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# ULTRASONIC WATER METER JOOBY JWM


## Jooby Development

- Message documentation
- Message encoders/decoders
- Message encoders/decoders GUI (Demo)
- API for interacting with Jobby devices. Other documentation
- Command and Parameter Examples

## Jooby Store

Jooby Smart City Devices

## Application

The ultrasonic water meter JOOBY JWM is designed for the accurate measurement of cold and hot water consumption in households, apartment buildings, commercial properties, and for the control of technological processes.

## Part numbers

- JWM2,5-110P-LRIR-T70
- JWM4-130P-LRIR-T70
- JWM6,3-150P-LRIR-T70
- JWM2,5-110P-LRIR
- JWM4-130P-LRIR
- JWM6,3-150P-LRIR

# Certificates and downloads

- Certificate of conformity CE
- Certificate of conformity UA
- User Manual EN
- User Manual UA
- DataSheet EN
- DataSheet DE
- DataSheet UA

# Ordering specification

| Example | Description |
|---|---|
| JWM**2,5**-110P-LRIR-T70 | Nominal flow rate Q3:<br>2.5 – 2.5 $m^3$/h;<br>4 – 4 $m^3$/h;<br>6.3 – 6.3 $m^3$/h. |
| JWM2,5-**110**P-LRIR-T70 | Installation length:<br>110 – 110 mm;<br>130 – 130 mm;<br>150 – 150 mm. |
| JWM2,5-110**P**-LRIR-T70 | Material of the hydraulic component:<br>P – Polymer; |
| JWM2,5-110P-**LRIR**-T70 | Communication technology:<br>LR – LoRaWAN®;<br>IR – Infrared output pulse for the verification procedure. |
| JWM2,5-110P-LRIR-**T70** | Temperature class:<br>T50, T70, T30/T70 – corresponding temperature class;<br>without designation - T30. |

# Features

- Water flow measurement without moving parts
- High-accuracy calculation of water consumption
- Long-term measurement stability and reliability
- 9 and 5 digits, two-line LCD, total volume, and instantaneous flow rate indication
- Sensitive in low flows, down to 1 L/h
- Compatible with LoRa IoT technologies
- Open API for new integration with suppliers' accounting systems
- Already connected to Jooby RDC
- Temperature classes: T30, T50, T30/90, T30/70, T90
- Nominal flow 2.5 / 4.0 / 6.3 $m^3$/h
- Wide measurement range $Q_3/Q_1$ = R 250
- Installation in any position
- Environment classes E2/M1/B
- Protection class IP68
- Pressure class PN16
- Maintenance-free

- Battery lifetime – more than 16 years
- Two independent batteries for flow measurement and communication core
- Bi-directional flow measurements
- Flow direction indication
- Durable composite body fiber-filled PPA-GF40
- Measurement units: $m^3$-L/h
- Flow presence animation
- DSP measurement core
- Two independent cores for measurement and communication
- Remote control of the Battery health, and the adaptive passivation algorithm for its maintenance
- Metering archive registration
- 3-month hourly log capacity
- 2-year daily log capacity
- 256 last alarm and events log
- Transport mode for low battery consumption before installation
- Automatic activation after quitting transport mode
- 4,6 or 8 litres of water consumption for the activation of new devices, according to the model's size
- OTA (ABP) LoRaWAN server connection
- The meters meet the requirements of Directive 2014/32/EU, Directive 2014/30/EU, Directive 2014/53/EU, and Directive 2011/65/EU.

