



JYT-E/F TURN RATIO TESTER

Operation manual





- I、 Thank you very much to select the products of our company, you will obtain the comprehensive technical support and service guarantee of our company.**
- II、 This operation instruction is applicable to the JYT transformer transformation ratio meter.**
- III、 Please read this application instruction carefully before you operate this product, and keep it properly for reference.**
- IV、 Please operate following to steps required in this instruction strictly, it may endanger safety of human body if it is operated improperly.**
- V、 In case there is doubt during reading this instruction or operating this instrument, please consult our company.**



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Please read this operation manual carefully before operating this instrument, it is duty of the user to ensure safety.

Version number of this manual: JY1.20—2016

It will not inform additionally in case there is change in this manual



1、 General

1.1 Purpose

During production process of the semi-final product and the final product of the power transformer and before the newly installed transformer is put into operation, the transformer is required to carry out turn ratio or voltage ratio testing according to preventative test procedure of Power Ministry of the country. Operation of the traditional transformation ratio electric bridge is complicate, reading isn't intuitional, and necesssary conversion shall be carried out, it is only carried out in single phase during testing, working efficiency is low. The JYT transformation ratio meter series overcomes disadvantage of testing of the traditional transformation ratio electric bridge. The screen utilizes the large screen colourful liquid crystal display screen, Chinese menu prompt, operation is simple and intuitive, transformation raito testing of three phases can be complete one time, testing speed is quick, accuracy is high and protection function is perfect. The JYT transformation ratio meter series can provide two poewer supply ways: external AC220V and internal battery, which faciliate the user to carry out testing.

1.2 Performance and characteristics

- 1、 The interface applies the intelligent type touch way, operation is simple and convenient. The circuit applies the new generation of the complete digital scheme, which can ensure stability of the instrument for long term.
- 2、 The E1 and F1 model instruments are embedded the battery to supply power, it is not necessary to connect the external AC power supply and carry out testing.
- 3、 Testing speed is quick, transformation ratio testing of three phases can be compeleted only through one wiring, taking only 10 seconds.
- 4、 Carry out testing of CT, PT, CVT and Z shape connected transformer.
- 5、 Applicable to transformation ratio measurement of the power distribution tansformer to the 1000KV transformer, the current transformer (CT), the



voltage transformer (PT) and the Z shape connected transformer.

- 6、Several short circuit measurement ways are set up in internal area, which facilitate fault judgment.
- 7、Non-power off clock and date display, the instrument can save 50 groups of data, data during powering-off will not be lost.
- 8、Large screen colourful liquid crystal display, data are clear and readable, print by the thermal printer. The RS485 communication interface and U disk memory interface.
- 9、The instrument has high voltage and low voltage reverse connection protection function, which has short circuit, turn to turn short circuit protection functions of the transformer and mis-connected 380V protection function of the power supply.

2、Special prompt

2.1 Power supply

This instrument provides two power supply ways, the external input power supply is AC220V \pm 10% 50/60HZ \pm 1HZ, the internal power supply is the lithium battery. When the external power supply is switched on, the instrument selects the AC power supply way to test. When the external power supply isn't connected, the instrument utilizes the internal power supply to work.

2.2 Safety

- 1) Be sure to read this manual carefully before utilizing this instrument.
- 2) The operator of this instrument shall have common operation knowledge of the electric device or the instrument.
- 3) In order to ensure safety of the instrument and the operation person, the instrument shall be grounded reliably during operation. The grounding wire shall be firstly wired well during testing of the device, the grounding wire is finally removed after working is complete.
- 4) Output voltage of the instrument is high, pay attention to safety and protect



against electric shock.

5) This instrument can be utilized indoor and outdoor, and avoid operation in rain, corrosive gas etc severe environment.

6) Maintenance, repair and adjustment of the instrument shall be carried out by the professional person.

7) The instrument shall avoid strong vibration.

8) Maintenance, repair and adjustment of the instrument shall be carried out by the professional person.

2.3 Operation

1) The connection between the instrument panel and the testing wire shall be tightened firmly, and no looseness phenomenon is allowed.

2) Yellow, green, red and black of the testing wire clamp shall correspond to A, B, C and O of the transformer respectively during wiring, the high voltage and the low voltage cables shall be connected adversely.

3) The E model and the E1 model only utilize the yellow and the green wire clamps during measurement of the single phase, the F model and the F1 model only utilize the yellow and the black wire clamps, don't utilize wrongly, the testing wire clamp which is not utilized shall be open.

4) After wiring is complete, inspect one time and check whether wiring is wrong. In case abnormal phenomenon occurs during testing process, switch off the power supply immediately, and inspect the wiring.



3、 Technical and characteristic

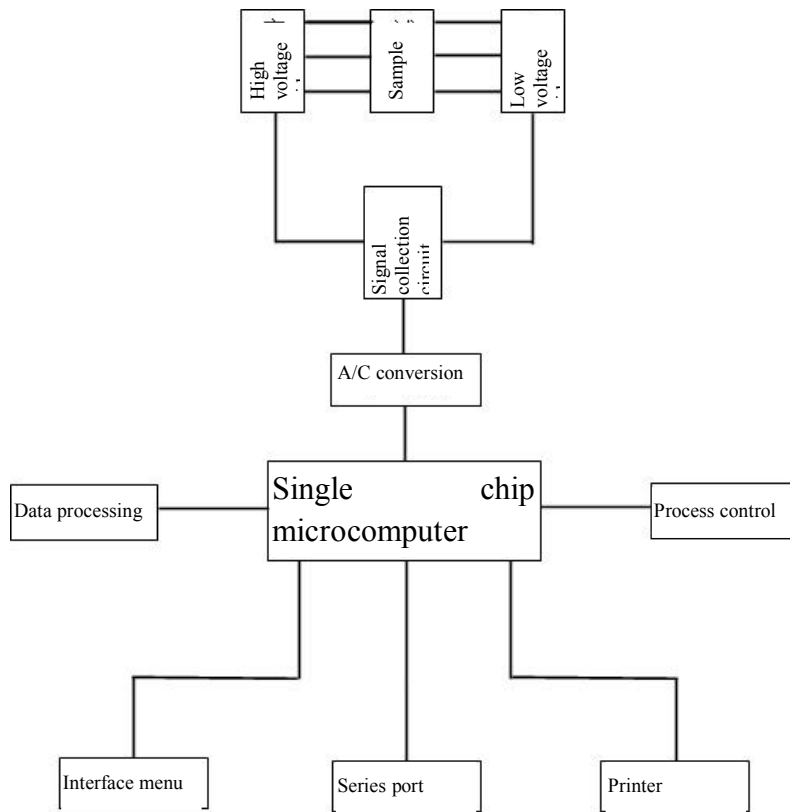
3.1 Technical index

Number of displayed bit	5 bits					
Output voltage	160V(AC power supply)		10V (AC power supply)		Automatic (DC power supply)	
Measurement scope	0.9-10000		0.9-500		0.9-5000	
Accuracy	<2000	±0.1%	≤150	±0.1%	<1000	±0.1%
	2000-10000	±0.3%	150-500	±0.3%	1000-5000	±0.3%
Minimum resolution	0.0001					
Working power supply	AC220V±10%, 50/60Hz±1Hz				Lithium battery	
Memory of testing data	50 groups					
Working temperature	-20℃~40℃					
Relative humidity	≤80%, no dewing					
Volume	Length 360mm × width 280mm × height 160mm					
Net weight	6kg					

3.2 Difference of every model

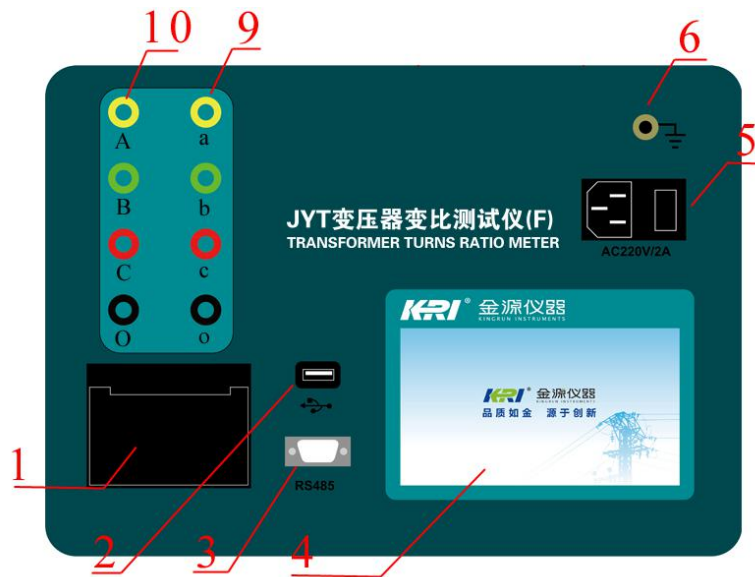
Model	Turn ratio testing	Internal battery
JYT-F	√	×
JYT-F1	√	√
JYT-E	×	×
JYT-E1	×	√

