



Meiruike Instruction Manual

RK2511N SERIES DC
RESISTANCE TESTER

SHENZHEN MEIRUIKE ELECTRONIC TECHNOLOGY CO., LTD.

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One、Product Overview

RK2511N series dc resistance tester is a testing instrument of transformer, motor, switch, relay, connectors and other kinds of dc resistance. The basic testing accuracy up to 0.05%, and has high measurement speed.

The instrument uses a high precision constant current flows through the measured, as well as four-terminal measurements, eliminate the error of lead effectively ;Using the high precision AD conversion, suitable for users with high precision measurement. The instrument has a sorting function (onlap, qualified, downlap) which allows users to set the upper and lower limit and the nominal value of resistance freely, improved the test efficiency of the instrument vastly.

Two、Product Specification

(2-1) Introduction of RK2511N Series:

Item No	Testing Scope	Testing Range	RS-232 Interface	HANDLER Interface
RK2511	10 μ Ω -20K Ω	200m Ω 、 2 Ω 、 20 Ω 、 200 Ω 、 2K Ω 、 20K Ω	Optional Matching	Optional Matching
RK2512	1 μ Ω -2M Ω	20m Ω 、 200m Ω 、 2 Ω 、 20 Ω 、 200 Ω 、 2K Ω 、 20K Ω 、 200K Ω 、 2M Ω	Optional Matching	Optional Matching

(2-2) Testing Scope

Rk2511: 10uΩ -20KΩ

Rk2512: 1uΩ -2MΩ

(2-3) Testing Range:

Ranges choosing can be divided into automatic and locking range. Locking range lock the current to measured. The range of corresponding instrument model as follows:

Rk2511: 200mΩ、2Ω、20Ω、200Ω、2KΩ、20KΩ。

Rk2512: 20mΩ、200mΩ、2Ω、20Ω、200Ω、2KΩ、20KΩ、200KΩ、2MΩ。

Testing Scope	20 mΩ	200 mΩ	2 Ω	20 Ω	200 Ω	2 kΩ	20 kΩ	200 kΩ	2 MΩ	
Accuracy	2511	0.2%±3		0.1%±3				none		
	2512	0.2%±3		0.05%±3						0.2%±3
Testing Current	2511	100mA		100 mA	10 mA	1 mA	100 uA	100 uA	无	
	2512	1A	100 mA	100 mA	10 mA	1 mA	100 uA	100 uA	10 uA	1 uA
Readout Resolution	2511	10 uΩ	100 uΩ	100 uΩ	1 mΩ	10 mΩ	100 mΩ	1 Ω	none	
	2512	1 uΩ	10 uΩ						10 Ω	100 Ω

(2-4) Displaying Scope:

Direct reading:resistance value display by 5 digits that

display only 4 digits when the first is greater than 2.

Percentage:resistance percentage display by 4 digits plus 1 sign bit,the range of display is $\pm 9999\%$.

Outrange display: |_| |_|_|_| |_| |_|

(2-5) Testing Speed:

speediness: about 15t/s

Low speed: about 8t/s

(2-6) Trigger Mode:

Single trigger:The HANDLER interface board (optional) of instrument receives the starting signal from outside, triggering and make a measurement at a time.It also can trigger measurements through the trigger key on the faceplate, every key one time measurement.The five digital tube will display -- -- -- -- -- if it is a single trigger when the instrument starting up.

Continuous trigger: The trigger signal generated by the internal instrument, and continuous to measure the testing, and will output the result to 5 digital tube.

Three、Parameter Specification

(3-1) Nominal Working Conditions:

(1) Supply voltage: $220V \pm 10\%$ frequency: $50Hz \pm 5\%$ 60 Hz

(2) Operating conditions: Temperature: $0^{\circ}C \sim 40^{\circ}C$, Relative

Humidity: < 80%RH

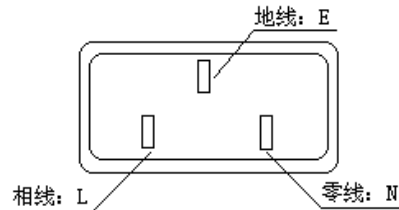
(3) Storage Condition: Temperature: $-10^{\circ}\text{C}\sim 70^{\circ}\text{C}$; Relative Humidity: < 70%RH

(4) Power: < 30 W。

(5) The power supply line L, zero line N, ground electrode E should be same as the instrument power plug, as picture 1.2.1. At the same time ground electrode E should be reliable grounding, Otherwise the instrument surface may have leakage phenomenon!