# Meter specifications

| Parameter names | Parameter values | | |
|---|---|---|---|
| | JWM2,5 | JWM4 | JWM6,3 |
| Nominal diameter DN, mm | 15 | 20 | 25 |
| Permanent flow rate $Q_3$, $m^3/h$ | 2.5 | 4 | 6.3 |
| Overload flow rate $Q_4$, $m^3/h$ | 3.125 | 5 | 7.875 |
| Transitional flow rate $Q_2$, $dm^3/h\backslash$ | 16 | 26 | 40 |
| Minimum flow rate $Q_1$, $dm^3/h$ | 10 | 16 | 25 |
| Sensitivity threshold, $dm^3/h$ | 1 | 1.6 | 2.52 |
| Disabling transport mode after minimum flow rate, $dm^3$ | 4 | 6 | 8 |
| Measurement range $R = Q_3/Q_1$ | R250 | | |
| Ratio $Q_2/Q_1$ | 1.6 | | |
| Water temperature class according to EN ISO 4064-1 | T30, T50, T70, T30/T70 | | |
| Flow disturbance immunity class according to EN ISO 4064-1 | U3, D3 | | |
| Counter-indication range, $m^3$ | 999999 | | |
| Actual scale interval, $m^3$ | 0.001 | | |
| Accuracy class according to EN ISO 4064-1 | 2 | | |
| Maximum permissible error for the upper flow rate zone ($Q_2 \leq Q \leq Q_4$), % | ±2 for temperatures from 0.1 to 30°C<br>±3 for temperatures greater than 30°C | | |
| Maximum permissible error for the lower flow rate zone ($Q_1 \leq Q \leq Q_2$), % | ±5 regardless of temperature range | | |
| Maximum admissible pressure, bar | 16 (MAP16) | | |
| Pressure loss class according to EN ISO 4064-1 | Δp 40 | | |

| | |
|---|---|
| Installation orientation | V and/or H |
| 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- | B |
| Environmental and mechanical requirements class according to the requirements of Directive 2014/32/EU | M1 |
| Environmental and electromagnetic requirements class according to EN ISO 4064-1 | E2 |
| Batteries | 2x integrated 3.6 V DC lithium batteries |
| Battery lifetime | 16 years |
| Total average lifetime, years | 15 |

# Radio transmission and data logging characteristics

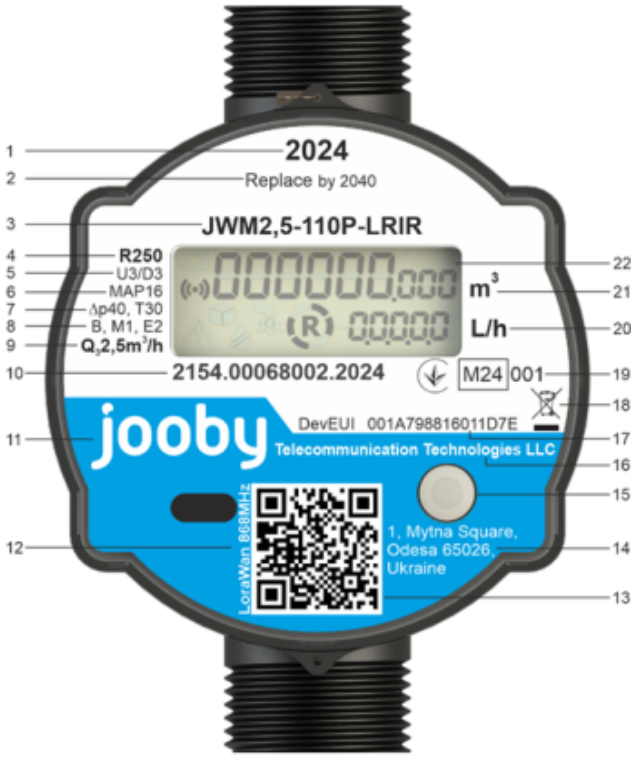
| **Modulation** | **LoRa™ Spread-Spectrum class A** |
|---|---|
| Radiation class (NCCIR No. 87) | 250KF1D |
| Receiver sensitivity, dBm | -118 ... -136 |
| Data transfer rate, kbit/s | 0.250 – 11 |
| Communication range in line-of-sight conditions, km | Up to 10 |
| Communication range in urban areas, km | Up to 2 |
| Frequency range, MHz | 868.0 – 868.6 |
| Transmitter power, mW(dBm) | 25(14) |
| Duty cycle, % | <1 |
| Bandwidth, kHz | 125 (62,5, 256) |
| Data transfer rate, bits/s | 250 – 50,000 |
| Cyclicity of data transmission | Configurable (default once every 4 hours) |
| Remote change of data transmission frequency | yes |
| Data storage period in non-volatile memory (not less than/max), years | 10/15 |
| Capacity of hourly consumption log, months | 3 |
| Capacity of daily consumption log, years | 2 |
| Capacity of events and alarms log, number of events | 256 |
| Battery status monitoring | yes |
| Support ADR (Adaptive Data Rate) | yes |