4、 Working principle



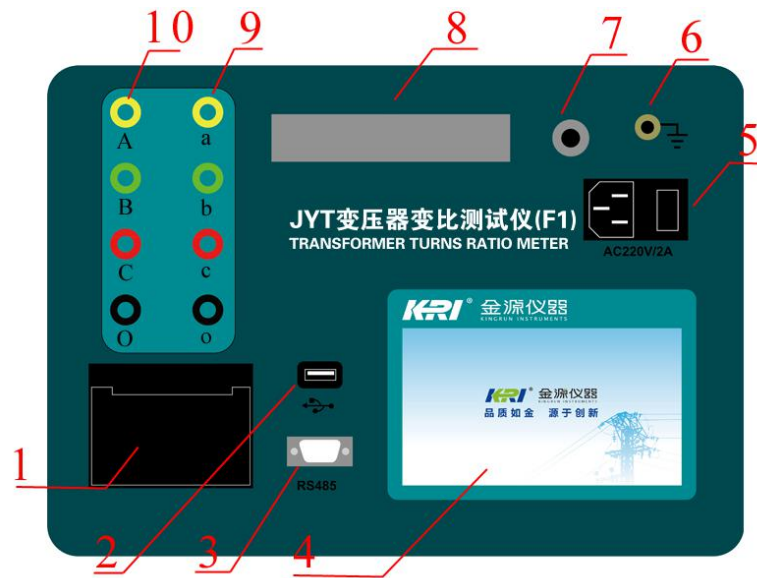
5、Panel arrangement

5.1 Schematic figure of panel:



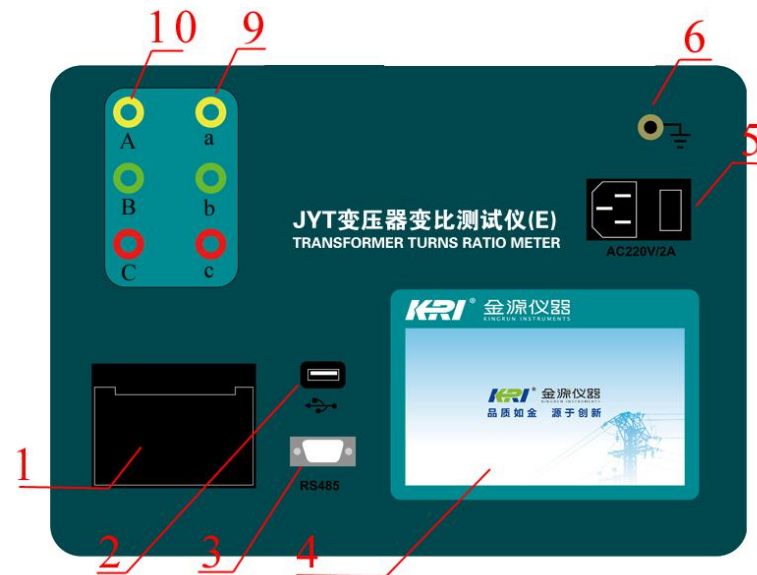
JYT transformer turns ratio meter [F]

F model



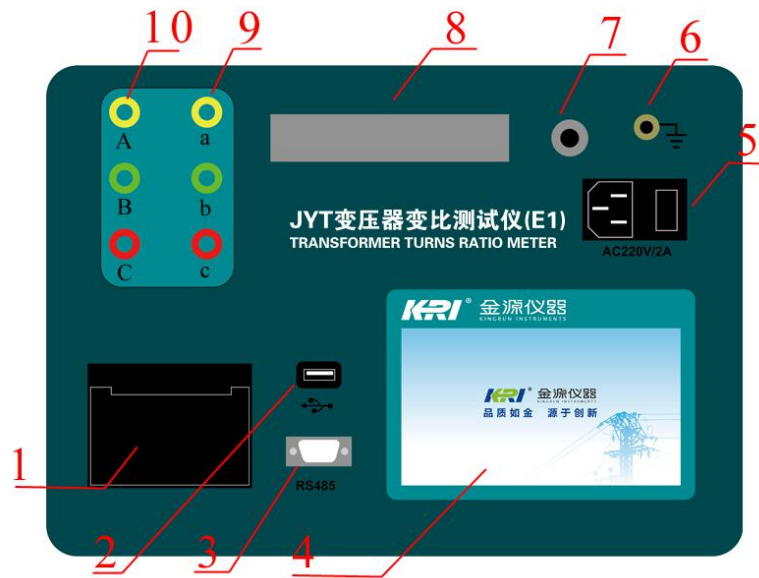
JYT transformer turns ratio meter [F1]

F1 model



JYT transformer turns ratio meter [E]

E model



JYT transformer turns ratio meter [E1]

E1 model

5.2 Description of every component:

- 1) Printer: front paper exchanging type Chinese printer, use to print out testing result.
- 2) USB interface: use to export testing records to the USB device.
- 3) RS485 communication interface: use to connect PC and facilitate remote control via PC.
- 4) LCD touch liquid crystal display screen: operate the menu and display testing result.
- 5) Power supply socket: input port of the power supply of the whole computer, connect the 220V, 50/60Hz power supply, the socket includes the fuse, the instrument shall be equipped with the 1A fuse.
- 6) \perp : P rotection grounding column, in order to guarantee safety of the operator and normal working of the instrument, the terminal of the wiring column shall be grounded reliably before operation.
- 7) Interface of battery charger: charge the battery in the testing meter.
- 8) Battery slot: store the battery necessary for the testing meter.
- 9) Low voltage input end: yellow, green, red and black wiring columns are



connected with a, b, c and o three phases respectively, which are connected with the cables in corresponding colours, another end of the cable has the yellow, green, red and black clamps, which correspond to a, b, c and o three phases of the low voltage side of the tested transformer. (E model and E1 model have no black wiring columns)

10) High voltage output end: yellow, green, red and black wiring columns are corresponding to A, B, C and O three phases respectively, which connect the cables in corresponding colour. Another end of the cable has the yellow, green, red and black clamps, which correspond to A, B, C and O three phase at high voltage side of the test transformer. (E model and E1 model have no black wiring columns)

6、 Page description

Whole process and result of the test are displayed on the display screen, whole set of complete chinese operation discription, the human machine interface is friendish.

6.1 Description of start-up interface of instrument

After the power supply of the instrument is switched on, display start-up picture for 2 seconds, the instrument carries out the corresponding initialization, shown as figure 1.



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Figure 1

6.2 Self-inspection interface of instrument

After relevant initialization of the instrument is complete, carry out internal self-inspection, shown as figure 2.





Figure 2

6.3 Main menu

After self-inspection of the instrument is complete, enter into the main menu automatically, shown as figure 3.

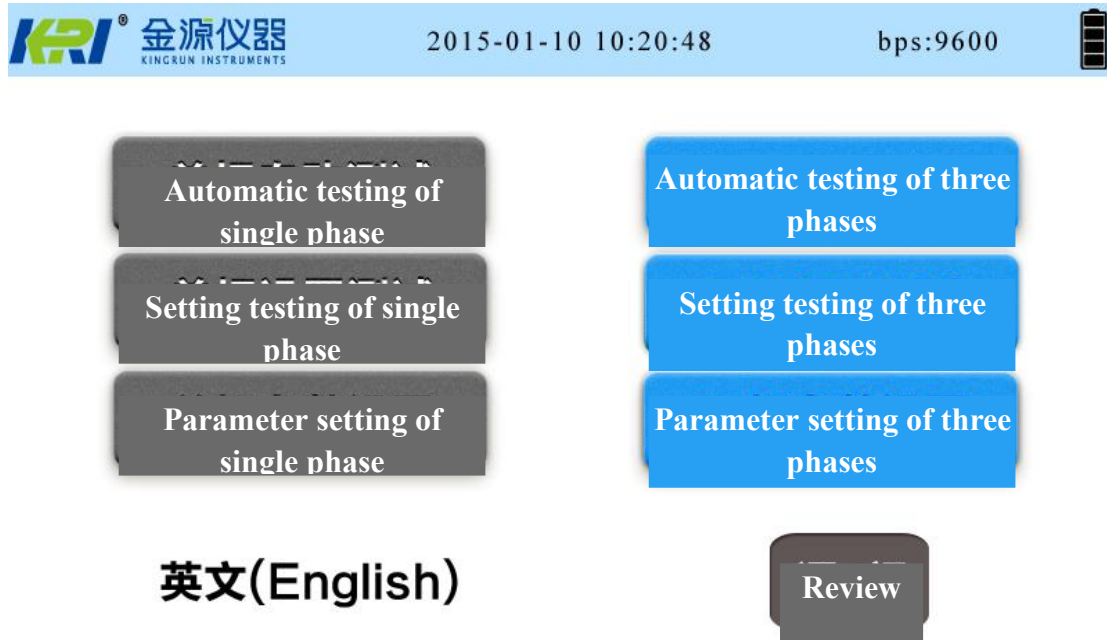


Figure 3

The main menu mainly consists of option area of testing operation,time display area, promot information display area, language change button, recalling history record button five parts.

A) Option area of testing operation:

<Automatic testing of single phase>: the instrument carries out testing of single phase automatically, it is not necessary to input parameters.

<Setting testing of single phase> : carry out testing according to parameters set in <parameter setting of single phase>.

<Parameter setting of single phase> :test the input menu of the relevant parameters according to <setting testing of single phase>.

<Automatic testing of three phases >: the instrument carries out testing of three phases automatically, it is not necessary to input parameters.

<Setting testing of three phases> : carry out testing according to parameters set in <parameter setting of three phases>.



<**Parameter setting of three phases**>: test input parameters of the relevant parameters according to <**setting testing of three phases**>.

B) **Time display area:**

Display information of the current calender, format as: 2015-01-20 10:20:48. Click the current time and enter into the time modification menu, and modify the current calender time.

C) **Promot information area:**

Promot information displayed on the current information is Baud rate value of the RS485 communication port.

