

ECAS level switch is a capacitive level sensor for level measurement of conductive liquid, nonconductive liquid, granulated materials with solid particles, adhesive and acid / base liquids.

When a material comes between electrode rod and tank wall, a capacitance change occurs and when this change exceed adjustment threshold, contact output is delivered.

Designed for difficult process conditions. Models with cooling apparatus can be manufactured for high temperature and pressure conditions.

Calibrations of triggering point and relay operation range can be performed by the user under workplace conditions.

It can be connected horizontally or vertically.

Application Areas

Liquid tanks, food machines, cooling liquid tanks, shipping, glycol tanks, brine, waste water tanks.

Oil tanks, CO2 liquid tanks, high temperature tanks, low-conductive liquids.

Grain silo, cement silo, sand feed, dough, milk powder, organic and plastic granule.

Sticky hot and high viscosity liquid, acid and chemical liquids.



Technical Specifications:

Measurable Material	Conductive liquids, refrigerants Non-conductive liquids Solids particulate materials Adhesive and acid/basic liquids
Supply	24 VDC
Signal Output	1 NO / NC x5 A / 250 VAC Relay
Min.Di-Electric Constant	1,6 ϵ_r
Connection Material	304 Stainless Steel Opt. 316 Stainless Steel
Isolation Material	PTFE, PFA Opt. Peek, Ceramic
Housing Material	PBT (Std.) Opt. Aluminium, Stainless Steel
Working Pressure	(-) 1 bar...100 bar (Depending on the model)
Working Temperature	(-) 40 °C / (+) 150 °C (Depending on the model) 200 °C with cooling apparatus 230 °C with PEEK isolation 400 °C with ceramic isolation
Ambient Temperature	(-) 20 °C...(+) 60 °C
Display	With LED-Power and Contact LED
Isolation	Max. 500 V
Power Consumption	Max. 1 W
Electrical Connection	Clemens
Protection Class(EN60529)	PBT-IP 66 , Aluminium , St.St. IP 65
Test	EMC, Low Voltage
Max. Tensile Force	Max. 40 Nm
Weight	285 g. for ECAS 101

ECAS

CAPACITIVE LEVEL SWITCH

ECAS 101 , ECAS 102 , ECAS 103 , ECAS 107
ECAS 202 , ECAS 203 , ECAS 204 , ECAS 205 , ECAS 20S
ECAS 301 , ECAS 304 , ECAS 305 , ECAS 30D , ECAS 30S
ECAS 408A , ECAS 408B , ECAS 408T , ECAS 408Tp , ECAS 408Tm

Advantages :

- * Optionally high temperature-resistant design.
- * Easy assembly and sensitivity adjustment.
- * No need to clean.
- * Not affected by foam, liquid splash and probe coating.
- * Can be mounted upside down (reverse)



Working Principle :

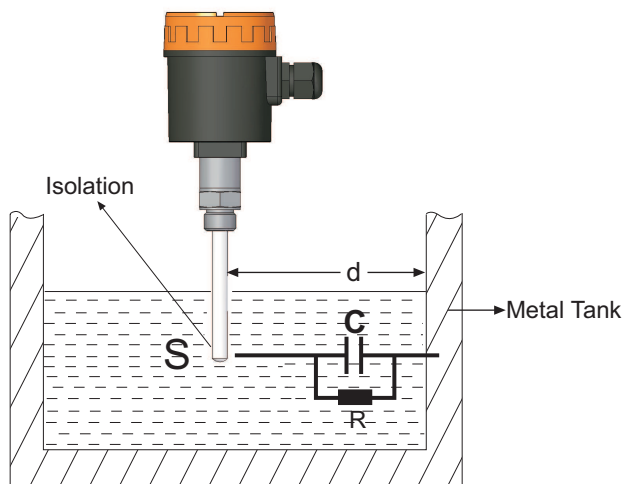
Capacitance definition, assuming two parallel conductive plates are used;

$$C = \frac{\epsilon_0 \cdot \epsilon_r \cdot S}{d}$$

C: capacity , Farad

S: Surface Area , m²

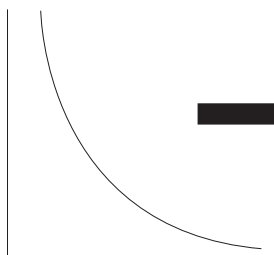
d: Distance , m



However, there are scarcely any sensor type which this definition can be practically utilized. Above Formula can no longer be reliable especially when residual areas increase due to large distance (d) (which is usually the case). Thus, measuring impedance for distance measurements gives more accurate results than capacitance measurement.

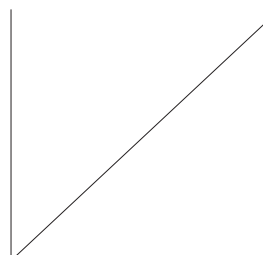
Excitation applied between 10 KHz...250 KHz based on length for all our models. ($\omega = 2 \times \pi \times f$) Linearity error that may be caused by conductivity component (R) effect is prevented by electronic circuit design and mechanical design. Reduced to a level lower than 1ppm, acceptable as zero.

