RF Admittance Level Transmitter

FineTek

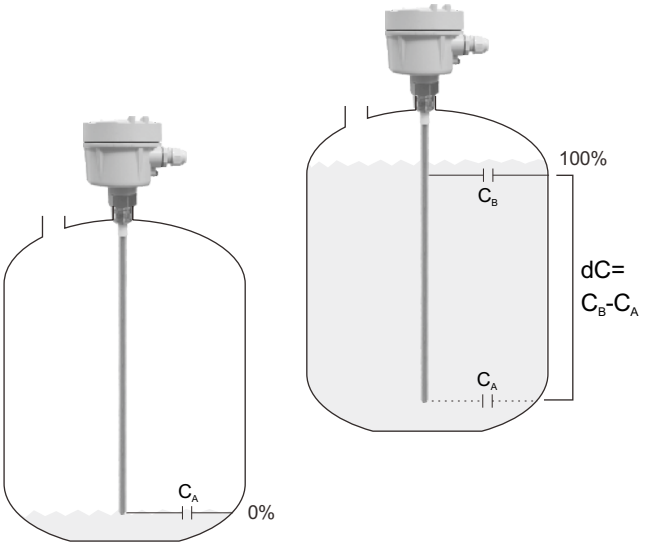
Innovation · Quality · Sharing

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.

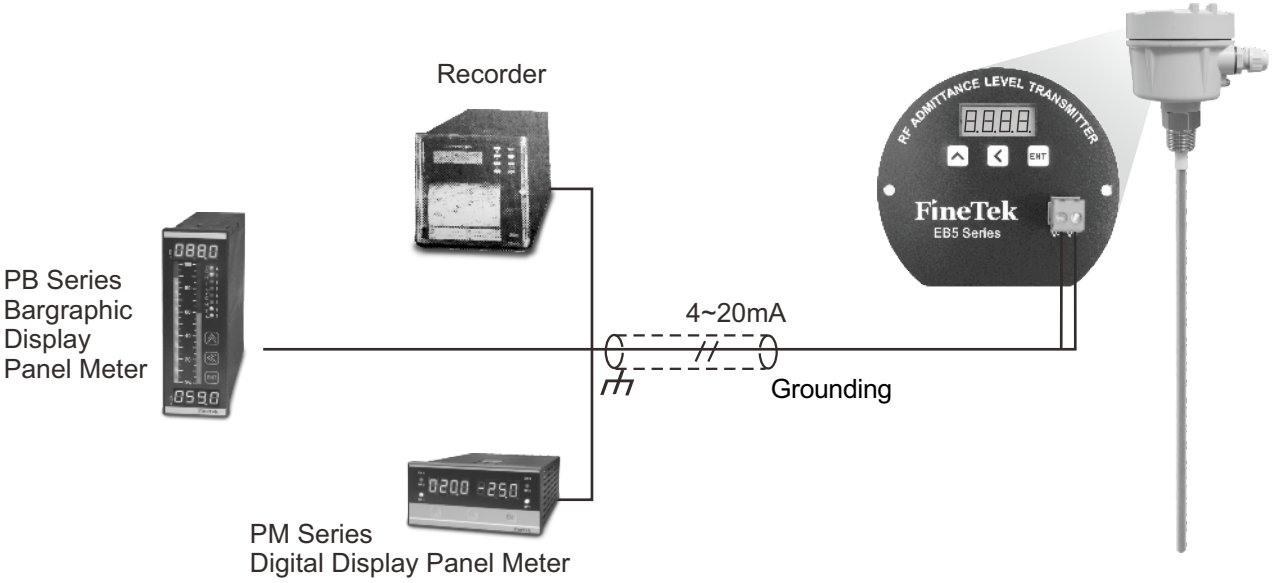
When the probe is surrounding by the air, little capacitance (C_A) is measured by the equivalent capacitor, the capacitance increase gradually as computing media, the max. capacitance (C_B) will be measured while the tank is full, the difference (dC) between C_A and C_B is proportional to the level. (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 or ± 0.5pF)
- Temperature compensation, low temperature effect(± 0.2% FS/°C or 0.1pF/°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℃ (Not more than 200℃)	✕	★	✕	★	✕	★	✕	★	✕	✕
Dielectric Constant of Media>4	✕	✕	★	★	✕	✕	★	★	✕	★
Dielectric Constant of Media<4	★	★	—	—	★	★	—	—	★	—
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										

