

# Ultrasonic Diffuse, Analogue Output Types UA18CSD.....TI

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- Cylindrical M18 PBT housing
- Sensing distance: 40-800 mm
- Power supply: 10-30 VDC
- Outputs: 0-10 VDC or 4-20 mA
- Linearity error 1%
- Repeatability 1%
- Beam angle:  $\pm 7^\circ$  or  $\pm 8^\circ$
- Protection: short-circuit and overvoltage
- Protection degree IP 67
- 2 m cable or M12 plug

## Product Description

A family of diffuse ultrasonic sensors with a sensing range from 40-300 mm and 80-800 mm with a resolution as low as 3.0 mm. The sensor contains an analogue output that is either 0-10 V or 4-20 mA. This sensor is the ideal choice

for distance measurement, level measurement, diameter measurement or loop control. Due to the use of micro-processor control the digital filtering makes the sensor immune to most electro-magnetic interferences.

## Ordering Key

**UA18CSD08AGM1TI**

|                      |       |
|----------------------|-------|
| 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> ) | Analogue Output | Ordering no.          |
|------------------|------------|-----------------------------------------|-----------------|-----------------------|
| M18              | Plug M12   | 40-300 mm                               | 4-20 mA         | UA 18 CSD 03 AG M1 TI |
| M18              | Cable      | 40-300 mm                               | 4-20 mA         | UA 18 CSD 03 AG TI    |
| M18              | Plug M12   | 40-300 mm                               | 0-10 V          | UA 18 CSD 03 AK M1 TI |
| M18              | Cable      | 40-300 mm                               | 0-10 V          | UA 18 CSD 03 AK TI    |
| M18              | Plug M12   | 80-800 mm                               | 4-20 mA         | UA 18 CSD 08 AG M1 TI |
| M18              | Cable      | 80-800 mm                               | 4-20 mA         | UA 18 CSD 08 AG TI    |
| M18              | Plug M12   | 80-800 mm                               | 0-10 V          | UA 18 CSD 08 AK M1 TI |
| M18              | Cable      | 80-800 mm                               | 0-10 V          | UA 18 CSD 08 AK TI    |

## Specifications

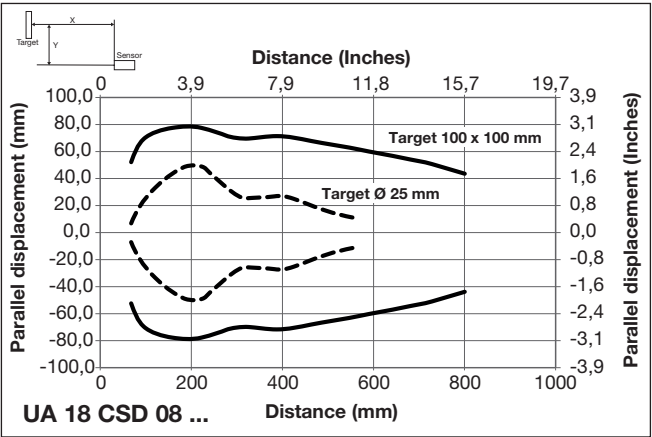
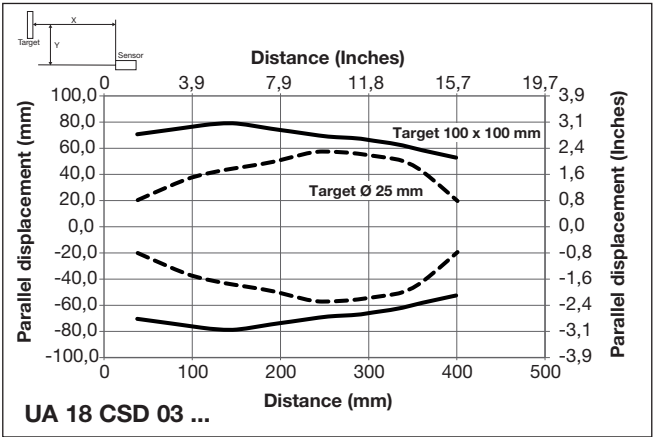
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|-------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------|
| <b>Rated operating distance (S<sub>n</sub>)</b> | Reference target: 1 mm metal rolled finish<br>100 x 100 mm<br>40 - 300 mm<br>80 - 800 mm | <b>Temperature compensation</b>                  | Yes                            |
| UA18CSD03<br>UA18CSD08                          |                                                                                          | <b>Hysteresis (H)</b>                            | Min. 1%                        |
| <b>Blind zone</b>                               |                                                                                          | <b>Rated operational voltage (U<sub>B</sub>)</b> | 10 to 30 VDC (ripple included) |
| UA18CSD03...                                    | ≤ 40 mm                                                                                  | <b>Ripple (U<sub>rip</sub>)</b>                  | ≤ 5%                           |
| UA18CSD08...                                    | ≤ 80 mm                                                                                  | <b>No-load supply current (I<sub>o</sub>)</b>    | 35 mA @ U <sub>B</sub> max     |
| <b>Repeatability</b>                            | 1%                                                                                       | <b>Protection analogue output</b>                | Short-circuit and overvoltage  |
| <b>Linear Accuracy</b>                          | 1%                                                                                       | <b>Output analogue output</b>                    |                                |
| <b>Beam angle</b>                               |                                                                                          | AG.. types                                       | 4 to 20 mA                     |
| UA18CSD03...                                    | 7° ± 2°                                                                                  | AK.. types                                       | 0 to 10 VDC                    |
| UA18CSD08...                                    | 8° ± 2°                                                                                  | <b>Load</b>                                      |                                |
| <b>Adjustment</b>                               |                                                                                          | 4 to 20 mA                                       | max. 500 Ω                     |
| Teach by wire                                   | P1 (farthest setpoint)<br>P2 (nearest setpoint)                                          | 0 to 10 VDC                                      | min. 3 kΩ                      |
| <b>Resolution</b>                               | 3 mm                                                                                     | <b>Carrier frequency</b>                         | 300 kHz                        |
| <b>Temperature drift</b>                        | 0.1%/°C @ -20° to +60° C                                                                 | <b>Response time analogue output</b>             | ≤ 400 mS                       |



