UT and UTR series

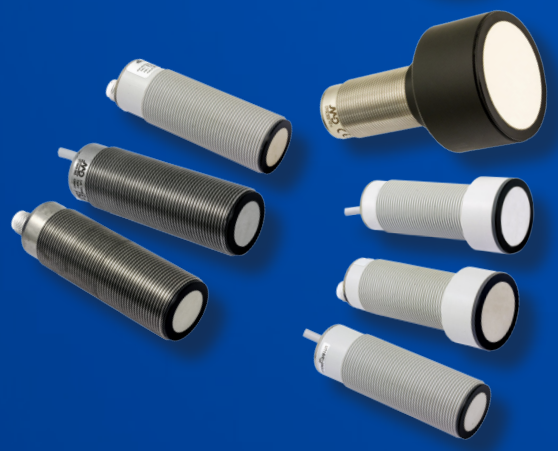
M30 cylindrical direct diffuse & retro-reflective Ultrasonic Sensor with Teach-In button

features

- **M30 ultrasonic sensor with standard housing and with large front with high performances and high sensing distances**
- **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 LEDs: orange LED for adjustment procedure and output type and green LED for target alignment**
- **Plastic and AISI 316L stainless steel housing, plug M12 or cable exit 4 pin**

web contents

- **Application notes**
- **Photos**
- **Catalogue / Manuals**



code description(*)

UT ■ 1 B / E 1 - 0 E 1I UL

series	UT	M30 Ultrasonic Sensor
function	■	Direct diffuse models
	R	Retroreflective models
housing type	1	Standard housing
	2	Large front transducer, Ø 38.8 mm
	5	Large front transducer Ø 61 mm
nominal sensing distance Sn	B	250 - 3,500 mm direct diffuse/350 - 3,500 metallic housing
	F	350 – 6,000 mm direct diffuse
	L	600 - 8,000 mm direct diffuse
adjustment	E	Sensitivity adjustment and NO/NC selection by Teach-in button
output	1	0...10 V single voltage analogue output
	2	4...20 mA single current analogue output
	P	PNP - NO/NC digital output
	N	NPN- NO/NC digital output
	W	PNP two digital outputs with standard window and adjustable hysteresis functions
	M	NPN two digital outputs with standard window and adjustable hysteresis functions
	6	PNP - NO/NC digital output + 4 ... 20 mA current analogue output
	4	NPN - NO/NC digital output + 4 ... 20 mA current analogue output
	7	PNP - NO/NC digital output + 0 ... 10 V voltage analogue output
	9	NPN - NO/NC digital output + 0 ... 10 V voltage analogue output
housing materials	0	Axial plastic housing
	1	Axial AISI 316L (DIN 1.4404) stainless steel housing
cable exit / connector	E	M12 plug cable exit
	A	2 m cable exit
transducer material	1I	Plastic transducer
cULus	UL	With cULus certification

available models

cULus certified - Single digital or analogue output

housing	distance (mm)	output	analogue output 0...10 V	analogue output 4...20 mA	1 x PNP - NO/NC	1 x NPN - NO/NC
plastic	250...3,500	M12	UT1B/E1-0EUL	UT1B/E2-0EUL	UT1B/EP-0EUL	UT1B/EN-0EUL
		cable	UT1B/E1-0AUL	UK1B/E2-0AUL	UT1B/EP-0AUL	UT1B/EN-0AUL

available models

cULus certified - Double digital output

housing	distance (mm)	output	2 X PNP (adjustable hysteresis + standard window MD)	2 X NPN (adjustable hysteresis + standard window MD)
plastic	250...3,500	M12	UT1B/EW-0EUL	UT1B/EM-0EUL
		cable	UT1B/EW-0AUL	UK1B/EM-0AUL
AISI316L	350...3,500	M12	UT1B/EW-1EUL	UT1B/EM-1EUL
		cable	UT1B/EW-1AUL	UT1B/EM-1AUL
plastic	350...6,000	M12	UT2F/EW-0EUL	UT2F/EM-0EUL
		cable	UT2F/EW-0AUL	UT2F/EH-0AUL
AISI 316L housing + plastic transducer	600...8,000	M12	UT5L/EW-1E1IUL	UT5L/EM-1E1IUL
		cable	UT5L/EW-1A1IUL	UT5L/EH-1A1IUL

