RESONANCE LTD
Optical Solutions & Technologies

D2ArCM-L

Operating Manual

REV 1.0

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Description

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.

Features

- Smooth continuum wavelengths with half power points at 190 and 350nm with a typical flux of >3 x 10^{14} photons per second per steradian. Complex molecular spectrum from 100 to 165nm with a typical flux of >1 x 10^{15} photons per second per steradian.
- Lamp bulb plasma cavity 20mm x 9mm ID
- Integrated units includes lamp bulb in housing with EMI shielded exciter/controller, 2.75 inch CF
- Adapter, wall plug power supply
- Input power to wall plug adapter 100 to 250V 1 amp max
- Case temperature range 0 to +55 degrees C
- Running life: min. 1500hrs > 100hrs typical
- Stability: max. drift of 1% per hr. < 0.2% per hr. typical
- Spectrum of entire UV region

Special Options

- Space qualification
- Miniature
- High Flux
- High power configurations

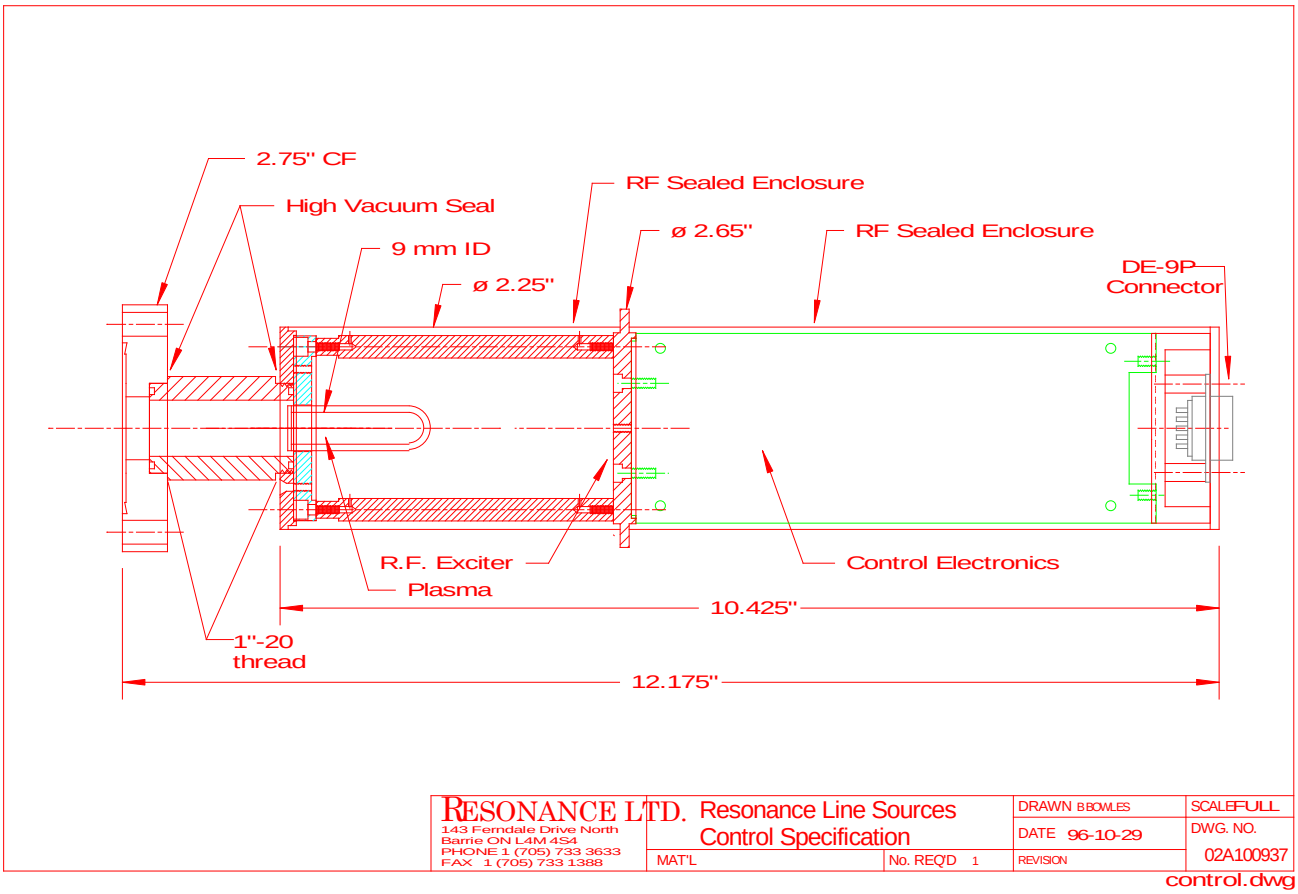
Configurations

- Low power
- High flux
- High power

Accessories

- Lens assembly
- Breakout connector for monitoring Stamp Lamp microcontroller
- UV diodes and Spectrometers
- PSD and Pulse counting
- Detector assemblies
- McPherson or Acton flanges
- Signal break-out box

Configuration



Installation/Mounting

Refer to the lamp configuration drawings (in this manual). The normal way to mount the lamp is with a 2.75" inch Conflat type flange. When the lamp is attached to the Conflat adaptor it is important to not “over torque” the lamp. The lamp shall not be torqued by the rear section of the assembly, only use the front section of the lamp (the end with the window) to tighten the lamp to the Conflat adaptor. During this process, the typical method is to tighten the lamp until the O-ring is seated, and then apply a vacuum.