Capacity

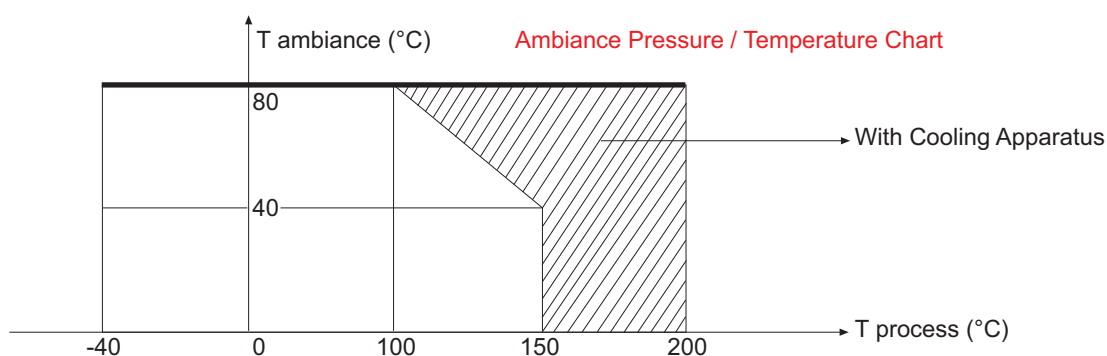
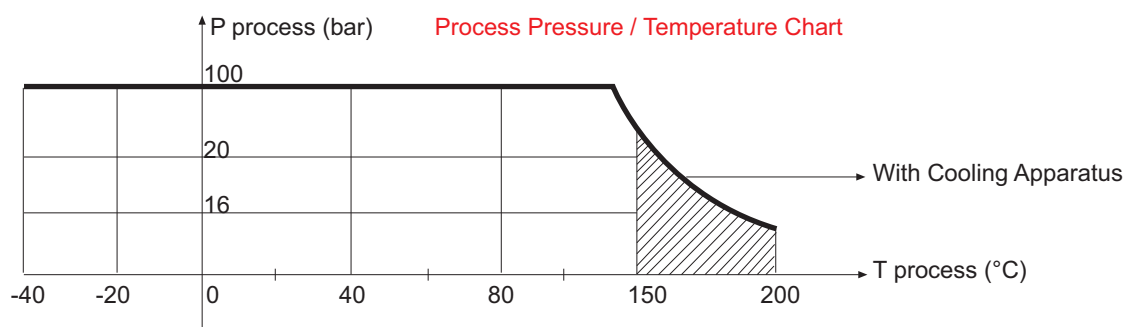


Distance

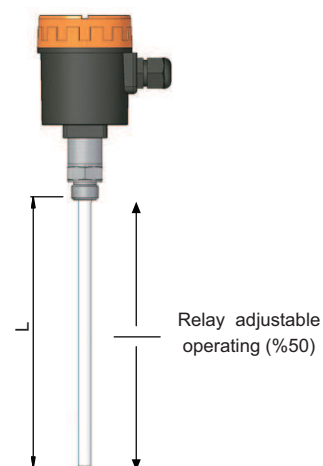
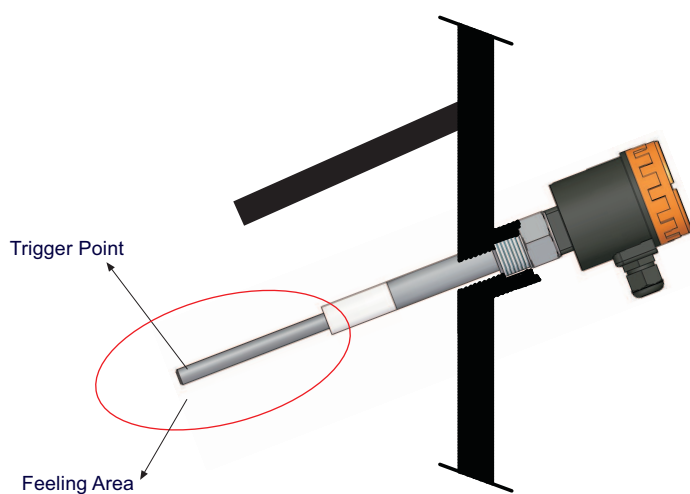
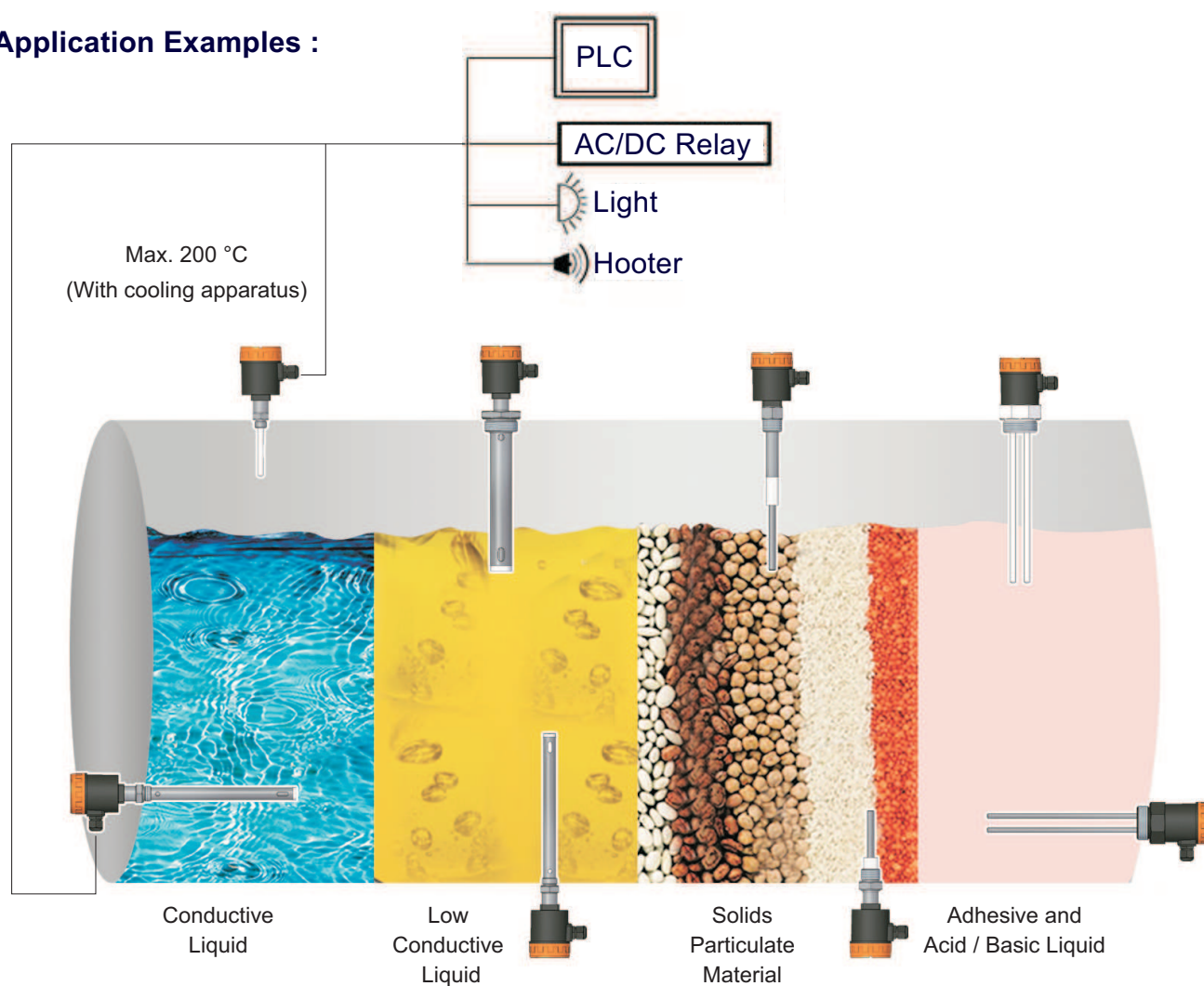
Impedance



