

## 4.10. MULTIPURPOSE DEVICE FOR DETERMINING RLC PARAMETERS



The device is intended to determine the parameters of an impedance (admittance) of electric circuits and their components by a two-element (sequential or parallel) substitution scheme in the electrotechnical, electronic, and radio engineering industry, during equipment support and maintenance, and in the information and measuring systems.

*It provides:*

- in case of autonomous use – the measurement of parameters of electric and radio engineering elements and circles in wide ranges of their values;
- if using information and measuring systems with various sensors – the monitoring of equipment parameters and technological processes.

**Technical specifications**

Parameters to be measured	Active resistance on alternating current; capacitance, inductance, tangent of phase angle, tangent of loss angle
<b>Measuring ranges:</b>	
Active resistance	0.01 Ohm ... 100.0 mega Ohm (measurement resolution in the lower part of the range 0.0005 Ohm)
Capacitance (at a frequency of 1 kHz)	1 pF ... 20 μF (measurement resolution in the lower part of the range 0,05 pF)
Inductance (at a frequency of 1 kHz)	1 μG ... 20 kG (measurement resolution in the lower part of the range 0,1 μG)
Tangent of phase angle (loss angle)	0,0001 ... 1000,0 (measurement resolution in the lower part of the range $2,5 \times 10^{-4}$ )
Time of one measurement	2 s (in fast mode 16 measurements per second)
Operating frequencies	1.0 kHz, 0.1 kHz
Basic error	0.1% in all ranges except extreme ones (impedance less than 1 Ohm and more than 106 Ohm);
Connection of a measurement object	Four-clamping
Test signal	0,005/0,05/0,5 V or 0,05/0,5/5 mA (depending on the measurement sub-range);
Interface	RS – 232C with an optical isolation
<b>General data:</b>	
Supply voltage	12 – 15 V (battery, AC - DC adapter)
Consumption current	25 mA
Overall dimensions of the measuring module	90×120×25 mm
Device weight	350 g (without power supply unit)

**Development advantages:**

- measurement of complex resistances: active resistance on alternating current, capacitance, inductance with an additional parameter (tangent of phase angle or loss angle in a wide range of their values);
- increased accuracy in comparison with existing analogues;
- high resolution capability at the edges of measuring ranges;
- reduced error of the measurement of objects' parameters with high values of the tangent of phase angle or loss angle;
- low level of the test signal;
- small dimensions and weight;
- low cost, ease of manufacturing technology, serial suitability.