Operating instruction

JK7122+/7110+
JK7123/7305
Voltage insulation grounding tester

Vear2.0

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Chapter One safety regulations

The contents of the instructions are subject to change without notice.
If there is no any detail in the instruction, please contact us directly.

Regulations and matters to be paid attention to before high voltage test!!!

1．1 general provisions

·Before using this tester, please read the instruction manual carefully, understand the operating rules and the relevant safety signs, so as to ensure safety.

·Before turning on the input power switch of the machine, select the correct input voltage (110V or 220V) specification.

Danger signs，Indicates high voltage output. Avoid contact。

Enclosure ground symbol.

WARNING

Caution should be noted that the operation, application or condition of the operation is highly dangerous and may lead to injury or death.

The voltage and current generated by the instrument are sufficient to cause injury to the personnel. In order to prevent accidental injury or death,When moving and using the instrument, be sure to observe it before proceeding.

1． 2 maintenance and maintenance

1．2．1 User maintenance

In order to prevent electric shock, the non professional should not open the cover of the instrument. All parts of this instrument shall not be replaced without permission. If the instrument is abnormal, please contact our designated distributor for assistance.

1．2．2 Periodic maintenance

This series of tester, input power line, test line and related accessories, etc.Check and check at least once a year to ensure operator safety and instrument accuracy.

1．2．3 User modifications

1． The user shall not alter the line or part of the instrument by itself, otherwise the warranty shall be invalid and shall not be liable for the consequences thereof.

2． 3 Test environment

1．3．1 Working position

When operating the instrument, you must ensure that the instrument is placed where the ordinary person can not touch it.If the production line is not possible, the test area must be

isolated from other facilities, with a special indication of the "high voltage test area"".Special attention must be paid to safety if the high voltage test area is very close to the other work areas. "Danger" must be indicated in high voltage test! In the high voltage test, please do not near the non staff."

1．3．2 Input power supply

The tester must have a good grounding. Before testing, the ground wire must be connected to ensure the safety of the operator. Test area power must have a separate switch, installed at the entrance of the test area, to ensure that everyone can identify. Once an emergency occurs, the power can be turned off immediately.

1．3．3 Workplace

Use as much as possible Table for non-conductive material.No metal shall be used between the operator and the subject to be measured.The position of the operator shall not exceed the object to be operated and adjusted. If the volume of the object to be tested is small, place the object to be placed in the non conductive box as far as possible.

The test site must be kept clean and tidy at all times and must not be disorganized. Do not use the instrument and test line, please put in a fixed position, must let all personnel can immediately distinguish the measured object, the tested object and the measured object.

Flammable gases must not be contained in the test area and surrounding air,and You can not use this tester beside flammable materials.

1． 4 Operation staff regulations

1．4．1 Personnel qualification

The voltage and current output by the tester are enough to cause injury or death to the operator in the event of an electrical shock, and must be used and operated by trained personnel.

1．4．2 Safety regulations

The operator must always be educated and trained to understand the importance of various operating procedures and to operate the tester in accordance with safety regulations.

1．4．3 Dress code

Operators can not wear metal decorative clothing or wear metal jewelry and watches, etc., these metal ornaments easily cause unexpected electric shock. Electric shock, the consequences will be more serious.

1．4．4 Medical regulation

The tester must not allow heart disease or A person who wears a heart rhythm regulator operate.

1． 5 test safety procedures

Never use a tester on a live circuit board or on a device!!

The grounding wire of the tester must be connected according to the regulations.When you receive the test line, you must first connect the measured end of the tester to the object to be

tested.Only when the test is done can the high voltage test line be inserted into the high voltage output terminal.When taking a high voltage test line, you must hold it at the insulated part and never hold it on the conductor.Operators must be sure that they can operate independently,Other people can not control the switch and remote control switch,Remote control switch should be placed in fixed position when not in use.Don't put it at will.

WARNING

In the process of testing,Never touch the test Or any object that is connected to the test object.

1． 6 Must remember the following safety points

·Non qualified operators and non related personnel should be kept away from the HV test area.

·safety and order must be maintained at all times in the high-pressure test area.

·In the high-pressure test process Never touch a test object or any object that is connected to the object under test.

·If any problems occur, turn off the high voltage output and the input power immediately.

·In the DC withstand voltage and insulation resistance test, we must first discharge operation, in order to remove the test line work.

Chapter 2 Introduces safety regulations

2. 1 The importance of testing

At a time when consumer awareness is high, every manufacturer of electrical and electronic products must do its utmost to do a good job of product safety.Each product must be designed so that it does not allow the user to have a chance to get an electric shock.Even if the user is wrong, they should not get an electric shock.In order to achieve generally accepted safety requirements, safety tests must be carried out.At present, safety enforcement units, such as UL, CSA, IEC, BSI, VDE, TUV and JSI, require manufacturers to use the"Withstand Voltage insulation tester" for safety testing.

2. 2 Dielectric Voltage Withstand Test

If a product can work well in a very bad environment, it can be sure that it can work well in a normal environment. The most frequently used pressure test is:

·**Functional testing at design time**——Determine the conditions in which the product is designed to meet its functional requirements.

·**Specification testing during production**——Confirm the conditions that the products manufactured can meet their specifications.

·**Quality assurance test -** confirm that the quality of the product conforms to safety standards.

·**Safety test after maintenance -** to confirm that the product after maintenance can meet the safety standards.

Different products have different technical specifications, basically in the pressure test, is a higher than the normal work voltage on the product test, this voltage must last for some time.If a component is within a specified time and the leakage current remains within the specified range, it can be determined that this component will work under normal conditions and should be very safe. And good design and choice of good insulation materials can guarantee the user from electric shock.

The withstanding voltage test made by this instrument is commonly referred to as "high voltage dielectric test", referred to as "withstanding voltage test".The basic requirement is the working voltage +1000V of 2 x to be measured, as the voltage standard of the test.The test voltage for some products may be higher than 2 * working voltage +1000V. For example, some products operate at voltage ranges from 100V to 240V, and the test voltage for such products may be between 1000V and 4000V or higher.In general, a product with a dual insulated design may use a test voltage that is higher than the standard of 2 * working voltage +1000V.

The pressure test is more accurate in product design and sample making than in formal production, Because the product has already decided the product's security in the design test stage. Although only a few samples are used to judge the product design, the on-line test during production should be strictly required, and all products must pass the safety standards to confirm that no defective products will flow out of the production line.

The output voltage of the withstand voltage tester must be within the range of 100% to

120% of the specified voltage.The frequency of the output AC voltage tester must be maintained between 40 and 70Hz,At the same time, the wave peak shall not be less than 1.3 times the RMS (RMS) voltage, and its peak value shall not be 1.5 times higher than the RMS (RMS) voltage.

2．3 The advantages and disadvantages of alternating current (AC) test and direct current (DC) test

Please be with safety unit testing products specified by the confirmation of the product should use what kind of voltage, some products can also accept DC and AC two test, but there are still many products are only allowed to accept a test of DC or AC .If the safety specifications permit simultaneous acceptance of DC or AC tests, the manufacturer can decide for himself which tests are appropriate for their products. To achieve this goal, users must understand the advantages and disadvantages of DC and AC testing.

2．3．1 AC withstand voltage (ACW) test features

Most of the items to be tested for resistance will contain stray stray capacitances. The AC test may not be full of stray capacitors, and there will be a constant current flowing through these capacitors.

2.3.1.1 The advantages of AC withstand voltage (ACW) test

1. Generally speaking, AC test is easier to be accepted by safety unit than direct current test. The main reason is that most products use alternating current, while AC testing can test both positive and negative polarity of the product at the same time. It is in accordance with the environment used by the product and conforms to the actual use.
2. Because the AC test cannot charge the stray capacitance, But there will be no instantaneous impact current,Therefore, there is no need to let the test voltage rise slowly,You can add full voltage at the start of the test.Unless this product is sensitive to impact voltage.
3. Because AC tests cannot fill those stray capacitors,There is no need to test the discharge of the test, after testing,This is another advantage.

2.3.1.2 Disadvantages of AC testing

1. the main disadvantage is that if the stray capacity of the object to be measured is very large or the measured matter is a capacitive load, the current generated will be much larger than the actual leakage current, so that the actual leakage current can not be known.
2. Another drawback is the current needed to supply stray capacitance of the object to be measured,The output current required by the instrument is much higher than that used in the DC test. This increases the risk of the operator.

2.3. 2 DC （DC）Test features

In the DC withstand voltage test, the stray capacitance of the object to be measured is filled,The capacitive current caused by DC withstand test will fall to zero when the stray capacitance is full.

