EXTECH Electronics Co.,Ltd.

6600 Series

Programmable AC Power Source

Operation Manual

ER 1.01

WARRANTY

eec certifies that the instrument listed in this manual meets or exceeds published manufacturing specifications. This instrument was calibrated using standards that are traceable to the National Institute of Standards Taiwan.

Your new instrument is warranted to be free from defects in workmanship and material for a period of (2) year from date of shipment. During the warranty period, you must return the instrument to eec or its branches or its authorized distributor for repair. eec reserves the right to use its discretion on replacing the faulty parts or replacing the assembly or the whole unit.

Follow below states, eec will void your warranty.

- Operate under non-normal , contrived omission, or accidental calamity (including, temblor, floods, rebellion, and fire etc.)
- Any non-authorized modifications, tampering or physical damage.
- Elimination of any connections in the earth grounding system or bypassing any safety systems.
- Use of non-authorized parts in the repair of this instrument. Parts used must be parts that are recommended by eec as an acceptable specified part.

This warranty does not cover accessories not of eec manufacture.

Except as provided herein, eec makes no warranties to the purchaser of this instrument and all other warranties, express or implied (including, without limitation, merchantability or fitness for a particular purpose) are hereby excluded, disclaimed and waived.

eec recommends that your instrument be calibrated on a twelve month cycle.

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CHAPTER 1. INTRODUCTION

1.1 Product Marking Symbols

Product will be marked with this symbol when it is necessary to refer to the operation and service manual in order to prevent injury or equipment damage.

Product will be marked with this symbol when hazardous voltages may be present.

1.2 Safety Precaution

- This product and its related documentation must be reviewed for familiarization with safety markings and instructions before operation.
- Before applying power verify that the instrument is set to the correct line voltage and the correct fuse is installed.
- When using an oscilloscope to measure DUT waveform, please refer description below to avoid DUT, instrument and oscilloscope damages.When the output of AC source has N-G or L-G shorted, customer must use differential isolation type of oscilloscope probe or using isolated oscilloscope.
- In order to avoid the interference, please DON'T combine the cables of input and output from instruments in bundle with GPIB or RS232 cable.

To prevent accidental injury or death, these safety procedures must be strictly observed when handling and using the test instrument.

1.3 Service and Maintenance

User Service

To prevent electric shock do not remove the instrument cover. There are no user serviceable parts inside. Routine maintenance or cleaning of internal parts is not necessary. Any external cleaning should be done with a clean dry or slightly damp cloth. Avoid the use of cleaning agents or chemicals to prevent any foreign liquid from entering the cabinet through ventilation holes or damaging controls and switches, also some chemicals may damage plastic parts or lettering. Any replacement cables and high voltage components should be acquired directly from eec or its distributor.

Service Interval

The instrument must be returned at least once a year to an eec authorized service center for calibration and inspection of safety related components. eec will not be held liable for injuries suffered if the instrument is not properly maintained and safety checked annually.

User Modifications

Unauthorized user modifications will void your warranty. eec will not be responsible for any injuries sustained due to unauthorized equipment modifications or use of parts not specified by eec. Instruments returned to eec with unsafe modifications will be returned to their original operating condition at the customer's expense.

CHAPTER 2. GETTING STARTED

This section contains information for the unpacking, inspection, preparation for use and storage of your eec product. ◦

2.1 Unpacking and Inspection

Your instrument was shipped in a custom foam insulated container that complies with ASTM D4169-92a Assurance Level II Distribution Cycle 13 Performance Test Sequence
If the shipping carton is damaged, inspect the contents for visible damage such as dents, scratches, or broken display. If the instrument is damaged, notify the carrier and eec's customer support department. Please save the shipping carton and packing material for the carrier's inspection. Our customer support department will assist you in the repair or replacement of your instrument. Please do not return your product without first notifying us. Please retain all of the original packaging materials.

2.2 Preparation For Use

2.2.1 Power Requirements

This instrument requires a power source of 110 volts AC ± 10%, 50/60 Hz single phase or 220 volts AC ±10%, 50/60 Hz single phase. Please check the rear panel to be sure the proper switch setting is selected for your line voltage requirements before turning your instrument on.

The terminal of power supply system connected to the main terminal shall be provided with a protection breaker. And the protection breaker must be a 30A circuit breaker approved by safety agency.

CAUTION Do not switch the line voltage selector switch located on the rear panel while the instrument is on or operating. This may cause internal damage and represents a safety risk to the operator.

2.2.2 Power Cable

WARNING Before connecting power to this instrument, the protective ground (Earth) terminals of this instrument must be connected to the protective conductor of the line (mains) power cord. The main plug shall only be inserted in a socket outlet (receptacle) provided with a protective ground (earth) contact. The main terminal shall only be connected to a connector provided with a protective ground (earth) contact. This protective ground (earth) **must not be defeated** by the use of an extension cord without a protective conductor (grounding).

!!! Please must use the Class I product to be as the load.

2.3 Environmental Conditions

Operating Environment
Temperatures:0° - 40° C (32°-104°F)
Relative humidity: 20% - 80%
Altitude: 2,000 meters (6,560 inches)

Please keep unimpeded around the units for good ventilation and convenient maintenance. The instrument should also be protected against temperature extremes which may cause condensation within the instrument.

Storage and Shipping Environment
This instrument may be stored or shipped in environments with the following limits:
Temperature..... -40° to +55°C
Altitude: …… 7,620 meters (25,000 inches)

The instrument should also be protected against temperature extremes, which may cause condensation within the instrument.

Packaging
Original Packaging
Please retain all original packaging materials that you originally received. If you are returning your instrument to us for servicing please repackage the instrument in its original container. Please enclose the instrument with all options, accessories and test leads. Indicate the nature of the problem or type of service needed. Also, please mark the container "FRAGILE" to insure proper handling.

Other Packaging
If you do not have the original packaging materials, please follow these guidelines:

- Wrap the instrument in a bubble pack or similar foam. Enclose the same information as above.
- Use a strong double-wall container that is made for shipping instrumentation. 350 lb. test material is adequate.
- Use a layer of shock-absorbing material 70 to 100 mm (3 to 4 inch) thick around all sides of the instrument. Protect the control panel with cardboard.
- Seal the container securely.
- Mark the container "FRAGILE" to insure proper handling.

CHAPTER 3. SPECIFICATIONS

3.1 Specification

MODEL		6605	6610	6620	6630	6650
INPUT						
Phase		1Ø				
Voltage		110 / 220Vac±10%		220±10%		
Frequency		47 - 63Hz				
Max. Current		10A / 5A	20A / 10A	20A	30A	50A
Power Factor		0.7				
AC OUTPUT						
Max. Power		500VA	1000VA	2000VA	3000VA	5000VA
Max. Current (r.m.s)*1	0 - 150V	4.6A	9.2A	18.4A	27.6A	46.0A
	0 - 300V	2.3A	4.6A	9.2A	13.8A	23.0A
Max Current (peak)	0 - 150V	18.4A	36.8A	73.6A	110.4A	184.0A
	0 - 300V	9.2A	18.4A	36.8A	55.2A	92.0A
Phase		1Ø / 2W				
Total Harmonic Distortion (T.H.D)		<1% at output voltage within the 80 - 140Vac at Low Range or the 160 - 280Vac at High Range				
Crest Factor		≧3				
Line Regulation		± 0.1V				
Load Regulation		± (0.5% of output + 0.5V) at Resistive Load				
Response Time		< 400usec				
SETTINGS						
Voltage	Range	0 - 300V, 150V / 300V Auto Range				
	Resolution	0.1V				
	Accuracy	±(1% of setting + 2 counts)		±(1% of setting + 5 counts)		
Frequency	Range	40 - 500Hz Full Range Adjust				
	Resolution	0.1Hz at 40.0 - 99.9Hz, 1Hz at 100 - 500Hz				
	Accuracy	±0.03% of setting				
Starting & Ending Phase Angle	Range	0 - 359°				
	Resolution	1°				
	Accuracy	±1° (45 - 65HZ)				
DC OUTPUT (Option)						
Max. Power		250W	500W	1000W	1500W	2500W
Max. Current	0 - 200V	2.3A	4.6A	9.2A	13.8A	23.0A
	0 - 400V	1.15A	2.3A	4.6A	6.9A	11.5A

SETTINGS							
Voltage	Range		0 - 200V / 0 - 400V Selectable				
	Resolution		0.1V				
	Accuracy		± (1% of reading + 2 counts)		± (1% of reading + 5 counts)		
Ripple and Noise (r.m.s)	Range	L	< 250mV			< 350mV	
		H	< 400mV			< 550mV	
Ripple and Noise (p-p)			< 2Vp-p			< 3Vp-p	
MEASUREMENT							
Voltage (AC & DC)	Range		0.0 - 400.0V				
	Resolution		0.1V				
	Accuracy		±(1% of reading + 2 counts) at Voltage > 5V		±(1% of reading + 5 counts) at Voltage > 5V		
Frequency	Range		0.0 - 500.0Hz				
	Resolution		0.1Hz				
	Accuracy		±0.1Hz				
Current (r.m.s)	Range	L	0.005A - 0.600A	0.005A - 1.200A	0.005A - 2.400A	0.005A - 3.600A	-
		H	0.50A - 6.50A	1.00A - 13.00A	2.00A - 26.00A	3.00A - 39.00A	0.00 - 65.00A
	Resolution*2	L	0.001A				
		H	0.01A				
	Accuracy	L	± (1% of reading + 5 counts) at Voltage > 5V			± (1% of reading + 5 counts) at 40 - 100Hz ± (2% of reading + 5 counts) at 101 - 500Hz at Voltage > 5V	-
		H	± (1% of reading + 5 counts) at Voltage > 5V				
Current (peak)	Range		0.0 - 19.0A	0.0 - 38.0A	0.0 - 76.0A	0.0 - 114.0A	0.0 - 190.0A
	Resolution		0.1A				
	Accuracy		± (1% of reading + 5 counts)				
Current (DC)	Range	L	0.010A - 0.600A	0.010A - 1.200A	0.010A - 2.400A	0.010A - 3.600A	-
		H	0.50A - 6.50A	1.00A -	2.00A -	3.00A -	0.05A - 65.00A

				13.00A	26.00A	39.00A	
	Resolution	L	0.001A				
		H	0.01A				
	Accuracy	L	± (1% of reading + 5 counts) at Voltage > 5V				-
		H	± (1% of reading + 5 counts) at Voltage > 5V				
Power (AC)	Range	L	0.0W - 60.0W	0.0W - 120.0W	0.0W - 240.0W	0.0W - 360W	-
		H	50W - 650W	100W - 1300W	200W - 2600W	300 - 3900W	0 - 6500W
	Resolution	L	0.1W				
		H	1W				
	Accuracy	L	± (2% of reading + 15 counts) at Voltage > 5V		± (2% of reading + 30 counts) at Voltage > 5V	± (2% of reading + 15 counts) at PF>=0.2 and 40 - 100Hz ± (2% of reading + 15 counts) at PF>=0.5 and 101 - 500Hz at Voltage > 5V	-
		H	± (2% of reading + 5 counts) at Voltage > 5V		± (2% of reading + 10 counts) at Voltage > 5V	± (2% of reading + 5 counts) at Voltage > 5V	
Power (DC)	Range	L	0.0W - 60.0W	0.0W - 120.0W	0.0W - 240.0W	0.0W - 360W	-
		H	50W - 650W	100W - 1300W	200W - 2600W	300 - 3900W	0 - 6500W
	Resolution	L	0.1W				
		H	1W				
	Accuracy	L	± (2% of reading + 5 counts) at Voltage > 5V				-
		H	± (2% of reading + 5 counts) at Voltage > 5V				
Power Factor	Range		0.000 - 1.000				
	Resolution		0.001				

	Accuracy	W / VA, Calculated and displayed to three significant digits				
GENERAL						
Surge / Drop		SD-Volt：0.0 - 300.0V, Resolution： 0.1V SD-Site ：0 - 20mS at SD-Cont.：ON, 0 - 99mS at SD-Cont.：OFF, Resolution： 1mS SD-Time ：0 - 20mS at SD-Cont.：ON, 0 - 99mS at SD-Cont.：OFF, Resolution： 1mS SD-Cont.：ON / OFF				
Remote Input Signal Interface (Option)		Test, Reset, Recall memory 1 through 7				
Remote Output Signal		Pass, Fail, Test-in Process				
Memory		50 memories, 9 steps/memory				
Sync Output Signal		DC Level 5V, Between the sync signal and the output voltage will be 0.5ms time difference				
Timer		0=Continuous, 0.5 - 999.9 (Unit: sec, minute, hour selectable)				
Alarm Volume Setting		Range: 0 - 9; 0=OFF, 1 is softest volume, 9 is loudest volume				
Graphic Display		240 x 64 dot resolution Monographic LCD / Contrast 9 Levels 1 - 9				
Auto loop cycle		0=Continuous, OFF, 2 - 9999				
Over Current Fold Back		On/Off, Setting On when output current over setting Hi-A value it will fold back output voltage to keep constant output current is setting Hi-A value				
Efficiency		≧80%(at Full Load)				
Protection		Over Current, Short Circuit, Over Temperature, Over Voltage, Over Power, Low Voltage and Alarm				
Calibration		Front Panel Calibration				
Interface		Standard USB & RS232, Option GPIB, PLC Remote Input Card				
Operation Environment		0-40℃ / 20-80%RH				
Dimension, mm*3	W	430	430	430	430	430
	H	89 (111.5)	89 (111.5)	89 (111.5)	223 (245.5)	223 (245.5)
	D	400	400	500	500 (528)	500 (528)
Net Weight		16.5Kg	19.5Kg	31.5Kg	57Kg	65Kg

Product specifications are subject to change without notice.

*1 At working voltage 110V / 220V

*2 a. When output frequency ≧100Hz & ≦500Hz & N-G short, the current meter guarantee minimum current from 0.010A

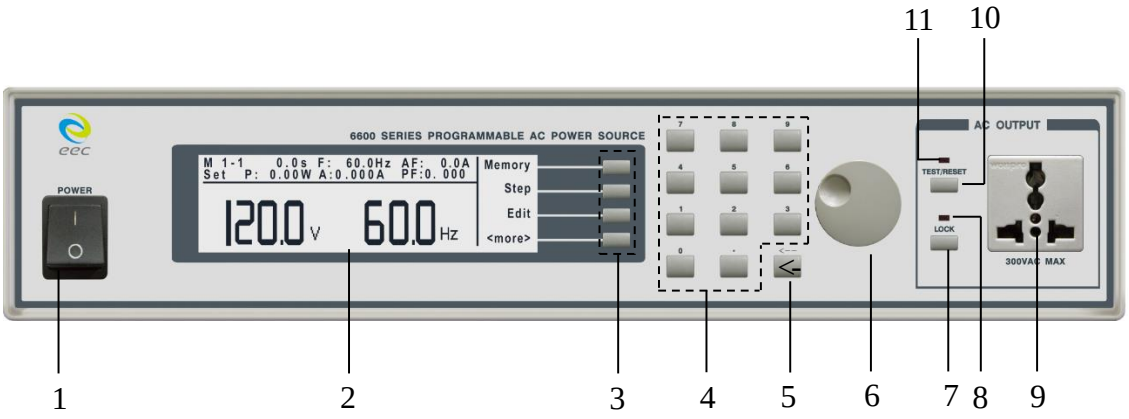
b. When output frequency ≧500Hz & N-G short, the current meter guarantee minimum current from 0.020A

*3 Figure in parentheses are maximum values

【Ordering Information】

- 6605 Programmable AC Power Source 0 - 300V / 40 - 500Hz (500VA)
- 6610 Programmable AC Power Source 0 - 300V / 40 - 500Hz (1000VA)
- 6620 Programmable AC Power Source 0 - 300V / 40 - 500Hz (2000VA)
- 6630 Programmable AC Power Source 0 - 300V / 40 - 500Hz (3000VA)
- 6650 Programmable AC Power Source 0 - 300V / 40 - 500Hz (5000VA)
- Opt.612 PLC Remote I/P Interface
- Opt.627 GPIB Interface card
- Opt.629 Input Voltage 100V / 200V for 6605 & 6610
- Opt.630 Input Voltage 120V / 240V for 6605 & 6610
- Opt.631 Input Voltage 200V for 6620, 6630 & 6650
- Opt.632 Input Voltage 240V for 6620, 6630 & 6650
- Opt.633 DC Output Function for 6605
- Opt.634 DC Output Function for 6610
- Opt.635 DC Output Function for 6620
- Opt.647 Ethernet Card
- Opt.651 DC Output Function for 6630
- Opt.652 DC Output Function for 6650
- Opt.653 External 0 - 10V control
- Opt.654 Sync Signal +5V/pulse 15ms
- 1936 AC Power Source Remote Controller

3.2 Front Panel Description



1. **POWER SWITCH:** Rocker style power switch with international ON (|) and OFF (0) markings.

