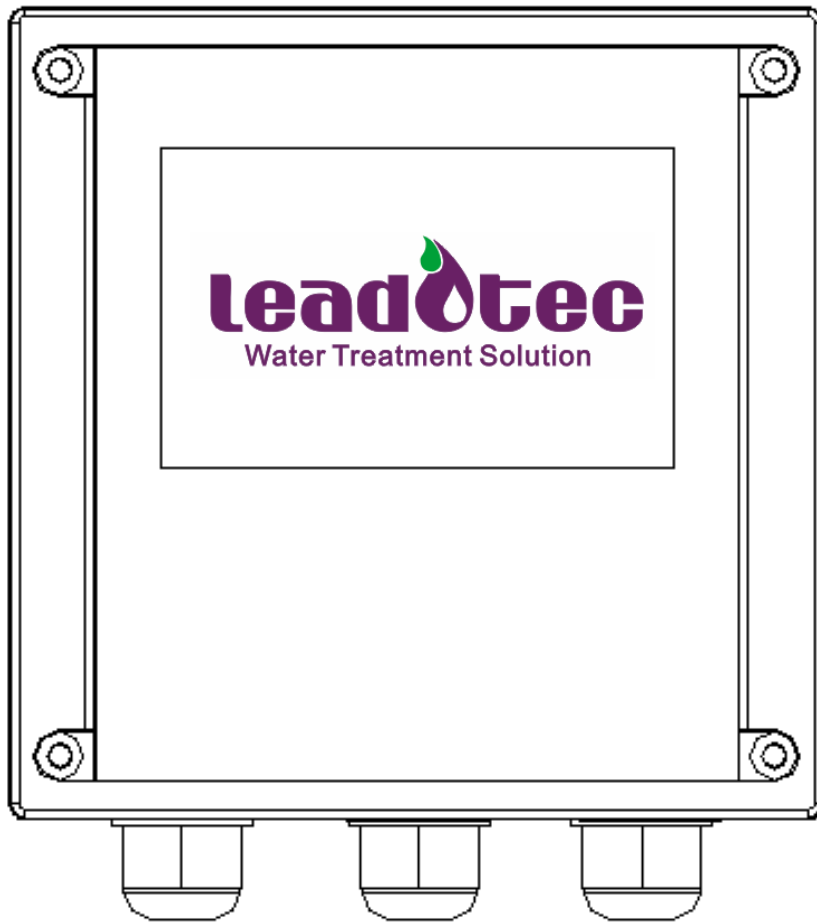


PH/DO Controller



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Safe operation procedures

Read the following instructions before using the instrument.

1. After unpacking the instrument please check for damage due to shipping.
2. The instrument must be operated by trained professional and technical personnel.
3. Read the manual carefully to avoid incorrect wiring connection that can cause equipment damage and safe problem.
4. After wiring carefully check all are correct then can power on and make sure the others equipments are correct.
5. Please avoid installing in a high humidity, high temperature, corrosive and in a direct sunlight environment.
6. Please separate the power lines of instrument from other machines that produces high noise in the power lines.

Instrument use

Instruments are used in industrial wastewater treatment, aquaculture, environmental monitoring, food process etc.

The instrument can be panel, wall or pipe mounted.

The instrument provides two current outputs. The maximum load is 500 Ohm.

The instrument provides 3 relays. It can pass though a maximum of 5 Amps at 250 VAC or 5 Amps at 30VDC.

Product content

For 6000 series, the product package contains 1 instrument, the printed manual, 4 sets of holder.(fixed block, fixed bar, screw)

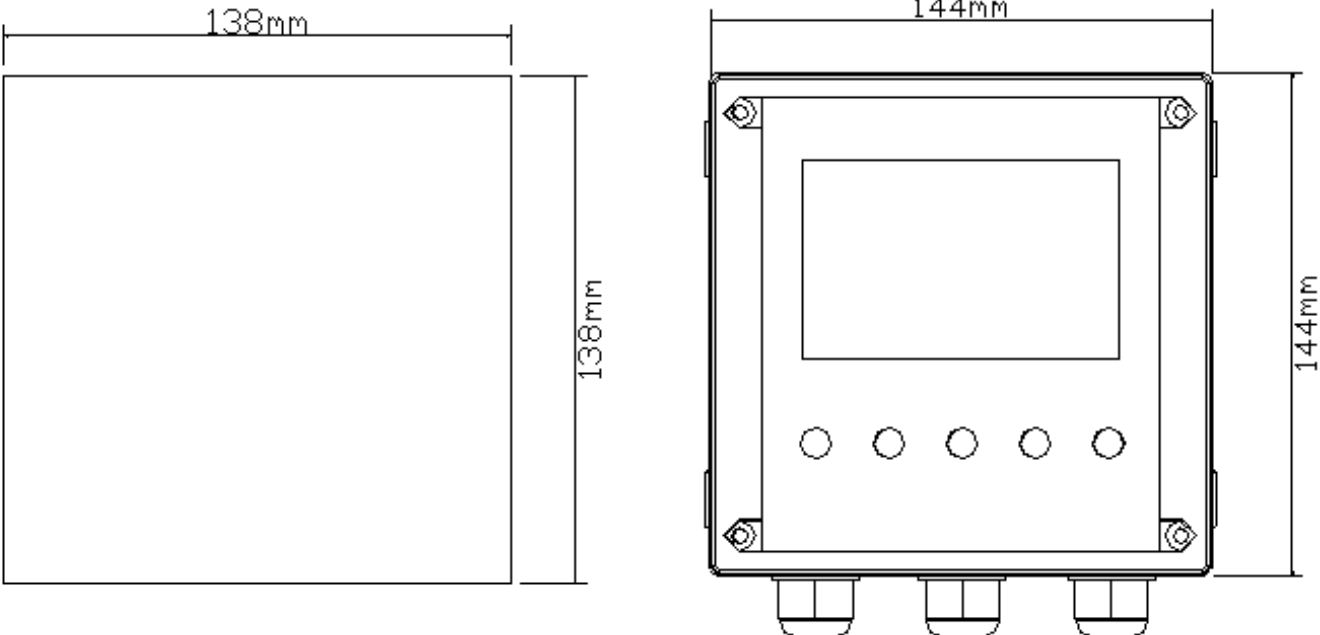
For 800 series, the product package contains 1 instrument, the printed manual, 2 holders

