OHTS1098 Evaporation Transmitter

1 Product Overview

The OHTS1098 Evaporation Transmitter is a water surface evaporation monitoring instrument based on pressure measurement principles. The device employs a gravimetric (weighing) method to measure liquid mass changes within an evaporation pan, calculating evaporation data through liquid level height variations. Featuring a dual-layer 304 stainless steel structure, the device effectively isolates external thermal radiation and interference. Combined with digital sensor technology, it exhibits zero temperature drift and zero time drift characteristics. The output interface utilizes standard RS-485 signals with Modbus-RTU protocol, suitable for long-term continuous monitoring applications.

2 Applications

- Evaporation monitoring at meteorological observation stations
- Water evaporation research in plant cultivation environments
- Evaporation measurement in seed culture laboratories
- Agroforestry microclimate environment monitoring
- Hydrological evaporation observation for geological surveys
- Water surface evaporation measurement for scientific research experiments
- Automatic evaporation station data acquisition
- Water surface evaporation parameter monitoring at environmental monitoring stations
- Combined rainfall-evaporation monitoring stations (requires integration with rain gauge sensors)
- Evaporation node deployment in hydrological monitoring networks

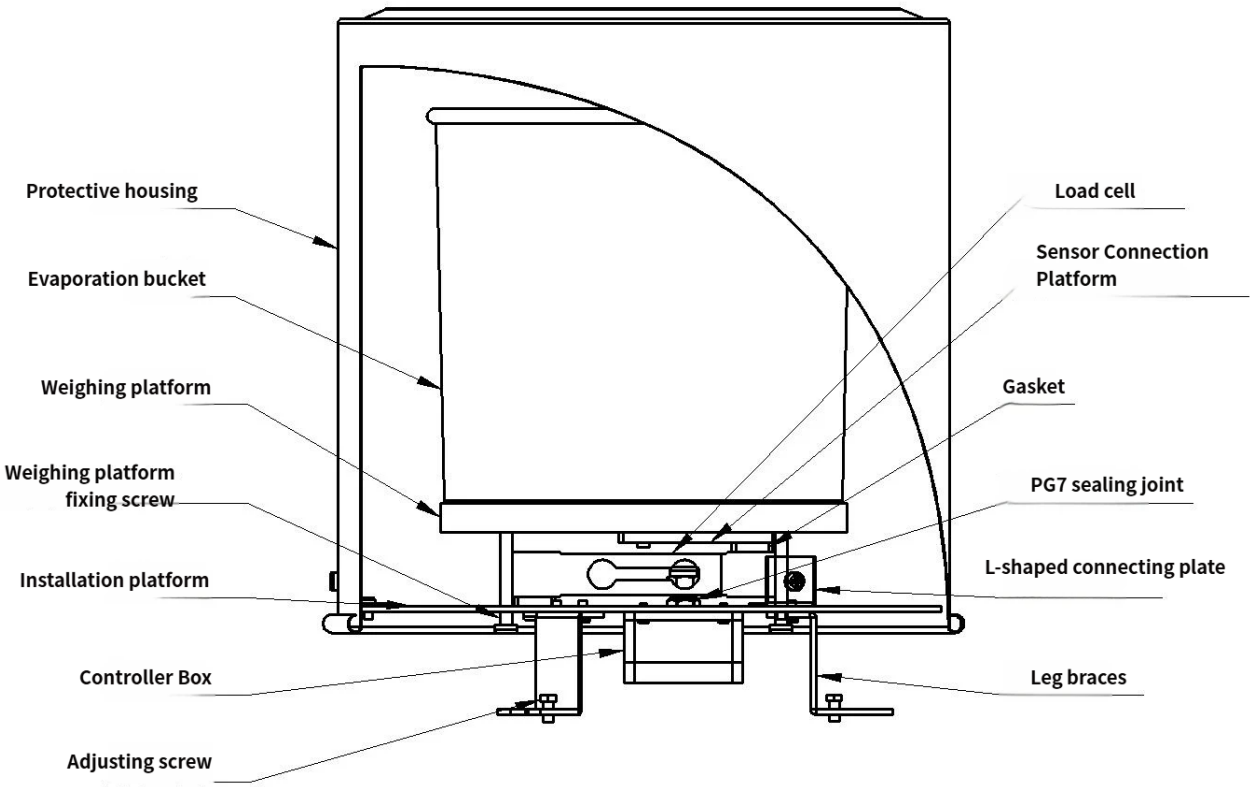
