

## 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--300mm
- 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.: 2181172



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 – 300mm
<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>	9°
<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 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

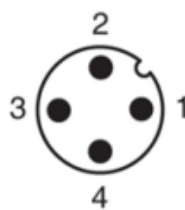
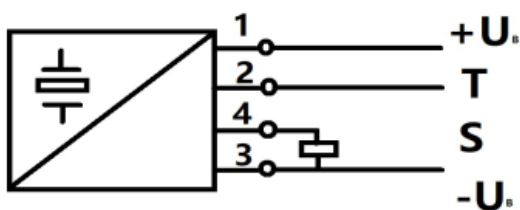
EAN	
Custom Tariff Number	

## Classification

eCl@ss Version	
UNSPSC Version	

## Approvals

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



1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)

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 objet 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  $+U_B$

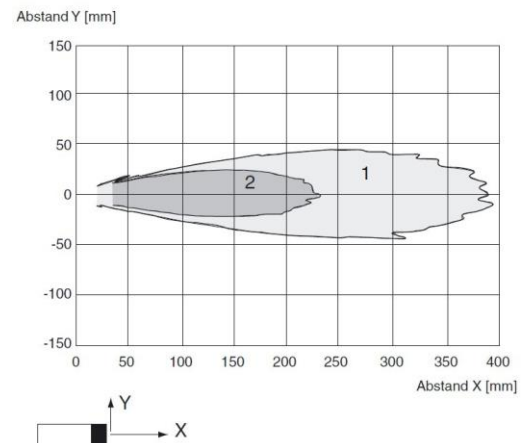
#### TEACH-IN window mode, normally-closed function

- 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  $-U_B$

### Charakteristische Ansprechkurve



# Ultrasonic Proximity Sensors

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

Curve2:round bar,  $\Phi 25\text{mm}$

- 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
- TEACH-IN switching point A2 with +  $U_B$

## TEACH-IN detection of objects presence

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

## Default setting of switching point

A1=blind range,A2=nominal distance

## LED displays

Displays in dependence on operating mode

	Red LED	Blue LED
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## 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  
 $A1 < A2$ :
2. Window mode, normally closed mode  
 $A2 < A1$ :
3. One switch point, normally open mode  
 $A1 \rightarrow \infty$ :
4. One switch point, normally closed mode  
 $A2 \rightarrow \infty$ :
5.  $A1 \rightarrow \infty, A2 \rightarrow \infty$ : 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  $0^{\circ}\text{C}$ ,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

