

# PRESENCE DETECTOR PD-2200 and PD-2400

## Installation instructions Art. No. 13140 / 13144

**This manual is not to be used for** projection matters.

A Warning is given for installation of this detector without proper technique knowledge.

Basic knowledge before projection is to be collected from the handbook "Presence Detection" (Art. No. 35100 )

### Introduction



The detector is a passive infrared detector for presence detection. It has a very sensitive dual-element, low-noise pyroelectric detector. Electronics and software in microprocessor is specially constructed for presence detection.

**PD-2200** requires a 10–16 VDC supply.

**PD-2400** requires a 24 VDC/VAC supply.

**NOTE!** PD-2400 is primarily intended for presence detection in systems for ventilation control where 24 VDC is used.

*PD-2400 must not be used in systems for lighting control, since other components of such a system (logic modules, level selectors, etc) are designed for 12 VDC operation and cannot therefore be easily combined.*

*In systems for lighting control by presence detection, the PD-2200 IR detector should be used, as this is designed for 12 VDC operation!*

Software will analyse the signal from the pyroelectric detector and measure noise level and signal power and sum of pulses. Counting the pulses is a slower method that detects presence in a locality with low activity with week signals as a result.

With a switch you can alter the signal process to be adapted to premises with high or low activity.

A build in photocell can be used for blocking the switching light on function when there is enough daylight.

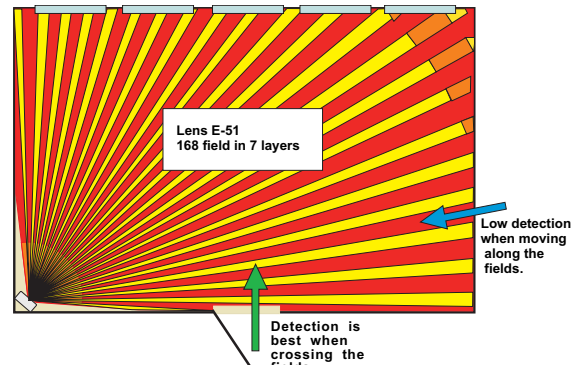
The lens in the detector, collects heat radiation from different fields, in to the sensor element. There are several different lenses for different type of premises (office, corridor, and culvert a.s.o)

When a person passes cross over one field, there will be a strong signal in the sensor element. When one moves

along the field (away from or toward the detector) in its direction, will also a signal occur, but weaker.

The detector should therefor be placed so one passes across (90°) through the lens field. Corner placing of the detector is more or less always the most optimal.

(See handbook for "Presence Detection" for placing advice)



### 2. Connection – Adjustment.

Opening of the front.

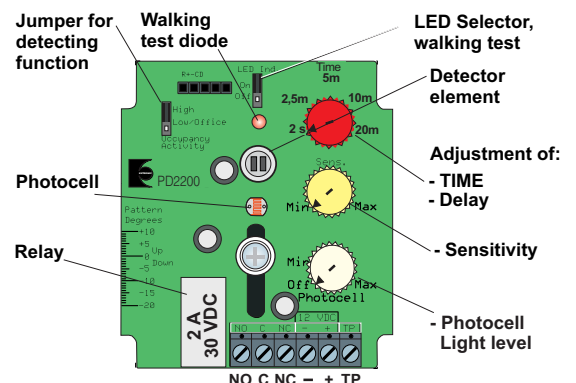
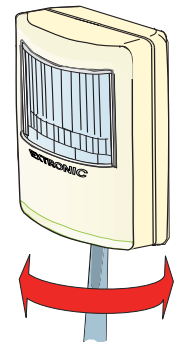
The cover opens in the middle at the top or underneath with a screwdriver that turns.

See picture!

### Terminals

**Relay;** NO (Normal Open), C (Closed), C (Common), NC (Normal closed).

Change over contacts. At detecting C and NO close. After chosen time laps, contact C and NO in relay open.



### Voltage supply; + -

After connection it takes up to two minutes until the detector is stabilized and works correct.

**PD-2200:** Detector requires 10–16 VDC. A suitable power supply is the EXE-2000.

**PD-2400:** Detector requires 15-26 VAC/18-37 VDC

**TP;** Test-Point 0-5 VDC

Measure the voltage with a digital multimeter connected between - and TP on PD-2200, or between the two metering points marked TP on PD-2400. This measures the signal strength.

If a digital multimeter is connected and voltage between - and TP is measured, is that a measure of signal strength.

The sensitivity adjustment does not effect this signal output.

