

Ultrasonic Diffuse, Dual Transistor Outputs Type M18 and M30

CARLO GAVAZZI



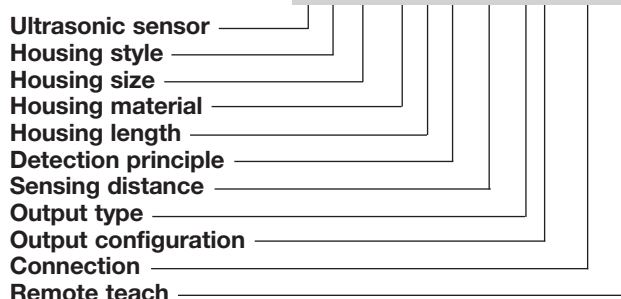
- M18 and M30 PBTP housing
- Sensing distance: 60 - 3500 mm
- Remote Teach by wire
- Outputs: 2 multi function switching outputs PNP, NO or NC
- Setup of "Normal Switching", "Window" or "Adjustable Hysteresis" function
- Power supply: 12 to 30 VDC
- 8° beam angle
- Protection: Short-circuit, reverse polarity, transients
- Protection degree IP 67
- Cable or M12 plug, 5 pin

Product Description

A self-contained multi function diffuse ultrasonic sensor with a sensing range of 60 to 3500 mm. 2 switching outputs - easily set up for 3 different switching 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 micro-processor controlled and digitally filtered sensor electronics. Excellent EMC performance and precision are typical features of this sensor based on true distance measurement.

Ordering Key **UA18CLD20PPM1TR**



Type Selection

Housing dimensions	Connection	Rated operating dist. (S _r)	Outputs	Ordering no.
M18 x 93 mm	Plug M12, 5 pin	200-2000 mm	2 x PNP, NO/NC	UA18CLD20PPM1TR
M18 x 93 mm	Cable	200-2000 mm	2 x PNP, NO/NC	UA18CLD20PPTR
M18 x 93 mm	Plug M12, 5 pin	200-2000 mm	2 x NPN, NO/NC	UA18CLD20NPM1TR
M18 x 93 mm	Cable	200-2000 mm	2 x NPN, NO/NC	UA18CLD20NPTR
M18 x 93 mm	Plug M12, 5 pin	100-800 mm	2 x PNP, NO/NC	UA18CLD08PPM1TR
M18 x 93 mm	Cable	100-800 mm	2 x PNP, NO/NC	UA18CLD08PPTR
M18 x 93 mm	Plug M12, 5 pin	100-800 mm	2 x NPN, NO/NC	UA18CLD08NPM1TR
M18 x 93 mm	Cable	100-800 mm	2 x NPN, NO/NC	UA18CLD08NPTR
M18 x 93 mm	Plug M12, 5 pin	60-500 mm	2 x PNP, NO/NC	UA18CLD05PPM1TR
M18 x 93 mm	Cable	60-500 mm	2 x PNP, NO/NC	UA18CLD05PPTR
M18 x 93 mm	Plug M12, 5 pin	60-500 mm	2 x NPN, NO/NC	UA18CLD05NPM1TR
M18 x 93 mm	Cable	60-500 mm	2 x NPN, NO/NC	UA18CLD05NPTR
M30 x 125 mm	Plug M12, 5 pin	300-3500 mm	2 x PNP, NO/NC	UA30CLD35PPM1TR
M30 x 123.5 mm	Cable	300-3500 mm	2 x PNP, NO/NC	UA30CLD35PPTR
M30 x 125 mm	Plug M12, 5 pin	300-3500 mm	2 x NPN, NO/NC	UA30CLD35NPM1TR
M30 x 123.5 mm	Cable	300-3500 mm	2 x NPN, NO/NC	UA30CLD35NPTR

Technical Data

Rated operational volt. (U_e)	12 to 30 VDC (ripple included)	Voltage drop (U_d)*	0.5 V
Ripple	10%	Off-state current (I_r)*	< 10 μA
Output current (I_e)	max. 500 mA (continuous)	Teach-in Set point adjustment	NO/NC selection Switching modes selection
No-load supply current (I_o)	≤ 35 mA	Indication	Set points, 2 LEDs yellow Echo, 1 LED green
Protection	Short-circuit, transients and reverse polarity	Rated operating distance	60 - 3500 mm
Rated insulation voltage	> 1 kV	Operating Frequency	CLD05 + CLD08 CLD20 CLD35
Output	2 PNP open collector outputs, NO or NC		4.7 Hz 1.2 Hz 1 Hz
Power-on delay*	< 10 ms		

* Preliminary

Specifications are subject to change without notice (14.09.2005)



Technical Data Ccont.)

