UZS-1M®

HIGH PRECISION ULTRASONIC FLOW METER FOR LIQUID AND LNG

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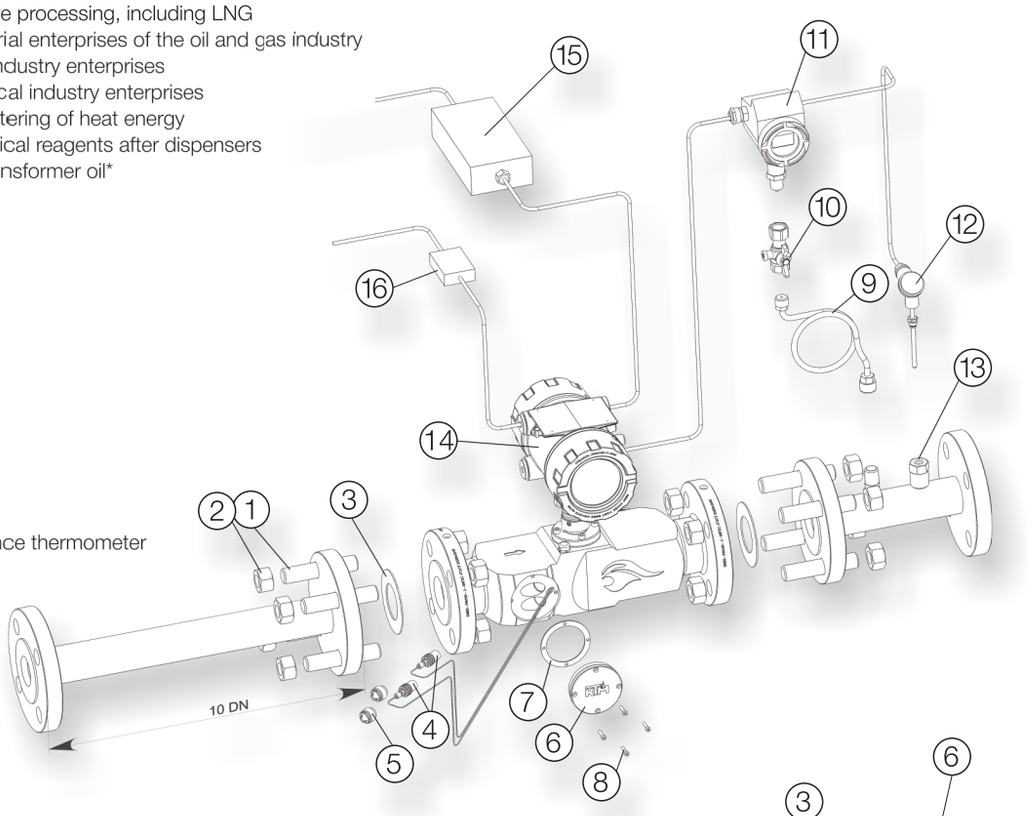
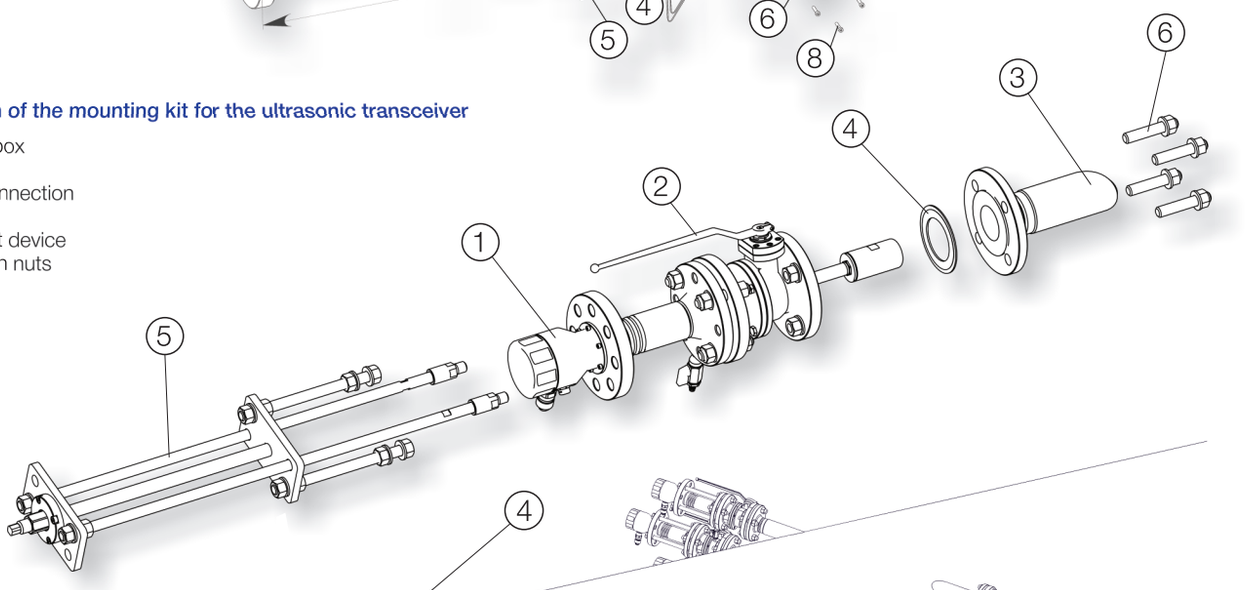
- Custody transfer and process metering of oil and petroleum products during transportation
- Custody transfer and process metering of liquefied natural gas (LNG) during transportation
- Technological processes for groove processing, including LNG
- Technological processes of industrial enterprises of the oil and gas industry
- Technological processes of food industry enterprises
- Technological processes of chemical industry enterprises
- Commercial and technological metering of heat energy
- Technological accounting of chemical reagents after dispensers
- Measurement of the amount of transformer oil*
  * in development and certification

