

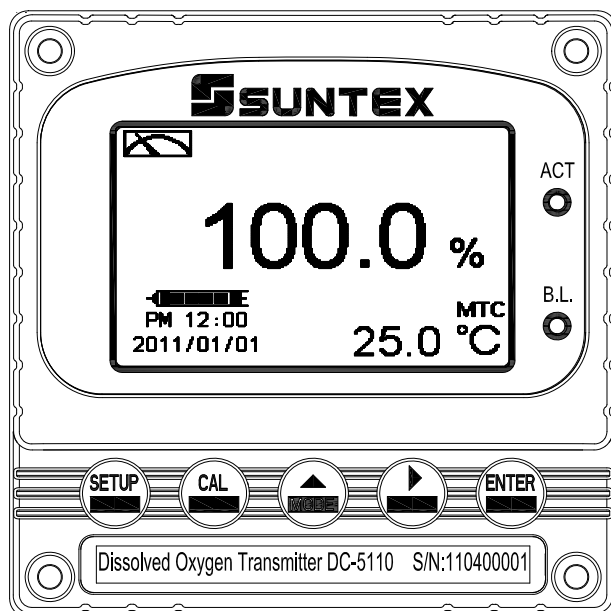
DC-5110

Intelligent

Dissolved Oxygen

Transmitter

Operation
Manual



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Precautions for installation

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


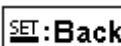


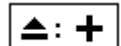


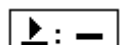


- To avoid potential danger, please do not send a current unless all wirings are finished and checked without any error.
- Please install this controller in an environment far away from high temperature, high humidity and corrosion, as well as from direct sunlight irradiation.
- The material of signal cable should be special coaxial cable. Strongly recommend using our coaxial cable. Do not use normal wires instead.
- Avoid electrical surge when using power. Especially when using three-phase power, use ground wire correctly. (In case of electrical surge, it is recommended to separate the power supply and controlling device of the control; for example, separate from the power supply of the Dose feeder and mixing machine, so that the controller can use a specific power supply independently. Or you can eliminate the surge by installing a surge absorber at the electromagnetic switch or the loop of dynamic controlling device).
- **The output contact of this controller is used to connect device of alarming or controlling function. For security and protection, make sure to connect a relay able to endure adequate current, in order to ensure the use security of the instrument.** (see electrical wiring reference diagram 3.5)

Brief Instruction






Description of set-up settings (see chapter 6 for details)












Press  and  simultaneously to see the overview of the set-up settings now. Then press  if you would like to modify set-up settings. Press keypad according to index of keypad on the screen.

Index of keypad




keypad	Accordingly item	Description
		Back to upper layer
		Choose leftward of change to left page
		Increase digit
		Choose rightward of change to right page
		Decrease digit
		Confirm settings after modifications and then go through next step

Selection of set-up items








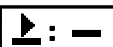


keypad	Accordingly item	Description
Mode		Measurement mode, to select from polarographic or pre-amplifier sensor
Unit		Unit setting, select saturation %, of concentration ppm or mg/l (when select concentration unit, the salinity concentration need to be set)
Product Adj		Sample readings adjust settings--Users may make correction without removing the electrode out of installation site. Adjust the on-site measurements until the reading is as same as the reading from the lab measurement to eliminate the doubt of measurement error.
Temperature		Temperature measurement and compensation, including MTC, PTC, NTC (3 types total). MTC---Manual temperature compensation, PTC/NTC--- auto temperature compensation
Relay 1		First relay setting, to choose action off or Hi/Lo alarm

Relay 2		Second relay setting, to choose action off or Hi/Lo alarm
Clean		Automatic wash time setting, to choose electrode clean equipment's ON and OFF duration
Analog 1		Current output according to saturation or concentration setting range
Analog 2		Current output according to temperature setting range
Clock		Clock setting (When out of power and reboot it, the instrument's time setting will return to the factory pre-setting)
Digital Filter		Take every serial 1~60 measurements, average them continuously, and make it as the readings
Back-light		Backlight setting, to set Auto/ON/OFF backlight, brightness, and sensitivity
Contrast		Contrast of screen setting
Return		Setting of returning to the measurement mode
Code		Security code of set-up mode. The set-up code is precedential to calibration code, thus it can pass a different security code of calibration. (Please refer to ch.6.2 for detail.)
Language		Available for English, Traditional Chinese, Simplified Chinese



Description of calibration settings (see chapter 7 for details)

Press  and  simultaneously to see the last calibration information. Then press  if you would like to make a new calibration or modify setting of calibration. Press keypad according to index of keypad on the screen.

Index of keypad:

keypad	Accordingly item	Description
		Back to upper layer
		Choose leftward of change to left page
		Increase digit
		Choose rightward of change to right page
		Decrease digit
		Confirm settings after modifications and then go through next step

Selection of calibration items

keypad	Accordingly item	Description
Calibration	Start Cal.	Calibration mode
Return		Time interval setting of returning to the measurement mode
Code		Security code of calibration mode.
1-point	1-point Calibration	One point slope calibration
2-point	2-point Calibration	Dual points offset and slope calibration
Pressure	bar	According to pressure unit to set pressure value
Pressure	mm Hg	According to pressure unit to set pressure value
Pressure	psi	According to pressure unit to set pressure value

Note: SUNTEX reserves the right to change the figure of icons and contents. The actual icons and contents please refer to the instruments.

1. Specifications

Model		DC-5110
Measuring mode		% / ppm / mg/L / TEMP.
Measuring Range	%	0~600 % (Depends on the sensor)
	mg/L	0~60.00 mg/L (Depends on the sensor)
	ppm	0~60.00 ppm (Depends on the sensor)
	Temp.	0~140°C(Depends on the sensor)
Resolution	%	0.1 %
	mg/L	0.01 mg/L / 0.001 mg/L
	ppm	0.01 ppm / 0.001 ppm
	Temp.	0.1°C
Accuracy	%	±0.5% of reading (±1 digit)
	mg/L	
	ppm	
	Temp.	±0.2°C (±1 digit) , Temperature error correction function
Temperature Compensation		NTC30K / NTC22K auto recognized
		Manual adjustment
Salinity compensation		00~45 ppt Manual compensation
Pressure compensation		Compensation range: 0.500~2.500bar or 7.25~36.25psi or 500~2500mmHg Manual adjustment
Calibration mode		One-point or two-point calibration
Ambient Temp.		0~50°C
Storage Temp.		-10~70°C
Display		Large LCM with auto-sense backlight sensor for contrast function. Text mode.
Analog output 1		Isolated DC 0/4~20mA corresponding to main measurement, max. load 500Ω
Analog output 2		Isolated DC 0/4~20mA corresponding to temp. measurement, max. load 500Ω
Settings	Contact	RELAY contact , 240VAC 0.5A Max.(recommend)
	Activate	Hi/Lo. Hi/Hi. Lo/Lo selectable two limited programmable, ON/OFF
Wash		ON 0~99min. 59sec. / OFF 0~999hr 59min.
Voltage output		DC±8V, Max. 0.5W
Protection		IP65
Power Supply		100V~240VAC±10% , 50/60Hz , 5W max.
Installation		Wall or Pipe or Panel Mounting
Dimensions		96mm × 96mm × 132mm (H×W×D)
Cut off Dimensions		93 mm × 93 mm (H×W)
Weight		0.5 Kg

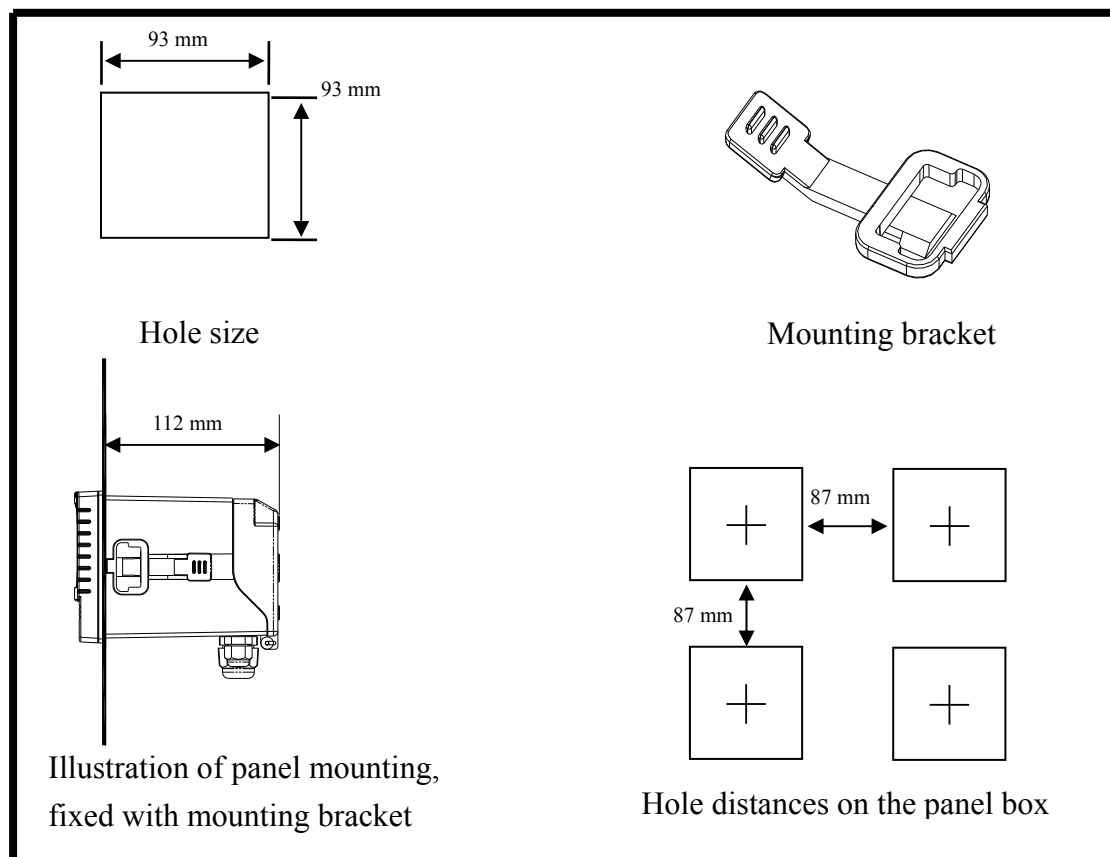
Note: The specifications are subject to change without notice.

2. Assembly and installation

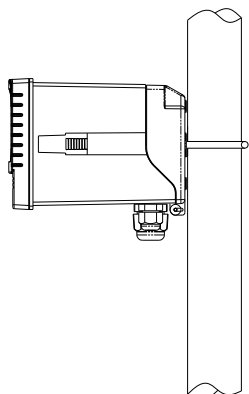
2.1 Transmitter installation: This Transmitter can be installed through panel mounting, wall mounting and pipe mounting.

Installation of panel mounting: First, prepare a square hole of 93 x 93mm on the panel box, and then insert the controller directly into the panel box. Insert the accessorial mounting bracket from the rear, and make it be fixed in to pickup groove.

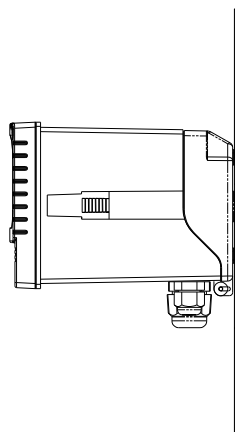
2.2 Illustration of panel mounting



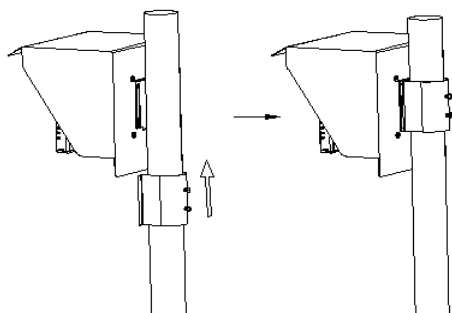
2.3 Illustration of Wall mounting and pipe mounting



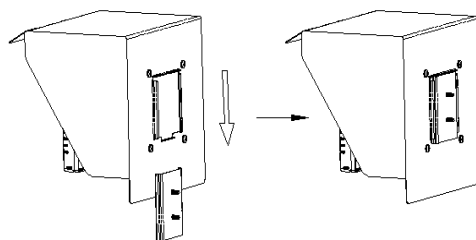
Installation of pipe mounting
Fixed with U-shaped pipe clip. The
distance between screw holes is 60mm



Installation of wall mounting
Fixed with 4 x M4 screws



Sun Shield (Pipe mounting)
Order No.: 8-35 and 8-35-1

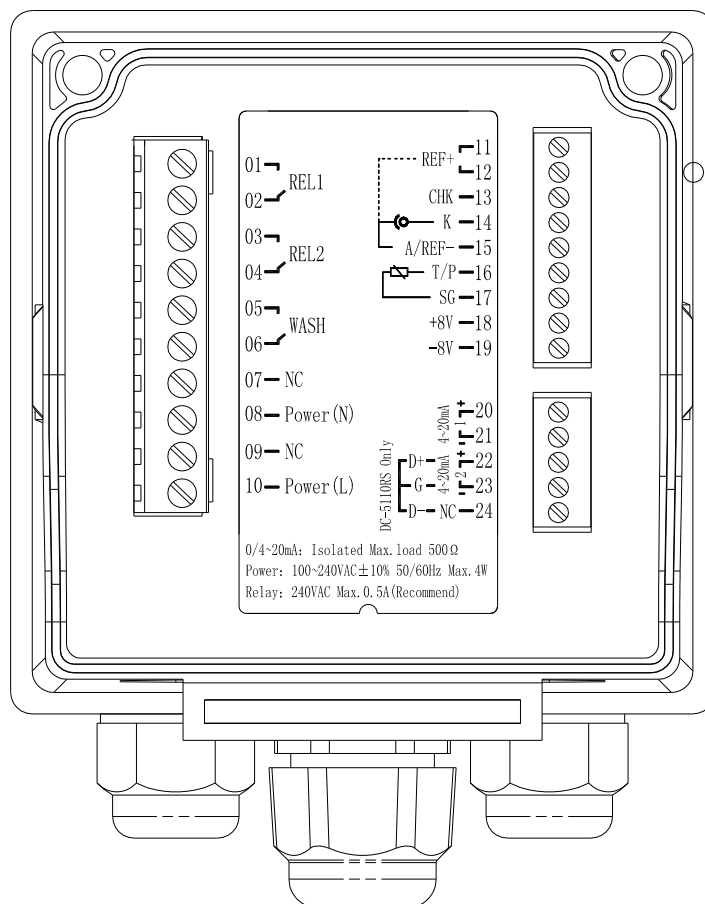


Sun Shield (Wall mounting)
Order No.: 8-35 and 8-35-2

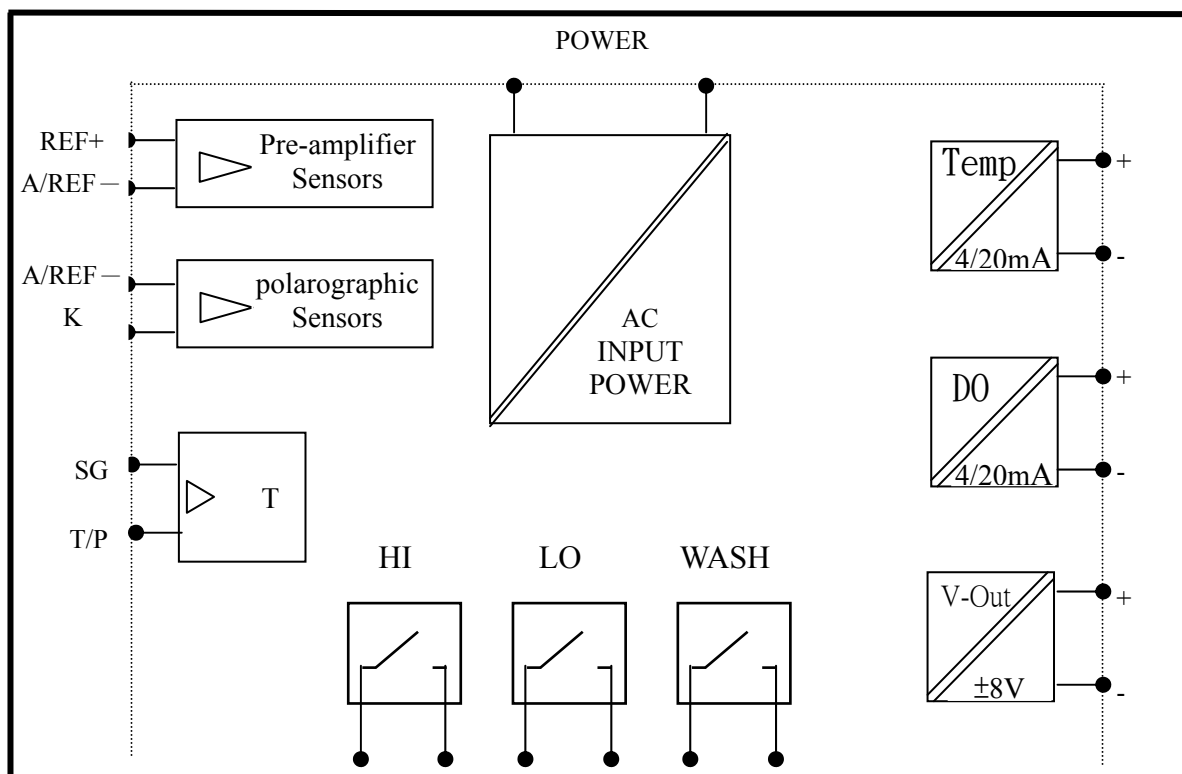
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3. Overview of Dissolved Oxygen transmitter DC-5110

