Ground Bond Tester

19572

Quick Start Guide

Chroma

www.chromaate.com

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CHROMA ATE INC.
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Material Contents Declaration

The recycling label shown on the product indicates the Hazardous Substances contained in the product as the table listed below.


: See **<Table 1>**.


: See **<Table 2>**.

<Table 1>

Part Name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls	Polybromodiphenyl Ethers
	Pb	Hg	Cd	Cr^{6+}	PBB	PBDE
PCBA	O	O	O	O	O	O
CHASSIS	O	O	O	O	O	O
ACCESSORY	O	O	O	O	O	O
PACKAGE	O	O	O	O	O	O

“O” indicates that the level of the specified chemical substance is less than the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

“×” indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

Disposal

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new one, the retailer is legally obligated to take back your old appliances for disposal at least for free of charge.

<Table 2>

Part Name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls	Polybromodiphenyl Ethers
	Pb	Hg	Cd	Cr^{6+}	PBB	PBDE
PCBA	×	O	O	O	O	O
CHASSIS	×	O	O	O	O	O
ACCESSORY	×	O	O	O	O	O
PACKAGE	O	O	O	O	O	O

"O" indicates that the level of the specified chemical substance is less than the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

"×" indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

1. Chroma is not fully transitioned to lead-free solder assembly at this moment; however, most of the components used are RoHS compliant.
2. The environment-friendly usage period of the product is assumed under the operating environment specified in each product's specification.

Disposal

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new one, the retailer is legally obligated to take back your old appliances for disposal at least for free of charge.

Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or specific WARNINGS given elsewhere in this manual will violate safety standards of design, manufacture, and intended use of the instrument. *Chroma* assumes no liability for the customer's failure to comply with these requirements.

BEFORE APPLYING POWER
Verify that the power is set to match the rated input of this power supply.

PROTECTIVE GROUNDING
Make sure to connect the protective grounding to prevent an electric shock before turning on the power.

NECESSITY OF PROTECTIVE GROUNDING
Never cut off the internal or external protective grounding wire, or disconnect the wiring of protective grounding terminal. Doing so will cause a potential shock hazard that may bring injury to a person.

FUSES
Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuse holders. To do so could cause a shock or fire hazard.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE
Do not operate the instrument in the presence of flammable gases or fumes. The instrument should be used in an environment of good ventilation.

DO NOT REMOVE THE COVER OF THE INSTRUMENT
Operating personnel must not remove the cover of the instrument. Component replacement and internal adjustment can be done only by qualified service personnel.

Safety Symbols

	**DANGER –** High voltage.
	**Explanation:** To avoid injury, death of personnel, or damage to the instrument, the operator must refer to an explanation in the instruction manual.
	**High temperature:** This symbol indicates the temperature is now higher than the acceptable range of human. Do not touch it to avoid any personal injury.
	**Protective grounding terminal:** To protect against electrical shock in case of a fault. This symbol indicates that the terminal must be connected to ground before operation of equipment.
⚠WARNING	The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.
CAUTION	The **CAUTION** sign denotes a hazard. It may result in personal injury or death if not noticed timely. It calls attention to procedures, practices and conditions.
Notice	This indicates important information or tips for the procedures and applications, etc. The contents should be read carefully.

Storage, Freight, Maintenance & Cleaning

Storage
When don't use the device, please pack it properly and store under a good environment. (The packing is no needed when the device under appropriate environment.)

Freight
Please use the original packing material when move the device. If the packing material is missing, please use the equivalent buffer material to pack and mark it fragile and waterproof etc to avoid the device damage during movement. The device belongs to precise equipment, please uses qualified transportation as possible. And avoid heavy hitting etc to damage the device.

Maintenance
There is no maintenance operation for the general user. (Except for the note in the manual.) Please contact our company or agent when the device occurred the user judgment abnormal. Don't maintain by yourself to avoid occurred unnecessary danger and serious damage to the device.

Cleaning
Remove all connected wires and cables on the instrument before cleaning. Use a brush gently to clean the dust on it. For internal cleaning, use a low-pressure air gun to vacuum the dust inside or send it back to the distributors or agents of Chroma for cleaning.

Table of Contents

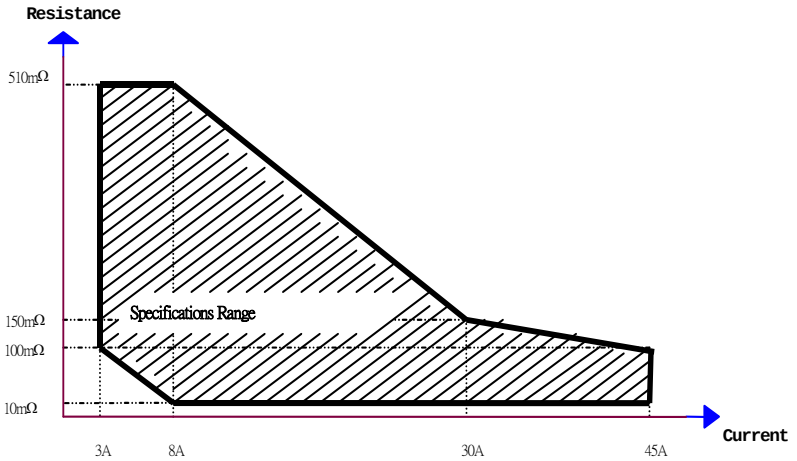
1. Introduction

1.1 An Overview of Product

This automatic ground bond tester is designed to test ground resistance automatically for electrical machinery and electronic devices. For ground resistance, its test range is from 0~140mΩ, under 10A can up to 510 mΩ. The output test current range is 3~45A can be set arbitrarily.

