

**Microprocessor Resistivity & Conductivity
Monitor/Controller**

EC410 / EC430

Operation Manual



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1. Specifications

Model	EC 410	EC 430
Mode	Resistivity/Conductivity/Temperature	
Measuring Range		
Resistivity	0.00 MΩ.cm~20.00 MΩ.cm	
Conductivity	0.00 μS/cm~200.0 mS/cm	
Temperature	0~100℃	
Resolution		
Resistivity	0.01 MΩ • cm	
Conductivity	0.01 μS/cm	
Temperature	0.1℃	
Accuracy		
Resistivity	±1%±1 digit	
Conductivity	±1%±1 digit	
Temperature	±0.5℃	
Cell constant	0.01, 0.05, 1.00, 10.00 cm ⁻¹ are fixed	
	0.001~19.99 are adjusted	
Temperature compensation	Choose temperature sensor PT1000 or NTC30K manually	
	Automatically / Manually	
Temperature coefficient		
Resistivity	Nonlinear compensation	
Conductivity	Linear temperature compensation (0.00% ~40.00%) or nonlinear	
Ambient temperature	0~50℃	
Storage temperature	-10~70℃	
Display	LCD	
Current output	Isolated DC4~20 mA , max. Load 500 Ω	
Alarm function	-	Yes
Alarm contact	-	Relay ON/OFF 240 VAC 2A max.
Alarm control	-	Hi/Lo controlling
Power supply	Switching power 88~265 VAC , 50/60 Hz	
Dimension	48×96×110 mm (H×W×D)	
Cut out dimension	44 x 96 mm (H x W)	
Weight	0.25 kg	

2. Assembly and installation

2.1 Precautions for installation

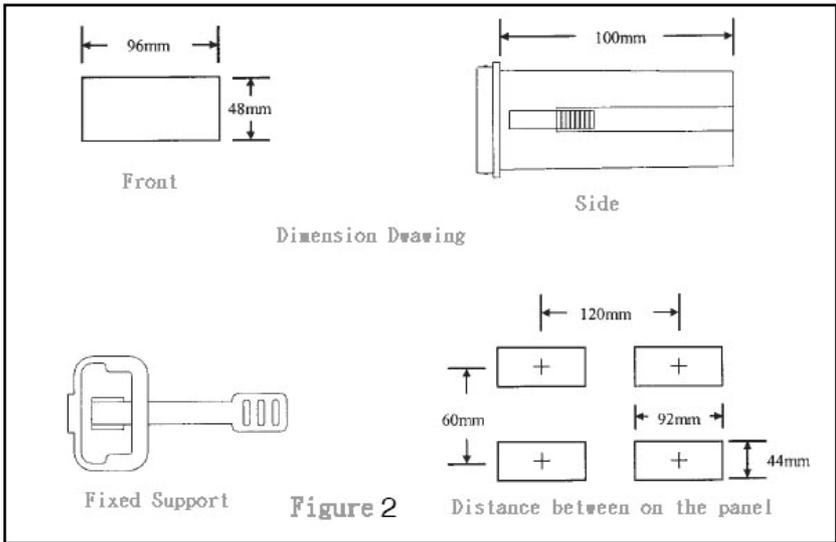
Wrong wiring will lead to breakdown or electrical shock of instrument, please read the operating manual clearly before installation.

- a. Make sure to remove AC power to the controller before wiring input and output connections, and before opening the controller housing.
- b. The installation site of the controller should be good in ventilation and avoid direct sun shining.
- c. Relay contacts are subjected to electrical erosion. Don't connect relay contacts directly to heavy loads, connecting a magnetic switch instead. Especially with inductive and capacitive loads, the service life of the contacts will be reduced.
- d. For suppression of sparks and arcing, components such as RC combinations, nonlinear resistors, series resistors, diodes and varistors are used.

2.2 Installation of controller

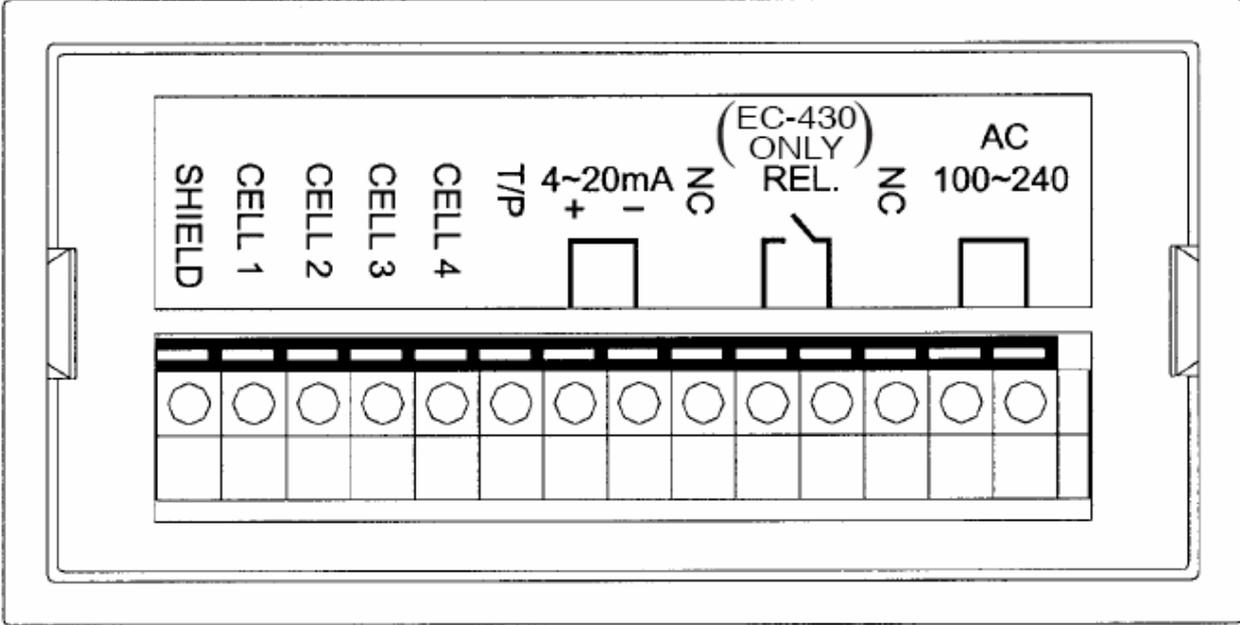
Reserve a 44 x 92 mm hole on the front panel of the wall mount chassis and insert the controller from the rear of the chassis, fasten the two sides fixing support.

