



# Micro Detectors

Italian Sensors Technology



## M30 Cylindrical Ultrasonic Sensor UT



Ultrasonic Sensors  
Catalogue

Cod. CAT3EUT1376502

Datasheet - UT - English - Ed.02/2013





Products

M30  
with Teach-in button

# Series UT

## M30 with Teach-in button



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### market sectors and applications

- construction equipments
- storage systems
- ceramic industry
- waste collecting systems
- general manufacturing



## features

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M30 ultrasonic sensor with standard housing and with large front with high performances and high sensing distances

Models with both analog and digital output to streamline the codes

Adjustable hysteresis function: models with double digital programmable output specific for level detection

Models with voltage or current output: programmable slope to optimize resolution

Adjustable working area (window mode or object mode) by Teach-in button on all models for a quick and easy installation

Two multifunction LED indicators: orange LED for adjustment procedure and output state and green LED for target alignment

Temperature compensation on all working range

## approvals

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## protection degree

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IP67





Products

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## UT M30 cylindrical ultrasonic sensor

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**UT1** products are M30 ultrasonic sensors with standard housing that work in **direct diffuse mode in a working range of 250 mm ÷ 3,500 mm.**

**UT2** ones are ultrasonic sensors characterized by M30 housing and large front that work in **direct diffuse mode reaching 6,000 mm of maximum distance with a transducer of only 38.8 mm of diameter.**

The products have a compact plastic housing and they are available with both cable exit and M12 plug exit. Through the use of Teach-in button it is possible to set the working distance, the output status (NO/NC) and the slope of analog output and to change function on the model with hysteresis function. Two LEDs visible through the transparent cable and plug holder, indicates the output, the Teach-in status (orange LED) and the echo detection (green LED), making easier the alignment with the target. All products of UT series are temperature compensated, to guarantee a reliable detection on all temperature working range.

## pack content

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Installation manuals (English + italian) : CAT8BUT1260401 (UT1) and CAT8BUT1364901 (UT2).

n° 2 plastic nuts

n° 2 flexible washers

## further commercial and technical documents available

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Datasheet (Italian CAT3IUT1370502)

High resolution pictures

Application note:

- coils distance detection (English: CAT3EUT1260801, Italian: CAT3IUT1260401 and Spanish: CAT3SUT1261601)
- filling level detection in silos for liquids and powders (English: CAT3EUT1261001, Italian: CAT3IUT1260901 and Spanish: CAT3SUT1261701)
- presence and height detection of plants in agricultural machines (English: CAT3EUT1261201, Italian CAT3IUT1261101 and Spanish: CAT3SUT1261801)

## customization already tested

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## minimum quantity that can be ordered

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1 piece

	UT	1	B	/	E	1	-	0	E	UL
<b>UT</b>	M30 ultrasonic sensor									
<b>1</b>	Standard housing									
<b>2</b>	Large shape transducer, Ø 38.8 mm									
<b>B</b>	250 - 3,500 mm direct diffuse									
<b>F</b>	350 - 6000 mm direct diffuse									
<b>E</b>	Sensitivity adjustment and NO/NC selection by Teach-in button									
<b>1</b>	0...10 V single voltage analogue output									
<b>2</b>	4...20 mA single current analogue output									
<b>P</b>	PNP NO/NC single digital output									
<b>N</b>	NPN NO/NC single digital output									
<b>W</b>	PNP two digital outputs with standard window and adjustable hysteresis functions <sup>(*)</sup>									
<b>M</b>	NPN two digital outputs with standard window and adjustable hysteresis functions <sup>(*)</sup>									
<b>6</b>	PNP - NO/NC digital output + 4 ... 20 mA current analogue output									
<b>4</b>	NPN - NO/NC digital output + 4 ... 20 mA current analogue output									
<b>7</b>	PNP - NO/NC digital output + 0 ... 10 V voltage analogue output									
<b>9</b>	NPN - NO/NC digital output + 0 ... 10 V voltage analogue output									
<b>0</b>	Plastic housing									
<b>E</b>	M12 plug cable exit									
<b>A</b>	2 m PVC Axial cable exit									
<b>UL</b>	with cULus certification									

<sup>(\*)</sup> The two functions switching is possible pressing the Teach-in button.

## available models (cULus certified)

dimension	function	max. distance	output	analogue output 0...10 V	analogue output 4...20 mA	1 x PNP NO/NC	1 x NPN NO/NC	2 x PNP (adjustable hysteresis MD std. window)	2 x NPN (adjustable hysteresis MD std. window)	1 x PNP NO/NC + 4...20 mA	1 x NPN NO/NC + 4...20 mA	1 x PNP NO/NC + 0...10 V	1 x NPN NO/NC + 0...10 V
M30	direct diffuse	3.500 mm	M12 plug	UT1B/E1-0EUL	UT1B/E2-0EUL	UT1B/EP-0EUL	UT1B/EN-0EUL	UT1B/EW-0EUL	UT1B/EM-0EUL	UT1B/E6-0EUL	UT1B/E4-0EUL	UT1B/E7-0EUL	UT1B/E9-0EUL
			cable	UT1B/E1-0AUL	UT1B/E2-0AUL	UT1B/EP-0AUL	UT1B/EN-0AUL	UT1B/EW-0AUL	UT1B/EM-0AUL	UT1B/E6-0AUL	UT1B/E4-0AUL	UT1B/E7-0AUL	UT1B/E9-0AUL
		6.000 mm	M12 plug	-	-	-	-	UT2F/EW-0EUL	UT2F/EM-0EUL	UT2F/E6-0EUL	UT2F/E4-0EUL	UT2F/E7-0EUL	UT2F/E9-0EUL
			cable	-	-	-	-	UT2F/EW-0AUL	UT2F/EM-0AUL	UT2F/E6-0AUL	UT2F/E4-0AUL	UT2F/E7-0AUL	UT2F/E9-0AUL



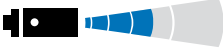
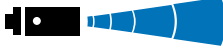


Products

**M30**  
with Teach-in button

## technical specifications (cULus certified models)

according to IEC EN 60947-5-2 and IEC EN 60947-5-7

	 	
models	UT1B/E*-0*UL	UT2F/E*-0*UL
	 	
nominal sensing distance $S_n$	3,500 mm <sup>(1)</sup>	6,000 mm <sup>(2)</sup>
minimum operating distance (blind zone)	250 mm	350 mm
beam angle	$\pm 7^\circ$	$15^\circ \pm 2^\circ$
switching frequency (digital output)	2 Hz	1 Hz
response time (digital output)	250 ms	500 ms
differential travel	1% of full scale value	
repeat accuracy	1% of full scale value	0.5% of full scale value
linearity error	1% of full scale value	
operating temperature	$-20^\circ \dots +70^\circ\text{C}$	
temperature compensation	yes	
thermal drift	$\leq 7\%$	$\pm 5\%$
rated operational voltage $U_e$	12..30 Vdc; 15.. 30 Vdc for model with analog voltage output (0-10 V)	
maximum ripple content	5%	
leakage current	$\leq 10 \mu\text{A}$ ( $V_{dc} = 30 \text{ Vdc}$ )	
output voltage drop	2.2 V max ( $I_L=100\text{mA}$ )	
No-Load supply current	$\leq 50 \text{ mA}$	
maximum load current (digital output)	100 mA	
minimum load resistance (analog voltage output)	3 k $\Omega$	
sensitivity adjustment	Teach-in button	
supply electrical protections	polarity reversal, transient	
digital output electrical protections	short circuit (auto reset), overvoltage pulses	
EMC	Conforming to the EC Directive 2004/108/EC requirements according to EN 60947-5-2	
electrical protections (analogue output)	overvoltage pulses	
protection degree	IP67 (EN 60529) NEMA 4X <sup>(3)</sup>	IP67 (EN 60529) <sup>(3)</sup>
housing material	PBT	
active head material	epoxy-glass resin	
weight	104 g (plug exit) - 167 g (cable exit)	130 g (plug exit) - 199 g (cable exit)
storage temperature	$-35^\circ \dots +70^\circ\text{C}$ (without freeze)	

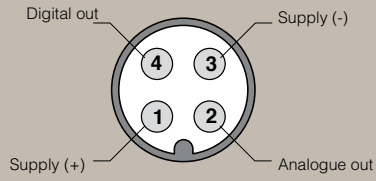
<sup>(1)</sup> Metallic target 200 x 200 mm<sup>(2)</sup> Metallic target 400 x 400 mm<sup>(3)</sup> Protection granted only by plug mounted in a correct way

BN	brown
BU	blue
BK	black
WH	white

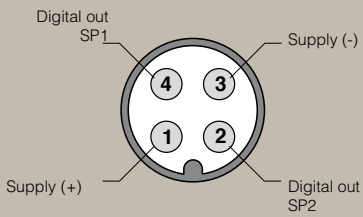
## electrical diagrams of connections

### M12

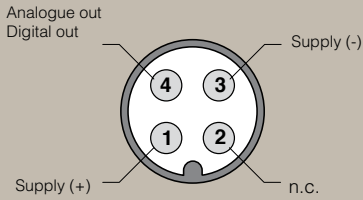
UT\*/E4-0EUL  
 UT\*/E6-0EUL  
 UT\*/E7-0EUL  
 UT\*/E9-0EUL



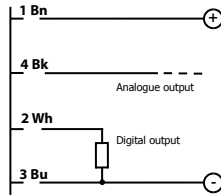
UT\*/EM-0EUL  
 UT\*/EW-0EUL



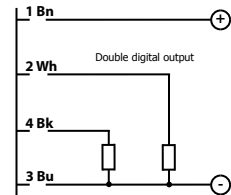
UT1\*/E1-0EUL  
 UT1\*/E2-0EUL  
 UT1\*/EP-0EUL  
 UT1\*/EN-0EUL



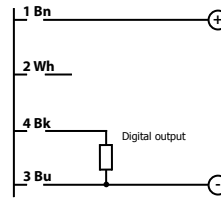
#### PNP NO/NC + analogue output



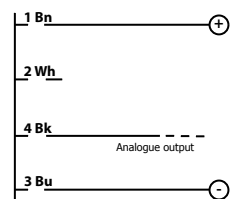
#### models with double PNP output



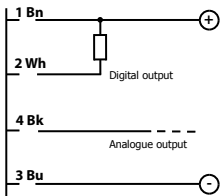
#### models with PNP NO/NC single digital output



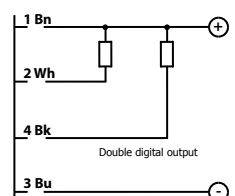
#### models with single analogue output



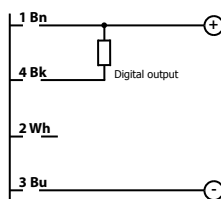
#### NPN NO/NC models + analogue output



#### models with NPN double digital outputs



#### models with NPN NO/NC single digital output





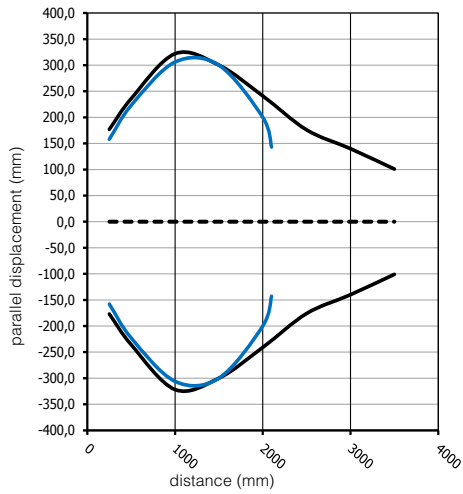
Products

M30

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## response diagram

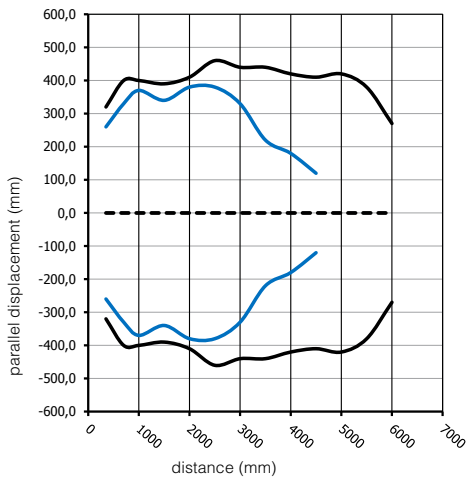
UT1B/\*\*\_\*\*



— Target 200 x 200 mm

— Barra Ø 25 mm

UT2F/\*\*\_\*\*



— Target 400 x 400 mm

— Target 200 x 200 mm



## available outputs

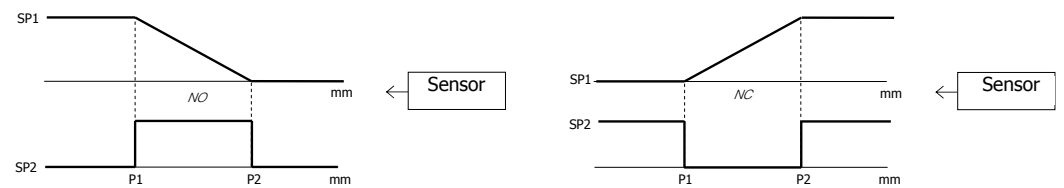
### models with single digital output



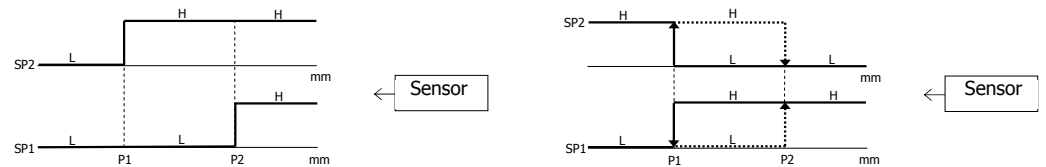
### models with single analogue output



### models with digital output + analogue output (\*)



### models with double output, hysteresis + standard window (\*\*)



(\*) Suitable, also, as single model output.

(\*\*) In the double digital output model with the standard window and adjustable hysteresis functions if the target is removed from sensor detection range, the output state switches. These models are not foreseen with NO/NC function.



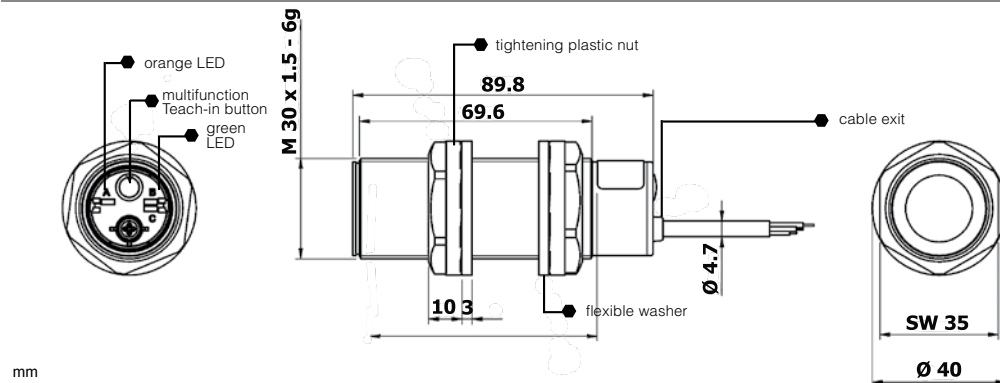
Products

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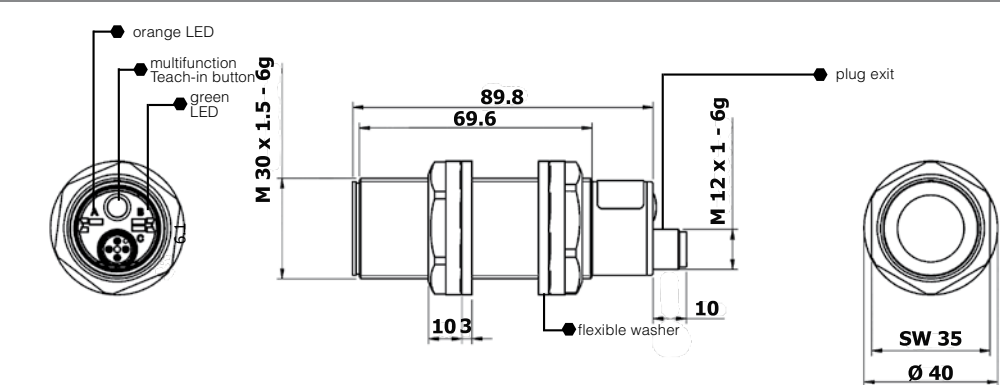
## dimensions

