

Gun-Mounted Faraday Cup Assemblies for Electron or Ion Guns

FEATURES / OPTIONS

MOUNTED ON MANY KIMBALL PHYSICS ELECTRON OR ION GUNS
 USES ONE FLANGE MULTIPLEXER PORT
 MANUAL CONTROL OR PNEUMATIC ACTUATOR
 INPUT: UP TO 2 WATTS MAXIMUM CONTINUOUS
 CUP ASSEMBLY COMPLETELY ENCLOSED IN GROUND SHIELD
 MAXIMUM OPERATING TEMPERATURE: 350°C
 FARADAY CUP BAKEOUT TEMP: 350°C MAX.
 REMOVABLE PNEUMATIC ACTUATOR: 65°C MAX.

GUN-MOUNTED FARADAY CUPS

Many Kimball Physics Electron and Ion Guns have the option of having a Faraday Cup Assembly mounted directly on the front end of the gun. This Faraday cup can be moved into and out of the beam while the gun is being operated, allowing easy measurement of actual beam current in real time. The particular style of Faraday cup, its mounting, and the type of control are uniquely designed for each gun model.

A Faraday Cup Assembly is available as an option on the following Electron and Ion Guns, providing the gun is equipped with a Flange Multiplexer. Consult Kimball Physics Engineering for design specifics. Some previously-purchased Kimball Physics guns can be modified to allow the addition of a new Faraday Cup Assembly.

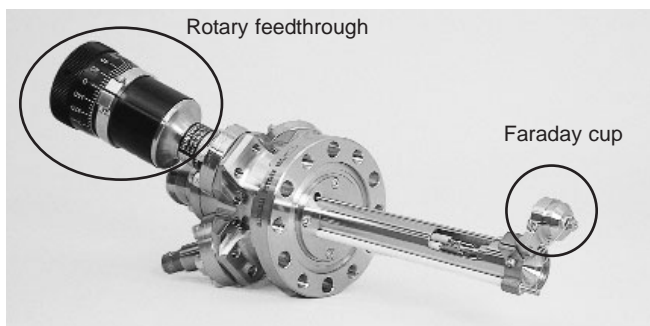
Electron Guns:

ELG-2
 FRA-2X1
 EFG-7
 EGA-1108

EGG-3101
 EFG-11
 EFG-11UD
 EMG-12

Ion Guns:

ILG-2C
 ILG-6

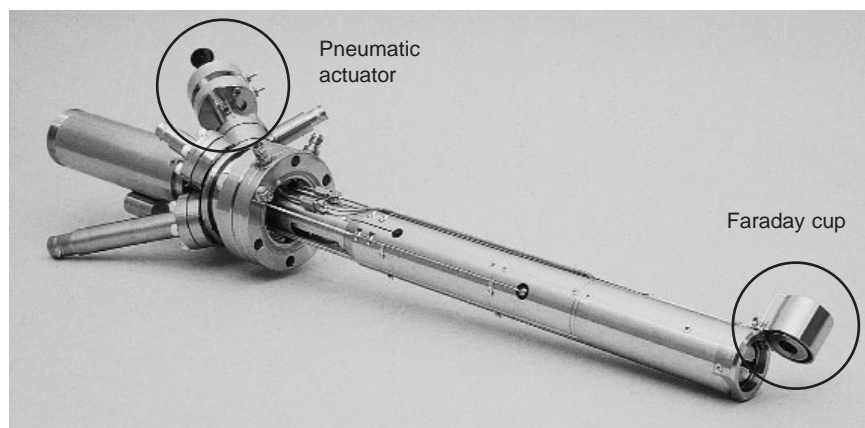


Faraday Cup Assembly with manual Rotary Feedthrough mounted on an FRA-2X1-2 Electron Gun

The Faraday cup at the end of the gun consists of three basic parts: an electrically-isolated stainless steel collector cup with aperture, a grounded external shield cup, and a hinge-link assembly. The cup assembly rotates around the hinge to move into the beam for current measurement or out of the beam line for normal gun operation. The hinge-link assembly is connected to either a rotary feedthrough or to a pneumatic actuator assembly on the Flange Multiplexer of the gun. The beam current signal is transmitted through a BNC feedthrough also located on the Flange Multiplexer. The Faraday cup can be biased at a non-ground potential to increase collection efficiency. The entire Faraday Cup Assembly is UHV compatible, and can be baked to 350°C, with the optional pneumatic cylinder and the external plastic tubing removed.

The Faraday cup may be positioned using either a rotary feedthrough or a pneumatic actuator assembly located on one of the 1 1/3 CF flanges of the Flange Multiplexer. The rotary feedthrough consists of a calibrated knob and a locking screw; it is operated manually to rotate the Faraday cup into and out of the beam. The alternative pneumatic actuator assembly consists of a dual-action pneumatic cylinder (removable for bakeout) and a bellows feed assembly welded to a 1 1/3 CF flange. The pneumatic cylinder can be actuated either with air pressure from a laboratory air pump or manually with a small knob.

For continuous measurement, beam power should not exceed 2 watts into the standard Faraday cup. To use the Faraday cup at a somewhat higher power, the beam current can be measured briefly, if the Faraday cup is allowed to cool between measurements.



Faraday Cup Assembly with Pneumatic Actuator mounted on an EMG-12 Electron Gun



Faraday cup in line for beam current measurement (0.5x)



Faraday cup moved out of line for normal gun operation (0.5x)