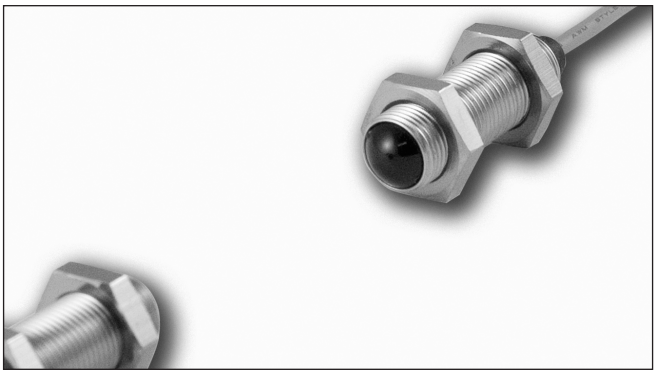
# Photoelectrics
# Through-beam, Transistor Output
# Type PA12BNT20..



- **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**
- **Protection: reverse polarity, short circuit, transients**
- **Cable versions with or without connector**
- **Emitter mute and power adjustment**
- **CE, UL325 and UL508 approved**

## Product Description

The PA12BNT. 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.
Available in 10-30 VDC version.

## Ordering Key

**PA12BNT20NO-C2**

- **Type**
- **Housing style**
- **Housing size**
- **Housing material**
- **Neutral**
- **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 |
|---|---|---|---|---|---|---|---|
| M12 | 20 m | NO | **PA12BNT20NO** | **PA12BNT20NC** | **PA12BNT20PO** | **PA12BNT20PC** | **PA12BNT20** |
| M12 | 20 m | YES | **PA12BNT20NO-C2** | **PA12BNT20NC-C2** | **PA12BNT20PO-C2** | **PA12BNT20PC-C2** | **PA12BNT20-C2** |

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

## Specifications Emitter

| | | | |
|---|---|---|---|
| **Rated operational volt.** ($U_B$) | 10 to 30 VDC | **Light source** | LED, 860 nm |
| **Ripple** ($U_{rrp}$) | ≤ 10% | **Light type** | Infrared, modulated |
| **Supply current** | ≤ 20 mA | **Light spot** | 1580 mm @ 12 m |
| **Protection** | Reverse polarity, transients | **Emitter angle** | ± 3.8° @ 12 m |
| **Power ON delay** ($t_v$) | ≤ 100 ms | **Power adjustment** $R_x$ ~ 3 kΩ -10 kΩ | 4...24 m in 19 steps |
| **Control input** | | | |
| Normal oper. | > 1.5 VDC | | |
| Mute | < 1.2 VDC | | |



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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** ($I_o$) | ≤ 16 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** | | > 20.000 Lux (EN60947-5-2) |
| **Detection angle** | | ± 2.9° @ 12 m |
| **Operating frequency** (f) | | 100 Hz |
| **Response time** | OFF-ON ($t_{ON}$)<br>ON-OFF ($t_{OFF}$) | ≈ 6.5 ms<br>≈ 3.5 ms |
| **Power ON delay** ($t_v$) | | ≤ 100 ms |
| **Output function**<br>NPN or PNP | | Make or break (NO or NC) |

## General Specifications

| | |
|---|---|
| **Environment**<br>Overvoltage category<br>Pollution degree<br>Degree of protection | <br>III (IEC 60664/60664A, 60947-1)<br>3 (IEC 60664/60664A, 60947-1)<br>IP67 (IEC 60529; EN60947-1)<br>1, 2, 3, 4, 6, 12, 13 (NEMA types) |
| **Temperature**<br>Operating<br>Storage | <br>-20° to +50°C (-4° to +122°F)<br>-25° to +80°C (-13° to +176°F) |
| **Rated insulation voltage** | 75 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)<br>Contact discharge<br>Air discharge | <br>> 12 kV<br>> 8 kV |
| **Radiated RF electromagnetic fields** (EN 61000-4-3) | > 10 V/m |

