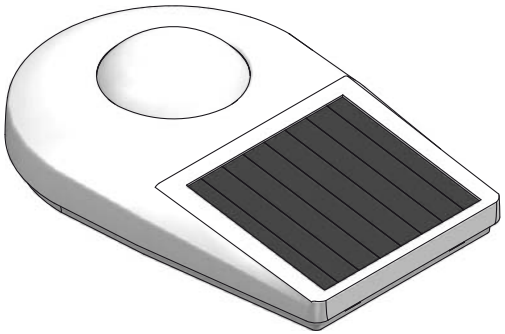
SERVODAN

Minilux Sensor PIR 360°
Wireless / Solar
41-580



enocean®

Advarsel: Indbygning og montering af elektriske apparater må kun foretages af aut. elinstallatør.
Ved fejl eller driftforstyrelser kontakt den aut. elinstallatør.
! Ret til ændringer forbeholdes !

Warning: Installation and assembly of electrical equipment must be carried out by qualified electricians.
Contact a qualified electrician in the event of fault or breakdown.
! Reserving the right to make changes !

Achtung: Einbau und Montage elektrischer Geräte dürfen nur durch Elektrofachkräfte erfolgen.
Wenden Sie sich bei Störungen bzw. Ausfall an einen Elektrofachkraft.
! Änderungen vorbehalten !

Avertissement: L'installation et le montage d'appareils électriques doivent exclusivement être exécutés par un électricien agréé.
En cas de défaut ou de perturbation du fonctionnement, contacter un installateur électricien agréé.
! Sous réserve de modifications !

41Y580_03_R2_081209

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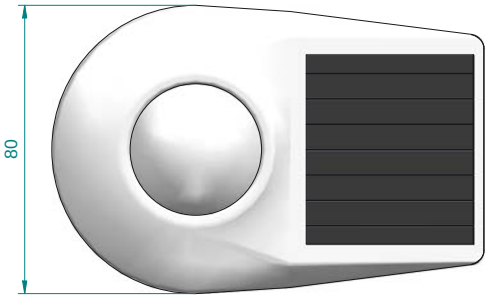


