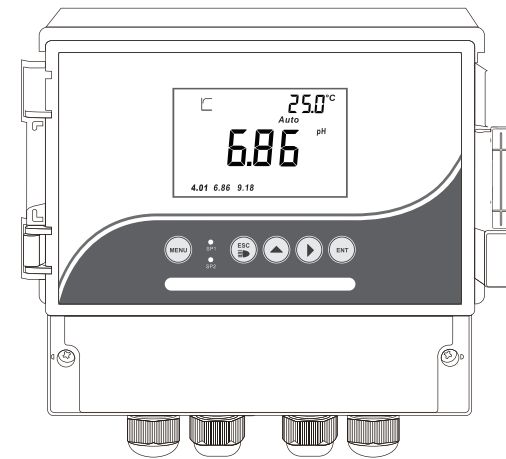


Operation Manual

pH/ORP

Transmitter /Controller



Pure Aquatics

PO Box 104 Wauchope, NSW, 2446 Australia
www.pureaquatics.com.au
gareth@pureaquatics.com.au
Sales and Technical Support
Tel - 0457 811 285
WHATSAPP - +61 457 811 285 SKYPE - gareth.barber4

Pure Aquatics

TABLE OF CONTENTS

Analyze on the data part:

Byte	1	2	3
Analyze	Unit type: 0 is for pH	Sensor type:0 is for Glass	Standard solution:
Byte	1 is for ORP	1 is for Antimony	0 is USA; 1 is NIST
Analyze	4	5,6	
	Temperature compensation type: 0 is Manual 1 is TH22,2 is PT1000	Manual temperature setting value or temperature offset value(Default 1 decimal point for 2 bytes integer,unit is°C)	

Note: In the ORH mode condition, only byte 1 is valid, other bytes are all 0.

Unit comparison table

Data	0	1	2	3	4	5	6
Unit	mV	nA	uA	mA	Ω	KΩ	MΩ
Data	7	8	9	10	11	12	13
Unit	uS	mS	S	PH	°C	°F	Ug/L
Data	14	15	16	17	18	19	20
Unit	Mg/L	g/L	ppb	ppm	ppt	%	mbar
Data	21	22					
Unit	bar	mmHg					

1 PREFACE	03
1.1 Before Use	03
1.2 In Use	03
1.3 Safety	03
2 PRODUCT OVERVIEW	04
2.1 Product Features	04
2.2 Technical Parameters	05
2.3 Measurement & Control System	06
2.4 Appearance	07
2.4.1 Display	07
2.4.2 Display Character Table	07
2.4.3 Key Panel	08
2.4.4 LED Indicator	08
2.5 Menu Preview	09
3 INSTALLATION	11
3.1 Installation	11
3.2 Connection Diagram	13
4 CALIBRATION	14
4.1 pH Calibration	14
4.2 ORP-mV Calibration	15
4.3 pH/ORP Mode Switch	15
5 pH SET UP	16
5.1 P01 Electrode	16
5.2 P02 Standard Solution	17
5.3 P03 Temperature	18
5.4 P04 Relay1	19
5.5 P05 Relay2	19
5.6 P06 Relay3	20
5.7 P07 Current Output	21
5.8 P08 RS-485 output	22
5.9 P09 Password	23
5.10 P10 Factory Defaults	24

6 ORP SET UP	25
6.1 P01 Relay1	25
6.2 P02 Relay2	25
6.3 P03 Relay3	26
6.4 P04 Current Output	27
6.5 P05 RS-485 Ouput	28
6.6 P06 Password	28
6.7 P07 Factory Defaults	29
7 APPENDIX	30
7.1 pH/temperature Corresponding To pH Buffer Solution	30
7.2 pH Factory Defaults	31
7.3 ORP Factory Defaults	31
8 PROTOCOL	32
9 GENERAL INFORMATION	37
9.1 Warranty	37
9.2 Return Of Malfunction Instruments	37
9.3 Guidelines Or Returning Unit For Repair	37

Model and Function

	pH/ORP controller							
Electrode	P01	Page16	P01	Page16	P01	Page16	P01	Page16
Standard Solution	P02	Page17	P02	Page17	P02	Page17	P02	Page17
Temperature	P03	Page18	P03	Page18	P03	Page18	P03	Page18
Relay 1			P04	Page19	P04	Page19	P04	Page19
Relay 2			P05	Page19	P05	Page19	P05	Page19
Relay 3					P06	Page20	P06	Page20
Current Output	P04	Page21	P06	Page21	P07	Page21	P07	Page21
RS-485 output					P08	Page22	P08	Page22
Password	P05	Page23	P07	Page23	P09	Page23	P09	Page23
Factory Defaults	P06	Page24	P08	Page24	P10	Page24	P10	Page24

3) Returned setting data (public), suppose the unit ID code is 01

01	03	XX	Data	CRC value
Unit ID code	Command	Number of data 1 byte (28 bytes)	28 bytes	The last 2 bytes

The definition of data part:

Relay 1:

1,2	3	4	5,6	7	8
ON integer	Decimal point	unit	OFF interger	Decimal point	unit

Relay 2:

9,10	11	12	13,14	15	16
ON integer	Decimal point	unit	OFF interger	Decimal point	unit

Relay 3:

17	18	19,20
Relay type	Cleaning second(s)	Cleaning interval(hours) 2bytes integer

Relay 3:

19,20	21,22	23	24	25,26	27
Cleaning interval(hours) 2 bytes integer	The transmitter 4mA corresponding value (2bytes integer)	Decimal point	unit	The 20mA corresponding value(2bytes integer)	Decimal point

4) Returned setting data (private), suppose the unit ID code is 01

01	03	XX	Data	CRC value
Unit ID	Command	Number of the data		The last 2 bytes

Analyze on the data:

01	03	Number of data	Data	CRC value
Unit ID	Command	1 byte (fix the number of data as 15 here)	15 bytes data	The last 2 bytes

Analyze on the data:

Byte	1,2	3	4
Analyze	The pH value integer	decimal point	unit

Note: 7FFF is outranged (ORP is the same), 8000 is below is range.
 Decimal point of the third byte: 02 is 2 decimal places,00 is without decimal point
 Unit of the fourth byte: 10 is pH, 00 is mV

Byte	5,6	5,6	8
Analyze	The temperature value integer	The temperature value integer	unit

Temperature value: 7FFF is outranged, 8000 is below is range.
 Byte 7: The decimal point of temperature 01 is a 1 decimal place.
 Byte 8:11 is °C,12 is °F
 Byte 9,10 ,11,12 are reserved bytes.
 Byte 13 and 14 are the current transmission output value (integer). The default is 2 decimal places, unit is mA.
 Byte 15 is the status of the Relays, 0 is disconnect, 1 is closed. The first 5 figures are independent bits. The sixth figure is Relay 3,the seventh figure is Relay2, the eighth figure is Relay 1.

2) Returned Calibration data: suppose the ID code of the unit is 01

01	03	0F	Data	CRC value
Unit ID	Command	1 byte (fix the number of data as 15 here)	15 bytes data	The last 2 bytes

The definition of data part:
 Calibration status of Byte 1:
 pH: the first 3 figures are independent bits. The forth figure is the high point; fifth is the middle point and sixth is the low point. The last 2 figure are independent bits.
 0 refers to without calibration, 1 refers to calibration done.
 ORP: The first 7 figures are independent bits. The eighth figure is the calibration mark.
 0 refers to without calibration, 1 refers to calibration done.
 Byte 2 and 3 are the offset integer of pH and ORP. Default the unit of 1 decimal point is mV
 Byte 4 and 5 are the acid slope,Byte 6 and 7 are the alkalinity slope.
 Byte 8,9,10,11,12,13,14 are reserved bytes.

