

RF Plasma Source for Hydrogen - RF-H 600

- Large range of adaptation for research & production
- Optimized reactive species production
- Perfect for wafer cleaning assisted by hydrogen: clean, smooth and preserved surfaces
- Efficient gas consumption and reliable design
- More than 50 high sources installed worldwide



Product introduction

Riber offers the largest range of RF sources on the market today and cover customer needs from research to production.

Hydrogen RF sources is a key solution to assist wafers cleaning step, ensuring a smoother process than a simple thermal annealing, with lower thermal load transferred to the wafer, thus preventing surface degradation.

PBN materials for the discharge one-piece cavity is available to configure the source for reactive Hydrogen species.

The minimum source configuration requires a cavity + cell body and a matching box (comprising a RF generator, cables and water switch). An isolation valve is available for direct installation in the gas line.

Optical emission diagnostics (OED) can also be implemented onto the source for flux stability.

A shutter is available as an option.

Semiconductor grade gas panels are available for mass flow control, gas purification, and driving electronics. Dual gas injection panel is available in case gas mixing is requested.

Working principles

The RF plasma source operates by mean of an electrical field produced by the inductive coupling of the RF coil surrounding the cavity. A RF (13.56 MHz) generator delivers power to the discharge cavity space. To maximize power transfer to the plasma, a matching network is used to match the 50 Ohm impedance of the generator to the purely 50 Ohm impedance of the cavity load. Plasma in the cavity space produces atoms by dissociation of the molecular species. Atoms flow along with the non-dissociated molecules into the vacuum environment through an array of small holes at the front disk of the cavity. The hole arrangement is also called the «pattern». This pattern depends on application.

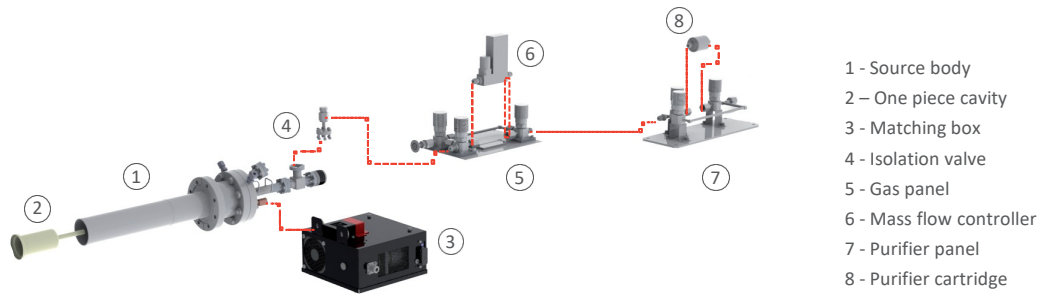
A large flux will require a large number of holes compared to an application where only a very small flux is required. Atoms generally have a very low recombination coefficient, so even those undergoing several wall collisions will ultimately contribute to the atom beam flux.

The electron sheet, covering the inside cavity walls, the hole sizes and shape are designed to minimize ions and electrons released from the cavity (Current lower than 10 nA / cm²).

Gas breakdown will occur above a certain pressure in the cavity. This pressure depends upon the gas ionization potential. As a result, and for a given cavity pattern, the flow rate of molecular gas will vary from gas to gas.

Plasma conditions is actively monitored via optical emission diagnostics to ensure flux stability and composition

Layout

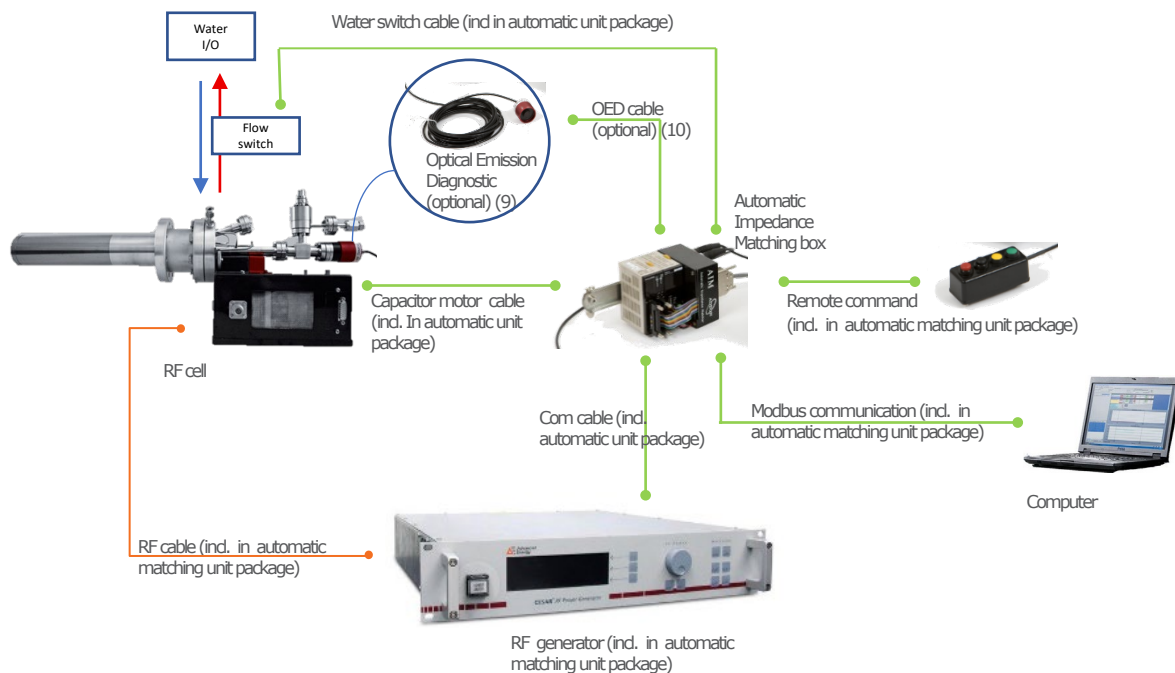


- 1 - Source body
- 2 - One piece cavity
- 3 - Matching box
- 4 - Isolation valve
- 5 - Gas panel
- 6 - Mass flow controller
- 7 - Purifier panel
- 8 - Purifier cartridge

Specifications

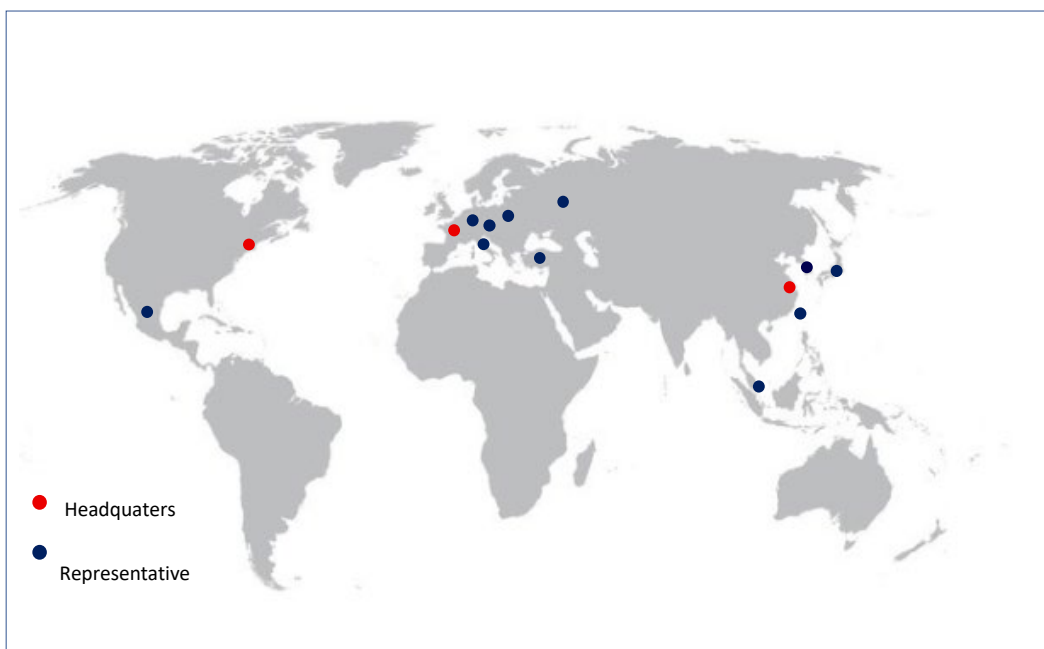
	RF-H 600
Cavity Material	PBN
Cavity type	One-piece cavity with patterned end
Mounting flange	CF 63 min – adaptations available
Tuning unit	Automatic matching box (2 modules) - manual version also available
Power supply	600 W
Plasma observation viewport	CF 16
Isolation valve	Included
Gas inlet	DN CF 16 / VCR ¼"
RF coil water cooling	Included – Ø6mm Swagelok connection DP>2 bars 0,3 l/min
RF tuning unit cooling	Air
Water security switch	Included
Options	Plasma optical emission detection
	Deflection plates
	Shutter
	Gas panel + mass flow controller
	Gas purifier panel

Component interfacing



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For more information, please contact your local sales representative



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