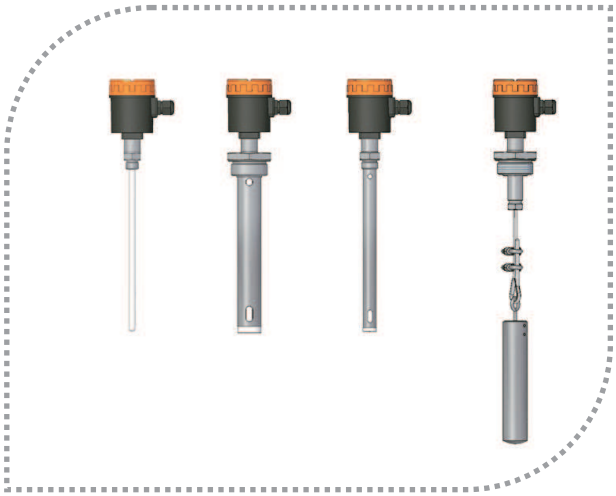
ECAS level switch is a capacitive level sensor for level measurement of conductive liquid, nonconductive liquid, granulated materials with solid particles, adhesive and acid / base liquids.
When a material comes between electrode rod and tank wall, a capacitance change occurs and when this change exceed 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.

ECAS

CAPACITIVE LEVEL SWITCH

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

CE

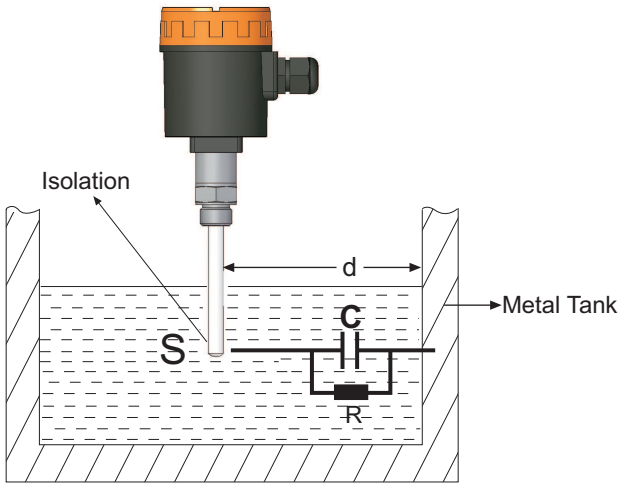
Model : 37-2019-005

Technical Specifications:

Measurable Metarial	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

Working Principle :

Capacitance definition, assuming two parallel conductive plates are used;

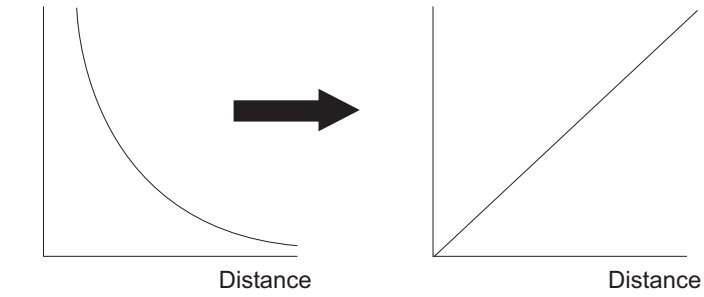


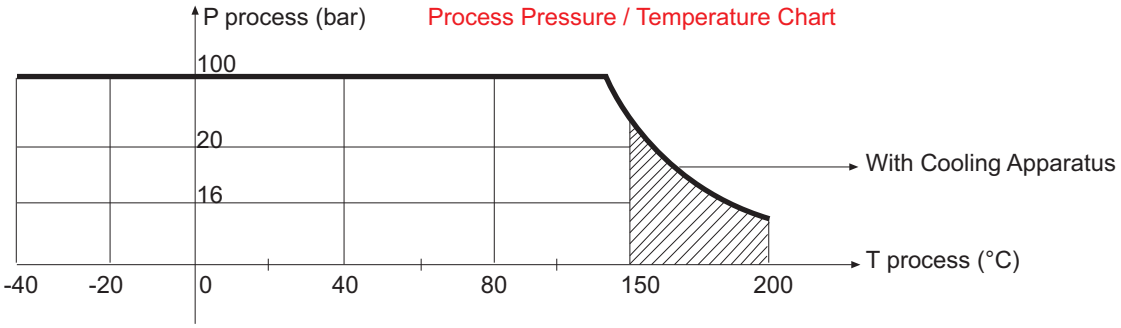
$$C = \frac{\varepsilon_o . \varepsilon_r . S}{d}$$

