USERS MANUAL
MODEL 568
Hi-Pot / Continuity Tester

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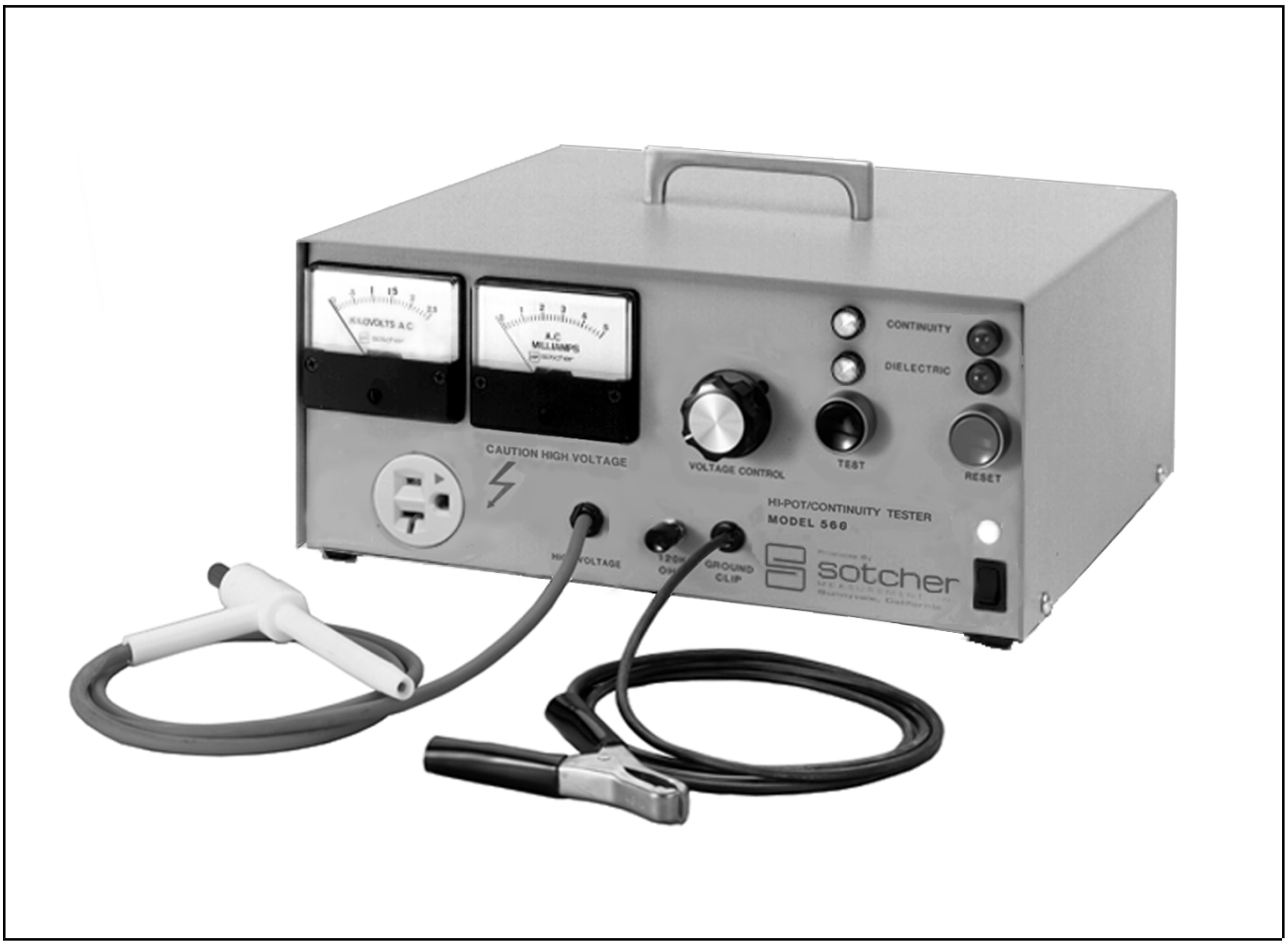
CERTIFICATION

All test stations are certified to comply with the current revision of U.L. Test Specifications, CSA Test Standards, the National Electrical Code and OSHA Specifications.

WARRANTY

All instruments manufactured by Sotcher Measurement Inc. are warranted against defects in material and workmanship for a period of one year. We will repair or replace products which prove to be defective provided they are returned to Sotcher Measurement Inc. This warranty is in lieu of all other warranties expressed or implied and no responsibility is assumed for consequential damage. In no case shall liability exceed the purchase price.

WARNING: THE TESTING OF PRODUCTS USING THIS EQUIPMENT CAN BE EXTREMELY DANGEROUS! READ AND UNDERSTAND ALL SAFETY PRECAUTIONS BEFORE USING THIS EQUIPMENT.



Model 568 Hi-Pot / Continuity Tester

SECTION 1
GENERAL INFORMATION

INTRODUCTION

Model 568
A Hi-Pot / Continuity Tester is used to verify the ground wire continuity and insulation integrity of electrical equipment. The model 568 brings state of the art technology to the testing of electrical products.

Standard Features
Pressing a single button, tests both the dielectric strength and ground wire continuity.

Full 25A Ground Bond Test
The ground wire test is conducted using a test current of 25 amperes, rejecting high resistance ground connections. The continuity test may be turned off when testing double insulated products.

Choice of Test Methods
The panel-mounted receptacle is useful for completed products with standard cord sets, while the high voltage probe is useful for testing components and products with nonstandard plugs.

Automatic Shut Down
Excessive leakage, dielectric flash over or failure of the ground circuit causes automatic shut down of the high voltage.

Visual and Audible Alarms
Both visual and audible alarms alert the operator of an out of tolerance condition. The reset switch must be operated to continue.

Automatic Timer
User can select test duration of one second, sixty seconds, or continuous.

Zero Crossing
Dielectric and continuity test voltages are applied at the zero crossing point for transient free operation.

Complies with UL's 120K Test
Test standard is available on the front panel for easy use.

Fast Response
The tester uses a fast response detection circuit to detect even short duration arcs or breakdowns that might occur. Once a fault is detected the test circuit opens within milliseconds.

Ground Continuity
When ground wire verification is selected, the tester prevents the application of the dielectric test voltage unless the ground wire to the product is verified. The grounded potential of the product is verified during the dielectric test as well.

Direct Reading Leakage Meter
A 0-10 milliamperes meter monitors the actual fault current, to help you identify marginal products.

Adjustable Limits
The dielectric leakage limit and continuity resistance limits are adjustable on the rear panel. A calibration label can be placed over the adjustments if desired.

SECTION 1
GENERAL INFORMATION

SPECIFICATIONS

Input Voltage:
120V, 60 Hz. (230V, 50 Hz with option 40563-568).

Output Voltage:
Sinusoidal with a peak to RMS ratio of 1.3 to 1.5 within a frequency range of 40 to 70 Hz.

Output Voltage Range: 0-2,500 volts AC.

Dielectric Trip Point:
Factory set at 5mA +/- 5% accuracy.

Transformer Rating: 50VA.

Volt Meter Impedance: 3 megohms.

Meter Accuracy: +/- 3% FS.

Ground Bond:
25 amperes AC at 0.2 second pulses applied every 1.0 second. Ground Bond Test is conducted continuously when a one second duration is selected.

Ground Bond Trip Point:
0.1 ohms at 25 Amperes +/- 10% accuracy.

Test Duration:
Selector switch selects one second, sixty seconds or continuous operation.

Dimensions:
12” wide, 5.5 “ high, 11” deep.

Weight: 18 pounds.

Options Available

- 40537 0 - 5,000 volts AC output
- 40561 High Voltage Probe
- 40563-568 230 Volt, 50 hertz, AC input
- 40566 Digital Volt Meter
- 40567 Digital mA Meter
- 40568 0 – 2500 volts DC output w/trip point of 1.0 mA DC
- 40570 0 - 3,000 volts AC output
- 40581 PLC Interface

SECTION 2
SAFETY PRECAUTION

WARNING! THIS TESTER PRODUCES VOLTAGES AND CURRENTS WHICH CAN CAUSE HARMFUL OR FATAL ELECTRICAL SHOCK TO THE USER OR BYSTANDER.

For your protection, take note of the following safety procedures:

The tester has been designed with careful attention to safety. Regardless of these efforts, it is not possible to eliminate all hazards from electrical test equipment. For this reason it is essential that the user understand the proper and safe use of this test station. Read the instructions and warnings with care. Be sure that you and anyone who uses the tester, fully understands them.

Pay special attention to the following:

Provide a dry test area with tester and operator shielded from traffic.

The product being tested must be treated as a shock hazard until proven otherwise.

Before conducting any tests, read this manual and follow the recommend test procedures.

