

Resonance Ltd.

143 Ferndale Drive North, Barrie, Ontario, L4M 4S4, Canada

Tel: (705) 733-3633 Fax: (705) 733-1388

Email: res@resonance.on.ca

RF Powered Deuterium Source **Operation Manual**



Contents:

- General Characteristics of the Deuterium Source
- Configuration Drawing of the Deuterium Source
- Accessories
- Special Option
- Operating Instructions
- Lamp Window Cleaning Instructions
- Trouble Shooting Guide
- Mounting and Heat Sinking
- Mounting Normal Lamps
- Lamp Specifications

General Characteristics of the Deuterium Source

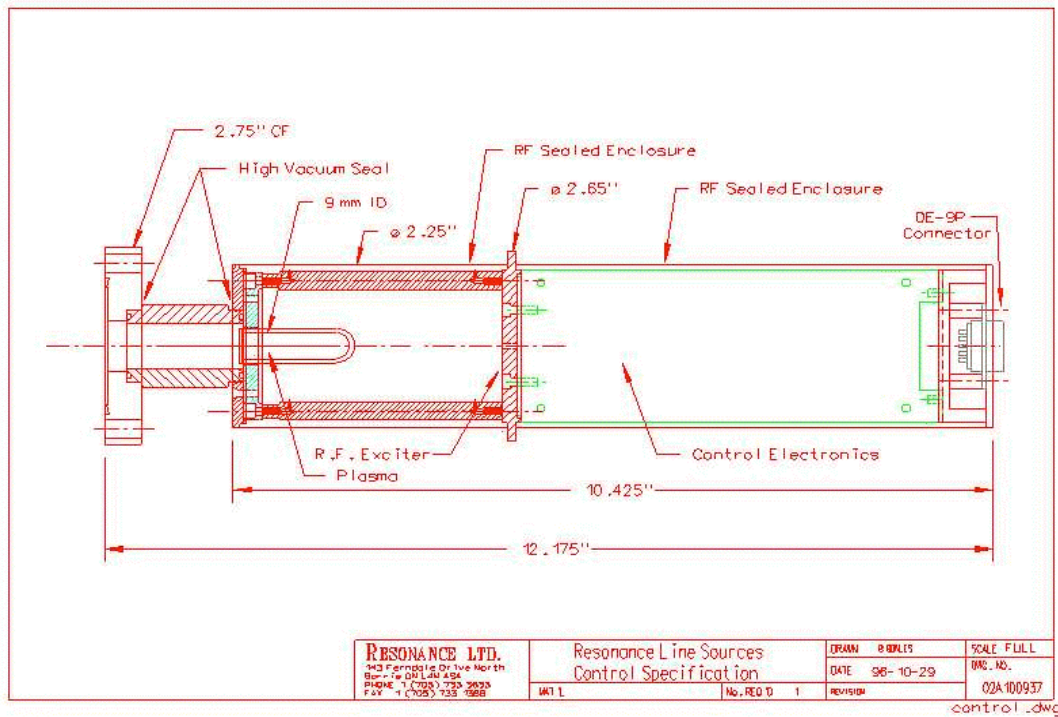
The Resonance RF powered Deuterium source is designed to be a reliable and maintenance free compact source of 110 to 400 nm. emission with an operating life in excess of 2000 hours.

The Resonance line sources are sealed RF excited sources with a window in an EMI shielded enclosure. The lamp mounts to a 2.75 inch or larger CF type flange. The lamp assembly has an integral RF exciter that is powered by a small wall plug power supply.

General Specifications:

- smooth continuum wavelengths with half power points at 190 and 350nm with a typical flux of $>1 \times 10^{15}$ photons per second per steradian. Complex molecular spectrum from 100 to 165 nm with a typical flux of $>2 \times 10^{15}$ photons per second per steradian
- Lamp bulb plasma cavity 30 mm x 9 mm ID
- Integrated units includes lamp bulb in housing with EMI shielded exciter/controller, 2.75" in CF
- Adapter, wall plug power supply
- Input power to wall plug adapter 100 to 250 V, 50 or 60 hz, 50 watts max
- Lamp unit input power 28 V 1 amp max
- Case temperature range 0 to +55 degrees C
- Running Life: min 1500 hrs > 2000 hrs typical
- Stability: max drift of $\pm 1\%$ per hr $< \pm 0.2\%$ per hr typical
- Absolute intensity determined by photo ionization or by traceable NBS standard
- Spectrum of entire UV region

