

# Surface Resistance Checker Installation, Operation and Maintenance



Made in the  
United States of America



Figure 1. Vermason [225717](#) Surface Resistance Checker



Figure 2. Vermason [225718](#) Surface Resistance Checker Kit

## Description

The Vermason Surface Resistance Checker is a portable battery powered checker fitted with built-in parallel electrodes that allow for tests of material surface resistance. This meter is designed for quick checks of surface resistance for ESD control applications in electronics manufacturing or handling environment. The Surface Resistance Checker is equipped with an automatic test voltage selector. The test voltage will switch from 10 V to 100 V should the measured resistance be  $1 \times 10^6$  ohms or higher. Two banana jacks and an electrode toggle switch allow for the connection of two external 2.27 kg electrodes that measure surface resistance point-to-point (Rp-p).

## Compliance Verification Plan

“A compliance verification plan shall be established to ensure the organization’s fulfilment of the requirements of the plan. Process monitoring (measurements) shall be conducted in accordance with a compliance verification plan that identifies the technical requirements to be verified, the measurement limits and the frequency at which those verifications shall occur. The compliance verification plan shall document the test methods used for process monitoring and measurements. If the organization uses different test methods to replace those of this standard, the organization shall be able to show that the results achieved correlate with the referenced standards. Where test methods are devised for testing items not covered in this standard, these shall be adequately documented including corresponding test limits. Compliance verification records shall be established and maintained to provide evidence of conformity to the technical requirements. The test equipment selected shall be capable of making the measurements defined in the compliance verification plan.” (EN 61340-5-1 clause 5.2.4)

The Surface Resistance Checker is not recommended for use in Resistance to Ground (Rg) measurements.

## Packaging

### [225717](#) Surface Resistance Checker

- 1 Surface Resistance Checker
- 1 9 V Battery
- 1 Certificate of Calibration

### [225718](#) Surface Resistance Checker Kit

- 1 Surface Resistance Checker
- 2 Test Leads
- 2 2.27 kg Electrodes
- 1 9 V Battery
- 2 Crocodile Clips
- 1 Plastic Carrying Case
- 1 Certificate of Calibration