(6)The instrument need to preheat for 20 minutes after opened, and then measure, to ensure the measurement accuracy.

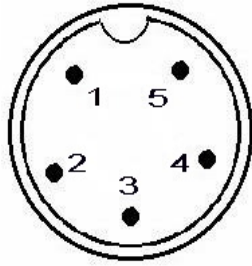
(7) Power socket cannot share with high-power electrical equipment, in order to avoid interference instrument work or electrical shock and damage the instrument.



Picture 3..1.1

(3-2) Test、Benchmark Instructions

Pin configuration of the Front Faceplate of the Test、Benchmark, as picture 3.2.1 show:

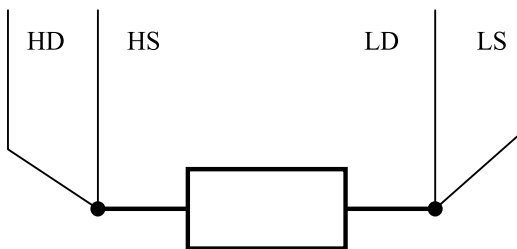


Picture 3.2.1: Pin configuration

The function of pin corresponding that shown in the following table:

Pin	The function of pin corresponding
1	HD Current incentive high-end
2	HS Current sampling high-end
3	GND Analog Grounding
4	LS Current sampling low-end
5	LD Current incentive low-end

Schematic diagram of port connected to the load, as picture 3.2.2:



Picture 3.2.2: Schematic diagram of port connected to the load

(3-3) Using Environment Instructions

1. Please avoid using in dusty, vibration, direct sunlight, corrosive gas environment.
2. Instrument working temperature is 0-40 °C, relative humidity $\leq 75\%$.
3. In order to ensure the instrument is well ventilated, please do not plug case about vents.
4. Please used in low noise, and away from strong electromagnetic field and under the environment of corrosive gas.
5. Do not switch apparatus frequently in order to avoid data corruption.

If users have the special requirement of the using environment, please contact with our company. We will try to solve for you.

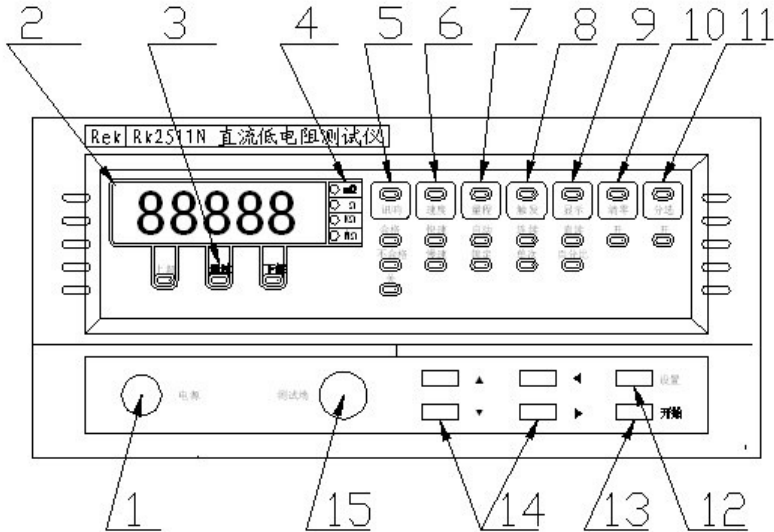
(3-4) Requirements of Fuse

The factory have equipped with the fuse, the user should use the fuse which company equipped. If need the fuse, please contact with our company. For testing and replacing the fuse, should unplug the power cord and fuse holder.

Warning: Whether your fuse location conform to the power supply voltage range should be paid attention to before power on.

Four、Control and Indicator of Faceplate

(4-1) Introduction of The Front Faceplate Function



2511N Schematic diagram of the Front Faceplate Function

The following content is the corresponding specification of the front Faceplate, Numbers on the front of caption is to figure the label on schematic diagram of the front Faceplate.

1:Power switch: Controlling instrument working power supply.

2:Display window: The resistance value、resistance percentage and function settings menu display by 5 digits digital tube.

