

## FEATURES

- Ultrasonic Sensors
- insensitivity to countless materials, surface types, and colors
- Wood, metal, or plastic; colored, reflective or transparent
- Very short dead band 30mm
- Detection range 30--500mm
- Output type PNP (NO/NC)
- Temperature compensation
- Intrinsically Safe CE & IP67 compliant in properly designed integrated system
- Tamperproof & Rugged
- IP67 enclosure rating
- Accurate under demanding environmental conditions

## RS PRO Ultrasonic Proximity Sensor

RS Stock No.: 2181178



RS Professionally Approved Products bring to you professional quality parts across all product categories. Our product range has been tested by engineers and provides a comparable quality to the leading brands without paying a premium price.

# Ultrasonic Proximity Sensors

## Product Description

Ultrasonic sensors precisely detect objects made from various materials regardless of their shape, colour, or surface contour. They operate using high-frequency sound waves that are inaudible to the human ear.

- Very Short Dead Band 30mm
- Small Size M18
- Liquid and Solid Level Measurement
- Position Detection
- Factory automation
- Tanks, Totes, Processing

## General Specifications

<b>Series</b>	M18
<b>Detection Range</b>	30mm – 500mm
<b>Transducer Frequency</b>	300KHz
<b>Sensor Configuration</b>	Diffuse Reflection
<b>Output Type</b>	1 Switch output PNP NO/NC, Programmable
<b>Response Time</b>	65ms
<b>Beam Angle</b>	8°
<b>Directivity (Deg)</b>	
<b>Sensitivity (mVp-p)</b>	
<b>Terminal Type</b>	M12 - 4 Pin
<b>Communication Interface</b>	
<b>Indicator</b>	LED
<b>Wire Technique</b>	4-wire
<b>Electrical Connection</b>	Male connector M12 4 pins
<b>Cable Length</b>	2m
<b>Minimum Operating Temperature</b>	-25°C
<b>Maximum Operating Temperature</b>	75°C
<b>Shock Resistance</b>	
<b>Vibration Resistance</b>	

## Electrical Specifications

<b>Operating Voltage Range</b>	10V dc to 30V DC
<b>Current Consumption</b>	≤ 15mA (No-load)
<b>Voltage Drop</b>	2V
<b>Maximum Load</b>	500 Ohm
<b>Switching Frequency</b>	MAX 10Hz
<b>Switching Current</b>	200mA
<b>Reverse Polarity Protection</b>	Yes
<b>Short Circuit Protection</b>	Yes

# Ultrasonic Proximity Sensors

Overload Protection	Yes
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## Mechanical Specifications

Body Style	Cylindrical
Thread Size	M18
Housing Material	Brass, nickel-plated
Front Material	Epoxy
Dimensions	∅18mm x 86mm
Width / Diameter	∅18mm
Length	86mm
Depth	
Weight	50g

## Protection Category

IP Rating	IP67
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## Additional Information

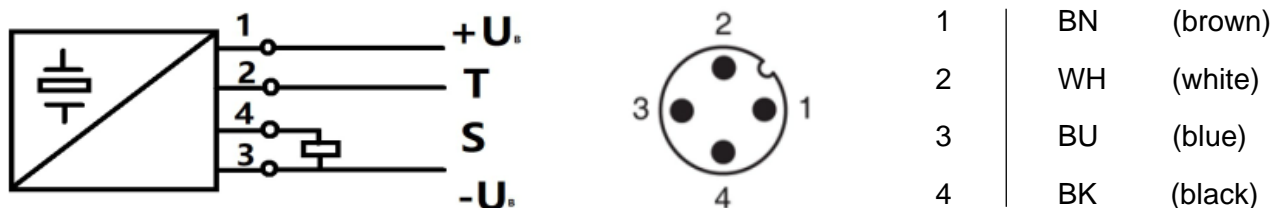
EAN	
Custom Tariff Number	

## Classification

eCl@ss Version	
UNSPSC Version	

## Approvals

Compliance/Certifications	CE / RoHS EN 60947-5-2:2020
Declarations	MFR Declaration of Conformity



Wire Colors in accordance with EN 60947-5-2

## Adjusting switching Points

The ultrasonic sensor features a switch output with two teachable switching points. These are set by applying the supply voltage  $-U_B$  or  $+U_B$  to the TEACH-IN input. The supply voltage must be applied to the TEACH-IN input for at least 1 s. LEDs indicate whether the sensor has recognised the target during the TEACH-IN procedure. Switching point A1 is taught with  $-U_B$ , A2 with  $+U_B$ . Five different output functions can be set.

