

OPTI RF POWER RACK

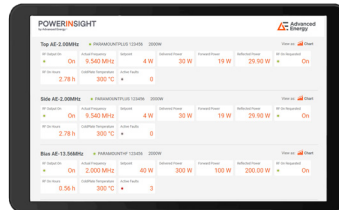
EFFICIENCY MEETS INSIGHT



OPTI RF POWER RACK



Modernizing RF
power delivery on
legacy tools.



PowerInsight Dashboard



Paramount® Generator (13 MHz, 5 kW)



Paramount Plus Generators (2 MHz, 5 kW)

Opti RF Power Rack

The Opti™ RF power rack is a modernized solution for 200 mm semiconductor fabs using high-density plasma chemical vapor deposition (HDP/CVD) tools. It utilizes high-performance generators combined with real-time data collection capability, providing the intelligence needed to monitor generator health and optimize processes.

Features

- High-performance AE generators with > 70% efficiency at full power
- Real-time HMI dashboard
- Built-in safety including EMO switch, leak detection, smoke detection, and overcurrent protection
- Optional remote access within secure fab networks

Benefits

- Higher efficiency from advanced RF power delivery
- View live system data and historical data (up to one hour), temperature charts, and time-stamped fault and warning history from each generator
- Significant ROI in operating cost and tool downtime
- Versatile design for easy accessibility and servability

Physical Specifications	
Rack Size (H x W x D)	
Frame only	38.625" (981 mm) x 22.56" (573 mm) x 36.88" (936.75 mm)
Frame with casters	41.88" (1064 mm) x 22.56" (573 mm) x 36.88" (935.75 mm)
Frame with casters and lifting hooks	43.67" (1109 mm) x 22.56" (573 mm) x 36.88" (935.75 mm)
Rack Details	
Top Panel	Full depth top panel with lift kit
Front Panel	Hinged design
Side Panels	Two-side panels; slotted style latches for panels
Bottom Panel	Drip tray
Casters	Two locking and two non-locking
Leveling Legs	Leveler kit
Mounting Rails	Two pairs of mounting rails
Clearance	Clearance is required at the rear of the rack for service access and installation of water hoses.
Weights	
Rack	150 lbs (68 kg)
Paramount® Generator (13Hz, 5kW)	80 lbs (36.5 kg)
Paramount Plus Generators (2 MHz, 5 kW)	66 lbs (30 kg) each, 132 lbs (60 kg) total
Power Insight Module	5 lbs (2.3 kg)
Total Power Rack	367 lbs (167 kg)
Connections	
Data Ports	RJ45
RF Outputs	HN-F (2 MHz, 5 kW generators) LC-F 9 (13.56 MHz, 5 kW generator)
Water Manifold	2x water manifolds with 1" NPT main connection 1/2" NPT connection for each generator hose
Water Hoses to Generators	1/2" tube to each generator
Hose Fittings	Swagelok hose barb connections to generator Threaded hose barb connections to manifold
Generator Quick Connects	Swagelok quick connects, male & female

Safety Features	
EMO	Attached to rack with guard
Smoke Sensor	Smoke/dust detector fed by a small fan. Tied to EMO.
Leak Detector	Sensor on bottom water catch tray. Tied to EMO.

Electrical Specifications

All input AC power connections are made individually from the Paramount® Plus 5002 generators, Paramount 6013 generator, and PowerInsight Module to the AC distribution section. One AC input to the rack (208 VAC).

Line Voltage	200/208 VAC $\pm 10\%$
Line Frequency	47 to 63 Hz
Line Current	23 A per phase max (2 MHz, 5 kW generators) 30 A per phase max (13.56 MHz, 5 kW generator)
Over-current Protection	Overcurrent protection is provided by the main breaker and the individual generators. Main Rack AC Input: 100 A Main Breaker 2 MHz, 5 kW Generators: 3 x 30 A fuses with disconnect switch 13.56 MHz, 5 kW Generator: 6 x 20 A fuses with disconnect switch
AC to RF Efficiency	>70% efficient at full power. 2 MHz, 5 kW Generators: >75% into 50 Ω at full power 13.56 MHz, 5 kW Generator: > 65% into 50 Ω at full power

