Guarantee

The instrument has been examined and checked by our company; its performance and specification have been tested completely and reached the standards before leaving factory.

The company guarantees the normal use of the instrument for one year from the instrument is sold out from the company or distributors. If it is the malfunction in circuit characteristics, the company provides maintenance for free except the following reasons; otherwise user shall afford the repairing fee:

1. Abnormal operations to the instrument without following the operating processes and orders;

2. Self modification or adjusting to the instrument.

Notice

The detailed operating notice and dangerous operation contents have been written in "Notice before use" in the user's manual, please read it carefully.

Tables of contents

CS5050、CS5051、CS5052、CS5053 are new generation of protected type voltage withstand/insulation resistance testers adopting CPU control, which can real-time display breakdown voltage value, current value, and tested resistance value. They also can test performance of various DUTS accurately and reliably including breakdown voltage, leakage current, insulation, and so on, which featured ARC function, and can be used for AC(DC) high voltage source to test components and complete appliance's performance. They are all equipped with RS232 (485) and signal input and output interfaces needed by PLC as standard feature in order to group integrated testing system with computer or PLC. Therefore, they can accurately measure withstand voltage strength of electronic components, domestic appliance, insulation materials, electrical lighting and heating appliance.

To ensure safety, 50 series safety testers all adopted working pattern Ⅰ of earth of casing, any polarity misconnection in external circuit can bring the danger of casing electrified. This instrument featured power safety detection function, which can judge whether L,N,C is connected properly or not , cover is electrified or not, earth return and DUT contacted well or not.

■ CS50 Series innovation characteristics

This series instrument is capable of measuring kinds of parameters conveniently with microprocessor control technology, whose test time can be set in the range between 0.1s and 999s. it is equipped with PLC interface, making it highly applicable to a variety of automatic testing system, in addition, it can also be equipped with corresponding communication software in order to group testing system with PC ,and realize the quality and statistics functions

- This instrument is capable of real-time displaying kinds of parameters with VFD display
- This series instrument adopted high-rate A/D sampling, making the measuring rate faster and more accurate
- New design- electric safety wall and open-circuit detection of earth return terminal function

- ARC function, over-zero startup, over-zero cutoff function, preventing voltage overshoot and reverse overshoot.
- The range of insulation resistance and tested voltage is wider than that of traditional instrument, and resistance range can be up to 9999MΩ
- Voltage withstand- insulation resistance, insulation resistance- voltage withstand; auto shift range in IR test
- Capable of recording and saving test data
- Add setting delayed alarm time function in IR test in coordination with IC distributed parameters of DUT
- ±2% high accuracy, high stability, wide test time range: 0.1-999s

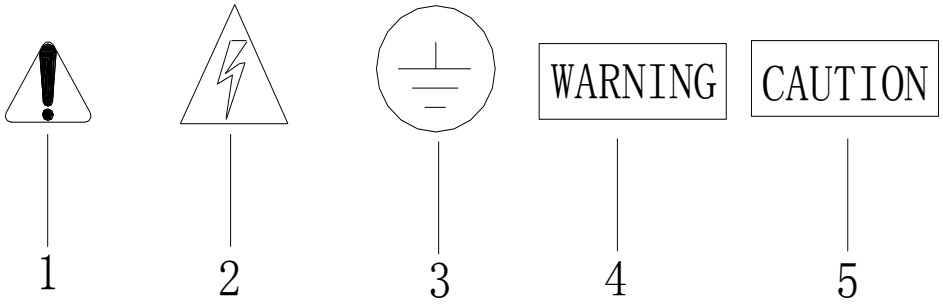
International Electrical standard is mainly published by IEC, every country also drew up corresponding electrical standards, such as, GB, GSA, EV, BS, WDE,UL, and so on.
When performing consecutive test in voltage withstand, IR, LC, or GR, please make sure of corresponding safety standards

Chapter one Safety Information

Regulation and notices before High-voltage test!!!

1. General regulation

- Please acknowledge of the relatively used safety symbols of this Withstanding Voltage Tester before using.
- Please check the input voltage with that signed on the brand before electrifying.



1-----High voltage caution. Please refer to the listed cautions and instructions in the reference book to prevent hurt and damage.

2-----Dangerous! Do not touch it for the high voltage may exist.

3-----Earth.

4----- Warning. Please attend to the high danger exists in the executive procedure, application or conditions which may lead to hurt even death.

5-----Caution. Please attend to the high danger exists in the executive procedure, application or conditions which may damage the instruments or lose the storied date.

The generated voltage and current by Withstanding voltage tester can enough hurt people or result a electric shock, in order to prevent such injuries or death, please inspect it clearly at first and then operate before moving and using.

2 Maintenance and Repair

2.1 Users' maintenance

To avoid electric shock, Please do not take apart the tester's box. All the inner

hardware of this Withstanding Voltage Tester needn't users' maintenance absolutely. If there is any problem or abnormity, please contact with CHANGSHENG INSTRUMENT or its appointed dealer.

2.2 Periodical maintenance

The inputting electrical source line, testing leads and related accessories etc. of this Withstanding Voltage Tester must be checked and verified carefully in due time according to their using frequency to protect users' safety and accuracy of the instrument.

3. Users' modification

Users can not change the inner circuitry and hardware of the instrument by themselves, if be changed, our company will not guarantee and be responsible for any duties anymore, making use of the hardware or accessories unauthorized by Allwin Instrument as well. If changes have been made in the instrument sent back, Allwin Instrument will renovate the changed circuitry or hardware into the formal design, and charge the servicing.

4. Testing work place

4.1 Worktable location

The worktable must be located in a special place where other non-workers have no need to go by and shall be far away from. If it does not work for assembly line's arrangement, it must be separated from other establishment especially marked "Area for High-Voltage test". If the High-Voltage Test worktable is much near to other

worktables, special attention shall be paid to avoid electric shock. While testing, “Dangerous”! High-voltage test is making, non-worker keeps away please!” must be marked.

4.2 Input power supply

Withstanding Voltage Tester must have good grounding. The tester has a grounding terminal on its rear panel, please ground the terminal with the earth well. This tester must have an individual switch, please equip it in a distinct place and mark its function. In case of any emergency, please cut off the electrical source for further processing.

The electrical source of this Withstanding Voltage Tester is AC one, with its Power Range: 220V±10%, Power frequency: 50Hz. If the power is unstable within the Power Range, it is possible to make the tester abnormal and damage the inner components.

4.3 Worktable in test

Being in the Withstanding Voltage testing, the tester must be put on the worktable made of non-conducting materials, no conducting materials can be used between operators and the DUT. Operator cannot cross the DUT to operate or calibrate the tester.

In case of explosion and fire, no test can be made in or around the area where flammable gas and/or flammable substance exist.

5. Operator

The output voltage and current of Withstanding Voltage Tester can lead to electric shock even casualty with wrong operation, therefore the operators must be strictly

practiced and qualified. Operators cannot wear clothes or decorations with metal ornaments, such as watch etc. and they cannot be the people with heart disease or heart pacemaker too.

6. Safety points

- Non-qualified operators and irrelevant staff shall be far away from the high-voltage test area.
- Always keep a safe and ordered state in the high-voltage test area.
- Mustn't touch the testing objects or anything connected with the DUT.
- Cut off the high voltage input and output power source immediately, if anything happens.
- Make sure that discharge appropriately first after DC Withstanding Voltage test, and then dismantle the test leads.

Chapter two Notices before Use

The highest output voltage of this Withstanding Voltage tester is 5kV(AC/DC); any incorrect or wrong using will result in accidents even death. Therefore in consideration of the users' safety, please read these notices carefully.

Prevention from electric shock

In order to guard against electric shock, please wear insulated rubber gloves to deal with the works related to electricity before using the test instrument.

A. Grounding

Ground the terminal on the rear panel of the test instrument, if there is no good grounding, the coat of the instrument will induce short circuit with power source or with high-voltage testing lead wires while testing, and then brings high voltage, and therefore it is very dangerous for any touch of the coat.

B. Power safety test

Plug in the instrument, but not power on, when one or two power safety detecting light 'OK' lighted out, please detect power line connection promptly. And detect whether there is good grounding or correct power supply connection.

Test stop

When the test has been finished in a period or halt for some time or the test instrument needn't using any longer, please be sure the power switch has been turned off.

Tester in testing state

While testing, please do not touch the test leads, device under test, test probe and output terminal for all of these are with voltage.

Notice: While testing, do not touch the alligator clip on the test leads to avoid electric shock for its low insulated quality cannot obstruct the high voltage the test leads brings.

4. Confirmation after test

At anytime before touching the high voltage lines, testing objects or high voltage output terminal, please confirm:

(1) The power source switch is opened and display is not enlightened.

(2) Do not touch anywhere that may make electric shock immediately, for after Insulation Resistance test or DC test, the tested object brings high voltage is probable, and it needs a period to discharge completely when the power source is cut off.

5. Replace DUT

When turning another object to be tested after one has been finished, please confirm:

- The tester states in “Replacement”
- Testing light does not sparkle
- Voltage digital display on the screen no more flickers

Special notice: Do not touch the high-voltage probe when changing the device under test.

6. Turn on or shut-off the Power

Once the power source switch has been opened, it will need a few seconds to restart, please be sure not to open and close the switch continuously especially as the high voltage is being output for it will work wrong to damage the instrument or generate dangers.

When turning on or cutting off the power source, the high voltage output terminal cannot be connected with any objects to prevent the dangers made by abnormal output.

