

## 10 POSSIBLE MALFUNCTIONS AND SUGGESTED REMEDIES

10.1 Possible malfunctions and suggested remedies are given in Table 10.1.

Table 10.1

Malfunction	Possible cause	Remedy
1. Water does not flow through the meter	Clogged strainer	Dismantle the meter, remove the strainer, clean and rinse it
2. Water is flowing through the meter, but the meter readings do not increase	Faulty ultrasonic sensors or electronic circuit	Replace the meter

10.2 Troubleshooting is carried out in the manufacturer's service center or in a specialised workshop and the meter is then submitted for verification.

## 11 TRANSPORTATION AND STORAGE

11.1 Meters in the original manufacturer's packaging can be transported by rail, road, water (except for sea) and air (in hermetically sealed baggage compartments of the aircraft) with the obligatory observance of the rules and requirements applicable to these types of transport. Transportation by sea requires special packaging.

11.2 Packaged meters can be transported at ambient temperatures from -50 to +50 °C and with 100% relative humidity of air at +25 °C.

11.3 During transportation and handling procedures, observe the manipulation signs on the packaging. The meters should not be exposed to direct atmospheric precipitation.

11.4 The meters must be stored in the manufacturer's packaging in closed, dry premises at ambient temperature from +5 to +50 °C and with maximum 80% relative humidity of air at +35 °C.

11.5 The air in the premises where the meters are stored should not contain aggressive, caustic and corrosive fumes.

11.6 Unpacking of meters that are transported in winter must be carried out in a heated room after keeping them unpacked under normal conditions for 6 hours.

## 12 DISPOSAL

12.1 At the end of its service life, the product must be disassembled into parts, sorted by material type, and handed over to a specialised recycling company.

## 13 MANUFACTURER'S WARRANTY

13.1 The manufacturer guarantees the compliance of the meters with the specified requirements, provided that the consumer fulfills all the conditions of product storage, transportation, installation and operation.

13.2 Warranty service life for water meters is five years from the date of sale.

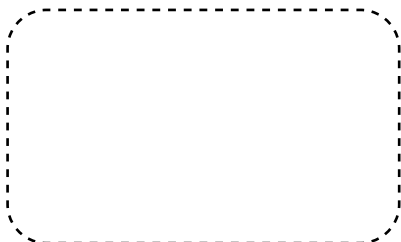
13.3 Meters with mechanical damage and broken seals will not be accepted for warranty maintenance.

13.4 No claims will be accepted if meters are submitted without a completely filled data sheet.

13.5 Send reclamation reports and claim letters to the manufacturing company.

## 14 ACCEPTANCE CERTIFICATE

Ultrasonic water meter



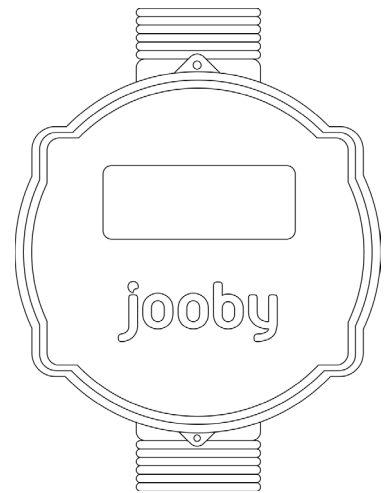
is manufactured and accepted in accordance with the mandatory requirements of state standards, current technical documentation and is recognized as suitable for operation.

Date of sale:

# jooby

## Ultrasonic water meters JWM

### USER MANUAL



## 1 GENERAL INFORMATION

1.1 Intended use

Ultrasonic water meters JWM are designed for the measurement of cold drinking water or hot water in hot water systems (according to temperature classes), flowing through a fully filled, closed pipe. The meters are used for accounting, including commercial accounting, of water consumption in the industrial and municipal sectors, and for technology processes control.

The meters are not intended for use in any area with a potentially explosive atmosphere.

1.2 Operating conditions:

- Ambient temperature from 5 to 55 °C;
- Relative humidity of air from 0 to 100 %;
- Water temperature depending on the temperature class of the meter:
  - T30 - from 0.1 to 30 °C;
  - T50 - from 0.1 to 50 °C;
  - T70 - from 0.1 to 70 °C;
  - T90 - from 0.1 to 90 °C;
  - T30/T70 - from 30 to 70 °C;
  - T30/T90 - from 30 to 90 °C;
- Water pressure from 0.03 to 1.6 MPa;
- Environmental requirements class – B;
- Environmental and mechanical requirements class – M1;
- Environmental and electromagnetic requirements class – E2.

