EGH-6002 / EGPS-6002
ELECTRON GUN / POWER SUPPLY

1 keV to 50 keV
FOCUSABLE SMALL SPOT HIGH-ENERGY ELECTRON BEAMS

NEW GUN

FOR USE IN:

GENERAL VACUUM PHYSICS
RADIATION STUDIES
SURFACE BOMBARDMENT
SEMICONDUCTOR RESEARCH
BIOLOGICAL SPECIMEN IRRADIATION
X-RAY GENERATION
PLASMA EXCITATION
FLUORESCENCE STUDIES
SURFACE PHYSICS STUDIES

FEATURES / OPTIONS:

MEDIUM BEAM CURRENTS
SMALL SPOTS
MAGNETOSTATIC FOCUSING
MAGNETOSTATIC DEFLECTION
PULSE CAPABILITY
INTERNAL ALIGNMENT WHILE OPERATING
USER-REPLACEABLE FIRING UNITS
4½ OR 6 INCH CFF MOUNTING
UHV TECHNOLOGY / BAKEABLE
COMPUTER / REMOTE CONTROL

EGH-6002 Electron Gun mounted on 6 inch CFF

The Kimball Physics EGH-6002 Electron Gun with its matching EGPS-6002 Power Supplies is a complete subsystem ready to attach to the user's vacuum system and turn on. It can deliver electrons over a very broad range of energies, currents and power. The EGH-6002 can be used in many different applications from semiconductor reasearch to secondary electron emission studies.

The gun can generate a high energy, focusable, small spot 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. The spot size can be varied from half a mm to ten cm. A magnetic focusing lens and magnetic centering deflection provide beam control with low aberration. In addition, the cathode to anode spacing is internally adjustable to change perveance.

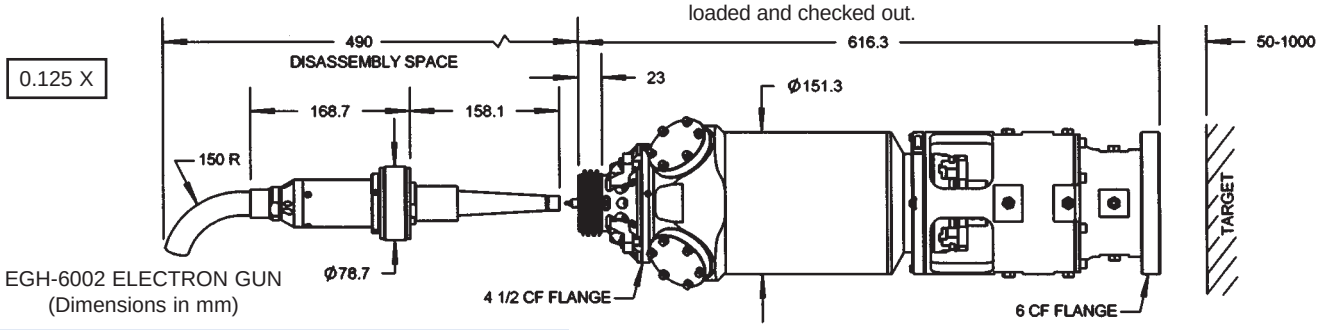
The gun features an adjustable cathode feedthrough assembly that allows the mechanical alignment of the firing unit with respect to the anode and the column. This alignment can be done in real time while the gun is operating at full voltage with beam on. The firing unit cartridge (including the cathode, 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 200ºC with cables and electronics box removed; bakeout is limited by the magnetic focus and deflection coils. The Source region separately is bakeable to 350ºC. The gun can be mounted on a 4½ inch or 6 inch CF flange, and has zero insertion distance into the vacuum chamber.

The EGPS-6002 Power Supply System contains all necessary power supplies to run the EGH-6002 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-8102 front panel. If desired, a computer system can be provided with the software loaded and checked out.



