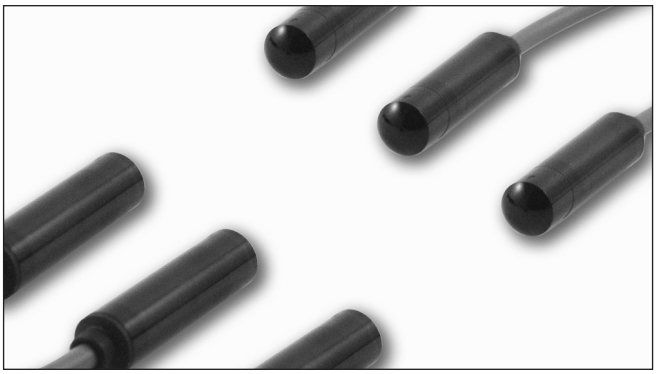
# Photoelectrics
# Through-beam, Transistor Output
# Type PB10C.T20..

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- 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 it's high long term relaibility. 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 $S_n$ | Connector | 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 | **PB10C1T20NO** | **PB10C1T20NC** | **PB10C1T20PO** | **PB10C1T20PC** | **PB10C1T20** |
| Ø10 mm Code 2 | 20 m | NO | **PB10C2T20NO** | **PB10C2T20NC** | **PB10C2T20PO** | **PB10C2T20PC** | **PB10C2T20** |
| Ø10 mm Code 3 | 20 m | NO | **PB10C3T20NO** | **PB10C3T20NC** | **PB10C3T20PO** | **PB10C3T20PC** | **PB10C3T20** |
| Ø10 mm Code 1 | 20 m | YES | **PB10C1T20NO-C2** | **PB10C1T20NC-C2** | **PB10C1T20PO-C2** | **PB10C1T20PC-C2** | **PB10C1T20-C2** |
| Ø10 mm Code 2 | 20 m | YES | **PB10C2T20NO-C2** | **PB10C2T20NC-C2** | **PB10C2T20PO-C2** | **PB10C2T20PC-C2** | **PB10C2T20-C2** |
| Ø10 mm Code 3 | 20 m | YES | **PB10C3T20NO-C2** | **PB10C3T20NC-C2** | **PB10C3T20PO-C2** | **PB10C3T20PC-C2** | **PB10C3T20-C2** |

**Note:** Please order emitter and receiver separately

## Specifications Emitter

| | |
|---|---|
| **Rated operational volt.** ($U_B$) | 10 to 30 VDC |
| **Ripple** ($U_{rrp}$) | ≤ 10% |
| **Supply current** | ≤ 20 mA |
| **Protection** | Reverse polarity, transients |
| **Power ON delay** ($t_v$) | ≤ 100 ms |
| **Control input** | |
| Normal oper. | > 1.5 VDC |
| Mute | < 1.2 VDC |
| **Light source** | LED, 880 nm |

| | |
|---|---|
| **Light type** | Infrared, modulated |
| **Light spot** | 1580 mm @ 12 m |
| **Emitter angle** | ± 3.8° @ 12 m |
| **Indication function** | |
| Power supply ON | LED, green |
| Mute input ON | LED, green flashing, 3.5 Hz |
| **Power adjustment** | |
| $R_x$ ~ 3 kΩ -10 kΩ | 4...24 m in 19 steps |



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## Specifications Receiver

| | |
|---|---|
| **Rated operating dist.** ($S_n$) | 20 m |
| **Blind zone** | None |
| **Temperature drift** | ≤ 0.4%/°C |
| **Hysteresis** (H) | 3 - 20% |
| **Rated operational volt.** ($U_B$) | 10 to 30 VDC (ripple included) |
| **Ripple** ($U_{rrp}$) | ≤ 10% |
| **No load supply current** ($I_o$) | ≤ 13 mA |
| **Output current**<br>Continuous ($I_e$)<br>Short-time (I) | <br>≤ 100 mA<br>≤ 100 mA,<br>(max. load capacity 100 nF) |
| **Minimum operational current** ($I_m$) | 0.5 mA |
| **OFF-state current** ($I_r$) | ≤100 µA |
| **Voltage drop** ($U_d$) | ≤ 1.6 VDC @ 100 mA |
| **Protection** | Short-circuit, reverse polarity, transients |

| | | |
|---|---|---|
| **Utility category** | DC12 | Control of resistive loads and solid state loads with optical insulation |
| | DC13 | Control of electromagnets |
| **Ambient light** | | > 80.000 Lux (EN60947-5-2) |
| **Detection angle** | | ± 2.9° @ 12 m |
| **Operating frequency** (f) | | 30 Hz |
| **Response time** | OFF-ON ($t_{ON}$) | ≈ 10 ms |
| | ON-OFF ($t_{OFF}$) | ≈ 20 ms |
| **Power ON delay** ($t_v$) | | ≤ 300 ms |
| **Output function**<br>NPN or PNP | | Make or break (NO or NC) |
| **Indication function**<br>Output ON | | LED, yellow |

