



AE PRODUCT & SERVICES PORTFOLIO
PRECISION POWER & CONTROL



AE is a leader in global high- technology applications.

- › Semiconductor
- › Glass
- › Flat panel display
- › Thin-film solar
- › Industrial coatings
- › Mass spectrometry
- › X-ray
- › Instrumentation
- › Other key markets





With a focus on power conversion and control that spans more than three decades, we build industry-specific expertise into every solution and deliver manufacturing solutions that create an advantage for our customers.

WE DELIVER



**AE Innovation
and Technology**

*Solutions as dependable as
they are innovative*



Premier Solutions

*Proven products that deliver
today and adapt to your
needs tomorrow*

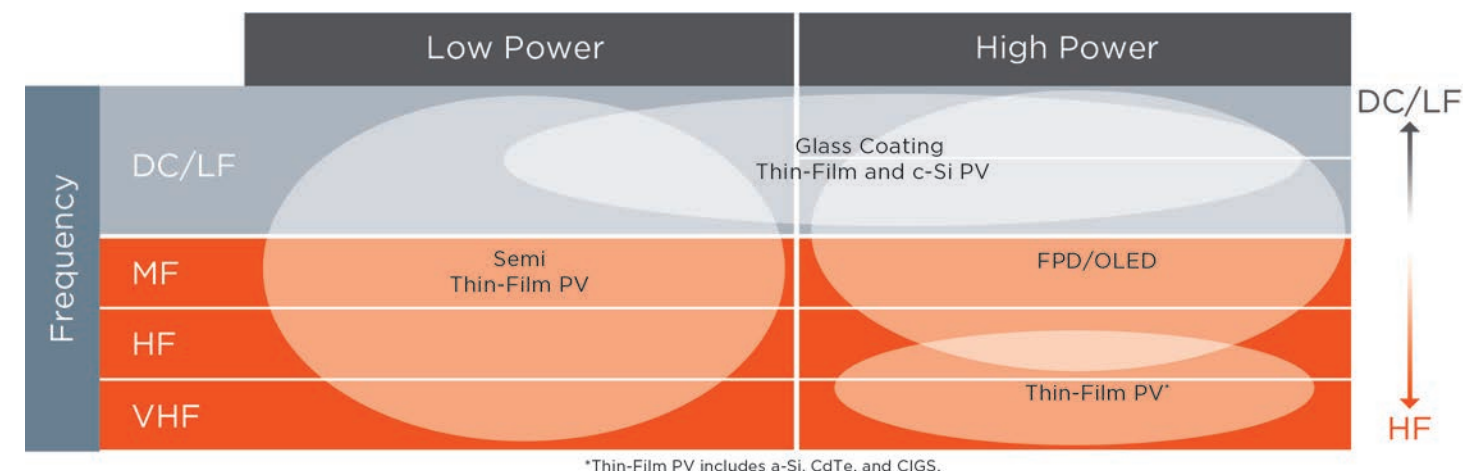


**Global Coverage
Local Resources**

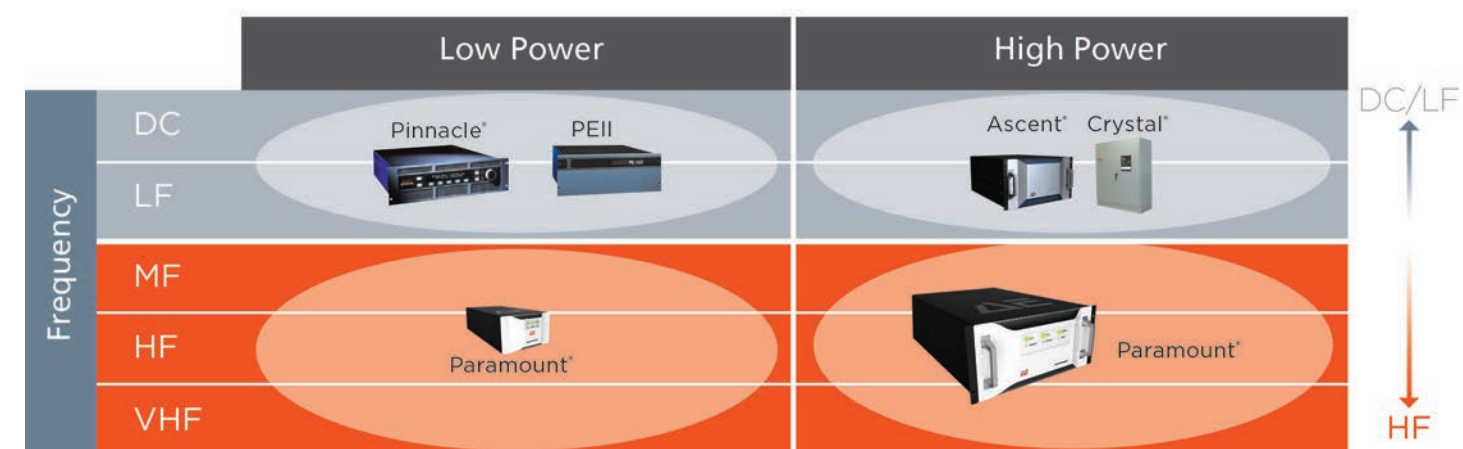
*Rapid-response service and
support, worldwide*



