

# **pH/ORP-7500**

## **pH/ORP Transmitting controller**

**Operation manual**

V1. 2

[www.ponpe.com](http://www.ponpe.com)

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## Notes before Operation

### 1. Notice before operation:

- (1) Carefully read the relevant parts of this manual before installation and operation to prevent wrong operation, measurement error and damage of instrument.
- (2) Improper installation and unsuitable flow speed will cause big measurement error, so please read the installation passage in detail.
- (3) This instrument is precise electrochemical measurement, and its installation and operation should be performed by technicians with relevant professional knowledge.
- (4) If for some special conditions, please consult our Technical Department for further details.

### 2. Maintenance items:

- (1) The indicators' quality guarantee is one year from the date of purchasing. During this period, if the meter has quality problems, manufacturer is responsible for maintenance work for free or changes it.
- (2) pH and ORP sensors are consumer goods which without quality guarantee. Because, the lifespan is based on the medium and working conditions.
- (3) Manufacturer offers the maintenance service for whole life of the sold meters.
- (4) If the damage of the meter is caused by the following reasons, it is out of the maintenance service:
  - A、The meter is burned or foundered caused by improper usage and maintenance.
  - B、The meter is refitted or misused without permit.
  - C、The meter is destroyed under the condition out of company's regulation.
  - D、The relevant damage caused by choosing the wrong type.
  - E、The cable damage and rupture caused by improper installation and usage.
  - F、The incorrect measurement of the sensor caused by disconnecting or connecting wires personally.
  - G、The measurement inaccurate caused by privately cutting the sensor cable.

H、 The inner broken wire caused by indiscreetly disassembling.

I、 The consumptive materials are not within the scope the warranty.



Please take care of the items which with this sign.

\*Without the influence on the operation, any small change or improvement on the products by the manufacturer will not be notified separately. Please make the object as the standard.

# 1 Conception

pH/ORP-7500 series is a kind of precise micro-computer industry online pH and ORP controller , which with large green font displayed on high-lighgt LCD screen, kinds of prompts and status shows and with easy operation menu.

## 1.1 Main Features

- ☆ There are two modes for measurement collection single high-resistance mode, and double high-resistance model.
- ☆ Switch pH&ORP function by program. Meter can work with kinds of pH & ORP sensor
- ☆ Double channels relay or double channels photoelectric switch can be selected.
- ☆ Double channels relay can support two point alarm control which is suitable for pH or ORP measurement hysteresis.
- ☆ There are 2 calibration methods can supports buffer solution calibration and directly input calibration.
- ☆ Isolated external auto temperature compensation to satisfy high accurate measurement.
- ☆ Isolated/transerable/reversible/passive/active , (4~20) mA
- ☆ Power supply DC 24V.
- ☆ The meters with rear cover for seal.
- ☆ The meter with strong ability for anti interference. There are Power filter and hardware watchdog circuit

## 1.2 Applications

It's used for online monitoring pH/ORP of water purification, environmental water treatment, plating solution, chemical process, circulating cooling water, aquaculture and etc.

## 1.3 Classifications

pH-7500 is a single high-resistance instrument, which suitable for common

measurement situation; while pH-7500A is a double high-resistance instrument which is suitable for high pure water and the media with electric potential.

## 1.4 Notices

For accuracy measurement, double high-resistance instrument pH-7500A must match with a temperature sensor which has potential balance function.

Please choose two-combination pH sensor to replace triple composite pH sensor to reduce the cost.

