

Dear Client,

Thank you for purchasing our **HTYJS-H Insulating Oil Dielectric 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!

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◆ **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.

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I. Overview

HTYJS-H insulating oil dielectric tester is high accuracy equipment applies to test the loss and volume resistance ratio of insulating oil and others insulating liquid. In the insulation preventive test of power equipment, it is required to regularly measure the insulating oil parameters of power equipment. The measurement of dielectric loss and resistivity of insulating oil is one of the most important ones. For a long time, the bridge method has been widely used in the measurement, which is cumbersome to operate, and the measurement accuracy is affected by many factors, resulting in large measurement error. With the rapid development of electronic technology and the requirements of power industry for measuring instruments with small volume, light weight, convenient operation, rapid measurement and high accuracy, our company has developed a leading dielectric loss factor and DC resistance of insulating oil in China with reference to relevant instruments at home and abroad

Rate tester. The instrument is designed and manufactured in accordance with gb5654-2007 and relevant standards. It

is controlled by microcomputer. It is easy to use, has high measurement accuracy and efficiency, and greatly reduces the labor intensity of personnel

II. Structure features and function

- The structure of the instrument is an integration of oil cup, heating, temperature control and pressure regulating functions.
- Large screen color LCD display, Chinese character thermal printing, Chinese character menu, simple operation.
- Empty cup automatic calibration.
- It has over-voltage, over-current and temperature limit protection functions.
- Medium frequency induction heating electrode cup, short-time uniform heating.
- The temperature is directly measured by the probe placed in the measuring electrode cup.
- It contains sine wave generator and digital voltage regulation to generate standard 50Hz high power test

power supply.

III. The main technical parameters

- Test voltage range: 0-2000vac 0-500vdc
- Test capacitance range: 50pF ~ 200pf
- Test temperature range: room temperature ~ 125 °C
- Dielectric loss test range: 0.00001 ~ 1
- Measurement accuracy: \pm (indication \times 0.5% + 0.0001)
- Relative permittivity: \pm (indication \times 0.5% + 0.1)
- Resistivity resolution: 0.001M $\Omega \cdot M$
- Resistivity measurement range: 2.5m $\Omega \cdot m \sim 20t$
 $\Omega \cdot M$
- Power: 500W
- Power supply voltage: AC220V \pm 22V
- Boundary dimension: 470 \times 430 \times 380mm
- Weight: 23kg

IV. Working condition

Environment temperature: 0 °C ~ + 40 °C

Relative humidity: \leq 75% RH

V. Control Panel

1. Operation Panel



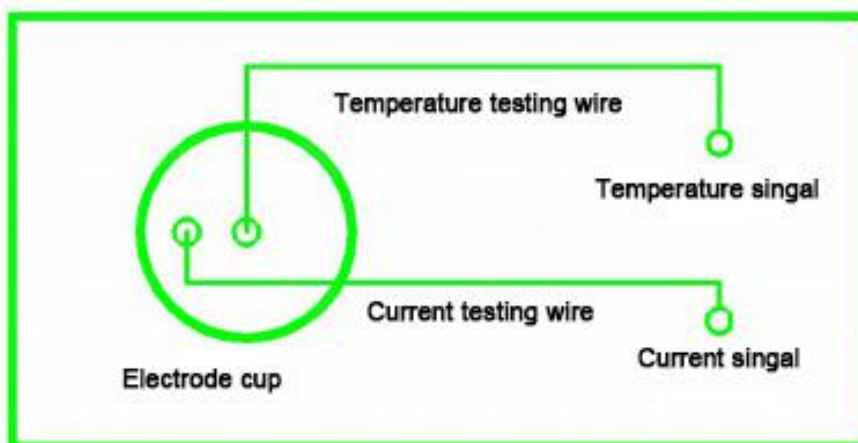
(1)

2. Testing Panel

Electrode cup: test electrode cup

Current signal: collect current signal

Temperature signal: collect temperature signal



(2)

VI. Operating Instructions

1. Preparation before test

1) Assembly

According to the requirements of gb5654, install the cleaned electrode cup to the position of the electrode cup on the test panel, and connect the test line as shown in the figure 2 connect well.

2) Power on

Turn on the power switch, and the LCD displays the standby interface as shown in Figure 3.