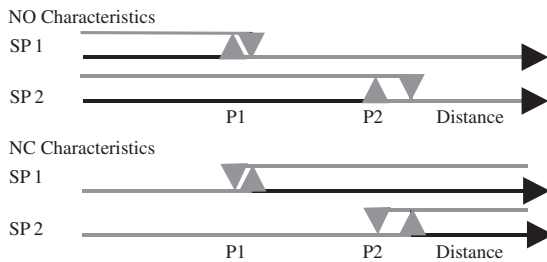
Carrier Frequency*	CLD05	350 kHz
	CLD08	300 kHz
	CLD20	180 kHz
	CLD35	130 kHz
Response time*	120 ms (target speed 1 m/s) 500 ms (step response)	
Hysteresis (H) (differential travel)	Programmable, min. 1%	
Repeatability		
CLD05 + CLD08	0.2% / 0.5 mm	
CLD20	0.1%	
CLD35	0.2% / 1.2 mm	
Temperature compensation	Yes	
Beam angle	8°	

* Preliminary

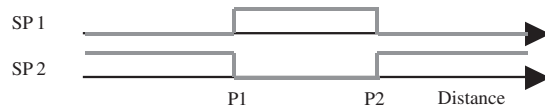
Ambient temperature		
Operating and Storage		-15° to +70°C (5° to +158°F)
Degree of protection		IP 67 (Nema 1, 3, 4, 6, 13)
Housing material		ABS
Tightening torque	M18	2.6 Nm
	M30	7.5 Nm
Connection		
Cable	2 m, 5 x 0.25 mm ²	
Plug	M12, 5-pin	
Cables for plug (M1)	CONM15 series	
Weight	UA 18 ...A.	96 g
	UA 18 ...A.M1	57 g
	UA 30 ...A.	199 g
	UA 30 ...A.M1	140 g
CE-marking	Yes	

Switching Operation

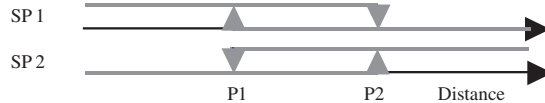
Normal Switching Operation



Windows Function



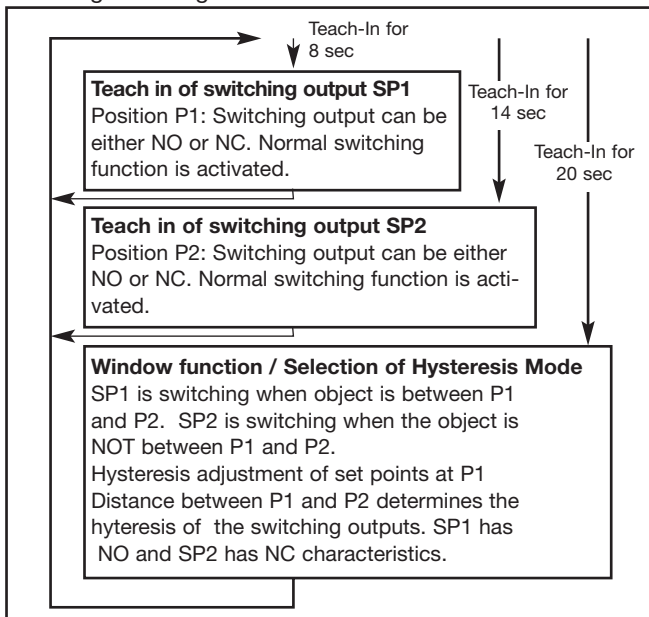
Hysteresis Adjustment



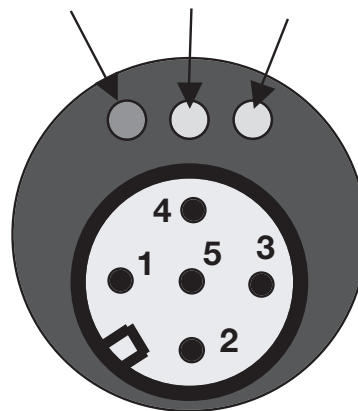
The following 3 different modes of the switching outputs can be selected:

- I Normal switching function
- II Window function
- III Adjustable hysteresis

All these functions may be programmed/taught by means of the Teach-in input (pin 5) present in the connector. Each mode has a unique indication using the Echo, P1 and P2 LEDs. The programming/Teach-In procedure is shown in the following flow diagram:



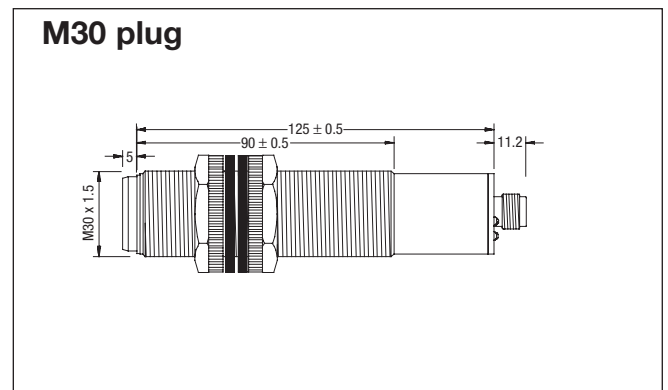
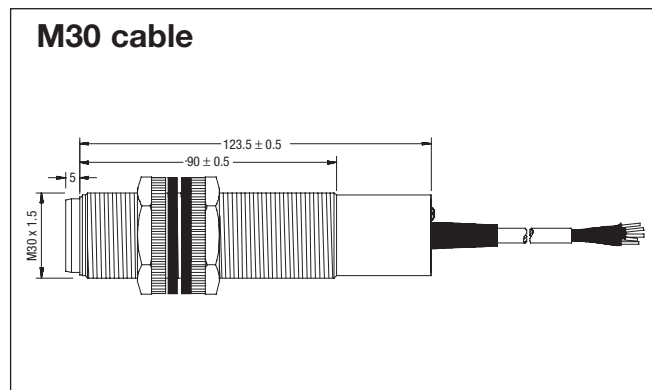
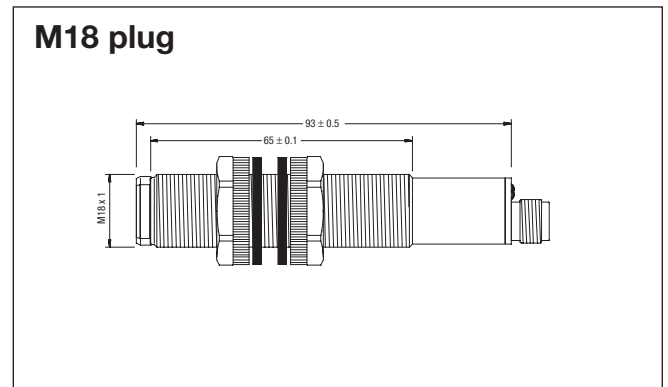
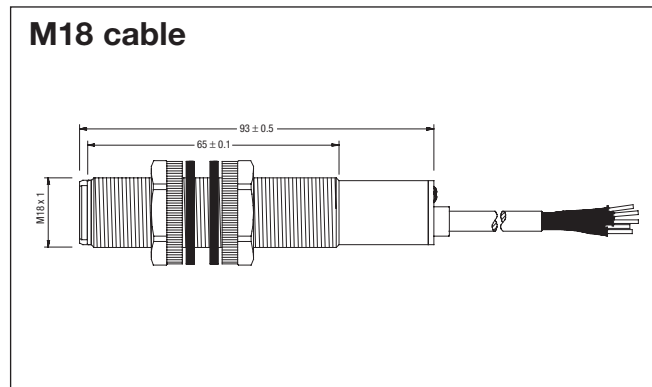
Echo P1 P2
Green Yellow Yellow



