Proximity Sensors Capacitive Thermoplastic Polyester Housing Types CD46, DC, Teach-in

TRIPLESHIELD™

CARLO GAVAZZI



- **Thin Profile Capacitive Level Sensor**
- **Featuring *TRIPLESHIELD*™ Sensor Protection**
- **Sensing distance: 1 - 10 mm**
- **Teach-in of sensing distance via push-button or wire-input**
- **Selectable make or break switching by means of Teach-in function**
- **Protection: Short-circuit, transients and reverse polarity**
- **Alarm output**
- **5 years of warranty**
- **Alarm output when operating current > 250 mA**

Product Description

Capacitive proximity level switch with a sensing distance of 10 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/black polyester housing with 2 m PVC cable.
Designed for front, pipe or plane mounting.

Ordering Key

CD 46 CNC 10 NP

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

Type Selection

Housing dimensions	Rated operating distance (S_n)	Ordering no. NPN, Cable	Ordering no. PNP, Cable
28x46x5,5 mm	10 mm	**CD46CNC10NP**	**CD46CNC10PP**

Specifications

Sensing range (S_d)	1 - 10 mm factory set at 10 mm
Sensitivity **Effective operating dist.** (S_r)	Adjustable (Teach-in) $0.9 \times S_n \le S_r \le 1.1 \times S_n$
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 30 VDC (ripple incl.)
Ripple	≤ 10%
Rated operational current (I_e)	≤ 200 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-EMC**	
IEC 1000-4-2/EN 61000-4-2	30 kV
IEC 1000-4-3/EN 61000-4-3	> 10 V/m
IEC 1000-4-4/EN 61000-4-4	3 kV
IEC 1000-4-6/EN 61000-4-6	> 10 V_{rms}*

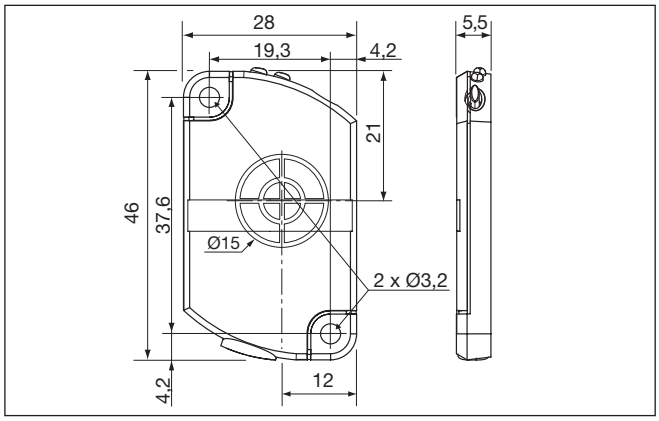
Frequency of operating cycles (f)	10 Hz
Indication	
For output ON	LED, yellow
For safe/unsafe	LED, green
Environment	
Degree of protection	IP 68
Operating temperature	-20° to +80°C (-4° to +176°F)
Storage temperature	-40° to +85°C (-40° to +185°F)
Housing material	
Body	Grey/black PBT
Button and Lightguide	TPE-U
Connection	
Cable	Black, 2 m, 4 x 0.14 mm², Ø = 3.2 mm. Oil proof, PVC
Weight	50 g
Approvals	UL, CSA
CE-marking	Yes

* Not observed around the oscillator frequency: 0.3 - 1.6 MHz

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Dimensions



Adjustment

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).

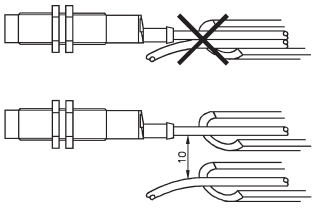
Installation Hints

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:

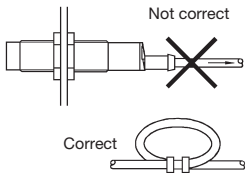
- **Plastics Industry**
  Resins, regrinds or moulded products.
- **Chemical Industry**
  Cleansers, fertilisers, liquid soaps, corrosives and pe-trochemicals.
- **Wood Industry**
  Saw dust, paper products, door and window frames.
- **Ceramic & Glass Industry**
  Raw material, clay or finished products,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

