Smart Water Meter

User Manual

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Declaration

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Document Revision History

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1	1.0	A	Initial Version	2026-8-18

*Change Status: A——Added; M——Modified; D——Deleted

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1. Product Introduction

1.1. Purpose and Introduction

NEWCAPEC LXS / LXS-Y / LXSY multi-jet smart water meters integrate IoT, photoelectric sensing, and remote-control technologies, combining mechanical metering, data acquisition, remote communications, and intelligent management in one device. The portfolio includes electronic remote-reading, prepaid valve-control, and photoelectric direct-reading series for communities, apartments, commercial buildings, industrial parks, and other applications, enabling the digital transformation of water management.
LXS / LXS-Y / LXSY meters use proven wet-type / dry-type vane-wheel multi-jet measuring mechanisms for accurate, stable metering and reliable billing. The fully sealed waterproof design reaches IP68 and incorporates an independent waterproof battery compartment for a wide range of installation environments. Multiple communication options are supported, including wired M-Bus, 4G / NB-IoT, and LoRaWAN®, allowing flexible adaptation to project requirements.
With more than 25 years of industry experience, NEWCAPEC provides water utilities, property management companies, schools, and enterprises with end-to-cloud intelligent water management solutions, supporting key capabilities such as remote meter reading, prepaid control, water-use monitoring, and consumption analysis.

1.2. Product Appearance

LXS

LXS-Y

LXSY

1.3. Accessories

Accessory	Applicable Series	Description
Dedicated Lithium Battery	LXS-Y / LXS	3.6 V lithium battery; dedicated battery must be ordered from the company
Tailpiece & Union Nut	All Series	Stainless steel; select R1/2 / R3/4 / R1 tailpieces and G3/4 / G1 / G1 1/4 union nuts according to nominal size
Sealing Gasket	All Series	supplied by size: G3/4, G1, G1 1/4
Tamper Seal	All Series	Factory tamper seal; remove it before removing the battery cover

1.4. Product Series Overview

Series	Mode	Measuring	Ingress	Valve	Communication

		Mechanism	Protection		
Electronic Remote-Reading Water Meter	LXS-Y	Wet-Type Multi-Jet	IP68	—	M-Bus / 4G / NB-IoT / LoRaWAN
Prepaid Water Meter	LXS	Wet-Type Multi-Jet	IP68	Motorized Ball Valve	M-Bus / 4G / NB-IoT / LoRaWAN
Photoelectric Direct-Reading Water Meter	LXSY	Dry-Type Multi-Jet	IP65	—	M-Bus

1.5. Application Scenarios

- Communities & Apartments: Remote meter reading and prepaid control, solving the challenges of in-home meter reading and fee collection
- Universities & Enterprises: Individual metering for dormitories/office buildings, with refined consumption management and data analysis
- Commercial Buildings: Independent tenant water metering, automatic bill generation, and improved operational efficiency
- Industrial Parks: Pipeline network monitoring and leakage alerts to reduce non-revenue water (NRW) losses

1.6. Certifications and Applicable Standards

Accuracy Class	Class 2
Environmental Class	Class B
Electromagnetic Environment Class	Class E1
Flow Profile Sensitivity Class	U10 / D5 (10DN upstream and 5DN downstream straight pipe)
Temperature Class	Cold Water Meter T30 / Hot Water Meter T90
Applicable Standards	ISO 4064-1:2014 • OIML R49-1:2013
Range Ratio (Q_3 /Q_1)	Cold Water Meter R100; Hot Water Meter R50

