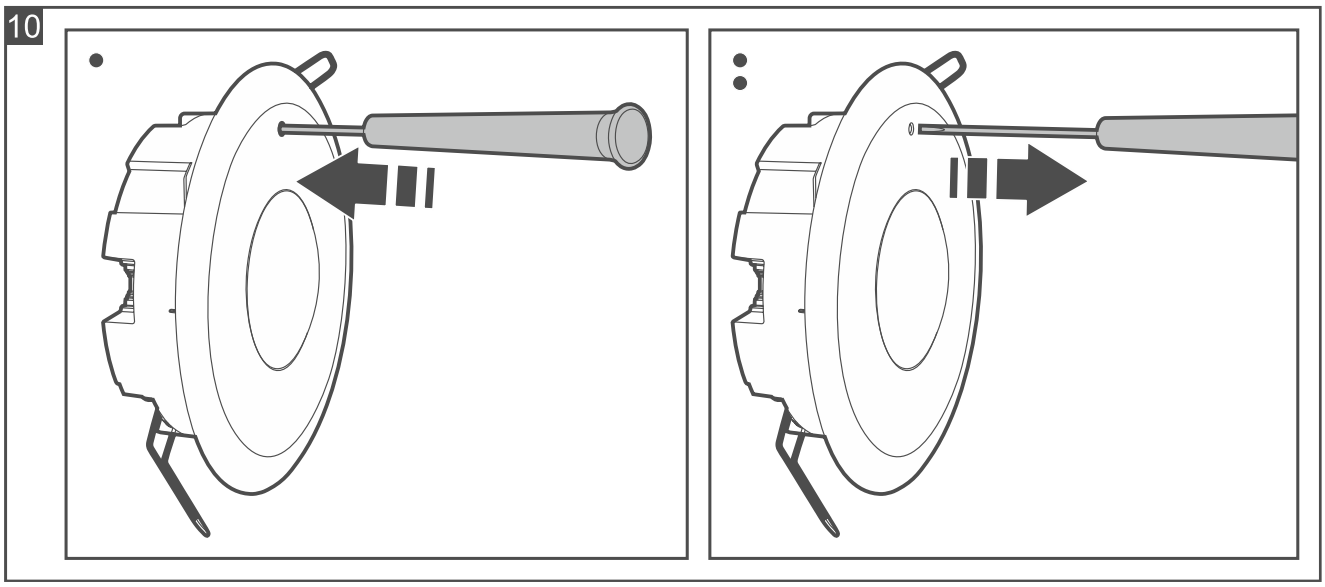
- The detector should be installed indoors, in spaces with normal air humidity.
- Do not install the detector outdoors (A).
- Do not mount the detector near heat sources (B), air conditioners (C) or fans (D).
- No object should obstruct the detector's field of view.
- Install the detector in a suspended 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 ø 8 m [50 m^2].