2.3 Cutout dimension

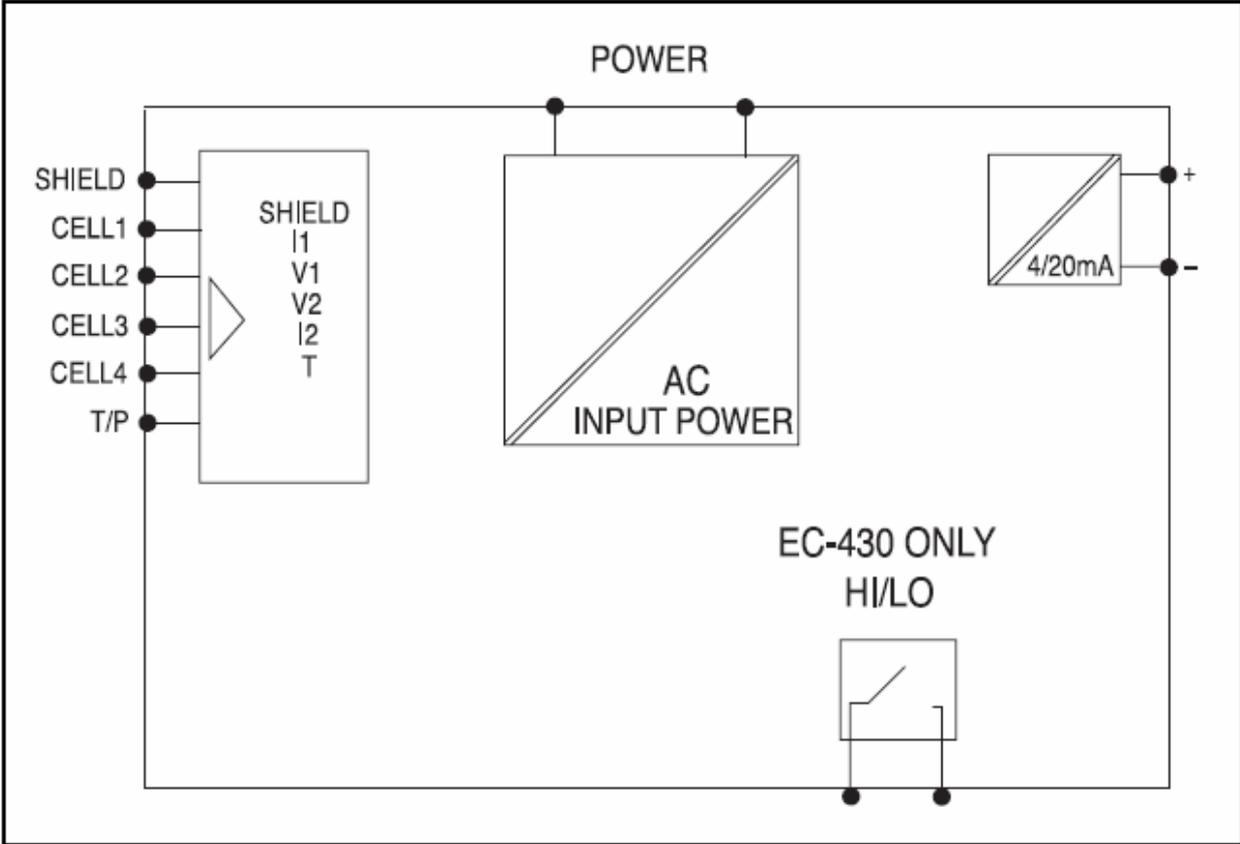


3. Block diagram and rear panel

3.1 Rear panel



3.2 Function block diagram

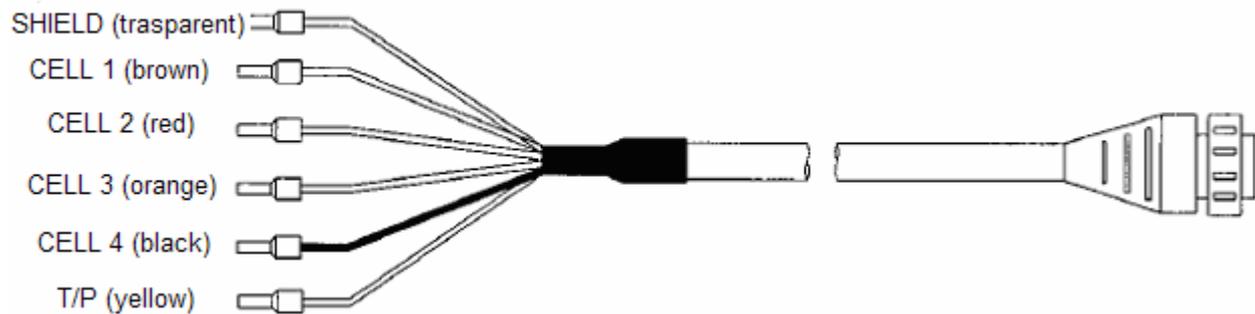


3.3 Descriptions of rear panel

- SHIELD : Connecting to the net wire of CELL
- CELL 1 : Connecting to the brown wire of CELL
- CELL 2 : Connecting to the red wire of CELL
- CELL 3 : Connecting to the orange wire of CELL
- CELL 4 : Connecting to the black wire of CELL
- T/P : Connecting to the yellow wire of CELL
- 4~20 mA : For the connection to outside recorder or PLC control
- NC : No function
- REL. : Hi/Lo alarm control contact (for EC 430)
- NC : No function
- AC100~240V : Controller power connection (the real value is from AC88V to 265V)