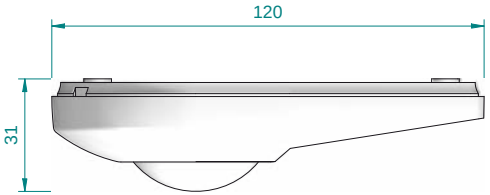


Fig. 1

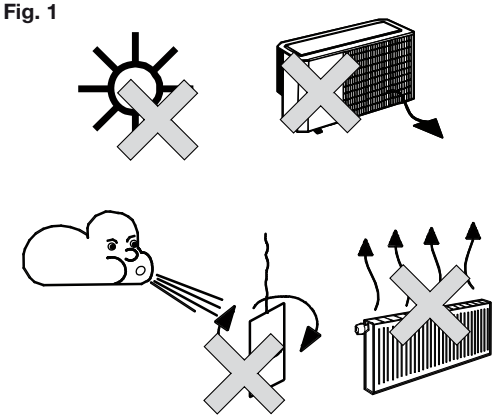


Fig.: 2

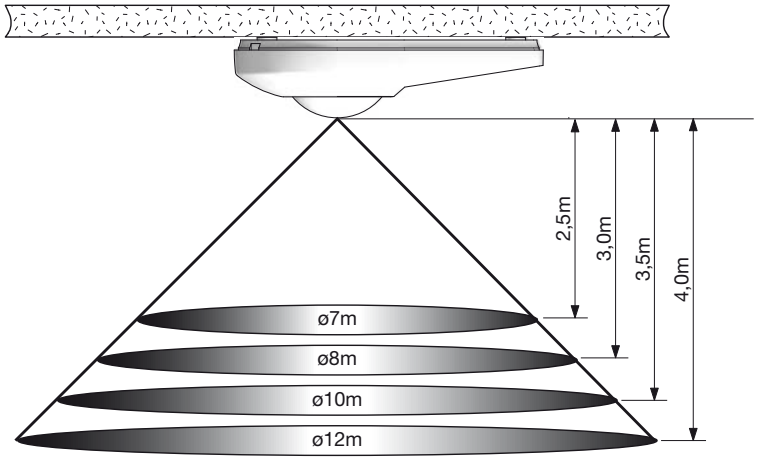


Fig. 3

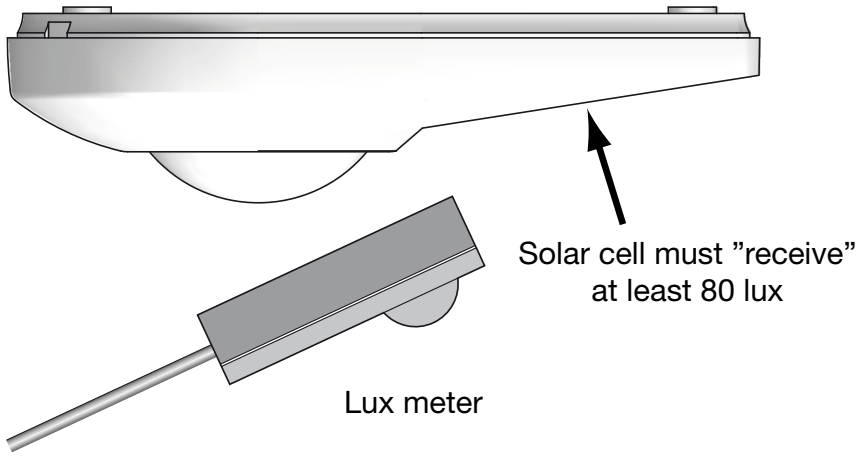


Fig. 4

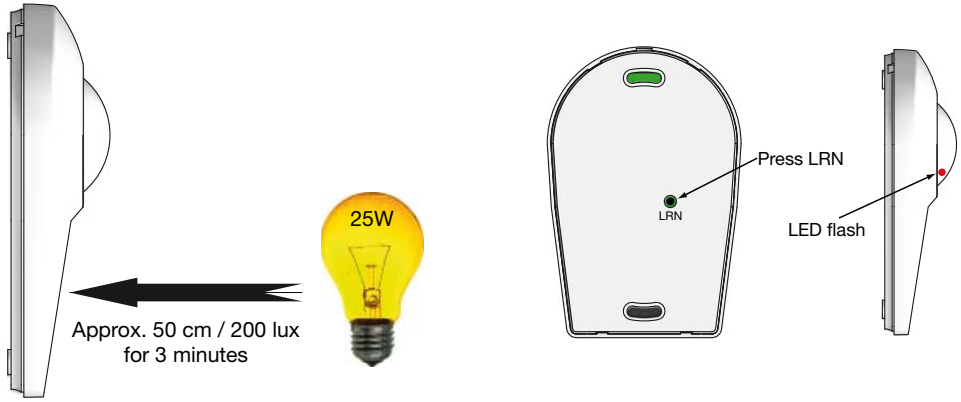
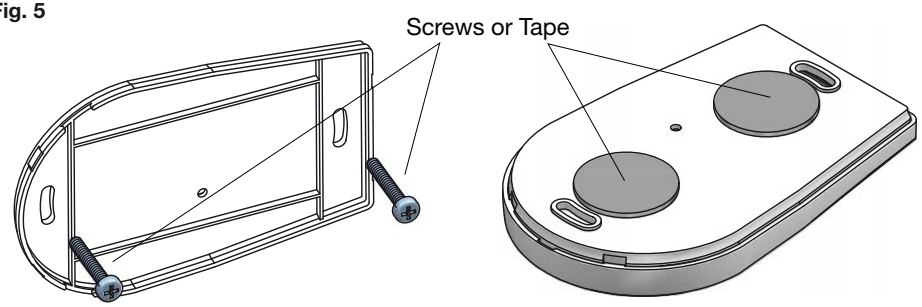


