# SIEMENS

# Presence Detector WIDE UP 258D31 / WIDE UP 258D33
# Presence Detector WIDE pro UP 258D41
# Presence Detector WIDE multi UP 258D51



**Presence Detector WIDE UP 258Dxx**

- Brightness, temperature, humidity and CO2 measurement
- Presence detection up to 64 m², motion detection up to 400 m²
- Mounted on the ceiling on a flush-mounting box with diameter of 60 mm, in a separately ordered housing for surface mounting or on a mounting plate for 4 x 4 boxes
- Integrated IR receiver for IR remote control

**Functions with configuration with ETS**

- Integrated constant light control for main lighting group and up to four sub-lighting groups, including automatic calibration
- Integrated 2-point lighting controller (switching)
- Temperature, humidity, air quality controller and dew point calculation
- Three independent control outputs, each with 4 actions for presence detection
- Operation as single detector or as master/slave detector to cover larger areas
- Adjustable sensitivity and sectorization of detection
- Comparator, calculator and threshold monitoring

| Product | Description | Article number | KNX PL-Link |
|---|---|---|---|
| UP 258D31 | Presence Detector WIDE | 5WG1258-2DB31 | Yes |
| UP 258D33 | Presence Detector WIDE | 5WG1258-2DB33 | Yes |
| UP 258D41 | Presence Detector WIDE pro | 5WG1258-2DB41 | Yes |
| UP 258D51 | Presence Detector WIDE multi | 5WG1258-2DB51 | Yes |
| **Accessories** | | | |
| AP 258E11 | Surface-mounting housing type B | 5WG1258-7EB11 | – |
| S 255/11 | IR remote control | 5WG1255-7AB11 | – |
| S 258/12 | Mounting plate | 5WG1258-8AB12 | – |

## Properties

| | Presence Detector WIDE UP 258D3x | Presence Detector WIDE pro UP 258D41 | Presence Detector WIDE multi UP 258D51 |
|---|---|---|---|
| Detection area | Up to 400 m² (motion)/64 m² (presence) | | |
| Brightness sensor | ● | ● | ● |
| 2-point dimmer | ● | ● | ● |
| Constant light level controller | ● | ● | ● |
| Temperature sensor and controller | ● | ● | ● |
| Adjustable sensitivity and sectorization | ● | ● | ● |
| Comparator | ● | ● | ● |
| Calculator | ● | ● | ● |
| Threshold monitoring | ● | ● | ● |
| IR receiver for S 255/11 | ● | ● | ● |
| Relative humidity sensor and controller | | ● | ● |
| Dew point calculation | | ● | ● |
| CO2 sensor and air quality controller | | | ● |
| Protection type | IP 54 | IP 20 | |

## Characteristics

These presence detectors are equipped with an integrated brightness sensor and HVAC sensors that use multiple calibration methods so that they can be adjusted at the particular installation location.

The maximum detection area is 64 m² for presence and 400 m² for motion.

The presence detectors capture brightness, humidity, temperature, brightness and $CO_2$ and thus control not only the illumination systems but also ventilation and heating systems.

Communication is conducted via KNX. All types are designed for mounting on the ceiling.

## Technical design

### Position of display/control elements and sensors
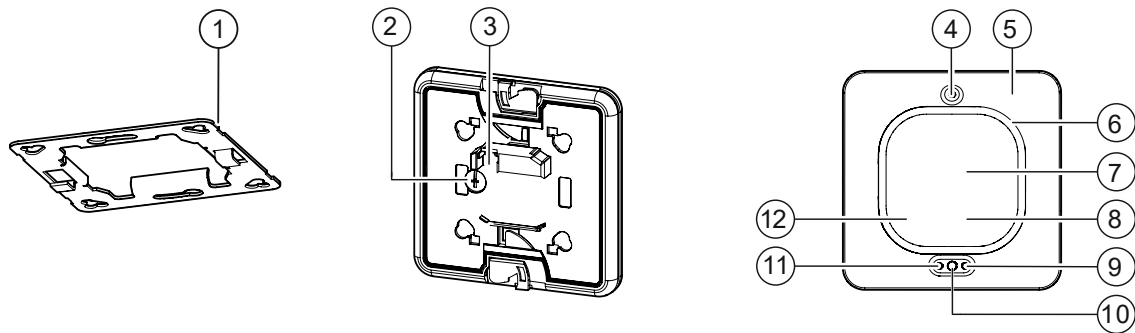
| Pos. | |
|------|-----------------------------|
| 1 | Mounting plate |
| 2 | PIR range adjustment |
| 3 | Bus terminal block |
| 4 | Programming button |
| 5 | CO2 sensor |
| 6 | Detection lens |
| 7 | Test LED for motion under the lens |
| 8 | Temperature sensor |
| 9 | Infrared receiver |
| 10 | Brightness sensor |
| 11 | Programming LED |
| 12 | Humidity sensor |

