

Ultrasonic Water Meter

User manual



Revision: 2024.8.7

CONTENTS

I .Overview	3
II . Product Features.....	3
III. Technical Parameters	3
IV. Instructions For Use	4
1. Main Menu Navigation	5
2. Fault Display Menu Operation 【E】	6
3. Information Menu Navigation 【I】	8
4. Detection Menu Operation 【F】	9
V . Installation And Usage Instructions	10
1. Installation Dimensions	10
2. Installation Requirements For Ultrasonic Water Meters	10
3. Pre-Installation Precautions	14
4. Common Installation Errors and Solutions.....	14
5. Wiring Instructions.....	15
6. Routine Maintenance	16
7. Common Fault Analysis And Troubleshooting	16
VI. Packaging Contents	16
VII. Transportation And Storage.....	17
VIII. Warranty Policy	17

I .Overview

Ultrasonic water meter is a new type of water meter that measures and displays flow rate based on the principle of the time difference between forward and backward flow when ultrasonic waves propagate in water. The instrument can be equipped with wired or wireless data communication interfaces to communicate with collectors, concentrators, or network servers, forming a remote meter reading management system. The management department can retrieve data from the meter as needed, facilitating the statistics and management of user water consumption.

The product complies with the standards of GB/T 778-2018 Measurement of Water Flow in Closed Full Pipelines - Drinking Cold Water Meters and Hot Water Meters, as well as the calibration regulations of JJG 162-2019 Drinking Cold Water Meters.

II. Product Features

1. High range ratio (maximum 400:1)
2. Equipped with self-diagnostic functions: flow sensor fault alarm, temperature sensor fault alarm, measurement over range alarm, battery undervoltage alarm
3. We have applied our company's patented flow measurement method (which has been granted invention patent authorization) and intelligent data error correction technology, resulting in high measurement accuracy and stability
4. Built in lithium battery power supply ensures over 6 years of use
5. Wired communication interface 485 MODBUS.
6. Supporting IoT system platform
7. Countable reverse flow

III. Technical Parameters

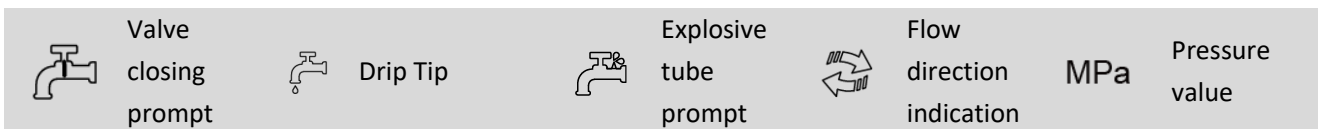
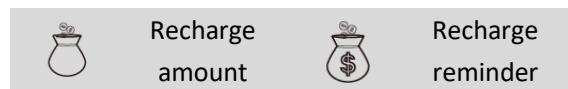
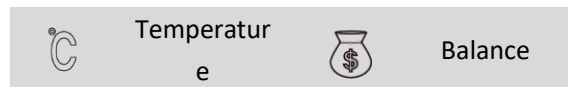
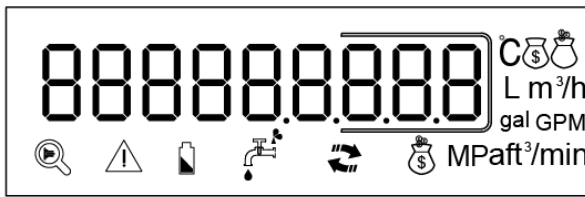
Main technical indicators

Accumulated volume resolution	0.001m ³ (in use) 0.00001m ³ (During calibration)
Current traffic resolution	0.001m ³ /h (in use) 0.001 m ³ /h (During calibration)
Battery lifespan	6 years
LCD display screen digits	9 digit
Temperature level	T30
Pressure level	MAP16
Pressure loss level	△p25
Environmental level	0
Protection level	IP68
Accuracy level	Level 2
Electromagnetic environment level	E1、 E2
Installation method	Horizontal or Vertical
Sensitivity level of upstream/downstream flow field	U5/D3
Reverse flow	Measurable reverse flow

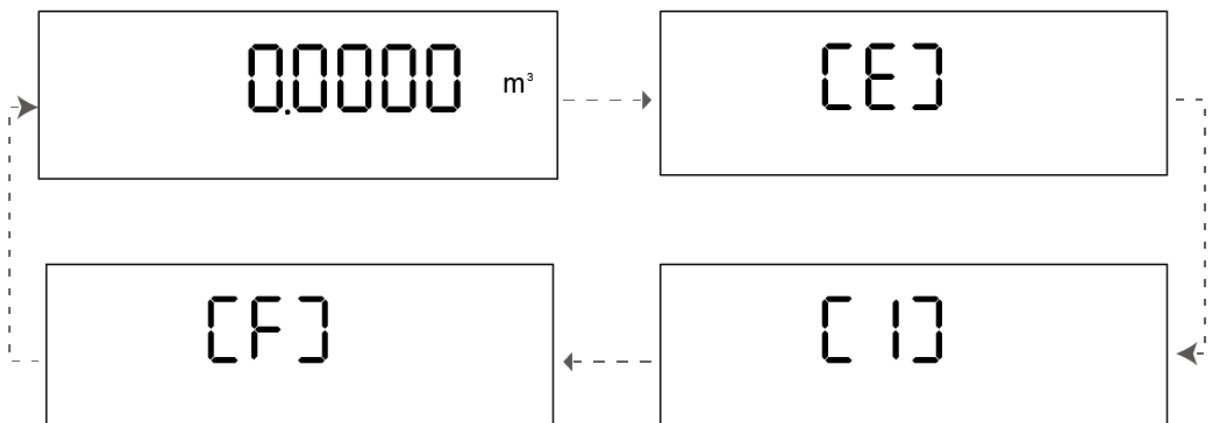
Customizable special features	Identification and alarm of pipeline dripping, bursting, and scaling
Caliber range	DN15~DN42
Range ratio Q_3/Q_1	125、160、200、250、400 Optional
QP Nominal Q_3	DN15: 2.5 m ³ /h DN20: 4.0 m ³ /h DN25: 6.3 m ³ /h DN32: 10 m ³ /h DN40: 16 m ³ /h

IV. Instructions For Use

This table uses an LCD screen that combines numbers and Chinese to present measurement parameters and working status information to the user, as shown below:



You can use the matching magnetic stick to lightly touch the magnetic induction area on the shell to switch between different function menus. The operation and display consist of four sets of menus:



Arrow example

- > Indicates using a magnetic rod to contact the sensing area for more than 2 seconds and maintain it (equivalent to long pressing, replaced by "long pressing" in the following text)
- > Indicates leaving the sensing area after approximately 1 second of contact with a magnetic rod (equivalent to short pressing, replaced by "short pressing" in the following text)

The complete menu screen loop is as follows:

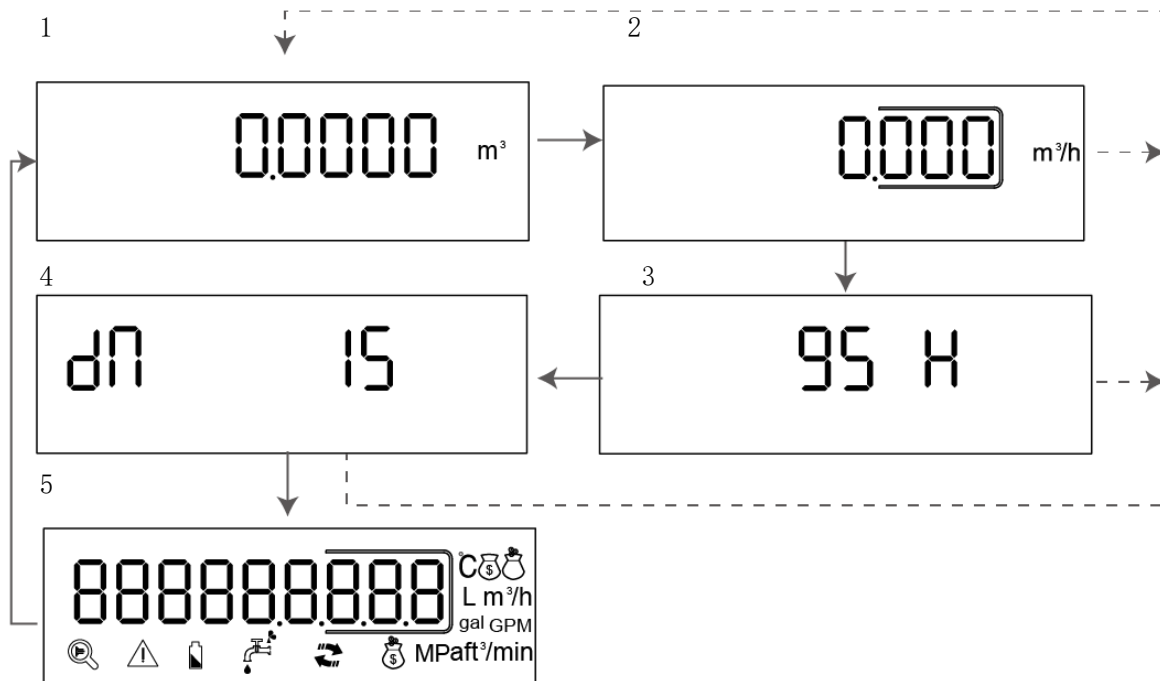
- 1) Main menu: the display interface for daily use
- 2) Fault menu **【E】** : Record and display the corresponding fault source and occurrence time
- 3) Information menu **【I】** : Display information on table addresses, communication parameters, and historical data
- 4) Detection menu **【F】** : Used during calibration

This instrument panel defaults to LCD display and displays the cumulative flow interface in the main menu. The "long press" operation can cycle through the four types of menus mentioned above, while the "short press" operation can switch the display content in the current level menu. Users can switch to the menu they need to view by long pressing, and then use short pressing to cycle through the operation diagram of the corresponding menu and view relevant content. If not operated for more than 3 minutes, the display screen will automatically return to the main menu page (except when in the detection menu **【F】** for various contents)

It should be pointed out that regardless of the menu display status (excluding calibration status), as long as there is water flowing through the water meter, the flow value will automatically accumulate in the meter, and there will be no missing or undercounting of measurement data due to viewing menu content or button operations.

