



EB17XX SERIES EXPLOSION PROOF TYPE RF- CAPACITANCE LEVEL TRANSMITTER OPERATION MANUAL

Applicable Model: EB1710, EB1711, EB1720, EB1721, EB1730, EB1731, EB1740, EB1742, EB1743, EB1752, EB1753

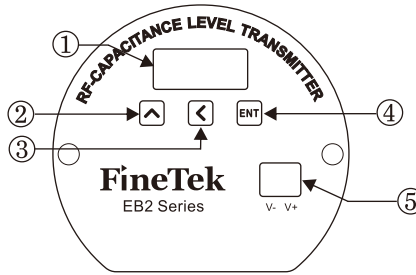


Thank for buying FineTek's products. Please read the user manual first before using it. It is important to be familiar with product's performance and function. Please keep the user manual for operation reference.



PTB PROOF NO.09 ATEX 1004 II 2G Ex d IIB T6~T3 Gb
II 2D Ex tb IIIC T80°C~T190°C
Db IP65

DESCRIPTION OF PANEL



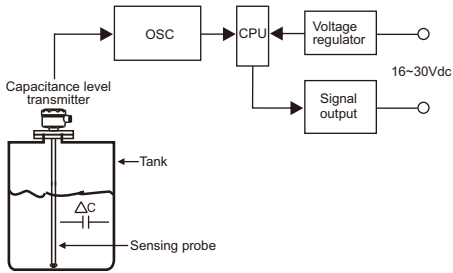
- ① LCD display
- ② "UP" button
- ③ "Shift" button
- ④ "Enter" button
- ⑤ Power supply

SPECIFICATION

Power supply	12~36Vdc	
Measuring range	0~5000PF	
Output	Output current	4~20mA(2 wire)
	Output linear range	3.8~21.5mA
	Upper limit	22mA
	Lower limit	3.5mA
	Output latch	3.5 ~ 22mA
Linearity	± 1% F.S. or 1PF (whichever is greater)	
Load resistance	<(Vs-12) × 50Ω Vs: Power Voltage (volt)	
Environment temperature	-40°C~80°C	
Operation temperature	According to the specification of probe	
Environment humidity	0~85% RH, non-condensing	
Temperature coefficient	< ± 0.02% F.S. per °C	
LCD Display range	-1999~9999	
Protection degree	IP 65	

WORKING PRINCIPLE

The level measurement of a medium in a tank is accomplished by capacitance theory. The tank wall, the sensing probe and the medium are all capacitors. A high frequency since wave is applied between the probe and the tank wall. The level change of the medium will consequently change the current of the applied since wave, forming a proportional relationship between medium level and output.



DESCRIPTION OF PANEL

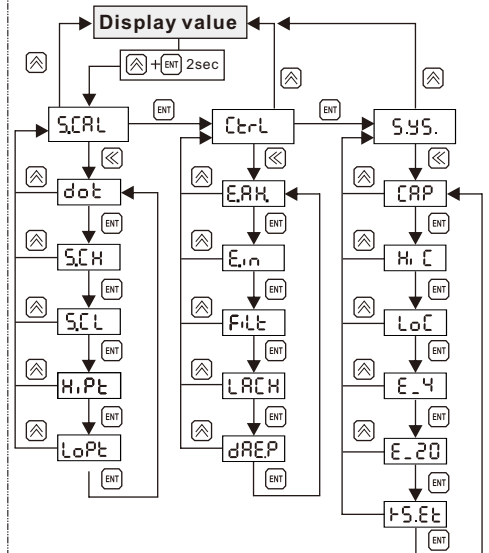
1. Button Protection, requiring to press ENT+UP buttons for 2 seconds in order to get into main menu.
2. Reversible Polarity
3. Any two points for calibration
4. Retention for maximum and minimum values.

DESCRIPTION OF PARAMETERS

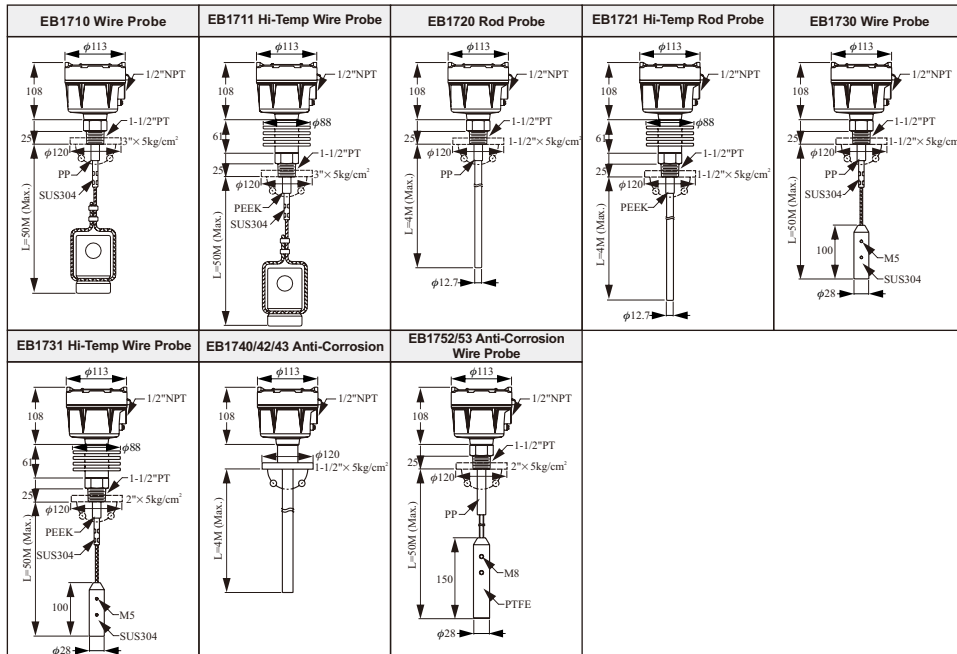
Main Menu	Sub-Menu	Range	Default	Description
SCAL	dot	0~3	DOT1	Decimal point setting
SCAL	H.Pt	-1999~9999	100.0	20mA corresponding display value
SCAL	L.Pt	-1999~9999	0	4mA corresponding display value
LoPt		-1999~9999	100.0	Corresponding calibration value for high point (HiPt). See remark 1
LoPt		-1999~9999	0.0	Corresponding Calibration Value for low point (LoPt). See remark 1
Ctrl	ERR	SAVE, RSET	SAVE	Memory for max & mini value during operation.SAVE:Save value into Eeprom
Ctrl	ERR	SAVE, RSET	BACK	REST:Clear present value and memory,BACK:Go back to sub-menu
Ctrl	ERR	SAVE, RSET	BACK	SAVE
FLt		Lo,MID,HI	LO	Software Filter
LACH		ON, OFF	OFF	Output latch enable or disable. See remark 2.
dREP		1~60sec	1	Output updated time
SYS.	CRP	0~9999		Display current capacitance value
HiPt		0~9999	5056	corresponding to calibration value of capacitance at high point
LoPt		0~9999	54	corresponding to calibration value of capacitance at low point
E_4		-1999~9999	0	4mA micro setting value
E_20		-1999~9999	0	20mA micro setting value
F.S.Et				Default

Remark 1: Please refer to calibration procedure for HIPT & LOPT setting.
Remark 2: If you select ON, the output will be latched at 3.5mA/22mA when it reached to 3.5mA/22mA.

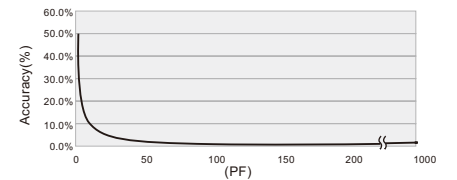
PROGRAM SETTING FLOW CHART



EXPLOSION TYPE



PF & ACCURACY CHART



ERROR MESSAGE

"1"	Over present display range
"-1"	Lower present display range
"OL"	It means over measuring range (0~1000pF). Please add covering to decrease capacitance.
"LACH" ↔ "1234"	Output latch start up.
"SPAN" ↔ "WARN"	Material ranges below 20pF.

CODE

A: 8	B: b	C: C	D: d	E: E	F: F
G: 9	H: H	I: i	J: J	K: k	L: L
M: E	N: n	O: o	P: P	Q: Q	R: r
S: S	T: t	U: U	V: V	W: W	X: X
Y: Y	Z: Z				

INSTALLTION INSTRUCTIONS FOR EX-PROOF PRODUCTS

1. There is an internal/external ground terminal in the housing. Please be sure to ground terminals when you use.
2. When install or maintain in the field, to comply with the caution "Open after power off"
3. Cable conduit should equip with explosion approval device (AD105DS). It can't be revised arbitrarily and have to lock well.
4. Be sure to obey the safe regulation of electric appliance for dangerous field when install and maintain.
5. Corrosive gas or liquid application isn't available for Aluminum & Stainless (SUS) material.
6. The level of temperature class for explosion sign and its maximum allowed temperature relating to the medium.

