

JYT-B

## Three-Phase Transformer Turn Ratio Tester (Angle)



## 1. Overview

### 1.1 Application:

JYT Transformer Ratio Tester (B) is a specialized product for special transformer testing. It can be used for three-phase transformer testing, especially for Z-type transformers, rectifier transformers, Scott, reverse Scott, and balanced transformers. The screen adopts a large color LCD screen, Chinese menu prompt, simple and intuitive operation, is an ideal transformer ratio test instrument for power systems, transformer manufacturers and railway systems.

JYT B turns ratio tester series provides two power supply methods: AC 100-240V and internal lithium battery, which is convenient for users to use in different scenarios.

### 1.2 Characteristics

- The interface adopts intelligent touch mode, which is simple and convenient to operate. The circuit adopts a new generation of all-digital scheme to ensure the long-term stability of the instrument.
- The instrument can optionally be powered by a built-in battery, so there is no need for an external AC power source for testing.
- Internally generates a three-phase, two-phase, or single-phase test power supply with stable amplitude and constant phase.
- It can test CT, PT, CVT and Z-type transformers, rectifiers, Scott, In-Scott and other transformers.
- It is not affected by the internal wiring mode of the transformer, and directly measures the transformer ratio and phase difference on the high and low voltage sides of the transformer.
- The test results are not affected by fluctuations in the frequency and amplitude of the operating power supply, and can be powered by generators.
- No power-down clock and date display, 100 sets of data can be saved in the machine, and the power-down data will not be lost.
- Large screen color LCD display, data is clear and easy to read, thermal printer printing. RS485 communication interface and U disk storage interface.
- The instrument has the function of high and low voltage reverse connection protection, with transformer short circuit, inter-turn short circuit protection function, and power misconnection 380V protection function.

## 2. Special tips

2.1 This instrument provides two power supply modes, AC model uses AC100~240V 50/60HZ, DC model has built-in lithium battery.

### 2.2 Security aspects

- 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 electrical equipment or instruments.
- 3) **For the safety of the instrument and the operator, the instrument should be reliably grounded when used.** When testing equipment, the ground wire is connected first, and the grounding wire is removed at the end of the work.
- 4) The output voltage of the instrument is high, and safety should be paid attention to to prevent electric shock.
- 5) This instrument can be used both indoors and outdoors, but it should be avoided in harsh environments such as rain and corrosive gas.
- 6) The maintenance, care and adjustment of the instrument should be carried out by professionals.
- 7) The instrument should avoid violent vibration.

### 2.3 Operational aspects

- 1) The connection between the instrument panel and the test line should be tightened and there should be no loosening.
- 2) When wiring, the yellow, green, red and black of the test wire clamp correspond to the A, B, C, O of the transformer respectively, and the high and low voltage cables should not be reversed.
- 3) When measuring in single phase, use yellow and black wire clamps, don't use the wrong ones, and the unused test clips should be suspended.
- 4) After the wiring is completed, it should be checked again to see if there is any wiring error. During the test, if there is any abnormal phenomenon, the power should be turned off immediately and the wiring should be checked.



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### Three- Phase Turn Ratio Tester **JYT-B** :



It can Test Transformer's phase angle and angle error



It can test Z-connected transformers, rectifier transformers, Scott transformers, and reverse Scott transformers



Accuracy can reach to  $\pm 0.1\%$



Automatically adjust the test voltage according to the load



Color LCD touch screen



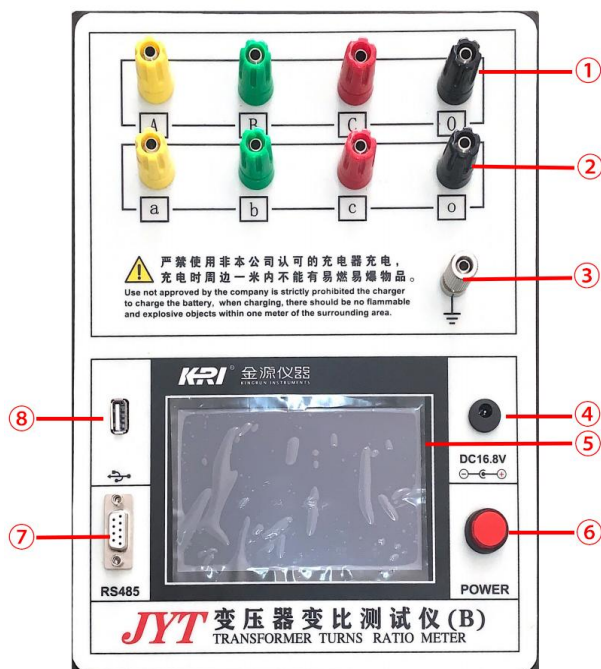
2 Years warranty time

### JYT-B Technical Specification:

Display digits	Four and half digits		
Output line voltage	160V max		
Test Range	0.9-10000		
Accuracy	1000	±0.1%±2	
	1000-5000	±0.5%±2	
	5000-10000	±1.0%±2	
	Angle	± 0.2 degrees	
Resolution	Turns ratio	0.0001	
	angle	0.01 degrees	
Working power supply	100~240V 50/60HZ	16.8V/7.8AH lithium battery	
Test data storage	200 groups		
Relative humidity	≤ 80%, non-condensing		
Volume	285 mm*218 mm*158 mm		
Net weight	6kg		

## 5.Panel

### 5.1 Panel schematic:



### 5.2 Description of each part:

1) High-voltage output: yellow, green, red, black binding posts, respectively A, B, C, O three phases, connected to the corresponding color cable, the other end of the cable has yellow, green, red, black clamps, corresponding to the high voltage side of the transformer under test A, B, C, O three phases.

2) Low-voltage input terminal: yellow, green, red, black binding posts, respectively a, b, c, o three phases, connect the corresponding color cable, the other end of the cable has yellow, green, red, black clamps, corresponding to the low voltage side of the transformer under test a, b, c, o three phases.

3)  $\perp$ : Protect the grounding post, in order to ensure the safety of the operator and the normal operation of the instrument, the terminal of the terminal should be reliably grounded before use.

4) Battery charger interface: used to charge the battery inside the tester.

5) LCD touch LCD display: used to operate the menu and display the test results.

6) Power switch: Long press the switch to turn the power on or off.

7) RS485 communication interface: used to connect to PC, convenient for remote control through PC.

8) U disk interface.

## 6.Menu descriptions:

### 6.1 Instrument boot interface

After turning on the power of the instrument, the self-test screen is displayed, and at this time, the instrument is being initialized accordingly.

### 6.2 Main Menu

The instrument automatically enters the main menu, as shown in the figure.



#### A) Single-phase test:

The instrument enters the single-phase transformer test menu.

Single Phase		2024-07-25 14:18:59			
Rated HV	20	kV	Taps Number	3	
Rated LV	1	kV	Taps Distance	5	%
Rated Tap	3		Asset Id	123	
Rated Tap Side	high side				

0	1	2	3	4	5	6	Manual Test	Auto Test
Exit	7	8	9	.		OK		

#### B) Three-phase test:

The instrument enters the three-phase transformer test menu.

#### C) Record:

Click the Record button to enter the Record interface, which is convenient to view and operate the relevant test



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records.

D) **System setting:**

Settings	2024-07-25 14:23:07	
20 24 - 07 - 25 - 14 : 22 : 56		
Language:	英文/English	
Comm mode:	RS232/RS485	
TEST MODE:	0~360°	
<div>Exit Ver1. 4. 7</div>		

6.3 Single-phase transformer testing:

Click the "single-phase" button in the main menu to enter the single-phase transformer test parameter setting menu, and after the test parameter setting is completed, click the "test" button to perform the ratio test.

Single Test	【 Completed 】	2024-07-25 14:20:02	
Ratio	1.0002	Voltage	148.79V
Error	0.02 %	Current	3.85mA
Polarity	—	Frequency	49.99Hz
Ratio	1.0000	Tap Number	Tap Distance 5%
Exit		Print	Save Test

6.4 Three-phase transformer testing

Click the "three-phase" button in the main menu to enter the three-phase transformer test parameter setting menu, and after the test parameter setting is completed, click the "test" button to enter the ratio test.