3:Sorting indicator light:

Overlap, red light, this light signify measured values higher than the upper limit value;

Qualified, green light, this light signify measured values between the upper and lower limit value;

Downlap, red light, this light signify measured values is below the upper limit value;

4:Resistor unit indicator light:m Ω 、 Ω 、K Ω 、M Ω 。

5:Alarm choice:can choose qualified alarm, unqualified alarm, closed alarm by the direction key.This function is invalid when sorting indicator light closing.

6:Measurement speed selection of indicator light:Fast and slow speed can choose measurement speed by the direction key.

7:The range of indicator light:can choose automatic or lock range by the direction key.

8:Trigger indicator light:can choose single trigger or continue trigger by the direction key.

9:Display mode selection of indicator light:can choose direct reading or resistance value displayed in percentage by the direction key.

10:Reset selection of indicator light:The radix of LP251X series resistance instrument is 0, so users don't need to reset;but we still keep the reset function for the user.Press the direction key can open or close the reset function.

11:Sorting function switch: can open or close the sorting function by the direction key.

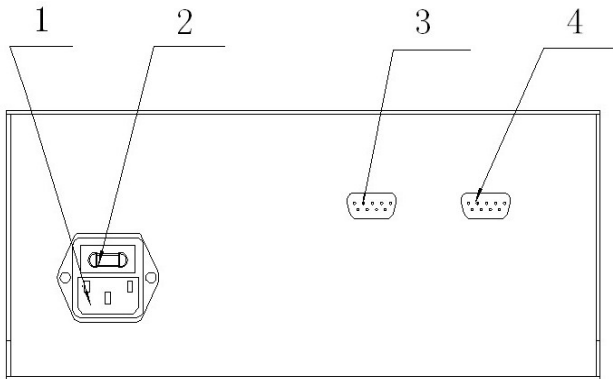
12:Setting key:enter the sorting setting function and select sorting set up the project. (The setting of upper、 lower limit and nominal value)While pressing the button can be paginated under the settings menu of sorting function.

13:Starting key:single measurement mode is used to launch the test,press the button once a measurement.At the same time,press the button can be save the upper、 lower limits、 nominal value and exit directly under the setting menu of extreme value and the nominal value.

14:Direction key:measurement state is used to change all sorts of function setting, setting state is used to change setting date.

15:The interface of the test:5 core print seat, used to connect the test cable.

(4-2) Introduction of The Rear Faceplate Function



2511N schematic diagram of the Rear Faceplate Function

The following content is the corresponding specification of the front Faceplate, Numbers on the front of caption is to figure the label on

schematic diagram of the rear Faceplate.

- 1: Outlet
- 2: Fuse block
- 3: Serialing RS - 232 Standard Interface (optional)
- 4: Introduction of HANDLER Interface (optional)

Five、Fuse block:

(5-1) Attention Items:

1. Please used in 0-40 °C environment temperature, relative humidity $\leq 75\%$, in order to ensure the instrument is well ventilated, please do not plug case about air vents, and keep sufficient space around the back of the instrument or instruments.
2. Please avoid using in dusty, vibration, direct sunlight, corrosive gas environment. Please used in low noise, and away from strong electromagnetic field and under the environment of corrosive gas.
3. Do not switch apparatus frequently in order to avoid data corruption.

(5-2) Introduction of Sorting Function

- 1、Display mode separation value is set to be read directly.

1. Press setting button on the faceplate in measuring state , enter the sorting setting menu.

2. Digital tube display “--H--” , it represent will enter the upper limit setting menu.

3. Press setting button to enter the upper limit setting menu, press “ \longleftrightarrow ” key can change which bits of date、radix point、flash unit;press “ $\uparrow \downarrow$ ” key can change the date of flicker bit.

4. Press setting button, Digital tube display “--L--” , it represent will enter the low limit setting menu.

5. Press setting button to enter the low limit setting menu, press “ \longleftrightarrow ” key can change which bits of date、radix point、flash unit;press “ $\uparrow \downarrow$ ” key can change the date of flicker bit.

6. Press setting button, enter the sorting setting to end menu. If the upper limit of sorting user setted is greater than the lower limit value, digital tube display “-END-” , press setting button, exit the sorting setting menu; If the upper limit of sorting user setted is less than or equal to the lower limit value, digital tube display “FAIL” to prompt the user sorting value is error, press setting button, enter the upper limit setting menu.

2、 The sorting value setting when the display mode is the percentage.

