

Operation Manual

JYR 40E/50E DC Resistance Testing Meter Temperature Rising Tester





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Carefully read the operation manual prior to use the instrument, it is sole responsibility of customer to secure safety.

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The manual is subject to change without notice

I. GENERAL

The DC resistance measurement of transformer is a mandatory test item for semi-finished products, finished product factory test, installation, handover test and preventive test of power department in transformer manufacturing, which can effectively find manufacturing defects and hidden dangers after operation such as material selection, welding, loose connection parts, missing strands, and broken wires of transformer coils. Transformer temperature rise direct resistance test is a mandatory test item for transformer factory. In order to meet the needs of rapid measurement of transformer DC resistance, **Kingrun has developed a new generation of JYR (**50/40E**) by using its own technical advantages** Series DC Resistance Tester. The instrument adopts the new

third-generation power supply technology, which has the characteristics of high power efficiency, wide measurement range and large output current. The whole machine is controlled by a single-chip microcomputer, which automatically completes the functions of self-check, data processing, display, etc., has a temperature rise timer, automatically saves and prints the temperature rise data, and can generate a temperature rise curve with the temperature rise data with the host computer. It has the functions of automatic discharge and discharge indication.

II. Safety measures

- 1. Be sure to read this manual carefully before using this instrument.
- 2. The operator of the instrument should have common sense of the use of general electrical equipment or instruments.
- 3. This instrument can be used indoors and outdoors, but it should be avoided in rain, corrosive gas, excessive dust, high temperature, direct sunlight and other places.
- 4. This instrument is a high-precision instrument and should avoid violent vibration.
- 5. The repair, maintenance and debugging of this instrument should be carried out by professionals.
- 6. After the test is completed, be sure to wait for the discharge alarm sound to stop before turning off the power and removing the test line.
- 7. To measure the no-load voltage regulating transformer, be sure to wait for the discharge alarm sound to stop, and then switch the transformer gear.
- 8. During the test, it is forbidden to disassemble and move the test clips and power supply lines.

III. Performance characteristic

- 1. This instrument has a large output current (up to 50/40A) and a high charging voltage (50V).
- 2. The measurement range is wide (0 Ω -40K Ω), and it can measure the inductive DC resistance of transformers and transformers.
- 3. Aiming at the problem of long low-voltage stability time of iron-core five-column large-capacity transformer, this machine has the function of automatic magnetic assistance of YNd, YNyn and Dyn according to the magnetic circuit, which can meet the time requirements of the transformer temperature rise test.

4. This machine also has dual-channel measurement and phase selection measurement, customized temperature rise timing, real-time sampling, and real-time printout, making the temperature rise test a simple and convenient thing.

5. In the conventional mode, it has the function of temperature conversion, magnetic assistance and phase selection measurement, and automatically calculates the unbalance rate after completing the three-phase test.

- 6. It has perfect protection circuit, audio discharge alarm, clear indication, strong reliability and reduced misoperation.
- 7. Large color screen, touch operation, simple and convenient, clear and easy to read the display data.
- 8. The instrument has the functions of perpetual calendar, 100 groups of conventional data storage, 3 times temperature rise test data storage, automatic conversion of conventional mode temperature, etc., and no data loss is lost when the machine is shut down. In addition, there is a "U disk" interface, which is convenient for exporting temperature rise data for reference and generating temperature rise curves.
- 9. This instrument is equipped with RS485 communication interface, with the host computer control software, to achieve long-distance control and measurement.
- This machine has the function of AC380V power protection alarm for input misconnection to reduce the damage to the instrument caused by misoperation.
- 11. This machine has the characteristics of wide applicable temperature, high precision, shockproof, anti-interference, high stability, and easy to carry.

