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

Certification

II 1/2G Ex db ia IIC T6...T2 Ga/Gb For Gas
II 1/2D Ex tb ia IIIC T85°C...T300°C Da/Db For Dust
*Have a look at the temperature class chart.

DX-ECAS

CAPACITIVE LEVEL SWITCH

DX-ECAS 101 / 102 / 103 / 107
DX-ECAS 202 / 203 / 204 / 205 / 20S
DX-ECAS 301 / 304 / 305 / 30D
DX-ECAS 408A

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.

CE 2284

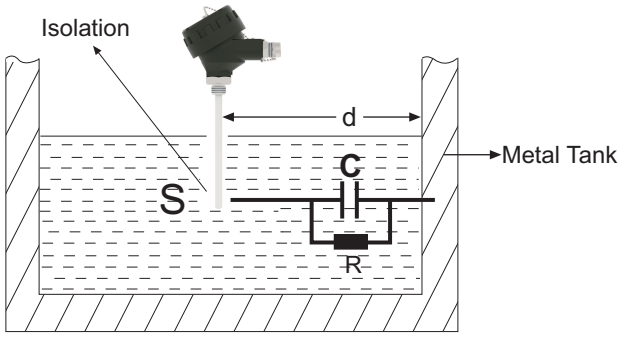
Model : 07-2023-010

Technical Specifications :

Measurable Metarial	Non-conductive liquids Conductive liquids, refrigerants Solids particulate materials Adhesive and acid/basic liquids
Supply	9-36 VDC
Signal Output	1 NONC x5 A / 250 VAC Relay
Min.Di-Electric Constant	1,6 ε_r
Connection Material	304 St.St. Opt. 316 St.St.
Isolation Material	PTFE, PFA Opt. Peek, Ceramic
Housing Material	Aluminum Injection - AlSi12Fe (Std) Black (RAL.9005)
Working Pressure	-1...25 bar (Depending on the model)
Working Temperature	(-) 40 / (+) 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	Terminal
Protection Class(EN60529)	IP 66 / 68
Test	EMC, Low Voltage
Max. Tensile Force	Max. 40 NM
Weight	285 g. for DX-ECAS 101

Working Principle :

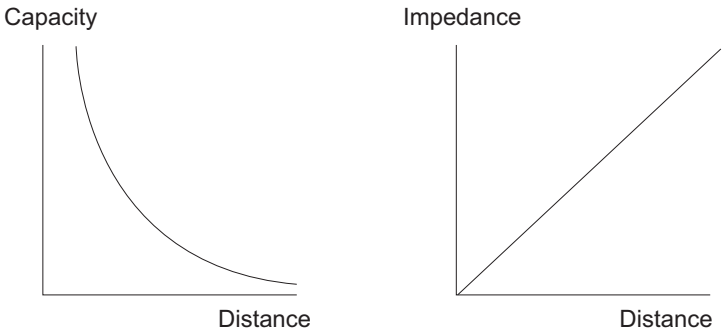
Capacitance definition, assuming two parallel conductive plates are used;



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

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 bi 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.



Impedance definition $Z = R + jL\omega + (jC\omega)^{-1}$ R is defined as real component and represent ambient conductivity.

jLw second component is defined as inductive reactance. This component is present even if we perform capacitive measurement. However we neglect this. Since we evaluate results based on electrostatic properties of the environment, no error will occur. Resulting impedance definition is $Z= R + (jC\omega)^{-1.}$

Measurement is made by charge transfer in our capacitive sensors. Total impedance is defined as Z = V / I.
I (current) I = Q/t
Q (Coulomb)
T (sec)

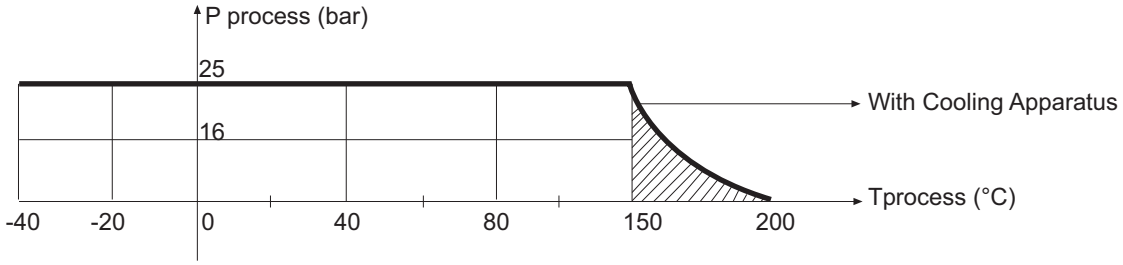
Capacitive reactance we desire to measure is $(jC\omega)^{-1.}$ Meaning that charge and impedance have the same phase.
To summarize, charge transferred to medium is directly proportional with capacitive reactance.
For sensors manufactured as coaxial;

a: Central electrode radius
b: Outer screen radius
L: length

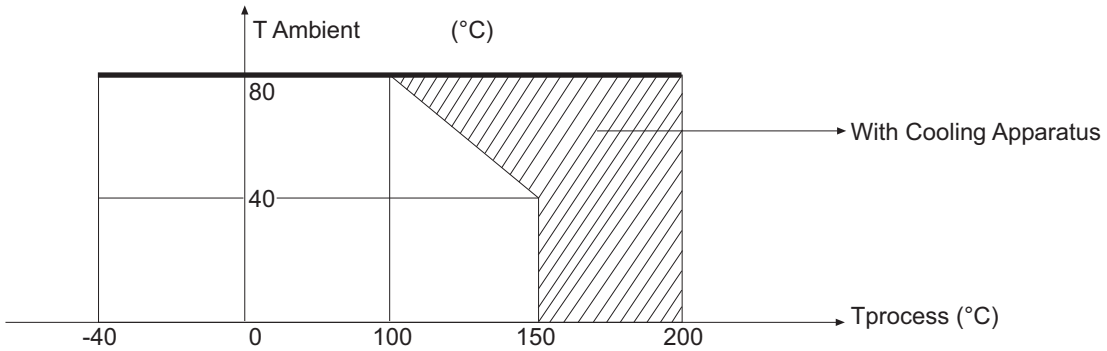
$C= \frac{2.\pi.\varepsilon_0.\varepsilon_r}{\ln (b/a)} .L$ Impedance is calculated by this definition

Excitation applied between 10 KHz…250 KHz based on length for all our models. (ω =2xpxf)
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.