1.2 Specifications (18°C ~ 28°C RH ≤ 70%)

❑ **Ground Bond Tester**	
❑ Output Current	3.00 ~ 45.0A AC (Note1, 2).
❑ Resolution	3.00A ~ 30.00A 0.01A 30.1A ~ 45.0A 0.1A
❑ Accuracy	± (1.5% of setting + 0.5% of full scale)
❑ Output Frequency	50Hz, 60Hz
❑ Accuracy	± 0.1%
❑ Current Meter	0.01 ~ 45.0A
❑ Resolution	3.00A ~30.00A 0.01A 30.1A ~ 45.0A 0.1A
❑ Accuracy	± (1.5% of reading + 0.5% of full scale)
❑ Resistance Range	0.1 ~ 510.0mΩ (Note 2)
❑ Resolution	(R display counts/ I display counts) ≥ 0.2, Resolution: 1mΩ (R display counts/ I display counts) < 0.2, Resolution: 0.1mΩ
❑ Accuracy (Note 3)	± (2% of reading + 0.5% of full scale), Detail Spec. Range



❑ Limit Value Setting	HI – LIMIT: 0.1 ~ 510.0mΩ LOW–LIMIT: OFF, 0.1mΩ ~ HI – LIMIT Value, 510.0mΩ MAX.
❑ Offset Function	
❑ Offset Range	0 ~ 100.0mΩ
❑ Test Time	0.5 ~ 999.0 sec. Continue (Note 2)
❑ Resolution	0.1sec
❑ Memory Storage	
❑ Memories, Steps	10 steps or 99 groups for total 500 memory locations
❑ Ambient Temperature and Relative Humidity	
❑ Specifications Range	18 to 28°C (64 to 82°F), ≤ 70% RH.
❑ Operable Range	Maximum relative humidity 80% for temperature up to 31°C (88°F). Decreasing linearly to 50% relative humidity at 40° C (104°F) Altitude up to 2000m. Indoor use only. Pollution degree 2
❑ Storage Range	-10 to 60°C (-14 to 140°F), ≤ 90% RH.
❑ Installation Category	CAT II
❑ Power Requirement	
❑ Line Voltage	AC 100V, 120V, 220V ± 10%, 240V -10% ~ +5%
❑ Frequency	50 or 60 Hz

❑ Power Consumption	No load: < 100VA, With rated load: 880W MAX.
❑ Dimension	320W x 105H x 400D mm
❑ Weight	< 16 kg.
❑ Safety	
❑ Ground Bond	Less than 100mΩ at 25Amp, 2sec
❑ Hipot	Less than 5mA at 1.8kVac, 3sec
❑ Insulation Resistance	Over 20MΩ at 500V 3sec
❑ Line Leakage Current	Less than 3.5mA at 127V, 2sec, normal, reverse

1.3 Standard Accessory

Item	Q'ty	Description
Power cord	1	90° elbow USA-type power cord, length 1.8m
3P – 2P adapter	1	USA-type power cord 3P – 2P adapter
GB test cable	1	The cable used for GB test, wire length 1m – Max. 45A (one pair, 2 of cables in total).
10A fuse	1	10A SLOW 110VAC used
5A fuse	1	5A SLOW 240VAC used
Quick Start Guide	1	Chinese/English
User's Manual CD-ROM	1	Chinese/English

1.4 Initial Inspection

Before shipment, this instrument was inspected and found to be free of mechanical and electrical defects. As soon as the instrument is unpacked, inspect for any damage that may have occurred in transit. Save all packing materials in case that the instrument has to be returned. If damage is found, please file claim with carrier immediately. Do not return the instrument to Chroma without prior approval.

2. Notices before Using

Please read through the notices described in this chapter and memorize them to prevent any accidents from happening.

■ **Induction and electric shock**

To avoid electric shock, please check the power of the tester related settings and descriptions firstly before operating the tester.

■ **Grounding**

There is a safety grounding terminal at the instrument rear panel. Please use appropriate test leads and tools to connect the grounding terminal surely. If it is not grounding correctly, the chassis of test machine may contain high voltage when the power circuit or the connecting line of any devices short-circuited with the grounding terminal. This is very dangerous as it may cause electric shock if anyone touches the instrument under the circumstances. Therefore, it is necessary to connect the safety grounding terminal to earth correctly.

■ **Remote control system**

This system is capable of remote control. Usually it uses control signal of rear panel coordinating with HI-POT series model (such as 1905X, 1907X) to do the high voltage output control. For your safety and to prevent accidents, the following principles of control must be performed accurately.

- Do not allow any unexpected high voltage output to cause any hazards.
- When the system has high voltage output, operators and other personnel are not allowed to touch the DUT, test cable and probe and output terminal, etc.

■ **Turn the power switch on or off ※ Caution ※**

The product should be so positioned that the power switch can be easily reached by the operator during emergency. Once the power switch is cut off, wait a few seconds to turn it on again. Do not turn on/off the power switch repeatedly to avoid causing any errors.

■ **Miscellaneous notices**

Do not short circuit the instrument output line, grounding line, transmission line, or other connector grounding line, and AC source to avoid the entire test device being charged to a very dangerous voltage.

If the tester is under full load output for a long period, the bottom partial site of the tester may be high temperature over 50°C. Before moving the tester, please power the tester off firstly as well as confirm the bottom site of the tester decrease to below 30°C for avoiding the danger of burning.

■ **Installation notices**

When installs or operates the tester, the ventilation holes should be at least 10cm from wall to keep adequate ventilation.

<<< Emergency Events >>>

■ **Emergency management**

In the emergency situations of electric shock, DUT on fire or system on fire, follow the steps below to avoid causing bigger hazards.

- First, cut off the power switch.
- Then, unplug the power cord.

