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

CARLO GAVAZZI



- **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. ±7° or ±8°**
- **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_n)	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

Rated operating distance (S_n)	Reference target: 1 mm metal rolled finish. 100 x 100 mm
UA18ESD03	40 - 300 mm
UA18ESD08	80 - 800 mm
Blind zone	
UA18ESD03...	≤ 40 mm
UA18ESD08...	≤ 80 mm
Repeatability	0.5%
Beam angle	
UA18ESD03...	7 ± 2°
UA18ESD08...	8 ± 2°

Adjustment	
Teach by wire	P1 (farthest setpoint) P2 (nearest setpoint)
Temperature drift	≤ 0.1%/°C @ -20° to +60° C
Temperature compensation	Yes
Hysteresis (H)	Min. 1%
Rated operational voltage (U_B)	10-30 VDC (ripple included)
Ripple (U_{rpp})	≤ 5%
No-load supply current (I_o)	≤ 35 mA @ U_B max

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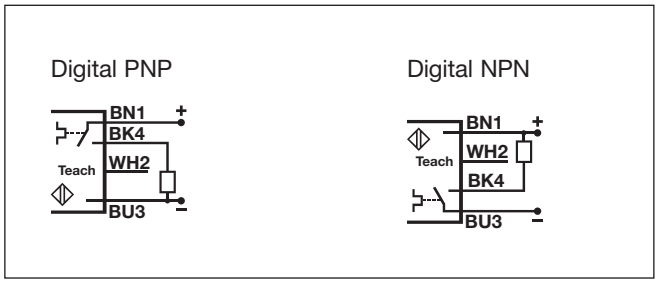
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Specifications (cont.)

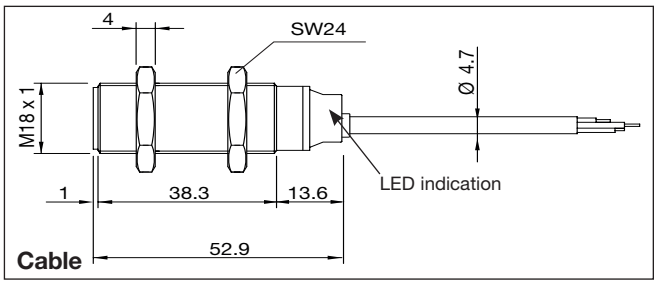
Output current continuous (I_e)	
Max. load capacity 100 nF	≤ 100mA
Output current short-time (I)	
Max. load capacity 100 nF	≤ 100 mA
Minimum operational current (I_m)	≤ 0.5 mA
OFF-state current (I_r)	≤ 10 µA @ U_B max.
Voltage drop (U_d)	≤ 2.2 VDC @ I_e max.
Protection	Short-circuit, overvoltage and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

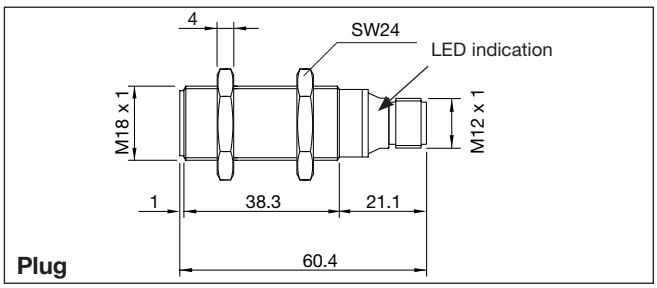
Ambient temperature	
Operating	-20° to +60°C (-4° to +140°F)
Storage	-35° to +70°C (-31° to +158°F)
Vibration	10 to 55 Hz, 1.0 mm/6g (IEC/EN 60068-2-6)
Shock	30 g / 11 mS, 3 directions (IEC/EN 60068-2-27)
Rated insulation voltage	< 500 VAC (rms)
Housing	
Material body	AISI 316L stainless steel
Material front	Epoxy-glass resin
Material back, plug	Grilamid
Material back, cable	Grilamid
Material sealing front	TPE
Connection	
Cable	PVC, grey, 2 m, 4 x 0.32 mm², Ø = 4.7 mm
Plug	M12, 4-pin (CON. 14-series)
Tightening torque	≤ 1 Nm
Weight incl. packaging	
Cable version	160 g
Plug version	85 g
CE-marking	Yes
Approvals	cULus (UL508)