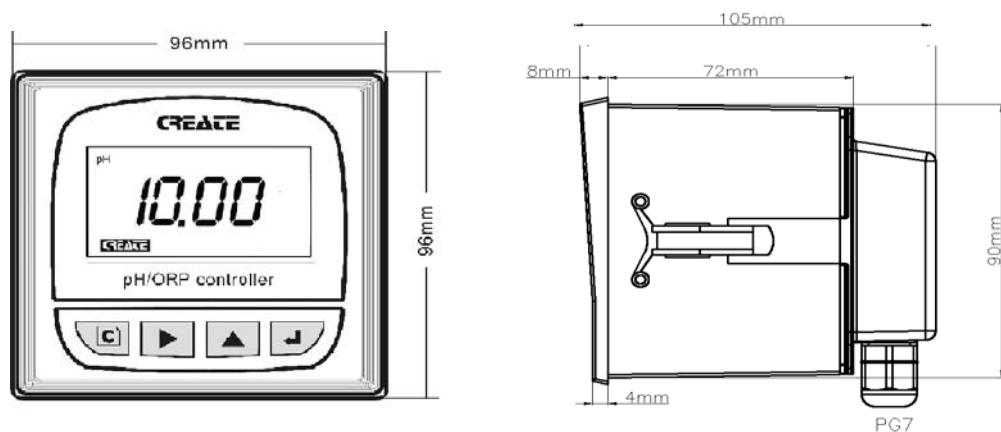
## 1.5 Technique index

Model		pH/ORP-7500 series pH/ORP transmitter controller
Measurement range	pH	0.00 ~ 14.00
	ORP	(-1999 ~ +1999) mV
	Temp.	(0.0 ~ 99.9) °C
Resolution	pH	0.01
	ORP	1mV
	Temp.	0.1°C
Accuracy	pH	±0.1
	ORP	±5mV
	Temp.	±0.5°C
Input impedance		$\geq 1.5 \times 10^{12} \Omega$
Temp. Compensation range		(0 ~ 99.9) °C
Environment	Temp.	(0 ~ 50) °C
	Humidity	≤85% RH
Temperature sensor		NTC-10K
Cable length		Standard 10m (or customized ≤20m)
Control output		Double relay (double contact ON/OFF), backlash of high and low limit can be set
contact capacity		AC 220V/AC 110V 2A(Max)      DC 24V 2A(Max)
Current output		Isolated/transferable/reversible/passive/active, (4~20) mA current loop (loop resistance ≤500Ω) accuracy: ±0.5%FS
Power supply		DC 24V ±4V
protection		IP65 (with back cover)

Consumption	≤3W
Outline dimension	96mm×96mm×103mm (H×W×D)
Hole dimension	91mm×91mm ( H×W )
Installation	Panel

## 2 Installation and wiring connection

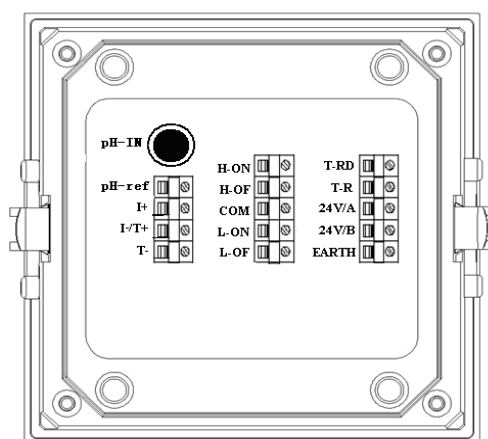
### 2.1 Outline dimension



### 2.2 Key board instruction

Sign	Name	Function
<b>C</b>	SET	1. Enter function menu under measurement status. 2. Give up the setting or skip the setting
<b>▶</b>	SELECT	1. Select thousand, hundred ten and unit in circulate under setting status. 2. Switch temperature under measurement status.
<b>▲</b>	ADD	1. Adjust the number 2. Switch mV reading under measurement status.
<b>↵</b>	ENTER	1. confirm the item 2. Confirm and save the data. 3. The buzzer ON/OFF under the measurement status

