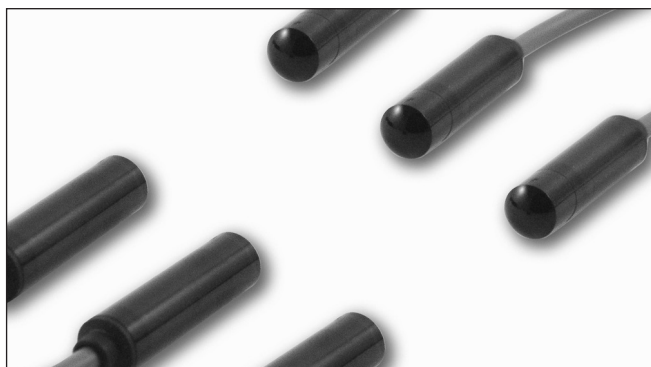


# Photoelectrics Through-beam, Transistor Output Type PB10C.T20..

CARLO GAVAZZI



- Elevators, Escalators and Entrance control
- Range 20 m
- ESPE-Type 2, PL C.
- Modulated, infrared light
- Supply voltage: 10 to 30 VDC
- Output: 100 mA, NPN or PNP type
- Make or break switching
- LED for output indication or power supply
- Protection: reverse polarity, short circuit, transients
- Cable versions with or without connector
- Emitter mute and power adjustment
- High neighbour immunity, 3-codes
- CE, UL325 and UL508 approved



## Product Description

The PB10CNT. is a through beam sensor set specially designed for Elevators, Escalators, Entrance control to meet the requirements in the door market. The housing is very robust and is known for its high long term reliability. The emitter has

a mute input to turn it off for evaluation of the sensor function.

The emitter and receivers can be delivered in 3 different codes on order to improve neighbour immunity. Available in 10-30 VDC version.

## Ordering Key

**PB10C1T20NO-C2**

Type	_____
Housing style	_____
Housing size	_____
Housing material	_____
Sensor code	_____
Detection principle	_____
Sensing distance	_____
Output type	_____
Output configuration	_____
Connection type	_____
Cable connector	_____

## Type Selection

Housing diameter	Range S <sub>n</sub>	Con-nec-tor	Ordering no. Receiver NPN, NO	Ordering no. Receiver NPN, NC	Ordering no. Receiver PNP, NO	Ordering no. Receiver PNP, NC	Ordering no. Emitter
Ø10 mm Code 1	20 m	NO	<b>PB10C1T20NO</b>	<b>PB10C1T20NC</b>	<b>PB10C1T20PO</b>	<b>PB10C1T20PC</b>	<b>PB10C1T20</b>
Ø10 mm Code 2	20 m	NO	<b>PB10C2T20NO</b>	<b>PB10C2T20NC</b>	<b>PB10C2T20PO</b>	<b>PB10C2T20PC</b>	<b>PB10C2T20</b>
Ø10 mm Code 3	20 m	NO	<b>PB10C3T20NO</b>	<b>PB10C3T20NC</b>	<b>PB10C3T20PO</b>	<b>PB10C3T20PC</b>	<b>PB10C3T20</b>
Ø10 mm Code 1	20 m	YES	<b>PB10C1T20NO-C2</b>	<b>PB10C1T20NC-C2</b>	<b>PB10C1T20PO-C2</b>	<b>PB10C1T20PC-C2</b>	<b>PB10C1T20-C2</b>
Ø10 mm Code 2	20 m	YES	<b>PB10C2T20NO-C2</b>	<b>PB10C2T20NC-C2</b>	<b>PB10C2T20PO-C2</b>	<b>PB10C2T20PC-C2</b>	<b>PB10C2T20-C2</b>
Ø10 mm Code 3	20 m	YES	<b>PB10C3T20NO-C2</b>	<b>PB10C3T20NC-C2</b>	<b>PB10C3T20PO-C2</b>	<b>PB10C3T20PC-C2</b>	<b>PB10C3T20-C2</b>

