

WD Series Ultrasonic Water Meter

DN15-DN40

Instruction Manual for Installation and Use



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Welle Digital Technology Co., Ltd.

Important Reminder

Please read this instruction manual carefully before installation. This instruction manual is mainly aimed at training professionals, so it does not include basic installation steps. In case of any changes to the product model and appearance, please refer to the actual product on site. This instruction manual is also applicable without affecting the product function description. If you need to know the detailed changes, please contact our company. The copyright of this instruction manual belongs to Welle Digital Technology Co., Ltd., and our company reserves the right of final interpretation of this instruction manual. Please operate strictly in accordance with this instruction manual to avoid any losses to your relevant rights and interests.

- ▶ This product is a precision measuring instrument and has been strictly verified before leaving the factory. Please operate it by professional personnel ;
- ▶ If this product fails to operate properly or requires maintenance, please contact our company or our officially authorized dealers ;
- ▶ This product is a precision measuring instrument. Please do not drop it or subject it to impacts.

Unless otherwise specified, the parameters of the products delivered from the factory are set as default values. If you have any special requirements, please state them when placing an order.

Quality Assurance:

- ▶ The design and production are carried out in compliance with the national standards of the People's Republic of China: GB/T 778.1-2018-GB/T 778.5-2018 "Cold Water Meters and Hot Water Meters for Drinking Water", CJ/T434-2013 "Ultrasonic Water Meters", and CJ266-2008 "Safety Rules for Cold Water Meters for Drinking Water" ;
- ▶ The ex-factory verification is based on the National Metrological Verification Regulation of the People's Republic of China, JJG162-2019 "Verification Regulation of Cold Water Meters for Drinking Water" ;
- ▶ Certificate of Approval for Type of Measuring Instruments of the People's Republic of China 2019F154-37 ;
- ▶ Quality standard system: GB/T 19001-2016 / ISO9001:2015 standard ;
- ▶ Environmental management system: GB/T 24001-2016 / ISO14001:2015 standard ;
- ▶ Measurement management system: GB/T 19022-2003 / ISO10012:2003 standard.

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1 Product Introduction

1.1 Product Features

- ▶ Low starting flow rate;
- ▶ Installation at any angle;
- ▶ Ultrasonic signal quality detection;
- ▶ Water temperature detection and low-temperature alarm;
- ▶ It complies with the requirements of the drinking water standard;
- ▶ Magnetic buttons, and the whole machine is designed with an IP68 protection rating ;
- ▶ No moving parts, no wear and tear, enabling long-term stable operation ;
- ▶ It is compatible with communication protocols such as GB/T26831, CJ/T188, and Modbus RTU.

1.2 Technical Parameters and Characteristics

1.2.1 General Situation

Accuracy Class	2 level
Turndown Ratio(Q3: Q1)	250:1 (80:1、100:1、160:1、400:1 customizable)
Maximum Flow Reading(m3)	99999.99999
Maximum Working Pressure	1.6MPa (1.0MPa)
Temperature Class	T50 (T30 customizable)
Data Storage	Daily Record (480 pieces) , Monthly Record (36 pieces) , annual record (16 pieces)
Protection Grade	IP68
Power Supply	3.6V lithium battery (24V DC customizable)
Environmental Grade	O level
Electromagnetic Environment Level	E1 level (E2 level optional)
Heat (cold) Carrier	Fill the pipeline under test with water
Communication Method (optional)	M-Bus、wM-Bus、RS485、LoRa、Pulse Output、NB-IoT、TTL
Installation Method	At any angle

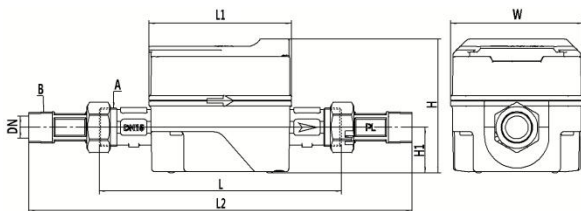
1.2.2 Flow Parameters

Nominal Diameter DN (mm)	15	20	25	32	40
Maximum Flow Rate Q4 (m ³ /h)	3.125	5	7.875	12.5	20
Common Flow Rate Rate Q3 (m ³ /h)	2.5	4.0	6.3	10.0	16.0
Transition Flow Rate Q2 (m ³ /h)	0.016	0.026	0.04	0.064	0.102
Minimum Flow Rate Q1 (m ³ /h)	0.01	0.016	0.025	0.04	0.064
Pressure loss Rating Δp	40				