1.1 Before Use

Thank you for selecting our company Controller/Transmitter
 Although the Controller/Transmitter use advanced technology and meet the requirements of current safety rules,improper use can still threaten the safety of users,and/or cause harmful influences to factory and other equipments.Therefore,before using the controller/transmitter,relevant person must read and understand contents of this operation manual.

Operation manual should be kept accessible within the person who use the controllers/transmitters.

If you have problems which are not mentioned or can not be explained in this manual,please contact our company local customer service center.They will be very glad to help you.

1.2 In Use

On any unmentioned use or the use that contradict with the technical parameters the operators should bear the responsibility

Other conditions of right use include:

- Remarks and requirements stated in operation manual.
- Local safety regulations on safe operation.
- Information and warning of products that are used together with the transmitters in the contract.(chassis,electrode,etc.)
- Required operating environment and working condition.

1.3 Safety



The transmitters may only be carried out by trained experts.

Unqualified Transmitters should not be installed and used.

The transmitters should be used under the required working condition

The transmitters should not be opened and repaired by clients themselves

Modified transmitter should not be used.Manufacturers and suppliers do not bear responsibility for the damage and lost caused by modifying instruments without permission.Clients should bear all the risks.

This instrument is Ip65 rated.Please use waterproof cable glands when you connect the cable.Also,please loose it when you open the cover.After connecting the cable,please tighten the cable conductor according to the following instruction with cable ties,or it will cause danger such as cable conductor or interface falls off when open the cover.

Please make sure to cut the power off when you open the cover to carry on any operation.

2.1 Product Features

Our company Controller/Transmitter is used to measure pH or ORP and temperature value. The transmitters can be panel-mounted or wall-mounted. They can be used as monitor in water treatment, controller in electrolytic water cleaning, in chemical industry, in food process, in cleaning water or water or waste water treatment and in neutralization process.

This transmitter has many user-friendly and safety features which include:

- Double high impedance input.
- IP65 rated, waterproof and anti-gas, applicable in extreme conditions.
- High protection against electromagnetic interference.
- Menu-driven program that simplifies set-up.
- Built-in memory backup to ensure that setup parameter and calibration information are not erased in power-off condition.
- Scaleable isolated 4-20mA Outputs for pH/ORP.
- Temperature value offset adjustment.
- Two relay circuits, can select high-low control freely. Separately adjustable high and low set-point hysteresis (dead bands) prevent chattering of relays around the set point.
- Glass electrode and antimony electrode are selectable to meet different industrial situations or HF (hydrofluoric acid) measurement situation
- LED indicators monitor control status from a distance
- Large LCD, with high luminance LED backlight.

5. Analyze on the error data from the Console computer

- 1) No responding from Console computer
 - a. Wrong sending address from the Host computer
 - b. Receive time out. Timing when the Console computer receives the first data. The receiving will stop if the received data is less than the required command bytes (5 bytes) when the second system is interrupted.
 - c. Host computer command bytes exceeding. Command will be invalid if the received command bytes in the receiving time are more than required. If the command sending from the Host computer is too frequent also leads to the same problem. Suggest the interval of the Host computer command sending be more than 0.5 seconds.

2) Returned Error code from the Console computer

Returned Error code from the Console computer is 5 bytes. The command from the Host computer and the Error code share the same beginning of 8, for example:

Address	Host computer command +0X80	Error code	CRC calibration
1 byte	1 byte	1 byte	2 bytes

The Error code can be classified as the following 4 circumstances:

- a. Error in command: The command from the Host computer is for example 01 05 01 E2 90 instead of 03.

The Console computer will return 01 05+80 81 82 F0

Command Error - 01 85 81 82 F0

- b. Error in Command objects. Available command object: 01. 02.03.04. If 01 03 07 61 32

the console computer will return: 01 03 +80 82 C1 51

Command object Error: 01 83 82 C1 51

- c. Error in CRC calibration code: If 01 03 01 AA BB (correct code: 01 03 01 E1 30)

the console computer will return: 01 03 +80 83 00 91

CRC calibration code Error: 01 83 83 00 91

- d. Unit not in the measurement condition, specially refers to when there is no mistake from the Host computer command, however, the Console computer is not in the correct measurement condition cause the failure of uploading the measurement results. For example:

Console computer returns: 01 03+80 80 40 90

Unit not in the measurement condition: 01 83 80 40 90

6. Analyze on the correct data from the Console computer

Note: The lower byte is behind the high byte in all returned integer data.

The returned data from the Console computer can also be classified in 4 circumstances as the Host computer.

- 1) Returned floating data: suppose the Unit ID code is 01

01	03	Number of data	Data	CRC value
Unit ID	Command	1 byte (fix the number of data as 15 here)	15 bytes data	The last 2 bytes

8 PROTOCOL

1. General Introduction

The unit adopts the RS-485 Modbus Protocol. The communication distance is as long as 1200m by merging 1-200 units in one communication line. Range of the ID code can be from 001-200.

Communication baud rate range 1200, 2400, 4800,9600,19200.

Data format can refer to the Modbus RTU format.

2. Composition of the communication command: Command from the Host computer

Console computer address(ID code)	Command code	Command object	CRC (Calibration)
1 byte	1 byte	1 byte	2 bytes(High in front)

3. Console computer address and the unit (ID code of the Console computer)

Command code: 03 is fixed here to read the contents from the register

Command object: the data format of the Host computer need to read from

Command	Object	Explanation of the data
01	Floating data (measured data)	The measured data, include the output current and the status of the Relays
02	Calibration data	The zero point, slope, calibration point, etc of the electrode after the calibration done
03	Parameter setting 1	The public part of the setup data
04	Parameter setting 2	The exclusive part of different units

4. The complete command from the Host computer (suppose the Console computer address is 01)

Console computer address	Command Code	Command Object	CRC Calibration	Explanation of the data
01	03	01	E1 30	reading the floating data
01	03	02	A1 31	reading the calibration data
01	03	03	60 F1	reading the parameter setting(public)
01	03	04	21 33	reading the the parameter setting(private)

