

# LITMAS RPS

## REMOTE PLASMA SOURCE



The Litmas RPS is a remote plasma source that delivers high concentrations of reactive gas species to enable effective abatement of environmentally harmful PFC gases. Its small footprint, high performance, ease of use, and low cost of ownership set it apart from competitive abatement solutions that require high upfront investment and high operating cost.

### PRODUCT HIGHLIGHTS

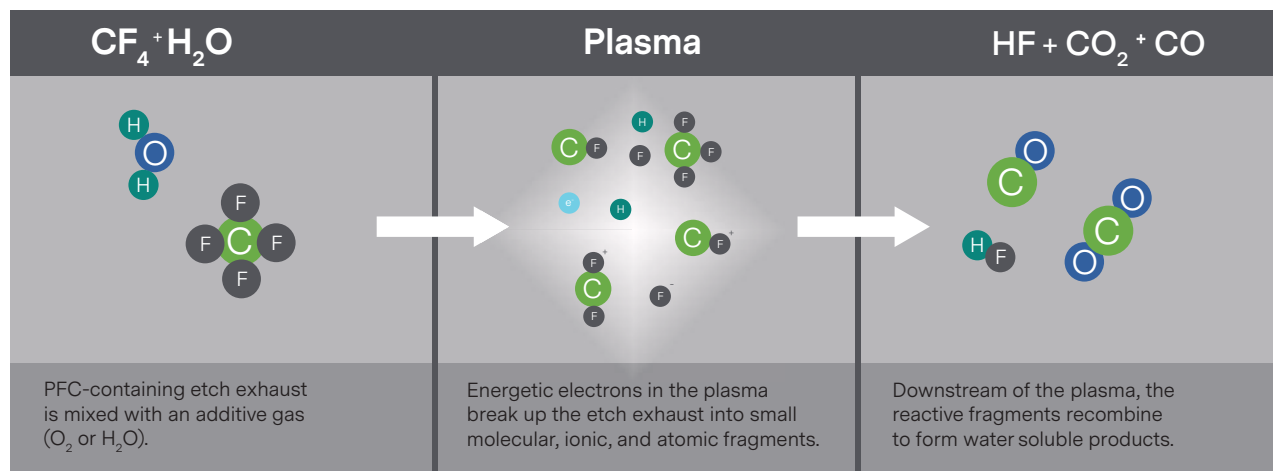
- High destruction rate efficiency
- Highest available plasma power density
- Patented LitmasMatch™ solid-state power-delivery topology
- Uses durable SiO<sub>2</sub> or Al<sub>2</sub>O<sub>3</sub> chamber materials
- Small size, low utilities, and long life reduce cost of ownership

### TYPICAL APPLICATIONS

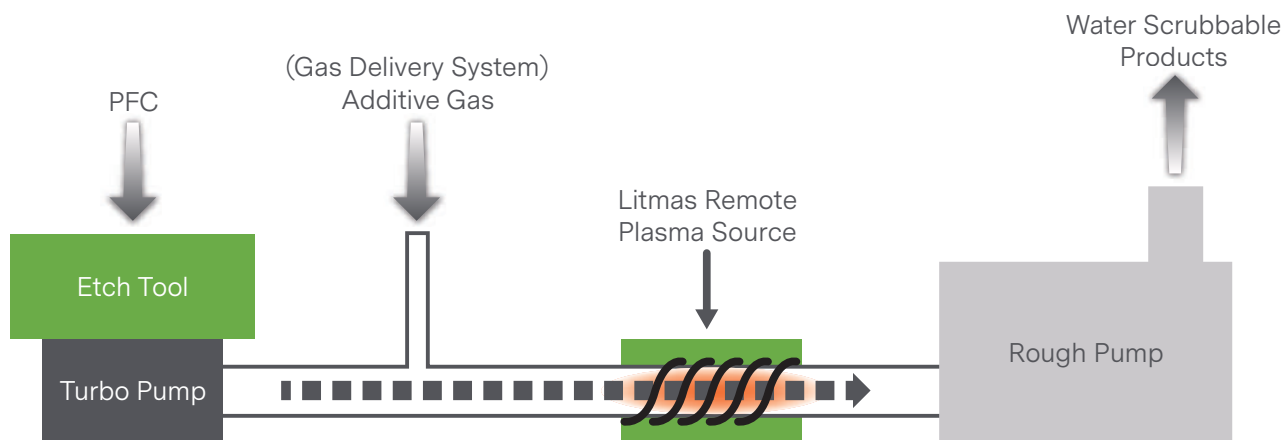
- On-demand PFC abatement
- Most focused greenhouse gas abatement product
- Non-metallic dielectric and conductor etch
- Carbon cleaning and surface treatment

## ABATEMENT OF ETCH EXHAUST GAS

The Litmas RPS captures PFC-containing etch exhaust and mixes it with a supplementary reactive gas, like O<sub>2</sub> or H<sub>2</sub>O. This gas and the PFC exhaust are dissociated in the highly energetic plasma, resulting in water soluble byproducts which can easily be treated downstream.



