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

- **Cylindrical M18 PBT housing**
- **Sensing distance: 50-2200 mm**
- **Power supply: 15 to 30 VDC**
- **Outputs: Two multi function switching outputs. PNP or NPN, NO or NC**
- **Setup: Normal switching or adjustable hysteresis**
- **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 multi function diffuse ultrasonic sensor with a sensing range of 50 to 2200 mm in three ranges. 2 switching outputs - easely 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

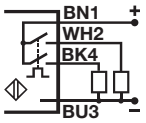
Rated operating distance (S_n)	Reference target: 1 mm metal rolled finish. CAD04: 100 x 100 mm CAD09 and CAD22: 200 x 200 mm
UA18CAD04	50 - 400 mm
UA18CAD09	100 - 900 mm
UA18CAD22	200 - 2200 mm
Blind zone	
UA18CAD04...	≤ 50 mm
UA18CAD09...	≤ 100 mm
UA18CAD22...	≤ 200 mm
Repeatability	0.5%
Beam angle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

Specifications (cont.)

Hysteresis (H)	Min. 1%
Rated operational voltage (U_B)	15 to 30 VDC (ripple included)
Ripple (U_{rpp})	≤ 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_e)	
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 µA
Voltage drop (U_d)	≤ 2.2 VDC @ I_e 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 transistor outputs to be configured as:.
	Normal Switching function with N.O and N.C. output. Adjustable hysteresis Filling or emptying control
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 mm², 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)

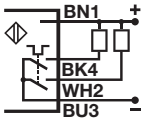
Wiring Diagram

PNP:

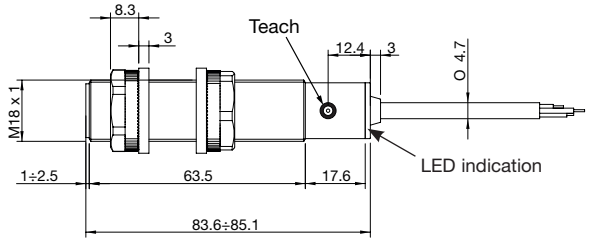


Digital

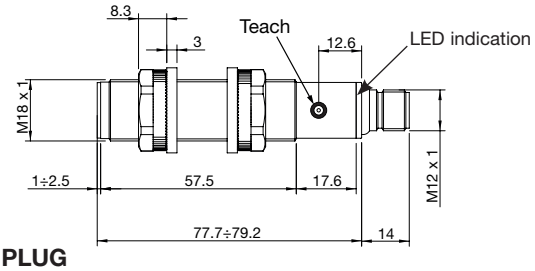
NPN:



Dimensions

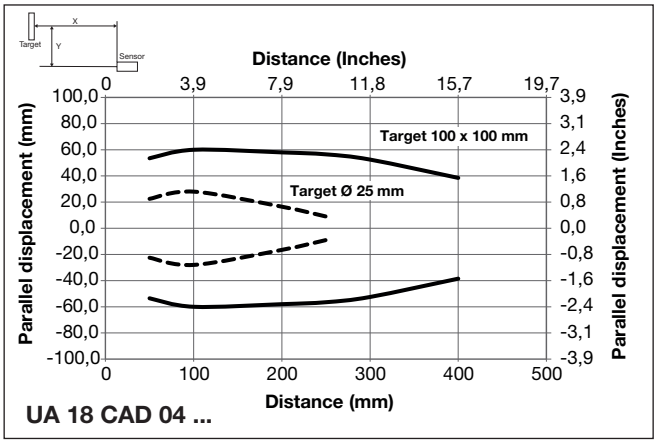


Cable

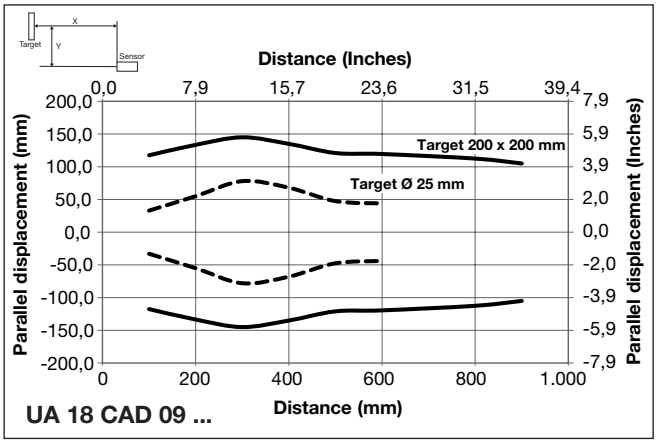


PLUG

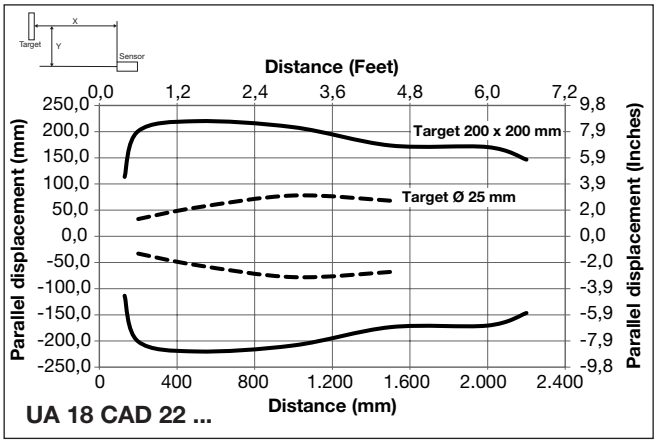
Detection Range



UA 18 CAD 04 ...



UA 18 CAD 09 ...



UA 18 CAD 22 ...

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 switches Off and then On again after a maximum of 2 seconds. Now, the distance (P1) is 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)

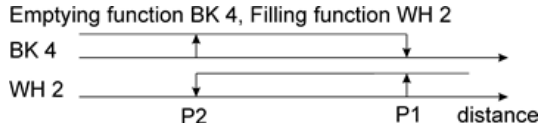
   I) P1 can be set to maximum exceeding the family specification for the sensor by removing the target in front of the sensor. Push and hold the teach-button for more than one second and the sensing distance is set at a unique distance for this sensor only.

   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

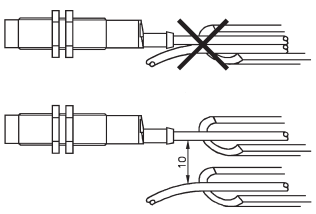
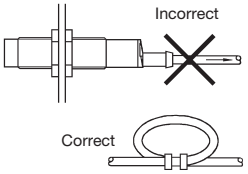
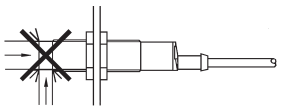
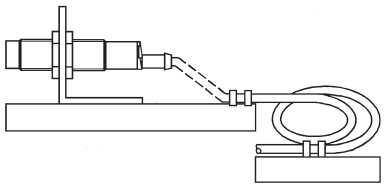
1) The factory settings are normal sensing function.

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

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Product	Code	Reference	Product link
Selected parameters SYSTEM Sensor HOUSING M18 SENSING RANGE >0,2 to 1 m CONNECTION M12 plug DC OUTPUT 2 x PNP MATERIAL Plastic Others HOUSING M18 x 84 mm SENSING RANGE 0,9 m MATERIAL Thermoplastic polyester	UA18CAD09PPM1TI		Buy on EAN