

# Model 320C

## High-Sensitivity , DC Stable Electrostatic Voltmeter



The Trek Model 320C Electrostatic Voltmeter is a versatile instrument which is used for a variety of electrostatic applications including contact potential measurements, materials evaluation, and electret studies. The Model 320C makes highly accurate, noncontacting measurement of electrostatic potentials of 1 mV to 100 V over a wide range of probe-to-surface distances. The Model 320C is specifically designed for high sensitivity applications.

The Model 320C has adjustments to compensate for many sensitive testing conditions. A calibrated Null Voltage supply of  $\pm 10$  volts nulls contact potentials when measuring voltages on dissimilar materials. The Null Voltage source may be used to null different work function voltages of the test surface or to function as a zero suppression voltage source.

A response Speed Control adjusts the speed/noise tradeoff of the Model 320C AC response. A self locking Drift/Spacing Null Adjustment minimizes the variation in monitored voltage values as the probe to test surface spacing changes.

The front panel has an easy to read  $3\frac{1}{2}$  digit LED display. The detected output voltage can be monitored through a 1:1 voltage monitor output and a switch selectable scale of 10:1 or 20:1 voltage monitor output.

The Trek patented low impedance probe assures measurement accuracy which is essentially independent of probe-to-test-surface spacing while eliminating the external environmental effects of high humidity and contamination, such as airborne dust, toner, ions and chemicals, on measurement accuracy.

- **Measurement Range:**  
0 to  $\pm 100$  V DC or peak AC
- **Sensitivity:** 1 mV
- **Speed of Response:**  
Less than 300 ms for a 100 V step
- **Measurement Accuracy:**  
Better than 0.05% of full scale
- **Null Voltage Source:**  
10 volt nulling supply for contact potential measurements
- **Response Speed Control:**  
AC response adjusted for speed/noise
- **Drift Spacing/Null Adjustment:**  
Minimizes variations in voltage values as probe to test surface spacing changes
- **Available Monitor Outputs:**  
1:1 of Voltage Monitor Output 10:1 or 20:1 (switch selectable)
- **CE compliant**



Measurement and Power Solutions™

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# Model 320C Specifications

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

## Performance

### Measurement Range

0 to  $\pm 100$  V DC 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  $\pm 2$  counts, referred to the voltage monitor.

### Speed of Response (10% to 90%)

Less than 300 ms for a 100 V step.

### Stability

#### Drift with Time

Less than 50 ppm/hour, noncumulative.

#### Drift with Temperature

Less than 50 ppm/ $^{\circ}$ C (1:1 monitor output).  
Less than 100 ppm/ $^{\circ}$ C (10:1/20:1 monitor output).

## Features

### Null Voltage Source

A calibrated 10-turn dial representing a 10 volt supply, with switch selectable polarity, used to produce zero volts output when the probe is coupled to a known zero volt surface. Also used to null contact potentials on dissimilar surfaces.

#### Range

$\pm 10$  volts

#### Accuracy

1%

#### Resolution

20 mV.

### Probe-to-Surface Separation

1 mm (recommended).

## Features (cont.)

### Response Speed Control

A front panel potentiometer that adjusts the speed/noise tradeoff of the Model 320C AC response.

### Voltage Display

$3\frac{1}{2}$  digit LED display.

#### Range

Switch selectable for  $\pm 10$  V or  $\pm 100$  V full scale.

#### Resolution

##### 10 V Range

0.01 V.

##### 100 V Range

0.1 V.

#### Zero Offset

$\pm 1$  count, referred to the voltage monitor.

#### Sampling Rate

3 readings per second.

### Drift/Spacing Null Adjustment

This back panel adjustment minimizes the variation in monitored voltage values as the probe to test surface spacing changes.

### Voltage Monitor Output (1:1 ratio)

A buffered 0 to  $\pm 100$  V output providing a replica of the measured voltage.

#### Scale Factor

1:1 of the measured voltage.

#### Output Noise

Less than 5 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).

#### Output Current

5 mA.

#### Output Impedance

100  $\Omega$ , nominal.

## Features (cont.)

### Voltage Monitor Output

A buffered 0 to  $\pm 10$  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  $\Omega$ , nominal.

## General

### Dimensions

108 mm H x 223 mm W x 370 mm D (4.25" H x 8.75" W x 14.5" D).

### 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.

### Line Supply

Factory set for one of two voltage ranges: 90 to 127 V AC or 180 to 250 V AC, at 48 to 63 Hz (specify when ordering).

### Operating Conditions

#### Temperature

0  $^{\circ}$ C to 40  $^{\circ}$ C.

#### Relative Humidity

To 90%, noncondensing.

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All specifications are subject to change.  
1122/DEC

## Model 320C Ordering Information

### Model 320C Electrostatic Voltmeter

Item	Part No.
Model 320C-L (90 to 127 V AC) .....	320C-L
Model 320C-H (180 to 250 V AC) .....	320C-H

### Probe

Model 3250 High-Sensitivity Probe .....	17014
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### Trek Certification

TREK, INC. certifies that each Model 320C is tested and calibrated to specifications using measurement equipment traceable to the National Institute of Standards and Technology or traceable to consensus standards. A Certificate of Calibration accompanies each instrument when it is shipped from the factory.



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