1.7. Technical Specifications

Product Image			

Product Name	Electronic Remote-Reading Water Meter	Prepaid Water Meter	Photoelectric Direct-Reading Cold Water Meter
Model	LXS-Y	LXS	LXSY
Ingress Protection Rating	IP68	IP68	IP65
Accuracy Class	Class 2	Class 2	Class 2
Environmental Class	Class B	Class B	Class B
Working Pressure	≤1MPa	≤1MPa	≤1MPa
Pressure Loss	≤0.063MPa	≤0.063MPa	≤0.063MPa
Range Ratio	100	100	100
Flow Profile Sensitivity	U10 D5	U10 D5	U10 D5
Temperature Class	T30/T90	T30/T90	T30
Sensing Method	Electronic Pulse	Electronic Pulse	Photoelectric Direct Reading
Battery Life	6 years	6 years	×
Valve Type	×	Motorized Ball Valve	×
Prepaid Function	×	Supported	×
Display	×	LCD	×
Key	×	Touch Key	×
Mechanical Register	99999.9999m^3	99999.9999m^3	99999.9999m^3
Minimum Electronic Reading	0.1m^3	0.1m^3	1/0.01m^3
Power Supply	3.6 V lithium battery	3.6 V lithium battery	M-Bus bus-powered
Communication	M-Bus/4G/NB-IoT/LoRaWAN	M-Bus/4G/NB-IoT/LoRaWAN	M-Bus
Integration Capability	API interface CJ/T 188 standard protocol	API interface CJ/T 188 standard protocol	API interface CJ/T 188 standard protocol
Product Type	Wet-Type Multi-Jet	Wet-Type Multi-Jet	Dry-Type Multi-Jet
Operating Environment	Operating ambient temperature: 5° C to 55° C	Operating ambient temperature: 5° C to 55° C	Operating ambient temperature: 5° C to 55° C
Applicable Standards	ISO 4064-1:2014 OIML R49-1:2013	ISO 4064-1:2014 OIML R49-1:2013	ISO 4064-1:2014 OIML R49-1:2013

2. Materials and Media Compatibility

All water-contacting components are made of materials that meet drinking-water hygiene requirements and have passed type evaluation and sanitary testing. Before shipment, the products are disinfected, dried, and hermetically packaged to prevent environmental

contamination before installation.

Component	LXS-Y (Electronic Remote Reading)	LXS (Prepaid)	LXSY (Photoelectric Direct Reading)	Remarks
Meter Body	Ductile Iron	Copper	Ductile Iron	Corrosion resistant
Measuring Mechanism	Engineering Plastic (Wet- Type)	Engineering Plastic (Wet -Type)	Engineering Plastic (Dry-Type)	—
Seals	Silicone Rubber	Silicone Rubber	Silicone Rubber	Heat- and aging-resistant
Valve	—	Motorized Ball Valve (Stainless Steel)	—	—
Electronics Enclosure	Composite Material	Composite Material	Composite Material	Fully Sealed
Tailpiece / Union Nut	Stainless Steel	Stainless Steel	Stainless Steel	—

2.1. Applicable Media

Cold Water Meter	Clean potable water, water temperature 0.1-30° C (T30)
Hot Water Meter	Clean hot water, water temperature 0.1-90° C (T90)
Water Quality	No large particulate impurities. Flush the pipeline before installation to prevent blockage by stones, sediment, or hemp packing fibers.

Hygiene and Safety:All water meters have passed drinking-water hygiene testing. Before shipment, they are disinfected and dried, then sealed in airtight APET packaging. The storage temperature after packaging should not exceed 40° C. Meter components contain no substances harmful to the human body.

3. Flow Characteristics and Pressure Loss

The following tables show the key flow parameters and pressure-loss characteristics for each nominal size within the rated flow range. Pressure loss at the overload flow rate Q_4 does not exceed 0.063 MPa (0.63 bar), meeting the ISO 4064 requirements for water meters with an R100 range ratio.

