TEPLOVODOKHRAN LTD.
Heat meters, water meters, AMR systems.
Founded in 1997

Smart metering

devices for heat, water, electricity measuring

2021

pulsarm.com

About us

Since 1997, we have been developing and producing energy metering devices under the Pulsar trademark: water and heat meters with digital and pulse outputs, electricity meters, GSM modems and automatic meter reading solution.
Solving the problems of the development and production of reliable devices, we have united a team of highly qualified professionals of more than 300 people who love their job. The metrological laboratory of the company is accredited for the right to verify the produced meters both in Russian and European standards. Our devices are certified as measuring instruments according to the European MID Directive 2014/32 / EU.

SMT production workshop

Metrological laboratory

Warehouse

Compact heat meter «Pulsar» mechanical

- Measures thermal energy consumption in heating and cooling systems
- Compact dimensions and removable calculator
- Insensitive against dirt, no magnet inside hydraulic part
- Pre - equipped for connection of water meters with 4 pulse output
- Heat metering in KW, MW, Gcal, GJ
- Various communication interfaces, open communication protocol: pulse, RS-485, M-bus, WM-bus, LoRa
- Hour, day or month data history available
- Non-volatile memory
- Self-diagnostic
- MID Certificate TMC 311/18 – 5583

CE APPROVED MID 2014/32/EU

Technical data

Flow meter					
Nominal diameter	**DN15**	**DN15**	**DN15**	**DN20**	**DN20**
Minimum flow q_i, m^3/h (horizontal/vertical)	0,012/0,24	0,02/0,04	0,03/0,06	0,03/0,06	0,05/0,10
Nominal flow q_p, m^3/h	0,6	1	1,5	1,5	2,5
Maximum flow q_s, m^3/h	1,2	2	3	3	5
Thread	G3/4B	G3/4B	G3/4B	G1B	G1B
Length, mm	110	110	110	130	130
Ambient temperature, C	5..55				
Pressure loss at q_p, bar	< 0,2				
Accuracy class (EN1434)	3				
Nominal pressure, bar	16				
Liquid specification	water				
Direction of flow	one direction				
Temperature range, C	0..90				
Installation	Return flow/forward flow horizontal/vertical				
Sensitivity to irregularity class	U3, D3				

Calculator, temperature sensors	
Temperature range, C	0...90
Temperature difference range, K	3-90
Temperature resolution, K	0,01
Ambient temperature, C	5...55
Protection	IP65
Environmental class	A
Electromagnetic class	E1
Mechanical class	M1
Display	LCD, 8 digits + icons
Units	MWh, kWh, GJ, Gcal
Inputs (optional)	4 pulse type for external meters
Interfaces (optional)	Pulse, M-Bus, RS-485, optical (IR), WM-bus, LoRa, Ultra Narrow RF band
Power supply	3,6 V, Lithium, 10 years
Temperature sensors	Pt1000
Data history in EEPROM memory	60 months, 184 Days, 1488 hours

Compact heat meter «Pulsar» ultrasonic

- Measures thermal energy consumption in heating and cooling systems
- Compact dimensions
- Removable calculator
- High accuracy and durability
- Different communication interfaces
- Insensitive against dirt
- Self diagnostics

Technical data

Nominal diameter	DN15	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150
Mnimum flow qi, m^3/h	0,012	0,015	0,025	0,035	0,06	0,1	0,15	0,25	0,4	0,6	1	1,5
Nominal flow qp, m^3/h	0,6	1,5	2,5	3,5	6	10	15	25	40	60	100	150
Maximum flow qs, m^3/h	1,2	3,5	6	7	15	20	30	50	80	120	200	300
Thread	G3/4B	G3/4B	G1B	G1 3/4B	G1 3/4B	G2B	Flange					
Lenghth, mm	110	110	130	160	180	200	220	260	300	360	420	500
Pressure loss at qp, bar	<0,025											
Accuracy class (EN1434)	2											
Nominal pressure, bar	16											
Temperature range, °C	105 (150 possible)											
Temperature difference range, K	3—104; 3-149											
Starting temperature difference, K	0,25											
Installation	return flow/forward flow, horizontal/vertical											
Protection	IP65											
Display	LCD, 8 digits + icons											
Units	MWh, kWh, GJ											
Inputs	4 pulse type for external meters											
Interfaces	pulse, M-BUS, wireless M-BUS, RS-485, ultra narrow RF band											
Power supply	3,6 V, lithium, up to 10 years lifetime											
Temperature sensors	Pt1000											
Data history in EEPROM memory	60 months, 184 days, 1488 hours											