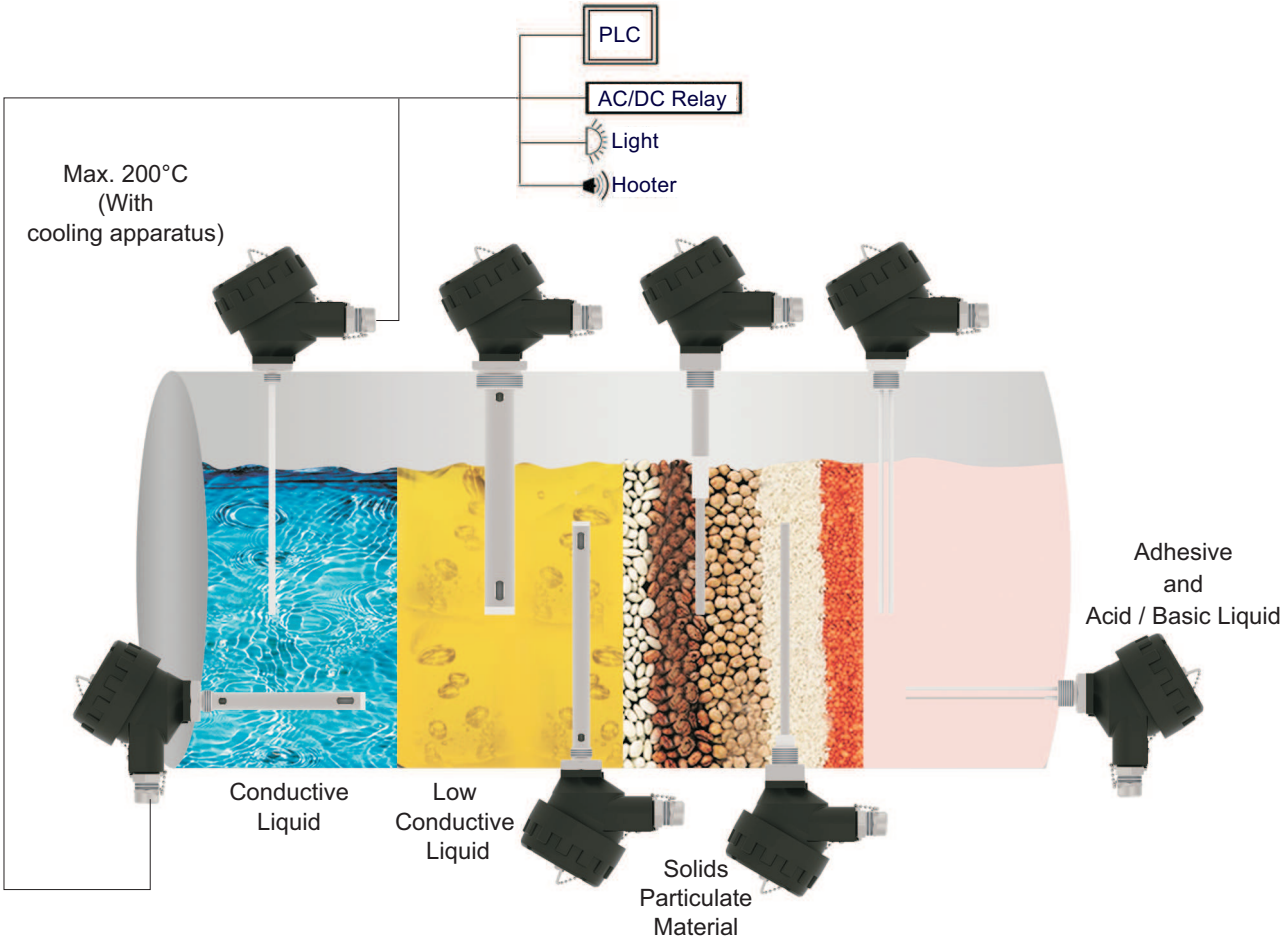
Process Pressure / Temperature Chart

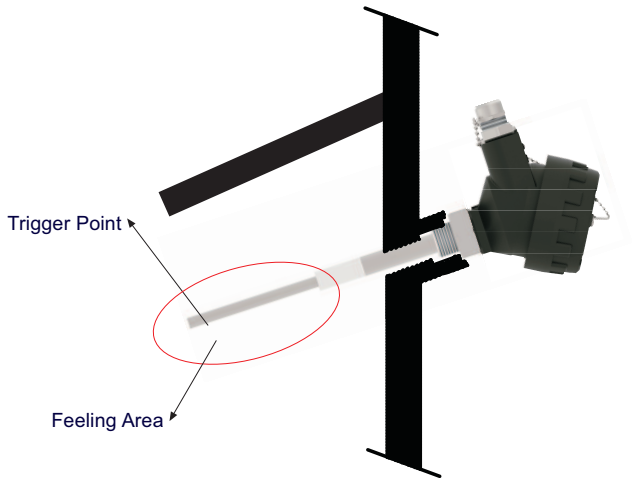


Environment Pressure / Temperature Chart

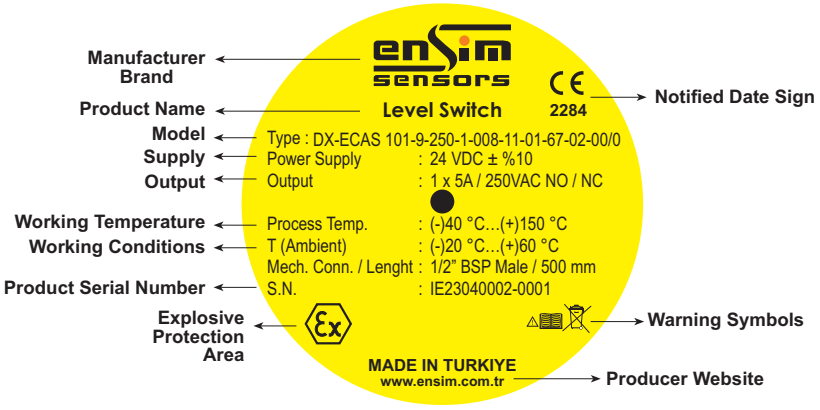


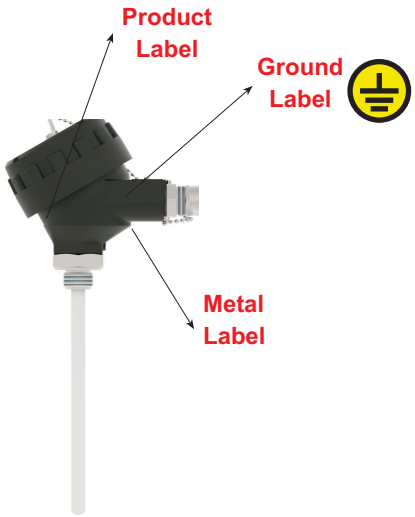
Application Examples :

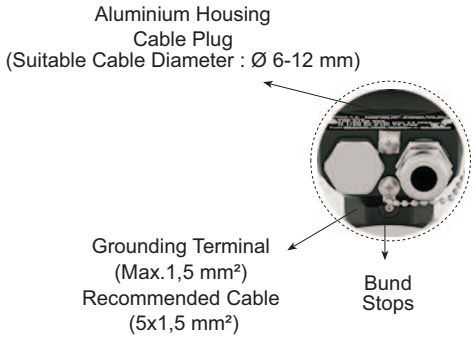


