

# Capacitive Level Detector For Plastic & Rubber Thermoplastic Polyester Housing Types CA, M30, M32, DC, Self-Teach

**TRIPLESHIELD™**

**CARLO GAVAZZI**



- Designed for plastic and rubber applications
- For dry bulk material detection
- Featuring **TRIPLESHIELD™** Sensor Protection
- Self-Teach of sensing distance or remotely by means of wire
- Withstands up to 120°C on the sensing surface
- Automatic detection of NPN or PNP load
- Selectable make or break switching by means of remote function
- Protection: Short-circuit, transients and reverse polarity
- Humidity compensation
- 5 years of warranty

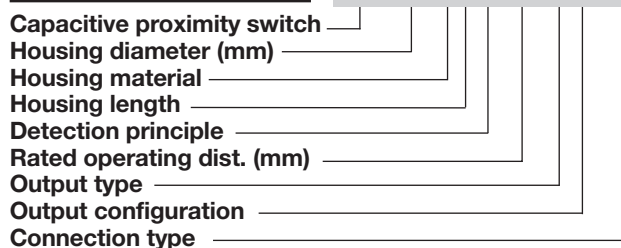
## Product Description

Capacitive level detector with specialized and optimized features for level detection in plastic and rubber applications. The sensor will adapt automatically to the application when power-on for the first time. The adjustment is easy to change by means of the

remote teach-in function. The sensor front can withstand temperatures up to 120°C. 3-wire DC output with selectable make (NO) or break (NC) switching. Grey polyester housing with 2 m PVC cable or M12 plug (Only M30).

## Ordering Key

**CA30CLN25BPM1**



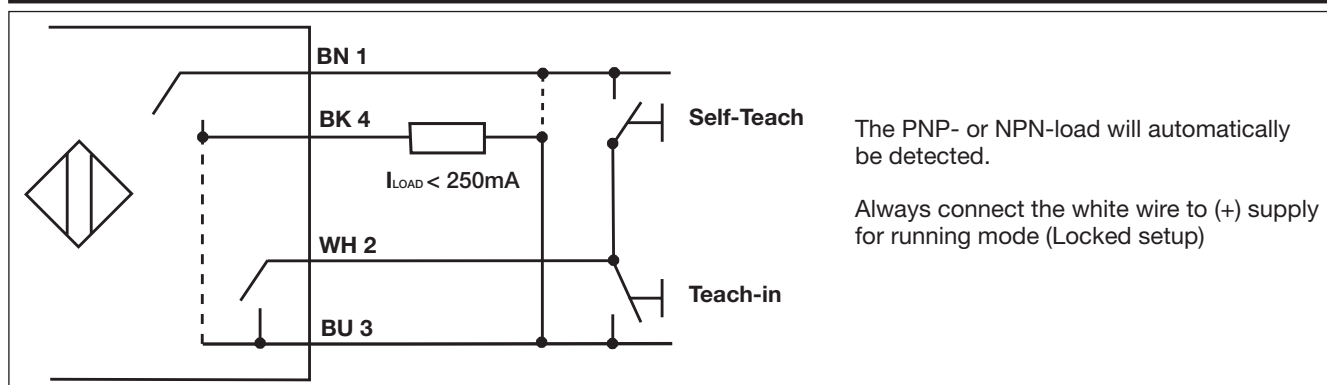
## Type Selection

| Housing diameter | Ordering no. Cable | Ordering no. Plug |
|------------------|--------------------|-------------------|
| M30              | CA30CLN25BP        | CA30CLN25BPM1     |
| M32              | CA32CLN25BP        |                   |

