RF Admittance Level Transmitter

FineTek
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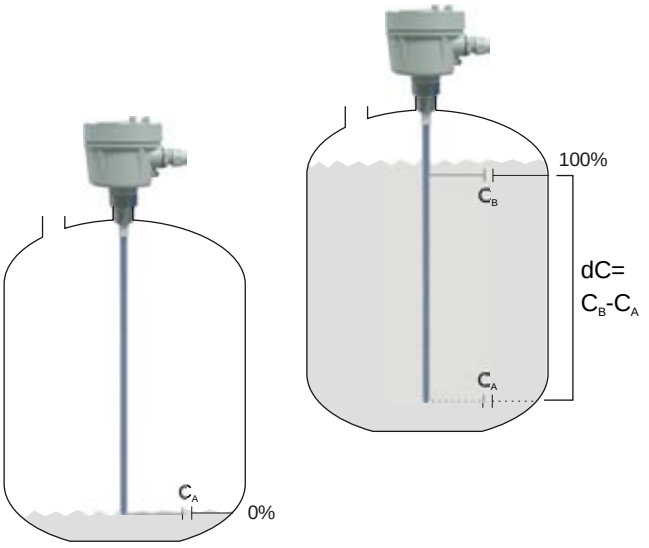
PRODUCT INTRODUCTION

PRINCIPLE

RF Admittance 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.

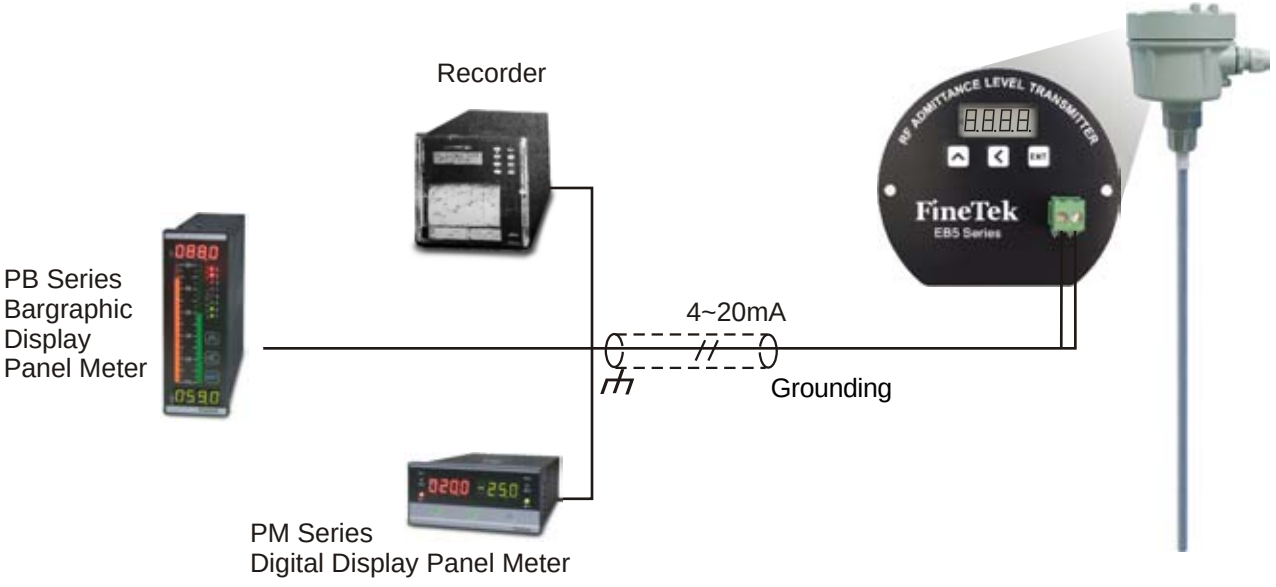
When the probe is surrounding by the air, little capacitance (C_A) is measured by the equivalent capacitor, the capacitance increase gradually as computing media, the max. capacitance (C_B) will be measured while the tank is full, the difference (dC) between C_A and C_B is proportional to the level. (Recommend range dC =25 ~2000 pF)



FEATURES

- 4~20mA 2 wire Loop power
- Low consumption of power (20mA Max)
- High accuracy of linearity (< ± 1% FS)
- Temperature compensation, low temperature effect(± 0.2% FS /°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

