

Digital Surface Resistance/Resistivity Test Kit

Operation and Maintenance

Description

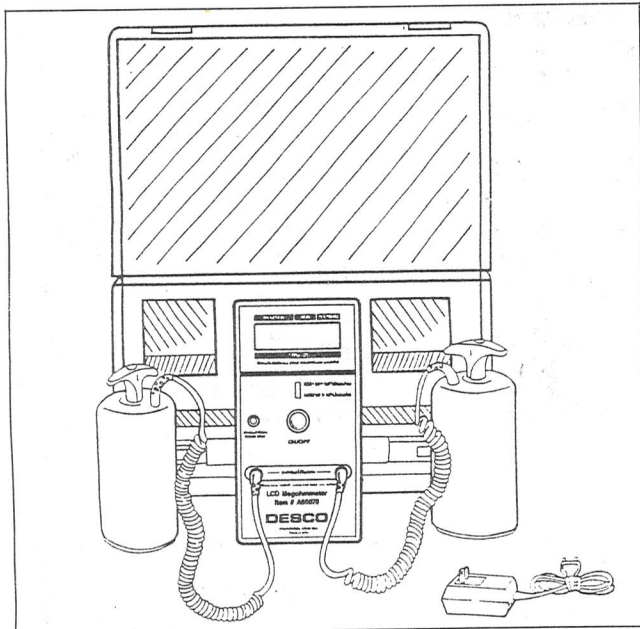


Figure 1. Desco Item No. A50070

The LCD Surface Resistance/Resistivity Test Kit is a portable instrument designed to measure resistance between two points (RTT), surface to ground (RTG), and surface resistivity in accordance with EOS/ESD Association Standard S-4.1. The unit's unique Liquid Crystal Display (LCD) allows the user to easily read measurements directly from the meter. No interpretation or calculations are necessary. This unit is ideally suited for evaluating the electrical properties of ESD protective work surfaces, materials and flooring products.

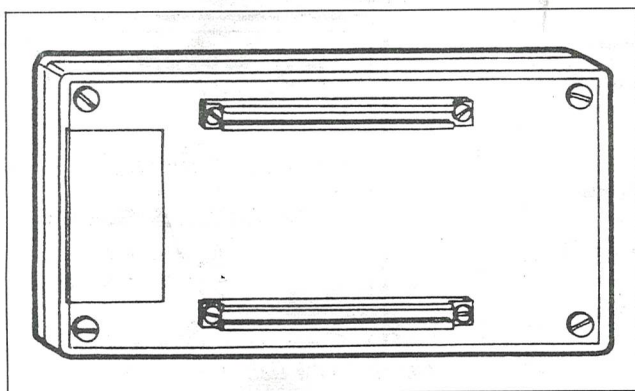


Figure 2. Parallel Resistivity Electrodes on bottom of meter.

The meter also incorporates two parallel probes on the bottom of the unit which allows surface resistivity measurements. These parallel electrodes allow for quick and easy testing of a variety of surfaces and materials, without the use of the 5 pound electrodes.

Recommended Literature

Desco recommends that you read the following standards from the ESD Association:

Description	Desco Item #
EOS/ESD-ADV1.0 — Glossary of Terms	6950
EOS/ESD-S4.1 — Worksurfaces	6954
EOS/ESD-S6.1 — Grounding	6956
ESD-S7.1 — Floor Materials	6957
EOS/ESD-S11.11 — Surface Resistivity	6961

These documents are available from Desco and they can also be obtained directly from the ESD Association, 7902 Turin Road, Suite 4, Rome, NY 13440-2069, (315) 339-6937.

In addition to the Association standards listed previously, anyone testing ESD protective surfaces may wish to obtain copies of:

MIL-HDBK 263A	EIA-IS-5-A	ASTM-F-150
ASTM-D257	EN 100015.	

These standards are available from the agencies who produce them. If you need help in obtaining these documents contact our Customer Service Department.

Inspection

Remove the meter from the carton and inspect for damage. Each unit should include the following:

- 1 Protective carrying case
- 1 LCD Display Meter
- 2 Test leads
- 2 5-pound weighted electrodes
- 1 Grounding clip
- 1 AC adapter/charger
- 1 P-2024 Technical Bulletin
- 1 Rechargeable battery

Properly store the meter and component assemblies when not in use. Do not charge battery unless it is fully discharged. Doing so will reduce the life of the battery.

Features

A. Scale: 1/2 inch high digital LCD display provides easy to read resistivity/resistance measurements. Values are expressed with a mantissa and exponent power.

B. Test Button: This button turns on the power to the meter. When released the measured reading will remain for 10-20 seconds.

