



7300 series

GROUND BOND TESTER

Operation Manual

E 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 Chinese National Laboratory Accreditation (CNLA).

Your new instrument is warranted to be free from defects in workmanship and material for a period of (3) 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.

Any non-authorized modifications, tampering or physical damage will void your warranty. Elimination of any connections in the earth grounding system or bypassing any safety systems will void this warranty. This warranty does not cover batteries or accessories not of eec manufacture. Parts used must be parts that are recommended by eec as an acceptable specified part. Use of non-authorized parts in the repair of this instrument will void the warranty.

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.



Compliance Information

Conforms with the following product standards:

EMC Standard

EN 55011:2009+A1:2010

EN 61326-1:2013

1. The product is intended for use in non-residential/non-domestic environments. Use of the product in residential/domestic environments may cause electromagnetic interference.
2. Connection of the instrument to a test object may produce radiations beyond the specified limit.
3. Use high-performance shielded interface cable to ensure conformity with the EMC standards listed above.

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CHAPTER 1 INTRODUCTION

1.1 Information On Safety Precaution

This product and its related documentation must be reviewed for familiarization with safety markings and instructions before operation.

The Ground Bond Tester is Safety Class I instrument (provided with a protective earth terminal).

Before applying power, verify that the instrument is set to the correct line voltage (115V or 230V) and the correct fuse is installed. Factory default is set to AC 230 V.



TOUCH.

INDICATES HIGH VOLTAGE MAY BE PRESENT, DO NOT



INDICATES HAZARDOUS VOLTAGES MAY BE PRESENT.



CHASSIS GROUND SYMBOL.

WARNING

CALLS ATTENTION TO A PROCEDURE, PRACTICE, OR CONDITION, THAT COULD POSSIBLY CAUSE BODILY INJURY OR DEATH.

CAUTION

CALLS ATTENTION TO A PROCEDURE, PRACTICE, OR CONDITION, THAT COULD POSSIBLY CAUSE DAMAGE TO EQUIPMENT OR PERMANENT LOSS OF DATA.

1.2 Test Station

Location :

Select an area away from the main stream of activity where employees do not walk through when performing their normal duties. If this is not practical because of production line flow, then the area should be roped off and marked for HIGH VOLTAGE TESTING. No employees, other than the test operators should be allowed inside.

Power :

Safety Test Equipment must be connected to a good ground. Be certain that the power wiring to the test bench is properly polarized and that the proper low resistance bonding to ground is in place. Power to the test station should be arranged so that it can be shut off by one prominently marked switch located at the entrance to the test area. In the event of an emergency, anyone can cut off the power before entering the test area to offer assistance.

Work Area :

Perform the tests on a non-conducting table or workbench, if possible. If you cannot avoid using a conductive surface, be certain that it is securely grounded to a good earth ground and insulate the high voltage connection from the grounded surface.

There should not be any metal in the work area between the operator and the location where products being tested will be positioned. Any other metal in the work area should be connected to a good ground, never left “floating”.

Position the tester so that the operator does not have to reach over the product under test to activate or adjust the tester. If the DUT is small, it may be possible to construct guards or an enclosure, made of a non-conducting material such as clear acrylic, such that the DUT is within the guards or enclosure during the test. Fit them with switches so that the tester will not operate unless the guards are in place or the enclosure closed.

Do not perform Hipot test in a combustible atmosphere or in any area where combustible materials are present.

1.3 Test Operator

Qualifications :

The operator should understand the electrical fundamentals of voltage, current, and resistance. The operator should recognize that the test instrument is a variable high-voltage power supply with the return lead directly connected to earth ground and therefore, current from the high-voltage output will flow through any available ground path.

Safety Procedures :

Operators should be thoroughly trained to follow these and all other applicable safety rules and procedures before they begin a test.

Dress :

Operators should not wear jewelry when performing hipot test.

Medical Restrictions :

This instrument should not be operated by personnel with heart ailments, or by those wearing devices such as pacemakers.

1.4 Test Procedures

NEVER PERFORM A HIPOT TEST ON ENERGIZED CIRCUITRY OR EQUIPMENT

NEVER TOUCH THE ITEM UNDER TEST OR ANYTHING CONNECTED TO IT WHILE HIGH VOLTAGE IS PRESENT DURING THE WITHSTAND VOLTAGE TEST.

1.5 Service Maintenance

User Service :

To prevent electric shock do not remove the instrument cover. There are no user serviceable parts inside. Refer servicing to eec or its authorized service center.

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 your expense.

KEY SAFETY POINTS TO REMEMBER

- **Keep unqualified and unauthorized personnel away from the test area.**
- **Arrange the test station in a safe and orderly manner.**
- **Never touch the product or connections during a test.**
- **In case of any problem, turn off the high voltage first.**

NOTE : THE WORD “HIPOT” IS USED INTERCHANGABLY WITH “WITHSTAND VOLTAGE”

1.6 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 meters. If the instrument is damaged, notify the carrier and the eec customer support department OR local distributor immediately. Please save the shipping carton and packing material for the carriers 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 and receiving an RGA (return goods authorization) number.

1.7 Environmental Conditions

Operating Environment

This instrument may be operated in temperatures from 0° - 40° C (32° - 104° F) and relative humidity of 20 to 80%, altitude 2000 meters (6560 feet)

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 feet)

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

CHAPTER 2 SPECIFICATIONS

MODEL		7314				7316			
GROUND BOND									
Output AC Current		1 - 40A				1 - 60A			
Output AC Voltage		8V, Maximum				12V, Maximum			
Output Frequency		50Hz / 60Hz \pm 0.1% , User Selection							
SETTINGS									
Max - Limit Resistance, m Ω	Range	0 - 600	0 - 200	0 - 150		0 - 600	0 - 300	0 - 150	
	AC Current	1.00 - 10.00A	10.01 - 30.00A	30.01 - 40.00A		1.00 - 15.00A	15.01 - 30.00A	30.01 - 60.00A	
	Resolution	1m Ω							
	Accuracy	Same as Resistance Measurement Accuracy							
Min - Limit Resistance, m Ω	Range	0 - 600	0 - 200	0 - 150		0 - 600	0 - 300	0 - 150	
	AC Current	1.00 - 10.00A	10.01 - 30.00A	30.01 - 40.00A		1.00 - 15.00A	15.01 - 30.00A	30.01 - 60.00A	
	Resolution	1m Ω							
	Accuracy	Same as Resistance Measurement Accuracy							
Lead Resistance Offset	Range	0 - 100 m Ω , Auto / manual							
	Resolution	1m Ω							
	Accuracy	\pm (2% of setting + 2 counts)							
Dwell Time, second	Range	0, 0.5 - 999.9 (0 = continuous)							
	Resolution	0.1							
	Accuracy	\pm (0.1% + 0.05s)							
MEASUREMENT									
AC Current, A	Range	1.00 - 40.00				1.00 - 60.00			
	Resolution	0.01				0.01			
	Accuracy	\pm (3% of reading + 3counts)				\pm (3% of reading + 3 counts)			
Resistance, m Ω	Range	0 - 600	0 - 600	0 - 200	0 - 150	0 - 600	0 - 600	0 - 300	0 - 150
	AC Current	1.00 - 5.99A	6.00 - 10.00A	10.01 - 30.00A	30.01 - 40.00A	1.00 - 5.99 A	6.00 - 15.00 A	15.01 - 30.00 A	30.01 - 60.00A
	Resolution	1m Ω							
	Accuracy	\pm (3% of reading +3 counts)	\pm (2% of reading + 2 counts)			\pm (3% of reading + 3 counts)	\pm (2% of reading + 2 counts)		
GENERAL									
Input Voltage AC		115V / 230Vac \pm 15%, 50HZ / 60Hz \pm 5%, max. current 10A for model 7314, 15A for model 7316							

PLC Remote Control	Input : Test, Reset, Withstand Processing, Memory1, 2, 3, Interlock Output : Pass, Fail, Processing, Reset-Out, Start-Out	
Memory	10 memories, 3 steps / memory	
Display	128 x 64 Graphic LCD	
Key Lock	To prevent unauthorized alteration of the test Parameters	
Calibration	Build-in software and external calibrated meters	
Verification	Build-in software driven verification menu to test fault detection circuits	
Alarm Volume Setting	Range : 0 - 9; 0 = OFF, 1 is softest volume, 9 is loudest volume	
Environment	0 - 40°C, 20 - 80%RH	
Dimension (W x H x D), mm	215 x 89 x 430	430 x 133 x 400
Net Weight	14Kg	20Kg
STANDARD ACCESSORIES		
Power Cord (10A)	x 1	x 1 (15A)
Fuses	x 2 (Including a spare contained in the fuse holder)	x 1 (On Board)
Interlock Disable Key (1505)	x 1	x 1
Ground Bond Test Lead 40A, 1.6m (1137)	x 1	-
Ground Bond Return Lead 40A, 1.6m (1138)	x 1	-
Ground Bond Test Lead 60A, 1.65m (1160)	-	x 1
Ground Bond Return Lead 60A, 1.65m (1161)	-	x 1

*Product specifications are subject to change without notice

[Ordering Information]

7314 AC Ground Bond Tester (40A / 8V)

7316 AC Ground Bond Tester (60A / 12V)

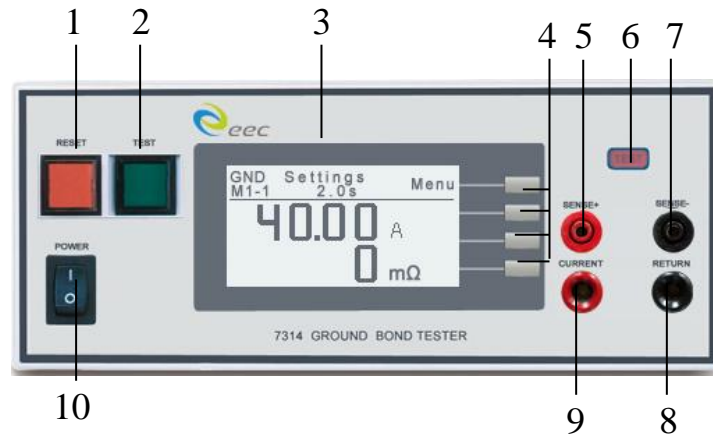
Opt. 748 Rear panel output for 7314 link with 7142

Opt. 786 Connection Kit for 7142 & 7314

CHAPTER 3 FRONT & REAR PANELS

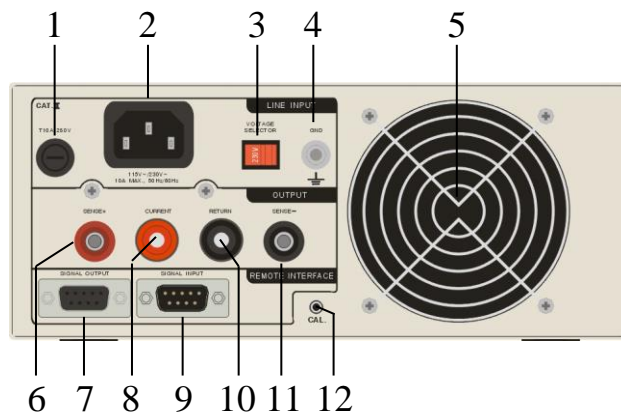
3.1 7314(40A/8V)

3.1.1 Front Panel



1. **RESET Button** : Press to abort test or stop audible alarm. In parameter setting mode, it has the same function as EXIT key. It is lighted red to indicate DUT fails test.
2. **TEST Button** : Press to start test. Lighted green when DUT passed test.
3. **Display** : 128 x 64 graphic LCD display.
4. **Key Pads** : Four key pads, press to execute function shown on display.
5. **Sense + Terminal** : Sense the real current, connect with CURRENT lead at the far end.
6. **Indicator** : Lighted to indicate AC current output.
7. **Sense - Terminal** : Sense the real current, connect with RETURN lead at the far end.
8. **RETURN Terminal** : AC current return terminal, up to 40A, connect to DUT.
9. **CURRENT Terminal** : AC current output terminal, up to 40A, connect to DUT.
10. **Power Switch** : Rocker style switch with ON(I) and OFF(0) markings.

