Low Resistance Tester Operation and Maintenance

Made in the United States of America



Figure 1. Desco 19245 Low Resistance Tester

Description

Desco's Low Resistance Tester is designed to measures resistance of grounding paths of banana jacks and other equipment. Selectable Test Ranges: <1 ohm, <2 ohms and <20 ohms allow the operator to test grounding conductors per ANSI/ESD S6.1 – Grounding and ESD TR20.20. The Tester is equipped with pass/fail (go/no go) audio and visual indicators that activate to confirm that the grounding conductor being tested meets the test range. The low battery indicator lets the operator know when battery needs to be replaced.

ESD Handbook ESD TR20.20 section 5.5.2.2 Electrical Hand Tools

"All electrical tools and equipment used to process ESD sensitive devices require the three prong, grounded-type AC plug. The metal portions of the tool that touch the device should have a low resistance (<2 ohms) to the equipment ground terminal on the plug. In some cases, the user may wish to verify that the metal portions of the tool have acceptable voltage levels and leakage current. The tester defined in ESD STM13.1 provides a means of checking soldering iron tips while being used. Although the document was written to make measurements on soldering and desoldering equipment, the measurement techniques can be used for other electrical hand tools. The working part of AC powered tools should be capable of providing a conductive path to ground. New powered hand tools such as soldering irons typically should have a tip to ground resistance of less than 1.0 ohm.
NOTE: This resistance may increase with use but should be less than 20.0 ohms for verification purposes."

ANSI/ESD S6.1 – Grounding

"***6.4.1*** The resistance of the conductor from the groundable point ground of any ESD technical element (e.g. worksurface, floor, chair, wrist strap, etc.) to the common point ground or common connection point shall not be greater than 1 ohm. Where a resistor is used in the grounding conductor, the total resistance shall include the value of the resistor.
6.4.2 The resistance of the conductor from the common point ground to the AC equipment ground shall not be greater than 1 ohm."

Packaging

1 Low Resistance Tester
1 Threaded Banana Plug
1 Threaded Needle Point
1 Alligator Clip
1 Banana Jack Outlet Adapter
1 Certificate of Calibration

Features and Components

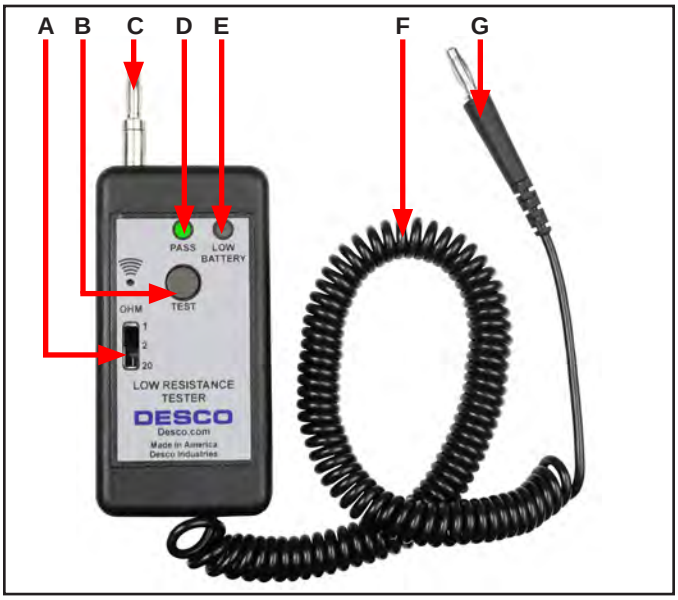


Figure 2. Low Resistance Tester features and components

A. Selectable Test Ranges: Select the appropriate range for required test <1 OHM, <2 OHMs, and <20 OHMs.

B. Test Button: Press and hold button to activate the tester.

C. Threaded Banana Plug/Needle Point: Standard Kit includes a banana plug and needle point adaptor.

D. Audio and Visual Test Indicators: LED and buzzer Pass result.

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E. Low Battery LED: LED illuminates when the battery needs to be replaced.

F. 6 Foot Coiled Cord: Insulation black color PVC

G. Banana Plug: Industrial Standard .175" (4.4 mm) Banana Plug, fits banana jack ≥ .157".

Operation

USING THE TESTER

1. Use the slide switch to select a test range.
2. Connect the coil cord banana plug end to known ground. Use adapters where needed. NOTE: The Desco Low Resistance Tester may be used with an outlet polarity checker such as the Desco 19219 to determine a known ground.
3. Connect or touch the tester end to a banana jack or other equipment that is being tested for resistance to ground.
4. Press and hold the test button.
5. An audio and visual indication will activate for a PASS condition.
6. A FAIL condition is indicated when the buzzer does not sound and the PASS does not illuminate.

