

# Ultrasonic Diffuse, Digital Output Types UA18CAD.....TI

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- Cylindrical M18 PBT housing
- Sensing distance: 50-2200 mm
- Power supply: 15 to 30 VDC
- Outputs: Two multi function switching outputs. PNP or NPN
- Setup: Normal switching or adjustable hysteresis
- Repeatability 0.5%
- Beam angle.  $\pm 7^\circ$  or  $\pm 8^\circ$
- Protection: Short-circuit, reverse polarity and overvoltage
- Protection degree IP 67
- 2 m cable or M12 plug

## Product Description

A self-contained multi function diffuse ultrasonic sensor with a sensing range of 50 to 2200 mm in three ranges. 2 switching outputs - easily set up for two different output modes and adjusted by teach-in - makes it ideal for level control tasks in a wide variety of vessels. A sturdy

one-piece polyester housing provides the perfect packaging for the sophisticated microprocessor controlled and digitally filtered sensor electronics. Excellent EMC performance and precision are typical features of this sensor on true distance measurement.

## Ordering Key

**UA18CAD04NPM1TI**

|                      |       |
|----------------------|-------|
| Ultrasonic sensor    | _____ |
| Housing style        | _____ |
| Housing size         | _____ |
| Housing material     | _____ |
| Housing length       | _____ |
| Detection principle  | _____ |
| Sensing distance     | _____ |
| Output type          | _____ |
| Output configuration | _____ |
| Connection           | _____ |
| Teach-in             | _____ |

## Type Selection

| Housing diameter | Connection | Rated operating dist. (S <sub>n</sub> ) | Digital output NPN/PNP | Ordering no.                 |
|------------------|------------|---|------------------------|------------------------------|
| M18              | Plug M12   | 50-400 mm                               | 2 x NPN                | <b>UA 18 CAD 04 NP M1 TI</b> |
| M18              | Cable      | 50-400 mm                               | 2 x NPN                | <b>UA 18 CAD 04 NP TI</b>    |
| M18              | Plug M12   | 50-400 mm                               | 2 x PNP                | <b>UA 18 CAD 04 PP M1 TI</b> |
| M18              | Cable      | 50-400 mm                               | 2 x PNP                | <b>UA 18 CAD 04 PP TI</b>    |
| M18              | Plug M12   | 100-900 mm                              | 2 x NPN                | <b>UA 18 CAD 09 NP M1 TI</b> |
| M18              | Cable      | 100-900 mm                              | 2 x NPN                | <b>UA 18 CAD 09 NP TI</b>    |
| M18              | Plug M12   | 100-900 mm                              | 2 x PNP                | <b>UA 18 CAD 09 PP M1 TI</b> |
| M18              | Cable      | 100-900 mm                              | 2 x PNP                | <b>UA 18 CAD 09 PP TI</b>    |
| M18              | Plug M12   | 200-2200 mm                             | 2 x NPN                | <b>UA 18 CAD 22 NP M1 TI</b> |
| M18              | Cable      | 200-2200 mm                             | 2 x NPN                | <b>UA 18 CAD 22 NP TI</b>    |
| M18              | Plug M12   | 200-2200 mm                             | 2 x PNP                | <b>UA 18 CAD 22 PP M1 TI</b> |
| M18              | Cable      | 200-2200 mm                             | 2 x PNP                | <b>UA 18 CAD 22 PP TI</b>    |

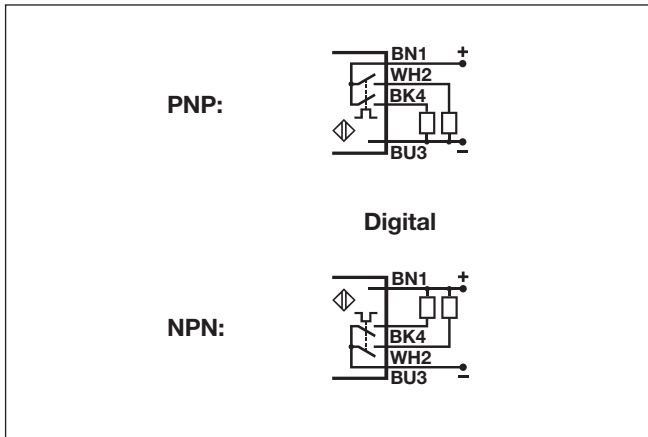
## Specifications

|   |   |   |  |
|---|---|---|--|
| <b>Rated operating distance (S<sub>n</sub>)</b>                   | Reference target: 1 mm metal rolled finish.<br>CAD04: 100 x 100 mm<br>CAD09 and CAD22: 200 x 200 mm<br>50 - 400 mm<br>100 - 900 mm<br>200 - 2200 mm | <b>Repeatability</b>  | 0.5%   |
| UA18CAD04<br>UA18CAD09<br>UA18CAD22                               |   | <b>Beam angle</b><br>UA18CAD04...<br>UA18CAD09...<br>UA18CAD22... | $\pm 8^\circ$<br>$\pm 7^\circ$<br>$\pm 7^\circ$                  |
| <b>Blind zone</b><br>UA18CAD04...<br>UA18CAD09...<br>UA18CAD22... | $\leq 50$ mm<br>$\leq 100$ mm<br>$\leq 200$ mm  | <b>Adjustment</b><br>Push-button                                  | P1 (farthest setpoint)<br>P2 (nearest setpoint)                  |
|   |   | <b>Temperature drift</b>  | $\leq 0.1\%/^\circ\text{C}$ @ $-20^\circ$ to $+60^\circ\text{C}$ |
|   |   | <b>Temperature compensation</b>                                   | Yes  |