If further tightening is required, small incremental 1/8 turns shall be performed until a vacuum seal is achieved.

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 (non-operational). Precautions should be taken to insure the lamp does not get heated above this temperature during system bake-outs. Also the lamp should not be operated during system bake-outs.

Operating Warnings

Be sure to read this section and thoroughly understand it before attempting to operate the light source – for both your own safety and that of the light source!

Warning: Eye Hazard

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

Warning: Avoid Damaging Window Seal

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

Warning: Do Not Heat Above 175^{o}C

Operating Instructions

Follow these instructions to properly operate the light source. It is recommended that you read this section over carefully before applying power.

1. **Inspect the Light Source Window**

   Inspect the front of the window and clean it if contamination is suspected, clean according to the window cleaning instructions found in the section titled “Window Cleaning”. Note that LiF window lamps normally appear yellow.

2. **Pre-Installation Test**

   It is recommended that the light source be tested prior to installing into your system to verify it turns on properly. Plug the light source into the power supply. If it does not start, or its output differs from its specifications, refer to the troubleshooting guide found in the section titled “Troubleshooting Guide”.

3. **Mount the Light Source**

   Now that the light source has been successfully tested, it may be installed onto your system. Refer to the section titled “Installation / Mounting” for suggestions and guidelines.

4. **Verify Installed Light Source Turns On**

   Once the light source has been installed onto your system, it should again be immediately tested to verify it turns on. Plug the lamp into the power supply. Plug power supply into wall at 110 volts. The visible light may be observed through a 1/16: hoe in the front section near the bulb. If there are any problems please refer to the “Troubleshooting Guide” section.

Maintenance

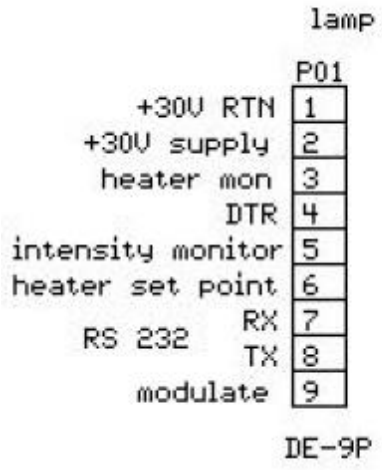
The only maintenance required is to ensure that the window remains clean. Please refer to the Window Cleaning section for proper cleaning technique.

Pin Out/Modulation

(Option)

In order to modulate the lamp connect return to pin 1 and the modulation signal to pin 9. If it is required we can supply an adapter to be inserted between the power supply and the lamp.

The lamp may be modulated with a nominal 0 to 5V signal. The low must be less than 0.5V and the high greater than 3V. TTL levels will work as long as the low level is less than 0.5V. **When the input to pin 9 is high the lamp is off** when pin 9 is low the lamp is on.



Window Cleaning

The light source 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. 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 along with polishing instructions are included with the light source unit.

Before using the light source, inspect the window for any signs of gross contamination, such as fingerprints. If there are or if, after operating the light source, you notice a drop in output then clean the window with polishing powder (aluminum oxide) following these instructions. All cleaning operations are carried out with cotton-tipped applicators or with lint-free tissues.

1. Apply the polishing powder to an applicator tip.
2. Polish the window by firmly pressing the applicator against the center of the window and, in a circular motion, work your way outwards to the edge of the window. You should notice a frictional resistance as you slide across the window.
3. Repeat, using a new applicator, until there is no evidence of a film on the window when it is viewed with reflected light and there has been a noticeable decrease in the frictional resistance.
4. 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.
5. Remove the final bits of powder 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.**

For quick cleaning, it is acceptable to wipe the window with isopropanol or methanol using a cotton-tipped applicator. This will only work for light cleaning (light finger prints, dust, light smudges) and not more serious window contaminants.

Troubleshooting

The following is a quick guide meant for diagnosing problems and offers possible solutions which will hopefully rectify any unwanted behavior.

Light Source Does Not Start

Often after sitting for a while the lamps are hard to start. Repeat the starting procedure until the plasma strikes.

Light Source Intensity Appears to Drop

This is most often caused by contamination of the outside of the light source window, and can occur in vacuum systems with 10^{-7} Torr total pressure and 10^{-9} Torr partial pressure of organic materials. The light source window should be cleaned according to the instructions found in the section “Window Cleaning”.

Lamp Current is Normal but 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.

Contact

Resonance Ltd. stands behind every product we sell. We welcome feedback and encourage any of our customers to contact us with questions, or concerns. You may contact us through e-mail, our website, telephone, or fax!

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