Temp. categories	T1	T2	T3	T4	T5	T6
Max. surface temp.	≤ 450°C	≤ 300°C	≤ 200°C	≤ 135°C	≤ 100°C	≤ 85°C
Medium temp.	≤ 440°C	≤ 295°C	≤ 195°C	≤ 130°C	≤ 95°C	≤ 80°C
7. Customers can't change the internal components and have to check the outer.

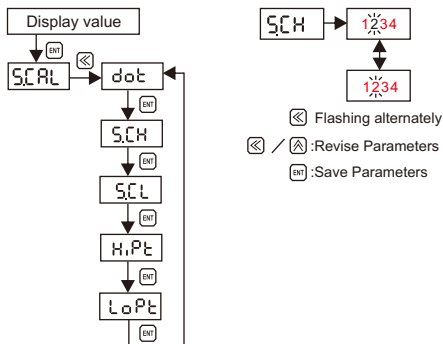
SETTING FLOWCHART FOR EACH FUNCTION

Compact Capacitance Level Transmitter is to press the three buttons (UP, SHIFT, ENTER) on display panel. Firstly, selecting the setting menu then input value by using three buttons showing below:

	Selection	Setting
▲ Up button	Escape button	Increment button
◀ SHIFT button	Enter button	Position shift button
▶ ENTER button	Swap button	Confirmation button

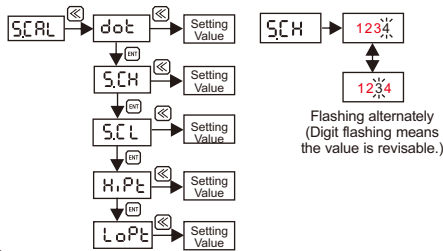
ENT Enter button

- **Swap button** is for swapping to different menus, such as from main menu to main menu or from sub menu to sub menu.
- **Confirmation button**. After revising the SCH value, press enter button to save the revised value.



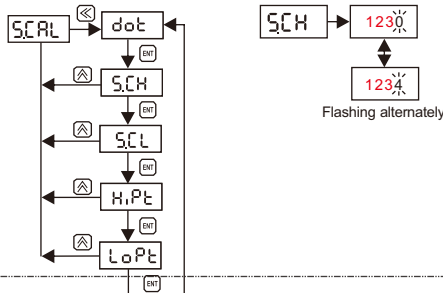
◀ SHIFT button

- **Shift button** is for entering a sub menu from main menu or doing a position shifting after entering sub menu.
- **Position shift button**. After entering revision mode, press this button to shift into revisable position.



▲ UP button

- **Up button** is enable to escape from revision mode or to escape from sub menu to main menu.
- **Increment button**. After entering revise mode, press this button to increase the revisable value. For example, changing SCH value from "1230" to "1234" is to press this button fourth.



CALIBRATION PROCEDURES

1. Read installation notice before calibration.
2. It is recommended to have the media touched probe bottom when users calibrate lowest value for empty tank.
3. During calibration, probe should be put into the tank. Don't calibrate the product outside the tank.
4. Please keep at least 50% distance between HIPT and LOPT to ensure accuracy. It is recommended to calibrate with empty and highest level in the tank.

Standard Procedures:

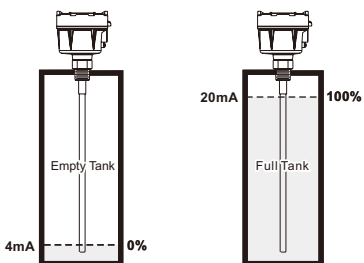
1. SCH : Set the max display value corresponding to 20mA at SCH.
 2. SCL : Set the min display value corresponding to 4mA at SCL.
 3. HIPT : Input and save the corresponding value at HIPT, while the medium is in high level.
 4. LOPT : Input and save the corresponding value at LOPT, while the medium is in low level.
- Completed Calibration

Example 1:

The lowest value sets at 0 and the output sets at 4mA. The highest value sets at 100.0 and the output sets at 20mA. Calibration is done in empty and full tank.

Procedures of calibration for example 1

1. Input : Dot=1, SCL=0.0, SCH=100.0. (It can be adjusted anytime; Nothing is related with the status of tank.)
2. When the tank is empty, go to the LOPT setting and input 0.0, then press "ENT" → "SAVE" (remark 1).
3. When the tank is full, go to the HIPT setting and input 100.0, then press "ENT" → "SAVE" (remark 1).