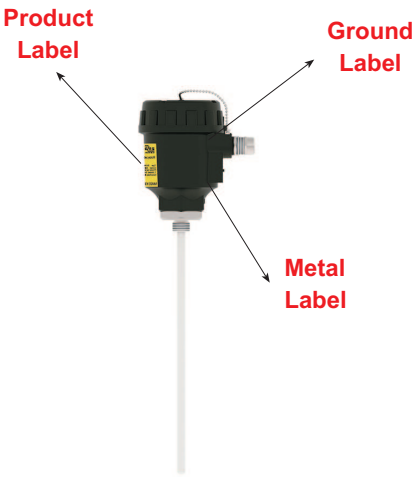


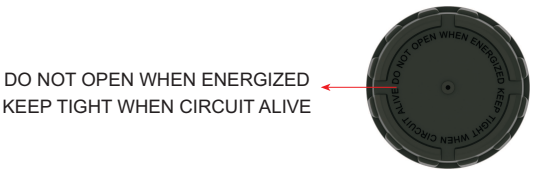
Label :

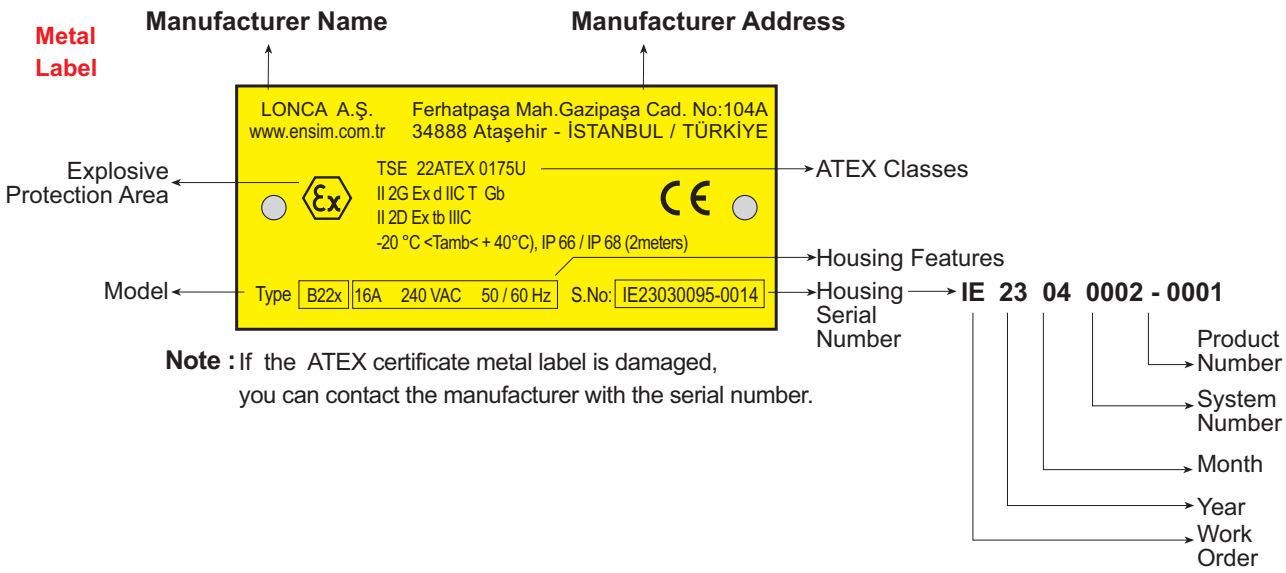










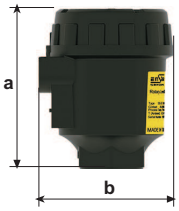


Note : If the ATEX certificate metal label is damaged, you can contact the manufacturer with the serial number.