D) **Language modification button:**

Click the language modification button (Chinese and English switch) and carry out real time shift of languages displayed on the instrument.

E) **Button to recall history record:**

Click the button to recall the history record, enter into the history record interface, facilitate operation to check the relevant testing records.

6.4 Automatic testing

The instrument can carry out automatic testings of single phase and three phases, it is not necessary to input parameters. During testing process of the instrument, it will prompt **【Testing】** at right upper corner. After testing is complete, it will prompt **【testing complete】**, automatic testing interface of single phase is shown as figure 4, automatic testing interface of three phases is shown as figure 5.

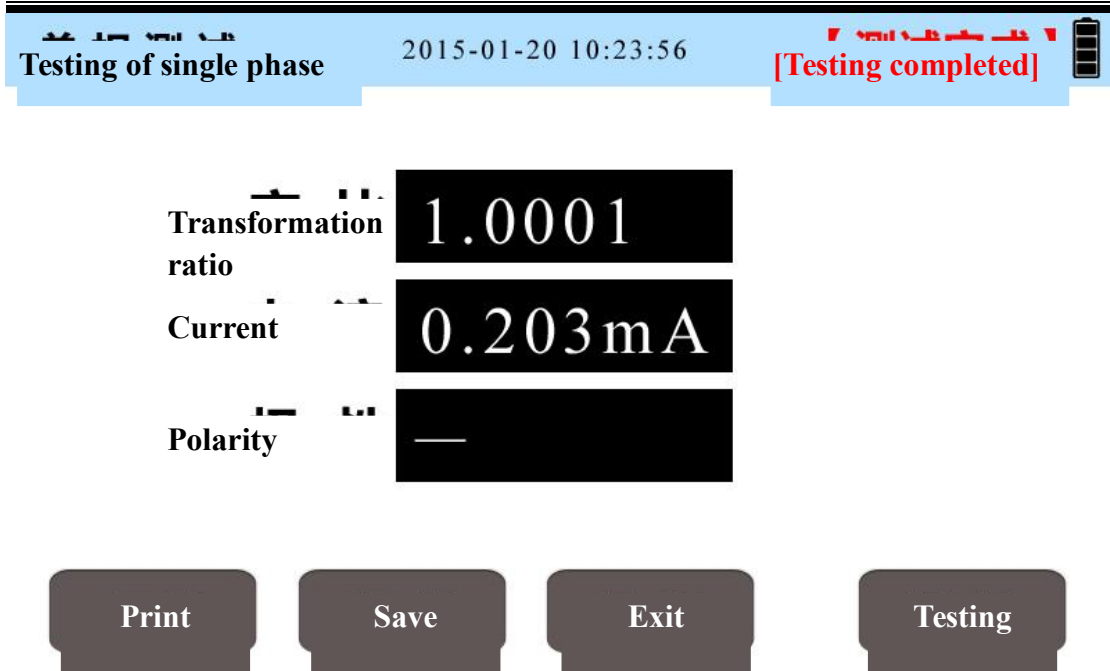


Figure 4

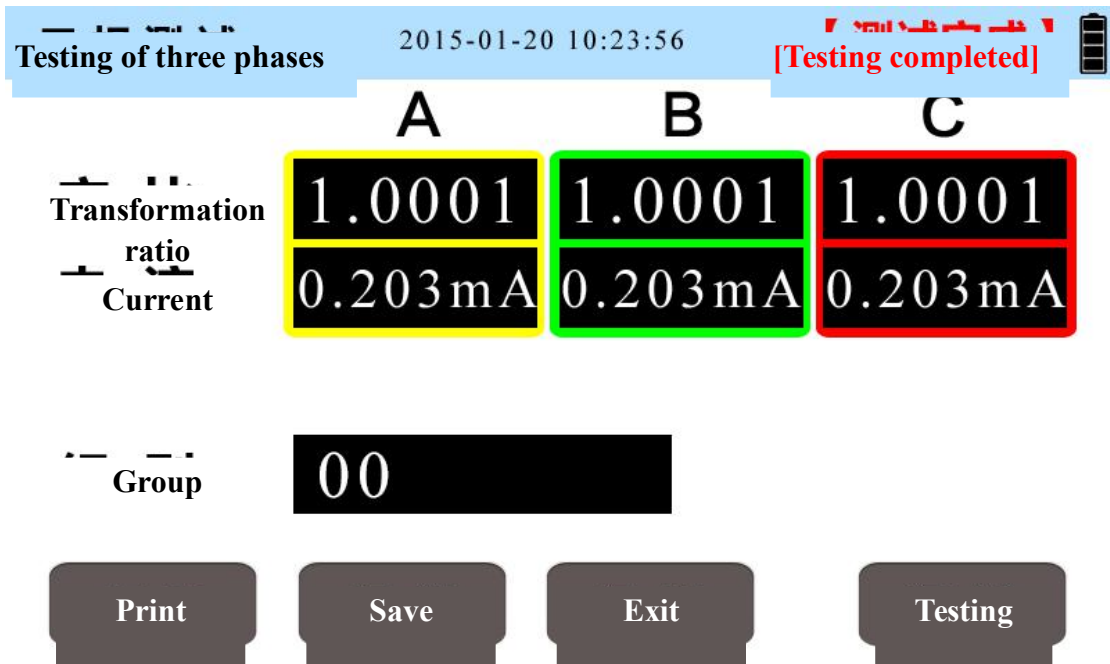


Figure 5

6.5 Testing with parameters

<Parameter setting of single phase> :

Click the <parameter setting of single phase> button on the main menu panel, the instrument will enter into relevant parameter setting on <setting testing of single phase>, shown as figure 6.

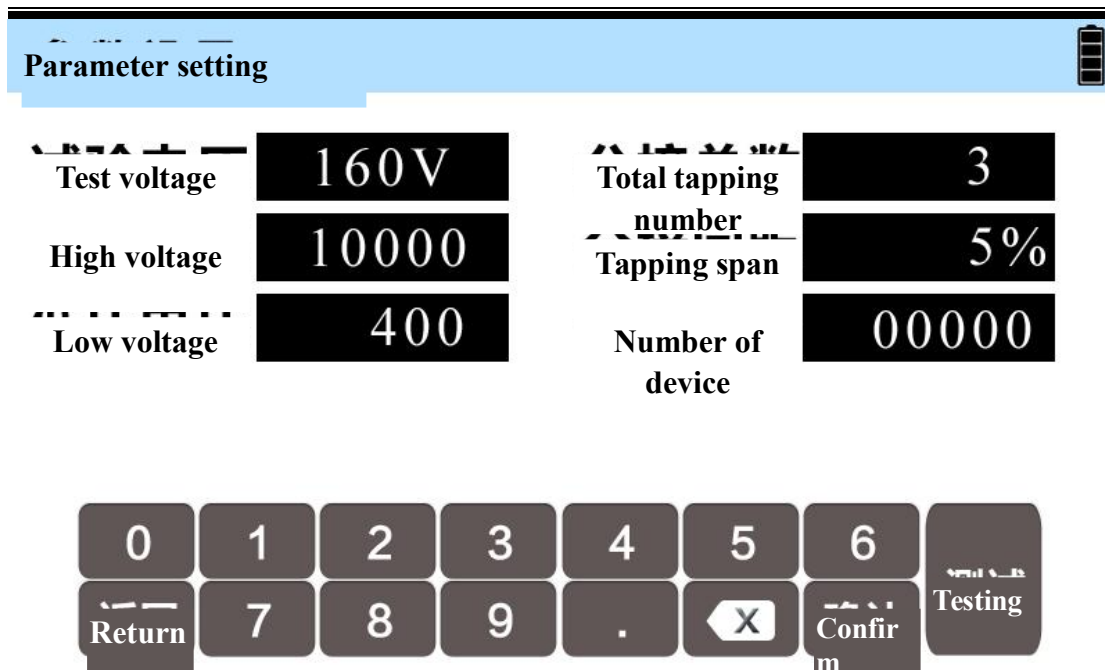


Figure 6

In which:

Test voltage: When the instrument applies AC power supply, there are 160V and 10V two options. When the instrument applies DC power supply, the instrument will automatically adjust testing voltage value according to testing voltage.

High voltage: rated voltage at high voltage side of the transformer.

Low voltage: rated voltage at low voltage side of the transformer.

Total tapping number : Number of the high voltage tap of the transformer.

Tapping gap: Equal tap gap of the transformer.

Device number : number of tested device.

Note: ① After high voltage, low voltage, total tapping number and tapping gap of the transformer these four data are input correctly, measurement result will automatically display number of tapping position and error value of this tapping.

② Parameters demanded by <Setting testing of single phase> is set at this location. If parameters demanded for several testings are same, not enter into the parameter setting menu, directly click the <setting testing of single phase > button to



test.

After setting of the parameters are complete, click the testing key at right lower corner, and carry out testing. Testing result is same as <setting testing of single phase>, shown as figure 7.

