

Qinboshi

IT Application Innovation Ultrasonic

Water Meter

(NB-IoT)

Installation and Operation Manual



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1. Overview

The NB-IoT wireless valve-controlled ultrasonic water meter is a new type of intelligent, fully electronic valve-controlled water meter based on ultrasonic sensing technology. It is an IoT water meter integrating measurement, totalization, display, valve control, and NB-IoT wireless communication. Using ultra-low-power technology, it features a low starting flow rate, a high turndown ratio, a compact size, stable performance, and strong resistance to interference.

It uses ultrasonic flow measurement technology, allowing installation at multiple angles without affecting measurement performance while minimizing pipeline pressure loss. The valve can be opened or closed remotely via NB-IoT to enable remote control of users' water supply. Designed specifically for individual household metering in residential communities, the meter can transmit data through an IoT platform.

Applicable Standards

1. GB/T 778.1-2007 Measurement of Water Flow in Fully Charged Closed Conduits — Meters for Cold Potable Water and Hot Water — Part 1: Specifications

2. GB/T 778.2-2007 Measurement of Water Flow in Fully Charged Closed Conduits — Meters for Cold Potable Water and Hot Water — Part 2: Installation Requirements

3. GB/T 778.3-2007 Measurement of Water Flow in Fully Charged Closed Conduits — Meters for Cold Potable Water and Hot Water — Part 3: Test Methods and Equipment

Factory verification is performed in accordance with the National Metrological Verification Regulation of the People's Republic of China, JJG 162-2009, Cold Water Meters.

2. Technical Parameters

Table 1-1 Technical Parameters

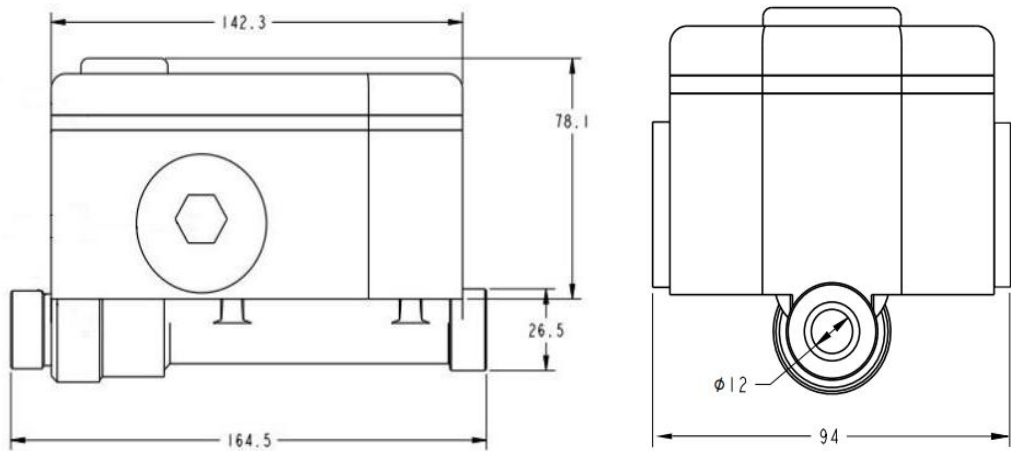
Parameter	Performance
Nominal Diameter (mm)	DN15~DN25
Q3/Q1	250
Pressure Loss Class	Δp_{63}
Measured Medium	Water or a homogeneous liquid that completely fills the measuring pipe
Accuracy Class	Class 2
Maximum Allowable Working Pressure	1.0 MPa
Operating Environment	5°C to +55°C; RH $\leq$ 100%
Temperature Class	T30
Upstream Flow Field Sensitivity Class	U10
Downstream Flow Field Sensitivity Class	D5

Parameter	Performance
Climatic and Mechanical Environmental Class	Class O
Electromagnetic Compatibility Class	E1
Button	Sensor Key
Display	8-digit LCD + indicators
Display Contents	Instantaneous flow rate (m ³ /h), cumulative flow volume (m ³), NB-IoT Signal, water temperature, meter address, date (YYYY/MM/DD), and software version
Display Range	Cumulative flow volume: 0 m ³ to +99,999.999 m ³
Data Communication (Optical Interface)	Baud rate: 2,400 bps; custom protocol based on CJ/T 188
Wireless Communication	NB-IoT; custom protocol based on CJ/T 188; one communication session per day by default
Power Supply	3.6 V DC battery power; one ER26500 battery
Ingress Protection Rating	IP67/IP68
Storage Temperature	-25°C to +55°C

