

RK9910-8U/4U Program controlled parallel AC/DC Withstanding

Voltage Insulation resistance Tester

SHENZHEN MEIRUIKE ELECTRONIC TECHNOLOGY CO.,LTD

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# Chapter 1 Installation and Use

This chapter describes some checks that must be carried out when you receive the instrument and the conditions that must be understood and met before installing and using the instrument.

This instrument conforms to the GB4793.1-2007/IEC61010-1:2001 standard.

## Precautions for Use

The following rules must be observed when using the instrument:

■ Do not use this instrument in flammable air

In order to prevent burning or explosion, do not be near alcohol, diluent and other combustible materials, do not use the instrument in the air with high concentration of these gases.

■ Avoid exposure to high temperatures and direct sunlight

Do not place the instrument in a place with heat or drastic temperature changes.

Operating temperature range of the instrument: 5℃ to +35℃

Storage temperature range of the instrument;-20℃ to +60℃

■ Avoid humid environment

Do not place the instrument in boiler, humidifier or high humidity environment with water.

Humidity range of the instrument: 20% to 80%RH (dew condensation is not allowed)

Humidity range of instrument storage;Less than 90%RH (dew condensation is not allowed)

Condensation may cause the circuit to malfunction.The instrument cannot be used until the environment is completely dry.

■ Do not place the instrument in an environment with corrosive gases.

Do not use the instrument in an environment with corrosive gases such as sulfuric acid, fog or the like.This may corrode wires, connectors and form hidden dangers or connection defects,It can lead to failures, and even fires.

■ Do not use the instrument in dusty environment

Soil and dust can cause short circuit of electronic devices or fire.

■ Do not use the instrument in poorly ventilated places

The instrument has a forced air-cooled heat dissipation system.Sufficient space should be provided for the side and rear tuyeres to ensure air circulation.

■ Do not use the instrument on an inclined surface or in a shaking place

If the instrument is placed on an uneven surface or a shaking place, the instrument may slide down and damage the instrument.

■ Do not use the instrument in places with strong magnetic or electric field

When the instrument is used in places with strong magnetic field or electric field, electromagnetic pulse will cause instrument failure and fire.

■ Do not use this instrument near sensitive test equipment and receiving equipment

If these devices are used in the vicinity of this instrument, the noise generated by failure and breakdown of the tested parts may affect these devices.When the test voltage exceeds 3KV, the electric field between the test lines will ionize the air and generate corona, which will generate a large amount of RF (radio frequency) bandwidth interference between the test lines.

In order to reduce this influence and ensure the distance between test lines is far enough.

In addition, keep the test line away from conductive surfaces (especially sharp metal ends).

## 1.2 Points for Attention when Moving

When moving or transporting the instrument, pay attention to the following precautions:

■ Turn off the power switch before moving

Moving with the power switch on will cause electric shock and damage.

■ Disconnect all connecting wires before moving.

Moving the instrument without disconnecting the cable may cause damage to the connecting cable or drop the instrument during moving.

## 1.3 Connect AC power cord

The power cord is supplied with the instrument by our company.Do not use AC power cord that is not standard on this instrument.

Connection sequence

1. Make sure the power supply is within the line power supply range of the instrument.

2. Determine the nominal value of the instrument fuse, and the fuse box is installed in the correct position (power file).

3. Make sure the power switch of the instrument is turned off.

4. Connect the AC power cord to the AC LINE end of the rear panel.

5. Please use the attached AC power cord or the AC power cord selected by qualified professionals.

6. Insert the AC power socket.

## 1.4 Grounding

△Warning: Make sure the instrument is connected to electrical ground (safely, earth).

If the output to the ground connected to the peripheral equipment or the nearby commercial wire is not directly connected to the ground, the instrument shell may have a very high voltage and become very dangerous.

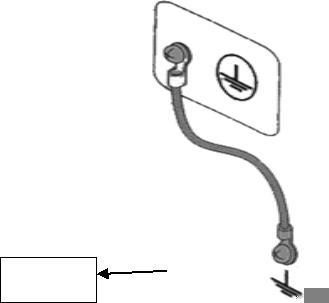
This instrument is Class II equipment (except for basic insulation, the equipment is protected from electric shock).

However, it is still possible to get electric shock without proper grounding.

In order to ensure safety, please make sure the instrument is grounded.

Select one of the following two available methods to de-ground:

1. The power cord is connected to a single-phase three-wire power outlet.(Please ensure that the socket grounding wire is available by connecting the earth)
2. Connect the protective terminal of the rear panel to the earth via the grounding bar (provided in the production line and reliably connected to the earth copper wire or bar) to the earth.Let specialized engineers select, make and install the Ground connection line.To ensure that the grounding connection is correct and reliable.



## 1.5 Operational Inspection

△Warning: When using the instrument normally, as far as possible make function interlock (interlock) to ensure the safety of use.

When the working space is relatively cramped: make a box-like structure for the tested piece;

In the case of testing large-scale test pieces with complicated structures: protective structures such as fences and the like are used around the test area to prevent electric shock.

When the electric shock protection structure is opened, the signal circuit is disconnected to ensure the safety of the workplace.

When the power switch is turned on, the instrument lights up all the lights on the front panel and starts self-checking, making sure all the lights are on to ensure safety.

It is particularly dangerous to carry out the test when the DANGER lamp is damaged.

△ Caution: After switching off the power switch, it will take several seconds to turn on the machine again.Repeated on/off power supply without sufficient time interval has damaged.

Check sequence

1. Make sure that the allowable range of power supply voltage is consistent with the input voltage range set by the fuse box.

2. Make sure that the AC power cord is connected to the AC LINE end of the rear panel.

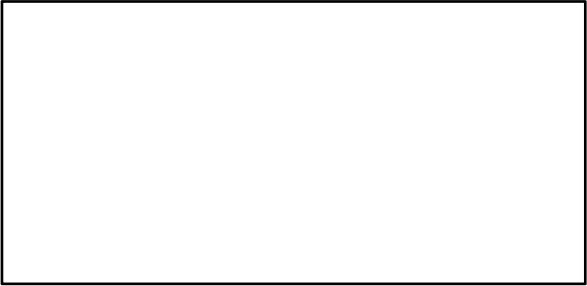
3. Insert the power plug into the AC power outlet.

4. Turn on the power switch to ensure that the indicator light on the front panel is all on and the panel displays the start-up screen.

5. The following screen displays the AC withstand voltage test (AC) parameter interface of the SETUP interface.

6. Turn off the power switch.

Note the boot screen (example):

。

：

Shenzhen Meiruike Electronic Technology co.,ltd

RK9910-8U

PARALLEL MUL TI-UNIT HIPOT TESTER AC/DC/IR

VERSION ：V0.0\_20220609 Copyright(c)2022

<http://www.chinarek.com>

## 1.6 Other characteristics of the instrument

(1) Power consumption: power consumption<1000VA

（2）Overall dimensions（W\*H\*D ）：W440mm\*H210mm\*D720mm ；

（3）Weight: 43.3kg（RK9910-4U）

61.5kg（RK9910-8U）

|  |  |  |  |
| --- | --- | --- | --- |
| Input voltage | Frequency Range | Fuse (slow melting)) | rated power |
| 90V-240V | 47-63Hz | 15A | 1200VA |

# Chapter 2 Operating Specifications and Measures

This chapter describes the specifications and measures to be followed during the use of this instrument.When using this instrument, special attention should be paid to ensure safety.

△ Warning: This instrument produces a test high voltage of 5kV that can cause personal injury or even death. When operating the instrument, you must be very careful and observe it.

## 2.1 Prohibited Operations

■ Do not switch power supply continuously

After the power switch is cut off, make sure there is an interval of one minute or more before the power switch is turned on again.Ensure the normal power failure of the circuit before starting.

If the power supply of the instrument is repeatedly turned on/off frequently, the control circuit of the instrument may be abnormal due to incomplete power failure.At this time, the protection facilities may the protection function cannot be completely performed.

Except in special or urgent circumstances.Do not turn off the power switch when the instrument is generating test voltage.

■ Do not short circuit the output to ground

If the high voltage test line of the instrument is connected to AC LINE (AC power line);Or other nearby devices (such as transmission devices) conductor of the earth.When the grounding end of the instrument is unreliable, the low end of the high voltage the shell of the instrument) will be filled with danger after the high voltage end is grounded.

Make sure that the protective earth terminal of the instrument is connected to the earth wire.In this way, even if the HIGH VOLTAGE terminal and the ground terminal are short-circuited, the instrument housing will not be charged with high voltage and there will be no danger.

When grounding the protection ground terminal, ensure it is correct and reliable.See "1.5 Grounding".

△Note: The term "AC LINE" refers to the power cord used by the instrument.It is the power source of commercial alternating current or power generation and the power source of instruments connected wires.

■ Do not connect external voltage to test terminal

Do not connect any external voltage to the output of the instrument.In non-discharge state, the instrument does not have external discharge function, output terminal and external voltage connecting may damage the instrument.

## 2.2 Emergency Treatment

In case of emergency (e.g. electric shock and burning of the tested part) and the instrument does not disconnect the high-voltage output, the following operations shall be carried out.You can do to (a) or (b), but both operations must be done.

(a) Turn off the power switch of the instrument;

(b) Unplug the power cord of the instrument from the power cord plug.

## 2.3 Preventive Measures in Testing

■ Wear insulating gloves

Wear insulating gloves when using the instrument to protect yourself from touching high-voltage electricity. Even if you wear high-voltage gloves, you are not allowed to use your hands in high voltage test to contact with a live conductor.

■ Discontinue (suspend) test preventive measures

When touching the test conductor or changing the test connection, first press the STOP switch once to ensure that the instrument exits the test preparation state.

If you need to rest for a period of time or will leave the testing place, please turn off the power switch to prevent the safety caused by touching the starting switch by mistake.

■ Electrified articles in high voltage test

During the test, the high-voltage output terminal, the high voltage test line, the high-voltage probe, the tested piece and the conductor exposed around them all carry dangerous high-voltage electricity.

Do not approach or touch these conductors at will even if there are reliable insulation measures during testing.

# △ Warning: The jacket on the alligator clip of the test line provided by the instrument is not sufficiently insulated from the test high voltage.Do not touch these parts during the test.

■ Precautions after Switching off High Voltage Output

If you have to touch the tested piece, test line, probe or output end and the surrounding area due to re-connection or other reasons, ensure the following two notices:

（a）Verify that the working state displayed by the instrument is not the test state.

（b）HV lamp goes out.

■ Remote Control Warning

Because the start and stop of high voltage is controlled remotely, the operator cannot know the actual working state of the instrument through the interface and is performing remote control.

Use special care when operating the instrument in mode.Please pay special attention to check the reliable connection of remote control.