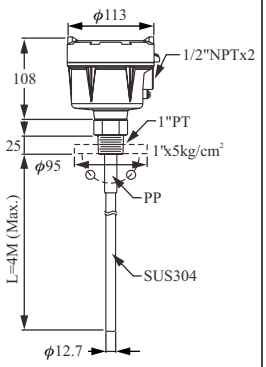
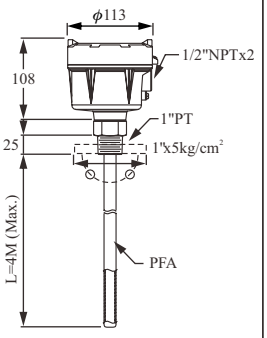
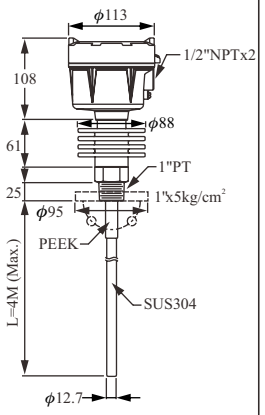
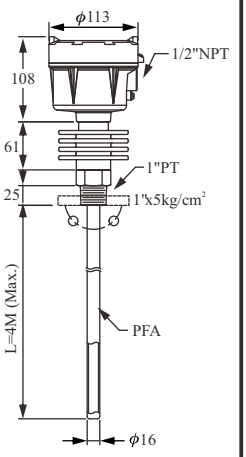
DIELECTRIC CONSTANTS CHART

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

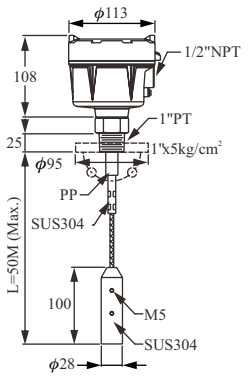
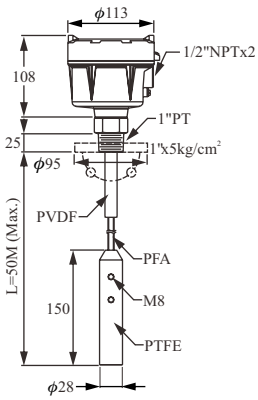
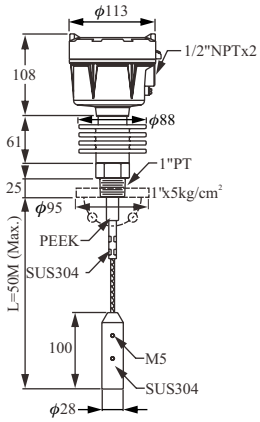
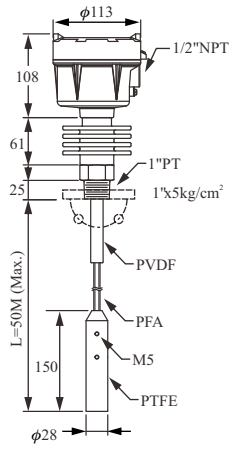
WIRING AND CAUTION

- 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.

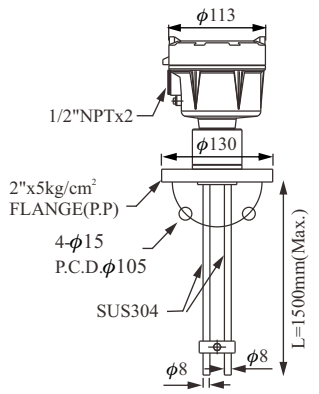
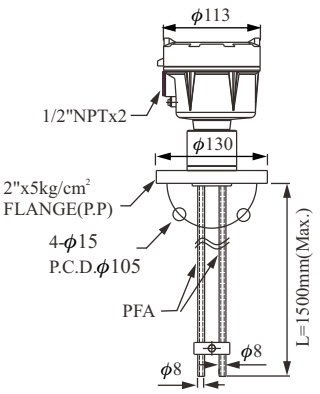
STANDARD TYPE

