

# ASCENT AP (ADVANCED PULSING) POWER SUPPLIES

UNPRECEDENTED POWER CONTROL FOR  
SINGLE- AND DUAL-MAGNETRON SPUTTERING



#### Power

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30 kW (15 kW)

#### Voltage

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1000 VDC

#### Average Current

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75 A (38 A)

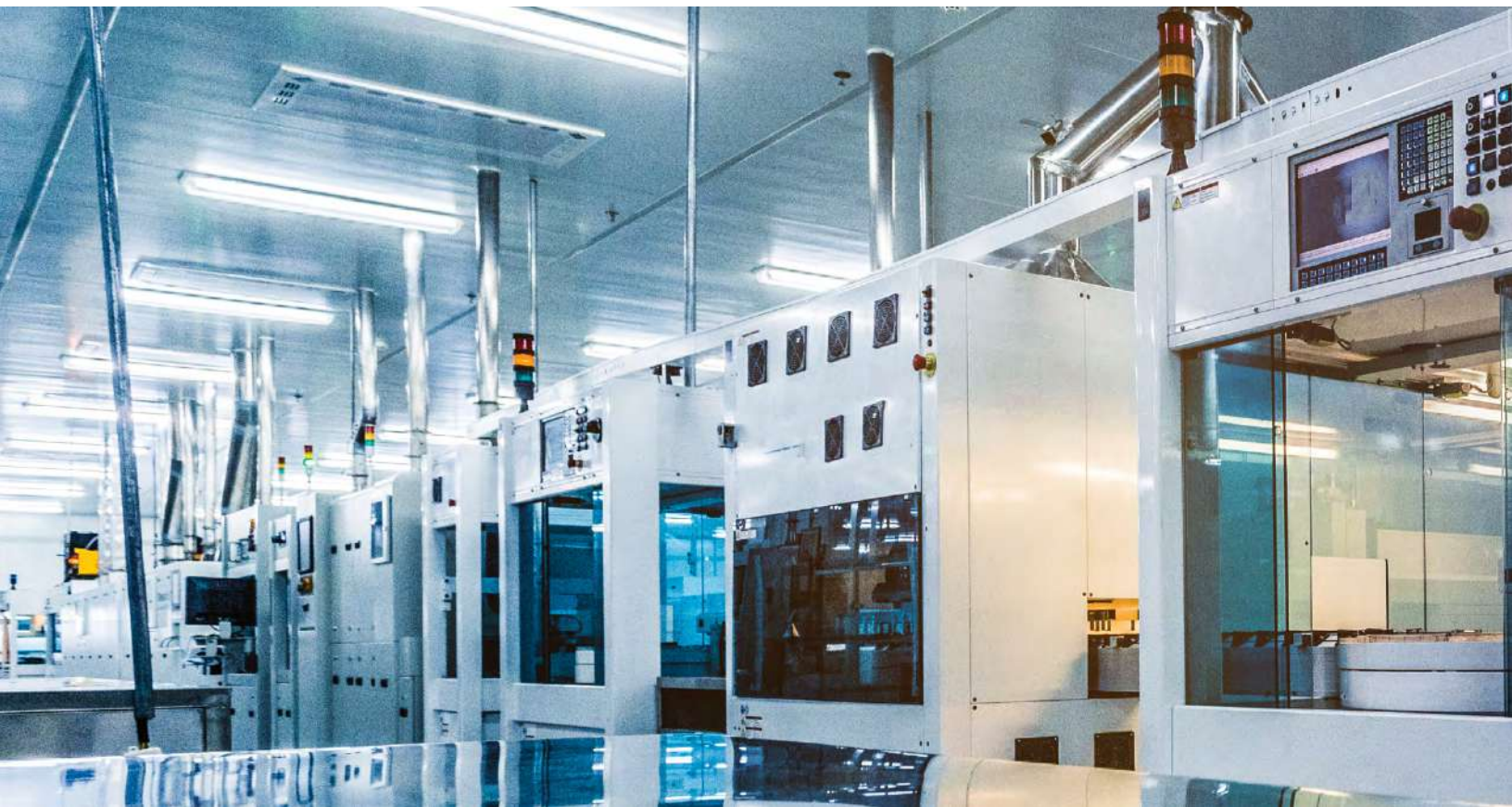
#### Frequency

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0, 5 to 150 kHz

## Ascent AP (Advanced Pulsing) Power Supplies

AE disrupted the dual-magnetron sputtering paradigm by introducing bipolar pulsed-DC technology, providing unprecedented plasma control where only limited control previously existed. Ascent<sup>®</sup> AP power supplies further extend your ability to optimize output by introducing additional control parameters in a compact solution for dual- and now also single-magnetron sputtering. With patented pulsing technology, the Ascent AP solution proactively inhibits arcs, and its wide operational range unlocks a range of material options to extend process flexibility and material innovation.



## Product Highlights

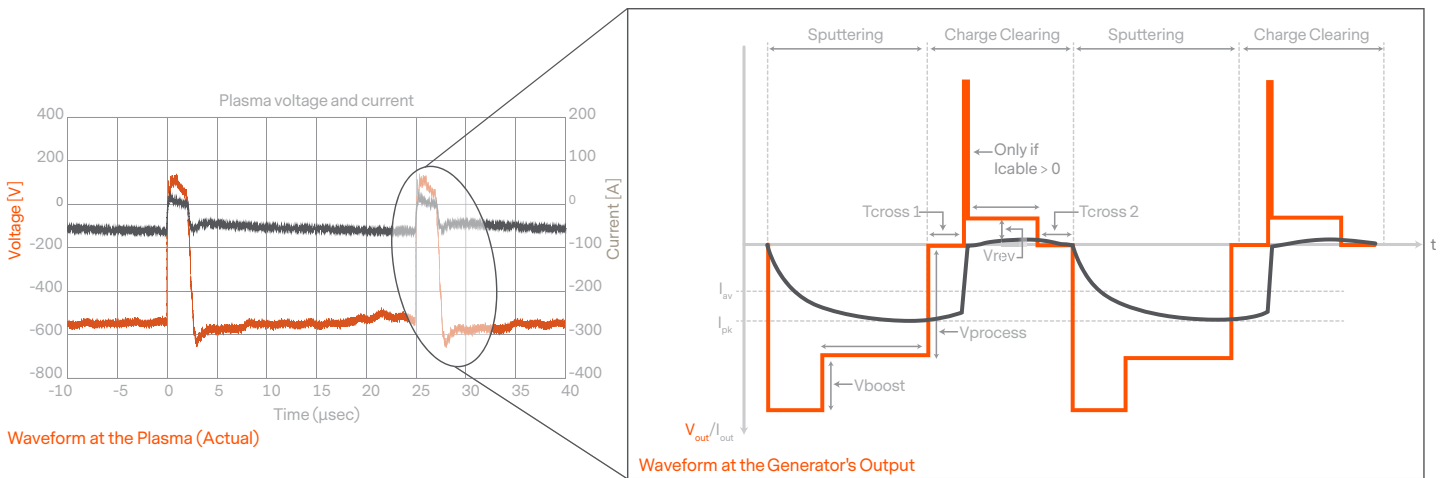
- Advanced waveform customization for expanded access to power delivery parameters
- Patented pulsing technology for remarkable arc prevention, higher power levels, and increased throughput
- Compact, single-unit solution (up to 30 kW)
- Set point compensation™ technology for stable throughput
- Wide operational range to enable a variety of process materials
- Precise sputtering of dielectric and conductive films
- Single-magnetron and dual-magnetron configurations available
- Extended process control, flexibility, and innovation
- High film quality and throughput
- Repeatable, customizable films
- Higher power levels with reduced arc damage
- Easy integration and control