2. **GRAPHIC LCD:** 240 X 64 Monographic LCD.

3. **SOFT KEYS:** Multifunction parameter selection keys. Keys used to select screens and change parameters.

4. **NUMERIC DATA ENTRY:** Keys used to enter numeric data.

5. **Delete Key**：If you make a mistake or want to change the character, press the Delete key to delete the last character.

6. **ROTARY KNOB:** Adjust the value of all parameters.

7. **LOCK Key.** To disable all the keys on the front panel (ON/OFF) and to escape from programmable operation mode.

8. **LOCK Indicator.** When this LED is lighting, all the keys are disabled.

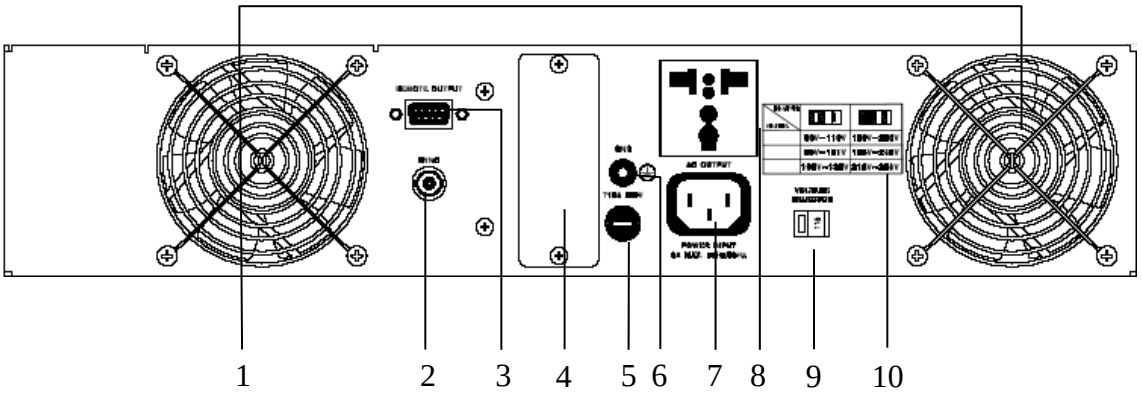
9. **Universal Ac Output Socket:** Output Socket (20A).

10. **TEST/RESET Key.** To turn the output ON and OFF and press the key when abnormal operation occurs.

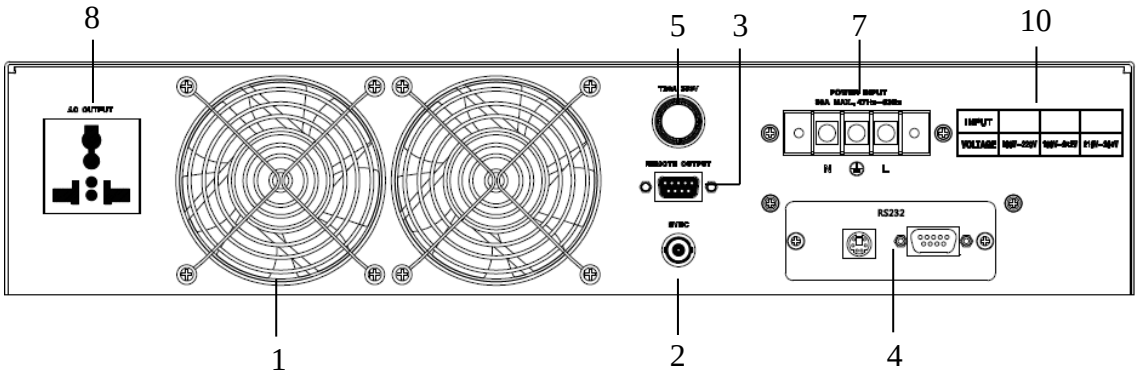
11. **TEST/RESET Indicator**： When this LED is lighting, the output voltage is turned ON.

3.3 Rear Panel Description

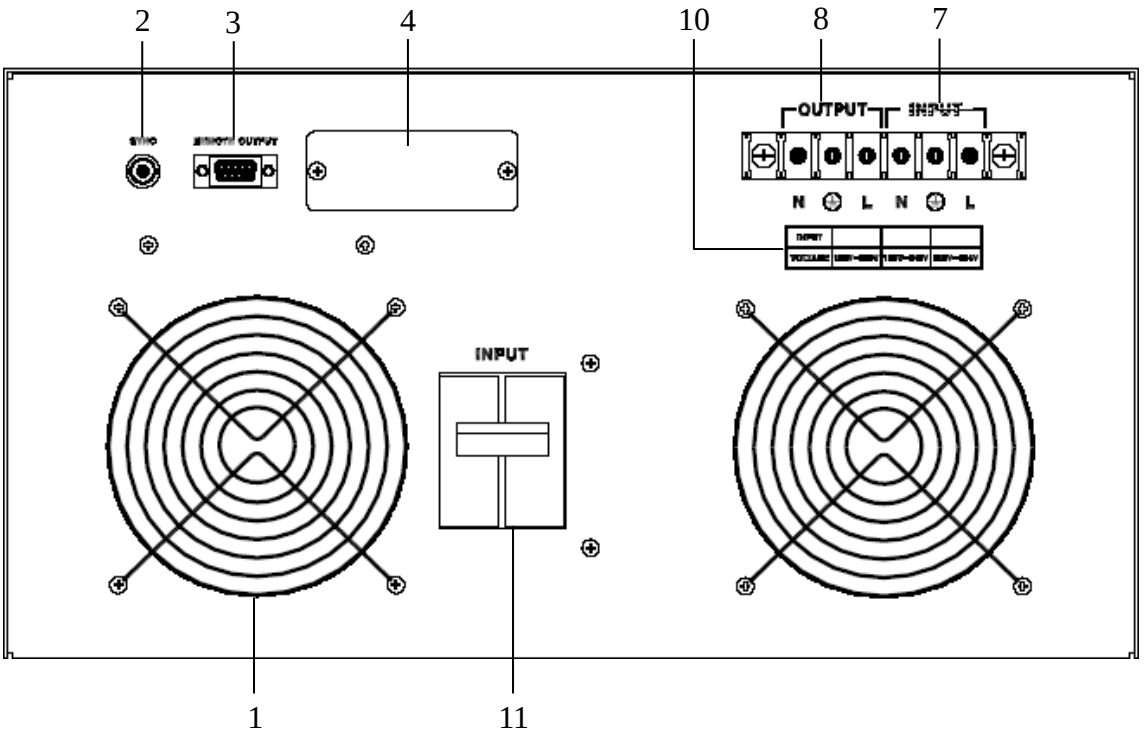
6605 & 6610 Rear



6620 Rear



6630 & 6650 Rear



1. **THERMAL FAN:** To cool the instrument.

2. **SYNCHRONISM SINGAL SCOKET:** BNC Socket. When the test is enable, it will output a 5V voltage signal at the same time from the socket.

3. **PLC REMOTE OUTPUT:** Connector for monitoring PASS, FAIL and PROCESSING output signals.

4. **INTERFACE PORT:** Optional connector for interconnection to the PLC Remote of TEST, RESET functions and program memory selection 1~7. Or optional RS-232 Bus interface and IEEE 488 interface may be selected.

5. **FUSE RECEPTACLE:** To change the fuse, unplug the power (mains) cord and turn the fuse receptacle counter-clockwise. The fuse compartment will be exposed. Please replace the fuse with one of the proper rating.

6. **GROUND TERMINAL**：Common Ground terminal for Input and Output.

7. **INPUT POWER TERMINAL:** Standard IEC 320 connector for connection to a standard NEMA style line power (mains) cord for model 6605, 6610 and 6620. Output terminal for model 6630, 6650.

8. **OUTPUT TERMINAL:** Universal AC output socket (20A) for model 6605, 6610 and 6620. Output terminal for model 6630, 6650.

9. **INPUT POWER SWITCH:** Line voltage selection is set by the position of the switch. In the left position, it is set for 110-volt operation, in the right position it is set for 220-volt operation.

10. **INPUT POWER INDICATION**： To indicate the range of input power.

Please must select officially voltage and power receptacle. (ex. 115V/15A for America, 230V 8A for Europe)

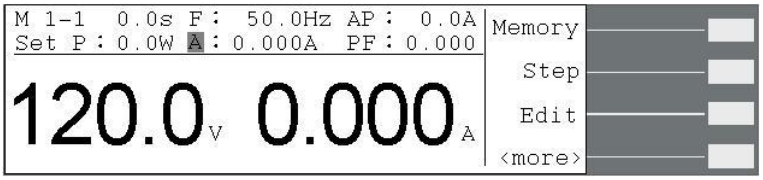
11. **INPUT BREAKER**： Turns the power source ON or OFF.

CHAPTER 4. OPERATION DESCRIPTION

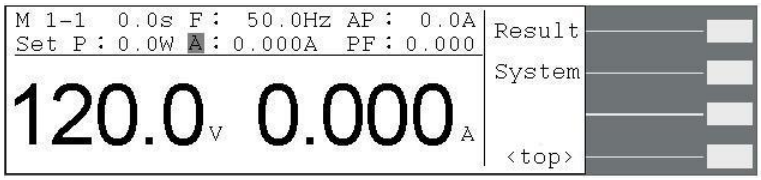
4.1 Power On

Turn on the Power switch located on the lower left-hand corner of the front panel.The Initialization screen will appear.

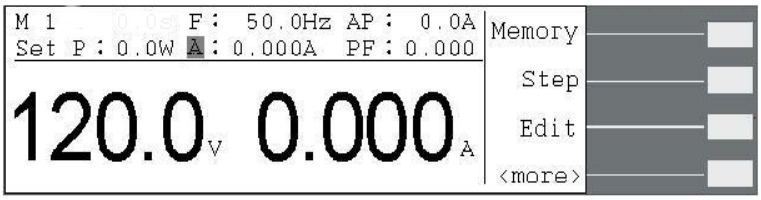
After a few seconds the initialization screen will change to the Set screen. The Set screen will be displayed as follows when in PROGRAM Mode:



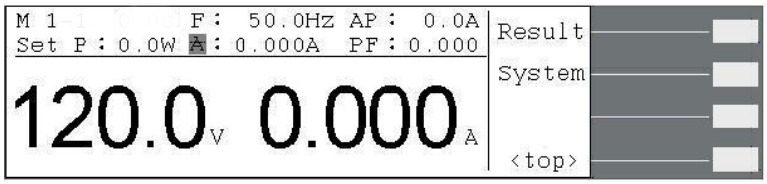
If you press the <more> soft key within the Set screen, the soft keys will change to include Result, System, and <top> in the PROGRAM Mode.



If you are in MANUAL Mode there will not be a step number 1 next to the M 1 and the set screen will appear as follows:



If you press the <more> soft key within the set screen, the soft keys will change to Result, System, and <top> in the MANUAL Mode.



4.1.1 Description of the parameters

When the instrument is in the Set screen the parameters indicate their current settings.However, when the indicator LED is active on the Test/Reset key the parameter settings will display their output value

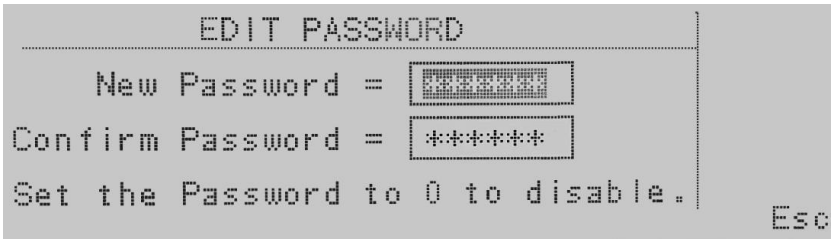
Set Screen Parameters	Description of Parameters
M 1-1	Memory and step number .
0.0s	Dwell time.
F：50.0Hz	Output Frequency.
AP：0.0A	Peak current.
Set	Display for present condition. It could be the “Set”, “Dwell”, “Pass”, “Abort” or others fail condition. For example, if it is under test condition and it will shows “Dwell”.
P: 0.0W	Output Power.
A：0.000A	Output Current.
PF：0.000	Power Factor.
Memory	Memory soft key used to change memory location
120.0V(Left meter reading)	Meter for voltage
0.00A(right meter reading)	Meter for parameters of F, Ap, P, A & PF

4.1.2 Security

Creating a Password

Creating a password prevents unauthorized access to the Lock parameters in the System menu. Once a password has been created, lock functions will require the password to access them.

Press and hold the <top> soft key while powering up the instrument, the Edit Password screen should now be displayed. The display will appear as follows:



You may now type in the new password using the numeric keypad. Press the Enter key to accept the new password or press the Esc key to escape. After you type in your new password,

you will be required to confirm your new password by typing it again into the “Confirm Password” field. Press the Enter key to confirm the new password or press the Esc key to escape.

If the password is set to 0, the Lock and Mem Lock parameters may be accessed by editing Lock and Mem Lock soft keys in the System Parameters menu. In this case, the key lockout on the front panel is enabled by pressing the Lock button.

If the password has been set to anything but 0, a password entry pop-up screen will appear to access the Lock and Mem Lock parameters as well as key lockout on the front panel of the unit. The password default is preset to 0 at the factory.

Forgotten Password

If you have forgotten your password, a new password should be entered or enter “0” to disable the password. The old password cannot be recovered.

Secure Lock and Mem Lock Access

If a password has been created, when you press the Lock or Mem Lock soft key or the key lockout on the front panel, a password pop-up screen will appear. The pop-up message will appear as follows:

In order for you to access the Lock or Mem Lock parameters, you will now have to enter the proper password. If you have forgotten the password, please refer to the Forgotten Password instructions in the Security section.

4.1.3 Lock

From the Set screen press the <more> soft key. Press the System soft key. Use the Ù, Ú soft keys to navigate to the Lock parameter. When the Lock parameter is highlighted, you may turn the function ON and OFF by pressing the Change soft key. Press the Enter key to accept the new setting or the Esc key to cancel and return to the original setting. When the Enter key is pressed, the newsecurity setting will take immediate effect.

Selecting Lock “ON” restricts access to parameter and system settings. The

level of security is determined by the Mem Lock function.

4.1.4 Mem Lock

From the Set screen press the <more> soft key. Press the System soft key. Use the Ù, Ú soft keys to navigate to the Mem Lock parameter. When the Mem Lock parameter is highlighted, you may turn the function ON and OFF by pressing the Change soft key. Press the Enter key to accept the new setting or the Esc key to cancel and return to the original setting.

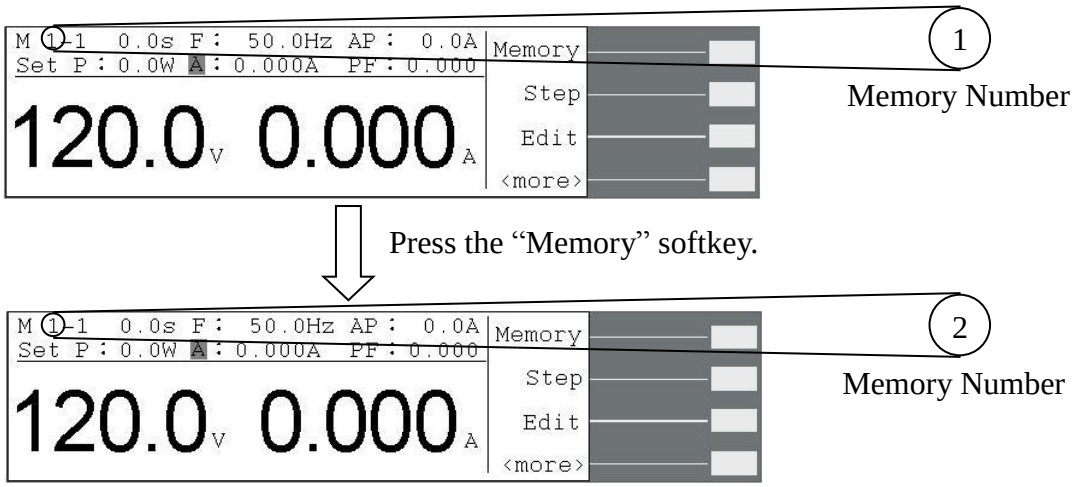
Mem Lock is a sub-function of the Lock setting. In order for the Mem Lock function to work, the Lock must first be turned ON. Selecting the Mem Lock OFF will allow the user to access all available memory locations but restricts access to memory and step editing capabilities. Selecting the Mem Lock ON will allow the user to only run the currently loaded memory.

4.2 Description of the Softkeys

There are fives softkeys for selection, and they are: “Memory”, “Step”, “Edit”, “Result” and “System”.

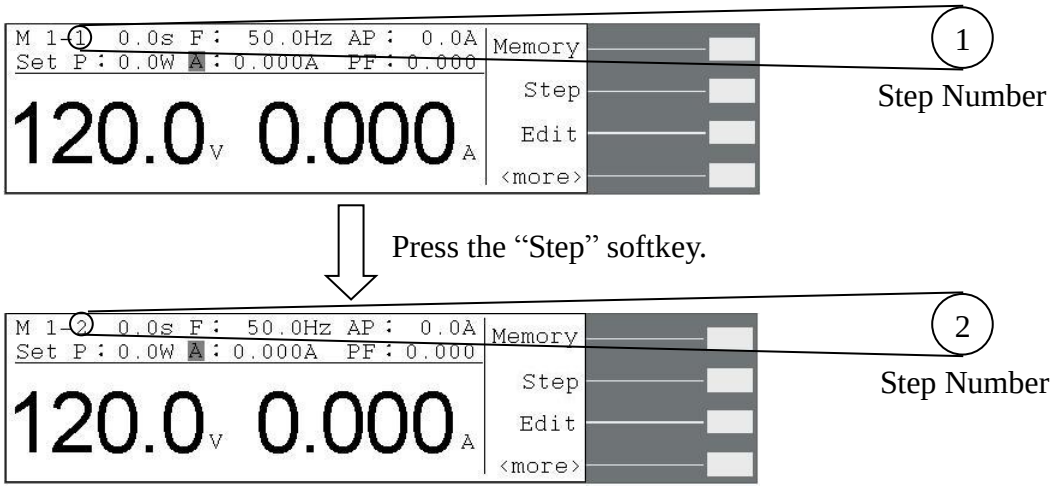
4.2.1 Memory Softkey

The softkey is for memory fast selected under reset condition. The display will show further number if press “Memory” softkey one time.



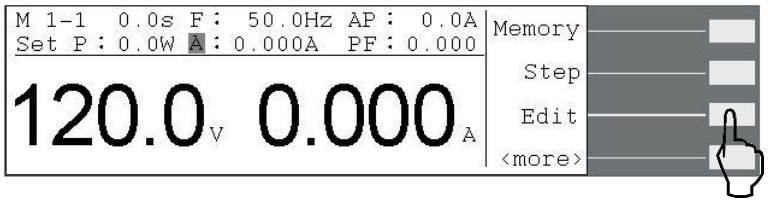
4.2.2 Step Softkey

The softkey is for step fast selected under reset condition. The display will show further number if press “Step” softkey one time.

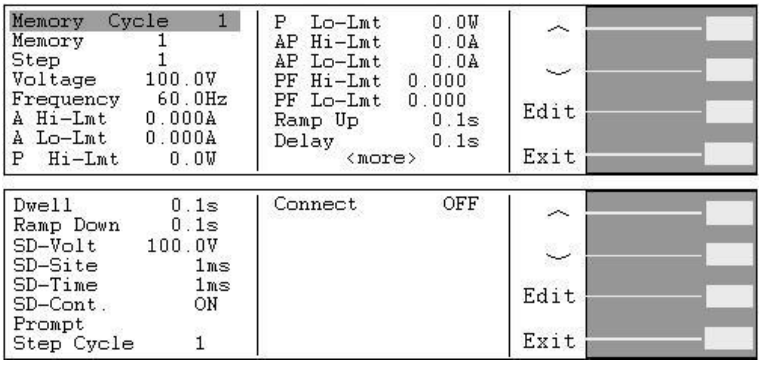


4.2.3 Edit Softkey

Press "Edit" softkey under the reset condition, it will enter parameters edition display.

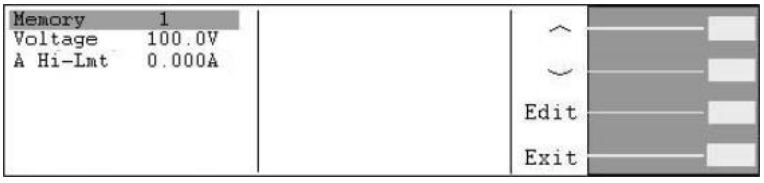


System parameter Auto Run is PROGRAM.



System parameter Auto Run is MANUAL.

System parameter Auto Run is DC+. (Option function)



Remark:

1. If the seeting of Surge/Drop is “OFF”, the display will not show the test parameters : ”SD-Volt”, ”SD-Site” and “SD-Time”.
2. Please refer to section 4.2.3.2 for Test parameters “Auto Run”. and section 4.2.5 for the System parameter “Surge/Drop”.

There are four softkeys under the display, and they are” ﹀” 、” ﹀” 、”Edit” and ”Exit”.

” ﹀”：Back to last parameter.

” ﹀”：Forward to next parameter.

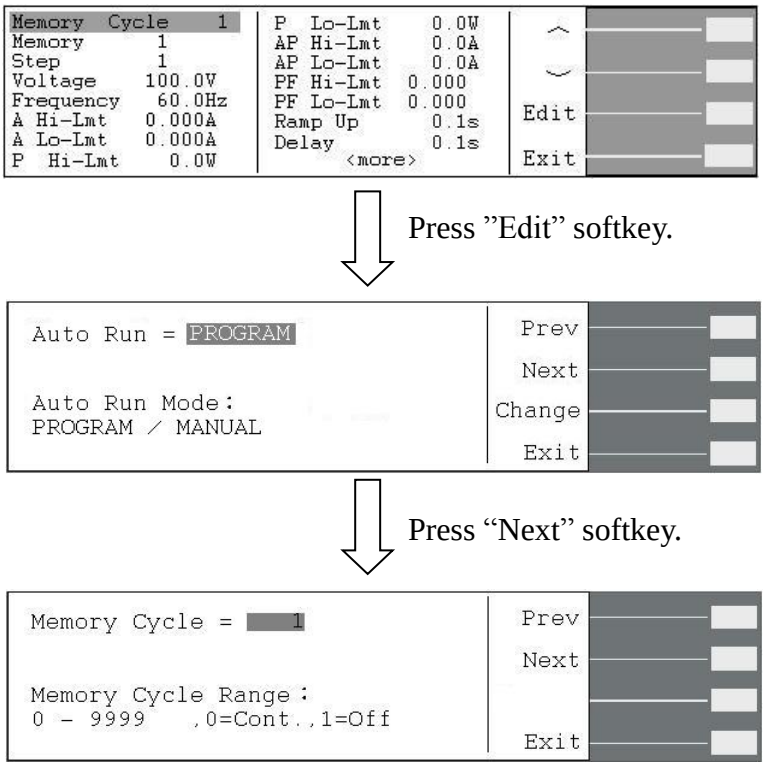
”Edit”：Parameter edit function.

”Exit”：Exit the edit display and back to reset display.

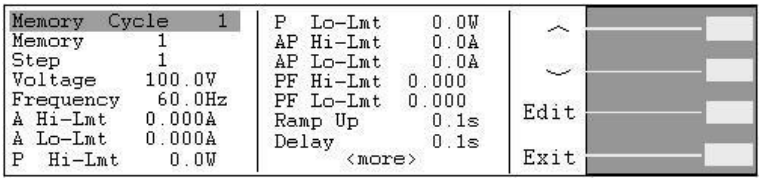
Press “Edit” softkey under the reset condition which is under the setting of Auto Run is “Manual” and ”Surge/Drop” is “ON", then display will show as follows.

4.2.3.1 Enter the Test Parameters Editting Mode

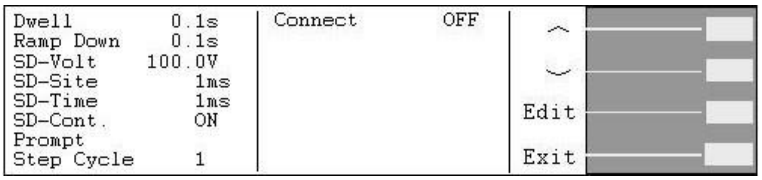
Please press “Edit” to edit the test parameters under Edit display.



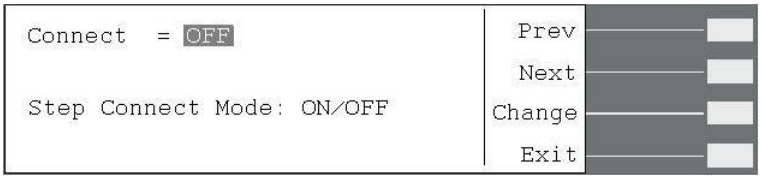
Or you can press ”﹀” or ”﹀” softkey to select the parameter you want to edit first, then press ”Edit” softkey to edit it.



Press ” ﹀” softkey.



Press ”Edit” softkey.

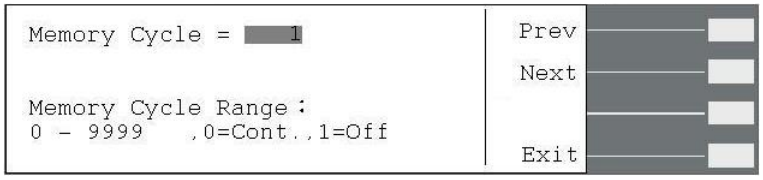


Use numeric keypad to enter the new number or pressing “Change” softkey to change the parameter mode.

4.2.3.2 Editting Test Parameter

Memory Cycle Setting

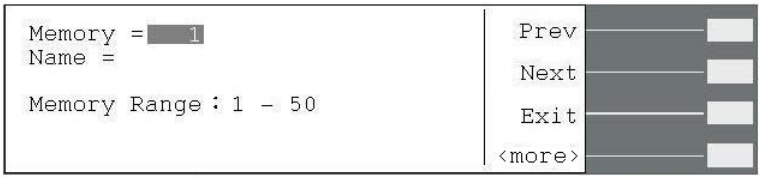
When the parameter “Memory Cycle” is selected, the display will show as follows.



Setting of “Cont” means continuous, and “1” is single operation. For “2”~“9999” setting, it becomes the number of sequence to be repeated for running operation. (Refer to section 4.2.4.2 for Loop Cycle Setting)

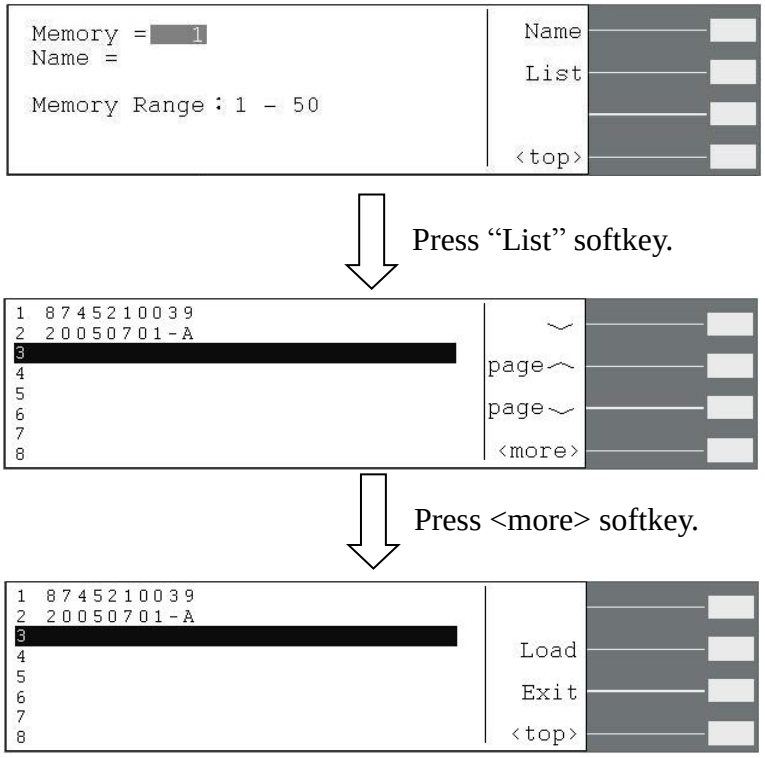
Selecting a Memory

When the parameter “Memory” is selected, the display will show as follows.



Two methods may be used to select a Memory.

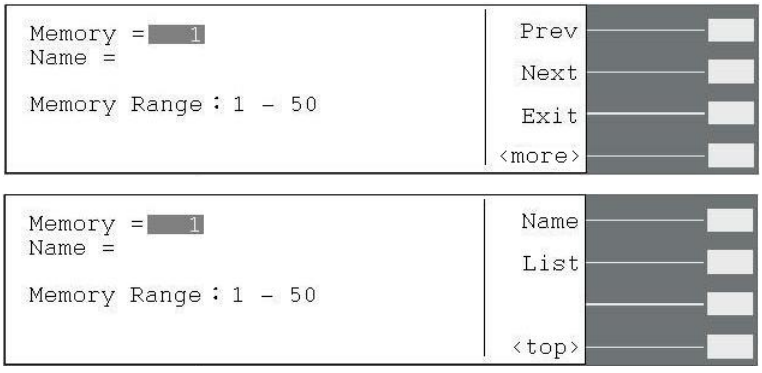
1. Type in the number of the Memory that you would like to use. As with all of the parameters, once you begin typing a new number, the parameter will blank and the cursor will begin blinking. This indicates that the parameter is being edited. Once a parameter is edited, it is necessary to complete the edit either by pressing the ENTER key to accept the new number or the EXIT key to escape from the edit and return to the original number.
2. Press the "List" soft key and scroll the highlighted area to the desired Memory, then press the ENTER key. An example of the list display is as follows:



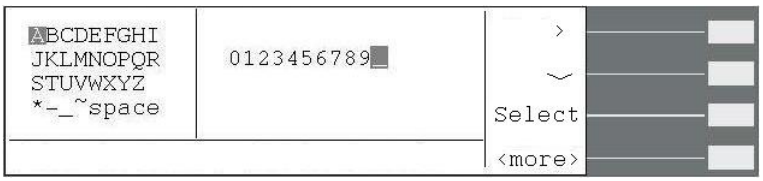
Once you press the ENTER key, the Memory location and all of its steps will be loaded into the instruments activate memory for use. Once the Memory is loaded, the Perform Test screen will once again be displayed.

Naming a Memory

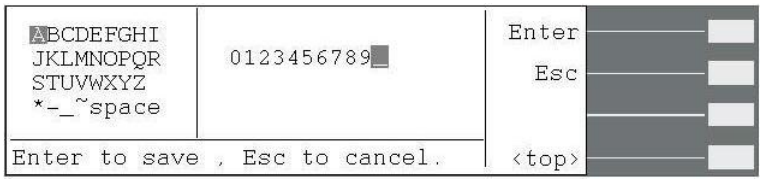
At the Memory recall screen, press the "Name" soft key.



Press “Name” softkey.



Press ”<more>” softkey.



Use the “ < >, ∧, ∨ ” soft keys to navigate through the character map and use the bottom soft key to select a character. The”<– –” key may be used to delete the last character. Press ENTER to save or EXIT to cancel changes. The memory name can be no more than 10 characters in length.