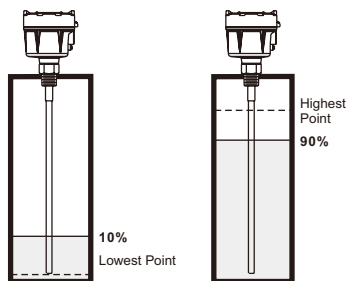


Example 2:

The lowest value sets at 100.0 and the output sets at 4mA. The highest value sets at 200.0 and the output sets at 20mA. It is calibrated at 10% of tank high and 90% of tank high. The 0% of the total height of the tank is corresponded to 4mA, while the 100% of the total height of the tank is corresponded to 20mA.

Procedures of calibration for example 2

1. Input : Dot=1, SCL=100.0, SCH=200.0. (It can be adjusted anytime; Nothing is related with the status of tank.)
2. To fill the medium till reaching to the 10% height of the tank, go to the LOPT setting and input the value of 10.0 and then press "ENT" → "SAVE" (Remark 2).
3. To fill the medium till reaching to the 90% height of the tank, go to the HIPT setting and input the value of 90.0 and then press "ENT" → "SAVE" (Remark 3).



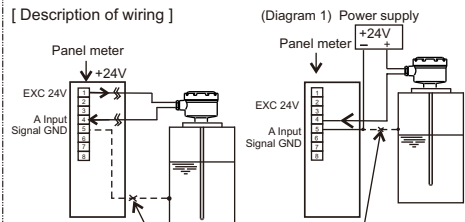
Remark 1: Under the setting for Hipt & Loipt, press "ENT" to show [Err] (screen flashing). Press "ENT" button to save the value and then press "UP" button to escape the setting.

Remark 2: When Hipt or Loipt setting is over range, the LCD show "Err", Please reset the value.

WIRING AND CAUTION

- After installation of the Compact Capacitance 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 wiring for panel meter is showing in diagram 1.
- The max cable length is depends on the max resistance. Maximum resistance is not to exceed $(V_s - 15) \times 50W$ to ensure the accuracy of measurement.
- Make sure to separate the signal cable with other big power cables (such as pump, conveyer and solenoid valve) while wiring. Before turning on power, make sure all wirings are correct.
- Connect isolation cable with GND of power.
- Connect tank with heater or cover of electric device to decrease EMI.

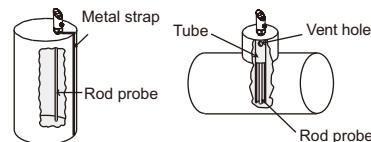
[Description of wiring]



Warning The Signal GND of panel meter should not be connected with tank wall or the cover of the EB Transmitter, otherwise the measurement will be incorrect.

INSTALLATION

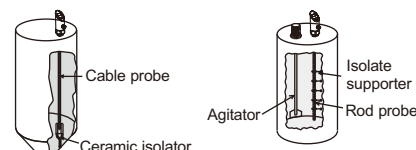
1. The rod probe or cable probe (depending upon which one you purchased) should be parallel to the tank wall and be positioned as close as possible to the tank wall. Make sure the medium does not stick in between the probe and the tank wall.
2. If the tank is not electrically conductive, a metal strap should be added outside of tank wall (fig. 1) for either liquid or non-liquid medium. Or place a metal tube, usually made out of stainless steel, around the rod (fig. 2) for liquid medium. This metal tube should come with a vent hole at top of the tube to allow the medium to go up inside of the tube.
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 metal tube with vent hole at the top. (Fig. 2)



(Fig. 1)

(Fig. 2)

4. For non-conductive medium of powder or granules in a new or empty tank, the cable probe should be fixed to the bottom of tank with ceramic isolator (EB2100 Series). If the tank is not empty, please use the EB2300 Series. (fig. 3)
5. Make sure to fix the rod probe or cable probe to the container wall with non-conductive supporting material. If an agitator is in place (see fig. 4). This will prevent the deformation of the rod probe and tangling of the cable probe around the agitator.
6. If the medium is conductive, make sure to coat the rod probe or cable probe with PVDF or PP material.
7. During the installation, the process connection should be grounded. An installation without proper grounding will not guarantee normal operation of the device later on.
8. When all electrical connections inside of a Capacitance Level Transducer housing are finished, the housing cover and the conduit opening should be sealed and tightened to prevent moisture from soaking in.



(Fig. 3)

(Fig. 4)