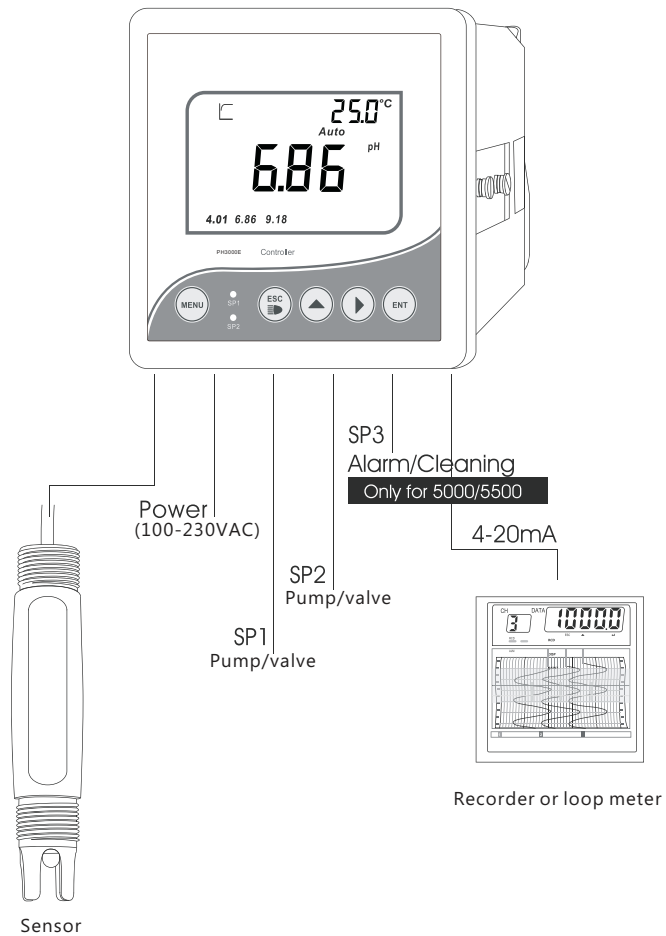
2.2 Technical Parameters

Model	PH2000E	PH3000	PH3000E	PH3300E
PH	Range	-2.00-16.00 pH		
	Resolution	0.01 pH		
	Accuracy	0. 01pH		
	Signal Input Impedance	≥ 1012 Ω		
ORP	Range	-2000-2000 mV		
	Resolution	1 mV		
	Accuracy	1mV		
Temperature	Temperature Range	-10. 0-110. 0℃		
	Resolution	0. 1℃		
	Precision	0. 3℃		
	Temperature Sensor	PH1000		
	TEMP. Compensation	Automatic/Manual		
Signal	Signal Output	4-20 mA (Adjustable)		
Output/load	Current Accuracy	≤ 1% F.S.		
	Load	< 500 Ω		
Data interface	RS485			MODBUS Protocol
	On/Off			2 SPST Relays
Relay	Output			2.5A 230 VAC
Ouput	Cleaning/Alarm Relays			1X 2.5A
Others	Power	85-260 VAC or 24 VDC		
	Working Temperature	0-60℃		
	Humidity	< 85%		
	IP Rated	IP65		
	Installation	Panel Mounting	Wall Mounting	
	Dimensions	(HXWXD)108X108X158mm	160X188X108mm	
	Panel Cut Size	94.5X94.5 mm		
	Weight	0.5 kg	0.7 kg	

2.3 Measurement & Control System

Typical measurement system includes:

- pH/ORP on-line transmitter
- pH/ORP combination sensor
- Suitable pH/ORP measurement cable
- Immersion system or flow cell or processing parts with or without grounding electrode
- Terminal control parts, eg. Pump or valve.
- 4-20mA output connected with recorder/PLC



7.2 pH Factory Defaults

Item	Corresponding interface	Factory Defaults
Sensor	P-01	pH Electrode
Standard Solution	P-02	USA: 10.01, 7.00, 4.01
Temperature	P-03	Manual Temperature Compensation 25°C
Relay 1	P-04	ON-Point is 4.00pH; OFF-Point is 4.50pH
Relay 2	P-05	ON-Point is 10.00pH; OFF-Point is 9.50pH
Relay 3	P-06	Alarm
Current Output	P-07	4.00mA corresponds to 0.00pH; 20.00mA corresponds to 14.00pH
Data transmission	P-08	ID of the protocol address is 001; Baud rate is 9600

7.3 ORP Factory Defaults

Item	Corresponding interface	Factory Defaults
Relay 1	P-01	ON-Point is 400mV; OFF-Point is 450mV
Relay 2	P-02	ON-Point is 1000mV; OFF-Point is 950mV
Relay 3	P-03	Alarm
Current Output	P-04	0000mV corresponds to 4.00mA; 1400mV corresponds to 20.00mA

7.1 pH/temperature Corresponding To pH Buffer Solution

Temperature(°C)	pH4.01	pH6.86	pH9.18	pH4.00	pH7.00	pH10.01
0	4.01	6.98	9.47	4.01	7.12	10.32
5	4.01	6.95	9.38	4.00	7.09	10.25
10	4.00	6.92	9.32	4.00	7.06	10.18
15	4.00	6.90	9.27	4.00	7.04	10.12
20	4.00	6.88	9.22	4.00	7.02	10.06
25	4.01	6.86	9.18	4.00	7.00	10.01
30	4.01	6.85	9.14	4.01	6.99	9.97
35	4.02	6.84	9.10	4.02	6.98	9.93
40	4.03	6.84	9.07	4.03	6.97	9.89
45	4.04	6.83	9.04	4.04	6.97	9.86
50	4.06	6.83	9.01	4.06	6.97	9.83
55	4.08	6.83	8.99	4.07	6.97	9.81
60	4.10	6.84	8.96	4.09	6.98	9.79
70	4.12	6.85	8.92	4.12	6.99	9.76
80	4.16	6.86	8.89	4.16	7.00	9.74
90	4.20	6.88	8.85	4.20	7.02	9.73

2.4 Appearance






2.4.1 Display

1 Measuring Status-Calculating
 2 Measuring Status-Stable Value
 3 Electrode inserted display
 4 Setup display
 5 offset-Electrode offset
 6 Slope-Electrode slopr
 7 Done-Calibration Done
 8 mV,pH,mA,°C ,%-Unit of Measurement
 9 Auto/Manual-Temperature Compensation
 10 4.01,7.00,10.01 Calibrated Points-USA Buffer Standard
 11 4.01,6.86,9.18 Calibrated Points-USA Buffer Standard

2.4.2 Display Character Table

SEN	Sensor	Offset	Sensor Offset
GLAS	Glass pH Sensor	P-	Menu item
ANT 1	Antimony pH Sensor	CODE	Password Setting
BUF	Buffer Solution	DEF	Factory Defaults
NIST	NIST Standard	SL 1	Sensor Slope 1
USA	USA Standard	SL 2	Sensor Slope 2
TC	Temperature Compensation	SAVE	Save Data
Auto	Automatic Temperature Compensation	Err	Error
Manual	Manual Temperature Compensation	ON	On
EH22	22K Sensor	OFF	Off
Pt	PT1000 Sensor	NO	No
TOFS	Temperature Offset	YES	Yes
RLY 1	Relay1	OUr	Temperature value Over
RLY 2	Relay2	Udr	Temperature value Under
RLY 3	Relay3	FULL	Full Data Storage
CURr	Current Output	OUEr	Measuring Value Over
485	Data output	UNdr	Measuring Value Under
Slope	Electrode Slope		

2.4.3 Key Panel

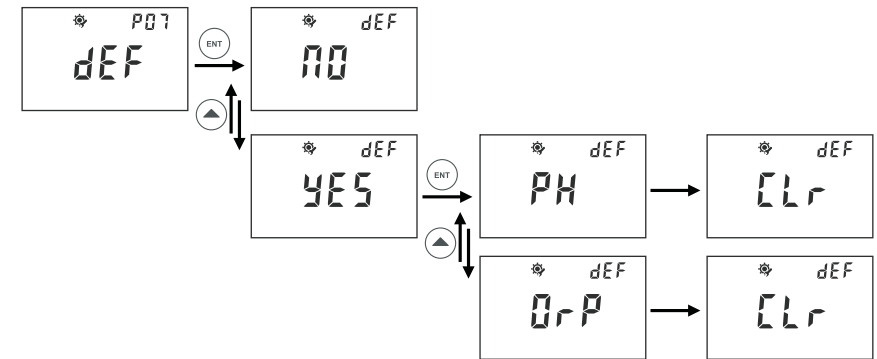
key	Description
	Menu Key In measuring status,press the key once into Calibration mode In calibration or Set up mode,Press the key back to measuring status
	Escape key Press and back to previous screen display in Calibration or Set Up mode Back light on and off switch in measurement status
	Up Arrow Key In measuring status,press the key into "Set Up Status Review" mode, press again to check each set up status. In SET UP mode,press to select items and to adjust set value. In Menu mode,act as forward cycle key
	Right Arrow Key In measuring status,press the key to change measurement mode In SET UP mode,press to select digits of value In Menu mode,act as backward cycle key
	Confirm Key Confirm the selection

2.4.4 LED Indicator

LED Indicator

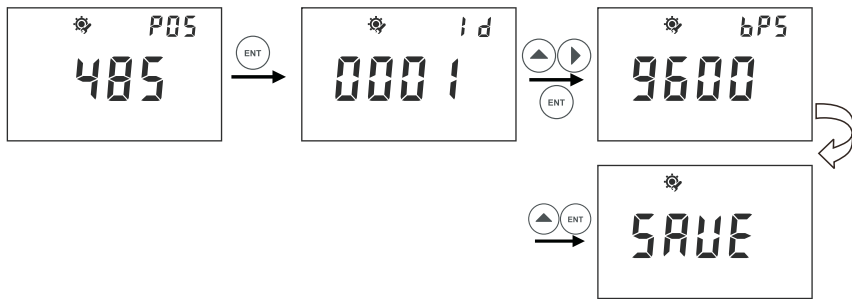
SP1/ SP2 LED light-on shows the relevant relay is in working status.