7. Other notices

Do not make short circuit happen among the output and grounding line and the transmission line or other grounding line's conductor, in case of the whole tester charged

Action when in emergency

For the sake of avoiding bigger loss, in any urgent circumstance such as electric shock, device under test or mainframe burns, please process as following steps:

- Firstly cut off the power source.
- Pull out the plug of power source line.

9. Problems happening

Under the following circumstance, please be extremely careful for even you have pressed the STOP key, the output terminal may still hold high voltage which will be very dangerous.

- The test light is still bright after pressing the STOP key.
- Voltmeter does not show data but the test light is still shining.

If such dangerous status happens, please cut off the power source and pull out its

plug, don't reuse it but return it back to our company or office for maintenance.

10. Malfunction of test light

Having pressed the START key, the Voltmeter shows data but the test light is not bright, then please turns off the tester and returns it back to our company or office for test light maintenance.

11. Processing when tester doesn't work

This series tester is Withstanding Voltage or Withstanding Voltage/Insulation resistance, with the highest output voltage is 5.000kVAC or5.000kVDC, the working environment of the tester is extremely abominable, if it does not work while being used, please cut off the power source and restart it after 5 seconds.

Chapter Three Function introduction

Auto save testing setting parameters

This instrument is capable of automatically saving kinds of setting parameters which will not be lose due to power off or power down. That is, after power on, the setting value last time still is valid not to process newly setting. For example, users can set leakage current upper-limit alarm value as customer's required value in an AC voltage withstand testing. And as long as user set and saved them correctly, tester can

save this setting value all the time.

Remote control and communication

This instrument is equipped with PLC interface, which can group assembly line testing system with PLC. And it also equipped with RS232(or485) ports as standard features, making them highly applicable to a variety of automatic testing system, which can process report printing, quality and statistics, analysis and so on.

Test steps with multi-combination

This series instrument has two kinds of tests as testing procedure, including single and two-item test. Single test included single ACW, single DCW as tester's model, while two-item test included ACW-IR; DCW-IR; IR-ACW;IR-DCW. And during performing the two-item test, the tester can switch to performing automatically next turn test upon end of the last test. Two –item test carry on continuously .

Timing test function

When timing value having been set (more than 0), this instrument starts to test and count, and after the reach of the preset value, the counting will be discontinued and at the same time voltage also will be cut off automatically. When the test time is set to be '00.0s', tester begins to perform the test consecutively after startup of test ,until user pressed 'stop' key, the test will be discontinued.

No matter it is timing test or consecutive test , users can end the test and shut off voltage output in any time by pressing the 'stop' key.

Remote interface

This instrument is equipped with remote probe, therefore, once the [REMOTE] terminal is connected, remote startup and reset control can be enabled, or this instrument is connected to PLC test device through PLC interface, thereby reset control and remote startup can be enabled by pressing the start and reset keys on PLC test device

6. Judgment of test terminal invalid connection

After having set lower-limit leakage current, if alarm with aural and visual happened at startup, the tester will prompt improper connection of test return circuit, at this time lower-limit value of leakage current should be set as ‘0’ .

7. Two test time

Two timing devices are used to perform timing in ACW AND DCW

8. Check whether power connection is proper

To ensure safety, this series safety tester all adopted working pattern I of earth of casing, but any polarity misconnection in external circuit can bring the danger of casing electrified. This instrument featured power safety detection function, which can judge whether N、L、G is connected properly or not. For example, above the high voltage output of tester, ‘0’ indicator light and ‘k’ indicator light is used to indicate whether power line connection is proper or not.. Don’t touch the case ,for it may be electrical.

Function of 'Danger' indicator

To ensure the security of the operators, badly lighting red Danger indicators have been adopted in this series of testers. When the tester is on, but the output voltage is lower than the safety voltage, the indicator will be sparking, otherwise it will be lighting. Even though the withstanding tester is off, If there is voltage in the output port which is greater than the security voltage the indicator will be lit in order to have a high-voltage warning and should not be contact with any object that the HV output port generate, to against electric shock.

Chapter Four Technology index

Function comparison list

MODE	FUNCTION
CS5050	ACW TESTER
CS5051	ACW,DCW TESTER
CS5052	ACW TESTER
CS5053	ACW,DCW TESTER

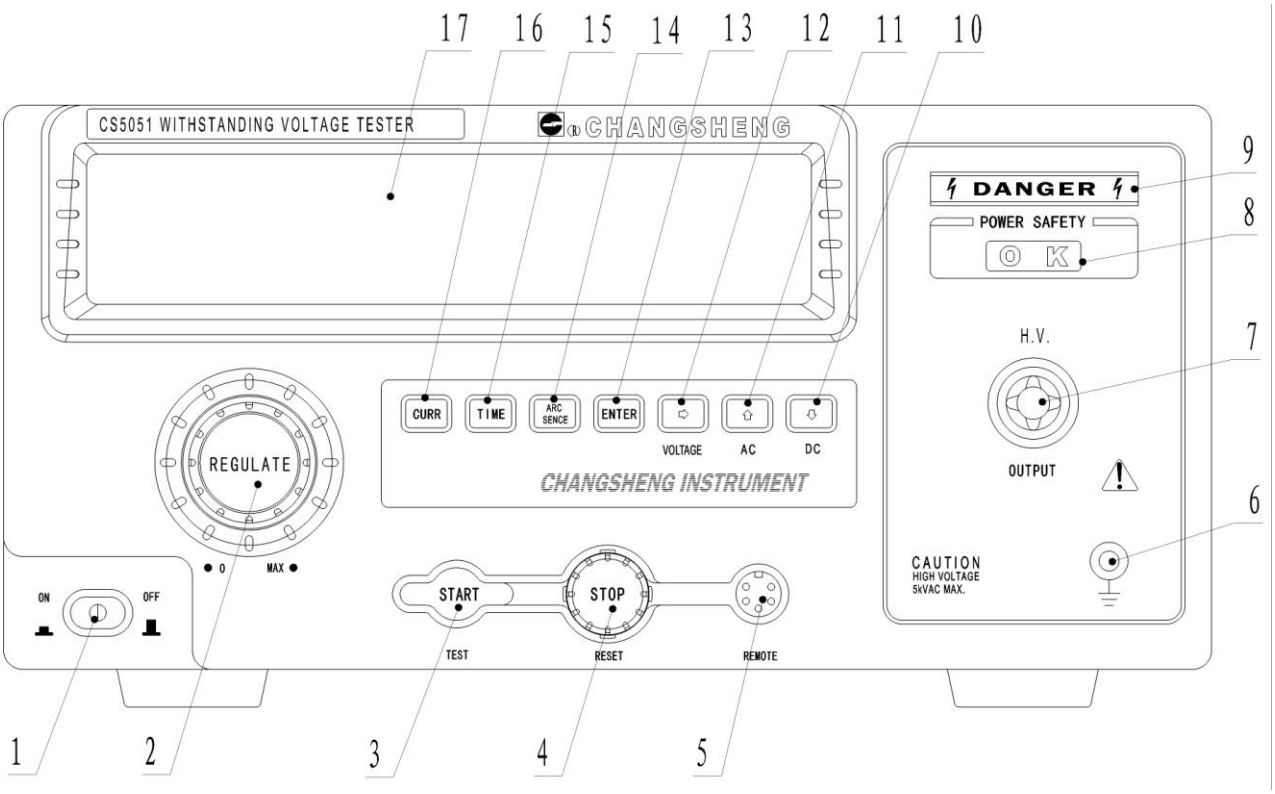
Technology index

Qualification	CS5050	CS5051	CS5052	CS5053

Voltage Withstand tester	0-5kV（AC） ±2% ±2 counts	0-5kV（AC＆DC） ±2% ±2 counts	0-5kV （AC） ±2% ±2 counts	0-5kV（AC＆DC） ±2% ±2 counts
Leakage current test range AC（mA）	0.1 - 1.999/ 2.000 - 19.99/ 20.00 - 100.0mA ±2% ± 2 counts	0.1 - 1.999/ 2.000 - 19.99/ 20.00 -100.0mA ±2% ± 2 counts	0.1 - 1.999/ 2.000-20.00mA ±2% ± 2 counts	0.1 - 1.999/ 2.000-20.00mA ±2% ± 2 counts
Leakage current Setting range AC（mA）	0.1 - 100.0mA	0.1 - 100.0mA	0.1 - 20.00mA	0.1 - 20.00mA
Leakage current test range DC（mA）	-	0.1 - 1.999/ 2.000-20.00mA ±2% ± 2 counts	-	0.1 - 1.999/ 2.000-10.00mA ±2% ± 2 counts
Leakage current setting range AC（mA）	-	0. 1 - 20.00mA	-	0. 1 - 10.00mA
Withstanding voltage test time	0 - 999s 0 = consecutive test			
ARC	1 - 9grades （0 = off, 9 = sensitive）			
Working condition	ambient temperature：from 0 to 40° C, Relative humidity：less than or equal to 75%, atmospheric pressure：101.25kPa			
Volume(mm^3)	320X150X340		320X150X340	
Weight	20kg		16kg	
Power Supply	220V±10% 50Hz±2Hz			

Chapter Five Panel instruction

Front panel (CS5051)



1) Input power switch

When it is pressed it is on, while it is pop-up， it is off.

2) Voltage rotary knob

In the test of DUT, rotate this knob to regulate voltage output value (turn knob clockwise: voltage rising, while counterclockwise: voltage falling)

3) Test key

Press this key, the tester starts to perform test

4) Stop key

During the testing, it is used to interrupt the test. When DUT test failed, failed light is on, and at this time press STOP key , tester will stop alarming and enter into next turn test.

5) Five-core socket

Use the remote probe to remotely control startup and reset of test

6) Loop terminal

Used for the input terminal of measured current

7) High voltage output terminal (H.V.)

Press ‘test’ key, the terminal can generate high voltage

8) Power supply safety detecting indicator light

Plug in, judge whether L,N,G connected properly or not before power on, when displaying ’OK’, power on and indicator lights out.

9) High voltage output indication

When the tester outputs high voltage, the indicator lights up all the time, which indicates it is dangerous during high voltage outputting

10) Downwards key

Used for function key to regulate parameter value when performing the parameter setting, press this key, and the regulated parameter value will get smaller.

11) Upwards key

Used for function key to regulate parameter value when performing the parameter setting, press this key, and regulated parameter value will get larger

12) Rightward key

Used as a function key to choose the parameter field during setting current and time parameters. Press this key, and the chosen parameter field will shift right one bit based on former chosen field. As in the voltage setting ,it plays a role in switching between 3.0kv and 5.0 kv.

13) ENTER key

Confirm Key: When the setting has finished and test will start, please press this key to confirm

14) ARC key

Combined with Downwards key and Upwards key to set sensitivity parameters of ARC.

15) TIME key

Test time setting key. Exit other function setting and press this key, and enter into time setting state. It also can combine with upward, downward, leftward and rightward keys to set parameter value.

16) CURR Key

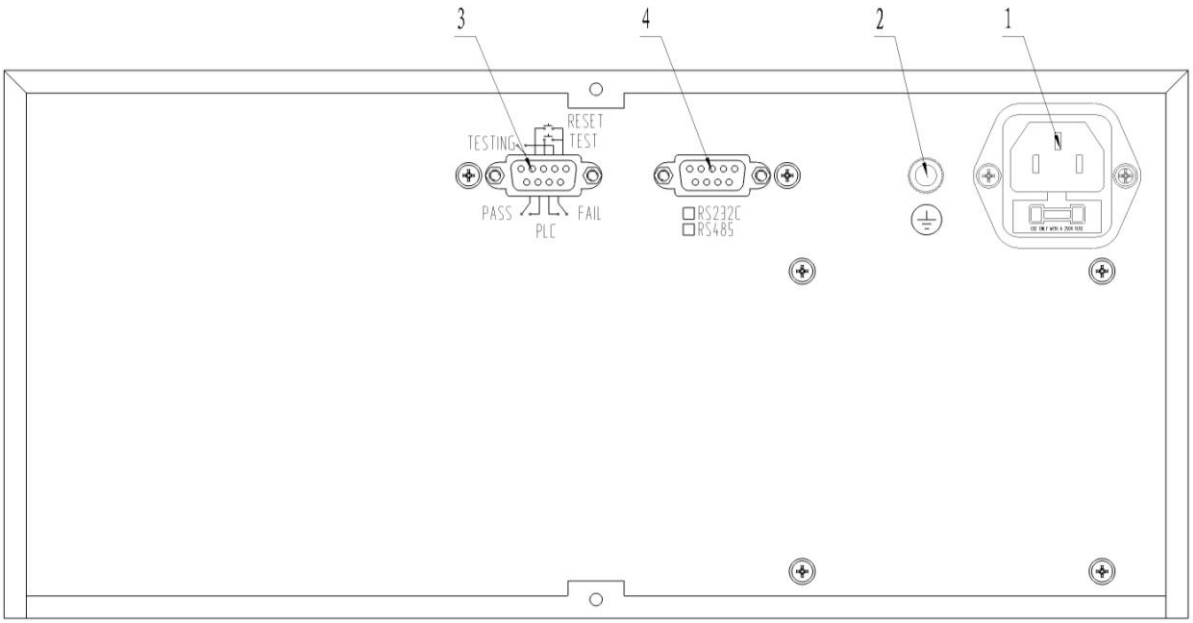
Upper and lower limits leakage current key settings. It is used to set the upper limit of leakage current and leakage current of the lower limit.

17) VFD display

In the setting process of key, corresponding setting value will be displayed

During the voltage withstand testing, voltage, current, time, and corresponding status marker will be displayed

2. Back panel instruction (CS5051series)



2.1 Power socket/fuse holder

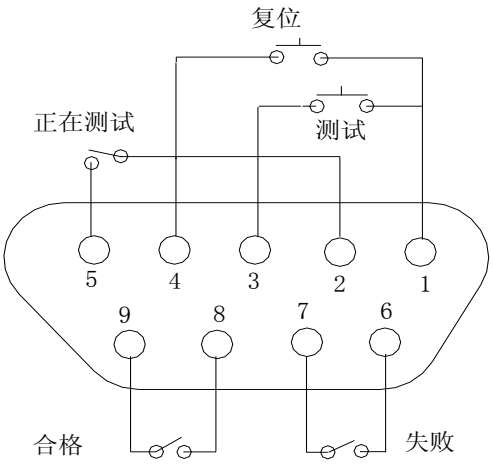
Pull out power supply before replacing the fuse

2.2 GND terminal

Make sure the instrument a good ground.