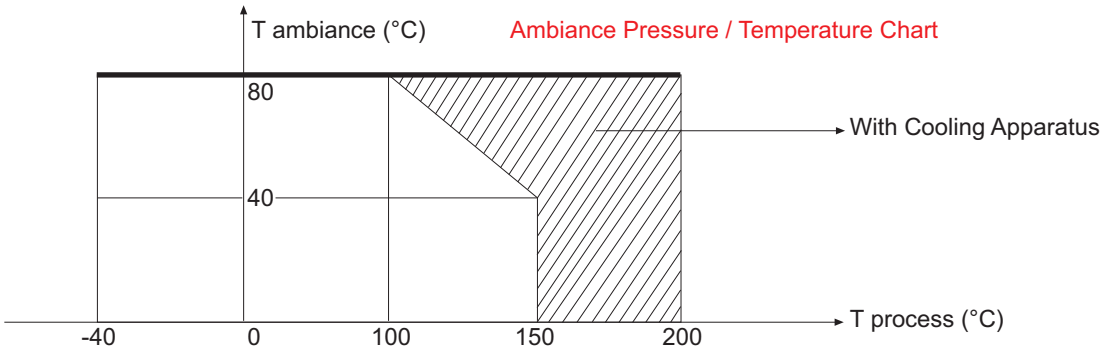
C: capacity , Farad
S: Surface Area , m²
d: Distance , m

However, there are scarcely any sensor type which this definition can be pratically utilized. Above Formula can no longer is 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.

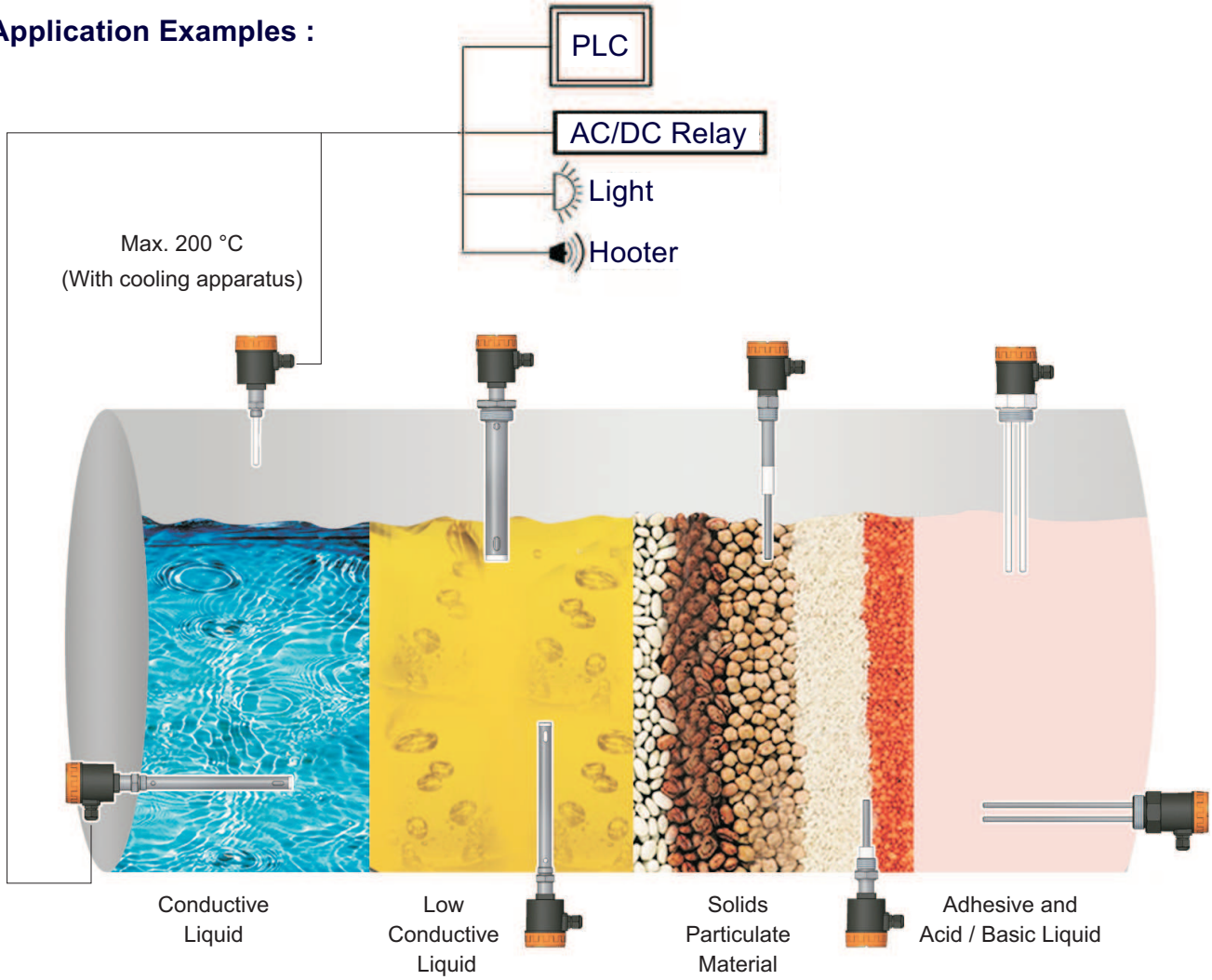
Excitation applied between 10 KHz…250 KHz based on length for all our models. (ω =2 x p x f) Linearity error that may be caused by conductivity component (R) effect is prevented by electronic circuit design and mechanical design. Reduced to a level lower than 1ppm, acceptable as zero.

