

TREK 325

Highly sensitive versatile instrument for highly accurate, low noise, and non-contacting measurement of electrostatic voltages of 0 to ± 40 V.



The Trek® 325 electrostatic voltmeter is a versatile instrument used for performing noncontacting electrostatic voltage measurements in applications which include contact potential (surface work function) determination, materials evaluation and electret studies. The Trek 325 was specifically designed for high sensitivity applications to allow highly accurate, low noise, non-contacting measurement of electrostatic voltages of 0 to ± 40 V over a wide range of probe-to-surface distances.

Special features of the Trek 325 allow adjusting the performance of the unit to compensate for specific test conditions. A calibrated null voltage supply of 0 to ± 10 volts nulls measured surface contact potential when measuring voltages on test surfaces.

PRODUCT HIGHLIGHTS

- Response speed control adjusts the speed/noise trade-off of the AC response
- Drift/spacing null adjustment minimizes the variation in zero offset voltage as the probe-to-test surface spacing changes
- Dual range front panel 3.5 digit LED display resolves ± 10 mV
- Monitor the detected output voltage through a 1:1 voltage monitor output and/or a 10:1 voltage monitor output
- Patented low impedance probes assure measurement accuracy essentially independent of probe-to-test-surface spacing, humidity conditions, and contamination such as airborne dust, toner, ions, and chemicals
- Bench top operable or, with optional hardware, in a half 9½ in or standard 19 in rack
- NIST-traceable Certificate of Calibration provided with each unit

AT A GLANCE

Measurement Range

0 to ± 40 VDC or peak AC

Sensitivity

1 mV

Noise

Less than 1 mV rms, referenced to measured voltage

High Speed of Response

Less Than 3 ms for a 10 V step

Voltage Monitor Accuracy

Better than 0.05% of full scale

Null Voltage Source

0 to ± 10 V calibrated supply

Drift Spacing/Null Adjustment

Minimizes variations in voltage values as probe-to-test surface spacing changes

©2021 Advanced Energy Industries, Inc.

TECHNICAL DATA

Performance Specifications ¹			
Measurement Range	0 to ± 40 VDC or peak AC		
Sensitivity	1 mV		
Accuracy	Voltage Monitor Output	Better than $\pm 0.05\%$ of full scale	
	Voltage Display	Better than or equal to ± 2 counts, referred to the voltage monitor	
Speed of Response (10 to 90%)	At Fastest Speed Setting	Less than 3 ms for a 10 V step	
	At Slowest Speed Setting	Less than 5 ms for a 10 V step	
Noise	Less than 1 mV rms, referenced to measured voltage. (typical)		
Stability	Drift with Time	Less than 50 ppm/hour, noncumulative	
	Drift with Temperature	1:1 monitor output	Less than 50 ppm/ $^{\circ}$ C
		10:1 monitor output	Less than 100 ppm/ $^{\circ}$ C

Mechanical Specifications ¹	
Dimensions (H x W x D)	108 x 223 x 370 mm (4.25 x 8.75 x 14.5 in)
Weight	3.6 kg (8 lb)
Voltage Monitor Connector	BNC connector
Ground Receptacle	Banana jack
AC Line Cord Receptacle	Standard three-prong line cord with integral fuse holder

Features		
Null Voltage Source	A calibrated 10-turn dial representing a 0 to ± 10 volt supply with switch selectable polarity, is used to produce zero volts output when the probe is coupled to a known zero volt surface. It is also used to null contact potentials on measured surfaces relative to the probe's gold sensitive reference electrode.	
	Range	± 10 volts
	Accuracy	1%
	Resolution	10 mV
Drift/Spacing Null Adjustment	This back panel adjustment minimizes the variation in monitored voltage values as the probe-to-test surface spacing changes.	
Voltage Display	3½ digit LED display.	
	Range	Switch selectable for ± 10 V or ± 40 V full scale
	Resolution	10 V Range: 0.01 V
		100 V Range: 0.1 V
	Zero Offset	± 2 counts, referred to the voltage monitor
Sampling Rate	3 readings per second	
Voltage Monitor Output (1:1)	A buffered 0 to ± 40 V output providing a replica of the measured voltage	
	Scale Factor	1:1 of the measured voltage
	Output Noise	Less than 1 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter)
	Output Current	5 mA
	Output Impedance	100 Ω , nominal
Voltage Monitor Output	A buffered 0 to ± 4 V output providing a replica of the measured voltage.	
	Scale Factors	10:1 of the measured voltage or 20:1 of the measured voltage (switch selectable)
	Output Current	5 mA.
	Output Impedance	0.1 Ω , nominal.

¹ All specifications are with a Trek PD1216P probe with a probe-to-surface separation of 0.4 mm.

TECHNICAL DATA

Probe

During operation, the metallic surfaces of the probe are driven to voltage levels equal to the measured surface voltage value, therefore, the probe holding fixture must be of an insulating material of 7.11 approximately 10 to 10 ohms/square. Phenolic or other dissipative type material is recommended to avoid any fixture charge retention.

Probe-to-Surface Separation	0.2 mm to 2 mm (recommended)	
Trek PD1216P Sensor Probe	Aperture Orientation	10:1 of the measured voltage or 20:1 of the measured voltage (switch selectable)
	Aperture Size	5 mA.
	Probe Body Type	0.1 Ω , nominal.
	Dimensions (D x L)	10 x 56 mm (0.4 x 2 in).
Probe Cable Length	2743 \pm 127 mm (9 ft \pm 5 in).	

REFERENCE NUMBERS

Trek 325 Electrostatic Voltmeter

325-L	Trek 325-L (90 to 127 VAC)
325-H	Trek 325-H (180 to 250 VAC)

Probes

PD1216P	Trek PD1216P High-Sensitivity Probe
---------	-------------------------------------