

DIGITAL MILLI OHM METER OPERATION MANUAL

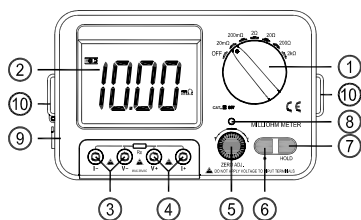
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1. General

Adopting a highly precise constant current source, this milli-ohm meter can make 4-wire resistance measurement via accurate digital bridge. It can measure milli resistance over 0.01mΩ, different conductors, heating components, soldered point resistance, ect.. With digital bridge, the instrument has the features of easy to operate, wide test range, highly stable performance, backlit LCD display, data hold and auto power off. Using a shoulder strap, it can be used by both hands. It is an ideal instrument to be used for contact resistance measurements of power resistor, motor coils, transformers, PCB boards, cables, antenna, communication equipments, electric machines, electrical facilities, etc.

2. Panel Descriptions



1. Power switch/function switch: power ON/OFF the instrument and selects functions. To save power, turn the switch to "OFF" when not in use.
2. LCD display: displays testing results and unit symbols

3. Input terminal for the black test lead
4. Input terminal for the red test lead
5. Zero knob: used to calibrate the zero readings in mΩ range
6. "*" key: LCD backlight ON/OFF key
7. "HOLD" key: press to hold the current readings on the LCD. The LCD will display "HOLD" symbol. Press again to cancel the data hold function.
8. Power indicator (LED)
9. Terminal of DC 9V AC adapter (+ - -). It is used to connect to external power source for power supply.
10. Shoulder strap locker: used to lock the shoulder strap so that the instrument can be hung on the neck to save hands.

3. Technical Specifications

1. General Specifications

- 1) Display: 3 1/2 LCD display, max.display 1999
- 2) Over range indication: displays "1" when exceeding upper limit
- 3) Zero calibration: calibrated to zero by external tools
- 4) Sampling rate: approx.3 times/Sec.
- 5) Lower battery indication: the LCD display "🔋" symbol.
- 6) Additional temperature coefficient: 0.15 x specified accuracy/°C (<18°C or >28°C)
- 7) Altitude: <2000m
- 8) Operation environment: in-door use; pollution category II; temperature -15°C-55°C, relative humidity <75%RH
- 9) Storage environment: temperature -40°C-60°C, relative humidity <90%RH
- 10) Power source: 5# battery LR6 (1.5V) x6 (or external AC adapter). With lower battery indication.
- 11) Power consumption: <120mA
- 12) Fuse: 150mA/60V resettable fuse
- 13) Dimension: 175 (L) x 116 (W) x 62.5 (D) mm
- 14) Weight: 580g (including battery)

2. Technical specifications

Accuracy:±(a% rdg+ least effective digit)

Ambient environment to ensure accuracy: temperature (23±5)°C, relative humidity <75%

Calibration date: 1 year from off-factory date

Range	Accuracy	Resolution	Testing current
20 mΩ	± (0.5%rdg±3)	0.01 mΩ	Approx.100mA
200 mΩ	± (0.5%rdg±3)	0.1 mΩ	Approx.50mA
2 Ω		1 mΩ	
20Ω		1 0mΩ	
200Ω		1 00mΩ	
2kΩ		1Ω	

4. Operation Instructions

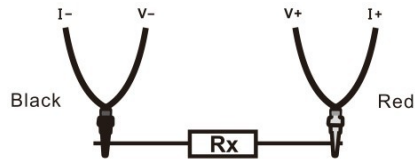
- 1) For the first time of operation, please make sure there is enough power source. If not, open the battery door and put into 6 pcs of 5# batteries (Refer to battery replacement on page 3). Note the batter polarities.
- 2) When connecting to an external AC adapter, the battery power supply will be shut off. Do not charge the batteries. NOTE: choose a correct power supply mode (+ - -).
- 3) To ensure measurement accuracy, warm up the instrument for at least 10 seconds before operation.
- 4) Before measurement, make sure the 4-wire test leads are safe and sound. Do not use broken test leads.
- 5) To check the instrument is working properly, test a resistor of known resistance before other measurements.
- 6) To avoid damage to instrument circuit, do not input voltage to the 4-wire test lead socket.

Principles:

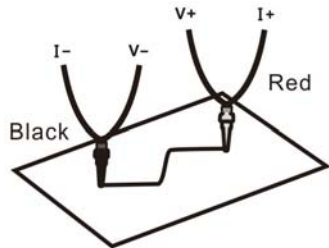
- 1) Refer to the following illustrations. There is a testing current going through the range from "I+" to "I—"
- 2) This current is going through a resistor Rx (resistance value not know)
- 3) The voltage Vx can be measured on terminal Rx1/Rx2: Vx=Rx x Is, hence Rx=Vx/Is
- 4) The unknown resistance value can be calculated via Vx value, and will be displayed on the LCD.
- 5) To have an accurate resistance value, please make zero calibration before measurement.