## Single-Magnetron Sputtering of Reactive and Conductive Materials

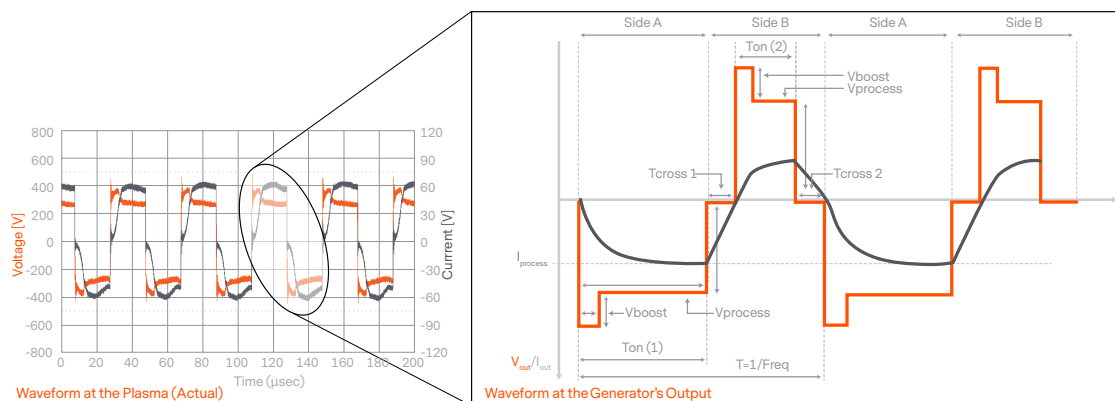
Use as a single-magnetron sputtering supply or as a bias supply



A patented boost circuit on the leading edge of the sputtering waveform accelerates delivery of power to the process compared to a sine wave generator. The reverse portion of the waveform maximizes control, allowing more definitive charge clearing during reverse cycle.

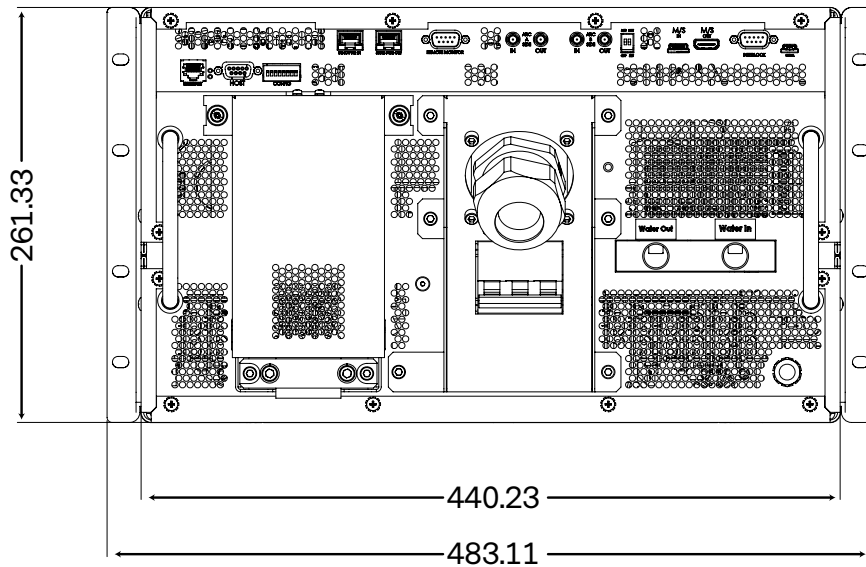
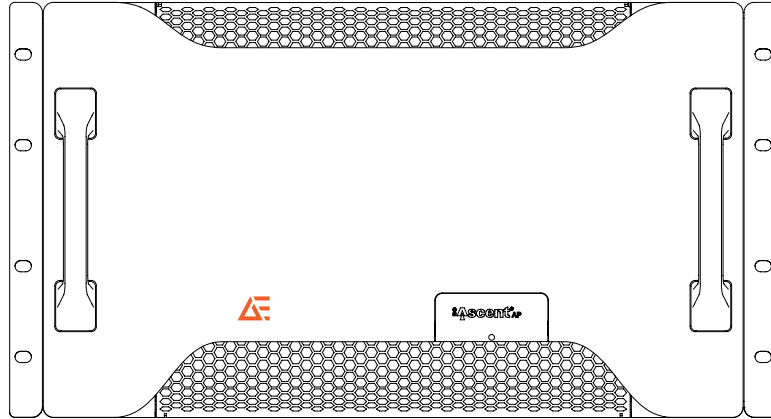
# Dual-Magnetron Sputtering of Reactive Materials and “Bi-Material Co-Sputtering”

