

# Photoelectrics Background Suppression Type PD112CNB25BP..

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- Range: 2500 mm
- Accurate & stable distance adjustment
- Modulated, infrared light 850 nm
- Supply voltage: 10 to 30 VDC
- Output: 200 mA, NPN or PNP preset
- Make or break switching function selectable
- Adjustable ON- / OFF delay, 1 – 16 sec.
- LED indication for output and power ON
- Protection: reverse polarity, short circuit and transients
- Cable and plug versions
- Excellent EMC performance
- Remote test feature (mute)



## Product Description

The PD112CNB25 sensor comes in a 112 x 45 x 25 mm strong polycarbonate (PC) housing. The sensors are useful in applications where long range and high accuracy detection is required. Robust housing, a sophisticated mechanical design and high power LED for excellent performance in harsh environments. The sensor has a test input, for door mode, designed to

remotely disable (mute) the emitter and thereby evaluate the sensor function from a door controller or e.g. a PLC. The output type is preset (NPN and PNP) with selectable switching function NO/NC. 2 selectable modes are built in: "Industrial" for general automation and "Door" specifically for control of doors & gates.

## Ordering Key

**PD112CNB25BPM1**

|                      |       |
|----------------------|-------|
| Type                 | _____ |
| Housing style        | _____ |
| Housing size         | _____ |
| Housing material     | _____ |
| Housing length       | _____ |
| Detection principle  | _____ |
| Sensing distance     | _____ |
| Output type          | _____ |
| Output configuration | _____ |
| Connection type      | _____ |

## Type Selection

| Housing<br>W x H x D | Range<br>S <sub>n</sub> | Connection | Ordering no.<br>NPN and PNP<br>Make or break switching |
|----------------------|-------------------------|------------|--------------------------------------------------------|
| 25 x 107.5 x 45 mm   | 500 - 2500 mm           | Cable      | <b>PD 112 CNB 25 BP</b>                                |
| 25 x 107.5 x 45 mm   | 500 - 2500 mm           | Plug       | <b>PD 112 CNB 25 BPM1</b>                              |

