

ECAPr level transmitter is a capacitive level sensor for level measurement of conductive liquid, nonconductive liquid and acidic/basic liquids.

Full-empty calibration can be performed easily and safely.

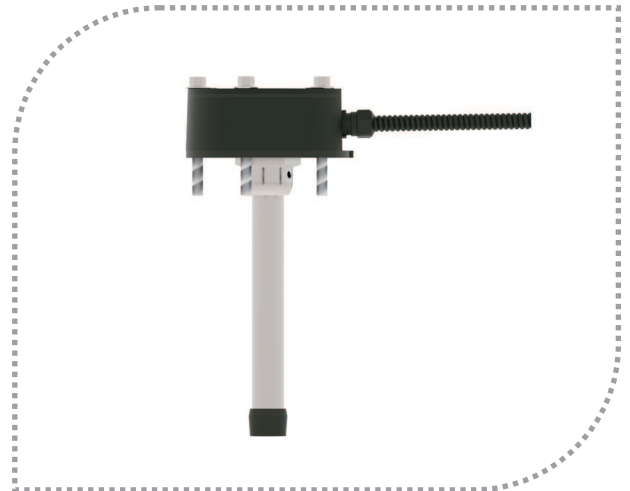
Different designs and different solutions related to industrial level measurement are offered especially for machinery manufacturers.

### Application Areas

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

Non-conductive liquid tanks like oil, liquidized CO2 etc.

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



# ECAPr

## CAPACITIVE LEVEL TRANSMITTER

**ECAPr 203**

**ECAPr 408B , 408T , 408Tm**

- \* It can be able to calibrated by customer
- \* There are no moving parts.
- \* Modular structure with easy assembly.
- \* Not affected by foam, liquid splashes.
- \* Not affected by vibration, has robust mechanical structure.
- \* Measurement along whole sensor.
- \* Operable upside down.



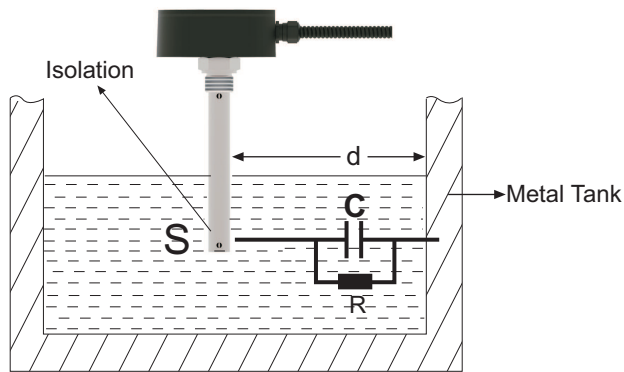
### Technical Specifications:

Measurable Material	Conductive liquids Low conductive liquids Adhesive and acid/basic liquids
Supply	9-36 VDC
Signal Output	3-330 Ohm, 3-180 Ohm, 13-1300 Ohm...
Accuracy	+/- % 2 , +/- %5
Probe Length	Min 150mm, Maks. 2000mm
Linearity	%0,5
Min. Di-Electric Constant	1,6 $\epsilon_r$
Connection Material	Aluminum, 304 St.St. , 316 St.St. PVDF, PTFE
Isolation Material	PFA Std.Opt. PTFE
Housing Material	Polyamide (Fiber reinforced)
Working Temperature	Max. 80°C 200°C with cooling apparatus
Ambient Temperature	(-)20 / (+) 60°C
Power Consumption	Max.250mW
Electrical Connection	Cable
Protection Class(EN60529)	IP 67
Test	EMC, Low voltage
Max.Tensile Force	Max. 10 Nm
Weight	358 gr. for ECAPr 203 1000mm 358 gr.

