

Dear Client

Thank you for Purchasing our **BC2010 Insulation Resistance Tester**. Please read the manual in detail prior to first use, which will help you use the equipment skillfully.



Our aim is to improve and perfect the company's products continually, so there may be slight differences between your purchase equipment and its instruction manual. You can find the changes in the appendix. Sorry for the inconvenience. If you have further questions, welcome to contact with our service department.



The input/output terminals and the test column may bring voltage, when you plug/draw the test wire or power outlet, they will cause electric spark. PLEASE

CAUTION RISK OF ELECTRICAL SHOCK!

Company Address:

- ◆ T4, No. 41, High-tech 2 Road, East Lake High-tech Development Zone, Wuhan
- ◆ Sales Hotline: 86-27- 87457960
- ◆ After Service Hotline: 86-27- 87459656
- ◆ Fax: 86-27- 87803129
- ◆ E-mail: qiao@hvtest.cc
- ◆ Website: www.hvtest.cc

◆ **SERIOUS COMMITMENT**

All products of our company carry one year limited warranty from the date of shipment. If any such product proves defective during this warranty period we will maintain it for free. Meanwhile we implement lifetime service. Except otherwise agreed by contract.

◆ **SAFETY REQUIREMENTS**

Please read the following safety precautions carefully to avoid body injury and prevent the product or other relevant subassembly to damage. In order to avoid possible danger, this product can only be used within the prescribed scope.

Only qualified technician can carry out maintenance or repair work.

--To avoid fire and personal injury:

Use Proper Power Cord

Only use the power wire supplied by the product or meet the specification of this produce.

Connect and Disconnect Correctly

When the test wire is connected to the live terminal, please do not connect or disconnect the test wire.

Grounding

The product is grounded through the power wire; besides, the ground pole of the shell must be grounded. To prevent electric

shock, the grounding conductor must be connected to the ground.

Make sure the product has been grounded correctly before connecting with the input/output port.

Pay Attention to the Ratings of All Terminals

To prevent the fire hazard or electric shock, please be care of all ratings and labels/marks of this product. Before connecting, please read the instruction manual to acquire information about the ratings.

Do Not Operate without Covers

Do not operate this product when covers or panels removed.

Use Proper Fuse

Only use the fuse with type and rating specified for the product.

Avoid Touching Bare Circuit and Charged Metal

Do not touch the bare connection points and parts of energized equipment.

Do Not Operate with Suspicious Failures

If you encounter operating failure, do not continue. Please contact with our maintenance staff.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in Explosive Atmospheres.

Ensure Product Surfaces Clean and Dry.

— **Security Terms**

Warning: indicates that death or severe personal injury may result if proper precautions are not taken

Caution: indicates that property damage may result if proper precautions are not taken.

Contents

I. Overview.....	6
II. The main technical indicators.....	7
III. Instrument structure diagram.....	8
IV. Schematic diagram of the testing.....	10
V. Test instructions.....	12
VI. Matters needing attention.....	17

I. Overview

With the development of modern technology continues to update and expand, the reliability of the power system and the high voltage equipment is also put forward higher requirements, electrical equipment failure or damage, usually associated with the insulation defects. Electrical equipment's of large capacity, high voltage, structure diversification and seal, the electrical equipment should be put forward newer, higher requirements. The use of large capacity equipment continues to increase, with the ordinary megger fail to detect its insulating properties.

Electric power test requirements for a large number of electrical equipment. For example: cables, motors, generators, transformers, transformer, high voltage switch, lightning arrester, The insulation performance requirements do a series of experiments, first of all is to do insulation resistance test.

In the insulation resistance testing of large capacity power equipment at, charge time determines the value of insulation resistance. Charge time longer, the insulation resistance will be higher. This phenomenon is called absorption phenomenon of insulation. If to understand the insulation performance of product, we must first do its the absorption ratio and polarization index test. In order to next step's leak, dielectric loss factor, partial discharge, Insulation performance test etc provide security. Our company is in accordance with the Standard Specification of electric power. Special launch of large capacity, high anti-interference, stable performance intelligent insulation resistance double display tester, the power equipment insulation, absorption ratio, polarization index test, provide accurate judgment of prophase series insulation test.