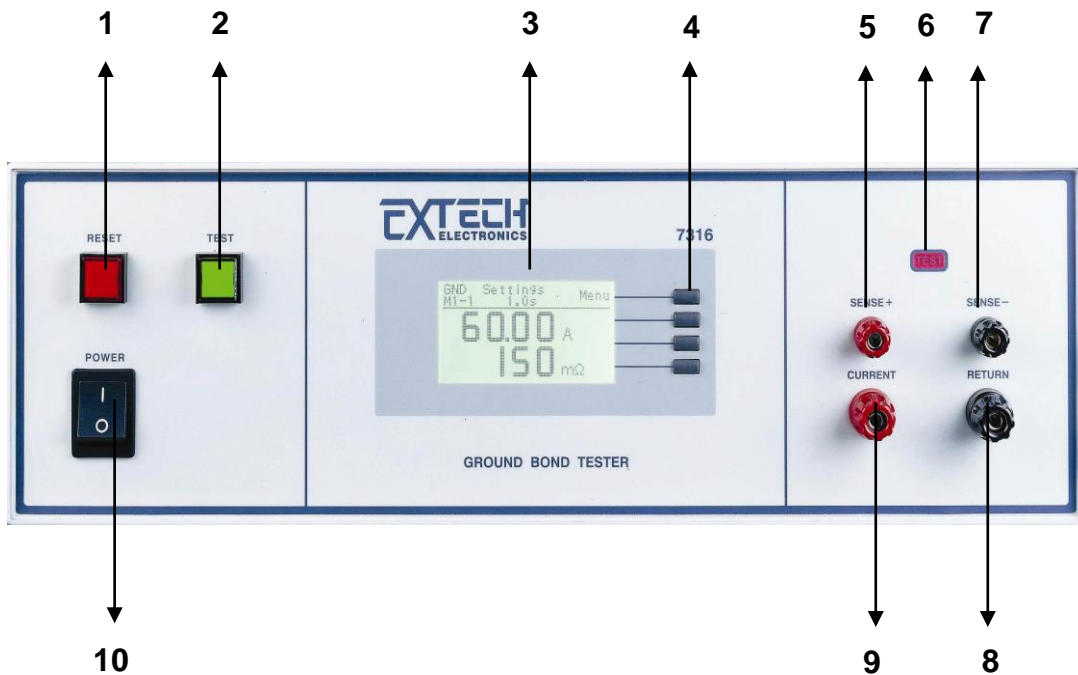
3.1.2 Rear Panel



1. **Fuse** : Line input fuse holder.
2. **Receptacle** : AC line input, standard IEC 320 connector for connection to a standard NEMA line power cord.
3. **AC Input Selector** : For setting line voltage, AC 115V or 230V operation.
4. **Earth Terminal** : Chassis ground terminal. This safety terminal should be connected to a good earth ground before operation.
5. **Ventilator** : Cooling Fan inside, keep a minimum 15cm away from any object.
6. **Sense + Terminal** : Sense the real current, connect with CURRENT lead at the far end.
7. **SIGNAL OUTPUT** : Output relay contact signal for START, PASS, FAIL, PROCESSING and WITHSTAND PROCESSING.
8. **CURRENT Terminal** : AC current output terminal, up to 40A, for connecting to DUT.
9. **SIGNAL INPUT** : Accept relay contact signal for TEST, RESET and MEMORY.
10. **RETURN Terminal** : AC current return terminal, up to 40A, connect to DUT.
11. **Sense - Terminal** : Sense the real current, connect with RETURN lead at the far end.
12. **CAL. Switch** : Hold down this switch and turn on the power to enter calibration mode.

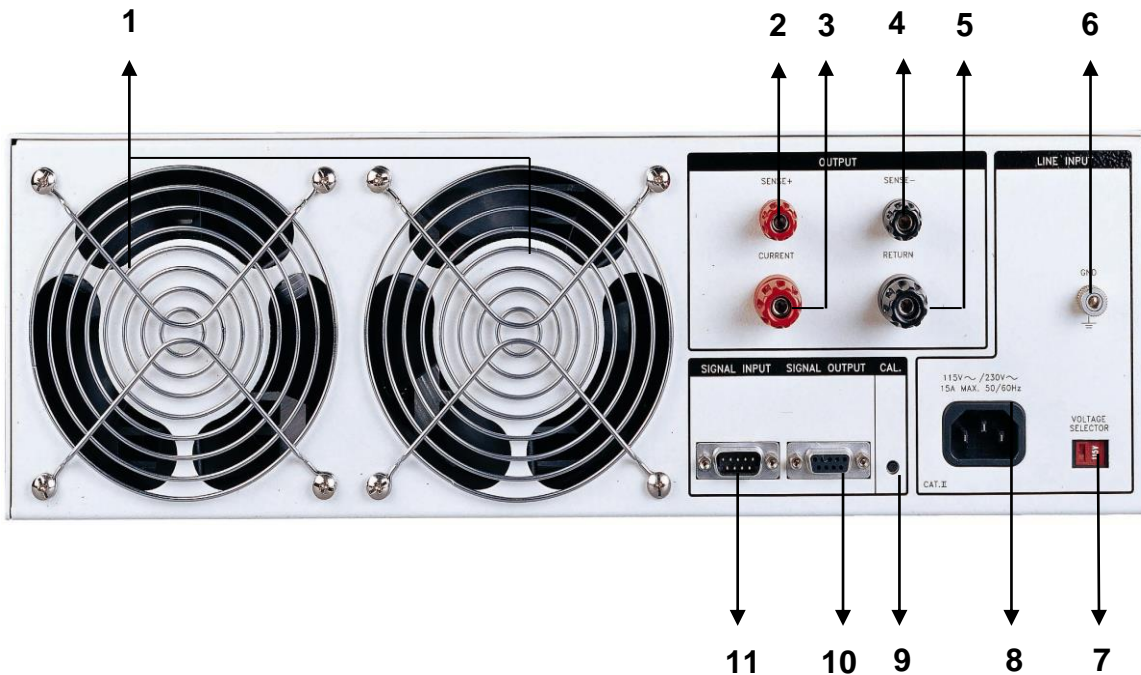
3.2 7316 Panels

3.2.1 7316 Front Panel



1. **RESET Button** : Press to abort test or stop audible alarm. In parameter setting mode, it has the same function as EXIT key. It is lighted red to indicate DUT fails test.
2. **TEST Button** : Press to start test. Lighted green when DUT passed test.
3. **Display** : 128 x 64 graphic LCD display.
4. **Key Pads** : Four key pads, press to execute function shown on display.
5. **Sense + Terminal** : Sense the real current, connect with CURRENT lead at the far end.
6. **Indicator** : Lighted to indicate AC current output.
7. **Sense - Terminal** : Sense the real current, connect with RETURN lead at the far end.
8. **RETURN Terminal** : AC current return terminal, up to 60A, connect to DUT.
9. **CURRENT Terminal** : AC current output terminal, up to 60A, connect to DUT.
10. **Power Switch** : Rocker style switch with ON(I) and OFF(0) markings.

3.2.2 7316 Rear Panel



1. **Ventilator** : Cooling Fan inside, keep a minimum 15cm away from any object.
2. **CURRENT Terminal** : AC current output terminal, up to 60A, connect to DUT.
3. **Sense + Terminal** : Sense the real current, connect with CURRENT lead at the far end.
4. **Sense - Terminal** : Sense the real current, connect with RETURN lead at the far end.
5. **RETURN Terminal** : AC current return terminal, up to 60A, connect to DUT.
6. **Earth Terminal** : Chassis ground terminal. This safety terminal should be connected to a good earth ground before operation.
7. **AC Input Selector** : For setting line voltage, AC 115V or 230V operation.
8. **Receptacle** : AC line input, standard IEC 320 connector for connection to a standard NEMA line power cord.
9. **CAL. Switch** : Hold down this switch and turn on the power to enter calibration mode.
10. **SIGNAL OUTPUT** : Output relay contact signal for START, PASS, FAIL, PROCESSING and WITHSTAND PROCESSING.
11. **SIGNAL INPUT** : Accept relay contact signal for TEST, RESET and MEMORY #1, #2 & #3.

CHAPTER 4 MANUAL OPERATION

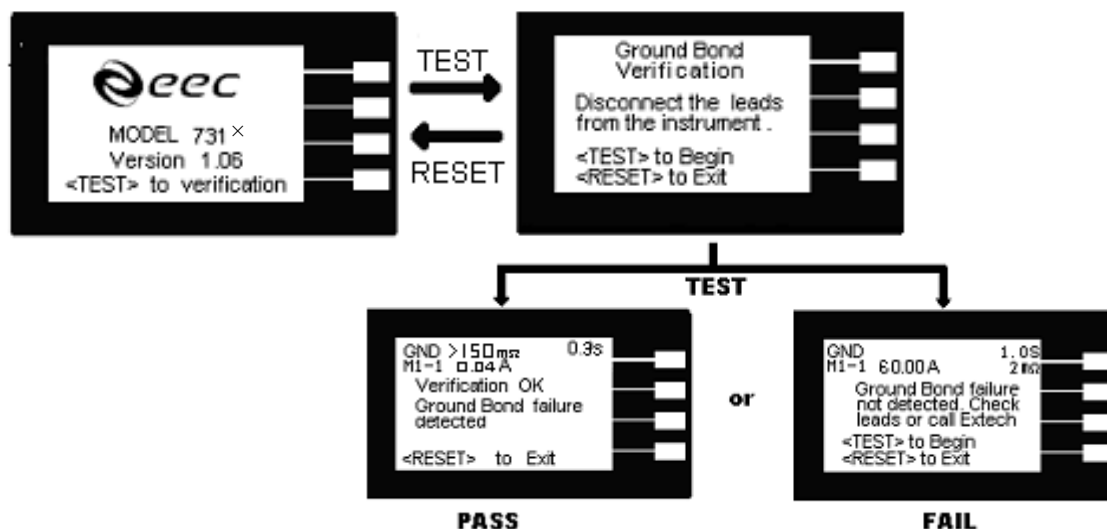
Ground Bond Tester is designed for use in production line and laboratory. Front panel setup is user friendly. Operation error will be responded by two short beeps and return to original setting. Please follow the instruction in this manual to operate the tester.