(3)

Click the button shown in the picture to enter the

corresponding interface and carry out corresponding operations.

3) Parameter setting



(4)

系统设置: System setting

试验参数设定: Testing parameters setting

交流试验电压: AC testing voltage

直流试验电压: DC testing voltage

试验温度: Testing temperature

系统设定: System setup

点击刷新: Click and refresh



: Ok



: ESC

自动打印 (1 为是 0 为否): Auto printing(1 is Yes, 0 is No)

背光亮度 (范围 12-64): Backlight brightness (Range 12-64)

The parameter setting interface is shown in Figure 4, which is set as required by clicking, the setting keypad will pop up for the parameters of. Click after input OK to complete the setting, or click ESC to cancel the setting;

Temperature range: 50 °C ~ 99 °C;

AC voltage range: AC 200V ~ 2000V;

DC voltage range: DC 200V ~ 500V.

2. Test steps

The starting test interface is shown in Figure 5, as the case may be select the corresponding test items and types. Standard test, during the test, the AC voltage is 2000V, the DC voltage is 500V test temperature 90 °C; direct test omits the heating process and test according to the voltage parameters set by the system; Set parameter test according to the parameters set by the system.



(5)

开始试验: Start testing

实验项目选择: Test items selection

相对电容率: Relative permittivity

介质损耗因素: Dielectric loss factor


直流电阻率: DC Resistivity

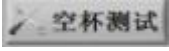
试验类型选择: Test type selection

标准测试: Standard test

直接测试: Direct test

设定参数测试: Parameter setting test

 样品测试: Sample test

 空杯测试: Empty electrode cup test

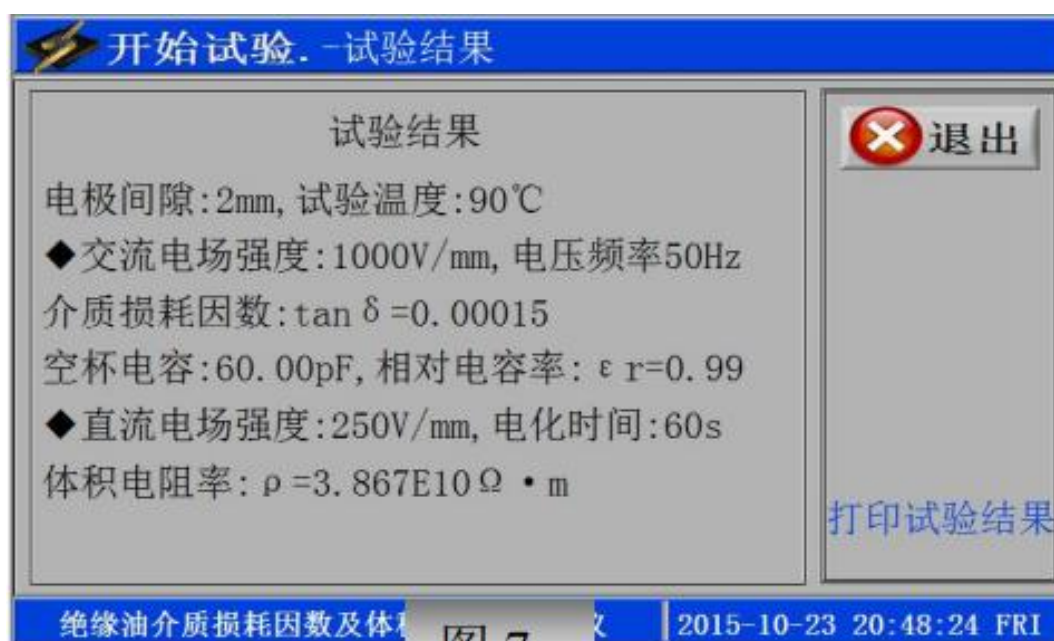
 退出: ESC

Select the test item and test type, and click sample test or empty cup test according to the situation to enter the test, The machine interface is as shown in Figure 6. During the test, you can click the exit button to end the test. Display this test after the test, The test results are shown in Figure 7. According to the system settings, you can choose to

automatically print the test report or click to print the test Results print the test report; click the exit button to return.



