

TECHNICAL INFO

Capacitance/Admittance Level Transmitter

Techcap - LTC series



FEATURES

- 4~20mA 2 wire Loop power
- Low consumption of power (20mA Max)
- High accuracy of linearity ($< \pm 1\%$ FS)
- Temperature compensation, low temperature effect ($\pm 0.2\%$ FS / $^{\circ}\text{C}$)
- Easy calibration (Any 2 points for calibration)
- No blind distance, ideal for different tanks.
- Suitable for high temperature, high pressure and corrosive environment.
- LCD local display

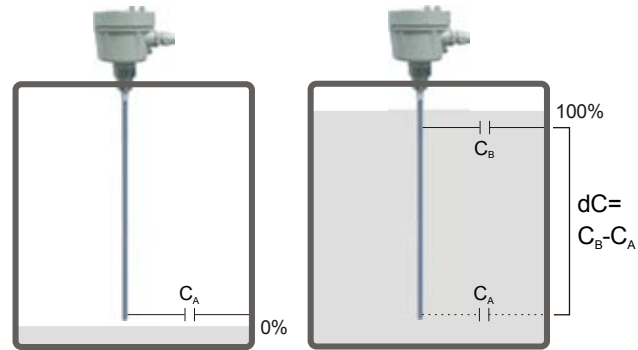


PRODUCT INTRODUCTION

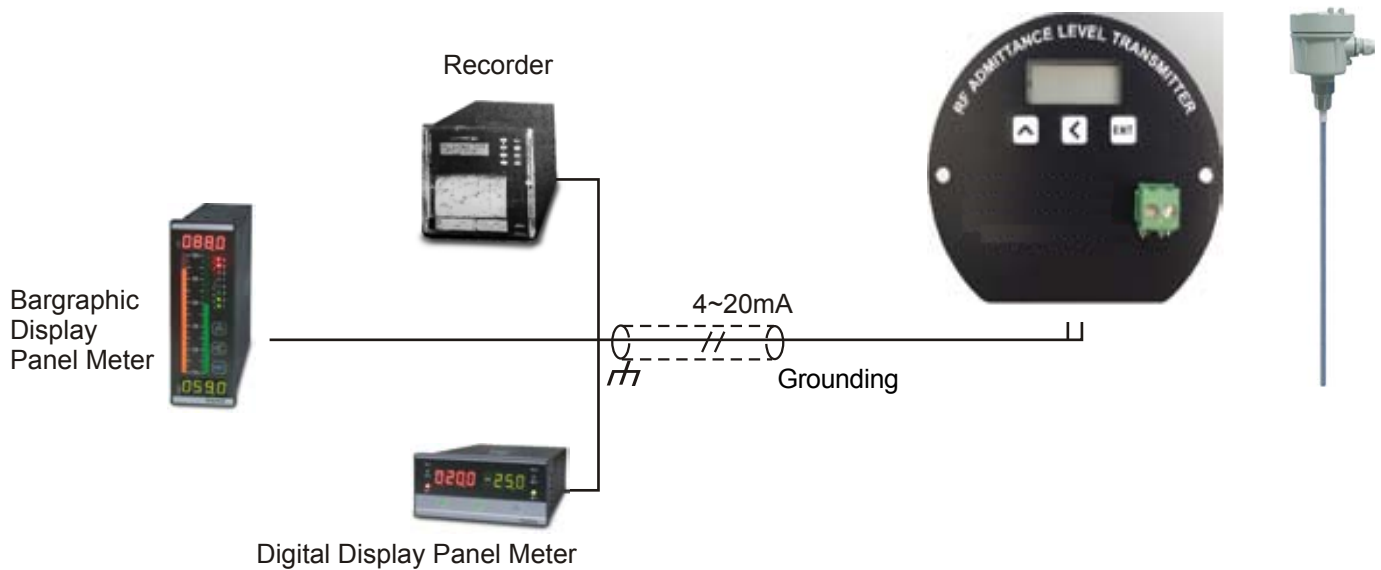
PRINCIPLE

This Level Transmitter utilizes the capacitance formed between the sensing probe and the reference probe or the metal vessel wall to calculate the level of the medium inside the vessel according to the capacitance theory that the capacitance and vessel are proportional increased.