■ **DANGER indicator failure**

If you press the [START] button and the current meter shows readings but the DANGER indicator is still off, it means the indicator may be failure. Turn the instrument off and replace it immediately, then return the malfunction device to Chroma or dealer for repair and services.

■ **There are four types of AC INPUT power source used in this instrument**

Switch the voltage selector on the rear panel to the correct position according to the voltage used locally. Ensure the AC power source is same as marked on the power switch that located on the rear panel, and the fuse is changed to the appropriate one when plug in the power cord. Following table lists the fuses for the voltage used:

Mark	Center Voltage	Range	Fuse
100	100V	90V ~ 110V	10A Slow/250V
120	120V	110V ~ 130V	10A Slow/250V
220	220V	200V ~ 240V	5A Slow/250V
240	240V	220V ~ 250V	5A Slow/250V

The fuse should conform to the voltage used and replace it when the power cord is unplugged to avoid electric shock. Use a flat screwdriver to pull open the fuse holder inside the power socket, remove the existing

fuse and insert the new one, then plug in the power cord.

⚠WARNING Be sure to use correct fuse when changing it, or it may cause danger easily.

■ **This instrument operates in AC power source**

If the power source is unstable in the range selected, it may cause the instrument to act abnormally or inaccurately. Please use appropriate equipment such as power regulator to convert it to applicable power source.

■ **Storage**

The normal temperature range is 0°C ~ 40°C, 80% RH. The operation may incorrect if over the range. The storage temperature is –10ºC ~ 60°C, 90% RH. If you are not planning to use it for a long period of time, pack it with the original box for storage. For the sake of correct test and safety of this instrument, make sure not to store it in a place with direct sunlight or high temperature, also away from shaky, damp and dusty area.

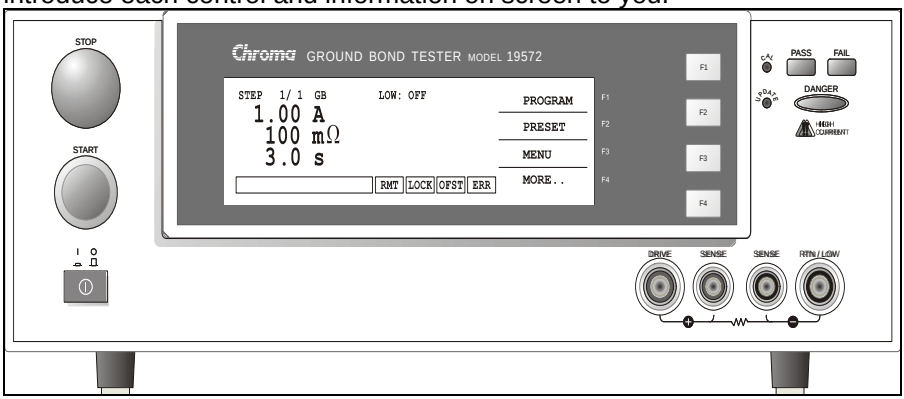
■ **Warming up**

This instrument activates at power on; however, in order to meet the accuracy specified in the specification, please warm it up for 15 minutes or above.

3. Panel Description

3.1 Front Panel

Front panel includes several function areas easy to use. This chapter will introduce each control and information on screen to you.



Display Area

Function Key: There are different function descriptions under different screens. The corresponding function keys (F1-F4) are at the right side of display. If the description part is blank, it means the corresponding function key is invalid.

Status List: It indicates setting method, setting value range, test result fail status.

RMT : If RMT is highlighted, it means the main machine under Remote state. The main machine is controlled by PC through GPIB/RS232 connection line. All of keys are loss function except for [STOP], [Local] and [MORE..].

LOCK : If LOCK is highlighted, it means the main machine under setting parameter protection state. All of modes can't enter except for three modes – "MEMORY", "TEST" and "KEY LOCK".

OFST : If OFST is highlighted, it means the tester zeroed the resistance of test lead.

ERR : If ERR is highlighted, it means there are unclear errors in error queue.

DANGER LED: The test status indicator. When LED is light, it means the tester is under testing status. Don't touch the test terminal when there is high voltage or mass current output.
PASS LED : Pass indicator. DUT judged as pass when the LED is lit.
FAIL LED : Fail indicator. DUT judged as fail when the LED is lit. Cut off the output of main machine when DUT judged as fail. The LED is still lighting until press [STOP].

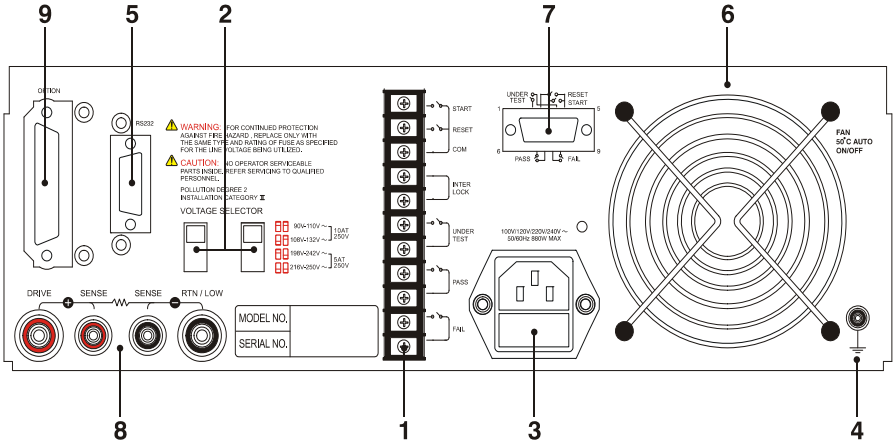
Keypad Area

Power Switch : The power switch provides AC source the tester needed.
STOP Key : Reset key, after pressing this key the main machine return to standby test status immediately. That is cut off output and clears all of judgments simultaneously.
START Key : After pressing this key, the main machine is under test. The test terminal has output and each judgment function start simultaneously.
Cal-Enable : Calibration switch. This key is only for calibration before exiting factory. A non-professional personnel using this function is prohibited or may cause the product malfunction.
UPDATE : This key is for updating the program before exiting from the factory. Non-professional is prohibited to use this function, or it may cause the tester malfunction.
Function Keys: Function keys F1 ~ F4, there are different functions under different display menus. The corresponding function keys are at the right side of display. If the description part is blank, it means the corresponding function key is invalid.