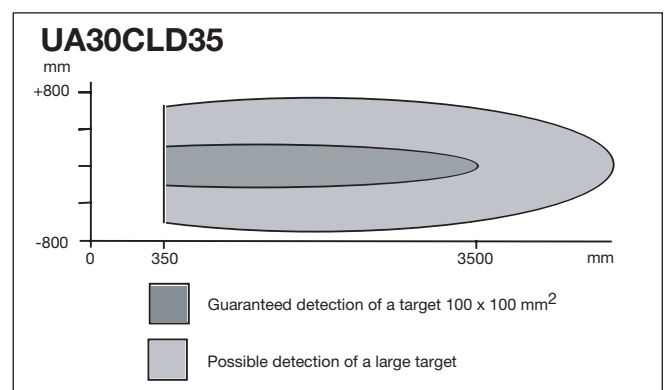
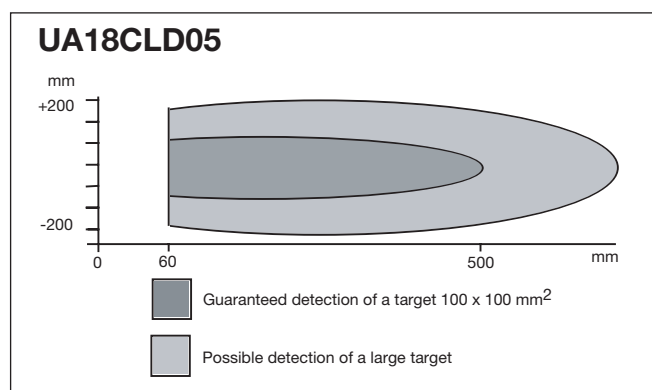
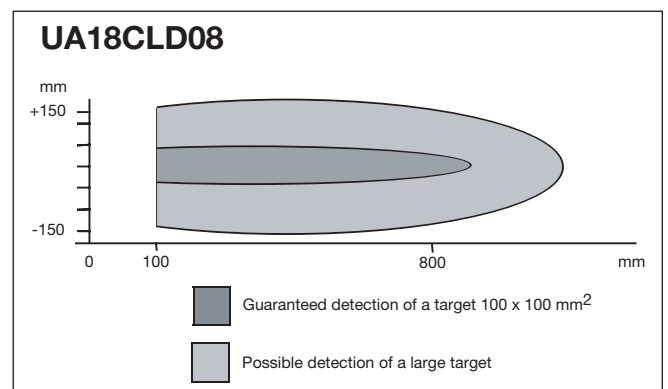
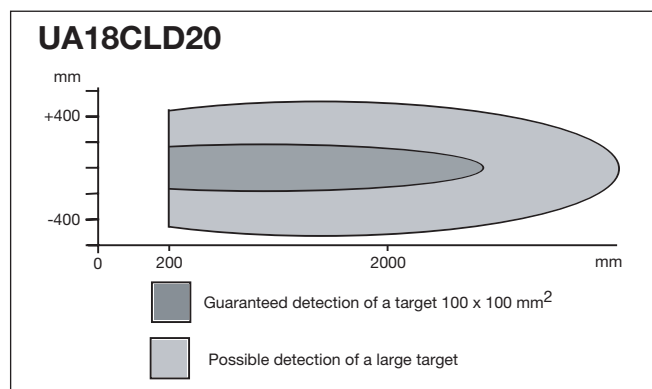
Normal function:

The Echo LED is ON when an echo is received (alignment LED). P1 and P2 LEDs are indicating status of the switching outputs.

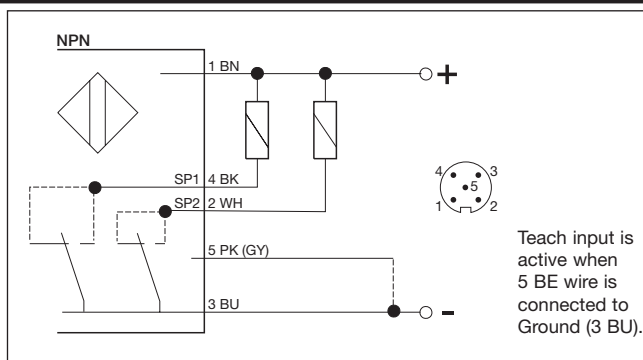
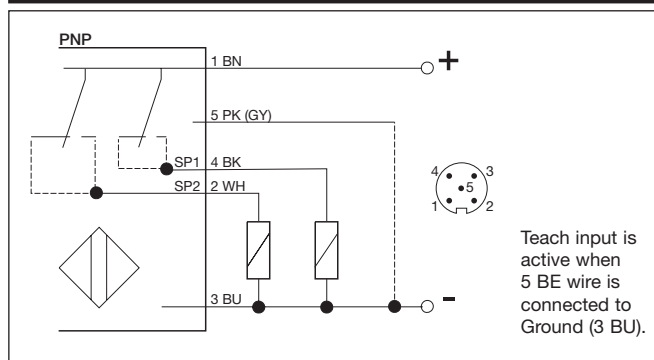
Dimensions



Detection Range



Wiring Diagram



Teach-in procedure

Normal switching function

The Teach-In function

When - in the following paragraphs, the term "Activate Teach-In" is used, this means: make contact between the Teach-in wire and GND wire once (ON-OFF) - could be done with an externally mounted switch.

