



Request for Quotation

Vortex flowmeter

Russia

March 16, 2022

System F LLC

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Environment

	PARAMETER NAME	VALUES OR DEFINING PARAMETER
1.23	Estimated winter ambient air temperature of the coldest five-day period, with a probability of 0.92, according to SP 131.13330	Minus 39 degrees. C
1.2.4	Estimated winter temperature of the ambient air of the coldest day, with a probability of 0.98, according to SP 131.13330	Minus 46 degrees. C
1.2.5	Absolute ambient temperature, minimal	Minus 49 degrees. C
1.2.6	Absolute ambient temperature, maximum	Plus 35 deg. C

RM - flow meter

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	PARAMETER NAME	VALUES OR DEFINING PARAMETER
2.1 TECHNICAL CHARACTERISTICS AND MAIN COMPOSITION OF THE EQUIPMENT		
2.1.2	Instrument position	UQT 3067 (1 pc.)
2.1.3	Minimum required kit	primary converter; secondary converter or calculator
2.1.3.1	RM includes:	
2.1.3.2	primary converter	Yes
2.1.4	secondary converter	Yes
2.1.5	Measured flow	Volume
2.1.6	Type of flowmeter	vortex flowmeter

2.1.7	Relative measurement error, %	No more than +/-2%
2.1.8	Type of explosion protection of the primary converter	Exd
2.1.9	Explosive zone of location of the primary converter (in accordance with GOST 30852.9)	Class 2 zone
2.1.10	Explosivity category of explosive mixtures	IIA
2.1.11	Explosive mixture group according to GOST 30852.5	T1
2.1.12	Type of explosion protection of the secondary converter	Exd
2.1.13	Explosive zone of placement of the secondary converter (in accordance with GOST 30852.9)	Class 2 zone
2.1.14	Wiring diagram	
2.1.14.1	primary converter	Identifies supplier/manufacturer
2.1.14.2	Converter	2 wire
2.1.15	Output signal	
2.1.15.1	primary converter	Identifies supplier/manufacturer
2.1.15.2	Converter	Digital (RS-485)
2.1.16	Supply voltage, V	
2.1.16.1	Primary converter	Defined by the manufacturer
2.1.16.2	Converter	220 V
2.1.17	The presence of a liquid crystal indicator	Yes

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2.1.18	Execution of the liquid crystal indicator	In the secondary converter
2.1.19	cable entry	Yes. Sealed metal gland with internal thread M20x1.5 for a cable with a diameter of not more than 14 mm, with a device for fastening a metal hose with an outer diameter of not more than 21.5 mm with a lock nut that ensures the reliability of the continuity of the electrical circuit, type of protection - Exd
2.1.20	<p>Communication cable between the primary converter and the secondary converter (cable type in accordance with GOST 31565. The supplied cable must comply with GOST IEC 60079.</p> <p>The supplied cable must have a valid certificate of conformity TR TS 004 (to be provided at the stage of design documentation approval)</p>	Yes. Length not less than 15 m (to be specified at the stage of delivery), complete with a protective metal hose
2.1.21	The presence of electric heating	Thermal cover
2.1.22	Calibration interval	At least 2 years
2.1.23	Pipeline Specifications	
2.1.23.1	Installation location	Pipeline : section 6-1 (from the gas separator GS-1 to the electric heater T-5 (to the P-Z furnace))
2.1.23.2	Straight section to RM	8DN
2.1.23.h	Straight section after RM	5DN
2.1.23.4	Ledges and local resistances	gate valve
2.1.23.5	Conditional passage, mm	250
2.1.23.6	Internal diameter of the pipeline, mm	259
2.1.23.7	Pipeline wall thickness, mm	7
2.1.23.8	Pipeline material (grade)	09G2S (gost 19281-2014)

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2.2 CHARACTERISTICS OF THE WORKING ENVIRONMENT

2.2.1	Measured environment	fuel gas
2.2.2	Consumption	nm ³ /h (kg/h)
2.2.2.1	Minimum	66 (60)
2.2. 2.z	Maximum	4620 (4100)
2.2.3	Medium pressure, MPa	
2.2.3.2	Rated	0.1 ... 0.2
2.2.3.4	Pressure drop	0.01
2.2. c.c	Maximum	0.3
2.2.4	Medium temperature, deg. C	
2.2.4.2	Rated	40
2.2. 4.h	Maximum	40
2.2.5	Medium density at t=20 degrees C , kg/m ³	0.9
2.2.6	Viscosity of the medium at t=20 degrees C, mPa*s	1.1 x 10 ⁻²
2.2.7	Medium flow rate, m/s	0.15 ... 10.3
2.2.11	Permissible pressure loss, MPa	0.01
2.2.12	Electromagnetic environment	No