The following are the loop operation diagrams for each menu:

1. Main Menu Navigation



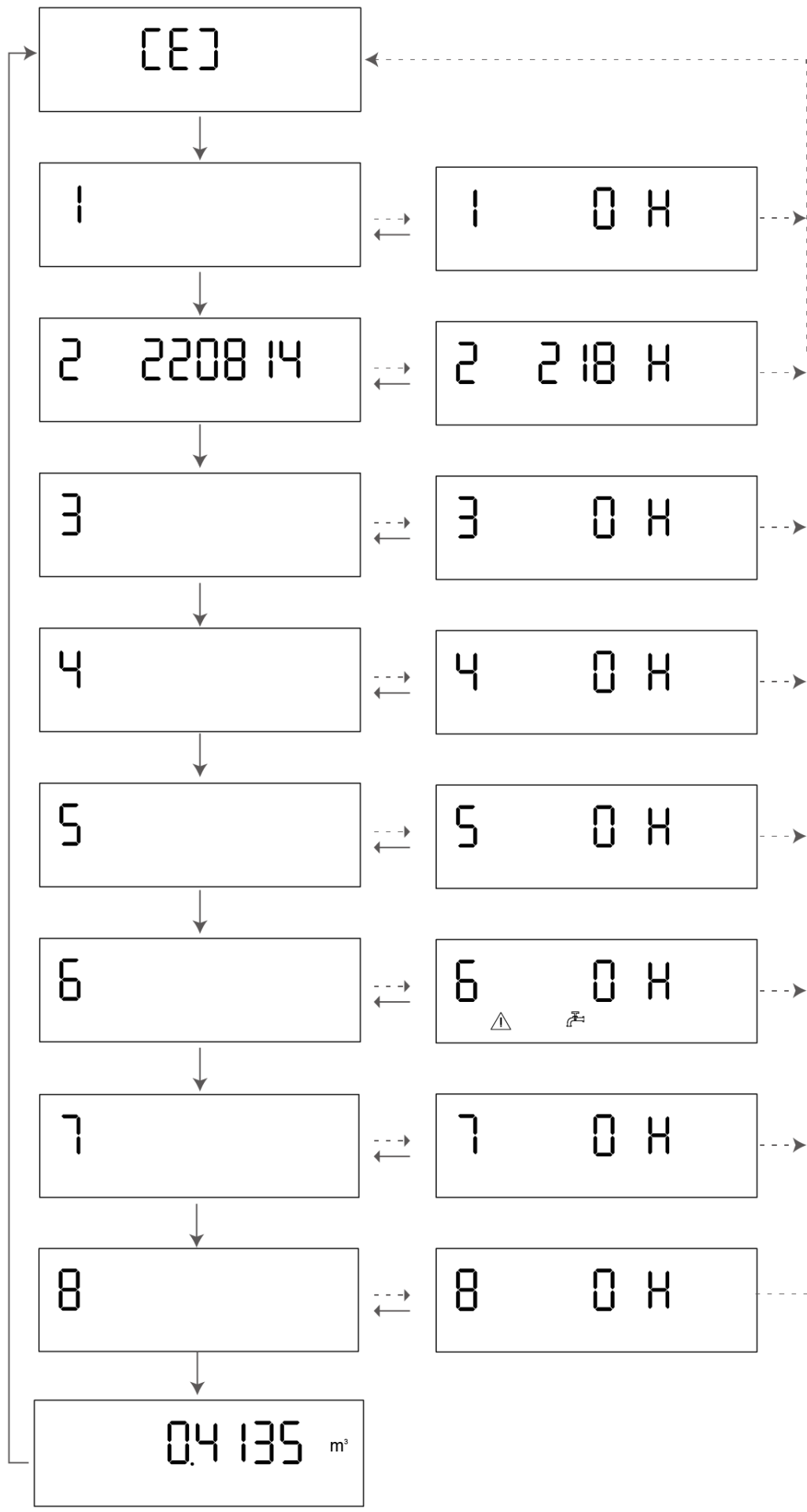
Note: In the above figure, the parameters corresponding to each menu in the order of the arrows are as follows:
1. Accumulated flow rate 2. instantaneous flow rate 3. accumulated working time (hours) 4. caliber specifications 5. full screen display

2. Fault Display Menu Operation **【E】**

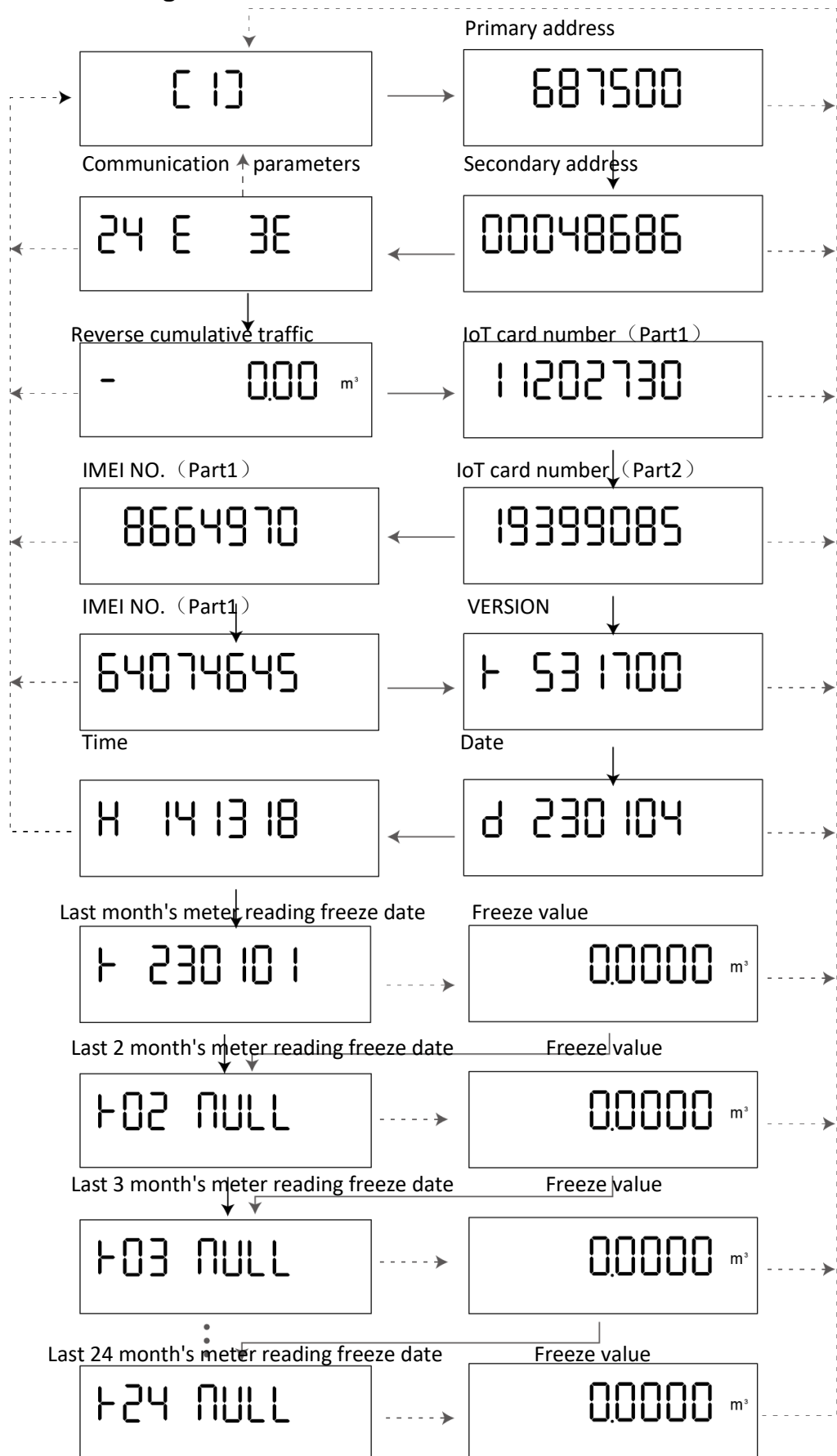
Note: The numbers 1-8 in the figure are fault codes, corresponding to the following:

1. Battery malfunction/occurrence date (year month day)
2. Air traffic control malfunction/occurrence date (year month day)
3. Reverse flow fault/occurrence date (year month day)
4. Exceeding range/occurrence date (year month day)
5. Water temperature malfunction/occurrence date (year month day)
6. Memory failure/occurrence date (year month day)
7. Date of transducer failure/water inlet end occurrence (year month day)
8. Date of transducer malfunction/water outlet end occurrence (year month day)

Long press the corresponding fault display menu to further view the duration of the fault (in hours)

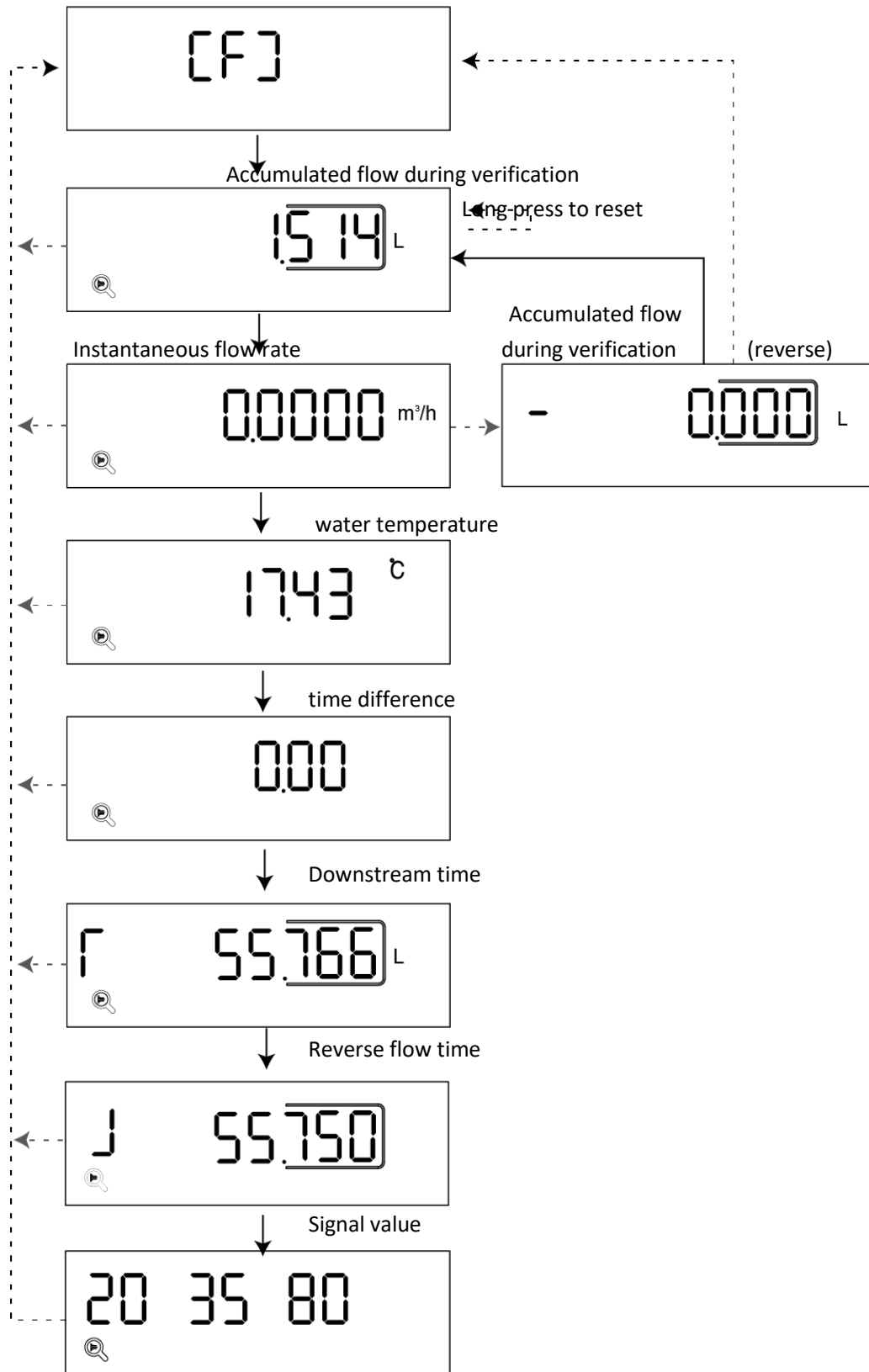


3. Information Menu Navigation [1]



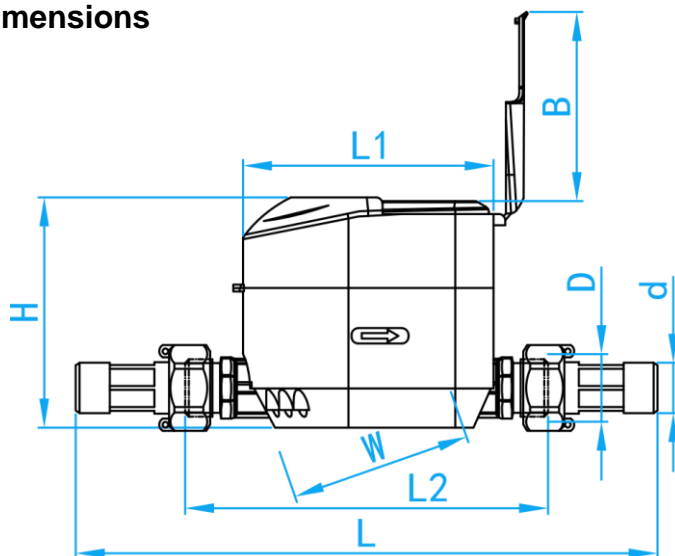
Note: If the meter reading freeze time is displayed as "NULL", it means that there is no historical data for that date.