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	 Suitable for middle/big tank Media: Dielectric Constant >4 Conductive Material
Model No.	**EB5200 Rod Probe**	**EB52A0 Rod Coating Type**	**EB5201 Hi-Temp Rod Probe**	**EB52A1 Hi-Temp Rod Coating**
Probe material	SUS304	SUS304 with PFA Coating	SUS304	SUS304 with PFA Coating
Ambient temperature	-40~85°C			
	LCD monitor: -20~85°C			
Operating temperature	-40~85°C		-40~200°C	
Operation voltage	18~30Vdc			
Analog output	4~20mA(two wire)			
Digital output	HART(option)			
Measuring range	20~2000pF			
Accuracy	±1% FS or ±0.5pF			
Effect temp.	<±0.2% FS/°C or 0.1pF/°C			
Protection	IP65			
Connection	1"PT or 1"x5kg/cm² flange			
Weight	Approx. 2.3kg(1m)	Approx. 2.3kg(1m)	Approx. 2.8kg(1m)	
Operating pressure	40kg/cm²	32kg/cm²	40kg/cm²	32kg/cm²

STANDARD TYPE

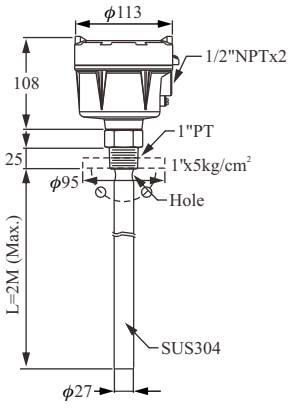
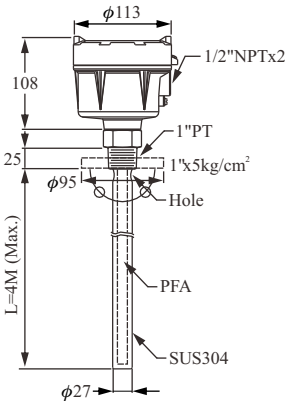
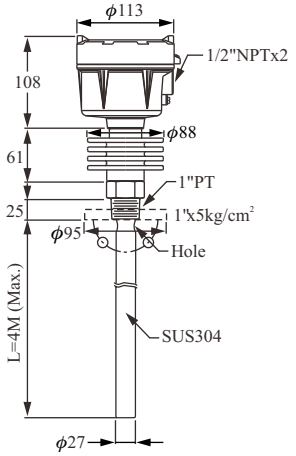
Dimensions (unit:mm)	 Suitable for middle/ small tank Media : non-conductive material low moisture material	 Suitable for middle/big tank Media: Dielectric Constant >4 Conductive Material	 Suitable for middle/ small tank Media : non-conductive material low moisture material	 Suitable for middle/big tank Media: Dielectric Constant >4 Conductive Material
Model No.	**EB5300 Cable Type**	**EB53A0 Cable Coating Type**	**EB5301 Hi-Temp Cable Type**	**EB53A1 Hi-Temp Cable Coating**
Probe material	SUS304	SUS304 with PFA Coating	SUS304	SUS304 with PFA Coating
Weight material	SUS304	PTFE	SUS304	PTFE
Ambient temperature	-40~85°C			
	LCD monitor: -20~85°C			
Operating temperature	-40~85°C		-40~200°C	
Tensile strength	2000Kgf			
Operation voltage	18~30Vdc			
Analog output	4 ~20mA(two wire)			
Digital output	HART(option)			
Measuring range	20~2000pF			
Accuracy	±1% FS or ±0.5pF			
Effect temp.	<±0.2% FS/°C or 0.1pF/°C			
Protection	IP65			
Connection	1"PT or 1"x5kg/cm² flange			
Weight	Approx. 2.3kg(1m)	Approx. 2.3kg(1m)	Approx. 2.8kg(1m)	
Operating pressure	40kg/cm²	32kg/cm²	40kg/cm²	32kg/cm²

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	-40~85°C	-40~85°C
	LCD monitor: -20~85°C	LCD monitor: -20~85°C
Operating temperature	-40~85°C	-40~85°C
Operation voltage	18~30Vdc	18~30Vdc
Analog Output	4 ~20mA(two wire)	4 ~20mA(two wire)
Digital output	HART(option)	HART(option)
Measuring range	20~2000pF	20~2000pF
Accuracy	±1% FS or ±0.5pF	±1% FS or ±0.5pF
Effect temp.	<±0.2% FS/°C or 0.1pF/°C	<±0.2% FS/°C or 0.1pF/°C
Protection	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

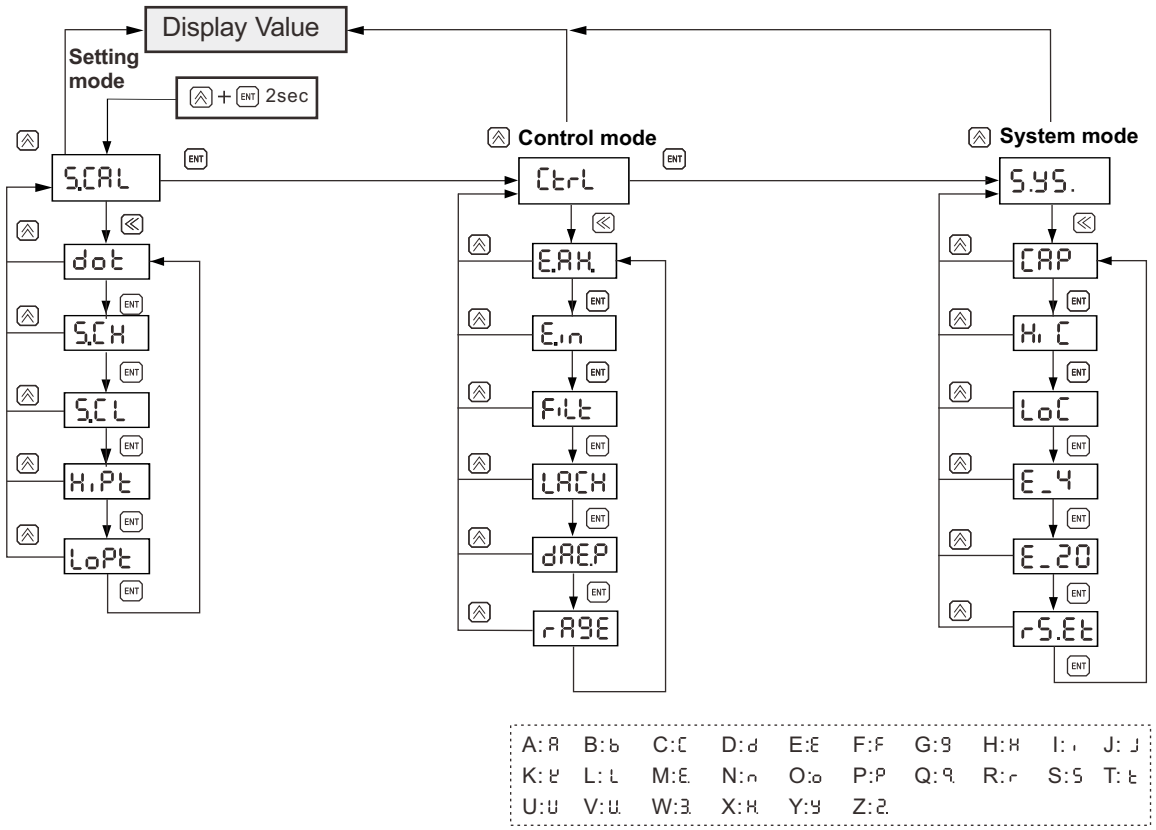
Note:Min. Connection is 2" flange

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.	**EB5500 Anti-wave tube Type**	**EB55A0 Anti-wave tube Type**	**EB5501 Hi-Temp Anti-wave tubeType**
Probe material	SUS304	SUS304 with PFA Coating	SUS304
Ambient temperature	-40~85°C	-40~85°C	-40~85°C
	LCD monitor: -20~85°C	LCD monitor: -20~85°C	LCD monitor: -20~85°C
Operating temperature	-40~85°C	-40~85°C	-40~200°C
Operation voltage	18~30Vdc	18~30Vdc	18~30Vdc
Analog output	4~20mA(two wire)	4~20mA(two wire)	4~20mA(two wire)
Digital output	HART(option)	HART(option)	HART(option)
Measuring range	20~2000pF	20~2000pF	20~2000pF
Accuracy	±1% FS or ±0.5pF	±1% FS or ±0.5pF	±1% FS or ±0.5pF
Effect temp.	<±0.2% FS/°C or 0.1pF/°C	<±0.2% FS/°C or 0.1pF/°C	<±0.2% FS/°C or 0.1pF/°C
Protection	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	32kg/cm²	40kg/cm²

