



# Micro Detectors

Italian Sensors Technology



Application:  
Filling level detection in silos  
for liquids and powders

UT1 - M30 Ultrasonic Sensors



**Ultrasonic Sensors**

Application note

CAT3EUT1261001

Application note - UT1 - English - Ed.01/2012



## MARKET SECTORS

Agriculture, chemical field

## PROBLEM DESCRIPTION

To check the filling level in silos used for liquids or powders, it is needed a system measuring the material level, and which is able to "manage" the different "overflow" (emptying) and "too low" (filling) phases. The critical application, consists in detecting objects no matter of the color and the type of material.

## APPLIED SOLUTION

The ultrasonic technology, is the ideal solution for this type of application, since it is not influenced by the type, color and shape of the material to be detected.

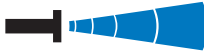
The Ultrasonic sensor UT1, thanks to the **maximum sensing distance of 3.5 m** is used to check the level of material stored in large silos.

Moreover, through the adjustable hysteresis function is the right solution for **managing 2 points "overflow" and "too empty"**.

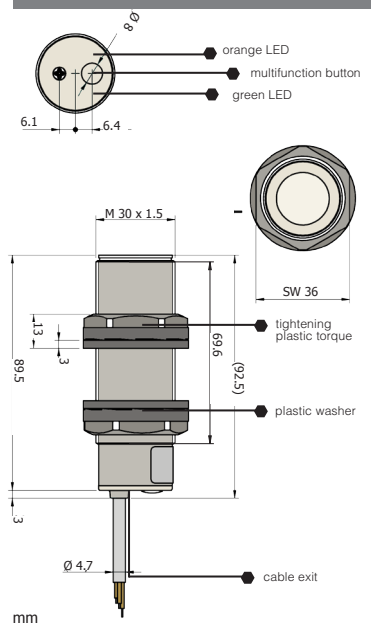
## GENERAL DESCRIPTION

- M30 compact ultrasonic sensors with high performances and high sensing distances
- Models with adjustable digital output: models with two programmable outputs and with single output
- Adjustable hysteresis output, model with double digital programmable designed 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: Teach-in function and NO/NC selection (orange) and eco detection (green)
- Temperature compensation on all working range

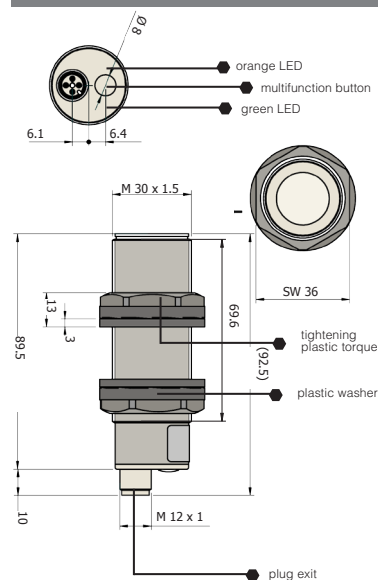
## TECHNICAL SPECIFICATIONS & DIMENSIONS

models	UT1B/E*-0*UL
	
Nominal sensing distance $S_n$	3,500 mm <sup>(1)</sup>
minimum operating distance (blind zone)	250 mm
beam angle	12° ± 2°
switching frequency (digital output)	2 Hz
response time (digital output)	250 ms
differential travel H	0,5%
repeat accuracy	0,2%
linearity error	0,5%
operating temperature	-20° ... +70°C
temperature compensation	yes
thermal drift of $S_r$	5%
rated operational voltage $U_e$	12 - 30 Vcc; 15 - 30 Vdc; voltage supply for voltage analogue output (0-10 V)
maximum ripple content	5%
leakage current	≤ 10 µA (Vdc max)
output voltage drop $U_d$	2.2 V max (IL=100mA)
No-Load supply current	50 mA max
maximum load current (digital output)	100 mA
minimum load resistance	3 k Ω (analogue voltage drop)
sensitivity adjustment	Teach-in button
supply electrical protections	polarity reversal, overvoltage pulses
digital output electrical protections	short circuit, 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>(2)</sup>
housing material	PBT
active head material	epoxy-glass resin
weight	90 g (plug exit) - 160 g (cable exit)
storage temperature	-35° ... +70°C (without freeze)

### UT1B/\*\*\_\*\* (cable)



### UT1B/\*\*\_\*\* (plug)



<sup>(1)</sup> Metallic target 200 x 200 mm

<sup>(2)</sup> Protection granted only by plug mounted in a correct way

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