available models

cULus certified - Double mixed output (digital + analogue)

housing	distance (mm)	output	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
plastico	250...3,500	M12	UT1B/E6-0EUL	UT1B/E4-0EUL	UT1B/E7-0EUL	UT1B/E9-0EUL
		cable	UT1B/E6-0AUL	UT1B/E4-0AUL	UT1B/E7-0AUL	UT1B/E9-0AUL
acciaio inox AISI 316L	350...3,500	M12	UT1B/E6-1EUL	UT1B/E4-1EUL	UT1B/E7-1EUL	UT1B/E9-1EUL
		cable	UT1B/E6-1AUL	UT1B/E4-1AUL	UT1B/E7-1AUL	UT1B/E9-1AUL
plastico	350...6,000	M12	UT2F/E6-0EUL	UT2F/E4-0EUL	UT2F/E7-0EUL	UT2F/E9-0EUL
		cable	UT2F/E6-0AUL	UT2F/E4-0AUL	UT2F/E7-0AUL	UT2F/E9-0AUL
AISI 316L housing + plastic transducer	600...8,000	M12	UT5L/E6-1E1IUL	UT5L/E4-1E1IUL	UT5L/E7-1E1IUL	UT5L/E9-1E1IUL
		cable	UT5L/E6-1A1IUL	UT5L/E4-1A1IUL	UT5L/E7-1A1IUL	UT5L/E9-1A1IUL

technical specification (cULus certified)

	UT1B/E*-**UL	UT2F/E*- 0*UL	UT5L/E*- 1*1LUL
maximum sensing distance	3,500 mm [1]	6,000 mm [2]	8,000 mm [2]
minimum sensing distance	250 mm / 350 mm metallic housing	350 mm	600 mm
sensing range (Sd)	250...3,500 mm (plastic) / 350...3,500 mm (metallic)	350...6,000 mm	600...8,000 mm
beam angle	± 7°	± 9°	15° ± 1°
switching frequency (digital output)	2 Hz / 1 Hz metallic housing	1 Hz	
response time (digital output)	250 ms	500 ms	
response time (analogue output)	600 ms	600 ms	
hysteresis	1 % off full scale value		
repeatibility	1 % off full scale value	0.5 % off full scale value	1 % off full scale value
resolution	4 mm	6 mm	10 mm
linearity error	1 % off full scale value		
temperature range	- 20°C...+ 70°C		
temperature compensation	●		
operating voltage	12 - 30 Vcc; 15 - 30 Vcc: for model with analog voltage output (0 - 10 V)		
temperature drift	± 8 % (digital output); ± 5 % (analogue output)		
ripple	5 %		
leakage current	≤ 10 µA @ 30 Vcc		
output voltage drop	2.2 V max. (IL = 100 mA)		
no-load supply current	≤ 50 mA		
output current (digital output)	100 mA		
minimum load resistance (analog voltage output)	3 k Ω		
set point adjustment	Teach-In button		
power on delay	≤ 500 ms (digital output)		
power on delay	≤ 900 ms (analogue output)		
power supply protections	polarity reversal, transient		
digital output electrical protection	short circuit (auto reset), overvoltage pulses		
analog output electrical protections	overvoltage pulses		
EMC	conforming to EMC Directive, according to EN 60947-5-2		
protection degree	IP67 (EN60529); NEMA 4X[3]	IP67 (EN 60529) [3]	
housing material	PBT/AISI 316L	PBT	AISI 316L + PBT
active head material	epoxy-glass resin AISI 316L + PBT		
tightening torque	1.5 Nm (plastic housing) / 100 Nm	1.5 Nm	100 Nm (metallic housing)
weight	plastic version: 140 g connector / 200 g cable metallic version: 215 g connector / 220	170 g connector / 300 g cable	
storage temperature	- 35°C...+ 70° without freeze		