2.3 PLC interface

Remote grouding terminal is accompanied by in the back of tester, which can be connected to the remote controller to process operation. And this terminal is standard 9PIN D terminal blocks, which has the following signals, reset signal, testing signal, qualified test signal ,and failed test signal, signal in the process of testing



Connection:

TEST control switch connected between PIN 1 and PIN3

RESET control switch connected between PIN 1 and PIN4

Signal output in the process of testing: between PIN 2 and PIN5

Failed signal: between PIN 6 and PIN7

Qualified signal: between PIN 8 and PIN 9

2.4 Serial Communication Port（RS232Cor485 interface）

Standard 9PIN D terminal socket

3. Connection instruction of remote input signal and output signal

This instrument has the remote connection, thereby TEST and RESET can be performed by external remote device operation instrument. This connected ports provided power supply with control function, and the momentary contact switch must be used as controller. And any other power supply can not be connected, if connected with them, the inner circuit of instrument will be damaged.

Output signal provided contacts of relay

Chapter Six Test parameter setting

Parameters setting instruction

CS50 series voltage withstand /insulation resistance tester has three states. Including as follows,

A. Standby mode

The tester enters into standby state automatically after power on, and tester will display test parameters under the corresponding test mode, for example, in the single ACW mode, the tester will display upper-limit setting value of ACW leakage current, ACW test time setting value, and test mode chosen currently. In the standby mode, tester can not generate high voltage

B. Parameter setting state

In the standby mode, press setting key CURR、TIME、ARC to enter into voltage withstand parameter setting state. In the parameter setting state, the tester can not generate high voltage

Note: ACW parameter setting enter key and DCW parameter enter key all used the CURR key, and user can switch to each other's state by pressing CURR key consecutively

C, Test state

In the standby mode, if we press the start key, the tester will enter into test state. In this state, user can make the tester enter into standby mode by pressing the stop key

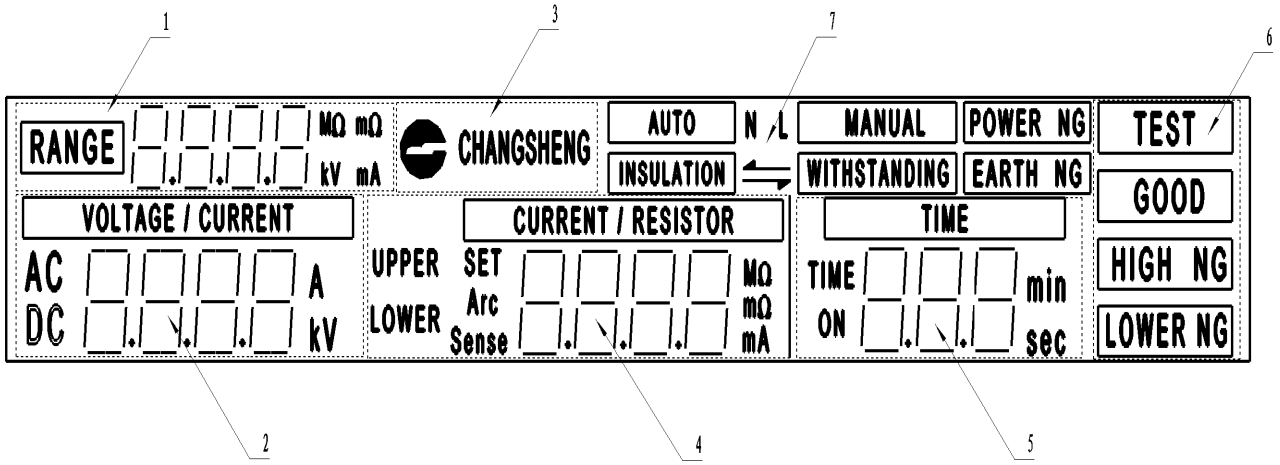
This series testers have two test parameters to set, including ACW parameter setting, DCW parameter setting.

AC parameter setting include, upper-limit setting for ACW leakage current and

lower-limit setting for test time setting, ARC setting for ACW

DC parameter setting include, upper-limit setting for DCW leakage current and lower –limit setting for DCW leakage current, test time setting for DCW, ARC setting for DCW

The first screen displays instruction after power on(CS5051)



A Display screen's overall layout instruction

Display screen generally has seven display areas

1. display area
2. voltage and current display area
3. brand display area
4. current and resistance display area
5. time display area
6. test state display area
7. test mode display area

Test mode setting

A. Test mode

According to the test mode, CS5051 series withstanding voltage tester has two modes at most.

