SIMPLE ENGINEERING SOLUTIONS FOR COMPLEX TECHNOLOGICAL TASKS

Ultrasonic Residential Smart Gas Meter LoRaWAN

SMART METER FOR THE INTERNET OF THINGS

Residential gas meters **"Smartico"** are produced by the size range G-1.6, G-2.5, G-4, G-6 and are used to measure the volume of used natural and liquefied gas, with conversion to standard reference at a temperature of 20 °C. The meter is made in a compact design, which has no moving mechanical parts and allows mounting in a confined space. The meter measurement system provides high-precision metrological characteristics.

The meter provides the possibility visual control and wireless data transmission by license-free frequency range using technology **LoRaWAN.**

Parameter		Size			
		G-1.6	G-2.5	G-4	G-6
Minimum flow rate Qmin, m³/h		0,016	0,025	0,04	0,06
Transient flow Qt, m³/h		0,3	0,4	0,6	1,0
Maximum flow rate Qmax, m³/h		2,5	4,0	6,0	10,0
Relative measurement error of volume, reduced to standard conditions of temperature,%	Qmin≤Q<Qt	±3,0			
	Qt≤Q≤Qmax	±1,5			
Excessive ambient pressure, kPa		≤50			
Ambient temperature, °C		-25...+75			
Gas temperature, °C		-25...+55			
Pressure loss, Pa		<100		<250	
Voltage of lithium battery, V		3,6			
Overall dimensions WxDxH, mm		82x85x193			
Weight, kg		0,9			
Average service life, years		>15			
Connecting size		1" (3/4")			
Ingress protection rating		IP54			

KEY FEATURES:

- Built-in temperature sensor and gas flow rate adjustment to standard conditions.
- Absence of mobile mechanical parts, resistance to external magnetic field due to the use of an ultrasonic sensor.
- Protection from external influences and transmission of an alarm message to the dispatcher's software when the case is opened.
- Control and transmission to the dispatcher's software:
  - presence of reverse flow;
  - excess of the flow above the maximum allowable;
  - the presence of an external magnetic field;
  - battery discharge status;
  - performance monitoring of internal sensors;
  - gas flow below the nominal, which indicates a gas leak;
  - determination of the gas/air;
  - shock control and repositioning of meter.
- Built-in non-volatile memory, archiving, built-in real-time clock.
- Battery life 10 years.
- Two systems of measurement: metric/imperial
- Data transmission in the license-free frequency range using technology LoRaWAN EU868/US915.
- Exclusion of the human factor when taking readings.
- Reducing the cost of gas distribution by reducing the number of staff of the subscriber service.
- Operative calculation of the balance of gas consumption in the house, district, city.
- Timely invoicing of consumers for the actually consumed volume of gas.
- Small size, aesthetic appearance, easy installation.

ADVANTAGES OF THE SYSTEM

- Unlimited network scaling;
- Long range of communication (up to 15 km with line of sight and up to 5 km in dense urban areas);
- Autonomous operation of the end devices (more than 10 years from the built-in batteries);
- Low cost of terminal equipment;
- Intelligent network (adaptive data transfer rate and individual power adjustment for battery saving);
- Noise immunity (the possibility of demodulation of the signal with a level up to 20 dB below noise and interference);
- Use of license-free frequency bands that do not require additional costs to acquire a radio frequency resource;
- Ability to expand and change functionality without significant additional investment;
- Flexibly configurable reporting and analytics functionality.

LoRaWAN

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