2.3.2.1 The Advantages of DC（DC）test

1.once the stray capacitance of the object to be detected is full, only the actual leakage current of

the object to be detected will be left. The DC withstand voltage test can clearly show the actual leakage current of the object to be measured.

2. another advantage is that it only takes a short time,supplly Charging current for Object to be measured,The current needed at other times is very small, so the current capacity of the instrument is much lower than the current capacity required for AC withstand voltage testing.

2.3.2.2Disadvantages of direct current (DC) test

1.Unless there is no capacity of object to be measured, otherwise the test voltage must be "zero" began to rise slowly, to avoid the charging current is too large, the greater the capacity required for the slow rise time is longer, The voltage that can be increased at one time is lower. When the charging current is too large, it will cause the misjudgment of the tester and make the test result incorrectThe DC withstand test will charge the analyte,

1. Therefore, after testing, you must first treat the discharge of the test, then you can do the next step.
2. unlike AC testing, DC withstand test can only be a single polarity test. If the product is to be used under AC voltage, this drawback must be considered. This is also the reason why most safety units recommend the use of AC withstand voltage testing.
3. in AC test, the peak value of the voltage is 1.4 times that of the meter, which is not shown by the general meter, and can not be reached by the DC voltage withstand. Therefore, most safety units require that if the DC withstand voltage test is used, the test voltage must be increased to equal value.

2.4 Insulation resistance test

Main measurement of insulation resistance test between a wire and a shell.The measurement is based on Ohm's law, adding a voltage between the wire and the shell, then measuring the voltage and current values, and then calculating the resistance according to Ohm's law.Usually a larger constant voltage (DC 500V or 1000V) is applied and maintained for a specified period of time as a test standard. If the resistance is kept within the specified specifications within a specified period of time, it is possible to operate under normal conditions and the appliance should be safer.

The higher the insulation resistance, the better the insulation of the product. An equivalent resistance value formed by an associated network of insulation values between two test points and their peripheral connections measured by the insulation resistance test.

However, the following conditions cannot be detected by the insulation test:

The insulating strength of the insulating material is too weak;

There is a pin hole on the insulator;

There is not enough distance between the parts;

The insulator was squeezed and burst;

The above conditions can only be detected by withstand pressure test.

2.5AC grounding resistance test

The grounding resistance test mainly measures the resistance of the contact point between

the grounding wire and the shell.The measurement is based on Ohm's law, which flows through a current at the point of contact, then measure the voltage of the current and the contact point, and then calculate the resistance according to Ohm's law.It usually flows through a larger current,The abnormal current occurred when the simulator is abnormal As a test standard.

If the contact resistance of the grounding wire on the appliance Through this kind of harsh environment test, under the normal use condition, this appliance should be safer.

Different products have different technical specifications,Basically, the safety code requires a constant current across the point of contact,The current must be maintained for a specified period of time,If within the stipulated time,The resistance of the contact point is kept within the specified range and can be determined to operate under normal conditions,The appliance should be safer, and properly designed and properly constructed, the user can be protected from accidental electric shock.

Although measurement of contact resistance can be measured with a general resistance meter, the current output by the ohmmeter is usually very small and does not meet the requirements of the safety regulations and can not be recognized by the safety inspection institution,Measurements must be made using a dedicated grounding resistance tester.For general users will often touch, the grounding resistance test specification in addition to the CSA requirements of 30 amps, most of the security agencies are required to 25 amperes, at the same time must be current for 60 seconds, and the resistance value must be maintained in the following 100m.Specifications for appliances that are difficult to touch by users are usually relatively loose and require a total current of 10 amperes, whereas the resistance at the contact point needs less than 500m ohms, but the time is still 60 secondsSome international standards are still higher than those mentioned above, The standard for device testing is 5 times the rated input current, while the contact point resistance is still 100m ohms, and the test time is 60 seconds. Most of these machines are of the type of electrical machinery and are of higher risk, so specifications are required to be higher than conventional appliances.

In the current world safety regulations, some special requirements are to measure the contact resistance of grounding wire first,Only when the resistance of the contact point must meet the requirements can the insulation withstand voltage test be carried out. This is mainly in order to prevent the grounding wire is not good, and mistakenly think of insulation or pressure well.

The grounding resistance tester has two output forms: AC and dc,The resistance values of the contact points can be correctly measured in the two forms, but the two forms are significantly different for the destructive contact points.Because the calculation of the resistance is based on the effective value of the voltage and current,The RMS value of the direct current is the same as the peak wave value,However, the peak value of the AC wave is 1.414 times the effective value,So the AC current at the crest is 1.414 times that of the dc.In exchange for the comparison of peaks produced by the two contact points for energy, in accordance with the power of the theorem (X = square resistance power current) calculation, AC wave moment generated by the contact point for 2 times as much energy as dc.

At present, the security inspection agency allows two types of grounding testers to be used, However, in the selection of grounding resistance tester specificationsAC grounding resistance testers are particularly recommended.Secondly, most of the appliances are supplied by city power, while the city electricity itself is alternating current. Therefore, the AC grounding resistance tester is used as the testing standard, which is in line with the actual conditions of use.

If you have problems with the use of instruments or instrument related problems, please call Advisory

Chapter three Technical index

3.1 Product introduction

Programmable voltage insulation grounding tester is a test instrument for testing safety parameters of electronic products. Can be used in household appliances, electronic instruments, electronic equipment, electronic components, wires, cables and other electrical products, voltage and insulation testing.

This series of products have qualified / unqualified identification function, sound and light alarm function and test time automatic control function, etc. it has the advantages of simple operation, beautiful appearance, high flow speed and quick cutting speed. The utility model is an ideal withstand voltage insulation detecting instrument.

3.2 Technical index

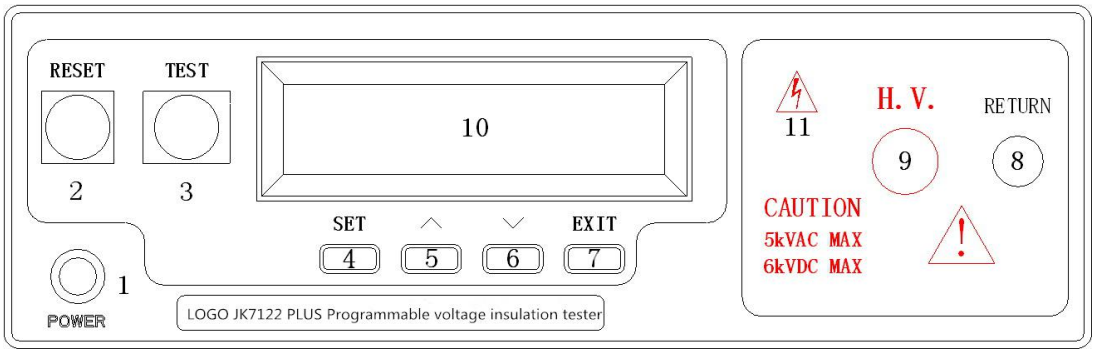
Function	Function description
Input characteristic	Voltage ： 220VAC，±10%，Single phase, selectable Frequency：47-63Hz Fuse：4A/250VAC
AC withstand voltage test	Rated output：5KV AC
Output frequency	50 or 60Hz, selectable
Output waveform	Sine wave, 1.3< crest factor <1.5
leakage current Ceiling setting	Range ：0.01-20.00mA Resolution: 0.01mA Accuracy:± (2% set value +2 words)
leakage current Lower limit setting	Range：0.00-20.00mA Resolution: 0.01mA Accuracy: ±(2% set value +2 words)
DC withstand voltage test	Rated output：6KV DC

leakage current Ceiling setting	Range：0.01-10.00mA Resolution: 0.01mA Accuracy: ± (2% set value +2 words)
leakage current Lower limit setting	Range ：0.00-10.00mA Resolution: 0.01mA Accuracy: ± (2% set value +2 words)
Voltage setting	Range：0-5000V AC 0-6000V DC Resolution: 1V Accuracy: + (2% setting value +5V)
voltage stability	±(1%Setting value+5V)
Delay time	Range：0.1-999.9S
	resolution：0.1S
	Accuracy：±(0.1%Setting value+0.05 S)
Test time	Range：0.5-999.9S，0 for continuous testing
	resolution：0.1S
	Accuracy：±(0.1% Setting value+0.05 S)
Voltage display	Range：0-5.00KV AC 0-6.00KV DC resolution：0.01KV Accuracy：±(3% shows the value of +3 words)
Current display	Range：0.01-20.00mA AC 0.01-10.00mA DC resolution：0.01mA Accuracy：±(2% shows the value of +3 words)
Insulation resistance test	Rated output：1000V DC
Voltage setting	Range：500 - 1000V DC resolution：100V Accuracy：±(2% Setting value+5V)
Voltage display	Range：0.50KV – 1.00KV DC resolution：0.01KV Accuracy：±2%shows the value of
Resistance display	Range：1.000 - 2000MΩ Accuracy：±(5%shows the value of +3 words)（1-1000MΩ） ±(10%shows the value of +3words)(1000-2000MΩ)
Resistor upper limit setting	0-2000MΩ，0 is not judgment
Lower limit resistor setting	1.0-999.9MΩ
Decision delay time	Range：0.8 - 999.9 S ,0 for continuous resolution: 0.1S Accuracy: + (0.1% display value +0.05, S)
Earth resistance test	Voltage output：<7VAC
Peak current display	3.0~30.0A, ±(3% shows the value of +3words)