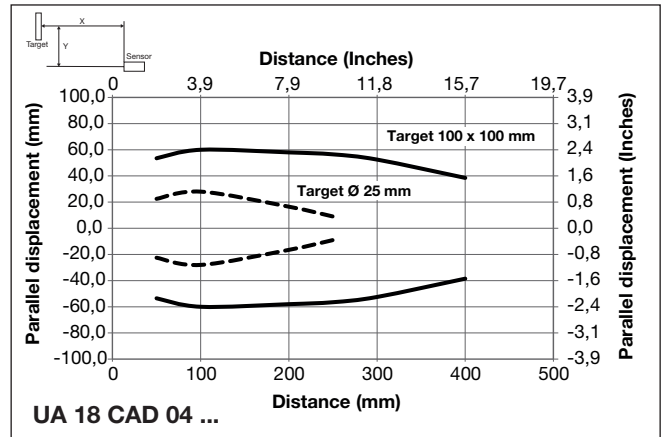
## Specifications (cont.)

|   |  |   |
|---|--|---|
| <b>Hysteresis (H)</b>                                 | Min. 1%  | Normal Switching function with N.O. output.<br>Adjustable hysteresis<br>Filling or emptying control |
| <b>Rated operational voltage (<math>U_B</math>)</b>   | 15 to 30 VDC<br>(ripple included)                          |   |
| <b>Ripple (<math>U_{rip}</math>)</b>                  | ≤ 5%   |   |
| <b>No-load supply current (<math>I_o</math>)</b>      |  | <b>Indication Output ON</b>   |
| UA18CAD04...  | ≤ 45 mA @ $U_B$ max  | Yellow LED  |
| UA18CAD09...  | ≤ 45 mA @ $U_B$ max  | <b>Environment</b>  |
| UA18CAD22...  | ≤ 50 mA @ $U_B$ max  | Installation category   |
| <b>Output current continuous (<math>I_o</math>)</b>   |  | Pollution degree  |
| Max. load capacity 100 nF                             | ≤ 500 mA   | Degree of protection  |
| UL508 specification                                   | ≤ 100 mA   | <b>Ambient temperature</b>  |
| <b>Output current short-time (I)</b>                  |  | Operating   |
| Max. load capacity 100 nF                             | ≤ 500 mA   | Storage   |
| UL508 specification                                   | ≤ 100 mA   | <b>Vibration</b>  |
| <b>Minimum operational current (<math>I_m</math>)</b> | ≤ 0.5 mA   | 10 to 55 Hz, 1.0 mm/6g<br>(IEC/EN 60068-2-6)  |
| <b>OFF-state current (<math>I_r</math>)</b>           | ≤ 10 $\mu$ A   | <b>Shock</b>  |
| <b>Voltage drop (<math>U_d</math>)</b>                | ≤ 2.2 VDC @ $I_o$ max.                                     | 30 g / 11 mS, 3 directions<br>(IEC/EN 60068-2-27)   |
| <b>Protection</b>                                     | Short-circuit, overvoltage and reverse polarity            | <b>Rated insulation voltage</b>   |
| <b>Carrier frequency</b>                              |  | < 500 VAC (rms)   |
| UA18CAD04...  | 400 kHz  | <b>Housing</b>  |
| UA18CAD09...  | 300 kHz  | Material body   |
| UA18CAD22...  | 200 kHz  | Material front  |
| <b>Operating frequency (f)</b>                        |  | Material back, plug   |
| UA18CAD04...  | ≤ 10 Hz  | Material back, cable  |
| UA18CAD09...  | ≤ 4 Hz   | Material push-button  |
| UA18CAD22...  | ≤ 1 Hz   | Sealing around push-button  |
| <b>Response time OFF-ON (<math>t_{ON}</math>)</b>     |  | Material sealing front  |
| UA18CAD04...  | ≤ 50 mS  | UA18CAD04...  |
| UA18CAD09...  | ≤ 125 mS   | UA18CAD09...  |
| UA18CAD22...  | ≤ 500 mS   | UA18CAD22...  |
| <b>Response time ON-OFF (<math>t_{OFF}</math>)</b>    |  | <b>Connection</b>   |
| UA18CAD04...  | ≤ 50 mS  | Cable   |
| UA18CAD09...  | ≤ 125 mS   | PVC, grey, 2 m,<br>4 x 0.32 mm <sup>2</sup> , $\varnothing = 4.7$                                   |
| UA18CAD22...  | ≤ 500 mS   | mm  |
| <b>Power ON delay</b>                                 | ≤ 900 mS   | Plug  |
| <b>Output function, open collector</b>                |  | M12, 4-pin (CON. 14-series)   |
| By sensor type  | NPN or PNP   | <b>Tightening torque</b>  |
| <b>Output switching function</b>                      | Two open collector transistor outputs to be configured as: | ≤ 1 Nm  |
|   |  | <b>Weight</b>   |
|   |  | Cable version   |
|   |  | Plug version  |
|   |  | <b>CE-marking</b>   |
|   |  | Yes   |
|   |  | <b>Approvals</b>  |
|   |  | cULus (UL508)   |

## Wiring Diagram



## Detection Range



## Dimensions