Note :Hi-Temp Wire Coating Type is available, the model is EB55A1 with PFA Coating

CALIBRATION & SETUP

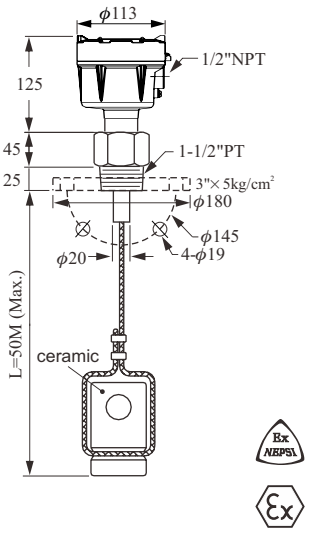
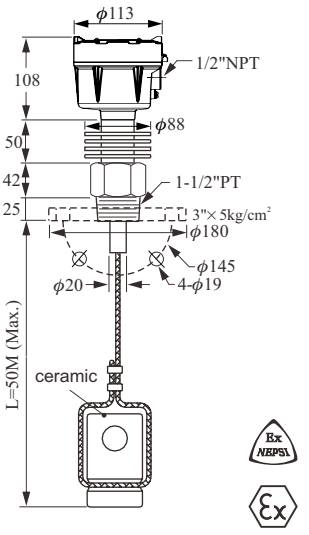
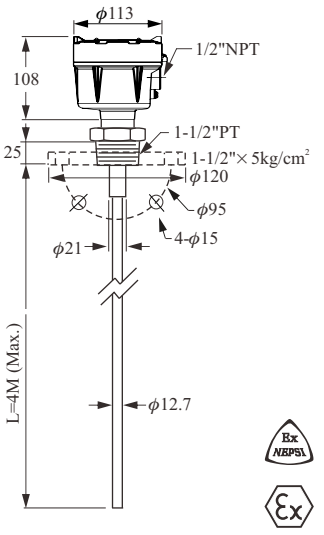


Main Menu	Sub-Menu	Range	Default	Description
S.CAL	dot	0~3	1	Decimal point setting
	S.CH	-1999~9999	100.0	20mA corresponding display value
	S.CL	-1999~9999	0	4mA corresponding display value
	H.Pt	-1999~9999	100.0	Value for high point (Hipt).
	LoPt	-1999~9999	0	Value for low point (Lopt).
CtrL	E.AH.	SAVE,RSET 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

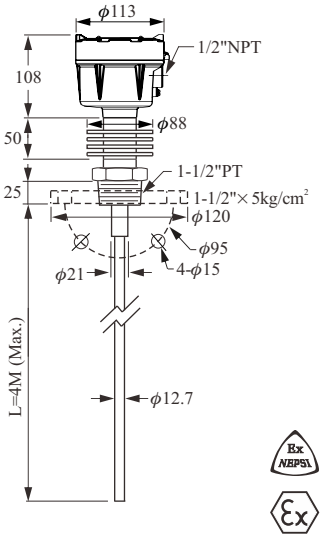
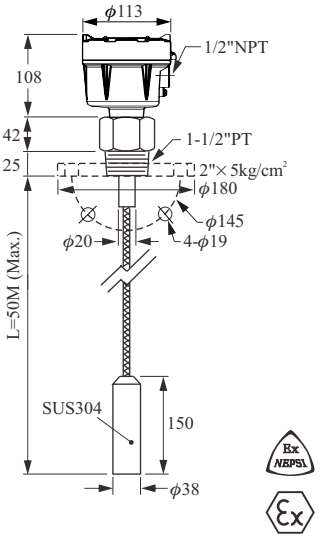
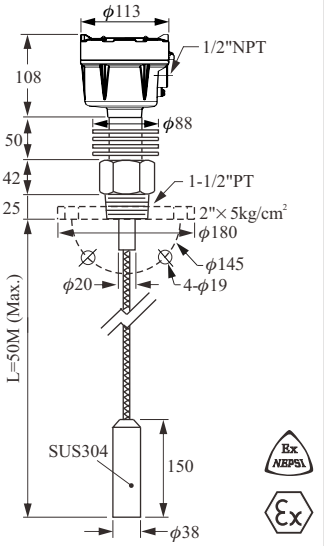
NEPSI Ex d IIB T3~T6 Gb
Ex tD A21 IP65 T190°C/T130°C/T95°C/T80°C
ATEX Ⓔx II 2G Ex d IIB T3~T6
Ⓔx II 2D Ex tD A21 IP65 T80°C ~T190°C

