



Real smart metering



Who we are

Teplovodokhran is Russian leading manufacture of system solutions for smart energy and water metering, founded in 1997. We produce variety of metering equipment for different utilities. Our products well known as "Pulsar" trade mark. We also produce some devices for our OEM customers.

Today Teplovodokhran is dynamic company, employs more then 230 people, including R&D team. We have high-performance SMT production workshop, modern accredited metrological laboratory.

The mission of the company is to supply highest quality products and services to every customer.

What we offer

We offer a full range of ultrasonic water, heat meters and heat cost allocators. The main advantage is our meters are completed with our own remote data read out services.

The main products are:

- residential, house and industrial ultrasonic water meters for cold and hot water,
- mechanical and ultrasonic heat meters,
- heat cost allocators,
- server software for metering data reading, storing in database and distribution.
- communication devices for RF, wired (RS485, M-BUS) and GSM data reading solutions,
- RF and M-BUS modules for water meters from other manufactures.

Our smart meters are the part of IoT (Internet Of Things) world.

SMT production workshop



Metrological laboratory



Warehouse



Compact heat meter «Pulsar» | mechanical

- + Measures thermal energy consumption in heating and cooling systems
- + Consists of a flow sensor, an integrator and a pair of temperature sensors
- + Compact dimensions
- + Removable calculator
- + High accuracy and durability
- + Ergonomically operated by touch switch
- + Pre - equipped for connection of water meters with pulse output
- + Different communication interfaces
- + PC software for data reading and storing
- + Volume measuring component DN15-20
- + Insensitive against dirt, no magnet inside hydraulic part
- + Self diagnostics
- + OEM possible
- + MID Certificate TMC 311/18 - 5583



Technical data

Flow sensor	mechanical single jet				
Nominal diameter	DN15	DN15	DN15	DN20	DN20
Minimum flow q_v , m ³ /h	0,012	0,02	0,03	0,03	0,05
Nominal flow q_D , 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
Starting flow, m ³ /h	<0,004	<0,006	<0,008	<0,015	<0,015
Pressure loss at q_D , bar	<0,025				
Accuracy class (EN1434)	3				
Dynamic range q_v/q_D	1:50				
Nominal pressure, bar	16				
Temperature range, °C	105 normal				
Temperature difference range, K	3—104				
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, RS485, optical, RF ultra narrow band				
Power supply	3,6 V, lithium, 10 years				
Temperature sensors	Pt1000				
Data history in EEPROM memory	60 months, 184 days, 1488 hours				
Thread	G3/4B	G3/4B	G3/4B	G1B	G1B
Length, mm	110	110	110	130	130

Compact heat meter «Pulsar» | ultrasonic

- + Measures thermal energy consumption in heating and cooling systems
- + Consists of a flow sensor, an integrator and a pair of temperature sensors
- + Compact dimensions
- + Removable calculator
- + High accuracy and durability
- + Ergonomically operated by touch switch
- + Pre - equipped for connection of water meters with pulse output
- + Different communication interfaces
- + PC software for data reading and storing
- + Volume measuring component DN15-200
- + Insensitive against dirt
- + Self diagnostics
- + OEM possible



Technical data

Flow sensor	ultrasonic												
Nominal diameter	DN15	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
Minimum flow q_v , 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	2
Nominal flow q_D , m ³ /h	0,6	1,5	2,5	3,5	6	10	15	25	40	60	100	150	500
Maximum flow q_S , m ³ /h	1,2	3,5	6	7	15	20	30	50	80	120	200	300	1000
Starting flow, m ³ /h	<0,004	<0,003	<0,005	<0,007	<0,012	<0,02	<0,03	<0,05	<0,08	<0,15	<0,24	<0,3	<0,35
Pressure loss at q_D , bar	<0,025												
Accuracy class (EN1434)	2 or 3												
Dynamic range q_v/q_D	1:100												
Nominal pressure, bar	16												
Temperature range, °C	105 normal, 130 optional												
Temperature difference range, K	3—104												
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, RS485, optical, RF ultra narrow band												
Power supply	3,6 V, lithium, 10 years												
Temperature sensors	Pt1000												
Data history in EEPROM memory	60 months, 184 days, 1488 hours												
Thread	G3/4B	G3/4B	G1B	G1 3/4B	G1 3/4B	G2B							Flange
Length, mm	110	110	130	160	180	200	220	260	300	360	420	500	500

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 available
- + Programmed due date
- + Wide range of mounting accessories
- + Parameterizing using contact or optical interfaces
- + DIN EN834 standard conformable
- + Automatic activation when installed on radiator



