

# Contents

## 1. Introduction

We have improved performance on anti-contamination, anti-interference, and a memory for storing measured data. It is ideal for measuring ground resistance of power, telecommunication, meteorologic and other electric equipments.

This measuring mechanism has been utilized by foreign manufacturers as a proved measuring method for many years. This method requires no additional electrode, which means there is no error related to electrode placing. And the measuring results are consistent in repetitive tests. The results of tests carried out by related state authorities for comparing the performance of other products and conventional voltage-current method showed that we demonstrated high precision in measuring grounding resistance and it can replace conventional grounding resistance measuring tools. In fact, Our Clamp Meter has been utilized in many industries and under a variety of environments, and its performance was appreciated by our customers.

Compared with conventional grounding resistance tester, Our Clamp Meter for Measuring Grounding Resistance (hereinafter referred to as "Clamp Meter") has the following advantages:

### 1. Easy operation

To measure grounding resistance using our products, you just need to surround the ground wire with the clamps and read the numbers displayed on the LCD screen.

To do the same thing using conventional resistance meter, you must separate the ground wire from the ground system, insert the voltage electrode and current electrode into soil, with a certain distance between them, and use them as accessorial electrodes.

### 2. Higher precision

The precision of conventional voltage-current method depends on the position of accessorial electrodes and their relative position to grounding conductor. In addition, the uneven resistivity of the soil between voltage and current electrodes and grounding conductor also can affect the measuring results. If the position of accessorial electrodes is limited and cannot match the calculated value, then there will be deviation due to electrode arrangement. For the same ground conductor, the different position of accessorial electrodes may cause discrepancy in measuring results and reduce measuring precision.

The measuring mechanism of this meter has been proved to be effective in eliminating error due to electrode arrangement by foreign manufacturers in years of practice. To measure grounding resistance correctly, a user just needs to measure the test ring attached to this product. If the reading is correct, then the measured resistance will also be correct.

### 3. Not limited by surrounding environment

Conventional voltage-current method requires two accessorial electrodes placed in a specified relative position. This means surrounding environment may affect the precision of measured resistance. With many cities in China undergoing a rapid modernization, sometimes it is hard to find any soil in the vicinity of the ground conductor to be measured, because in many cases, the soil is covered by cement. It is even harder to find soil meeting the requirement on relative position.

There is not such limit if you use our Clamp Meter. Using this tool, you can measure correct grounding resistance with only one operation of opening and closing the clamps.

### 4. In some cases, we can be used to detect grounding error that cannot be detected using conventional method.

For example, in multi-point grounding system (such as pole tower and some buildings using more than one grounding conductor), its ground resistance may meet relevant requirements, but the wire connecting grounding conductor and overhead ground wire may have excessively large resistance or even short due to long time of use, and the grounding system may not meet relevant requirements.

In such cases, it is not possible to detect such error of resistance using conventional method.

However, using our products, it is possible to measure the correct comprehensive resistance of grounding

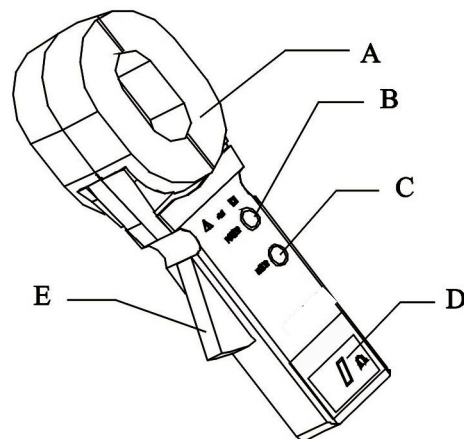
conductor and wire.

(See Appendix 2: Section A)

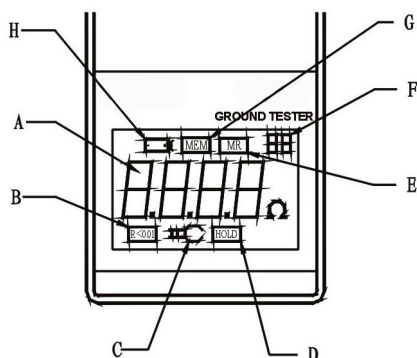
## 2. Appearance and Structure

The following figure shows the structure of this meter

- A: Clamp. The clamp can be opened and surround ground wire for measuring grounding resistance.
- B: POWER button for switching on/off the power. When the power is on, you can push down this button for about 3 seconds and then release it to enter data memory mode.
- C: HOLD button is for holding the reading of the meter. To release holding, push down the button again. When the power is on, push down HOLD button for about 3 seconds and then release it to enter reading mode.
- D: LCD screen for displaying measured results and other functional marks.
- E: Clamp handle for controlling the opening/closing of the clamp.