C. Test Range Voltage Switch:
10 Volts for 1×10^3 - 1×10^{11} ohms
100 Volts for 1×10^6 - 1×10^{12} ohms

D. Jacks: 2.5mm phone plugs will fit the meter jacks. Banana plugs will only fit the electrodes.

E. AC-Battery Charger Adapter:
12 volts DC - 100mA.

F. 9 Volt Battery Compartment

G. Parallel Electrodes.

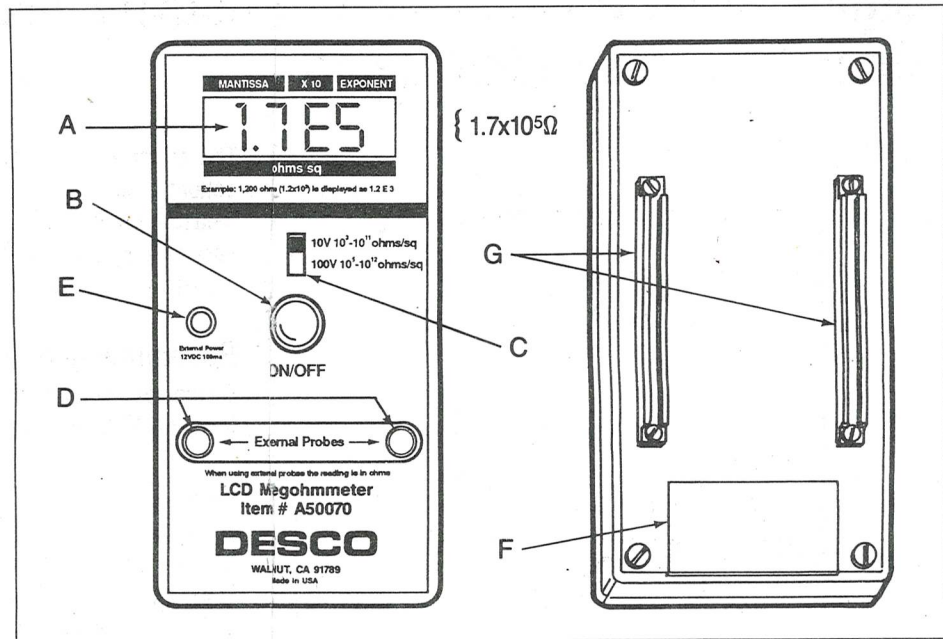


Figure 3. Features of the LCD Surface Resistance/Resistivity Meter

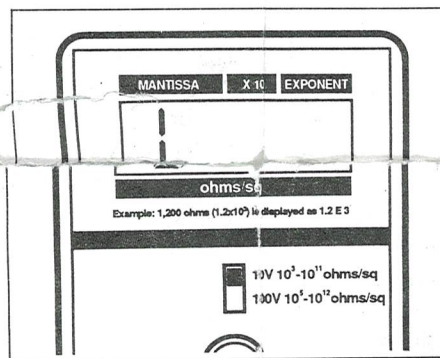


Figure 4. If the value of the measurement is below 1000 ohms on the 10 volt scale or 1×10^6 on the 100 volt scale an "L" will appear on the LCD display.

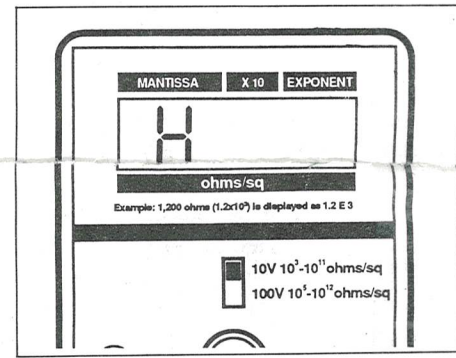


Figure 5. If the value of the measurement is over 5×10^{12} ohms an "H" will appear on the LCD display.

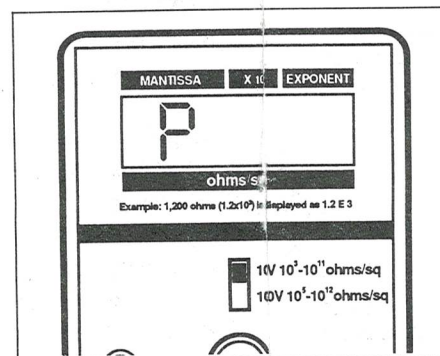


Figure 6. A "P" will appear on the LCD display if there is too much electrical 60 Hz noise in the area or if a test is performed on a high open resistance.