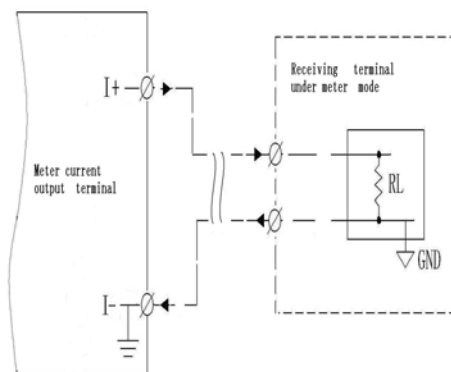
## 2.3 Wiring connection



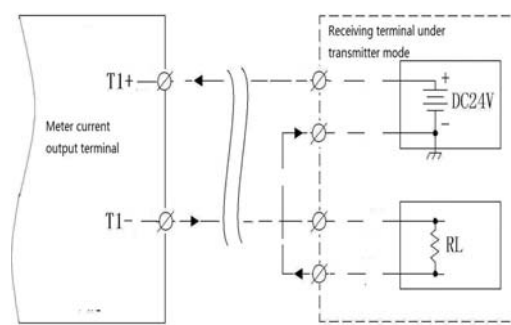
T-RD	Connect with black wire of temperature sensor	
T-R	Connect with red wire of temperature sensor	
24V/A	Connect with DC 24V	Automatic polarity recognition
24V/B	Connect with DC 24V	
EARTH	EMC Grounding wire.	
H-ON	NO contact of high limit alarm relay	
H-OFF	NC contact of high limit alarm relay	
COM	Public terminals of high limit, low limit alarm relay.	
L-ON	NO contact of low limit alarm relay	
L-OFF	NC contact of low limit alarm relay	
pH-IN	Connect with measurement electrode of pH sensor (center line )	
pH-ref	Connect with reference electrode of pH sensor （shield line）	
T+ T-	Anode of external power supply under transmitter mode.	
I+ I-	Under meter mode, mA output	
I-/T+	Public connection under transmitter/meter model	



## 2.4 4-20mA output

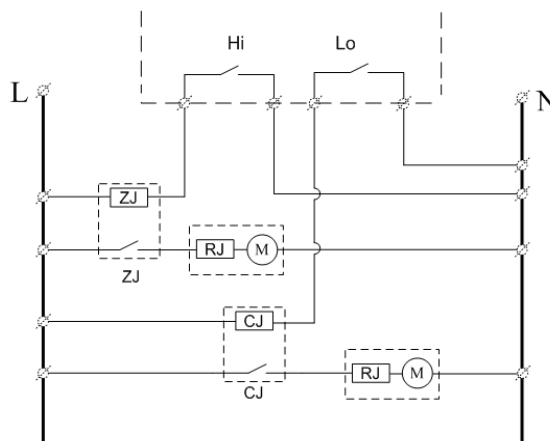


Wiring connection diagram under meter mode(left)



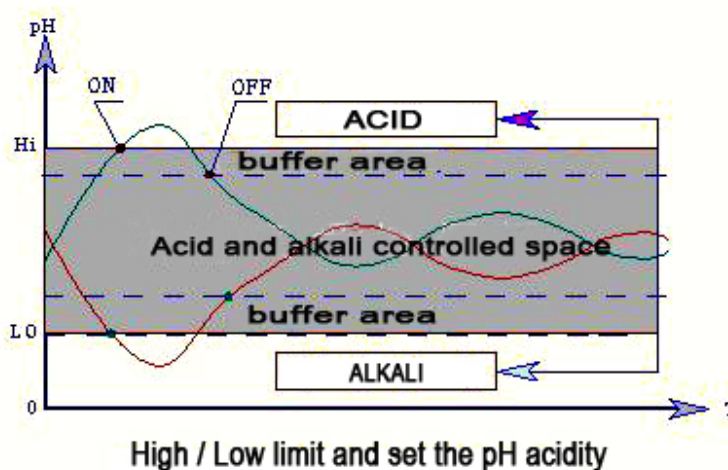
Wiring connection diagram under transmitter mode(right)

