Proximity Sensors Capacitive Thermoplastic Polyester Housing
Type EC, M30, DC

• Featuring TRIPLESHEILD™ Sensor protection
• Rated operational voltage: 10-40 VDC
• Adjustable sensing distance 2-16 mm or 4-25 mm
• Output: DC 200 mA, NPN or PNP
• Make and break switching function
• LED indication
• High noise immunity
• Flush and non-flush types
• Plug and Cable versions available
• AC versions in the same housing

Product Description
Capacitive proximity switches with either sensing distance 16 mm flush mounted in metal or sensing distance 25 mm non-flush mounted. 4-wire DC output with both make (NO) and break (NC) switching. Grey M30 polyester housing with 2 m PVC cable or plug. Ideal for use in level and plastic machinery applications.

Ordering Key
EC 3025 NPA P L-1

Type Selection

<table>
<thead>
<tr>
<th>Housing diameter</th>
<th>Rated operating dist. (S_n)</th>
<th>Mounting</th>
<th>Ordering no.</th>
<th>Ordering no.</th>
<th>Ordering no.</th>
<th>Ordering no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>M30</td>
<td>16 mm</td>
<td>Flush (built-in)</td>
<td>EC 3016 NPAPL</td>
<td>EC 3016 NPAPL-1</td>
<td>EC 3016 PPAPL</td>
<td>EC 3016 PPAPL-1</td>
</tr>
<tr>
<td>M30</td>
<td>25 mm</td>
<td>Non-flush</td>
<td>EC 3025 NPAPL</td>
<td>EC 3025 NPAPL-1</td>
<td>EC 3025 PPAPL</td>
<td>EC 3025 PPAPL-1</td>
</tr>
</tbody>
</table>

1) Object: Grounded steel plate

Specifications

<table>
<thead>
<tr>
<th>Rated operating dist. (S_n)</th>
<th>Sensitivity</th>
<th>Effective operating dist. (S)</th>
<th>Usable operating dist. (S_u)</th>
<th>Repeat accuracy (R)</th>
<th>Hysteresis (H)</th>
<th>Rated operational volt. (U_d)</th>
<th>Ripple</th>
<th>Rated operational current (I_o)</th>
<th>No-load supply current (I_o)</th>
<th>Voltage drop (U_d)</th>
<th>Protection</th>
<th>Frequency of operating cycles (f)</th>
<th>Indication for output ON</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>3016:</td>
<td></td>
<td>2 to 16 mm factory set at 16 mm</td>
<td>4 to 25 mm factory set at 25 mm</td>
<td></td>
<td></td>
<td>10 to 40 VDC (ripple included)</td>
<td>≤ 10%</td>
<td>≤ 200 mA</td>
<td>≤ 10 mA (no load)</td>
<td>≤ 2.5 VDC at max. load</td>
<td>Reverse polarity, short-circuit, transients</td>
<td>50 Hz</td>
<td>LED, yellow</td>
<td></td>
</tr>
<tr>
<td>3025:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IP 67 (Nema 1, 3, 4, 6, 13)</td>
</tr>
</tbody>
</table>

Temperature
- Operating temperature: -25 to +80°C (-13 to +176°F)
- Storage temperature: -40 to +85°C (-40 to +185°F)

Housing material
- Body: Grey thermoplastic polyester
- Cable end: Polyurethane
- Nuts: Black reinforced nylon

Connection
- Cable: Grey, 2 m, 4 x 0.34 mm² Oil proof, PVC M12 x 1 CON.1A-series
- Plug: -1
- Cable for plug: -1

Weight (incl. nuts)
- 3016: 140 g
- 3025: 150 g

Approvals
- UL, CSA

CE-marking
- Yes

Specifications are subject to change without notice (30.05.2017)
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**Dimensions**

<table>
<thead>
<tr>
<th>Type</th>
<th>A Ø mm</th>
<th>B mm</th>
<th>C mm</th>
<th>D mm</th>
<th>E mm</th>
<th>F mm</th>
<th>SW mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC 3016xPAPL(-1)</td>
<td>M 30 x 1.5 x 50</td>
<td>28</td>
<td>50</td>
<td>13.6</td>
<td>15.4</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>EC 3025xPAPL(-1)</td>
<td>M 30 x 1.5 x 50</td>
<td>28</td>
<td>62</td>
<td>13.6</td>
<td>15.4</td>
<td>10</td>
<td>36</td>
</tr>
</tbody>
</table>

**Wiring Diagrams**

**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 TRIPLESHEILD™ 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 maximum rated sensing range.

**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:

- **Plastic 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.
Installation Hints (cont.)

<table>
<thead>
<tr>
<th>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</th>
<th>Relief of cable strain</th>
<th>Protection of the sensing face</th>
<th>Switch mounted on mobile carrier</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Incorrect" /></td>
<td>Incorrect</td>
<td><img src="image2" alt="Correct" /></td>
<td>The cable should not be pulled</td>
</tr>
<tr>
<td><img src="image3" alt="Correct" /></td>
<td>A proximity switch should not serve as mechanical stop</td>
<td><img src="image4" alt="Any repetitive flexing of the cable should be avoided" /></td>
<td></td>
</tr>
</tbody>
</table>

Delivery Contents

- Capacitive switch: EC 30.. PAPL(-1)
- Screw driver
- 2 nuts
- Packaging: Cardboard box
- Installation & Adjustment Guide

Accessories

- Plugs CON.1A.. serie.