3.4 Connection diagram of Electrode

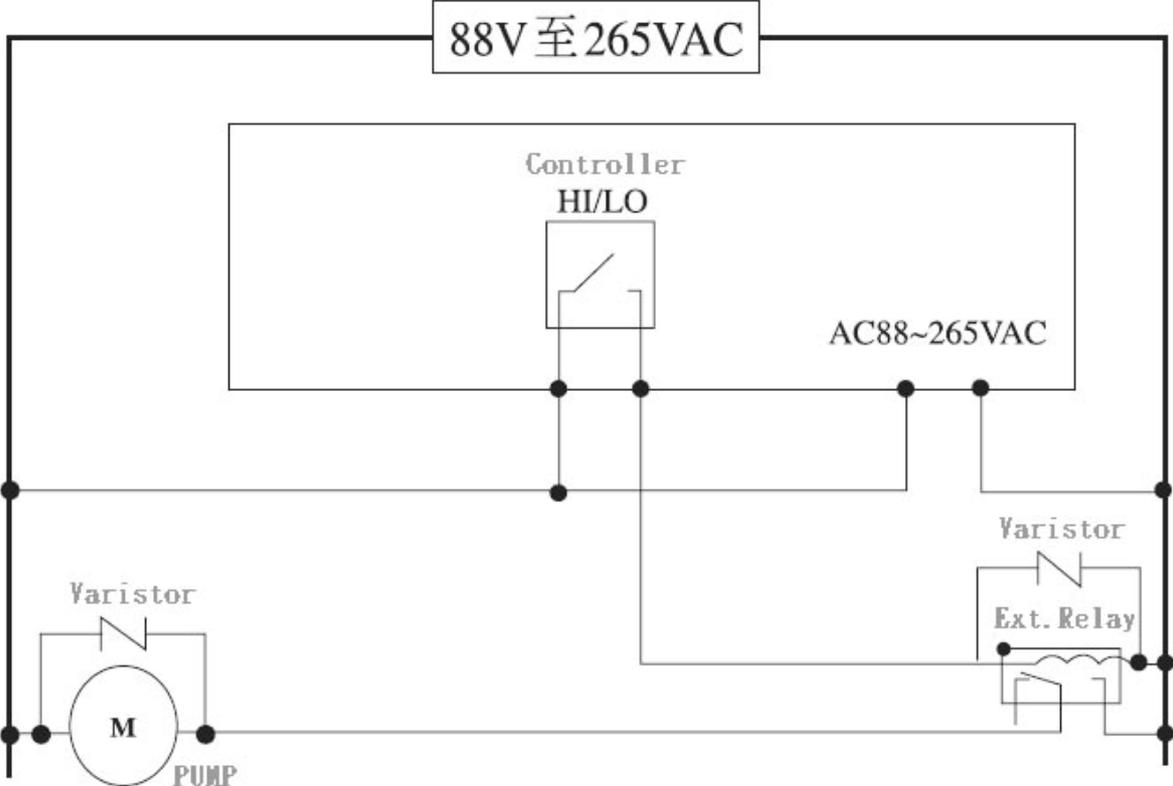
3.4.1 Wiring of electrode



3.4.2 Circuit of electrode

SUNTEX Electrode				Others
Type	2E electrode 8-221/8-222 4E electrode 8-241 Circuit statement	8-11-3 Circuit statement	8-12-6 Circuit statement	Please read the descri- ption of electrode
SHIELD	Transparent line	Net line	Net line	SHIELD
CELL1	Brown line	Short with transparent line	Short with transparent line	CELL1
CELL2	Red line	Short with white line	Short with green line	CELL2
CELL3	Orange line			CELL3
CELL4	Black line			CELL4
T/P	Yellow line	Yellow line	Red line	T/P

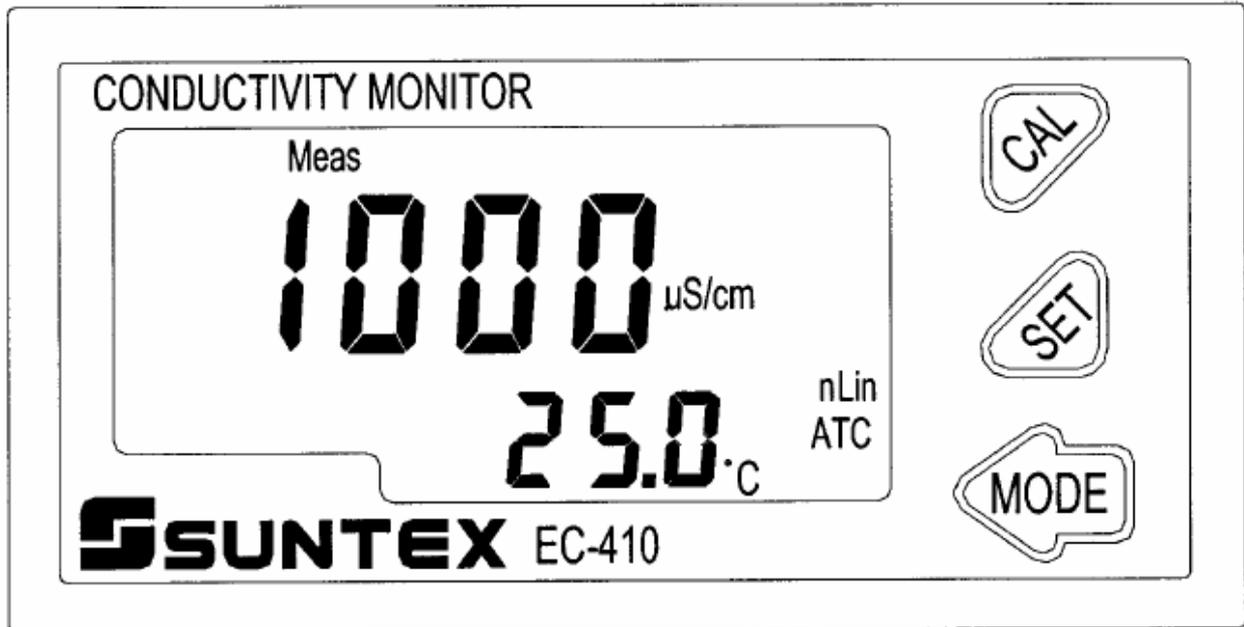
3.5 Electrical connection diagram



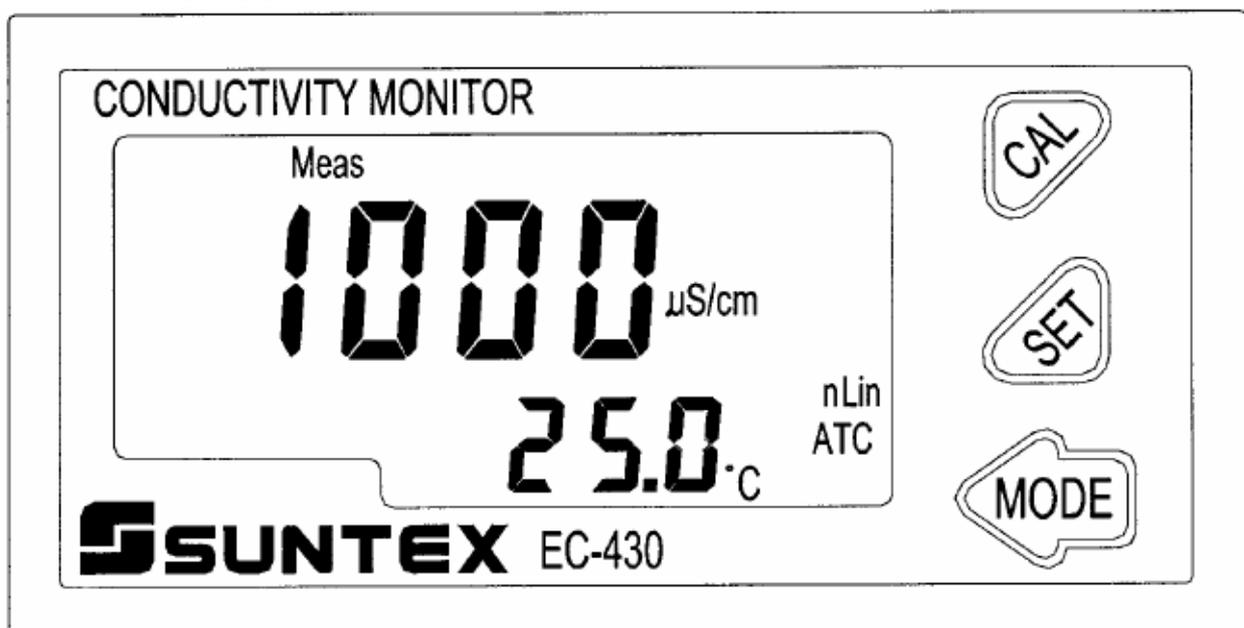
4. Illustration of functions on front panel