(6)



(7)

开始试验: Start testing

正在加热, 温度 86.2 °C: In Heating, Temperature 86.2 °C

退出: ESC

开始试验-实验结果: Start test - test results

实验结果: Test results

电极间隙: 2mm, 试验温度: 90℃

---Electrode gap: 2mm, Test temperature: 90℃

交流电场强度: 1000V/mm, 电压频率 50Hz,

--- AC electric field strength: 1000V / mm, voltage frequency 50Hz

介质损耗因素: $\tan \delta=0.00015$

---Dielectric loss factor: $\tan \delta=0.00015$

空杯电容: 60pF, 相对电容率: $\epsilon_r=0.99$

---Empty cup capacitance: 60pF, Relative permittivity: $\epsilon_r=0.99$

直流电场强度: 250V/mm, 电化时间: 60S

---DC electric field strength: 250V / mm, Electrochemical time: 60s

体积电阻率: $\rho = 3.867E10 \Omega \cdot m$

---Volume resistivity: $\rho = 3.867E10 \Omega \cdot m$

4. Other information

Other interfaces are shown in Figure 9, showing the name of the instrument, version number, standard number, etc.



3. Test data processing

The historical data interface is shown in Figure 8. The instrument can store 100 groups of historical test data; click up and down button to browse other data; click the print button to print data currently displayed; click clear to delete all historical storage data; click exit to exit the historical data processing page noodles.



(9)

历史数据: Storage data

电极间隙: 2mm, 试验温度: 90°C

直流电场强度: 250V/mm, 电化时间: 60S

---DC electric field strength: 250V / mm, Electrochemical time: 60s

体积电阻率: $\rho = 3.867E10 \Omega \cdot m$

---Volume resistivity: $\rho = 3.867E10 \Omega \cdot m$

试验日期时间: test date & time

VII. Attentions

1. The instrument shall be reliably grounded.
2. There is high pressure and high temperature inside during the test. It is forbidden to contact the electrode cup, cable and socket during power on and test.
3. When filling oil, be careful not to spill oil into electrode cup groove and operation panel.

VII.Common faults and Solutions

1. When the power is turned on, the indicator light of the power switch is not on. Please check whether the fuse is broken.
2. When the device is boosting, the LCD displays "electrode cup short circuit". Please check whether the electrode cup is assembled properly.
3. When the capacitance of empty cup measured by the equipment deviates greatly from the standard value ($60\text{pf} \pm 5\text{pf}$), please check the power supply signal power

Check whether the RF head on the cable protection electrode cover is loose.

4. When the equipment is warming up, the temperature signal cannot be detected. Please check whether the temperature signal cable is connected correctly.

5. When the equipment does not heat up (i.e. there is no special sound of medium frequency heating), please check whether the heating insurance is broken.

VIII.Cleaning method of electrode cup

1. Take out the electrode cup and disassemble it (refer to the schematic diagram of the electrode cup).

2. Clean all parts of the oil cup thoroughly with chemically pure petroleum ether and benzene (Note: do not clean the RF base).

