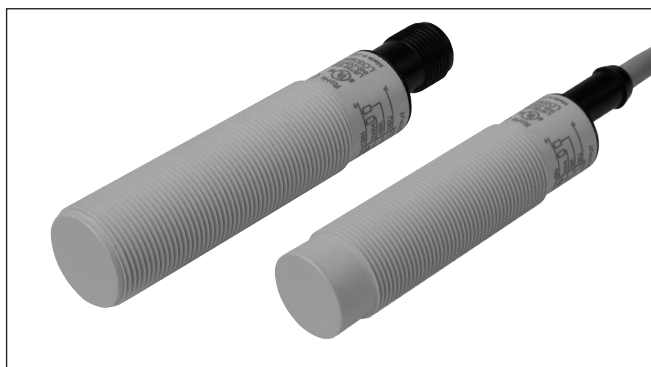


# Proximity Sensors Capacitive Thermoplastic Polyester Housing Types CA18CAN/CAF.....

CARLO GAVAZZI



- 4<sup>TH</sup> Generation **TRIPLESHIELD™**
- Adjustable sensing distance: 2 - 10 mm Flush or 3-15 mm Non-flush
- Protection: short-circuit, transients and reverse polarity
- Dust and humidity compensation
- Dust or Temperature alarm output
- Rated operational voltage: 10-40 VDC
- Output: DC 200 mA, NPN or PNP
- Standard Output: NO and NC
- LED indications for Power-supply, Target and Stability
- IP67, IP68, IP69K, Nema 1, 2, 4, 4X, 5, 6, 6P, 12
- Cable and M12 connector versions available



## Product Description

The CA18CA.. capacitive proximity switches feature an improved 4<sup>TH</sup> Generation **TRIPLESHIELD™** technology. Furthermore, these sensors feature increased immunity to electromagnetic interference (EMI), especially to frequency drives. Not only does 4<sup>TH</sup> Generation **TRIPLESHIELD™** feature an increased EMI, but it also increases the immunity to humidity and dust. The implementation of stability indication eases the setup procedure as both Stable ON and Stable OFF positions are

indicated by the Green and yellow LEDs.

The sensing distance is increased by 25 % allowing room for additional stable detection.

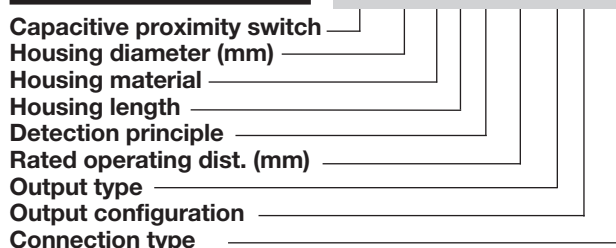
The Dust Alarm function gives an early warning that the sensing surroundings have to be cleaned.

The Temperature alarm function raises an alarm if the sensing surface goes beyond 60 degree celcius.

The sensor housing is featuring IP69K as well as approval by ECOLAB for cleaning- and disinfection agents.

