Kind Reminder:

Please read the user manual carefully before installation and debugging!

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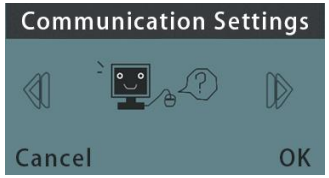
LEFOO

Ultrasonic Open Channel Flow Meter

User Manual

Ⅲ、Communication Settings



In the Communication Settings Menu:RS485 and Current Output Settings

RS485 Channel 1，Communication Address: Default 001，Communication Rate: Default 9600，Parity: Default No Parity

Current Output: Current Output 1

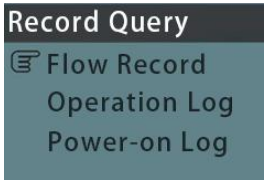
Current Mode: (4-20) mA and (0-20) mA; (4-20) mA is the default and commonly used mode at the factory.

Current Settings:0/4 mA is generally set to 0 m³/h.

20 mA is set to the maximum hourly flow rate in the current channel. For example, if the maximum instantaneous flow in the field channel is 20 m³/h, set 20 mA to 20 m³/h.

The meter supports both modes, and users can choose the one that best fits their actual application.

Ⅳ、Record Query



Flow Record refers to the data that the instrument stores and allows users to query based on time intervals such as hours, days, months, and years.

Ⅴ、System Settings

Time Calibration, Screen Settings, Language Selection, Restart Instrument, Restore Factory Settings, and Login Password Modification

Ⅵ、Advanced Features

Administrator Mode (Default factory password: 4832)

1）、Flow-related Functions:Flow Correction Factor.Cumulative Flow Modification.Cumulative Flow Reset.Clear Historical Records

2）、Ultrasonic-related Functions:Engineer-only menu. Please do not modify without proper authorization!

3）、Administrator Password Modification:

To prevent unauthorized operations, authorized personnel can modify the default factory password.

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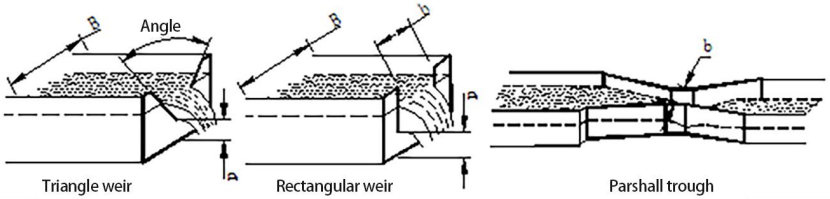
1、Purpose

Used in conjunction with weirs and flumes to measure the flow of water in open channels. It is primarily used for measuring the flow at wastewater outlets in sewage treatment plants, industrial wastewater discharge points, and urban sewer systems.

2、Working Principle

The open channel flow meter directly measures the water level. When used for open channel flow measurement, a weir or flume is installed in the channel. The weir or flume converts the flow rate in the channel into a corresponding water level. The instrument measures the water level in the weir or flume and then calculates the instantaneous flow rate by using the relationship between the water level and flow rate for the specific weir or flume.

Commonly Used Weirs and Flumes:Right-Angle Triangular Weir.Rectangular Weir.V-Notch Weir (Bashforth Flume)



Open Channel Flow Meter Calibration Standard:

Open Channel Weir Flow Meters JG711-1990，Technical Requirements and Testing Methods for Ultrasonic Open Channel Sewage Flow Meters HJ/T15-2019

For the V-Notch Weir (Bashforth Flume), the relationship between water level and flow rate can be determined using the appropriate formula once the throat width (b) is known.

Both the Right-Angle Triangular Weir and Rectangular Weir also have corresponding formulas, but the water level-flow relationship also depends on the channel dimensions.

For the triangular weir, the relationship is influenced by the channel width (B), opening angle, and the height of the upstream weir crest (p).

For the rectangular weir, the relationship depends on the channel width (B), the opening width (b), and the height of the upstream weir crest (p).

Instrument Display: The instrument displays the water level height, instantaneous flow rate, and cumulative flow.

3、Technical Specifications

1)Flow Range: 0.1 L/s to 10 m³/s

2)Cumulative: 12-digit decimal, automatically resets after full accumulation

3)Flow Accuracy: ±(1–3)% (depends on the specifications of the paired weir or flume)

4)Maximum Ultrasonic Measurement Range: 3 meters

5)Probe Blind Zone: ≤0.4 meters

6)Measurement Error: ±0.3% (within 3-meter range)

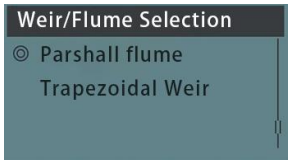
7)Resolution: 1 millimeter

8)Instrument Protection: IP65

9)Cumulative Flow: Can be queried by year, month, day, or hour

10) Output Signal: (4-20) mA (transmits instantaneous flow) and RS485 (transmits instantaneous and cumulative flow)

In the weir and flume selection, there are: Bashforth flume (V-notch weir), triangular weir, and rectangular notch weir. The selection should be based on the actual weir or flume at the site.



