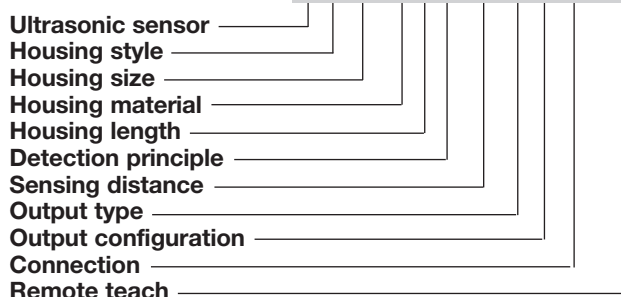# Ultrasonic
# Diffuse, Analogue Output
# Type M18 and M30

- M18 and M30 PBT housing
- Sensing distance: 60 - 3500 mm
- Remote Teach by wire
- Outputs: Analog 0-10 V or 4-20 mA
- Setup of positive or negative slope
- Power supply: 15 to 30 VDC
- 8° beam angle
- Protection: Short-circuit, reverse polarity, transients
- Protection degree IP 67
- M12 plug, 5 pin

## Product Description

A family of multi function diffuse ultrasonic sensors with a sensing range of 60 to 3500 mm. The analog output is easily set up in 2 setpoints (pos./neg. slope) and adjusted by teach-in - makes it ideal for level control tasks in a wide variety of vessels. A sturdy one-piece PBT housing provides the perfect packaging for the sofisticated microprocessor controlled and digitally filtered sensor electronics. Excellent EMC performance and precision are typical features of this sensor based on true distance measurement.

## Ordering Key       UA18CLD20AKM1TR

| Ultrasonic sensor |
| Housing style |
| Housing size |
| Housing material |
| Housing length |
| Detection principle |
| Sensing distance |
| Output type |
| Output configuration |
| Connection |
| Remote teach |

## Type Selection

| Housing dimensions | Connection | Rated operating dist. ($S_n$) | Outputs | Ordering no. |
|---|---|---|---|---|
| M18 x 93 mm | Plug M12, 5 pin | 60-500 mm | 0-10 V | UA18CLD05AKM1TR |
| M18 x 93 mm | Cable | 60-500 mm | 0-10 V | UA18CLD05AKTR |
| M18 x 93 mm | Plug M12, 5 pin | 60-500 mm | 4-20 mA | UA18CLD05AGM1TR |
| M18 x 93 mm | Cable | 60-500 mm | 4-20 mA | UA18CLD05AGTR |
| M18 x 93 mm | Plug M12, 5 pin | 100-800 mm | 0-10 V | UA18CLD08AKM1TR |
| M18 x 93 mm | Cable | 100-800 mm | 0-10 V | UA18CLD08AKTR |
| M18 x 93 mm | Plug M12, 5 pin | 100-800 mm | 4-20 mA | UA18CLD08AGM1TR |
| M18 x 93 mm | Cable | 100-800 mm | 4-20 mA | UA18CLD08AGTR |
| M18 x 93 mm | Plug M12, 5 pin | 200-2000 mm | 0-10 V | UA18CLD20AKM1TR |
| M18 x 93 mm | Cable | 200-2000 mm | 0-10 V | UA18CLD20AKTR |
| M18 x 93 mm | Plug M12, 5 pin | 200-2000 mm | 4-20 mA | UA18CLD20AGM1TR |
| M18 x 93 mm | Cable | 200-2000 mm | 4-20 mA | UA18CLD20AGTR |
| M30 x 125 mm | Plug M12, 5 pin | 300-3500 mm | 0-10 V | UA30CLD35AKM1TR |
| M30 x 123.5 mm | Cable | 300-3500 mm | 0-10 V | UA30CLD35AKTR |
| M30 x 125 mm | Plug M12, 5 pin | 300-3500 mm | 4-20 mA | UA30CLD35AGM1TR |
| M30 x 123.5 mm | Cable | 300-3500 mm | 4-20 mA | UA30CLD35AGTR |

## Technical Data

| | |
|---|---|
| **Rated operational volt.** ($U_e$) | 15 to 30 VDC (ripple included) |
| **Ripple** | ≤ 10% |
| **No-load supply current** ($I_o$) | ≤ 40 mA |
| **Protection** | Short-circuit, transients and reverse polarity |
| **Rated insulation voltage** | > 1 kV |
| **Power-on delay** | |
| UA18..D05/D08 | 60 ms |
| UA18..D20 | 90 ms |
| UA18..D35 | 220 ms |

| | |
|---|---|
| **Output** | |
| UA..CLD..AK.. | 0-10 VDC |
| UA..CLD..AG.. | 4-20 mA |
| **Output slope** | Positive or negative Setup via teach-in |

