SIEMENS

Presence Detector, Constant Light Level Controller UP 258E22
Presence Detector, Brightness Sensor UP 258D12
Brightness Controller UP 255D21

5WG1 258-2EB22
5WG1 258-2DB12
5WG1 255-2DB21

Presence detector with brightness sensor for detection of motion and presence for ceiling mounting

- Contrast measurement of brightness
- Presence motion detection up to Ø8 m
- Flush mounted installation in ceilings with wall box or clamps
- Integrated IR receiver for IR remote control

Functions with commission with ETS
- Three independent output channels with four commands each in case of motion detection
- Integrated 2-level light controller (switching)
- Integrated constant light level controller for up to five lighting groups including
- Usage of motion detector as standalone mode or extension mode to cover wider areas
- Independent output channel for HVAC applications

Types

Type	Article number	Description	Sensors	Applications	KNX PL-Link
UP 258E22	5WG1 258-2EB22	Presence detector, Constant light	Motion , brightness	• Presence detection with 3 independent output channels • 2-level light controller (switching) • Constant light level controller (dimming) • Locking functions	No
UP 258D12	5WG1 258-2DB12	Presence detector, Brightness sensor	Motion, Brightness	• Presence detection with 3 independent output channels • 2-level light controller (switching)	Yes
UP 255D21	5WG1 255-2DB21	Brightness controller	Brightness	• 2-level light controller (switching) • Constant light level controller (dimming)	Yes

Purchased parts package

Detector, Clamps, Shade, Design ring

Accessories

Picture	Article number	Description
	5WG1 255-7AB11	IR remote control S 255/11
	5WG1 258-7EB01	AP surface mounting box AP 258E01

Features

The devices are presence and motion detectors with integrated brightness sensor. The devices communicate via KNX. All are designed for ceiling mounting.

Usage

The main application of the equipment is the detection of the presence of persons in the area and/or the measuring of the current brightness under the device depending on sensor equipping.

Presence / motion detector

The sensor recognizes the presence of a person or that nobody is in the detection range.

Brightness measuring (Contrast measurement of brightness)

All devices have a integrated brightness sensor. The measured value can be used on KNX and internally. In case of a indirect detection the value has to be calibrated by a correction factor to adapt it to different installation situations. The measuring range is between 20 and 1000 lux.

Infrared (IR) receiver

The integrated IR receiver enables the control of lighting and solar protection applications, and to recall and save scenes via the IR remote control.

5WG1 255-7AB11
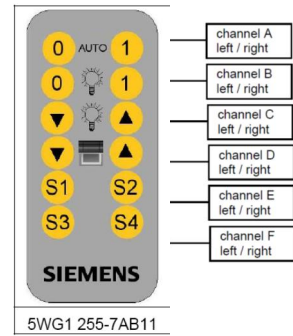
In case of commissioning with ETS different controls can be configured for different applications. Additional the light controllers can be defined by parameters and communication objects.

Presence / Motion detector

The detector senses the presence of a person or that there is no longer anyone in its detection area. The detector signal can be analyzed via two separate communication channels, termed motion detector and presence detector. The detection range is identical for all channels. Each channel can be locked individually via objects.

HVAC detector

The detector has an additional control output for HVAC applications.

For example, this function can switch systems that are used for heating, ventilating and climate control (HVAC) of the room from "Energy saving mode" in an unused room to "Comfort mode" in an occupied room and back to "Energy saving mode", when the room is again unoccupied.

