Test

Programmable Auto Safety Tester
9032C
User's Manual

Edition
June 2005
P/N All 00346

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___Test_____

※※※ Inspection Before Use ※※※

Before send out from factory, this tester has been under a series of check and test of the mechanical and electrical character to assure is normal and make a guarantee of the quality of this product. But if any damage happened of some functions are useless which are caused by collision during transportation, please contact our company and will dispatch our service man to solve the problem.

Standard Accessories

Name	Part No.	Q'ty	Remark
Power Cord	W12 010100	2	BLK- 7CM
Power Cord	W12 010130	1	Power Cord
AC Source Power Cord	W38 001710	1	BLK- 1.5M
3P – 2P Adaptor	N31 000039	1	For change power plug
Test Cable 1	W38 001940	1	For high terminal of WV test cable
Test Cable2	W38 001760	1	For low terminal of WV test cable
Test Cable3	W38 001830	1	For ground test cable
Test Cable4	W38 000870	1	Special test cable for power plug
Fuse 1	A21 022200	2	For 6.3A Slow Blow 110V AC
Fuse 2	A21 020400	2	For 3.15A Slow Blow 240V AC
Insulating Gloves	G51 012800	1	Outside of test gloves
Cotton Gloves	G59 004100	1	Inside of test gloves
Label for Warning		1	For marking danger
Manual	A11 000349	1	English

NOTE：Just specify the name or type if you need any extra accessories.

Option Accessories

Name	Part No.	Q'ty	Remark
Remote Control Box	9 19570199	1	for TEST/RESET external control
GP-IB Iterface	8 19033700	1	IEEE-488 Interface
GP-IB Connector 1M	Y91 013555	1	for computer control connecting
GP-IB Connector 2M	Y91 013556	1	for computer control connecting
RS232 Connector(1)	W32 844000	1	CBL25P/9S/25S 2M
RS232 Interface	8 19034500	1	RS422 Interface
Centronics Interface	8 19034800	1	Centronics Interface
9030A Scan Box	9 19030199	1	8HV. Scanner
9030A-2 Scan Box	8 19032700	1	8HV. 2GC Scanner
9030A-4 Scan Box	8 19032900	1	8HV. 4GC Scanner
9030A-6 Scan Box	8 19033100	1	8HV. 6GC Scanner

Remark：RS422 cable used on a 10 Base-T twisted-pair Ethernet work cable (RJ-45 connector, Cat.5 cable)

6000-02 Plug in Scan Unit	9 19030399	1	3 HV, 5 GC Scanner
6000-01 Plug in Scan Unit	9 19030299	1	5HV, 3 GC Scanner
6000-03 Plug in Scan Unit	9 19030499	1	8HV Scanner
6000-04 Plug in Scan Unit	9 19030599	1	HV/LC Scanner
6000-05 Plug in Scan Unit	9 19032699	1	HV/LC Scanner with probe

※※※ Caution ※※※

1. Do not touch the tested area when the tester is under voltage-output status, or you will get a shock and may be caused to death.

Please obey the following rules:

- **Drain wire requires suitable connector and standard power cable must be used.**
- **Do not touch output terminals.**
- **Do not touch test cable which is being connected to output terminal for charging.**
- **Do not touch tested-object.**
- **Do not touch tested-object immediately as end off test or turn off output.**

2. The following cases will cause shocking accident:

- **The ground terminal of the tester doesn't ground well.**
- **Wouldn't use insulating glove when testing.**
- **Touch tested-object as soon as test is finished.**

L Note

About detail caution operation description is written in "Precaution Before Use", the chapter 3 of this manual.

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1. Forward

1.1 General

Automatic Withstanding/Insulation/Ground tester, this tester, is a high-evaluation equipment that is specially designed for automatically test electric and electronic equipment in withstanding, insulation resistance, and ground resistance, and static leakage current.

Withstanding test, the output power of this tester is AC : 200VA (5kV,40mA) /DC:120VA (6kV,20mA), the output power of transformer is 200VA. Hence it is suitable for test electronic and electric equipment in withstanding test, also it can test parts by the way.
Insulating resistance test, the range that this tester can test is 0.1MΩ-50GΩ, output test voltage range is 50V-1000V which can be arbitrarily set.

Ground resistance test, the range that this tester can test is 0-510mΩ, output current is 3-30A which can be arbitrarily set.

In dynamic leakage testing, capable test range is 0.01mA~9.99mA, output test voltage range is 110V~220VAC. The test standard meet IEC950、UL1950、UL3101.

The display on this tester can be clearly realized, all of setting status, time, current, voltage, resistance, memory number can be seen from the display so user no need to memories any parameters.

This tester equips with the device for GOOD/NO GOOD judgment, signal output of test result, remote controller, and GPIB interface and scanning interface that is available for automatic testing system.

This tester has above-mentioned functions, so it can do a high effectiveness and precision test for electric and electronic equipment or parts.

1.2 Features

(1) Multi-testing Status

This tester can chose MANUAL to do individual test, such as only with standing (AC) test, only withstanding (DC) test, only insulating resistance test, only ground resistance test, only leakage current test. This tester can also do continuous test in different combination, such as withstanding (AC) test→insulation test→ground test →leakage current test→withstanding test→……it just chooses STEP testing status to do continuous test with many kinds of combination.

(2) The display that can be known all at one glance

This tester makes a clearest design in display. All of setting parameters, such as test voltage, current, time the readings, memory number, test procedure, test status can be clearly read from display.

(3) Save and Call Setting Status

Any setting parameter can be saved into memory. If you want change it, it can be called from memory that needn't reset all parameters. So you can save time for reset. Up to 50 groups of parameter can be saved.

(4) Memory Back-up

This tester can back up the date of setting parameter which has been saved in memory. The date won't lose even turn off the tester. So, don't save any unnecessary to prevent from it occupy memory space.

(5) High/Low limit compare judgment of Pass or Fail

When design the internal of this tester, it has high/low limit compare judgment of tested-object no matter what in withstanding test or insulating resistance test or leakage current test. In DC-W mode. It has more charge Low, Ramp High.... test functions, It's available for test the load of capacitance.

(6) Remote Control

This tester can extend Start and Reset signals to external to control output, normally it connects to high voltage bar or control box.

(7) GPIB Interfacial & RS232/RS422 Interfacial Function

The GPIB interface in this tester meets ANSI/IEEE488-1978 standard interface. These two interfaces are suitable for automatic testing system, it can be changed from keyboard setting on the front panel to PC command control.

(8) Signal Output of Test Result

This tester can send out test result, such as Pass, Fail, Test, etc., to external by relay.

(9) Key Lock

Except [STOP] and [▲][▼] keys, the rest of function keys and input keys of this tester will be locked that can't be operated in test status to prevent from changing test condition suddenly which will induce danger by change voltage or current. So, all keys will be lock except [Stop] and [▲][▼] key.

(10) Change the time for rising voltage

This tester has a [Ramp] function to change the time which is required for rising voltage from 0 to setting value.

(11) Test cable correction for WV and GR Test

This tester has a [Offset] key. This key will auto-call the OFFSET value of test terminal under each test conditions. For example, leakage current of W-V test and resistance of ground test co-exist in memory. And it will auto-subtract to make test value more exactly.

(12) SCANNING interface function

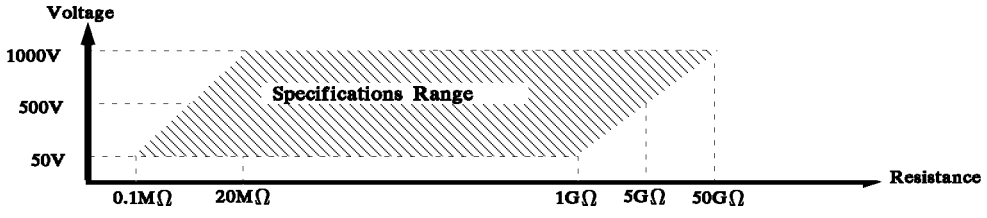
This tester can be connected with 8 sets of scan box (9032M/9032C has built-in one scan box internally). The max scan points, HV is 64 Points, ground resistance is 8 points.

(13) CENTRONICS interface function

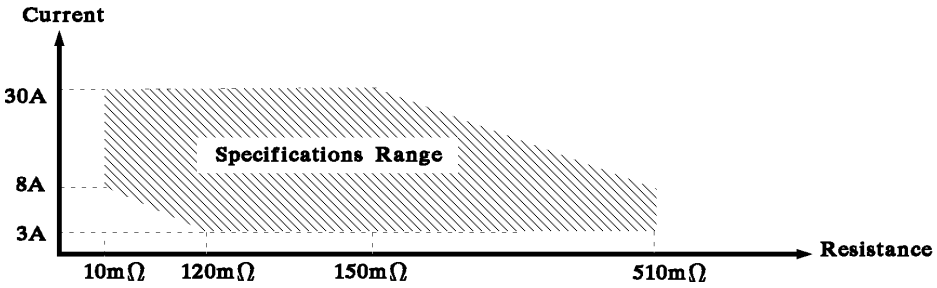
This tester can be connected with printer, when testing end, the measurement value and judge result will print out.

2. Specification (18℃~28℃ RH ≦ 75%)

É Withstanding Voltage Test	
É Test Voltage	AC: 0.05 ~ 5kV/ DC: 0.05 ~ 6kV Constant Voltage
É Voltage Regulation	≦ 1%+5V, Rated Load
ƒ V-display Accuracy	4 digits, ± 1% of reading + 5 counts (50/60 Hz only)
ƒ Cutoff Current	AC: 0.1mA ~ 40mA DC: 0.01mA ~ 20mA, 0.1uA DC resolution
ƒ I-display Accuracy	4 digits, ± 1% of reading + 5 counts (50/60Hz only)
ƒ Output Frequency	50Hz, 60Hz
ƒ Test Time	0.1 ~ 999 Sec. (± 20mS), off
ƒ Ramp Time	0.1 ~ 999 Sec. (± 20mS), off
ƒ Arc Detection	
ƒ Setting Mode	Programmable Setting
ƒ Detection Current	AC: 1mA ~ 40mA, DC: 1mA ~ 20mA
ƒ Min. pulse width	≦ 10us approx.
É GOOD/NO-GO Judgment Function	
É Judgment System	Ç Window comparator
	Ç A Fail Judgment is made when a current greater than the high
	limit value or smaller than the low limit value is detected.
	Ç When a Fail Judgment is made, the output voltage is cut out and
	a Fail alarm signal is delivered.
	, If no abnormal state is detected during the test time a GOOD
	Judgment is made and a Pass signal is delivered.
ƒ Insulation Resistance Test	
ƒ Test Voltage	DC: 0.05kV ~ 1kV, Constant Voltage
ƒ V-display Accuracy	4 digits, ± 1% of reading + 5 counts (NOTE 1)
ƒ Resistance Range	0.1MΩ ~ 50GΩ
É Measuring Accuracy	≧500: 10 ~ 1000MΩ: ± 5% 1001 ~ 9999MΩ: ± 10% 10GΩ ~ 50GΩ: ± 15% of reading (NOTE 2) < 500V: 0.1 ~ 1000MΩ: ± 10% of reading.



NOTE 1: Reference 1000 volts NOTE 2: Without scan unit
NOTE : I-display accuracy reference 1.2kV Resistance Load only.

ƒ **Test Time**	0.1 ~ 999 Sec. (± 20mS), off
ƒ **Judgment Delayed**	0.3 ~ 99.9 Sec. (± 20mS)
ƒ **GOOD/NO-GO Judgment Function**	
ƒ **Judgment System**	, Window comparator system
	, A Fail Judgment is made when a resistance less than the low
	limit value or greater than the high limit value is detected.
	, When a Fail Judgment is made, the output voltage is cut out
	and a Fail alarm signal is delivered.
	, If no abnormal state is detected during the test time, a Pass
	judgment is made and a GOOD signal is delivered.
ƒ **Ground – Earth Tester**	
ƒ **Output Current**	3.0 ~ 30.0A AC. digital setting, 0.01A step
ƒ **Accuracy**	± (1% of setting + 0.3A)
ƒ **Output Frequency**	50Hz, 60Hz
ƒ **Current Meter**	4 – Digitals, 30.00A. FS.
ƒ **Accuracy**	± (1% of reading + 5 counts)
ƒ **Resistance Range**	0 ~ 510.0mΩ 4 – Digitals, 510.0mΩ FS.
É **Accuracy**	± (1% of reading + 5 counts)
	
É **Judgment System**	ÇA Fail Judgment is made when a resistance greater than the high limit value is detected ÇWhen a Fail Judgment is made. The output current is cut out and a Fail alarm signal is delivered ÇIf no abnormal state is detected during the test time, a Pass judgment is made and a Pass signal is delivered
É **Limit Value Setting**	HI - LIMIT 0 ~ 510.0mΩ Digital setting (4 - digits)
É **Offset Function**	
É **Offset**	ÇThe short circuit resistance can be measured and offset ÇA predetermined value can be subtracted from the measured value and the result of subtraction can be display
É **Offset Range**	0 ~ 100.0mΩ
É **Test Time**	0.5 ~ 999 sec. (20 msec.), off

É Leakage Current Test (Option) (NOTE 3)			
É Input Characteristic	DC - 1MHz		
	Input Impedance: 1MΩ // ≦ 20pF		
É Accuracy (NOTE 4)	**Range**	**Resolution**	**DC - 5kHz**
	0.1 – 590.0 uA	0.2 uA	2% + 5 counts
	500 - 6000 uA	2 uA	2% + 5 counts
É Built-in Measurement Devices:	UL 544 NP UL 544 P UL 1563 UL 2601-1, IEC610-1 UL 3101-1, UL 1950, IEC 950 5 type Human Body Model RC network		
ƒ **Measurement Mode**	Normal, Reverse		
	Single Fault Normal, Single Fault Reverse		
ƒ **Probe Connection**	Line to Ground fixed		
ƒ **Line Voltage Meter**	0 – 300.0V, ± (1.5% + 5 counts) NOTE 4		
ƒ **Line Current Meter**	0.1A - 10A, ± (1.5% + 5 counts) NOTE 4, NOTE 5		
ƒ **General**			
ƒ **LC Hi/Lo Limit**	0 – 9.99mA, 1uA resolution		
ƒ **Current Hi/Lo Limit**	0 – 9.999Amp		
ƒ **VA Hi/Lo Limit**	0 - 2200VA		
ƒ **DUT Input Power Capacity:** 300V AC / 10A maximum			
ƒ **Protection**	10A, 250V fuse for DUT shorted.		
ƒ **Secure Protection Function**			
ƒ **Fast Output Cut-off**	< 0.4mS		
ƒ **Fast Discharge**	< 0.2S		
ƒ **Panel Operation Lock**	YES, with password On/Off		
ƒ **Power On Data Rally**	YES		
ƒ **Reset Protection Key**	YES		
ƒ **Memory Storage**			
ƒ **Memories, Steps**	50 groups of memory, each memory includes 10 Steps		
ƒ **GO/NG Judgment Window**			
ƒ **Indication、Alarm**	Pass: (Short Sound) Fail: W-Arc, W-Hi, W-Lo, IR-Lo, IR-Hi, GR-Hi (Long Sound)		
É Data Hold	YES		
É Remote Connector			
É Rear Panel	9-Pins connector: START, RESET, UNDER TEST, PASS, FAIL		
É Start/Reset Control	ÇLow – active control.		
	Input requirements		

NOTE 3: dynamic line leakage tests.
NOTE 4: ± (% of reading + counts)
NOTE 5: calibrated at full scale.

	ÇHigh level input voltage : 4.5 - 5V
	ÇLow level input voltage : 0 – 0.6V
	ÇLow level output current : ≦ 1mA
	ÇInput time duration : ≧ 20msec.
	Note 1: The above input circuits are isolated from other
	internal circuits.
	Note 2: To make the input terminal open is equivalent to
	that the high level signal is applied the terminal.
ƒ **Options**	
ƒ **Interface Card**	
ƒ **GP-IB Interface**	Talk, Listen all function
ƒ **RS232/RS422 Interface**	Baud rate 300 ~ 19200, data bits: 8. stop bit: 1
É**Fixture**	
É**Scan Interface**	For 9030A, 3006 scan unit used
É**9006**	Self-judgment fixture
É**3002**	20 pins Transformer Scan Test Fixture
É**Transformer Fixture**	Std: 5mm or 7.5mm Interval between pin to pin, 20pins max.
	Other spec order is possible
ƒ **Remote Controller**	
ƒ **(3) 9 19010199**	Remote Test Gun (Hi-pot)
ƒ **(25) 9 19570199**	Remote Control Box
ƒ **Test Cable**	
ƒ **(7) W38 000980**	Clamp type (Hi-pot, HI)
ƒ **(8) W38 001760**	Clamp type (Hi-pot, LO)
ƒ **(21) W38 000840**	Clamp type (Ground)
ƒ **(22) W38 000960**	Plug type (Hi-pot)
ƒ **(23) W38 000850**	Plug type (Ground)
ƒ **Ambient Temperature and Relative Humidity**	
ƒ **Specifications range**	15 to 35°C (59 to 95°F), 20 to 75% RH.
ƒ **Operable range**	0 to 40°C (32 to 104°F), 20 to 80% RH.
ƒ **Storage range**	-20 to 70°C (-4 to 158°F), ≦ 80% RH.
É**Power Requirement**	
É**Line Voltage**	AC 100V, 120V, 220V ± 10%, 240V +5 -10%
É**Frequency**	50 or 60 Hz
É**Power**	No load: < 100VA
É**Consumption**	With rated load: 600W max.
É**Dimension**	430 W x 175 H x 450 D mm
ƒ **Weight**	Approx 24 kg

3. Precaution Before Use

This tester output high voltage which is up to 6KV to external. Any incorrect or improper operation will cause accident happened, or even to death. Please read the notice described in this chapter carefully and memories it to get rid of accident.

1. Electric Shock

In order to prevent shock accident happened. Before operating this tester, please wear insulating rubber glove first, then engage in the job which is related to electricity.

2. Ground

There is a ground terminal on the rear panel of the chassis. Please use proper tool ground this terminal to earth exactly. If ground didn't make exactly, it is very dangerous because the chassis of tester may have high voltage as power circuit shorts to ground or the connect cable of any equipment shorts to ground. Any person touches the tester during above-mentioned conditions may cause shock accident. So, make sure the terminal is grounded to earth. Refer Figure 3-1, as the arrow directs:

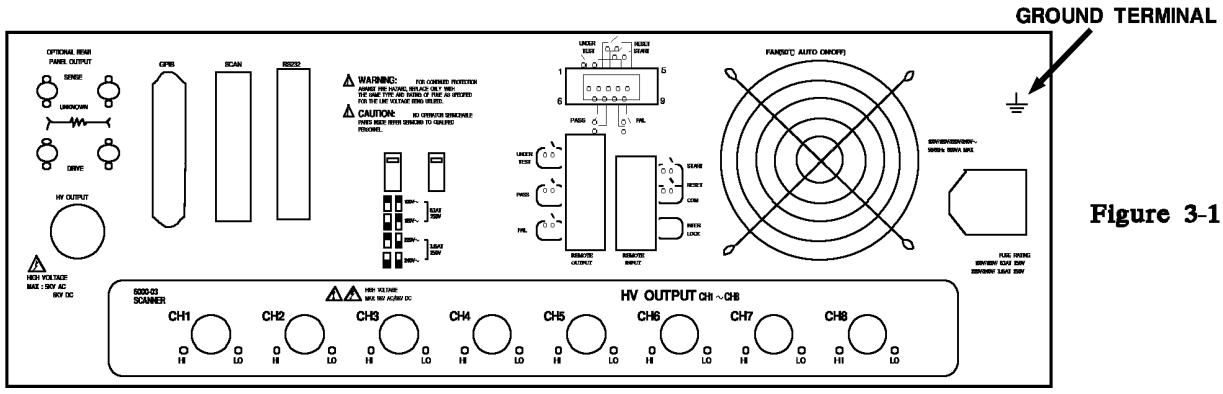


Figure 3-1

3. Connect test cable to COMMON terminal

As Figure 3-2 shows, connect test cable to COMMON terminal. Check test cable whether it isn't connected well, or it has come loose, or it falls off at any time during the tester is running. Before your connect test cable to tested-object, please connect test cable which has been connected to COMMON terminal to tested-object. It is very dangerous if test cable on COMMON terminal isn't connected exactly or even it falls off because whole body of tested-object will be charged with high voltage.

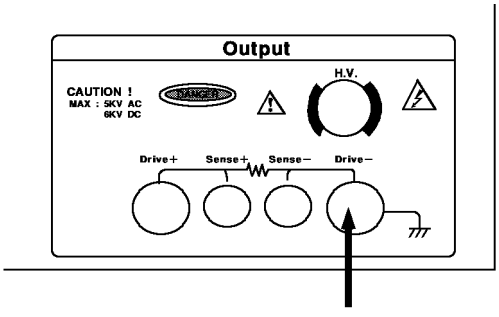


Figure 3-2

This test cable should be connected exactly.

4. Connect test cable to high-voltage output terminal

After connect test cable to COMMON terminal completely, then connect high-voltage output terminal by following procedure:

ƒ Press [STOP] key first.

ƒ Make sure DANGER indicator doesn't lights.

ƒ Short test cable on COMMON terminal with high-voltage output terminal.
Be sure no output voltage.

ƒ Plug high-voltage test cable into high-voltage output terminal.

ƒ Finally, connect test cable on COMMON terminal to tested-object, then connect high-voltage test cable too.

5. Ending Test

If want to stop or don't use the tester, or must leave during operation, please set power switch at "0" (i.e., turn off power). As Figure 3-3 shows:

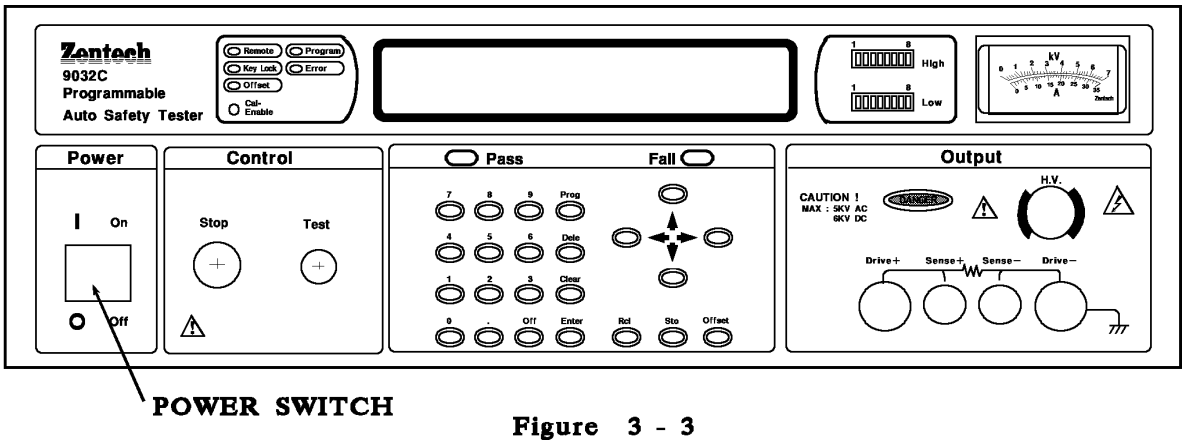


Figure 3 - 3

6. It has some dangerous areas when tester is under test situation

When this tester is running, it is very dangerous to touch high-voltage area, such as tested-object, test cable, probe or output terminal.

L Attention

Never touch alligator clip on test cable. As alligator clip isn't enough. So, it will cause danger if you touch it. As Figure 3-4 shows :

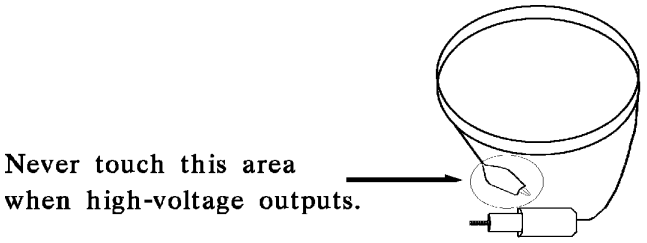


Figure 3-4

※ ※ ※ Warning! When output is cut off ※ ※ ※

7. Test-finished check

Ignored to change wiring or some requirements related to test, you may need to touch high-voltage area, like tested-object or high-voltage cable, or output terminal, ect. But please make sure :

ƒ Power switch has been turn off.

ƒ The tested-object which is treated as insulating resistance may have high voltage on it after finished test. At the moment, user must fully understand the description of 3-8 and 3-9, then carefully execute the procedures which is described in those section.

L Attention

Insulating resistance is charged high-voltage during test.

8. Charging

When insulating resistance is tested, tested object, capacitor, test cable, probe, output terminal, even tester may be charged a high-voltage on it. It takes a long time to completely discharge those high-voltage after power switch is cut off. You must follow the above-mentioned description to do, never touch any place which is possibly caused shock, especially power is just cut off.

9. Make sure charged-voltage has been fully discharge

The required time that charged-voltage is fully discharged depends on test voltage and the character of tested-object. For example, if a high-voltage adds on an evaluation circuit that a 0.01uF capacitor parallels with a 100MΩ resistor, then it takes about 3.5 seconds for voltage which is charged on test cable and tested-object decreasing to 30V or below when test voltage is 1000V. And it will be about 2.8 seconds if test voltage is 500V. If the time-constant of tested-object has been known you can use the above methods, ie, multiply the time that charge voltage can decrease to 30V or below with its time constant, to realize how long it takes for charged-voltage goes below 30V after power is cut off.

As Figure 3-5 shows:

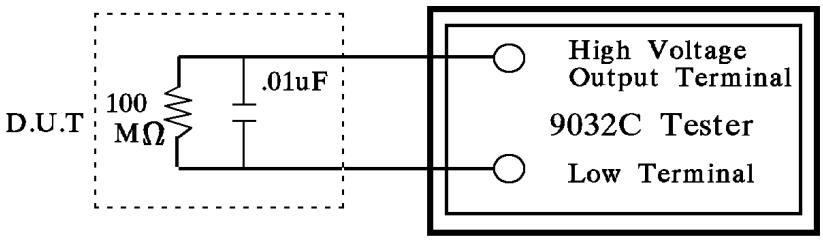


Figure 3-5

10. Remote Control The Tester

This tester has remote control function which is controlled high-voltage output by external control signal. Just for user's safety and prevention from accident happened, user must truly obey the following principle when doing this control.

ƒ Never permit any unexpected high-voltage output that will cause hazard.

ƒ Never permit operator or others touch tested-object, test cable, probe, output terminal, etc. when the tester has high-voltage output.

11. Turn ON Power Switch

Before turn On/ Off the power switch, High-Voltage test lead must be removed away from the device under tester. When power were shut off it requires a few seconds of waiting before it re-start on. The continuously turn on then off the power switch is prohibited. Unpredictable harmful dangerous might happen during incorrect operation.

12. Other Notice

Don't short output cable, ground cable and transmission line or the tester, or ground cable of other connectors, or AC power to get rid of charging whole chassis of tester to hazardous voltage. If you want to make high-voltage output terminal and COMMON terminal be shorted, you must well connect the chassis of the tester and ground first.

※※※ Very Urgent Cases ※※※

13. The Management in An Emergency

In order to prevent from producing more danger in any emergency, such as electricity shock, a fire on tested-object, or the tester, please obey the following procedures.

É **Turn off power switch first.**

É **Then pull out the plug of power cable.**

※ ※※ Solve Problem ※※※

14. Problem Happened

It is very dangerous that the problems are produced in following cases. Even press [Stop] key, you must be careful because output terminal may still have high-voltage output.

ƒ **DANGER indicator goes on lighting when press [Stop] key.**

ƒ **No reading on voltage meter, but DANGER indicator is lighting.**

When the above-mentioned situations happened, turn off power at once as well as pull out power plug to stop running. This trouble is very dangerous. Please send it back to our company or our office for repairing.

15. The Trouble of TEST ON Indicator
After press [TEST] key, there are reading on voltage meter, but DANGER indicator does still light, At the time, it may be the trouble of indicator. Please turn off the tester at once bad use another tester, then send it back to our company or our office for repairing.

16. Under normal operation, user must notice the following item if he wants to continue use the tester for a long time. If high limit is set at 20.00mA (withstanding test), please notice the variation of temperature. If ambient temperature exceeds 40℃, stop running. After temperature decreases to normal condition, then re-use it. The temperature must be checked.

17. AC power which is adopted by the tester is categorized into four kinds. According to the local power source, please set the voltage selection switch which is on the rear panel of the tester at right position.

Before plug into power line, make sure input AC power and the label of voltage election switch are the same, and the fuse has to be changed too. The following table lists operating voltage and fuses.

