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

CE   cULus

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	Connec-tion	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	**Temperature drift**	0.1%/°C @ -20° to +60° C
		Temperature compensation	Yes
UA18ESD03	40 - 300 mm	**Hysteresis** (H)	Min. 1%
UA18ESD08	80 - 800 mm	**Rated operational voltage** (U$_B$)	10-30 VDC (ripple included)
Blind zone			
UA18ESD03...	≤ 40 mm	**Ripple** (U$_{rpp}$)	≤ 5%
UA18ESD08...	≤ 80 mm	**No-load supply current** (I$_o$)	35 mA @ U$_B$ max
Repeatability	1%	**Protection analogue output**	Short-circuit and overvoltage
Linear Accuracy	1%		
Beam angle		**Output analogue output**	
UA18ESD03...	7 ± 2°	AG.. types	4 to 20 mA
UA18ESD08...	8 ± 2°	AK.. types	0 to 10 VDC
Adjustment			
Teach by wire	P1 (farthest setpoint) P2 (nearest setpoint)	**Load** 4 to 20 mA 0 to 10 VDC	max. 500 Ω min. 3 kΩ
Resolution	3 mm		

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Specifications (cont.)

Carrier frequency	300 kHz		Shock	30 g / 11 mS, 3 directions (IEC/EN 60068-2-27)
Response time analogue output	≤ 400 mS		Rated insulation voltage	< 500 VAC (rms)
Power ON delay	≤ 900 mS		**Housing**	
Output switching function	Analogue output with positive or negative slope		Material body	AISI 316L stainless steel
			Material front	Epoxy-glass resin
Indication			Material back, plug	Grilamid
Output ON	Yellow LED		Material back, cable	Grilamid
Echo ON	Green LED		Material sealing front	TPE
Environment			**Connection**	
Installation category	III (IEC 60664/60664A; 60947-1)		Cable	PVC, grey, 2 m, 4 x 0.32 mm², Ø = 4.7 mm
Pollution degree	3 (IEC 60664/60664A; 60947-1)		Plug	M12, 4-pin (CON. 14-series)
Degree of protection	IP67 (IEC 60529; 60947-1)		**Tightening torque**	≤ 50 Nm
Ambient temperature			**Weight**	
Operating	-20° to +60°C (-4° to +140°F)		Cable version	160 g
Storage	-35° to +70°C (-31° to +158°F)		Plug version	85 g
Vibration	10 to 55 Hz, 1.0 mm/6g (IEC/EN 60068-2-6)		**CE-marking**	Yes
			Approvals	cULus (UL508)

Detection Range

UA 18 ESD 03 ...

UA 18 ESD 08 ...