3 Features

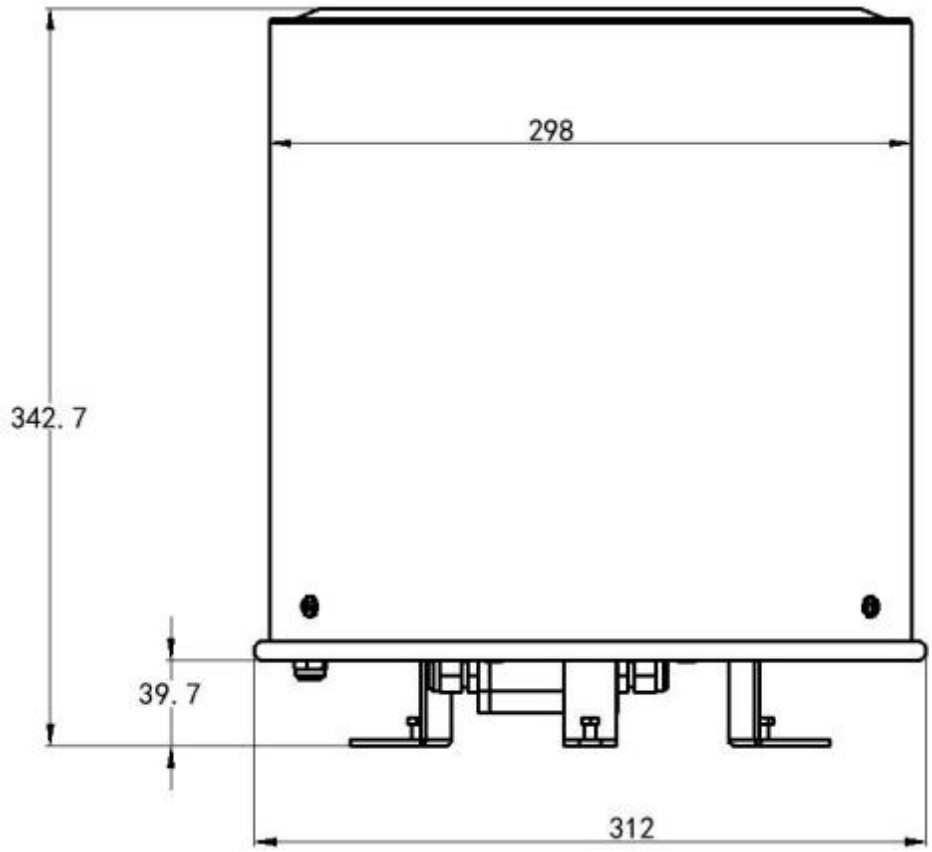
- Entire unit constructed from 304 stainless steel with corrosion-resistant properties, suitable for long-term outdoor deployment
- Dual-layer protective structure effectively isolates solar radiation heat and external interference, enhancing measurement stability
- Based on pressure-based gravimetric measurement principles, unaffected by liquid freezing; resolves failure issues of ultrasonic sensors under low-temperature and water-free conditions
- Bottom cable exit design reduces exposed wiring and lowers risk of line faults
- Wide DC voltage supply range of 10-30VDC, adapting to different power supply environments
- Digital sensor architecture eliminates temperature drift and time drift, ensuring long-term stability
- Electromagnetic interference immunity with data retention capability after power failure
- Maintains measurement accuracy under windy/wave and rainfall weather conditions

4 Technical Specifications

Parameter	Specification	Remarks
Supply Voltage	10-30VDC	-
Power Consumption	0.17W	-
Measurement Range	0~200mm	Evaporation liquid level height
Measurement Accuracy	±1%FS	Percentage of full scale
Response Time	<1s	-
Output Type	RS-485	Standard Modbus-RTU protocol
Protection Rating	IP66	-
Operating Temperature	-40~85℃	-
Operating Humidity	0~100%RH	-
Storage Temperature	-40~125℃	-
Storage Humidity	<80%RH	No condensation
Inner Cylinder Diameter	18.4cm	-
Inner Cylinder Height	20cm	-

