

Ultrasonic water meter Pulsar

Installation and operation instructions



1. GENERAL INFORMATION

Valid standards for the application of water meters: ISO 4064.

For the selection, installation, commissioning, monitoring, and maintenance of the device observe the standard ISO 4064, as well as the verification regulations any relevant national verification regulations in other countries.

The technical regulations for electrical installations must be observed.

The device marking and the seals must not be removed or damaged – otherwise, the guarantee and the approved application of the device are no longer valid!

2. APPLICATION AND FUNCTION

Ideal ultrasonic water meters are used to measure the volume of water flowing through pipelines of hot and cold-water supply systems and water flowing through pipelines of heat supply systems. According to the operating principle, the meter belongs to time-pulse ultrasonic devices, the operation of which is based on measuring the difference in the transit times of ultrasonic signals in the direction of the liquid flow in the pipeline and against the flow.

3. PACKING CONTENT

The Ideal ultrasonic water meter consists of primary measuring transducer and calculator. The kit includes water meter and operating manual.

4. INSTALLATION

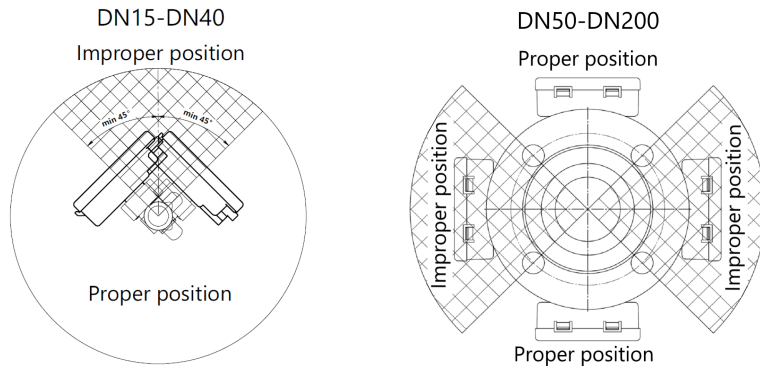
Conduct an external inspection to detect mechanical damage to the device body.

When choosing an installation location, the following criteria must be observed: the meter should not be installed in places where dust may accumulate, shaking, vibration, water may enter, or in places on pipelines where air may accumulate.

Before installing the flow meter, the pipeline must be flushed, removing scale, sand and other solid particles. Straight sections of pipes must have a DN equal to the DN of the flow meter.