## 3. Display Parts

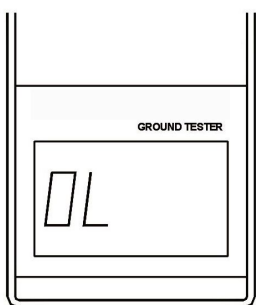


The following figure shows the display part of this meter

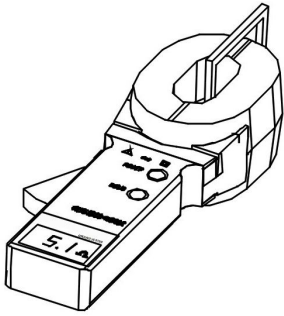
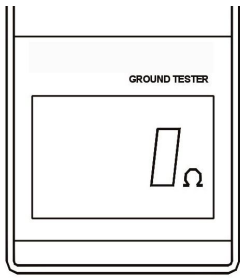
- A: LCD screen displaying grounding resistance.
- B: A mark indicating that grounding resistance is less than 0.01.
- C: State of clamp. This mark lights up when clamp is open.
- D: The holding mode mark. It shows that the meter is in holding mode (but not measuring mode). To switch to measuring mode, push down HOLD button again.
- E: A mark showing the meter is in reading mode. In this mode, you can read grounding resistance data stored in the meter.
- F: This mark displays when the meter is in memory mode or reading mode. It shows the number of data stored or read.
- G: This mark shows that the meter is in memory mode. The meter can store up to 30 records of measured data.
- H: Low-battery mark. It shows that the power is extremely low and is not sufficient for ensuring measuring precision. When this mark lights up, please replace the old batteries with new batteries.

## 4. Operation Guide

Caution: When the power is on, the clamp should not surround any metal conductor, the ground wire to be measured, or the testing ring.



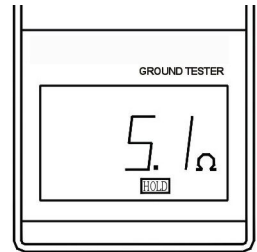
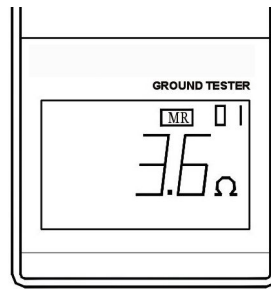
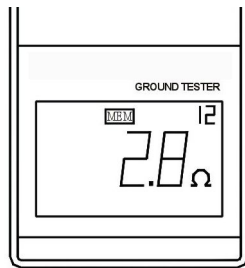
- A. The meter starts to work when the POWER button is pushed down. The LCD screen displays information shown in the figure in the left. The clamp meter is now in self-checking mode. Be sure to maintain the meter in a natural and static state. Don't turn the meter or apply any force on the handle or the clamp. Otherwise the precision of the meter may be reduced.
- B. Once the self-checking procedure is completed, the LCD screen displays OL (see the figure in the left), which means completion of self-checking and the



meter is functioning normally. Now the meter is in measuring mode.

- C. You can start measuring operation after self-checking is completed (the LCD screen displays OL), or you can carry out a test using the random testing ring as shown in the figure in the right. When you do such test, the reading should be the same as the nominal value (i.e. 5.1Ω) of the testing ring. However, a reading such as 5.0Ω or 5.2Ω is also normal, because the ambient temperature may more or less impact the measured resistance.
- D. To hold reading, push down the HOLD button for less than 3 seconds. The LCD screen displays HOLD and the reading is constantly renewed, as shown in the figure in the right. If you push down the HOLD button again, the meter will enter into measuring mode, and the HOLD mark in the screen disappears.
- E. When the power is on and you push the POWER button for more than 3 seconds, a MEM mark will be displayed and the meter enters into memory mode, as shown in the figure in the right. Now if you push down the POWER button for less than 3 seconds, the meter exits from memory mode and the data displayed on the screen will be stored in a memory shown in the upper right corner. The entries in the memory do not disappear even if the power is turned off. The memory can store up to 30 entries.