Because the charge current will affect a large capacitive testing products for tested value, so we need large charging current. The charge ability is better, absorption ratio test value is more close to the true value. This instrument is short circuit current is greater than 3mA, to overcome the ordinary megger short-circuit current small, the test is not accurate, Susceptible to interference

problems. The instrument adopts the real-time voltage and current sampling to do division, so in the process of testing, even if the voltage change, resistance of value calculated from Ohm's law is accurate. The instrument adopts the principle of combining digital and pointer, the multi gear output voltage, convenient use for old and new customers. Easy to carry, simple operation; with large capacity lithium ion rechargeable battery, AC-DC dual-use, and an undervoltage tip and the battery overcharge protection. The instrument can automatically display the current time, save 200 sets of test data and Storage time, for the test personnel's work provide a great convenience . This instrument is a new type of intelligent instrument, is the best choice for power test insulation detection.

II. The main technical indicators

1. The output voltage: -DC 500V, -1000V, -2500V, -5000V

Error: $\pm 5\%$ FS(FS for the full-scale value);

2. Test accuracy

1 M Ω ~20 M Ω Error: $\pm 10\%$ FS(FS for the full-scale value);

20 M Ω ~1000 M Ω Error: $\pm 5\%$ FS(FS for the full-scale value);

1G Ω ~20 G Ω Error: $\pm 5\%$ FS(FS for the full-scale value);

20G Ω ~200G Ω Error: $\pm 10\%$ FS(FS for the full-scale value);

1T \cong 200G Ω Error: $\pm 20\%$ FS(FS for the full-scale value);

Test range: 500V (0-10G Ω) 1000V(0-20G Ω)

2500V (0-200 G Ω) 5000V(0-1T Ω)

