

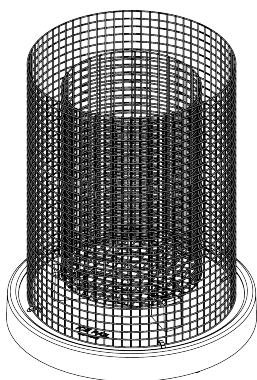
Faraday Ice Pail

ES-9042A

Introduction

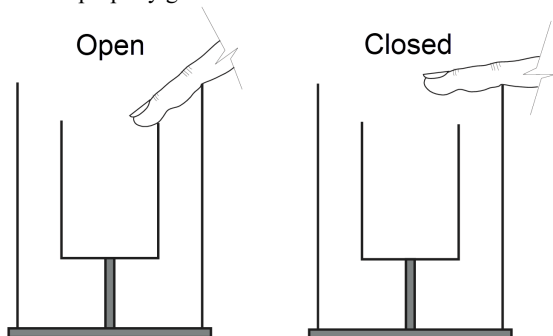
The Faraday Ice Pail can be used to sample a charge distribution. It operates on the principle that a charge placed inside a conducting surface will induce an equal charge on the outside of the surface. For example, if a charged ball were hung inside a coffee can, the charge on the outside of the can would be equal to the charge of the ball. This charge can be measured using the Basic Electrometer (ES-9078A) or the Wireless Charge Sensor (PS-3240).

The Faraday Ice Pail is a wire mesh cylinder with a wire mesh bottom. It is mounted on three insulating rods along the outer edge of the cylinder and surrounded by a wire mesh shield. The shield provides complete visibility of the experiment and also helps eliminate the problem of stray charges and AC fields.



Grounding the Ice Pail

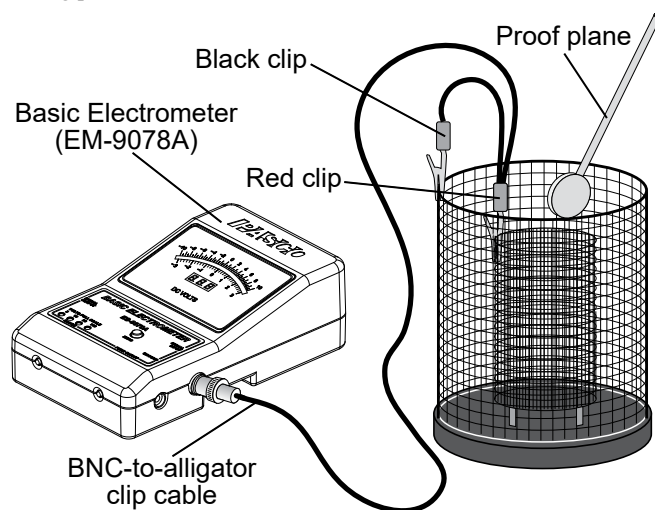
To prevent stray charges from producing erroneous results, the Faraday Ice Pail should be temporarily grounded prior to starting the experiment. To ground the apparatus, start by touching a single finger to the inner pail and the outer shield at the same time. This will connect the inner pail to the grounded outer shield, thereby grounding both cylinders. Once this is done, remove your finger from the inner pail while still in contact with the outer shield, *then* release contact with the outer shield. Do *not* let go of the outer shield while still in contact with the inner pail, as this will not properly ground the Ice Pail.



NOTE: To minimize error, make sure the person performing the grounding procedure is grounded during the entire experiment.

Measuring charges

To measure the charge of an object using the ice pail, start by connecting the Basic Electrometer (ES-9078A) or Wireless Charge Sensor (PS-3240) to the apparatus. Connect the red clip of the BNC-to-alligator clip cable to the inner pail, then connect the black clip of the cable to the outer shield to ground it, as shown below. A charged object, such as one of the planes from the Charge Producers and Proof Plane (ES-9057A), should then be lowered into the inner pail *without touching its walls or bottom*. The electrometer or sensor will then read the potential between the ice pail and the ground. Objects with more charge will produce a greater potential, allowing you to measure relative charges by varying the charges in the ice pail and observing the resulting potential.



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Limited warranty

For a description of the product warranty, see the Warranty and Returns page at www.pasco.com/legal.

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