

AC/DC Hipot Tester Manual sheet



Chapter 1. Automatic console

I. Description

This equipment is designed to test the withstand voltage of electric devices. It is made up of two main parts: Control Unit and HV Transformer. The Control Unit is fully digitalized, and uses a large true-color touchable LCD as its HMI (human machine interface). So it has advanced performance, high accuracy, great convenience and high aesthetic.

II. Functions & Features

- ◆ Full digital measurement and control, ensures high performance, high accuracy and high reliability.
- ◆ Large true-color touchable HMI, helps to be advanced, convenient and aesthetic.
- ◆ Auto/Manual testing mode.
- ◆ Goal voltage, threshold current, and time duration can be set freely.
- ◆ Auto step-by-step regulating HV when near the Goal.
- ◆ Auto timing at Goal HV, and auto return to zero position when time up.
- ◆ Auto stop HV when over the protection threshold, and give an alarm, and then auto return to zero position.
- ◆ Auto captures peak voltage when break down.
- ◆ Auto saves test result, and it can be reviewed and printed.

III. Technical Data

- ◆ Power Supply: AC 220V±10%, 50/60Hz
- ◆ Rated Power: 5kVA
- ◆ Output Voltage: 0~250V
- ◆ Input Current: 0~22.7A
- ◆ Time Range: 0~9999S
- ◆ Voltage Resolution: 0.1kV
- ◆ Current Resolution: 0.1mA
- ◆ Measurement Accuracy: ≤ 2%
- ◆ Ambient Temperature: 0~40°C

- ◆ Ambient Humidity: $RH \leq 85\%$
- ◆ Gross weight: 29kgs.
- ◆ Package dimension :500*370*450mm

IV Overview

1.1 Control Unit



Power MCB : Switch ON/OFF the power & work as over current protection.

Emergency Stop : Push down to cut off the power in case of emergency, and Rotate right to restore.

Power Indicator : Turn ON/OFF when power ON/OFF.

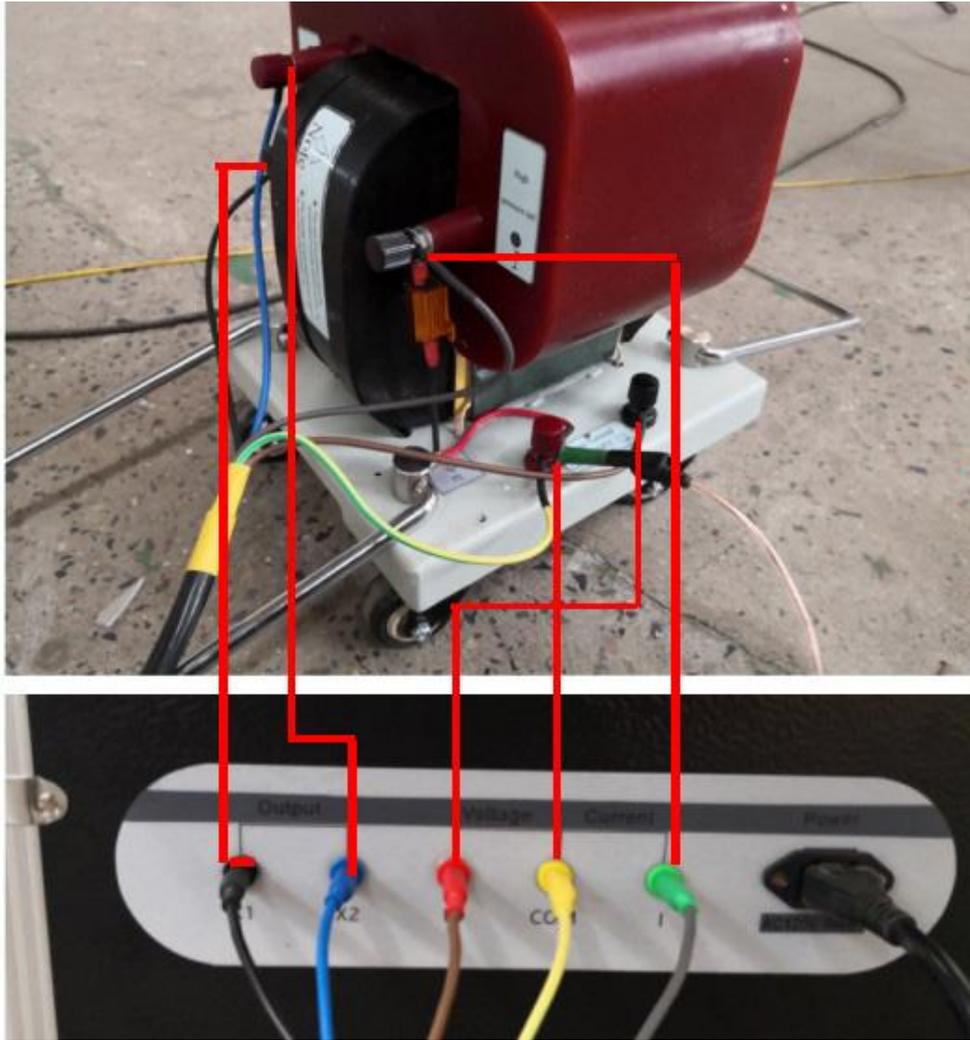
HV Indicator : Turn ON when HV started.