| Type | UP 258D3x | UP 258D41 | UP 258D51 |
|---|---|---|---|
| **Power supply** | | | |
| KNX bus voltage | DC 24 V (DC 21...30 V) | DC 24 V (DC 21...30 V) | DC 24 V (DC 21...30 V) |
| KNX bus current | approx. 12.5 mA | approx. 12.5 mA | approx. 30 mA |
| KNX power loss (internal consumption) | approx. 0.28 W | approx. 0.28 W | approx. 0.4 W |

| Type | UP 258D3x | UP 258D41 | UP 258D51 |
|---|---|---|---|
| KNX-medium | TP1-256 | | |

| **Motion detection** | |
|---|---|
| Type | Passive infrared (PIR) 4 sensors |
| Optimal installation height | 3 m |
| Detection area | Horizontal 360°, vertical approx. 150° See image and table |

| **Brightness measurement** | |
|---|---|
| Type | Mixed light measurement |
| Measuring range | 1...1000 Lux |

| Type | UP 258D3x | UP 258D41 | UP 258D51 |
|---|---|---|---|
| **Temperature measurement** | | | |
| Type | NTC | Measuring module | Measuring module |
| Measuring range | 0...50 °C | | |
| Typ. accuracy | 23°C: ±1.0K 5-30°C: ±1.2K | 23°C: ±0.6K 5-30°C: ±0.8K | 23°C: ±0.6K 5-30°C: ±0.8K |

| **CO2 measurement** | | |
|---|---|---|
| Type | | Measuring module |
| Measuring range | | 400...10000 ppm |
| Typ. Accuracy | | 25°C and 1013 mbar: ±(100 ppm + 5% of measured value) |

| **Humidity measurement** | | |
|---|---|---|
| Type | | Measuring module | Measuring module |
| Measuring range | | 0...100 % r.h. | 0...100 % r.h. |
| | | 23°C and 50% r.H.: ±4% r.H. 5-30°C and 20-80% r.H.: ±6% r.H. | 23°C and 50% r.H.: ±4% r.H. 5-30°C and 20-80% r.H.: ±6% r.H. |

| Type | UP 258D3x | UP 258D41 | UP 258D51 |
|---|---|---|---|
| **Physical specifications** | | | |
| Housing material | Plastic | | |
| Dimensions | See dimension drawing | | |
| Weight | 124 g | 127 g | 129 g |
| Color | UP 258D31: polar white (similar to RAL 9016) UP 258D33: black (similar to RAL 9005) | polar white (similar to RAL 9016) | polar white (similar to RAL 9016) |
| Fire load | approx. 4 MJ | | |

| Type | UP 258D3x | UP 258D41 | UP 258D51 |
|---|---|---|---|
| **Environmental conditions** | | | |
| Ambient temperature in operation | -25 °C...+50 °C | -5 °C...+45 °C | -5 °C...+45 °C |
| Storage temperature | -20 °C...+70 °C | | |
| Transport temperature | -25 °C...+70 °C | | |
| rel. humidity (non-condensing) | 5 % r. F. to 95 % r. F. | | |
| Environmental category (as per EN 60721-3-3) | EN 60721-3-3 class 3k5 | | |

