IGS-4 / IGPS-2014
ALKALI ION GUN / POWER SUPPLY

50 eV to 5 keV
Cs, Li, Na, K, Rb ALKALI METAL ION BEAMS

FOR USE IN:

- SECONDARY ION MASS SPECTROMETRY
- ION ACCELERATORS
- SURFACE PHYSICS
- VACUUM PHYSICS

FEATURES / OPTIONS:

- BEAM CURRENTS UP TO 2 µA
- WIDE OPERATING ENERGY RANGE
- SIMPLE OPERATION
- CONTAMINATION IMMUNITY
- RASTERING
- LOW POWER CONSUMPTION
- BAKEABLE TO 350°C
- INTERCHANGEABLE ALKALAI METAL FIRING UNITS
- COMPUTER / REMOTE CONTROL

IGS-4 Ion Source Mounted on a 2¾ inch CFF

The Kimball Physics IGS-4 Ion Gun, with its matching IGPS-2014 Power Supply represents a significant advance in alkali-metal surface-ionization ion-source technology. It is intended for use in a variety of mass spectrometry and surface physics applications.

By use of different source firing units, the alkali ion beams of Cs, Li, Na, K, and Rb can be generated. The alkali metal is generated as needed by a solid-solid chemical reaction, and is then surface ionized and evaporated with low energy spread. The resulting ion beams can be generated down to low energies, and very low currents. Beam divergence and beam alignment are both controllable using a built-in electrostatic condenser lens and electrostatic centering deflection plates. The ion gun with its power supply is a complete subsystem ready to attach and turn on.

UHV technology is used throughout. The source may be completely dissassembled for cleaning or repair. Source firing units are user replaceable, and can be inexpensively rebuilt at Kimball Physics. The source is not damaged by repeated exposure to atmospheric gases or water vapor when cold. It may be run in vacuums from 10^{-11} to10^{-5}torr. It is bakeable up to 350^{0}C with cables removed. Non-standard mountings are available. Various stand-alone Faraday cup designs are available.

IGPS-2014 Ion Source Power Supply

The control grid allows pulsing options: either fast capacitive beam pulsing or dual grid pulsing. Capacitive beam pulsing, using a Pulse Junction Box, permits fast beam pulsing down to 20 ns with 20% maximum duty cycle. Capacitive pulsing requires an external, variable-voltage pulse generator (not included). Pulsing of the electron beam can also be accomplished with dual grid supplies, requiring only a TTL pulse input with widths from 2µs to DC.

The IGPS-2014 Power Supply features a modular design with miniaturized power supply clusters, optically isolated signals, and the FlexPanel digital interface controller. The included power supplies are Ion Beam Energy, Focus and X,Y Deflection, as well as the floating Source/ECC, and Grid. The power supply for the Focus is not floating. A rastering option can be provided with the raster generator/deflection unit inside the power supply with no change to the size of the IGPS-2014 power supply.

The FlexPanel provides a digital display screen and a keyboard for programming control on the front panel. Rear panel connectors allow remote computer control and metering of all gun power supplies. An RS-232 serial port and an analog input/output connector are included on standard power supply units. all common computer interface bus types can be accommodated by the use of appropriate digital to analog converters. RS-422/485 conversion is possible.

An optional LabVIEW™ computer program designed for the IGS-4 is available for remote computer control and metering. Software is available in two types: Standard is via a simple serial connector interface; an option is National Instriements DAQ boards and SCSI connectors on the IGPS-2014. The program provides a virtual panel of controls and real-time metering on the user's computer screen.

Tel. 1 603 878-1616 Fax: 1 603 878-3700
Toll Free: 1 888 KIM-PHYS (1 888 546-7497) e-mail: info@kimphys.com

IGS-4 ION GUN SPECIFICATIONS

BEAM ENERGY	50 eV to 5 keV (Independently adjustable)
BEAM CURRENT	1 nA to 2 µA (Independently adjustable) Ion species dependent
ENERGY SPREAD	Approx. 0.4 eV thermal spread, calculated
SPOT SIZE	Less than 1mm to 20mm @ 100mm working distance (independantly adjustable)
WORKING DISTANCE	Typical: 100 mm. Range: 10 mm to 200 mm
BEAM DEFLECTION	Optional: 4 Pole Electrostatic: ± 1° at 5000 eV
PULSE CAPABILITY (using appropriate pulse generator, not furnished)	Optional Dual Grid Power Supply: pulse width 2 µsec to DC, rep rates to 5 kHz or Capacitive: 20ns to 100 µsec
ION SPECIES	Cs^+, Li^+, Na^+, K^+, or Rb^+
ION GENERATION METHOD	Surface-ionization Alkali Alumino Silicate Plug. Directly heated, not harmed by atmospheric gases while cold
MOUNTING	Flange Multiplexor with a 2¾ inch CFF
BEAM ALIGNMENT	Optional: Mechanical alignment with ±2° Port Aligner
INSERTION LENGTH	Standard: 127 mm. Range: 107 mm to 147 mm. Custom lengths available. Gun manufactured at standard length unless otherwise specified at time of order.
SOURCE DIAMETER	25.4 mm at gun flange. Necks up to 31.8 mm at 83 mm from flange
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: 3 m Optional: 5 m
MAXIMUM BAKEOUT	350°C with cables removed* See blue text at right