Excitation Output

HV Current
Measurement

Power Supply

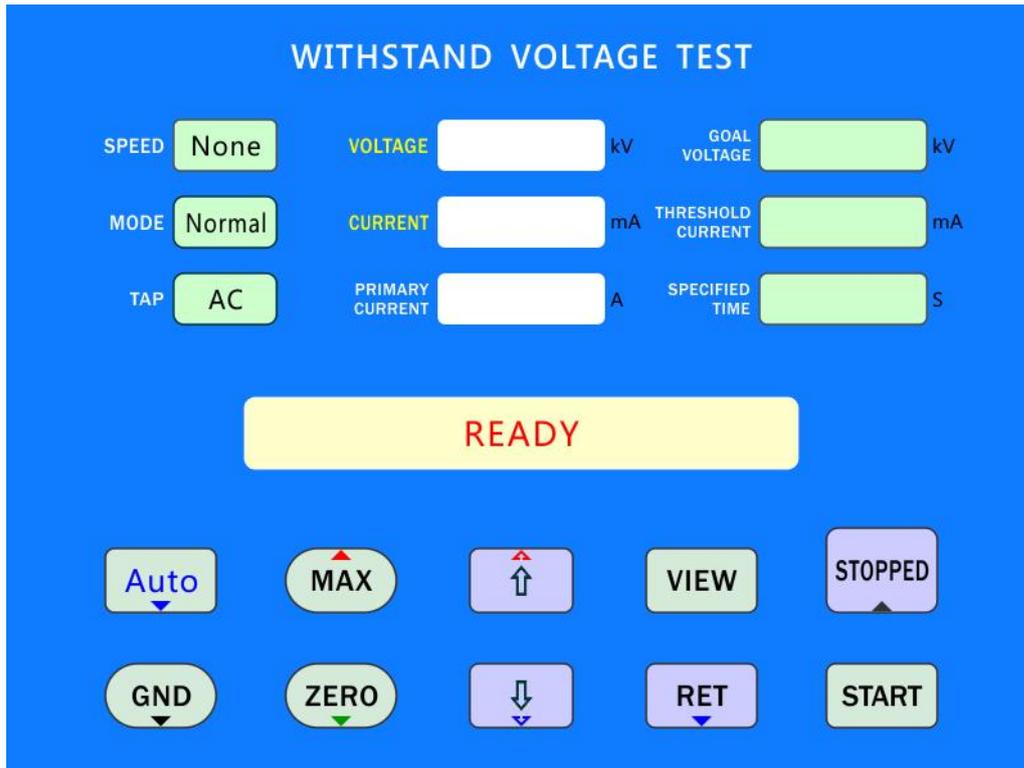


Wire connection as above photos (testing transformer to console)

Remark: All should be grounded well

V. Operation

1.2 Main Screen



SPEED : Reserved (0~255 x 0.1kV/S)

MODE : fixed Normal mode (Burst mode is reserved)

TAP : AC/DC voltage type to output.

