

Voltmeter of internal battery resistance

1. Overview

Voltmeter of internal battery resistance is an intelligent instrument for battery online measurement, which is mainly used to measure battery terminal voltage and internal resistance. The internal resistance is measured with the international standard AC signal ($1000\text{Hz} \pm 10\%$) by means of four-wire method to ensure the impact of the test probe of the contact resistance of the instrument, the wire and battery output terminal on the measured value, and the battery voltage can also be measured at the same time.

It is applicable for measurement of internal resistances of Lithium-ion, nickel-hydroxide, lithium-manganese cells or assembled battery.

2. Technical indicators

1) Voltage measurement range

0~2V
2V~20V
20~100V

2) Voltage resolution

(0~2V) 1mV
(2V~20V) 10mV
(20V~100V) 100mV

Measurement accuracy: $\pm(1\%+1)$

3) Internal resistance measurement range

0~199.9m Ω
200m Ω ~1999.9m Ω
2 Ω ~20 Ω

4) Internal resistance resolution

(0~199.9m Ω) 0.1m Ω
(200m Ω ~1999.9m Ω) 1m Ω
(2 Ω ~20 Ω) 10m Ω

Measurement accuracy: $\pm(3\%+1)$

5) Environment temperature: -10 $^{\circ}\text{C}$ ~+40 $^{\circ}\text{C}$

6) Power: One 9V battery

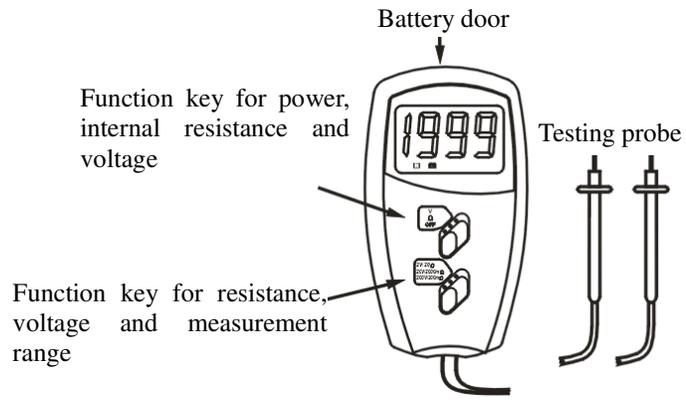
7) Display: LCD

8) Low voltage prompt

9) Weight: 177g

10) Dimensions: 130 \times 72 \times 30mm

3. Panel



4. Operation instructions

A: Internal battery resistance measurement

- 1) Open battery door, and put in a 9V battery then close the battery door properly.
- 2) Turn the power switch to " Ω " position, and "1" will be displayed on the screen, put the measurement range to "100V/200m Ω " position and put the respective test probe to the positive and negative electrode of the battery, if the reading is "1", put the measurement range to "20V/2000m" position or "2v/20 Ω " position.
- 3) The reading of the instrument will display "1" in case of over-range.
- 4) Turn the switch back to "OFF" position to switch off the power after the measurement is completed.

B: Battery voltage measurement

- 1) Open its battery door, and put in a 9V battery and close the battery door properly.
- 2) Turn the power switch to "V" position, and "0" will be displayed on the screen, select proper position with reference to the rated voltage of the battery to be tested (attention: the position selected shall be larger than the rated voltage so that the instrument will not be damaged), put the respective test probe to the positive and negative electrode of the battery properly.
- 3) The instrument will not indicate the polarity of the battery but instead the absolute value of the voltage.
- 4) The reading of the instrument will display "1" in case of over-range. Turn the switch to the large position immediately. If you do not know how large the voltage is, turn the switch to "100V/200m Ω " position; if the measured value is less than 20V, turn the switch to "20V/2000m Ω " position; if the measured value is less than 2V, turn the switch to "2V/20 Ω " position. Avoid over-range measurement as possible in voltage testing as it is hazardous to the instrument.
- 5) Turn the switch back to "OFF" position to switch off the power after the measurement is completed.

5. Caution:

As the instrument is a kind of measuring meter of high precision, please pay attention to the following items in using it:

- 1) The voltage of the test end of the instrument shall not exceed 100V, or the instrument will be damaged permanently.
- 2) Its red test probe shall be put to the high voltage end (positive electrode) of the tested battery and the black one shall be put to the low voltage end (negative electrode) of the tested battery in voltage testing.
- 3) When testing the internal resistance of the battery, the respective test probe shall be directly connected to the positive and negative output terminal rather than connected with wires to ensure the accuracy of the measurement result, this is because if connected to the positive and negative terminal with wires, the internal resistance of such connection wires will also be included in the internal battery resistance.
- 4) As the instrument is an intelligent meter with low-power consumption, the battery (batteries) shall be removed from the instrument when it is not use for a long time;
- 5) Keep the test probe away from AC signal to avoid the instrument from getting damaged.