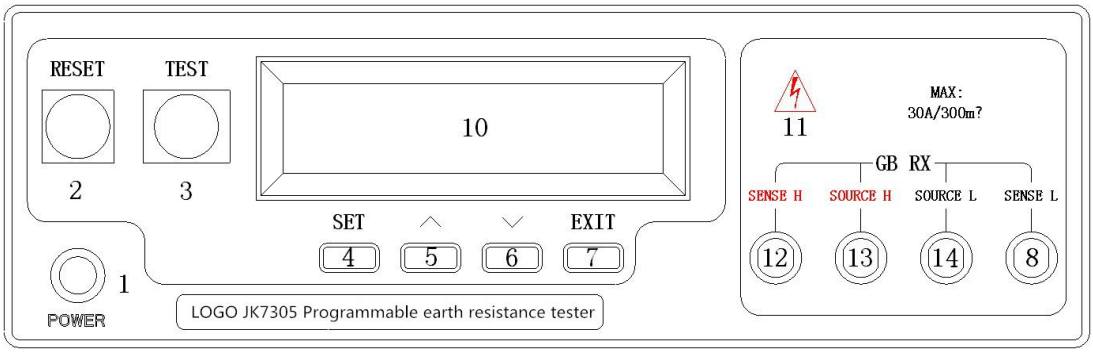
Grounding resistance Ceiling setting	1 ~ 300 mΩ（3 ~ 10A） 1 ~ 120 mΩ（11 ~ 30A）
Grounding resistance Lower limit setting	0 ~ 300 mΩ（3 ~ 10A） 0 ~ 120 mΩ（11 ~ 25A）
Resistor display	0 ~ 300mΩ
Trest time	0.5 ~ 999.9 S ， 0 is continuous

Model	**JK7123**	**JK7122+**	**JK7110+**	**JK7120+**	**JK7305**
Function description	**withstand voltage test Insulation test Grounding test**	**AC withstand voltage test DC withstand voltage test Insulation test**	**AC withstand voltage test**	**AC withstand voltage test DC withstand voltage test**	**Grounding test**

3．3．1 Front panel description



JK7122+/JK7110+/JK7120



JK7305

1．Power switch: instrument work, power input switch.

2．reset switch

The red instantaneous contact switch contains an indicator light for test failure (FAIL). Its function is:

When setting the mode, the switch is used as the setting off mode;

The switch can be used as a break test when the test is in progress;

At the end of the test, the switch is displayed as the exit test to enter the next state to be tested;

The red indicator light is on when the subject has failed to pass the test.

3．Start switch

The green instantaneous contact switch contains a test pass (PASS) indicator light. Its function is:

Starting switch as output of test voltage;

The green indicator light is on when the object to pass the test.

4．SET key

In the pending state, the function key is entered as the setting mode;
When setting the model, it is used as the function key to select the test parameter item;
In the correction mode, the function key is used as the select correction parameter item;
When connecting tests, as a function key to view the test results.

5．+ key

A function key that is selected as a parameter group when the test state is to be measured;
A function key that is used as parameter for each test parameter in parameter setting;
In correction mode, the function key is entered as a standard value.

6．- key

A function key that is selected as a parameter group when the test state is to be measured;
A function key that is used as parameter for each test parameter in parameter setting;
In correction mode, the function key is entered as a standard value.

7．EXIT key

When setting the mode, the function key is left as the setting mode and the setting value is saved;
In the correction mode, the function key is used as the output to close and save the standard value.

8．The tested end: as the loop test end of the tested component,With 9 combinations test voltage and insulation resistance; with 12, 13, 14 combination test grounding resistanc

9．High voltage output terminal

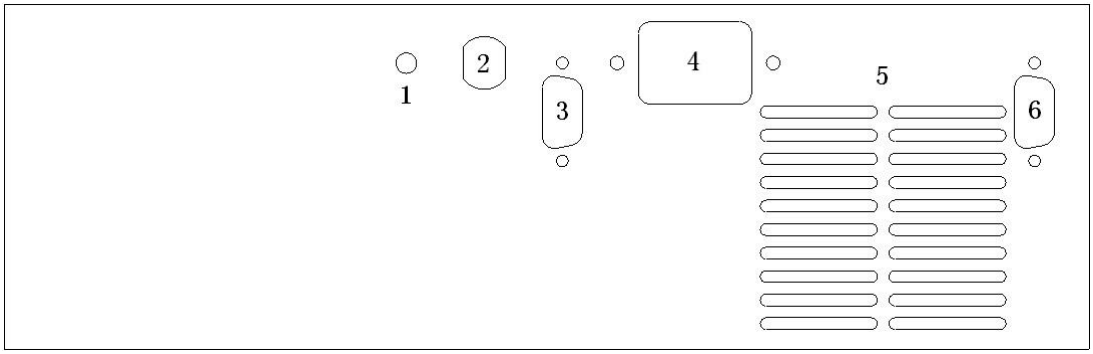
The special output terminals can withstand high voltage within 10KV. High voltage test end as tested.

10．LCD display

20 word x2 line backlit LCD display for setting data or test results.

11. Test execution

When the instrument starts the output voltage, the indicator light in the high voltage sign flashes, indicating "high voltage outputting " and "danger".



3．3．2 Rear panel instruction

1．Ground terminal

The earthing terminal of the machine must be properly earthed to ensure the safety of the operator.

2．Input power fuse holder

Note that the first switch off the input power switch, disconnect the power plug, in order to replace the fuse, and should replace the standard specifications of the fuse (10A /250VAC).

3. Remote control signal terminal (PLC) interface

It's a standard 9PIN D type terminal block.Provide normally open (N.O.) contact to PASS (test passed), FAIL (test failure) remote control monitoring signal and TEST (start) and RESET (reset) control contacts.

4.input Power supply socket

The standard input power outlet provides the power supply for the instrument and the input voltage is AC220V.

5．Instrument cooling hole

Used to emit heat inside an instrument.

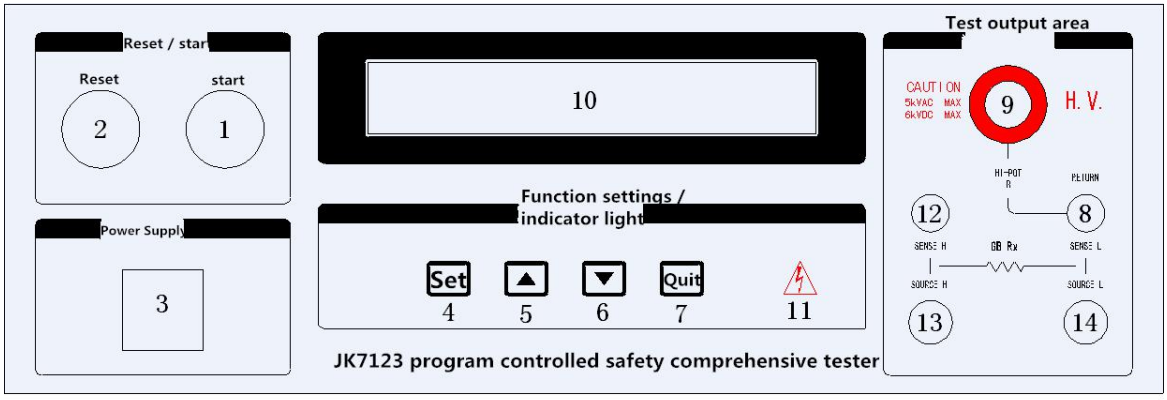
6.RS232 interface

Used to connect the computer, the use of supporting software parameters of the instrument settings, test changes in the state.

Chapter four　　panel description

4．1 Front panel structure

4．1．1 Front panel schematic drawing



4．1．2 Front panel description

1．Start switch

The green instantaneous contact switch contains a test pass (PASS) indicator light. Its function is:

Starting switch as output of test voltage;

The green indicator light is on when the object to pass the test.