| Type | UP 258D3x | UP 258D41 | UP 258D51 |
|---|---|---|---|
| **Protection settings** | | | |
| Pollution degree rating as per IEC 60664-1 | 2 | | |
| Overvoltage category as per IEC 60664-1 | III | | |
| Protection type IP | IP54 | IP20 | IP20 |
| Electrical safety, bus | Safety extra low voltage SELV DC 24 V | | |
| Electrical safety, device complies with | EN 50428 | | |
| EMC requirements, device complies with | EN 61000-6-1 EN 61000-6-3 | | |

| Type | UP 258D3x | UP 258D41 | UP 258D51 |
|---|---|---|---|
| **Reliability** | | | |
| Failure rate (at 40°C) | 460 fit | 565 fit | 2473 fit |

| Test mark | |
|---|---|
| KNX approval mark | Yes |
| CE marking | Yes |

## Motion detection

The detection area has the following zones:

- A) Seated person
- B) Walking person: step radial in direction of the presence detector on the floor
- C) Walking person: step tangential in relation to the presence detector on the floor
- D) Installation height from floor
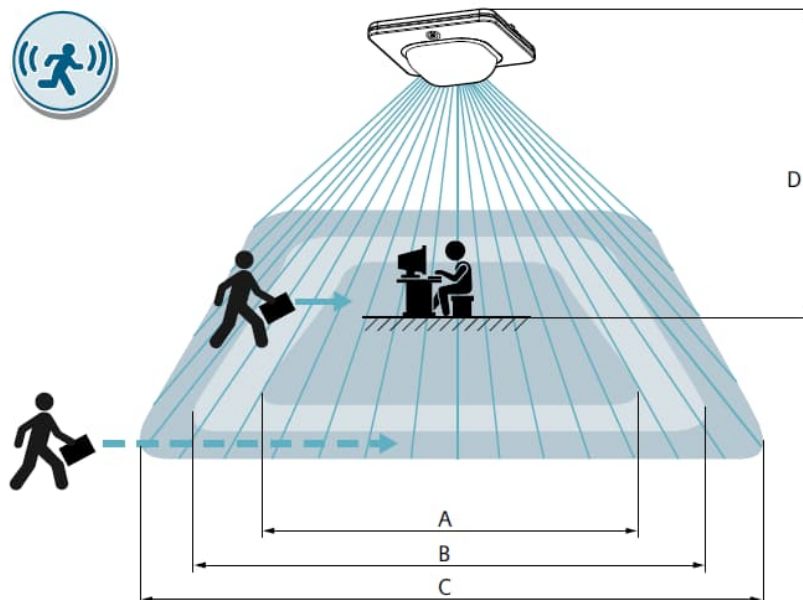


The table shows the maximum possible diameter of the individual zones in meters at different installation heights (M) and with adjustable range. The presence detector has a 7-level PIR range adjustment on the back of the presence detector.

| | | A | | | B | | | C | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ①| ④ | ⑦ | ① | ④ | ⑦ | ① | ④ | ⑦ |
| D | 2.5 m | 3.6 m x 3.6 m | 5.2 m x 5.2 m | 7.8 m x 7.8 m | 3.6 m x 3.6 m | 5.2 m x 5.2 m | 7.8 m x 7.8 m | 4 m x 4 m | 6 m x 6 m | 18 m x 18 m |
| | 3 m | 4 m x 4 m | 5.8 m x 5.8 m | 8 m x 8 m | 4 m x 4 m | 5.8 m x 5.8 m | 8 m x 8 m | 4 m x 4 m | 7 m x 7 m | 22 m x 22 m |
| | 5 m | - | - | - | 6 m x 6 m | 7 m x 7 m | 8.1 m x 8.1 m | 8 m x 8 m | 17 m x 17 m | 27 m x 27 m |
| | 10 m | - | - | - | 7.4 m x 7.4 m | 7.5 m x 7.5 m | 8 m x 8 m | 13 m x 13 m | 27 m x 27 m | 42 m x 42 m |

### Range

The presence detector has a 7-level PIR range adjustment on the back of the presence detector.

### Infrared (IR) receiver

The IR receiver that is built into the presence detectors allows you to remotely control the lighting and solar protection as well as store and recall scenes. The physical address can also be programmed with the IR remote control.