When the probe is surrounded by the air, little capacitance (C_A) is measured by the equivalent capacitor, the capacitance increases gradually as the measuring media, the max. capacitance (C_B) will be measured while the tank is full, the difference (dC) between C_A and C_B is proportional to the level.
(Recommend range $dC = 25 \sim 2000 \text{ pF}$)



APPLICATION EXAMPLE



APPLICATION EXAMPLE

	LTC5200	LTC5201	LTC52P0	LTC52A1	LTC5300	LTC5301	LTC53P0	LTC53A1	LTC5400	LTC5401	LTC54P0
Conductive Tank	★	★	★	★	★	★	★	★	✗	✗	✗
Non-Conductive Tank	▲	▲	▲	▲	✗	✗	✗	✗	★	★	★
Height of Vessel > 4m	✗	✗	✗	✗	★	★	★	★	✗	✗	✗
Height of Vessel < 4m	★	★	★	★	—	—	—	—	★	★	★
Operation Temperature > 100°C (Not more than 200°C)	✗	★	✗	★	✗	★	✗	★	✗	★	✗
Dielectric Constant of Media>10	✗	✗	★	★	✗	✗	★	★	✗	✗	★
Dielectric Constant of Media<10	★	★	—	—	★	★	—	—	★	★	—
Corrosive Media	✗	✗	★	★	✗	✗	★	★	✗	✗	★
Agitator inside the vessel	▲	▲	▲	▲	✗	✗	✗	✗	—	—	—
★ Good ▲ Pipe shield is suggested ✗ Unsuitable — Fair											

DIELECTRIC CONSTANTS CHART

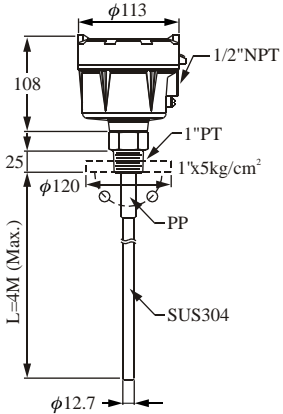
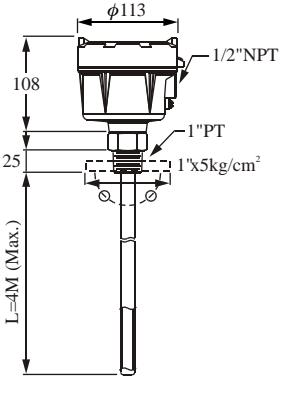
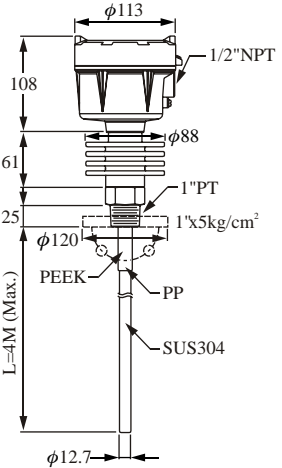
Material	Dielectric Constant.	Material	Dielectric Constant.
Air	1	Cement	4~6
Gasoline	1.9	Butanol	11
Diesel	2.1	Ethanol	16~31
Edible Oil	2~4	Ammonia	21
Heavy Oil	2.6~3.0	Acetone	20~30
Grain	2.5~4.5	Carbide Powder	25~30
Corn	2.3~2.6	Sulfuric Acid	84
Rice	3~8	Water	81

WIRING AND CAUTION

- After installation of the Admittance Level Transmitter on the top of tank, please make sure the cover of the transmitter is contacted with tank perfectly. Please avoid the grounding of panel meter to touch the tank wall.
- While the panel meter is not supplied with a power supply, please prepare a 24V power supply for use.
- The max cable length is depends on the max resistance .Maximum resistance is not to exceed $(V_s-22) \times 50\Omega$ to ensure the accuracy of measurement.
- Make sure to separate the signal cable with other big power cables (such as pump, conveyor and solenoid valve)while wiring. Before turning on power, make sure all wirings are correct.
- Connect isolation cable with GND of power.
- If there is heater or other electric device in the application, contacting the cover of the transmitter and tank can decrease EMI.

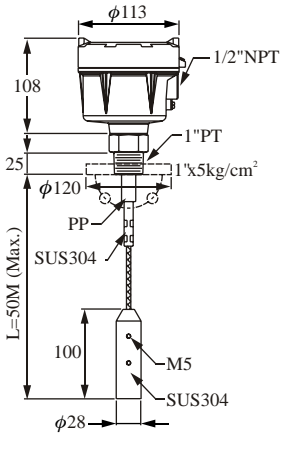
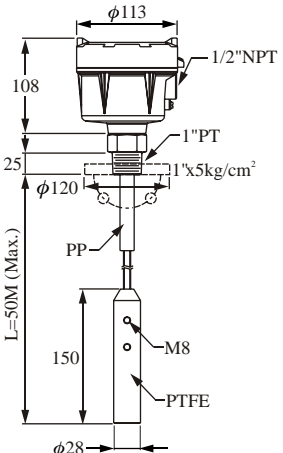
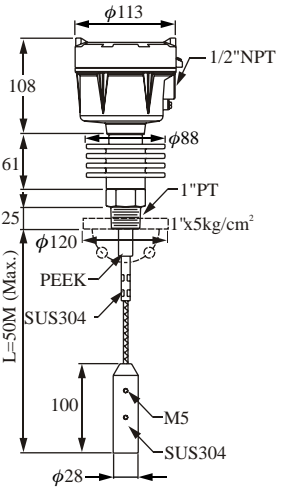