Housing :

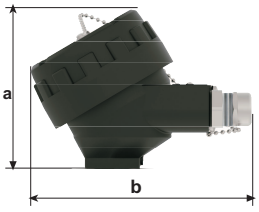
ORDER CODE	TYPE	MATERIAL	PROTECTION CLASS	TEMPERATURE (°C)	SIZE a x b (mm)
750	B22x	Aluminium	IP 66 /68	(-) 40...(+) 200	117 x 102
704	B21x	Aluminium	IP 66 /68	(-) 40...(+) 200	132 x 104

Alüminium



B21x

Alüminium



B22x

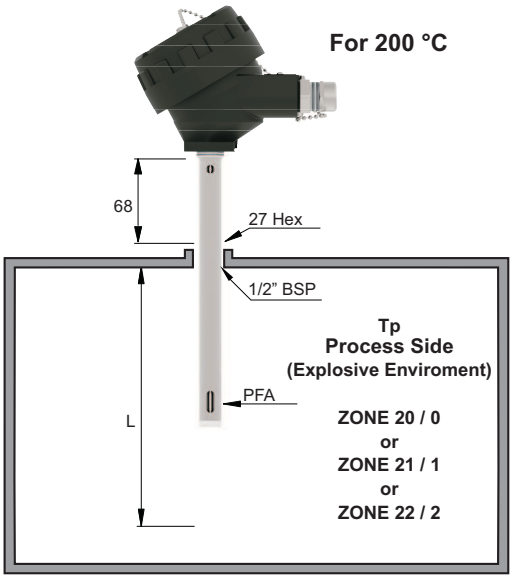
Cover Seal : NBR Nitrile Rubber 120 °C, Opt. FPM (Viton) 200 °C)

EU-Type Examination Certificate Number : TSE 22ATEX 0175U

The marking of the e

II 2G Ex d IIC Gb
II 2D Ex tb IIIC

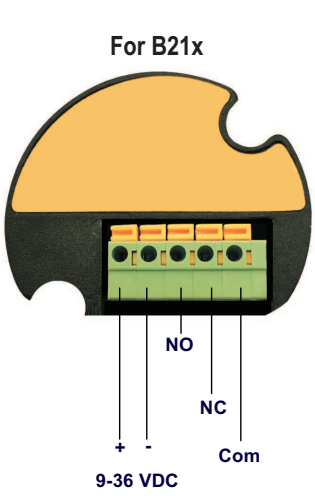
Cooling:

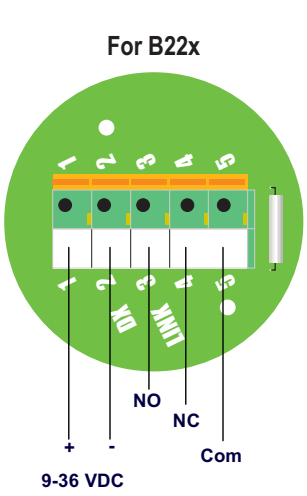


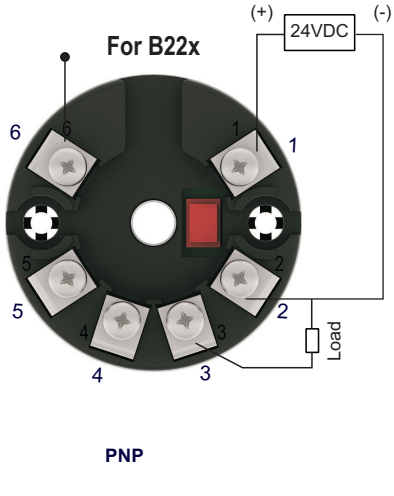
Protection Case:

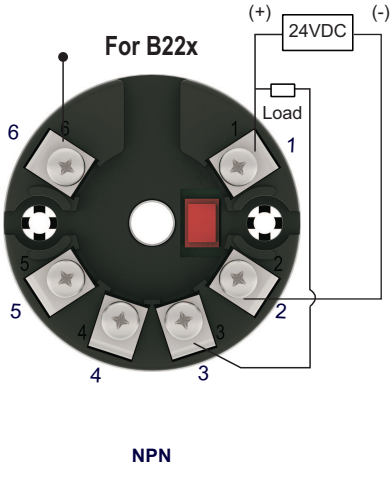
Material : 304 Stainless Steel
Welded manufacturing
Opens - Closes Hinged
To Protect Against external conditions.

Electrical Connection :