2．Reset switch

The red instantaneous contact switch contains an indicator light for test failure (FAIL). Its function is:

When setting the mode, the switch is used as the setting off mode;

The switch can be used as a break test when the test is in progress;

At the end of the test, the switch is displayed as the exit test to enter the next state to be tested;

The red indicator light is on when the subject has failed to pass the test.

3．Power switch

Instrument work, power input switch.

4．SET key

In the pending state, the function key is entered as the setting mode;

When setting the model, it is used as the function key to select the test parameter item;

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When connecting tests, as a function key to view the test results.

5．+ key

A function key that is selected as a parameter group when the test state is to be measured;

A function key that is used as parameter for each test parameter in parameter setting;

In correction mode, the function key is entered as a standard value.

6．- key

When the test state is to be measured,The function key that is selected as a parameter group;

When the parameter is set ,A function key that is used as data for each test parameter;

In correction mode, the function key is entered as a standard value.

7．EXIT key

When setting mode, as leave setting mode And save the settings function keys;

In the correction mode, the function key is used as the output to close and save the standard value.

8．Measured end

As the loop test end of the tested component,With 9 combinations test voltage and insulation resistance; with 12, 13, 14 combination test grounding resistance.

9．High voltage output terminal

The special output terminals can withstand high voltage within 10KV. High voltage test end as tested.

10．LCD display

20 word x2 line backlit LCD display,Used to display set data or test results.

11. Test execution

When the instrument starts the output voltage, the indicator light in the high voltage sign flashes, indicating "high voltage outputting " and "danger".

12.Grounding resistance test, high end

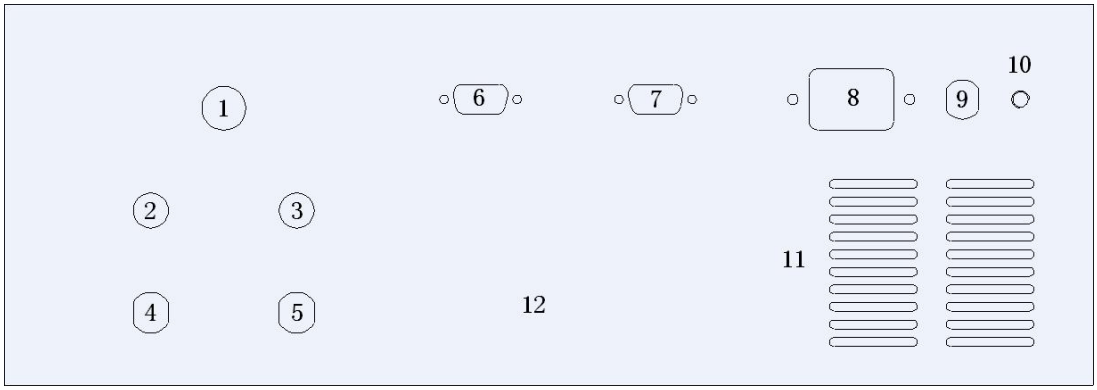
Check the grounding resistance value with the 8 combination.

13/14. ground resistance current output

Output 3-30A AC current.

4．2　JK7123 Rear panel structure

4．2．1 JK7123 Sketch map of rear panel



4．2．2 Rear panel instruction

1~5 output interface (standby) with

6. remote control signal terminal (PLC) interface

It's a standard 9PIN D type terminal block. Provide normally open (N.O.)The remote control signal for the PASS (test through) and FAIL (test failure) And TEST (start) and RESET (reset) control contacts.

7.RS232 interface

Used to connect the computer, the use of supporting software parameters of the instrument settings, test changes in the state.

8.Input power outlet

The standard input power outlet provides the power supply for the instrument and the input voltage is AC220V.

9．Input power fuse holder

Note that the first switch off the input power switch, disconnect the power plug, in order to replace the fuse, and should replace the standard specifications of the fuse (10A /250VAC).

10．Ground terminal

The earthing terminal of the machine must be properly earthed to ensure the safety of the operator.

11. Instrument Radiating hole

Used to emit heat inside an instrument.

12. Nameplate

Display date of manufacture, instrument number and company name

Chapter five operation procedure and procedure

5. 1 Operation instructions

This series of voltage insulation test instrument is mainly used for general production line or quality inspection, and its operation and setting are very simple. Unreasonable settings and operations will not respond.

5. 2 Operation steps

1. Please operate the instrument in accordance with the following procedures and steps :

Before the plug of the instrument's power cord is connected to the mains power supply ,Please turn off the instrument inputt "power switch" first",Switch the voltage selection switch on the rear panel to the correct input voltage position and check that the fuse is correct. Then connect the ground wire to the "ground terminal" on the rear panel of this instrument.The input power line is connected to the socket of this instrument. Please don't connect the high voltage test line to the high voltage output end of this instrument.

2. Connect the test line of the object to be tested, then connect the loop line to the end of this instrument,Finally, connect the high tension test line to the high voltage terminal of the instrument and check whether all the test lines are properly connected.

3. open the input of this instrument "power switch", after the program shows the type of instrument Will automatically display the last test of the instrument when the group and test parameter message, and enter the test and parameter setting mode, at this time the display will appear:

AC withstand voltage test

ACW	SETUP	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	SETUP	XXX.XS
MX	X.XXKV	XX.XXmA

Insulation resistance test

IR	SETUP	XXX.XS
MX	X.XXKV	XXXXMΩ

Earth resistance test

GND	SETUP	XXX.XS
MX	XX.XXA	XXXmΩ

4.If you want to reset the test parameters, press the "SET" button for parameter settings, detailed settings and steps, refer to the "test parameter settings" instructions.

5. Press the start switch again, and output high voltage, red on panel“ ”The high voltage indicator light next to the sign flashes and the timer starts clocking simultaneously. Do not touch the object to be tested while testing.

6. When the test is completed, the instrument will automatically turn off the output, and the green indicator light will start on the switch.In the meantime, a "beep" sound indicates that the test object has passed the test, and the monitor will show "PASS" and the data of the test result.If you want to continue testing, you can press the start switch again. If you want to see the original settings, press the reset switch, the program will immediately clear the test results and show the original settings.

7. If you want to abort the test during the test, press the reset switch, and the instrument will stop the test immediately, and the monitor will retain the test value at that time.If you want to continue testing, press the start switch, and the program will restart the test from the original starting point.

8. If the test of the object to be tested fails, the instrument will stop testing immediatelyAnd the display will display its status and the value of the failure, the red reset switch on the indicator light, while continuing to issue "beep" warning sound.You can press the reset button to turn off the alarm sound. If you want to continue the test, press the start switch again. For information on various displays, refer to the "display information" instructions.

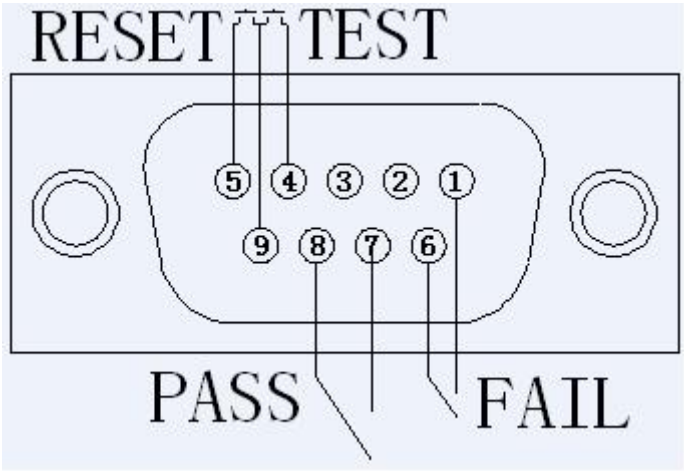
9. If you want to operate the tester with an external remote control, connect the remote control to the remote control input terminal on the rear panel.The functions and functions of the TEST and RESET switches on the remote control are exactly the same as those of the start and reset switches on the front panel of the instrument.Due to the start and reset switch of this instrument and The TEST and RESET switches of the remote control can be operated at the same time, Therefore, the remote control must be properly kept and can not let the non operating personnel have the opportunity to contact the remote control, in order to avoid accidents.

10. The tester has the output of PASS (test through) and FAIL (test failure) signal,These signals can be connected to the control center to monitor and remotely monitor the signals of the instrument.

Chapter six Remote input and output signals

6．1 Input and output signals

On the back of the tester, there is a remote monitoring and remote control terminal,It can monitor the working state of the instrument to the monitoring center,And can be connected to the remote control for operation.This terminal is standard 9PIN D type terminal block, containing PASS (test passed),FAIL (test failure) and other two monitoring signal output and TEST (start), RESET (reset) two remote control input signal.