Fig. 5



Mounting with screws is recommended

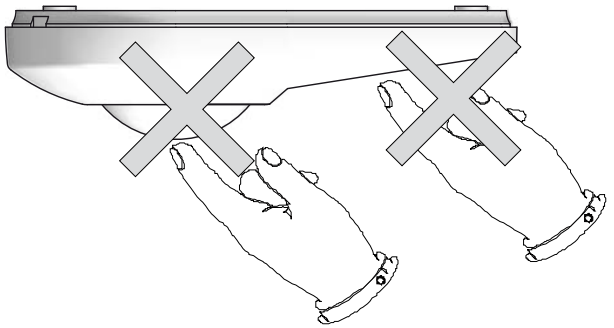


Fig. 6

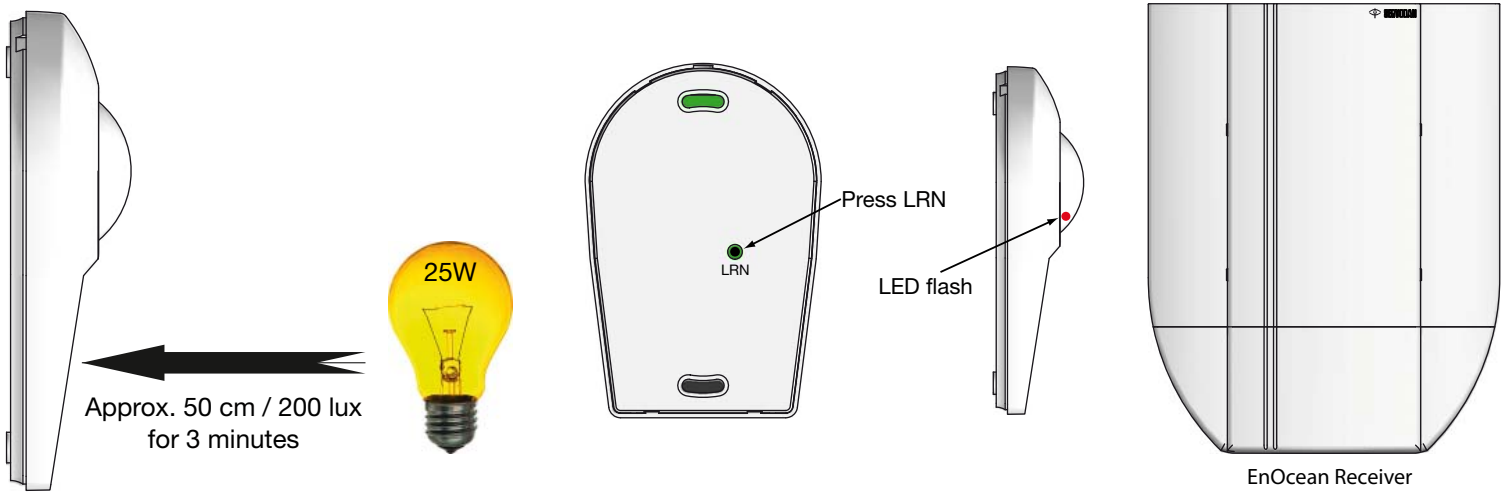
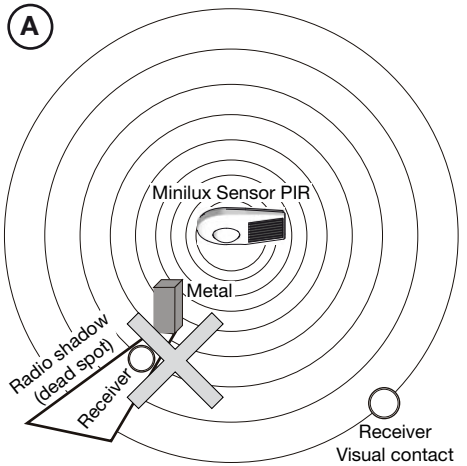
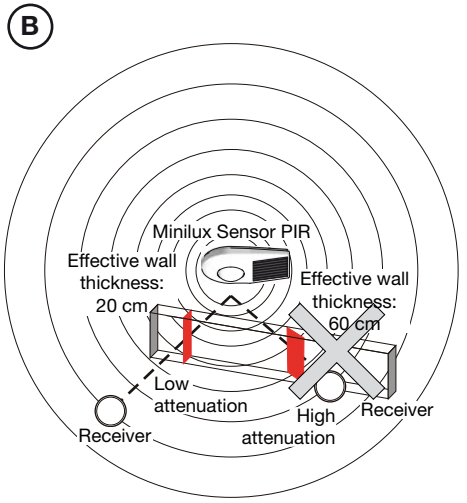


Fig. 7





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Minilux 360° PIR Sensor - Wireless/Solar 41-580

Fitting and operating instructions

Application

The Minilux Wireless/Solar 41-580 360° PIR sensor is a motion sensor for fitting to a ceiling, and is intended for use as a sensor unit in Servodan's wireless concept. The sensor, which acts as a transmitter, will combine with a receiver of type 70-100 or a Comlux 73-369 Interface to make use of the benefits of wireless technology. The sensor is powered via a solar cell, and thus requires no batteries for operation, allowing a perfect, simple fitting. Areas which can benefit from the use of this wireless and battery-free PIR sensor would be:

- Zero-energy solutions for office environments, among other places.
- New architectonic options for correct location.
- When renovating, or carrying out other room conversions.
- Pedestrian areas.
- Open premises, glass areas or places where cabling is not possible.