Technical data	
Measurement method	single or two-sensor (in case of single sensor method, indoors temperature can be more then +20°C)
Lithium battery lifespan	more than 10 years
Data history	36 months
Choice of wireless interfaces	Wireless M-Bus, proprietary ultranarrowband communication, LoraWan
Protection from unauthorized device access	AES-128 key
LCD	8 digits
Temperature sensor type	NTC
Temperature range	0 — 105°C
T _m max	105°C
T _m min	35°C for 2 sensor type, 55°C for 1 sensor type

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 overload flows
- + Compact dimensions
- + Horizontal and vertical installation
- + Reverse flow measurement
- + Independent to permanent magnet
- + Low power operation
- + Automatic wireless or wired data transmission via different communication interfaces
- + PC software for data reading and storing
- + Automatic error diagnostics
- + OEM possible
- + IP68 possible



Technical data

	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
Nominal diameter	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
Starting flow, m ³ /h	0,003	0,005	0,008	0,013	0,021	0,053	0,084	0,133	0,213	0,333	0,533	0,840
Q1, m ³ /h	0,01	0,016	0,0252	0,04	0,064	0,16	0,252	0,4	0,64	1	1,6	2,52
Q2, m ³ /h	0,016	0,026	0,04	0,064	0,102	0,256	0,403	0,64	1,024	1,6	2,56	4,032
Q3, m ³ /h	2,5	4	6,3	10	16	40	63	100	160	250	400	630
Q4, m ³ /h	3,125	5	7,875	12,5	20	50	78,75	125	200	312,5	500	787,5
Pressure loss at Q3, bar	< 0,25											
Q3/Q1 (R)	250											
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											
Units	m ³											
Interfaces	Pulse, M-BUS, Wireless M-BUS, RS485, Optical, RF ultra narrow band											
Power supply	3,6 V, Lithium, 12 years											
Data history in EEPROM memory	60 Months, 184 Days, 1488 hours											
Thread	G3/4B	G1B	G1 1/4B	G1 1/2B	G2B	flange						
Length, mm	110	130	160	180	200	200	200	225	250	250	300	350

Multi-jet dry dial water meter «Pulsar»

- + Ready for equipping with communication module
- + Communication module with inductive scanning system
- + Different communication interfaces
- + Magnetic field immunity
- + Reverse flow detection by communication module
- + Both horizontal and vertical installation
- + OEM is possible
- + Water protected



Technical data					
Nominal diameter	DN15	DN20	DN25	DN32	DN40
Q4, m ³ /h	3,13	5	7,875	12,5	20
Q3, m ³ /h	2,5	4	6,3	10	16
Q2, m ³ /h	0,05	0,08	0,126	0,2	0,32
Q1, m ³ /h	0,031	0,05	0,079	0,125	0,2
Q3/Q1 (R) (Horizontal)	80				
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%				
Water pressure class	MAP 16				
Pressure-loss class	ΔP 63				
Temperature class	T30/T50/T90				
Flow disturbance class	U0/D0				
Protection	IP68				
Hydraulic part material	brass				
Interfaces	OMS/Wireless MBUS; Lora; NBIOT; RF ultra narrow band; RS485; MBUS				
Power supply (communication module)	Lithium battery, 10+ years lifetime				
Data history in communication module	60 months, 184 days, 1488 hours				
Thread	G3/4B	G1B	G1 3/4B	G1 1/2B	G2B
Lengtht, mm	165	190	260	260	300

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
- + Server's software for data reading and storing
- + OEM is possible



Technical data					
Nominal diameter	DN15		DN20		
Q4, m³/h	3,13	3,313	5	5	
Q3, m³/h	2,5	2,5	4	4	
Q2, m³/h	0,05	0,04	0,08	0,064	
Q1, m³/h	0,031	0,025	0,05	0,04	
Starting flow, m³/h	0,008		0,014		
Q3/Q1 (R) (Horizontal)	80	100	80	100	
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	OMS/Wireless MBUS; Lora; NBIOT; RF ultra narrow band; RS485; MBUS				
Power supply	Lithium battery, 10+ years lifetime				
Data history in EEPROM memory	60 months, 184 days, 1488 hours				
Thread	G3/4B		G1B		
Length, mm	80 / 110		130		

Communication modules for water meters

- + Different communication interfaces: OMS/Wireless MBUS; Lora; RF ultra narrow band; RS485; MBUS
- + Reverse flow detection
- + Removal detection
- + Magnet detection
- + 10+ years lithium battery lifetime
- + Protection class: IP65/ IP68
- + Data storage in nonvolatile memory: 60 months, 184 days, 1488 hours
- + RF frequency: 868/433 MHz
- + Server software for data reading and storing
- + RF USB modem for configuring and data reading



USB / RF Modem



RF



RF



MBUS



MBUS

Electronic single-phase multi-tariff meter «Pulsar»