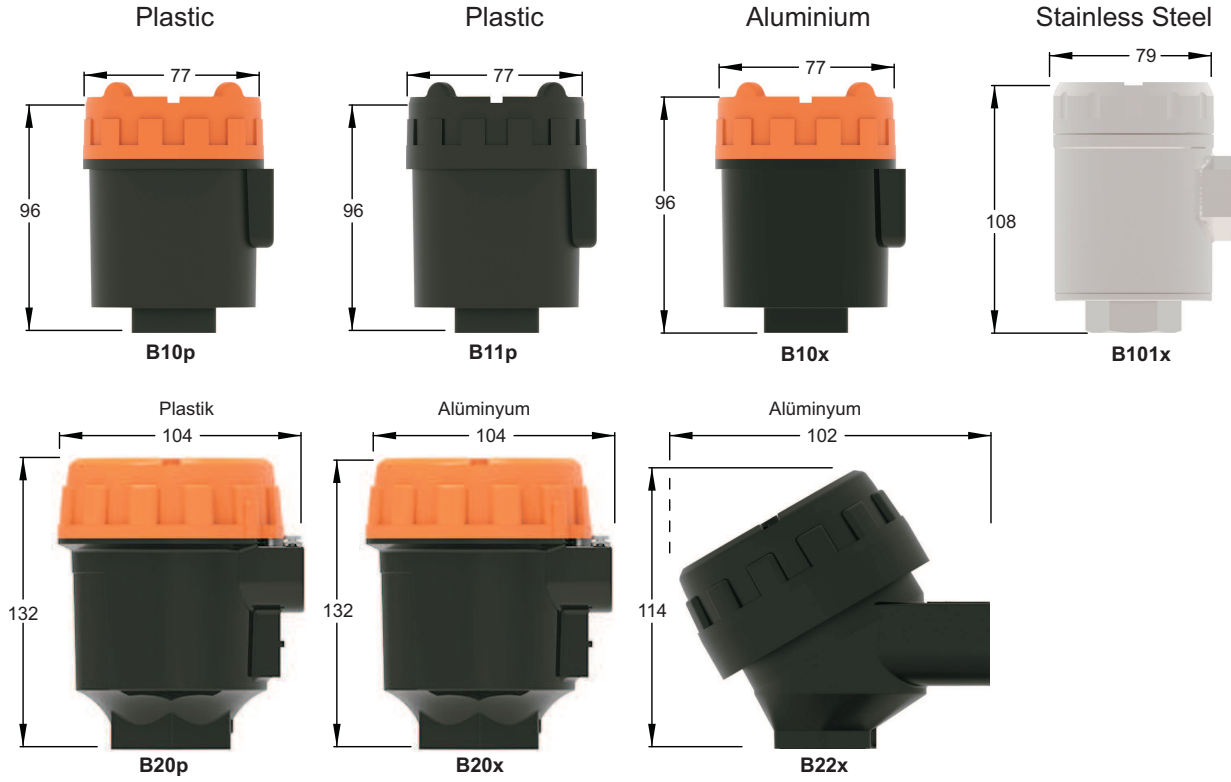
Distance



Application Examples :



Housing :



ORDER CODE	TYPE	MATERIALS	PROTECTION CLASS	TEMPERATURE (°C)	DIMENSION a x b x c (mm)
050	B10p	Plastic (PBT)	IP 65	(-) 40...(+) 150	96 x 77
053	B11p	Plastic (PVDF)	IP 65	(-) 40...(+) 120	96 x 77
103	B20p	Plastic (PBT)	IP 65	(-) 40...(+) 150	132 x 104
503	B10x	Aluminium	IP 65	(-) 40...(+) 150	96 x 77
603	B20x	Aluminium	IP 66	(-) 40...(+) 200	132 x 104
750	B22x	Aluminium	IP 66	(-) 40...(+) 200	114 x 112
851	B101x	Stainless Steel	IP 65	(-) 40...(+) 150	108 x 79

Protection Case:

Material : 304 Stainless Steel
Welded manufacturing
Opens - Closes Hinged
To Protect Against external conditions.