# Operating conditions

- Ambient temperature from 5 to 55 °C;
- Relative humidity of air from 0 to 100 %;
- Water temperature depends on the temperature class of the meter:

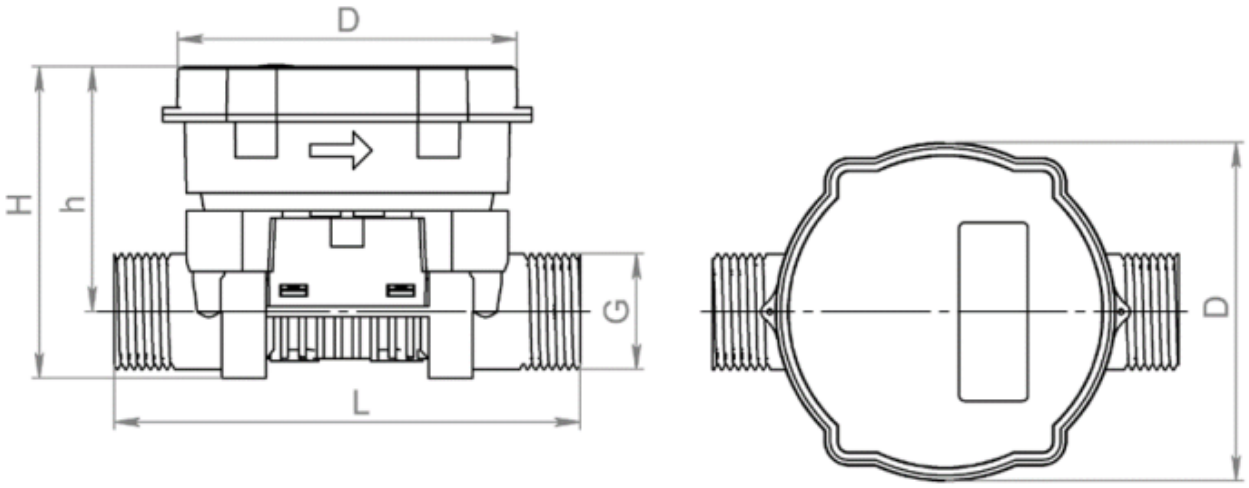
- T30 - from 0.1 to 30 °C;
- T50 - from 0.1 to 50 °C;
- T70 - from 0.1 to 70 °C;
- T90 - from 0.1 to 90 °C;
- T30/T70 - from 30 to 70 °C;
- T30/T90 - from 30 to 90 °C;
- Water temperature from 0.1 to 90 °C;
- Water pressure from 0.03 to 1.6 MPa;
- Environmental requirements class – B;
- Environmental and mechanical requirements class – M1;
- Environmental and electromagnetic requirements class – E2.

## Appearance



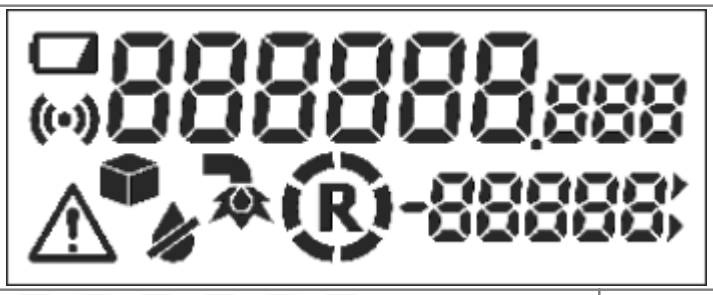

1. Production year;
2. Date for changing the meter;
3. Part number;
4. Measurement range Q3/Q1;
5. Flow disturbance immunity class;
6. Maximum pressure;
7. Pressure loss class and temperature class;
8. Environmental, mechanical, and electromagnetic requirements classes;
9. Permanent flow rate;
10. Serial number;
11. Manufacturer’s logo;
12. Communication type;
13. QR-code;
14. Manufacturer’s address;
15. Button;
16. Manufacturer’s name;
17. EUI number;
18. Conformity markings and additional metrology marking;
19. Instantaneous flow rate indication, L/h;
20. Total volume, m3;
21. LCD.