IV. Technical index

Output voltage:	50V				
Output current:	50/40A, 20A, 10A	A, 3A, 1A,	0.3A	0.1A、	0.02 A
Testing range:	0Ω——1Ω	(50A)			
	0Ω——1.2Ω	(40A)			
	0.001Ω2.5Ω	(20A)			
	0.002Ω—5Ω	(10A)			
	0.006Ω——16Ω	(3A)			
	0.02Ω—50Ω	(1A)			
	0.08Ω——160Ω	(0.3A)			
	0.2Ω—500Ω	(0.1A)			

 30Ω —40000 Ω (0.02A) Accuracy: 0.2%±0.2µ Ω Min. resolution: 0.01 µ Ω Input power supply: AC220V±10%; 50HZ±1 HZ Working temperature: -20°C~40°C Relative humidity: ≤90%RH, no dewing Volume: 412mm*290mm*330mm Net weight: 22kg

V. System description

Refer to Fig.1 for front panel of the instrument..



Fig 1

- 1. AC power supply (AC220V/16A): AC220V AC power input socket of the whole machine.
- 2. **Power switch:** Turns the power on and off of the whole machine.
- 3. **±**Grounding: The grounding post is used for the grounding of the whole machine shell and is a protective ground.
- 4. **Fuse:** 20A/AC250V fuse needs to be installed.

- 5. VA, VB, VC, VO terminals: Voltage measurement input terminals for high-voltage windings.
- 6. IA IB IC IO teminals. Current measurement input terminals for high-voltage windings. .
- 7. VC (V1+), VO (V1-): Voltage input terminal for single-channel measurement, or input terminal for dual-channel measurement voltage channel 1.

8. IC (I+) and IO (I-): Current output terminals for single and dual channels.

- 9. Va (V2+), VB (V2-): Voltage output terminals for dual-channel measurement voltage channel 2.
- 10. Ia, Ib, Ic, Ic terminals: Current measurement input terminals for Low-voltage windings.
- 11. Va, Vb, Vc, Vo terminals: Voltage measurement input terminals for low-voltage windings.
- 12. LCD display: large screen true color touch LCD display, touch selection display menu, operation test and input information, display test current value and resistance value and related information.
- 13. RS485: RS485 standard communication interface.
- 14. U disk interface: Connect to a U disk to export memory temperature rise data, which is convenient for generating temperature rise curves.
- 15. Printer: Prints current, resistance values, and auxiliary information results.

VI. Testing and operation methods

1. **Wiring:** The tested product is connected to the test post of the machine through a special cable, the thick wire insert of the test cable is connected to the current end, and the thin wire insert is connected to the voltage end. The connection is firm and prevents loosening.

At the same time, connect the ground wire. The clamp ends are clamped at the coil resistance pins of the test specimens.

Connect the power cord provided with the unit to the AC power input. Turn on the switch and the LCD is lit.

(If the power supply is connected to AC380V by mistake, the internal protection of the instrument will work, and the buzzer will always alarm, and the LCD will not be lit). Single-channel direct measurement wiring: (Fig. 2).



Fig 2







Dual-channel high-voltage CO low-voltage bc series wiring: see Figure 4





2. **Boot interface:** Turn on the power switch, the display screen shows the company LOGO interface, stay for about 3 seconds, it will automatically skip to enter the main interface of selection settings, as shown in Figure 5:

3.Test method selection: As shown in Figure 5, you can touch the corresponding test method to enter the corresponding test selection interface.

3.1 System setting key: adjust the calibration system clock, switch between Chinese and English interfaces, select communication mode, etc.

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Regular Test



Heat run test

Fig 5

4. Regular test selection: As shown in Figure 6 interface, select the mode to be measured: single channel, dual channel, magnetic, high-voltage phase selection, and low-voltage phase selection. The output current of the test product can be selected by the up and down arrows of

the current function button, and the output current of the test product can be selected between 50A, 20A, 10A, 3A, 1A, 0.3A, and 0.02A. (Note: 0.02A can only be selected in regular, single-channel mode.)