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Three Phase		【 Completed 】		2023-07-24 12:00:01			
	AB	BC	CA				
Vol. Ratio	0.9999	0.9998	0.9999				
Turns Ratio	0.9999	0.9998	0.9999				
Error	-0.04 %	-0.05 %	-0.04 %				
Angle	0.37	0.37	0.37				
Phase shift angle	0.37	0.37	0.37				
Combine	Y - y -00		Tap position		02		
Ratio	1.0000	Taps Number	3	Taps Distance	5%	Combine	Y - y -00
Exit		Print		Save			
						Test	

Three Phase		【 Completed 】		2023-07-24 12:00:01			
	AB	BC	CA				
HV	0.0122V	0.0120V	0.0114V				
HV Angle	0.00	120.76	246.33				
Current	52.99mA	52.98mA	52.89mA				
LV	0.0122V	0.0121V	0.0124V				
LV Angle	0.00	120.86	-119.88				
Frequency	50.00Hz						
Ratio	1.0000	Taps Number	3	Taps Distance	5%	Combine	Y - y -00
Exit		Print		Save			
						Test	

## 6.5 Scott Transformer Testing

Click the "Three-phase" button in the main menu, select the connection method as "Scott", and click the "Test" button to enter the test.

Three Phase		【 Completed 】		2023-07-24 12:00:01			
	AB	BC	CA				
Vol. Ratio	0.9999	0.9998					
Turns Ratio	---	---					
Error	-0.04 %	-0.05 %					
Angle	0.37	0.37					
Phase shift angle	0.37	0.37					
Combine	Scott		Tap position		02		
Ratio	1.0000	Taps Number	3	Taps Distance	5%	Combine	Scott
Exit		Print		Save			
						Test	





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Three Phase		【 Completed 】		2023-07-24 12:00:01			
		AB	BC	CA			
HV		140.02V	140.02V	140.02V			
HV Angle		0.00	120.10	240.02			
Current		52.99mA	52.98mA	52.89mA			
LV		0.0122V	0.0121V				
LVAngle		0.00	90.01				
Frequency 50.00Hz							
Ratio	1.0000	Taps Number	3	Taps Distance	5%	Combine	Scott
Exit		Print		Save			
						Test	

## 6.6 In-Scott transformer test

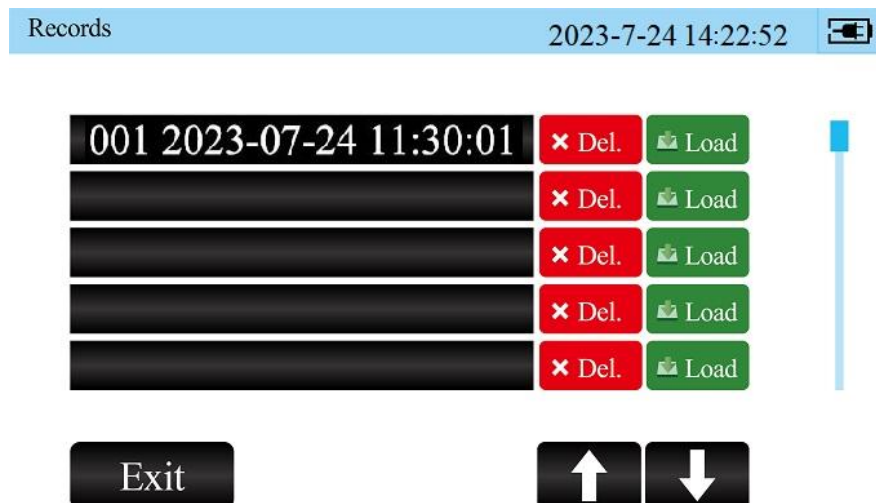
Click the "Three-phase Test" button in the main menu, select the connection method as "In-Scott", and click the "Test" button to enter the test.