5 Physical Specifications



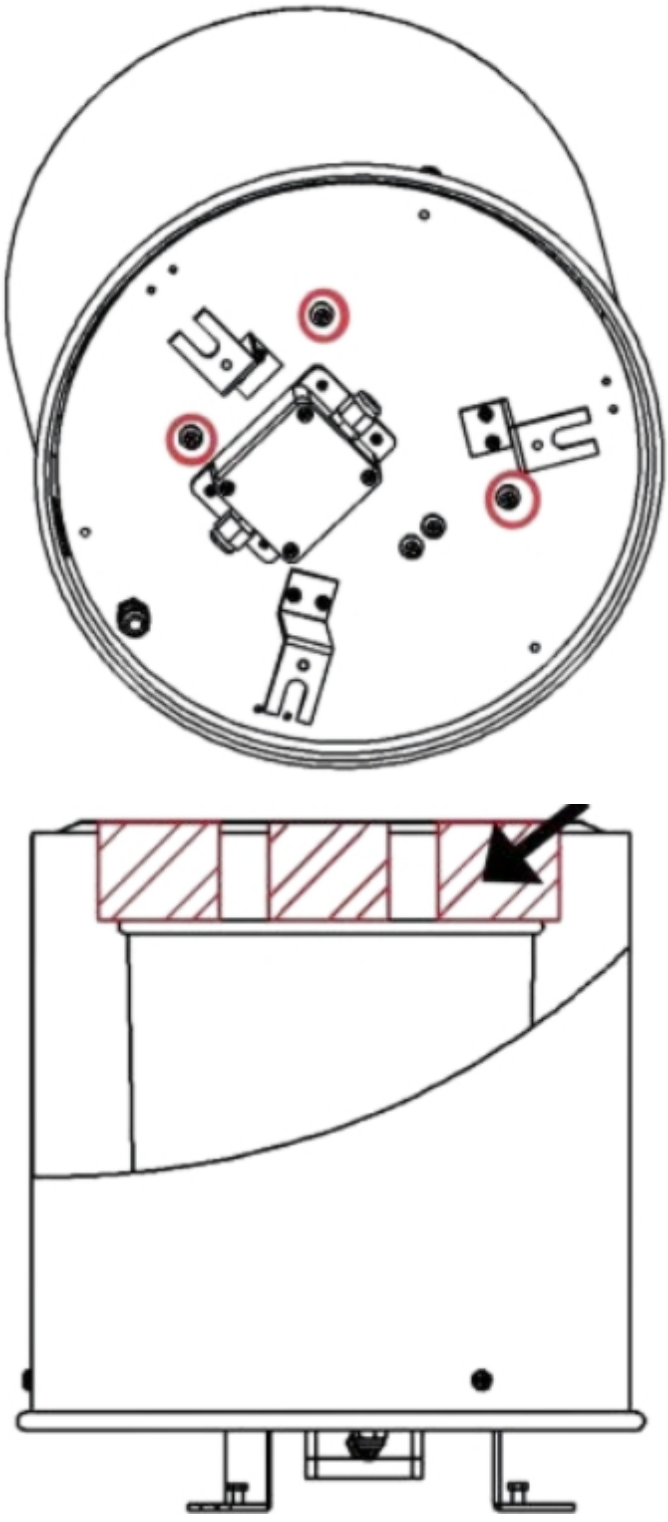


Parameter	Specification
Inner Cylinder Diameter	18.4cm
Inner Cylinder Height	20cm
Material	304 Stainless Steel
Structure Type	Dual-layer stainless steel protection

