

Dear Client,

Thank you for Purchasing our HTZZ-S20A Three Phase Transformer DC 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!

## ◆ **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.

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**Thank you very much for selecting our products!**



**For your better use of this instrument, you are kindly requested to read this manual carefully before you use it, so as to understand its major performances and operation method.**



- Caution:**
- ① It is not allowed to remove the wiring and directly switch off the power supply during the measurement.
  - ② For the no-load voltage regulating transformer, it is not allowed to switch the tapping switch during the measurement.
  - ③ In case of a sudden power failure during the measurement, this instrument can discharge automatically. Please do not remove the wiring immediately. Wait for at least 30 seconds before the connection can be removed.
  - ④ The three-phase measurement applies to the windings of YN connection. For the windings of yn connection, since difference exists between the three-phase and single-phase measurement results due to the effect of the resistance of the copper bus connected, the single-phase measurement is recommended.
  - ⑤ Caution: The three-phase measurement result does not include the resistance value of the neutral lead. Therefore, it is suggested to at least verify one data using the single-phase testing method for each phase after completing the measurement of three-phase resistance value, so as to determine if the neutral lead is normal.

## **1. General**

This fast DC resistance tester (hereinafter referred to as DC resistance tester) is the product of the latest generation for measuring the DC resistance of transformer and is optimally designed for measuring the DC resistance of the three-phase winding of the large-capacity transformer. It can measure the DC resistance of the three-phase winding at the same time. In case of the on-load voltage regulating transformer, it is not required to discharge but to directly adjust the tapping switch. The measurement time is one third of the traditional single-phase measurement, greatly shortening the working time and labor intensity. As the DC resistor tester is provided with large-screen LCD and the graphical interfaces in Chinese, the operation is visual, clear and easy.

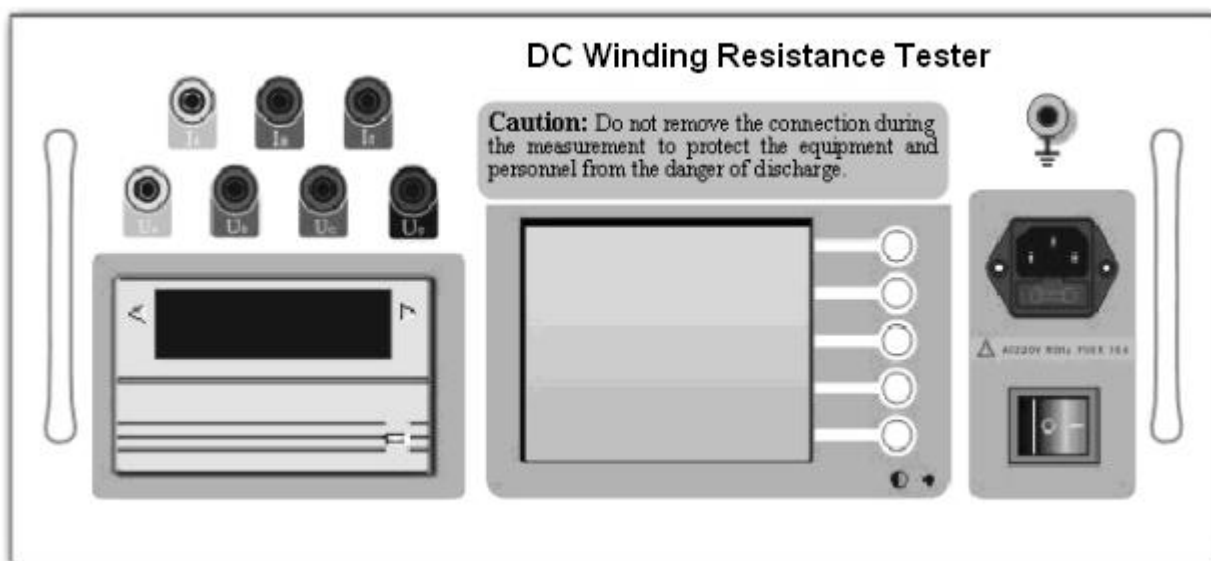
Besides, it is provided with panel type printer and large-capacity non-volatile memory, so the measurement results can be stored and printed out easily. With good stability in data testing, speediness and perfect repeatability, it is the best choice for the on-site measurement of DC resistance of transformer

