



OIML Member State
SLOVAKIA

OIML Certificate No.
R49/2013-A-SK1-2024.07

OIML CERTIFICATE ISSUED UNDER SCHEME A

OIML Issuing Authority

Name: **Slovak Legal Metrology (SLM)**
Address: **Hviezdoslavova 1124/31, 974 01 Banská Bystrica, Slovakia**
Person responsible: **Dušan Šmigura, Director of PCB**

Applicant

Name: **Nanjing Ningyuan Intelligent Instrument Co., Ltd.**
Address: **Building 6, No. 669 Jiangjun Avenue, Jiangning District
Nanjing City, Jiangsu Province (Jima Industrial Park), China**

Manufacturer

Name: **Nanjing Ningyuan Intelligent Instrument Co., Ltd.**
Address: **Building 6, No. 669 Jiangjun Avenue, Jiangning District
Nanjing City, Jiangsu Province (Jima Industrial Park), China**

Identification of the certified type *(the detailed characteristics are defined in the additional pages)*

Water meter type **LXC-15, LXC-20, LXC-25**

Designation of the module *(if applicable)*

Ultrasonic water meter with electronic indication device

This OIML Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML type evaluation report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 49, Edition (year): 2013
For accuracy class (if applicable): 1 and 2



**OIML Certificate No.
R49/2013-A-SK1-2024.07**

This OIML Certificate relates only to metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML Recommendation identified above.

This OIML Certificate does not bestow any form of legal international approval.

The conformity was established by the results of tests and examinations provided in the associated:

OIML Test Report No 2024/CV042/312.15 dated 18th October 2024 that includes 70 pages.
OIML Type Evaluation Report No. 2024/ER042/SK1 dated 18th October 2024 that includes 16 pages.

The technical documentation relating to the identified type is contained in documentation file name:
„Technical documentation file Nanjing Ningyuan_LXC_00“ dated 18th October 2024 that includes a sum of documents 121 pages.


OIML Certificate History

| Revision No. | Date | Description of the modification |
|--------------|-------------------------------|---------------------------------|
| 0 | 18 th October 2024 | Certificate first issued |
| - | - | - |

Identification, signature and stamp

The OIML Issuing Authority




Dušan Šmigura

Date: 18th October 2024

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1. Designation

The water meters types **LXC-15, LXC-20 and LXC-25** are designed to measure, memorise and display the volume of water passing through the measurement transducer at metering conditions. The water meters are intended for the measurement of volume of clean water in residential use.

The water meter types LXC-15, LXC-20 and LXC-25 are compact ultrasonic water meter with electronic indication device. The measurement is based on ultrasonic bidirectional transit-time principle.

The flow is measured by the difference in time-of-flight of ultrasonic pulses with flow (downstream) and opposite to flow (upstream).

The water meter types LXC-15, LXC-20 and LXC-25 can be installed to operate in the horizontal position with indication device on the top or in the vertical position. The water meters are not designed to measure the reverse flow.

2. Description

Essential parts of the water meter type LXC-15, LXC-20 and LXC-25:

Flow sensor:

- the brass cylindrical body with inlet and outlet firmly connected with the plastic housing for the calculator;
- the inner plastic elements placed in the cylindrical brass body with two reflection sheeds installed in the centre of the pipe;
- two ultrasonic transducers at the upstream and downstream of the measurement channel (pipe section) to transmit and receive ultrasonic signals;

Calculator and indication device:

- the plastic housing of the calculator with indication device directly mounted on the flow sensor;
- magnetic sensing area on the box - magnetic buttons or light photo sensitive buttons to switch the display menu;
- the PCB board;
- the electronic scrolling LCD display with:
 - o 8 digits and indication range of 99999.999 m³. The sub-multiples of a cubic meter are indicated on the LCD display by three digits marked by line above numbers (LXC-15 and LXC-20)
 - o 9 digits and indication range of 999999.999 m³. The sub-multiples of a cubic meter are indicated on the LCD display by three digits marked by frame around numbers (LXC-25);
- one non-replaceable lithium battery for metering. The battery voltage is below 3,6 V, lifetime 10 years
- magnet for to switch between different menus on the display (supplied together with water meters).

Non-essential parts of the water meters:

- communication types: NB-IOT/Lora/RS485 wired/M-bus (optionally);
- wired or wireless data communication port;
- antenna (optionally);
- M-bus for upstream;
- Infrared for downstream.

2.1 Metrological functions

- measuring, memorizing and displaying the volume of water passing through the water meter.