3.1. Indication Error

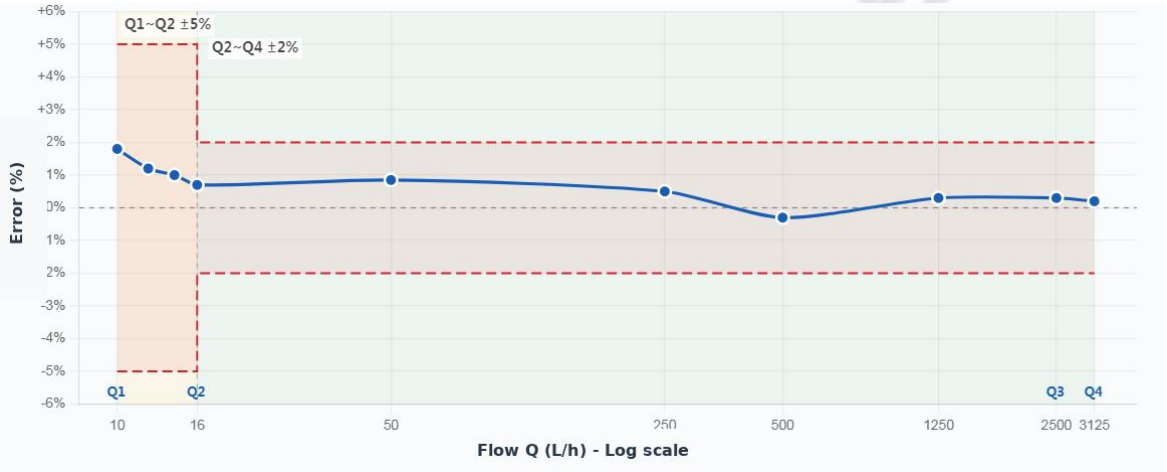
Flow Range	Cold Water Meter	Hot Water Meter

$Q_1 \leqslant Q < Q_2$	±5%	±5%
$Q_2 \leqslant Q \leqslant Q_4$	±2%	±3%

3.2. Flow Parameters (Cold Water Meter, R100)

Nominal Size	Permanent Flow Rate Q_3 (m^3/h)	Transitional Flow Rate Q_2 (L/h)	Minimum Flow Rate Q_1 (L/h)	Overload Flow Rate Q_4 (m^3/h)	Range Ratio Q_3/Q_1
DN15	2.5	40	25	3.125	100
DN20	4.0	64	40	5.0	100
DN25	6.3	100.8	63	7.875	100

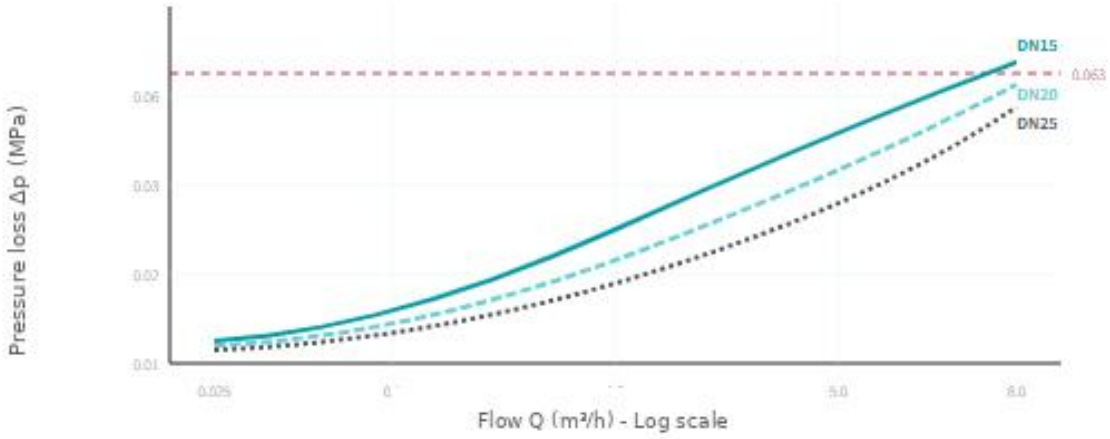
3.3. Accuracy Curve



The red lines indicate the upper and lower permissible error limits; the blue line indicates typical measured values.

