CLEAN INSTRUMENTS

pH / ORP

Transmitter / Controller
PH2000/ PH3000/ PH5000/ PH5500

PH5500 Turbidimeter/Transmitter

PH3000 Controller

25.0℃
Auto
6.86 pH
4.01 6.86 9.18

MENU SP1 SP2 ESC ▲ ▶ ENT
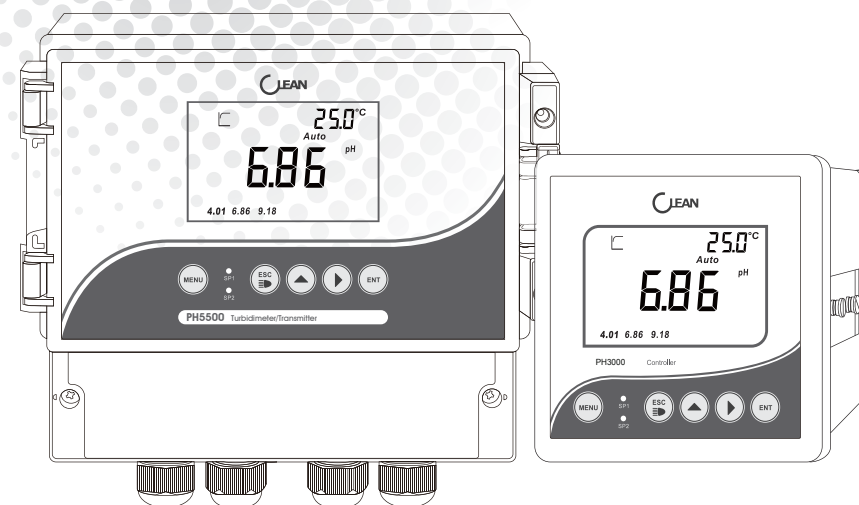
pH / ORP
Controller / Transmitter (PH2000/PH3000/PH5000/PH5500)

www.cleaninst.com
Customer Service: CS@cleaninst.com

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Analyze on the data part:

Byte	1	2	3
Analyze Byte	Unit type: 0 is for pH , 1 is for ORP	Sensor type: 0 is for Glass , 1 is for Antimony	Standard solution: 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					

TABLE OF CONTENTS

Model and Function

	PH2000		PH3000		PH5000		PH5500	
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 ℃,12 is ℉
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	OF	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 eigth 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 PREFACE

1.1 Before Use

Thank you for selecting CLEAN 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 CLEAN 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 transmitters 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

CLEAN 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 waste water treatment and in neutralization process.

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

- Double high impedence input .
- IP65 rated,waterproof and anti-gas,applicable in extreme conditions.
- High protection against electromagnetic inteference.
- 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, users can select high-low control freely. Separately adjustable high and low set-point hysteresis (dead bands) prevent chattering of relays around the set points.
- 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		PH2000	PH3000	PH5000	PH5500
PH	Range	-2.00-16.00 pH			
	Resolution	0.01 pH			
	Accuracy	±0.01 pH			
	Signal Input Impedance	≥1012 Ω			
ORP	Range	-2000-2000 mV			
	Resolution	1 mV			
	Accuracy	±1 mV			
Temperature	Temperature Range	-10.0-110.0 ºC			
	Resolution	0.1 ºC			
	Precision	±0.3 ºC			
	Temperature Sensor	Pt1000			
	TEMP.Compensation	Automatic/Manual			
Signal Output/load	Signal Output	4-20 mA (Adjustable)			
	Current Accuracy	≤1% F.S.			
	Load	<500 Ω			
Data interface	RS485			MODBUS Protocol	
Relay Ouput	On/Off		2 SPST Relays		
	Output		2.5A 230 VAC		
	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)108×108×158 mm			160×188×108 mm
	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.

Sensor

Power
(100-230 VAC)

SP1
Pump/Valve

SP2
Pump/Valve

SP3
Alarm/Cleaning
Only for 5000/5500

4-20mA

Recorder or loop meter
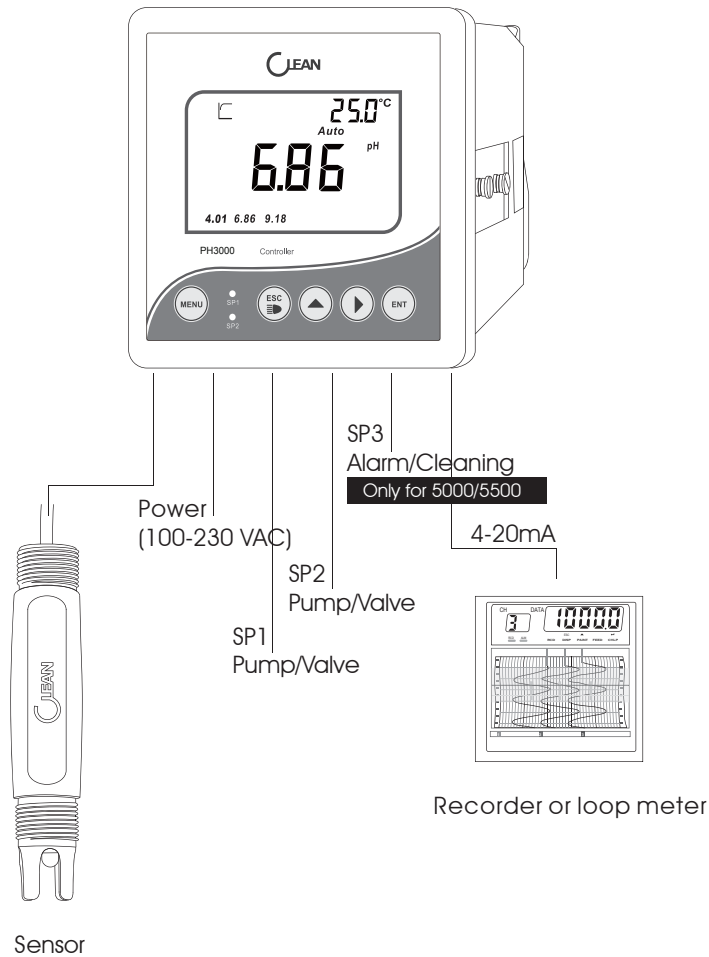
7.2 pH Factory Defaults