## 2.5 Relay output

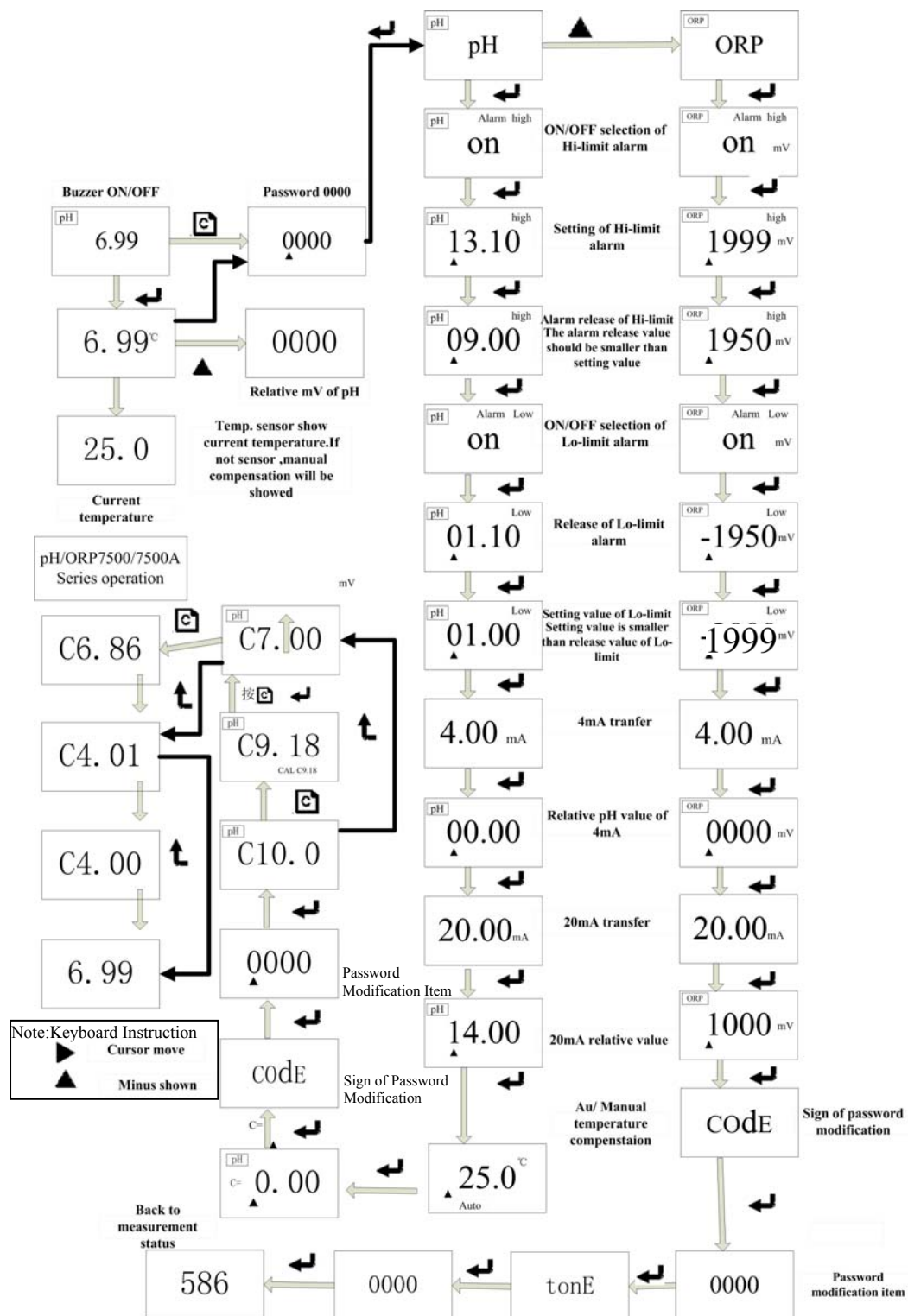


Control diagram by Relay ON/OFF

## 2.6 Relay setting



### 3 Operation process






### 3.1 Calibration

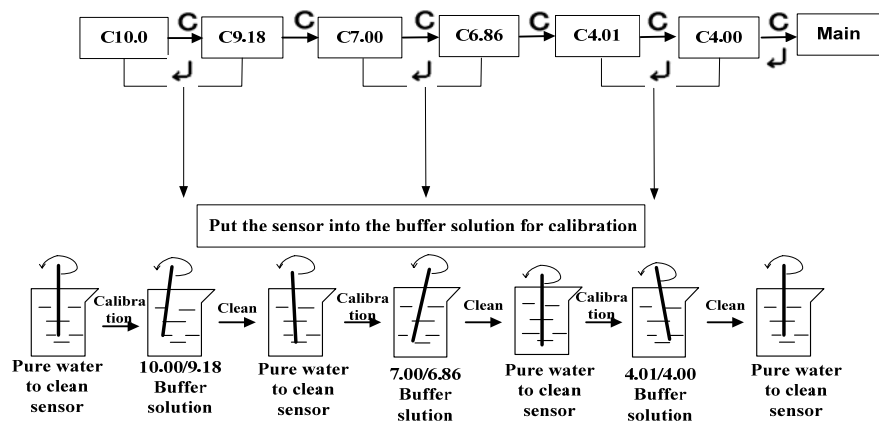
pH/ORP sensors are electrochemical and their sensitivity decreases with influence of time and medium. In order to get an accurate measurement, it is suggested to often calibrate sensor's slope. The calibration period relays on the influence from the measured medium

- 1) Normal buffer solution ,10.00/9.18/7.00/6.86/4.00/4.01
- 2) If the medium are acid or alkali, please choose two point slope calibration, use two kind buffer solution.
- 3) The meter with directly input calibration method, please reference the calibration steps.
- 4) If the sensor with long time storage, please put it in the water or KCL solution for 12 hours , and then calibrate it.
- 5) If the membrane glass bulb is dry, please use 5% hydrochloric acid to clean for 2 minutes.
- 6) Under double high-resistance mode, connect the grounding line with pH buffer solution.

### 3.2 Buffer solution calibration

- 1) Choose the correct buffer solution to calibrate.
- 2) When the "C10.0"blinks, enter into the buffer solution selection.
- 3) Press“  ”to calibrate, and press“  ”to skip this selection
