

Dear Client,

Thank you for Purchasing our HTZZ-40A Transformer DC Winding Resistance Tester. Please read the manual in detail prior to first use, which will help you operate the equipment skillfully.



Our aim is to continually improve and perfect the company's products, 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 in/pull out test line or power outlet, they will cause electric spark. PLEASE CAUTION RISK OF ELECTRIC SHOCK! To avoid risk of electric shock, be sure to follow the operating instructions!

**Company Address:**

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- ◆ Sales Hotline: 86-27- 87492243
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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 personal injury and to prevent the product or any other attached products being damaged. In order to avoid possible danger, this product can only be used within the scope of the provision..

*Only qualified technician can carry out maintenance or repair work.*

**--To avoid fire hazard or personal injury:**

### **Use Proper Power Cord**

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

### **Connect and Disconnect Correctly**

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

### **Grounding**

The product is grounded through the power cord; besides, the ground pole of the shell must be grounded. To prevent electric shock, the grounding conductor must be connected to earth ground.

Before making connections to the input or output terminals of the product, please do check that the product is properly grounded.

### **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 Wire and Charged Conductor**

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

### **Do Not Operate with Suspicious Faults**

If you encounter operating faults/suspect there is damage to this product, 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**

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

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

## I. Overview

DC resistance measurement of transformer winding is an essential test project during transformer delivery, repair and changing tapping switch. Usually, it is a time consuming task to use traditional methods (bridge method and voltage drop method) to measure transformer winding and DC resistance of high-power inductive device. In order to change this situation: shorten measurement time and reduce the staff's workflow, our company has developed DC resistance rapid tester. The instrument using new power technology, with characteristics such as stable performance, rapid test, small size, light weight, easy operation, high measure precision and good data reproducibility, is the ideal equipment to measure transformer winding and DC resistance of high-power inductive device.

This product complies with DL/T845.3-2004, national standards GB6587 "Environmental test general program of electronic measuring instruments" and GB6593 "Quality inspection provisions for electronic measuring instruments".

