

# Model 430

## High-Speed DC-Stable Electrostatic Voltmeter



The Trek Model 430 Electrostatic Voltmeter represents the next generation of DC-stable noncontacting, precision surface voltage measuring instruments which incorporates the exclusive Trek vibrating electrode probe sensor.

Excellent step response characteristic eliminates measurement jitter, maintains signal integrity and provides a consistent flat and stable measurement with low noise characteristics.

Trek's patented probe design significantly improves noise and drift performance, both in the presence of contaminating particulates and under conditions of high humidity and wide temperature ranges.

A rear panel USB Connector allows data transfer to a computer with a sampling rate of either 1 ms or 10  $\mu$ s between data points (stream data or block data transfer protocols). PC software records and graphs the unit's output.

A precision voltage monitor provides a low-voltage replica of the measured electrostatic voltage for external monitoring purposes, or for use as a feedback signal in a closed-loop system.

A front panel potentiometer adjusts for zero allowing the capability to provide up to  $\pm 10$  volts zero level correction.

The Model 430 is designed for bench top operation.

**High Speed of Response:**  
Less than 50  $\mu$ s for a  
1 kV step

**Measurement Range:**  
0 to  $\pm 2$  kV DC or peak AC

**Measurement Accuracy:**  
Better than 0.05% of  
full scale

**Precision voltage monitor  
output**

**Data acquisition with an  
USB port interface**

**Zero Potentiometer  
adjusts for a zero volt  
level correction**

**CE compliant**

[www.trekinc.com](http://www.trekinc.com)



# Model 430 Specifications

All specifications are with a 430P-E probe at a probe-to-surface separation of 1 mm unless otherwise specified.

## Performance

### Measurement Range

0 to  $\pm 2$  kV DC or peak AC.

### Measurement Accuracy

#### At the Voltage Monitor

Better than  $\pm 0.05\%$  of full scale.

#### At the Voltage Display

Better than  $\pm 0.1\%$  of full scale  $\pm 1$  count, referred to the voltage monitor. Note: The measurement accuracy degrades to the larger of  $\pm 1.2\%$  or 36 V in the presence of line transients or RF fields up to 3 V/m.

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

Less than 50  $\mu$ s for a 1 kV step.

### Stability

#### Drift with Time

Less than 300 mV/hour, noncumulative.

#### Drift with Temperature

Less than 200 mV/ $^{\circ}$ C.

## Features

### Zero Control

A front panel potentiometer provides up to  $\pm 10$  volts zero level correction when the probe is coupled to a known zero volt surface.

### Voltage Display

3  $\frac{1}{2}$  character, 7-segment LED display.

#### Range

0 to  $\pm 2000$  V.

#### Resolution

1 V.

#### Zero Offset

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

#### Sampling Rate

2.5 readings per second.

## Features (cont.)

### Voltage Monitor Output

A buffered output providing a low-voltage replica of the measured voltage.

#### Scale Factor

1 V/200 V.

#### Offset Voltage

Less than 5 mV.

#### Output Noise

Less than 10 mV rms (measured with the true rms feature of the Hewlett Packard Model 34401A digital multimeter).

#### Output Current Limit

$\pm 10$  mA.

#### Output Impedance

Less than 0.1  $\Omega$ .

### USB Connector

Allows data transfer to a computer with a sampling rate of either 1 ms or 10  $\mu$ s between data points (stream data or block data transfer protocols). PC software records and graphs the unit's output.

### Digital Enable

A TTL compatible input to enable or disable the measurement. A TTL high will disable the measurement, while a TTL low will enable the measurement.

## Probe

### Probe-to-Surface Separation

2 mm  $\pm 1$  mm.

### Model 430P-E Probe

**Body Shape** Square.

**Aperture Size** 2.35 mm diameter.

**Aperture Location** End.

**Dimensions** 6.4 mm sq. x 76 mm L.

### Probe Cable Length

3048 mm  $\pm 76$  mm (10 ft.  $\pm 3$  in.)

## General

### Dimensions

102 mm H x 203 mm W x 356 mm D (4" H x 8" W x 14" D).

### Weight

1.6 kg (3.5 lb).

### Digital Enable

BNC connector.

### Voltage Monitor Output Connector

BNC connector.

### Ground Receptacle

Binding post.

### Power Requirements

Available for all nominal line voltages. The Universal wall cube provides the following input power to the ESVM:

#### Voltage

24 V DC,  $\pm 5\%$  @ 1 Amp.

#### Output Connector

2.1 mm DC power plug.

### Operating Conditions

#### Temperature

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

#### Relative Humidity

To 85%, noncondensing.

#### Altitude

To 2000 meters

### Certification and Compliance

TREK, INC. certifies that each Model 430 is tested and calibrated to specifications using measurement equipment traceable to the National Institute of Standards and Technology. RoHS compliant (EU). CE compliant.

### Low-Voltage Safety Compliance

EN 61010-1

### Overvoltage Category

CAT II: Local-level mains, appliances, portable equipment.

### Pollution Category

Degree 1: Operate in environments where no pollution or only dry, nonconductive pollution occurs.

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0907/JNC All specifications are subject to change.

## Model 430 Accessories (supplied)

Operator's Manual..... 23428

Universal Power Cube (90 V to 264 V AC  $\pm 10\%$ )..... L5190

## Probe

Model 430P-E (end-viewing)..... 430P-E



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ISO 9001:2000  
FM 56910