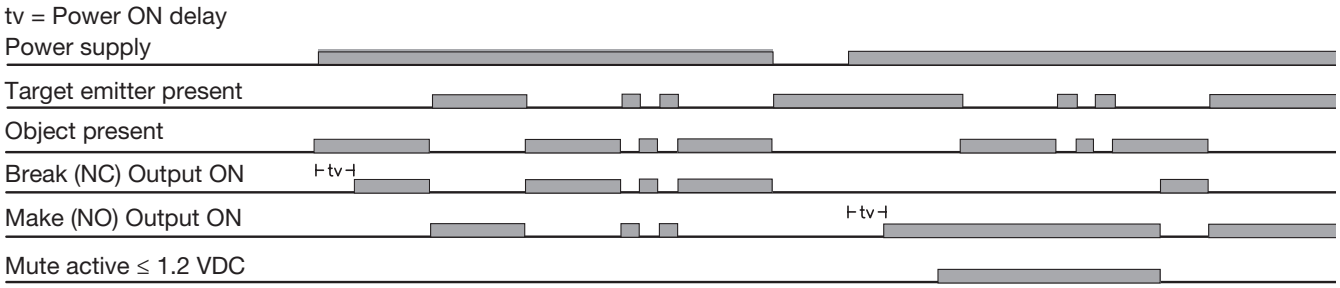
| | |
|---|---|
| **Electrical fast transients/burst** (EN 61000-4-4) | ± 4 kV |
| **Surge** (EN 61000-4-5)<br>Power-supply<br>Sensor output | <br>> 1 kV (with 500 Ω)<br>> 1 kV (with 500 Ω) |
| **Wire conducted disturbances** (EN 61000-4-6) | > 10 Vrms |
| **Power-frequency magnetic fields** (EN 61000-4-8)<br>Continous<br>Short-time | <br>> 30 A/m, 38 µ tesla<br>> 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**<br>Body<br>Front | <br>M12-Stainless Steel<br>PC black |
| **Connection**<br>Cable | <br>PVC, Emitter: grey / Receiver: black, 5 m, 3 x 0.14 $mm^2$, Ø 2.9 mm |
| **Weight**<br>Emitter<br>Receiver | <br>80 g<br>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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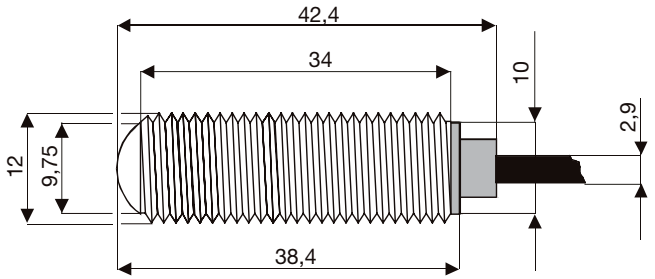
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## Operation Diagram