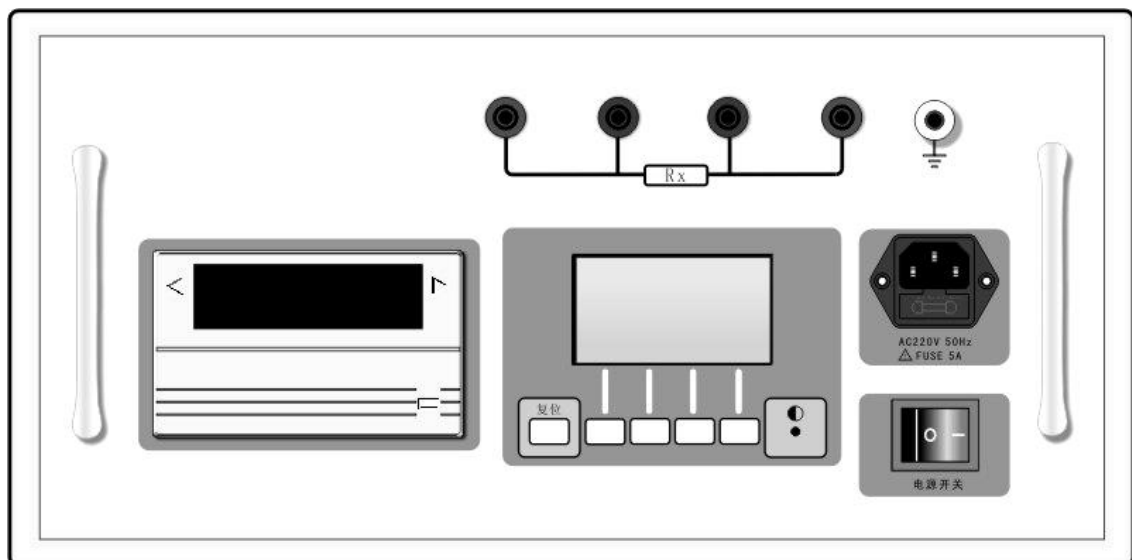
## II. Technical Specifications

Item	Technical specifications and parameters	Remarks
Measure current	2.5A, 5A, 10A, 20A, 40A	/
Measure Range	2.5A            10m Ω ~8 Ω	/
	5A                1m Ω ~4 Ω	
	10A              1m Ω ~2 Ω	
	20A              1m Ω ~1 Ω	
	40A              1m Ω ~500m Ω	
Accuracy	±0.2%（full range）±2d	/
Data Storage	255	
Display	LCD	Resistance display: 4 1/2 bits

Maximum resolution	0.1 $\mu\Omega$	/
Power supply	AC 220V $\pm$ 22V, 50Hz $\pm$ 2 Hz	Fuse 10A
Maximum Power Dissipation	1200W	Inputting 10A test current will reach maximum power dissipation.
Work Environment	Temperature:0 $^{\circ}$ C $\sim$ 40 $^{\circ}$ C Relative Humidity: $\leq$ 80%RH	/

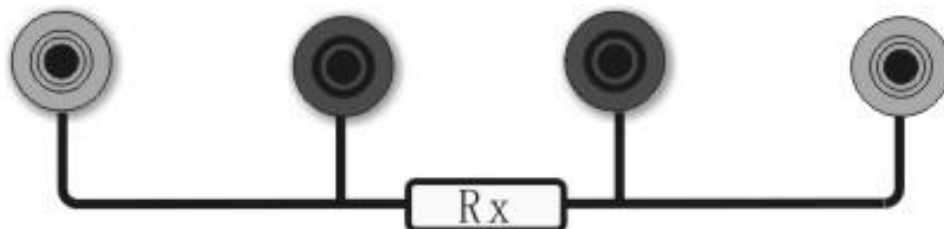
### III. Panel Introduction

Panel is shown below:



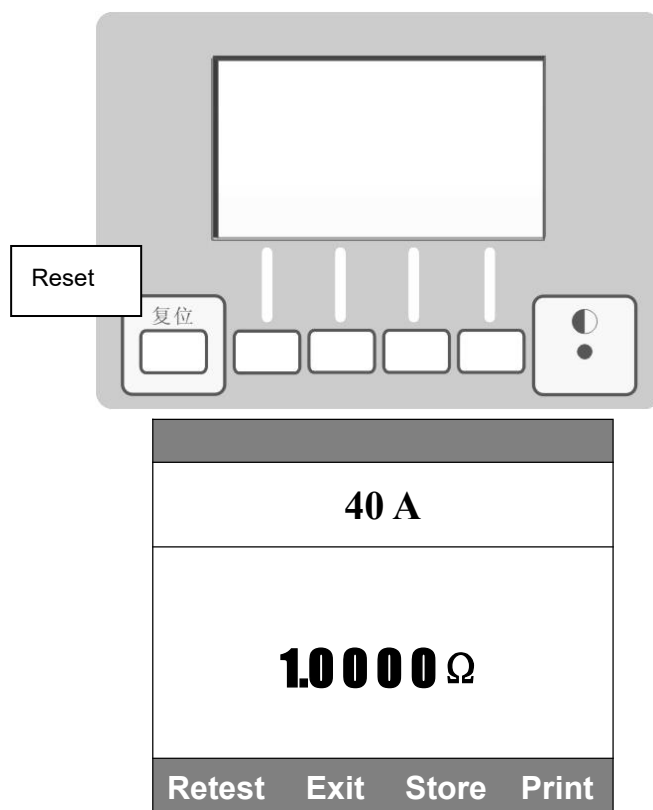
The panel layout as shown above consists of panel printer, LCD, keyboard, power outlet and power switch, output connecting terminal and ground terminal.

**The output part**



As shown above, the input and output connecting terminal contains four terminals. In which the two outer red terminals are used for current output. The two inner terminals are used for measuring the voltage sampling input.