4.1 Operation Procedure

1. Care must be taken to ensure that the working area for safety tester is a safe environment.
2. Before power ON, be sure the voltage selector switch is set to correct AC input voltage. Connect earth wire to the tester earth terminal at the rear panel.
3. Do not connect test cable until you are familiar with the tester.
4. Turn on power, the tester will display the last settings before the unit was turn off. Note the test function and the memory location shown in the display.
5. Press Menu key to select memory location and step. Press Memory key will scroll the settings of each memory location. Press Step key will scroll the settings of next step within the memory location.
6. Press Menu key again to change the keys for test and system parameters settings.
7. Press Test key to enter test parameter setting mode. Refer to section 4.4
8. Press System key to enter system parameter setting mode. Refer to section 4.5.
9. Setup the required function and value.
10. Short the Current and Return Test Lead. Press TEST to make sure the test step is set properly.
11. Connect the Current and Return Test Leads to DUT. Check connection carefully. Ensure safety measures are taken.
12. Press Test to start testing. Do not touch DUT when the Red Lighting mark is flashing.
13. Press RESET to abort test if necessary.

4.2 Power Up & Verification

Turn on the Power Switch, the initial display showing <TEST> to verification, press TEST button to enter verification mode. Press TEST again to execute verification. The user can verify the tester is in good working condition before testing DUT. The verification display is shown below.



4.3 Main Display

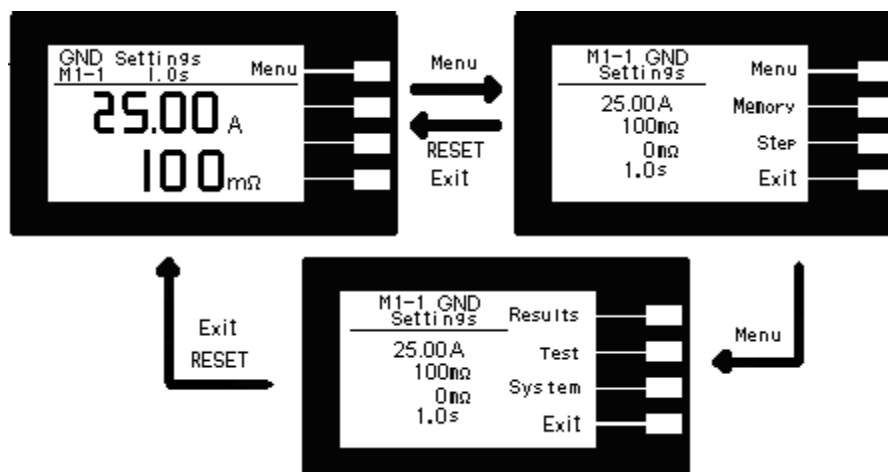
Interlock Turn on the instrument, If the Interlock key is not attached to the SIGNAL INPUT connector at the rear panel, this display is shown to warn user that the interlock connection is opened when the **TEST** button is pressed. Please attached the Interlock key at the SIGNAL INPUT connector and tighten firmly.



Key Lock If the **Key Lock** function is ON, this display is shown to indicate that the instrument is LOCK with a password. Only **TEST** and **RESET** buttons are active. To enter setup mode, enter the password to unlock the instrument, please refer to Key Lock function in this manual.



Menu At the main display, press “Menu” soft key to enter sub-menu of Menu, Memory, Step and Exit functions. Press **Menu** soft key again will enter the next sub-menu of Results, Test, System and Exit. Press **Exit** soft key will return to the main display.



Memory There are 10 memory locations. In each memory location, there are 3 steps. Pressing Memory soft key will index to the next memory location in ascending order, after Memory 9 will increment to Memory 0.

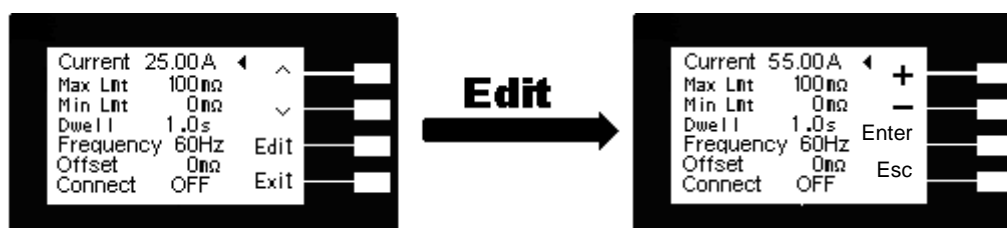
Step Press **Step** soft key to increment to the next step, i.e. step 1 to step 2 to step 3 and repeat. The setting in each step is shown accordingly. If “Connect” is set to ON, the tester will continue the test of next step.



Exit Press **Exit** soft key to return to main display.

4.4 Test Parameter Setup

At the sub-menu display, press **Menu** soft key to enter next sub-menu, press **Test** soft key will enter test setup menu. For setting test functions and test parameters, use \wedge or \vee soft key to move cursor and **Edit** soft key to edit each item.



Current Setup Move cursor to “Current” location by \wedge or \vee key. Press **Edit** soft key will enter current setting mode. Set current using + or - soft key. Press **Enter** soft key to confirm. Press **Esc** soft key to cancel setting.

Maximum Limit Setup Move cursor to “Max Lmt” location by \wedge or \vee soft key. Press **Edit** soft key will enter maximum limit setting mode. Set Resistance using + or - soft key. Press **Enter** soft key to confirm. The display will return to setup screen.

Minimum Limit Setup Move cursor to “Min Lmt” location by \wedge or \vee soft key. Press **Edit** soft key will enter minimum limit setting mode. Set Resistance using + or - soft key. Press **Enter** soft key to confirm. The display will return to setup screen.

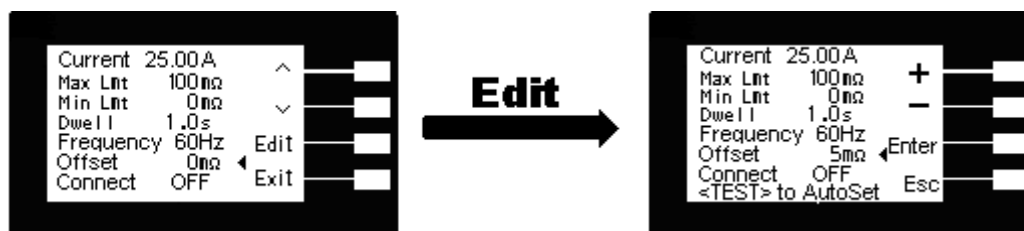
Dwell Time Setup Move cursor to “Dwell” location by \wedge or \vee soft key. Press **Edit** soft Key will enter Dwell Time setting mode. Set Time using + or - soft key. Press **Enter** soft key to confirm. The display will return to setup screen.