Mounting

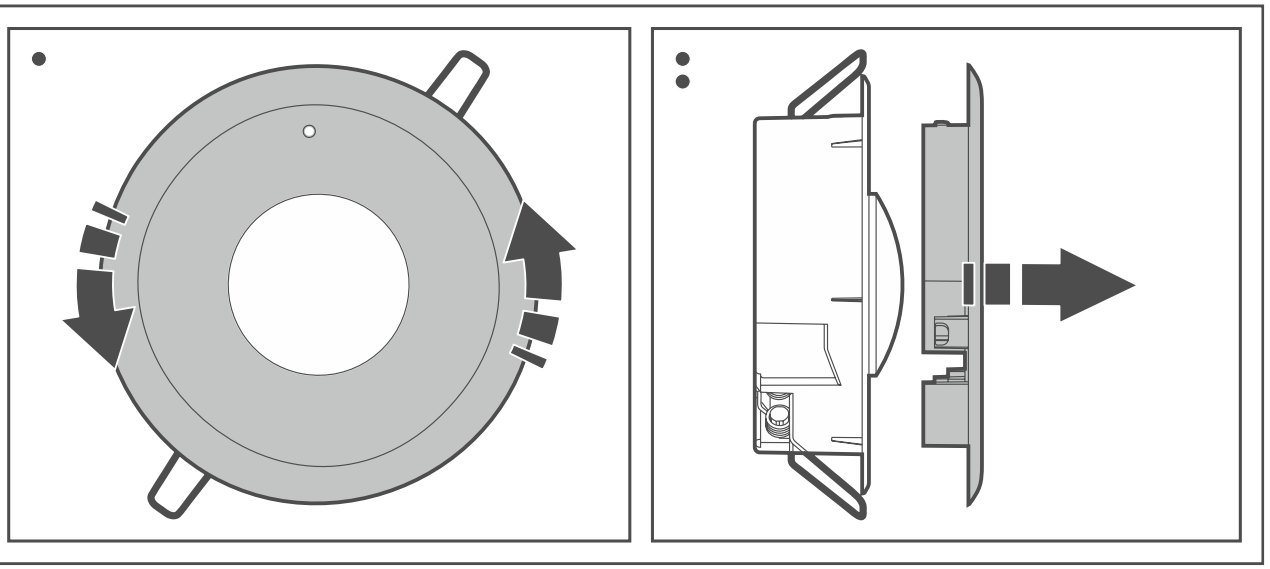
1. Unlock the enclosure cover (Fig. 10). To unlock the cover, you can use a 1.8 mm flathead screwdriver.

10



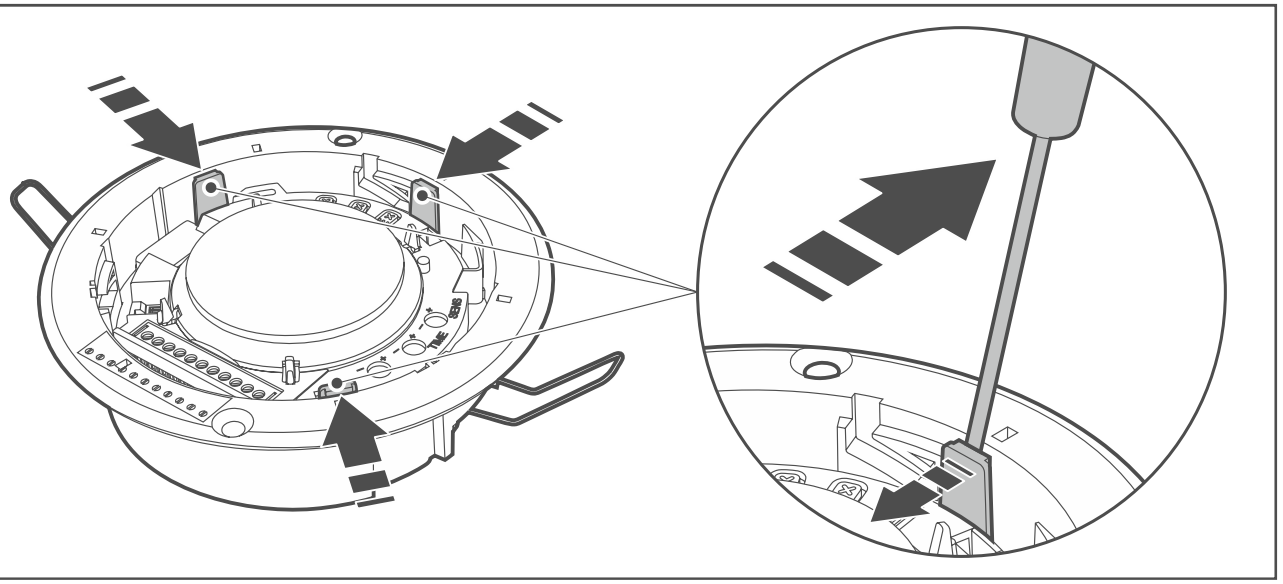
2. Turn the cover counter-clockwise and remove it (Fig. 11).

