

Model 541 A Non-Contacting Electrostatic Voltmeter for EOS/ESD



The Trek Model 541A Electrostatic Voltmeter provides accurate non-contacting measurements of electrostatic surface voltage associated with EOS/ESD processes. The Model 541A series is ideally suited to monitor critical operations associated with semiconductor, LCD, electronic assembly and other processes where static charge accumulation may impact production yield or product quality.

The unit utilizes a miniature electrostatic field chopper probe which can be remotely located and easily positioned within process equipment to provide highly accurate, noncontacting, DC stable, spacing independent, voltage measurements in either ionized or non-ionized environments.

A twenty by four (20 x 4) alphanumeric LCD screen displays the present measured voltage, the positive peak voltage value, the negative peak voltage value, and additional menu information. Two specific voltage detection ranges are available. The Model 541A-1 has a voltage measurement range of 0 to ± 1 kV. The Model 541A-2 has a measurement range of 0 to ± 100 V. Both instruments have exceptional 1% accuracy and 0.1% resolution.

The Model 541A series includes independently programmable plus (+) and minus (-) voltage threshold/alarm limits to provide audible, visual, and external warning signals. A relay contact activates when alarm thresholds are met or exceeded. This relay signal can be connected to a process controlling device or other equipment to monitor a particular environment.

A voltage output monitor and a 4-20 mA current loop output provide additional signal interfacing to facility monitoring equipment. Either an USB or RS-232 serial port can provide computer based control and monitoring. The walking test adapter kit [CN 1K037] for the Model 541A allows analysis of charge levels accumulated on the human body per compliance with ANSI/ESD STM 97.2. and IEC Standard 61340-4-5.



Measurement and Power Solutions™

www.trekinc.com

- Chopper probe is DC stable with or without incident air ion flow
- Measurement Ranges: Model 541A-1 ± 1 kV DC or peak AC
Model 541A-2 ± 100 V DC or peak AC
- Microprocessor based
- LCD screen displays the present voltage, and holds the most positive and the most negative measured values
- Visual and audible alarms upon reaching preset voltage threshold levels
- Voltage output monitor for remote monitoring or control
- USB or RS-232 serial port
- 4-20 mA current output
- 20 x 4 alphanumeric LCD display screen
- Walking Test Adapter Kit Available

Model 541A Non-Contacting Electrostatic Voltmeter Specifications

Performance

Measurement Ranges

Model 541A-1

0 to ± 1 kV DC or peak AC.

Model 541A-2

0 to ± 100 V DC or peak AC.

Speed of Response (10% to 90%)

Model 541A-1

Less than 50 ms for a ± 1 kV step.

Model 541A-2

Less than 50 ms for a ± 100 V step.

Accuracy

1% of full scale.

Recommended Probe-to-Test-Surface Separation Resistance

2.5 mm ± 1 mm.

Features

Alphanumeric LCD Display

Twenty character by four line (20 x 4) LCD displays present voltage, positive peak, and negative peak voltages.

Reset

Resets the alarms (manual mode) and the Peak Hold display to zero.

Visual Alarms

LEDs on front panel light when alarm thresholds are reached.

Audible Alarms

(ON/OFF programmable)

A pulsating or continuous tone (selectable) is sounded when the measured voltage reaches the programmed (+) or (-) voltage limit. The (+) and (-) alarms have different tone rates for the pulsed tone selection.

Alarm Relay Output

Form C relay contact with barrier strip terminals. Contacts will change state when voltage thresholds are met or exceeded.

Ground Receptacle

Banana jack.

ZERO Control

Adjusted to produce zero volts when probe is coupled to a known zero source.

Alarm Output (Digital Alarm)

The alarm output is a logic level output indicating the alarm status of the Model 541A. A TTL low (0 to 0.8 V) signals an alarm condition. A TTL high

Features (cont.)

(2.5 to 5.0 V) indicates a normal condition.

Monitor Output

Model 541A-1

The voltage monitor output voltage is 1/100th of the measured voltage.

Model 541A-2

The voltage monitor output voltage is 1/10th of the measured voltage.

Output Noise

Less than 30 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital voltmeter).

Output Impedance

47 ohms.

Current Output

Provides a current of 4-20 mA that represents -1 kV to +1 kV (Model 541A-1) or -100 V to +100 V (Model 541A-2).

Serial port and USB port

Provides control of specific functions and acquires sensor data through Trek software and a PC computer by connecting into either a rear panel standard RS-232 serial port or an USB [Type B] port.

MENU $\uparrow\downarrow$ Buttons

Used for selecting and programming menu options. $\uparrow\downarrow$ buttons are used to set alarm threshold voltages, alarm conditions, and alarm reset type.

Power ON/OFF

Rear panel switch.

Probe

Miniature electrostatic field chopper probe. End viewing and side viewing probes are available.

Walking Test Adapter Kit [CN 1K037] (optional accessory)

This kit allows analysis of charge voltage levels accumulated on the human body per compliance with ANSI/ESD STM 97.2. and IEC Standard 61340-4-5.

Probes

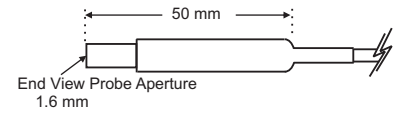
Probe Model 541PR-E (round body)

End-view aperture orientation. 1.6 mm (0.06") diameter aperture size.

Probes (cont.)

Dimensions

9.7 mm diameter x 50 mm L (0.38" dia. x 2" L, nominal).

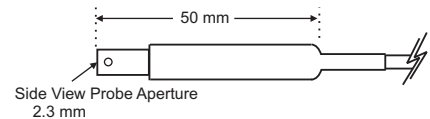


Probe Model 541PR-S (round body)

Side-view aperture orientation. 2.3 mm (0.09") diameter aperture size.

Dimensions

9.7 mm diameter. x 53 mm L (0.38" dia. x 2.1" L, nominal).

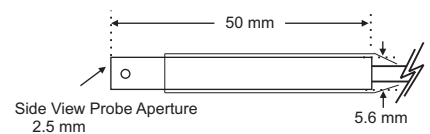


Probe Model 541P-S (square body)

Side-view aperture orientation. 2.5 mm (0.1") diameter aperture size.

Dimensions

5.6 mm square x 50 mm L (0.22" x 2" L, nominal).



Cable Length

3000 mm ± 75 mm (118"), nominal.

General

Unit Dimensions

152 mm W x 97 mm H x 204 mm D (6" W x 3.8" H x 8" D).

Unit Weight

0.77 kg (1.7 lb).

Power Requirement

15 V DC $\pm 20\%$, 800 mA, power bus or AC/DC adapter with a 2.1 mm DC plug.

Operating Conditions

Temperature

15 °C to 35 °C.

Relative Humidity

5% to 85%, noncondensing.