4. Detection Menu Operation 【F】



V. Installation And Usage Instructions

1. Installation Dimensions



SKU	L (mm)	L1 (mm)	L2 (mm)	W (mm)	D (mm)	d (mm)	H (mm)	B (mm)	WEIGHT (kg)
WMSUN015	262	114	165	96	G ¾"	R ½"	106	85	0.93
WMSUN020	300	114	195	96	G 1"	R ¾"	106	85	1.20
WMSUN025	347	114	225	96	G 1¼"	R 1"	110	85	1.65
WMSUN035	307	114	180	96	G 1½"	R 1¼"	135	85	1.91
WMSUN042	329	114	200	96	G 2"	R 1½"	137	85	2.60

2. Installation Requirements for Ultrasonic Water Meters

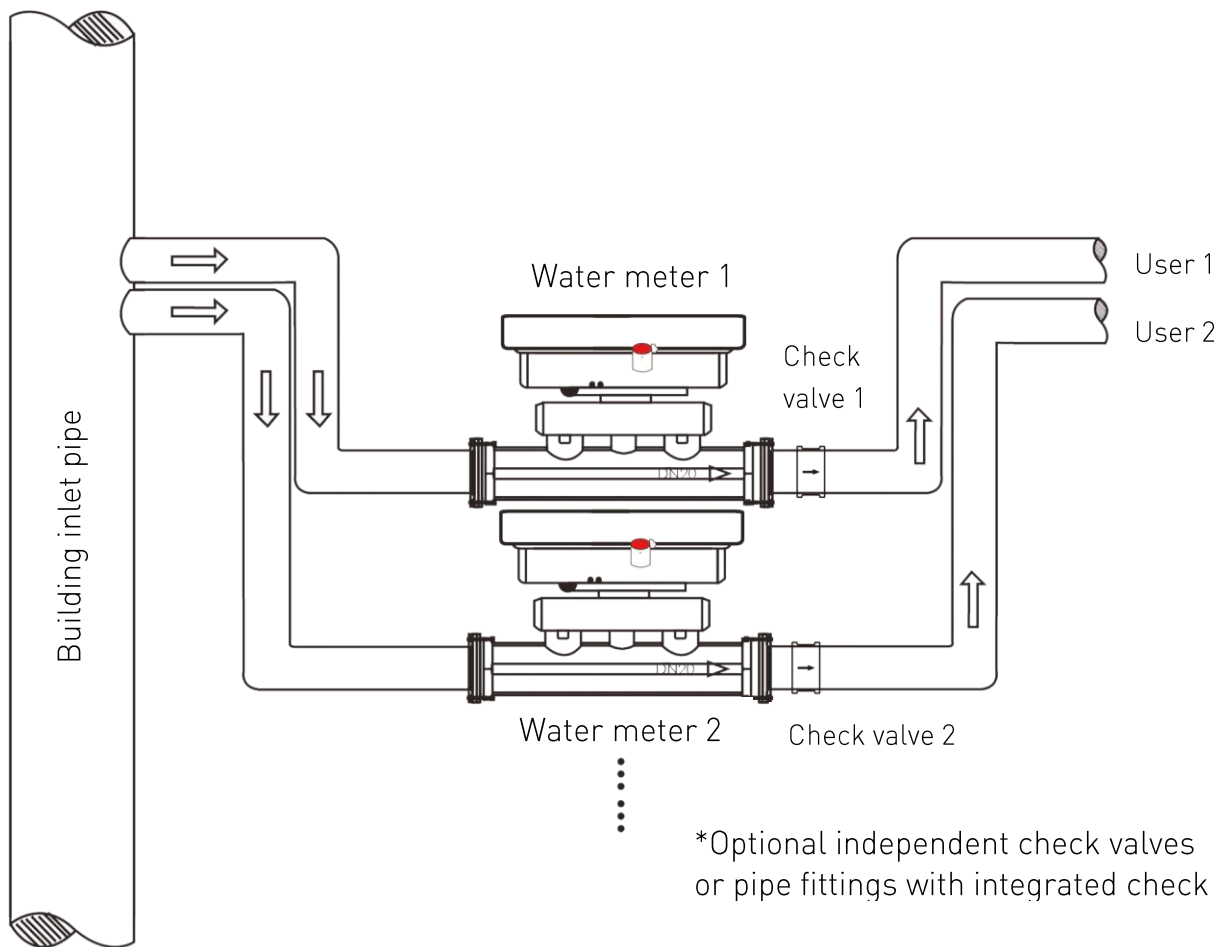
★ **Special reminder:** For ultrasonic water meters that have been installed, in winter freezing conditions, to prevent damage to the ultrasonic sensor caused by pipeline freezing and cracking, please open at least one side of the valve (valve in front of the water meter or inlet valve or faucet in the user's room). Especially in situations where there is no one living or water is not used, this is particularly important.

Ultrasonic water meters, due to their different measurement principles from mechanical water meters, should not have empty pipes or accumulated bubbles in the pipeline, otherwise it will lead to the inability to transmit ultrasonic signals, resulting in the meter not counting or inaccurate measurement.

At the same time, in order to prevent the fluctuation of water in the measurement section caused by changes in water pressure in the pipeline, which may affect the normal operation of the meter, **it is strongly required to install a check valve at the outlet end of the ultrasonic water meter.**

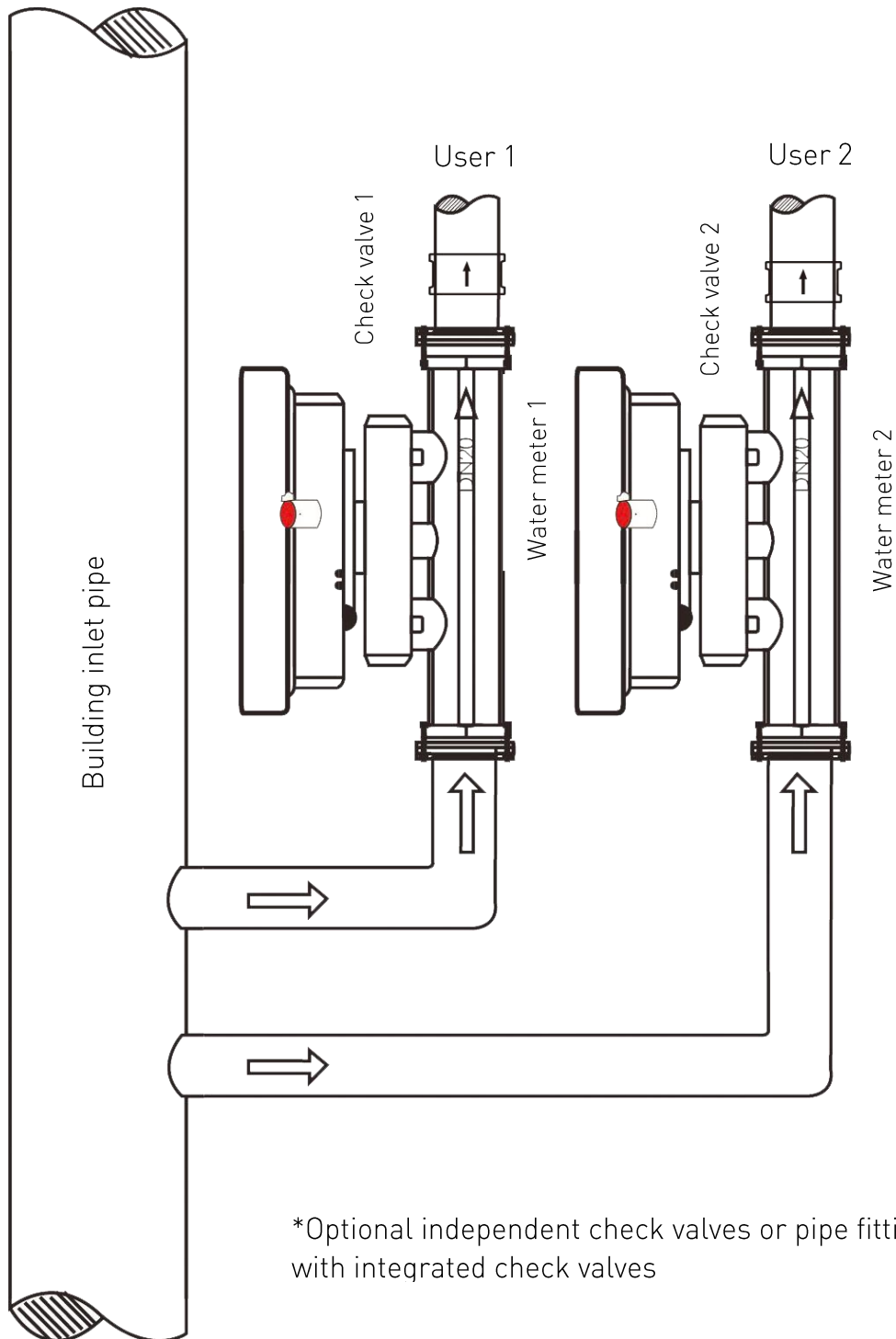
Based on the above reasons, the recommended installation method is as follows:

Horizontal Installation



When installing horizontally, it is recommended to install the pipeline in a "U" shape as follows. In this case, the ultrasonic water meter section located at a low position can remain full.