Heat cost allocator «Pulsar»

- Automatic Wireless data transmission enables readouts 365 days per year
- Software for data readout and consumption calculation
- Fast error detection (disassembling from radiator, room temperature rising up caused dy covering or solar radiation)
- Checksum is used to avoid data errors
- Interrupting of metering during summer months is possible
- Remote radiator's sensor version available
- Unit scale or product scale devices are avialable
- Programmed due date
- Wide range of mounting accessories
- Parameterizing using contact or optical interfaces
- DIN EN 834 Standard approved by IGTE – certificate No. SM20 H009PU
- Automatic activation when installed on radiator

Technical data

Parameter	Value
Standards	DIN EN 834
Principle of measurement	2-sensors / 1-sensor
Operation limits of temperature 2-sensor type (1-sensor type)	Compact type tmin/tmax = 35°C/95°C (55°C/95°C) Remote sensor tmin/tmax = 35°C/105°C
Operating temperature	0°C...55°C
Power supply	lithium battery
Operating lifetime with one battery	10 + 2 (reserve) years
Radiators normalized power	Up to 10.000 W with product scale
Interfaces	RF, ultra narrow band, LoRa, WM-Bus
Data history	Last 16 (LoRa) or 18 (WM-bus, RF) month consumption values
Measuring cycle	4 minutes
Protection	IP 41

Ultrasonic water meter «Pulsar»

- High Precision , wide range measurement of hot and cold water
- No moving parts inside
- Long term stability
- Leak detection
- Suitable for bad quality water and hydraulic shocks
- Resistant to overloas flows
- Compact dimensions
- Horizontal and vertical installation
- Reverse flow measurement
- Independent to permanent magnet
- Low power operation
- Automatic error diagnostics
- IP68 possible

Technical data

Flow meter												
Nominal diameter	**DN15**	**DN20**	**DN25**	**DN32**	**DN40**	**DN50**	**DN65**	**DN80**	**DN100**	**DN125**	**DN150**	**DN200**
Q3, m^3/h	1,6/2,5	2,5/4	4/6,3/10	6,3/10	10/16	16/25/40	25/40	40/63	100	160	250	400
R/ Q3/Q1	160/250/400											
Thread	G3/4B	G1B	G1 1/4B	G1 1/2B	G2B	Flange						
Lengtht, 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, T90											
Hydraulic part material	DN15..DN40 brass DN50..DN200 casting iron											
Installation	Return flow/forward flow horizontal/vertical											
Protection	IP65 (IP68 optional)											
Display	LCD, 8 digits + icons											
Interfaces	Pulse output, M-BUS, Wireless M-BUS, RS-485, Optical, RF ultra narrow band											
Power supply	3,6 V, Lithium, up to 10 years lifetime											
Data history in EEPROM memory	60 Months, 184 Days, 1488 hours											

Single jet electronic water meter «Pulsar»

- Sapphire bearing
- Inductive scanning system
- Different integrated communication interfaces
- Full magnetic field immunity
- Reverse flow detection
- Both horizontal and vertical installation
- Low power operation

Technical data

Flow meter	ultrasonic	
Nominal diameter	**DN15**	**DN20**
Q3, m³/h	2,5	4
Q3/Q1 (R) (Horizontal)	80; 100; 160	
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	
Pressure loss at Q3, bar	<0,25	
Temperature class	T30/T50/T90	
Flow disturbance class	U0/D0	
Protection	IP65	
Hydraulic part material	brass	
Display	LCD, 8 digits, could be rotated	
Interfaces	Lora, RS-485, M-BUS, pulse output, WM-BUS, ultra narrow RF band, NB-IoT	
Power supply	Lithium battery, up to 10 years lifetime	
Data history in EEPROM memory	60 months, 184 days, 1488 hours	
Thread	G3/4B	G1B
Lengtht, mm	80 / 110	130

Communication modules for water meters

- Different communication interfaces; Wireless M-BUS; Lora; RF ultra narrow band; RS-485; M-BUS
- Reverse flow detection
- Removal detection
- Magnet detection
- 10+ years lithium battery lifetime
- Protection class: IP65/ IP68
- Data history in nonvolatile memory: 60 months, 184 days, 1488 hours
- RF frequency: 868/433 MHz
- RF USB modem for configuring and data reading

Electricity single-phase multi-tariff meter «Pulsar»

- Stable precision and reliability
- Safety and data protection
- Bidirectional measurement of active power
- Measurement of reactive power
- Up to 4 tariffs, 12 seasons
- Current measurement via shunt and current transformer (option)
- Magnetic field immunity
- Voltage, current, frequency, active, reactive and apparent power measurements logging
- Hour, day and month data history
- Built-in real time clock (RTC)
- The tariffs are controlled via internal clock
- Events log
- Large segment LCD display
- Button for display control (optional)
- Optical test output
- Anti-tampering: detection and logging attempts of manipulate the meter installation, cover removal, reverse run, magnetic disturbance

Technical data	
Accuracy (active energy)	Class 1 (IEC 62053 -21) B (EN 50470 -3)
Accuracy (reactive energy)	1 or 2 (IEC 62053 -23)
Refrence voltage Un	230 V
Voltage range	80%-120% Un
Refrence frequency	50 Hz ± 5%
Current, Ib/Imax	5/60 A; 5/80 A; 10/100 A
Starting current	0,4% Ib
Power consumption	< 10 VA (<2,0 W)
Operating temperature	-40 °C...+60 °C
Interfaces	RS-485, optical port, M-BUS, LoRa, ultra narrow RF band, WM-Bus
Protection class	IP51
Real Time Clock accuracy	<0,5 sec/day
Time backup for RTC	32 years
Weight	<0,4 kg
Dimensions	65 x 100 x 83 mm

Electricity 3-phase multi-tariff meter «Pulsar»

- Stable precision and reliability
- Safety and data protection
- Bidirectional measurement of active power
- Measurement of reactive power
- Up to 4 tariffs, 12 seasons
- Voltage, current, frequency, active, reactive and apparent power measurements logging
- Hour, day and month data history
- Built-in real time clock (RTC)
- The tariffs are controlled via internal clock
- Events log
- Large segment LCD display
- Button for display
- Optical test output
- Anti-tampering: detection and logging attempts of manipulate the meter installation, cover removal, reverse run, magnetic disturbance

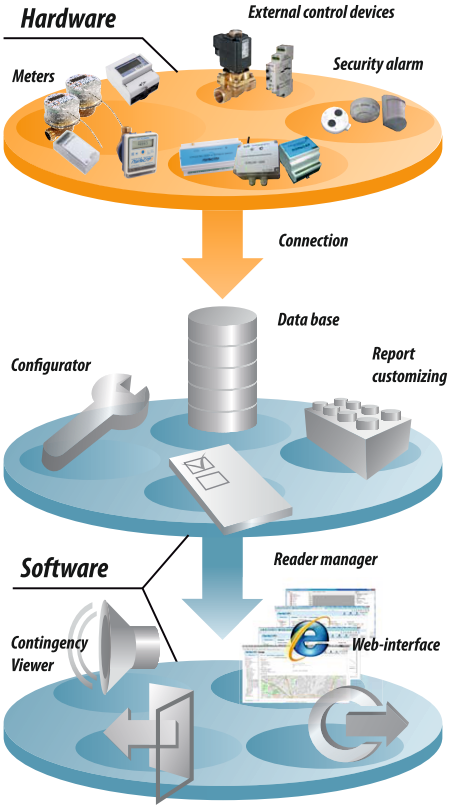
Technical data	
Accuracy (active energy)	Class 0,2s; 0,5s (IEC 62053-22); 1 (IEC 62053-21)
Accuracy (reactive energy)	1 or 2 (IEC 62053-23)
Refrence voltage Un	230 V
Voltage range	80%-120% Un
Refrence frequency	50 Hz ± 5%
Current, Ib/Imax	5/60 A; 5/7.5 A; 10/100 A
Starting current	0,1% Ib (0,2S, 0,5S); 0,4% Ib (1)
Power consumption	< 10 VA (<2,0 W) per each phase
Operating temperature	-40 °C...+60 °C
Interfaces	RS-485, optical port, M-BUS, LoRa, ultra narrow RF band, WM-Bus
Protection class	IP51
Real Time Clock accuracy	<0,5 sec/day
Time backup for RTC	32 years
Weight	<0,4 kg
Dimensions	73 x 150 x 102 mm

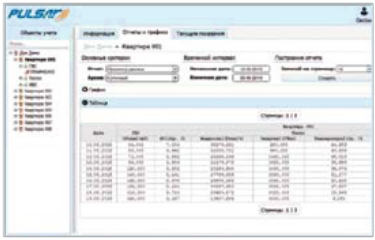
Pulse registrator «Pulsar»

