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

TRIPLESHIELD™

CARLO GAVAZZI



- **Featuring *TRIPLESHIELD*™ 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_n) [1]	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)	**EC 3016 NPAPL**	**EC 3016 NPAPL-1**	**EC 3016 PPAPL**	**EC 3016 PPAPL-1**
M30	25 mm	Non-flush	**EC 3025 NPAPL**	**EC 3025 NPAPL-1**	**EC 3025 PPAPL**	**EC 3025 PPAPL-1**

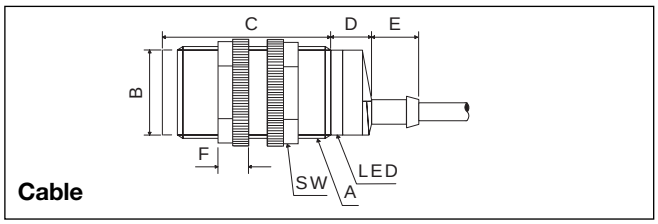
[1] Object: Grounded steel plate

Specifications

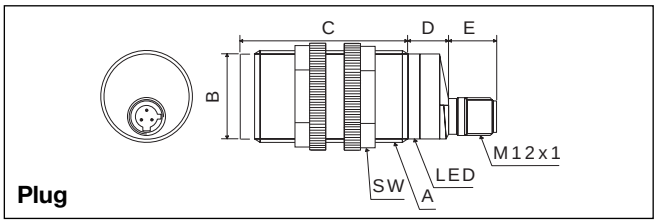
Rated operating dist. (S_n)	
3016:	2 to 16 mm factory set at 16 mm
3025:	4 to 25 mm factory set at 25 mm
Sensitivity	Adj. multiturn pot.meter
Effective operating dist. (S_r)	$0.9 \times S_n \leq S_r \leq 1.1 \times S$
Usable operating dist. (S_u)	$0.8 \times S_r \leq S_n > 1.2 \times S_r$
Repeat accuracy (R)	≤ 5%
Hysteresis (H)	3 to 20% of sensing distance
Rated operational volt. (U_B)	10 to 40 VDC (ripple included)
Ripple	≤ 10%
Rated operational current (I_e)	
Continuous	≤ 200 mA
No-load supply current (I_o)	≤ 10 mA (no load)
Voltage drop (U_d)	≤ 2.5 VDC at max. load
Protection	Reverse polarity, short-circuit, transients

Frequency of operating cycles (f)	50 Hz
Indication for output ON	LED, yellow
Environment	
Degree of protection	IP 67 (Nema 1, 3, 4, 6, 13)
Temperature	
Operating temperature	-25 to +80°C (-13 to +176°F)
Storage temperature	-40 to +85°C (-40 to +185°F)
Housing material	
Body	Grey thermoplastic polyester
Cable end	Polyester
Nuts	Black reinforced nylon
Connection	
Cable	Grey, 2 m, 4 x 0.34 mm^2 Oil proof, PVC
Plug (-1)	M12 x 1
Cable for plug (-1)	CON.1A-series
Weight (incl. nuts)	**3016:** 140 g **3025:** 150 g
Approvals	UL, CSA
CE-marking	Yes

Dimensions



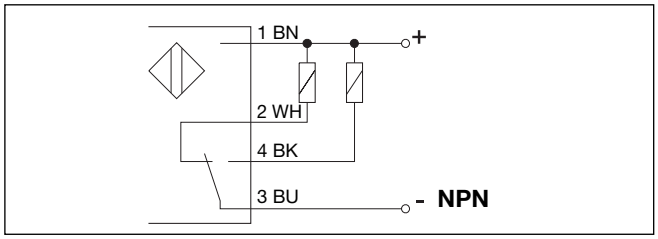
Cable



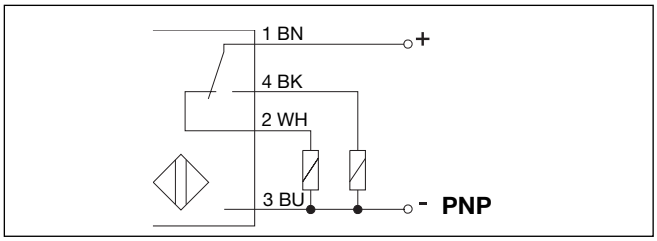
Plug

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



NPN



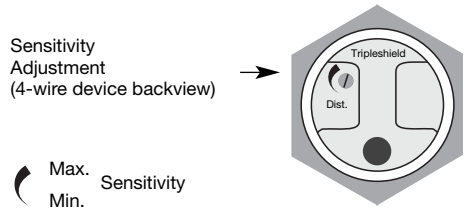
PNP

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 *TRIPLESHIELD*™ capacitive sensors a user-friendly sensitivity adjustment instead of having a fixed sensing range, extended sensing range to accommodate 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)



Installation Hints

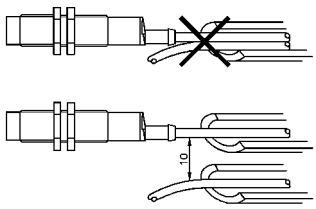
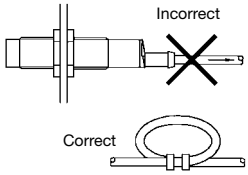
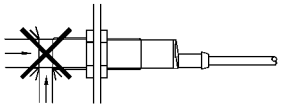
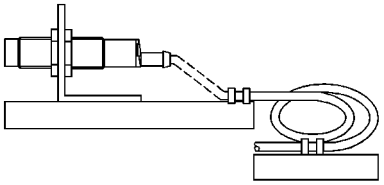
Capacitive sensors have the unique ability to detect almost all materials, either in liquid or solid form. Capacitive sensors can detect metallic as well as non-metallic objects, however, their traditional use is for non-metallic materials such as:

- **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.

Specifications are subject to change without notice (20.08.01)

Installation Hints (cont.)

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	*Relief of cable strain*	*Protection of the sensing face*	*Switch mounted on mobile carrier*
	 The cable should not be pulled	 A proximity switch should not serve as mechanical stop	 Any repetitive flexing of the cable should be avoided

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.