11

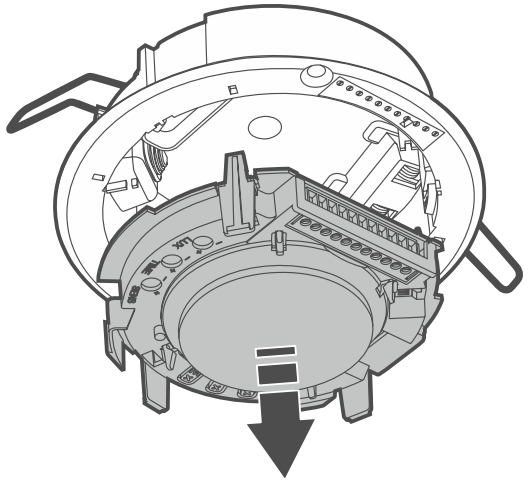


3. Release the mounting catches one by one to unlock the electronics module (Fig. 12). To release the catches, you can use a flathead screwdriver.
4. Remove the electronics module from the base (Fig. 13).

12



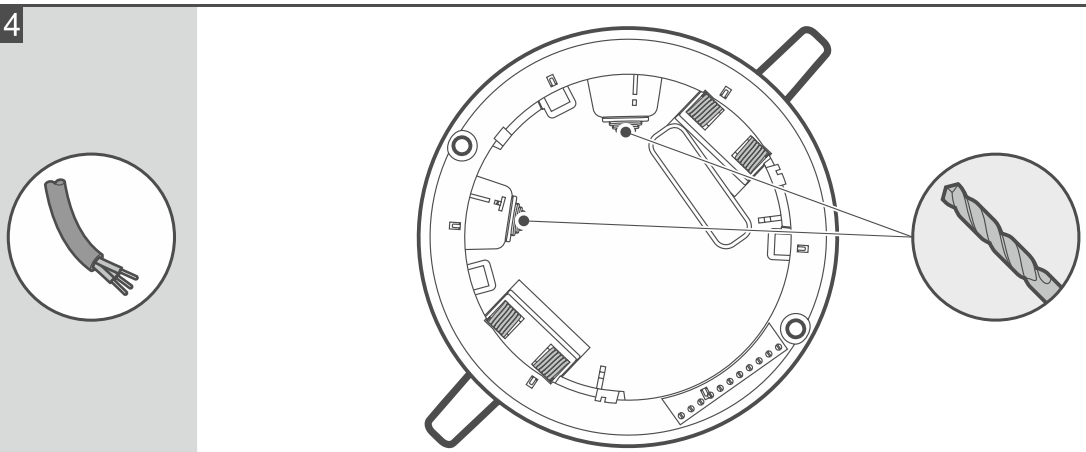
13



5. Make the opening for a cable in the base (Fig. 14).
6. Configure the detector using the DIP-switches (see *DIP-switches* p. 6).
7. Make a 100 mm diameter opening in the suspended ceiling for the detector (Fig. 16).

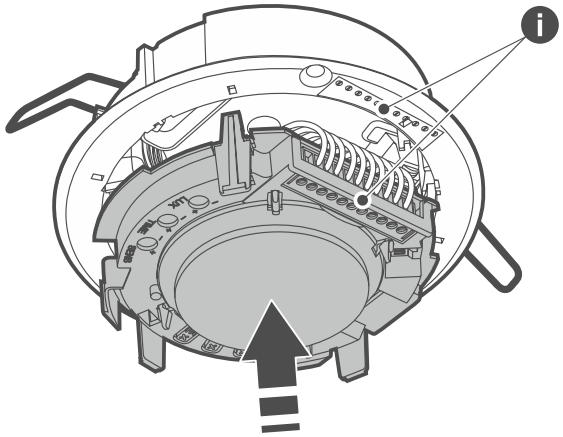
8. Run the cable inside the detector enclosure.
9. Screw the wires to the detector terminals.

14



10. Place the electronics module in the enclosure base, then press it down onto the base to lock it. There are markings on the base flange showing where the terminals should be located (Fig. 15).

