

Product Information

The Semion™ Retarding Field Energy Analyzer System is designed to measure both the Ion Flux and Ion Energy on a biased surface in a plasma chamber.

The Semion™ System consists of a Retarding Field Energy Analyzer (RFEA) multi-grid Probe, chamber feed-through assembly, and electronic control unit.

The RFEA Probe can be mounted on an electrode/substrate holder, or in a dummy wafer to sample wafer processing conditions.

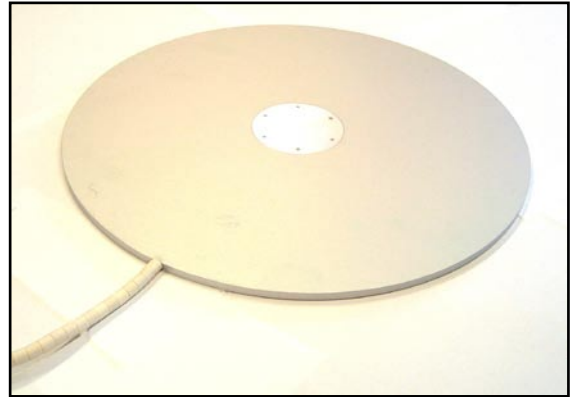
The Semion™ System is suitable for installation on a wide range of plasma source configurations; capacitively coupled, inductively coupled, magnetron, cascaded arc, and remote source.

Semion™ can be used under the following bias conditions (single-, dual-, and multi-frequency)

- Grounded
- DC
- Floating
- RF
- Pulsed/shape

A unique feature of the product is the ability to place the RFEA probe on an RF biased surface. The RFEA probe floats with the electrode, similar to a wafer, and can measure the ion flux and ion energy at the surface.

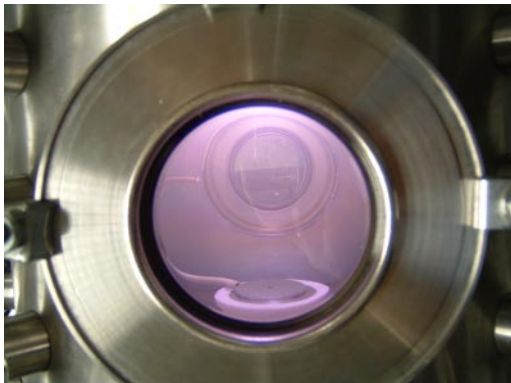
The Semion™ Control Unit provides all of the required grid voltage biases and comes with software to sweep and control the RFEA Probe automatically.



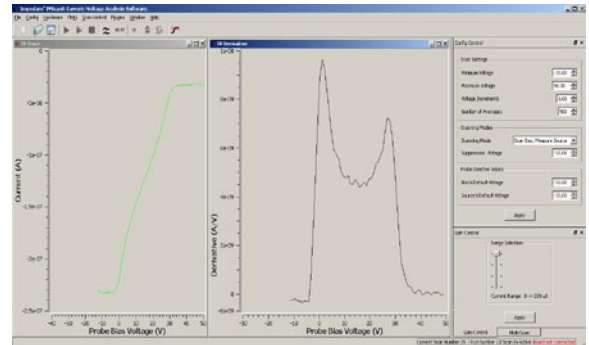
300mm RFEA Probe

Features

- ❖ Substrate mounted Retarding Field Energy Analyzer Probe
- ❖ In-situ measurement of
 - Ion Energy Distribution
 - Ion Flux
 - Ion Current
 - Electron Flux and Energy
- ❖ Measurement of Energies in range of 500eV at pressures up to 300mT
- ❖ Time resolved measurement capability up to 500kHz for pulsed systems, with time step resolution of 44nS
- ❖ Plasma floating potential measurement adjustment feature
- ❖ Easy to install, no retrofit required
- ❖ Portable system allowing analysis in multiple chambers using single system



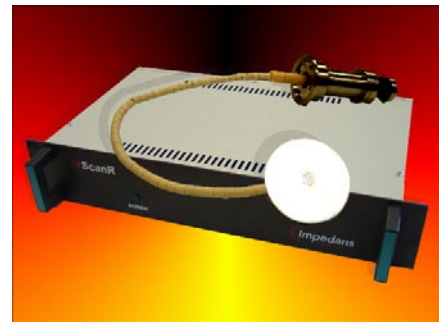
**Semion™ RFEA Probe mounted
 in a plasma chamber**



Semion™ Software screenshot



Semion™ RFEA Feedthrough Assembly



Semion™ Control Unit

System Specifications

RFEA Probe
 Probe Diameter: 60mm
 Holder diameter: 70mm to 450mm
 Holder thickness: 5mm
 Mounting: Probe mounted flush with holder

IEDF resolution: +/- 1eV nominal
 Enclosure Material: Aluminium, to order
 Probe holder material: Aluminium, to order

Feed-through Assembly
 Flange type: KF40, to order
 Substrate Holder to Chamber wall length: 300mm to 3m, to order

Control Unit
 Ion Current: 2mA DC max.
 Ion flux: 0.1 - 20mA/cm²
 Time Resolved freq.range: 10 Hz to 500 kHz

Electron and Ion Energy Range:-
 Model S-150: 0 -150eV
 Model S-500: 0 - 500eV

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