RK500-11 Liquid Temperature 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
Sensor	1	
Cable	1	The length depends on the order

1. Product Introduction

RK500-11 Liquid Temperature Sensor is used to measure the temperature of the liquid medium, applied to the automatic meteorological station, pond or reservoir water temperature detection and other fields. Sensor with precision thermal resistance as a sensing component, built-in signal sampling and amplification, zero drift and temperature compensation function, has the characteristics of high measuring precision and good stability.

2. Product Features

- Real-time temperature measurement
- Good corrosion resistance, suitable for all kind of soil
- High accuracy
- Good linearity
- All stainless steel probe

3. Specifications

Item	Technical Specification
Range	-40-+80℃ (Customizable)
Supply	12-24VDC
Accuracy	±0.5℃
Element	PT100 class A
Response Time	<1s
Output Signal	4-20 mA ,0-5V, RS485
Operating Temperature	-40-+80℃
Ingress Protection	IP68
Storage	10-60℃@20%-90%RH
Probe Weight(Unpacked)	145g
Housing Material	304SS(typ.) ,316L (seawater)

4. Electrical Connections

Cable	Current	Voltage	RS485
Red	V+	V+	V+
Green	Signal out	V-	V-
Yellow		Signal out	RS485A
Blue			RS485B

5. Output Types & Formulas

Current Type (℃):	4-20mA	T=(I - 4)/16 × (Max Range - Min Range) + Min Range
Voltage Type (℃):	0-5V	T=V/5× (Max Range - Min Range) + Min Range

T: Temperature Data in ℃;

V: Transmitter output voltage in V;

I: Transmitter output current in mA.

6. Product Dimensions

Unit:mm

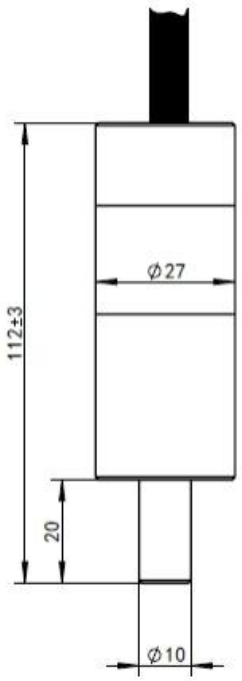

Figure 6.1
Dimension Specification

7. Communication Protocol(MODBUS-RTU)

Parameter	Value
Data Bits	8 bits
Check Bit	None
Stop Bit	1 bit
Baud Rate	9600 bps
Slave Address	0x01 (Factory Default)

7.1 Read Real-time Data

Client sends:

01 03 00 04 00 01 C5CB

Return:

01 03 02 00 B4 B833

7.1.1 Description of Return Data Format

No.	Conception	Byte Number	Description	Remarks
1	Address block	1	Address(0x01)	0x01
2	Function code	1	Only read(0x03)	0x03
3	Number of bytes	1	0X02	2bytes
4	Data block	2	Temperature	0x00B4(18℃)
5	Check block	2		0xB8 0x33

7.2 Modify Slave Address(Address setting range: 00H to FFH)

Step1:

Client sends:(Change slave address from 01H to 02H.)

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x01	0x06	0x00	0x00	0x00	0x02	0x08	0x0B

Response:

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x01	0x06	0x00	0x00	0x00	0x02	0x08	0x0B

Step 2:

Client sends:(Save the new address)

Slave id	Function code	Address_H	Address_L	Data		CRC_L	CRC_H
0x02	0x06	0x00	0x0F	0x00	0x00	0XB9	0xFA

Response:

Slave id	Function code	Address_H	Address_L	Data		CRC_L	CRC_H
0x02	0x06	0x00	0x0F	0x00	0x00	0XB9	0xFA

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. 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.

9. 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.

10. 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.

11. 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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