

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

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- Cylindrical M18 PBT housing
- Sensing distance: 40-800 mm
- Power supply: 10-30 VDC
- Outputs: PNP or NPN, NO or NC
- 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 multifunctional diffuse ultrasonic sensor with a sensing range from 40-300 mm and 80-800 mm. One switching output - easily set up for "windows" detection with two setpoints. NO or NC output is selectable. 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

**UA18CSD08NPM1TI**

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 distance ( $S_n$ )	Digital output NPN/PNP	Ordering no.
M18	Plug M12	40-300 mm	NPN	UA 18 CSD 03 NP M1 TI
M18	Cable	40-300 mm	NPN	UA 18 CSD 03 NP TI
M18	Plug M12	40-300 mm	PNP	UA 18 CSD 03 PP M1 TI
M18	Cable	40-300 mm	PNP	UA 18 CSD 03 PP TI
M18	Plug M12	80-800 mm	NPN	UA 18 CSD 08 NP M1 TI
M18	Cable	80-800 mm	NPN	UA 18 CSD 08 NP TI
M18	Plug M12	80-800 mm	PNP	UA 18 CSD 08 PP M1 TI
M18	Cable	80-800 mm	PNP	UA 18 CSD 08 PP TI

## Specifications

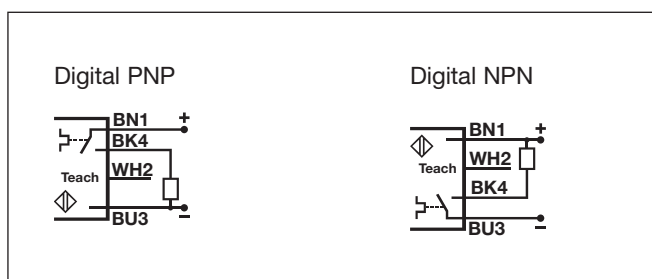
<b>Rated operating distance (<math>S_n</math>)</b>	Reference target: 1 mm metal rolled finish 100 x 100 mm 40 - 300 mm 80 - 800 mm	<b>Adjustment</b> Teach by wire	P1 (farthest setpoint) P2 (farthest setpoint)
UA18CSD03 UA18CSD08		<b>Temperature drift</b>	$\leq 0,1\%/^\circ\text{C}$ @ $-20^\circ$ to $+60^\circ\text{C}$
<b>Blind zone</b>		<b>Temperature compensation</b>	Yes
UA18CSD03... UA18CSD08...	$\leq 40$ mm $\leq 80$ mm	<b>Hysteresis(H)</b>	Min. 1%
<b>Repeatability</b>	0,5%	<b>Rated operational voltage(<math>U_B</math>)</b>	10-30 VDC (incl. ripple)
<b>Beam angle</b>		<b>Ripple (<math>U_{rpp}</math>)</b>	$\leq 5\%$
UA18CSD03... UA18CSD08...	$7^\circ \pm 2^\circ$ $8^\circ \pm 2^\circ$	<b>No-load supply current (<math>I_o</math>)</b>	$\leq 35$ mA @ $U_B$ maks.

## Specifications (cont.)

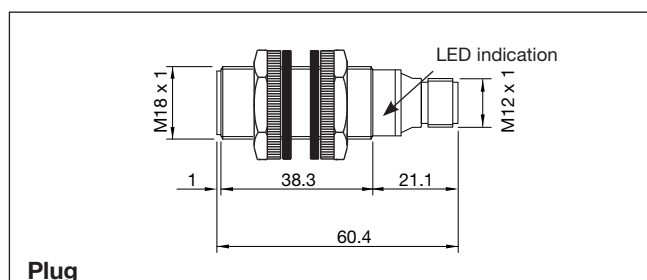
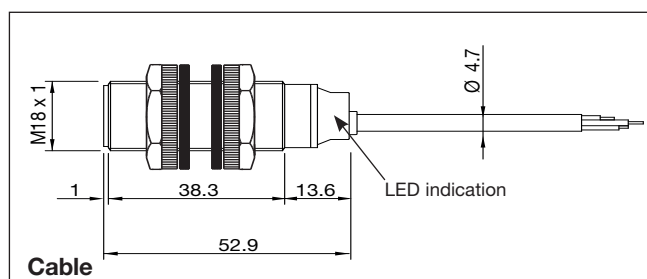
<b>Output current continuous</b> ( $I_o$ ) Max. load capacity 100 nF	≤ 100mA
<b>Output current short-time</b> (I) Max. load capacity 100 nF	≤ 100 mA
<b>Minimum operational current</b> ( $I_m$ )	≤ 0.5 mA
<b>OFF-state current</b> ( $I_r$ )	≤ 10 $\mu$ A @ $U_g$ max.
<b>Voltage drop</b> ( $U_d$ )	≤ 2.2 VDC @ $I_o$ max.
<b>Protection</b>	Short-circuit, overvoltage and reverse polarity
<b>Carrier frequency</b>	300 kHz
<b>Operating frequency</b> (f) UA18ESD03... UA18ESD08...	≤ 8 Hz ≤ 5 Hz
<b>Response time OFF-ON</b> ( $t_{ON}$ ) UA18ESD03... UA18ESD08...	≤ 60 mS ≤ 100 mS
<b>Response time ON-OFF</b> ( $t_{OFF}$ ) UA18ESD03... UA18ESD08...	≤ 60 mS ≤ 100 mS
<b>Power ON delay</b>	≤ 100 mS
<b>Output function, open collector</b> By sensor type	NPN or PNP
<b>Output switching function</b>	One open collector transistor output to be configured as NO or NC
<b>Indication</b> Output ON Echo ON	Yellow LED Green LED
<b>Environment</b> Installation category Pollution degree Degree of protection	III (IEC 60664/60664A; 60947-1) 3 (IEC 60664/60664A; 60947-1) IP67 (IEC 60529; 60947-1)