## Ordering Key

**CA18CAN12NAM1**




## Type Selection

| Housing diameter | Sensor type | Output type | Output function | Connection | Rated operating distance (S <sub>n</sub> ) | Ordering no. Standard | Ordering no. Dust alarm | Ordering no. Temperature alarm |
|------------------|-------------|-------------|-----------------|------------|--|-----------------------|-------------------------|--------------------------------|
| M 18             | Flush       | NPN         | NO+NC           | Cable      | 0 - 8 mm                                   | <b>CA18CAF08NA</b>    |                         |                                |
| M 18             | Flush       | NPN         | NO+NC           | M12 Plug   | 0 - 8 mm                                   | <b>CA18CAF08NAM1</b>  |                         |                                |
| M 18             | Flush       | PNP         | NO+NC           | Cable      | 0 - 8 mm                                   | <b>CA18CAF08PA</b>    |                         |                                |
| M 18             | Flush       | PNP         | NO+NC           | M12 Plug   | 0 - 8 mm                                   | <b>CA18CAF08PAM1</b>  |                         |                                |
| M 18             | Flush       | PNP         | NO              | Cable      | 0 - 8 mm                                   |                       | <b>CA18CAF08PODU</b>    | <b>CA18CAF08POTA</b>           |
| M 18             | Flush       | PNP         | NC              | Cable      | 0 - 8 mm                                   |                       | <b>CA18CAF08PCDU</b>    | <b>CA18CAF08PCTA</b>           |
| M 18             | Non-Flush   | NPN         | NO+NC           | Cable      | 0 - 12 mm                                  | <b>CA18CAN12NA</b>    |                         |                                |
| M 18             | Non-Flush   | NPN         | NO+NC           | M12 Plug   | 0 - 12 mm                                  | <b>CA18CAN12NAM1</b>  |                         |                                |
| M 18             | Non-Flush   | PNP         | NO+NC           | Cable      | 0 - 12 mm                                  | <b>CA18CAN12PA</b>    |                         |                                |
| M 18             | Non-Flush   | PNP         | NO+NC           | M12 Plug   | 0 - 12 mm                                  | <b>CA18CAN12PAM1</b>  |                         |                                |
| M 18             | Non-Flush   | PNP         | NO              | Cable      | 0 - 12 mm                                  |                       | <b>CA18CAN12PODU</b>    | <b>CA18CAN12POTA</b>           |
| M 18             | Non-Flush   | PNP         | NC              | Cable      | 0 - 12 mm                                  |                       | <b>CA18CAN12PCDU</b>    | <b>CA18CAN12PCTA</b>           |

## Specifications EN 60947-5-2

|   |  |   |   |
|---|--|---|---|
| <b>Rated operating distance (S<sub>n</sub>)</b><br>Non-flush mounted sensor | 0 - 12 mm (factory setting 12 mm),<br>(ref. target 36x36 mm ST37,<br>1 mm thick, grounded)                     | <b>Sensitivity control</b><br>Electrical adjustment<br>Mechanical adjustment<br>Adjustable distance<br>Flush types<br>Non-flush types | Adjustable by potentiometer<br>11 turns<br>16 turns<br>2 to 10 mm<br>3 to 15 mm |
| Flush mounted sensor  | 0 - 8 mm (factory setting<br>8 mm - non-flush mounted)<br>(ref. target 24x24 mm ST37,<br>1 mm thick, grounded) | <b>Effective operating dist. (S<sub>r</sub>)</b>  | 0.9 x S <sub>n</sub> ≤ S <sub>r</sub> ≤ 1.1 x S <sub>n</sub>                    |

