

# 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:  $\pm 1$  kV DC or peak AC  
Model 541A-2:  $\pm 100$  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
- 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  $\pm 1$  kV DC or peak AC

*Model 541A-2* 0 to  $\pm 100$  V DC or peak AC

Speed of Response (10% to 90%) Less than 50 ms for a  $\pm 1$  kV step (541A-1)  
Less than 50 ms for a  $\pm 100$  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  $\Omega$

### 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

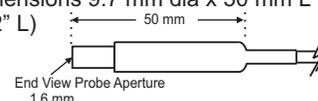
P/N 1K037 Walking Test Adapter - Round Body Probe

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

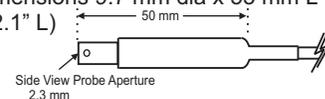
### Probes

**Probe** Miniature electrostatic field chopper probe

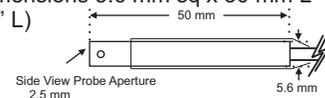
**End-view orientation (round body)** Model No: 541PR-E. Aperture 1.6 mm (0.06") diameter. Dimensions 9.7 mm dia x 50 mm L (0.38" dia. x 2" L)



**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  $\pm 1$  mm (recommended)

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

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