# Technical Data (cont.)

| | | | |
|---|---|---|---|
| **Linearity error** | < 0.5% | | |
| **Repeat accuracy** (R) | | | |
| UA....D05/08 | 0.2%; 1 mm | | |
| UA....D20/35 | 0.2%: 2 mm | | |
| **Rated operating distance/ Resolution\*** | | | |
| UA18CLD05 | 60-500 mm: | 0.25 mm | |
| UA18CLD08 | 100-800 mm: | 0.25 mm | |
| UA18CLD20 | 200-2000 mm: | 1.0 mm | |
| UA30CLD35 | 300-3500 mm: | 1.0 mm | |
| **Load** | | | |
| 4-20 mA | max. 500 Ω | | |
| 0-10 V | min. 1 kΩ | | |
| **Carrier frequency** | | | |
| UA....D05 | 330 KHz | | |
| UA....D08 | 300 KHz | | |
| UA....D20 | 180 KHz | | |
| UA....D35 | 130 KHz | | |
| **Response time** | | | |
| UA18CLD05/08 | 100 ms | | |
| UA18CLD20 | 200 ms | | |
| UA30CLD35 | 400 ms | | |

| | | |
|---|---|---|
| **Indication** | Set points, 2 LEDs yellow Echo, 1 LED green | |
| **Rated operating distance** | 60 - 3500 mm | |
| **Temperature compensation** | Yes | |
| **Beam angle** | 8° | |
| **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** | Polyester, PBTP | |
| **Connection** | | |
| Cable | 2 m, 5 x 0.25 mm$^2$ | |
| Plug | M12, 5-pin | |
| Cables for plug (M1) | CONM15 series | |
| **WeightWeight** | UA 18 ...A. | 96 g |
| | UA 18 ...A.M1 | 57 g |
| | UA 30 ...A. | 199 g |
| | UA 30 ...A.M1 | 140 g |
| **Tightening torque** | M18 | 2.6 Nm |
| | M30 | 7.5 Nm |
| **CE-marking** | Yes | |

# Analogue Output Adjustment

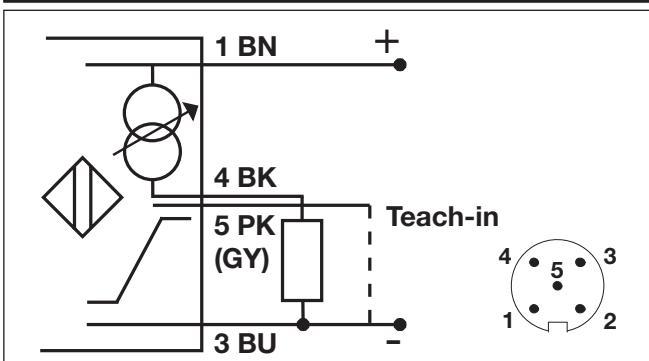



**Echo** **P1** **P2**
**Green** **Yellow** **Yellow**
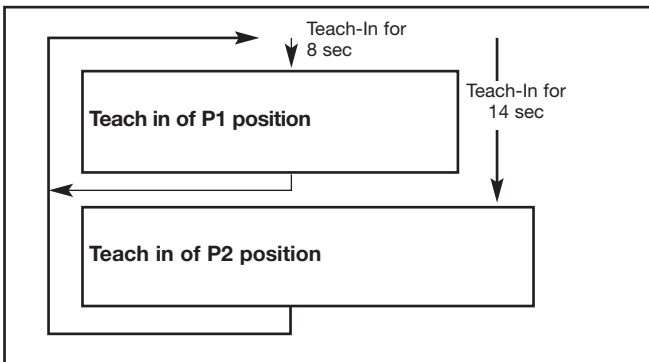
**Normal function:**
The Echo LED is ON when the echo is received (this is the alignment LED confirming that the target is properly aligned). The LED P1 is ON, when the target is between the sensor face and P1. The LED P2 is ON when Target is farther than P2.
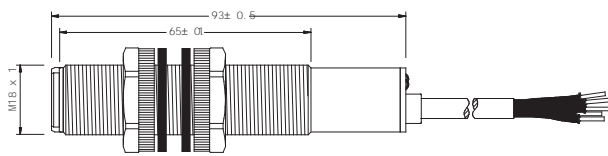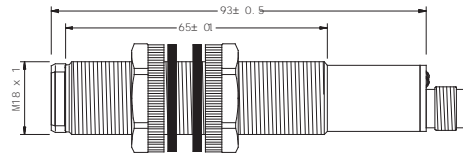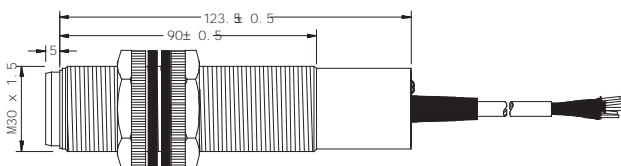
# Wiring Diagram



