ESD Measurement Instruments

Model 158A Charged-Plate Monitor

Our ESD measurement instruments deliver not only high accuracy but also high confidence. Trek charged-plate monitors (see photo) help with ionizer setup, calibration and auditing processes.

Trek hand-held electrostatic voltmeters and portable electrostatic voltmeters (see table) are easy-to-use and provide accurate surface voltage measurements throughout manufacturing processes, whether in semiconductor, hard disk drive, flat panel display or other highly sensitive environments.

Trek's ESD audit kit (see photo) includes an electrostatic field meter (with charger and charge plate) and surface resistance meter in a compact carrying case; it provides versatility and utility for electrostatic field measurements, air ionizer verification, testing of floor materials and systems, and resistance measurements.

Model 511/1501 ESD Audit Kit

Model 152-1 Surface Resistance Meter

Trek's surface resistance/resistivity meters (see photo) deliver precise surface resistance measurements on virtually any conductive, dissipative or insulative material. These instruments enable quick and accurate checks on dissipative floors, work surfaces, table mats, and other static-controlled materials to insure that static charge is safely dissipated to ground.

Applications Include:

- ♦Static charge monitoring
- ♦Material dissipation testing
- ♦Measurements for ESD control

Some of Trek's ESD Measurement Instruments

Model	Measurement Range (DC or Peak AC)	Measurement Accuracy (full scale)	Probe-to-Surface Separation Distance	Cable Length	Features/Applications
884	0 to ±20 kV	±5%	45 mm ±15 mm	1.8 meter (6 ft)	Charge accumulation in LCD manufacturing, static charge in Semiconductor manufacturing
523-1	0 to ±20 kV	±5%	45 mm ±15 mm	probe tip on unit	
542A-2	0 to ±20 kV	±5%	30 mm to 60 mm	3 meter (10 ft)	Static charge evaluation, Semiconductor, LCD, electronic assembly
542A-1	0 to ±10 kV	±5%	15 mm to 30 mm	3 meter (10 ft)	
520	0 to ±2 kV	±5%	15 mm ±10 mm	Probe tip on unit	Measurements in difficult to reach areas, battery or line operation, records temperature and humidity
876	0 to ±2 kV	±5%	15 mm ±10 mm	1.8 meter (6 ft)	
541A-1	0 to ±1 kV	±1%	2.5 mm ±1 mm	3 meter (10 ft)	Static charge evaluation, Semiconductor, LCD, electronic assembly
541A-2	0 to ±100 V	±1%	2.5 mm ±1 mm	3 meter (10 ft)	

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Measurement and Power Solutions™

www.trekinc.com

1443/JRB

TREK, INC.

High-Voltage Power Amplifiers ♦ Power Supplies ♦ Electrostatic Voltmeters ♦ ESD Instruments

TREK, INC. is a privately-held company (est. 1968) with technical and application expertise in electrostatics and high-voltage power amplification. Trek's products are used by Original Equipment Manufacturers (OEMs) to enhance operational precision of their equipment and by researchers to enable innovation around the world in electrostatics, materials, nanotechnology, piezoelectrics and plasmas.

TREK, INC. headquarters and manufacturing are now located in a 40,000 sq ft facility in Lockport, NY

Engineering and R&D are housed nearby in the Trek Technology Center

Trek designs and manufactures high-voltage amplifiers, piezo drivers, power supplies & generators and high performance electrostatic measurement instruments — including electrostatic sensors and detectors, electrostatic discharge (ESD) instruments, electrostatic voltmeters, charged plate monitors, and surface resistance/resistivity meters — to meet the high performance needs of the global marketplace.