VOLTAGE : Actual output High Voltage.

CURRENT : Actual Current of test object.

PRIMARY CURRENT : The input Current of HV transformer.

GOAL VOLTAGE : the Goal voltage to output.

THRESHOLD CURRENT : the Threshold current for judgement.

SPECIFIED TIME : the expected Duration of HV applied to test object.

STATE WINDOW (the long window) : Display state information and time.

Auto/Manual : Button to switch test mode, Auto or Manual.

GND : Grounding (Earthing) indicator, turns ON when grounded well.

MAX : the maximum indicator, turns ON when regulator at top limit.

ZERO : Zero position indicator, turns ON when regulator at bottom limit.

↑ : Button to step up HV.

↓ : Button to step down HV.

RET : Button to return regulator to Zero position.

VIEW/TIME : Button to review test result, or start timer in manual mode.

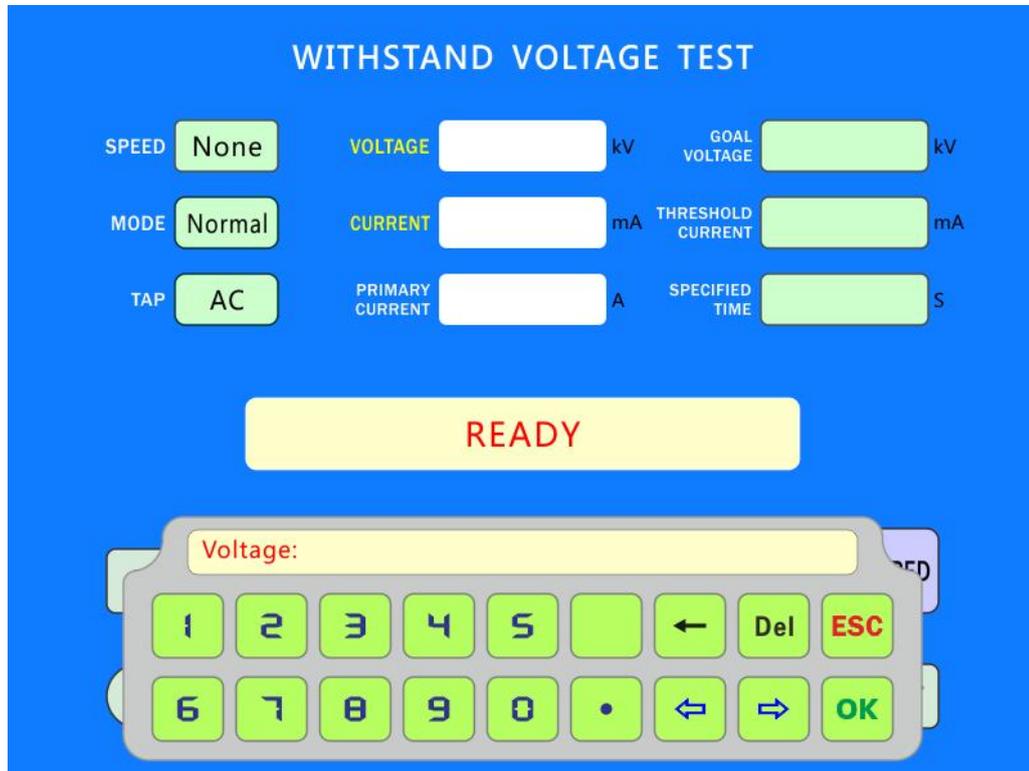
START : Button to start HV output.

STOP : Button to stop HV output.

