Novascan PSD-UV, PSDP-UV and PSDP-UVT
UV/Ozone Systems

With thousands of users worldwide Novascan’s PSD and PSDP series UV Ozone systems are proven instruments that work. Contact Novascan today for help in selecting the proper system for your application.

- Atomic cleaning of surfaces
- Wafer cleaning
- Stripping Resist
- Polymer, PDSM, COC, PS bonding
- Preparation for thin films
- Cleaning LCDs
- Organic Molecule stripping
- Release of trapped inorganic molecules
- Microfluidic fabrication
- Cleaning AFM probes
- Micro and nano-patterning
- UV curing adhesives, inks, etc.
- Chemical surface modification
- Sterilization
- Oxidize surfaces
- Metal bonding prep and more

Sample Applications

In addition to the above uses, Novascan’s PSD series instruments are often used for scanning probe microscopy applications. Our instruments can be used to clean common oily films and trapped inorganic materials from AFM tips, SPM standards and surfaces. Treatment can also be used to alter surface hydrophobicity, assist in tip and surface chemical modifications, oxidize and harden tips helping to maintain tip geometry while scanning, and sharpen tips for improved lateral resolution.

Novascan instruments are used in nanotechnology, chemistry, biology, optics, electronics, semiconductor, and other scientific laboratories around the world. The PSD Series publication list continues to grow.

**Please try this link to search a thousand publications where Novascan UV systems were successfully utilized for a wide variety of applications:** https://scholar.google.com/scholar?q=novascan+AND+%28ultraviolet+OR+UV%29

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Instrument Specifications

The PSD and PSDP systems are similar in performance and dimensions, but vary in controller capability, upgradability and heated stage options.

The PSD Series
The PSD series instruments are digitally controlled benchtop systems that are available in sizes ranging from 4x4" to 20x20". These systems feature a powerful UV grid system with reflector and adjustable height stage for optimal sample positioning and performance. In/Out Gas Ports are available on the 4x4" and larger systems. The system is controlled by a convenient preset controller that makes operation a breeze.

Features:
- Preset Digital Controller
- Convenient 2 button operation is convenient and simple.
- Automated 15, 30, 45, 60, 90, 120 minute process time
- Process cycle can be manually interrupted at any time
- System cannot be easily upgraded with a temperature stage
- Cost saving yet functional design makes this system a popular choice
- Very simple setup and use
- A host of valuable options are available for the PSD, PSDP and PSDP-UVT to match all of your application needs.

The PSD Pro Series
The PSDP series instruments are research grade UV/ozone cleaning systems that offer maximum versatility for molecular or organic stripping and numerous other applications. Operate in ambient air or flow oxygen through one of two standard gas ports for increased ozone production. A programmable digital controller handles the system processing ensuring accurate timing regimes and optimum scouring parameters.

Features:
- Programmable Digital Controller for more operation control
- Digital Count down display. The PSDP (pro system) can go as high as 999 hours if the controller is set to hours:min versus the standard min:sec setting.
- Easily upgradable to the temperature controlled system
- Function “pause” and “interrupt” capability
- A powerful system that offers enhanced process control
- Internal Memory for previous settings
- A host of valuable options are available for the PSD, PSDP and PSDP-UVT to match all of your application needs.

The PSD Pro Heated Series
The PSDP-UVT takes the power of the PSDP-UV to a new level with the addition of a temperature controlled stage designed to maximize the destruction of molecular organic materials. A digital controller with PID feedback loop accurately maintains stable temperatures of up to 150 degrees Celsius. (200C available as an option)

Features:
- Identical to the PSDP, but factory installed with the temperature stage.
- Offers maximum potential and flexibility
- Ideal for multiple user environment
- A host of valuable options are available for the PSD, PSDP and PSDP-UVT to match all of your application needs.

