

# DECAY ACCESSORY SET

PGB-745

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User Manual



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### PROSTAT® PGB-745 DECAY ACCESSORY SET

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## I. Introduction

The PGB-745 Decay Accessories Set is designed to provide indication of charge movement time across or through a material. It is intended for use with PFM-711A Field Meter, CPM-720A Charge Plate Monitor, PCS-730 Charging Source and PDT-740B Static Decay Timer. It is compact and relatively easy for the intermediate and advanced ESD practitioner for measuring charge decay on most materials.

## II. Description & General Function

The PGB-745 Decay Accessories Set consists of two stainless steel electrodes and two high resistance test leads. One lead and electrode is used in conjunction with the CPM-720 Charge Plate for charging purposes, while the second electrode and lead would be employed to provide a path to ground from a material.

## III. Preparation for Use

The following items are generally used to make decay measurements across or through materials:

1. PFM-711A Field Meter
2. CPM-720A Charge Plate Monitor
3. PCS-730 Charging Source
4. PDT-740B Static Decay Timer
5. Analogue Timer cable for connection between PFM-711A Field Meter and PDT-740B Decay Timer
6. PGB-745 Decay Accessories Set of two steel electrodes and two high resistance test leads
7. Grounding connections, wrist strap and insulated or steel test beds, depending on measurement objective.

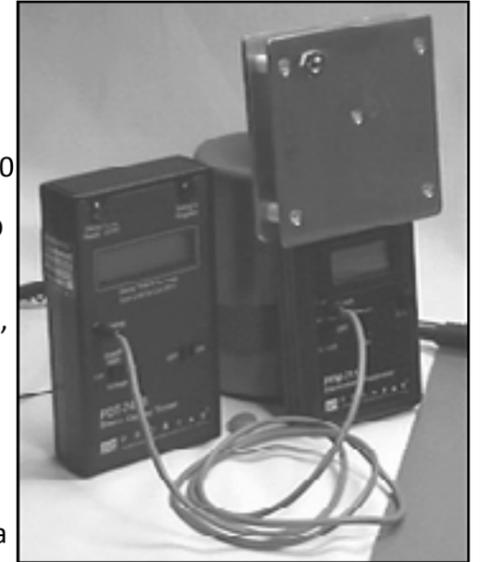


## IV. Typical Setup

Prepare for decay measurements by taking the following steps:

1. Mount the CPM-720 Charge Plate Monitor to the PFM-711A Field Meter. Be sure to slide the lower plate of the CPM-720 into the lower groove of the Field Meter.
2. Ground the PFM-711A Field Meter using the 10 mm grounding snap on the back of the unit. This can be accomplished by holding the unit in your hand while wearing a wrist strap. Another method is to use a PROSTAT modified wrist strap assembly and PRS-801 five-pound electrode with the wrist strap mounted on the electrode as a mounting assembly, as shown.
3. Connect the special gray analogue output cable to the PFM-711A Field Meter, and the opposite end to the analogue input of the PDT-740B Static Decay Timer. This cable "tells" the CPM-720A's plate voltage to the Static Decay Timer, which in turn controls its functions, as follows:

- a. When the CPM-720A's plate voltage is greater than  $\pm 1,000$  volts, the Green, Ready LED is illuminated and the Decay Timer is reset to time the impending function.
  - b. When the CPM-720A's plate voltage falls below  $\pm 1,000$  volts, the Decay Timer Red LED is illuminated; the timer is started, and it displays elapsed time in its LCD display.
  - c. When plate voltage drops below the Cut Off Set Point, the timer stops.
4. Connect a high resistance lead to the CPM-720A, and the opposite end to one of the Static Decay Electrodes.



- a. When the CPM-720A plate is "charged" with a voltage, it shares its voltage equally through the high resistance lead to the Static Decay Electrode. Consequently, the Electrode must not be in contact with any material or object during the charging process.
- b. When the Electrode makes contact with a material, its charge is dissipated to the material under test. Its actual voltage is monitored by the CPM-720A plate and PFM-711A Field Meter.
- c. When the electrode voltage drops to the Cut Off set point, the timer stops. Thus, that is the time required to dissipate an equivalent of  $\pm 1,000$  volts from the Electrode, through the material to ground.