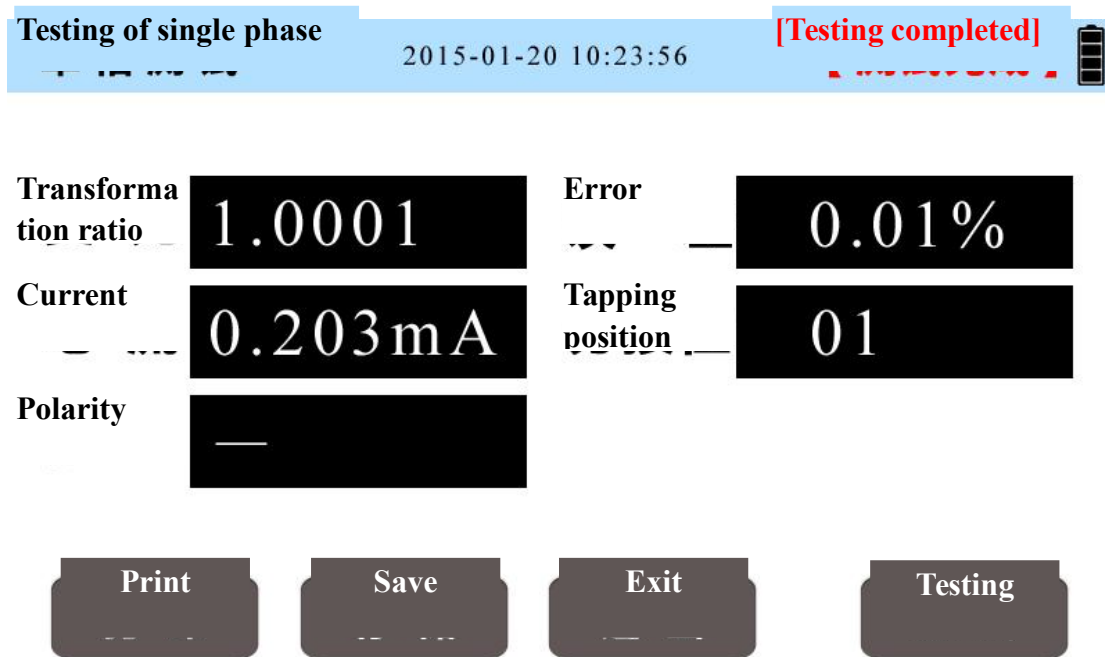


Figure 7

< Parameter setting of three phases > :

Click the <parameter setting of three phases> button on the main menu panel, the instrument will enter into relevant parameter setting on <setting testing of three phases>, shown as figure 8.

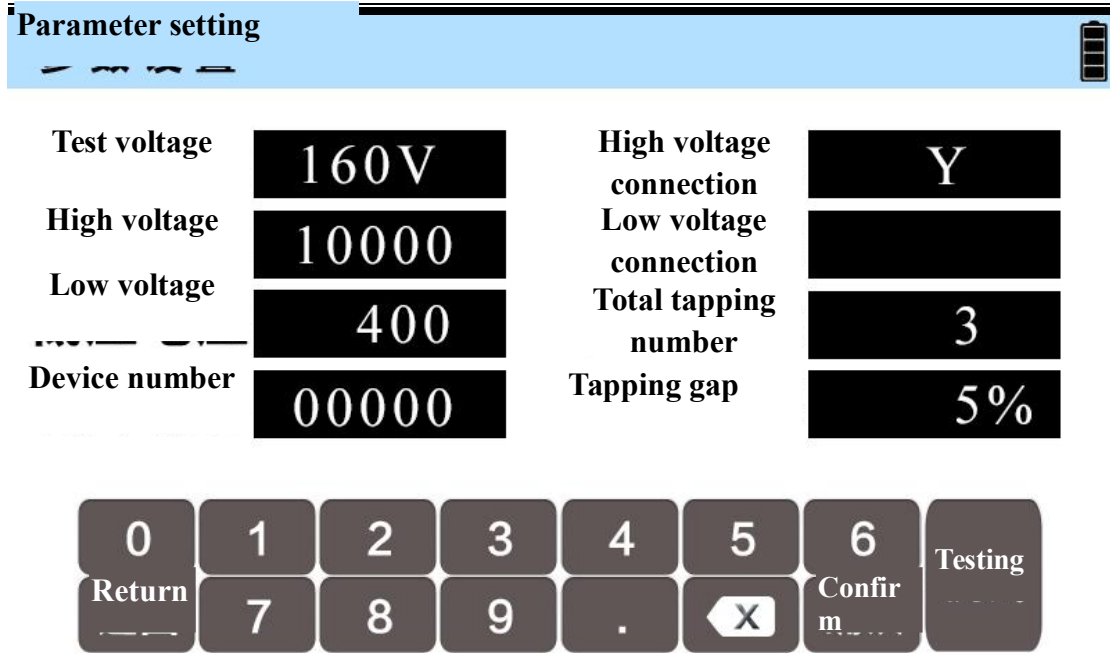


Figure 8

In which:

Test voltage : When the instrument applies AC power supply, there are 160V and 10V two options. When the instrument applies DC power supply, the instrument will automatically adjust testing voltage value according to testing voltage.

High voltage: rated voltage at high voltage side of the transformer.

Low voltage: rated voltage at low voltage side of the transformer.

Total tapping number : Number of the high voltage tap of the transformer.

Tapping gap: Equal tap gap of the transformer.

Device number : number of tested device.

High voltage connection: select the connection way at high voltage side, option is shown as following:

Y, YN, D, Z

Low voltage connection: select the connection way at high voltage side, option is shown as following:

Y, YN, D, Z



(This option is only applicable to F model and F1 model, this option isn't applicable to E model and E1 model)

Note: ① After high voltage, low voltage, total tapping number and tapping gap of the transformer these four data are input correctly, measurement result will automatically display number of tapping position and error value of this tapping.

② Parameters demanded by <Setting testing of three phases> is set at this location. If parameters demanded for several testings are same, not enter into the parameter setting menu, directly click the <setting testing of three phases > button to test.

After setting of the parameters are complete, click the testing key at right lower corner, and carry out testing. Testing result is same as <setting testing of three phases>, shown as figure 9 for F model and F1 model, shown as figure 10 for E model and E1 model.

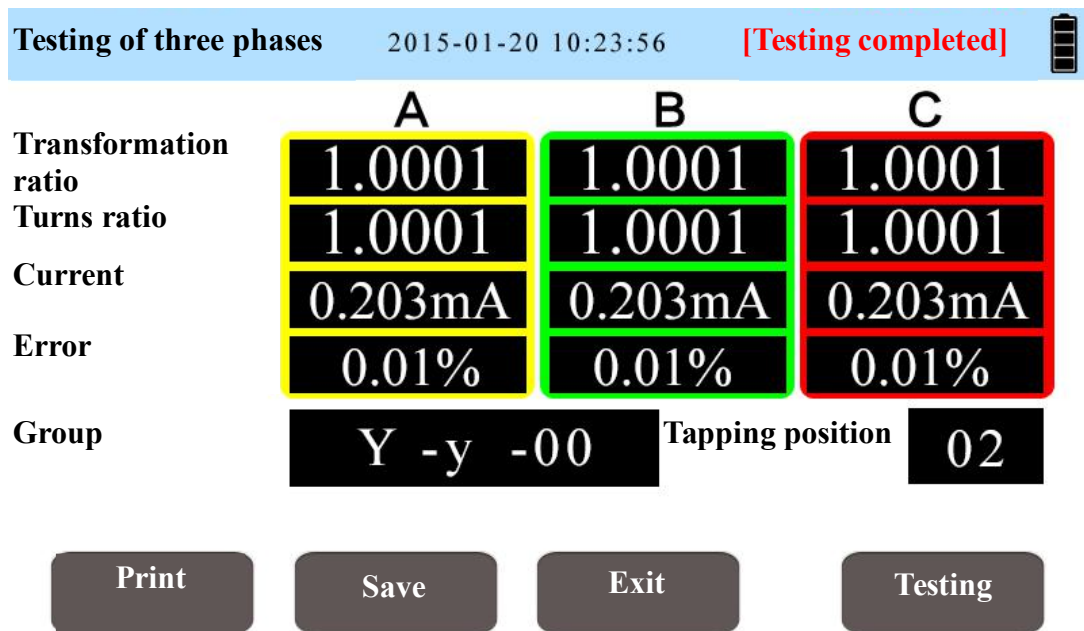


Figure 9

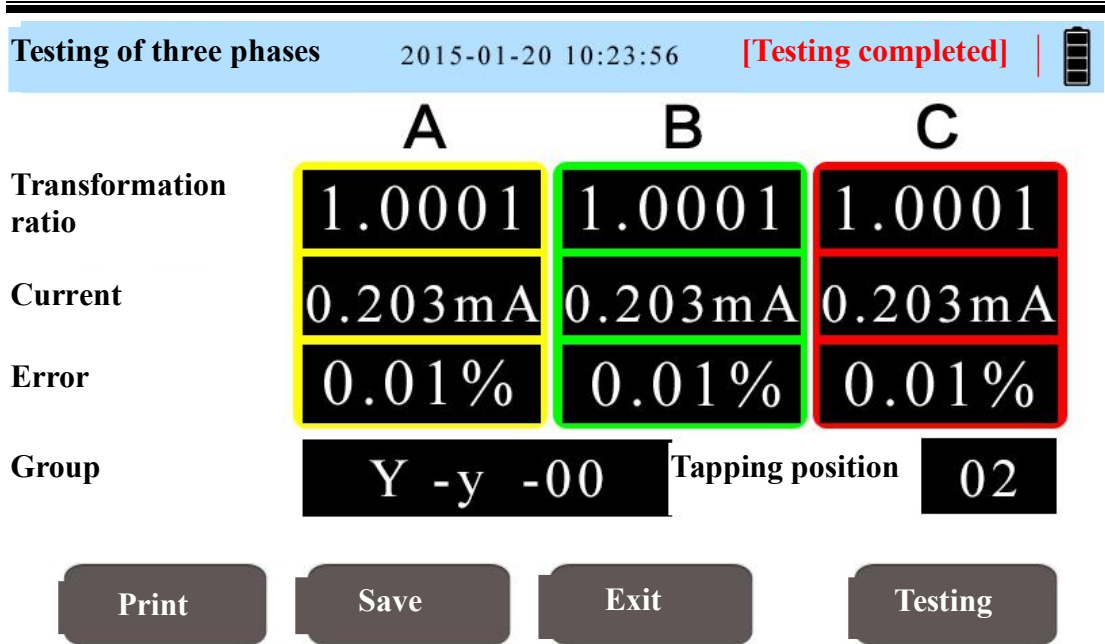


Figure 10

6.6 History record interface

Select the <recall> key on the main menu, enter into the history record interface, shown as figure 11:

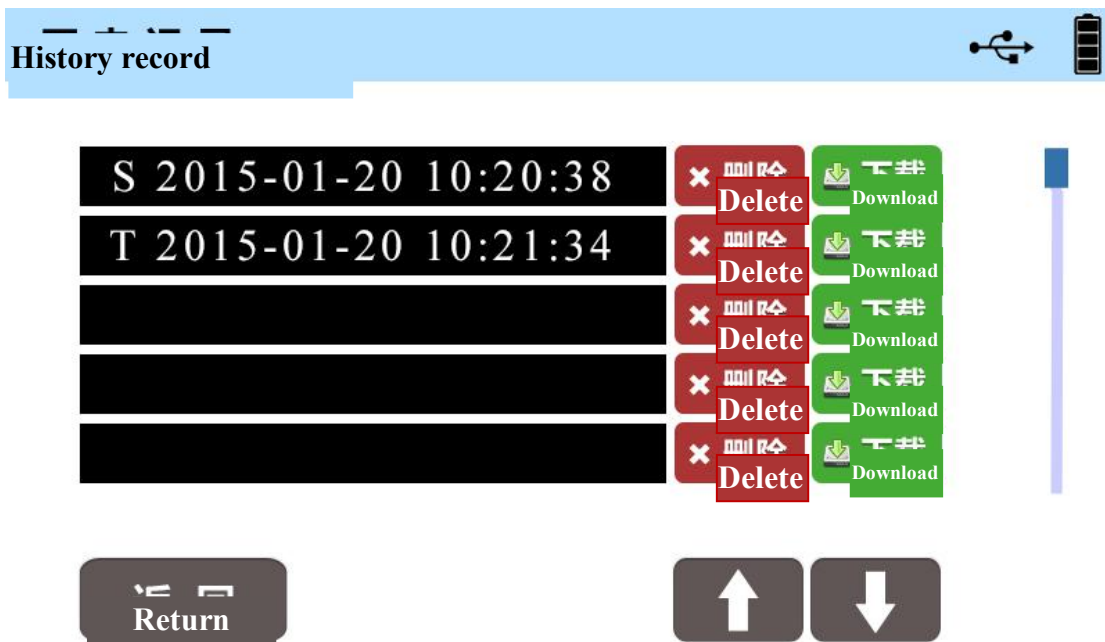


Figure 11

The instrument can save 50 groups of data in total, 50 groups data can be displayed on every screen, 10 screens in total. The user can pagedown the screen



through “↑”“↓”, the blue process bar at right can prompt position of the current rolling screen. After the data are fully saved 50 groups, the latest data will cover the original data. Every group of the data can carry out data deletion and exporting to the USB device respectively.

The content consists of data type and data testing time, for example: S 2015-01-20 10:20:38, in which S means this group of testing data are data tested for single phase. If tested data are three phases testing data, they are T. The later time means time to test data. Click the data on the content, enter into the concrete data display page, such as: recording page for automatic testing of single phase is shown as figure 12.

Check the record page, and print out the current data through pressing “print”.

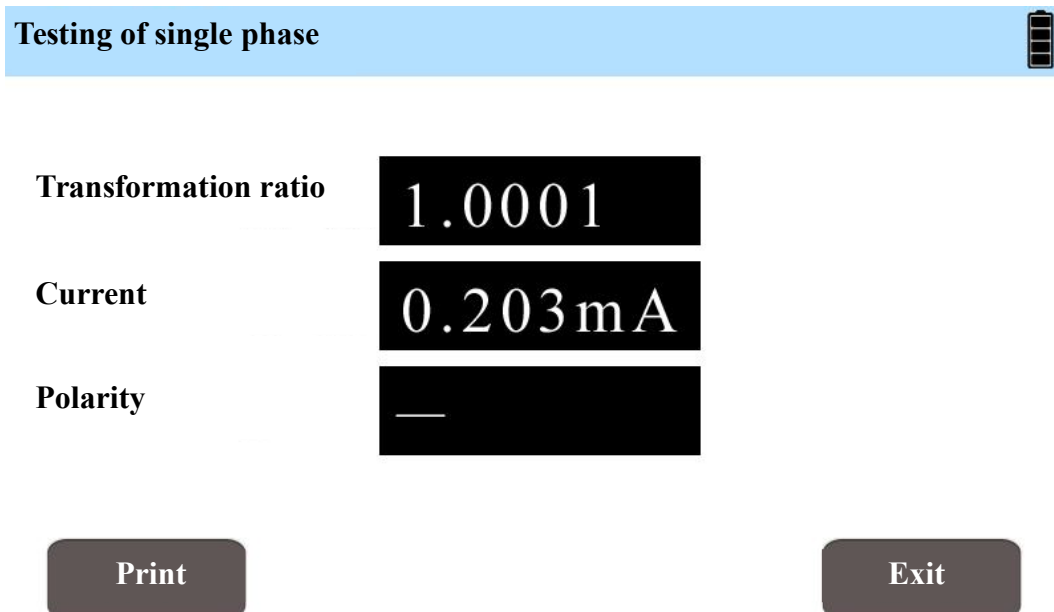


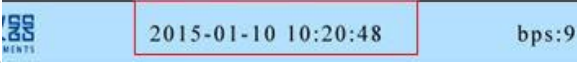
Figure 12

7、 Basic operation

7.1 How to set date and time

Click the time display area on the main menu



interface,  enter into the time setting interface, shown as figure 13, set date and time through the up and down keys at the corresponding positions.

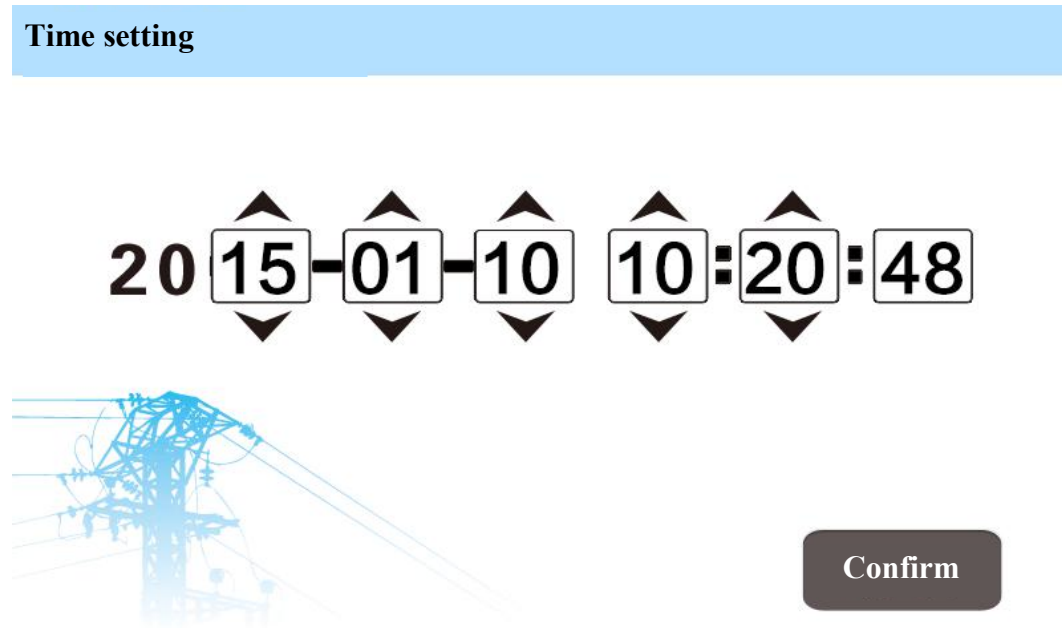


Figure 13

7.2 How to save data:

After a group of data are tested, the instrument will automatically display testing result, press down the “save” key to save data. After it is complete, **【save completed】** is prompted at right upper corner of the instrument.

7.3 How to read saved data:

Enter into the history record interface through the “Recall”key on the main menu. Refer to 6.6 for History record interface.

