

# 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  $\pm 1000$  V in 1 V increments
  - Start/Stop Accuracy: Within  $\pm 1$  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
- $\text{CE}$  compliant



TREK, INC. • 190 Walnut Street • Lockport, NY 14094 • USA • 800-FOR TREK  
716-438-7555 • 585-201-1804 (fax) • [www.trekind.com](http://www.trekind.com) • [sales@trekind.com](mailto:sales@trekind.com)

## Model 156A Specifications

### Performance

|   |  |
|---|--|
| Monitored Voltage Range                       | 0 to $\pm 1100$ 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)    |  |
| <i>Drift with Time (no incident ion flow)</i> | Less than 6 V/minute   |
| <i>Drift with Temperature</i>                 | Less than 10 mV/°C, noncumulative  |
| Decay Mode Thresholds                         |  |
| <i>Start Voltage</i>                          | Programmable from 1 to $\pm 1000$ V in 1 V increments  |
| <i>Stop Voltage</i>                           | Programmable from 0 to $\pm 999$ V in 1 V increments   |
| <i>Start/Stop Accuracy</i>                    | Within $\pm 1$ V of programmed voltage   |
| <i>Discharge Time Resolution</i>              | 0.1 seconds, from 0.1 to 999.9 seconds;<br>1 second, from 1000 to 9999 seconds.<br>(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 |
| <i>Scale Factor</i>     | 1/200th of the plate voltage              |
| <i>DC Accuracy</i>      | Better than 0.1% of full scale            |
| <i>Offset Voltage</i>   | Less than $\pm 10$ mV                     |
| <i>Output Noise</i>     | Less than 10 mV rms*                      |
| <i>Output Impedance</i> | Less than 0.1 $\Omega$                    |

### 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 $\pm 2$ V.  |

### Features (cont.)

|                                   |   |
|-----------------------------------|---|
| Plate Voltage Digital Panel Meter | 3.5 digit red LED display.                    |
| Range                             | 0 to $\pm 1100$ V.                            |
| Resolution                        | 1 volt.                                       |
| Accuracy                          | Better than 0.1% of full scale $\pm 1$ 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<br>(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        |                                     |
| <i>Output Connector</i>   | 2.1 mm DC power plug                |
| <i>Output Current</i>     | 1 A                                 |
| Battery Operation         | Rechargeable battery, supplied      |
| <i>Recharge Time</i>      | Less than 3 hours to full charge    |
| <i>Recharge Indicator</i> | LCD screen battery status indicator |
| <i>Operating time</i>     | 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  $\pm 2$  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

Copyright © 2014 TREK, INC. All specifications are subject to change. 1432/JRB



www.trekinc.com  
Measurement and Power Solutions™

