

# Photoelectrics

## Diffuse-reflective, Background Suppression

### Type PB 15I

CARLO GAVAZZI



- Range: 0 to 150 mm
- Adjustable background suppression 50 to 150 mm
- Infrared modulated light
- Voltage supply 10 to 30 VDC
- Output NPN or PNP, light and dark switching
- Operating frequency: 1000 Hz
- Protection: Reverse polarity, short-circuit, transients
- ABS housing
- LED output indication

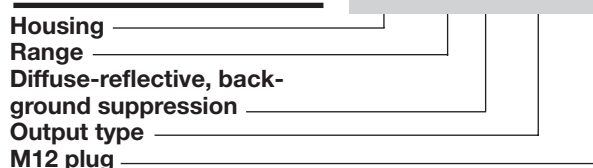


### Product Description

Diffuse-reflective photoelectric switch with high accuracy background suppression down to 0.1 mm. Application range 0 to 150 mm. 1 kHz operating frequency. DC supply voltage. Cable and plug versions. ABS housing.

### Ordering Key

**PB 15 I NPA-1**



### Type Selection

Housing size	Housing material	Ordering no. NPN/cable Make & break switching	Ordering no. NPN/plug Make & break switching	Ordering no. PNP/cable Make & break switching	Ordering no. PNP/plug Make & break switching
36 x 18 x 75	ABS	PB 15I NPA	PB 15I NPA-1	PB 15I PPA	PB 15I PPA-1

### Specifications

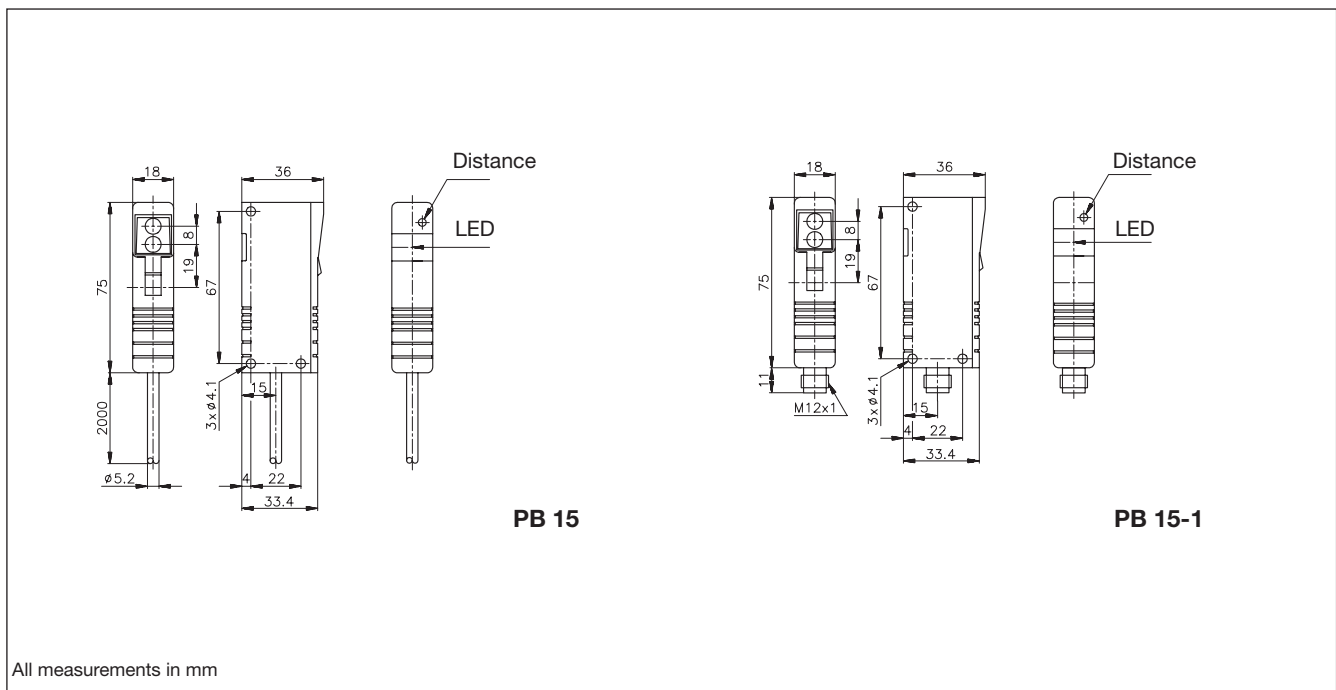
<b>Rated operating dist. (<math>S_n</math>)</b>	0 to 150 mm Reference: Kodak test card R27, white 100 x 100 mm, 90% reflectance	<b>Light source</b> <b>Light type</b> <b>Light spot size</b> <b>Optical angle</b> <b>Ambient light</b>	GaAlAs LED, 880 nm Infrared, modulated 7 mm at 150 mm $\pm 0.85^\circ$ Max. 10,000 lux
