

## MDX 500 FEATURES



**Status LEDs**  
Indicate present system status.



**Digital Meter**  
Display, setpoint or output power, voltage, or current.



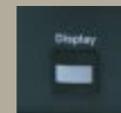
**Level**  
Adjusts the output setpoint.



**Output Stop & Start**  
Turn output on and off.



**Regulation Switches**  
Select the power regulation mode.



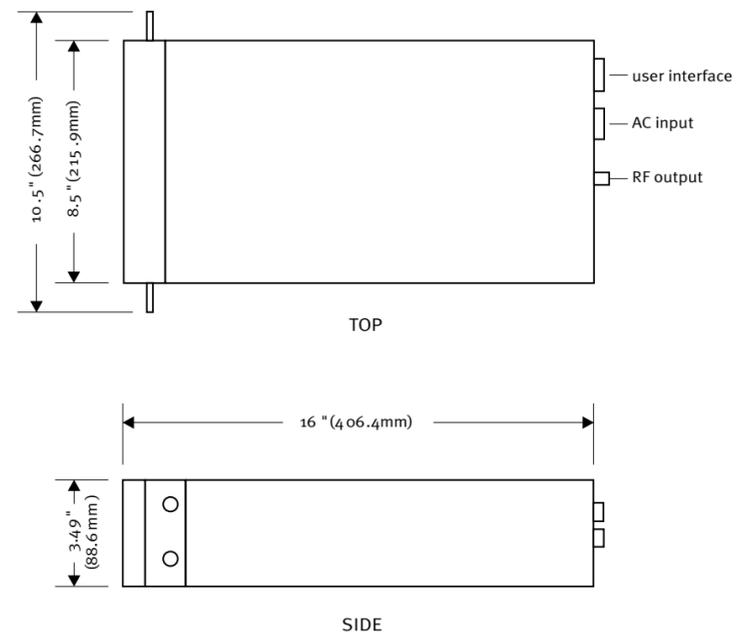
**Display**  
Selects displayed parameter.



## SPECIFICATIONS

| PHYSICAL                      |   |
|-------------------------------|---|
| <b>Size</b>                   | Single: 88.63 mm (H) x 215.9 mm (W) x 406.4 mm (D)<br>3.5" (H) x 8.5"(W) x 16"(D)<br>Dual: 88.63 mm (H) x 482.6 mm (W) x 406.4 mm (D)<br>3.5" (H) x 19"(W) x 16"(D) |
| <b>Weight</b>                 | Single: 5.57 kg (12.25 lb)<br>Dual: 11.14 kg (25 lb)  |
| <b>Power Output Cable</b>     | RG-8U coaxial cable<br>Discrete cables, optional  |
| <b>Power Output Connector</b> | UHF style<br>"N" type, optional<br>SHV style, optional  |

## DIMENSIONS



DISCOVER THE POWER OF **AE** ADVANCED ENERGY®

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**MDX DC**  
500 W



**MDX LOW-POWER 500 W**  
used for continuous hard use  
in small-scale vacuum  
environments.



**MDX LOW-POWER 500 W**

The MDX 500 is intended for continuous hard use in a vacuum environment. It is a leading performer in basic magnetron sputtering, dc sputtering with RF bias, and dc-biased RF sputtering. Its small size makes it well suited for laboratory systems and small-scale production environments.

**MDX drives use a high-frequency conversion technique to provide tight regulation, high conversion efficiency, and low stored energy at the output.**

The MDX 500 provides exceptional accuracy and repeatability in a conveniently small and affordable package.

**FEATURES**

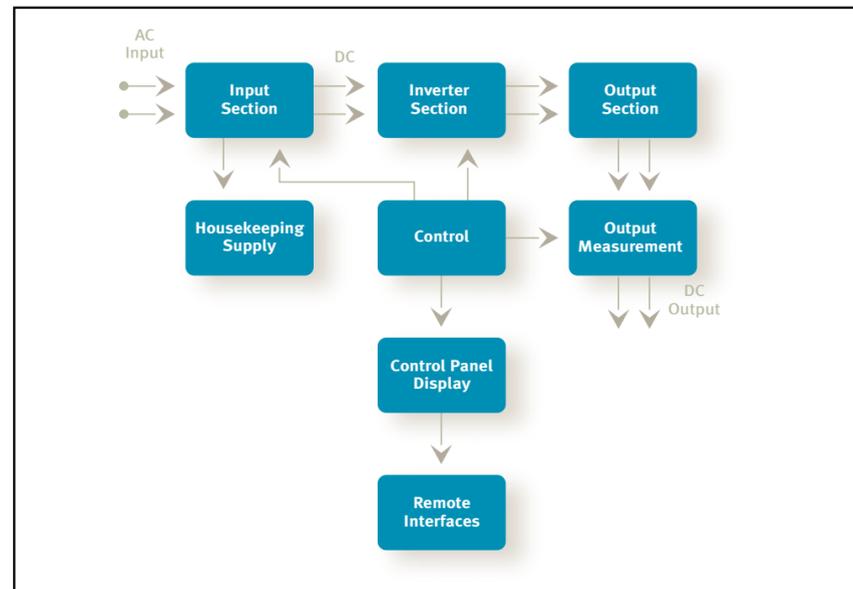
Advanced Energy® switchmode conversion modules achieve high efficiency from line to load. The high-frequency method ensures a rapid response to plasma load changes. The design reduces stored energy at the output by several orders of magnitude. The fast response time virtually eliminates line-induced surges and noise spikes.