Digital test and display range: 0-1T Ω

3. Conditions of use: Environmental temperature: 0 $^{\circ}$ C—40 $^{\circ}$ C

Relative humidity: $\leq 70\%$ RH

4. Power range: AC: 220V $\pm 10\%$

5. The volume: 230mm \times 190mm \times 90mm (L \times W \times H)

Weight: <3kg

III. Instrument structure diagram

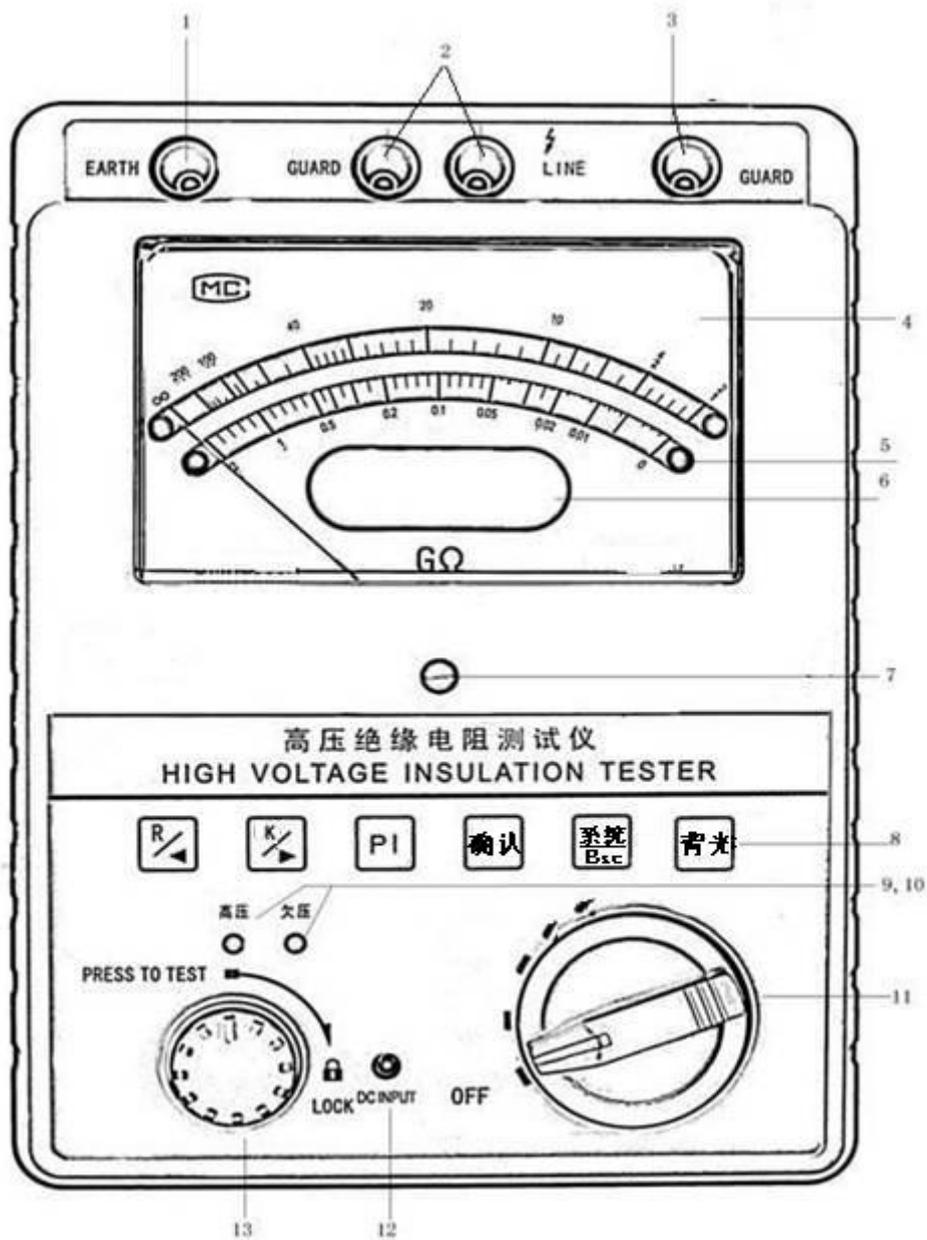
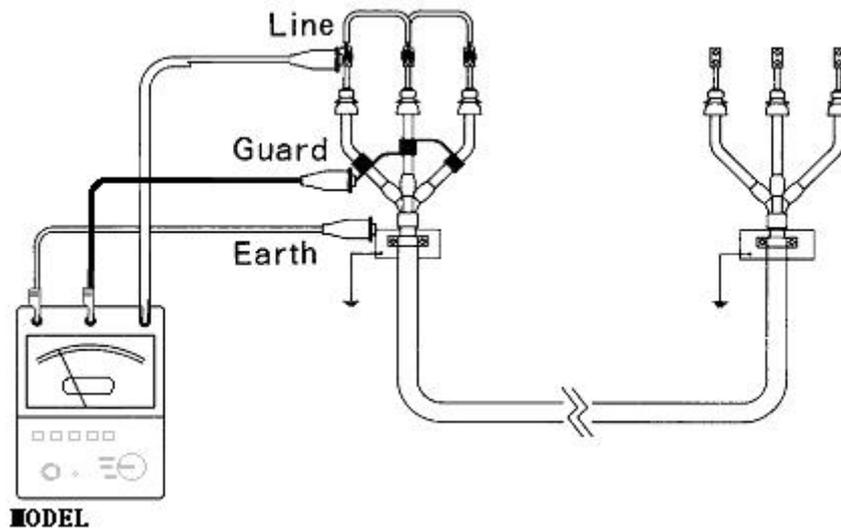


Table 2: structural map

Need to calibrate before use to ensure accurate pointer reading. The pointer points to ∞ .

S/N	Name	Function
1	EARTH	It is connected to the device under test or on the ground.
2	LINE (Red bar)	High voltage output, Connected to high voltage conductor of test equipment. (The probe, the clip and the hook this three ways)
3	GUARD	Connected to the high voltage protection ring is detected, In order to eliminate the effect of surface leakage current.
4	Mechanical meter with double scale line	Top gear is green, The green area represents GΩ. Top gear is red, The red area represents MΩ
5	Indicator light of range	Red light that read in following scale value, green light that read in above scale value
6	LED Monitor	Display test value, type, voltage, time, historical test data
7	Mechanical zero	Adjusting the mechanical pointer position, When the power is off the scale line alignment ∞.
8	The selection of test function	The selection of test types, find historical data, set the current time
9	High voltage output indicator	This lights are output high voltage
10	Battery status light	When the light shines, Apparatus under voltage, The instrument need to charge.
11	The power switch and the voltage selector knob	The power switch, Selection of test voltage
12	Special charger access	It will be inserted in the voltage of the power supply for the AC 220V (± 15%), for the instrument charge
13	High voltage output button	Press the right rotation lock high voltage output, rotate left lifted high voltage output

