

# Ultrasonic Diffuse, Digital Output Types UA18ESD.....TI

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- Cylindrical M18 stainless steel housing INOX AISI316L
- 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 of 40 to 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 stainless steel

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

**UA18ESD08NPM1TI**

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	40-300 mm	NPN	UA 18 ESD 03 NP M1 TI
M18	Cable	40-300 mm	NPN	UA 18 ESD 03 NP TI
M18	Plug M12	40-300 mm	PNP	UA 18 ESD 03 PP M1 TI
M18	Cable	40-300 mm	PNP	UA 18 ESD 03 PP TI
M18	Plug M12	80-800 mm	NPN	UA 18 ESD 08 NP M1 TI
M18	Cable	80-800 mm	NPN	UA 18 ESD 08 NP TI
M18	Plug M12	80-800 mm	PNP	UA 18 ESD 08 PP M1 TI
M18	Cable	80-800 mm	PNP	UA 18 ESD 08 PP TI

## Specifications

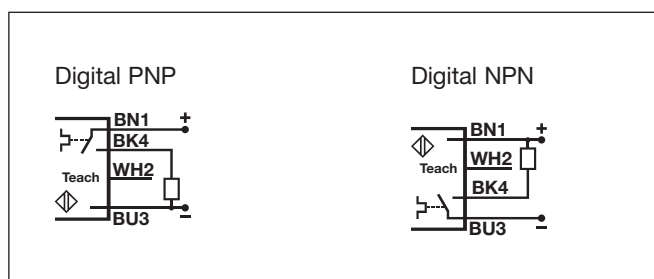
<b>Rated operating distance (S<sub>n</sub>)</b>	Reference target: 1 mm metal rolled finish. 100 x 100 mm 40 - 300 mm 80 - 800 mm	<b>Adjustment</b> Teach by wire	P1 (farthest setpoint) P2 (nearest setpoint)
UA18ESD03 UA18ESD08		<b>Temperature drift</b>	≤ 0.1%/°C @ -20° to +60° C
<b>Blind zone</b>		<b>Temperature compensation</b>	Yes
UA18ESD03... UA18ESD08...	≤ 40 mm ≤ 80 mm	<b>Hysteresis (H)</b>	Min. 1%
<b>Repeatability</b>	0.5%	<b>Rated operational voltage (U<sub>B</sub>)</b>	10-30 VDC (ripple included)
<b>Beam angle</b>		<b>Ripple (U<sub>rip</sub>)</b>	≤ 5%
UA18ESD03... UA18ESD08...	7 ± 2° 8 ± 2°	<b>No-load supply current (I<sub>0</sub>)</b>	≤ 35 mA @ U <sub>B</sub> max

## Specifications (cont.)

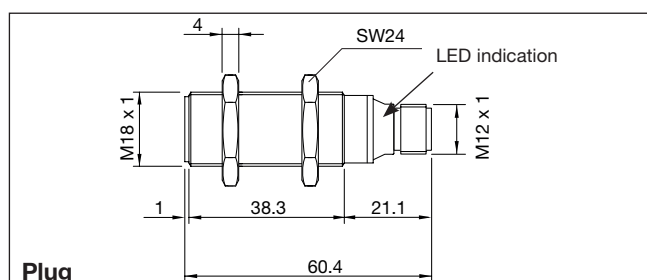
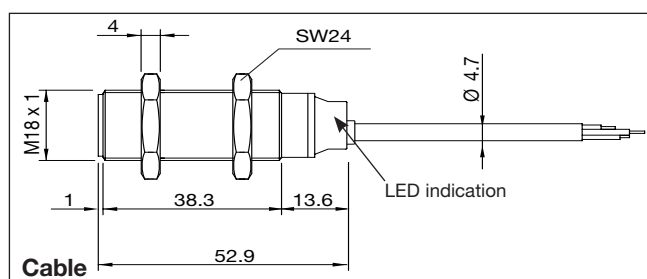
<b>Output current continuous</b> ( $I_o$ ) Max. load capacity 100 nF	≤ 100mA
<b>Output current short-time</b> (I) Max. load capacity 100 nF	≤ 100 mA
<b>Minimum operational current</b> ( $I_m$ )	≤ 0.5 mA
<b>OFF-state current</b> ( $I_r$ )	≤ 10 $\mu$ A @ $U_g$ max.
<b>Voltage drop</b> ( $U_d$ )	≤ 2.2 VDC @ $I_o$ 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	AISI 316L stainless steel 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	160 g 85 g
<b>CE-marking</b>	Yes
<b>Approvals</b>	cULus (UL508)

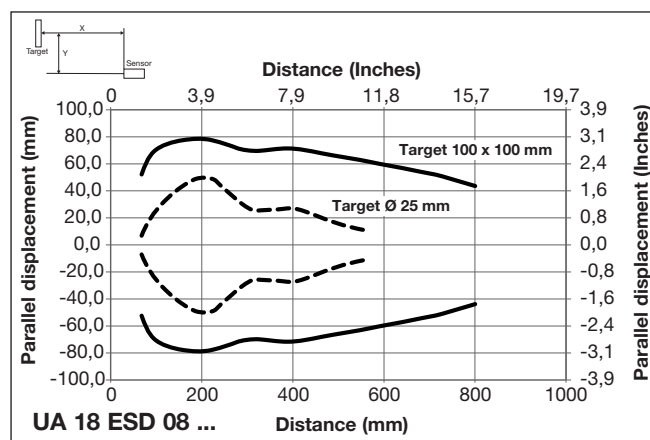
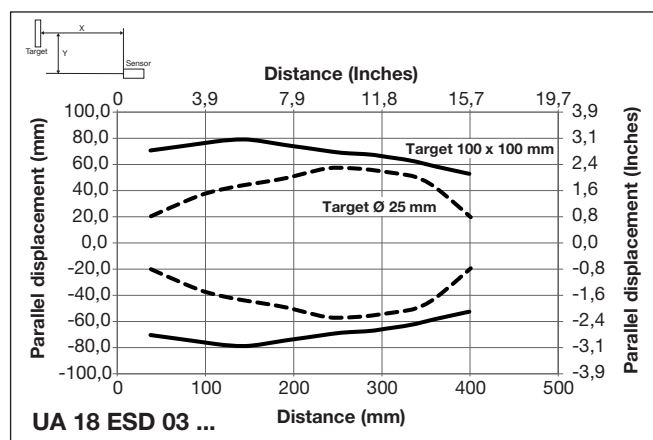
## Wiring Diagram



## 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)