Three Phase		【 Completed 】		2023-07-24 12:00:01			
		AB	BC	CA			
Vol. Ratio		0.9999	0.9998				
Turns Ratio		---	---				
Error		-0.04 %	-0.05 %				
Angle		0.37	0.37				
Phase shift angle		0.37	0.37				
Combine	In-Scott	Tap position		02			
Ratio	1.0000	Taps Number	3	Taps Distance	5%	Combine	In-Scott
Exit		Print		Save			
						Test	

Three Phase		【 Completed 】		2023-07-24 12:00:01			
		AB	BC	CA			
HV		140.02V	140.02V				
HV Angle		0.00	90.01				
Current		52.99mA	52.98mA				
LV		0.0122V	0.0121V	0.0124V			
LVAngle		0.00	120.10	240.02			
Frequency 50.00Hz							
Ratio	1.0000	Taps Number	3	Taps Distance	5%	Combine	In-Scott
Exit		Print		Save			
						Test	

## 6.7 Record

Select the <Record> button of the main menu to enter the test record interface, as shown in the figure:



The instrument can store total 100 sets of data, and each screen displays 5 sets of data catalogs, a total of 20 screens. Users can flip the screen by "↑" and "↓", and the blue progress bar on the right indicates the current scrolling position. When 100 data sets are stored, the latest data overwrites the oldest data. Each set of data can be deleted and exported to a USB device separately.

The directory consists of the data type and the data test time, for example: S 2015-01-20 10:20:38, where S indicates that this set of test data is single-phase test data, if the test data is three-phase test data, it is T. The following time indicates the time when the data was tested. Click on the data in the catalog to go to the specific data display page.

## 7.Basic operations

### 7.1 Stored Data:

After testing, the instrument will automatically display the test results, press the "Save" button to store the data, and after completion, the upper right corner of the instrument will prompt [Save Completed].

### 7.2 Review Data:

The "Review" button on the main menu allows you to access the Record screen. For details, refer to the Record page

### 7.3 Print data: (external Bluetooth printer required).

After testing a set of data, the instrument will prompt [Test Completed]. At this time, press "Print" to print the data, (Note: During the test, the printing and storage operations are invalid, and the instrument will not execute the

corresponding commands.)

#### 7.4 Delete Data:

Enter the history interface through the "Access" key of the main menu, at this time the stored record directory is displayed, each record corresponds to a "delete" key, the user can delete the data through the "Delete" key on the right, delete a group of data needs to click the "Delete" key 2 times in a row, the first time you click the "Delete" key, the corresponding data directory will become a red number, and when you click the "Delete" button again, the data will be deleted.

#### 7.5 Download data:

The user can export the data saved by the instrument to a USB flash drive, and when the interface is in history, insert the USB flash drive, and the USB flash drive connection logo will be displayed in the upper right corner of the screen. After the USB flash drive is unplugged, the USB flash drive connection symbol disappears automatically. After the USB flash drive is successfully connected, click the "Download" button corresponding to the data to be exported, and the data will be imported to the USB flash drive, and the upper right corner of the screen will prompt [Exporting], and when the data export is completed, the screen will prompt [Export Completed].

At this time, the instrument will automatically create a folder named "JT \*\*\*\*\*" in the root directory of the USB flash drive (the last six digits are the year, month and day of the data storage) and create a file named "JT \*\*\*\*\*.TXT" (the last six digits are the hours, minutes, and seconds of the data storage).

### 8.Test:

#### 8.1 Wiring Preparation

1) Clamp one end of the grounding wire on the ground grid, and one end is reliably connected to the grounding terminal of the panel. Note: The grounding point of the ground grid should have good electrical conductivity, otherwise the correctness of the measurement will be affected.

2) Wiring in strict accordance with the wiring diagram, and ensure that each contact point is in good contact.

3) During the test, the sample should be disconnected from the external line.

#### 8.2 Test Procedure

1) Turn on the power switch and wait for the instrument to enter the main menu.

2) Select "single-phase transformer" and "three-phase transformer" according to the situation.

8.3 After the test, the site is cleaned up

- 1) Turn off the power switch.
- 2) Dismantle and put away the two sets of dedicated test wires for easy use next time.
- 3) Remove the grounding wire and tidy it up.