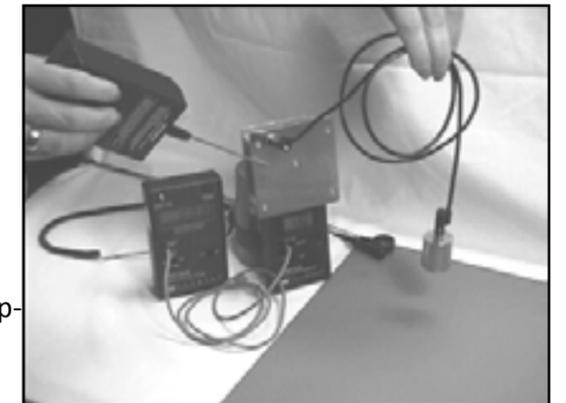
Assuming we wished to measure the time required for a  $\pm 1,000$  volt charge to dissipate through a work-surface, one would perform the test setup as shown below,

### IMPORTANT NOTE

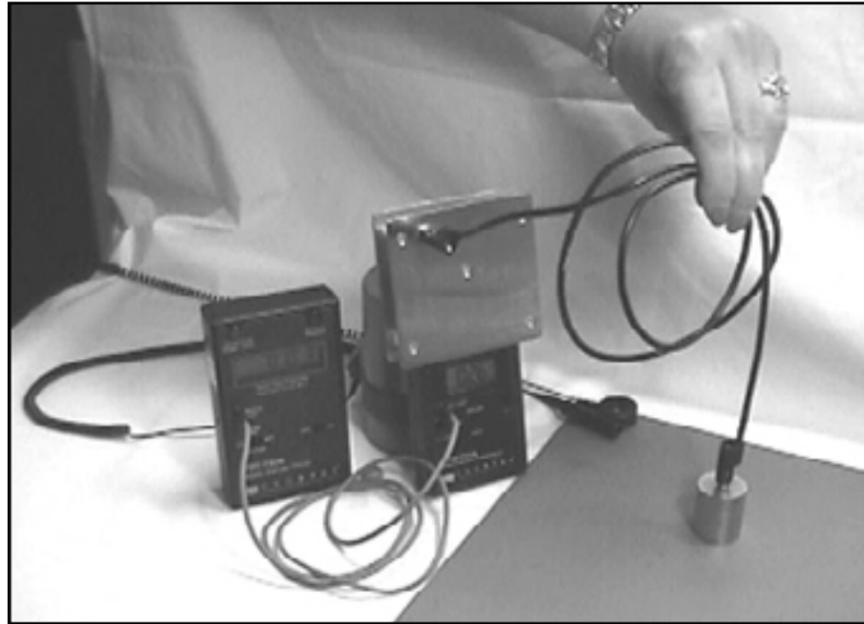
The PFM-711A must be properly grounded for accuracy, and the PCS-730 Charging Source must grounded in order to function properly and provide full charging voltage.

Once the test setup is complete:

1. With the PFM-711A Field Meter and electrode properly grounded, carefully adjust the Field Meter's display to zero (00.0) using its manual adjustment knob
2. Lift the Decay Electrode at least one inch or more above the worksurface. Be sure not to contact the Electrode or its connection with the high resistance lead.



3. Charge the CPM-720A Charge Plate with the grounded PCS-730 Charging Source. Select either positive (+) or negative (-) charging voltage.
4. Note the amount of charge on the CPM-720A plate by observing the PFM-711A Field Meter LCD display.
5. Once voltage exceeds  $\pm 1,000$  volts, the Green Ready LED will illuminate on the PDT-740B Decay Timer, indicating it is ready to begin the decay timing test.
6. Lower the charged Decay Electrode to the surface being tested, as shown below.



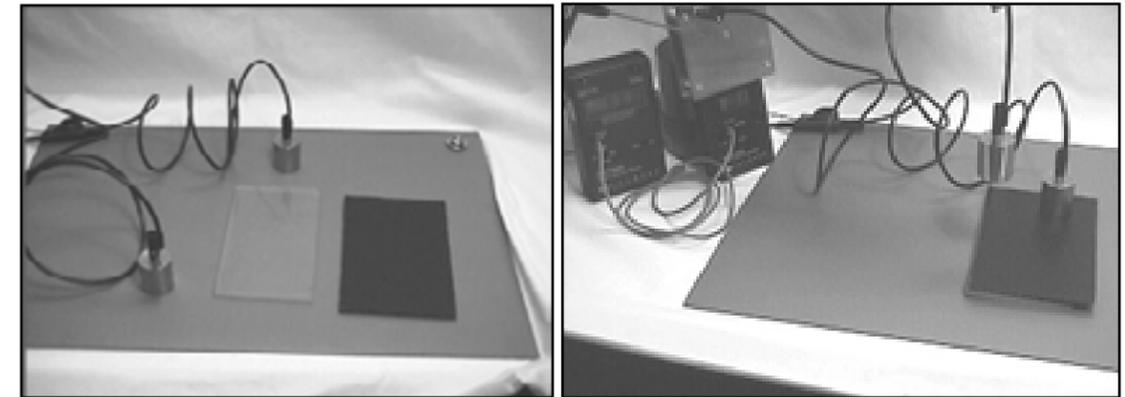
7. As the Electrode begins to dissipate its charge to the worksurface, plate voltage falls below 1,000 volts, the PDT-740B Timer's Red LED illuminates and its clock starts.
8. Once the Electrode and Plate voltage reach the Cut Off Set Point, the timer stops, displaying the total decay time from  $\pm 1,000$  volts to the set point.