（c）The "STOP" button must be connected reliably. Press the "STOP" button before replacing the tested piece.

（d）When working in a crowded working environment, the remote control switch must have an "INTLOCK" interlock switch and a high voltage indicator.Disconnect the "INTLOCK" interlock switch before replacing the tested piece.

## 2.4 High Voltage Test Warning

△ Warning: In high voltage test, the test line, test probe, and the tested piece are all charged with high voltage.The instrument has a discharge circuit and sometimes needs to be discharged after the output is cut off.Danger of electric shock during discharge.In order to avoid electric shock, ensure that the tested piece, test line, probe and output with high voltage do not touch anything other than the test element. If you may come into contact with these, make sure the DANGER lamp goes out and remove the hidden danger.

Once the test is finished, the discharge circuit of the instrument starts to discharge forcibly.Do not disassemble the tested part during the test and before the discharge is completed.

Under normal circumstances, it can be ensured that the voltage of the test loop will be within the range of safe voltage at the end of discharge.When the capacitance of the tested piece is too large or the special structure of the tested piece will cause incomplete discharge, technicians must change the testing method to ensure complete discharge.

■ Discharge time:

Calculation formula of discharge time: t= -ln(30 /U )×R×C

T: discharge time

30: Discharge remaining safe voltage 30V

U: test set voltage

R: the discharge impedance of the tested piece, and the instrument discharge impedance is about 10k.

C: capacitance of the tested part

In general, only DC high voltage test needs to be discharged, and the length of discharge time depends on the nature of the tested piece.

During the test, if the test ends normally, the voltage will drop to zero according to the voltage drop time.If the test fails, the discharge of the tested element is realized through the secondary side of the transformer (about 10k resistance), and the 1uF capacitor with 6000V high voltage is discharged to 30V for about 0.05S s.The fixed discharge time of the instrument is 0.2S, which can ensure that the device is completely discharged.

## 2.5 Handling of Dangerous States of Faulty Instruments

Typical possible dangerous states of the instrument, the most dangerous of which is the occurrence of "high voltage at output and out of control of the instrument".When this happens,

1. Turn off the power switch immediately and unplug the AC power cord from the AC power outlet.

2. Please stay away from this instrument immediately and ask relevant technicians to check the test circuit to make sure there is no danger.Or let the instrument stand for more than one hour to confirm that there is no output voltage at the test end.

3. Remove the relevant connecting wires and send the instrument back to us for maintenance.

△ Warning: Stay away from this instrument immediately after turning off the power supply and prevent other personnel from approaching. Never disassemble the test circuit immediately.

Contact our distributor or agent immediately.High voltage may remain inside the instrument, and it is very dangerous for non-professional personnel to try to overhaul the instrument.

## 2.6 Conditions for Guaranteeing Long-term Fail-free Use

Due to the volume, weight and actual usage of the instrument, the heat dissipation design of the voltage generation module of the instrument is relatively small.Therefore, the instrument is recommended to be used in the following range.

Necessary Conditions for Voltage Withstand Test

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ambient temperature | Output power | | Pause time | Output time limit |
| t ≤40 ℃ | AC | >6mA | At least as long as the output time | Up to 1 minute |
| <4mA | No requirement | Can output continuously |
| DC | >3mA | At least as long as the output time | Up to 1 minute |
| <2m A | At least one charge waiting time  Sample length (WAIT TIME) | Can output continuously |

Note: Output time=（Voltage rise time + test time + voltage drop time）

## 2.7 Daily Inspection

In order to avoid accidents, at least the following points should be guaranteed before use:

1. The input power of the instrument conforms to the specifications, and the power supply of the instrument is configured correctly.

2. The instrument is reliably connected with the earth.

3. The material of the test line is in good condition, free from fracture, crack and breakage.

4. The instrument is not connected to the test line, and the test can be started under the default condition, and the test can be successfully completed.

5. When the test line is connected to start the test, the low-voltage end of the test line contacts the high-voltage end of the test line, and the instrument can generate a FAIL signal.

# Chapter 3 Overview of Instrument Panel

This chapter describes the basic operational characteristics of the RK9910-4U / 8U series of instruments.Read this chapter in detail so that you can learn about the RK9910-4U / 8U series very quickly.

## 3.1 Description of the front panel

The front panel of the RK9910-4U / 8U series is briefly illustrated in Figure 3-1.

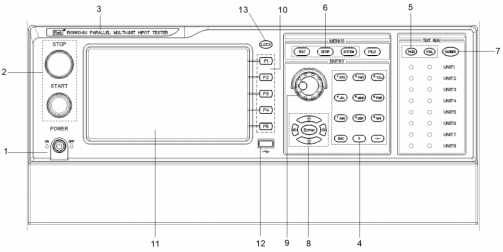


Figure 3-1 Front panel description

3.1.1 POWER switch (POWER)

Power switch.Before starting the machine for the first time, the operator should pay attention to check whether the power type of the instrument and the connection of the test line are normal.

3.1.2 START key and STOP key

START key (green circle): used to start the test. once the test starts, the HV indicator will be on.

STOP key (red circle): stop key to stop the test;Can also be used to cancel PASS, FAIL and other prompt status.

3.1.3 Trademarks and Models

Trademarks and models of instruments

3.1.4 Numeric Keypad

Used for numeric value input

3.1.5 Indicator area

● FAIL

During the test, the set test data is exceeded, the instrument judges that the test is unqualified, and the FAIL judgment light is on.

● PASS

After the test, no test data beyond the initial setting is found. The instrument judges that the test is qualified and PASS judges that the light is on.

When the test timing function is turned off (TIME OFF), the test can only be ended with‘STOP’ without PASS judgment.

3.1.6 FUNCTION

Select test mode setting, system setting and document operation interface.

● TEST

Press this key to turn on the light, and the instrument will enter the ready test state.

● SETUP

Press this key to turn on the light, and the instrument will enter the parameter setting interface.

● SYSTEM

This key is lit to display the SYSTEM setting interface (SYSTEM)

● FILE

This key is lit to display the FILE operation interface (FILE)

3.1.7 HV

DANGER ！! As long as the test is in progress, the light will come on, indicating that the test is in progress.

3.1.8 Move the key

For cursor on-screen movement and selection of parameter items.

3.1.9 Rotary encoding potentiometer

Used to adjust and confirm the parameters.

3.1.10 Shortcut function key

F1-F5 corresponds to the functional operation area on the right side of the LCD to realize the quick operation. 3.1.11 800 \* 480TFT lattice LCD display screen, display and setting interface, measurement interface, etc.

3.1.12 USB interface

Implement the parameter settings for copy storage.

3.1.13 LOCK lock key

Press this key to lock all the keys on the operation panel, except for STARTT and STOP, to prevent misoperation.

## 3.2 Rear panel description

The rear panel of the RK9910-4U / 8U series is briefly illustrated in Figure 3-2.

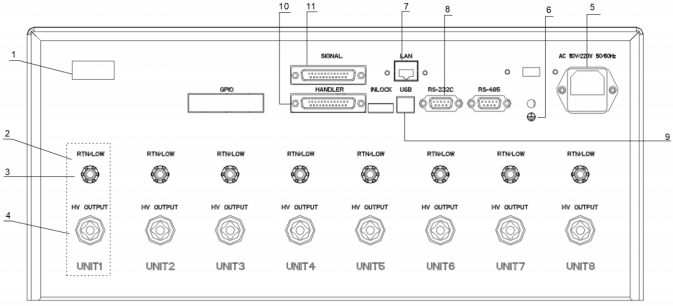


Figure 3-2 Back-panel description

3.2.1 Product nameplate Information code on the product model and production date.

3.2.2 Test the unit output module Parallel high voltage output control module with 8 RK9910-8U and 4 RK9910-4U.Each module high voltage is independent of each other, can To test a single subject separately. Note: Do not connect different test units to the same subject, with unpredictable risks.

3.2.3 Test low-end, test current return end (one for each test unit) Test low end of parallel high voltage test interface; all low end of test has ground circuit. The differential connection error is not only instrument judgment error, but also has unpredictable risk.

3.2.4 High-voltage output end (one per test unit) High voltage output end of the high voltage test interface.

3.2.5 Power socket: come with a fuse box. For input AC power, use the voltage within the specified input voltage range of the instrument and the power cord provided with the instrument.

3.2.6, Protection ground terminal When the three-legged power socket connected to the instrument power supply cannot guarantee reliable connection to the earth, it must be connected to a reliable grounding row.

Note: This instrument should not be used without connecting the earth, otherwise the instrument shell may be charged, with the danger of electric shock.

3.2.7 LAN interface

The LAN communication interface, to realize the communication with the computer.

3.2.8 RS232C Serial interface Serial communication interface, to realize the communication with the computer.

3.2.9 USB Serial Communication interface Connect to the computer and the computer to upgrade the instrument.

3.2.10 HANDLER interface Control and output of the instrument connected to the external control equipment.

3.2.11 SINGLE interface Interface used to output dedicated signals, used to connect multiplex scan controllers.

## 3.3 Instrument performance overview

The RK9910-8U / 4U can provide 8 / 4 parallel test voltage-resistant units, which are independent of each other. Unit 8 / 4 means about 8 / 4 times the safety gauge test speed.

The output of each test unit is the same: 5kVAC / 10mA voltage resistance, 6kVDC / 5mA voltage resistance, 1kVDC / 5m A insulation resistance test.

The following are detailed with the test unit parameters:

Principle structure of the test unit:The high voltage module is a DA reference, controllable sine generator, PWM power amplifier, 40~ 600Hz high voltage transformer boost, output voltage closed-loop control loop.

1. DA reference: Ensure that the output voltage amplitude can be programmable and controlled.

1. Controlled sinusoidal generator: in the AC output can be set at 50 or 60Hz operation, no longer limited by the line voltage;
2. PWM power amplifier: high efficiency, good output performance, high sensitivity. 4. 40~600Hz high voltage transformer boost: in view of the problem of large power supply ripple of DC and insulation resistance test, the test instrument produces 600Hz AC power supply, and the rectified DC voltage is formed as a power supply, to ensure that the DC power supply ripple is far less than the previous voltage regulator type old voltage resistance meter.

5. Output voltage closed-loop control: the load adjustment rate is very small, and the test data is reliable.

Software related to the instrument: multi-parameter continuous test, a variety of upper computer control functions. The RK9910-8U / 4U series is all equipped with HANDLER, RS-232C, and USB, allowing the instrument to adapt to a variety of different needs Automatic test system with high security and reliability.

Characteristics of the test unit: ■ Three test functions-AC voltage resistance test, DC voltage resistance test, insulation resistance test, When the load is connected, the instrument can continuously conduct the multi-parameter test through the editing test step.