## Working Principle :

Capacitance definition, assuming two parallel conductive plates are used;

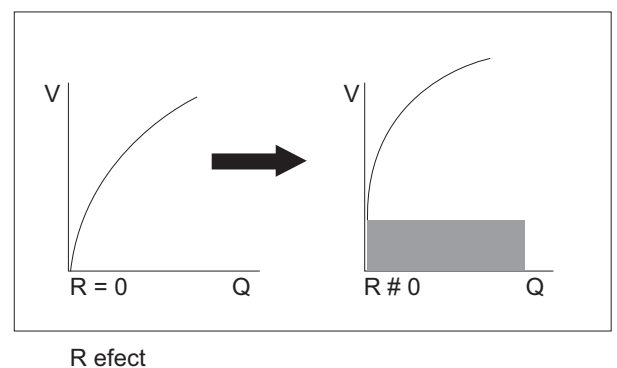
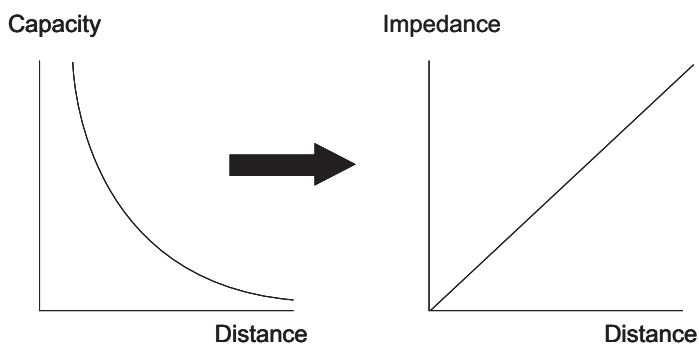
$$C = \frac{\epsilon_0 \cdot \epsilon_r \cdot S}{d}$$



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

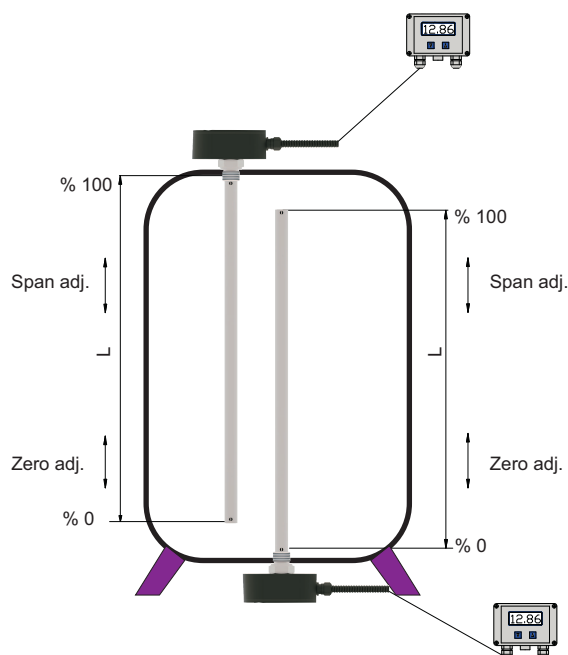
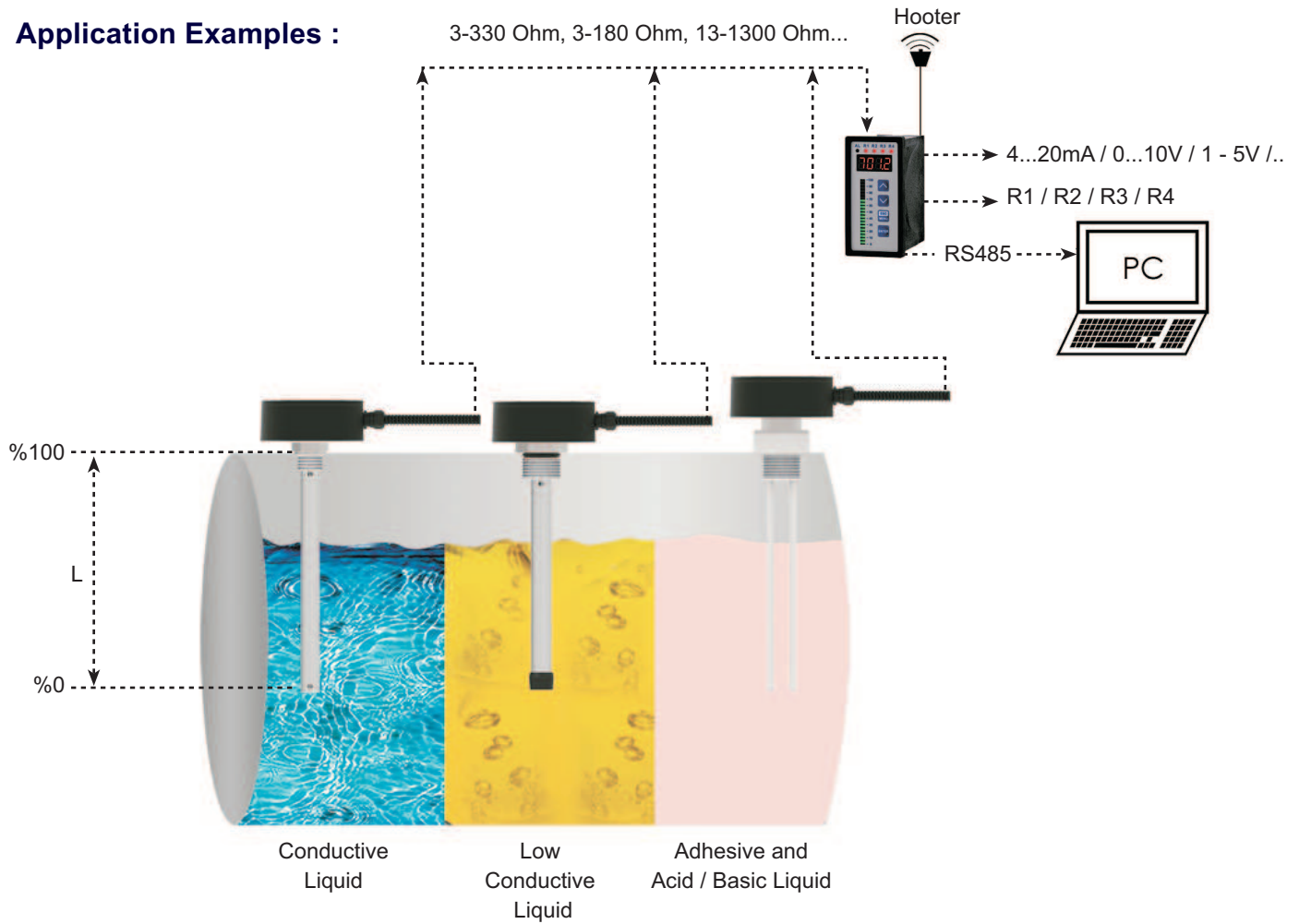
However, there are scarcely any sensor type which this definition can be practically utilized. Above Formula can no longer be reliable especially when residual areas increase due to large distance (d) (which is usually the case). Thus, measuring impedance for distance measurements give more accurate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

