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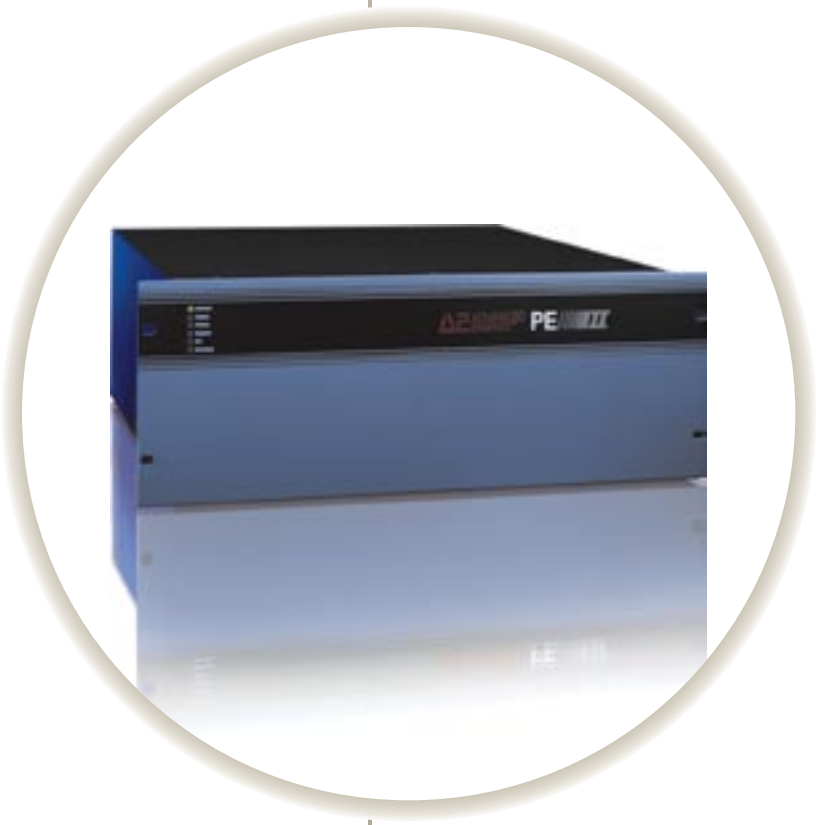
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ADVANCED ENERGY®



PEII Series Low-Frequency Power Supplies, 5 to 60 kW

Enhanced arc control with internal load matching for 40 kHz reactive sputtering applications

Benefits

High power density

Wide tap range

Regulation on power, voltage, or current

Enhanced arc control

Automatic process safeguard

Flexible modularity

The PEII power supply provides 40 kHz pulse width modulation (PWM), and features advanced arc control and internal load matching with outputs of up to 60 kW when combining units—requiring no external hardware such as transformers or tuners. The power supply also offers two distinct arc-handling circuits, and the floating output can be grounded on either side.

PEII power supplies feature a water-cooled design and tight output regulation on power, voltage, or current, with a measurement accuracy of 1% and with low harmonics. The PEII power supply is compatible with a programmable logic controller (PLC) and is CE compliant.

High Power Density

PEII units offer remarkable power density—with a power factor of > 0.9. Their efficient, compact design offers internal load matching, which enables you to take advantage of the PEII series' wide tap range without additional hardware and at significant space savings over other types of power supplies.

Wide Tap Range

The PEII series' comprehensive voltage range (307 to 953 V_{RMS}) allows you to operate continuously through nearly a 10:1 impedance range. This wide tap range saves money because you only need to buy the power output that your application actually needs.

Constant Regulation on Power, Voltage, or Current

You can select to control your process not only by constant load power, but also by voltage or current. Thus, you can optimize your processes using whichever control regulation mode best fits the running process.

The compact PEII series offers 40 kHz with up to 60 kW and two distinct arc-handling circuits.

Enhanced Arc Control

PEII power supplies offer two distinct arc-handling circuits. Current-arc circuitry handles major process arcs. In addition, voltage-arc circuitry detects and reacts to micro-arcs—substantially reducing the occurrence of major process arcs by pulsing the PEII unit off for a short period. The voltage-arc circuitry detects changes in the output waveform created by a micro-arc within one half-cycle of the output. You can select how sensitive the voltage-arc circuit is to the changes in the output waveform, and you can select the duration of the "off" pulse. Thus, the PEII power supply provides the fastest possible response with the best possible signal-to-noise ratio.

Automatic Process Safeguard

If a fault occurs, such as a water flow restriction that causes thermal shutdown to a slave unit, the PEII system automatically recognizes the fault occurrence and redistributes the power output to the working units. This ensures maximum power output to the process and enables you to work through a fault condition to complete the runs you have in process.

Flexible Modularity

With its high power density and wide tap range, the PEII power supply offers designed-in flexibility. Because of their high power density, PEII units are a compact 178 mm (7") high—which translates into valuable space savings. For comparable power configurations, the PEII unit is up to two-and-a-half times smaller than competing power systems.

Built-In Protection

All PEII power supplies have complete internal protection for over-voltage, over-current, over-power, and open and short circuits. User connections let you add inputs such as vacuum, water, and system interlocks.

CE Compliance

All PEII power supplies comply with the following CE standards: EN55011 (emissions), EN61000-6-2 (immunity), and EN50178 (safety).

Reliability and Serviceability

Designed to be among the most reliable and highest-quality power supplies available, all PEII units carry our standard one-year warranty for parts and labor.

The PEII series' automatic process safeguard ensures maximum power output to the process and enables you to work through a fault condition.