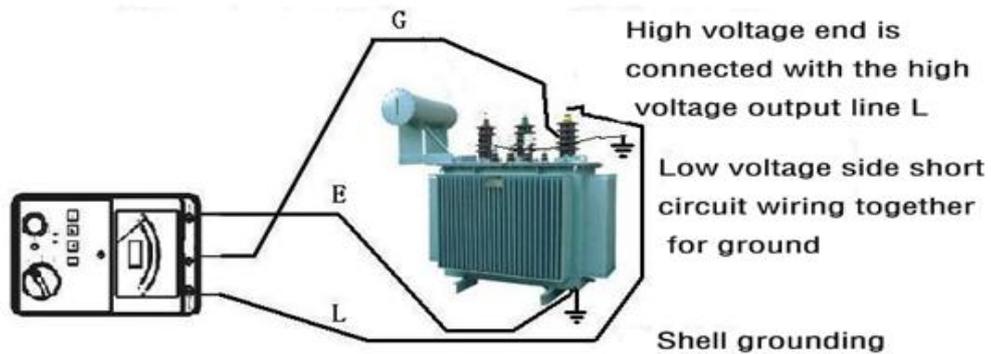
IV. Schematic diagram of the testing



The cable core insulation test chart

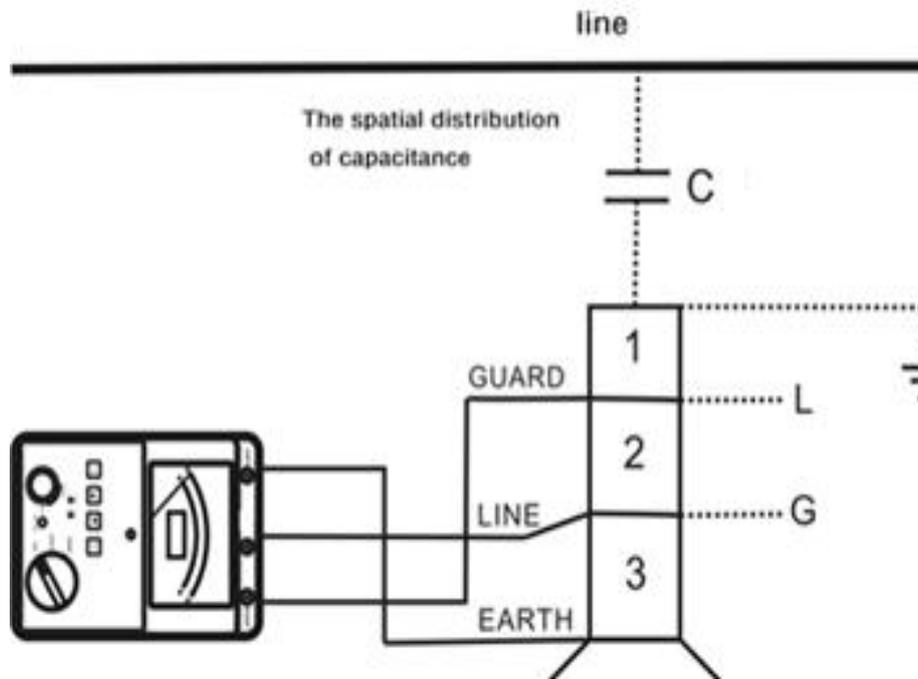
(According to this diagram can test the insulation of the cable core)

If there is interference then G lines received Porcelain insulator



Transformer high voltage side for insulation to ground

(This connection can test the insulation of high and low pressure side, Low voltage side to ground insulation etc.)



Lightning arrester, coupling capacitance test, using the shielding wire can shield interference

(Use the shield end shield interference) In measuring the insulating of power cable etc. There are electromagnetic interference, In order to eliminate the interference of external electromagnetic field and surface leakage and affect the accuracy of measurement results, In actual measurement process, Using the shielding terminal of instrument to eliminate the leakage current、Shielding interference.

