

# Analogue Surface Resistance Test Kit

## Operation and Maintenance



Made in the  
United States of America



Figure 1. Vermason [222635](#) Analogue Surface Resistance Test Kit

### Description

The Vermason Analogue Surface Resistance Test Kit is a portable battery-powered instrument designed to measure resistance point-to-point ( $R_{p-p}$ ) and surface to ground ( $R_g$ ). The meter is equipped with an automatic test voltage selector. The test voltage will switch from 10 V to 100 V should the measured resistance exceed  $1 \times 10^5$  ohms.

ESD protected area products should be tested:

- Prior to installation to qualify for listing in user's ESD control plan. Approved ESD materials (see product qualification table at EN 61340-5-1 Table 3 EPA requirements).
- During initial installation.
- For periodic checks of installed products as part of EN 61340-5-1 Compliance Verification testing per EN 61340-2-3.

### 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 Analogue Surface Resistance Meter and its accessories are available as the following item numbers:

Item	Description
<a href="#">222635</a>	Analogue Surface Resistance Test Kit (Test Leads and Electrodes Included)
<a href="#">222637</a>	Analogue Surface Resistance Meter
<a href="#">222636</a>	Shielded Test Leads
<a href="#">222634</a>	Electrodes, 2.27 kg

### Packaging

#### [222635](#) Analogue Surface Resistance Test Kit

- 1 Analogue Surface Resistance Meter
- 1 9 V Alkaline Battery
- 2 Shielded Test Leads
- 2 2.27 kilograms Electrodes
- 1 Plastic Carrying Case
- 1 Certificate of Calibration

#### [222637](#) Analogue Surface Resistance Meter

- 1 Analogue Surface Resistance Meter
- 1 9 V Alkaline Battery
- 1 Certificate of Calibration

## Features and Components

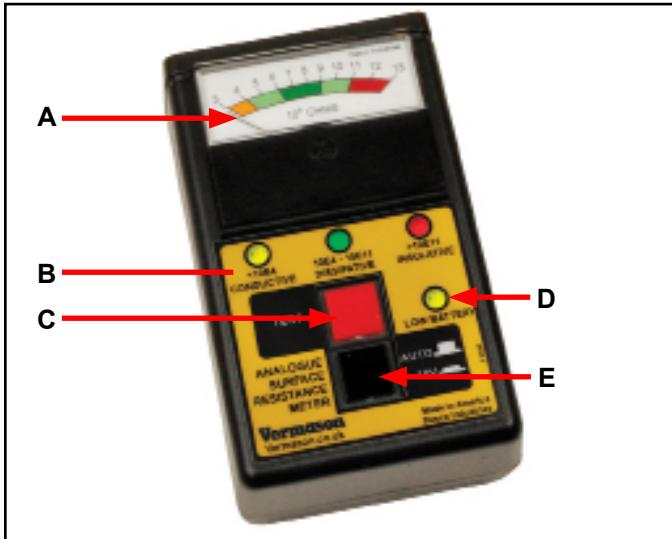


Figure 2. Analogue Surface Resistance Meter features and components

- A. Analogue Display:** Displays surface resistance measurements from  $1 \times 10^3$  -  $1 \times 10^{13}$  ohms.
- B. Resistance Property LEDs:** Colour-coded LEDs that provide quick-check resistance indicators.
- C. Test Button:** Hold this button down to operate the Analogue Surface Resistance meter.
- D. Low Battery LED:** Illuminates when the battery power drops to 4.0 V ( $\pm 0.1$  V).
- E. Test Voltage Button:** Test voltage will automatically switch from 10 V to 100 V when set to AUTO. Test voltage will stay at 10 V HOLD when set to 10 V.

## Operation

"The test methods in the compliance verification column refer to the basic test procedure only. It is not expected that the test method will be followed in its entirety." (EN 61340-5-1 EPA requirements Table 3, Note 2).

NOTE: The test kit can be used to measure R<sub>g</sub> and R<sub>p-p</sub> of storage racks, garments, floor and trolley working surfaces using test procedures similar to working surfaces and foot grounders.

## MEASURE WORKSURFACE RESISTANCE TO GROUND (R<sub>g</sub>)

1. Do not clean the surface.
2. Remove all ESD sensitive items from the surface and items that might interfere with the test.
3. Connect one lead to ground.
4. Use one electrode on the other test lead and place it at the centre of the surface.
5. Set the Test Voltage Button to AUTO. Press and hold the TEST button until the measurement is displayed (see Figure 3).