Specifications

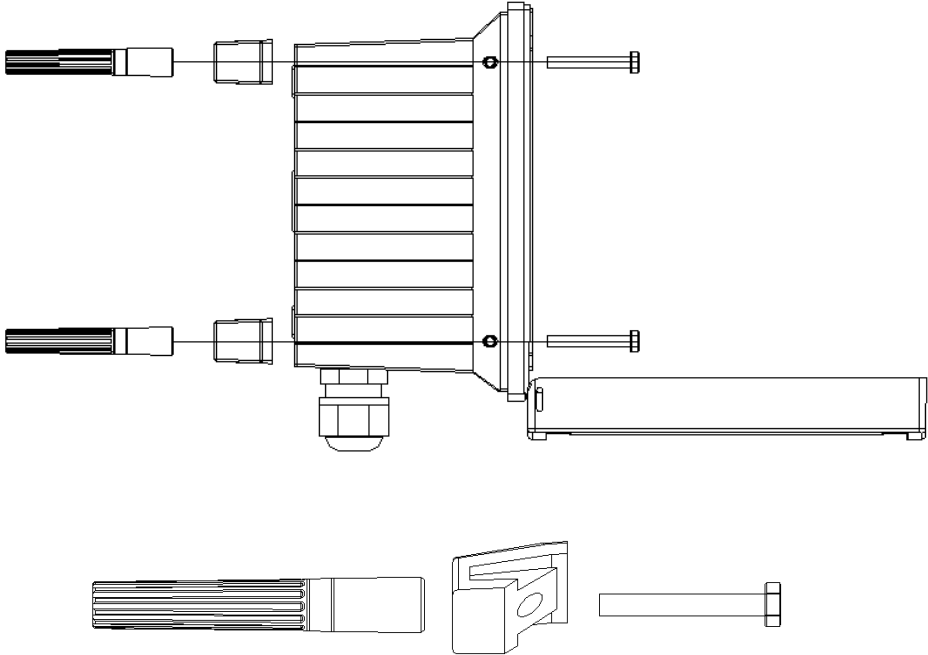
Functions	pH	DO
Measuring range	-2.00pH to +16.00 pH	0.00 to 30.00ppm(0.0-300.0%)
Resolution	0.01pH	0.01ppm/ 0.1%
Accuracy	±0.01pH	±0.02ppm/±0.2%
Temp. compensation	6000 series:NTC22K 800 Series: Pt1000 / NTC22K	
Temp. range	-10.0 to +130.0°C	
Temp. compensation range	-10.0 to +130.0°C	
Temp. resolution	0.1°C	
Temp. accuracy	±0.2°C	
Ambient temperature range	0 to +70°C	
Storage temp.	-20 to +70°C	
Input impedance	>10 ¹² Ω	
Display	Back light, dot matrix	
pH current output	Isolated, 4 to 20mA output , max. load 500Ω	
DO current output	Isolated, 4 to 20mA output , max. load 500Ω	
Current output accuracy	±0.05 mA	
RS485	Mod bus RTU protocol	
Baud rate	9600/19200/38400	
Maximum relay contacts capacity	5A/250VAC,5A/30VDC	
Cleaning setting	ON: 1 to 1000 seconds, OFF: 0.1 to 1000.0 hours	
One multi function relay	clean/period alarm/error alarm	
Relay delay	0-120 seconds	
Data logging capacity	500,000	
Language selection	English/traditional Chinese/simplified Chinese	
Waterproof grade	IP65	
Power supply	From 90 to 260 VAC, power consumption < 5 watts	
Installation	panel/wall/pipe installation	
Weight	6000 series:0.85Kg/ 800 series:0.55Kg	

Instrument installation

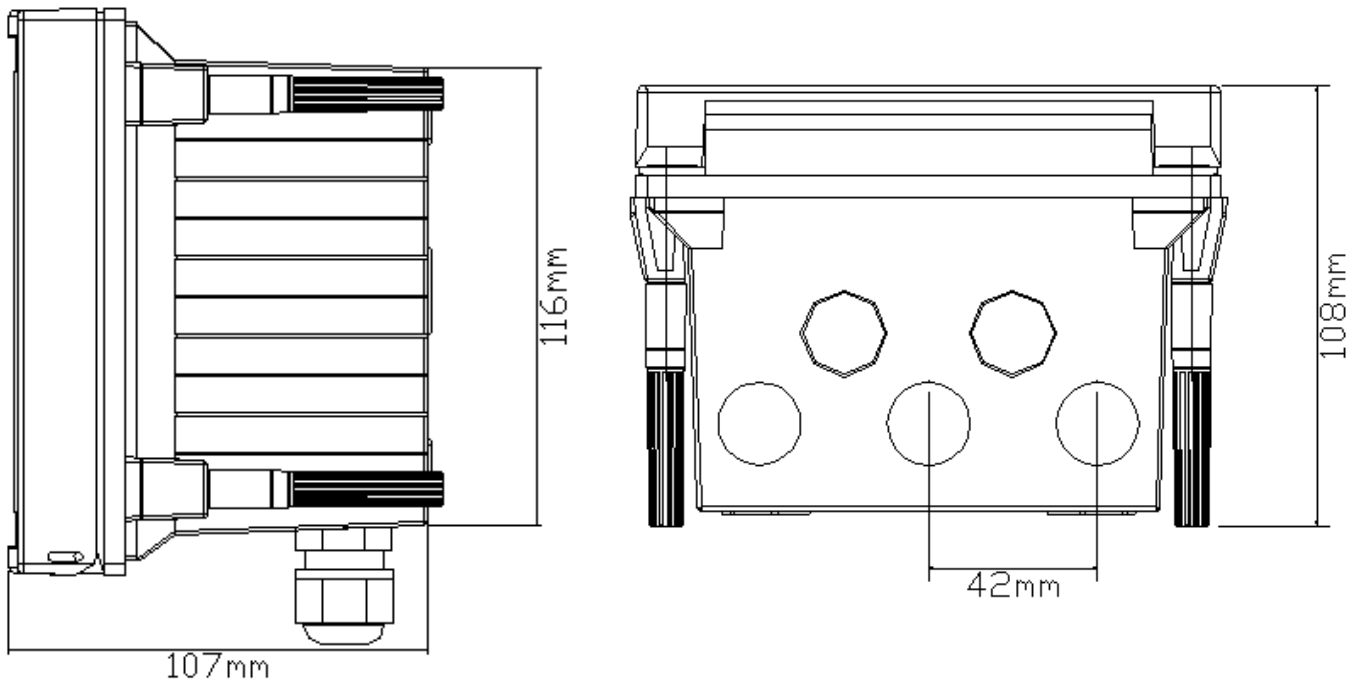
6000 series : The instrument can be panel, wall or pipe mounted installation.
Panel Installation: Make a 138x138 mm square cutout and insert the instrument. Screw in the fixed block with the screws and fixed bar.