EXPLOSION PROOF TYPE

Dimensions (unit:mm)	 Suitable for non-conductive material and big tank.	 Suitable for non-conductive material and big tank.	 Suitable for non-conductive material and middle-size tank.
Model No.	**EB1710 Wire Probe**	**EB1711 Hi-Temp Wire Probe**	**EB1720 Rod Probe**
Probe material	SUS304	SUS304	SUS304/316
Weight material	CERAMIC	CERAMIC	————
Ambient temperature	-20~70°C	-20~70°C	-20~70°C
Operating temperature	-40~80°C	-40~190°C	-40~80°C
Tensile strength	2000Kgf	2000Kgf	————
Operation voltage	12~36Vdc	12~36Vdc	12~36Vdc
Output current	4 ~20mA(two wire)	4 ~20mA(two wire)	4 ~20mA(two wire)
Measuring range	0~5000pF	0~5000pF	0~5000pF
Accuracy	±1%FS (25°C)	±1%FS (25°C)	±1%FS (25°C)
Protection	IP65	IP65	IP65
Connection	3"x5kg/cm² flange or 1-1/2"PT screw	3"x5kg/cm² flange or 1-1/2"PT screw	1-1/2"x5kg/cm² flange or 1-1/2"PT screw
Weight	Approx. 3.7kg(1M)	Approx. 4.2kg(1M)	Approx. 2.3kg(1M)
Operating pressure	40kg/cm²	40kg/cm²	40kg/cm²

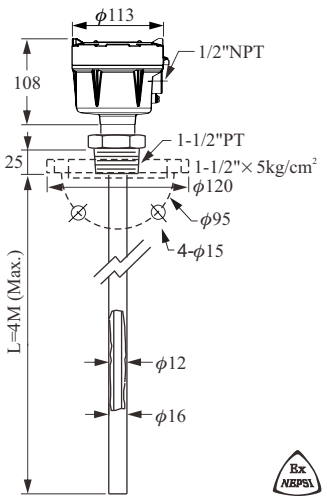
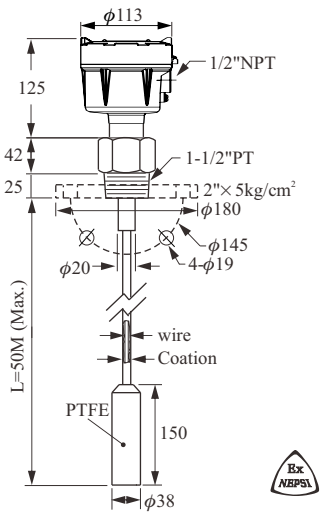
NEPSI Ex d IIB T3~T6 Gb
Ex tD A21 IP65 T190°C/T130°C/T95°C/T80°C
ATEX Ⓔx II 2G Ex d IIB T3~T6
Ⓔx II 2D Ex tD A21 IP65 T80°C ~T190°C

