

ECASm level switch is a capacitive level sensor for level measurement of conductive liquid, low conductive liquid, granulated materials with solid particles, adhesive and acidic/basic liquids.

When product comes over the sensor, a capacitance change occurs and when this change exceed adjustment threshold, contact output is delivered.

Designed for difficult process conditions.

Refrigerated models 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, non-conductive liquids.

Grain stores, cement, sand feed, flour, milk powder, organic and plastic granule.

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



# ECASm

## CAPACITIVE LEVEL SWITCH

**ECASm 101**

**ECASm 203**

**ECASm 305**

**ECASm 408B , 408T , 408Tm**

### Avantajları :

- \* Optionally high temperature-resistant design
- \* Easy assembly and sensitivity adjustment.
- \* Not affected by foam, liquid splash and probe coating.



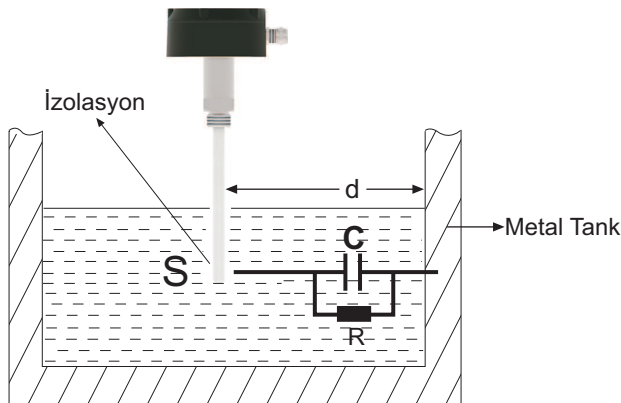
### Technical Specifications:

|                           |   |
|---------------------------|---|
| Measurable Material       | Conductive liquids, refrigerants<br>Low conductive liquids<br>Solids particulate materials<br>Adhesive and acid/basic liquids |
| Supply                    | 24 VDC  |
| Signal Output             | 1 NO / NC x 5 A / 250 VAC Relay   |
| Min.Di-Electric Constant  | 1,6 $\epsilon_r$  |
| Connection Material       | 304 St.St. Opt. 316 St.St.  |
| Isolation Material        | PFA<br>Opt. PTFE, Delrin, Peek, Ceramic   |
| Housing Material          | Aluminium Injection (std.)  |
| Working Pressure          | Max. 150 bar (Depending on the model)   |
| Working Temperature       | Max.150 °C<br>(230 °C with PEEK isolation)<br>(200 °C with cooling apparatus)   |
| Ambient Temperature       | (-) 20 °C...(+) 60 °C   |
| Display                   | With LED-Power and Contact LED  |
| Power Consumption         | Max. 1 W  |
| Electrical Connection     | Terminal  |
| Protection Class(EN60529) | Aluminium   |
| Test                      | EMC, Low Voltage  |
| Weight                    | 190 g. for ECASm 101  |
| Max. Tensile Force        | Max. 40 Nm  |

## Working Principle :

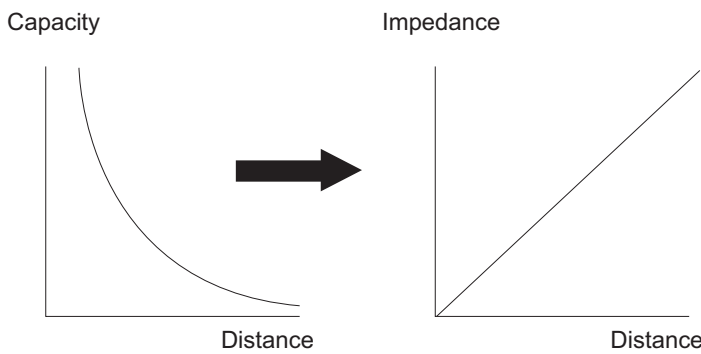
Capacitance definition, assuming two parallel conductive plates are used;