## Features and Components

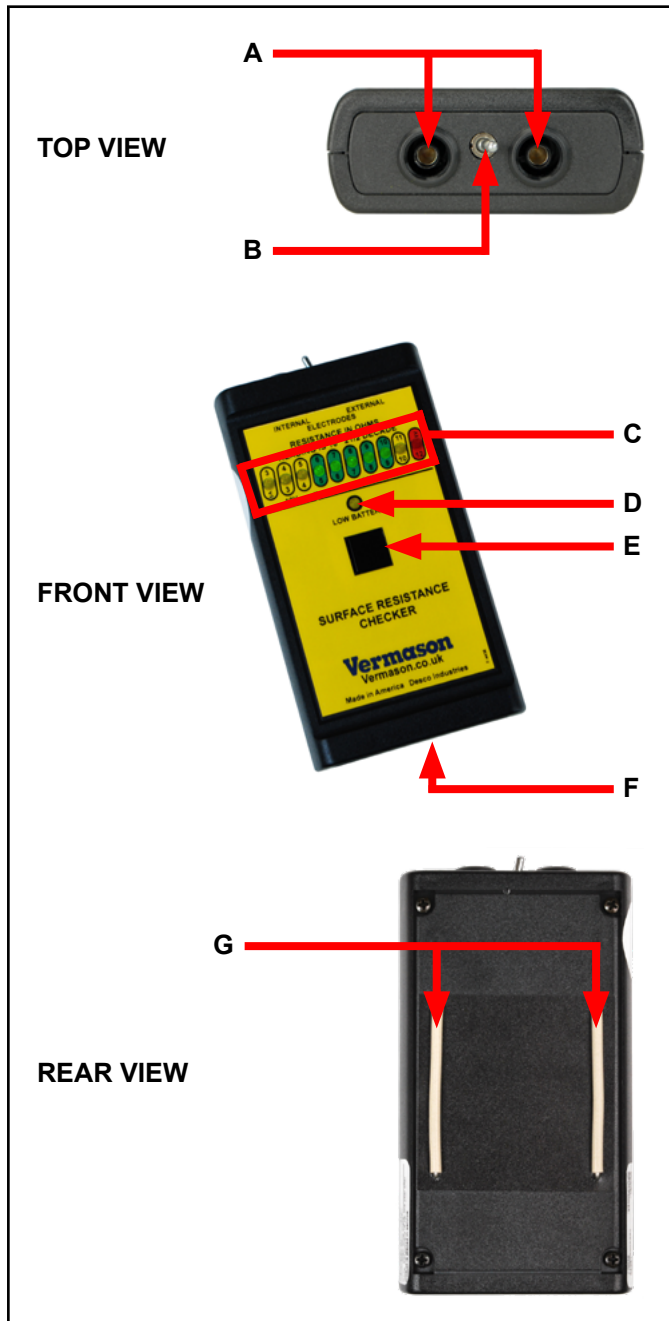


Figure 3. Surface Resistance Checker features and components

**A. Electrode Banana Jacks:** Insert the test leads from the 2.27 kg electrodes here.

**B. Electrode Toggle Switch:** Position the switch to the left (“INTERNAL”) to measure using the built-in parallel electrodes on the back of the Surface Resistance Checker. Position the switch to the right (“EXTERNAL”) to measure using two of the 2.27 kg electrodes.

**C. Resistance Measurement LEDs:** The resistance is measured in ohms and read as  $10^X \pm 1/2$  decade where X is the range illuminated on the checker.

**D. Low Battery LED:** When illuminated, this LED indicates when the battery needs to be replaced. Do not use the Surface Resistance Checker when this LED is illuminated.

**E. Test Contact:** Use this contact area to make a surface resistance measurement. Press and continue to hold until one of the Resistance Measurement LEDs remains illuminated.

**F. Battery Compartment:** Remove the cover to allow access to the 9 V battery compartment.

**G. Parallel Electrodes:** Be sure to position the Electrode Toggle Switch to “INTERNAL” when choosing to make a measurement using the parallel electrodes built-in on the back of the Surface Resistance Checker. Take care not to damage the electrodes’ conductive foam.

## Operation

### USING THE INTERNAL PARALLEL ELECTRODES

#### MEASURE RESISTANCE POINT-TO-POINT (Rp-p) ON THE SURFACE

- Do not clean the surface prior to testing.
- Remove all items from the surface that may interfere with the test.
- ESD sensitive devices should also be removed
- Place the Surface Resistance Checker on the most commonly used portion of the surface (5 cm from any edge, 8 cm from any groundable point).
- Toggle the Electrode Switch located at the top of the Surface Resistance Checker to “INTERNAL”.
- Press and continue to hold the test contact until the measurement is displayed.
- If the measurement is outside acceptable limits, clean the surface and re-test to determine if the cause of failure is an insulative dirt layer or the surface material.

NOTE: For working surfaces, use the Vermason [229021](#) Reztore® Antistatic Surface and Mat Cleaner or other silicone-free ESD cleaner. Be sure the surface is dry before testing.

