

9458-SERIES

PROGRAMMABLE WITHSTANDING VOLTAGE TESTERS OPERATION MANUAL



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MN-9458-SERIES-E

V0

Compound key description

Compound key			
Parameter setting:			
0:	ENT	1:	F1/New
2:	F2/Delete	3:	F3/Prev
4:	F4/Next	5:	F5/Save
6:	Mode	7:	Menu
8:	Shift	9:	Esc

Compound key	Function declaration
ENT	Numeric setting page: digit "0"
F1/New	Numeric setting page: digit "1"
F2/Delete	Numeric setting page: digit "2"
F3/Prev	Numeric setting page: digit "3"
F4/Next	Numeric setting page: digit "4"
F5/Save	Numeric setting page: digit "5"
Mode	Numeric setting page: digit "6"
Menu	Numeric setting page: digit "7"
Shift	Numeric setting page: digit "8"
Esc	Numeric setting page: digit "9"

Safety warning:

Instrument grounding This instrument is a Class I safety instrument. When connecting the power supply, please make sure that the power socket contains grounding wire. If it is not grounded, the casing

Static electricity or induced electricity on the computer may cause personal injury!

Danger of electric shock beware of electric shock during operation, testing and instrument maintenance. Non-professionals are not allowed to open the chassis without authorization. If professionals need more information, When changing the fuse or carrying out other maintenance, be sure to unplug the power plug first, and do it with others. Even if the power plug has been unplugged, there may still be dangerous voltage on the capacitor, so it should be operated after discharge.

In the process of electric shock damage test, any incorrect removal or addition of the tested part will cause abnormal damage to people, property or instruments.

Harm! ! ! If the instrument is damaged due to abnormal operation, the maintenance cost shall be borne by the customer.

Please use the power supply according to the power supply parameters specified in this instrument, and the power supply input that does not meet the specifications may damage this instrument.

Stay away from the explosion

Sexual gas environment Electronic instruments should not be used in flammable and explosive gas environment or environment containing corrosive gas or smoke, because this may

Bring danger.

Other safety

Please do not apply any voltage source or current source to the test terminal of this instrument.

An important supplement or reminder to the content elaborated.

Instructions for use:

* Please read and understand the contents described in the instruction carefully before operating the tester. After reading, please put the instructions near the operator for reading when necessary. When moving the tester from one workplace to another, please carry the manual with the instrument to avoid losing it.

* With the improvement of instrument function and the upgrade of software, the instruction manual will be improved and upgraded continuously. Please pay attention to the software and manual version of the tester.

Safety warning:	1
Chapter 1 Installation and Use	3
Chapter 2. Operating Specifications and Measures	6
Chapter 3 Overview of Instrument Panel	10
Chapter 4. Operating instructions	17
Chapter 5 Technical parameters	37

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Chapter 1 Installation and Use

This chapter describes some checks that you must carry out after receiving the instrument, and the conditions that you must know and have before installing and using the instrument.

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

1.1 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 combustion or explosion, do not use the instrument near alcohol, diluent and other flammable materials, and do not use it in air with high gas concentration.

- Avoid exposing the instrument to high temperature and direct sunlight.

Don't put the instrument in a place where it is hot or the temperature changes sharply.

Temperature range of the instrument: 5°C to +35°C

Storage temperature range of instruments; -20°C to +60°C ■ Avoid humid environment.

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

Humidity range of the instrument: 20% to 80%RH (dew condensation is not allowed); Less than 90%RH (dew condensation is not allowed)

Condensation may cause the circuit to malfunction. You must wait until the environment is completely dry before using the instrument.

- Do not put the instrument in an environment with corrosive gas.

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

- Do not use this instrument in dusty environment.

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

- Do not use this instrument in a place with poor ventilation.

The instrument has a forced air-cooled cooling 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 shaking place.

If the instrument is placed on an uneven surface or shaken place, it may slip and damage the instrument.

- Do not use this instrument in places with strong magnetic or electric field effects.

When the instrument is used in the place 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 near this instrument, the noise generated by the failure and breakdown of the tested part may affect these devices. When the test voltage exceeds 3kV, the electric field between the test lines will ionize the air and produce corona, which will cause a lot of RF bandwidth interference between the test lines. In order to reduce this influence, ensure that 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

Pay attention to the following precautions when moving the instrument or transporting it:

- 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 the AC power cord

The power cord is provided by our company together with the instrument. Do not use the AC power cord that is not standard on this instrument. Connection sequence

1. Make sure that 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 terminal of the rear panel.
5. Please use the accompanying AC power cord, or the AC power cord selected by sufficient qualified professionals.
- 6.

Plug in an AC power outlet.

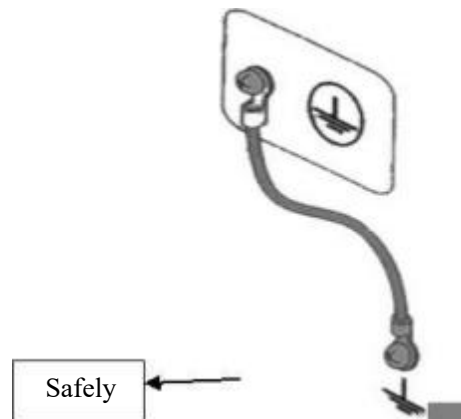
1.4 electrical grounding

△ Warning: Ensure that the instrument is connected to the electrical ground (safe, earth).

If the output is connected to the peripheral equipment or the nearby commercial wire output transit earth, which is not directly connected to the earth, the shell of the instrument may have a very high voltage and become very dangerous. The instrument is Class I equipment (the equipment is protected from electric shock except for basic insulation). However, there is still a possibility of an electric shock if there is no correct grounding.

To ensure safety, be sure that the instrument is grounded.

Select one of the following two available methods to deground: 1. The power cord is connected to a single-phase three-wire power outlet.(Make sure that the socket ground wire is acceptable To connect with the earth.) 2. Connect the protective terminal of the rear panel to the earth through the grounding row (copper wire or copper row reliably connecting the earth with the production line). Ask specialized engineers to select, make, and install the connection Ground connecting line. To ensure that the ground connection is correct and reliable



1.5 operation inspection

△ Warning: When using the instrument normally, make the function interlocking (INTERLOCK) as much as possible to ensure the safety of use. Workspace situations: Make a box-like structure for the piece under test; In the test occasions of large test parts with complex structure: use fences around the test area and other protective structures to prevent electric shock. When the electric shock protection structure is opened, disconnect the (INTERLOCK) signal circuit to ensure the safety of the workplace.

When the power switch is on, the instrument lights all lights on the front panel and starts a self-test, confirming that all indicator lights are on to ensure safety. It is particularly dangerous to damage the DANGER (high pressure hazard at test) lamp. In △ Careful: After cutting off the power switch, it will take a few seconds to power it on again. Repeating the on / off power supply without sufficient time interval is harmful to the instrument.

Check the order 1. Determine that the allowable range of the power supply voltage is consistent with the input voltage range set by the fuse box. 2. Determine that the AC power cord is connected to the AC LINE (AC power cord) end of the rear panel. 3. Plug the power plug into the AC power socket. 4. Turn on the power switch, determine that the indicator of the front panel is fully on, and the panel shows the boot screen. 5. The next screen displays the AC voltage resistance test (AC) parameters interface in the setting (SETUP) interface.

1.6 Other characteristics of the instrument

(1) Overall dimension (W * H * D): 260mm * 100mm * 400mm (2) Weight: about 6.7kg

input voltage	frequency range	Fuse (slow melting)	rated power
110V	47-63Hz	5A	400VA
220V		3A	400VA

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.

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.

2.1 Prohibited operations

■ Do not continuously switch on the power supply After cutting off the power switch, ensure that the interval is one minute or more before opening the power switch again. Ensure that the circuit drops the power normally and then start again. If the on / off the instrument power supply is repeated frequently, the control circuit of the instrument may cause disorder due to incomplete power failure. At this point, the protection facility may not fully perform the protection function. Unless in special or urgent circumstances. Do not turn off the power switch when the instrument is generating the test voltage.