3.4. Pressure Loss Curve

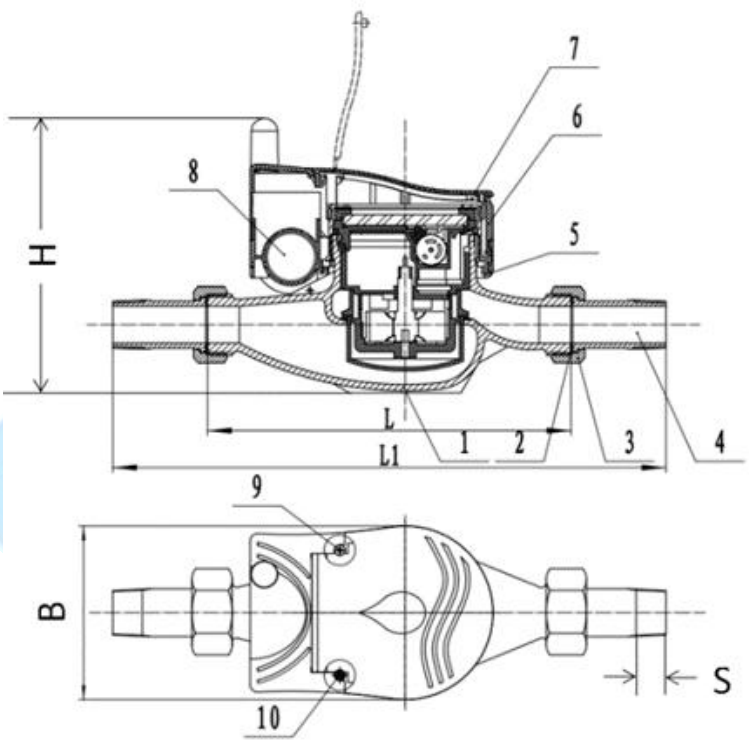
The figure below shows a typical pressure-loss versus flow-rate characteristic curve (logarithmic scale). Pressure loss does not exceed 0.063 MPa throughout the Q_1 to Q_4 range.



Note: Typical values. For accuracy, use straight pipe ≥10DN upstream and ≥5DN downstream.

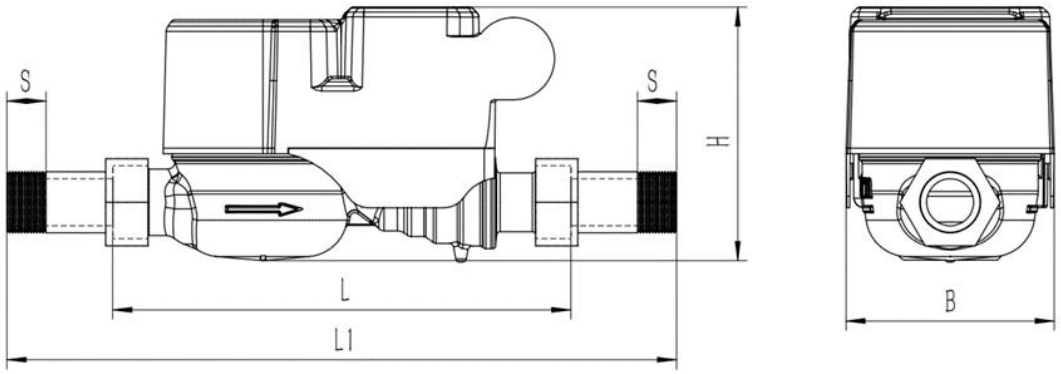
3.5. Nominal Sizes and Dimensions

3.6. Electronic Remote-Reading Water Meter LXS-Y (Wet-Type)



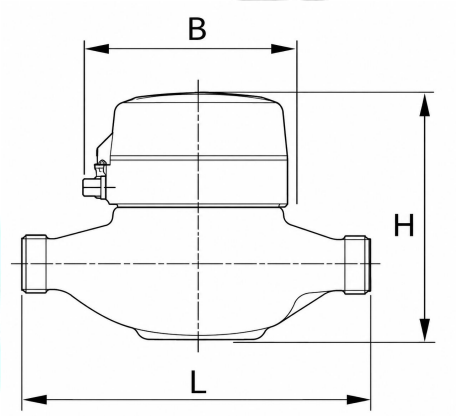
Nominal Size (mm)	Length L (mm)	Overall Length L_1 (mm)	Width B (mm)	Height H (mm)	Thread Length S (mm)	Tailpiece Thread	Union Nut Thread
DN15	165	257	98	154	14	R1/2	G3/4
DN20	195	297	98	154	18	R3/4	G1
DN25	225	341	98	154	19	R1	G1 1/4