APPLICATION EXAMPLE



APPLICATION EXAMPLE

	EB5200	EB5201	EB52A0	EB52A1	EB5300	EB5301	EB53A0	EB53A1	EB5400	EB54A0
Conductive Tank	★	★	★	★	★	★	★	★	✕	✕
Non-Conductive Tank	▲	▲	▲	▲	✕	✕	✕	✕	★	★
Height of Vessel > 4m	✕	✕	✕	✕	★	★	★	★	✕	✕
Height of Vessel < 4m	★	★	★	★	—	—	—	—	★	★
Operation Temperature > 80°C (Not more than 200°C)	✕	★	✕	★	✕	★	✕	★	✕	✕
Dielectric Constant of Media>4	✕	✕	★	★	✕	✕	★	★	✕	★
Dielectric Constant of Media<4	★	★	—	—	★	★	—	—	★	—
Corrosive Media	✕	✕	★	★	✕	✕	★	★	✕	★
Agitator inside the vessel	▲	▲	▲	▲	✕	✕	✕	✕	—	—

★ Good ▲ Pipe shield is suggested ✕ Unsuitable — Fair

	EB5200	EB5201	EB52A0	EB52A1	EB5300	EB5301	EB53A0	EB53A1	EB5400	EB54A0
Aqueous Solution	✕	✕	★	★	✕	✕	★	★	✕	★
Oil Solution	▲	▲	✕	✕	✕	✕	✕	✕	✕	✕
Acid or Akali Solution	✕	✕	✕	✕	✕	✕	✕	✕	✕	★
Feed & Grain	★	★	✕	✕	★	★	✕	✕	✕	✕
Mining & Cement	★	★	✕	✕	★	★	✕	✕	✕	✕

★ Good ▲ Pipe shield is suggested ✕ Unsuitable

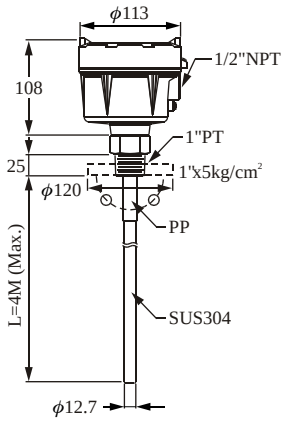
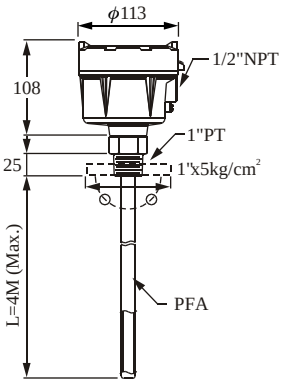
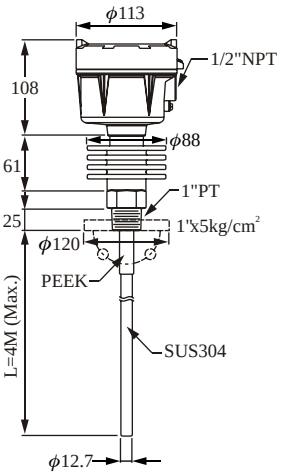
DIELECTRIC CONSTANTS CHART

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

WIRING AND CAUTION

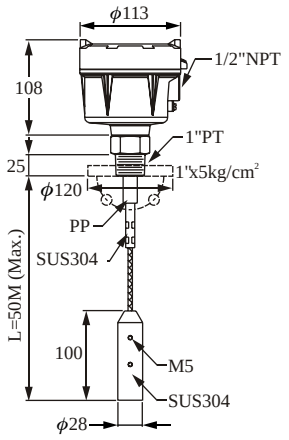
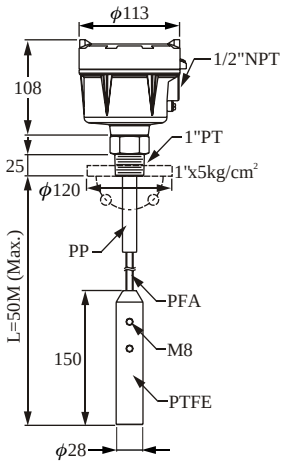
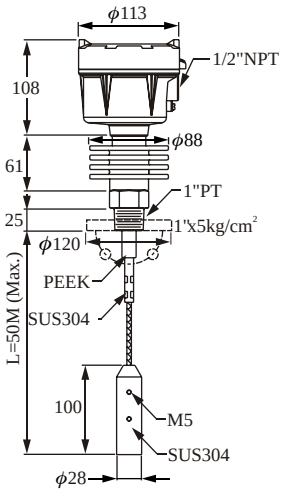
- After installation of the Admittance Level Transmitter on the top of tank, please make sure the cover of the transmitter is contacted with tank perfectly. Please avoid the grounding of panel meter to touch the tank wall.
- While the panel meter is not supplied with a power supply, please prepare a 24V power supply for use.
- The max cable length is depends on the max resistance .Maximum resistance is not to exceed (Vs-22)X 50Ω 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)	 Suitable for middle/ small tank Media : non-conductive material low moisture material	 Suitable for middle/big tank Media: Dielectric Constant >4 Conductive Material	 Suitable for middle/ small tank Media : non-conductive material low moisture material
Model No.	**EB5200 Rod Probe**	**EB52A0 Rod Coating Type**	**EB5201 Hi-Temp Rod Probe**
Probe Material	SUS304	SUS304 with PFA Coating	SUS304
Ambient Temperature	-20~70°C	-20~70°C	-20~70°C
Operating Temperature	-40~80°C	-40~80°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/cm² flange	1"PT or 1"x5kg/cm² flange	1"PT or 1"x5kg/cm² flange
Weight	Approx. 2.3kg(1m)	Approx. 2.3kg(1m)	Approx. 2.8kg(1m)
Operating Pressure	40kg/cm²	5kg/cm²	40kg/cm²

