RK500-15 Ammonium ion (NH_4^+) Sensor User Manual

Revision Time	Reviser	Current Version	Remarks
20250827	LI	V5.0	

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
Sensor	1	
Cable	1	The length depends on the order
Bracket	1	Optional

1. Product Introduction

The RK500-15 Ammonia Nitrogen Sensor uses an ammonium ion electrode based on PVC film to test the content of ammonium ion in water. With temperature compensation, the measurement is fast, simple and accurate. The internal reference liquid of the ammonium ion electrode exudates from the microporous salt bridge very slowly. the service life of the electrode is longer than that of the ordinary industrial electrode.

2. Product Features

- Magnetic isolation technology with strong anti-interference ability
- Simple operation and high reliability
- No external module , a whole design
- 4-20mA and RS485 at the same time
- Immersion in water or pipe installation

3. Specifications

Item	Technical Specification
Range	0-10 ppm ,0-100ppm (Customizable)
Accuracy	±5%FS
Resolution	0.1mg/ L
Drift	≤0.1ppm/24h
Supply	7-28VDC
Output	4-20mA&RS485(Modbus-RTU)
Pressure Resistance	<0.5MPa
Response Time	5s (98%,flowing liquid) , 14s (98%,stationary liquid)
Power Consumption	<0.5W
Operating Temperature	0-55℃
Probe Material	ABS
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. Product Dimensions

Unit:mm

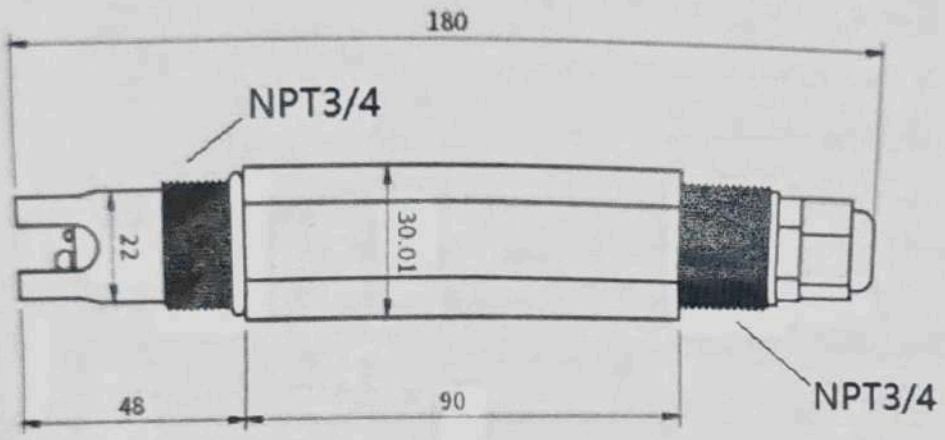

Figure 5.1
Dimension Specification

6. Output Types & Formulas

Current Type	$NH4^+=(I-4)/(20-4)*Max\_Range$

I: Transmitter output current in mA;

7. Communication Protocol(MODBUS-RTU)

Parameter	Value
Data Bits	8 bits
Check Bit	None
Stop Bit	1 bit
Baud Rate	9600 bps
Slave Address	0x0D (Factory Default)

7.1 Read Real-time Data

Client sends:

0D 03 00 00 00 02 C4C7

Return:

0D 03 04 41 31 47 AE C18C

7.1.1 Description of Return Data Format

No.	Conception	Byte Number	Description	Remarks
1	Address block	1	Address(0x0D)	0x0D
2	Function code	1	Only read(0x03)	0x03
3	Number of bytes	1	0X04	4bytes
4	Data block	4	$NH4^+$ Value	0x413147AE(11.07ppm)
5	Check block	2		0xC1 0x8C

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

Client sends:(Change slave address from 0CH to 01H.)

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x0C	0x06	0x00	0x14	0x00	0x01	0x09	0x13

Response:

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x0C	0x06	0x00	0x14	0x00	0x01	0x09	0x13

Note:if you forget the original address, you should use the broadcast address(FEH) (ensure that no other devices on the bus at this time).

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)

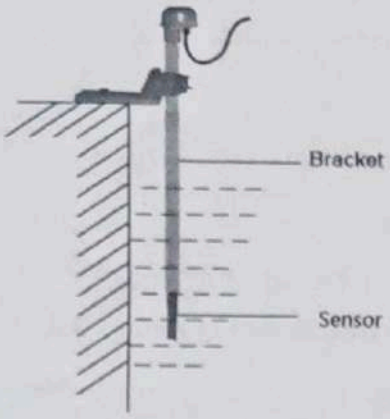

Figure 8.1.2 Probe Submersible Installation

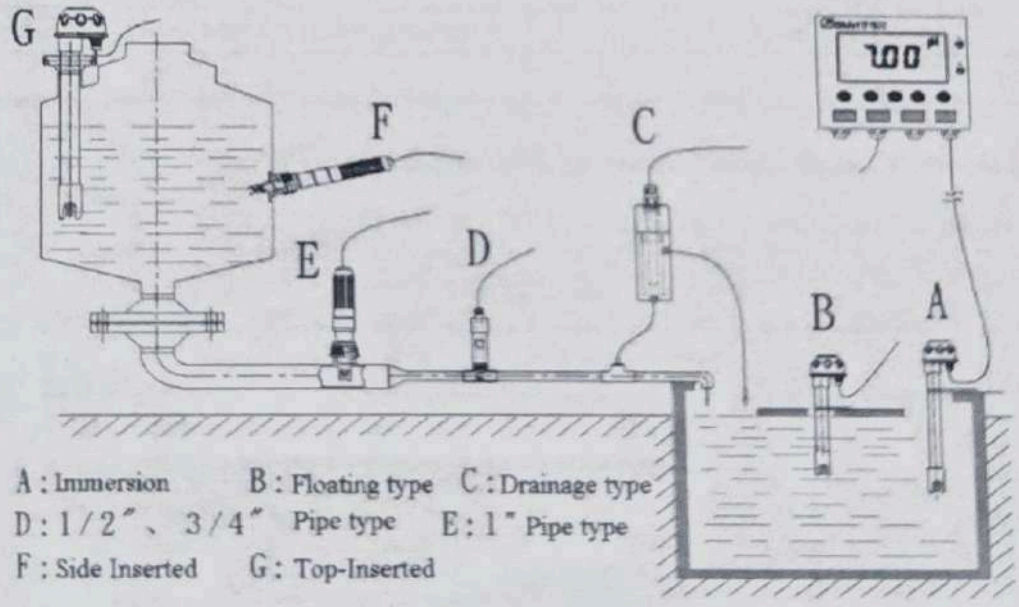

Figure 8.1.3 Typical Installation Method

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.

Electrode Activation

- The electrode needs to be activated in the deionized solution for more than 24 hours before use.
- The dry electrode needs to be activated before it can be used.

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

- Regularly clean and inspect the sensor to maintain performance.
- Do not expose the sensor to extreme temperatures, moisture, or corrosive substances unless explicitly specified.
- 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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