1.3 The meters meet the requirements of the Directive 2014/32/EU, Directive 2014/30/EU, Directive 2014/53/EU, Directive 2011/65/EU.

Table 1.1.

Example	Description
JWM2,5-110P-LRIR-T50	Nominal flow rate Q <sub>3</sub> : 2.5 – 2.5 m <sup>3</sup> /h; 4 – 4 m <sup>3</sup> /h; 6.3 – 6.3 m <sup>3</sup> /h.
JWM2,5-110P-LRIR-T50	Installation length: 110 – 110 mm; 130 – 130 mm; 150 – 150 mm.
JWM2,5-110P-LRIR-T50	Material of the hydraulic component: P – Polymer; B – Brass.
JWM2,5-110P-LRIR-T50	Communication technology: LR – LoRaWAN®; IR – Infrared output pulse for the verification procedure.
JWM2,5-110P-LRIR-T50	Temperature class: T50, T70, T90, T30/T70, T30/T90 – corresponding temperature class; without designation - T30.

The manufacturer reserves the right to change the design and meter markings that do not affect the product specifications.

1.5 Meter name, serial number, date of manufacture – refer to section 14.

1.6 Manufacturing company:

TELECOMMUNICATION TECHNOLOGIES LLC

Manufacturer's address:

1, Mytna Sq., Odessa, 65026, Ukraine

Phone: +380 48 759-09-09

E-mail: sales@jooby.com.ua, www.jooby.eu

## 2 SPECIFICATIONS

2.1 Meter specifications are given in Table 2.1.

Table 2.1

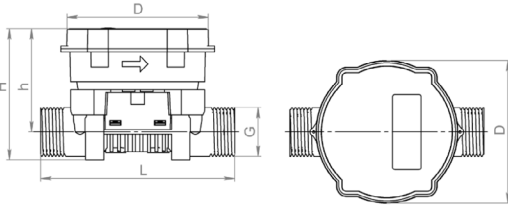
Parameter names	Parameter values		
	JWM2,5	JWM4	JWM6,3
Nominal diameter DN, mm	15	20	25
Permanent flow rate Q <sub>pr</sub> , m <sup>3</sup> /h	2.5	4	6.3
Overload flow rate Q <sub>ov</sub> , m <sup>3</sup> /h	3.125	5	7.875
Transitional flow rate Q <sub>t</sub> , dm <sup>3</sup> /h	16	25.6	40.32
Minimum flow rate Q <sub>min</sub> , dm <sup>3</sup> /h	10	16	25.2
Sensitivity threshold, dm <sup>3</sup> /h	1	1.6	2.52
Disabling transport mode after minimum flow rate, dm <sup>3</sup>	4	6	8
Measurement range R = Q <sub>ov</sub> /Q <sub>pr</sub>	R250		
Ratio Q <sub>t</sub> /Q <sub>pr</sub>	1.6		
Water temperature class according to EN ISO 4064-1	T30, T50, T70, T90, T30/T70, T30/T90*		
Flow disturbance immunity class according to EN ISO 4064-1	U3, D3		
Counter indication range, m <sup>3</sup>	999999		
Actual scale interval, m <sup>3</sup>	0.001		
Accuracy class according to EN ISO 4064-1	2		
Maximum permissible error for the upper flow rate zone (Q <sub>pr</sub> ≤ Q ≤ Q <sub>ov</sub> ), %	±2 for temperatures from 0.1 to 30 °C ±3 for temperatures greater than 30 °C		
Maximum permissible error for the lower flow rate zone (Q <sub>min</sub> ≤ Q ≤ Q <sub>pr</sub> ), %	±5 regardless of temperature range		
Maximum admissible pressure, bar	16 (MAP16)		
Pressure loss class according to EN ISO 4064-1	Δp 40		
Installation orientation	H, V, H/V		
Backflow	Backflow counting in a separate counter		
Ambient temperature, °C	5 ... 55		
Relative humidity, %	0 ... 100		
IP rating according to EN 60529	IP68		
Climate and environmental requirements class according to EN ISO 4064-1	B		
Environmental and mechanical requirements class according to the requirements of the Directive 2014/32/EU	M1		

**Table 2.1 (Table continued)**

Parameter names	Parameter values		
	JWM2,5	JWM4	JWM6,3
Environmental and electromagnetic requirements class according to EN ISO 4064-1	E2		
Batteries	2x integrated 3.6 VDC lithium batteries		
Battery lifetime	16 years		
Total average lifetime, years	15		
* The temperature class is determined according to table 1.1 and the marking of the meter.			