■ Do not short-circuit the output end to the ground If the high voltage test line of the instrument is connected to the AC LINE (AC power line); or if other nearby equipment (such as delivery equipment) connects to the conductor of the earth. When the grounding end of the instrument is not reliable, the high voltage low end (that is, the shell of the instrument) after the grounding end will be filled with dangerous high voltage. Determine the protective ground end and ground line connection of the instrument. In this way, even if the HIGH VOLTAGE (high voltage power) and ground ends are short circuit, the instrument housing will not be charged with high voltage. Ensure correct and reliability when grounding the protective ground. See "1.4 grounding".

△ pay attention to: The term "AC LINE" refers here to the power cord used by the instrument. It is a wire in which the power supply generated by commercial AC power or power generation is connected to the power supply of the instrument.

■ **Do not connect the external voltage to the test end**

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

2.2 Handling of emergencies In an emergency

(such as electric shock and combustion under test) and when the instrument does not disconnect the high pressure output, perform the following operations. You can do it first 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 head.

2.3 Preventive measures in the test

■ **Wear insulating gloves**

When using instruments and wearing insulating gloves, you can protect yourself from touching the high voltage. Even if you have high voltage gloves, it is forbidden to touch the live conductor by hand during the high voltage test.

■ **Discontinue and (suspend) the test precautions**

If you need to touch the test conductor or change the test connection, please press the STOP switch once first to ensure that the instrument exits the test preparation state.

If you need to rest for a while, or will leave the test place, please turn off the power switch to prevent the safety hazard caused by touching the start switch by mistake.

■ **Charged items in high voltage test.**

During the test, the high-voltage output terminal, high voltage test line, high-voltage probe, the tested part and the conductors 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 sheath on the crocodile clamp of the test line provided by the instrument is not fully insulated from the test high voltage. Do not touch these parts during the test.

■ **Matters needing attention after turning off high voltage output**

If you have to touch the DUT, test line, probe or output and the surrounding area because of reconnection or other reasons, make sure that

The following two:

- (a) Confirm that the working state displayed by the instrument is not a test state.
- (b) the HV light goes out.

■ **Remote control warning**

Because the start and stop of high voltage is controlled remotely, the operator can't know the actual working state of the instrument through the interface, so be especially careful when using the instrument in remote control mode. Please pay special attention to check the reliable connection of remote control.

- (c) The "Stop" button must be reliably connected. Press the "STOP" button before replacing the DUT.

2.4 high voltage test warning

△ Warning: In high voltage test, the test line, the test probe and the tested part are all charged with high voltage. The instrument has a discharge circuit, sometimes when the output is

Discharge is still needed after cutting off. There is still the danger of electric shock during discharge. In order to avoid electric shock, it is necessary to ensure that the tested part, test line, probe and output terminal with high voltage do not touch anything other than the test element. If you may come into contact with these, make sure the DANGER light goes out to remove the hidden danger.

Once the test is finished, the discharge circuit of the instrument begins to discharge forcibly. Do not disassemble the DUT during the test and before the discharge is over.

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

■ Discharge time:

Discharge time calculation formula: $t = -\ln(30/U) \times R \times C$

t: discharge time.

30: Discharge residual safe

voltage 30U: Test set voltage.

R: the discharge impedance of the measured part, and the discharge impedance of the instrument is about 10k
C: the capacitance of the measured part.

Generally, only DC-like high voltage test needs to be discharged, and the length of discharge time depends on the nature of the tested part.

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

2.5 dangerous state treatment of faulty instruments

The typical possible dangerous state of the instrument is that "high voltage is output and the instrument is out of control". When this happens, 1. Turn off the power switch immediately and unplug the AC power cord from the AC power socket.

2. Please stay away from this instrument immediately, and ask the relevant technicians to check the test circuit to make sure that 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. Dismantle the relevant connecting wires and send the instrument back to us for maintenance.

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

Contact our distributors or agents immediately. There may be high voltage in the instrument, and it is very dangerous for non-professionals to try to repair the instrument.

2.6 Conditions for ensuring trouble-free use for a long time

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

Necessary conditions for withstand voltage test

ambient temperature		the maximum output power	Time out	Output time limit
≤40 °C	AC	>12mA	At least as long as the output time.	Max. 1 minute
		<8mA	There is no requirement	Can output continuously.
	DC	>6mA	At least as long as the output time.	Max. 1 minute
		>5mA	At least as long as the charging WAIT TIME.	Can output continuously.

Note: output time = (voltage rise time+test time+voltage fall time)

The fan has been working continuously for 30 minutes, so the use of the instrument must be suspended, otherwise the power amplifier output module may be burnt out due to overheating.

2.7 Daily inspection

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

1. The instrument input power supply conforms to the specifications and the instrument power supply configuration is correct.
2. The instrument is reliably connected with the earth.
3. The test line material is in good condition, without fracture, crack and damage.
4. The instrument is not connected to the test line, and the test can be successfully completed by starting the test under the default conditions.
5. When the test line is connected to start the test, the low-voltage end of the test line is in contact with 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 operating characteristics of 9458 series instruments. Please read this chapter carefully before using the instruments, so that you can learn the operation quickly.

3.1 front panel description

Figure 3-1 briefly describes the RK9320/10 series front panel.

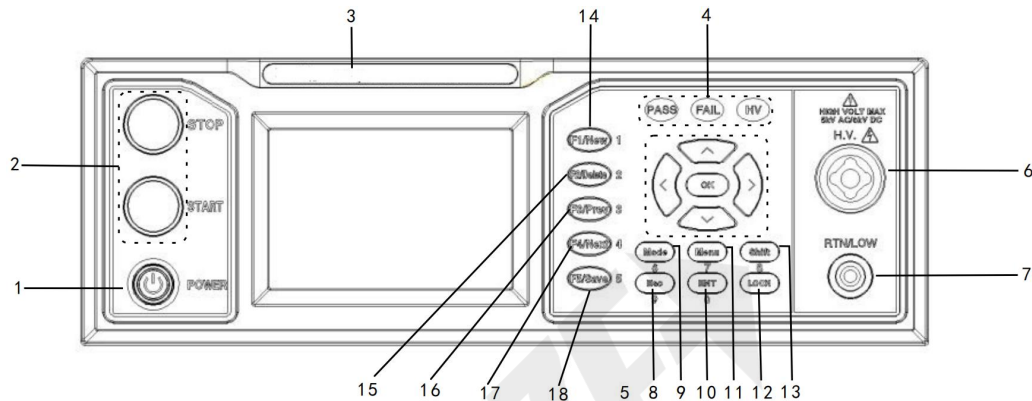


Figure 3- 1 Description of Front Panel

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 instrument power supply type and test line connection 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 light up.

STOP key (red circle): stop key, used to stop the test; It can also be used to cancel prompt states such as PASS and FAIL.

3.1.3 Trademark and model

Trademark and model of instrument

3.1.4 Indicator light area

● FAIL

In the test, there are test data beyond the set, 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 was found, the instrument judged that the test was qualified, and the PASS judgment light was on. When the test timing function TIME OFF, the test can only be ended with 'STOP' without PASS judgment.

● HV

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

3.1.5 Move key

Used for cursor movement on the screen and parameter selection.

3.1.6 High-voltage end of output voltage

High voltage output of high voltage test interface.

3.1.7 Test LOW end and test current RETurn end (low, ret)

Output end of test voltage and current sampling end.

3.1.8.Esc

Return to the superior menu or return to the test page.

3.1.9.Mode

Used to set the operation mode of the equipment.

3.1.10 ENT

Used to adjust and confirm parameters.

3.1.11 Menu

Used for equipment system parameter setting.

3.1.12 LOCK key

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

3.1.13 Shift
Press (the screen is displayed) to realize the second function of other keys.

3.1.13 shift

Press this key (display shown on screen) to enable the preparatory functions of other keys.

