



## Ultrasonic flowmeter PRAMER-510

This flowmeter refers to time-and-frequency ultrasonic flowmeters. It operates using the transit-time differential method, based on difference of propagation time for ultrasonic waves travelling down- and against the stream.

**Advantages:** No construction elements in flow passage of pipe, high stability of measurement, noise immunity, possibility of application at low conductivity fluids.

PRAMER-510 allows to measure consumption of liquids in both directions of the flow in pipelines with diameter up to 2000 mm.

**Application:** ultrasonic flowmeters are used at pressure pipelines for measurement of liquids flow (water, industrial oil, waste water, stratal water, etc.) in various fields of industry and municipal engineering.

PRAMER-510 consists of 1 or 2 sections of pipe (measuring sections), electronic transducer (signal converter) and connection cable 12-150 meters length (up to 500 m upon request).



At the moment "PromServis" manufactures ultrasonic flowmeters with the following **passage diameters (Dp) of measuring sections:**

Dp, mm: 40; 50; 65; 80; 100; 125; 150; 200; 250; 300 - in serial production and

Dp, mm: from 300 to 2000 – upon request.

For pipelines with diameter 300 mm and more mounting with use of cut-in technology is possible.

Depending of quantity of measuring sections and constructive features flowmeters are produced in several versions, listed in Table 1:

Version of flowmeter	Nominal passage diameter, mm	Qty of measuring sections	Qty of acoustic channels at measuring section	Position of transducers at measuring section
01	40 - 2000	1	1	diametrical
02	40 - 2000	2	1	diametrical
03	100 - 2000	1	2	chordal

### Characteristics of measured liquids:

Temperature range: from -20 (without freezing) to +150 °C;

Excess pressure: not more than 1.6 or 2.5 MPa;

Kinematic viscosity: not more than  $5 \cdot 10^{-6}$ ;

Volume content of gas and solid inclusions: not more than 2%.

### Operating Conditions:

Ambient temperature:

- for measuring sections: from -30 to +55 °C;
- for signal converter: from +10 to +55°C.

Relative humidity: up to 95% (at temperature +30°C and lower, without moisture condensation).

Atmospheric pressure: from 84,0 kPa to 106,7 kPa.



Maximal ( $Q_{max}$ ), transit ( $Q_p$ ) and minimal ( $Q_{min}$ ) **values of measured flow** depending on passage diameter of measuring section and a method of calibration are given in Table 2:

Flow, m <sup>3</sup> /h <sup>1)</sup>	Dp of pipe section, mm							
	40	50	65	80	100	125	150	200
$Q_{max}$	50	70	125	200	300	450	630	800
$Q_{min}$	0,5	0,7	1,25	2,0	3,0	4,5	6,5	12

**Notes:**  
1 Velocity of liquid's flow at  $Q_{max}$  does not exceed 11 m/sec.  
2  $Q_{max}$ ,  $Q_p$  and  $Q_{min}$  for measuring section with DN 100 mm and more at indirect method of calibration can be calculated with help of the formulas:  
 $Q_{max} = 0,03 Dp^2$ , (1)  
 $Q_p = Q_{max}/50$ , (2)  
 $Q_{min} = Q_{max}/100$  (3)  
 $Dp$  – passage diameter of measuring section.  
<sup>1)</sup> Values of flow at hydraulic method of calibration

**Relative accuracy** range at flow-rate and volume conversion into electric signal output:

- for flowmeters version 01, 02:  
at hydraulic method of calibration:
  - from  $Q_{min}$  to  $Q_{max}$  -  $\pm 1,5$  %;at indirect method of calibration:
  - from  $Q_{min}$  to  $Q_p$  -  $\pm 2,0$  %;
  - from  $Q_p$  to  $Q_{max}$  -  $\pm 1,5$  %;
- for flowmeters version 03:  
at hydraulic method of calibration:
  - from  $Q_{min}$  to  $Q_{max}$  -  $\pm 1,0$  %;at indirect method of calibration:
  - from  $Q_{min}$  to  $Q_p$  -  $\pm 1,5$  %;
  - from  $Q_p$  to  $Q_{max}$  -  $\pm 1,0$  %.

### Technical characteristics:

Protection degree: IP55 for electronic transducer; IP67 for measuring sections.

Power supply: 187-242 V, (50 $\pm$  1) Hz.

Power consumption: not more than 10 W.

Frame size of electronic transducer (max): 222x170x56 mm.

Average life time: not less than 12 years.

Recalibration interval - 4 years.

Warranty period - 12 months.