

# Photoelectrics Through-beam, Relay Output, Battery Powered Type PD180CBT30Q/MU

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- Designed for industrial doors and gates
- ESPE type 2, Performance level C
- Range 15 m or 30 m
- Modulated, infrared light
- Supply voltage: 12 to 24 VAC/DC (receiver)
- Supply voltage: 2 x ER14505 3.6 VDC size AA Lithium batteries (emitter)
- SPST relay output
- SPST relay low battery
- LED for output indication
- Connection, terminal block
- Emitter test input
- CE (EN 12453, EN 12978) and UL325 approved



## Product Description

The PD180CBT30Q/MU sensor is developed specifically for the domestic and industrial door market. The sensor meets the regulations for industrial doors in Europe and North America. The robust polycarbonate housing allows flexible installation as the lenses are adjustable both in horizontal and vertical direction. The sensor is easy to use and no sensitivity adjustments are necessary. The aspherical lens design is superior to previous design of sensors with built-in parabolic reflectors that had corrosion and dust

problems.

Increased safety by build-in:

- Sensor test function; the emitter has a built-in test input designed to mute the emitter and thus evaluate the sensor function. Test function is to be activated by the door controller or the door function can be activated by a limit switch, magnet sensor or a safety edge profile.

The receiver works with a power-supply from 12 to 24 VAC/DC and the emitter is designed to use 2 x ER14505 3.6 VDC size AA Lithium batteries.

## Ordering Key

**PD180CBT30Q/MU**

|                      |       |
|----------------------|-------|
| Type                 | _____ |
| Housing style        | _____ |
| Housing size         | _____ |
| Housing material     | _____ |
| Battery operated     | _____ |
| Detection principle  | _____ |
| Sensing distance     | _____ |
| Output type          | _____ |
| Output configuration | _____ |
| Mute function        | _____ |

## Type Selection

| Housing size     | Range S <sub>n</sub> | Ordering no. Emitter | Ordering no. Receiver |
|------------------|----------------------|----------------------|-----------------------|
| 180 x 51 x 49 mm | 30 m                 | PD180CBT30MU         | PD180CBT30Q           |

## Specifications Emitter

|                                                               |                                                              |                                                            |                               |
|---------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------|-------------------------------|
| <b>Rated operating dist (S<sub>n</sub>)</b>                   | 15 m with jumper not activated<br>30 m with jumper activated | <b>Mute input</b><br>Normal operation<br>Mute              | > 6 KΩ<br>< 4 KΩ              |
| <b>Rated operational volt. (U<sub>e</sub>)</b>                | 2 x ER14505 3.6 VDC size AA<br>≥2700 mAh Lithium batteries   | <b>Light source</b>                                        | LED, 850 nm                   |
| <b>Battery lifetime</b><br>Jumper not active<br>Jumper active | 15m => 2.5 years<br>30m => 1.5 years                         | <b>Light spot size</b><br>@ 15 m setting<br>@ 30 m setting | 1.2 m @ 7.5 m<br>2.4 m @ 15 m |
| <b>Supply current</b><br>With Mute active (I <sub>o</sub> )   | Typ. 29 μA                                                   | <b>Light type</b>                                          | Infrared, modulated           |
| <b>Protection</b>                                             | Reverse polarity, transients                                 | <b>Optical angle</b>                                       | ± 4.1°                        |