6.7 P07 Factory Defaults



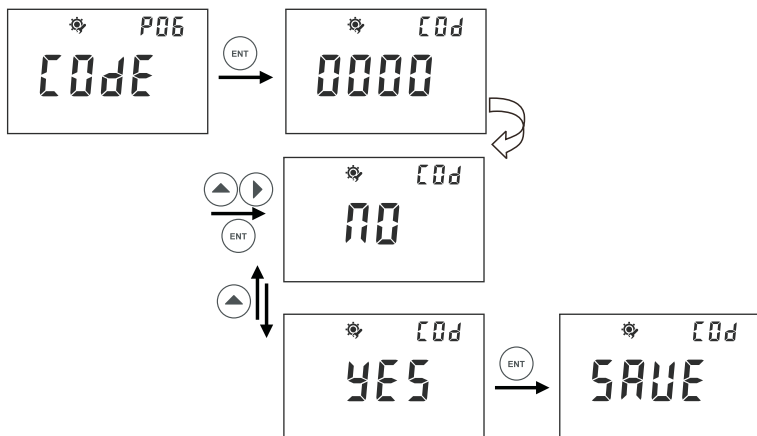
- In P-07,you can select to change factory defaults or to revert to factory default status.
- Please refer to above description steps to set up P-05
- You can go to next parameter setting by pressing \uparrow or press MENU key to quit and go back to measurement mode.

6.5 P05 RS-485 Output



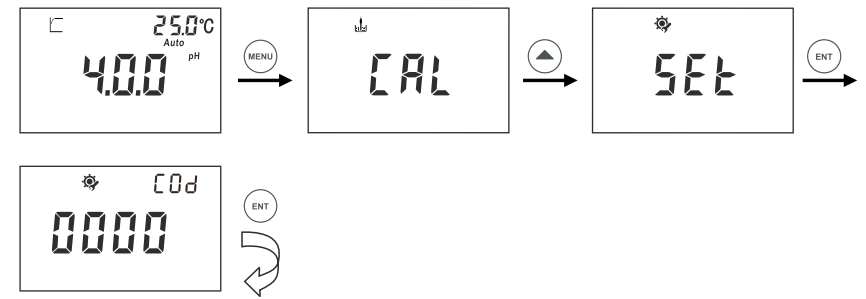
- After entering P-05, you can press ▲▶ to set the ID of the protocol address and press ENT to confirm. ID range can be set from 01 to 200.
- You can press ▲ to set the protocol rate you need and confirm by pressing ENT.

6.6 P06 Password

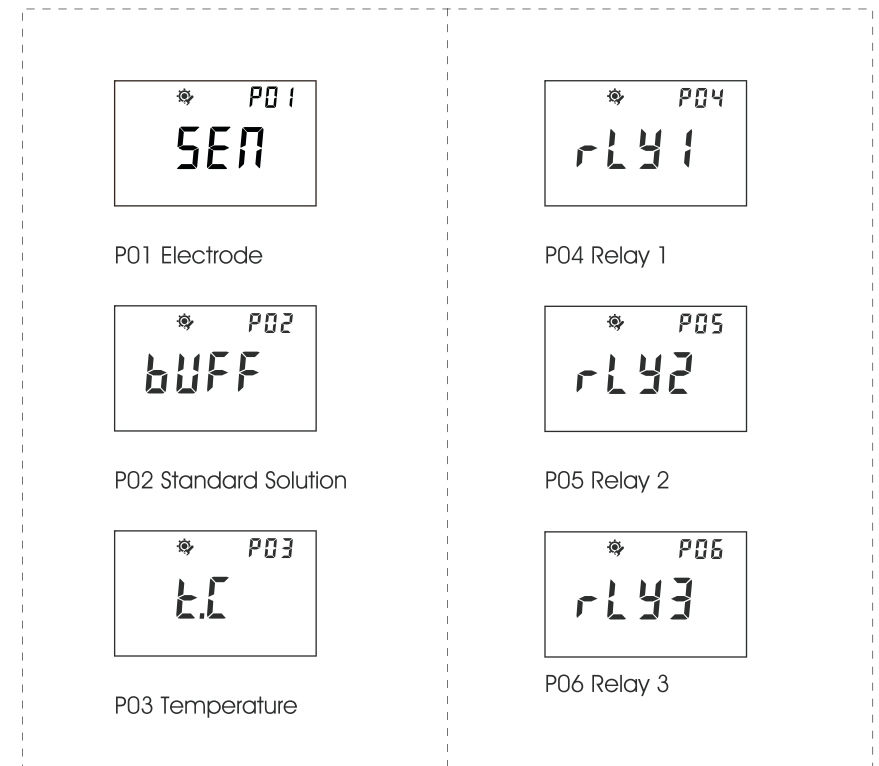


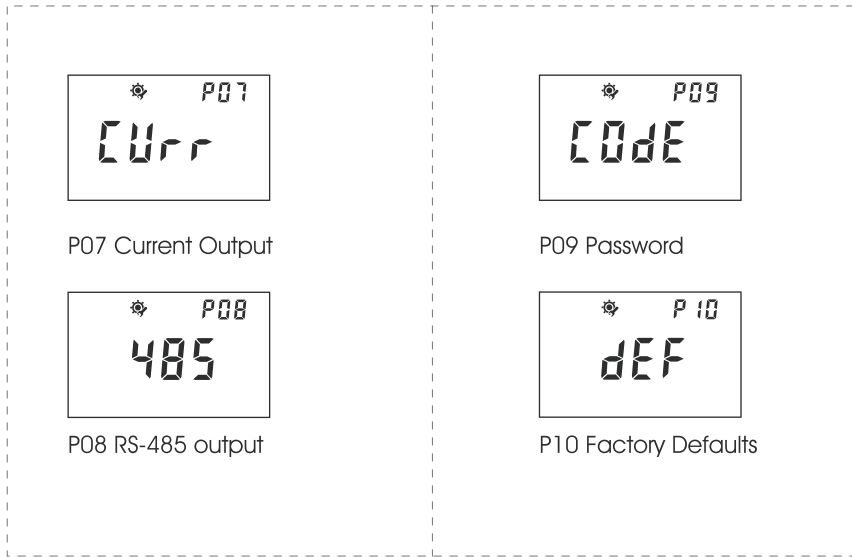
- In P-06, you can select to change factory defaults or to revert to factory default status.
- Please refer to above description steps to set up P-04
- You can go to next parameter setting by pressing ▲▶, or press MENU key to quit and go back to measurement mode.

