

## **MODEL JK2512B Series**

Intelligent DC low resistance tester

### **Operating manual**

## **Summary**

JK2512B Intelligent DC low resistance tester is smooth and simple in appearance and easy to operate. With new design ideas, all kinds of touch people have a new feeling.

### ***Feature introduction***

#### **1. Visual display**

The use of liquid crystal display makes the display of all parameters have a clear hint. No matter what day or night, there are clear characters to let you see at a glance, There is no dazzling indicator

light that makes it difficult to remember.

## 2.A small number of buttons

This instrument has only four buttons to operate, so you don't have to remember more articles and set more functional data.

## 3.Multi parameter display

When you read the resistance value and convert it into percentage error, you feel troublesome. When you read the percentage error and turn the instrument display to a display resistor, you feel it repeating. You may as well choose the sorting function of this instrument. The instrument displays both the resistance value and the percentage error in the separation measurement. It is convenient for your reading to display both the resistance value and the measurement range and reading range in the direct reading measurement. And when set up, display the text to tell you what you are doing.

## 4. Level noise display

On the production line, you may have to divide the resistance into three precision levels, and this instrument can fully meet your requirements. The instrument can be set up to three grades in percentage form. There are qualified flash hints and qualified level displays, and there are also qualified messages, but you can turn off the noise and only have a qualified light indication and level display.

## 5. communication interface

If you need to automate the measurement, you can use the communication interface to achieve this. The interface design of the instrument takes full account of the convenience of users. You can simply program your programmer or computer according to the instructions, or you can easily accomplish it with a simple hardware circuit.

## 6.Convenient calibration

A new calibration method of this instrument, the standard mode of man-machine dialogue, can be calibrated as long as the keyboard is pressed.



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## JK2512B Intelligent DC low resistance tester Operating manual

### Chapter one : Precautions in the test

#### 1.Preheating

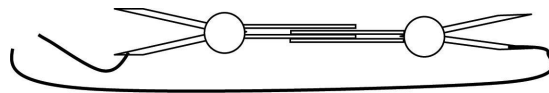
The instrument must be preheated for 15 minutes before the machine is opened., After waiting for the stability of the electrical parameters of the internal line of the instrument Measure.

#### 2.Zero clearing

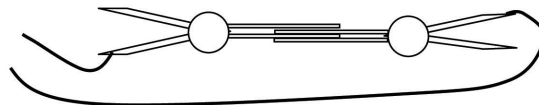
Before measuring, it is usually necessary to clean up. When the zero is cleared, the measuring clips should be clamped and suspended in a short way (do not touch with hands), then press the "exit / clear" button, and the instrument will automatically zero the files.

#### 3.Short clip method

Because the instrument adopts four terminal measurement method, when clearing the zero, the I+ terminal of the measuring clamp must be directly contacted with the I- terminal, the V+ terminal will be directly contacted with the V- terminal, and make the I terminal reliable contact, such as the schematic diagram of short circuit clamping.



Correct schematic diagram of short circuit clip method



Incorrect schematic diagram of short circuit clip method

#### 4. Use of shielded end

In the field with strong external electric field or magnetic field, the measurement is unstable or incorrect due to the interference of external factors. In this case, we need to use shielding ends to measure (shielding method). In the measurement, the measured product can be placed in the metal box, and the shield clamp of the instrument is clipped on the metal box.

Note: at any time you should not contact the shield with other items, such as the measuring clip or the instrument.

### Chapter two : Safety regulations

#### 2.1 general provisions

- The specification quoted by this machine is the regulation of safety class I (the body has a protected grounding terminal).
- Before opening the power switch, Please connect the earthing column on the rear panel of the

instrument to the earth(the size of the connection line is not less than AVR0.75 square millimeter multiple strand lines).

## 2.2 Maintenance and maintenance

### 2.2.1 User maintenance

In order to prevent the electric shock accident, please don't press the lid open the machine in the energized state. If the machine has an abnormal situation, please seek the help of this unit or the designated dealer.