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℃
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 Slope
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 - NIST Buffer Standard
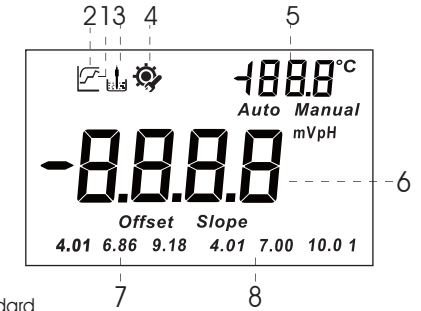
2.4.2 Display Character Table

SEN	Sensor	Offset	Sensor Offset
GLAS	Glass pH Sensor	P-	Menu item
ANt1	Antimony pH Sensor	COdE	Password Setting
bUF	Buffer Solution	dEF	Factory Defaults
NISt	NIST Standard	SL1	Sensor Slope 1
USA	USA Standard	SL2	Sensor Slope 2
t.C	Temperature Compensation	SAUE	Save Data
Auto	Automatic Temperature Compensation	Err	Error
Manual	Manual Temperature Compensation	On	On
tH22	22K Sensor	OFF	Off
Pt	PT1000 Sensor	nO	No
tOFS	Temperature Offset	YES	Yes
rLY1	Relay 1	OUr	Temperature value Over
rLY2	Relay 2	Udr	Temperature value Under
rLY3	Relay 3	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

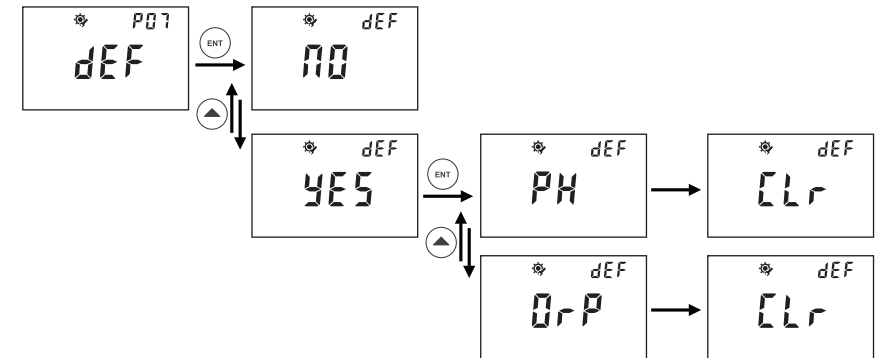| Key	Description
MENU	Menu Key In measuring status, press the key once into Calibration mode In calibration or Set up mode, Press the key back to measuring status
ESC	Escape Key Press and back to previous screen display in Calibration or Set Up mode Back light on and off switch in measurement status
▲	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
ENT	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 ▲ ▶ ,or press **MENU** key to quit and go back to measurement mode.
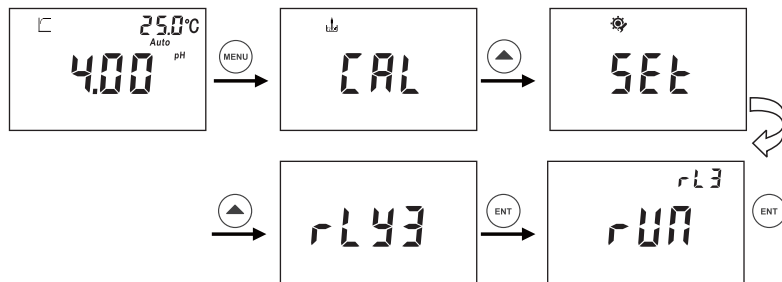
6.5 P05 RS-485 Output `Only for 5000/5500`
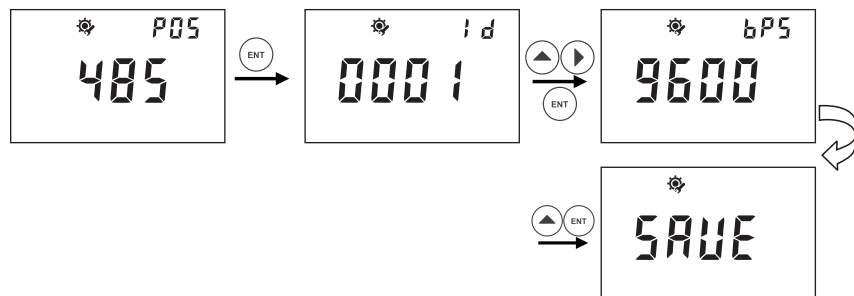
- After entering P-05, you can press ▲ ► to set the ID of the protocol address and press **ENT** to confirm. ID range can be set from 01 to 200.
- You can press ▲ to set the protocol rate you need and confirm by pressing **ENT**.