## Specifications

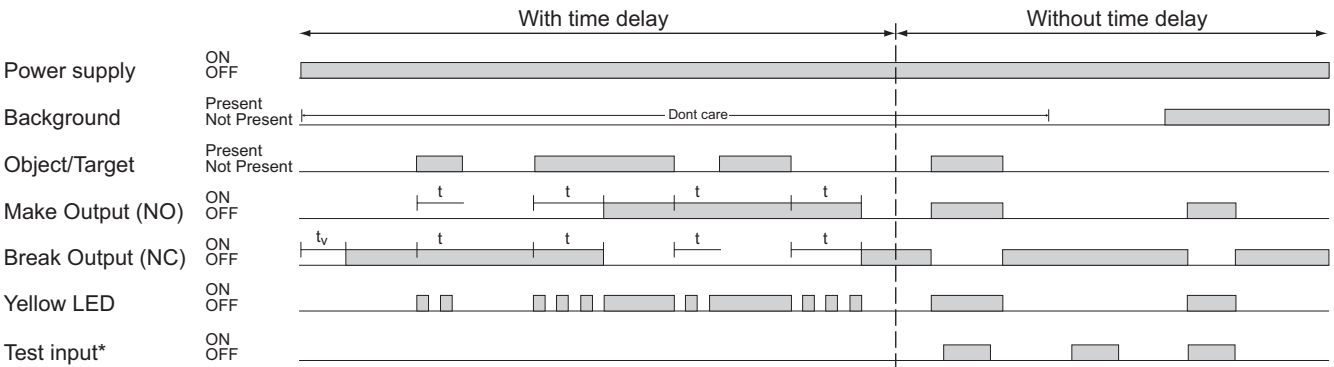
|                                                    |                                                                                          |                                       |                          |
|----------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------|--------------------------|
| <b>Rated operating distance (S<sub>n</sub>)</b>    | 50 to 2500 mm, reference target Kodak test card R27, white, 90% reflective, 200 x 200 mm | <b>Light type</b>                     | Infrared, modulated      |
| <b>Background adjustment</b>                       | 500 to 2500 mm (28 turns calibration screw)                                              | <b>Sensing angle</b>                  | Industry<br>Door         |
| <b>Blind zone</b>                                  | 50 mm                                                                                    |                                       | ± 1.9°<br>± 2.6°         |
| <b>Temperature drift</b>                           | ≤ 0.2%/°C                                                                                | <b>Ambient light</b>                  | 10,000 lux               |
| <b>Rated operational volt. (U<sub>B</sub>)</b>     | 10 to 30 VDC (ripple included)                                                           | <b>Light spot</b>                     | 60 mm @ 1.5 m            |
| <b>Ripple (U<sub>ripple</sub>)</b>                 | ≤ 10%                                                                                    | <b>Operating frequency</b>            | Industry<br>Door         |
| <b>Output current</b>                              |                                                                                          |                                       | 250 Hz<br>16.7 Hz        |
| Continuous (I <sub>a</sub> )                       | ≤ 200 mA (max. load capacity 100 nF)                                                     | <b>Response time</b>                  |                          |
| <b>No load supply current (I<sub>o</sub>)</b>      | ≤ 40 mA @ 24 VDC                                                                         | OFF-ON (t <sub>ON</sub> )             | Industry ≤ 2 ms          |
| <b>Minimum operational current (I<sub>m</sub>)</b> | 0.5 mA                                                                                   | ON-OFF (t <sub>OFF</sub> )            | Industry ≤ 2 ms          |
| <b>OFF-state current (I<sub>r</sub>)</b>           | ≤ 100 µA                                                                                 | OFF-ON (t <sub>ON</sub> )             | Door ≤ 30 ms             |
| <b>Voltage drop (U<sub>d</sub>)</b>                | ≤ 2.5VDC @ 200 mA                                                                        | ON-OFF (t <sub>OFF</sub> )            | Door ≤ 30 ms             |
| <b>Protection</b>                                  | Short-circuit, reverse polarity and transients                                           | <b>Power ON delay (t<sub>v</sub>)</b> | ≤ 50 ms                  |
| <b>Light source</b>                                | GaAlAs, LED, 850 nm                                                                      | <b>Output delay</b>                   |                          |
|                                                    |                                                                                          | ON-delay                              | 1-16 s                   |
|                                                    |                                                                                          | OFF-delay                             | 1-16 s                   |
|                                                    |                                                                                          | <b>Output function</b>                |                          |
|                                                    |                                                                                          | NPN and PNP                           | Preset                   |
|                                                    |                                                                                          | NO/NC switching function              | Selectable by DIP switch |



Specifications (cont.)

|                                                              |                                                                                                 |                                          |                                                                                        |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------|
| <b>Test input</b><br>Door mode<br>Emitter off (voltagelevel) | < 1 VDC, NPN<br>(No pull-up resistor) or<br>> 9 VDC PNP<br>(No pull-down resistor)<br>< 3 mA DC | <b>Vibration</b>                         | 10 to 150 Hz, 0.5 mm/7.5 g<br>(IEC 60068-2-6)                                          |
| Input current<br>Industrial mode                             | Not available                                                                                   | <b>Shock</b>                             | 2 x 1 m, 100 x 500 mm<br>(IEC 60068-2-32)                                              |
| <b>Indication</b><br>Output ON<br>Power ON                   | LED, yellow<br>LED, green                                                                       | <b>Rated insulation voltage</b>          | 2 kV (rms)                                                                             |
| <b>Environment</b><br>Installation category                  | III (IEC 60664/60664A;<br>60947-1)                                                              | <b>Housing material</b><br>Body<br>Cover | PC (polycarbonate), black<br>PC (polycarbonate), clear                                 |
| Pollution degree                                             | 3 (IEC 60664/60664A;<br>60947-1)                                                                | <b>Connection</b><br>Cable               | PVC, black, 2 m<br>5 x 0.34 mm <sup>2</sup> , Ø = 5.2 mm<br>M12, 5-pin (CONB15-series) |
| Degree of protection                                         | IP 67 (IEC 60529; 60947-1)                                                                      | Plug                                     |                                                                                        |
| <b>Ambient temperature</b><br>Operating<br>Storage           | -25° to +55°C (-13° to +131°F)<br>-25° to +80°C (-13° to +176°F)                                | <b>Weight</b>                            | With cable: 160 g<br>With plug: 80 g                                                   |
|                                                              |                                                                                                 | <b>CE-marking</b>                        | Yes                                                                                    |
|                                                              |                                                                                                 | <b>Approvals</b>                         | cULus (UL508)                                                                          |

