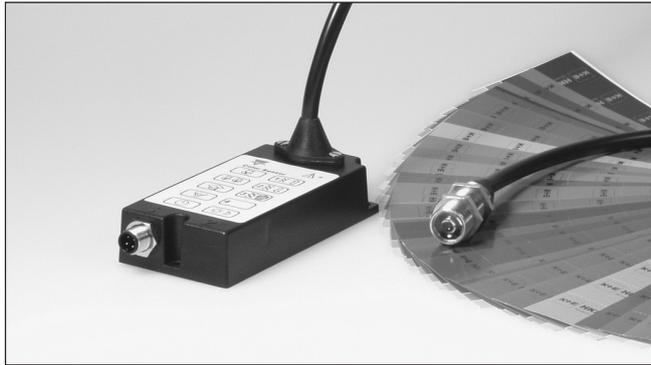


# Photoelectrics, Fibre Optic Sensor Colour Sensor Type PD12CNC0.BPM1T

CARLO GAVAZZI



- Range: From 2 to 60 mm, fibre dependent
- Teach-In (keyboard or remote setup)
- Keyboard lock
- Detection of 1 or 1 to 4 recorded colours
- Microprocessor controlled and EEPROM parameter storage
- Operational voltage 24 V DC
- Output 100 mA, NPN and PNP
- Light or dark switching selectable
- M12 standard plug
- IP65 protection
- Timer: One shot function 0.05 to 5 s



## Product Description

The Colour Sensor is a fibre optic amplifier made specifically for recognition of 1 or 1 to 4 colours. Teaching of the colours is easily performed by means of the "Teach-in" function. Each colour has a separate output which can be delayed up to 5 sec by means

of the built-in timer. The output function can also be programmed to be either NO or NC. The colour sensor is used for detection of coloured labels, marks, tags, wires, liquids, etc.

## Ordering Key

**PD12CNC04BPM1T**

Type	_____
Housing style	_____
Housing size	_____
Housing material	_____
Not used	_____
Colour sensor	_____
Number of channels	_____
Output type	_____
Output configuration	_____
Connection type	_____
Teach-In mode	_____

## Type Selection Amplifier

Housing W x H x D	Range	Ordering no. 1-channel	Ordering no. 4-channel
61 x 115 x 26 mm	2 to 60 mm	PD12CNC01BPM1T	PD12CNC04BPM1T

## Type Selection Fibres

Detection distance	Spot	Cable length	Ordering no.
18 mm	Ø 1.5 mm	1000 mm	FPDC01SCC100
40 - 60 mm	Ø 6.0 mm	1000 mm	FPDC02SCC100
4 - 6 mm	Small tip	1000 mm	FPDC03SCC100
2 - 4 mm	12 mm Needle-nose tip	1000 mm	FPDC04SCC100
2 - 4 mm	40 mm Needle-nose tip	1000 mm	FPDC05SCC100

## Specifications

<b>Detection distance (S<sub>n</sub>)</b>	2 to 60 mm, (fibre-dependent)	<b>Voltage drop (U<sub>d</sub>)</b>	
<b>Analysis type</b>	True RGB analysis	I <sub>L</sub> = 100 mA	≤ 2.2 VDC
<b>Teach input</b>	Active	I <sub>L</sub> = 10 mA	≤ 0.5 VDC
	Not active		
<b>Recording time</b>	4 to 24 VDC @10 µs minimum	<b>Timer</b>	
	≤ 1 VDC	Range programmable	0 to 5 s
<b>Levels of sensitivity</b>	1 sec	First step	50 ms
<b>Temperature drift</b>	Fine, medium and low	Following steps	250 ms
<b>Rated operational volt. (U<sub>B</sub>)</b>	< 0,4%/C°	<b>Protection</b>	Short-circuit, reverse polarity, transients
<b>Ripple (U<sub>pp</sub>)</b>	24 VDC ±10% (ripple included)	<b>Light source</b>	LED, red, green and blue
<b>Output current</b>	≤ 10%	<b>Spot diameter</b>	0.5 mm
Continuous (I <sub>e</sub> )	100 mA	<b>Ambient light</b>	
Short-time (I)	100 mA	Incandescent light	3'000 Lux
<b>No load supply current (I<sub>o</sub>)</b>	120 mA	Sunlight	5'000 Lux