6．2Remote control output signal wiring and instructions

The tester provides two normally open (N.O.) contact signals,They are supplied by two relays inside the instrument, and the capacity of the contacts is: AC250V l.0A/ DC250V 0.5A， hese contacts are not limited by positive and negative polarity,And each signal is independent of the wiring,There is no common ground wire .The terminal block is marked with pin numbers,The output signal is wired as follows:

PASS signal: the output signal is connected between PlN7 and PIN8.

FAIL signal：The output signal is connected between PlN1 and PIN6.

6．3 Remote input signal wiring instructions

The tester is equipped with remote control contact,The TEST (start) and RESET (reset) functions of the instrument can be operated by an external remote control device.The "momentary contact" switch must be used as the controller.Please pay special attention to it and never connect to any other power supply,If access to other power supply, it will cause damage or malfunction of the internal circuit of the instrument.The terminal block is marked with pin number. The detailed wiring is as follows:

1.TEST control: the control switch is connected between PIN4 and PIN9

2.RESET control: switch between PIN5 and PIN9

Chapter seven Automatic discharge circuit

7．1 Discharge principle

When tested,especially the DC withstand voltage test, the measured objects and the circuit will retain a great deal of energy,Must be discharged first to do test line removal and so on.After the test has been completed, the program automatically drives the discharge circuit. Within 0.2 seconds or so, all the energy remaining on the analyte and the circuit will be discharged. The total capacitance that a discharge circuit can withstand is as follows：

Maximum discharge capacitance： 0.2uF -----When the output voltage ≤1KV
0.1uF -----When the output voltage≤2KV
0.06uF ----When the output voltage≤3KV
0.05uf ---When the output voltage≤4KV
0.04uf ---When the output voltage≤5KV
0.0l5uF ---When the output voltage≤6KV

7．2 Matters needing attention

If the range of capacitance corresponding to the output voltage is exceeded, the automatic discharge circuit will suffer damage and cause a fault. Please pay special attention not to exceed the allowable capacitance of the discharge.

Please note that if the input power is switched off automatically, the automatic discharge circuit will not work and the tested object will not be discharged. The input power should be avoided during testing.

Chapter eight , test parameter setting and display

8．1 Test parameter specification

After power on, the program automatically enters the parameters set at the last test before the last shutdown, and the LCD will display:

AC withstand voltage test

ACW	SETUP	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	SETUP	XXX.XS
MX	X.XXKV	XX.XXmA

Insulation resistance test

or

IR	SETUP	XXX.XS
MX	X.XXKV	XXXXMΩ

Earth resistance test

GND	SETUP	XXX.XS
MX	XX.XXA	XXXm Ω

Prompt Explain

ACW：represents AC withstand voltage test

DCW：represents DC withstand voltage test

IR：representsInsulation resistance test

GND：representsEarth resistance test

SETUP：Prompt information,，Represents the current state of being tested or parameter set variable declaration

MX：Parameter groups (1-3)

XXX.X S：Test time

X.XX KV：Output voltage setting

XX.XX mA：Leakage current upper limit value

XXXX MΩ：Upper limit of insulation resistance

XX.XXA：AC current value

XXXmΩ：Upper limit of grounding resistance

(the following variables are the same as above)

The "SET" key is the parameter item setting key,when to be measured and parameter setting mode,Every time the "SET" key is pressed,Will change the parameter settings to the next setting.Press the "EXIT" button, you will automatically set the test parameters the into memory card；Press the “reset ”switch The setting is invalid.Test parameters stored in memory,After the input power is turned off, it is still reserved and will not be removed,Unless it's been artificially reset.

“+”and “-” is the input key for the operation key and parameter value selected by the group.

“+”key：When you press this button, the number is reduced.but “-”key：When you press this button, the number is reduced.Each time the "+" and "-" key is pressed, the last digit on the monitor will "increase by "1 "or "decrease by "1",If you continue to press Increase decrease and hold more than 10, will quickly "increase by 10" or "reduce by 10",If you press and hold continuously more than 100,It will quickly" increase by 100 "or "decrease by 100",After

releasing the button, it will return to the initial rate.

In the process of setting up the test parameters，If you do not have to reset all of them,After any step is completed, press the "EXIT" button to leave the test parameter setting mode, the program will automatically enter the mode to be tested, and set the test parameters into the memory.The program does not accept unreasonable settings and inputs. In the following parameter setting instructions, "X" stands for any number between 0-9.

8．2 Test parameter setting:

After power on, the program will automatically enter the last time before the shutdown, the last test set parameters, the LCD will display:

AC withstand voltage test

ACW	SETUP	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	SETUP	XXX.XS
MX	X.XXKV	XX.XXmA

Insulation resistance test

or

IR	SETUP	XXX.XS
MX	X.XXKV	XXXXMΩ

Earth resistance test

GND	SETUP	XXX.XS
MX	XX.XXA	XXXmΩ

1.Group setting

Press "+" or "-" key,The program automatically displays the parameters set by the previous group or the next group.

2.Test parameter setting

Parameter setting is to use the SET key as the selection key for the parameter item, and then enter the next parameter item each time.AC / DC withstand voltage test order: test mode selection 、Set the output voltage、Leakage current upper limit setting、Leakage current limit setting、Rise time setting、Test time setting、Output frequency selection (DC withstand voltage test without this item),Arc sensitivity setting and connection test setting； The test sequence of insulation resistance is： Test mode selection, output voltage setting,setting upper limit of insulation resistance,Setting lower limit of insulation resistance,Delay determination, time setting, and connection test settings.The sequence of grounding resistance is Output current setting,Earthing resistance upper limit setting,Earthing resistance lower limit setting,Test time setting,Output frequency setting and Connection test settings.

3.Test mode (Test Mode)selection

After pressing the "SET" key, the program will enter the test mode selection, and the LCD will display:

AC withstand voltage test

```
Test Mode   =   ACW
Select   by  ∧  or  ∨
```

or

DC withstand voltage test

```
Test Mode   =   DCW
Select   by  ∧  or  ∨
```

Insulation resistance test

or

```
Test Mode   =   IR
Select   by  ∧  or  ∨
```

Earth resistance test

```
Test Mode   =   GND
Select   by  ∧  or  ∨
```

Please use the "+" or "-" key on the panel,Enter the test mode you want to set: ACW, DCW, IR, or GND.

4.Output voltage and current setting

After The test mode selection is complete and pressing the "SET" key,The program will enter the AC / DC withstand voltage orOutput voltage setting mode of insulation resistance test or Output current mode of ground resistance test，The LCD will show:

AC withstand voltage test

```
Voltage =   XXXXV
Range:0-5000
```

or

DC withstand voltage test

```
Voltage =   XXXXV
Range:0-6000
```

Insulation resistance test

or

```
Voltage =   XXXXV
Range:500-1000
```

Earth resistance test

```
Current   =   XX.XXA
Range:3.00-30.00
```

Please use the "+" or "-" key on the panel to enter the output voltage or current you want to set.

5.Leakage current or insulation resistance upper limit (HI-Limit) setting

After the output voltage setting is complete and press the "SET" button,The program will enter the AC / DC withstand test leakage current Or insulation resistance upper limit setting mode Or ground resistance upper limit setting mode, the LCD will display:

AC withstand voltage test

```
HI-Limit =   XX.XXmA
Range:   0.01-12.00
```

or

DC withstand voltage test

```
HI-Limit =   XX.XXmA
Range:   0.01-6.00
```

Insulation resistance test

or

HI-Limit = XXXXM Ω
Range: 0-2000 0=OFF

Earth resistance test

HI-Limit = XXXm Ω
Range:1-300

Please use the "+" or "-" key on the panel to enter the upper limit you want to set.If the upper limit of the insulation resistance is set to "0", the program does not determine the upper limit of the insulation resistance.

6.Leakage current or insulation resistance lower limit (LO-Limit) setting

After completing the upper limit of the leakage current or the insulation resistance of the AC / DC withstand test and pressing the "SET" key,The program will enterLeakage current of AC / DC withstand voltage test or Setting lower limit mode of insulation resistance Or ground resistance lower limit setting mode, the LCD will display:

AC withstand voltage test

LO-Limit = X.XXmA
Range: 0.00-12.00

or

DC withstand voltage test

LO-Limit = X.XXmA
Range: 0.00-6.00

Insulation resistance test

or

LO-Limit = XXX.XM Ω
Range: 1.0-999.9

Earth resistance test

LO- Limit = XXXmA
Range: 0-300

Please use the "+" or "-" key on the panel to enter the lower limit you want to set.

