Proximity Sensors Capacitive Thermoplastic Polyester Housing Types CA, M18, M30, DC, Teach-in

TRIPLESHIELD™

CARLO GAVAZZI

- Featuring *TRIPLESHIELD*™ Sensor Protection
- Sensing distance: 0.5 - 12 mm (M18) and 1.0 - 30 mm (M30)
- 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 8 mm flush mounted in metal or 12 mm non-flush mounted for the M18 version, and either 16 mm flush mounted in metal or 30 mm non-flush mounted for the M30 version.

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

CA18CLC12BPM1

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
M18	12 mm	CA18CLC12BP	CA18CLC12BPM1
M 30	30 mm	CA30CLC30BP	CA30CLC30BPM1

Specifications

Sensing range (S_d)		**Frequency of operating cycles** (f)	15 Hz
CA18CLC12	0.5 - 12 mm factory set at 8 mm	**Indication**	
CA30CLC30	1.0 - 30 mm factory set at 15 mm	For output ON	LED, yellow
		For safe/unsafe	LED, green
Sensitivity	Adjustable (Teach-in)	**Environment**	
Effective operating dist. (S_r)	$0.9 \times S_n \leq S_r \leq 1.1 \times S_n$	Degree of protection	IP 68
Usable operating dist. (S_u)	$0.8 \times S_r \leq S_u \leq 1.2 \times S_r$	Operating temperature	-20° to +85°C (-4° to +185°F)
Repeat accuracy (R)	≤ 5%	Storage temperature	-40° to +85°C (-40° to +176°F)
Hysteresis (H)	Depending on Teach-in	**Housing material**	
Rated operational volt. (U_B)	10 to 40 VDC (ripple incl.)	Body	Grey, thermoplastic polyester
Ripple	≤ 10%	Cable end	Polyester, softened
Rated operational current (I_e)	≤ 250 mA (continuous)	Nuts	Black, PA12 Grilamid
No-load supply current (I_o)	≤ 12 mA	**Connection**	
Voltage drop (U_d)	≤ 2.5 VDC @ max. load	Cable	Grey, 2 m, 4 x 0.25 mm² Oil proof, PVC
Protection	Short-circuit, reverse polarity, transients	Plug (M1)	M12 x 1
		Cable for plug (M1)	CON.1A-series
TRIPLESHIELD™ protection-EMC		**Weight**	
IEC 1000-4-2/EN 61000-4-2	30 kV	Cable version - M18 / M30	110 g/160 g
IEC 1000-4-3/EN 61000-4-3	> 15 V/m	Plug version - M18 / M 30	30 g/70 g
IEC 1000-4-4/EN 61000-4-4	3 kV	**Approvals**	UL, CSA
IEC 1000-4-6/EN 61000-4-6	> 10 V_{rms}	**CE-marking**	Yes

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Dimensions

CA18	CA30

CA18

89.55
50 | 23
14.9
M18 x 1 — LED

Cable

89.2
50 | 23
14.9
M18 x 1 — LED — M12

Plug

CA30

99.2
50 | 23
24
M30 x 1.5 — LED

Cable

90.45
50 | 23
24
M30 x 1.5 — LED — M12 x 1

Plug
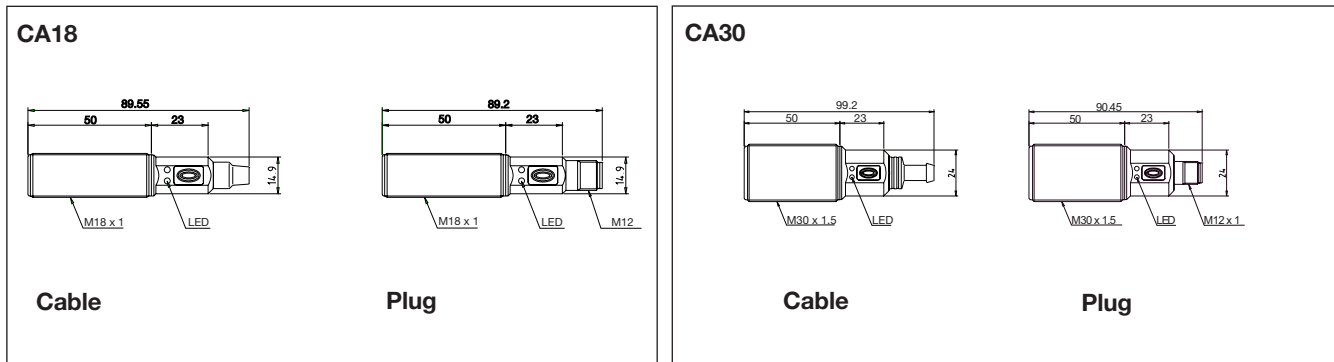
Adjustment Guide

The environments in which capacitive sensors are installed can often be unstable as regards to temperature, humidity, object distance and industrial (noise) interference. This is why Carlo Gavazzi offers, as a standard feature in all TRIPLESHIELD™ capacitive sensors, a user-friendly sensitivity adjustment instead of a fixed sensing range. Likewise, these sensors provide an extended sensing range to accommodate mechanically demanding areas and temperature stability to ensure high immunity to electromagnetic interference (EMI) and a minimum need for adjusting sensitivity if the temperature varies.