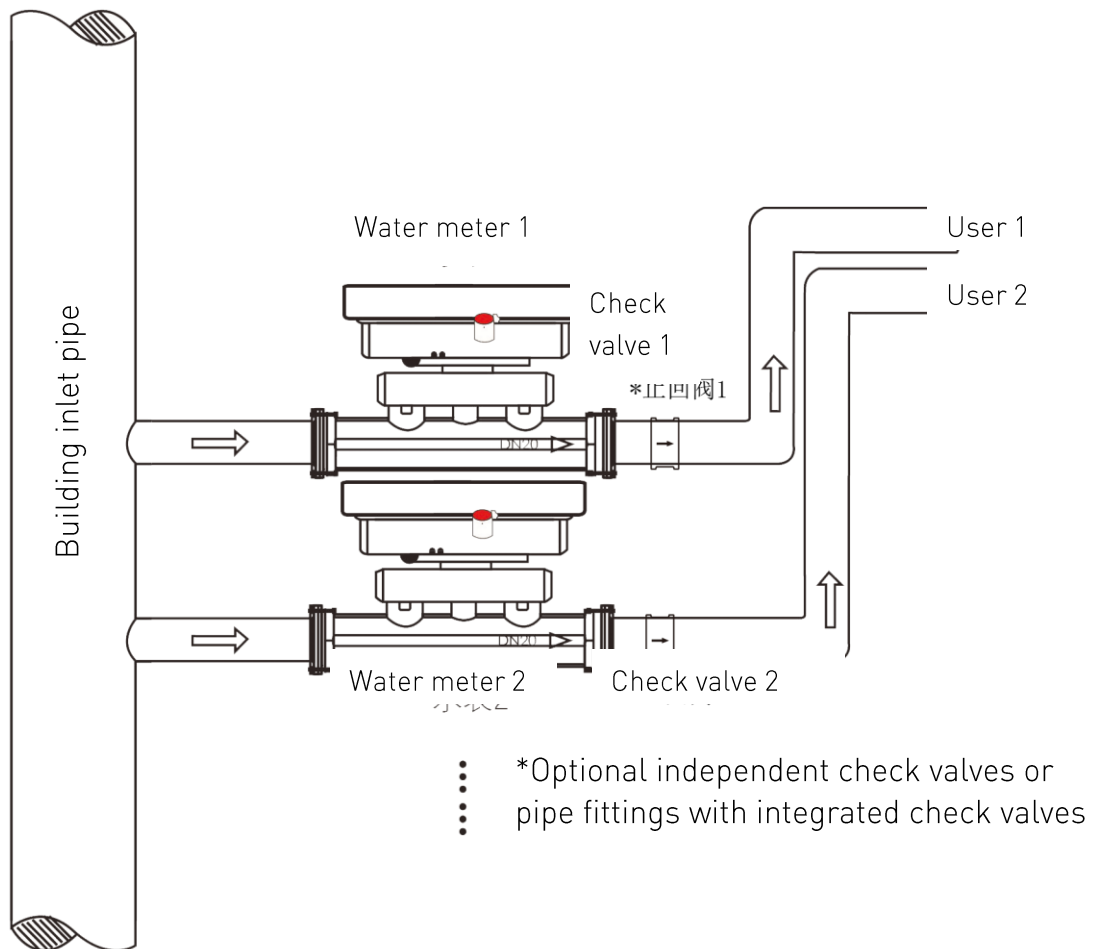
Vertical installation



When installed vertically, as shown in the above figure, the water flow direction at the water meter is the lower end inlet and the upper end outlet. In this case, when there is water flowing through, it can prevent bubbles from gathering in the water meter measurement pipeline.

Compromised installation method (horizontal)

When it is difficult to implement the recommended horizontal installation conditions due to objective on-site conditions, at least the installation should be carried out according to the following diagram.



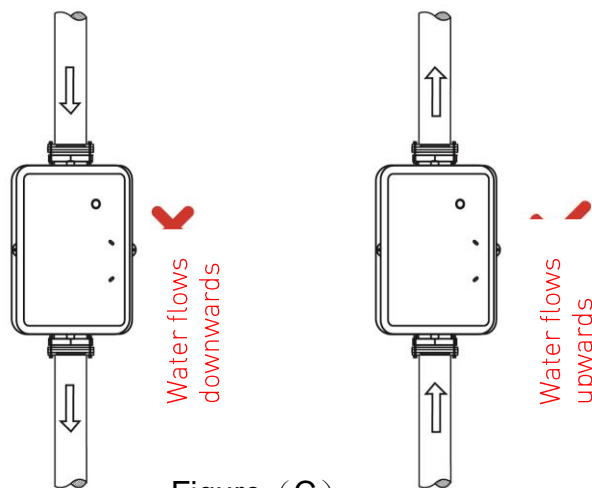
In the figure, the pipe section in front of the water meter can be parallel to the water meter body (compared to the recommended method, the structure of right-angle bending has been eliminated), but the pipeline at the back of the water meter must be arranged as shown in the figure to avoid bubbles gathering in the pipeline.

3. Pre-installation Precautions

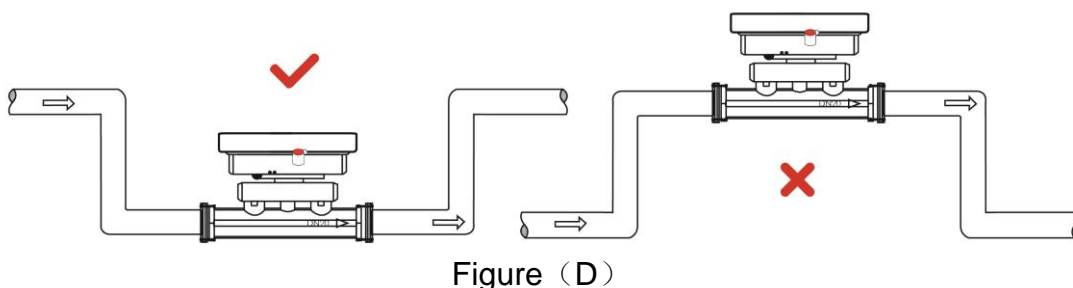
- (1) Before installing the ultrasonic water meter, the pipeline must be thoroughly cleaned to avoid damage to the water meter caused by debris;
- (2) Ultrasonic water meters are relatively expensive and precise instruments. When picking up and putting them down, care must be taken and it is prohibited to directly lift or pull the meter head or sensor wire; It is strictly prohibited to approach high temperature heat sources (such as electric gas welding, to prevent battery explosions from injuring people and damaging instruments);
- (3) Special attention should be paid to the installation position of ultrasonic water meters, which should be avoided from being installed at the upper end of the pipeline (there may be bubbles in the pipe section), near the bend (which may cause vortex flow), and away from pumps and other equipment (which may cause pulsating flow);
- (4) The connecting pipes at the upstream and downstream of the ultrasonic water meter should be consistent with the diameter of the water meter and cannot be reduced;
- (5) The direction indicated by the arrow on the surface of the ultrasonic water meter is the direction of water flow and cannot be reversed;
- (6) Suggest installing a filter with the corresponding caliber in front of the ultrasonic water meter; Valves with corresponding diameters are installed in front and behind the meter, and they can be separated from the meter body for easy maintenance and repair in the future.

4. Common installation error and solutions

- 1) When the meter is installed vertically, it must be installed on a straight pipeline with water flowing upwards, because the pipeline with water flowing downwards is affected by the gravity of the earth, which can cause the water inside the pipeline to be unable to be filled. This can lead to inaccurate or even non measurement of the meter (as shown in Figure C).



- 2) When installing at the "U-shaped" pipe, please install the meter at the lowest point, as the pipeline may accumulate air at high places, causing inaccurate or unmeasurable measurement of the meter (as shown in Figure D).



- 3) When the meter is installed at the bend, it must be ensured that the distance between the front straight pipe is ≥ 5 times the pipe diameter and the back straight pipe is ≥ 3 times the pipe diameter, otherwise it may cause inaccurate meter measurement (as shown in Figure E).

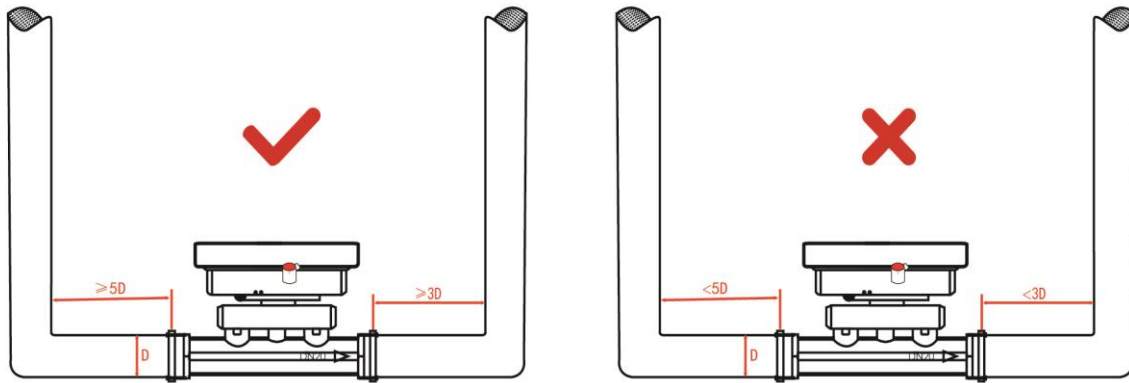


Figure (E)

- 4) When installing valves or other objects in front of the meter, it is necessary to ensure that there is a distance of ≥ 5 times the diameter between the meter and this object, otherwise it may cause inaccurate measurement of the meter; (As shown in Figure F)

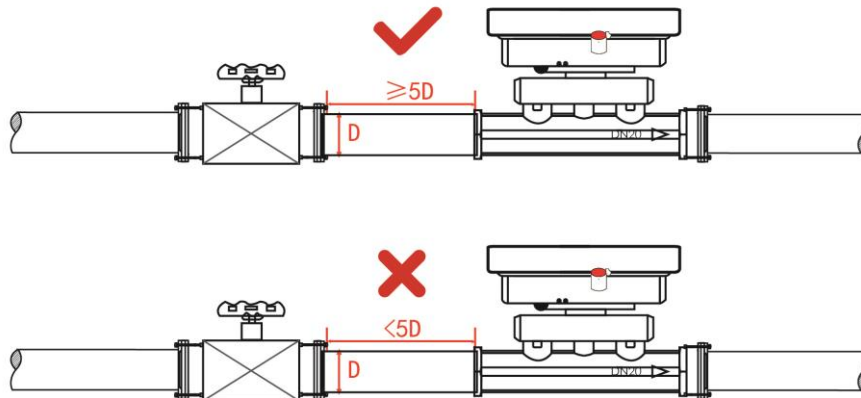


Figure (F)

5. Wiring Instructions

● Power cord

Default to power with built-in lithium battery, no additional power cord required.

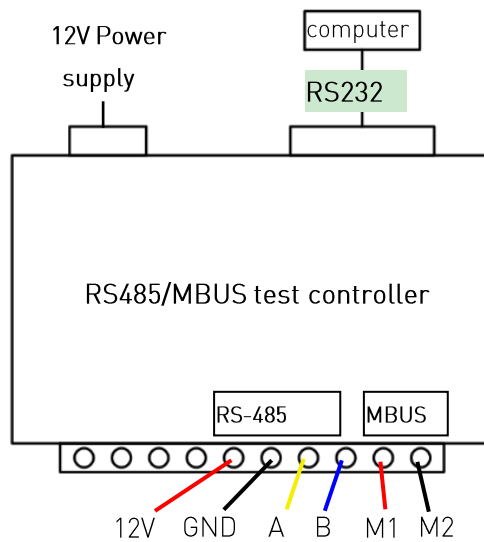
External power supply mode (optional), red wire connected to the positive pole of the power supply, black wire connected to the negative pole of the power supply, voltage range DC 12 V;

● Communication line


MODBUS communication mode: Simply connect two communication lines to the MODBUS bus without distinguishing between positive and negative poles;

485 communication mode: There are four wires led out from the table, namely: A (yellow), B (green), ground (black), and power (red, DC 12V), which are connected properly (pay attention to distinguishing polarity, incorrect connection may burn):

Wiring diagram



6. Routine maintenance

- (1) Before using the ultrasonic water meter, the current status must be checked;
- (2) The lead seal on the ultrasonic water meter cannot be damaged. If it is damaged, the manufacturer will no longer be responsible for quality and accuracy assurance;
- (3) The ultrasonic water meter is powered by a built-in lithium battery and can run for up to 6 years. When the battery life is about to expire or if it is less than 6 years but the LCD screen displays a symbol  (indicating insufficient voltage), promptly notify after-sales personnel to avoid affecting their normal operation;

7. Common fault analysis and troubleshooting

Code	Error type	Error cause	Troubleshooting
1	Battery malfunction	Low battery voltage or poor connection	Check the connection plug and replace the battery
2	Empty pipe fault	No water in the pipe section or water not filling the pipe section	Fill the pipe section with water and remove air bubbles
3	Reverse flow fault	Inlet and outlet end of the pipe section are reversed	Install according to the indicated water flow direction
4	Overrange	Current instantaneous flow rate is too high	Reduce flow rate or replace with a meter of corresponding range
5	EE malfunction	EEPROM memory fault	Contact manufacturer's technical personnel
6	sensor	Ultrasonic sensor malfunction	Contact manufacturer's technical personnel

VI. Packing Contents

Item	name	Unit	Qty
1	Ultrasonic water meter	Pc	1
2	Pipe joint (including connecting nut and sealing gasket)	Set	1
3	Product manual	Pc	1
4	Product Qualification Certificate	Pc	1

VII. Transportation and Storage

1. Handle with care during transportation to avoid severe impact.
2. Storage environment temperature: (-25 ~ 55) °C, relative humidity <80%, avoid strong electromagnetic field and direct sunlight.
3. Stored products should be at least 30cm above the ground, at least 1m away from walls, and at least 2m away from heating equipment.
4. The warehouse should be kept dry and free of corrosive substances, gases, and dangerous goods.