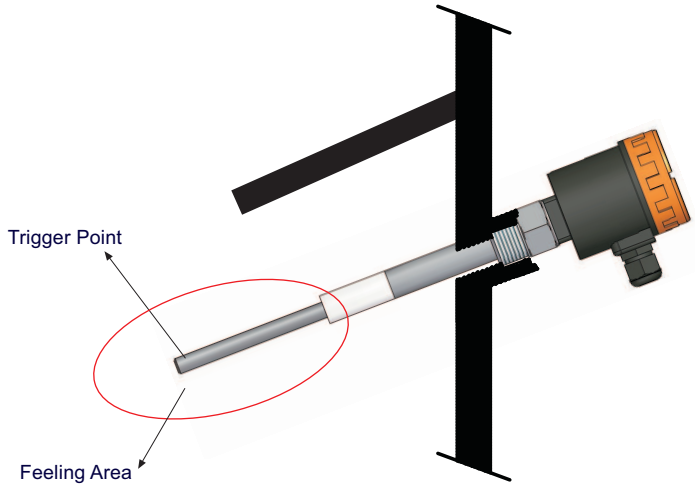


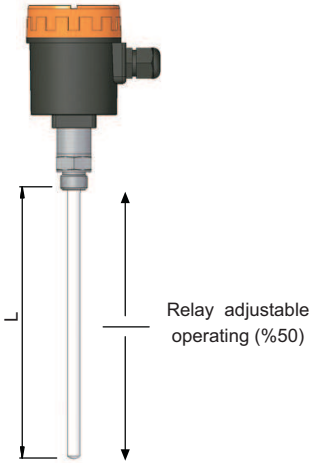




Application Examples :

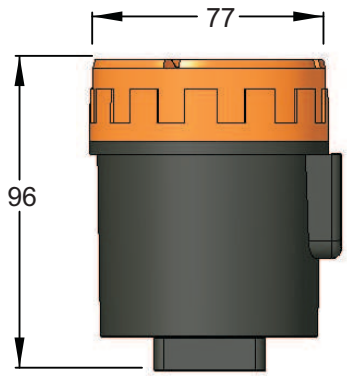






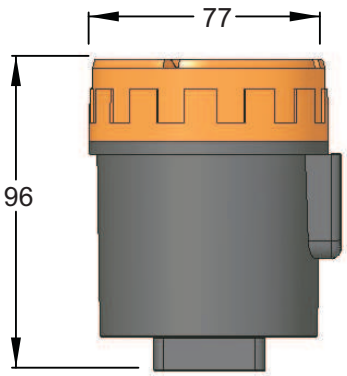
Muhafaza :