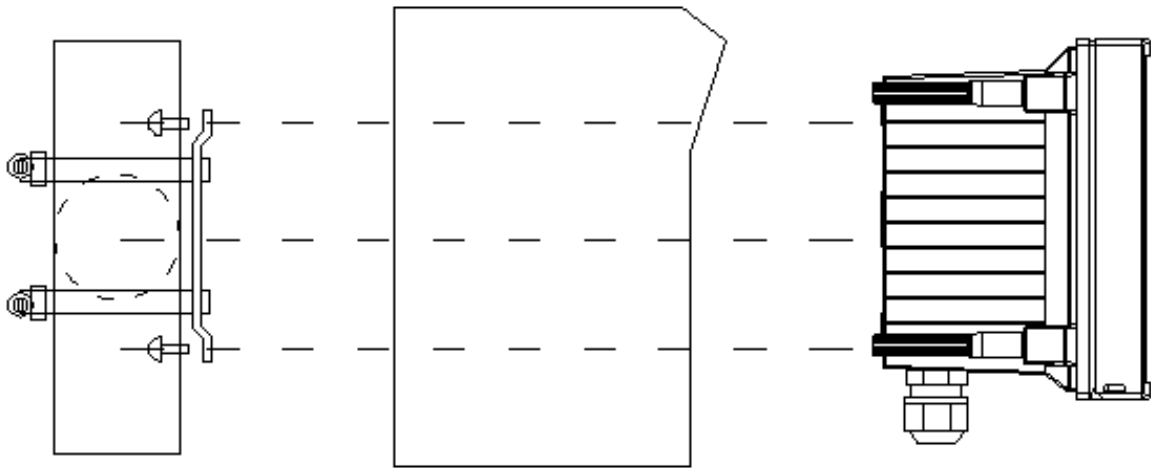
6000 series cutout size



6000 series installation figure



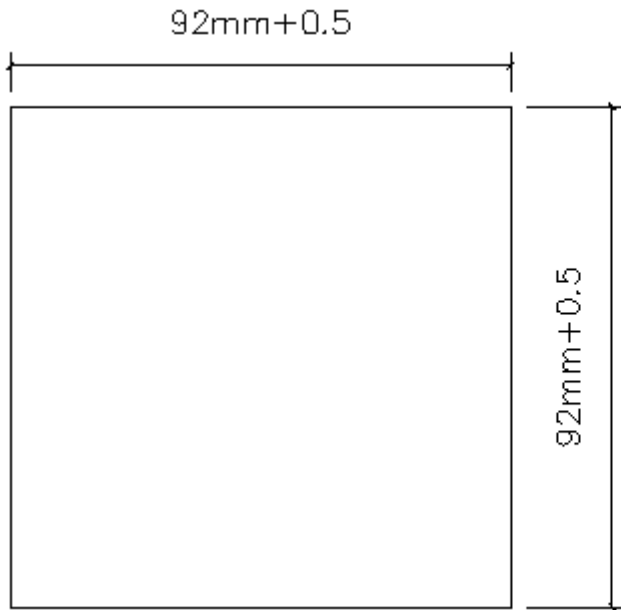
6000 series dimension



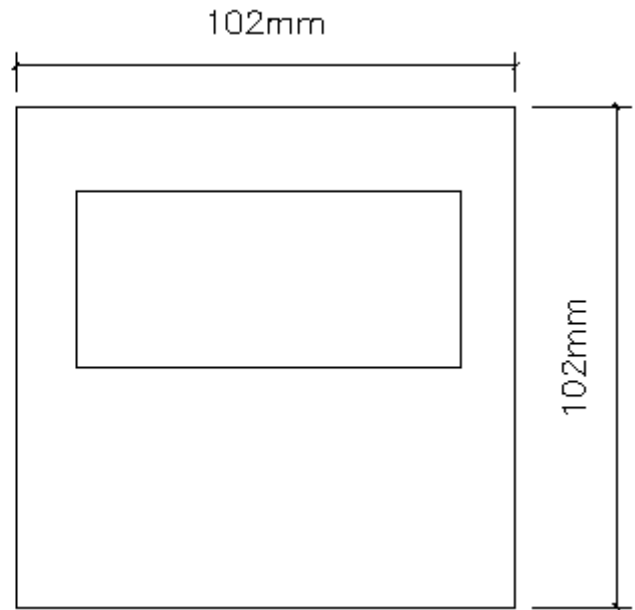
6000 series wall and pipe installation

800 series : The instrument can be panel, wall or pipe mounted installation.

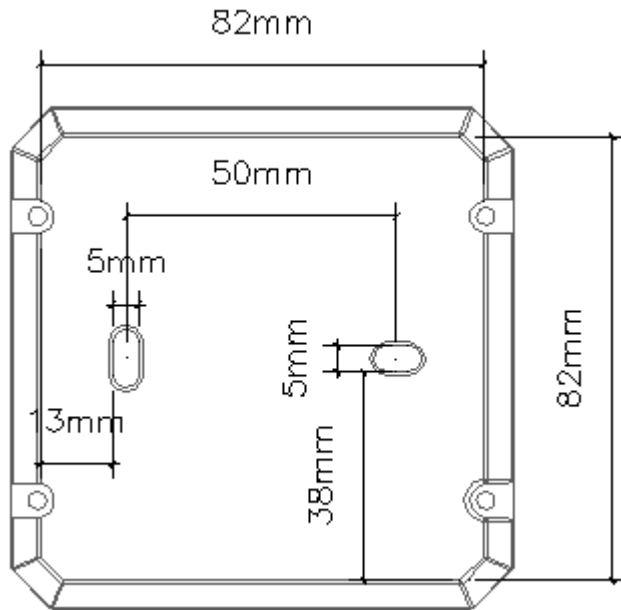
Panel Installation: Make a 92x92 mm square cutout and insert the instrument then screw in the fixed HOLDER.



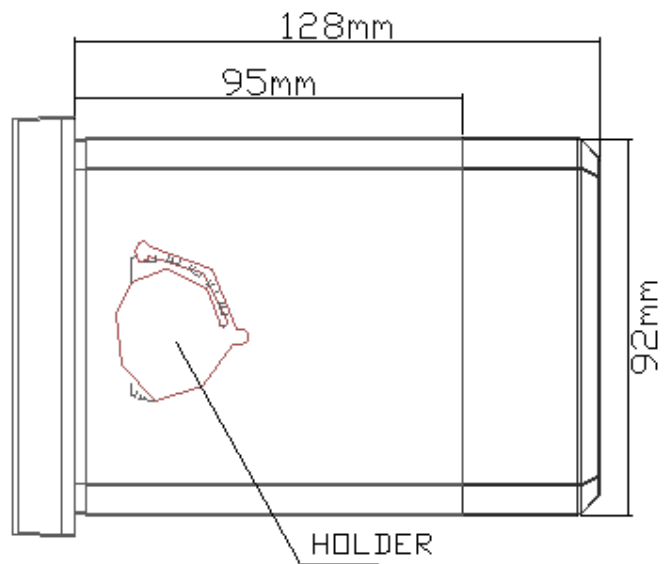
800 series panel cutout size



800 series front



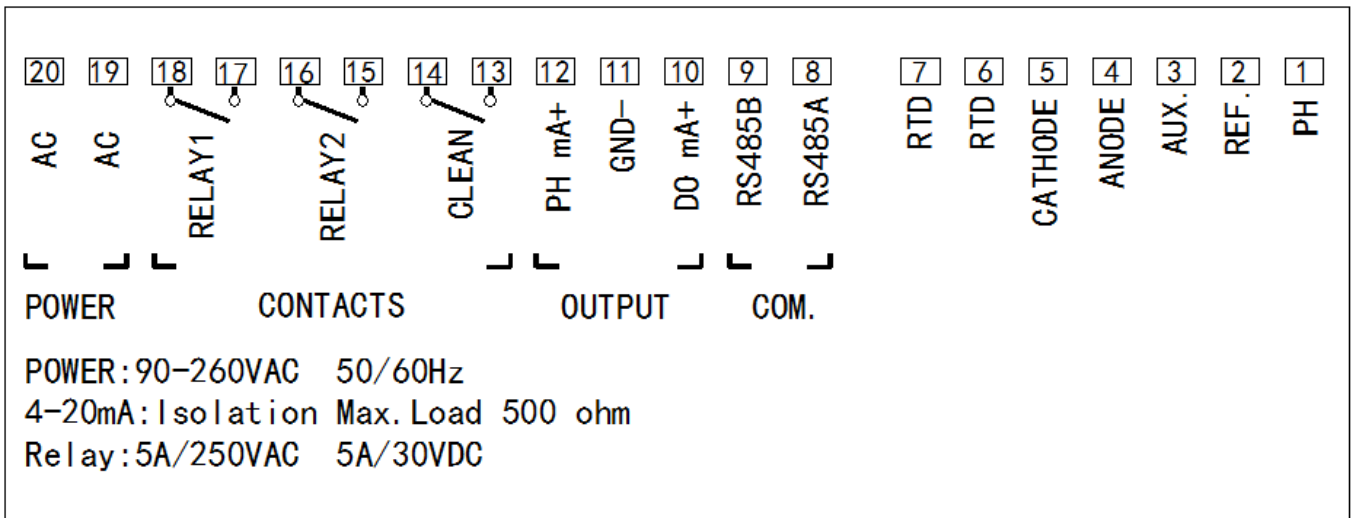
800 series back (for wall/pipe mounting)