7.Ramp Time(Ramp Time)setting

After completing the upper limit of the leakage current or the insulation resistance of the AC / DC withstand test and pressing the "SET" key,The program will enter the slow down time setting mode, and the LCD will display:

AC / DCwithstand voltage test

Ramp Time= XXX.XS
Range: 0.1-999.9

Note: insulation grounding resistance test without this function, the program will automatically skip the setting, and go directly to the next seplease use the "+" or "-" key on the panel to enter the set delay time. The unit is seconds.

8.Dwell Time(Dwell Time) setting

After the delay time setting of the AC / DC voltage test is completed and press the "SET" key, the program will enter the test time setting mode, and the LCD will display:

AC / DC withstand voltage or ground test

Dwell Time = XXX.XS
0.5-999.9 0=Constant

Note:Insulation resistance test without this function, the program will automatically skip this setting, and go directly to the next set.Use the "+" or "-" key on the panel to enter the value of the test time you want to set. The unit is seconds.If the test time is set to "0", the test will continue without stopping,Unless the test is failed or the test is stopped artificially. Otherwise, it will not automatically abort.

9Deferred decision time (Delay, Time) setting

After the lower limit of the insulation resistance is set and press the "SET" key, the program will enter the setting mode of the delay judgment time, and the LCD will display:

insulation resistance test

Delay Time = XXX.XS
0.8-999.9 0=Constant

Note： AC / DC voltage test and ground resistance test do not have this function, the program will automatically skip this setting, and go directly to the next setting.Please use the "+" or "-" key on the panel to enter the set delay decision time value, in seconds.If the test time is set to "0", the test will continue without stopping,Unless the test is failed or the test is stopped artificially. Otherwise, it will not automatically abort.The setting time of the delay is that the majority of the objects are capacitive and produce a large charging current,After the charging current is stable, the delay judgment time can be judged.

10.Output frequency (Frequency) setting

After the AC voltage test time setting is completed and press the "SET" key, the program will enter the output frequency selection mode, and the LCD will display:

AC withstand voltage and ground resistance test

Frequency = 50 Hz
Select by ∧ or ∨

Note:DC voltage and insulation resistance test without this function, the program will automatically skip the settings, and directly into the next set. Please use the "+" or "-" key on the panel to select the output frequency "50" or "60" Hz.

11Connection test (Connect) settings

In the AC / DC voltage arc sensitivity or insulation resistance delay decision time setting is

completed and press the "SET" key,The program will enter the connection test setting mode, and the LCD will display:

CONNECT = YES
Select by ∧ or ∨

Please select the connection test as "YES" or "NO" using the "+" or "-" key on the panel". If the connection test is set to "YES", the test will automatically connect to the next group and continue the test after the test has been completed,The maximum number of connections is 3 times.If it is set as "NO", the test will be stopped immediately after the test is completed and not connected to the next group test. When connected to the test set to "YES",The program automatically displays the symbols in the group after _",Indicates that this group is tested and connected to the next set of tests.This is the last step in the parameter setting, and you can press the "SET" button to return to the first parameter setting stepPress the "EXIT" button to hold the data or press the “reset” button not to hold the data and leave the parameter setting mode,The program automatically calls the test parameters of the current group, enters the model to be tested, and is ready for testing.

8．3 LCD information

Following is the equipment in the implementation of AC / DC withstand voltage or insulation resistance test, will appear on the display of various types of information, as follows.

1.Parameters to be measured and set mode（SETUP）

The following display information indicates that this instrument has entered the AC / DC withstand voltage or insulation resistance or grounding resistance to be measured and the parameter setting mode:

AC withstand voltage test

ACW	SETUP	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	SETUP	XXX.XS
MX	X.XXKV	XX.XXmA

Insulation resistance test

IR	SETUP	XXX.XS
MX	X.XXKV	XXXXMΩ

Earth resistance test

GND	SETUP	XXX.XS
MX	XX.XXA	XXXmΩ

If you press the start switch, the instrument will start testing. If you press the "SET" key, the instrument will immediately enter the parameter setting mode, and you can set the parameters.

2.Test aborted(ABORT)

If the AC / DC withstand voltage or insulation resistance or ground resistance test is under way, the test will be displayed when the reset switch or the remote control device is used to interrupt the test:

AC withstand voltage test

ACW	ABORT	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	ABORT	XXX.XS
MX	X.XXKV	XX.XXmA

Insulation resistance test

or

IR	ABORT	XXX.XS
MX	X.XXKV	XXXXMΩ

Earth resistance test

GND	ABORT	XXX.XS
MX	XX.XXA	XXXmΩ

Press the reset button to enter the mode to be tested. Press the "start" button to start the test again.

3. Slow rise test（RAMP）

In the process of AC / DC voltage rise test, the program does not make the lower limit judgment, and the test result will be updated constantly, the monitor will show:

AC withstand voltage test

ACW	RAMP	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	RAMP	XXX.XS
MX	X.XXKV	XX.XXmA

4. AC / DC withstand voltage test (DWELL) or insulation resistance delay decision (DELAY) setting

During testing, the results of the tests are constantly updated and display:

AC withstand voltage test

ACW	DWELL	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	DWELL	XXX.XS
MX	X.XXKV	XX.XXmA

Insulation resistance test

or

IR	DELAY	XXX.XS
MX	X.XXKV	XXXXMΩ

Earth resistance test

GND	DWELL	XXX.XS
MX	XX.XXA	XXXmΩ

5.The leakage current or insulation resistance superior limit failed(HI-Failt)

If the object to be tested for AC / DC voltage resistance or insulation resistance, the leakage current or the insulation resistance exceed the upper limit setting value,The test failure will be determined by the program as the upper limit of the leakage current or the insulation resistance value. If the leakage current or the insulation resistance value is still within the upper limit of the instrument, the monitor will display:

AC withstand voltage test

ACW	HI-Fail	XXX.XS

or

DC withstand voltage test

DCW	HI-Fail	XXX.XS

MX X.XXKV XX.XXmA

MX X.XXKV XX.XXmA

Insulation resistance test

IR	HI-Fail	XXX.XS
MX	X.XXKV	XXXXMΩ

or

Earth resistance test

GND	HI-Fail	XXX.XS
MX	XX.XXA	XXXmΩ

If the leakage current or the insulation resistance exceeds the upper limit of the instrument, the monitor will display:

AC withstand voltage test

ACW	HI-Fail	XXX.XS
MX	X.XXKV	>12 mA

or

DC withstand voltage test

DCW	HI-Fail	XXX.XS
MX	X.XXKV	>6 mA

Insulation resistance test

IR	HI-Fail	XXX.XS
MX	X.XXKV	>2000MΩ

or

Earth resistance test

GND	HI-Fail	XXX.XS
MX	XX.XXA	>300mΩ

6.Leakage current or insulation resistance lower limit failed(LO-Fail)

If the object to be tested for AC / DC withstand voltage or insulation resistance,The leakage current or the insulation resistance value is less than the lower limit setting value,The test failure will be determined by the program as the leakage current or the lower limit of the insulation resistance value. If the insulation resistance value is still within the scope of this instrument, the monitor will display:

AC withstand voltage test

ACW	LO-Fail	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	LO-Fail	XXX.XS
MX	X.XXKV	XX.XXmA

Insulation resistance test

Or

IR	LO-Fail	XXX.XS
MX	X.XXKV	XXXXMΩ

Earth resistance test

GND	LO-Fail	XXX.XS
MX	XX.XXA	XXXmΩ

If the insulation resistance exceeds the instrument's range of detection, the monitor will show:

Insulation resistance test

IR	LO-Fail	XXX.XS
MX	X.XXKV	<1MΩ

7. withstand voltage Breakdown (BREAK)

If the object to be tested in the AC / DC withstand test, the leakage current is far beyond the range that the instrument can measure,Moreover, the electric current of the arc is much higher than the normal value measured by this instrument,The test failed to be determined by the program as a voltage collapse, and the LCD monitor will show:

AC withstand voltage test

ACW	BREAK	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	BREAK	XXX.XS
MX	X.XXKV	XX.XXmA

8. Overcurrent failure(OVER)

If the object to be tested during the AC / DC voltage test,The output current is beyond the normal range of the instrument .The program will determine the test failure caused by overcurrent, The monitor will show:

AC withstand voltage test

ACW	OVER	XXX.XS
MX	X.XXKV	>12 mA

or

DC withstand voltage test

DCW	OVER	XXX.XS
MX	X.XXKV	>6 mA

Grounding resistance overcurrent failure(OVER)