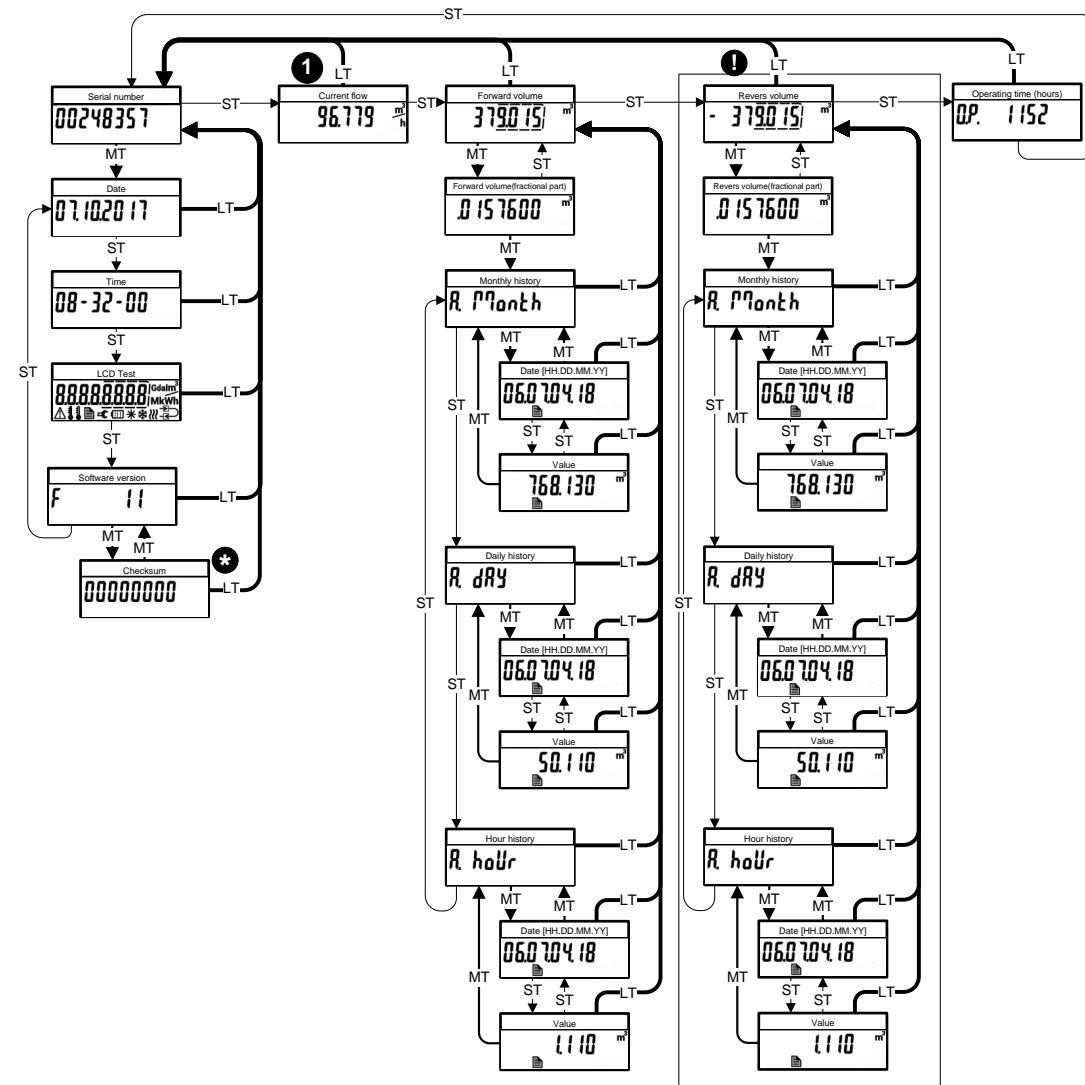
When installing meters, the following conditions must be met:

- check the tightness of the connections;
- the direction of the arrow on the flow meter body must match the direction of the water flow in the pipeline;
- connect the fittings to the pipeline, install gaskets between the water meters and the fittings;
- install the meter in the pipeline without tension, compression or distortion;
- the meter can be installed on horizontal, inclined and vertical pipelines.



5. DISPLAY

MENU



- Checksum values
 8E40A5F2 – Pulse Out, M-Bus, RS-485
 4F135A7B – RF IoT
 C42AD38E – RF LoRa
 D37DD26F – RF WM-Bus

When no button touch for 60 sec, current flow display

May not be available depending on modification

SHORT touch button for less then 0,7 sec

MEDIUM touch button for more then 0,7 sec but less then 2,5 sec

LONG touch button for more then 2,5 sec

6. TECHNICAL DATA SHEET

Nominal diameter	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN 100	DN 125	DN 150	DN 200
Q3, m ³ /h	1,6 2,5	2,5 4	4 6,3	6,3 10	10 16	25 40	40 63	63 100	100 160	160 250	250 400	400 630
R/ Q3/Q1	160/250/400											
Thread	G ¾	G 1	G 1¼	G 1½	G 2	Flange						
Length, mm	110	130	160	180	200	200	200	225	250	250	300	350
Maximum permissible error Q2≤Q<Q4	±2% for cold water t≤30 °C, ±3% for hot water t>30 °C											
Maximum permissible error Q1≤Q<Q2	±5%											
Nominal pressure, bar	16											
Temperature range, °C	T30, T50											
Water pressure classes	MAP 16											
Hydraulic part material	DN15...DN40 brass, DN50...DN200 casting iron											
Installation	All installation positions (vertical, horizontal, rising pipe, down pipe)											
Pressure - loss classes	Δp63											
Sensitivity to irregularity class	U0/D0											
Protection	IP65 (IP68 optional)											
Display	LCD, 8 digits + icons											
Interfaces	Pulse output, M-BUS, Wireless M-BUS, RS-485, RF ultra-narrow band											
Power supply	3,6 V, lithium, up to 10 years lifetime											
Data history in EEPROM memory	60 Month, 184 Days, 1488 Hours											

