UNISOKU
TII Group

UNISOKU IB201

2kV Backfill Ion Source and Control

Description

UNISOKU IB201 sputter Ion Gun is the ideal solution for sputter cleaning of samples under UHV conditions. IB201 sputter Ion Gun consists of the Model 04-165 2kV Backfill Ion Source and the Model 32-165 Ion Source Control. These units are interchangeable with the PHI® 04-161 and 04-162 ion guns and the PHI® 20-045 control, respectively.

The Model 04-165 Backfill Ion Source generates an energetic inert gas ion beam for sputter-etching solid surfaces. The source requires a static pressure of 5×10^{-5} torr with an inert gas such as argon. Ions are generated by electron impact within the ion source's dual filament ionization chamber and are then focused at the target with energies of up to 2kV. The impurity content of the ion beam is minimized by using an off-axis filament geometry. A focusing lens permits high ion current density to be obtained for a given operating pressure and source-to-sample distance. A dual tungsten filament assembly permits continued operation when the first filament opens. The expected lifetime of the filament assembly is several years under normal usage at the recommended operating conditions. The filament assembly is easily replaced in the field.

The Model 32-165 2kV Ion Source Control provides all the necessary voltages and currents required to operate the Model 04-165 2kV Backfill Ion Source. The beam voltage may be activated manually, remotely, or with the built-in timer. Additionally, the anode (ion) and filament currents, as well as the beam and focus voltages, may be externally monitored to ensure accurate reproduction of sputtering conditions.

Advantages

- **Unique 04-165 Features**
  - Fits on standard 2.75" flange (1.35" ID tude; 1.5" OD)
  - Designed for easy maintenance
- **Unique 32-165 Features**
  - Built-in timer for sputtering
  - Hour meter to track filament lifetime

04-165 Backfill Ion Source and 32-165 Ion Source Control

04-165 ion source specifications

Source Type	Hot filament electron impact (Dual filament, backfill type)
Beam Energy	0.5 to 2kV
Beam Diameter	
at 25mm working distance	2.5 mm FWHM (at target)
at 50mm working disatance	3.5 mm FWHM (at target)
Maximun Total Target Current	10μA at V_B = 2 kV
Current Density	
at 25mm working distance	200μA/cm^2 when V_B = 2 kV, Emission Current = 30 mA
at 50mm working distance	100μA/cm^2 when V_B = 2 kV, Emission Current = 30 mA
Mounting	Standard 70 mm (2.75") CF bored flamge OD, approx. 34.3 mm (1.35") ID minimum tube required
Working Distance	Typically 25-50 mm from end-of-optics to target
Source Gases	Typically Argon, but can also use He, Ne, Kr & Xe
Bake-Out Temperature	200℃ Maximum

32-165 ion source control specifications

Input Power	90-264 VAC @ 47-63 Hz, single phase
Beam Supply Voltage	500 to 2000 V in 500 V increments
Controls	
Beam Control	Manual, Timer, Remote (TTL high → on)
Beam Voltage	4-position switch
Focus Voltage	5-turn potentiometer
Filament Current	5-turn potentiometer
Timer	1-turn potentiometer (0-60 min.)
Front Panel Monitors	
Beam	0 to 2 V correnspondsti 0 to 2 kV
Focus	0 to 2 V corresponds to 0 to 2 kV (referenced to V_B)
Filament	0 to 2.5 V corresponds to 0 to 2.5 A
Anode Current	0 to 10mV correnspondsto 0 to 10μA
Cooling	Convection
Dimentions	19" rack mount x14" deep x3" high

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