## 2. Performance Index

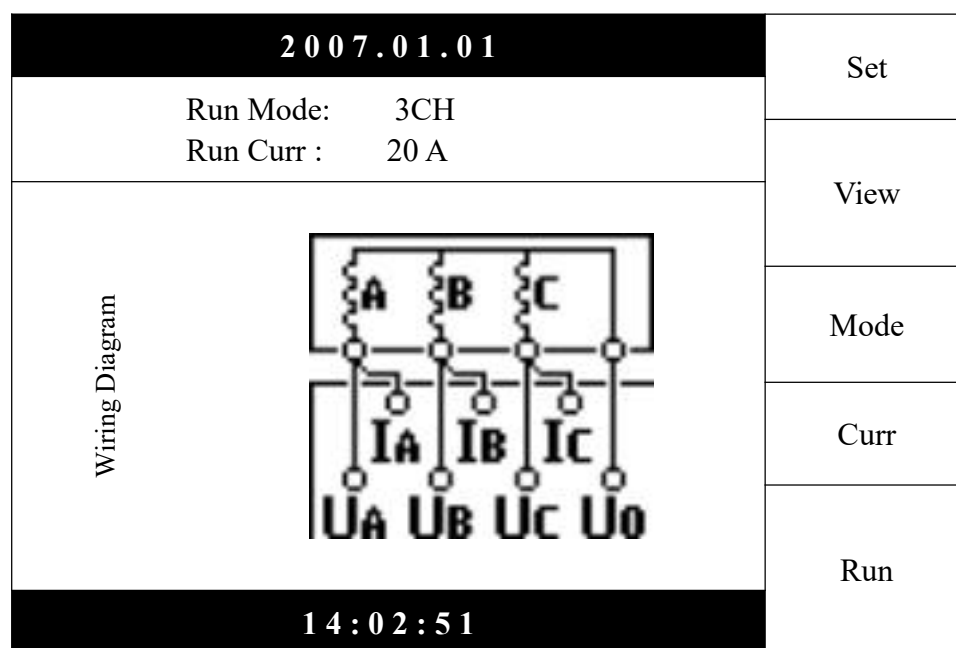
Testing current	Single phase: 1A 5A 10A 20A 40A Three phase: 1A 5A 10A 20A
Measurement scope	Single phase: 1A 10 mΩ~20Ω 5A 1 mΩ~4Ω 10A 1 mΩ~2Ω 20A 1 mΩ~1Ω 40A 1 mΩ~0.5Ω Three-phase: 1A 10 mΩ~6Ω (each phase) 5A 1 mΩ~1Ω (each phase) 10A 1 mΩ~0.6Ω (each phase) 20A 1 mΩ~0.3Ω (each phase)
Measurement accuracy	$\pm (0.2\% \text{full-scale} \pm 2 \text{ digital})$
Maximum resolution	0.1μΩ
Data storage capacity	150 groups
Power supply	AC 220V±22V, 50Hz±2 Hz
Working environment	Ambient temperature: 0°~40° Relative humidity :≤80%

## 3. Panel Description

The panel of DC Winding resistance tester is shown in the figure below:



- ①  $I_a$   $I_b$   $I_c$ : The dc current output. In case of single phase or two-phase measurement,  $I_a$  and  $I_b$  are current output.
- ②  $U_a$   $U_b$   $U_c$   $U_o$ : The input of measuring voltage. In case of single-phase measurement,  $U_a$  and  $U_b$  are voltage input. In case of two-phase measurement,  $U_a$  and  $U_b$  are the voltage input of the first channel;  $U_c$  and  $U_o$  are the input of the second channel.
- ③ Panel printer: Prints the output measurement results.
- ④ LCD: displays the measurement results and operation prompting information, with the function definition of the five multi-function key-presses under the current state given in the key definition zone on the right, as shown in the figure below :