Function

The Solar 41-580 PIR sensor will, after completing a learning procedure, send wireless information about the presence of people in the coverage area. A suitable receiver, for example the EnOcean receiver or Comlux Interface, will maintain the lighting on the basis of the RF information transmitted. If a wireless and battery-free model 76-922 operating button is activated, the lighting will switch on, and provided the Solar PIR sensor receives more than 80 lx, within five minutes it will be ready to maintain the lighting in the room. If the room becomes empty, the PIR will ensure that the lighting is switched off after the set cut-off time. The light must always be turned on via the switch.

Installation

Location:

As the Solar PIR sensor is a wireless sensor, any location can be chosen without causing major problems. However, there are two important factors to consider: one is the coverage area, while the other is the minimum lux value that the solar cell needs to generate energy. Avoid locations close to "heat sources" such as cookers, electric radiators, ventilation systems or moveable parts such as mobiles etc. The solar cell must not be exposed to direct sunlight. **Fig. 1.**

Coverage area:

The PIR sensor is for fitting to a ceiling at a recommended height of between 2 and 4 metres. When fitted at a height of 2.5 metres, the sensor will cover a floor area with a diameter of 7 metres and provide full 360° coverage for people moving. The sensor's lens has over 400 fields, symmetrically distributed over the coverage area for optimum detection. **Fig. 2.**

Energy for the solar cell:

As the PIR sensor is solar driven (zero-energy), it is important that a minimum light energy of 80 lux should reach the solar cell from the switched on light source. This minimum generated "light energy" ensures that the sensor is able to start up and be ready to transmit RF information within 5 minutes. **Fig. 3.**

Test function:

A quick check of the function would be to illuminate the PIR sensor's solar cell at, for example, 200 lx (a 25W incandescent light bulb, distance approx. 50 cm) for approx. 3 minutes.
If the LRN button is then activated, it will be possible to see a red LED flash behind the PIR lens, which indicates that an RF signal is being transmitted and that the sensor is therefore functioning. **Fig. 4.**

Fitting:

Remove and secure the base plate of the sensor using the two screws provided. Alternatively, use double adhesive tape on smooth surfaces such as glass or similar suitable surface etc. **Fig. 5.**
Avoid applying touch or pressure to the solar cell and PIR lens as this can affect the function of the PIR sensor.

Settings

Learn mode:

This wireless system requires the transmitter/receiver to exchange data between them. For this reason, a Learn mode function has to be completed.
Connect the receiver to the power supply and place it in LRN mode. If in doubt, refer to the instructions for the receiver. Provide constant illumination to the PIR sensor's solar cell, for example 200 lx (25 W incandescent light bulb, distance approx. 50 cm) and after 3 minutes it will be ready.
Activate the sensor's LRN button and the receiver will visually demonstrate, via an LED, that the sensor has been accepted by the receiver. **Fig. 6.**

In a corresponding way, the wireless operating button is also learned to the receiver, though this is done simply by activating the operating button itself while the receiver is in Learn mode.
As there are various function and learning procedures for different receivers, refer to the appropriate instructions for a description of the procedure.

Troubleshooting

Problem:

The lighting does not come on when the wireless switch is activated.

Possible cause:

1. The wireless switch has not been learned by the receiver. Repeat the LRN procedure for the switch to the receiver.
2. The program setup in the Comlux system is not correct. Check the software (applies only to the Comlux system).
3. The switch must not be fitted to a metal surface as this reduces the strength of the RF signal.
4. The RF signal is being affected by metal reinforcements in buildings or walls, or for example by metal cabinets.
5. See also "RF wireless information".

Problem:

The lighting switches off at inappropriate times.

Possible cause:

1. Check the installation height and coverage area of the PIR sensor (free line of sight to the sensor in the coverage area) in accordance with **Fig. 2.**
2. Extend the cut-off time of the receivers, where applicable.
3. The program setup in the Comlux system is not correct. Check the software (applies only to the Comlux system).
4. Check that the lighting conditions around the PIR sensor exceed 80 lux, measured using a LUX meter in accordance with **Fig. 3.**
5. Illuminate the PIR sensor, for example at 200 lx for at least 3 minutes (25 W incandescent light bulb, distance approx. 50 cm), activate the LRN button and confirm that the red LED is giving short flashes. **Fig. 4.**
6. Repeat the LRN procedure for the PIR sensor to the receiver. **Fig. 6.**
7. The PIR sensor has been fitted to a metal surface, which reduces the strength of the RF signal.
8. The RF signal is being affected by metal reinforcements in buildings or walls, or for example by metal cabinets.
9. See also "RF wireless information".

