



Product introduction

Evaporation sensor is an instrument used to observe the changing law of water surface evaporation at different times. It can be used directly with the evaporation bucket to monitor the water surface evaporation. This sensor is a new generation of high-precision sensor, with a large measurement range, high accuracy, high resolution, reverse polarity protection and current limiting protection, safety and explosion-proof features. The sensor has a variety of signal output forms (current type, voltage type, etc.) for customers to choose arbitrarily. It is suitable for meteorology, agriculture and other fields.

Technical parameter

Range: 0 ~ 1000mm

Accuracy: $\pm 0.5\%$ (0~+50 °C)

Resolution : 0.1mm

Power supply method :

- DC 12V
- DC 24V
- Other _____

Output form:

- Current: 4~20mA
- Voltage: 0~5V
- RS485
- Other _____

Instrument cable length:

- Standard: 5 meters
- other _____

Load resistance: voltage type: $RL \geq 1K$

Current type: $RL \leq 600\Omega$

Working temperature: $-20^{\circ}C \sim 85^{\circ}C$

Relative humidity: 100%

Product weight: Evaporating barrel: 1.84Kg Sensor: 330g

Product power consumption: 177.6mW

Calculation formula

Voltage type:

$$E=V/2.5$$

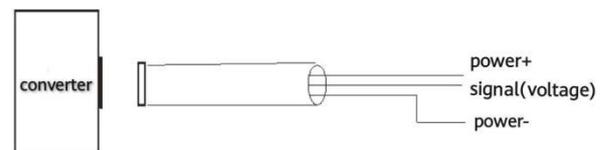
Among them:

E—Evaporation

V—Evaporation channel input voltage, range 0-2500mV

3. Interface description

1. Voltage output wiring

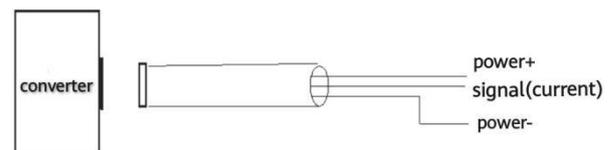


Red wire: Power+

Yellow wire: signal (voltage signal)

Green wire: Power-

2. Current mode output wiring



Red wire: Power+

Yellow wire: signal (current signal)

Green wire: Power-

Wiring method

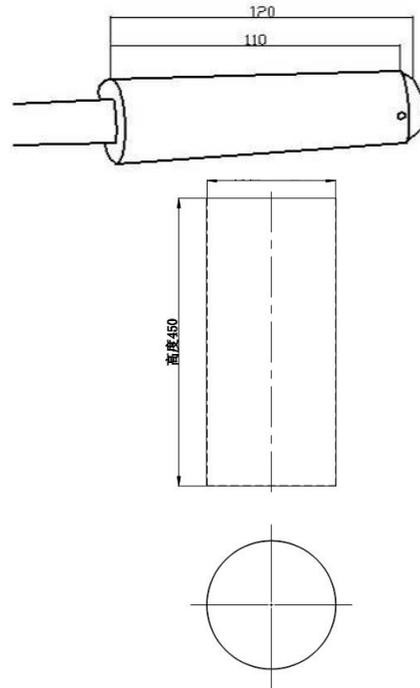
(1) If equipped with the collector produced by our company, directly connect the sensor to the corresponding interface on the collector using the sensor cable.

(2) If the transmitter is purchased separately, the matching line sequence of the transmitter is divided into:

line color	output signal		
	Voltage type	current type	communication type
Red	Power is positive	Power is positive	Power is positive
Black (green) color	power ground	power ground	power ground
Yellow	voltage signal	current signal	A+/TX
Blue			B-/RX

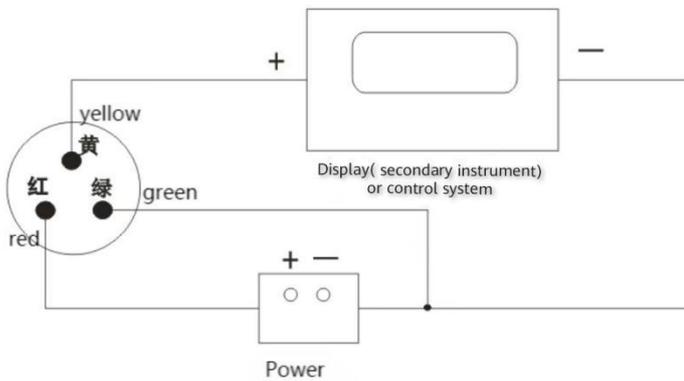
Structure size

Outline Drawing of Evaporation Barrel

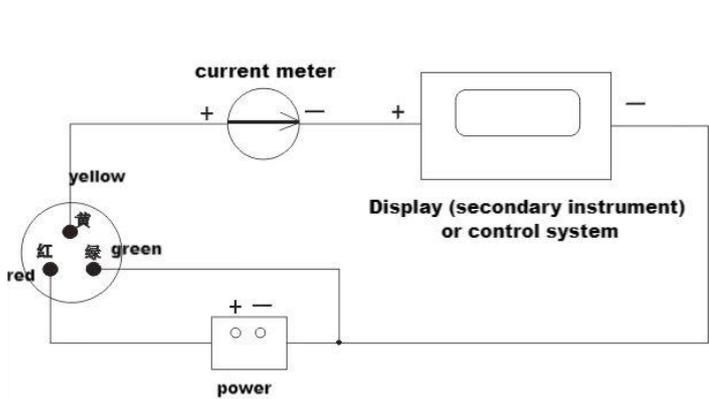


Evaporation Sensor Outline Drawing

(3) There are two output wiring methods for transmitter voltage and current:

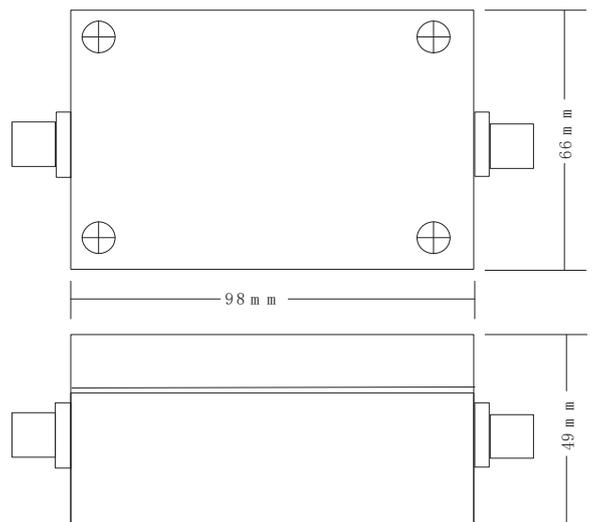


(voltage output mode wiring)



(Current output mode wiring)

Transmitter size



MODBUS-RTU communication protocol

一、Serial format

data bits 8 bits
 stop bit 1 or 2 digits
 Check Digit none
 baud rate 9600 The interval between two communications should be at least 1000ms or more

2. Communication format

【 1 】 Write the device address
 Send: 00 10 Adress CRC (5 bytes)
 Returns: 00 10 CRC (4 bytes)
 Instructions:

1. The address bit of the read/write address command must be 00.
 2. Adress is 1 byte, the range is 0-255.
- For example:
 Send:00 10 01 BD C0
 Return: 00 10 00 7C

【 2 】 Read device address
 Send: 00 20 CRC (4 bytes)
 Returns: 00 20 Adress CRC (5 bytes)
 Description: Adress is 1 byte, the range is 0-255
 For example:
 Send:00 20 00 68
 Return:00 20 01 A9 C0

【 3 】 Read real-time data
 Send: Adress 03 00 00 00 01 XX XX
 Description: As shown in the figure below:

code	function definition	Remark
Adress	Station number (address)	
03	function code	
00 00	initial address	
00 01	read points	
XX XX	CRC check code, low front and high back	

Return: Adress 03 02 XX XX XX XX

illustrate:

code	function definition	Remark
Adress	Station number (address)	
03	function code	
02	read unit byte	
XX XX	Data (front high and back low)	hex
XX XX	CRC check code	

Steps to calculate CRC code:

1. The preset 16-bit register is hexadecimal FFFF (that is, all 1s). Call this register the CRC register;
2. XOR the first 8-bit data with the lower bits of the 16-bit CRC register, and place the result in the CRC register;
3. Shift the contents of the register one bit to the right (toward the lower bit), fill the highest bit with 0, and check the lowest bit;
4. If the lowest bit is 0: repeat step 3 (shift again)
 If the lowest bit is 1: XOR the CRC register with the polynomial A001 (1010 0000 0000 0001);
5. Repeat steps 3 and 4 until the right shift is performed 8 times, so that the entire 8-bit data is processed;
6. Repeat steps 2 to 5 to process the next 8-bit data;
7. The final CRC register is the CRC code;
8. When the CRC result is put into the information frame, the high and low bits are exchanged, and the low bits are first.

Instructions for use

The evaporation sensor and the stainless steel cylinder frame are placed in the evaporating dish, the evaporating bucket is pre-buried in the soil, and the opening of the evaporating bucket is about 10cm-20cm from the ground, and the chassis plane is adjusted to a horizontal state. Fill the evaporating dish with water so that the water surface reaches the high water level mark of the sensor. When the water

in the evaporation bucket is lower than the low water level mark, water should be injected into the evaporation bucket in time.

Precautions

1. Please check whether the packaging is in good condition, and check whether the product model is consistent with the selection;
2. Do not connect with live power. After the wiring is completed and checked, the power can be turned on;
3. The length of the sensor line will affect the output signal of the product. Do not arbitrarily change the components or wires that have been soldered when the product leaves the factory. If you need to change it, please contact the manufacturer;
4. The sensor is a precision device, please do not disassemble it by yourself, or touch the surface of the sensor with sharp objects or corrosive liquid, so as not to damage the product;
5. Please keep the verification certificate and qualification certificate, and return it together with the product during maintenance.

Instrument maintenance

1. Requirements for water use in the evaporator: water that represents the local natural water body (river, river, lake) should be used as much as possible. In areas where it is difficult to obtain natural water, drinking water (well water, tap water) can also be used; the water in the device should be kept Clean, no floating objects on the water surface, no small insects and suspended dirt in the water, no moss, no significant change in water color; generally change the water once a month. When changing the water in the evaporator, the evaporation barrel should be cleaned, and the temperature of the replaced water

should be close to the temperature of the original water;

2. In areas with a long freezing period in winter, the observation was stopped, and a small evaporator was used to observe the evaporation of the ice surface throughout the freezing period. Drain the water in the large evaporator to avoid freezing;
3. Every year before and after the flood season (for long-term stable freezing areas, before starting to use and after stopping use), the leakage of the evaporator should be checked once a year; if any problems are found, they should be dealt with;
4. Regularly check the installation of the evaporator, if it is found that the height is inaccurate, not level, etc., it should be corrected in time;
5. The water surface in the water ring should be close to the water surface in the evaporation bucket.

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