

OPERATION ATTENTION

It is very important that you read through the instrument manual before measuring operation.

Attention:

1. Testing Probe: red test probe shall be put to the high voltage end (positive electrode) of the tested battery and black one shall be put to the low voltage end (negative electrode) of the tested battery, to avoid the instrument from getting damaged;
2. In case that no acknowledgement of the tested battery's internal resistance and terminal voltage, select the largest testing range (20 Ω) for internal resistance measurement and the largest testing range (100V) for terminal voltage measurement. Later, put to the proper testing range accordingly;
3. Regardless of internal resistance or terminal voltage measurement, select the proper testing range before testing operation. Also, never switch testing between internal resistance and terminal voltage during measurement, to avoid the damage of instrument.

I Generation

Voltmeter of internal battery resistance is an intelligent instrument specifically designed to measure various battery resistance. It not only measure battery resistance with off-line mode, but also with on-line mode. Meanwhile, it has the function of measuring battery voltage. in measurement of battery resistance, it is adopted the international standard 1KHz constant current, And the adoption of four contactor & four wires eliminate the effect between lead resistance and contact resistance in order to accurately measure. It is applicable for measurement of various kinds of internal resistances of Lithium-ion, nickel-hydroxide, lithium-manganese cells or assembled battery and quickly assess whether battery resistance is good or not.

II Technical indicators

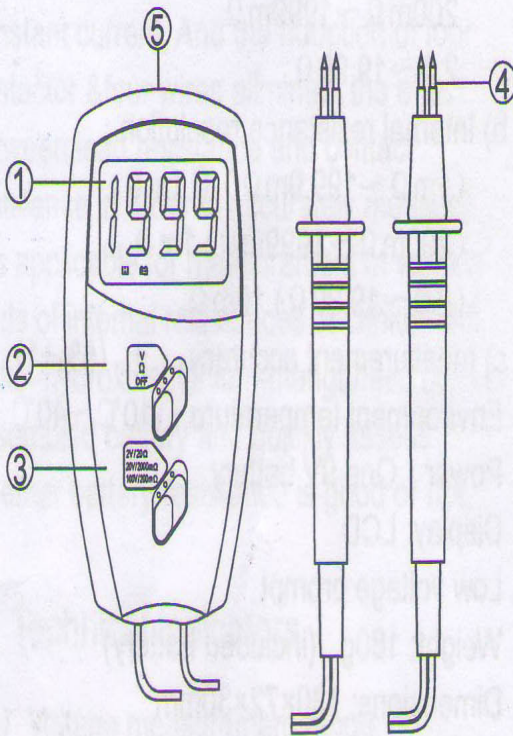
1.a) Voltage measurement range

- 0~1.999V
- 2V~19.99V
- 20V~100.0V

- b) Voltage resolution :
 - (0~1.999V) 1mV
 - (2V~19.99V)10mV
 - (20V~100.9V)100mV
- c) measurement accuracy : $\pm (1\%+1)$
- 2. a) Internal resistance measurement range :
 - 1m Ω ~199.9m Ω
 - 200m Ω ~1999m Ω
 - 2 Ω ~19.99 Ω
- b) Internal resistance resolution :
 - (1m Ω ~199.9m Ω) 0.1m Ω
 - (200m Ω ~1999m Ω) 1m Ω
 - (2 Ω ~19.99 Ω) 10m Ω
- c) measurement accuracy : $\pm (5\%+1)$
- 3. Environment temperature : -10 $^{\circ}$ C~40 $^{\circ}$ C
- 4. Power : One 9V battery
- 5. Display: LCD
- 6. Low voltage prompt
- 7. Weight: 180g (included battery)
- 8. Dimensions: 130 \times 72 \times 30mm

III Panel

1. LCD
2. Function key for power, internal resistance and voltage
3. Function key for resistance, voltage and measurement range
4. Four contactor & four wires
5. Battery door



IV 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 "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 "2000m Ω " position or "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 tested 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" position; if the measured value is less than 20V, turn the switch to "20V" position; if the measured value is less than 2V, turn the switch to "2V" 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.

V Cautions

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, In order to ensure the accuracy of the measurement result, 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.
6. During the process of operation, please specially pay more attention to the probe. As the probe of four contactor & four wires is of elastic, please properly press it and make the probe compress to 1/2, keep it away from the big strength to avoid the instrument from getting damaged.
7. It is necessary to replace a new 9V battery, when left corner of LCD display show “  ”.