6 Installation

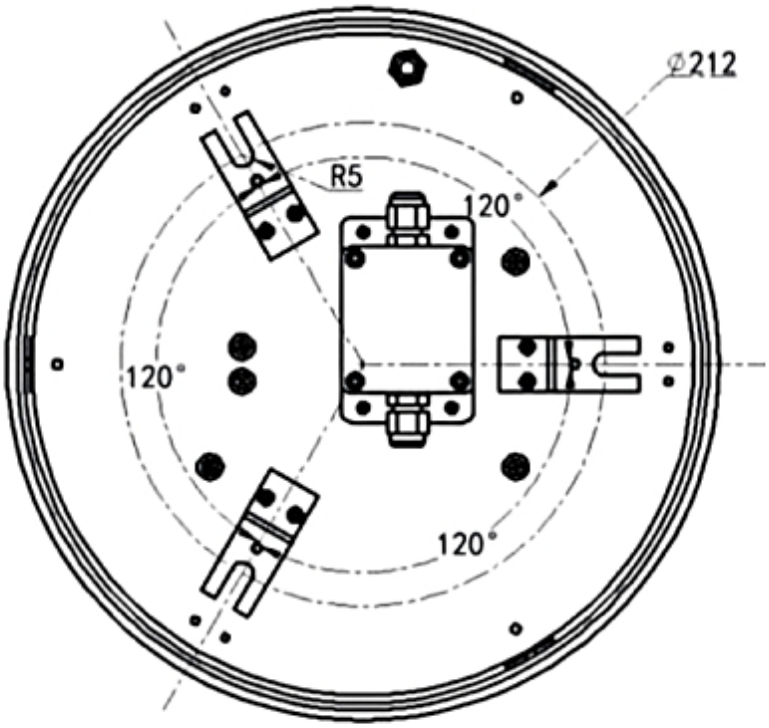
6.1 Pre-Installation Preparation

1. **Loosen Support Screws**: Counterclockwise loosen the 3 support screws at the bottom, keeping the screw heads at least 3cm above the installation platform, or remove the screws entirely.
2. **Remove Support Materials**: Remove the three top support foam pads (pearl cotton) from the top of the device. If the inner cylinder deviates from the center position, manually adjust it to the center.