A History of Technical Innovation:

- ♦First to design and offer solid state AB class amplifiers for ion beam steering in medium power ion implanters in the semiconductor industry
- ♦First to design and offer fully-controllable Electrostatic Chuck (ESC) power supplies
- ♦First to design and offer a Charged Plate system that allows any size of charge plate to be used, making it much more versatile in ionizer testing
- ♦First (and only) to design and utilize hybrid AC feedback technology which enables low cost measurement of electrostatic voltage on surfaces via incorporation of a versatile distance-insensitive probe

Now Under Development:

- ♦Technology for a 30kV Pulser with less than 10nS rise times
- ♦High current (20A) low voltage amplifiers for piezo driving
- ♦Advancements in Trek's innovative ultra-high impedance Infinitron® voltmeter technology for contacting or noncontacting measurement

Now Featuring
1 kV Pulser

-Fast rise time
-High peak current
-Adjustable pulse width

Voltage
0 to +1 kV

Max Source Current
5 A

Rise Time
< 10 ns

Repetition Rate (Freq)
1 Hz to 1 kHz

Pulse Width Range
20 µs to 200 µs

Contact sales@trekinc.com
or call +1-716-438-7555 for info

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High-Voltage Power Amplifiers & Power Supplies

Model 50/12 High-Voltage Amplifier

Trek developed the world's first all-solid-state, high-voltage (±20 kV), high speed, DC-stable amplifier in 1980. Since then, Trek has continued to design and build high-voltage amplifiers to serve the evolving needs of semiconductor equipment manufacturers and other OEMs with demanding requirements. Trek also provides high-voltage amplifiers to the research community for a variety of applications, such as polymer & ceramic poling, vibration damping, electrophoresis and plasma chemistry.

Trek's amplifiers, using 4-quadrant output drive, are specifically designed to drive reactive as well as resistive loads with high slew rates, wide bandwidth and excellent stability. Models are now available from ±50 V to ±60 kV DC or peak AC.

Applications Include:
- Plasma chemistry
- Material poling
- Ion beam steering
- AC or DC biasing
- Piezoelectrics

Model 2220 Piezo-Driver Amplifier

Model 20/20C-HS High-Speed High-Voltage Amplifier

Some of Trek's High-Voltage Amplifiers

Model	Output Voltage Range (DC or peak AC)	Output Current (DC or peak AC)	Slew Rate (greater than)	Large Signal Bandwidth (DC to greater than)
50/12	0 to ±50 kV	0 to ±12 mA	350 V/µs	1.4 kHz (2% distortion)
30/20A*	0 to ±30 kV	0 to ±20 mA	550 V/µs	2.5 kHz (2% distortion)
20/20C-HS	0 to ±20 kV	0 to ±20 mA DC, ±60 mA peak AC for 1 ms	800 V/µs	5.2 kHz (1% distortion)
PD07016	0 to ±10 kV	0 to ±60 mA DC, ±300 mA peak AC for 20 µs	1000 V/µs	7.5 kHz (2% distortion)
10/40A-HS	0 to ±10 kV	0 to ±40 mA DC, ±120 mA peak AC for 1 ms	900 V/µs	23 kHz (-3 dB)
10/10B-HS	0 to ±10 kV	0 to ±10 mA DC, ±40 mA peak AC for 1 ms	700 V/µs	19.5 kHz (-3 dB)
610E	0 to ±1 kV or 0 to ±10 kV	0 to ±200 µA or 0 to ±2000 µA	20 V/µs	1.2 kHz (-3 dB)
615-10	0 to 20 kV peak-to-peak AC 0 to ±10 kV DC bias	0 to ±10 mA DC 0 to ±35 mA peak AC	500 V/µs	7.5 kHz (2% distortion)
5/80	0 to ±5 kV	0 to ±80 mA	1000 V/µs	60 kHz (-3 dB)
609E-6	0 to ±4 kV	0 to ±20 mA	150 V/µs	13 kHz (-3 dB)
PZD2000A	0 to ±2 kV	0 to ±200 mA DC, ±400 mA peak AC for 2 ms	750 V/µs	60 kHz (3% distortion)
2220, 2210, 2205	0 to ±2 kV, 0 to ±1 kV. 0 to ±500 V	0 to ±20 mA peak AC, 0 to ±40 mA peak AC, 0 to ±80 mA peak AC	100 V/µs, 150 V/µs, 150 V/µs	7.5 kHz (-3 dB), 40 kHz (-3 dB), 75 kHz (-3 dB)
PZD700A-1 and -2**	0 to ±700 V (bipolar) 0 to +1.4 kV or 0 to -1.4 kV (unipolar)	0 to ±100 mA (bipolar) 0 to ±50 mA (uniipolar)	380 V/µs (bipolar) 370 V/µs (unipolar)	125 kHz (-3 dB) (bipolar) 120 kHz (-3 dB) (unipolar)
PZD350A-1 and -2**	0 to ±350 V (bipolar) 0 to +700 kV or 0 to -700 kV (unipolar)	0 to ±200 mA (bipolar) 0 to ±100 mA (uniipolar)	550V/µs (bipolar) 440 V/µs (unipolar)	250 kHz (-3 dB) (bipolar) 200 kHz (-3 dB) (unipolar)
2100HF	0 to ±150 V	0 to ±300 mA	2000 V/µs (typical)	2.6 MHz (-3dB)
645	0 to ±2 kV	0 to ±6.5 mA DC, 10 mA peak	-	-
646	0 to ±3 kV	0 to ±6.5 mA DC, 10 mA peak	-	-

