



Ion Beam Systems



Model 750

The Model 750 Ion Beam system (previously the XIAD) provides ion energies up to 225eV, with beam currents available up to 4 Amps (to a maximum of **750W**).



Model 1250

The Model 1250 Ion Beam system (previously the ST-55) provides ion energies up to 225eV, with beam currents available up to 6 Amps (to a maximum of **1250W**).



Model 2000

The Model 2000 Ion Beam system provides ion energies up to 300eV, with beam currents available up to 8 Amps (to a maximum of **2000W**).



Model 3000

The Model 3000 Ion Beam system provides ion energies up to 300eV, with beam currents available up to 12 Amps (to a maximum of **3000W**).

Telemark ion beam sources have been designed to provide superior performance across large and small substrates. Telemark technology offers low pressure operation (10^{-5} mbar) for a longer mean free path and higher ion energies than traditional End Hall sources.

The source design is extremely low maintenance with no consumable components except for filaments. The Telemark ion beam source line is capable of either mixed gas or pure oxygen operation, allowing for deposition of metal oxide films of the highest index and lowest stress. Pulsed Mode for ion assisted fluorides provides fully compacted, damage free results not achievable with any other ion source.

Telemark sources achieve stable films with no substrate pre-heating, and are an excellent choice for depositing durable films on low temperature substrates.

Mini UHV Ion Beam Source

The Mini is a constant DC filtered Source, which can be pumped into the 10^{-10} Torr vacuum range, capable of energies up to 225eV, with beam current of up to 1.5 amps in oxygen, nitrogen or argon (500W maximum). The ion source head, with feedthroughs and electrical connections, is installed on a single 6" CF Flange (or 4 1/2" CF, if a separate 2 3/4" CF port is available for the electrical connector), and is bakeable to 250°C, without cooling water. Price includes source with single filament, feedthroughs, and one mass flow controller, all mounted on 6" CF, with power supply and cables for installation. Bakeable mass flow controller upgrade available at additional cost.





Digital Touchscreen Control

Features:

- Ion beam energies up to 300eV
- Anode currents to 15 amps max
- Full-time use of high purity oxygen, argon or nitrogen.
- Highly efficient design **greatly reduces gas load**
- Water-cooled to reduce maintenance and radiation load
- Extremely low maintenance. The patented design utilizes a specially coated anode, which resists build-up of electrically insulating oxide coatings. No need to change anodes for different gases
- Extremely stable operation in IAD processes due to electrode design
- Broad-beam divergence for large area coverage with a uniform ion flux
- **Pulse-mode** operation for ion-assistance of radiation-sensitive film materials such as many commonly used infrared and UV thin film materials eg MgF_2 & LaF_3 . For further information please refer to separate information sheets.
- Remote Control and Monitoring – all control through an RS232 interface
- **Dual Filament** - Electronic system detects filament failure and auto switches to second filament.

Complete package includes:

- Ion Source.
- Power supply - 208 or 230 VAC, single phase 50 or 60Hz; 10 amps.
- Gas flow controller supplied 30 sccm Alicat Scientific.
- Operational, maintenance and service manual.
- All feedthroughs – gas, electrical & water.
- 1 package (10 each) of filaments.

Notes:

- System comes programmed for the commonly used Ion Beam Gases Argon and Oxygen, and also includes settings for Nitrogen, Krypton, Xenon, Neon, and Helium. Custom gases may be programmed in by the customer.
- Standard remote communication is RS-232.

Options Available:

Dual Gas option provides facility to deliver either of two installed gases in either pure gas or specified gas mix ratio. Gas mixture is set from the touch screen.

Ion Current Monitor provides real-time monitoring of Ion Flux, with electronics built into the power supply, together with sensor head, feed through and cables.

Mounting Hardware Several options are available. The mounting brackets are clamped to a special gas feedthrough.