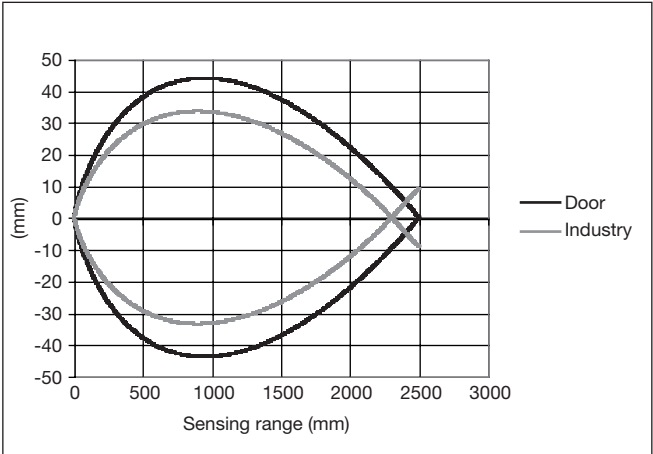
Operation Diagram



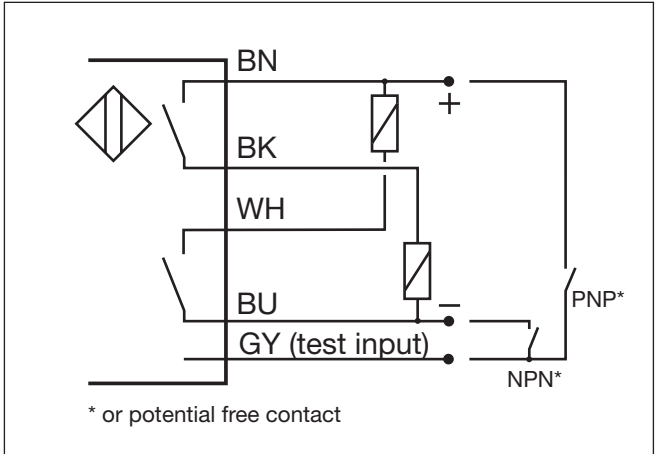
t<sub>v</sub> = Power on delay, t = Time delay (delay on operate and delay on release)