Product Label :

Manufacturer Brand Product Name Approval Sign



LEVEL SWITCH

Model → Type : ECAS 101-10-300-0-0006-11- 5239-066-002-00/0
Power Supply : 24 VDC ± %10
Output : 1 x NO / NC , 5A / 250VAC
Process Temp. : (-)40 °C...(+)150 °C
T (Ambient) : (-)20 °C...(+)60 °C
Mech. Conn. / Lenght (mm) : 1" BSP / 300
Serial Number → S.N. : IE20060002-0001

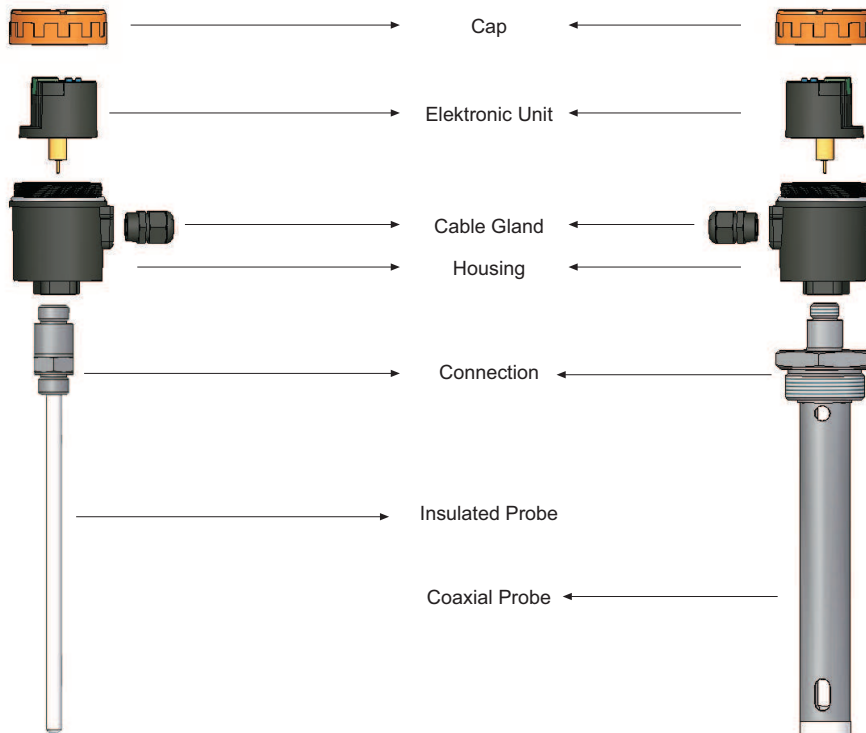
MADE IN TURKIYE www.ensim.com.tr

Approval Sign → EAC CE

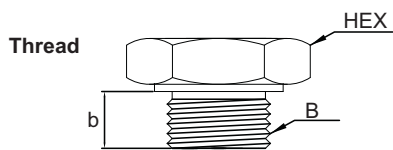
Warning Symbols → 

Manufacturer Website → www.ensim.com.tr

Parts:

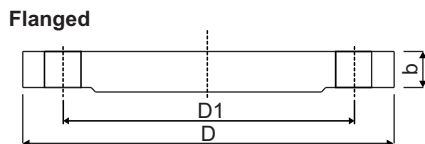


Mechanical Connection :



(ISO228-1)

Order Code	Dimension B	Hex (mm)	Thread Lenght b (mm)
0004	1/2" BSP	27	14
0005	3/4" BSP	32	14
0006	1" BSP	41	23
0008	1 1/4" BSP	51	23
0009	1 1/2" BSP	60	23
0012	2" BSP	70	23



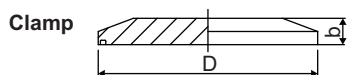
(ISO1092-1)

Order Code	PN 16	D (mm)	D1 (mm)	b (mm)
0502	DN 25	165	85	16
0503	DN 32	140	100	16
0505	DN 50	165	125	18
0507	DN 80	200	160	20
0508	DN 100	220	180	20

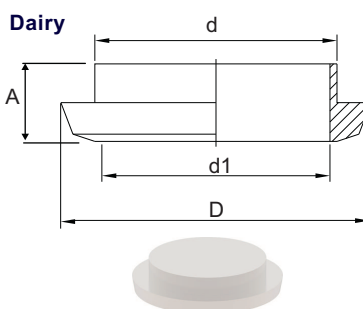
Order Code	(ISO1092-1) PN 40	D (mm)	D1 (mm)	b (mm)
0702	DN 25	115	85	18
0703	DN 32	140	100	20
0705	DN 50	165	125	20
0707	DN 80	200	160	20
0708	DN 100	235	190	24

(ANSI B16.5)

Order Code	150 LBS	D (mm)	D1 (mm)	b (mm)
1005	DN 50	152,4	121	19
1006	DN 65	177,8	139,7	22,2
1007	DN 80	190,5	152,4	23,8
1008	DN 100	228,6	157,2	23,8



Order Code	(ISO2852) Measurement	D (mm)	b (mm)
1501	DN 32	50,5	15
1502	DN 50	64	17
1503	DN 65	91	17

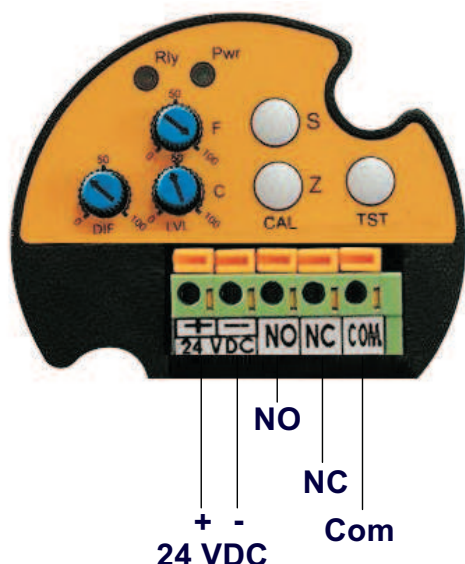


Order Code	Measurement	Measurement	D (mm)	d1 (mm)	A (mm)
1600	DN 40	DN 40	56	48	13
1601	DN 50	DN 50	68	61	14
1602	DN 100	DN 100	121	114	20