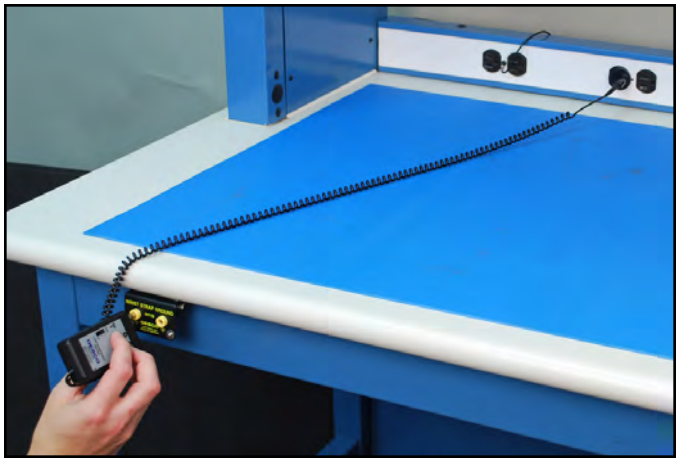


Figure 3. Testing ground points with the 19245 tester

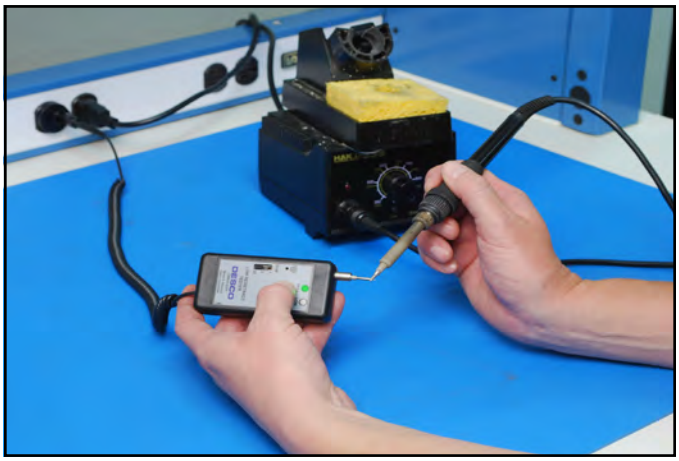


Figure 4. Testing a soldering iron with the 19245 tester

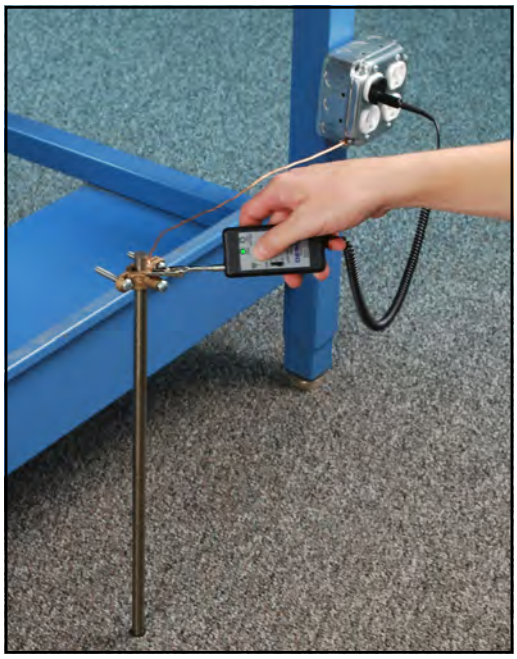


Figure 5. Testing auxiliary ground with the 19245 tester

Example of Test Range Uses

<1 OHM Range
- ESD Technical element Grounding Conductors: Banana Jacks, Grounding Blocks, Mat Ground Cords *ANSI/ESD S6.1 Grounding, sections 6.4 Technical Elements,* 6.4.1, 6.4.2 and 6.4.3
- New AC Powered Hand Tools *ESD Handbook ESD TR20.20 section 5.5.2.2 Electrical Hand Tools*

<2 OHM
- Soldering Irons *ESD Handbook ESD TR20.20 section 5.5.2.2 Electrical Hand Tools*
- Other AC Powered Hand Tools *ESD Handbook ESD TR20.20 section 5.5.2.2 Electrical Hand Tools*

<20 OHM
- Soldering iron verification *ESD Handbook ESD TR20.20 section 5.5.2.2 Electrical Hand Tools*
- Auxiliary grounds (ground rods) *ANSI/ESD S20.20**

* ANSI/ESD S20.20 requires <25 ohms from the Auxiliary Ground to the Equipment Grounding Conductor. Desco's Low Resistance Tester only tests to <20 ohms. In cases of a no pass result with the Low Resistance Tester when testing an Auxiliary Ground, an Ohm meter should used to determine the actual resistance from the Auxiliary Ground to the Equipment Grounding Conductor

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Calibration

The Low Resistance Tester is calibrated to standards traceable to NIST. Frequency of recalibratrion should be based on the critical nature of those ESD sensitive items handled and the risk of failure for the ESD protective equipment and materials. In general, we recommend that calibration be performed annually.

