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# Photoelectrics

## Retro-reflective for Transparent Objects

### Type PD30CNG02....RT

CARLO GAVAZZI



- Miniature sensor range
- Range: 2 m, with reflector
- Sensitivity adjustment by Teach-In programming
- Modulated, red light 617 nm
- Supply voltage: 10 to 30 VDC
- Output: 100 mA, NPN or PNP preset
- Make and 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



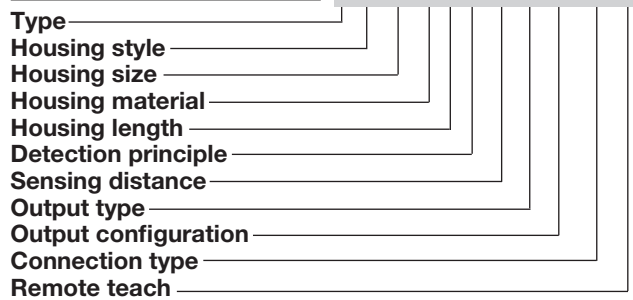
## Product Description

The PD30CNG02 sensor family comes in a compact 10 x 30 x 20 mm reinforced PMMA/ABS housing. The sensors are useful in applications where detection of transparent objects are needed. 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 programmable (NO or NC). A remote teach feature allow the sensor to be set up from e.g. a PLC.

## Ordering Key

PD30CNG02PPM5RT



## 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	2 m	Cable	PD 30 CNG 02 NPRT	PD 30 CNG 02 PPRT
10 x 30 x 20 mm	2 m	Plug	PD 30 CNG 02 NPM5RT	PD 30 CNG 02 PPM5RT

**Note:** Reflectors to be ordered separately

## Specifications EN 60947-5-2

<b>Rated operating distance (S<sub>n</sub>)</b>	Up to 2 m, with reflector Ø 80 mm (ER4)	<b>Light source</b>	inGaAlP, LED, 617 nm
<b>Detection reliability</b>	20% attenuation	<b>Light type, not polarized</b>	Red, modulated
<b>Blind zone</b>	10 mm	<b>Sensing angle</b>	± 2°
<b>Sensitivity</b>	Adjustable by Teach-In	<b>Ambient light</b>	10,000 lux
<b>Temperature drift</b>	≤ 0.1%/°C Teach settings are valid for teach temperature ± 20°C	<b>Light spot</b>	110 mm @ 1.5 m
<b>Hysteresis (H) (differential travel)</b>	≤ 10%	<b>Operating frequency</b>	1000 Hz
<b>Rated operational volt. (U<sub>B</sub>)</b>	10 to 30 VDC (ripple included)	<b>Response time</b>	
<b>Ripple (U<sub>rpp</sub>)</b>	≤ 10%	OFF-ON (t <sub>ON</sub> )	≤ 0.5 ms
<b>Output current</b>		ON-OFF (t <sub>OFF</sub> )	≤ 0.5 ms
Continuous (I <sub>a</sub> )	≤ 100 mA	<b>Power ON delay (t<sub>v</sub>)</b>	≤ 300 ms
Short-time (I)	≤ 100 mA (max. load capacity 100 nF)	<b>Output function</b>	
<b>No load supply current (I<sub>o</sub>)</b>	≤ 30 mA @ 24 VDC	NPN and PNP	Preset
<b>Minimum operational current (I<sub>m</sub>)</b>	0.5 mA	NO/NC switching function	Set up by button
<b>OFF-state current (I<sub>r</sub>)</b>	≤ 100 µA	<b>Remote teach function</b>	
<b>Voltage drop (U<sub>d</sub>)</b>	≤ 2.4 VDC @ 100 mA	Teach on (push button active)	0 to 2.5 VDC (NPN) 5 to 30 VDC (PNP)
<b>Protection</b>	Short-circuit, reverse polarity and transients	Tamper proof	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



