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

CARLO GAVAZZI



- 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



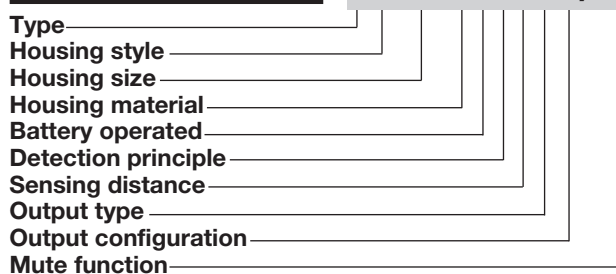
Product Description

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 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	Mute input Normal operation Mute	> 6 K Ω < 4 K Ω
Rated operational volt. (U_o)	2 x ER14505 3.6 VDC size AA \geq 2700 mAh Lithium batteries	Light source	LED, 850 nm
Battery lifetime Jumper not active Jumper active	15m => 2.5 years 30m => 1.5 years	Light spot size @ 15 m setting @ 30 m setting	1.2 m @ 7.5 m 2.4 m @ 15 m
Supply current With Mute active (I_o)	Typ. 29 μ A	Light type	Infrared, modulated
Protection	Reverse polarity, transients	Optical angle	\pm 4.1 $^\circ$

Specifications Receiver

Rated operating dist. (S_n)	15 or 30 m dependent on emitter settings	Ambient light	
Blind zone	None	Incandescent light @ 3000 ... 3200 °K	≥ 100 000 lux (EN 60947-5-2)
Temperature drift	≤ 0.4%/°C	Incandescent light 3200 °K	≥ 10 000 lux* (EN 61496-2)
Hysteresis (H)	3 - 20%	Fluorescent light	≥ 3 000 lux* (EN 61496-2)
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%	Stroboscopic light	0.05 J @ 200 Hz to 0.5 J @ 5 Hz* (EN 61496-2)
Ripple (U_{rrp})	≤ 10%	Flashing beacon light	3 to 5 J @ 0.5 to 2 Hz* (EN 61496-2)
Output		Optical angle	± 4.7°
Contact ratings	AgPd-Au	Protection	Reverse polarity, transients
Resistive loads	AC 1 0.5 A/30 VAC DC 1 1 A/30 VDC	Operating frequency (f)	25 Hz
Mechanical life (typical)	≥ 10 000 000 cycles	Response time	OFF-ON (t _{ON}) ≤ 20 ms ON-OFF (t _{OFF}) ≤ 20 ms
Lifetime contacts (typical)		Power ON delay (t_v)	≤ 300 ms
	AC 1 0.5 A/30 VAC 100 000 DC 1 1 A/30 VDC 100 000	Indication function	
Minimum load power	1 mW	Power ON	LED, green
No load supply current (I_o)	≤ 36 mA DC (relay ON)	Output ON	LED, yellow
+ Battery low alarm	≤ 55 mA DC (both relays ON)		

* Failure to danger (worst case alignment)