## Specifications

|  |   |                                  |                                     |
|--|---|----------------------------------|-------------------------------------|
| <b>Sensitivity</b>                               | Adjustable (Self-Teach)                     | <b>Environment</b>               |                                     |
| <b>Repeat accuracy (R)</b>                       | ≤ 5%  | Degree of protection             | IP 68                               |
| <b>Hysteresis (H)</b>                            | 5 - 10%                                     | Operating temperature            | -20° to +85°C (-4° to +185°F)       |
| <b>Rated operational volt. (U<sub>B</sub>)</b>   | 10 to 40 VDC (ripple incl.)                 | Max. temperature on sensing face | 120°C (248°F)                       |
| <b>Ripple</b>                                    | ≤ 10%                                       | Storage temperature              | -40° to +85°C (-40° to +185°F)      |
| <b>Rated operational current (I<sub>o</sub>)</b> | ≤ 250 mA (continuous)                       | <b>Housing material</b>          |                                     |
| <b>No-load supply current (I<sub>o</sub>)</b>    | ≤ 12 mA                                     | Body                             | Grey, thermoplastic polyester       |
| <b>Voltage drop (U<sub>v</sub>)</b>              | ≤ 2.5 VDC @ max. load                       | Cable end                        | Polyester, softened                 |
| <b>Protection</b>                                | Short-circuit, reverse polarity, transients | Nuts                             | Black, PA12 Grilamid                |
| <b>TRIPLESHIELD™ protection-EMC</b>              |   | <b>Connection</b>                |                                     |
| IEC 1000-4-2/EN 61000-4-2                        | 30 kV                                       | Cable                            | M30                                 |
| IEC 1000-4-3/EN 61000-4-3                        | > 15 V/m                                    |                                  | M32                                 |
| IEC 1000-4-4/EN 61000-4-4                        | 4 kV  | Plug (M1)                        | Grey, 2 m, 4 x 0.34 mm <sup>2</sup> |
| IEC 1000-4-6/EN 61000-4-6                        | > 10 V <sub>rms</sub>                       | Cable for plug (M1)              | Grey, 2 m, 4 x 0.75 mm <sup>2</sup> |
| <b>Frequency of operating cycles (f)</b>         | 5 Hz  |                                  | Oil proof, PVC                      |
| <b>Indication</b>                                |   | <b>Weight</b>                    | M12 x 1                             |
| For output ON                                    | LED, yellow                                 | Cable version - M30 / M32        | CON.1A-series                       |
| For calibration                                  | LED, red                                    | Plug version - M 30              |                                     |
|  |   | <b>Approvals</b>                 | UL, CSA                             |
|  |   | <b>CE-marking</b>                | Yes                                 |

## Wiring Diagram



The PNP- or NPN-load will automatically be detected.  
Always connect the white wire to (+) supply for running mode (Locked setup)

## Installation

### First time calibration

Install and wire the sensor according to the above wiring diagram. Remember to connect the white wire, the 4th wire, to (+) supply  
The very first time the sensor is powered up, the sensor will

automatically adapt to the surroundings and calculate an optimal sensitivity by itself – no matter what kind of plastic material to be detected.  
As long as the white wire is connected to (+) supply, the sensor will be locked and be in running mode.

| New                    | Action  | Description of sensor setup                                       |
|------------------------|---|---|
| First time calibration | New sensor  | Factory settings  |
|                        | Install the sensor in the application                   | -   |
|                        | Connect the sensor electrical. White wire to (+) supply | -   |
|                        | Power ON  | Self-Teach: Red LED blinking<br>The sensor is now in running mode |

### Locked sensor set-up

No other adjustment is needed. As long as the white wire is connected to (+) supply, the set-up of the sensor is locked, and will not change during another power down/up.

| Locked | Action                         | Description of sensor setup                      |
|--------|--------------------------------|--|
|        | Sensor running                 | Last setup                                       |
|        | Power OFF                      | -  |
|        | Power ON (Startup delay 600ms) | No Self-Teach. The sensor is now in running mode |

### Re-calibration of the sensor

If needed, a new Self-Teach can be activated by disconnecting the white wire from (+) supply, and then connect it again to (+) supply.