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



### Application Examples :

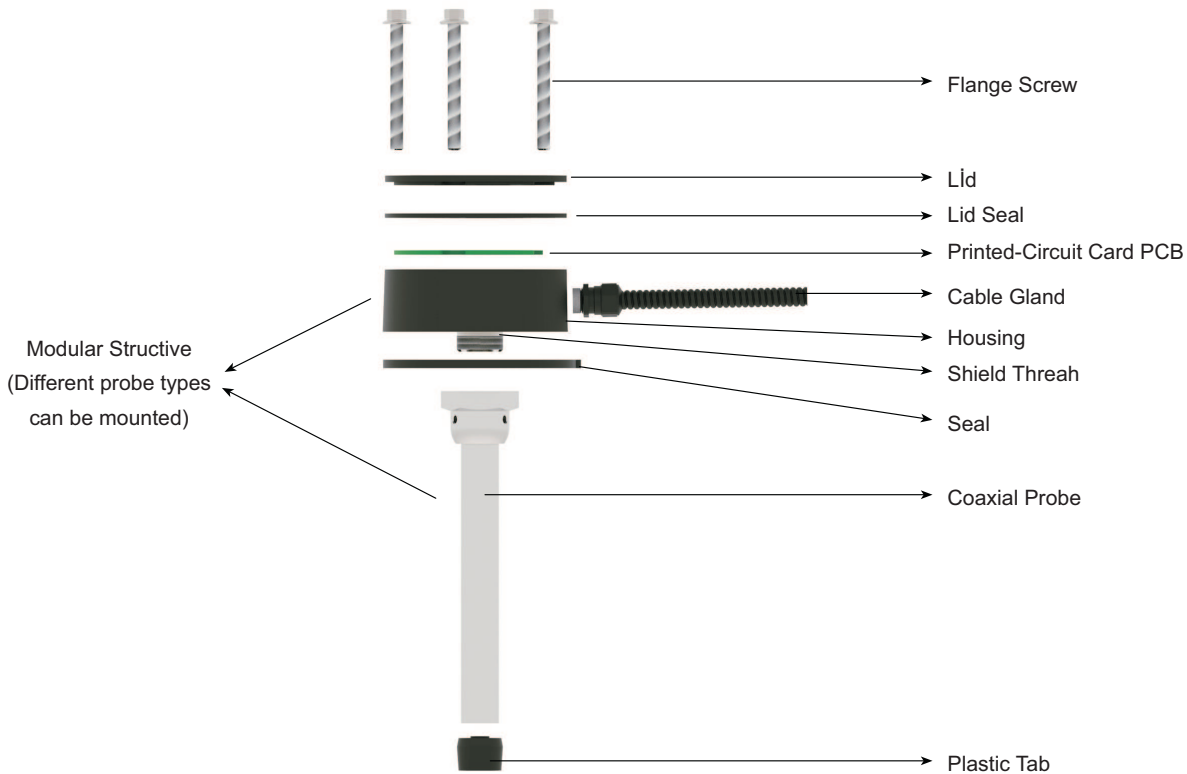
3-330 Ohm, 3-180 Ohm, 13-1300 Ohm...



