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

CARLO GAVAZZI

- **Cylindrical M18 Stainless Steel housing INOX AISI 316L**
- **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. ±7° or ±8°**
- **Protection: Short-circuit and overvoltage**
- **Protection degree IP 67**
- **2 m cable or M12 plug**

Product Description

A family of diffuse ultrasonic sensors in stainless steel housing and with a sensing range of 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 microprocessor control the digital filtering makes the sensor immune to most electromagnetic interferences.

Ordering Key

UA18ESD08AGM1TI

- **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)	Analogue Output	Ordering no.
M18	Plug M12	40-300 mm	4-20 mA	**UA 18 ESD 03 AG M1 TI**
M18	Cable	40-300 mm	4-20 mA	**UA 18 ESD 03 AG TI**
M18	Plug M12	40-300 mm	0-10 V	**UA 18 ESD 03 AK M1 TI**
M18	Cable	40-300 mm	0-10 V	**UA 18 ESD 03 AK TI**
M18	Plug M12	80-800 mm	4-20 mA	**UA 18 ESD 08 AG M1 TI**
M18	Cable	80-800 mm	4-20 mA	**UA 18 ESD 08 AG TI**
M18	Plug M12	80-800 mm	0-10 V	**UA 18 ESD 08 AK M1 TI**
M18	Cable	80-800 mm	0-10 V	**UA 18 ESD 08 AK 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	1%
Linear Accuracy	1%
Beam angle	
UA18ESD03...	7 ± 2°
UA18ESD08...	8 ± 2°
Adjustment	
Teach by wire	P1 (farthest setpoint) P2 (nearest setpoint)
Resolution	3 mm

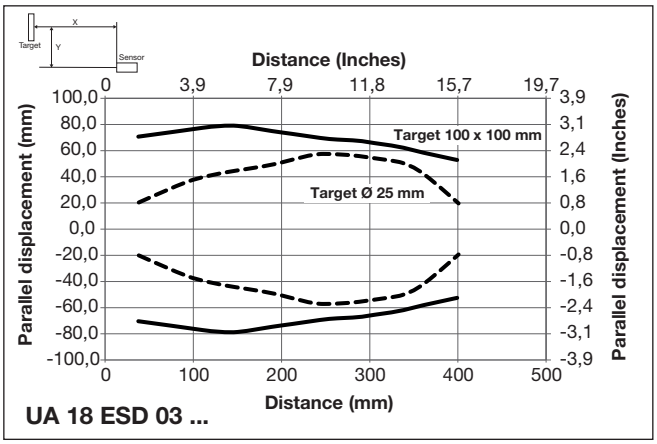
Temperature drift	0.1%/°C @ -20° to +60° C
Temperature compensation	Yes
Hysteresis (H)	Min. 1%
Rated operational voltage (U_B)	10-30 VDC (ripple included)
Ripple (U_{rpp})	≤ 5%
No-load supply current (I_o)	35 mA @ U_B max
Protection analogue output	Short-circuit and overvoltage
Output analogue output	
AG.. types	4 to 20 mA
AK.. types	0 to 10 VDC
Load	
4 to 20 mA	max. 500 Ω
0 to 10 VDC	min. 3 kΩ

Specifications (cont.)

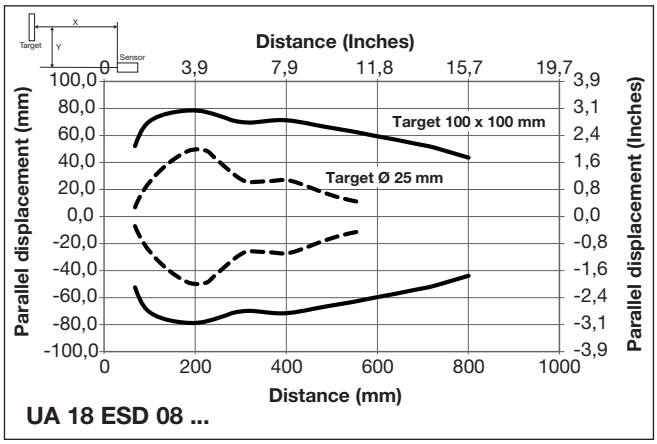
Carrier frequency	300 kHz
Response time analogue output	≤ 400 mS
Power ON delay	≤ 900 mS
Output switching function	Analogue output with positive or negative slope
Indication	
Output ON	Yellow LED
Echo ON	Green LED
Environment	
Installation category	III (IEC 60664/60664A; 60947-1)
Pollution degree	3 (IEC 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	≤ 50 Nm
Weight	
Cable version	160 g
Plug version	85 g
CE-marking	Yes
Approvals	cULus (UL508)

Detection Range

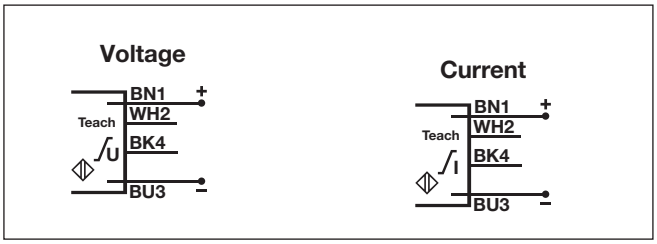


UA 18 ESD 03 ...