You have now activated a new Self-Teach and the sensor will now re-calibrate and calculate a new sensitivity according to the application. Be sure that the application is empty – no object to detect.

| Self-Teach           | Action                           | Description of sensor setup                                       |
|----------------------|----------------------------------|---|
| Force new Self-Teach | Disconnect white wire            | -   |
|                      | Connect white wire to (+) supply | Self-Teach: Red LED blinking<br>The sensor is now in running mode |
|                      | Power OFF                        | -   |
|                      | Power ON (Startup delay 600 ms)  | The sensor is still in running mode                               |



Every time the white wire is being disconnected from (+) supply, the Self-Teach function will be initiated and take place when connecting it again to (+) supply

| Self-Teach           | Action                           | Description of sensor setup                                       |
|----------------------|----------------------------------|---|
| Force new Self-Teach | Power OFF                        | -   |
|                      | Disconnect white wire            | -   |
|                      | Power ON (Startup delay 600 ms)  | -   |
|                      | Connect white wire to (+) supply | Self-Teach: Red LED blinking<br>The sensor is now in running mode |

### Remote teach-in

It is possible to teach-in either background or object, like the CAxxCLL sensors with normal teach-in function.

### Teach-in Background

| Teach-in                   | Action   | Description of sensor setup   |
|----------------------------|--|---|
| Remote Teach-in background | Disconnect white wire  | -   |
|                            | Be sure that the application is empty<br>Connect the white wire to (-) supply > 3 sec.<br>Remove the wire during the next 3 seconds. | The red LED will flash once per second<br>Remote teach-in of background |
|                            | Connect white wire to (+) supply   | Self-Teach: Red LED blinking<br>The sensor is now in running mode       |

### Teach-in Object

| Teach-in               | Action   | Description of sensor setup  |
|------------------------|--|--|
| Remote Teach-in object | Disconnect white wire  | -  |
|                        | Be sure that the application is <b>with</b> object.<br>Connect the white wire to (-) supply > 6 sec.<br>Remove the wire during the next 3 seconds. | The red LED will flash twice per second<br>Remote teach-in of object |
|                        | Connect white wire to (+) supply   | The sensor is now in running mode                                    |