800 series dimension

Connection label

6000 Series



Notice

1. User must strip the pH wire to remove the black rubber conductor.

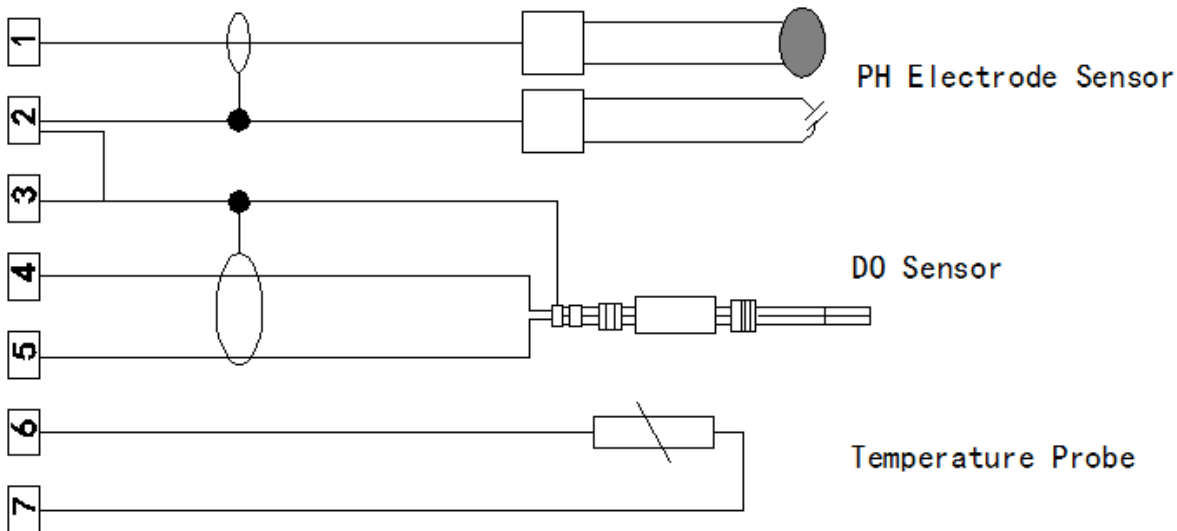


Rubber conductor not removed

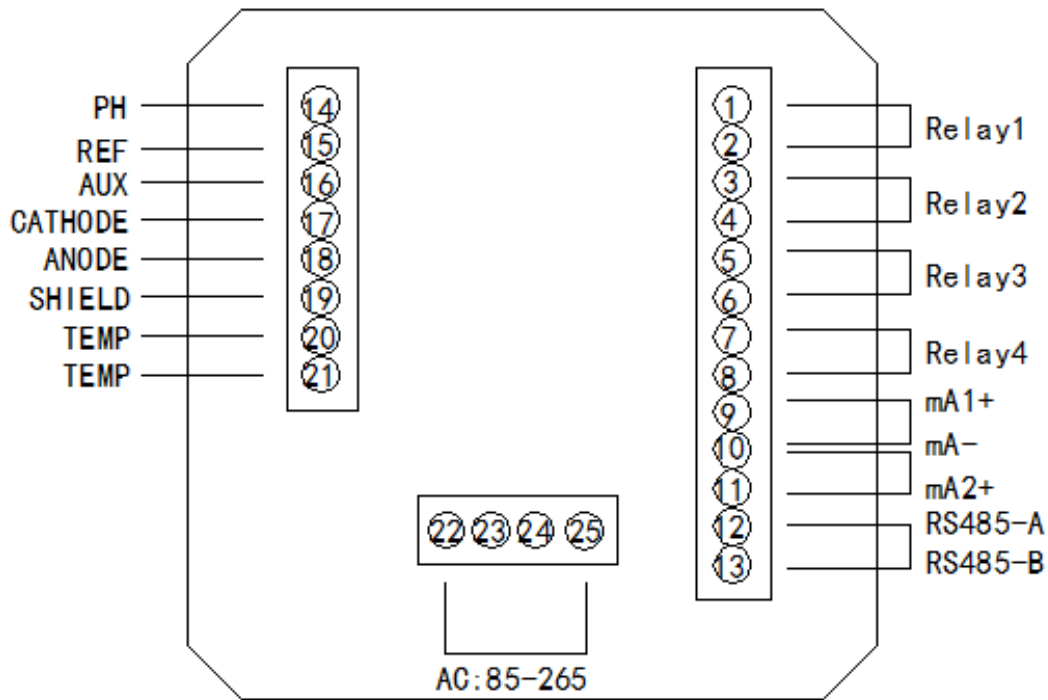
Rubber conductor removed

2. Different connection of 2-wire electrode (short pin 2 and 3) and 3-wire electrode (ground pin), Please see the connect label.

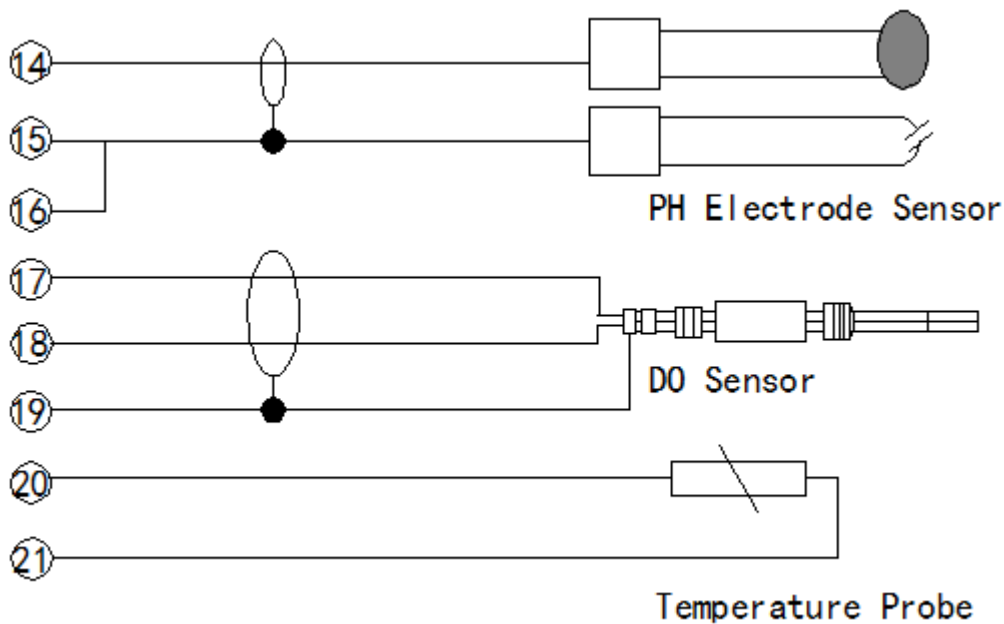
Electrode connection figure



800 Series

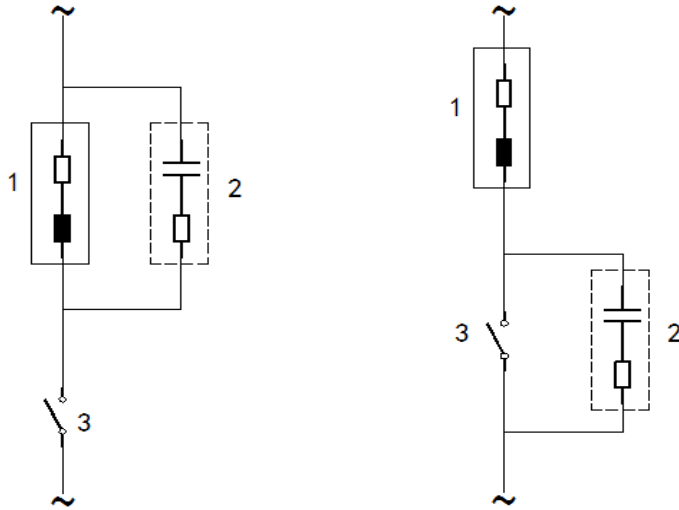


Electrode connection figure



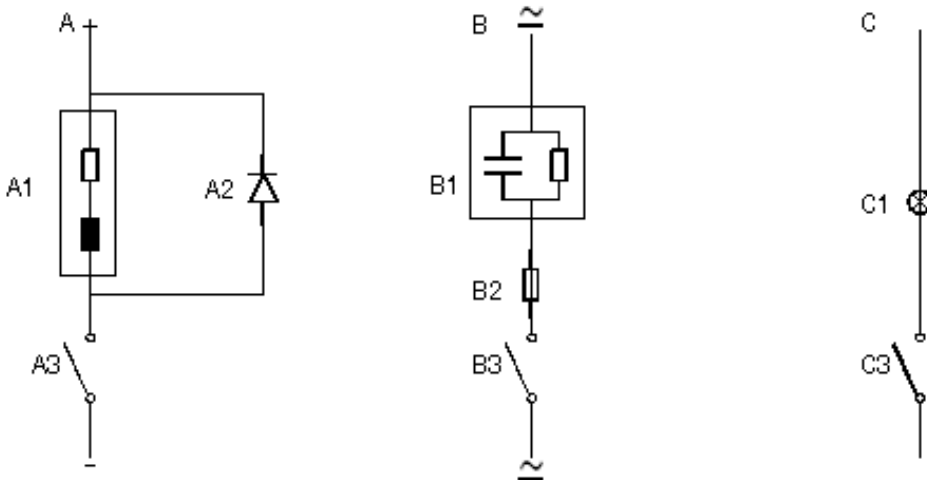
Relay contact protection

Electrical spark at the relay contact may affect the life of the relay, especially in an inductive and capacitive load. In order to inhibit the spark and arc, user should use an RC circuit to extend the life of the relay.