Frequency Setup Move cursor to “Frequency” location by \wedge or \vee soft key. Press **Edit** soft key will enter Frequency setting mode. Set Frequency using + or - soft key. Press **Enter** soft key to confirm. The display will return to setup screen.

Test Lead Offset Setup There are two setting methods as follows;

Method One Manual Input : move cursor to “Offset” location by \wedge or \vee soft key. Press **Edit** soft Key will enter Offset setting mode. Set Resistance using + or - soft key. Press **Enter** soft key to confirm.

Method Two Auto Setting : connect end of two leads, press **TEST** button for the tester to make a measurement and save the measured value as an offset.

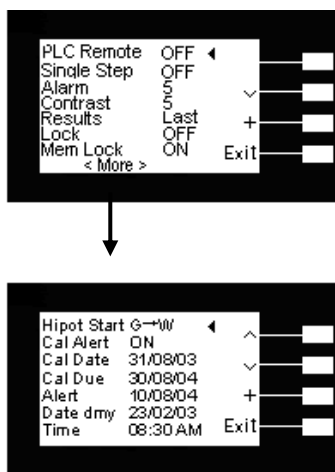


Memory Step Connection Setup Move cursor to “Connect” location by \wedge or \vee soft key. Press **Edit** soft Key will enter Connect setting mode. Set ON or OFF using “+” or “-” soft key. Press **Enter** soft key to confirm. The display will return to setup screen. In main display, “underscore” after memory location, MX-X_, denote this step is connected to the next step.

This is the last test parameter setting. Press **Exit** soft key will return to Memory setting screen. The setting of Current, Maximum limit, Minimum limit and Test time are shown. Press **Step** soft key will show the setting of next test step. Press **Exit** soft key again will return to the main screen.

4.5 System Parameter Setup

At the setup screen, press **System** key to enter system parameter setting screen. There are 14 items as follows :



ITEM	PARAMETER
PLC Remote	ON, OFF
Single Step	ON, OFF
Alarm	0 – 9
Contrast	1 – 9
Results	All, Last, P/F
Lock	ON, OFF
Mem Lock	ON, OFF
Hipot Start	G→W, G+W
Cal Alert	ON, OFF
Cal Date	dd / mm / yy
Cal Due	dd / mm / yy
Alert	dd / mm / yy
Date dmy	dd / mm / yy
Time	hh : mm AM(PM or Military)

PLC Remote Move the cursor to “PLC Remote” location by “∨” soft key, then press “+” soft key to change the setting from OFF to ON or vice versa. When “PLC Remote” is set to ON, “TEST” button on the front panel is disable. Relay contact signal is required to start test. However “RESET” button is still active. See PLC remote section for pin assignment. When “PLC Remote” is OFF, the RESET function is still active but not the TEST function at the rear connector.

Single Step Move the cursor to “Single Step” location by “∨” soft key, then press “+” soft key to change the setting from OFF to ON or vice versa. When “Single Step” is set to ON, the tester will stop after completion of current test. Then press TEST button for the next step. When “Single Step” is set to OFF, the tester will continue to next step automatically if “Connect” is set to ON.

Alarm Move the cursor to “Alarm” location” by “√” soft key, then press “+” soft key to change the volume of the tone from 0 to 9. When the reading is changed, a tone correspond to the level can be heard.

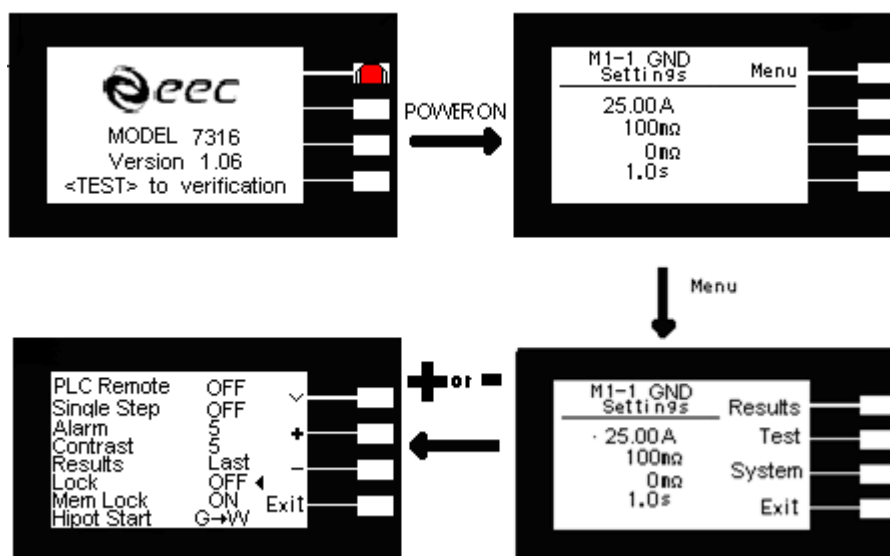
Contrast Move the cursor to “Contrast” location by “√” soft key, then press “+” soft key to change the contrast level of the LCD screen from 1 to 9.

Result Move the cursor to “Results” location by “√” soft key, then press “+” soft key to change the display format of the test results, P/F, Last or All. P/F is in stead of PASS or Fail sign, Last means only last reading be shown, All means readings of three steps will be shown.

Lock Move the cursor to “Lock” location by “√” soft key, then press “+” soft key to change the Lock status to ON or vise versa. When “Lock” is set to ON, all setting cannot be modified. Only TEST and RESET buttons are active for testing. Attempt to modify setting will see “Key Lockout” warning message on the screen.

To unlock, follow these procedures:

1. Turn off the power.
2. Hold down the top soft key and turn on the power.
3. Release after Main screen is shown.
4. Press Menu soft key twice and then System soft key.
5. Change the Lock status to OFF.



Mem Lock When “Lock” is set to OFF, this function is inactive, regardless of its status. When “Lock” is set to ON and “Mem Lock” is set to OFF, user can recall test setup in any location and start test. However, test setup cannot be modified. When “Lock” is set to ON and “Mem Lock” is set to ON, user cannot recall test setup in any location and start test, except the current memory location. Test setup cannot be modified.

Move the cursor to “Mem Lock” location by “√” soft key, then press “+” soft key to change the Lock status to ON or vice versa. When “Mem Lock” is set to ON, no memory location can be recalled. If “Mem Lock” is set to OFF and “Lock” is set to ON, then settings in any memory location can be recalled but cannot be edited. The setting from the factory is set to ON.

Hipot Start There are two methods to test when Ground Bond Tester is linked to 713x/714x series Hipot Tester.

1. Set to “G→ W”, Ground Bond test follow by Hipot test
2. Set to “G+W”, Hipot and Ground Bond test at the same time.

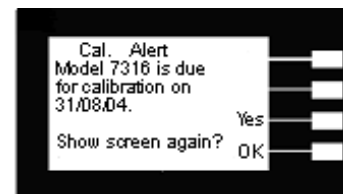
Move the cursor to “Hipot Start” location by “√” soft key, then press “+” soft key to change the status to “G→ W” or “G+W”.

WARNING

Method 2 is not recommended. If you must use method 2, please make sure that the connection to DUT is correct.

Cal Alert User may turn ON and OFF the alert function, turning this parameter ON will activate the tester display the Cal. Alert warning screen (refer to below picture) upon power up when the date matches and passes the alert date.

Cal. Alert function is automatically turned OFF for next power up, if “NO” was selected for question “ Show screen again ? ” in the Cal. Alert warning screen. Toggle “Yes/No” soft key then confirm by pressing “OK” soft key.



Cal Date The initial date was the calibration date in the factory, it will be automatically overwritten after next calibration procedure.

Cal Due It is recommended that calibration should be performed at least once a year. The date is manual changeable, move the flashing underline by “>” soft key to day, month and year location then set the date by using the “+” soft key.

Alert The Alert date is like an alarm clock that will warn you in advance of the actual calibration due date. After a calibration is performed, the Alert date is automatically set 11 months after the calibration date. Although this date is automatically written into the Alert date location, it may be manually overwritten to any advanced date desired.

At the Alert date setting screen, move the flashing underline by “>” soft key to day, month and year location then set the date by using the “+” soft key.

Date dmy This is the position to input the local and present date, the format is day/month/year, the original date is Taipei time.

Move the flashing underline by “>” soft key to day, month and year location then set the date by using the “+” soft key.

Time The Time format is “hour : minute“, 12 hour and 24 hour modes selectable, in 12 hour mode AM/PM symbol is automatically switched.

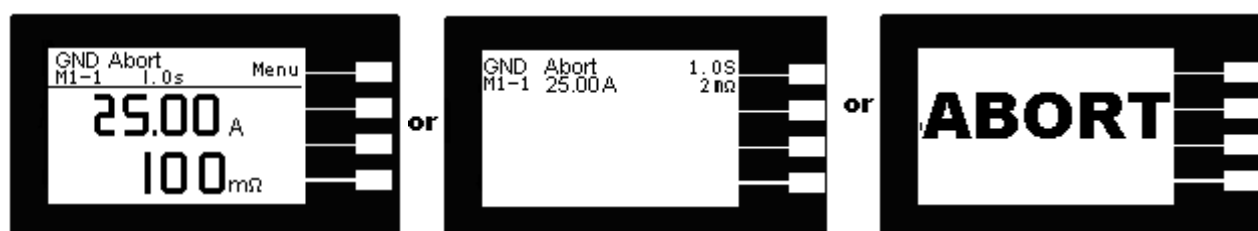
Move the flashing underline by “>” soft key to hour and minute location then set the Time by using the “+” soft key.

This is the last step of System Parameters setup. Press **Exit** key will return to main screen. The tester is ready for testing.

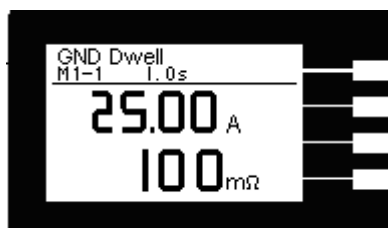
4.6 Display Message

This tester has many display messages to indicate various conditions. Understanding the meaning of each display will help to identify the status of testing and the condition of the DUT.

Abort If testing is in progress, press “RESET” key or Remote PLC Reset signal is present will abort the test and one of the following format is shown.



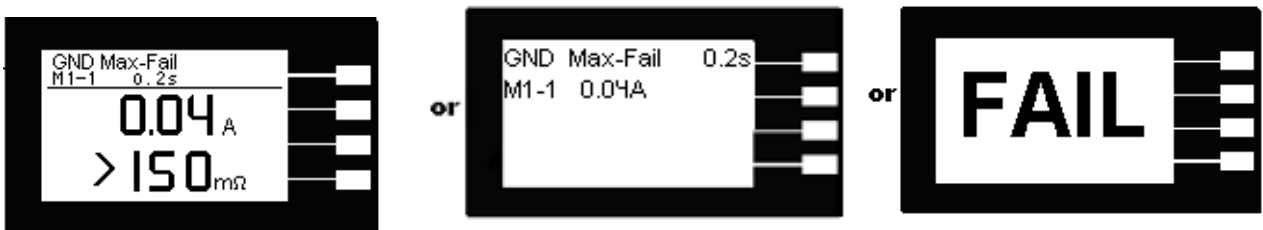
Dwell GND Dwell is shown on the Top of screen. During the dwell period, the test result is being updated continuously.



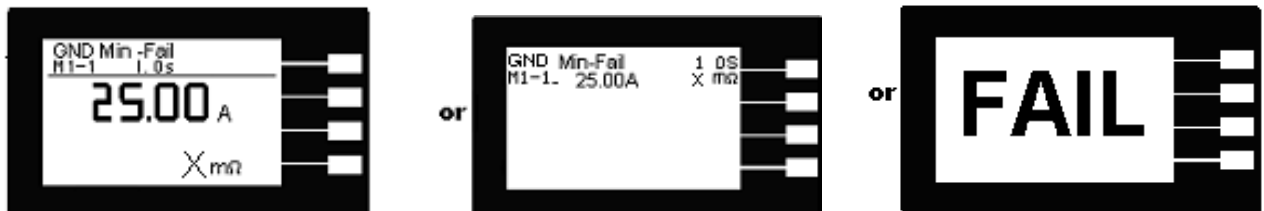
Max-Fail If the result of the test exceeds the upper limit setting, the tester will judge DUT fails the test. “GND Max-Fail” is shown in one of the following format.



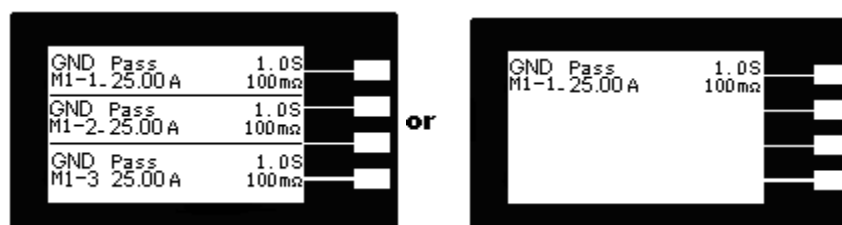
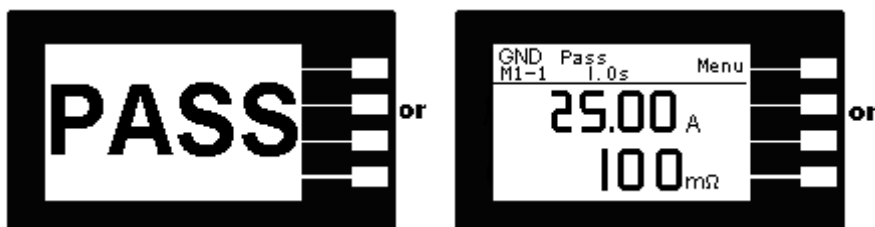
Open If the test loop is open and measured resistance is higher than 150mΩ for current below set value, Open signal is shown in one of the following format.



Min-Fail If the result of the test is below the lower limit setting, the tester will judge DUT fails the test. GND Min-Fail is shown in one of the following format.