Other decay tests are illustrated below:

#### V. Decay Across a Surface to Ground

Setup for this procedure requires:

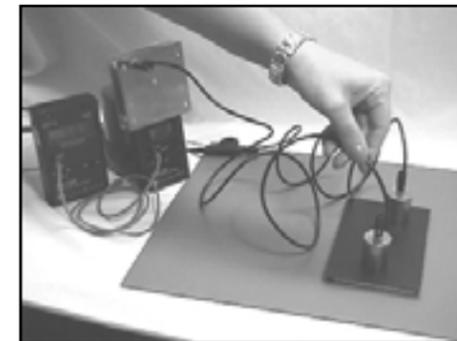
1. An insulated test bed
2. One Electrode connected to a defined ground
3. The other Electrode connected to the CPM-720A Charge Plate
4. The material to be tested.



To complete the setup and prepare to test:

1. Place the material under test on the insulated test bed.
2. Place the grounded Electrode at one end of the specimen.
3. Raise the charging Electrode a minimum of one inch above the test specimen.
4. Charge the CPM-720A until the Green Ready LED illuminates on the PDT-740B Static Decay Timer.

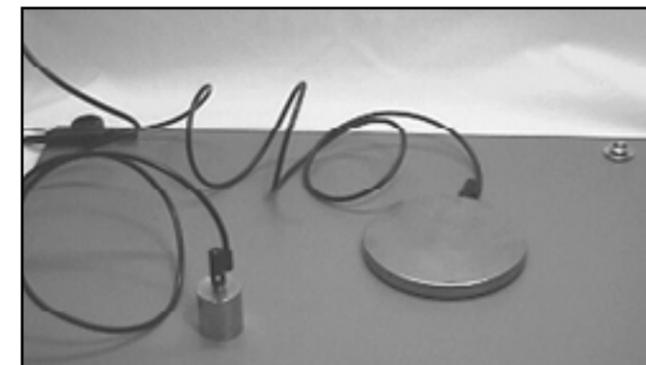
Once the system is fully "charged" to greater than  $\pm 1,000$  volts:



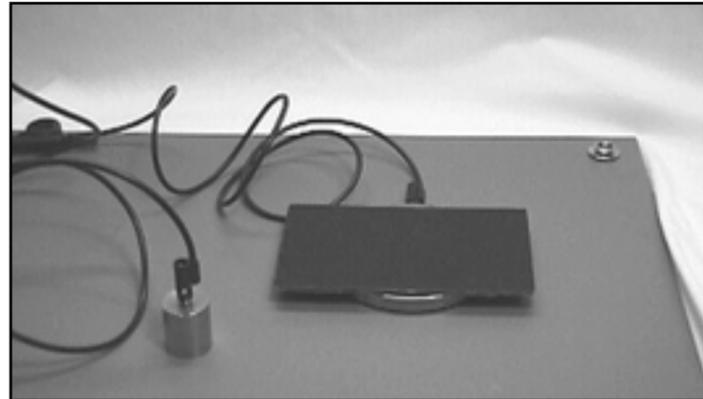
1. Lower the Electrode to the material under test. Try to position it approximately 3-inches from the grounded Electrode.
2. The Red Decay Timer LED will illuminate once plate voltage falls below 1,000 volts.
3. Observe the PFM-711A Field Meter display as plate voltage dissipates across the material.
4. Once the plate voltage falls below the Cut Off Set Point, the timer will stop.

#### VI. Measuring Charge Movement Through a Material

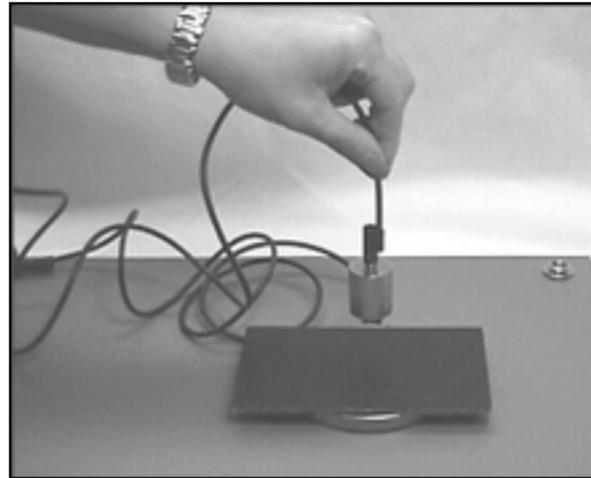
For this test, connect ground to a steel test bed instead of using the second Decay Electrode.



Place the material to be tested on the steel test bed.



As before, charge the CPM-720A Plate and lower the Electrode to the center of the test specimen. The recorded Decay Time is the time required for the charge to dissipate through, across and around the specimen to the metal plate.



#### VII. A Few Suggestions

Always ground the instruments when in use.



Periodically clean the CPM-720A's white Teflon™ insulators with a solution of laboratory grade isopropyl alcohol and dry thoroughly to prevent charge "leakage" from the upper plate to the lower ground plate.

## NOTES

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