

CALIBRATION TEST FIXTURES

Model 809B (Surface)

Model 819 (Volume)



Instruction Manual

7/08



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1.0 INTRODUCTION

The Model 809B Surface Resistance Calibration Test Fixture and the Model 819 Volume Resistance Test Fixture, shown in Figure 1.0-1a and b respectively, are designed to check both the electrode alignment of the ETS 803 series of Resistance/Resistivity Probes, the electrification time of the Probe/Cable/Meter test setup at 1 terohm (1×10^{12}) plus verification of the overall measurement accuracy of the test setup at both ends of the static dissipative measurement range.



Figure 1.0-1: Model 809B (a) and Model 819 (b) Calibration Test Fixtures

2.0 DESCRIPTION

2.1 Model 809B

The Model 809B consists of an array of twenty (20), 1%, 10 megohm resistors connected 18° apart around the circumference of a pair of concentric rings having the same diameters as the inner and outer rings of the Model 803A/B Probes. When the Probe is placed in the Test Fixture the measured resistance should be one-twentieth of the 20 individual 10 megohm resistors in parallel which is 0.5×10^6 ohms. Measurements above 0.51×10^6 ohms indicate that the probe electrodes may not be making total surface contact.

On the opposite side of the Test Fixture is another concentric ring configuration with all points on the outer ring connected to all points on the inner ring by a 1 terohm resistor ($1 \times 10^{12} \pm 5\%$ ohms). When the Probe is placed on the Fixture the time for the measuring instrument to indicate the value specified on the Test Fixture is then determined. This time plus 5 seconds establishes the electrification time for the test setup.

This unique test fixture virtually eliminates potential measurement errors caused by probe misalignment or insufficient electrification time plus it verifies the upper and lower resistance range measurement accuracy. The Model 809B is specifically designed for the ETS Model 803A and B series Resistance Probes, but may also be used with other probes designed to meet the requirements of ESDA STM 11.11, "Surface Resistance Measurement of Static Dissipative Planar Materials."

2.2 Model 819

The Model 819 checks the degree of flatness of the 1.2" (30.5mm) center conductive rubber electrode of the ETS Model 803A and B series of Resistance/Resistivity Probes.

The Model 819 consists of an array of 20, 1%, 10 megohm resistors in parallel with contact pads spread over the area of the inner measuring electrode. When the Probe is placed on the Test Fixture, the measured resistance should be one-twentieth of the 20 individual 10 megohm resistors in parallel which is 0.5×10^6 ohms. Any measurement above 0.51×10^6 ohms indicates the probe electrodes may not be making total surface contact.

The Model 819 Test Fixture virtually eliminates potential measurement errors caused by probe misalignment, and when used in conjunction with the Model 809B, insufficient electrification time plus upper and lower resistance range measurement accuracy. The Model 809B is specifically designed for the ETS Model 803A and B series Resistance Probes, but may also be used with other probes designed to meet the requirements of ESDA STM 11.12, "Volume Resistance Measurement of Static Dissipative Planar Materials."

3.0 SETUP

Connect the Resistance Probe to the resistance measuring setup (either a wide range resistance meter or a power supply/ammeter apparatus). Refer to the Probe Operating Manual.

Place the Test Fixture on a flat surface.

3.1 Model 809B

With the low resistance side facing up (nominal 0.5×10^6 ohms printed on outer alignment ring) place the Probe on the Fixture and rotate it $\frac{1}{2}$ turn to ensure good contact. Select the appropriate range and set the test voltage to 10V

Take a measurement. The meter should read the value printed on the ring, typically 503 kohms. Readings greater than 510 kohms usually indicate one or more of the 20 pads are not making contact with the

rubber electrodes. Repeat the procedure. If the correct reading still cannot be obtained then the Probe should be returned to ETS for recalibration.

Turn the Test Fixture upside down so the printed (0.95 terohm typical) is visible. Place the Probe on the fixture and rotate it ½ turn. Select the appropriate range and set the test voltage to 100V. Measure the time it takes for the meter to read the value marked on the Test Fixture. This time plus 5 seconds is the electrification time. This is the time required to apply the test voltage to a sample in the static dissipative range to obtain the correct resistance measurement. Lower resistance samples may require a shorter electrification time. This is determined by noting the time required to obtain a stable reading.

NOTE: If the resistance of the sample is in excess of 1×10^{12} ohms the electrification time required will be much longer.

3.2 Model 819

This fixture only has only a low resistance side (nominal 0.5×10^6 ohms) for checking the flatness of the center electrode. Place the Probe on the Fixture and rotate it ½ turn to ensure good contact. Select the appropriate range and set the test voltage to 10V

Take a measurement. The meter should read the value printed on the Fixture, typically 503 kohms. Readings greater than 510 kohms usually indicate one or more of the 20 pads are not making contact with the rubber electrodes. Repeat the procedure. If the correct reading still cannot be obtained then the Probe should be returned to ETS for recalibration.

Electrification time is established using the Model 809B. If a Model 809B is not available then placing a 1 terohm resistor across the Probe electrodes will provide the same information. Measure the time it takes for the meter to read the actual value of the resistor less 5%. This time plus 5 seconds is the electrification time. This is the time required to apply the test voltage to a sample in the static dissipative range to obtain the correct resistance measurement. Lower resistance samples may require a shorter electrification time. This is determined by noting the time required to obtain a stable reading.

NOTE: If the resistance of the sample is in excess of 1×10^{12} ohms the electrification time required will be much longer.

4.0 MAINTENANCE

The only maintenance required is to keep the contact pads clean using isopropyl alcohol. The nominal 500 kohm resistor value can be checked by using a precision resistance meter to measure the resistance between the inner and outer contact rings.

5.0 WARRANTY

Electro-Tech Systems, Inc. warrants its equipment, its accessories and parts of its manufacture to be and remain free from defects in material and workmanship for a period of one (1) year from the date of invoice, and will, at the discretion of Seller, either replace or repair without charge, F.O.B. Glenside, similar equipment or a similar part to replace any equipment or part of its manufacture which, within the above stated time, is proved to have been defective at the time it was sold. All equipment claimed defective must be returned properly identified to the Seller (or presented to one of its agents for inspection). This warranty only applies to equipment operated in accordance with Seller's operating instructions.

Seller's warranty with respect to those parts of the equipment that are purchased from other manufacturers shall be subject only to the manufacturer's warranty.

The Seller's liability hereunder is expressly limited to repairing or replacing any parts of the equipment manufactured by the manufacturer and found to have been defective. The Seller shall not be liable for damage resulting or claimed to result from any cause whatsoever.

This warranty becomes null and void should the Model 803B Resistance/Resistivity Probe or any part thereof, be abused or modified by the customer or if used in any application other than that for which it was intended. This warranty to replace or repair is the only warranty, either expressed or implied or provided by law, and is in lieu of all other warranties and the Seller denies any other promise, guarantee, or warranty with respect to the equipment or accessories and, in particular, as to its or their suitability for the purposes of the buyer or its or their performance, either quantitatively or qualitatively or as to the products which it may produce and the buyer is expected to expressly waive rights to any warranty other than that stated herein.

ETS must be notified before any equipment is returned for repair. ETS will issue an RMA (Return Material Authorization) number for return of said equipment.

Equipment should be shipped in the original packaging. If this is not possible, the equipment should be packed in a sufficiently large box of double wall construction with substantial packing around all sides. A description of the problem along with the contact name and telephone number must be included in formal paperwork and enclosed with the instrument.

Electro-Tech Systems, Inc. will not assume responsibility for additional cost of repair due to damage incurred during shipment as a result of poor packaging.