■ test power

Each high voltage module of the instrument is a PWM power amplifier circuit and a 50VA high voltage transformer for the output of AC: 5kV / 10mA and DC: 6kV / 5mA.The distortion of the waveform is less than 3%. If the customer has a continuous current output, the maximum output time is 60 seconds when the rated output current exceeds 60%.Pay attention to limit the continuous working time within 60%~40% rated output current.Continuous operation is guaranteed below 40% rated output current.

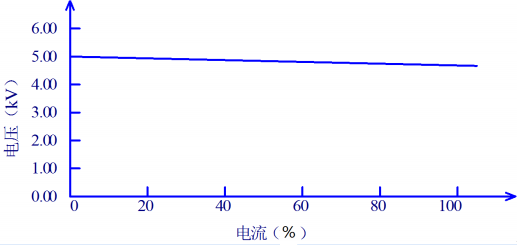


图 3-3 AC voltage load adjustment rate

■ DC withstand voltage test: 6kV / 5mA

The instrument series provides DC voltage resistance with a wide voltage range (maximum output DC 6kV). Automatic voltage adjustment of 600H z frequency hardware, voltage load adjustment rate of 1% + 10V.

6.00

5.00

4.00

3.00

2.00

1.00

0.00

0 1 2 3 4 5

图 3-4 RK9910-8U/4U The DC voltage output range

■ Insulation resistance test of 0.050kV to 5.000kV (resolution of 1V) / 0.2 MΩ to 1 00.0G with a maximum rated current of 5mA.

Insulation resistance test range:

When the voltage is less than 500V: 0.2M ~ 1.0G accuracy is ± [10% reading + 5 words], more than 1G display- - - - - -the voltage is more than 500V: 0.2 MΩ ~ 1.0G range accuracy is ± (5% reading + 5 words), 1.0G ~50G range accuracy is ± (10% reading + 5 words).The 50G Ω ~ 100G range precision is ± (15% readings + 5 words),

The ■ RS-232C interface was used as the standard

In addition to power conversion, key lock and other functions, other can be remotely controlled. In DC voltage resistance test, AC voltage resistance test, test voltage, judgment function, test time and insulation resistance test conditions can be remotely controlled. Test results can also be read from the back by remote control. The USB and RS-232C interfaces provide a stable and unified standard test interface with the PC or other devices.

■HANDLER interface

HANDLER interface: it can input START and STOP signals, and output TEST, PASS and FAIL signals.It can be very easily connected with the foot switch into the foot control, and the simple test clamp connection to achieve safety interlock, pneumatic control, test instructions and so on.Internal or external 24V power supply can be used as the output interface power supply for easy control and connection.

■ The USB interface used for the backup

The instrument is equipped with a USB interface, which can save the test documents written by the instrument and the customer measurement documents to the external U disk, or transfer the instrument from the U disk, to facilitate the batch setting of the instrument use parameters and archiving scheme.

■ Up-up time control function

In the AC voltage resistance test, DC voltage resistance test and insulation resistance test, the test voltage can slowly rise to the set value, rather than providing the set voltage to the subject piece immediately after starting the test.Voltage rise time was 0.1s to a 999.9s resolution of 0.1s.The instrument series meets the requirements of the various U L test standards and the IEC voltage resistance test standards (the initial voltage is less than half of the test voltage and the rise time can be specified when the set test voltage is reached).

■Drop-down time control function

In the qualification judgment of the AC withstand voltage test, the test voltage can be gradually reduced. The voltage drop time can be set at 0.1s with a resolution of 0.1s to 999.9s.

■Discharge function

Usually, the test piece is compatible. The test piece is kept in full charge at the moment when the DC withstand voltage resistance test and the insulation resistance test are cut off, so there is a danger of electric shock. The instrument series has the forced fast discharge function of the tested parts after the DC withstand voltage resistance test and the insulation resistance test are completed.

■Enhanced security

In order to improve safety, the instrument series is equipped with many facilities and safety functions, including safety output, discharge function and ground line current detection, the so-called ground line current detection is the local high voltage test circuit through the shell return current more than 0. 5mA to cut off the high voltage output.

■ High test accuracy

The instrument series of voltage display, with voltage test accuracy of ± (1% + 5 words) during voltage resistance test, and voltage accuracy of ± (1% during insulation resistance test + 5 words).The accuracy is ± (1% + 5 words).

The AC and DC voltage resistance tests require high voltage and high current sensitivity, and the current of the stray capacitance flowing through the test line and fixtures Will make the test inaccurate.

■ Easy operability

The instrument series is easy to operate, giving the user no difficulty in starting it.The instrument lists all the test parameters in the setting interface.Use the direction key to select a parameter from the interface displayed by the LCD, and then the function button to modify the parameter, and the customer can measure the data directly.

■The instrument can be stored inside: 140 test files, each file can have 20 test steps

One can edit 140 test files for various test project combinations required by customers; each test file can have up to 20 test steps: AC voltage resistance test, DC voltage resistance test, insulation resistance test, and opening For any one of the circuit short circuit determination, the test conditions of each step are not correlated; the stored files of the instrument can be transferred to the computer or another similar instrument through the external U disk in the file operation interface.

warn: The instrument uses a high pressure of 5kV AC / 6kV DC. Do not touch the test parts and test lines at will, there will be a risk of electric shock. Safety measures such as fence should be provided around the tested parts. When safety measures such as fence are not in a safe state, please disconnect the INT LOCK short circuit cap signal jumper to ensure the user safety.complete To ensure safety, it is recommended to disconnect the INT LOCK short circuit cap signal jumper when high voltage is not required. When high pressure needs to be started, carefully check the high pressure test cable and the tested components.

# Chapter 4: Basic Operations

## 4.1 Overview of the instrument interface structure

This chapter describes the operating procedures for voltage resistance and insulation resistance testing.The interface structure of the instrument is shown as follows:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  | | --- | | 测量 TEST |  |  | | --- | | 设置 SETUP |  |  | | --- | | 文件修改和检查 |  |  | | --- | | DC (直流耐压) |  |  | | --- | | IR (绝缘电阻) |  |  | | --- | | 系统 SYSTEM |  |  | | --- | | 文件 FILE |  |  | | --- | | 保存 SAVE |  |  | | --- | | 调取 LOAD |  |  | | --- | | Test 测试 |  |  | | --- | | 启动测试 |  |  | | --- | | STEP ：01/01 |  |  | | --- | | AC (交流耐压) |  |  | | --- | | AC 参数 |  |  | | --- | | I/O 接口 |  |  | | --- | | Int.File 内部 |  |  | | --- | | Ext.File 外部 | |

Schematic diagram of the test operation process

Interface description: The first column of the interface structure is called with the panel function keys.The TEST interface cannot modify the parameters. Interface structure The second column is the parameter structure of the initial interface.For example, the SETUP interface is default STEP 01 / 01: scheme step 1, total steps 1, AC: AC voltage resistance test interface, AC parameters: other parameters are AC voltage resistance test parameters. The third column of interface structure is the function switching interface. When some function identities are selected in the second interface, these functions can be changed, and the relevant parameters of this interface will change.If the AC is changed to DC, the instrument will change the AC voltage resistance test mode to the DC voltage resistance test mode, and the 'AC parameter' of the current interface will become the 'DC parameter' required to set the DC voltage resistance.

Note: The instrument only saves the data modification when switching the interface. After modifying the data at the setup interface and the system interface, switch the interface to the "TEST" interface.

## 4.2 Panel functional interface and parameter description

This section introduces the functional interface and related parameters of the instrument according on the software process and interface correlation. To guide users about the function and use of the instrument.

Initial Status description of the instrument

1. The boot instrument will be self-check,
2. After the boot, the system enters the test interface by default.
3. The default data is the test data of the last interface switch before the last shutdown.

4. The default setting of the instrument is single step, AC voltage resistance and default parameter state.

The interface switching of the instrument can be switched directly switched with four function keys, they are

Measurement display (TEST): Start the high-pressure test process. Measurement Settings (SETUP): Modify the high-pressure test process. System interface (SYSTEM): Modify the conditions related to the instrument system. File processing (FILE): Save and call a set test file from the instrument storage area or the U disk.

Note: The instrument will only save the data modification during the interface switching.After modifying the data at the setting interface and the system interface, the interface must be switched.Please be careful not to turn off the data directly after modifying it to avoid the data lose.

4.2.1 TEST test interface.

The test interface is used to start the test process and test the test subject according to the existing requirements. Enter with the "TEST" key

The interface diagram is as follows: (Take AC as an example)



Figure 4.2.1 AC Test Interface

注意：

1. High pressure measurement of the measured element can be started in the TEST interface.This interface has not been modified for the test parameters.
2. The high voltage start of the instrument must meet: the "INTLOCK" short circuit cap of the HANDLER interface is closed, the "STOP" key is not pressed, and any "START" key is pressed.

3. The LOCK function key can lock the keyboard to avoid misoperation

After starting the measurement, the instrument displays the real-time test data during the test. In FAIL, the instrument determines the working method according to the failure mode function.

When all test steps complete the PASS, the instrument displays the total PASS test results. When a FAIL is available after all test steps, the instrument displays the FAIL test results.Press the STOP key to return to the test waiting state.

2

4.2.2 SETUP measurement settings.

The setting interface is used to set up the test items according to the product safety requirements.Press the "SETUP" key to enter

Note: After modifying the data in the setting interface, switch the interface to TEST, and the instrument will save all the data modifications. Please note that no Turn off the data directly after modifying it to avoid data loss.

The interface diagram is shown as follows:

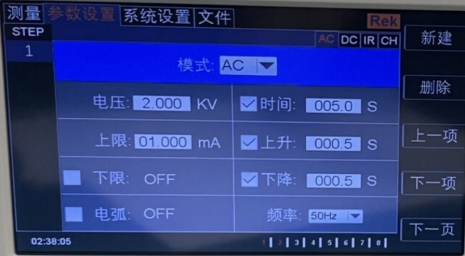


Figure 4.2.2 AC setting interface diagram

Description of the test file modification

STEP: 01 Test steps: Step number for the current project The test step value is the serial number of the current test item in the test file.That is, the order in which the test file is tested.

The project identification of the test file, the current parameter is the first / total steps of the test file.

|  |  |  |  |
| --- | --- | --- | --- |
| key | function | explain | |
| F1 | NEW | Create a new empty test file (STEP) and create a new default step and test item automatically. | |
| F2 | DEL | Delete the current test steps and test items. The next steps item will move one bit forward. | |
| F3 | PREW | Access the parameters for the previous step in the current display step | |
| F4 | NEXT | Access the parameters in the step after the current display step. | |
| F5 | PGDN | Go to the next page | 。 |

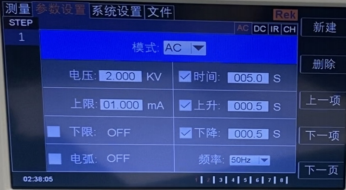
Test items: AC voltage withstand (AC) The test item for the current test procedure is AC voltage withstand voltage. The test item of the current test step is AC withstand voltage resistance, and the cursor can be switched to DC, IR and OS items through F1~F 4 in this position. For parameter modification of test items, see "4.3 Test project interface and Parameter Description".