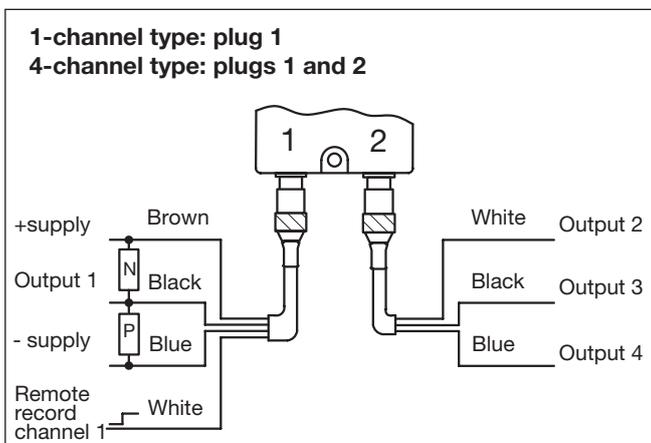


## Specifications (cont.)

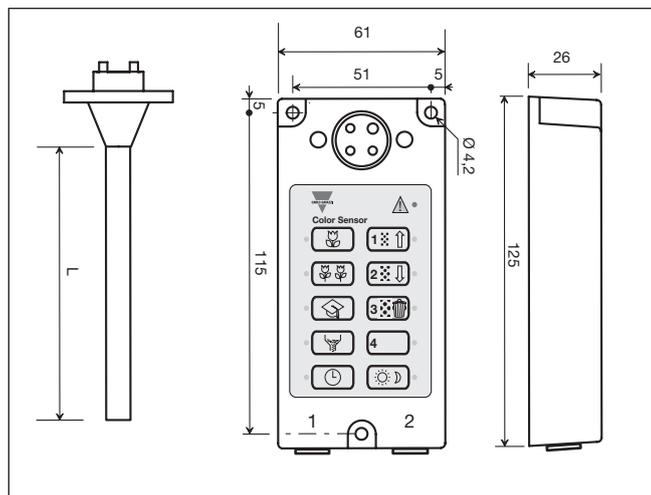
<b>Switching frequency</b> Mode "short distance" Mode "long distance"	500 Hz 25 Hz
<b>Response time</b> OFF-ON (t <sub>ON</sub> ) ON-OFF (t <sub>OFF</sub> )	1 ms 20 ms
<b>Power ON delay (t<sub>v</sub>)</b>	≤ 300 ms
<b>Output function</b> NPN and PNP	Available (Push-pull output)
<b>Indication function</b>	Signal, Teach-in, Output ON
<b>Environment</b> Installation category Pollution degree Degree of protection	I (IEC 60664/60664A;60947-1) 3 (IEC 60664/60664A;60947-1) IP 65 (IEC 60529; 60947-1)
<b>Temperature</b> Operating Storage	0° to +40°C (32° to +104°F) -20° to +60°C (-4° to +140°F)
<b>Vibration</b>	10 to 150 Hz, 0.5 mm/7.5 g (IEC60068-2-6)

<b>Shock</b>	2 x 1 m & 100 x 0.5 m (IEC 60068-2-6, 60068-2-32)
<b>Rated insulation voltage</b>	50 VAC (rms)
<b>Housing material</b> Body Tip Tip dimensions Sheath Length (for each reference)	Polycarbonate NPB or anodized aluminium Ø 1.8 - Ø 18 mm PVC 60 cm and 100 cm
<b>Connection</b> Plug	M12
<b>Weight</b>	150 g
<b>Approvals</b>	cUL
<b>CE-marking</b>	Yes

## Wiring Diagram



## Dimensions



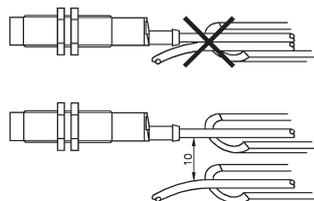
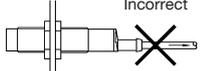
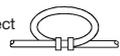
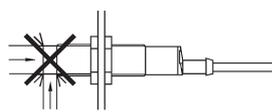
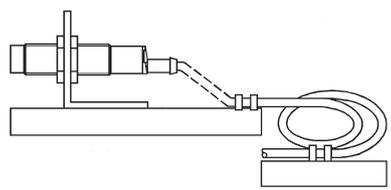
## Fibers Dimensions and Specifications

Fibre heads	Tip	SPOT mm	Distance	TR	Application
FPDC01...100	M18	1.5	18 mm	1 mS	Fine detection with focus spot
FPDC02...100	M18	6	40-60 mm	20 mS	Fine detection at fluctuating distance
FPDC03...100	M8	1.5	4-6 mm	1 mS	Fine detection with small tip dimensions
FPDC04...100	M4 + extension 1.8 x 12	2-3	2-4 mm	1 mS	Fine detection with the smallest head
FPDC05...100	M4 + extension 1.8 x 40	2-3	2-4 mm	1 mS	Fine detection with the smallest head and pliable extension

## Programming Functions

<p><b>Teach-in<sup>*)</sup></b></p>	<p>Place the object under the tip of the fibre and press</p> <p> for short distance or</p> <p> for long distance</p> <p>The respective LED flashes</p>	<p><b>Light or dark operation</b> Change the output function</p>	<p>Press  for 4 s</p>
<p><b>Output</b></p>	<p>Select the output by pressing</p> <p>   or</p> <p></p>	<p><b>Timing function</b></p>	<p>Press </p>
<p><b>Sensitivity adjustment</b></p> <p>For fine sensitivity</p> <p>For medium sensitivity</p> <p>For low sensitivity</p>	<p>Sensitivity assigned for the selected output</p> <p>Press </p> <p>Press </p> <p>Press </p>	<p>To clear the Timer</p>	<p>The LED "Timer" flashes</p>
<p><b>Record colour</b></p>	<p>Place the object in position</p> <p>Press </p> <p>Select the output by pressing</p> <p>   or</p> <p></p> <p>The colour is recognized, and the corresponding LED goes ON</p>	<p>Increase time (50 ms/1st step, following steps: 250 ms/step)</p>	<p>Press </p>
		<p>Decrease time (50 ms/1st step, following steps: 250 ms/step)</p>	<p>Press </p>
		<p>Exit timer setting</p>	<p>Press </p>
		<p><b>Filter function</b></p>	<p>Press </p>
		<p>To clear the filter value</p>	<p>The "Filter" LED flashes</p>
		<p>Increase the filter value</p>	<p>Press </p>
		<p>Decrease the filter value</p>	<p>Press </p>
		<p>Exit filter setting</p>	<p>Press </p>
		<p><sup>*)</sup>To get started, unlock the keyboard by pressing  and </p> <p>To lock the keyboard, press the same two keys.</p>	

## 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>Incorrect </p> <p>Correct </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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## Delivery Contents

- Photoelectric switch: PD12CNC04
- Installation instruction
- **Packaging:** Cardboard box

## Accessories

- Plastic fibres type FPDC0.SCC103
- Connector type: CON.1A../CON.14NF.. series