

RK500-25 COD Sensor User Manual



Revision Time	Reviser	Current Version	Remarks
20250828	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

1. Product Introduction

Most organic substances dissolved in water is absorbent to ultraviolet light. Therefore, the content of dissolved organic pollutants in water can be accurately measured by measuring the extent to which these organics absorb UV light at 254nm.

The RK500-25 COD sensor adopts two light sources, one is ultraviolet light for measuring COD content in water and the other is reference light for measuring turbidity in water. The optical path attenuation is compensated by a specific algorithm, which can eliminate the interference of particulate suspended matter impurities on the measurement results to a certain extent, thus making the measurement results more stable and reliable.

2. Product Features

- No reagent required, no pollution, more economical and environmental friendly
- Sapphire measurement window, not afraid of sand abrasion
- Using advanced third-order curve method to ensure measurement accuracy
- Equipped with cleaning brush, automatic cleaning, can prevent biological adhesion
- Low drift, fast response and more accurate measurement
- Excellent stability
- Maintenance free, long service life and low cost
- RS-485 interface, Modbus/RTU protocol

3. Specifications

Item		Technical Specification
Measurement Principle		Dual wavelength 254nm and 550nm absorption method
Standard		DIN 38402 C2 , DIN 38404 and HJ T191
Range	COD	0-500mg/L ,0-1000mg/L
	Turbidity	0-200NTU
Accuracy		± 5%F.S
Resolution		0.02mg/ L
Supply		DC12-24V
Power Consumption		When the cleaning brush is not working: <0.2W During cleaning brush operation: <1.5W
Cleaning Brush		Automatic
Response Time		<2s
Output Signal		4-20mA&RS485
Operating Environment		-5-+60℃ (<0.6MPa)
Cable Length		5m (default) , customizable
Probe Material		316L stainless steel
Ingress Protection		IP68
Storage		10-60℃ @20%-90%RH

4. Electrical Connections

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

5. Product Dimensions

Unit:mm

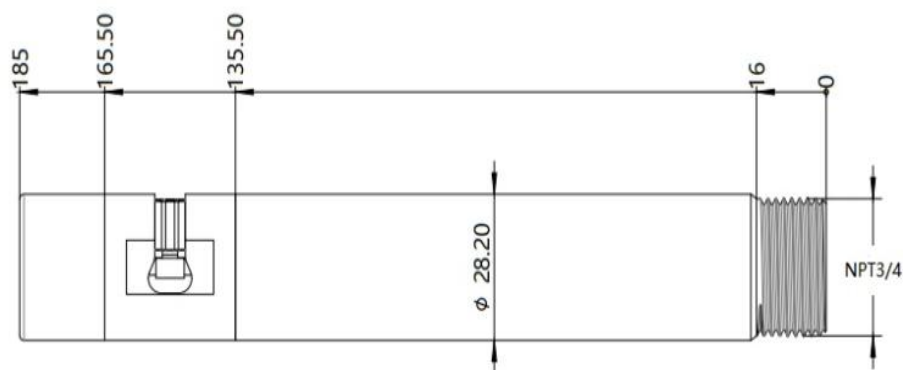


Figure 5.1
Dimension Specification

6. Output Types & Formulas

Current Type	$F = (I - 4) / 16 \times (\text{Max Range} - \text{Min Range}) + \text{Min Range}$
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F:Current measurement parameters;

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	0x0B (Factory Default)

7.1 Read Real-time Data

Client sends:

0B 03 00 00 00 06 C562

Return:

0B 03 0C 41 20 00 00 43 0A B0 9E 41 D8 8F 5C E3 8C

7.1.1 Description of Return Data Format

No.	Conception	Byte Number	Description	Remarks
1	Address block	1	Address(0x0B)	0x0B
2	Function code	1	Only read(0x03)	0x03
3	Number of bytes	1	0X0C	12bytes
4	Data block	4	COD Value	0x41200000(10.0mg/L)
5	Data block	4	SS Value	0x430AB09E(138.69NTU)
6	Data block	4	Temp Value	0x41D88F5C(27.07℃)
7	Check block	2		0xE3 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

- This type of installation is prone to fouling/deposit buildup during measurement and requires regular cleaning.
- Non-uniform measurement.
- Variations in insertion depth affect measurement values.
- The probe position must remain above sediment level.

8.1 Installation Method



Figure 8.1.1 Mounting Bracket(Length=1m)

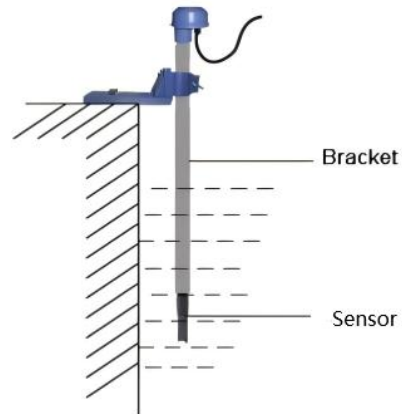


Figure 8.1.2 Probe Submersible Installation

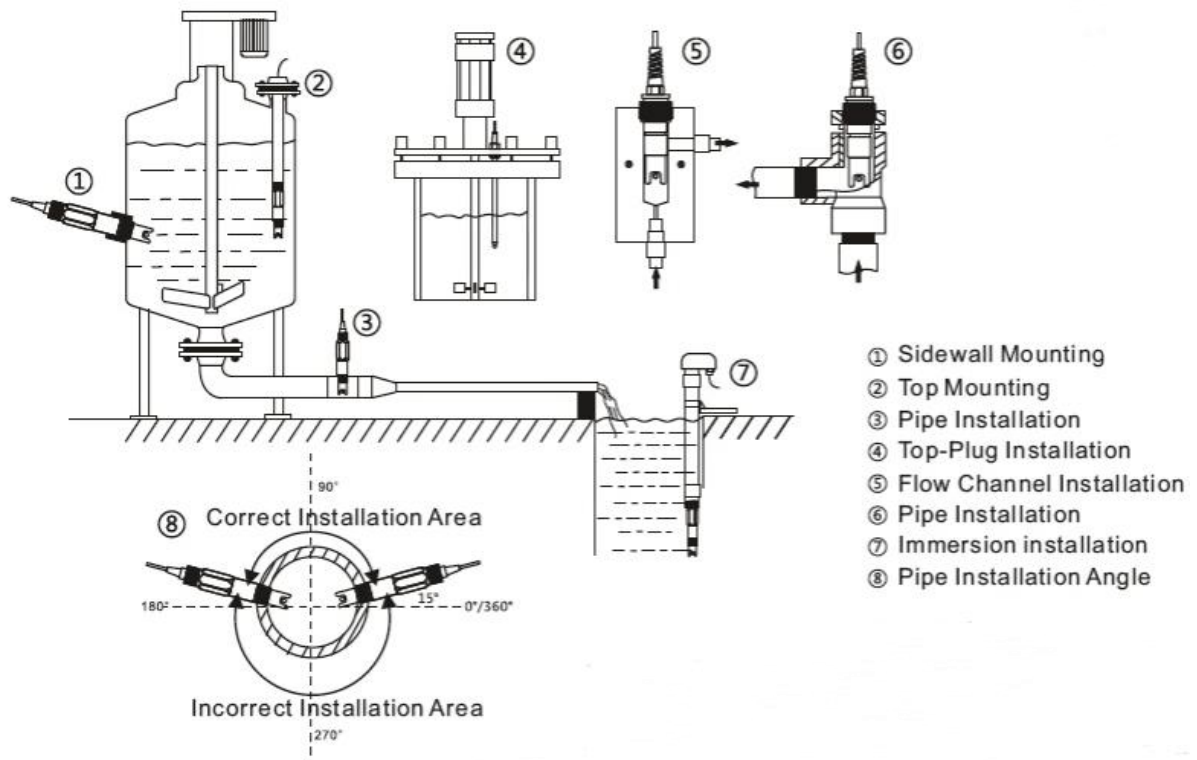


Figure 8.1.3 Typical Installation Method

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

- 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.

 Complies with applicable CE directives.

Manual subject to change without notice.

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