## UT1B/\*\*-AUL (cable)



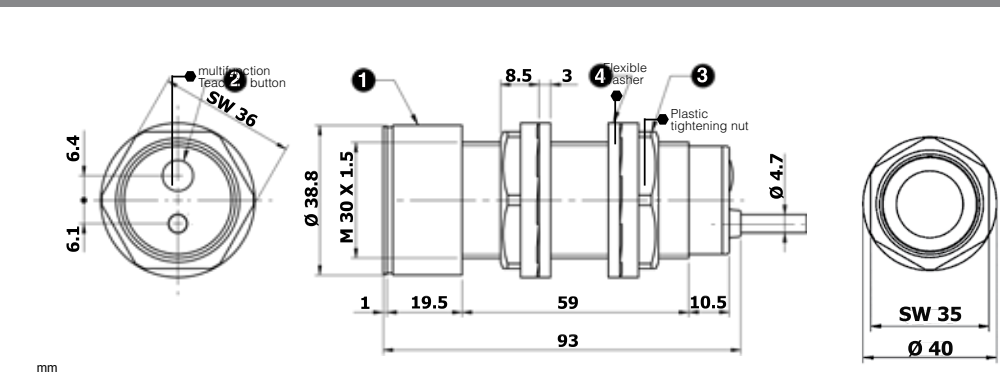
mm

## UT1B/\*\*-EUL (plug)



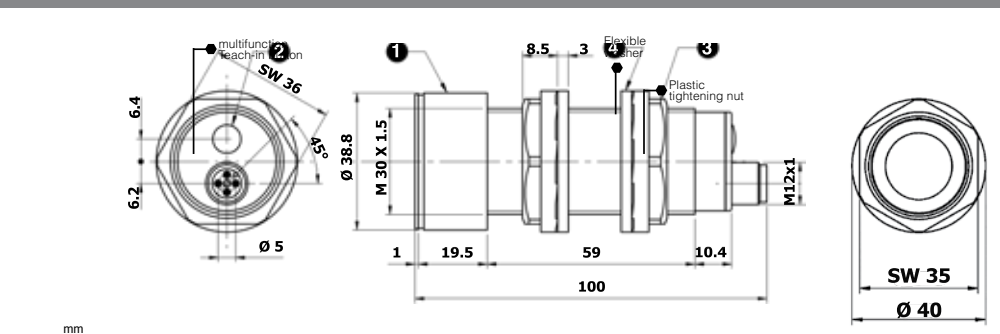
mm

## UT2F/\*\*-AUL (cable)



mm

## UT2F/\*\*-EUL (plug)



mm

## accessories

code	description
<b>ST 13</b>	Metal swing bracket with threaded holes for M30 ultrasonic sensors. Mounting with M6 screws from beneath the surface or through the wall
<b>ST 14</b>	Plastic swing bracket for M30 ultrasonic sensor. Mounting with M6 screws from upper side
<b>ST 30-A</b>	Metal axial mount bracket for M30 ultrasonic sensors. Mounting with M5 screws
<b>ST 30-C</b>	Metal right angle mount bracket for M30 ultrasonic sensors. Mounting with M5 screws
<b>ST 30-D-U</b>	Beam deflector bracket for M30 ultrasonic sensors
<b>ST 30-D-U-F</b>	Focusing beam deflector bracket for M30 ultrasonic sensors
<b>ST 55-U</b>	Plastic M30 ultrasonic sensors beam deflector
<b>CD12/0B-***A1US</b>	Connectors with PVC cable and cCSAus certification. Axial
<b>CD12/0B-***C1US</b>	Connectors with PVC cable and cCSAus certification. Right angle
<b>CD12/0B-***A5US</b>	Connectors with PUR cable and cCSAus certification. Axial
<b>CD12/0B-***C5US</b>	Connectors with PUR cable and cCSAus certification. Right angle

\*\*\*= 050 (5 m) / \*\*\*= 100 (10 m) / \*\*\*= 150 (15 m)



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CAT3EUT1376502 DATASHEET UT ENGLISH ED.02/2013

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