When others are using the tester they must be trained in its proper use and made aware of the hazards. They should be trained to follow a fixed operation routine for each setup, and be supervised by a person who fully understands the safe use of the tester.

Conduct the recommended functional test at least once per shift and have the calibration performed at least once per year. Sotcher Measurement Inc. maintains a fully staffed calibration service, which is available to you as required.

Should the tester fail to pass the functional test, all products tested since the prior functional test should be retested.

Should any condition occur where the test station might have been damaged, or any indication of malfunction or unusual operation be noted, discontinue its use immediately. Do not reuse the test station until the problem is corrected and a recalibration is performed.

The tester and its accessories should not be used for any purpose except those described in this manual.

If there are any questions, please call us. You will find our technical support people helpful and friendly. They may be reached

by phone at	**(800) 922-2969**
by fax at	**(408) 574-0116**
or by e-mail at	**service@sotcher.com**

SECTION 3
OPERATION INSTRUCTIONS

SET UP PROCEDURES

CAUTION: Hi-pot (High Potential) testing imposes a hazard.

Such testing should only be conducted in clean, well-lit areas and by personnel trained in the subject.

1. Place the tester in a clean work area and provide an insulated surface for the item to be tested.

2. Plug the tester into a 120 volt, 15-20 amp, 60 Hz, grounded receptacle.

3. Set the **PRODUCT** switch on rear panel to the **3 WIRE** position.

4. Turn on the tester and press the **TEST** button to start the test.

   - *The buzzer should sound.*
   - *The red **CONTINUITY** lamp should light.*

NOTE: This procedure verifies the fuctional test of the Ground Continuity circuit.

5. Press the **RESET** button to clear the failure.

6. Set the **PRODUCT** switch in the **2 WIRE** position and

7. Set the **DIELECTRIC TEST DURATION** switch to **60 SECONDS** position.

8. Turn the **VOLTAGE CONTROL** fully counter clockwise, and then turn the tester on.

9. Press the **TEST** button to turn on the dielectric test.

10. Push and hold the **120K OHM** button and raise the test voltage by slowly turning the **VOLTAGE CONTROL** clockwise. The **AC KILOVOLTS** meter reflects the test voltage in kilovolts (one kilovolt is equal to 1000 volts).

11. As the voltage increases, monitor the Milliammeter. When the test current reaches 4.8 to 5.2 Milliamps the test voltage should drop to zero, the buzzer should sound, and the red **DIELECTRIC** lamp should light.

NOTE: This procedure verifies the sensitivity setting of the hi-pot circuit. If the unit does not perform as indicated, or a different sensitivity is desired, see the calibration instructions in the back of this manual.

12. Reset the tester by pressing the **RESET** button.

13. Press the **TEST** button again and set the test voltage that will be used by turning the **VOLTAGE CONTROL** knob.

14. Press the **120K OHM** button.

15. The buzzer should sound, the voltage should drop to zero and the red **DIELECTRIC** lamp should light until the **RESET** button is pressed.

NOTE: This procedure verifies compliance with Underwriters Laboratory (120K OHM) test specifications.

16. Turn off the tester (Power switch to **0**)

17. Select the desired test duration of **1 SECOND, 60 SECONDS** or **CONTINUE**, using the **DIELECTRIC TEST DURATION** settings on the rear panel.

18. If the products to be tested are double insulated and do not contain a ground wire then select **PRODUCT - 2 WIRE**, otherwise select **PRODUCT - 3 WIRE**, on the rear panel.

SECTION 3
OPERATION INSTRUCTIONS

TESTING PRODUCTS

This procedure applies to completed products with standard 120V, 15/20A Non-Locking plugs.

1. Set the **DIELECTRIC TEST DURATION** switch on the rear panel for the proper test time.

2. Set the **PRODUCT** switch (on the rear panel) to the **2 WIRE** or **3 WIRE** position.

3. Place the product to be tested on an well-insulated surface. A clean, dry rubber mat is recommended.

4. Lock the product's switch in the **ON** position for the full test duration.

CAUTION: Keep clear of the product during the test. Failure to do so can expose you to lethal electrical current.

5. Plug the product to be tested into the receptacle on the front of the tester.

6. Attach the test clip from the **GND** terminal to the metal frame of the product. The clip should be attached to an unpainted, exposed metal part. It is important that a good solid connection is maintained at all times during the test.