Table 1-2 Flow Parameters

Nominal Diameter	Permanent Flow Q3 (m ³ /h)	Transitional Flow Q2 (m ³ /h)	Minimum Flow Q1 (m ³ /h)	Overload Flow Q4 (m ³ /h)
DN15	2.5	0.016	0.01	3.125
DN20	4.0	0.025	0.016	5.0
DN25	6.3	0.040	0.025	7.875

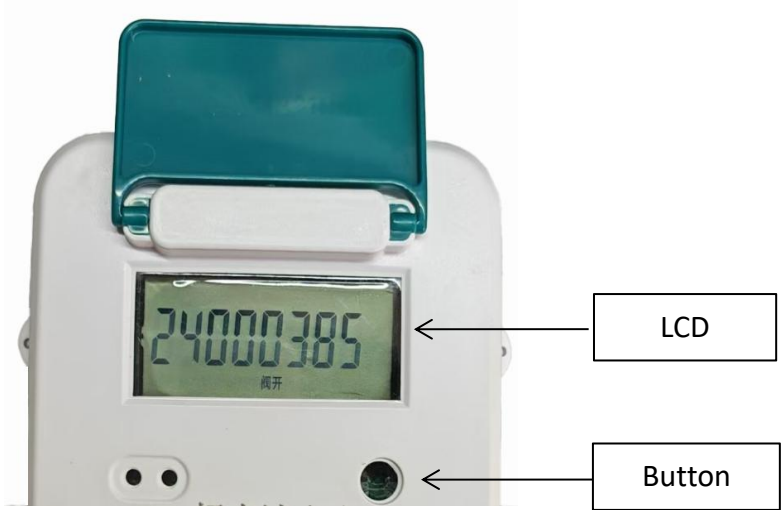
3. Overall Dimensions



Nominal Diameter (mm)	DN15	DN20	DN25
Thread Specification	G $\frac{3}{4}$ B	G1B	G1 $\frac{1}{4}$ B
Housing (mm)	142.3	142.3	142.3
Pipe Segment Length (mm)	164.5	194.5	224.4
Height (mm)	102.2	102.5	102.5
Width (mm)	94	94	94