3.1 Illustration of rear panel:



3.2 Illustration of terminal function

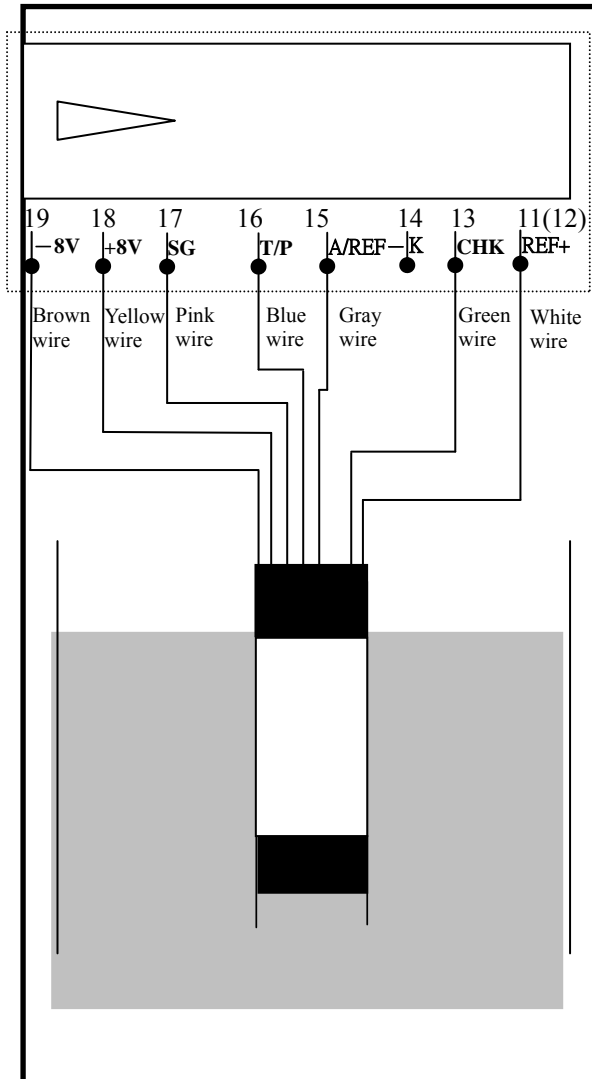


3.3 Description of terminal function:

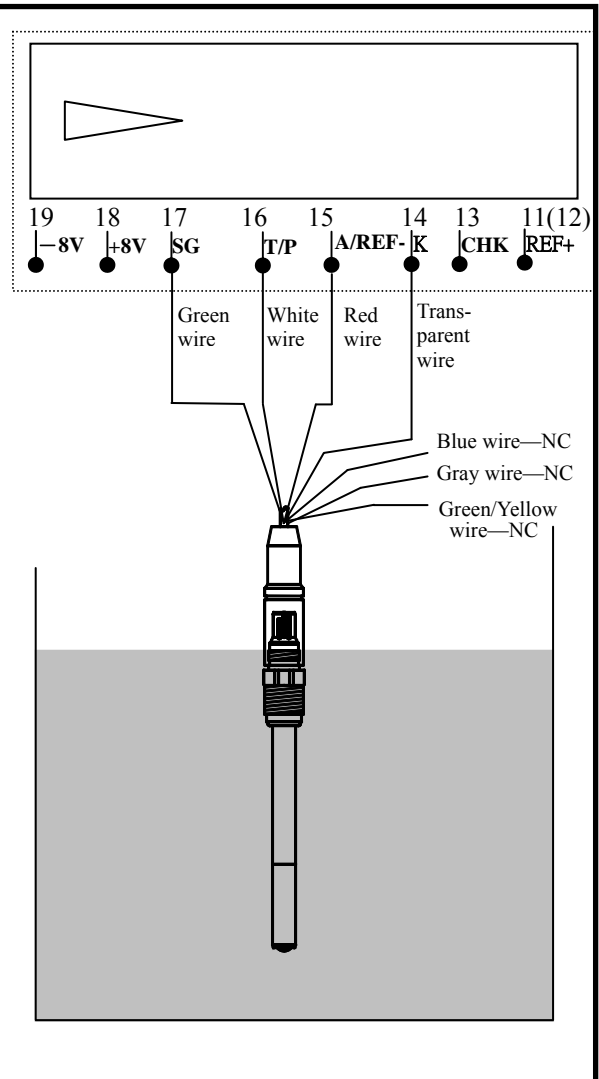
Terminal number	Wiring No.1-- Preamplifier voltage sensor	Wiring No.2 -- Polar-graphic current signal sensor
01-02 REL1	HI, External relay terminal high control	
03-04 REL2	L0, External relay terminal low control	
05-06 WASH	External wash relay terminal	
07 NC	NC	
08 Power(N)	100~240V Power supply terminal	
09 NC	NC	
10 Power(L)	100~240V Power supply terminal	
11-12 REF +	Sensor cable---White wire	NC
13 CHK	Sensor green wire (Only applied for WTW TriOxmatic 700 series sensor)	NC
14 K	NC	Sensor cable---Transparent wire (Negative pole)
15 A/REF —	Sensor cable---Gray wire	Sensor cable---Red wire (Positive pole)
16 T/P	Temperature cable---Blue(NTC30K)	Temperature cable---White wire(NTC22K)
17 SG	Temperature cable---Pink wire(NTC30K)	Temperature cable---Green wire(NTC22K)
18 DC + 8V	Sensor power input---Yellow wire	NC
19 DC — 8V	Sensor power input---Brown wire	NC
20 (1) 4~20mA +	D.O. measurement value current output terminal +, for external recorder or PLC control	
21 (1) 4~20mA —	D.O. measurement value current output terminal —, for external recorder or PLC control	
22 (2) 4~20mA +	Temperature value current output terminal +, for external recorder or PLC control	
23 (2) 4~20mA —	Temperature value current output terminal —, for external recorder or PLC control	
24 NC	NC	

3.4 Typical wirings:

Wiring No.1
Preamplifier voltage sensor

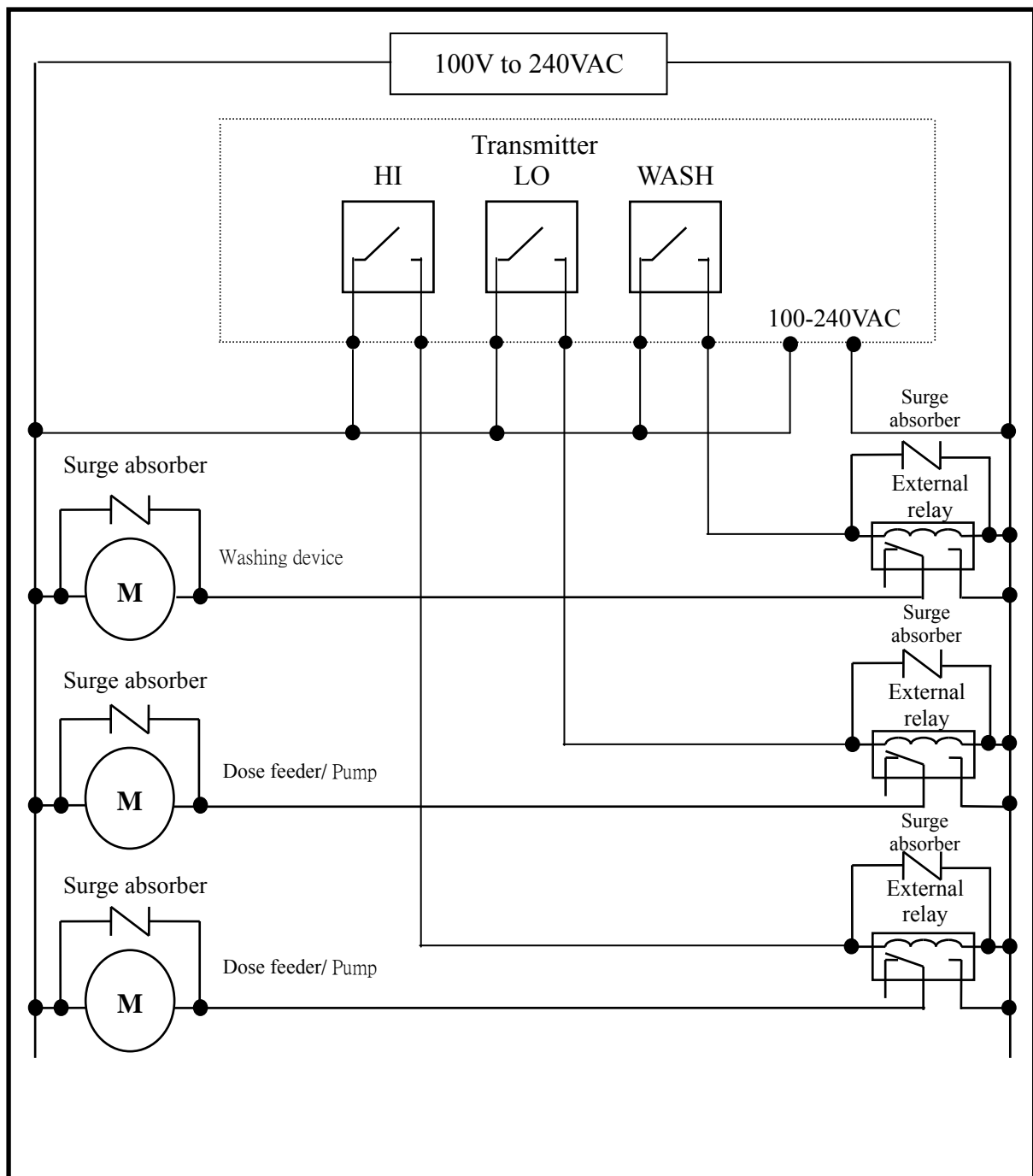


Wiring No.2
Polar-graphic current signal sensor



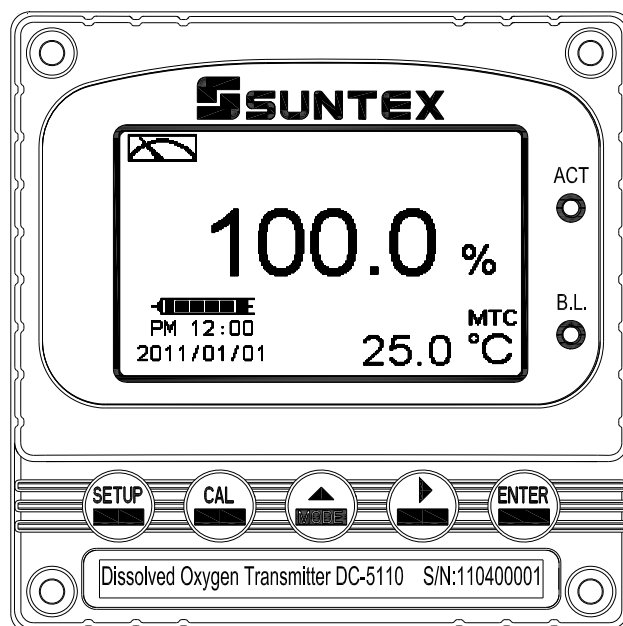
Note: Sensor green wire is only applied for WTW TriOxmatic 700 series sensor.

3.5 Illustration of electrical connection








4. Configuration

4.1 Illustration of front panel



4.2 Keypad

In order to prevent inappropriate operation by others, before the parameter setting and calibration, the operation applies composite keys and coding protection if necessary. Description of the key functions is in the following:

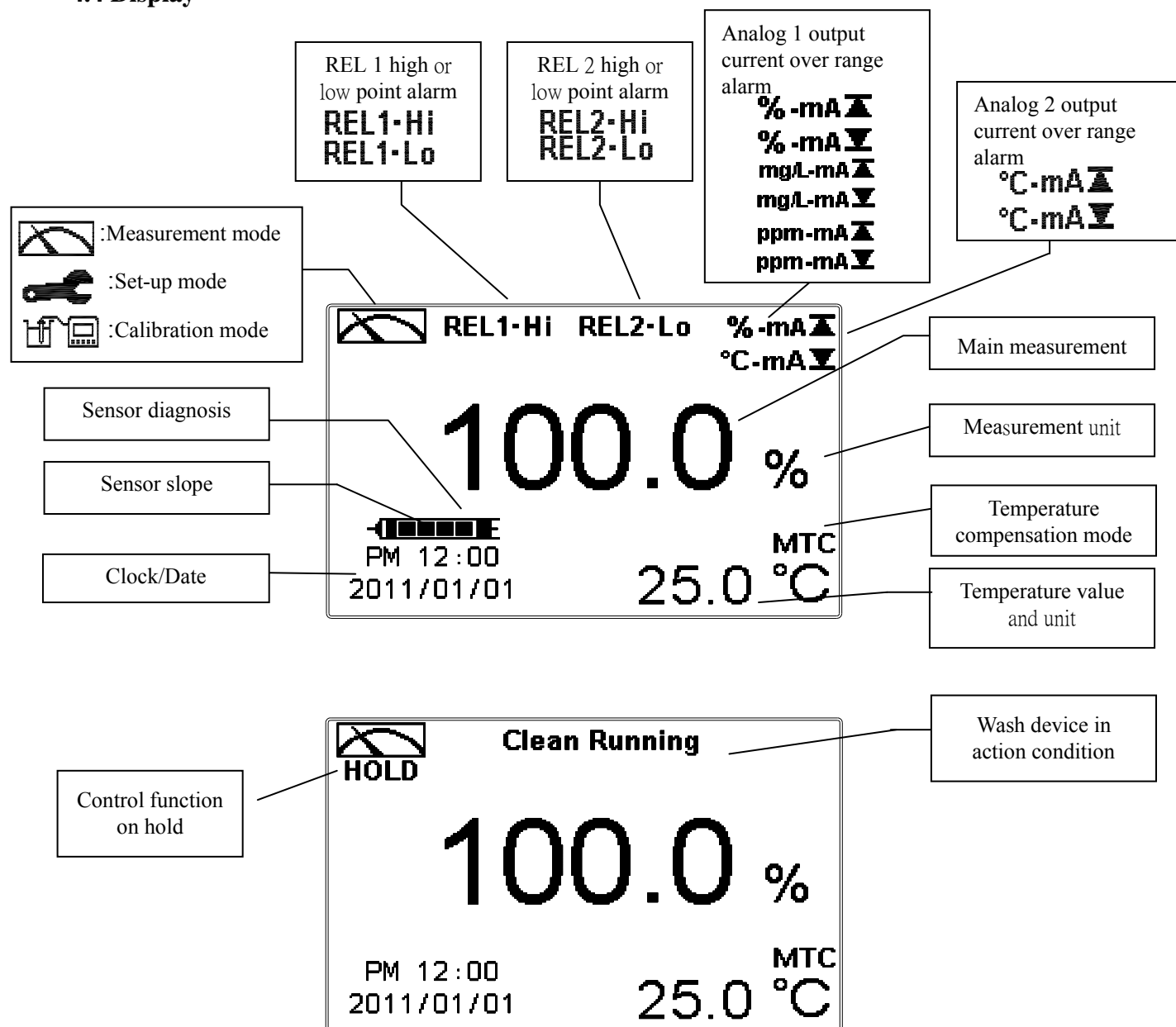
-  : In the parameter set-up mode, pressing this key allows you exit parameter set-up mode and back to Measurement mode.
-  : In the Calibration mode, pressing this key allows you exit Calibration mode and back to Measurement mode.
-  :
 1. In the parameter set-up mode and Calibration mode, pressing this key to select leftward or change to another page.
 2. When adjusting value, press this key to increase the value
-  :
 1. In the parameter set-up mode and Calibration mode, pressing this key to select rightward or change to another page.
 2. When adjusting value, press this key to decrease the value.
-  : Key for confirmation; pressing this key is essential when modifying data value or selecting the parameter setting items in the window.

4.3 LED indicators:

ACT : Washing device operation indicator and controlling operation indicator (Relay 1, Relay 2)

B.L. : Light sensor; in the automatic display backlit mode, the lamp will light or go out as the change of environmental brightness.

4.4 Display



- Note: 1. When the wash device is turned on, the display shows and twinkles the description, “Clean Running”. At the same time, the ACT indicator LED lights up, and the transmitter automatically turns off Relay 1 and Relay 2 function. After finishing cleaning, the Relay 1 and Relay 2 will automatically back to normal status.
2. When Relay 1 which is set in high setting point is in action, the display shows and twinkles the description, “REL 1_Hi”, and ACT indicator LED lights up. When Relay 1 which is set in low setting point is in action, the display shows and twinkles the description, “REL 1_Lo”, and ACT indicator LED lights up.
3. When Relay 2 which is set in high setting point is in action, the display shows and twinkles the description, “REL 2_Hi”, and ACT indicator LED lights up. When Relay 2 which is set in low setting point is in action, the display shows and twinkles the description, “REL 2_Lo”, and ACT indicator LED lights up.
4. When under measurement mode, if the temperature compensation mode is set in MTC (Manual adjustment), press or to adjust the MTC temperature manual.

4.5 Sensor slope status



: to represent the sensor of perfect condition



: to represent the sensor of good condition

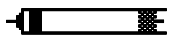


: to represent the sensor of still acceptable condition

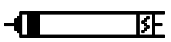


: to represent the sensor status is of aging, in need of replacement a new sensor

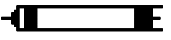
4.6 Sensor diagnosis status : (Only applicable to WTW TriOxmatic 700 series sensors)



: Flashing said that the sensor is contaminated or aging, need to clean and replace the membrane and electrolyte.