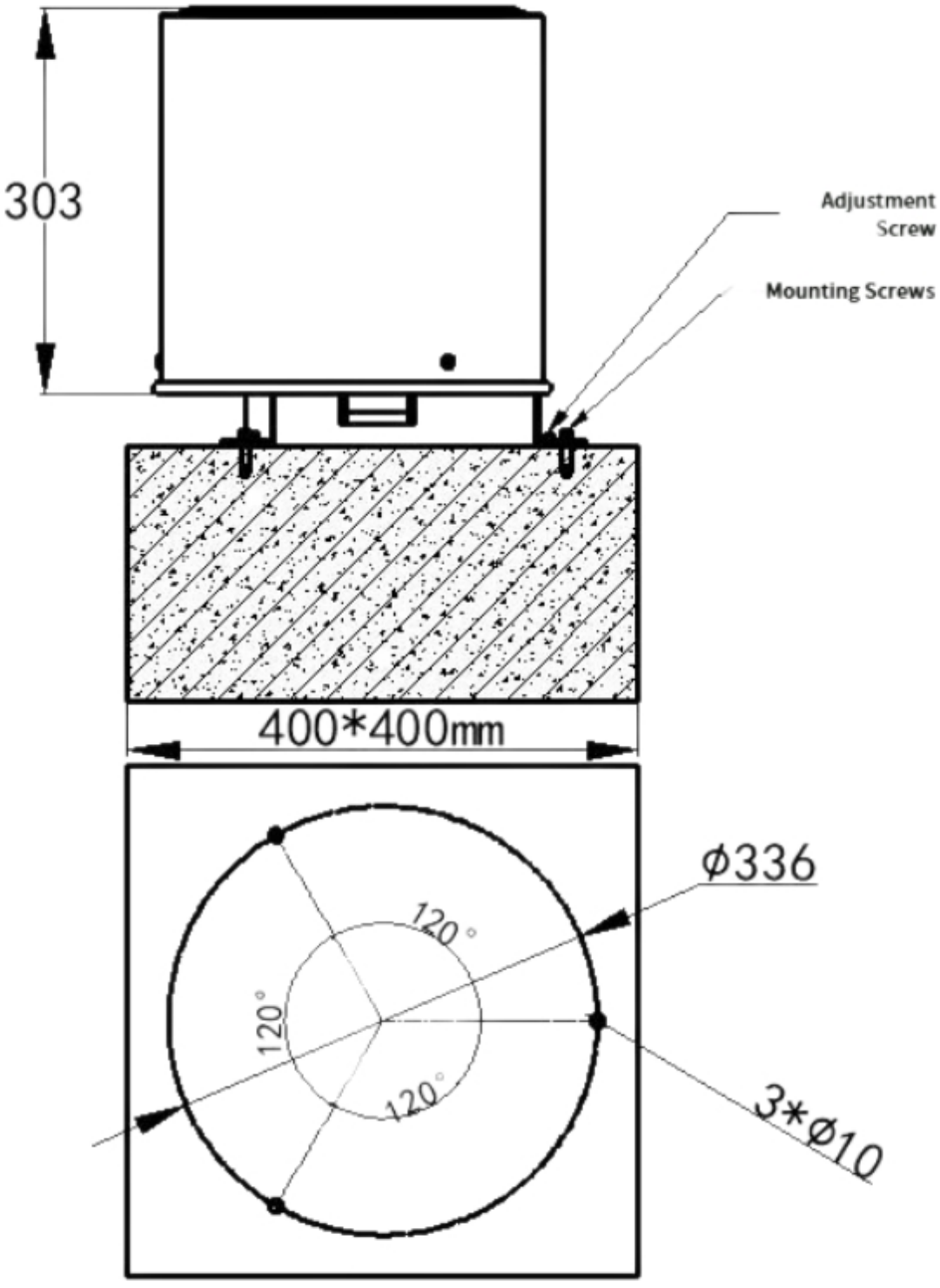


6.2 Installation Method 1: Meteorological Station Pole Mounting

Install the device on the tray of the meteorological station pole.

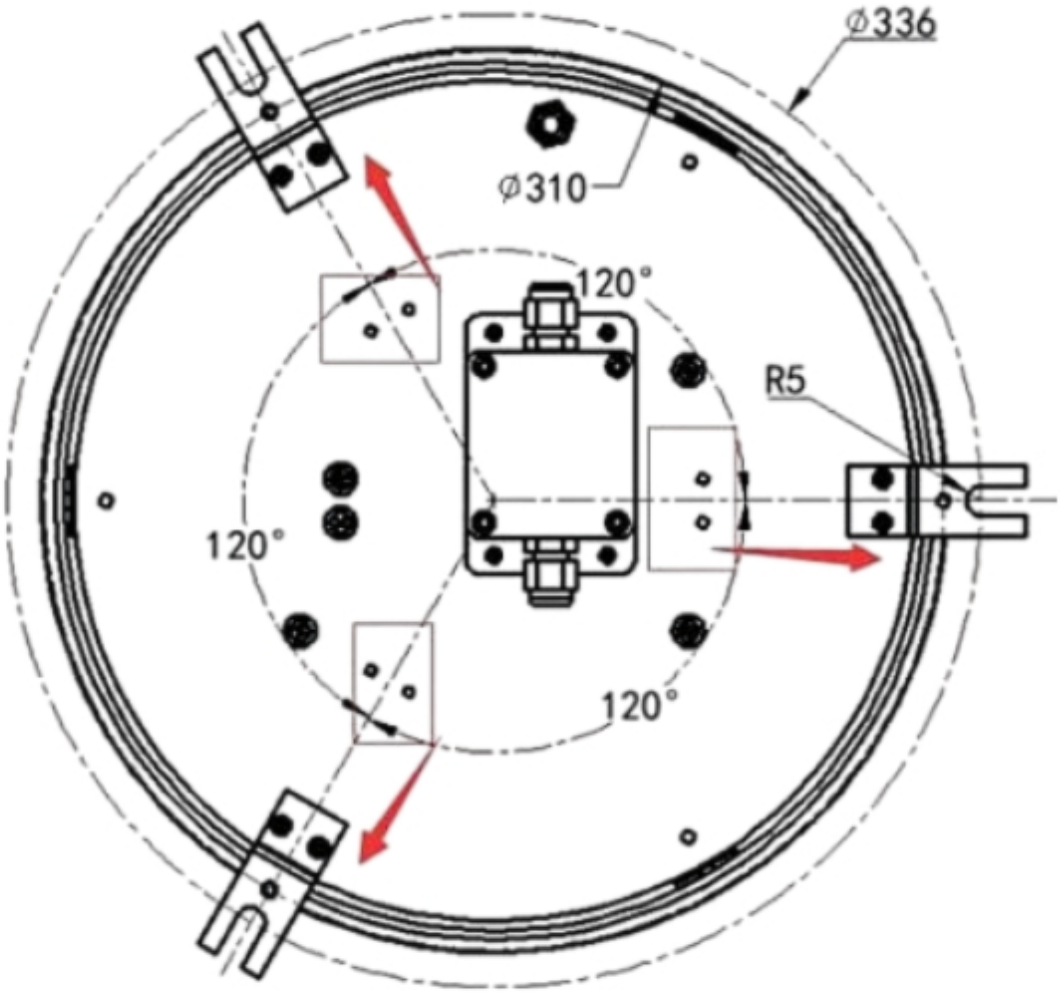


6.3 Installation Method 2: Concrete Base Installation



Suitable for installation on concrete bases elevated above ground level, preventing rainwater from submerging the base and backflowing into the device interior.