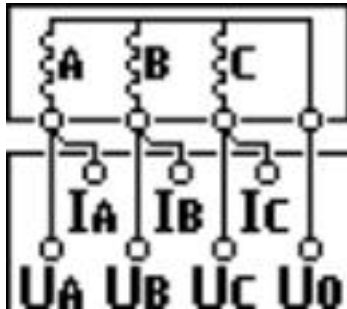


- ⑤ : Contrast regulation of LCD
- ⑥ Power socket: the power input of the complete unit, with built-in fuse tube. The fuse tube is 10A/250V.
- ⑦ Earthing pole: The earthing pole on the enclosure of the complete unit. Make sure that it is reliably grounded during measurement.

#### 4. Testing and Operating Method

- ① Connect with the power source and earth wire, switch on the power supply to enter into the initial interface, as shown in the figure below:



2 0 0 7 . 0 1 . 0 1		Set
Run Mode: 3CH Run Curr : 20 A		View
Wiring Diagram		Mode
		Curr
		Run
		1 4 : 0 2 : 5 1

“Set” key-press: Set the current date and time.

“View” key-press: View the data stored, including measurement results, testing date, tapping number and etc.

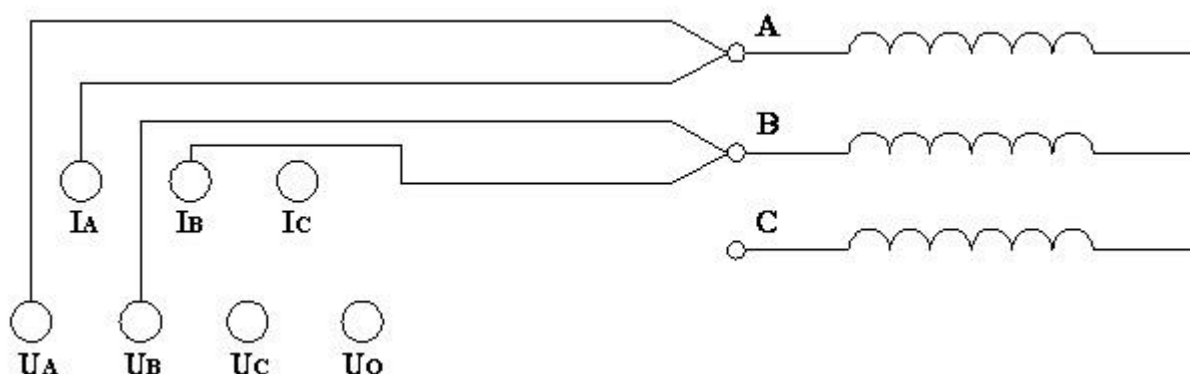
“Mode” key-press: Sets the measurement mode, including “Single Phase”, “Two-phase” and “Three-phase”, besides, corresponding schematic wiring diagram will be displayed in the zone of “Schematic Wiring Diagram” as the reference for actual wiring.

“Curr” key-press: Sets the size of testing current. In case of the single-phase or two- phase measurement, the current 1A, 5A, 10A and 20A can be selected. You may select suitable measuring current by referring to the related parameters listed in the technical indicators as the reference.

“Run” key-press: After the testing wire is connected and the measuring current is selected, press “Run” key-press to start the test.

## ② Single-phase measurement:

The wiring method is shown in the figure below (Taking the measurement as of  $R_{AB}$  an example):



After the winding under test is wired and the suitable measuring current is selected, press the “Run” key-press to allow the tester to enter into its measuring state and to start to supply power to the winding, and then it enters into the interface as follows:

2007.01.01		
R	<div></div> 0.0 A	TAP
		Save
The battery is charging, please wait a moment! Current tap: 01		Test
		PRT
		Exit
14:02:51		

At this time, the current of the winding starts to increase. If the charging progress strip and the current display value stand still for a long time, it indicates that the value of the resistance value to be measured is probably beyond the measuring scope of the current, so it is not able to reach its set value. At this time, press “Exit” key-press to return and re-select the current and retry. When the set value is reached, it becomes constant. Then, enter into the next interface.

