# SxQP360L

## Extended range PIR sensor

### Benefits

- **Integrated system.** Dupline® is the brand name for Carlo Gavazzi's 2-wire bus system.
- **Cost reduction.** The use of a bus system is a proven way to reduce installation costs – especially when the distance between I/O points are extensive.
- **Fast and easy installation.** Completely free topology, no special cable required, no screen or twist. It can go for 2 km and even further with repeaters.
- **High noise immunity.** Can run next to power cables.
- **Scalability.** New modules can be progressively integrated into the system according to the application needs.
- **Modularity.** The system is composed by many modules, powered by the bus, so that each installation can be precisely and easily sized.

### Description

The SxQP360L is a 360° PIR sensor to detect presence and/or movement in indoor installations with a built-in luxmeter, combining two products in one.

It is part of the Carlo Gavazzi building automation sistem and can be used to control lights, rollerblinds, air-conditioning, intruder alarms and all the other functions supported by the system, in an automatic way depending on people-presence. This sensor is completely programmable via the UWP/Sx tool.
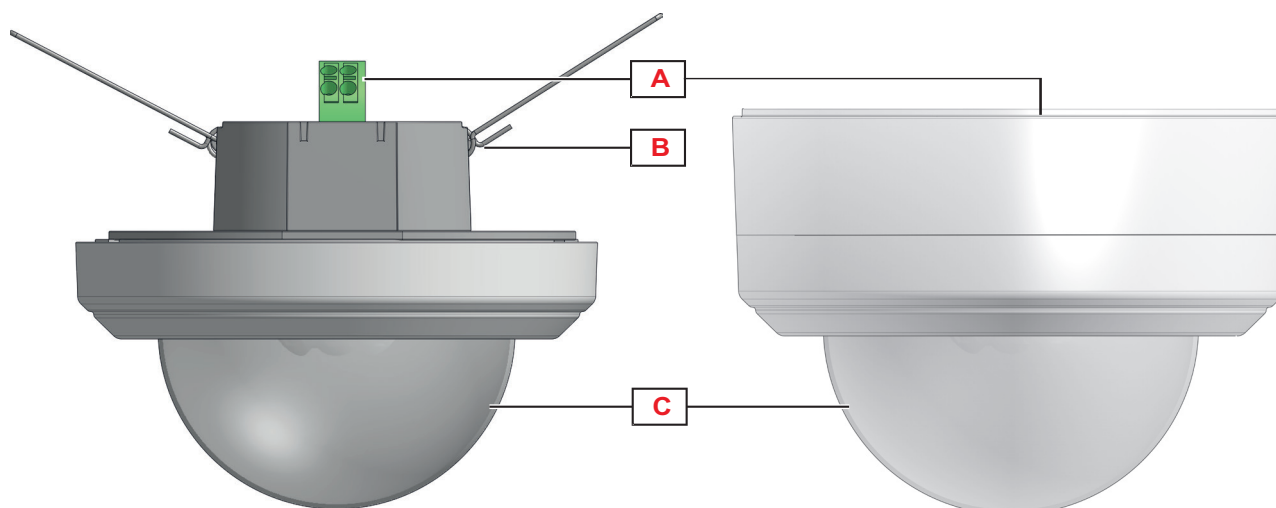
### Applications

Home and building automation.

### Main features

- Detection range: SHQxxx Ø 14 m at 2.7 m, SBQxxx Ø 24 m at 2.7 m
- Detection angle: 360°
- Presence and movement detection
- Integrated daylight sensor: light measuring range 0 to 80 klux
- Mounting height: 2 m ....4 m
- Programmable blue and white LEDs
- Programmable detection area
- Indoor and outdoor installation
- Powered by the bus

► **Structure**



| Element | Component | Function |
|---------|-----------|----------|
| A | Dupline bus | Detachable 2 x spring terminals, 1.5mm$^2$ - D+, D- |
| B | Mounting brackets | For built-in mounting |
| C | Sensing elements and LEDs | 3 pyroelectric sensors. One white LED, one blue LED |