7. Press and release the **TEST** switch.

   - *The amber **CONTINUITY** lamp indicates that the product's ground wire meets the test requirement.*

   - *The red **CONTINUITY** lamp indicated a defective electrical ground connection in the product's cord or plug.*

8. Slowly rotate the **VOLTAGE CONTROL** until the desired voltage is read on the **AC KILOVOLTS** meter.

Note that one kilovolt is equal to 1000 volts, for example, 1250 Volts would be read as 1.250 Kilovolts on the meter.

9. Avoid applying a voltage higher than that specified for the test. Excessive voltage can cause permanent damage to the product under test.

10. Maintain the test voltage for the specified time duration, adjusting the voltage as required to maintain the specified voltage level.

    - *The amber **DIELECTRIC** lamp indicates that the product meets the dielectric test requirement.*

    - *The red **DIELECTRIC** lamp indicates an electrical breakdown in the product's insulation.*

11. If either red lamp comes on, indicating a defective product, the test voltage will drop to zero and the internal buzzer will sound. To clear this condition press the **RESET** button.

DO NOT ACCEPT THE PRODUCT UNTIL THE PROBLEM HAS BEEN CORRECTED AND THE TEST REPEATED SUCCESSFULLY.

12. This completes the continuity and hi-pot tests. Turn off the tester (Power switch to **0**).

***Note:** The voltage can be preset to the desire voltage, thus avoiding the need to turn it up and down for each test. This is an acceptable procedure for small components, heating products, or other noninductive devices. For products containing large motors, transformers, or voltage sensitive circuits, the slow application and removal of the test voltage is recommended.*

SECTION 3
OPERATION INSTRUCTIONS

TESTING COMPONENTS

Note: *Option 40561 High Voltage Probe required.*

This procedure applies to individual components or products without standard 120V, 15A Non-Locking plugs.

INSTALLATION

1. Unplug the hold plug from **HIGH VOLTAGE** hold.

2. Insert the red anderson connector of high voltage probe through the hold and connect to the red anderson connector inside tester.

3. Install the strain relief around the wire and insert to the hold.

Procedures

1. Place the **PRODUCT** switch in the **2 WIRE** position and the **DIELECTRIC TEST DURATION** to the **HOLD** position.

2. Place the component to be tested on an well-insulated surface, a clean, dry rubber mat is recommended.

3. Connect the ground clip to an exposed metal frame or housing of the component.

CAUTION: Keep clear of the product during the test. Failure to do so can expose you to lethal electrical current. DO NOT TOUCH THE PRODUCT UNDER TEST!

4. Press the **TEST** button.
   - *The amber **DIELECTRIC** lamp turns on.*

5. Rotate the **VOLTAGE CONTROL** until the desired voltage is read on the **AC KILOVOLTS** meter.

Note that one kilovolt is equal to 1000 volts, for example 1250 Volts would be read as 1.250 Kilovolts on the meter.

6. Avoid applying a voltage higher than that specified for the test. Excessive voltages can cause permanent damage to the component under test.

7. Touch the tip of the high voltage probe to each of the wires or contacts. This can be done by connecting all the leads together or by testing them one at a time. On components such as an armature or field winding where the wires are connected internally a single test checks all insulation points.

8. Adjust the **VOLTAGE CONTROL** as requires to maintain the specified voltage. Monitor the **AC Milliamperes** meter for indications of current flow or arcing.

   - *The amber **DIELECTRIC** lamp indicates that the product meets the dielectric test requirement.*

   - *The red **DIELECTRIC** lamp indicates an electrical breakdown in the product insulation.*

DO NOT ACCEPT THE PRODUCT UNTIL THE PROBLEM HAS BEEN CORRECTED AND THE TEST REPEATED SUCCESSFULLY.

9. If the red lamp comes on, the voltage will drop to zero and the buzzer will sound. Press the **RESET** button to clear.

10. This completes the test.

Note: *If the product under test is sensitive to the high voltage test, you might choose to place the* **DIELECTRIC TEST DURATION** *switch in the* **1 SECOND** *or* **60 SECOND** *position. Then touch the probe to each test point before pressing the TEST button. This allows the zero crossing switch to reduce the voltage stress during the application. The stress level can be further reduced by starting with the test voltage at zero and increasing it to the desired level and then decreasing it at the end of the test period.*

SECTION 4
EQUIPMENT SERVICING

Prior to returning the tester, or setting up to service it, a quick verification of the following is recommended:

1. Is the unit plugged into a grounded, 120 Volt, 60 Hz receptacle?

2. Has the fuse blown?

CAUTION - FOR CONTINUED PROTECTION AGAINST FIRE, REPLACE ONLY WITH FUSE OF THE SPECIFIED VOLTAGE AND CURRENT RATING.

