WD Series Ultrasonic Water Meter

DN50-DN600

Installation and User Manual

新疆西部联合数字产业发展有限公司

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 undergone strict calibration before leaving the factory. Please ensure that it is operated by qualified personnel.
- This product is a precision measuring instrument. Please do not drop or impact it.
- Do not modify the length of any cables, as this may affect the product's performance.
- If the product is not functioning properly or requires maintenance, please contact our after-sales service department or an authorized distributor officially authorized by our company.

Unless otherwise specified, the factory default parameters apply. If you have special requirements, please specify them when placing your order.

Quality Assurance：

- Designed and manufactured in accordance with the national standards of the People's Republic of China: GB/T 778.1-2018 to GB/T 778.5-2018 "Cold and Hot Water Meters for Drinking Water," CJ/T 434-2013 "Ultrasonic Water Meters," CJ 266-2008 "Safety Rules for Cold Water Meters for Drinking Water";
- Factory calibration based on the National Metrology Calibration Procedure of the People's Republic of China, JJG 162-2019 "Calibration Procedure for Cold Water Meters for Drinking Water";
- People's Republic of China Metering Equipment Type Approval Certificate 2019F153-37;
- Quality management system in accordance with GB/T 19001-2016 / ISO 9001:2015 standard;
- Environmental management system in accordance with GB/T 24001-2016 / ISO 14001:2015 standard;
- Measurement management system in accordance with GB/T 19022-2003 / ISO 10012:2003 standard.

Contents

1 Product Introduction

1.1 Product Features

- Low starting flow rate.
- Installable at any angle.
- Ultrasonic signal quality detection.
- Water temperature detection, low-temperature alarm.
- Magnetic buttons, with the entire device designed to be IP68.
- No moving parts, no wear, ensuring long-term stable operation.
- Supports communication interfaces such as infrared, M-Bus, RS485, and wireless.
- Communication protocols compatible with GB/T 26831, CJ/T 188, Modbus RTU.
- DN50-DN300 products can be optionally equipped with an internal pressure sensor, while DN350-
- DN600 products can be optionally equipped with an external pressure sensor for monitoring pipeline pressure.

1.2 Technical Parameters and Characteristics

1.2.1 Overview

Accuracy Class		2nd Class
Flow Range Ratio (Q3:Q1)		250:1 （100:1、160:1、400:1、500:1 customizable ）
Maximum Flow Reading (m^3)	DN50-DN100	9999999.99999
	DN125-DN600	99999999.99999
Maximum Working Pressure		1.0 MPa （1.6MPa customizable）
Temperature Class		T50 （T30 customizable）
Upstream Flow Field Sensitivity Class		U3
Downstream Flow Field Sensitivity Class		D0
Data Storage		Daily record (480 entries), Monthly record (36 entries), Annual record (16 entries)
Protection Class		IP68 (when dual power supply, protection grade is IP65)
Power Supply		3.6V lithium battery (24V DC, 220V AC customizable)
Environmental Class		Class O
Electromagnetic Environment Class		E2 Class (E1 Class optional)
Heat (Cold) Carrier		Water-filled measured pipeline
Communication Method (Optional)		M-Bus, wM-Bus, LoRa, RS485, Pulse Output, 4-20mA , NB-IoT
Installation Method		Installable at any angle

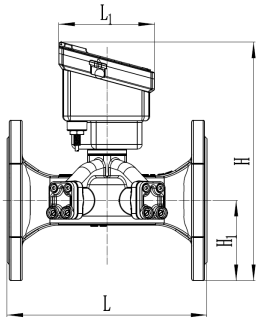
1.2.2 Flow Parameter

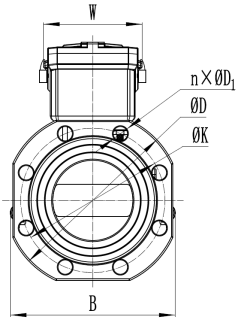
Nominal diameter DN (mm)	50	65	80	100	125	150	200
Maximum flow rate Q4 (m³/h)	31.25	50	78.75	125	200	312.5	500
Common flow rate Q3 (m³/h)	25	40	63	100	160	250	400
Boundary flow rate Q2 (m³/h)	0.16	0.256	0.4032	0.64	1.024	1.6	2.56
Minimum flow rate Q1 (m³/h)	0.1	0.16	0.252	0.4	0.64	1	1.6
Pressure loss rating	25	25	25	25	25	25	25

Nominal diameter DN (mm)	250	300	350	400	500	600	
Maximum flow rate Q4 (m³/h)	787.5	1250	1250	2000	3125	5000	
Common flow rate Q3 (m³/h)	630	1000	1000	1600	2500	4000	
Boundary flow rate Q2 (m³/h)	4.032	6.4	6.4	10.24	16	25.6	
Minimum flow rate Q1 (m³/h)	2.52	4	4	6.4	10	16	
Pressure loss rating	25	25	10	10	10	10	