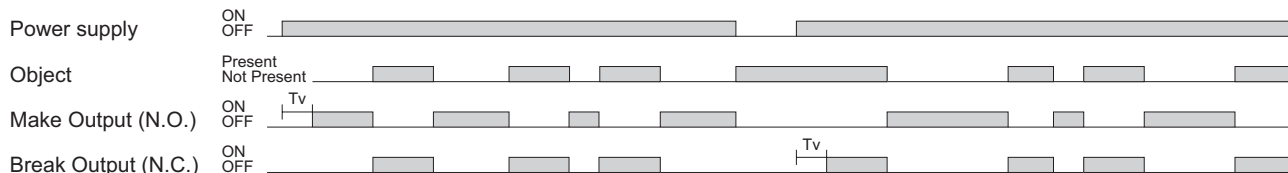


## Specifications (cont.) EN 60947-5-2

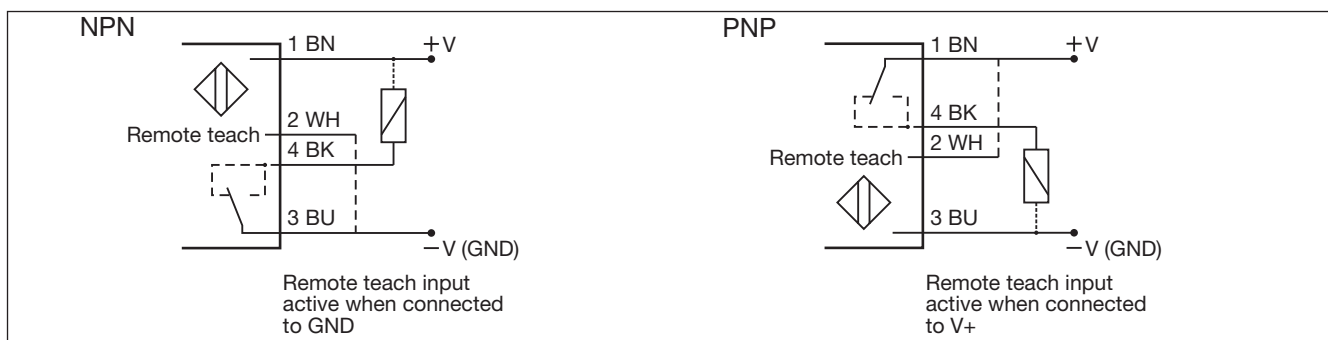
<b>Environment</b>		<b>Rated insulation voltage</b>	500 VAC (rms)
Installation category	III (IEC 60664/60664A; 60947-1)	<b>Housing material</b>	
Pollution degree	3 (IEC 60664/60664A; 60947-1)	Body	ABS
Degree of protection	IP 67 (IEC 60529; 60947-1)	Front material	PMMA, red
<b>Ambient temperature</b>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

