

# Proximity Sensors Capacitive Thermoplastic Polyester Housing Type EC, M30, DC

**TRIPLESIELD™**

**CARLO GAVAZZI**



- Featuring **TRIPLESIELD™** Sensor protection
- Rated operational voltage: 10-40 VDC
- Adjustable sensing distance 2-16 mm or 4-25 mm
- Output: DC 200 mA, NPN or PNP
- Make and break switching function
- LED indication
- High noise immunity
- Flush and non-flush types
- Plug and Cable versions available
- AC versions in the same housing

## Product Description

Capacitive proximity switches with either sensing distance 16 mm flush mounted in metal or sensing distance 25 mm non-flush mounted. 4-wire DC output with both make (NO)

and break (NC) switching. Grey M30 polyester housing with 2 m PVC cable or plug. Ideal for use in level and plastic machinery applications.

## Ordering Key **EC 3025 NPA P L-1**

Capacitive proximity switch  
 Housing diameter (mm) \_\_\_\_\_  
 Rated operating dist. (mm) \_\_\_\_\_  
 Output type \_\_\_\_\_  
 Housing material \_\_\_\_\_  
 Housing type \_\_\_\_\_  
 Connection type \_\_\_\_\_

## Type Selection

Housing diameter	Rated operating dist. (S <sub>n</sub> ) <sup>1)</sup>	Mounting	Ordering no. Transistor NPN/cable Make & break switching	Ordering no. Transistor NPN/plug Make & break switching	Ordering no. Transistor PNP/cable Make & break switching	Ordering no. Transistor PNP/plug Make & break switching
M30	16 mm	Flush (built-in)	<b>EC 3016 NPAPL</b>	<b>EC 3016 NPAPL-1</b>	<b>EC 3016 PPAPL</b>	<b>EC 3016 PPAPL-1</b>
M30	25 mm	Non-flush	<b>EC 3025 NPAPL</b>	<b>EC 3025 NPAPL-1</b>	<b>EC 3025 PPAPL</b>	<b>EC 3025 PPAPL-1</b>

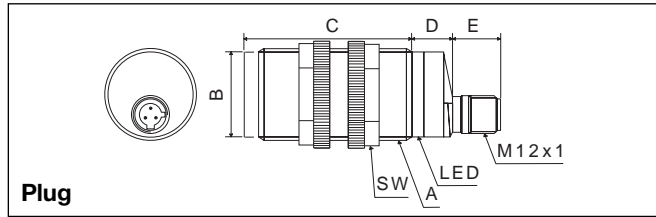
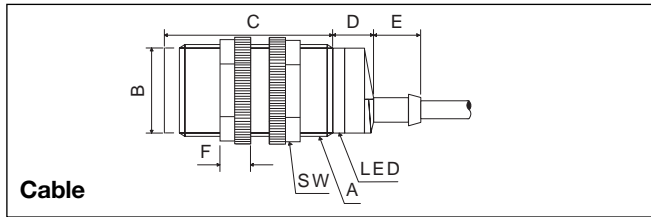
<sup>1)</sup> Object: Grounded steel plate

## Specifications

<b>Rated operating dist. (S<sub>n</sub>)</b> <b>3016:</b>	2 to 16 mm factory set at 16 mm	<b>Frequency of operating cycles (f)</b>	50 Hz
<b>3025:</b>	4 to 25 mm factory set at 25 mm	<b>Indication for output ON</b>	LED, yellow
<b>Sensitivity</b>	Adj. multiturn pot.meter	<b>Environment</b> Degree of protection	IP 67 (Nema 1, 3, 4, 6, 13)
<b>Effective operating dist. (S<sub>r</sub>)</b>	0.9 x S <sub>n</sub> ≤ S <sub>r</sub> ≤ 1.1 x S <sub>n</sub>	<b>Temperature</b> Operating temperature Storage temperature	-25 to +80°C ( -13 to +176°F) -40 to +85°C (-40 to +185°F)
<b>Usable operating dist. (S<sub>u</sub>)</b>	0.8 x S <sub>r</sub> ≤ S <sub>u</sub> < 1.2 x S <sub>r</sub>	<b>Housing material</b> Body Cable end Nuts	Grey thermoplastic polyester Polyester Black reinforced nylon
<b>Repeat accuracy (R)</b>	≤ 5%	<b>Connection</b> Cable	Grey, 2 m, 4 x 0.34 mm <sup>2</sup> Oil proof, PVC
<b>Hysteresis (H)</b>	3 to 20% of sensing distance	Plug (-1) Cable for plug (-1)	M12 x 1 CON.1A-series
<b>Rated operational volt. (U<sub>B</sub>)</b>	10 to 40 VDC (ripple included)	<b>Weight (incl. nuts)</b>	<b>3016:</b> 140 g <b>3025:</b> 150 g
<b>Ripple</b>	≤ 10%	<b>Approvals</b>	UL, CSA
<b>Rated operational current (I<sub>e</sub>)</b> Continuous	≤ 200 mA	<b>CE-marking</b>	Yes
<b>No-load supply current (I<sub>o</sub>)</b>	≤ 10 mA (no load)		
<b>Voltage drop (U<sub>d</sub>)</b>	≤ 2.5 VDC at max. load		
<b>Protection</b>	Reverse polarity, short-circuit, transients		