## General Specifications

| | |
|---|---|
| **Environment** | |
| Overvoltage category | III (IEC 60664/60664A, 60947-1) |
| Pollution degree | 3 (IEC 60664/60664A, 60947-1) |
| Degree of protection | IP67 (IEC 60529; EN60947-1) 1, 2, 3, 4, 6, 12, 13 (NEMA types) |
| **Temperature** | |
| Operating | -20° to +50°C (-4° to +122°F) |
| Storage | -25° to +80°C (-13° to +176°F) |
| **Rated insulation voltage** | 50 VDC |
| **Dielectric test voltage** | 500 Vac rms (EN60947-1) |
| **Rated impulse withstand test** | 800 V (1.2 / 50 µs) (EN60947-1) |
| **ESPE** | Type 2 |
| **$PFH_d$** | 6 x $10^{-8}$ failure per hour (worst case SRP for CS) |
| **Diagnostic coverage** | 99 % (EN13849-1: 2008) |
| **Performance level** | C (EN13849-1: 2008) |
| **$MTTF_d$** (worst case full sensor) | 345 Years (worst case full receiver) EN ISO 13849-1, SN 29500<br>412 Years (worst case full emitter) EN ISO 13849-1, SN 29500 |
| **Electrostatic discharge** (EN61000-4-2) | |
| Contact discharge | > 12 kV |
| Air discharge | > 8 kV |
| **Radiated RF electromagnetic fields** (EN 61000-4-3) | > 10 V/m |
| Electrical fast transients/burst (EN 61000-4-4) | ± 4 kV |

| | |
|---|---|
| **Surge** (EN 61000-4-5) | |
| Power-supply | > 1 kV (with 500 Ω) |
| Sensor output | > 1 kV (with 500 Ω) |
| **Wire conducted disturbances** (EN 61000-4-6) | > 10 Vrms |
| **Power-frequency magnetic fields** (EN 61000-4-8) | |
| Continous | > 30 A/m, 38 µ tesla |
| Short-time | > 300 A/m, 380 µ tesla |
| **Vibration** (IEC 60068-2-6) | 10 to 150 Hz, 1 mm / 15 g |
| **Shock** (IEC 60068-2-27) | 30 G / 11 ms, 6 pos, 6 neg per axis |
| **Free fall** (IEC 60068-2-31) | 2 times from 1 m<br>100 times from 0.5 m |
| **Pig-tail connector (-C2)** | 3-pol micro MATE-N-LOK Series, AMP/TE |
| **Housing material** | |
| Body | PC black |
| **Connection** | |
| Cable | PVC, Emitter: grey / Receiver: black, 5 m, 3 x 0.14 $mm^2$, Ø 2.9 mm |
| **Weight** | |
| Emitter | 80 g |
| Receiver | 80 g |
| **CE-marking** | EN12445, EN12453, EN12978, EN 60947-5-2 |
| **UL-Approval** | UL325<br>UL508, CSA-C22.2 No.247 |