Note: Please order emitter and receiver separately

## Specifications Emitter

<b>Rated operational volt. (U<sub>B</sub>)</b>	10 to 30 VDC	<b>Light type</b>	Infrared, modulated
<b>Ripple (U<sub>rrp</sub>)</b>	≤ 10%	<b>Light spot</b>	1580 mm @ 12 m
<b>Supply current</b>	≤ 20 mA	<b>Emitter angle</b>	± 3.8° @ 12 m
<b>Protection</b>	Reverse polarity, transients	<b>Indication function</b>	Power supply ON Mute input ON
<b>Power ON delay (t<sub>v</sub>)</b>	≤ 100 ms		LED, green LED, green flashing, 3.5 Hz
<b>Control input</b>		<b>Power adjustment</b>	R <sub>x</sub> ~ 3 kΩ -10 kΩ
Normal oper.	> 1.5 VDC		
Mute	< 1.2 VDC		
<b>Light source</b>	LED, 880 nm		4...24 m in 19 steps

## Specifications Receiver

<b>Rated operating dist. (S<sub>n</sub>)</b>	20 m	<b>Utility category</b>	DC12	Control of resistive loads and solid state loads with optical insulation
<b>Blind zone</b>	None		DC13	Control of electromagnets
<b>Temperature drift</b>	≤ 0.4%/°C	<b>Ambient light</b>		> 80.000 Lux (EN60947-5-2)
<b>Hysteresis (H)</b>	3 - 20%	<b>Detection angle</b>		± 2.9° @ 12 m
<b>Rated operational volt. (U<sub>B</sub>)</b>	10 to 30 VDC (ripple included)	<b>Operating frequency (f)</b>		30 Hz
<b>Ripple (U<sub>rrp</sub>)</b>	≤ 10%	<b>Response time</b>	OFF-ON (t <sub>ON</sub> )	≈ 10 ms
<b>No load supply current (I<sub>o</sub>)</b>	≤ 13 mA		ON-OFF (t <sub>OFF</sub> )	≈ 20 ms
<b>Output current</b>		<b>Power ON delay (t<sub>v</sub>)</b>		≤ 300 ms
Continuous (I <sub>a</sub> )	≤ 100 mA	<b>Output function</b>		NPN or PNP
Short-time (I)	≤ 100 mA, (max. load capacity 100 nF)			Make or break (NO or NC)
<b>Minimum operational current (I<sub>m</sub>)</b>	0.5 mA	<b>Indication function</b>		Output ON
<b>OFF-state current (I<sub>r</sub>)</b>	≤ 100 μA			LED, yellow
<b>Voltage drop (U<sub>d</sub>)</b>	≤ 1.6 VDC @ 100 mA			
<b>Protection</b>	Short-circuit, reverse polarity, transients			

## General Specifications

<b>Environment</b>		<b>Surge (EN 61000-4-5)</b>	
Overvoltage category	III (IEC 60664/60664A, 60947-1)	Power-supply	> 1 kV (with 500 Ω)
Pollution degree	3 (IEC 60664/60664A, 60947-1)	Sensor output	> 1 kV (with 500 Ω)
Degree of protection	IP67 (IEC 60529; EN60947-1) 1, 2, 3, 4, 6, 12, 13 (NEMA types)	<b>Wire conducted disturbances (EN 61000-4-6)</b>	> 10 Vrms
<b>Temperature</b>		<b>Power-frequency magnetic fields (EN 61000-4-8)</b>	
Operating	-20° to +50°C (-4° to +122°F)	Continuous	> 30 A/m, 38 μ tesla
Storage	-25° to +80°C (-13° to +176°F)	Short-time	> 300 A/m, 380 μ tesla
<b>Rated insulation voltage</b>	50 VDC	<b>Vibration (IEC 60068-2-6)</b>	10 to 150 Hz, 1 mm / 15 g
<b>Dielectric test voltage</b>	500 Vac rms (EN60947-1)	<b>Shock (IEC 60068-2-27)</b>	30 G / 11 ms, 6 pos, 6 neg per axis
<b>Rated impulse withstand test</b>	800 V (1.2 / 50 μs) (EN60947-1)	<b>Free fall (IEC 60068-2-31)</b>	2 times from 1 m 100 times from 0.5 m
<b>ESPE</b>	Type 2	<b>Pig-tail connector (-C2)</b>	3-pol micro MATE-N-LOK Series, AMP/TE
<b>PFH<sub>d</sub></b>	6 x 10 <sup>-8</sup> failure per hour (worst case SRP for CS)	<b>Housing material</b>	
<b>Diagnostic coverage</b>	99 % (EN13849-1: 2008)	Body	PC black
<b>Performance level</b>	C (EN13849-1: 2008)	<b>Connection</b>	
<b>MTTF<sub>d</sub> (worst case full sensor)</b>	345 Years (worst case full receiver) EN ISO 13849-1, SN 29500 412 Years (worst case full emitter) EN ISO 13849-1, SN 29500	Cable	PVC, Emitter: grey / Receiver: black, 5 m, 3 x 0.14 mm <sup>2</sup> , Ø 2.9 mm
<b>Electrostatic discharge (EN61000-4-2)</b>		<b>Weight</b>	
Contact discharge	> 12 kV	Emitter	80 g
Air discharge	> 8 kV	Receiver	80 g
<b>Radiated RF electromagnetic fields (EN 61000-4-3)</b>	> 10 V/m	<b>CE-marking</b>	EN12445, EN12453, EN12978, EN 60947-5-2
Electrical fast transients/burst (EN 61000-4-4)	± 4 kV	<b>UL-Approval</b>	UL325 UL508, CSA-C22.2 No.247