In accordance with different types of the tester, it can be divided into the following modes:

Single ACW test mode

Single DCW test mode

NOTE: Single test mode have two states including 'test time is not set to be zero' and 'test time is set to be zero'

'Test time is set to be zero' indicates that tester will stop testing once time is out

'Test time is not set to be zero' indicates that tester will continually perform test until user presses the stop key, and the tester returns standby interface or alarms for its disqualification.

B. Procedures of setting testing mode

In the standby mode, user can choose the test mode as required by pressing the upward key or the downward key.

If the upward key is pressed, the tester is set in AC Withstanding voltage test mode; While the downward key is pressed, the tester will enter into the DC withstanding voltage test mode.

Note: Enter test mode setting only in the standby mode, but not in any other parameter setting mode

4. ACW parameter setting

ACW parameter setting has upper limit and lower limit setting for leakage current, test time setting, and ARC setting.

A. Enter ACW parameter setting interface

In the standby mode or parameter setting state, users can press upward key to enter ACW parameter setting state, and in the ACW parameter setting state, on the left of display screen, AC indicator lights up and DC indicator lights out. In the current and resistance display area, the last setting ACW upper limit value of leakage current displayed, in this interface, we can press the right key to switch voltage between 3.0kv and 5.0kv.

B. Upper and lower limit setting for leakage current

1) Upper-limit value setting for ACW leakage

In the ACW parameter setting mode, User can press ‘CURR’ key to enter ACW leakage current upper limit setting mode

Leakage current upper limit setting, as figure:

Marker bit ‘UPPER SET ‘ lighting and the first bit on the right side glittering indicated this bit has been chosen, and the four digits can be set by pressing ‘up, down, right key’ in the figure. Set upper limit current, in the meantime, leakage current measured range will be fixed on, when the setting value is less than or equal to 2mA, measured value is 2mA, while the

measured value is less than or equal to 20mA, measured value is 20mA, and while the setting value id less than or equal to 99.99mA, measured range is 100mA.

When users have set the leakage current upper limit as required, setting parameter this time can be saved by using two methods: one is pressing ENTER key to save, exit parameter setting state and return standby mode. The other method is pressing other parameter setting key and save having set parameter, which can accelerate parameter setting.

2) Lower limit setting for ACW leakage current

In the ACW parameter setting mode, user can press CURR key to enter ACW lower limit setting state.

ACW lower limit setting, as figure:

Marker Bit ’LOWER SET ’lights up, and operation procedure in parameter setting is the same as that in upper limit parameter setting

3) Test time setting

In the ACW parameter setting mode, user can press TIME key to enter ACW test time setting state.

Test time setting, as figure.

Unit's digit starts to glitter in time display area, and user can set parameter value in the time range between from 0.0 to 999.9s by pressing ‘up, down, right’ key.

Test time setting can be separated as two kinds of modes:

a. when test time is set as zero, this test can be performed consecutively and not stop, unless the failure test of DUT or stop of test by men. The timer can count up to upper limit value 999.9s and return ‘0’, and start timers from square once again automatically, and test can’t terminate

b. Test time in not set as zero.

For example, when set as 520s, the normal test time is 520s

D. ARC setting

In the ACW parameter setting state, users can press ARC key to enter ACW test time setting state.

Test time setting as figure,

Press the ARC key to enter the setting mode of ARC grade setting, marker bit ’SET Arc Sense’ lights up. Combined with upward and downward keys can set 0-9 ARC grades. And zero indicates that shut off of ARC function, 1 grade indicates that

sensitivity of ARC is lowest, for the matter, 9 grade indicates that sensitivity of ARC is highest

DCW parameter setting

DCW parameter setting have upper limit and lower limit setting for leakage current, test time setting, and ARC setting

A. Enter DCW setting interface

In the standby mode or parameter setting state, users can press downward key to enter DCW parameter setting state, and in the DCW parameter setting state, on the left side of display screen, DC indicator lights up and AC indicator lights out. In the current and resistance display area, the last setting current upper limit value of DCW leakage displayed, and in this interface, we can press the right key to switch voltage between 3.0kv and 5.0kv.