7.4 How to print testing data :

After testing of a group of data are complete, the instrument will prompt **【Testing completed】**. Now print the “Print” key to print out data, (Note: print and save operation are invalid during testing process, the instrument will not carry out corresponding commands.) The print format is shown as following;

Print format for **<automatic testing of single phase>**:



```

*****

Testing record of transformation ratio

2015-01-10    11:23:12

Number:00000

Polarity: -

Transformation ratio value    Current
(mA)
A      1.0000    0.218mA
  
```

Print format for <automatic testing of single phase>:

```

*****

Testing record of transformation ratio

2015-01-10    11:23:12

Number: 00000

Polarity: -

Tapping position: 02

Transformation ratio value    Current
(mA)    Error
A      1.0000    0.218mA    0.01%
  
```

Print format for <automatic testing of three phases>:

```

*****

Testing record of transformation ratio

2015-01-10    11:23:12

Number: 00000

Group: 00

Transformation ratio value    Current (mA)
A      1.0000    0.218mA
  
```




B	1.0000	0.218mA
C	1.0000	0.218mA

Print format for <setting testing of three phases>:

Testing record of transformation ratio			
2015-01-10		11:23:12	
Number: 00000			
Group: Y-y-00			
Tapping position: 02			
Transformation ratio value		Current (mA)	
Error			
A	1.0000	0.218mA	0.01%
B	1.0000	0.218mA	0.01%
C	1.0000	0.218mA	0.01%
Turns ratio			
A	1.0000		
B	1.0000		
C	1.0000		

Note: E model and E1 model Print No turns ratio value

7.5 How to delete data of history record:

Enter into the history record interface through the “recall” key on the main menu, it will display the record menu to save, every record will correspond to one “delete” key, the user can delete a through the “delete” key at right side. When a group of data shall be deleted, continuously click the “delete” key twice. When the “delete” key is clicked for first time, the corresponding data content will become red digit, and click the “delete” key again, the data will be deleted



7.6 How to download history record to U disk:

The user can export data saved in the instrument to the U disk. When the interface is located at history record, insert the U disk, the marking for U disk connection will display at right upper corner of the screen. After the U disk is withdrawn, the marking for U disk connection will disappear automatically. After the U disk is connected successfully, click the “download” key corresponding to the exported data, data starts to be exported to the U disk, **Exporting** will be prompted at right upper corner of the screen, shown as figure 14. After data export is complete, **export completed** will be prompted on the screen, shown as figure 15

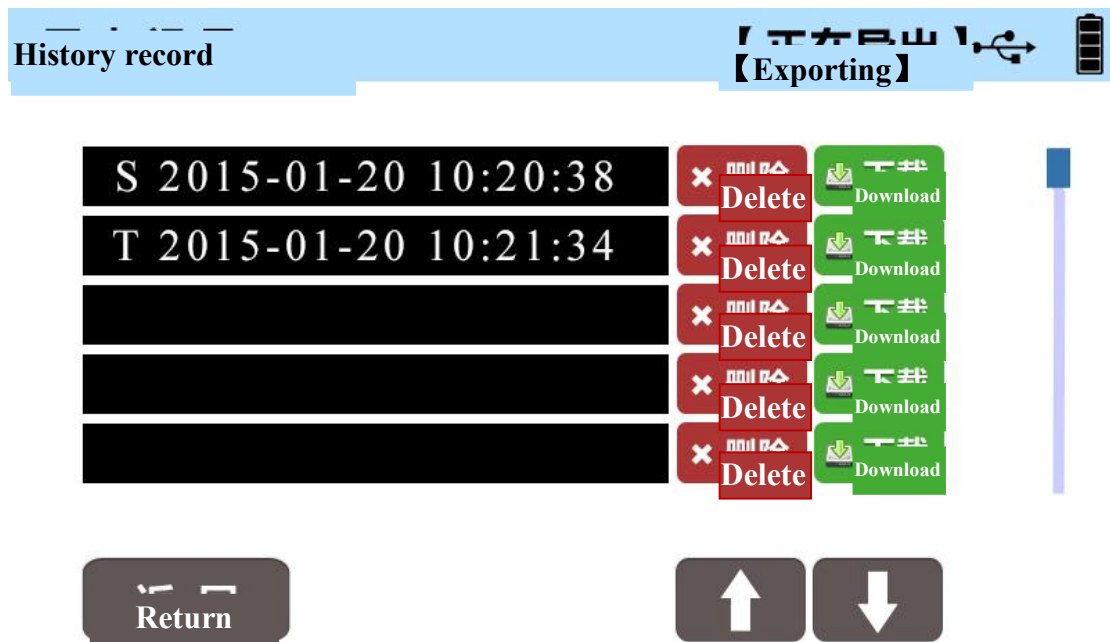


Figure 14

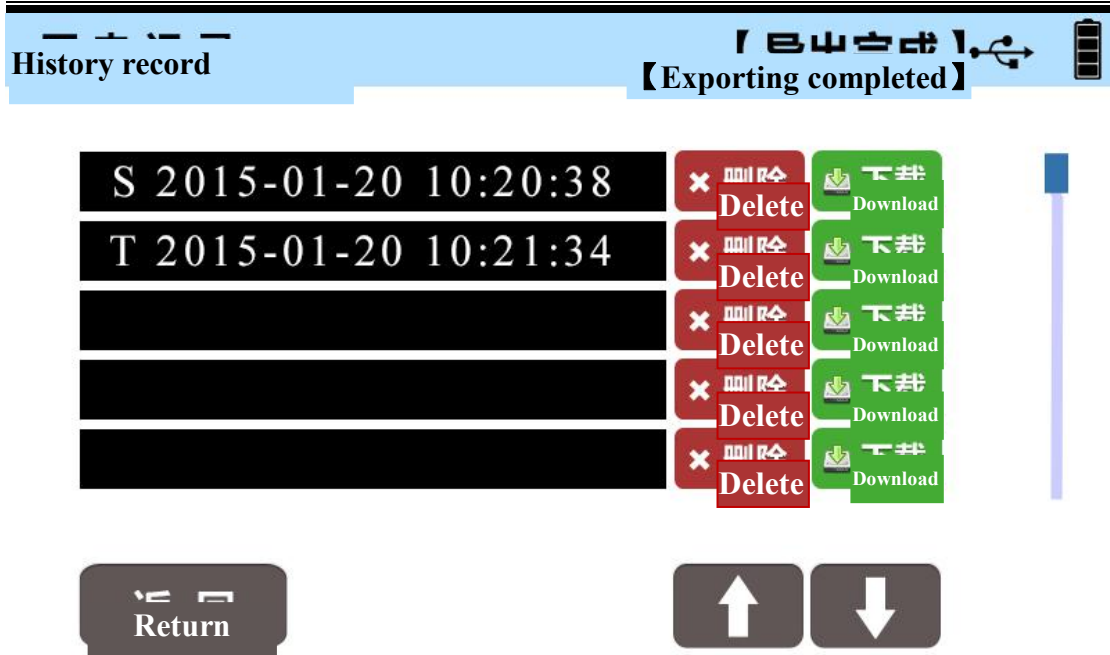


Figure 15

Now the instrument will automatically create the file folder with the name of “JT*****” (later six digits are year month and day for data saving) under root content of the U disk, and the file with the name of “JT*****.TXT” (later six digits are year month and day for data saving) will be created.

Format of exported data is shown as following:

Format of <automatic testing of single phase>:

Testing record of transformation ratio	
Teting time:2015-01-04-08:52:19	
Number: 00000	
Polarity:-	
Transformation ratio value	Current(mA)
A 1.0000	0.204mA



Format of <Setting testing of single phase>:

Testing record of transformation ratio
Teting time:2015-01-03-15:33:20
Number: 00000
Polarity:-
Tapping position:02

Transformation ratio	value	Error
Current(mA)		
A	0.9999	-0.01% 0.217mA

Format of <Automatic testing of three phases>:

Testing record of transformation ratio
Testing time:2015-02-04-08:52:36
Number: 00000
Group: 00

Transformation ratio	value	Current(mA)
A	1.0000	0.207mA
B	1.0000	0.209mA
C	1.0000	0.210mA

Format of <Setting testing of three phases>:

Testing record of transformation ratio
Teting time:2015-01-04-08:52:53
Number: 00000
Group:YN-y -00



Tapping position:02
Transformation ratio value
Current(mA) Error
A 1.0000 0.216mA 0.00%
B 1.0000 0.221mA 0.00%
C 1.0000 0.200mA 0.00%
Turns ratio
A 1.0000
B 1.0000
C 1.0000

Note: E model and E1 model Print No turns ratio value.

7.7 How to replace fuse

There is a fuse box under the power supply socket, use the flat screw driver to pull the fuse box upward, and the fuse can be replaced. Specification of the fuse is 1A.

8、Testing:

8.1 Wiring preparation

- 1) Clamp one end of the grounding wire on the grounding network, one end is reliably connected with the grounding terminal on the panel. Note: the grounding point of the grounding network shall have good conductivity, otherwise it will affect correctness of measurement.
- 2) Strictly connect the wire according to the wiring figure, and ensure touch of every contact is good.
- 3) The sample shall be disconnected with the external circuit during testing process.

8.2 Testing step



- 1) Switch on the switch of the power supply, and wait the instrument to enter into the main menu.
- 2) Select “automatic testing of single phase”, “setting testing of single phase”, “parameter setting of single phase”, “automatic testing of three phases”, “setting testing of three phases”, “ parameter setting of three phases” according to conditions.

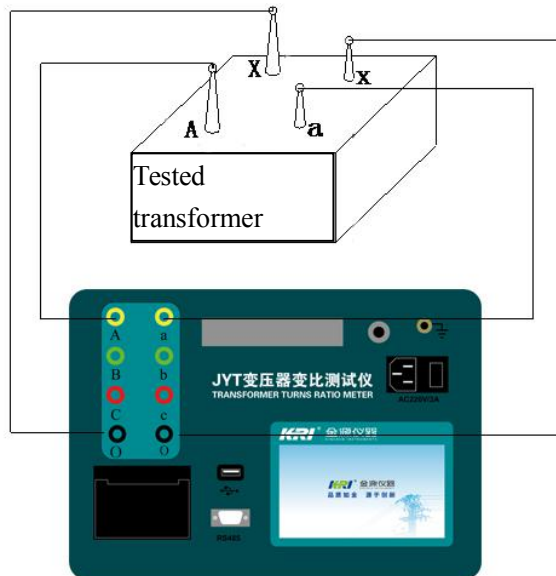
8.3 Cleaning at site after test is complete

- 1) Switch off the switch of the power supply.
- 2) Remove two groups of the special testing wires and pack well so as to facilitate next operation.
- 3) Remove the grounding wire and arrange well.

