RK500-06 ORP Sensor User Manual

Revision Time	Reviser	Current Version	Remarks
20250826	LI	V5.0	

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User Notice

Please read this manual carefully before use to ensure safe and optimal operation. Retain this manual for future reference.

Pre-Use Instructions

- Carefully review this manual and follow all operational and safety guidelines to prevent malfunctions and hazards.

Unpacking Inspection

- Upon receipt, carefully inspect the sensor device and accessories for any shipping damage.
- If damage is detected:
- Immediately notify the manufacturer and distributor.
- Retain all packaging materials for return or replacement processing.

Parts List

Item	Quantity	Remarks
ORP sensor	1	
Cable	1	The length depends on the order
Bracket	1	Optional

1. Product Introduction

RK500-06 ORP Sensor uses platinum electrodes, with a measurement range of -1500mV to +1500mV, a resolution of 0.1mV, built-in signal isolation, strong anti-interference ability, and an IP68 protection level design. It can work stably in liquids for a long time. Suitable for harsh environments such as sewage treatment, chemical industry, aquaculture, etc.

2. Product Features

- On-line & real-time monitoring
- Platinum ring electrode
- High accuracy
- Simple operation and high reliability
- Internal signal isolation, strong anti-interference
- Widely power supply(7-28VDC)
- Probe can be used under water (IP68)
- Submerged mounting bracket is optional

3. Specifications

Item	Technical Specification
Measurement Principle	Electrochemical(Platinum ring)
Range	-1500mV-+1500mV
Resolution	0.1mV
Accuracy	±1mV
Supply	7-28VDC
Response Time	5s (90%),14s (98%)
Output	4-20mA & RS485 at the same time
Operating Environment	-5-+60℃(<0.6MPa)
Maintenance	Every 1 month to clean the electrode,every 6 months calibrated
Power Consumption	<0.4W
Ingress Protection	IP68
Storage	10-60℃@20%-90%RH
Cable Length	5m default , customizable

4. Electrical Connections

Connector(Cable)	Current	RS485
Red	V+	V+
Black	V-	V-
Yellow		RS485A
Green		RS485B
White	Signal+	

5. Output Types & Formulas

Current Type	ORP=(I-4)/(20-4)*Max_Range

I: Transmitter output current in mA;

6. Product Dimensions

Unit:mm

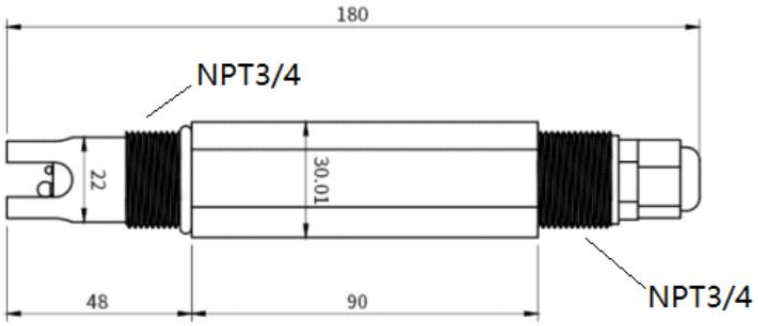

Figure 6.1 Dimension Specification

7. Communication Protocol（MODBUS-RTU）

Parameter	Value
Data Bits	8 bits
Check Bit	None
Stop Bit	1 bit
Baud Rate	9600 bps
Slave Address	0x05 (Factory Default)

7.1 Read Real-Time Data

Client sends:

05 03 00 00 00 02 C58F

Return:

05 03 04 42EB3333 8F5A

7.1.1 Description of Return Data Format

No.	Conception	Byte Number	Description	Remarks
1	Address block	1	Address(0x05)	0x05
2	Function code	1	Only read(0x03)	0x03
3	Number of bytes	1	0X04	4bytes
4	Data block	4	ORP	0x42EB3333(117.6mV)
5	Check block	2		0x8F 0x5A

7.2 Modify Slave Address(Address setting range: 01H to F7H)

Client sends:(Change slave address from 05H to 02H.)

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x05	0x06	0x00	0x14	0x00	0x02	0x49	0x8B

Response:

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x05	0x06	0x00	0x14	0x00	0x02	0x49	0x8B

8. Installation Guidelines

- Do not install the sensor in a location where bubbles are prone to accumulate. Bubbles adhering to the electrode surface can isolate the reaction, resulting in inaccurate readings or slow response.
- Intense turbulence can generate a large number of microbubbles, interfere with measurements, and may physically damage sensors.