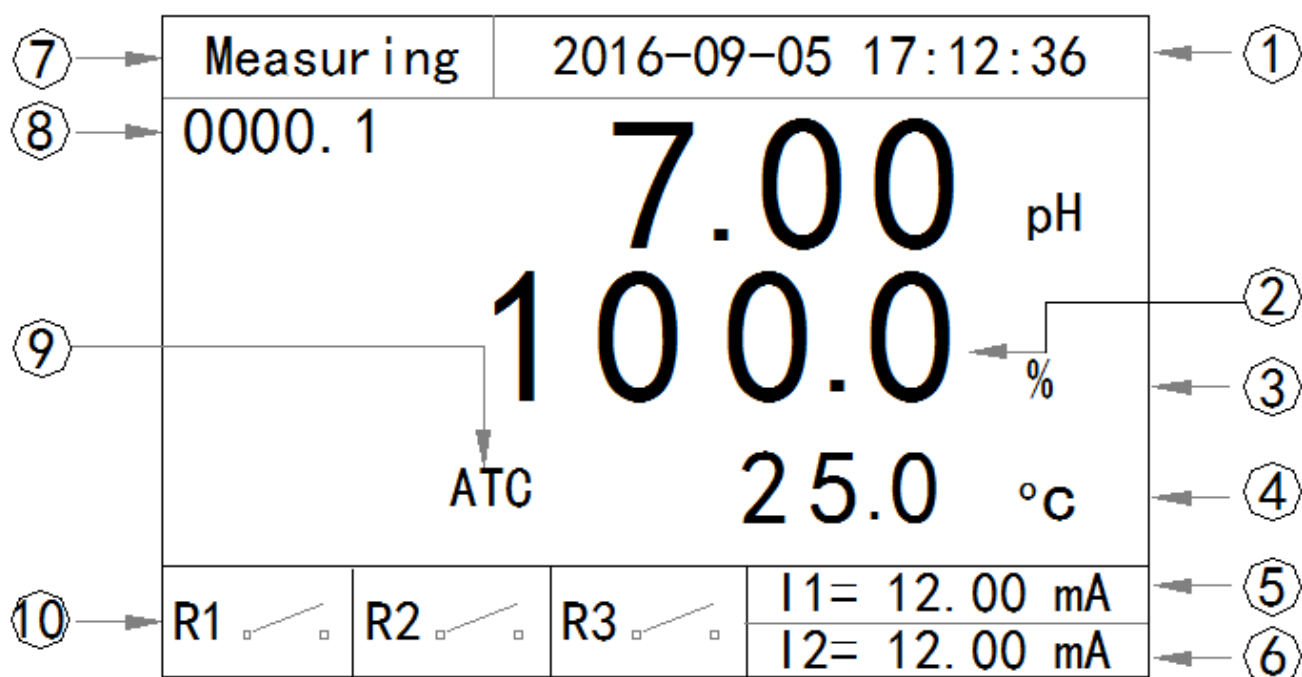
AC protection, use for inductive load

1. load
2. RC eliminate spark, using in 220VAC, $R=100\ \text{ohm}1\text{W}$,
3. Relay contact



- A. DC protection ,A1: inductive load A2: 1N4007, A3: relay contact
- B. AC/DC protection ,B1: capacitive load ,B2: $0.8\ \text{Ohm}/1\text{W}$ (DC24V) ,B3: relay contact
- C. Resistive load ,C1:lamp bulb ,C3:relay contact

Display



1. Date and time
2. Main display
3. Unit
4. Temperature and unit
5. PH current output
6. EC current output
7. Measurement status and Error indicator, there is no display if meter is in keeping mode
8. Count down timer: cycle time/clean time, it also displays the “delay” when relay3 has a delay enabled.
9. Temp. compensation: auto(ATC) or manual(MTC)
10. Relay indicator

Note:

If the pH readings are under or over the range, it will display -9.99/99.99.

If the DO readings are under or over the range, it will display 0.0/999.9%.

If the temperature readings are under or over the range, it will display -99.9/999.9.

Key



MODE



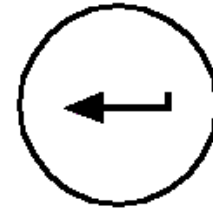
SHIFT



UP



DOWN



ENTER

Key name	Meas. status	Setting status	Cal. status	Record status
MODE	Enter password	Exit	Exit	Exit
SHIFT	none	Move digit	Mode digit	Mode digit
UP	Enter record	Inc	Inc	Inc
DOWN	None	Dec	Dec	Dec
ENTER	ON/OFF back light	Enter	Enter	Enter

Keeping mode

Keeping mode is a safe mode. It is for Calibration, Setting, Record and Clean. In this mode all the relays are open(inactive), current output follows the setting by user(last current or fixed current).

The instrument will enter keeping mode when user presses into Calibration, Setting, Record or the instrument works in clean mode.

It will in keeping mode around 10 seconds when it goes back to measurement mode form the above mentioned 4 modes then left keeping mode.

The instrument will go into the keeping mode when turn on the power.

Current output in keeping mode:

User has two choices: fixed current output or last current output.

Fixed current: User can set the output current from 4.00 to 20.00mA when instrument goes into keeping mode.

Last current: User can set the output current keep at the last current when instrument goes into keeping mode.

Relays in keeping mode: All relays are opened.(inactive)

Setting

Press MODE key to enter the password menu and then press UP/DOWN/SHIFT key to input password 1200 then press ENTER will enter to setting mode or press MODE key to exit. If no key is be pressed and over 10 minutes then it will go back to measurement mode.

PASSWORD
0 0 0 0

PASSWORD
1 2 0 0

Main display

Press UP/DOWN key to choose functions, press ENTER key enter the function.

CONF I G U R A T I O N
<input checked="" type="checkbox"/> PH Current Settings
<input type="checkbox"/> DO Current Settings
<input type="checkbox"/> Relay1 Settings
<input type="checkbox"/> Relay2 Settings
<input type="checkbox"/> Relay3 Settings
<input type="checkbox"/> Measurement Settings
<input type="checkbox"/> Temperature Settings
<input type="checkbox"/> RS485 Settings

Page1

CONF I G U R A T I O N
<input checked="" type="checkbox"/> Date Settings
<input type="checkbox"/> Data Log Settings
<input type="checkbox"/> Output Test
<input type="checkbox"/> Language Settings
<input type="checkbox"/> Reset Parameters

Page2

Notices:

1. When the input data is not in correct range then it will display ERROR on the top of LCD
2. After input data user needs to press ENTER to save the data.
3. Press MODE to exit.
4. No key is be pressed in 10 minutes then it will go back to measurement mode.

PH Current settings

PH CURRENT SETTINGS	
4.00 mA	= + 0 0 . 0 0 pH
20.00 mA	= + 1 4 . 0 0 pH
Offset	= + 0 . 0 0 mA
Filter Time	= 0 0 0 SEC
HOLD Type	= <input type="checkbox"/> Fixed 0 4 . 0 0 mA <input type="checkbox"/> Last

1. Set the corresponding 4.00mA to pH.
2. Set the corresponding 20.00mA to pH, the difference between 4.00mA and 20.00 mA at least is 1.00pH.
3. Set the offset current, the range is \pm 1.00mA.
4. The filter time range is 0-120 seconds, the low pass filter of software will active when the current from one point to another point if user sets the filter time.

5. Set the PH current output mode(fixed / last) when instrument enter into keeping mode.

DO Current settings

DO CURRENT SETTINGS	
4.00 mA	= 0 0 0 . 0 %
20.00 mA	= 1 0 0 . 0 %
Offset	= + 0 . 0 0 mA
Filter Time	= 0 0 0 SEC
HOLD Type	= <input type="checkbox"/> Fixed 0 4 . 0 0 mA <input type="checkbox"/> Last

1. Set the corresponding 4.00mA to %, ppm, mg/L.
2. Set the corresponding 20.00mA to %, ppm, mg/L, the difference between 4.00mA and 20.00 mA at least for % is 10.0, for ppm, mg/L is 1.00.
3. Set the offset current, the range is \pm 1.00mA.
4. The filter time range is 0-120 seconds, the low pass filter of software will active when the current from one point to another point if user sets the filter time.