## Functions with configuration with ETS

### Version of the Engineering Tool Software and application program

| Application | Version |
|---|---|
| Engineering Tool Software (ETS) | ETS 5 or above |
| Application program | 5WG1258-2DB31 WIDE: 9A1001 or above<br>5WG1258-2DB33 WIDE: 9A1001 or above<br>5WG1258-2DB41 WIDEpro: 9A1101 or above<br>5WG1258-2DB51 WIDEMulti: 9A1201 or above |

### Behavior with bus voltage failure/recovery

As the electronics of the presence detector are bus-powered, a loss of voltage only results in a loss of function for the presence detector if the voltage failure also causes the bus voltage to fail as well.

Each channel can be independently configured with parameters to define what status it is to assume in case of bus voltage failure.

In case of bus voltage failure, the current status and other values for each channel are saved permanently so that they can be restored when the bus voltage is recovered.

When the bus voltage is recovered, one of the following functions can be selected as the starting value: on, off and as before bus voltage failure. A delay can be configured for the starting value. In addition, a starting behavior when bus voltage is recovered can be configured for each active override.

On bus voltage recovery, the configured actions are executed and, if applicable, new status values are reported.

### Behavior on unloading the application program

After "unloading" the application program with the ETS, the unloaded presence detector has no functions.

Pushing the programming button for longer than 20 seconds resets the presence detector to its factory settings.

### How the presence detector works

The presence detector has three independent function blocks (evaluation units), each with four communication objects, i.e. a total of 12 different communication objects. Depending on how the parameters are configured, these communication objects can be used to each send one or two telegrams on KNX at the end of a detected movement. The values of the communication objects are set via corresponding parameters for each function block (presence detector, presence detector (HVAC) or slave).

### Sensors with adjustable sensitivity and sectorization

The presence detectors have 4 PIR sensors. The PRI sensors can be deactivated individually in order to reduce the area recorded in a targeted manner. The sensitivity of the sensors can be set to high, low or automatic to offer flexible adjustments for different situations.

### HVAC presence detector

The presence detector has a control output for HVAC applications.

This function can be used to switch systems used for heating, ventilation and air conditioning (HVAC) the room from "power saving mode" when the room is not in use to "comfort mode" when the room is in use and back to "power saving mode" when the room is no longer in use.

### Presence detector, master-slave

The presence detector can be used as a standalone device, master or secondary (slave) detector. Depending on the requirements, additional presence detectors can be connected as "slave connectors" to the "master detector" via KNX in order to extend the presence detection area or cover larger areas. The "slave detectors" only supply motion information to the master detector.

### Presence detector extension input

Two extension inputs are provided for three different use cases with external button:
- Semi-automatic auto-off,
- Semi-automatic auto-on and
- Switching on in spite of excessive brightness value.

### Presence detector - blocking the sensor and output

There are two options for blocking the operating modes "presence detector" and "presence detector (HVAC):" Sensor and/or output. Slave operating mode has sensor blocking only.

The difference is that the response of the channel to activating or deactivating the output block can be configured.

### Brightness measuring - can be calibrated via KNX

The presence detector has a light sensor. The measured value for indirect measurement can be calibrated so that it can be adapted to the respective installation location. The brightness sensor can be calibrated in four different ways:
- with adjustment factor and offset for rooms without daylight,
- with adjustment factor without offset for rooms without daylight,
- via object (mixed light, artificial light) for rooms with artificial and daylight, without massive shift between artificial and daylight,
- via two separate objects (artificial light and daylight) for rooms with constant light control because the calibration detects the lighting characteristics.

### Integrated 2-point brightness controller

If the brightness controller is activated (automatic mode), the lighting is switched on as soon as the brightness falls below the configured lower brightness limit. The lighting is switched off once the configured upper brightness limit is exceeded. The brightness limits can be set using parameters or communication objects.

## Integrated steady constant lighting control

The illuminance of daylight entering a room through the window decreases the deeper it enters into the room. In order to use the entering daylight in the best possible way with constant lighting control, the presence detector offers the option to control a main lighting group directly and up to four additional sub-lighting groups, each via a separate characteristic curve and a separate controller (master/slave mode). All lighting groups are dimmed to the same setpoint (e.g. 500 Lux).