: Said sensor membrane rupture, in need to replace the membrane and electrolyte.






: Said that the sensor is working properly.

5. Operation




5.1 Measurement mode

After all electrical connections are finished and tested, connect the instrument to the power supply and turn it on. The transmitter will automatically enter measurement mode with the factory default settings or the last settings from user.



5.2 Set-up menu

Please refer to the set-up instructions in Chapter 6. Press  and  simultaneously to enter into set-up menu, and press  to go back to measurement mode.

5.3 Calibration menu

Please refer to the calibration instructions in Chapter 7. Press  and  simultaneously to enter into calibration menu, and press  to go back to measurement mode.

5.4 Shortcuts

In the measurement mode, if selecting MTC for temperature compensation mode, you may press  and  to adjust MTC temperature value.

5.5 Reset

5.5.1 Master reset

Measurement mode: Pre-amplifier
Measurement unit: %
Product adj : 0.0
Temperature compensation: ATC, Adjust : 0.0°C
Relay 1 : High point alarm: AUTO, SP1= 125.0%
Relay 2 : Low point alarm: AUTO, SP2 =25.0 %
Wash time: OFF
Analog 1 current output (DO) : 4~20 mA , 0.0~100.0%
Analog 2 current output (Temp) : 4~20 mA , 0~50.0°C
Display backlit: OFF
Contrast: 0
Auto return: Auto
Code: OFF
Date & Time : 2011/1/1 00:00:00

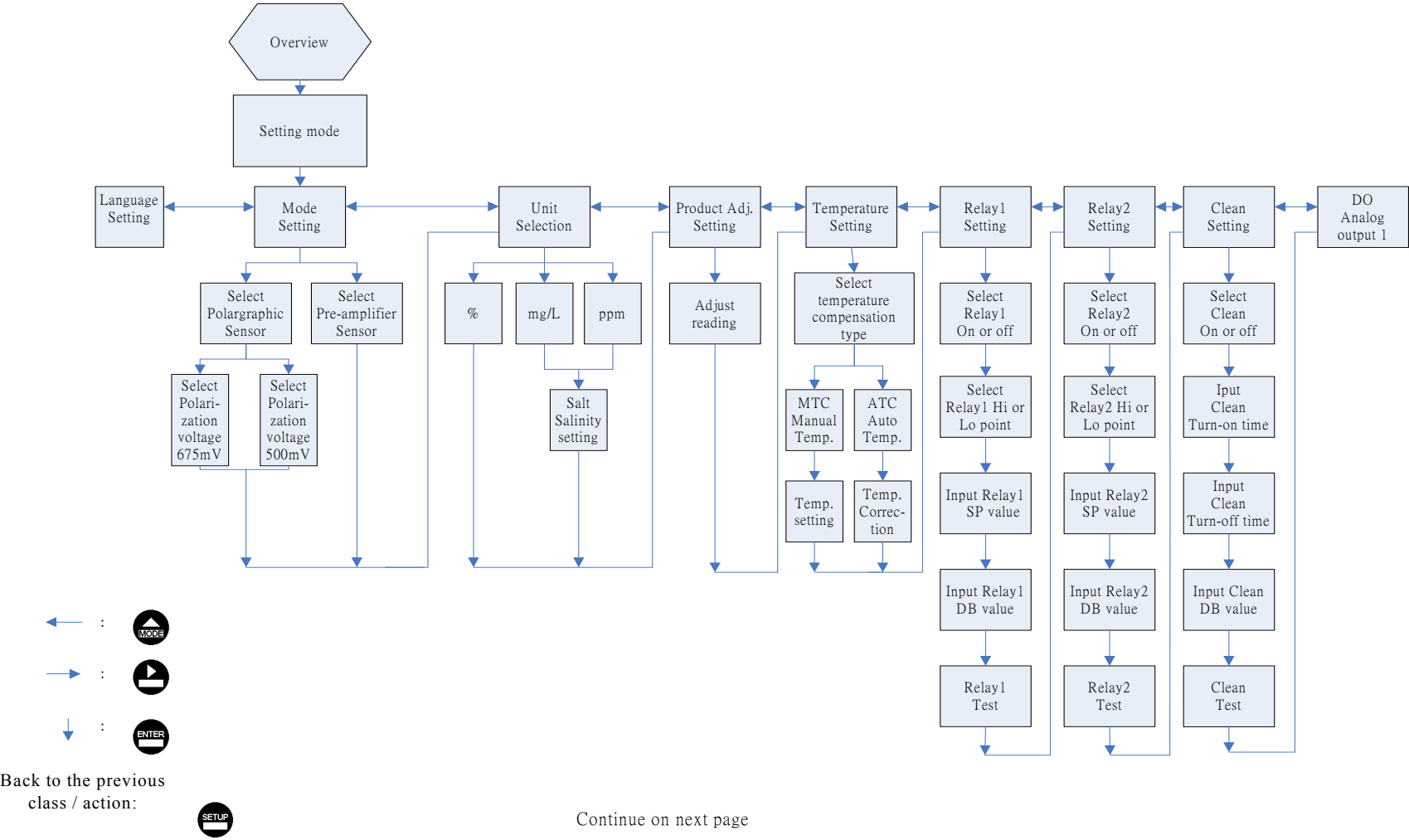
5.5.2 Calibration reset

Cal Time : 2011/01/01 , 00:00
Cal Type : No Cal
Cal Pressure : 1.013bar
Cal Temp : none
Relative Slope : none
Saturation : none
Return : Auto

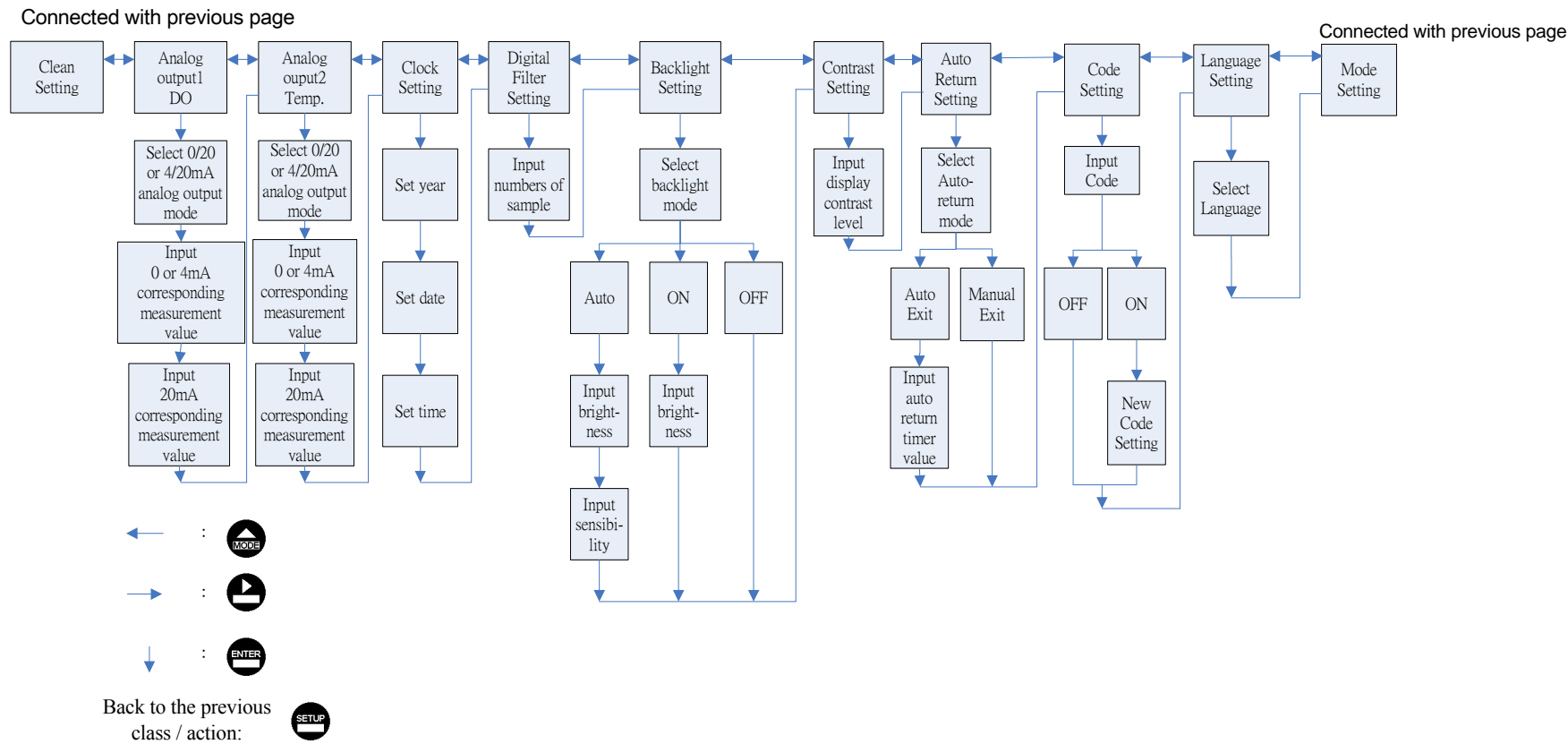
Note: The factory default of calibration presetting is “No Cal”, and the calibration value is “None”. It means that the user has not calibrated the sensor with the transmitter yet.

6. Settings




Block diagram of settings-part 1

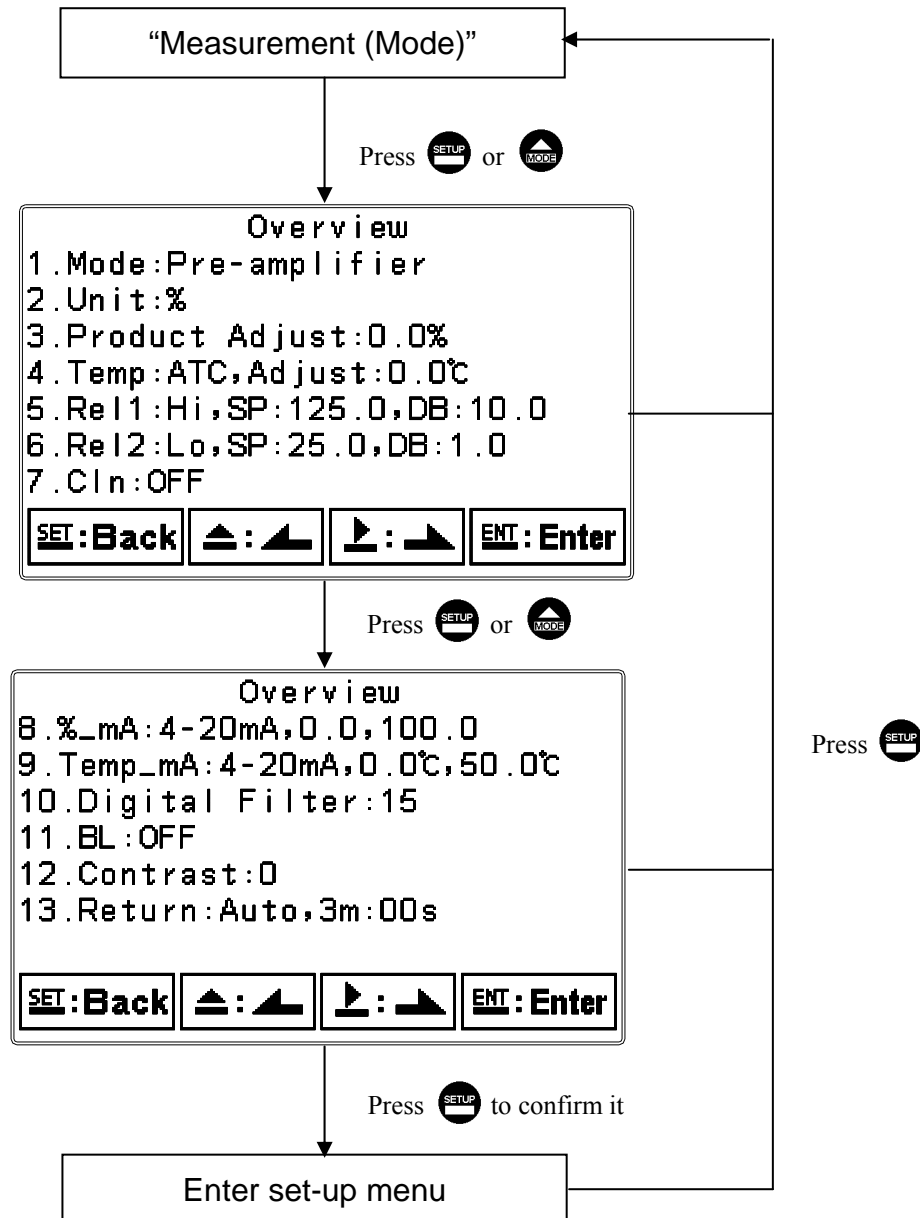


Block diagram of settings-part 2




6.1 Entry of set-up menu

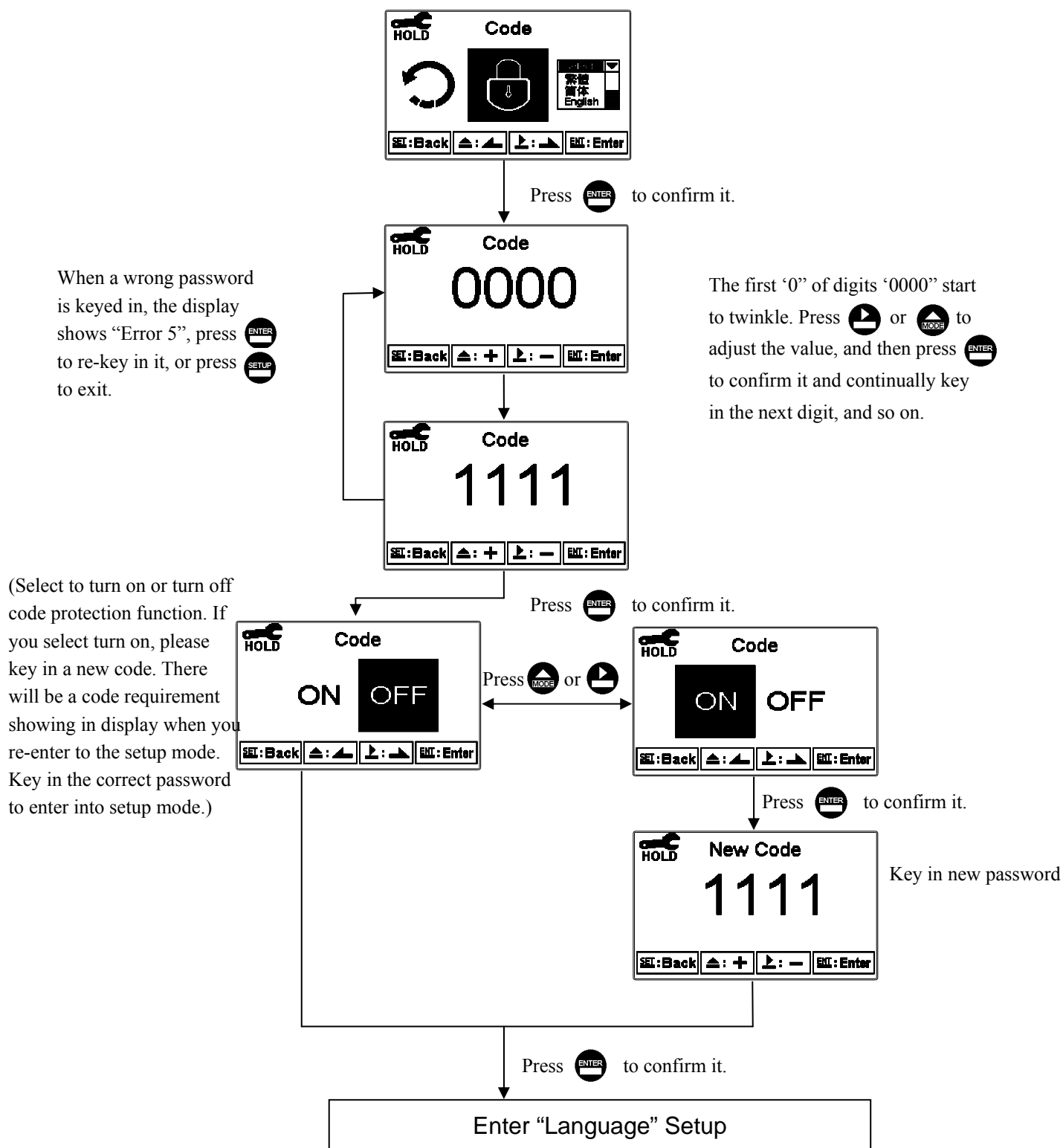
In the measurement mode, pressing the two keys  and  simultaneously allows you enter the overview of current setting, and press  to enter the set-up mode to modify the setting if necessary.