Pass If the result of the test is within the upper and lower limits, DUT passes the test. Pass is shown in one of the following format.

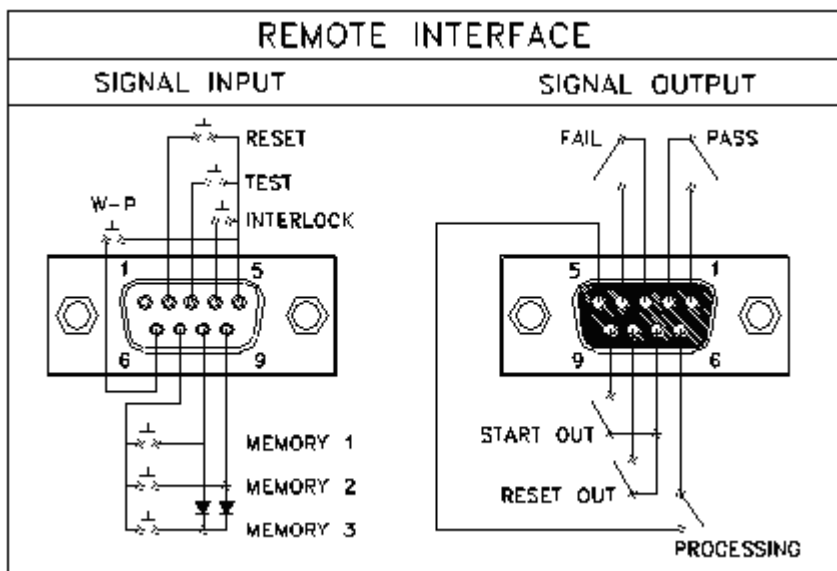


CHAPTER 5 REMOTE INTERFACE

5.1 Pin Assignment

Two 9 pin “D” type connectors are mounted on the rear panel which provide REMOTE INPUT and OUTPUT control. These connectors mate with standard 9 pin “D” subminiature connector provided by the user.. For best performance a shielded cable should be used. To avoid ground loops the shield should not be grounded at both ends of the cable. Suggested AMP part numbers for interconnecting to the Remote I/O are shown below.

205204-4	PLUG SHELL WITH GROUND INDENTS
205203-3	RECEPTACLE SHELL
745254-7	CRIMP SNAP-IN PIN CONTACT (for plug)
745253-7	CRIMP SNAP-IN SOCKET CONTACT (for receptacle)
745171-1	SHIELDED CABLE CLAMP (for either plug or receptacle)
747784-3	JACKSCREW SET (2)



5.2 Signal Outputs

The rear panel connector provides output signals to remotely monitor PASS, FAIL, PROCESSING, RESET and START 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.

Pins 1 and 2 provide the PASS signal.

Pins 3 and 4 provide the FAIL signal.

Pins 5 and 6 provide the PROCESSING signal.

Pins 8 and 7 provide the RESET OUT signal.

Pins 9 and 7 provide the START OUT signal.

PASS

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

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.

PROCESSING

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

RESET OUT

The relay contact closes the connection between pin (8) and pin (7) while the RESET bottom is pressed.

START OUT

The relay contact closes the connection between pin (9) and pin (7) while the TEST bottom is pressed.

5.3 Signal Inputs and Memory Programs

The pin assignment of signal input terminal is as following;

Pins (2) and (5) accept RESET signal

Pins (3) and (5) accept TEST signal

Pins (4) and (5) accept INTERLOCK signal

Pins (6) and (5) accept W-P signal

Pins (8) and (7) accept Memory 1 action signal

Pins (9) and (7) accept Memory 2 action signal

Pins (8) and (9) and (7) accept Memory 3 action signal, two diodes are suggested to prevent conflicting signal from pin (8) or (9)

TEST & RESET The Signal Input remote connector enables remote operation of the TEST and RESET functions or allows the operator to select one of three pre-programmed tests. When the remote function is (ON), the “TEST” switch on the front panel will be disabled to prevent a test from being activated through the test switch. A normally open momentary switch can then be wired across pins 3 and 5 to allow remote operation of the TEST function. A normally open momentary switch can also be wired across pins 2 and 5 to allow remote operation of the RESET function. For safety reason, the front panel “RESET” switch remains active even when a remote “RESET” switch is connected so that high voltage can be shut down from either location.

Interlock When Pin 4 and 5 is open, the tester will not start. Pin 4 and 5 must remain shorted for the tester to operate normally. In manual operation, an interlock key is attached to this connector to provide a short for Pin 4 and 5. A protective cover with a micro switch can replace this interlock key. When the cover is closed, the switch is closed to complete the circuit so that the tester is ready to start testing.

Withstand Processing(W-P) When Ground Bond Tester links to eec 7130/7140 series Safety, the W-P accept PROCESSING signal from Safety Tester. Related information refer to “Hipot Start” of section 4.5.

Memory 1 Momentarily connecting terminal 8 to 7 signals the instrument to immediately begin the test program that is stored in memory one.

Memory 2 Momentarily connecting terminal 9 to 7 signals the instrument to immediately begin the test program that is stored in memory two.

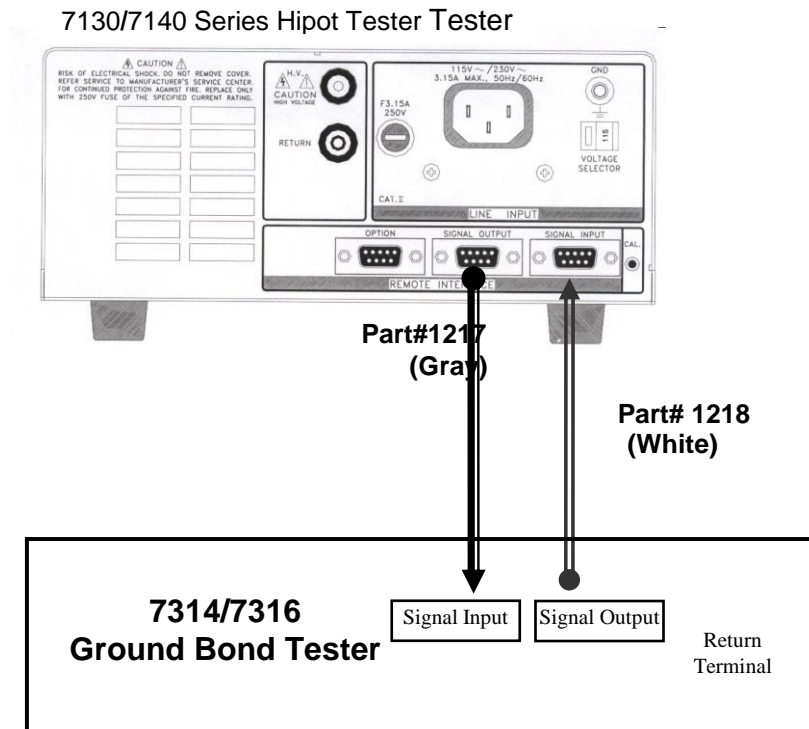
Memory 3 Momentarily connecting terminals 8 and 9 to terminal 7 signals the instrument to immediately begin the test program that is stored in memory three.

CAUTION

DO NOT CONNECT VOLTAGE OR CURRENT TO THE SIGNAL INPUTS, THIS COULD RESULT IN DAMAGE TO THE CONTROL CIRCUITRY.

