

# Sensor

Sensor to detect presence and/or the brightness

(Up to 18 m installation height/Circular or square/rectangular detection zone)

iN

## DESCRIPTION

The occupancy and light regulator is designed to control SMART dimming receivers (P8 R DALI N - P8 R2 DALI N). The occupancy and light regulator continuously controls the levels of their outputs based on the ambient light level. The device includes an internal movement sensor that can automatically turn lamps on or off based on the presence of people in the monitored area.

The internal light sensor is used to measure to light intensity and send the values with the use of wireless communication protocol for further processing to P8 TR IP Ethernet interface. The occupancy and light regulator can be also used as signal repeater to re-transmit RF signal (RETR function).

The sensor is designed to be used primarily in manufacturing halls (P8 LR HF) and warehouses (P8 LR HC).

### FUNCTION

The sensor consists of three functional elements: movement sensor (occupancy), light sensor (lx levels) and light regulator (daylight dimming), for some types of regulation modes it can be extended up to four independent regulators.

#### Movement sensor

The sensor can work as a movement sensor capturing the heat difference between ambient temperature and the temperature of moving people, animals or objects. The internal movement sensor only sends the signal about movement to connected receivers in case the ambient lighting level is lower than the Lighting level (lx) set at the movement sensor card at the section Parameters.

In the ON+OFF mode, the regulator transmits two different signals to the connected receiver. The first one is the turn ON signal, the second one is the OFF signal. The turned-ON state (closed state) lasts as long as the sensor senses movement plus for a period of time set as a Timer. The mode ON+OFF is suitable for applications, where the sensor controls just one receiver. In Only ON mode the sensor transmits only the ON signal and the Timer is set at the connected receivers. The Only ON mode is suitable for applications with more sensors which control one receiver. The connecting link between the sensor and the receiver must be set as TIMER. To optimize the frequency of transmission of the information about movement the minimum transmission period (Minimal Tx period) has to be set. If needed the sensor sensitivity can be adjusted. The movement sensor functions can be also set by other SMART transmitters.

#### Light sensor

The value of light intensity measured by light sensor is used by movement sensor and by light regulator. It is also possible to transmit this value for further use to other SMART devices. The daylight sensor is located under the light guide next to the lens of the movement sensor.

#### Light regulator

Light regulator functions in several modes, which can be set and controlled by the internal movement sensor and/or by other SMART transmitters.

During the feedback daylight regulation, the sensor compares the actual light value measured at the lens of the sensor with the wanted light value which was measured at the lens during the commissioning and which corresponds to the required lx level at working desk. If the two values differ more than the set hysteresis level, sensor sends the output control signal to adjust the lights accordingly. The comparison continues in the preset time steps until the measured and wanted light values are equal. The feedback daylight regulation can only be set for regulator no.1. For some applications the curve daylight regulation is a more favorable option. The curve daylight regulation uses the conversion curve which describes the relation between direct daylight level at the lens of the daylight sensor and the level of its output control signal. The sensor provides the possibility to set up 8 conversion curves which can control up to 4 groups of lights on two different light levels (Normal and Low). The sensor used as a light sensor for the curve daylight regulation has to be installed in places without influence of the lighting fixtures. During the daylight regulation the output control signal can be set also at a fixed level. Each of the 4 output control signals (Normal regulation) provide a possibility to use the offset function i.e. to use the second (offset) output control signal level adjusted by a fixed percentage value, e.g. for independent control of the series of lights in darker or lighter areas. For each of the output control signals it is possible to set the state for situations power is ON and power is ON after a power failure. The SMART transmitters can control and set some of the special functions of the sensor.

Fig. 1a

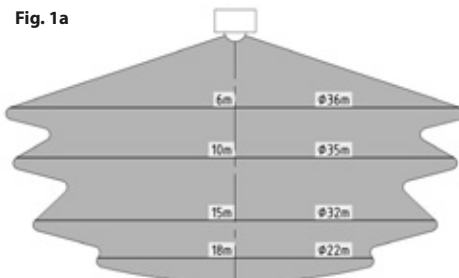


Fig. 1b

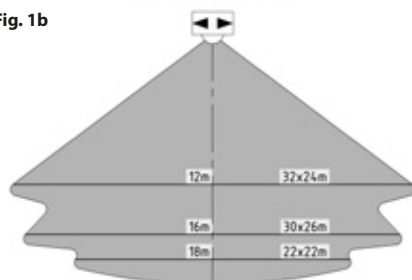


Fig. 2a

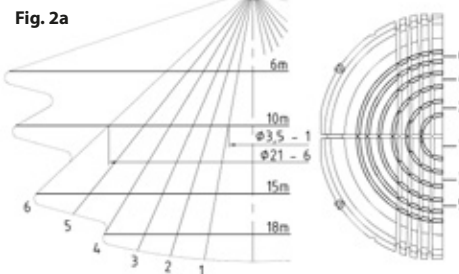
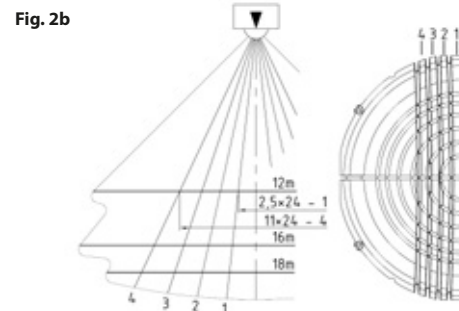


