

Digital Surface Resistance Meter Kit Installation, Operation and Maintenance



Made in the
United States of America



Figure 1. Desco Digital Surface Resistance Meter Kit

Description

The Desco [19290](#) Digital Surface Resistance Meter Kit is an instrument designed to measure resistance point-to-point (Rtt) or surface to ground (Rtg).

Its test functions include:

- Resistance measurement accuracy of $\pm 10\%$ ($\pm 20\%$ accuracy for 1×10^{12} ohms and greater)
- Resistance range of $< 1 \times 10^3$ ohms to $> 1 \times 10^{12}$ ohms
- Under load voltages of 10 and 100 volts $\pm 5\%$
- Electrification period of approximately 15 seconds

The Digital Surface Resistance Meter also measures ambient temperature and relative humidity. Up to 100 measurements may be stored and recalled from the meter's internal memory. This includes the resistance value, temperature, relative humidity and test voltage at the time of the measurement.

The Surface Resistance Meter is referenced and designed to be used to make measurements in accordance with the test procedures in:

- Compliance Verification - ESD TR53 - Resistance Measurements
- Worksurfaces - ANSI/ESD S4.1 Worksurfaces
- Floors - ANSI/ESD S7.1- Resistive Characterization of Materials Floor Materials
- Foot Grounders - ESD SP9.2 - Foot Grounders Resistive Characterization
- Garments - ANSI/ESD STM2.1 Garments
- Seating - ANSI/ESD STM12.1- Seating - Resistive Measurement
- Floor/Footwear - ANSI/ESD STM97.1 - Floor Materials and Footwear- Resistance Measurement in Combination with a Person

“A Compliance Verification Plan shall be established to ensure the Organization’s fulfillment of the technical requirements of the ESD Control Program 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 and equipment used for process monitoring and measurements. If the test methods used by the Organization differ from any of the standards referenced in this document, then there must be a tailoring statement that is documented as part of the ESD Control Program Plan. 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.” (ANSI/ESD S20.20 section 7.3)

The Digital Surface Resistance Meter and its accessories are available in the following item numbers:

Item	Description
19290	Digital Surface Resistance Meter Kit
19291	Digital Surface Resistance Meter
19292	Carrying Case
19293	Electrode Spacers, 10" and 36"
19294	Test Leads
19295	Handheld Electrode
19296	Measurement Location Labels, 25 Pack
50003	Replacement 5 lbs. Electrodes
50004	Replacement T-Handles for 5 lbs. Electrodes
50005	Concentric Ring Probe

Packaging

19290 Digital Surface Resistance Meter Kit

- 1 Digital Surface Resistance Meter
- 2 Test Leads, 5' Length
- 2 5 lbs. Electrodes
- 1 Electrode Spacer, 10"
- 1 Electrode Spacer, 36"
- 4 AA Alkaline Batteries
- 1 Ground Plug Adapter
- 1 Gator Clip
- 25 Measurement Location Labels
- 1 Plastic Carrying Case
- 1 Certificate of Calibration



Figure 2. Desco 19290 Digital Surface Resistance Meter Kit

19291 Digital Surface Resistance Meter

- 1 Digital Surface Resistance Meter
- 4 AA Alkaline Batteries
- 1 Certificate of Calibration



Figure 3. Desco 19291 Digital Surface Resistance Meter

Features and Components

Digital Surface Resistance Meter



Figure 4. Digital Surface Resistance Meter features and components

A. Test Jacks: The shielded black test lead's male SMA connector connects into the meter's female SMA connector, and the red test lead's banana plug connects into the meter's banana jack.

B. Exponent LEDs: These LEDs indicate the surface resistance exponent value. They are color coded for resistance decade quick checks.

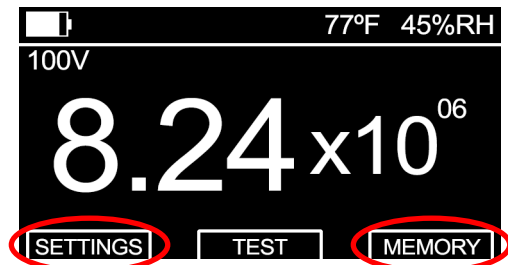
Exponent	Color
<3, 3	Yellow
4, 5, 6, 7, 8, 9, 10	Green
11, 12, >12	Red

(i.e. 8 = 10^8 ohms or 100,000,000 ohms).

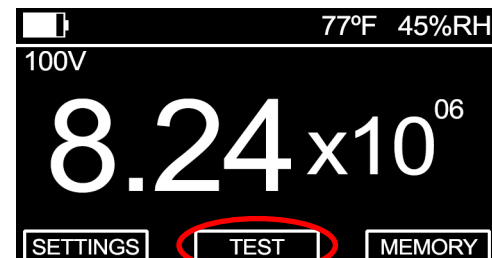
C. OLED Display: Displays the temperature, relative humidity, battery life, test voltage and resistance measurement.

D. Power Switch: Slide the switch to the left to power the meter OFF. Slide the switch to the right to power the meter ON.