6.6 P06 Password
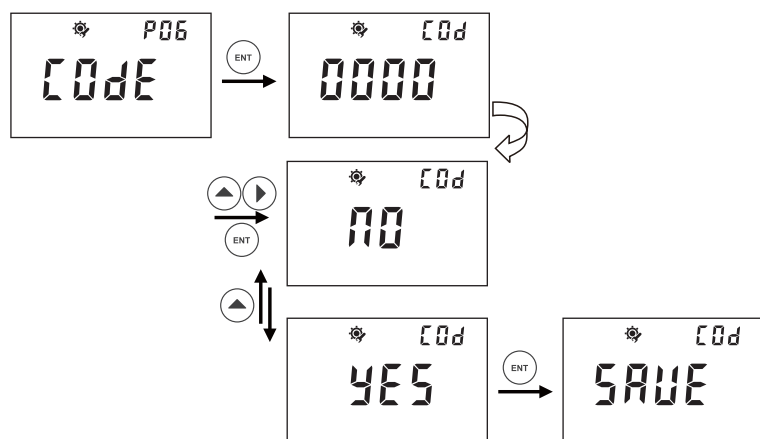
- In P-06, you can select to change factory defaults or to revert to factory default status.
- Please refer to above description steps to set up P-04
- You can go to next parameter setting by pressing ▲ ► ,or press **MENU** key to quit and go back to measurement mode.

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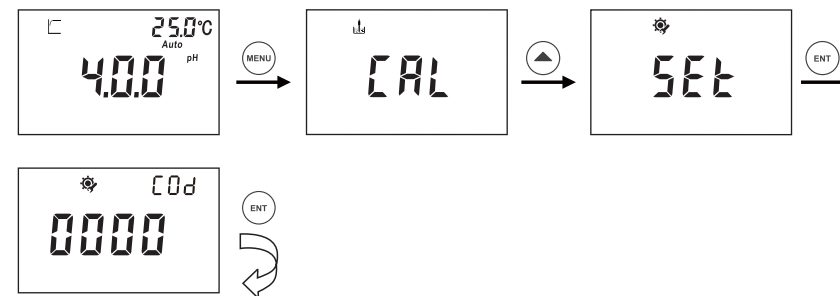
- In measurement mode, press **MENU** key to enter calibration step, and then, press ▲ key to enter set up process.
- Press **ENT** key to pass through, if you have not set up password.

P01 Electrode

P02 Standard Solution

P03 Temperature

P04 Relay 1

P05 Relay 2

P06 Relay 3
`Only for 5000/5500`
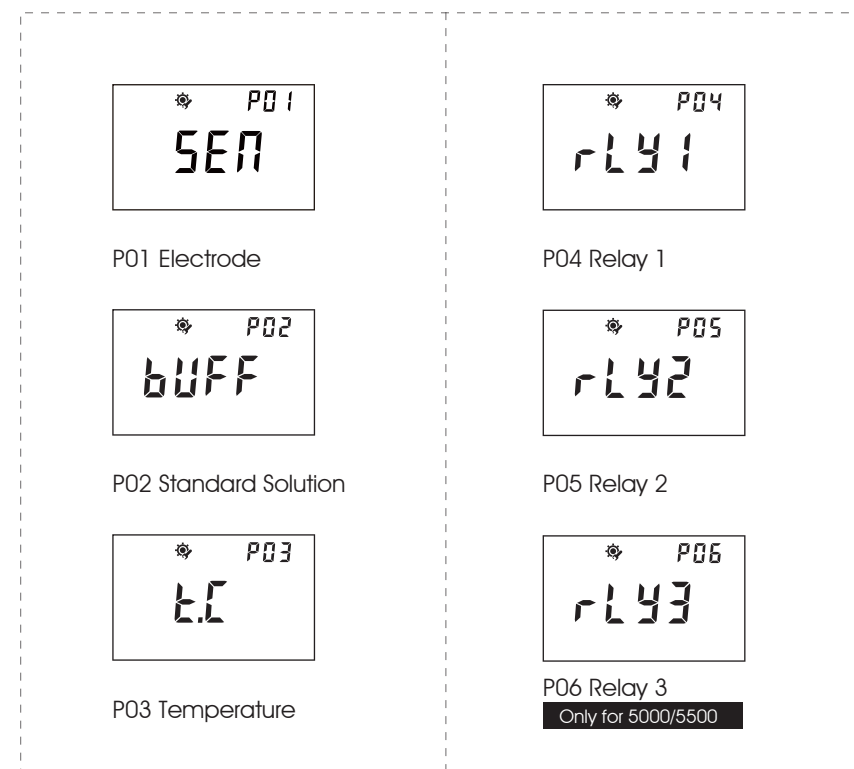
P07 Current Output

