

# Instruction Manual for Digital Grounding Resistance Meter

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### Warning

The warnings and safety requirements stated in this manual must be strictly observed to ensure safety. Please read the operating instructions carefully before using this meter.

### I. Overview



Grounding Resistance Meter, as a professional instrument for measurement of grounding resistance of electrical equipment, is **made by** improving the circuit, structure and technology of traditional ground resistance meter. With a beautiful and practical fashion style, this meter will provide more complete function, higher accuracy and more convenient **operation**. Thanks to the dust-and-moisture proof structure, this meter is better suited to field operation. It is designed to measure the grounding resistance of grounding systems of a variety of power systems, electrical equipment and lightning protection equipment, and also to measure AC voltage.









### II. Open-case Inspection

1. Grounding resistance meter	1 set
2. Canvas bag	1 Pcs
3. Ground drill rod	2 Pcs
4. Auxiliary testing wire (including: a piece of 15-meter red wire, 10-meter yellow wire, and 5-meter green wire)	1 set
5. Simple testing wire (including: a piece of 1.6-meter red wire and 1.6-meter green wire)	1 set
6. 5# alkaline battery (LR 6 AA) (1.5V) x 8	8 Pcs
7. Instruction manual	1 copy
8. Strap	1 piece

### III. Safety Precautions

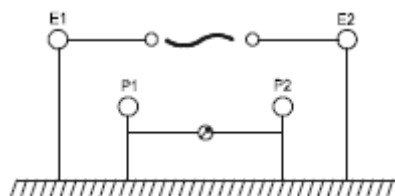
1. Please read this instruction manual carefully before using this grounding resistance meter
2. Do not use the grounding resistance meter and measuring wire with damaged surface.
3. Do not touch the conductor with a voltage of higher than DC 60V or AC36V RMS in order to prevent electric shock, since the said voltage has reached the standard of electric shock.
4. Before the measurement of resistance, the tester must be completely isolated with power circuit in order to ensure accurate readings and personal safety.
5. The meter shall not be stored at high temperature; direct sunlight shall be avoided so as not to affect the service life of LCD.

6. When the symbol " " which indicates "low battery" appears, the battery shall be replaced. Before long-term storage, the batteries shall be taken out to prevent the damage to meter caused by battery leakage.
7. Special care should be exercised during the measurement for bare wires.
8. The battery will be disconnected when an external adapter is used. In this case, the battery cannot be recharged. Note: please select the power supply mode ().
9. Grounding resistance testing requirements:
  - a. The AC grounding resistance shall not be greater than  $4 \Omega$  ;
  - b. The safety grounding resistance shall not be greater than  $4 \Omega$  ;
  - c. The DC grounding resistance shall be determined according to specific requirements of computer system;
  - d. Lightning protection grounding resistance shall not be greater than  $10 \Omega$  ;
  - e. For the joint grounding of shielding system, the grounding resistance shall not be greater than  $1 \Omega$  ;

	Warning!		Resistance
	High Voltage! Dangerous!		AC
	Earth		Battery under-voltage
	Double insulation		CE complied

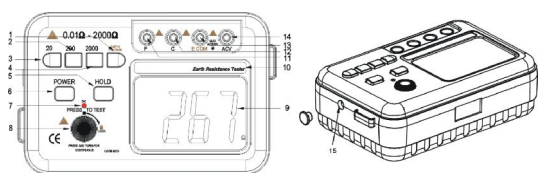
#### IV. Work Principle

The measuring principle of grounding resistance is based on the law of resistance. Insert 4 electrodes (E1, P1, P2, E2) to a certain depth under the ground, and the distance between electrodes shall be around 20 meters. See the figure below:




AC signals act on electrodes E1 and E2, and the current that flows through the earth shall be measured by ammeter through electrodes P1 and P2. If the current value is a constant, the measured voltage will be proportional to earth resistance. The displayed value depends on swamping resistance; hence, the appropriate range shall be determined according to measured resistance values in order to get the best readings. AC signal is generated by the built-in converter.

#### V. Appearance Description



- 1, 2, 3 and 4: Range selector switch ( $10 \Omega / 100 \Omega / 1000 \Omega / AC750V$ ).
- 5: Digital holding switch (HOLD)
- 6: Power Switch: self-locking power switch (POWER)
- 7: Testing indicator: this lamp goes on during the testing if the connection is correct.
- 8: Test button.
- 9: LCD: display measurement data and unit symbols.

- 10: Instrument model
- 11: P2: test the jack of the input part
- 12: E2 ACV: test the jack of the input part
- 13: E1 com: AC current test the input part
- 14: D1: Contact the ground jack of the tested equipment
- 15: Power adapter jack (+  -).

**VI. Technical Characteristics**

1. General features

- (1) Display: 84.8 × 59.8mm window-type LCD display; Maximum displayed value "1999".
- (2) Over-range indication: the first digit is "1" when the upper limit is exceeded.
- (3) Power supply: 5# alkaline battery LR6 (1.5V) x 8 (can be connected to optional adapter); under-voltage indication function is provided.
- (4) Power consumption: power consumption during no-load testing is ≤800mw.
- (5) Operating environment: 0°C- 40°C. Relative humidity: 30% - 85%RH.
- (6) Overall dimensions: 175 (L) ×110(W) ×70 (D) mm
- (7) Weight: about 680g (including batteries).

2. Technical data

Grounding resistance

Measuring range	Basic accuracy	Resolution
10Ω	± (3%+0.1Ω)	0.01Ω
100Ω	± (3%+8d)	0.1Ω
1000Ω		1Ω

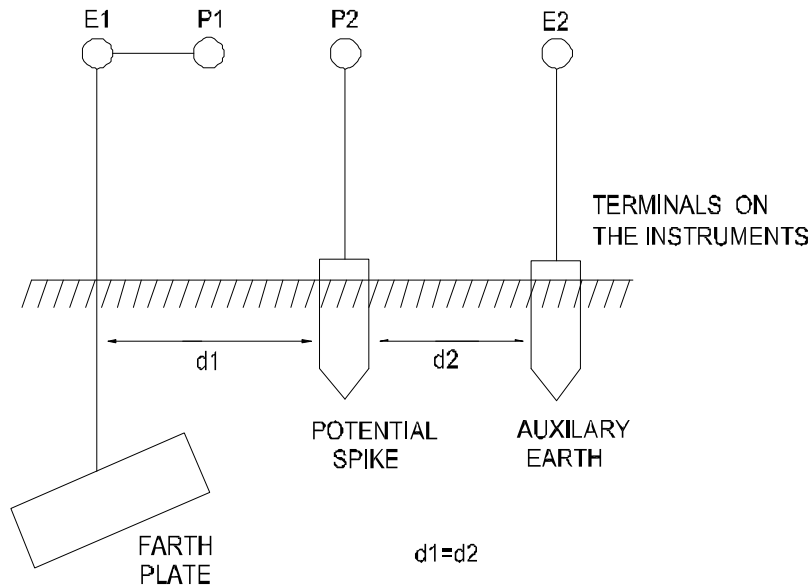
Grounding voltage (50Hz - 200Hz)

Measuring range	Basic accuracy	Resolution	Input impedance	Overload protection
750 V	±( 1.0 % +10 d )	1 V	10 MΩ	750V rms

**VII. Resistance Measurement Method**

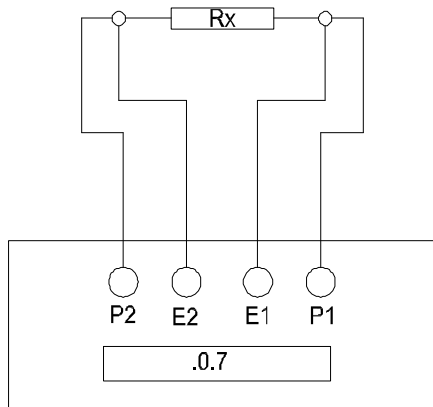
- 1) Use method when a ground resistor is connected with three connection terminals

Insert two pieces of steel bars into the ground with equal distances to the EL straight line of the tested ground board as the auxiliary electrodes to connect to P2 and E2. When the earth resistance is very small, the spacing between the ground board and the auxiliary electrodes shall be above 20m. The measurement site shall try to avoid the strong electric field in order to reduce the measurement error.



2) The earth resistance tester is set with 4 connection terminals: E1, P1, P2 and E2. However, in order to meet the demand of three-line measurement of most users, generally, the meter inside has been connected with E1 and P1, so it is necessary to connect E1 with the tested earth board (P1 not connected) and connect P2 and E2 to the auxiliary electrodes.

As the lead resistor may produce errors, before measurement, be sure to connect it to P2 steel bar clip and clamp the resistor to the tested earth plate electrode E1 and record down the reading of this short-circuit resistor. Then connect the lead wires to the corresponding auxiliary electrodes P2 and E2; adjust a proper range, read the measurement value, finally subtract the short-circuit resistance reading and obtain the actual resistance R. The distance between E1 and P2 is about 20~30m, depending on different earth conditions.



3) Measure the resistance of other objects:

The digital resistance tester can also measure other objects with resistance below 1,000Ω and the connection of objects during test is as shown in the diagram. Press the TEST key, directly read the resistance from the screen. Therefore, this meter can be used to measure the resistance of the earth electrodes of other earth equipment.

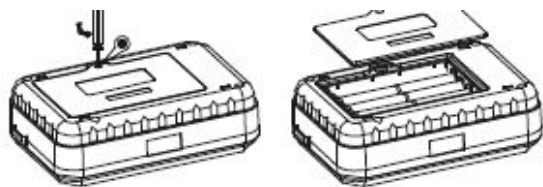
Note

For the first use of the meter, please adjust the range to the position of 1,000Ω. Press the TEST key to display the resistance; if the reading is too low, please adjust the range to the position 100Ω or 10Ω. The measurement site should be kept away from the strong earth electric field to decrease the measurement error. After the test is over, please power off the device to save electricity.

### VIII. Battery Installation

When the battery power is low, a "🔋" symbol will appear on the screen, which means the battery needs to be replaced.

Turn off the instrument and take out the batteries.  
 Unscrew the screws at battery door with a screwdriver.  
 Open the battery door.  
 Load a new battery (pay attention to polarity).  
 Close the battery cover and tighten the screws.




Step I

Step II

### IX. Troubleshooting

If your meter can't operate properly, the following methods can help you quickly resolve general problems. If the faults are still not removed, please contact the service center or distributor.

Symptom	Check position and method
No display	<ul style="list-style-type: none"> <li>● Power supply is not connected;</li> <li>● Replace the battery.</li> </ul>
 symbol occurs	<ul style="list-style-type: none"> <li>● Replace the battery.</li> </ul>
Big display error	<ul style="list-style-type: none"> <li>● Replace the battery.</li> </ul>

This manual is subject to change without notice.

The contents of this manual are considered correct. If you find some errors and omissions therein, please contact the manufacturer.

We are not responsible for any accident and hazard due to user's faulty operation.

The functions described in this manual cannot be taken as the reason for using this product for special purposes.

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