3.1.14 F1/New

New Step

3.1.15 F2/Delete

Delete Step

3.1.16 F3/Prev

Previous Page (Step Move- forward)

3.1.17 F4/Next

Next Page (Step Move- backward)

3.1.18 F5/Save

Save as File

3.2 Description of rear panel

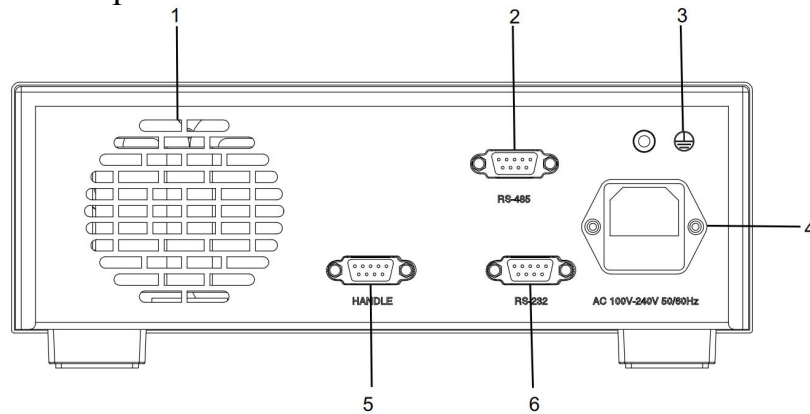


Figure 3-2 Description of Back Panel

3.2.1 Power amplifier fan radiator

Power amplifier circuit radiator, pay attention to keep the air circulation space.

3.2.2 RS485 serial interface

Serial communication interface to realize communication with computer.

3.2.3 Protective ground terminal

When the three-pin power socket plugged into the instrument power supply cannot ensure reliable connection to the earth, it must be connected to a reliable grounding bar from now on.

Note: Do not use this instrument without connecting it to the earth, otherwise the instrument shell may be charged with high voltage and there is a danger of electric shock.

3.2.4 Power socket

For inputting AC power, please use the voltage within the specified input voltage range of the instrument, and use the power cord that comes with the instrument. Built-in power supply fuse, select the fuse corresponding to the input power supply.

3.2.5 HANDLER interface

■TEST: the synchronous control signal output by this machine when the instrument starts high-voltage output.

■START: input the START signal of this machine, which is used to start the high-voltage output, equivalent to the start signal of the front panel. ■RESET: Input the reset signal of this machine to STOP the high voltage output, which is equivalent to the stop signal of the front panel.

■PASS: the qualified signal output by this machine is equivalent to the PASS indication of the front panel. ■FAIL: The unqualified signal output by this machine is equivalent to the FAIL indication on the front panel.

3.2.6 Rs232 serial interface

Serial communication interface to realize communication with compute

3.3 Overview of instrument performance

9458-DW61 can provide the voltage withstand test of 5kVAC/20mA and 6kVDC/10mA.

9458-AW52 can provide 5kVAC/20mA withstand voltage test.

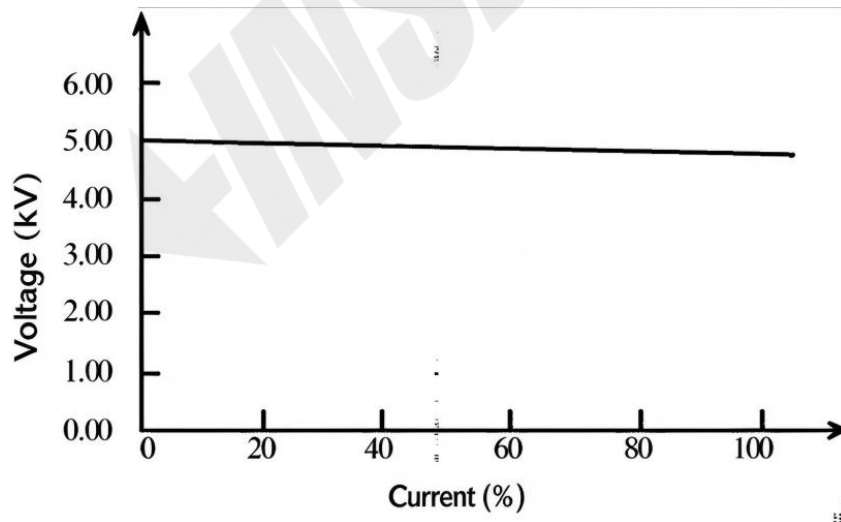
Principle and structure of the instrument:

Because the M C U processor generates signals, the sine wave generated by the signal processing circuit is amplified by the power amplifier, and the high voltage is produced by the 40 ~ 600 Hz high voltage transformer. DA reference signal ensures that the voltage amplitude is controllable. The controllable sine wave can be set at 50 or 60Hz in AC output. In order to solve the problem of power supply ripple in DC and insulation resistance test, the DC output voltage formed after rectification by 600Hz AC power supply is controlled by closed loop to ensure the small load regulation rate.

Features:

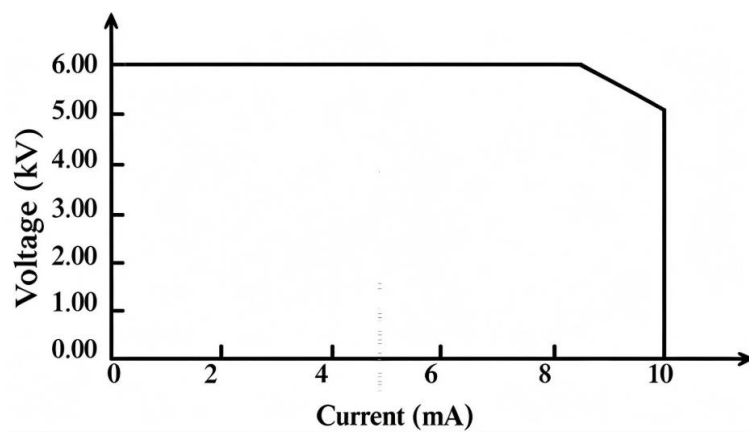
The high voltage module of 9458 series is a class AB power amplifier circuit and a 100VA high voltage transformer, which can realize AC and 5kV/20mA output. Output of DC, 6kV/10mA. The distortion of the waveform is less than 3%.

If the customer has continuous current output, in order to ensure the reliability of the instrument, the maximum output time is 60 seconds when working above 60% of the rated output current. Within 60% ~ 40% of the rated output current, please pay attention to limit the continuous working time. Below 40% rated output current can ensure continuous operation.



AC voltage load regulation rate

9458-DW61 can provide a wide voltage range (maximum output DC 6kV) for DC withstand voltage test. 600Hz frequency hardware automatic voltage adjustment, voltage load adjustment rate $\leq 1\% + 10V$.



DC voltage output range

■ RS-232C interface as standard.

In addition to power conversion, key lock and other functions, others can be remotely controlled. In DC withstand voltage test, AC withstand voltage test, test conditions such as test voltage, judgment function and test time can be controlled remotely. The test results can also be read from the back through remote control. RS-232C and RS485 interfaces provide a stable and unified standard test interface with PC or other devices.

■ HANDLER interface and input signal interface convenient for connection control.

HANDLER interface: START and STOP signals can be input, and TEST, PASS and FAIL signals can be output. It can be conveniently connected with a foot switch for foot control, and connected with a simple test fixture to realize safety interlock, pneumatic control, test indication and the like.

■ Rise time control function

In AC withstand voltage test, DC withstand voltage test and insulation resistance test, the test voltage can slowly rise to the set value, instead of providing the set voltage to the tested part immediately after the test begins. The voltage rise time is 0.1s to 999.9s, and the resolution is 0.1s.

The series conforms to various test standards of UL and withstand voltage test standards of IEC (the initial voltage is less than half of the test voltage and the rising time can be specified when the set test voltage is reached).

