

# Model PD04002A

## Charged Plate Monitor Controller



**The Trek Model PD04002A is a versatile microprocessor based charged plate monitor which is ideally suited to monitor the performance of air ionizers that are used in critical wide temperature operations associated with semiconductor, LCD, electronic assembly, and other processes where static charge accumulations pose a threat to production yields and/or product quality.**

The Model PD04002A utilizes a new technique which requires less than 0.1 picoampere of ion field current to achieve full accuracy and stability. Other product designs require up to 2000 times more ion current to be drawn from the ion field to achieve stability.

The ultra sensitivity of the Model PD04002A makes this product the ideal choice in air ionizer monitor applications where small area ion collecting sensors are used to meet the requirement for high accuracy ion balance measurement to levels of less than one volt. The voltage of the charged plate is initialized prior to discharge time testing. Balance tests, positive discharge tests, and negative discharge tests can be initialized from a remote location through digital command signals.

The charged plate voltage can be remotely monitored through a rear panel connection. The voltage output at the Output "HI" terminal in reference to the Output "LO" terminal (ground) is a proportional buffered representation of the charged plate voltage at a scale factor of 1 to 22 (other scale factors are available). The Model PD04002A wide temperature range charged plate monitor functions with standard, custom, or high temperature charged-plates. The monitor and high-temperature charged-plate can be used on a table top or securely mounted by fasteners to the bottom of the unit.

**Utilizes Standard, Custom and Wide-Temperature Range Charged Plates**

**Hi-Temperature Charged Plate (Model PD04002AP)**

**25 mm x 25 mm (1" x 1")**

**Cable Length**

**3 meters**

**Capacitance**

**20 pF  $\pm$ 5 pF**

**Operating Range**

**-60° to 160° C**

**Relative Humidity**

**To 85%, noncondensing**

**Voltage Monitor Output for Remote Monitoring**

**Exceptional Accuracy and Stability**

**Compact Design**

**CE compliant**

**CONTROL WITHOUT COMPROMISE**



# Model PD04002A Charged Plate Monitor

## Performance

### Charged Plate Voltage Range

0 to  $\pm 55$  V DC or peak AC, nominal.

### Charged Plate Voltage Measurement Accuracy

0.2% of full scale.

### Large Signal Bandwidth (-3 dB)

DC to greater than 200 Hz.

### Small Signal Bandwidth (-3 dB)

DC to 2.5 kHz.

### Charged Plate Self-Discharge Rate (no incident ion flow)

Less than 2 V per minute at 55 V for relative humidity up to 85%.

### Charged Plate Capacitance

20 pF  $\pm$  4 pF. (The capacitance is independent of charged plate connecting cable length.)

## Features

### Voltage Monitor Output V

0 to +5 V DC represents a charged plate voltage of -55 V to +55 V (other scale factors are available).

When the charged plate is at -55 volts, the voltage at the Voltage Monitor Output V HI is 0 V. When the charged plate is at 0 volts, the voltage at the voltage monitor is +2.5 volts. When the charged plate is at +55 volts, the voltage at the voltage monitor is +5 volts.

### Accuracy

0.2% of full scale.

## Features (cont.)

### Digital Command Terminals

**Plate (O)** discharges the floating plate to zero volts.

**Plate (+)** precharges the floating plate to +55 V.

**Plate (-)** precharges the floating plate to -55V.

Positive discharge tests, Negative discharge tests, and Balance tests can be initialized from a remote location through these digital command signals. The voltage of the charged plate is initialized to +55 V or -55 V for discharge time testing or zero for balance testing.

*All the above digital command inputs are at a 10 V DC High Level. A minimum of 6 mA of current sink capability is required to pull the digital command inputs to ground (0 V).*

### High-Temperature Charged Plate (Trek Model PD04002AP)

25 mm x 25 mm (1" x 1").

#### Cable Length

3 meters.

#### Capacitance

20 pF  $\pm$  5 pF.

#### Operating Range

-60° to 160° C.

#### Relative Humidity

To 85%, noncondensing.

### Mounting

#### Model PD04002A Monitor

Four (4) M4 mounting screws can be used to secure the monitor assembly from the bottom.

#### Charged Plate

One (1) M4 mounting screw can be used to secure the charged-plate monitor assembly from the bottom.



### User Connections

Connection block and M4 ground lug.

## General

### Dimensions

122 mm W x 43 mm H x 153 mm D (4.8" W x 1.7" H x 6" D).

### Weight

0.3 kg (0.6 lb).

### Power

The Model PD04002A operates from a +24 V  $\pm$ 10% supply @ 0.21 amps.

### Connection Block

Phoenix Contact Connector.

Connections include:

- +24 V DC power input (+),
- +24 V DC return (-),
- Voltage Monitor (Hi),
- Voltage Monitor (Lo),
- Digital Reset (plate 0),
- Digital Reset (plate +), and
- Digital Reset (plate-)

### Charged Plate Assembly Input Connector

BNC connector.

### Unit Operating Conditions

#### Temperature

5 °C to 35 °C.

#### Relative Humidity

To 85%, noncondensing.

## Certification

TREK, INC. certifies that each Model PD04002A Charged Plate Monitor is tested and calibrated to specifications using measurement equipment traceable to the National Institute of Standards and Technology or traceable to consensus standards. CE compliant.

**Caution:** These instruments are designed to make electrostatic voltage measurements only. Do not use this instrument to make measurements of "hard" voltage sources or voltage sources which can deliver currents high enough to cause harmful shocks or personal injury.

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