[1] Metallic target 200 x 200 mm [2] Metallic target 400 x 400 [3] Protection guarantee only with plug cable well mounted

available models

retroreflective models M30

housing	function	portata (mm)	output	PNP - NO/NC	NPN - NO/NC
plastic	retroreflective	250…3,500	M12	UTR1B/EP-0EUL	UTR1B/EN-0EUL
		350...6,000		UTR2F/EP-0EUL	UTR2F/EN-0EUL
		250...3,500	cable	UTR1B/EP-0AUL	UTR1B/EN-0AUL
		350...6,000		UTR2F/EP-0AUL	UTR2F/EN-0AUL

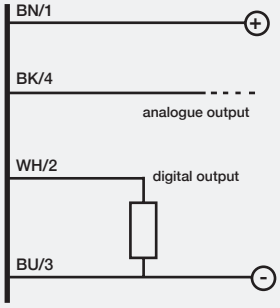
technical specification (cULus certified)

	UTR1B/E*-0*	UTR2F/E*-0*
nominal sensing distance Sn	3,500 mm [1]	6,000 mm [2]
reflector minimum sensing distance	250 mm	350 mm
beam angle	± 7°	± 8°
switching frequency	1 Hz	1 Hz
operating voltage	15 - 30 Vdc	
max. ripple content	5 %	
output type	PNP o NPN NO/NC selectable	
output current	100 mA	
output voltage drop	≤ 2.2 V (@ I = 100mA)	
no-load supply current	≤ 50 mA @ Val=24V	
leakage current	≤ 10 µA @ 30V	
power on delay	≤ 500 ms	
temperature range	-20°C...+70°C	
temperature drift of Sr	≤ 5 %	
short-circuit protection	● (autoreset)	
induction protection	●	
voltage reversal protection	●	
LEDs	yellow: output green: alignment	
protection degree	IP67	
EMC	conforming to EMC Directive according to EN 60947-5-2	
housing material	PBT	
active head material	epoxy glass resin	
connection	M12 plug cable exit, 2 m cable exit	

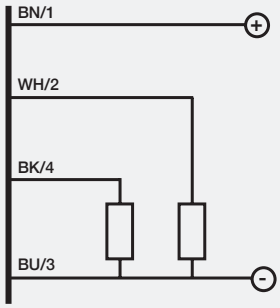
[1] Metallic target 200 x 200 mm [2] Metallic target 400 x 400 mm [3] Protection granted only by plug mounted in a correct way

electrical diagrams of connections

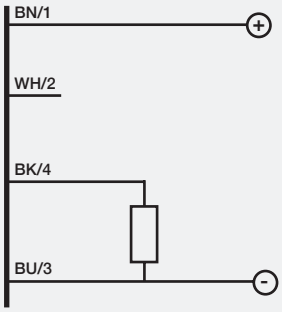
PNP NO/NC + analogue output



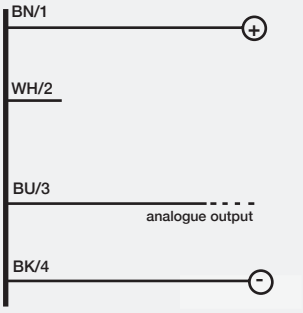
models with double PNP output



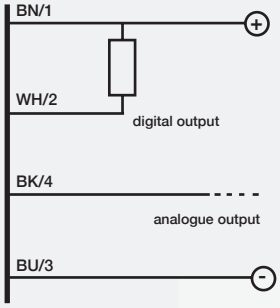
models with PNP NO/NC single output



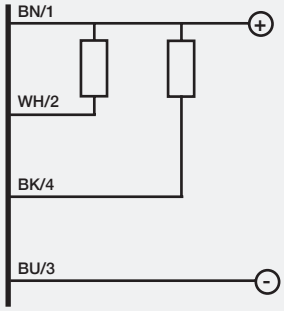
models with single analogue output



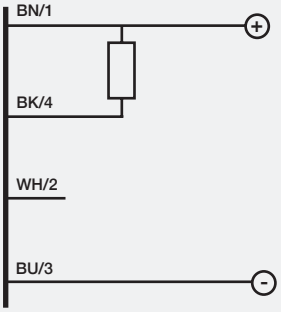
NPN NO/NC models + analogue output



models with NPN double digital output



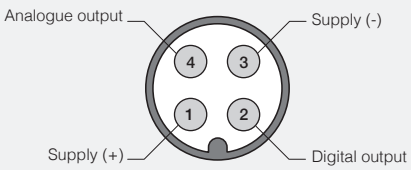
models with NPN NO/NC single digital output