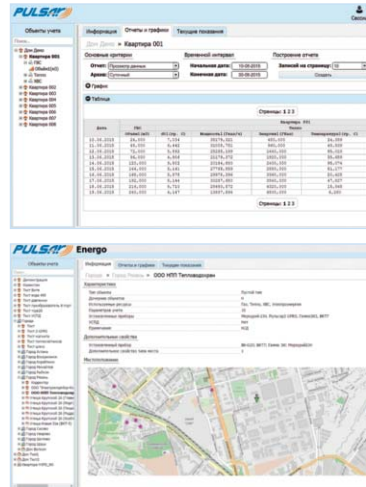
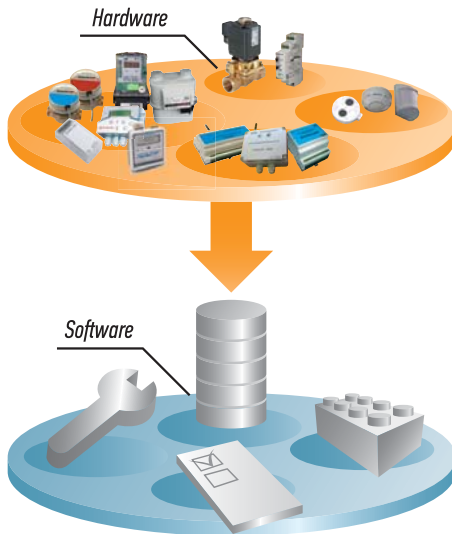
- + Stable precision and reliability
- + Safety and data protection
- + Bidirectional measurement of active power
- + 4-quadrant measurement of reactive power
- + Up to 4 tariffs, 12 seasons
- + Current measurement via shunt and current transformer (option)
- + Magnetic field immunity
- + Voltage, current, frequency, active, reactive and apparent power measurements logging
- + Voltage quality logging (frequency accuracy and supply voltage variation)
- + 15/30/60 minutes, daily and monthly load profile log
- + Built-in real time clock (RTC)
- + The tariffs are controlled via internal clock
- + Events log
- + Large segment LCD display
- + Button for display control
- + Communications: RS-485 (Modbus RTU), optical port, M-BUS, pulse output
- + 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)
Nominal voltage	230 V
Voltage range	0,8—1,15 Un
Nominal frequency	50 Hz ± 5%
Current, base/maximal	5/60 A; 5/80 A; 10/100 A
Starting current	20 mA; 40 mA
Power consumption	< 10 VA (<2,0 W)
Operating temperature	-40 °C...+60 °C
Protection class	IP51
Real Time Clock accuracy	<0,5 s/d
Time backup for RTC	>16 years
Weight	< 0,4 kg
Dimensions	65 x 100 x 83 mm

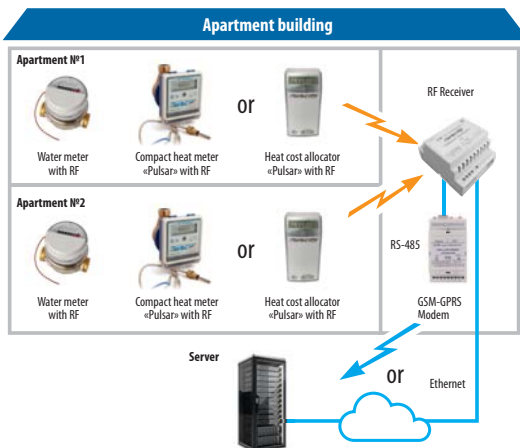
Server's software



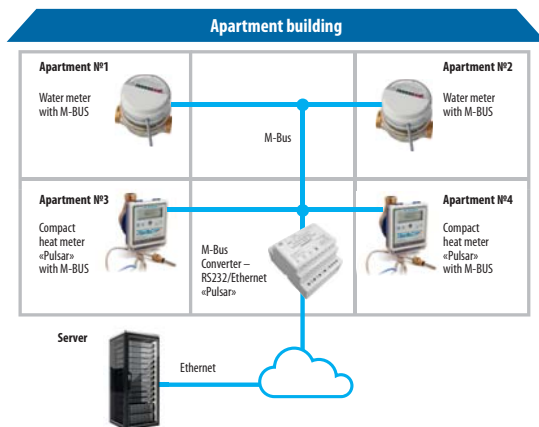
- + Suitable for water meters, heat meters, gas meters, power supply meters
- + Variety of meter's types from different manufacturers. Ready to add new types.
- + Types of communication: MBUS, MBUS Wireless, RS485, GPRS, NBIOT
- + WEB interface
- + PostgreSQL database
- + Customizing
- + User's reports
- + Data transfer to third party programs

AMR systems

Radio



M-Bus



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