THIN-FILM PROCESSES REQUIRE DIVERSE POWER TECHNOLOGIES



AE'S BROAD PRODUCT PORTFOLIO MEETS YOUR NEEDS





AE POWER DELIVERY SYSTEMS AND CONTROLS

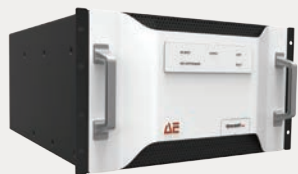
PRODUCT		POWER/MAX DATA RATE	PERFORMANCE RANGE	APPLICATION							
				SPUTTERING		ETCH/CLEAN	CVD	ALD	ABATEMENT	HEATING, MELTING, AND MOULDING	OTHER
				METAL	INSULATIVE						
Direct Current/ Low Frequency	DC Suite: Ascent®, Pinnacle®, and Solvix® Series	3 to 480 kW	—	X							X
	Pulsed-DC Suite: Pinnacle® Plus+ and Solvix® Series	3 to 60 kW	5 to 350 kHz	X	X						X
	Solvix® Arc Series	0 to 400 A	1 to 200 Hz (optional)	X	X						X
	Solvix® Bias Series	3 to 30 kW	1 to 350 kHz (optional)	X	X						X
	PEII Series	5 to 10 kW	40 kHz	X	X	X	X				X
	Ascent® DMS Accessory for Ascent® AMS DC	30 to 180 kW	500 Hz to 50 kHz	X	X						X
	Crystal® Series	60 to 180 kW	Up to 100 kHz	X	X		X				X
Mid Frequency	Paramount® MF Series	2 to 8 kW	330 to 460 kHz			X	X				X
		5 to 15 kW	2 MHz			X	X				X
	PDX® Series	900 W to 8 kW	235 to 460 kHz			X	X				X
	Cesar® Series	300 W to 5 kW	400 kHz to 4 MHz			X	X				X
High Frequency	Paramount® HF Series	1.5 to 6 kW	13 MHz	X	X	X	X	X			X
	Apex® Series	1.5 to 10 kW	13 MHz			X	X				X
	Cesar® Series	300 W to 5 kW	13 to 40 MHz			X	X				X
Very High Frequency	Paramount® VHF	3 to 7 kW	27 to 60 MHz	X		X	X	X			X
	Cesar® Series	300 W to 4 kW	13 to 40 MHz			X					X
Matching Networks	Navigator® II Matching Networks	Up to 50 kW	Up to 60 MHz			X	X	X			
	Navigator® Matching Networks	1 to 15 kW	2 to 60 MHz			X	X				X
	Navio™ Matching Networks	1 to 5 kW	13 to 60 MHz				X				X
Source Technology	Quanta™ Remote Plasma Sources	3 and 6 kW	60 MHz			X		X			X
	Litmas® RPS 1501 and 3001 Remote Plasma Sources	1.5 and 3 kW	1.7 to 3 MHz			X	X				X
	Litmas® RPS for Foreline Abatement	1.5 and 3 kW	1.7 to 3 MHz						X		X
Optical Temperature Pyrometers and Reflectometers	Sekidenko MXE with Reflectance	10 kHz	945, 1075 nm	X	X	X	X				X
	Sekidenko MXE Reflectometer	10 kHz	405, 605 nm	X	X	X	X				X
	Sekidenko OR4000T Multi-Channel	2 kHz	919, 950, 1020, 1500 nm	X	X	X	X			X	X
	Sekidenko OR4000E with Reflectance	1 kHz	919, 1020 nm	X	X	X	X			X	X
	Sekidenko OR400M	250 Hz	3.3, 5.2 µm	X	X	X	X			X	X
	Sekidenko OR400T	20 Hz	919, 950, 1020, 1500 nm	X	X	X	X			X	X
Thyristor Power Controllers	Thyro-A® Digital Thyristor Power Controllers	1.8 kW to 1.55 MW	8 to 1500 A 230, 400, 500, or 600 V							X	
	Thyro-AX® Digital Thyristor Power Controllers with Touchscreen Display	0.3 kW to 1.55 MW	16 to 1500 A 24 to 600 V							X	
	Thyro-PX™ High-Precision Digital Thyristor Power Controllers for Industrial Applications with Touchscreen Display	3.6 kW to 3.4 MW	16 to 2900 A 230 to 500, or 690 V							X	
	Thyro-S® Digital Thyristor Switches	3.6 to 140 kW	16 to 280 A 230, 400, or 500 V							X	