P08 RS-485 output
Only for 5000/5500

P09 Password

P10 Factory Defaults

6.4 P04 Current Output
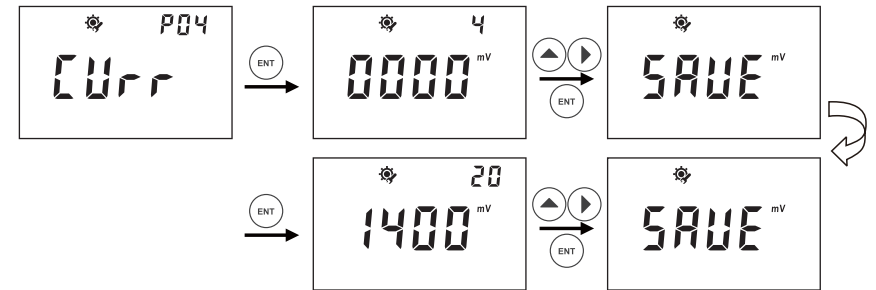
- In P-04, you can set up current output / transmitting for measurement value for advanced application.
- After entering P-03, the figure 4 on top right corner represents transmitting 4 mA out for below set value (0000mV), you can press ▲ ▶ to set a value you need to transmit 4 mA for your application.
- 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   `Only for 5000/5500`
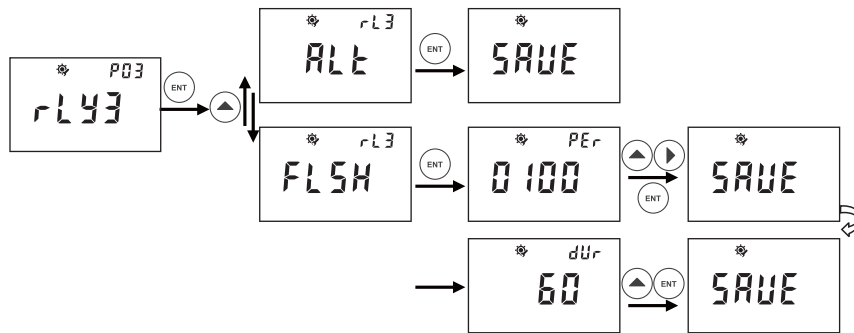
- In P-03, you can set up Relay 3 (rLY3) , also called the Cleaning/Alarm Relay.

- 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 0-1000hours 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 ▲ to 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.
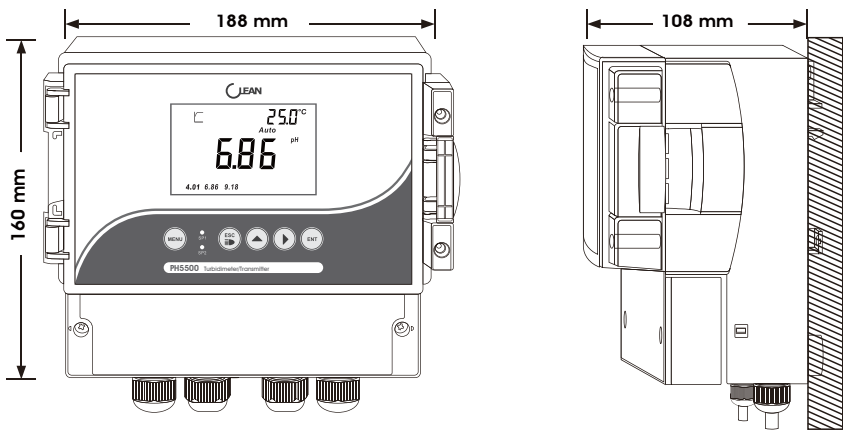

3.1 Installation

Panel Mounting

Panel cutout :
94.5 * 94.5mm (± 0.5 mm)
(panel-mounting)
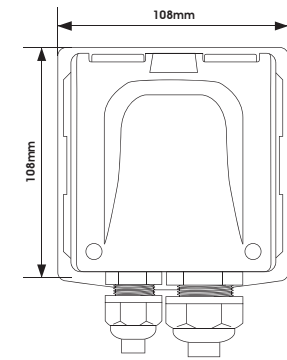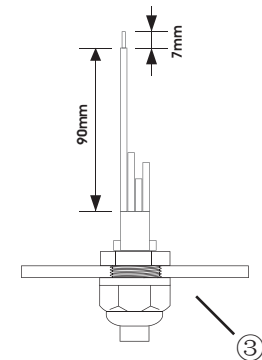
①. Cable (Recommended stripping length for cables is at least 90mm, please use 0.5 to 1 square meter's wire)
②. Cable ties
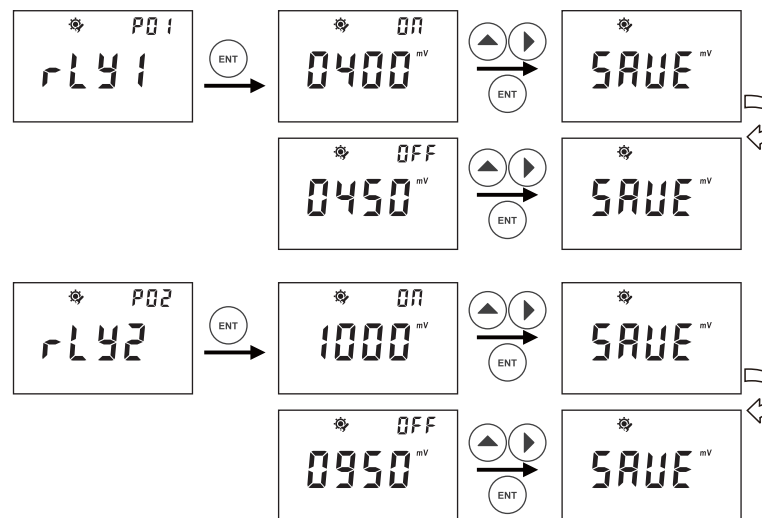③. Waterproof cable glands

Wall Mounting

188 mm

108 mm

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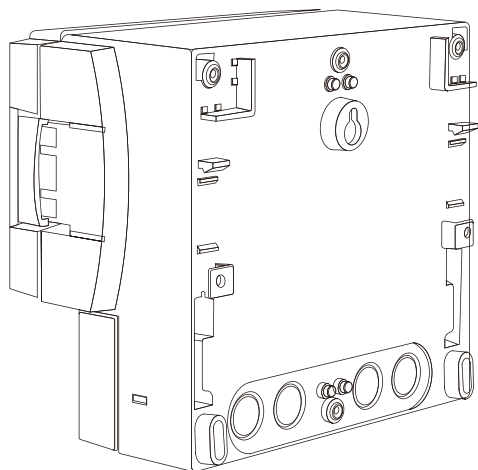
. In ORP measurement mode, press **MENU** key to enter ORP calibration step, then press ▲ key to enter ORP set up process.

6.1 P01 Relay 1 (SP1)   6.2 P02 Relay 2 (SP2)

- In P-01, you can set up Relay 1 (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
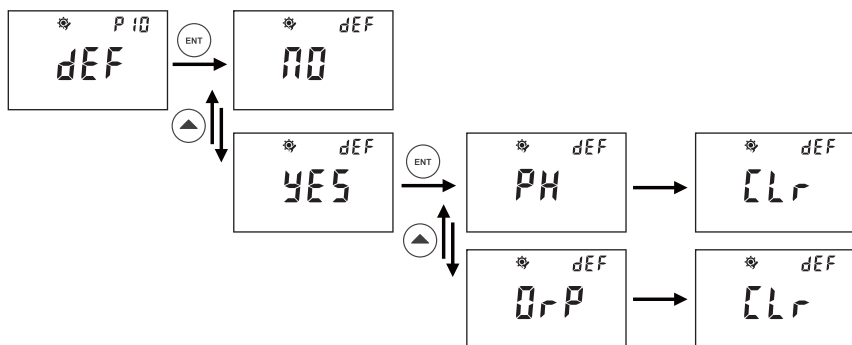
- In P-10, you can select to change factory defaults or to revert to factory default status.
- Please refer to above description steps to set up P-04
- You can go to next parameter setting by pressing ▲ ▶,or press **MENU** key to quit and go back to measurement mode.

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-	

PH3000/PH5000 Connection Diagram

Terminal	Function	Terminal	Function
PD	Pt1000 drive positive	COM(RL2)	COM(RL2)
PT+	Pt1000 signal positive	OPEN(RL2)	OPEN(RL2)
PT-	Pt1000 signal negative	COM(RL3)	COM(RL3)
T1	T1	OPEN(RL3)	OPEN(RL3)
T2	T2	4-20mA (positive)	4-20mA output, positive
SEN+	Sensor +	4-20mA(negative)	4-20mA output, negative
EL		485(B)	485 output
SEN-	Sensor -	485(A)	485 output
PH-		pH	pH/ORP input terminal
COM		L	Line
COM(RL1)	COM(RL1)	N	Neutral
OPEN(RL1)	OPEN(RL1)	⏚	Earth

PH5500 Connection Diagram

| Terminal	Function	Terminal	Function
S2	Sensor - [Positive]	B	485 output
S1	Sensor + [Negative]	A	485 output
COM	COM	R3	COM(RL3)
PD	Pt1000 drive positive	R3	OPEN(RL3)
PT+	Pt1000 signal positive	R2	COM(RL2)
PT-	Pt1000 signal negative	R2	OPEN(RL2)
T1	NTC22K input	R1	COM(RL1)
T2	NTC22K input	R1	OPEN(RL1)
I+	4-20mA output, positive	FG	Earth
I-	4-20mA output, negative	FG	Earth
		N	Neutral
		L	Live

Note:
For 2-wire Pt1000 temperature sensing terminal system, use short circuit between PD and PT+.
Connect Earth with SEN- when Earth pH sensor is required.

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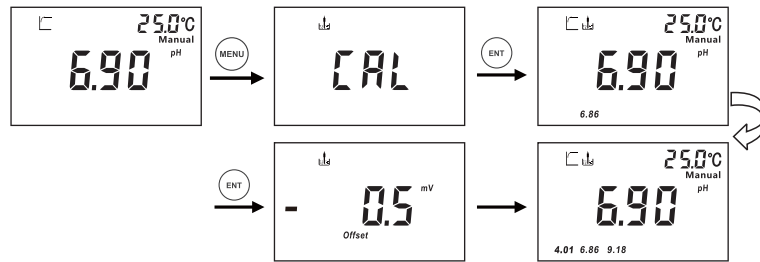
- In pH measurement mode, press **MENU** key to enter pH calibration step, and then, press **ENT** key to enter calibration process.
- Dip the sensor into 7.00 or 6.86 pH buffer solution first, you will soon get the zero point offset value form the screen.
- After point of 7.00 or 6.86 pH calibrated,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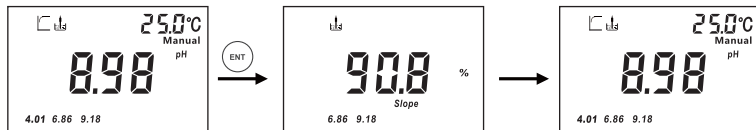

- To continue to calibrate second point (4.01,10.1,or 9.18). When the value is stable, press **ENT** key to confirm the result. You will get slope value of sensor from the screen.
- You can go next to third point calibration or quit the calibration process.

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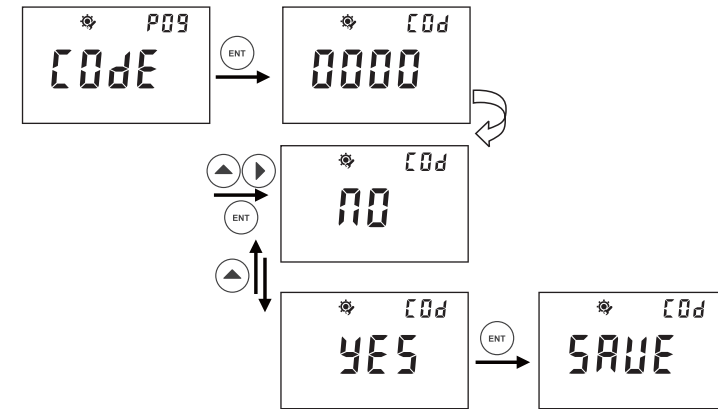
- In P-09, you can set up password method to prevent anyone from changing your settings.
- Please refer to above description steps to set up P-04
- You can go to next parameter setting by pressing ▲ ▶,or press **MENU** key to quit and go back to measurement mode.
- Factory default: 0000

## 5.8 P08 RS-485 output `Only for 5000/5500`
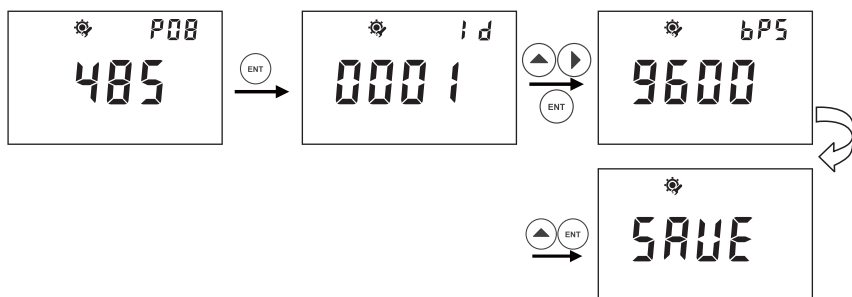
- 1. After entering P-08, you can press ▲ ► to set the ID of the protocol address and press **ENT** to confirm. ID range can be set from 01 to 200.

- 2. You can press ▲ to set the protocol rate you need and confirm by pressing **ENT**.

4.2 ORP–mV Calibration
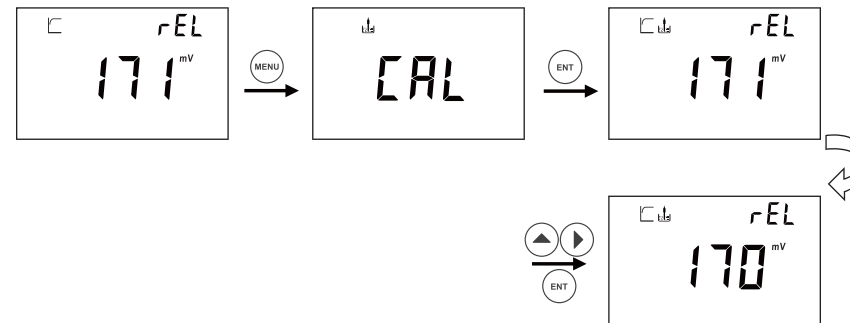
- In ORP measurement mode, press **MENU** key to enter ORP calibration step, and then, press **ENT** key to enter calibration process.
- Dip the sensor into standard solution, after stable symbol shows up, you get the real mV value.

- When the value is twinkling, press ▲ ► to adjust value to match with standard solution.
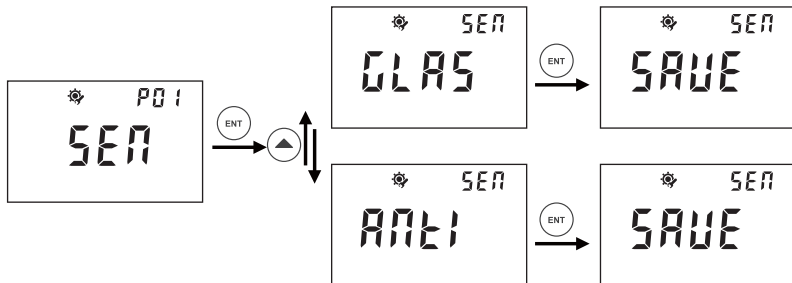
4.3 pH/ORP Mode Switch
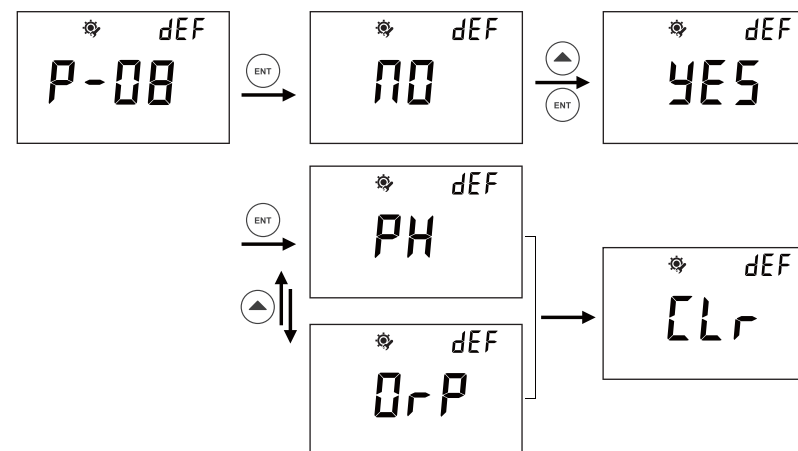
- In P-08, revert to factory default.

- Press ▲ tto swich to pH or ORP.
- Please refer to above description steps to set up.

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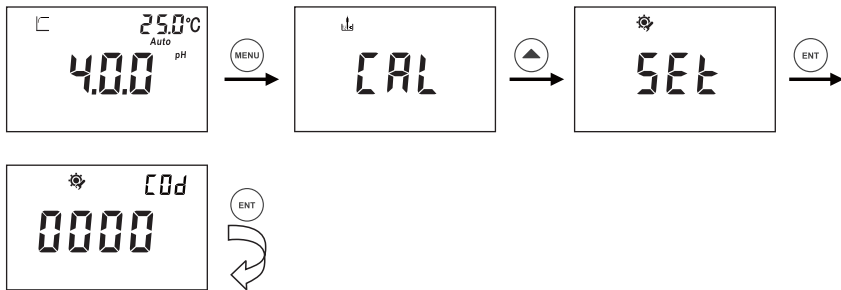
- In measurement mode, press **MENU** key to enter pH calibration step, and press ▲ to enter Set UP step, then press **ENT** key to enter set up process.

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
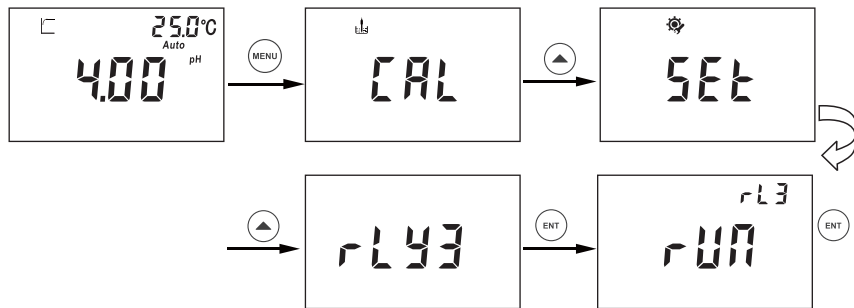
5.7 P07 Current Output
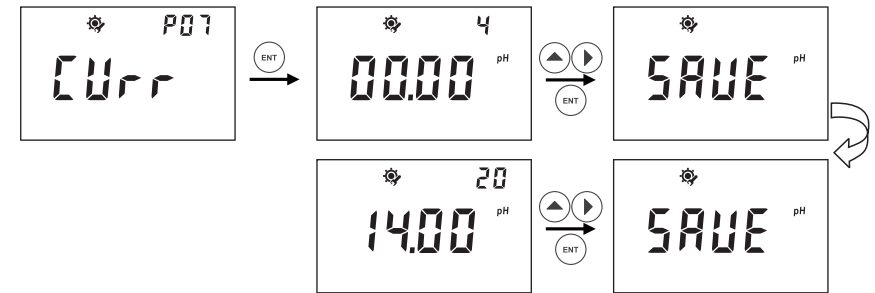
- In P-07, you can set up current output / transmitting for measurement valve for advanced application.
- After entering P-07, the figure 4 on top right corner represents transmitting 4 mA out for below set value (0.00pH), you can press ▲ ► to set a value you need to transmit 4 mA for your application.
- 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 Only for 5000/5500
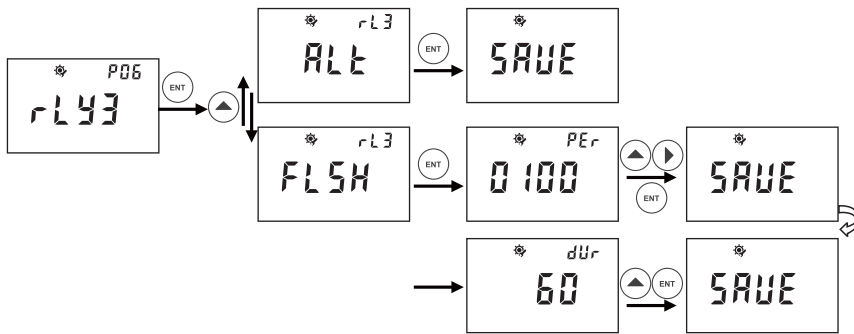

- In P-06, you can set up Relay 3 (rLY3) , also called the Cleaning/Alarm Relay.

