

**BY2571 Earth  
Resistance Tester**



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## I . Product Overview

The instrument is suitable for measuring the grounding resistance of various devices and measuring the resistance of low resistance conductors in electric power, post and telecommunications, railway, communication, mining and other departments; this table can also measure soil resistivity and ground voltage.

## II . Working Principle

This instrument abandons the traditional manual hand-cranked power generation mode, adopts advanced medium-large scale integrated circuit, and applies DC/AC conversion technology to combine the three-terminal button and four-terminal button measurement mode into a new type of grounding resistance measuring instrument.

The DC/AC converter turns the DC into an AC low-frequency constant current, and forms an AC voltage through the auxiliary grounding electrode C and the measured object E. The AC voltage drop is generated on the measured object, and is sent to the AC amplifier through the auxiliary grounding pole P. And then sent to the meter display after detection. With the override switch, three different limits are available: 0~2Ω, 0~20Ω, 0~200Ω.

## III. Product Features

1. High-strength aluminum alloy is used as the casing on the structure. In order to prevent power frequency and radio frequency interference, the phase-locked loop synchronous tracking detection method is adopted and the switch capacitor filter is used to make the instrument have better anti-interference ability.
2. The DC/AC conversion technique is used to convert the direct current into

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a low frequency constant current of the alternating current for measurement.

3. Allow the auxiliary grounding resistance to vary between 0~2K $\Omega$  (RC) and 0~40K $\Omega$ (RP), which will not affect the measurement results.
4. The instrument does not need to manually adjust the balance, 3 (1/2) LCD display, in addition to the earth resistance, it can also measure low resistance conductor resistance, soil resistivity and AC ground voltage.
5. If the test loop does not pass the meter display "1" represents overflow, in line with the usual measurement habits.

#### IV. Technical Parameter

##### 1. Conditions of use

- 1) Ambient temperature: 0~+45 $^{\circ}$ C
- 2) Relative humidity: <85%RH

##### 2. Measurement Range and Constant Current Value (RMS)

- 1) Resistance: 0~2 $\Omega$ (10mA), 2~20 $\Omega$ (10mA), 20~200 $\Omega$ (1mA)
- 2) Voltage: AC 0~20V

##### 3. Measurement accuracy and resolution

- 1) Accuracy: 0~0.2 $\Omega$   $\leq$  3% $\pm$ 2d; 0.2~200 $\Omega$   $\leq$  1.5% $\pm$ 1d; 1~20V  $\leq$  3% $\pm$ 1d
- 2) Resolution: 0.001 $\Omega$ , 0.01 $\Omega$ , 0.1 $\Omega$ , 0.01V

##### 4. Measurement Errors Caused by Ground Voltage

- 1) Permissible ground voltage ( $\leq$ 5V) (RMS of power frequency) error ( $\leq$ 5%)

##### 5. power and power consumption

- 1) Maximum power loss:  $\leq$ 2W

- 2) Power supply: 6.8V~9V (7 5# rechargeable battery packs), external 220V AC power supply for charging.
- 3) Volume: 220 mm x 200 mm x 105 mm
- 4) weight: ≤ 1.4kg

## V. Method Of Operation

### 1. Grounding resistance measurement (Figure 1)

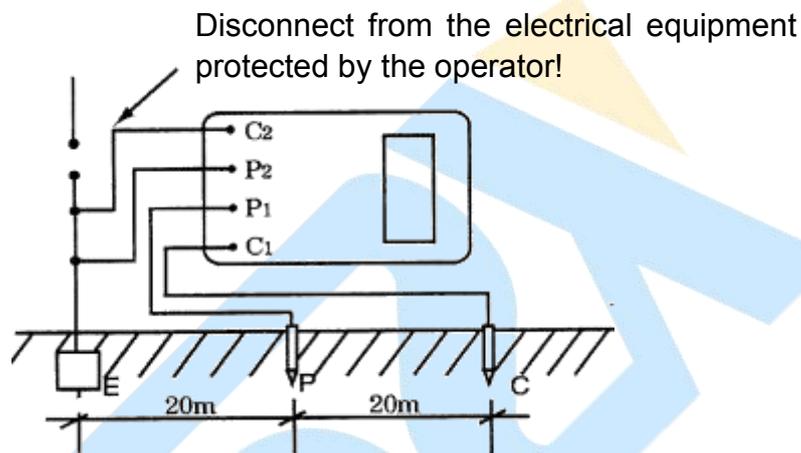


Figure 1

- 1) Along the measured grounding electrode E (C2, P2) and the potential probe P1 and the current probe C1, they are 20 meters apart from each other in a straight line, so that the potential probe is in the middle of E and C, and the probe is inserted into the ground as required.
  - 2) Connect the ground resistance meter terminals E (C2, P2), P1, and C1 to the position of the probe with a dedicated wire.
  - 3) Turn on the ground resistance meter power switch "ON", select the appropriate gear position and press the button lightly. The indicator light is on, and the value displayed on the LCD of the meter is the measured ground resistance.
- ### 2. Soil resistivity measurement (Figure 2)