9、 Sample of wiring figure:

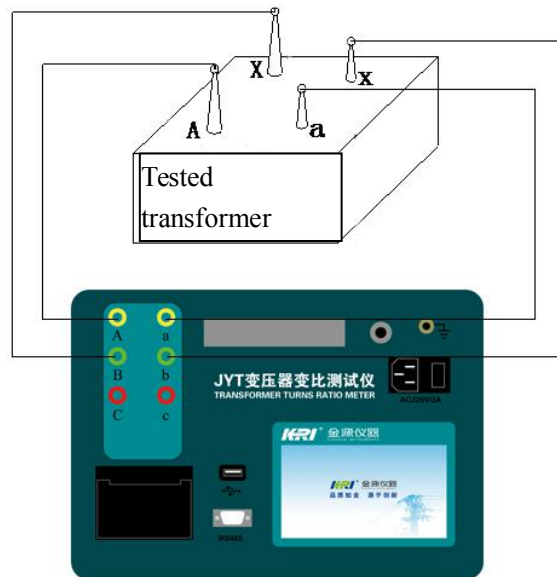
9.1 Single phase transformer:

Wiring ways of F model and F1 model are shown as following figure:



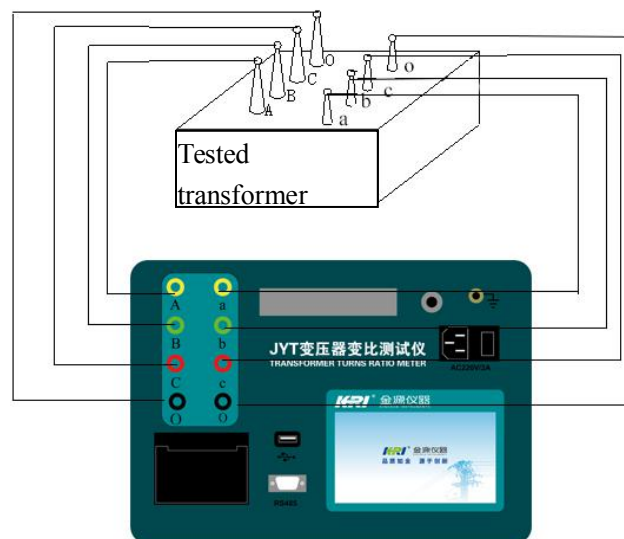


Wiring ways of E model and E1 model are shown as following figures:

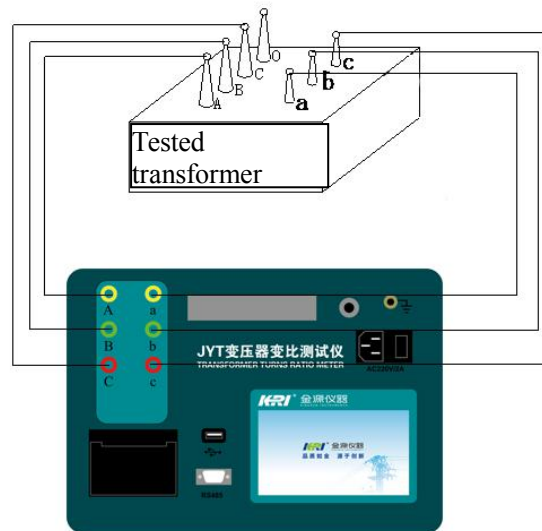


9.2 Three phases transformer:

Wiring ways of F model and F1 model are shown as following figures:



Wiring ways of E model and E1 model are shown as following figures:



10、 Transportation and Servicing

10.1 Transportation

This product must be packed during transportation, the package box applies the paper carter or the wooden carter, the packing carter shall be cushioned with the foam anti-vibration layer. The product after packing shall withstand road, railway and aerial transportation. It is not allowed to place in an open cabin. The warehouse shall be rain proof, dust proof and mechanical damage proof.

10.2 Storage

When the instrument isn't used regularly, it shall be stored in a room with ambient temperature of $-20^{\circ}\text{C}\sim 60^{\circ}\text{C}$, relative humidity not exceeding 85%, ventilated and free of corrosive gas. It shall not be close to the wall and ground when it is stored.

10.3 Damp proof

If this instrument isn't used for long time in area with damp climate or during damp season, it is required to start the machine and energize once every month (about two hours) so as to evaporate moisture and protect the element.

10.4 Sunlight exposure proof



When the instrument is used outdoor, try to avoid or reduce direct sunlight exposure of the liquid crystal display screen in sunlight.

10.5 Maintenance

When the instrument isn't used for long term, the battery shall be maintained periodically (carry out one complete charge every 90 days at least) so as to protect the battery against influence caused by invalidity of the battery.

11、Precaution

11.1、 When input of the power supply is greater than 300V, it alarms,inspect the input terminal of the power supply in time.

11.2、 When output voltage of the instrument is 160V, pay attention to safety and protect against electric shock.

11.3、 For the transformer with 19 shifts of the load tapping switch, No 9, 10 and 11 tap are same value. When the instrument inputs the tapping type, input 17. After No 12 is tapped, the tapping position displayed on the instrument is 2 less than actual position.

11.4、 Setting of the tapping position of the instrument is designed according to voltage regulation of the high voltage side and the low voltage side. If voltage is designed adversely or the tapping switch is placed at low voltage side of the transformer, it displays the tapping position is adverse to the actual tapping position.

12、 Fittings supplied together with machine

Name	Quantity	Remark
JYT main machine	One unit	
Testing cable	One set	13 m long, each 2 pieces for yellow, green, red and black
Three cores power supply wire	One piece	250V/10A
Grounding wire	One piece	2 m
Operation manual	One book	
Qualification certificate/warranty card	One page	
Fuse tube	Two pieces	1A



Print paper	One roll	Thermal
Packing list	One page	
Charger	One set	E1 and F1 model

13、 After sale service

The instrument will be repaired and replaced free of charge in case of product quality issue within 18 years from procurement date, and provide repair and technical service for whole life. In case abnormal condition or fault is found in the instrument, please contact our company in time so as to provide you the most convenient treatment proposal.

Special after sale service line: 0312-8915618

Contact phone number: 0312-5880715、 3332159

Fax number: 0312-3332659

Company address: South building, No 2 building, Torch industry park of High-new district, Baoding city

E-mail: kri@kri.net.cn

Website: www.kri.net.cn



(Appendix One) JYT transformer transformation ratio testing meter (F model and F1 model)

Short circuit and measurement way of winding

Group designation	High voltage side UH	Low voltage side UL	Transformation ratio K	Turns ratio Kz
D-d-0	A-B	a-b	K=UH/UL	Kz=K
D-d-6	B-C	b-c		
	C-A	c-a		
D-d-2	A-B	b-c	K=UH/UL	Kz=K
D-d-8	B-C	c-a		
	C-A	a-b		
D-d-4	A-B	c-a	K=UH/UL	Kz=K
D-d-10	B-C	a-b		
	C-A	b-c		
Y-y-0	A-(B-C)	a-(b-c)	K=UH/UL	Kz=K
Y-y-6	B-(C-A)	b-(c-a)		
	C-(A-B)	c-(a-b)		
Y-y-2	A-(B-C)	b-(c-a)	K=UH/UL	Kz=K
Y-y-8	B-(C-A)	c-(a-b)		
	C-(A-B)	a-(b-c)		
Y-y-4	A-(B-C)	c-(a-b)	K=UH/UL	Kz=K
Y-y-10	B-(C-A)	a-(b-c)		
	C-(A-B)	b-(c-a)		
YN-yn-0	A-O	a-o	K=UH/UL	Kz=K
YN-yn-6	B-O	b-o		
	C-O	c-o		
YN-yn-2	A-O	b-o	K=UH/UL	Kz=K
YN-yn-8	B-O	c-o		
	C-O	a-o		



YN-yn-4	A-O	c-o	K=UH/UL	Kz=K
YN-yn-10	B-O	a-o		
	C-O	b-o		
YN-y-0	A-O	a-(b-c)	K=(UH/UL)×1.5	Kz=K
YN-y-6	B-O	b-(c-a)		
	C-O	c-(a-b)		
YN-y-2	A-O	b-(c-a)	K=(UH/UL)×1.5	Kz=K
YN-y-8	B-O	c-(a-b)		
	C-O	a-(b-c)		
YN-y-4	A-O	c-(a-b)	K=(UH/UL)×1.5	Kz=K
YN-y-10	B-O	a-(b-c)		
	C-O	b-(c-a)		
Y-yn-0	A-(B-C)	a-o	K=(UH/UL)/1.5	Kz=K
Y-yn-6	B-(C-A)	b-o		
	C-(A-B)	c-o		
Y-yn-2	A-(B-C)	b-o	K=(UH/UL)/1.5	Kz=K
Y-yn-8	B-(C-A)	c-o		
	C-(A-B)	a-o		
Y-yn-4	A-(B-C)	c-o	K=(UH/UL)/1.5	Kz=K
Y-yn-10	B-(C-A)	a-o		
	C-(A-B)	b-o		
YN-d-1	A-O	a-b	K=(UH/UL)×√3	Kz=K/√3
YN-d-7	B-O	b-c		
	C-O	c--a		
YN-d-3	A-O	b-c	K=(UH/UL)×√3	Kz=K/√3
YN-d-9	B-O	c-a		
	C-O	a-b		
YN-d-5	A-O	c-a	K=(UH/UL)×√3	Kz=K/√3
YN-d-11	B-O	a-b		
	C-O	b--c		



Y-d-1	A-(B-C)	a—b	$K=(UH/UL)\times(2/\sqrt{3})$	$K_z=K/\sqrt{3}$
Y-d-7	B-(C-A)	b—c		
	C-(A-B)	c--a		
Y-d-3	A-(B-C)	b—c	$K=(UH/UL)\times(2/\sqrt{3})$	$K_z=K/\sqrt{3}$
Y-d-9	B-(C-A)	c—a		
	C-(A-B)	a—b		
Y-d-5	A-(B-C)	c—a	$K=(UH/UL)\times(2/\sqrt{3})$	$K_z=K/\sqrt{3}$
Y-d-11	B-(C-A)	a—b		
	C-(A-B)	b--c		
D-yn-1	A—B	b—o	$K=(UH/UL)/\sqrt{3}$	$K_z=K*\sqrt{3}$
D-yn-7	B—C	c—o		
	C—A	a—o		
D-yn-3	A—B	c—o	$K=(UH/UL)/\sqrt{3}$	$K_z=K*\sqrt{3}$
D-yn-9	B—C	a—o		
	C—A	b—o		
D-yn-5	A—B	a—o	$K=(UH/UL)/\sqrt{3}$	$K_z=K*\sqrt{3}$
D-yn-11	B—C	b—o		
	C—A	c—o		
D-y-1	A—B	b-(c-a)	$K=(UH/UL)/(2/\sqrt{3})$	$K_z=K*\sqrt{3}$
D-y-7	B—C	c-(a-b)		
	C—A	a-(b-c)		
D-y-3	A—B	c-(a-b)	$K=(UH/UL)/(2/\sqrt{3})$	$K_z=K*\sqrt{3}$
D-y-9	B—C	a-(b-c)		
	C—A	b-(c-a)		
D-y-5	A—B	a-(b-c)	$K=(UH/UL)/(2/\sqrt{3})$	$K_z=K*\sqrt{3}$
D-y-11	B—C	b-(c-a)		
	C—A	c-(a-b)		
ZN-yn-1	A—O	a-b (c-o)	$K=(UH/UL)*\sqrt{3}$	$K_z=K/\sqrt{3}$
ZN-yn-7	B—O	b-c (a-o)		
	C—O	c-a (c-o)		



ZN-yn-3	A-O	b-c (a-o)		
ZN-yn-9	B-O	c-a (b-o)	$K=(UH/UL)*\sqrt{3}$	$Kz=K/\sqrt{3}$
	C-O	a-b (c-o)		
ZN-yn-5 ZN-yn-11	A-O	c-a (b-o)	$K=(UH/UL)*\sqrt{3}$	$Kz=K/\sqrt{3}$
	B-O	a-b (c-o)		
	C-O	b-c (a-o)		

(Appendix Two) JYT transformer transformation ratio

testing meter (E model and E1 model)

Short circuit and measurement way of winding

Group designation	High voltage side	Low voltage side	Transformation ratio K
	UH	UL	
Y-y-0 YN-yn-0 YN-y-0 Y-yn-0 D-d-0	A- (B-C)	a-b	$K=UH/UL$
	B- (C-A)	b-c	
	C- (A-B)	c-a	
Y-y-2 YN-yn-2 YN-y-2 Y-yn-2 D-d-2	A- (B-C)	b-c	$K=UH/UL$
	B- (C-A)	c-a	
	C- (A-B)	a-b	
Y-y-4 YN-yn-4 YN-y-4 Y-yn-4 D-d-4	A- (B-C)	c-a	$K=UH/UL$
	B- (C-A)	a-b	
	C- (A-B)	b-c	
Y-y-6 YN-yn-6 YN-y-6 Y-yn-6 D-d-6	A- (B-C)	a-b	$K=UH/UL$
	B- (C-A)	b-c	
	C- (A-B)	c-a	
Y-y-8	A- (B-C)	b-c	








YN-yn-8	B- (C-A)	c-a	K=UH/UL
YN-y-8			
Y-yn-8	C- (A-B)	a-b	
D-d-8			
Y-y-10	A- (B-C)	c-a	K=UH/UL
YN-yn-10	B- (C-A)	a-b	
YN-y-10			
Y-yn-10	C- (A-B)	b-c	
D-d-10			
Y-d-1	A- (B-C)	a-b	K=(UH/UL)/1.5
YN-d-1			
D-y-1	B- (C-A)	b-c	
D-yn-1	C- (A-B)	c-a	
Y-d-3	A- (B-C)	b-c	K=(UH/UL)/1.5
YN-d-3			
D-y-3	B- (C-A)	c-a	
D-yn-3	C- (A-B)	a-b	
Y-d-5	A- (B-C)	c-a	K=(UH/UL)/1.5
YN-d-5			
D-y-5	B- (C-A)	a-b	
D-yn-5	C- (A-B)	b-c	
Y-d-7	A- (B-C)	a-b	K=(UH/UL)/1.5
YN-d-7			
D-y-7	B- (C-A)	b-c	
D-yn-7	C- (A-B)	c-a	
Y-d-9	A- (B-C)	b-c	K=(UH/UL)/1.5
YN-d-9			
D-y-9	B- (C-A)	c-a	
D-yn-9	C- (A-B)	a-b	
Y-d-11	A- (B-C)	c-a	K=(UH/UL)/1.5
YN-d-11			
D-y-11	B- (C-A)	a-b	
D-yn-11	C- (A-B)	b-c	



Address: Building 2# Torch High-tech Park Baoding City, China
Tel:+86 312 5308005 Fax:+86 312 3156229 E-mail: overseas.kingrun@gmail.com



(Appendix Three) Prompt information and processing

Prompt information		Demedanded operation
	The instrument applies AC power supply to work, the battery has been disconnected.	
	The instrument applies the battery to supply power, electricity of the power supply remains 100%	
	The instrument applies the battery to supply power, electricity of the power supply remains 75%	
	The instrument applies the battery to supply power, electricity of the power supply remains 50%	
	The instrument applies the battery to supply power, electricity of the power supply remains 20%	It shall be charged as soon as possible, so as avoid affecting operation of the instrument



	<p>The instrument applies the battery to supply power, electricity of the power supply is consumed completely</p>	<p>It shall be charged as soon as possible, so as avoid affecting operation of the instrument</p>
<p>【正在测试】</p> <p>[Testing]</p>	<p>The instrument is testing, please wait.</p>	
<p>【测试完成】</p> <p>[Testing is complete]</p>	<p>Testing of the instrument is complete, carry out printing and saving of data</p>	
<p>【正在打印】</p> <p>[Printing]</p>	<p>The instrument is printing, please wait</p>	
<p>【打印完成】</p> <p>[Printing is complete]</p>	<p>Printing of the instrument is complete</p>	
<p>【正在保存】</p> <p>[Saving]</p>	<p>The instrument saves testing data in the memory, please wait</p>	
<p>【保存完成】</p> <p>[Saving is complete]</p>	<p>Saving testing data of the instrument is complete</p>	
	<p>USB has been inserted into the instrument correctly, carry out export operation of data</p>	



<p>【正在导出】</p> <p>[Exporting]</p>	<p>Record data in the instrument is importing into the U disk, please wait</p>	
<p>【导出完成】</p> <p>[Export is complete]</p>	<p>Operation which exports record data is complete, pull out of the U disc and carry out exporting of next group of data after waiting 2 seconds.</p>	
<p>【导出失败】</p> <p>[Export fails]</p>	<p>Wrong appears during recording exporting process of data, record exporting failure</p>	<p>Carry out one data export again. If it is still prompted export failure, please replace the U disk, restart the instrument and export again. After several exportings are failed, please contact technician of the manufacturer to treat</p>
<p>USB模块错误</p> <p>USB module is wrong</p>	<p>The module in the instrument fails</p>	<p>please contact technician of the manufacturer to treat</p>
<p>【输入错误】</p> <p>[Input is wrong]</p>	<p>The input parameters are wrong</p>	<p>Please inspect whether input parameters are in accordance with specification</p>



<p>【内部错误】</p> <p>[Inner wrong]</p>	<p>Inner part of the instrument is wrong</p>	<p>Please restart the instrument and test again. If fault isn't excluded, please contact technician of the manufacturer to treat</p>
<p>【测试错误】</p> <p>[Testing is wrong]</p>	<p>Wrong appears during testing process of the instrument</p>	<p>Please inspect whether connection of the testing wire is correct, if fault isn't excluded, please contact technician of the manufacturer to treat</p>
<p>! Current 保护 Current protection</p>	<p>Current is too great</p>	<p>Please change to the 10V (AC) shift to test</p>
<p>! 电压保护 Voltage protection</p>	<p>Voltage is too great</p>	<p>Please inspect whether high voltage and low voltage connections of the testing wire are connected adversely</p>
<p>! 电池保护 Battery protection</p>	<p>The inversion power supply fails</p>	<p>Please restart the instrument and test again. If fault isn't excluded, please contact technician of the manufacturer to treat</p>