## Overall, connecting dimensions and weight




| Parameter names | Parameter values | | |
|---|---|---|---|
| | JWM2,5 | JWM4 | JWM6,3 |
| Connection G thread, inch | 3/4” | 1” | 1 1/4” |
| Mounting fitting thread, inch | 1/2” | 3/4” | 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 |

# Appearance of the meter LCD and description of its symbols and icons

| LCD indications | | | |
|---|---|---|---|
|  | | | LCD view |
|  | | | Volume indication, $m^3$ |
|  | | | Flow rate indication, L/h |
|  | Low battery indication |  | Empty pipe indication |
|  | Active data transmitting indication |  | Leakage indication |
|  | Warning indication |  | Burst indication |

| | | | |
|---|---|---|---|
|  | Transport mode indication |  | Direct flow direction animation |
|  | Reverse flow direction animation | | |

# Alarms and events

- Leakage
- Burst
- Backflow
- Empty pipe
- Radio communication
- Warning indication
- Low Battery indication

# Installation requirements

- The meter must be easily accessible for reading, installation, maintenance, and dismantling.
- The meter should always be filled with water to ensure proper operation. When there is a possibility of air entering the meter, a vent valve must be installed.
- The meter must be protected from the risk of damage caused by shocks or vibrations.
- The meter must not be subjected to excessive loads caused by pipes and fittings. The pipe and associated fittings should be securely fastened.
- Pipes, fittings, and shut-off valves must not mechanically affect the internal components of the meter (on to the metal partition in the lumen of the meter openings).
- The meter can be installed on a horizontal or vertical section of the pipe.
- Ensure that there are straight sections of pipe upstream and downstream of the meter that are at least 3DN long.
- 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.
- 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.
- To increase operational reliability, a coarse strainer should be installed upstream of the meter (but downstream of the shut-off valve).
- The nominal internal diameter of the pipe must correspond to the nominal diameter DN of the meter.
- Avoid adverse hydraulic conditions such as cavitation, pulsations, and water hammer.
- The meter must be installed at a sufficient distance from sources of electromagnetic interference (switches, electric motors, fluorescent lamps, and other electrical equipment).

# Installation

- Before installing the meter, check the integrity of the packaging, scope of supply according to the data sheet, lack of mechanical damage, and integrity of the seals.
- The operation of the meter without seals or with an expired verification stamp is not allowed.

- 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.
- The meter should be mounted on the pipe using kits of mounting fittings with union nuts of a suitable size, which must be purchased additionally.
- 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.
- 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.
- Filling the pipe with water after installation of the meter must be done slowly to prevent hydraulic shocks and increased vibration.
- Seal the fitting nuts.

## Warning

Do not use connection fittings that have a protruding part on the surface adjacent to the water meter, which can penetrate inside the water meter and damage it. Use fittings with a flat abutting surface only. see Fig.

## Activation

- The new meters remain in transport mode, as indicated on the display.
- To activate the meter, after installation and filling the pipe with water, pour an amount of water (4L for DN15, 6L for DN20, 8L for DN25) through the meter until the transport mode indication on the screen is disabled.
- After quitting the transport mode, the radio channel is also activated and is ready to be connected to the network in OTA LoRaWAN mode by default.

## Verification

- The 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.
- Verification of the meter during operation and after repair is carried out by companies authorised to carry out this type of work.

## User interface

- The meter user interface consists of a display and buttons.
- The meter can operate in the following operating modes:
- main mode;
- verification mode;
- service information display mode.
- See detailed description