<b>Background suppression</b>	Adjustable between 50 - 150 mm	<b>Operating frequency (f)</b> <b>Response time</b>	Max. 1000 Hz OFF - ON ON - OFF
<b>Accuracy</b>	See chart	<b>Power ON delay (<math>t_d</math>)</b>	330 $\mu$ s 660 $\mu$ s
<b>Temperature drift</b>	- 0.1%/°C	<b>Output function</b>	$\leq 130$ ms 4-wire device Make and break switching
<b>Differential travel (H) (Hysteresis)</b>	$\leq 3.3\%$ of sensing distance	<b>Indication</b> Target detected	LED, yellow
<b>Rated operational volt. (<math>U_B</math>)</b>	10 to 30 VDC (ripple incl.)	<b>Environment</b>	Overvoltage category Pollution degree Degree of protection
<b>Ripple (<math>U_{rpp}</math>)</b>	$\leq 20\%$		III (IEC 60664/60664A; 60947-1) 3 (IEC 60664/60664A; 60947-1) IP 67 (IEC 60529; 60947-1)
<b>Output current</b> Continuous ( $I_a$ ) Short-time (I)	$\leq 200$ mA 200 mA max. load capacity 100 nF	<b>Temperature</b>	Operating Storage
<b>No load supply current (<math>I_o</math>)</b>	$\leq 40$ mA		-20° to +60°C (-4° to 140°F) -20° to +60°C (-4° to 140°F)
<b>OFF-state current</b>	$\leq 100$ $\mu$ A	<b>Vibration</b>	10 to 150 Hz, 0.5 mm/7.5 g (IEC 60068-2-6)
<b>Voltage drop (<math>U_d</math>)</b>	$\leq 2.5$ V	<b>Shock</b>	2 x 1 m & 100 x 0.5 m (IEC 60068-2-32)
<b>Protection</b>	Reverse polarity, short-circuit, transients		
<b>Transient voltage</b>	1 kV/0.5 J		
<b>Sensitivity</b>	Fixed		