4. Operation Instructions

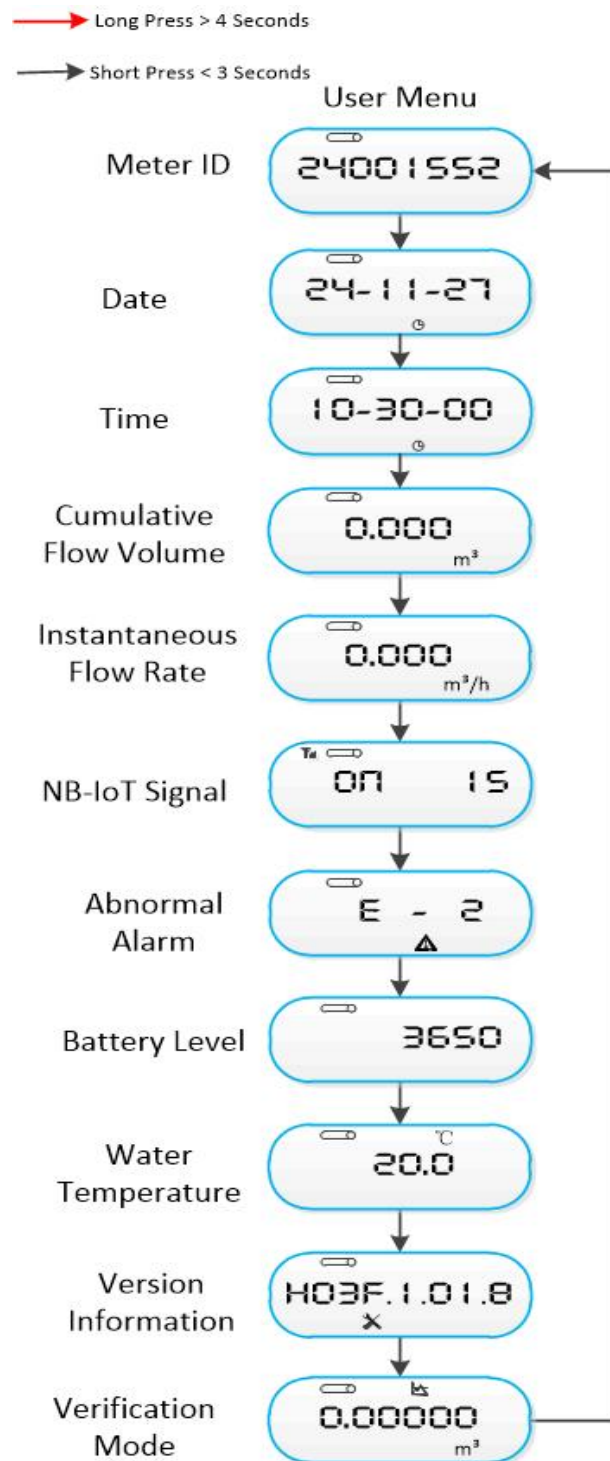
4.1 Panel Display



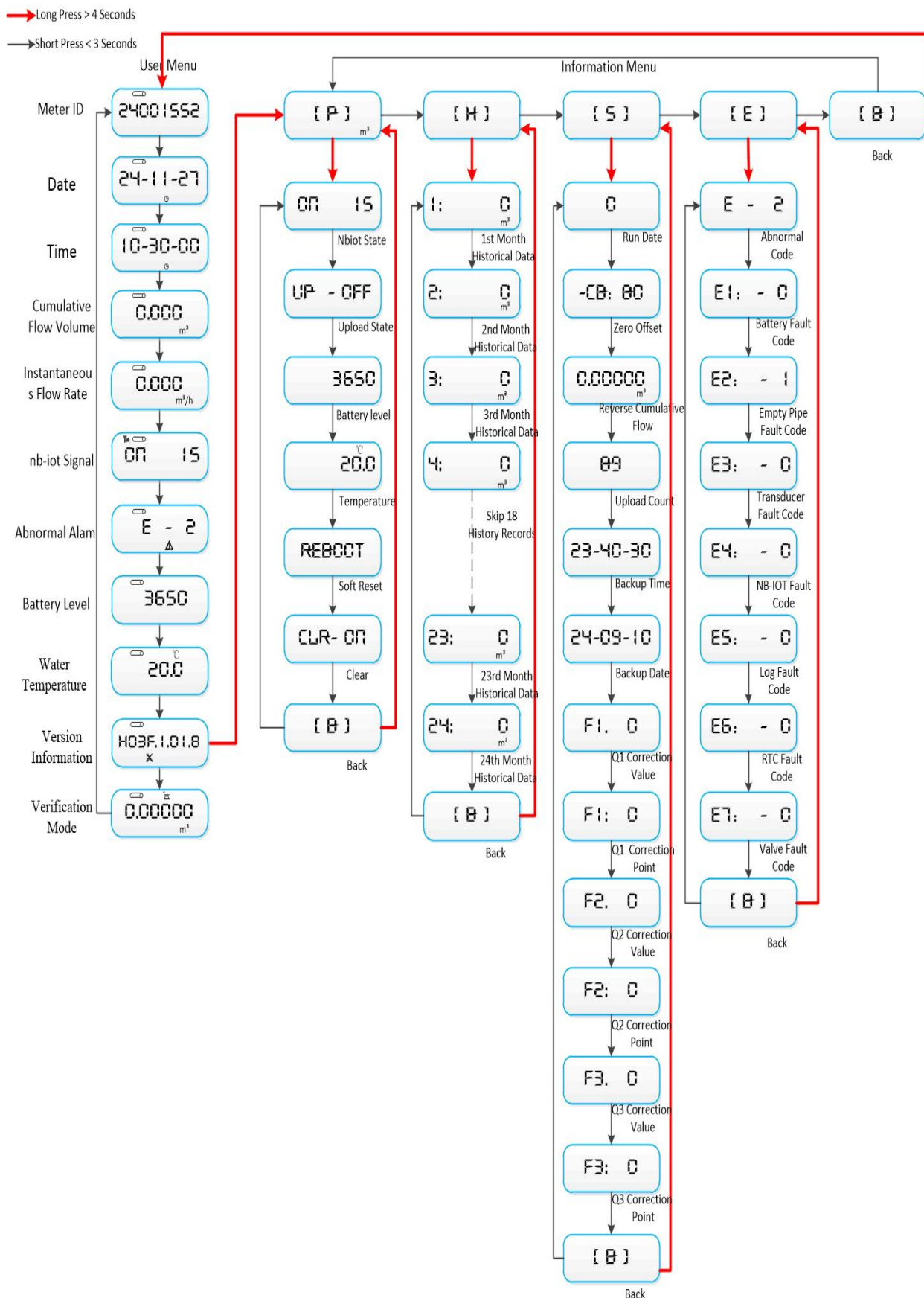
4.2 Operation Guide

Users can use a finger to switch cyclically between display screens and view the relevant data measured by the meter, as shown below:

4.2.1 User Operation Mode



4.2.2 Information Query Mode



5. Installation and Connection

5.1 Installation and Connection Requirements

1. Install the meter strictly at the location specified in the professional design. Unauthorized relocation is prohibited.
2. Before installing the meter on a newly installed pipeline, thoroughly flush out sand, sediment, hemp fibers, and other debris to prevent meter malfunction.
3. During installation, pay attention to the meter's connection length. If the distance between the two pipe ends exceeds the meter's connection length, adjust the pipe spacing so that it matches the connection length and ensure that the pipe ends on both sides are coaxial.