Electrical Connection :

Indification and Calibtarion :

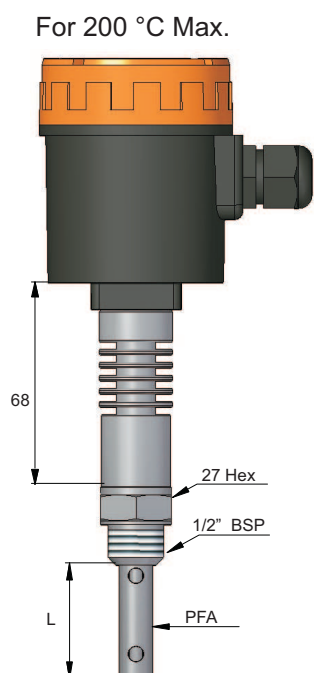
- * **RlyLED:** "Relay active" during normal operation; means operation continues during calibration. Flashes continuously in normal operation mode –if relay is active– and blinks in calibration mode. It is red colored.
- * **PwrLED:** Means there is no sensor failure during normal operation, and means "desired measurement values are saved in memory" during calibration. Operates by flashing. If light is continuous, it indicates failure. It is gren colored.
- * **CAL - S Button:** Used to acquire "High Level-span-"value during calibration.
- * **CAL - Z Button:** Used to acquire "Low Level-zero-"value during calibration.
- * **TST Button:** During normal operation, it functions as "Relay Test". While calibration, it is used for saving the Zero and Span values, wich is taken before with S and Z buttons, transfer to permanent memory.
- * **LVL - C Pot:** Adjusts relay triggering point between Zero-Span values.
- * **LVL - F Pot:** Performs as "fine tuning" for triggering point. Adjustment field is equal to $\pm 5\%$ of the point adjusted by "C Pot" (total 10 %).
- * **DIF Pot:** Adjusts "Release" level of the relay activated by "C/F Pot". Highest adjustable value is equal to half (50 %) of the operation region specified by "Z and S". Meaning that, when DIF Pot is at 100 % and relay is pulled, the level to release it shall be reduced as half of the total scale.



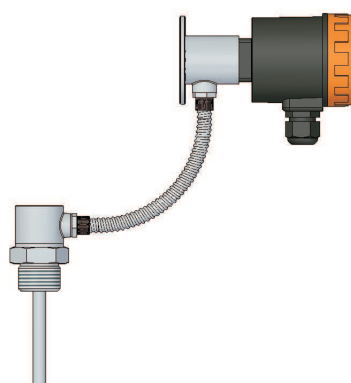
Electronic Unit with Cable:

Electronic unit and sensor component can be separated by a cable that protected against exterior conditions for easy calibration on site. Thanks to the properties of cable, easy assemble for user is possible.

Cooling :



Sample Models :

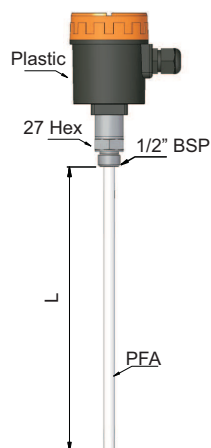


CONDUCTIVE LIQUIDS

**Sample
Models:**

ECAS 101

**Fully Insulated Probe
Conductive Tank**



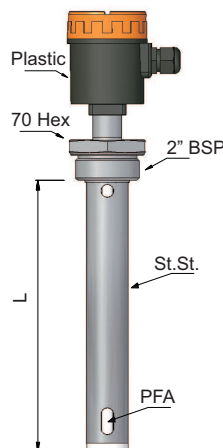
L= 250 mm. (Std) Max. 4 m.

(-) 1 bar...(+) 100 bar

(-) 40 °C...(+) 150 °C

ECAS 102

**Fully Insulated Coaxial Probe
Insulated Tank**



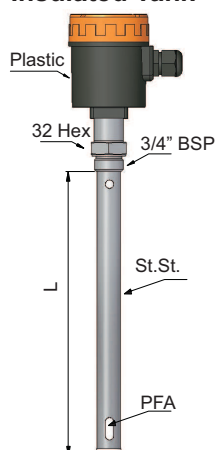
L= 250 mm. (Std) Max. 4 m.

(-) 1 bar...(+) 100 bar

(-) 40 °C...(+) 150 °C

ECAS 103

**Fully Insulated Coaxial Probe
Insulated Tank**



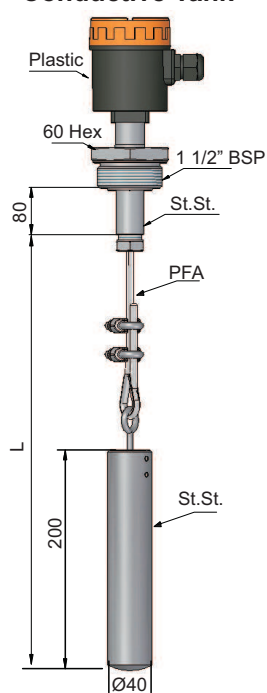
L= 250 mm. (Std) Max. 1 m.

