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



- **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_n	Ordering no. Emitter	Ordering no. Receiver
180 x 51 x 49 mm	**30 m**	**PD180CBT30MU**	**PD180CBT30Q**

Specifications Emitter

Rated operating dist (S_n)	15 m with jumper not activated 30 m with jumper activated
Rated operational volt. (U_e)	2 x ER14505 3.6 VDC size AA ≥2700 mAh Lithium batteries
Battery lifetime Jumper not active Jumper active	 15m => 2.5 years 30m => 1.5 years
Supply current With Mute active (I_o)	 Typ. 29 µA
Protection	Reverse polarity, transients

Mute input Normal operation Mute	 > 6 KΩ < 4 KΩ
Light source	LED, 850 nm
Light spot size @ 15 m setting @ 30 m setting	 1.2 m @ 7.5 m 2.4 m @ 15 m
Light type	Infrared, modulated
Optical angle	± 4.1°

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Specifications Receiver

Rated operating dist. (S_n)	15 or 30 m dependent on emitter settings
Blind zone	None
Temperature drift	≤ 0.4%/°C
Hysteresis (H)	3 - 20%
Rated operational volt. (U_e)	Supply class 2 12 to 24 VDC, -15% +10%
AC: 45 Hz - 65 Hz	12 to 24 VAC, -15% +10%
Ripple (U_{rrp})	≤ 10%
Output	
Contact ratings	AgPd-Au
Resistive loads AC 1	0.5 A/30 VAC
DC 1	1 A/30 VDC
Mechanical life (typical)	≥ 10 000 000 cycles
Lifetime contacts (typical)	
AC 1	0.5 A/30 VAC 100 000
DC 1	1 A/30 VDC 100 000
Minimum load power	1 mW
No load supply current (I_o)	≤ 36 mA DC (relay ON)
+ Battery low alarm	≤ 55 mA DC (both relays ON)

Ambient light	
Incandescent light @ 3000 … 3200 °K	≥ 100 000 lux (EN 60947-5-2)
Incandescent light 3200 °K	≥ 10 000 lux* (EN 61496-2)
Fluorescent light	≥ 3 000 lux* (EN 61496-2)
Stroboscopic light	0.05 J @ 200 Hz to 0.5 J @ 5 Hz* (EN 61496-2)
Flashing beacon light	3 to 5 J @ 0.5 to 2 Hz* (EN 61496-2)
Optical angle	± 4.7°
Protection	Reverse polarity, transients
Operating frequency (f)	25 Hz
Response time OFF-ON (t_{ON})	≤ 20 ms
ON-OFF (t_{OFF})	≤ 20 ms
Power ON delay (t_v)	≤ 300 ms
Indication function	
Power ON	LED, green
Output ON	LED, yellow

* Failure to danger (worst case alignment)

General Specifications

Environment	
Overvoltage category	III (IEC 60664/EN 60947-1)
Pollution degree	3 (IEC 60664/EN 60947-1)
Degree of protection	IP 55 (IEC 60529; 60947-1)
Temperature	
Operating	-25° to +55°C (-13° to +131°F)
Storage	-25° to +80°C (-13° to +176°F)
Vibration	10 to 150 Hz, 0.5 mm/7.5 g (EN 60068-2-6)
Drop test	2 x 1 m & 100 x 0.5 m (IEC 60068-2-31)
Lens adjustment	
Adjustable optics	Horisontal 200° Vertical ±30°
Rated insulation voltage	50 VDC
Housing material	
Front	PC black
Backpart	PC black
Connection	
Emitter	2 pole terminal block
	Receiver 6 pole terminal bock

Weight	
Emitter	270 g
Receiver	230 g
UL-Approval cURus	UL325, CSA-C22.2 No.247
CE-marking	Yes EN 12453, EN 12978, EN 61496-1, Type 2 ESPE
General reference	Sensor designed according to EN 60947-5-2
MTTFd related to combined product life time (Rx+Tx)	110 years @ 40°C (+104°F) (EN ISO 13849-1 (Parts count method, annex D.1), SN 29500)
ESPE architecture (Cat.)	2 (EN ISO 13849-1)
Performance level (PL.)	C (EN ISO 13849-1)
PFHd	1.04 x 10^{-6} Errors per hour (EN ISO 13849-1)
Mission Time	20 years (EN ISO 13849-1)