## Operation Diagram

tv = Power ON delay

Power supply

Target emitter present

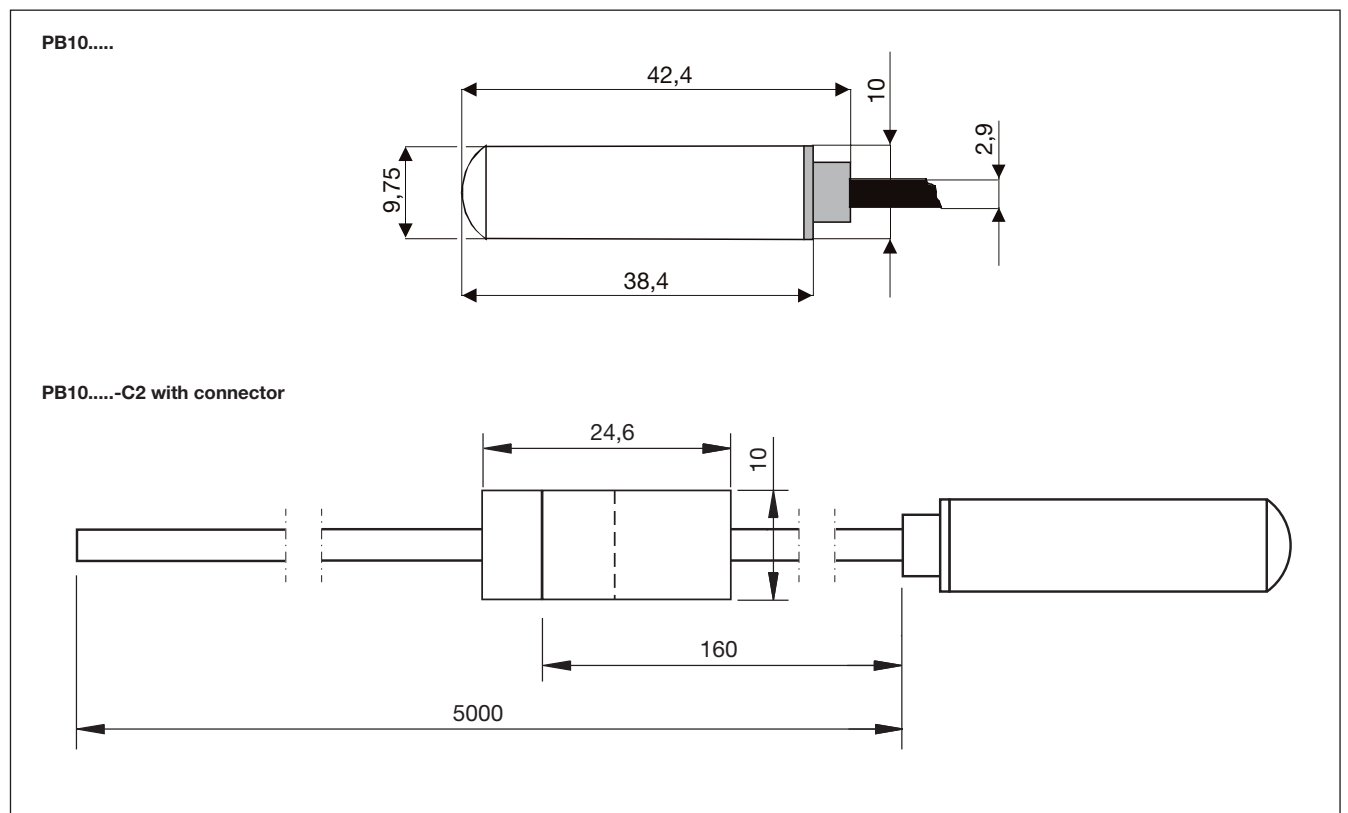
Object present

Break (NC) Output ON

Make (NO) Output ON

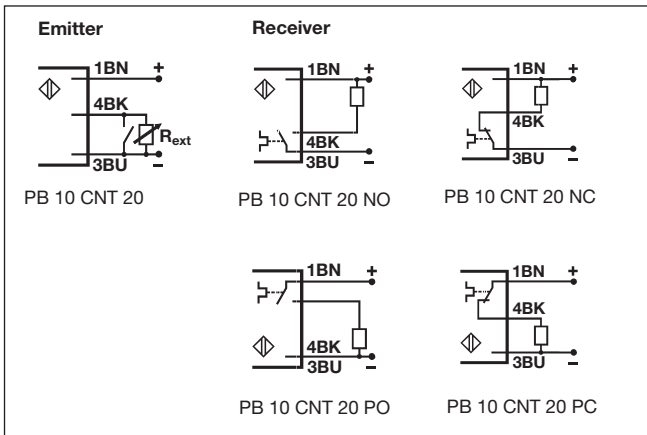
Mute active  $\leq 1.2$  VDC

## Dimensions

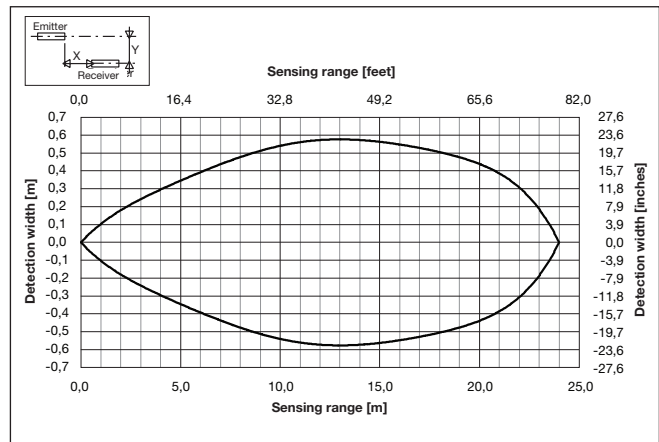




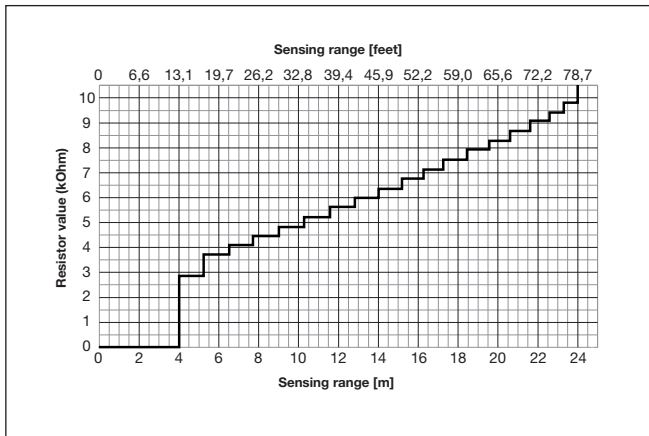
## Wiring Diagram



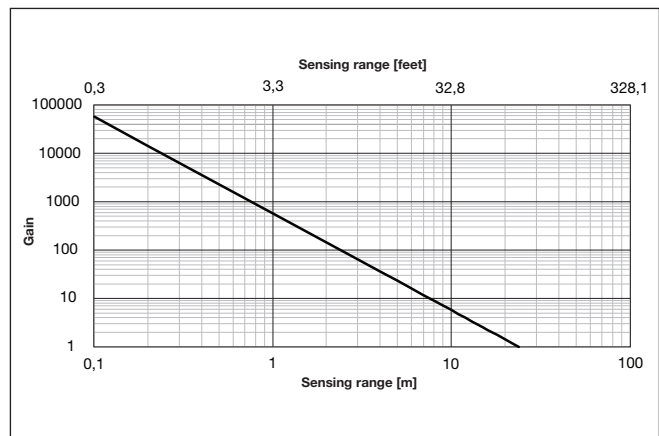