1.3 Set Goal Voltage, Threshold Current, Time Duration.

On the Main Screen, touch Goal Voltage, Threshold Current, Specified Time

windows respectively to set the corresponding values. The popup keyboard is as following.



On the keyboard,   button is to move cursor,   is to delete incorrect input,  is to confirm, and  is to cancel the input.

Goal Voltage and Threshold Current are not allowed more than the customized rated values, and should not be zero.

Specified Time is not allowed more than 65535, and should not be zero.

1.4 Switch Test Mode

At any time, touch  button to switch the test mode to Auto or Manual. Once the test mode is switched, the timer is cleared concurrently.

1.5 Startup Conditions

- 1) The equipment must be grounded well (GND indicator is ON).
- 2) The regulator must be at zero position (Zero indicator is ON).
- 3) The regulator must not be at top limit (MAX indicator is OFF).
- 4) The regulator is not returning to zero position (RET indicator is OFF).
- 5) The goal voltage must not be Zero.
- 6) The threshold current must not be Zero.
- 7) The specified time must not be Zero.
- 8) The voltage speed must not be Zero.(Or it is reserved)

1.6 Perform test in Manual mode



Caution:

High Voltage is Dangerous, Must be Careful !



Note:

During testing, If abnormal event happen, Do power OFF Immediately.

- 1) Check the startup conditions (Refer to 6.4)
- 2) Check Goal Voltage, Threshold Current, Specified Time are all correct (Refer to 6.2).
- 3) Check the test MODE is **Manual**.
- 4) Touch **START** button to start HV output, then HV indicator turns ON.
- 5) Touch and hold  button to raise output HV.
- 6) When HV is close to Goal Voltage, release  button, and then touch 
or  button several times, till the output HV is equal to the Goal.
- 7) Touch **TIME** button to start timer, then the middle window display the actual time, and speaker make sound concurrently.

- 8) When time up, the regulator returns to zero automatically.
- 9) When regulator reaches the zero position, the output voltage is cut off automatically, then the test process is completed.
- 10) During testing, if test-object current is over the threshold, the output HV is cut off automatically, and then the regulator returns to zero. The test process is also completed.
- 11) Once the test process is completed, the HMI shows the Result Screen as following.(Refer to 6.7)

1.7 Perform test in Auto mode



Caution:

High Voltage is Dangerous, Must be Careful !



Note:

During testing, If abnormal event happen, Do Power OFF Immediately.

- 1) Check the startup conditions (Refer to 6.4).
- 2) Check Goal Voltage, Threshold Current, Specified Time are all correct (Refer to 6.2).
- 3) Check the test MODE is **Auto**.
- 4) Touch **START** button to start HV output, then HV indicator turns ON.
- 5) The output HV is raised automatically.
- 6) When HV is close to Goal Voltage, the regulator enter step-by-step mode automatically, till the output HV is equal to the Goal.
- 7) The timer is opened automatically, and the middle window display the actual time, and speaker make sound concurrently.
- 8) When time up, the regulator returns to zero automatically.

- 9) When regulator reaches the zero position, the output HV is cut off automatically, then the test process is completed.
- 10) During testing, if test-object current is over the threshold, the output HV is cut off automatically, and then the regulator returns to zero. The test process is also completed.
- 11) Once the test process is completed, the HMI shows the Result Screen as following.(Refer to 6.7)

1.8 Test Result

When the test process is completed, the HMI shows the Result Screen automatically as following. Or touch the **View** button to review the test result.

TEST RESULT			
SPEED	None	ACTUAL VOLTAGE [] kV	GOAL VOLTAGE [] kV
MODE	Normal	ACTUAL CURRENT [] mA	THRESHOLD CURRENT [] mA
TAP	AC	ACTUAL TIME [] S	SPECIFIED TIME [] S
ESC		Print	

TAP : the output HV type, AC/DC

ACTUAL VOLTAGE : the actual HV applied to test object

ACTUAL CURRENT : the actual Current of test object

ACTUAL TIME : the actual time duration of HV applied to test object.