### 2.2.2 Regular maintenance

The input power cord and related accessories of the instrument should be checked and checked at least once a year to protect users' safety. The measuring clamp and measuring line should be checked regularly to ensure the accuracy of the instrument.

### 2.2.3 User modification

The user can't modify the line or part of the instrument by itself, or it will affect the measuring accuracy of the instrument. If it is changed, the guarantee of the machine will automatically fail, and the unit will not take any responsibility. Any spare part that is not approved by this unit can not be guaranteed by the unit. If the instrument that needs to be overhauled is changed, the unit will repair the state of the original design and charge the maintenance cost.

## Chapter three: Installation points

### 3.1 Introduction of installation

This chapter mainly introduces the unpacking, inspection, the use of pre preparation and storage rules.

### 3.2 Unpacking and inspection

The product of our unit is packed in a box packed with foam protection. If the container is damaged, please check whether the appearance of the machine is deformed, scratched or damaged. If there is any damage, please notify the unit or its dealer immediately. And please keep the packing box and the foam to understand the cause of the occurrence. Our service center will help you to repair or replace the new machine. Do not return the product immediately before the unit or its distributor is notified.

### 3.3 Pre use preparation

#### 3.3.1 Regulation of input voltage

2512series of Intelligent DC low resistance tester use 220VAC  $\pm 10\%$ , 47.5Hz-52.HzSingle phase power supply. The correct fuses must be used. Before replacing the fuse, the input power line must be pulled out first to avoid danger.

**Be careful! ! ! The fuse is 0.5A Fuse fuse.****3.3.2 Requirement for input power supply**

Before the input power is connected, it is necessary to confirm whether the power line is properly connected. The power plug on the instrument can only be inserted into a power plug with a ground wire. If the extension line is used, it is necessary to pay attention to whether the extension line is with the grounding wire.

**3.3.3 Environmental conditions used**

Temperature: 0-40°C (32-104° F) 。

Relative humidity: Between 0 to 80%RH.

Height: below 2000 meters above sea level (6500 feet).

**3.4 Storage and transportation****3.4.1 surrounding environment**

25122512 series of Intelligent DC low resistance tester can be stored and transported under the following conditions:

Ambient temperature.....—40 to  $\pm 75^{\circ}\text{C}$

Height.....7620 meters (25000 feet)

This machine must avoid a sharp change in temperature, and a sharp change in temperature may cause the gas to be condensed inside the cell phone.

**Chapter four : technical specifications****4.1 Input specification**

project	Specifications
Voltage	Single phase 220VAC input range $\pm 10\%$
Frequency	input range: 47.5Hz-52.5Hz

**4.2 Output specification**

Project	Measurement range	Measurement current
current	20m $\Omega$ (noly 2512B)	1A
	200m $\Omega$	100mA
	2 $\Omega$	10 mA
	20 $\Omega$	10 mA
	200 $\Omega$	1 mA
	2k $\Omega$	1 mA
	20k $\Omega$	100 $\mu\text{A}$
Resistance meter	Measurement range: 1 $\mu\Omega$ -20k $\Omega$	
	Resolution: 1 $\mu\Omega$	
	Accuracy (20°C $\pm 5^{\circ}\text{C}$ ) : $\leq \pm (0.2\% + 3 \text{ words})$	

### 4.3 General specification

project	specification
Memory device	Memorizing all set parameters
Liquid crystal display	16 * 2 character matrix type with backlight
Use of the environment	working temperature: 0-40℃ relative humidity: 0-75%RH Height: below 2000 meters above sea level
Instrument controller size	90H×280W×220D (mm)

## Chapter five panel and backplane

### 5.1 Panel diagram



### 5.2 Panel description

#### 1. Input power switch (1)

International standards "1" (ON) and "0" (OFF) the symbol is related to the input power switch of the controller.

#### 2. "setting" key

In the settings as the choice to enter the set mode and select the parameters set the operation key.