- At low noise level you can await a voltage level not over 0.3 VDC
- At strong detection, the voltage level is at close 5V.
- At maximum sensitivity lies the trigger level at 0.6 V

### Jumper

**“LED”;** If jumper is placed at “ON” the LED will light at detection. When placed in “OFF” LED will not light at detection. LED should be disabled after adjustments to prevent and minimise sabotage.

### “Occupancy Activity” (different activity)

- “Low/Office” is used in premises where one is sitting still i.e. office, storage room and libraries. Sensitivity increases when relay is activated.
- “Activity High” is used where people is visiting the premises for a short time, in other word in well-defined passages.

### Potentiometers

**Time;** time delay until relay drops after last detection. Time can be set from 2 sec. to 20 minutes.

**Sensitivity;** The potentiometer is used to set the sensitivity for direct signal strength, pulse count and in Activity low/office mode. The detector also adjusts its own sensitivity to suit the existing noise level.

**Photocell;** the photocell will block the light when its darker than chosen level. When relay is activated the photocell is disabled.

When photocell is turned down to min. photocell is likewise disabled. When potentiometer is turned towards max. Detector LED will start indicate photocell status. LED flash faster when blocking and slow when not blocking.

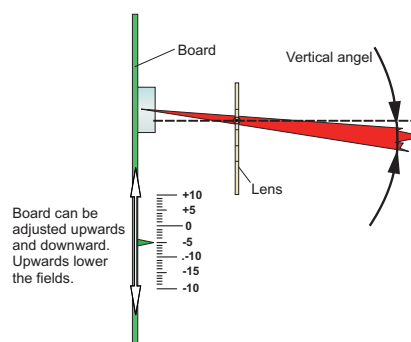
LED will go back to normal function 30 sec. after adjustment is finished.

When Logic Module's are used, the photocell shall be disabled(off).

### Vertical adjustment

Adjusting the vertical detecting fields by pushing the board upwards and downwards. The scale gives angel between upper field and the given horizontal line. Board being pushed upward detecting fields will go lower vice versa.

Board vertical adjustment is factory set for - 5°.

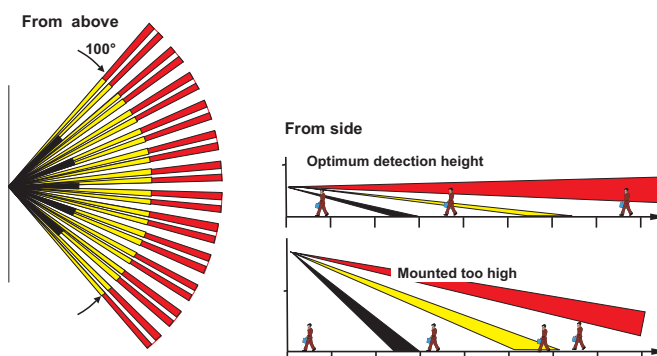


### 3. Choice of lens

There are several different lenses for PD2200 that can be used for different functions. Long distance lenses for corridors up to 80 meter (lens 41 and 43). Lenses with many narrow fields for use i.e classrooms (lens 51).

All lenses are described in handbook for “Presence Detection”.

PD2200 are supplied as standard with lens no. 15. With 58 fields in 3 layers. Detection area is 40 x 40 meters and suitable to be placed in a corner.



## 4. Changing and adjusting a lens

### Changing lens

1. Press the locking device inside the cover lose.
2. Remove the clips from outside and remove the old lens.
3. Fit the new lens with the ribbed surface outwards and with the lens number in the top right hand-hand corner, as seen from the front.



### Adjusting the lens

With field indicator diode BL-1 you can "see" the sensing fields of the detector in the room. Especially recommended when long-range lenses are used.

Vertical angel is adjusted by moving the board upwards and downward.

Horizontal angel is adjusted by moving the lens right or left.

### Masking of lens element.

For limited detection area the lens can be masked. Self-adhesive aluminium folio tape of the same type used for window glass-break protections will block the sensitivity 100%.

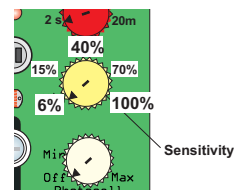
## 5. Signal analyse

PD2200 with microprocessor analysing the signals from the pyroelectric detector has algorithms that continuous counts single pulse, sum of pulse and noise level.

Single pulse is a method used for ex. entering into a premises. A fast method that activate when signal is strong enough.

Sum of pulse a slower method of measurement that takes longer detecting a human. Used i.e. when low activity, as for sitting people and signal does not reach level single pulse.