■ Falling time control function

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

■ Discharge function

Usually, the measured part is capacitive. At the moment when the DC withstand voltage test is cut off, the tested part remains fully charged, so there is a danger of electric shock. 9458 series has the function of forced rapid discharge of the tested part after the DC withstand voltage test is completed.

■ Enhanced security

In order to improve safety, 9458 series is equipped with many facilities and safety functions, including safety output terminal, discharge function and ground current detection. The so-called ground current detection means that the local high voltage test circuit cuts off the high voltage output when the return current through the shell is greater than 0.45mA.

■ High test accuracy

9458 series voltage digital display, the voltage test accuracy is (2% reading +2V) in the withstand voltage test. The accuracy in voltage and current withstand test is (2% reading +2 digitals).

■ Simple operability

9458 series is easy to operate, ensuring that users have no difficulty in starting to use it. This instrument lists all the test parameters in the setting interface. Use the arrow keys to select a parameter from the LCD interface, and then modify the parameter with the function button. After the customer sets the data, it can directly measure.

■ 8M FLASH, each of which can have 50 test items.

You can edit 20 test files, corresponding to various test item combinations required by customers; Each test file can have at most 50 test items, and the test items are AC withstand voltage test, DC withstand voltage test, and the test conditions of each item are irrelevant; The stored files of the instrument can be transferred to a computer or another similar instrument through an external USB drive in the file operation interface.

WARNING

The instrument uses a high voltage of 5kVAC/6kV DC. Therefore, don't touch the tested part and test line at will, which will lead to the danger of electric shock.

Security measures such as fences should be provided to ensure user safety. In addition, to ensure safety, take extreme care to prevent inappropriate connection, operating output of high pressure.

Chapter 4. Operating instructions

4.1 Boot on description

Before the power cord plug is connected to the mains, please close the input "power switch", check whether the insurance specification is correct, and connect the safety grounding wire to the "grounding terminal" on the rear panel of the tester.

The basic operations are described as follows:

- Use the menu buttons ([Menu]) and the soft keys to select the page you want to display.
- Use the cursor to move the cursor to the domain you want to set up. When the cursor moves to a domain, the domain turns on in blue. A domain is an area where you can set the cursor.
- The current cursor can set the parameter value by encoding potentiometer or number key. Use the [ENTER] key or tap the enTED potentiometer when ending data entry.

4.2 Operation steps

4.2.1 Set the tester parameters

Please refer to the "Parameter Setting" section to set each parameter.

4.2.2 Connect the tester to the measured object

Plug in the three-wire power supply plug.

Note: The supply voltage shall be maintained operating at 100V-240V AC (50 / 60Hz). The power supply input phase line L, zero line N and ground line E shall be the same as the phase line and zero line on the power supply plug of this instrument. Turn on the power supply, press the power supply switch on the lower left corner of the front panel, turn the instrument on, and display the boot screen. As shown above. Please press the "reset" key once, and determine that the test indicator is not on, the display is working normally and no output, connect the test line, and check whether all wiring is reliable.

4.2.3 Press the "Start" key to start the test.

After pressing the "Start" key, the tester outputs. At this time, the test indicator light on the front panel will light up, the display will display "Being Tested" and the test value will be displayed at the same time. The timer will also start working and the data will be updated continuously.

4.2.4 Determination of qualified products

After the test is completed, the tester will automatically turn off the output, the qualified indicator light on the front panel will light up and make a sound at the same time, and the display will display "PASS" and test data, indicating that the tester determines that the tested object is qualified.

If you want to continue the test, you can press the "Start" button again and the tester will start the test again.

If you want to stop the test, you can press the "Reset" key, and the tester will stop the test immediately, and the display will keep the current test value.

4.2.5 Determination of nonconforming products

If the test fails, the tester will immediately turn off the output, the unqualified light on the front panel will light up, and a warning sound will be issued at the same time. The display will display the test failure prompt and test data, indicating that the tester determines that the tested object is unqualified. Test failure tips include: upper limit failure and over-current protection.

If you want to turn off the alarm sound, you can press the "Reset" key.

4.2.6 START and STOP operation instructions

START key is the key to start the test. Press this key to start the test. The STOP key is the reset STOP key. In the test state, press the stop key once to interrupt the test of the instrument. The running light DANGER turns off and the LOCK light turns on. Press STOP to enter the reset state of the secondary instrument, and the DANGER and LOCK lights go out.



Panel function interface and parameter description

4.3 instrument self-test

4.3.1 Instrument self-check items

When the tester runs POST, the screen displays as follows

The self-inspection items are as follows:

1. Detection of internal crystal oscillator working state: If it is normal, it will display OK; if it is abnormal, it will give an alarm sound and cannot enter the self-inspection of the next project.
2. I/O memory status detection: If it is normal, OK will be displayed; if it is abnormal, an alarm sound will be given, and the next self-check cannot be entered.
3. State detection of complex programmable logic: If it is normal, OK will be displayed; if it is abnormal, an alarm sound will be given, and the self-check of the next project cannot be entered.
4. State detection of serial peripheral interface: If it is normal, OK will be displayed; if it is abnormal, an alarm sound will be given, and the self-check of the next item will not be entered.
5. Keyboard status detection: If it is normal, OK will be displayed; if it is abnormal, an alarm sound will be given, and the next item cannot be self-checked.
6. System status detection: If it is normal, OK will be displayed; if it is abnormal, an alarm sound will be given, and the self-inspection of the next project cannot be entered.
7. Data initialization status detection: If it is normal, OK will be displayed; if it is abnormal, an alarm sound will be given, and the next self-check cannot be entered. If there are no errors in the above self-inspection, the instrument self-inspection is successful. Enter the test interface, as shown below:

measure		
AC step: 1/1 voltage: 0.050kV 15:07:54		
Upper limit:	0.000 KV	
20.000mA		
A lower limit:	0.000 mA	
0.001mA		
time:	0.0 S	
3.0s	ready	
0%		0%

4.4 Parameter setting mode

After starting up, enter the main interface, press the button "Mode" on the instrument panel, enter the mode selection, adjust the mode selection according to the upper and lower buttons. After selecting, press OK to confirm

measure		
AC step: 1/1 voltage: 0.050kV 15:07:54.		
Upper limit:	0.000 KV	
20.000m		
A lower limit:	0.000 mA	
0.001m		
A time:	0.0 S	
3.0s	ready	
0% 0%		

Press this key.

Prev

NewDeleteNext

Mode

Menu

Exit

ENT

Lock

Save

The parameter setting interface is shown below:

Parameter setting	
STEP 1/1 shift+ ↑ : prev shift+ ↓ : next	
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz ▼

Note: The specific difference varies according to the test mode of the test step.

4.4.1 Parameter setting instructions

Test mode: a parameter in the step details panel is always a test mode parameter. Editing this parameter can change the test mode of the test step. Scope: Test modes supported by the instrument. After pressing the "ENT" key on this parameter, modify the test mode control value according to the selection box control modification method, and then press the "ENT" key again to save the modification. If the test mode of the test step changes, the parameter panel corresponding to the new test mode is automatically updated. In the process of revision, you can press the "ESC" key to cancel all current operations.

4.4.2 Description of test modes supported by steps

The test mode supported by the test step is determined by the following factors: the test mode supported by the tester and the file working mode. For example, suppose the tester supports ACW, DCW test modes.

4.4.3 Example of parameter setting (ACW)

Select "AC" withstand voltage test mode under the parameter panel setting, and the test parameter setting will enter "AC" withstand voltage mode, as shown below.

Parameter setting	
STEP 1/1 shift+ ↑ : prev shift+ ↓ : next	
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz ▼

Figure 4.3.1 Schematic diagram of AC setting interface

Set the parameters as follows:

Test mode: after the cursor moves to the test mode, press the "OK" key to enter the test mode editing, press the "→" or "←" key to change the test mode, set the AC withstand voltage tester to select AC, and then press the "OK" key to save. In this way, all the following parameters are changed to AC withstand voltage parameters.