#### 3. "add" Key

A function key that is used as a numeric input of the parameters when setting the mode.

#### 4. "Shift" key

When setting the mode, as a function key to select the parameters, the measurement range is changed when the test is selected.

In the separation measurement, the instrument will not automatically select the range, and the "shift" key can be used to transform the range. Press a "shift" keyboard once, An increase in the range of the range, When it's on the seventh, The range is converted to the first gear.

#### 5. "Exit / zero" key

In the setup mode, it is used as a function key to leave the set mode. In the test mode as the "school zero" function key.

#### 6. LCD display

16 - word \* 2 - line backlight LCD display, which is used as a display to display data or test state and result.

#### 7. Qualified indicator lamp

In the separation of measurement, the index of qualified products.

## 8. Measuring end (UNKNOWN)

Measuring line socket

**5.3 Backboard explanation**

## 1. Input power supply seat

The working power of the instrument is introduced.

## 2. earthing column

The wiring of the instrument to the earth.

## 3. Input power fuse block

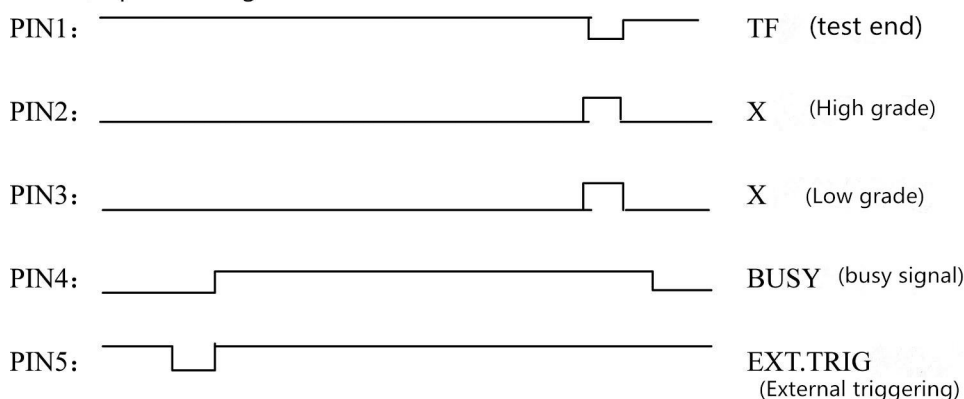
Switch off the input power switch and unplug the power line to replace the fuse and replace the standard fuse.

The communication interface instrument is the DB9/F type socket, and the corresponding plug can be used with the external connection. Each end is defined as the following table:

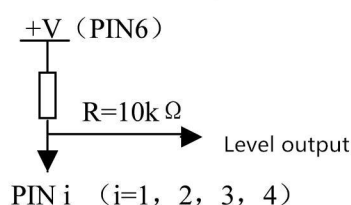
PIN	Signal name	Explain
1	TF	Test end signal
2	RESET	Qualified switch output
3	OUTPUT	Unqualified switch output
4	OUTPUT	Busy signal
5	EXT. TRIG	External trigger signal: low level trigger (2ms~20ms)
6	+V (约 15V)	Isolation from internal power supply (load capacity: 100mA)
7	N.C	RS232 interface standby (PIN7 of computer RS232)
8		RS232 interface standby (PIN8 of computer RS232)
9	GND	Relative to the +V, it is isolated from the internal power supply.

Note: the output signal of this interface is aimed at The measuring method of the instrument has the corresponding signal output when the percentage method is used. There is no output of the corresponding interface signal when the direct reading method is measured.

Time sequence diagram



Note: the external connection mode of the total four output signals of PN1-PN2 as picture





## Chapter six : Chinese and English comparison table

## 6.1 Chinese and English comparison table

Serial number	English words	Corresponding Chinese
1	SET	"Set" key
2	EXIT	"Exit" key
3	INC	"Add" key
4	DISPLAY MODE	display mode
5	DISPLAY R	Display resistance value (direct reading measurement)
6	DISPLAY $\delta$ %	Display percentage error (sorting measurement method)
7	SETTING VALUE	Nominal value setting
8	SETTING LIMIT	Limit set of grade
9	GOOD ALARM	Eligibility alarm
10	ALARM	alarm
11	NOT ALARM	No alarm
12	SHOT PULE	Short circuit measuring clip
13	PRESS SET=CLR	Clean by the SET key
14	INPUT STD. R	Input nominal resistance value
15	TESTING MODE	Measurement method
16	TRIG	Trigger test
17	AUTO	automatic testing
18	GD1 (2, 3)	One (two, three) grade
19	NGD	unqualified
20	CAL No.X RANG? (X=1,2,3,4,5,6,7)	CAL No.X RANG?
21	SET=YES INC=NO	Calibration by the "setup" key; Uncalibration by "add" key
22	RANGE (RAN.)	Range

## Chapter seven: Test parameter setting program

JK2512 Series Intelligent DC low resistance tester has simple and intuitive setting function.

The "set" key is the set key that enters the parameter setting. When you enter the set mode, when you press the "set" key, the program automatically changes the parameter items and rolls in the following order:

Display mode (DISPLAY MODE) setting It is divided into direct reading and percentage Two methods of measurement.

If for direct reading, the next step is set to the test mode (TESTING MODE) setting, divided into AUTO (automatic) and TRIG (external trigger).

If it is for sorting (DISPLAY  $\delta$  %) is carried out in the following order:

Setting the nominal value (SETTING VALUE) setting,

Positive limit of first grade (+  $\delta$  1%) setting,

Negative limit of first grade (-  $\delta$  1%) setting,

Positive limit of two grade (+  $\delta$  2%) setting,

Negative limit of two grade (-  $\delta$  2%) setting,

Positive limit of three grade (+  $\delta$  3%) setting,

Negative limit of three grade (-  $\delta$  3%) setting,

Qualified bee sounding (GOOD ALARM) setting,

Testing mode (TESTING MODE) (Automatic / trigger measurement mode) setting。

In the test parameter setting mode, the "add" key is an increase in the selection key or the flashing bit value of the parameter. The "shift" key is selected as the selection key for the selection of the parameter bits.

In the set mode, the position to be set is flickering continuously, which is added by the "increase" key.

Each "increase" on the display will increase the number of "1" on the display.

Under the set of test parameters, the "exit" ("/ zero") key is used as a function key to leave the test parameter setting mode. In any parameter setting mode, press the exit / Clear button to exit the parameter setting mode, and store the set parameters in the memory body, then automatically enter the measurement state.

In parameter setting, it is not subject to any unreasonable setting and input. There is no change in the instrument when there is an unreasonable input. The "X" in the following parameter setting represents a certain value of the 0-9 range.

## 7.1 Preparation of test parameter setting

In the state of measurement, the display shows:

<div>Rx=X X X . X X m <math>\Omega</math> RAN . X : 10 <math>\mu</math> <math>\Omega</math> — 2 0 0 m <math>\Omega</math></div>	or	<div>OVER RANGE RAN . X : 10 <math>\Omega</math> — 2 0 0 k <math>\Omega</math></div>
Or	Or	
<div><math>\delta</math> % = + X X . X X % NG D Rx=X X X . X X m <math>\Omega</math></div>		<div><math>\delta</math> % &gt; 99.99% OVER RANGEX</div>

注：显示器所显示的类型为 200 m  $\Omega$  量程时的型式。In different range, the display is the same type,

but the content is changed

$R_X = X X X . X X \text{ m}\Omega$  : The measured resistance value.

R A N G E :  $2 0 0 \text{ m}\Omega - 1 0 \mu\Omega$  : Now running range file .

$\delta \% = + X X . X X \%$  G D : The percentage error is measured. The GD on the right is qualified. NGD is not qualified. The qualification is divided into three grades: GD1, GD2 and GD3, and there is acousto-optic warning.

$R_X = X X X . X X M\omega$  : The measured resistance value.

