

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



The Trek Model 541A Electrostatic Voltmeter (pictured at left with the Model 541PR-S probe) provides accurate non-contacting measurements of the electrostatic surface voltage associated with EOS/ESD processes. The instrument is configured with a miniature electrostatic field chopper probe that can be remotely located and easily positioned within process equipment to provide highly accurate, non-contacting, DC-stable, spacing-independent voltage measurements in either ionized or non-ionized environments. A 20x4 alphanumeric LCD screen displays the present measured voltage, the positive peak voltage, the negative peak voltage and additional menu information.

Key Specifications

- Measurement Range
Model 541A-1: ± 1 kV DC or peak AC
Model 541A-2: ± 100 V DC or peak AC
- Measurement Accuracy: Better than $\pm 1\%$ of full scale over a probe-to-surface separation of $2.5 \text{ mm} \pm 1 \text{ mm}$
- Alphanumeric LCD Display: 20 x 4 characters

Typical Applications Include

- Semiconductor
- LCD
- Electronic assembly
- ESD-sensitive processes

Features and Benefits

- Chopper probe is DC-stable with or without incident air ion flow
- Drift-free measurements
- LCD screen displays present voltage and holds the most positive and negative values
- Visual and audible alarms activate when the preset voltage threshold levels are reached
- Voltage output monitor for remote monitoring or control
- USB and RS-232 serial ports
- NIST-traceable Certificate of Calibration provided with each unit
- CE compliant
- Optional Walking Test Adapter kits available

Walking Test Adapter



Optional Walking Test Adapter kits for the Model 541A allow analysis of charge levels accumulated on the human body per compliance with ANSI/ESD STM97.2. and IEC Standard 61340-4-5. See page 2 for details.



Model 541A 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%) Less than 50 ms for a ± 1 kV step (541A-1)
Less than 50 ms for a ± 100 V step (541A-2)

Accuracy 1% of full scale

Resolution 0.1%

Monitor Output

Model 541A-1 1/100th of the measured voltage

Model 541A-2 1/10th of the measured voltage

Output Noise Less than 30 mV rms*

Output Impedance 47 Ω

Features

Alarms Activated if measured voltage exceeds preset threshold limits; positive/negative limits may be programmed separately

Visual Front-panel LEDs illuminate when thresholds are reached

Audible ON/OFF programmable pulsating or continuous tone. (+) and (-) alarms have different tone rates for the pulsating tone selection

Alarm Relay Output Form C relay contact with barrier strip terminals; changes state when voltage thresholds are met or exceeded

Alarm Digital Output TTL output with a TTL low (0 to 0.8 V) as the alarm "ON" status; TTL high (2.5 to 5.0 V) indicates a normal condition

Reset Button Resets alarms and peak hold to zero

Zero Control Adjustable to produce zero volts when probe coupled to a known zero voltage source

Alphanumeric LCD Display 20 character by four line (20x4) LCD displays the present voltage and holds the most positive and most negative values

Ground Receptacle Banana jack

Serial Port and USB Port Provides control of specific functions and acquires sensor data utilizing Trek software and a PC connected to the RS-232 serial port or the USB Type B port (connectors are on back panel)

Current Output Provides a current of 4 mA to 20 mA representing -1 kV to +1 kV (541A-1) and -100 V to +100 V (541A-2)

Features (cont.)

Menu $\uparrow \downarrow$ Buttons Select and program menu options - the $\uparrow \downarrow$ set the alarm threshold voltages, alarm conditions and alarm reset type

Mechanical

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

Weight 0.77 kg (1.7 lb.)

Operating Conditions

Temperature 15°C to 35°C (59°F to 95°F)

Relative Humidity 5% to 85% RH, non-condensing

Altitude To 2000 m (6561.68 ft.)

Electrical

Power 15 V DC $\pm 20\%$, 800 mA (minimum) adapter with a 2.1 mm DC plug.

Power ON/OFF Rear panel switch

Supplied Accessories

P/N 24005 Operator's Manual (with software CD)

P/N F5054R Universal AC Adapter

P/N N9056 6P/4C Plug

P/N BA108 Serial Cable

P/N N9044 Ground Cord

Optional Accessories

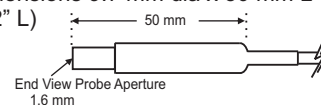
P/N 1K037 Walking Test Adapter - Round Body Probe

P/N 1K038 Walking Test Adapter - Square Body Probe

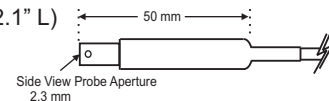
Probes

Probe Miniature electrostatic field chopper probe

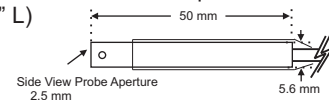
End-view orientation (round body) Model No: 541PR-E. Aperture 1.6 mm (0.06") diameter. Dimensions 9.7 mm dia x 50 mm L (0.38" dia. x 2" L)



Side-view orientation (round body) Model No: 541PR-S. Aperture 2.3 mm (0.09") diameter. Dimensions 9.7 mm dia x 53 mm L (0.38" dia x 2.1" L)



Side-view orientation (square body) Model 541P-S. Aperture 2.5 mm (0.1") diameter. Dimensions 5.6 mm sq x 50 mm L (0.22" sq x 2" L)



Probe Cable Length 3 meters (9.8 ft.) nominal

Probe-to-Surface Separation Distance 2.5 mm ± 1 mm (recommended)

*Measured using the true rms feature of the HP Model 34401A digital multimeter

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