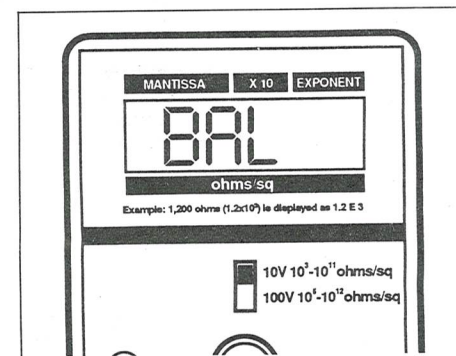


Figure 8. Low Battery Indicator

When the unit's batteries need recharging a "BAL" will appear on the LCD display as the meter is being operated. To maximize the life of the battery do not recharge until a low battery "BAL" is displayed.

Cleaning

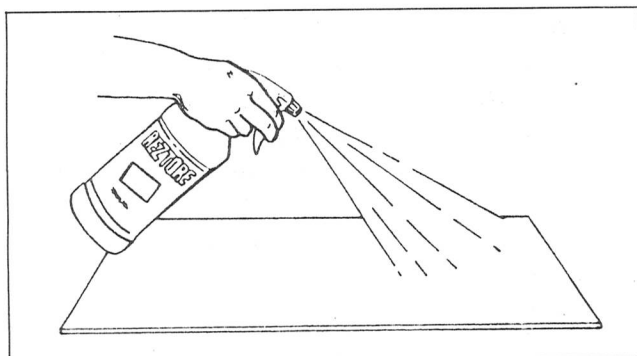


Figure 8. Clean surface of material before testing.

Work surfaces or materials to be tested should be cleaned prior to testing to ensure that surface dirt and contamination do not affect the test results. Periodically clean the built-in parallel electrodes and the two 5 lb. conductive rubber probe electrode surfaces. Use solvent-free rubber cleaners. We recommend using Desco Reztore anti-static cleaner or Stat Wipes, pre-saturated cleaning wipes. Be sure the surface is dry before testing.

Power Requirements

The meter is powered by a rechargeable 9 volt Nickel/Cadmium battery or a special AC to DC adapter. The adapter is also used to recharge the 9 volt battery.

Surface Resistance Measurements (RTT)

Complies with EOS/ESD-S4.1

Point to point surface resistance measurements are made using the meter with both of the 5 pound weight electrodes. This test will determine the resistance between two points, independent of a groundable point. To perform surface resistance tests you must first determine what test procedure you will be using. The test procedure will help you to determine proper preparation of the material to be tested and the spacing of the weights. Once testing parameters are determined you can proceed with the following instructions:

A. Connect the test leads to the meter by inserting the banana termination end of a test lead into the weighted electrode and the 2.5mm mini phone plug end into the meter.

B. Place both electrodes on the material at positions determined by the procedure selected. Set the meter to the required test voltage determined by the test procedure and the resistance of the material.

C. Press and hold the red test button for 10-20 seconds. The measured resistance value will appear on the display. This reading should be expressed in ohms.

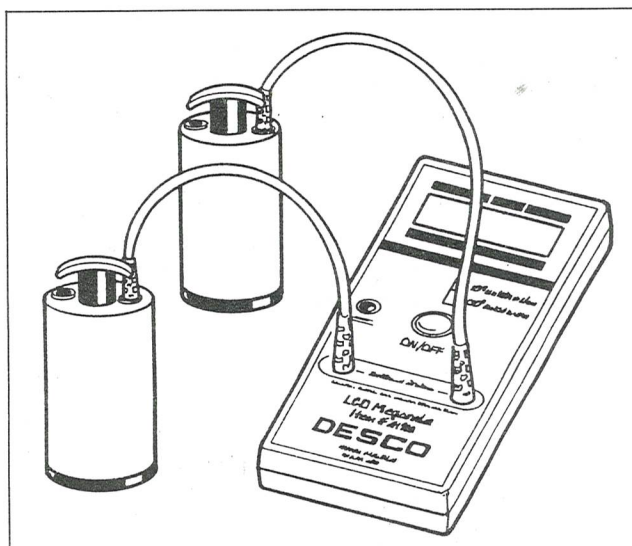


Figure 9. Setting up for RTT testing

Surface-to-Ground Measurements (RTG)

Complies with EOS/ESD-S4.1

The Surface-to-Ground measurements will indicate the surface resistance between selected locations on a work surface and a groundable point or points. Ground points are usually in the form of snaps installed on the material so that the material can be grounded via ground cords. The charge dissipation rate of all ESD protective materials is related directly to electrical resistance to ground. When making Surface-to-Ground measurements, follow this procedure:

A. Connect one of the 5 pound electrodes to the meter using one of the test leads.

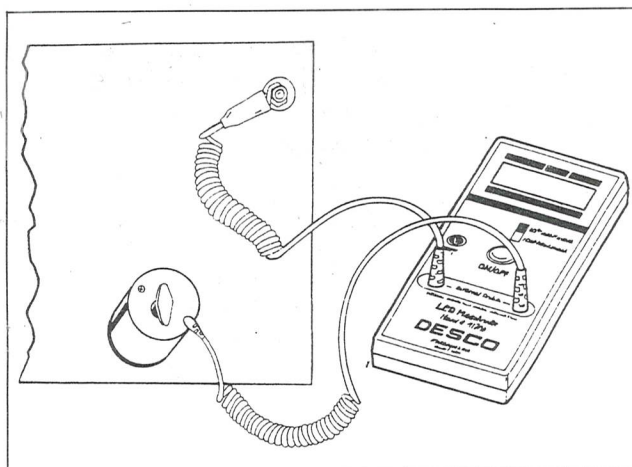


Figure 10. Setting up for RTG testing.

B. Using the other test lead connect the mini phone plug end to the meter. Connect the grounding clip, included, onto the banana plug on the other end of the lead. Now connect the grounding clip to the groundable point on the surface to be tested.

C. Position the electrode on the material at the position specified by the procedure selected. Set the meter to the desired test voltage range. Be sure to keep the cords separated in order to prevent false readings especially when testing high resistance materials.

D. Press and hold the red test button for 10-20 seconds. The measured resistance value will appear on the display. This reading should be expressed in ohms. Record the reading, humidity, temperature and test voltage.

E. Repeat procedure on other points on the material under test.

Surface Resistivity Measurements - Quick Reference

Complies with EOS/ESD-S11.11

A. Firmly place the meter's parallel probes on the surface of the material to be tested, at the position specified by the procedure selected.

B. Press and hold the red test button for 10-20 seconds. The measured resistance value will appear on the display. This reading should be expressed in ohms/sq. You may also want to record ambient temperature and humidity.

Maintenance

Your Surface Resistance Test Kit will require little maintenance, and there are no user serviceable parts. If your meter requires service beyond cleaning the probes or recharging the battery, please contact the factory.

Calibration

The A50070 LCD Surface Resistance Test Kit is calibrated to manufacturers specifications. Calibration to NIST traceable standards is available, please call or fax our Customer Service Department for information on factory calibration.

In-house calibration can be performed by using 1% resistors in each of the meter ranges. Simply attach the resistors to the enclosed cords using grounding clips and recording the meter display. Keep the cords separated. Adjustments to the internal resistance pots can be done quite easily. Request this procedure from the Desco Customer Service Department.

Specifications

Ranges:	1x10 ³ - 1x10 ¹¹ ohms @ 10 Volts 1x10 ⁶ - 1x10 ¹² ohms @ 100 Volts
Power Supply:	9 volt Rechargeable Nickel/Cadmium battery and AC adapter/charger included. Alkaline battery optional.
Battery Life:	Nickel/Cadmium - 1 hour
Charge Time	12 hours
AC Adapter Output:	12 volt DC - 100mA
Internal Electrodes:	Two parallel conductive silicone rubber replaceable electrodes
External Electrodes	Two 5-pound weighted electrodes, 2.5" in diameter, complies with EOS/ESD-S4.1
Operating Conditions:	60°F - 80°F, 10-50% RH
Display:	One six character .500" LCD display
Accuracy:	10 ³ - 10 ⁹ = ±15% at 10-90% RH 10 ⁹ - 10 ¹¹ = ±20% at 10-60% RH 10 ¹¹ - 10 ¹² = ±30% at 10-50% RH
Meter Weight:	13 oz.
Charger Weight:	11 oz.
Dimensions:	7.5" L x 4" W x 1.75" H
Power Switch:	Momentary on. Releasing the switch will hold and display for >10 seconds.

Limited Warranty

Desco expressly warrants that for a period of one (1) year from the date of purchase, Desco's A50070 Test Kits will be free of defects in material (parts) and workmanship (labor). Within the warranty period, product will be tested, repaired or replaced at Desco option, free of charge. Any unit under warranty should be shipped prepaid to the Desco factory. Call Customer Service at 909-598-2753 for proper shipping instructions and address. Include a copy of your original packing slip, invoice, or other proof of purchase date. Warranty repairs will take approximately two weeks.

If your unit is out of warranty, Desco will quote repair charges necessary to bring your unit up to factory standards. Ship your unit freight prepaid and call Customer Service at 909-598-2753 for proper shipping instructions and address.

Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability

In no event will Desco or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.