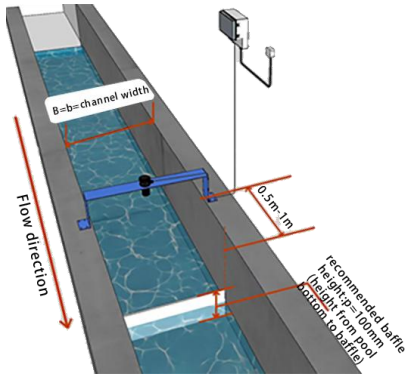
For weir and flume settings, enter through the menu key. If the site uses a Bashforth flume, press the menu key to enter, and the default setting will be 1# Bashforth flume. If the site uses 3# Bashforth flume, press the "+" key to change it to 03, then press the save key.

The instantaneous flow rate of a right-angled triangular weir is only related to the water depth. Therefore, when setting up a triangular weir on site, you only need to select the right-angled triangular weir.

The instantaneous flow rate of a rectangular notch weir is related to the weir opening width (b), the channel width (B), and the height of the upstream weir crest (p).

Rectangular Equal Width Weir: The width of the rectangular channel is the same as the width of the weir.

For the Rectangular Equal Width Weir, a baffle with a height of at least 100mm should be installed at the bottom of the rectangular channel to ensure that all water flows over the baffle, meaning b = B. In this case, set b = ?, and p = 100mm.

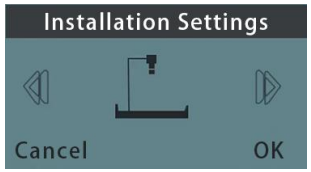


5、Instrument Commissioning：

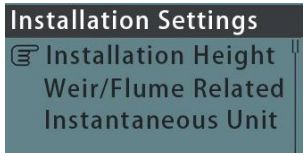
Ⅰ、Login Password：

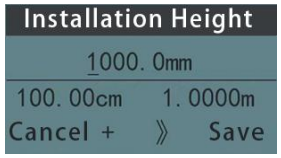
When the first "*" on the left is blinking, press the "+" key to change it to "1***", then press the menu key to enter the instrument's internal menu.

Ⅱ、Installation Settings：



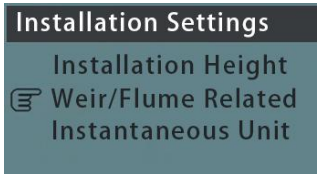
1）、Installation Height Setting：

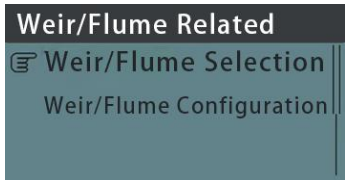




In the installation settings menu, press the menu key to enter the next level menu, then press the menu key again to enter the installation height setting interface.
Installation Height: The vertical distance between the surface of the weir (Bashforth flume, triangular weir, or rectangular weir) where the flow is 0 and the instrument probe surface. After modifying the installation height, press the save key to save, then press the exit key to return to the previous menu.

2）、Weir and Flume Selection and Settings：



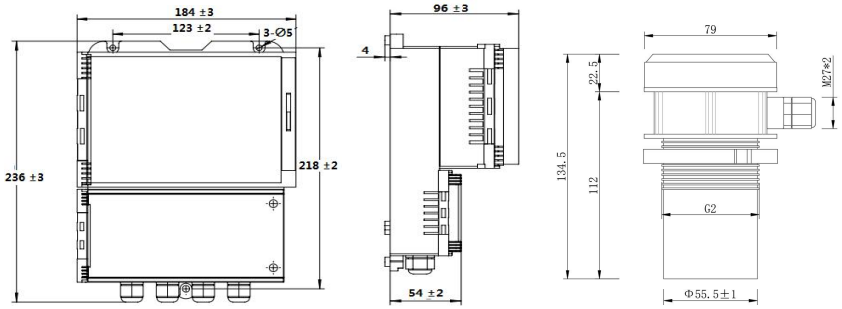


11) Relay Output: (1-4) channels (please specify when ordering if needed)
12) Operating Temperature: -20°C to 55°C
13) Power Supply:AC: 220V 50HzDC: (12-36)V, 3W

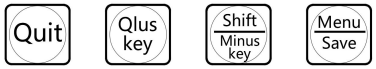
4、Instrument Installation

1）、Instrument Dimensions

(The probe dimensions may vary depending on the instrument's range.)