Functionality of the Presence detector / Motion detector / HVAC-detector

For each detector channel 4 communication objects are available, in sum 12 different communication objects. It is possible to send one or two KNX telegrams at the beginning and at the end of a detected presence, according to configuration. The values of the communication objects are configured for each functional block (motion detector, presence detector, HVAC-detector) via corresponding parameters.
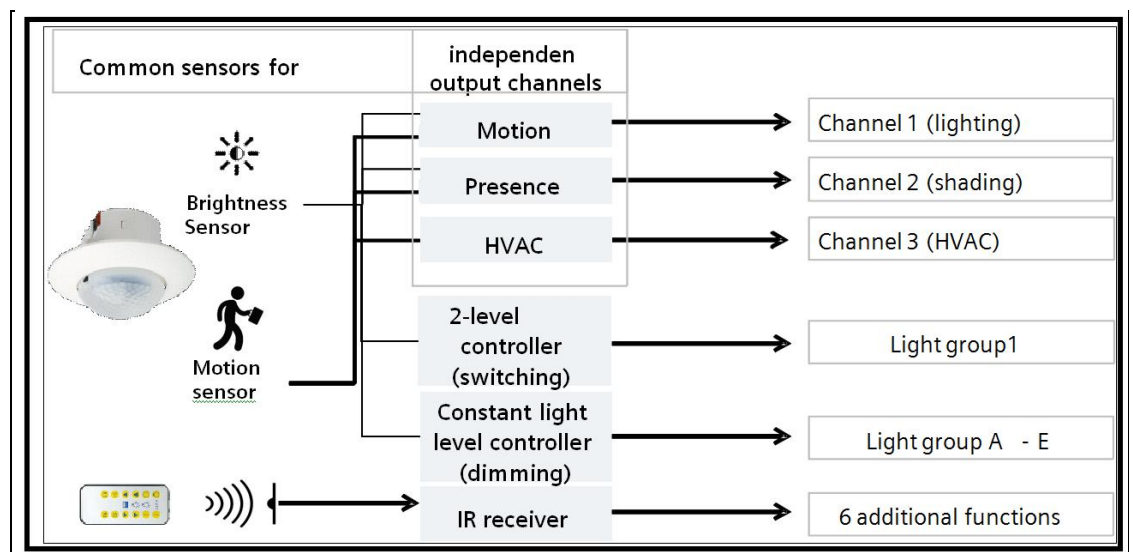
Each time a presence is detected, the overshoot time is started. Its duration is configurable for each functional block separately. The end of presence is determined by the end of the overshoot time.

The duration of the dead time is also configurable per functional block. It is used to protect the actuators that are connected to the detector. If a presence is detected during the dead time, neither telegrams are sent nor the overshoot time is started.

In the following the telegrams, which are send at the beginning of a presence, are called **A** and **B**, the telegrams, which are sent at the end of a presence, are called **C** and **D**.

Operating Sequence

After the device has detected a presence, telegram **A** is sent immediately. If it has been configured to send also a telegram **B**, then telegram **B** is sent after the configured time (optionally also cyclically).

If there are no motions any more, at the end of the overshoot time telegram **C** and (if configured) telegram **D** are sent. Telegram **D** can also be sent cyclically.
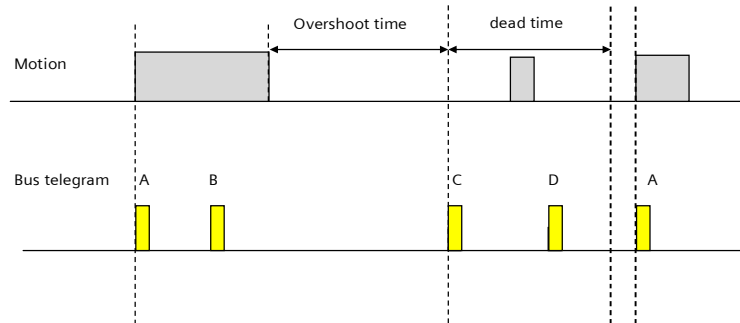
Use as single device or as main detector, respectively secondary detector

The detector can be operated as an independent device, as the main or secondary detector.

According to the requirement, additional presence detectors can be connected with the "main detector" via KNX as "secondary detectors" to extend the presence detection zone. "Secondary detectors" supply motion information only to the main detector.

Brightness measuring – adjustable via KNX

The device contains an independent light sensor. The signal measured there is available both at the KNX and internally.

Because the light sensor measures directly, it must be possible to calibrate it for indirect measurement, so that it can be adapted to the different installation sites. Rapid brightness fluctuations are filtered out. The measurement range of the internal light sensor is between 20 and 1000 lux.

The settings determine whether the brightness value computed by the device or a brightness value received from outside is used for the detector's remaining functional blocks.
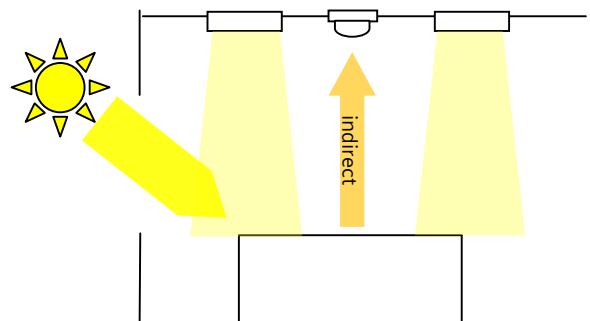
For indirect brightness measuring a maximal distance of 2.8 m is recommended. In case of larger distances the measuring can be realized via a reference area with 2.8 m distance.

Integrated 2-level light control (switching)

If the brightness controller is enabled (automatic mode) the lighting is switched on as soon as the brightness falls below a set lower threshold. The lighting is switched off if the set upper brightness threshold is exceeded. The brightness thresh-olds are variable either via parameters or via communication objects.

The controller can also be operated semi-automatically by separating into two individual switching objects for exceeding or falling below the threshold. In this way, it can be switched to "Only on" or "Only off."

If the controller receives a switching or dimming command via the associated communication object over KNX, then this is deemed an external override and the controller switches automatic mode off. This change of status is sent simultaneously on the bus via the "Automatic Status" object.

Integrated constant light level control (dimming)

The luminance of the day light falling through a window into a room decreases in the room with the distance from the window.

Depending on lamp type, the lighting is controlled to the preset brightness value via dimming actuators or switching/dimming actuators. The brightness setpoint may be configured via a parameter or set via a communication object.

For optimum use of the day light penetrating the room the presence detector with constant light level control offers the option to control a main lighting group directly and up to four additional lighting control groups each via their own characteristic curve and their own controller (master/slave operation).

All lighting groups are dimmed to the same set point value. This allows controlling the light level in a room with only one presence detector with constant light level control. Depending on the relative distance of the additional lighting groups to the window compared to the main lighting group, each of these additional lighting groups has to be dimmed brighter or darker than the main lighting group.

Firstly, this requires determining the installation position of the presence detector. The presence detector can be installed on the ceiling at any of the positions A - E. The position of the presence detector determining the main lighting group is in principle freely selectable. Yet, it should be close to the window allowing the best measurement of the daylight contribution.

For master/slave operation the day light curve under lighting groups A – E has to be captured. For this purpose the artificial lighting has to be completely turned off, such that just the natural day light is illuminating the room. Ideally, the day light is evenly falling into the room (no sharp shade / sunlight edges), bright, and diffused, e.g. at noon on a bright day with overcast sky. Under each lighting group the luminance (Lux) has to be measured manually and these values have to be entered into ETS.

The control characteristic curve for the additional lighting groups has to be determined without day light. For that purpose the room has to be completely darkened or the characteristic curve has to be determined at night. Sending a start signal to communication object 71 starts the determination of the characteristic curves. The presence detector automatically generates 15 discrete control values in the range 0%...100% for each constant light level controller of the main and additional lighting groups. The controllers send dimming values to the corresponding lighting groups and the presence detector measures the resulting luminance level. The period for the measurement can be configured between 10 and 60 s.

Operation via infrared (IR) remote control

The IR receiver integrated in the presence detector can control light and shade, as well as store and call up scenes via a special IR remote control.

The IR commands implemented can be combined via communication objects with the other function blocks or used to control other devices. The functionality of button pairs A to F will be configured via the ETS.

Channel F can be used optional to enable the programming mode.
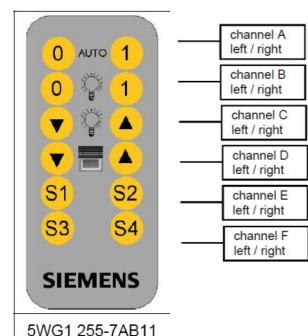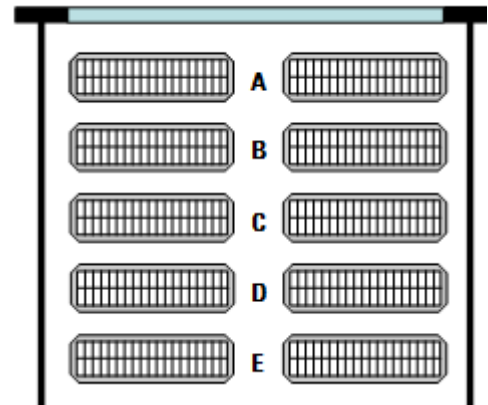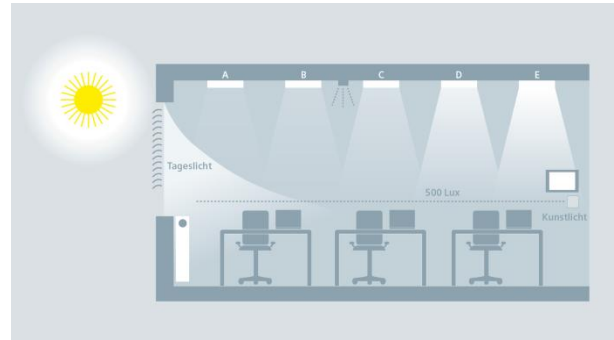
Location / Function of the Display and Operating Elements

A6

A1

A4

A8

A2

A3

A5

A7

A1   Device
A2   Fixing clamps
A3   Detector lens
A4   Programming button
A5   Shade
A6   Bus terminal
A7   Design ring
A8   Programming mode LED behind lens
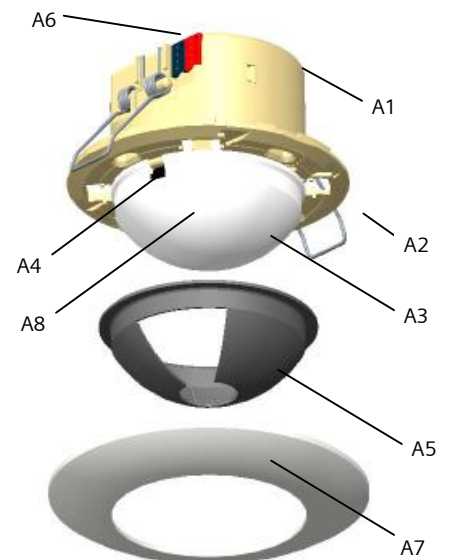
Product documentation

Additional information like operating and mounting instruction, application program description, Product database, additional software, product image, CE declaration etc. is available here:

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

Notes

Safety

⚠	**DANGER**
	• The device must be mounted and commissioned by an authorized electrician. • When connecting the device, it should be ensured that the device can be isolated. • The device must not be opened. • For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.

Mounting

→ Brightness measurement in particular

The daylight measurement determines an average brightness value in the room, which can differ from the brightness on the worktop. You should therefore avoid mounting sites with extreme light ratios.

If the detector is fitted near lights with a high proportion of indirect light, the artificial light level at the detector mounting point must not exceed the wanted nominal lighting level in the room. This can be compensated by increasing the separation between the light cone and the detector. For constant lighting control, direct artificial light on the detector should be avoided.

It is recommended to orientate the programming button of the device to the window, if possible. With increasing mounting height the sensitivity of the brightness measuring is reduced.

→ Presence-motion detection in particular:

Normally, the switching pattern is determined by people in the detector's catchment area.