3.7. Prepaid Water Meter LXS (Wet-Type + Motorized Ball Valve)



Nominal Size (mm)	Body Length L (mm)	Overall Length L_1 (mm)	Width B (mm)	Height H (mm)	Tailpiece Thread	Union Nut Thread
DN15	165	225	88.5	108	R1/2	G3/4
DN20	195	295	88.5	108	R3/4	G1
DN25	225	341	88.5	108	R1	G1 1/4

3.8. Photoelectric Direct-Reading Water Meter LXSY (Dry Type)



Model	Size	Body Length L (mm)	Width B (mm)	Height H (mm)	Union Nut Thread
LXSY	DN15	165	98	122	G3/4
LXSY	DN20	195	98	122	G1
LXSY	DN25	225	98	135	G1 1/4

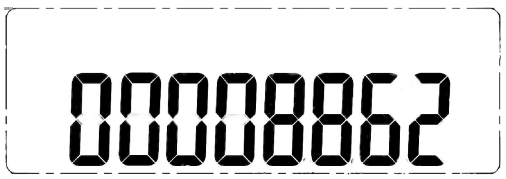
4. Display and Status Codes

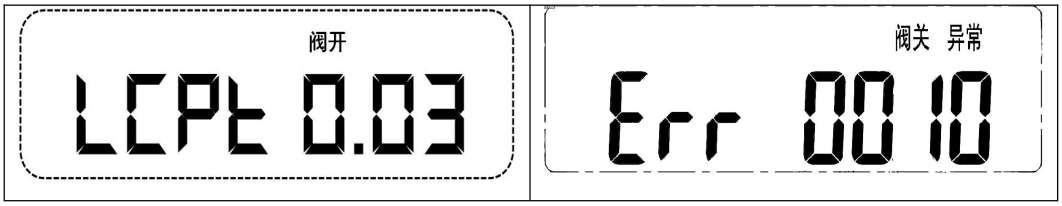
The prepaid water meter (LXS) is equipped with an LCD and a touch key, supporting

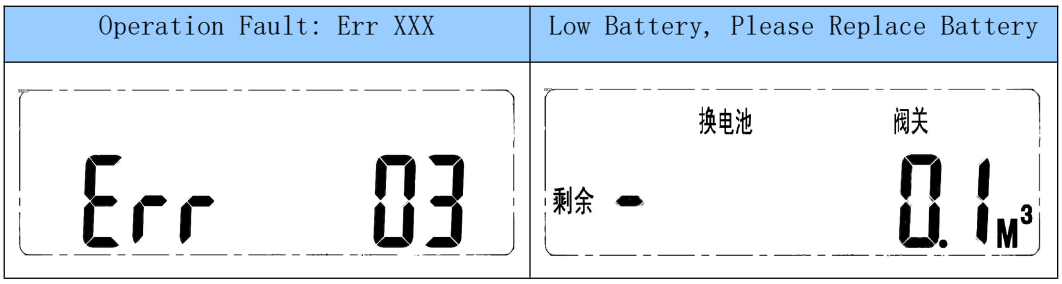
cyclic screen display and status prompts.

The electronic remote-reading water meter (LXS-Y) and photoelectric direct-reading water meter (LXSY) report status codes through remote communications.

4.1. LCD Cyclic Display Sequence (LXS Prepaid Series)

Full Display	Remaining Water Volume
	
Cumulative Water Volume	**Building No.**
	
Room No.	**Factory Status (Store Mode)**
	
MAC Address	**System Status: Running (Activated)**
	
Firmware Version: LCPt 0.03	**Operation Error Code: Err XXXX**





Touch-triggered communication (LXS): Hold the touch key for 5 s and release it when the communication icon appears. The meter then sends one NB-IoT / CAT1 / LoRaWAN report.

