

# Ultrasonic Diffuse, Dual Transistor Outputs Type UC 80 CND 60 . P M1 TR

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- Square 80 mm ABS housing
- Sensing distance: 600 - 6000 mm
- Remote Teach by wire
- Outputs: 2 multi function switching outputs PNP or NPN, NO or NC
- Setup of "Normal Switching", "Window" or "Adjustable Hysteresis" function
- 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 self-contained multi function diffuse ultrasonic sensor with a sensing range of 600 to 6000 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 ABS 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 based on true distance measurement.

## Ordering Key UC80CND60PPM1TR

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

## Type Selection

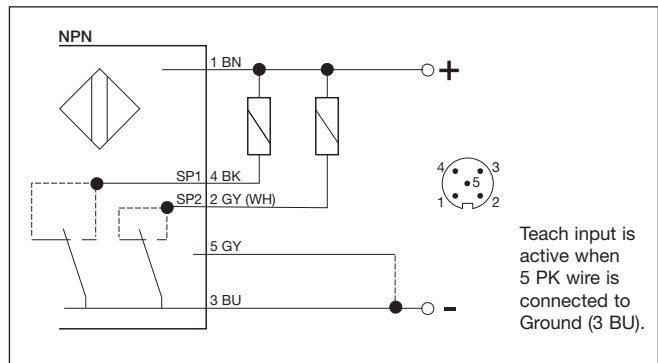
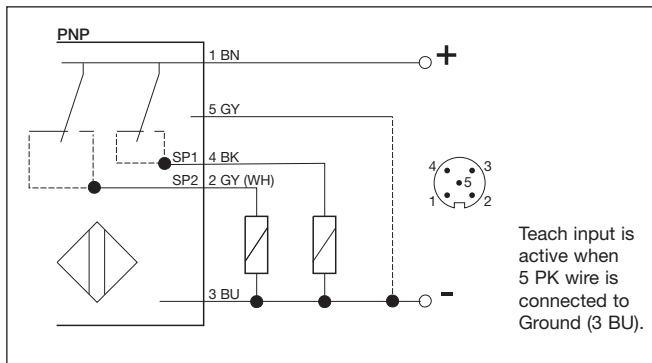
Housing dimensions	Connection	Rated operating dist. (S <sub>n</sub> )	Outputs	Ordering no.
80 x 80 x 50 mm	Plug M12, 5 pin	600-6000 mm	2 x PNP, NO/NC	<b>UC 80 CND 60 PP M1 TR</b>
80 x 80 x 50 mm	Plug M12, 5 pin	600-6000 mm	2 x NPN, NO/NC	<b>UC 80 CND 60 NP M1 TR</b>

## Technical Data

<b>Rated operational volt. (U<sub>e</sub>)</b>	15 to 30 VDC (ripple included)	<b>Response time</b>	70 ms (target speed 1 m/s in beam direction) 700 ms (step response)
<b>Ripple</b>	≤ 10%	<b>Hysteresis (H) (differential travel)</b>	Programmable
<b>Output current (I<sub>e</sub>)</b>	max. 500 mA (continuous)	<b>Temperature compensation</b>	Yes
<b>No-load supply current (I<sub>o</sub>)</b>	≤ 80 mA	<b>Beam angle</b>	8°
<b>Protection</b>	Short-circuit, transients and reverse polarity	<b>Ambient temperature</b> Operating and Storage	-15° to +70°C (5° to +158°F)
<b>Rated insulation voltage</b>	> 1 kV	<b>Environment</b> Overvoltage category	II (IEC 60664/60664A, 60947-1)
<b>Output</b>	2 PNP or NPN open collector outputs, NO or NC	Pollution degree	3 (IEC 60664/60664A, 60947-1)
<b>Power-on delay</b>	200 ms	Degree of protection	IP 67 (IEC 60529, 60947-1)
<b>Voltage drop (U<sub>d</sub>)</b>	< 0.5 V	<b>Housing material</b>	ABS
<b>Off-state current (I<sub>r</sub>)</b>	< 10 μA	<b>Connection</b> Cables for plug (M1)	Plug M12, 5-pin CONM15 series
<b>Teach-in Set point adjustment</b>	NO/NC selection Switching modes selection	<b>Weight</b>	300 g
<b>Indication</b>	Set points, 2 LEDs yellow Echo, 1 LED green	<b>CE-marking</b>	Yes
<b>Rated operating distance</b>	600 - 6000 mm		
<b>Operating frequency</b>	0.5 Hz		
<b>Carrier frequency</b>	80 kHz		

