

EXHIBIT 28

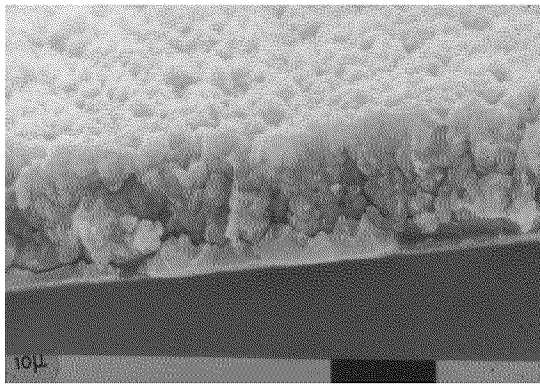
Pinnacle™ Plus+ Pulsed DC Power Supply: New Horizons in Reactive Sputtering Performance

AE's new Pinnacle Plus+ pulsed dc power supply opens up new performance horizons for your reactive processes. Traditionally, RF has been used to create high quality films by sputtering insulating targets directly. With its advanced pulsed dc capabilities, AE's new Pinnacle Plus+ product line offers a cost-effective, technologically advanced alternative—and it's available in single- and dual-output 5 kW models as well as single-output 10 kW models.

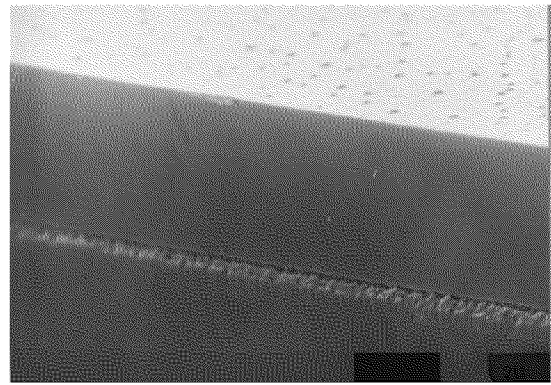
Using RF technology is expensive and complex compared with using pulsed dc technology available in the Pinnacle Plus+ product line. This new product line delivers high-quality films and allows increased throughput. It is ideal for extending the performance of existing processes as well as for expanding the possibilities for developing new, previously unachievable dc processes.

The Pinnacle Plus+ product line is an effective combination of standard dc technology and process-proven pulsed dc technology first invented by AE in the early 1990s. AE's application and engineering expertise ensures a robust, flexible, reliable design that delivers the high output accuracy and process repeatability that is critical in reactive processes.

Performance Results You Can See



Al₂O₃ sputtered without pulsed dc.



Al₂O₃ sputtered with pulsed dc.

Photo Source: Centre for Advanced Materials and Surface Engineering, University of Salford, UK

Innovative Features and Performance Benefits You Can Bank On

- ∞ Individually controllable dual-output pulsed dc power from a single unit
 - Provides a cost-effective solution for multi-chamber production
- ∞ Increased process flexibility
 - Incorporates an extended frequency range of 5 kHz to 350 kHz
 - Full power over a wide impedance range with high current at low voltage
 - 50% duty cycle—the highest available—enables bi-polar pulsed dc operation
- ∞ More repeatable process performance
 - Integrated microprocessor
- ∞ Active front panel
 - Provides easy access to critical parameters
- ∞ Meets CE requirements

Easy to Operate

Ease-of-use is a top design consideration with the Pinnacle Plus+ product line which offers a wide selection of well established User and Host port protocols. In addition, we've designed the "form and fit" to allow easy transition from earlier generations of AE supplies.

Electrical Specifications

Output

Power Options	10 kW: Single output 5 kW: Single output; dual output, independently controlled
Voltage Range	325 Vdc to 650 Vdc
Maximum Current	10 kW: 30.8 A (below 325 V) 5 kW: 15.4 A (below 325 V)
Frequency	5 kHz to 350 kHz (variable)
Reverse Time	400 nsec to 5 μ sec (variable)
Duty Cycle	Up to 50%
Reverse Voltage	10% of the operating voltage
Ignition Voltage	1700 V
Regulation Modes	Power, voltage, or current
Repeatability	Output power repeatability from run to run at a constant setpoint is 0.1% from 10% to 100% of rated power
Output Readback Accuracy	Accuracy of actual output value (V, kW, or A) to setpoint at 25°C is $\pm 1\%$ of the actual value or $\pm 0.2\%$ of the full rated output (whichever is greater) for the full input voltage range and output impedance range

Input

Voltage Range	360 Vac to 440 Vac, 3 ϕ , 50/60 Hz, no neutral required
Current	Dual 5 kW & Single 10 kW: 17 A nominal Single 5 kW: 9 A nominal