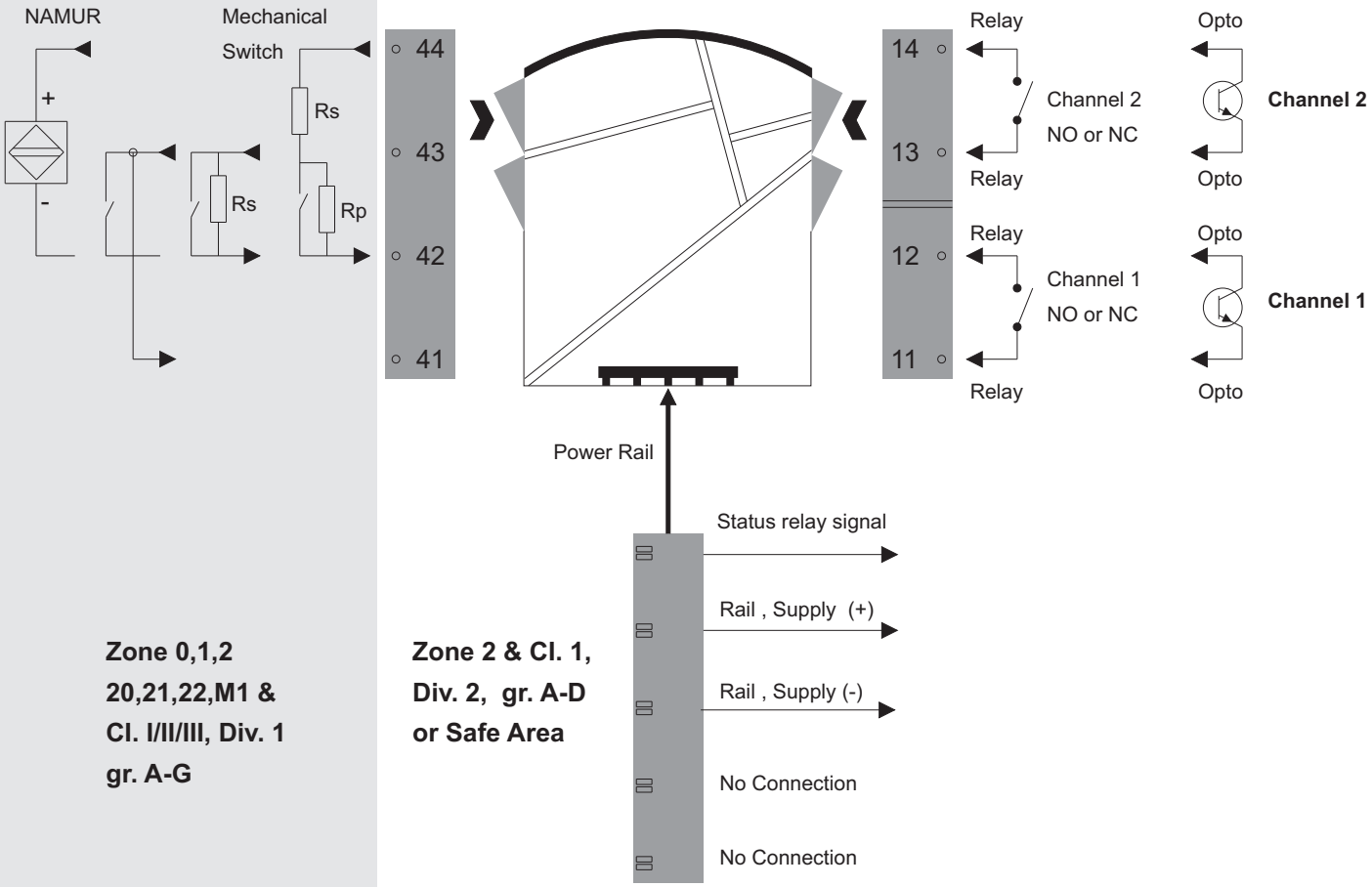




Input Signals

Output Signals

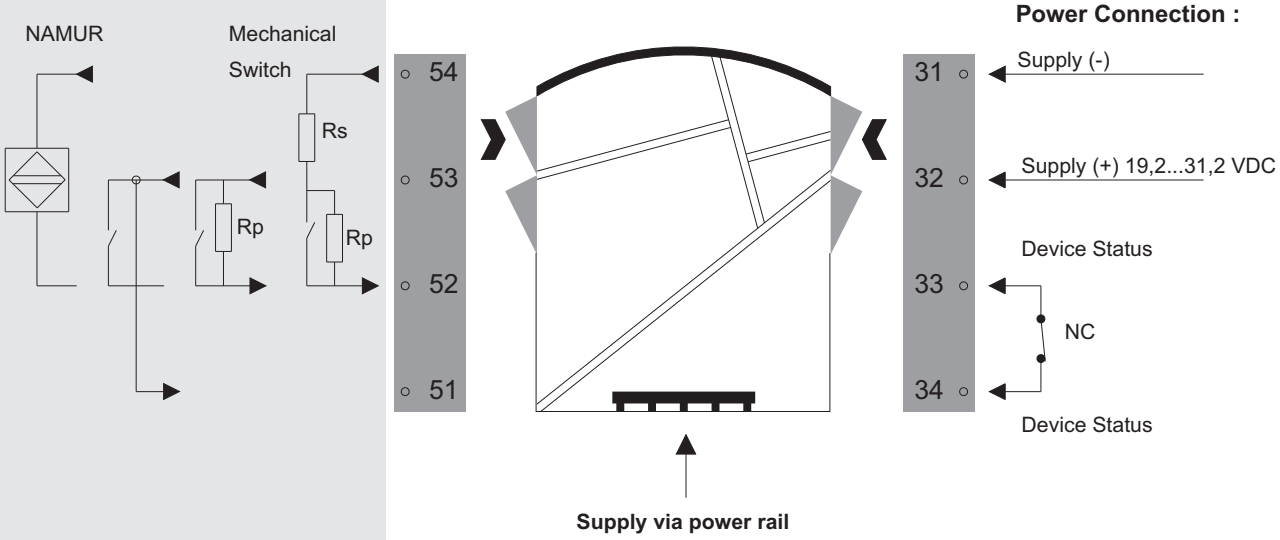
Channel 1



Zone 0,1,2 20,21,22,M1 & Cl. I/II/III, Div. 1 gr. A-G

Zone 2 & Cl. 1, Div. 2, gr. A-D or Safe Area

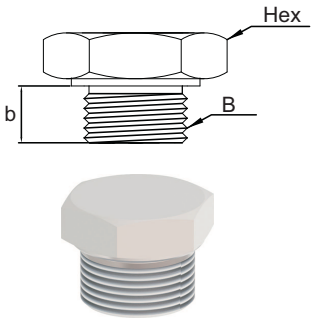
Channel 2



Power Connection :

Mechanical Connection :

Thread

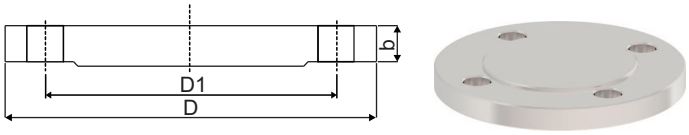


(ISO228-1)

Order Code	Dimension B	Hex [mm]	Stem Lenght b [mm]
0001	1/8" BSP	17	12
0002	1/4" BSP	17	12
0003	3/8" BSP	24	20
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

Flanged

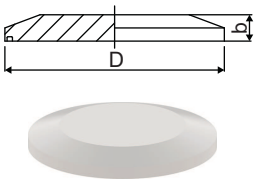
Order Code	(ISO1092-1) PN 16	D (mm)	D1 (mm)	b (mm)
0502	DN 25	165	85	16
0503	DN 32	140	100	16
0505	DN 50	165	125	18
0507	DN 80	200	160	20
0508	DN 100	220	180	20



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

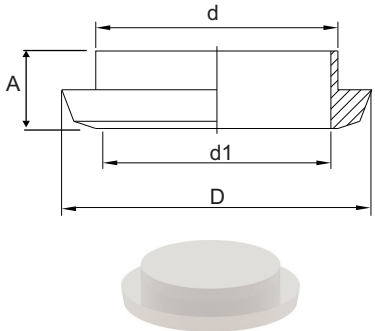
Order Code	(ANSI B16.5) 150 LBS	D (mm)	D1 (mm)	b (mm)
1005	DN 50	152,4	121	19
1006	DN 65	177,8	139,7	22,2
1007	DN 80	190,5	152,4	23,8
1008	DN 100	228,6	157,2	23,8