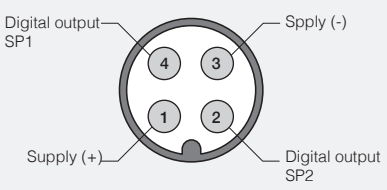
BN	brown
BU	blu
BK	black
WH	white

plugs

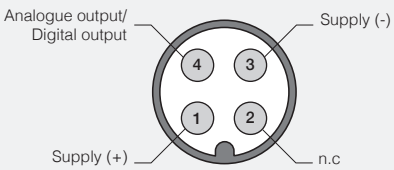
M12 UT**/E4 - EUL UT**/E7 - EUL UT**/E6 - EUL UT**/E9 - EUL



M12 UT**/EM - EUL UT**/EW - EUL



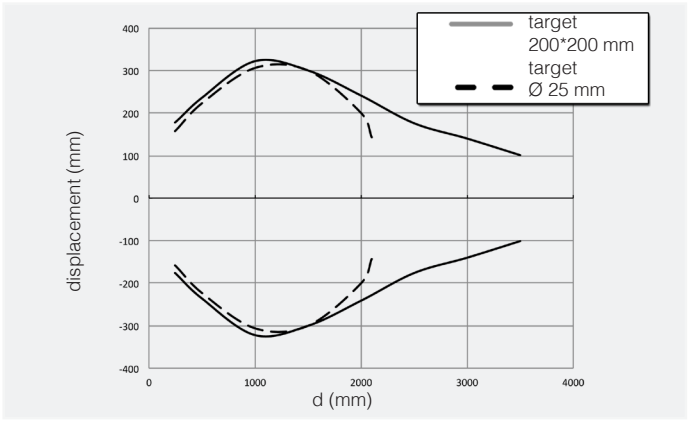
M12 UT**/E1 - EUL UT**/EP - EUL UT**/E2 - EUL UT**/EN - EUL