- 4) Put the clean sensor into the buffer solution and the screen blinks all the time.
- 5) It stopped blinking after calibration ,press  to save it and enter into the next calibration. Then do the same calibration in turn.
- 6) Check the buffer solution and recalibrate when“~~ERRO~~” comes out.;
- 7) Repeat the calibration until the “PASS” comes out.

Please follow the below detailed calibration process:



【NOTE】 “ C ” means skip this operation; and “ ↵ ” means enter the operation.

### 3.3 Off-line calibration

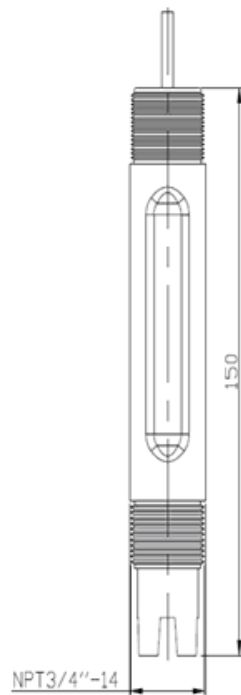
When field calibration is not good to carry on, the calibration to sensor's slope by using lab devices and buffer solution is recommended. Take notes of corresponding mV value of buffer solution in room temperature. Input of this record value to off-line calibration is called as manual input calibration.

Operation process:

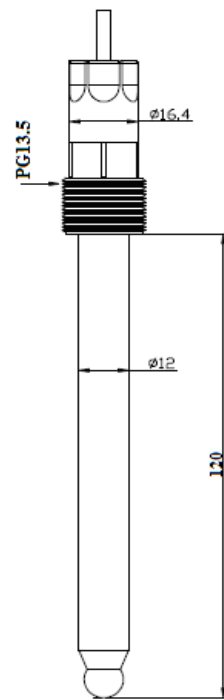
- 1、 Press “ ► ” button for 10 seconds until the screen displays “0000”, then input the password 7571 and press “ ↵ ” into the off-line calibration interface.
- 2、 pH buffer solution sequence (10.0, 9.18, 7.00, 6.86, 4.01, 4.00)
- 3、 Press the BACK key to find the buffer solution prompt.
- 4、 Press the enter key and input the corresponding mV value.
- 5、 Two points or three points calibration can be selected.