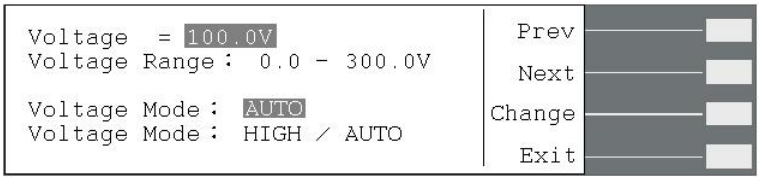
Selecting a Step

When the parameter “Step” is selected, the display will show as follows.

Type in the number of the Step that you would like to use. Once a parameter is edited, it is necessary to complete the edit either by pressing the ENTER key to accept the new number or the EXIT key to escape from the edit and return to the original number.

Setting of Output Voltage

When the parameter “Voltage” is selected, the display will show as follows.



Setting the voltage mode to be “AUTO”, the system will auto judge the voltage range from the setting value of voltage. Setting the mode to be “HIGH” , the voltage range is always set to be high range , and the range of current limit drops to half as comparing the current limit at the low range (Refer to the specification table). Setting of voltage range may not influence the

existing output voltage setting.

Setting of Output Frequency

When the parameter “Frequency” is selected, the display will show as follows.

Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.

Setting of Current High Limit and Low limit

When the parameter “A Hi-Lmt” is selected, the display will show as follows.

When the parameter “A Lo-Lmt” is selected, the display will show as follows.

Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.If the setting value of high limit is 0, the function will be displayed.

Setting of Power High Limit and Low Limit

When the parameter “P Hi-Lmt” is selected, the display will show as follows.

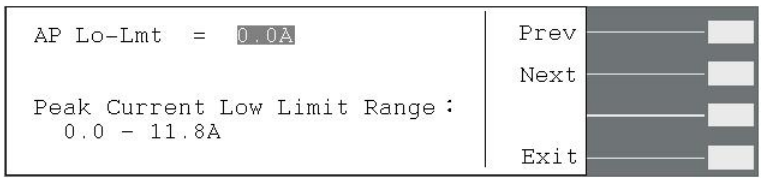
When the parameter “P Lo-Lmt” is selected, the display will show as follows.

Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting. If the setting value of high limit is 0, the function will be displayed.

Setting of Peak Current High Limit and Low Limit

When the parameter “AP Hi-Lmt” is selected, the display will show as follows.

When the parameter “AP Lo-Lmt” is selected, the display will show as follows.

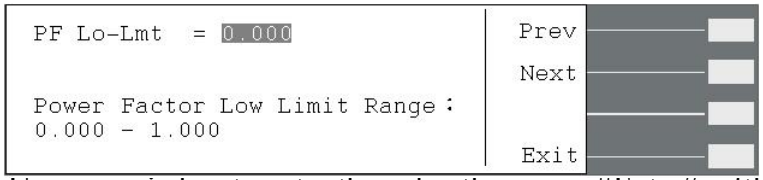


Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting. If the setting value of high limit is 0, the function will be displayed.

Setting of Power Factor High Limit and Low Limit

When the parameter “PF Hi-Lmt” is selected, the display will show as follows.

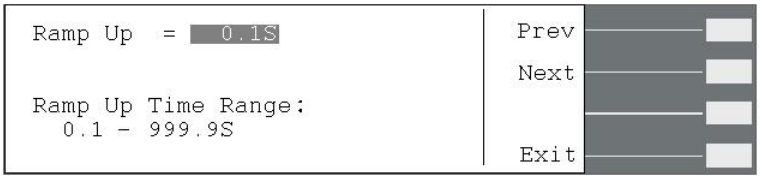
When the parameter “PF Lo-Lmt” is selected, the display will show as follows.



Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting. Note. If the setting value is 0, the function will be displayed.

Setting of Ramp Up Time

When the parameter “Ramp Up” is selected, the display will show as follows.



Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting. If the setting value is 0, the function will be displayed.

Setting of Delay Time

When the parameter “Delay” is selected, the display will show as follows.

Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.

Setting of Dwell Time

When the parameter “Dwell” is selected, the display will show as follows.

Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting. Setting 0 is continuing test till teat fail or abort.

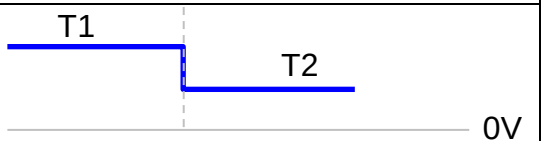
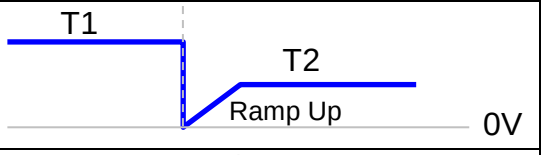
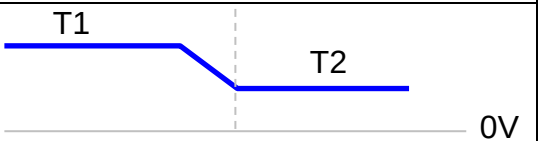
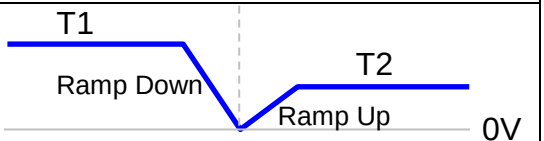
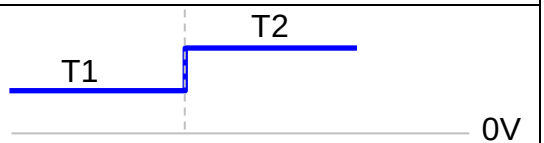
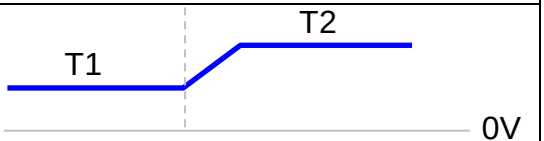
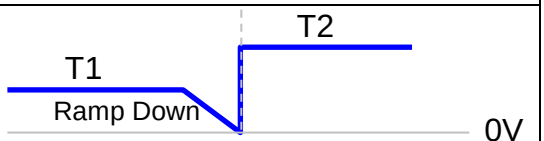
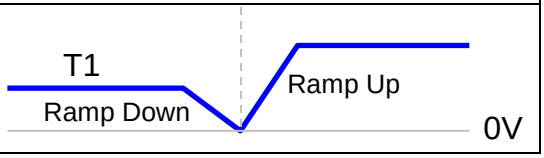
Setting of Ramp Down Time

When the parameter “Ramp Down” is selected, the display will show as follows.

Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting. If the setting value is 0, the function will be displayed.

Below is the test status of Ramp Down and Ramp Up when the steps connection test of the instrument is run.

Step 1: Voltage=V1, Dwell=T1； Step 2: Voltage=V2, Dwell=T2

V1 & V2	Ramp Down	Ramp Up	
V1 >V2	0 (OFF)	0 (OFF)	
	0 (OFF)	0.1~999.9s (ON)	
	0.1~999.9s (ON)	0 (OFF)	
	0.1~999.9s (ON)	0.1~999.9s (ON)	
V2>V1	0 (OFF)	0 (OFF)	
	0 (OFF)	0.1~999.9s (ON)	
	0.1~999.9s (ON)	0 (OFF)	
	0.1~999.9s (ON)	0.1~999.9s (ON)	

Setting of Surge / Drop Voltage

When the parameter “SD-Volt” is selected, the display will show as follows.

The function is setting it belongs to surge or drop. Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.

Setting of Surge / Drop Site

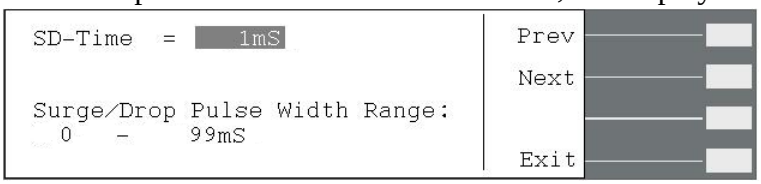
When the parameter “SD-Site” is selected, the display will show as follows.

The function is setting the location of Surge / Drop. Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.

When SD-Cont. function is enabled, the range of SD-site function is 0-20mS. When SD-Cont. function is disabled, the range of SD-site function is 0-99mS.

Setting of Surge / Drop Time

When the parameter “SD-Time” is selected, the display will show as follows.



The function is setting the puls width of Surge / Drop. Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.

When SD-Cont. function is enabled, the range of SD-site function is 0-20mS. When SD-Cont. function is disabled, the range of SD-site function is 0-99mS.

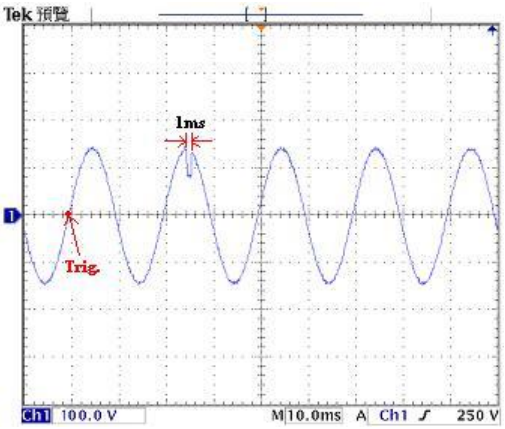
Setting of Surge / Drop Continuous Test

When the parameter “SD-Cont.” selected, the display will show as follows.

The function is setting if Surge/Drop output is continuous or not. When the function is “ON”, the trigger will be activated per 100ms until the test is fail or reset button is pressed. When the function is “ OFF” , the trigger will only be activated a time after “Trig.” Softkey is pressed.

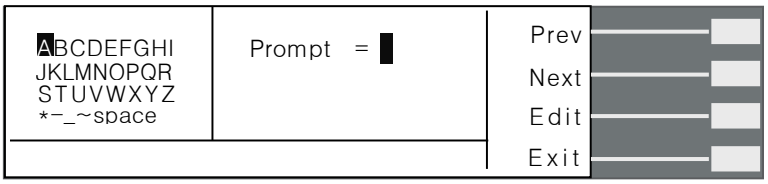
For an example, If output voltage is 100Vrms, output frequency is 50Hz，Surge/Drop voltage is 60Vrms, Surge/Drop site is 25mS, and Surge/Drop time is 1mS.

If the SD-Cont. is setting to “OFF” and the “Trig.” softkwy is only pressed a time, the waveform will be as the right figure.

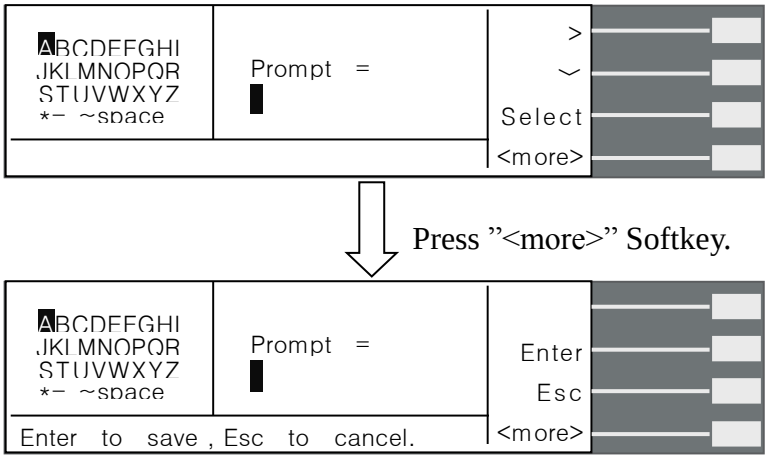


Setting of Prompt

When the parameter “Prompt” is selected, the display will show as follows.



The Prompt function allows you to insert a short line of text in a step. The Prompt will appear on the screen before the step is initiated and remains on the screen until the TEST button is pressed. After the TEST button is pressed, the Prompt will clear and the step will initialize.



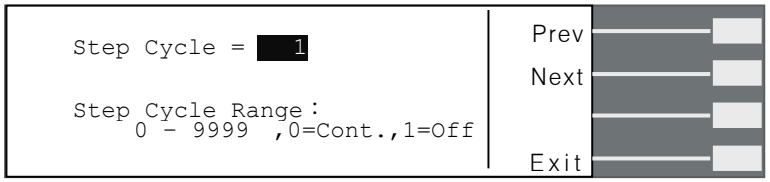
This screen will only show when scrolling one parameter at a time through the parameter list with “Prev and Next” soft keys. Press the “Edit” soft key to Edit or insert a Prompt.

To enter a text prompt, use the arrow keys to scroll the highlighted area to the character (or enter a number from the numeric keypad) you wish to use and then press the “Select” soft key, the letter or symbol will be inserted at the point where the cursor is flashing. The cursor will then increment to the next position and wait for an additional character insertion. If you make a mistake or want to change the character, press the delete key in the numeric keypad. The cursor will decrement and erase the character. When you have finished editing the

prompt press the ENTER key. The prompt can be no more than 10 characters in length.

Setting of Step Cycle

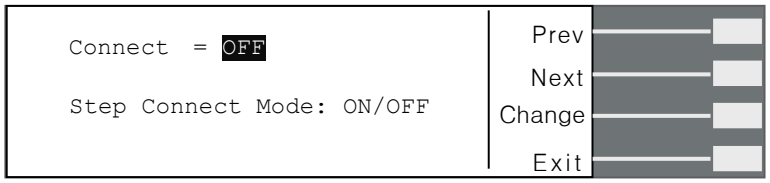
When the parameter “Step Cycle” is selected, the display will show as follows.



Setting of “Cont” means continuous, and “1” is single operation. For “2”~“9999” setting, it becomes the number of sequence to be repeated for running operation. (Refer to section 4.2.4.2 for Loop Cycle Setting)

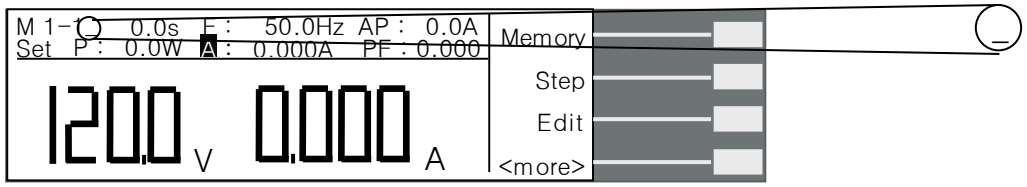
Setting of Step Connect

When the parameter “Connect” is selected, the display will show as follows.



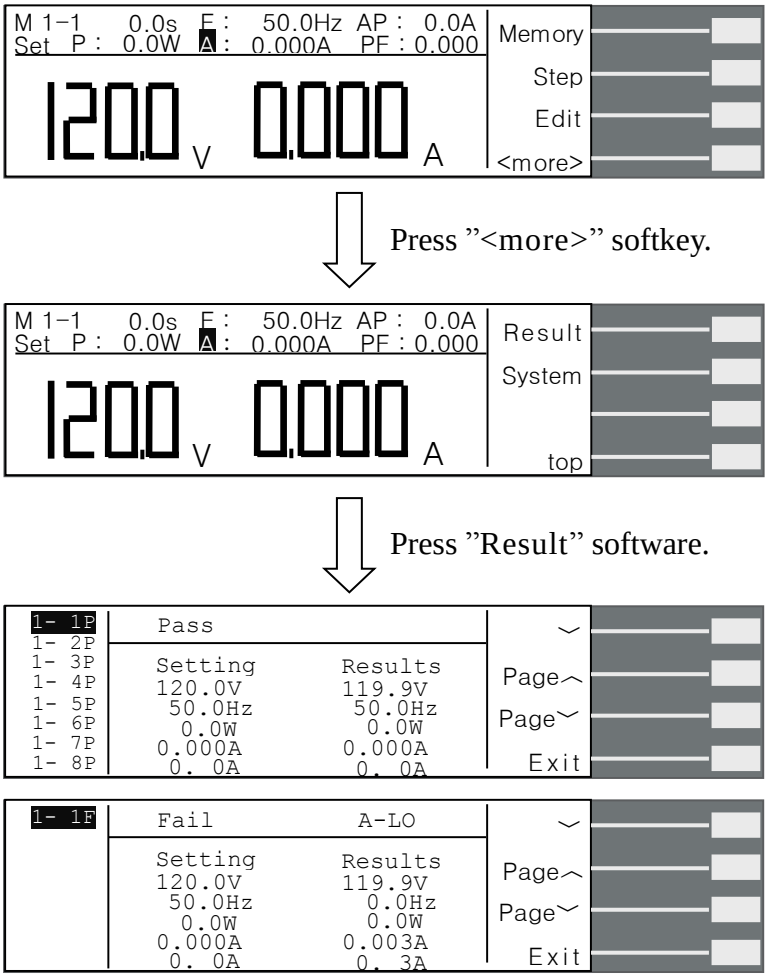
This function when turned ON will connect or link the step to the next step. When step 9 connect is turned “ON”, it will be linked to the first step of the next memory. For example, memory 1, step 9 will be connected to memory 2, step1. It is possible to connect all 450 steps together when the connect parameter of all steps has been turned “ON”.