5. Set the DO current output mode(fixed / last) when instrument enter into keeping mode.

Relay 1 settings

RELAY 1 SETTINGS	
Mode	= <input checked="" type="checkbox"/> PH <input type="checkbox"/> DO
ON/OFF	= <input type="checkbox"/> ON <input type="checkbox"/> OFF
Close S. P.	= + 1 0 . 0 0 pH
Open S. P.	= + 0 4 . 0 0 pH
Delay Time	= 0 0 0 SEC

1. Press UP/DOWN key to choose relay 1 works for PH or DO
2. Press UP/DOWN key to ON/OFF (enable/disable) relay1.
3. Close set point: active point.
4. Open set point: inactive point.
5. Delay time: the range is 0-120 seconds. Relay needs to delay first then active if the measuring data is reach to close set point.

Ex: If user wants turn on the pump at pH10.00

and turn off it at pH4.00, then the close S.P. needs to set to pH10.00, Open S.P. sets to pH4.00.

Relay 2 settings

RELAY 2 SETTINGS	
Mode	= <input type="checkbox"/> PH = <input checked="" type="checkbox"/> DO
ON/OFF	= <input type="checkbox"/> ON = <input type="checkbox"/> OFF
Close S.P.	= 0 2 . 0 0 mg/L
Open S.P.	= 0 8 . 0 0 mg/L
Delay Time	= 0 0 0 SEC

1. Press UP/DOWN key to choose relay 2 works for PH or DO
2. Press UP/DOWN key to ON/OFF (enable/disable) relay2.
3. Close set point: active point
4. Open set point: inactive point
5. Delay time: the range is 0-120 seconds. Relay needs to delay first then active if the measuring data is reach to close set point.

Ex: If user wants turn on the pump at

2.00mg/L and turn off it at 8.00mg/L, then the close S.P. needs to set to 2.00mg/L, Open S.P. sets to 8.00mg/L.

Relay 3 settings

RELAY 3 SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON = <input type="checkbox"/> OFF
Period Time	= 0 0 0 1 . 0 HOUR
Clean Time	= 0 0 1 0 SEC
Delay Time	= 0 0 0 SEC
Function	= <input type="checkbox"/> Rinsing = <input type="checkbox"/> Interval Alarm = <input type="checkbox"/> Error Alarm

1. Press UP/DOWN key to ON/OFF (enable/disable) relay3.
2. Period time: The period for Rinsing or interval function.
3. Clean time: When period is timeout then relay active.
4. Delay time: the range is 0-120 seconds. Relay needs to delay first then active if the period is timeout.

5. Function: press UP/DOWN key to choose Rinsing/Interval/Error.

Notice:

1. Rinsing: when period timeout then clean-relay will active, when clean time is timeout the repeat count for the period.
2. Interval alarm: When period timeout then clean-relay active until user resets the interval then the clean-relay inactive and repeat count for the period.
3. Error alarm: The clean-relay active when there is a error produce. No delay time function in this mode.

Measurement settings

MEASUREMENT SETTINGS	
Mode	= <input checked="" type="checkbox"/> % <input type="checkbox"/> ppm <input type="checkbox"/> mg/L
PH Offset	= + 0 . 0 0 pH
DO Offset	= + 0 0 . 0 %
Filter	= 0 1

1. Choose the mode for DO measuring unit (for DO only), press UP/DOWN key to choose.
2. Input PH offset, the range is ± 1.00 pH.
3. Input DO offset, the range for % is ± 10.0 ,for ppm and mg/L is ± 1.00 .
4. Filter: Range 0-10.

Notice:

If the reading is not stable then user can set the filter to average the readings.

Temperature settings(6000 Series)

TEMPERATURE SETTINGS	
Automatic	= <input checked="" type="checkbox"/> Auto <input type="checkbox"/> Manual
Offset	= + 0 . 0 °C
Manual Meas.	= + 0 2 5 . 0 °C
Manual Cal.	= 2 5 . 0 °C
Display	= <input type="checkbox"/> YES <input type="checkbox"/> NO

1. Temperature compensation setting, press UP/DOWN key to choose.
2. Temperature offset ,the range is ± 5.0 °C.
3. Temperature for measurement, the range is -10.0 to +130.0°C.
4. Temperature for calibration , the range is 0.0 to 60.0°C.
5. Temperature display: display the temperature on measurement mode or not.

Temperature settings(800 Series)

TEMPERATURE SETTINGS	
Automatic	= <input checked="" type="checkbox"/> Auto <input type="checkbox"/> Manual
Probe	= <input type="checkbox"/> Pt 1000 <input type="checkbox"/> NTC 22K
Offset	= + 0 . 0 °C
Manual Meas.	= + 0 2 5 . 0 °C
Manual Cal.	= 2 5 . 0 °C

1. Temperature compensation setting, press UP/DOWN key to choose.
2. Choose probe type.
3. Temperature offset ,the range is ± 5.0 °C.
4. Temperature for measurement, the range is -10.0 to +130.0°C.
5. Temperature for calibration , the range is 0.0 to 60.0°C.

TEMPERATURE SETTINGS	
Display	= <input checked="" type="checkbox"/> YES = <input type="checkbox"/> NO

6. Temperature display: display the temperature on measurement mode or not.

Notice:

1. When user chooses AUTO and doesn't connect temperature probe then the display will not correct.
2. When select the probe needs to make sure the probe type is correct.

3. Manual measurement: the instrument will use this temperature for compensation in measurement mode when user chooses Manual.
4. Manual calibration: the instrument will use this temperature for compensation in calibration mode when user chooses Manual.

RS485 settings

RS485 SETTINGS	
ID Address	= 0 0 1
Baud Rate	= <input type="checkbox"/> 9600 = <input type="checkbox"/> 19200 = <input type="checkbox"/> 38400

1. ID address:1-255.
2. Baud rate ,press UP/DOWN key to choose.

Date settings

DATE SETTINGS	
Year	= 2 0 1 5
Month	= 0 8
Day	= 1 5
Hour	= 1 3
Minute	= 3 6
Second	= 0 4

Press UP/DOWN key to set the date. When power off the date will be kept for around 2 days.

Data log settings

DATA LOG SETTINGS	
ON/OFF	= <input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
Reset Record	= <input type="checkbox"/> Yes <input type="checkbox"/> No
Save Period	= 0 6 0 SEC

1. Press UP/DOWN key to ON/OFF (enable/disable) this function.
2. Erase all the records.
3. Saving period from 5 to 120 second.

Notice:

1. When user chooses ON, then it will save measuring data follow the saving period time.
2. When reset the records, it will spend around 10 seconds.

Output test

OUTPUT TEST	
PH Current	= 0 4 . 0 0 mA
DO Current	= 0 4 . 0 0 mA
Relay 1	= <input type="checkbox"/> CLOSE <input type="checkbox"/> OPEN
Relay 2	= <input type="checkbox"/> CLOSE <input type="checkbox"/> OPEN
Relay 3	= <input type="checkbox"/> CLOSE <input type="checkbox"/> OPEN

1. PH current output: 4.00-20.00mA, press UP/DOWN to set.
2. DO current output: 4.00-20.00mA, press UP/DOWN to set.
3. Relay 1 output, press UP/DOWN to choose.
4. Relay 2 output, press UP/DOWN to choose.
5. Relay 3 output, press UP/DOWN to choose.

Notice: This function for testing the output only.

Language settings

LANGUAGE SETTINGS	
Language	= <input checked="" type="checkbox"/> English <input type="checkbox"/> 繁體中文 <input type="checkbox"/> 简体中文

Press UP/DOWN key to choose the language.

Reset parameters

RESET PARAMETERS	
Reset Type	= <input checked="" type="checkbox"/> Current
	<input type="checkbox"/> Relay1
	<input type="checkbox"/> Relay2
	<input type="checkbox"/> Relay3
	<input type="checkbox"/> All

Press UP/DOWN key to choose the reset.

