

### General Operational Parameters

	8 kW unit	6 kW unit
Plasma Power Range (within the power supply impedance range)	1000 to 8000 W	1000 to 6000 W
Process Applications	Remote delivery of activated gases for CVD chamber cleaning, reactive-etching processes, and reactive-deposition processes	
Ignition	100 mTorr to 4.00 Torr, Ar, < 1 slm	
Chemical Compatibility	Intended for use with selected gases, such as Ar, O <sub>2</sub> , H <sub>2</sub> , N <sub>2</sub> , F <sub>2</sub> , H <sub>2</sub> O, NF <sub>3</sub> , or O <sub>2</sub> :CxFy <b>Note:</b> Other gases and chemistries may be selected; contact AE Technical Support for suitable combinations.	

### NF<sub>3</sub> Operating Specifications

	8 kW unit	6 kW unit
Flow Range	Up to 6 slm at 12 Torr	Up to 4 slm at 6 Torr
Pressure Range	Up to 15 Torr at 1 slm	Up to 10 Torr at 1 slm
NF <sub>3</sub> Dissociation Efficiency	> 98% dissociation at 6 slm and 7 Torr at 8 kW as measured by FTIR	> 98% dissociation at 4 slm and 5 Torr at 6 kW as measured by FTIR

### Mechanical and Physical Specifications

Size	267 mm (H) x 252 mm (W) x 478 mm (D) 10.5" (H) x 9.9" (W) x 18.8" (D)
Weight	28.7 kg (63.2 lb)

### Plasma Source and Vacuum Chamber Sub-System Specifications

Wall Materials	Anodized aluminum. Alumina spacers
Vacuum Seals	Chemraz® O-rings

### AC Electrical Requirements

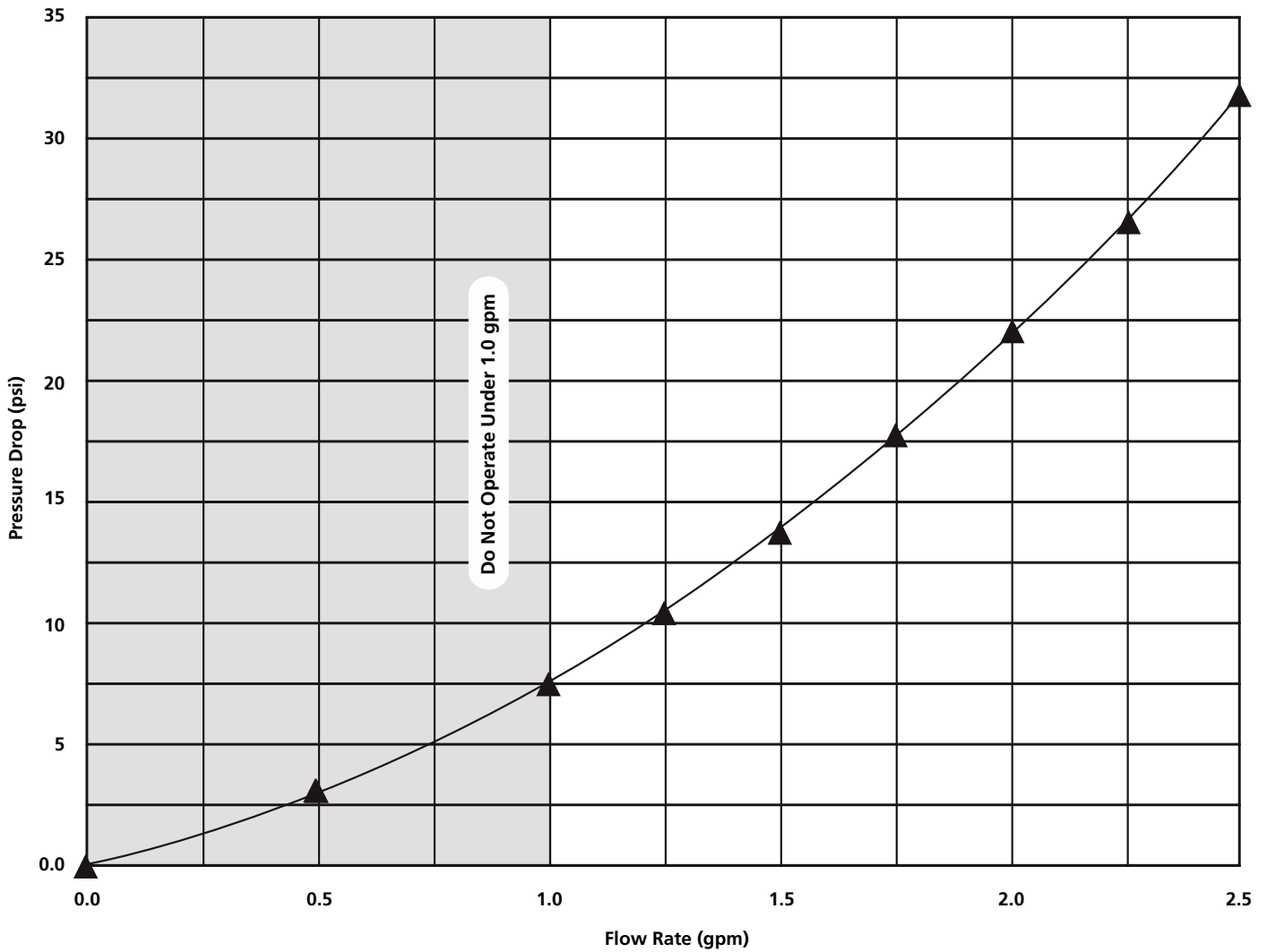
	8 kW unit	6 kW unit
Input Voltage	200/208 VAC ±10% (180 to 229 VAC), no neutral, 3 $\Phi$ with ground ( $\Phi$ insensitive)	
Line Frequency	50/60 Hz nominal; 47 to 63 Hz range	
Input Current	27 A nominal, 31 A max per $\Phi$	20 A nominal, 24 A max per $\Phi$