3. Clean the electrode cup again with acetone, and then rinse it with neutral detergent.

4. Boil 5% sodium phosphate distilled water solution for 5 minutes, then wash several times with distilled water.

5. Boil all parts (pay attention to protect the radio frequency base) with distilled water for 1 hour.

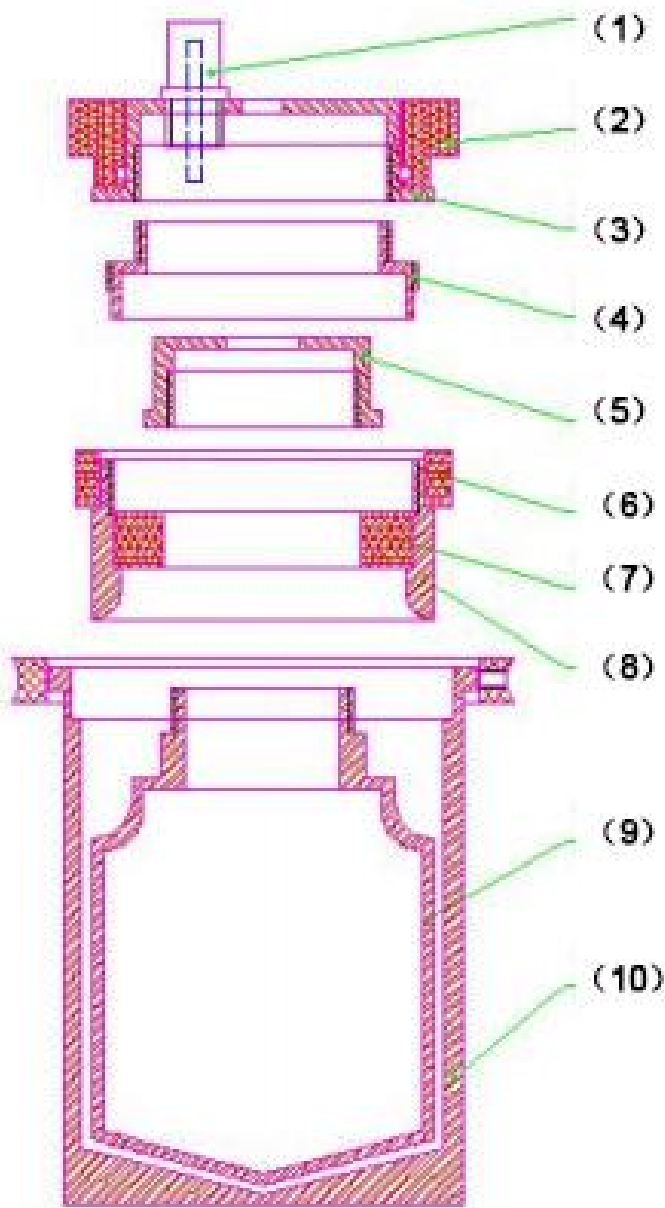
6. Dry the parts in an oven with a temperature of 105-110 °C for 60-90 minutes.

7. After the parts are cleaned, they shall be assembled when the temperature is reduced to not hot.

Pay attention not to scald hands and damage the surface of electrode cup, ensure that the core wire of RF base is well connected with the test electrode!

Note: when testing a group of liquid samples that have not been used in the same category, as long as the last tested sample has excellent performance, at the specified value of the oil to be measured, the same electrode cup can be used without intermediate cleaning. If the previous sample has been tested, if the performance value is inferior to the measured value of the oil sample to be tested, the electrode cup must be cleaned before the last test.

X. Removal and installation method of electrode cup



electrode cup schematic diagram

- (1) BNC base
- (2) Proection electrode cover insulation ring
- (3) Proection electrode cover
- (4) Double thread sleeve
- (5) Inner electrode cap
- (6) Proection electrode inner insulation ring
- (7) Proection electrode outter insulation ring
- (8) Proection electrode
- (9) Inner electrode

(10) Outer electrode

Note: the electrode cup is composed of protection electrode, inner electrode and outer electrode.

Among them, the protective electrode and the internal electrode are integrated structure, and the external electrode share the same structure

It is the same as the capacitance electrode cup with a distance of 2mm.

Disassembly method of electrode cup: (refer to schematic diagram of electrode cup)

1. First take out the inner electrode and the protective electrode from the outer electrode.
2. Screw out the protective electrode cover anticlockwise.
3. Screw off the outer insulating ring of the protective electrode.
4. Screw out the double thread sleeve and the inner electrode cap anticlockwise.
5. Remove the protective electrode directly. (Note: protection does not have to be removed
Insulation ring inside electrode)
6. Remove BNC holder from the protective electrode cover.

Installation method of electrode cup: (see schematic diagram of electrode cup)

1. Install the protective electrode and the insulating ring in the protective electrode directly

Press on the electrode.

2. Screw the inner electrode cap clockwise.

3. Tighten the double threaded sleeve clockwise.

4. Install the outer insulating ring of the protective electrode.

5. Install BNC seat on the protective electrode cover.

6. Tighten the protective electrode cover clockwise.

7. Put the installed inner electrode and protective electrode into the outer electrode

VIII. The attachment list

1	Host	1 pcs
2	Power cord	1 pcs
3	Fuse (4A)	4 pcs
4	Electrode cup	1 pcs
5	Electrode cup rack	1 pcs
6	Measuring cup (50mL)	1pcs
7	Printing paper (thermosensitive)	2 pcs
8	Manual	1 pcs