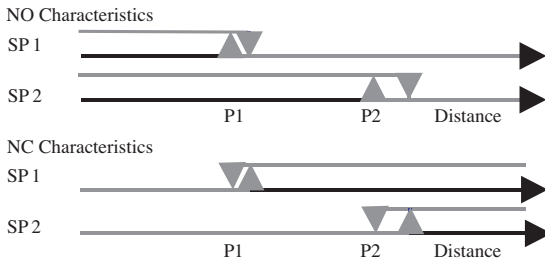


## Wiring Diagram

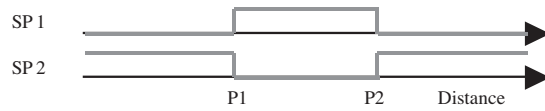


## Switching Operation

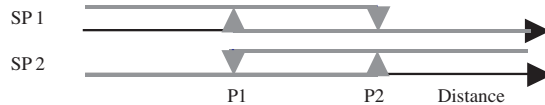
### Normal Switching Operation



### Windows Function



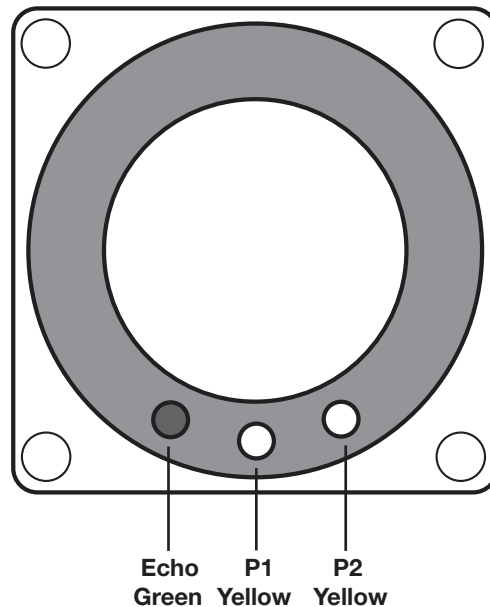
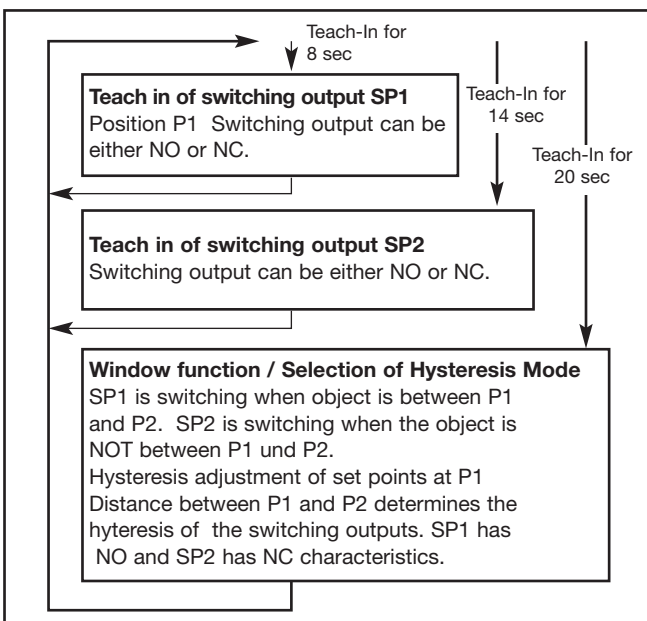
### Hysteresis Adjustment



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

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

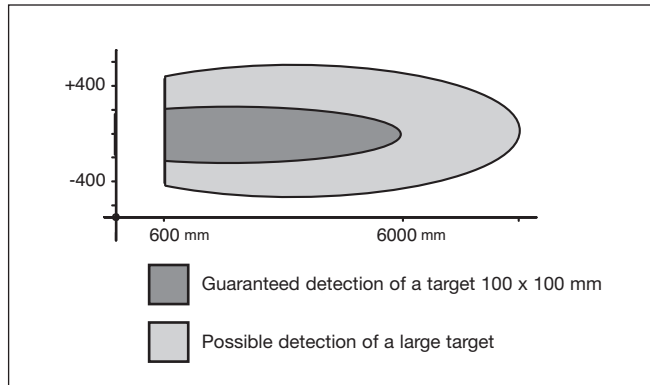
All these functions may be programmed/taught by means of the Teach-in input (pin 5) present in the connector. Each mode has a unique indication using the Echo, P1 and P2 LEDs. The programming/Teach-In procedure is shown in the following flow diagram:



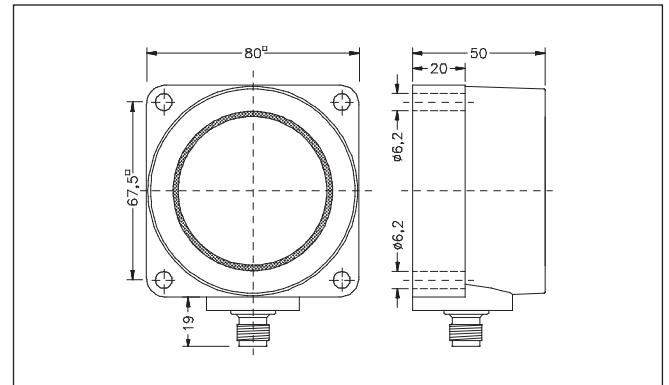
### Normal function:

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

## Detection Range



## Dimensions



Dimensions in mm.

## 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:

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 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 hysteresis teach mode.

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

P1 and P2 LED are 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 and P2 LED are 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 and P2 LED are 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><i>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</i></p>	<p><i>Relief of cable strain</i></p> <p>The cable should not be pulled</p>	<p><i>Protection of the sensing face</i></p> <p>A proximity switch should not serve as mechanical stop</p>	<p><i>Switch mounted on mobile carrier</i></p> <p>Any repetitive flexing of the cable should be avoided</p>
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