Channel setting steps

1. Press "SETUP" to enter the parameter setting interface, as shown in the figure below:

Note: After modifying the data in the setting interface, switch the interface to TEST, and the instrument will save all the data modifications.Please be careful not to turn down the data directly after modification to avoid data loss.

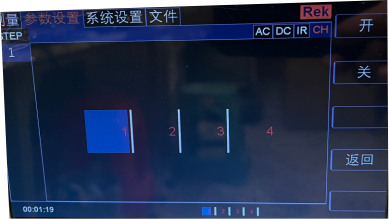
The interface diagram is shown as follows:



2. After entering the above interface, press the "Next page" option in the lower right corner of the screen to enter the next interface, as shown in the figure below:



3. Press the screen "Set" option in the above interface to enter the next interface, as shown in the figure below:

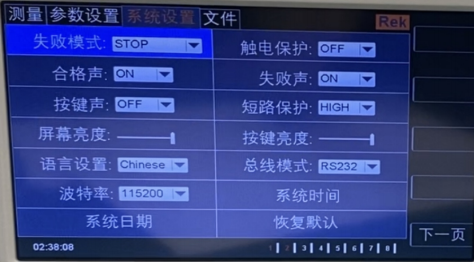


3. After entering the above channel setting interface, press the direction key to select the channel to open. There is a channel status switch on the right side of the screen to select. Note: RK9910-4U has 4 channel choices, and RK9910-8U has 8 channel choices.

4.2.3 SYSTEM system interface.The interface schematic diagram is as follows:

The system interface is unrelated to test items, but related to test result processing, test process control and instrument communication scheme.Press "SYSTEM" to enter and press "SYSTEM" again to switch the interface. Note: After modifying the setting interface and system interface, the interface must be switched to save all data modifications.

1. Test the relevant system subinterface



The next page in the step mode: normal, cycle, single step three states.

Figure 4.2.3.1 Relevant interface of the test system

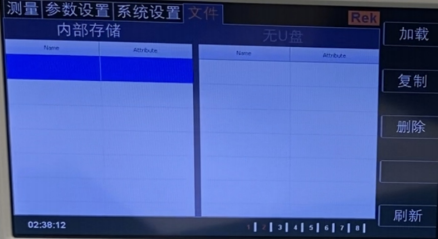
界面参数说明：Description of the interface parameters:

|  |  |  |  |
| --- | --- | --- | --- |
| 中文 | Set the mark | Parameter numerical description | 中文含义 |
| 失败模式 | STOP、CONTIUE  RESTART、NEXT  REPEAT | STOP  CONT | If unqualified, exit the test state directly.If unqualified, continue to test Restart, next, cycle |
| 合格声 | ON/OFF |  | ON: sound on, OFF: sound off |
| 按键声 | ON/OFF |  | ON: sound on, OFF: sound off |
| 屏幕亮度 |  |  | Can adjust the brightness of the left and right, reduce to the left, increase to the right |
| 语言设置 | CHINIESE、ENGLISH |  | Chinese, English |
| 波特率 | 115200、38400  19200、9600 |  | Set the baud rate for the communication |
| 系统日期 |  |  | Set the system date |
| 系统时间 |  |  | Set system time |
| 恢复默认 |  |  | factory data reset |
| 触电保护 | ON OFF | ON 、OFF | Electric shock protection is switched off and open |
| 步骤模式 | STEP MODE | NORM | Normal test |
| STEP | single stepping test |
| REPEAT | Test existing files |
| 失败声 | ON OFF | ON 、OFF | ON: sound on, OFF: sound off |
| 短路保护 | HIGH LOW | HIGH、LOW | Short-circuit protection sensitivity level is high |
| 按键亮度 |  |  | Can adjust the brightness of the left and right, reduce to the left, increase to the right |
| 总线模式 | BUS MODE | RS232C、RS485 | Communication bus mode |

4.2.4 FILE file storage interface.

The file interface is used to save an edited test file, or to call a previously edited test file. Press "FILE" to enter and press "FILE" again to switch interface.

内部文件操作分界面示意：Internal file operation subinterface signal:



4.2.4.1 Internal file operation interface

External file operation subinterface signal:

Interface description: 1, I: Internal file. Internal storage area within the instrument, save or calling test files. 2, E: Files stored by the external U disk. The U disk stores, saves, or calls test files for the use of current setup files on other instruments. 3. When copied to E: internally, the U disk is saved to the currently open U disk directory by default, and the default state is the root directory.

注意 ：

1. Due to the simple instrument system, the analysis speed of the optimal disk reads is very slow.Suggestion: Excellent disk capacity should not exceed 8G; the stored files are placed in the root directory to avoid instrument reading failure. 2. Files of different program versions may be incompatible due to possible changes in the setting project.If the test condition is incomplete after the call file, reedit the new test file.

## 4.3 Test project interface and parameter description

This section introduces the test function parameters of the setting interface and their meanings to guide the setting of relevant parameters.

4.3.1 AC AC voltage resistance test parameters setting.The setting interface is as follows:

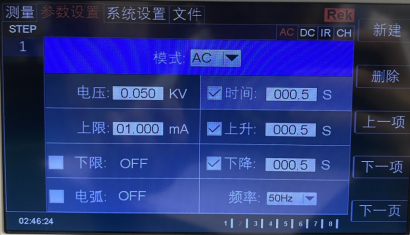


图 4.3.1AC 设定界面示意

Description of the AC withstand voltage (AC) test parameters:

|  |  |  |  |
| --- | --- | --- | --- |
| VOLT ： | 测试电压 | 0.050~5.000kV | AC high voltage test voltage value |
| UPPER ： | 电流上限 | 0.001~10.00mA | AC voltage resistance and current upper limit |
| LOW R ： | 电流下限 | 0.001~10.00mA | The AC lower limit current value, must be less than the UPPER value. |
| OFF | no requirement for the lower limit |
| ARC ： | 电弧限制 | 0.1~20.0mA | Allow AC arc current maximum value |
| OFF | The arc has no requirements |
| TIME ： | 测试时间 | 0.2~999.9S | AC voltage resistance test time, the test |
| OFF | There is no limit to test time |
| RISE ： | 上升时间 | 0.1~999.9S | AC high voltage test voltage rise time |
| OFF | Default =0.1S, and test time integration. |
| FALL ： | 下降时间 | 0.1~999.9S | AC high voltage test voltage drop time |
| OFF | Cut off the voltage output directly after the test end.(The tested parts are available Can be charged) |
| FREQ ： | 测试频率 | 50/60 | Frequency of communication work |

4.3.2 DC DC voltage test parameters.

Move the cursor to Test mode and select DC Test mode. The setting interface is as follows:



图 4.3.2 The DC setting interface indicates that

The DC withstand voltage (DC) test parameters are described as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| VOLT ： | 测试电压 | 0.050~6.000kV | High voltage test voltage value |
| UPPER ： | 电流上限 | 0.1uA~5.00mA | Current upper limit |
| LOW R ： | 电流下限 | 0. 1uA ~5.00mA | Lower limit of current, less than UPPER value. |
| OFF | There is no requirement for the lower limit |
| TIME ： | 测试时间 | 0.1~999.9S | Test time, time to the end of the test |
| OFF | There is no limit to test time |
| RISE ： | 上升时间 | 0.1~999 9S | Test the voltage rise time |
| OFF | Default =0.1S, and test time integration. |
| FA LL： | 下降时间 | 0.1~999.9S | Test the voltage drop time |
| OFF | Stop voltage output after test. |
| ARC ： | 电弧限制 | 0.1~20.0 mA | DC arc current maximum value |
| OFF | The arc has no requirements |
| RAMP ： | 升压判定 | ON | When the voltage rises, the upper current upper limit is allowed. |
| OFF | No current limit. |

注意：

1. After the DC test, the instrument will automatically discharge quickly for 0.2 seconds. 2. The waiting time does not affect the test timing, but the instrument does not limit the limit from the voltage rise until the end of the waiting time.But the short-circuit detection circuit is still working.

4.3.3 IR insulation resistance test parameter setting.

When moving the cursor to a test condition, select the IR test mode.

The setting interface is as follows: (schematic diagram 4.3.3):



图 4.3.3 The IR setting interface indicates that

Insulation resistance (IR) test parameters are described as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| 电压 | VOLT ： | 0.050~1.000kV | Insulation test voltage value. |
| 上限 | UPPER ： | 0.2M ~100.00G | Upper limit of insulation resistance. |
| OFF | The upper limit of insulation resistance is not determined. |
| 下限 | LOW R ： | 0.01M ~100.0G | Lower limit of insulation resistance, less than UPPER value. |
| 时间 | TIME ： | 0.1~999.9S | Insulation resistance test time. |
| OFF | There is no limit to test time |
| 上升 | RISE ： | 0.1~999 9S | Insulation voltage rise time. |
| OFF | Default =0.1S, and test time integration. |
| 下降 | FA LL： | 0.1~999.9S | Insulation voltage drop time. |
| OFF | Cut off the voltage output directly after the test end.(Tested Parts may be charged similarly below) |
| 量程 | RANG ： | AUTO | Automatic range mode: Improve the test accuracy. |
|  | 1M 、 10M 、 100M、  1G 、 100G | Fixed range mode: You can use I= U / R estimation range to accelerate the test speed. |

注意：

1. Judge the upper and lower limits of the instrument at the end of the test. But the current short circuit limit is always open in judgment!!！
2. When the range is automatic, the minimum test time is 0.6S!!!
3. Due to the influence of the current and voltage collection time sequence, the voltage rise time and the voltage drop time display of the resistance value will be significantly different, which is hereby explained for reference.

4. The instrument must be preheated for 15 minutes before the insulation resistance test value can be more accurate.

## 4.4 Test function principle and use instructions

多 项 目 测 试



DC模式在WAIT时间内允

许不处理 电 流超限

|  |
| --- |
| 7. Ground wire current |
| 8. Arc detection |

8. Current over limit

5、high voltage test

|  |
| --- |
| 11、STOP |

This section introduces the principle and use of grounding connection, ground line current detection, arc detection and other tests.

|  |
| --- |
| 1. Start the test |

2. Test delay



4、Charging current detection

3.Voltage rises



在此范围内如果出 现不合格皆会

触发下列不合格判断

6. Voltage drops

9. Unqualified treatment

、

|  |
| --- |
| 10. Test result processing |

|  |
| --- |
| 12. End of the test |

Test flow block diagram of the instrument

pay attention to: 1. When FAIL appears in a test unit, the test unit is finished and the instrument indicates the FAIL format. 2. A one-step test ends only when all the test units are FAIL, or at the end of the testing process for testing the other test units. 3. After the test step, if a FAIL appears in the test unit, the next step of the instrument will be determined according to the setting mode of the FAIL.