Description of AC withstand voltage (AC) test parameters:

VOLT :	voltage	0.050~5.000kV	AC high voltage test voltage value
UPPER:	upper limit	0.001~20.00mA	AC withstand voltage current upper limit value
LOW R :	lower limit	0.001~20.00mA	AC lower limit current value must be less than the UPPER value.
		OFF	No requirement for lower limit
ARC :	electric arc	1.0 ~ 20.0 mA	Maximum allowable AC arc current
		OFF	Arc no requirement
TIM E:	time	0.1~999.9S	Ac withstand voltage test time, when the time is up, end the test RISE ≠OFF.
		OFF	Test time is not limited.
RISE :	rise	0.1~999.9S	Rise time of AC high voltage test voltage
		OFF	Default =0.1S and test time > 0.2s..
FALL:	descend	0.1~999.9S	AC high voltage test voltage drop time
		OFF	Cut off the voltage output directly after the test. (The tested part may be charged)
FREQ :	frequency	50/60 Hz	Ac operating frequency

Output voltage: press the "↓" key to move the cursor to the value after the output voltage, as shown in the following figure:

Parameter setting	
STEP 1/1	shift+ ↑ : prev shift+ ↓ : next
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz ▼

In this interface, press the "OK" key to edit the output voltage value, and the output voltage range is (0.050-5.000)KV. To change the output voltage value, press the keys "←" "↓" "→" to adjust. Then press the "OK" key.

Current upper limit: press the "↓" key to move the cursor to the value after the current upper limit, as shown in the following figure:

Parameter setting	
STEP 1/1	shift+ ↑ : prev shift+ ↓ : next
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz ▼

In this interface, press the "OK" key to edit the upper limit value of current, with the range of (0.001-20.00)mA. To change the current upper limit value, press the keys "←" "↓" "→" to make adjustment, and then press the "OK" key.

Lower current limit: press the "↓" key to move the cursor to the value after the lower current limit, as shown in the following figure:

Parameter setting	
STEP 1/1	shift+ ↑ : prev shift+ ↓ : next
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz ▼

Note: Turn on or off the lower limit function with the "OK" key. The lower limit range is (0.001-20)mA.

Press "ENT" key after turning on the lower limit function. To change the current lower limit value, press "←" "→" keys to adjust, and then press "OK" key.

Arc function: press the "↓" key to move the cursor to the arc function item, as shown in the following figure:

Parameter setting	
STEP 1/1	shift+ ↑ : prev shift+ ↓ : next
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz▼

Note: Turn on or off the arc function with the "OK" key, and the arc range is (1-20)mA.

Press the "ENT" key after turning on the arc function. To change the arc value, press the "←" "→" keys to adjust, and then press the "OK" key. The smaller the arc value is set, the lighter or flashover phenomenon of the measured object will not be detected by the tester during the test.

Test time: press the "↓" key to move the cursor to the time function item, as shown in the following figure:

Parameter setting	
STEP 1/1	shift+ ↑ : prev shift+ ↓ : next
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz▼

Note: Turn on or off the time function with the "OK" key, and the time range is (0.1-999.9) s.

Press the "ENT" key after turning on the time function to edit the time, and the range is (0.1-999.9) s. To change the time value, press the keys "←" "↓" "→" to adjust, and then press the "OK" key.

Rise time: press the "↓" key to move the cursor to the rise time function item, as shown in the following figure:

Parameter setting	
STEP 1/1	shift+ ↑ : prev shift+ ↓ : next
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz▼

In this interface, press the "ENT" key to edit the time in the range of (0.1-999.9) s. To change the time value, press the keys "←" "↓" "→" to adjust, and then press the "OK" key

Descent time: press the "↓" key to move the cursor to the function item of descent time, as shown in the following figure:

Parameter setting	
STEP 1/1	shift+ ↑ : prev shift+ ↓ : next
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz ▼

In this interface, press the "ENT" key to edit the time in the range of (0.1-999.9) S s. To change the time value, press the keys "←" "↓" "→" to adjust, and then press the "OK" key.

Frequency: press the "↓" key to move the cursor to the frequency function item, as shown in the following figure:

Parameter setting	
STEP 1/1	shift+ ↑ : prev shift+ ↓ : next
Mode: AC ▼	
voltage: 1.000KV	☒ Time: 000.5 S
Upper limit: 01.000mA	☒ Rise: 000.5 S
☐ lower limit: OFF	☒ Decline: 000.5 S
☐ Arc: : OFF	Frequency: 50Hz ▼

In this interface, press the "ENT" key to edit the frequency with the range of (50/60) Hz. Press the "↓" and "↑" keys to change the frequency value.

New Step: Press the shift key "New" on the panel in the test interface to create a new test step, and a total of 50 test steps can be created. A new test step is established after the current step, which adopts the default test mode-AC voltage.

Delete step: Press the "shift" key "Delete" on the panel in the test interface to delete the test step. The tester deletes the current step, and the subsequent steps move to the current step.

Previous Page: (Step Forward) In the test interface, press the "Previous Page" key on the panel to move forward the current step, that is, the contents of the current test step and the previous test step are exchanged, which can conveniently realize the sorting function of test steps, but when the current step is the first test step, the moving forward operation is invalid.

Next Page: (Step Move Back) Press the "Next Page" key on the panel in the test interface to move back the current step, that is, the contents of the current test step and the next test step are exchanged, which can conveniently realize the sorting function of test steps. However, when the current step is the last test step, the move back operation is invalid.

Save as file: in the test interface, press the "Mode" key on the panel to the parameter setting interface, press the "Shift" key and then press the "ENT" key to enter the file name interface. After inputting the file name, press the "ENT" key to "Save as file" to save the current test steps, which is convenient to retrieve and use in the form of a file. Storage interface, as shown below:

Please enter a file name

ENT

7STU

8VWX

9YZ_

4JKL

5MNO

6PQR

1ABC

2DEF

3GHI

ESC

0

shift+

↑

shift+

ok

shift+

↓

shift+

menu

Press mode to switch case.

After entering the interface shown above, press the number keys on the panel, and the screen will be displayed as follows:

Please enter a file name

ENT

7STU

8VW X

9YZ_

4JKL

5MNO

6PQR

1ABC

2DEF

3GHI

ESC

0

shift+

↑

shift+

ok

shift+

↓

shift+

menu

1

a

b

c

Press mode to switch case.

Type the relevant characters on the screen, press the "ENT" key, and the file will be saved in the memory of the tester.

4.5 System Setup Mode

4.5.1 Description of system setting parameters

System Settings	
Language setting	Qualified voice
Sound of failure	keying chirps:
System time	System date
Restore system settings	Recovery Test Settings

1 system language

There are two languages in this program, Chinese and English. You can use the [↑] [↓] key to select the function item to be set.

2 failure sound

This option has two functions, on and OFF. You can use the [↑] [↓] key to select the function item to be set.

3 system time

This item can set the current time of the instrument. Once the system time is set, the time function will continue regardless of the power-on and power-off state, unless the internal battery fails. You can use the [write] [↓] [←] [→] key to select the value to be set.

4 Restore system settings

This function is to restore system settings, parameter settings and factory settings, and all settings will be reset. Press the [OK] key to pop up [Parareset], and then press the [OK] key to confirm, that is, restore the factory settings and restart the instrument.

5 qualified sound

This optiON has two functions, on and OFF. You can use the [↑] [↓] key to select the function item to be set.

6 key sound

This optiON has two functions, on and OFF. You can use the [↑] [↓] key to select the function item to be set.

7 system date

This item can set the current time of the instrument. Once the system time is set, the time function will continue regardless of the power-on and power-off state, unless the internal battery fails. Use the [write] [↓] [←] [→] cursor to select the time to be set.

8 Restore test settings

4.5.2 Description of communication settings

通讯设置	
Communication interface:	RS232
Communication protocol:	Modbus Rtu
Baud rate:	115200
Mailing address:	001
Next page:	

1 communication mode

This item has three communication modes, RS232, RS485 (default RS232). You can use the [↑] [↓] key to select the item to be set.