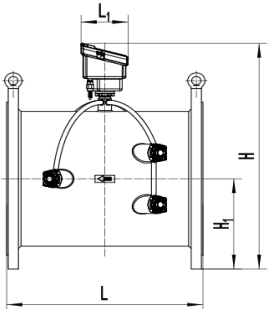
1.2.3 Product Size

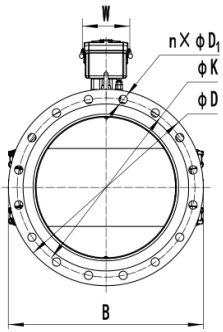
DN50-DN150 (Excluding DN125)





DN125-DN600 (Excluding DN150)





Pressure Class	DN (mm)	Dimension (mm)								
		L	L1	H	H1	W	B	ΦD	ΦK	n×ΦD1
PN10 /PN16	50	200	120	240	60	123	155	165	125	4×Φ18
	65	200	120	255	70	123	170	185	145	4×Φ18
	80	225	120	280	90	123	185	200	160	8×Φ18
	100	250	120	300	100	123	205	220	180	8×Φ18
	125	250	120	380	125	123	250	250	210	8×Φ18
	150	300	120	325	130	123	260	285	240	8×Φ22
PN10	200	350	120	470	170	123	340	340	295	8×Φ22
	250	450	120	525	198	123	395	395	350	12×Φ22
	300	500	120	575	223	123	445	445	400	12×Φ22
	350	500	120	635	253	123	505	505	460	16×Φ22
	400	600	120	690	283	123	565	565	515	16×Φ26
	500	600	120	790	335	123	670	670	620	20×Φ26
	600	800	120	895	390	123	780	780	725	20×Φ30
PN16	200	350	120	470	170	123	340	340	295	12×Φ22
	250	450	120	530	203	123	405	405	355	12×Φ26
	300	500	120	580	230	123	460	460	410	12×Φ26
	350	500	120	640	260	123	520	520	470	16×Φ26
	400	600	120	695	290	123	580	580	525	16×Φ30
	500	600	120	815	358	123	715	715	650	20×Φ33
	600	800	120	925	420	123	840	840	770	20×Φ36

1.2.4 Identification Description

Communication Method Identification

M-Bus ----M-Bus

Pulse ----脉冲输出

M-Bus wireless ----Wireless M-Bus

4-20mA ----4-20mA

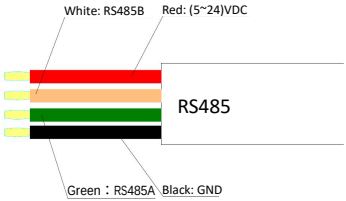
LoRa ----LoRa

NB-IoT ----NB-IoT

RS485 ----RS485

Communication wire sequence identification

The RS485 wire sequence is as follows:



Note: When external power supply (24V DC or 220V AC) is used, the red wire is not connected.

Power supply interface identification

There is no identification for the default 3.6V lithium battery power supply. The identification for external power supply (220V AC or 24V DC) is as follows:

220VAC,50Hz

24VDC

2 Liquid Crystal Display

2.1 Liquid crystal display interface

Liquid crystal display interface is divided into single-screen menu display and general menu display;

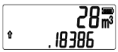
DN50-DN300 caliber ultrasonic water meter with a magnet to contact the magnetic switch icon on the cover of the product box.

DN50-DN300 caliber ultrasonic water meter can be switched to each display item in the same menu by touching the magnetic switch icon on the cover of the product box with magnet.

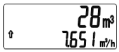
DN350-DN600 caliber ultrasonic water meters use photosensitive switches to switch the displays in the same menu.

➢ Single-screen menu display

When a single screen menu is displayed, the first line of the LCD always shows the positive cumulative flow rate, and the second line of the instantaneous flow rate, temperature, or pressure can be switched using a magnetic switch, as exemplified in the figure below:

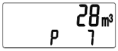


Forward cumulative flow (default display)



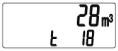
Cumulative flow

Instantaneous flow rate



Accumulated flow

Pipe pressure (unit: kPa, displayed only with pressure module)

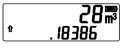


Accumulated flow rate

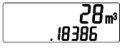
Water temperature (Unit: ℃)

➢ Standard Menu Display

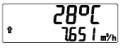
The magnetic switches can be utilized to switch between the various LCD displays, an example of which is shown below:



Forward cumulative flow (default display)

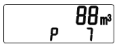


Reverse cumulative flow



Water temperature

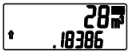
Instantaneous flow rate



Pipe pressure (in kPa, displayed only with pressure module)

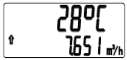
Full screen display

High-precision Menu Display

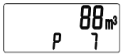


Forward cumulative flow (default display)

Reverse cumulative flow



Water temperature
Instantaneous flow rate

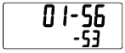


Pipe pressure (in kPa, displayed only with pressure module)

Primary Address
Battery Voltage

Secondary Address

Month-Day
Year



Hour-Minute
Second

Accumulated Runtime
Accumulated Alarm Time

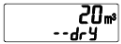
Main program version number
Flow correction version number

Difference in time between upstream and downstream

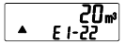
Caliber parameter
Transducer signal strength

Full screen display

2.2 Fault Alarm Display

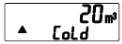


Empty Pipe Alarm



Transducer Fault Alarm

Sound Channel (1/2/3/4)



Water Temperature Below 4℃, Low Water Temperature Alarm

Flow Overload Alarm

3 Installation and Connection Requirements

3.1 Important Installation Notes

- Before installing the instrument, the pipeline should be thoroughly cleaned to prevent debris such as stones from remaining inside.
- It is recommended to install valves before and after the instrument to facilitate future maintenance.
- The instrument must be installed strictly at the designated position as per professional design; unauthorized relocation is strictly prohibited.
- Calibration, maintenance, component replacement, and repair of the instrument must be performed by professional technicians and only when the equipment is in a depressurized state.
- When using AC 220V power supply, an external power source must be equipped with fuse protection and a residual current protective device.
- Battery replacement must be carried out by professional personnel.
- The length of the instrument cables must not be altered.
- The instrument's sealing must not be damaged.

3.2 Installation and Connection Requirements

- The sealing gasket and the flange sealing surface should be thoroughly cleaned, with no scratches, spots, or any other defects that could affect the sealing performance. (Sealing gaskets should not be made from easily rusted metal materials.)
- The outer diameter of the sealing gasket should be smaller than the outer diameter of the flange sealing surface, and the inner diameter of the gasket should be slightly larger than the pipeline inner diameter. The difference between the two inner diameters is typically twice the thickness of the gasket, ensuring that after compression,the inner edge of the gasket does not extend into the pipeline, which could affect the water flow and the meter's measurement.The direction of water flow through the instrument must be consistent with the actual water flow direction in the pipeline.
- The pipeline and the instrument flange must be concentric, and the flange connection holes should be aligned before connecting.
- When installing a sealing gasket with a raised-face flange, ensure that the gasket is concentric with the pipeline.
- Avoid bending or jamming the bolts when tightening the nuts. If the back of the flange is rough, place a washer under the nut.

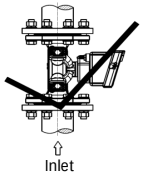
➢ To ensure even pressure on the sealing gasket, the bolts should be tightened symmetrically and evenly in 2-3 stages.

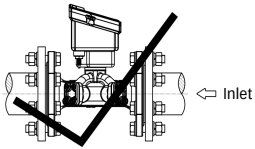
➢ If there is leakage at the pipeline connection, pressure must be reduced before replacing or adjusting the sealing gasket. Operating under pressure is strictly prohibited.

3.3 Instrument Installation Location

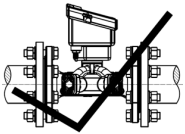
➢ If a valve is installed before the instrument, the valve must be fully opened when using the meter. When opening or closing the valve, it should be done slowly to prevent water hammer, which could damage the transducer.

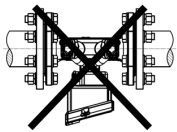
➢ The instrument should be installed on a vertical pipeline with upward (or slightly upward) water flow, followed by a horizontal pipeline. It is prohibited to install the instrument on a downward (or slightly downward) flowing pipeline to prevent the pipe from being incompletely filled with water, which could affect the measurement performance.



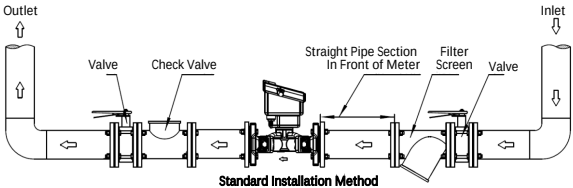


➢ The instrument must not be installed upside down.



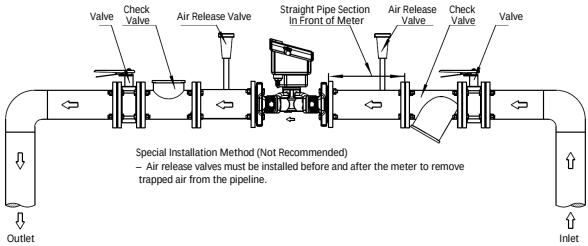


➢ When installing the instrument, a check valve must be installed before the meter. If space allows, the straight pipe section should be at least 10 times the pipe diameter before the meter and 5 times after it. At a minimum, the installation should meet the requirement of 3 times the pipe diameter before the meter and 0 times after it, ensuring that the measured pipeline is fully filled with water.

