SPARC-LE® 20 ACCESSORY

DC PULSING
ARC HANDLING

The Sparc-le® 20 accessory is for AE MDX dc power supplies output currents under 25 A. In response to today's demand for improved film quality with fewer defects, the Sparc-le 20 unit accessory provides exceptional arc repression capability by preventing the formation of arcs. It's also a cost-effective method to improve sputtered film quality.

The Sparc-le 20 unit clears arcs in 5 ms and dramatically reduces the number of hard arcs, resulting in reduced particulates and increased process time. Its small size allows for easy integration into existing systems with both old and new MDX products.

PROCESS IMPROVEMENTS

- *A decrease in uniformity defects in some ZnO and Al_2O_3 processes*
- *Virtual elimination of particulates in some aluminum processes*
- *A 50% reduction in defect rate in carbon sputtering processes*
- *Improved film quality*
- *Increased throughput due to the ability to operate at higher powers*
- *Fewer and softer nodule formations on carbon targets*
- *Higher deposition rates in reactive processes*

BENEFITS

- *Reduced arcing*
- *Reduced particulates*
- *Improved uniformity*
- *Improved sputter yields*
- *Higher throughput*
- *Reduced target contamination*
- *Wider process latitude*

APPLICATIONS

- *ITO*
- *Al_2O_3*
- *SiO*
- *SiN*
- *Ta_2O_5*
- *ZnO*
- *TiO_2*
- *TiN*
- *TiW*
- *ZrO_2*
- *Si_3N_4*

OPERATING MODES

Self-Run Mode

The self-run mode is key in inhibiting the formation of arcs. When this mode is selected, the Sparc-le 20 unit will automatically reverse the target voltage for 5 ms at a 20-kHz rate. This voltage reversal prevents charge buildup on the system surfaces, slows the growth of insulating layers (i.e., oxide, nitride, carbon nodules), and thereby extends target life and reduces the introduction of destructive particulates from the target's insulating layers. While in the self-run mode, the Sparc-le 20 unit will continue to process arcs if they occur.

Active Arc-Handling Mode

The active arc-handling mode is the primary operating mode. In this mode, the target current is immediately shunted away from the target when an arc is about to begin. When the current source is removed and the target voltage is reversed for a short time, the arcs are quenched quickly.

Arc-Out™ Enhancement Mode

For certain target materials, some arc energy is required to clean and condition the target. In this mode, the target is cleaned more quickly than with the standard MDX supply alone. When the Sparc-le 20 is turned off, it automatically activates the Arc-Out enhancement circuit.

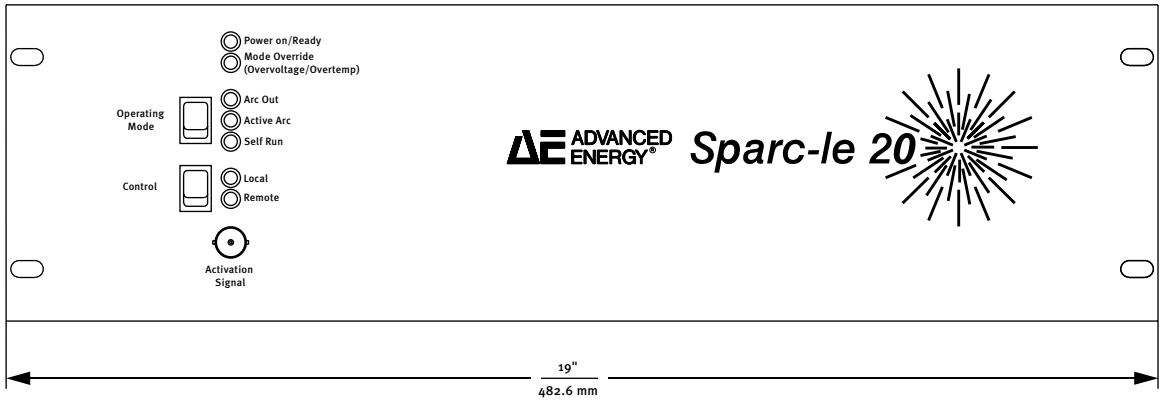
Activation Counting

The Sparc-le 20 unit includes an isolated signal, connected to a BNC connector, which can be monitored by a counter. Each time Sparc-le 20 suppresses an arc, a 5-V, 5-ms signal is generated.

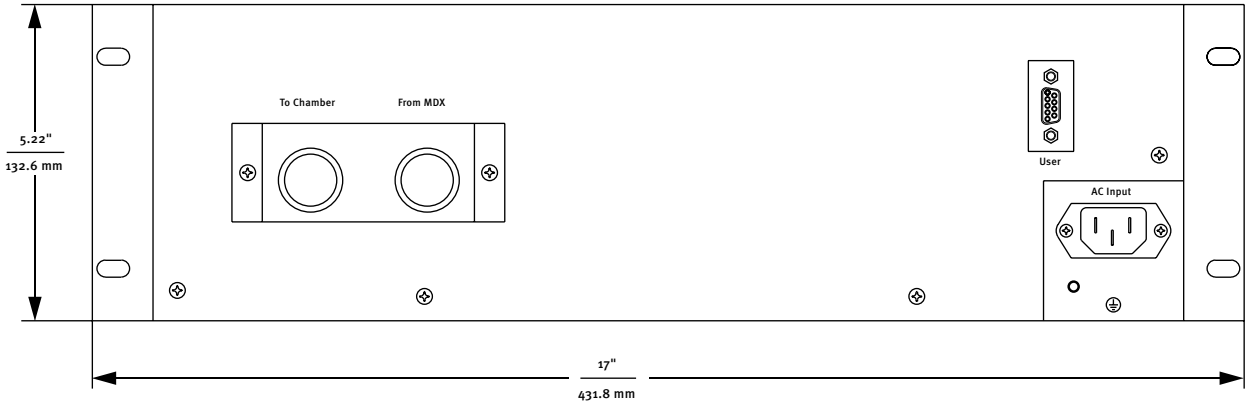
SPECIFICATIONS

SPARC-LE 20 SPECIFICATIONS	
AC Input Voltage	90-126.5 Vac RMS, 50/60 Hz, single phase, 30 VA 180-253 Vac RMS, 50/60 Hz, single phase, 30 VA
DC Input Voltage	Any low-Z or standard-Z output from an MDX magnetron supply with output current below 1.5 A
DC Current	25 A steady state maximum; no minimum current is required for operation The supervisory circuit requires a minimum of 1.5 A before it is operational
DC Input and Output Connectors	UHF type, female, Amphenol part number 83-1R
Cable Connector for DC Input and Output	UHF type, male, Amphenol part number 83-822
DC Input and Output Cables	RG-8U coaxial cable; output cable from the unit to chamber not to exceed 6 m (20')
Input and Output DC Polarity	Negative output (positive at ground) Negative output (positive floating less than 100 V from ground)
Arc-Handling Characteristics	40,000 arcs/s maximum; 5-7 ms typical arc recovery time; 1,800 V absolute maximum input dc voltage; 150 V minimum to 1000 V maximum output operating range; 5-20 ms delay before next arc can be processed
Size	132.08 mm (H) x 482.6 mm (W) x 175.26 mm; 5.2" (H) x 19" (W) x 6.9" (D)
Weight	7.7 kg (17 lb) maximum

Front View



Rear View



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