Photoelectrics
Background Suppression
Type PD112CNB25BP..

CARLO GAVAZZI



- **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 W x H x D	Range S_n	Connection	Ordering no. NPN and PNP Make or break switching
25 x 107.5 x45 mm	500 - 2500 mm	Cable	**PD 112 CNB 25 BP**
25 x 107.5 x45 mm	500 - 2500 mm	Plug	**PD 112 CNB 25 BPM1**

Specifications

Rated operating distance (S_n)	50 to 2500 mm, referece target Kodak test card R27, white, 90% reflective, 200 x 200 mm
Background adjustment	500 to 2500 mm (28 turns calibration screw)
Blind zone	50 mm
Temperature drift	≤ 0.2%/°C
Rated operational volt. (U_B)	10 to 30 VDC (ripple included)
Ripple (U_{rpp})	≤ 10%
Output current Continuous (I_e)	≤ 200 mA (max. load capacity 100 nF)
No load supply current (I_o)	≤ 40 mA @ 24 VDC
Minimum operational current (I_m)	0.5 mA
OFF-state current (I_r)	≤ 100 µA
Voltage drop (U_d)	≤ 2.5VDC @ 200 mA
Protection	Short-circuit, reverse polarity and transients
Light source	GaAlAs, LED, 850 nm

Light type		Infrared, modulated
Sensing angle		
Industry		± 1.9°
Door		± 2.6°
Ambient light		10,000 lux
Light spot		60 mm @ 1.5 m
Operating frequency		
	Industry	250 Hz
	Door	16.7 Hz
Response time		
OFF-ON (t_{ON})	Industry	≤ 2 ms
ON-OFF (t_{OFF})	Industry	≤ 2 ms
OFF-ON (t_{ON})	Door	≤ 30 ms
ON-OFF (t_{OFF})	Door	≤ 30 ms
Power ON delay (t_v)		≤ 50 ms
Output delay		
ON-delay		1-16 s
OFF-delay		1-16 s
Output function		
NPN and PNP		Preset
NO/NC switching function		Selectable by DIP switch

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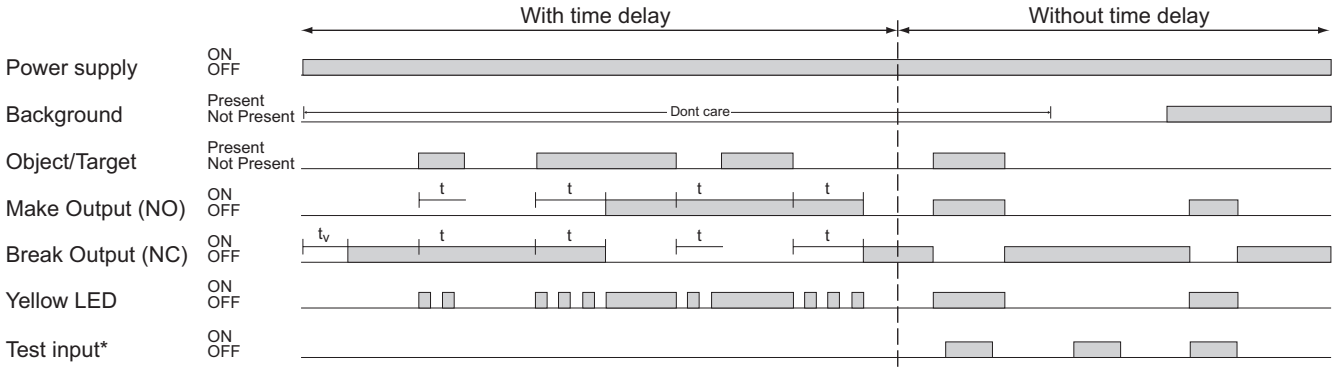
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Specifications (cont.)

Test input	
Door mode	
Emitter off (voltagelevel)	< 1 VDC, NPN (No pull-up resistor) or > 9 VDC PNP (No pull-down resistor)
Input current	< 3 mA DC
Industrial mode	Not avaliable
Indication	
Output ON	LED, yellow
Power ON	LED, green
Environment	
Installation category	III (IEC 60664/60664A; 60947-1)
Pollution degree	3 (IEC 60664/60664A; 60947-1)
Degree of protection	IP 67 (IEC 60529; 60947-1)
Ambient temperature	
Operating	-25° to +55°C (-13° to +131°F)
Storage	-25° to +80°C (-13° to +176°F)

Vibration	10 to 150 Hz, 0.5 mm/7.5 g (IEC 60068-2-6)
Shock	2 x 1 m, 100 x 500 mm (IEC 60068-2-32)
Rated insulation voltage	2 kV (rms)
Housing material	
Body	PC (polycarbonate), black
Cover	PC (polycarbonate), clear
Connection	
Cable	PVC, black, 2 m 5 x 0.34 mm², Ø = 5.2 mm
Plug	M12, 5-pin (CON.15NF..series)
Weight	With cable: 160 g With plug: 80 g
CE-marking	Yes
Approvals	cULus (UL508)