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# Features

General

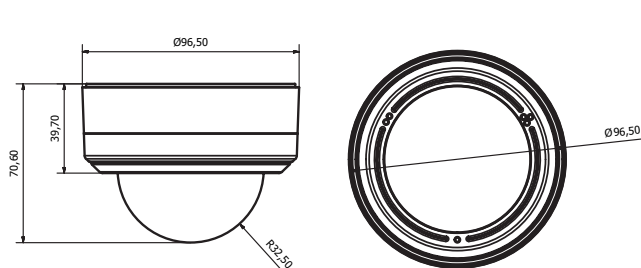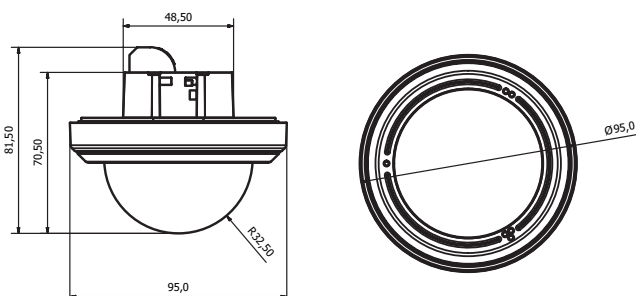| Material | White plastic (ABS/TBD), RAL9003 |
|---|---|
| Dimensions | Flush: Ø 96.5 x 70.6<br>Built-in: Ø 95.0 x 81.5 |
| Weight | 25 g |
| Protection grade | SxQP360L: IP20<br>SxQP360L...O: IP55 |
| Pollution degree | 3 (IEC 60664) |



**Fig. 1** *Flush version*



**Fig. 2** *Built-in version*

### Environmental

| Operating temperature | -20° to +50°C (-4° to 122°F) |
|---|---|
| Storage temperature | -5° to +85°C (-58° to +185°F) |
| Humidity (non-condensing) | 20 to 90% RH |

### Compatibility and conformity

| Electromagnetic compatibility (EMC) - immunity | EN 61000-6-2 |
|---|---|
| Electromagnetic compatibility (EMC) - emissions | EN 61000-6-3 |
| Approvals | CE  c(UL)us LISTED |

### Power Supply

| Power Supply | Supplied by bus |
|---|---|

## Dupline®

| Voltage | 8.2 V |
|---|---|
| Maximum Dupline® voltage | 10 V |
| Minimum Dupline® voltage | 4.5 V |
| Maximum Dupline® current | 7 mA (all LEDs ON) |
| Addressing | Automatic: the controller recognises the module through the SIN (Specific Identification Number) that has to be inserted in the UWP/Sx tool.<br>Used channels: max. 3 input channels (presence, movement, alarm), max. 2 output channels (blue LED, white LED). |

## Input specifications

| PIR | **SBQP360L...:** 3 pyroelectric sensors, configurable via software | **Detection angle:** 3 pyros 360°, 2 pyros 240°, 1 pyros 120°<br>**Detection range:** 3 pyros, Ø 24m, @ 2.7m; 2 and 1 pyros: see diagram |
|---|---|---|
| | **SHQP360L...:** 1 pyroelectric sensor | **Detection angle:** 360°<br>**Detection range:** Ø 14 m, @ 2.7 m |
| | Configurable detection signals | Presence (central zone @ 5 m), movement, alarm. Each of this signals has independent filter |
| Luxmeter | **Range:** 0..80000 LUX (resolution 1 Lux)<br>**Measurement drift across temperature (typ):** 0.01 %/°C | |

## Output specifications

| LED | 1 white / 1 blue<br>The LEDs can be used:<br>- to identify the device during commissioning (only blue one, slow blinking)<br>- as guide light<br>- as feedback LED for presence/movement detection<br>- as output signal |
|---|---|

# Mode of operation

This PIR sensor responds to any fluctuation in infrared heat radiation, so any object or human presence changes the thermal image detected by the sensor when entering its field of vision.
The sensor is equipped with a segmented lens that divides the field of vision into active and passive zones (zones not visible to the sensor, see figure 3).
When a heat source crosses these zones, the sensor detects the change in infrared radiation and presence and/or movement are recognised.
How sensitive and fast the sensor has to be to detect presence and/or movement can be programmed by means of four parameters, by means of the UWP/Sx tool.
The four parameters are: mode of detecting the crossing of active zones, sensitivity, number of pulses and time window in which these pulses have to be detected. These four parameters have to be set for the presence, movement and alarm signals.
Movement is used to switch the light on, while presence is used in the light function to reload the energy-save timer (i.e. each time presence is detected, the energy-save timer starts counting from the beginning).

**Mode of detection**

A: one border between the active and the passive zone has to be crossed to give a pulse signal. This option has to be selected for presence detection and movement and turns the light on as soon as a person moves from an active to a passive area or vice versa (very quick response).
B: two borders have to be crossed to give a pulse signal. The person has to move from an active area to another active area, passing through a passive one or vice versa.
This option is recommended for sensors used in the intruder alarm function, in order to avoid false alarms.