### Teach-in Background and Object

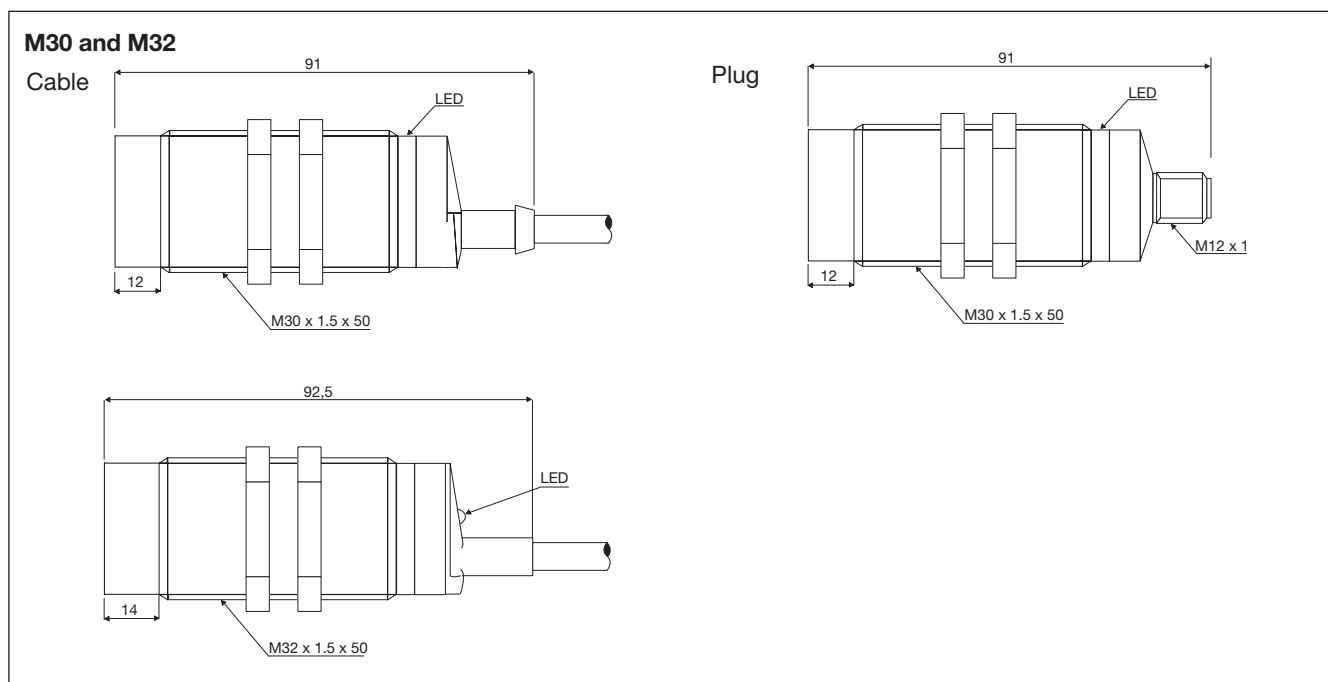
| Teach-in                                 | Action   | Description of sensor setup   |
|--|--|---|
| Remote Teach-in of background and object | Disconnect white wire  | -   |
|  | Background: Be sure that the application is empty.<br>Connect the white wire to (-) supply > 3 sec.<br>Remove the wire during the next 3 seconds.          | The red LED will flash once per second<br>Remote teach-in of background |
|  | Object: Be sure that the application is <b>with</b> object.<br>Connect the white wire to (-) supply > 6 sec.<br>Remove the wire during the next 3 seconds. | The red LED will flash twice per second<br>Remote Teach-in of object    |
|  | Connect white wire to (+) supply   | The sensor is now in running mode                                       |

### Toggle between normally open and normally closed

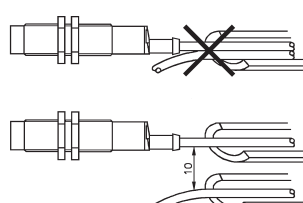
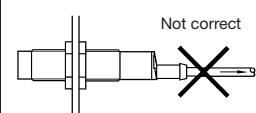

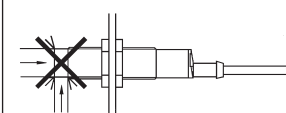
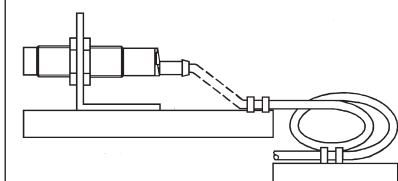
It is possible to toggle between normally open and normally closed by means of the teach-in function.

| Teach-in                            | Action  | Description of sensor setup   |
|-------------------------------------|---|---|
| Normally open<br><> Normally closed | Disconnect white wire   | -   |
|                                     | Connect the white wire to (-) supply > 9 sec.<br>Remove the wire during the next 3 seconds. | The red LED will flash three times per second<br>Toggle between NO and NC |
|                                     | Connect white wire to (+) supply  | The sensor is now in running mode   |

## Dimensions



## Installation Hints

|   |  |  |   |
|---|--|--|---|
| <p><i>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</i></p>  | <p><i>Relief of cable strain</i></p> <p>Not correct</p>  <p>Correct</p>  <p>The cable should not be pulled</p> | <p><i>Protection of the sensing face</i></p>  <p>A proximity switch should not serve as mechanical stop</p> | <p><i>Switch mounted on mobile carrier</i></p>  <p>Any repetitive flexing of the cable should be avoided</p> |
|---|--|--|---|

## Delivery Contents

- Capacitive switch: CA..CLN25BP..
- Manual
- **Packaging:** Cardboard box

## Accessories

- Plugs CON.1A.. series.