Plastic



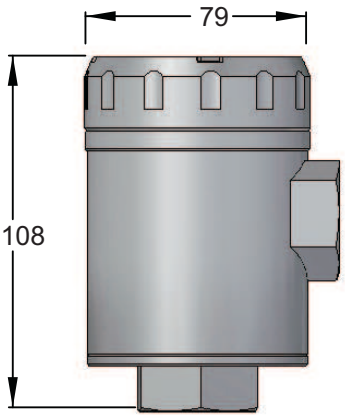
B10p

Aluminium



B10x

Stainless Steel



B101x

Plastic

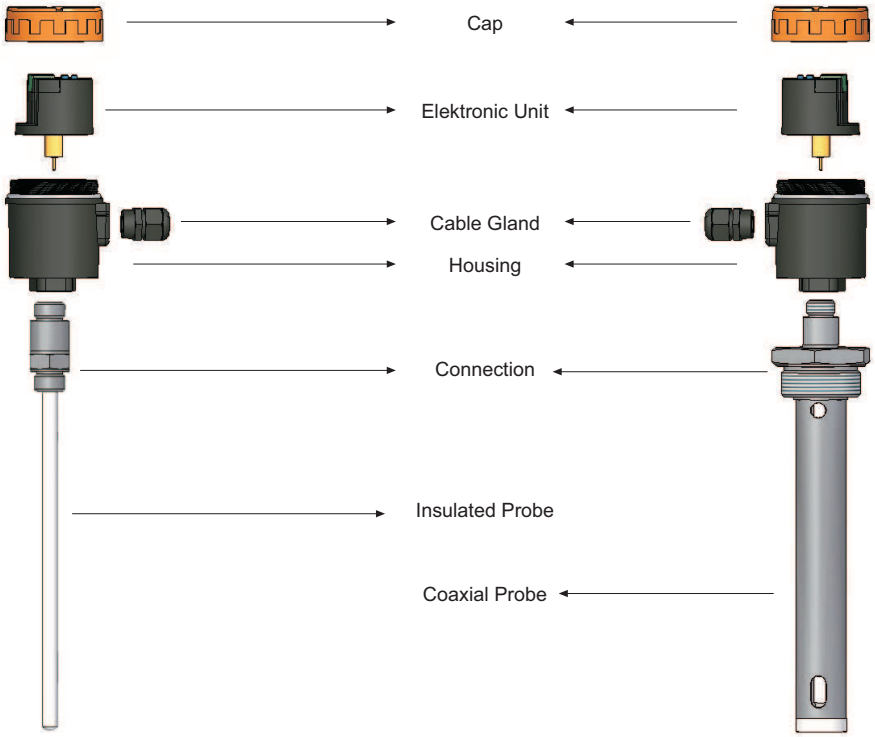
B20p

Aluminium

B20x

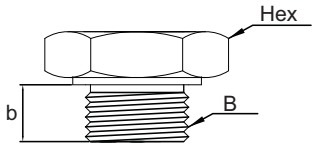
ORDER CODE	TYPE	MATERIALS	PROTECTION CLASS	TEMPERATURE (°C)	BOYUT a x b x c (mm)
050	B10p	Plastic (PBT)	IP 65	(-) 40...(+) 150	96 x 77
016	B20p	Plastic (PBT)	IP 65	(-) 40...(+) 150	132 x 104
333	B10x	Aluminium	IP 65	(-) 40...(+) 150	96 x 77
378	B20x	Aluminium	IP 66	(-) 40...(+) 200	132 x 104
102	B101x	Stainless Steel	IP 65	(-) 40...(+) 150	108 x 79

Parts:



Mechanical Connection :

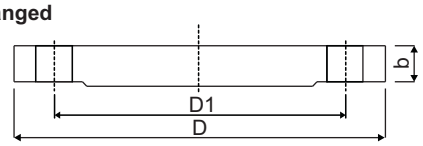
Thread



(ISO228-1)

Order Code	Dimension B	Hex (mm)	Thread Lenght b (mm)
004	1/2" BSP	27	14
005	3/4" BSP	32	14
006	1" BSP	41	23
007	1 1/4" BSP	51	23
008	1 1/2" BSP	60	23
009	2" BSP	70	23

Flanged

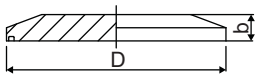


Order Code	(ISO1092-1) PN 16	D (mm)	D1 (mm)	b (mm)
103	DN 25	165	85	16
106	DN 50	165	115	18

Order Code	(ISO1092-1) PN 40	D (mm)	D1 (mm)	b (mm)
303	DN 25	115	85	18
304	DN 32	140	100	20
306	DN 50	165	125	20
308	DN 80	200	160	20
309	DN 100	235	190	24

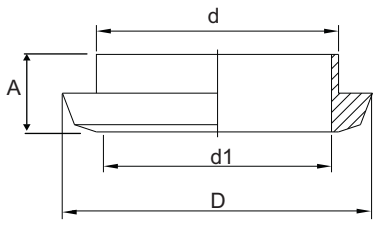
Order Code	(ANSI B16.5) 150 LBS	D (mm)	D1 (mm)	b (mm)
606	DN 50	152,4	121	19
607	DN 65	177,8	139,7	22,2
608	DN 80	190,5	152,4	23,8
609	DN 100	228,6	157,2	23,8