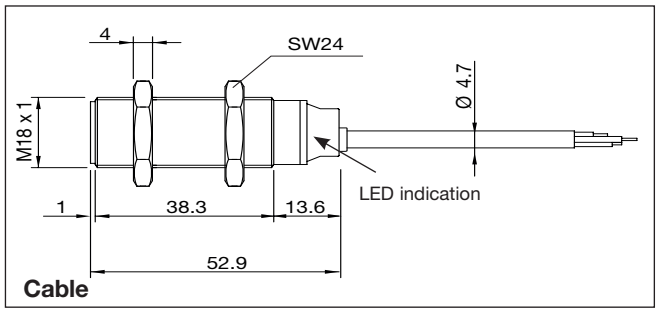


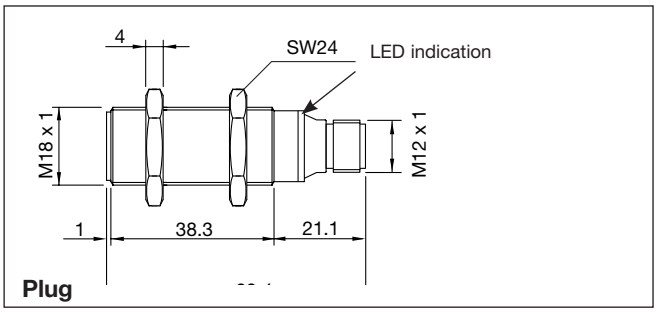
UA 18 ESD 08 ...

Wiring Diagram



Dimensions





Programming set-up

Teach-in by wire adjustment options

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

Two 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)

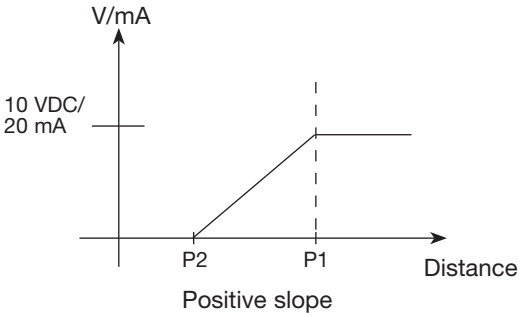
Teach-in of set point P1:
- Place the target at the selected far distance P1 - the green Echo LED is ON
- *"Activate Teach"* shortly
- Setpoint P1 has been stored and the sensor is still in teach mode
- The orange LED will continue flashing rapidly with a frequency of 2 Hz until setpoint P2 has been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

Programming set-up (cont.)

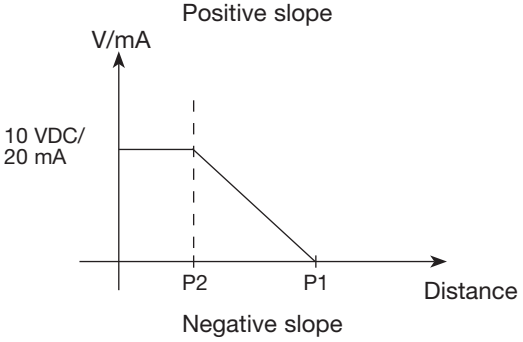
Configuration of the slope of the analogue output
The analogue version's default setting is positive slope.

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

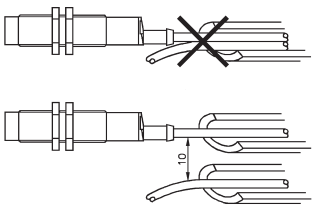
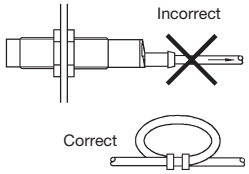
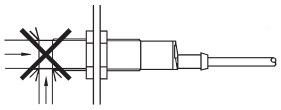
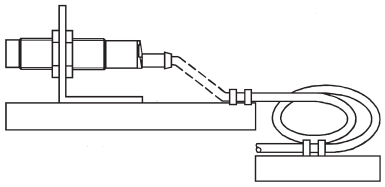


Positive slope



Negative slope

Installation Hints

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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