6.2 Security code of settings (Code)

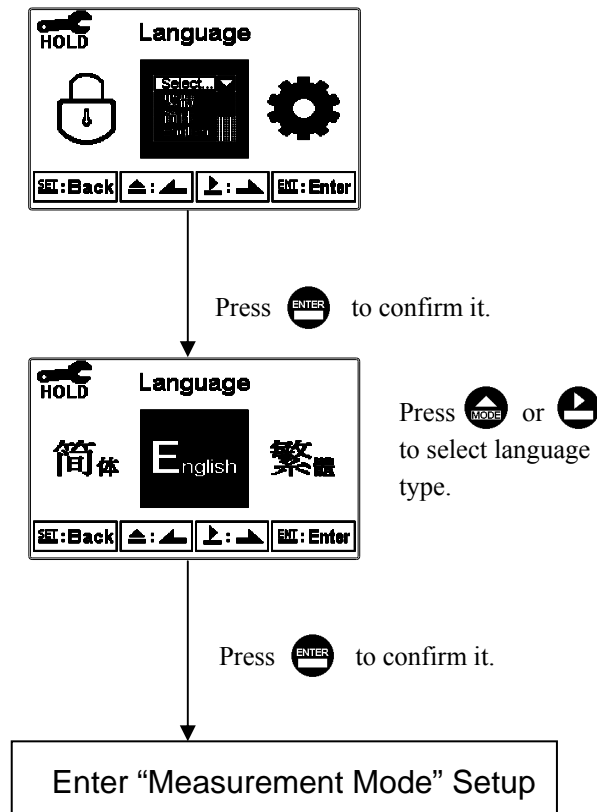
After entering set-up mode, select “code” item, press  to enter into code procedure. The code pre-setting is 1111.

Note: The code of setting mode is prior to the code for calibration. That means that the code of setting mode can be used for the code of calibration mode.



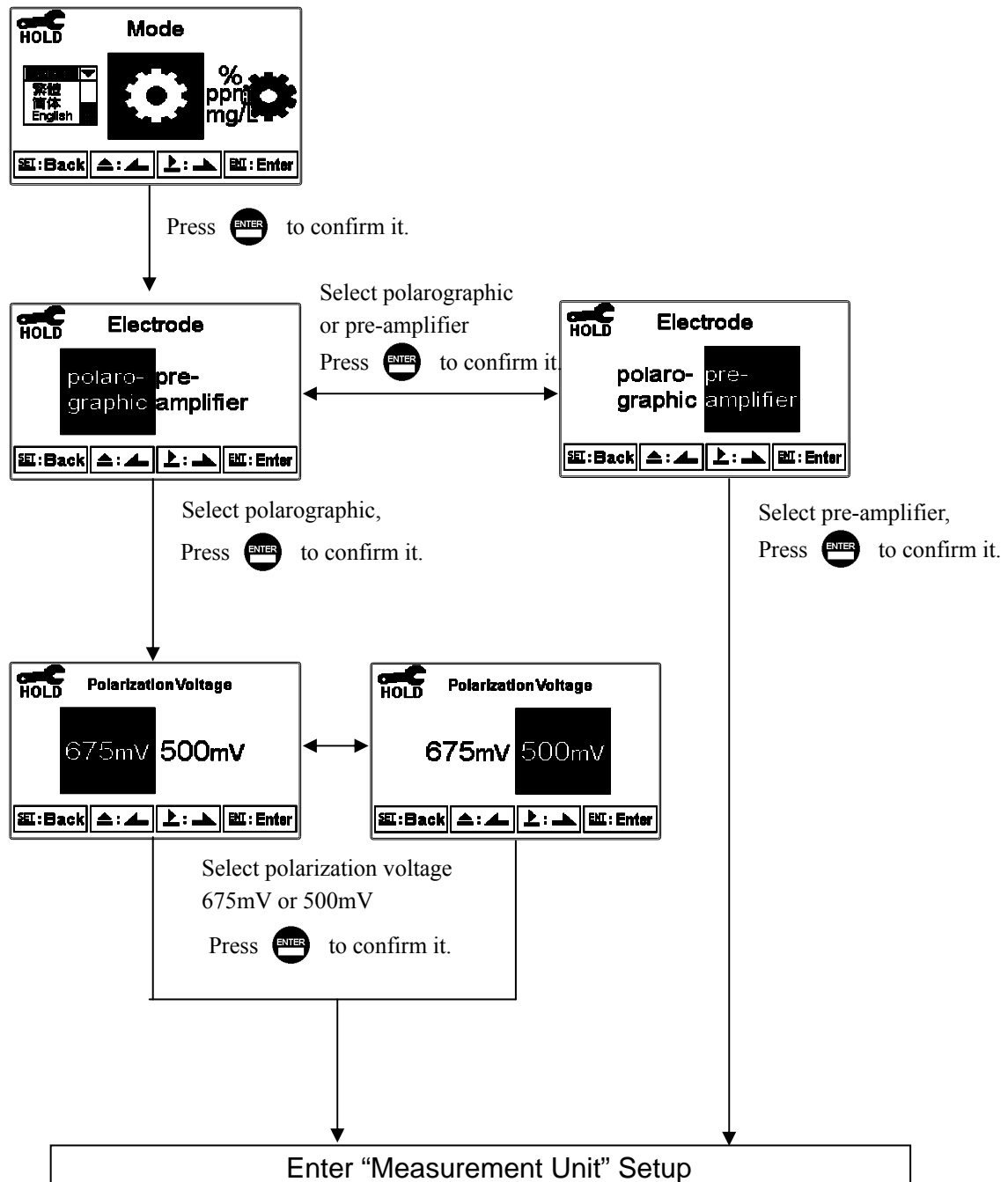
6.3 Language

Enter Language setup menu, select the system language from English, Traditional Chinese and Simplified Chinese.



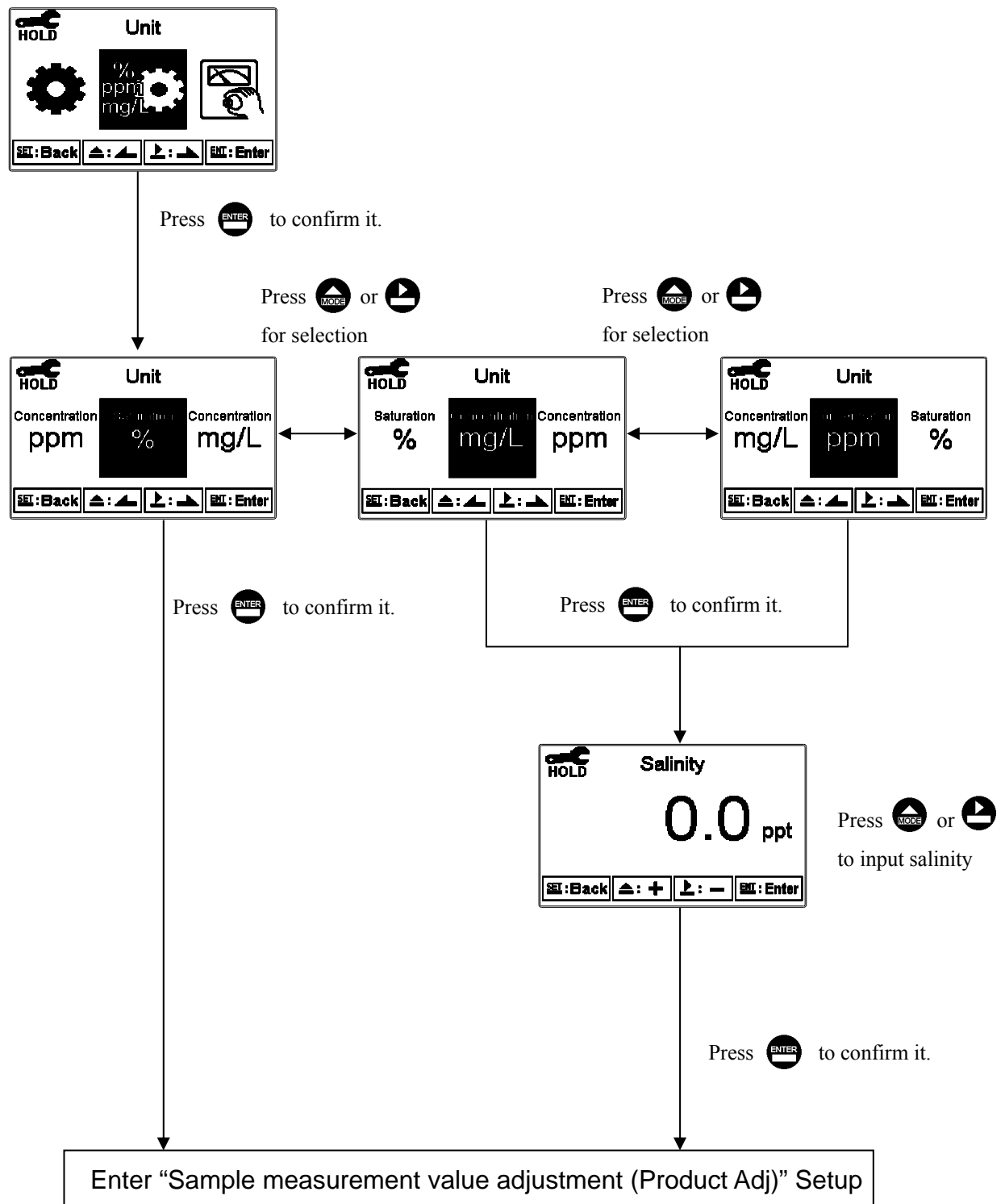
6.4 Mode

Enter setup of “Mode”. Select between “polarographic” or ”pre-amplifier(ex. WTW sensor) measurement mode. When select polarographic, select polarization voltage 675mV or 500mV according to measurement sensor.



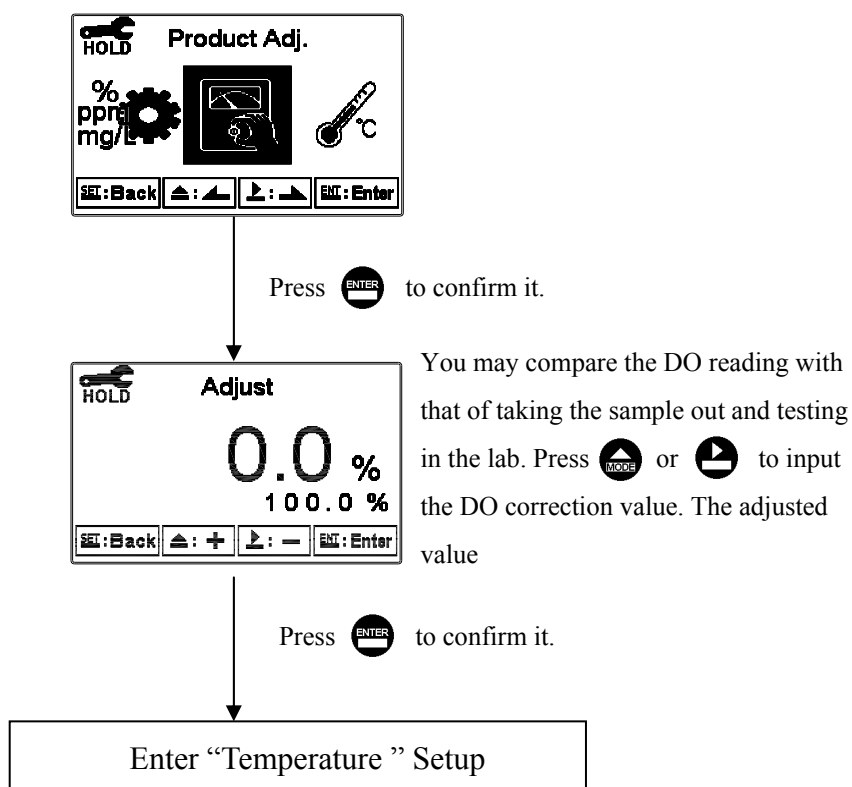
6.5 Unit

Enter unit setup, select saturation unit(%), or concentration unit(ppm, mg/l) according to your application requirement. When selecting concentration unit, input salinity value of sample solution for salinity compensation.







6.6 Product Adjustment)

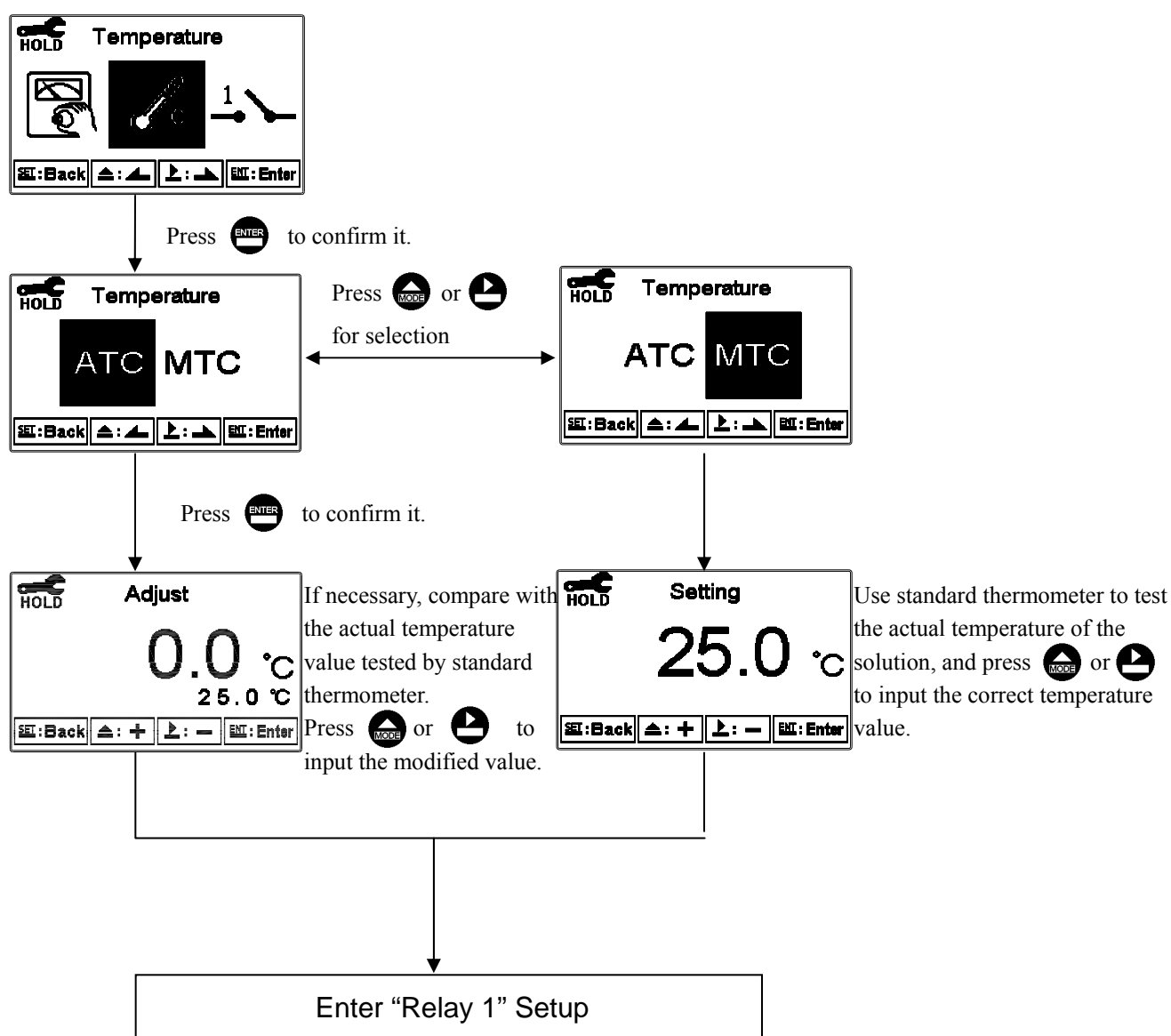
Enter setup of “Product Adj.”, make the sample reading modifications. Users are allowed to make sample reading adjustment without taking out the sensor and making calibration. Utilize the function to adjust the field measurement as same as the lab measurement to eliminate the doubt of measurement error.



6.7 Temperature

Enter Temperature setup menu, select ATC for auto temperature compensation or select MTC for manual temperature compensation. Under temperature setting menu, press  and  simultaneously to back to the default value. Under measurement mode, if the compensation is MTC mode, you may press  or  to adjust the MTC temperature value directly.