General Specifications

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

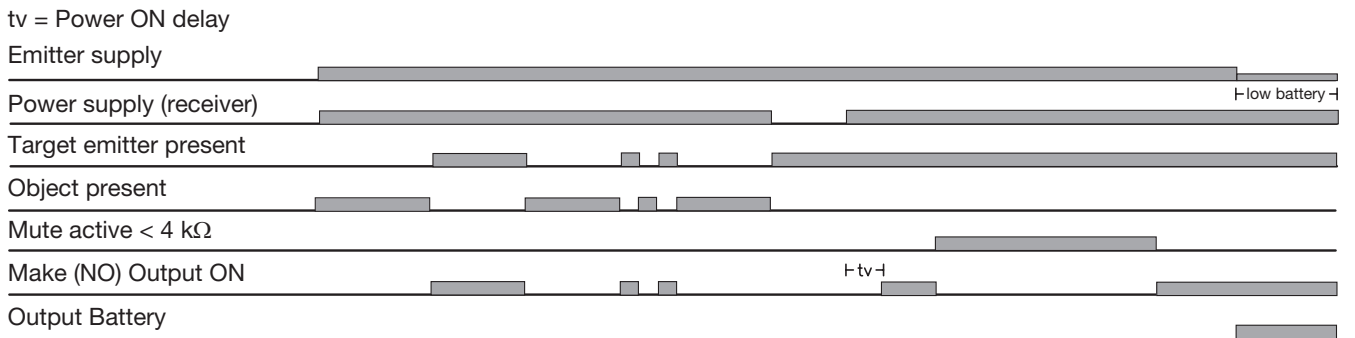
Target emitter present

Object present

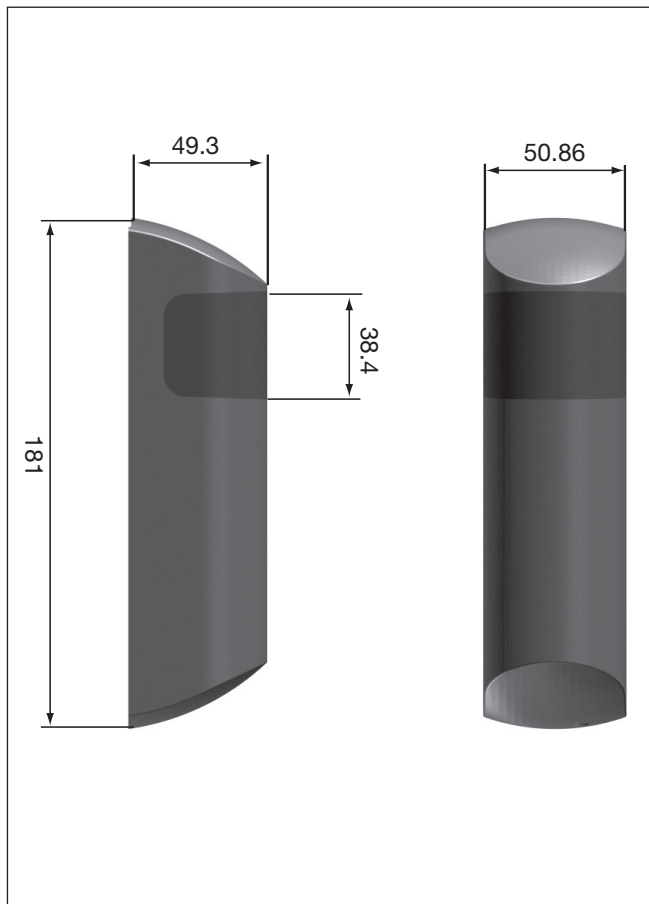
Mute active < 4 kΩ

Make (NO) Output ON

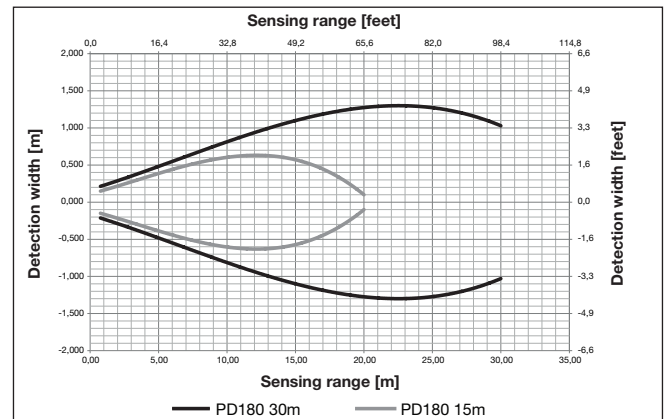
Output Battery



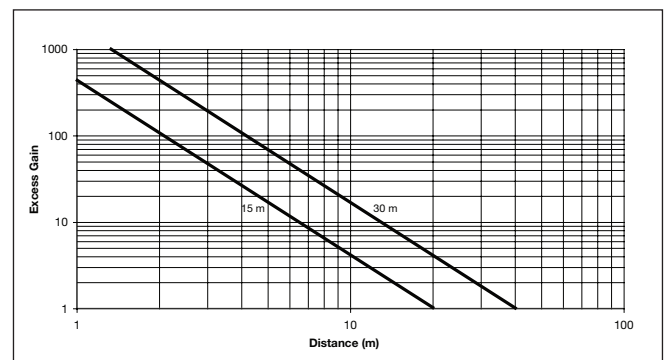
Dimensions



Detection Diagram

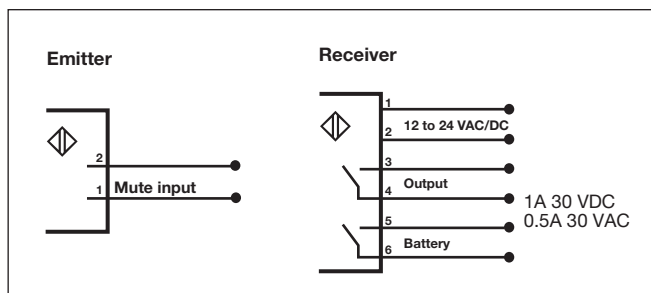


Excess Gain



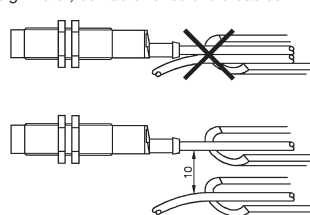
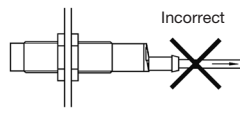
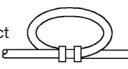
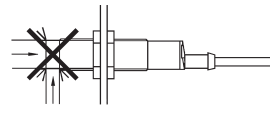
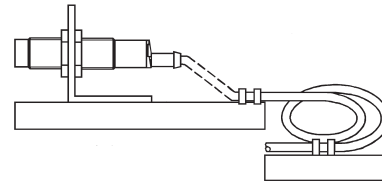
Wiring Diagram

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>Incorrect</p>  <p>Correct</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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