



Electrostatic Voltage Sensor

The Trek Model 533C Electrostatic Voltage Sensor provides accurate, noncontacting measurements of electrostatic surface voltage for ESD-sensitive processes in either ionized or nonionized environments.

The Model 533C utilizes a new measurement technique that overcomes the disadvantage of the typical electrostatic fieldmeter by providing surface voltage measurements which are essentially independent of the sensor probe-to-measured-surface spacing. Over a spacing range of 30 mm to 50 mm, the 533C provides better than a 5% voltage measurement accuracy, while the typical fieldmeter provides a voltage measurement error in excess of 50%. The 533C provides a measurement system which can be calibrated using standardized calibration equipment.

The 533C employs an efficient probe design that provides the flexibility required to make measurements in many locations which are impossible to reach using the large, bulky sensing surfaces of the typical fieldmeter. The probe design also allows for higher spatial resolution capability by allowing the measurement of small surface areas.

A voltage monitor output provides a 1/2000th buffered low-voltage replica of the value of the measured voltage while a 4 mA to 20 mA current loop output, representing -20 kV to +20 kV, can be used for connection to a data acquisition system.

- Measurement Range:
0 to ± 20 kV DC or
peak AC
- No need to maintain a
fixed spacing
- Accurately measures
surface voltage over a
wide range of
probe spacings
- Inspect small spots for
voltage accumulation
- Measure voltage
accumulation in difficult-
to-reach locations
- Chopper stabilized probe
for drift-free operation in
ionized environments
- Voltage Output Monitor
- Current Loop Output
- Low cost



Trek Model 533C Electrostatic Voltage Sensor

All specifications are with a probe-to-surface separation of 40 mm.

Performance

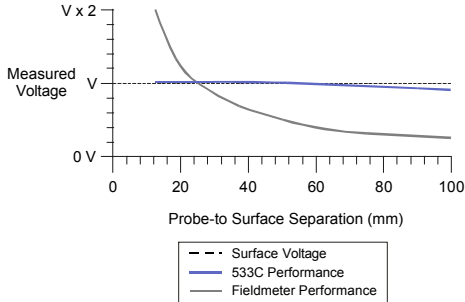
Electrostatic Voltage Measurement Range (see note)

0 to ± 20 kV DC or peak AC.

Accuracy

Better than $\pm 5\%$ of full scale.

Model 533C Compared to Typical Fieldmeter
Measured Voltage vs. Probe-to-Surface Separation



Speed of Response (10% to 90%)

Less than 50 ms for an input step change of 20 kV.

Stability

Drift with Time

Less than 150 ppm/hr, noncumulative.

Drift with Temperature

Less than 50 ppm/ $^{\circ}$ C.

Mechanical

Dimensions

56 mm H x 150 mm W x 254 mm D
(2.2" H x 5.9" W x 10" D).

Weight

1 kg (2.2 lb).

Probe

Probe-to-Surface Separation (recommended)

40 mm \pm 10 mm.

Dimensions

8.7 mm dia. x 70 mm (nominal) L
(0.34" dia. x 2.75" L).

Cable Length

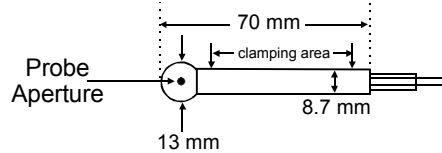
1000 mm (39"), nominal

Aperture Orientation

Side.

Aperture Size

4 mm (0.156") diameter.



Features

Voltage Monitor Output

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

Ratio

1/2000th of the value of the measured voltage.

Offset Voltage

Less than 20 mV.

Output Noise

Less than 50 mV p-p.

Output Current

5 mA, maximum.

Output Impedance

Less than 0.1 Ω .

Features (cont.)

Current Monitor Output

A current output representing the measured voltage.

Output Range

+4 mA to +20 mA representing -20 kV to +20 kV.

Offset Current

Less than ± 25 μ A.

Output Noise

Less than 25 μ A rms.

Recommended Termination Resistance

750 Ω , maximum.

General

Power Requirements

+24 V DC $\pm 10\%$.

Operating Conditions

Temperature

5 $^{\circ}$ C to 35 $^{\circ}$ C.

Relative Humidity

To 80%, noncondensing.

Power/Monitor Output Connector

Euro-style terminal block.

TREK, INC. certifies that each Model 533C is tested and calibrated to specifications using measurement equipment traceable to the National Institute of Standards and Technology.

Note: The Trek Model 533C is designed to make electrostatic voltage measurements only! Do not use the Model 533C to make measurements of "hard" voltage sources or voltage sources which can deliver currents high enough to cause harmful shocks or personal injury.

0105/JNC

Ordering Information

Model 533C

Item	Part No.
Electrostatic Voltage Sensor	533C

Accessories

Item	Part No.
Customer Connection Drawing	Q11131CC

Copyright © 2001 TREK, INC.
All specifications are subject to change.