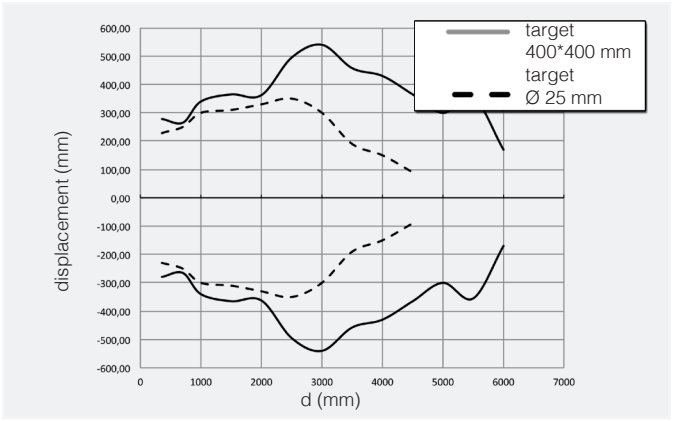
response diagrams

direct diffuse models

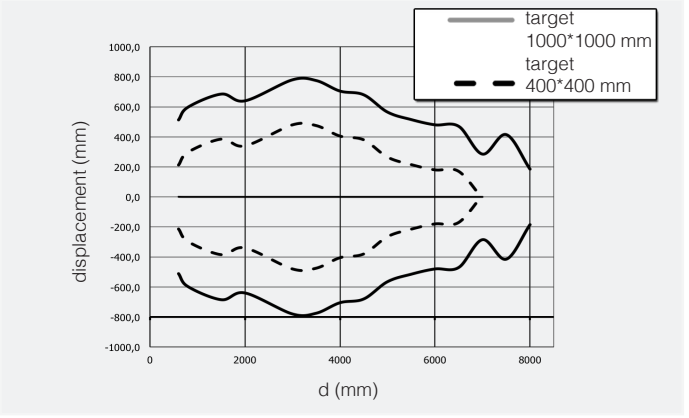
parallel displacement UT1B/**-**



parallel displacement UT2F/**-**



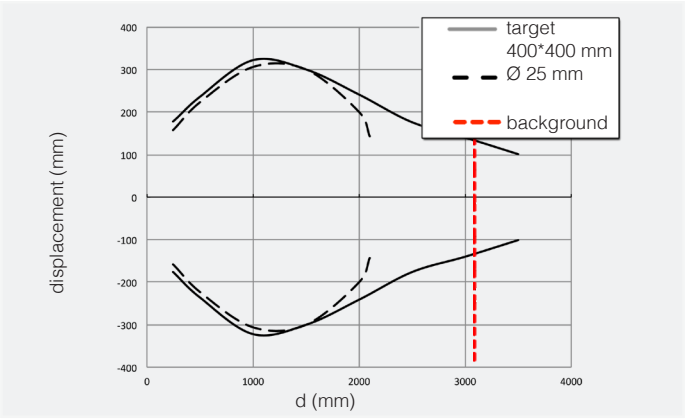
parallel displacement UT5L/**-**



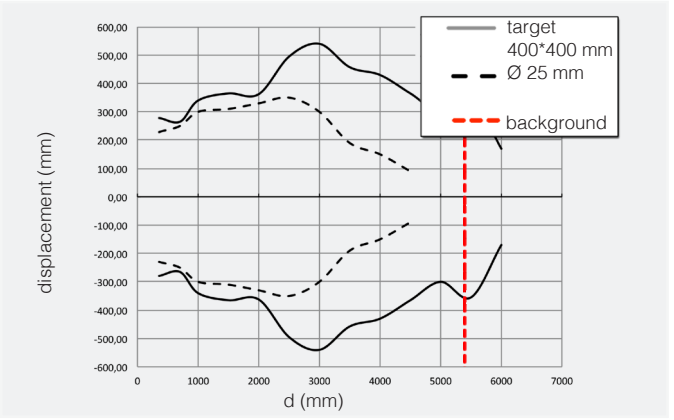
response diagrams

retroreflective models

parallel displacement UTR1B/**-**

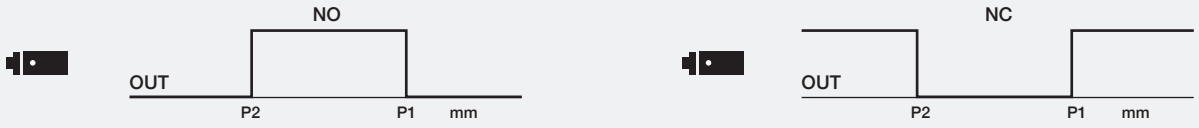


parallel displacement UTR2F/**-**

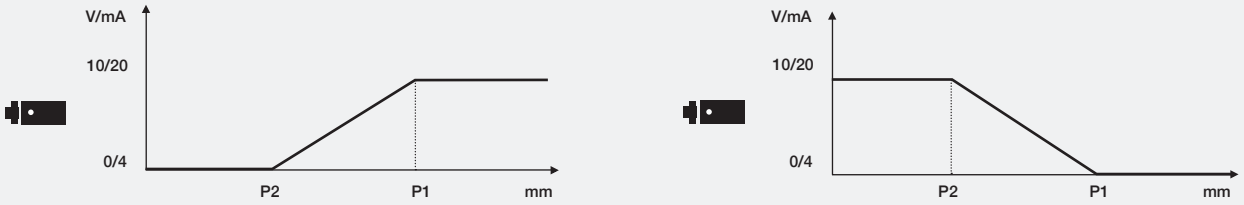


available outputs

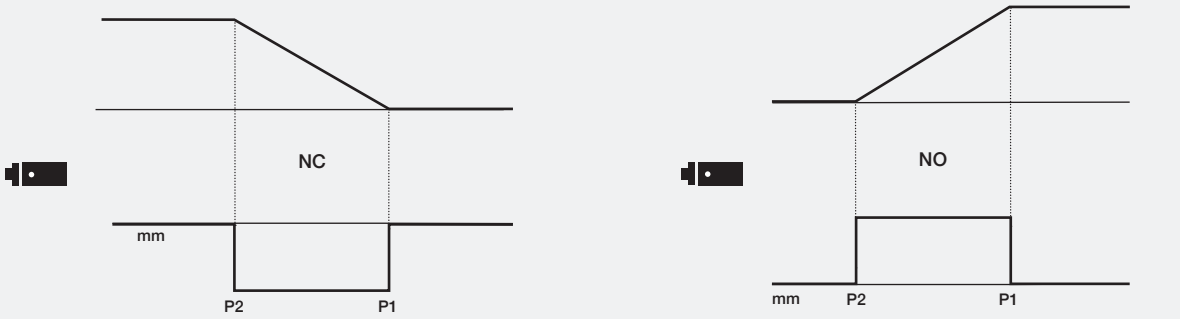
models with single digital output



