JCI 150 Faraday Pail

A compact unit for measurement of electrostatic charge on components and small quantities of materials

The JCI 150 Faraday Pail is a compact instrument of low profile for reliable measurement of nett electrostatic charge on powders, liquids and small items. Charge received into the pail is measured using a JCI 178 Charge Measuring Unit with 20 and 200nC ranges of sensitivity. Charge is measured with a resolution down to 10pC. Readings are zeroed by a 'Zero' button on the JCI 178.

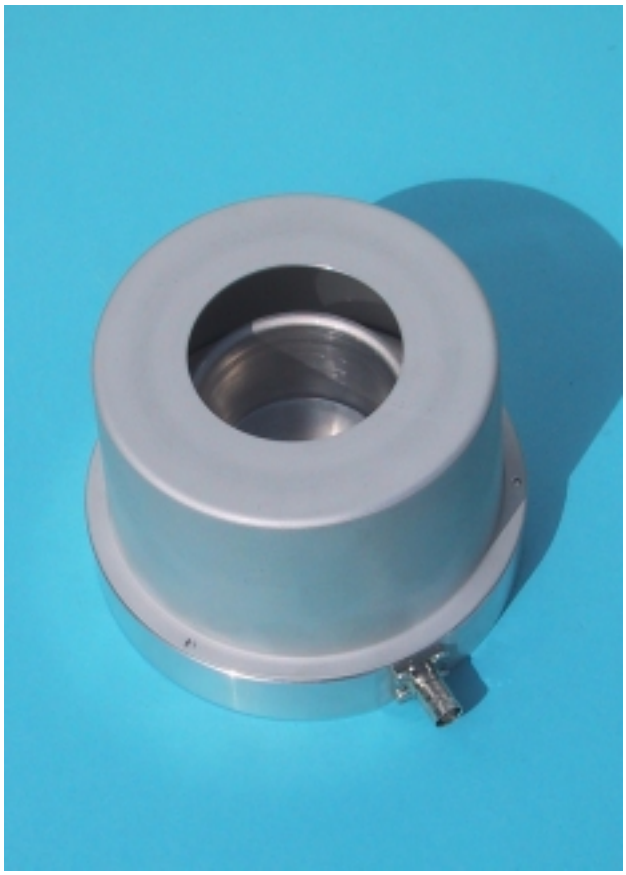
The JCI 150 unit comprises a Faraday Pail mounted on high quality insulation. The pail is cable connected, via a BNC connector, to a virtual earth charge measurement unit. The pail is not very deep compared to its diameter (a height to diameter ratio of about 0.63) so the level of powder introduced should be kept low to ensure all charge introduced into the pail couples to the pail. The earthed shield over the pail minimizes the influence of any static charges on surfaces nearby. It is wise for the operator to wear outer clothing that can dissipate static charge easily and to be bonded to earth.

The charge appearing on the outside of the pail is equal to the nett quantity of charge placed into the pail. It is not necessary that the charge introduced conducts to the pail, so measurements are equally applicable to insulating materials and conducting components placed into the pail. The shield over the pail ensures that measurements are little affected by nearby static charges on people or surfaces.

The sensitivity and performance of the JCI 150 Faraday Pail is not as high as the JCI 147 unit. It is however more suitable for measurements in confined spaces and where head height is limited – such as within a JCI 191 Controlled humidity Test Chamber.

If there is any doubt about the quality of the electrical insulation this may be tested by observing how quickly readings drift with time after zeroing and after charge has been introduced into the pail.

The shield and the pail can easily be removed for emptying the pail and for cleaning.



Why bother about static?

Many materials, in particular plastics, easily become electrostatically charged when rubbed against other materials. Such 'triboelectric' charging causes problems in many areas of industry. It can cause ignition of flammable gases and give shocks to personnel. It can make thin films and light fabrics cling, attract airborne dust and debris, damage semiconductor devices and upset the operation of microelectronic equipment.

The risks and problems arising from static electricity are best avoided by ensuring that static charge can dissipate over and through the surfaces of materials and away to earth more quickly than charge is generated. For normal manual handling and body motion activities this means the charge decay is preferably below ¼ second.

jci
John Chubb
Instrumentation

JCI 150 SPECIFICATION

Sensitivity with JCI 178:	• 20 and 200 nano-Coulombs full scale 10pC resolution • Sensitivity selected via on/off switch or by external control signal
Zero stability:	• Noise within ±10pC. Zero stable ±100 pC.
Accuracy and linearity:	• Within ±5%FSD on JCI 178 display and analogue output
Response:	• -3dB at 35Hz.
Display on JCI 178:	• 3½ digit liquid crystal display of charge directly in pico-Coulombs with polarity and `LO BATT' indication
Audio alarm:	• Pulsing audio signal when above user set level
JCI 178 Controls:	• On/off slide switch: off - range 1 - range 2 • Screwdriver set alarm threshold • Screwdriver zero setting adjustment
JCI 178 Power supply:	• Replaceable PP3 battery • via 8w mini DIN from external floating 12V supply • 2.1mm d.c. power connector for 12v 'Wall Cube' external floating power supply input
External connections:	• via 8w mini DIN connector: - analogue output signal (±2V FSD) - sensitivity range indication and sensitivity external control - earth - external power supply inputs • 2.1mm d.c. power input
Earth bonding:	• earth connection terminal on side of mounting frame
Dimensions:	• 130mm dia baseplate 95mm high • 60mm dia pail, 38mm high. 60mm aperture in shield • Weight: about 2 kg

JCI 150 Faraday Pail: baseplate, BNC connector, insulation, pail and shield

HELP LINE

JCI offers consultancy through which we advise and assist customers who need to assess and overcome problems with static electricity. We also test customer materials for static charge dissipation and capacitance loading performance.

The business of JCI is the design, development, manufacture and marketing of high quality instruments for electrostatic measurements. JCI also carries out electrostatic testing of materials, consultancy and calibration of JCI instruments to BS 7506: Part 2: 1996.

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