Clamp



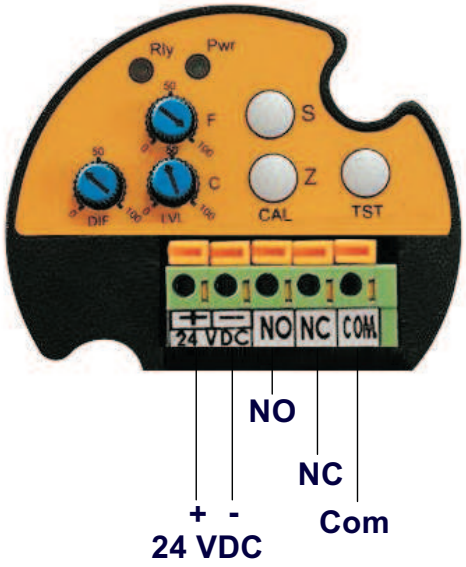
Order Code	(ISO2852) Measurement	D (mm)	b (mm)
851	DN 32	50,5	15
852	DN 50	64	17
853	DN 65	91	17

Dairy



Order Code	Measurement	Measurement	D (mm)	d1 (mm)	A (mm)
870	DN 40	DN 40	56	48	13
871	DN 50	DN 50	68	61	14
872	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 ± 5 % of the point adjusted by "C Pot" (total 10 %).

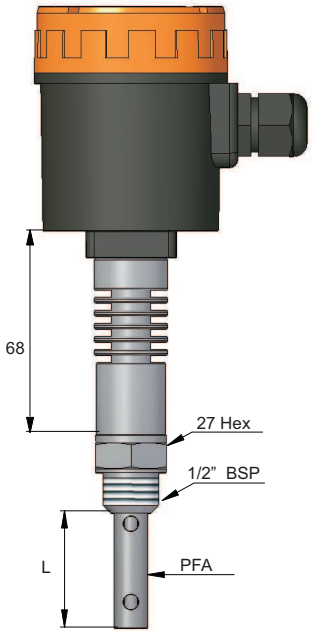
* **DIF Pot:** Adjusts "Release" level of the relay activated by "C/F Pot". Highest adjustable value is equal to half (50 %) of the operation region specified by "Z and S". Meaning that, when DIF Pot is at 100 % and relay is pulled, the level to release it shall be reduced as half of the total scale.

Electronic Unit with Cable:

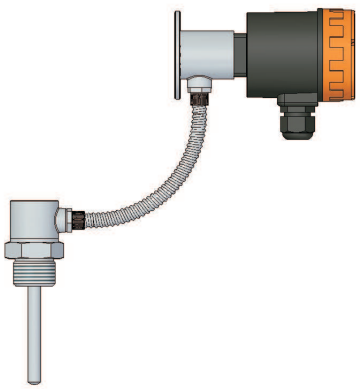
Electronic unit and sensor component can be separated by a cable that protected against exterior conditions for easy calibration on site. Thanks to the properties of cable, easy assemble for user is possible.

Cooling :

For 200 °C Max.



Sample Models :

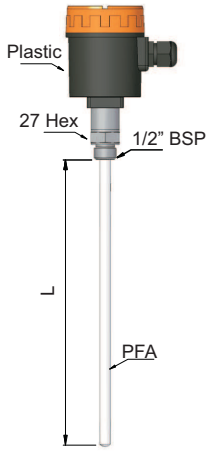


CONDUCTIVE LIQUIDS

Sample Models:

ECAS 101

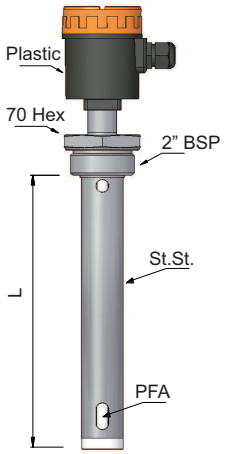
Fully Insulated Probe
Conductive Tank



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

ECAS 102

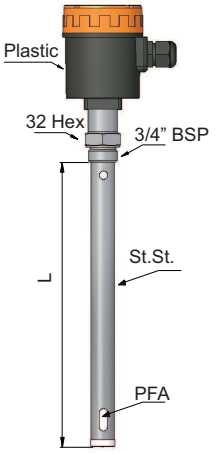
Fully Insulated Coaxial Probe
Insulated Tank



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

ECAS 103

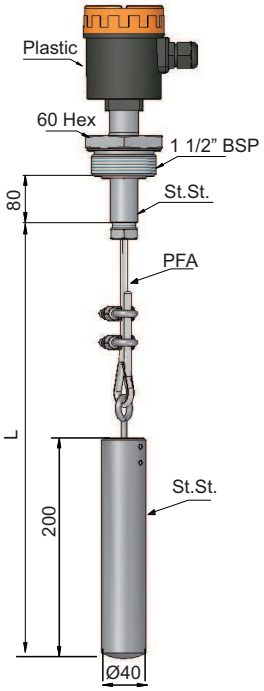
Fully Insulated Coaxial Probe
Insulated Tank