In exceptional cases, however, it can be switched on inadvertently through "outside factors". Accordingly, potential "sources of interference" should be corrected during planning or before mounting.

<u>Basics:</u>
- The PIR - sensor reacts to temperature differences.
- The lower the temperatures difference between the ambient temperature and the moving object, the less sensitive the analysis. In other words, moving objects will not then be detected as efficiently and the catchment area is restricted.

Note:
- There must be an unobstructed line of sight to the person in the catchment area. People behind walls, etc. (including glass) cannot be detected!
- Obstacles such as party walls, plants or shelves can limit the catchment area.
- Hanging lights cause shadows in the catchment area if they are mounted in the immediate vicinity of the presence detector.

<u>Interference factors to be avoided:</u>
- Rapid temperature changes in the vicinity of the detector, caused by fan heaters being switched on or off, fans, etc., simulate motion.
- Lights being switched on or off in the immediate catchment area (mainly incandescent and halogen lamps) simulate motion.
- Moving objects such as machines, robots, hanging posters, falling flower petals, hot paper from laser printers, animals, etc.
- The mounting site must not be exposed to vibrations or motion.

Mounting

There are the following options for this:

→ UP mounting (A) in an UP socket with screw fixing

→ UP mounting (A) with fixing claws in suspended ceiling

→ AP mounting (B) in the AP housing (see accessories)
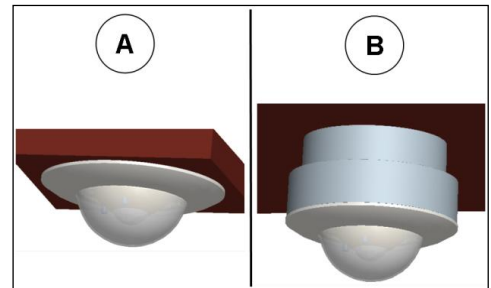
<u>Connecting the detector:</u>

Connecting:

Plug wires into the bus terminal. Ensure you have stripped the insulation back! Push the bus terminal on the plug in the device

Disconnecting:

Separate the bus terminal from the device (use a screwdriver if necessary) Separate the wires from the bus terminal by turning.

D1	Device
D2	Bus terminal
D2.1	(-) Terminal (grey)
D2.2	(+) Terminal (red)
D2.3	Test contact
D2.4	Bus line wire
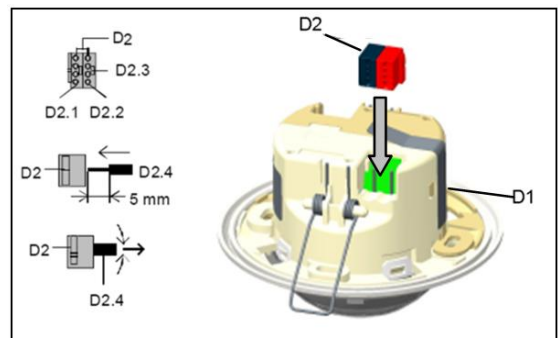
Installation in UP socket using screws
The device is secured with fixing screws in the UP socket. The device can be installed offset by 90° with the additional fixing holes.
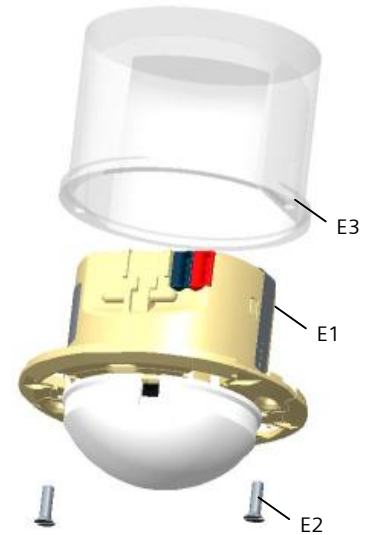
Note:
* Fixing clamps must not be mounted!