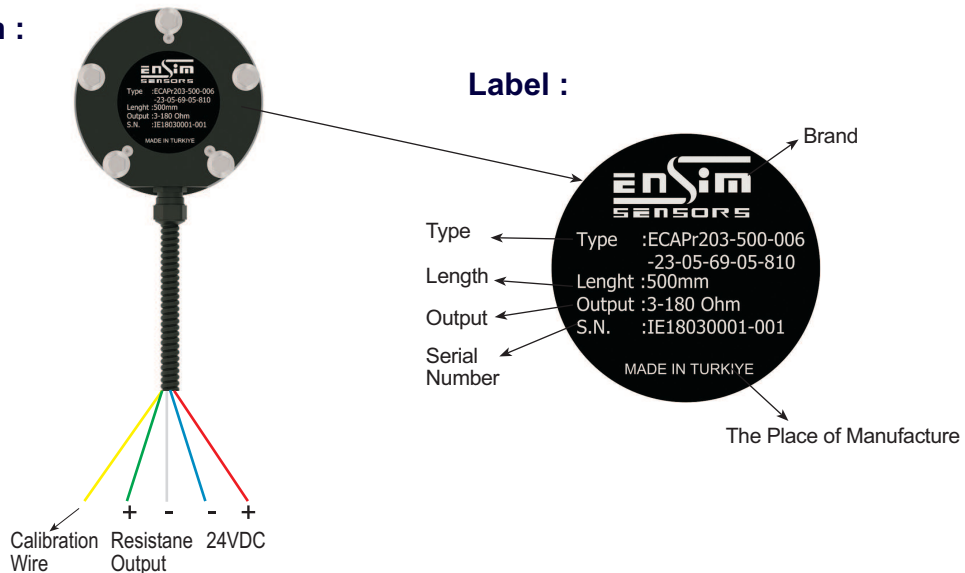
\* Measuring range can be set 1/10 during probe.

\*Can be mounted upside down

**Parts :**



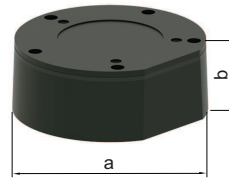
**Electrical Connection :**



**Calibration :**

Energize the probe. Emerge the probe into liquid about 0,5-1 cm from bottom. Wait 10 seconds and connect - touch- the calibration wire with (-) supply (chassis). Zero point calibration done. Now Emerge the probe up to max. level and do the same procedure with zero cal. Calibration is ended and cal. data saved.