## HVAC sensors - can be calibrated via KNX

The presence detectors have built-in sensors for capturing the temperature, relative humidity and $CO_2$ concentration the room. ETS can be used to calibrate these internal actual values to the ambient conditions.

## Temperature control

The presence detectors offer room-specific temperature control for heating and/or cooling. The room temperature controller sends a control value to the actuator. This value is calculated by a control algorithm (2-point control, steady PI control or steady PI control with sequence control) based on the actual room temperature that is measured and the set setpoint. This actuator controls a heating or cooling valve that changes the room temperature.

The temperature controller has a comprehensive range of functions, including setpoint settings for setpoint shifting or absolute setpoint, automatic/manual operation, comfort extension, permanent protective mode, dew point mode and ventilation control.

## Humidity and air quality controller

The regulation of humidity and air quality can function either as a treshold value switch or as a continuous PI controller. Up to 5 control signal levels can be selected with the treshold value switch regulation.

The type of control variable output can either be switching (1-bit) or continuous (8-bit).

## Dew point calculation

The presence detectors calculate the dew point temperature and send it via object.

The dew point temperature is the temperature under which air with a specific humidity and a constant pressure can condense water vapor as dew. At the dew point the relative humidity is 100%, and the air is (just barely) saturated with water vapor. The more water vapor the air contains, the higher the dew point temperature will be.

## Calculator

This module is used when external measured values are to be taken into account in setting the setpoints used in the sensor controllers. Percentage values can also be used.

For each value recorded by the sensors (brightness, temperature, relative humidity and $CO_2$), the following values can be calculated based on the internal and external value:

- Maximum of the two values
- Minimum of the two values
- Composite value: Weighting of internal and external value can be set via parameters

## Threshold monitoring

2 threshold values for 8 evaluation logics can be defined via parameters for each of the measured values for temperature, humidity and $CO_2$. Parameters for going below or over the threshold values with an evaluation time are available for this purpose.

## Comparator

With the value comparator, two equivalent analog values (e.g. temperature) can be compared with each other. The internal and calculated values, the external values (received via communication objects) and constant values can be used as input values.

The result is output in binary form.

## Notes

### Safety

| | WARNING |
|---|---|
| ⚠⚡ 👷 | • The presence detector should only be installed and put into operation by a certified electrician.<br>• Do not open the casing of the presence detector.<br>• For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.<br>• Devices with an integrated CO2 sensor are not suitable for safety applications, such as gas or smoke detection. |

### Note on installation

The presence detector can be used for fixed installations indoors and in dry locations. The Presence Detector WIDE UP 258D3x is in protection class IP54. This means that it can be installed in weather-protected outdoor areas.

### Note on cleaning

The device may only be cleaned using dry and damp cloths. The use of detergents or disinfectants is not permitted and can result in damage to the device.

### Mounting recommendation for climate ceilings

ⓘ • **The table is only relevant, if the presence detector WIDE is mounted on a climate ceiling**

| Use of climate ceiling | Min. distance of sensors to activated panel [1] | Remark |
|---|---|---|
| Only cooling | 25 cm | Negative temperature offset |
| Only heating | 25 cm | Positive temperature offset |
| Cooling & heating | 60 cm | Opposing temperature offsets |

[1] Results may vary depending on room conditions.

**Brightness measurement**

The daylight measurement calculates an average brightness value in the room. The value may differ from the brightness on the work surface. Installation locations with extreme brightness contrasts should therefore avoided.

If the presence detector is mounted near lights that emit a large percentage of indirect light, the artificial lighting brightness at the installation location of the presence detector must not exceed the desired illuminance value in the room. This can be compensated for by increasing the distance between the light cone and the presence detector. For constant light control, direct artificial light pointing at the presence detector should be avoided.

We recommend facing the programming button towards the window if possible and the brightness sensor away from the window. Increasing the installation height decreases the sensitivity of the brightness detection.

