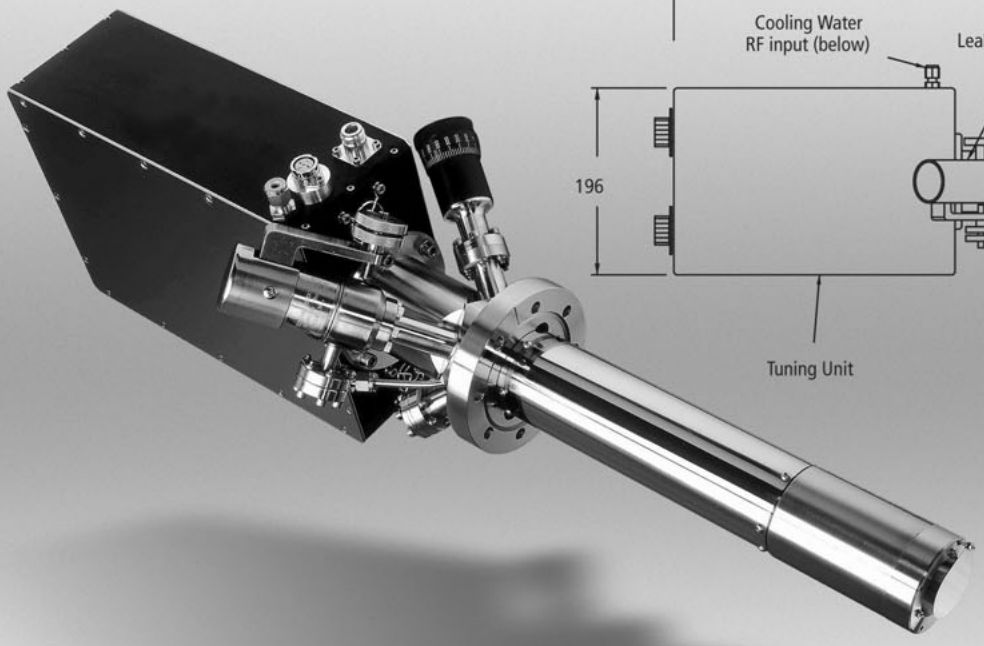
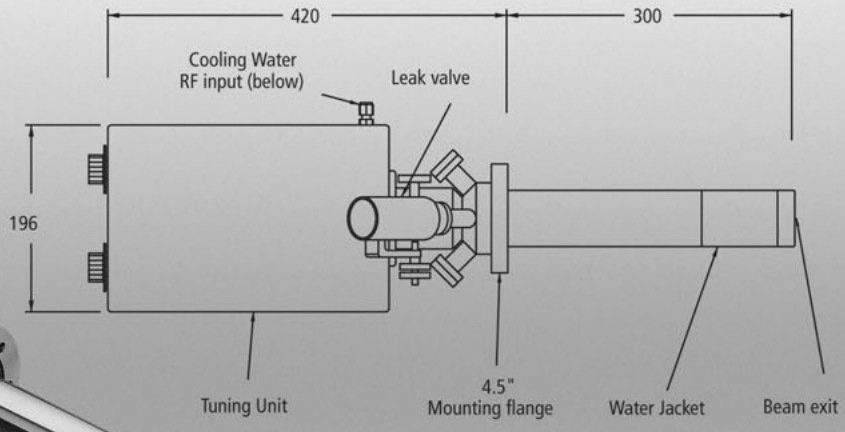
COMPONENTS FOR SURFACE ANALYSIS

Plasma Cracker Atom Source (RF Plasma)

PCS-RF

- Radio frequency plasma
- For Oxygen, Nitrogen, Hydrogen
- Filamentless design
- Unique coaxial design
- Integral water cooling jacket
- Ideal for MBE and many other applications





SPECS®

Plasma Cracker Source PCS-RF

The SPECS Plasma Cracker Source PCS-RF is a truly UHV compatible source suitable for the most demanding MBE and other applications. The unique RF coil and shielding design allows operation from 500 W RF (13.56 MHz) to less than 60 W making the source suitable for both high growth rate bulk materials (GaN) and dilute nitrogen applications (GaInNAs). Moreover, high RF powers lead to very high power density in the plasma and thus highest possible cracking efficiencies. The absence of a hot filament permits operation with most gases including reactive gases such as oxygen, chlorine, nitrogen and hydrogen.

Main Features:

- Mounting flange: 4.5" (NW63CF)
- UHV compatible
- Bakeable: 200° C
- Power: 500 W max. at 13.56 MHz
- Integral water cooling (RF coil and jacket)
- In vacuum length: 300 mm
- Beam diameter: 23 mm at source
- Gas flow rate typically ~ 1 sccm
- Working distance: 50 mm - 300 mm
- Manual tuning as standard
- Power supply: 300 W and 600 W available

Options:

- Integrated shutter
- Autotuning unit
- Viewport: Provides a direct view of the plasma from the rear
- Differential pumping: Extends the operational range of working pressures into the 10^{-7} and 10^{-8} mbar range
- Plasma monitor: Provides a readout of the plasma intensity
- Plasma controller: Stabilises the plasma brightness
- Ion trap: Deflects residual ion current out of the beam

The source can be operated in two distinct modes:

Atom source - Thermal energy neutrals

This mode is intended for low energy and low damage surface treatment and sample growth. A specially designed aperture inhibits the release of ions from the plasma while allowing neutral atoms and molecules to effuse out. The particles released are largely thermalised (< 1 eV) and are therefore suitable for use in sensitive semiconductor growth, cleaning and surface treatment applications.

Downstream plasma mode - Low energy ions and neutrals

The optics in this mode allow ions and higher energy plasma particles (~25eV) to flood out into the chamber. The sample is typically placed some centimetres in front of the source, but still "downstream" of the most energetic species in the plasma region. This mode is ideal for growth/cleaning of e.g. ceramic oxides where the increased kinetic energy of the particles enhances the process dynamics without damage.

Applications:	
Nitrogen:	Nitriding (GaN, AlN, InN and SiN), doping (ZnSe) and alloying (GaInNAs,GaAlAsN)
Oxygen:	HTc superconductors, optical coatings, dielectrics, reactive sputtering, laser ablation and ceramic growth (Al_2O_3) oxygen cleaning and oxidation kinetics, post growth oxidation / low temperature SiO_2
Hydrogen:	Cleaning, growth enhancement / surfactant
Chlorine:	In-situ etching
Methane (carbon):	SiC film growth

SPECS GmbH - Surface Analysis and Computer Technology
Voltastr. 5
13355 Berlin
Germany

Phone.: +49 (0)30 467824 - 0
Fax: +49 (0)30 4642083
E-mail: support@specs.de
http://www.specs.de

ISO 9001 Certificate

Your Representative: