

EGH-6005 / EGPS-6005 ELECTRON GUN / POWER SUPPLY

1 keV to 50 keV FOCUSABLE FLOOD HIGH-ENERGY ELECTRON BEAMS

NEW GUN

FOR USE IN:

GENERAL VACUUM PHYSICS
SPACECRAFT MATERIALS TESTING
UHV CHARGING
SURFACE PHYSICS

FEATURES / OPTIONS:

UNIFORM FLOOD BEAM
RASTERING FOR UNIFORM SPOT
ELECTROSTATIC FOCUSING
MEDIUM BEAM CURRENTS
MEDIUM BEAM CURRENT DENSITIES
INTERNAL ALIGNMENT WHILE OPERATING
USER-REPLACEABLE FIRING UNITS
6 INCH CFF MOUNTING
UHV TECHNOLOGY / BAKEABLE
COMPUTER / REMOTE CONTROL
INDUSTRIAL COMPUTER / PROGRAMING



EGH-6005 Electron Gun mounted on 6 inch CFF

The Kimball Physics EGH-6005 Electron Gun with its matching EGPS-6005 Power Supplies is a complete subsystem ready to attach to the user's vacuum system and turn on. It can deliver electrons over a broad range of energies, currents and power. The EGH-6005 is a high-power, focusable flood gun for use in spacecraft materials testing and other surface physics and general vacuum physics applications.

The gun can generate a high energy, focusable, flood electron beam. Both beam energy and beam current are independently adjustable over wide ranges; energies from 1 keV to 50 keV and currents from picoamps to tens of milliamps can be achieved. The electron beam can be pulsed by an input signal to the control grid.

The adjustable optics of the gun can adapt to different divergences and different working distances. Rastering is used to provide a large uniform spot. An electrostatic focusing lens provides control of the spot size, which is typically in the tens of centimeters. However as a flood-style gun, the spot size is also partially dependent on the grid, anode and working distance. In addition, the cathode to anode spacing is internally adjustable to change perveance.

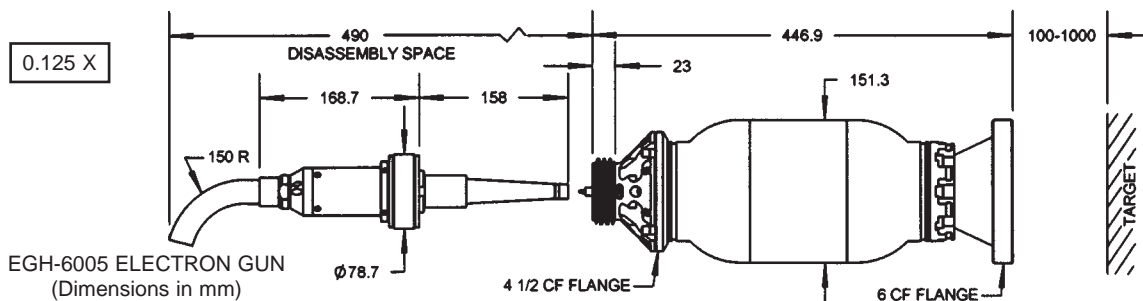
The firing unit cartridge (including the cathode, cathode-mount, and Wehnelt aperture) is user-replaceable without even removing the gun from the vacuum chamber; used firing units may be returned to the factory for rebuild.

Several cathode types and sizes are available: tantalum disc cathodes, thoria-coated (ThO_2) iridium cathodes, or single-crystal lanthanum hexaboride (LaB_6) cathodes. These cathodes are not damaged by repeated exposure to atmospheric gases or water vapor when cold.

UHV technology is used throughout. The gun can be run in vacuums from 10^{-11} torr to 10^{-6} torr for the metal cathodes, or to 10^{-7} torr for LaB_6 cathodes. The thoria-coated iridium cathode can survive a total vacuum dump. The electron gun is bakeable to 350°C with cables and electronics box removed. The gun is usually mounted on a 6 inch CF flange, and it has zero insertion distance into the vacuum chamber.

The EGPS-6005 Power Supply System contains all necessary power supplies to run the EGH-6005 Electron Gun. The power supply design includes a unique optically-controlled floating electronics box that is mounted close to the gun. Among other advantages, this design reduces the possibility of arc damage due to excess stored energy in the high voltage cable

Rear panel connectors allow control and metering of all gun power supplies, including the floating supplies, via analog inputs at ground potential. A National Instruments LabView™ computer program, written by Kimball Physics, is available for complete remote computer control. The program can provide the user with a virtual control panel on the user's computer screen similar to the real EGPS-6005 front panel. If desired, a computer system can be provided with the software loaded and checked out.