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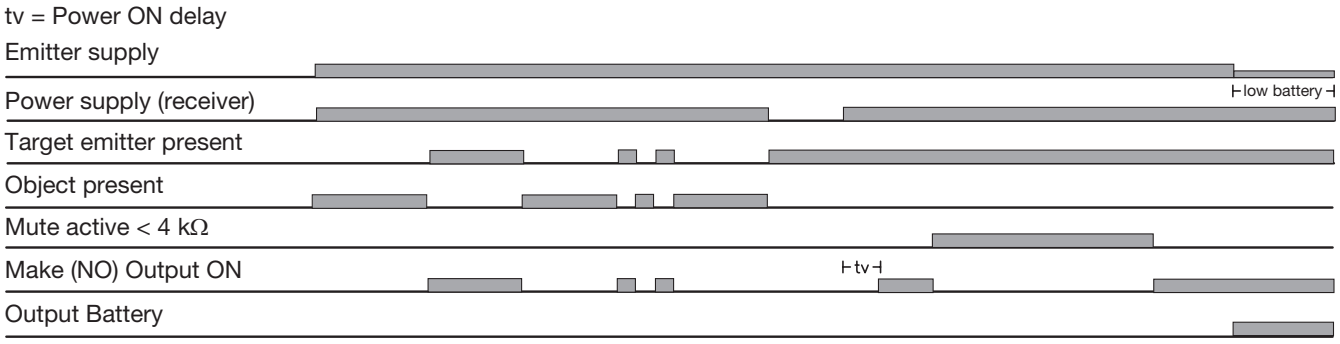
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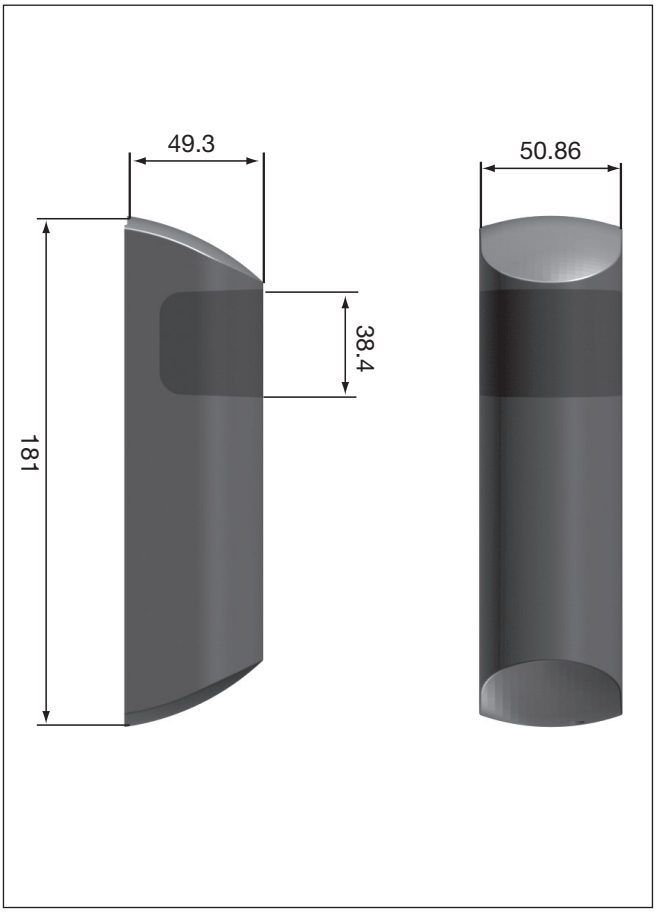
Operation Description

- 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 fittet with “Photo test” or similar sensor verification function.

