

RK500-07 Turbidity Sensor



Revision Time	Reviser	Current Version	Remarks
20250418	SUN	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.
- Check that the packaging is intact and verify the product model matches the selected specifications.

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
Turbidity sensor	1	
Cable	1	The length depends on the order
Bracket	1	Optional

1. Product Introduction

RK500-07 Turbidity sensor is an instrument which uses optical principle to measure the degree of turbidity of water. Turbidity is caused by suspended particles in water. The suspended particles reflect the incident light. Usually, the scattered light in the direction of 90° is used as the test signal, so the unit tested is called NTU. This method is suitable for testing low to medium range, ranging from 0.01 to 4000FNU. According to EN27027 and ISO7027 standards, infrared light of 860nm is used as light source, which cannot be disturbed by the chromaticity of samples.

2. Product Features

- On-line & real-time monitoring
- With temperature compensation
- High accuracy
- Easy operation and high reliability
- No external module, a whole design
- Multiple output signal is optional
- Measurement of scattered and attenuated radiation

3. Specifications

Item	Technical Specification			
Type	A	B	C	D
Self-cleaning	/	/	/	Yes
Main Material	316L	PEEK,Nylon	316L,UPVC	316L
Screw Thread	Upper: NPT3/4, Lower: NPT3/4		/	NPT3/4
Accuracy	±1%FS			±2%FS
Resolution	0.01NTU(≤10NTU) , 0.1NTU(>10NTU)			0.1NTU
Power Consumption	<0.2W			Cleaning brush start:<1.5W Cleaning brush stop:<0.2W
Operating Temperature	0-+60℃			-5-+60℃
Range	0-10NTU ,0-100NTU,0-1000NTU,0-4000NTU			
Supply	7-28VDC			
Output	4-20mA&RS485 at the same time			
Response Time	1S			
Pressure Resistance	<0.8MPa			
Ingress Protection	IP68			
Storage	10-60℃@20%-90%RH			
Cable Length	5m Default			
Type	Application			
A	General freshwater environment			
B	Mariculture, strongly corrosive sewage, complex scenes etc			
C	Pipe installation			
D	With cleaning brush, maintenance free			

4. Electrical Connection

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

5. Output Types & Formulas

Current Type	Value $= (I - 4) / (20 - 4) * \text{Max_Range}$
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Value: Turbidity value in NTU;

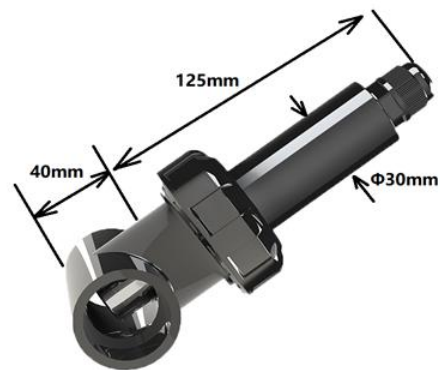
I: Transmitter output current in mA;

6. Product Dimensions

Unit:mm

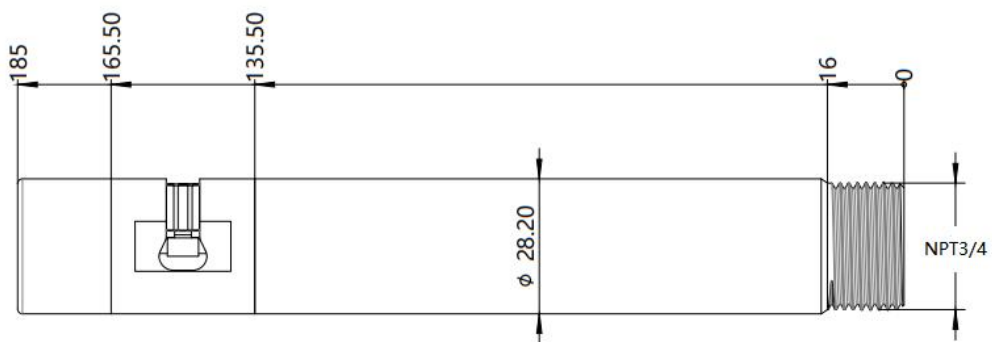


Type A/B



Use UPVC with an outer diameter of 32mm for docking

Type C



Type D With cleaning brush

7. Communication Protocol (MODBUS-RTU)

Parameter	Value
Data Bits	8 bits
Check Bit	None
Stop Bit	1 bit
Baud Rate	9600 bps
Slave Address	0x08 (Factory Default)

7.1 Read Real-time Data

Client sends:

08 03 00 00 00 02 C492

Return:

08 03 04 41 0F EA FD C9ED

7.1.1 Description of Return Data Format

No.	Conception	Byte Number	Description	Remarks
1	Address block	1	Address(0x08)	0x08
2	Function code	1	Only read(0x03)	0x03
3	Number of bytes	1	0X04	4bytes
4	Data block	4	Turbidity (Floating point 4 bytes)	0x410FEAFD(8.99NTU)
5	Check block	2		0xC9 0xED

7.2 Modify Slave Address

Client sends:(Change slave address from 08H to 01H.)