Clamp



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

Dairy

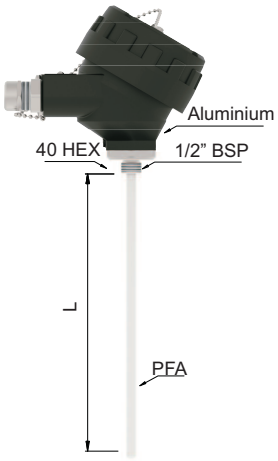


Order Code	Dimension	Dimension	D (mm)	d1 (mm)	A (mm)
1600	DN 40	DN 40	56	48	13
1601	DN 50	DN 50	68	61	14
1602	DN 100	DN 100	121	114	20

CONDUCTIVE LIQUIDS

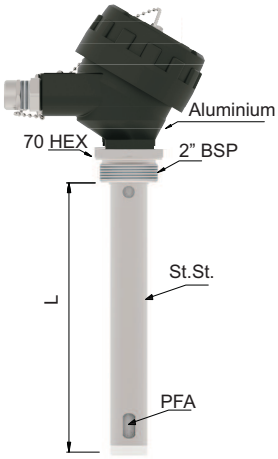
Sample Models:

DX-ECAS 101
Fully Insulated Probe
Conductive Tank



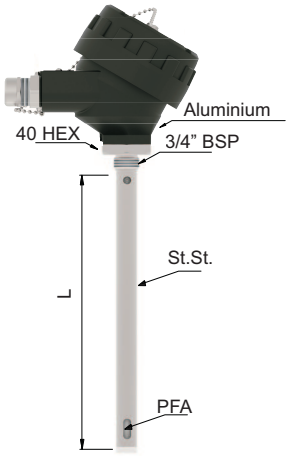
L=250 mm.(Std) Max. 4 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 102
Fully Insulated Coaxial Probe
Insulated Tank



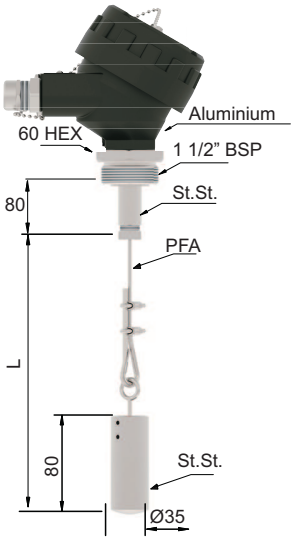
L=250 mm.(Std) Max. 4 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 103
Fully Insulated Coaxial Probe
Insulated Tank



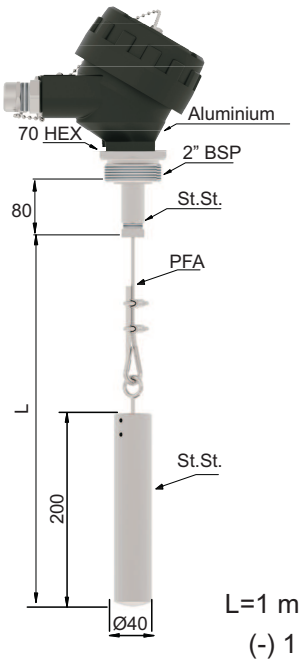
L=250 mm.(Std) Max. 1 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 107
Fully Insulated Rope
Conductive Tank



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

DX-ECAS 107
Fully Insulated Rope
Conductive Tank

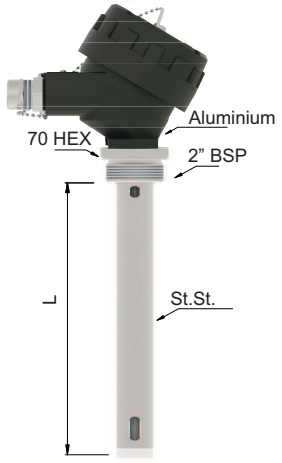


L=1 m.(Std) Max. 32 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

LOW CONDUCTIVE LIQUIDS

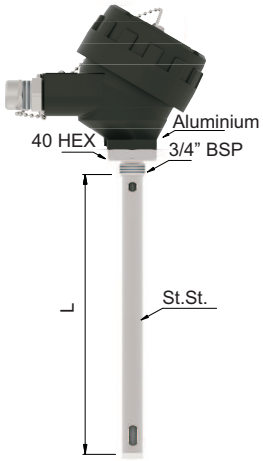
Sample Models:

DX-ECAS 202
Partly Insulated Coaxial Probe
Conductive / Insulating Tank



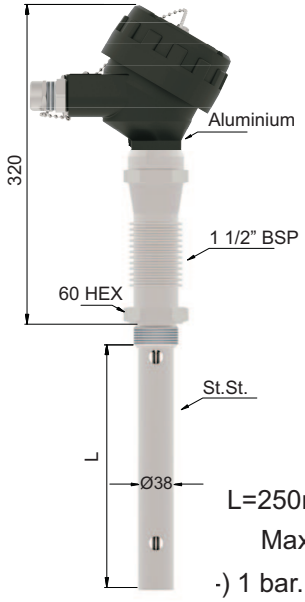
L=250 mm.(Std) Max. 4 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 203
Partly Insulated Coaxial Probe
Conductive / Insulating Tank



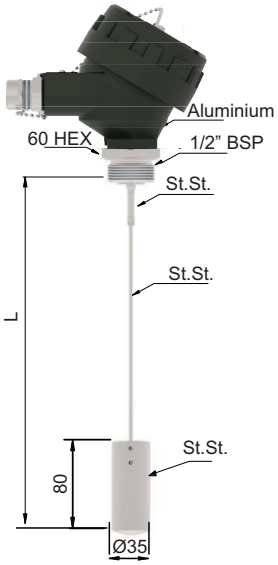
L=250 mm.(Std) Max. 1 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 20S
İzolesiz Koaksiyel Prob
İletken / Yalıtkan Tank