5. Core Functions

- IP68 Waterproof: Fully sealed waterproof construction + independent waterproof battery compartment, suitable for harsh installation environments such as damp or submerged locations and designed for long-term reliable operation.
- Accurate Metering: Proven wet-type / dry-type vane-wheel multi-jet measuring mechanism, R100 range ratio, and ±2% indication error (cold water) for accurate billing.
- Prepaid Valve Control (LXS): Built-in motorized ball valve for pay-before-use operation; supports remote valve opening/closing, low water balance alarms, and valve self-maintenance (automatic weekly cycling to prevent seizing).
- Remote Monitoring and Alerts: Operating parameters (battery level, valve status, signal strength, etc.) are reported automatically, with proactive low-water alerts for efficient operation and maintenance.
- Photoelectric Direct Reading (LXSY): Directly reads the mechanical register with no cumulative error. The meter uses a passive zero-standby-power design and is powered only during meter reading, with no built-in battery required.
- Remote OTA Upgrade: Supports remote online firmware upgrades for continuous feature updates without on-site maintenance, reducing operating costs.
- Magnetic Tamper Alarm: Automatically reports a tamper status when external magnetic interference is detected and clears the status after the magnetic field disappears, helping prevent water theft.
- Low-Power Design: Standby current is below 15 μA. A 3.6 V lithium battery provides up to 6 years of service life, reducing maintenance frequency.

6. Integrated Communications

LXS / LXS-Y / LXSY meters support multiple communication methods for flexible project deployment. Wired M-Bus is suitable for centralized meter reading, 4G / NB-IoT cellular communication is suitable for distributed installations, and LoRaWAN® long-range wireless communication is suitable for wide-area coverage.

6.1. M-Bus

- Wired Communication
- EN 1434-3 standard
- CJ/T 188 protocol
- Two-wire cabling with low installation cost
- Suitable for large-scale centralized meter reading
- Bus-powered (LXSY)

6.2. 4G / NB-IoT

- Cellular Communication
- CAT1 / NB-IoT dual mode
- Wide cellular network coverage
- No cabling required; flexible deployment
- Touch-key triggered reporting
- Remote OTA upgrade

6.3. LoRaWAN®

- Long-Range Wireless
- LoRaWAN standard protocol
- Long range and low power consumption
- Wide coverage from a single gateway
- Suitable for industrial park/campus applications
- No SIM-card data charges

6.4. Communication Methods Supported by Series

Series	M-Bus Wired	4G / NB-IoT	LoRaWAN®
Electronic Remote Reading LXS-Y	✓	✓	✓
Prepaid LXS	✓	✓	✓
Photoelectric Direct Reading LXSY	✓	-	-

Specification: LoRaWAN communication equipment must be deployed in conjunction with a gateway.

6.5. Communication Protocols and Interfaces

Standard Protocol	CJ/T 188-2004, Technical Requirements for Data Transmission of Household Metering Instruments
M-Bus Interface	EN 1434-3 standard, two-wire non-polarized connection
API Interface	API provided for integration with third-party water management platforms
Standard Protocol	CJ/T 188-2004, Technical Requirements for Data Transmission of Household Metering Instruments

Communication triggering: Wireless versions support scheduled automatic reporting and manual reporting triggered by the touch key. Press and hold the touch key for 5 seconds to actively trigger one communication report.