## 7.2 Test parameter setting mode

7.2.1 Display mode settings (direct reading measurement or percentage measurement) (DISPLAY MODE) According to the "set" key, the program automatically enters the display mode setting from the measurement state, and the display shows that:

<div style="border: 1px solid black; padding: 5px; width: fit-content;"> D I S P L A Y   M O D E  D I S P L A Y : R </div>	=	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> display mode  Display: R (resistance value) </div>
Or		
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> D I S P L A Y   M O D E  D I S P L A Y : <math>\delta \%</math> </div>	=	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> display mode  Display: <math>\delta \%</math> (percentage error) </div>

Press the "add" key display to switch between the two types of display. "DISPLAY R" For direct reading test. At the time of measurement, the display only displays the value of the resistance, and does not distinguish "qualified / unqualified". "DISPLAY  $\delta \%$ " is the method of sorting measurement, and the measured resistance value is also displayed while showing the percentage. And the result is judged, showing "qualified / unqualified".

Note: the percentage error shown by the instrument varies by 0.01% of the percentage error calculated according to the value of the direct reading of the instrument. This is a normal phenomenon.(it is caused by a four - house five entry that is not shown in the operation).

Note: in direct reading, only two items are set. In the way of sorting, the following settings can be made.

### 7.2.2 Nominal value setting (SETING VALUE)

After the "set up" key "determine the percentage measurement", the program will automatically enter the "nominal value" setting mode. The display will show:

<div style="border: 1px solid black; padding: 5px; width: fit-content;"> S E T I N G   V A L U E  R A N G E L : <math>1 0 0 . 0 0 \text{ m}\Omega</math> </div>	=	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> Nominal value setting  Range 1 : <math>1 0 0 . 0 0 \text{ m}\Omega</math> </div>
---	---	---

Please select the parameter bits to be modified with the "shift" key. Use the "add" key to change the number you need for the selected bit.

Note: the range 1 may be the range 2, 3, 4, 5, 6, 7, and the units are also changed accordingly.The data is generally not 100.00,It is the value of the previous set.

That is to say, the setting is divided into two parts, the first part is the range, the variable range is

RANGE1—RANGE7; The second part is the basic value part, and the variable range is 00000—20000 (Do not consider the decimal point), For the accuracy of the measurement, the range of change should be 02000—20000.

Example 1.

In the 2512 setting, if the nominal value of the resistance you want to measure is  $10\text{ m}\Omega$ , please set it correctly.

$10\text{ m}\Omega$  should be in the first range (RANGE1) test, When entering the nominal value setting, press the "increase" button to change the range to 1, then press a shift key to make the first digit of the basic value flash, then press the "increase" button to make the value of the bit "0". Then press a shift button to make the second bit flickering, then press the "increase" button to make the second bit 1, and in this way, until the basic value part is changed to  $010.00\text{ m}\Omega$ .

Example two, if the nominal value of the resistance you want to measure is  $15.6\text{ }\Omega$ , please set it correctly.

$15.6\text{ }\Omega$  should be tested in third range (RANGE3), When entering the nominal value setting, press the "increase" button to change the range to 3, then press a shift key to make the first digit of the basic value flash, then press the "increase" button to make the value of the bit "1". Then press a shift button to make the second bit flickering, then press the "increase" button to make the second bit 5, in this way, until the basic value part is changed to  $15.600\text{ }\Omega$ .

### 7.2.3 SETING LIMIT (SETING LIMIT)

In the "nominal value" is set, click "Settings" button, the program will enter the first "very limited" setting mode, the screen will display:

S E T I N G      L I M I T $+ \delta 1\% = \text{X X} . \text{X X}\%$
--

Set percentage error of grade $+ \delta 1\% = \text{X X} . \text{X X}\%$
---

This setting is divided into three grades, each of the upper and lower two limit values totalling six set items. It can be set by selecting any limit by the "set" key.

Please select the number that you need to select with the "shift" key. Use the "add" key to modify the values you need.