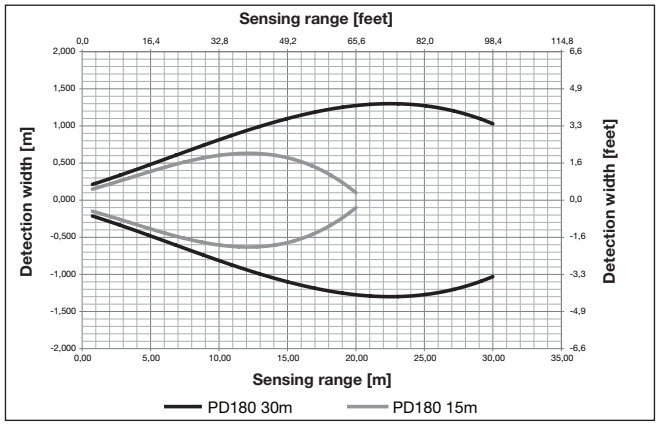
Operation Diagram



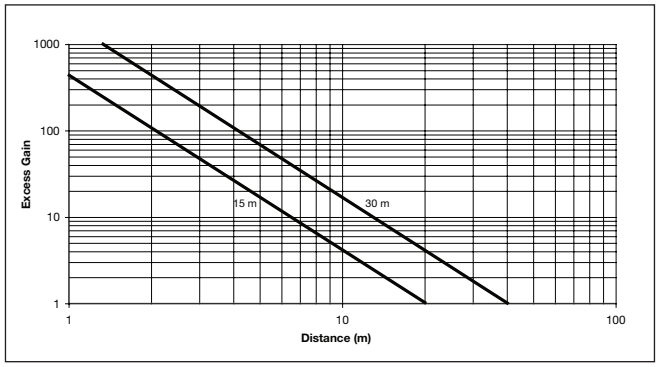
Dimensions



Detection Diagram

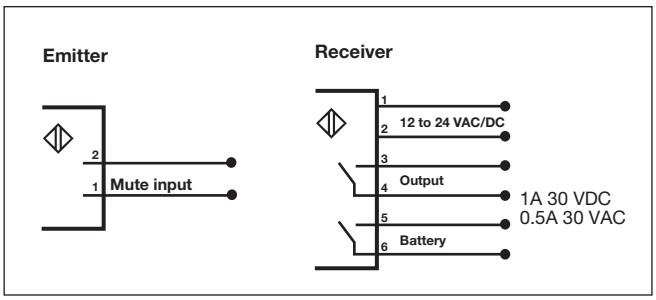


Excess Gain



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Wiring Diagram

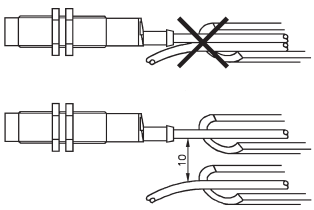


Delivery Contents

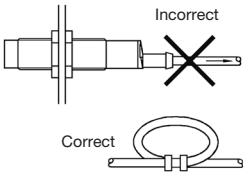
- PD180 emitter or receiver (separate box)
- Installation instruction in emitter box
- **Packaging:** Cardboard box
- 2 x 3 screws for raw plugs ø2.9 x 25 DIN 7981C
- 2 x 3 raw plugs for 8 mm hole
- 2 x 1 Strain releif
- 2 x 2 Screws for strain releif M3 x 12 mm
- 2 x 1 Cable gland

Installation Hints

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

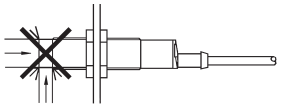


Relief of cable strain



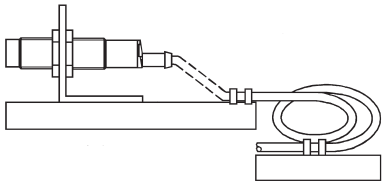
The cable should not be pulled

Protection of the sensing face



A proximity switch should not serve as mechanical stop

Switch mounted on mobile carrier



Any repetitive flexing of the cable should be avoided

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