Specifications

Model	Mini UHV	750	1250	2000	3000
Source Diameter	47mm diameter by 70mm long (1.86" x 2.74")	63mm diameter by 64mm long (2.48" x 2.53")	74mm diameter by 61mm long (2.91" x 2.4")	74mm diameter by 61mm long (2.91" x 2.4")	114mm diameter by 93mm long (4.49" x 3.66")
Source Weight	1.4 kgs (approx. 3 lbs)	1.4 kgs (approx. 3 lbs)	1.4 kgs (approx. 3 lbs)	1.4 kgs (approx. 3 lbs)	4 kg (approx. 8.5 lbs)
Beam Power	Anode volts selectable to 225 volts; anode power 500 W	Anode volts selectable to 225 volts; anode power 750 W	Anode volts selectable to 225 volts; anode power 1250 W	Anode volts selectable to 300 volts; anode power 2000W	Anode volts selectable to 300 volts; anode power 3000 W
Anode Current	Maximum 5 amps under manual or automatic beam control	Maximum 5 amps under manual or automatic beam control	Maximum 5 amps under manual or automatic beam control	Maximum 7 amps under manual or automatic beam control	Maximum 10 amps under manual or automatic beam control
Beam Divergence	Wide beam divergence in excess of 80 degrees	Wide beam divergence in excess of 80 degrees	Wide beam divergence in excess of 80 degrees	Wide beam divergence in excess of 80 degrees	Wide beam divergence in excess of 80 degrees
Gas Flow	Approximately 7sccm argon required to produce 2 amps (typical)	Approximately 7sccm argon required to produce 2 amps (typical)	Approximately 7sccm argon required to produce 2 amps (typical)	Approximately 8sccm argon required to produce 2 amps (typical)	Approximately 8sccm argon required to produce 2 amps (typical)
Cooling Water	Minimum 2.3 liters/minute. Water flow is constantly monitored	Minimum 2.3 liters/minute. Water flow is constantly monitored	Minimum 2.3 liters/minute. Water flow is constantly monitored	Minimum 2.5 liters/minute. Water flow is constantly monitored	Minimum 4.5 liters/minute. Water flow is constantly monitored
Power Unit Dimensions	135mm x 480mm x 406mm	135mm x 480mm x 406mm	135mm x 480mm x 406mm	135mm x 480mm x 406mm	180mm x 525mm x 435mm
Power Unit Weight	28 kgs (60lbs)	28 kgs (60lbs)	28 kgs (60lbs)	30 kgs (66lbs)	30 kgs (66lbs)

Ion Current Monitor (ICM)

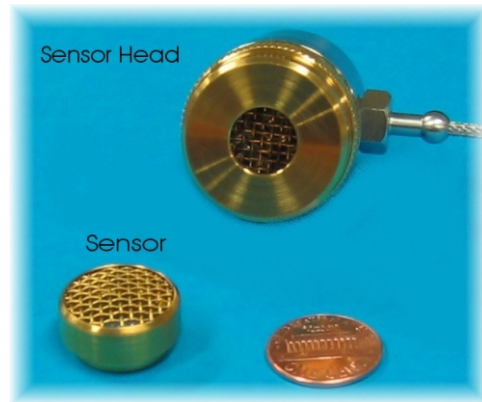
REAL TIME Monitoring of Ion Flux throughout Ion-based Deposition Processes Available as a stand-alone instrument or fully integrated into Ion Beam Power Supply

The Ion Current Monitor has been developed to provide essential deposition information for any ion-based process. The ICM monitors the flux of positive ions and outputs the beam current in units of amps per square centimetre. Three amplifier ranges are provided to adequately cover the flux density output from a wide range of commercially available ion beam systems. An adjustable bias voltage is provided to reject negatively charged particles (electrons).

The Sensor Head

The sensor head incorporates a revolutionary patented design that allows for the continuous monitoring of the ion beam flux **even during the evaporation of dielectric materials**.

The sensor head is designed to be ultra-low maintenance and is constructed from materials to be compatible with UHV applications. The head can safely operate at temperatures compatible with deposition processes to a max. 350 deg. C.



Auto-ranging of the Output Signal

Three auto-ranging ion anode current ranges provided:

10 μ A/volt - 100 μ A/volt - 1000 μ A/volt

The output signal is displayed in any of the following formats:

- A front panel Digital LCD panel displays the RMS digital ion current signal complete with appropriate units of either microamps or milliamps.
- A bar graph display provides visual representation of the RMS ion current signal.
- The digital RMS signal is available through a connector on the rear panel. The signal can be viewed on a remote voltmeter or signal logging facility.
- The real-time AC signal can also be output to a cathode-ray oscilloscope (CRO) using a front-panel BNC socket.



Stand-alone Instrument