Please refer to the corresponding range to select the appropriate current. (Generally 3%-10% of the rated current of the winding) The current should be selected as much as possible in the range to facilitate the stability of measurement.



4.1 Parameter key: used to input the number of the tested product, the material of the resistance value conversion, the oil temperature and the conversion temperature, etc.

4.2 Record key: used to view the general mode history. You can export records to a USB flash drive and delete them one by one.

4.3 Exit button: return to the parent interface.

4.4 Confirm button: Confirm the test option in the selected regular mode and enter the regular test interface.

5. Regular Testing:

5.1 Single-channel test (Fig. 7)

Press test button to start the set according to the channel and current set. The display indicates the charging current value and at the same time indicates "charging", and the system clock starts to clock and shows the time from the start of the charging start test. When the

current stabilizes, it prompts "Testing", and then displays the resistance value. Observe that the current value and resistance value of the test are stable, and the instrument continuously tests. The data is followed by the percentage data, which is the percentage change of the data over a set time period and is used to judge the stability of the data. Press the stop button to end the test process, lock the data, and automatically discharge.



Fig 7

5.2 Dual-channel test (Fig. 8)

Press button to start the test according to the set channel and current. The display indicates the charging current value and at the same time indicates "charging", and the system clock starts to clock and shows the time from the start of the charging test. When the current stabilizes, it prompts "Testing", and then displays the resistance values of R1 and R2. Observe that the current value and resistance value of the test are stable, and the instrument is continuously tested. The data is followed by the percentage data, which is the percentage change of the data over a set time period and is used to judge the stability of the data. Press the stop button to end the test process, lock the data, and automatically discharge.



Fig 8

5.3 High-voltage/low-voltage phase selection test (Fig. 9)

Select the YN method/DY method of the sample winding and select the corresponding phases. Touch test button to start the test.

The display indicates the charging current value and at the same time indicates "charging", and the system clock starts to clock and shows the time from the start of the charging test. When the current stabilizes, it prompts "Testing", and then displays the resistance value of the selected phase. Observe that the current value and resistance value of the test are stable, and the instrument is continuously tested. The data is followed by the percentage data, which is the percentage change of the data over a set time period and is used to judge the stability of the data. Press the stop button to end the test process, lock the data, and automatically discharge. Replace the next phase for the test and repeat the above test operation, and the three-phase resistance test result shows the three-phase unbalance rate data.





When selecting low-voltage phase selection measurement, it is necessary to confirm all terminals of the high-voltage winding of the instrument and the high-voltage side of the sample The leads remain open, otherwise the induced voltage may cause damage to the instrument.

5.4 Magnetic assist test (Fig. 10)

Confirm the connection method and group of the windings of the selected sample. Touch test button to start test.

The display indicates the charging current value and at the same time indicates "charging", and the system clock starts to clock and shows the time from the start of the charging test. When the current stabilizes, it prompts "Testing", and then displays the resistance value of the selected phase. Observe that the current value and resistance value of the test are stable, and the instrument is continuously tested. The data is followed by the percentage data, which is the percentage change of the data over a set time period and is used to judge the stability of the data. Press the stop button to end the test process, lock the data, and automatically discharge. Replace the next phase for the test and repeat the above test operation, and the three-phase resistance test result shows the three-phase unbalance rate data.

According to the selected connection method and group, according to the direction of the winding flux, curing test winding (cannot be changed) The user needs to confirm that the selected connection method with the test product is consistent with the group, otherwise it may cause the data to be stable for a long time and fail to achieve the purpose of magnetic assistance.