Label	Central Value	Range	Fuse
100	100V	90V ~ 110V	6.3A Slow/250V
120	120V	110V ~ 130V	6.3A Slow/250V
220	220V	200V ~ 240V	3.15A Slow/250V
240	240V	220V ~ 250V	3.15A Slow/250V

Before change fuse, make sure operating voltage is correct, mean while the power cable must be not connected with power. Pull out power cable from socket first, then use "–" type screwdriver to push away the fuse box located on socked and replace a new fuse.

L Warning
Be sure the new fuse meets correct specification, or it will easily cause danger.

18. Normally the tester is operated at AC power. In the selected voltage range, if power is unstable, it may make the tester incarceration. Therefore, please use the proper equipment, like regulator, to convert the power into available range.

19. This tester uses a high-voltage transformer that is applies over 200VA.
If tested-object sucks in a large amount of current, before judging NO-GOOD situation and output current is cut off, it may flow in a large current (about several ten-amperes) for several ten-millisecond. It also occurs before test. So, must care of the rated current of power line as well as the power cable which is connected commonly.

20. Storage

The tester is normally used in 5℃- 40℃ of temperature, 75% RH. of humidity.
The tester will abnormal if it exceeds the above-mentioned range.

The storage range is -20℃~70℃ of temperature, 80% RH. of humidity. If it won't be used for a long time, please packed it in original package then store it. For correct test and safe operation, don't install the tester at the place which will be shone by sunshine or high temperature directly, frequent vibration, wetly, or dusty.

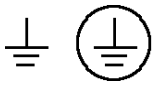
21. Warm-up

The tester will start as power is turn on. But for precision test, please warm it up for 15 minutes or above.

22. Safety Symbols


：Lethal voltage may be present on the terminals. Observe all safety precautions.


：Instruction manual symbol. This symbol is to indicate that the information about usage of a feature is contained in the manual.


：Protective conductor terminal. For protection against electrical shock in case of a fault. To indicate that the terminal must be connected to ground before operating equipment.

Warning ：**Calls attention to a procedure, practice, condition or the like, if not correctly performed, that could result in injury or death to personnel.**

Caution ：**Calls attention to a procedure, practice, condition or the like, correctly performed, that could result in damage to the equipment or other property.**

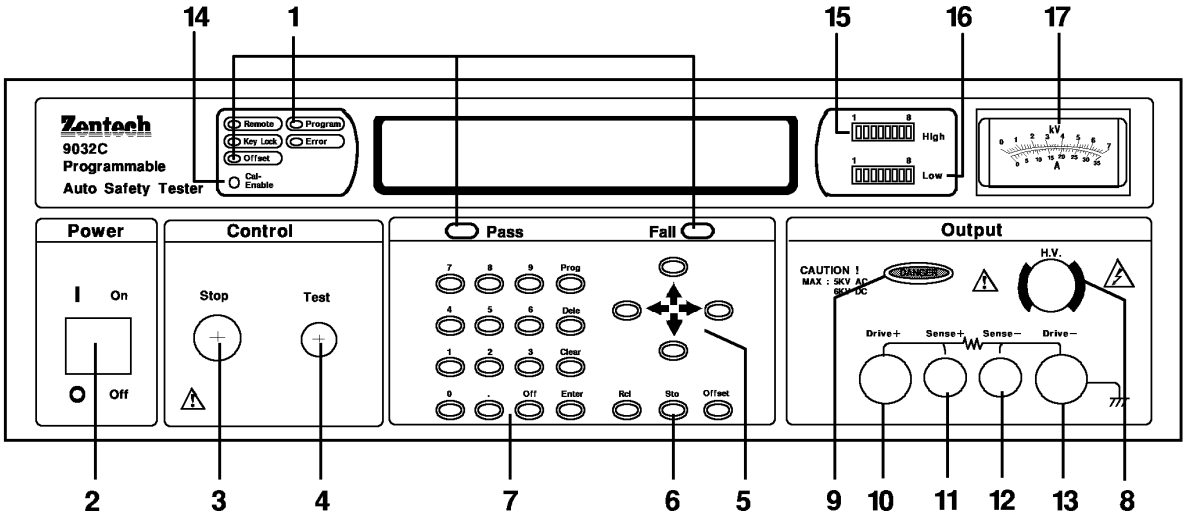
Note ：**It calls attention to a procedure, practice, condition or the like, which is essential to highlight for important information.**

23. Warning Sign (during)：

"DANGER –HIGH VOLTAGE TEST IN PROGRESS, UNAUTHORIZED PERSON KEEP AWAY"

4. Operation Description

4.1 Description of Front Panel



1. Result Indicator LEDS

ƒ **Pass :** Indicator for good product. When indicator lights, the tester results is judged to be good. If you don't set TIMER, it doesn't work.

ƒ **Fail :** Indicator for bad product. When indicator lights, the test results is judged to be NO-GOOD. AS NO-GOOD judgment appears, the output of the tester is cut off at once, and the indicator will go on lighting unless [STOP] key is pressed.

ƒ **Remote :** Press this keys, the tester is under REMOTE status. The tester is controlled by PC through GP-IB connector. All keys won't work except [Stop].

É **Key Lock :** Press this keys the tester is under key-locked status. Except [Stop]、[Test] and [Rcl] three control keys, the other keys won't work.

É **Offset :** When offset light is ON, machine has already been testing cable and the leakage current must be zero.

ƒ **Program :** When indicator light, means enter to parameters set up status.

ƒ **Error :** Option.

.

2. Power Switch

The switch supplies AC power for the tester. Before using, please read chapter 3, "Precaution Before Use", in the manual.

3. Stop Key

After you press this switch, the tester will be back to standby status (ends output and clean all judgments).

4. Test Key

After you press this switch, the tester is under test status. The test terminal goes on outputting and all judgment functions will be turned on at the same time.

5. Cursor Keys

Under STOP status, [▲] [▼] two keys are used for the STEP test. Under DANGER (W-ACV/W-DCV/I-R) status. [▲] [▼] two keys are fine adjustment keys that are used for change output-voltage. (Press once ±10V). Under PROG status, [▲] [▼] keys are used for change test status. [W] [X] keys are used for inputting parameter.

6. Memory/Offset Keys

É **Offset :** Test terminal offset key & current unit switch key. In each state if like to offset the test lead or the leakage current, all could be done by press this key, for detail description, please see the manual of each chapter description.

ƒ **Rcl :** This key can read out the data saved in memory. After press the key, can use numerical key input or [▲] [▼] selecting memory number. Press down twice [Enter] key to finish action.

É **Sto :** This key can store each set parameters into memory. Action as Rcl, but press [Enter] key, can input memory code (max. 11 digits).

7. Data Entry Keys/Prog Keys

É **[0][.]..[9] :**numerical keys to input every test parameter.

ƒ **[Off] :**lock keys for locking some optional test parameter. Such as scanning test, HIGH LOW LIMIT, ARC TEST, RAMP UP TIME, and so on.

ƒ **[Prog] :**for setting status. Press this key and then enter parameter setting status. It will leave setting status after you press this key again.

ƒ **[Dele] :**Press this key, the steps below that step(including that step) will move up one step and that step will be deleted.

ƒ **[Clear] :**cancellation key. Press this key to cancel wrong number and then input again if you find something wrong.

ƒ **[Enter] :**confirmation key. Press this key to confirm after input test parameters.

8. H.V-Out : High potential terminal for high-voltage output. This terminal is used to output high voltage. So, it is very dangerous, especially during DANGER indicator is lighting. Don't touch it.

9. Danger LED : Test status indicator. It indicates the tester is under test status when this indicator lights. At the time, don't touch test terminal because there is high-voltage or large current out from test terminal.

10. Driver＋: High potential terminal for large current output. This terminal is high potential terminal of large current output when in ground resistance test.

11. Sense＋: Resistance test terminal, Sense＋terminal.

12. Sense- : Resistance test terminal, Sense – terminal.

13. Driver- : Common terminal. This terminal is reference terminal, ie, low potential terminal when in high voltage or large current test. This terminal almost equals to the ground terminal of chassis.

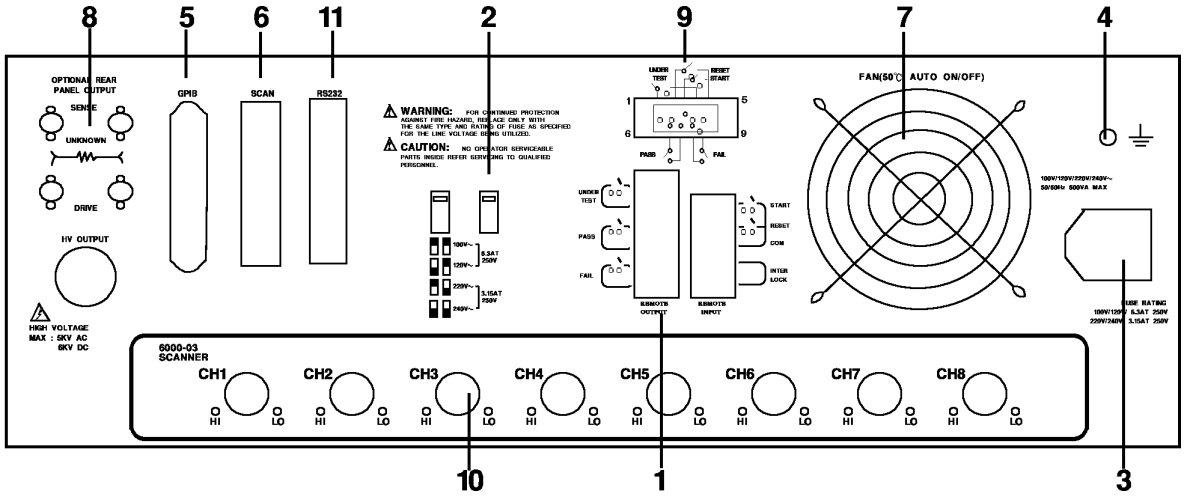
14. Cal-Enable：Revise switch. Setted before leaving from factory. Before send out from company, the machine must not break down when testing.

15. Scan Box HV Output or Grounding Output Indicator

16. Scan Box Lo Voltage Output Indicator

17. Analog Meter for Monitor Main Output Signal

4.2 Description of Rear Panel



1. REMOTE I/O : Output terminal for test result

ƒ **START :** This input terminal to start the tester.

ƒ **RESET :** This input terminal to stop the tester.

ƒ **INTER LOCK :** Short the terminal to enable HV output.

ƒ **UNDER TEST :** This output terminal will be short when the tester is under test status because the contacts of relay will connect this output terminal to device which is powered by 115AC, and current is less than 0.3A. Acting time: From the test is under test status to it is reset.

ƒ **PASS :** This output terminal will be short when the tester-object is judged as GOOD by the tester because the contacts of relay will connect this output terminal to the device which is powered by 115AC, and current is less than 0.3A. Acting time：0.2sec~ 99.9sec. (Adjustable)

É **FAIL :** This output terminal will be short when the tester-object is judged as NO-GOOD by the tester because the contacts of relay will connect this output terminal to the device which is powered by 115AC, and current is less then 0.3A. Acting time : From judging tested-object as NO-GOOD to STOP.

2. VOLTAGE SELECTOR : The switch is for selecting input power range. The switch is used for changing input AC power. Four sorts of the AC power are below :

a. 100V suits voltage 90-100V AC b.

120V suits voltage 110-130V AC c.

220V suits voltage 200-240V AC d.

240V suits voltage 220-250V AC

PS. Please notice fuse changing when press this switch.

3. AC line : AC power socket and fuse box. It is 3-line power socket and fuse box. AC power is supplied to the tester form this socket. The specification of fuse please refer chapter 3, "Precaution Before Use", or "Description of Rear Label", in the manual.

4. GND TERMINAL

Please use the proper tool to ground this terminal to earth exactly. If ground didn't make exactly, it is very dangerous because the chassis of tester may have high voltage as power circuit shorts to ground or the connect cable of any equipment shorts to ground. Any person touches the tester during above-mentioned conditions may cause shock accident. So, make sure the terminal is grounded to earth.

5. GPIB/PRINTER INTERFACE : (Option)

These interfaces are option accessories. The detail description, please refer to the operation manual of chapter 5. interface function description. This connector can only allow PRINTER option to use.

6. SCAN INTERFACE :

The scan interface which is for connecting 9030 or (Option) Scanning box is equipped in the tester.

7. FAN :

Temperature control Fan, If Temp > 50℃, Fan ON. Temp < 45℃, Fan OFF.

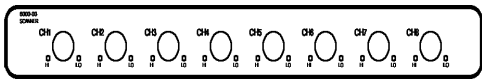
8. REAR PANEL OUTPUT (Option)

Floating output with ground bond on/off control.

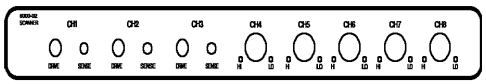
9. 9 Pin D Connector (Option)

The 9 pin D-Sub connector all of function same as (1) Remote I/O.

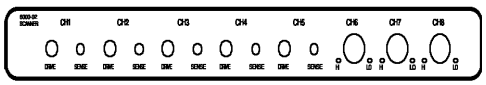
10. Optional Plug in Scan Unit Slot



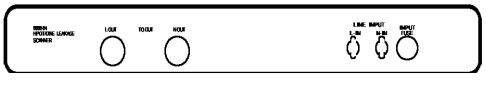
Option(6000-03): 8 points of HV output.



Option(6000-01): 5 points of HV output
& 3 sets of grounding terminals.



Option(6000-02): 3 points of HV output
& 5 sets of grounding terminals.



Option(6000-04): HV/LC scanner

11. RS232 INTERFACE:

The slot is a accessories for RS232 interface card, **GPIB and RS232 can not be used together.**

4.3 Notice and Procedure Before Use

1. Before plug into AC power, be sure the power which will be used matches the power written on the label on rear panel, and power switch is OFF.

2. Before turn the power on, please carefully read chapter3, "Precaution Before Use", and keep it in mind firmly.

3. The tester will check itself when power is turned on. If abnormal phenomenon happened, turn off the tester at once, pull out power cable.

4.3.1 Offset Subtract

Some times, need using Offset subtraction function to subtract the offset value, to get the real test data. This offset value come from leads, scanner or test fixtures.

The process are

1. Preset test parameter
2. Connect test lead.
3. Connect isolation transformer (if LC mode ON)
4. remove the DUT
5. Short the Ground Bond Clip (if GB mode ON)
6. Press "Offset" key, display [Get Offset]
7. Start Test, each step wait 5 second to get offset value.

When finish offset procedure, the Offset LED light, if re_Start test, the leakage current must show 0.0uA, the GB resistance show 0.0mohm

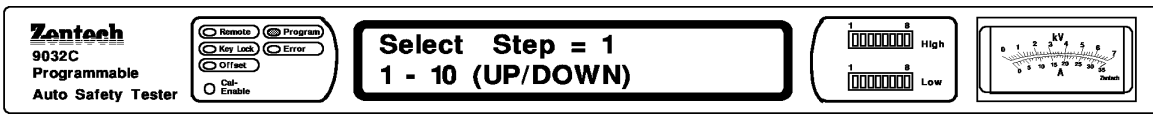
4.4 Single Mode of Withstanding Test (ACV/DCV)

4.4.1 Parameter Setting

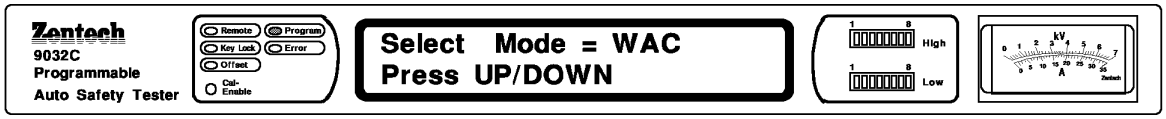
Use numerical key and program key to input test parameters. The range of parameters are as follows:

(1) Set desired-voltage in withstanding test : 0.05 KV –5.00KV (DC 6.00KV)
(2) Set voltage type in withstanding test: AC/DC
(3) Set high limit of leakage current : 0.1-40.00mA (DC 0.01~20.00mA)
(4) Set low limit of leakage current : lower than high limit of leakage current or OFF.
(5) Set desired-time : 0.5-999sec, 0 sec means continue test.
(6) Set rising time of set-voltage : 0.1-999sec or OFF.
(7) The ARC setting : 1mA-40.00mA(DC 1mA~20.00mA) or OFF.

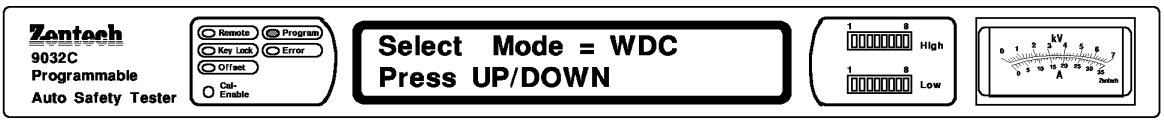
Setting procedures for each parameters are explained as follows :
Press [Prog] to enter parameter-setting status. The LCD display.



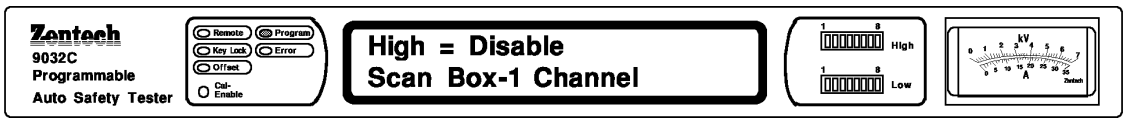
Because of single mode, the STEP parameter is not set under auto testing. Press [X] key to enter MODE setting status.



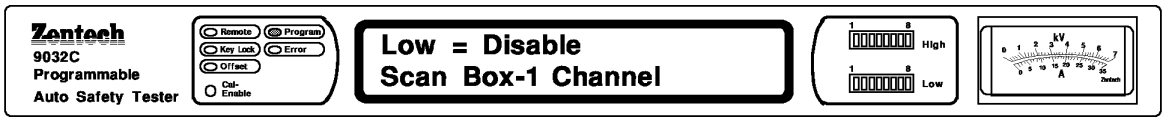
And then press [▼] to set WAC or WDC. Take WDC MODE for example :



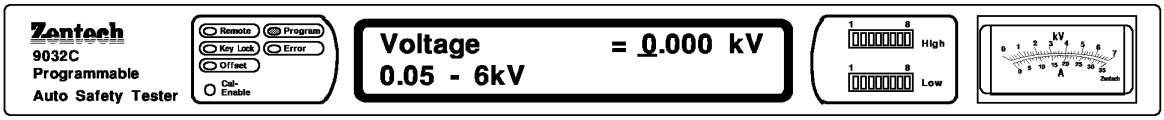
After deciding test status, press [Enter] to enter setting status of output terminal in scanning test.



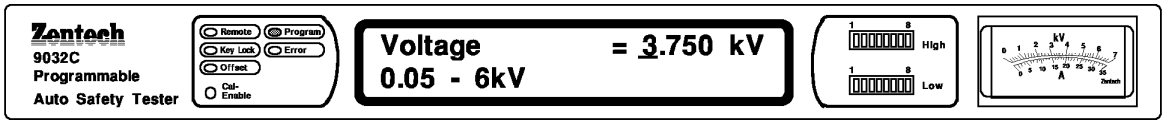
At this time, LCD shows High=Disable. It's under auto-series test and press [Enter] to enter the next parameter setting. Directly, enter into the setting status of voltage test.



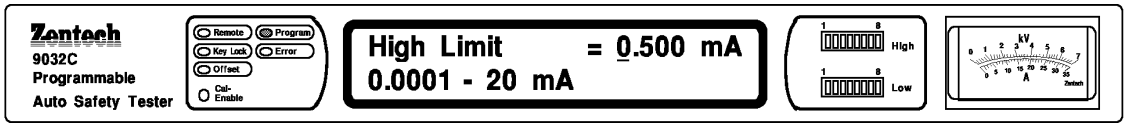
At this time, LCD shows Low=Disable. It's under auto-series test and press [Enter] to enter the next parameter setting.



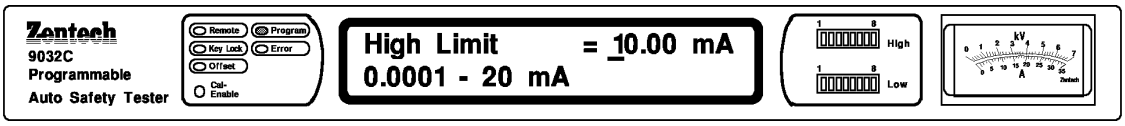
At this time, LCD shows Voltage and waits for inputting desired-voltage. Press [0][.]……[9] numerical keys to input voltage. For example, the test voltage is 3.75V.



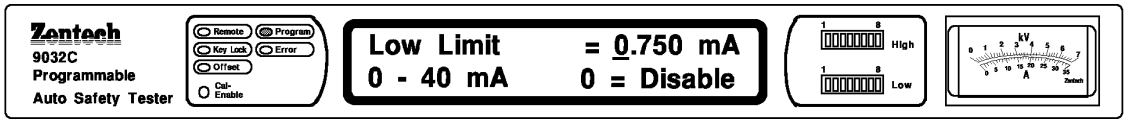
Press [Enter] key and [X] key to enter setting status of high limit of leakage current.



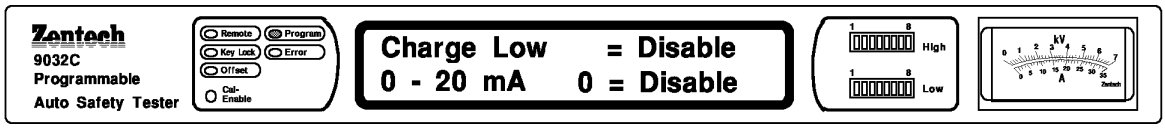
At this time, LCD shows High Limit =Disable and waits for inputting high limit of leakage current. Press numerical keys to input high limit . For example, high limit of leakage current is 10mA. After finish inputting, press [Enter] and [X] to enter setting status of high limit of leakage current.
When input current lower than 0.3mA, unit will auto change to uA range. (W-DCV only)



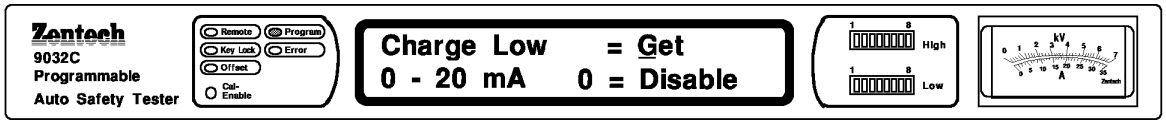
At this time, LCD shows Low Limit =Disable and waits for inputting low limit of leakage current. Press numerical keys to input low limit or [Off].
Low limit of leakage current is 0.75mA.



Press [Enter] and [X] key to enter Charge Low setting status. (W-DCV only)



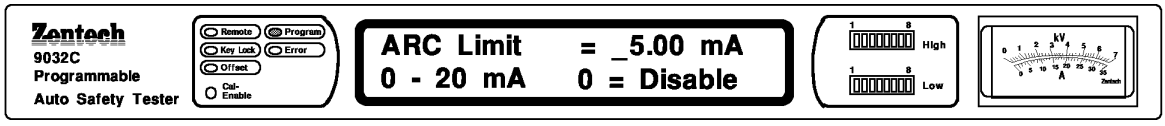
Press [0]…[9] input directly or if original setting value is 0, to press [Off] key, set at is [Charge Get], to make this tester to get charge value in next time directly. This value is 1/2 of charge transmit, current value, indicator will show as follow:



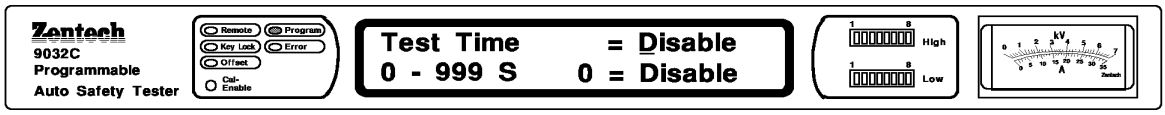
When setting Charge Low, [Off] key action as follow：

Original setting value	After press [Off] key of setting value
GET or 0.001 ~ 20.00mA	Disable
Disable	GET

Press [Enter] and [X] to enter ARC setting status.
At this time, LCD shows ARC Limit =Disable and waits for inputting ARC value.
Press numerical keys to input ARC setting value or press [Off].
For example, ARC setting value is 5.00mA.

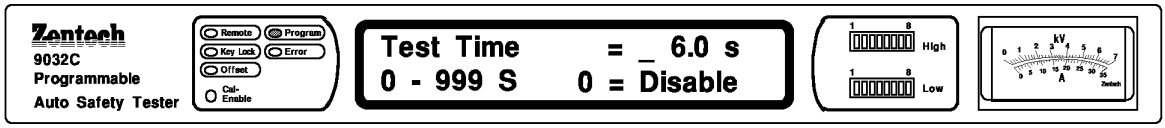


Press [Enter] and [X] to enter setting status of test time.

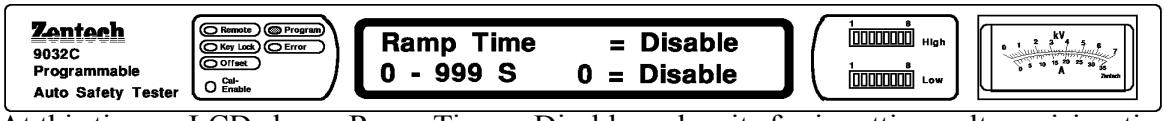


At this time, LCD shows Test Time =Disable and waits for inputting test-time.
Press numerical keys to input desired-time (range is 0.5~99.9 sec)

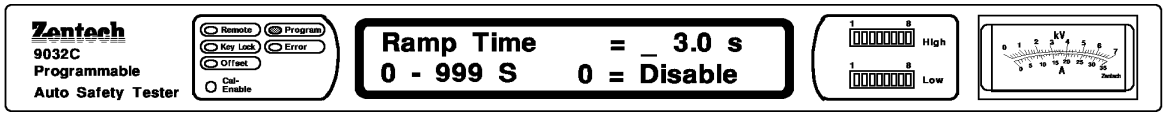
For example, test time is 6.0 sec.



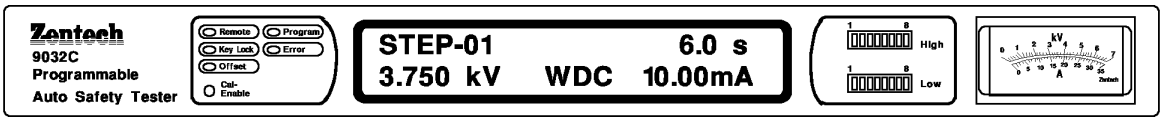
After inputting number, press [Enter] and [X] to enter setting status of RAMP TIME.



At this time. LCD shows Ramp Time = Disable and waits for inputting voltage rising-time.
Press numerical keys to input voltage rising-time (range is 0.1~99.9sec) or press [Off]. For example, voltage rising-time is 3.0sec



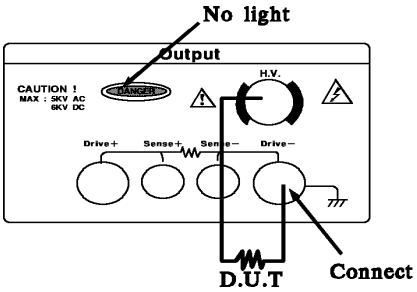
Press [Enter] and [X] to go back to STEP setting status. At this time, press [Prog] means that end setting status and come back to presetting status.



4.4.2 The Step of Test Procedure

(1) Connect tested-object

First, make sure no voltage-output and high-voltage output, indicator DANGER doesn't light. Then connect test cable of low potential (black) to Driver – terminal of the tester and lock up fixing plate. To short the test cable to high-voltage output terminal and make sure no high-voltage output. At this time, plug high-voltage test cable (red or white) into high-voltage output terminal, High-voltage. Finally, connect low potential test cable to tested-object first, then connect high potential test cable to tested-object.



L CAUTION

Before turn On/Off the power switch, High-Voltage test lead must be removed away from the device under tester. When power were shut off it requires a few seconds of waiting before it re-start on. The continuously turn on then off the power switch is prohibited. Unpredictable harmful dangerous might happen during incorrect operation.

(2) Please press [Stop] key to prepare test

Only press this key, the tester will then be under test status. It can't start to test, even all parameter has been set if user doesn't press key. Each time any status or value is changed, this key should be pressed that will make the tester be under standby status.

(3) Please press [Test] key to start test

When press this key, high-voltage output is started. At this time, DANGER indicator lights to warn user it is in test status and there is high-voltage output now.
The voltage meter shows voltage value, current meter shows leakage current reading, meanwhile, timer will start to countdown.