1. Window mode, normally-open function.
2. Window mode, normally-closed function.
3. One switching point, normally-open function
4. One switching point, normally-closed function.
5. Detection of object presence.

Switching point, Setting distance only after power on. The internal clock can assure can't be changed after 5 mins when power on. If want to change the switching point, the user can only set the request distance after power restart.

### TEACH-IN window mode, normally-open function

- Set target to near switching point
- TEACH-IN switching point A1 with  $-U_B$
- Set target to far switching point
- TEACH-IN switching point A2 with  $+U_B$

### TEACH-IN window mode, normally-closed function

- Set target to near switching point
- TEACH-IN switching point A2 with  $+U_B$
- Set target to far switching point
- TEACH-IN switching point A1 with  $-U_B$

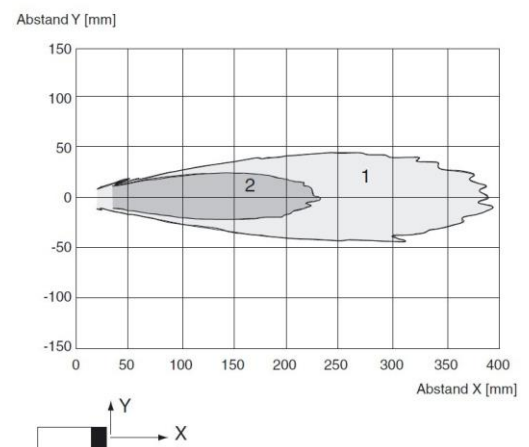
### TEACH-IN switching point, normally-open function

- Set target to near switching point
- TEACH-IN switching point A2 with  $+U_B$
- Cover sensor with hand or remove all objects from sensing range
- TEACH-IN switching point A1 with  $-U_B$

### TEACH-IN switching point, normally-closed function

- Set target to near switching point
- TEACH-IN switching point A1 with  $-U_B$
- Cover sensor with hand or remove all objects from sensing range

## Charakteristische Ansprechkurve



Curve1: flat surface 100mm×100mm

Curve2: round bar,  $\Phi 25$ mm

-TEACH-IN switching point A2 with + U<sub>B</sub>

#### TEACH-IN detection of objects presence

-Cover sensor with hand or remove all objects from sensing range

-TEACH-IN switching point A1 with - U<sub>B</sub>

-TEACH-IN switching point A2 with + U<sub>B</sub>

#### Default setting of switching point

A1=blind range,A2=nominal distance

#### LED displays

Displays in dependence on operating mode

Red LED

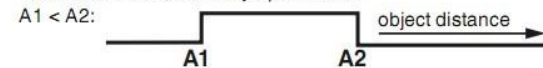
Blue LED

#### TEACH-IN switching point

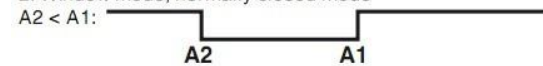
Object detected	off	flashes
No object detected	flashes	off
Object uncertain(TEACH-IN invalid)	off	off
Normal operation	off	Switching state
Fault	on	Previous state

#### Programmable output modes

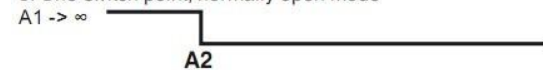
1. Window mode, normally open mode



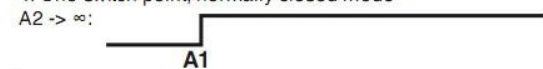
2. Window mode, normally closed mode



3. One switch point, normally open mode



4. One switch point, normally closed mode



5. A1 -> ∞, A2 -> ∞: Object presence detection mode

Object detected: Switch output closed

No object detected: Switch output open

#### Installation conditions

If the sensor is installed at the environment temperature fall below 0°C,It should do well on the protective measures. In case of direct mounting of the sensor in a through hole using the steel nuts, it has to be fixed at the middle of the housing thread.

#### Drawing