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

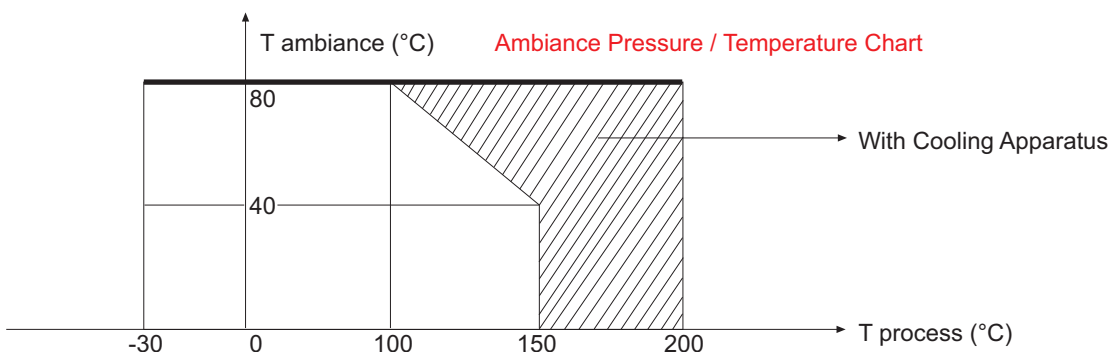
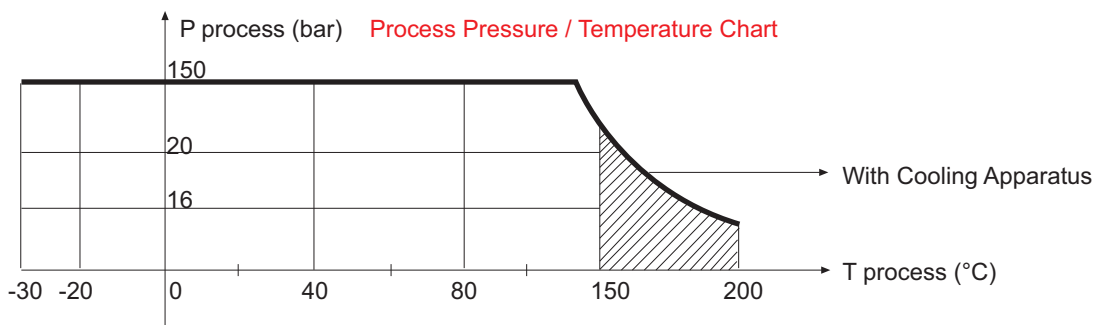


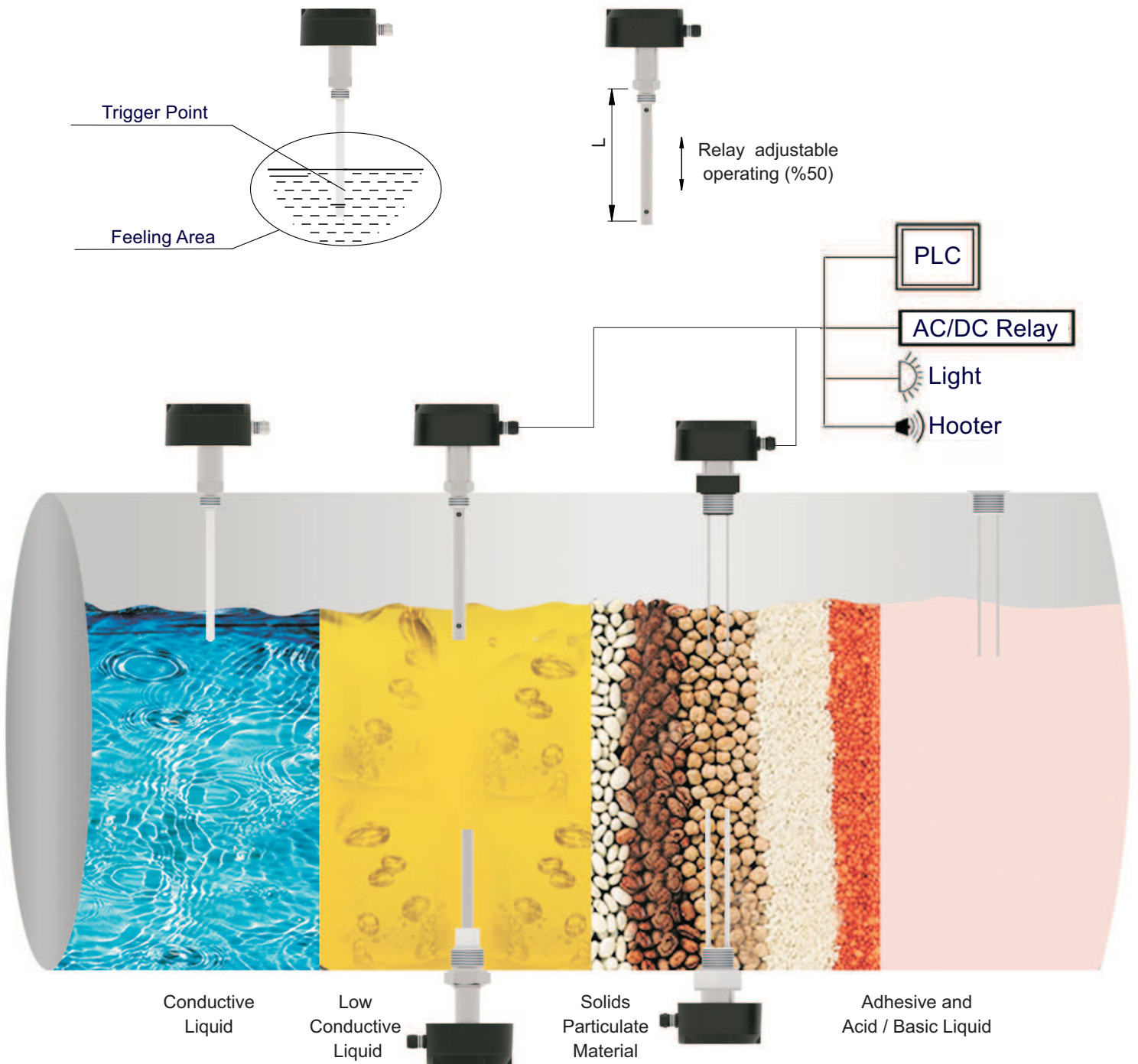
C: Capacity , Farad  
S: Surface Area , m<sup>2</sup>  
d: Distance , m