15

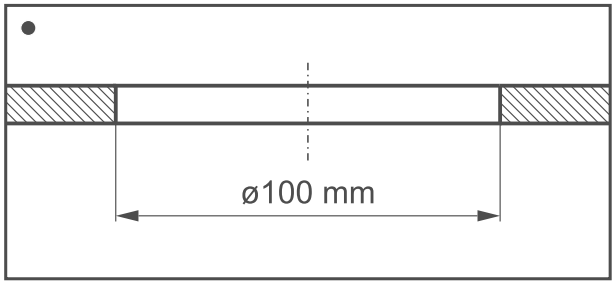


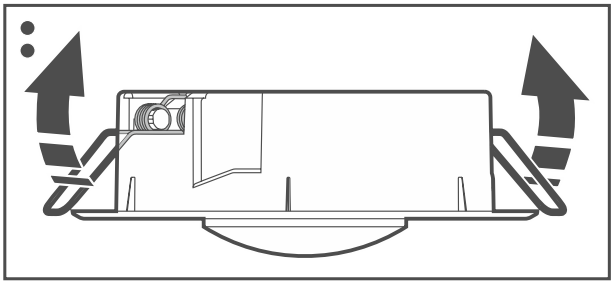
11. Bend the mounting springs and place the detector in the opening made in the ceiling (Fig. 16). When released, the springs will lock the detector in the opening.

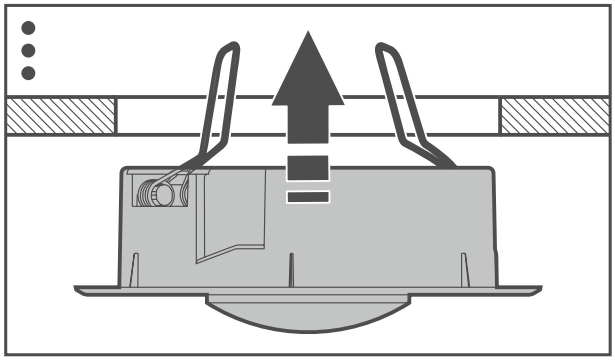
i *There are screw holes in the base flange (Fig. 17). You can also use screws for mounting or remove the springs and use only screws for mounting.*

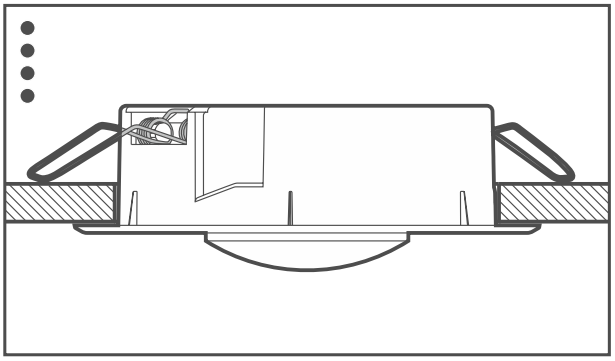
12. Power on the detector. The LED indicator will be flashing alternately different colors for 30 seconds to indicate the detector warm-up.
13. Once the LED indicator stops flashing, configure the remaining detector settings (see *Configuring the detector using the buttons / keyfob* p. 11).
14. Replace the cover and turn it clockwise to lock it in place (Fig. 18).