## 9.Wiring legend:

### 9.1 Single-phase transformers:

The wiring method is shown in Figure 16 below:

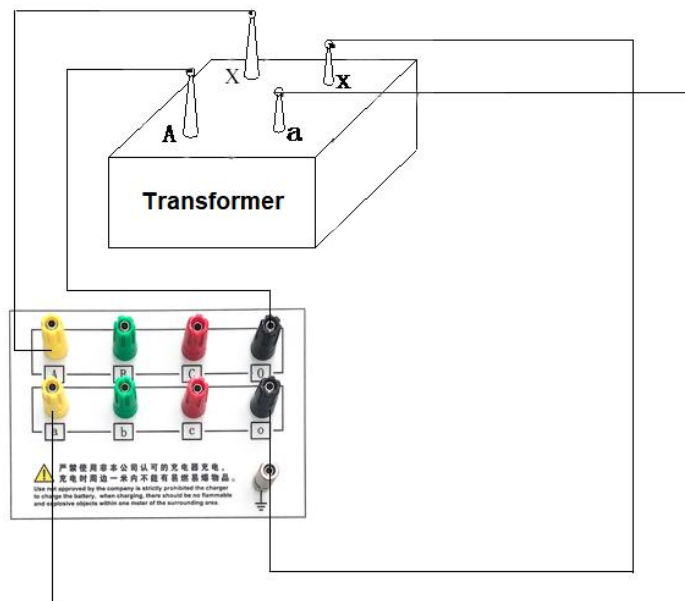


Figure 16

### 9.2 Three-phase transformers: (refer to figure 17)

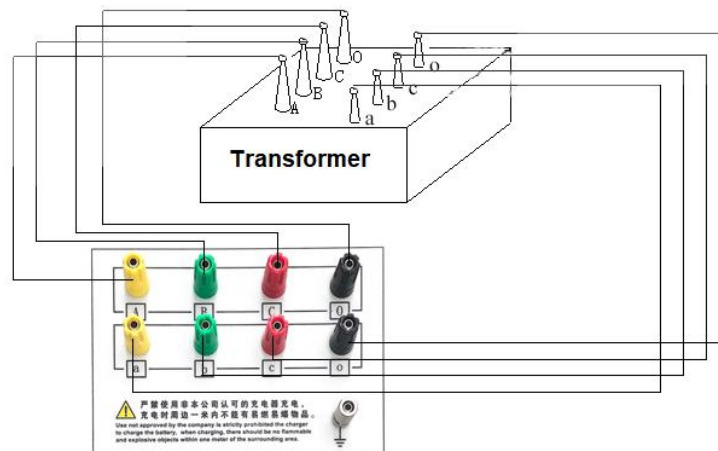


Figure 17

9.3 Scott transformer: (refer to figure 18)

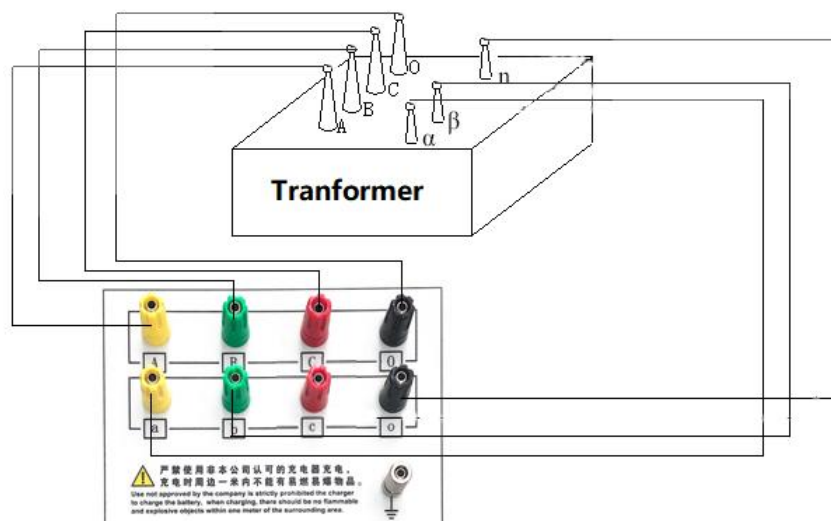
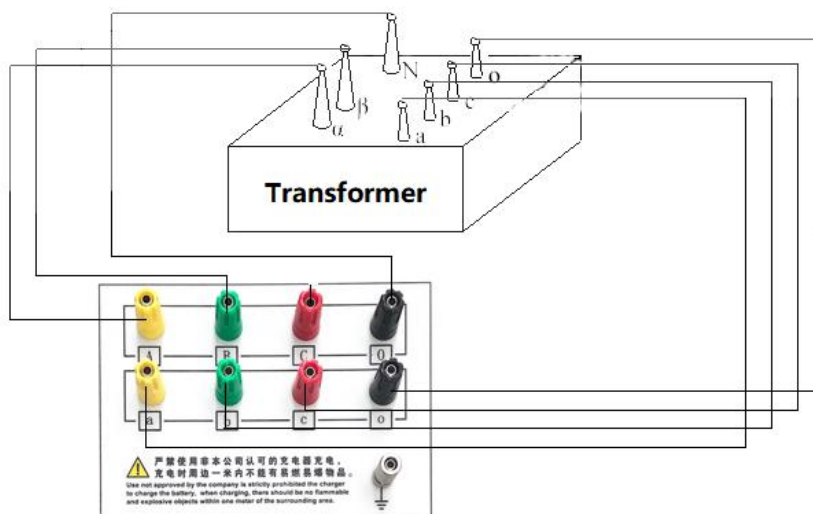


Figure 18

#### 9.4 In-scott transformer: (refer to figure 19)



## 10.Warning messages

- **The battery is too low**

The battery is out of grid, indicating that the battery is almost empty, so please use the charger to charge it as soon as possible to maintain the battery. Over-discharge of the battery may cause permanent damage to the battery.

- **Voltage protection**

If the low voltage is too high, please check the wiring to confirm whether the high and low voltage test cables are reversed.

- **Current protection**

If the output current is too large, please check the wiring and the product to be tested to confirm whether the high-voltage test cable is short-circuited.

- **Test errors**

The test data is abnormal, please check the wiring to confirm whether the test cable has poor contact or open circuit.

## 11. Care & Maintenance

To avoid damaging the instrument, never immerse the instrument in water. When the instrument is wet, please dry it before storing it. When it is necessary to calibrate or repair the instrument, please refer the

instrument to a qualified professional maintenance personnel or designated maintenance department for repair.

The instrument should charge the battery regularly for maintenance, generally at least once a month.