For two or more sample , for example lightning arrester, coupling capacitance can adopt the connection shown above of were measured. In fig shield end is connected to the lightning arrester flange of the tested on the first section. such, interference current caused by the above the high-pressure line, by shielded end terminal shield, Don't pass the test of main circuit, avoid the influence of interference current. For the upper section of arrester, Can put on the first flange connection instrument earth, then the ground. The interference current directly into the ground. But the latter can not be of completely eliminated the interference.

The method can be used for reference in other aspects.

V. Test instructions

Insulation Meter General test, can use two wire method. The meter is composed of probe L output voltage, Connected to the high voltage end of the tested product, E termination in the tested product low voltage side or surface (EARTH). First connect the test line and then turn on the power, According to the operating instructions to start test button to start the test. Large capacity test products need to give it a discharge and then test. After the test, need to wait for a few seconds or longer. After the completion of the discharge pull out test line. Many power test, can refer to the above a few picture to complete. Instrument operation method According to the instrument structure diagram, turn on the power, select the required voltage.



Pictured above

Selection of test types into the corresponding test.

For example test type:

1. Conventional insulation resistance test (Choose to enter by the "R")
2. Absorption ratio test (Choose to enter by the "K")
3. The polarization index test (Choose to enter by the "PI")

Select Conventional insulation resistance test "R" key, go to the next interface



According to the menu prompt start high voltage button (13) output high voltage test.

As shown here are routine resistance testing: voltage 2.5KV, resistance 1.00GΩ



Now close the high-pressure output, menu prompt whether to save the current test data. As shown in Fig:



Press "confirm" button to save the current Conventional insulation resistance testing results.

If you select the "K" key absorption ratio test, go to the next interface



Start high pressure tested, the following diagram has been testing 20S, The test voltage is 1.00kV, test resistance is 1.02 GΩ, 15 seconds values have been locked in 1.02 GΩ.



Absorption ratio test time after 60 seconds, as below shows, Closing high voltage output



Close the high-pressure output complete absorption ratio test, test results show as below



Tested voltage 1.00KV, 15 seconds to test resistance value is 1.02 GΩ, 60 seconds to test resistance value is 1.11 GΩ, absorption ratio test results is 1.08. If you press "ESC" key to exit, can automatically save the current test results and the test time, and return to the main menu.

Test Polarization index: Like test absorption ratio operating procedures. Select the "PI" key to enter the test.

Operation and absorption ratio test same not detail introduction.

Press the "system" button in the main menu to select "Historical data" "modified time"



Select the "modified time" press "confirm" key:



Can save the current date (year, month and day) and time (left and right key adjustment),press "confirm" button to save and return to the main menu.

Select the "historical data " press "confirm" key:



Can view the data of storage, this time press left key or right key can turn to front or next record.

The diagram above, 05 said the fifth times test values, The test voltage is 1.00KV, the final test value is 1.11 GΩ. "K" said absorption ratio test, The test results absorption ratio is 1.08. The test time is 13 years in November 6th.

"PI" said the polarization index storage type, "Res" said the conventional resistance testing types. Factory debugging "correction data", the user does not need to change.

VI. Matters needing attention

1. Confirm the connection and correct and then start the test Note: the tested line ban mopping the floor, "high voltage output" light indicates have high voltage output, At this time strictly prohibited to touch the high-voltage wire! In the process of the test do not pull and plug tested line, so as not to endanger the personal safety and damage the instrument.

2. Battery measurement of instrument internal, Show dim or the boot does not show, undervoltage display light turn on , said battery is low, should promptly shut down the instrument and charging.

3. When the instrument is not used for a long time should be regularly to charge the battery (Two months for once). Frequently check whether the battery liquid leakage, Battery leakage will corrosion and damage the instrument .

4. Instrument stored in a dry, clean, no corrosive gas environment.

5. For large capacity load test, the tested finish have enough time discharge, the discharge is completed can disassemble test line. (Large capacitive load discharge is best for more than 1 minutes)

6. Instruments are not connected to the test product, Insulation resistance measured value is generally greater than T ($1T=1000G$), this value is generally random infinite values, like tested air, It is not practical.

7. If the instrument failure, Should be invited to professional repair personnel or send to the company repair, shall not be opened instrument, otherwise, the loss caused our company is not responsible for.