If the object to be tested during grounding resistance test, the output current is beyond the normal output range of the instrument， .The program will determine the test failure caused by overcurrent, The monitor will show:

GND	OVER	XXX.XS
MX	>25A	XXXmΩ

9.Test passed(PASS)

If the test object is in the process of doing AC / DC voltage resistance or insulation resistance test without any abnormal phenomenon, it is considered to be passed by test, and the monitor will show:

AC withstand voltage test

ACW	PASS	XXX.XS
MX	X.XXKV	XX.XXmA

or

DC withstand voltage test

DCW	PASS	XXX.XS
MX	X.XXKV	XX.XXmA

Insulation resistance test

IR	PASS	XXX.XS
MX	X.XXKV	XXXXMΩ

Earth resistance test

GND	PASS	XXX.XS
MX	XX.XXA	XXXmΩ

10. List display

If the current group connection test is set to "Yes", then at the end of this test, the program automatically enters the next group of tests, the most connected 4 groups, after the connection test is normal, the monitor will display:

M1-A	M2- D	M3-I	M4-G
PASS	PASS	PASS	PASS

The first row shows the test group and test mode, such as M1-A: group 1, AC voltage test;M2-D: group 2, DC withstand voltage test; M3-I: group 3, insulation resistance test; M4-G: Group 4, ground resistance test.The second line shows the corresponding test results. If you want to check the test data of each group, press the "SET" key. If you want to go back to the test state, press the reset switch to quit. After the exit, the test result is not saved.

Chapter nine Calibration procedures and steps

The instrument has been in accordance with the relevant regulations of the national standard before leaving the factory,The calibrated instruments, precision fully meet the national standard specification, the instrument for at least a year needs to make a correction, the accuracy of the instrument calibration standards must meet the corresponding requirements, to ensure the accuracy of the instrument.

9. 1 Enter correction mode:

Please press the front panel "SET" button first, then switch on the local power switch. The LCD will display:

```
Calibration     Mode
<SET>   to   Select
```

At this point, the instrument has entered the correction mode. Please release the button.Press the SET key to select the correction parameter item,Respectively, AC withstand voltage voltage correction, the AC voltage current profile correction,DC withstand voltage vol correction（There is no such item），DC voltage each current correction（There is no such item），Insulation resistance, voltage correction, Insulation resistance, each resistor is adjusted.

9．2 AC withstand voltage voltage correction

Press the "SET" key, the program enters the AC voltage voltage correction mode, and the monitor will display:

```
CAL ACW V = 4000V
<TEST>   to   Calibrate
```

The "H.V." and "measured end" of the instrument are connected with a standard high voltage voltmeter which can be measured to 6000VAC,If the standard high voltage meter specifically indicates "high" and "low"，please Connect the high point to the H.V. terminal of this instrument,Then, the low point is connected to the "measured end" of the instrument to avoid the inaccuracy or damage of the high-voltage voltmeter.Then press the "start" button, when the instrument's calibration program will automatically output a voltage of about 4000VAC, the monitor will display:

```
CAL ACW V = XXXXV
<EXIT>   to   Save
```

Please use the "+" or "-" key on the panel to enter the standard voltage into the calibration program,Press the “+”key to add the number, and the “-” key is numeric subtraction, with the unit V.Please make sure the numbers are correct,Press the "EXIT" button to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．3 AC voltage withstand current 10mA correction

Press the "SET" key, the program enters the AC voltage current 10mA correction mode, the monitor will display:

```
CAL ACW I1 = 10.00mA
<TEST>   to   Calibrate
```

Please connect the standard AC ammeter and with a resistor of about 100K /10W in series:，

Then, between the "H.V." and "measured end" of the instrument, the ammeter depends on the end of the measured end.Press the "start" button, when the instrument's calibration program automatically outputs a current of about 1000VAC/10.00mA, the monitor will display:

```
CAL ACW I1 = XX.XXmA
<EXIT>   to   Save
```

Please use the "+" or "-" key on the panel to enter the standard value of the standard ammeter into the correction program. The unit is mA..Please make sure the numbers are correct,Press the "EXIT" button again to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．4 AC voltage withstand current 2mA shift correction

Press the "SET" key, the program enters the AC voltage current 2mA correction mode, the monitor will display:

```
CAL ACW I2 = 2.000mA
<TEST>   to   Calibrate
```

Please use standard AC ammeter and a resistor of approximately 500K /2W Connect in series，Then, between the "H.V." and "measured end" of the instrument, the ammeter depends on the end of the measured end.Press the start button,At this point, the instrument's calibration program will automatically output a current of about 1000VAC/2.000mA, the monitor will display:

```
CAL ACW I2 = XX.XXmA
<EXIT>   to   Save
```

Please use the "+" or "-" key on the panel to enter the standard value of the standard ammeter into the correction program. The unit is mA.Please confirm the number and then press the "EXIT" button to turn off the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．5 DC withstand voltage correction

Press the "SET" key, the program enters the DC voltage correction mode, and the monitor will display:

```
CAL DCW V = 4000V
<TEST>   to   Calibrate
```

On the instrument "H.V." and "measured end", connect to a standard high voltage voltmeter that can be measured to 6000VDC.If the standard high voltage meter specifically indicates "high" and "low",Please connect the high point to the H.V. terminal of the instrument, Then, the

low point is connected to the "measured end" of the instrument to avoid the inaccuracy or damage of the high-voltage voltmeter.Then press the "start" button, now the instrument's calibration program will automatically output a voltage of about 4000VDC, the monitor will display:.

```
CAL DCW V = XXXXV
<EXIT>    to    Save
```

Please use the "+" or "-" key on the panel to enter the standard voltage into the calibration program,Its units are V .Please make sure the numbers are correct,Press the "EXIT" button again to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．6 DC voltage current 6mA shift correction

Press the "SET" key, the program enters the DC voltage current 6mA correction mode, the monitor will display:

```
CAL DCW I1 = 6.00mA
<TEST>    to    Calibrate
```

The standard DC ammeter is connected in series with a resistor about 100K /10W And then receive the instrument "H.V." and "measured end" between, the ammeter by "measured end" this end.Press the "start" button, when the instrument's calibration program automatically outputs a current of about 600VDC/6.00mA, the monitor will display:

```
CAL ACW I1 = X.XXmA
<EXIT>    to    Save
```

Please use the "+" or "-" key on the panel to enter the standard value of the standard ammeter into the correction program. The unit is mA.Please confirm the number and then press the "EXIT" button to turn off the output and save the input data.If the data is not saved, press the reset switch to turn off the output.

9．7 DC voltage current 2mA shift correction

Press the "SET" key, the program enters the DC voltage current 2mA correction mode, the monitor will display:

```
CAL DCW I2 = 2.000mA
<TEST>    to    Calibrate
```

The standard DC ammeter is connected in series with a resistor about 500KΩ/2W ,And then receive the instrument "H.V." and "measured end" between, the ammeter by "measured end" this

end.Press the "start" button, when the instrument's calibration program automatically outputs a current of about1000VDC/2.000mA, the monitor will display:

```
CAL DCW I2 = XX.XXmA
<EXIT>    to    Save
```

Please use the "+" or "-" key on the panel to enter the standard value of the standard ammeter into the correction program. The unit is mA.Please confirm the number and then press the "EXIT" button to turn off the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．8 Insulation resistance voltage correction:

Press the "SET" key, the program enters the insulation resistance voltage correction mode, and the monitor will display:

```
CAL IR V = 1000V
<TEST>    to    Calibrate
```

The "H.V." and "measured end" of the instrument are connected with a standard voltmeter which can be measured to 1000VDC,If the standard voltmeter is particularly marked "high and low",Please connect the high point to the H.V. terminal of the instrument, and then connect the low point to the end of the instrument ,avoid the inaccuracy or damage of the voltmeter. Then press the "start" button, when the instrument's calibration program will automatically output a voltage of about 1000VDC, the monitor will display:

```
CAL IR V = XXXXV
<EXIT>    to    Save
```

Please use the "+" or "-" key on the panel to enter the standard voltage into the calibration program,Its units are V .Please make sure the numbers are correct,Press the "EXIT" button again to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．9Insulation resistance 0.5MΩ correction:

Press the "SET" key, the program enters the insulation resistance **0.5MΩ** correction mode, and the monitor will display:

```
CAL IR R1 = 0.500MΩ
<TEST>    to    Calibrate
```

On this instrument, "H.V." and "measured end" are connected with a standard resistor of about 500KΩ/2W,Then press the "start" button, and the instrument's calibration program will automatically output a voltage of about 1000VDC, the monitor will display:

```
CAL IR R1 = X.XXXM Ω
<EXIT>   to   Save
```

