

# Photoelectrics

## Diffuse-reflective, Background Suppression

### Type PD30CNB15....RT

CARLO GAVAZZI



- Miniature sensor range
- Range: 150 mm
- Sensitivity adjustment by Teach-In programming
- Modulated, red light 660 nm
- Supply voltage: 10 to 30 VDC
- Output: 100 mA, NPN or PNP preset
- Make or break switching function programmable
- LED indication for output, stability and power ON
- Protection: reverse polarity, short circuit and transients
- Cable and plug versions
- Excellent EMC performance
- Remote teach features



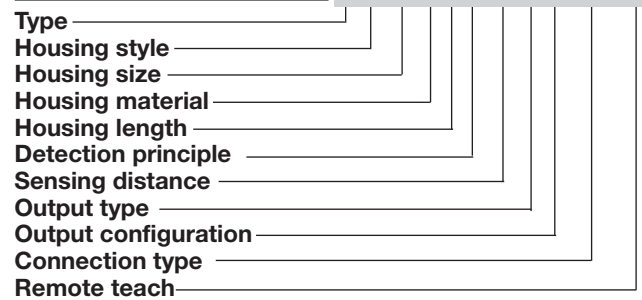
## Product Description

The PD30CNB15 sensor family comes in a compact 10 x 30 x 20 mm reinforced PMMA/ABS housing. The sensors are useful in applications where high-accuracy detection as well as small size is required. Compact housing and high power LED for excellent performance-size ratio.

The Teach-In function for adjustment of the sensitivity makes the sensors highly flexible. The output type is preset (NPN or PNP), and the output switching function is NO or NC output. A remote teach feature allow the sensor to be set up from e.g. a PLC.

## Ordering Key

PD30CNB15PPM5RT



## Type Selection

Housing W x H x D	Range S <sub>n</sub>	Connection	Ordering no. NPN Make or break switching	Ordering no. PNP Make or break switching
10 x 30 x 20 mm	150 m m	Cable	PD 30 CNB 15 NPRT	PD 30 CNB 15 PPRT
10 x 30 x 20 mm	150 m m	Plug	PD 30 CNB 15 NPM5RT	PD 30 CNB 15 PPM5RT

## Specifications

<b>Rated operating distance (S<sub>n</sub>)</b>	Up to 150 mm, reference target Kodak test card R27, white, 90% reflective, 200 x 200 mm	<b>Light source</b>	GaAlAs, LED, 660 nm
<b>Blind zone</b>	30 mm	<b>Light type</b>	Red, modulated
<b>Sensitivity</b>	Adjustable by Teach-In	<b>Sensing angle</b>	± 2°
<b>Temperature drift</b>	≤ 0.2%/°C	<b>Ambient light</b>	10,000 lux
<b>Hysteresis (H)</b>		<b>Light spot</b>	110 mm @ 1.5 m
90% White	< 10%	<b>Operating frequency</b>	1000 Hz
18% Grey	< 15%	<b>Response time</b>	
<b>Rated operational volt. (U<sub>B</sub>)</b>	10 to 30 VDC (ripple included)	OFF-ON (t <sub>ON</sub> )	≤ 0.5 ms
<b>Ripple (U<sub>rpp</sub>)</b>	≤ 10%	ON-OFF (t <sub>OFF</sub> )	≤ 0.5 ms
<b>Output current</b>		<b>Power ON delay (t<sub>v</sub>)</b>	≤ 400 ms
Continuous (I <sub>a</sub> )	≤ 100 mA	<b>Output function</b>	
Short-time (I)	≤ 100 mA (max. load capacity 100 nF)	NPN and PNP	Preset
<b>No load supply current (I<sub>o</sub>)</b>	≤ 32 mA @ 24 VDC	NO/NC switching function	Set up by button
<b>Minimum operational current (I<sub>m</sub>)</b>	0.5 mA	<b>Remote teach function</b>	
<b>OFF-state current (I<sub>r</sub>)</b>	≤ 100 μA	Teach on	0 to 2.5 VDC (NPN)
<b>Voltage drop (U<sub>d</sub>)</b>	≤ 2.4 VDC @ 100 mA	Tamper proof	5 to 30 VDC (PNP)
<b>Protection</b>	Short-circuit, reverse polarity and transients		When activated more than 20 sec. the sensor goes into a Tamper proof mode.
		<b>Indication</b>	
		Output ON	LED, yellow
		Signal stability ON and power ON	LED, green

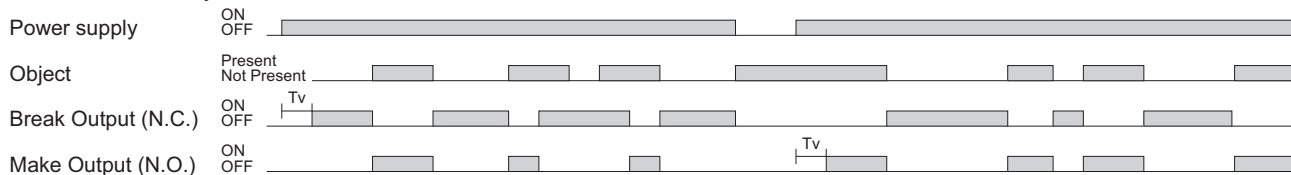


## Specifications (cont.)

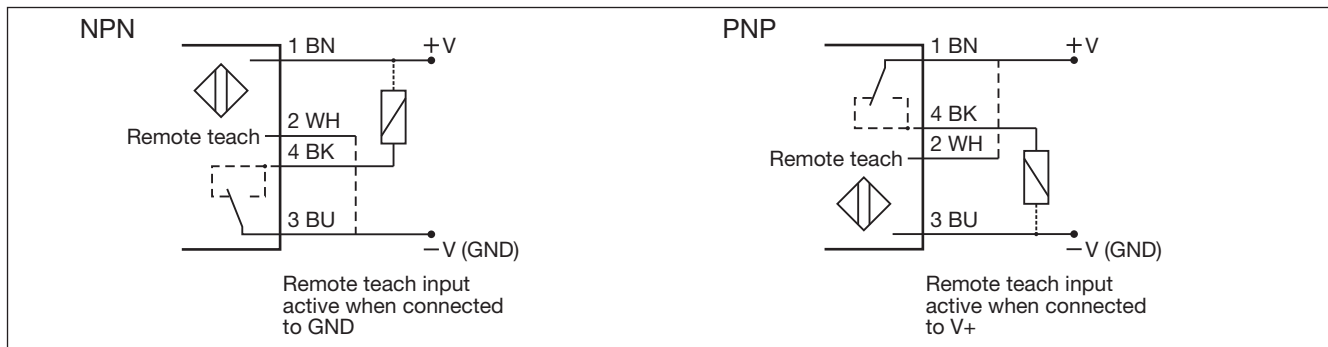
<b>Environment</b>		<b>Rated insulation voltage</b>	500 VAC (rms)
Installation category	III (IEC 60664/60664A; 60947-1)	<b>Housing material</b>	
Pollution degree	3 (IEC 60664/60664A; 60947-1)	Body	ABS
Degree of protection	IP 67 (IEC 60529; 60947-1)	Front material	PMMA, red
<b>Ambient temperature</b>		<b>Connection</b>	
Operating	-25° to +55°C (-13° to +131°F)	Cable	PVC, black, 2 m 4 x 0.14 mm <sup>2</sup> , Ø = 3.3 mm M8, 4-pin (CON. 54-series)
Storage	-40° to +70°C (-40° to +158°F)	Plug	
<b>Vibration</b>	10 to 55 Hz, 0.5 mm/7.5 g (IEC 60068-2-6)	<b>Weight</b>	With cable: 40 g With plug: 10 g
<b>Shock</b>	30 g / 11ms, 3 pos, 3 neg per axis (IEC 60068-2-6, 60068-2-32)	<b>CE-marking</b>	Yes
		<b>Approvals</b>	cULus (UL508)