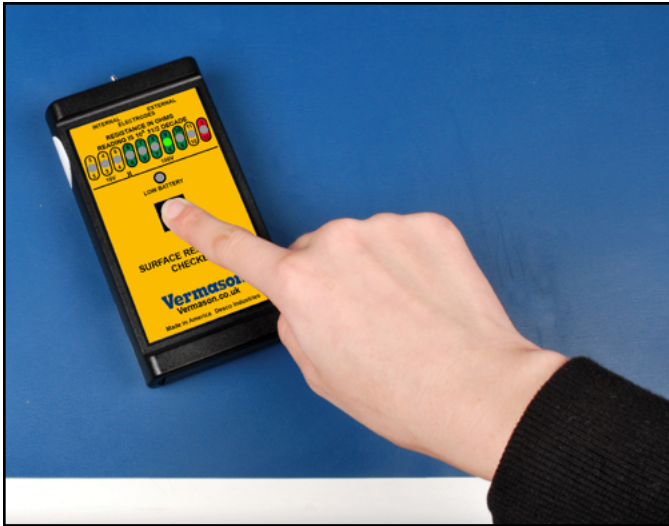


Figure 4. Using the internal parallel electrodes to measure surface resistance

## USING THE TEST LEADS AND ONE OR TWO 2.27 kg ELECTRODES

### GENERAL GUIDELINES

- Use both 2.27 kg electrodes for Rp-p.
- Ensure that the item being measured is electrically isolated (i.e. placed on an insulative surface) as the checker will measure the lowest resistance path.
- Ensure that the test leads are separated as a best practice.
- When using the 2.27 kg electrodes:
  - Place no closer than 5 cm from the edge of the surface being measured. Place no closer than 8 cm to any groundable point.
  - Place the 2.27 kg electrodes about 25 cm apart for Rp-p of worksurface and about 90 cm for floor.
  - Preferred placements include: most commonly used surface portion, most worn, centre, and furthest from groundable point.
- If surface has sections (floor tiles, garment panels), for Rp-p place the 2.27 kg electrodes on different sections.



Figure 5. Using the test leads and 2.27 kg electrodes to measure Rp-p

## RECOMMENDED FREQUENCY OF PERIODIC COMPLIANCE VERIFICATION OF INSTALLED PRODUCTS

The ESD Association lists test procedures and troubleshooting tips in Compliance Verification ESD TR53.

NOTE: "The frequency of periodic testing is normally specified in corporate operating procedures. ...The frequency of testing is driven by the amount of risk exposure that can occur between tests. For example, what is the quantity of product handled between test periods?" (See ESD Handbook ESD TR20.20)

### A GUIDE FOR PERIODIC TESTING

- Worksurface, carts, shelves - at least quarterly (see ESD TR20.20 section 5.3.1.13 Periodic Tests)
- Footwear - "Incoming inspection on a lot sampling basis should be performed for all static control footwear." (see ESD TR20.20 section 5.3.3.4 Testing)
- Floor - "In some cases, a simple electrical resistance test with a megohmmeter may suffice. In others, a static charge generation test may be required. The frequency of testing is also a consideration. Some materials, such as floor finishes, may require more frequent testing because of their lack of permanency." (see ESD TR20.20 section 5.3.4.15.1.4)
- Seating - "The recommended electrical resistance range for seating is less than E9 ohms as tested in accordance with ANSI/ESD STM 12.1. This value should be during acceptance testing, installation and periodically thereafter." (see ESD TR20.20 section 5.3.5.3 Testing)
- Garments - "ESD TR53 describes periodic verification test methods and trouble shooting for garments. The sleeve to sleeve resistance test should be made to ensure proper resistance range through the entire garment. Alternately, the garment while worn can be tested using a wrist strap tester." (ESD Handbook ESD TR20.20-2008 section 5.3.13.3.1.7 Periodic Verification Testing)

### Specifications

Accuracy	±1/2 decade
Weight	0.2 kg
Size	13 cm x 7 cm x 3 cm
Power Supply	9 V alkaline battery

## Maintenance

The area surrounding the cable jacks at the top end of the meter should be wiped with a clean cloth moistened with alcohol to remove skin oils that will accumulate and affect the accuracy at high resistances. The frequency of cleaning will depend on usage; once a month would be a good starting point.

“Clean the electrodes with a minimum 70 % isopropanol alcohol-water solution.” Make sure electrodes are dry prior to use.

For compliance verification testing, do not clean surfaces. However, if any measurements lie outside acceptable range, then clean the material's surface and re-test.

NOTE: For working surfaces, use the [229021](#) Reztore® Antistatic Surface and Mat Cleaner or other silicone-free ESD cleaner. Be sure the surface is dry before testing.

The Surface Resistance Checker requires little maintenance, and there are no user serviceable parts. If your unit requires service beyond cleaning the electrodes or replacing the batteries, please contact [Desco Europe Customer Service](#).

## Limited Warranty, Warranty Exclusions, Limit of Liability and RMA Request Instructions

See the Desco Europe Warranty - [DescoEurope.com/Limited-Warranty.aspx](http://DescoEurope.com/Limited-Warranty.aspx)