2.5 Menu Preview

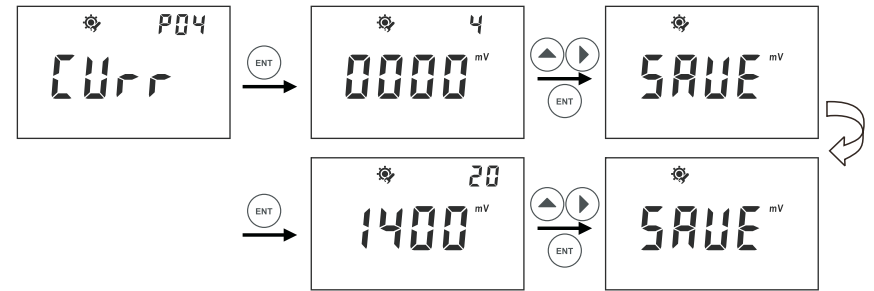


- In measurement mode, press MENU key to enter calibration step, and then, press ▲ key to enter set up process
- Press ENT key to pass through, if you have not set up password.



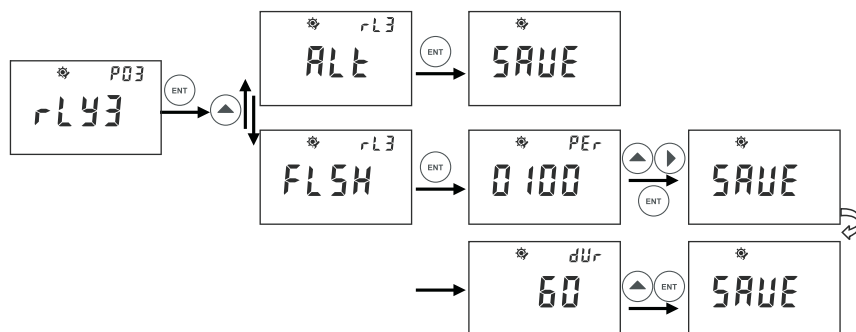


6.4 P04 Current Output



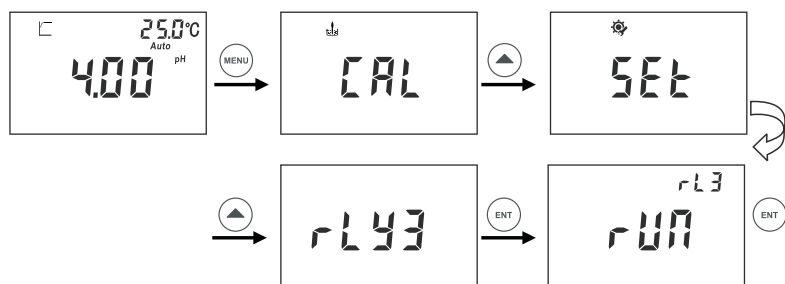
- In P-04, you can set up current output/transmitting for measurement value for advanced application
- After entering P-03, the figure 4 on top right corner represents transmitting 4 mA out for below set value (0000mV), you can press **▶** to set a value you need to transmit 4mA for your application
- The figures 20 on top right corner represent transmitting 20 mA out for below set value (1400mV).
- The mV range for setting is from -2000 to 2000mV.
- Please refer to above description steps to set up P-03
- You can go to next parameter setting by pressing **▶**, or press MENU key to quit and go back to measurement mode.

6.3 P03 Relay 3



- In P-03, you can set up Relay3 (rLY3), also called the Cleaning/Alarm Relay.
- After entering P-03, you can press ▲ to set the ALT and FLSH.
- By pressing ENT to set the ALT function, the unit will then alarm if the other two Relays have any operation.
- FLSH refers to the Cleaning function. The cleaning frequency can be set per each 0-1000 hours and 0-120 seconds for the time of duration.
- You can press ▲▶ to set the specific hours you need to clean per each time. Press ▲ set the duration time per each cleaning.
- Please refer to above description steps to set up P-06.

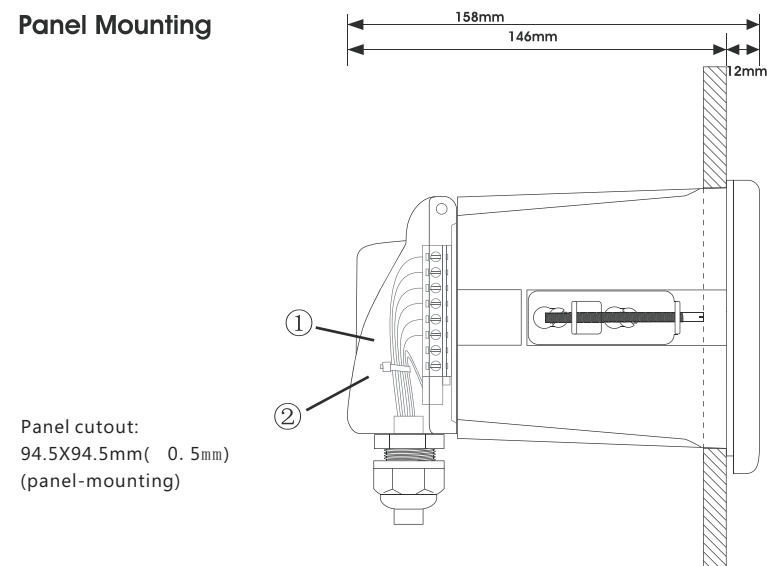
Note: The Cleaning/Alarm Relay can also be set as Manual in the measuring mode as below: After entering Relay3 Manual setting, press ENT key, the screen will twinkle and display "RUN". The twinkling will stop by pressing ENT and the unit starts to clean/alarm.



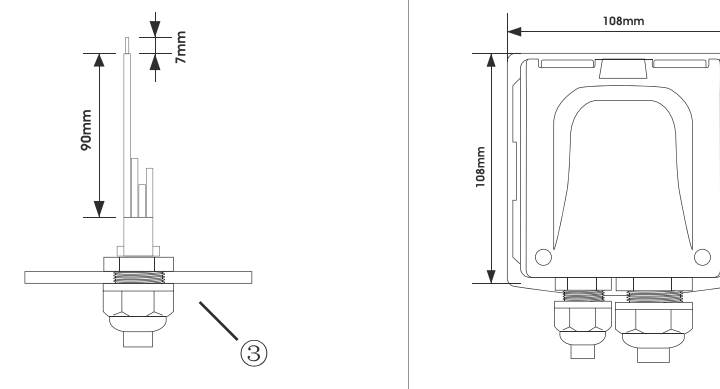
3 INSTALLATION

3.1 Installation

Panel Mounting

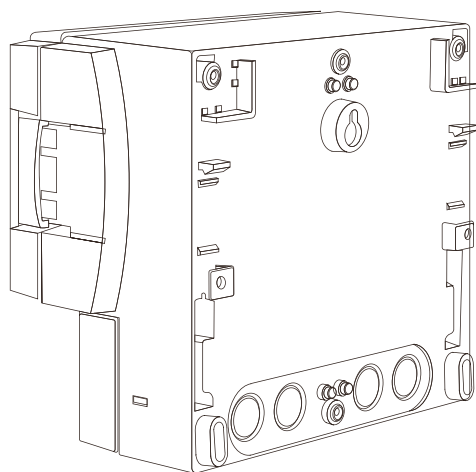
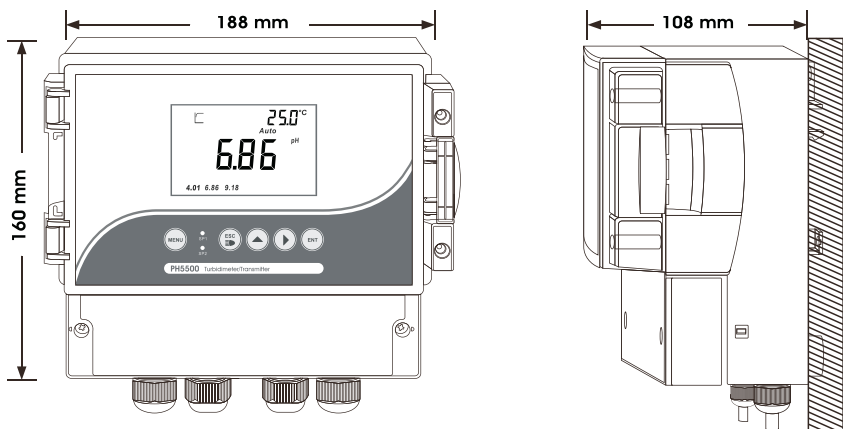