## Specifications Receiver

|                                                |                                                                      |                                       |                                               |
|------------------------------------------------|----------------------------------------------------------------------|---------------------------------------|-----------------------------------------------|
| <b>Rated operating dist. (S<sub>n</sub>)</b>   | 15 or 30 m dependent on emitter settings                             | <b>Ambient light</b>                  |                                               |
| <b>Blind zone</b>                              | None                                                                 | Incandescent light @ 3000 ... 3200 °K | ≥ 100 000 lux (EN 60947-5-2)                  |
| <b>Temperature drift</b>                       | ≤ 0.4%/°C                                                            | Incandescent light 3200 °K            | ≥ 10 000 lux* (EN 61496-2)                    |
| <b>Hysteresis (H)</b>                          | 3 - 20%                                                              | Fluorescent light                     | ≥ 3 000 lux* (EN 61496-2)                     |
| <b>Rated operational volt. (U<sub>e</sub>)</b> | Supply class 2<br>12 to 24 VDC, -15% +10%<br>12 to 24 VAC, -15% +10% | Stroboscopic light                    | 0.05 J @ 200 Hz to 0.5 J @ 5 Hz* (EN 61496-2) |
| AC: 45 Hz - 65 Hz                              |                                                                      | Flashing beacon light                 | 3 to 5 J @ 0.5 to 2 Hz* (EN 61496-2)          |
| <b>Ripple (U<sub>rp</sub>)</b>                 | ≤ 10%                                                                | <b>Optical angle</b>                  | ± 4.7°                                        |
| <b>Output</b>                                  |                                                                      | <b>Protection</b>                     | Reverse polarity, transients                  |
| Contact ratings                                | AgPd-Au                                                              | <b>Operating frequency (f)</b>        | 25 Hz                                         |
| Resistive loads                                | 0.5 A/30 VAC                                                         | <b>Response time</b>                  | OFF-ON (t <sub>ON</sub> ) ≤ 20 ms             |
| AC 1                                           | 1 A/30 VDC                                                           | ON-OFF (t <sub>OFF</sub> )            | ≤ 20 ms                                       |
| DC 1                                           | ≥ 10 000 000 cycles                                                  | <b>Power ON delay (t<sub>v</sub>)</b> | ≤ 300 ms                                      |
| Mechanical life (typical)                      |                                                                      | <b>Indication function</b>            |                                               |
| Lifetime contacts (typical)                    |                                                                      | Power ON                              | LED, green                                    |
| AC 1                                           | 0.5 A/30 VAC 100 000                                                 | Output ON                             | LED, yellow                                   |
| DC 1                                           | 1 A/30 VDC 100 000                                                   |                                       |                                               |
| Minimum load power                             | 1 mW                                                                 |                                       |                                               |
| <b>No load supply current (I<sub>o</sub>)</b>  | ≤ 36 mA DC (relay ON)                                                |                                       |                                               |
| + Battery low alarm                            | ≤ 55 mA DC (both relays ON)                                          |                                       |                                               |

\* Failure to danger (worst case alignment)

## General Specifications

|                                 |                                           |                                                     |                                                                                      |
|---------------------------------|-------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Environment</b>              |                                           | <b>Weight</b>                                       |                                                                                      |
| Overvoltage category            | III (IEC 60664/EN 60947-1)                | Emitter                                             | 270 g                                                                                |
| Pollution degree                | 3 (IEC 60664/EN 60947-1)                  | Receiver                                            | 230 g                                                                                |
| Degree of protection            | IP 55 (IEC 60529; 60947-1)                | <b>UL-Approval</b>                                  | cURus UL325, CSA-C22.2 No.247                                                        |
| <b>Temperature</b>              |                                           | <b>CE-marking</b>                                   | Yes                                                                                  |
| Operating                       | -25° to +55°C (-13° to +131°F)            |                                                     | EN 12453, EN 12978,                                                                  |
| Storage                         | -25° to +80°C (-13° to +176°F)            |                                                     | EN 61496-1,                                                                          |
| <b>Vibration</b>                | 10 to 150 Hz, 0.5 mm/7.5 g (EN 60068-2-6) | General reference                                   | Type 2 ESPE                                                                          |
| <b>Drop test</b>                | 2 x 1 m & 100 x 0.5 m (IEC 60068-2-31)    | MTTFd related to combined product life time (Rx+Tx) | Sensor designed according to EN 60947-5-2                                            |
| <b>Lens adjustment</b>          |                                           |                                                     | 110 years @ 40°C (+104°F) (EN ISO 13849-1 (Parts count method, annex D.1), SN 29500) |
| Adjustable optics               | Horizontal 200°<br>Vertical ±30°          | ESPE architecture (Cat.)                            | 2 (EN ISO 13849-1)                                                                   |
| <b>Rated insulation voltage</b> | 50 VDC                                    | Performance level (PL.)                             | C (EN ISO 13849-1)                                                                   |
| <b>Housing material</b>         |                                           | PFHd                                                | 1.04 x 10 <sup>-6</sup> Errors per hour (EN ISO 13849-1)                             |
| Front                           | PC black                                  | Mission Time                                        | 20 years (EN ISO 13849-1)                                                            |
| Backpart                        | PC black                                  |                                                     |                                                                                      |
| <b>Connection</b>               |                                           |                                                     |                                                                                      |
| Emitter                         | 2 pole terminal block                     |                                                     |                                                                                      |
|                                 | Receiver 6 pole terminal block            |                                                     |                                                                                      |