启动 

合格通道时序

步骤 1 测试

阶梯上升

步骤2

阶梯上升

启动

1

空闲

初始化

结果处理 PASS

初始化

结果处理

FAIL

阶梯上升 测试 阶梯下降 阶梯上升

初始化

初始化

0

步骤2

不合格通道时序

步骤 1

4.4.1 Start the test

仪器测试时序示意图

In the test mode, check the test conditions and the test piece is correctly connected, press the START key to start the test

4.4.2 Voltage rise

Some of the tested features are sensitive to mutations in voltage and require this function. The output voltage is zero when the instrument starts to output. At the beginning of the voltage output, the instrument will control the output voltage in 0.1S. The step boost value is determined according to the test voltage and the voltage rise time (V = V / (10 \* S)). If the turn-off voltage rise time (RISE OFF), the default voltage rise time is 0.1 seconds to automatically add the test time, so that the minimum test time value is 0.2S. This value is too small to cause an error in ARC or DC boost determination, please note.

4.4.3 DC boost determination

Whether to start the current upper limit determination function switch or not in the process of voltage rise is mainly used to avoid test misjudgment. When the distribution of the test capacitor is small, the charging current of the capacitor is relatively small and will not cause a significant change in the current, opening the boost judgment can find the poor performance of the measured parts as early as possible, and reduce the chance of excessive current damage of the component. When the step capacitor is large, the capacitor will have a charging process during the voltage rise process. The current may be far greater than the set upper limit of the measured current set. If the boost judgment is opened, it will cause the misjudgment of the super upper limit. If necessary, open the short circuit threshold to lower the short circuit sensitivity and improve the charging current

4.4.4 High-pressure test

Conduct a high-pressure test on the subject piece. At this time, it should be able to ensure that the test circuit is correct, and the test results will not be affected by some special attached parameters, and the display content is the actual voltage resistance and current required by the test.

4.4.5 Test voltage drop

The rise of the same test voltage is determined by the characteristics of the measured device. When the voltage drops after the high voltage test, the instrument will control the output voltage drop in 0.1S (DC voltage will not drop with the control voltage), and the step step down value is determined according to the test voltage and voltage rise time (V = -V / (10 \* S)). If the off voltage drop time (FAIL OFF) the default voltage drop time is 0.1 seconds. At this time, the instrument does not test the comparison judgment, and the data is for reference only. At the end of the voltage drop, the instrument will connect the test circuit to the AC withstand voltage resistance mode, and if the DC voltage drop discharges through the AC loop of the instrument.

4.4.6 Ground line current detection function

Ground wire current detection is to detect the current flowing through the shell of the instrument to prevent electric shock. When high voltage output, current from the voltage output through the body to the instrument shell, which may cause very serious consequences. Description of the circuit response of the ground current detection and judgment of the instrument:

Local line current detection is enabled, and the ground line current is greater than 0.45mA is determined as the ground line current exceeds the limit. When the electric shock is judged, the instrument will end the high pressure output in 0.3S and exit the test state. And display the (GFI FAIL).

Note: The instantaneous output current of the instrument may be greater than 30mA, and if it is indeed an electric shock, it may cause the operator's coma or death. Therefore, it is recommended to start the ground wire current detection and use it if the product allows.

4.4.7 Current Overlimit and Arc Detection (ARC) function

Current over-limit classification: current lower limit, current upper limit, current over-limit, arc detection.

Current lower limit judgment (LOW): generally used as a test low-end disconnection judgment. When the equipment tests the equipment, the equipment will certainly have a certain leakage current. When the leakage current of the instrument test is less than the lower limit set current value, the test is considered to fail (no equipment is connected). If the leakage current of the tested element itself is very small, this function must be turned off. Judgment display (LOW FAIL), only the test mode is valid, timing sampling, the rate is 100mS each time.

Current upper limit judgment (HIGH): the most commonly used test current over-limit judgment. When the equipment tests the equipment, the equipment will certainly have a certain leakage current, when the leakage current of the instrument test is greater than the maximum set current value, think that the equipment resistance voltage impedance test failure. Over the limit judgment display (HI FAIL), timing sampling, the rate of 100mS each time.电Flow limit determination: the current sampling judgment is slow, the current change faster sampling circuit cannot be reflected in time when the insulation collapse, and the current peak value exceeds the allowable output range of the instrument, such over-limit judgment will be triggered, and the judgment display when the over-limit is exceeded (SHORT FAIL). Since the data cannot be collected after such a current exceeds the limit, the output result of the system is: the test result within 100mS before the current exceeds the limit. The current limit value is twice the output current allowed by the instrument (1.5 times the peak). The drop time is invalid, and this judgment is not masked.

Arc detection (ARC): it is a very practical function for the coil type element measurement. It tests the local current shock caused by the instantaneous discharge of the local circuit in the high-voltage test circuit. Because of the superposition on the normal test current, the mutation time is short, and the above ordinary current detection circuit cannot make an appropriate judgment in response to the current change. The arc detection circuit filters out normal current values for only high-speed current pulse changes. Because low-pass filtering and the size of the arc itself are random, this function can only roughly estimate the extent of local firing. Because the data cannot be collected after the current exceeds the limit, the output result is the last test result when qualified, and the judgment when passing over the limit is displayed (ARC FAIL). ARC current test is a qualitative analysis, the size of the quantity and test environment, test line distribution

And so on affect the great randomness, pay attention when using.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | B |  |  | C |  |
| A |

10 100 1k 10k 100k 

Frequency response comparison of current overlimit determination and arc detection: (see figure above)

Area A in the figure: display the circuit frequency sound for the current sampling. Because the ripple AD sampling calculation filter the test results analyze whether the current exceeds the set limit. Test current range than 100m S. Area B: Current fast response circuit. It only filters out the signal voltage peak of the high-frequency interference and compares the overcurrent peak signal lock, and only makes the limit judgment. Greater than the instrument allowable output current, the pulse is wider than 1mS. Area C in the figure: the arc detection circuit. The arc detection circuit samples only samples the amplitude of mutations in the current, and the signal high-pass filters the low-frequency voltage peak against pulse locking. The current mutation edge around the setpoint, the pulse width is about 1uS-1mS.

4.4.8

1. The test results shall be processed separately according to the test unit for the judgment. 2. There are multiple test steps in one test file, including one step, FAIL. The file mode test result of the test unit is FAIL.
2. When the unqualified standard occurs during the test, the instrument will stop the output of the corresponding unit and suspend the data collection and display of the corresponding unit. At the end of other unit tests, the qualified and unqualified test results will be given.
3. If a unit is unqualified, the subsequent tests shall be controlled by FAIL MODE.

5. If the above unqualified state occurs during the test, the instrument will give the unqualified judgment, and save the corresponding FAIL status. Wait for the instrument software to query the unqualified type.

4.4.9 Test result processing

If the test process exceeds the limit, it is judged as unqualified, and there are multiple test items, and the unqualified judgment processing mode is controlled by the test mode of the system. Otherwise, the instrument will display the unqualified judgment and category, waiting for the user to handle. After the test, there is no unqualified mark, the test result is judged as (PASS), the qualified judgment processing mode is controlled by the PASS HOLD of the SYSTE M, and then ready to start the next step of measurement or return to the test waiting state.

In the multistep test, the control signal output of the system is controlled by the control mode. Select the FILE mode to output the test results only after the entire file test ends. The end of the test is controlled by the failure mode. See the System Options Description for more details. From this status to the next project, customers can query the test data and results with software.

4.4.10 STOP (Stop measurement)

Press the STOP'button in any state throughout the test process, and the instrument will automatically end the test, and there will be no test result judgment output at the end of the test. Test end status, the customer can query the test data with the software.

1. If the customer does not set the test time, he can stop the test with the STOP key.

注意：

When GET, do not connect the product to the test end. Clearing the product will not improve the actual test range of the instrument.

## 4.6 Structure and use of HANDLER interface circuit

4.6.1 Control interface principle

Internal principle of HANDLER and SINGAL interfaces. The interface signals are as follows:

|  |
| --- |
| PT1  GND  BK250  DB1  D1  1  14  2  15  3  16  4  17  5  18  6  19  7  20  8  21  9  22  10  23  11  24  12  25  13  +24VO  EXT\_24V+  SS34  /UINT1  /UINT2  /UINT3  /UINT4  /UINT5  /UINT6  /UINT7  /UINT8  PASS\_n  FAIL\_n  HANDLER 接口  BAK1\_n  DB25 母头  WAIT\_n  READY\_n  TEST\_n  DANGER\_n  ERR\_n  START\_n  STOP\_n  INLOCK\_n  BAK2\_n  PT2  24V-GND  GND  BK250  DB25 |

|  |  |  |
| --- | --- | --- |
| UP5  5.1K  14  TEST STOP  \_  R29 5.1K  330R  9  +24VO  24V-GND  SS34  \_   |  | | --- | | INLOCK n |   3  EXT\_24V+  R19  2 START\_n  TEST START 16  \_  1  EXT\_24V+  15  GND  R22 5.1K  4 STOP\_n  R25  13  GND  5 INLOCK\_n    EXT\_24V+  INTLOCK 12  R25A  10K  6 24V-GND 10K  11  R28 GND  7 EXT\_24V+  BAK2 10  8 BAK2\_n  PS2801-4    GND  P1 D2   |  | | --- | | 1  2  3  4  5  6 |   对外输出供电 24 V |

说明：

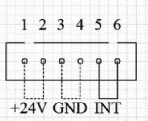
1. + 24V: + 24Vdc power inside the instrument, COM1. Output current is 200mA. The POWER JMP short circuit provides the pull-up power supply for the output optical coupling, and can also be connected to the external light-emitting diode for indication.

2. EXTV1: External input port control power supply, low-end is COM1. This pin can be connected to the internal + 24V or the external 8-24V power supply, and the internal current amount of the instrument is

3. E5V: The instrument input optical coupled power supply, generated by EXTV1 voltage stabilization. Used to photopower the input signal without the input signal is invalid.

4. INTLOCK: the instrument online lock. The instrument forbids any high-pressure output operation when disconnected here.

5. START and STOP signals constitute remote input control. Effective for the COM 1-terminal short connection.

6. The TEST, PASS, FAIL and DANGER signals form a remote output control, and the optical coupling of the pull-up output signals. Specific effective state users can be customized, the default low level is effective, the optical coupling side is turned on.