E1 Device
E2 Socket fixing screws
E3 UP socket Depth: min. 40mm, ∅ 60mm

Mounting the fixing clamps for mounting the device in suspended ceilings
Extend the fixing claws slightly and push over the lugs on the device.

Installation in suspended ceilings with fixing clamps
Press the fixing clamps together (see figure 7) and push the device into the opening (∅ 60mm - 65 mm) with the fixing clamps in front.
The fixing clamps hold the device on the ceiling.
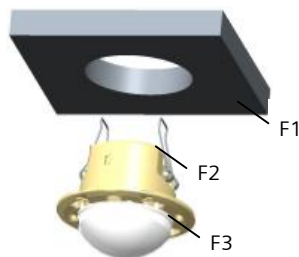Max. thickness of the suspended ceiling: 30mm
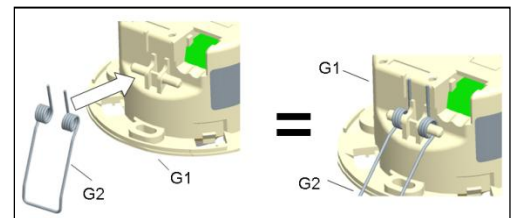
G1 Device
G2 Fixing clamp

Caution:
* When dismounting the device hold it where the two housing parts are joined together.
  Otherwise, the fixing clamps may hit your fingers.

F1 Suspended ceiling
    (max. thickness of the suspended ceiling: 30mm)
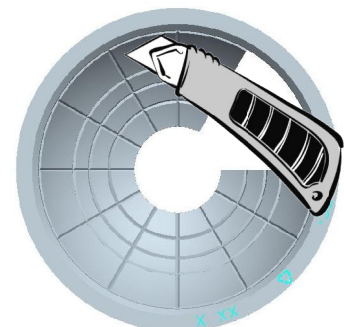F2 Fixing clamps
F3 Device

Cutting the shade
If the detection range of the motion sensor must be reduced, a shade can be used.

The shade is cut out in the wanted sectors with a knife.

Caution:
* Do not cut out the mounted shade!
* Only cut out the dismounted shade!

Mounting / Dismounting the shade

Put the shade H2 over the lens of the device H1and fix it with the design ring H3.


Note:

The programming button be reached only partly when the shade is mounted.

Mounting the design rings

The design ring H3 is clipped on to the device H1 from below, until the snaplock hooks on the design cover engage on the outer edge of the device with an audible click.

Dismounting the design ring

The design ring is dismounted by pulling downwards. Use a screwdriver to help with this operation.

H1

H2

H3
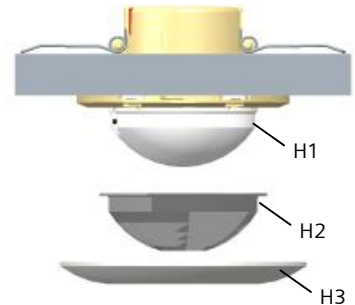
Caution:
- Be careful when handling the screwdriver. There is a risk of scratching the ceiling or the design cover. Accordingly, be gentle while working

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Commissioning / Factory default

After the device is connected to the bus voltage, the sensor must first "Restart", i.e. the motion sensor will be initialized.

Factory default

In the delivered state, the parameter Operating Mode is set to setting mode.

While the device is in "Setting Mode", the integrated programming LED displays the PIR sensor state. (flashes briefly with motion).

The programming mode can be set in factory default status also with the available IR remote control S 255/11 5WG12557AB11 (S3 = On / S4 = Off).

Programming mode

A short push of programming button (< 2 s) enables the programming mode. This will be indicated by a continuous light at the programming mode LED. A second push disables this mode.
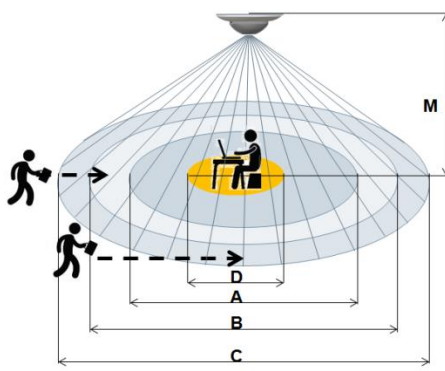
Factory settings (UP 258D12 and UP 255D21 only)

A very long push of the programming button (> 20 s) effects a reset to factory settings. This is indicated by constant flashing for 8 seconds.

Note (UP 258D12 and UP 255D21 only)

A long push of the programming button (> 5 s to 20 s) enabled the Connection Test for commissioning with Desigo. This mode can be disabled by a short push any time.

Power supply	
Power supply	via KNX
Current drain	approx. 10 mA
Dissipation loss typ.	approx. 0.24W at DC 24 V

Presence detection	
Type	Passive infrared (PIR)
Range	horizontal 360°, vertical approx. 105°, 288 sectors

The detection range is divided in following areas:
- A) sitting in working desk height (0.8m)
- B) walking straight to the detector
- C) walking across the detector

and

- D) Area of the brightness measuring in working desk height (0.8m)

Table 1 shows the maximum reachable diameter in meter of the different areas for different installation heights (M).
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| M	A	B	C	D
5.0m	-	8.5	14	Ø3.0
4.0m	-	7.5	12	Ø2.3
3.5m	5.5	6.5	10	Ø2.0
3.0m	5	6	8	Ø1.6
2.5m	4.5	5	7	Ø1.2

Brightness measurement	
Type	Contrast measurement
Range	20...1000 Lux
Note	Recommended mounting height for constant light level control : 2.4 m – 3.0 m
Control elements	
1 learning button	for switching between normal operating mode and addressing mode
Display elements	
1 red LED	for monitoring bus voltage and for displaying normal mode/ addressing mode This LED indicates motion during test mode.
Connections	
KNX	Bus terminal

Physical Specifications	
Housing	plastic
Dimensions (diameter x height)	⌀ 88 mm x 63 mm
Weight	approx. 65 g
Colour	Titanium white (similar RAL 9010)
Fire load	approx. 2 MJ
Mounting	In wall box , ceiling cutout or into surface mounting housing

Environment and safety regulations	
Degree of pollution (according to IEC 60664-1) Overvoltage category (according to IEC 60664-1)	2 III
Protection class (to EN 60529)	IP20
Electrical Safety Bus Devices covers Electromagnetic compatibility	 Safety extra low voltage SELV DC 24 V EN 50428 complies with EN 50428
Environmental specifications Climatic withstand capability Ambient temperature in operation Storage temperature Relative humidity (non-condensing)	 EN 50090-2-2 -5℃...+45℃ -20℃...+70℃ 5 % to 93 %
Reliability Failure rate	 UP 255D21: 250 fit at 40℃ UP 258E22: 308 fit at 40℃ UP 258D12: 308 fit at 40℃
Markings	KNX EIB
CE marking	Complies with the EMC regulations (residential and functional buildings), low voltage regulations

Dimension drawing

Dimensions in mm

Ø 88±0,3
Ø 53±0,3

max. 32

max. 31
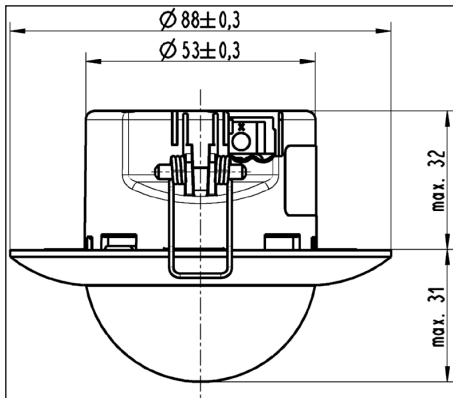
Support

General notes
- The operating instructions must be handed over to the client.
- Any faulty device is to be sent together with a return delivery note of the local Siemens office.
- If you have further questions concerning the product please contact our technical support.

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www.siemens.de/automation/support-request

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