If the step connect is turned “ON”, the display will show as follows.



4.2.4 Results Softkey

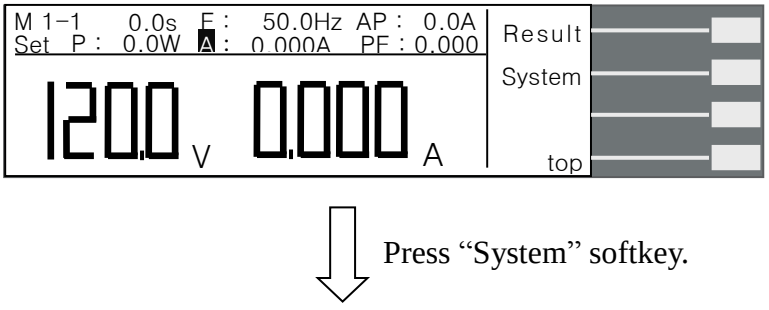
Press “<more>” softkey under the reset condition, then display will show as follows.

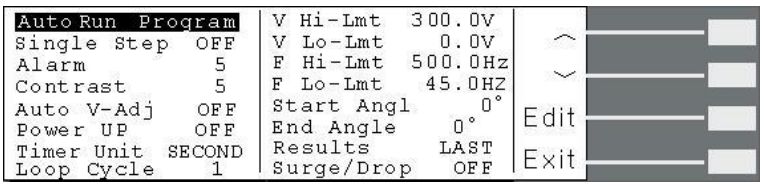


Using the” ﹀”, ” Page ﹀” or ” Page ﹀” softkeys to review the last test result. If the system is never executed any test, the display will hold on the rest condition after you press the softkey.

4.2.5 System Softkey

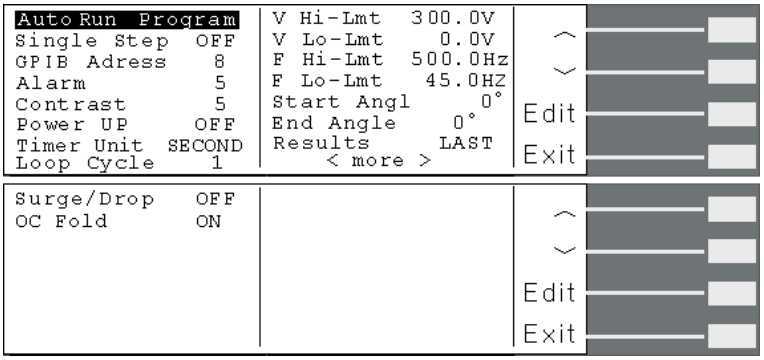
Press “<more>” softkey under the reset condition, then display will show as follows.





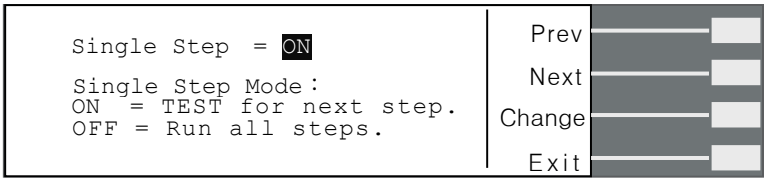
4.2.5.1 Enter the System Setting Mode

Press “Edit” softkey under system mode, then you can enter the setting mode.

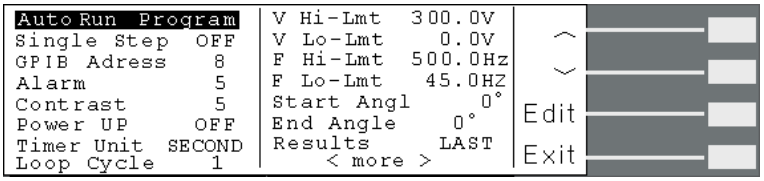


Press “Edit” softkey.

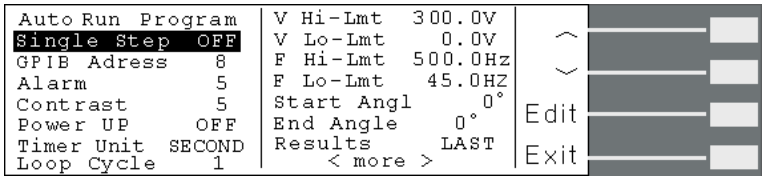
Press “Next” Softkey.



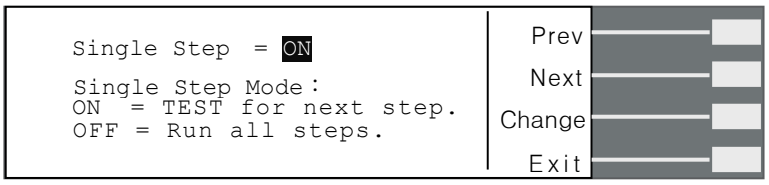
Or you can press ”﹀” or ”﹀” softkey to select the parameter you want to edit first, then press ”Edit” softkey to edit it.



Press ”﹀” softkey.



Press ”Edit” softkey.

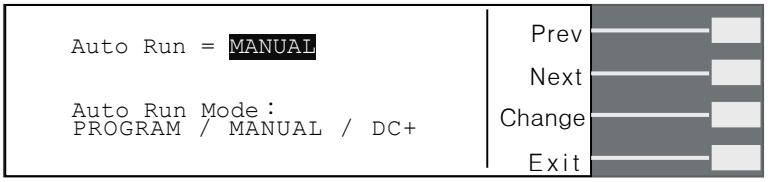


Use numeric keypad to enter the new number or pressing “Change” softkey to change the parameter mode.

4.2.5.2 System parameter

Auto Run Mode Selection

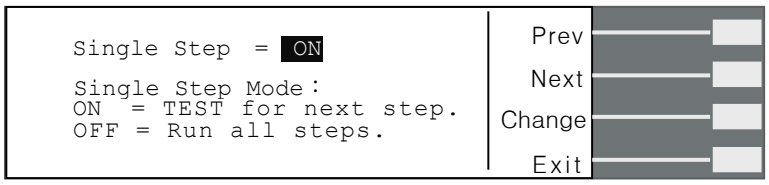
When the parameter “Auto Run” is selected, the display will show as follows.



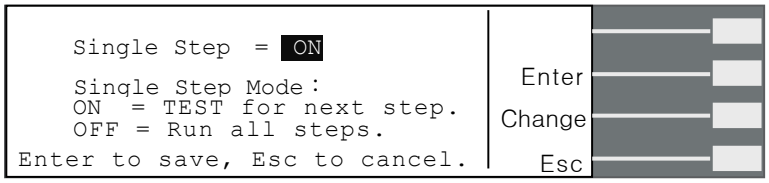
If the parameter is set to “PROGRAM”, it can be executed program linking test. If the setting is “MANUAL”, it can’t be executed program linking test. And if the setting is “DC+”, 6600 series will be DC output mode.

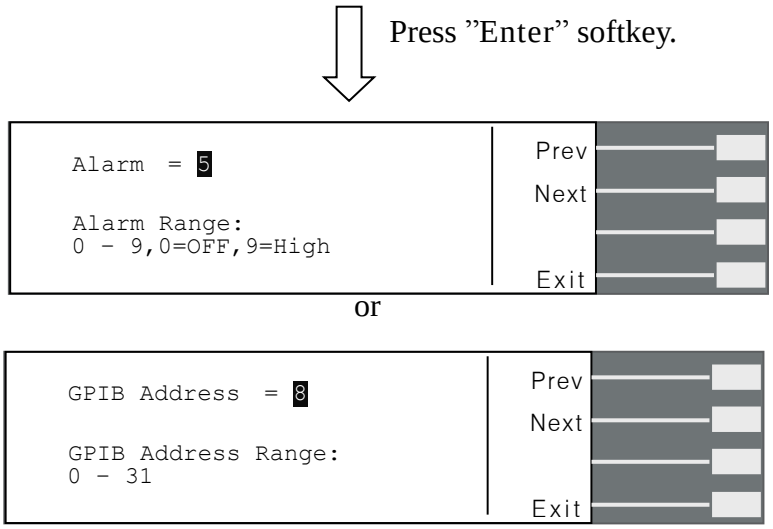
Single Step

When the parameter is selected, the display will show as follows.



Press “Change” softkey.





You may turn the Single Step function ON and OFF by pressing the “Change” soft key. Accept the change by pressing ENTER or cancel the edit by pressing EXIT.

This function is used to temporarily override the automatic connection feature. When the Single Step function is ON the instrument will pause after each step is completed. To continue the test sequence, press the Test button to execute the next connected step. Each time the Test button is pressed the next connected step will execute. If you press the Reset button before completing all connected steps, it will return you to the original starting step. If a step fails and you wish to continue to the next step, do not press Reset.

GPIB Address (Option function)

If 6600 series option with GPIB function, the system setting will have the parameter.

To change the value of the GPIB address, type in a numeric value between 0 and 31. Press the ENTER key to accept the new number or the EXIT key to escape from the edit and return to the original number.

Alarm Volume

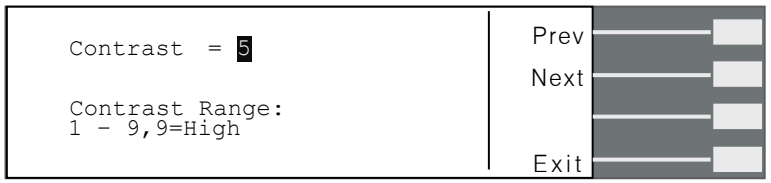
When the parameter is selected, the display will show as follows.

To change the volume of the alarm, type in a numeric value between 0 and 9. Press the ENTER key to accept the new number or the EXIT key to escape from the edit and return to the original number.

The numbers corresponding to the different volume settings are 0 through 9, 0 meaning the volume is off, and 9 being the loudest setting. After the number is entered, a momentary alarm chirp will occur to indicate the volume of the new setting.

LCD Contrast

When the parameter is selected, the display will show as follows.

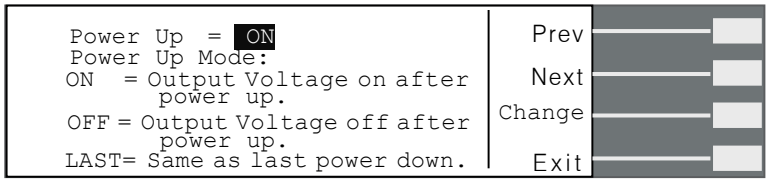


To change the Contrast of the display, type in a numeric value between 0 and 9. Press the ENTER key to accept the new number or the EXIT key to escape from the edit and return to the original number.

The numbers corresponding to the different contrast settings are 0 through 9, 0 meaning the lightest color of displayed characters and 9 meaning the darkest color of displayed characters. After the number is entered, the display will automatically adjust to the new display setting.

Power Up

When the parameter is selected, the display will show as follows.



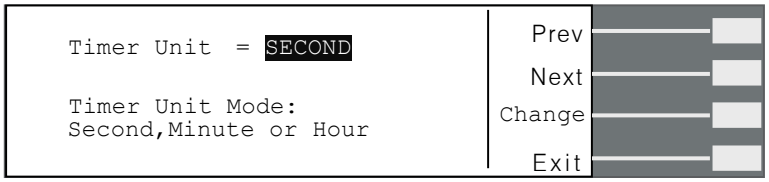
You may turn the function ON , OFF and LAST by pressing the “Change” soft key. Accept the change by pressing ENTER or cancel the edit by pressing EXIT.

When the Power Up function is ON the instrument will auto test after power up. When the Power Up function is OFF the instrument will return the reset condition after power up. When the Power Up function is LAST, the display will show “Same as last power down”.

.

Timer Unit

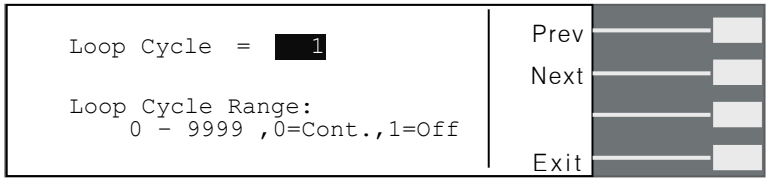
When the parameter is selected, the display will show as follows.



You may turn the function SECOND , Minute and Hour by pressing the “Change” soft key. Accept the change by pressing ENTER or cancel the edit by pressing EXIT.

Loop Cycle

When the parameter is selected, the display will show as follows.



Setting of “Cont” means continuous, and “1” is single operation. For “2”~“9999” setting, it becomes the number of sequence to be repeated for running operation. This selected loop rate will then be used as a multiplier to the value of step cycle and memory cycle.

For an example, the Loop Cycle is 2,
Memory 1：Memory Cycle=2
M1-1：Connect=ON，Step Cycle=2
M1-2：Connect=ON，Step Cycle=1
M1-3：Connect=ON，Step Cycle=1
M1-4：Connect=ON，Step Cycle=3
M1-5：Connect=ON，Step Cycle=2
M1-6：Connect=ON，Step Cycle=1
M1-7：Connect=ON，Step Cycle=1
M1-8：Connect=ON，Step Cycle=1
M1-9：Connect=ON，Step Cycle=2
Memory 2：Memory Cycle=3
M2-1：Connect=ON，Step Cycle=1
M2-2：Connect=ON，Step Cycle=3

All the test steps as follows.
M1-1➔M1-1➔M1-2➔M1-3➔M1-4➔M1-4➔M1-4➔M1-5➔M1-5➔M1-6➔M1-7➔M1-8➔M1-9➔M1-9➔
M1-1➔M1-1➔M1-2➔M1-3➔M1-4➔M1-4➔M1-4➔M1-5➔M1-5➔M1-6➔M1-7➔M1-8➔M1-9➔M1-9➔
➔M2-1➔M2-2➔M2-2➔M2-2 ➔M2-1➔M2-2➔M2-2➔M2-2 ➔M2-1➔M2-2➔M2-2➔M2-2

Voltage High Limit and Low Limit

When the High Limit is selected, the display will show as follows.

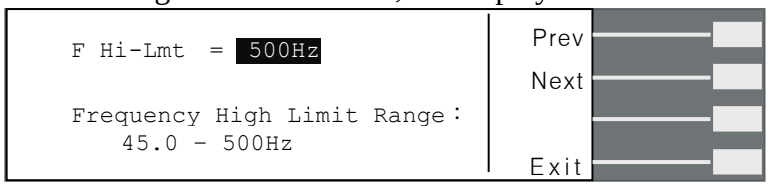
When the High Limit is selected, the display will show as follows.

Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.

This feature disallows user to vary the output voltage during RESET and TEST conditions, which may cause to exceed the acceptable range of voltage for any particular DUTs.

Frequency High Limit and Low Limit

When the high limit is selected, the display will show as follows.



When the low limit is selected, the display will show as follows.