## 4 Outline dimension and installation of the probe

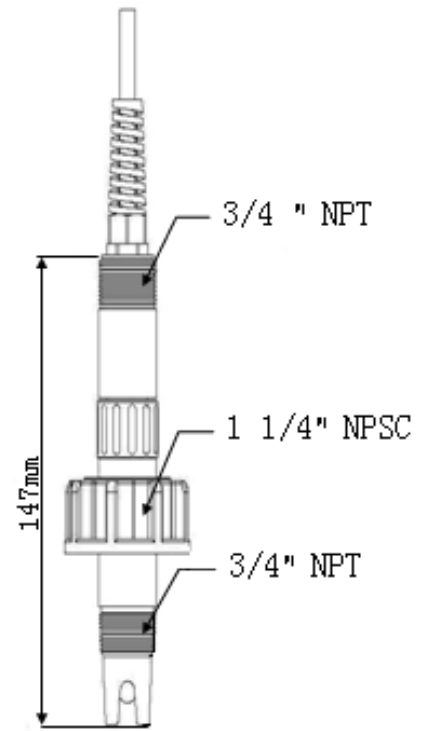
### 4.1 Outline dimension



pH/ORP one-piece sensor

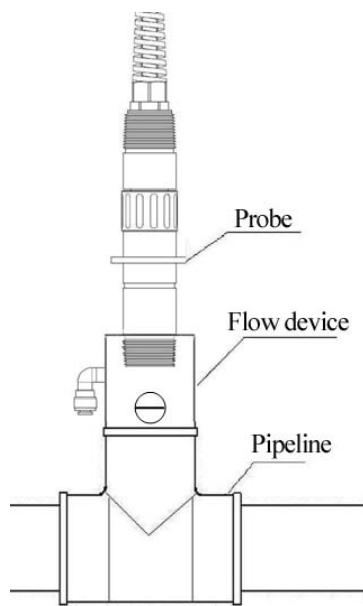


pH/ORP glass sensor

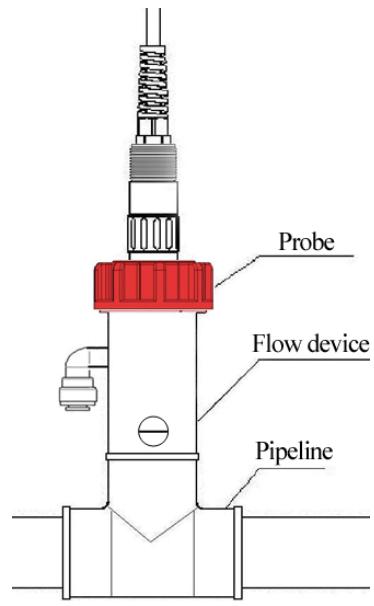


pH/ORP plug-in sensor

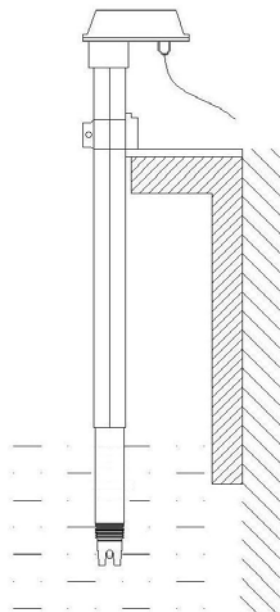
## 4.2 Installation method



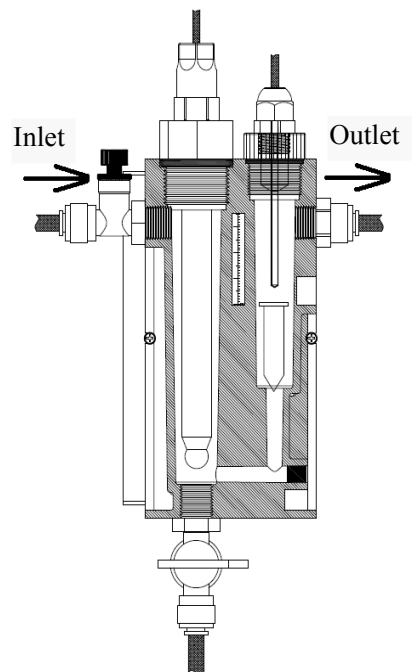
Flow device P34A



Flow device P34B



P16 submersible installation



pH sensor and temp. sensor by using P33

**NOTE: Only one-piece PH/ORP sensor could be used for submersible installation.**

#### 4.3 Installation requirements



Middle 1 1/4 " NPSC straight pipe thread fitting Upright install or slant install no more than 30 °



bottom 3/4 " NPT taper thread fitting; Upright install or slant install no more than 30 °