5.4 Link To 7130/7140 Series Hipot Tester

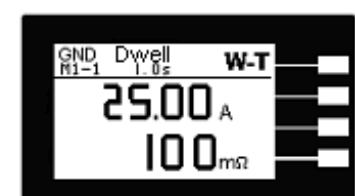
Wiring Diagram



Note : The RESET button on both instruments are active. By pressing any RESET button will stop testing immediately.

Front Panel Operation

1. The PLC Remote setting of Ground Bond Tester and 7130/7140 series Hipot Tester must set to ON.
2. Refer to Hipot Start of section 4.5, right side screen present in “G→W” mode, Withstand Test is testing after pass the Ground Bond test. The Withstand Test will not test if DUT fails the Ground Bond test.
3. Refer to Hipot Start of section 4.4, right side screen present in “G+W” mode, Ground Bond and Withstand test in simultaneity.



CHAPTER 6 CALIBRATION

This tester has been calibrated in the factory by standard instruments traceable to the National Institute of Standards Taiwan. eec recommends that this tester should be calibrated at least once a year. Instruments used for the calibration should be within 0.5% basic accuracy to ensure the performance will meet the specifications stated in this manual.

Required Calibration Equipment

40 Amp AC Ammeter for 7314

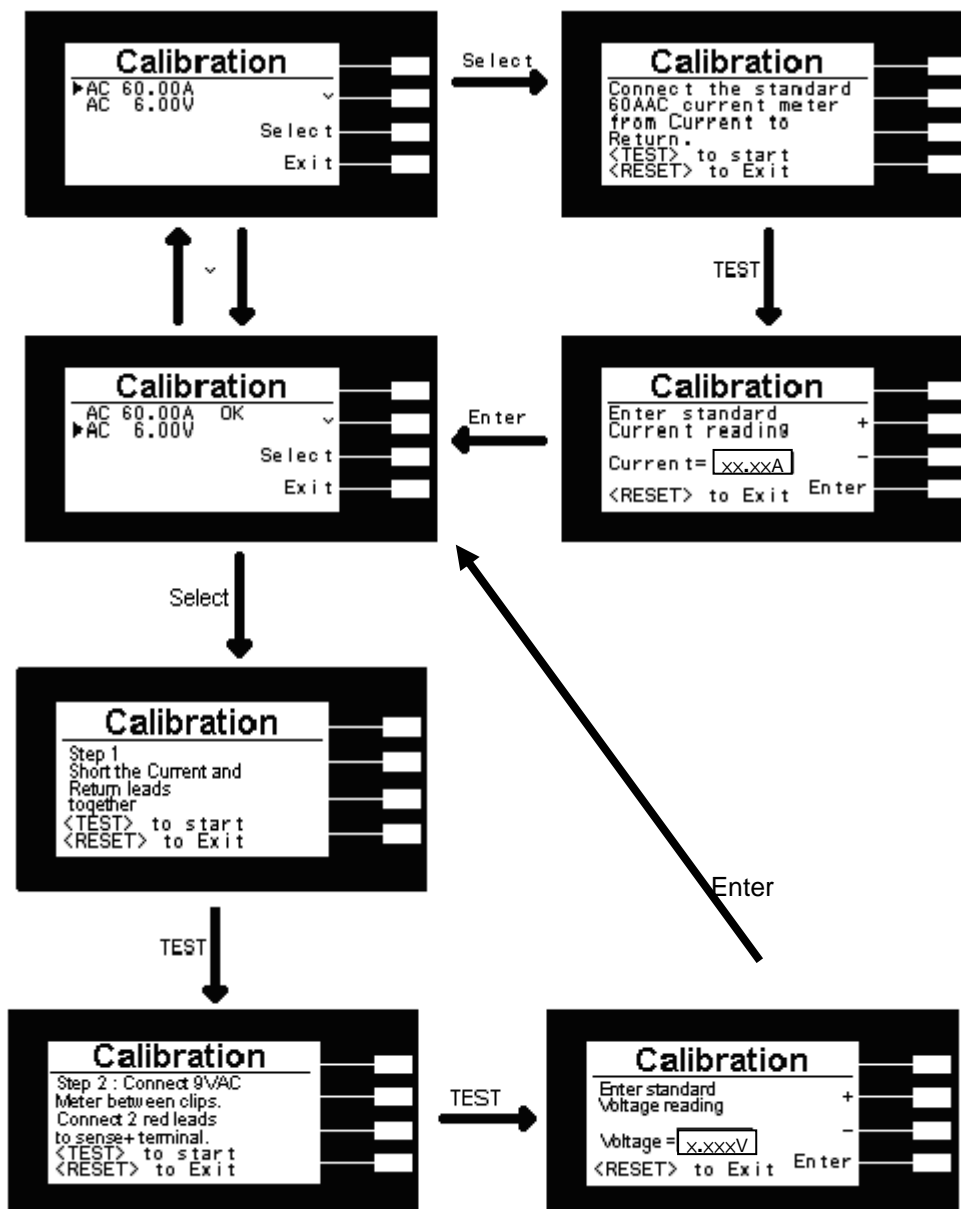
60 Amp AC Ammeter for 7316

10 VAC Voltmeter.

Below is the calibration screen for 7316. Please follow the Ground Bond Tester indicates for the factual calibration procedure.

6.1 Calibration Procedure

Hold down the “CAL” key at the rear panel and turn on the power. The tester will enter calibration mode. Use “ V “ key to move cursor to desire calibration item then press “Select” key to enter.



Current Calibration

1. In Calibration mode, use “√” soft key to point current calibration, press “Select” soft key to enter.
2. Connect a Standard AC Ammeter to CURRENT and RETURN terminals.
3. Press “TEST” button on the front panel.
4. Use “+” and “—” keys to adjust the display current until it is the same reading as the Standard meter. After setting, the Ground Bond Tester automatically save the parameter into the memory.
5. Press “Enter” to confirm and jump into Voltage calibration mode. Or press “RESET” button back to Calibration initial display.

Voltage Calibration

1. Press “ Select “ soft key to enter voltage calibration mode.
2. Short CURRENT and RETURN leads. Press “ TEST “ button. The Ground Bond Tester will automatically measure a offset value but is not displayed.
3. Remove Current lead from current terminal and then connect the lead to Sense+ terminal.
4. Connect a AC Standard Voltmeter to Red and Black clips.
5. Press “ TEST ” button on the front panel.
6. Use “ + “ and “ — “ soft keys to adjust the display voltage until it is the same reading as the Standard Voltmeter. After setting, the Ground Bond Tester will automatically save the parameter into the memory.

NOTE : 1. The calibration data will not change unless you perform another calibration procedure.

2. Exit by turning OFF the tester or press “ RESET ” button back to calibration initial display.

CHAPTER 7 ACCESSORIES

Standard Accessories

Part Number	Description
1137	High Current Test Cable for Model 7314
1138	High Current Return Test Cable for Model 7314
1160	High Current Test Cable for Model 7316
1161	High Current Return Test Cable for Model 7316
1505	Interlock Disable Key

Optional Accessories

Part Number	Description
1217	Signal Link Cable, 7130/7140 series to 7316
1218	Signal Link Cable, 7316 to 7130/7140 series