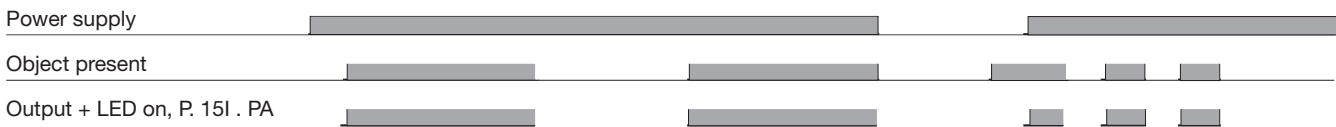
## Specifications (cont.)

<b>Dielectric voltage</b>	500 VAC (rms)	<b>Connection</b>	Black, 2 m, oilproof PVC, 4 x 0.34 mm <sup>2</sup> , Ø 5.2 mm CONH1A-..
<b>Housing material</b>	Glass-filled ABS Glass-filled ABS Acrylic lenses	Cable	
Body			<b>Plug</b>
Front		<b>Weight</b>	
Optics			

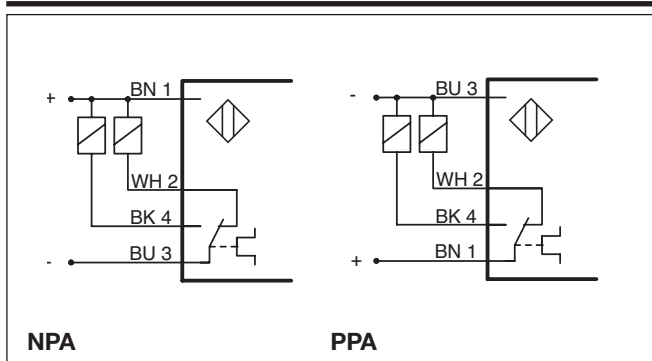
## Dimensions



## Operation Diagram (Make switching function only)



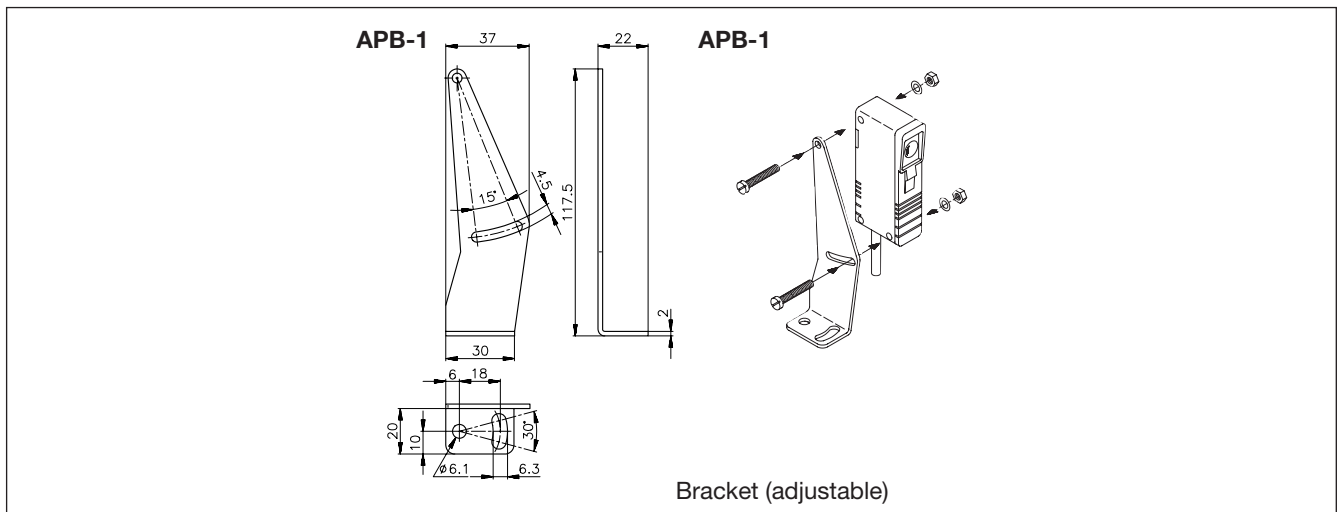
## Wiring Diagrams



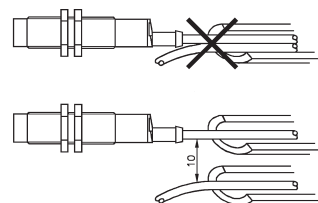
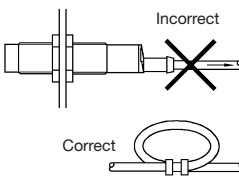
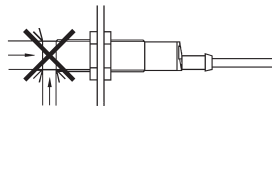
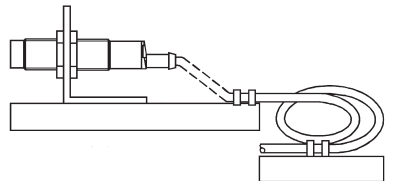
## Truth Table

	Make switching		Break switching	
	No	Yes	No	Yes
Object present	No	Yes	No	Yes
LED	OFF	ON	OFF	ON
Load	Non-act.	Active	Non-act.	Active
Output NPN	High	Low	Low	High
Output PNP	Low	High	High	Low

## Mounting



## Installation Hints

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

Reflectance		Distance of object from sensor		
Object	Background	50 mm	100 mm	150 mm
90%	90%	0.1 mm	0.25 mm	0.6 mm
18 %	18%	0.3 mm	0.4 mm	1.2 mm
18%	90%	1.4 mm	2.0 mm	5.0 mm

## Accessories

- Connector type CON.1A..

## Delivery Contents

- Photoelectric switch: PB 15
- Mounting bracket: PB 15: APB-1
- 2 bolts, 2 nuts and 2 washers (with PB 15)
- Screw driver (77-000)
- Installation instruction
- **Packaging:** Cardboard box

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