4.1 Display

4.1.1 EC 410



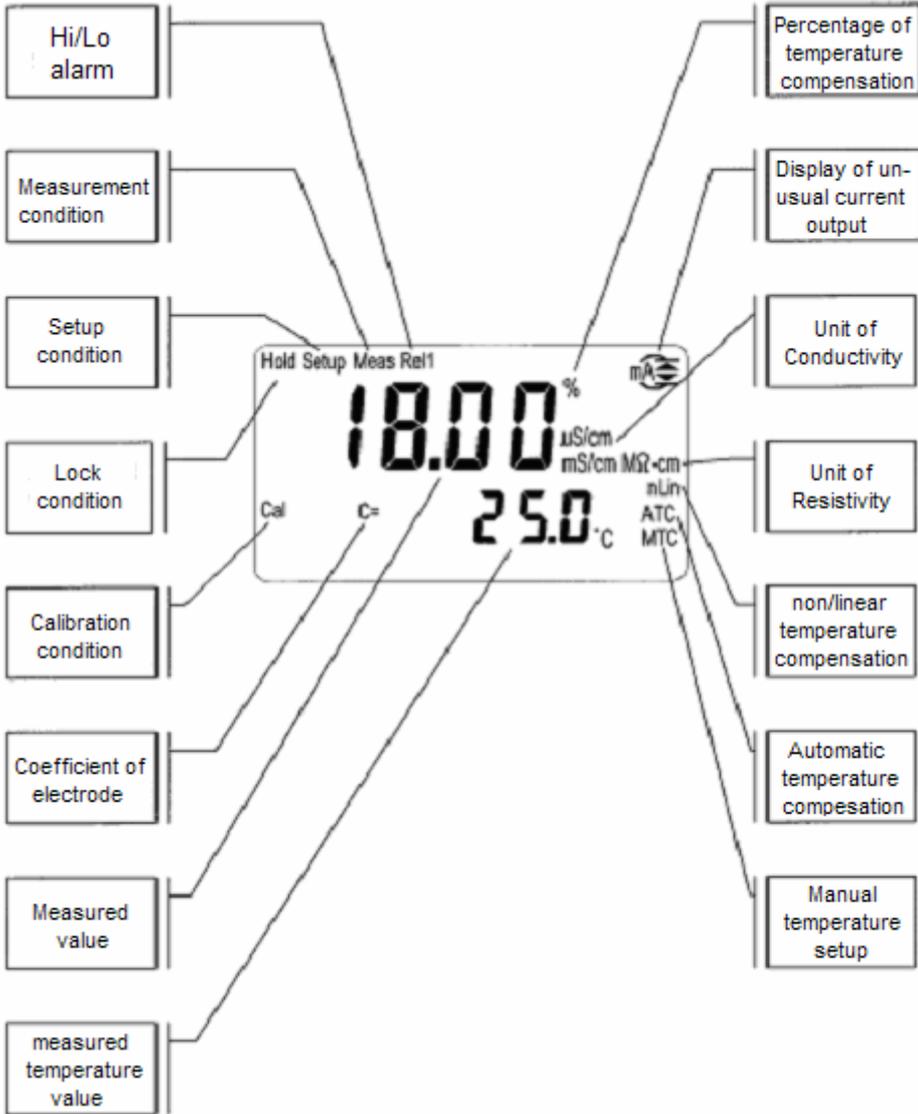
4.1.2 EC430



4.2 Descriptions of LCD screen

-  : Current output is over 20 mA
-  : Current output is lower than 4 mA
- Meas : Measurement condition
- Setup : Setup condition
- Cal : Rectification condition
- Rel1 : HI/Lo, alarm setup condition
- Hold : Lock of control condition

4.3 Functions of LCD screen



4.4 Descriptions of buttons

To avoid wrong operation, SUNTEX designs the combo-button system to operation. All functions of buttons are described as following:

 : Up adjustment button; working with  button to enter calibration mode.

 : Down adjustment button; working with  button to enter setup mode.

 : Confirm button; work with  or  button to enter calibration or setup mode. Be the selection button in calibration and setup mode.

 +  : At measurement mode, push these two buttons to enter parameters setup mode.

 +  : At measurement mode, push these two buttons to enter calibration mode.