12. MANUFACTURER

TEPLOVODOKHRAN LTD

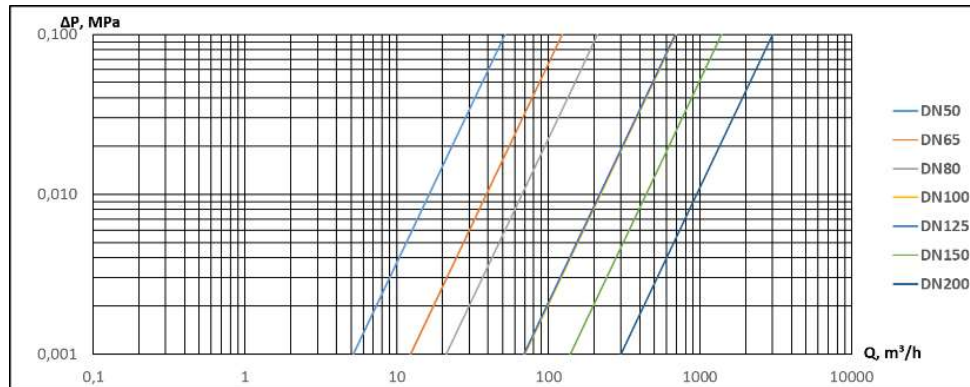
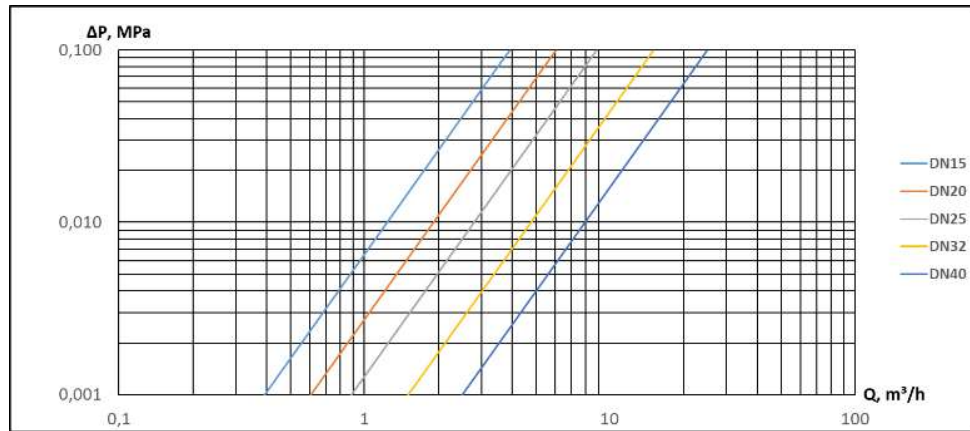
Address^ Novaya str. 51v, letter «J» nonresidential room H2, Ruazan, 390027 Russia

+7 (4912) 240-270, www.pulsarm.com

sale@pulsarm.ru

10. PRESSURE LOSS CURVES

PRESSURE LOSS DIAGRAM



11. WARRANTY AND SERVICING

The reliable operation of the Ultrasonic water meter is guaranteed for a warranty period specified in the enclosed warranty certificate, provided that operation of the water meter complies the requirements provided in this document. The warranty does not cover any damage caused by improper shipping or operation. The user's warranty rights will be void and null if the product is repaired without authorization by the manufacturer.

The warranty is void and null when the following is found:

- repairs made by personnel unauthorized to perform warranty service;
- unauthorized removal of tamper seals;
- modifications or alteration of the product design;
- installation or operation against the intended use of the product specified in the operating manual;
- damage to the counter enclosure.

7. SEALING

The Ideal water meters are sealed with self-adhesive seals that prevent unauthorized access to the electronic system - see the figure below.



8. INTERFACES AND OPTIONS

Several communication interfaces are available.

8.1 Pulse output (open collector).

One pulse means 0,001 m³/h (other scale factors are possible).

Pulse duration 100 ms, switching I_{max} 50 mA, switching U_{max} 24 V.

Pin assignment: brown – OUT; white – GND.

8.2 RS-485 used for current and history data reading.

Pin assignment: brown– VCC (9-30 V, 10 mA); white – GND; yellow – RS-485 A; green– RS-485 B.