6. Perform additional measurements by placing the electrode on the most commonly used or worn areas.

CAUTION: If there is a current limiting resistor in the worksurface and the worksurface resistance is lower, the measurement will primarily be the resistance of the resistor. It is recommended to measure R<sub>p-p</sub> particularly if the material colour is black.

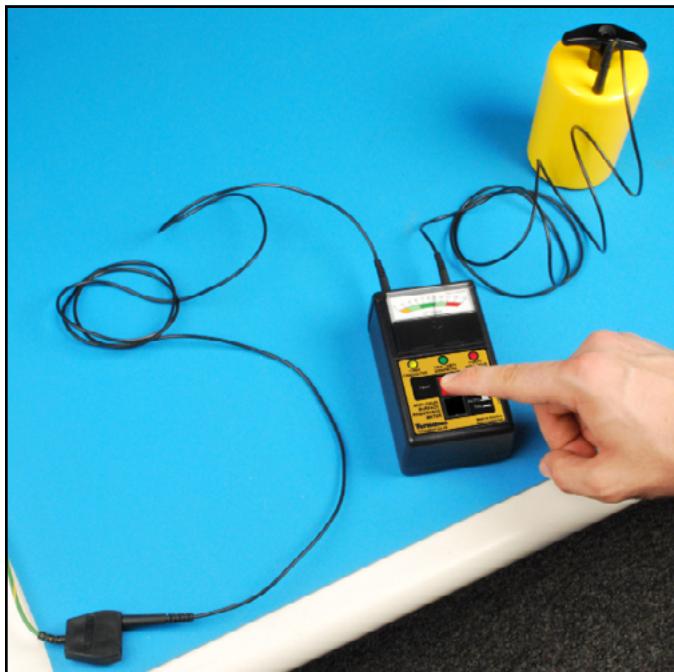


Figure 3. Using the test leads and one 2.27 kg electrode to measure R<sub>g</sub>

## MEASURE WORKSURFACE RESISTANCE POINT-TO-POINT ON THE SURFACE (R<sub>p-p</sub>)

1. Do not clean the surface.
2. Remove all ESD sensitive items from the surface and items that might interfere with the test.
3. Use two electrodes and place them 25 cm apart on the most frequently used area of the surface (5 cm from any edge, 8 cm from any groundable point).
4. If the most used area of the surface is not obvious, use two points near the centre of the surface.
5. Set the Test Voltage Button to AUTO. Press and hold the TEST button until the measurement is displayed (see Figure 4).

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 ESD worksurface material. NOTE: Use an ESD cleaner containing no insulative silicone (i.e. [229021 Reztore® Antistatic Surface and Mat Cleaner](#)).



*Figure 4. Using the test leads and two 2.27 kg electrodes to measure Rp-p of worksurfaces (place electrodes 1 m apart for flooring)*

#### **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)

#### **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-water solution. Make sure conductive pads are dry prior to use.

The Analogue Surface Resistance Meter 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](#).

#### **Specifications**

Resistance Ranges	1 x 10 <sup>3</sup> to 1 x 10 <sup>13</sup> ohms @ 10 Volts, complies with IEC 61340-2-3
	1 x 10 <sup>6</sup> to 1 x 10 <sup>13</sup> ohms @ 100 Volts, complies with IEC 61340-2-3
Accuracy	±1/2 decade
Power Supply	9 V alkaline battery
Operating Temperature	41 °F to 85 °F (5 °C to 30 °C)
Environmental Requirements	Indoor use only at altitudes less than 6500 ft. (2 km) Maximum relative humidity of 80% up to 85 °F (30 °C)
Meter Dimensions	4.5" x 2.8" x 2.1" (11 cm x 7 cm x 5 cm)
Meter Weight	0.5 lbs (0.2 kg)
Carrying Case Kit Dimensions	9.5" x 12.0" x 3.5" (24 cm x 30 cm x 9 cm)
Carrying Case Kit Weight	12.0 lbs (5.4 kg)
External Electrode	5 lbs (±2 oz), 2.5" (2.27 kg [±0.06 kg], 6.35 cm) in diameter complies with IEC 61340-2-3

#### **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)