2 communication protocol

There are two communication protocols, Scpi and Modbus Rtu (Scpi by default). You can use the [↑] [↓] key to select the item to be set.

3 baud rate

There are four baud rates for this item. 9600/19200/38400/115200 (default 115200) can be used to select the item to be set.

4 mailing address

The mailing address of this item is 0-255, and (001 by default) you can use the [write] [left] key to select the item to be set. This item is only used in RS485 mode.

Communication Settings	
Local port:	05000
The local udp port:	07000
The local tcp port:	00050
Remote port:	05500
DNS:	114.114.114.114
On the page :	

1 Local interface

The default is 05000. You can use the [↑] [↓] [←] [→] key to select the item to be set.

2 local udp port

The default is 07000. You can use the [↑] [↓] [←] [→] key to select the item to be set.

3 local tcp port

The default is 00050. You can use the [↑] [↓] [←] [→] key to select the item to be set.

4 Remote port

The default is 05500. You can use the [↑] [↓] [←] [→] key to select the item to be set.

5 DNS

default 114.114.114.114. You can use the [↑] [↓] [←] [→] key to select the item to be set.

4.5.3 Description of composite keys

Compound key			
Parameter setting:			
0:	ENT	1:	F1/New
2:	F2/Delete	3:	F3/Prev
4:	F4/Next	5:	F5/Save
6:	Mode	7:	Menu
8:	Shift	9:	Esc

Compound key	Function declaration
ENT	Numeric setting page: digit "0"
F1/New	Numeric setting page: digit "1"
F2/Delete	Numeric setting page: digit "2"
F3/Prev	Numeric setting page: digit "3"
F4/Next	Numeric setting page: digit "4"
F5/Save	Numeric setting page: digit "5"
Mode	Numeric setting page: digit "6"
Menu	Numeric setting page: digit "7"
Shift	Numeric setting page: digit "8"
Esc	Numeric setting page: digit "9"

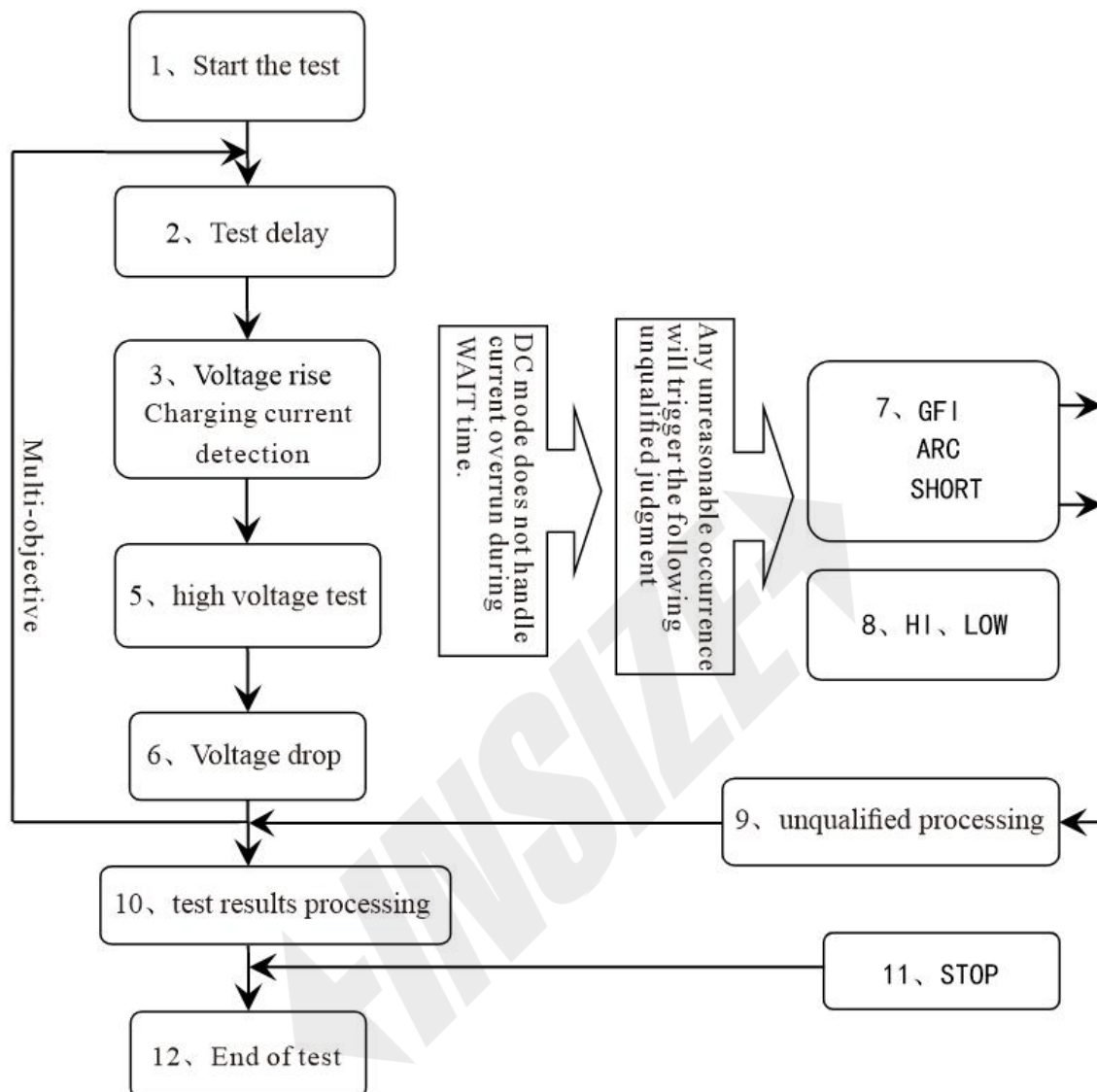
4.5.4 Description of Contact Check Function (This function is recommended for use when voltage is higher than 1.5 kV.)

The contact check uses 1 kV high-voltage to judge whether the DUT (Device Under Test) is connected. It is generally applied to DUTs below 100 G. The contact check is recommended when testing with high-voltage probe output.

Parameter Setting	
Contact Check:	Off
Step Mode:	Normal
Short-circuit Protection:	HIGH
Step Wait:	Off
Fail Mode:	Stop
Electric Shock Protection:	Off

4.6 Test function principle and instructions for use

This section introduces the principle and application of grounding connection, grounding current detection, arc detection and other tests in the order of testing process. Block diagram of test flow of instrument



Schematic diagram of instrument test sequence

4.6.1 Start the test

When the instrument is in test mode, after checking the test conditions and the correct connection of the tested part, press the START key to start the test.

4.6.2 Voltage rise

Some characteristics of the tested part are sensitive to the sudden change of voltage, so this function is needed. When the instrument starts to output, the output voltage is zero. When the voltage is output, the instrument will control the output voltage to step up in units of 0.1S. The step-up value is determined according to the test voltage and voltage rise time ($\Delta V = V / (10 * S)$). If the default voltage rise RISE OFF 0.1 second is turned off, the test time is automatically added, so that the minimum test time is 0.2S. If this value is too small, it may cause an error in the judgment of ARC or DC boost. Please note.

4.6.3 DC boost judgment

Whether to start the current upper limit judging function switch in the process of voltage rise is mainly used to avoid test misjudgment.

When the distributed capacitor is small, the charging current of the capacitor is relatively small, which will not cause obvious changes in the current. If the boost judgment is turned on, the poor performance of the tested part can be found as early as possible, and the probability of over-current damage of the component can be reduced.

When the step capacitor is large, the capacitor will have a charging process during the voltage rise, and the current at this time may be far greater than the set upper limit of the measured current. If the step-up judgment is turned on, it will cause misjudgment of exceeding the upper limit. If necessary, you can open the short-circuit threshold to lower the short-circuit sensitivity and increase the charging current.

4.6.4 high voltage test

High voltage test is performed on the tested piece. At this time, it should be possible to ensure that the test circuit is correct, and the test results will not be affected by some special attached parameters. The display content is the actual withstand voltage and current required for the test.