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

ECAS 107

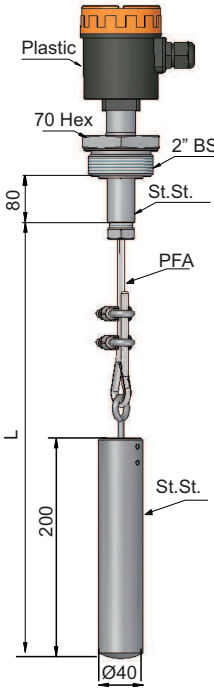
Fully Insulated Rope
Conductive Tank



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

ECAS 107

Fully Insulated Rope
Conductive Tank

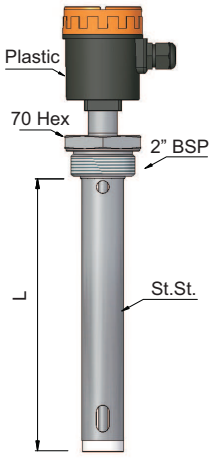


L= 1 m. (Std) Max. 32 m.
(-) 1 bar...(+) 60 bar
(-) 40 °C...(+) 150 °C

LOW CONDUCTIVE LIQUIDS

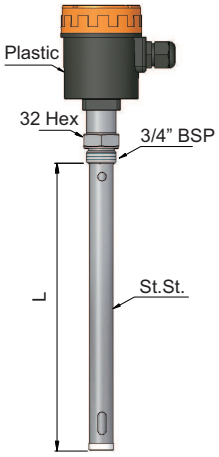
Sample Models:

ECAS 202
Partly Insulated Coaxial Probe
Conductive / Insulating Tank



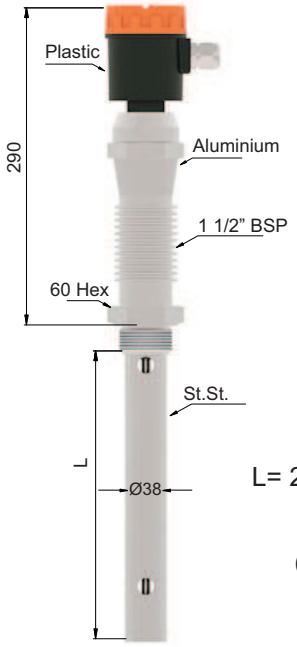
L= 250 mm. (Std) Max. 4 m.
(-) 1 bar...(+) 100 bar
(-) 40 °C...(+) 150 °C

ECAS 203
Partly Insulated Coaxial Probe
Conductive / Insulating Tank



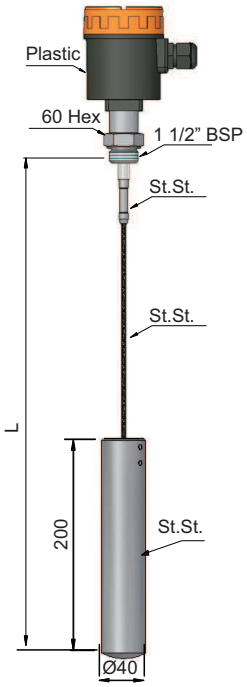
L= 250 mm. (Std) Max. 1 m.
(-) 1 bar...(+) 100 bar
(-) 40 °C...(+) 150 °C

ECAS 20S
Partly Insulated Coaxial Probe
Conductive / Insulating Tank



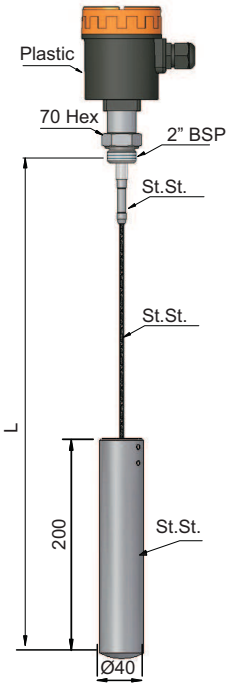
L= 250 mm. (Std) Max. 4 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 400 °C

ECAS 204
Partly Insulated Rope
Conductive Tank



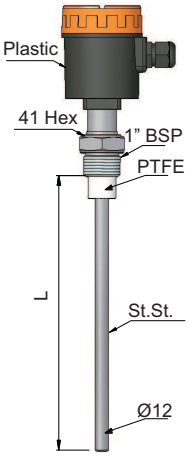
L= 1 m. (Std) Max. 16 m.
(-) 1 bar...(+) 60 bar
(-) 40 °C...(+) 150 °C