2.2 Operation and presentation of legal data

With a magnet, it is possible to switch the display between different menus (on the magnetic sensing surface on the box).

There are four menu groups for operation and display:

- 1 main menu
- 2 s/n menu
- 3 time menu
- 4 software version menu

The following are visible on the displays:

mandatory:

- accumulated volume (m³);
- flow rate (m³/h);
- display test (an “eights” test);
- display test (a “blanks” test);
- software version number and checksum;
- “VER”verification mode (L)

informative:

- serial number;
- water temperature (°C);
- date (year-month day);
- time (hour-minute-second);
- error number

2.3 Software specification

Software version and checksum of legally relevant software for water meter types LXC-15, LXC-20, LXC-25:

| Software versions | Checksum | water meter types | The software version and checksum on the scrolling display in the form |
|-------------------|----------|-------------------|------------------------------------------------------------------------|
| V1.02 | 48 | LXC-15 | U 15 10248 *) |
| | 53 | LXC-20 | U 20 10253 *) |
| 8000 | 61 | LXC-25 | 618000 **) |

*) U represents V
15 / 20 represents DN
10248 / 10253 102 represents numbers of software version and 48 / 53 represent checksums

***) 61 represents checksum (for DN25)
8000 represents software version (for DN25).

2.4 Accountable alarms

If a fault condition occurs and the measurement stops, follow the user manual issued by the manufacturer.



3. Technical and metrological data

| Characteristics | Unit | LXC-15 | LXC-20 | LXC-25 |
|----------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------|-----------|-------------|
| Nominal diameter DN | mm | 15 | 20 | 25 |
| Permanent flowrate Q_3 | m ³ /h | 2,5 | 4 | 6,3 |
| Minimum flowrate Q_1 | m ³ /h | 0,00625 | 0,010 | 0,01575 |
| Transitional flowrate Q_2 | m ³ /h | 0,010 | 0,016 | 0,0252 |
| Overload flowrate Q_4 | m ³ /h | 3,125 | 5 | 7,875 |
| Ratio Q_3/Q_1 | R | 400 | | |
| Ratio Q_2/Q_1 | - | 1,6 | | |
| Connection thread | mm | G 3/4 B | G1 B | G1 1/4 B |
| Construction length L | mm | 130 / 165 | 190 / 195 | 160/225/260 |
| Installation orientation | - | H/V | | |
| Water temperature range (temperature class) | °C | 0,1 to 50 T50 | | |
| Maximum admissible pressure MAP | bar | 16 | | |
| Pressure loss class Δp | bar - | 0,63 Δp 63 | | |
| MPE in upper flowrates range $Q_2 \leq Q \leq Q_4$ | % | ± 2 (at $\theta \leq 30^\circ\text{C}$) ± 3 (at $\theta > 30^\circ\text{C}$) | | |
| MPE in lower flowrates range $Q_1 \leq Q < Q_2$ | % | ± 5 | | |
| Capacity of calculator | m ³ | 99999,999 | | |
| Capacity of calculator with high resolution | L | 99999,999 | | |
| Scale interval | m ³ | 0,001 | | |
| Scale interval (high resolution) | L | 0,001 | | |
| Accuracy class | - | 2 | | |
| Mechanical class | - | M1 | | |
| Climatic class | °C | - 25 to + 70 | | |
| Electromagnetic class | - | E1 | | |
| Climatic and mechanical environmental conditions (class) according to EN ISO 4064-1/OIML R 49-1 | - | O (fixed meters installed outdoors) | | |
| Flow profile sensitivity class | - | U5D3 | | |
| Battery | - | non-replaceable li-battery 3,6 V, life time 10 years | | |

4. Marking and inscriptions

The following data shall be marked on the water meter:

- a) unit of measurement (m³);
- b) flowrate Q_3 and ratio Q_3/Q_1 (R);
- c) type of water meter;
- d) manufacturers name or trademark;
- e) year of manufacture or the month and year of manufacture;
- f) serial number;
- g) the flow direction shall be marked on a water meter's body in form of an arrow;
- h) maximum admissible pressure (MAP);
- i) temperature class (T);
- j) pressure loss class (Δp);



- k) letter H, if the meter can only be operated in the horizontal position, letter V, if the meter can only be operated in the vertical position;
- l) the installation sensitivity class U5/D3;
- m) the latest date by which the meter shall be replaced;
- n) environmental classification (can be given on a document supplied separately);
- o) electromagnetic environmental class (can be given on a document supplied separately);
- p) type approval sign according to national regulations.