2007.01.01		
R	351.2 mΩ	TAP
		Save
Current tap: 01		Test
		PRT
		Exit
14:02:51		

Now, the dc resistance tester starts to display the resistance value of the winding under test and such value gradually becomes stable. At this time, press the Tap button to adjust and set the current tap value or winding name so as to mark the measurement result. After the Tap button is pressed down, the multi-functional key on the right becomes “▲” “▼” “◀▶” “OK” and “Cancel”, and the tap setting dialogue box is ejected. After setting, press “OK” button to save it and press “Cancel” button to modify it. Then, press “Save” and “PRT” button to save or print the measurement result. In case of any doubt about the data, press “Test” button to carry out the measurement and calculation again.

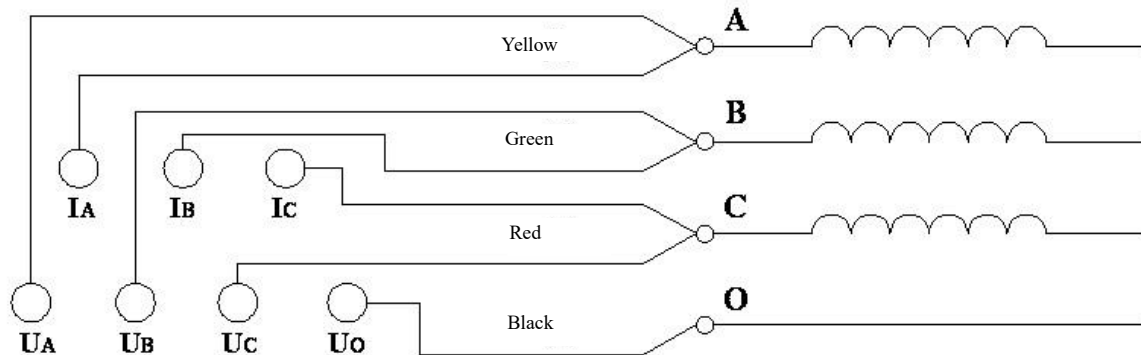
When measuring the on-load voltage changing transformer, after the testing data of one tapping position becomes stable, the on-load tapping switch may be switched to the next tapping position, without discharging to conduct the measurement over again. At this time, the resistance value of the winding will change gradually until it becomes stable. You may also press “Test” button to quickly refresh the data. Repeat the above-mentioned procedure until all the tapping tests are completed.

### ③ Three-phase measurement:

The three-phase measurement applies to the windings of YN star connection with neutral lead. For the windings of yn connection, since difference exists between the three-phase and single-phase measurement results due to the effect of copper bus connected, single-phase

measurement is recommended.

The three-phase wiring is shown in the figure below:



After the winding under test is wired and the suitable measuring current is selected, press the “RUN” key-press to allow the tester to enter into its measuring state and to start to supply power to the winding, and then it enters into the interface as follows:

2 0 0 7 . 0 1 . 0 1			
A	<input type="text"/>	0 . 0 A	TAP
B	<input type="text"/>	0 . 0 A	Save
C	<input type="text"/>	0 . 0 A	
The battery is charging, please wait a moment ! Current tap: 0 1			Test
			PRT
			Exit
1 4 : 0 2 : 5 1			

At this time, the current of the winding starts to increase. If the charging progress strip and the current display value stand still for a long time, it indicates that the value of the resistance value to be measured is probably beyond the measuring scope of the current, so it is not able to reach its set value. At this time, press “Exit” key-press to return and re-select the current and retry. When the set value is reached, it becomes constant. Then, enter into the next interface.