## Display and keyboard control part



The display is dot matrix LCD screen, operating tips, measuring results, and function display of 4 function keys can be shown through it. The lower-left side is the reset key. When system halt appear or you want to exit from menu, pressing “Reset” key return to the initial state of the instrument; the lower-right side is contrast adjustment holes to adjust the LCD contrast.

## Print part

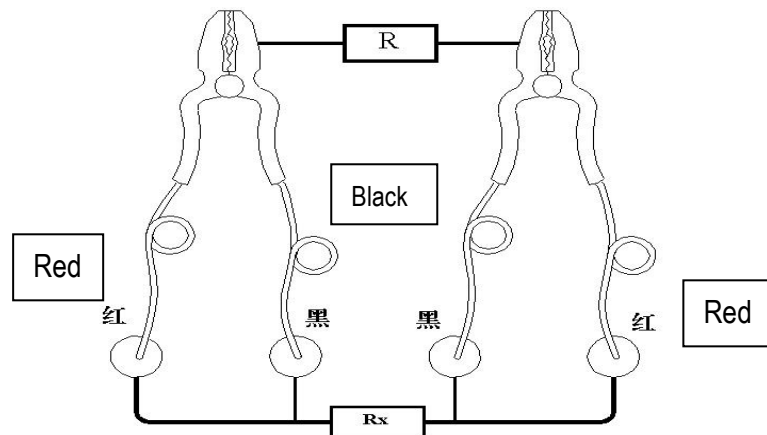


This instrument is equipped with a 16-line mini panel printer. It is easy to replace paper and ribbon and prints fast. It has a long service life and not need other maintenance and repair. The main power is on; the light on the lower-right corner of the printer will light indicating the printer in standby mode. During test or completed test pressing print key, you can print out the data.

## IV. Operation Instruction

### 1. Preparation for measurement

First, make power cord and groundwire connect to the instrument, in accordance with color matching connect test line to terminal on the panel, then using test clamps well clip tested transformer windings as shown below:



Turn the power switch on, then the instrument will display information as follow.

Measurement mode: Normal test Measure current: 40A			
Test	Check	Mode	Current

The instrument provides two test methods: Temperature rise test and Normal test. "Temperature rise test" applies to measure DC resistance of transformer winding in temperature rise test. Under test the instrument will automatically store and print the change of winding DC resistance per 30 seconds. "Normal test" is used for measuring DC resistance of transformer winding in common case. In this mode the instrument record and store data by manual control. Press "mode" key to switch these two modes. "Current" key is used in measuring current. The instrument provides four different measuring current, you can press "▲" and "▼" keys to select. please pay attention to the maximum measure range of each current, if DC resistance value of measured



winding is greater than maximum measure range of the selected current, during test current will not reach the predetermined value, this will cause the instrument long time staying in waiting state (Detailed information please refer to technical specifications section).

“Check” key is used for checking and printing the stored measured data. (Detailed information please refer to “Check and process data” section)

After selecting measurement method and measure current, pressing “test” key will start the whole measurement.

## 2. Start the measurement

In "Normal test" mode, pressing "test" key the instrument will charge up measured winding as shown below:

40A			
Charging...00.0A			
<div></div>			
Retest	Exit	Store	Print

In the middle of the screen a charging progress bar will appear, above that is the current value in current state. For the measurement of large inductive load, usually the current will take some time to reach a stable value. The current value increases from zero to the rated value.

**Note: If the charge progress bar stays at a value for a long time not to increase, may be the current winding resistance value exceeds the selected current range, the current cannot reach the predetermined value. Press "Exit" key to exit the measurement, then select a small current and try again.**

When the current reaches the rated value, charge is completed. The instrument will sample data and calculate. Display prompts "Measuring, please wait". After calculation, the measured resistance value will display on the screen. Data has stabilized, press "Store" key to store data or press "Print" key to print data.