16

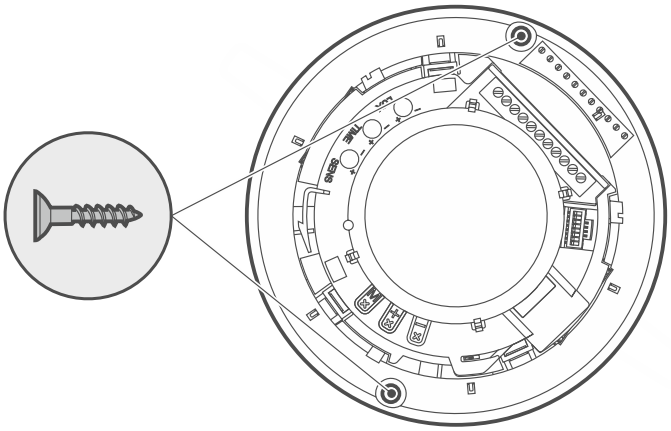




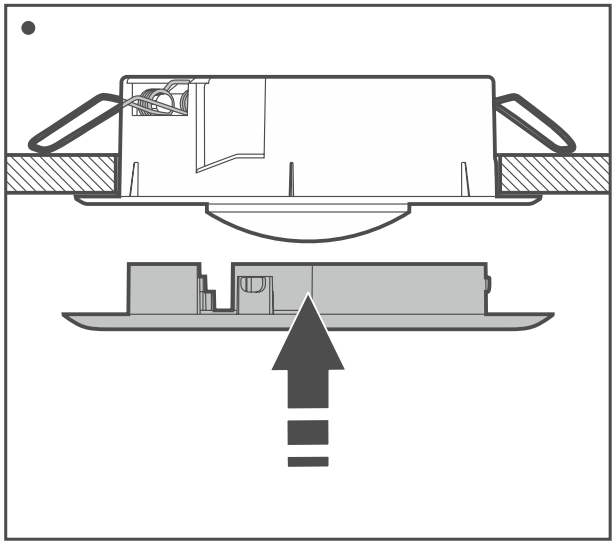


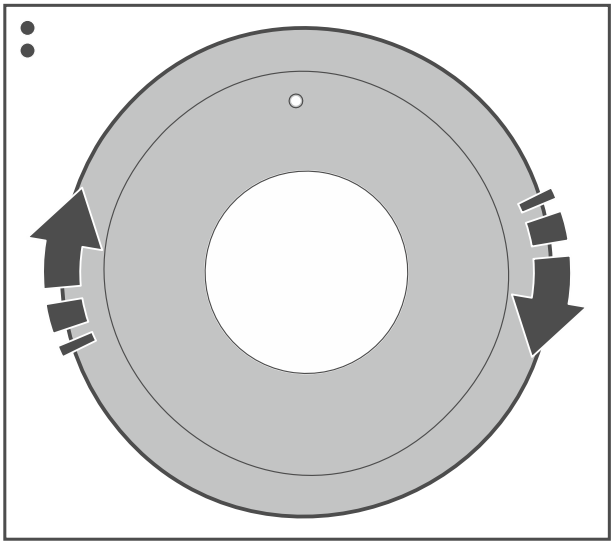


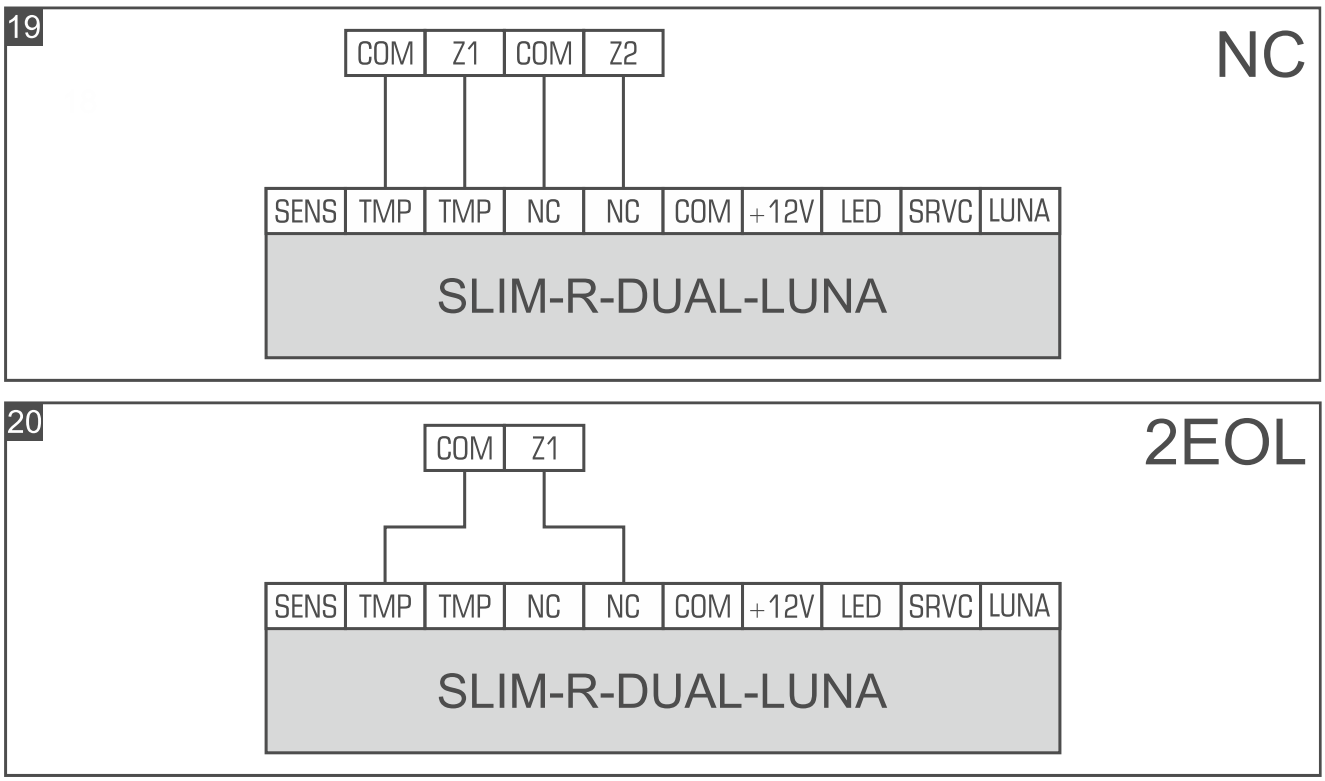
17



18







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.

In the configuration mode, the LED lighting is OFF.

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 for the first set of parameters** 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 PIR sensor sensitivity for the second set of parameters** 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.
3	**Setting the MW sensor sensitivity for the first set of parameters** 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.
4	**Setting the MW sensor sensitivity for the second set of parameters** 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.
5	**Selecting the operation mode for the first set of parameters** You can program **1** (basic), **2** (advanced), **3** (PIR) or **4** (MW). By default: **1** (basic).
6	**Selecting the operation mode for the second set of parameters** You can program **1** (basic), **2** (advanced), **3** (PIR) or **4** (MW). By default: **1** (basic).
7	**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 – OFF). By default: **4** (purple). The LED indicator shows the selected color (for 2 seconds).

Function number	Description of function
8	**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 – OFF). By default: **2** (green). The LED indicator shows the selected color (for 2 seconds).
9	**Setting the LED indicator light color for indicating alarm / 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).
10	**Selecting the lighting operation modes** You can program **1** (remote control only), **2** (remote control and activation by motion) or **3** (activation by motion if the LUNA terminal is connected to common ground). By default: **1** (remote control only).
11	**Setting the duration of motion activated lighting** You can program **1** (5 s), **2** (15 s), **3** (30 s), **4** (60 s), **5** (90 s) or **6** (180 s). By default: **3** (30 s).
12	**Selecting the lighting turn off method** You can program **1** (instant turn off) or **2** (slow dim down). By default: **2** (slow dim down).

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.