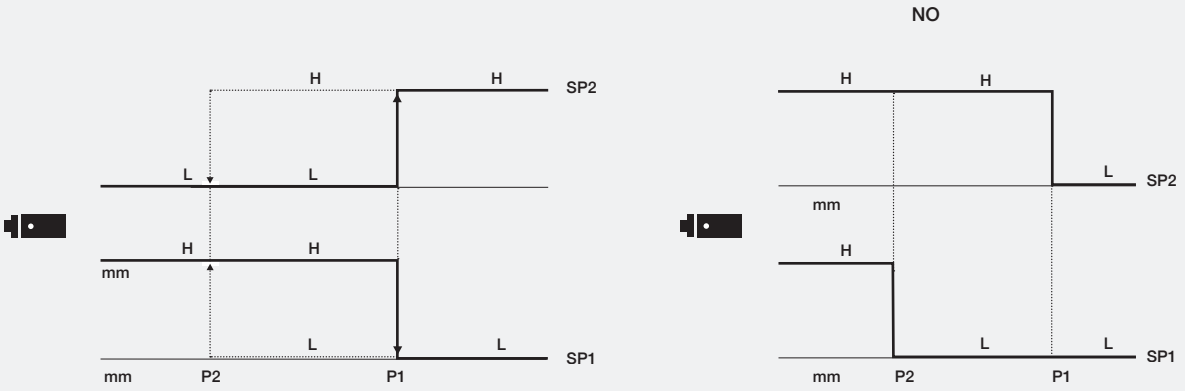
models with single analogue output



models with digital output + analogue output [1]



models with double output, hysteresis + standard window [2]



[1] Suitable, also, as single model output.

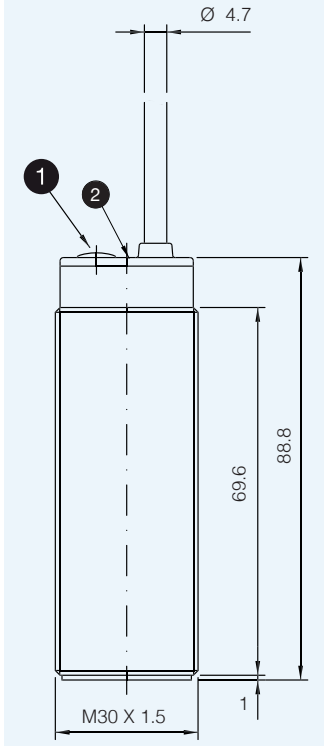
[2] In the double digital output model with the standard window and adjustable hysteresis functions if the target is removed from sensor detection range, the output type switches. These models are not forseen with NO/NC function.

P1	maximum selected working distance and first point to select
P2	minimum selected working distance and second point to select