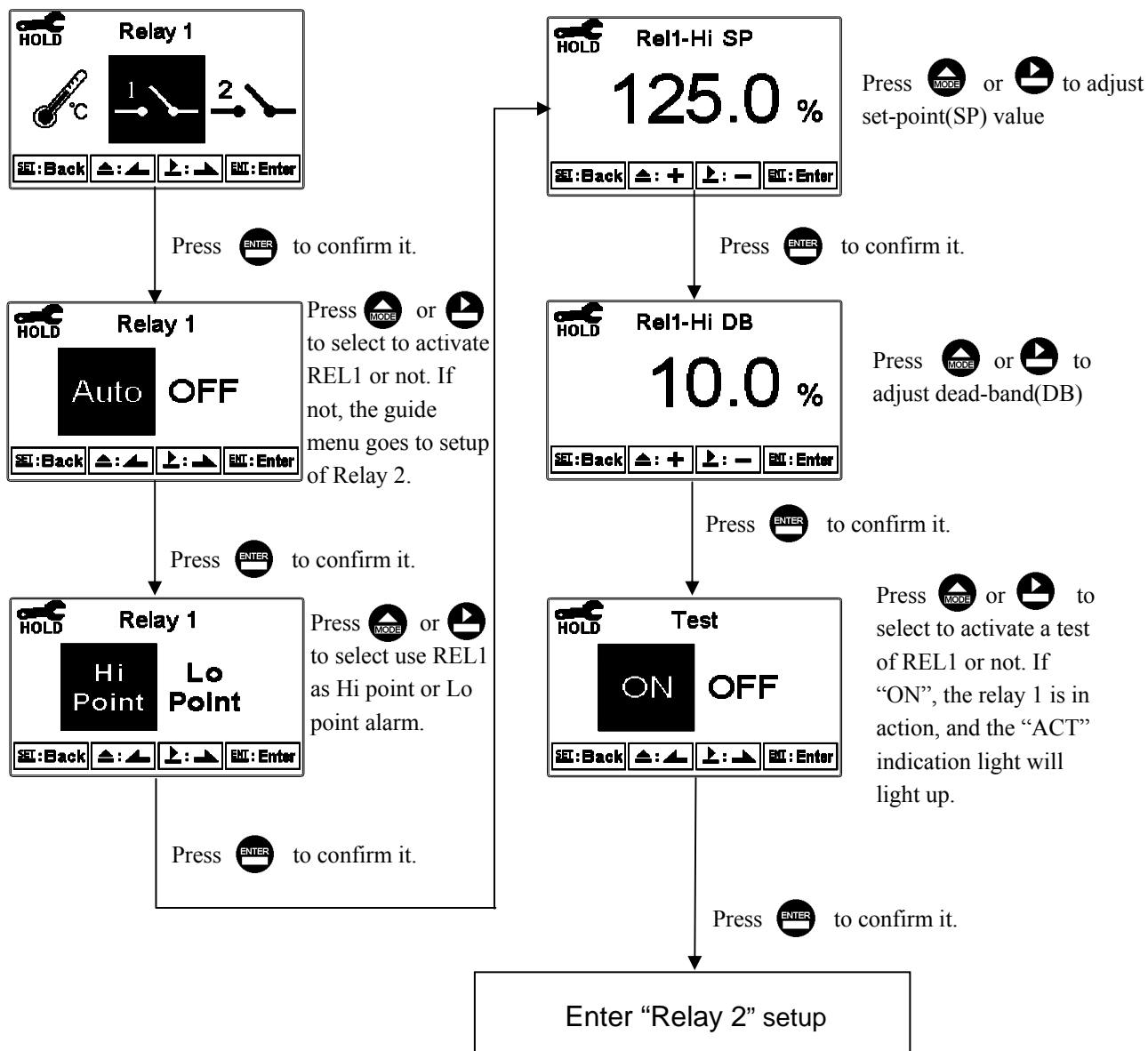
PS : If select polarographic measurement mode, the temperature compensation system automatically switches to NTC 22K. If select pre-amplifier measurement mode, the temperature compensation system automatically switches to NTC 30K.



6.8 Relay 1

Enter setup of Relay 1. Select the item to turn on or turn of the relay 1 function. If you select to turn on the relay 1, then select for using relay 1 as “Hi set-point” alarm or “Low set-point” alarm. Set the value of set-point (SP) and dead-band (DB).

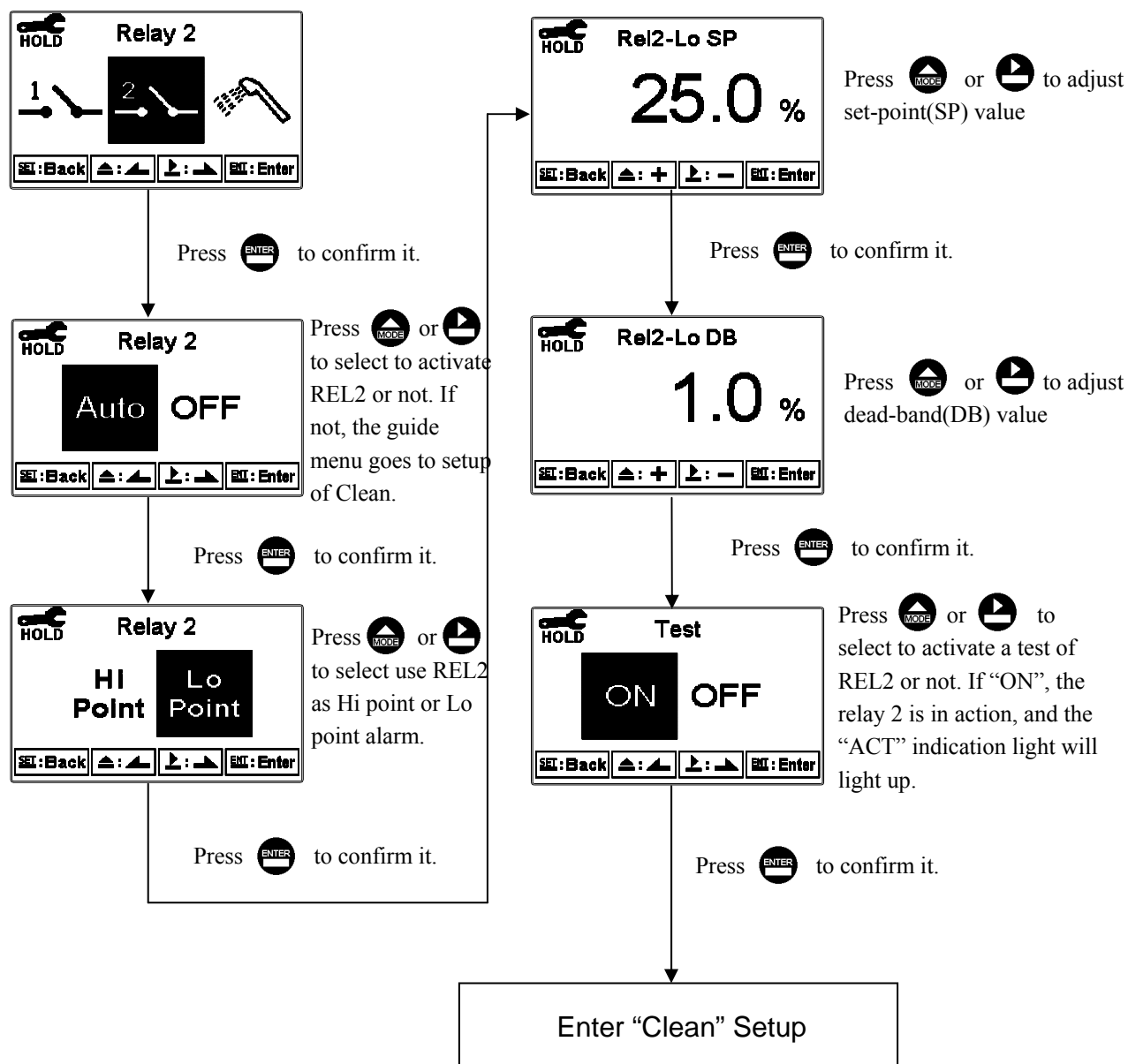
About the range for set-point please refer to the specification’s measurement range corresponding to different measurement unit.



6.9 Relay 2

Enter setup of Relay 2. Select the item to turn on or turn of the relay 2 function. If you select to turn on the relay 2, then select for using relay 2 as “Hi set-point” alarm or “Low set-point” alarm. Set the value of set-point (SP) and dead-band (DB).

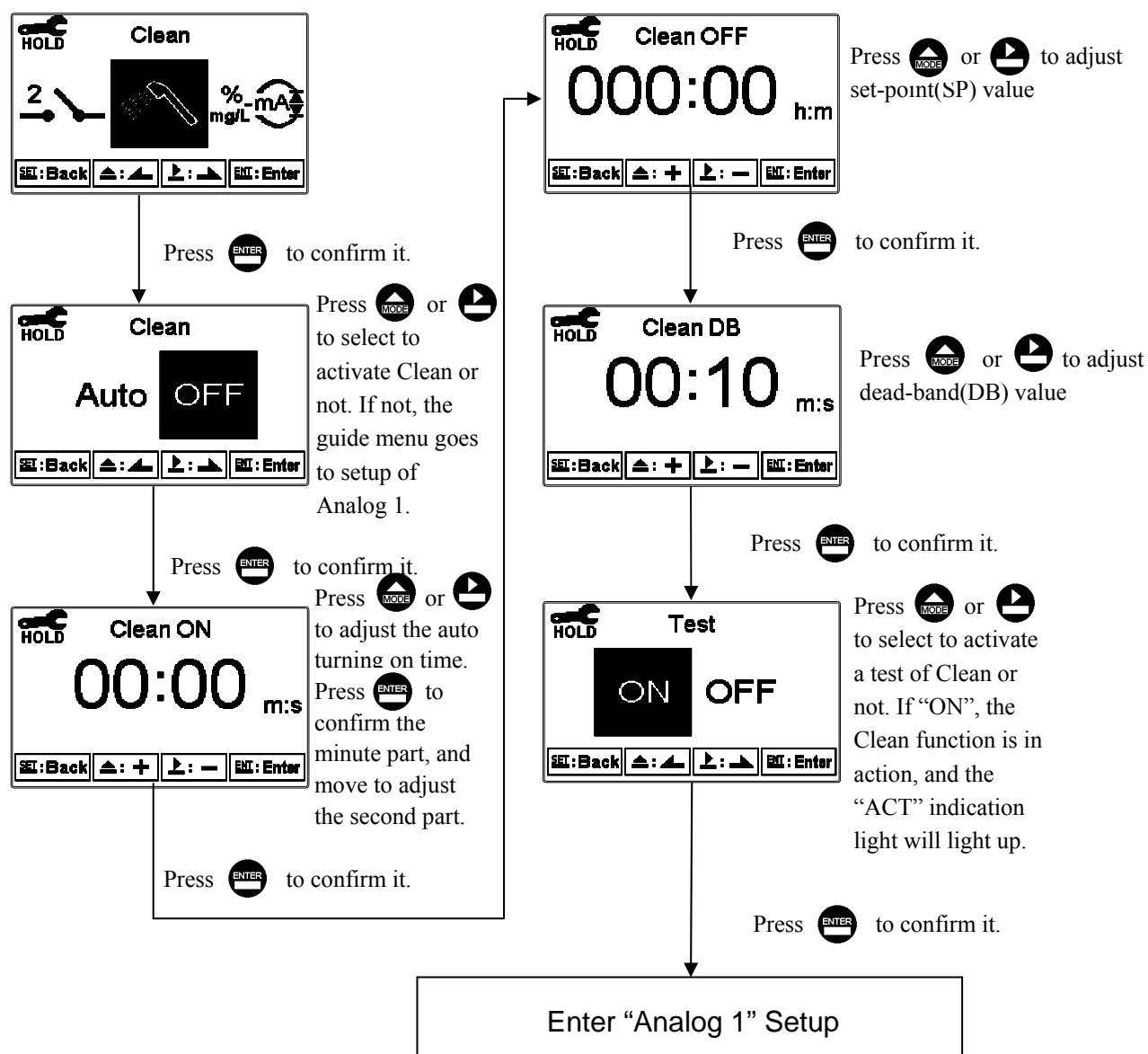
About the range for set-point please refer to the specification’s measurement range corresponding to different measurement unit.



6.10 Clean

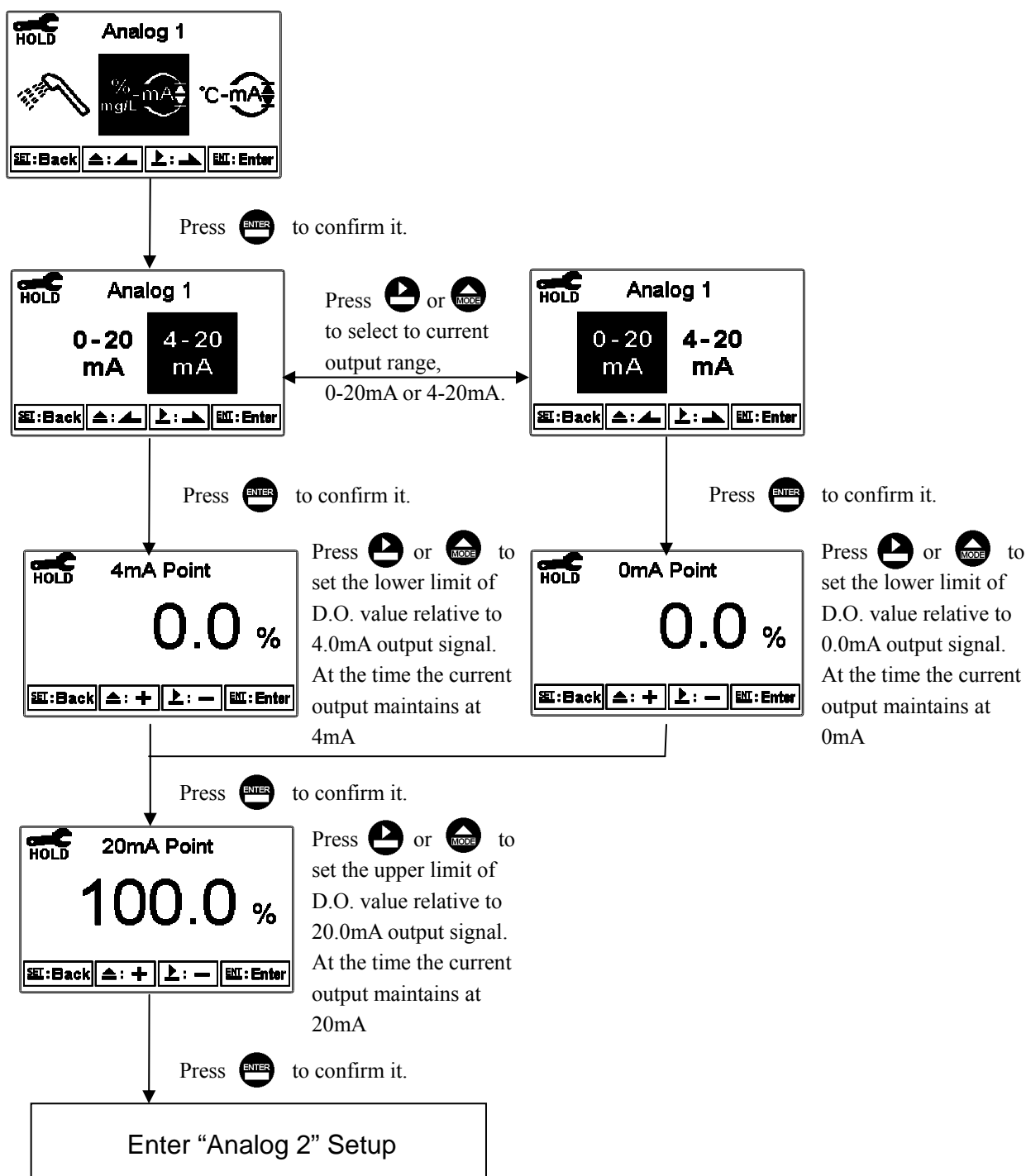
Enter setup of “Clean” function. Select the icon to turn on or turn off the clean function. If you select “Auto” turning on, and set the timer of the clean function including automatically turning on time and turning off time, and set the bead-band value(DB).

Note: When the clean function is turned on, if any value is set to be 0, the instrument will automatically turn off this function. And the measurement value will be hold as the last measurement value before wash status. If enter parameter setting mode or calibration setting mode under wash status, the instrument will stop wash status automatically.



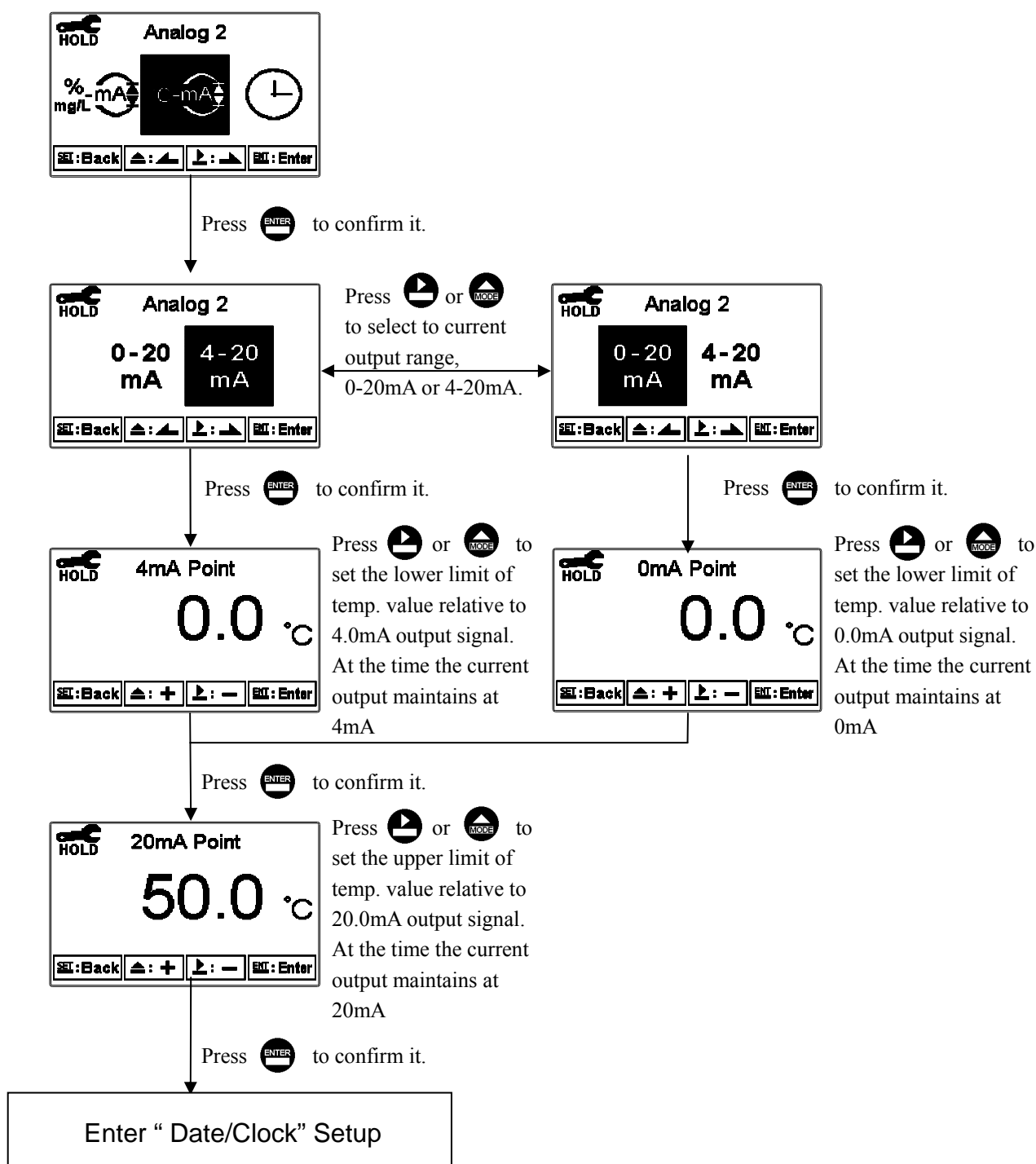
6.11 Analog output 1(D.O.)