Calibration is performed by placing various resistors between the probe tip and the lead wire.

1. Attach the alligator clip to the lead wire.
2. Set the Low Resistance Tester to the 1 ohm test setting.
3. Attach the lead of a 1 ohm resistor to the alligator clip.
4. Firmly place the tester's probe tip on the opposite resistor lead.
5. Press and hold the test button. The PASS LED should illuminate.
6. Repeat the procedure with a 1.2 ohm resistor. The PASS LED should not illuminate.
7. Repeat this process with the ranges listed in the table below. If the unit fails calibration, check and replace the battery.

Test Range Setting	PASS	FAIL
1 ohm	0 to 1 ohm	≥ 1.2 ohms
2 ohms	0 to 2 ohms	≥ 2.2 ohms
20 ohms	0 to 20 ohms	≥ 22 ohms

Maintenance

BATTERY REPLACEMENT

1. Properly ground yourself using a wrist strap.
2. Remove the 2 screws located at the back of the tester.



Figure 6. Locating the enclosure screws

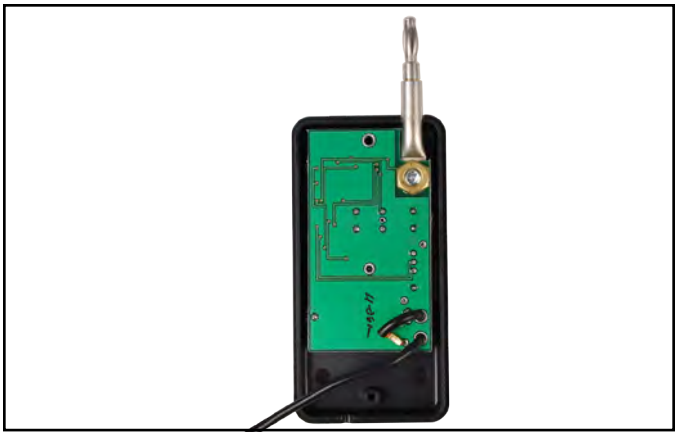


Figure 7. Removing the back cover

3. Remove and turn over the circuit board.
4. Locate and replace the battery (3 Volt; Model CR2032).

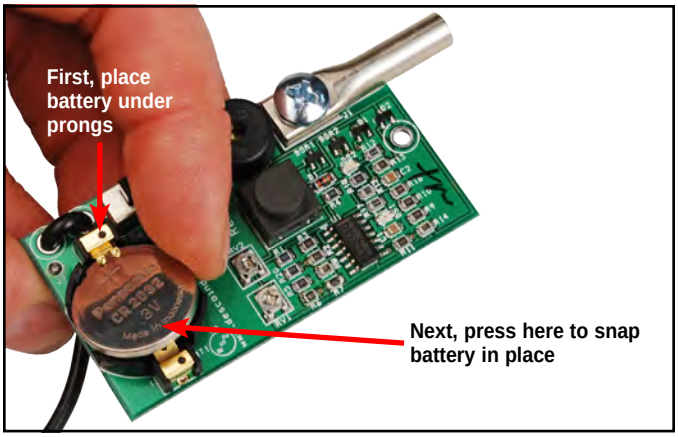


Figure 8. Replacing the battery

5. Re-assemble the tester.

Specifications

Output Voltage: 2.5 volts DC @ 10mA

Dimensions: 4.75" x 1.75" x .75" (12cm x 4.5cm x 2cm)

Operating Temperature: 0° - 40°C

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Limited Warranty

Desco expressly warrants that for a period of one (1) year from the date of purchase, Desco Low Resistance Testers will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a credit for purchase of replacement Desco products, or, at Desco's option, the product will be repaired or replaced free of charge. If product credit is issued, the amount will be calculated by multiplying the unused portion of the expected one year life times the original unit purchase price. Call Customer Service at 909-627-8178 (Chino, CA) or 781-821-8370 (Canton, MA) for Return Material Authorization (RMA) and proper shipping instructions and address. Include a copy of your original packing slip, invoice, or other proof of date of purchase. Any unit under warranty should be shipped prepaid to the Desco factory. Warranty replacements 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. Call Customer Service at 909-627-8178 (Chino, CA) or 781-821-8370 (Canton, MA) for a Return Material Authorization (RMA) and 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 consequent, 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.

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