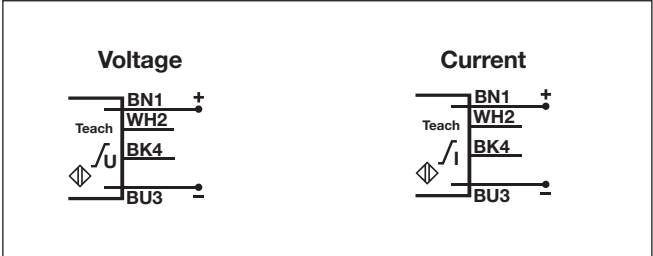
Specifications (cont.)

|                           |                                                  |                          |                                                                      |
|---------------------------|--------------------------------------------------|--------------------------|----------------------------------------------------------------------|
| Power ON delay            | ≤ 900 mS                                         | Rated insulation voltage | 500 VAC (rms)                                                        |
| Output switching function | Analogue output with positive or negative slope. | Housing                  |                                                                      |
| Indication                |                                                  | Material body            | PBT                                                                  |
| Output ON                 | Yellow LED                                       | Material front           | Epoxy-glass resin                                                    |
| Echo ON                   | Green LED                                        | Material back, plug      | Grilamid                                                             |
| Environment               |                                                  | Material back, cable     | Grilamid                                                             |
| Installation category     | III (IEC 60664/60664A; 60947-1)                  | Material sealing front   | TPE                                                                  |
| Pollution degree          | 3 (IEC 60664/60664A; 60947-1)                    | Connection               |                                                                      |
| Degree of protection      | IP67 (IEC 60529; 60947-1)                        | Cable                    | PVC, grey, 2 m, 4 x 0.32 mm², Ø = 4.7 mm M12, 4-pin (CON. 14-series) |
| Ambient temperature       |                                                  | Plug                     |                                                                      |
| Operating                 | -20° to +60°C (-4° to +140°F)                    | Tightening torque        | ≤ 1 Nm                                                               |
| Storage                   | -35° to +70°C (-31° to +158°F)                   | Weight                   |                                                                      |
| Vibration                 | 10 to 55 Hz, 1.0 mm/6g (IEC/EN 60068-2-6)        | Cable version            | 135 g                                                                |
| Shock                     | 30 g / 11 mS, 3 directions (IEC/EN 60068-2-27)   | Plug version             | 65 g                                                                 |
|                           |                                                  | CE-marking               | Yes                                                                  |
|                           |                                                  | Approvals                | cULus (UL508)                                                        |