B. DCW parameter setting

The setting method is the same that of the ACW setting

Chapter Seven Operating procedure and step

ACW test mode

a) Parameter setting range

The key on the panel can be used to set parameters of voltage withstand, and every parameter's range is as follows:

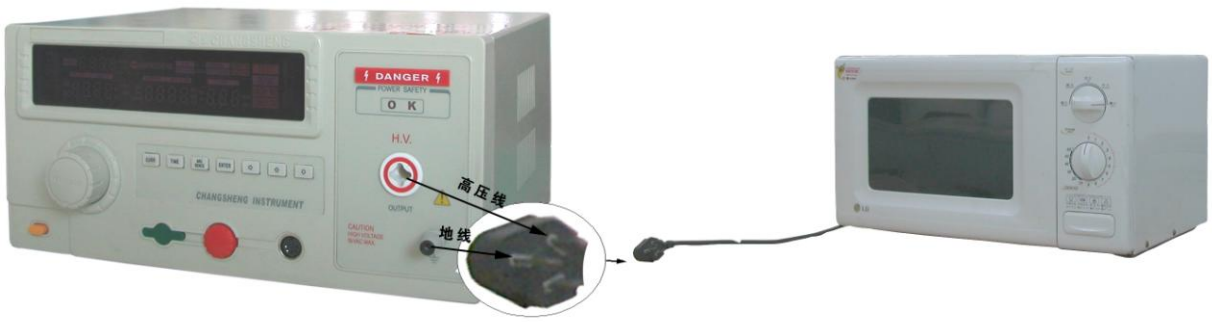
- Upper limit setting for leakage current: 0.1-99.99mA
- Lower limit setting for leakage current: 0.000-9.99mA
- Test time setting: 0.1-999.9s 0=consecutive test

Note: single test mode, generalized interval time will be set as zero

a) Test program step

1) connect DUT device

Firstly, make sure that the tester doesn't generate high voltage in the reset state and high voltage output lights out, then connect the loop line used by low potential to the loop terminal of tester; make sure that there is no high voltage output, then plug the connector plug of high voltage test line in the H.V. terminal of tester. then connect the loop line used by low potential to DUT, at last, connect the high voltage test line to DUT. As figure;



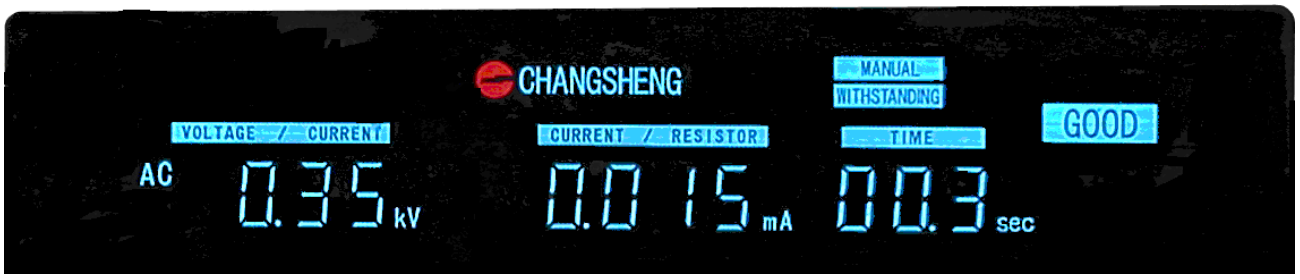
2) Start testing

As figure:

When pressing the TEST key, the test marker bit 'TEST' lights up, at the same time the high voltage output indicator lights up, and the tester starts to perform test and output high voltage. VFD displayed output voltage value, test current value and test time value.

3) Judgment of qualified product

As figure



The time parameter is not set to be zero. when test time's out, the tester automatically will stop performing test, while the buzzer started to make a buzzing sound and the marker bit 'GOOD' lights up, if the test time is set to be zero, there is no judgment of qualified product

4) Judgment of disqualified product

A.. Current upper-limit alarm, as figure:

If the leakage current detected exceeded the leakage current upper-limit setting value, the tester will stop performing test immediately, at the same time the buzzer will make a buzzing sound and marker bit alarming lights up.

B . Current lower-limit alarm

As figure

If the leakage current detected is less than lower limit setting value of leakage current, the tester will stop testing immediately, while the buzzer starts to make a buzzing sound, and alarming lights up

C. ARC alarm

As figure:

If the ARC detected excesses, the tester will stop testing immediately, while the buzzer starts to make a buzzing sound and the marker bit alarming lights up.

二、DCW test mode

It is nearly the same procedure between DCW test and ACW test. Users can set the test mode as single DCW test mode.

Chapter eight Accessories and Maintenance

Accessories:

1、	Power wire	1pc
2、	High-voltage test pole	1set
3、	User Manual	1pc
4、	Quality guarantee	1pc
5、	Product certification	1pc
6、	Series communication installation and introduction disk (optional)	1pc

When receive the instrument, please open the package to check with the above contents, if any missing, please contact with the company or distributors.

Maintenance:

1、 **Maintenance period**：The instrument is warranted to be free from use for a period of 12 months from the date of shipment to the original end users in different sales spots.

2、 **Maintenance**：Please bring forth the warranty card while maintaining. The company provides lift-long maintenance service to all the shipped instruments.

In this period, consumer is responsible for the maintaining fee if the instrument is damaged by improper operation.

The products of Changsheng appreciate the protection of approved and examining Chinese potent. The information of the Operation Manual replaces all the data and files published before. The company holds the rights to change the specification and price; no additional notice will be available.