## Specifications (cont.) EN 60947-5-2

|  |  |   |  |
|--|--|---|--|
| <b>Usable operating dist. (S<sub>u</sub>)*</b>     | 0.85 x S <sub>r</sub> ≤ S <sub>u</sub> ≤ 1.15 x S <sub>r</sub>   | <b>Temperature alarm output</b>                   | 60°C ± 5°C   |
| <b>Repeat accuracy (R)</b>                         | ≤ 5%   | Response time examples<br>T <sub>A</sub> = 25°C   | 14 sec @ T <sub>EXC</sub> = 800°C<br>315 sec @ T <sub>EXC</sub> = 80°C |
| <b>Hysteresis (H)</b>                              | 3 - 20%  | <b>TRIPLESHIELD™</b>                              |  |
| <b>Rated operational volt. (U<sub>B</sub>)</b>     | 10 to 40 VDC (ripple incl.)  | <b>Exceeding the norms for capacitive sensors</b> |  |
| <b>Ripple</b>                                      | ≤ 10%  | Electrostatic discharge (EN61000-4-2)             |  |
| <b>Output function</b>                             | NPN or PNP   | Contact discharge                                 | > 40 kV  |
| <b>Output switching function</b>                   | N.O. and N.C.  | Air discharge                                     | > 40 kV  |
| <b>Rated operational current (I<sub>a</sub>)</b>   | ≤ 200 mA (continuous)  | Electrical fast transients/burst (EN 61000-4-4)   | ±4kV   |
| <b>Capacitive load</b>                             | 100 nF   | Surge (EN 61000-4-5)                              |  |
| <b>No-load supply current (I<sub>o</sub>)</b>      | ≤ 12 mA  | Power-supply                                      | > 2kV (with 500 Ω)   |
| <b>Voltage drop (U<sub>d</sub>)</b>                | ≤ 2.0 VDC @ 200 mA DC  | Sensor output                                     | > 2kV (with 500 Ω)   |
| <b>Minimum operational current (I<sub>m</sub>)</b> | ≥ 0.5 mA   | Wire conducted disturbances (EN 61000-4-6)        | > 20 Vrms  |
| <b>OFF state current (I<sub>i</sub>)</b>           | ≤ 100 μA   | Power-frequency magnetic fields (EN 61000-4-8)    |  |
| <b>Protection</b>                                  | Short-circuit, reverse polarity, transients  | Continuous  | > 60 A/m, 75.9 μ tesla   |
| <b>Frequency of operating cycles (f)</b>           | 50 Hz  | Short-time  | > 600 A/m, 759 μ tesla   |
| <b>Response time OFF-ON (t<sub>on</sub>)</b>       | ≤ 10 ms  | Radiated RF electromagnetic fields (EN 61000-4-3) | > 20 V/m   |
| <b>Response time ON-OFF (t<sub>off</sub>)</b>      | ≤ 10 ms  | Shock (IEC 60068-2-27)                            | 30 G / 11ms, 3 pos, 3 neg per axis                                     |
| <b>Power ON delay (t<sub>v</sub>)</b>              | ≤ 200 ms   | Rough handling shocks (IEC 60068-2-31)            | 2 times from 1m<br>100 times from 0,5m                                 |
| <b>Indication</b>                                  |  | Vibration (IEC 60068-2-6)                         | 10 to 150 Hz, 1 mm / 15 G  |
| Target detected                                    | LED, yellow  | <b>Housing material</b>                           |  |
| Power and detection stability                      | LED, green   | Body  | PBT, grey,<br>30% glass reinforced                                     |
| <b>Environment</b>                                 |  | Cable gland                                       | PA12, black  |
| Installation category                              | III (IEC 60664, 60664A; 60947-1)   | Fingernuts  | PA12, black  |
| Degree of pollution                                | 3 (IEC 60664, 60664A; 60947-1)   | Trimmershaft                                      | Nylon  |
| Degree of protection                               | IP 67, IP 68/60 min., IP69K** (IEC 60529; 60943-1)   | <b>Weight</b>                                     |  |
| NEMA type  | 1, 2, 4, 4X, 5, 6, 6P, 12  | Cable version                                     | 150 g  |
| Operating temperature                              | -30 to +85°C (-22 to +185°F)   | Plug version                                      | 75 g   |
| Max. temperature on sensing face                   | 120°C (248°F)  | <b>Approvals</b>                                  | cULus (UL508), ECOLAB  |
| Storage temperature                                | -40 to +85°C (-40 to +185°F)   | <b>CE-marking</b>                                 | Yes  |
| <b>Rated insulation voltage</b>                    | 1 kVAC (rms)<br>IEC protection class III  | <b>MTTF<sub>d</sub></b>                           | 825 years @ 40°C (+104°F)  |
| <b>Tightening torque</b>                           | ≤ 2.6 Nm   |   |  |
| <b>Connection</b>                                  |  |   |  |
| Cable  | PVC,<br>Ø5.2 x 2 m, 4 x 0.34 mm <sup>2</sup><br>Oil proof, grey  |   |  |
| Plug (M1)  | M12 x 1 - 4 pin  |   |  |

\* For Flush type sensor flushmounted in conductive material, the usable operating distance (S<sub>u</sub>) is 0.80 x S<sub>r</sub> ≤ S<sub>u</sub> ≤ 1.2 x S<sub>r</sub>, for temperatures exceeding 0 - 60 °C (32 - 140°F).

\*\* The IP69K test according to DIN 40050-9 for high-pressure, high-temperature wash-down applications. The sensor must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning. The sensor is exposed to high pressure water from a spray nozzle that is fed with 80°C water at 8'000-10'000 KPa (80-100bar) and a flow rate of 14-6L/min. The nozzle is held 100-150 mm from the sensor at angles of 0°, 30°, 60° and 90° for 30s each. The test device sits on a turntable that rotates with a speed of 5 times per minute. The sensor must not suffer any damaging effects from the high pressure water in appearance and function.