Arc-Out™ suppression circuitry provides multi-level suppression and quenching of different types of arcs in the magnetron environment. An added advantage is that Arc-Out reduces target burn-in time and material loss. This feature also prevents dumping of energy into hot spots by sensing a change in current and immediately shutting the power off. Start-up is controlled so that hot spots cool before power is turned back on, preventing renewed arcing.

The MDX 500 can be used as a power, current, or voltage source, depending on the method of output regulation selected. The setpoint level is set with a locking potentiometer to ensure repeatability from run to run. The MDX 500 can be controlled either from the front panel or from the optional analog/digital User port.

By configuring three ramp switches on the rear panel, you can select fast ramp or some combination of 0.1, 1, or 10 seconds (the ramp times are additive).

The contactor hold function causes the contactor to remain closed after the first ramp start. Contactor hold shortens the time needed for the output to reach setpoint on subsequent runs.



**Several MDX 500 models meet strict CE standards for safety, immunity, and emissions.**

**User I/O Access**

Many of the functions that are available from the control panel are also available through the user interface: turning output on and off; specifying the method of output regulation; completing the system interlock string; specifying the output setpoint; and monitoring output parameters and status.

**Built-in Protection**

The MDX 500 has complete internal protection for all overload conditions. Three separate pins on the User port and a front panel indicator are provided for safety-related inputs such as vacuum, water, and auxiliary (user specified) interlocks.

**Compliance Certifications**

Several CE-compliant MDX 500 models are available. These models meet the requirements of EN50081-2 (emissions), EN50082-2 (immunity), and EN50178 (safety). They also meet the requirements of the German safety standard, DIN VDE0160.

**Reliability and Serviceability**

Advanced Energy Industries, Inc., has used great care in selecting components and designing the MDX family of power supplies, making them among the most reliable and quality-oriented systems available. All parts and labor carry our standard one-year warranty. When a unit does require service, its small size makes removal and handling easy. These features, combined with responsive factory support, give you superior productivity over the long life of the unit.

**FUNCTIONAL SPECIFICATIONS**

**Meters**

The MDX 500 has a digital meter that displays the actual output in Watts, Volts, or Amps, or the Setpoint level in the selected mode of regulation.

**Controls**

Output Stop & Start switches turn output on and off; Regulation selects the method of output regulation; the Level knob adjusts the output setpoint; Display cycles through the display parameters.

**Status Indications**

Arc occurred; Setpoint has been reached; Output is on; Interlock conditions have been satisfied; Plasma is present; either on/off control or setpoint control or both are under Remote control.

**Remote Operation (Analog/Digital)**

The 25-pin analog/digital I/O port provides lines for controlling output on/off, regulation mode, setpoint, and three interlocks. It is also possible to monitor the setpoint and actual output levels, and to determine whether output is on and if the unit is at setpoint. The analog signals can be either 0 to 5 V or 0 to 10 V.

**SPECIFICATIONS**

| ELECTRICAL                     |  |
|--------------------------------|--|
| <b>Input Voltage</b>           | 90 to 132 Vac (50 to 60 Hz), 1 phase<br>180 to 265 Vac (50 to 60 Hz), 1 phase                            |
| <b>Input Current</b>           | 10 A at 120 Vac at 500 W<br>6.3 A at 230 Vac at 500 W<br>Power factor = 0.55                             |
| <b>Output Power</b>            | 0 to 600 V at 0 to 1 A, 500 W (maximum of 500 W)<br>0 to 1200 V at 0 to 0.5 A, 2000 W (maximum of 500 W) |
| <b>Output Voltage/Current</b>  | 0 to 500 W   |
| <b>Regulation</b>              | Power, current, and voltage  |
| <b>Ripple</b>                  | Switching: 2% p-p (100 kHz)<br>Line: 1% p-p (100/120 Hz)   |
| <b>Ramp Timer</b>              | 0.1, 1.0, or 10 second, selectable at the rear panel   |
| <b>Output Display Accuracy</b> | Within 2% of actual output level or 0.2% of maximum rated output level, whichever is greater             |
| <b>Methods of Control</b>      | Local or analog/digital remote<br>Factory set to 0 to 10 V<br>0 to 5 V, optional                         |

| ENVIRONMENTAL                        |   |
|--------------------------------------|---|
| <b>Ambient Operating Temperature</b> | Storage: minimum -25°C (-13°F), maximum 55°C (131° F)<br>Operating: minimum 0°C (32°F), maximum 40°C (104° F)<br>Transportation: minimum -25°C (-13°F), maximum 55°C (131° F) |
| <b>Coolant Temperature</b>           | Air (gas) minimum 0°C (32°F), maximum 35°C (95°F)   |
| <b>Humidity</b>                      | 15 to 85% relative humidity, no condensing or icing   |
| <b>Atmospheric Pressure</b>          | Storage and operation: 800 mbar minimum<br>Transportation: 600 mbar minimum   |