

Electrostatic Solutions Technical Brief No. 7

Detecting and measuring electrostatic fields

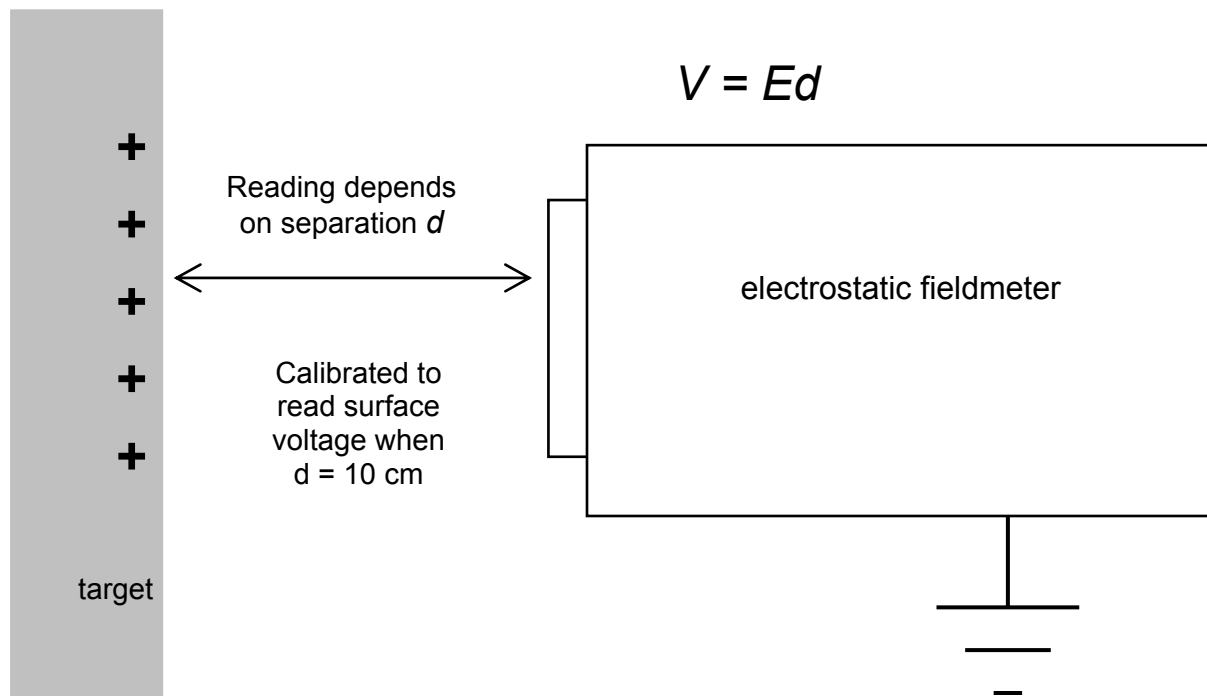


Using a fieldmeter to detect and measure the surface voltage of charged polystyrene foam

Electrostatic fields and voltages

Measurements of electrostatic fields and voltages are an important way of checking that all static measures are operating correctly, and of detecting any unforeseen static sources.

Many electrostatic voltmeters are actually field meters, and calibrated to read correctly at a certain distance from a large flat target surface. They have wide field of view. The voltage reading is reduced for small objects, and can be influenced by nearby charged surfaces or fields.



The apparent voltage reading increases if the meter is brought closer to the surface. A correction can be made if the distance is known, but it is normally most convenient to make readings with the fieldmeter/voltmeter at the calibrated distance.

The instrument must be grounded correctly when measurements are made. If held in the hand and not grounded, any reading will be influenced by your body voltage as well as the object being measured.

Some types of low cost instrument suffer from drift. It is important to zero these instruments, with the sensitive aperture shielded by a grounded surface, before measurements are made.

Experiment: Measurement of electric fields and voltages

Equipment:

- JCI140 electrostatic voltmeter
- Various objects and materials

Procedure:

- Charge various objects by rubbing with cloths, paper or other materials provided
- Ground the JCI140 and switch it on to position 1 (± 2 kV) or 2 (± 20 kV)
- Measure the surface voltages of the objects with the instrument held at the calibrated distance (10 cm) from the target

Note that the reading varies with the position of the voltmeter.

Equipment:

- JCI140 electrostatic voltmeter
- Various objects and materials placed around the bench

Procedure:

- Charge various objects by rubbing with cloths, paper or other materials provided
- Ground the JCI140 and switch it on to position 1 (± 2 kV)
- Use the instrument hand held to detect the fields from charged objects and “home in” on the object.
- If necessary the meter may be set to position 2 to measure fields from surface voltages over 2 kV

The information given here is believed to be correct but no liability is accepted for any consequences arising from the application of the information.

Electrostatic Solutions Ltd

<http://www.electrostatics.net>

Telephone: +44 (0)23 8090 5600

Email: jeremys@electrostatics.net

13 Redhill Crescent, Bassett, Southampton, Hampshire, SO16 7BQ, U.K.