

ION SOURCES

5 kV Differential Ion Gun Control

Model 11-065 5 kV Differential Ion Gun Control

This 5 kV Differential Ion Gun Control is a multi-output power supply with a two-axis deflection system for use with the Model 04-303A 5 kV Differential Ion Gun. The ion gun control is comprised of five voltage-regulated power supplies and one current-regulated power supply.

The beam supply is adjustable between 500 and 5000 V and is referenced to ground. Local or remote on/off control of the beam voltage is provided via a front panel switch or a remote, TTL-level control signal.

The condenser and objective supplies are slaved to the beam supply so that the output of these supplies is adjustable between 70 and 100 percent of the beam supply. Once the ratio is set to the desired value, the ratio will be approximately maintained as the beam voltage is varied. However, the minimum focus voltage is +100 V DC.

The grid and extractor supplies are fixed-voltage supplies referenced to the beam voltage.

The current output of the grid supply represents the "emission current" of the ion gun filament. This current can be monitored by the front panel meter of the ion gun control. While both grid and extractor supplies have fixed outputs, they do have a limited range of adjustment by means of board-mounted potentiometers. A rear panel switch allows the ionization energy to be changed from 120 eV (ISS mode) to 200 eV (normal mode).

The filament current supply is a current-regulated supply that is also referenced to the beam voltage. Since it is important that the emission current remain constant, the measurement of the emission current is used as a feedback signal to the filament current supply.

The two-axis deflection system provides push-pull, sawtooth, output voltage waveforms for both axes. The amplitude is adjustable between 0 and +1200 V AC, peak-to-peak maximum. Independent, single-turn potentiometers for each axis, mounted on the front panel, are used to control the size and shape of the rastered area. Back panel, BNC connectors are provided for external horizontal and vertical drive inputs, which can be used for ion-induced imaging or with PHI SIMS controls for SIMS signal gating purposes.

An aperture plate in the ion gun collects a fraction of the ions that are produced in the ionization region. This current is a function of pressure and is used as a pressure measurement signal and feedback signal for the optional regulated leak valve. The current is read as a pressure on the panel meter of the control. The meter circuit has a switch to select either emission current or pressure in Pascal.

Power requirements for the ion gun control are supplied by a power module. The power module transforms the line voltage to the required voltage levels and regulates and filters these voltages. The module has all the required heat sinking and overload protection.



Model 11-065 5 kV Differential Ion Gun Control

ION SOURCES

5 kV Differential Ion Gun Control

Continued
Model 11-065
5 kV
Differential Ion
Gun Control

Specifications:

Beam Voltage:	To 5 kV continuously variable, local or remote on/off control
Beam Deflection:	<i>Static:</i> independent control for x- and y-deflection (± 0.5 mm); automatic compensation for constant beam position when beam voltage is changed. <i>Raster:</i> independent control for x- and y-deflection to a maximum 10 mm by 10 mm rastered area; automatic compensation for constant beam position when beam voltage is changed; provision for external or computer-controlled drive (0 to 10 V input).
Ion Source Emission Current Range:	0 to 50 mA, metered; feedback provided for automatic leak valve regulation.
Order # (for stand alone component):	612368 (The Model 11-065 is also included in the Model 6033 5 kV Differential Sputter Etching System. Refer to page 123 for ordering information.)
Shipping Weight:	26.4 kg (58 lb)
Includes:	Manual
Cable/Support Kit #:	615424
Related Equipment: Model 04-303A 5 kV Differential Ion Gun, Model 04-250 Multiple Gas Inlet Manifold, Model 6033-LV-02 Regulated Leak Valve and Control, 371027 Manual Leak Valve, Gas Capsules, and Model 6033 5 kV Differential Sputter Etching Base System.	