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 give more accurate results than capacitance measurement.



Excitation applied between 10 KHz...250 KHz based on length for all our models. ( $\omega = 2\pi \times f$ ) 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.





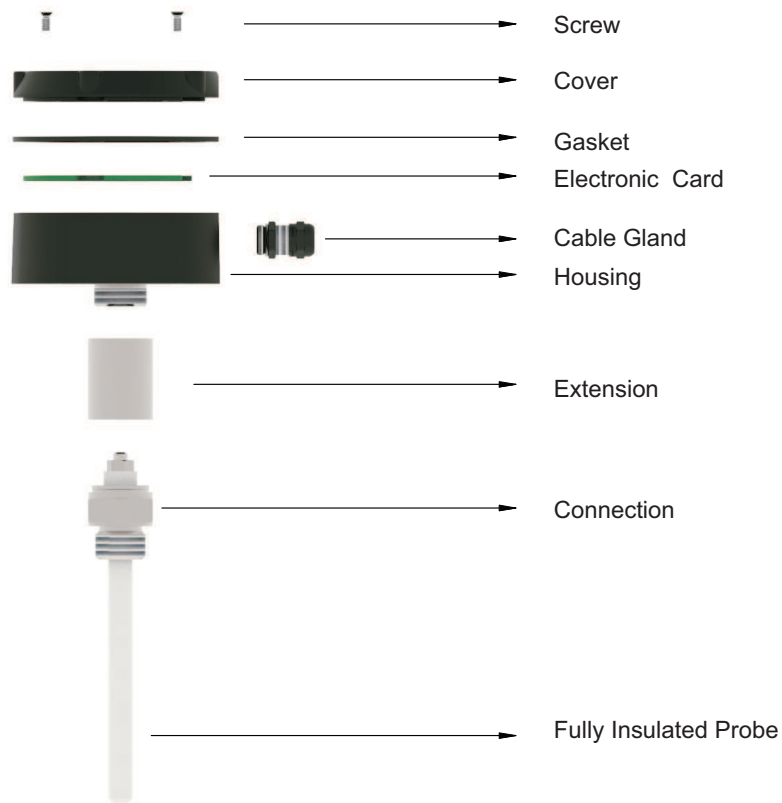
**Electronic Unit with Cable:**

Electronic unit and sensor component can be separated by a cable protected against exterior conditions for easy calibration on site. Cable provides easy assembly for user by its property not affecting capacitive measurement.