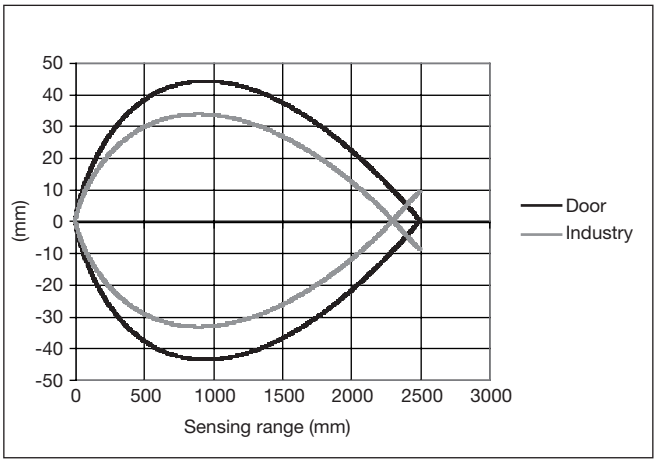
Operation Diagram



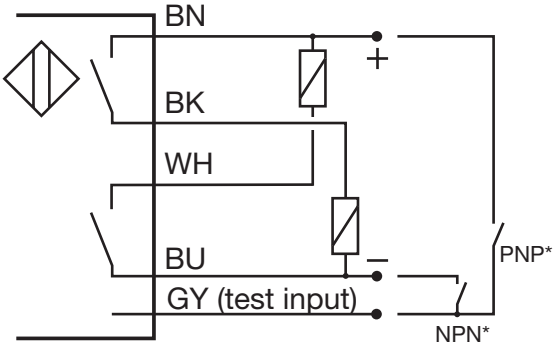
t_v = Power on delay, t = Time delay (delay on operate and delay on release)

* Only active in Door Mode

Detection Diagram



Wiring Diagrams

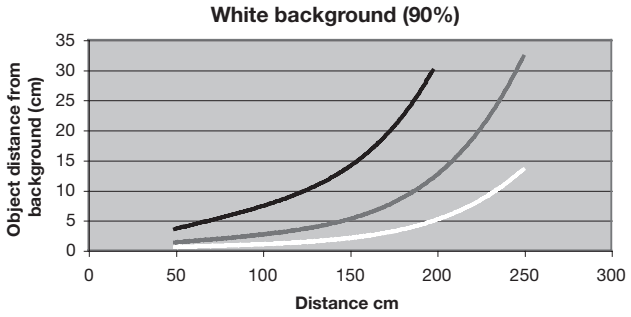


* or potential free contact

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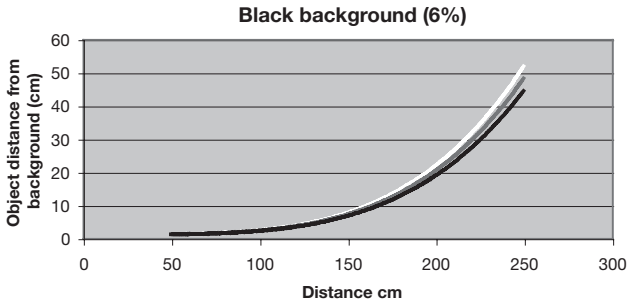
Sensing Conditions “Industrial” mode



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.

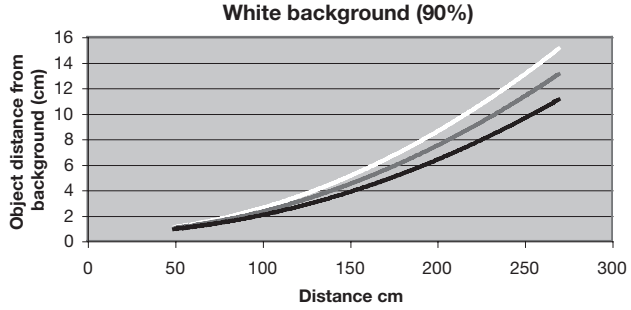
White object (90%)
Grey object (18%)
Black object (6%)

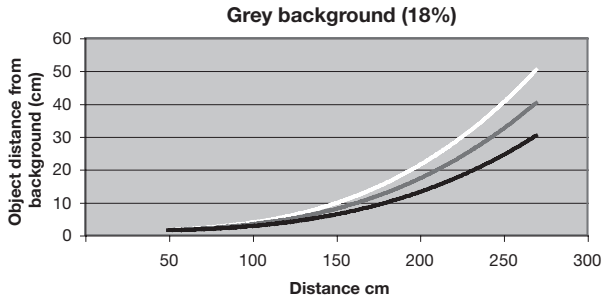
Sensing Conditions “Door” mode



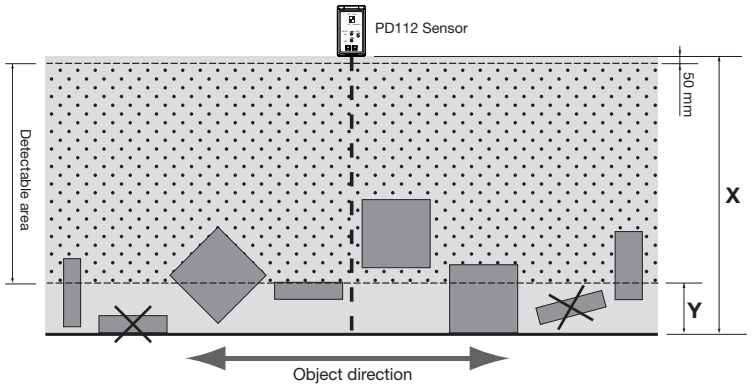
In this mode various parameters are optimized for monitoring and control of doors, from a position above the door/in the ceiling. Maximum operating frequency is set to 16.7 Hz, adapting to moving persons, and the test input – for evaluation of the sensor functioning through muting of the emitter – is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