1.2.3 Product Dimension

Nominal Diameter D N (mm)	15	20	25	32	40
L (mm)	165/110 *	190/130/195 *	225/260 *	230/260 *	245/300 *
L1 (mm)	97	97	97	97	97
L2 (mm)	259/204	294/234/299	345/380	350/380	373/428
H (mm)	91	91	91	128	139
H1 (mm)	31	28	25	29	36
W (mm)	90	90	90	90	90
Thread of the meter A	G3/4B	G1B	G1 1/4B	G1 1/2B	G2B
Union thread B	R1/2	R3/4	R1	R1 1/4	R1 1/2

Note: The first digit of L is the default length.



1.2.4 Identification Instructions

Communication Method Identifiers

M-Bus ---- M-Bus



----pulse output

M-Bus_{wireless} ----Wireless M-Bus



----RS485

LoRa ----LoRa



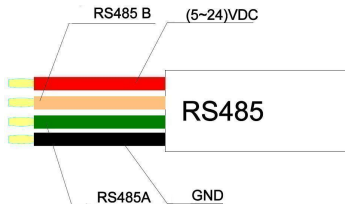
----NB-IoT



----TTL

Communication Line Sequence Identification

RS485The wire sequence is as follows:



Note: When using external power supply (24VDC), the red wire should not be connected.


Power Supply Interface Identification

The default power supply is from a 3.6V lithium battery without identification. The identification of the external 24VDC power supply is as follows:

24VDC

2 Liquid Crystal Display

The liquid crystal display interface is divided into single-screen menu display, circular menu display and ordinary menu display. The magnetic switch can be used to switch between display items within the same menu.

Usage method of the magnetic switch: Touch  at the position of the icon.

2.1 Liquid crystal display interface

➤ Single-screen menu display

When in single-screen menu display mode, the first line of the liquid crystal display always shows the integer part of the forward cumulative flow. The second line, by default, shows the decimal part of the cumulative flow (or the instantaneous flow). The magnetic switch can be used to switch the display content of the second line successively, as shown in the following figures.



Forward cumulative flow (default display)



Cumulative flow

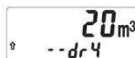
Instantaneous flow



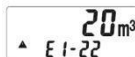
Cumulative flow

Water temperature (Unit: °C)

2.2 Fault Alarm Display



Empty pipe alarm



Transducer fault alarm



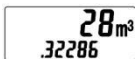
The water temperature is too low (An alarm is triggered when the temperature falls below 4°C.)

Channel (1/2/3/4)

2.3 High Precision Menu Display



Forward cumulative flow (default display)



Reverse cumulative flow



Water temperature
Instantaneous flow



Full-screen display



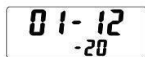
Primary address
Battery voltage



Secondary address



Month - Day
Year



Hour - Minute
Second



Cumulative working hours
Cumulative failure time



Major version number of the main program
Version number of flow correction



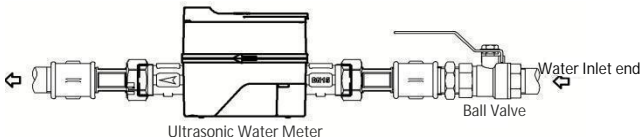
Time difference between downstream and upstream



Full screen display

3 Typical Installation and Maintenance Guide

3.1 Typical Installation Diagram



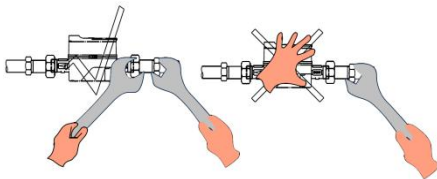
3.2 Installation Precautions

To ensure safety and reliability, please carefully read and master the following key points before installation:

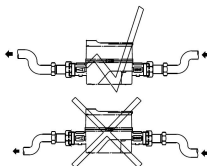
- When using this product, you must comply with the working conditions indicated on the parameter label. Otherwise, it may lead to danger, and our company will not assume the warranty obligation;
- When carrying out construction at locations with explosive and flammable substances, effective protective measures should be taken in accordance with professional protection regulations. When installing, it is strictly prohibited to touch the pipe openings with your hands to avoid cutting or crushing your fingers;
- It is strictly prohibited to install it in places with toxic, irritating, or corrosive gases, liquids, or dust;
- When installing, confirm that there are no potential hazards in the surrounding environment that could cause harm to the human body; Please pay attention to the size of the water meter and check whether there is enough space for installation and maintenance;
- The pipeline must be thoroughly flushed before installation;
- Only trained personnel are allowed to install and remove the product;
- Installation and removal of the water meter are only permitted when the equipment is in a pressure-free state;
- The water meter is not equipped with lightning protection measures; therefore, lightning protection measures should be in place when wiring through buildings;
- The bus must utilize multi-strand shielded twisted pair cables with a wire diameter of not less than 0.75 mm².

3.3 Several Common Incorrect Installation Methods

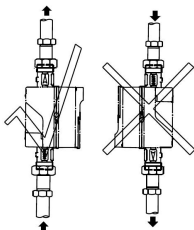
- When installing, use a wrench to tighten the connecting pipe nut. Do not hold the plastic box body by hand while using the wrench to tighten the nut, as the box body is made of plastic, and damage to it should be avoided.



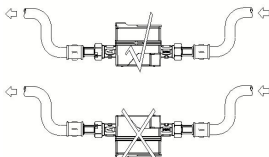
- When the water meter is installed at the "U"-shaped pipe section, it should be installed at the lowest point. This is because air may accumulate at the higher parts of the pipeline, which could cause the water meter to stop measuring or measure inaccurately.



- When the water meter is installed vertically, it must be installed on a straight pipeline with the water flowing upwards. If it is installed on a pipeline with the water flowing downwards, the pipeline section may not be filled with water, which will affect the metering accuracy and may even result in the inability to measure the water flow.



- When installing the water meter horizontally, ensure that the LCD face is oriented upwards, as installing it with the LCD face downwards can affect the battery's service life.



- When installing a water meter, it is necessary to install a check valve and a ball valve before the meter. After the water meter is installed and if the end user has not used water, the valves before and after the water meter should be closed to keep the water in the pipe section of the water meter in a static state. Alternatively, the valve before the meter can be closed, and the water in the rear pipeline can be drained to avoid pressure fluctuations in the pipeline network causing the water in the pipeline to be in a fluctuating state, which could lead the water meter to register these minor fluctuations.
- When using a water meter, it is essential to ensure that the valve before the meter is fully open;
- When installing a water meter, it is prohibited to install a water pump behind the meter. The water pump in front of the meter must maintain a straight pipe section ten times the diameter of the pipe; simultaneously, it should be kept away from equipment with interfering properties such as large generators, electric motors, and frequency converters.
- During the installation of a water meter, it is advisable to avoid reducer installations as much as possible. If a reducer installation is unavoidable, the section before the meter must meet the requirement of a straight pipe ten times the diameter of the pipe. A sudden transition from a large-diameter pipe to a smaller one, especially when a water meter is fitted on the smaller pipe, can cause significant impact on the water meter and valves, thereby affecting their lifespan and accuracy. In such installation scenarios, it is crucial to ensure that valves are opened and closed evenly and gently.
- The installation position of the antenna should be as far away as possible from large metal surfaces or dense metal grids; the installation position of the antenna should preferably not be less than 50 centimeters above the ground; the installation position of the antenna should avoid being submerged in water, and should be kept clear of frost, wet mud, and large areas of water vapor.
- In cases where space is ample, the requirement of ten times the pipe diameter straight section before and five times after should be satisfied, and the water must completely fill the pipeline being measured.