EXPLOSION PROOF TYPE

Dimensions (unit:mm)	 Suitable for non-conductive material and middle-size tank.	 Suitable for non-conductive material and big tank.	 Suitable for non-conductive material and big tank.
Model No.	**EB1721 Hi-Temp Rod Probe**	**EB1730 Wire Probe**	**EB1731 Hi-Temp Wire Probe**
Probe material	SUS304/316	SUS304	SUS304
Weight material	———	SUS304	SUS304
Ambient temperature	-20~70°C	-20~70°C	-20~70°C
Operating temperature	-40~190°C	-40~80°C	-40~190°C
Tensile strength	———	2000Kgf	2000Kgf
Operation voltage	12~36Vdc	12~36Vdc	12~36Vdc
Output current	4 ~20mA(two wire)	4 ~20mA(two wire)	4 ~20mA(two wire)
Measuring range	0~5000pF	0~5000pF	0~5000pF
Accuracy	±1%FS (25°C)	±1%FS (25°C)	±1%FS (25°C)
Protection	IP65	IP65	IP65
Connection	1-1/2"x5kg/cm² flange or 1-1/2"PT screw	2"x5kg/cm² flange or 1-1/2"PT screw	2"x5kg/cm² flange or 1-1/2"PT screw
Weight	Approx. 2.8kg(1M)	Approx. 2.3kg(1M)	Approx. 2.8kg(1M)
Operating pressure	40kg/cm²	40kg/cm²	40kg/cm²

NEPSI Ex d IIB T3~T6 Gb
Ex tD A21 IP65 T190°C/T130°C/T95°C/T80°C
ATEX Ⓔx II 2G Ex d IIB T3~T6
Ⓔx II 2D Ex tD A21 IP65 T80°C ~T190°C

EXPLOSION PROOF TYPE

Dimensions (unit:mm)	 EB1740 --- PVDF Coating EB1742 --- PP Coating EB1743 --- FEP Coating Suitable for conductive/ corrosive material and middle-size tank.	 EB1752 --- PP Coating EB1753 --- FEP Coating Suitable for conductive/ corrosive material and big tank.(weight can not be fixed at the bottom of tank)
Model No.	**EB1740/42/43 Anti-Corrosion**	**EB1752/53 Anti-Corrosion Wire Probe**
Probe material	SUS304+Coating	SUS304+Coating
Weight material	———	SUS304+PTFE
Ambient temperature	-20~70°C	-20~70°C
Operating temperature	-40~80°C	-40~80°C
Tensile strength	———	2000Kgf
Operation voltage	12~36Vdc	12~36Vdc
Output current	4 ~20mA(two wire)	4 ~20mA(two wire)
Measuring range	0~5000pF	0~5000pF
Accuracy	±1%FS (25°C)	±1%FS (25°C)
Protection	IP65	IP65
Connection	1-1/2"x5kg/cm² flange or 1-1/2"PT screw	2"x5kg/cm² flange or 1-1/2"PT screw
Weight	Approx. 2.3kg(1M)	Approx. 2.3kg(1M)
Operating pressure	40kg/cm²	40kg/cm²

ORDER INFORMATION

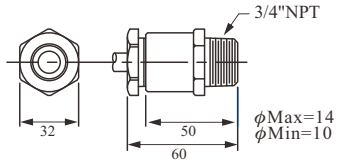
Model Number	Order Code
EB5200	EBX10000-A1
EB52A0	EBX10000-B1
EB52A1	EBX10200-B1
EB5201	EBX10200-A1
EB5300	EBX10000-A2
EB53A0	EBX10000-B2
EB53A1	EBX10200-B2
EB5301	EBX10200-A2
EB5400	EBX10000-A3
EB54A0	EBX10000-B3
EB5500	EBX10000-A4
EB55A0	EBX10000-B4
EB5501	EBX10200-A4

Model Number	Order Code
EB1710	EBX1001C-A8
EB1711	EBX1021C-A8
EB1720	EBX1001C-A1
EB1721	EBX1021C-A1
EB1730	EBX1001C-A2
EB1731	EBX1021C-A2
EB1740	EBX1001C-B1□□□□□□24
EB1742	EBX1001C-B1□□□□□□18
EB1743	EBX1001C-B1□□□□□□14
EB1752	EBX1001C-B2□□□□□□18
EB1753	EBX1001C-B2□□□□□□03

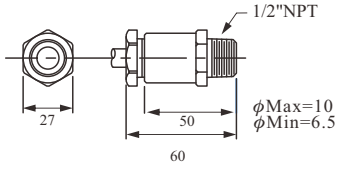
ACCESSORIES

Cable Conduit - Ex d IIC
Material: Washer — NBR
Body— Copper alloy(3/4"NPT)
Nickel plated(1/2"NPT)

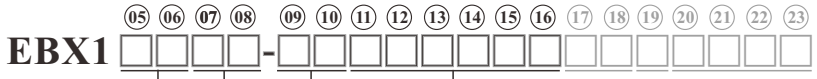
HP415-A23100MH01(29-1104)