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

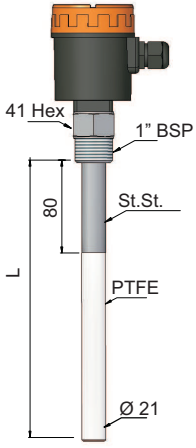
S O L I D P A R T I C L E M A T E R I A L S

Sample Models:

ECAS 301

Compled Insulated Probe
Conductive Tank

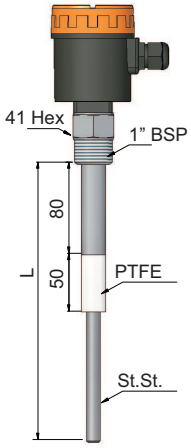
Antistatic
For Materials



L= 250 mm. (Std) Max. 1 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

ECAS 305

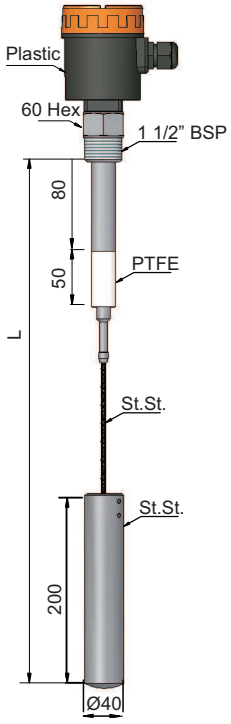
Partly Insulated Probe
Conductive Tank



L= 250 mm. (Std) Max. 6 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

ECAS 304

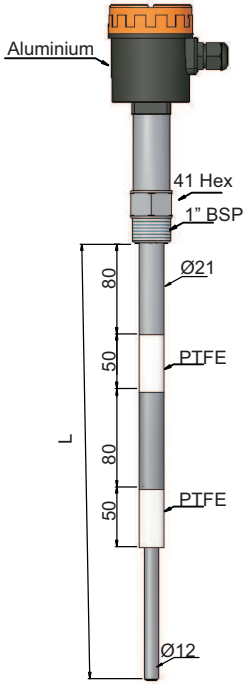
Partly Insulated Rope
Conductive Tank



L= 1000 mm. (Std) Max. 16 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

ECAS 30D

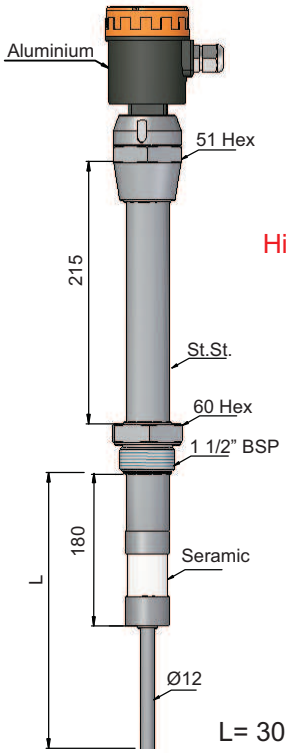
Double Partly Insulated Probe
Insulating Tank



L= 380 mm. (Std) Max. 1 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 200 °C

ECAS 30S

Ceramic Partly Insulated Probe
Conductive Tank



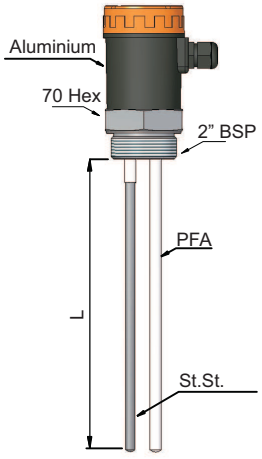
High Temperature
Version

L= 300 mm. (Std) Max. 4 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 400 °C

Sample Models:

ECAS 408A

Double Probe (Single Fully Insulated)
Conductive / Insulating Tank



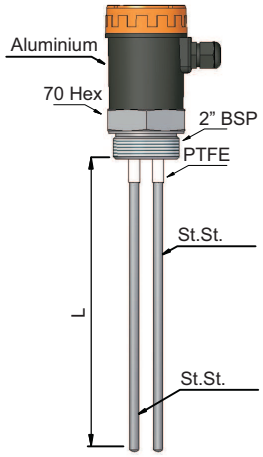
L= 250 mm. (Std) Max. 4 m.