**Sensitivity**

A number can be set from 3 to 100: the smaller this value is, the longer the detection distance, but the higher the sensitivity to heating sources. In the figures 4, 5, 6 and 7, examples of different sensitivity can be seen.

**Number of pulses**

The number of pulses is calculated according to mode A or B before sending a people detection message to the controller. This can be set from 1 to 8.
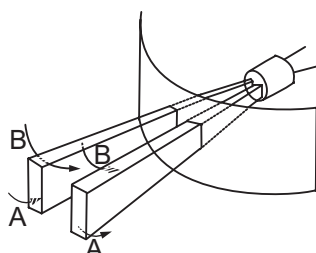


**Fig. 3** *Active and passive zones*

**Time window**

This is the time interval within which the predefined number of pulses is detected. It can be set from 1 to 10 seconds.
In the table below is an example of settings which, of course, might depend on environmental conditions, application and type of installation.

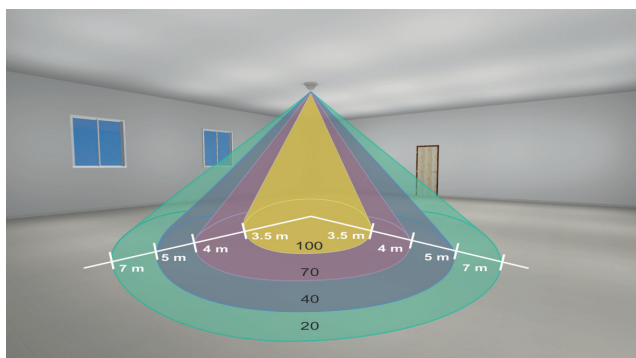| | Presence | Movement | Alarm |
|---|---|---|---|
| Mode of detection | A | A | B |
| Sensitivity | 10..30 | 30..70 | 50..100 |
| Number of pulses | 1 | 1 | 3 |
| Time window | 10 | 2 | 10 |



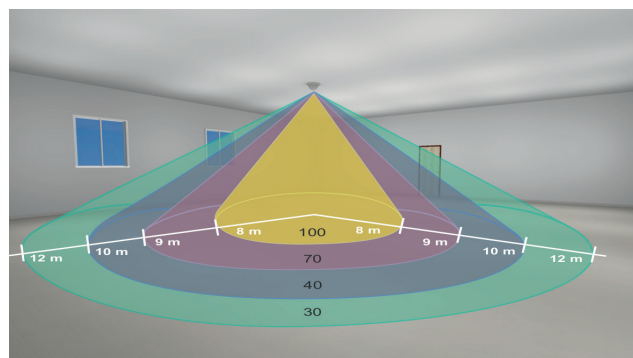**Fig. 4** *Detection area vs. sensitivity - SHQP360L7...*


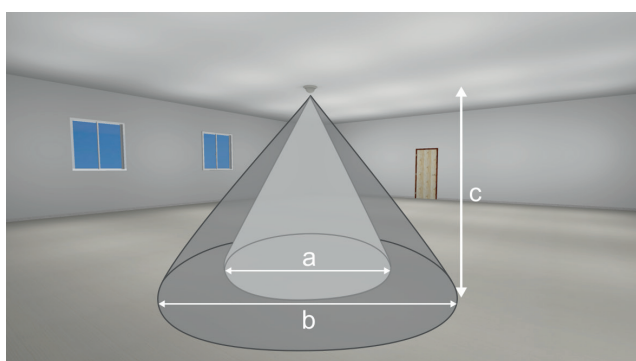
**Fig. 5** *Detection area vs. sensitivity - SBQP360L24...*



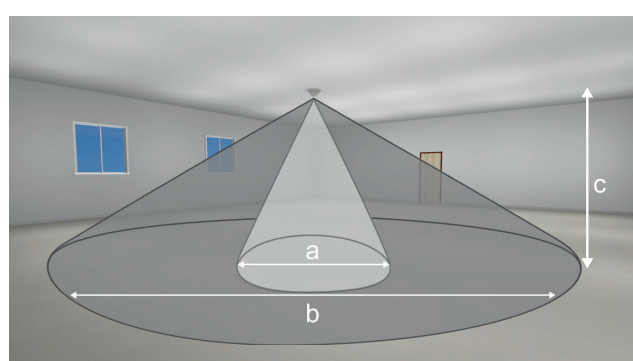**Fig. 6** *Detection area - SHQP360L7...*