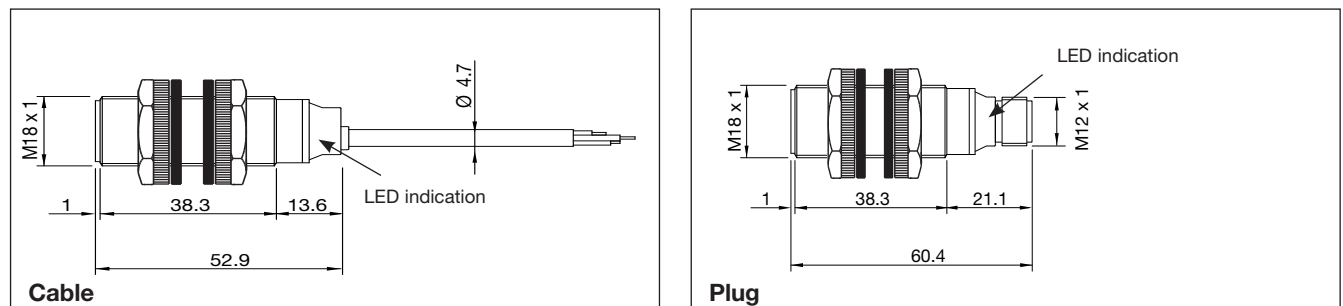
Detection Range



Wiring Diagram



## Dimensions



## Programming set-up

### Teach-in by wire adjustment options

Two Teach-in adjustment options are available:

In the following, **“Activate Teach”** means:  
Connect the white wire to GND (Blue wire)

#### 1) Window Teach-in Option (adjustment of two points: P1 and P2)

*Teach-in of set point P1:*

- Place the target at the selected far distance P1 - the green Echo LED is ON
- “Activate Teach” shortly
- Setpoint P1 has been stored and the sensor is still in teach mode
- The orange LED will continue flashing rapidly with a frequency of 2 Hz until the setpoint P2 has been learned

*Teach-in of set point P2:*

- Place the target at the selected close distance P2 - the green Echo LED is still ON
- “Activate Teach” shortly
- The green LED switch OFF and the orange LED will flash 5 times with a frequency of 2,5 Hz
- Setpoint P2 has been stored.
- The sensor is in normal mode and the green and yellow LEDs are steady.

#### 2) Target adjustment on P1 only (Minimum P2 distance)

*Teach-in of set point P1:*

- Place the target at the selected far distance P1 - the green Echo LED is ON
- “Activate Teach” shortly
- Setpoint P1 has been stored and the sensor is still in teach mode
- The orange LED will continue flashing rapidly with a frequency of 2 Hz until setpoint P2 has been learned
- Without moving the target
- “Activate Teach” shortly
- The green LED switches OFF and the orange LED will flash 5 times with a frequency of 2,5 Hz
- Setpoint P2 has been stored at the minimum distance
- The sensor is in normal mode and the green and yellow LEDs are steady

## Programming set-up (cont.)

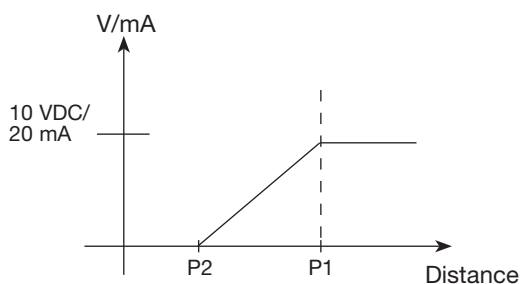
### Configuration of the slope of the analogue output

The analogue version's default setting is positive slope.

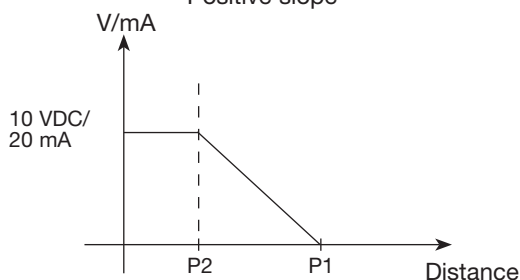
*Change configuration from positive to negative slope:*

- "Activate Teach" for more than 6 seconds until the orange LED flashes at a high rate/10 times per second.
- Deactivate Teach: The orange LED flashes 5 times, and the output stage is changed.

### Analogue

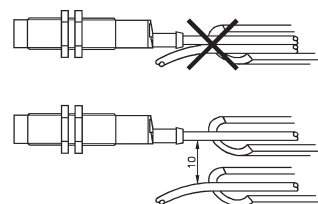
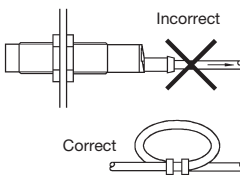
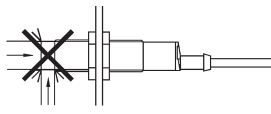
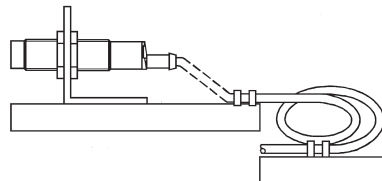


Positive slope



Negative slope

## Installation Hints

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

## Delivery Contents

- Ultrasonic sensor: UA18CSD....
- Installation instruction
- Mounting:
  - 2 x M18 nuts
  - 2 x rubber washers
- **Packaging:** Carton box 35 x 107 x 173 mm