Fig. 2b



## INSTALLATION

The sensor is suitable for non-stop operation and for connection to the fixed installation which must comply with the relevant standards and regulations. The device must be connected to the mains only by a specialized technician with appropriate electrical qualification. Turn off the mains voltage supply before initiating installation work!

### Connecting and installation

Place the sensor so that the monitored area covers the area of supposed movement (e.g. alley between the stands). The center of the monitored area is also the spot where the light intensity is measured. The shape of the monitored area for P8 LR HF approximates the shape of the circle (Fig. 1a) and the range is independent of the direction of movement. The monitored area for the P8 LR HC approximates the rectangle (Fig. 1b), and for the optimal movement detection in the corridors between the shelves it is necessary to install the device in way that the arrows on the sensor housing (Fig. 1b) match the direction of corridor. The adjustment of the monitoring area is done by an easy to cut blind covers Fig. 2a for P8 LR HF and Fig. 2b for P8 LR HC.

The sensor is after connecting to the power supply fixed on the defined spot at the defined mounting height so that the size of the monitored area of the sensor matches the area on the ground. For P8 LR HC, it is important to make sure that the direction of movement of people in the corridor corresponds to the arrows placed on the sensor housing.

Note:

Fig. 3

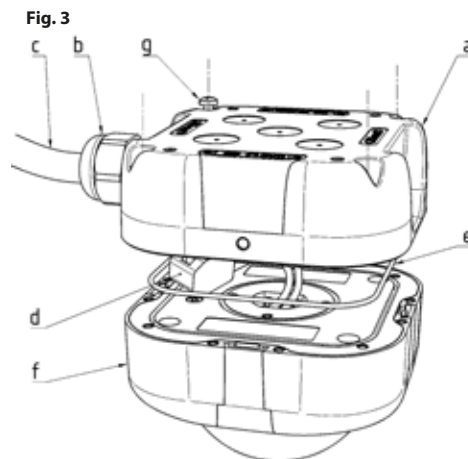


Fig. 4a

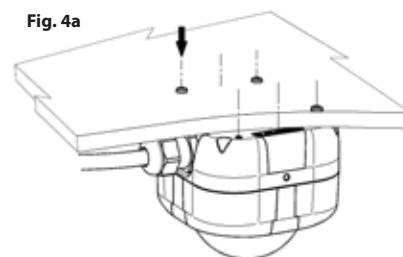


Fig. 4b

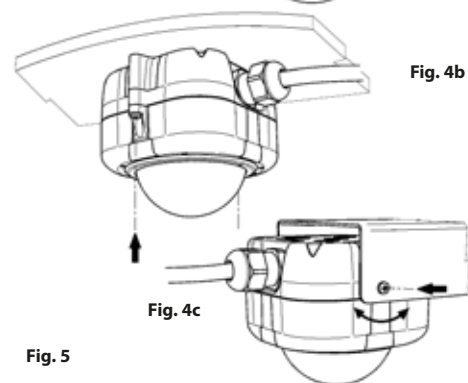
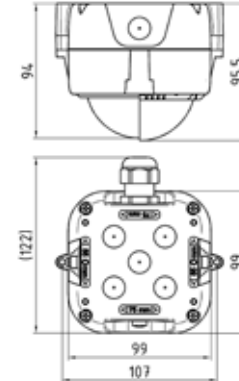


Fig. 5



In case more sensors are used to cover large areas, it is necessary to link them together in the SMART Assistant commissioning software using the Movement function or if required using one of the functions which control directly the light regulator. The mounting method (Fig. 3): insert the power supply cable through the supplied grommet (b) and screw it into sensor housing (a). Use the supplied terminals (d) to connect the corresponding pairs of wires L and N from the power

supply cable and from the sensor. Insert the supplied O-ring (e) into the slot on the back side of the sensor body (f) and close sensor housing (a), screw the sensor body (f) with four screws (g) and after that tighten the grommet.

The assembled sensor can be mounted on a ceiling or other suitable surface in several ways:

- Screwed through the ceiling plate into the pre-pressed holes on the sensor housing with 4mm plastic screws (Fig. 4a). The depth of screwing into the box is max. 12 mm.

