Trek Model 156A

Charged Plate Monitor

The Model 156A Charged-Plate Monitor is an important tool for evaluating the performance of air ionizers used to neutralize static charges.

The Model 156A tests the efficiency of an ionizer's ion production by timing how long it takes air ions produced to discharge a floating plate that has been pre-charged to either a positive or negative value. The Model 156A also tests the balance between positive and negative air ions by measuring the offset voltage generated on a floating plate due to an imbalance of positive and negative air ions impinging on the plate from the ionizer.

Typically, as an ionizer ages, the rates of positive and negative air ion production decline. Consequently, the time required for the ionizer to neutralize static charges increases, and the balance of positive and negative air ions changes.

The neutralization (decay) time may become too long for the ionizer to fully neutralize charges that are generated at a work location, or the ionizer may begin to charge objects that were initially uncharged.

Key Specifications

- Large Signal Bandwidth: DC to 10 Hz
- Decay Mode Thresholds:
  - Start/Stop Voltages: Programmable from 1 to ±1000 V in 1 V increments
  - Start/Stop Accuracy: Within ±1 V of programmed voltage

Typical Applications Include

- ESD monitoring of sensitive manufacturing processes such as semiconductor, disk drive and LCD
- Testing of all types of ionizers, including room ionization systems, AC and DC blowers, nuclear ionizers, gun type ionizers, and pulsed DC ionizers
- High temperature applications
- ESD measurement of de-ionized water
- Dissipative testing applications

Features and Benefits

- Customizable measurement capacitance provides assurance that ESD process needs are met in manufacturing and that there is compliance to ANSI/ESD-STM3.1 and IEC 61340-5-1.
- Extremely low offset and drift ensures high accuracy, making it ideal for applications requiring critical ion balance such as GMR and TMR manufacturing areas
- Compact and lightweight, for easy portability within a facility
- NIST-traceable Certificate of Calibration provided with each unit
- CE compliant

TREK, INC. • 190 Walnut Street • Lockport, NY 14094 • USA • 800-FOR TREK
716-438-7555 • 585-201-1804 (fax) • www.trekinc.com • sales@trekinc.com

Model 156A Specifications

Performance

Monitored Voltage Range	0 to ±1100 V DC or peak AC
Large Signal Bandwidth	DC to 10 Hz (measured at 2000 V p-p)
Small Signal Bandwidth (-3dB)	DC to 1 kHz (measured at 20 V p-p)
Zero Stability (referred to plate voltage)	
Drift with Time (no incident ion flow)	Less than 6 V/minute
Drift with Temperature	Less than 10 mV/°C, noncumulative
Decay Mode Thresholds	
Start Voltage	Programmable from 1 to ±1000 V in 1 V increments
Stop Voltage	Programmable from 0 to ±999 V in 1 V increments
Start/Stop Accuracy	Within ±1 V of programmed voltage
Discharge Time Resolution	0.1 seconds, from 0.1 to 999.9 seconds; 1 second, from 1000 to 9999 seconds. (The display will indicate "- - - -" when the decay time exceeds 9999 seconds.)
Plate Self-Discharge Rate	Less than 12 V/minute

Voltage Monitor

Output	BNC provides low voltage replica of plate
Scale Factor	1/200th of the plate voltage
DC Accuracy	Better than 0.1% of full scale
Offset Voltage	Less than ±10 mV
Output Noise	Less than 10 mV rms*
Output Impedance	Less than 0.1Ω

Features

Mode Select	A three-position toggle switch selects the +Decay, -Decay, or Float mode of operation. This switch is also used in combination with the Test/Reset Control switch to program the START and STOP voltages.
Test/Reset Control	A momentary toggle switch used in conjunction with the Mode Select switch to program the START and STOP voltages.
+Decay and -Decay Modes	Sets the plate voltage to a value greater than the programmed start voltage and resets the decay timer to zero.
Float Mode	Sets the plate voltage to 0 V ±2 V.

Features (cont.)

Plate Voltage Digital Panel Meter	3.5 digit red LED display.
Range	0 to ±1100 V.
Resolution	1 volt.
Accuracy	Better than 0.1% of full scale ±1 count.
Decay Time Digital Panel Meter	4-digit red LED display.
Range	0 to 9999 seconds

Mechanical

Dimensions	83 mm H x 318 mm W x 280 mm D (3.25" H x 12.5" W x 11" D)
Weight	2 kg (4.4 lb.)
Connections:	
Voltage Monitor	BNC Connector
Ground Receptacle	Banana Jack
Cable 156A to Plate	Coaxial (3 m length, 4.95 mm diameter)

Operating Conditions

Temperature	5°C to 35°C (41°F to 95°F)
Relative Humidity	To 80%, non-condensing
Altitude	To 2000 m (6561.68 ft.)

Electrical

Battery Eliminator	
Output Connector	2.1 mm DC power plug
Output Current	1 A
Battery Operation	Rechargeable battery, supplied
Recharge Time	Less than 3 hours to full charge
Recharge Indicator	LCD screen battery status indicator
Operating time	8 hours from a full charge

Supplied Accessories

Operator's Manual	PN: 23126
Ground Cord	PN: N9044

Optional Accessories

Universal AC Adapter	PN: F5054R
Carrying Case	PN: 43433
Ion Collecting Plate Tripod	PN: DK232

Ion Collecting Plates

Capacitance: 20 pF ±2 pF
Please contact Trek for custom plate options

150 mm x 150 mm (6" x 6" sq)	PN: 17397
25 mm x 25 mm (1" x 1" sq)	PN: 17375

*Measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter