

# XK-Ultrasonic water meter instruction manual

# Catalogue

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# **I. Overview**

The ultrasonic water meter produced by our company follows the national standard of the People's Republic of China GB/T 778-2018 "Drinking Cold Water Meter and Hot Water Meter", the industry standard of the People's Republic of China for urban construction CJ/T 434-2013 "Ultrasonic Water Meter", and the industry standard of the People's Republic of China for urban construction CJ/T 224-2012 "Electronic Remote Transmission Water Meter". This product adopts the difference between the propagation time of the ultrasonic pulse in the fluid in the downstream and the propagation time in the countercurrent to measure the fluid flow rate, so as to calculate the flow rate of the fluid in the pipeline, and compensated by the collected fluid temperature, which makes the metering more accurate. No mechanical moving parts in the meter body, no wear and tear, long service life, low maintenance costs. Supporting a variety of communication modes, it can realise the function of remote meter reading, which is convenient for centralized management.

## **II. Functional features**

1. Using picosecond-level high-precision metering chip, small starting flow, wide range, high metering accuracy, and can achieve drip metering.

2. The electronic components are fully sealed design, with waterproof, moisture-proof, dust-proof, dirt-proof, sand-proof and other characteristics.
3. It can store 24 monthly records, 360 daily records and 192 hourly records, and the data can be stored for a long time after power failure.
4. Real-time monitoring of battery, temperature and flow rate, with judgement, recording and alarm function when there are abnormal states such as power supply undervoltage, transducer abnormality, non-full pipe (empty pipe) in the pipeline. At the same time, the screen will display the corresponding prompts.
5. A variety of communication modes (infrared, RS-485, M-Bus, NB-IoT, LoRa, CAT.1, TTL, LoRaWAN, etc.) can be selected to achieve centralised meter reading and parameter setting.
6. Optional valve control function is available to achieve remote valve control.
7. The meter end supports remote online upgrade, continuously meets the new demand for water meters, and solves the user's worries.

### **III. Main technical parameters**

1. Flow range

performances		parametric				
Nominal calibre	range ratio	starting flow Q <sub>s</sub> (L/h)	Minimum flow Q <sub>1</sub> (L/h)	divided flow Q <sub>2</sub> (L/h)	Common Flow Rate Q <sub>3</sub> (L/h)	Overload flow rate Q <sub>4</sub> (L/h)
DN15	R250	2.4	10	16	2500	3125
DN20	R250	4	16	25	4000	5000
DN25	R250	6.4	25	40	6300	7875
DN32	R250	10.2	40	64	10000	12500
DN40	R250	16	64	100	16000	20000
performances		parametric				
Nominal calibre	range ratio	starting flow Q <sub>s</sub> (L/h)	Minimum flow Q <sub>1</sub> (L/h)	divided flow Q <sub>2</sub> (L/h)	Common Flow Rate Q <sub>3</sub> (L/h)	Overload flow rate Q <sub>4</sub> (L/h)
DN15	R400	2.4	6	10	2500	3125
DN20	R400	4	10	16	4000	5000
DN25	R400	6.4	16	25	6300	7875
DN32	R400	10.2	25	40	10000	12500
DN40	R400	16	40	64	16000	20000

## 2. Technical parameters

performances	parametric
Measured medium	Domestic water (other liquids to be customised) and filled pipes
Power supply	DC3.6V (disposable lithium battery)
Accuracy class	Class 2
Measurement range ratio	R250/R400
Nominal calibre	DN15~DN40
Maximum Allowable Working Pressure	1.6MPa
Environmental class	Class O
Temperature Rating	T30/T50/T90(optional)
Upstream flow field sensitivity class	U10
Downstream flow field sensitivity class	D5
Electromagnetic compatibility	E1 grade
Communication Interface	RS-485/M-Bus/IR/NB-IoT/LoRa/CAT.1/TTL/LoRaWAN(Optional)
Protection class	IP68
Keypad	Touch Key

### 3.Data recording

#### Type of record

Data Recording Interval	Number of data records	Recorded content
Monthly	24 records	Time, cumulative flow, maximum flow rate, minimum temperature, alarm event, water flow time
Daily	360 records	
Hourly Records	192 records	
Alarm Record	128 records	Alarm events, cumulative flow and time
Timed Freeze	120 records	Time, Cumulative Flow, Instantaneous Flow, Temperature
Instantaneous Freeze	24 articles	Time, Cumulative Flow, Instantaneous Flow, Temperature

#### Alarm events

No.	Alarm Events
1	Temperature sensor abnormality
2	Transducer or flow field abnormality
3	High temperature alarm
4	Low temperature alarm
5	Storage Abnormality Alarm
6	Leakage alarm
7	Burst Alarm
8	Empty pipe alarm
9	Reverse flow alarm

### 4.Display resolution and range

$Q_3$ (m <sup>3</sup> /h)	Corresponding calibre	cumulative flow		instantaneous flow	
		Resolution (m <sup>3</sup> )	Display range (m <sup>3</sup> )	Resolution (m <sup>3</sup> /h)	Display range (m <sup>3</sup> /h)
$Q_3 \leq 6.3$	DN15-DN25	0.001	0~999999	0.0001	0~99999
$6.3 < Q_3 \leq 16$	DN32-DN40	0.001	0~999999	0.0001	0~99999

#### IV. Display notes

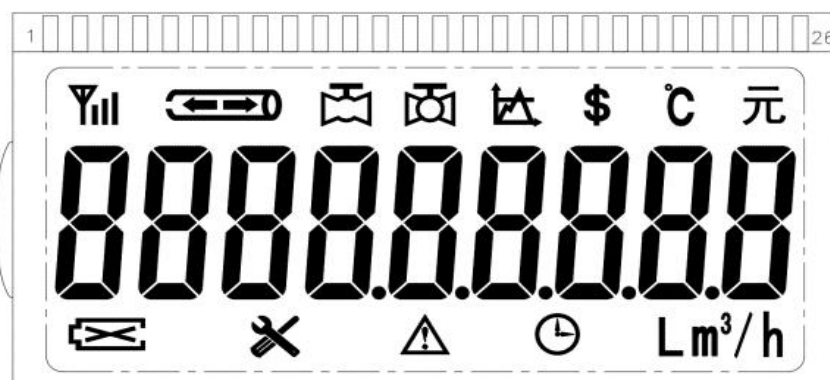















Fig. 1 Schematic diagram of the display

sign	Meaning
	Wireless signal strength or network status indication
	Empty pipe symbol (always on when there is water in the pipe, blinking when there is no water in the pipe)
	Downstream symbol (indicates that the flow of water in the pipeline flow in the positive direction)
	Reverse flow symbol (indicates the reverse flow of water in the pipeline)
	Valve open symbol (valve open is always on, open the valve is abnormal when blinking)
	Valve off symbol (valve off is always on, off the valve abnormal flashing)
	Pre-payment sign
°C	Temperature unit
元	Amount unit
	Battery undervoltage symbol
	Calibration mode mark
	Alarm symbol
	Time mark
Lm <sup>3</sup> /h	Flow rate unit

注：  : This symbol is used only when the wireless communication function is available.

 : This symbol is used only when the valve control function is available.

## V. External Dimensions

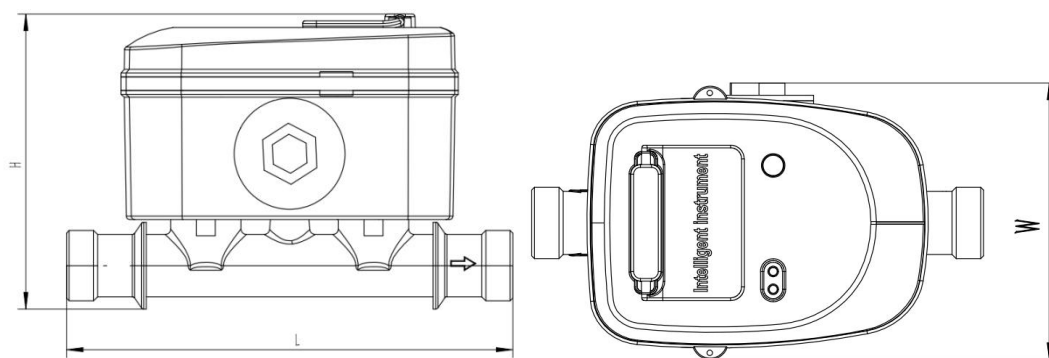










Figure 2 Schematic diagram of the LXCH-A

Nominal calibre	L (mm)	W (mm)	H (mm)	D (mm)
DN15	165	98	109	G3/4B
DN20	195	98	116	G1B
DN25	225	98	125	G1 1/4B
DN32	260	98	132	G1 1/2B
DN40	300	98	144	G2B