Configuration of Deuterium line source (drawing)



Accessories

- Short adapter for wide angle output
- Lens assembly
- Modulator
- UV diodes
- PSD and Pulse counting
- Detector assemblies
- McPherson or Acton flanges

Special Options

- Space qualification
- Miniature low power configurations
- High flux
- High power configurations
- RS 232 computer control (9600 baud, 8 data bits, 1 stop bit, no parity)

Operating Instructions

WARNING EYE HAZARD

Do not look directly at the lamp plasma unless wearing glasses. Normal eyeglasses will block extreme UV of all lamps except Mercury and D2. For these lamps use special UV blocking glasses.

WARNING AVOID DAMAGING WINDOW SEAL

Do not use chloroform, acetone or xylene to clean the lamp window. Use of these (or similar based solvents) might dissolve the window or the window seal.

Step 1: CLEAN THE LAMP WINDOW

Inspect the front of the lamp window and clean it, (following the lamp window cleaning instructions) if contamination is suspected.

Step 2: MOUNT THE LAMP

Ensure that the lamp is properly mounted. (see mounting and heat sinking instructions).

Step 3: POWER UP THE LAMP

Plug power supply into the wall at 110 volts. Plug the lamp into the power supply. If the lamp does not light or problems occur refer to the troubleshooting guide.

Lamp Window Cleaning Instruction

The lamp window is polished magnesium fluoride and its vacuum ultraviolet transmission will be degraded if it is touched or otherwise contaminated. In all but the best vacuum systems a slow loss of window transmission will result from photo polymerization of organic materials on the outside window surface. Both of these problems may be overcome by proper cleaning of the window. A small bottle of polishing powder (1 micron aluminum oxide powder) and cotton tipped applicators are included with the lamp unit.

Inspect the window for any signs of gross contamination, such as fingerprints. If there are signs of this, first clean the window with polishing powder (aluminum oxide) following the instructions below.

All cleaning operations are carried out with cotton tipped applicators or with lint free tissues. Apply the polishing powder to an applicator tip and gently polish the window. Repeat until there is no evidence of a film on the window when it is viewed with reflected light. Wipe away excess powder with a dry applicator. A few specks of powder on the window will have a negligible effect on the optical transmission. The final bits of powder may be removed by directing a stream of ultra-high-purity helium, nitrogen or argon across the window. Never use a lab source of air for this process because it may contain compressor oil.

Trouble Shooting Guide

Symptom	Remedy
Lamp intensity appears to go down	This is often caused by contamination of the lamp window. Clean the window according to the window cleaning instructions in section 2.
Lamp does not start	Often after sitting for a while the lamps are hard to start. Repeat the starting procedure until the plasma strikes.
The lamp current checks out but the lamp still does not start.	As a last resort you can start the lamp by holding a Tesla coil in the vicinity of the lamp window. Be VERY CAREFUL that the coil does not arc to the window or lamp can as this can damage the window, the lamp electronics, and even the power supply.

Mounting and Heat Sinking

We recommend operating the lamps either with the heat sink (supplied with later units) or with a small cooling fan. While this is not necessary for lamp operation in normal lab conditions, cool operation will enhance the spectral purity of the lamp output and prolong the life of the electronics.

Mounting Normal Lamps

Refer to the configuration drawings above (page 3). The normal way to mount the lamp is with a 2.75" inch Conflat type flange. The lamp has been vacuum tested and should bolt onto a standard flange or adapter. The lamp is designed to operate on High Vacuum equipment at pressures less than 10^{-7} torr. The seals in the mounting adapters are viton and should operate to vacuums less than 10^{-9} torr. The lamp is not designed to be bakable to more than 100°C. Precautions should be taken to insure the lamp does not get heated above this temperature during system bakeouts. Also the lamp should not be operated during system bakeouts.

Lamp Specifications

A sheet of test data for each individual lamp is attached.