- F. When the power is on, a long push (more than 3 seconds) on the HOLD button will make the screen display the MR mark, and the meter enters into reading mode, as shown in the figure in the right. At such moment, the upper right corner of the screen shows the position of a record in the memory. Each time when the meter is in reading mode, the first record will be displayed first, and each short push (less than 3 seconds) on the HOLD button will make the next record displayed. After reading all 30 records, the first record will be displayed.



To exit from reading mode and enter into measuring mode, make a long push (more than 3 seconds) on the HOLD button.

Caution: 5 minutes after the power is turned on, the LCD screen starts to flicker. After 30 seconds of flickering, the power will be automatically turned off for the purpose of saving power. If you push down the POWER button when the LCD screen is flickering, the power-saving procedure will be terminated and the meter will be in measuring mode.

## 5. Cautions

- A. To ensure the measuring precision, make sure the meter is in a natural state when self-checking procedure is going on, and do not touch the handle when you are holding the meter with one hand.
- B. To ensure measuring precision for relatively large resistance (e.g. larger than 100Ω), press the handle to make the clamp open for 2 or 3 times before pushing down the POWER button (i.e. before turning the power on).
- C. Always keep the contacting plane of the clamp clean. Although it is contamination resistant, excessive contamination will reduce measuring precision, particularly in the case of resistance higher than 100Ω.
- D. It is anti-interference and capable to deal with interference caused by current in ground wire of pole tower. However, for low-voltage transformer of system connecting to zero line, which has excessively large and unbalanced current, it is necessary to turn off power for measuring.
- E. Take out batteries if the meter is not supposed to be used for a long time.
- F. Always keep in mind the principle of "safety is first".

## 6. Trouble Shooting

Note: This Trouble Shooting only covers commonly seen problems and countermeasures for solving such problems. If you encounter any problem that cannot be solved using the methods listed in the following table, please contact us for after-sales service. In no circumstances should the user disassemble the meter for repairing purpose.

Problem	Possible cause	Countermeasures
The "clamp opened" mark lights up on the screen, although the clamp is closed.	The clamp is seriously contaminated.	Clean the clamp.
Battery mark displays or the power turns off automatically once the handle is pressed self-checking.	Low-battery	Replace new battery.
A "E" mark displays when the meter is performing self-checking.	Error in self-checking makes it impossible To enter into measuring mode.	Check whether the clamp surrounds any metal when the meter is performing self-checking.
During self-checking, other numbers, but not "OL", are displayed.	The clamp is contaminated or there is other failure of the meter.	Clean the clamp or send the meter to us for repair.
"OL" is displayed during measuring.	The resistance to be measured is larger than 1000Ω.	Exceeds the range of measurement.
A "<0.01Ω" is displayed during measuring.	The resistance to be measured is less than 0.01Ω	Exceeds the range of measurement.

## 7. Specifications

### A . General specifications

LCD screen: 4-digit LCD screen, 28.5mm×47mm.

Clamp opening: 28mm

Working temperature: -10°C-55°C

Working humidity: RH 10%-90%

Weight (including batteries): Long clamp 1320g

Power: 4 No. 5 alkaline batteries (6V)

Dimensions: Long clamp 300mm(L)× 90mm(W) × 66mm(H)

Protection grade: double insulation

Structural characteristics: Clamp type

Explosion proof mark: Exia II BT3

### B. Range of measurement and precision

Range (Ω)	Resolution (Ω)	Precision (Ω)
0.010~0.099	0.001	±(1%+0.01Ω)
0.10~0.99	0.01	±(1%+0.01Ω)
1.0~49.9	0.1	±(1.5%+0.1Ω)
50.0~99.5	0.5	±(2%+0.5Ω)
100~199	1	±(3%+1Ω)
200~395	5	±(6%+5Ω)
400~590	10	±(10%+10Ω)
600~1000	20	±(20%+20Ω)

## 8. Packing List

Clamp type grounding resistance meter	1	Testing ring	1
AA battery	4	Meter box	1
User's manual	1		