2.2 Overall, connecting dimensions and weight of the meters are given in Table 2.2 and Figure 2.1.

Parameter names	Parameter values		
	JWM2,5	JWM4	JWM6,3
Connection G thread, inch	¾"	1"	1 ¼"
Mounting fitting thread, inch	½"	¾"	1"
Water meter length L, mm	110	130	150
Water meter height H, mm	84	88	92
Water meter height from tube axis h, mm	69	69	71
Width (counter size) D, mm	95		
Weight, kg	0.3	0.33	0.4



**Figure 2.1 – Overall dimensions**

2.3 The characteristics of the LoRaWAN® radio interface are shown in Table 2.3.

**Table 2.3**

Communication: LoRaWAN™	
Modulation	LoRa™ Spread-Spectrum class A
Radiation class (NCCIR No. 87)	250KF1D
Receiver sensitivity	-118 ... -136 dBm
Data transfer rate	0.250 – 11 kbit/s
Communication range in line of sight conditions	Up to 15,000 m
Frequency range	868.0 – 868.6 MHz
Transmitter power	25 mW (14 dBm)
Duty cycle	<1 %
Bandwidth	125 kHz

**3 SCOPE OF SUPPLY**

3.1 The scope of meter supply is given in Table 3.1.

**Table 3.1**

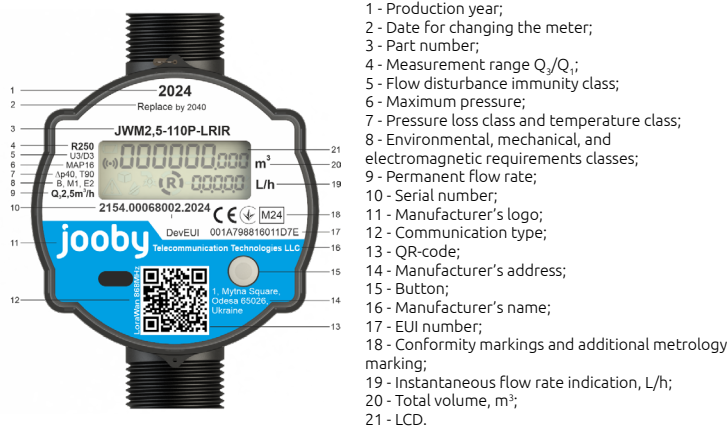
Name	Quantity
Ultrasonic water meter JWM	1 pc.
Data sheet	1 pc.
Packaging	1 pc.

**4 LABELLING AND SEALING**

- 4.1 The meters are labelled in accordance with the requirements of EN ISO 4064-1 and the Directive 2014/32/EU. The elements of labelling are shown in Figure 5.1.
- 4.2 There is an arrow on the meter casing showing the direction of water flow.
- 4.3 To prevent unauthorised access, the meters are sealed by the manufacturer in accordance with the requirements of design documentation.