4. To ensure metering accuracy, provide at least 10D of straight pipe upstream and at least 5D downstream, and avoid interference from elbows, tees, reducers, and pumps as far as possible (D is the pipe diameter).
5. If a reducer is installed upstream, provide at least 15D of straight pipe upstream;
6. If a 90° elbow is installed upstream, provide at least 20D of straight pipe upstream;
7. If a half-open valve is installed upstream, provide at least 50D of straight pipe upstream.
8. Protect the meter from impact or vibration at the installation site. Avoid excessive stress on the meter from pipes and fittings; install the meter on a base or support bracket if necessary.
9. Protect the meter from damage caused by extreme water or ambient temperatures and corrosive environments.

10. Take measures to prevent adverse hydraulic conditions, including cavitation, surges, and water hammer.

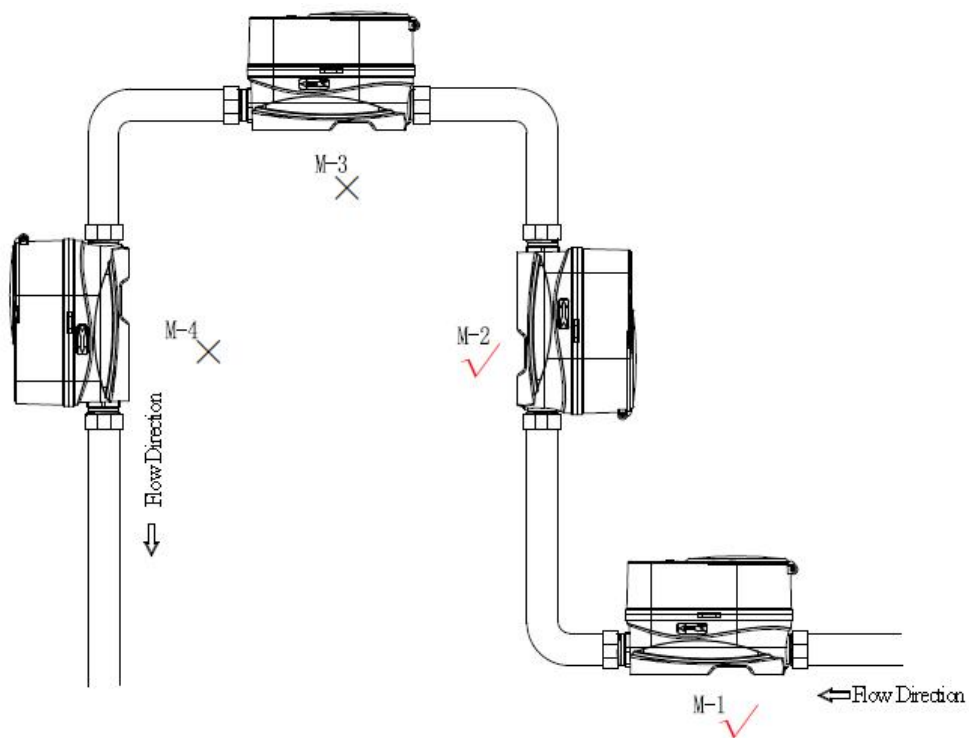
11. Notify the manufacturer in advance if the product will be installed outdoors in the open air or submerged in water.

12. Before installation, verify that stable NB-IoT signal coverage is available at the installation location. If the signal is unstable, confirm whether the network operator can resolve the issue, as this directly affects subsequent data transmission and battery life.

5.2 Meter Installation Position

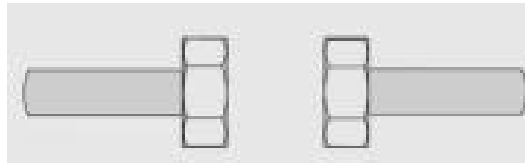
1. Install the meter preferably in a vertical pipe where the liquid flows upward or obliquely upward, or alternatively in a horizontal pipe. Avoid pipes where the liquid flows downward or obliquely downward to prevent the pipe from being partially filled.

2. Do not install the meter at the highest point of the pipeline, as accumulated air bubbles may cause abnormal measurement.

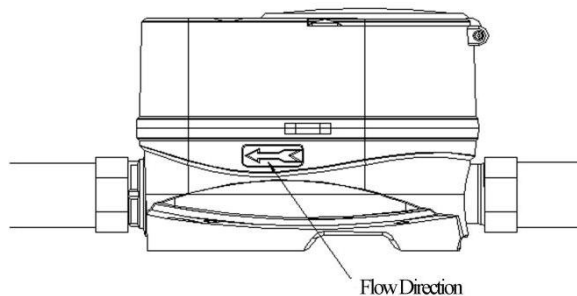


5.3 Installation Steps

1. Cut the water-supply pipe at the meter installation point, leaving sufficient space for installation, as shown below:



2. Align the meter concentrically with the pipe, and use a wrench to tighten the pipe union onto the meter thread. This completes installation.



6. Verification Function

The verification method for this meter complies with JJG 162-2019, Cold Potable Water Meters.

7. Troubleshooting

1. Low-battery indication on the cold-water meter: The battery is low and should be replaced as soon as possible.
2. No reading or a negative reading on the cold-water meter: Check whether the inlet and outlet directions have been reversed. If not, return the meter to the manufacturer for service.
3. Abnormal or fluctuating data on the cold-water meter: ① The installation position is incorrect, with the meter installed at a low water level.

② The upstream and downstream straight pipe sections are too short, the bends are excessive, or the upstream pipe diameter changes significantly.

4. Flow is detected but no temperature is displayed on the cold-water meter: Do not disassemble the meter without authorization; return it to the manufacturer for service.

8. Transportation and Storage

1. Store the water meter in its original packaging at an ambient temperature of 5°C to 40°C in an atmosphere free of corrosive gases.

2. When stored on shelves, do not stack full cartons more than five high.

9. Disclaimer

1. This water meter is intended for residential, commercial, and light-industrial use (Class E1) and is a fixed water meter designed for outdoor installation (Class O).

2. This manual provides no express or implied warranties. The company reserves the right to amend and revise this manual without prior notice. The actual product shall prevail.

3. The company assumes no liability if the lead seal is damaged or incomplete. It also assumes no liability beyond the water meter itself, including but not limited to liability for water-metering disputes caused by meter malfunction or measurement error.