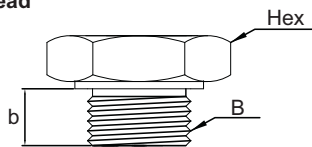
**Housing :**



ORDER CODE	TYPE	MATERIAL	PROTECTION CLASS	TEMPERATURE (°C)	SIZE a x b (mm)
05	B036	Plastic	IP 65	-30...+100	Ø 93 x 43
06	B037	Plastic	IP 65	-30...+100	Ø 93 x 43

**Mechanical Connection :**

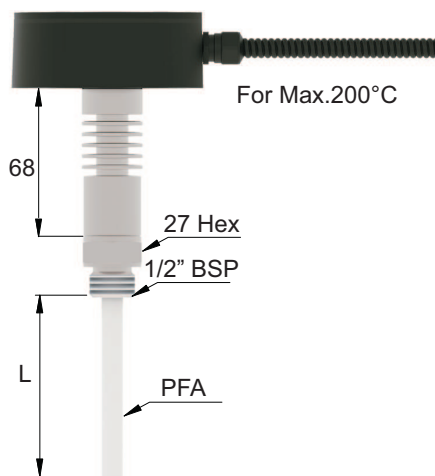
Thread



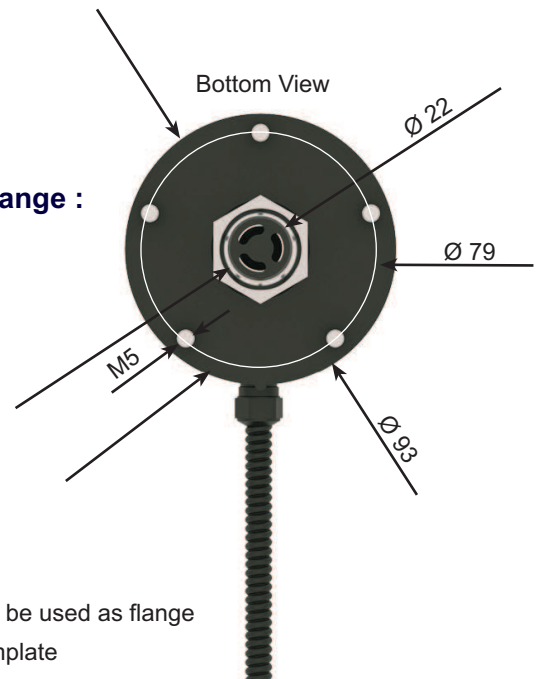
(ISO228-1)

Order Code	Dimension B	Hex [mm]	Screw Length b [mm]
003	1/2" BSP	27	14
004	3/4" BSP	27	14
005	1" BSP	32	14
006	1 1/4" BSP	36	23
007	1 1/2" BSP	51	23
008	2" BSP	60	23

**Cooling :**



**Flange :**

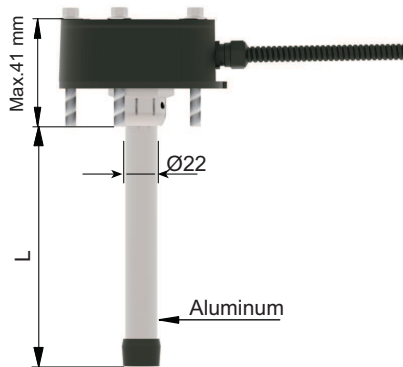


Note : Seal can be used as flange hole Template

**Sample Models:**

**LOW CONDUCTIVE LIQUIDS**

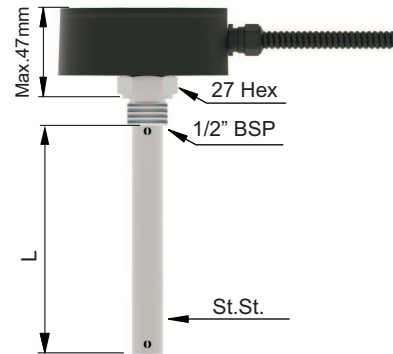
**ECAPr 203**  
Coaxial Probe  
Conductive / Insulated Tank



L=Max. 2 m. Min. 150mm  
Max.+80°C

**CONDUCTIVE LIQUIDS**

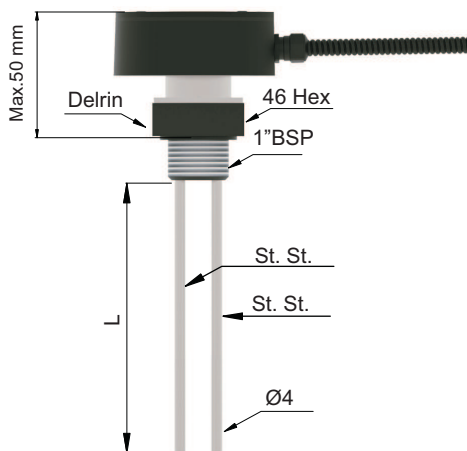
**ECAPr 203**  
Coaxial Probe  
Conductive / Insulated Tank