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2.3 MANUFACTURING AND DESIGN REQUIREMENTS

2.3.1	Primary requirements	<p>Each element of the RM must provide the necessary electrical and mechanical protection of the parts of the apparatus and the safety of the consumer and the environment.</p> <p>RM must be fully factory-ready (delivery in one set in the most assembled form).</p> <p>The equipment must be newly manufactured and maintainable. Maintenance of maintainability as a whole should be carried out in accordance with the requirements of GOST 23660.</p> <p>Nominal diameters of flow transducers (volume, mass) should be selected from the range: 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 125, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, 1400, 1600, 1800, 2000 mm. In justified cases, it is allowed to use other values of nominal bore diameters.</p> <p>If the caliber RM is smaller than the diameter of the pipeline, the RM is installed between two conical transition pipes. The use of adapter flanges is prohibited.</p> <p>During the installation and operation of the RM, the requirements of the PUE, GOST R 30852.13 must be observed. The RM must be installed in accordance with the instructions of the manufacturer's design documentation.</p> <p>Measures must be taken to prevent damage to the PM due to hydraulic effects such as cavitation, impact</p>
2.3.2	Flow meter	
2.3.2.1	Process connection	Flanged according to GOST 33259-2015. type 21, Spanish F, DN - manufacturer's choice, PN16
2.3.2.2	Material of parts in contact with the medium	Stainless steel
2.3. 2.z	Housing material	Aluminium alloy
2.3.2.4	Degree of protection of the body of the primary converter	IP65
2.3.2.4	Degree of protection of the body of the secondary converter	IP65
2.3.2.5	Execution of the secondary converter	remote
2.3.2.6	Installation of the secondary converter (if	In a heated cabinet. wall mounting

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2.3.2.7	Overall dimensions of the secondary converter, no more (if the secondary converter is remote version)	200x150x400 (LxWxH)
2.3.2.1 1	Type of valve block (for variable differential pressure PM)	
2.3.2.12	Availability of factory calibration	Yes on the pouring stand
2.3.2.14	External ground screw	Yes
2.3.3	Thermal case / thermal cabinet	
2.3.3.1	Required temperature	Must meet performance specifications as per instrument manual
2.3.3.2	Design	built-in self-regulating cable; junction box fixed on the body
2.3. c.c	Mains parameters	P=100 W; U=-220 V; 50 Hz;
2.3.3.4	Type of execution	explosion-proof
2.3.3.5	Viewing window (yes / no)	Yes
2.3.3.6	Mounting method	For primary converter: - on the pipeline DN250; - nonflammable frost-resistant Velcro.
2.3.3.7	Number and diameter of cable glands	one cable gland for control cable: from 7 to 14 mm; one cable gland for grounding conductor : 5 mm; one cable entry for power cable: 9 to 14 mm
2.3.3.8	Possibility of connecting a flexible metal hose	Yes
2.3.3.9	Possibility of extracting the primary converter without stopping the technological process	Not

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2.4.1	Equipment test requirements	<p>The RM must be subjected to acceptance, periodic, control tests for reliability and type tests, as well as tests for the purpose of MI type approval.</p> <p>The scope and sequence of acceptance and periodic tests should be established in the RD on the RM.</p> <p>Type tests should be carried out in accordance with GOST 15.309 according to the program, which should include mandatory verification of parameters (characteristics) that could be affected by changes made to the design, manufacturing technology and (or) software of the RM.</p> <p>All proposed equipment and systems must have data confirming their successful operation in similar conditions.</p> <p>It is not allowed to use prototypes or equipment that has not been tested without reliable performance. Only generic models that are in standard current production are allowed.</p> <p>The volume and content of tests necessary to prevent the production of unused equipment that meets the technical specifications is determined by the manufacturer, taking into account novelty, complexity, and production features.</p> <p>The control is carried out by the manufacturer in the manner prescribed by the manufacturer and according to the current RD.</p>
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2.5 Reliability

2.5.1	Primary requirements	The manufacturer must provide data on the reliability of the equipment: the frequency of maintenance, time between failures, service life before overhaul, full service life.
2.5.2	Safe operation period, years	At least 10
2.5.3	Manufacturer's warranty obligations	<p>The warranty period is 24 months from the date of shipment and 36 months from the date of commissioning.</p> <p>All equipment must be newly manufactured and repairable .</p> <p>The equipment used must comply with the operating conditions.</p> <p>If during the warranty period defects caused by poor-quality manufacturing and confirmed by an act of the established form drawn up by the Customer are detected, the manufacturer must eliminate the defects found or replace the equipment / product / structural element or the entire product.</p>