7. All inputs and outputs are low-end to COM1 (ground).

说明：

1、 HANDLER接口：START、STOP、COM信号组成远程输入控制，开关输入闭合有效。

2、 HANDLER接口：TEST、PASS、FAIL信号组成远程输出控制。开关输出闭合有效。 TEST 可以 来作为高压启动信号，或者仪器工作正常的脉冲信号。

3、 INLOCK接口用于仪器开启与断开,此信号单机默 认为短路， 开路时禁止本仪器启动高压输出。

4、 SIGNAL接口另外提供大概输出电压为+24V的电源，输出电流小于 0.5A，配合HANDLER 接口控制信号,可用驱动于指示灯、光电开关、小功率电磁阀等等。 (见下图)

INLOCK接口图

4.6.2 HANDLER 控制接口主要信号时序说明

控制接口一般用来做远程控制和测试同步或指示 。接口外部连接如下：



幅值

最小设定(S)

/READY

/TEST

/DENGER



/FAIL

/PASS

/CH n

上升

测试

下降

结束

测试

下降

结束

启动

2

0.2

0.1

0.1

0.1

0.1

0.1

步骤 n

0.1

步骤1

STEP MODE  单步结果

单步结果



FILE MODE

文件结果

HANDLER 端口 加粗时信号有效 

图 4.5.2 ：HANDLER 接口时序示意视图

## 4.7 Other interfaces and functions of the instrument

1. Front panel USB DEV is used to connect the excellent disk, for the export and import of customer setting files and instrument software upgrade.

1. The rear panel USB HOST is used to connect online with the computer.
2. 3. RS232 is used to connect with the computer. For the port rate, the data format is 8.n.1. Compatible software format IEE485.

控制接口使用

PT1

GND

BK250

DB1

D1

1

14

2

15

3

16

4

17

5

18

6

19

7

20

8

21

9

22

10

23

11

24

12

25

13

+24VO

EXT\_24V+

SS34

/UINT1

/UINT2

/UINT3

/UINT4

/UINT5

/UINT6

/UINT7

/UINT8

PASS\_n

FAIL\_n

HANDLER 接口

BAK1\_n

DB25 母头

WAIT\_n

READY\_n

TEST\_n

DANGER\_n

ERR\_n

START

START\_n

1

1

STOP\_n

|  |
| --- |
| 1 |

INLOCK\_n

BAK2\_n

PT2

24V-GND

STOP

GND

1

BK250

DB25

INLOCK

1

1

FAIL

1K/1W

6

5

4

3

2

1

PASS

INT

TEST

GND

+24V

+24V

外部电路连接图

# Chapter 5: Remote Control

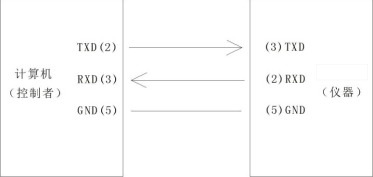
## 5.1 Description of the RS232C interface

The current widely used serial communication standard is RS-232C standard, can also be called asynchronous serial communication standard, RS is "Recommended Standard" (recommended standard) English abbreviation, 232 is the standard number, the American Electronics Industry Association (IEA) officially announced in 1969 standard, it stipulates that one person through a data line at a time. As with most serial ports in the world, the serial interface of the instrument is not strictly based on the RS-232C standard, but rather only provides a minimal subset. The following table:

|  |  |  |
| --- | --- | --- |
| signal | abbreviation | Connector pin number |
| send data | TXD | 2 |
| receive data | RXD | 3 |
| grounding | GND | 5 |

Instrument RS232C signal was controlled with the pin

The reason is that the operation of three lines is cheaper than that of five lines or six, which is the biggest advantage of using serial port communication. The instrument and the computer are connected as shown in Fig.:

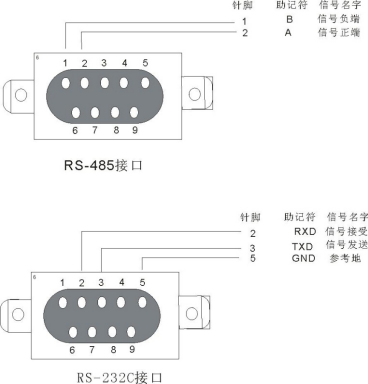


Schematic diagram of the computer and the instrument connection

As you can see from the figure, the pin definition of the instrument is different from the 9-core connector serial interface pin definition used by the computer machine. The RS232 interface wave rate can be selected from 9600~115200, with no check (no parity), 8-bit data bit, and 1-bit stop bit. The instrument command meets the SCPI standard. When the command string is sent to the instrument, the LF (hex: 0AH) should be sent as the end character. The maximum acceptable SPCI command string bytes at a time is 2kByte. For the command reference section, to see the resulting data format that the instrument sends to the computer.

## 5.2 RS485 / 232C interface description

The communication interface of the tester can provide RS232C and RS485 for users to choose. The interface is defined as follows:



信号正端 信号负端

|  |
| --- |
| A  B |

5.3 USB interface

The USB (Universal Serial bus) connects to the computer through the USB interface to upgrade the instrument.

# Chapter 6 Serial Command Set Description

Brief description of the instruction format:

1. The instrument instruction set only describes the actual characters accepted or sent by the instrument.

2. Command characters are all ASCII characters.

3. Data for the instruction " " Are all ASCII strings. The default format is integer or floating point, and the default unit of data does not appear in the instruction.

4. The end of the instruction must have the end of the instruction: an identifier of the end, without which the instrument does not resolve the instruction. A) The default end tag is: return character (NL), print controller (\ n), decimal number (10), hexadecimal number (0x0A). End mark of b) IEEE-488 bus: keyword (^ END), signal (EOI).

## 6.1 The S C PI instruction set

Instrument subsystem commands for RK9920 / 9910

● DISPlay ● FUNCtion

● SYSTem ●MMEM ●FETC

## 6.2 The D ISPLAY subsystem command set

The DISPlay subsystem command set is mainly used to set the display page of the instrument, the characters? You can query the current page.

DISPlay ：PAGE

命令语法： DISPlay：PAGE 空格<page name> 备注：page name 用数字代表 <page name> 具体如下：

1----TEST

2----TESTSET

3----SYSSET

4----FILE

Set the display page to: Measurement display page

Set the display page to: Measurement Settings page

Set the display page to: System Settings page

Set the display page to:, (internal) file list

character? You can query the current page.

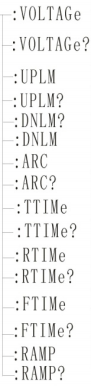
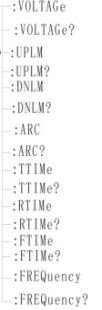
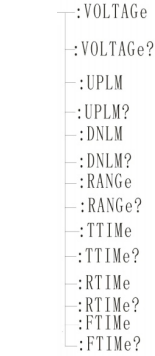
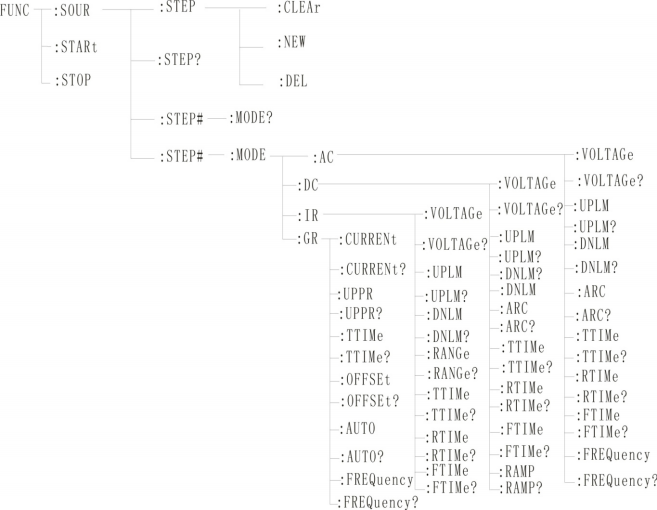
-- 范例：

设定显示页面至：测量显示页面。

设置指令： DISP：PAGE 1

查询指令： DISPlay：PAGE?

返回值： 1



## 6.3 The FUNC tion subsystem command set

The 6.3.1FUNCtion subsystem command set is mainly used to set the test parameters of the instrument test function. Command tree:

|  |
| --- |
|  |

6.3.2 The P R O G functional command set

|  |  |
| --- | --- |
| FUNC ：STARt | When the instrument is at the test interface, start the test. |
| FUNC ：STOP | When the instrument is at the test interface, stop the test. |
| FUNC ：STEP :<num>: INS | Add a new test item to the existing test scheme (STEP) |
| FUNC ：STEP :<num>: DEL | Within the existing test scheme (STEP), delete the current test item. |
| FUNC ：STEP :<num>: NEW | Create a new empty test scheme to write a completely new test scheme. |
| FUNC ：STEP :<num>: | Edit steps of the current test protocol, = 1 to 50. |

The 6.3.3AC Setup feature command set

FUNC:SOURce ：STEP#:MODE:AC:VOLTage 设置/查询 AC 的电压

FUNC ：SOURce ：STEP ：AC ：VOLT set/inquire the voltage of ACW

-format: setting format： FUNC ：STEP :<num>: AC ：VOLT < voltage value >

Query format： FUNC ：STEP :<num>: ：AC ：VOLT

-data<sn>data type: integer

-data < voltage value >: data type: floating point number

Data range:

0.050~5 .000

Data accuracy： 0.001

-sample data unit: KV

Set the voltage of ACW in STEP 1 to：1000V、

Data type: floating point number

Data range: 0.001~20.000 mA (where 0 is OFF) RK 9920

0.001~10.000 mA (where 0 is OFF) RK9910

Data accuracy: 0.001 mA

Data unit: mA

1.000

？

-Example:

Set the lower current limit of ACW in STEP 1 to 1mA

Setting command：FUNC ：SOURce: STEP1:MODE:AC:UPLM

Query command：FUNC ：SOURce: STEP1:MODE:AC:UPLM

Return value： 1

FUNC:SOURce：STEP#:MODE:AC:ARC Set / query arc value

-format:

Setting format： FUNC ：FUNC ： STEP#:MODE:AC:ARC

Query format： FUNC ：FUNC ： STEP#:MODE:AC:ARC？

Data type: floating point number

Data range: 0.001-20.00mA

Data accuracy: 0.001

Data unit: mA

FUNC:SOURce：STEP#:MODE:AC:TTIMe Set / query AC test time

-format:

Setting format： FUNC ：FUNC ： STEP#:MODE:AC:TTIMe

Query format： FUNC ：FUNC ： STEP#:MODE:AC:TTIMe？

Data type: floating point number

Data range: 0~999.9 (where 0 is OFF)

Data accuracy: 0.1

Data unit: s

-Example:

Set the test time of ACW in STEP 1 to: 1s

Setting format： FUNC ：FUNC ： STEP#:MODE:AC:TTIMe

Query format： FUNC ：FUNC ： STEP#:MODE:AC:TTIMe？

Return value： 1.