The maximum limit for 99.99%, the minimum value is 0.00%; the maximum limit is -0.00%, the minimum value is -99.99%.

In the setting, the upper and lower limit range of the first grade can not be wider than that of grade two, and the upper and lower limit range of grade two should not be wider than grade three. Otherwise, it will cause no significance in the setting of one or two grade products.

### 7.2.4 Eligibility alarm setting (GOOD ALARM)

After the "limit" setting is completed, click the "set" key, the program will enter the qualified alarm setting mode, the display will show:

G O O D      A L A R M A L A R M
-------------------------------------

=

Eligibility alarm setting No alarm
---------------------------------------

or

GOOD	ALARM	=	Eligibility alarm setting
NO	ALARM		No alarm

"ALARM" is in the separation measurement, When the percentage error of the measurement does not exceed the limit of all three grades, it is judged to be qualified and alarm "NO ALARM" is in the sorting measurement, When the percentage error of the measurement does not exceed the limit of all three grades, it is judged to be qualified and not to alarm.

Please use the "add" key to switch the above two display contents and select the status you need.

Notes :Even if it is set to fail to call the alarm, the passing light will always flicker when it is qualified.

#### 7.2.5 Measurement mode setting (automatic measurement or trigger measurement)

After "determining the display mode or the qualified alarm"

Click the "set" button, and the program automatically enters the "measure mode" setting mode. The display will show:

TESTING MODE	=	Test pattern
AUTO		automatic measurement

or

TESTING MODE	=	Test pattern
TRIG		Trigger measurement

Press the "add" key display to switch between the two types of display. "AUTO" is automatic measurement, and "TRIG" is a trigger test. It is not used for automatic control.

#### 7.2.6 Check and exit setting mode for setting parameters and functions

After all the parameters have been completed, the set parameters can be checked according to the "setting". If there is a mistake, we can continue to modify it. To exit the set mode, only press the "exit" key. And the exit is valid in any parameter setting mode. When exiting, the instrument memorizing the parameters that you modify, and will not lose the parameters that you have not changed.

## Chapter eight : Operating procedures and steps

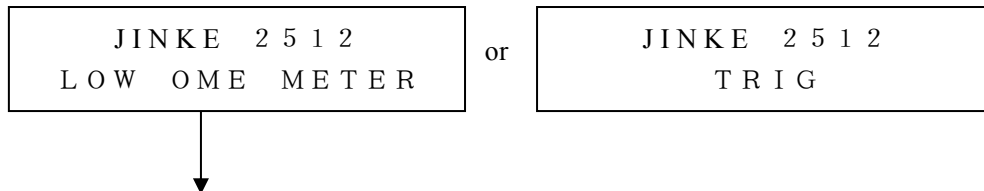
JK2512 Series Intelligent DC low resistance measuring instrument is mainly used to measure the

resistance of contact resistance and low value resistance, and its operation and setting are very simple.

Please operate the instrument according to the following procedures and steps.

8.1 After switching off the power switch of the instrument, connect the power line correctly.

8.2 The power switch of the instrument is opened, and the instrument enters the measuring state after opening the machine.



This is the way to trigger the test. When you do not do external control measurements, please reset the test mode to AUTO.

$R_x = X X . X X m \Omega$   
RAN.1 : 2 0 0 m  $\Omega$  — 10  $\mu \Omega$

or:

$\delta \% = + X X . X X \%$  G D  
 $R_x = X X X . X X m \Omega$

or:

OVER RANGE 7  
RANGE : 1 0  $\Omega$  — 2 0 0 K  $\Omega$

or:

$\delta \% > 99.99\%$   
OVER RANGE 7

8.3 Set the parameters according to your test requirements (see the seventh chapter)

8.3.1 Direct reading measurement

The measured resistance value is displayed during the measurement

8.3.2 Percentage measurement

When the percentage is measured, the display displays the percentage error and the resistance value at the same time. Percentage error is calculated as a percentage error

$$(\delta \%) = (\text{Nominal resistance value} - \text{display resistance value}) / \text{Nominal resistance value} \times 100\%$$

The nominal resistance value is the "SETTING VALUE (nominal resistance value)" in the parameter setting.

