

TREK 541A

Electrostatic voltmeter for accurate non-contacting measurements of the electrostatic surface voltage associated with EOS/ESD processes.



The Trek® 541A electrostatic voltmeter 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.

PRODUCT HIGHLIGHTS

- Chopper probe is DC-stable with or without incident air ion flow
- Drift-free measurements
- LCD screen displays present voltage, the positive peak voltage, the negative peak voltage and additional menu information.
- Visual and audible alarms activate when the preset voltage threshold levels are reached
- Voltage output monitor for remote monitoring or control
- USB and RS232 serial ports
- NIST-traceable Certificate of Calibration provided with each unit
- Optional walking test adapter kits available

APPLICATIONS

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

AT A GLANCE

Measurement Range

Trek 541A-1 ±1 kVDC or peak AC

Trek 541A-2 ±100 VDC or peak AC

Measurement Accuracy

Better than $\pm 1\%$ of full scale over a probe-to-surface separation of 2.5 mm ± 1 mm

Alphanumeric LCD Display

20 x 4 characters

TREK ELECTROSTATIC VOLTMETER 541A

TECHNICAL DATA

| Performance Specifications | | |
|-------------------------------|------------------|-----------------------------------|
| Measurement Range | Trek 541A-1 | 0 to ±1 kVDC or peak AC |
| | Trek 541A-2 | 0 to ±100 VDC or peak AC |
| Speed of Response (10 to 90%) | Trek 541A-1 | Less than 50 ms for a ±1 kV step |
| | Trek 541A-2 | Less than 50 ms for a ±100 V step |
| Accuracy | 1% of full scale | |
| Resolution | 0.1% | |

| Monitor Output | |
|------------------|----------------------------------|
| Trek 541A-1 | 1/100th of the measured voltage |
| Trek 541A-2 | 1/10th of the measured voltage |
| Output Noise | Less than 30 mV rms ¹ |
| Output Impedance | 47 Ω |

| Mechanical Specifications | |
|---------------------------|------------------------------------|
| Dimensions (H x W x D) | 97 x 152 x 204 mm (3.8 x 6 x 8 in) |
| Weight | 0.77 kg (1.7 lb) |

| Electrical Specifications | |
|---------------------------|--|
| Power | 15 VDC ±20%, 800 mA (minimum) adapter with a 2.1 mm DC plug. |
| Power ON/OFF | Rear panel switch |

| Environmental Specifications | |
|------------------------------|----------------------------|
| Temperature | 15 to 35°C (59 to 95°F) |
| Relative Humidity | 5 to 85% RH, noncondensing |
| Altitude | To 2000 m (6561.68 ft.) |

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|--|--|---|
| 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 Advanced Energy software and a PC connected to the RS232 serial port or the USB Type B port (connectors are on back panel) | |
| Current Output | Provides a current of 4 mA to 20 mA | |
| Menu ↑↓ Buttons | Select and program menu options - the $\uparrow\downarrow$ set the alarm threshold voltages, alarm conditions and alarm reset type | |

 $^{^{\}mathbf{1}}$ Measured using the true rms feature of the HP Model 34401A digital multimeter



PROBES

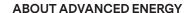
| Probe Specifications | | | |
|--------------------------------------|---|--|--|
| Probe | Miniature electrostatic field chopper probe | | |
| Probe Cable Length | 3 mn (9.8 ft) nominal | | |
| Probe-to-Surface Separation Distance | 2.5 mm ±1 mm (recommended) | | |
| End-View Orientation (Round Bo | ody) | | |
| Model | 541PR-E | 50 mm — | |
| Aperture | 1.6 mm (0.06 in) D | End View Probe Aperture | |
| Dimensions | 9.7 D x 50 mm (0.38 D x 2 in) | 1.6 mm | |
| Side-View Orientation (Round B | ody) | | |
| Model | 541PR-S | 50 mm —————————————————————————————————— | |
| Aperture | 2.3 mm (0.09 in) D | Side View Probe Aperture | |
| Dimensions | 9.7 D x 53 mm (0.38 D x 2.1 in) | 2.3 mm | |
| Side-View Orientation (Square E | Body) | | |
| Model | 541P-S | 50 mm | |
| Aperture | 2.5 mm (0.1 in) D | Side View Probe Aperture | |
| Dimensions | 5.6 D x 50 mm (0.22 D x 2 in) | 2.5 mm | |

REFERENCE NUMBERS

| Included Accessories | |
|----------------------|-----------------------------------|
| 24005 | Operator's Manual (with software) |
| F5054R | Universal AC Adapter |
| N9056 | 6P/4C Plug |
| BA108 | Serial Cable Serial Cable |
| N9044 | Ground Cord |

| Optional Accessories | | |
|----------------------|---|--|
| 1K037 | Walking Test Adapter, Round Body Probe | |
| 1K038 | Walking Test Adapter, Square Body Probe | |





Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. We design and manufacture highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

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