This instrument is equipped with a special rechargeable battery for JYT variable ratio tester. When the battery is low, the battery should be charged in time. The instrument is equipped with a charging port and a dedicated charger.

#### ● Battery charging

When the charger indicator lights up red, it means charging, and when it lights up, it turns green to indicate that charging is complete.

A flashing light indicates that the battery is poorly connected or the battery is not connected.

#### ● Replace the battery

The battery of this machine is a built-in rechargeable battery, and the replacement of the battery needs to be carried out by professionals or under the guidance of professionals

**\*It is strictly forbidden to replace rechargeable batteries not provided by the company, otherwise it may cause potential safety hazards\***

### 12.Precautions

12.1. Please plug the cable correctly according to the instructions.

12.2. After confirming the test stops, the wire can be disconnected。

### 13. Accessories

name	quantity	remark
JYT B host	1	
Test cable	1 set	It is 13 meters long, with yellow, green, red and black each 2 pieces
Power adapter	1	MH-168250
Grounding wire	1	2 meters
Operator's manual	1 copy	
Certificate of Conformity/Warranty Card	1 sheet	
Packing list	1 sheet	

### 12.After-sales service

The instrument is granted with free repair and replacement for problems arising from product quality within two years from the date of purchase, and lifetime warranty and technical services. For any abnormality or fault of the instrument, please contact us in time for the most convenient solution.





Kingrun Instrument Co.,Ltd.



## **Kingrun Transformer Instrument Co., Ltd**

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