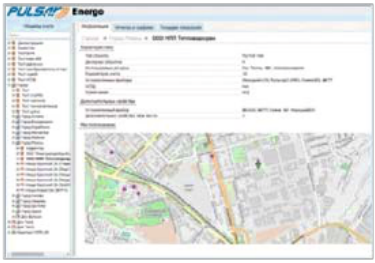
- Non-volatile archive
- Powered by built-in lithium battery
- Reading data from metering devices without access to the house, apartment
- Up to 16 inputs possible
- Different communication intrfaces
- Hour, day and month data history possible

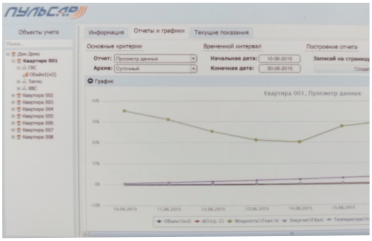
Technical data	
Inputs possible	2, 3, 4, 6, 10, 16
Type of sense	reed, transistor, active (potential)
Minimum pulse duration, ms	1
Pulse frequency, Hz,	Less than 100
Ambient temperature, ° C	- 10 to + 50
Data history	1080 hours, 180 days, 24 months
Internal clock accuracy, seconds / day	5
Dimensions, mm	70x56x88
Interfaces	RS-485, NB-IoT, ultra narrow RF band, LoRa, WM-Bus
Battery life	Up to 6 years
External supply voltage, V	7-25

Server's software









- Suitable for water meters, heat meters, gas merers, electricity meters
- Variety of meter's types from different manufactures. Ready to add new types.
- Types of communication: M-bus, Wireless M-bus, RS-485, NB IoT
- WEB interface
- PostgreSQL database
- Customizing
- User's reports
- Data export to third party programs

Reference List

1) Utility suppliers:

Moscow water supplying company

The biggest heat supplying company

2) The most famous Russian developers are our clients

Vesper

Marmax, Georgian branch

PIK Group

Samolet group

LSR Group

3) Other partners

Gazprom PJS

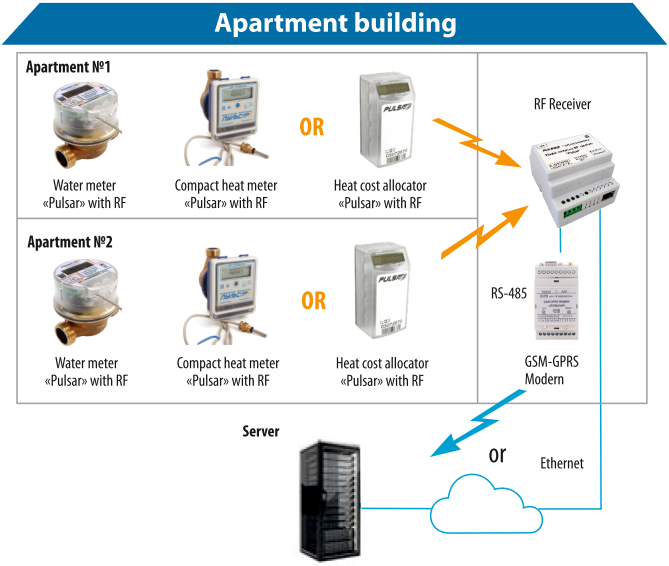
PJSC Rosneft

OJSC Rostelecom

In 2020 Teplovodokhran Ltd produced more than 1,5 million of meters. We are leader of Russian market and our meters and AMR systems "Pulsar" have been already supplied to Belorussia, Kazakhstan, Armenia, Uzbekistan, Latvia, Estonia. In Customs Union we have about 40% market share. We are he only one company in Russia with MID module D certificate. To join our distributor network please fill free to contact us.