4.6.5 Test voltage drop

The rise of the same test voltage is determined by the characteristics of the tested part. When high voltage test finishes the voltage drop, the instrument will control the output voltage drop in units of 0.1S (the DC voltage will not drop with the control voltage), and the step-down value will be determined according to the test voltage and voltage rise time ($\delta v = -v/(10 * s)$). If the voltage drop time (FAIL OFF) is turned off, the default voltage drop time is 0.1 second. At this time, the instrument is judged by comparison without testing, and the data is for reference only. When the voltage drop is over, the instrument will connect the test circuit to AC withstand voltage mode and be tested at this time.

If there is a DC voltage drop, it will be discharged through the AC circuit of the instrument.

4.6.6 Ground wire current detection function

Ground wire current detection is to detect the current flowing through the instrument shell to prevent electric shock. When high voltage is output, there is current flowing back from the voltage output end to the instrument shell through the human body, which may cause very serious consequences.

Description of the response of the ground current detection and judgment circuit of the instrument:

■Ground wire current detection is enabled, and if the ground wire current is greater than 0.45mA, it is judged that the ground wire current exceeds the limit.

■When electric shock is judged, the instrument will end the high-voltage output within 0.3S and exit the test state. And display (GFI FAIL).

Note: The instantaneous output current of the instrument may be greater than 30mA. If it is really electric shock, it may cause coma or death of the operator. Therefore, it is recommended to turn on the ground wire current detection when the product allows.

4.6.7 Current overrun and arc detection function

Classification of current overrun: current lower limit, current upper limit, current overrun and arc detection.

■Current lower limit judgment (LOW): It is generally used for testing low-end disconnection judgment. When the instrument tests the equipment, the equipment will definitely have a certain leakage current. When the leakage current tested by the instrument is less than the lower limit set current value, it is considered that the test failed (no equipment is connected).

This function must be turned off if the leakage current of the tested component itself is very small. When the limit is exceeded, the judgment is displayed (LOWFAIL). This judgment is valid only in the test mode, and the sampling is carried out at regular intervals at a rate of 100mS each time.

■Current upper limit judgment (HIGH): the most commonly used judgment of test current exceeding the limit. When the instrument tests the equipment, the equipment will definitely have a certain

Leakage current, when the leakage current tested by the instrument is greater than the upper limit set current value, it is considered that the voltage resistance impedance of the equipment is not enough and the test fails. Over-time judgment display (HI FAIL), sampling regularly, with a rate of 100mS each time.

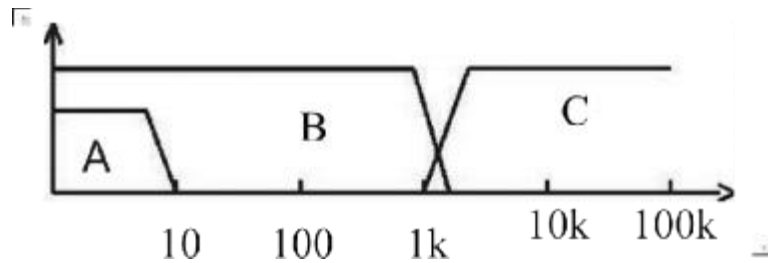
■Current limit judgment: the current sampling judgment is slow, and the current changes rapidly when the insulation collapses, and the sampling circuit cannot reflect it in time, but

If the peak current exceeds the allowable output range of the instrument, this kind of overrun judgment will be triggered, and short failure will be displayed when the overrun occurs. Because the data cannot be collected after the current exceeds the limit, the output result of the system at this time is: the test junction within 100mS before the current exceeds the limit.

Fruit. The current limit is twice the allowable output current of the instrument (1.5 times the peak value of relative AC). The falling time is invalid, and ■'s judgment cannot be shielded.

ARC detection (ARC): It is a very practical function for measuring coil components. It tests the local current oscillation caused by instantaneous discharge of local circuits in high voltage test loop. Because it is superimposed on the normal test current, the sudden change time is short, so the common current detection circuit on the circuit can not make appropriate judgments in response to the current change. The arc detection circuit filters out the normal current value,

Only deal with high-speed current pulse changes. Because of the randomness of low-pass filtering and arc size itself, this function can only roughly estimate the degree of local ignition. Because the data can't be collected after the current exceeds the limit, the output result at this time is the last test result when it is qualified, and it will be judged and displayed when it exceeds the limit (ARCFAIL). ARC current is a qualitative analysis for testing, and the size of the quantity, the testing environment and the distribution of test lines have great influence on randomness, so pay attention to it when using.



Frequency response comparison between current overrun judgment and arc detection: (see the above figure)

- Area A in the figure shows the frequency response of the current sampling display circuit. Because it is necessary to filter the ripple of power frequency → AD sampling → calculate the test results → analyze whether the current exceeds the set limit. Within the test current range, the pulse width is greater than 100ms.
- Area B in the figure: current fast response circuit. It only filters out high-frequency interference signals → voltage peak comparison → overcurrent peak signal locking, and only makes limit judgment. It is greater than the allowable output current of the instrument, and the pulse width is greater than 1 ms.
- Area C in the figure: arc detection circuit. The arc detection circuit only samples the amplitude of sudden change in current, and the signal Qualcomm filters out low frequency → voltage peak comparison → pulse locking. At the abrupt current edge near the set value, the pulse width is about 1 us-1 ms.

4.6.8 Unqualified judgment

1. When the current exceeds the maximum output current that the instrument can withstand during the test, or the instrument finds that there is a potential safety hazard, the instrument will immediately cut off the voltage of the test loop, and wait for the instrument software to query the cause of the error and judge that it is unqualified.
2. If the test result exceeds the limit set by the test item, the instrument will judge that the tested part is unqualified. And immediately stop the current test, cut off the voltage output, and enter the processing program with unqualified test results.
- 3, multi-step testing. There is a step of FAIL, and the total test result is FAIL.

4.6.9 Processing of test results

If the test process exceeds the limit, it is judged as (FAIL). FAIL appears in the multi-step test, and the final result is FAIL.

There are many test items, and the failure judgment processing mode is controlled by the failure mode of the system. Otherwise, the instrument will display the FAIL judgment and category (see the figure below, taking HI as an example), waiting for the user to handle it.

After the test, there is no unqualified mark, and the test result is judged as (PASS). PASS determines that the processing mode is controlled by the PASS HOLD of the SYSTEM, and then prepares to start the next measurement or return to the test waiting state. HANDLER signal output is controlled by control mode. Select FILE mode, so the test will not be output until the whole file test is finished.

Result. STEP mode will control the interface to output corresponding signals at each step.

From this state to the next step, customers can use software to query test data and results.

measure	
AC step: 1/1 voltage: 0.050kV 15:07:54	
Upper limit: 20.000mA	0.000 KV
A lower limit: 0.001mA	0.000 mA
time: 3.0s	0.0 S
ready	
0%	0%

4.6.10 STOP (stop measuring)

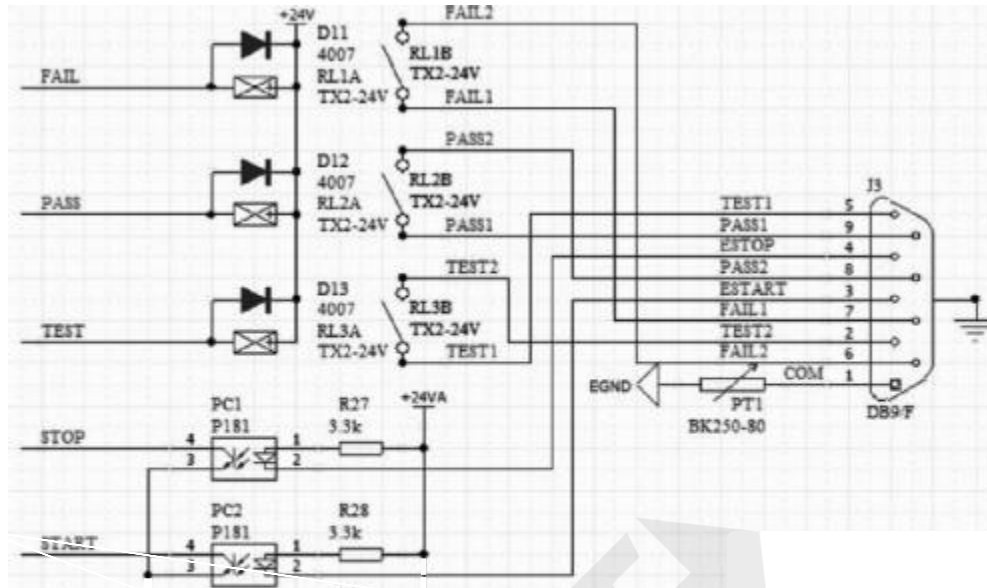
Press the STOP key in any state during the whole test, and the instrument will automatically end the test and enter the test end state. Press the STOP key again, and the instrument will return to the test waiting state. When the test is stopped, no test result judgment output will be given.