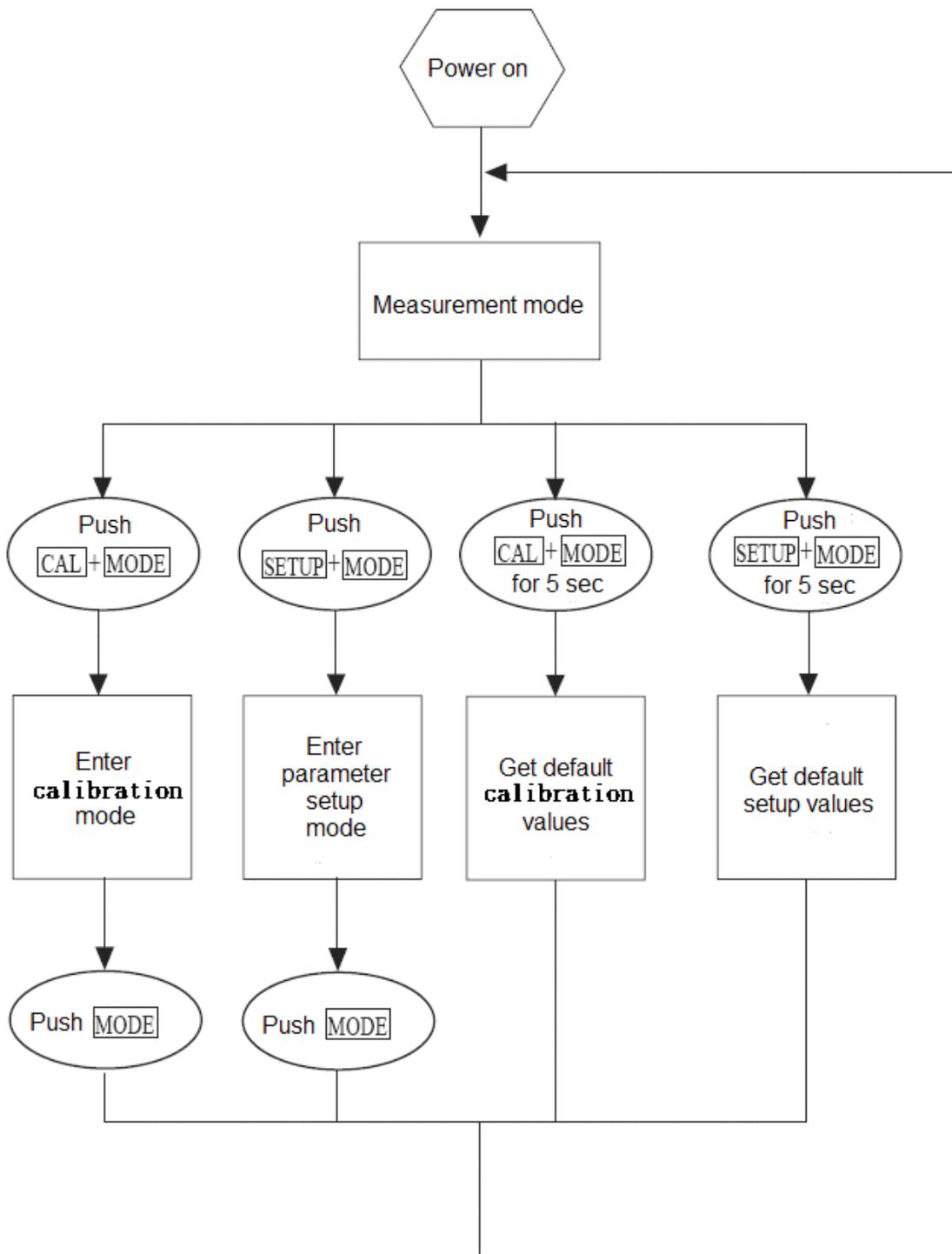
 +  : At parameters or calibration mode, push these two buttons simultaneously to get the default values.

 +  : At measurement mode, push  +  buttons simultaneously until words on screen are gone to get default parameter values.

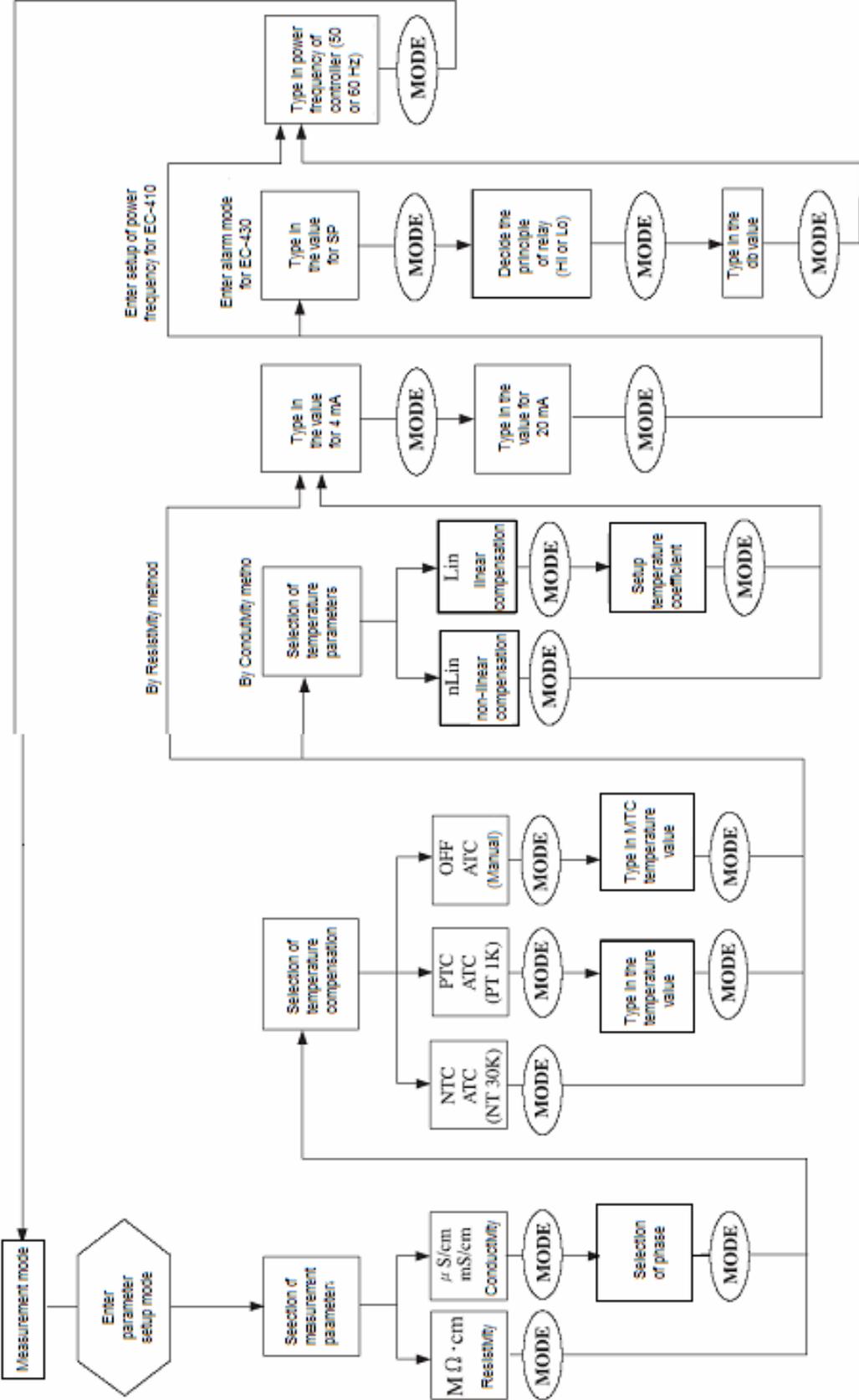
 +  : At measurement mode, push  +  buttons simultaneously until words on screen are gone to get default calibration values.

5. Operation

Make sure the circuit is ok and then power it on. Enter the operation mode to start measurement, and adjust parameters or rectifications by following below dialogues.