Testing the setup is recommended particularly when installing at heights above 3 m. The presence detector must also be calibrated when installing at heights above 3 m. In general, the brighter the room is, the more accurate the presence detection will be.

The brightness sensor has an opening angle of 60°.
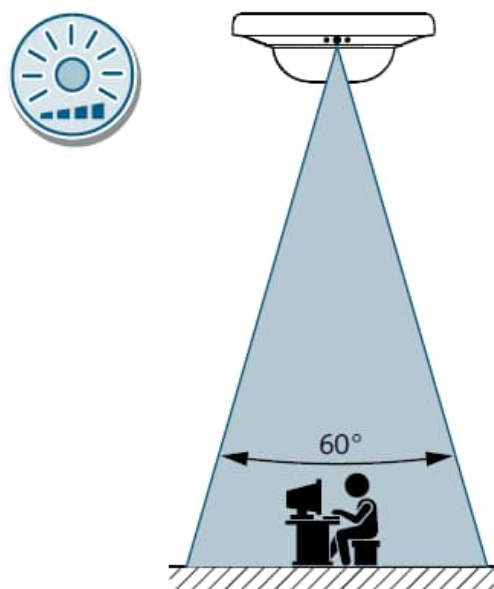
## Temperature, humidity and CO2 sensor

Depending on the model, the presence detectors have integrated sensor elements to measure the temperature, relative humidity and CO2 concentration of the ambient air. These measured values are used as control variables for the HVAC controller and can be transferred to other bus devices.

For best performance:
- The presence detectors must not be installed near heat sources and air currents.
- The presence detectors must not be exposed to direct sunlight.
- The box or conduit must be sealed to prevent air currents from triggering fault indicators on the sensors.
- The permissible ambient conditions are to be observed.

Notes on the CO2 sensor:
- The CO2 sensor determines the CO2 concentration by means of a non-dispersive infrared sensor (NDIR). Thanks to its inbuilt ABC (Automatic Baseline Correction) algorithm, the CO2 sensor is maintenance-free when operated in a normal environment. The algorithm stores the lowest measurement recorded within 8 days and corrects any measurement deviation that might occur. The CO2 sensor also includes auto-diagnostics for correct operation during its entire lifespan.
- Normal environments, such as offices, classrooms or other rooms that are not permanently occupied, typically reach the CO2 concentration of outdoor air (400 ppm) once a week. If the lowest CO2 concentration is not based on the outdoor air (400 ppm), this can lead to reduced precision and incorrect operation.
- Improper handling during transport, storage and assembly can affect the measurement during the initial operating period.
- The specified precision is reached after 25 days of continuous operation.
- The CO2 sensor is not suitable for safety applications, such as gas or smoke detectors.

## Calibration

All measured values can be calibrated so that they can be adjusted at the specific installation location. Several methods are available. More information:
➲ *Functions for configuration with ETS Brightness measuring - can be calibrated via KNX*

Switching is normally triggered by persons present in the detection area.

External factors can sometimes also cause unintentional switching, however. Possible sources of disturbance should therefore be considered or removed before project planning and installation.

Essentially, the PIR sensor reacts to temperature differences. This means that a smaller difference between the ambient temperature and the moving object will result in lower sensitivity. In other words, moving objects are detected with less accuracy when there is a smaller temperature difference and limit the detection area.

- **There must be a line-of-sight path for the detector to register persons. Persons behind walls, glass, etc. cannot be detected.**

- **Barriers such as partitions, plants or shelves can limit the detection area.**

- **Suspended lights cause shadowing in the detection area if they are mounted very close to the presence detector.**

Avoid the following interference factors:
- Rapid temperature changes caused by heaters, ventilators, etc. switching on or off in the detection area of presence detector.
- Lamps switching on or off in the nearby detection area (particularly incandescent and halogen lamps) that simulate movement.
- Moving objects, such as machines, robots, swinging posters, falling flower petals, warm paper from laser printers, animals, etc.
- The installation location must not be subjected to vibrations or movements.