Enter setup of Analog 1. Select 0~20mA or 4~20mA current output. Set the related value to the range of D.O. measurement. If the range of the D.O. measurement is to be set smaller, the resolution of current output is higher. When the measured value exceeds the higher range limit, the current will remain approximately 22mA output. When the measured value exceeds the lower range limit, under 0~20mA mode the current output will remain 0mA output; while under 4~20mA mode the current output will remain approximately 2mA output. The exceptional output value can be used as a basis for failure determination. Under HOLD(measurement) status, the current output maintain the last output value before HOLD status. However, in order for convenience of insuring the current setting of a external recorder or of a PLC controller, the current output will be 0/4mA or 20mA under the analog output 1 setup menu.



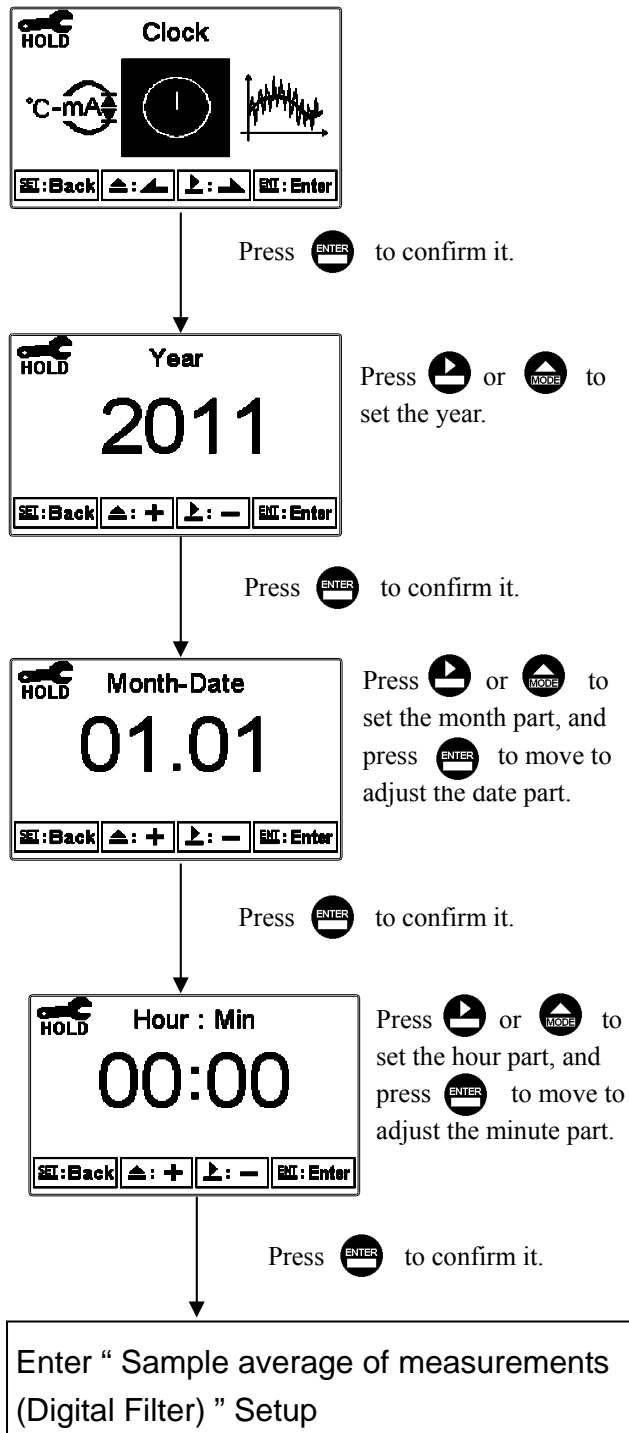
6.12 Analog output 2(Temperature)

Enter setup of Analog 2. Select 0~20mA or 4~20mA current output. Set the related value to the range of temperature measurement. If the range of the temperature is to be set smaller, the resolution of current output is higher. When the measured value exceeds the higher range limit, the current will remain approximately 22mA output. When the measured value exceeds the lower range limit, under 0~20mA mode the current output will remain 0mA output; while under 4~20mA mode the current output will remain approximately 2mA output. The exceptional output value can be used as a basis for failure determination. Under HOLD(measurement) status, the current output maintain the last output value before HOLD status. However, in order for convenience of insuring the current setting of a external recorder or of a PLC controller, the current output will be 0/4mA or 20mA under the analog output 2 setup menu.



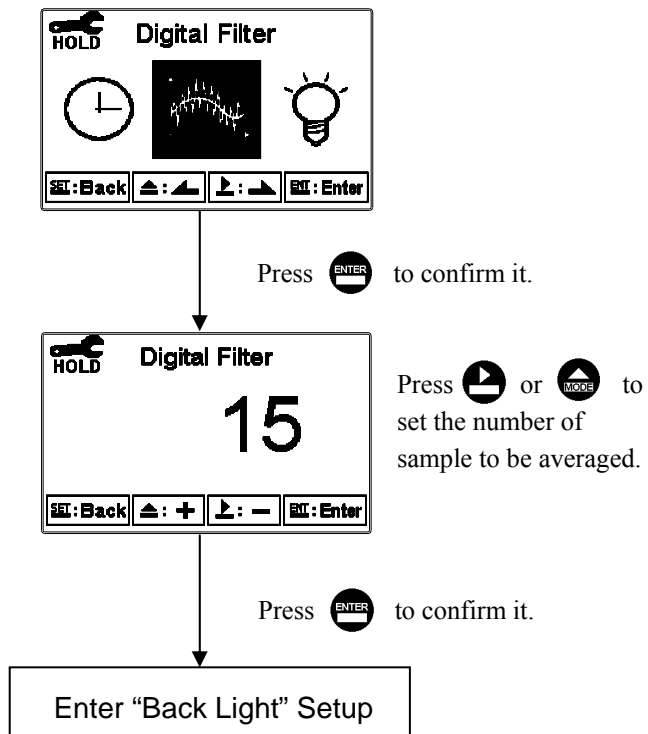
6.13 Date/Time(Clock)

Enter setup of Date/Time(Clock). Set the “Year”, “Month”, “Date”, “Hour”, and “Minute” time. Note: The clock needs to be reset once encounters power failure.



6.14 Sample average of measurements (Digital Filter)

Enter the setup of Digital filter. You may select the number of sample to be averaged each time to become a reading which is gradually counted in order to increase the stability of measurement.



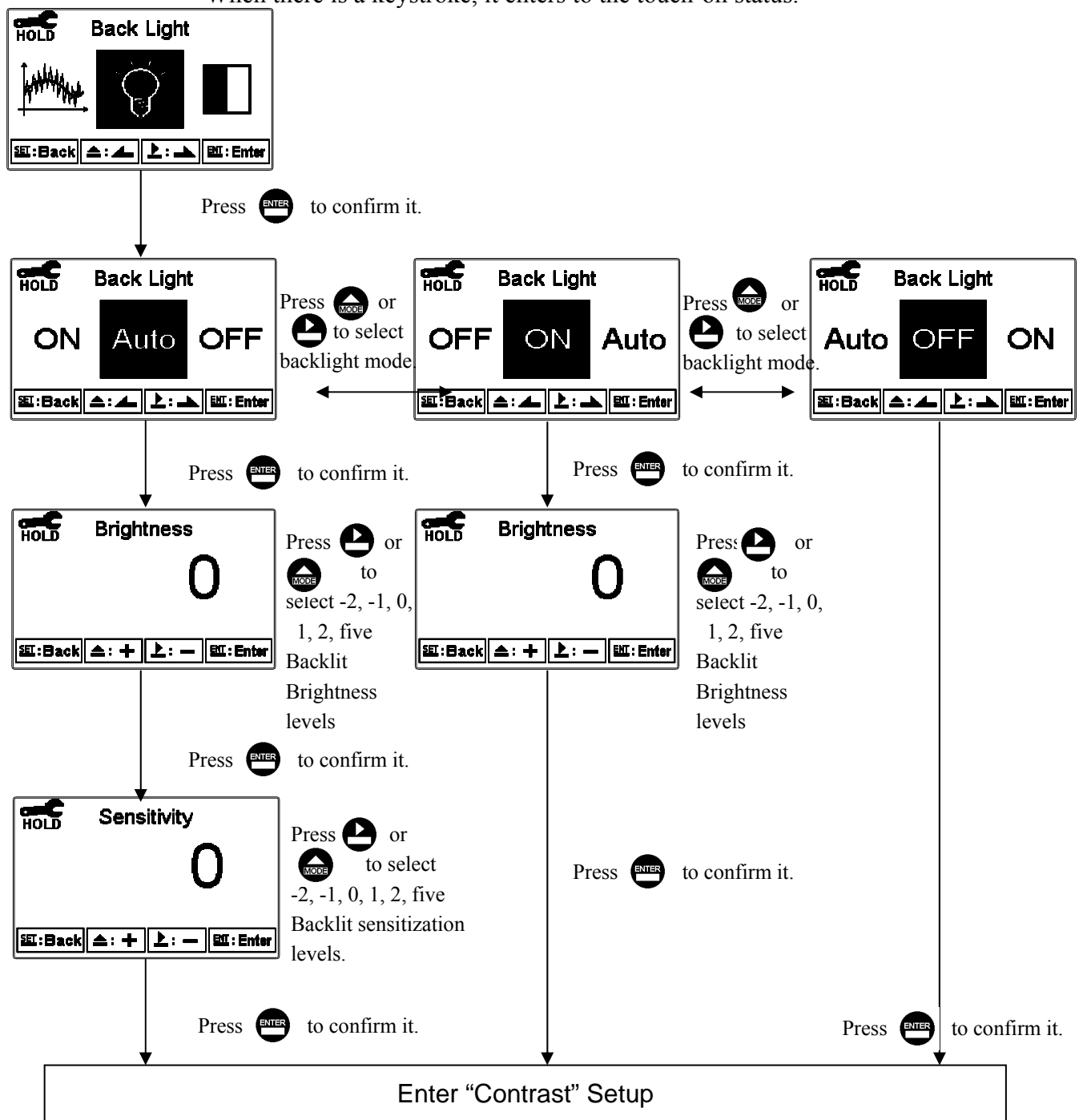
6.15 Backlight settings

Enter setup of backlight display. According to your need, you can set the brightness of display(-2~2, dark~bright) and sensitivity of the sensitization sensor(-2~2, insensitive~sensitive). Where there is a keystroke, then activate the touch-on backlight function. Regardless of what kind of backlight mode, the touch-on function will activate the backlight. If there is no keystroke for 5 seconds, the display will back to the original backlight setting status.

ON setting: The backlight is always on.

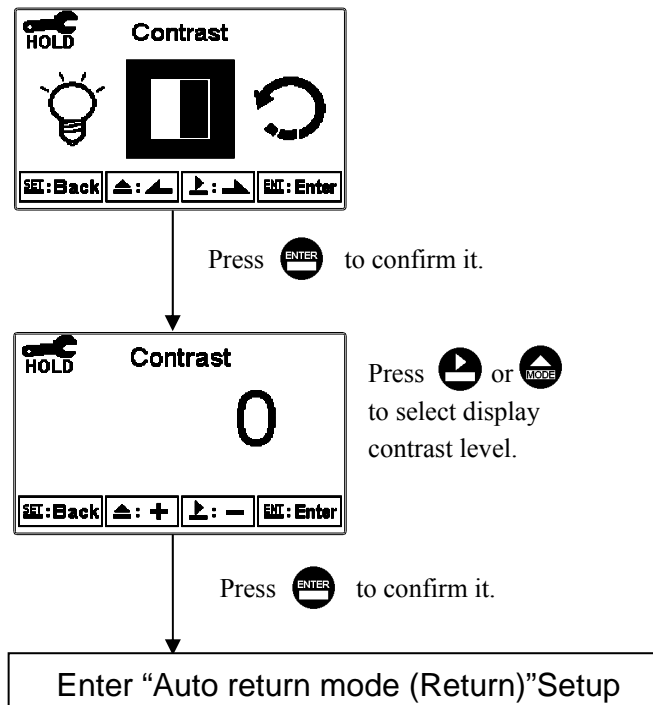
OFF setting: The backlight is off. When there is a keystroke, it enters to the touch-on status.

Auto setting: According to the ambient light, activate or deactivate the backlight. When there is a keystroke, it enters to the touch-on status.



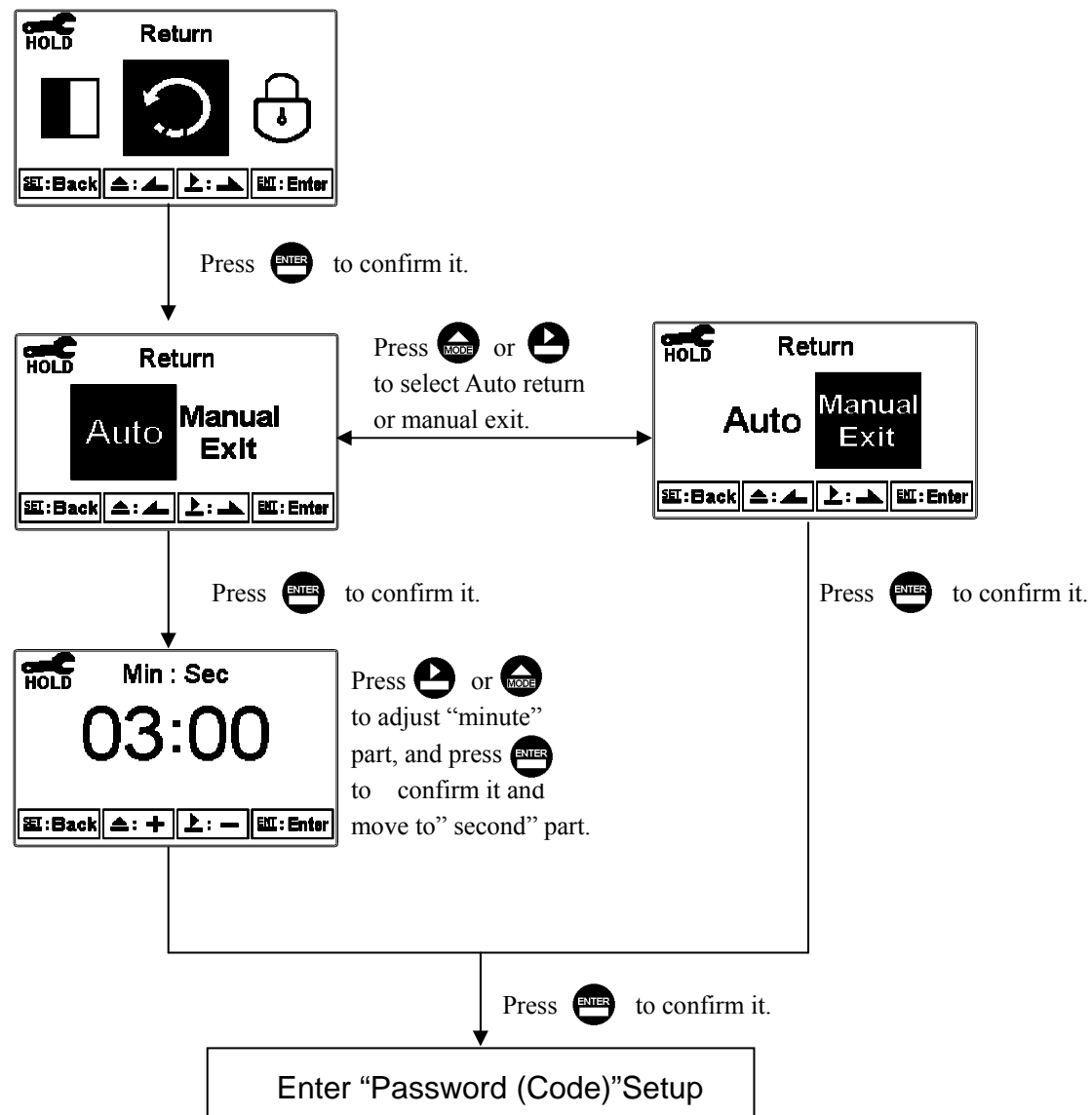
6.16 Contrast settings

Enter setup of display contrast. You can set the contrast of display according to your need. (-2, -1, 0, 1, 2, light to strong)