- Screwed on the ceiling plate using covers with holes. These accessory covers have to be replaced before assembling the sensor by two caps attached to the sensor body and two caps attached to sensor housing. By twin screws of 4mm and of suitable length, the sensor is screwed to the ceiling (Fig. 4b). The length of the hole for the screws in the covers is 37 mm.

- Mounted with the use of the U-shape holder with flexible fixation points (not supplied). Use the two ø4 mm plastic screws on the sensor sides to achieve a desired tilt of the sensor (Fig. 4c). The depth of screwing into the box is max. 8 mm.

Note:

Do not install the sensor in the vicinity of any disturbing source like lights or heating elements. Unless the device is used as a light sensor in the daylight curve regulation do not install it in place facing the direct sunshine. The monitoring area is changing according to the installation height of sensor.

COMMISSIONING

sensor is designed for commissioning using software SMART Assistant and the P8 TR USB transmitter.

Modes of light regulator:

DIMM

Output control signals of the sensor are set on the wanted value independently from the value of ambient light. The change of output control signal value is done according to the preset rise and decay time.

NORMAL

Regulation is on and the set Wanted light value Normal is used.

LOW

Regulation is on and the set Wanted light value Low is used.

OFF

Regulation is off. The values of the output signals are zero (lights are off).

AUTO

Regulation is on and both Wanted light values (Normal and Low) are used. Modes DIMM, NORMAL and LOW are active for the duration of the three independent timers. After timers are expired the mode OFF is activated. Timers can be changed by internal movement sensor and/or by any connected SMART transmitter.

Modes of built-in movement sensor:

MOVEMENT

Command sent by a SMART transmitter simulates movement and activates the internal movement sensor.

In case the ambient light intensity is lower than the set value (Lighting) at the movement sensor (Movement sensor/Parameters), the sensor sends the command to the connected SMART receiver and the light is on for the set period of time (Timer). It is possible to ignore the Lighting level so the lights will always be switched on when the button is pressed. This function can be used in large corridors where the transmitter is placed outside the range of the monitored area of the movement sensor.

OFF PIR

Command sent by a SMART transmitter to cancel the current mode and running Timer of the movement sensor. It is also possible to set time interval when the movement sensor shall be non-active (Forced off time) to prevent re-activation of movement sensor when leaving the monitored area.

TIMER

Command sent by a SMART transmitter to activate the internal movement sensor and to set a new Timer. By selecting "Off when button hold" option it is also possible by holding (long press for more than 0.5 s) to switch off the Timer and also to set the time when the movement sensor is non-active (Forced off time). This mode is automatically terminated after the expiry of the Timer. Any new movement detected by internal movement sensor doesn't have influence on the Timer until the remaining time is lower than the Timer set at the internal movement sensor. Any movement sensed after that condition is met results in the refresh of the Timer set at the internal movement sensor.

TIMER + OFF PIR

Short press of the SMART transmitter button activates the function Timer. Long press (Hold) of the SMART transmitter button activates OFF function. Possibility to set the Forced off time.

ADD TIMER + OFF PIR

Short press of the SMART transmitter button activates the function Timer. It is possible to refresh the Timer up to max. 4 x times by short press of the button. Long press (Hold) of the SMART transmitter button activates OFF function. Possibility to set the Forced off time.

By default, the sensor is set to time-limited search i.e. that when the sensor is connected to the mains it is possible to identify it in the commissioning software SMART Assistant

within the first five minutes. This feature can be changed at the Setup card at the Visibility mode settings to unlimited visibility or hide it completely and access the device only from the commissioning file. The actual Visibility settings are indicated by built in LEDs: Three short flashes of green and red LEDs indicate unlimited search, one short flash indicates time-limited search, no flash indicates searching is disabled.

Note:

For an easy identification of installed sensor it is possible to use the Device identification (at the State and Control card). The red/green flashing LEDs are used as identification signal. In the factory setting the sensor has all transmission functions OFF which is indicated by green flashing of the built-in LEDs approximately once a minute.

| Technical data                       | P8 LR HF, P8 LR HC          |
|--------------------------------------|-----------------------------|
| Power supply:                        | 230 V ±10 % 50 Hz           |
| Frequency:                           | 868 MHz                     |
| Range:                               | 150 m in open space         |
| RF power:                            | 10dBm                       |
| Number of codes                      | 2 <sup>24</sup>             |
| Number of codes in the device memory | 32                          |
| Operating temperature:               | -20 to + 55 °C              |
| Terminal blocks:                     | WAGO 222-412                |
| max. 2,5 mm2                         | 868 MHz                     |
| IP protection:                       | IP 67 according to EN 60529 |
| Dimensions:                          | according to Fig. 5         |
| Codes in memory:                     | max. 4                      |

It is forbidden to do any technical modifications on the device!