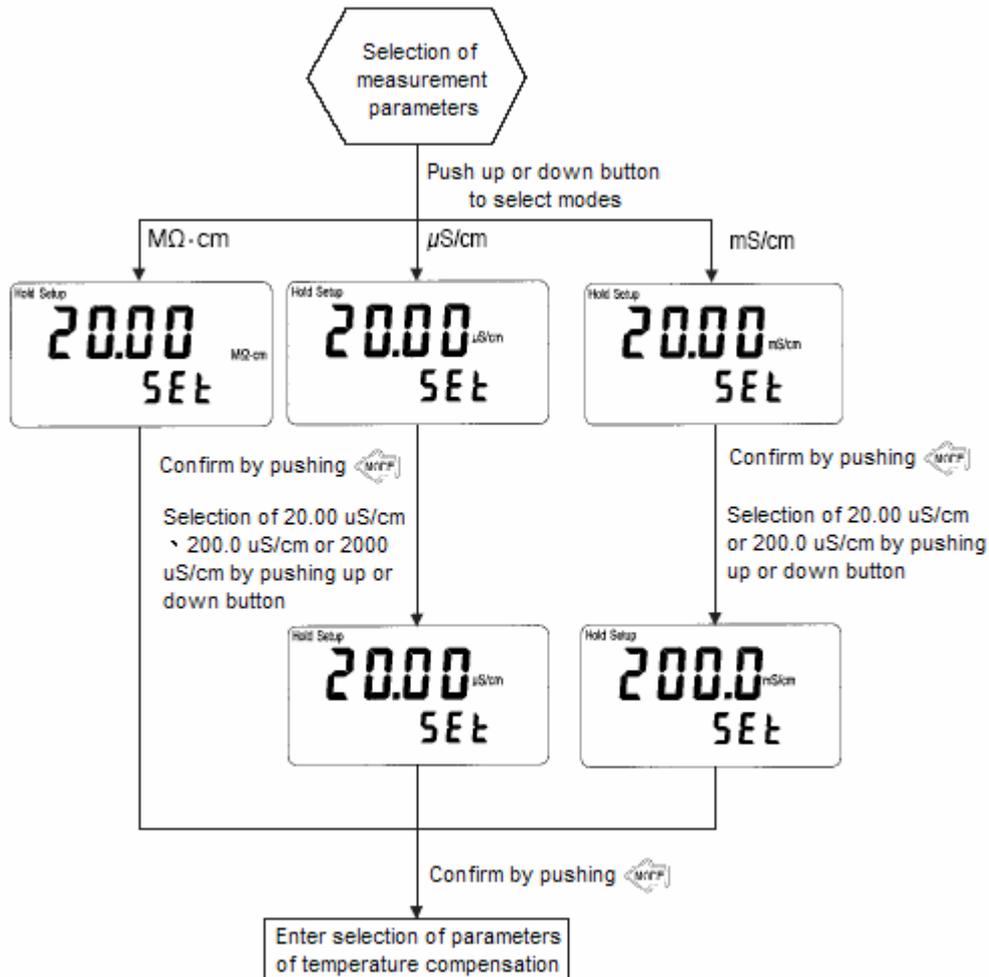
6. Setup



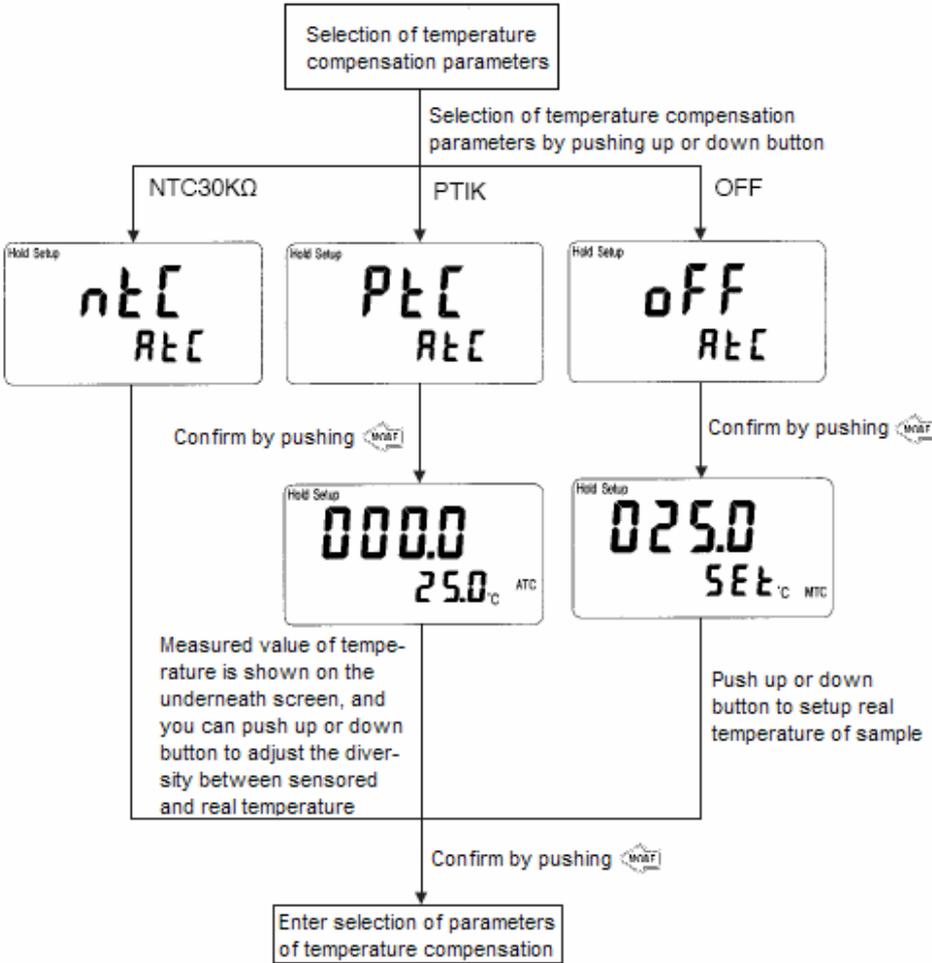
6.1 Setup mode

Push  +  buttons simultaneously to enter setup mode for parameters.