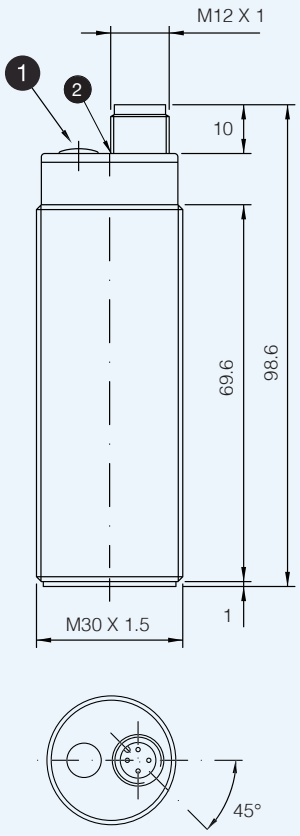
dimensions (mm)

plastic models

UT1B*/** - 0AUL



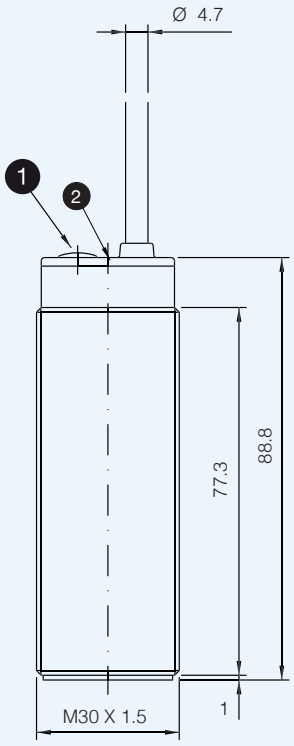
UT1B*/** - 0EUL



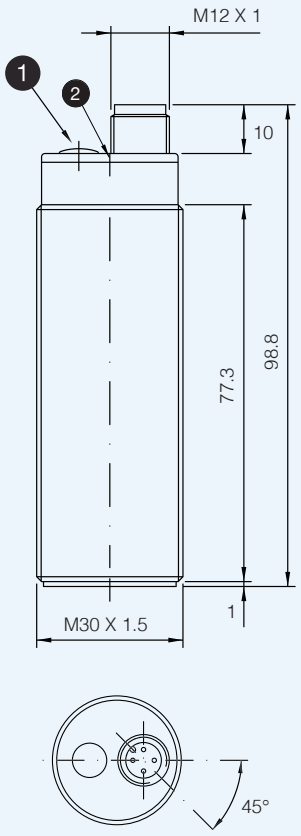
dimensions (mm)

metallic models

UT1B*/** - 1AUL



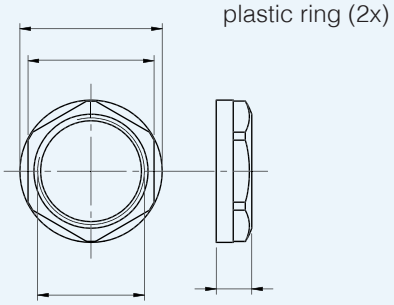
UT1B*/** - 1EUL



1 Teach-In button 2 LED

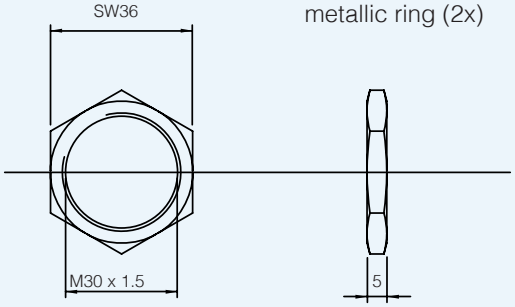
dimensions (mm)

accessories included in all metallic models



dimensions (mm)

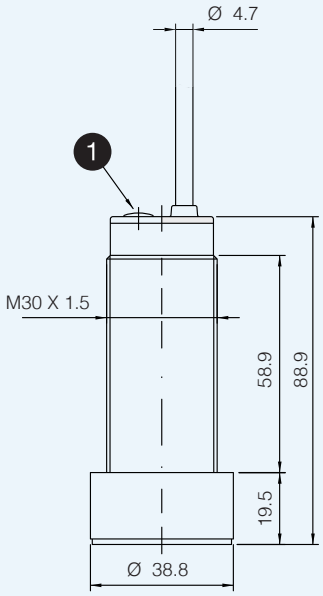
accessories included in all metallic models