**Sample Model:**



**Parts:**



**Housing :**

| ORDER CODE | TYPE  | MATERIAL | PROTECTION CLASS | TEMPERATURE (°C) | SIZE a x b (mm) |
|------------|-------|----------|------------------|------------------|-----------------|
| 192        | B036p | Plastic  | IP 65            | (-) 30...(+) 100 | Ø 93 x 35       |
| 193        | B037p | Plastic  | IP 65            | (-) 30...(+) 100 | Ø 93 x 43       |

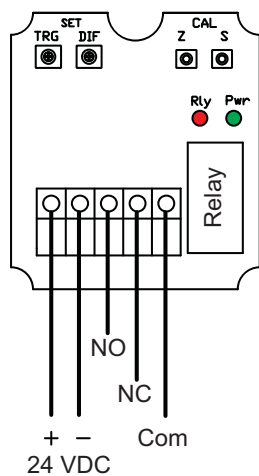
**Cooling :**



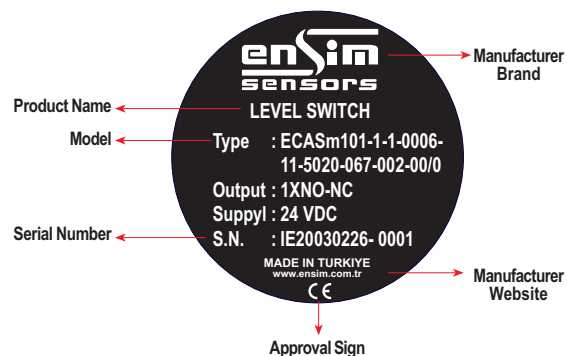
### Infication and Calibration :

- **RlyLED ( Red ) :** Means “Relay Active” during normal operation; means operation continues during calibration. Light is continuous during normal operation mode – if relay is active – and flashes during calibration mode. It is red colored
- **PwrLED ( Green ) :** 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. Green colored.
- **CAL - S Button:** Used to acquire “High Level-span-“value during calibration
- **SET - TRG Pot:** Used to acquire “Low Level-zero-“value during calibration
- **SET - DIF Pot:** Adjusts relay triggering point between Zero-Span values.
- **CAL - Z Button:** Adjusts “Release” level of the relay activated by “TRG 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

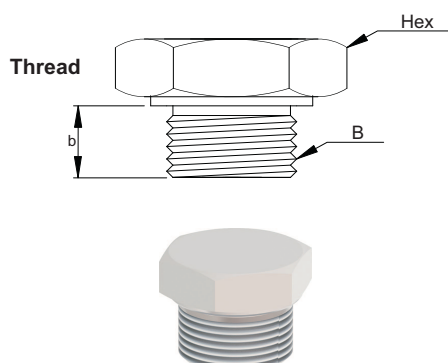
### Electrical Connection :



### Product Label :



### Mechanical Connection :



### (ISO 228-1)

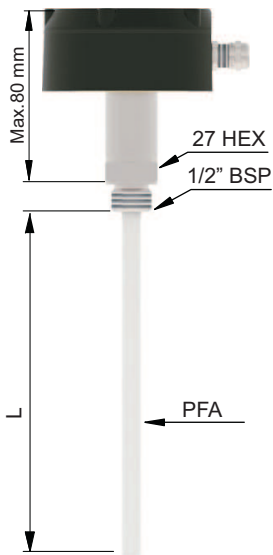
| Order Code | Dimension B               | Hex (mm) | Screw Length b (mm) |
|------------|---------------------------|----------|---------------------|
| 0003       | 3/8" BSP                  | 27       | 14                  |
| 0004       | 1/2" BSP                  | 27       | 14                  |
| 0005       | 3/4" BSP                  | 32       | 14                  |
| 0006       | 1" BSP                    | 36       | 23                  |
| 0008       | 1 1/4" BSP                | 51       | 23                  |
| 0010       | 1 1/2" BSP                | 60       | 23                  |
| 0012       | 2" BSP                    | 70       | 23                  |
| 0305       | M14 x 1,5 mm <sup>2</sup> | 27       | 12                  |
| 0306       | M16 x 1,5 mm <sup>2</sup> | 27       | 14                  |
| 0307       | M18 x 1,5 mm <sup>2</sup> | 27       | 14                  |
| 0203       | 1/2" NPT                  | 27       | 16                  |
| 0204       | 3/4" NPT                  | 27       | 23                  |
| 0205       | 1" NPT                    | 27       | 23                  |