Manufacturer uses the following trademarks on the water meter:



5. Security measures

The water meter types LXC-15, LXC-20 and LXC-25 shall be protected against unauthorized manipulation and opening by:
one plastic seal with a wire ensuring the connection of the upper cover (blocks access to the PCB and software) with the lower part of the water meter (contains the body of the water meter (Fig. 3).

6. Figures

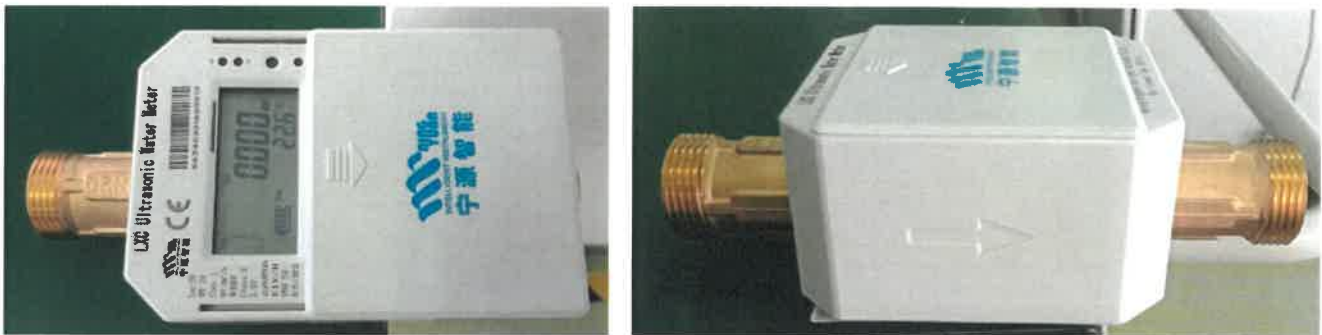


Fig. 1a: Illustrative views of the water meters type LXC-15 and LXC-20

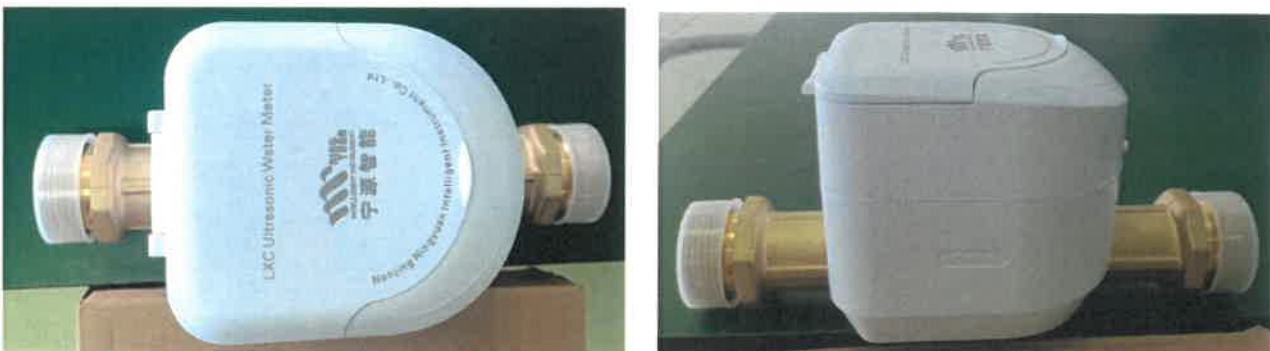
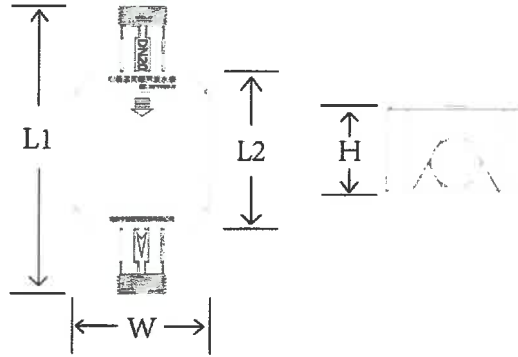


Fig. 1b: Illustrative views of the water meters type LXC-25

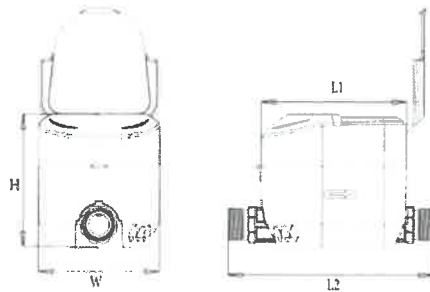




Dimensions in mm

| Type | DN | L1 | L2 | W | H | Thread |
|--------|----|-----------|-----|----|-------|--------|
| LXC-15 | 15 | 130 / 165 | 106 | 94 | 60,35 | G ¾ B |
| LXC-20 | 20 | 190 / 195 | | | | G 1 B |