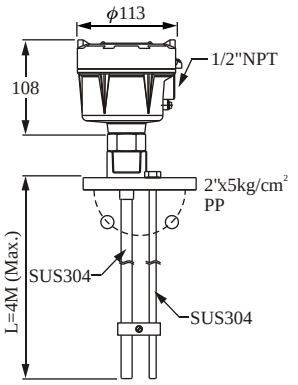
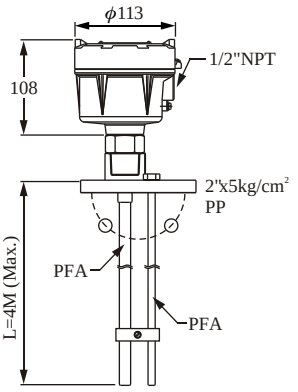
Note :Hi-Temp Wire Coating Type is available, the model is EB52A1 with PFA Coating

STANDARD TYPE

Dimensions (unit:mm)	 Suitable for middle/ small tank Media : non-conductive material low moisture material	 Suitable for middle/big tank Media: Dielectric Constant >4 Conductive Material	 Suitable for middle/ small tank Media : non-conductive material low moisture material
Model No.	**EB5300 Wire Probe**	**EB53A0 Wire Coating Type**	**EB5301 Hi-Temp Wire Probe**
Probe Material	SUS304	SUS304 with PFA Coating	SUS304
Weight Material	SUS304	PTFE	SUS304
Ambient Temperature	-20~70°C	-20~70°C	-20~70°C
Operating Temperature	-40~80°C	-40~80°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/cm² flange	1"PT or 1"x5kg/cm² flange	1"PT or 1"x5kg/cm² flange
Weight	Approx. 2.3kg(1m)	Approx. 2.3kg(1m)	Approx. 2.8kg(1m)
Operating Pressure	40kg/cm²	5kg/cm²	40kg/cm²

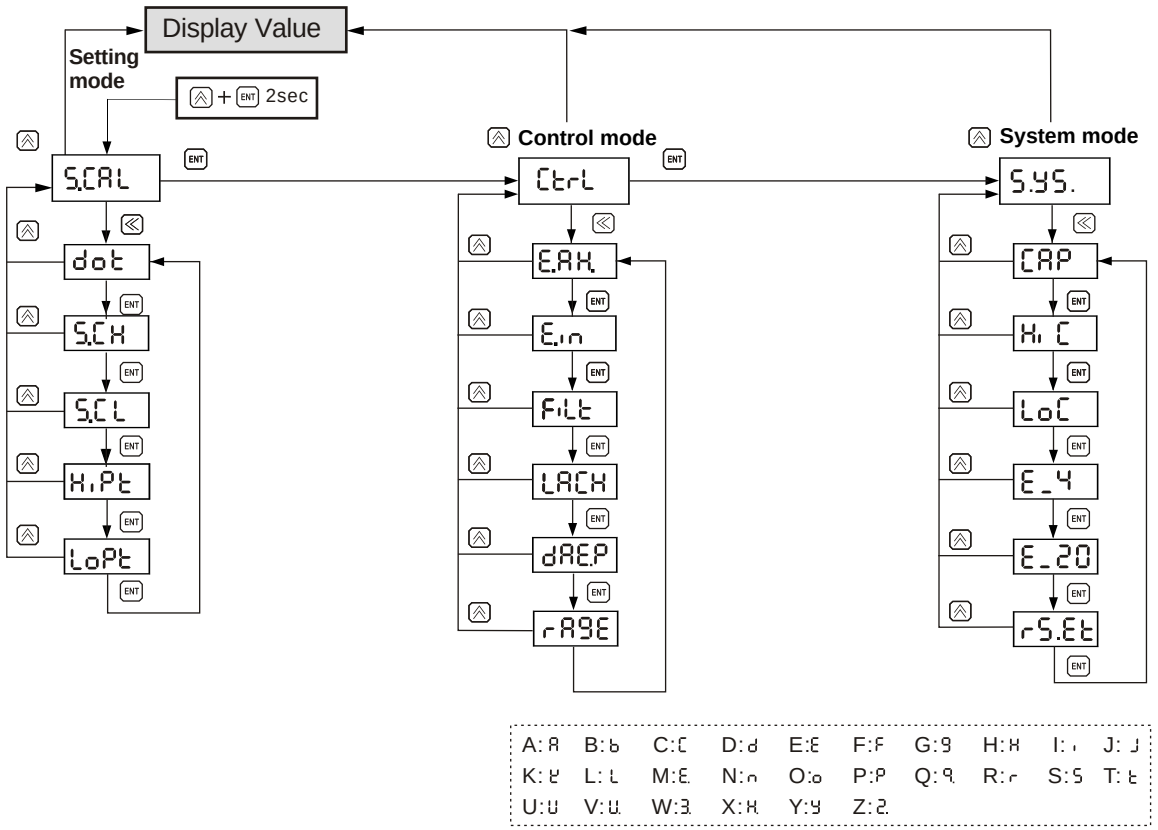
Note :Hi-Temp Wire Coating Type is available, the model is EB53A1 with PFA Coating