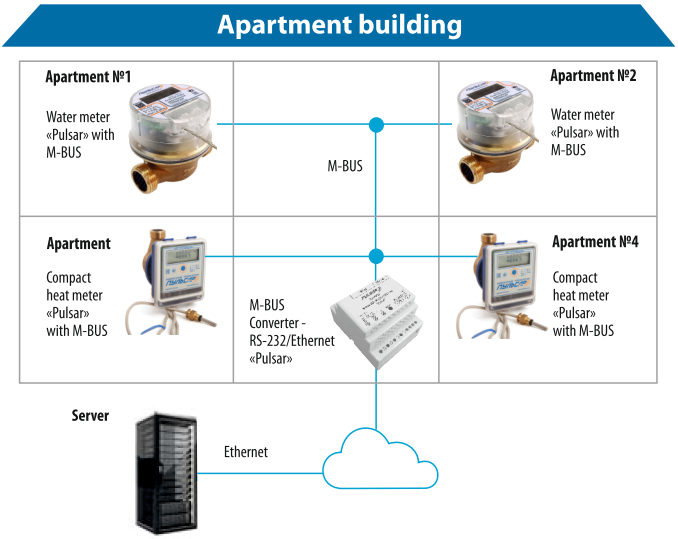
AMR systems

RF ultra narrow band



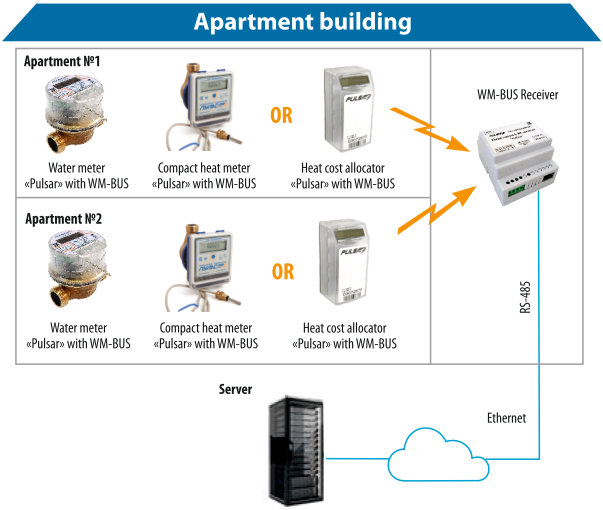
M-Bus*

*RS-485 possible with same scheme

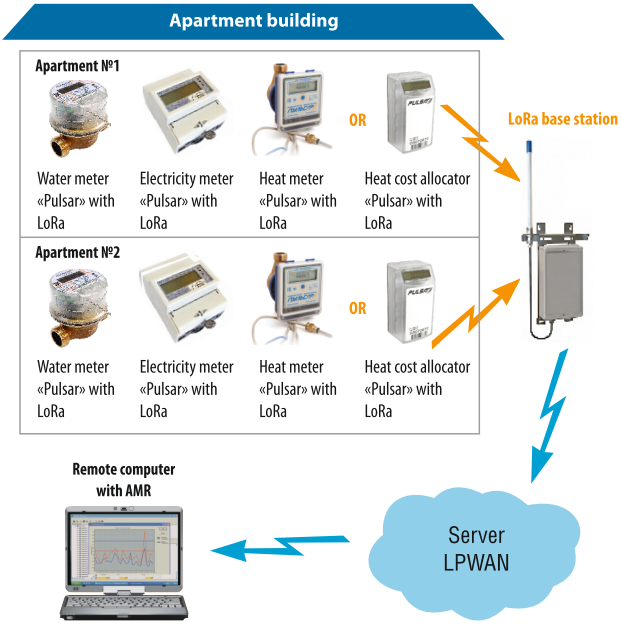


AMR systems

Wireless M-Bus

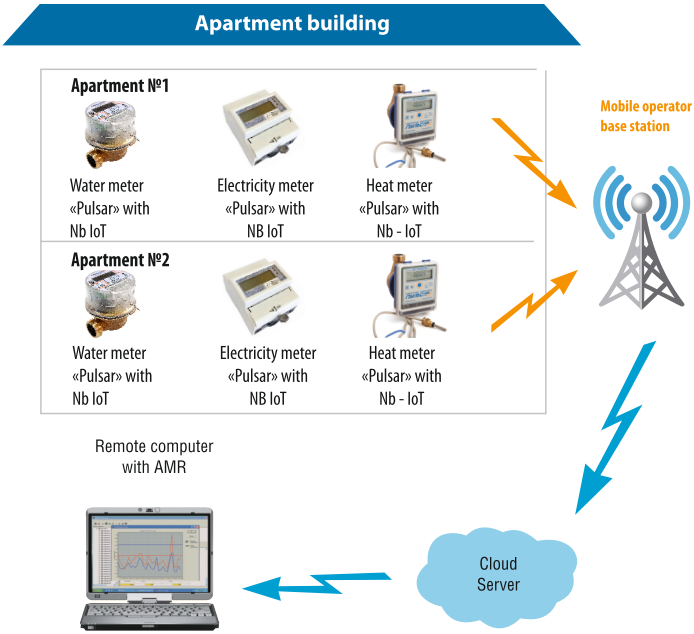


LoRa



AMR systems

NB IoT



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