Proximity Sensors Capacitive Thermoplastic Polyester Housing Types CA, M12, DC, Teach-in

TRIPLESHIELD™

CARLO GAVAZZI

- **Featuring *TRIPLESHIELD*™ Sensor Protection**
- **Sensing distance: 0.5 - 8 mm**
- **Teach-in of sensing distance via push-button or COM-input**
- **Automatic detection of NPN or PNP load**
- **Selectable make or break switching by means of Teach-in function**
- **Protection: Short-circuit, transients and reverse polarity**
- **Humidity compensation**
- **Alarm output**
- **5 years of warranty**

Product Description

Capacitive proximity switches with a sensing distance of either 6 mm flush mounted in metal or 8 mm non-flush mounted.
The switching points can be altered by means of the Teach-in function. 3-wire DC output with selectable make (NO) or break (NC) switching and NPN Alarm. Grey polyester housing with 2 m PVC cable or M12 plug.

Ordering Key

CA12CLC08BPM1

- **Capacitive proximity switch**
- **Housing diameter (mm)**
- **Housing material**
- **Housing length**
- **Detection principle**
- **Rated operating dist. (mm)**
- **Output type**
- **Output configuration**
- **Connection type**

Type Selection

Housing diameter	Rated operating distance (S_n)	Ordering no. Cable	Ordering no. Plug
M12	8 mm	**CA12CLC08BP**	**CA12CLC08BPM1**

Specifications

Sensing range (S_d)	0.5 - 8 mm factory set at 8 mm
Sensitivity	Adjustable (Teach-in)
Effective operating dist. (S_r)	$0.9 \times S_n \le S_r \le 1.1 \times S_n$
Usable operating dist. (S_u)	$0.8 \times S_r \le S_u \le 1.2 \times S_r$
Repeat accuracy (R)	≤ 5%
Hysteresis (H)	Depending on Teach-in
Rated operational volt. (U_B)	10 to 40 VDC (ripple incl.)
Ripple	≤ 10%
Rated operational current (I_e)	≤ 250 mA (continuous)
No-load supply current (I_o)	≤ 12 mA
Voltage drop (U_d)	≤ 2.5 VDC @ max. load
Protection	Short-circuit, reverse polarity, transients
***TRIPLESHIELD*™ protection**	
Electrostatic discharge	30 kV
Burst	3 kV
Airborne HF	> 15 V/m
Wire-conducted noise	> 10 V_{rms}
Frequency of operating cycles (f)	15 Hz

Indication	
For output ON	LED, yellow
For safe/unsafe	LED, green
Environment	
Degree of protection	IP 68
Operating temperature	-20 to +85°C (-4 to +185°F)
Max. temperature on sensing face	120°C (248°F)
Storage temperature	-40 to +85°C (-40 to +176°F)
Housing material	
Body	Grey, thermoplastic polyester
Cable end	Polyester, softened
Nuts	Black, PA12 Grilamid
Connection	
Cable	Grey, 2 m, 4 x 0.25 mm^2 Oil proof, PVC
Plug (M1)	M12 x 1
Cable for plug (M1)	CON.1A-series
Weight	
Cable version	110 g
Plug version	30 g
Approvals	UL, CSA
CE-marking	Yes

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 nominal sensing range S_n.

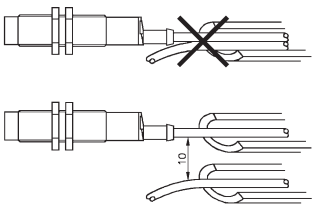
Installation Hints

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:

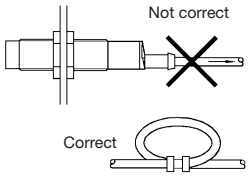
- **Plastics Industry**
  Resins, regrinds or moulded products.
- **Chemical Industry**
  Cleansers, fertilisers, liquid soaps, corrosives and petrochemicals.
- **Wood Industry**
  Saw dust, paper products, door and window frames.
- **Ceramic & Glass Industry**
  Raw material, clay or finished products, 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.

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

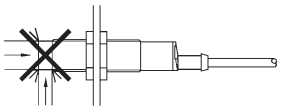


Relief of cable strain



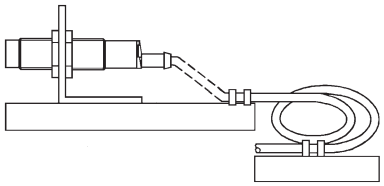
The cable should not be pulled

Protection of the sensing face



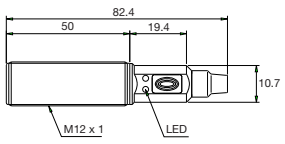
A proximity switch should not serve as mechanical stop

Switch mounted on mobile carrier

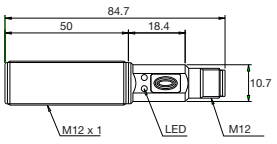


Any repetitive flexing of the cable should be avoided

Dimensions



Cable



Plug

Accessories

- Plugs CON.1A.. series.