HP415-A23000MG01(29-1108)



ORDER INFORMATION



⑤⑥ Type

00：Stan bard Type
02：Hi-Temp. Type
03：Sanitary Type
32：Sanitary+Hi-Temp. Type

⑦⑧ Certificafe

00：None
1C：ATEX-Sealed Explosion-proof
1D：ATEX-Dust Explosion-proof
7C：NEPSI-Sealed Explosion-proof
7D：NEPSI-Dust Explosion-proof

(Next page)

⑨⑩ Probe Typ

A1：Rod Probe Type
A2：Cable Type
A3：Two Rod Probe Type
A4：Anti-wave tube Type
A5：Anti-wave tube Coating Type
A8：Insulator Type
B1：Rod Coating Type
B2：Cable Coating Type
B3：Two Coating Rod Probe
B4：Anti-wave tube Two Coating Type

Connection

⑪⑫

Flange item
AK：JIS-FF
AN：ANSI-RF
AS：DIN-FF

Thread item
AA：JIS
AB：ISO
AC：ANSI
AD：DIN

⑬⑭

A8：1"
B1：1-1/2"
B2：2"
B4：2-1/2"
B5：3"
D8：DN25
E1：DN40
E2：DN50
E3：DN65
E4：DN80

⑮⑯

01：PT male
03：PF male
05：BSP male
07：NPT male
13：GAS male
40：5 kg/cm^2
42：10 kg/cm^2
48：150 Lbs
49：300 Lbs
57：PN10
58：PN16

⑰⑱Probe Material

MA：SUS 304
MB：SUS 316
03：FEP
14：PFA
18：PP
24：PVDF

⑲ Communication

A：None
B：HART

⑳㉑㉒㉓ Length

Code	Probe Range
0500~4000	500mm~4000mm, Rod Probe Type
0500~1500	500mm~1500mm, Two Rod Probe Type
0500~A500	500mm~50000mm, Cable Type("A" means multiplied by 100 times)

* 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.

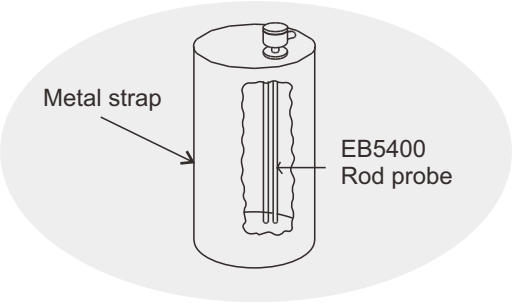


Fig. 1

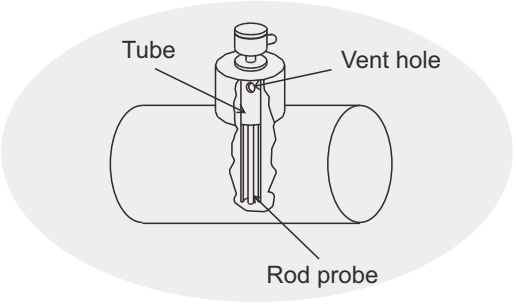


Fig. 2

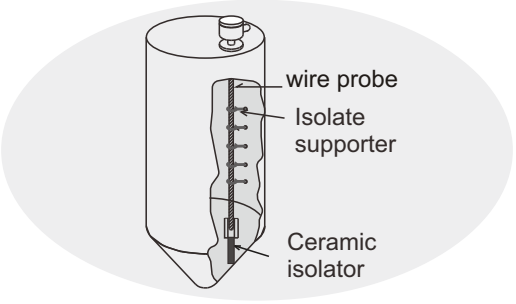


Fig. 3

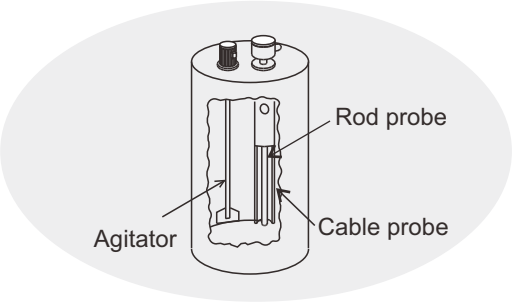


Fig. 4