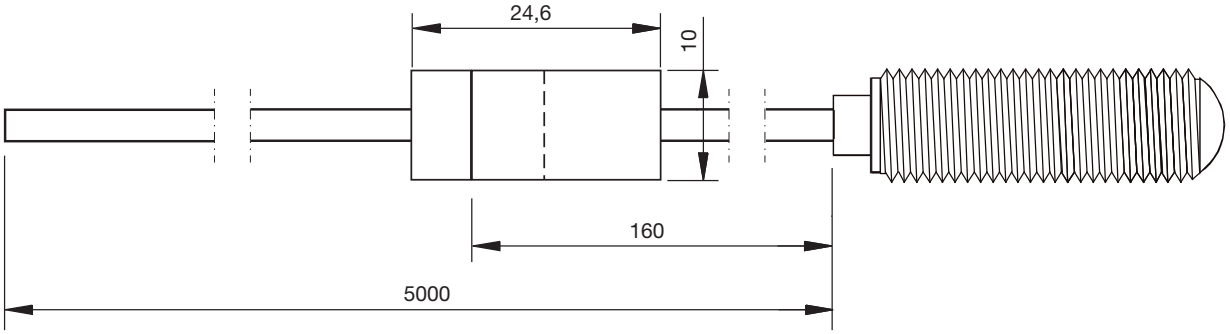



## Dimensions

**PA12.....**



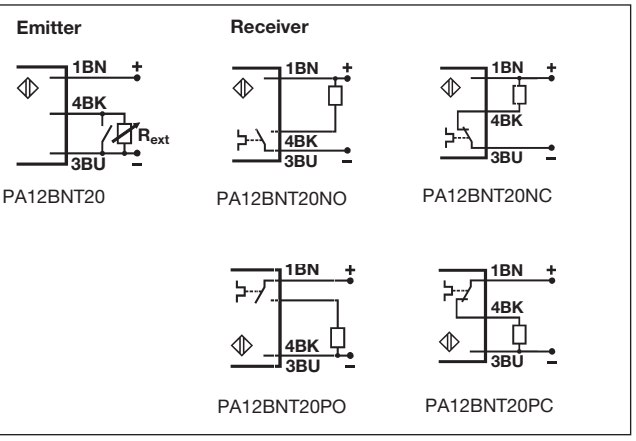

**PA12.....-C2 with connector**



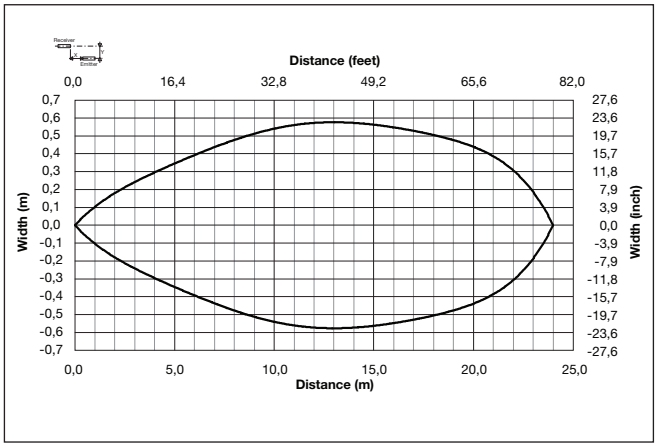



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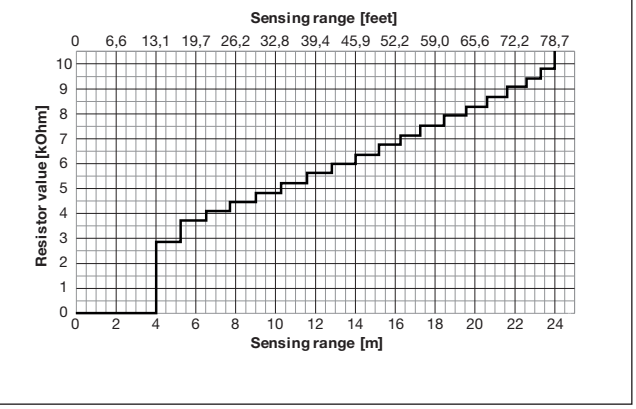
## Wiring Diagram



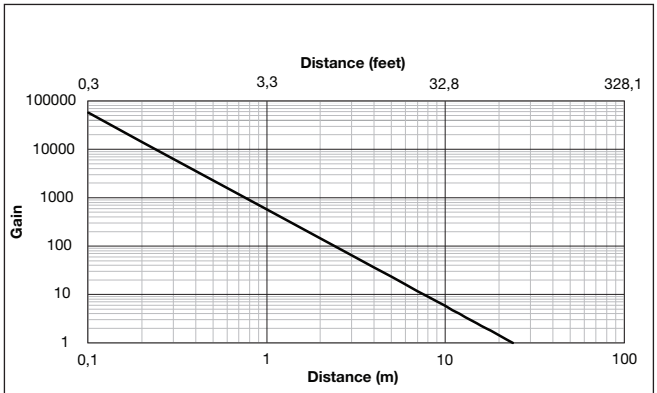

## Detection Diagram




## Power adjustment curve

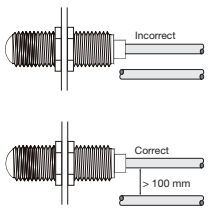



## Excess Gain

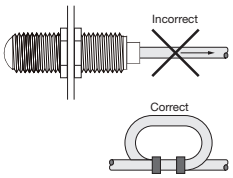



## Installation Hints

*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*

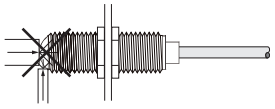



*Relief of cable strain*



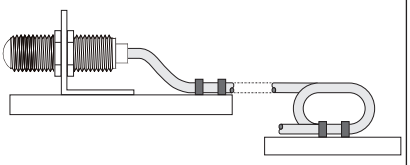

The cable should not be pulled

*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

## Delivery Contents

- PA12
- **Packaging:** plastic bag



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