Panel cutout:
94.5X94.5mm (±0.5mm)
(panel-mounting)



- ① Cable (Recommended stripping length for cables is at least 90mm, please use 0.5 to 1 square meter's wire)
- ② Cable ties
- ③ Waterproof cable glands

Wall Mounting

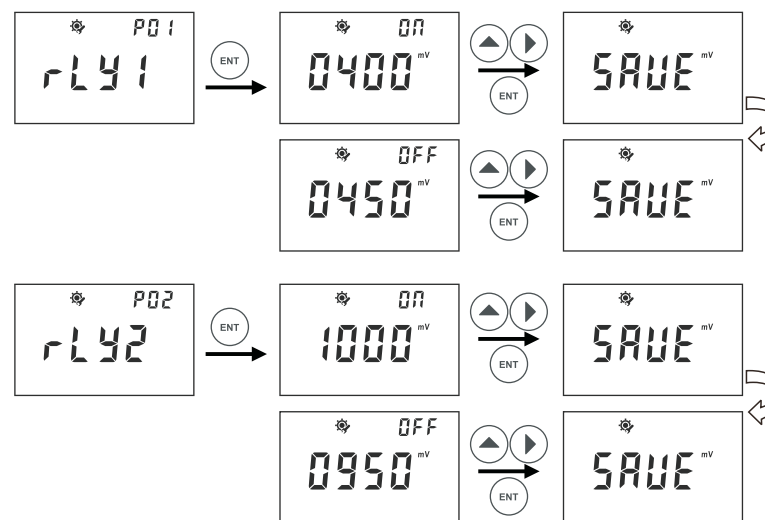


6 ORP SET UP



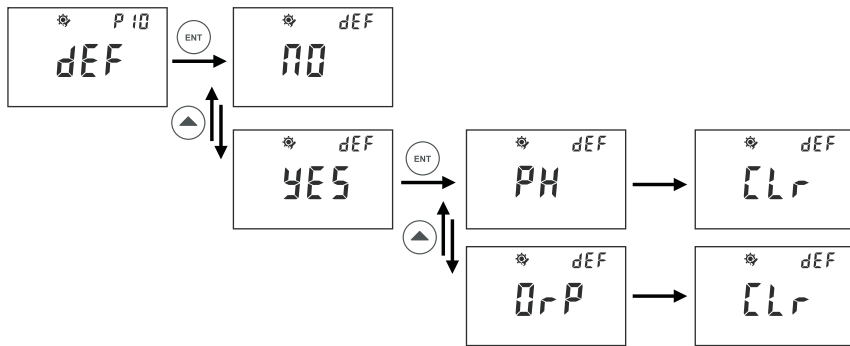
- In ORP measurement mode, press MENU key to enter ORP calibration step, then press ▲ key to enter ORP set up process.

6.1 P01 Relay1(SP1) 6.2 P02 Relay2(SP2)



- In P-01, you can set up Relay1 (SP1):ON-Point and OFF-Point.
- The range for setting up ON-Point and OFF-Point is from -2000mV to 2000mV.
- Please refer to above description steps to set up P-01.
- You can go to next parameter setting by pressing ▲▶, or press MENU key to quit and go back to measurement mode.
- P-02, the same setting procedure as P-01.

5.10 P10 Factory Defaults



- In P-10, you can select to change factory defaults or to revert to factory default status.
- Please refer to above description steps to set up P-04.
- You can go to next parameter setting by pressing ▲▶, or press MENU key to quit and go back to measurement mode.

3.2 Connection Diagram

PH2000 Connection Diagram

Terminal	Function	Terminal	Function
PD	Pt1000 drive positive	TP+	4-20mA output, positive
PT+	Pt1000 signal positive	TP-	4-20mA output, negative
PT-	Pt1000 signal negative	I+	240VDC(positive)
T1	T1	I-	240VDC(negative)
T2	T2	COM	
		PH-	

PH3000E Connection Diagram

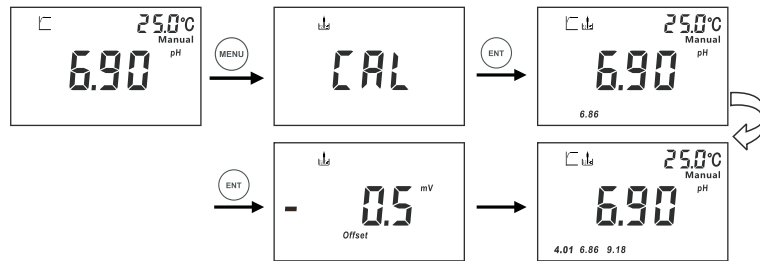
Terminal	Function	Terminal	Function
Metal terminal	pH sensor input	B	485 output
S4	REF sensor input	A	485 output
S2	Short circuit S2 and S1	R3	COM(RL3)
S1	Short circuit S2 and S1	R3	OPEN(RL3)
COM	COM	R2	COM(RL2)
PD	Pt1000 drive positive	R2	OPEN(RL2)
PT+	Pt1000 signal positive	R1	COM(RL1)
PT-	Pt1000 signal negative	R1	OPEN(RL1)
T1	NTC22K input	FG	Earth
T2	NTC22K input	FG	Earth
I+	4-20mA output, positive	N	Neutral
I-	4-20mA output, negative	L	Live

Note:

For 2-wire Pt1000 temperature sensing terminal system, use short circuit between PD and PT+.
For normal sensor terminal system, use short circuit between PH- and COM.

4 CALIBRATION

4.1 pH Calibration



- In pH measurement mode, press MENU key to enter pH calibration step, and then, press ENT key to enter calibration process.
- Dip the sensor into 7.00 or 6.86 pH buffer solution first, you will soon get the zero point offset value from the screen.
- After point of 7.00 or 6.86 pH calibrated, you can go to next point calibration.

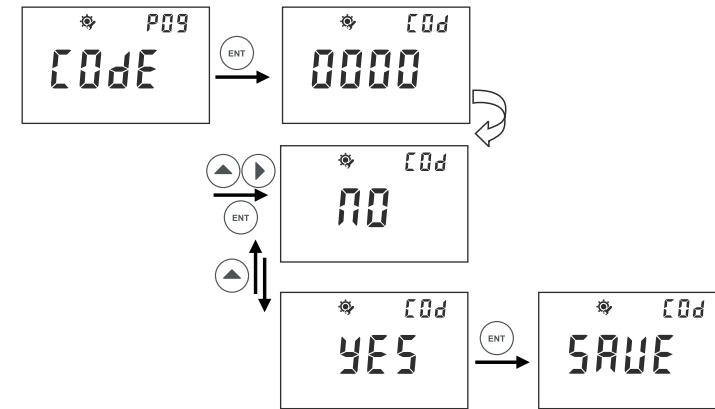


- To continue to calibrate second point (4.01, 10.1, or 9.18). When the value is stable, press ENT key to confirm the result. You will get slope value of sensor from the screen.
- You can go next to third point calibration or quit the calibration process.