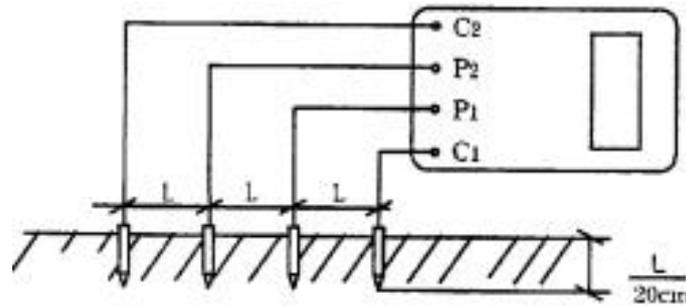


Figure 2

1) When measuring, four probes are inserted in the measured soil along a straight line and the distance between probes is equal. The distance between probes is  $L$ . The depth of probes entering the ground is  $L/20\text{cm}$ . The probes are connected with four probes by wires from terminals of  $C1$ ,  $P1$ ,  $P2$  and  $C2$ , respectively. If the resistance value measured by the earth resistor is  $R$ , the soil resistivity is calculated in the following formula:

$$\Phi = 2\pi RL \quad \Phi \text{—Soil resistivity } (\Omega \cdot \text{cm})$$

$L$ —Distance between probe and probe(cm)

$R$ —Ground resistance meter reading ( $\Omega$ )

The soil resistivity measured by this method can be approximately regarded as the average soil resistivity in the area between the buried probes.

2) The probes used for geodesic resistance and soil resistivity are usually aluminium alloy tubes or round steel with a diameter of 25 mm and a length of 0.5-1 M.

3. Conductor resistance measurement ( )

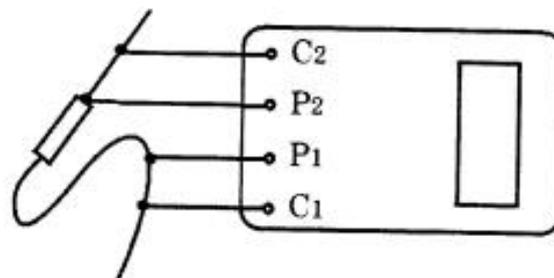


Figure 3

4. Ground voltage measurement

The measurement wiring is shown in Figure 1. The C1 plug is removed, the plug between E and P1 is retained, the ground voltage (EV) is activated, the indicator light is on, and the reading head value is the AC ground voltage between E and P1.

After the measurement is completed, press the power "OFF" button and the meter will shut down.

## VI. Maintenance

1. When storing and keeping this table, attention should be paid to the ambient temperature and humidity. It is advisable to place it in a dry and ventilated place to avoid dampness and to prevent acid, alkali and corrosive gases.
2. When measuring protective grounding resistance, it is necessary to disconnect the connection point between electrical equipment and power supply. When measuring grounding resistance less than  $1\Omega$ , special wires should be connected to the grounding body separately. C2 is on the outside and P2 is on the inside as shown in Figure 4.

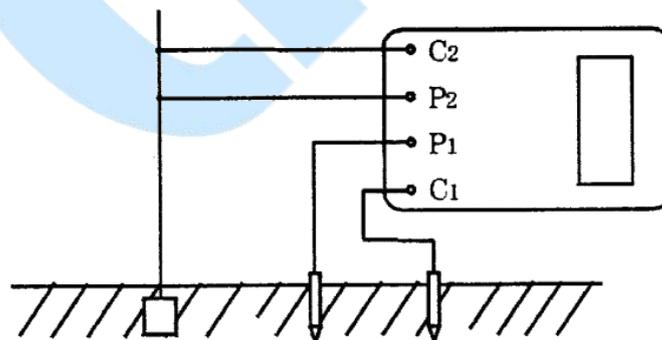


Figure 4

3. When measuring the grounding resistance of a large grounding grid, it cannot be measured according to the general wiring method. The buried

point can be selected according to the regulations in the ammeter and voltmeter measurement methods.

4. When measuring the ground resistance, it is best to repeatedly measure in different directions for 3~4 times and take the average value.
5. This instrument is equipped with a rechargeable battery pack. When the rechargeable battery pack voltage is lower than 7.2V, the undervoltage symbol “←” is displayed in the upper left corner of the meter. It is recommended to charge the battery pack in the machine for 8 to 14 hours in a timely manner. When the meter is not used for a long time, the battery should be charged and maintained regularly.

## VII. Packing List

NO.	Name	Quantity
1	Host	1
2	Test line	1
3	Grounding probe	2
4	manual	1
5	Test Report	1
6	Certificate / warranty card	1