VIII. Warranty terms

The ultrasonic water meter is default covered by a one-year free warranty from the date of shipment. However, the following damages are not covered by the warranty:

- The lead seal (seal) of the ultrasonic water meter is opened or damaged.
- Any part of the ultrasonic water meter is intentionally damaged.
- Damage caused by conditions beyond the specification parameters or chemical contamination.
- Failure to clean the pipeline or excessive impurities in the pipeline before installation, resulting in damage to the flow sensor.
- Malfunction and damage caused by not selecting the appropriate product model specifications.
- Incorrect installation
- Abnormal usage environment

Note: Please read this document carefully before using the product. We recommend that you frequently contact us for the latest information, as our products are constantly being updated and improved.

超声水表

使用说明书



修改时间：2024.8.7

目录

一、概述.....	3
二、产品特点.....	3
三、技术参数.....	3
四、使用方法.....	4
1. 主菜单.....	5
2. 故障显示菜单【E】	5
3. 信息菜单【I】	7
4. 检测菜单【F】	8
五、安装使用说明.....	9
1. 安装尺寸.....	9
2. 超声水表的安装要求.....	9
3. 安装前的注意事项.....	13
4. 常见的错误安装示例.....	13
5. 接线方式.....	14
6. 日常维护.....	14
7. 常见故障分析及排除.....	15
六、装箱清单.....	15
七、运输与储存.....	15
八、保修条款.....	15

一、概述

超声水表是基于超声波在水中传播时，顺流和逆流的时间差原理进行流量测量和显示的新型水表。仪表可配备有线或无线的数据通信接口，与采集器、集中器或网络服务器通信，组成远程抄表管理系统，管理部门可按需抄取表中数据，方便对用户用水量的统计和管理。

产品执行《GB/T 778-2018 封闭满管道中水流量的测量 饮用冷水水表和热水水表》标准以及《JJG 162-2019 饮用冷水水表》检定规程。

二、产品特点

- 1、高量程比（最大 400:1）
- 2、具有自诊断功能：流量传感器故障报警、温度传感器故障报警、测量超量程报警、电池欠压报警、
- 3、应用了本公司专利的流量测量方法（已获得发明专利授权）和智能数据纠错技术，测量准确度和稳定性高
- 4、内置锂电池供电可确保使用 6 年以上
- 5、有线通信接口 485 MODBUS
- 6、配套物联网系统平台
- 7、可计反向流

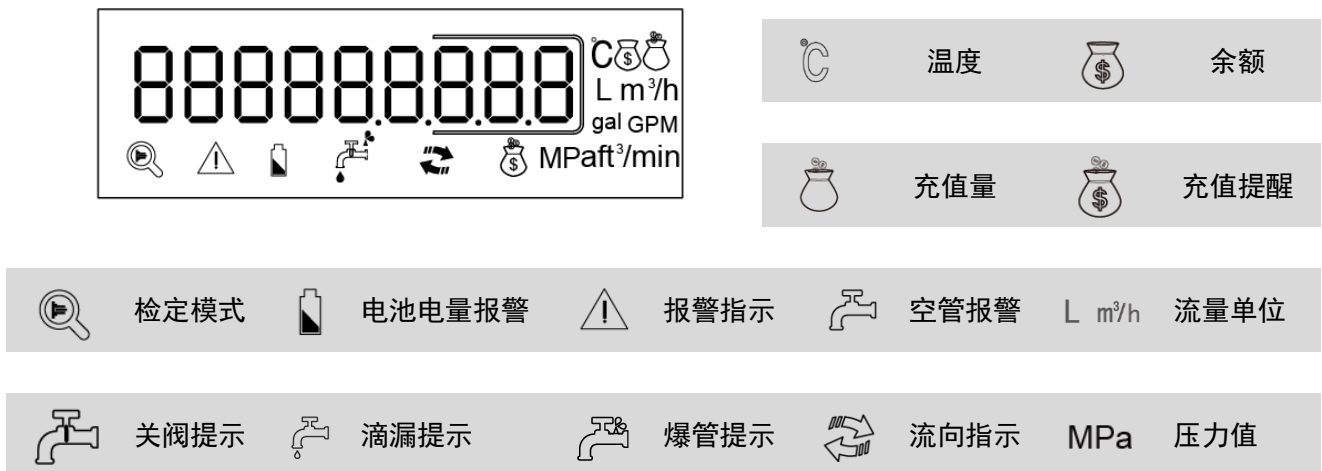
三、技术参数

主要技术指标

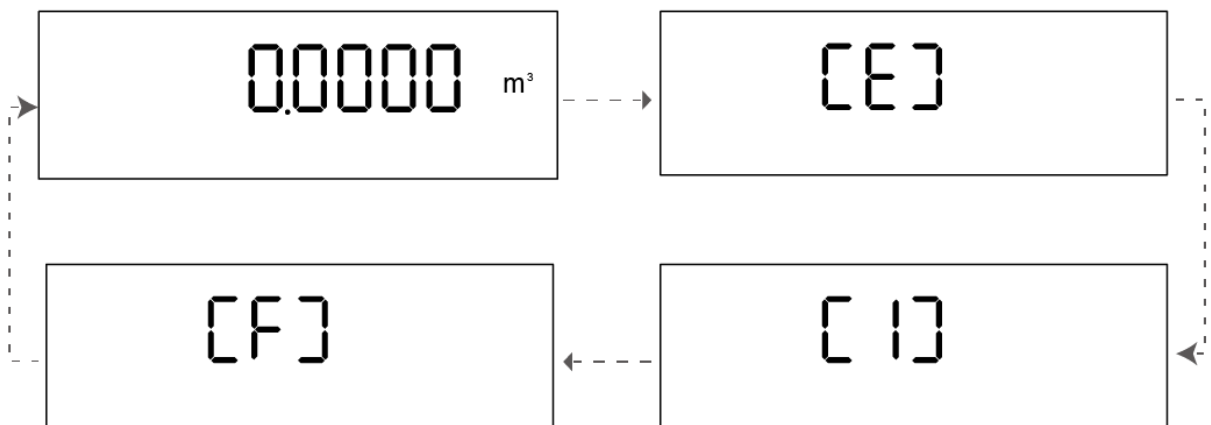
累积体积分辨力	0.001m ³ （使用时）	0.00001m ³ （检定时）
当前流量分辨力	0.001 m ³ /h（使用时）	0.001 m ³ /h（检定时）
电池使用寿命	6 年	
液晶显示屏位数	9 位	
温度等级	T30	
压力等级	MAP16	
压力损失等级	△p25	
环境等级	O 级	
防护等级	IP68	
准确度等级	2 级	
电磁环境等级	E1、E2	
安装方式	水平或垂直	
上/下游流场敏感度等级	U5/D3	
反向流	可测反向流	
可定制的特殊功能	管路滴漏、爆管、结垢的识别与报警	
口径范围	DN15~DN40	
量程比 Q ₃ /Q ₁	125、160、200、250、400	
常用流量 Q ₃	DN15: 2.5 m ³ /h	DN20: 4.0 m ³ /h DN25: 6.3 m ³ /h
		DN32: 10 m ³ /h DN40: 16 m ³ /h

四、使用方法

本表采用数字与中文结合的 LCD 屏，将测量参数及工作状态信息呈现给用户，如下所示：



可使用配套的磁棒轻触外壳上的磁感应区域切换不同的功能菜单。操作与显示由 4 组菜单组成：



箭头示例

- > 表示用磁棒接触感应区域大于 2 秒并保持（等同于长按，下文中以“**长按**”代替）
- > 表示用磁棒接触感应区域大约 1 秒后离开（等同于短按，下文中以“**短按**”代替）

完整的菜单画面循环依次为：

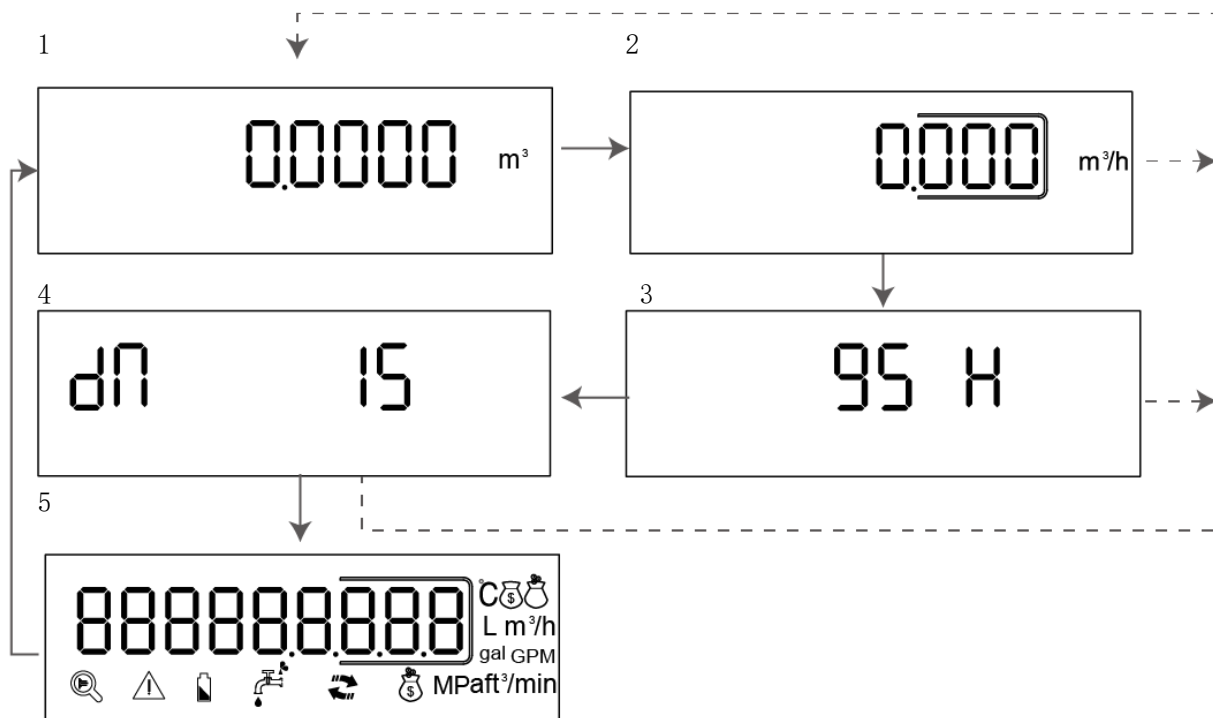
- 1) 主菜单：即日常使用时的显示界面
- 2) 故障菜单【E】：记录和显示对应的故障源和发生时间
- 3) 信息菜单【I】：显示表地址、通信参数以及历史数据的信息
- 4) 检测菜单【F】：检定时使用