FUNC:SOURce：STEP#:MODE:AC:RTIMe set/query rise time of ACW

-format:

Setting format： FUNC ： STEP#:MODE:AC:RTIMe

Query format FUNC ： STEP#:MODE:AC:RTIMe?

-data < time value >:

Data type: floating point number

Data range: 0~999.9 (where 0 is OFF)

Data accuracy: 0.1

Data unit: s

-Example:

Set the rise time of ACW in STEP 1 to: 1s

Setting command： FUNC ：STEP :<num>: AC ：RTIM 1

Query command： FUNC ：STEP :<num>: AC ：RTIM?

Return value： 1.000.

FUNC:SOURce：STEP#:MODE:AC:FTIMe Set/Query the Fall Time of ACW

-format:

Setting format：FUNC ： STEP#:MODE:AC:FTIMe < time value>

Query format：FUNC ： STEP#:MODE:AC:FTIMe?

-data < time value >:

Data type: floating point number

Data range: 0~999.9 (where 0 is OFF)

Data accuracy: 0.1

Data unit: s

-Example:

Set the rise time of ACW in STEP 1 to: 1s

Setting command： FUNC ： STEP1:MODE:AC:FTIMe 1

Query command： FUNC ： STEP1:MODE:AC:FTIMe ?

Return value： 1

FUNC:SOURce：STEP#:MODE:AC:FREQuency freq set/query ACW test frequency

-format:

Format：FUNC ： STEP#:MODE:AC:FREQuency

Query format：FUNC ： STEP#:MODE:AC:FREQuency？

-data < frequency >:

Data Type: Character

Data range: 50/60

Data accuracy:0.1

Data unit: Hz

-Example:

Set the test frequency of ACW in STEP 1 to 50Hz

Setting command：

FUNC ：SOURce ：STEP1:MODE:AC:FREQuency 50

Inquiry command：FUNC ：SOURce ：STEP1:MODE:AC:FREQuency?

Return value： 50.

6.3.4 DC Setup function command set

Note: the basic format refers to the DC Setup function command set.

FFUNC:SOURce：STEP#:MODE:DC:VOLTage set/inquire the voltage of DCW

Format：FUNC ： STEP#:MODE:DC:VOLTage

Query format：FUNC ： STEP#:MODE:DC:VOLTage ？

-data < voltage value >:

Data type: floating point number

Data range: 0.050~6 .000

Data accuracy: 1

Data unit: KV

Format：FUNC ： STEP1:MODE:DC:VOLTage 1.000

Query format：FUNC ： STEP1:MODE:DC:VOLTage？

FUNC:SOURce：STEP#:MODE:DC:UPLM Sets/Queries the Upper Current Limit of DCW

-data < current value >:

Data type: floating point number

Data range: 0.001 ~10.000 mA RK 9920

0.001 ~5.000 mA RK 9910

Data accuracy: 0.001 mA

Data unit: mA

FUNC:SOURce：STEP#:MODE:DC:DNLM set/query the lower limit current of DCW

-data < current value >:

Data type: floating point number

Data range: 0~10.0 mA (where 0 is OFF) RK 9920

0~5.0 mA (where 0 is OFF) RK 9910

Data accuracy: 0.001 mA

Data unit: mA

FUNC:SOURce：STEP#:MODE:DC:TTIMe set/query test time for DCW

-data < time value >:

Data type: floating point number

Data range: 0~999.9 (where 0 is OFF)

Data accuracy: 0.1

Data unit: s

FUNC:SOURce：STEP#:MODE:DC:RTIMe set/query rise time of DCW

-data < time value >:

Data type: floating point number

Data range: 0~999.9 (where 0 is OFF)

Data accuracy: 0.1

Data unit: s

FUNC:SOURce：STEP#:MODE:AC:FTIMe setting/querying the drop time of DCW

-data < time value >:

Data type: floating point number

Data range: 0~999.9 (where 0 is OFF)

Data accuracy: 0.1

Data unit: s

FUNC:SOURce：STEP#:MODE:DC:ARC Set/Query ARC Current Limit for DCW

-data < current value >:

Data type: floating point number

Data range: 0~20.0 mA (where 0 is OFF) Rk9920

0~10.0 mA (where 0 is OFF) Rk9910

Data accuracy: 0.1mA

Data unit: mA

FUNC:SOURce：STEP#:MODE:AC:RAMP Set/Query the Boost Status of DCW

-format:

Setting format：FUNC ： STEP#:MODE:DC:RAMP ：<ON/OFF> or<1/0>

FUNC ： STEP#:MODE:DC:RAMP ?

Query format：

-data < voltage >:

Data Type: Character

Data range: OFF(0), ON(1)

Data accuracy:

Data unit:

-Example:

Set the RAMP state of DCW in STEP 1 to: OFF

Setting command： FUNC ： STEP1:MODE:DC:RAMP 0

Query command：FUNC ： STEP1:MODE:DC:RAMP？

Return value： O.

### 6.3.5 IR Setup function command set

FUNC:SOURce ：STEP#:MODE:IR:VOLTage Set / query the voltage of the IR

--格式

设置格式： FUNC ：SOURce: STEP#:MODE:IR:VOLTage< 电压值 >

查询格式： FUNC ：SOURce: STEP#:MODE:IR:VOLTage ？

-data < voltage value >:

Data type: floating point number

Data range:

0.050~1 .000

Data accuracy: 0.001

Data unit: K V

Example: Set the voltage value of IR in STEP1 to 1000V

设置命令： FUNC ：SOURce: STEP1:MODE:IR:VOLTage 1.000

查询命令： FUNC ：SOURce: STEP1:MODE:IR:VOLTage ？

返回值： 1

FUNC:SOURce ：STEP#:MODE:IR:UPLM Set / set the upper limit of the query IR

--格式

设置格式： FUNC ：SOURce: STEP#:MODE:IR:UPLM< 电阻值 >

查询格式： FUNC ：SOURce: STEP#:MODE:IR:UPLM ？

-data < current value >:

Data type: floating point number

data area： 0.1M -10G Ω (0为OFF) RK9920

data area： 0.2M -10G Ω( 0为 OFF)RK9910

Data accuracy： 0.1M Ω

data unit ： M Ω

Example: Set the upper resistance limit of IR in STEP1 to 100M

Set the command： FUNC ：SOURce: STEP1:MODE:IR:UPLM 100

Query command： FUNC ：SOURce: STEP1:MODE:IR:UPLM ？

returned value ： 100

FUNC:SOURce ：STEP#:MODE:IR:DNLM Set / query the lower limit value of the IR

--form

设置格式： FUNC ：SOURce: STEP#:MODE:IR:DNLM< 电阻值 >

查询格式： FUNC ：SOURce: STEP#:MODE:IR:DNLM ？

-data < current value >:

Data type: floating point number

data area： 0.1M -1G Ω

data area： 0.1M Ω

data unit ： 0.1M Ω

Example: Set the resistance value of IR in STEP1 to 10M Ω

设置命令： FUNC ：SOURce: STEP1:MODE:IR:UPLM 10

查询命令： FUNC ：SOURce: STEP1:MODE:IR:UPLM ？

返回值： 10

FUNC:SOURce ：STEP#:MODE:IR:RANGe Set up / query the resistance range

--form

Set the format： FUNC ：SOURce: STEP#:MODE:IR: RANGe < 范围值 >

Query format： FUNC ：SOURce: STEP#:MODE:IR: RANGe ？

--数据<A Range value>：

Data type: Integer

data area： 1、10、100

Data accuracy: no

data unit ： M Ω

Example: Set the resistance range of the IR in the STEP1 to 100M Ω

Set the command： FUNC ：SOURce: STEP1:MODE:IR: RANGe 100

Query command： FUNC ：SOURce: STEP1:MODE:IR: RANGe ？

Return value: 100

FUNC:SOURce ：STEP#:MODE:IR:TTIMe Set up / query the test time of the IR

--格式

设置格式： FUNC ：SOURce: STEP#:MODE:IR:TTIMe< 时间 >

查询格式：FUNC ：SOURce: STEP#:MODE:IR:TTIMe ？

--数据<Time value>

Data type: the whole type

data area： 0-999.9

Data accuracy： 0.1

data unit ： S

Example: Set the time value of IR in STEP1 to 1S

设置命令： FUNC：SOURce: STEP1:MODE:IR:TTIMe [1](#_bookmark71)

查询命令：FUNC ：SOURce: STEP1:MODE:IR:TTIMe ？

返回值： [1](#_bookmark72)

FUNC:SOURce ：STEP#:MODE:IR:RTIMe Set / query the rise time of the IR

--格式

设置格式：FUNC ：SOURce: STEP#:MODE:IR:RTIMe< 时间 >

查询格式： FUNC ：SOURce: STEP#:MODE:IR:RTIMe ？

--数据<Time value>

Data type: the whole type

data area： 0-999.9

Data accuracy： 0.1

data unit ： S

Example: Set the time value of IR in STEP1 to 1S

设置命令： FUNC：SOURce: STEP1:MODE:IR:RTIMe 1

查询命令： FUNC：SOURce: STEP1:MODE:IR:RTIMe ？

返回值： 1

FUNC:SOURce ：STEP#:MODE:IR:FTIMe Set / query the drop time of the IR

--格式

设置格式： FUNC ：SOURce: STEP#:MODE:IR:FTIMe< 时间 >

查询格式： FUNC ：SOURce: STEP#:MODE:IR:FTIMe ？

--数据<Time value>

Data type: the whole type

data area： 0-999.9

Data accuracy： 0.1

data unit ： S

Example: Set the time value of IR in STEP1 to 1S

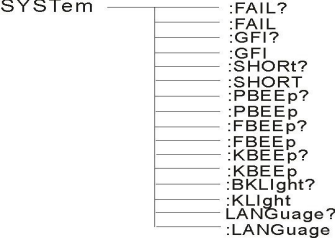
设置命令： FUNC ：SOURce: STEP#:MODE:IR:FTIMe 1

查询命令： FUNC ：SOURce: STEP#:MODE:IR:FTIMe ？

返回值： 1

## 6.4 SYSTEM Subsystem Command Set

Command tree:



SYSTem ：PBEE/FBEE/KBEE

Set / Query Test pass / fail / key buzzer status

--格式

设置格式： SYST ：PBEE<ON/OFF>OR<1/0>

查询格式： SYST ：PBEE ？

--数据： <ON/OFF>

Data type: Character

data area： 0 (OFF ) ,1 (ON )

example:

Set the BEEP to 1

Set the command： SYST:BEEP 1

--return information

Query command: SYST: BEEP?, Return value: Bezzer status, such as 1

SYSTem ：REset Restore all of the default states

--form:

Set the format： SYST ：RES

## 6.5MMEM Subsystem Command Set

**MMEM:SAVE** saves the current file to the file number.

-format:

Format: MMEM ：SAVE < file name >

-data < file name >:

Data Type: String

**MMEM LOAD** exports the file specified by the file number to the current.

-format:

Format: MMEM ：LOAD < file name >

-data < file name >:

Data Type: String

## 6.6FETCH Subsystem Command Set

FETCH used to obtain the measurement results of the instrument

-format:

Setting format：FETCh ：AUTO

Query format：FETCh : AUTO?