(4) GOOD judgment

When test ends, test voltage will be cut off, and PASS indicator lights, output PASS signal and buzzer will be actuated at the same time. Acting time is about 0.2sec ~ 99.9sec.

(Adjustable) If not set up the test time, it won't do the GO judgment.

(5) NO-GOOD judgment

It leakage current is detected higher or lower than setting limit, the tester will make FAIL judgment and cut-off high voltage output at once, output signal, buzzer will on alarm at the same time, and it keeps on working until the tester is stop by press [Stop] key. More over, LCD shows what kind of NG status, if is Charge Low Fail, current window indicator will show Charge" and Fail indicated lights.

(6) At any situation, just press [Stop] key to stop test.

4.5 Single Mode of Ground Resistance Test

4.5.1 Parameters setting

Use numerical key and program key to input test parameters. The range of Parameter are as follows：

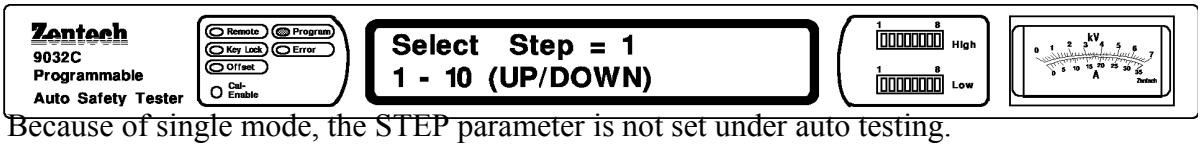
(1) Set desired-current in withstanding test : 3.0A~30.0A

(2) Set high limit of ground resistance : 0.1mΩ~min(510,6300/desired-current)mΩ

(3) Set desired-time : 0.5 ~ 999sec, 0 sec means continue test.

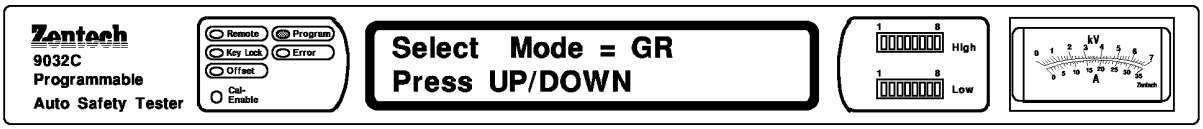
Setting procedure for each parameter are described as follows：

Press [Prog] to enter parameter-setting status. The LCD shows：

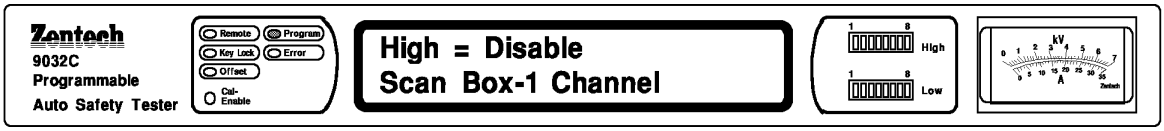


Because of single mode, the STEP parameter is not set under auto testing.

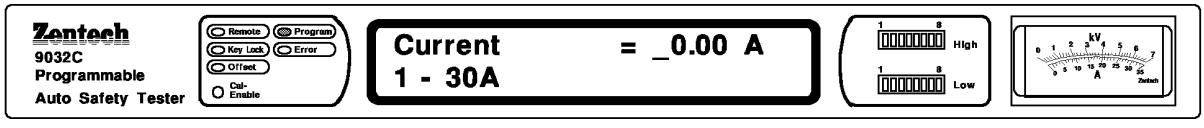
Press [X] key to enter MODE setting status.



And then press [▼] to set GR TEST. After deciding test status, press [Enter] to enter setting status of output terminal in scanning test.

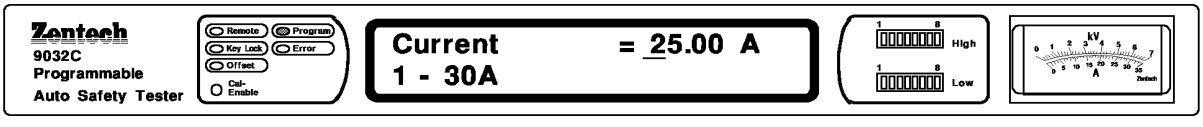


At this time, LCD shows High. It's under auto-series test and press [Enter] to enter setting status of current testing.



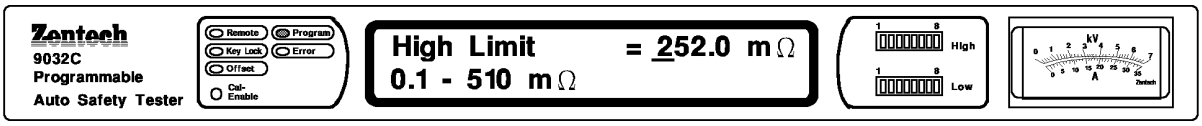
At this time, LCD shows Current and waits for inputting desired-current.

Press [0][.]……[9] numerical keys to input current. For example, the test current is 25.0A

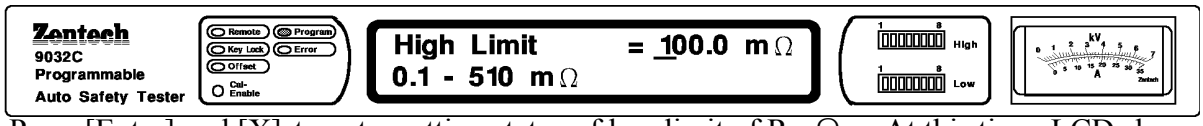


Note：Because the current(25.0A) x High-Limit (510mΩ) is larger then 6300. So the High-Limit is auto-set to 252.0mΩ. (Over and above 250mΩ of original enactment)

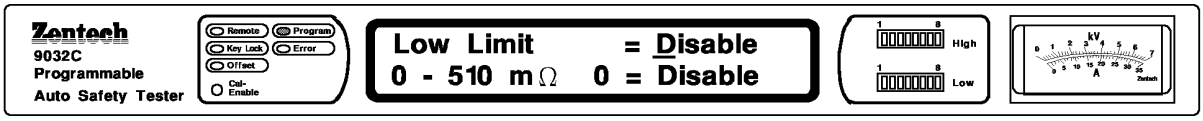
Press [Enter] and [X] to enter setting status of high limit of R－Ω.



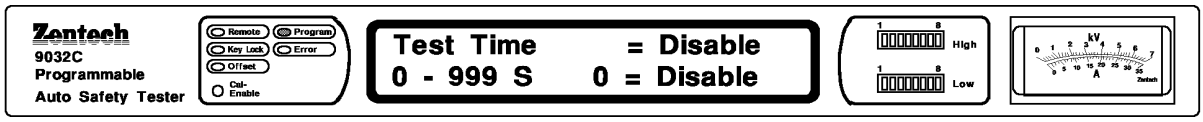
At this time, LCD shows High Limit and waits for inputting high limit of ground resistance. Press numerical keys to input high limit. For example, high limit of ground resistance is 100mΩ.



Press [Enter] and [X] to enter setting status of low limit of R－Ω. At this time, LCD shows Low limit and waits for inputting low limit of ground resistance. Press numerical keys to input low limit. For example, low limit of ground resistance is Disable.

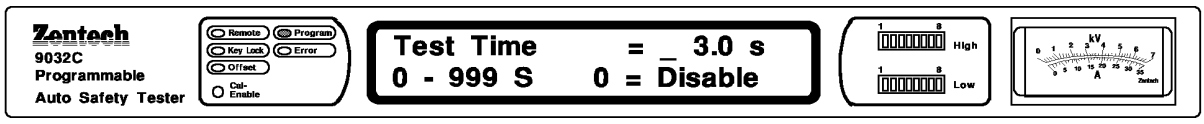


Press [Enter] and [X] to enter setting status of test time.

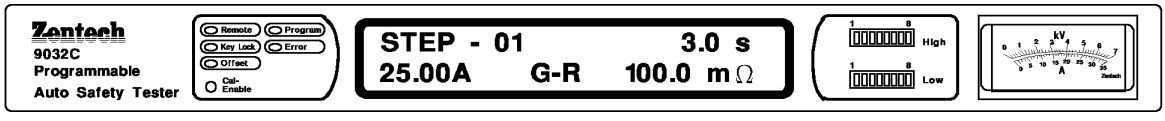


At this time, LCD shows Test Time =Disable and waits for inputting test-time.
Press numerical keys to input desired-time (range is 0.5 ~ 999sec).

For example, test time is 3.0 sec.



Press [Enter] and [X] to go back to STEP setting status. At this time, press [Prog] means that end setting status and come back to presetting status.



4.5.2 The Step of Test Procedure

(1) Correction OFFSET of Test Cable

First, plug the test cables used in ground test into HI and LOW terminals, then short test cables (make sure it's in ground test now) and press [Offset] key. LCD show out Offset is GET. Push Test switch to GET OFFSET value, and save it in memory DANGER indicator light.

*OFFSET correction range is 0~100mΩ. If the reading exceeds this range, it means some problem of test cable, please replace it. Push OFFSET key twice to release offset function.

(2) Connect tested-object

First, make sure no current output, and DANGER indicator does not light. Then, use test cable to clip tested-object.

(3) Press [Stop] key to prepare test

Only press this key, the tester will then be under test status. It can't start to test, even all parameters has been set, if user doesn't press key. And any status or value is changed at each time, this key should be pressed that will make the tester be under standby status.

(4) Please press [Test] key to start test

When press this key, current output is started. At this time, DANGER indicator light to warn user it is in test status and there is large current output now. And current meter will read output current, on meter shows resistance reading, timer will start to countdown.

(5) GOOD judgment

When test ends, test current will be cut off, and PASS indicator lights, output PASS signal and buzzer will be actuated at the same time.

Acting time is about 0.2sec ~ 99.9sec. (Adjustable)

If not set up the test time, it won't do the GO product judgment.

(6) NO-GOOD judgment

If measured-resistance exceeds high limit of set-value, the tester will make Fail judgment and cut off output at once. And LCD shows NG status, output Fail signal and buzzer will be actuated at the same time. It keep on working until the tester press [Stop] key.

(7) At any situation, just press [Stop] key to stop test.

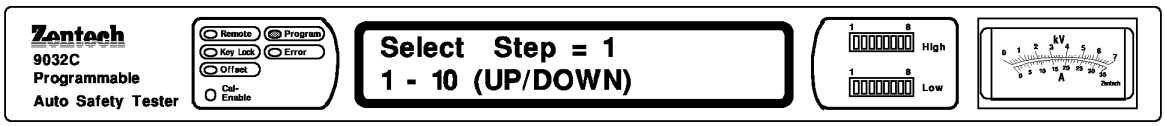
4.6 Single Mode of Insulating Resistance Test

4.6.1 Parameters setting

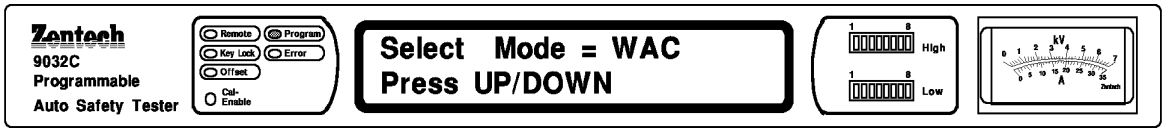
Use numerical key and program key to input test parameters. The range of parameters are follows:

(1) Set desired-voltage in insulation test : 0.05KV ~ 1KV
(2) Set high limit of insulating resistance : 0.1MΩ ~ 50GΩ or OFF
(3) Set low limit of insulating resistance : 0.1MΩ ~ 50GΩ
(4) Set desired-time : 0.5 ~ 999Sec, 0 sec means continue test.
(5) Set rising time of set-voltage : 0.1-999sec or OFF.

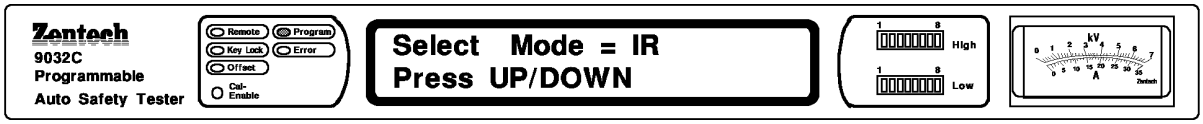
Setting procedure for each parameter are described as follows:
Press [Prog] to enter parameter-setting status. The LCD shows:



Because of single mode, the STEP parameter is not set under auto testing.
Press [X] key to enter MODE setting status.

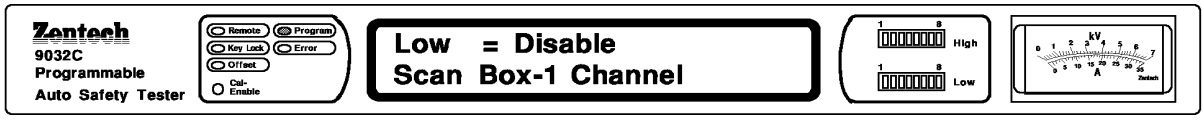


And then press [▼] to set IR test.

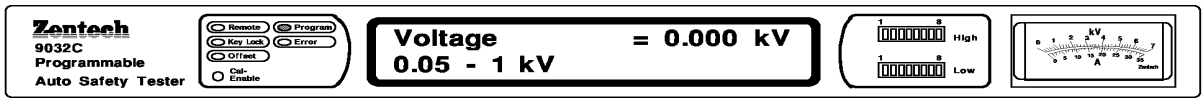


After deciding test status, press [Enter] to enter setting status of output terminal in scanning test.

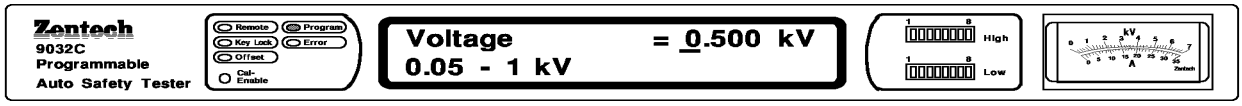
At this time, LCD shows High =Disable. It's under auto-series test and press [Enter] to enter the next parameter setting.



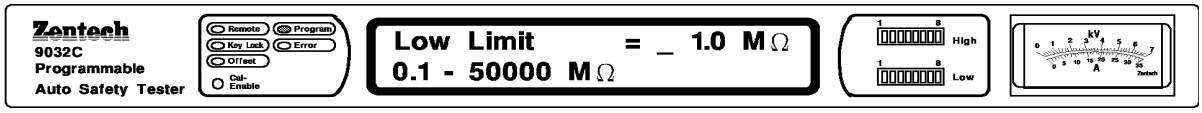
At this time, LCD shows Low =Disable. It's under auto-series test and press [Enter] to enter the next parameter setting.
Directly, enter into the setting status of voltage test.



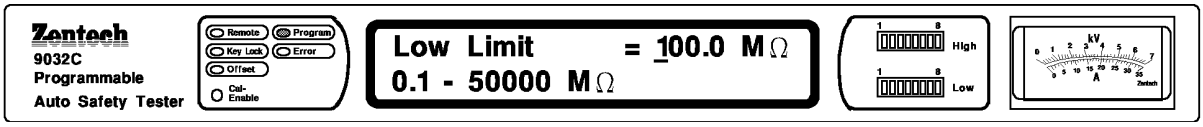
At this time, LCD shows Voltage and waits for inputting desired-voltage. Press [0][.]……[9] numerical keys to input voltage. For example, the test voltage is 0.5kV.



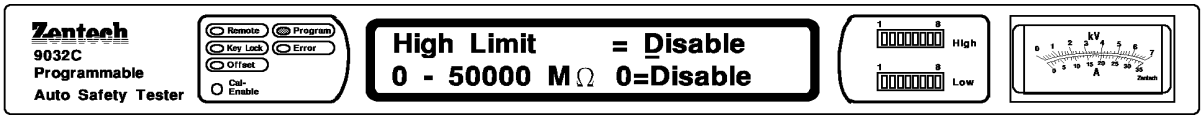
Press [Enter] and [X] key to enter setting status of low limit of insulating resistance.



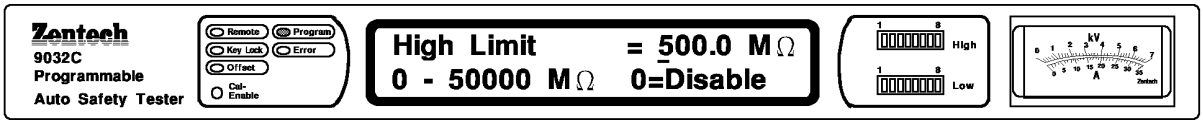
At this time, LCD shows Low Limit and waits for inputting low limit of insulating resistance. Press numerical keys to input low limit. For example, low limit of insulating resistance is 100MΩ.



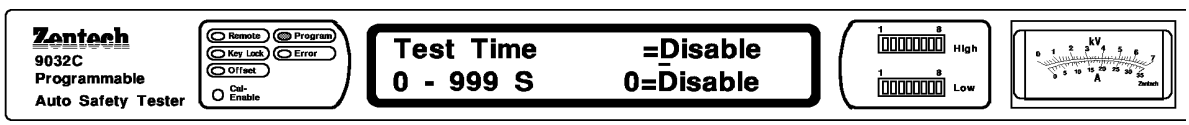
Press [Enter] and [X] to enter setting status of high limit of insulating resistance.



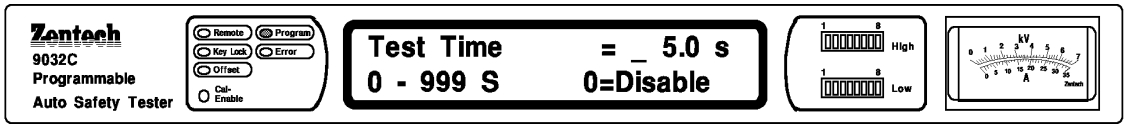
At this time, LCD shows High Limit and waits for inputting high limit of insulating resistance. Press numerical keys to input high limit or [Off]. For example, high limit of insulating resistance is 500MΩ.



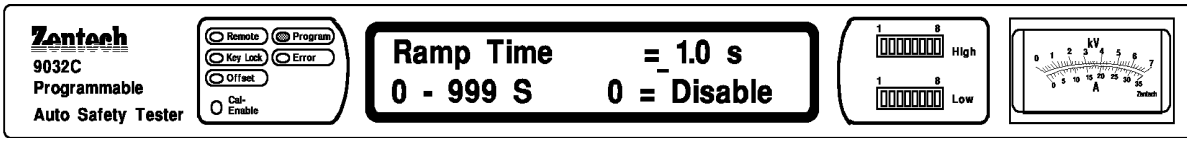
Press [Enter] and [X] to enter setting status of test time.



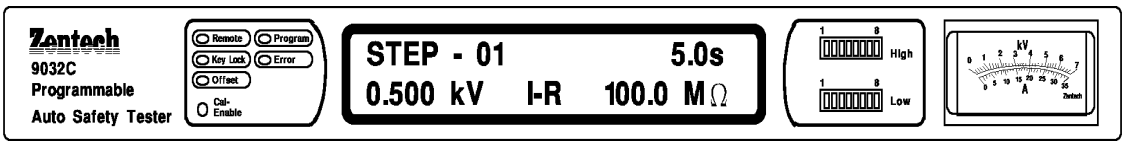
At this time, LCD shows Test Time =Disable and waits for inputting test-time.
Press numerical keys to input desired-time (range is 0.5 ~ 999 sec)
For example, test time is 5.0 sec. Inputting number.



Press [Enter] to enter setting status of Ramp Time. At this time, LCD shows Ramp Time =Disable and waits for inputting Ramp-Time.
For example, Ramp Time is 1 sec. Inputting number.

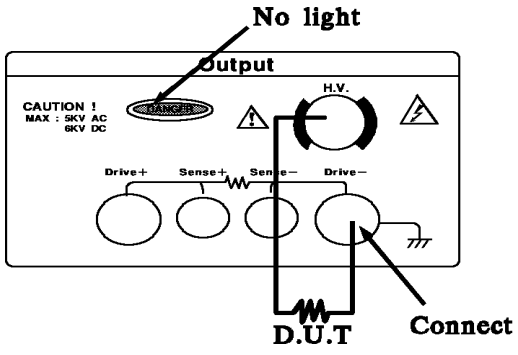


Press [Enter] and [X] to come back to STEP setting status. At this time, press [Prog] means that end setting status and go back to presetting status.



4.6.2 The step of Test Procedure

(1) Connect tested-object
First, make sure no voltage-output and high-voltage output, indicate DANGER doesn't light. Then connect test cable of low potential (black) to Driver-terminal of the tester, and lock up fixing plate. To short test cable to high-voltage output terminal and make sure no high-voltage output. At this time, plug high-voltage test cable (red or white) into high-voltage output terminal, High-Voltage. Finally, connect low potential test cable to tested-object first, then connect high potential test cable to tested-object.



(2) Please press [Stop] key to prepare test
Only press this key, the tester will then be under test status. It can't start to test, even all parameter has been set, if user doesn't press key. Each time any status or value is changed, this key should be pressed that will make the tester be under standby status.

(3) Please press [Test] key to start test
When press this key, high-voltage output is started. At this time, DANGER indicator lights to warn user it is in test status and there is high-voltage output now. The voltage meter shows voltage value, current meter shows leakage current reading, meanwhile, timer will start to countdown.

(4) GOOD judgment
The test voltage will be cut off, when the setting time arrived, and PASS indicator lights output PASS signal and buzzer will be actuated at the same time. Acting time is about 0.2sec ~ 99.9sec. (Adjustable) If not set up the test time, it won't do the GO product judgment.

(5) NO-GOOD judgment
If insulating resistance higher than high limit or lower than low limit, the tester will make FAIL judgment and cut off high voltage output at once. And LCD shows NG status, output Fail signal, buzzer will be actuated at the same time, and it keep on working until the tester is stop by press [Stop] key.

(6) At any situation, just press [Stop] key to stop test.

4.7 Single Mode of Leakage Current Test (Option)

4.7.1 Parameters setting

Use numerical key and program key to input test parameters. The range of parameters are follows：

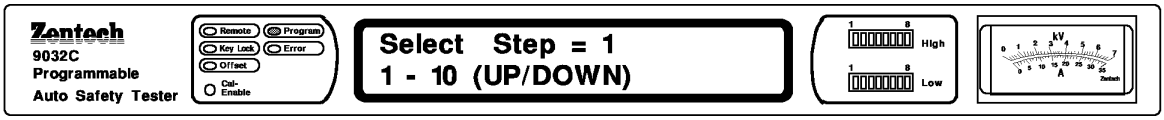
(1) Selecting human Simulating Circuit :
1. UL544NP
2. UL544P
3. UL1563
4. UL2601-1, IEC610-1
5. UL1950, UL3101-1, IEC950 5 types.

(2) Selecting test mode :
0. Normal
1. Reverse
2. Single Fault Normal
3. Single Fault Reverse

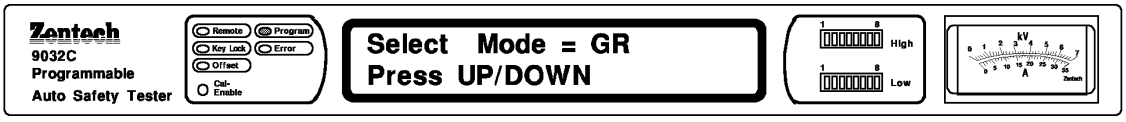
(3) Set high limit of leakage current : 0.01mA ~ 9.999mA(Max)
(4) Set low limit of leakage current : lower than leakage current Hi limit, or OFF.

(5) Selecting Power measurement : Voltage, Current, VA
(6) Set up Hi-limit of Power measurement :
Voltage: 0 ~300V
Current: 0 ~10A
VA: 0 ~2200VA
(7) Set up Lo-limit of Power measurement : lower than Hi-limit
(8) Set desired-time: 1 ~ 999.0 Sec, or OFF.

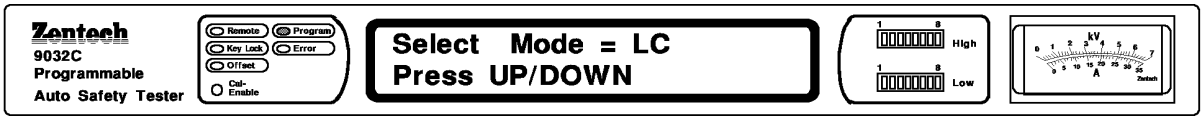
Setting procedure for each parameter are described as follows:
Press [Prog] to enter parameter-setting status. The LCD shows:



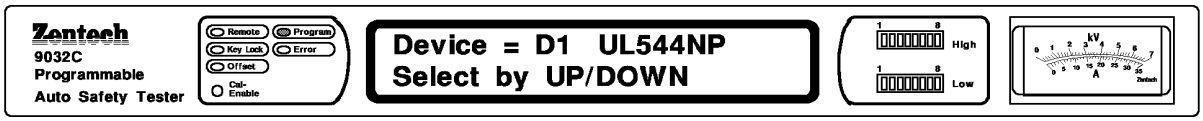
Because of single mode, the STEP parameter is not set under auto testing.
Press [X] key to enter MODE setting status.



And then press [▼] to set leakage current test.

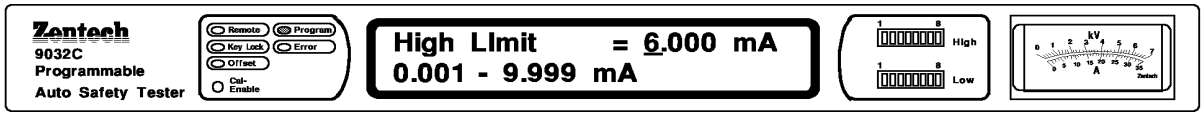


After deciding test status, press [Enter] key to enter human simulating circuit selecting.

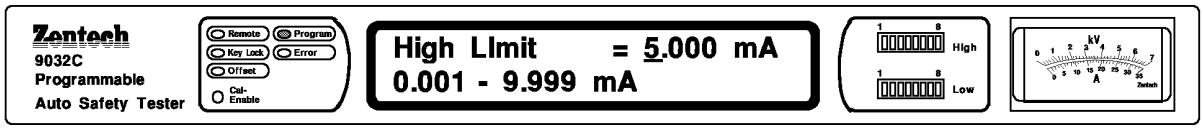


After selected press [Enter] key to enter test mode.

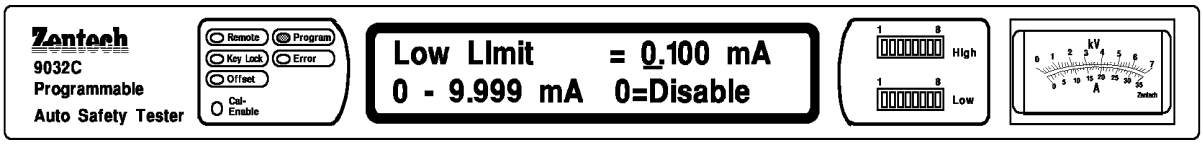
Press [Enter] key to enter setting status of high limit of leakage current.



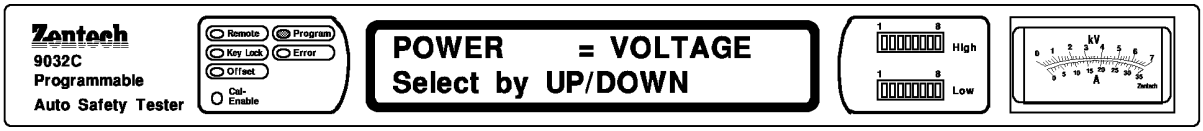
At this time, LCD shows High Limit=6.000mA and waits for inputting high limit of leakage current. Press numerical keys to input High limit. For example, high limit of leakage current is 5mA, after finish inputting, press [Enter] and [X] to enter setting status of low limit of leakage current.



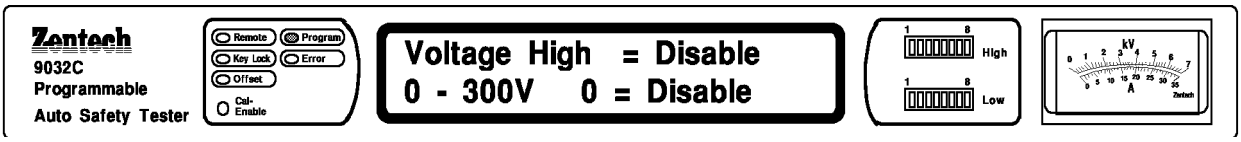
At this time, Low Limit =Disable and waits for inputting low limit of leakage current. Press numerical keys to input high limit or [Off]. For example, low limit of leakage current is 0.1mA.