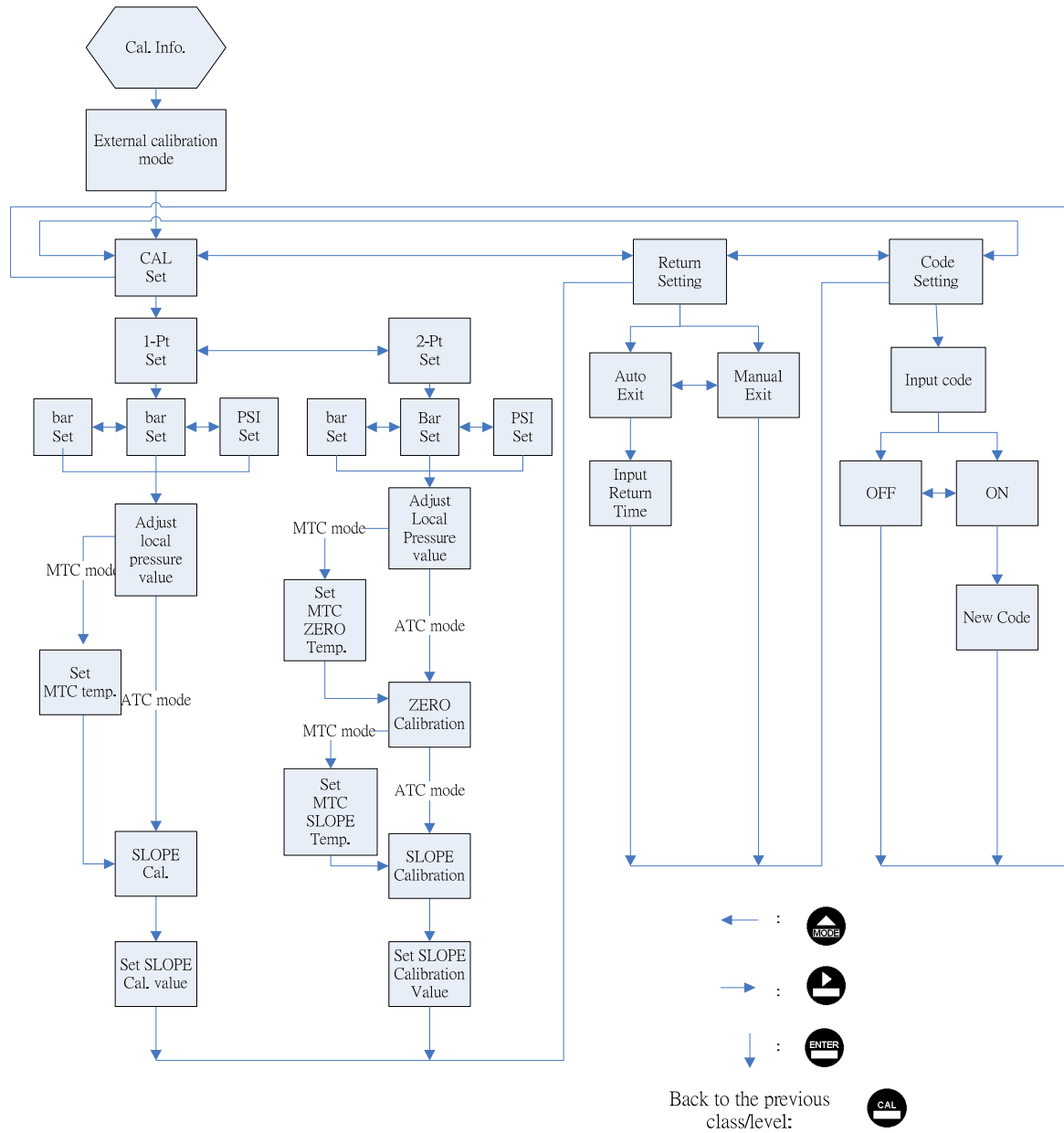
6.17 Return

Enter setup of auto return mode (Return) to set the function that the instrument automatically exit the setup menu after a period of time without pressing any key. The “Manual Exit” means that it needs to exit setup menu manually, while “Auto” means that the display automatically exit the setup menu and back to measurement mode after a period of time without pressing any key.







7. Calibration

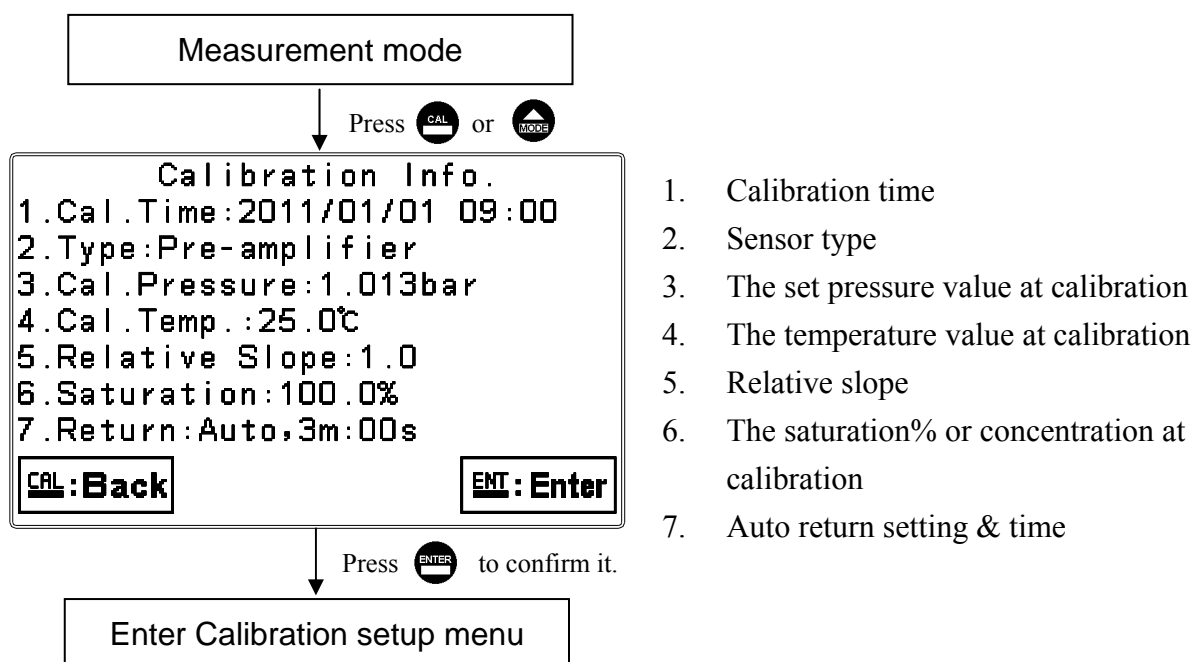
Block diagram of calibration



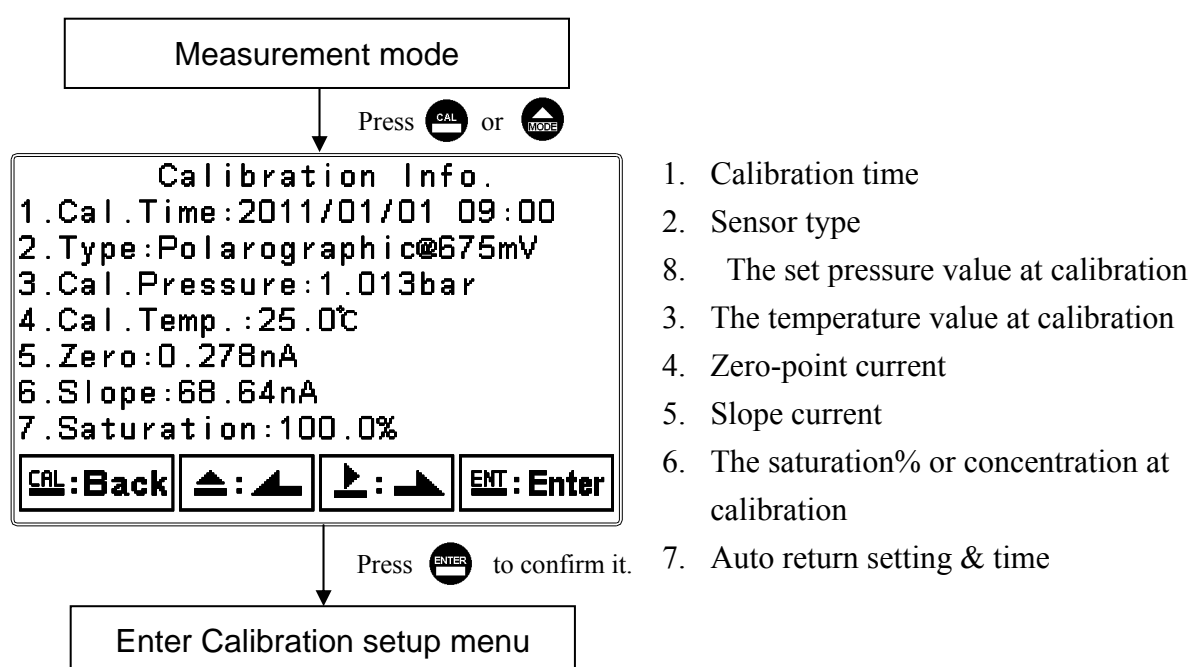
7.1 Enter calibration setup menu

In the measurement mode, pressing the two keys  and  simultaneously allows you enter the Calibration Information. If you do not need to re-calibrate the measurement system, press  to go back to measurement mode. If you need to re-calibrate the system, press  to enter to the calibration setup menu.

Ex.1: Calibration information of applying Pre-amplifier type sensor

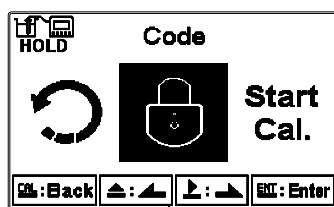


Ex.2: Calibration information of applying Polarographic type sensor

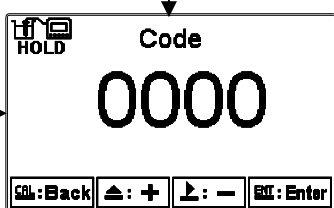


7.2 Security password of calibration (Code)

Select the Code (password) icon after entering calibration setup mode. Select to activate code function or not. The default Calibration setting code is “1100”.

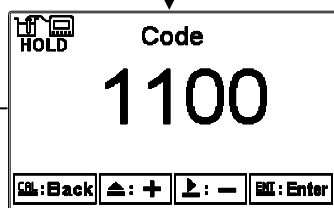


Press to confirm it.



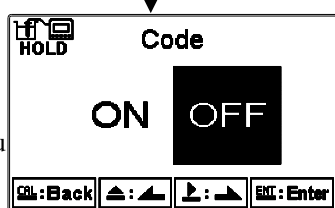
The first '0' of digits '0000' start to twinkle. Press or to adjust the value, and then press to confirm it and continually key in the next digit, and so on.

If you input a wrong code, then the display shows a “Error 5” message. Press to restart inputting another code, or press to exit the calibration menu.

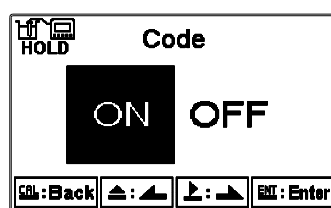


If you input a wrong code, then the display shows a “Error 5” message. Press to restart inputting another code, or press to exit the calibration menu.

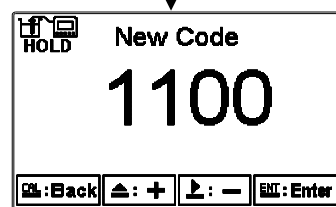
(Select to turn on or turn off code protection function. If you select turn on, please key in a new code. There will be a code requirement showing in display when you re-enter to the setup mode. Key in the correct password to enter into calibration setup menu.)



Press or



Press to confirm it.



Input new code

Press to confirm it.

Enter “Calibration” Setup

7.3 Calibration

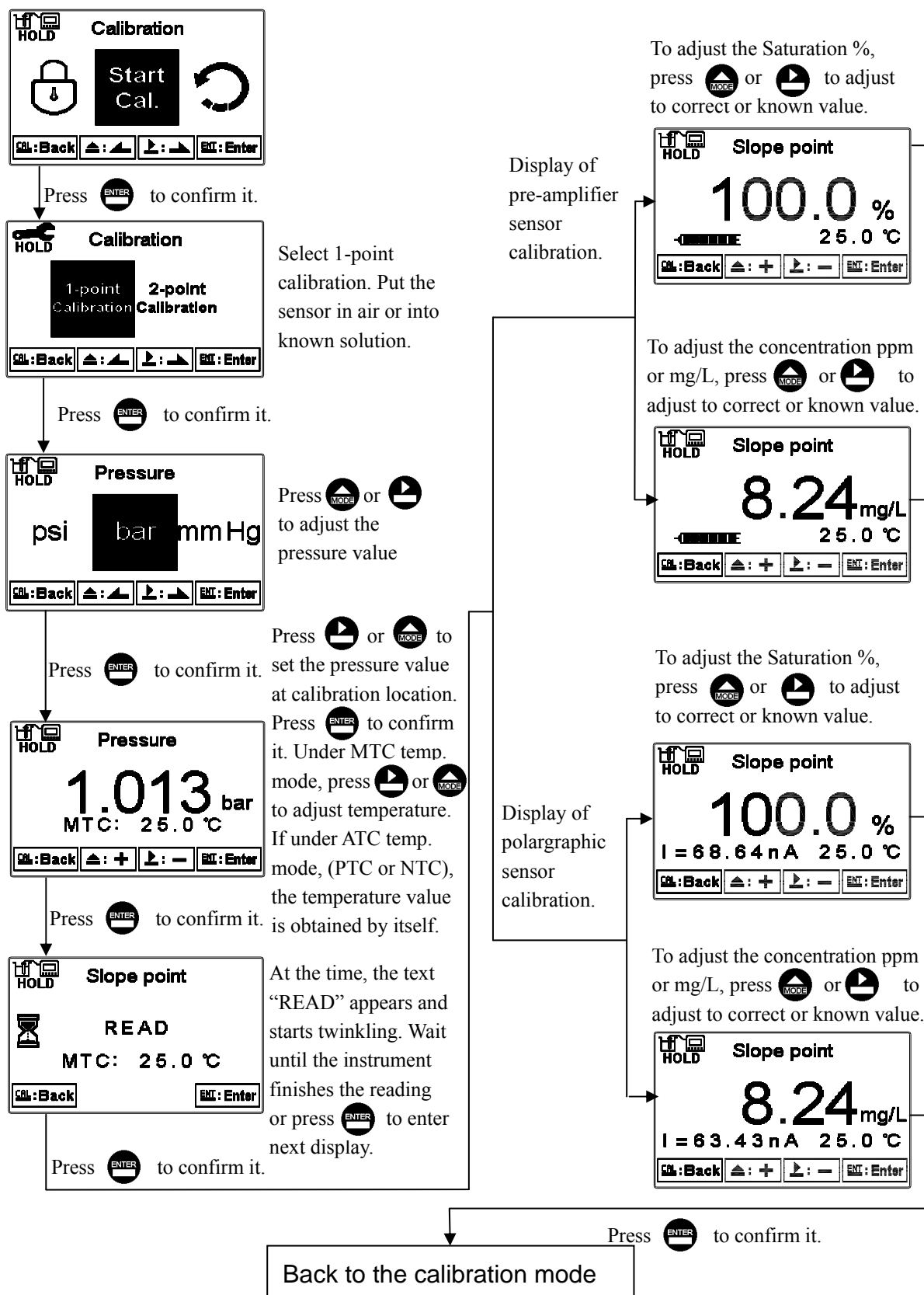
Each D.O. transmitter has not been calibrated with a sensor before out of factory because every sensor has different condition. Thus, the transmitter is necessary to be calibrated when connecting with a sensor or replace the electrolyte.

- According to set unit(% , mg/l, or ppm) under setup mode to start the calibration
- According to set polarographic sensor or pre-amplifier sensor to start the calibration
- The D.O. sensor is recommended for single point calibration(1-pt)100% in the air, not for 2 points calibration (2-pt).
- If it is necessary to make the zero point check(CHECK), please refer to the operation manual of the sensor.
- The two points calibration needs to make zero-points calibration at first, and then the slope calibration at last.

Note: Before calibration, please refer to the operation manual of the sensor about the instruction of the polarization, zero point calibration, calibration in the air, etc.