- 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 ▲ to 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.
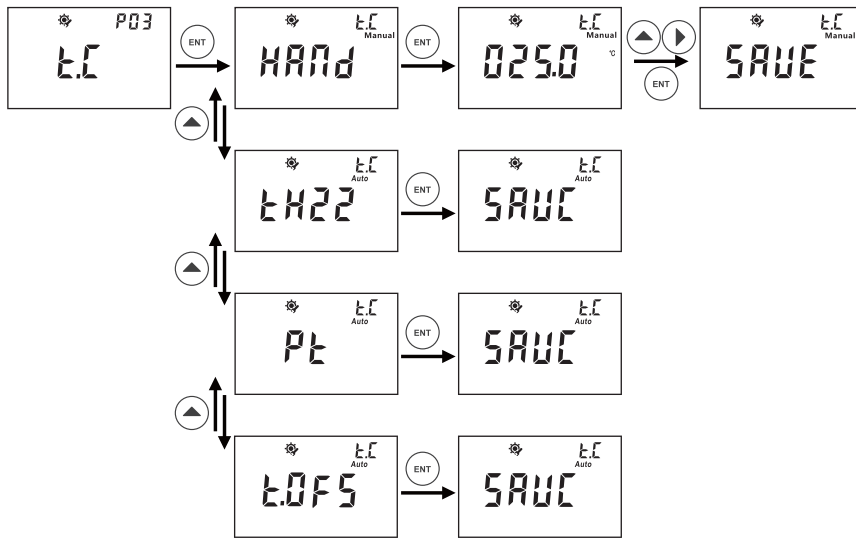
5.2 P02 Standard Solution
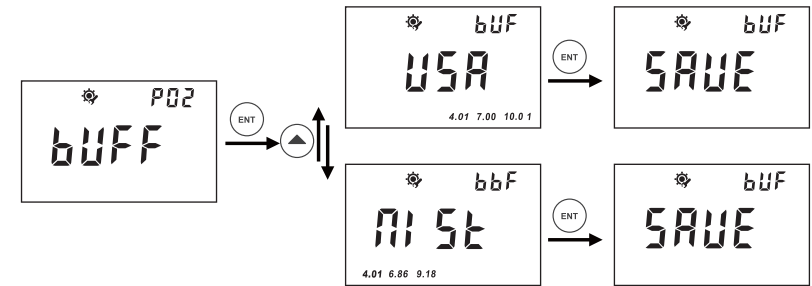
- In P-02, you can select a group of buffer solutions as a standard: USA(4.01，7.00，10.01) or NIST(4.01，6.86，9.18).

- 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)
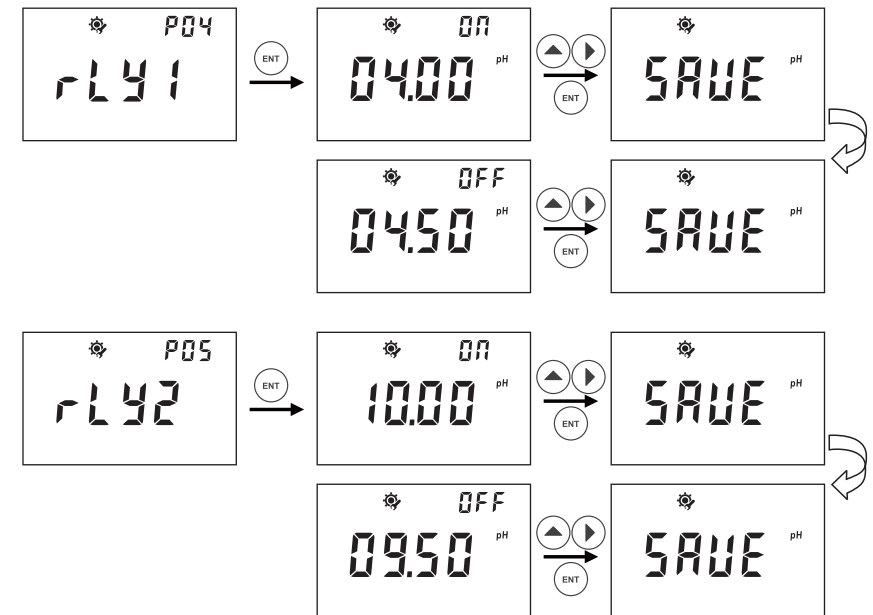
- In P-04, you can set up Relay 1 (SP1): ON-Point and OFF-Point.
- The range for setting up ON-Point and OFF-Point is from -2.00pH to 16.00pH.
- Please refer to above description steps to set up P-04.

- 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.

9.1 Warranty

CLEAN Instruments warrants this product to be free from significant deviations in material and workmanship for a period of one year from the date of purchase. If repair is necessary and has not been the result of abuse or misuse within the warranty period, please return to CLEAN Instruments and amendment will be made without any charge. CLEAN Instruments Customer Service Center will determine if product problem is due to deviations or customer abuse. Out of warranty products will be repaired on a charge basis.

9.2 Return Of Malfunction Instruments

Authorization must be obtained from CLEAN Instruments Customer Service Center to issue a RIR number before returning items for any reason. When applying for authorization, please nclude date requiring the reason of return. Instruments must be carefully packed to prevent damage in shipment and insured against possible damage or loss. CLEAN Instruments will not be responsible for any damage resulting from careless or insufficient packing.
Warning: Damage as a result of inadequate packaging is the User / distributor's responsibility. Please follow the guidelines below before transporting.

9.3 Guidelines Or Returning Unit For Repair

Use the original packaging materialif possible, when transporting back the unit for repair. Otherwise wrap it with bubble pack and use a corrugated box for better protection. Include a brief description of any faults suspected for the convenience of Customer Service Center, if possible.If there are any questions, feel free to contact our Customer Service Center or distributors.