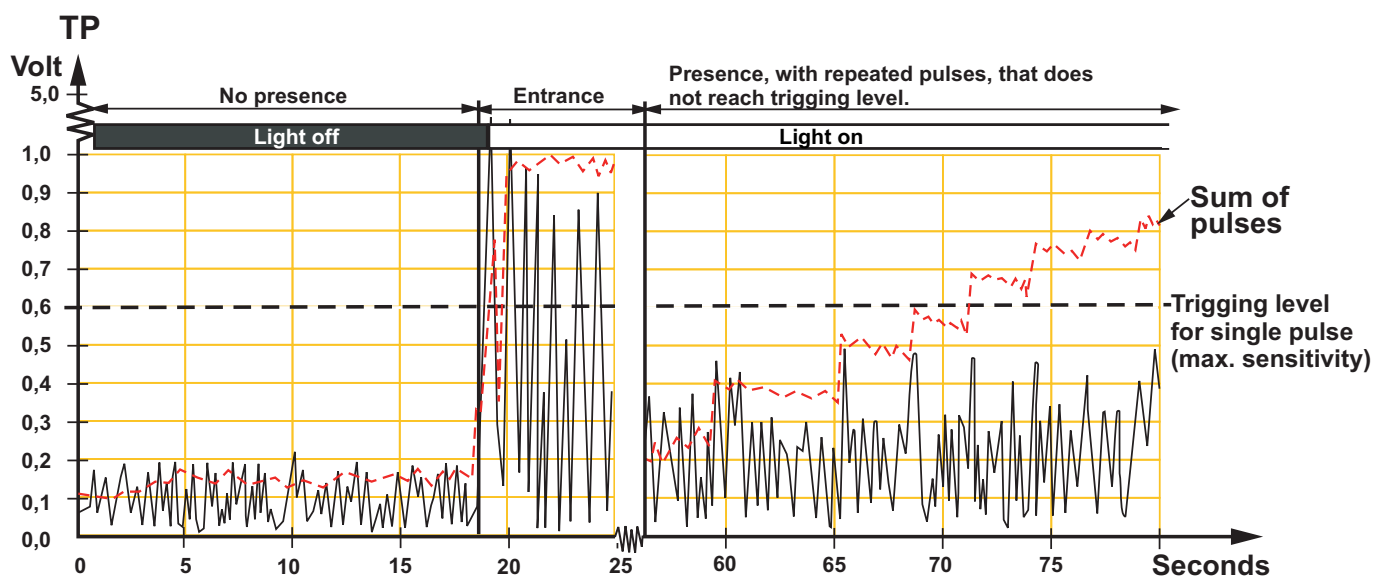
Level is chosen with potentiometer "Sensitivity"



PD2200 automatically adjust sensitivity after estimated noise level. A time laps of 1-2 minutes after movements detected by detector before the detector will increase sensitivity. Change of sensitivity with up to 20% from adjusted value.

With jumper "Activity High/Low-Office" adjustment of detector is possible according to locality.

In localities with part time low activity where detection is unclear the detector could let the light be switched on for a longer period.



## 6. Commissioning

### Checklist

Check the installation using the checklist below. If in doubt, refer to the manual "Energy-efficient detection technology", order no. 35100.

Always consider the following questions for each installation:

1. **Is the correct detector being used?**
2. **Is it placed in the correct corner?**
3. **Is it at the correct height?**
4. **Is the correct lens fitted?**
5. **Is the correct logic unit being used?**
6. **Is the power supply correctly rated for the detectors, relays and logic?**
7. **Do you have the necessary skills and tools to carry out final adjustment of the installation?**

You should also answer the following questions about the light sources:

1. **Is the correct type of light source being used?**
2. **Is the correct control method being used for the light source?**
3. **Is the correct type of ballast being used?**

If you can answer yes to all the questions in the checklist then you can continue with commissioning.

- Check the voltage and polarity, and connect the power supply.
- Set the "Photocell" to "Off". If the photocell is not to be used it should always be turned off. See the "Photocell" section if the photocell is to be used.
- Turn down the delay time to "Min" using the "Time" potentiometer.
- Move the jumper to the "Activity High" position.
- Carry out a run test in the entire area covered by presence detection.  
**Note!** *The lens must be fitted and the cover must be in place.* Adjust vertically and horizontally as required.

- After completing the run test and adjustment, set the time to the lowest possible. In the case of dynamic lighting control in a stairwell or corridors, for example, this should be 1–2 minutes. In other applications, such as a classroom or garage, the time should be set to 6–8 minutes or according to the light source manufacturer's recommendations.
- Set the jumper according to the level of activity in the premises.
- Disconnect the LED when adjustment is complete (see "Jumpers"), to reduce the risk of tampering.