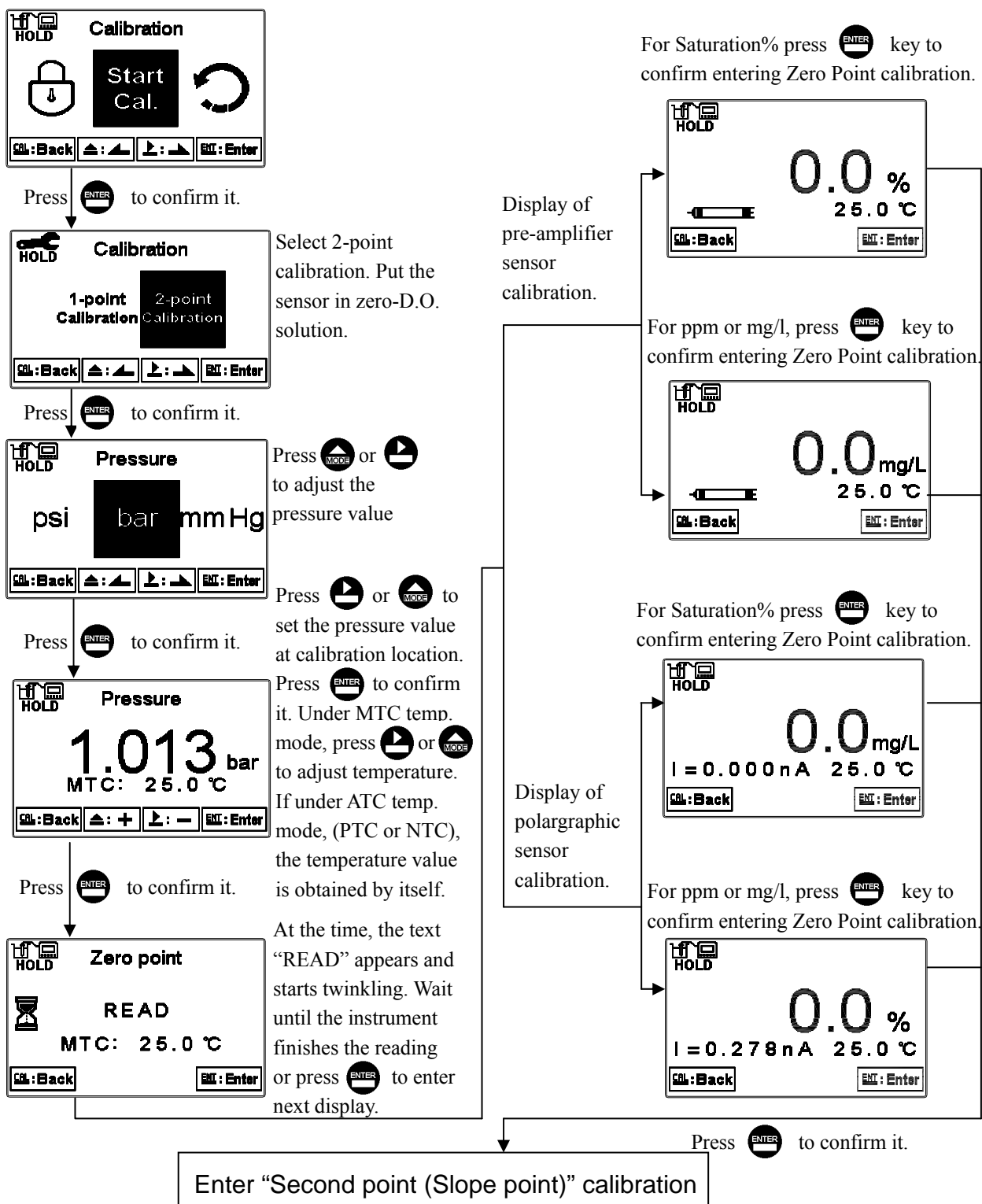
7.3.1 Single point calibration(1-Point.)

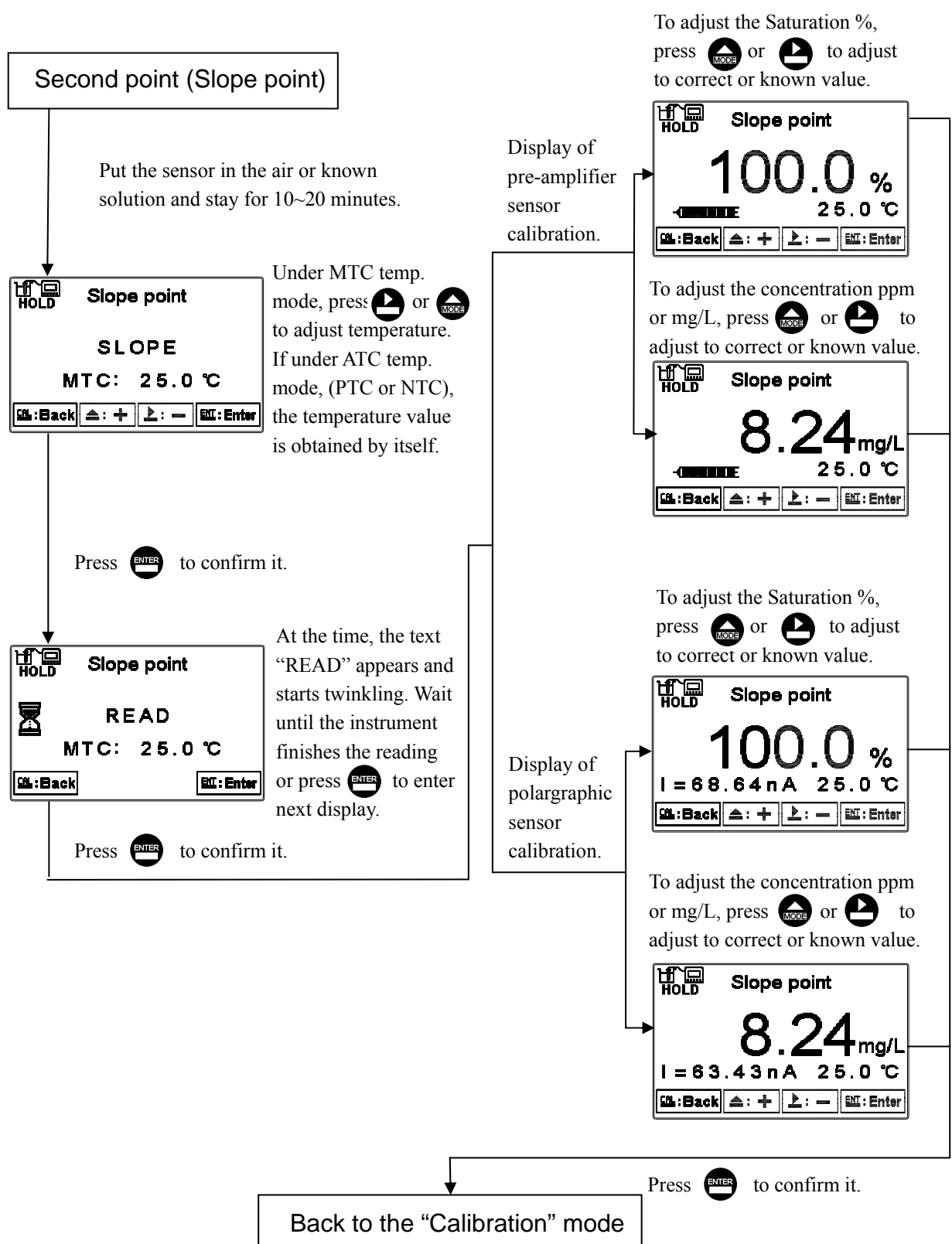
It is for the slope calibration of a sensor. Normally, the D.O. sensor is only necessary for 100% calibration in the air. The transmitter applies theoretical zero-point for the zero point base.



7.3.2 Two-Point Calibration (2-Point)

Normally, the D.O. sensor is not recommended for Two Point calibration. The first point of two-point calibration is to calibrate the ZERO point, and the second point is for slope calibration. Due to the extremely low current at zero point of a sensor, thus the zero point is only necessarily applied with very low D.O. measurement. For the two points calibration, please make sure the solution is indeed a zero-D.O. solution for zero point calibration. After finishing the zero point correction, the sensor is necessary to be steadily placed in the calibration medium for 10 ~ 30 minutes. Then, it is ready for the second point slope calibration. It is necessary the procedure of two point calibration to prevent the linear slope problem.

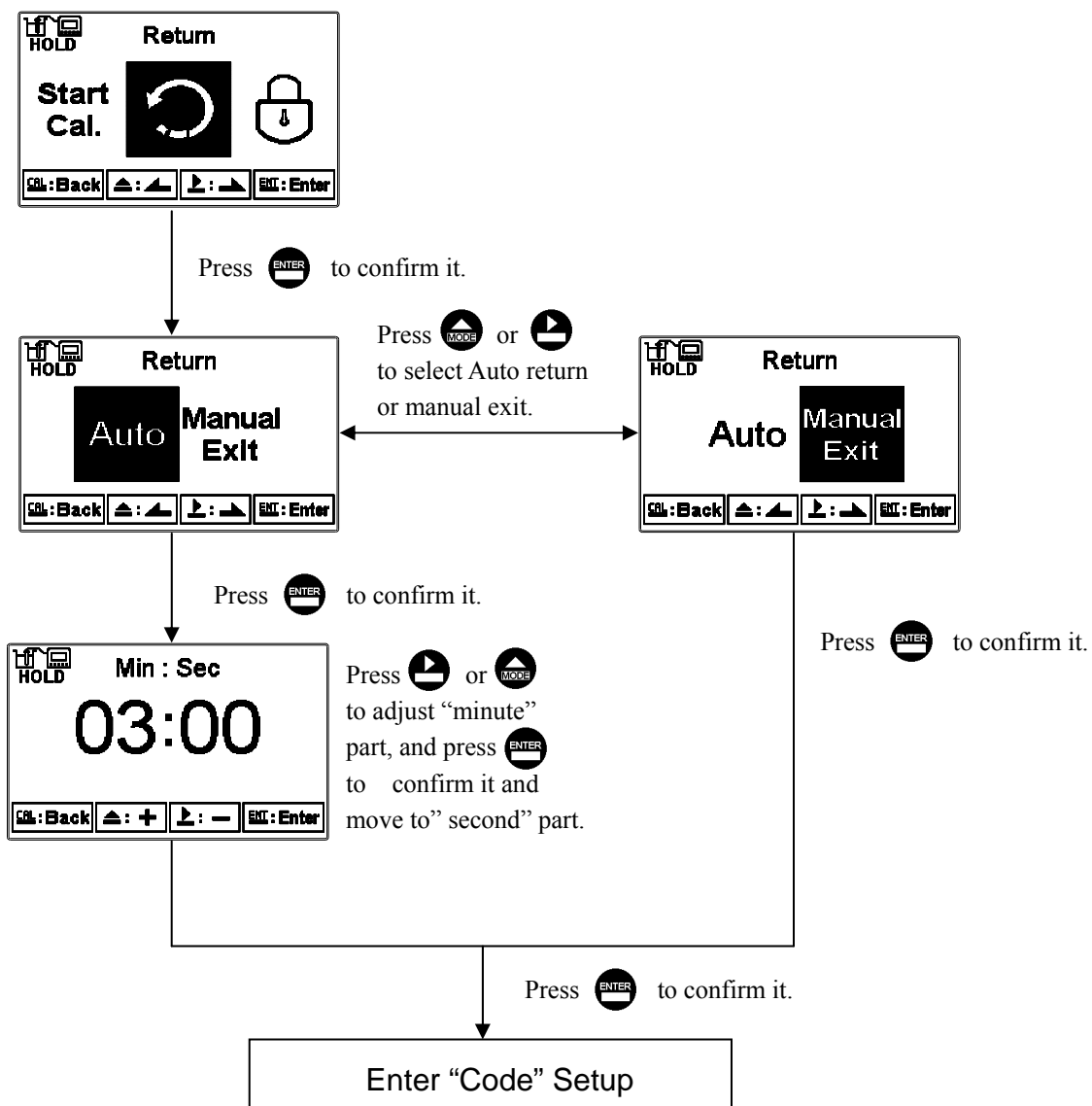




7.4 Return

Enter setup of auto return mode (Return) to set the function that the instrument automatically exit the setup menu after a period of time without pressing any key. The “Manual Exit” means that it needs to exit calibration setup menu manually, while “Auto” means that the display automatically exit the calibration setup menu and back to measurement mode after a period of time without pressing any key.

Note: the return function of setup menu and calibration setup menu are independent settings.



8. Error messages (Error code)

Messages	Reason	Dispositions
ERROR CODE	Wrong password	Re-enter a password
Error1	SLOPE value exceeds the upper or lower limit	1. Replace the new membrane and electrolyte 2. Sensor failure, please replace a new sensor
Error2	The offset (zero-point) exceeds the upper or lower limit.	3. Replace the new membrane and electrolyte 1. Sensor failure, please replace a new sensor
Error3	The reading is unstable while calibration	Please maintain or replace the electrode, and make calibration again
Error4	The temperature is over the range 0~50°C while calibration.	Please adjust the standard solution to the proper temperature range.
Error9	Serious error that does not permit any further measuring	Please call service engineer.

9. Maintenance

Generally speaking, if normally operated, the controller produced by our company need no maintenance except regular cleaning and calibration of the electrode, in order to ensure accurate and stable measurement value and normal system operation.

The cleaning cycle for the electrode depends on the pollution degree of the tested water sample. For the electrode cleaning time and methods, please refer to the Electrode Use Manual.

Note: We reserve the right to modify displays and contents. The actual display of the transmitter is subject to change without notice.

10. Appendix

10.1 Atmospheric pressure and relative height and% Air saturation table

At 100% relative humidity, % Air saturation and pressure, height table

PSI	Bar	Relative height	CALIB VALUE
14.84	1.023	84	101
14.69	1.013	0	100
14.54	1.003	85	99
14.49	0.999	170	98
14.25	0.983	256	97
14.11	0.973	343	96
13.96	0.963	431	95
13.81	0.952	519	94
13.66	0.942	608	93
13.52	0.932	698	92
13.37	0.922	789	91
13.23	0.912	880	90
13.08	0.902	972	89
12.94	0.892	1066	88
12.79	0.882	1160	87
12.63	0.871	1254	86
12.49	0.861	1350	85
12.34	0.851	1447	84
12.19	0.841	1544	83
12.05	0.831	1643	82
11.91	0.821	1743	81
11.76	0.811	1843	80
11.60	0.800	1945	79
11.46	0.790	2047	78
11.31	0.780	2151	77
11.17	0.770	2256	76
11.02	0.760	2362	75
10.88	0.750	2469	74
10.73	0.740	2577	73
10.59	0.730	2687	72
10.29	0.710	2797	71
10.28	0.709	2909	70
10.14	0.699	3023	69
9.99	0.689	3137	68
9.84	0.679	3253	67
9.70	0.669	3371	66

10.2 Temperature and salinity, dissolved oxygen saturation degree table

Under one atmospheric pressure (1.013Bar), exposed to the water saturated of air, the table of saturation degree of dissolved oxygen at different temperatures and different salinity.

Temp °C	Chlorinity Salinity	5.0 9.0	10.0 18.1	15.0 27.1	20.0 36.1	25.0 45.2
0	14.62	13.73	12.89	12.10	11.36	10.66
1	14.22	13.36	12.55	11.78	11.07	10.39
2	13.83	13.00	12.22	11.48	10.79	10.14
3	13.46	12.66	11.91	11.20	10.53	9.90
4	13.11	12.34	11.61	10.92	10.27	9.66
5	12.77	12.02	11.32	10.66	10.03	9.44
6	12.45	11.73	11.05	10.40	9.80	9.23
7	12.14	11.44	10.78	10.16	9.58	9.02
8	11.84	11.17	10.53	9.93	9.36	8.83
9	11.56	10.91	10.29	9.71	9.16	8.64
10	11.29	10.66	10.06	9.49	8.96	8.45
11	11.03	10.42	9.84	9.29	8.77	8.28
12	10.78	10.18	9.62	9.09	8.59	8.11
13	10.54	9.96	9.42	8.90	8.41	7.95
14	10.31	9.75	9.22	8.72	8.24	7.79
15	10.08	9.54	9.03	8.54	8.08	7.64
16	9.87	9.34	8.84	8.37	7.92	7.50
17	9.67	9.15	8.67	8.21	7.77	7.36
18	9.47	8.97	8.50	8.05	7.62	7.22
19	9.28	8.79	8.33	7.90	7.48	7.09
20	9.09	8.62	8.17	7.75	7.35	6.96
21	8.92	8.46	8.02	7.61	7.21	6.84
22	8.74	8.30	7.87	7.47	7.06	6.72
23	8.58	8.14	7.73	7.34	6.96	6.61
24	8.42	7.99	7.59	7.21	6.84	6.50
25	8.26	7.85	7.46	7.08	6.73	6.39
26	8.11	7.71	7.33	6.96	6.62	6.29
27	7.97	7.58	7.20	6.85	6.51	6.18
28	7.83	7.44	7.08	6.73	6.40	6.09
29	7.69	7.32	6.96	6.62	6.30	5.99
30	7.56	7.19	6.85	6.51	6.20	5.90
31	7.43	7.07	6.73	6.41	6.10	5.81
32	7.31	6.96	6.62	6.31	6.01	5.72

33	7.18	6.84	6.52	6.21	5.91	5.63
34	7.07	6.73	6.42	6.11	5.82	5.55
35	6.95	6.62	6.31	6.02	5.73	5.46
36	6.84	6.52	6.22	5.93	5.65	5.38
37	6.73	6.42	6.12	5.84	5.56	5.31
38	6.62	6.32	6.03	5.75	5.48	5.23
39	6.52	6.22	5.93	5.66	5.40	5.15
40	6.41	6.12	5.84	5.58	5.32	5.08
41	6.31	6.03	5.75	5.49	5.24	5.00
42	6.21	5.93	5.67	5.41	5.17	4.93
43	6.12	5.84	5.58	5.33	5.09	4.86
44	6.02	5.75	5.50	5.25	5.02	4.79
45	5.93	5.67	5.41	5.17	4.94	4.72
46	5.84	5.58	5.33	5.10	4.87	4.66
47	5.74	5.49	5.25	5.02	4.80	4.59
48	5.65	5.41	5.17	4.95	4.73	4.52
49	5.57	5.32	5.09	4.87	4.66	4.46
50	5.48	5.24	5.02	4.80	4.59	4.39



SUNTEX INSTRUMENTS CO., LTD.

13F, No. 31, Lane 169, Kangning St.,
Xizhi Dist., New Taipei City, Taiwan (R.O.C.)
Tel: 886-2-2695-9688
Fax: 886-2-2695-9693
e-mail: suntex@ms1.hinet.net

www.suntex.com.tw/en