Note:
The sensors are factory set (default) to nominal sensing range S_n.
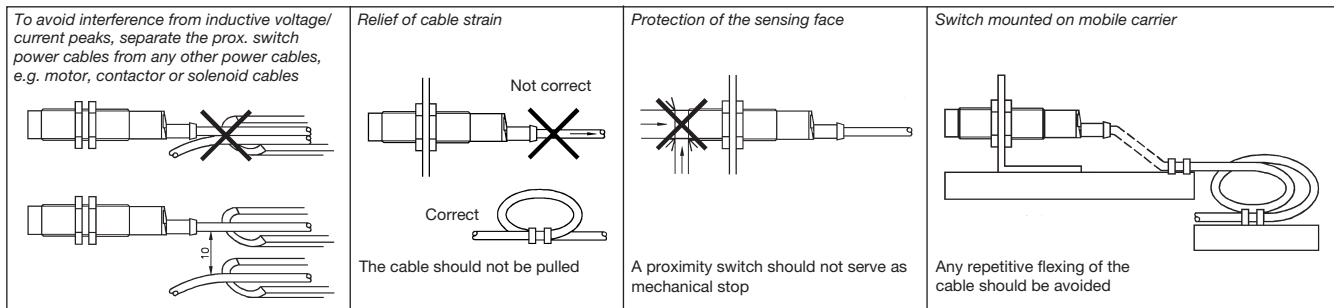
Installation Hints

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 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

Not correct

Correct

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

Accessories

- Plugs CON.14NF.. series.

For further information please refer to "Accessories.

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Teach-in Guide

Adjustment - Background
No target present

Press push-button > 3 seconds until LEDs are flashing once per second. The background will be calibrated when the push-button is released during the following 3 seconds
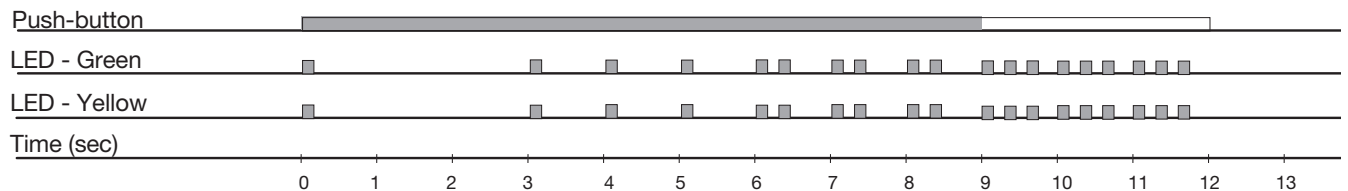
Push-button

LED - Green

LED - Yellow

Time (sec)

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
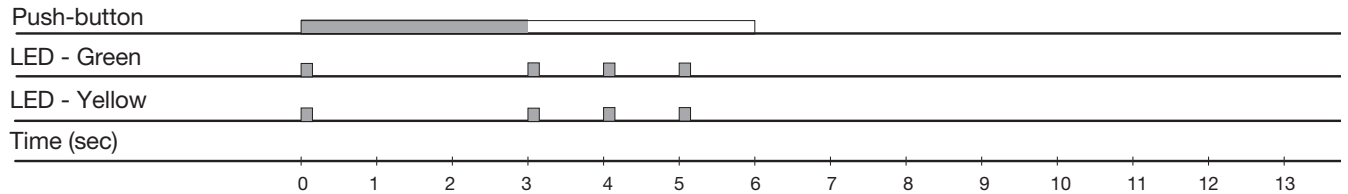
Adjustment - Object
Target present

Press push-button >6 seconds until LEDs are flashing twice per second. The object will be calibrated when the push-button is released during the following 3 seconds

Push-button

LED - Green

LED - Yellow

Time (sec)

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
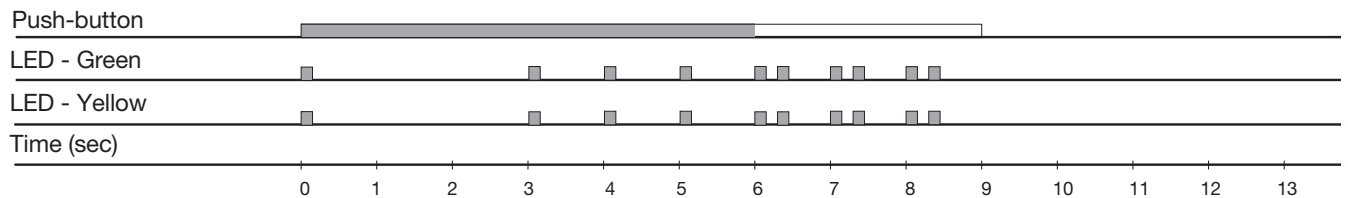
Adjustment - NO - NC

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

Push-button

LED - Green

LED - Yellow

Time (sec)

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

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

Wiring Diagram

BN+ (1)

BK (4)

$I_{LOAD} < 250mA$

$I_{ALARM} < 20mA$

WH (2)

Teach-in

BU- (3)

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