## Operating Specifications

<b>Duty Cycle</b>	Continuous operation within specified operating range
<b>Cooling Flow Rate</b>	2 gpm @ 8 kW and 25°C input water; 1.0 gpm @ 6 kW and 25°C input water
<b>Ambient Air</b>	+5° to +40°C (+41° to +104°F)

## Pressure/Flow Chart

**Flow Rate vs. Differential Pressure for Complete Unit**



## System Protection Features

<b>Functional Interlock</b>	A hard-wired functional interlock that disables the input AC power rectifier and RF control via the analog I/O signal is provided.
<b>AC Line</b>	
Over-Voltage	Unit is protected.
Under-Voltage	Unit is protected.
Missing Phase	Unit is protected.
High Ripple	Unit complies with SEMI F47 requirements.
Unit Over-Current	Unit is protected.
<b>Over-Temperature</b>	Thermal sensors are applied to the following thermally-sensitive components. Warning upon operation outside of specification. RF power is disabled upon fault.
Electronics	Power electronics cold-plate temperature
Plasma Source	Plasma source body temperature
Ambient Air	Intake and exhaust air temperature
Water Temperature	Input and output water temperature
Internal Fan Failure	Fan rotation and failure identification; RF power disabled upon fault.
<b>Plasma Detection</b>	
Plasma Ignition Failure	Failure to ignite is detected by unit.
Inductively Coupled Plasma Extinguished	Inductively coupled plasma loss is detected by unit.
Communication Loss	In the event of serial communication loss or disruption, the unit shuts off power output within user-specified time. Condition only applicable when the unit is controlled through the User Host port and the timeout feature is enabled.
Front Panel Control(s)	The front panel is passive (i.e., used for display purposes only).

## Reliability

<b>Demonstrated Reliability</b>	> 750,000 hr MTBF
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## Safety and Regulatory Requirements

<b>CE Marking Compliance</b>	<ul style="list-style-type: none"> <li>73/23/EEC—Low Voltage Directive (Laws for electrical equipment within certain voltage limits) (Refer to Product Safety Compliance below for safety standards.)</li> <li>89/336/EEC—EMC Directive (Laws relating to electromagnetic compatibility) (Refer to EMC Compliance below for EMC Standards.)</li> <li>“Declaration of Conformity” supplied to customer</li> </ul>
<b>Product Safety Certification</b>	<ul style="list-style-type: none"> <li>61010-1—Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use Over-Voltage Category II; Pollution Degree 2</li> <li>CSA C22.2 No. 1010.1—Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use Over-Voltage Category II; Pollution Degree 2</li> <li>ANSI/ISA-82.02.01—Safety Standard for Electrical and Electronic Test, Measuring, Controlling and Related Equipment – General Requirements (Harmonized standard to IEC publication 61010-1) Over-Voltage Category II; Pollution Degree 2</li> <li>NRTL/C Certificate of Compliance is available</li> <li>SEMI S2-0302—Conform with IEC 61010-1 as applicable and referenced in SEMI S2-0302 (Referenced Standard 4.4)</li> <li>SEMI F47—Meets requirements</li> </ul>
<b>EMC General Compliance</b>	<ul style="list-style-type: none"> <li>EN 55011—Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment Group 2, Class A</li> <li>EN 61000-6-2—Electromagnetic Compatibility – (EMC) - Part 6-2: Generic Standards – Immunity for Industrial Environments</li> <li>47 CFR Part 18—Code of Federal Regulations - Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific, and Medical Equipment</li> </ul>

*AE Xstream Remote Plasma Source products are not for sale or use in the U.S. or Europe.*



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 ENG-XSTREAM-340-09 0M 8/06