<b>2 0 0 7 . 0 1 . 0 1</b>		
A	<b>3 5 1 . 2 mΩ</b>	TAP
B	<b>3 5 0 . 6 mΩ</b>	Save
C	<b>3 5 1 . 6 mΩ</b>	
Imbalance rate: <b>0 0 . 2 8 %</b> Current tap : <b>0 1</b>		Test
		PRT
		Exit
<b>1 4 : 0 2 : 5 1</b>		

Now, the dc resistance tester starts to display the resistance value of each phase. With the resistance value of each phase becoming stable, the imbalance rate will gradually decrease. Under such state, the “TAP” button may be pressed to adjust and set the current tap value or winding name so as to mark the measurement result. After the “TAP” button is pressed down, the multi-functional key on the right becomes “▲” “▼” “◀▶” “OK” and “Cancel”, and the tap setting dialogue box is ejected. After setting, press the “OK” button to save it and press the “Cancel” button to modify it. Then, press “Save” and “PRT” button to save or print the measurement results. In case of any doubt about the data, press “Test” button to carry out the measurement and calculation again. The maximum display scope of the imbalance rate is 50%. If such scope is exceeded, only “50%” will be display.

When measuring the on-load voltage changing transformer, after the testing data of one tapping position becomes stable, the on-load tapping switch may be switched to the next tapping position, without discharging to conduct the measurement over again. At this time, the resistance value and imbalance rate of each phase will change gradually until they become stable. You may also press “Test” button to quickly refresh the data. Repeat the above-mentioned procedure until all the tapping tests are completed.

**Upon the completion of the measurement, press the “Exit” key to end the measurement. At this time, the DC resistance tester starts to discharge and the display gives corresponding discharge indication and the buzzer rings. After the discharge is completed and the tester**

returns to the initial interface, the measurement wiring may be removed.

## 5. Precautions

- ① When measuring the no-load voltage changing transformer, be sure to exit from the discharge before switching the tapping switch. Do not switch the tapping switch before the discharge is completed according to the discharge indication.
- ② Do not remove the wiring during the measurement.
- ③ If the charging progress strip and the current display value stand still for a long time, it indicates that the value of the resistance value to be measured is probably beyond the measuring scope of the current, so it is not able to reach its set value. At this time, press the “Exit” button to return and reselect the current to retry.
- ④ When replacing the fuse tube and the fittings, please use the same model as this instrument.

## 6. Troubleshooting

Fault phenomenon	Cause analysis	Solution	Remarks
There is no display after switching on.	1) The power supply is not switched on.	Switch on the power supply	Replace with the fuse tube of the same model. Do not substitute it with the fuse tubes of other models.
	2) The 10A fuse tube of the instrument is not properly fitted or the circuit is open.	Fit or replace the fuse tube	
There is no current output	1) The equipment to be tested is open-circuited	Check the equipment and eliminate the faults.	
	2) The test circuit is open-circuited.	Check the test circuit and eliminate the open-circuit fault.	

## 7. Transportation and Storage

### ■ Transportation

When transporting the equipment, it is suggested using the instrument packing wood boxes and damping materials of our company to avoid any unnecessary damage and loss during the transportation.

Do not stack the equipment if it is not transported in a wood box. If the instrument packing box

of our company is used, the maximum permissible stacking layers are two layers.

The equipment shall be transported with the instrument panel facing upward.

### ■ Storage

The equipment shall be stored in the dry, dust-free and well-ventilated room without corrosive gas. Do not stack the equipment if it is not packed in the wood box.

The equipment shall be stored with its panel facing upward. Besides, damproof materials shall be provided at its bottom to protect it from dampness.

## 8. Unpacking and Inspection

### ■ Precautions for unpacking

Before unpacking, make sure that the arrow on the package of the equipment is upward. When unpacking, do not knock it by force, otherwise the equipment will be damaged. Unpack and take out the equipment. To protection the environment, keep the equipment package and damping materials so that you can use them for future transportation and storage.

### ■ Inspection content

Take out the equipment and check and count the equipment and fittings against the packing list. In case of any shortage, please make contact with our company. We will give serve you as soon as possible.

## 9. Others

The warranty period for the whole set of this product is one year and “Three-guarantees” (repair, return and exchange guarantees) is implemented. Maintenance service can be provided throughout its service life. For any quality problem of the equipment within the warranty period, free maintenance will be provided. For the damages due to the improper operation or carelessness of the user, services will be provided at favorable prices.

We are looking forward to your precious suggestions about our product. If the address and contact information of your company are changed, please keep us informed so that we can serve you in good time.