Technical data RS-485

Primary address	According to factory number
Baud rate	9600
Stop bit	1
Parity	None
Data bits	8

8.3 M-Bus used for reading current data.

Pin assignment: white– M-Bus; brown– M-Bus.

Technical data M-Bus

Primary address	0 (factory setting)
Baud rate	2400
Stop bit	1
Parity	Even
Data bits	8

8.4 WM-Bus

Installation of devices with radio interfaces between or behind heating/water pipes, or the presence of other bulky metallic obstacles directly over or in front of the housing must be avoided. The transmission quality (range, telegram processing) of devices with radio interfaces can be negatively influenced by devices or equipment with electromagnetic emissions, such as telephones (particularly LTE mobile radio standard), wi-fi routers, baby monitors, remote control units, electric motors, etc. In addition, the construction of the building has a strong influence on the transmission range and coverage. Furthermore, when using installation boxes (substations) they must be equipped with non-metallic covers or doors.

Technical data radio

Frequency	868 MHz
Transmission power	up to 12 dBm
Selectable modes	S1 / T1
Telegrams	- short telegram in conformity to AMR (OMS-Spec_Vol2_Primary_v301 and _v402): total volume, information message, outlet flow - long telegram for walk-by total volume, information message, outlet flow, 4 archived readings (volume)

Radio configuration

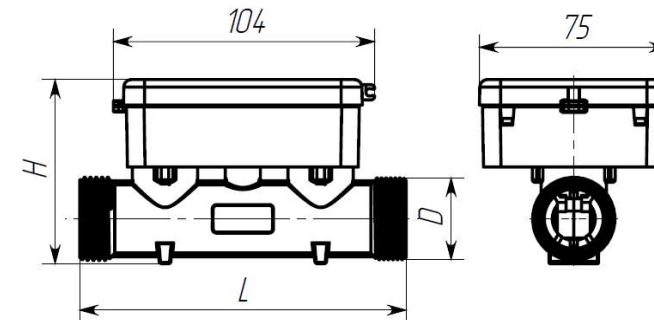
Parameter	Possible settings	Factory setting
Mode	S1 / T1; unidirectional	T1 (unidirectional)
Transmission interval	240 seconds	240 seconds
AES-128-Encryption	- not encrypted. - encrypted according to MODE 5	not encrypted
Type of telegram	- short telegram in conformity to AMR (OMS-Spec_Vol2_Primary_v301 and _v402) - long telegram for walk-by read-out	long telegram (walk-by)

8.6 LoRa

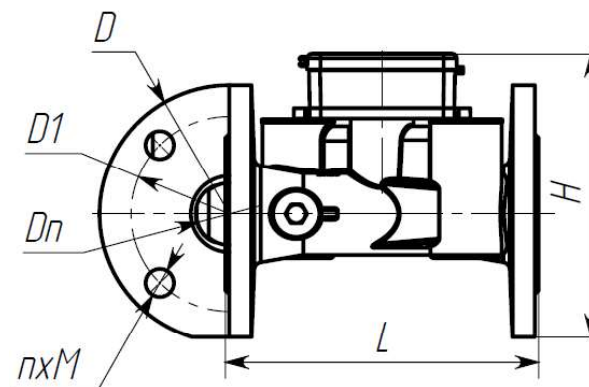
Technical data radio

Specification LoRaWAN	V. 1.0.3
Frequency plans	EU868, RU864, IN865, KZ865, AS923_1, AS923_2, AS923_3, UZ926
Transmission power	max 14 dBm (20 dBm optional)
Radio cycles	typically, 8 hours
Activation type	OTAA
Activation of radio	Always on / optional activation device

9. DIMENSIONS



DN	15	20	25	32	40
Connecting thread D	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
Mounting length L, mm no more	110	130	160	180	200
Htight H, mm no more	75	90	90	95	105
Weight, kg no more	0,8	0,8	1,1	1,3	1,4



Dn, mm	50	65	80	100	125	150	200
L, mm	200	200	225	250	250	300	350
D, mm, no more	165	185	200	220	250	285	340
D1, mm	125	145	160	180	210	240	295
H, mm, no more	195	205	220	230	256	285	340
n x M	4 x M16		8 x M16		8 x M20	12 x M20	
Weight, kg no more	7,4	8,4	9,4	12,2	16,6	22,2	28,5