Note: the percentage error displayed by the instrument is 0.01% different from the percentage error calculated by the direct message value displayed by the instrument. This is a normal phenomenon (it is caused by four of the five operators who did not show it in operation).

8.4 If the product is to be detected, the resistance value or percentage error of the product can be read by the measurement clip at both ends of the product to be checked.

Under direct reading measurement, the instrument automatically determines the range according to the measured resistance value. Under the test of percentage error, the measuring range is fixed. The

operator can use the shift key to change the measuring range to the appropriate measurement range according to the indication value. Of course, to get the exact grade, it is necessary to set the allowable error range and the nominal value of each grade. What is directly mentioned is that when the instrument is sorted and measured, it not only shows percentage error, but also shows the magnitude of resistance. This provides users with great convenience.

8. 5 There are two kinds of testing methods for this instrument, one is automatic test (AUTO) and the other is a trigger test ((TRIG). That is, a test signal is given outside, the instrument is tested once (see the 5.3.4: communication interface). This function gives the user the convenience of automatic control and on-line measurement. But do not set this function when measuring in a single machine. If it is under this function, the instrument will not be able to measure the resistance (at this time display the "TRIG" character).

## Chapter nine : Calibration procedures and steps

The measurement accuracy of the JK2512 type intelligent DC low resistance measuring instrument has been calibrated in detail before the factory is out of the factory. The index of the instrument is in conformity with the specification of the technical index of the instrument. It is suggested that the unit should be calibrated at least once a year. The standard resistance accuracy of the calibration must be better than 0.05% to ensure the accuracy of the calibrated instrument.

### 9.1 Calibrated instruments and standard resistors

Standard resistance box: when the resistance standard is used, the specification requirements are referred to below.

Test range	Standard resistance value	Resistance precision	Resistance power (W)
RANGE1 (200 m $\Omega$ )	100 m $\Omega$	Better than 0.05%	0.25
RANGE2 (2 $\Omega$ )	1 $\Omega$		
RANGE3 (20 $\Omega$ )	10 $\Omega$		
RANGE4 (200 $\Omega$ )	100 $\Omega$		
RANGE5 (2K $\Omega$ )	1K $\Omega$		
RANGE6 (20K $\Omega$ )	10 K $\Omega$		
RANGE7 (200K $\Omega$ )	100 K $\Omega$		

### 9.2 Standard environment

9.2.1 Temperature : 20°C  $\pm$  5°C。

9.2.2 The working environment requirements of other reference instruments.

### 9.3 Resistance calibration steps

9.3.1 The calibration of the resistance is divided into seven gear. In turn, the following is:  $200\text{ m}\Omega$ ,  $2\Omega$ ,  $20\Omega$ ,  $200\Omega$ ,  $2\text{k}\Omega$ ,  $20\text{k}\Omega$ ,  $200\text{k}\Omega$ . The calibration of the resistance of each gear will be carried out in the mode of man-machine dialogue. The standard resistance used for calibration is recommended to select the resistance parameters in the "standard resistance box" listed in this chapter.

Note: the instrument must be preheated for more than 15 minutes to be calibrated.

9.3.2 At the same time, press the "set" and "shift" keys, and then turn on the power switch.

Instrument display

S H O R T	P U L E
P R E S S	S E T

9.3.3 The instrument displays a reminder of the short circuit clip and then press the "set" button. The instrument is automatically "zero" to each file. The clearing is finished and the instrument is displayed.

C A L	N O . X	R A N G E ?
S E T = Y E S	I N C = N E X T	

Notes : X is a range number, Respectively is 1、2、3、4、5、6、7, Corresponding to each other  $200\text{m}\Omega$ 、 $2\Omega$ 、 $20\Omega$ 、 $200\Omega$ 、 $2\text{k}\Omega$ 、 $20\text{k}\Omega$ 、 $200\text{k}\Omega$  range file.