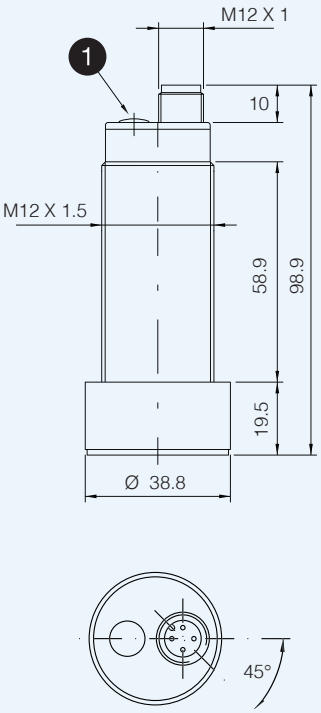
dimensions (mm)

plastic models

UT2F*/ - 0AUL**



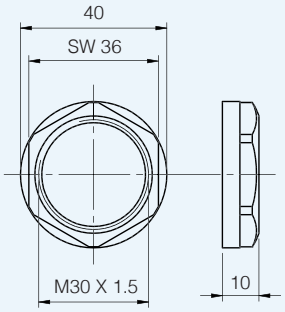
UT2F*/ - 0EUL**



1 Teach-In button

dimensions (mm)

accessories included in all metallic models

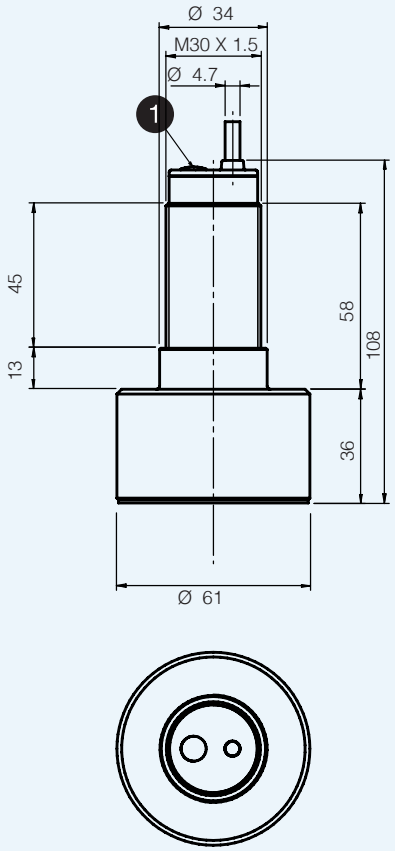


plastic ring (2x)

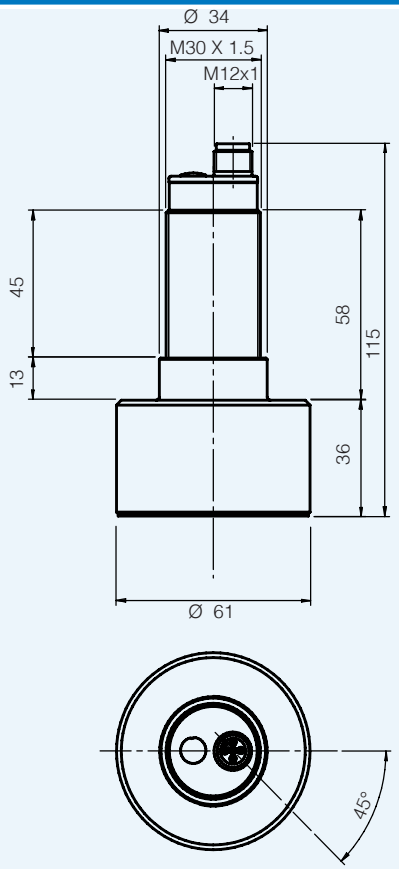
dimensions (mm)

metallic models

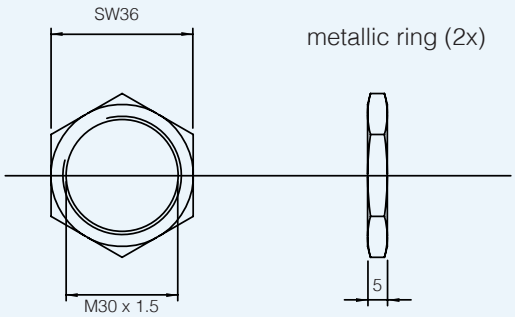
UT5L/ - 1A1IUL**



UT5L/ - 1E1IUL**



1 Teach-In button

dimensions (mm)

accessories included in all metallic models