GOAL VOLTAGE : the Goal voltage expected to output.

THRESHOLD CURRENT : the Threshold current for judgement.

SPECIFIED TIME : the expected Duration of HV output.

ESC : Button to return to Main Screen.

OK/PRINT : Button to print the test result.

If actual current is over the threshold, the window becomes red.

Touch **OK/PRINT** button to print the test result, the printing content is as following.

TEST REPORT	
Object:	_____
VOLTAGE:	kV
CURRENT:	mA
TIME:	S
Conclusion:	PASSED
Date:	- -
Time:	: :
Operator:	_____

Chapter II. Testing Transformer

Warnings and attention

In order to avoid electric shock or personal safety, and at the same time in order to avoid damage to the instrument or the device under test, to remind the user of reliable control and reasonable use, the following principles must be observed at all times:

Test transformer must be grounded before turning on the power!

Do not connect the power supply before it is grounded!

I.Overview

The test also called transformer booster, which is used in areas of power supply equipment, all kinds of electrical products and tools and materials of insulation dielectric strength test.

Dry testing transformer series is produced, it is completely changed by the backward state of old test transformer stupid, big and heavy, it can produce our matching mounted on a high-voltage silicon stack to provide DC high-voltage test power supply, with a control box ,automatic protection microammeters, gap and other ancillary equipment. Especially suitable for testing at field, so that heavy work becomes convenient, rapid, easy and flexible, efficiency is greatly improved. As a result, it is well received by power systems and large test workers at large factories and mines.

II.Structure

This series are entirely new in design concept, material selection and process flow, so as to minimize volume and reduce weight without reducing performance.

This series use of advanced production equipment, CD type iron core coil winding epoxy vacuum casting and winding with high quality cold-rolled silicon steel, effectively weakening the magnetic leakage, do DC voltage test without external silicon pile, only the DC high voltage silicon company supporting the stack installed in the high voltage side can be obtained dc.

III.Advantage

- 1.Epoxy resin vacuum casting and CD type iron core structure technology
- 2.Small size, light weight and compact structure, noleakage, maintenance free;
- 3.Simple wiring, easy to use;
- 4.Reliable Insulation, beautiful appearance;
- 5.Over voltage protection function

IV. General technical indicators

- 1 output voltage waveform: sine wave
- 2 Output waveform distortion rate: $\leq 1\%$.
- 3 No-load loss: 0.2%~0.35%
- 4 Induced voltage level: $1.1U_0/1\text{min}$.
- 5 Surface temperature rise: $<55^\circ\text{C}$
- 6 Permissible continuous operating time at rated capacity: 0.5 hours (long-running transformers can be ordered)
- 7 consecutive running times: Below 10kVA, each interval of 2 hours, allows continuous operation of 0.5 hours
Above 15kVA, every 4 hours, allowing continuous operation for 0.5 hours
- 8 Allows continuous operation for 4 hours at half rated voltage and half rated current.