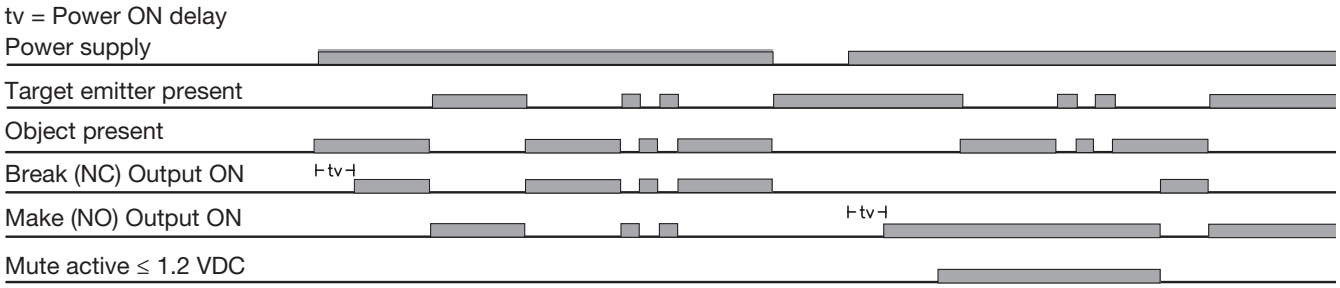


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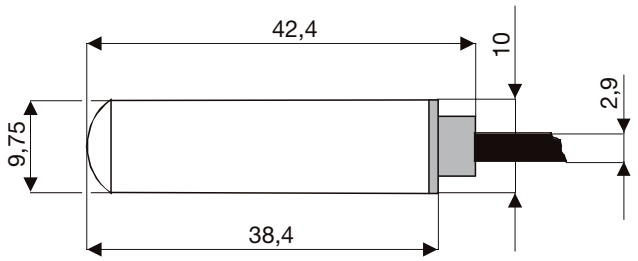
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## Operation Diagram

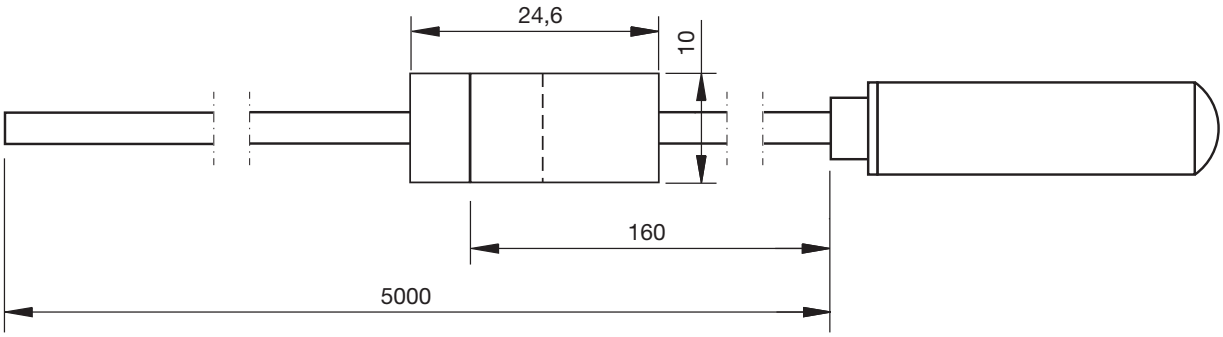



## Dimensions

**PB10.....**



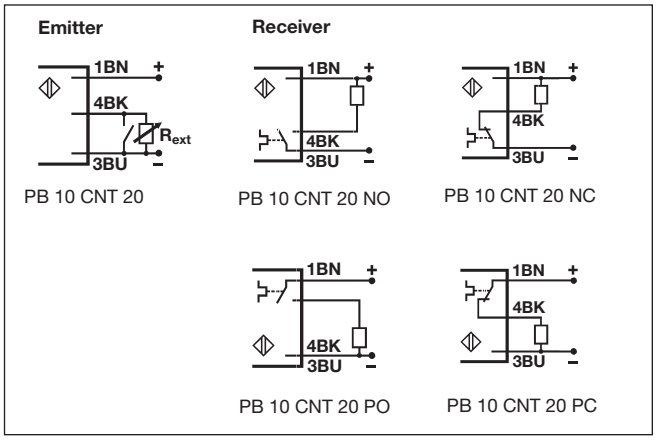

**PB10.....-C2 with connector**



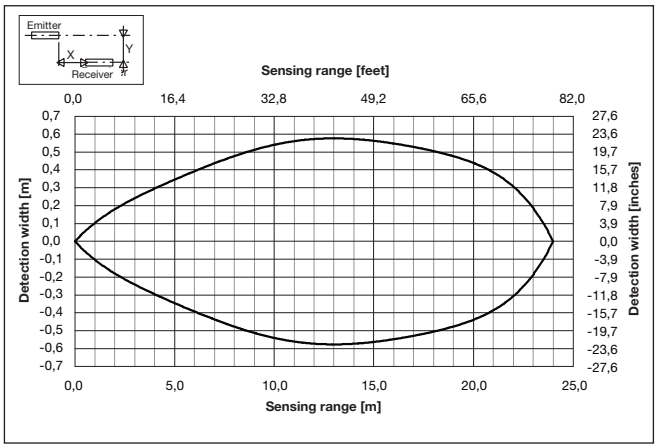



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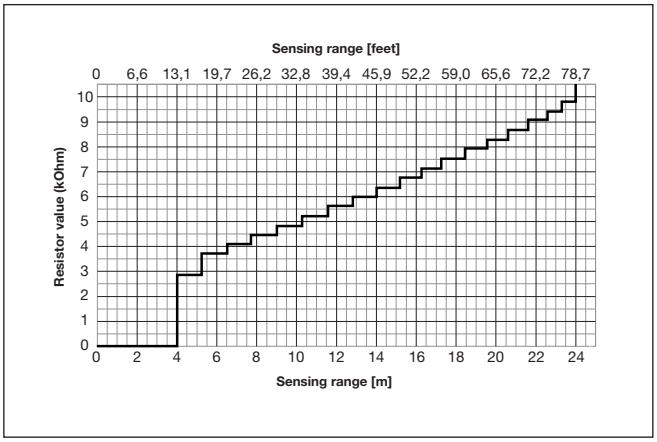
## Wiring Diagram