Applications

The PEII power supply is an integral part of your plasma-based industrial coating system. It contributes to improved efficiency and cost-effectiveness by helping to reduce arcing, increase throughput and film quality, and maximize target utilization. The PEII supply is valuable in applications such as

- *Dual-cathode and other reactive sputtering applications such as Al_2O_3, SiO_2, and diamond-like carbon (DLC) used to create energy-efficient optical and glass coatings*
- *Dual-cathode PECVD of SiO/SiO_2 that produce film and plastic coatings for decorative films, food packaging, capacitor films, and other films*
- *PECVD, DLC, metal oxides, and carbon coatings that provide tool and tribological coatings for cutting tools, surface hardened gears, and other rotating and wear surfaces as well as for hip joint replacements and lubricating surface treatments*

Accessories

AE® offers the following optional accessories to enhance the performance of your PEII power supply.

RAS Split Inductor

AE's redundant anode sputtering (RAS) split inductor eliminates the disappearing anode problem from single-target reactive sputtering processes, thus enabling such systems to approximate DC sputtering rates. The RAS inductor's novel design incorporates two anodes and a single cathode, which facilitates retrofitting onto existing systems.

Solenoid Controller

Strongly recommended in high-humidity environments, this accessory interrupts coolant flow when the unit is not producing power. This reduces the likelihood of condensation, which can interfere with the power supply's electronics. User-configurable switches allow you to adjust the delay time from power-off to a water interruption from 30 seconds to 30 minutes.

Extender Hoses for Stacking Units

Extender hoses, connected before you stack your PEII power supplies, ease installation by extending hard-to-reach water connections behind the units. This makes these connections readily accessible, thus simplifying set up and maintenance.

LMII 10 k

The LMII product is an external, three-tap step-up transformer that works with the PEII supply's internal seven-tap transformer to provide seamless load matching and increased flexibility for processes requiring higher operating voltages.

		Min Input 307 V at 10 kW	Max Input 953 V at 10 kW
Taps	**Ratio**	**Min V Output**	**Max V Output**
1	2.0	614	1906
2	5.0	1535	4765
3	10.0	3070	9530

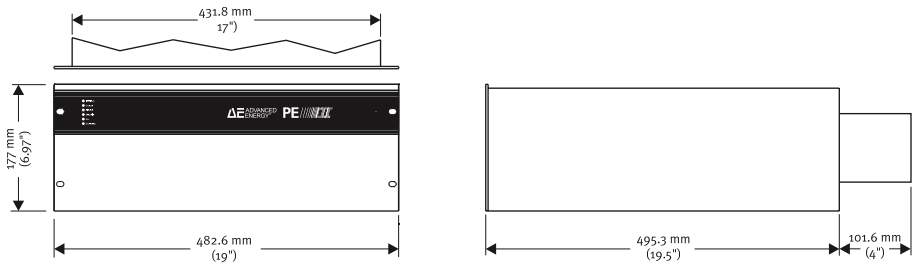
Specifications

Physical	5 kW Model	10 kW Model
Dimensions	177 mm (H) x 482.6 mm (W) x 495.3 mm (D); 6.97" (H) x 19" (W) x 19.5" (D) 102 mm (4") required for rear panel connections	
Weight	40.8 kg (90 lb) max	
Connector and Cable Specifications		
RF Output Connector	Dual output, terminal block with approved safety cover	
RF Voltage and Current Monitors	BNC female	
User Port Connector	25-pin, sub-miniature D, female, with 4-40 jack post	
AC Power Input	Site wired, 4-wire DIN rail (terminal block) with cover	
Input CEX/Drive Connector	50-pin, SCSI 2, female, with 2-56 jack post	
Output CEX/Drive Connector	50-pin, SCSI 2, female, with spring clips	
Coolant Connectors	3/8" female NPT	

Electrical	5 kW Model	10 kW Model
Source Voltage	180 to 230 VAC (208 VAC nominal); 3ϕ with ground (no neutral)	
Efficiency	85% at full-rated output	
Power Factor	0.90 at full-rated output	
Output Frequency	40 kHz ±0.01%	
Output Power	5 kW and 10 kW models	
Output Voltage	547 V_{RMS} nominal in tap 4; 953 V_{RMS} max in tap 7	
Output Current	9 A_{RMS} nominal in tap 4; 16 A_{RMS} max in tap 1	18 A_{RMS} nominal in tap 4; 32 A_{RMS} max in tap 1
Output Load	42 Ω dual floating outputs nominal in tap 4	84 Ω dual floating outputs nominal in tap 4
Load Match	7 taps, 2:1 impedance range per tap	
Arc Circuitry		
Voltage Arc	The minimum output voltage level required for this circuit to become activated is user-selectable at 15%, 29%, 44%, or 58% of full-scale voltage for a given tap. When the half-cycle average drops below a user-selectable trigger level, the circuit pulses power off for a user-selectable time. You can also choose to completely disable this circuit.	
Current Arc	Removes output power for 10 msec when current exceeds 20% above maximum current allowed in a given tap position. Re-application of output power goes through a programmed ramp sequence.	
Regulation Modes	Power, voltage, and current	
Measurement Accuracy	±1%	

Environmental	5 kW Model	10 kW Model
Ambient Temperature	0 to 40°C (32 to 104°F)	
Relative Humidity	15% to 85%, non-condensing	
Cooling Requirements		
Cooling Medium	Water	
Temperature	5 to 30°C (41 to 86°F) to inlet temperature	
Flow	7.57 lpm (2 gpm) min	
Pressure	6.9 bars (100 psi) max	

Dimensional Drawing



Specifications are subject to change without notice.

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