



Application Instructions Concentric Ring Probe



Figure 1. 99120 Concentric Ring Probe with BNC Adapter (not included with kit)

- Probe dimensions:
65mm diameter x 105mm high
- Weight: 2.5kg +/- 0.1kg
- Supplied with test certificate
- Supplied in yellow carry case,
310mm x 235mm x 80mm

Physical and Electrical Specifications

- Dimensions: 67 mm x 120 mm
- Outer probe diameter: 63 mm
- Inner probe diameter: 30 mm
- Mass: 2.5 kg
- Insulation between probes:
higher than 200 Giga-ohm @ 1000 Volt test voltage
- Probe resistance – carbon pads:
less than 200 ohm at low test voltage
- Correction factor: 10

Resistivity and Resistance:

The resistance expresses the ability of a material to conduct electricity. It is therefore related to current and voltage. With a pure resistive material, $R=U/I$ where R is the resistance (expressed in Ohm Ω), U the voltage (expressed in Volt) and I the current (expressed in Amp). The resistance of a material is the result of the material's dimensions combined with its resistivity. For example, the resistance of a wire is $R = \rho l / s$, where l is the length of the wire, s the section of the wire and ρ the resistivity of the material used for making the wire.

A concentric ring can be used for measuring surface resistivity (BS EN 61340-5).

Description

The concentric ring probe is designed to measure the surface resistivity of materials to be used in an EPA to EN 61340-5-1. It will provide more accurate measurements than the square probe, especially in the high resistance range, as it ensures controlled and uniform electrification of the test sample. Surface resistance is the direct reading of the ohmmeter, and is the most common and meaningful measurement used to evaluate ESD materials. Surface resistivity may be obtained by multiplying the ohmmeter reading by 10, but this is a true reading only for single-layer, thin materials.

The centre electrode is spring loaded. Carbon loaded pads are standard. The probe is fitted with a BNC plug (not included with kit).

Kit includes:

- Concentric ring probe 99120
- Case
- Test certificate for 99120
- Measuring resistance
- Product Information Sheet

Instructions for Use

1. Connect the probe to an ohmmeter using lead.
2. Place the test material on an insulative surface.
3. Place the probe on the test material.
4. Take a reading on the ohmmeter.

Specifications

- Use for testing surface resistance to EN 61340-5-1 and ESD-S11.11-1993
- Available with carbon loaded pads
- Probe resistance with carbon loaded pads: < 500 Ω
- Carbon pad hardness:
Shore A = 70 +/- 5
- Insulation resistance:
> 2x10¹³ Ω @ 100V, rH < 50%



Figure 2. Concentric Ring Probe connected to Surface Resistance Test Kit

The concentric ring probe conversion factor (usually 10) is representing the ratio $1 / s$. Resistivity ρ is therefore obtained by multiplying the measured resistance R by the geometric factor 10. Care must be taken when doing so as the factor 10 does not take the thickness of the material into account. Such measurement can be done on thin material, and are once again only an approximation of ρ .

Verifying the probe properties

When measuring resistance of material exhibiting resistance values of more than 10^{11} ohm, it is important to ensure that the probe insulation resistance is up to specification. The test bed must also exhibit a surface resistance at least two decades higher than the material under test.

Relative humidity can affect the insulation resistance of the probe. It is therefore important to condition the probe should it have been exposed to high relative humidity. To condition the probe, keep it in a dry environment for a least 24 hours before use, preferably use a relative humidity chamber set to 10% maximum relative humidity. The probe should be stored in a clean dry environment. It is important to ensure that the centre electrode moves freely and that the resistance of the probe is within specification.

Limited Warranty

Charleswater expressly warrants that for a period of one (1) year from the date of purchase, the Concentric Ring Probe will be free of defects in material. Within the warranty period, the material will be replaced at Charleswater's option, free of charge. Call Customer Service at 00 44 (0) 1892-665313 for a Return Material Authorisation (RMA) and for proper shipping instructions and address. You should include a copy of your original packing slip, invoice, or other proof of purchase date. Any material under warranty should be shipped prepaid to the Charleswater factory. Warranty replacements will take approximately two weeks.

Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability

In no event will Charleswater or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.