7. Selection Guide and Configuration Notes

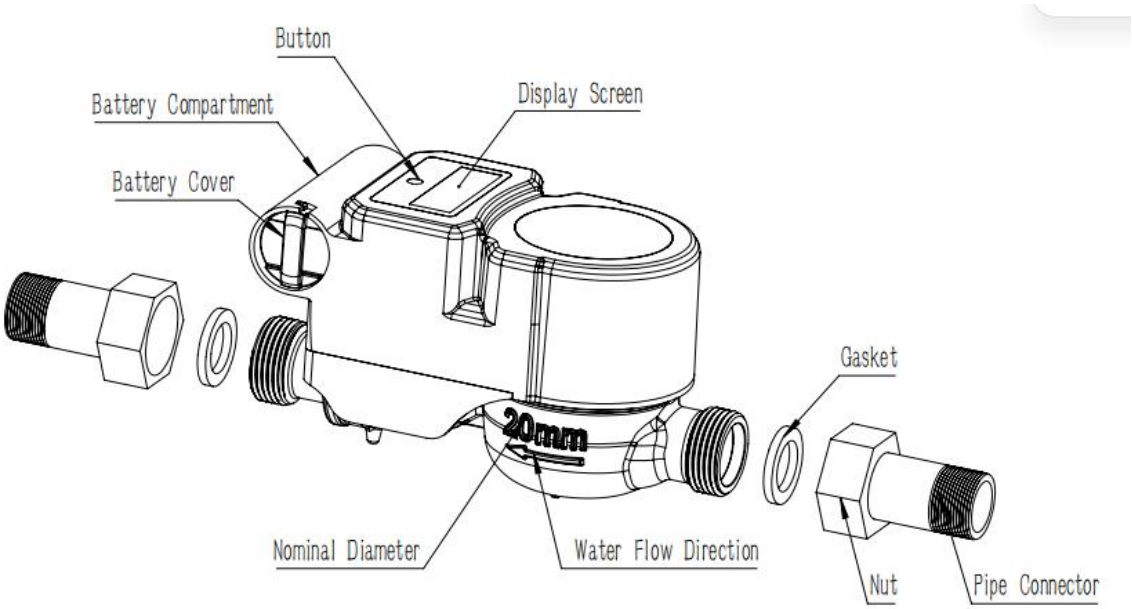
7.1. Selection Decision Matrix

Scenario	Comm.	Use	Series	Selection Rationale
Communities / apartments; centralized installation; cabling available	M-Bus	Prepaid	LXS	Pay before use; solves collection issues; wired, real-time response
		Remote Meter Reading	LXS-Y/LXSY	Wired, real-time response
Industrial parks / commercial streets; distributed installation	NB-IoT / 4G	Prepaid	LXS	Pay before use; no cabling; cellular coverage; lower deployment cost
		Remote Meter Reading	LXS-Y/LXSY	No cabling; cellular coverage; lower deployment cost
Communities / industrial parks; wide-area coverage	LoRaWAN	Prepaid	LXS	Pay before use; no cabling; wide single-gateway coverage; no SIM data charges.

		Remote Meter Reading	LXS-Y	No cabling; wide single-gateway coverage; no SIM data charges

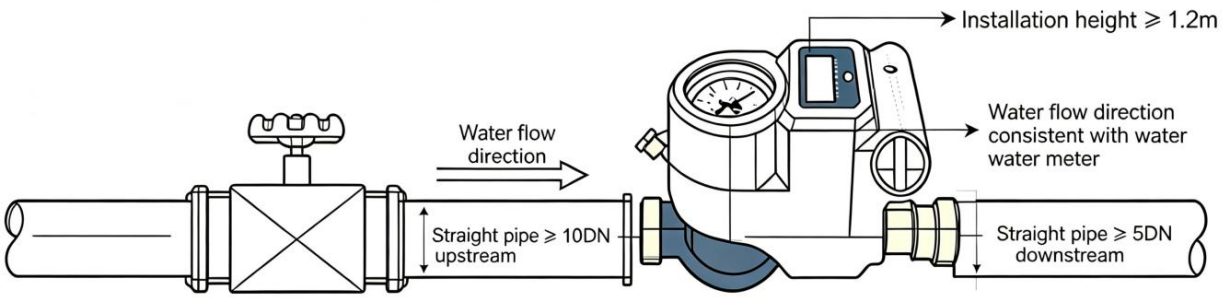
Specification: LoRaWAN communication equipment must be deployed in conjunction with a gateway.