IGPS-2014 ION GUN POWER SUPPLY SPECIFICATIONS

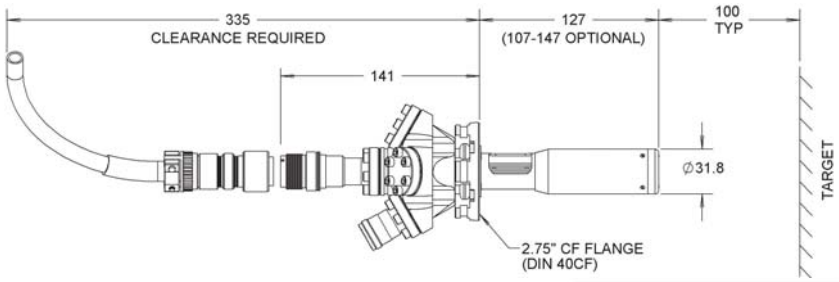
OUTPUTS	All necessary voltages to drive the IGS-4 Ion Gun
ENERGY STABILITY	±0.01% per hour; ±0.02% per 8 hours at full output
BEAM STABILITY	±0.1% per hour with Emission Current Control or ±10% per hour after warm up without ECC
CONTROLS	Energy, Focus, Grid, Source, Emission Current Control, X and Y Deflection (optional)
COMPUTER REMOTE CONTROL	Power supplies: 0 to +10 V (-10 V to +10 V, deflection) Metering: 0 to +2 V (-2 V to +2 V, deflection)
METERING	Energy, Focus, Emission, Grid, Source Volts, Source Amps, X and Y Deflection (optional);
INPUT	115 VAC switchable to 230 VAC, 47 to 63 Hz, 100 W
DIMENSIONS (width x height x depth)	17 in. x 7 in. x 17 in. (432 mm x 178 mm x 432 mm); with rack mount kit, overall width is 19.5 in. (495 mm)

OPTIONAL HARDWARE RASTER SPECIFICATIONS

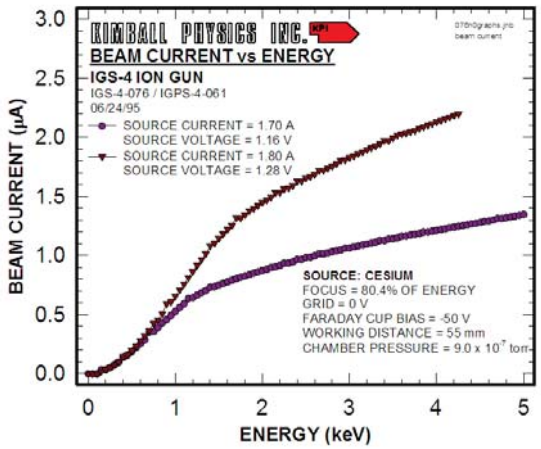
RASTER GENERATOR	Continuous control of X & Y Raster Amplitude, variable Centering and Frequency, with 0-10 kHz (X) and 0-100 Hz (Y) standard. All parameters controllable via RS-232, RS-422, RS-485, analog input, or computer control with LabVIEWTM software option.

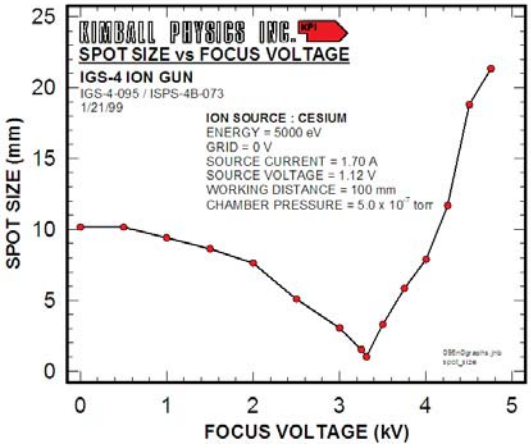
*350°C standard with Cables removed
65°C with Faraday cup

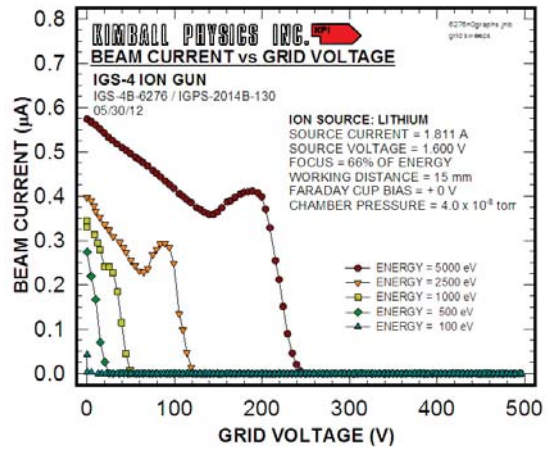
IGS-4 ION SOURCE
(Dimensions in mm)

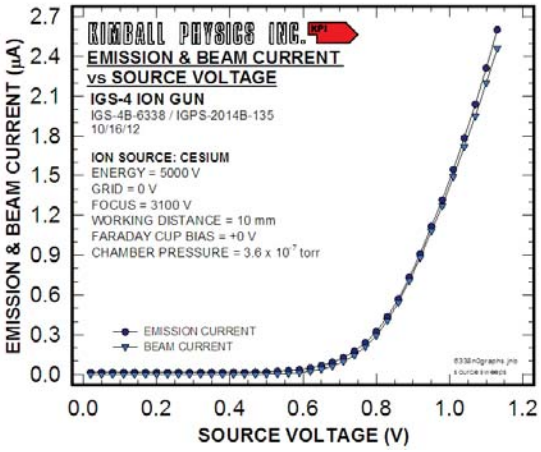


Typical performance; data for guidance only.









It is not necessarily possible to achieve all maximum specifications simultaneously.
Specifications Subject to Change Without Notice.