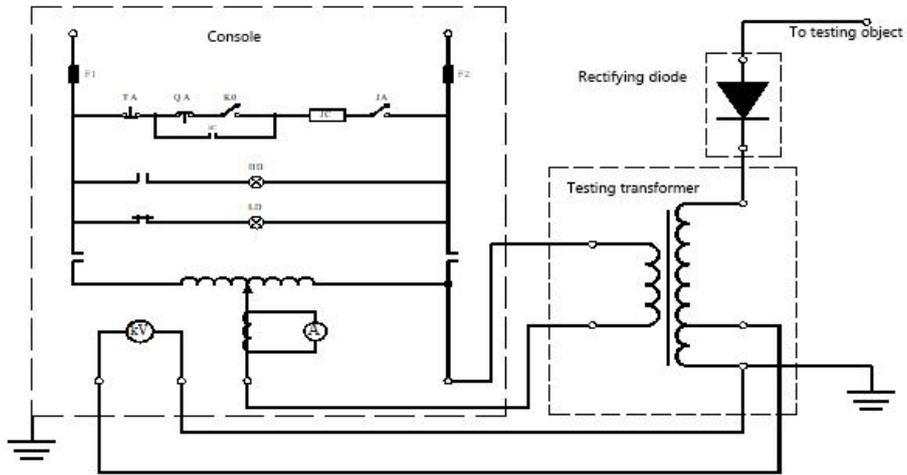
V. Technical data

1. Rated capacity: 5kVA
2. Rated input voltage: 0~200V
3. Rated input current: 25A
4. Testing voltage: AC 100kV
5. Rated output current: 50mA
6. Output DC High Voltage: 140kV
7. Hipot time: 1min
8. Gross weight: 94kgs
9. Package dimension: 500*430*1230mm

VI. Working principle

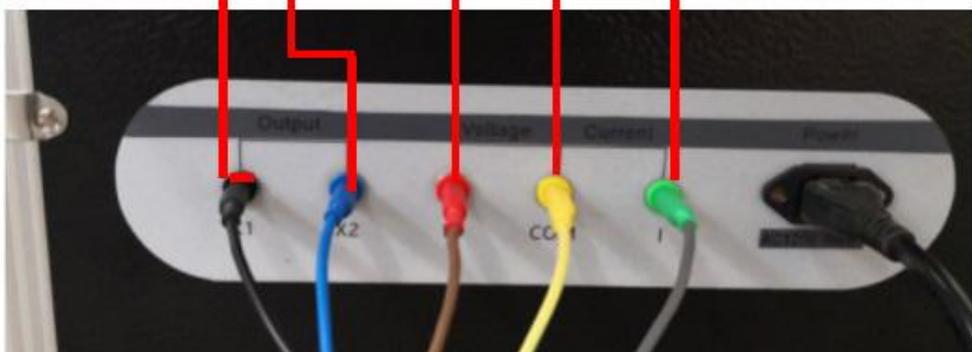
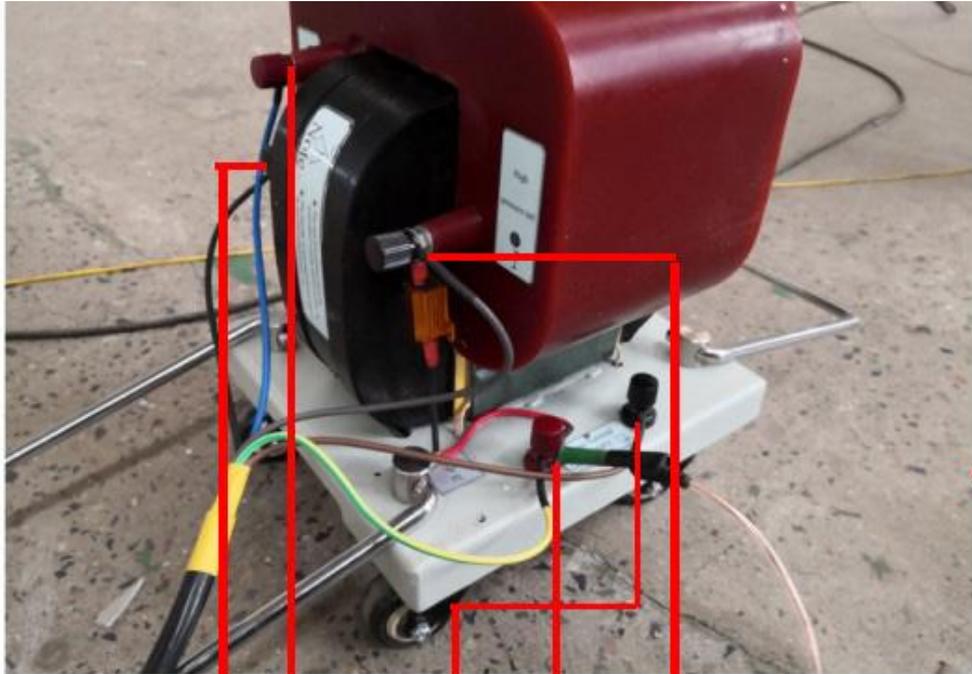
The model's input voltage supporting access control box, the auto transformer to adjust the input voltage to test the transformer primary winding (low voltage), based on the principle of electromagnetic induction in the secondary winding (high pressure) to obtain the output voltage according to the ratio of the same ratio with the primary winding turns, from the highest value to zero volts continuous rated. In DC voltage test and leakage current test, as long as the high voltage silicon stack is installed on the high voltage output terminal, the DC high voltage can be obtained, and its amplitude is 1.414 times of the high frequency power value.