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

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

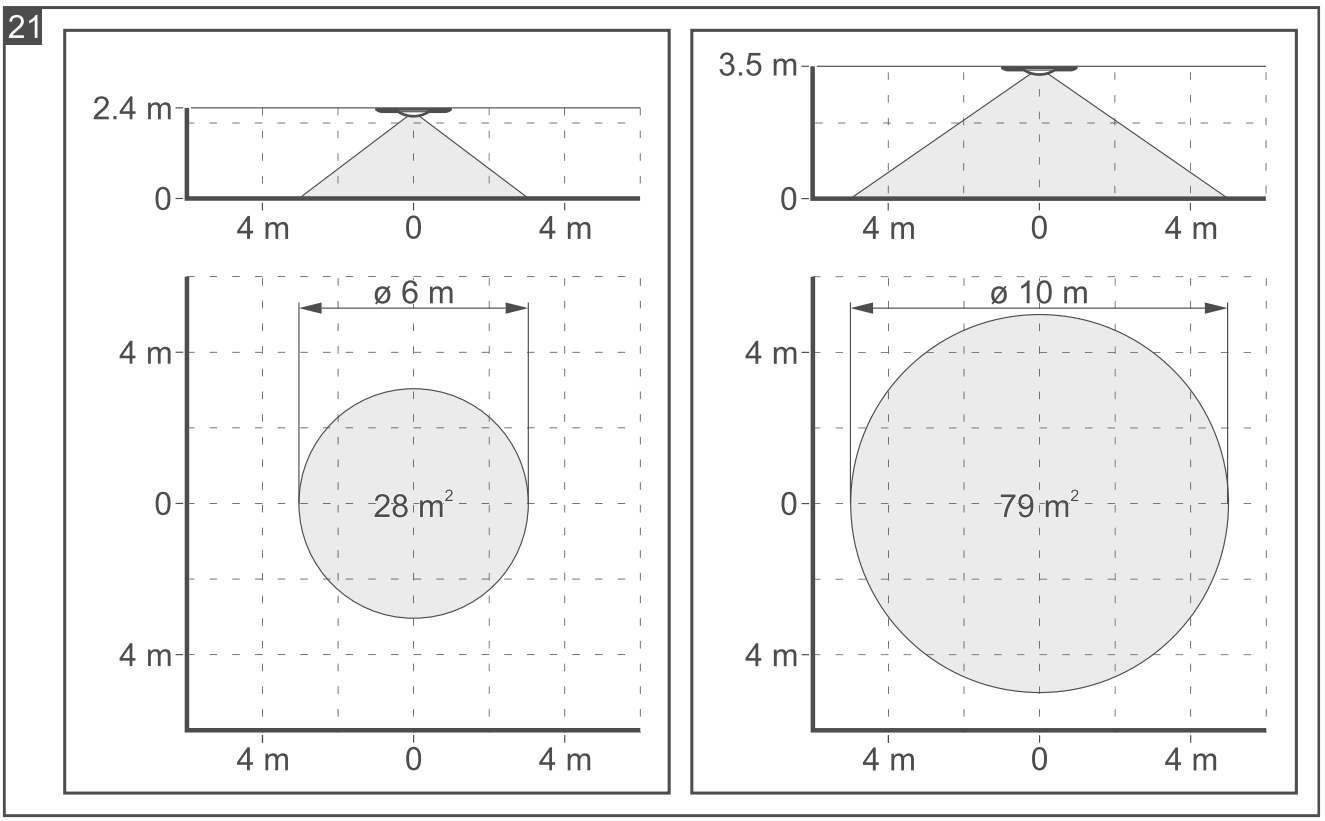
Check if moving within the detector coverage area will make the LED indicator turn ON. Figure 21 shows the maximum coverage area of the detector.

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* p. 11).

1. Run the sensor sensitivity configuring function.
2. Make sure that moving within the coverage area will make the LED indicator turn on.
3. If necessary, change the sensitivity of the sensors (see *Configuring the detector using the buttons / keyfob* p. 11).

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7. Specifications

Supply voltage ..... 12 VDC ±15%
Standby current consumption .....12 mA
Maximum current consumption .....70 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
tamper (NC relay, resistive load) ..... 40 mA / 24 VDC
Relay contact resistance
alarm output..... 26 Ω
tamper output..... 26 Ω
Microwave frequency .....24.125 GHz
Detectable speed ..... 0.3...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 2
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 ..... ø130 x 42 mm
Weight ..... 141 g

5 year warranty from date of manufacture