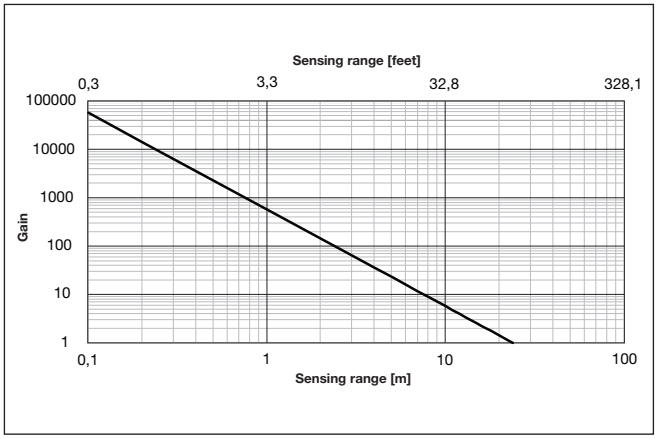

## Detection Diagram



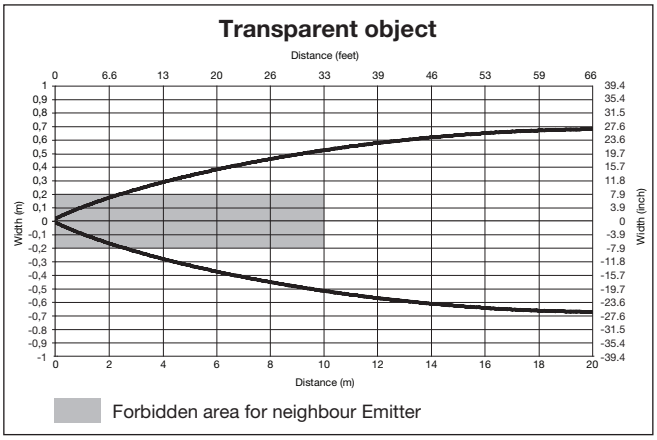

## Power adjustment curve

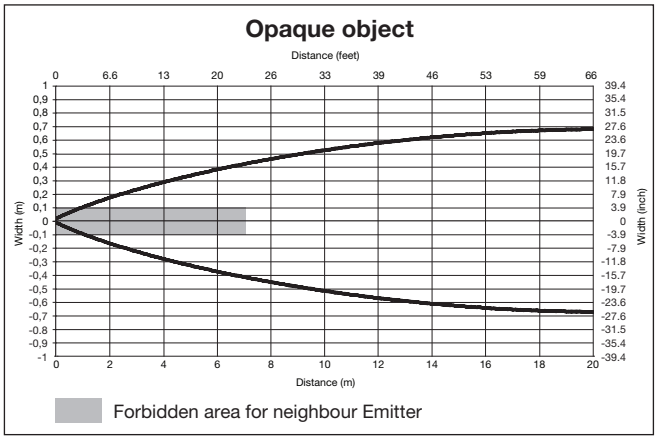



## Excess Gain




## Neighbour Immunity Diagram



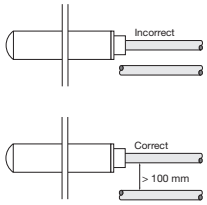
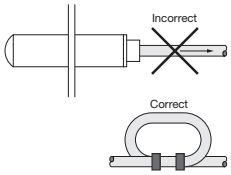
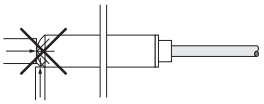
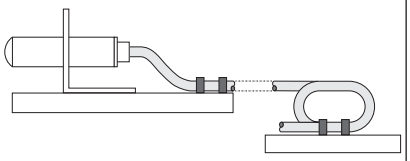






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## Installation Hints

| *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* | *Protection of the sensing face* | *Switch mounted on mobile carrier* |
|---|---|---|---|
|  | <br>The cable should not be pulled | <br>A proximity switch should not serve as mechanical stop | <br>Any repetitive flexing of the cable should be avoided |

## Delivery Contents

- PB10
- **Packaging:** plastic bag



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