STANDARD TYPE

Dimensions (unit:mm)	 <p>Suitable for middle/ small tank Media : non-conductive material Low moisture material</p>	 <p>Suitable for middle/big tank Media: Dielectric Constant >10 Conductive Material</p>	 <p>Suitable for middle/ small tank Media : non-conductive material Low moisture material</p>
Model No.	LTC5200 Rod Probe	LTC52P0 Rod Coating Type	LTC5201 Hi-Temp Rod Probe
Probe Material	SUS304	SUS304 with PP / PFA Coating	SUS304
Ambient Temperature	-20~70°C	-20~70°C	-20~70°C
Operating Temperature	-40~100°C	-40~100°C	-40~200°C
Operation Voltage	24 ± 10%Vdc	24 ± 10%Vdc	24 ± 10%Vdc
Analog Output	4 ~20mA(two wire)	4 ~20mA(two wire)	4 ~20mA(two wire)
Measuring Range	20~2000pF	20~2000pF	20~2000pF
Accuracy	± 1%FS(25°C)	± 1%FS(25°C)	± 1%FS(25°C)
Housing IP Degree	IP65	IP65	IP65
Connection	1"PT or 1"x5kg/cm ² flange	1"PT or 1"x5kg/cm ² flange	1"PT or 1"x5kg/cm ² flange
Weight	Approx. 2.3kg(1m)	Approx. 2.3kg(1M)	Approx. 2.8kg(1m)
Operating Pressure	40kg/cm ²	5kg/cm ²	40kg/cm ²



STANDARD TYPE

Dimensions (unit:mm)	 <p>Suitable for middle/ small tank Media : non-conductive material Low moisture material</p>	 <p>Suitable for middle/big tank Media: Dielectric Constant >10 Conductive Material</p>	 <p>Suitable for middle/ small tank Media : non-conductive material Low moisture material</p>
Model No.	LTC5300 Wire Probe	LTC53P0 Wire Coating Type	LTC5301 Hi-Temp Wire Probe
Probe Material	SUS304	SUS304 with PP / PFA Coating	SUS304
Weight Material	SUS304	PTFE	SUS304
Ambient Temperature	-20~70°C	-20~70°C	-20~70°C
Operating Temperature	-40~100°C	-40~100°C	-40~200°C
Tensile Strength	2000Kgf	2000Kgf	2000Kgf
Operation Voltage	24 ± 10%Vdc	24 ± 10%Vdc	24 ± 10%Vdc
Analog Output	4 ~20mA(two wire)	4 ~20mA(two wire)	4 ~20mA(two wire)
Measuring Range	20~2000pF	20~2000pF	20~2000pF
Accuracy	± 1%FS(25°C)	± 1%FS(25°C)	± 1%FS(25°C)
Housing IP Degree	IP65	IP65	IP65
Connection	1"PT or 1"x5kg/cm ² flange	1"PT or 1"x5kg/cm ² flange	1"PT or 1"x5kg/cm ² flange
Weight	Approx. 2.3kg(1m)	Approx. 2.3kg(1M)	Approx. 2.8kg(1m)
Operating Pressure	40kg/cm ²	5kg/cm ²	40kg/cm ²