9.3.4 If you want to calibrate the file, press the "set (SET)" key. If you want to skip this file, press the "increase (INC)" button, the X value will increase by 1, and it will turn to 1 when it is 7.

According to the "set" key, the instrument displays (the first measure):

I N P U T	S T D . R
R A N G E I = 1	0 0 .00m $\Omega$

The next item of the display shows the value of the standard resistance that should be sandwiched on the measuring clip. The value of the display is as follows:

If you do not have a standard resistor that is prompted by the display, It can also be calibrated with the common standard resistance. As long as your standard resistance is measured in this range of measurements. But please note that the standard resistance value is suitable for 40% greater than the corresponding range and not exceeding the maximum value allowed in the range, so as to improve the measurement accuracy in the calibrated measurement.

After the clamp is used to clamp the standard resistance, the "parameter setting" method is used. Using "shift key" and "add" key to modify the "standard resistance parameter" in the display is the true value of the standard resistor that you are sandwiched on the measuring clip. After determining the standard value of input, after setting the key correctly, the file is calibrated.

The seven gear range is calibrated with the same method above.

9.3.5 Call out factory calibration data

After switching off the power, short-circuit the PIN17 and PIN20 of CPU (89XX), then turn on the



power and revoke the short circuit of PIN17T PIN20 (when we do this work, we need to open the instrument cover).When the data is not recognized by CPU, the instrument will also ask for the following work, and you must carry the work through to the end. You can only press the "SET" button in the hints.

According to the "SET" key, the prior unreasonable data will be cleared.In the prompt of waiting for "please wait", the instrument will be saved and the relevant unreasonable data will be cleared.

Do you want CAL?

SET=YES   EXIT=NO

Then the display shows:

According to the "SET" key, the standard data from the factory will be obtained. After waiting for the "please wait" prompt, the instrument will enter the state of measurement.At this point you have to "clean up" the instrument,And must be set up sorting once(it must be done even if it does not need to be selected.)Then, if you need a direct reading test, reset it to a direct reading test mode.

Write FLASH?

SET=YES   EXIT=NO

***Note 1: at any time in the calibration, the "exit" key can be dropped out of the calibration.***

***Note 2: this file is not calibrated when the "set" key is not pressed after the standard value is entered and the "exit" key is pressed directly.***

***Note 3: A calibrated person must be a trained specialist with a specified standard resistance. If the calibration is improper, the accuracy of the instrument will be reduced, and it is very likely that the instrument can not work properly. So the use of the unit should be strictly controlled to make unnecessary calibration.***

- ***It is suggested that the instrument be calibrated at least once a year.***

Function /model	7122 (AC/DCW.I)	7120 (AC/DCW)	7112 (ACW.I)	7110(ACW)
Voltage Withstand Test	Test voltage : AC0-5.00KV;DC0-6.00KV, LCD display			
Current test	AC0-12.00mA;DC0-5.00mA,Lcd display			
Cut off current setting	Upper limit setting and lower limit setting.			
Test time	0-999.9 seconds, 0= time control turn off.			
Slow rise time	Range : 0.1-999.9S。			
ARC Detector	Can Set sensitivity: 0-9 level, 0= turn off.			
Insulation resistance test	7122/7112 apply			
Test voltage	Range : DC0.10-1.00kv。			
High resistance test range	1-1000 m $\Omega$ , Automatic shift			
Discriminant setting	Upper limit setting and lower limit setting.			
General specification	5 sets of test conditions: recalling the keyboard safety lock; using software to calibrate.			

## 7305 AC impedance tester

Output current	Resistance range	Test time	Display mode	Accuracy	Output power frequency
3-30A Program controlled constant current source	0-0.51 $\Omega$ (10A) 0-0.12 $\Omega$ (>10A)	0.5-999.9s 0=continuity	Backlit LCD	$\pm 2\%$	50Hz/60Hz

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