For further information please refer to “Accessories.

Delivery Contents

- Capacitive switch: CA..CLC..BP..
- **Packaging:** Cardboard box
- Installation & Adjustment Guide (MAN CAP ENG/GER)

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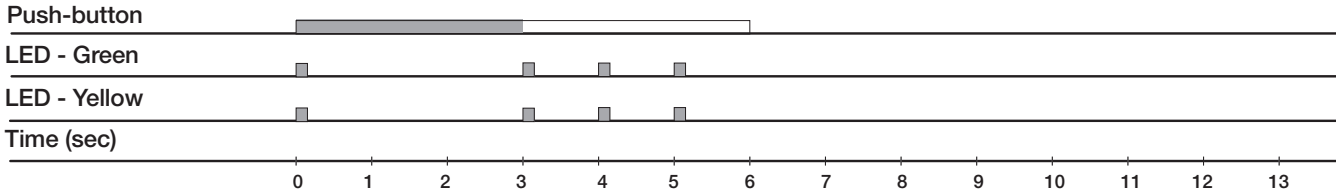
Teach-in Guide

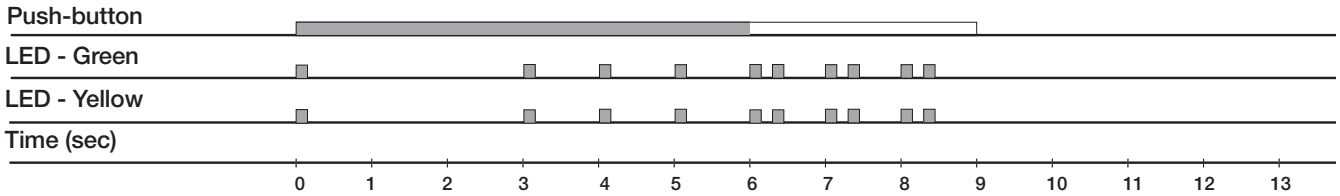
Adjustment - Background
No target present

Press push-button >3 seconds until LED´s are flashing one time per second. The background will be calibrated when the push-button is released during the following 3 seconds



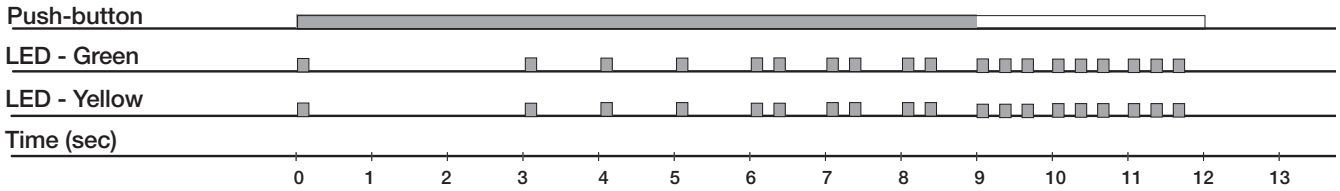
Adjustment - Object
Target present

Press push-button >6 seconds until LED´s are flashing two times per second. The object will be calibrated when the push-button is released during the following 3 seconds



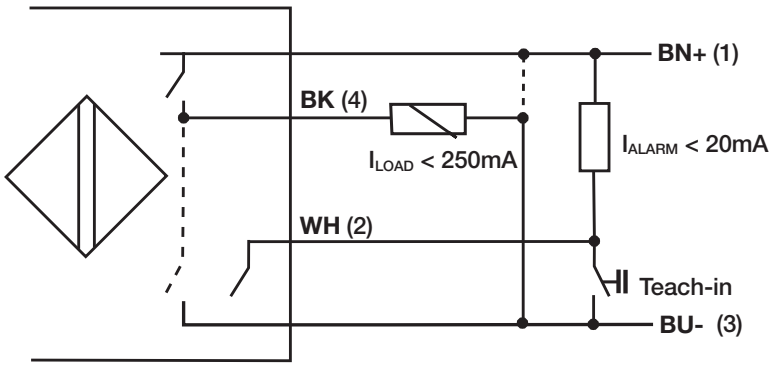
Adjustment - NO - NC

Press push-button >9 sec. until LED´s are flashing three times per second. The status of NO-NC will toggle when the push-button is released during the following 3 seconds



Releasing the push-button after 12 sec. returns the sensor to factory settings.

Wiring Diagram



The PNP- or NPN-load will automatically be detected.

By means of the Teach-in wire, the functions described in the Teach-in Guide can be set-up.

It is possible to Teach-in more sensors at the same time by connecting the WH-wires in parallel to the common ”-” supply.

(#): Plug connections

Important: If alarm output (WH-wire) is unused, it has to be terminated to +supply