EGH-6002 ELECTRON GUN
(Dimensions in mm)

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Tel. 1 603 878-1616 Fax: 1 603 878-3700

EGH-6002 ELECTRON GUN SPECIFICATIONS

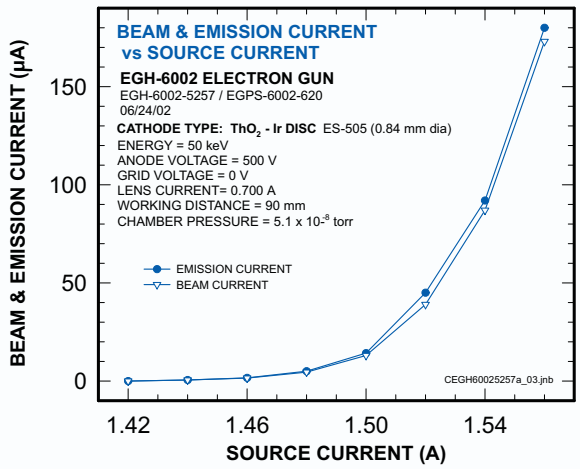
BEAM ENERGY	1 keV to 50 keV (Independently adjustable)
BEAM CURRENT	10 nA to 100 µA (Independently adjustable) High Current option: 10 nA to 15 mA Low Current option: 100 pA to 100 nA
ENERGY SPREAD	Approx. 0.4 eV cathode thermal spread, calculated
BEAM FOCUSING	Magnetostatic
BEAM DIVERGENCE	Variable. Adjustable optics to adapt to different divergences and working distances
SPOT SIZE	0.5 mm to 100 mm
WORKING DISTANCE	50 mm to 1000 mm; Typical: 100 mm
BEAM DEFLECTION	Magnetostatic ±0.5°
PULSE CAPABILITY	Optional Dual Grid Power Supply: pulse width 2 µs to DC, rep rates to 1 kHz, 500 ns rise/fall, using appropriate pulse generator, not furnished
BEAM UNIFORMITY	Gaussian
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
INTERNAL GUN ALIGNMENT	Adjustable Feedthrough for mechanical alignment of firing unit while gun is operating
MOUNTING	4½ inch or 6 inch CFF
GUN DIMENSIONS, (OUTSIDE VACUUM)	Gun length:636 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 (30 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
MAXIMUM BAKEOUT	200°C with cables and floating electronics box removed (200°C for magnetic Lens and Deflection coils, 350°C for Source chamber region)

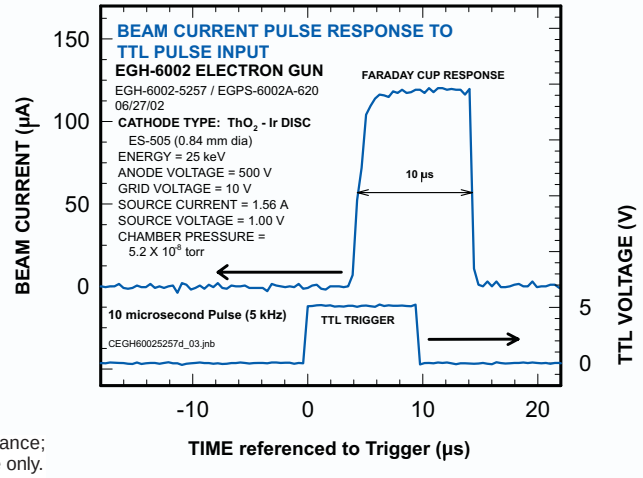
Standard specifications listed; Enhanced and custom specifications available.

EGPS-6002 ELECTRON GUN POWER SUPPLY SPECIFICATIONS

OUTPUTS	All necessary voltages to drive the EGH-6002 Electron Gun.
ENERGY SUPPLY STABILITY	<0.01% per hour with 0.05% rms ripple at full output
BEAM STABILITY	±1.0% per hour with Emission Current Control or ±10% per hour after warm up without ECC
CONTROLS	Energy, Lens, Anode, Grid, Source, Emission Current Control, X and Y Deflection
COMPUTER/REMOTE CONTROL	All power supplies: 0 to +10 volts or -10 to +10 volts All meters: 0 to +2 volts
METERING	Digital: Energy, Lens, Anode, Emission, Grid, Source Volts, Source Amps, optional X and Y Deflection
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 a focusable electron gun, power supplies and optional computer control system (details vary with gun model)





Typical performance; data for guidance only.