

Ultrasonic Diffuse, Digital Output Types UA18CAD.....TI

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- Cylindrical M18 PBT housing
- Sensing distance: 50-2200 mm
- Power supply: 15 to 30 VDC
- Outputs: Two multi function switching outputs. PNP or NPN
- Setup: Normal switching or adjustable hysteresis
- 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 multi function diffuse ultrasonic sensor with a sensing range of 50 to 2200 mm in three ranges. 2 switching outputs - easily set up for two different output modes and adjusted by teach-in - makes it ideal for level control tasks in a wide variety of vessels. 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

UA18CAD04NPM1TI

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	50-400 mm	2 x NPN	UA 18 CAD 04 NP M1 TI
M18	Cable	50-400 mm	2 x NPN	UA 18 CAD 04 NP TI
M18	Plug M12	50-400 mm	2 x PNP	UA 18 CAD 04 PP M1 TI
M18	Cable	50-400 mm	2 x PNP	UA 18 CAD 04 PP TI
M18	Plug M12	100-900 mm	2 x NPN	UA 18 CAD 09 NP M1 TI
M18	Cable	100-900 mm	2 x NPN	UA 18 CAD 09 NP TI
M18	Plug M12	100-900 mm	2 x PNP	UA 18 CAD 09 PP M1 TI
M18	Cable	100-900 mm	2 x PNP	UA 18 CAD 09 PP TI
M18	Plug M12	200-2200 mm	2 x NPN	UA 18 CAD 22 NP M1 TI
M18	Cable	200-2200 mm	2 x NPN	UA 18 CAD 22 NP TI
M18	Plug M12	200-2200 mm	2 x PNP	UA 18 CAD 22 PP M1 TI
M18	Cable	200-2200 mm	2 x PNP	UA 18 CAD 22 PP TI

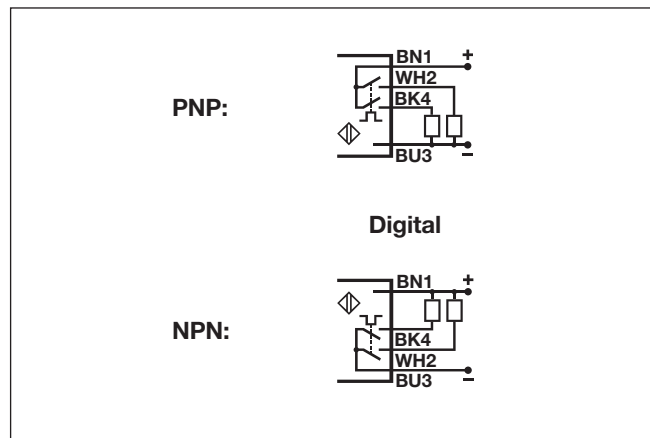
Specifications

Rated operating distance (S_n)	Reference target: 1 mm metal rolled finish. CAD04: 100 x 100 mm CAD09 and CAD22: 200 x 200 mm 50 - 400 mm 100 - 900 mm 200 - 2200 mm	Repeatability	0.5%
UA18CAD04 UA18CAD09 UA18CAD22		Beam angle UA18CAD04... UA18CAD09... UA18CAD22...	$\pm 8^\circ$ $\pm 7^\circ$ $\pm 7^\circ$
Blind zone UA18CAD04... UA18CAD09... UA18CAD22...	≤ 50 mm ≤ 100 mm ≤ 200 mm	Adjustment Push-button	P1 (farthest setpoint) P2 (nearest setpoint)
		Temperature drift	$\leq 0.1\%/^\circ\text{C}$ @ -20° to $+60^\circ\text{C}$
		Temperature compensation	Yes

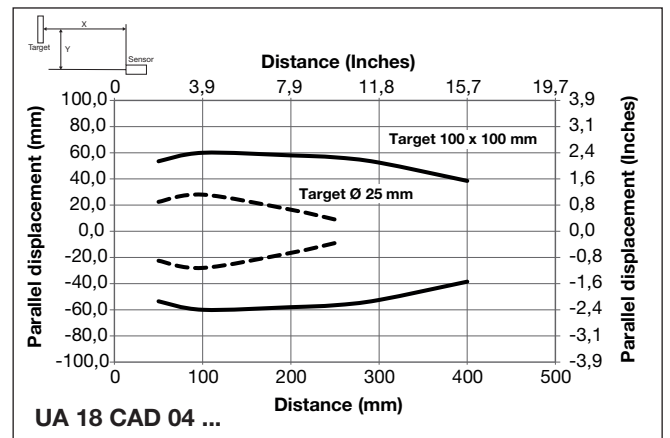
Specifications (cont.)