\* Only active in Door Mode

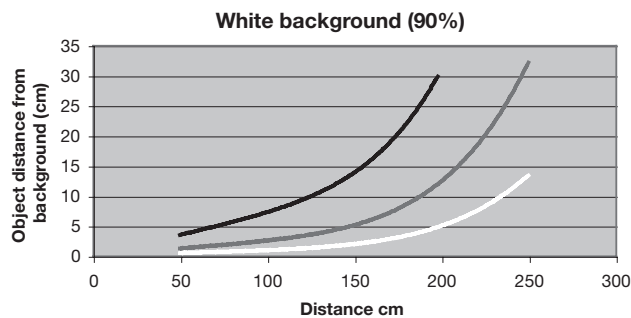
Detection Diagram



Wiring Diagrams

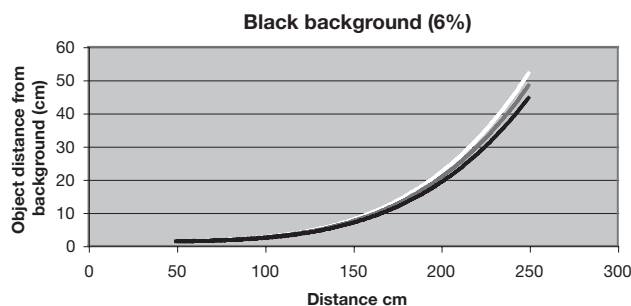


## Sensing Conditions "Industrial" mode

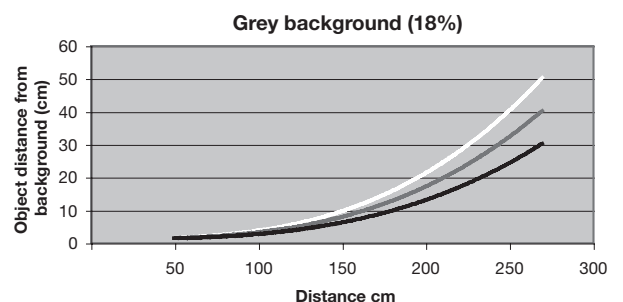
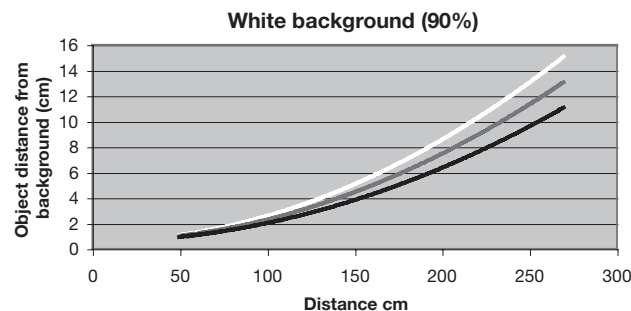


In this mode the maximum operating frequency is set to 250 Hz and detection is optimized for objects close to the background for top performance in general industry automation applications such as pallet wrapping machines, airport baggage conveyors, wood planks handling/stacking.

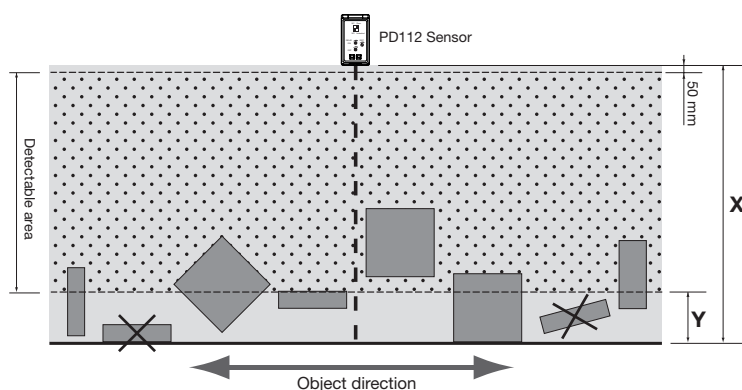
## Sensing Conditions "Door" mode



In this mode various parameters are optimized for monitoring and control of doors, from a position above the door/in the ceiling. Maximum operating frequency is set to 16.7 Hz, adapting to moving persons, and the test input – for evaluation of the sensor functioning through muting of the emitter – is enabled for use by a door controller or e.g. a PLC.



## Detection Principle



- X** = Distance to background
- Y** = Object distance (min.) from background
- = Detectable objects
- = Not detectable objects