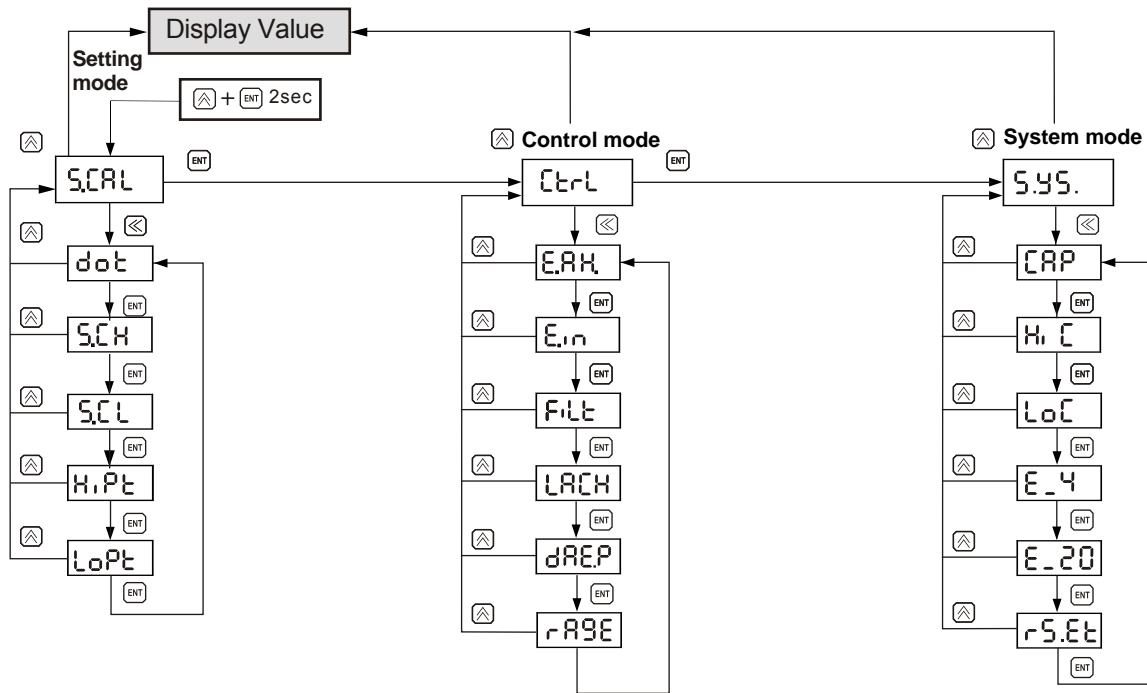


STANDARD TYPE

Dimensions (unit:mm)		
	Suitable for middle/ small non-conductive tank Media : non-conductive material Low moisture material	Suitable for middle/ small non-conductive tank Media: Conductive Material
Model No.	LTC5400 Two Rode Probe	LTC5400 Two Coating Rode Probe
Probe Material	SUS304	SUS304 with PP / PFA Coating
Ambient Temperature	-20~70°C	-20~70°C
Operating Temperature	-40~100°C	-40~100°C
Operation Voltage	24 ± 10%Vdc	24 ± 10%Vdc
Analog Output	4 ~20mA(two wire)	4 ~20mA(two wire)
Measuring Range	20~2000pF	20~2000pF
Accuracy	± 1%FS(25°C)	± 1%FS(25°C)
Housing IP Degree	IP65	IP65
Connection	2"x5kg/cm ² flange	2"x5kg/cm ² flange
Weight	Approx. 2.3kg(1m)	Approx. 2.3kg(1M)
Operating Pressure	5kg/cm ²	5kg/cm ²

Note:Min. Connection is 2" flange

CALIBRATION & SETUP



Main Menu	Sub-Menu	Range	Default	Description
SCAL	dot	0~3	1	Decimal point setting
	SCX	-1999~9999	100.0	20mA corresponding display value
	SCL	-1999~9999	0	4mA corresponding display value
	H.Pt	-1999~9999	100.0	Value for high point (Hipt).
	LoPt	-1999~9999	0	Value for low point (Lopt).
Ctrl	ERK	SAVE,RSET BACK	SAVE	Memory for max & mini value during operation. SAVE: Save value into Eeprom REST: Clean present value and memory BACK: Go back to sub-menu
	E.in	SAVE,RSET BACK	SAVE	
	FILT	Lo,MID,HI	LO	Software Filter
	LACH	ON, OFF	OFF	Output latch
	dREP	1~60sec	1	Reflash time
	rRGE	HI,Lo	HI	Measuring range
SYS.	CAP	0~9999		Capacity Value
	Hi.C	0~9999	2200	High point Capacity V value
	Lo.C	0~9999	200	Low point Capacity Value
	E_4	-1999~9999	0	4mA fine turn
	E_20	-1999~9999	0	20mA fine turn
	rS.Et			Load default

Note 1: The setting of Hipt,Lopt please refer to calibration procedures on the manual