E. Black Pushbuttons: Each black pushbutton corresponds to the prompts on the bottom-left and bottom-right of the display. These buttons are used to access the Settings and Memory Recall menus and scroll up and down between menu options.



F. Red Pushbutton: Corresponds to the prompts located in the bottom-center of the display. This button is used to perform tests and select menu options. Press and hold this button when in the Settings and Memory Recall menus to exit and return to the home screen.



G. Battery Compartment: Open this compartment to install the four AA alkaline batteries needed to power the meter. Replace the batteries once the battery icon on the display is empty.

Home / Test Results Screen

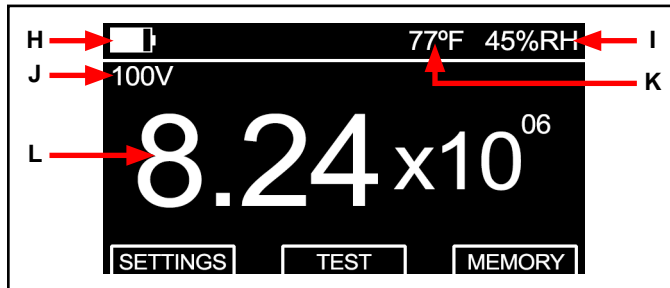


Figure 5. Home / Test Results screen

H. Battery Life Indicator: Displays the approximate life of the meter's 4 AA alkaline batteries.

I. Relative Humidity: Displays the relative humidity.

J. Test Voltage: Displays the test voltage used to complete the measurement.

K. Temperature: Displays the ambient temperature.

L. Resistance Measurement: Displays the resistance measurement in ohms (Ω).

Settings Menu

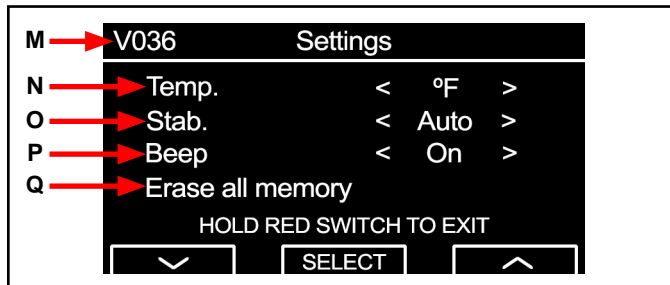


Figure 6. Settings menu

M. Firmware Revision: Displays the meter's firmware revision.

N. Temperature: Sets the unit of measurement for temperature to either Fahrenheit ($^{\circ}\text{F}$) or Celsius ($^{\circ}\text{C}$).

O. Stabilization Mode: Sets the meter's electrification period setting to either Auto and Fixed Stabilization.

Auto - Enables a 15-second electrification period when the measured resistance is 1×10^{10} ohms or greater to maintain test accuracy.

Fixed - Complies with ANSI/ESD S4.1 and enables a 15-second electrification period when the measured resistance is 1×10^6 ohms or greater.

P. Beep: Enables and disables the audible beep when the meter's pushbuttons are pressed.

Q. Erase all memory: Erases all stored measurement transactions saved in the meter's memory.

Memory Recall Menu

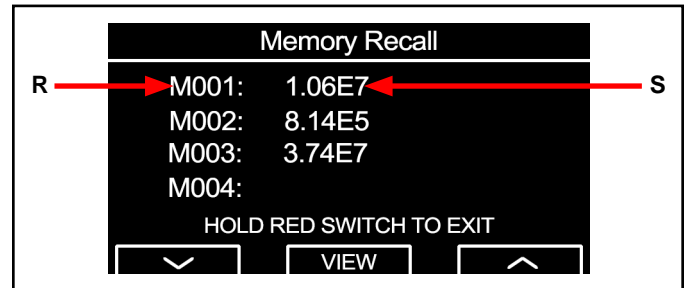


Figure 7. Settings menu

R. Memory Slot Number: Indicates the memory slot number.

S. Resistance Measurement: Indicates the resistance measurement value for the respective memory slot.

Operation

General Guidelines

Use both 5-pound electrodes for Resistance Point-to-Point (Rtt) measurements.

Use one 5-pound electrode, and connect the black test lead to ground for Resistance-to-Ground (Rtg) measurements.

Ensure that the item being measured is electrically isolated (placed on an insulative surface). The meter will measure the lowest resistance path.

Minimize crossing the test leads when possible.

When using 5-pound electrodes:

- Place them no closer than 2" from the edge of the surface being measured.
- Place them no closer than 3" to any groundable point.
- Place them about 10" apart from each other for Rtt measurements of a worksurface.
- Place them about 3' apart from each other for Rtt measurement of a floor.

Preferable electrode placements include:

- Most commonly used area of a surface
- Most worn area
- Center of surface
- Furthest area from a grounded point

If the surface to be measured has sections (i.e. floor tiles, garment panels), place the 5-pound electrodes on different sections for Rtt measurements.

Clean the material's surface for test lab measurements, but do not clean the surface for materials that are already installed. Only clean and re-test the installed material if failure occurs.