

**LHT2571**  
**Grounding Resistance Tester**  
**User Manual**

Dear Customer,

Thanks for choosing our products, when you use them for the first time, please read the manual carefully, which will help you use our products expertly.



Our aim is to continuously improve and perfect our products, so there may be a little difference with the instruction of the products you are using. However, we will inform you by additional page in case of any change, please kindly understand. If there is any query, please feel free to contact with our service

department, we will try our best to satisfy your requirement.



Be careful with personal safety to avoid electric shock risk when you plug in or take out the test power line or outlet which will produce spark.

#### **Quality Guarantee**

If there is any product defect within three months from the date of delivery, we will replace. If within three years, we will maintain for free and we will maintain for lifetime with charge if above three years. Except the agreement show in contract.

#### **◆ Safety Requirement**

◆ Please read the following safety precautions to avoid personal injury, and to prevent damage of the product or any other connected product. In order to avoid the possible danger, this product only can be used within the prescribed scope.

Only qualified technicians can perform maintenance.

Prevent fire damage or personal injury.

Use proper power wire. Only can use special designed power wire and conform to the product specification.

Connect and disconnect correctly. Please don't connect or disconnect the test leading wire when the device connection is online.

Product groundings. The product housing grounding column must be grounded except that the product is grounded through power wire grounding. To prevent electric shock, grounding conductor must connect with ground. Please ensure this product has been correctly grounded before on-line testing.

Pay attention to all terminal ratings. Pay attention to all terminal ratings and markings in

order to prevent fire damage or electric shock hazard. Please read product manual for further information about rating before connecting the product.

Please don't operate in the absence of product cover. If the cover or panel has been removed, please don't operate this product.

Use appropriate fuse. Only fuse in accordance with product types and related value can be used.

Avoid to touch exposed circuit and charged metal. Don't touch exposed point and site if power on.

Don't operate if there is suspicious fault. Don't continue operating, please contact our maintenance person to check if you doubt any damage of product.

Don't operate under wet conditions.

Don't operate under explosive environment.

Keep the surface clean and dry .

## **Security term**

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Warning: warning\_the situations or practices\_that\_may result\_in\_personal\_injury.

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## 1. Product Introduction

### 1.1. Working principle

In this table, the traditional manual power generation mode is abandoned, and the advanced medium and large scale integrated circuit is adopted. The DC/AC transformation technology is applied to combine the measuring mode of three-end knob and four-end knob into a new type of grounding resistance measuring instrument.

The working principle is that the DC/AC converter converts DC into AC with low frequency constant current. The circuit consists of auxiliary grounding pole C and measured object E, and AC voltage drop is generated on the measured object. The circuit is sent to AC amplifier by auxiliary grounding pole P for amplification, and then sent to the watch head for display through detection. With the aid of multiplying power switch, three different quantity limit can be obtained:  $0 \sim 2 \Omega$ ,  $0 \sim 20 \Omega$ ,  $0 \sim 200 \Omega$ .

### 1.2. Scope of use

This table is suitable for measuring the grounding resistance of various devices and the conductor resistance of low resistance in power, post and telecommunications, railway, communication, mining and other departments. This table can also measure the soil resistivity and ground voltage.

### 1.3. Main features

(1) The structure adopts high strength aluminum alloy as the chassis. In order to prevent power frequency and radio frequency interference, the circuit adopts phase-locked loop synchronous tracking detection mode and equipped with

switching capacitor filter, so that the instrument has better anti-interference ability.

(2) DC/AC conversion technology is adopted to convert DC into AC low-frequency constant current for easy measurement.

(3) allow auxiliary grounding resistance in  $0 \sim 2 \text{ k } \Omega$  (RC),  $0 \sim 40 \text{ k } \Omega$  (RP), don't affect the measurement result.

(4) This instrument does not need manual adjustment balance, 3(1/2) LCD display, in addition to measuring the ground resistance, but also can measure the low resistance conductor resistance, soil resistivity and ac ground voltage.

(5) If the test circuit is closed and the header shows "1" for overflow, it is in accordance with the conventional measurement habit.

