

# METROLOGY SERVICES

CALIBRATION OF FLOW METERS FOR GAS,  
STEAM AND LIQUID MEASUREMENT



**INITIAL/PERIODIC VERIFICATION:**

- ✓ Mass flow meters
- ✓ Ultrasonic flow meters
- ✓ Electromagnetic flow meters

Measuring instrument, type (group)	Measurement range	Error
Gas and steam meters (flow meters, flow meter counters)	(4...6,500) m <sup>3</sup> /h	ERR ± (0.3...5) %
Ultrasonic liquid meters	(0.014...3,125) m <sup>3</sup> /h	ERR ± (0.15...5) %
Liquid and gas mass meters (flow meters, flow meter counters)	(0...600) t/h	ERR ± (0.1...5) %
Flow rate meters (flow meters, flow transducers)	(0.5...350,000) m <sup>3</sup> /min steam (0.5...20,000,000) m <sup>3</sup> /h liquid (0.1...50,000) m <sup>3</sup> /h	ERR ± (0.8...6) % ERR ± (0.8...6) % ERR ± (0.8...6) %
Electromagnetic liquid flow meters (flow meters, flow meter counters)	(0.0036...3,060) m <sup>3</sup> /h	ERR ± (0.15...5) %

**GAS TEST BENCH — “12-FOLD NOZZLE TEST BENCH” TEST RIG**

provides traceability to the State primary standard of gas volume and mass flow rate units and can be used in the sphere of state regulation to ensure the uniformity of measurements as a working standard of gas volume flow rate units of the first category

- ✓ Number of critical nozzles - 12 pcs (up to 4096 flow values)
- ✓ Number of vacuum pumps - 2 pcs
- ✓ Automatic system tightness check
- ✓ Pressure and temperature sensors to adjust the flow to standard conditions
- ✓ The developed software allows the verification procedure to be carried out automatically
- ✓ Thermo- and hydrostatting of the room where the test bench is located

**TECHNICAL DETAILS**

Name	Value
Flow range $Q_{\min}$ - $Q_{\max}$ , not less than, $m^3/h$ : under operating conditions	4-6500
Maximum diameter, mm	500
Working medium	atmospheric air
Relative expanded uncertainty of the test bench when reproducing the volume flow rate of gas	$\pm 0,20\%$
Number of simultaneously tested instruments	up to 3 pcs
Instrument connection interfaces	4-20mA current loop Pulse input up to 10kHz

## LIQUID TEST BENCH - “HERMITAGE” TEST RIG

- ✓ Availability of Chiller to maintain a stable water temperature of 20 °C; with an accuracy of 0.5 °C
- ✓ Ability to regulate the water temperature within the range of +10...+30 °C
- ✓ The straight sections of the bench are manufactured to N9 tolerances
- ✓ 2 working tables that work independently, which ensures high productivity
- ✓ 2 standards in one “Hermitage” test rig:  
Secondary standard of mass flow by static weighing;  
Standard of category 2 by the method of comparison by electromagnetic flowmeters indications
- ✓ High accuracy of the mass flow rate unit up to 0.04% and the volumetric 0.045% relative to the measured value
- ✓ Wide range of generated flow rates from 0.02 to 1000 m<sup>3</sup>/h
- ✓ Operating medium - potable water



## TECHNICAL DETAILS

Name	Value
Flow range $Q_{\min}$ - $Q_{\max}$ , not less than, m <sup>3</sup> /h:	
Large diameter table (LDT)	0,3-1000
Small diameter table (SDT)	0,02-120
Working medium	water
Limits of acceptable relative installation error:	
When measuring mass	±0,04%
When measuring volume	±0,045%
When measuring the mass flow rate	±0,05%
When measuring the volumetric flow rate	±0,055%