L=Max. 2 m. Min. 150mm  
Max.+80°C

**ADHESIVE AND  
ACID / BASIC LIQUIDS**

**ECAPr 408B**  
Double Probe - Non Insulated  
Conductive / Insulated Tank

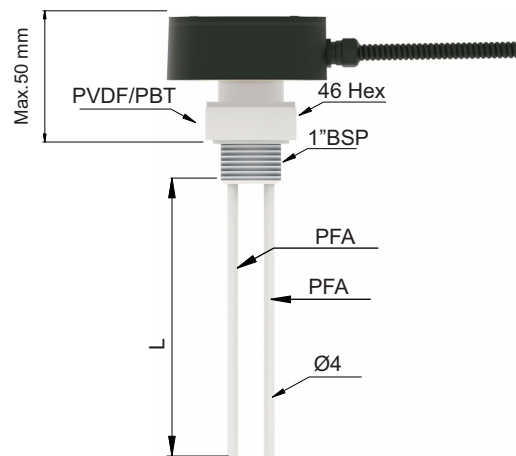


-1...+25 bar  
Max.80°C

L=Max. 2 m. Min. 150mm

**ADHESIVE AND  
ACID / BASIC LIQUIDS**

**ECAPr 408Tm / 408T**  
Double Probe - Non Insulated  
Conductive / Insulated Tank



-1...+25 bar  
Max.120°C / 150°C

L=Max. 2 m. Min. 150mm

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

**1 MODEL ECAPr**

Conductive Liquids.....1 Adhesive and Acid/Basic Liquids.....4  
Low Conductive Liquids .....2

**2 CERTIFICATE**

No .....0 (EN10204-3-1) Malzeme Sertifikasyonu.....1

**3 PROBE TYPE**

Single Probe - Insulated (Max.1000mm) .....1 Double Probe - Non Insulated (Max.1000mm).....8B  
Coaxial Probe (Max 1000mm) ...Ø13 or 21mm.....3 Double Probe - Double Insulated (Max.1000mm).....8T  
Single Probe - Non Insulated (Max.1000mm) .... 5 Thin Double Probe - Double Fully Insulated (Max.1000mm).....8Tm  
Special.....x

**4 STEM LENGHT (Min. 150mm)**

...mm.....0

**5 PROCESS TEMPERATURE**

Max.85°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**

Flanged with 5 poles (on body).....999 1 1/4"BSP.....007  
1/2"BSP .....004 1 1/2"BSP .....008  
3/4" BSP .....005 2" BSP.....009  
1" BSP.....006 Special.....x

**7 OUTPUT**

3-180 Ohm.....23 Special.....x  
10-180 Ohm.....24  
240-33 Ohm.....25

**8 HOUSING**

Plastic , B036 Flanged .....05 Special.....x  
Plastic , B037 for OEM .....06

**9 INSULATION MATERIAL**

PBT.....65 Polyamid.e.....69  
PTFE.....66 Ceramic.....70  
PFA.....67 Rubber.....81  
PEEK.....68 FKM.....84  
Special.....x

**10 CONNECTION MATERIAL**

304 Stainless Steel .....01 PVDF.....64  
316 Stainless Steel .....02 PBT.....65  
Aluminum (Std.).....07 PTFE.....66  
Polypropylene.....62 Special.....x  
Delrin.....63

**11 ELECTRICAL CONNECTION / CABLE DIMENSION (m.)**

PVC Cable (Max.105°C).....81 Silicon Cable (Max.200°C).....82  
Special.....x

**12 OPTIONAL**

No...../ 0 Special.....x

**SAMPLE**

ECAPr 203 - 300mm - 999 - 23 - 05 - 69 - 07 - 81 / 2 / 0

ECAPr for Low Conductivity Liquid, L=300mm, Flaşlı (5 poles), 3-180 Ohm, PVC Cable, 2m.