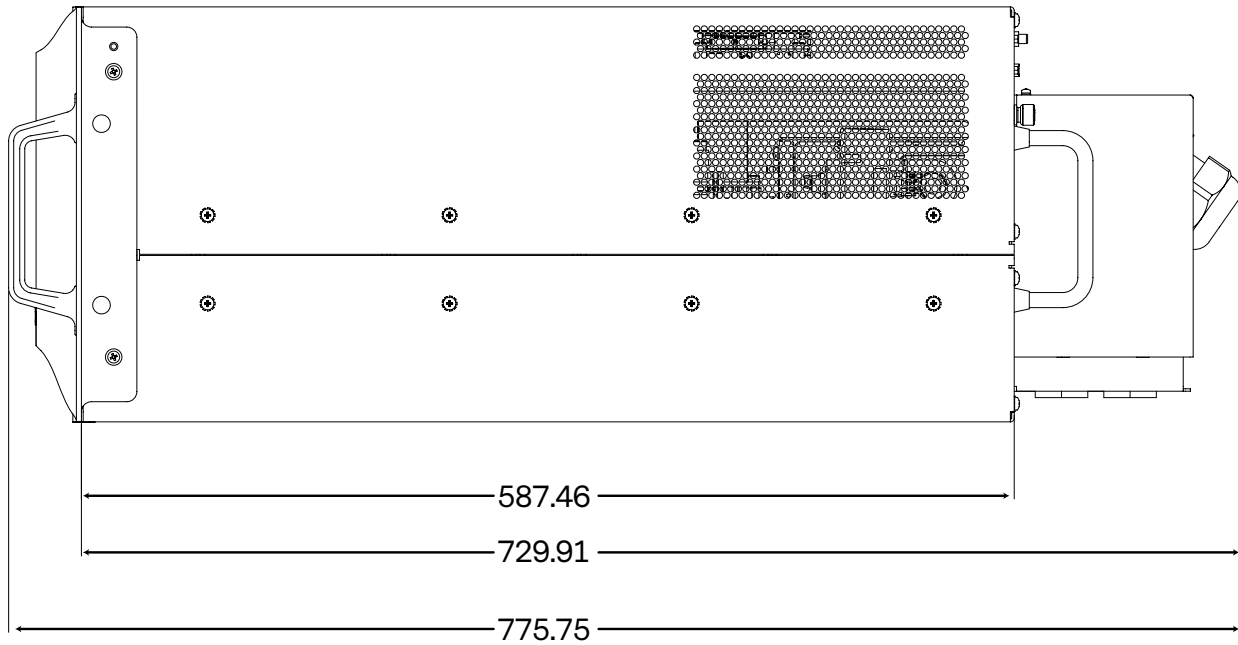
Control power delivery to each magnetron independently for increased deposition rates and target utilization.



|                     | Ascent SMS AP Power Supply | Ascent DMS AP Power Supply |
|---------------------|----------------------------|----------------------------|
| Power               | 30 kW (15 kW)              | 30 kW (15 kW)              |
| Voltage             | 1000 VDC                   | 1000 VDC                   |
| Peak Current        | 100 A (50 A)               | N/A                        |
| Average Current     | 75 A (38 A)                | 75 A (38 A)                |
| Frequency           | 0, 5 to 150 kHz            | 0, 5 to 150 kHz            |
| Reverse Time (Max)  | 15 µsec                    | N/A                        |
| Duty Cycle          | > 60% ON time              | 5 to 95%                   |
| Reverse Voltage     | 300 VDC max                | N/A                        |
| Pulse Configuration | Unipolar                   | Bipolar                    |

# ASCENT AP







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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.

PRECISION | POWER | PERFORMANCE

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