



Product introduction

Double tipping bucket rain sensor is suitable for meteorological stations (stations), hydrological stations, agriculture, forestry, national defense and other related departments, used for remote measurement of liquid precipitation, precipitation intensity, precipitation start and end time. This instrument is in strict accordance with SL61-2003 hydrological automatic reporting system specifications, GB11831-89 hydrological reporting device telemetry rain gauge, GB11832-89 tipping bucket rain gauge national standards require the organization of the production, assembly, verification. Can be used for flood control, water supply scheduling, power station reservoir water management for the purpose of hydrological automatic reporting system, automatic field station.

Technical Parameters

- Bearing water caliber: $\Phi 200 \pm 0.6\text{mm}$
- Measuring range: 0-4mm/min (precipitation intensity)
- Resolution: 0.1mm (3.14ml)
- Accuracy: $\pm 4\%$ (indoor static test, rain intensity of 2mm/min)
- Power supply:
 - DC 5V
 - DC 12V-24V

Output:

- Switch signal: reed switch on/off
- Voltage: 0~2.5V
- Voltage: 0~5V
- RS485
- Others

Instrument cable length: 5 meters

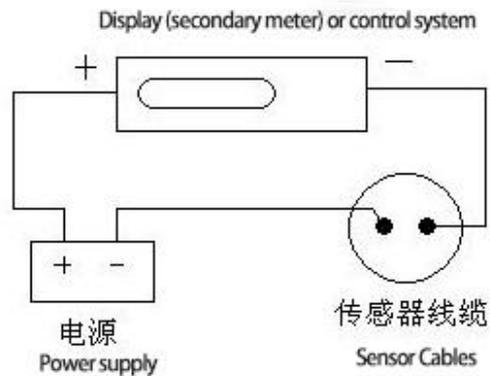
Operating Temperature: 0~60°C

Storage temperature: -40°C~80°C

Product weight: Bucket weight 2000 g, total weight 3500 g.

Connection method

- (1) If you are equipped with a weather station produced by our company, you can directly use the sensor cable to connect the sensor to the corresponding interface on the weather station.
- (2) If the sensor is purchased separately, since the sensor outputs a set of switching signals, the cable connector does not matter whether it is positive or negative. Connect the sensor to the circuit as shown in the diagram.

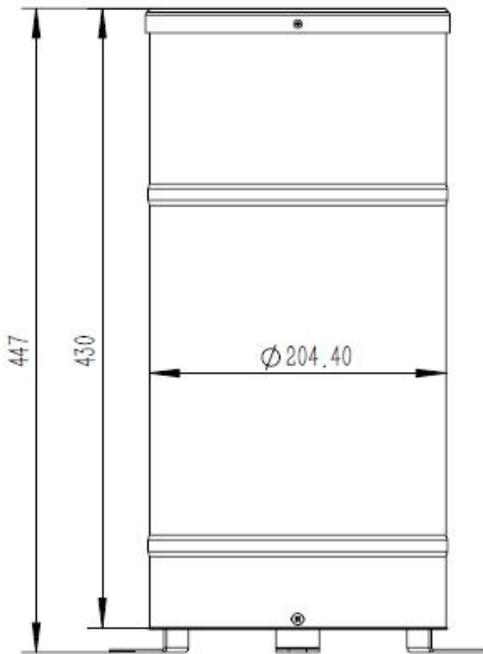
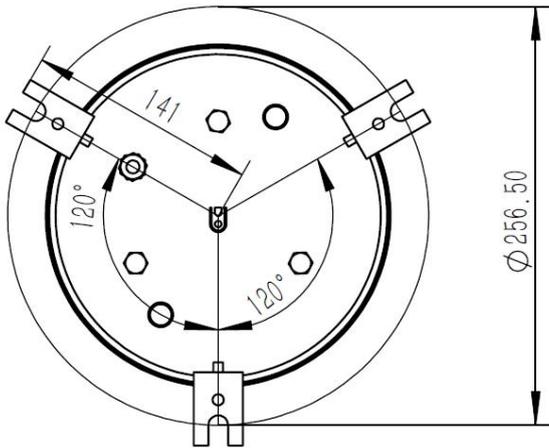


- (1) If the sensor outputs other signals, the wiring sequence and function of the conventional sensor wires are shown below:

Wire Color	Output signal			RS485 Type
	Pulse Type		Voltage Type	
Red	Power Positive		Power +	Power +
Black (Green)	Pulse Signal		Power -	Power -

Yellow			Voltage Signal	A
Blue				B

Dimensions



MODBUS Communication protocol

I. Serial Port Format
 Data bits 8 bits
 Stop bit 1 or 2 bits

Check digit None
 Baud rate 9600 two communication interval of at least 1000ms or more
 Communication Format

[1] Write device address
 Send: 00 10 Adress CRC (5 bytes)
 Return: 00 10 CRC (4 bytes)
 Note: 1. The address bit of the read/write address command must be 00. 2. Address is 1 byte, the range is 0-255.
 Example: Send 00 10 01 BD C0
 Return 00 10 00 7C
 [2] Read device address
 Send: 00 20 CRC (4 bytes)
 Return: 00 20 Adress CRC (5 bytes)
 Explanation: Address is 1 byte, the range is 0-255.
 Example: Send 00 20 00 68
 Return: 00 20 01 A9 C0
 [3] Reading real-time data
 Send: Adress 03 00 00 00 00 01 XX XX
 Explanation: As shown in the figure below:

Code	Function Definition	remark
Adress	Station number (address)	
03	Function Code	
00 00	Starting address	
00 01	Read Points	
XX XX	CRC check code, front low and back high	

Return: Address 03 02 XX XX XX XX XX

Description:

Code	Function Definition	remark
Adress	Station number (address)	
03	Function code	
02	Read unit byte	
XX XX	Data (front high, back low)	hexadecima I
XX XX	CRC check code	

Example: Send 01 03 00 00 00 01 84 0A

Return 01 03 02 00 1A 39 8F

Note: 00 1A converted to hexadecimal is 26, after parsing the data, with a decimal point need to divide by ten, the actual rainfall value is 2.6mm.

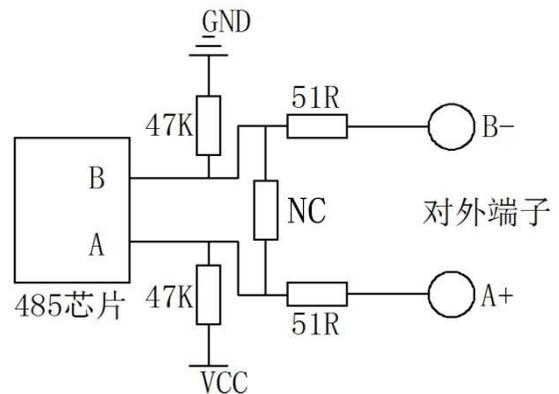
Steps to calculate the CRC code:

1. Preset the 16-bit register to hex FFFF (i.e., all ones). Call this register the CRC register;
2. Different or the first 8-bit data with the low bit of the 16-bit CRC register, and put the result in the CRC register;
3. Shift the contents of the register right one bit (towards the low bit), fill the highest bit with 0, and check the shifted out bit after the right shift;
4. If the shifted-out bit is 0: repeat step 3 (right-shift one bit again)

If the shifted out bit is 1: the CRC register is iso-or with the polynomial A001 (1010 0000 0000 0001);

5. Repeat steps 3 and 4 until it is shifted right 8 times so that the entire 8-bit data is all processed;
6. Repeat steps 2 through 5 for the next 8-bit data processing;
7. The final CRC register obtained is the CRC code;
8. When putting the CRC result into the information frame, the high and low bits will be exchanged, with the low bit coming first.

RS485 electric circuit



Installation Instructions

1. the sensor installation location can be selected according to the actual requirements of the ground, homemade large cylinder, iron post flange or the roof of the house;
2. adjust the three leveling screws on the chassis or the fixed screws of the triangular plate, so that the level bubble indication for the level (bubble stays in the center of the circle), and then slowly tighten the three M8 × 80 fixed with expansion screws; such as the level of the bubble to change, it is necessary to re-adjust;
3. As shown in the above figure, the sensor assembly is fixed;
4. fixed, open the rain barrel, and cut off the funnel on the nylon tie, the water slowly injected into the rain sensor, and observe the tipping bucket flipping process, check the collection of data received on the instrument. Finally, inject quantitative water (60-70mm), if the data displayed on the collection instrument and the amount of water injected in line with the instrument is normal, otherwise it must be overhauled and adjusted;
5. Please avoid disassembling the sensor during installation.

Precautions

- 1、 please check whether the package is intact, and check whether the product model is consistent with the selection;
- 2、 Do not wire with electricity, check the wiring is complete before energizing;
- 3、 the sensor line length will affect the product output signal, do not change the use of the product has been welded at the factory components or wires, if there is a need to change, please contact the manufacturer;
- 4、 the sensor should be regularly checked to remove dust, mud, sand, leaves, insects, so as not to block the upper tube (funnel) water flow channels, cylindrical filter outline can be unloaded and rinsed with water;
- 5、 the inner wall of the hopper has dirt, can be rinsed with water or alcohol or detergent solution, it is strictly prohibited to use fingers or other objects to wipe, so as not to stain the oil or bruise the inner wall of the hopper;
- 6、 During the winter icing period, the instrument should be out of use and can be taken back indoors;
- 7、 Please keep the calibration certificate and certificate of conformity, and return with the product when repairing.

Trouble clearing

- 1、 Display meter does not show value:
- 2、 may be due to wiring problems caused by the acquisition of the instrument, can not get the information correctly. Please check whether the wiring is correct and firm;

- 3、 Check whether the internal tipper tie has been cut.
- 4、 Display meter indicated value obviously does not match the actual situation:
- 5、 Please empty the water in the water-bearing bucket and re-fill the bucket with quantitative water (60-70mm), and clean the inner wall of the tipping bucket;
- 6、 If it is not the above reasons, please contact the manufacturer.

Selection table

No.	Power supply	output signal	Description
NBL-W-DRS			Rain sensor (transmitter)
	12V-24V		Switching Signal Output
		M	0-2.5V
		V	0-5V
		V	RS485
		W2	Others
		X	Description
Example: NBL-W-DRS-5V-M: Rain sensor. 5V power supply, switch signal output			

Contact us

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