Maintenance

No significant maintenance is required, apart from cleaning the solar cell and lens using a soft, dry cloth. Contact a qualified electrician in the event of a fault or breakdown.

RF wireless information.

The sensor has an integrated model STM110 RF transmitter (EnOcean). The frequency of this RF signal is 868 MHz and, with a transmission output of less than 10 mW, an RF environment is guaranteed that is typically at least 100 times less than that of conventional wireless systems.

RF signal distance/penetration:

As an RF signal involves electromagnetic oscillations/ waves (of a certain field strength), these are suppressed on the way to the receiver. The RF signal's field strength weakens proportionally by the square of the distance between transmitter and receiver. However, this natural reduction of the field strength as a function of distance is not the only suppression that affects the distance. Metal parts, e.g. in connection with reinforcements to wall and ceiling elements, metal foil in vapour barriers or UV/colour filters through metal foil will all reflect, distort or suppress the RF signal on its way to the receiver. **Fig. 7A.**

Below is a list of penetration rates for commonly used building materials:

Materials	*Penetration*
Wood, plaster and glass without surface foil	90 to 100%
Brick, MDF and chipboard panels	65 to 95%
Concrete reinforcement	10 to 80%
Metal, aluminium panels, etc.	0 to 10%

In practice this means that the materials in the rooms have a decisive influence on the distance between transmitter and receiver. As a guideline the following distances can be used:

Visible distance between transmitter and receiver
Typically 30 m in walkways, up to 100 m in large rooms, e.g. sports halls.

Plaster or wooden walls
Typically 30 m distance through max. 5 walls.

Brick/aerated concrete walls
Typically 20 m distance through max. 3 walls.

Steel-reinforced walls/ceilings (floor structures)
Typically 10 m distance through max. 1 ceiling/wall.

The angle at which the RF signal hits the wall/ceiling also has an effect on the field strength. The ideal angle is a right angle. **Fig. 7B.**

The RF signal is affected by other high frequency signals:
Devices that also operate with high-frequency signals, such as computers, audio/video appliances, mobile telephones, electronic transformers, connection units, frequency converters and other RF transmitting/receiving equipment are considered to be a source of noise for a wireless RF signal. We therefore recommend a minimum distance to such devices of 0.5 metres.

RF transmitter rate of recurrence:
The Solar PIR sensor only sends an RF signal if there is sufficient light energy to the solar cell and the room is in use. The PIR sensor will then transmit an RF signal as a function of an event-controlled process, but also in a fixed time-controlled process.

Measurement principle and telegram delivery:
a) Delivery of an event-controlled process can take place by activating the button labelled “LRN”, which causes the internal microprocessor to start, the status of the PIR sensor to be registered and an RF signal to be transmitted immediately to the receiver. However, this is only the case if the sensor is receiving sufficient light energy via the solar cell.

b) Delivery of a time-controlled process. At a suitable interval of 10 seconds (T_wake up), the microprocessor is started and the status of the PIR sensor is registered. If there is no change, for every 100 events (event control) an RF telegram will be transmitted to the receiver approximately every 1000 seconds. This status is defined when the PIR sensor is continually activated and there is sufficient light energy via the solar cell.

Default set up of STM110:

T_wake up: 10, T_event: 10
T_send = 10 wake up x 10 event = 100 sec.

EnOcean Profile:
Profile 0b000111 – Occupancy Sensor
Type 0b0000001 – Occupancy Sensor 1
Manufacturer ID 0b00000000011

DATA BYTES
DB_1:

PIR off	0 to 127
PIR on	128 to 255

DB_0.BIT_3:

Learn button	0 = Teach-in telegram 1 = Data telegram

Technical data

Input:

Power supply:	Solar cell, zero-energy.
Light conditions for function	more than 80 lx measured by Lux meter. guideline – 25 W incandescent light bulb distance approx. 50 cm
Power consumption	<10µW
Protection	IP20
Temperature range	+5°C to +50°C indoor use

Performance:

Installation height	2.5 to 4 metres
Range	360°, ø7-12 m

Signal type/range:

RF signal EnOcean technology	868 MHz, <10 mW
RF range	100 metres in open space/line of vision 30 metres in buildings, see RF wireless information

Approval:

CE according to..... R&TTE 1999/5/EC
ETSI EN 301 489-1: 2005-09
ETSI EN 301 489-3: 2002-08 (SRD class 2)
ETSI EN 300 220-3: 2000-09