**Tip:** when you measure the tapping resistor of transformer with load tap changer, completed the measurement of a tapped resistor, do not need to exit, but directly switch to measure the next tapped resistor. Press "Retest" key to refresh the data. After data has stabilized, press "Store" key to continuously store data or press "Print" key to continuously print data until finishing all the measurement of tapped resistor.

**Measuring no-load tap charger, it is forbidden that directly switch the tap changer. You must exit the measurement mode and wait the discharge is completed, then you can switch the tap changer!**

### 3. Complete the measurement

After measurement, press "Exit" key to exit measure. At this time if it is inductive load, the winding of instrument will automatically release current, display prompts "discharging, please wait" and buzzer will sound. Discharge signal disappeared; you can remove the test line.

**Note: when measuring or discharge signal not disappear, test line cannot be directly removed to avoid the winding discharge endanger the safety of personnel and equipment!**

## V. Check and process data

### 1. Check data

In the initial screen, press "Check" key to enter data check interface as follow:

001/050			
10.000m Ω			
Print	Delete	▲	▼

The upper part of the screen shows the total number of current data and the amount of stored data. If the current data is stored in "Temperature rise test" mode, the right-upper part of the screen will display stored time; if it is stored in

"Normal test" mode, there is no time display. You can use "▲" and "▼" key to view all stored data.

## 2. Print data

If you want to print the stored data, pressing "Print" key to enter the print interface as follow:

001/050			
Starting at: 001			
Ok	Exit	◀▶	◆

Before printing, you need to set the beginning and ending sequence number of data, use "◀▶" key to switch sequence number, use "◆" key to select digital, press "OK" key to confirm operation.

**Note: Printed number and stored sequence number of data is different, when print; data will automatically generate page number.**

## 3. Delete data

When you want to delete the stored data, press "Delete" key to enter delete interface, as shown below:

001/050			
Select delete range			
All	Current	Exit	

Press "All" key to delete all the stored data; press "current" key to delete the data currently appeared in your eyes; Press "Exit" key to return to the check interface.

## VI. Notes

**For ensuring safety of personnel and equipment, operator must read the following instruction carefully:**

1. Completed measuring the inductive load, test line cannot be directly removed to avoid inductor discharge endangering the safety of personnel and equipment. The output terminal of the instrument designed with discharge circuit. Closed output, the inductor will discharge energy through the instrument. Must sure the discharge is completed, and then the test line can be removed.

2. For off-load voltage regulation transformer, do not switch tap-changer during testing.

3. If the power is failed during testing, the instrument will automatically release discharge. Do not immediately remove test line; wait at least 30 seconds before removing it.

4. Under test, do not let the other untested windings short circuit and ground. Otherwise which will make transformer magnetizing process become slowly and settling time of the data prolong.

5. Check the power supply and voltage before starting up: AC 220V  $\pm$  10% 50Hz.

6. Under test, make sure the power of tested instrument is disconnected and it does not connect with the other charged devices.

7. Under test, the case must be grounded.

8. Under test, it is forbidden to place any irrelevant objects on the panel and around the device.

9. Replacing the fuse and accessories, please use the same model with the instrument.

10. You should prevent the instrument damp, oil pollution

## **VII. Transport and Storage**

### **Transport**

If the instrument needs to be transported, it is recommended to use our packing wooden boxes and cushioning materials to avoid unnecessary damage and losses.

If do not use wooden box wooden in transit, it is not allowed to stack devices randomly. The allowable maximum packing stacking layer is two layers.

In transit, the instrument panel should be faced up.

### **Storage**

The instrument should be placed in a dry, clean, ventilated, non-corrosive gases room. In the absence of wooden packing cases, it is not allowed to stack randomly.

In storage, the instrument panel should be faced up. And add dampproof pad at the bottom of the instrument to prevent it from moisture.

## **VII. Packing List**

1. Instrument host	1
2. Test line	1
3. Power cord	1
4. Printing paper	2
5. Fuse	2
6. Report	1
7. The instruction manual	1
8. Certificate	1