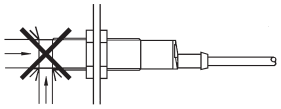


Relief of cable strain



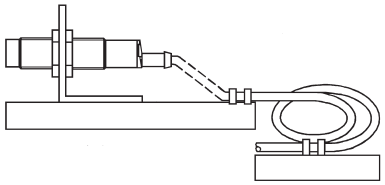
The cable should not be pulled

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

Delivery Contents

- Capacitive switch
- Packaging: Cardboard box
- Installation & Adjustment Guide

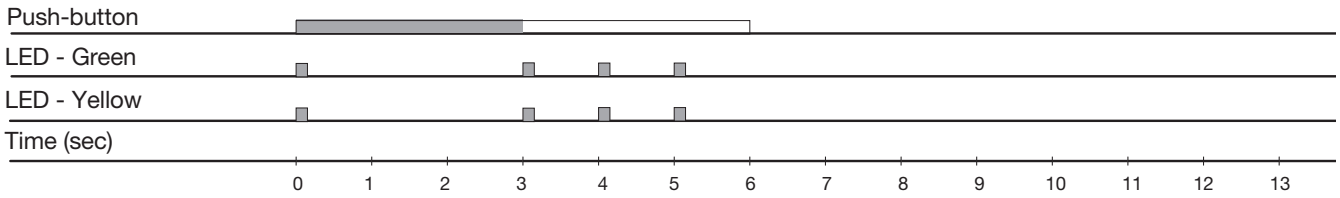
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Teach-in Guide

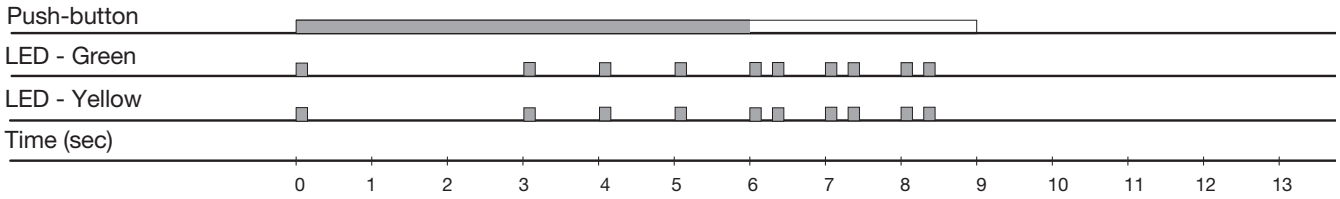
Adjustment - Background
No target present

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



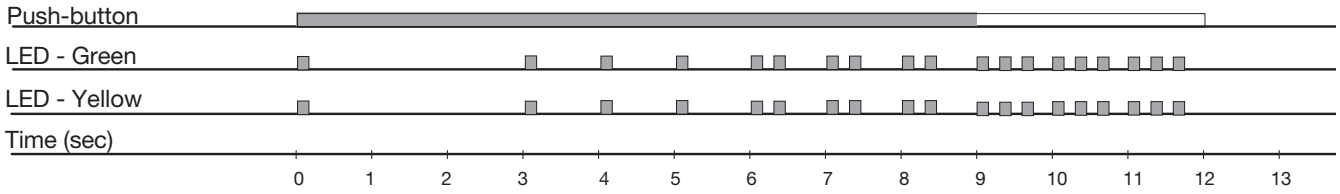
Adjustment - Object
Target present

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



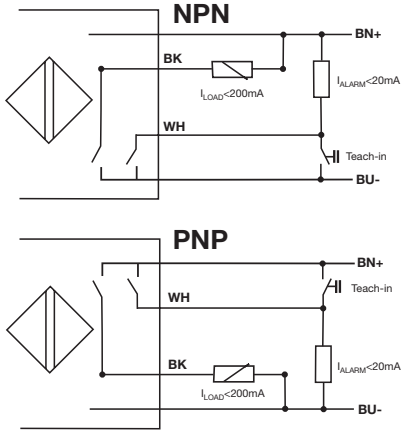
Adjustment - NO - NC

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 Diagrams



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

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

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

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