

MATERIALS SCIENCE, INC.

Vacuum & Thin Film Technology



Ion™ Series Research DC Sputtering Packages



Shown with 3" Polaris™ Adjustable Position Source with Tilt and Shutter

- ▶ **500/1000/1500 Watt Low Cost Packages for Those With Limited Budgets Desiring Full Capability**
- ▶ **Advanced Ion™ DC Magnetron Power Supply with Superior Arc Detection & Suppression - < 100 nsecs (.1 μ secs)**
- ▶ **2" & 3" Polaris™ Sputtering Sources in Many Configurations**
- ▶ **Complete - All Cables, Vacuum Hardware and Feedthroughs Included**

Description

The Polaris™ packages feature the most advanced research sputtering sources and magnetron power supply available at an economical price. Simply select the sputtering source from the wide variety of configurations offered and note the target mounting method to define the exact package desired. Click [here](#) to examine your options.

Polaris™ sources provide industrial robustness and performance in a small package. They can operate stably at low 10^{-4} Torr background pressures at very low power levels. Conversely, because cooling water flow rates through the sources are nearly 2.5x that of competing sources, extremely high power levels can be achieved using directly water cooled targets during long process runs and pre-commercial development efforts.

The Ion™ DC Magnetron Power Supply is a full featured, advanced, software driven device - detecting and suppressing arcs in < 100 nsecs (.1 μ secs). It has a wide 0-1000 volt range compared to 0-800 volts supply supplied by competitors allowing full rated power under nearly all conditions. It is

packaged in a compact, low profile 19" rack mount chassis. Click [here](#) for more information.

An optional DC Pass/RF Blocking Filter is required to protect the Ion™ DC power supply if an RF power supply will be used to drive a second sputtering source or to provide substrate bias.


Everything required to install the Polaris™ internally mounted sputtering source into the users system and connect it to the Ion™ DC power supply is supplied, including all necessary electrical, gas, rotary motion, vacuum hardware and an 8' long cable between the sputtering source and power supply. A comprehensive documentation package is provided. Other feedthrough arrangements and cable lengths are possible - please consult the factory.

Typical Polaris™ Sputtering Source Configurations



Fixed position, adjustable position, tilt, shutters and flange mounted assemblies are among the various configuration possibilities


Specifications

Sputtering Source	Polaris™ GEN II Sputtering Source or Assembly
Target Size	2" or 3" diameter
Feedthroughs & Mounting Flanges	Refer to Polaris™ Interface Control Drawings
Ion™ DC Power Supplies	
Input Frequency	50 - 60 Hz
Input Phase	1 phase
Input Voltage	85 - 275 VAC (lower VAC may limit output)
Input Current	12 amps maximum
Power Factor	> 0.98
Input Power Consumption	1.75 kW
Output Power	1500 watts; 1000 watts; 500 watts
Output Power @ 1000 volts	1500 watts; 1000 watts; 500 watts
Output Power @ 500 volts	1500 watts; 1000 watts; 500 watts
Output Power @ 200 volts	800 watts; 600 watts; 400 watts
Output Voltage (steady state)	1000 volts maximum
Output Voltage (strike)	1000 volts maximum
Output Power Resolution Compared to Setpoint - 500 to 1500 watts	±1 watt
Output Power Resolution Compared to Setpoint - 500 watts or less	± 0.5 watt
Output Current (maximum)	4A (1500 watts); 3A (1000 watts); 2A (500 watts)
Arc Detection Time	< 100 nsecs (.1 μ secs)
Arc Energy	< 1 mJ
Arc Detect Delay Time	0.1 to 6500 μ secs (adjustable)
Arc Out/Off Time	0 (no arc handling) or 32 to 65000 μ secs (adjustable)
Arc Rate Counter	Yes
Arc Recovery Time	Set points will be re-established < 200 μ secs after arc off time
Line Regulation	> 99% (includes load and line variations over an arbitrary time interval) - aka < 1%
Load Regulation	> 99% (includes load and line variations over an arbitrary time interval) - aka < 1%
Power Ramping	0.001 to 65 seconds (adjustable)
Run Timer	0.1 to 6553 seconds (adjustable)
kWHr Counting	Yes


kWhr Limit	0 (limit shutdown disabled) or 0.01 to 655 kWhr's
LED Display Accuracy	1%

Display Resolution	0.1 watt, 1 volt, 0.001 amp (1 milliamp)
Stored Target Information	Stores parameter sets for targets that can be re-installed after exchange. Saves P/V/I, ramp time, run time, arc detect delay, arc off time, kWhr's for 7 separate targets
Interlocks	1 each
Temperature Monitoring/Protection	Yes. "Fan on Demand" cooling with thermal shutdown protection.
Dimensions	48.3 cm/19" x 53.3 cm/21" x 4.44 cm/1.75" (1 U Rack Height)
Weight	8.2 kG/18 pounds
RS-232/Analog Interfaces	Yes
DC Bias Operation	Basic open circuit operation between 1000 volts to < 100 volts
Output Power Connector	Female HN
Ordering Information	Contact factory or refer to Polaris™ Ordering Information for a complete list of possible packages.

Options

DC Pass/RF Blocking Filter and 12" long RG-8/U Cable	
RF Filtering Range	1 - 13.56 MHz
DC Pass	Complete
Dimensions - Click here for drawing	16.51 cm x 8.89 cm x 7.62 cm (6.50" x 3.5" x 3")
Weight	861 grams (1.9 pounds)
Specifications	See Sales Brochure AC 200
Ordering Information	Contact Factory or refer to Ion™ DC Magnetron Power Supply Ordering Information

Options - Continued

<p>DC/RF Power Supply Switches</p>	
<p>Inputs</p>	<p>1 or 2 each DC and/or RF power supply</p>
<p>Outputs</p>	<p>2, 3 or 4 output models</p>
<p>Dimensions - Click here for drawings</p>	<p>16.51 cm x 19.05 cm x 5.08 cm (8.01" x 7.5" x 2")</p>
<p>Weight</p>	<p>1.36 kG (3 pounds)</p>
<p>Specifications</p>	<p>See Sales Brochure AC 400</p>
<p>Ordering Information</p>	<p>Contact Factory or refer to Ion™ DC Magnetron Power Supplies Ordering Information</p>

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