Wiring Diagram



Dimensions

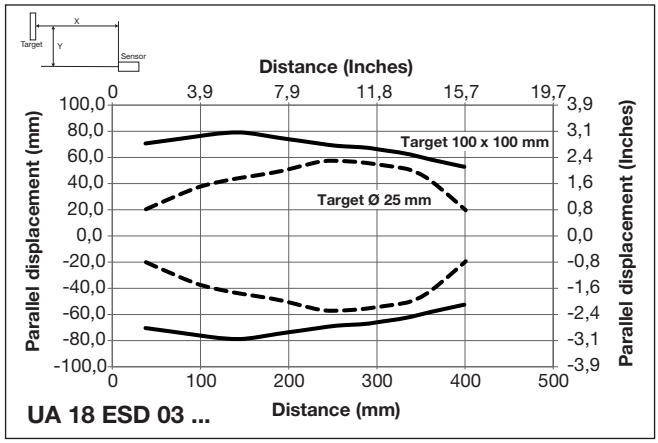


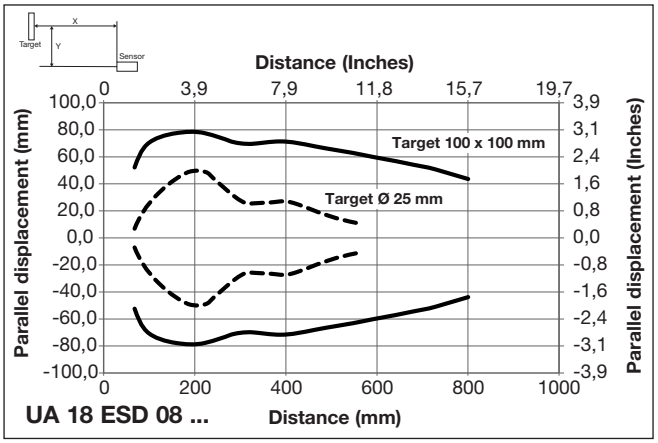


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Detection Range





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

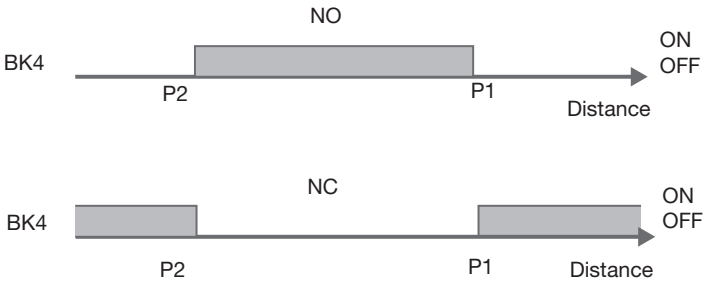
(this distance is not uniquely definite and repeatable throughout the different sensor types)

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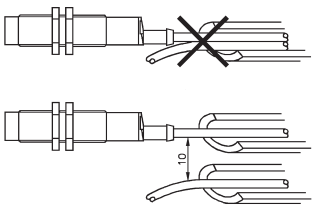
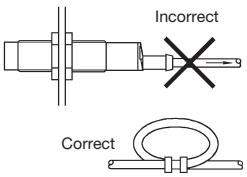
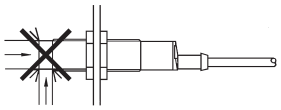
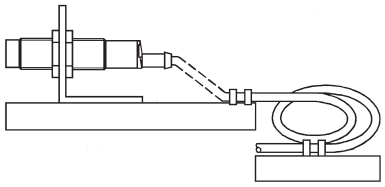
Programming set-up (cont.)

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

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

Delivery Contents

- Ultrasonic sensor: UA18ESD....
- Installation instruction
- Mounting:
  2 x M18 Nuts
- **Packaging:** Carton box 35 x 107 x 173 mm

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