Terminal Area

Drive (+) : Positive electric potential of mass current output.
Sense (+) : The grounding impedance testing positive terminal.
Sense (-) : The grounding impedance test negative.
RTN/LOW : Common test terminal. It is mass current output negative terminal also is low potential terminal. This terminal is almost equivalent to chassis ground terminal.

3.2 Rear Panel



(1) REMOTE I/O PORT 1: The remote input/output port 1.

START : Start test signal input terminal.

STOP : Stop test signal input terminal.

INTER LOCK : Output high voltage only when this two terminals are short-circuited.

UNDER TEST : When the tester is under testing, this output terminal will be short-circuited. Control external signal by using this short condition. The junction specification 30V AC or 60V DC current is less than 0.3A action time. The tester is under testing until be stopped.

PASS : When the tester judge DUT as pass, this output terminal will be short-circuited. User specifies the time of short circuit. Control external signal by using this short circuit condition. The junction specification 30V AC or 60V DC current is less than 0.3A action time. The product judge as pass until is stopped.

FAIL : When the tester judge DUT as fail, this output terminal will be short-circuited. Control external signal by using this short circuit condition. The junction specification 30V AC or 60V DC current is less than 0.3A action time. The product judge as fail until is stopped.

(2) VOLTAGE SELECTOR: Input Power Range Switch

Change the tester inputted AC power. AC power by using has below four types.

a. 110V applicable voltage range 90 ~ 110V AC
b. 120V applicable voltage range 100 ~ 130V AC
c. 220V applicable voltage range 200 ~ 240V AC
d. 240V applicable voltage range 220 ~ 250V AC

As changing this power switch, please notice replacement of fuse.

(3) AC LINE: AC power socket and fuse holder.
A tri-cord power and fuse holder. Input AC power the tester needed from AC power socket. The detailed specification of using fuse, please refers “Chapter 2 – Notices before Using” or descriptions of rear panel in this manual.

(4) GROUND: Safety ground terminal, please use applicable implement to connect this ground terminal actually. If there is no grounded to earth actually, the circuit or other instruments connection line with ground terminal is short-circuit. The chassis of tester may exist high voltage. This is very dangerous, anyone touch the tester under the above state may cause shock hazard. Therefore, please be sure to connect safety ground terminal to earth.

(5) RS232 INTERFACE:
This socket is for RS232 interface. GPIB and RS232 interface can’t use simultaneously.

(6) FAN: The temperature controlled fan, as temperature reaches 50°C, fan opens automatically. When the temperature is lower than 45°C, fan stops automatically.

(7) REMOTE I/O PORT 2: The remote input/output port 2.
All functions of 9 pin D-Sub connector are the same as (1) Remote I/O port 1.

(8) Terminal Area of Rear Panel
The function of this area is the same as terminal area on front panel.

(9) OPTION INTERFACE
This interface is for the users to purchase GPIB CARD or PRINTER CARD. GPIB CARD can use computer by GPIB (IEEE 488-1978) interface to remote control and data transfer. PRINTER CARD can plug in CENTRONICS PORT printer with DOS support mode direct to print test parameters and results of the tester.

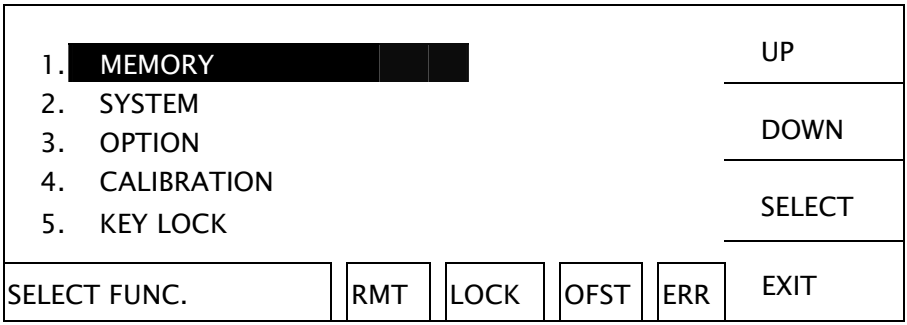
3.3 Notices and Procedures before Operation

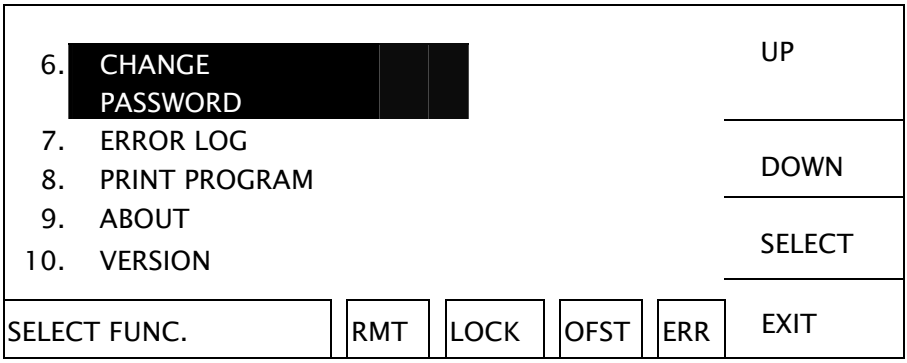
1. Before plug in AC power cord, please confirm power used is meeting to marked power on the rear panel firstly and power switch is OFF status.
2. Before power on, please peruse “Chapter 3 – Notices before Using” and memorize it.
3. When power on, the tester will self-test. If there is abnormal condition, please turn off switch and pull off power cord immediately.