本仪表默认 LCD 常显，且固定显示主菜单中的累计流量界面。“长按”操作可在前述 4 类菜单间循环切换，“短按”操作可在本级菜单中切换显示内容。用户可通过“长按”切换到需要查看的菜单，再通过“短按”，对照相应菜单的循环操作图，查阅相关的内容。超过 3 分钟不操作，显示屏自动回到主菜单页面（处于检测菜单【F】下各项内容时除外）

需指出的是，无论在何种菜单显示状态下（检定状态除外），只要水表中有水流过，流量值将自动累积到表中，并不会因为查看菜单内容或者按键操作而造成测量数据的漏计、少计。

以下为各个菜单的循环操作图：

1. 主菜单



注：上图中，各菜单依箭头顺序分别对应的参数如下：

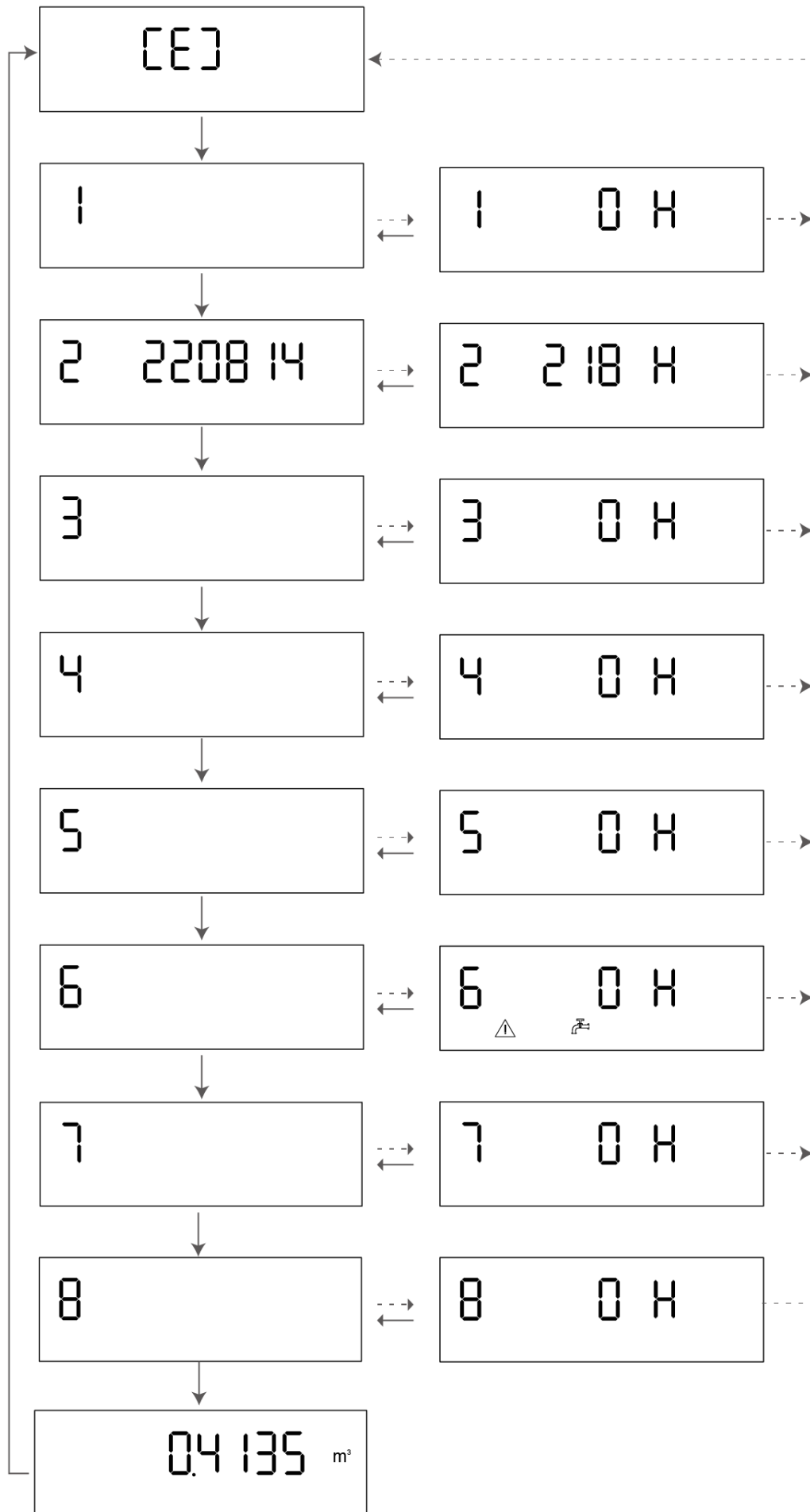
- 1、累积流量
- 2、瞬时流量
- 3、累积工作时间（小时）
- 4、口径规格
- 5、全屏显示

2. 故障显示菜单【E】

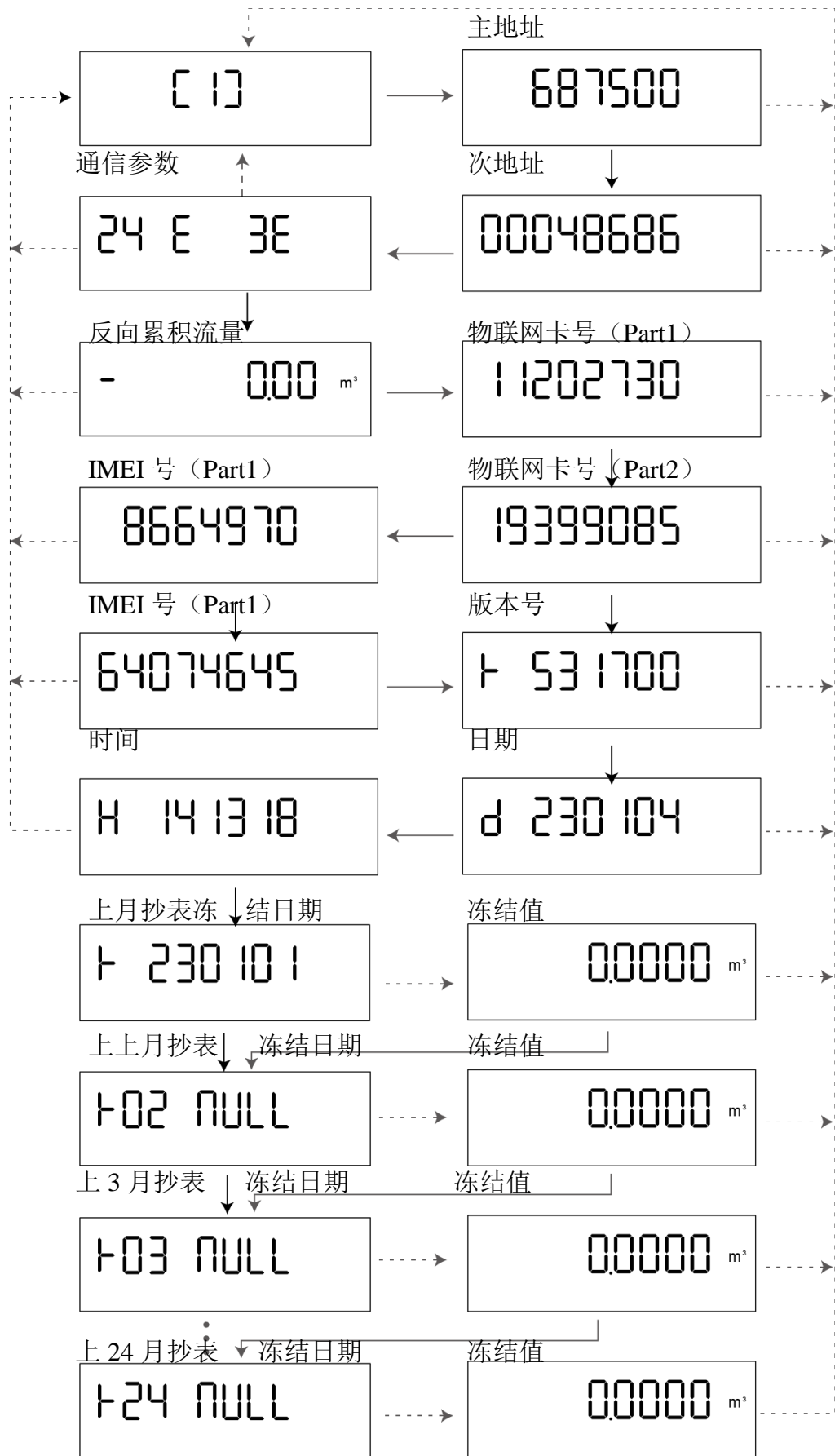
注：图中编号 1~8 为故障码，对应如下：

- 1、电池故障 / 发生日期(年月日)
- 2、空管故障 / 发生日期(年月日)
- 3、逆流故障 / 发生日期(年月日)
- 4、超量程 / 发生日期(年月日)
- 5、水温故障 / 发生日期(年月日)
- 6、存储器故障 / 发生日期(年月日)
- 7、换能器故障 / 进水端 发生日期(年月日)
- 8、换能器故障 / 出水端 发生日期(年月日)

在相应的故障显示菜单进行“长按”操作，可进一步查看该故障的持续时间（单位：h）

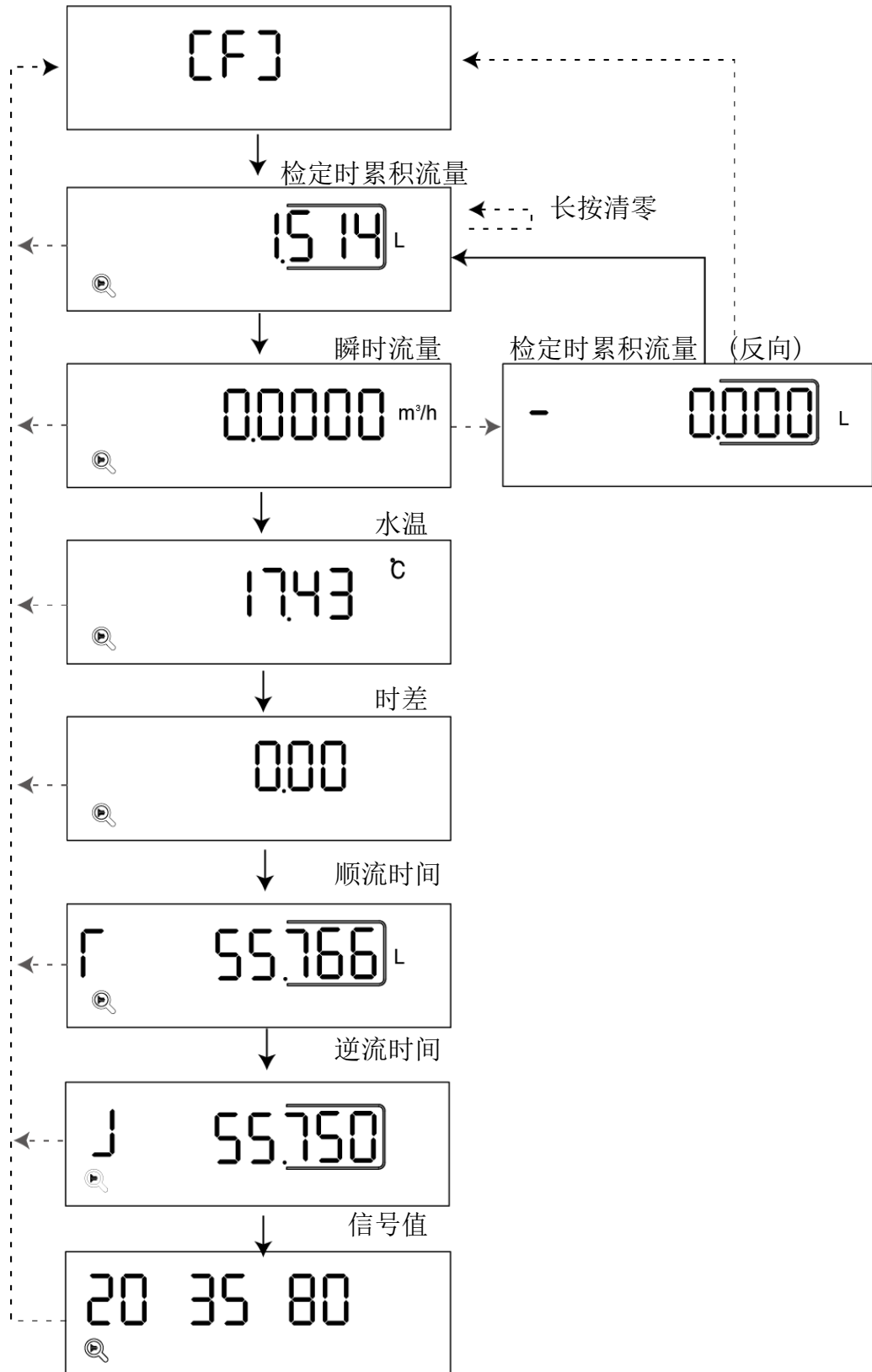


3. 信息菜单【I】



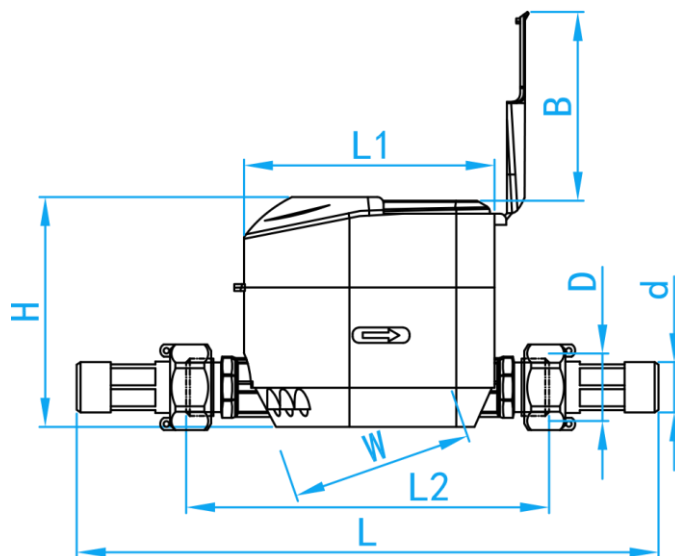
注：若抄表冻结时间显示为“NULL”，表示该日期没有历史数据

4. 检测菜单【F】



五、安装使用说明

1. 安装尺寸



SKU	L (mm)	L1 (mm)	L2 (mm)	W (mm)	D (mm)	d (mm)	H (mm)	B (mm)	WEIGHT (kg)
WMSUN015	262	114	165	96	G ¾"	R ½"	106	85	0.93
WMSUN020	300	114	195	96	G 1"	R ¾"	106	85	1.20
WMSUN025	347	114	225	96	G 1¼"	R 1"	110	85	1.65
WMSUN035	307	114	180	96	G 1½"	R 1¼"	135	85	1.91
WMSUN042	329	114	200	96	G 2"	R 1½"	137	85	2.60

2. 超声水表的安装要求

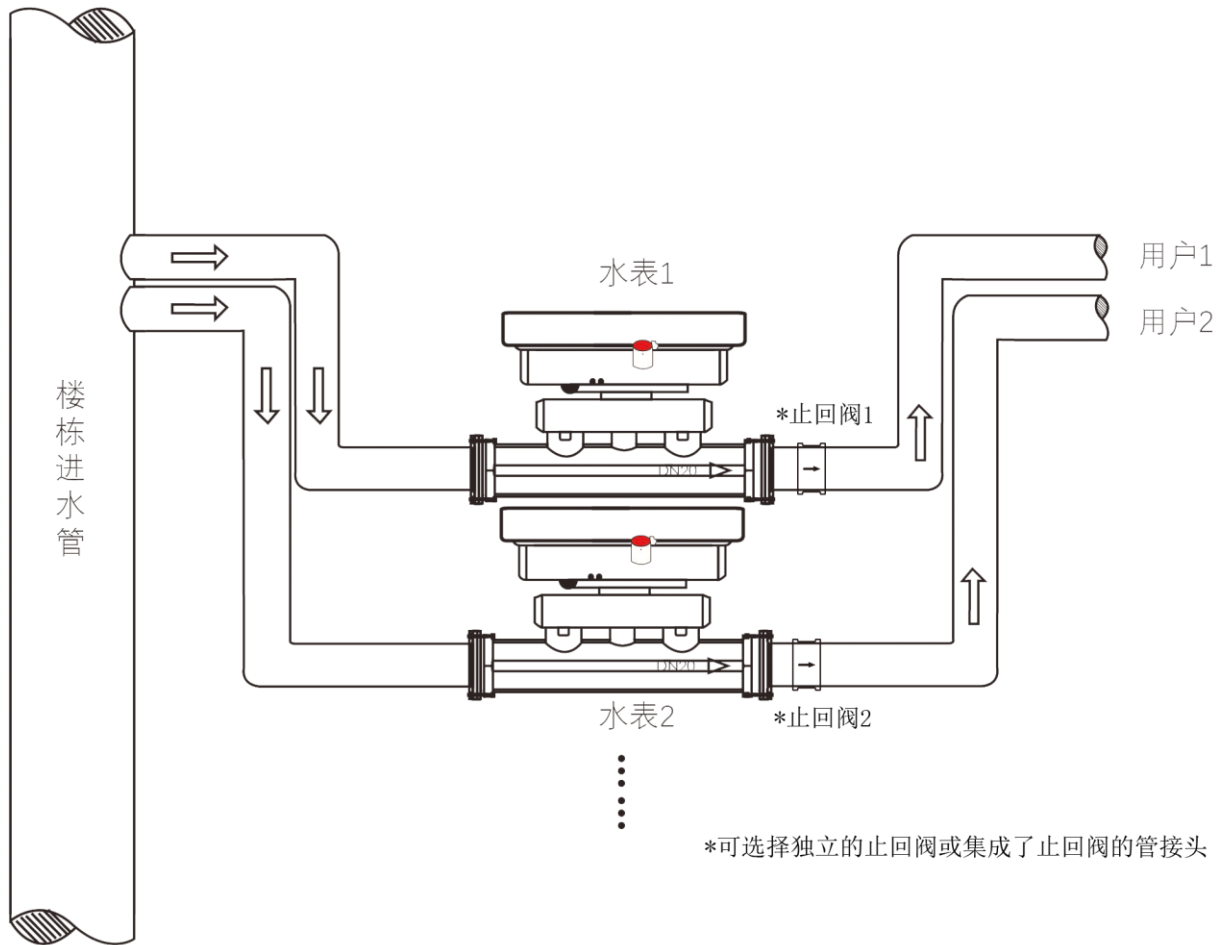
★ **特别提醒：**已安装完毕的超声水表，在冬天结冰的条件下，为防止管道被冻裂可能导致的超声传感器损坏，请至少打开一侧的阀门（水表前的阀门或者用户室内的进水阀、水龙头）。尤其是无人居住或不用水的情况，这点特别重要。