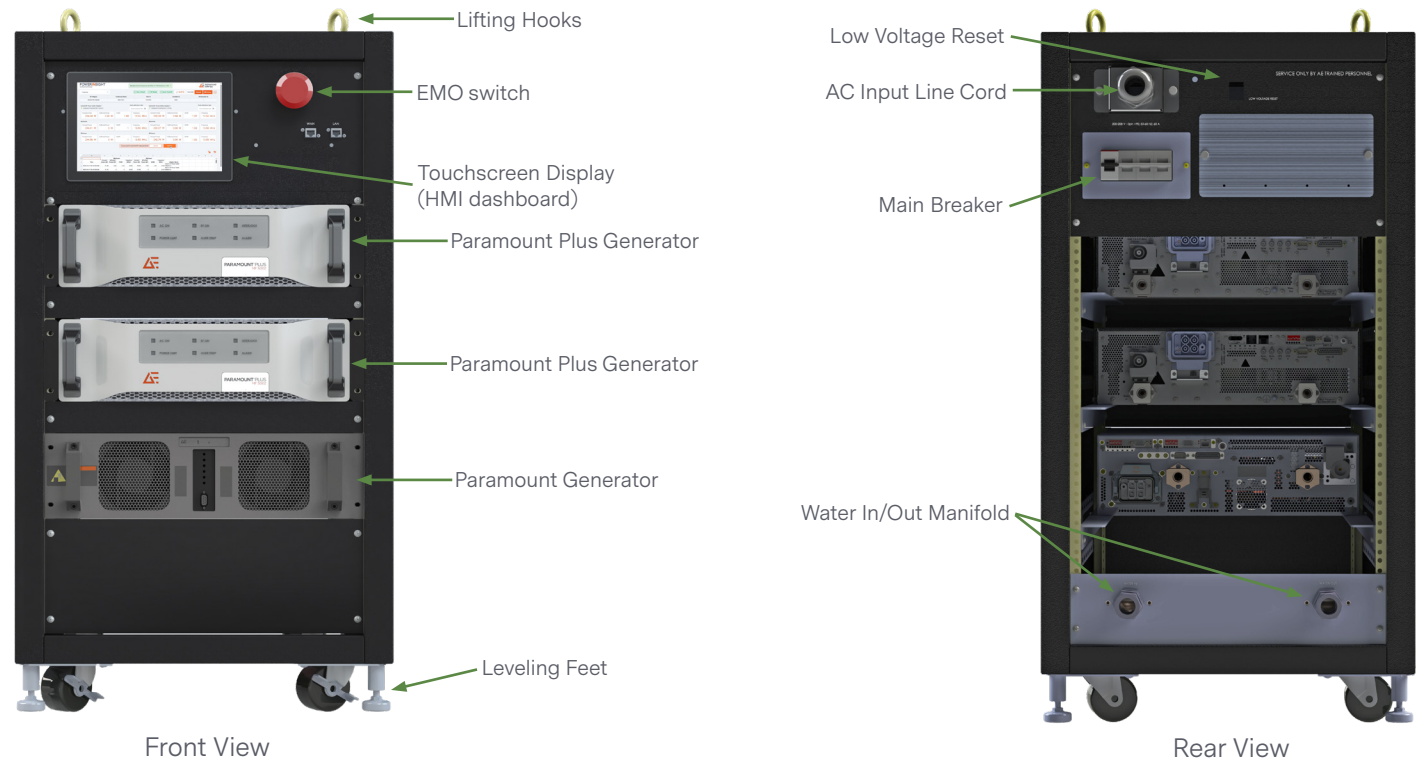
Cooling Specifications

Cooling Method	Water and air
Water Temperature	41 to 95°F (5° to 35°C)
Flow Rate	6.25 GPM for < 77°F (25°C) water 7.5 GPM for 77 to 97°F (25 to 35°C) water
Pressure	200 psi
Air Flow	Forced air intake on front panel. Exhaust on rear panel. Minimum clearance required for both front and rear panels: 2" (50.8 mm)
Ambient Air Temperature	5 to 40 °C

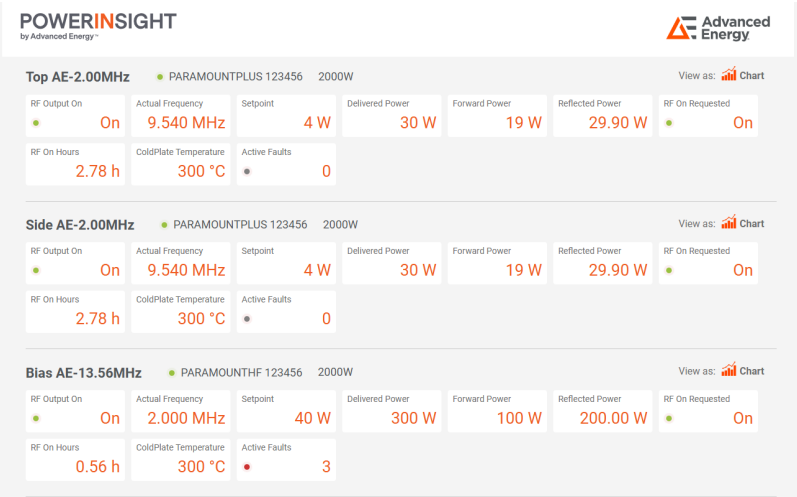
Software Specifications

Display	Touch Panel PC with PowerInsight by Advanced Energy™
Generator Information	Name, Type, Serial Number, Maximum Power
HMI Data fields	RF On hours, Forward Power, Reflected Power, Delivered Power, Setpoint, Actual Frequency, RF Output On, RF On Requested, ColdPlate Temperature, Active Faults
Data Storage	Long term recording of all data measurements to allow data extraction and reports
HMI Remote Access	Easy to use display via local touch screen or remote display via ethernet connection
Sample Rate	10 Hz (configurable)
Data History	Power Output (chart format), and Active Faults (list format) for the last 5, 30, or 60 minutes
PowerInsight Functionality	<ul style="list-style-type: none"> Long-term recording of comprehensive AE Bus commands and FastDAQ events. Expanded data visualization on web browser with custom panels and FastDAQ captures. Onboard RF generator health metrics evaluating overall health "score" based on previously recorded faults, warnings, or out-of-spec operating conditions.

Power Rack Exterior



PowerInsight



Example real-time human machine interface (HMI) dashboard integrated with PowerInsight



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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

AE's power solutions enable customer innovation in complex semiconductor and industrial thin film plasma manufacturing processes, demanding high and low voltage applications, and temperature-critical thermal processes.

With deep applications know-how and responsive service and support across the globe, AE builds collaborative partnerships to meet rapid technological developments, propel growth for its customers and power the future of technology.

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