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

(-) 40 °C...(+) 150 °C

ECAS 408B

Double Partly Insulated Probe
Conductive / Insulating Tank



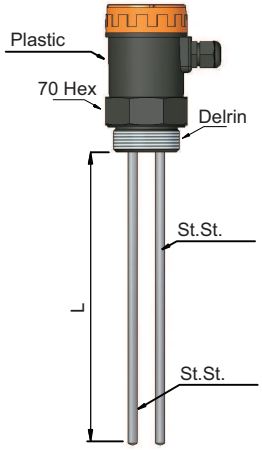
L= 250 mm. (Std) Max. 6 m.

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

(-) 40 °C...(+) 150 °C

ECAS 408B

Double Partly Insulated Probe
Conductive / Insulating Tank



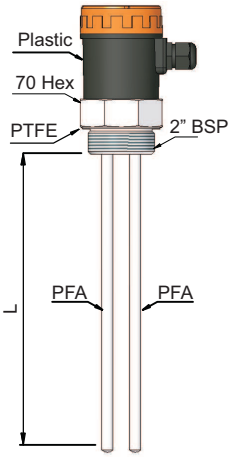
L= 250 mm. (Std) Max. 6 m.

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

(-) 20 °C...(+) 80 °C

ECAS 408T

Double Partly Insulated Probe
Conductive / Insulating Tank



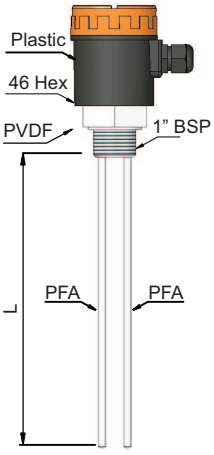
L= 250 mm. (Std) Max. 1 m.

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

(-) 40 °C...(+) 150 °C

ECAS 408Tm

Double Partly Insulated Probe
Conductive / Insulating Tank



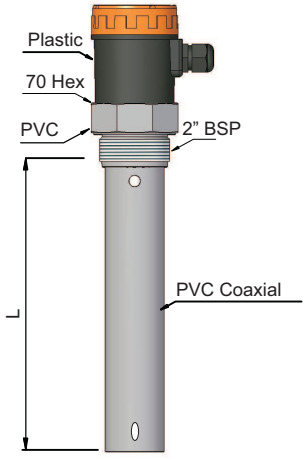
L= 250 mm. (Std) Max. 1 m.

(-) 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

Order Form : Please consider sample models when coding.

1 MODEL ECAS

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

2 CERTIFICATE

None.....0
(EN10204-3-1)Material Certification.....1

3 PROBE TYPE (MAX. LENGHT)

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

4 PROBE DIAMETER (Ø)

.....mm
Special.....x

5 STEM LENGHT

.....mm

6 PROCESS TEMPERATURE

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

7 CONNECTION

Thread (ISO 228-1)	Clamp (ISO 2852)	ISO Flange(1092-1)	ASA Flanged (B16.5)
1/2" BSP 004	DN 25 - PN 16 ... 851	DN 25 - PN 40 ... 103	DN 50 - 150 lb ... 606
3/4" BSP 005	DN 32 - PN 16 ... 852	DN 32 - PN 40 ... 104	DN 65 - 150 lb ... 607
1" BSP.....006	DN 50 - PN 16 ... 853	DN 50 - PN 40 ... 106	DN 80 - 150 lb ... 608
1 1/2" BSP.....008		DN 80 - PN 40 ... 108	DN 100 - 150 lb ... 609
2" BSP.....009		DN 100 - PN 16 ... 109	
1/2" NPT.....54			
3/4" NPT.....55			

8 OUTPUT

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

9 HOUSING

Plastic housign , B10p 050
Plastic housign , B20p 016
Aluminium housign , B10x 333
Aluminium housign , B20x 378
Stainless Steel housign , B101x.....102
Special.....x

10 INSULATION MATERIAL

PBT.....65
PTFE.....66
PFA.....67
PEEK.....68
Polyamide.....69
Seramic.....70
Rubber.....81
FKM.....84
Special.....x

11 CONNECTION MATERIAL

316 Stainless Steel 02
Brass.....41
PVC.....61
Polypropylene.....62
Delrin.....63
PVDF.....64
PBT.....65
PTFE.....66
Special.....x

12 ELECTRICAL CONNECTION

With Terminal.....00
Special.....x

13 OPTIONAL

None...../ 0
With By - Pass Tube..... / T
Seperable Electronic Unit...../ S
Wall Apparatus...../ W
Special.....x

SAMPLE

ECAS 101 - Ø 10 - 300 mm - 0 - 006 - 11 - 050 - 66 - 02 - 00 / 0

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

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