*Unipolar models also available.
**Master/Slave model also available.

Electrostatic Voltmeters

Model 821HH Hand-Held Contacting Electrostatic Voltmeter

Model 341B Electrostatic Voltmeter

Trek non-contacting electrostatic voltmeter instruments are high performance devices that provide outstanding measurement speed and accuracy along with high surface resolution and no arc over. The voltmeter probes are designed to be less sensitive to dust particulates, enabling usage in diverse applications. Probe options include high temperature, high sensitivity, high resolution, transparent, miniature, and vacuum-friendly designs. Options also exist for probe aperture size, end/side view detection and body shape.

Trek's standard capabilities go well beyond the norm for others in this industry. What others call special, we call standard. Trek electrostatic voltmeters provide measurement ranges up to ±20 kV, accuracies to the millivolt level, and speed of response to 50 microseconds for a 1 kV step.

Applications Include:
- Surface voltage measurements of photoconductors or dielectric surfaces
- Charge monitoring in semiconductor production
- Measuring of electrostatic potentials on film, polymers, and paper

Some of Trek's Electrostatic Voltmeters

Model	Output Voltage Range (DC or peak AC)	Speed of Response (10-90%) (less than)	Voltage Monitor Output Accuracy (better than)	Probe Models (order separately unless otherwise noted)
341B	0 to ±20 kV	200 µs for a 1 kV step	±0. 1% of full scale	3450 Standard 3453/3455 High-Temperature, High-Humidity
P0865	0 to ±10 kV			
370	0 to ±3 kV	50 µs for a 1 kV step	±0.05% of full scale	3800 Miniature 3870 High-Temperature 7000 Standard
347	0 to ±3 kV	3 ms for a 1 kV step	±0.05% of full scale	6000B Standard/High Res 555P Miniature 6300 High-Temperature
368A	0 to ±2 kV	200 µs for a 1 kV step	±0. 1% of full scale	3800 Miniature 3870 High-Temperature
706B	0 to +1 kV or 0 to -1 kV (switch selectable)	DPM Sampling Rate: 3 readings/second	±0.5% of full scale	Side Viewing Probe (included)
323	0 to ±100 V	300 ms for a 100 V step	±0.05% of full scale	6000B Standard 555P Miniature 6300 High-Temperature
320C	0 to ±100 V	300 ms for a 100 V step	±0.05% of full scale	3250 High-Sensitivity
325	0 to ±40 V	3 ms for a 10 V step	±0.05% of full scale	PD1216P High-Sensitivity
800	0 to ±100 V	3.5 ms for a 100 V step	±0.1% of full scale	800P Contacting Noncontacting Probe (included)
820	0 to ±2 kV	500 µS for a 1 kV step	±0.1% of full scale	Model 820P Contacting Noncontacting Probe (included)
821HH	0 to ±2 kV	500 µS for a 1 kV step	±0.1% of full scale	Model 821P Contacting Noncontacting Probe (included)