3. Have you reviewed "**SET UP PROCEDURES**" in **SECTION 3**?

FACTORY SERVICE

Should the tester require service at any time it may be sent, postage prepaid, to Sotcher Measurement Inc. for prompt factory service. Loaners are often available upon request.

Is sure your name, address, and phone number is on the tester, or on a tag attached to it.

Enclose a note explaining the trouble.

Return the unit to:

SOTCHER MEASUREMENT INC.
175 Lewis Rd., Unit 23
San Jose, CA 95111
(800) 922-2969
Fax (408) 574-0116

SELF SERVICE

Sotcher Measurement Inc. stands ready to provide you with technical information or replacement parts.

WARNING: As with all components that operate at 120 volts, caution must be taken when servicing the tester to avoid potentially lethal shock hazards.

CALIBRATION

There are a number of adjustments that control the sensitivity and accuracy of the tester. Care must be taken when altering them to insure that the tester will continue to properly identify defective equipment.

Refer to **SECTION 3** for information on verifying the operation of the tester.

Equipment Required

1. AC Voltmeter - 0.2% FS. or better, capable of reading 0-3000 volts AC Voltage
2. Probe - To use with the AC voltmeter
3. AC milliamperes Meter - 0.2% or better, capable of reading 0-10 AC milliamperes
4. AC Ammeter - 2% or better, capable of reading 0-30 amperes
5. Load resistor - 0.10 ohms, 1%, 300 watts
6. Load resistor - 0.09 ohms, 1 %, 300 watts
7. Load resistor - 300,000 ohms, 5%, 10 watts

Ground Bond

1. Place the **DIELECTRIC TEST DURATION** switch in the **1 SECOND** position and the **PRODUCT** switch in the **3 WIRE** position.

2. Turn the **VOLTAGE CONTROL** to its fully counter clockwise position.

3. Attach the 0.10 ohm resistor standard in series with the 0-30 ammeter standard between the test clip and the ground pin in the test receptacle.

4. Verify that the tester produces 25 amp of test current when the test button is pressed and held. Limit the test duration to five seconds or less during calibration.

5. Verify that the continuity test passes with the 0.09 ohm test resistor in place and fails with the 0.10 ohm resistor in place.

6. Adjust the **CONTINUITY RESISTANCE LIMIT** on the rear of the tester as required.

Kilovolt Meter

1. Zero the kilovolt meter using the manual adjustment screw on the meter face.

2. Attach the 0-3000 volt meter standard and probe between the high voltage probe and the test clip.

3. Verify the meter reading at 1, 2 and 2.5 kilovolts.

4. Adjust trim pot R5 on the internal circuit board as required.

Milliamp Meter

1. Zero the milliamp kilovolt meter using the manual adjustment screw on the meter face.

2. Attach the 0-10 Milliammeter standard in series with the 300,000 ohm resistor between the high voltage output and the test clip.

3. Slowly increase the test voltage checking the milliamp meter at 4 milliamps, if the tester is adjusted for a 5 milliamp trip point. Check at 8 milliamps if a 10 milliamps trip point is used.

Dielectric Trip Point

Using the same test setup, Verify that the tester trips with a fault current of 5.0 milliamps +/- 5% (or other selected point). Adjust the **DIELECTRIC LEAKAGE LIMIT** on the rear of the tester as required.

Fault Detector

Verify that the detector circuit operates the red lamps, buzzer and holds the hi-pot voltage off, until reset.

Test Duration

Verify both the **1** and **60 SECOND** time duration.

REPLACEMENT PARTS

Any of the following replacement parts can be ordered from Sotcher Measurement Inc.

Part #	Description
10231	PWR.SWITCH, ROCKER,BLK
11048	TEST SWITCH, PUSH, BLK
11049	RESET SWITCH, PUSH, RED
10331	PWR. LAMP, AMBER
11315	TEST LAMP, AMBER, DOME
11314	FAIL LAMP, RED, DOME
13224	METER, 2-1/2 INCH, 200UA
11298	TRANSFORMER, 120/6V, CONT
10548	TRANSFORMER, 2600V, HI-POT
10489	TRANSFORMER, VARIABLE
10710	FUSE, 5A
10448	POWER CORD, 18/3X8FT

SECTION 5
SCHEMATIC DIAGRAM