The presence detector is mounted either in the ceiling with a flush-mounting box, in a separately ordered surface-mounting housing or on a mounting plate for 4x4 boxes. The presence detector has a programming button that enables quicker programming without requiring disassembly.
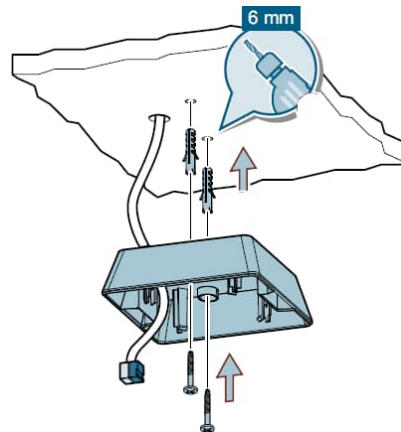
### Mounting with flush-mounting box

1. Screw the metal mounting brackets onto the flush-mounting box.
2. Fold out the mounting wings on the side of the presence detector.
3. Connect the KNX cable to the presence detector.
4. Attach the presence detector to the metal mounting brackets.
5. Push the mounting wings on the presence detector to the end position (flush with the edge of the housing).
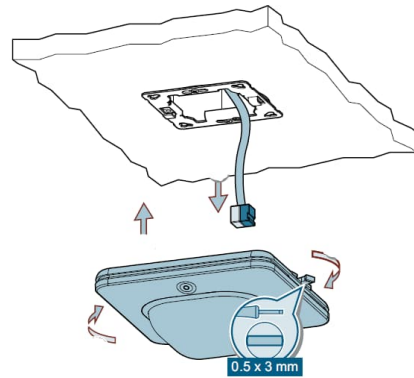
### Mounting with surface-mounting housing

1. Attach the surface-mounting housing to the ceiling.
2. Guide the KNX cable through the surface-mounting housing.
3. Place the metal mounting bracket into the surface-mounting housing.
4. Fold out the mounting wings on the side of the presence detector.
5. Connect the KNX cable to the presence detector.
6. Attach the presence detector to the metal mounting brackets.
7. Push the mounting wings on the presence detector to the end position (flush with the edge of the housing).

### Mounting with the mounting plate for 4 x 4 boxes

1. Screw the mounting plate onto the 4 x 4 boxes on ceiling.
2. Fold out the mounting wings on the side of the presence detector.
3. Connect the KNX cable to the presence detector.
4. Attach the presence detector to the mounting plate.
5. Fold in the mounting wings on the side of the presence detector.

## Connecting/disconnecting

**Connecting**
- Insert the wires into the bus terminal block
- Notice the bare wire length.
- Attach the bus terminal block to the connector in the presence detector.

**Disconnecting**
- Release bus terminal block from the presence detector (e.g. with a screwdriver).
- Rotate the wires to release them from the bus terminal block.
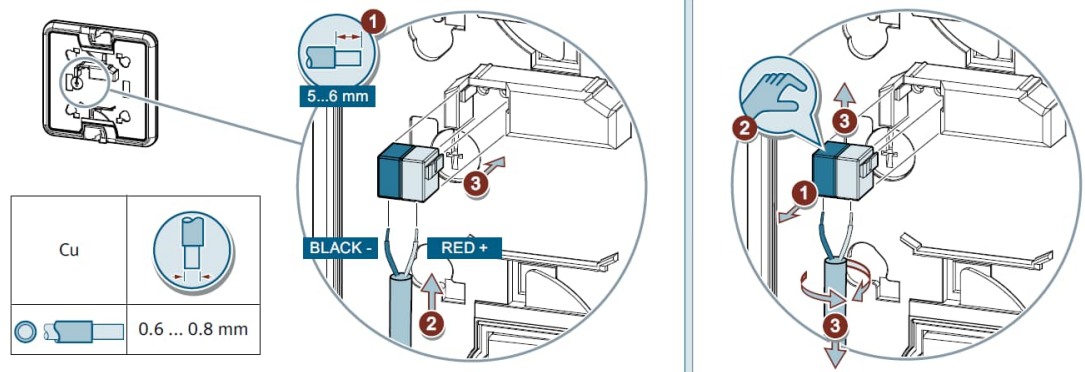


## Delivery state

After connecting the presence detector to the bus voltage, the presence detector must first "start up", i.e. the motion sensor takes up to 40 seconds to initialize. While this is happening, no motion is detected and no telegrams are sent.

