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

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 height (mm)
Housing material
Housing length
Detection principle
Rated operating dist. (mm)
Output type
Output configuration

Specifications

<table>
<thead>
<tr>
<th>Sensing range (S_d)</th>
<th>Sensitivity</th>
<th>Effective operating dist. (S_e)</th>
<th>Usable operating dist. (S_u)</th>
<th>Repeat accuracy (R)</th>
<th>Hysteresis (H)</th>
<th>Rated operational volt. (U_R)</th>
<th>Ripple</th>
<th>Rated operational current (I_R)</th>
<th>No-load supply current (I_0)</th>
<th>Voltage drop (U_d)</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 10 mm</td>
<td>Adjustable (Teach-in)</td>
<td>0.9 x S_d ≤ S_e ≤ 1.1 x S_d</td>
<td>0.8 x S_u ≤ S_u ≤ 1.2 x S_u</td>
<td>≤ 5%</td>
<td>Depending on Teach-in</td>
<td>10 to 30 VDC (ripple incl.)</td>
<td>≤ 10%</td>
<td>≤ 200 mA (continuous)</td>
<td>≤ 12 mA</td>
<td>≤ 2.5 VDC @ max. load</td>
<td>Short-circuit, reverse polarity, transients</td>
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</tbody>
</table>

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

TRIPLESHEILD™ 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_m

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

Specifications are subject to change without notice (24.08.2017)
Classification of materials and objects detection

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 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.

Dimensions

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

- Correct
- The cable should not be pulled

Protection of the sensing face

- Not correct
- 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
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.

<table>
<thead>
<tr>
<th>Push-button</th>
<th>LED - Green</th>
<th>LED - Yellow</th>
<th>Time (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12 13</td>
</tr>
</tbody>
</table>

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.

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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.

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<th>LED - Green</th>
<th>LED - Yellow</th>
<th>Time (sec)</th>
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<td>0 1 2 3 4 5 6 7 8 9 10 11 12 13</td>
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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