White object (90%)
Grey object (18%)
Black object (6%)





Detection Principle



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

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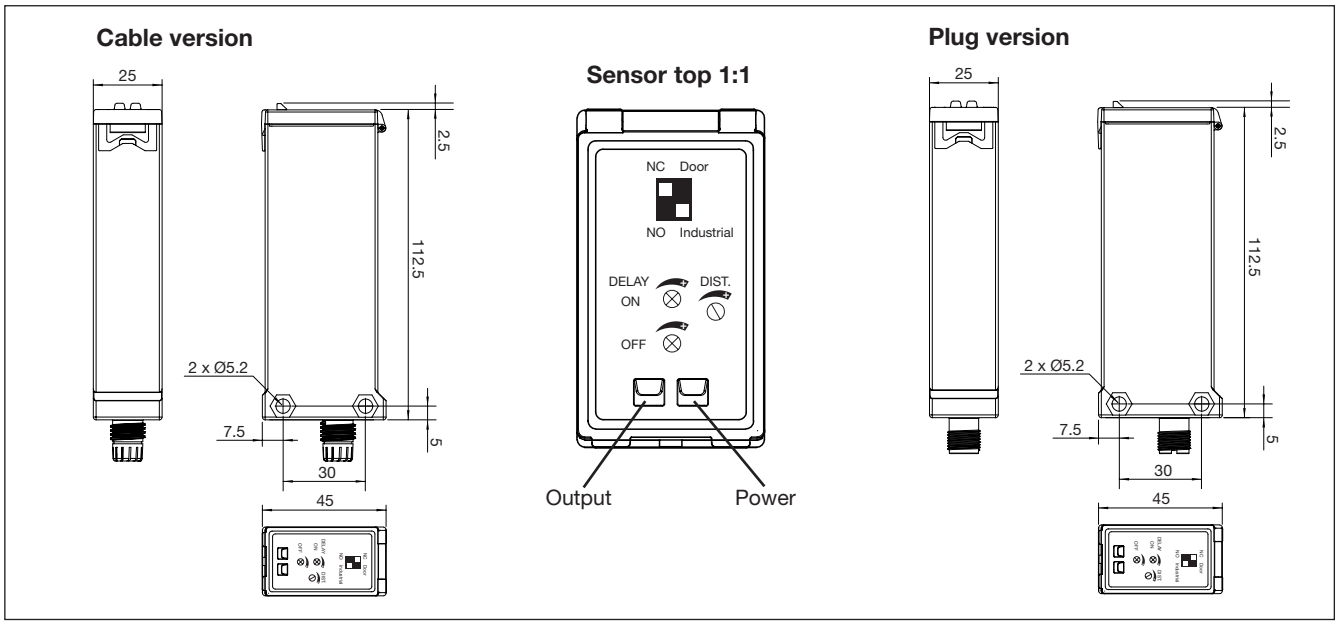
Adjustment

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
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

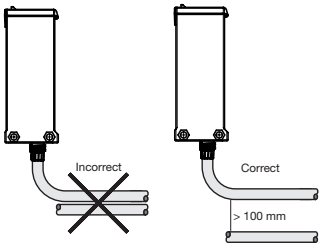
*If no background exists a white cardboard can be used as background.

Dimensions (mm)

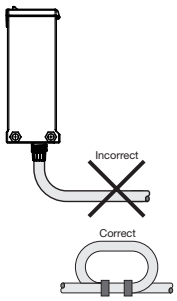


Installation Hints

To avoid interference from inductive voltage / current peaks, separate the proximity switch cables from any other power cables. E.g. Engine, contactor or solenoid cables

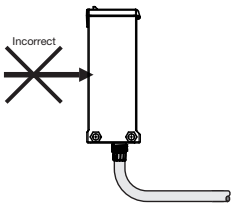


Relief of the cable strain



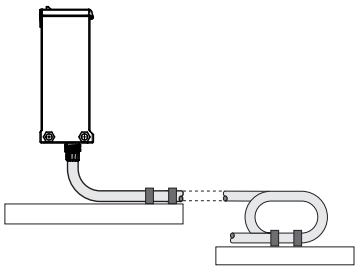
The cable should not be pulled

Protection of the sensing face



A proximity switch should not serve as mechanical stop

Sensor mounted on a mobile carrier



Any repetitive flexing of the cable should be avoided

Delivery Contents

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

Accessories

- Connector type CON.15NF.. series

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