TELEMARK

Saintech Ion Beam Systems - Ion Current Monitor

The Saintech Ion Current Monitor (ICM) provides REAL TIME Monitoring of Ion Flux throughout Ion-based Deposition Processes

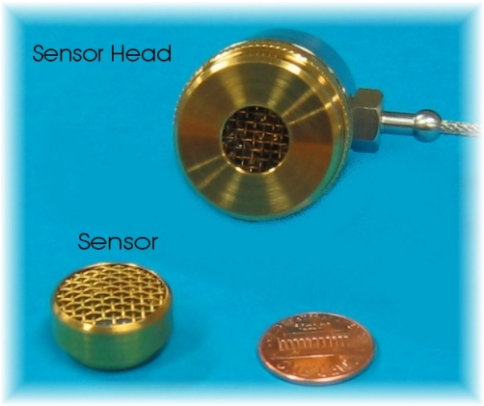
US Patent Nos. 6645301, 6734434 and 6849854 apply - Other patents Pending

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:

10µA/volt - 100µA/volt - 1000µA/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.

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Saintech Ion Beam Systems - XIAD

Announcing the Series III XIAD ion source system for Physical Vapor Deposition (PVD) processes

The SainTech XIAD Ion System has been specially developed to provide a cost effective solution for ion-based vacuum processes for medium to large sized deposition systems. The XIAD provides an extremely reliable and maintenance-free facility for many applications in PVD processes. The compact design and rugged construction allows easy installation to both new and existing vacuum deposition systems.

XIAD Features:

- Power supply now comes with touch screen interface.
- Touch Screen can be tilted to 45º to allow ease of use.
- Multi-Mode system operation – Continuous, Pulse, Gas Purge, Substrate Pre-clean all at the touch of the screen.
- Save regularly used deposition procedures to file. Save up to 15 separate files with all operational parameters.
- Ion beam energies up to 200eV.
- Ion Beam power to 1.0 kilowatts.
- Anode currents to 5 amps.
- Full-time use of high purity oxygen.
- Highly efficient patented gas injection design greatly reduces gas load.
- Direct water-cooling to reduce maintenance, radiation load and venting delays.
- Extremely low maintenance. The patented design utilizes a specially coated anode, that resists build-up of electrically insulating oxide coatings. No need to change anodes for different gases.
- Extremely stable operation in IAD processes due to patented electrode design.
- Broad - beam divergence for large area coverage with a uniform ion flux.
- Rapid start-up – Only 3 seconds to stable operation from Start.
- Special Coiled Filaments provide >12 hours in pure oxygen per filament.
- **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_2. For further information please refer to separate information sheets.
- **Gas Purge Mode** provided to allow routine purging of gas lines. Automatically switches off at pre-set timeout or when gas flow reaches < 1% of flow range.
- **Pre-deposition Clean Mode** provided to easily pre-clean the substrates immediately prior to deposition.
- **Remote Control & Monitoring** of process parameters. Remote control through RS232 protocol.

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SAINTECH ION BEAM SYSTEMS
SPECIFICATION – SERIES III XIAD

Dimensions	Source diameter 60 mm diameter by 60 mm long (2.5” x 2.5”) Source weight – 1.0 kgs (approx. 2.2 lbs)
Beam power	Anode volts selectable to 225 volts; anode power 1000 W Anode current to maximum 5 amps under manual or automatic beam control
Beam divergence	Wide beam divergence in excess of 80 degrees
Gas flow	Approximately 7sccm argon required to produce 2 amps (typical)
Cooling water	minimum 2.3 liters/minute. Water flow is constantly monitored
Power Unit	weight approx. 28 kgs (60lbs) 135mm x 480mm x 406mm

Options Available:

Dual Gas DG. 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.

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

Complete Series III XIAD package includes:

- XIAD Ion Source
- XIAD Series III Power supply - 208 or 230 VAC, single phase 50 or 60Hz; 10 amps
- Gas flow controller supplied 25 sccm (oxygen) Alicat Scientific.
- Operational, maintenance and service manual
- All feedthroughs – gas, electrical & water.

Complete system supplied with all hardware for installation to new or existing vacuum systems.
All vacuum feedthroughs for process cooling water, reactant gas and electrical supply are supplied to individual requirements. Vacuum chamber flange types supplied to individual requirements.

XIAD Series III power supply
with Touch Screen interface

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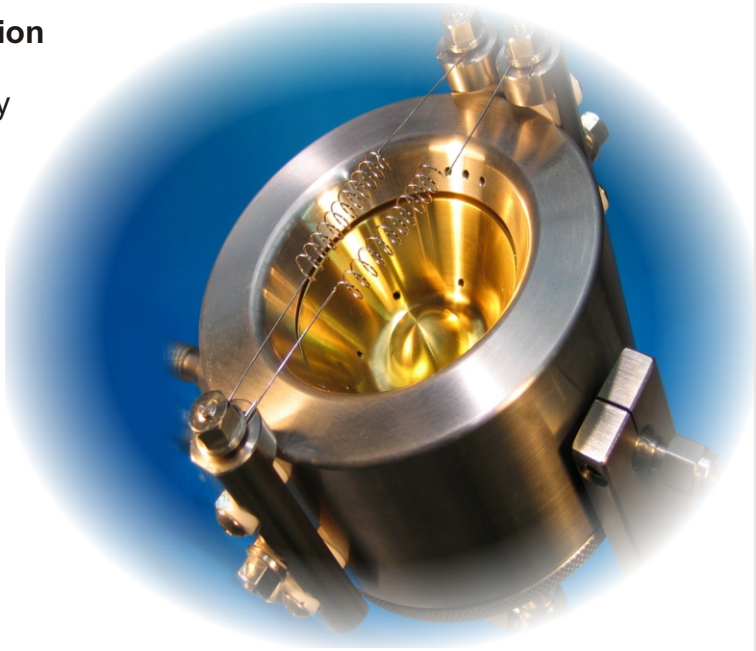
Saintech Ion Beam Systems - ST3000