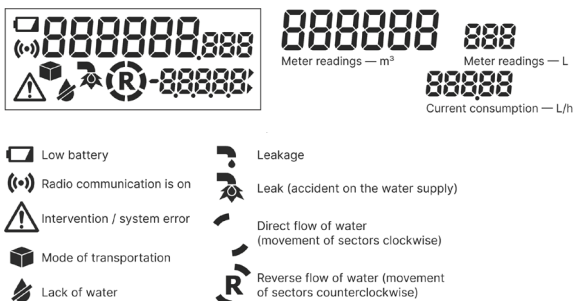
**5 DESCRIPTION**

5.1 The appearance of the meter and its labelling elements are shown in Figure 5.1.



**Figure 5.1 – Appearance of the meter**

5.2 The appearance of the meter LCD and description of its symbols and icons are shown in Figure 5.2.



**Figure 5.2 – Meter LCD**

**6 GETTING STARTED**

- 6.1 Meter installation and commissioning must be carried out by qualified specialists in accordance with this data sheet.
- The installation and commissioning of meters intended for commercial accounting must be carried out by companies that have an appropriate license for the type of work performed.
- 6.2 Installation requirements
  - 6.2.1 The meter must be easily accessible for reading, installation, maintenance and dismantling.
  - 6.2.2 The meter should always be filled with water in order to ensure the proper operation. When there is a possibility of air entering the meter, a vent valve must be installed.
  - 6.2.3 The meter must be protected from the risk of damage caused by shocks or vibrations.
  - 6.2.4 The meter must not be subjected to excessive loads caused by pipes and fittings. The pipe and associated fittings should be securely fastened.
  - 6.2.5 The meter can be installed on a horizontal or vertical section of the pipe.
  - 6.2.6 Ensure that there are straight sections of pipe upstream and downstream of the meter that are at least 3DN long.
  - 6.2.7 The meter should be installed in such a way that the direction of water flow in the system coincides with the direction of the arrow on the meter casing.
  - 6.2.8 To ensure the meter repair and replacement, it is recommended to install shut-off valves of a suitable diameter upstream and downstream of the meter.
  - 6.2.9 To increase operational reliability, a coarse strainer should be installed upstream of the meter (but downstream of the shut-off valve).
  - 6.2.10 The nominal internal diameter of the pipe must correspond to the nominal diameter DN of the meter.
  - 6.2.11 Avoid adverse hydraulic conditions such as cavitation, pulsations, and water hammer.
  - 6.2.12 The meter must be installed at a sufficient distance from sources of electromagnetic interference (switches, electric motors, fluorescent lamps and other electrical equipment).
- 6.3 Installation
  - 6.3.1 Before installing the meter, check the integrity of the packaging, scope of supply according to the data sheet, lack of mechanical damages, and integrity of the seals.
  - The operation of the meter without seals or with an expired verification stamp is not allowed.
  - 6.3.2 Installation of the meter is carried out only after the pipe cleaning and flushing, as well as after pressure testing (when laying a new pipe). When carrying out these operations, the meter must be replaced with a suitable insert.
  - 6.3.3 The meter should be mounted on the pipe using kits of mounting fittings with union nuts of suitable size, which must be purchased additionally.
  - 6.3.4 Install the meter in the following order:
    - Connect the mounting fittings with union nuts to the pipe using couplings;
    - Insert a straight branch tube into the pipe instead of the meter using gaskets. The length of the branch tube must match the length of the meter;
    - Flush the pipe with water;
    - Dismantle the straight branch tube;
    - Install gaskets on the mounting fittings, connect the meter to the mounting fittings in such a way that the arrow on the meter casing coincides with the direction of water flow;
    - Tighten the fitting nuts.
  - 6.3.5 After installation, the section of the pipe with the installed meter will be tested with excess water pressure. Water leakage is not allowed at the joints between the meter and the pipe.
  - 6.3.6 Filling the pipe with water after installation of the meter must be done slowly to prevent hydraulic shocks and increased vibration.
  - 6.3.7 Seal the fitting nuts.
- 6.4 Activation
  - 6.4.1 The new meters remain in transport mode, as indicated on the display.
  - 6.4.2 To activate the meter, after installation and filling the pipe with water, pour an amount of water, specified in Table 2.1, through the meter until the transport mode indication on the screen is disabled.
  - 6.4.3 After quitting from the transport mode, the radio channel is also activated and is ready to be connected to the network in OTA LoRaWAN mode by default.

**7 OPERATION**

- 7.1 Normal operation of the meter is possible in case of meeting the requirements of this data sheet.
- 7.2 The meter with the flow rate  $Q_0$  should not operate for more than one hour per day.
- 7.3 During operation, the meter must not be subjected to shocks.
- 7.4 During operation, the meter must be protected from the effects of ambient air and water with high and low temperatures.
- 7.5 It is prohibited to conduct welding operations on the pipe after the meter has been installed.
- 7.6 When taking meter readings, follow the guidelines given in section 5 of this data sheet.
- 7.7 What to do in case of emergency
  - If you find any signs of water leakage at the location of the meter, as well as in cases where water is flowing through the meter and the meter readings do not increase, you should immediately contact the specialised repair company.

**8 TECHNICAL MAINTENANCE**

- 8.1 During operation, it is necessary to periodically check the tightness of the meter and pipe connections, and the integrity of the meter cover and seals.
- 8.2 It is recommended to regularly clean the meter from dirt and dust.
- 8.3 It is not permitted to use the meter for measurements, the results of which are used in water consumption calculations, if the meter seals are broken.
- 8.4 The meter shall be repaired by the manufacturer's service center or a specialised repair company.
- 8.5 The meter is subject to verification after repair and during operation.

**9 VERIFICATION**

- 9.1 Verification interval for the meter is 4 years.
- At the end of this period, the consumer must ensure that the meter is verified and possibly repaired.
- 9.2 Verification of the meter during operation and after repair is carried out by companies authorised to carry out this type of work.
- 9.3 If a valid metrological stamp or seal is damaged, the manufacturer does not guarantee the metrological characteristics of the meter given in paragraph 2.1.
- 9.4 The results of the verification are shown in Table 9.1.

**Table 9.1**

Verification date	Verification results	Signature, verification mark