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2.6 REQUIREMENTS FOR COATING, MARKING AND VISUAL IDENTIFICATION

2.6.2	Requirements for coatings and visual identification	<p>Marking of RM and (or) its components - according to GOST 18620.</p> <p>Moreover, it must additionally contain:</p> <ul style="list-style-type: none">name and symbol;serial number according to the numbering system of the manufacturer; manufacturer's trademark; permissible working pressure of the medium; medium flow direction indicators;accuracy class or limits of permissible relative error of flow measurements; power supply parameters; Year of manufacture. <p>Nameplate markings must be made in a way that ensures their safety and legibility of the data printed on them during the period of operation of the device.</p> <p>The marking must be resistant to climatic conditions and clearly stand out against the background of the surface on which it is applied.</p> <p>In accordance with GOST 14192, the container for the transportation of RM and its components must be marked with basic, additional, informational inscriptions and handling signs corresponding to the designations: "Fragile. Caution", "Protect from moisture", "Top".</p> <p>Provide a stainless steel plate indicating the technological position of the device</p>
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2.8 PACKAGING REQUIREMENTS

2.8.1	Contents of delivery	<ol style="list-style-type: none">1. Vortex flowmeter with built-in temperature and pressure sensors, integral version, consisting of:<ul style="list-style-type: none">• primary flow converter; temperature sensor built into the primary flow converter; pressure sensor built into the primary flow converter;• secondary converter (converter for bringing the flow rate to standard conditions);2. Cable glands;3. Reciprocal flanges (according to the pipeline material, type 11, version E, dimensions according to row 1 according to GOST 33259-2015), gaskets SNP type B according to GOST R 52376-2005, fasteners;<ol style="list-style-type: none">4. Thermal cover for the primary converter with an explosion-proof electrical heating system;5. A set of documentation in accordance with clause 2.9 of this OL;6. Flanged mounting coil isp. F (according to pipeline material);7. Flow straightener with mating flanges, gaskets SNP type B in accordance with GOST R 52376-2005 and fasteners; material execution is chosen by the supplier;8. Transitions (if necessary). <p>The delivery set of the measuring complex should include:</p> <ul style="list-style-type: none">- embedded structures (bosses \ fittings) for mounting temperature and pressure sensors;- a set of cables for connecting the flow meter, temperature and pressure transducers to the calculator (the length of each cable is at least 15 m, to be specified at the stage of delivery);- metal hose for protection of complete cables;- thermal covers (for the flow meter and pressure transducer) with an explosion-proof electrical heating system.
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2.9 Documentation requirements

2.9.1	Requirements for documentation for measuring instruments	<p>When supplied in the documentation package, INCLUDE certificates, certificates and permits (certified copies):</p> <ul style="list-style-type: none">a valid certificate of primary verification issued by an organization accredited for the right to carry out verification, with an expiration date less than the verification interval as of the date of delivery of the MTR to the Customer;approved method of verification; technical certificate; user manual; registration in the HART association;shipping documentation: picking list, packing list, shipping specification, component parts. <p>All documentation included in the delivery set must be in Russian / English, as well as in electronic form (with signatures of responsible persons) in Adobe Acrobat format (*.pdf). Graphic resolution and quality of files should be sufficient for confident perception of all contained graphic and textual information.</p>
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2.10 REQUIREMENTS FOR TRANSPORTATION, PRESERVATION AND STORAGE

2.10.1	requirements for transportation, conservation and wounding	<p>The RM must be stored in its original packaging and must be protected from undesirable external influences (dust, high humidity, etc.).</p> <p>The choice of packaging must be made in accordance with the requirements of GOST 23216.</p> <p>The storage temperature, depending on the location, must comply with GOST 15150.</p> <p>Transportation of packed boxes is carried out in a closed transport by group.</p> <p>Storage conditions in accordance with the requirements of GOST 15150.</p> <p>Preservation and storage must be carried out in accordance with the requirements of GOST 23216.</p> <p>Packaging of equipment, as well as complete materials, fixtures, spare parts and accessories must provide reliable protection during transportation by any mode of transport, as well as storage at construction sites within 12 months from the date of delivery of the equipment to the Customer's warehouse.</p> <p>Storage conditions should provide:</p> <ul style="list-style-type: none">preservation of geometric dimensions;equipment performance. <p>The material design of the supplied equipment must ensure its safety during storage at the minimum ambient air temperature, depending on the requirements of the equipment manufacturer and operating conditions.</p> <p>Preservation and packaging of equipment must ensure the storage of equipment without re - preservation in an open area in the climatic conditions of the area of operation for 24 months from the date of delivery of the equipment to the Customer's warehouse.</p>
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Terms and requirements

Delivery terms: ExWorks or DDP in Ekaterinburg, Russia (INCOTERMS).

Price breakdown required for each flowmeter.

Fixed price for at least 30 days in Russian Ruble (RUB) or Chinese yuan (CYN).

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