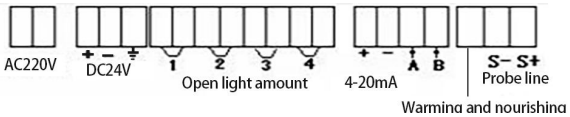


2）、 Instrument Button Description

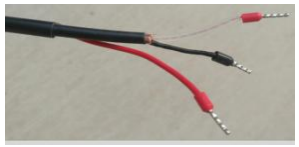


Menu / Save:To enter the instrument settings menu, press the menu key. After completing the settings, press the save key.
Increase, Decrease, or Shift:Use this key to change the data value or shift.
Exit:After completing all settings, press this key to return to the main interface.

3)、 Instrument Wiring Terminal Description：



Instrument Power Supply:AC 220V or DC 24V. The instrument requires a proper ground connection.
Output Signals:(1–4) channels of switchable signals (optional), standard configuration: 4-20mA and RS485.
Wiring Terminal Description:S+: Connect to the white high-frequency wire of the probe.
S-: Connect to the shielding wire of the probe.
Temperature Compensation (Temp Comp): Connect to the red wire of the probe.
75-3 Type Special Cable Description:
(Diagram would follow here, as indicated in the original text.)
(Standard length: 10 meters. If an extension is required, please notify in advance!)



4)、 Weir and Flume Installation：

Ⅰ、Bashforth Flume Installation：

Bashforth Flume Installation Requirements:

1）. When installing the Bashforth flume in the channel, it must be kept level, without tilt or deformation.

2）. The dimensions of the Bashforth flume are related to the channel water flow. Please choose based on the actual site conditions.

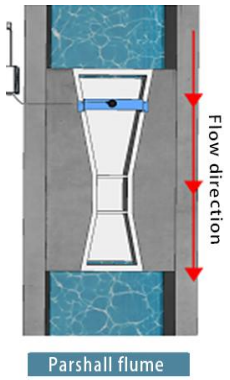
3）. The centerline of the flume must align with the centerline of the channel to prevent the water from flowing off-center into the flume.

4）. The flow in the flume must be free-flowing.

5）. There should be a straight section of the channel upstream of the flume that is at least 5 times the channel width to allow smooth water entry, without lateral deviation or turbulence caused by channel slope.

6）. The flume must be securely installed in the channel so that all water flows through the measuring section of the flume.

7）. The downstream discharge of the flume must have a sufficient water level difference, and drainage must be unobstructed. If the water level difference is not enough, raise the flume to increase the level difference.



Ⅱ.Installation Precautions for Rectangular Weir and Right-Angle Triangular Weir:

1）. When selecting weir plate material, ensure the hardness is sufficient and corrosion-resistant. The thicker the weir plate, the larger the flow capacity it can handle.

2）. The surface of the rectangular flume should be smooth, flat, and free of deformation or distortion.

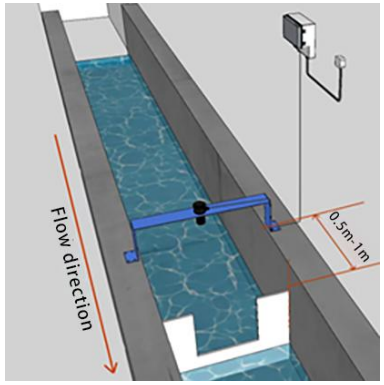
3）. The downstream edge of the weir opening in the rectangular flume should have a 45-degree angle, be straight, and smooth.

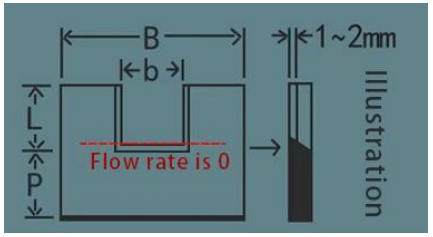
4）. The upstream channel of the weir must have a straight section, with the length of the straight section being more than 10 times the channel width.

5）. When installing the rectangular flume in the channel, ensure the centerline of the flume coincides with the centerline of the channel, it must be vertical (perpendicular to the flow), and should not be tilted; keep the flume level.

6）. During installation, the depth of the flume embedded in the wall and the channel floor should generally be between 5-10 mm, though it can be adjusted based on site conditions. The flume should be firmly installed in the channel, with a tight connection to the channel's side walls and floor to prevent water leakage, ensuring that all the water flows through the measuring section of the weir.

7）. The discharge outlet of the weir should have a water level difference, and the drainage should be unobstructed.





he installation precautions for the triangular weir are similar to those for the rectangular weir. Additionally, the notch of the triangular weir should be an isosceles right triangle, with the bottom angle being a right angle. The downstream edge of the weir opening should have a 45-degree angle.