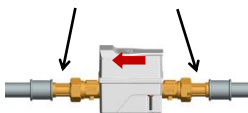
3.4 Installation Steps

- Cut the water supply pipe section at the location where the meter is to be installed, leaving space for the meter and the union joint;
- Tighten the union joint onto the cut section of the water supply pipe;
- Align and install the meter with the connecting accessories, using the provided sealing ring between the meter and the union joint, as shown in the diagram:

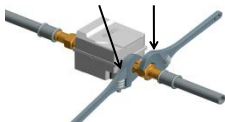
1. It is mandatory to use the EPDM rubber sealing ring that comes with the union joint.



2. First, hand-tighten the union joints at both ends (pay attention to the direction of water flow) to ensure that the sealing gasket is compressed.



3. Use an adjustable wrench to secure the meter in place.



4 Product Hazardous Substance Content Statement

Component Names	Toxic and Hazardous Substances or Elements					
	Lead Pb	Mercury Hg	Cadmium Cd	Hexavalent Chromium Cr (VI)	Polybrominated Biphenyls PBB	Polybrominated Diphenyl Ethers PBDE
Complete Machine	×	○	○	○	○	○

○: It indicates that the content of this toxic and hazardous substance in all homogeneous materials of this component does not exceed the limit requirements specified in the SJ/T 11363-2006 standard.

×: It indicates that the content of this toxic and hazardous substance exceeds the limit requirement specified in the SJ/T 11363-2006 standard in at least one homogeneous material of this component. It also indicates compliance with the limit requirements stipulated by the EU RoHS Directive 2011/65/EU.

Note:

- 1.This table indicates that the model of the product supplied by our company does not contain these substances.This table indicates that the model of the product supplied by our company does not contain these substances.
- 2.The interpretation of the component definitions in this table is reserved by our company.
- 3.If this product requires disposal, it can be returned to our company for unified disposal, or it can be handed over to a qualified recycling company for processing.

5 Warranty Promise

To ensure the protection of your legal rights and interests and to avoid unnecessary losses, please carefully read the following content:

- **Free Warranty:** From the date of your purchase (as indicated by the official purchase invoice), within the warranty period, provided that the lead seal remains intact, if the product malfunctions or fails to operate normally due to quality issues, our company is responsible for free repair or replacement. However, we do not cover the costs associated with on-site service;
- **Exemption from Warranty Obligations:** Our company shall not be held responsible for providing warranty services for malfunctions, abnormal operations, or damages resulting from the following circumstances, and repair services will be chargeable;
 - 1.Damage caused by misuse, self-disassembly, improper repairs, or evidence of intentional damage;
 - 2.Damage caused by misuse, self-disassembly, improper repairs, or evidence of intentional damage;
 - 3.Unauthorized breaking of the product's lead seal;
 - 4.Accidental factors (such as handling, collisions, etc.);
 - 5.Damages caused by other force majeure events such as natural disasters (e.g., earthquakes, fires, etc.).
- **After-Sales Service:** Should a malfunction occur during normal use of the product, please contact the dealer or our company's after-sales service department to ensure prompt assistance is provided to you.
- **Regarding Batteries:** When the product displays a "low battery" message (indicating a remaining lifespan of 180 days from the date of display) or when the battery replacement period marked on the product is reached, the battery should be replaced within this timeframe to prevent the product's measurement accuracy from being affected by low battery voltage. The lifespan of the communication battery depends on the frequency of data uploads.

Important Notice: Our company has made every effort in the design of the provided products to ensure the reliability of measurement data, but we cannot guarantee that all products will be free from issues. In the event of measurement data loss due to product malfunction or other reasons, our company will endeavor to assist customers in data recovery. However, we do not assume

responsibility for losses incurred as a result of measurement data loss. Users are advised to regularly read and save their measurement data.

Packing List

Mame	Model	Quantity	Remarks
Ultrasonic Water Meter	WD	1	*
Instruction Manual		1	
Certificate of Conformity		1	

*Indicated as Main Components

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