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.	**EB5400 Two Rode Probe**	**EB54A0 Two Coating Rode Probe**
Probe Material	SUS304	SUS304 with PP / PFA Coating
Ambient Temperature	-20~70°C	-20~70°C
Operating Temperature	-40~80°C	-40~80°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/cm² flange	2"x5kg/cm² flange
Weight	Approx. 2.3kg(1m)	Approx. 2.3kg(1m)
Operating Pressure	5kg/cm²	5kg/cm²

Note:Min. Connection is 2" flange

CALIBRATION & SETUP



Main Menu	Sub-Menu	Range	Default	Description
S.CAL	dot	0~3	1	Decimal point setting
	S.CH	-1999~9999	100.0	20mA corresponding display value
	S.CL	-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	E.AH.	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
	dAEP	1~60sec	1	Reflash time
	rAGE	HI,Lo	HI	Measuring range
S.YS.	CAP	0~9999		Capacity Value
	Hi C	0~9999	2200	High point Capacity Value
	LoC	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

EB 5 2 0 0 – H M 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	A: PFA	

TEMPERATURE RESISTANCE

0: Standard (max.80℃)
1: Hi-Temp Type (max.200℃)

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 (Uuit: 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.**
*** Please contact your nearest distributing office for further informations.**

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.

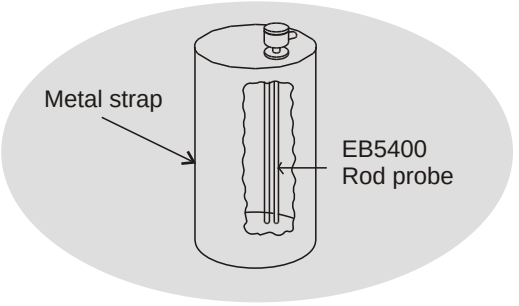


Fig. 1

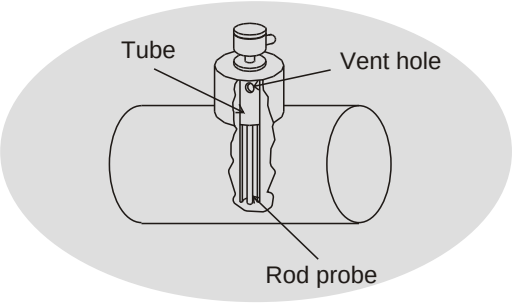


Fig. 2

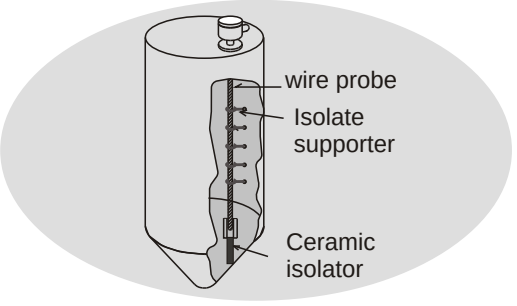


Fig. 3

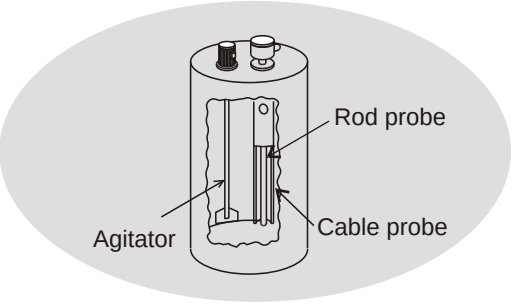
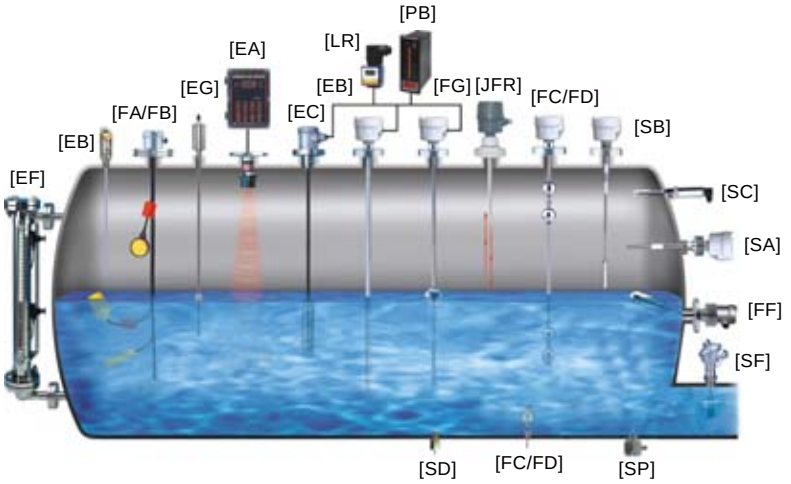
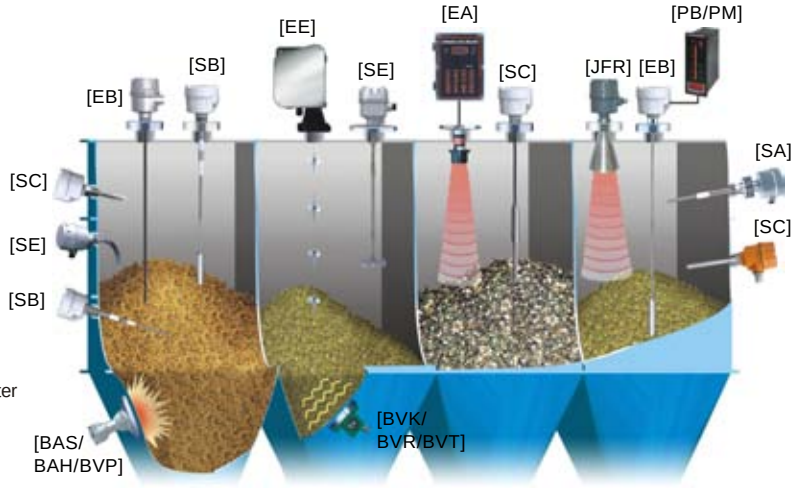


Fig. 4

EXAMPLES OF TANK MOUNTING

[FC/FD] Mini Float/Magnetic Float Level Switch
[FG] Magnetic Float Level Transmitter
[FF] Side Mounting Float Switch
[FA/FB] Cable Float Level Switch
[SP] Thermal Dispersion Flow Switch
[SF] Paddle Flow Switch
[SD] Optical Level Switch
[SE] Rotary Paddle Level Switch
[SA] Capacitance Level Switch
[EC] Pressure Level Transmitter
[LR] Loop Power Indicator
[SC] Vibrating Probe Level Switch
[SC] Tuning Fork Level Switch
[EB] RF-Capacitance Level Transmitter
[SB] RF-Capacitance / Admittance Level Switch
[EG] Magnetostrictive Level Transmitter
[EF] By-Pass Level Transmitter
[MEF] Mini By-Pass Level Transmitter
[EA] Ultrasonic Level Transmitter
[JFR] FMCW Radar Level Transmitter
[EE] Electromechanical Level Measuring System
[ED] Speed Monitor
[SRT/SRS] Conveyer Belt Misalignment Switch & Safety Cable Pull Switch
[PB/PM] Microprocessor Based Bargraphic Display Scaling Meter
[BRD/AE] Valve and Controller for Dust Collector System
[BAS/BAH/BVP] Air Hammer
[BVK/BVR/BVT] Pneumatic Vibrator





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