3.4 SYSTEM Setup

3.4.1 How to Enter SYSTEM Menu

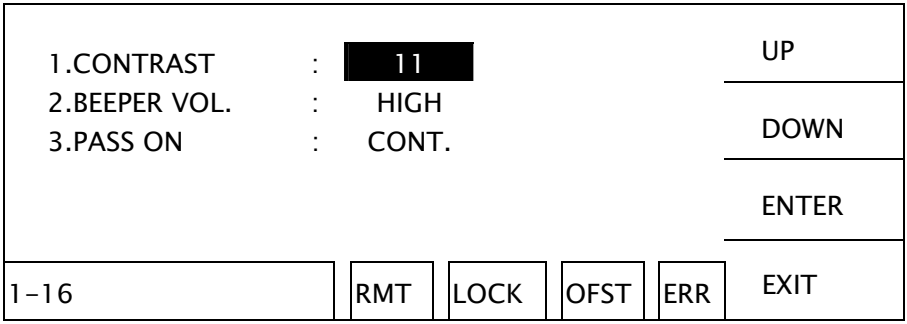
1. Under power on screen, press Function Key [MENU] to display the menu below:





2. Move the highlight to “SYSTEM” by using Function Key [UP], [DOWN].

Press Function Key [SELECT] to enter SYSTEM SETUP menu, display the menu below:



3.4.2 Operation Method

1. Enter SYSTEM SETUP screen, press function Key [ENTER] to move the highlight to the parameter you want to set.
2. Press function Keys [UP], [DOWN] to set this parameter.

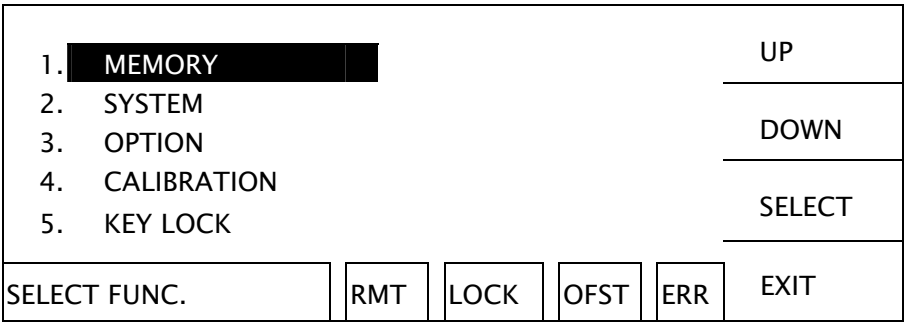
System parameter setting description table

Setting Item	Range	Initial Setting	Description
Contrast	1~16	7	Adjust LCD brightness
Beeper Vol.	LOW / MEDIUM / HIGH / OFF	HIGH	Adjust buzzer volume
Pass ON	0, 0.1 ~ 99.9 s (0: CONT.)	CONT.	When test result is PASS, set the time of “Pass Relay ON” on rear panel.

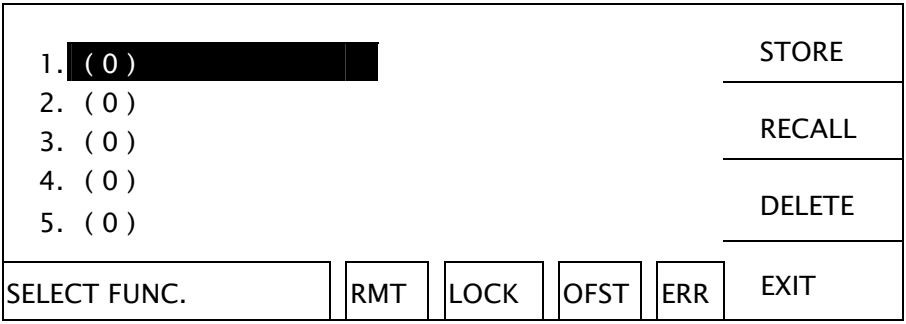
3.5 Memory Management

3.5.1 How to Enter Memory Process

1. In power on menu, press Function Key [MENU] to display the menu below:



2. Move the highlight to “Memory” by using Function Key [UP], [DOWN]. Press Function Key [SELECT] to enter Memory management mode and is shown as below menu.



3. At the same time, follows the instruction of Function Key can recall, store or delete this memory.
4. The value in ( ) means the test step numbers included in the memory.

3.5.2 Delete Memory

If you want to delete the test parameter stored in the memory. Please follow the procedures below to process.

1. When the status list shows “SELECT FUNC.”, press Function Key [DELETE].
2. By using Function Key [UP], [DOWN] to select the test parameter data of the memory which want to delete. Press Function Key [SELECT] will show a delete confirmation screen.

3. Press Function Key [YES] to confirm or press Function Key [NO] to cancel.

3.5.3 Recall Memory

If there are a lot of test parameter values in the main memory. Follow the below procedures to recall test parameter.

1. When the status list shows “SELECT FUNC.”, press Function Key [RECALL].
2. By using Function Key [UP], [DOWN] to select the test parameter data of the memory which want to recall.
3. Press Function Key [SELECT] will show a recall confirmation window.
4. Press Function Key [YES] to confirm or press Function Key [NO] to cancel.

3.5.4 Store Memory

If you want to store the test parameter set in the memory. Please follow the procedures below to process.

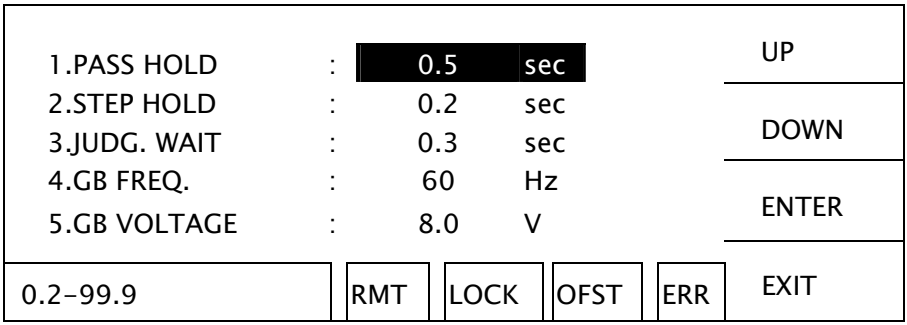
1. When the status list shows “SELECT FUNC.”, press Function Key [STORE].
2. By using Function Key [UP], [DOWN] to select the memory which want to store. Press Function Key [SELECT] the highlight becomes a blinking underline.
3. By using Function Key [UP], [DOWN] to input the memory name in the meantime.
4. By using Function Key [ENTER] to move the blinking underline highlight to the next position of character.
5. If press Function Key [ENTER] twice continuously, and then will show a store confirmation window.
6. Press Function Key [YES] to confirm or press Function Key [NO] to cancel.

   (Note: If there is data in the memory, it will be overlapped. Please confirm carefully before store.)

3.6 PRESET Setting

3.6.1 How to Enter PRESET Setting Menu

1. In power on menu, press Function Key [PRESET] then enter PRESET setting menu, the menu display as below:



3.6.2 Operation Method

1. After entering PRESET menu, move the highlight to the parameter you want to set by pressing [ENTER].
2. Press Function Keys [UP] or [DOWN] to set the parameter.

Test preset parameter functions table:

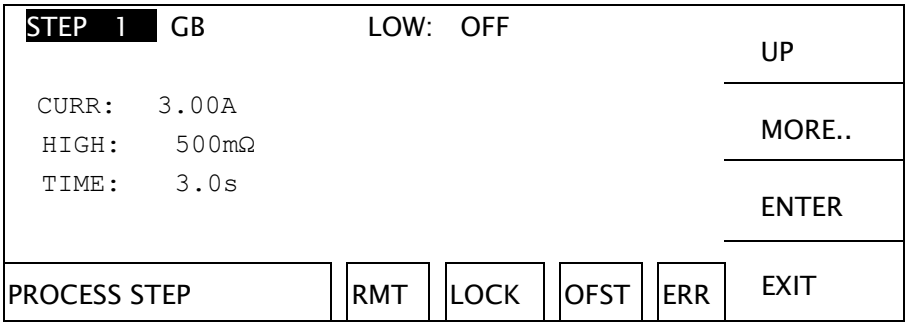
Setting Item	Range	Initial Setting	Description
PASS HOLD	0.2 ~ 99.9	0.5	When the test result is PASS, set the continuous time of buzzer beeps.
STEP HOLD	0 ~ 99.9 / 0 = KEY	0.2	Set interval time between test procedures. Key: Set test procedure interrupted (Please press [START] to continue when test stop.)
JUDG. WAIT	0.1 ~ 99.9	0.3	Set no judgment time
GB FREQ.	50/60	60	Set output voltage frequency when grounds continue testing.
GB	1 - 8	8	Set output voltage when grounds

VOLTAGE			continue testing.
SOFT. AGC	ON/OFF	ON	Set if software auto gain compensation function is open.
FAIL CONT.	ON/OFF	OFF	Set if continue the next step after happening NG.
SCREEN	ON/OFF	ON	Set if show the test screen.
SMART KEY	ON/OFF	OFF	Set if open the function of parameter memory.
START WAIT	0-99.9/0=OFF	OFF	Set the waiting time of starting test.
PART NO.	Maximum 13 characters	NONE	Set the part number of the product.
LOT NO.	Maximum 13 characters	NONE	Set the lot number of the product.
SERIAL NO.	Maximum 13 characters	NONE	Set the serial number of the product, * means universal character. The minimum is 5 characters, and can't all be *.

3.7 PROGRAM Setting

3.7.1 Test Procedure Setting

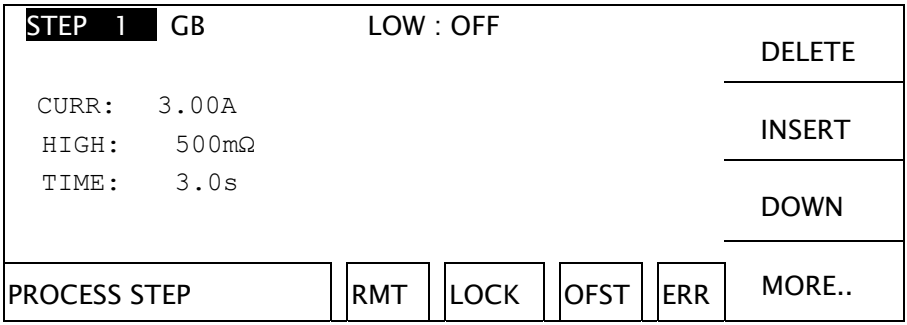
1. In power on menu, press Function Key [PROGRAM] then enter PROGRAM setting menu, the menu display as below:



2. Enter PROGRAM setting menu, the test procedures increase by using Function Key [UP], the range is from 1~99.
3. Press [ENTER] to move the highlight to the other parameter want to

set.