超声水表由于其测量原理不同于机械水表，管道内不能是空管或积累较多的气泡，否则会导致超声信号无法传输，造成表不计数或者计量不准。

同时，为防止由于管路中水压的变化，导致留存在测量管段中的水来回波动，可能影响表的正常工作，**强烈要求在超声水表的出水端加装止回阀。**

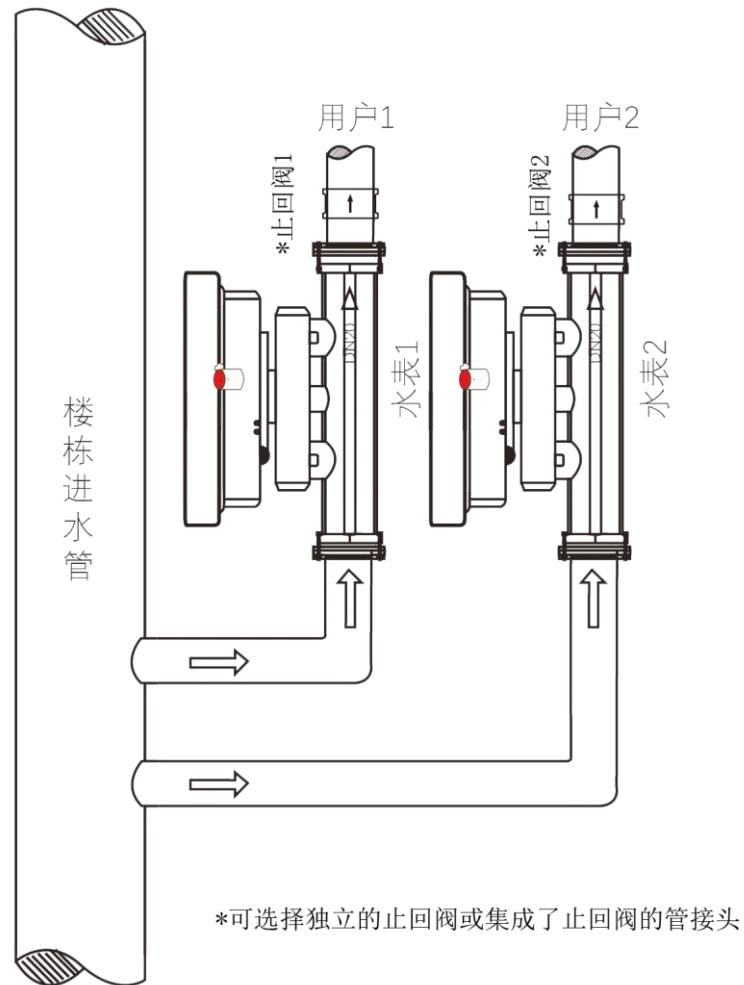
基于以上原因，建议的安装方式如下：

水平安装



水平安装时，建议如下安装，将管路做成“U”型。在此情况下，处于低处的超声水表管段内能保持满管。

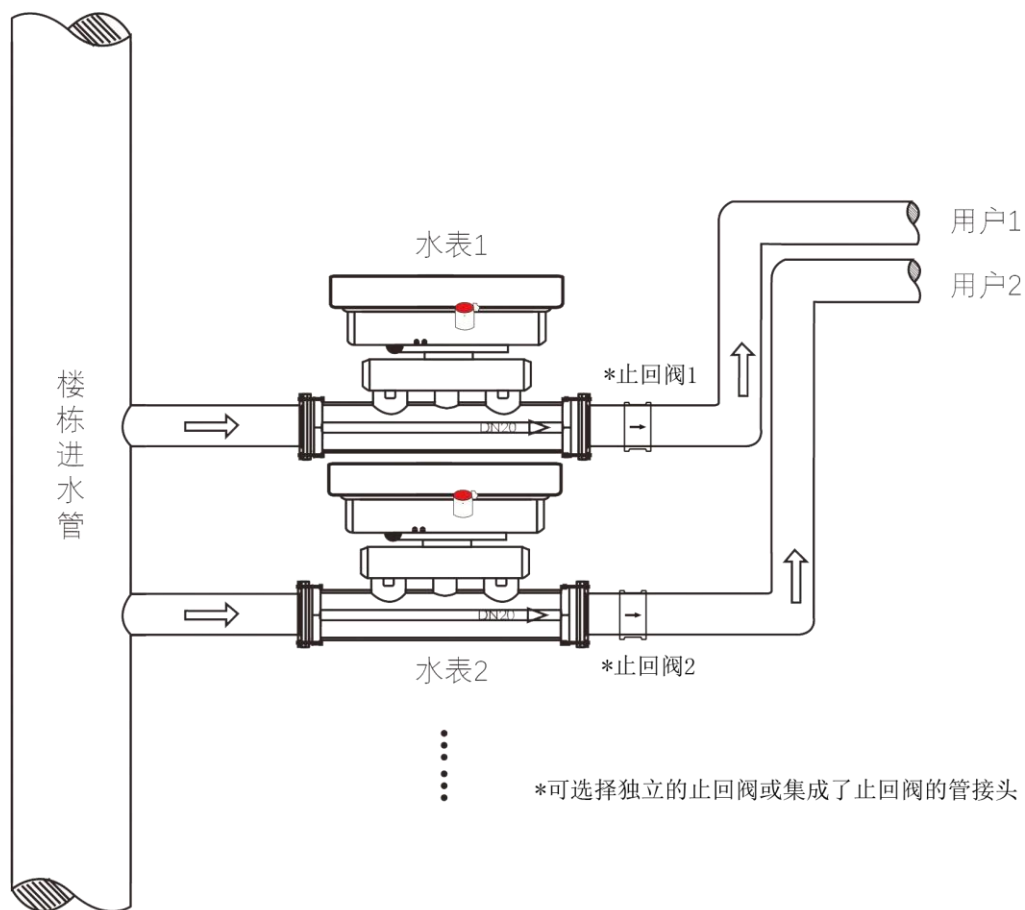
垂直安装



垂直安装时，如上图所示，水流方向在水表处为下端进水，上端出水。在此情况下，有水流经时，能避免气泡集聚在水表测量管道内。

妥协的安装方式（水平）

受现场客观条件限制，确实难以实施推荐的水平安装条件时，至少要按下图的方式安装



图中，水表前的管段可以和水表本体平行（相比推荐方式，取消了直角弯折的结构），但水表后端管路必须布局成如图所示，由此避免气泡在管道中集聚。

3. 安装前的注意事项

- (1) 安装超声水表前必须彻底清洗管道，避免碎片损坏水表；
- (2) 超声水表属于比较贵重精密仪表，拿起放下时必须小心，禁止直接提拽表头或传感器线；严禁靠近较高温度热源（如电气焊，防止电池爆炸伤人以及损坏仪表）；
- (3) 超声水表安装位置应特别注意，应避免水表安装在管道的上端（会有气泡在管段内），避免安装在靠近弯头处（会产生旋涡流），应远离泵等设备（会引起脉动流）；
- (4) 超声水表的上下游处的连接管道应与水表口径大小一致，不能缩径；
- (5) 超声水表的表体上箭头所指的方向为水流方向，不得装反；
- (6) 建议超声水表的表前装有相应口径的过滤器；表前和表后装有相应口径的阀门且其能够与表体分离，便于今后的维护和检修。

4. 常见的错误安装示例

1)、当表垂直安装时，一定要安装在水流向上的直管道上，因为水流朝下的管道受地心的引力作用下会造成管道内水无法充满的现象，此时会导致表计量不准甚至造成不计量（如图 C 所示）。

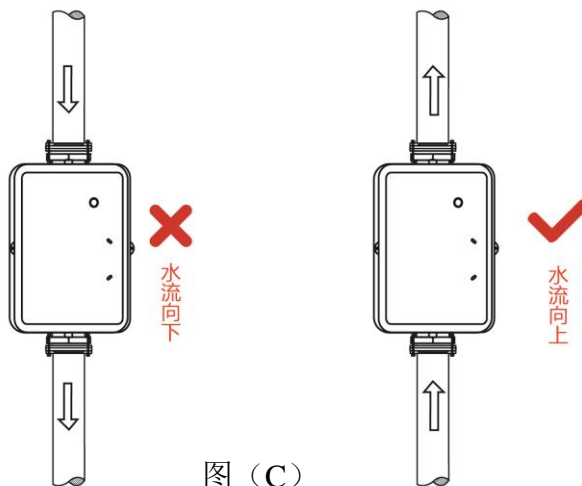


图 (C)

2)、当安装在“U”型管处时，请将表安装在最低处，因为管道在高处的地方可能会聚集空气，造成表计量不准或不计量（如图 D 所示）。

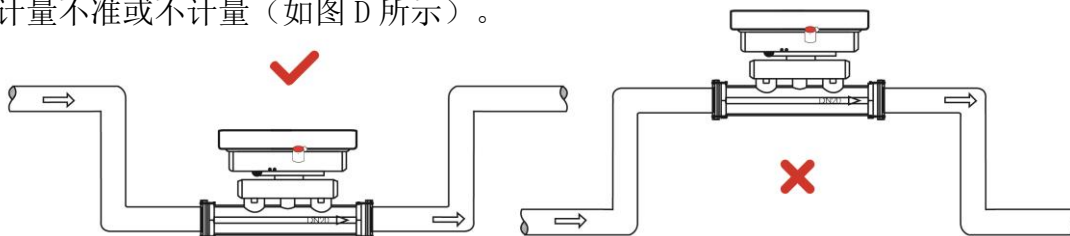


图 (D)

3)、当表安装在弯管处时，必须保证前直管距离 ≥ 5 倍管径、后直管 ≥ 3 倍管径，否则有可能会造成表计量不准（如图 E 所示）。

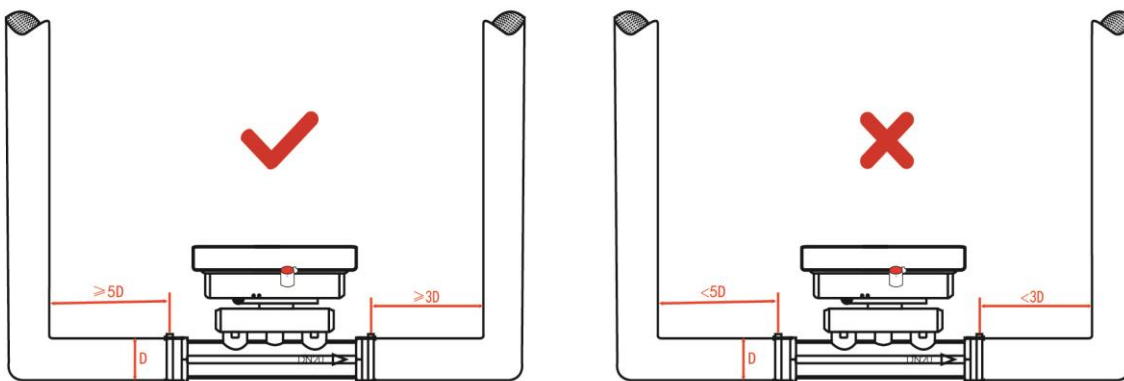


图 (E)

4)、当表前安装阀门或其他物件时，必须保证表和此物件之间留有 ≥ 5 倍直径的距离，否则可能会造成表计量不准；（如图 F 所示）

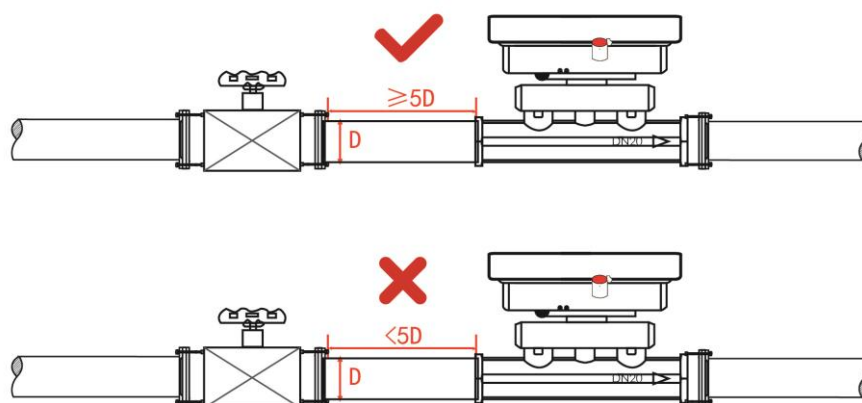


图 (F)

5. 接线方式

●电源线

默认为内置锂电池供电，无需额外电源线

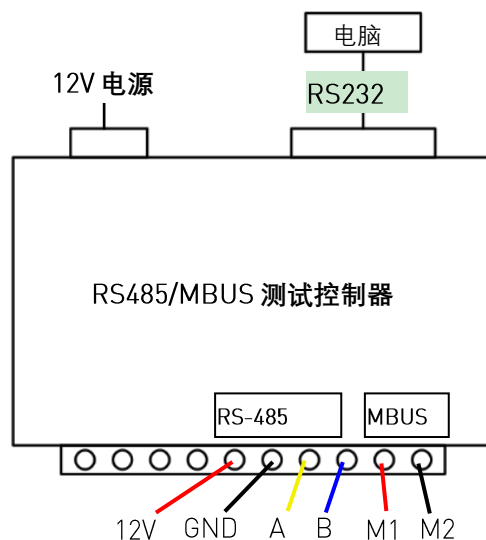
外供电模式（可选），红色导线连电源正极，黑色连电源负极，电压 DC 12V；

●通讯线


MODBUS 通讯模式：直接将两根通讯线连接至 MODBUS 总线即可，无需区分正负极；

485 通讯模式：表上引出有 4 根导线分别为：A（黄）、B（绿）、地（黑）、电源（红，DC 12V），对应接好（注意区分极性，接错可能烧毁）；

接线图



6. 日常维护

- (1) 超声水表使用前必须对当前状态进行检查；
- (2) 超声水表上的铅封不能损坏，如果损坏生产厂商将不再承担质量和准确度保证；
- (3) 超声水表使用内置锂电池供电，运行时间可达 6 年。当电池寿命将尽或虽不到 6 年但液晶屏显示  符号（提示电压不足），即及时通知售后人员，以免影响其正常工作；

7. 常见故障分析及排除

编号	错误类型	错误原因	处理方法
1	电池故障	电池欠压或连接不良	检查连接插头、更换电池
2	空管故障	管段内无水或水没有充满管段	管段内充满水，并排除气泡
3	逆流故障	管段进水端与出水端装反	按照标示的水流方向安装
4	超量程	当前瞬时流量过高	降低流量或更换对应量程的表
5	EE 故障	EE 存储器失效	联系厂家技术人员
6	传感器	超声传感器故障	联系厂家技术人员

六、装箱清单

序号	名称	单位	数量
1	超声水表	只	1
2	管接头（含连接螺母、密封垫圈）	套	1
3	产品说明书	份	1
4	产品合格证	份	1

七、运输与储存

1. 仪表运输过程中需小心轻放，避免剧烈冲击。
2. 储存环境温度（-10~50）℃，相对湿度小于 80%，防止强电磁场作用和阳光直射。
3. 码存的产品离地面至少 30cm，距离四壁至少 1m，离采暖设备不少于 2m。
4. 仓库保持干燥，没有腐蚀性物品、气体及危险品。

八、保修条款

超声水表自发货之日起**默认整机一年内免费保修**，但下列情况导致的损坏则不予保修：

- 1) 超声水表的各部件封印标志被开启、破坏；
- 2) 超声水表的各部件被人为破坏；
- 3) 超声水表的各部件遭受暴晒、水淹、冰冻和化学污染；
- 4) 安装前未清理管道或管道内杂质过多，导致流量传感器损坏；
- 5) 因未选用适合的产品型号而造成的故障和损害。
- 6) 未正确安装
- 7) 非正常使用环境

注意：

建议您在使用产品之前仔细阅读本资料。

希望您经常和我们联系，索取最新资料，因为我们的产品在不断更新和完善。