

# Retrofit: MDX-L to Pinnacle III

Digitally Controlled DC Power Supply with Increased Reliability, Efficiency, and Functionality

The Advanced Energy (AE) Retrofit Program aims to replace existing, aged AE legacy products with a new drop-in solution. With a retrofit of your existing MDX-L units to the Pinnacle® III, Total Cost of Ownership improvements can be realized through reduced tool down time, improved process and wafer yields, and efficiency gains.



## Overview

As semiconductor tools and process power components age, factories are seeing increases in failure rates and repair costs of those components. A retrofit of MDX-L to Pinnacle III provides a reset of the unit life, and an upgrade in unit capability and reliability. A retrofit maximizes tool uptime while reducing overall maintenance costs.

The MDX-L product line is no longer in production. Retrofitting your MDX-L is the preferred service option as:

- Used equipment available on the market is in unknown condition
- Repairing existing units could be limited in the future due to obsolete components

## Total Cost of Ownership (TCoO)

TCoO in the process power space on a semiconductor tool extends beyond the transactional cost of a repair:

- Tool down time: lost production dollars
- Wafer scrap
- Wafer yield
- Operational costs (efficiency)

## Benefits

- Increased uptime with longer mean time between failures (MTBF)
- Lower overall maintenance costs
- Performance equivalent to processes with new tools
- Additional features allow for enhanced process control or new process development
- Higher efficiency
- Enhanced plasma stability and process repeatability

## Features

- Includes 12-month, whole-box warranty
- Supports wafer fabrication with partnership of AE refurbishment experts
- Resets the clock on aging tools
- Provides cost-effective, modern replacement for discontinued or aging DC power supplies
- Presents an efficient upgrade process that is replicable for subsequent tools
- Retrofit kit designed to be a seamless drop-in replacement for MDX-L
- Pinnacle III is easily upgradable to 20 kW maximum output power
- Dual MDX-L 6 kW / 12 kW units used in Master / Slave applications can be retrofitted by a single Pinnacle III 18 kW

## Return on Investment (ROI)<sup>1</sup>

The AE Quality Advantage – Maximizing Uptime

### With a retrofit of MDX-L to Pinnacle III:

- Save up to **83%** annually on repair and maintenance costs with new units<sup>2</sup>
- See a five-year ROI<sup>3</sup> of **105%**
- Break even in **2.4** years

<sup>1</sup> Figures are for illustrative purposes only. Contact AE for a customized ROI calculation specific to your install base. Trade-in and volume discounts are also available.

<sup>2</sup> Annual savings achieved through reduced tool downtime, improved process and wafer yields, and efficiency gains.

<sup>3</sup> Figures calculated off of 30-unit population.

## Specification Comparison – MDX-L to Pinnacle III

With the inclusion of a retrofit kit, which contains all required interfaces and adapters, transitioning to a newer product is made seamless by eliminating equipment changes.

Feature	MDX-L	Pinnacle III	Benefits to Retrofit
Arc Management	Fixed	Variable	Increased process yields
Power Ramping	No	Programmable	More controlled processing
Strike Voltage	1500 V	Variable up to 1700 V	Additional process capability
Power Setpoint	0 to 6000 W 0 to 12,000 W 0 to 18,000 W	25 to 6000 W 25 to 12,000 W 25 to 18,000 W	Similar power performance range <sup>1</sup>
Power Accuracy	± 1.0%	± 1.0%	Same accuracy
Arc Process Data Monitor	Not Available	Available	Process quality indicator
Sag / Surge Protection	Not Available	SEMI F47-0706	Fewer process interruptions
Master / Slave	Available	Available	Expanded process capability
Advanced Interfaces	Not available	Available	Increased flexibility
Analog Interface	Available	Available	Drop-in replacement
Output Connector	UHF	UHF	No power cable changes
Input power	208 V, 3 ph	208 V, 3 ph	No electrical panel rewiring
Weight	25 kg	32.2 kg	No significant change
Height	178 mm	178 mm	Equivalent
Width	483 mm	483 mm	Complies with standard rack dimensions
Depth	483 mm	574 mm	Rack ear extensions provided in retrofit kit
Efficiency	> 85%	> 87%	Decreased operational costs

<sup>1</sup> Pinnacle III is easily upgradable to 20 kW maximum output power.

## Get in Touch

To learn more about your retrofit options, contact Advanced Energy Technical Support at [technical.support@aei.com](mailto:technical.support@aei.com) or reach out to your local Service Center.

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