Horizontal installation does not work



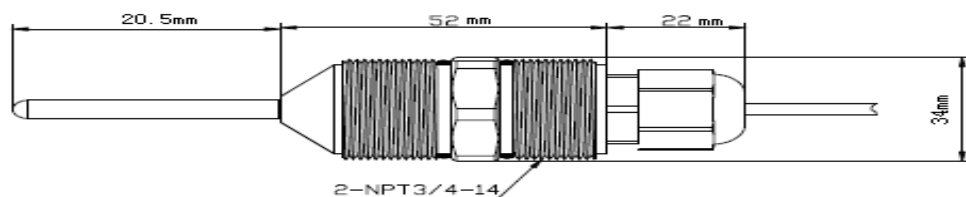
Backward installation does not work

#### 4.4 Notices during installation

1. Direct pipeline installation is not recommended since quickly flow and bubbles in water would cause the inaccuracy of the measurement.
2. Directly install the sensor in to the pure water pipeline would cause the inaccuracy and failure of the sensor. So flow device P34A/B is recommended, which you could not stop the water when you replace the sensor.
3. Please use the flow adjustment device P33 for the pipeline which with inconvenient installation.
4. Add a filter if the medium with fibrous material which will wrap the sensor.

5. It must select glass material sensor、PPS material of sensor.
6. pH sensor should not be directly measure high temperature medium. should be exchange the high temperature medium down to 60 degree.
7. Plug-in type pH sensor 1220A suitable for the environment of always calibration and changing. It's no need to change cable, only the head of the sensor (Please be noted that the plug-in sensor is only suitable for pipeline installation, it can not be used for submersible installation.)
8. The channels in reservoirs, rivers, installation, recommended the use of floating-bed installation, and ensure a reliable anchor to reduce the cable pulling
9. Sewage pool、waste water pool、solution pool recommended submersible installation by using one-piece pH sensor
10. Please use Flange installation method(one-piece sensor) in Material tank or reaction kettle
11. If used in material tank or reaction kettle, please protect the sensor body to avoid breaking.
12. biological、high-pressure sterilization recommend high-temperature glass pH sensor, with high-pressure jacket
13. The installation must ensure that any environmental sensors mounted vertically (down the glass bulb, or less than 15 degrees), horizontal or inverted installation is not working properly
14. pH signal is weak voltage signal, the cable should be independent ,not recommend wear with strong electronic.
15. The cable of the sensor is low-noise cable .It's not allowed to cut or extend privately.
16. To avoid the damage from the particle , please choose the flow adjustment device.

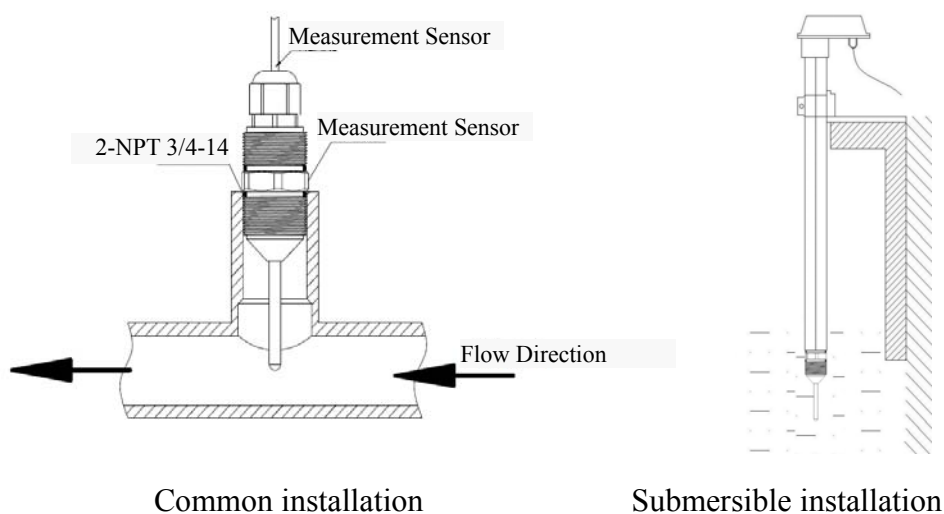
#### 4.5 Outline dimension of the temperature sensor