Notice: The reset will not affect the calibrated parameters.

Record query

Press UP key at the measurement mode to enter record query mode.

INPUT RECORD START NUMBER
0 1 0 3 0 0

Press UP/DOWN and SHIFT key to input record number then press ENTER key enter or press MODE key exit.

Display PH/DO record

RECORD 020300		
15-08-14	07.00	pH
21:20:59	99.8	%
15-08-14	07.00	pH
21:21:04	99.8	%
15-08-14	07.00	pH
21:21:09	99.8	%
15-08-14	07.00	pH
21:21:14	99.8	%
15-08-14	07.00	pH
21:21:19	99.8	%

Calibration

Press MODE key to enter the password menu and then press UP/DOWN/SHIFT key to input password 1100 then press ENTER will enter to calibration mode or press MODE key to exit. If no key is be pressed and over 10 minutes then it will go back to measurement mode.

PASSWORD
1 1 0 0

PASSWORD
0 1 0 0

Manu

Press UP/DOWN key to select the functions and then press ENTER key to enter.

CALIBRATION
<ul style="list-style-type: none"><input checked="" type="checkbox"/> PH Automatic CAL.<input type="checkbox"/> PH Manual CAL.<input type="checkbox"/> PH Reset Parameters<input type="checkbox"/> DO Parameters Settings<input type="checkbox"/> DO Zero CAL.<input type="checkbox"/> DO Saturation CAL.<input type="checkbox"/> DO Concentration CAL.<input type="checkbox"/> DO Reset Parameters

- 1.PH Automatic calibration: follow the indication to select standard buffer.
- 2.PH Manual input calibration: manual input standard buffer.
- 3.PH Reset parameters: reset all of the calibrated parameters to default.
- 4.DO Parameters setting: set the parameters
- 5.DO Zero calibration: calibrate the zero point
- 6.DO Saturation calibration: calibrate the

saturation point

7. DO Concentration calibration: calibrate the concentration

8. DO Reset parameters: reset all of the calibrated parameters to default.

Notice:

If the PH electrode efficiency is lower than 80% or the waiting time is too long and can not locked, user should check the electrode if aged, user should Replace the new electrode.

PH Automatic calibration

Stand calibration

CALIBRATION	
<input checked="" type="checkbox"/> 6.86 <input type="checkbox"/> 7.00	7.00 pH 25.0 °C
Select buffer and press ENTER	

1. Put the electrode to the first buffer.
2. Press UP/DOWN key to select the correct buffer and then press ENTER to start calibration.
3. User can press ENTER to go to next or wait for it auto lock.
4. Display the idea pH on the right side.
5. If the offset is over +/-1.5 pH or temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

Slope calibration

CALIBRATION	
<input type="checkbox"/> 1.68 <input checked="" type="checkbox"/> 4.01 <input type="checkbox"/> 9.18 <input type="checkbox"/> 10.01 <input type="checkbox"/> 12.45	4.00 pH 25.0 °C
Select buffer and press ENTER	

1. Put the electrode to the second buffer.
2. Press UP/DOWN key to select the correct buffer and then press ENTER to start calibration.
3. User can press ENTER to go to next or wait for it auto lock.
4. Display the idea pH on the right side.
5. If the offset is over 30% or temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

Display efficiency

CALIBRATION	
<input type="checkbox"/> 1.68 <input checked="" type="checkbox"/> 4.01 <input type="checkbox"/> 9.18 <input type="checkbox"/> 10.01 <input type="checkbox"/> 12.45	4.00 pH 25.0 °C
EFFICIENCY = 98.0 %	

If the efficiency is lower than 80%, that means the electrode is aged, user should Replace the new electrode.

PH Manual calibration

Stand calibration

CALIBRATION	
7.0 0	7.00 pH 25.0 °C
Input buffer and press ENTER	

1. Put the electrode to the first buffer.
2. Press UP/DOWN key input the standard buffer and then press ENTER key to start calibration. User can press ENTER to go to next or wait for it auto lock.
3. Display the idea pH on the right side.
4. If the idea pH is over 7.00+/-1.5 pH or temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

Slope calibration

CALIBRATION	
4.0 1	4.00 pH 25.0 °C
Input buffer and press ENTER	

1. Put the electrode to the second buffer.
2. Press UP/DOWN key input the standard buffer and then press ENTER key to start calibration. User can press ENTER to go to next or wait for it auto lock.
3. Display the idea pH on the right side.
4. If the input is over 0.00-14.00 pH, or temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

Display efficiency

CALIBRATION	
04.01	4.00 pH 25.0 °C
EFFICIENCY = 98.0 %	

If the efficiency is lower than 80%, that means the electrode is aged user should Replace the new electrode.

PH Reset parameters

RESET PARAMETERS
RESET

This will reset all of the calibrated parameters to default.

DO Parameters setting

PARAMETERS	SETTINGS
Pressure	= 1 0 1 3 mBAR
Salinity	= 0 0 . 0 ppt
Membrane	= 3 . 0 6 %

1. Pressure range is from 500 to 9999 mbar.
Ex: if DO sensor is be used with 1KG pressure in fermentation. User should modify the pressure to 2026 mBar
2. Press UP/DOWN key to input the salinity.
The range is from 0.0 to 50.0 ppt
3. Press UP/DOWN key to input the coefficient of membrane. The range is from 0.01% to 9.99%. It depends on the

Membrane type.

DO Zero calibration

ZERO CALIBRATION
+ 0 1 . 1 nA (25. 0 °C) 2 5 . 0 °C
Wait stable and press ENTER

1. Put the DO electrode into the nitrogen or saturated solution of anhydrous sodium sulfite.
2. Waiting for the current is stable then press ENTER to finish the calibration.

Notice:

1. The zero point current range is from -2nA to +10nA, if the current is over the range then make sure the DO electrode is good.
2. If the temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

DO Saturation calibration

SATURATION CALIBRATION
+ 0066.1 nA (25.0°C) 25.2 °C
Wait stable and press ENTER

1. Use the calibration bottle(with sponge and water) to calibrate DO in 100%. You can also calibrate in air as your 100% calibration.
2. Waiting for the current is stable then press ENTER to go to next or press MODE to exit

SATURATION CALIBRATION
+ 0066.1 nA (25.0°C) 25.2 °C 100.0 %
Input standard data

1. Input standard data, the range is form 50% to 200%.
2. Press ENTER to finish the calibration or press the MODE to exit.

Notice:

1. The saturation current is from +25nA to +200nA,if the current is over the range, please make sure the DO electrode is good.

2. If the temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

DO Concentration calibration

CONCENTRATION CALIBRATION
+ 0066.1 nA (25.0°C) 25.2 °C
Wait stable and press ENTER

1. Use the calibration bottle(with sponge and water) to calibrate DO in concentration. You can also calibrate in air as your concentration calibration.
2. Waiting for the current is stable then press ENTER to go to next or press MODE to exit

CONCENTRATION CALIBRATION
+ 0066.1 nA (25.0 °C)
25.2 °C
08.2 0 ppm
Input standard data

1. Input standard data, the range is form 4.00 to 20.00 ppm.
2. Press ENTER to finish the calibration or press the MODE to exit.

Notice:

1. The saturation current is from +25nA to +200nA,if the current is over the range, please make sure the DO electrode is good.
2. If the temperature is over 0.0-60.0°C then it will display error message on the button of LCD.

Reset parameters

RESET PARAMETERS
RESET

This will reset all of the calibrated parameters to default.