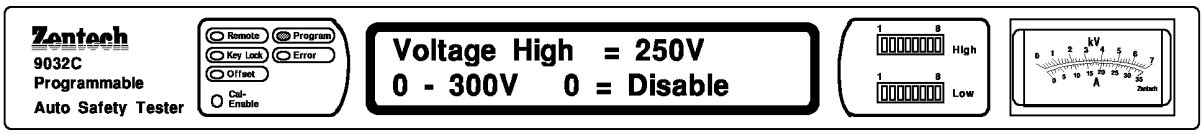
Press [Enter] and [X] key to enter power measurement selecting.



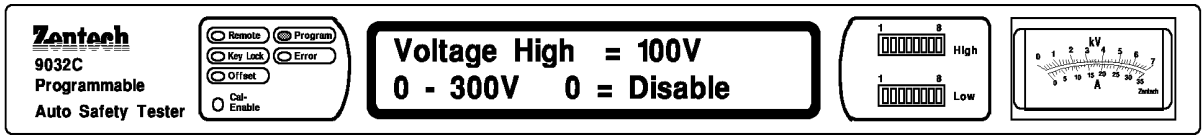
After selected voltage press [Enter] and [X] key to enter setting status of high limit of power measurement.



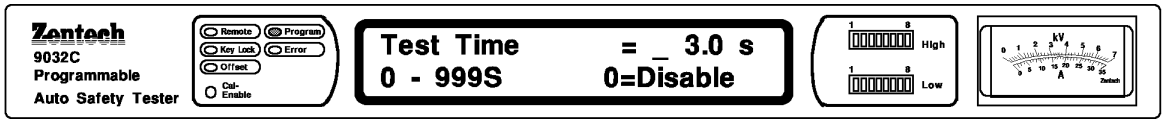
At this time, LCD shows Voltage High =Disable and waits for inputting high limit of power measurement. Press numerical keys to input low limit. For example, high limit of power voltage is 250V, after finish inputting, press [Enter] and [X] to enter setting status of low limit of power measurement.



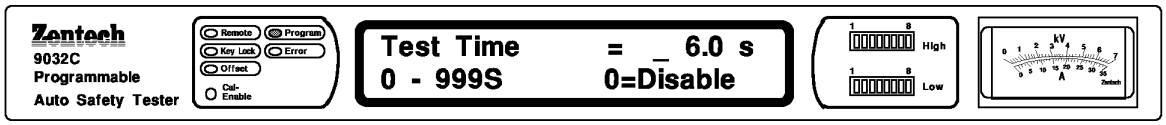
At this time, Voltage Low =Disable and waits for inputting low limit of leakage current. Press numerical keys to input high limit or [Off]. For example, low limit of leakage current is 100V.



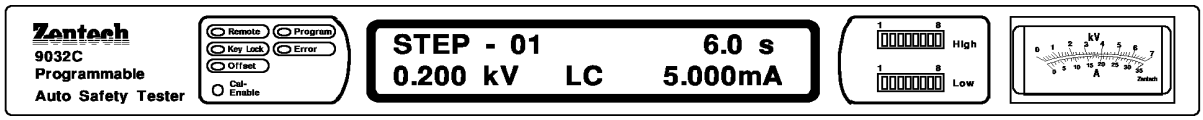
Press [Enter] and [X] to enter setting status of test time.



At this time, LCD shows Test Time =Disable and waits for inputting test-time.
Press numerical keys to input desired-time (range is 0.5 ~ 999 sec)
For example, test time is 6.0 sec. Inputting number.



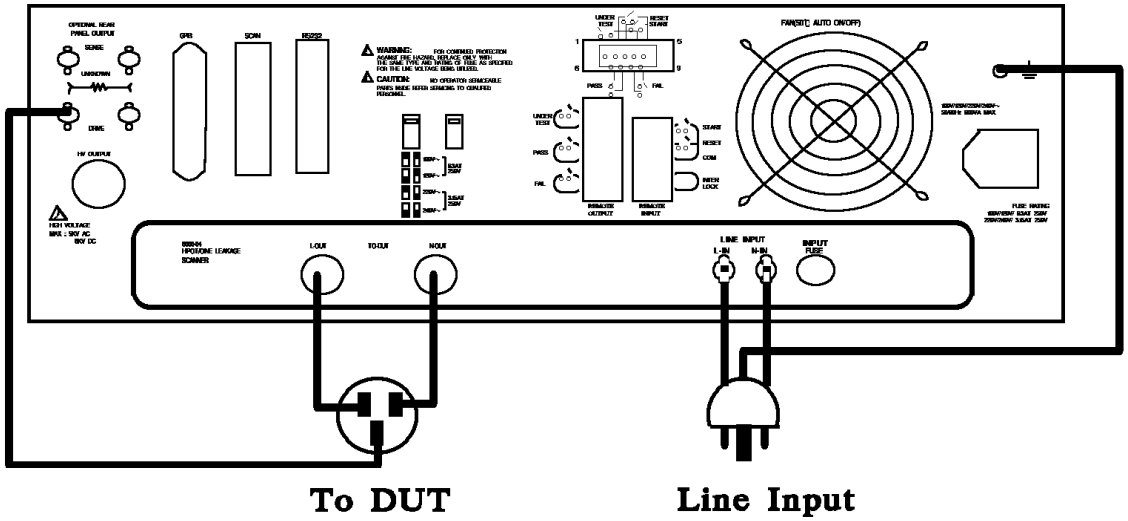
Press [Enter] to come back to STEP setting status. At this time, press [Prog] means that end setting status and go back to presetting status.



4.7.2 The Step of Test Procedure

(1) Connect tested-object

First, make sure no voltage-output and high-voltage output, indicate DANGER doesn't, light. Then connect test cable of low potential (black) to Driver-terminal of the tester, and lock up fixing plate. To short test cable to high-voltage output terminal and make sure no high-voltage output. At this time, as drawing connection.



L CAUTION
Before turn On/Off the power switch, High-Voltage test lead must be removed away from the device under tester. When power were shut off it requires a few seconds of waiting before it re-start on. The continuously turn on then off the power switch is prohibited. Unpredictable harmful dangerous might happen during incorrect operation.

(2) Please press [Stop] key to prepare test
Only press this key, the tester will then be under test status. It can't start to test, even all parameter has been set, if user doesn't press key. Each time any status or value is changed, this key should be pressed that will make the tester be under standby status.

(3) Please press [Test] key to start test
When press this key, high-voltage output is started. At this time, DANGER indicator lights to warn user it is in test status and there is high-voltage output now. The voltage meter shows voltage value, current meter shows leakage current reading, meanwhile, timer will start to countdown.

(4) GOOD judgment
The test voltage will be cut off, when the setting time arrived, and PASS indicator lights output Pass signal and buzzer will be actuated at the same time.
Acting time is about 0.2sec ~ 99.9sec. (Adjustable)
If not set up the test time, it won't do the GO product judgment.

(5) NO-GOOD judgment
If the test result or power measurement is exceed Hi/Lo limit, it will judge Fail, and out off HV output immediately. Output Fail signal, buzzer will on at the same time till the stop key is pressed, and LCD shows NG status.

(6) At any situation, just press [Stop] key to stop test.

4.8 Auto-mode Test

This test divides different test mode into several test STEP to work auto-series test. It's for reducing manpower and sparing time.

4.8.1 Parameters Setting

Use numerical key and program key to input test parameters. The range of parameters are as follows:
É test step ：1 ~ 99 step
É test status ：R, Ω, W-ACV, W-DCV, I-R, L-C

Other parameter setting are the same as the parameters in single mode. Please read the description of each single mode. There is a SWITCHING POWER SUPPLY will do auto safety test. Its test parameter and value are below :

STEP1: R-Ω test

test current : 25.0A
high limit of ground resistance : 100.0mΩ
test time : 3.0sec

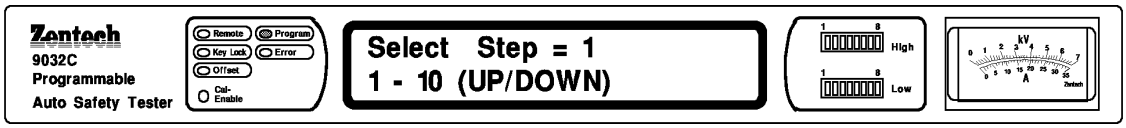
STEP2: WAC test

test voltage : 3.75KV AC
high limit of leakage current : 10.0mA
low limit of leakage current : 3.0mA
ARC setting : 5.0mA
test time : 3.0sec
voltage rising-time : 1.0sec

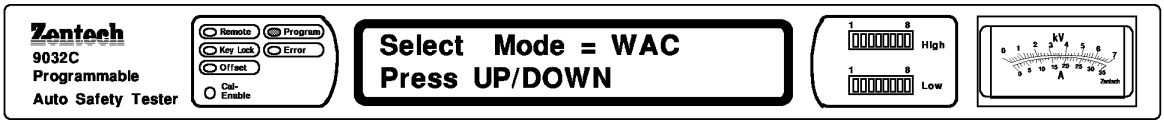
STEP3：IR test

test voltage : 0.5kV DC
low limit of insulating resistance : 100MΩ
high limit of insulating resistance : 500MΩ
test time : 3.0sec
voltage rising-time : 0.0sec

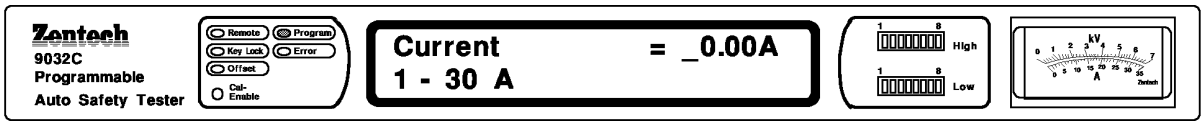
According to the value above, setting way 13 showed as figure below:
É STEP1(R-Ω). Step of setting parameter is described below:
(1) Press [Prog] to enter parameter-setting status. The LCD shows:



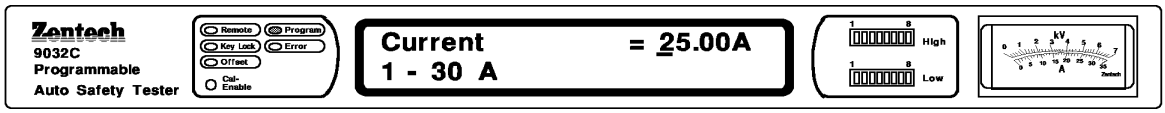
Because of single mode, the STEP parameter is not set under auto testing. Press [Enter] key to enter MODE setting status.



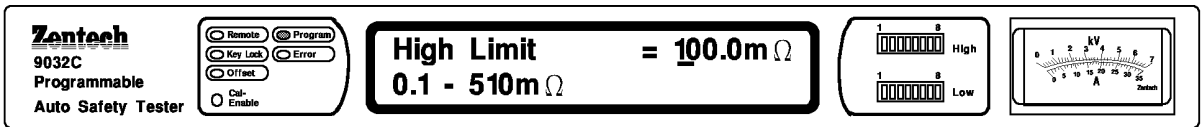
And then press [▼] to set R-Ω TEST.
Press [Enter] to enter setting status of current testing. STEP window display indicate is High, this is a setting of scan box output terminal press [Off] [Enter] key, disable scan box setting, then to enter test current setting status.



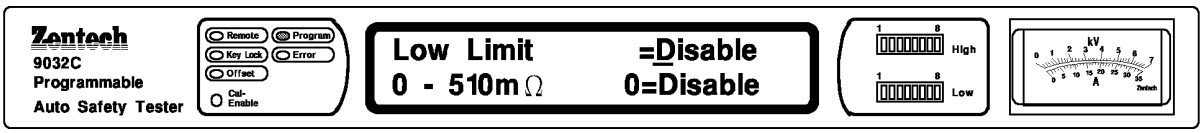
At this time, LCD shows Current and waits for inputting desired-current. Press [2][5][.][0] numerical keys to input current.



Press [Enter] and [X] to enter setting status of high limit of R-Ω. At this time, LCD shows High Limit and waits for inputting high limit of ground resistance. Press [1][0][0] numerical keys to input high limit of ground resistance.

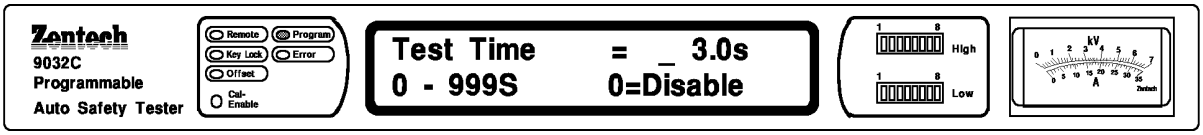


Press [Enter] and [X] to enter setting status of low limit of R-Ω.

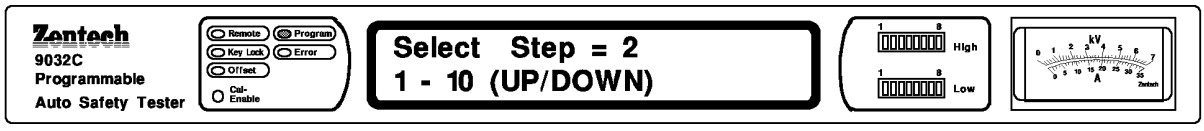


At this time, LCD shows Low Limit and waits for inputting low limit of ground resistance. Press [1][0][0] numerical keys to input low limit of ground resistance or [Off]. Press [Enter] and [X] to enter setting status of test time. At this time, LCD shows Test Time =Disable and waits for inputting test-time. Press [3][.][0] numerical keys to input desired-time (range is 0.5 ~ 999 sec).

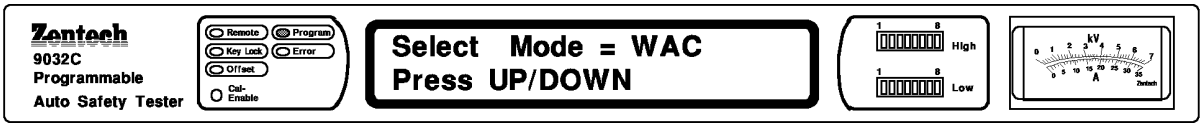
Note：Test Time can't [Off]



Press [Enter] and [X] to go back to STEP setting status. At this time, press [▼] and enter STEP2 setting status.



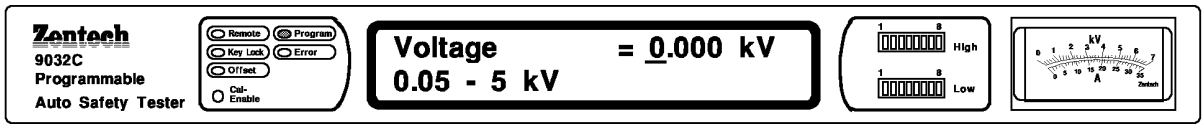
Press [Enter] and [X] key to enter MODE setting status.



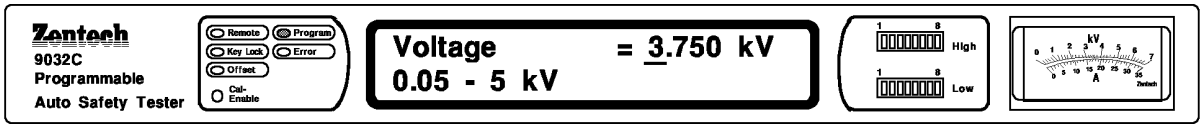
And then press [▼] to set WAC TEST. After deciding test status, press [Enter] to enter setting status of output terminal in scanning test.

At this time, display shows HI. It's under auto-series test and press [Enter] to enter the next parameter setting.

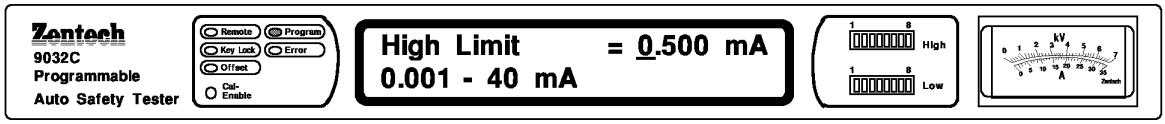
At this time, LCD shows Low =Disable, Press [Enter] to enter into the setting status of voltage test.



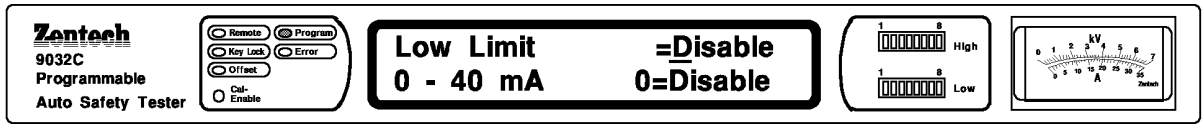
At this time, LCD shows Voltage and waits for inputting desired-voltage. Press [3][.][7][5] numerical keys to input voltage.



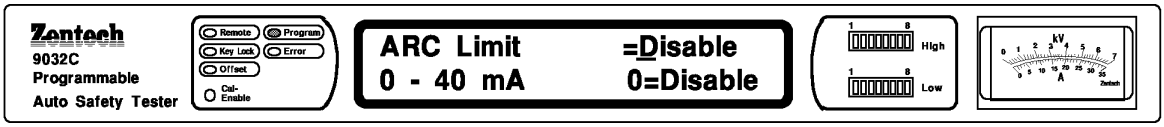
Press [Enter] and [X] key to enter setting status of high limit of leakage current.



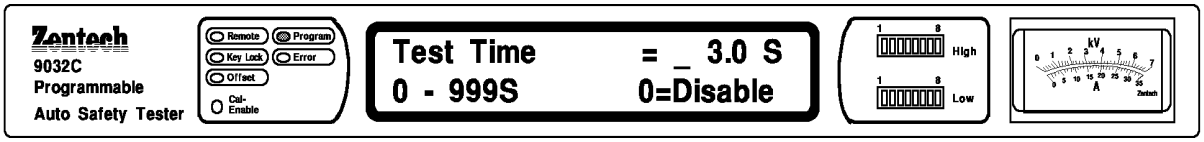
At this time, LCD shows High Limit and waits for inputting high limit of leakage current. Press [1][0] numerical keys to input high limit of leakage current, After finish inputting, press [Enter] and [X] to enter setting status of high limit of leakage current.



At this time, LCD show Low Limit =Disable and waits for inputting low limit of leakage current. Press [3][.][0] numerical keys to input low limit of leakage current.
After finish inputting, press [Enter] and [X] to enter ARC setting status.



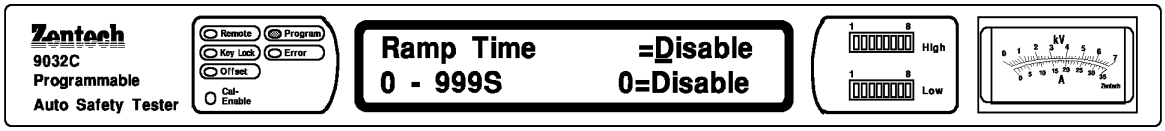
At this time, LCD shows ARC Limit =Disable and waits for inputting ARC value. Press [5][.][0] numerical keys to input ARC setting value. Press [Enter] and [X] to enter setting status of test time.



At this time, display flashes and waits for inputting test-time. Press [3][.][0] numerical keys to input desired-time (range is 0.5 ~ 99.9sec).

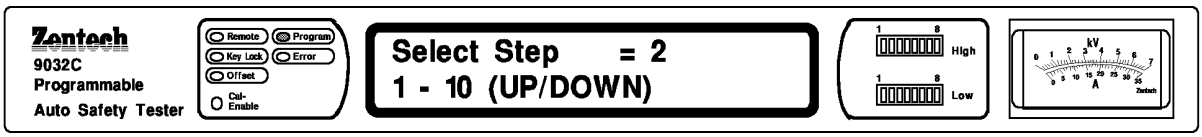
Note：Test Time can't [Off]

After inputting number, press [Enter] and [X] to enter setting status of RAMP TIME.

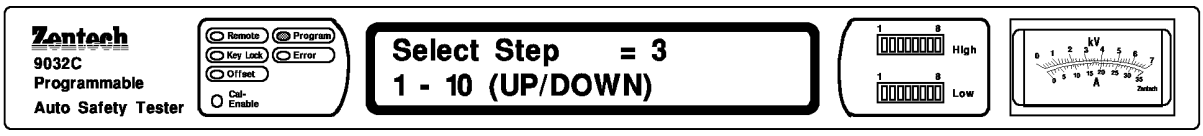


At this time, RAMP indicator of TIMER lights. Display flashes and waits for inputting voltage rising-time. Press [1][.][0] numerical keys to input voltage rising-time (range is 0.1 ~ 99.9 sec).

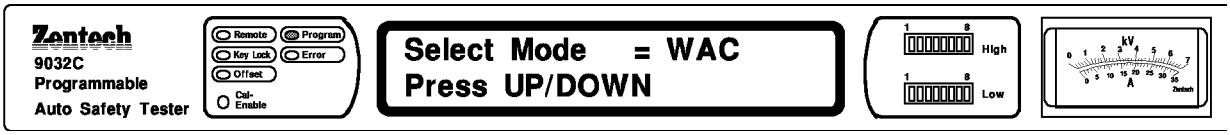
Press [Enter] and [X] to go back to STEP setting status.



At this time, press [▼] and enter STEP3 setting status.

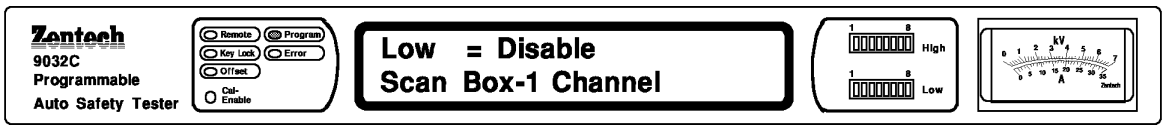


Press [Enter] key to enter MODE setting status.

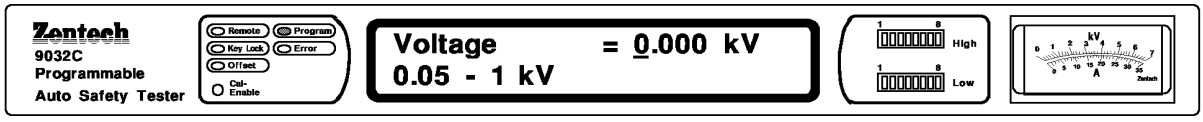


And then press [▼] to set I-R test. After deciding test status, press [Enter] to enter setting status of output terminal in scanning test.

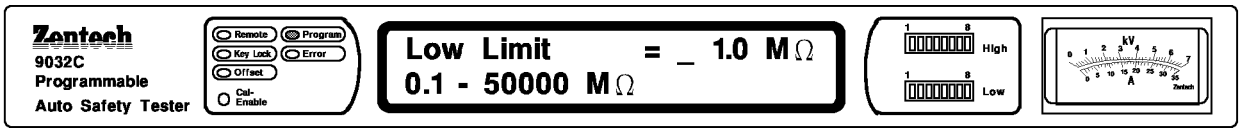
At this time, LCD shows High =Disable. It's under auto-series test and press [Enter] to enter the next parameter setting. Directly, enter into the setting status of low voltage test.



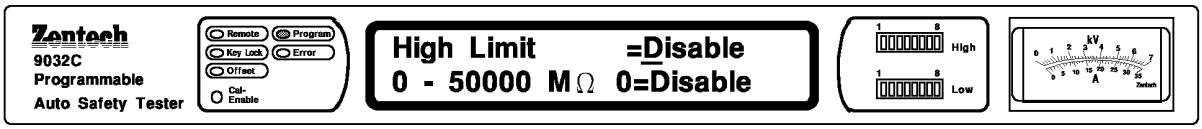
At this time, LCD shows Low =Disable. Press [Enter] and [X] to enter the next parameter setting.



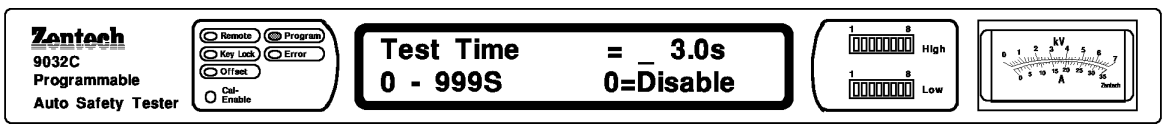
At this time, LCD shows Voltage and waits for inputting desired-voltage. Press [0][.]…[9] numerical keys to input voltage. For example, the test voltage is 0.5kV. Press [Enter] and [X] key to enter setting status of low limit of insulating resistance.



At this time, LCD shows Low Limit and waits for inputting low limit of insulating resistance. Press numerical keys to input low limit. For example, low limit of insulating resistance is 100MΩ. After finish inputting, press [Enter] to enter setting status of high limit of insulating resistance.



At this time, LCD shows High Limit =Disable and waits for inputting high limit of insulating resistance. Press numerical keys to input high limit or [Off]. For example, high limit of insulating resistance is 500MΩ. Press [Enter] and [X] to enter setting status of test time. At this time, LCD shows Test Time =Disable and waits for inputting test-time. Press numerical keys to input desired-time (range is 0.5~999sec). For example, test time is 3.0 sec. Inputting number.



Press [Enter] and [X] to enter Ramp Time setting, and then press [X] to go back to STEP setting status. At this time, press [Prog] means that end setting status and go back to presetting status. After input all parameters, press [Prog] to end setting status and go back to pre-setting status.

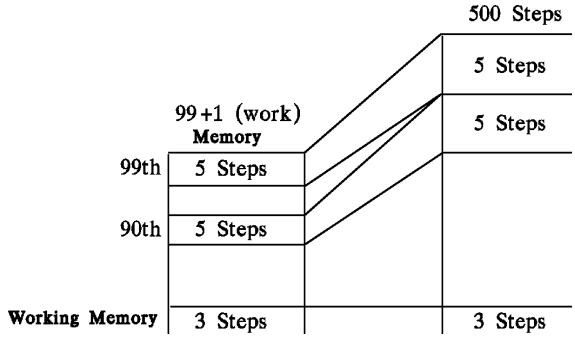
4.8.2 Proceeding Test

ƒ **Note :** The Offset correction has to be done before ground resistance test or the test result will have mistake.

1. Connect test cable according to the description of single test.
2. Press [Stop] key to have the tester enter preparing status.
3. Press [Test] key to proceed test.
4. If there is NO-GOOD judgment of any test, the tester will cut off output and stop the next test.
5. After all tests have been passed and there is no NO-GOOD judgment, the tester will make a GOOD judgment and cut the output off.

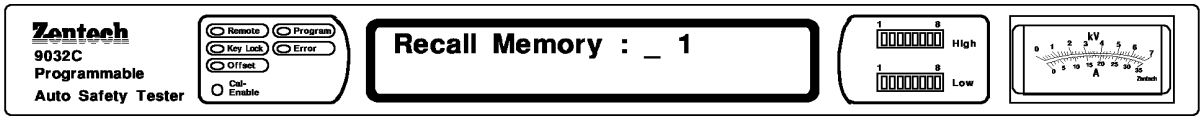
4.9 Recall and Store Test Parameters

It has 500 Steps, can be saved to 99 memories setting each memory max has 99 Steps.
Usage as shows in right side.
Working memory has 3 Steps
Memory 90 has 5 Steps
Memory 99 has 5 Steps
Total has 13 Steps, rest of 487 Steps.

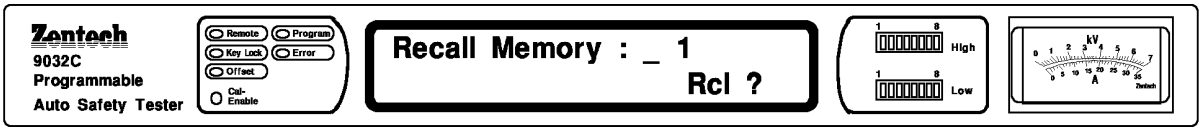


If you have saved many pairs of parameters in memory, then you want to call these data out. Please do following proceeding :

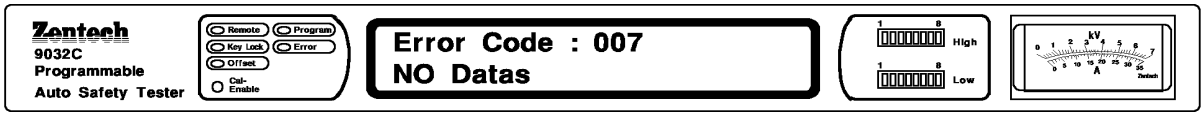
1. When the tester is under preparing status, Press [Rcl] key, at the time, MEMORY display will flash.



2. Press numerical key or [▼] [▲], input the memory number which is desired to be called out.
3. Press [Enter] key to enter the window.



4. After confirm all test parameters will show on the front panel, if in recall editing memories has no date, than press [Enter] key, it will show as follow.