1. Press setting button on the faceplate in measuring state , enter the sorting setting menu.

2. Digital tube display “-RRO-” , it represent will enter the

nominal value setting menu.

3. Press setting button, enter the nominal value setting menu. Press “←→” key can change which bits of date, radix point, flash unit; press “↑↓” key can change the date of flicker bit.

4. Press setting button, digital tube display “—H—”, it represent will enter the percentage of upper, low limit set setting menu.

5. Press setting button, enter the percentage of upper, low limit set setting menu. Press “←→” key can change which bits of date flicker; press “↑↓” key can change the date of flicker bit and plus-minus sign.

6. Press setting button, enter the sorting setting to end the menu. If the upper limit of sorting user setted is greater than the lower limit value, digital tube display “-END-”, press setting button, exit the sorting setting menu; If the upper limit of sorting user setted is less than or equal to the lower limit value, digital tube display “FAIL” to prompt the user sorting value is error, press setting button, enter the nominal value setting menu again.

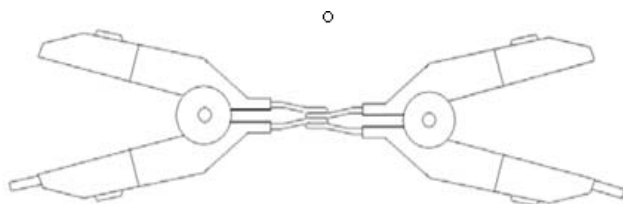
Note: no matter what kind of display mode, press the starting button can be exit sorting extreme settings menu directly. The percentage calculation method is as follows:

$$\frac{RX-RS(\text{标称值})}{RS(\text{标称值})} * 100.0\%$$

(5-3) Introduction of Reseting Function

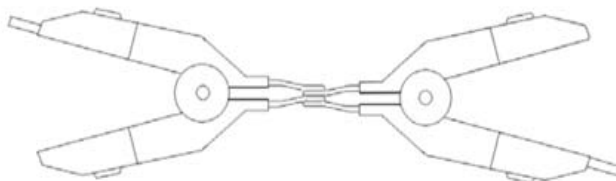
Rek251X series resistance meter reset radix constant to

0, so users don't need to reset. But we still keep the reset function for the user. The user can open or close reset function by the direction key. When the circuit opened, open the reset button will display the "FAIL"; When connected to the measured resistance, the current test value will as the radix of reset to clear, and save the radix. Close the indicator light when you don't need to reset. To test the line clamp short circuit, the red end clamp test fixture should be red, black end clamp test fixture should be black; At this point the radix of digital tube display up to 0. If the test wire clamp connect inversely, line test data will be changed a lot, at this time connect inversely again and test, can obtain the correct radix. (Note: reset process need about 3 seconds, please do not remove the test fixture until the digital tube display value to zero, otherwise reset failure)



正确的测试端短路方法

以下示例是错误的!



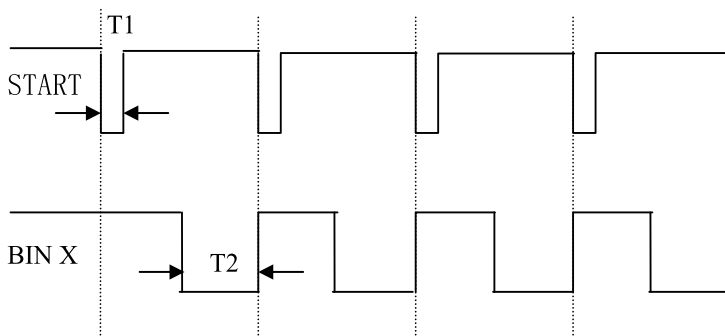
(5-4) Introduction of The Rear Faceplate

HANDLER Interface (optional)

Instrument function is set to the single test mode, will determine the range according to the data setted, locking range after press the starting key and open the sorting switch. Remote control signal is valid when equipped with remote control interface board and in the mode of the trigger is single measurement. At this time can start a test on the faceplate by start button, also may be started by remote control signal, remote control and sorting output signal is the 9 core type D hole output, the pin output function as below:

1. Feet and 5 feet is empty, can not connection.
2. Feet sorting onlap signal, low level effective onlap, sorting signals remain until the next starting signal is valid;
3. Feet sorting through signal, low level through effectively, sorting signals remain until the next starting signal effective;
4. Feet remote control downlap signal, the low level effective downlap, sorting signals remain until the next starting signal is valid.
5. Feet measurement end the signals and the end is measured with the low level effectively.
6. Feet remote control starting signal(trigger signal), low level effectively, a low level can start one time, pulse width > 10 ms;
7. The power converter circumscribed of feet 12-24V
8. Feet as signal of benchmark

HANDLER Interface operation time sequence as below:



The slow test, sorting result will send in 150 ms after the start signal (T2 and T1 falling edge time difference for 150 ms), The quick test, sorting result will send in 80 ms after the start signal (The time lag of T2 and T1 is 80 ms)

(5-5) Serialing RS - 232 Standard Interface (optional)

This instrument use RS - 232C standard serialized communication bus interface with external control devices asynchronously, transmission baud rate fixed for 9600bit, the signal of logic level is $\pm 12V$, the maximum transmission distance is 15 meters. Serial interface using the direct communication, only using TXD (send), RXD (accepted), GND (ground) this three signal lines, using the nine core standard socket interfaced.

The basic format of PC sent data is: (computer \rightarrow instrument)

AB + Command Word + The data and the decimal point + units + AF
 A total of 11 bits data (DB0 - DB10)

Any directive sent by computer are AB initially, end with AF, send 11 bits data in total, the part of lack for digits will fill

up 00H in front of the AFH, reach to a total of 11 bits data.

No.	command function	command data	Format/note
The data format for digital quantity:5 bits data+1 radix point bits			
		X. XXXX	X 2EH XXXX
		XX. XXX	XX 2EH XXX
		XXX. XX	XXX 2EH XX
Instructions:Resistance Setting is decimal number Eg:If the upper limit of Resistance Setting is 123.45Ω, the data format will be:			
ABH EAH 01H 02H 03H 2EH 04H 05H A1H 00H AFH			
1	The upper limit of Resistance Setting	EAH	ABH EAH data+radix point units(A0-A3) 00H AFH
2	The low limit of Resistance Setting	EBH	ABH EBH data+radix point units(A0-A3) 00H AFH
3	The upper limit of percentage setting	EDH	ABH EDH data+radix point the symbol of upper limit(00H:+ 01H:-) 00H AFH
4	The low limit of percentage setting	EFH	ABH EFH data+radix point the symbol of low limit(00H:+ 01H:-) 00H AFH
5	Nominal value setting	ECH	ABH ECH data+radix point units(A0-A3) 00H AFH
6	Reset setting	D9H	ABH D9H open(55H) or close(5AH) (fill seven 00H, analogize) AFH
7	Sorting	DAH	ABH DAH open(55H) or close(5AH)

	setting		AFH
8	Fail-on setting	DBH	ABH DBH open (55H) or close (5AH) AFH
9	Display setting	DFH	ABH DFH % (55H) or R (5AH) AFH
10	Speed setting	DEH	ABH DEH quick (55H) or slow (5AH) AFH
11	Mode setting	DDH	ABH DDH lock (55H) or Automatic (5AH) AFH
12	Trigger setting	DCH	ABH DCH outer (55H) or inner (5AH) AFH
13	Single time	9DH	ABH 9DH AFH single time is effective when trigger for outside, test once a key press.

Units (1 bits)	
m Ω	A0H
Ω	A1H
K Ω	A2H
M Ω	A3H

The basic format of PC measured data received: (instrument->computer)

ABH+Measured Data(6 bits)+Units(1 bits)+Sorting Result(1 bits)+Measuring Condition(1 bits)+AFH

Any measurement packet computer received is AB initially, end with AF, and receive 11 data as a data packet. Six bits measured data is (This data is only output from the machine during the test).

Measured data (6 bits)	
Blank Space	20H
Radix Point	2EH
Digit	0—9
Minus	2DH

Sorting result (1 bits)	
High	B0H
Pass	B1H
Low	B2H
Closing sort	B4H

Units (1 bits)	
m Ω	A0H
Ω	A1H
K Ω	A2H
M Ω	A3H
Percentage	A4H
Range exceeding	A5H

Measuring Condition (1 bits)	
Direct Reading	C0H
Error	C1H
Onlap	C2H
Downlap	C3H
Percentage	C4H

Slave machine will send the data to computer when every test data, each time will send a data packet, the format standard as the table above. Program will initialize when it starting up.