## VI. Operating instructions

The menu interface can be switched by short press of the key, and each menu interface is as follows:



No.	Menu name	menu display
1	Cumulative flow	
2	Instantaneous flow rate	
3	Table Address	
4	Running time	
5	Accumulated alarm time	
6	Current Purchase Amount	
7	Accumulated Purchase Amount	
8	Remaining amount	

Note:

1. No operation for 1 minute on the meter side will automatically restore to the "Accumulated Flow" interface.
2. The interface of "current purchase amount", "accumulated purchase amount" and "remaining amount" will be displayed only after the prepayment function is enabled.
3. Ultrasonic water meter with NB-IoT communication mode can trigger data reporting by pressing the button for about 4 seconds in the "Meter Address" interface and releasing it after seeing the "UPLOAD" character on the display.

## VII. Installation instructions

### (I) Selection of installation point

Avoid the position of flow field disturbance or sudden change when installing, the nominal calibre of the pipeline at the installation location

should be the same as the calibre of the water meter, and reserve the corresponding length of straight pipe section in accordance with the requirements on the length of straight pipe section on the nameplate of the water meter.

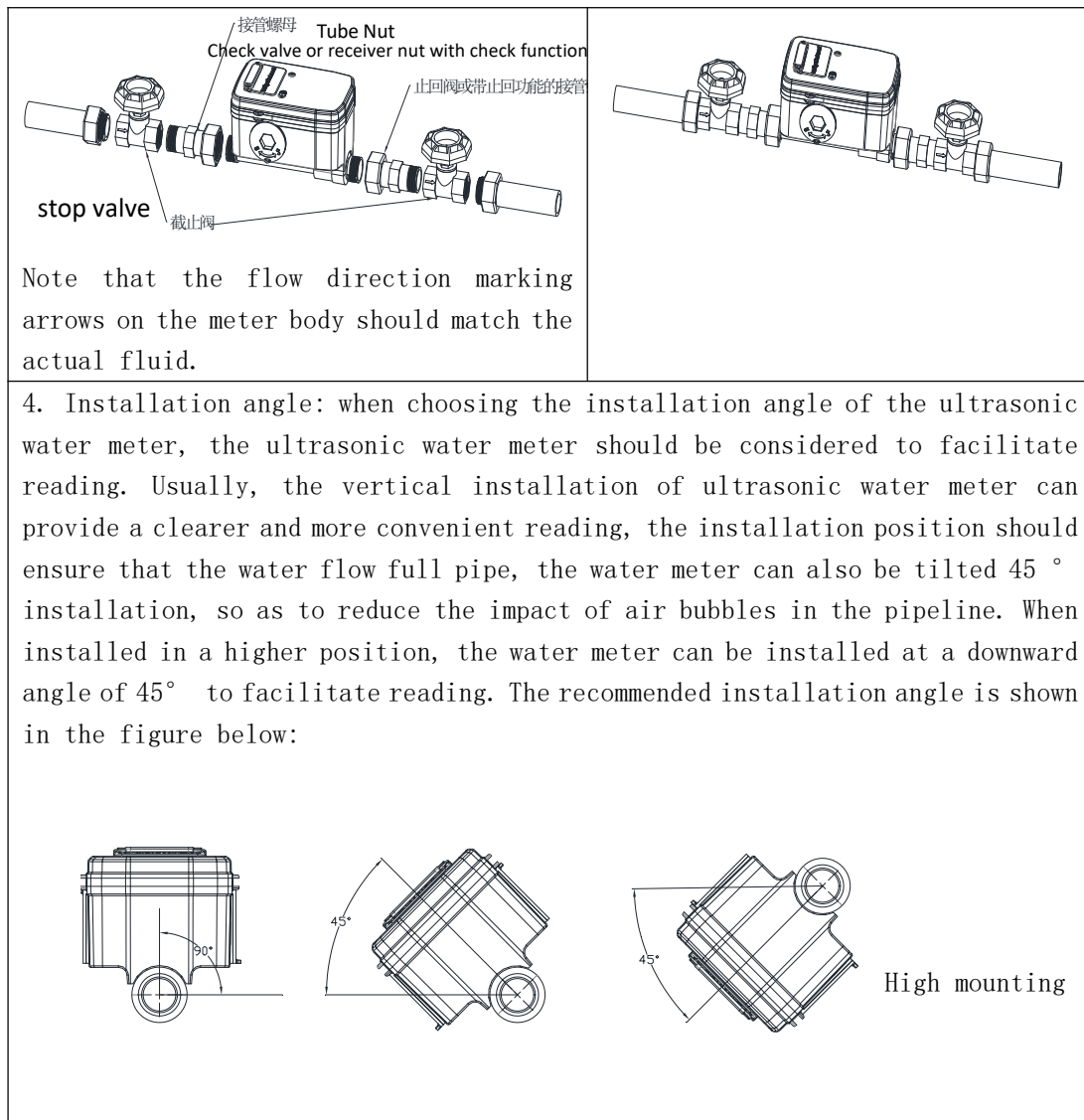
Example: the nameplate requires "U10D5", i.e., the length of upstream straight pipe section  $\geq 10D$ , the length of downstream straight pipe section  $\geq 5D$  (D is the nominal calibre), and to ensure that the water flow is full of pipes.

Recommended Installation Points		Prohibited Installation Points	
<ul style="list-style-type: none"> <li>✓ lowest point in the piping system to ensure a full pipe.</li> <li>✓ A section of pipe that flows vertically or obliquely upwards.</li> </ul>		<ul style="list-style-type: none"> <li>✗ At the highest point in the piping system, there may not be enough pipe.</li> <li>✗ A pipe section that flows vertically downward or diagonally downward.</li> </ul>	

**Note:** The direction indicated by the arrow is the direction of fluid flow.

### (ii) Installation methods

1. When the water supply pressure is unstable and there is air in the end pipeline, the water flow may fluctuate back and forth, resulting in the measurement value of the ultrasonic water meter does not match the actual water consumption. Therefore, in the water meter installation must be added check valve to stabilise water flow, reduce end pressure fluctuations.	
2. Firstly, cut off the pipeline and leave the installation position, connect the threaded interface of the water pipe with the valve, the receiver nut and the ultrasonic water meter, and screw it tightly, as shown in the figure:	3. Concentric alignment of the ultrasonic water meter with pipes and fittings, and tightening of each connection with a spanner. As shown in the figure:



### (iii) Installation precautions

1. When selecting an ultrasonic water meter, the pipeline calibre and flow range of the installation site should be used as a basis to ensure that the calibre of the selected ultrasonic water meter matches the calibre of the pipeline. At the same time, the need to select the appropriate water meter according to the actual maximum and minimum flow requirements;
2. The installation location of ultrasonic water meter should be far away from heat sources, strong radiation and corrosive environments; it

should avoid exposure to sunlight, rain, flooding and environments with strong magnetic field interference;

3. Ultrasonic water meter built-in precision devices, disassembly and installation of the water meter should be gently, do not drop the water meter, so as not to cause damage;

4. In order to ensure the accuracy of measurement, the ultrasonic water meter should be installed in accordance with the requirements of straight pipe section length on the nameplate, and the corresponding length of straight pipe section should be reserved;

5. The arrow direction of the base meter or pipe section must be consistent with the direction of water flow during installation;

6. Installation should be to avoid hemp wire, raw material belt, tape, gravel and other debris into the water meter pipeline, resulting in valve failure or measurement error;

7. The ultrasonic water meter and water pipe should be insulated during installation, and if it is not used for a long time, the water in the pipeline should be excluded cleanly during winter to prevent the pipeline from freezing, resulting in damage to the water meter.

※ This document is only used as a reference document, the detailed functions are subject to the actual delivery of the product.