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 ±1% of full scale over a probe-to-surface separation of 2.5 mm ± 1mm
- Alphanumeric LCD Display: 20 x 4 characters

Typical Applications Include

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

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.

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

TREK, INC. • 190 Walnut Street • Lockport, NY 14094 • USA • 800-FOR TREK
716-438-7555 • 716-201-1804 (fax) • www.trekinc.com • sales@trekinc.com

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)

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

Features (cont.)

Menu ↑ ↓ Buttons	Select and program menu options - the ↑ ↓ 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 ±20%, 800 mA, power bus or AC/DC adapter with a 2.1 mm DC plug.
Power ON/OFF	Rear panel switch

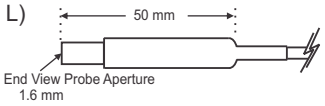
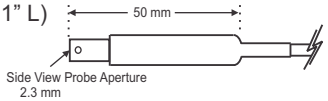
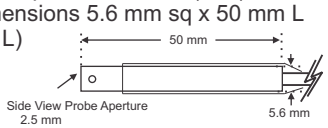
Supplied Accessories

PN: 24005 Operator Manual (with software CD), PN: N9056 6P/4C Plug, PN: BA108 Serial Cable, PN: N9044 Ground Cord

Optional Accessories

AC/DC Adapter	PN: F5054R
Walking Test Adapter - Round Body Probe	CN: 1K037
Walking Test Adapter - Square Body Probe	CN: 1K038

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)