When - in the following paragraphs, the term "Hold Teach-In" is used, this means: make contact between the Teach-in wire and GND wire (ON) - could be done with an externally mounted switch.

Teach-In of P1 (SP1 position)

Hold Teach-In for 8 seconds until P1 and Echo LED's start flashing 2 times per second.

The sensor is now in teach mode for P1:

P1 LED will now flash once per second and the Echo LED returns to normal function (alignment LED).

The Teach-In function is now open for 1 minute to do the programming of P1.

Place the target at the new position P1.

Activate Teach-in: P1 is now programmed.

Sensor returns to normal function with new value for P1.

Switching output characteristics can be selected during teaching of the set point P1. If activating the Teach-In as the LED is ON - the switching output will have NO characteristics, if doing this as the LED is OFF, the switching output will have NC characteristics.

Teach-In of P2 (SP2 position)

Hold Teach-In for 14 seconds until the P2 and Echo LEDs start flashing 2 times per second. After 8 seconds, the P1 and Echo LEDs will start flashing, but this must be ignored and after an additional 5 seconds the P2 is reached.

The sensor is now in teach mode for P2:

P2 LED is flashing once per second. The Echo LED returns to normal function (alignment LED).

Teach-mode is now open for 1 minute to do the programming of P1.

Move the target to the new position P2.

Activate Teach-in: P2 is now programmed.

Sensor returns to normal function with new value for P2.

Switching output characteristics can be selected during teaching of the set point P2. If activating the Teach-In as the LED is ON - the switching output will have NO characteristics, if doing this as the LED is OFF, the switching output will have NC characteristics.

Window function/ Hysteresis adjustment

Hold Teach-In for 20 seconds - to skip through the P1 and P2 teaching sequences - until P1, P2 and Echo LED's start flashing 2 times per second indicating the function teach mode.

De-activate Teach-In to enter teach mode for Window Function / Hysteresis Adjustment:

P1 LED is flashing once per second.

The Echo LED returns to normal function (alignment LED).

Teach-mode is now open for 1 minute to complete the programming.

Now activate Teach-In at the desired LED indication (see below):

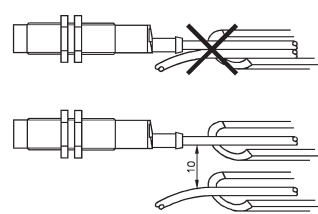
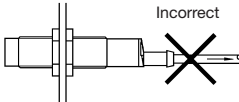

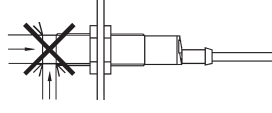
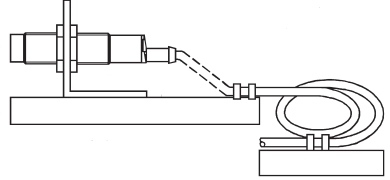
P1 LED is OFF = Window Function

Activating Teach-In now, makes the sensor operate in Windows Function mode. If there is an object between P1 and P2, SP1 will switch ON and SP2 will switch OFF. If there is no object between P1 and P2, SP1 will switch OFF and SP2 will switch ON.

P1 LED is ON = Hysteresis Adjustment

Activating Teach-In now, makes the sensor operate in Hysteresis Adjustment mode. (The switching output SP1 will be NO at P1 with hysteresis P1-P2 and switching output SP2 will be NC also at P1 with hysteresis P1-P2).

Installation Hints

<p>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</p>  <p>The diagram shows two sets of cables. The top set shows a proximity switch cable and other power cables bundled together, with a large 'X' over it indicating this is incorrect. The bottom set shows the proximity switch cable separated from the other power cables, with a 'C' over it indicating this is correct.</p>	<p>Relief of cable strain</p> <p>Incorrect</p>  <p>Correct</p>  <p>The cable should not be pulled</p> <p>The diagram shows a cross-section of a cable being pulled. The top part is labeled 'Incorrect' and has a large 'X' over it. The bottom part is labeled 'Correct' and shows the cable with a loop, indicating that it should not be pulled.</p>	<p>Protection of the sensing face</p>  <p>A proximity switch should not serve as mechanical stop</p> <p>The diagram shows a proximity switch with a large 'X' over its sensing face, indicating that it should not be used as a mechanical stop.</p>	<p>Switch mounted on mobile carrier</p>  <p>Any repetitive flexing of the cable should be avoided</p> <p>The diagram shows a proximity switch mounted on a mobile carrier. The cable is shown with a loop, indicating that repetitive flexing should be avoided.</p>
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