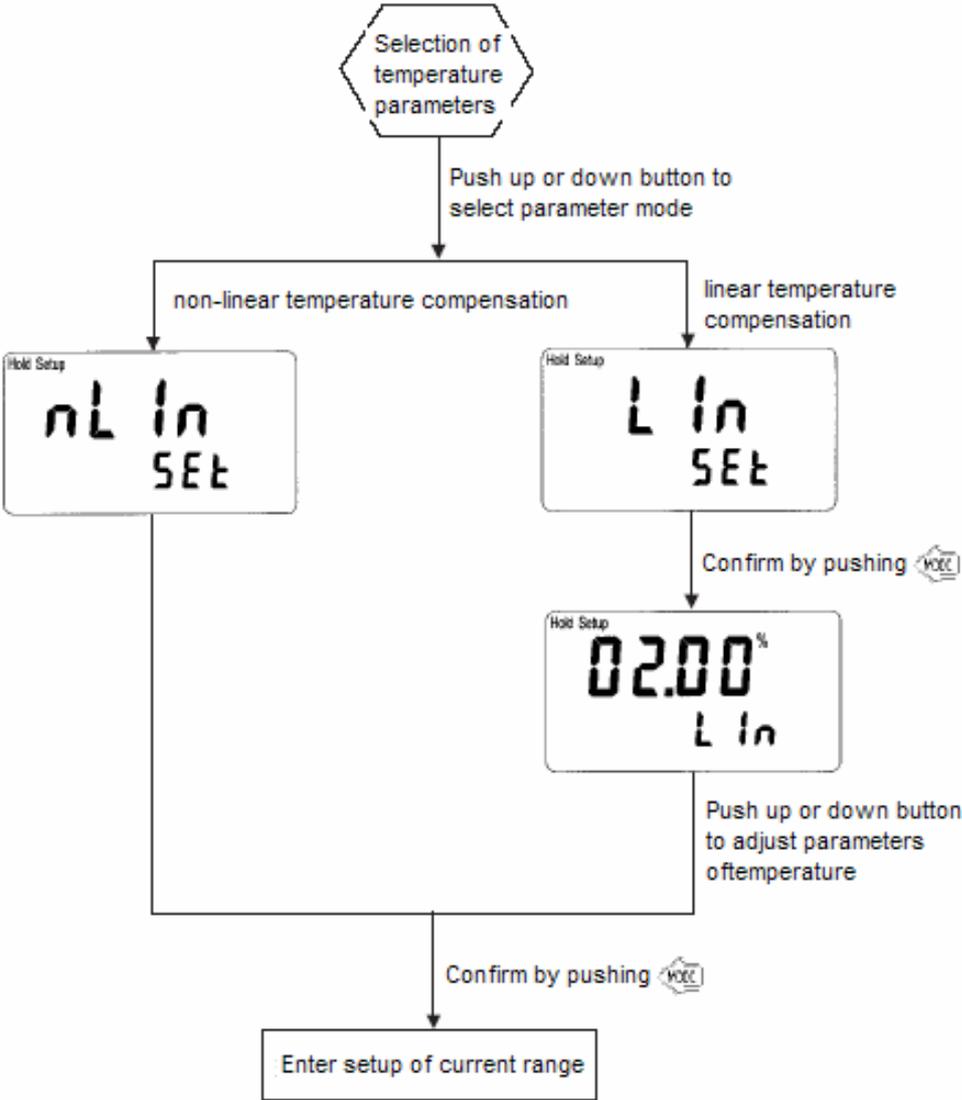
6.2 Selection of measuring mode



6.3 Selection of temperature compensation mode

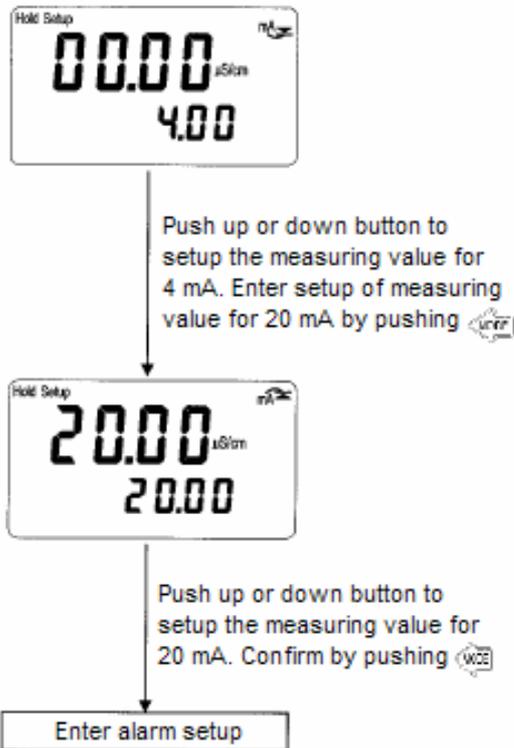


6.4 Selection of temperature coefficient mode (Used for Conductivity measurement mode ONLY)



6.5 Current mapping

Adjusting the measuring range of Conductivity/Resistivity corresponded with output current to raise the resolution of output current.



Enter setup of power frequency for EC-410

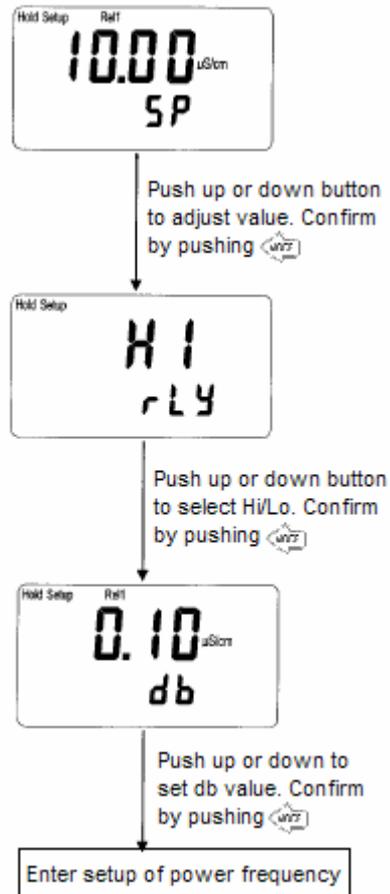
6.6 Alarm setting

(Only for EC-430)

Set the start of alarm by Hi or Lo action, the set value (TH, THRESHOLD), and the dead band (DB, DEADBAND).

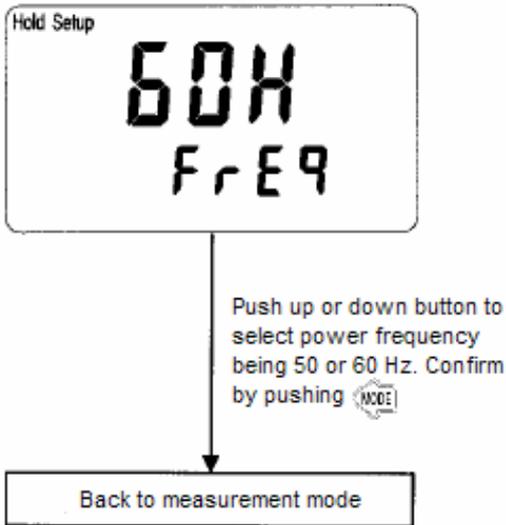
Resistivity: 0.00~20.00 MΩ

Conductivity: 0.00μS ~200.0mS



6.7 Frequency of power supply setting

Select the working power frequency to be 50 or 60 Hz



Select the right power frequency according to the local standard.