Please use the "+" or "-" key on the panel to enter the standard resistance into the calibration program,Its units are MΩ.Please make sure the numbers are correct,Press the "EXIT" button again to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．10 Insulation resistance 5MΩ correction:

Press the "SET" key, the program enters the insulation resistance **5MΩ** correction mode, and the monitor will display:

```
CAL IR R2 = 5.000M Ω
<TEST>   to   Calibrate
```

On this instrument, "H.V." and "measured end" are connected with a standard resistor of about 5MΩ /0.25W,Then press the "start" button, when the instrument's calibration program will automatically output a voltage of about 1000VDC, the monitor will display:

```
CAL IR R2 = X.XXXM Ω
<EXIT>   to   Save
```

Please use the "+" or "-" key on the panel to enter the standard resistance into the calibration program,Its units are MΩ.Please make sure the numbers are correct,Press the "EXIT" button again to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．11 Insulation resistance 50MΩ correction:

Press the "SET" key, the program enters the insulation resistance **50MΩ** correction mode, and the monitor will display:

```
CAL IR R3 = 50.00M Ω
<TEST>   to   Calibrate
```

On this instrument, "H.V." and "measured end" are connected with a standard resistor of about 50M /0.25W,Then press the "start" button, and the instrument's calibration program will automatically output a voltage of about 1000VDC, the monitor will display:

```
CAL IR R3 = XX.XXMΩ
<EXIT>   to   Save
```

Please use the "+" or "-" key on the panel to enter the standard resistance into the calibration program,Its units are MΩ.Please make sure the numbers are correct,Press the "EXIT" button again to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．12 Insulation resistance 500MΩ correction:

Press the "SET" key, the program enters the insulation resistance 500M Omega correction mode, and the monitor will display:

```
CAL IR R4 = 500.0MΩ
<TEST>   to   Calibrate
```

On this instrument, "H.V." and "measured end" are connected with a standard resistor of about 500M /0.25W,Then press the "start" button, when the instrument's calibration program will automatically output a voltage of about 1000VDC, the monitor will display:

```
CAL IR R4 = XXX.XMΩ
<EXIT>   to   Save
```

Please use the "+" or "-" key on the panel to enter the standard resistance into the calibration program,Its units are MΩ.Please make sure the numbers are correct,Press the "EXIT" button again to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．13 Grounding resistance AC voltage correction

Press the "SET" key, the program enters the ground resistance, AC voltage correction mode, the monitor will display:

```
CAL GND V = 6.000V
<TEST>   to   Calibrate
```

At the end of the tester, connect to a standard voltmeter that measures 10VAC. Then press the "start" button. At this point, the instrument's calibration program automatically outputs a voltage of about 6VAC, and the monitor will display:

```
CAL GND V = X.XXXV
<EXIT>   to   Save
```

Please use the "+" or "-" key on the panel to enter the standard voltage into the correction program, press "+" key to add the number, and "-" key is "digital subtraction", the unit is "V".Please make sure the numbers are correct,Press the "EXIT" button to close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．14 Grounding resistance AC current correction

Press the "SET" key, the program enters the ground resistance, AC current correction mode, the monitor will show:

```
CAL GND I = 25.00A
<TEST>    to    Calibrate
```

At the end of the tester, connect to a standard ammeter that can measures 30AAC. Then press the "start" button. At this point, the instrument's calibration program automatically outputs an electric current of about 25AAC. The display will display:

```
CAL GND I = XX.XXA
<EXIT>    to    Save
```

Please use the "+" or "-" key on the panel to enter the standard value of the standard ammeter into the correction program. The unit is A.Please make sure the numbers are correct,
Press the "EXIT" button again,Close the output and save the input data. If the data is not saved, press the reset switch to turn off the output.

9．15 Calibration complete

After the calibration has been completed, the input power must be turned off and then switched on, otherwise it will not enter the mode to be tested. The program does not accept unreasonable input.

9．16 Please pay special attention to the following items:

(1) "Start" correction voltage output.

(2)"reset" does not save data , closes the output.

(3) “EXIT”save data，closes the output.

(4) After the calibration has been completed, the input power must be turned off and then switched on, otherwise it will not enter the mode to be tested. The program does not accept unreasonable input.

(5) The stored correction data will be stored in the memory and will not change or disappear unless it changes again.

(6) It is suggested that the calibration period of this instrument is one year.

JK7123/7122+
RS232 Communication format

Command function definition	Instruction data	Format / remarks
Send start	ABH	Send by lower computer
Send end	AFH	Send by lower computer
Receive start	AAH	Receive by lower computer
Receive end	BFH	Receive by lower computer
start-up	FAH	AAH FAH BFH
reset	FBH	AAH FBH BFH
Send measurement data		ABH measured data(15 bits) + sorting (1 bits) AFH
Sorting (1bit) : 90H: normal measurement; 91H: measurement through; 92H: AC current limit alarm; 93H current limit alarm		
98H: over-current alarm; 99H:short circuit alarm; 9AH, withstand voltage breakdown; 9BH: test aborted		
9CH: resistance upper limit alarm; 9DH: resistance lower limit alarm		
Lower computer abort communication	ADH	ABH ADH AFH
Set group	AEH	AAH AEH (group data 1-50H) BFH
Setting test parameters	ACH	AAH ACH parameter (A0-A4) BFH.parameter A0: AC withstand voltage; A1: DC withstand voltage; A2: insulation resistance; A3: Grounding resistance; A4: leakage current
Setting output voltage	EAH	AAH EAH parameter(A0-A4) output voltage(5bits)BFH
Setting output current	EBH	AAH EBH parameter(A0-A4)output current (5bits) BFH
Set current upper limit	ECH	AAH ECH parameter(A0-A4)current upper limit (5 bits) BFH
Set current lower limit	EDH	AAH EDH parameter(A0-A4)current lower limit(5 bits) BFH
Set delay time	EFH	AAH EFH parameter(A0-A4)delay time(5 bits) BFH
Set test time / decision time	DAH	AAH DAH parameter(A0-A4)test time(5 bits) BFH
Set output power	DBH	AAH DBH parameter(A0-A4)output power(1 bit) BFH
		Output frequency (1 bits): BA:50Hz:BB:60Hz
Set current to zero / resistance to zero	DEH	AAH DEH parameter (A0-A4) current is zero (5 bit) BFH
Set resistance upper limit	CAH	AAH CAH parameter (A0-A4) Upper limit of resistance (5bits) BFH
Set resistance lower limit	CBH	AAH CBH parameter (A0-A4) Upper limit of resistance (5bits) BFH
Set step connection	CEH	AAH CEH parameter (A0-A4) Step connection (1bit) BFH
		Step connection (1bit) : BC:open:BD: close
Setup completed(downsidemachine Shuabing)	BEH	AAH BEH BFH (Brush once State to be measured)
Save upper monitor settings data	E7H	AAH E7H BFH (Save settings data to EEPROM)
The result of sorting has been received by the upper computer	C7H	AAH C7H BFH

Add scan gun function and scan start switch function

Chapter ten Maintenance Guide

10．1 Routine maintenance

1.the test instrument should use good ventilation, dry, no dust and no strong electromagnetic interference.

2. if the tester does not use for a long time, it should be energized regularly. Usually the power is switched on once a month, and the power on time is not less than 30 minutes.

3. test instrument after long time work (8 hours) should turn off electricity more than 10 minutes, in order to keep the instrument in good working condition.

4., the test line after long-term use may appear bad contact or open circuit phenomenon, should be regularly overhaul.

10．2 Simple fault handling

fault	processing method
After the boot, there is no display, the button does not respond	Please check the power supply is normal, the fuse on the rear panel is blown, if the fuse, please replace the fuse.
After starting, the high voltage indicator is not on, but there is a test voltage	The high voltage indicator is out of order
After the test failed, the alarm light is not on	The warning light is out of order.
After starting, the voltage is normal, but no current output	Please check if the test line is open, the measured object is not in good contact, or the tested object is open.

If there is a fault can not be ruled out in time, please contact our company as soon as possible, we will provide you with timely service.

10．3 Quality assurance

The company guarantees that all the products manufactured have been strictly confirmed by quality, and the quality guarantee period is one year. The product defects or failures during this period will be repaired free of charge.

For the user to modify the circuit, function or more than the warranty period products, depending on the actual situation, the cost of repair and maintenance.

Enclosure

When the instrument leaves the factory, the following items are available randomly:

1. power line x 1

2. test line x 1 sets

3. instruction manual x 1 copies

4. warranty card x 1 copies

5. certificate of quality x 1

6. test report x 1 copies