At the end of the test, customers can use the software to query the last test data obtained before STOP.

4.7 Structure and use of the interface circuit of Handler and SIGNAL

4.7.1 Control interface principle

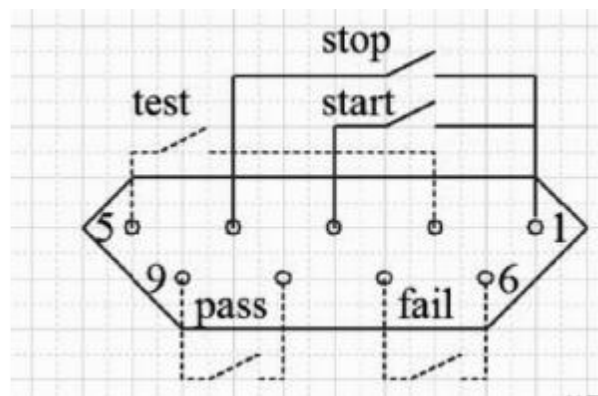
HANDLER and SIGNAL interface instrument internal principle, as follows:



Interface structure and timing of HANDLER and SIGNAL

Description:

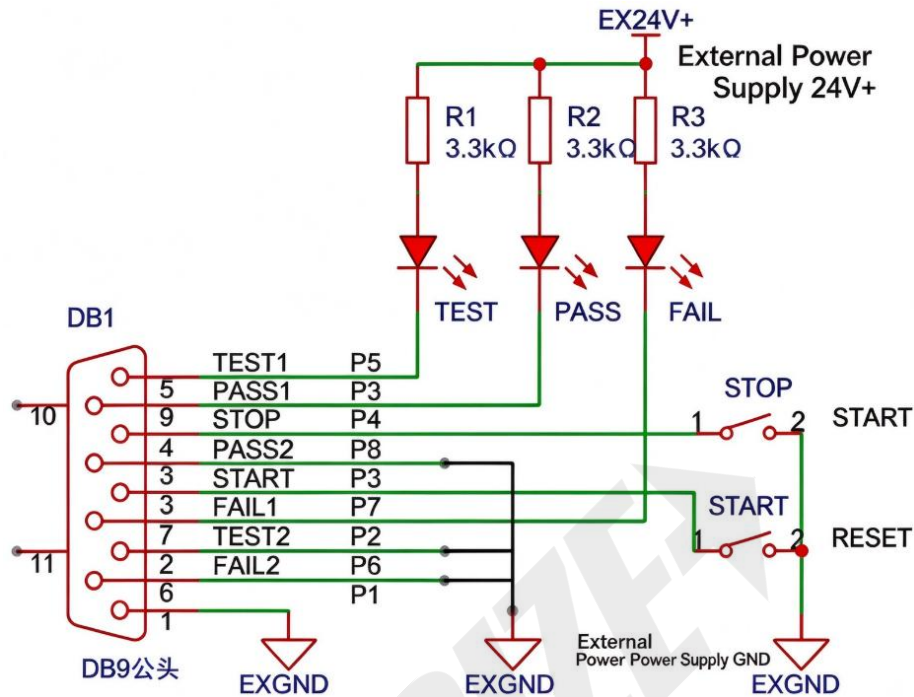
1. HANDLER interface: START, STOP and COM signals form remote input control, and the switch input is closed effectively.
2. HANDLER interface: remote output control is composed of TEST, PASS and FAIL signals. The switch output is closed effectively. TEST can be used as a high-voltage start signal or a pulse signal that the instrument works normally.
3. The SIGNAL interface is mainly used to provide the instrument selection signal (INTLOCK) when multiple instruments are tested online. This signal is short-circuited by default on a single machine, and it is forbidden to start high-voltage output when the instrument is open.
4. In addition, the SIGNAL interface provides a power supply with an output voltage of +24V, and the output current is less than 0.5A. With the control signal of the HANDLER interface, it can be used to drive indicator lights, photoelectric switches, low-power electromagnetic valves and so on. (see the picture below)



HANDLER SIGNAL interface rear panel view (schematic)

4.7.2 Use of control interface

The control interface is generally used for remote control and test synchronization or indication. The external connection of the interface is as follows:



Schematic diagram of external circuit connection

Description:

1. Switches can be replaced by isolated switching elements such as optocoupler secondary side, and the current direction refers to the principle shown above (COM terminal is low-end).
2. The indicator light here can be replaced by other drive control components, and the current direction depends on the power supply.
3. the instrument internal power performance
 - A) The output is rectified and filtered by AC power supply, and the output without voltage regulation is about 24V. Please confirm it before use.
 - B) The instantaneous maximum current shall not be greater than 0.5A, and the long-term working current shall be less than 0.2a. Please bring your own power supply if you need more current.
 - C) The external control signal needs a voltage greater than 220V or a current of 2A, so the internal relay of the instrument can't bear it. Please transfer it by yourself.

5 Technical parameters

parameter	type	9458-DW61	9458-AW52
ACW	voltage range	0.050kV ~ 5.000kV	0.050kV ~ 5.000kV
	Voltage accuracy	$\pm (2\%+5V)$	$\pm (2\%+5V)$
	resolution ratio	1V	1V
	Maximum output power	100VA(5.000kV/20mA)	100VA(5.000kV/20mA)
	Maximum rated current	20mA	20mA
	Lower limit current range	0 ~ 20mA,0= no judgment lower limit.	0 ~ 20mA,0= no judgment lower limit.
	Output waveform	sine wave	sine wave
	Output waveform distortion	$\leq 5\%$ (no-load or pure resistive load)	$\leq 5\%$ (no-load or pure resistive load)
	Output signal	DDS linear power amplifier	DDS linear power amplifier
	Voltage rise time	0.1s ~ 999.9s , OFF= voltage rise time off	0.1s ~ 999.9s , OFF= voltage rise time off
	testTime	0.3s ~ 999.9s, OFF= continuous test.	0.3s ~ 999.9s, OFF= continuous test.
	Voltage drop time	0.1s OFF	0.1s OFF
DCW	voltage range	0.050	
	voltage accuracy	$\pm (2\%+5V)$	
	resolution ratio	1V	
	maximum(power)output	60W	
	Maximum rated current	0	
	Lower limit current range	0	
	ripple factor	$\leq$	
	discharge time	$\leq$	
	Voltage up time	0.1s OFF	
	testing time	0.3s	
	Voltage drop time	0.1s OFF	
ammeter	measuring range	AC 0~20mA DC 0~10mA	AC 0~20mA
	measurement accuracy	$\pm (2\% + 5 \text{ words})$	$\pm (2\% + 5 \text{ words})$
type		horizontal	
Arc detection		1	
input characteristics		100V~240V	
Test alarm		Buzzer, LCD display	
External volume (L×W×H)		260*400*100mm	
Weight (KG)		6.7kg	