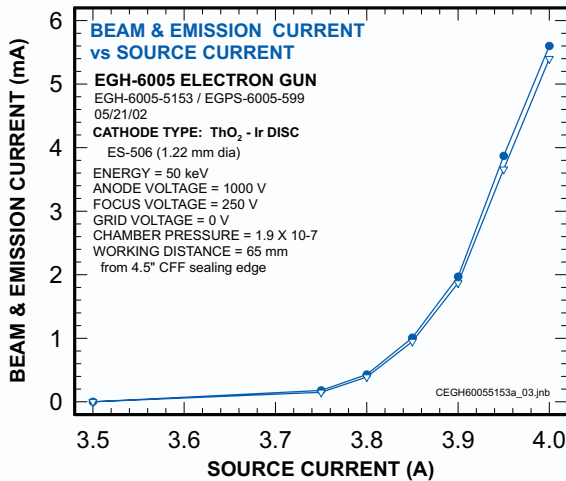
EGH-6005 ELECTRON GUN SPECIFICATIONS	
BEAM ENERGY	1 keV to 50 keV (Independently adjustable)
BEAM CURRENT	1 nA to 5 mA (Independently adjustable) Low Current option: 100 pA to 100 nA
ENERGY SPREAD	Approx. 0.4 eV cathode thermal spread, calculated
BEAM DIVERGENCE	Variable. Adjustable optics, to adapt to different divergences and different working distances
SPOT SIZE	10 mm to 500 mm
WORKING DISTANCE	100 mm to 1000 mm
RASTERING	Optional: For improved beam uniformity.
PULSE CAPABILITY	Optional Dual Grid Power Supply: pulse width 2 μ s to DC, rep rates to 1 kHz, 500 ns rise/fall, using appropriate pulse generator, not furnished
BEAM UNIFORMITY	Center to outer edge \pm 20%, with rastering and appropriate gun potentials
FIRING UNIT	Customer-replaceable Firing Unit Cartridge includes precision-aligned cathode, and Wehnelt (G-1) assembly Entire firing unit also includes first anode
CATHODE TYPES	Tantalum disc, Thorium oxide (ThO ₂), or Lanthanum hexaboride (LaB ₆) Cathodes not harmed by repeated exposure to atmospheric gases while cold
MOUNTING	Standard: 6 inch CFF
GUN DIMENSIONS (OUTSIDE VACUUM)	Gun length: 575 mm sealing surface to end of cable connector, Gun diameter: 151 mm for most of length Gun with electronics box & H.V.cable: approx 745 mm x 415 mm x 220 mm overall (27 in x 16 in x 9 in)
INSERTION LENGTH	Zero mm
FEEDTHROUGHS	Multipin brazed ceramic, threaded stainless steel shell
CABLES / CONNECTORS	Multiconductor high voltage fully ground-shielded, with mating aluminum connector to connect gun and power supply. Standard lengths: 3m Optional: 5 m or longer.
MAXIMUM BAKEOUT	350°C with cables and floating electronics box removed

EGPS-6005 ELECTRON GUN POWER SUPPLY SPECIFICATIONS	
OUTPUTS	All necessary voltages to drive the EGH-6005 Electron Gun.
ENERGY SUPPLY STABILITY	<0.01% per hour with 0.05% rms ripple at full output
BEAM STABILITY	\pm 1.0% per hour with Emission Current Control or \pm 10% per hour after warm up without ECC
CONTROLS	Energy, Focus, Anode, Grid, Source, Emission Current Control, optional Raster X and Y Size and Frequency
COMPUTER/REMOTE CONTROL	All power supplies: 0 to +10 volts or -10 to +10 volts All meters: 0 to +2 volts
METERING	Digital: Energy, Focus Anode, Emission, Grid, Source Volts, Source Amps, optional Raster X Size and Y Size
INPUT	115 VAC switchable to 230 VAC, 50 to 60 Hz, 100 W
DIMENSIONS (width x height x depth)	Two units, total approx: 17 in. x 12 in. x 17 in. (432 mm x 305 mm x 432 mm); with rack mount kits, overall width is 19.5 in. (495 mm)
COMPUTER SYSTEM	Optional: Industrial computer system including data acquisition and control hardware DAC.
LAB SOFTWARE	Optional: National Instruments LabView™ executable file (installed on computer system)



A typical lab set-up of a complete Kimball Physics high energy system with an flood-style electron gun, power supplies and optional computer control system (details vary with gun model)

Standard specifications listed; Enhanced and custom specifications available.



Typical performance; data for guidance only.