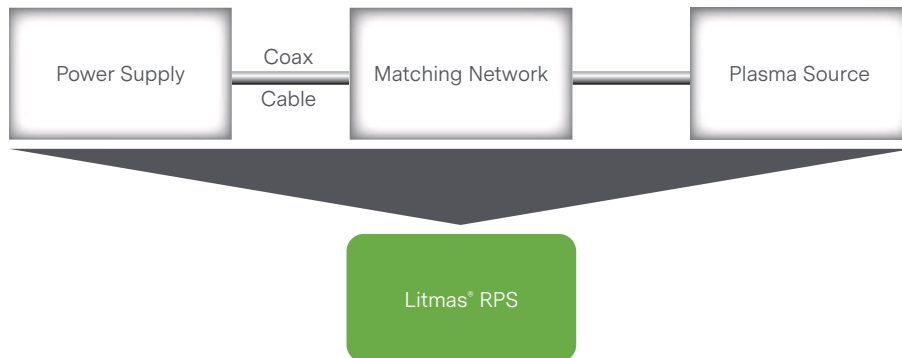
## TYPICAL INSTALLATION



The remote plasma source is placed before the rough pump, which results in significantly lower energy and resource consumption than downstream abatement solutions. It also reduces wear and maintenance on the rough pump. Plasma abatement greatly reduces the production of NO<sub>x</sub> compared to other abatement options.

## REVOLUTIONARY LITMASMATCH™ TECHNOLOGY ENABLES WIDE OPERATING RANGE

Engineered to offer a uniquely wide operating window for maximum process development flexibility, the Litmas RPS combines advanced power and source technologies in a fully integrated, compact design. Unlike traditional plasma-generation technologies, the Litmas RPS eliminates the 50  $\Omega$  power supply, and the associated cable and variable capacitor matching network, from the system design.

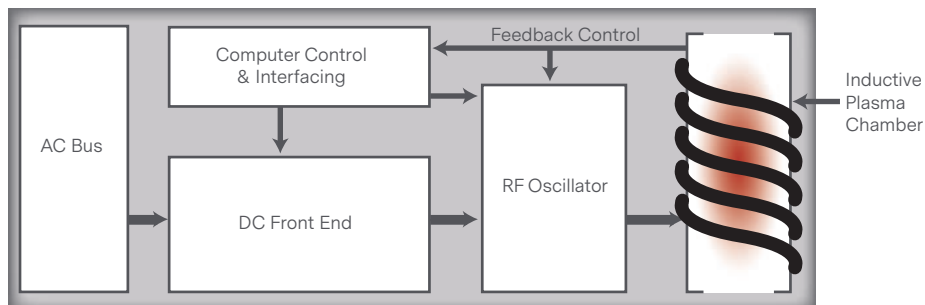


The Litmas® RPS replaces three separate components. Instead, the LitmasMatch™ technology directly couples electrical energy to the plasma chamber by varying the frequency of the power supply.

As the plasma load changes (with changes in pressure, gas mixture, or power set point), a patented feedback and control circuit adjusts the RF frequency within a few cycles to always maintain efficient operation.

## LOW-SURFACE-AREA CHAMBER FOR A BROAD RANGE OF PROCESS CHEMISTRIES

The patented water-cooled Litmas RPS plasma chamber handles up to 4 kW in a low surface-to-volume ratio geometry, allowing maximum reactive species production efficiency.



## LITMAS RPS

### COMPACT AND VERSATILE FOR ANY PROCESS ENVIRONMENT

The Litmas RPS is compact in size for easy installation and seamless integration into your new or existing processes. The small product footprint and unique exit flange design, which can be flush mounted or remotely mounted, maximize your chamber design flexibility. Its lack of external air exchange allows mounting of the Litmas RPS within non-vented enclosures and makes it uniquely suited to operate in both ultra-clean semiconductor environments as well as challenging industrial environments. These qualities, when coupled with the wide operating range, can significantly decrease greenhouse gas emissions while keeping your utilities usage and operating costs low.

### COMMUNICATION OPTIONS

The Litmas RPS interfacing options include analog and RS-232 (AE Bus). Its RS-232 interface, when used with the optional AE Virtual Front Panel (VFP) software package, allows full data-logging capabilities of almost all internal source parameters and fault conditions. Contact your AE representative for more information.

### RELIABILITY AND COMPLIANCE

The Litmas RPS remote plasma source is designed for robust usage and long life. Extensive self-protection features protect the unit from unintentional misuse, while conservative component deratings ensure that the unit is always operating safely within its mechanical and electrical limits. The Litmas RPS has a demonstrated MTBF of > 100,000 hours in AE's internal testing laboratory, and it has received the following safety certifications:

- CE 73/23/EEC & 89/336/EEC
- IEC/EN 61010-1
- CSA C22.2 No. 1010.1
- ANSI/ISA-82.02.01
- NRTL/C
- SEMI S2-0302
- SEMI F47
- EN 55011, EN61326, and 47 CFR

## VALUE-ADDED OPTIONS

AE's optional Virtual Front Panel (VFP) graphical computer interface gives you the ability to perform critical functions dynamically and in real time:

- Process setup
- Troubleshooting
- Operational control
- Data logging

### Foreline Process Abatement Capability

When combined with an additive gas delivery system (GDS) and installed on the foreline of etch tools, the Litmas RPS technology provides a high-performance, zero-footprint, low CoO solution to etch tool PFC abatement.

### Product Training

Our commitment to you goes beyond delivering a world-class plasma source. We offer advanced product training, so you can use the advanced capabilities of the Litmas RPS to their fullest in optimizing your current and future processes.

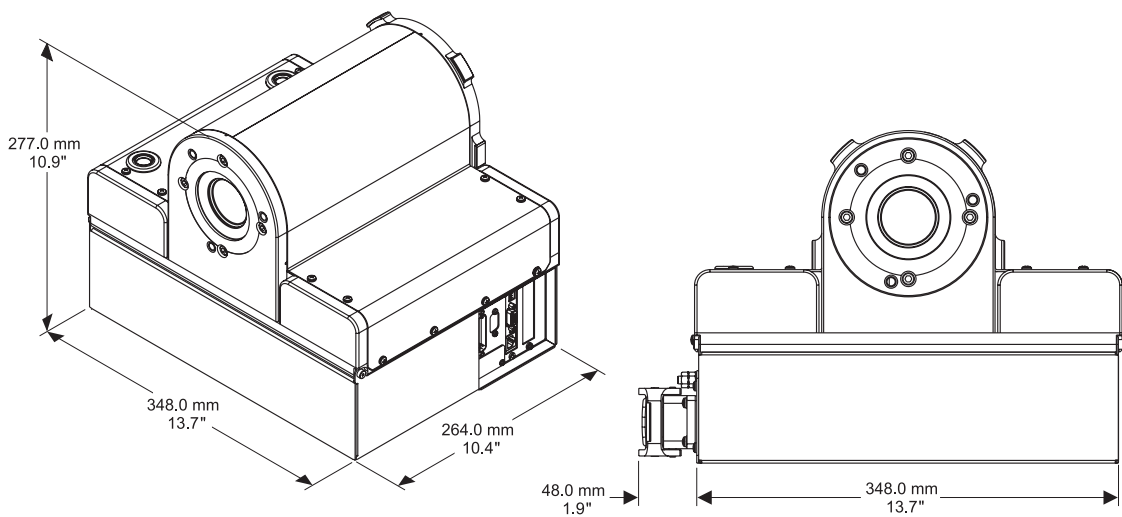
ELECTRICAL SPECIFICATIONS

	LB-3001	LB-4001
AC Power	208 VAC nominal, 3 $\phi$ , Harting® HAN® 6 HsB, male, 6-pin, 35 A	
AC Line Frequency	50/60 Hz nominal	
AC Input Current	16 A max	20 A max
	20 A Breaker	25 A breaker
RF Frequency	~1.7 to 3.0 MHz	
Power <sup>1</sup>	100 to 3000 W, continuously adjustable	100 to 4000 W, continuously adjustable
Interfaces	Analog (25-pin), RS-232 (AE Bus)	

<sup>1</sup> Maximum power may not be achieved under all conditions, or with all process gases.

Environmental Specifications	All Types
Cooling Water	SS female SAE 9/16", 18 straight-thread
	1.5 gpm (5.71 lpm) at 35°C (95°F)
Operating Temperature	+5 to +40°C (+41 to +104°F)

MECHANICAL SPECIFICATIONS



Dimensions	26.4 cm (H) x 40.4 cm (W) x 27.4 cm (D)
	10.4" (H) x 15.9" (W) x 10.8" (D)
Weight	22 kg (49 lb)
Flanges	ISO63, tapped, or flush 3-bolt



For international contact information,  
visit [advancedenergy.com](http://advancedenergy.com).

[sales.support@aei.com](mailto:sales.support@aei.com)  
+1.970.221.0108

## 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

---

Specifications are subject to change without notice. Not responsible for errors or omissions. ©2019 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy®, and AE® are U.S. trademarks of Advanced Energy Industries, Inc.