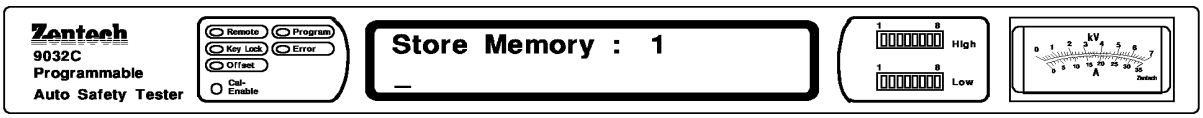
It need to be reset the memories editing.

5. When finish the test, in next test state set up finish but not execute it, if need to read the test value of last time. Press [RCL] key, select [0] value to identity, it will display last time test value. Using [▲] [▼] key select step, after finish reading. Press any key to enter next test set up.

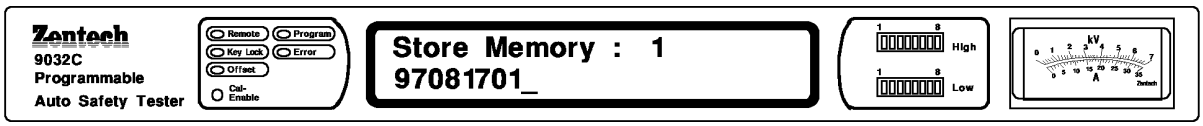
6**.** The memory number is 01-99.

If you want to store the parameters which has been set in memory so that they can be conveniently used one day, please refer following procedure to store.
1. Press [Sto] key when the tester is under preparing status, at the time, MEMORY display will flash.

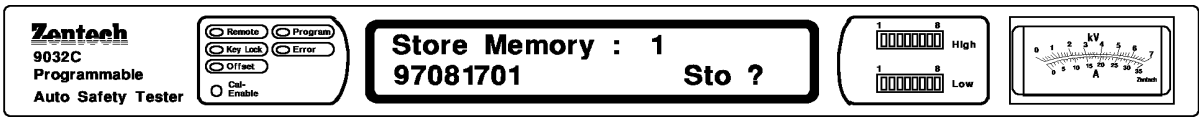
Press numerical key or [▲] [▼], to input the number which is desired to save in memory.



Press [Enter] key, enter memory code set up, please press numerical key or ◄► the max can input 11 number. Ex.：97081701



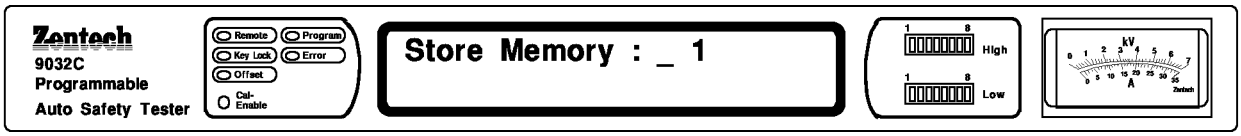
4. Press [Enter] key identify, enter identical window.



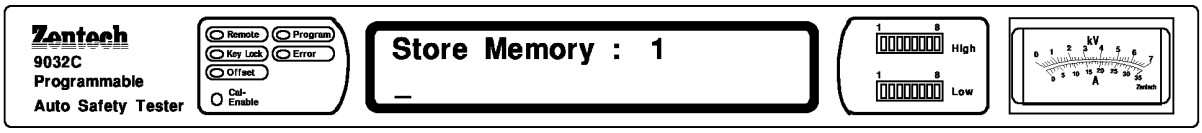
To identify the store test parameters, press [Enter] to store, if need to changes by press [Clear] key, back to step 3 reset and exit Store procedure.
(Note：if memory has data in side will be recovered, please make sure before store.)

5. The memory number is 01-99.

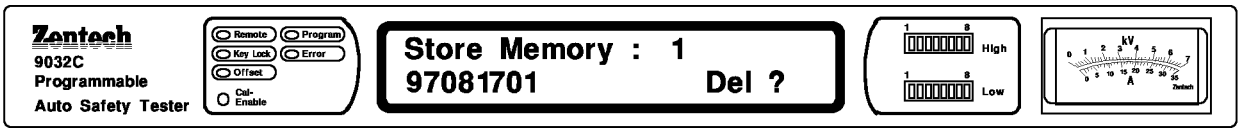
If intend to delete the data, please follow the procedure.
1. Under standby mode, press [Sto] key meanwhile LCD shows as follow:



2. Press numerical key or [▲] [▼], to input the memory number to delete.



3. Press [Del] key to enter confirm screen.



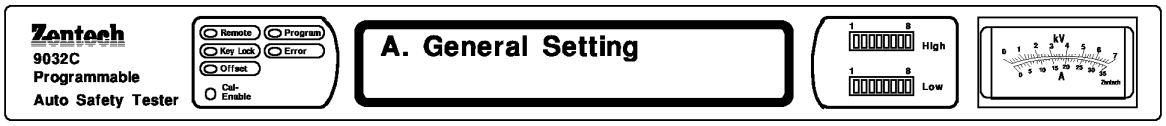
To confirm deleted memory, press [Enter].

4.10 Initial Parameter Setting

4.10.1 System Setting

Some parameter in the tester that needn't be set again when the tester turn on because they have been set themselves. Usually, these setting won't change or seldom use once they have been set. The following is the description of method to set parameters.

1. After turning on the tester, press [Enter] [Password] or [the test name(four number)] under STOP status and then enter INITIAL setting status. At the time, display shows:



It this time display value is General Setting preset value, if need to change just press▲ ▼ key, main screen has four types.

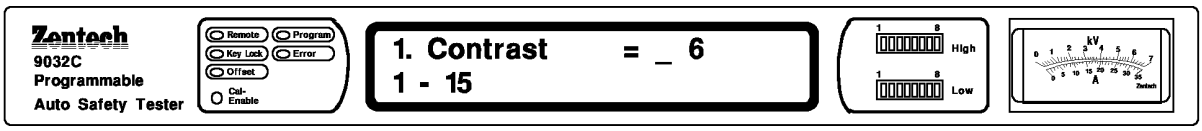
A. General Setting

B. Timing Setting

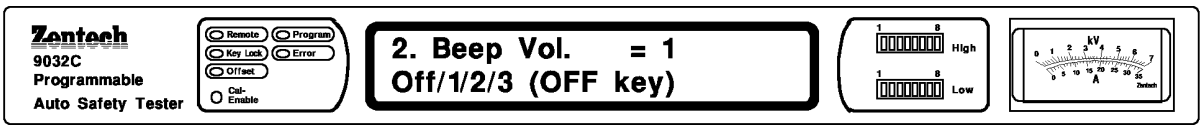
C. Special Setting

D. Remote Setting

2. Main screen A. General Setting.
Press [X] key, enter next screen selecting. Enter Contrast.



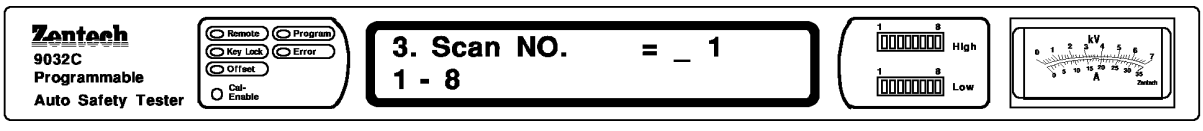
Press [▼] key, enter BUZZER Volume Control.



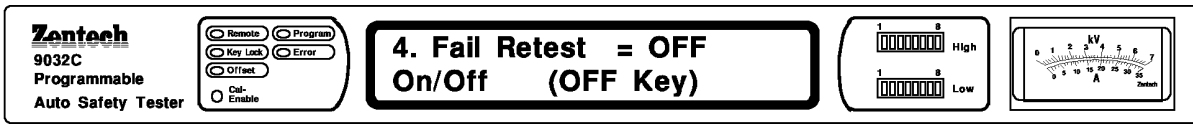
At the time, Buzzer Volume level control presetting value displays. If you want to change, just press [Off] key.

[Off] ：no sound
[1] ：low volume
[2] ：mid volume
[3] ：high volume

Press [▼] to enter setting status of Scan Box Number.



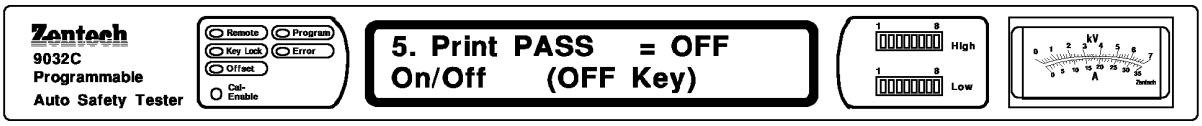
Now display value is Scan Box Number preset value, press numeric key can change it, setting range. Press [▼] key to enter Fail Restart setting status.



Now display value is Fail Restart preset value, press [Off] key can change.
OFF—ON—OFF circulation.

Note：When Fail Restart On, after Fail judgment, no need to press [Stop] key, can direct press [Test] key start testing.

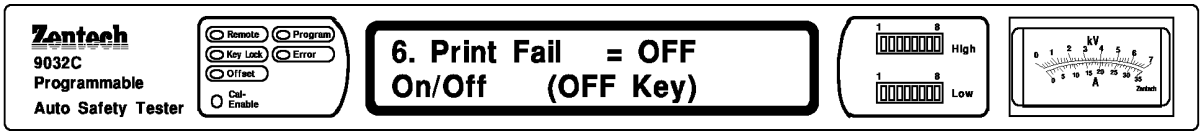
Press [▼] key to enter Print Pass setting status.



Now display value is Print Pass preset value, press [Off] key can change. OFF--ON--OFF circulation.

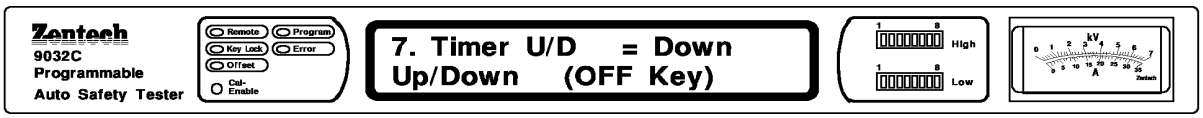
Note：When Print Pass set in on, means result shows Pass, it will Print out.

Press [▼] key to enter Print Fail setting status.



Now display value is Print Fail preset value, press [Off] key can change. OFF--ON--OFF circulation.

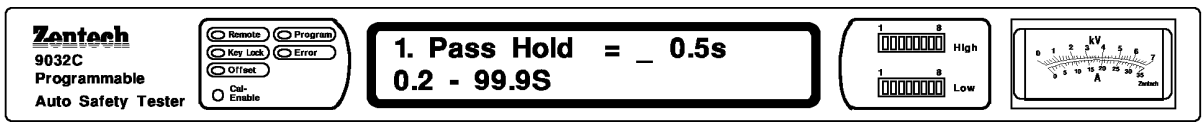
Press [▼] key to enter Timer U/D setting status.



Now display value is Timer U/D preset value, press [Off] key can change. OFF--ON--OFF circulation.

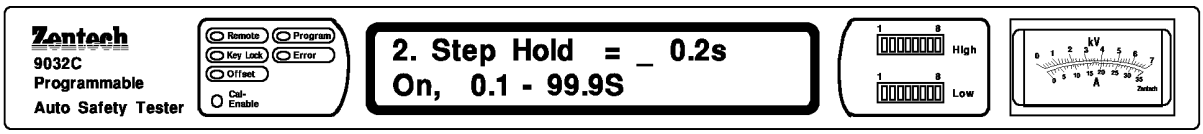
Note：When Timer U/D set in UP, test time counts from 0 sec. When Timer U/D set in Down, test time counts from setting value to 0 sec.

3. Press [W] key, Main screen, use [▼] key to B Timing Setting. Press [X] key, enter to screen selecting. Enter Pass Hold Time setting status.



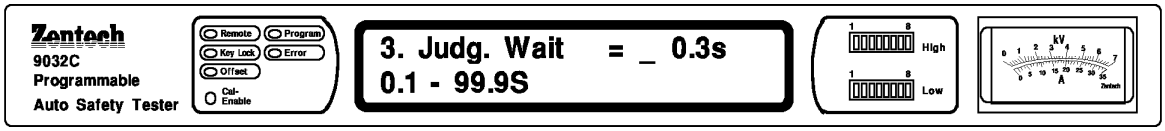
Now display value is Pass Hold Time preset value, if want to change by numeric key. Setting range 0.2 ~ 99.9 sec.

Press [▼] key enter Step Hold Time setting status.



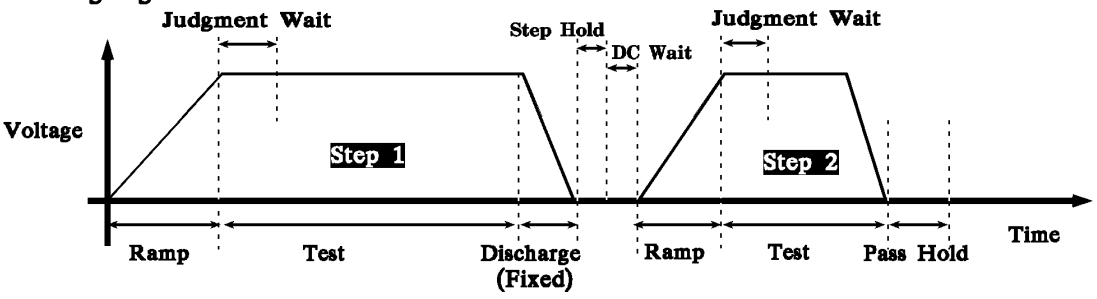
Now display value is Step Hold Time preset value, by numeric key can make it change setting range 0.1 ~ 99.9 sec or ON(0). When Step Hold = ON (0), it will stop test one step, and display PASS/FAIL. Press [Test] key show next STEP preset value, press [Test] key twice start test next STEP (If Fail Restart = ON, can do Fail Continue function).

Press [▼] key enter Judgment Hold setting status.

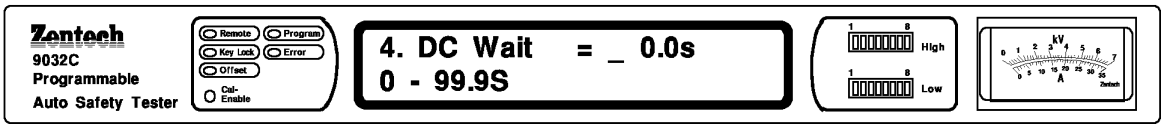


Now display is Judgment Hold Time preset value, by numeric key can make it change. Setting range 0.1 ~ 99.9sec.

Timing figure:

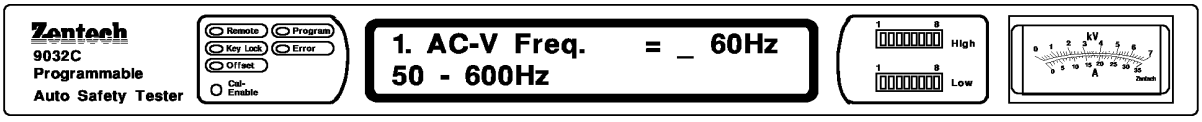


Press [▼] key enter DC Wait setting status.

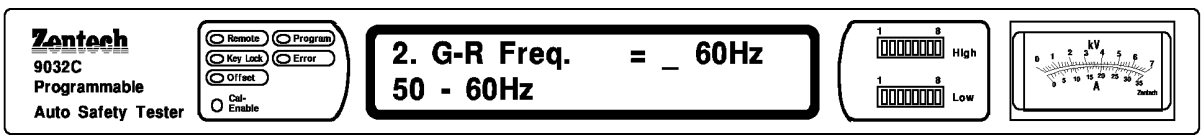


Now display is DC Wait preset value, by pressing number keys can make it change.
Note：The purpose of DC Wait is for discharging DUT, to avoid residual voltage on DUT.

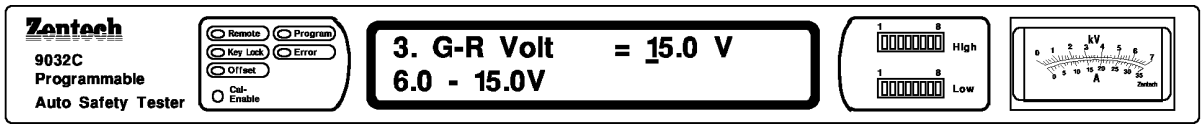
4. Press [W] key, back to main screen, use [▼] key to C. Special Setting. Press [X] key, enter to next screen selecting. Enter W-AC FREQUENCY status.



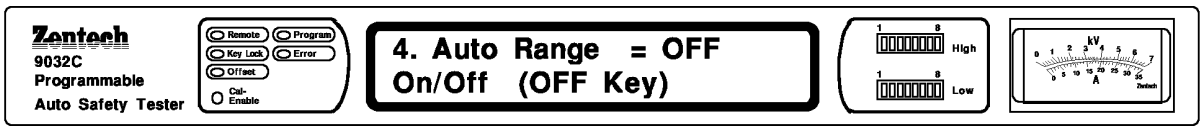
Now display is AC-V FREQUENCY preset value, by number key can make it change. Setting range 50~600Hz. Press down [▼] key to enter G-R FREQUENCY setting status.



Now display is GR AC FREQQUENCY preset value, by number key can make it change. Setting range 50~60Hz. Press down [▼] key to enter G-R Open Voltage setting status.



Now display is G-R Open Voltage preset value, by number key can make it change. Setting range 6.0~15.0 V. Press down [▼] key to enter WV Auto Range setting status.



Now display value is a preset value of WV Auto Range, Press [Off] key can change it. OFF-ON-OFF circulation.

Note：when WV Auto Range On, if meet the conditions, it will switch to proper range, for adding the effective digits.

Conditions： c Set up time about 1sec.

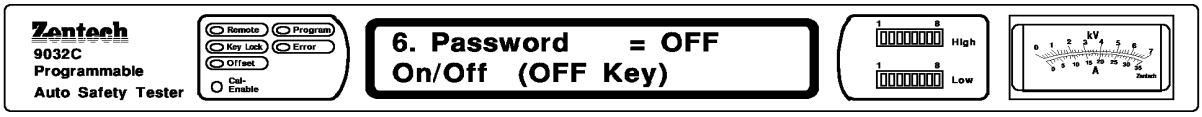
d Within 0.6 sec before the end of the test.

eThe leakage value less than the Hi-limit of next range.

Press down [▼] key to enter Software AGC setting status.

Now display value is a preset value of Software AGC, Press [Off] key can change it. OFF-ON-OFF circulation.

Press down [Enter] key to enter Password setting status.



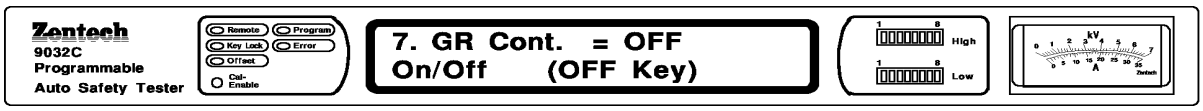
Now display is Password switch, by [Off] key can make it change. Can be set 1~8 number, via 0~9 compose to password, when Password via OFF change to ON, input password twice (once for identify).

Note：The password can not be [7][9][3][1], because it against cal password.

When Password switch to On, enter System Setting, Clear RAM, Key Lock etc. function, it needs input this password to change the action. Ex: Password = 1234, then into

1. System Setting = [Enter][1][2][3][4]
2. Clear RAM = [Clear][1][2][3][4][Clear]
3. Key Lock = [1][2][3][4][Off]

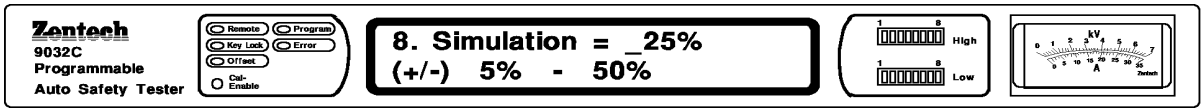
Press down [▼] key to enter GR Cont. setting status.



Now display value is a preset value of GR Cont, Press [Off] key can change it.
OFF-ON-OFF circulation.

Note：when GR Cont. set in on, means GR NG still output when it happens.

Press down [▼] key to enter Simulation setting status.



Now display is "Simulation" preset value, by pressing numeric keys can make it change.

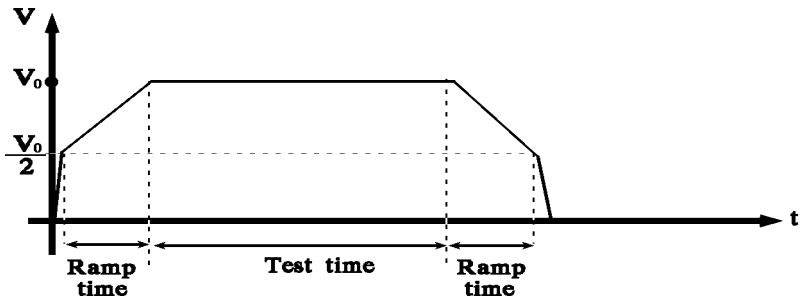
Note1 : Simulation is auto voltage gain compensation, under L/C setting, input V error if within the range, all can be set voltage output.

Note2 : If DUT voltage max. spec. above 250V, input voltage must multiply 1.1 times, if under 250V, input must multiply 1.06 times.

Press down [▼] key to enter IEC601-1 setting status.

Now display value is a preset value of IEC601-1, Press [Off] key can change it.
OFF-ON-OFF circulation.

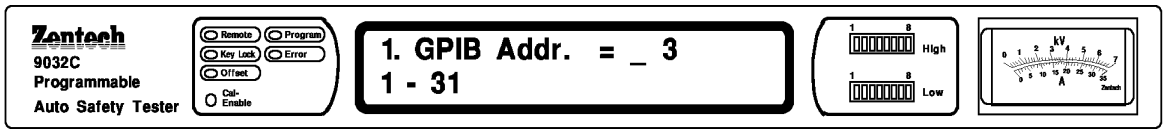
Note：When IEC601-1 set On, waveform as follow.



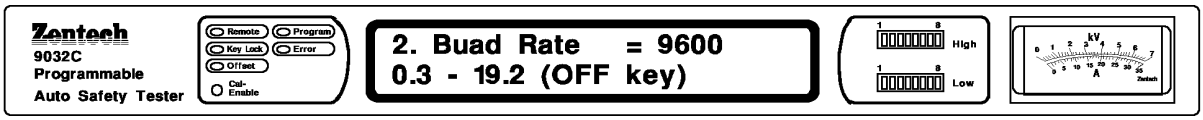
Press down [▼] key to enter Lock Rcl setting status.

Now display value is a preset value of Lock Rcl, Press [Off] key can change it.
OFF-ON-OFF circulation.

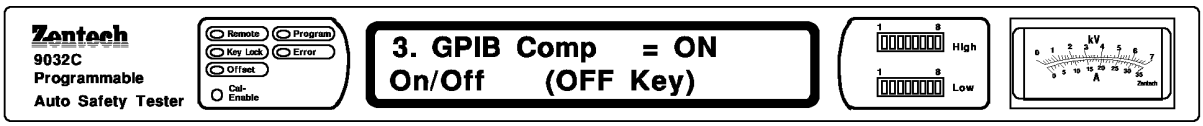
5. Press [W] key, enter main screen, use [▼] key to main screen D. Remote Setting. Press [X] key , enter second screen selecting. Enter GPIB Address setting status.



Now display is GPIB ADDRESS preset value, by number key to change.
Setting range 1~31. Press down [▼] key to enter Baud Rate setting status.



Now display value is a preset value of Baud Rate, press [Off] can change it.
0.3, 1.2, 2.4, 4.8, 9.6, 19.2 circulation. (unit：kbps)
Press down [▼] key to enter GPIB Comp setting status.



Now display value is a preset value of GPIB Comp, Press [Off] key can change it.
OFF-ON-OFF circulation.
Note：When GPIB Comp. set On, mean GPIB commands with 9032A/M used altogether.

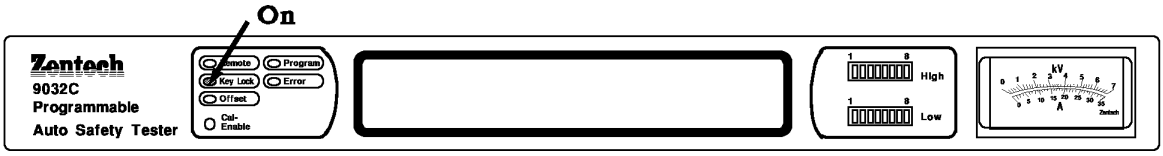
6. Press [Prog] key to exit, when finish.

4.10.2 System Setting Before Sending Out Of Factory

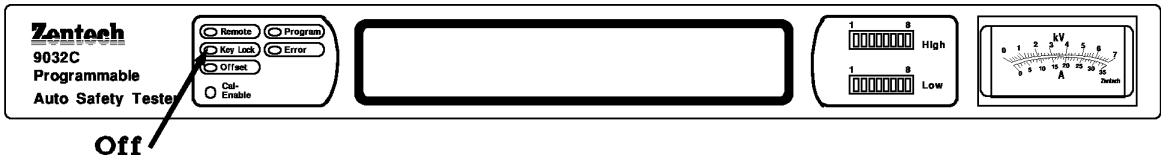
Display	Range	Initial Value
A. General Setting		
1. Contrast	1 ~ 15	5
2. Beep Vol.	OFF, 1,2,3	3
3. Scan No.	1 ~ 8	1
4. Fail Retest	ON/OFF	OFF
5. Print Pass	ON/OFF	OFF
6. Print Fail	ON/OFF	OFF
7. Timer U/D	Up/Down	Down
B. Timing Setting		
1. Pass Hold	0.2 ~ 99.9 S	0.5
2. Step Hold	ON(0), 0.1 ~ 99.9 S	0.2
3. Judg. Wait	0.1 ~ 99.9 Sec	0.3
4. DC Wait	0 ~ 99.9 S	0.0S
C. Special Setting		
1. AC-V Freq.	50 ~ 600 Hz	60
2. G-R Freq.	50 ~ 60Hz	60
3. G-R Voltage	6.0 ~ 15.0V	15.0
4. Auto Range	ON/OFF	OFF
5. Soft. AGC	ON/OFF	ON
6. Password	ON/OFF	OFF
7. GR Cont.	ON/OFF	OFF
8. Simulation	5% ~ 50%	25%
9. IEC601-1	ON/OFF	OFF
10. Lock Rcl	ON/OFF	OFF
D. Remote Setting		
1. GPIB Addr.	1~31	3
2. Baud Rate	0.3,1.2,2.4,4.8,9.6,19.2 kbps	9.6
3. GPIB Comp.	ON/OFF	ON

4.11 KEY LOCK setting method

Under STOP status, press [Password] or [the test name (four number)] [Off] and then the tester will be under LOCK status. Except [Test]，[Stop] and [Rcl] keys, all keys will be locked. And LOCK indicator will light.



The way to remove LOCK is the same with the way to set it.



4.12 Remote Control

There is a REMOTE control socket on rear panel of the tester. If you want to control the output of the tester by external signal, plug control cable into this socket so you can make it. Be attention, please be careful don't touch high-voltage terminal to avoid danger because it's controlled by external. Remote control is always controlled by high-voltage probe, sometimes use the other controlling circuit instead of high-voltage probe to control. But be attention, because it's the output switch of high-voltage. So, please care of control cable which is connected, and don't close high-voltage terminal and test cable as possible to prevent from danger.

1. If want to single control TEST and STOP signal, As Figure 4-5 shows：

According to the way, connect in REMOTE of rear panel.

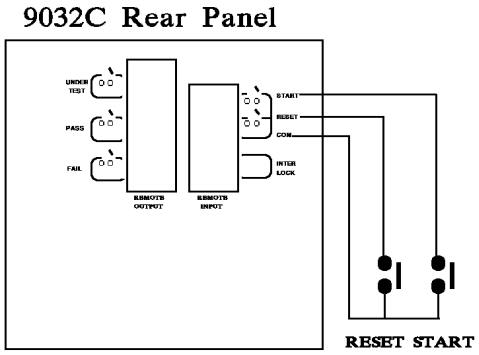


Figure 4 - 5

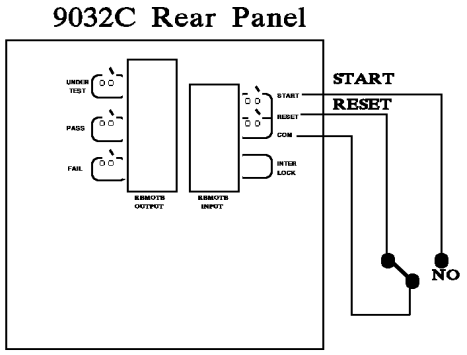


Figure 4 - 6

2. If wire as Figure 4-6, it will make the tester is under STOP normally, because NC connects to STOP and NO connects START.