Default

pH 20.00mA	corresponding	14.00	pH	range: -1.00 - 16.00
pH 4.00mA	corresponding	0.00	pH	range: -2.00 - 15.00
				difference : 1.00
DO 20.00mA	corresponding	200.0	%	range: 10.0 - 200.0
DO 4.00mA	corresponding	0.0	%	range: 0.0 - 190.0
				difference : 10.0
ppm 20.00mA	corresponding	10.00	ppm	range: 1.00 - 20.00
ppm 4.00mA	corresponding	0.00	ppm	range:0.00 - 19.00
				difference : 1.00

PH current output offset	0.00	mA	range: +/- 1.00
DO current output offset	0.00	mA	range: +/- 1.00
PH current filter	0	second	range: 0 - 120
DO current filter	0	second	range: 0 - 120
PH fixed current output	4.00	mA	range: 4.00 - 20.00
DO fixed current output	4.00	mA	range: 4.00 - 20.00
PH HOLD type	last		range: fixed/last
DO HOLD type	last		range: fixed/last
Relay 1 PH close S.P.	10.00	pH	range: -2.00 - 16.00
Relay 1 PH open S.P.	4.00	pH	range: -2.00 - 16.00 difference : 0.01
Relay 1 DO close S.P.	20.0	%	range: 0.0 - 200.0
Relay 1 DO open S.P.	80.0	%	range: 0.0 - 200.0 difference : 0.1
Relay 1 ppm close S.P.	2.00	ppm	range: 0.00 - 20.00
Relay 1 ppm open S.P.	8.00	ppm	range: 0.00 - 20.00 difference : 0.01
Relay 1 delay time	0	second	range: 0-120
Relay 2 PH close S.P.	10.00	pH	range: -2.00 - 16.00
Relay 2 PH open S.P.	4.00	pH	range: -2.00 - 16.00 difference : 0.01
Relay 2 DO close S.P.	20.0	%	range: 0.0 - 200.0
Relay 2 DO open S.P.	80.0	%	range: 0.0 - 200.0 difference : 0.1
Relay 2 ppm close S.P.	2.00	ppm	range: 0.00 - 20.00
Relay 2 ppm open S.P.	8.00	ppm	range: 0.00 - 20.00 difference : 0.01
Relay 2 delay time	0	second	range: 0-120
Relay 3 period time	1.0	hour	range: 0 - 1000.0
Relay 3 clean time	10	second	range: 0 - 1000
Relay 3 delay time	0		range: 0 - 120
Relay 3 function	error alarm		range: clean/period alarm/ error alarm
Save time	60	second	range: 5 - 120
ID address	1		range: 1 - 255
Baud rate	9600		range: 9600,19200,38400
PH offset	0.00	pH	range: +/- 1.00
DO offset	0.0	%	range: +/- 10.0
ppm offset	0.00	ppm	range: +/-1.00
DO Mode	%		range: %, ppm, mg/L
Temp. Offset	0.0	°C	range: +/- 5.0

Manual Temp. for measurement	25.0 °C	range: -10.0 - 130.0
Manual Temp. for calibration	25.0 °C	range: 0.0 - 60.0
Language	English	range: English/ traditional Chinese /simple Chinese
Filter	1	range: 0 - 10
Temp. probe	NTC22K	range: NTC22K
Pressure	1013 mBar	range: 500 - 9999
Salinity	0.0 ppt	range: 0.00 - 50.00
Membrane coefficient	3.06 %	range: 0.01% - 9.99%

Password

Press MODE key

1100:Calibration mode

1200:Setting mode

If no key is be pressed and over 10 minutes then it will go back to measurement mode.

Error code

Error 01	memory error
Error 02	reading is over maximum
Error 03	reading is under minimum
Error 04	temperature is over maximum
Error 05	temperature is under minimum
Error 06	current 1 output is over 20.5 mA,the maximum is 22.00mA
Error 07	current 1 output is under 3.8 mA, the minimum is 3.5mA
Error 08	current 2 output is over 20.5 mA,the maximum is 22.00mA
Error 09	current 2 output is under 3.8 mA, the minimum is 3.5mA
Error 10	record error
Error 11	ADC damage
Error 99	default parameters lost

RS485 command

The instrument use the standard Mod bus-RTU protocol, all of the data are word type(2 bytes), the range is -32767~32767 ,16 system.

PC command:

	ID address	command	Start address	Data number	CRC16
length	1 byte	1byte	2 byte	2 byte	2 byte
Ex.	0x01	0x03	0x0001	0x0001	0xD5CA

Instrument response:

	ID address	command	Data number	data	CRC16
length	1 byte	1 byte	1byte	N byte	2 byte
Ex.	0x01	0x03	0x02	0x02 0xBC	0xB895

If response is 01,the command is wrong.

If response is 02,the address is not correct.

If response is 03,data number is not correct.

command 03: read the settings

command 04: read the readings

04:definition

address

(00)	0x00	pH reading	reading : pH X 0.01
(01)	0x01	%/ppm reading	reading : % X 0.1, ppmX0.01
(02)	0x02	PH current	reading : X 0.01
(03)	0x03	%/ppm current	reading : X 0.01
(04)	0x04	Temperature	reading : X 0.1
(05)	0x05	Error code	reading : X 1
(06)	0x06		
(07)	0x07		
(08)	0x08		
(09)	0x09	Model type	fix to 14

03:definition

Address

(00)	0x00	pH 20.00mA corresponding	reading:X 0.01
(01)	0x01	pH 4.00mA corresponding	reading:X 0.01
(02)	0x02	DO 20.00mA corresponding	reading:X 0.1
(03)	0x03	DO 4.00mA corresponding	reading:X 0.1
(04)	0x04	ppm 20.00mA corresponding	reading:X 0.01
(05)	0x05	ppm 4.00mA corresponding	reading:X 0.01
(06)	0x06	PH Current offset	reading:X 0.01
(07)	0x07	DO Current offset	reading:X 0.01
(08)	0x08	PH Current filter	reading:X 1
(09)	0x09	DO Current filter	reading:X 1
(10)	0x0A	PH Current fixed current	reading:X 0.01
(11)	0x0B	DO Current fixed current	reading:X 0.01
(12)	0x0C	PH Current HOLD type	reading:X 1 0=fixed,1=last
(13)	0x0D	DO Current HOLD type	reading:X 1 0=fixed,1=last

(14)	0x0E	Relay 1 PH close S.P.	reading:X 0.01	
(15)	0x0F	Relay 1 PH open S.P.	reading:X 0.01	
(16)	0x11	Relay 1 DO close S.P.	reading:X 0.1	
(17)	0x12	Relay 1 DO open S.P.	reading:X 0.1	
(18)	0x13	Relay 1 ppm close S.P.	reading:X 0.01	
(19)	0x14	Relay 1 ppm open S.P.	reading:X 0.01	
(20)	0x15	Relay 1 delay time	reading:X 1	
(21)	0x16	Relay 2 PH close S.P.	reading:X 0.01	
(22)	0x17	Relay 2 PH open S.P.	reading:X 0.01	
(23)	0x18	Relay 2 DO close S.P.	reading:X 0.1	
(24)	0x19	Relay 2 DO open S.P.	reading:X 0.1	
(25)	0x1A	Relay 2 ppm close S.P.	reading:X 0.01	
(26)	0x1B	Relay 2 ppm open S.P.	reading:X 0.01	
(27)	0x1C	Relay 2 delay time	reading:X 1	
(28)	0x1D	Relay 3 clean period	reading:X 0.1	
(29)	0x1E	Relay 3 clean time	reading:X 1	
(30)	0x1F	Relay 3 delay time	reading:X 1	
(31)	0x20	Relay 3 function	reading:X 1	0:clean,1:period alarm ,2:Error alarm
(32)	0x21	Record storage time	reading:X 1	
(33)	0x22	Mode	reading:X 1	0=%,1=ppm,2=mg/L
(34)	0x23	pH offset	reading:X 0.01	
(35)	0x24	DO offset	reading:X 0.1	
(36)	0x25	ppm offset	reading:X 0.01	
(37)	0x26	Temp. offset	reading:X 0.1	
(38)	0x27	Manual temp. for measurement	reading:X 0.1	
(39)	0x28	Manual temp. for calibration	reading:X 0.1	
(40)	0x29	Temp. compensation	reading:X 1	0=Auto,1=manual
(41)	0x2A	Language	reading:X 1	0=English ,1=traditional Chinese,2=simple Chinese
(42)	0x2B	Filter	reading:X 1	