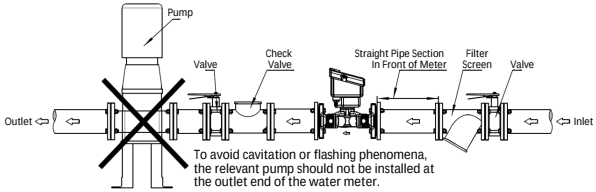


Standard Installation Method

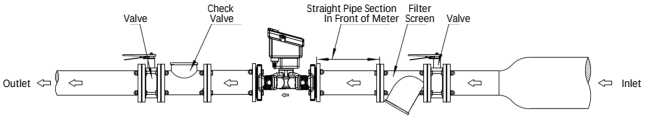
➢ The instrument should not be installed at the highest point of the pipeline to prevent air bubbles from accumulating and causing inaccurate measurements. If installation at a high point is unavoidable, an air release valve must be installed before the instrument. Additionally, the valve before the meter should be fully opened, while the valve after the meter can be used to adjust the flow.



➢ When installing the instrument, a water pump must not be installed after the meter. If a water pump is installed before the meter, a straight pipe section at least 10 times the pipe diameter must be maintained between the pump and the meter. Additionally, the instrument should be kept away from large generators, electric motors, frequency converters, and other equipment that may cause interference.



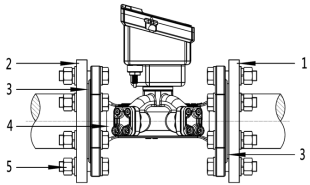
➢ When installing the instrument with a reducer, especially when a large-diameter pipe section suddenly transitions to a smaller diameter where the instrument is installed, significant impact may occur on the instrument, valves, and other components, affecting their lifespan and accuracy. In such cases, it is crucial to open and close the valves smoothly and evenly.



If there is a reducer pipe section before the meter, the valve must be opened and closed smoothly and evenly to avoid impact, which could damage the valve, filter, and meter. This is especially important in cases of reduced-diameter installation, as shown in the diagram, where the impact can be more significant.

- The antenna should be installed as far away as possible from large metal surfaces or dense metal meshes.
- The antenna should not be installed lower than 50 cm below the ground surface.
- The antenna should not be submerged in water and should be protected from frost, wet mud, and extensive water vapor.
- If the end user is not using water after the instrument is installed, the valves before and after the meter should be closed to keep the water inside the instrument's pipe section stationary. Alternatively, the valve before the meter can be closed, and the downstream pipeline can be drained to prevent pressure fluctuations in the network from causing minor water movement, which may affect measurement accuracy.

3.4 Installation Steps



1.Inlet Flange 2.Outlet Flange 3.Gasket

4.Ultrasonic Water Meter 5.Bolt Fastening Assembly

- Place one gasket each on the inlet and outlet flanges of the pipeline.
- Align the flow direction marked on the meter with the actual flow direction of the pipeline, then position the meter onto the pipeline.
- Connect the meter's flanges to the pipeline flanges using the bolt fastening assembly. Adjust the gasket position to ensure proper alignment with the flanges, then tighten the bolts securely to firmly install the meter onto the pipeline.

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:

(1) Free Warranty: Since the date of your purchase (based on the date of the official purchase invoice), within the warranty period, to ensure that the seal is intact under the premise that the product, if the product malfunctions or can not be used normally due to quality problems, the company is responsible for repair or replacement without compensation, but does not bear the costs associated with door-to-door service.

(2) Exemption of warranty obligation: Our company will not undertake the warranty obligation for the failure, abnormal work or damage caused by the following circumstances, and will have to pay for the repair.

a. The product exceeds the warranty period;

b. The use of the wrong, self-disassembly, improper maintenance and other reasons for product damage, or man-made traces of damage;

c. Open the product seal privately;

d. Accidental factors (handling, collision, etc.);

e. Other force majeure such as natural disasters (such as earthquakes, fires, etc.) caused by damage.

(3) After-sales service: When the product fails during normal use, please contact the dealer or our after-sales service department in order to provide you with timely service.

(4) About the battery: the replacement date of the battery is subject to the date on the product panel; if the product “battery power” message prompts, there are 180 days of service life from the date of display, the battery should be replaced during this period, so as not to affect the accuracy of the product metering due to undervoltage batteries; the communication battery life based on the frequency of 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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