* High voltage power supplies also are available for semiconductor implantation and inspection, x-ray, mass spectrometry, scientific, industrial, and medical applications.

Solve manufacturing challenges, elevate productivity, and push the limits of innovation.

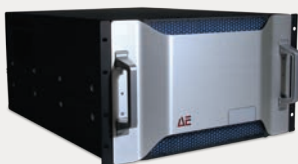
DC MAGNETRON SPUTTERING PRODUCTS

Largest install base and broadest array of DC products to meet the most demanding applications



ASCENT® DC POWER SYSTEMS

- › Ensures maximum field reliability
- › Effectively manages arcs for improved film quality, productivity, throughput, and yield
- › Simplifies power supply integration in sputtering processes
- › Reduces arc-caused contamination and damage



ASCENT® DMS ACCESSORIES

- › Unprecedented power delivery ease and control for dual-magnetron sputtering
- › Precise tuning of film characteristics
- › Selectable frequency, regulation mode, and duty cycle
- › Simplified, modular system configuration

Independent power regulation to each cathode

MISSION-CRITICAL HIGH VOLTAGE PRODUCTS FOR EXACTING APPLICATION REQUIREMENTS



Merging more than 30 years of precision power design with the high voltage expertise and technology of UltraVolt® and Hitek Power®, Advanced Energy® offers a comprehensive portfolio of standard and custom high voltage components to precisely match system specifications and provide unparalleled energy quality.

- › 54 product lines
 - High voltage modules, racks, and systems
 - 50 VDC to 500 kV and 0 to 100 μ W to 120 kW
 - DC power, capacitor charging, and pulse/waveform generation

For complete HV products and applications, visit www.advanced-energy.com/en/High_Voltage.html.

NEXT-GENERATION RF POWER SOLUTIONS

Digital Architecture and Industry-Leading RF Plasma Control



PARAMOUNT® RF POWER SYSTEMS

- › Optimizes film uniformity and throughput with unprecedented power delivery accuracy
- › Enables faster, seamless process transitions
- › Provides advanced pulsing and pulse synchronization
- › Reduces RF delivery system complexity
- › Reduces arc-caused contamination and damage



NAVIGATOR® II DIGITAL MATCHING NETWORKS

- › Speeds matching response time
- › Tightens process control
- › Helps increase tool throughput and product yield
- › Improves reliability and cost of ownership

Innovative
technologies,
premier service
solutions, and
**well-established
direct support**



DRIVING QUALITY IN EVERY ASPECT OF OUR BUSINESS



SUPPORTING YOUR SUCCESS THROUGH THE ENTIRE PRODUCT LIFECYCLE





PROVIDING HIGHLY RESPONSIVE SALES, SERVICE, AND TECHNICAL SUPPORT



Americas

- Vancouver, WA, U.S.A.
- San Jose, CA, U.S.A.
- ★ Fort Collins, CO, U.S.A.
- Georgetown, MA, U.S.A.
- Ronkonkoma, NY, U.S.A.



EMEA

- Littlehampton, West Sussex, U.K.
- Villaz-St-Pierre, Switzerland
- Warstein-Belecke, Germany
- Metzingen, Germany



APAC

- Seoul, Korea
- Tokyo, Japan
- Shanghai, China
- New Taipei City, Taiwan
- Shenzhen, China
- Singapore
- Pune, India

- Design and Launch
- Sales and Service
- Manufacturing
- ★ World Headquarters



For international contact information, visit
advanced-energy.com.