## Operation Description

- The sensor shall be mounted with the draining hole facing down.
- The cable must be mounted pointing downwards to avoid water entering the sensor (See Dimensions).
- This product can only be used to detect direct interruption between Tx and Rx; it must not be reflected
- The sensors must be mounted on a hard vibration-free surface
- In order to obtain an "ESPE type 2" safety device, the sensors must be connected to a control system fitted with "Photo test" or similar sensor verification function.

## Operation Diagram

tv = Power ON delay

Emitter supply

Power supply (receiver)

Target emitter present

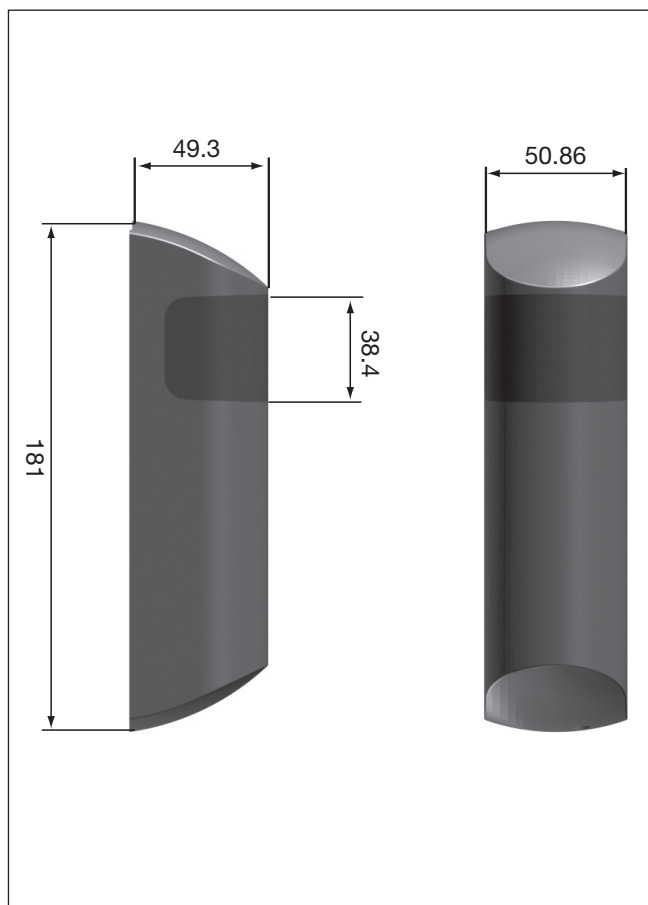
Object present

Mute active < 4 kΩ

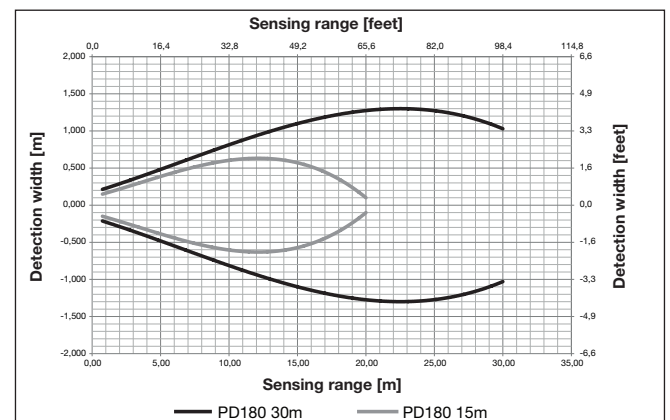
Make (NO) Output ON

Output Battery

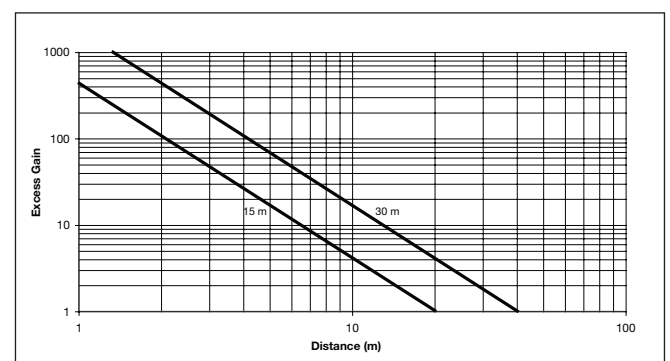
## Dimensions



## Detection Diagram

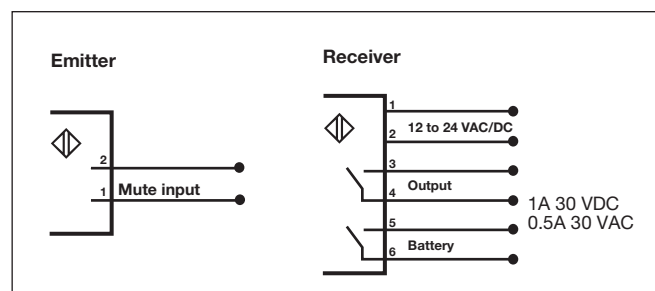


## Excess Gain



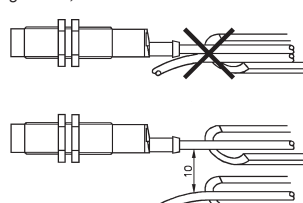
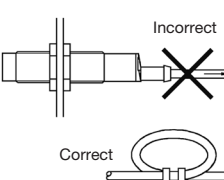
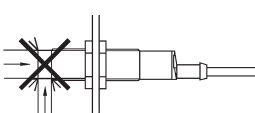
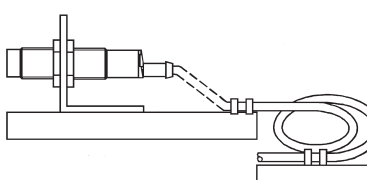
## Wiring Diagram

## Delivery Contents



- PD180 emitter or receiver (separate box)
- Installation instruction in emitter box
- **Packaging:** Cardboard box
- 2 x 3 screws for raw plugs ø2.9 x 25 DIN 7981C
- 2 x 3 raw plugs for 8 mm hole
- 2 x 1 Strain relief
- 2 x 2 Screws for strain relief M3 x 12 mm
- 2 x 1 Cable gland

## Installation Hints

|                                                                                                                                                                                                                                                                   |                                                                                                                                                       |                                                                                                                                                                                       |                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>To avoid interference from inductive voltage/current peaks, separate the prox. switch power cables from any other power cables, e.g. motor, contactor or solenoid cables</p>  | <p>Relief of cable strain</p>  <p>The cable should not be pulled</p> | <p>Protection of the sensing face</p>  <p>A proximity switch should not serve as mechanical stop</p> | <p>Switch mounted on mobile carrier</p>  <p>Any repetitive flexing of the cable should be avoided</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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