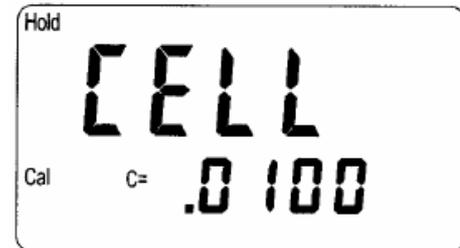
7. Calibration

1. Push  +  buttons simultaneously to enter calibration mode.

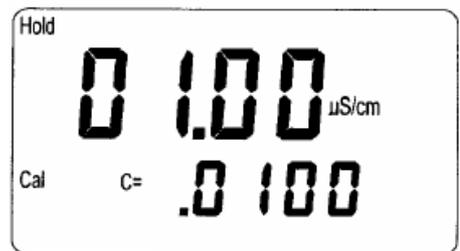
2. The last value of electrode will be shown on the screen after entering calibration mode. Waiting for 3 seconds or push  button directly to go to next step.



3. When the value of electrode is flashing, pushing up or down button to set the value. Choices of Conductivity, 0.01, 0.05, 1.00, and 10.0, can be selected. After selection, push  button to next step.



4. When the values of electrode and measurement are flashing at the same time, push buttons up or down to adjust the value of electrode. User can calibrate by using calibration solutions or electrodes, and push  button to confirm to return to measurement mode after you finish calibrate.



This controller supplies 4 CELL constant to be adjusted:

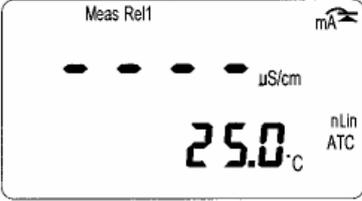
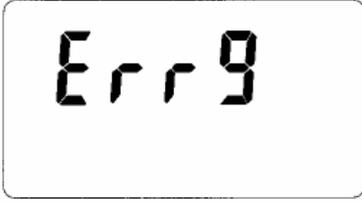
Range 0.001~1.000 when cell constant is 0.01

Range 0.001~1.000 when cell constant is 0.05

Range 0.050~9.999 when cell constant is 1.00

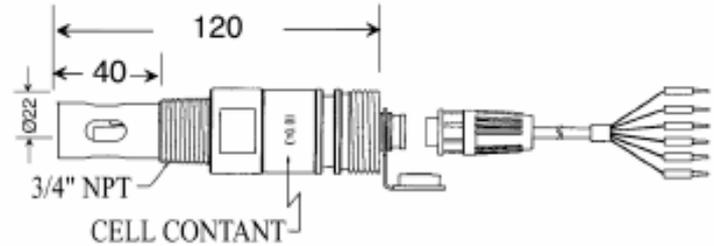
Range 1.000~19.99 when cell constant is 10.00

8. Troubleshooting

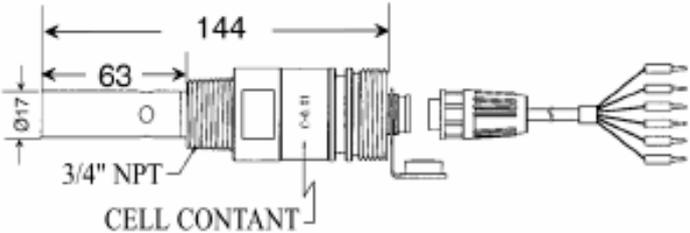
Symptoms	Possible Problems	Resolutions
	<ol style="list-style-type: none"> 1. Measuring value is out of the detection range 2. Wrong circuit 	<ol style="list-style-type: none"> 1. Change to the higher detection range 2. Check the circuit
	<ol style="list-style-type: none"> 1. Temperature is out of detection range 2. Wrong circuit 	<ol style="list-style-type: none"> 1. Decrease the temperature of sample to proper range 2. Check the circuit
	<p>Breakdown of controller</p>	<p>Call the service people</p>

9. Installation of electrode

9.1 Diagram of electrodes

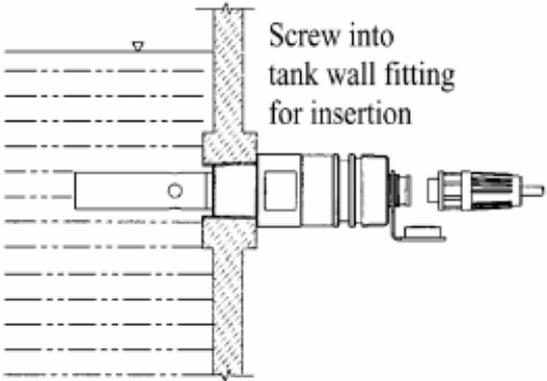
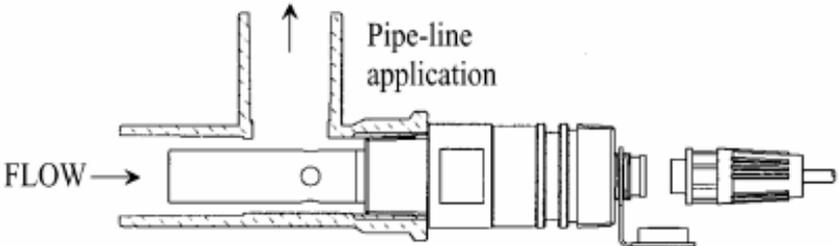


[Four-wire electrode]



[Two-wire electrode]

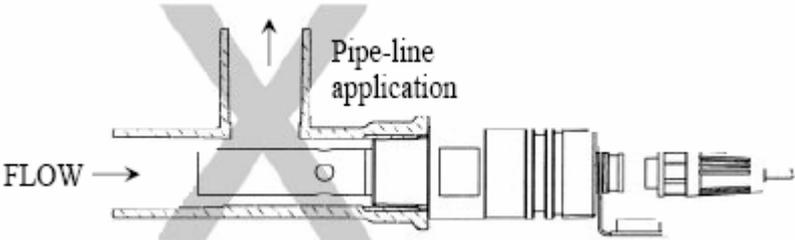
9.2 Correct installation



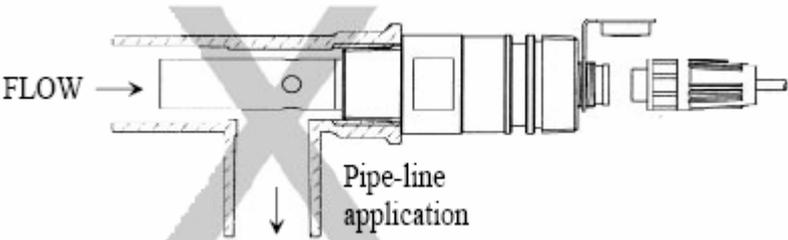
Conductivity Cells

9.3 Incorrect installation

- a. Inserted part of electrode is too short to circulate well and may cause false measurement.



- b. Insufficient stream may cause the false measurement of electrode.



- c. Immersed part of electrode is too insufficient to circulate well and may cause false measurement.