**Sample Models :**

**CONDUCTIVE LIQUIDS**

ECASm 101

Fully Insulated Probe  
Conductive Tank

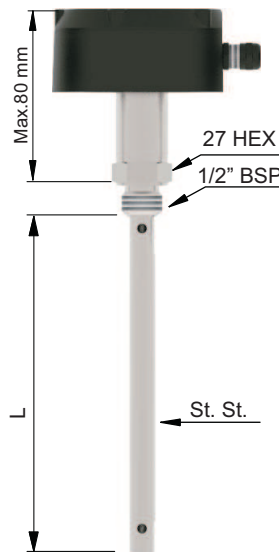


L= 50/100 mm (Std.)  
Max. 500 mm  
(-) 1...(+) 150 bar  
Max.150 °C

**LOW CONDUCTIVE LIQUIDS**

ECASm 203

Coaxial Probe  
Conductive / Insulating Tank

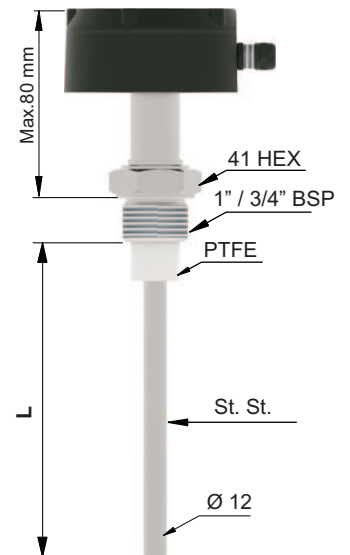


L= 50/100 mm (Std.)  
Max.500 mm  
(-) 1...(+) 150 bar  
Max.150 °C

**SOLID PARTICLE LIQUIDS**

ECASm 305

Partly Insulated Probe  
Conductive Tank

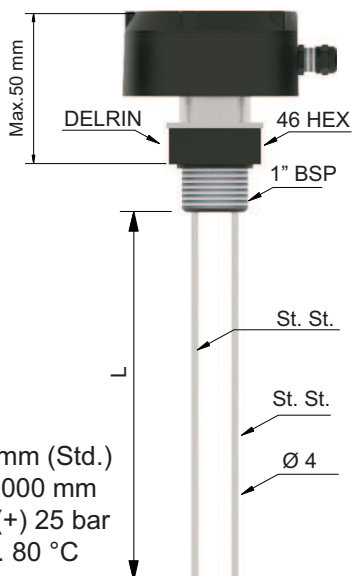


L= 50/100 mm (Std.)  
Max.1000 mm  
(-) 1...(+) 60 bar  
Max.150 °C

**SOLID PARTICLE LIQUIDS**

ECASm 408P

Double Probe  
Conductive / Insulating Tank

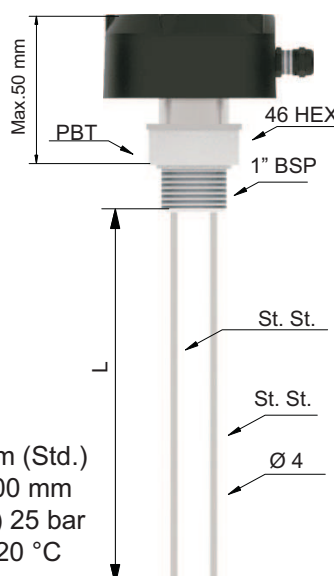


L=100 mm (Std.)  
Max.1000 mm  
(-) 1...(+) 25 bar  
Max. 80 °C

**SOLID PARTICLE LIQUIDS**

ECASm 408B

Double Probe  
Conductive / Insulating Tank

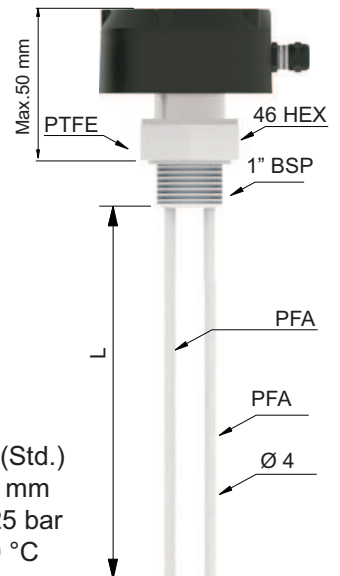


L=100 mm (Std.)  
Max.1000 mm  
(-) 1...(+) 25 bar  
Max. 120 °C

**YADHESIVE AND ACID / BASIC LIQUIDS**

ECASm 408Tm , 408T

Double Probe  
Conductive / Insulating Tank



L=100 mm (Std.)  
Max.1000 mm  
(-) 1...(+) 25 bar  
Max. 150 °C

**Order Form : Please consider sample models when coding.**

**1 MODEL ECASm**

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

**2 CERTIFICATE**

|          |   |   |   |
|----------|---|---|---|
| No ..... | 0 | (EN10204-3-1) Material Certification..... | 1 |
|----------|---|---|---|