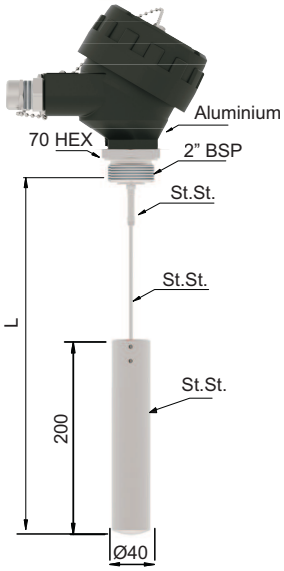
L=250mm.(Std)
Max. 4 m.
-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 400 °C

DX-ECAS 204
Partly Insulated Rope
Conductive Tank



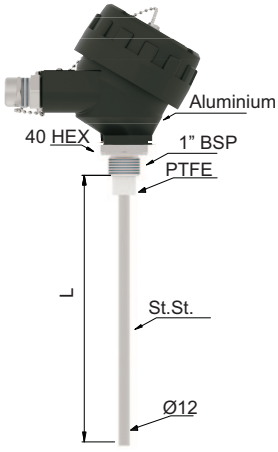
L=1 m.(Std) Max. 16 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 204
Partly Insulated Rope
Conductive Tank



L=1 m.(Std) Max. 32 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 205
Partly Insulated Probe
Conductive Tank

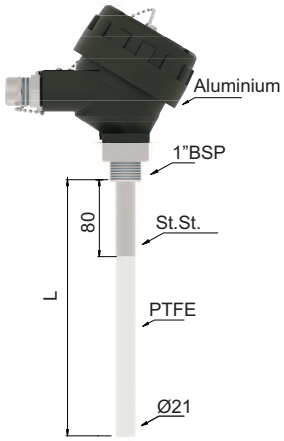


L=250 mm.(Std) Max. 6 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

Sample Models:

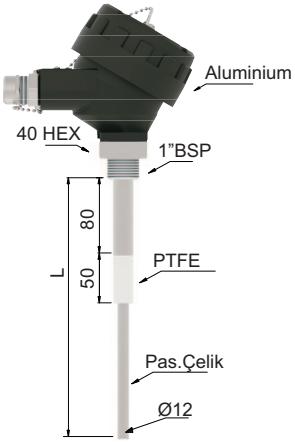
DX-ECAS 301
Compled Insulated Probe
Conductive Tank

Antistatic
For Materials



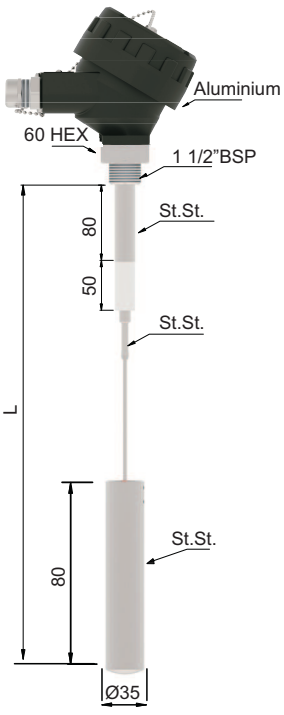
L=250 mm.(Std) Max. 1 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 305
Partly Insulated Probe
Conductive Tank



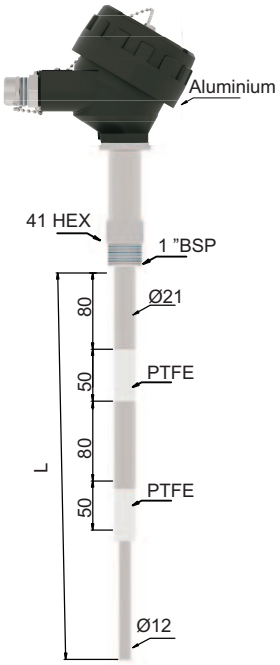
L=250 mm.(Std) Max. 6 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 150 °C

DX-ECAS 304
Partly Insulated Rope
Conductive Tank



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

DX-ECAS 30D
Double Partly Insulated Probe
Insulating Tank

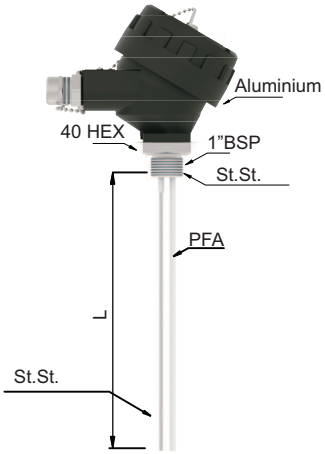


L=380 mm.(Std) Max. 1 m.
(-) 1 bar...(+) 25 bar
(-) 40 °C...(+) 200 °C

Sample Models:

ECAS 408A

Double Probe (Single Fully Insulated)
Conductive / Insulating Tank



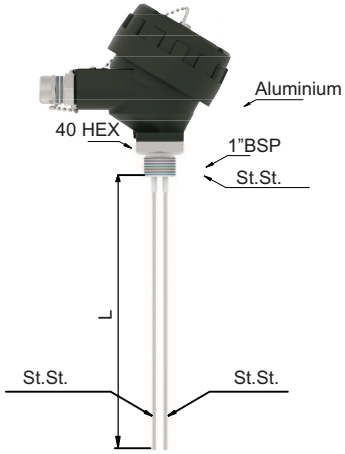
L=250 mm.(Std) Max. 4 m.

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

(-) 40 °C...(+) 150 °C

ECAS 408A

Double Probe (Single Fully Insulated)
Conductive / Insulating Tank



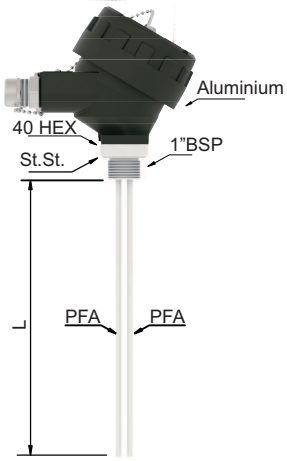
L=250 mm.(Std) Max. 6 m.