## Operation Diagram

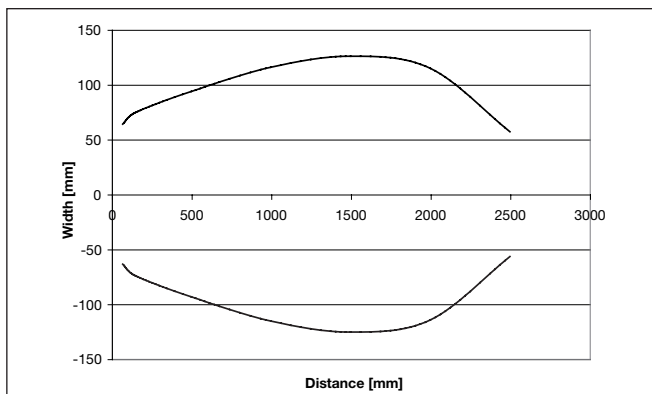
tv = Power ON delay



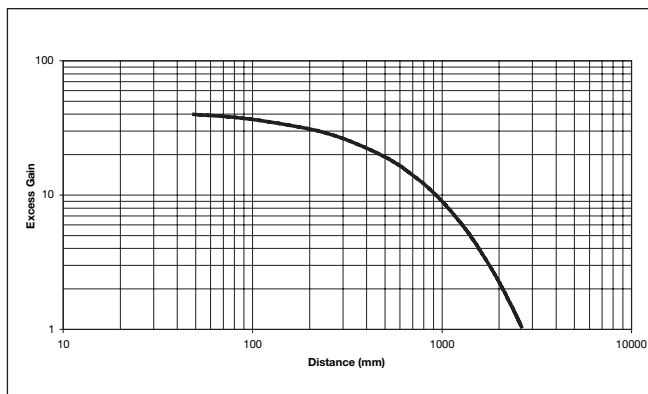
## Wiring Diagrams



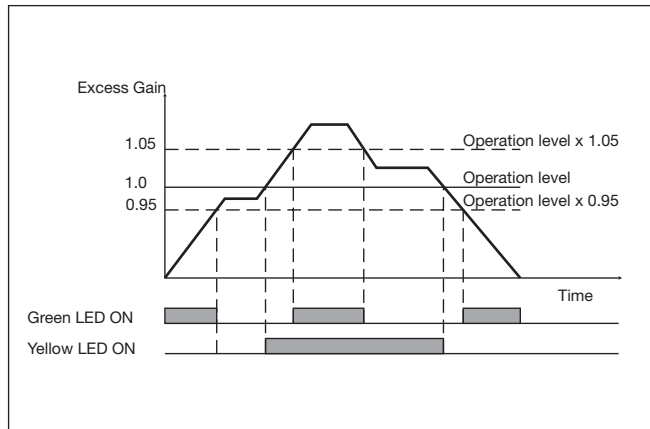
## Detection Diagram



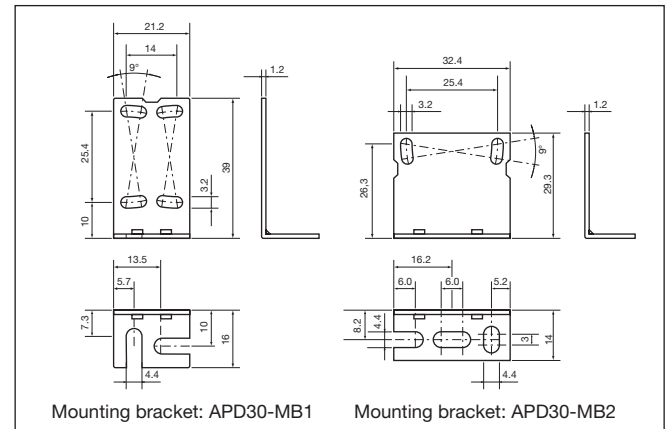
## Excess Gain



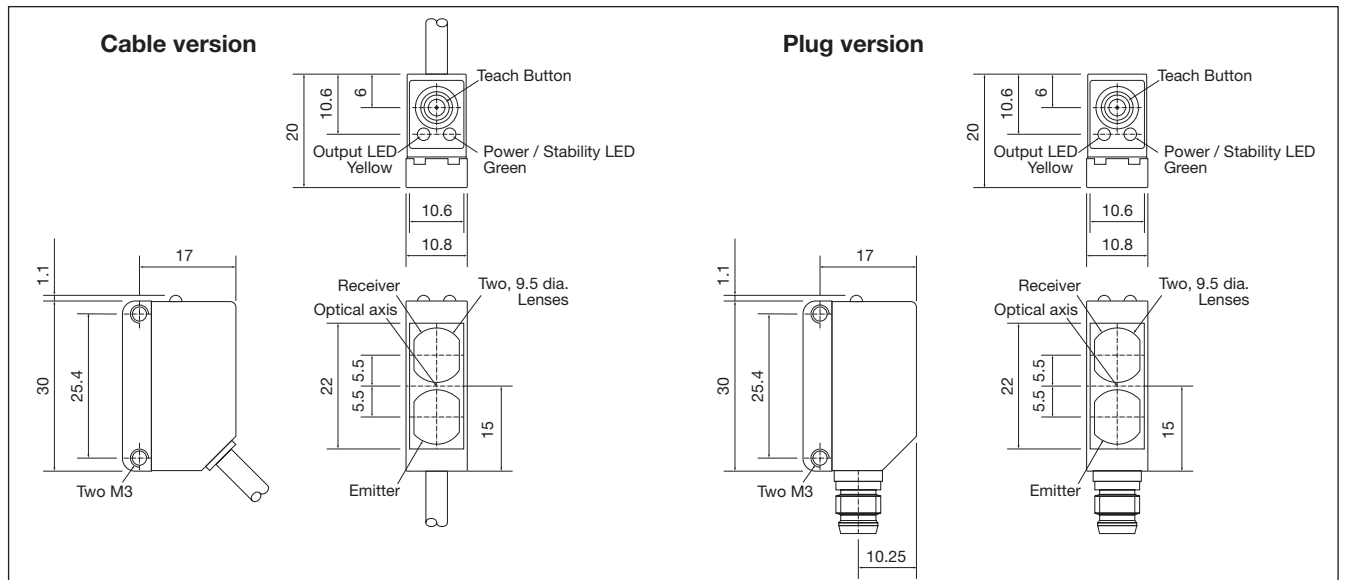
## Signal Stability Indication



## Accessories



## Dimensions



## Installation Hints

<p>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</p> <p>Incorrect Correct &gt; 100 mm</p>	<p>Relief of the cable strain</p> <p>Incorrect Correct</p> <p>The cable should not be pulled</p>	<p>Protection of the sensing face</p> <p>Incorrect</p> <p>A proximity switch should not serve as mechanical stop</p>	<p>Sensor mounted on a mobile carrier</p> <p>Any repetitive flexing of the cable should be avoided</p>
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## Delivery Contents

- Photoelectric switch: PD 30 CNG 02...RT
- Installation instruction
- Mounting bracket APD30-MB1
- **Packaging:** Cardboard box

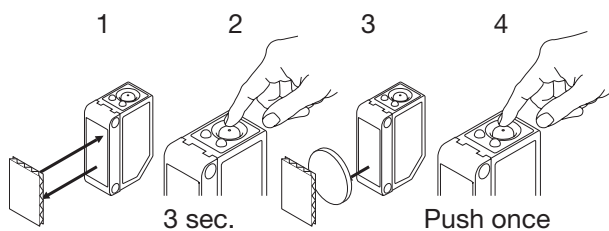