Note 2: The output will latch when display is 110% or -10%

Note 3: Re-Calibration is necessary if measuring range is changed



ORDER INFORMATION

LTC **5** **2** **0** **0** - **HM** **5** **0** **0** **0**

ORDER NO. _____

Standard Type

- 52: Rod Probe Type
- 53: Wire Probe Type
- 54: Two Rod Probe Type

MATERIAL _____

- Metal Probe** 0: SUS304 6: SUS316
Plastic Coated Probe P: PP A: PFA

TEMPERATURE RESISTANCE _____

- 0: Standard (max.100°C)
- 1: Hi-Temp Type (max.200°C)

CONNECTING _____

Dimension	Specification
D --- 1"	M --- 5kg/cm ²
E --- 1-1/2"	N --- 10kg/cm ²
F --- 2"	O --- 150 Lbs
G --- 2-1/2"	P --- 300 Lbs
H --- 3"	Q --- PT
I --- 4"	R --- PF(G)
J --- 5"	T --- BSP
K --- 6"	U --- NPT
S --- others	V --- GAS
	S --- others

PROBE LENGTH (Unit: mm) _____

- 0500:** below 500mm
 - 1000:** 501~1000mm
 - 1500:** 1001~1500mm
 - :
 - :
- ※ 500mm per Unit
 - ※ Use English letter as first code for probe length over 10m.
A150 represents 15m, A200 represents 20m

* Tolerance of the total product length is ±5mm
 * Characteristics, specifications and dimensions are subject to change without notice.



INSTALLATION

1. Please choose Two Rod Probe type for non conductive tank (Fig.1), or install a concentric circles metal pipe shield with vent hole at the top outside the probe (Fig. 2)
2. The rod or wire probe should be parallel to the tank wall. To prevent material from sticking between the probe and tank wall , the probe shouldn't be too close to the tank wall.
3. If the container is irregular-shaped, such as a cylindrical , and the medium is liquid with low viscosity, the rod should be placed inside a concentric circles metal pipe shield with vent hole at the top.(Fig. 2)
4. Coating Probe type is necessary for conductive media (eg. Water...) , as the bare electrode can't operation normally in conductive media.
5. During the installation, the process connection should be grounded. An installation without proper grounding will not guarantee normal operation of the device later on.
6. For non-conductive medium of powder or granules in big tank , the wire probe should be fixed to the bottom of tank
7. When all electrical connections inside of Admittance Level Transmitter housing are finished, the housing cover and the conduit opening should be sealed and tightened to prevent moisture from soaking in.
8. If an agitator is in place (see fig. 4), a pipe shield outside the probe is recommended.

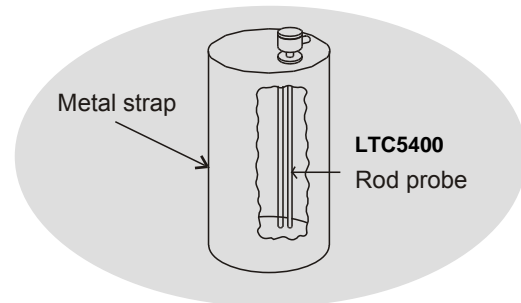


Fig. 1

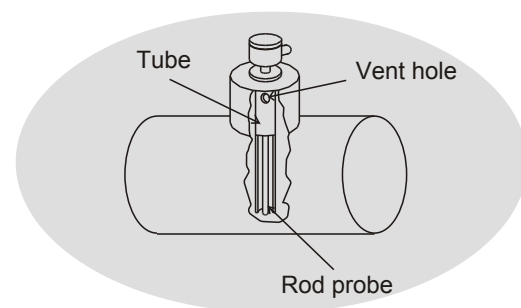


Fig. 2

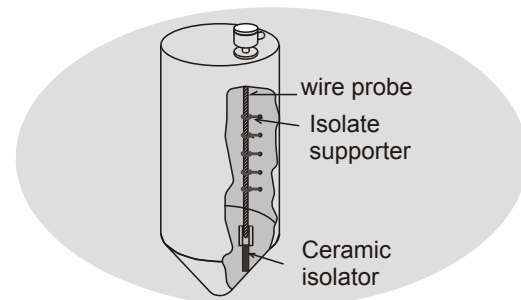


Fig. 3

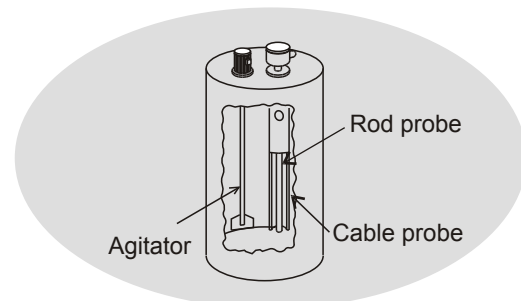


Fig. 4