ST3000 (Series III) 3.0 kW ion beam system - for Physical Vapor Deposition processes in large vacuum systems

The **SainTech ST3000 Ion System** has been specially developed to provide an extremely reliable and maintenance-free facility for many applications in physical vapor deposition processes. The compact design and rugged construction allows easy installation to both new and existing vacuum deposition systems.

The ST3000 and Ion Assisted Deposition
The IAD of thin film growth is a proven technique that provides dense and highly stable films without need of additional substrate heating.
The **ST3000** has further enhanced the IAD process to include deposition onto a wide variety of glasses, plastics and metals.
The **ST3000** provides unparalleled film adhesion for both metal and non-metal films.



ST3000 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 requiring routine replacemen
- Extremely stable operation in IAD processes due to patented 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_2. For further information please refer to separate information sheets.
- Remote Control and Monitoring – all control through an RS232 interface
- Choice of coiled or straight wire filaments

Optional Features Available

- **Dual Filament** - Electronic system detects filament failure and auto switches to second filament.
- **Dual Gas** - This feature provides use of either pure gas delivery or a mixture of two gases in any ratio.

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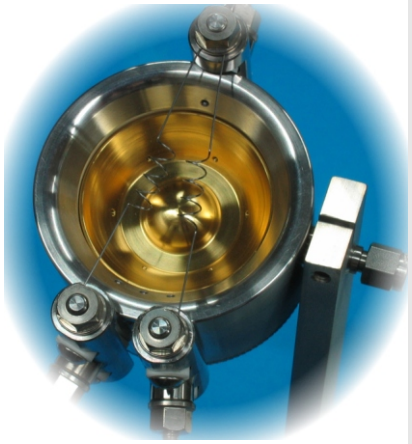
Saintech Ion Beam Systems - ST55

Announcing the Series III ST55 ion source system for Physical Vapor Deposition (PVD) processes

The SainTech ST55 Ion System has been specially developed to provide a cost effective solution for ion-based vacuum processes for medium to large sized deposition systems. The ST55 provides an extremely reliable and maintenance-free facility for many applications in PVD processes. The compact design and rugged construction allows easy installation to both new and existing vacuum deposition systems.



ST55 Features:

- Power supply now comes with touch screen interface.
- Touch Screen can be tilted to 45º to allow ease of use.
- Multi-Mode system operation – Continuous, Pulse, Gas Purge, Substrate Pre-clean - all at the touch of the screen.
- Save regularly used deposition procedures to file. Save up to 15 separate files with all operational parameters.
- Ion beam energies up to 230eV.
- Ion Beam power to 1.5 kilowatts.
- Anode currents to 7 amps.
- Full-time use of high purity oxygen.
- Highly efficient patented gas injection design greatly reduces gas load.
- Direct water-cooling to reduce maintenance, radiation load and venting delays.
- Extremely low maintenance. The patented design utilizes a specially coated anode, that resists build-up of electrically insulating oxide coatings. No need to change anodes for different gases.
- Extremely stable operation in IAD processes due to patented electrode design.
- Broad - beam divergence for large area coverage with a uniform ion flux.
- Rapid start-up – Only 3 seconds to stable operation from Start.
- Special Coiled Filaments provide >12 hours in pure oxygen per filament.
- **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_2. For further information please refer to separate information sheets.
- **Gas Purge Mode** provided to allow routine purging of gas lines. Automatically switches off at pre-set timeout or when gas flow reaches < 1% of flow range.
- **Pre-deposition Clean Mode** provided to easily pre-clean the substrates immediately prior to deposition.
- **Remote Control & Monitoring** of process parameters. A front panel control toggles control from local operator to remote master control and monitoring of all operational parameters.

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SAINTECH ION BEAM SYSTEMS
SPECIFICATION – SERIES III ST55

Dimensions	Source diameter 75 mm diameter by 70 mm long (3” x 2.75”)
	Source weight – 1.4 kgs (approx. 3 lbs)
Beam power	Anode volts selectable to 225 volts; anode power 1500 W Anode current to maximum 7 amps under manual or automatic beam control
Beam divergence	Wide beam divergence in excess of 80 degrees
Gas flow	Approximately 8sccm argon required to produce 2 amps (typical)
Cooling water	minimum 2.5 liters/minute. Water flow is constantly monitored
Power Unit	weight approx. 30 kgs (66lbs) 135mm x 480mm x 406mm

Options Available:

Dual Filament DF. Electronic system detects filament failure and auto switches to second filament. Operator is alerted to first-filament failure by visual signal on screen.

Dual Gas DG. 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.

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

Complete Series III ST55 package includes:

- ST55 Ion Source.
- ST55 Series III 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.

Complete system supplied with all hardware for Installation to new or existing vacuum systems. All vacuum feedthroughs for process cooling water, reactant gas and electrical supply are supplied to individual requirements. Vacuum chamber flange types supplied to individual Requirements.

ST55 Series III power supply
with tilting Touch Screen interface

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