-data < ON/OFF> or<1/0 >

Data Type: Character

Data range: 0 (OFF) ,1 (ON)

-Example:

The set test data is automatically returned to ON

Command is：FETCh ：AUTO ON or： FETCh ：AUTO 1

-return information

Query command: FETCh?, return the current measurement results of the instrument.

Command syntax: FETCh?

## 6.7 Channel settings and query command

6.7.1 Channel command in AC mode

命令：FUNC:SOURce:STEP#：MODE:AC:CH#：STATE

Set / query the switch status of the channel in AC mode

--form:

设置格式：FUNC:SOURce:STEP#：MODE:AC:CH#：STATE<状态值>

FUNC:SOURce:STEP#：MODE:AC:TEAM#：CHALL<8个状态值>

Query format：FUNC:SOURce:STEP#：MODE:AC:CH#：STAT？

--数据< state value >

Data type: the whole type

Data range: 0 / 1

0:open 1:close

Example: Open the CH2 of the AC mode in STEP1

Set the command：FUNC:SOURce:STEP1：MODE:AC:CH2S：TATE0

Query command：FUNC:SOURce:STEP1：MODE:AC:CH2：STATE？

returned value ：0

Set the 8 channels of the AC Mode group 1 in STEP1 to open, open, open, open, open, open, open open

Set the command：FUNC:SOURce:STEP1：MODE:AC:TEAM1：CHALL0，0，0，0，0，0，0，0

6.7.2 Channel command in DC mode

order：FUNC:SOURce:STEP#：MODE:DC:CH#：STATE

Set up / query the switch status of the channel in DC mode

--form:

Set the format：FUNC:SOURce:STEP#：MODE:DC:CH#：STATE<状态值>

FUNC:SOURce:STEP#：MODE:DC:TEAM#：CHALL<8个状态值>

Query format：FUNC:SOURce:STEP#：MODE:DC:CH#：STAT？

--数据<state value >

数据类型：整型

Data range: 0 / 1

0:open 1:close

Example: Open the CH2 of the DC mode in STEP1

设置命令：FUNC:SOURce:STEP1：MODE:DC:CH2S：TATE0

查询命令：FUNC:SOURce:STEP1：MODE:DC:CH2：STATE？

returned value ：0

Set the eight channels of DC Mode group 1 in STEP1 to open, open, open, open, open, open, open open

设置命令：FUNC:SOURce:STEP1：MODE:DC:TEAM1：CHALL0，0，0，0，0，0，0，0

6.7.3 Channel command in Ir mode

命令：FUNC:SOURce:STEP#：MODE:IR:CH#：STATE

Set up / query the switch status of the channel in DC mode

--form:

设置格式：FUNC:SOURce:STEP#：MODE:IR:CH#：STATE<state value >

FUNC:SOURce:STEP#：MODE:IR:TEAM#：CHALL<Eight state values>

Query format：FUNC:SOURce:STEP#：MODE:IR:CH#：STAT？

--数据<state value >

Data type: the whole type

Data range: 0 / 1

0:open 1:close

Example: Open the CH2 of the IR mode in STEP1

Set the command：FUNC:SOURce:STEP1：MODE:IR:CH2S：TATE0

Query command：FUNC:SOURce:STEP1：MODE:IR:CH2：STATE？

Return value: 0

Set the 8 channels of the IR Mode Group 1 in STEP1 to open, open, open, open, open, open, open open

设置命令：FUNC:SOURce:STEP1：MODE:IR:TEAM1：CHALL0，0，0，0，0，0，0，0

## 6.8 Other control command sets

\*IDN query instrument model, version information

Query returns： <manufacturer>,<model>,<firmware><NL^END>

Here：<manufacturer> gives the name of the manufacturer（REK）

<model> give the machine model (e.g RK9920/9910）

<firmware> gives the software version number (such as Version1.0.0）

For example：WrtCmd( “\*IDN? ”);

# Chapter 7 Appendix

## 7.1 RK9910-8U/4U Model and specification

1、 Specific parameters

|  |  |  |  |
| --- | --- | --- | --- |
| model | | | RK9910-8U/4U Series single route parameters (8 for RK9910-8U and 4 for RK9910-4U) |
| Voltage resistance test | | | |
| output voltage | AC | voltage range | 0.050kV —5.000kV |
| voltage waveform | sine wave |
| degree of distortion | < 3％ |
| working frequency | 50 、60Hz optional |
| Frequency accuracy | ±1%+5 words |
| output power | 50VA (5.000kV 10mA ) |
| voltage regulation | ±(1.0% +50V) (power rating) |
| DC | voltage range | 0.050 kV —6.00kV |
| Signal source frequency | 600Hz |
| output power | 25VA (5.000kV 5mA ) |
| voltage regulation | ±(1.0% +100V) (power rating) |
| Voltage resolution | | 1V |
| Voltage output accuracy | | ±(1.0% +5words) (no load ) |
| Voltage generation mode | | DDS signal source plus PWM power amplifier |
| Current test range | AC | current range | 0.001mA –10mA |
| short-circuit current (moment) | >20 mA  (Set output voltage> 500V) |
| Current resolution | 0.001 mA |
| Current accuracy | ± ( 1% +5 个字) |
| The actual current | OFF-0.001 mA-10mA |
| DC | current range | 0.1uA –5.00mA |
| Current accuracy | ± ( 1% +5 words) |
| Discharge function | | Automatic discharge after the test (DCW) |
| insulation resistance test | | | |
| output voltage | | | 0.05kV-5.0kV ± ( 1% +5 words) |
| Voltage resolution | | | 1V |
| Voltage test accuracy | | | ± ( 1% +5 words) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| maximum output current | | | 5mA | |
| maximum(power)output | | | 5VA (1000V/5mA ) | |
| Output instantaneous short-circuit current | | | >10mA(Set output voltage> 500V) | |
| load regulation | | | ≤1％(power rating) | |
| Waves (1kV) | | | ≤ 3% (1kV，no load ) | |
| Discharge function | | | Automatic discharge after the test | |
| Range of resistance measurement | | | 0.02M Ω –100.0GΩ | |
| Resistor displays the range(1000V) | | | 1M  10M  100M  1G  100G | 0.2 M Ω-1 M Ω  1 M Ω-10 M Ω  10 M Ω-100 M Ω  100 M Ω-1G Ω  50GΩ-100GΩ |
| Resistance measurement accuracy | | | ≥ 500V  0.2MΩ –100M Ω ±(5% +5words )  100M Ω –50G Ω±(10% +5 words) 50G Ω –100GΩ±(15% +5 words) < 500V  0.2M Ω –1GΩ±(10% +5 words)  1G Ω –100G ΩNo accuracy requirement is provided for reference only. | |
| Current measurement accuracy | | | ± (1% range + 5 words) | |
| Arc detection | | | | |
| 测量measure  范围range | AC | | 1mA –20mA | |
| DC | | 1mA –20mA | |
| comparer | | | | |
| Discrimination method | | | Window comparison  I下 ON ： 当 I下< Ix< I上 ， PASS ； 当 Ix ≤I下 或 Ix ≥I上 ， FAIL  (条件 I下 < I上 )  I下 OFF ： 当 Ix< I上 ， PASS ； 当 Ix ≥I上，  FAIL  Insulation resistance discrimination method is the same as above | |
| Current upper limit setting I上 | | AC | 0.001mA –10mA | |
| DC | 0.1uA –5mA | |
| Current lower limit setting I下  (LOWER OFF) | | AC | 0.001mA –10mA | |
| DC | 0.1uA – 5mA | |
| Resistance upper limit setting | | | OFF -0.2M Ω- 100GΩ | |
| Resistance lower limit setting | | | 0.01M Ω –100GΩ (Lower minimum actual current shall not be greater than 5mA) | |

|  |  |
| --- | --- |
| Discriminate output | PASS / FAIL LCD and LED display respectively, sound alarm |
| parameter setting | |
| Voltage up time | 0.1s –999.9s |
| Voltage drop time | 0 s –999.9s， (Effective only after voltage-resistant PASS.) |
| Test time setting | 0.3s –999.9s (At TIMER ON) |
| time accuracy | ± (0.2% Setpoint + 0.1s) |
| Measurement function | |
| Keyboard lock | Prevent accidental modification of test conditions, or prevent test conditions from being modified |
| Current overscale range judgment | Hardware quickly judge insulation collapse, faster and safer than voltage sampling, reduce the impact damage to the product |
| ARC electric arc detection | Sample the mutation signal of the current to determine the potential hidden danger and the approximate scale of the circuit |
| Ground wire current detection (human body protection) | Protect personal safety during accidental electric shock or high pressure leakage to the shell |
| High pressure instructions | Window indication and the LED light indicator |
| Storage and interface | |
| File programming and storage | 16M memory stores test files, each file in which AC, DC and insulation resistance can be set separately, and 140 test files and 20 test steps can be stored |
| USB joggle | yes |
| Boot parameter preservation | Set parameters are saved as default parameters, and can be automatically restored next time |
| control interface | HANDLER SINGAL  ， |
| communication interface | RS232C ，USB、RS485 |

2 、Model number and function corresponding table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ACW | DCW | IR | 测试单元 |
| RK9910-8U | \* | \* | \* | 8 路 |
| RK9910-4U | \* | \* | \* | 4 路 |

General technical indicators

|  |  |  |
| --- | --- | --- |
| General technical indicators | | |
| Operating temperature and humidity | | 0 C －40 C, 80%RH |
| source | | 100V-242V 47.5-63Hz |
| power dissipation | | ≤ 1200VA |
| Appearance volume | RK9910-8U(W\*D\*H) | W440mm ×D720mm ×H210mm |
| RK9910-4U(W\*D\*H) | W440mm × D720mm ×H210mm |
| weight | RK9910-8U | 61.5KG |
| RK9910-4U | 43.3KG |

7.2 Description of the instrument system upgrade procedure:

1. U disk is FAT32 format, less than 8G, preferably empty disk, upgrade file copy in the root directory.(Do not change the original file name of the upgrade file)
2. 2. Insert the upgrade file U disk into the U disk socket of the front panel. You can see that the panel prompts that the U disk is available.

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