Schematic diagram



VII. Connection method for power frequency withstand voltage test

Remark: All should be grounded well



Below is setting up on site.



VIII.Operation

- 1) Before testing, it is necessary to connect transformer's HV end terminal “⊥” to grounding, otherwise it is dangerous.
- 2) Before testing, the operator must be familiar with the electrical principle and use method of test transformer.
- 3) Connecting cables according to wiring diagram.
- 4) Preparation and safety inspection are ready, test the equipment without load.
- 5) Connecting to device under test (DUT).
- 6) Power supply on, controller's power indicator lights.
- 7) Operation details as per “Operation instruction” of control unit.
- 8) Press closing button and turn on indicator light.
- 9) Carefully boost voltage with clockwise, watch meter's voltage amplitude and test condition until the rated test voltage to be reached.
- 10) Continue to specify the withstand time and watch ammeter and device under testing.
- 11) When time is up, observe the “kV” meter, and quickly adjust regulator back to “0” position, finally power off.
- 12) Discharging with discharge rod, then grounding discharging.
- 13) Discharging every high voltage part may be discharged, removing connections, testing is finished.

IX.Pay attention

1.Connect the work line according to your ongoing experiments.The crust of experimental transformer and operating system must earthing reliably.The X end(high voltage tail) of experimental transformer high-voltage winding and the F end of measuring winding must earthing reliably.

2. When doing cascade testing, the low-voltage windings' X-side of the second grade and third grade test transformer, the F-side of measurement windings and high-voltage windings' X-side (high pressure tail) are all connected to the shell of the test transformer. The second grade, third grade test transformer' bracket shell must be grounded through the insulation.

3. Connected to power before the voltage regulator of the operating system must be zero to be connected, switched on, beginning to step up.

4. Start from zero to step up by pressure regulator, Step-up method: rapid step-up method, Step-up method that is level 20s; Slow Step Method, Step-up method that is level 60s, A very slow step-up method for the selection of. Voltage step-up from scratch by a certain way and at a rate up to your desired test voltage rating of 75% in 2% per second at the rated voltage of the speed test you need to rise to the rated voltage And pay close attention to the direction of measuring instruments as well as the test case goods Step-up the process or testing the process of measuring instruments, such as found in the instructions and sample cases were abnormal Blood pressure should be immediate, Cut off the power supply, the identification of the situation.

5. After the test, it should be uniform within seconds of the regulator to return to zero, and then cut off the power

6. This product is used must not exceed the rated parameters. In addition to the pilot to be outside and will never allow full voltage electricity or power.

7. The use of the product high-voltage test, the familiar with the specification, but also to strictly enforce the state standards and procedures. Reference to GB311-83 "high-voltage transmission line with variable insulation equipment, high voltage test technique"; "of preventive tests electrical equipment point of order" and so on.

X. Operation condition

1. Environmental temperature :0-40 °C;
2. 2. Altitude: <1000m;
3. 3. Relative humidity: <85%;
4. 4. Workplace should be no gas, steam, chemical dust which seriously affect the insulation and other explosive and corrosive media.

XI. Storage

The product should be placed in ventilated, cool and dry cleaning position, Pay attention to moisture, prevent corrosive gas.