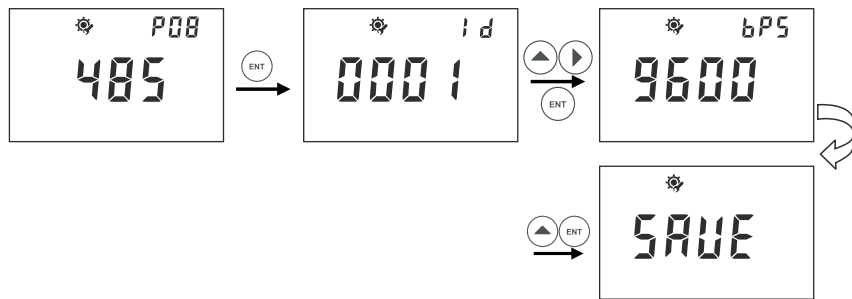
- During the calibration process, you can press ESC key to terminate calibration process, or press MENU key to go back to measurement status.

5.9 P09 Password



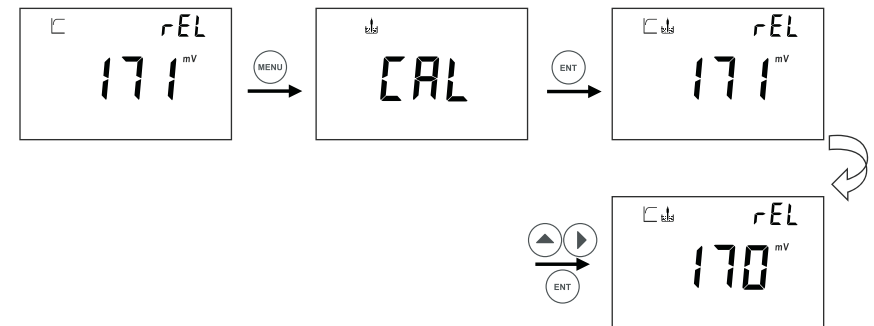
- In P-09, you can set up password method to prevent anyone from changing your settings.
- Please refer to above description steps to set up P-04.
- You can go to next parameter setting by pressing ▲▶ or press MENU key to quit and go back to measurement mode.
- Factory default: 0000.

5.8 P08 RS-485 output



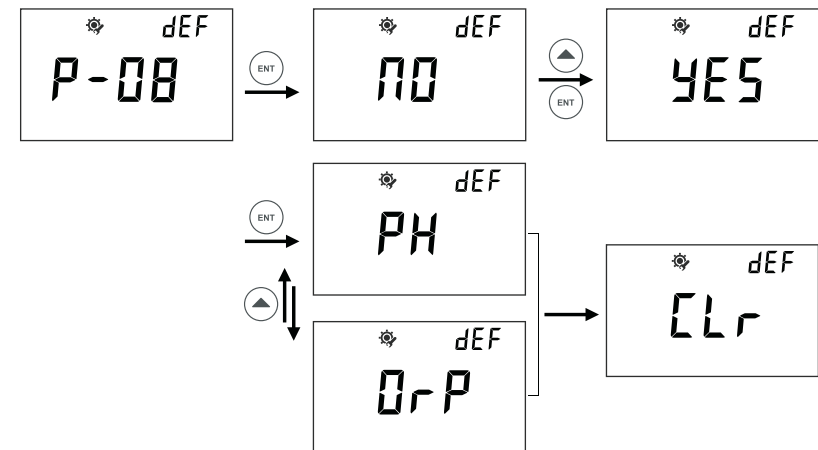
- 1. After entering P-08, you can press ▲▶ to set the ID of the protocol address and press ENT to confirm. ID range can be set from 01 to 200.
- 2. You can press ▲ to set the protocol rate you need and confirm by pressing ENT.

4.2 ORP-mV Calibration



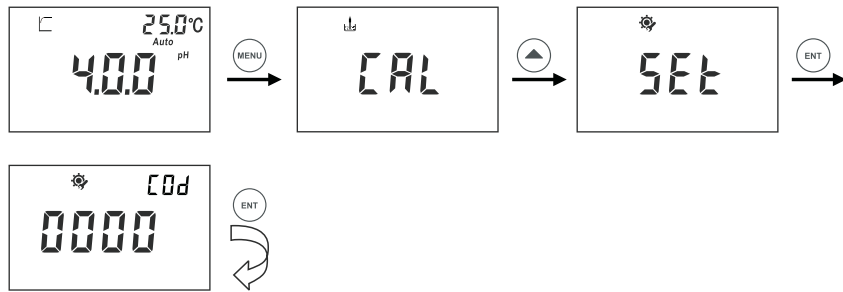
- In ORP measurement mode, press MENU key to enter ORP calibration step, and then, press ENT key to enter calibration process.
- Dip the sensor into standard solution, after stable symbol shows up, you get the real mV value.
- When the value is twinkling, press ▲▶ to adjust value to match with standard solution.

4.3 pH/ORP Mode Switch



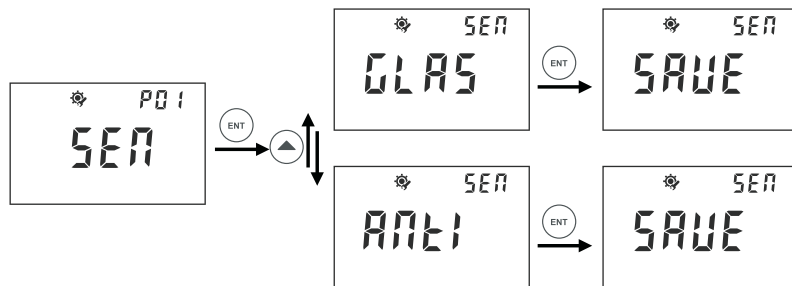
- In P-08, revert to factory default.
- Press ▲ to switch to pH or ORP.
- Please refer to above description steps to set up.

5 pH SET UP



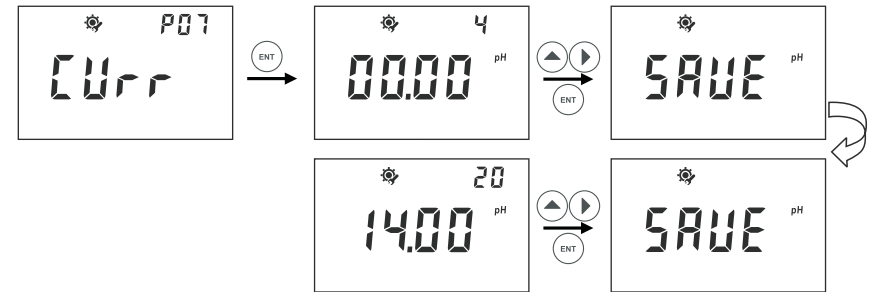
- In measurement, press MENU key to enter pH calibration step, and press ▲ to enter Set UP step, then press ENT key to enter set up process.