## **2. Technical Index**

### **2.1. Conditions of use**

Ambient temperature:  $0^{\circ}\text{C} \sim +45^{\circ}\text{C}$

Relative humidity:  $\leq 85\% \text{RH}$

### **2.2. Measuring range and constant current value (Root Mean Square)**

Resistance:  $0 \sim 2 \text{ } \Omega$  (10 mA),  $2 \sim 20 \text{ } \Omega$  (10mA),  $20 \sim 200 \text{ } \Omega$  (1mA)

Voltage: AC  $0 \sim 19.99\text{V}$

### **2.3. Measurement accuracy and resolution**

Accuracy:

$0 \sim 0.2 \text{ } \Omega \leq \pm 3\% \pm 1\text{d}$

$0.2 \text{ } \Omega \sim 199.9 \text{ } \Omega \leq \pm 1.5\% \pm 1\text{d}$

$1 \sim 19.99\text{V} \leq \pm 3\% \pm 1\text{d}$

Resolution:  $0.001 \text{ } \Omega$ 、 $0.01 \text{ } \Omega$ 、 $0.1 \text{ } \Omega$ 、 $0.01\text{V}$

## 2.4. Auxiliary grounding resistance and measurement error caused by ground voltage

Auxiliary grounding resistance  $R_C$  (between  $C1$  and  $C2$ )

$0 \sim 2\Omega$ ,  $2 \sim 20\Omega \leq 1K\Omega$

$20 \sim 200\Omega \leq 2K\Omega$

$R_P$  (between  $P1$  and  $P2$ )  $< 40K\Omega$  Error  $\leq \pm 5\%$

Allowable ground voltage (power frequency effective value)  $\leq 5V$  Error  $\leq \pm 5\%$

## 2.5. Power supply and power consumption

Maximum power loss  $\leq 2W$

DC:  $8 \times 1.5V$  (AA, R6) battery

Communication:  $220V \pm 10\%$  / 50 Hz

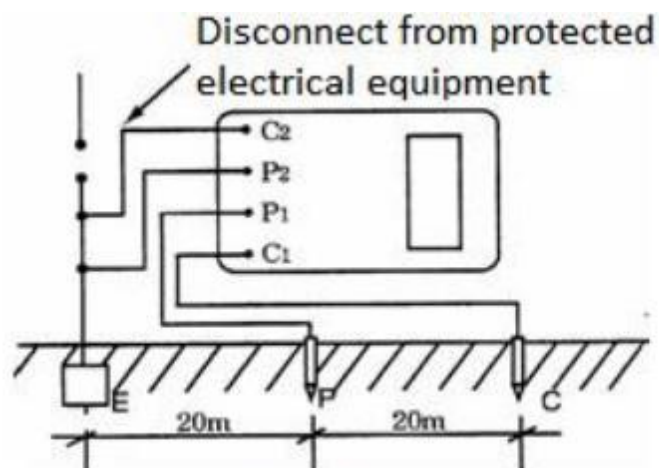
## 2.6. Volume and weight

Size: 220 mm \* 200 mm \* 105 mm

Weight:  $\leq 1.4$  kg

## 3. Operation Method

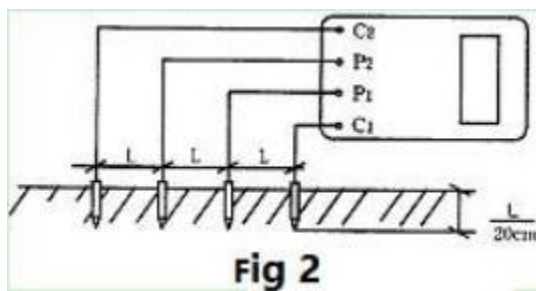
### 3.1. Grounding resistance measurement (as shown in Figure 1)



**Fig 1**

- (1) Make the potential probe in the middle position of E and C 20 meters apart from each other along the measured grounding pole E (C2 and P2), potential probe P1 and current probe C1, and insert the probe into the ground as required.
- (2) Use a special wire to connect the earth resistance terminals E (C2, P2), P1 and C1 to the position of the probe.
- (2) Turn on earth resistance tester "ON", select the appropriate gear and press the key to light up the indicator light of this gear. The value displayed by the LCD of the meter is the measured ground resistance.