To change the connection method and group, you need to touch the connection method and group button to enter the selection interface. Make your changes. All group options of YNd, YNyn, and Dyn are supported. (Figure 11)



Fig 10



Fig 11

5.5 Print key: used to print the current test data results and information.

5.6 Storage key: used to save the current test data results and information.

- **5.7 Quick key:** used for testing under normal circumstances, if the data is unstable for a long time, you can touch this key to change to "slow" to increase data stability.
- **5.8 30" key: The** time interval used to determine the stable percentage of data. 10", 20", and 30" for selection.
- **5.9 Tap-/tap+key:** used to change the tap position of the transformer sample.
- **5.10 Conversion key:** It is used to set the coil material, sample temperature, conversion temperature and other information according to the parameter options, and the resistance value to the converted temperature is convenient for comparison with historical data.
- 6. Temperature rise test selection: As shown in Figure 12 interface, select the method to be measured: single channel, dual channel, magnetic, high-voltage phase selection, and low-voltage phase selection. The output current of the test product can be selected by the up and down arrows of the current function key, and the output current of the test product can be selected from 50A, 20A, 10A, 3A, 1A, and 0.3A. Please refer to the corresponding range to select the appropriate current. (Generally 3%-10% of the rated current of the winding) The current should be selected as much as possible in the range to facilitate the stability of measurement.



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6.1 5" key: for the sampling interval of temperature rise resistance data, input range: 5 seconds - 90 seconds.

6.2 **Record key**: used to view the temperature rise mode history. The instrument provides three temperature rise test data, and the system memory will be automatically updated to replace the earliest recording unit when the system memory is used up, so confirm whether the memory data is useful before the temperature rise test, and if necessary, please record the data before starting the test, otherwise it will cause data loss. You can export records to a USB flash drive and delete records one by one.

6.3 Exit button: Return to the parent interface.

6.4 Confirm button: Confirm the test options in the selected temperature rise mode and enter the temperature rise timing interface.

7. Temperature rise test:

7.1 Single-channel preparation timing (Figure 13)

Touch the confirmation button on the temperature rise test selection interface to enter the temperature rise preparation timing interface, and the timer of the temperature rise test should start from the time when the transformer is heated and powered off, once the timing starts, the channel selection, mode selection, and current selection will be locked, so these options should be confirmed to be correct before the temperature rise timing, so as not to cause the temperature rise test to fail.

When selecting low-voltage phase selection measurement, it is necessary to confirm all terminals of the high-voltage winding of the instrument and the high-voltage side of the sample The leads remain open, otherwise the induced voltage may cause damage to the instrument.

7.2 Single-channel startup timing (Fig. 14)

Touch the "Timing" button to start the temperature rise timer, the system clock starts to wait for the transformer test to be wired in time from 00:00 in seconds, and after the wiring is completed, touch the "Test" button to start the temperature rise resistance test.



Fig 14

7.3 Single-channel temperature rise resistance test (Fig. 15)

The display indicates the charging current value and prompts "charging" at the same time, and the system clock continues to time. When the current stabilizes, it prompts "Testing", and then displays the resistance value. The instrument is continuously tested. The temperature rise data is automatically saved and printed at the set sampling interval. The data area on the right records the data of the last two time intervals, which is convenient for observation and comparison. To end the test, press the "Stop" button to end the test process and it will be discharged automatically. Press the "Exit" key to exit.





7.4 Temperature rise resistance test of dual channel/high-voltage phase selection / low-voltage phase selection / magnetism

The above example is the temperature rise test process of a single channel, and the temperature rise test process of the other methods is similar to that of a single channel, and the specific options can be selected by referring to the conventional mode.

- 8. View memory record data: In the general or temperature rise selection interface, touch the "Record" button to enter the view record interface. The regular mode can store and view 100 sets of data, and the temperature rise mode provides three temperature rise test data. You can touch the "Exit" button to return to the selection settings screen, and touch the "Print" button to return to the selection settings screen, and touch the "Print" button to print the recorded data. If there is no data to review, it will show "No record yet".
- 9. Import to USB disk: In the regular or temperature rise view data interface, press the "Export" function key to import the instrument memory data into the "U disk", if there is no data for export, it will display "no record yet". Before that, please insert the USB drive first, when the USB disk is inserted, the icon will be prompted in the upper left corner of the instrument . After unplugging the USB drive, the regular disappears. During the process of exporting data, the message "Exporting" is displayed. After the data export is completed, the message "Export Completed" is displayed, and you can pull out the USB drive after the export is complete.

*******Don't unplug the drive while you're exporting! ********

The name of the file to be imported from the USB drive is defined as follows:

First, create a folder in days, such as DT170408

where "DT" is the fixed format at the beginning of the file; "17" is the last two in 2017;

"04" is April; "08" is the number 8. Then create the file in hours, minutes and seconds, e.g. SJ092458

where "SJ" is the fixed format at the beginning of the file; "09" at 9 a.m.; "24" is 24 points;

"58" is 58 seconds.

The time when the file is created is exported. (System default)

10. "Communication" function, the instrument adopts standard RS485 or RS232 interface (optional wireless Bluetooth mode), connects the RS485 interface of the instrument with the computer USB interface through the UT850 converter, and cooperates with the host computer operation software to complete the communication control of the instrument and the editing and printing of test data.

VII. Precautions

- 1. Before measuring the reverse tapping of the no-load voltage regulating transformer, it must be reset, and after the discharge is over, the alarm sound stops before switching the tap point.
- 2. When measuring the resistance on the HV side of a transformer with on-load voltage regulation, it is measured from the maximum resistance level of tap.
- 3. Before dismantling the wire, be sure to wait for the discharge to end and the discharge alarm sound to end, and then disassemble and replace the wire.
- 4. When selecting the current, refer to the range in the technical index column, and do not exceed the range and under-range. The large current should be selected as much as possible in the range to enhance the stable performance, and the current bearing capacity of the sample should also be considered.
- 5. For the LV side winding of the core large-capacity five-column transformer, the magnet assistance method can be used to save measurement time.

VIII. Common problem and troubleshooting

1. The buzzer can't be turned on and keeps beeping

In this case, first check whether the power supply is plugged into the AC380V power supply or the input voltage is too low.

2. The LCD screen cannot be lit when it is turned on

In this case, first check whether the power supply is normal, and then check whether the fuse has been fused, such as fusing for a new one.

3. The LCD screen lights up but the display is abnormal or cannot be displayed

In this case, the system should be turned on and off again to allow the system to run again.

4. The test data is unstable or has a large error

In this case, first check the test line to see if there is a false connection or looseness. If it still can't be solved, check whether the sample is rusted. The data instability may be solved by choosing a small current and choosing a large current test.

5. During the test, it keeps showing "Charging..."

In this case, first of all, the problem of transformer magnetic circuit is ruled out, if the current has not changed for a long time, it has been near zero, and whether the line is open or not, if the current has not been charged, it is necessary to change the corresponding small current to restart the measurement.

6. The instrument prompts "internal error".

If this situation occurs, it means that the instrument self-test has not passed, and you can restart it to try it.

7. The instrument prompts "out of range".

During the test, a "**out of range**" **prompt appears**, indicating that the resistance value of the tested sample exceeds the selected test range, and the test will not be stopped at this time, but the measurement accuracy will decrease, and the current and range can be re-selected with reference to the corresponding resistance value for testing.

******The above problems cannot be solved by yourself, please contact us in time******

IX. Completeness of instrument

JYR DCOMETER Main Unit (50/40E	One
Configuration)	
Type 50/40E test lead	А
Three-core power cord (16A)	one

10A to 16A socket	One	
Fuse tube 20A	Two sticks	
Certificate of Conformity/Warranty	One sheet	
Card		
Packing list	One sheet	
Operator's manual	One copy	

X. After sale service

Within 18 months after purchasing of instrument, guarantee repair and replacement service are provided for product with defective quality, and lifetime warranty and technical service are provided. If there should be any abnormal situation or fault, please contact the company in time to facilitate arrangement for you of most convenient solution.