**Fig. 7** *Detection area - SBQP360L24...*

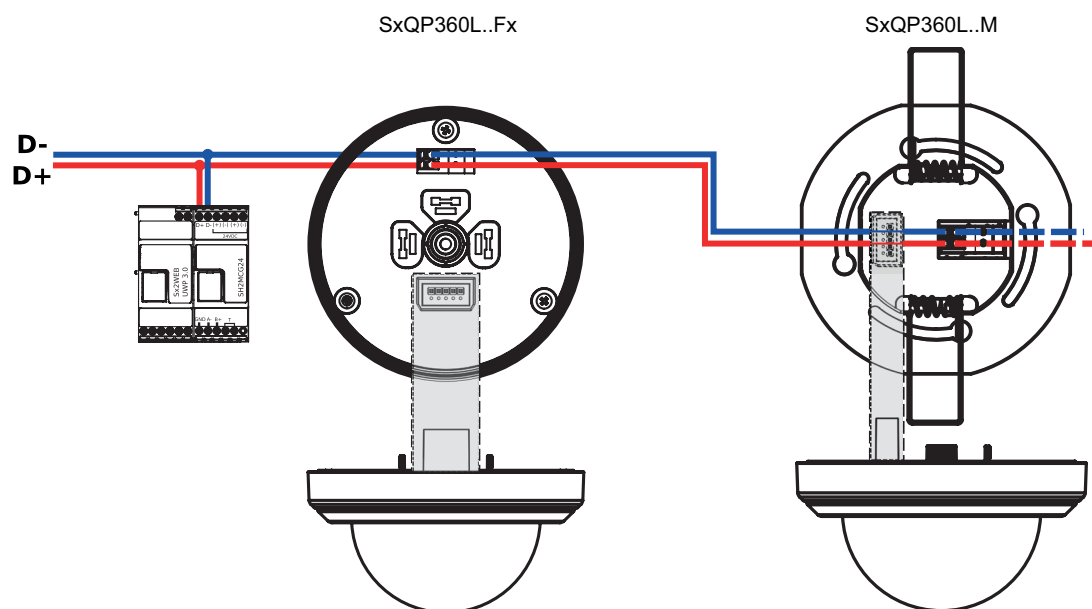| SHQP360L7... | | | SBQP360L24... | | |
|---|---|---|---|---|---|
| Height (c) | Presence (a) | Movement (b) | Height (c) | Presence (a) | Movement (b) |
| 2.4 m | 5 m | 12 m | 2 m | 5 m | 20 m |
| 2.7 m - 3 m | 5 m | 14 m | 2.4 m | 5 m | 22 m |
| | | | 2.7 m - 3 m | 5 m | 24 m |
| | | | 4 m | 5 m | 26 m |



**Fig. 8** *Three enabled sensors*



**Fig. 9** *Two enabled sensors*



**Fig. 10** *One enabled sensor*

SBQP360L24...: 3 pyroelectric sensors. They can be disabled via the configuration tool.

# Connection Diagrams

SxQP360L..Fx                          SxQP360L..M

**D-**
**D+**

# References

## ► Further reading

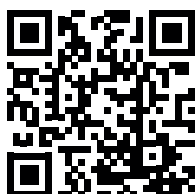| Information | Document | Where to find it |
|---|---|---|
| UWP3.0 installation guide | System manual | www.productselection.net/MANUALS/UK/uwp3.0_system.pdf |
| UWP3.0 software manual | UWP3.0 tool manual | www.productselection.net/MANUALS/UK/uwp3.0_tool.pdf |

## ► Order code

### ☞ S☐QP360L☐ ☐ ☐

Complete the code entering the corresponding option instead of ☐

| Code | Option | Description |
|---|---|---|
| S | - | Smart building |
| ☐ | B | Long distance |
| | H | Short distance |
| Q | - | Ceiling mounting |
| P | - | Pir sensor |
| 360 | | Detection angle |
| L | | Luxmeter |
| ☐ | 24M | 452 m$^2$ detection area |
| | 7M | 154 m$^2$ detection area |
| ☐ | F | Surface |
| ☐ | O | IP55 - available only with F (surface) version |

## ► CARLO GAVAZZI compatible components

| Purpose | Component name/code | Notes |
|---|---|---|
| Controller | Sx2WEB24 / UWP 3.0 | |
| Bus generator | SH2MCG24 /SBP2MCG324 | |