4. Can switch Function Key menu by using Function Key [MORE..], as shown below:



5. By using Function Key [DOWN] can decrease the test step want to set, the range is 1~99.
6. By using Function Key [DELETE] and [INSERT] can delete and insert a test step.
7. Press Function Key [MORE..] can return to the previous Function Key menu, and continue to set the other test parameter.

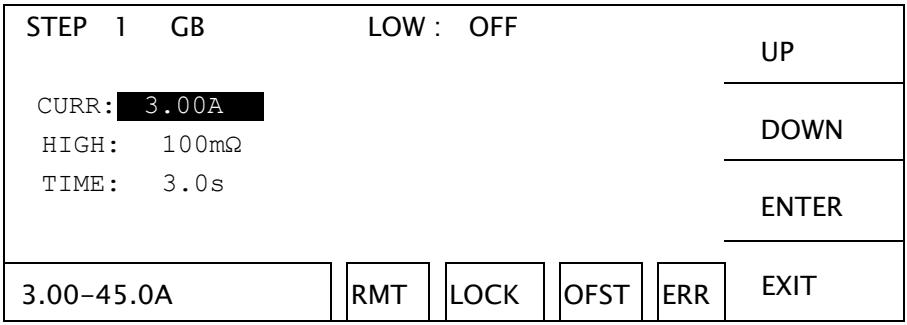
3.7.2 Operation Method

1. Enter PROGRAM setting menu, move the highlight to the parameter you want to set by pressing [ENTER].
2. Press Function Key [UP] or [DOWN] to set the parameter.

3.7.3 Each Parameter Setting Data Description

The following are the parameter setting data of each test mode.

Ground resistance test mode (GB)



CURR: It sets ground resistance test needed current.

Note: Because the test current multiply the high limit of resistance can't more than 6.3V. High limit of resistance will be auto modify to adaptable value when it isn't correspondence with the above condition.

HIGH: It sets ground resistance high limit value, the value is 510mΩ or minor value in 6.3V/ CURRENT.

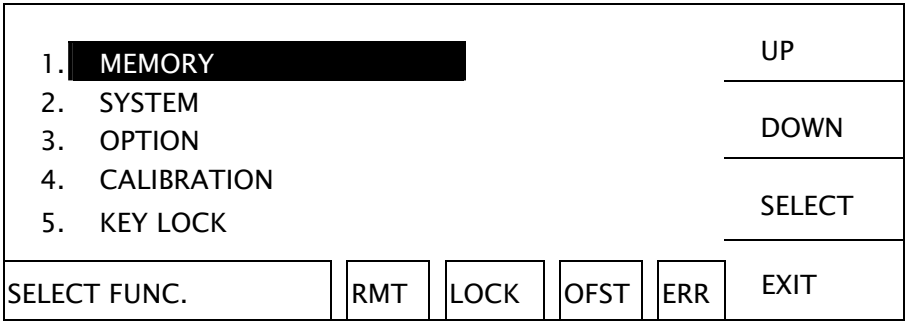
LOW: It sets ground resistance low limit value, the value is less than high limit value of ground resistance or OFF.

TIME: It sets test needed time, input 0 means continuous test.

3.8 KEY LOCK Function

3.8.1 KEY LOCK Setting

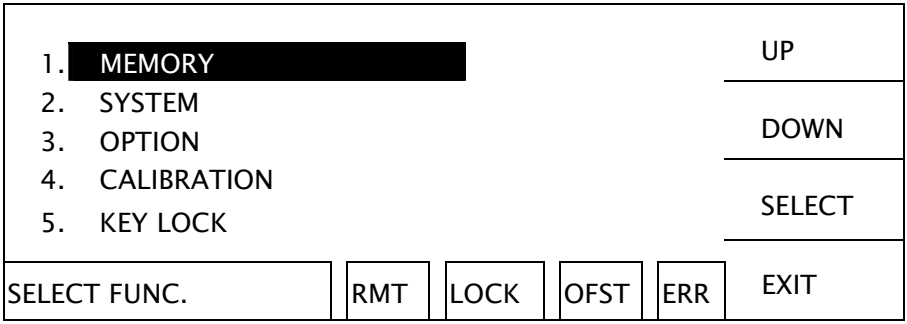
1. In Power On Menu, you can set KEY LOCK if "LOCK" is not highlighted.
2. Press Function Key [MENU], the menu shown below.



3. Use Function Key [UP] and [DOWN] to move the highlight to “KEY LOCK”, and press Function Key [SELECT] to enter KEY LOCK setting menu.
4. Use Function Key [A] and [B] to input the PASSWORD (default is AAAA.)
5. Press [ENTER] will prompt a selection window, and “LOCK” is highlighted. The user can press Function Key [YES] or [NO] to select if lock the MEMORY RECALL function as well.

3.8.2 Canceling KEY LOCK

1. In Power On Menu, you can release KEY LOCK if ”LOCK” is highlighted.
2. Press Function Key [MENU], the menu shown below:

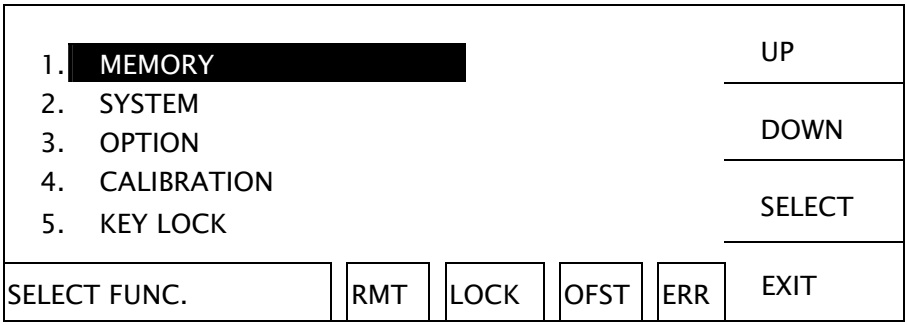


3. Move the highlight to “KEY LOCK” by using Function Key [UP] and [DOWN]. Press Function Key [SELECT] to enter KEY LOCK release menu.