Specifications are subject to change without notice (06.08.2008)
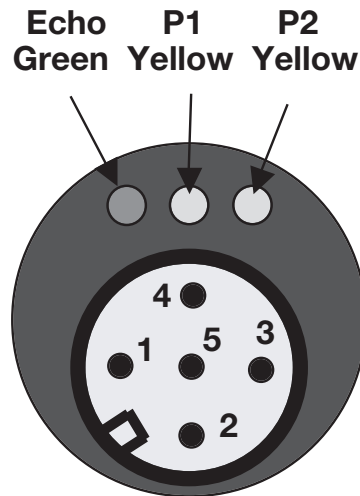
# Dimensions

### M18 cable

M18 x 1
65± 01
93± 0.5

### M18 plug

M18 x 1
65± 01
93± 0.5

### M30 cable

M30 x 1.5
5
90± 0.5
123.5± 0.5

### M30 plug

M30 x 1.5
5
90± 0.5
125± 0.5
11.2
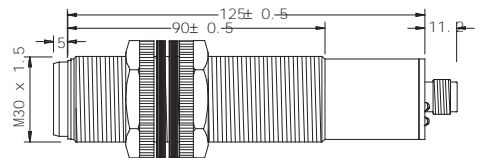
# Detection Range

### UA18CLD05

mm
+150
-150
0    60                                    500    mm

Guaranteed detection of a target 100 x 100 mm

Possible detection of a large target

### UA18CLD08

mm
+150
-150
0    100                                   800    mm

Guaranteed detection of a target 100 x 100 mm

Possible detection of a large target

### UA18CLD20

mm
+400
-400
0    200                                  2000    mm

Guaranteed detection of a target 100 x 100 mm

Possible detection of a large target

### UA30CLD35

mm
+800
-800
0    300                                  3500    mm

Guaranteed detection of a target 100 x 100 mm

Possible detection of a large target

**CARLO GAVAZZI**

# Teach-in procedure

## Analogue output adjustment

P1 and P2 define the analogue output slope.
P1 determines the 4 mA position and P2 the 20 mA position.
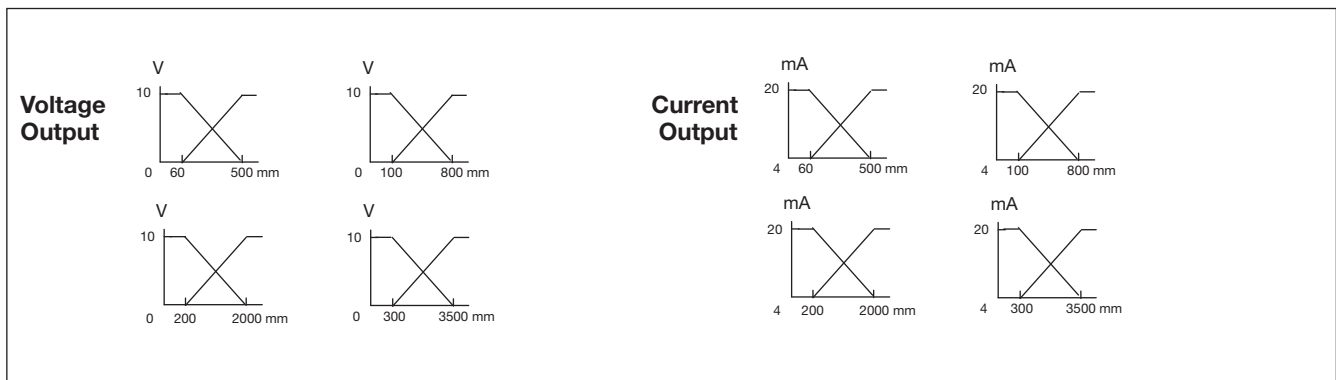Positive slope: P1 < P2
Negative slope: P2 < P1

### Teach-In of P1 position (4 mA output)

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.
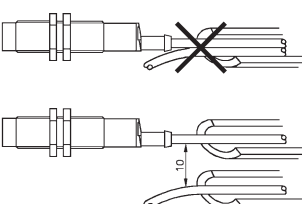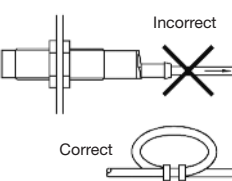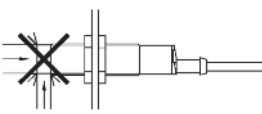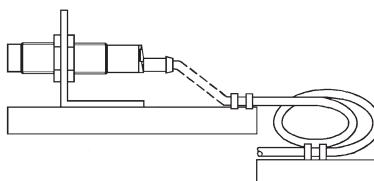Sensor returns to normal function with new value for P1.

### Teach-In of P2 position (20 mA output)

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 P2.
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.

# Output Functions



# 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

Specifications are subject to change without notice (06.08.2008)