Fig. 2a: Dimensions of the water meters types LXC-15 and LXC-20

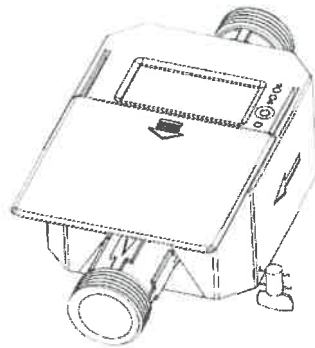


Dimensions in mm

| Type | DN | L1 | L2 | W | H | Thread |
|--------|----|-----|-----|----|-----|---------|
| LXC-25 | 25 | 114 | 225 | 96 | 110 | G 1 ¼ B |

Fig. 2b: Dimensions of the water meters types LXC-25

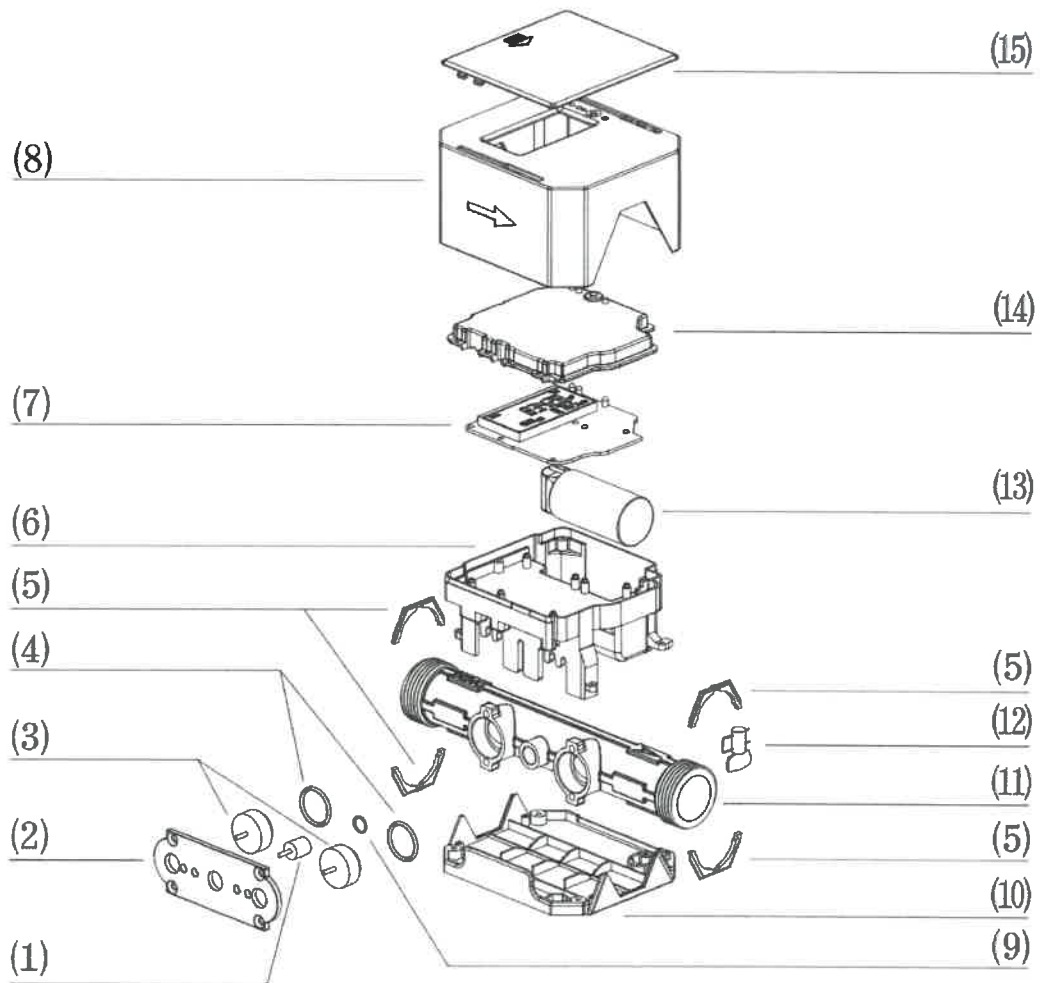
LXC-15 and LXC-20



LXC-25



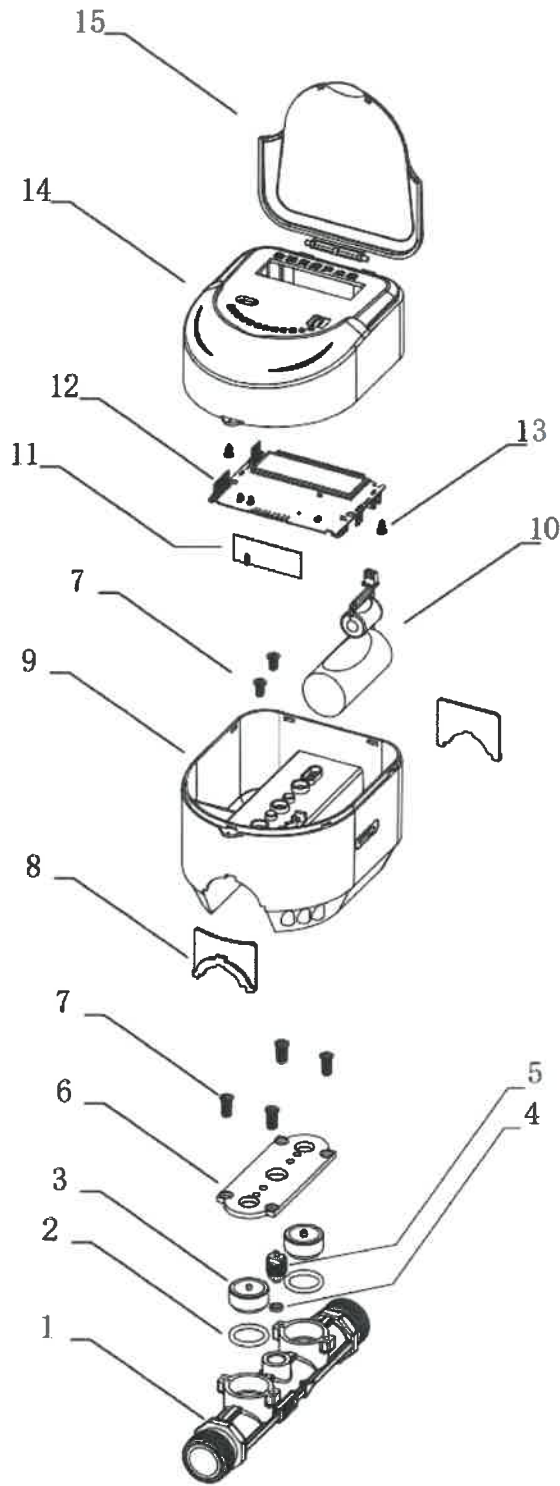
Fig. 3: The sealing of water meter types LXC-15, LXC-20 and LXC-25



| s/n | name | Quantity | s/nr | Name | Quantity |
|-----|------------------------|----------|------|------------------------------|----------|
| (1) | Temperature sensor | 1 | (9) | Temperature sensor seal ring | 1 |
| (2) | Pipe clamp plate | 1 | (10) | Water meter base | 1 |
| (3) | Ultrasonic transducer | 2 | (11) | Measuring pipe section | 1 |
| (4) | Transducer seal ring | 2 | (12) | Lead seal | 1 |
| (5) | Pipe divider | 4 | (13) | Lithium battery | 1 |
| (6) | Water meter down shell | 1 | (14) | PCB transparent cover | 1 |
| (7) | Water meter PCBA | 1 | (15) | slide cover | 1 |
| (8) | Water meter up shell | 1 | | | |

Fig: 4a: Exploded view of water meters types LXC-15 and LXC-20





| NO | Description | Quantity |
|----|---------------------------|----------|
| 1 | Water meter pipe segments | 1 |
| 2 | Sealing rings | 2 |
| 3 | Ultrasonic transducer | 2 |
| 4 | Sealing rings | 1 |
| 5 | Temperature sensor | 1 |
| 6 | clapboard | 1 |
| 7 | Temperature sensor | 6 |
| 8 | clapboard | 1 |
| 9 | Protective ring | 1 |
| 10 | lithium battery | 1 |
| 11 | Antenna | 1 |
| 12 | PCB | 1 |
| 13 | Self-tapping screws | 2 |
| 14 | Protective ring | 1 |
| 15 | Protective cover | 1 |

Fig: 4b: Exploded view of water meter type LXC-25