(-) 1 bar...(+) 100 bar

(-) 40 °C...(+) 150 °C

ECAS 107

**Fully Insulated Rope
Conductive Tank**



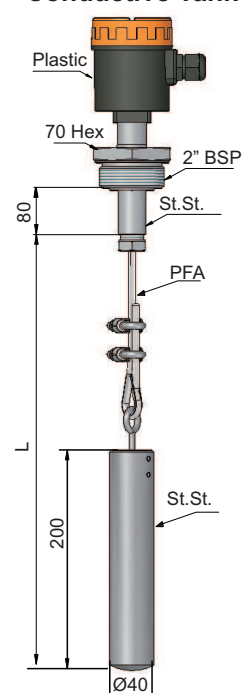
L= 1 m. (Std) Max. 16 m.

(-) 1 bar...(+) 60 bar

(-) 40 °C...(+) 150 °C

ECAS 107

**Fully Insulated Rope
Conductive Tank**



L= 1 m. (Std) Max. 32 m.

(-) 1 bar...(+) 60 bar

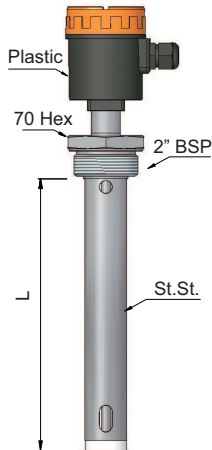
(-) 40 °C...(+) 150 °C

**Sample
Models:**

LOW CONDUCTIVE LIQUIDS

ECAS 202

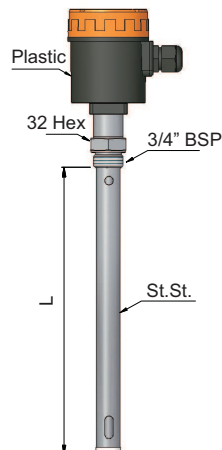
Partly Insulated Coaxial Probe
Conductive / Insulating Tank



L= 250 mm. (Std) Max. 4 m.
(-) 1 bar...(+) 100 bar
(-) 40 °C...(+) 150 °C

ECAS 203

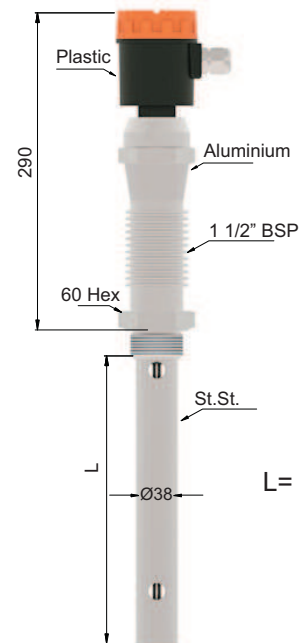
Partly Insulated Coaxial Probe
Conductive / Insulating Tank



L= 250 mm. (Std) Max. 1 m.
(-) 1 bar...(+) 100 bar
(-) 40 °C...(+) 150 °C

ECAS 20S

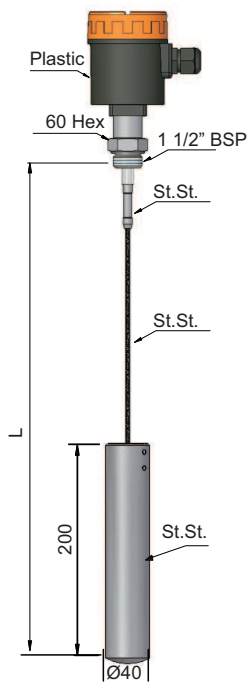
Partly Insulated Coaxial Probe
Conductive / Insulating Tank



L= 250 mm. (Std) Max. 4 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 400 °C

ECAS 204

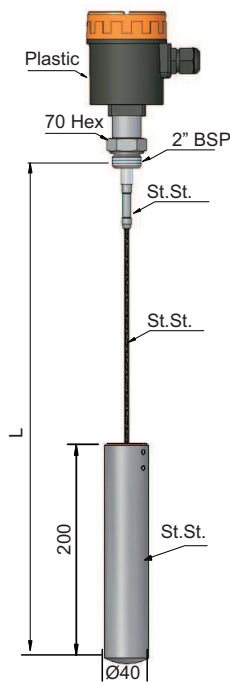
Partly Insulated Rope
Conductive Tank



L= 1 m. (Std) Max. 16 m.
(-) 1 bar...(+) 60 bar
(-) 40 °C...(+) 150 °C

ECAS 204

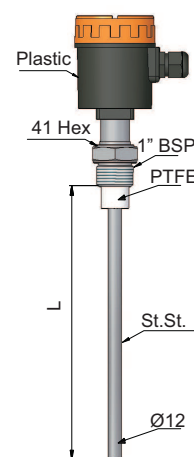
Partly Insulated Rope
Conductive Tank



L= 1 m. (Std) Max. 32 m.
(-) 1 bar...(+) 60 bar
(-) 40 °C...(+) 150 °C

ECAS 205

Partly Insulated Probe
Conductive Tank



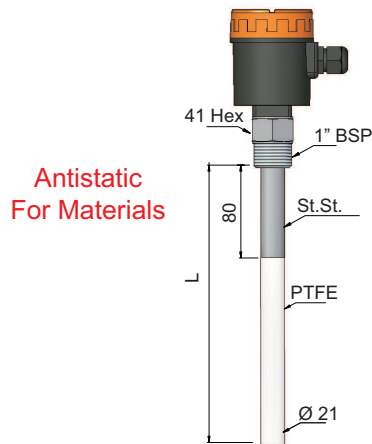
L= 250 mm. (Std) Max. 6 m.
(-) 1 bar...(+) 60 bar
(-) 40 °C...(+) 150 °C

SOLID PARTICLE MATERIALS

**Sample
Models:**

ECAS 301

**Compled Insulated Probe
Conductive Tank**



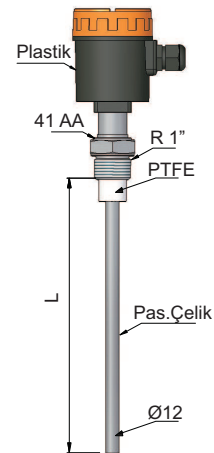
L= 250 mm. (Std) Max. 1 m.