Hysteresis (H)	Min. 1 %		
Rated operational voltage (U_B)	15 to 30 VDC (ripple included)		Normal Switching function with N.O. output. Adjustable hysteresis Filling or emptying control
Ripple (U_{rip})	≤ 5 %		
No-load supply current (I_o)			
UA18CAD04...	≤ 45 mA @ U_B max		
UA18CAD09...	≤ 45 mA @ U_B max		
UA18CAD22...	≤ 50 mA @ U_B max		
Output current continuous (I_o)			
Max. load capacity 100 nF	≤ 500 mA		
UL508 specification	≤ 100 mA		
Output current short-time (I)			
Max. load capacity 100 nF	≤ 500 mA		
UL508 specification	≤ 100 mA		
Minimum operational current (I_m)	≤ 0.5 mA		
OFF-state current (I_r)	≤ 10 μ A		
Voltage drop (U_d)	≤ 2.2 VDC @ I_o max.		
Protection	Short-circuit, overvoltage and reverse polarity		
Carrier frequency			
UA18CAD04...	400 kHz		
UA18CAD09...	300 kHz		
UA18CAD22...	200 kHz		
Operating frequency (f)			
UA18CAD04...	≤ 10 Hz		
UA18CAD09...	≤ 4 Hz		
UA18CAD22...	≤ 1 Hz		
Response time OFF-ON (t_{ON})			
UA18CAD04...	≤ 50 mS		
UA18CAD09...	≤ 125 mS		
UA18CAD22...	≤ 500 mS		
Response time ON-OFF (t_{OFF})			
UA18CAD04...	≤ 50 mS		
UA18CAD09...	≤ 125 mS		
UA18CAD22...	≤ 500 mS		
Power ON delay	≤ 900 mS		
Output function, open collector			
By sensor type	NPN or PNP		
Output switching function	Two open collector transis- tor outputs to be config- ured as:		
		Indication Output ON	Yellow 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	PBT
		Material front	Epoxy-glass resin
		Material back, plug	Grilamid
		Material back, cable	Grilamid
		Material push-button	POM
		Sealing around push-button	TPE
		Material sealing front	
		UA18CAD04...	TPE
		UA18CAD09...	TPE
		UA18CAD22...	PBT
		Connection	
		Cable	PVC, grey, 2 m, 4 x 0.32 mm ² , Ø = 4.7
		mm	
		Plug	M12, 4-pin (CON. 14-series)
		Tightening torque	≤ 1 Nm
		Weight	
		Cable version	98 g
		Plug version	35 g
		CE-marking	Yes
		Approvals	cULus (UL508)

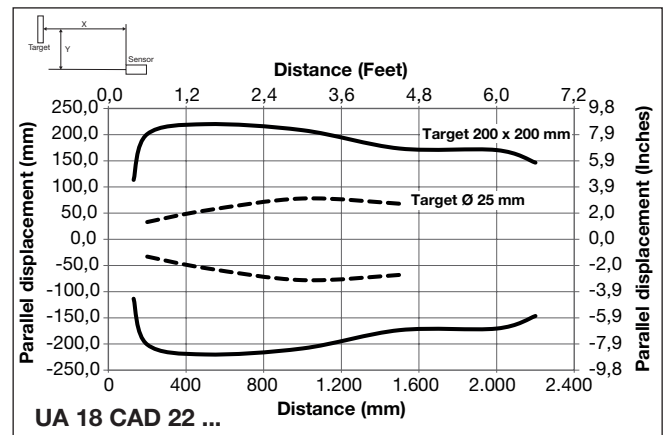
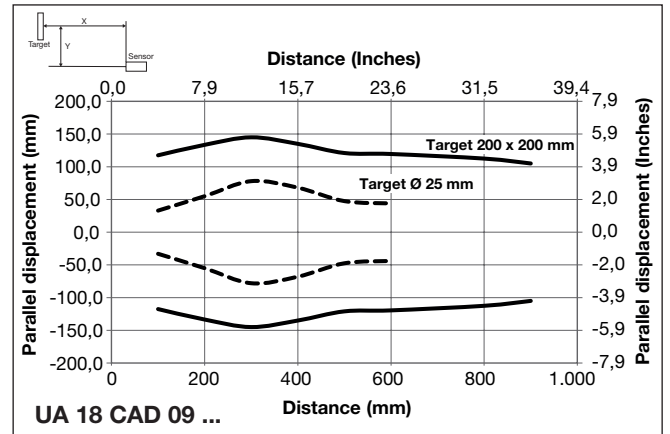
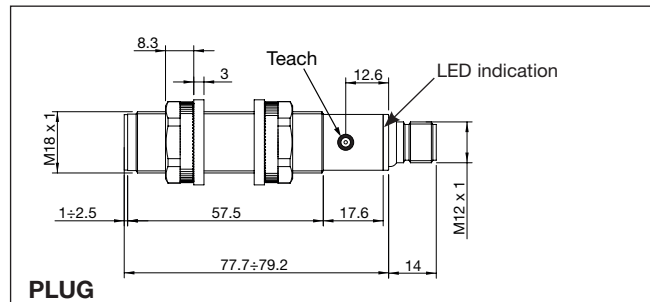
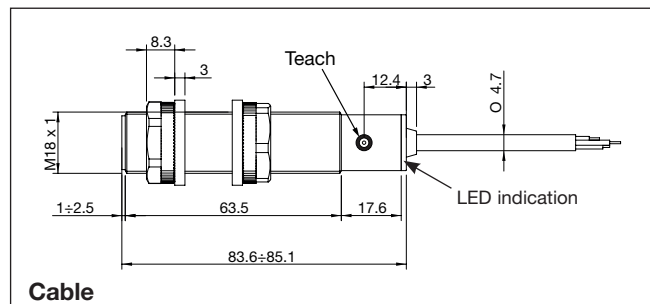
Wiring Diagram



Detection Range



Dimensions



Programming setup

General set up of sensing point P1 (longest distance) and P2 (shortest distance) independently of the sensor type or function.

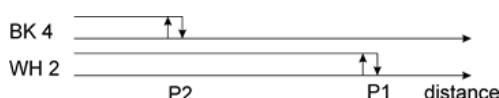
- 1) Mount the sensor in the selected application.
- 2) Place a target in front of the sensor at the maximum required distance (P1), then press shortly on the teach-button, the Yellow LED switch Off and then On and start flashing. The distance (P1) is now saved in the sensor, and the target can be moved. I)
- 3) Place the target at the minimum distance requested (P2), then press shortly on the teach-button. The yellow LED turns Off and then flashes 5 times. Now, the distance (P2) is saved in the sensor and the target can be moved. II)

I) P1 can be set to maximum exceeding the family specification for the sensor by removing the target in front of the sensor. Push and hold the teach-button for more than one second and the sensing distance is set at a unique distance for this sensor only.

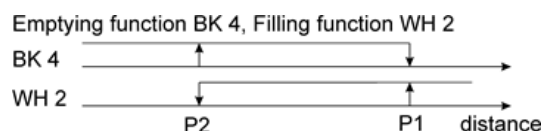
II) The second switch point can be set to minimum by setting the target within the blind zone close to the sensor head or by covering the sensor head with your hand while teaching P2.

Sensors with 2 digital outputs: UA..CAD..PP/NP types, Normal sensing function or Adjustable Hysteresis

- 1) The factory settings are normal sensing function.

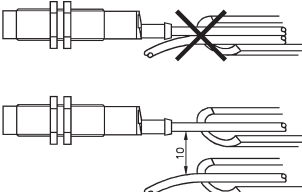
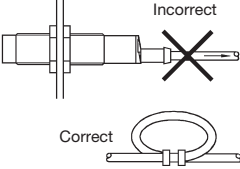
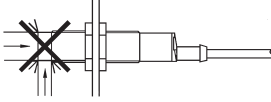
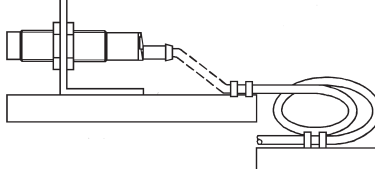


- 2) Push and hold the teach-button for 8 seconds (12 for UC18CAD22..) until the yellow LED flashes fast, then release the teach-button and the LED will flash 5 times to acknowledge the change in function. Now, the sensor is in adjustable hysteresis mode.



- 3) To switch back to normal function, repeat step 2.

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
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Delivery Contents

- Ultrasonic sensor: UA18CAD....
- Installation instruction
- Mounting:
 - 2 x M18 Nuts
 - 2 x rubber washers
- **Packaging:** Carton box 35 x 107 x 173 mm