1. hairpin
2. screw
3. sealing gasket
4. ultrasonic transceivers
5. screws
6. lid
7. sealing gasket
8. screws
9. impulse tube
10. ball valve
11. pressure transducer
12. resistance thermometer
13. place of installation of the resistance thermometer
14. signal processing unit
15. power unit
16. interface converter



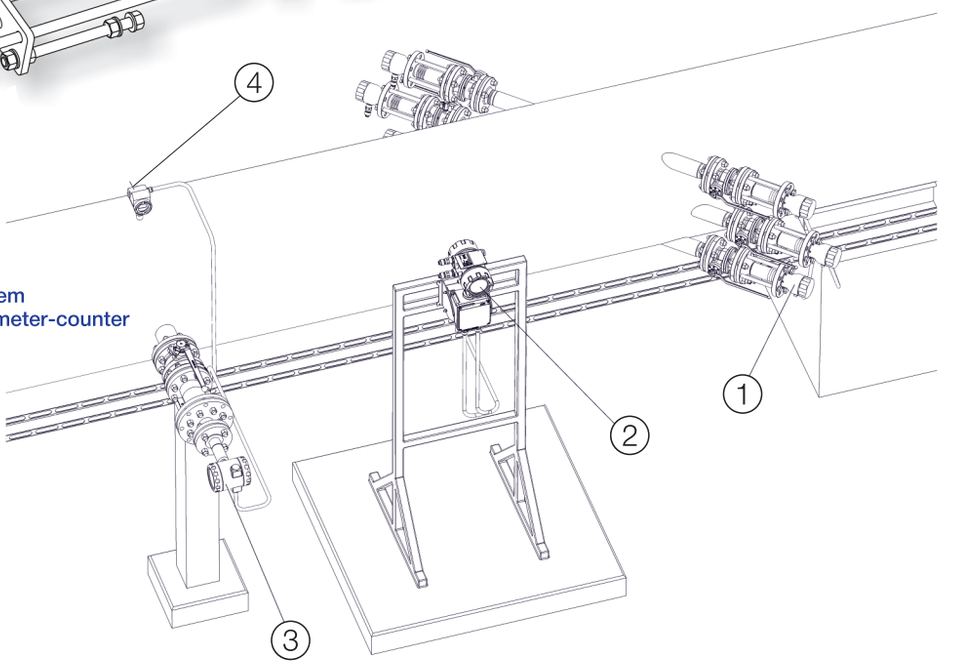
Composition of the mounting kit for the ultrasonic transceiver

1. junction box
2. ball valve
3. flange connection
4. pad
5. alignment device
6. studs with nuts



Installation diagram of the metering system on the pipe based on the UZS-1 M flow meter-counter