<b>Ambient temperature</b> Operating Storage	-20° to +60°C (-4° to +140°F) -35° to +70°C (-31° to +158°F)
<b>Vibration</b>	10 to 55 Hz, 1.0 mm/6g (IEC/EN 60068-2-6)
<b>Shock</b>	30 g / 11 mS, 3 directions (IEC/EN 60068-2-27)
<b>Rated insulation voltage</b>	< 500 VAC (rms)
<b>Housing</b> Material body Material front Material back, plug Material back, cable Material sealing front	PBT Epoxy-glass resin Grilamid Grilamid TPE
<b>Connection</b> Cable Plug	PVC, grey, 2 m, 4 x 0.32 mm <sup>2</sup> , $\varnothing = 4.7$ mm M12, 4-pin (CON. 14-series)
<b>Tightening torque</b>	≤ 1 Nm
<b>Weight incl. packaging</b> Cable version Plug version	135 g 65 g
<b>CE-marking</b>	Yes
<b>Approvals</b>	cULus (UL508)

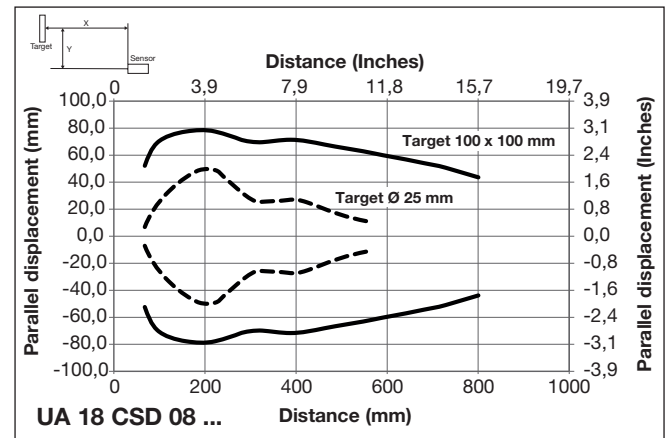
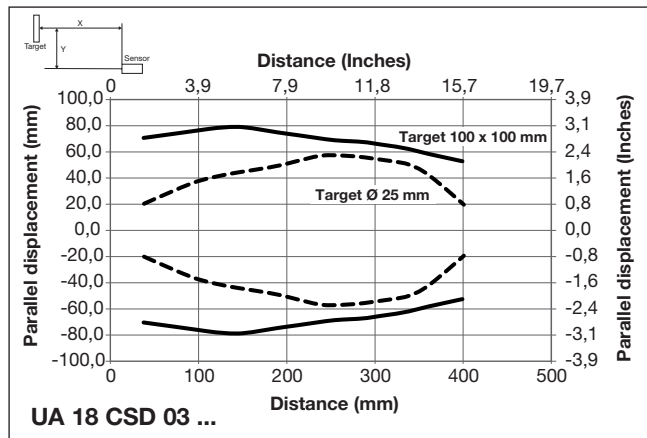
## Wiring Diagram



## Dimensions



## Detection Range



## Programming set-up

### Teach-in by wire adjustment options

In the following, “**Activate Teach**” means:

- PNP – Connect the white wire to V+ (Brown wire)
- NPN – Connect the white wire to GND (Blue wire)

Three Teach-in adjustment options are available:

#### 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

#### 3) Full range teach (NPN and PNP versions only)

- Remove the target in front of the sensor -the green Echo LED switches OFF
- “Activate Teach” shortly
- The orange LED will flash 5 times with a frequency of 2,5 Hz
- Setpoint P1 has been stored at the maximum distance and P2 at the minimum distance (this distance is not uniquely definite and repeatable throughout the different sensor types)

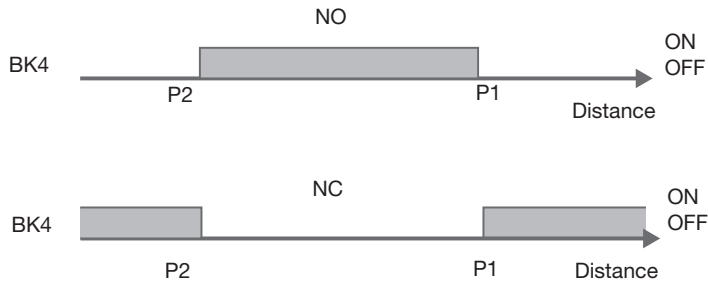
## Programming set-up (cont.)

### Configuration of the NO/NC states

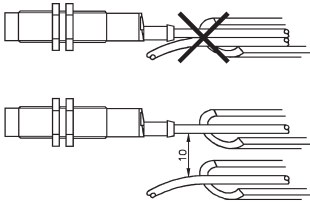
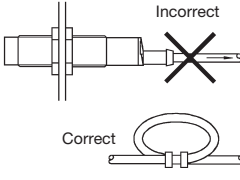
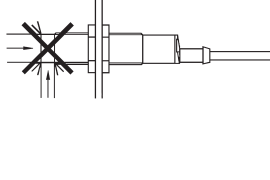
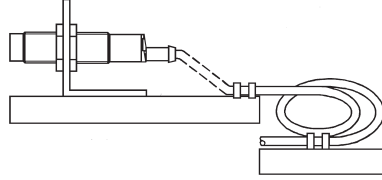
Default setting is NO (normally open)

Change configuration from NO to NC:

- "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.



## 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>Incorrect</p> <p>Correct</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>
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## Delivery Contents

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

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