## Operation Diagram

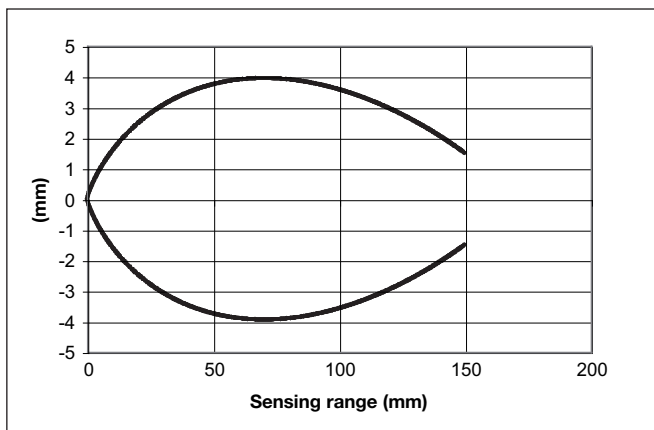
tv = Power ON delay



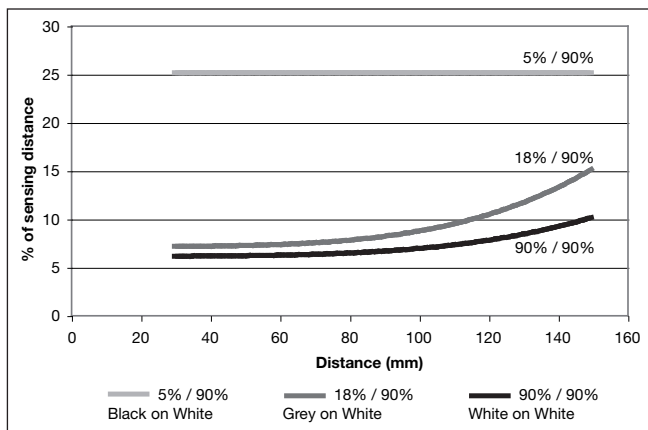
## Wiring Diagrams



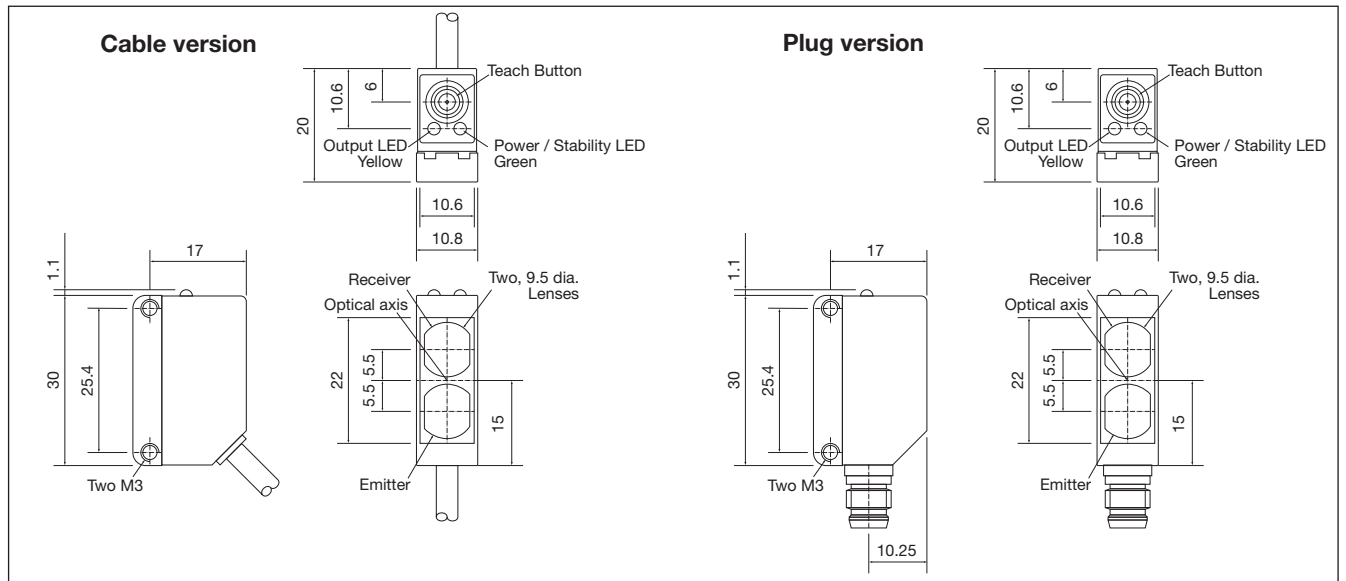
## Detection Diagram



## Sensing Conditions



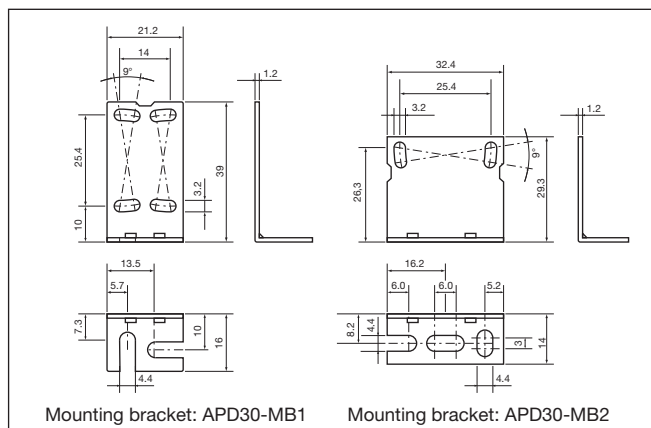
## Dimensions



## Installation Hints

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



- Mounting bracket APD30-MB2 to be purchased separately
- Connector type CONG 5A./CON. 54NF. series.