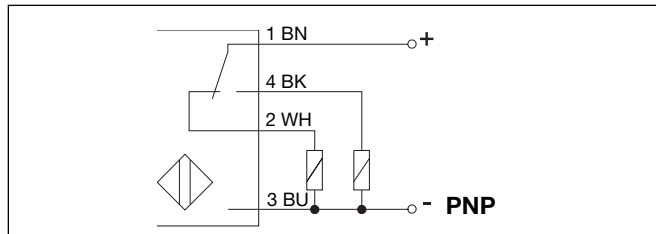
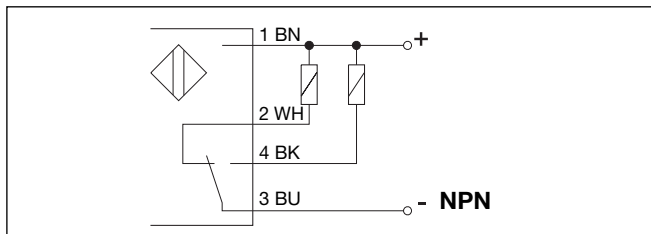


## Dimensions



Type	A	B Ø mm	C mm	D mm	E mm	F mm	SW mm
EC 3016xPAPL(-1)	M 30 x 1.5 x 50	28	50	13.6	15.4	10	36
EC 3025xPAPL(-1)	M 30 x 1.5 x 50	28	62	13.6	15.4	10	36

## Wiring Diagrams

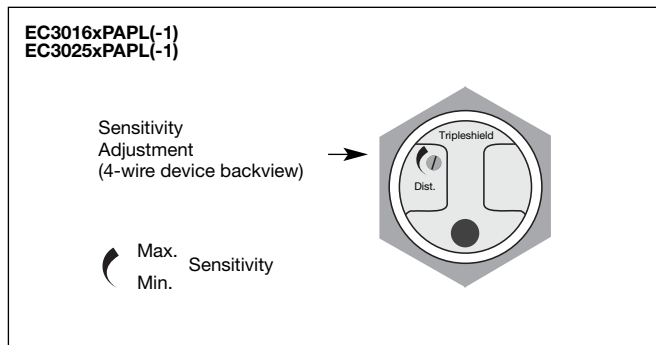


## Adjustment Guide

The environments in which capacitive sensors are installed can often be unstable regarding temperature, humidity, object distance and industrial (noise) interference. Because of this, Carlo Gavazzi offers as standard features in all *TRIPLESIELD™* capacitive sensors a user-friendly sensitivity adjustment instead of having a fixed sensing range, extended sensing range to accom-

modate mechanically demanding areas, temperature stability to ensure minimum need for adjusting sensitivity if temperature varies and high immunity to electromagnetic interference (EMI).

**Note:**  
Sensors are factory set (default) to maximum rated sensing range.



## Installation Hints

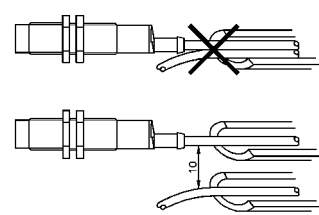
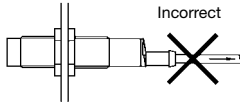

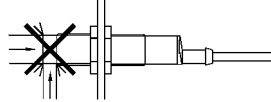
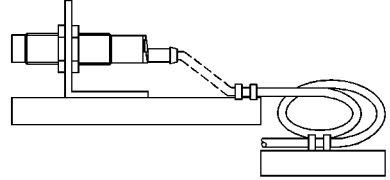
Capacitive sensors have the unique ability to detect almost all materials, either in liquid or solid form. Capacitive sensors can detect metallic as well as non-metallic objects, however, their traditional use is for non-metallic materials such as:

- **Plastic Industry**  
Resins, regrinds or moulded products.
- **Chemical Industry**  
Cleansers, fertilisers, liquid soaps, corrosives and petrochemicals.
- **Wood Industry**  
Saw dust, paper products, door and window frames.

- **Ceramic & Glass Industry**  
Raw material, clay or finished products, bottles.
  - **Packaging Industry**  
Package inspection for level or contents, dry goods, fruits and vegetables, dairy products.
- Materials are detected due to

their dielectric constant. The bigger the size of an object, the higher the density of material, the better or easier it is to detect the object. Nominal sensing distance for a capacitive sensor is referenced to a grounded metal plate (ST37). For additional information regarding dielectric ratings of materials please refer to Technical Information.

## Installation Hints (cont.)

<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

- Capacitive switch: EC 30.. PAPL(-1)
- Screw driver
- 2 nuts
- **Packaging:** Cardboard box
- Installation & Adjustment Guide

## Accessories

- Plugs CON.1A.. serie.

For further information please refer to "Accessories."