1. ultrasonic transceiver
2. processing unit
3. information tuning fork density meter
4. sensor



HIGH PRECISION ULTRASONIC FLOW METER FOR LIQUID AND LNG UZS-1M

- Our products are completely developed and manufactured in Russian Federation
- We have complete set of design and experimental data of our products that verify product quality
- We have own testing facilities that guarantee product precision and durability
- We have service centers across the world that can provide complete set of customer support
- We have robust production line that ensures shortest on-time product delivery to our customers

made in Russia

- **Suitable for media: LNG, LBG, N2 and other cryogenic media in liquid state**
- **Range of working temperatures of the environment from -200 to +450 °C**

YOUR BENEFIT

- Measurement flow rate error limit 0,2%
- Wide flow rate range from 0.03 m/s to 25 m/s
- Operating temperature range from -200 °C to +450 °C
- Viscosity limit of the fluid up to 1000 cSt
- Steam jacketed version for use on bitumen, maltose syrup and other highly viscous liquids
- Mass flow measurement when a density sensor is connected using the HART protocol
- Application for chemically active media
- Solid-machined high pressure measuring section
- Operating pressure up to 50 MPa
- High-tech titanium and stainless-steel ultrasonic transducers ensure stable signal even in harsh process conditions
- High level of measured ultrasonic signal allows to use transducers on pipe diameters up to 3000 mm
- Self-diagnostics while working with status recording in the archive
- Applicable in heat energy measurement systems without external solversUp to two pressure sensors and up to two temperature sensors can be connected
- Operation in the Far North with air temperatures down to -60 °C. Provided with an external heating jacket and electronic components operable in the temperature range from -40 °C to +65 °C and an OLED indicator using COG technology
- Installation of the device with removable sensors under pressure is possible without stopping the flow of liquid in the pipe
- The device has an explosion-proof design Exd according to HC group and an intrinsically safe circuit ia
- Simulation method of verification without removal from the pipeline -1 time in 4 years
- Service life - 15 years

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TECHNICAL DETAILS

Parameter name	Parameter range	Notes
Internal pipe diameter (DN), mm	from 8 to 1400 from 100 to 3000	measuring section (MS) mounting kit without MS
Liquid flow rate, m/s	±0,03...25	
Operating ambient temperature, °C	-10…+45 -40[1]…+65 -60[2]... +65	
Storage temperature, °C	-50…+60	
Medium temperature, °C Type T1 Type T2 Type T3 Type T4 (cryogenic)	 -45… +140 -60…+180[3] -45…+450[3] -200…+180[3]	
Permissible gas content in liquid (volume fraction),%	≤ 3	
Permissible content of mechanical impurities in liquid (volume fraction),%	≤ 5	
Relative flow measurement error,%	1 0,5 0,2	1 path measurement 2 path measurement 3 path measurement
Maximum viscosity of the medium, cSt Type V1 Type V2	 up to 300 up to 1000[3]	
Operating pressure range, MPa	up to 50	
Number of measurement paths	1, 2, 3	
Length of straight inlet section	5 x DN 10 x DN 15 x DN	With flow conditioner for 2 path measurement for 3 path measurement
Installation angle,°	30, 45, 60	
Operating frequencies of ultrasonic transducers, MHz	1,5 2	with a deviation of ± 5%
Interfaces	RS-485 0-20 mA 0-5 mA 4-20 mA pulse-frequency Profibus PA Profile 3.02 Slave ITK6 Foundation Filedbus	with Modbus RTU support, Modbus ASCII current loop with HART support up to 10 kHz, NAMUR NE107 Profibus to ModbusRTU protocol gateway Fieldbus to Modbus RTU gateway
Enclosure rating, IP	66/67/68	
Explosion protection marking Information processing unit Measuring section	 1 Exd [ia Ga] IIC T6…T3 Gb X 0 Ex ia IIC T6…T2 Ga	 Zones 1,2 Zones 0, 1,2
Supply voltage DC, B Supply voltage AC, B	12…30 187…242	With AC-DC module
Power consumption: DC current, W Alternating current, V*A	 6 11	
Mean time between failures, h	85000	

[1] Without the possibility of «Cold Start»
[2] Using heating devices for the IPU
[3] Extended range by temperature, pressure and viscosity

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