Accurate impedance measurement:

- 1) Input the two connectors of the red test lead into the two red connectors of the instrument on the right side, and the two connectors of the black test lead to the two black connectors of the instrument on the left side.
- 2) Tune the switch to a suitable range.
- 3) Clamp the two test clips on the 0 ohm circuit terminals, and adjust the zero knob to make the reading as 0.
- 4) Once a new range is selected, always do the zero calibration before measurement.
- 5) To measure an unknown resistor R_x , follow the following method as illustrated below:



- 6) To measure a resistor on a PCB, allow the following method as illustrated below:



- 7) The tested result will be displayed on the LCD.

CAUTION!

1. If the tested resistance is over $2k\Omega$ or there is open circuit, the LCD displays "1".
2. When testing a live resistor, to ensure safety, do not proceed testing until the tested circuit is completely powered off and all capacitors are fully discharged.
3. If testing results have considerable error, it may be caused by other live components of the same circuit or by electric potential on the two ends of the resistor.
4. Do not input voltage to the resistance range!

Data Hold:

Press the "HOLD" button, the current data will be held on the LCD. Press the "HOLD" button again to cancel data hold.

NOTE: There is no data hold function during insulation resistance measurement.

Backlit Display:


Pressing "*" button, the LCD backlight turns on. Pressing "*" button again, the LCD backlight turns off.

Safety Instructions and Maintenance

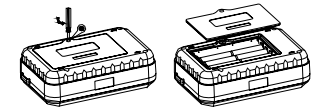
The tester is a precise instrument. User is not allowed to apply any modification to the instrument circuit.

CAUTION!

1. To ensure safety, the tested object must be completely shut off from power supply and must be testified that the tested object has been fully discharged by short circuit discharge to testify that the tested object does not have any electrical hazard.
2. Do not apply voltage measurement to the input terminals.
3. Do not apply any measurement before the instrument's batteries are well installed or before the rear cover is well loaded.
4. Before change battery or change fuse, remove all test leads from the tested object and turn off the power switch.
5. Keep the instrument away from water and dust. Do not fall or throw the instrument.
6. Keep the instrument away from high temperature, high humidity, flammable, explosive and strong magnetic environment.
7. Use a soft cloth dampened in a solution of mild detergent and water to clean the instrument. Do not spray cleaner directly onto the instrument or use any abrasives or strong solvent.
8. If long time no use, take out the batteries from the instrument to avoid battery leakage damaging the instrument.
9. When use 9V battery, if the LCD displays low battery

symbol , replace battery according to the following steps:

- 1) Use a screw driver to open the battery door screws, and take off the battery door.
- 2) Take off the battery and replace with a new one. To ensure long time battery power supply, it is recommended to use alkaline batteries.
- 3) Load the battery door and tighten the screws.



Fuse replacement

The instrument uses a 150mA/60V resettable fuse. In case of replacement, please use a fuse of same specification. And follow instructions as below:

- 1) Tune the function switch to "OFF" position.
- 2) Use a screw driver to open the screws on the bottom, and take off the bottom cover.
- 3) Take off the PCB screws, and take off the PCB.
- 4) Locate the resettable fuse on the PCB, which is marked with "FUSE". Use an iron to take off the fuse and replace it with a new one of same spec.
- 5) Re-load the PCB, bottom cover and screws.

CAUTION!

The instrument uses a resettable fuse, which will protect the internal circuits once wrong operations occur. Once the wrong operation is canceled, the fuse will automatically reset, no need to change fuse. Once a fuse change is in need, use a fuse of same spec.


Packing List

1. Digital milli-ohm meter x1pcs
2. 4-wire test lead x1 pair

3. 5# battery (1.5V) x6pcs
4. Operation manual x1pcs
5. Shoulder strap x1pcs

Trouble Shooting

If the instrument does not work properly, the following self-check steps will help to solve general faults. If the default still not eliminated, please contact the maintenance or local distributor.

Fault	Solution
No display	<ul style="list-style-type: none"> • Power off - please turn on the power • Replace the batteries
 symbol appearance	<ul style="list-style-type: none"> • Replace the batteries
Error value	<ul style="list-style-type: none"> • Replace the batteries

The operation manual is subject to change without prior notice.

The contents in this operation manual are considered to be correct. If user finds any mistake or omission, please contact the manufacturer.

The manufacturer hereby will not be responsible for any accident or damage caused by improper operation.

The functions described in this manual are not meant for any reason for any special usage.