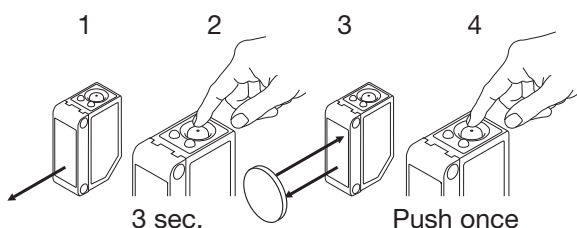
## Delivery Contents

- Photoelectric switch: PD 30 CNB 15 ...
- Installation instruction
- Mounting bracket APD30-MB1
- **Packaging:** Cardboard box

## Teach functions

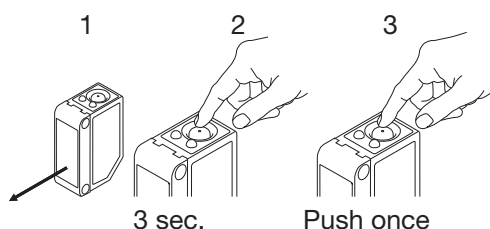
### Normal operation, optimized switching point.

1. Line up the sensor at the background. Yellow LED is not important and Green LED is ON.
2. Press the button for 3 seconds until both LEDs flashes simultaneously.  
(The first switch point is stored)
3. Place the object in the detection zone.
4. Press the button once and the sensor is ready to operate (Green LED ON, Yellow LED ON)  
(The second switch point is stored)
  - a) if the object is too close to the background the sensor will teach both background and object as object.



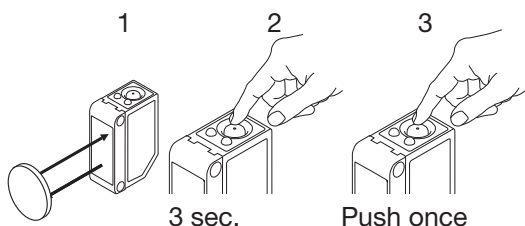
### For maximum sensing distance (default setting)

1. Line up the sensor without a background. Yellow LED is not important and Green LED is ON.
2. Press the button for 3 seconds until both LEDs flashes simultaneously.  
(The first switch point is stored)
3. Press the button a second time and the sensor is ready to operate (Green LED ON, Yellow LED ON)  
(The second switch point is stored)



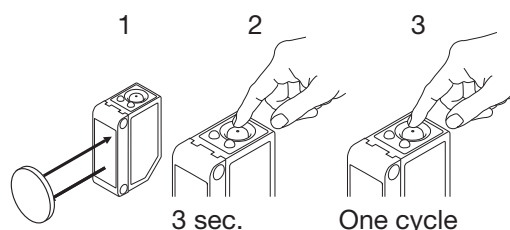
### For minimum sensing distance

1. Line up the sensor at the object. Yellow LED is not important and Green LED is ON.
2. Press the button for 3 seconds until both LEDs flashes simultaneously.  
(The first switch point is stored)
3. Press the button a second time and the sensor is ready to operate (Green LED ON, Yellow LED ON)  
(The second switch point is stored)



### For dynamic set-up (running process)

1. Line up the sensor at the object. Green LED is ON, status on the yellow LED is not important.
2. Press the button for 3 seconds until both LEDs flashes simultaneously.
3. Press the button a second time for at least one second, both LEDs flash simultaneously and keep the button pressed for at least one process cycle, release the button and the sensor is ready to operate (The second switch point is stored)



### For make or break set-up (N.O. or N.C.)

1. Press the button for 10 seconds, until the green LEDs flashes.
2. While the green LED flashes, the output is inverted each time the button is pressed. Yellow LED indicates N.O. function selected.  
If the button is not pressed within the next 10 seconds, the current output is stored.