In the delivery state, the presence detector can be tested without programming. A green LED will light up for as long as motion is detected.

## Address mode

Briefly pressing the programming button (< 2 s) activates address mode. This is indicated through constant illumination of the programming LED.

Pressing it again deactivates address mode. In the delivery state, the address mode can also be activated or deactivated using the IR remote controller S 255/11 5WG1255-7AB11 (S3 = On / S4 = Off), which is available as an accessory.

## Resetting the presence detector to factory default settings

Pushing the programming button for longer than 20 seconds resets the presence detector to its factory default settings. This is indicated by an even flashing of the programming LED with a duration of 8 seconds. All configuration settings are deleted.

> **Holding down the programming button (> 5 s to 20 s) starts the connection test for commissioning with Desigo. Briefly pressing the button exits this mode.**

120 mm [4.72 in]

120 mm [4.72 in]

134.5 mm [5.29 in]

40.9 mm [1.61 in]
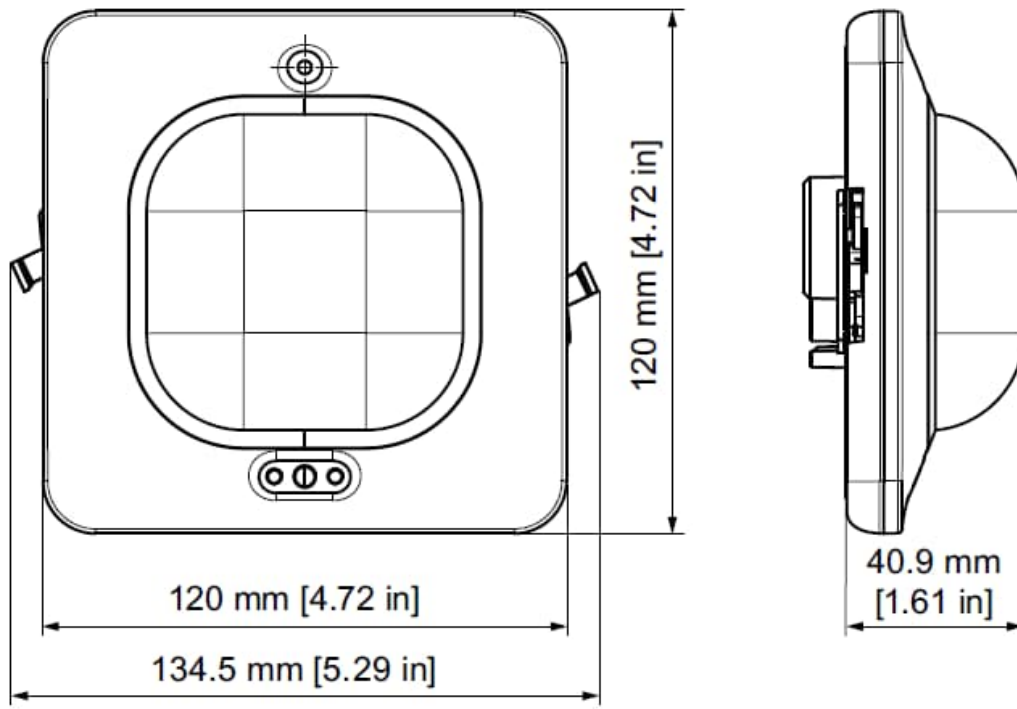
## Product documentation

Associated documents such as the operating and installation instructions, application program description, product database, additional software, product image, CE declaration etc. can be downloaded from the following internet address:

http://www.siemens.com/gamma-td

## Support

- Provision of operating/installation instructions
- Return a defective device to the appropriate sales office.
- Contact details for technical support in case of additional questions relating to the product:
  ☎        +49 89 9221-8000
  www.siemens.com/supportrequest

Technical Support:
http://www.siemens.com/supportrequest

FAQ:
https://support.industry.siemens.com/cs/ww/en/ps/faq

The technical product information must be handed over to the client.