

# Proximity Sensors Capacitive Thermoplastic Polyester Housing Type EC, M 30, DC

**TRIPLESIELD™**

**CARLO GAVAZZI**



- Featuring **TRIPLESIELD™** Sensor protection
- Adjustable sensing distance 2-16 mm or 4-25 mm
- Rated operational voltage: 10-40 VDC
- Output: DC 200 mA, NPN or PNP
- Make and break switching function
- LED indication
- High noise immunity
- Both 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 M 30 polyester housing with 2 m PUR cable or plug. Ideal for use in level and plastic machinery applications.

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

Type: 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 (build-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

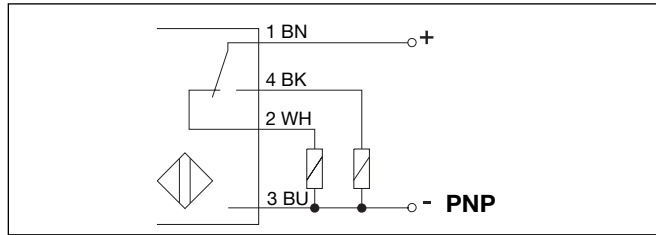
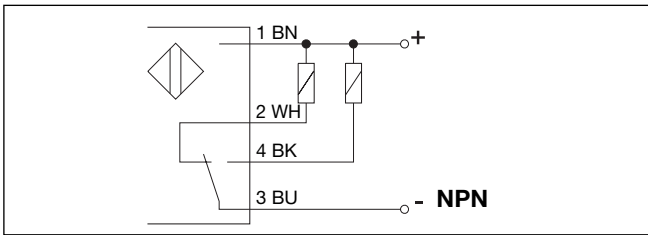
<b>Rated operational volt. (U<sub>B</sub>)</b>	10 to 40 VDC (ripple included)	<b>EMC ratings</b>	Acc. to EN 50 082-2
<b>Ripple</b>	≤ 10%	ENV 50 140 RF Electromagnetic field AM, 80-1000 MHz, Level 3	10 V/m
<b>Rated operational current (I<sub>o</sub>)</b> Continuous	≤ 200 mA	ENV 50 204 RF Electromagnetic field PM, 80-900 MHz, Level 3	10 V/m
<b>No-load supply current (I<sub>o</sub>)</b>	≤ 10 mA (no load)	EN 61000-4-2 ESD	
<b>Voltage drop (U<sub>d</sub>)</b>	≤ 2.5 VDC at max. load	Contact discharge, Level 4	8 kV
<b>Protection</b>	Reverse polarity, short-circuit	Air discharge, Level 4	17 kV
<b>Frequency of operating cycles (f)</b>	100 Hz	ENV 50 141 RF Common mode	
<b>Indication for output ON</b>	LED, yellow	EN 61000-4-4 Fast transient	
<b>Rated operating dist. (S<sub>n</sub>)</b> (adjustable)	<b>3016:</b> 2 to 16 mm factory set at 16 mm <b>3025:</b> 4 to 25 mm factory set at 25 mm	Rep. freq. 5 kHz, Level 3	2 kV
<b>Effectiv operation dist. (S<sub>i</sub>)</b>	0.9 x S <sub>n</sub> ≤ S <sub>r</sub> ≤ 1.1 x S <sub>n</sub>	IEC 60947-5-2 Surges common mode, Gen. Imp. 500E, Level 3	2.5 kV
<b>Usable operation dist. (S<sub>u</sub>)</b>	0.8 x S <sub>r</sub> ≤ S <sub>n</sub> ≤ 1.2 x S <sub>r</sub>	<b>Environment</b>	
<b>Repeat accuracy (R)</b>	≤ 5%	Degree of protection	IP 67 (Nema 1, 3, 4, 6, 13)
<b>Hysteresis (H)</b>	4 to 20% of sensing distance	Operating temperature	-25° to +80°C (-13° to +176°F)
		Storage temperature	-40° to +85°C (-40° to +185°F)
		<b>Housing material</b>	Grey thermoplastic polyester
		<b>Cable</b>	2 m, 4 x 0.34 mm <sup>2</sup> grey PUR, oil proff
		<b>Plug (-1)</b>	M12 x 1
		Cable for plug (-1)	CONH1A-series
		<b>Weight (incl. nuts)</b>	<b>3016:</b> 140 g <b>3025:</b> 150 g

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Specifications are subject to change without notice



## Wiring Diagrams



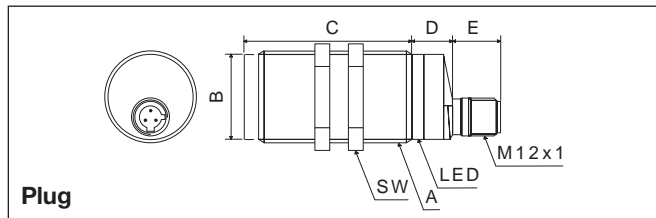
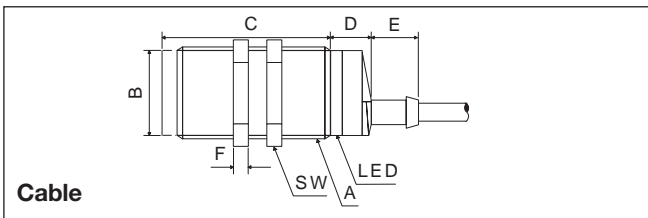
## Accessories

- Plugs CONH6A.. serie, please refer to “Accessories.”

## Delivery Contents

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

## 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	5	36
EC 3025xPAPL(-1)	M 30 x 1.5 x 50	28	62	13.6	15.4	5	36

## 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 *TRIP-LESHIELD™* 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).

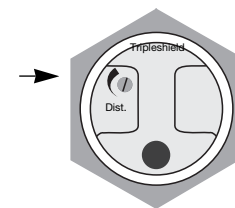
### Note:

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

### EC3016xPAPL(-1) EC3025xPAPL(-1)

Sensitivity Adjustment  
(4-wire device backview)

Max. Sensitivity  
Min.



## 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 capaci-

ve sensor is referenced to a grounded metal plate (ST37). For additional information regarding dielectric ratings of materials please refer to Technical Information.