Installation Steps:



1. Install the three leg brackets to the outer mounting holes of the base
2. Drill 3 installation holes of Φ10 in the concrete foundation according to the dimensions shown in the diagram
3. Place expansion bolts into the installation holes
4. Secure with lock nuts

7 Wiring Definition

The device utilizes waterproof plug-in cable connections with the following pin definitions:

Wire Color	Definition	Description
Brown	VCC	Positive power supply (DC 10-30V)
Black	GND	Negative power supply
Yellow (Green)	RS-485 A	485 Signal A
Blue	RS-485 B	485 Signal B

8 Communication Protocol and Data Conversion

8.1 Communication Basic Parameters

Parameter	Setting
Encoding	8-bit binary
Data Bits	8 bits
Parity Bit	None
Stop Bit	1 bit
Error Check	CRC (Cyclic Redundancy Check)
Baud Rate	2400/4800/9600 bit/s configurable, default 4800 bit/s from factory

8.2 Data Frame Format

Utilizes Modbus-RTU communication protocol with the following data frame structure:

Initial Structure: $\geqslant 4$ byte time interval

Address Code: 1 byte (factory default 0x01)

Function Code: 1 byte

Data Area: N bytes (16-bit data, high byte first)

Error Check: 16-bit CRC code

End Structure: $\geqslant 4$ byte time interval

8.3 Register Address Definitions

Register Address	Content	Function Code	Description
0000H	Weight	0x03/0x04	Current weight value, unit: g
0001H	Water Level Height	0x03/0x04	Actual water level value, unit: mm
0050H	Tare Zeroing	0x03/0x04/0x06/0x10	Write value 1 to zero current weight
07D0H	Device Address	0x03/0x04/0x06/0x10	Range 1-254, factory default 0x01
07D1H	Baud Rate	0x03/0x04/0x06/0x10	0:2400, 1:4800, 2:9600

8.4 Data Conversion Formulas

Weight Data Conversion:

$$Weight_{actual}(g) = Value_{register}$$

Where $Value_{register}$ is the 16-bit signed integer returned from reading register 0000H (high byte first).

Example: Register returns 0266H (hexadecimal), converted to decimal is 614, meaning the actual weight is 614g.

Water Level Height Data Conversion:

$$Height_{actual}(mm) = Value_{register}$$

Where $Value_{register}$ is the 16-bit signed integer returned from reading register 0001H (high byte first), directly corresponding to the actual water level height in millimeters.

9 Precautions

1. **Safety Risk Warning**: This device is strictly prohibited from use as a safety device or emergency stop device, nor shall it be used for other purposes where equipment failure may cause personal injury. Failure to follow operating instructions may result in serious injury.
2. **Pre-Installation Inspection**: Before use, the device function must be inspected to ensure normal operation and parameter compliance, guaranteeing no impact on field use.
3. **Preprocessing Operations**: Before installation, the bottom support screws must be loosened and the top support foam pads must be removed, ensuring the inner cylinder is in a freely suspended state.
4. **Professional Maintenance**: Unauthorized technical personnel are prohibited from disassembling, repairing, altering, or modifying internal device components.
5. **Environmental Limitations**: Avoid using the product beyond the operating temperature, humidity, and electrical parameters listed in the product parameter table.
6. **Waterproof Protection**: Although the device possesses an IP66 protection rating, prolonged immersion or direct high-pressure water jet exposure to connector areas must still be avoided.

10 After-Sales Guarantee & Support

Warranty Period: 12 months from the date of purchase (subject to valid purchase documentation).

Warranty Coverage: Under normal use and maintenance conditions, failures caused by inherent mechanical defects, material issues, or workmanship problems are covered by free repair and parts replacement services.

Lifetime Service: Beyond the warranty period, lifetime paid repair services are provided.

Non-Warranty Coverage:

- Device damage caused by incorrect installation, use, or operation
- Disassembly, repair, alteration, or modification by non-authorized technical personnel
- Damage caused by negligent use or water/other substance infiltration into the device interior
- Failures or damage caused by accidents or natural disasters
- Failures resulting from use beyond the product technical parameter specifications

11 Manufacturer Information

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12 Revision History

Version	Date	Description
V1.0	-	Initial release