(-) 1 bar...(+) 25 bar

(-) 40 °C...(+) 150 °C

ECAS 305

**Partly Insulated Probe
Conductive Tank**



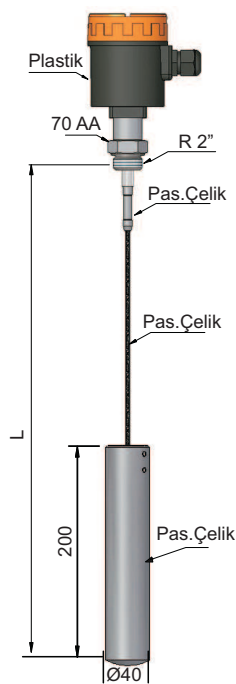
L= 250 mm. (Std) Max. 6 m.

(-) 1 bar...(+) 25 bar

(-) 40 °C...(+) 150 °C

ECAS 304

**Partly Insulated Rope
Conductive Tank**



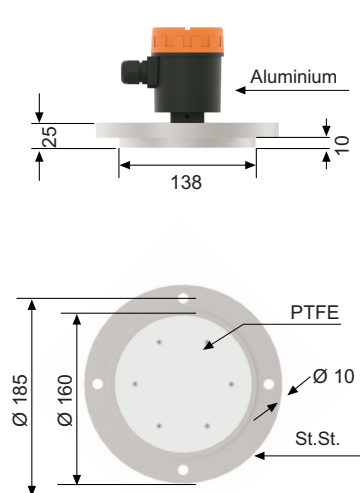
L= 1000 mm. (Std) Max. 16 m.

(-) 1 bar...(+) 25 bar

(-) 40 °C...(+) 150 °C

ECAS 30D

**Horizontal Diaphragm
Conductive Tank**



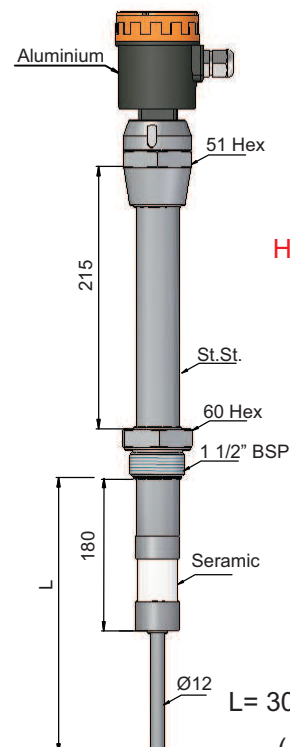
L=10 mm.(Std)

(-) 1 bar...(+) 25 bar

(-) 40 °C...(+) 150 °C

ECAS 30S

**Ceramic Partly Insulated Probe
Conductive Tank**



L= 300 mm. (Std) Max. 4 m.

(-) 1 bar...(+) 25 bar

Opt. (-) 1 bar...(+) 50 bar

(-) 40 °C...(+) 400 °C

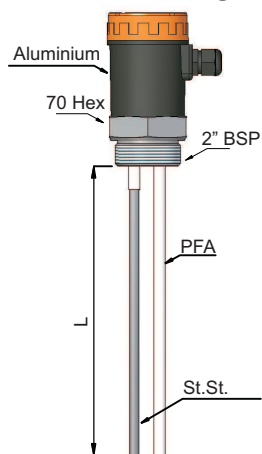
ADHESIVE AND ACID / BASIC LIQUIDS

Sample

Models:

ECAS 408A

Double Probe (Single Fully Insulated)
Conductive / Insulating Tank



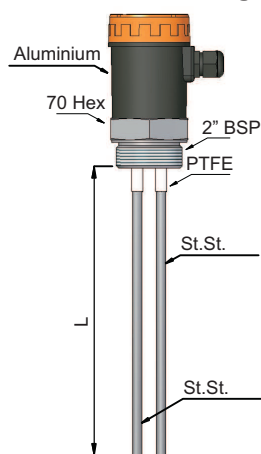
L= 250 mm. (Std) Max. 4 m.

(-) 1 bar...(+) 100 bar

(-) 40 °C...(+) 150 °C

ECAS 408B

Double Partly Insulated Probe
Conductive / Insulating Tank



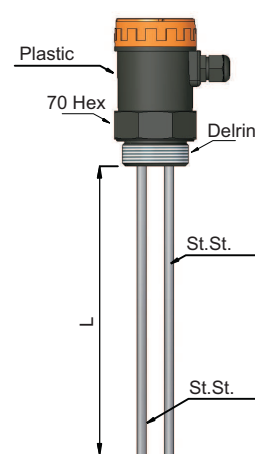
L= 250 mm. (Std) Max. 6 m.

(-) 1 bar...(+) 60 bar

(-) 40 °C...(+) 150 °C

ECAS 408B

Double Partly Insulated Probe
Conductive / Insulating Tank



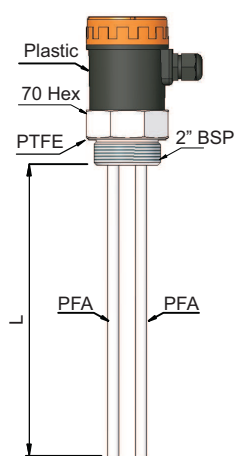
L= 250 mm. (Std) Max. 6 m.

