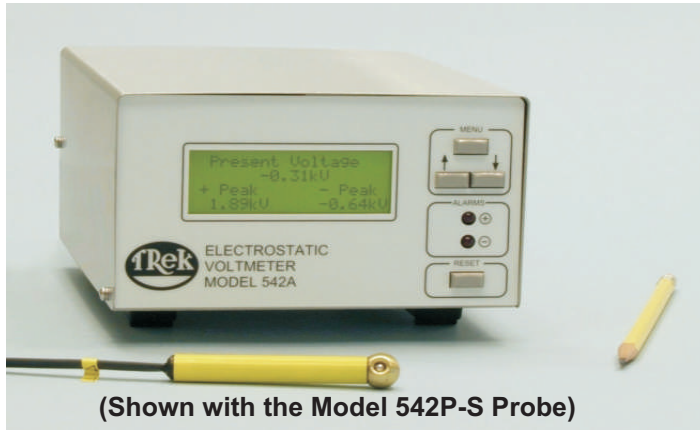


Model 542A Non-Contacting Electrostatic Voltmeter for EOS/ESD



(Shown with the Model 542P-S Probe)

The Trek Model 542A Electrostatic Voltmeter provides accurate non-contacting measurements of electrostatic surface voltage associated with EOS/ESD processes. The Model 542A series is ideally suited to monitor critical operations associated with semiconductor, LCD, electronic assembly and other processes where static charge accumulation may impact production yield or product quality.

A 20x4 alphanumeric LCD screen displays the present measured voltage, the positive peak voltage value, the negative peak voltage value and additional menu information. The Model 542A includes independently programmable plus and minus (+, -) voltage threshold/alarm limits. Audible and visible alarms indicate the detection of surface voltages that meet or exceed the programmed limits.

The Model 542A-1 has a measurement range of 0 to ± 10 kV and Model 542A-2 has a range of 0 to ± 20 kV. Both models feature exceptional 5% reading accuracy, $\pm 2\%$ of full scale, over the probe to surface separation distance of 15 to 30 mm for the Model 542A-1 and 30 to 60 mm for the Model 542A-2.

The 542A series utilizes a DC stable electrostatic field chopper probe that can be remotely located and easily positioned within process equipment to provide drift-free, highly accurate, non-contacting, spacing independent voltage measurements in either ionized or non-ionized environments. A side-viewing probe and a probe with a 45 degree sensor surface angle are available.

A relay contact output activates upon reaching the preset alarm voltage setting. A voltage output monitor and a 4-20 mA current loop output provide additional signal interfacing to facilitate equipment monitoring. A USB port or RS-232 serial port provide computer based control and monitoring.

- Chopper probe is DC stable with or without incident air ion flow
- Drift-Free Measurements
- Measurement Ranges:
Model 542A-1 ± 10 kV DC or peak AC
Model 542A-2 ± 20 kV DC or peak AC
- LCD screen displays the present voltage, and holds the most positive and the most negative measured values
- Visual and audible alarms upon reaching preset voltage threshold levels
- Analog voltage monitor output
- USB and RS-232 serial port
- 4-20 mA current output
- 20 x 4 alphanumeric LCD display screen
- CE compliant
- Walking Test Adapter Kit Available



Measurement and Power Solutions™

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Model 542A Electrostatic Voltmeter Specifications

NOTE: This instrument is designed to make electrostatic voltage measurements only! For safety, this instrument should never be used to perform measurements of "hard" voltage sources or voltage sources that can deliver currents high enough to cause harmful shocks or personal injury.

Performance

Measurement Ranges

Model 542A-1

0 to ± 10 kV DC or peak AC.

Model 542A-2

0 to ± 20 kV DC or peak AC.

Speed of Response (10% to 90%)

Less than 50 ms for a ± 1 kV step.

Accuracy

Model 542A-1

Better than $\pm 5\%$ of the reading, over a probe-to-surface separation of 15 mm to 30 mm.

Model 542A-2

Better than $\pm 5\%$ of the reading, over a probe-to-surface separation of 30 mm to 60 mm.

Drift with Time

Less than $\pm 1\%$ of full scale, non-cumulative.

Probes*

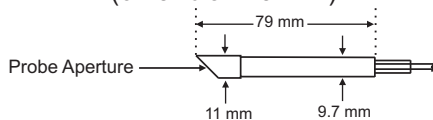
The probes are chopper stabilized for drift-free operation.

45° Orientation (Model 542P-45D)

Aperture size of 3.8 mm (0.15") diameter.

Dimensions

11 mm dia. x 79 mm L
(0.43" dia. x 3.1" L).

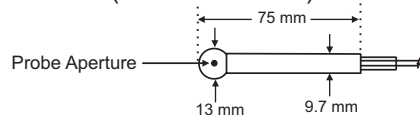


Side Orientation (Model 542P-S)

Aperture size: 4 mm (0.156") dia.

Dimensions

13 mm dia. x 75 mm L
(0.51" dia. x 3" L).



Probe Cable Length

5 meters (16 ft), nominal.

Recommended Probe-to-Surface Separation Distance

Model 542A-1: 15 mm to 30 mm.

Model 542A-2: 30 mm to 60 mm.

Walking Test Adapter

A Walking Test Adapter kit is available (CN 1K040).

Features

Alphanumeric LCD Display

Twenty character by four line (20x4) LCD displays present voltage and holds the most positive and the most negative measured values.

Alarms

Various alarms (listed below) are activated when the measured voltage exceeds the adjustable threshold limits. Individual threshold limits for positive and negative voltages are independently programmable.

Visual Alarms

LEDs on front panel are illuminated when programmed thresholds are reached.

Audible Alarms

A programmable pulsating or continuous tone. The (+) and (-) alarms have different tone rates for the pulsed tone selection.

Alarm Relay Output

A form C relay contact rated at 175 V, maximum, at 5 watts.

Alarm Digital Output

A TTL output with a TTL low as the alarm "ON" status.

Monitor Output

Model 542A-1

1/1000th of the measured voltage.

Model 542A-2

1/2000th of the measured voltage.

Output Noise

Less than 30 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital voltmeter).

Output Impedance

47 ohms.

RESET Push Button

Resets the alarms (manual mode) and the Peak Hold display to zero.

ZERO Control

Adjusted to produce zero volts when the probe is coupled to a known zero voltage source.

MENU $\uparrow\downarrow$ Buttons

Used for selecting and programming menu options, the $\uparrow\downarrow$ buttons set

Features (con't.)

alarm threshold voltages, alarm conditions, and alarm reset type.

Current Output

Provides a current of 4-20 mA representing -10 kV to +10 kV (542-1) or -20 kV to +20 kV (542-2).

Serial Port and USB Port

Provides control of specific functions and acquires sensor data through Trek software and a PC computer by connecting to either the RS-232 serial port or the USB Type B port (each with a back panel connector).

Ground Receptacle

Banana jack.

Power ON/OFF

Rear panel switch.

General

Unit Dimensions

152 mm W x 97 mm H x 204 mm D
(6" W x 3.8" H x 8" D).

Unit Weight

0.77 kg (1.7 lb)..

Power

15 V DC $\pm 20\%$, 800 mA, power bus or AC/DC adapter with a 2.1 mm DC plug. Positive polarity connected to the center contact.

Operating Conditions

Temperature / Relative Humidity

15 to 35 °C / 5 to 85% RH

Accessories

Accessories Supplied

Operator's Manual, 6P/4C plug (N9056), serial cable (BA108), software CD-ROM (45833), and ground cord (N9044).

Accessories Optionally Available

For 115 / 230 V, use the Trek AC/DC Adapter #L5133R (with ground connection). For all other line voltage ranges, contact the factory.

* Vacuum application probes are also available

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