IonEtch

Sputter Ion Gun, GenII

The tectra IonEtch ion gun is a filamentless ion source based on a microwave plasma discharge. The IonEtch works by coupling microwave energy into a coaxial waveguide and from there via evanescent wave coupling, into an Alumina plasma chamber. The intense oscillating electric fields cause the gas to breakdown and a plasma discharge to take place.

Typical applications:

- sputter cleaning / surface preparation in surface science
- MBE and HV sputter processes
- ion assisted deposition, ion beam sputter coating
- reactive ion etching.

KEY FEATURES AND BENEFITS

- Filamentless Ion Source
- No Microwave Tuning. Factory set. Simply turn plasma on / off
- The ion optics are designed to be quickly and easily exchanged allowing users to customize their source to suit a particular combination of sample size, working pressure and current density
- Suitable for use with most gases including reactive ones such as oxygen, hydrogen, …
- User Configurable
- Easily exchanged apertures enable beam diameter, gas load and current density to be optimized.

A quadrupole field around the chamber further enhances the plasma density via the Electron Cyclotron Resonance (ECR) effect. Ions are extracted from the plasma using a two grid single-hole extraction optics.

The use of microwaves to sustain the plasma allows ions to be extracted at very low energies without the plasma collapsing (down to 25eV) and since there are no hot metal electrodes in the plasma also permits the use of reactive gases such as oxygen and hydrogen.

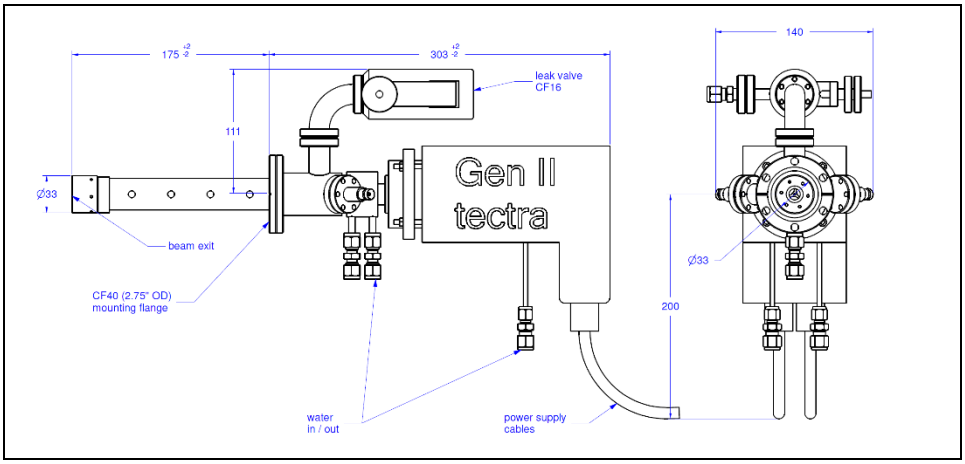
The GenII is the second generation of the IonEtch sputter gun with some significant improvements in performance and features. To name only some: higher total beam current, high efficiency direct microwave coupling without need of tuning, Alumina plasma cup now standard, only 4 screws to undo non-bakeable parts and more compact, space saving air side setup.

Integration of the robust microwave generator and the ion source, mean that no tuning of the source is required and there is no waveguide to construct or install.

Due to the evanescent wave coupling, no electrodes are present in the plasma i.e. no filaments or other metal. The plasma is entirely surrounded by alumina or other dielectric materials e.g. Boron Nitride (BN). Therefore the source is also suitable for use with reactive gases such as oxygen and hydrogen. A selection of grids and grid conductances allow the optimum balance between gas flow, working pressure and beam current to be achieved.

SPECIFICATION

Dimensions



Technical Specification

Source	Microwave Plasma Discharge (No Filament)
Source Diameter	33 mm (Vacuum Side)
Ion Energy	25 eV – 5 keV
Total Beam Current	~ 0.5 mA (at 5kV with Ø1,5mm aperture and Argon),
	~ 2 mA (with Ø3mm aperture and Argon)
Beam Divergence	Dependent on Ion Energy (typically 15°)
Working Distance	100 mm (typically)
Mounting	CF35 (2.75” O. D.)
Gas Inlet	CF16 (1.33” O. D.)
Leak Valve	Required (not included)
Gas Flow Rate	1 – 5 sccm (1.5 sccm typical, gas dependent)
Working Pressure	~ $5x10^{-5}$ mbar to $2x10^{-4}$ mbar
	(without optional differential pumping)
	Low 10^{-6} mbar range possible at reduced beam current

Power Supply

Power	230 VAC / 50 Hz (Standard)
	115 VAC / 60 Hz (to be stated with order)
Size	19” rack mount, 3U height

Options

Gas	Mass Flow Controller
	Differential Pumping
	Different Apertures
Control	Remote Control Options

Please contact us for more Information.
We and our team behind us will be happy to help you!

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Rev: Feb. 2017