**3 PROBE TYPE**

|   |   |  |     |
|---|---|--|-----|
| Single Probe - Insulated (Max 500 mm) .....         | 1 | Double Probe - Non-Insulated (Max.1000 mm).....          | 8B  |
| Coaxial Probe (Max 500 mm) ..... Ø 10.....          | 3 | Double Probe - Double Insulated (Max.1000 mm).....       | 8T  |
| Single Probe - Partly Insulated (Max.1000 mm) ..... | 5 | Double Probe - Double Fully Insulated (Max.1000 mm)..... | 8Tm |
|   |   | Special.....   | x   |

**4 STEM LENGHT**

|                        |   |              |   |
|------------------------|---|--------------|---|
| 50 mm .....            | 0 | Special..... | x |
| 100 mm (Standard)..... | 1 |              |   |

**5 PROCESS TEMPERATURE**

|                                     |   |                                       |   |
|-------------------------------------|---|---------------------------------------|---|
| 150 °C Standard .....               | 0 | 80 °C For Plastic (Delrin) Model..... | 2 |
| 200 °C with Cooling Apparatus ..... | 1 | 120 °C For Plastic (PVDF) Model ..... | 3 |
|                                     |   | 150 °C For Plastic (PBT) Model.....   | 4 |

**6 CONNECTION**

Theread (ISO 228-1)

|                 |      |                 |      |
|-----------------|------|-----------------|------|
| 3/8" BSP.....   | 0003 | 1/2" NPT.....   | 0203 |
| 1/2" BSP.....   | 0004 | 3/4" NPT.....   | 0204 |
| 3/4" BSP.....   | 0005 | 1" NPT.....     | 0205 |
| 1" BSP.....     | 0006 | M 14 x 1,5..... | 0305 |
| 1 1/4" BSP..... | 0008 | M 16 x 1,5..... | 0306 |
| 1 1/2" BSP..... | 0011 | M 18 x 1,5..... | 0308 |
| 2" BSP.....     | 0012 | Special.....    | x    |

**7 OUTPUT**

|                                 |    |  |    |
|---------------------------------|----|--|----|
| Relay Output NO / NC (5 A)..... | 11 | Double Relay Output (Independent)..... | 27 |
|                                 |    | Special.....                           | x  |

**8 HOUSING**

|                                  |     |              |   |
|----------------------------------|-----|--------------|---|
| Plastic , B036p For Flanged..... | 192 | Special..... | x |
| Plastic , B037p For OEM .....    | 193 |              |   |

**9 INSULATION MATERIAL**

|           |     |                |     |
|-----------|-----|----------------|-----|
| PBT.....  | 065 | Polyamide..... | 069 |
| PTFE..... | 066 | Ceramic.....   | 070 |
| PFA.....  | 067 | Rubber.....    | 081 |
| PEEK..... | 068 | FKM.....       | 084 |
|           |     | Special.....   | x   |

**10 CONNECTION MATERIAL**

|                          |     |              |     |
|--------------------------|-----|--------------|-----|
| 316 Stainless Steel..... | 002 | Delrin.....  | 063 |
| Brass.....               | 041 | PVDF.....    | 064 |
| Polypropylene.....       | 062 | PBT.....     | 065 |
|                          |     | PTFE.....    | 066 |
|                          |     | Special..... | x   |

**11 ELECTRICAL CONNECTION**

|                             |    |                                   |    |
|-----------------------------|----|-----------------------------------|----|
| With Terminal.....          | 00 | Silicone Cable (Max. 200 °C)..... | 82 |
| PVC Cable (Max.105 °C)..... | 81 | Special.....                      | x  |

**12 OPTIONAL**

|         |     |                                 |     |
|---------|-----|---------------------------------|-----|
| No..... | / 0 | Electronic Unit with Cable..... | / S |
|         |     | Special.....                    | x   |

**SAMPLE**

ECASm 101 -1 - 1 - 0006 - 11 - 192 - 067 - 002 - 00 / 0 For Cond. Liquid, L=100 mm,1/2" BSP, With Cooling Apparatus