8.1 Installation Method

Figure 8.1.1 Mounting Bracket(Length=1m)

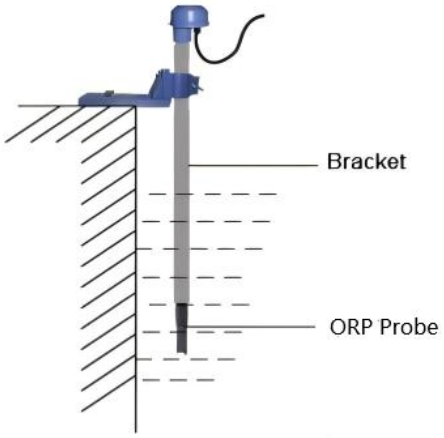

Figure 8.1.2 Probe Submersible Installation

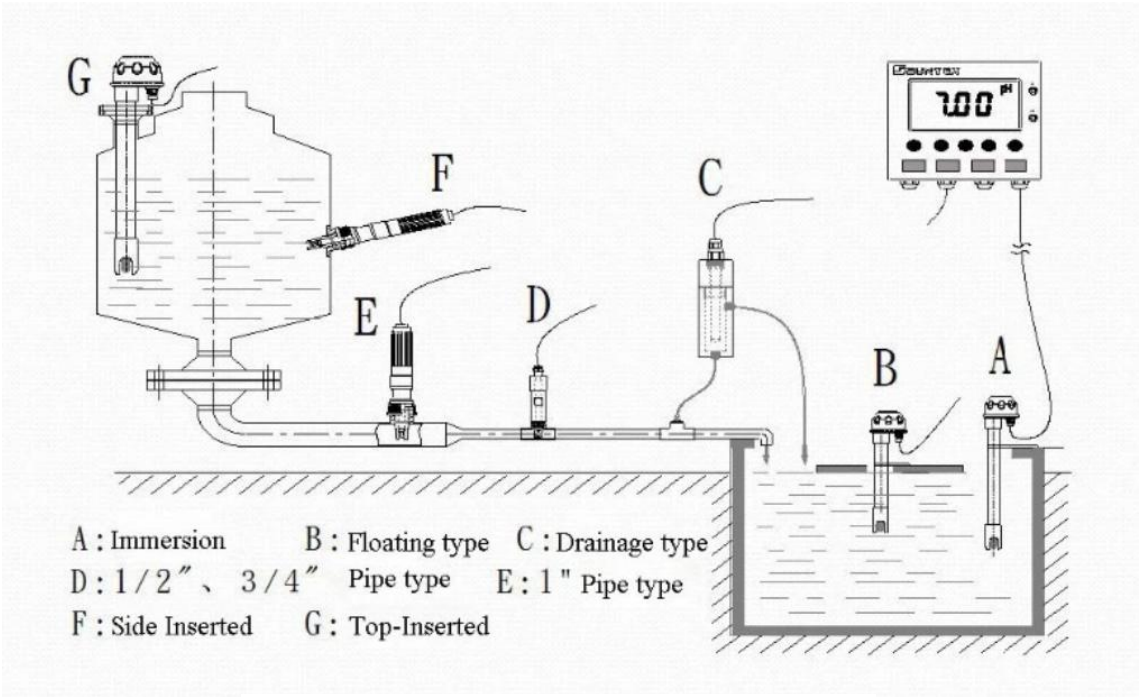

Figure 8.1.3 Typical Installation Method

9. Precautions

Package and Model Verification

- Ensure the packaging is intact and verify the sensor model and specifications match your purchased product.

Powered Wiring Prohibition

- Do not connect wires while powered. Only energize the sensor after confirming correct wiring.

Component Modification Restriction

- Do not alter factory-soldered components or pre-connected wires.

Precision Handling Requirement

The sensor is a precision device. Avoid:

- Unauthorized disassembly
- Structural components are strictly prohibited from being compressed under stress

  Note: Unauthorized modifications void the warranty.

10. Troubleshooting

Incorrect Output Signals (Analog/RS232/RS485):

- Verify wiring correctness and secure connections.
- Check if the serial port is occupied or malfunctioning.
- Confirm serial port settings (baud rate, data/stop bits) match device requirements.

Persistent Issues:

- Contact the manufacturer if the above steps fail to resolve the problem.

11. Product Maintenance

Maintenance and Safety

- According to the work environment, clean the electrodes with tap water every 3 or 6 months.
- When the probe is not in use, it can be soaked in 3mol/l KCL solution or saturated KCL solution.
- It is strictly prohibited to immerse the electrode in distilled water, deionized water, or tap water with very low ion content.
- If the pH electrode is contaminated with inorganic substances, it can be cleaned with 0.1mol/l HCl or sodium hydroxide solution for a few minutes, and then rinsed with distilled water.

- If the pH electrode is contaminated with organic matter, it can be cleaned with alcohol or acetone, and then rinsed with distilled water.
- Unauthorized disassembly, modification,or repairs may void the warranty and lead to malfunctions.

Troubleshooting Protocol

- In case of malfunction, refer to the troubleshooting section of this manual.
- Do not attempt unauthorized disassembly or repairs.
- Contact the manufacturer's after-sales department directly for technical support.

12. Warranty Terms

This product comes with a one-year warranty, starting from the date of delivery. Within twelve months, the Company shall be responsible for free repair or replacement of any failure caused by sensor quality issues (non-human damage). Fees will be charged for repairs or replacements after the warranty period expires.

CE Complies with applicable CE directives.

Manual subject to change without notice.

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