(-) 1 bar...(+) 25 bar

(-) 20 °C...(+) 80 °C

ECAS 408T

Double Partly Insulated Probe
Conductive / Insulating Tank



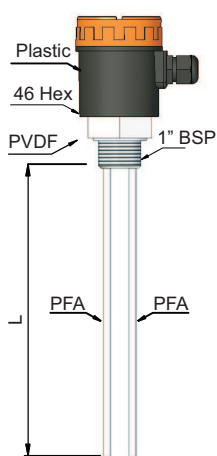
L= 250 mm. (Std) Max. 1 m.

(-) 1 bar...(+) 60 bar

(-) 40 °C...(+) 150 °C

ECAS 408Tm

Double Partly Insulated Probe
Conductive / Insulating Tank



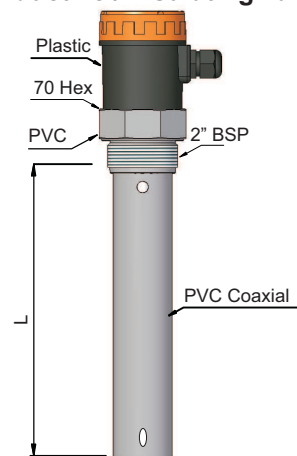
L= 250 mm. (Std) Max. 1 m.

(-) 1 bar...(+) 60 bar

(-) 40 °C...(+) 150 °C

ECAS 408Tp

Double Partly Insulated
PVC Coaxial Probe
Conductive / Insulating Tank



L= 250 mm. (Std) Max. 1 m.

(-) 1 bar...(+) 6 bar

(-) 40 °C...(+) 60 °C

1 MODEL ECAS

Conductive Liquids.....1	Solids Particulate Materials.....3
Non-Conductive Liquids 2	Adhesive and Acid / Basic Materials.....4

2 CERTIFICATE

None.....0	(EN10204-3-1)Material Certification.....1
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3 PROBE TYPE (MAX. LENGHT)

Single Probe - Insulated (Max. 4 m.) 1	Double Probe - Single Insulated (Max. 4 m.) 8A
Single Probe - Coaxial (Max. 4 m.) Ø 38 2	Double Probe - Non-Isolated (Max. 6 m.) 8B
Single Probe - Thin Coaxial (Max. 1 m.), Ø 21 3	Double Probe - Double Insulated (Max. 4 m.) 8T
Rope - Non-Insolated (Max. 32 m.) 4	Double Probe - Double Insulated, PVC Coaxial (Max. 4 m.) .. 8Tp
Single Probe - Non-Insolated (Max. 6 m.) 5	Double Probe Thin - Double Insulated (Max. 1 m.) 8Tm
Single Probe - High Temperature (Max. 4 m.) 6	Ceramic Insulated Probe (Max. 4 m.) S
Rope - Insulated (0 ... 32 m.)..... 7	Diaphragm Probe..... D
	Special..... x

4 PROBE DIAMETER (mm) Ø

Ø 10 mm (Std.).....10	Ø 8 mm 08
	Ø 12 mm 12

5 STEM LENGHT (mm) L

.....mm

6 PROCESS TEMPERATURE

150 °C (Standard).....0	(-) 196 °C For Cryogenic Tank 2
200 °C with Cooling Apparatus 1	230 °C with Peek Insulated 3
	400 °C with Ceramic Insulated 4

7 CONNECTION

Thread (ISO 228-1)	Clamp (ISO 2852)	ISO Flange(1092-1)	ISO Flange (1092-1)	ASA Flanged (B16.5)
1/2" BSP.....0004	DN 32 - PN 16...1501	DN 25 - PN 16...0502	DN 25 - PN 40...0702	DN 50 - 150lb ... 1005
3/4" BSP 0005	DN 50 - PN 16...1502	DN 32 - PN 16...0503	DN 32 - PN 40...0703	DN 65 - 150lb ... 1006
1" BSP.....0006	DN 65 - PN 16...1503	DN 50 - PN 16...0505	DN 50 - PN 40...0705	DN 80 - 150lb ... 1007
1 1/2" BSP.....0010		DN 80 - PN 16...0507	DN 80 - PN 40...0707	DN 100 - 150lb ... 1008
2" BSP.....0012		DN 100 - PN 16...0508	DN 100 - PN 40...0708	
1/2" NPT.....0203				
3/4" NPT.....0204				

8 OUTPUT

Relay Output NA/NK (5A).....11	Special.....x
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9 HOUSING

Plastic Housing , B10p 050	Aluminium Housing , B20x 603
Plastic Housing , B11p 053	Aluminium Housing , B22x 750
Plastic Housing , B20p 103	Stainless Steel Housing , B101x.....800
Aluminium Housing , B10x 503	Special.....x

10 INSULATION MATERIAL

PBT.....065	Polyamide.....069
PTFE.....066	Seramic.....070
PFA.....067	Rubber.....081
PEEK.....068	FKM.....084
	Steel Shielded Cable (Max. 350 °C).....048
	Special.....x

11 CONNECTION MATERIAL

304 Stainless Steel 001	Delrin.....063
316 Stainless Steel 002	PVDF.....064
Brass.....041	PBT.....065
PVC.....061	PTFE.....066
Polypropylene.....062	Special.....x

12 ELECTRICAL CONNECTION

With Terminal.....00	Special.....x
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13 OPTIONAL

None...../ 0	Seperable Electronic Unit...../ S
With By - Pass Tube...../ T	Wall Apparatus...../ W
Shetter (For the outside of the tank) 304 St. St../ K6	Long Isolation...../ L1
	Special...../ x

SAMPLE

ECAS 101-10-300-0-0006-11-050-066-002-00/0

For conductive liquids , L= 300 mm, 1" BSP , Relay Output, Aluminium Housing , Ø 10 Probe