Communications Specifications

Front Panel	Active front panel or passive display front panel
Remote Panel	Accessory available
Host (Serial)	RS-232/422/485 or Profibus (12 Mbit)
User (Analog)	24-V isolated or 15-V non-isolated

Physical Specifications

Size	133 mm (H) x 483 mm (W) x 639 mm (D), including connectors 5.22" (H) x 19" (W) x 25.18" (D)
Weight	Dual 5 kW & Single 10 kW: 30 kg (66 lb) Single 5 kW: 25 kg (55.25 lb)
Input Power Connector	Five terminal, DIN compression terminal block
Input Cable	Supports up to 8 AWG wire per terminal
Output Connector	Shielded strain relief with a 3-terminal, multi-contact, pluggable connector; other options are available
Output Cable	Triax or twinax (shielded) cable recommended
Host and User Port Cable	Shielded cable recommended

Compliance Specifications

Electro-Magnetic Compatibility	Tested for and complies with Directive 89/336/EEC: Standards EN 55011 (CISPR 11 Group 2, Class A) and EN 50082-2
Safety Standards	Tested for and complies with Directive 73/23/EEC: Standard EN 50178
Installation Requirements	Standards listed and also EN 60204 (IEC 204), VDE 0113, and other applicable requirements

Environmental Specifications During Operation

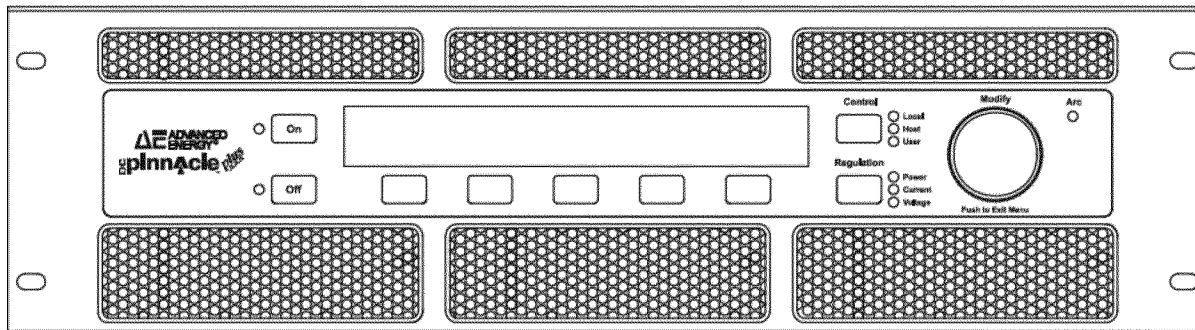
Air Temperature	0°C to +40°C (+32°F to +104°F)
Relative Humidity	5% to 85% (+1 g/m ³ to +25 g/m ³), no condensing or icing
Air Pressure	80 kPa to 106 kPa (800 mbar to 1060 mbar)

Ordering Information

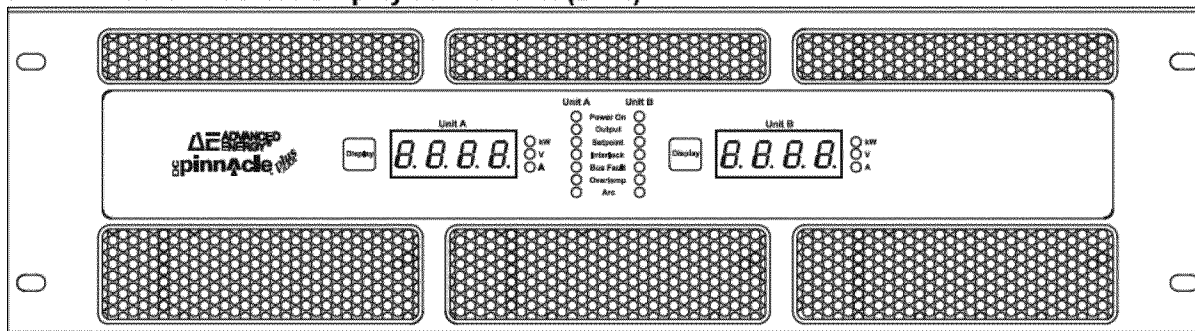
Description	AE Part Number	Configuration
5 kW /5 kW	3152430-xxx	5 kW, dual output
10 kW	3152432-xxx	10 kW, single output
5 kW	3152434-xxx	5 kW, single output

xxx Please contact your local AE sales representative for information on available options and pricing.

Pinnacle Plus+ Active Front Panel



Pinnacle Plus+ Passive Display Front Panel (Dual)



Pinnacle Plus+ Rear Panel (Dual)