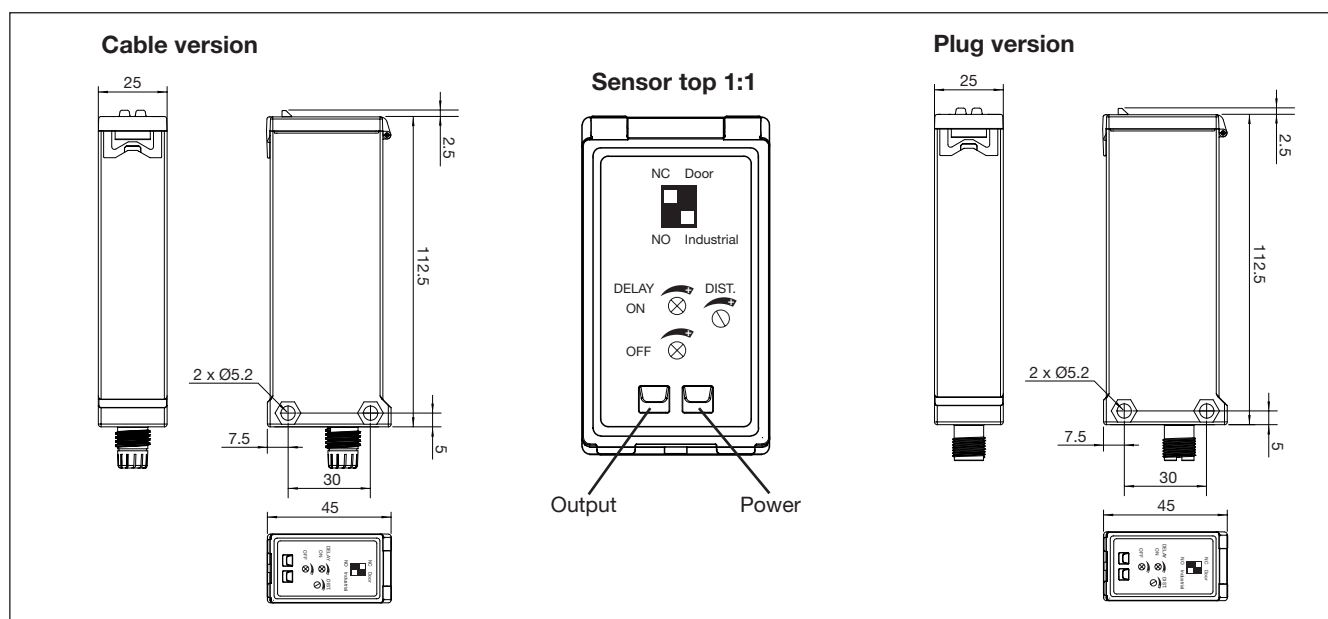
## Adjustment

### Background suppression adjustment\*

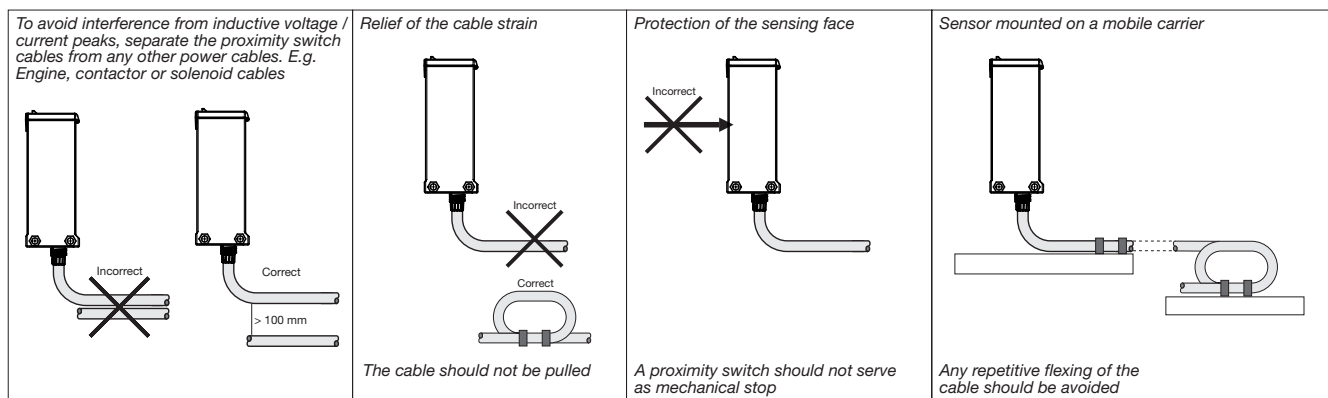
1. Align the sensor at the background
  2. Turn distance calibration screw (28 turns) clockwise until yellow led is ON
  3. Turn distance calibration screw (28 turns) counter clockwise until yellow led turns OFF
  4. Background is now neglected
- Object detection adjustment  
 \*If no background exists a white cardboard can be used as background.

1. Align the sensor at the background
2. Turn distance calibration screw (28 turns) counter clockwise until yellow led turns OFF
3. Turn distance calibration screw (28 turns) clockwise until yellow led turns ON
4. The object can now be detected

## Dimensions (mm)



## Installation Hints



## Delivery Contents

- Photoelectric switch: PD 112 CNB 25 BP..
- Screwdriver for adjustment: 77-005
- Installation instruction
- **Packaging:** Cardboard box

## Accessories

- Connector type CONB15NF... series