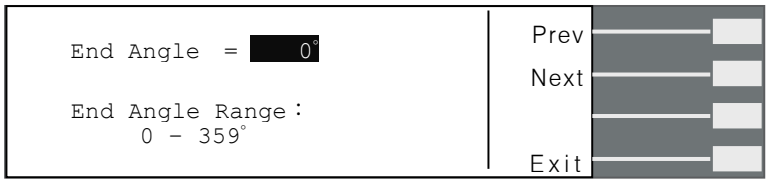
Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.

This feature disallows user to vary the output frequency during RESET and TEST conditions, which may cause to exceed the acceptable range of frequencies for any particular DUTs.

Start Angle and End Angle

When the “Start Angle” is selected, the display will show as follows.

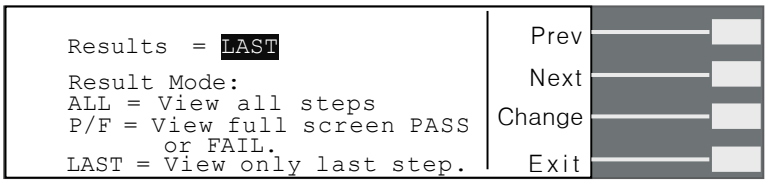
When the “End Angle” is selected, the display will show as follows.



Use numeric key to enter the value then press “Enter” softkey to save and escape the parameter setting.

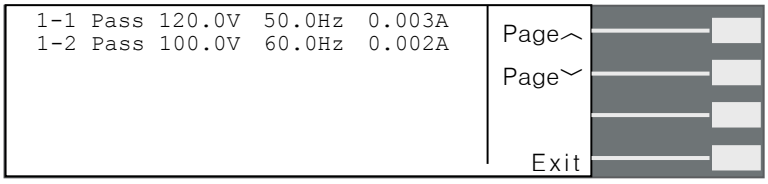
Results

When the parameter is selected, the display will show as follows.



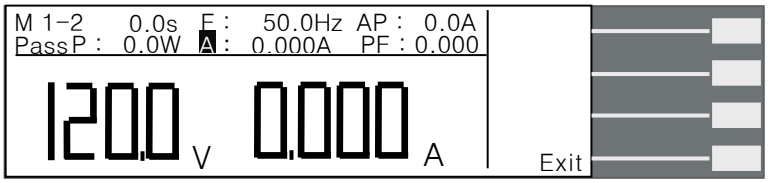
When the Results parameter is highlighted, you may use the “Change” soft key to select what type of results you would preferred displayed at the end of a test or sequence of connected steps. The available selections are: All, P/F and Last. Press the ENTER key to accept the new setting or the EXIT key to cancel and return to the original setting.

When All is selected, a Results summary screen will be displayed at the end of the test or sequence of connected steps, displaying the results of all of the steps. The Results summary screen will appear as follows:



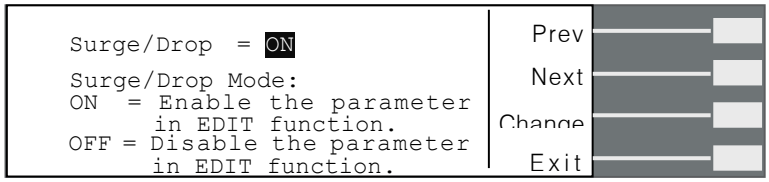
When P/F is selected, a Pass or Fail screen will be displayed at the end of the test. The Pass and Fail screens will appear as follows:

When Last is selected, the results of the last step performed will be displayed on the Perform Tests screen. There will not be a change in appearance or special screen displayed in this mode.



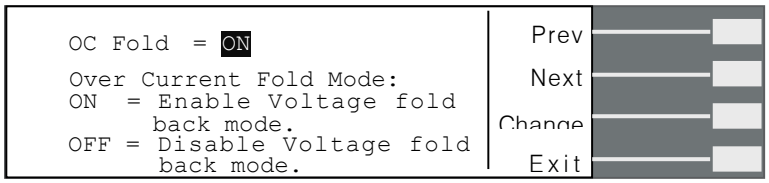
Surge/Drop Mode(Surge/Drop)

Setting on, the test parameter ”SD-Volt”、”SD-Site” and ”SD-Time” will be enabled. Setting off, the test parameter ”SD-Volt”、”SD-Site” and ”SD-Time” will be disabled.



Over Current Fold Back (OC-Fold)

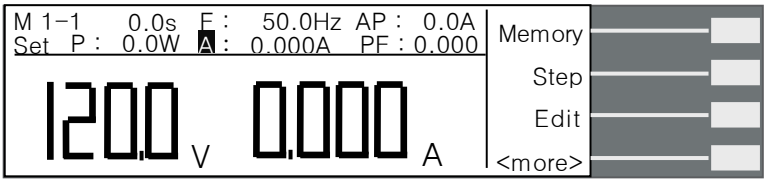
Setting On, when output current is higher than Programmable Parameters “A-HI” current setting current value, it will keep constant A-HI setting current value output.



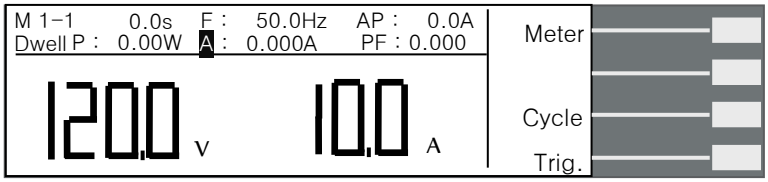
4.3 Description of Test

4.3.1 If the setting of the test parameter “AUTO RUN” is ”PROGRAM”.

If the setting of the test parameter “AUTO RUN” is **”PROGRAM”**, the Rotary Knob on the panel will be disabled.



When you press ”TEST/RESET” key to activate the test, the display will show as follows.



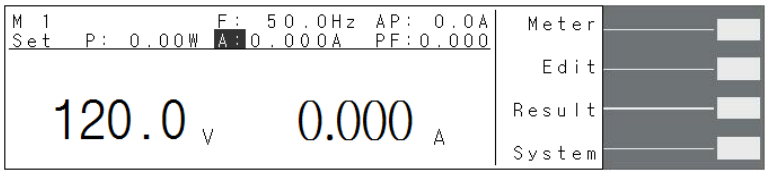
You can monitor the value of Frequency, Peak Current, Power or Power factor by pressing the

“Meter” softkey when the test is activating. Or you can monitor the times of Step, Memory and loop cycle by pressing the “cycle” softkey.

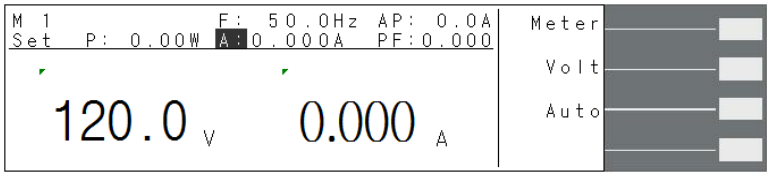
4.3.2 If the setting of the test parameter “AUTO RUN” is ”MANUAL”.

If the setting of the test parameter “AUTO RUN” is **”MANUAL”**, the Rotary Knob on the panel will be enabled.

Under reset condition, you can adjust the setting value of voltage, current, Memory or frequency by the Rotary Knob and the display will show as follows.



When you press ”TEST/RESET” key to activate the test, the display will show as follows.

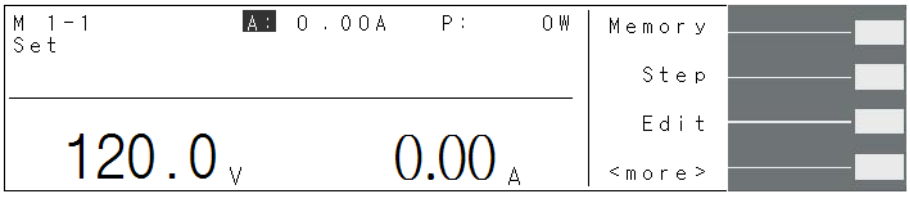


In the meanwhile, you can adjust the output value of voltage or frequency by the Rotary Knob.

Whenever it is under reset condition or testing condition, you can monitor the value of Frequency, Peak Current, Power or Power factor by pressing the “Meter” softkey. Or you can monitor the times of Step, Memory and loop cycle by pressing the “cycle” softkey.

4.3.3 AUTO RUN Set DC Mode

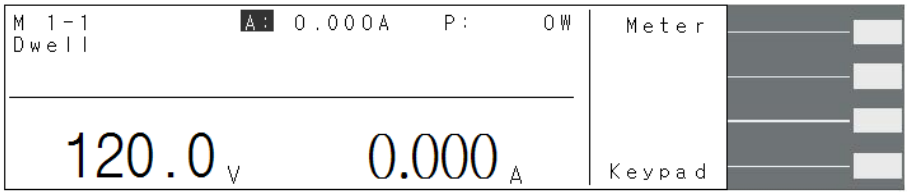
When the AUTO RUN parameter in the System Parameters menu is set to DC Mode the Set screen will be displayed as follows:



To initialize the test press the Test/Reset key and the LED for the key will illuminate. The text “Set” on the set screen will turn to Dwell, in addition your soft keys will change to include Meter and Keypad. The output will run continuously until the Test/Reset key is pressed again, or there is a failure condition.

When the RESET key is pressed or a Hi-Limit failure occurs, the instrument DC output voltage has a fixed 1 second ramp down discharge time. The Test/Reset LED flashes during this ramp down period to indicate the output is still active.

If you press the Meter soft key a shaded black box (■) will highlight the meter parameters P: or A: and the display will read the output on the right side of the display. Every time the meter key is pressed it will toggle between the two meter parameters.



If you press the Keypad soft key the display will show the text Voltage = above the voltage meter on the left hand side of the display. A shaded black box (■) will be flashing waiting for a voltage value to be entered from the numeric keypad. Once the value has been typed into the instrument you must press the Enter soft key to accept the value. The Esc soft key is available to exit out of this mode and move back to the test screen.

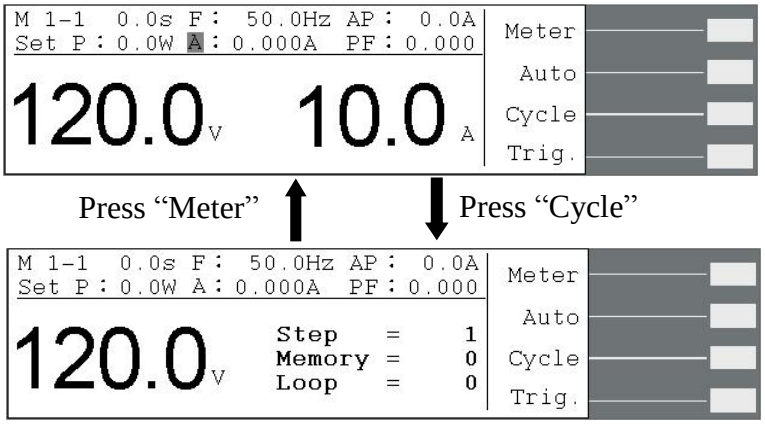
The Rotary Knob on the front panel also becomes active. To adjust the voltage rotate the knob either clockwise or counterclockwise. Clockwise rotations will increase the voltage, whereas counterclockwise rotations will decrease the voltage. If LOCK is set to ON, the Rotary Knob is disabled.

4.3.4 Description of Test Softkeys

“Meter” ：You can select the parameter you want to monitor by pressing “Meter” softkey.

“Auto” ：It can be set to be ”AUTO” or ”HIGH”.
If the setting is “AUTO” mode, the system will auto judge the voltage mode belongs to low range or high range from the setting value of voltage. If it is “HIGH” mode, it is always set to be high range.

“Cycle” ： Monitoring the times of Step, Memory and loop cycle.



"Trig." ： If the setting of system parameter "Surge/Drop" is ON，the softkey will be enabled. After you finished all the set about Surge/Drop function, the trigger can be activated by pressing "Trig." softkey.

Note. Each trigger must be separated at least 200ms then it can be activated.

4.3.5 DC Output

When the AUTO RUN parameter in the System Parameters menu is set to DC Mode the Set screen will be displayed as follows:

The set parameter mode is same as AC mode, please refer to4.2.3.

4.4 Displayed Messages

Below are the descriptions of error messages that may occur at abnormal conditions:
At any abnormal conditions, there are several error messages to be indicated on the display. Thereafter the output will be disabled and the alarm will sound. The TEST/RESET LED Indicator will also light up at the same time. If the indicator is blinking that shows an abnormal operation is encountered, thereby the output voltage will be cut off immediately. By pressing the TEST/RESET key will reset the audible alarm, an error message is indicated.

WARNING All error messages are occurred at any abnormal conditions and therefore must be recorded. Check the cause of error to ensure the problem is eliminated before restarting the operation, or contact eec or our official distributors for further assistance.

Over Setting Current Protection (HI – A)

If the reading of output current has exceeded the setting of current, the display will indicate "HI-A" and the alarm will sound. Consequently, the TEST/RESET LED indicator will blink.

Over Current Protection (OCP)

If the output current has exceeded 110% of full rated current or or output circuit short for 1 second, the display will indicate "OCP" and the alarm will sound. Consequently, the TEST/RESET LED indicator will blink.

Over Temperature Protection (OTP)

If the heat sink of the instrument itself has exceeded 130 °C, the display will indicate "OTP". This shows that the heat sink is overheated and thus the alarm will sound. Consequently, the TEST/RESET LED indicator will blink.

Over Voltage Protection (OVP)

If the output voltage has exceeded 5V of setting voltage at 0-150V range or has exceeded 10V of setting voltage at 0-300V range, the display will indicate "OVP" and the alarm will sound. Consequently, the TEST/RESET LED indicator will blink.

Low Voltage Protection(LVP)

If the output voltage is under 5V of setting voltage at 0-150V range or under 10V of setting voltage at 0-300V range for 0.5 second, the display will indicate "LVP" and the alarm will sound. Consequently, the TEST/RESET LED indicator will blink.

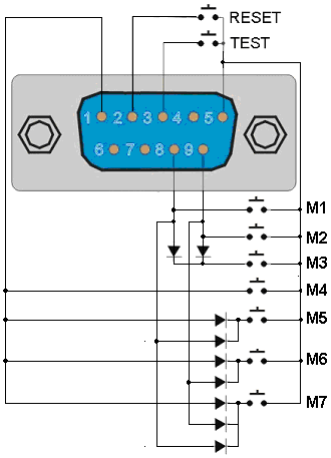
Over Power Protection (OPP)

If the output power has exceeded 105-110% of rating power for 5s or the output power has exceeded 110% under 1 second, the display will indicate "OPP" and the alarm will sound. Consequently, the TEST/RESET LED indicator will blink.

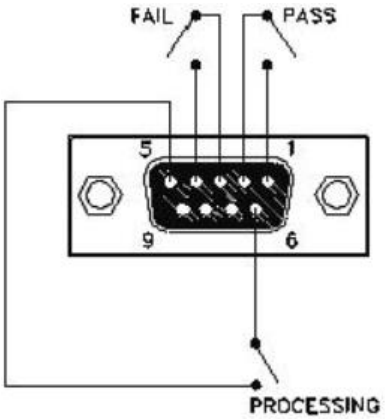
CHAPTER 5. DESCPIPTION OF APPLICATION

5.1 Remote Interface

The rear panel connector of 6600 Series AC Power Source provides output signals to remotely monitor PASS, FAIL, and PROCESSING conditions. 6600 Series AC Power Source also provide an optional remote input interface and thus can control any test operation via remote The 9-pin D-type connector signals for Test , Reset, and 7 memories (M1~M7) input control signal. PLC remote function will be activated once the PLC Remote setting from SYSTEM setup parameter is turned on.



Signal Input (Option)



Signal Output

Signal Input and Storage

Upon turning on the PLC Remote setting, the TEST/RESET Indicator will be lit and the buzzer will beep twice before return to RESET condition, when any key on the front panel is pressed. In fact, whenever there is an abnormal output detected, it can be reset by pressing the "OUTPUT／RESET" key from the front panel or the Reset button from the PLC Remote and return to RESET condition.

TEST Connect between PIN 3 and PIN 5

RESET Connect between PIN 2 and PIN 5

Memories Input Control

Memories Input Control can be achieved by using Normally Open (N.O) Momentary Button and the connection as:

	PIN 1	Pin 9	Pin 8
M1	OFF	OFF	ON
M2	OFF	ON	OFF
M3	OFF	ON	ON

M4	ON	OFF	OFF
M5	ON	OFF	ON
M6	ON	ON	OFF
M7	ON	ON	ON

For an example,
Memory 3 (M3) Connect PIN 8 and PIN 9 with a series diode (ex. D4148) at each pin and the joint point is connected to PIN 5.
Note: PIN 5 is Common of input signal (COM).

Signal Output

The rear panel connector provides output signals to remotely monitor PASS, FAIL, and PROCESSING conditions. These signals are provided by three normally open internal relays that switch on to indicate the current condition of the tester. These are normally open free contacts and will not provide any voltage or current. The ratings of the contacts are 1A / 250 VAC (0.5 ADC). The signal outputs are provided on the 9 pin female type D connector. Below is a listing that indicates what conditions activate each pin. When a terminal becomes active the relay closes thereby allowing the external voltage to operate an external device.

PASS Connect between PIN 1 and PIN 2.
FAIL Connect between PIN 3 and PIN 4.
PROCESSING Connect between PIN 5 and PIN6.
Pins 7, 8, and 9 are blank.

The following describes how the relays operate for each test condition.

PROCESSING - The relay contact closes the connection between pin (5) and pin (6) while AC Source is performing a test. The connection is opened at the end of the test.

FAIL - The relay contact closes the connection between pin (3) and pin (4) after detecting that the item under test failed any test. The connection is opened when the next test is initiated or the reset function activated.

PASS - The relay contact closes the connection between pin (1) and pin (2) after detecting that the item under test failed any test. The connection is opened when the next test is initiated or the reset function activated.

Note: To avoid any accident to be happened, the remote must be kept and handled by the assigned person in charge only.

5.2 Interface GPIB AND RS-232

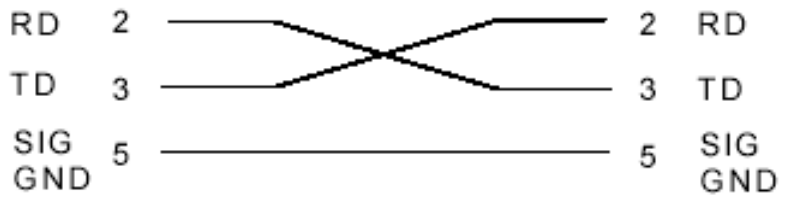
Bus Remote Interface RS-232 / GPIB

This chapter provides information on the proper use and configuration of bus remote interface for RS232 and GPIB interface, whereby both interfaces are using different command lists. These interfaces are optional on 6600 Series AC Power Source.

5.2.1 Interface

5.2.1.1 RS-232

The RS232 connection is configured as follows for a 9 pins Serial Port interface.



The COM port should have the following configuration: 9600 baud, 8 data bits, 1 stop bit, no polarity, and etc. This interface does not support XON/XOFF protocol or any hardware handshaking. The controller should be configured to ignore the Handshaking Lines DTR (PIN 4), DSR (PIN 6) and RTS (PIN 9). If the port cannot be configured through software to ignore the lines, the handshake lines should be then jumped together in two different sets. The PIN 4 and 6 jumped together while PIN 7 and 8 jumped together at the controller end of the cable.

When sending command over the RS232 bus the AC Power Source will send a response string of 06 Hex or 6 decimal and the Acknowledge (ACK) ASCII control code if the transfer was recognized and completed by the AC Power Source. If there is an error with the command string that is sent, the AC Power Source will respond with 15 Hex or 21 decimal and the Not Acknowledge (NAK) ASCII code. The ACK or NAK response allows for software handshaking, in order to monitor and control data flow. When requesting data from the AC Power Source, it will automatically send the data back to the controller input buffer. The controller input buffer will accumulate data being sent from the AC Power Source including the ACK and NAK response strings, until the controller has read it. *When the strings or command has been sent, it must be terminated with* **LF=(0AH)**, *such as* **“TEST”+LF**.

5.2.1.2 GPIB Interface

This interface of a device connected to the BUS is specified by its interface functions. These functions provide the means for a device to receive, process, and send messages over the bus. The interface functions are listed in the chart below.

IEEE-488 INTERFACE	Complete Handshake Capability
	Talker/Listener Capability
	Service Request Capability
	No Remote/Local Capability
	No parallel poll Capability
	No Device Clear Capability
	No Device Trigger Capability
	No Controller Capability
	3 state driver
	Setting of test condition and parameters
	Reading of display status
	Reading of measurement results
Controllable Item	Test/Reset Control
DATA CODES	ASCII

GPIBAddress

All the above commands are required by the IEEE-488.2 GPIB Interface BUS. The factory default address of the 6600 Series AC Power Source is set to 8.

5.2.2 Commands

Test Commands

COMMAND	Function	Description		UNIT
		AC Range	DC Range	
TEST	Test	Power On		
RESET	Reset	Power Off		
TD?	All present displayed values Query	MEMORY, STEP, STATUS, FREQ, VOLT, CURR, WATT, CURR, PEAK,PF, TIMER		
TDFREQ?	Reading of Frequency Query	45.0~500.0		Hz
TDVOLT?	Reading of Voltage Query	0.0~300.0	0.0~400.0	V
TDCURR?	Reading of Current Query	0.000~42.00		A
TDAP?	Reading of Peak Current Query	0.0~59.0	0.0~59.0	A
TDP?	Reading of Power Query	0.0~4000		W
TDPF?	Reading of PF Query	0.000~1.000		
TDTIMER?	Reading of Test Time Query	0.0~999.9		s/m/h
METER X	Displayed Meter selection	X=0~4, 0=FREQ, 1=AP, 2=POWER, 3=CURR, 4=PF	X=2~3, 2=POWER, 3=CURR	
METER?	Displayed Meter Query			
SDTRG	Surge/Drop Trigger	Trigger one time Surge/Drop		
STEPCYCLE?	Step Cycle times Query			
MEMORYCYCLE?	Memory Cycle times Query			
LOOPCYCLE?	Loop Cycle times Query			

Program Commands

COMMAND	Function	Description		UNIT
		AC Range	DC Range	
AR X	Test Mode Selection	X=0~3, (2,3 option function) 0=PROGRAM, 1=MANUAL, 2=DC+, 3=DC-		
AR?	Test Mode Query			
MC XXXX	Memory Cycle setting	XXXX=0~9999, 0=Contine,1=OFF		
MC?	Memory Cycle times Query			
MEMORY X	Memory Number Selection	X=1-50		
MEMORY?	Memory Number Query			
STEP X	Step Number Selection	X=1-9		
STEP?	Step Number Query			
VOLT XXX.X	Voltage Setting	XXXX=0.0~300.0	XXXX=0.0~400.0	V
VOLT?	Setting Voltage Query			
RANG X	Voltage Range Selection	X=0~1, 0=HIGH, 1=AUTO		
RANG?	Voltage Range Query			
FREQ XXXX	Frequency Setting	XXXX=45.0~500		Hz
FREQ?	Setting Frequency Query			
AHI XXXX	High Limit of Current Setting	XXXX=0.000~42.00	XXXX=0.000~42.00	A
AHI?	High Limit of Current Query			
ALO XXXX	Low Limit of Current Setting	XXXX=0.000~42.00	XXXX=0.000~42.00	A
ALO?	Low Limit of Current Query			
APHI XXXX	High Limit of Peak Current Setting	XXXX=0.0~59.0	XXXX=0.0~59.0	A
APHI?	High Limit of Peak Current Query			
APLO XXXX	Low Limit of Peak Current Setting	XXXX=0.0~59.0	XXXX=0.0~59.0	A
APLO?	Low Limit of Peak Current Query			
PHI XXXX	High Limit of Power Setting	XXXX=0.0~5000	XXXX=0.0~5000	W
PHI?	High Limit of Power Query			
PLO XXXX	Low Limit of Power Setting	XXXX=0.0~5000	XXXX=0.0~5000	W
PLO?	Low Limit of Power Query			
PFHI XXXX	High Limit of Power Factor Setting	XXXX=0.000~1.000		
PFHI?	High Limit of Power Factor Query			
PFLO XXXX	Low Limit of Power Factor Setting	XXXX=0.000~1.000		
PFLO?	Low Limit of Power Factor Query			
RAMPUP XXXX	Ramp Up Time Setting	XXX.X=0.1~999.9		s
RAMPUP?	Ramp Up Time Query			
DELAY XXXX	Delay Time Setting	XXX.X=0.1~999.9		s/m/h
DELAY?	Delay Time Query			
DWELL XXXX	Test Time Setting	XXXX=0.0~999.9, 0=Const		s/m/h
DWELL?	Test Time Query			
RAMPDOWN XXXX	Ramp Down Time Setting	XXX.X=0.1~999.9		s
RAMPDOWN?	Ramp Down Time Query			
SDVOLT XXXX	Surge/Drop Voltage Setting	XXXX=0.0~300.0		V
SDVOLT?	Surge/Drop Voltage Query			
SDLT XXXX	Surge/Drop Site Setting	XXXX=0~99		ms
SDLT?	Surge/Drop Site Query			
SDHT XXXX	Surge/Drop Time Setting	XXXX=0~99		ms
SDHT?	Surge/Drop Time Query			
SDCT XXXX	Surge/Drop Continue Test Setting	X=0~1, 0=OFF, 1=ON		
SDCT?	Surge/Drop Continue Test Query			
PTD	Delete Prompt			
PT XXXX	Prompt Setting	XXXX=1~30 BYTES		
PT?	Prompt Query			
SC XXXX	Step Cycle Times Setting	XXXX=0~9999, 0=Cont, 1=OFF		
SC?	Step Cycle Times Query			
CONNECT X	Connect Mode Setting	X=0~1, 0=OFF, 1=ON		
CONNECT?	Connect Mode Query			

System Commands

COMMAND	Function	Description		UNIT
		AC Range	DC Range	
SS X	Test Mode of Single Step selection	X=0~1, 0=OFF, 1=ON		
SS?	Test Mode of Single Step Query			
ALARM X	Alarm Level Setting	X=0~9, 0=OFF, 9=highest		
ALARM?	Alarm Level Query			
CONTRAST X	Contrast Level Setting	X=1~9, 9=highest		
CONTRAST?	Contrast Level Query			
PUP X	Power Up Mode Setting	X=0~2, 0=OFF, 1=ON, 2=LAST		
PUP?	Power Up Mode Query			
TUNIT X	Time Unit Selection	X=0~2, 0=Second, 1=Minute, 2=Hour		
TUNIT?	Time Unit Query			
LC XXXX	Loop Cycle Times Setting	XXXX=0~9999, 0=Cont, 1=OFF		
LC?	Loop Cycle Times Query			
VHI XXXX	Hi Limit of Voltage Setting	XXXX=0.0~300.0	XXXX=0.0~400.0	V
VHI?	Hi Limit of Voltage Query			
VLO XXXX	Low Limit of Voltage Setting	XXXX=0.0~300.0	XXXX=0.0~400.0	V
VLO?	Low Limit of Voltage Query			
FHI XXXX	Hi Limit of Frequency Setting	XXXX=40.0~500.0		Hz
FHI?	Hi Limit of Frequency Query			
FLO XXXX	Low Limit of Frequency Setting	XXXX=40.0~500.0		Hz
FLO?	Low Limit of Frequency Query			
SAG XXXX	Start Angle Setting	XXXX=0-359		°
SAG?	Start Angle Query			
EAG XXXX	End Angle Setting	XXXX=0-359		°
EAG?	End Angle Query			
RESULTS X	Mode of Result Display Selection	X=0~2, 0=ALL, 1=P/F, 2=LAST		°
RESULTS?	Mode of Result Display Query			
SD X	Surge/Drop Function Selection	X=0~1, 0=OFF, 1=ON		
SD?	Surge/Drop Selection Query	0~1		
OF X	Over Current Fold Function Selection	X=0~1, 0=OFF, 1=ON		
OF?	Over Current Fold Selection Query	0~1		

IEEE 488.2 Common Commands

Command	Description	Acknowledgement
*IDN?	Identification Query	Company, Model Number, Serial Number, Firmware Revision
*RST	Reset Command	
*TST?	Self-Test Query	00H=OK
		01H=TEST EEPROM ERROR
*CLS	Clear Status Command	Clear Standard Event Status Register
		Clear Service Request Register
*OPC	Operation Complete Command	When TEST command ok setting ESR BIT0 =1
*OPC?	Operation Complete Query	
*WAI	Wait for next command	
*ESR?	Standard Event Status Register Query	BIT 0 ,01H, (1) Operation Complete
		BIT 1 ,02H, (2) Not Used

		BIT 2 ,04H, (4) Query Error
		BIT 3 ,08H, (8) Device Error
		BIT 4 ,10H,(16) Execution Error
		BIT 5 ,20H,(32) Command Error
		BIT 6 ,40H,(64) Not Used
		BIT 7 ,80H,(128) Power On
*ESE XXX	Standard Event Status Enable Command	value=0~255
*ESE?	Standard Event Status Enable Query	0 - 255
*STB?	Read Status Byte Query	BIT 0 ,01H,(1) Not Used
		BIT 1 ,02H,(2) Not Used
		BIT 2, 04H,(4) Not Used
		BIT 3, 08H,(8) Not Used
		BIT 4, 10H,(16) Message Available
		BIT 5, 20H,(32) Standard Event (ESB)
		BIT 6, 40H,(64) Request Service (MSS)
		BIT 7, 80H,(128) Not Used
*SRE XXX	Service Request Enable	value=0~255
*SRE?	Service Request Enable Query	0 - 255
*PSC X	Power-On Status	value=0/1
*PSC?	Power-On Status Query	0, 1

5.3Non Volatile Memory

The instrument saves each parameter in non-volatile memory when the file save "FS" command is used to save the file. The non-volatile memory has a limited write cycle life, therefore for programmers who wish to send all parameters before executing each test the "FS" command should not be used. The parameters will be stored in the CPU's Random Access Memory (RAM) until another memory location is selected. However, settings written to RAM from GPIB/RS-232 mode will be lost when power is shut down. Parameter changes to RAM are unlimited and will not effect the life of the internal non-volatile memory chip.

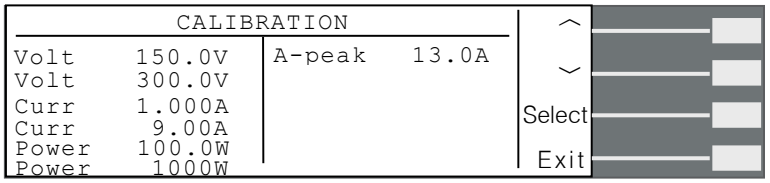
CHAPTER 6. CALIBRATION

eec offers a standard one-year manufacture's warranty. This warranty can be extended an additional four years provided that the instrument is returned each year to eec for it's annual calibration. In order to be eligible for the extended warranty instruments must be returned to eec for calibration service at least once every twelve months.

Follow calibration is an example for model 6610.

6.1 Enter The Calibration Mode

Press and hold key 4 while powering ON the 6600. The 6600 enters calibration mode after the power on sequence is complete. The initial calibration screen will appear as follows:

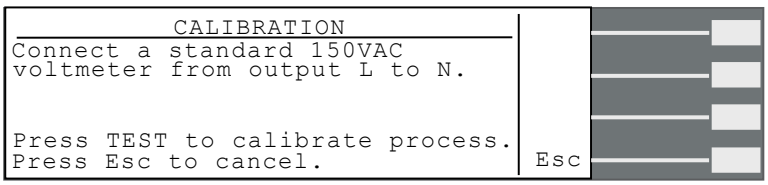


Use "ﹿ " or " ﹀ " softkey to scroll the highlighted area to the desired calibration point, .Then Press "Select" softkey to start the calibration.

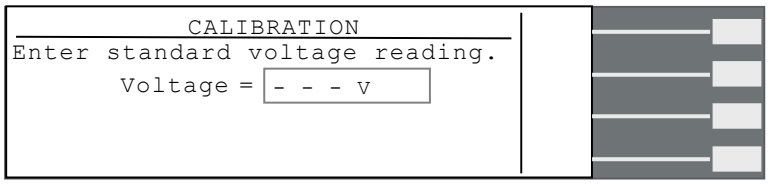
6.2 Calibration points

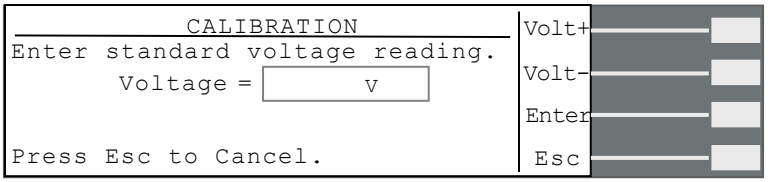
Use "ﹿ " or " ﹀ " softkey to scroll the highlighted area to the desired calibration point. Then Press "Select" softkey to start the calibration.

Calibration of AC 150.0V Low Voltage Range



Follow above prompt to activate the calibration. After the calibration is activated, the screen will change to the text indicated as follows:

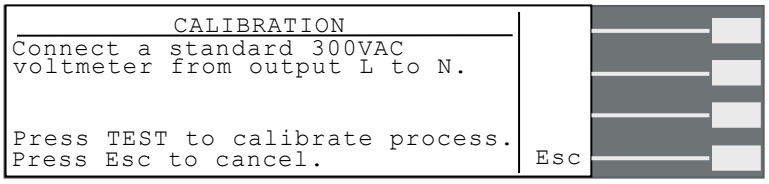




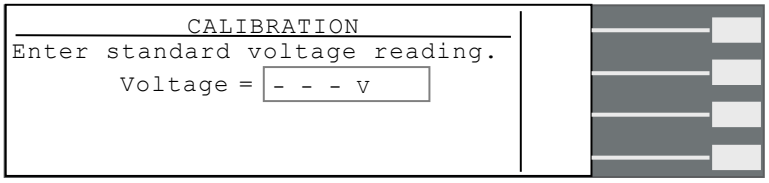
Read the measurement from your standard meter and enter it using the numeric keypad. You may now store the new calibration number by pressing the “ENTER” softkey or cancel by pressing the “Esc” softkey.

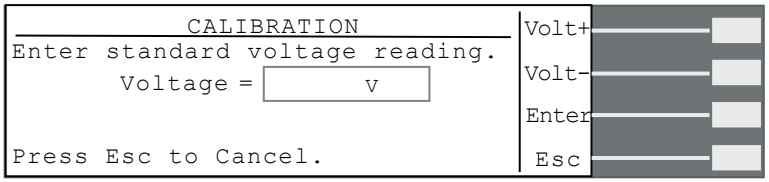
If the calibration is completed, the display will forward to the next calibration point.

Calibration of AC 300.0V Low Voltage Range



Follow above prompt to activate the calibration. After the calibration is activated, the screen will change to the text indicated as follows:

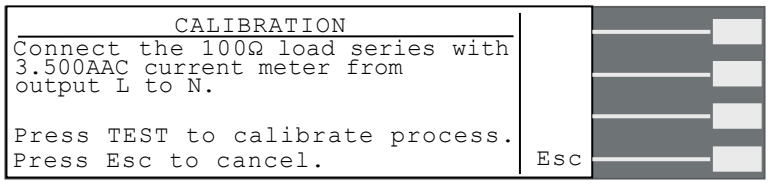




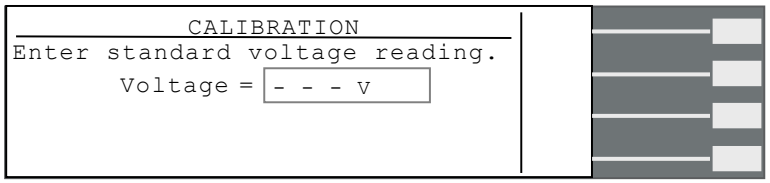
Read the measurement from your standard meter and enter it using the numeric keypad. You may now store the new calibration number by pressing the “ENTER” softkey or cancel by pressing the “Esc” softkey.

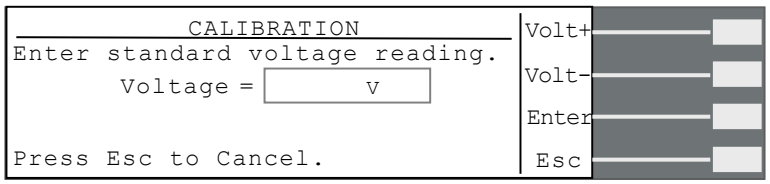
If the calibration is completed, the display will forward to the next calibration point.

Calibration of AC 1.000A Low Current Range



Follow above prompt to activate the calibration. After the calibration is activated, the screen will change to the text indicated as follows:

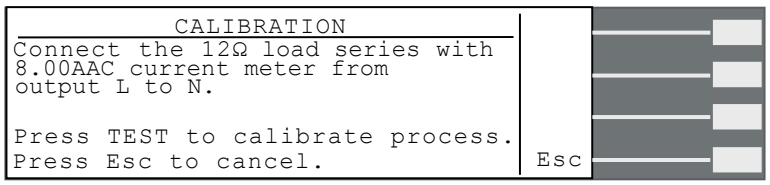




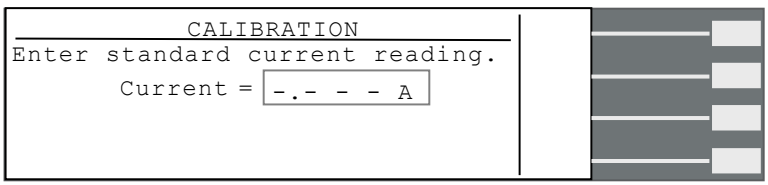
Read the measurement from your standard meter and enter it using the numeric keypad. You may now store the new calibration number by pressing the “ENTER” softkey or cancel by pressing the “Esc” softkey.

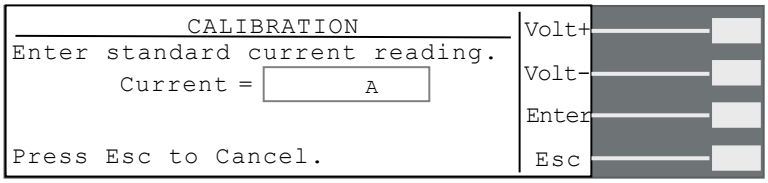
If the calibration is completed, the display will forward to the next calibration point.

Calibration of AC 9.00A High Current Range



Follow above prompt to activate the calibration. After the calibration is activated, the screen will change to the text indicated as follows:

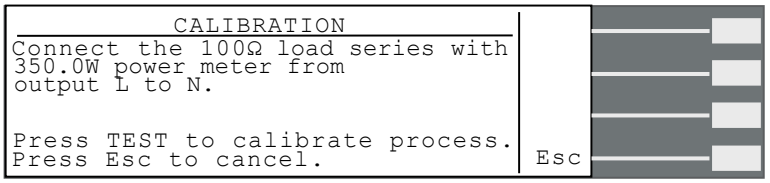




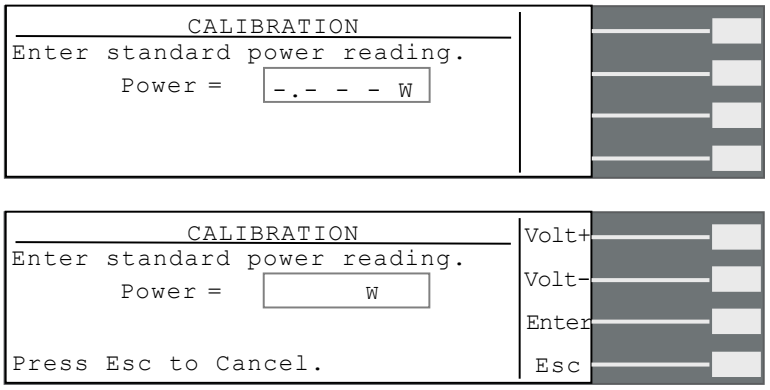
Read the measurement from your standard meter and enter it using the numeric keypad. You may now store the new calibration number by pressing the “ENTER” softkey or cancel by pressing the “Esc” softkey.

If the calibration is completed, the display will forward to the next calibration point.

Calibration of 100.0W Low Power Range



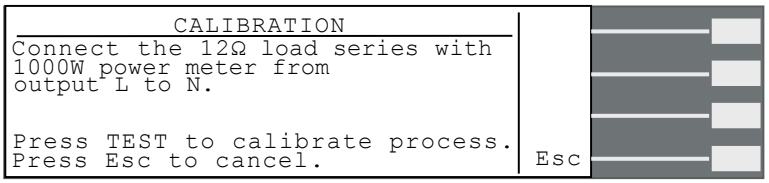
Follow above prompt to activate the calibration. After the calibration is activated, the screen will change to the text indicated as follows:



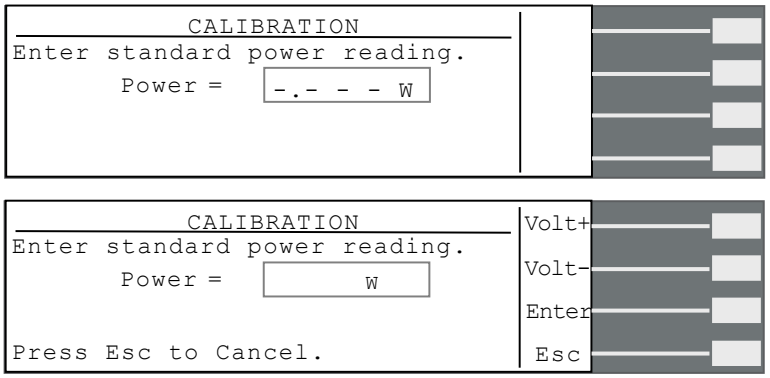
Read the measurement from your standard meter and enter it using the numeric keypad. You may now store the new calibration number by pressing the “ENTER” softkey or cancel by pressing the “Esc” softkey.

If the calibration is completed, the display will forward to the next calibration point.

Calibration of 1000W High Power Range



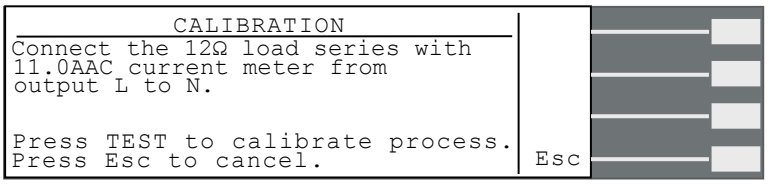
Follow above prompt to activate the calibration. After the calibration is activated, the screen will change to the text indicated as follows:



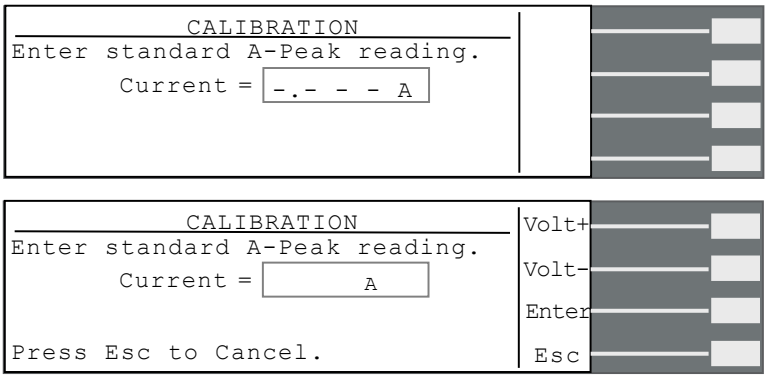
Read the measurement from your standard meter and enter it using the numeric keypad. You may now store the new calibration number by pressing the “ENTER” softkey or cancel by pressing the “Esc” softkey.

If the calibration is completed, the display will forward to the next calibration point.

Calibration of AC13.0A High Peak Current Range



Follow above prompt to activate the calibration. After the calibration is activated, the screen will change to the text indicated as follows:



Read the measurement from your standard meter and enter it using the numeric keypad. You may now store the new calibration number by pressing the “ENTER” softkey or cancel by pressing the “Esc” softkey.

If the calibration is completed, the display will forward to the next calibration point.

Note: Above any item can be calibrated separately.

CHAPTER 7. SUGGESTION for OUTPUT CONNECTION DIAGRAM

1. If it has an electrolytic capacitor within great capacity on DUT power terminal, you can adopt the connection of Fig. 1 or Fig.2.

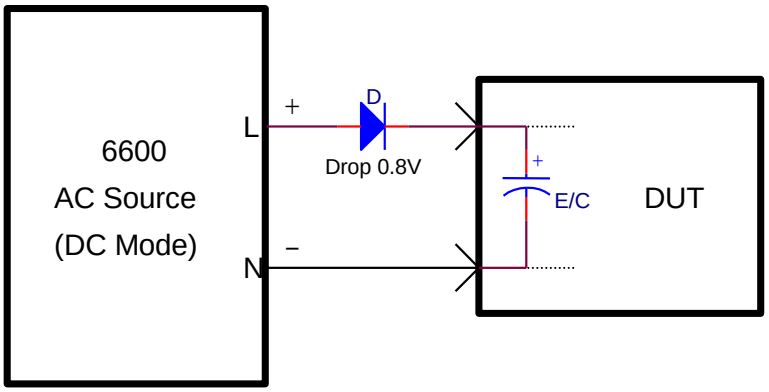


Figure 1

Note: The drop voltage of Fig. 1 is lower than Fig. 2, and it needs to be cared output polarity. Oppositely Fig. 2 doesn't to be cared the polarity.

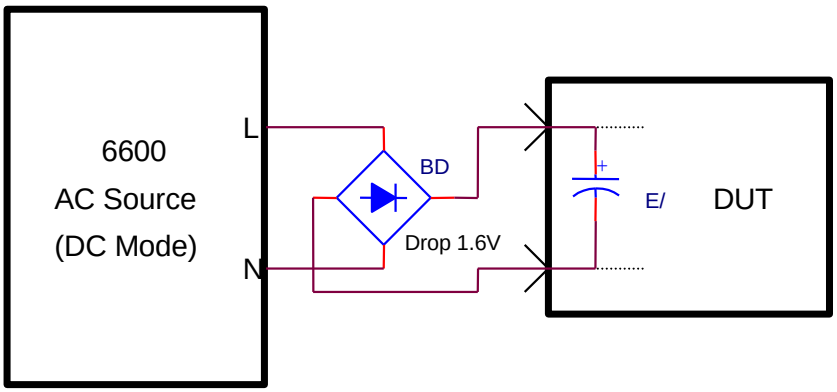


Figure 2

2.If you need the lower ripple and noise circuit, you can adopt the connection of Fig.3.

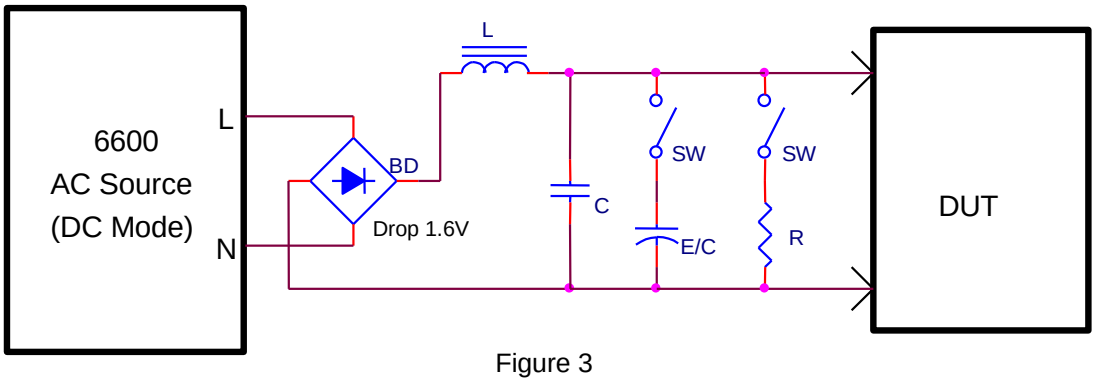


Figure 3

Whatever DUT you have , please connect in series with a diode on DUT power terminal.