## Accessories

- Reflector is to be purchased separately
- Mounting bracket APD30-MB2 to be purchased separately

## Teach functions

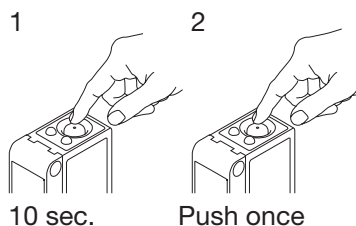
### Normal operation, optimized switching point.

1. Line up the sensor with the reflector. Yellow LED and Green LED are ON.
2. Press the button for 3 seconds until both LEDs flashes simultaneously.  
(The first switch point is stored)
3. Place the object between the sensor and reflector 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)



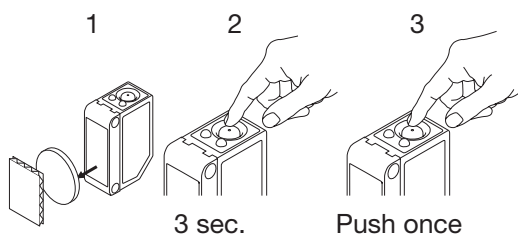
### For make or break set-up (N.O. or N.C.)

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.



### For maximum sensing distance (default setting)

1. Line up the sensor with the reflector, place a new transparent object between the sensor and reflector in the detection zone. Yellow LED is OFF 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 the most transparent objects

1. Line up the sensor with the reflector. Yellow LED and Green LED are 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)