Outline dimension



## 4.6 Installation method of the Temp. Sensor



**NOTES:** The upper part NPT3/4" thread can connect with the measuring lath for immersion measurement.

## 5 Maintenance of the sensor

1. Please protect the glass on the top of the sensor, to avoid directly touching.;
2. Please clean the sensor at a regular time by using swab and neutral cleanser; do not use the acid and corrosive solution to clean the sensor.
3. please use 5% dilute hydrochloric acid to clean the attachment not easy to wash out.
4. Measurement cable is for special use, it's not allowed to cut or lengthened privately or replaced by other cables.;
5. Pls purchase the same model pH sensor and calibrate if the sensor is broken or invalid.
6. The rear terminals of the sensor should keep clean since the sensor is high impedance signal.

## 6 Trouble shooting

Problem	Possible causes	Trouble shooting
No display when powered on	A. Bad connection of power supply B. Instrument fault	A. check to see if there is 24V voltage between power terminals 24VA and 24VB. B. Check by professional technicians.
Unstable display	A. Improper wire connection of sensor B. Air bubbles in the pipeline C. Unstable water quality D. badness connection	A. refer to the instruction manuals B. select the proper measurement point or change the pipeline C. stabilizing the water quality D. Check the connector to be connected
Big deviation	A. Sensor fault B. The cable is damaged C. incorrect installation D. setting problem	A. Take out the sensor from the pipeline and calibrate B. replace the sensor which can not be calibrated C. find the correct measurement point and use the flow device D. reset the parameter of the instrument
Difference at transmitting data	A. receiving unit can not reappear B. loop resistance is too large C. incorrect connection mode D. unusual power supply E. wrong transfer volume	A. check the 4-20mA output by the signal calibration instrument B. replace the cable to reduce the loop resistance C. check the connection right or not D. powered by the standard E. reset the transferred volume

## 7 Complete Set

- |                                   |                      |
|-----------------------------------|----------------------|
| 1. Indicator (pH/ORP Meter)       | 1 pc                 |
| 2. waterproof rear cover          | 1 pc (for selection) |
| 3. pH/ORP sensor                  | 1pc (for selection)  |
| 4. fast installation clamps       | 2pcs                 |
| 5. operation manual of instrument | 1pc                  |
| 6. operation manual of sensor     | 1 pc                 |
| 7. certificate                    | 1pc                  |

## 8 Order directory

Order the right meter and accessories according to the medium and usage, the recommendation as below:

### 8.1 Applications

model	pH/ORP-7500 (single high resistance)	pH/ORP-7500A (double high resistance)
medium	Chemical processing, environmental protection, water treatment	High pure water, water with electrical potential, electroplate water

### 8.2 Accessories for selection

Flow device	sensors	applications
P33 flow device	Glass sensor	Automatically controller or lab system
P34A flow device	Plug-in sensor	Pipeline installation
P34B flow device	Plug-in sensor	Pipeline installation
P16 used for submersible installation	One-piece sensor	Channel or reservoir
P17 used for flange installation	One-piece sensor	reaction still or material tank
Accessories for fold submersible installation	One-piece sensor	Wastewater pool or aeration tank
Floating accessories	One-piece sensor	Channel, river or aquaculture
Jacket accessories	High temp. glass sensor	Bio-pharmaceuticals and food fermentation
Noble metal protection	One-piece sensor	Metallurgy or flotation system