## 7. Technical specification.

### Adjustment

Vertical: +10° to –20° calibrated scale  
Horizontal: Up to 30°

### Electrical

Voltage: 10-16 VDC  
Current: 25 mA at 13,8 VDC  
Start-up time: < 2 minutes  
Relay output: Changeover contacts  
2 A / 30 VDC,  
0,5 A // 60 VDC (resistive)

### LED

Test point: For background interference.  
Detector: Dual-elements, low-noise, pyroelectric detector

### Environment

Ambient temp.: 0° to + 50°C  
Storage temp.: - 20° to + 60°  
Dimensions: 102 x 70 x 50 mm  
Weight: 100 g  
Colour: White

## 8. Accessories

### Field indication diode BL-1

Used for adjusting detection area. Art. No. 13035.

For further information see handbook "Presence Detection"

### Protective Grille

For mounting in exposed premises as for indoor sports. There is also one model that can be used for mounting a detector in 45° with angel plate to a wall.

For further information see handbook "Presence Detection"

### Universal bracket

BR1, BR2, BR3 can be used when the detector cannot be mounted directly in the corner. With the bracket the detector can be moved out a short distance and still give maximum coverage. *Use with precaution.*

Contact Extronic for further advice and information when a bracket is used.

### Lens-library

See lens-library in handbook for a great number of changeable lenses.

### Handbook

Handbook "Presence Detection".

**The following accessories are only compatible with PD-2200 (12 VDC).**

### Logic modules

As for manually switched on lighting.

EX-11: Two channels i.e. one channel for main lighting and one for board lighting.

EX-13: Four + One channel i.e. in a divided Gym with two levels of lighting in each half and air-condition.

EX-22: Like EX-11 but guided by DSI-protocol and constant-lighting with compensation for lights from windows.

For further information see handbook "Presence Detection"

### Level control

**Level switches NV2 / NV2-DSI:** Are intended for use on HF fittings with 1-10 V low-level input, dimmable 1-100%, and for control by presence sensors. Using the level switch, one can switch between two preset lighting levels.

**Level switches NV2T / NV2T-DSI:** As NV2 / NV2-DSI but they also have a built-in timer for control of the supply voltage. Push-buttons, photocells etc. can also be connected.

### Acoustic detectors

Detector AD-500 / AD-600 has an input for PIR presence detector.

### Help detector

Detector AD-300, acoustic help detector that switches light on.

Detector AD-350, acoustic help detector that keeps light on.

### Rectifier EXE-2000 (13,65 VDC)

A Rectifier for mounting on DIN rail and suitable for NORM box.

It has current limitation / short-circuit proof, max. 1,5 A and suitable as power supply for PD2200.

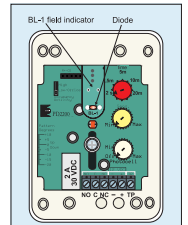
## 9. BL-1 field indicator

The BL-1 field indicator diode makes it easier to align the PD-2200. It allows you to "see" the detector's detection fields in the room, which makes it easier to aim the detector. In order to use the BL-1 field indicator.



### Mounting

First remove the LED jumper, then press BL-1 down over the three pins so that the small LED is in line with the centre of the detector element and facing forwards.



### Adjusting the detection area

When the detector is powered up the LED will come on and provide a point source of light at the focus of the lens system. Refit the front cover on the detector. BL-1 will now allow you to see each individual detection field when you look towards the detector from various distances and angles. When a lens segment lights up it means that you are looking at the corresponding detection field.

By moving back and forth at different distances you can determine what the detector "sees" and adjust the detection area precisely, then mask off those lens segments that "see" potential sources of interference.

Remove BL-1 after adjustment. Reset the LED switch to the required position and refit the front cover.

#### BL-1 field indication diode

BL-1 field indication diode temporarily mounted at focus of lens system

Dual-element detector

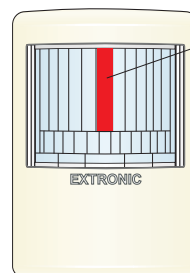
Circuit board in detector

Filter for visible light, usually silicon

Polythene Fresnel lens divided into small sub-lenses

The Fresnel lens focuses the BL-1 point light source through the sub-lenses so that each detection field can be seen when you look towards the detector.

Each sub-lens in the main lens lights up when the observer's eye is positioned in a detection field.



The field indication diode greatly simplifies optical adjustment in a long corridor.