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

(-) 40 °C...(+) 150 °C

ECAS 408A

Double Probe (Single Fully Insulated)
Conductive / Insulating Tank



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

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

(-) 40 °C...(+) 150 °C

Temperature Class Table

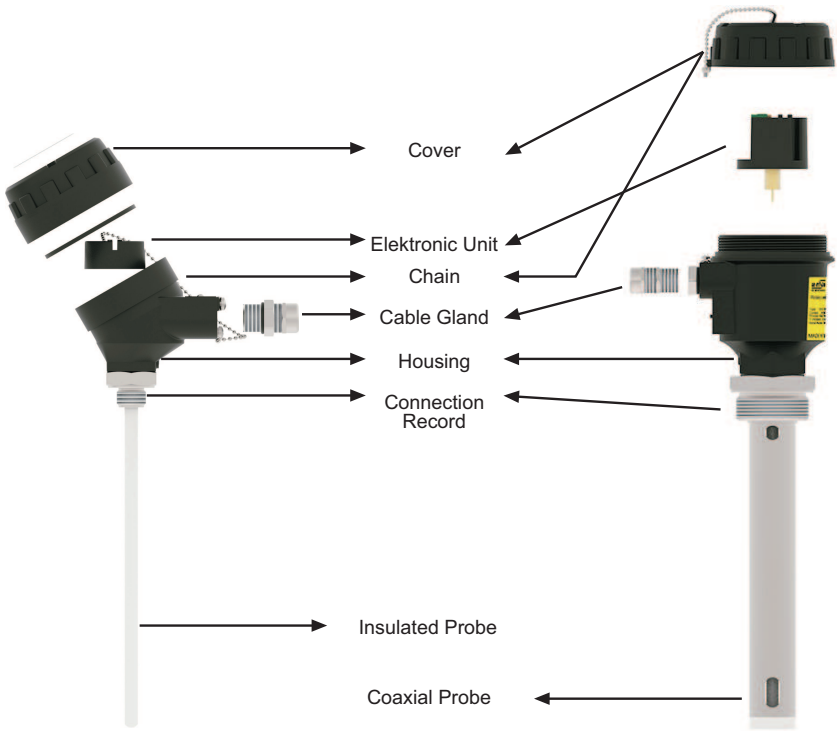
(-) 20° C ≤ Ta Ambient ≤ (+) 30° C...(+) 60°C	Working Temperature: (-) 20°C ... (+) 80°C / 90°C / 125°C / 190°C / 250°C	Group II
MODEL	DX-ECAS101 - DX-ECAS102 - DX-ECAS103 - DX-ECAS107 DX-ECAS202 - DX-ECAS203 - DX-ECAS204 - DX-ECAS205 - DX-ECAS20S DX-ECAS301 - DX-ECAS304 - DX-ECAS30D DX-ECAS408A	
Without opening the cover standby time	30 min. (-)40...(+)150°C	40 min. (-)40...(+)200°C

Ta AMBIENT TEMPERATURE	Tp PROCESS TEMPERATURE	TEMPERATURE CLASS
60°C	< 80°C	T6
60°C	< 90°C	T5
60°C	< 125°C	T4
60°C	< 190°C	T3
60°C	< 250°C	T2

(-) 20° C ≤ Ta Ambient ≤ (+) 30° C...(+) 60°C	Working Temperature: (-) 20°C ... (+) 60°C	Group III
MODEL	DX-ECAS101 - DX-ECAS102 - DX-ECAS103 - DX-ECAS107 DX-ECAS202 - DX-ECAS203 - DX-ECAS204 - DX-ECAS205 - DX-ECAS20S DX-ECAS301 - DX-ECAS304 - DX-ECAS30D DX-ECAS408A	
Without opening the cover standby time	10 min. (-)40...(+)60°C	

Ta AMBIENT TEMPERATURE	Tp PROCESS TEMPERATURE	TEMPERATURE CLASS
60°C	< 60°C	T6

Parts :



Order Form: Please consider sample models when coding!.. (Lined spaces defines the standard code)

1 MODEL DX-ECAS

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

2 CERTIFICATE

No.....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), Ø21 3
Rope - Partly Insulated (Max 32 m).....4
Single Probe - Partly Insulated (Max 6 m) 5
Single Probe - High Temperature (Max 4 m) 6
Rope - Fully Insulated (0 ... 32 m) 7
Double Probe - Single Fully Insulated (Max 4 m) 8A
Ceramic Partly Insulated Probe (Max 4 m) ..... S
Double Fully Insulated Probe (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)	ISO Flange (1092-1)	ASA Flanged (B16.5)
1/2" BSP.....0004	DN 25 - PN 16 ... 0502	DN 25 - PN 16...0502	DN 25 - PN 40...0702	DN 50 - 150lb ... 1005
3/4" BSP 0005	DN 32 - PN 16 ... 0503	DN 32 - PN 16...0503	DN 32 - PN 40...0703	DN 65 - 150lb ... 1006
1" BSP.....0006	DN 50 - PN 16 ... 0504	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 (NO/NC) (5A).....11
Special.....x

9 HOUSING

Aluminium Housing, B21x IP66 / 68 (Std.).....750
Aluminium Housing, B21x IP66 / 68.....704
Special.....x

10 INSULATION MATERIAL

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

11 CONNECTION MATERIAL

316 Stainless Steel.....002
Brass.....041
Special.....x

12 ELECTRICAL CONNECTION

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

13 OPTIONAL

No...../ 0
Shetter (For the outside of the tank) 304 St.St. ../ K2
Wall Apparatus...../ W
Zener Baryer 9202B-BIB Single Channel..../B1B
Zener Barier 9202B-B2B Double Channel../B2B
Special...../ x

SAMPLE

DX-ECAS 101 - 10 - 300- 0 - 0006 - 11 - 750 - 066 - 002 - 00 / 0
For Cond. Liquid, L=300 mm, 1" BSP, Relay Output, Aluminium Housing B22x , Ø 10 Probe

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