Wiring Diagram

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Dimensions

Cable

Plug
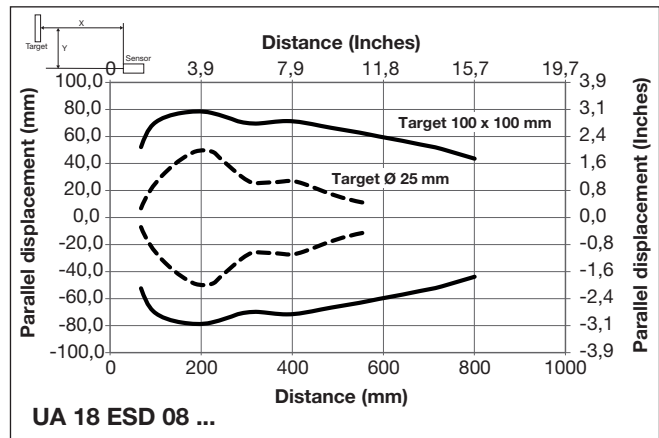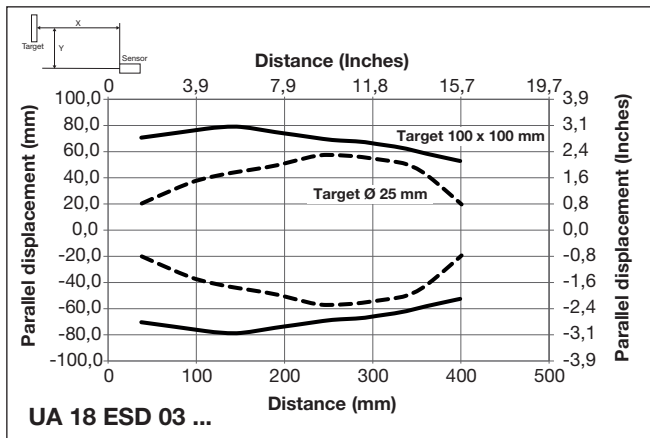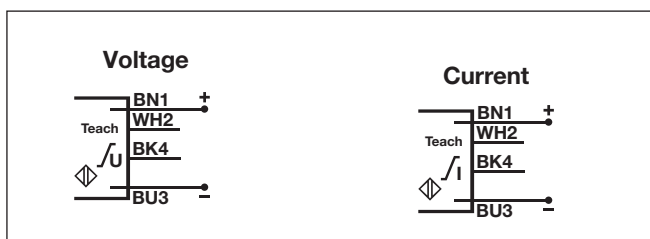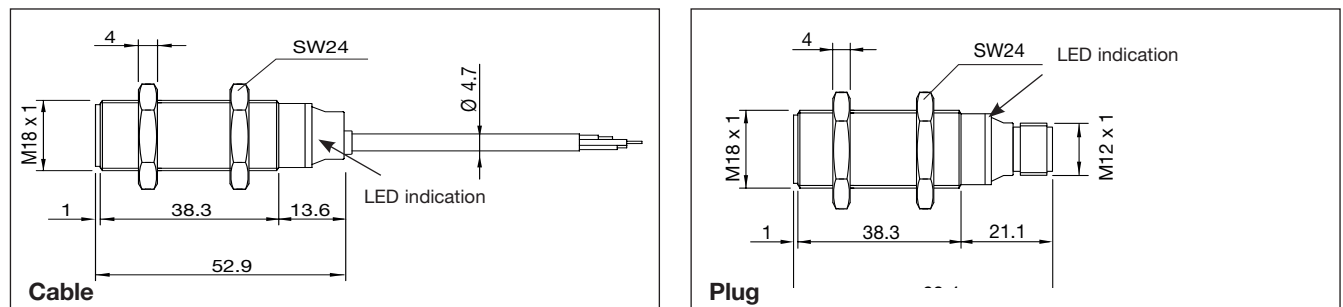
Programming set-up

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
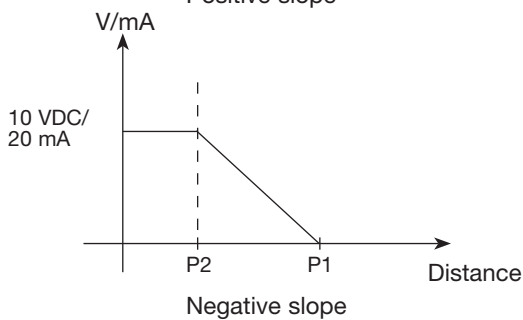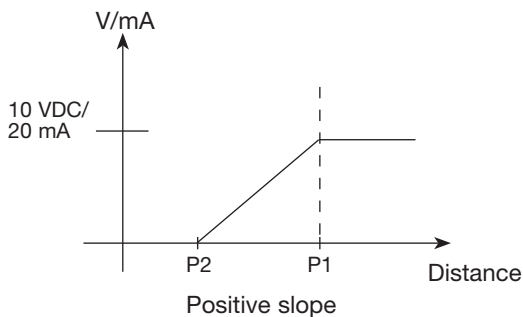
Programming set-up (cont.)

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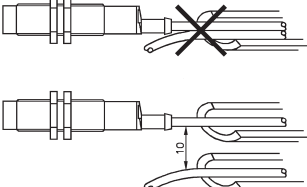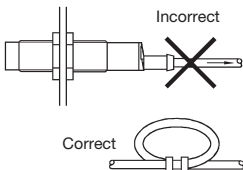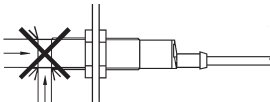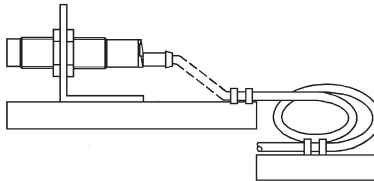The analogue version's default setting is positive slope.

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

V/mA

10 VDC/
20 mA

P2   P1   Distance

Positive slope

V/mA

10 VDC/
20 mA

P2   P1   Distance

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* Incorrect Correct The cable should not be pulled	*Protection of the sensing face* A proximity switch should not serve as mechanical stop	*Switch mounted on mobile carrier* 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