### 3.2 Soil resistivity measurement (Figure 2)



- (1) During the measurement, insert four probes along a straight line in the measured soil, and make the spacing of each probe equal, the distance of each probe is L, and the depth of the probe into the ground is L/20cm. Connect the four probes with wires from each terminal of C1, P1, P2 and C2 respectively. If the resistance value measured by the earth resistance meter is R, the soil resistivity can be calculated as follows:

$$\Phi = 2\pi RL$$

Among them:  $\Phi$  - soil resistivity ( $\Omega \cdot \text{cm}$ )

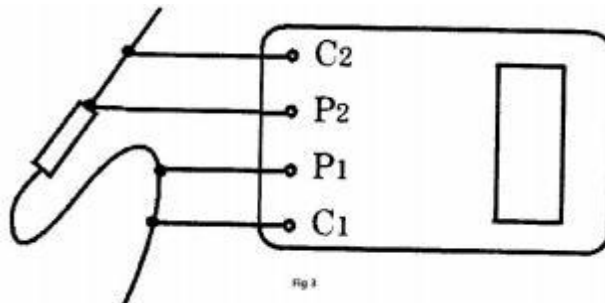
L - Distance from probe to probe (cm)

R - earth resistance meter readings ( $\Omega$ )



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

### 3.3 Conductor resistance measurement (Fig. 3)



### 3.4 Ground voltage measurement

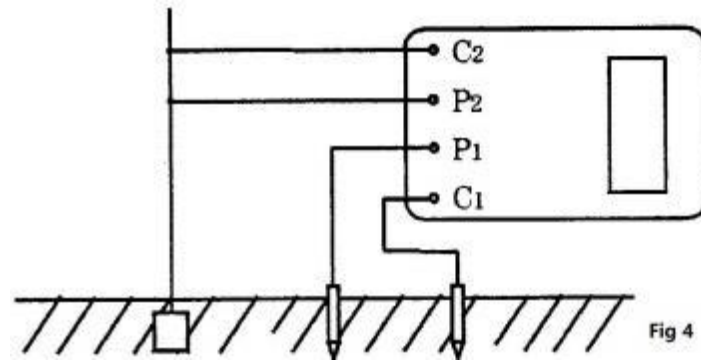
The measurement wiring is shown in Figure 1. Remove the plug of C<sub>1</sub> and keep the plug between E and P<sub>1</sub>. Press the ground voltage (EV) gear and the indicator light is on. Read the value of the meter head is the alternating ground voltage value between E and P<sub>1</sub>.

3.5 Press the power "OFF" button after measurement to shutdown the meter.

## 4.Attention

4.1. When storing the meter, attention should be paid to the ambient temperature and humidity. It is advisable to keep it in a dry and ventilated place to avoid dampness and prevent acid, alkali and corrosive gases.

4.2. When measuring the protection grounding resistance, disconnect the electrical equipment from the power supply. When measuring grounding resistance of less than 1Ω, use the special wire connect with the earthing body, C<sub>2</sub> is outside, P<sub>2</sub> is inside as shown in figure 4:



4.3. When measuring the grounding resistance of large grounding grid, it cannot be measured according to the general wiring method, but the buried insertion point can be selected by referring to the ammeter and voltmeter measurement method.

4.4. When measuring ground resistance, it is better to repeatedly measure it in different directions for 3 to 4 times and take its average value.

4.5. The meter is used for both AC and DC. When it is not connected to AC, the meter is powered by battery.

4.6. When "←" is displayed in the top left corner of the meter, it means the battery voltage is insufficient and a new battery should be replaced. When the instrument is not in use for a long time, the battery should be taken out to avoid corrosion of the instrument.

## 5. Maintenance

### 5.1. Verify the availability of equipment

The appearance of the instrument should be observed before using it. Check whether the liquid crystal display of the instrument is displayed and whether the display is complete after power is switched on. Check whether the output terminal posts of the instrument that has not been used for a long time are corroded or

aged. Otherwise, it should be cleaned and used in a timely manner.

## 5.2. Maintenance of equipment

After each test, clean the connection on the instrument terminal, turn off the power supply, disconnect the power plug, and place it in a dry, dust-free, ventilated and non-corrosive room.

5.3. Check the reliable connection of all parts, especially the firm connection of ground wire.

5.4. When the instrument is not in use, it shall be packed and sealed. After each test, the connection on the junction post of the instrument shall be cleaned, the power shall be turned off, the power shall be disconnected, and the instrument shall be placed in a dry, dust-free, ventilated and non-corrosive gas room.

## 6.Packing list

1.Host machine	1 set
2.Test wire	1 set
3.Reel (black:20m,red:40m)	1 set
4.Grounding probe	4 pcs
5.Battery	8 section
6.Power line	1 pcs
7.Manual	1 pcs
8.Factory inspection report	1 pcs