When start initializing, the computer will send command “ADH” to slave machine. And then slave machine send the initialization data to computer after receive the command. The computer initialize the interface, and makes data state of the upper machine and slave machine consisted.

No.	Command Function	Command Data	Format/Note
1	Sending the upper limit of resistance	EAH	ABH EAH data+radix point units(A0—A3) AFH

2	Sending the low limit of resistance	EBH	ABH EBH data+radix point units(A0—A3) AFH
3	Sending the upper limit of percentage	EDH	ABH EDH data+radix point AFH
4	Sending the low limit of percentage	EFH	ABH EFH data+radix point AFH
5	Sending the nominal value	ECH	ABH ECH data+radix point units(A0—A3) AFH
6	Sending state	9DH	ABH ACH open(55H)or close(5AH) AFH
			The order of the state:Reset Sort Fail-on Display Speed Mode Trigger

Slave machine will send the instructions in the form of data packets:six data packets in total.

Instructions:

1. The transmission baud rate of serial port fixed for 9600bit.

2. There is a synchronized process with instrument once open by custom-made software our company provide(Or redacted by yourself). At this point the date display on the software interface may be inconsistent with instrument data, please wait a few seconds after data stabilizing will operate the function of the interface.

3. The control commands sent to slave machine are all by computer, and the slave machine just send the measured data and sorting results to computer in the testing process, the computer will display the data.

4.The trigger for the “inside” as a state of continuous testing, if it is “outside” trigger state, test once key press(or test once received a trigger signal)

Six、Common Trouble-Shooting

(6-1) Common Trouble-Shooting

fault phenomenon	Reason	Solution
Test data is not accurate.	1.Reset is not correct 2.Test on the inappropriate range 3.The resistance which contact with the test fixture one side is too large. 4.The temperature of Ambient is too high or too low.	1.Closing reset or resetting again. 2.Setting the range to automatically. 3.Checking and repairing test fixture. 4.Removing the instrument to the suitable environment.
Test data is not stable.	1.The test fixture didn't clamping or malfunction 2.Test on the inappropriate range. 3.The voltage of power source is too low or unstable. 4.The lead be measured is oxidized or not clean.	1.Checking and repairing test fixture. 2.Setting the range to automatically. 3.Using a stabilized voltage power source. 4.Cleaning a lead be measured.
The percentage showed abnormal.	Nominal value setting is error.	Resetting the nominal value,especially attention to the radix point and units if settings correct.
Don't show the sorting data.	Sorting function is not opened.	Opening the sorting function.

The percentage showed is normal but the sorting result is wrong.	The setting of the sort parameters extreme value is not correct.	Resetting the sorting data.
Unable to exit the set menu of the extreme.	The low limit of extreme value is greater than the upper limit.	Checking and modify the data of extreme value, the upper limit of data must be greater than the low limit, especially pay attention to the symbols and units.
Can' t FAIL-ON	The FAIL-ON function isn' t opened.	Opening the FAIL-ON function.
Test fixtures short splice reset, the radix of reset is too large or unstable.	Test fixture connected inversely.	Connecting the test fixture reversely.
Display FAIL after resetting.	Taking away the test fixture while resetting didn' t over.	Resetting and waiting for 2 seconds.
Can' t opening the machine.	The fuse burned.	Changing the fuse.
Display FAIL after opening the machine.	The data of breakpoints which store in EEPROM Store loss.	Pressing any key to initialize the instrument.

(6-2) Maintenance

- 1、Please pull out the power plug before cleaning.
- 2、Wipe the instrument with the wet soft fabric which bedew neutral detergent and water, don' t spray cleanser on the

instrument directly.

3、Do not use the solvent contains hydrocarbon、chloride or similar solvent, and also do not use the cleanser contains grinding ingredients.

Seven、Replacement of Fuse

If the fuse burned-out, the instrument will cease to work, don't open the fuse holder except a problem occurred. And find and correct the reason of the fuse burned-out, then use a fuse of the same value to replace.

The fuse holder is on the power socket. When replacement, remove the plug first, open the small plastic cover which at the top of the power input socket on the rear faceplate of the instrument with a screwdriver, you can see the fuse, please use the same type and specification fuse to change, install the fuse holder back in.

Note that the backup fuse of instrument is on inter layer of the fuse box which at the top of power outlet on instrument. When replacement, open the fuse box above the power socket, replace the backup fuse in the inter layer of the fuse box.



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