3. Some logic components, like transistor, FET, coupler, ect., can be connected as Figure 4-10 shows to be a controlling circuit The signals and circuit are shown on Figure 4-10. But if want to have this circuit can control the tester, the circuit must have following conditions :

(1) The voltage of HI signal is 4.5-5V
(2) The voltage of LO signal is 0-0.6V
(3) The current of LO signal is 2mA or less.
(4) The acting time of input signal must be 20ms or above.

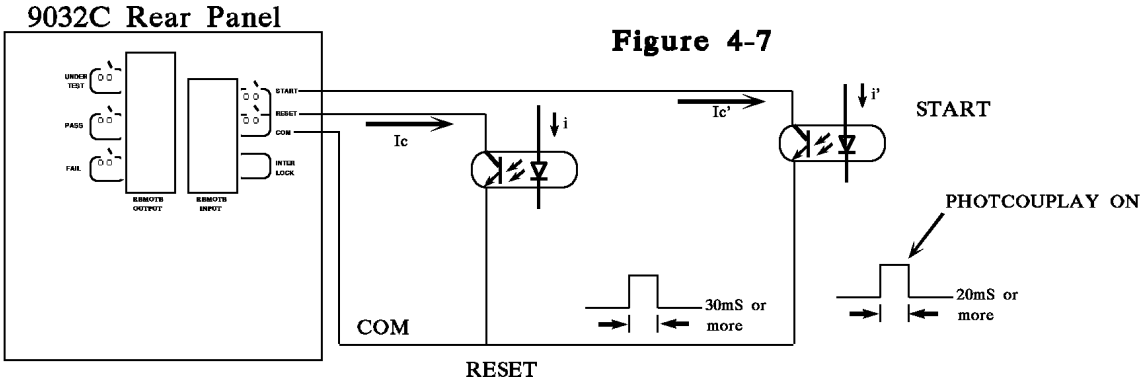


Figure 4-7

4. Both relay control which is shown on Figure 4-5 or photo-ocular which is shown on Figure 4-7 use contacts of component to control. If can effectively avoid noise that will cause wrong operation. Although the tester has many device to prevent from noise, but it still must be care of setting measuring system.

5. The drawing of REMOTE CONTROL is shown on Figure 4-8. You must firmly memorize the drawing if you want to use external control.

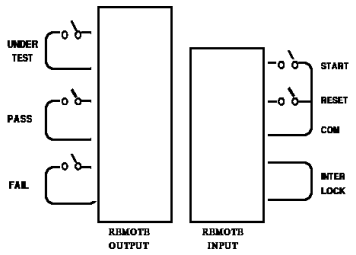


Figure 4-8

Layout of connector prints viewed form panel surface

4.13 Output Signal

The tester has indicating signal for lamp and buzzer. There are two output signals from the rear of the test:

(1) UNDER TEST : This output terminal will be short when the tester is under test status because the contacts of relay will connect this output terminal to the device which is powered by 115V AC, and current is less than 0.3A. Acting time: From the test is under test status to it is restored.

(2) PASS : This output terminal will be short when test-object is judged as GOOD by the tester because the contraction of relay will connect this output terminal to the device which is powered by 115V AC, and current is less than 0.3A. Acting time：0.2~99sec. (adjustable)

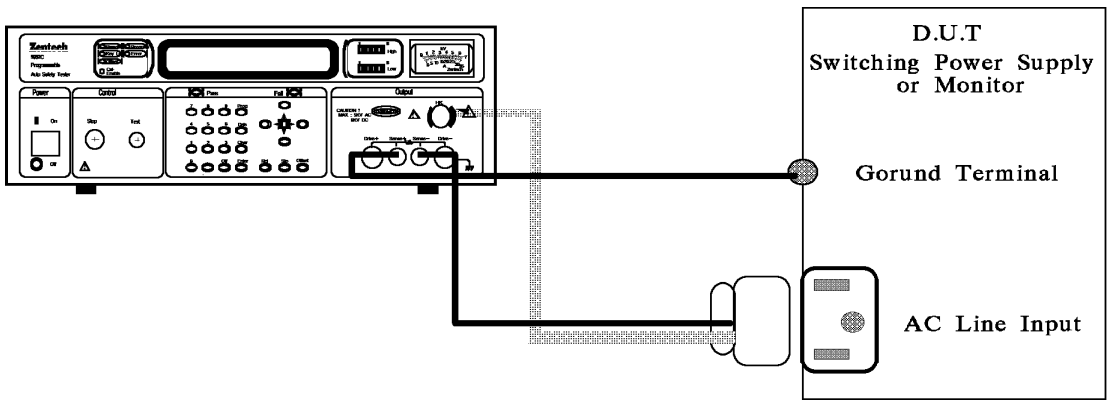
(3) FAIL : This output terminal will be short when tested-object is judged as NO-GOOD by the tester because the contraction of relay will connect this output terminal to the device which is powered by 115V AC, and current is less than 0.3A. Acting time: From judge tested-object as NO-GOOD to STOP.

4.14 Scan Test (OPTION)

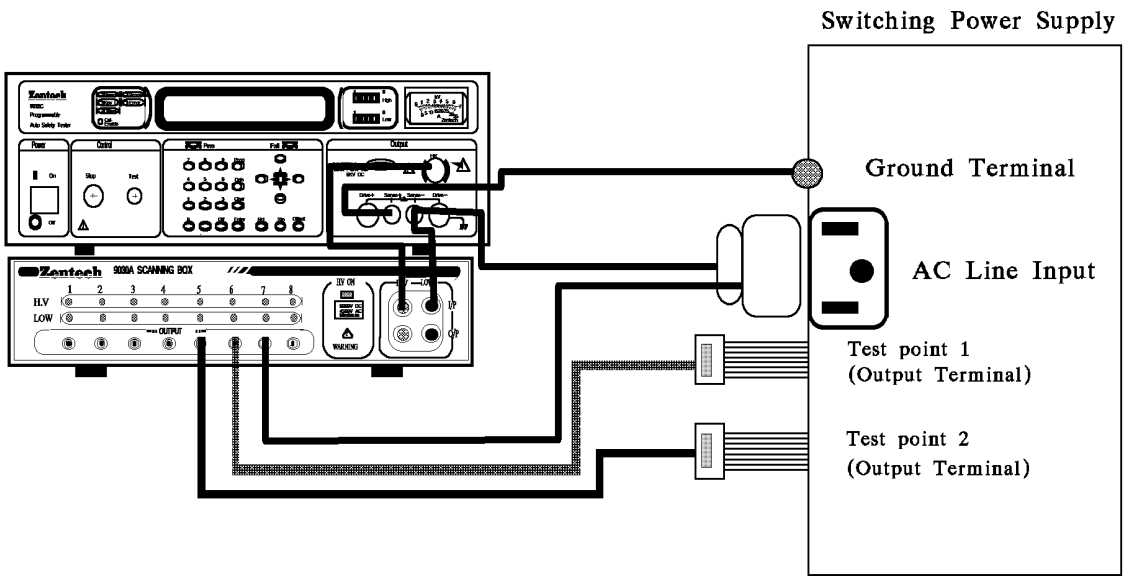
The unit may combine with scan testing interface. The DUT may scan multi-point once by using scan box to achieve fastest and efficient.

4.14.1 The application of scan testing (Single Box)

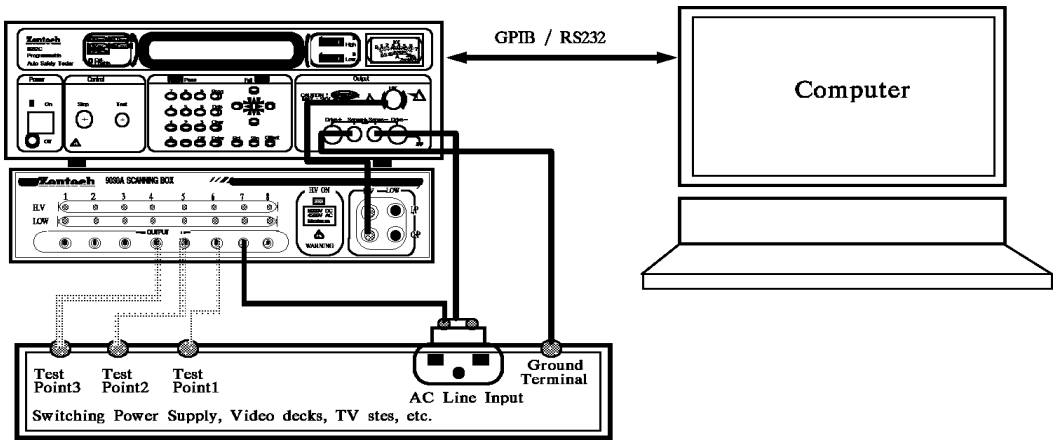
App 1：The single unit is using for grounding, Hi-pot and isolation testing of Switch Power Supply or Monitor.



App 2：The unit may combine with 9030A Scanning box for grounding and multi-points Hi-pot testing of Switch Power Supply or Monitor.



App 3：Using PC via GPIB or RS232 interface controlling：The unit may combine with 9030A Scanning box for grounding and multi-point Hi-pot isolation testing of Switching Power Supply, Monitor, Video decks, TV sets and other electronic equipments.



Ex : 1. The description of scanning controller and Scanning box.

There are 16 indicators on the front panel which are used for indicating the Hi or Low output.

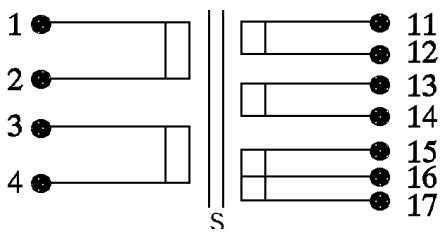
The setting method is described as below :

The following diagram is an example of the connection pin of the transformer and the tested points and voltage.

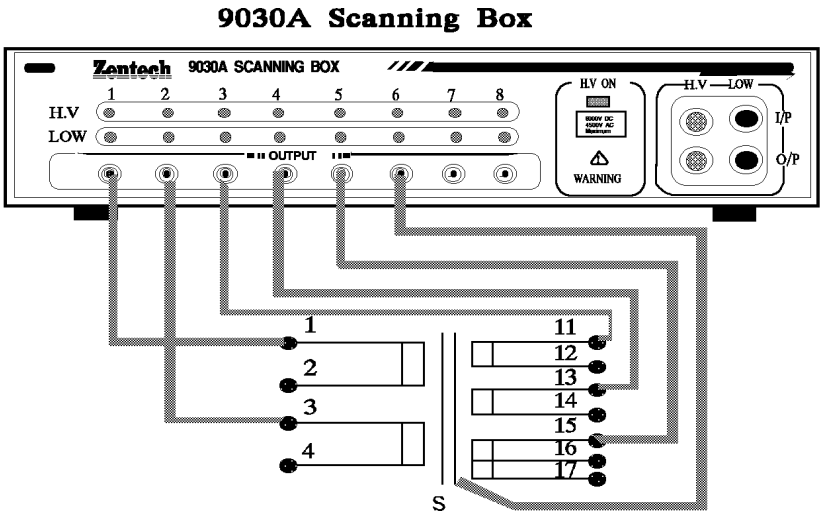
a. 1,3 -11,13,15 ：3.75KV

b. 1,3 -S ：4.0KV

c. 11,13,15 -S ：4.0KV



the leakage current on each step：10mA
the testing time on each step：3 sec.
The connection between DUT and Scanner is an follows：

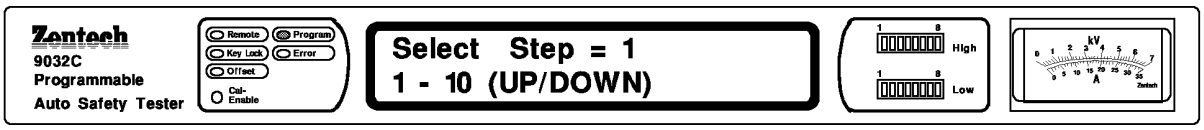


The setting parameter are calculated from above link lines and conditions

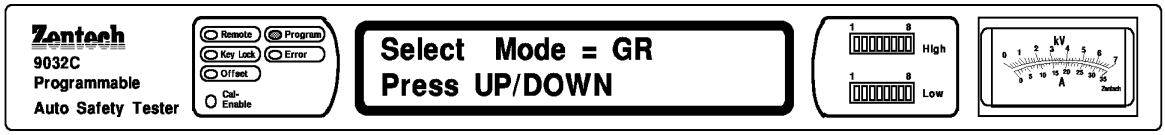
STEP	HI CH.	LO CH.	MODE	V / I	LIMIT	TIMER
STEP1	1,2	3,4,5	W-ACV	3.75KV	10mA	3sec.
STEP2	1,2	6	W-ACV	4.0 KV	10mA	3sec.
STEP3	3,4,5	6	W-ACV	4.0 KV	10mA	3sec.

Turn the power on to start the parameter setting. (The unit must be restart if it connect with scanning box)

1. Press [Prog] to start the parameter setting status. The Prog indicator light on.



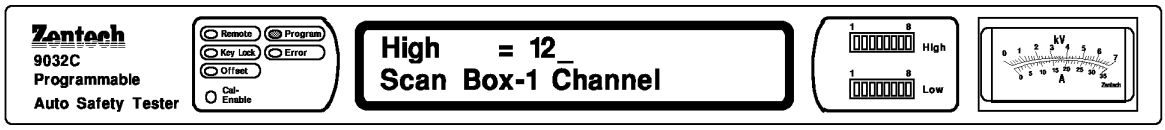
2. Press [X] to switch to MODE status.



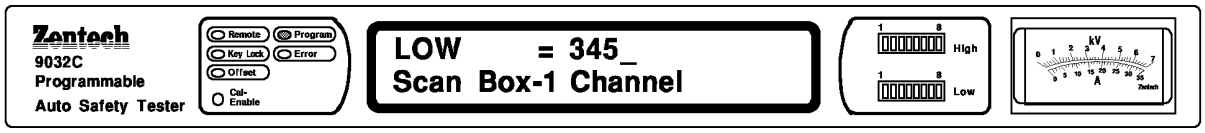
Press [▼] to select the voltage tested as W-ACV on the testing mode.

3. Press [Enter] and [X] to start scan testing output setting.

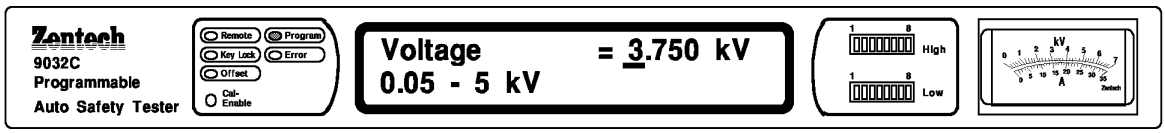
Meanwhile, LCD shows High =Disable. Key in [1],[2].



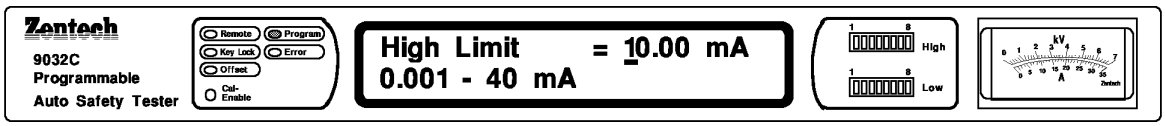
When the value is selected, press [Enter] and [X] to start the scan testing output setting. Meanwhile, LCD shows Low =Disable. Key in [3],[4],[5]



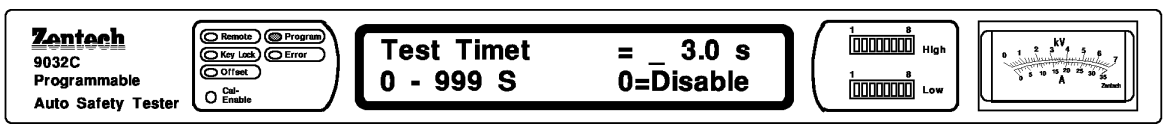
4. Press [Enter] and [X] to start the testing voltage setting. The voltage window is flashing and key in the voltage as 3.75KV.



5. Press [Enter] and [X] to start the leakage current Hi-Limit setting. The LCD shows High Limit and key in the current as 10mA.

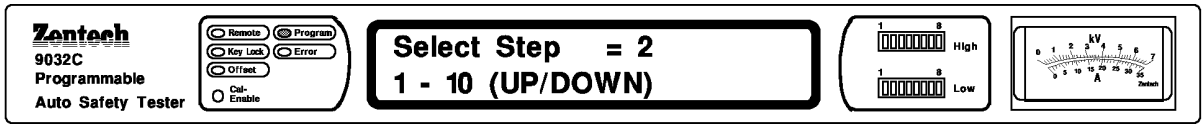


Press [Enter] and [X] to start the low limit setting. The unit may jump to testing time setting by pressing [X] as the unit is without low-limit comparative function.

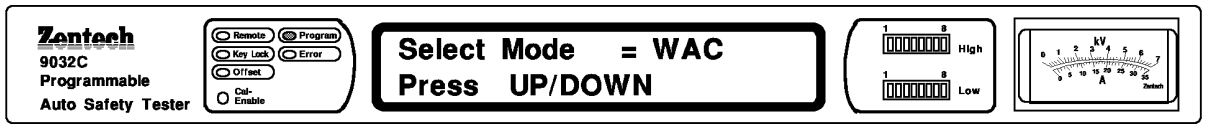


6. Press [X] to start the testing time setting.
The LCD shows Test Time. Key in [3] as the testing time and press [Enter] and [X] to start the RAMP TIME setting. Press [Enter] to next STEP as this function is unset.

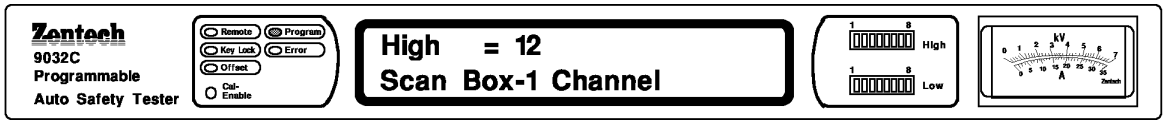
7. Press [▼] to start the STEP2 setting.



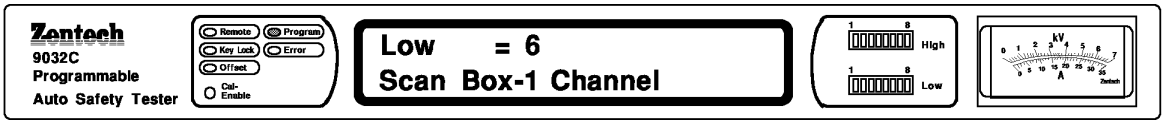
8. Press [Enter] to switch to MODE status.
Press [▼] to select the voltage tested as W-ACV on the testing mode.



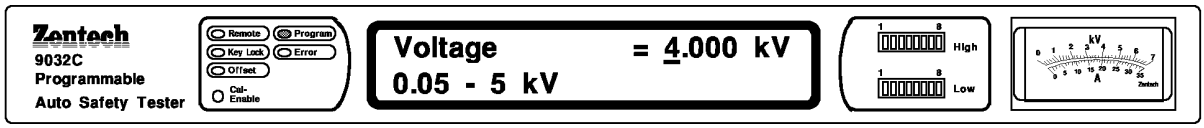
9. After the testing mode is selected. Press [Enter] to start scan testing output setting.
The LCD shows High =Disable. Key in [1] and [2] .



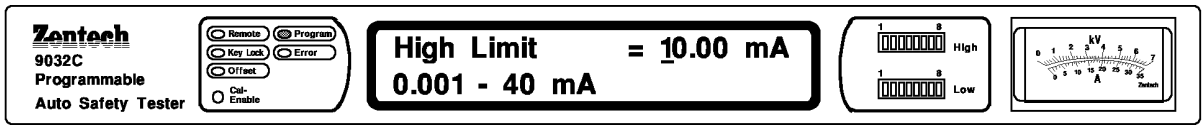
When the value is selected, press [Enter] to start the scan testing output setting.
The STEP window shows Lo and the letter is flashing. key in [6].



10. Press [Enter] and [X] to start testing voltage setting.
The LCD shows Voltage and key in the value as 4.0KV

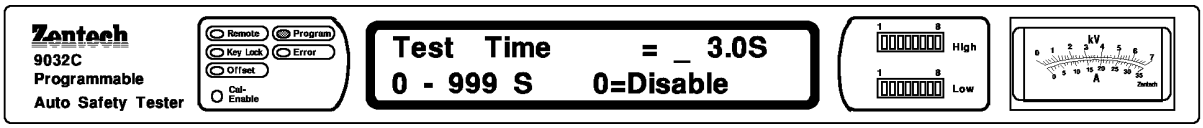


11. Press [Enter] and [X] to start leakage current Hi-limit setting.
The LCD shows High Limit and key in the value as 10mA.

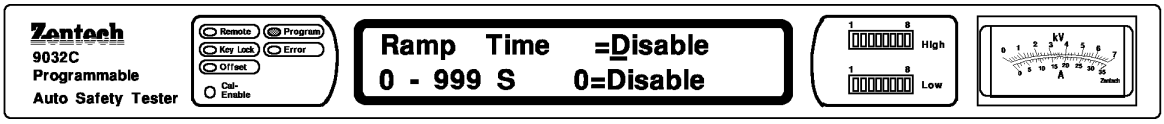


Press [Enter] and [X] to start the low limit setting. The unit may jump to testing time setting by pressing [X] as the unit is without Low-limit comparative function.

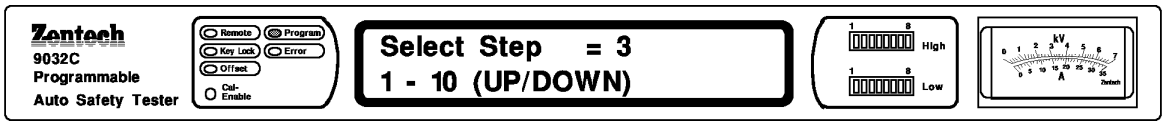
12. The LCD shows Test Time and key in [3] as the testing time.



Press [Enter] to start the Ramp Time setting after the testing time is set.
Press [Enter] to next STEP as this function is unset.

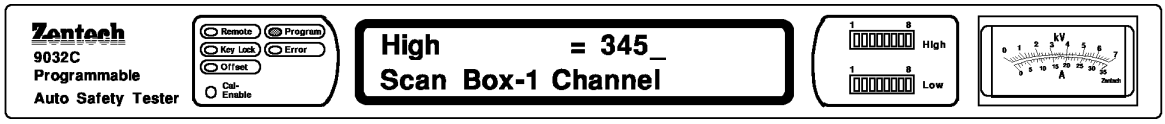


13. Press [▼] to start STEP3 setting status.

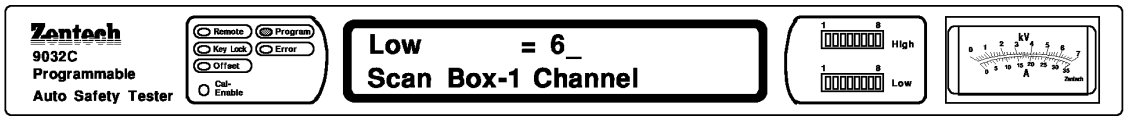


14. Press [Enter] to switch to MODE setting status.
Press [▼] to select the voltage testing as W-ACV on testing mode.

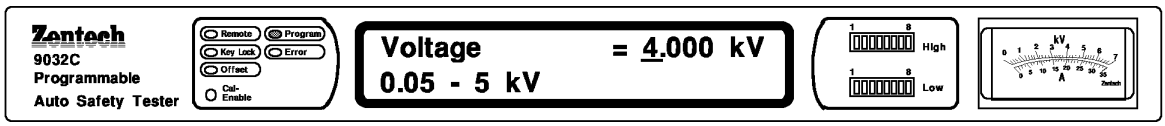
15. After the testing mode is selected, press [Enter] to start the scan testing output setting.
The LCD shows High =Disable. Key in [3],[4],[5].



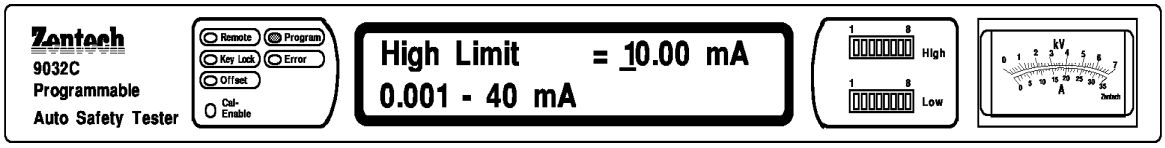
Press [Enter] and [X] to start the scan testing output setting.
the LCD shows Low =Disable. Key in [6].



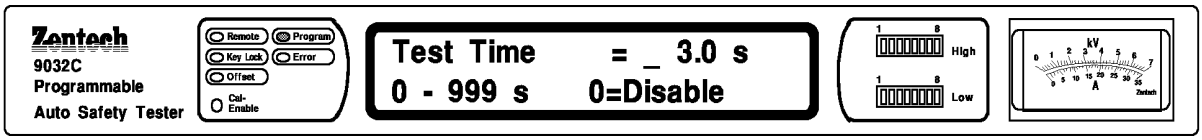
16. Press [Enter] and [X] to start testing voltage setting.
The LCD shows Voltage and key in the value as 4.0KV.



17. Press [Enter] and [X] to start leakage current Hi-limit setting.
The LCD shows High Limit and key in the current as 10mA

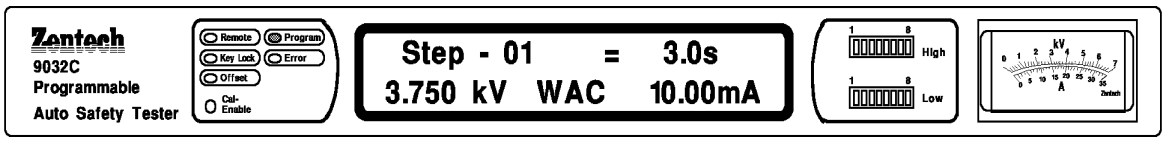


Press [Enter] to start the low-limit setting. The unit may jump to testing time setting by pressing [X] as the unit is without Low-limit comparative function.



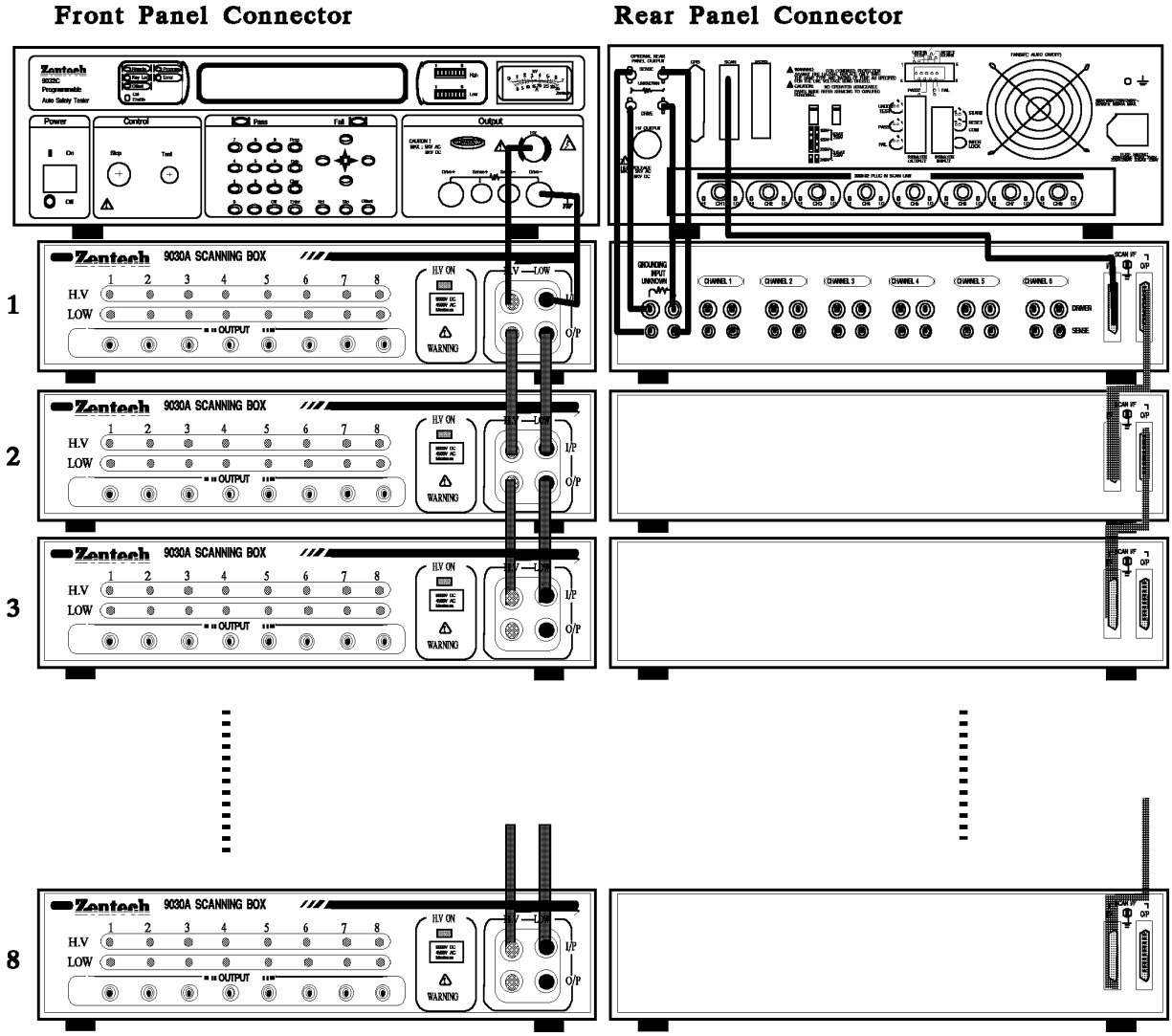
18. Key in [3] sec of testing time when LCD shows Test Time.

Press [Enter] to start the Ramp Time setting after the testing time is set.
Press [Enter] to jump to STEP setting as this function is unset.
Press [Prog] to finish the setting status and return to starting.
Please check each item before testing for safety.



4.14.2 Multi Box Scan testing

The Hipot tester can be controlled up to 8 units scanning box. The maximum scanning capacity are 64 Hv points and 6 GC points. The numbers of scan control boxes can be set in system, scan box numbers from 1 to 8, but if plug-in scanner, only can connect 7 sets scan controller.



4.14.3 Plug-in Scan Control Testing

Optional plug-in scanner controller, all of rules as 4.14.1, if do compound scanning plug-in scanner address will be memory to 1 automatically.

5. GPIB (OPTION)

5.1 GPIB interface

Using the GPIB interface, you can operate the meter by remote control, transfer data and etc.

5.2 GPIB Specification

5.2.1 Applicable Standard

IEEE Standard 488-1978

5.2.2 GPIB Function

Code	Meaning
SH1	Source Handshake
AH1	Acceptor Handshake
T4	Basic Talker function
L4	Basic Listener function
SR0	No service request function
RL1	All remote/local function
PP0	No parallel poll function
DC1	All device clear function
DT0	Device trigger function
C0	No controller functions

5.2.3 Using Code

ISO (ASCII) code

5.3 GPIB Panel Description

5.3.1 Address Setting

Please refer to the System Setting method on 4.10.

5.3.2 Remote/Local

1. It is on Remote status when the Remote is lighting.
2. To switch to Local status by pressing [Prog] under Remote.
3. The functions are useless on Remote except the [Prog] (switch to Local State) and [Stop] (reset the unit).
4. To make the [Prog] being useless by the LLO comment of the GPIB.

5.4 Response to Interface Messages

Interface Message	Meaning	Response
GET	Ground Execute Trigger	the response depends on the *DDT, setting to Test or Reset
GTL	Go To Local	To switch the unit to Local state
SDC	Selected Device Clear	Reset the unit
LLO	Local Lockout	To prohibit [Prog] switch to Local State
IFC	Interface Clear	To reset GPIB interface

5.5 GPIB Control/Setting commands description

5.5.1 General

The GPIB function is controlled by input the ASCII code which including {[command +parameter]；[command + parameter] + ending code}. The length of the string is 128 characters. It is not necessary to input any sign or space between command and parameter. Any two commands can connect by "," and add [Ending Code]. [Ending Code] can be any type of the following and the unit can distinguish automatically.

LF
CR+LF
EOI
LF+EOI
CR+LF+EOI

The data can be send out by GPIB to achieve transfer function. The data command is {string message + ending code}. The ending code is CR+LF+EOI.

5.5.2 Command list

Item	Command	Parameter	Function
1	STOP	X	stop testing
2	TEST	X	start testing
3	SHOW（?）	{c}	set the testing value
4	STEP（?）	{n}	set STEP
5	MODE（?）	{n|c}	set testing mode
6	SOUR（?）	{f}	set the output voltage or current
7	VOLT（?）	{f}	set output voltage
8	CURR（?）	{f}	set output current
9	HILI（?）	{f¦*}	set High Limit
10	LOLI（?）	{f¦*}	set Low Limit
11	CHAR（?）	{f¦*¦c}	set Charge Low Limit
12	SARC（?）	{f¦*}	set ARC
13	BOXN（?）	{n}	set Box number
14	HICH（?）	{n¦*}	set High Channel
15	LOCH（?）	{n¦*}	set Low Channel
16	TIME（?）	{f¦*}	set testing time
17	RAMP（?）	{f¦*}	set the voltage arise time
18	OFST（?）	{c}	set offset
19	*SAV	{n}	save the setting value
20	*RCL	{n}	read the setting value
21	CLER	X	clear the memory
22	*IDN ?	X	check the unit number
23	*DDT（?）	{n¦c}	set the response of Trigger
24	*TRG	X	execute Trigger command
25	*RST	X	reset the unit
26	DEV（?）	{n¦c}	selecting human simulating circuit
27	LINE（?）	{n¦c}	selecting LC test mode
28	POWER（?）	{n¦c}	selecting LC power measurement
29	PWHI（?）	{f¦*}	set up Hi-limit of power measurement
30	PWLO（?）	{f¦*}	set up Low-limit of power measurement

P.1：Comment of parameters

x：no parameter required

n：indicates the integer

f：indicates the floating

c：indicates the memory sign

：indicates the "" character of ASCII

5.5.3 Listener Function

1. STOP

function : stop testing
parameter : none
comment : same as the [Stop] function on the panel

2. TEST

function : start testing
parameter : none
comment : same as the [Test] function on the panel

3. SHOW（?） {c}

function : set and check the testing values
parameter : [STATUS] [STEP] [MODE] [SOURCE] [MEASURE] [TIMER] [CHAN] [SAVE]

comment : using for send out the testing value. The command can be connected each parameter with "¦" . Each parameter may used abbreviation.
Ex: STA=STATUS, STE=STEP, SO=SOURCE, SA=SAVE……The meaning and output string of each parameter may refer to Receiver function.

4. STEP（?） {n}

function : set STEP
parameter : n = 1 ~ 99
comment : Please set STEP before setting testing items (Ex: Mode, Time…etc)
The testing Items are set and saved on present STEP.

5. MODE（?）{n¦c}

function : set MODE
parameter : to memory the marks or number of Mode

Testing Mode	Memory Mark	Number
Grounding resistance	GR or G	0
AC Hi-Pot	WA or A	1
DC Hi-Pot	WD or D	2
Isolation voltage	IR or I	3
LC Leakage current	LC or L	4

comment : If the testing mode is changed, the testing item will be cleared at same time and become initial value.

6. SOUR（?） {f}

function : set the output voltage or current of SOURCE
parameter : Please refer to each specification, Ex: 9032C

GR Mode	f = 1 ~ 30 Amp
WA Mode	f = 0.01 ~ 5.0 kV
WD Mode	f = 0.01 ~ 6.0 kV
IR Mode	f = 50 ~ 1000 V

comment : 1. the input unit is according to the setting of MODE. Please make sure the testing mode is correct. Then setting the SOURCE by "VOLT" and "CURR" or set SOURCE directly.

2. If is in the GR MODE, the value of high limit would be changed, when the current multiple high limit is larger then 6300.
Ex: Current is 10 Amp. High Limit is 510mΩ. Set the current to 30 Amp. The high limit would be auto-set to 210mΩ.

7. VOLT（?） {f}

function : set output voltage
parameter : Please refer to "SOUR" command
comment : this command is similar with "SOUR". It may set the output voltage only. The command shows Error 1 on GR Mode..

8. CURR（?） {f}

function : set output current
parameter : Please refer to "SOUR" command
comment : this command is similar with "SOUR". It may set the output current only. The command shows Error 1 on GR Mode.
P.S. To avoid danger of setting 5 Amp to 5KV on Mode, please set SOURCE by "VOLT" and "CURR".

9. HILI（?）{f¦*}

function : set High Limit value
parameter : 1. "*":disable which means no High Limit testing.
2. f: please refer to each specification. Ex. 9032C

GR Mode	f = 0.1 ~ 500.0 mΩ
WV Mode	f = 0.01 ~ 40.00 mA
WD Mode	f = 0.01 ~ 20.00 mA
IR Mode	f = 1 ~ 9999 MΩ
LC Mode	f = 0.001 ~ 9.999 mA(Max)

comment : 1. the Disable is working under IR Mode
2. if the High Limit is small than Low Limit, the Low limit will become Disable under WV and WD Mode.
3. The setting value can not small than Low Limit on IR Mode, otherwise will become Error 2.
4. If is in the GR Mode. The maximum of high limit is the minimum of 510.0 and 6300/current.
Ex: The maximum of high limit is 510.0mΩ when the current is 10 Amp. The maximum of high limit is 210mΩ when the current is 30 Amp.
5. If is in the AC LC Mode. The max. value is depending on human simulating circuit.

10. LOLI（?）{f¦*}

function : set Low Limit value
parameter : Please refer to "HILI" command
comment : 1. It may Disable under GR, WV and WD Mode. The Low Limit can not greater than High Limit.
2. It will become disable under IR Mode. Making the High Limit Disable when the setting value is greater than High Limit.

11. CHAR（?）{f¦*¦c}

function : setting and examine Charge Low Limit.
parameter : 1. "*": Disable the function
2. f: 0.001 ~ 20.00mA
3. c: is "GET" or abbreviation of words characters, set at Charge Low is auto scratch.
comment : 1. Only in W-DCV mode, Charge Low is available.
2. Scratch value is 1/2 of max current when being charge.

12. SARC（?）{f¦*}

function : set ARC value
parameter : 1. "*": disable the function
2. f: please refer to each specification. Ex. 9032C

WA Mode	f = 0.1 ~ 40.00 mA
WD Mode	f = 0.1 ~ 20.00 mA

comment : the ARC may set under Hi-Pot testing only

13. BOXN（?）{n}

function : select scan box
parameter : n: 1~x, x is decide by initial Hipot system, refer to 4.9.2
comment : If over one scan box, before Hi channel or Low channel set commend must be use this command to select which box

14. HICH（?）{n ¦*}

function : set High channel

parameter : 1. "*": disable the function

2. n: please refer to the specification of SCAN box. Ex. 9030
n: 1~8, n is the number of Channel.

comment : it may connect each parameter with "¦" to start many Channels.
Ex: HICH 1¦3¦5

15. LOCH（?）{n ¦*}

function : set Low Channel

parameter : please refer to "HICH" commands.

comment : 1. please refer to "HICH" commands.

2. can not be set under GR Mode

16. TIME（?）{f ¦*} function :

setting Timer parameter : 1. "*":
disable timer

2. f: 0.1 ~ 999 second

comment : the unit will stay on Test ON status until testing stop if the Disable Timer is on Test ON.

17. RAMP（?）{f ¦*}

function : setting the voltage arise time

parameter : f : 0 ~ 99.9 second

comment : the Ramp may set under Hi-Pot testing

18. OFST（?）{c}

function : setting and examine Offset status

parameter : c : is a word character or abbreviation.
c "GET" : set at a scratch status.
d "OFF" : close OFFSET function.

comment : "STOP" commend can clean "OFST GET" status, makes become "OFST OFF"

19. *SAV {n}

function : save the testing value

parameter : n =1~99

comment : it may save all testing items on each STEP and able to recall them in the future.

20. RCL（?）{n}

function : set testing value

parameter : n =1~99

comment : to recall the testing items which have saved.

21. CLER

function : to clear the data on the memory
parameter : none
comment : all data will be erase on the memory except the Address of GPIB and RS232 Baud Rate.

22. *IDN ?

function : check the unit number
parameter : none
comment : the unit shows the number as following after enter the command : "Zentech 9032C"

23. *DDT（?）{n ¦ c}

function : set the response of Trigger
parameter : "0"，"1"，"2"，"3" or "S"，"T"，"NS"，"NT"
comment : set the response from the interface when the unit receives "*TRG" or "GET" command.
"0" or "S" : stop testing (STOP)
"1" or "T" : start testing (START)
"2" or "NS" : the unit will stop testing after receive "*TRG" or "GET" messages and "*DDT" will change to "NT".
"3" or "NT" : the unit will start testing after receive "*TRG" or "GET" messages and "*DDT" will change to "NS".

24. *TRG

function : Trigger
parameter : none
comment : its function is same as "GET" of interface message. Its function is depends on the setting of "*DDT". Please refer to "*DDT" command

25. *RST

function : reset unit
parameter : none
comment : this command is using to reset the unit. Its function is same as the "SDC" of interface message.

26. DEV（?）{n ¦ c}

function : selecting human simulating circuit of LC mode.
parameter : 1.UL544NP
2.UL544P
3.UL1563
4.UL2601-1，IEC610-1
5.UL1950，UL3101-1，IEC950
comment : for example, setup the type 5 human simulating circuit parameter could, be "5", "UL1950", "UL3101-1" or "IEC950".

27. LINE（?）{n ¦ c}

function : selecting LC test mode.
parameter : 0. NORMAL
1. REVERSE
2. SF-NORMAL
3. SF-REVERSE
comment : SF-NORMAL is Single Fault Normal.

28. Power（?）{n ¦ c}

function : selecting LC Power measurement.
parameter : 0. Voltage
1. Current
2. VA

29. PWHI（?）{f ¦*}

function : set up High Limit of Power measurement
parameter : Voltage : 0~300V
Current : 0~10A
VA : 0~2200VA

30. PWLO（?）{f ¦*}

function : set up Low Limit of Power measurement
parameter : Lower than Power High Limit.

5.5.4 Talker Function

The message of {string＋ending code} will send to IEEE-488 interface when the unit is assigned as TALKER. The ending code consists CR＋LF＋EOI. The string is depend on the present status.

There are many commands with "?". The "?" is Query, its goal is to set the testing values on each testing item. Such testing values send to IEEE-488 by ASCII string.
The form is :

Item Setting Comment

P.S：SHOW? "IDN? have no comment. EX：
1.Command : mode WD ; mode ?

Output : MODE 2 :With standing DC voltage test mode.

2.Command : high 1 ¦ 3 ¦ 5 ;high ?

HIGH 1 ¦ 3 ¦ 5 :High Channel 1, 3, 5 is ON.

All command will feedback an Error Message except [*RST]，[*TRG] [SHOW] and "?".
If the Error Code is not 0, the result will displayed. The Error Message is as follows:

Error Message

Error 0 : Save OK!
Error 1 : The command is ineffectual!
Error 2 : The parameters is ineffectual!
Error 3 : Can not TEST ON!
Error 4 : Unconnected scan box!
Error 5 : Channel can not set by ZERO!
Error 6 : Channel is collision!

The TALKER function is completed by SHOW(?) command. EX: Press the "SHOW parameter", the unit will send the testing value which representative the parameter.
It may check more than one testing values by connecting "¦" with parameters.

1. STATUS : to check the present status. If the user want to check more than STATUS, the unit display status code, the output form is following:
STATUS_X 8-- bytes
P.S. : "_" is a space

STATUS MESSAGE

STATUS 0 : Now is in STOP status.
STATUS 1 : Now is in TEST status.
STATUS 2 : TEST END. It is GOOD.
STATUS 3 : TEST STOP. It is NO__GOOD
STATUS 4 : TEST STOP. It is not good for WV__ARC.
STATUS 5 : TEST STOP. It is not good for WV__HI.
STATUS 6 : TEST STOP. It is not good for WV__LO.
STATUS 7 : TEST STOP. It is not good for IR__HI.
STATUS 8 : TEST STOP. It is not good for IR__LO.
STATUS 9 : TEST STOP. It is not good for GR__HI.
STATUS A : TEST STOP. It is not good for WV__CHARGE__LOW

2. **STEP** : to check the present STEP.
output form is STEP_XX -- 7 bytes

3. **MODEL** : to check the testing mode.
output form is MODE_X --6 bytes

4. **SOURCE** : to check the output voltage or current
output form are : { GR Mode → AC_XXX.X_A
| WA Mode → AC_XX.XX_KV
} WD Mode → DC_XX.XX_KV
~ IR Mode → DC.XXXX_ _V
LC Mode → LC_X.XXX_KV

5. MEASURE: to check the tested resistance or current
output form is MEASURE_XXXXX_UU
XXXXX : the tested value
UU : testing unit total：16 bytes

6. TIMER : to check the reminder time of testing
output form : { TIME_XXX.X
| RAMP_XXX.X total：10 bytes

7. CHAN : to check the Channel status
output form : HICH_X ¦ X ¦…¦ X，LOCH_X ¦ X ¦…¦ X
string length : shortest 13 bytes
longest：41 bytes

8. SAVE : to save the data of each testing item. The unit may read the data without pressing "SHOW Parameter"

EX : Write : "SHOW Step ¦ save"
Read : STEP 1
Read : STEP 1
Write: "SHOW mode"
Read : MODE1
Read : STEP 1→ shows step by pressing "SHOW step ¦ save"
command "SAVE" parameter can not used singly.

EX : "SHOW SAVE" will display "Error 2"

If the unit is required to display saved item, just press "SHOW ? " command.

If the unit is required to display more than one testing values, no matter the order of each parameter, the output data will display as the following :
[STATUS],[STEP],[MODE],[SOURCE],[MESSAGE],[TIMER],[CHAN]
Any two data will divide by ","

EX : Write : "SHOW STEP ¦ STATUS ¦ MODE"
Read :STATUS 2，STEP 1，MODE 1

The string length sent by "SHOW" may not more than 107 bytes (including ending code)

5.5.5 Command Examples

1. command : step 1；mode wa；volt 0.5；hili 20；time 2.0
   description : step :1
   mode : W–ACV
   output : 0.5kV（unit in kilo volts）
   high_limit : 20mA（unit in mA）
   test time : 2 seconds
2. command : stop
   description : same as front panel [Stop] key
3. command : test
   description : same as front panel [Test] key
4. command : show status
   description : command 9032C sent out status of this tests.
5. command : show source ¦ measure
   description : command 9032C sent out output voltage and measured current

f GPIB Operation Using Basic

```
‘GPIB example program for NI–GPIB card
‘Please load ULI.COM before run the program
‘Program compiled using Microsoft QBASIC version 1.1（MS–DOS 6.22）
‘Initializing GPIB interface & device
OPEN "gpib0" FOR OUTPUT AS ＃1                  ‘open ＃1 for output （Write）
OPEN "gpib0" FOR INPUT AS ＃2                   ‘open ＃2 for input （read）
PRINT ＃1, "abort"                              ‘initializing GPIB bus
SLEEP 1                                         ‘wait initializing complete
PRINT ＃1, "output 3; stop"                     ‘send "STOP" command to device 3

‘Set the test condition
‘step1 is WAC mode, output 0.5kV, high limit 3mA, test ime 3 second
‘step2 is WDC mode, output 0.5kV, high limit 3mA, test ime 3 second
‘step3 is I–R mode, output 500V, low limit 1MOhm, test ime 3 second
FOR I = 1 TO 15                                 ‘clear all（1-15）steps data
        PRINT ＃1, "output 3; DELE"
NEXT I
PRINT ＃1, "output 3;step 1;mode WA; sour 0.5;hili 3,time 3"
PRINT ＃1, "output 3;step 2;mode WD; sour 0.5;hili 3,time 3"
PRINT ＃1, "output 3;step 3;mode IR; sour 500;loli 1,time 3"

‘start test & get the measure
PRINT ＃1, "output 3;show STATUS｜STEP｜MEASURE｜SOURCE｜SAVE"  ‘set output data
PRINT ＃1, "output 3;stop,test"                 ‘restart instrument to test
PRINT ＃1, "enter 3"                            ‘read data from the device 3
INPUT ＃2, status$, step$, source$, measure$
IF status $＜＞"STATUS 1" THEN                  ‘if status !=TEST
        PRINT “!!! Device can not start !!!”
ELSE
        WHILE status$ = "STATUS 1"              ‘do while status = TEST
                PRINT ＃1, "enter 3"
                INPUT ＃2, status$, step1$, source1$, measure1$
                IF step$＜＞step1$ THEN PRINT step$, source$, measure$
                step$ = step1$                  ‘backup the last data of each step
                source$ = source1$
                measure$ = measure1$
        WEND
        IF status$ = "STATUS 0" THEN            ‘if status = STOP
                PRINT "!!! Device stop by user !!! "
        ELSEIF status$ = "STATUS 2"THEN         ‘if status = GOOD
                PRINT step1$ source1$ measure1$ ‘print last step
                PRINT "…Product is GOOD…"
        ELSE                                    ‘if status = FAIL
                PRINT step1$ source1$ measure1$  ’print last step
                PRINT "…Product is FAIL…"
        END IF
END IF
PRINT ＃1, "output 3;stop"                      ‘send "STOP" command
CLOSE ：SYSTEM                                  ‘close device ＃1, ＃2
END
```

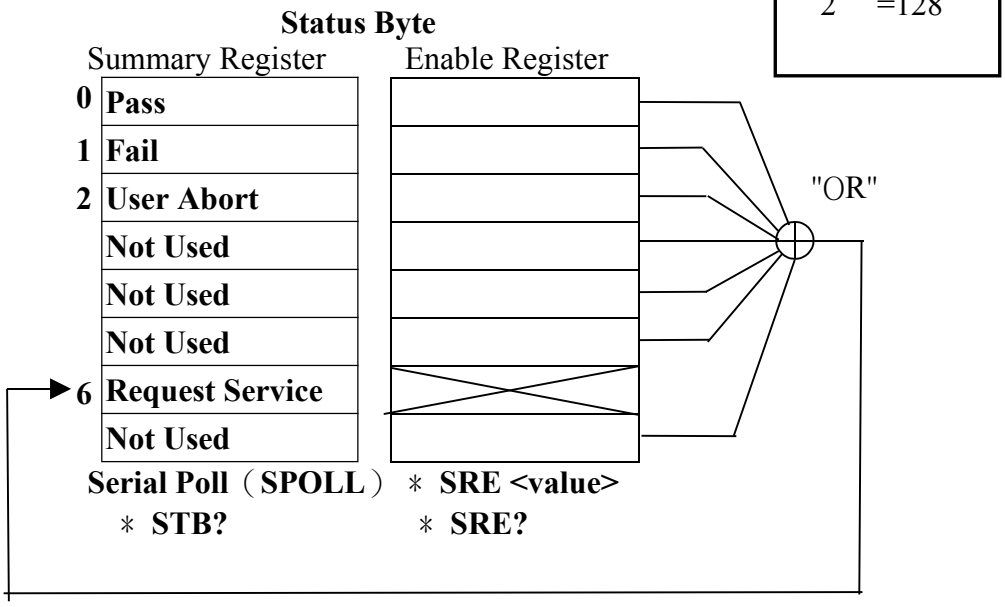
É SRQ Function

É GPIB commands

a. ＊ **CLS** -Clear status command
b. ＊ **SRE**＜**value**＞ **-**Service request enable command
c. ＊ **SRE**？ -Service request enable query
d. ＊ **STB**？ -Read status byte query
e. ＊ **RST** -Reset command
（When Initial setting–GPIB compatible = OFF）

Binary Weights

2^0	= 1
2^1	= 2
2^2	= 4
2^3	= 8
2^4	= 16
2^5	= 32
2^6	= 64
2^7	=128



f. **MEAS:ALL?** – Read all step measure query.

Output format：step 1 source, step1 measure [, step2 source, step2 measure]

6. RS232

6.1 Quote

User can use PC by RS-232 interface. It has remote control and data transfer function for this tester.

6.2 Interface Specification

It is standard RS-232 interface, setting value as follow :
data bits : 8 - bit
stop bits : 1 - bit
parity : No parity
baud rat : 0.3/1.2/2.4/4.8/9.6/19.2k 6 kinds variable.
(Setting method, please refer to 4.9 segment, initial setting method. Set up St-E (Baud Rate) is required value of Baud Rate.)

6.3 Command Form

The RS232 of this tester is inputted ASCII code when received commands. { [Commands＋Parameters]；[Commands＋Parameters]；……＋Ending code} Command string of combination, it has remote control and setting function, command string is limited in 128 characters (including ending code) [Command＋Parameters] to combine one command, it's not necessary to use separate symbol or " " space to separate it between [Command] and [Parameter]. Any of two commands can be used semi colon "；" to link to gather；in the final adding [Ending code]. [Ending code] could be any one of list column, the tester could make self-judgment.

Ending code

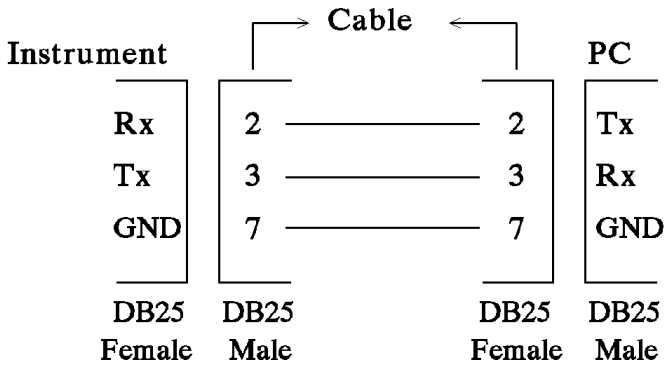
LF
CR
CR＋LF

6.4 When the RS-232 of this tester output ASCII code, date form is [Character string message＋Ending code] ending code is CR＋LF.

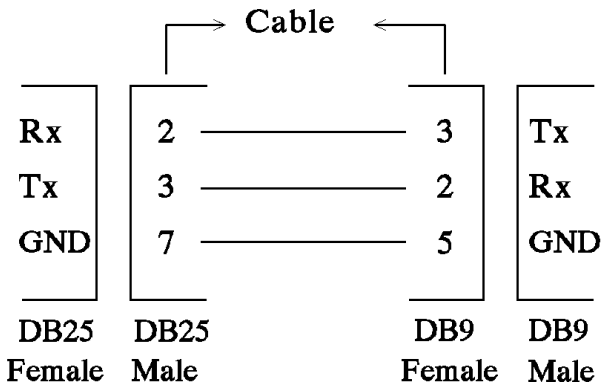
6.5 The commands of RS232 is same with the commands of GPIB, please reference GPIB interface of chapter 5.

6.6 RS-232 Interface Configuration

DB-25 Serial Connection



DB-9 Serial Connection

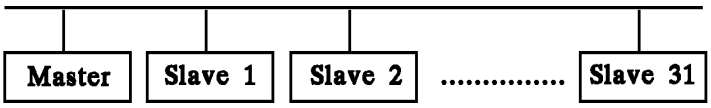


RS232 Operation Using Basic

```
‘RS232 example program
‘Program compiled using Microsoft QBASIC version 1.1（MS-DOS  6.22）
OPEN "COM2:9600,N,8,1,RS,CS,DS,CD,LF" FOR RANDOM AS＃1 ‘open serial port as device 1
PRINT  ＃1, "stop"                                    ‘send "STOP" command to device
FOR｜= 1 TO  10
          PRINT  ＃1,  "DELE"
NEXT｜                                                ‘clear all（1-10）steps data
SLEEP 1                                               ‘wait data send end
temp$ = INPUT$(LOC(1), 1)                             ‘clear receive buffer
PRINT  ＃1, "step 1;mode WA;SOUR 0.5;hili 3;time 3"
SLEEP 1                                               ‘wait data send end
temp$ = INPUT$(LOC(1), 1)                             ‘clear receive buffer
PRINT  ＃1, "step 2;mode WD;SOUR 0.5;hili 3;time 3"
SLEEP 1                                               ‘wait data send end
temp$ = INPUT$(LOC(1), 1)                             ‘clear receive buffer
PRINT  ＃1, "step 3;mode IR;SOUR 500;loli 1;time 3"
SLEEP 1                                               ‘wait data send end
temp$ = INPUT$(LOC(1), 1)                             ‘clear receive buffer
PRINT  ＃1, "stop,test"                               ‘start test
SLEEP 1                                               ‘wait commands process end
PRINT  ＃1, "show STATUS｜STEP｜MEASURE｜SOURCE"
SLEEP 1                                               ‘wait data send end
INPUT  ＃1, status$, step$, source$, measure$         ‘read data
IF status$ <> "STATUS 1" THEN                         ‘if status not = TEST
       PRINT   "!!! Device can not start !!!"
       PRINT   status$, step$, source$, measure$
ELSE
       WHILE   status$ =     "STATUS 1"               ‘do while status = TEST
                 PRINT   #1,   "show   STATUS｜STEP｜MEASURE｜SOURCE"
                 SLEEP 1                              ‘wait data send end
                 INPUT #1, status$, step1$, source1$, measure1$
                 IF step$ <> step1$ THEN PRINT step$, source$, measure$
                 step$ =
                 step1$ source$ =
                 source1$ measure$ =
                 measure1$
       WEND
       IF status$ =   "STATUS 0" THEN                 ‘if status = STOP
                 PRINT "!!! Device stop by user !!!"
       ELSEIF status$ =   "STATUS 2" THEN             ‘if status = PASS
                 PRINT step1$, source 1$, measure 1$  ‘print last step data
                 PRINT   "…Product is PASS…"
       ELSE                                           ‘if status = FAIL
                 PRINT step1$, source 1$, measure 1$  ‘print last step data
                 PRINT   "…Product is FAIL…"
       END IF
END IF
PRINT   #1, "stop"                                    ‘send "STOP" command
CLOSE #1                                              ‘close device 1
END
```

7. RS485（OPTION）

7.1 Connection



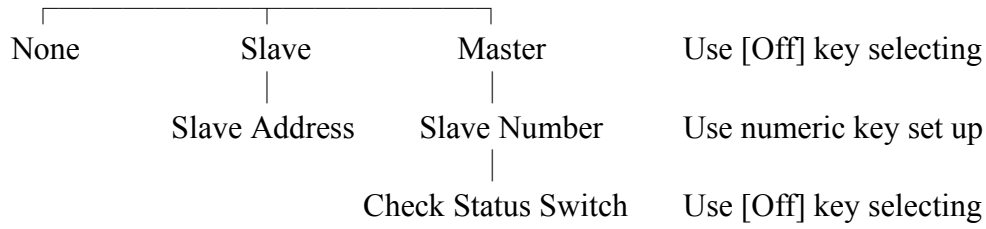
7.2 Functions

1) Via Master set up, operating (Test, Stop, Program).
2) Max. units are 32 (Master＋Slaves).
3) Master could detect linking malfunction and slave whether Test End.
4) Master could be tested for hipot also.