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x08	0x06	0x00	0x14	0x00	0x01	0x08	0x97

Response:

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x08	0x06	0x00	0x14	0x00	0x01	0x08	0x97

7.3 Test and Calibration Instructions

When testing and calibrating, use a dark-colored container and leave a 4-5 cm safety margin at the bottom to avoid reflection from the container affecting measurements. Before calibration, use a magnetic stirrer or similar tool to agitate the standard solution and prevent sedimentation, which could cause measurement errors.

7.4 Product Calibration

The product currently supports two calibration methods:

7.4.1 Calibration via our host computer software – please contact our sales team to obtain the software.

7.4.2 Calibration via RS485 protocol.

One-Click Calibration

After the sensor is installed and it is inconvenient to remove it, when there is a difference between the known turbidity value of the liquid in the current environment and the actual reading of the sensor, the one-click calibration method can be used. At this time, the calibration value of the sensor needs to be converted into a positive floating-point number in accordance with the IEEE 754 standard. Examples are as follows.

Client sends:(Use the one-click calibration function to set the current value to 100 NTU,the calibration value is a positive floating-point number.)

Slave id	Function code	Address_H	Address_L	Reg Num		Bytes	Calibration Value	CRC_L	CRC_H
0x08	0x10	0x00	0x50	0x00	0x02	04	42C80000	0x4D	0x89

Note:If the return command matches the sent command, it indicates that the calibration is successful.

8. Installation Guidelines

- Stay away from corners, drainage outlets, or backflow areas and choose a location where the water flow is stable and can represent the overall water quality.

8.1 Installation Method

Directly into the liquid, adopt submersible mounting bracket.



Figure 8.1.1 Mounting Bracket(Length=1m)

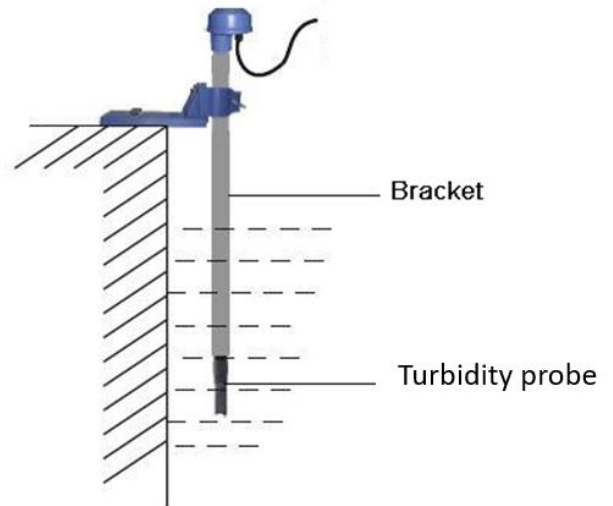


Figure 8.1.2 Probe Submersible Installation

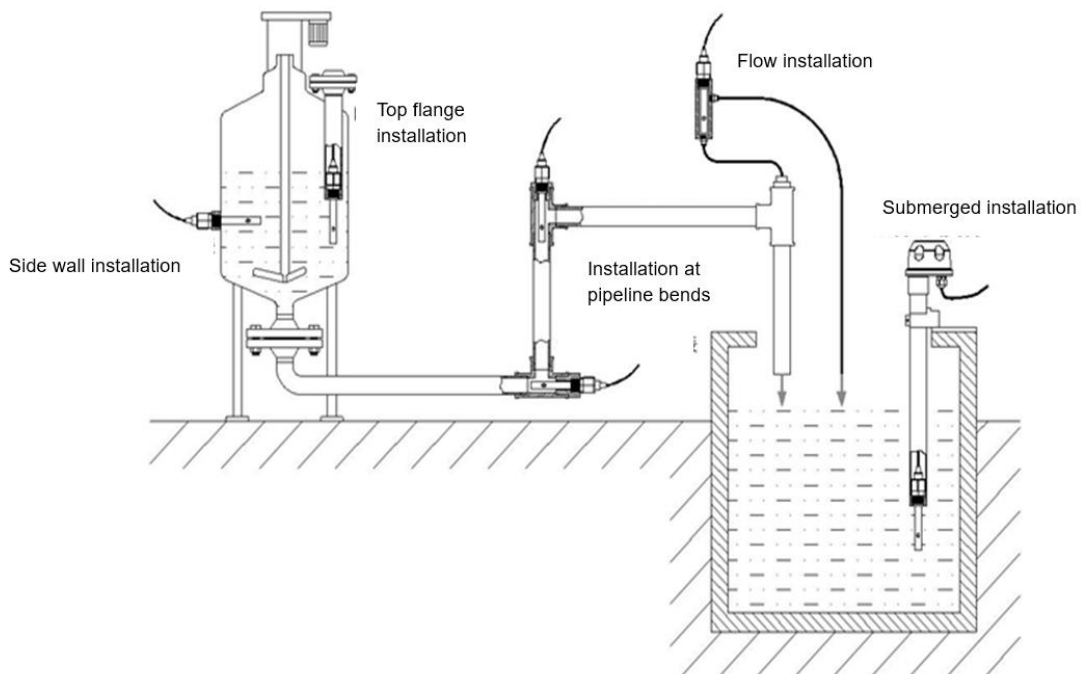


Figure 8.1.3 Typical Installation Method

9. Precautions

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
- Do not touch internal components to prevent product damage

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.
- Keep the sensor's illuminated mirror clean and wipe it clean if necessary.
- Avoid strong vibrations that may damage the transparent glass in front of the ring, and do not scratch it with hard objects.

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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