5.1 P01 Electrode



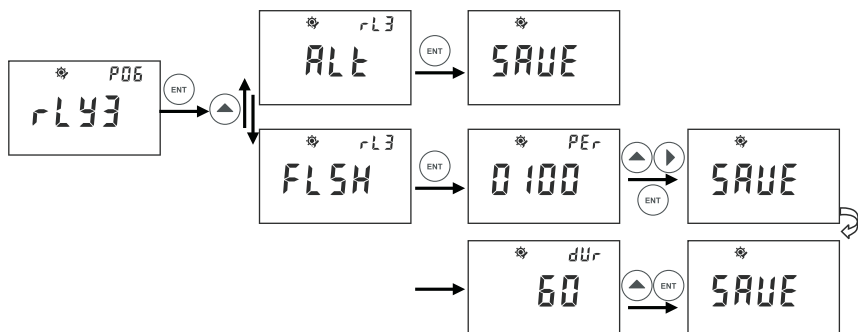
- In P-01, you can select a glass electrode for general application or an antimony electrode for hydrofluoric acid environment application.
- Please refer to above description steps to setup P-01.
- You can go to next parameter setting by pressing ▲▶ or press MENU key to quit and go back to measurement mode.
- Factory default: GLASS

5.7 P07 Current Output



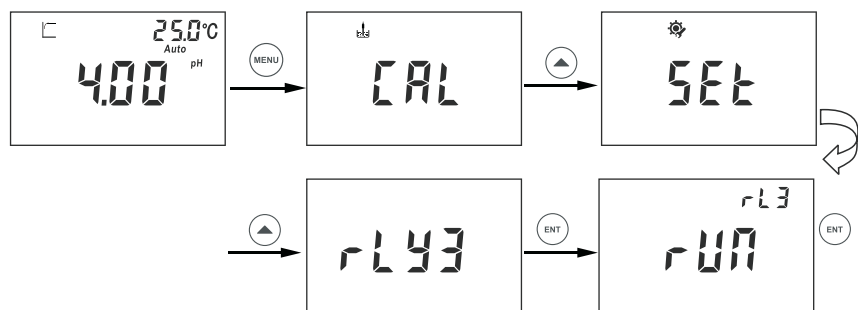
- In P-07, you can set up current output/transmitting for measurement valve for advanced application.
- After entering P-07, the figure 4 on top right corner represents transmitting 4 mA out for below set value (0.00pH), you can press ▲▶ to set a value you need to transmit 4mA for your application.
- The figures 20 on top right corner represent transmitting 20 mA out for below set value (14.00pH).
- The pH range for setting is from -2.00 to 16.00pH.
- Please refer to above description steps to set up P-05.
- You can go to next parameter setting by pressing ▲▶ or press MENU key to quit and go back to measurement mode.

5.6 P06 Relay 3

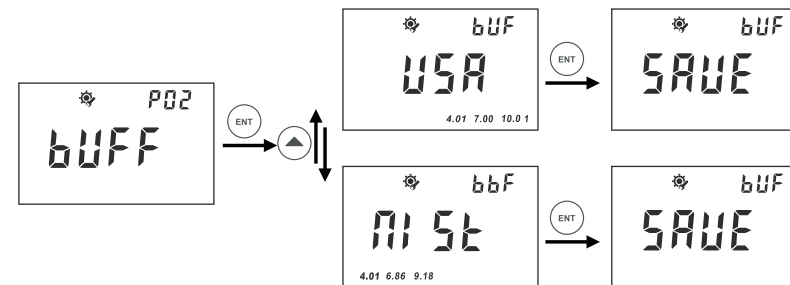


- In P-06, you can set up Relay3 (rly3), also called the Cleaning/Alarm Relay.
- After entering P-06, you can press ▲ to set the ALT and FLSH.
- By pressing ENT to set the ALT function, the unit will then alarm if the other two Relays have any operation.
- FLSH refers to the Cleaning function. The cleaning frequency can be set per each 0-1000hours and 0-120 seconds for the time of duration.
- You can press ▲▶ to set the specific hours you need to clean per each time. Press 🖱 set the duration time per each cleaning.
- Please refer to above description steps to set up P-06.

Note: The Cleaning/Alarm Relay can also be set as Manual in the measuring mode as below:
After entering Relay 3 Manual setting, press ENT key, the screen will twinkle and display "RUN". The twinkling will stop by pressing ENT and the unit starts to clean/alarm.

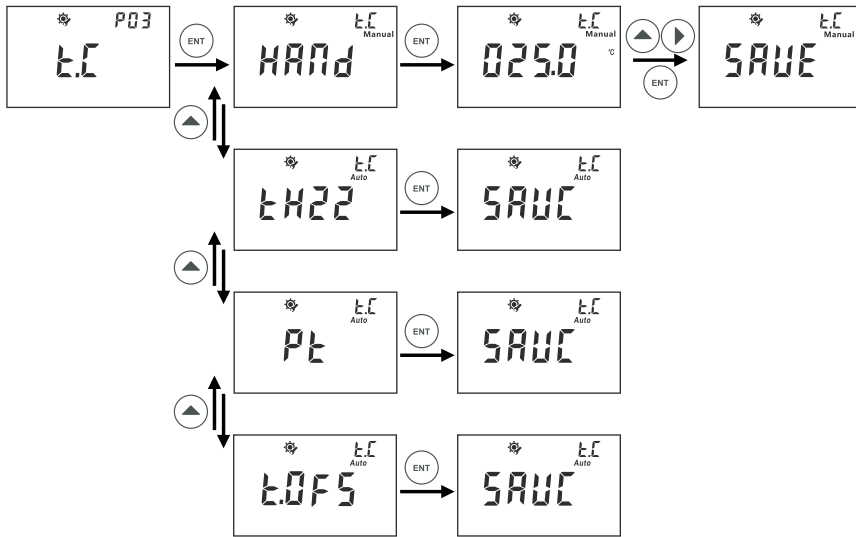


5.2 P02 Standard Solution



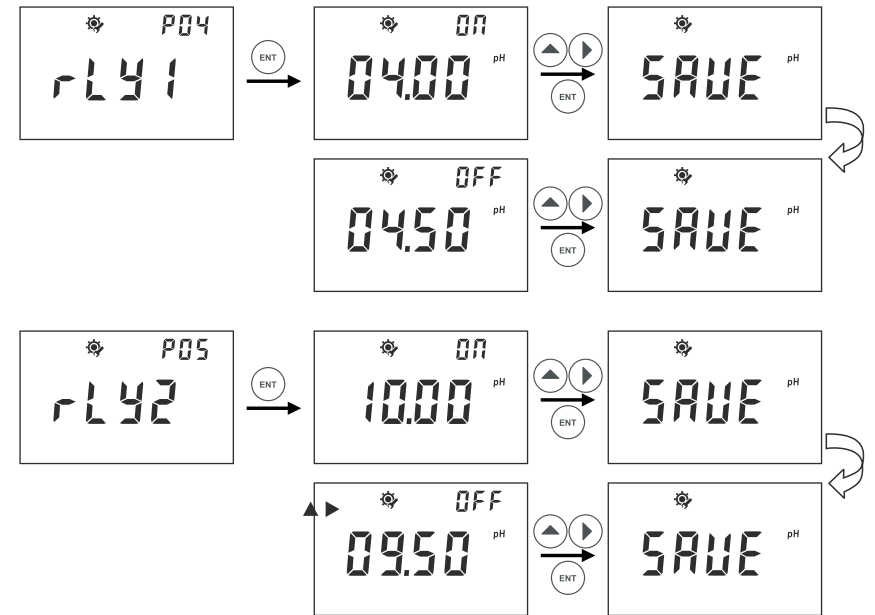
- In P-02, you can select a group of buffer solutions as a standard: USA(4.01,7.00,10.01) or NIST (4.01,6.86,9.18).
- Please refer to above description steps to setup P-02.
- You can go to next parameter setting by pressing ▲▶ or press MENU key to quit and go back to measurement mode.
- Factory default: NIST

5.3 P03 Temperature



- In P-03, you can complete 3 temperature related settings:
- 1, set up manual temperature compensation or automatic temperature compensation.
- 2, set up temperature sensor type.
- 3, set up temperature offset value.
- Please refer to above description steps to set up P-03.
- You can go to next parameter setting by pressing ▲▶ or press MENU key to quit and go back to measurement mode.

5.4 P04 Relay 1 (SP1) 5.5 P05 Relay 2 (SP2)



- In P-04, you can set up Relay 1 (SP1):ON-Point and OFF-Point.
- The range for setting up ON-Point and OFF-Point is from -2.00pH to 16.00pH.
- Please refer to above description steps to set up P-04.
- You can go to next parameter setting by pressing ▲▶ or press MENU key to quit and go back to measurement mode.
- P-05, the same procedure as P-04.