Note：3、4 functions selects either one of them.

7.3 Settings

1) Turn Cal on, press [Enter][7][9][3][1] enter Cal settings status.
2) Press [Enter][4] [8] [5] enter RS485 settings status.
3) Press [Up] [Down] key select setting items, [Off] key select set up value, numeric＋[Enter] set up value data.
4) Settings items as follow：



7.4 Descriptions

1) Note : general mode, no RS485 function.
2) Master : a. one line only has one Master, all operations on the Master.
   b. when Check Status Switch is On, Master only has Check function, can not connect to DUT. Rear panel signal meanings as follow :
   Under Test → Slave under testing.
   Pass → All Slaves Test End
   Fail → Slave link Error。

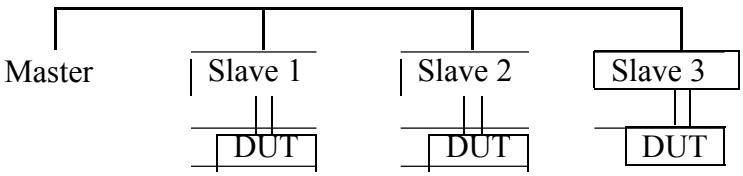
c. when Check Status Switch is Off, Master and Slave can connect to DUT.

3) Slave ：a. each line of Slave unit must has his own Address, and must set start from 1 to Master settings number of Slave units.

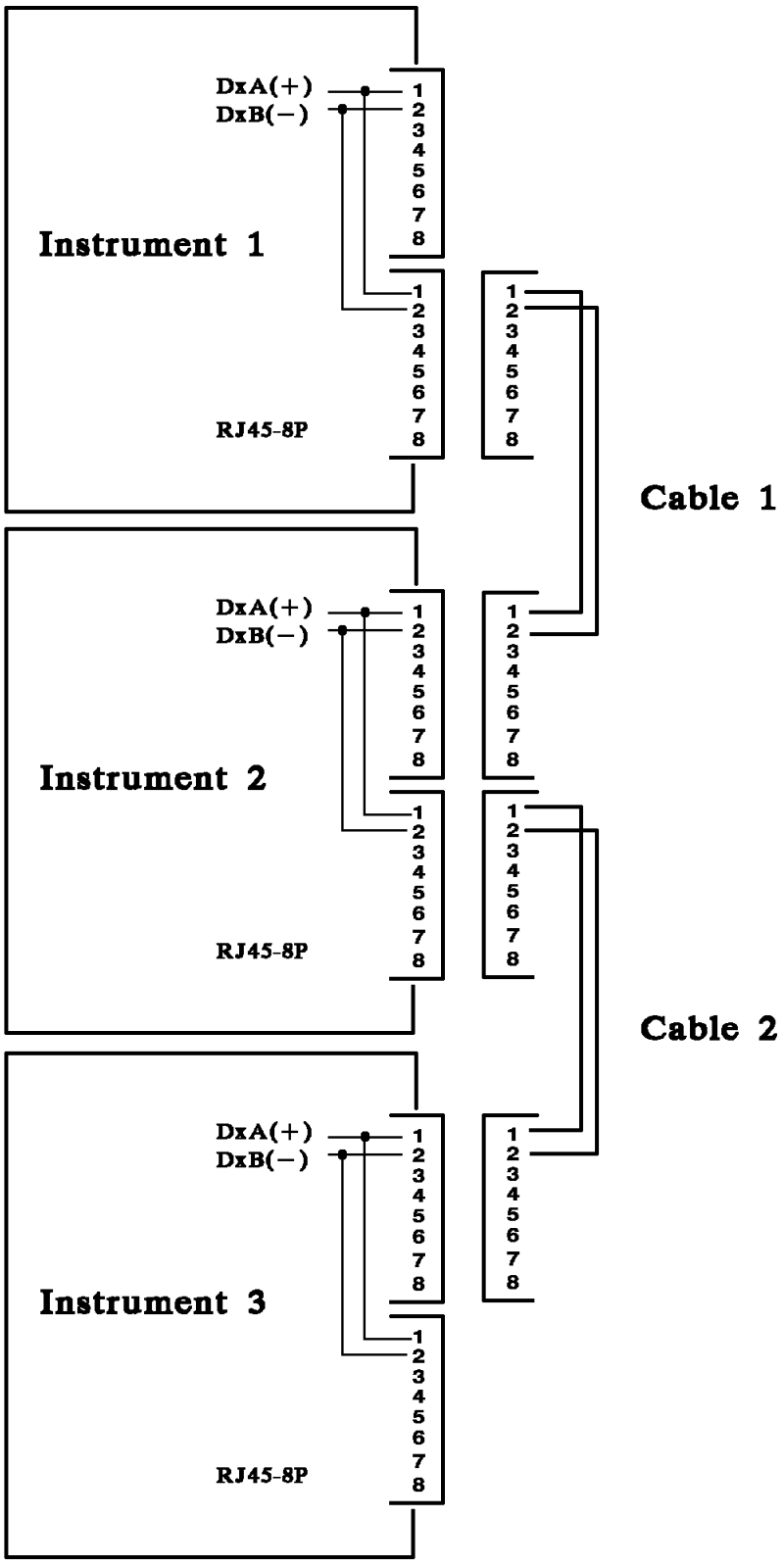
b. Slave max. number is 31.

Ex：

Required：one time test 3 object, and need to test link status, so totally need 4 units, one unit is Master, Slave Number set 3, Check Status Switch set On, the other 3 units set Slave Address to 1,2,3. Connection as follow :



RS485 Connection



8. Calibration Procedure

Before process this section the HI-POT tester must be warm up at least 30 minutes. Take off the calibration label that at front panel. Press the lock switch, this is a hardware data backup protection circuit, to avoid calibration data loss. The following items are need to calibration.

Voltage Calibration（See 8.2）

"Cal ACV 5kV Offset" ；WAC Voltage OFFSET point
"Cal ACV 5kV Full " ；WAC Voltage FULL point
"Cal DCV 6kV Offset" ；WDC Voltage OFFSET point
"Cal DCV 6kV Full " ；WDC Voltage FULL point
"Cal IRV 1kV Offset" ；IR Voltage OFFSET point
"Cal IRV 1kV Full " ；IR Voltage FULL point

Current Calibration（See 8.3）

"Cal ACA 3mA Offset" ；WAC 2.99mA range OFFSET point
"Cal ACA 3mA Full " ；WAC 2.99mA range FULL point
"Cal ACA 40mA Offset" ；WAC 40mA range OFFSET point
"Cal ACA 40mA Full " ；WAC 40mA range FULL point
"Cal DCA 3mA Offset" ；WDC 2.99mA range OFFSET point
"Cal DCA 3mA Full " ；WDC 2.99mA range FULL point
"Cal DCA 12mA Offset " ；WDC 12mA range OFFSET point
"Cal DCA 12mA Full " ；WDC 12mA range FULL point

Grounding Mode Calibration（See 8.4）

"Cal GRA 30A Offset " ；GR Current OFFSET point
"Cal GRA 30A Full " ；GR Current FULL point
"Cal GRV 8V Offset " ；GR Voltage OFFSET point
"Cal GRV 8V Full " ；GR Voltage FULL point

Withstanding Voltage Mode ARCing Calibration（See 8.5）

"Cal AC ARC 40mA " ；WAC ARCing Calibration
"Cal DC ARC 12mA " ；WDC ARCing Calibration

Insulation Resistance Mode Resistor Calibration（See 8.6）

"Cal IRR Range 0 " ；IR Resistor range 0 Calibration
"Cal IRR Range 1 " ；IR Resistor range 1 Calibration
"Cal IRR Range 2 " ；IR Resistor range 2 Calibration
"Cal IRR Range 3 " ；IR Resistor range 3 Calibration

Leakage Current Mode Leakage Current Meter Calibration（See 8.7）

"Cal LC 1V Offset" ；LC leakage Current 1V range OFFSET point
"Cal LC 1V Full " ；LC leakage Current 1V range FULL point
"Cal LC 10V Offset" ；LC leakage Current 10V range OFFSET point
"Cal LC 10V Full " ；LC leakage Current 10V range FULL point

Leakage Current Mode Power Meter Calibration（See 8.8）

"Cal LCV 300V Offset" ；LC Voltage OFFSET point
"Cal LCV 300V Full " ；LC Voltage FULL point
"Cal LCA 1A Offset" ；LC Current 1A range OFFSET point
"Cal LCA 1A Full " ；LC Current 1A range FULL point
"Cal LCA 10A Offset" ；LC Current 10A range OFFSET point
"Cal LCA 10A Full " ；LC Current 10A range FULL point

8.1 Calibration

Press [Enter] [7] [9] [3] [1]
Display CAL OFF / CAL ON / CAL TEST
CAL OFF ：calibration data install zero.
CAL ON ：calibration finish, in normal operation.
CAL TEST ：into calibration procedure.
Press [Off] key to change CAL OFF / CAL ON / CAL TEST
Display CAL TEST ：ready to calibration
Press [Prog] key for ready to calibration

8.2 Voltage Calibration

8.2.1 ACV Calibration

Connection a ACV HI voltage meter into HI – POT tester

Press [Up] or [Down] key few times to display.
Display Cal ACV 5kV Offset ；ACV Voltage offset
0.050kV
Press [Off] key to display.
Display STEP-01 0.0s
0.050kV WAC 0.500mA
Press [Stop] [Test] ；read out the HV meter value
；example 0.062kV

Press [0] [.] [0] [6] [2] [Enter]
Press [Stop] ；stop ACV Voltage offset calibration
Press [Down] key to display
Display Cal ACV 5kV Full ；ACV Voltage full scale
4.000kV
Press [Off] key to display.
Display STEP-01 0.0s
4.000kV WAC 0.500mA

Press	[Stop] [Test]	；read out the HV meter value ；example 4.052kV
Press	[4] [.] [0] [5] [2] [Enter]	
Press	[Stop]	；stop ACV Voltage full scale calibration

8.2.2 DCV Calibration

Connection a DCV HI voltage meter into HI – POT tester

Press	[Down] key to display.	
Display	Cal DCV 6kV Offset 0.050kV	；DCV Voltage offset.
Press	[Off] key to display.	
Display	STEP-01 0.0s 0.050kV WDC 0.500mA	
Press	[Stop] [Test]	；read out the HV meter value ；example 0.062kV
Press	[0] [.] [0] [6] [2] [Enter]	
Press	[Stop]	；stop DCV Voltage offset calibration
Press	[Down] to display	
Display	Cal DCV 6kV Full 4.000kV	；DCV Voltage full scale
Press	[Off] key to display.	
Display	STEP-01 0.0s 4.000kV WDC 0.500mA	
Press	[Stop] [Test]	；read out the HV meter value ；example 4.052kV
Press	[4] [.] [0] [5] [2] [Enter]	
Press	[Stop]	；stop DCV Voltage full scale calibration

8.2.3 IR voltage Calibration（IR option）

Connection a DCV HI voltage meter into HI – POT tester

Press	[Down] key to display.	
Display	Cal IRV 1kV Offset 0.050kV	；IR Voltage offset
Press	[Off] key to display.	
Display	STEP-01 0.0s 0.050kV IR 1.0MΩ	
Press	[Stop] [Test]	; read out the HV meter value ；example 0.062kV

Press	[0] [.] [0] [6] [2] [Enter]	
Press	[Stop]	; stop IR voltage offset calibration
Press	[Down] key to display	
Display	Cal IRV 1kV Full 1.000kV	; IR Voltage full scale.
Press	[Off] key to display.	
Display	STEP-01 0.0s 1.000kV IR 1.0MΩ	
Press	[Stop] [Test]	; read out the HV meter value ; example 1.052kV
Press	[1] [.] [0] [5] [2] [Enter]	
Press	[Stop]	; stop IR voltage full scale calibration

8.3 Current Calibration

L Caution

The dummy load must be between HI-POT HI terminal and ammeter input terminal. If reverse, dangerous may be happen.

8.3.1 AC Current Calibration

Connection **a dummy load resistor 10Mohm** between HI-POT HI terminal into AC ammeter input HI terminal, connection HI-POT LO terminal into AC ammeter input LO terminal.

Press	[Down] key to display.	
Display	Cal ACA 3mA Offset 0.120mA	; ACA 2.99mA range offset
Press	[Off] key to display.	
Display	STEP-01 0.0s 1.200kV WAC 2.999mA	
Press	[Stop] [Test]	; read out the ammeter value ; example 0.124mA
Press	[0] [.] [1] [2] [4] [Enter]	
Press	[Stop]	; stop ACA 2.99mA range offset calibration
	change the dummy load resistor to 420kohm 50watt or more	
Press	[Down] to display	
Display	Cal ACA 3mA Full 2.500mA	; ACA 2.99mA range full scale.
Press	[Off] key to display.	
Display	STEP-01 0.0s 1.200kV WAC 2.999mA	

Press	[Stop] [Test]	; read out the ammeter value ; example 2.903mA
Press	[2] [.] [9] [0] [3] [Enter]	
Press	[Stop]	; stop ACA 2.99mA range full scale calibration
Press	[Down] to display.	
Display	Cal ACA 40mA Offset 2.50mA	; ACA 40.0mA range offset.
Press	[Off] key to display.	
Display	STEP-01 0.0s 1.200kV WAC 30.00mA	
Press	[Stop] [Test]	; read out the ammeter value ; example 2.903mA
Press	[2] [.] [9] [0] [3] [Enter]	
Press	[Stop]	; stop ACA 40.0mA range offset calibration

change the **dummy load resistor to 50kohm 200watt** or more

Press	[Down] to display.	
Display	Cal ACA 40mA Full 2.50mA	; ACA 40mA range full scale.
Press	[Off] key to display.	
Display	STEP-01 0.0s 1.200kV WAC 30.00mA	
Press	[Stop] [Test]	; read out the ammeter value ; example 24.50mA
Press	[2] [4] [.] [5] [0] [Enter]	
Press	[Stop]	; stop ACA 40mA range full scale calibration

8.3.2 DC Current Calibration

Connection **a dummy load resistor 10Mohm** between HI-POT HI terminal into DC ammeter input HI terminal, connection HI-POT LO terminal into DC ammeter input LO terminal.

Press	[Down] key to display.	
Display	Cal DCA 3mA Offset 0.120mA	; DCA 2.99mA range offset.
Press	[Off] key to display.	
Display	STEP-01 0.0s 1.200kV WDC 2.999mA	
Press	[Stop] [Test]	; read out the ammeter value ; example 0.124mA

Press [0] [.] [1] [2] [4] [Enter]
Press [Stop] ; stop DCA 2.99mA range offset calibration

change **t e dummy load resistor to 420 ohm 50watt** or more

Press [Down] to display
Display Cal DCA 3mA Full 2.500mA ; DCA 2.99mA range full scale.

Press [Off] key to display.
Display STEP-01 0.0s
1.200kV WDC 2.999mA

Press [Stop] [Test] ; read out the ammeter value
; example 2.903mA
Press [2] [.] [9] [0] [3] [Enter]
Press [Stop]
; stop DCA 2.99mA range full scale calibration

Press [Down] to display.
Display Cal DCA 12mA Offset 2.50mA ; DCA 12.0mA range offset.
Press [Off] key to display.
Display STEP-01 0.0s
1.200kV WDC 12.00mA
Press [Stop] [Test] ; read out the ammeter value
; example 2.903mA
Press [2] [.] [9] [0] [3] [Enter]
Press [Stop] ; stop DCA 12.0mA range offset calibration

change **the dummy load resistor to 120kohm 100watt** or more

Press [Down] to display.
Display Cal DCA 12mA Full 10.00mA ; DCA 12.0mA range full scale.

Press [Off] key to display.
Display STEP-01 0.0s
1.200kV WDC 12.00mA
Press [Stop] [Test] ; read out the ammeter value
; example 10.02mA
Press [1] [0] [.] [0] [2] [Enter]
Press [Stop] ; stop DCA 12.0mA range full scale calibration

8.4 Grounding Calibration

Connection a 4 terminal 0.1 ohm 200Watts or more resistor into unknown sense and driver, driver section with a up to 30Amp ammeter.

Press	[Down] key to display.	
Display	Cal GRA 30A Offset 3.00A	; Grounding Current offset.
Press	[Off] key to display.	
Display	STEP-01 0.0s 3.00A GR 200.0mΩ	
Press	[Stop] [Test]	; read out the ammeter value ; example 2.897Amp
Press	[2] [.] [8] [9] [7] [Enter]	
Press	[Stop]	; stop ACA offset calibration
Press	[Down] key to display	
Display	Cal GRA 30A Full 25.00A	; Grounding Current full scale
Press	[Off] key to display.	
Display	STEP-01 0.0s 25.00A GR 200.0mΩ	
Press	[Stop] [Test]	; read out the ammeter value ; example 24.87Amp
Press	[2] [4] [.] [8] [7] [Enter]	
Press	[Stop]	; stop ACA full scale calibration

Connection a AC voltage meter to sense HI and LO

Press	[Down] key to display.	; Grounding Voltage offset
Display	Cal GRA 8V Offset 0.300V	; 3.0 Amp into 100mohm
Press	[Off] key to display.	
Display	STEP-01 0.0s 300A GR 200.0mΩ	
Press	[Stop] [Test]	; read out the voltmeter value ; example 0.342 volts
Press	[0] [.] [3] [4] [2] [Enter]	
Press	[Stop]	; stop ACA offset calibration
Press	[Down] key to display	; Grounding Voltage full scale
Display	Cal GRA 8V Full 3.000V	; 30Amp into 100mohm

Press	[Off] key to display.	
Display	STEP-01 0.0s 30.00A GR 200.0mΩ	
Press	[Stop] [Test]	; read out the ammeter value ; example 3.402 volts
Press	[3] [.] [4] [0] [2] [Enter]	
Press	[Stop]	; stop ACA full scale calibration

8.5 Withstanding Voltage mode ARCing Calibration

L Caution

1. ARCing calibration is very special, the high voltage terminal are in out side.

2. Please contact your local agent for more detail description.

Press	[Down] key to display.	; WAC arcing sensitivity calibration
Display	Cal AC ARC 40mA 5.00mA	; WAC hipot ARCing
Press	[Off] key to display.	
Display	STEP-01 0.0s 1.250 kV WAC 10.00mA	
Press	[Stop] [Test]	; change the arcing value to happen ; ARCing NG, the value range from ; 0.1 to 9.9 for arcing calibration ; dummy load is 250kΩ 5watts resistor ; wiring as left.
Press	[1] [.] [2] [Enter]	; example set 1.2 ARCing happen NG.
Press	[Stop]	; stop WAC ARCing calibration
Press	[Down] key to display.	; WDC arcing sensitivity calibration
Display	Cal DC ARC 20mA 5.00mA	; WDC hipot ARCing
Press	[Off] key to display.	
Display	STEP-01 0.0s 1.250 kV WDC 10.00mA	
Press	[Stop] [Test]	; change the arcing value to happen ; ARCing NG, the value range from ; 0.1 to 9.9 for arcing calibration ; dummy load is 250kΩ 5watts resistor ; wiring as left
Press	[1] [.] [2] [Enter]	; example set 1.2 ARCing happen NG.
Press	[Stop]	; stop WDC ARCing calibration

8.6 Insulation Resistance Mode Resistor Calibration

Connection a dummy load resistor between HI-POT HI terminal into AC ammeter input HI terminal, connection HI-POT LO terminal into AC ammeter input LO terminal.

CL rnG0 1.00 GΩ irr ; resistor of IR to 1GΩ
CL rnG1 100.0 MΩ irr ; resistor of IR to 100.0MΩ
CL rnG2 10.0 MΩ irr ; resistor of IR to 10.0MΩ
CL rnG3 10.0 MΩ irr ; resistor of IR to 10.0MΩ

Change the dummy load resistor to 1GΩ.

Press [Down] key to display. ; resistor of IR to 1GΩ
Display Cal IRR Range0
1.00GΩ
Press [Off] key to display.
Display STEP-01 0.0s
0.250kV IR 1.0MΩ
Press [Stop] [Test] ; read the irr value.
; example 1GΩ
Press [1] [0] [0] [0] [enter]
Press [Stop] ; stop rnG0 range calibration.

Change the dummy load resistor to 100MΩ.

Press [Down] key to display.
Display Cal IRR Range1 ; resistor of IR to 100.0MΩ
100.0MΩ
Press [Off] key to display.
Display STEP-01 0.0s
0.500kV IR 1.0MΩ
Press [Stop] [Test] ; read the irr value.
; example 100.0MΩ
Press [1] [0] [0] [enter]
Press [Stop] ; stop rnG1 range calibration.

Change the dummy load resistor to 10MΩ

Press [Down] key to display.
Display Cal IRR Range2
10.0MΩ
; resistor of IR to 10.0MΩ
Press [Off] key to display.
Display STEP-01 0.0s
0.500kV IR 1.0MΩ

Press [Stop] [Test] ；read the irr value.
；example 10.0MΩ
Press [1] [0] [enter]
Press [Stop] ；stop rnG2 range calibration.

Change the dummy load resistor to 10MΩ

Press [Down] key to display.
Display Cal IRR Range3 ；resistor of IR to 10.0MΩ
10.0MΩ
Press [Off] key to display.
Display STEP-01 0.0s
1.000kV IR 1.0MΩ
Press [Stop] [Test] ；read the irr value.
；example 10.0MΩ
Press [1] [0] [enter]
Press [Stop] ；stop rnG3 range calibration.

8.7 Leakage Current mode Leakage Current Meter Calibration（Option）

Connection a AC Voltage Source, AC Source terminals into HI-POT L-in and Driver-terminals.
Press [Down] key to display.
Display Cal LC 1V Offset ；LC Leakage Current 1V range OFFSET point
0.08V
Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
Disable LC 599.0uA
Press [Stop] [Test]
Set AC Voltage Source 0.08V and output ON
Press [0] [.] [0] [8] [Enter] ；example AC Source output 0.08V
Set AC Source Output Off
Press [Stop]
Press [Down] key to display.
Display Cal LC 1V Full ；LC Leakage Current 1V range FULL point
0.8V
Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
Disable LC 599.0uA
Press [Stop] [Test]
Set AC Voltage Source 0.8V and output ON

Press [0] [.] [8] [Enter] ；example AC Source output 0.8V
Set AC Source Output Off
Press [Stop]
Press [Down] key to display.
Display Cal LC 10V Offset ；LC Leakage Current 10V range OFFSET point
0.8V
Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
Disable LC 6.000mA
Press [Stop] [Test]
Set AC Voltage Source 0.8V and output ON
Press [0] [.] [8] [Enter] ；example AC Source output 0.8V
Set AC Source Output Off
Press [Stop]
Press [Down] key to display.
Display Cal LC 10V Full ；LC Leakage Current 10V range FULL point
8V
Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
Disable LC 6.000mA
Press [Stop] [Test]
Set AC Voltage Source 8V and output ON
Press [8] [Enter] ；example AC Source output 8V
Set AC Source Output Off
Press [Stop]

8.8 Leakage Current mode Power Meter Calibration （Option）

8.8.1 Voltage Meter Calibration

Connection a AC Voltage Source, AC Source terminals into HI-POT L-in and N-in terminals.

Press [Down] key to display.
Display Cal LCV 300V Offset ；LC Voltage OFFSET point
20V

Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
Disable LC 6.000mA

Press [Stop] [Test]
Set AC Voltage Source 20V and output ON
Press [2] [0] [Enter] ；example AC Source output 20V
Set AC Source Output Off
Press [Stop]
Press [Down] key to display.
Display Cal LCV 300V Full ；LC Voltage FULL point
200V

Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
Disable LC 6.000mA
Press [Stop] [Test]
Set AC Voltage Source 200V and output ON
Press [2] [0] [0] [Enter] ；example AC Source output 200V
Set AC Source Output Off
Press [Stop]

8.8.2 Current Meter Calibration

Connection a AC Current Source, AC Source terminals into HI-POT N-in and N-out terminals.

Press [Down] key to display.
Display Cal LCA 1A Offset ；LC Current OFFSET point
0.08A

Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
0.900A LC 6.000mA

Press [Stop] [Test]

Set AC Voltage Source 0.08A and output ON
Press [0] [.] [0] [8] [Enter] ；example AC Source output 0.08A
Set AC Source Output Off
Press [Stop]
Press [Down] key to display.
Display Cal LCA 1A Full ；LC Current FULL point
0.8A
Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
0.900A LC 6.000mA

Press [Stop] [Test]
Set AC Voltage Source 0.8A and output ON
Press [0] [.] [8] [Enter] ；example AC Source output 0.8A

Set AC Source Output Off
Press [Stop]
Press [Down] key to display.
Display Cal LCA 10A Offset ；LC Current OFFSET point
0.8A
Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
10.00A LC 6.000mA
Press [Stop] [Test]
Set AC Current Source 0.8A and output ON
Press [0] [.] [8] [Enter] ；example AC Source output 0.8A
Set AC Source Output Off
Press [Stop]
Press [Down] key to display.
Display Cal LCA 10A Full ；LC Current FULL point
8A
Press [Off] key to display.
Display STEP-01 D1 LO 0.0s
10.00A LC 6.000mA
Press [Stop] [Test]
Set AC Current Source 8A and output ON
Press [8] [Enter] ；example AC Source output 8A
Set AC Source Output Off
Press [Stop]

8.9 Finish Calibration

Press [Enter] [7] [9] [3] [1]
Display CAL OFF / CAL ON / CAL TEST
CAL OFF ：calibration data install zero.
CAL ON ：calibration finish, in normal operation.
CAL TEST ：into calibration procedure.
Press [Off] to change CAL OFF / CAL ON / CAL TEST
Display CAL ON ：calibration finish, in normal operation.
Press [Prog] to FINISH calibration
Press the lock switch, stick the calibration label or other paper to finish this process.

9. Maintenance

9.1 General

Our warranty（at the front of the manual）attests the quality of materials and workmanship in our products. If malfunction should be suspected, or other information be desired applications engineers are available for technical assistance. Application assistance is available in the Taiwan by calling 886-2-22983855 and asking for Applications support. For support outside of the Taiwan please contact your local **Chroma** distributor.

9.2 Batteries Replacement

Batteries are included in the tester. Please contact the service center for battery replacement.

Note：Do not open the cover of the equipment for battery replacement by yourself.

9.2.1 Batteries Rating

1. Type designation ：CR2/38.L
2. Nominal voltage ：3V
3. Typical capacity ：1800mAH（Rated capacity at 200uA to 20℃）
   (End-point voltage：2.0V)

9.4 Error Message

Display	Message
Error Code：100 Time Error	Timer of CPU is Error
Error Code：101 Can Not Get LF	Can not get the line frequency
Error Code：102 Fail Signal Error	Can not clear the NG-Signal
Discharging… X.XXX kV	The number of A/D is over 42V

Note 1：This tester is overweight, please use wheelbarrow to avoid injuring.

Note 2：If tester no output, please open upper cover, check Amplifier of fuse （F1/F2）whether been burned.

（Amp fuse rating：7A/250V slow F1/F2）