8. Installation Requirements and Accessories

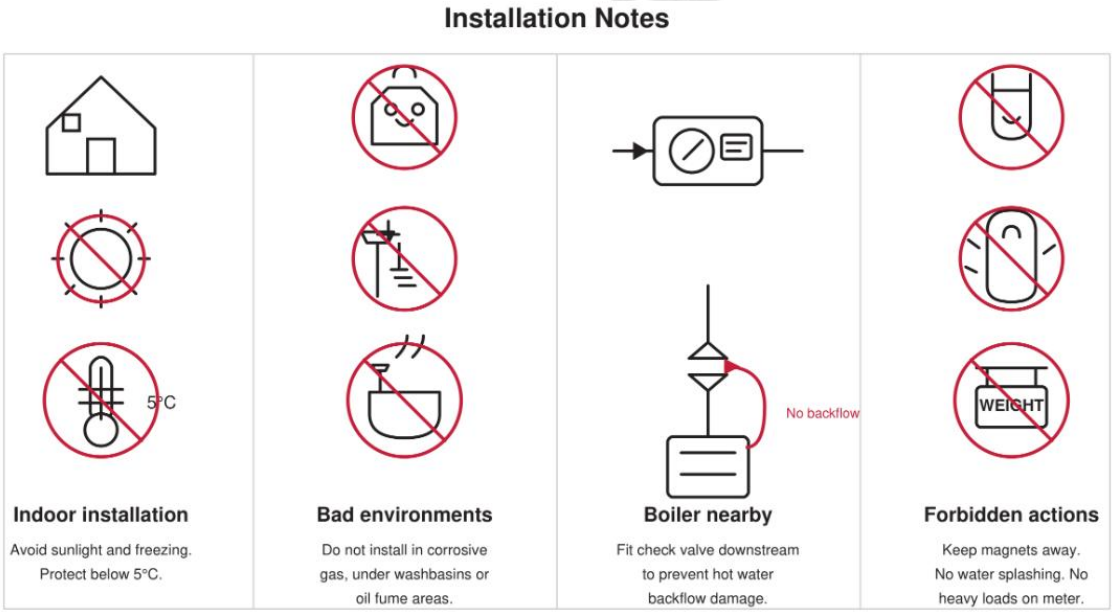


Water Meter Installation Accessories Diagram

- Install at an appropriate height above the floor (recommended not lower than 1.2 m), with adequate surrounding space for operation and maintenance.
- Install horizontally with the water-flow direction matching the arrow on the base meter.
- Provide an upstream straight pipe length ≥ 10DN and a downstream straight pipe length ≥ 5DN; align the meter coaxially with the upstream and downstream straight pipe sections.



- The reserved installation dimension must match the meter dimensions. Forcing installation across an excessive gap may break the threaded ends or cause leakage.
- Flush stones, sediment, hemp packing fibers, and other debris from the pipeline before installation to prevent blockage.
- Install indoors and protect the meter from direct sunlight and freezing. When ambient temperature falls below 5°C in severe winter conditions, take anti-freezing measures.
- Avoid installation in corrosive-gas environments, beneath showers/washbasins, or where the meter may be exposed to oil fumes or heat.
- Fit rubber sealing rings when connecting union fittings to the inlet and outlet; seals must not protrude into the pipe bore.
- If an industrial water meter is installed near a boiler, install a check valve downstream of the meter to prevent hot-water backflow from damaging the meter.
- Do not place magnetic materials or devices near the meter, deliberately splash water onto the meter, or place heavy objects on it.



9. FAQ

1. ✓ **How can I tell when the battery is low?**

The meter is powered by a built-in 3.6 V lithium thionyl chloride battery. When the battery

level is low, the LCD prompts the user to replace the battery, and the reminder is reported to the management platform through the communication network.

2. ✓ **Can the battery be replaced on-site, and how is it replaced?**

Each meter has an independent battery compartment for convenient on-site replacement. Refer to the appendix for replacement instructions. The battery is a dedicated meter battery and must be purchased from the company or an authorized agent.

3. ✓ **What should I do if the LCD does not display?**

The display may be blank when the screen is sleeping, or the battery is depleted. First, wake the screen using the touch key; if the display does not recover, replace the battery.

4. ✓ **Is remote meter reading (AMR/AMI) supported?**

All meters in this series are smart meters equipped with communication functions and support remote meter reading.

5. ✓ **What should I do if the meter registers flow when no water is being used?**

This may be caused by pressure fluctuations in the pipe network, installation too close to the main pipe, water hammer in centralized installations, or leakage in the downstream piping. Installing a check valve downstream of the meter can help resolve the issue.

6. ✓ **What is the rated working pressure?**

The rated working pressure is 1 MPa.

7. ✓ **Which nominal sizes are supported?**

This water meter series supports DN15-DN25 (1/2-1 inch).

8. ✓ **Do meters with valves have a valve self-maintenance function?**

To prevent the valve from seizing, the meter includes a self-maintenance function that periodically opens and closes the valve automatically.