4. Use Function Key [A] and [B] to input the PASSWORD (default is AAAA).
5. Press Function Key [ENTER], ”LOCK” will not be highlighted means KEY LOCK function has cancelled.

3.9 User Password Setting

1. In Power On Menu, press Function Key [MENU] to show the menu below:



2. Use Function Key [UP] and [DOWN] to move the highlight to “CHANGE PASSWORD” and press Function Key [SELECT] to enter the password menu.
3. Use Function Key [A] and [B] to input the OLD PASSWORD (default is AAAA). After pressing [ENTER], use Function Key [A] and [B] to input NEW PASSWORD (the maximum is 10 characters). After pressing [ENTER], use Function Key [A] and [B] to input CONFIRM PASSWORD (same as NEW PASSWORD) and press Function Key [ENTER]. Press [EXIT] after completing the setting.

3.10 Remote Control

The REMOTE outlet for remote control switch is located at the rear panel. You can plug in the control line to use external signal for controlling the device output externally.

Be aware when using remote control as it is done by external signal and using carefully to avoid the tester error operation to cause any danger.

Other control circuit usually does remote control. Be careful that it is the switch to control the mass current output, so you must connect the control line do not get near the power terminal and noise to avoid causing any danger.

1. For single control of START and STOP signals follow Figure 3-1 listed below to connect them to the REMOTE position on front panel of the main system.

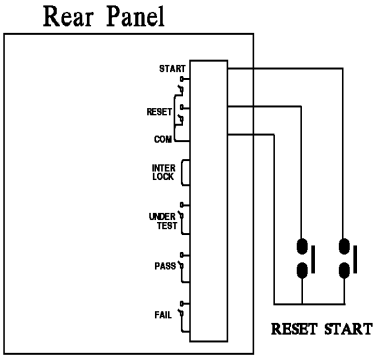


Figure 3-1

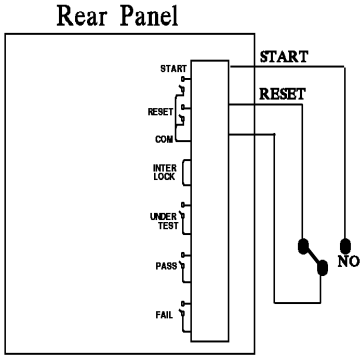


Figure 3-2

2. If it is connected as Figure 3-2 shows, the system routine is in STOP state as the NC is connected to STOP and NO is connected to START.

3. The logic components of transistor, FET and couplers can be connected and used as control circuit. The connected signals and circuit are shown as Figure 3-3 below. To use this circuit to control the system, it must contain the following:
   (1) The current of LOW signal is 2mA or less.
   (2) The active time for input signal is more than 20mS.

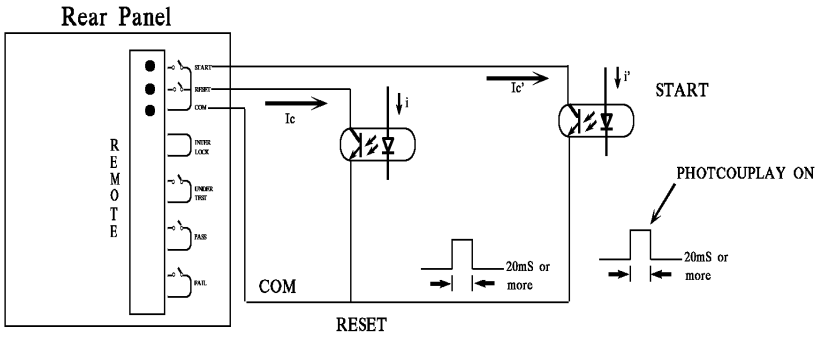


Figure 3-3

4. Either the relay switch control in Figure 3-1 or the coupler control in Figure 3-3 uses the contact of components for control action. It can prevent the error operation from interference effectively. Though the system has a lot of precautions, you would still need to watch out the interference caused by the measurement system settings.

5. The pin assignment of REMOTE CONTROL is shown as Figure 3-4 below. It should be memorized when using external control.

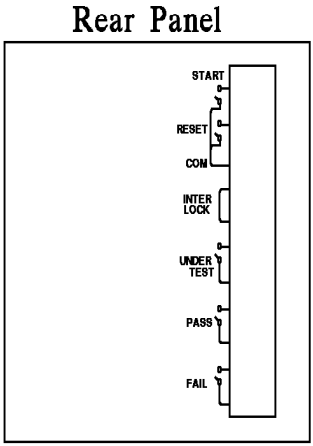


Figure 3-4 Pin assignment printed on the rear panel surface

3.11 Output Signal

This instrument has indicator and beeper for indication signals. The output signals in the system rear panel are:

UNDER TEST: This terminal will be short circuited when in test state, thus it can be used to control the external signal. The connection point specification is 30V AC or 60V DC, the current is less than 0.3A.

PASS : This terminal will be short circuited when the DUT passes the tests, the user specifies the time of short circuit and it can be used to control the external signal. The connection point specification is 30V AC or 60V DC, the current is less than 0.3A. The action time is from the DUT is passed until it is stopped.

FAIL : This terminal will be short circuited when the DUT fails the tests, thus it can be used to control the external signal. The connection point specification is 30V AC or 60V DC, the current is less than 0.3A. The action time is from the DUT is failed until it is stopped.

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