## Detection Diagram



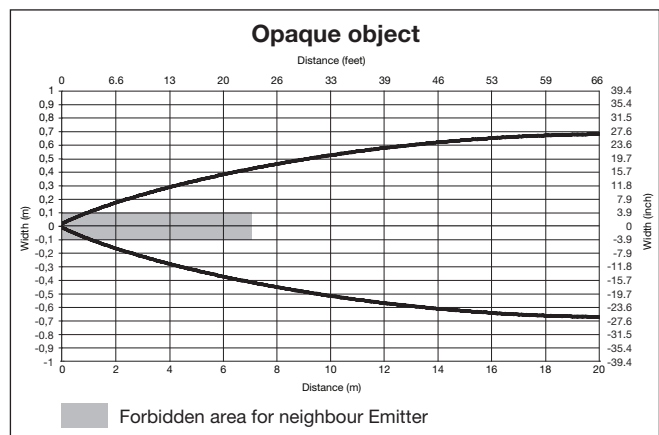
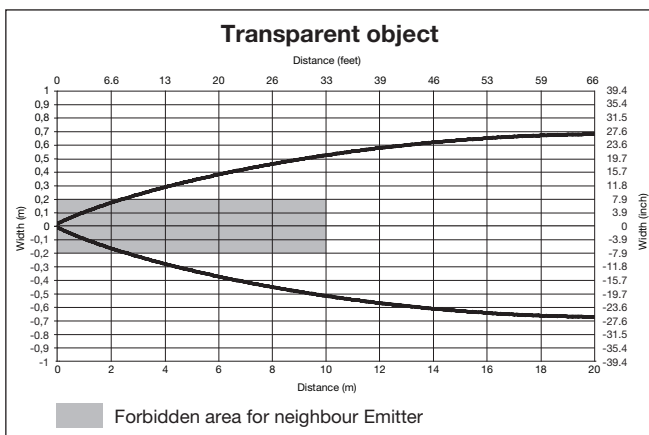
## Power adjustment curve



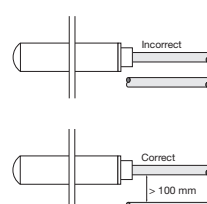
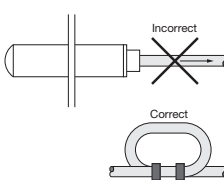
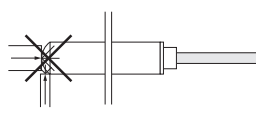
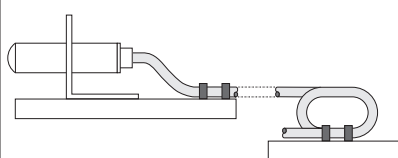
## Excess Gain



## Neighbour Immunity Diagram



## Installation Hints

<p><i>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</i></p> 	<p><i>Relief of cable strain</i></p>  <p>The cable should not be pulled</p>	<p><i>Protection of the sensing face</i></p>  <p>A proximity switch should not serve as mechanical stop</p>	<p><i>Switch mounted on mobile carrier</i></p>  <p>Any repetitive flexing of the cable should be avoided</p>
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## Delivery Contents

- PB10
- **Packaging:** plastic bag