Common System Features and Information

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>100, 120, 220, 240 VAC, 50-60 cycle</td>
</tr>
<tr>
<td>Sample Height</td>
<td>All systems have an adjustable height stage with an external stage lock for proper sample spacing from the lamp. Standard stages are the UV grid size or larger.</td>
</tr>
<tr>
<td>UV Grid</td>
<td>Ozone producing Mercury vapor grid lamp with reflector. Half life approximately 5000 hours.</td>
</tr>
<tr>
<td>UV Reflector</td>
<td>The UV Reflector is generally 1&quot; larger than the grid size. For example for a 4x4&quot; grid the reflector is 5x5&quot;.</td>
</tr>
<tr>
<td>Sample loading</td>
<td>Chamber hinges up and away from the sample staging area allowing ~360 degree access for loading.</td>
</tr>
<tr>
<td>Safety</td>
<td>Safety interlock turns off UV lamps when chamber is opened.</td>
</tr>
<tr>
<td>Gas Ports</td>
<td>Two ports standard, more ports optional</td>
</tr>
<tr>
<td>Vacuum Chamber</td>
<td>Optional by special order - Aluminum and Quartz fabrication.</td>
</tr>
<tr>
<td>Thermal UV</td>
<td>Enhanced and faster treatment for resist stripping, polymer bonding, etc. up to 150C (200C Optionally)</td>
</tr>
<tr>
<td>Ozone Neutralizer</td>
<td>Neutalizer and Pump optional for PSD and PSDP systems. Automated Ozone Evacuation also available.</td>
</tr>
<tr>
<td>Dual UV</td>
<td>Optional Top and Bottom lamps for simultaneous treatment of both sides of the sample.</td>
</tr>
</tbody>
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How the PSD and PSDP Series Work

The PSD and PSDP Series Instruments destroy organic molecules (contaminants) by producing the proper ratio of high energy ultraviolet light at wavelengths of 185 nm and 254 nm. The 185 nm line drives molecular oxygen O₂ to form the energized O₃ Ozone radical. The 254 nm line simultaneously excites the organic molecules on the surface making them highly susceptible to destruction by the Ozone radical.

Since Ozone has a short half life and is also destroyed by the 254 nm line, an adjustable sample stage is used to properly position the sample relative to the lamp for optimal performance. The PSD and PSDP destroyed contaminants are then released in the form of CO₂ and H₂O vapor, and remaining Ozone returns to the state of molecular Oxygen O₂.

Contaminated glass laboratory slide  Contaminated glass laboratory slide after 10 minutes of PSD treatment  Contaminated glass laboratory slide after 20 minutes of PSD treatment

PSD and PSDP Model Specifications

<table>
<thead>
<tr>
<th>System</th>
<th>Lamp Size</th>
<th>Sample Height</th>
<th>System Weight</th>
<th>System Footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSD-UV4, PSDP-UV4, PSD-UV4T</td>
<td>4&quot;x4&quot;</td>
<td>~4&quot;</td>
<td>41lbs</td>
<td>12L x 15.5W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV48, PSDP-UV48, PSDP-UV48T</td>
<td>4&quot;x8&quot;</td>
<td>~4&quot;</td>
<td>41lbs</td>
<td>12L x 15.5W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV8, PSDP-UV8, PSDP-UV8T</td>
<td>8&quot;x8&quot;</td>
<td>~4&quot;</td>
<td>41lbs</td>
<td>12L x 15.5W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV10, PSDP-UV10, PSDP-UV10T</td>
<td>10&quot;x10&quot;</td>
<td>~4&quot;</td>
<td>56lbs</td>
<td>15L x 17W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV12, PSDP-UV12, PSDP-UV12T</td>
<td>12&quot;x12&quot;</td>
<td>~4&quot;</td>
<td>56lbs</td>
<td>15L x 17W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV816, PSDP-UV816, PSDP-UV816T</td>
<td>8&quot;x16&quot;</td>
<td>~4&quot;</td>
<td>56lbs</td>
<td>15L x 17W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV1216, PSDP-UV1216, PSDP-UV1216T</td>
<td>12&quot;x16&quot;</td>
<td>~4&quot;</td>
<td>56lbs</td>
<td>26L x 28W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV1616, PSDP-UV1616, PSDP-UV1616T</td>
<td>16&quot;x16&quot;</td>
<td>~4&quot;</td>
<td>56lbs</td>
<td>26L x 28W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV1020, PSDP-UV1020, PSDP-UV1020T</td>
<td>10&quot;x20&quot;</td>
<td>~4&quot;</td>
<td>95lbs</td>
<td>26L x 28W x 10.5H&quot;</td>
</tr>
<tr>
<td>PSD-UV2020, PSDP-UV2020, PSDP-UV2020T</td>
<td>20&quot;x20&quot;</td>
<td>~4&quot;</td>
<td>95lbs</td>
<td>26L x 28W x 10.5H&quot;</td>
</tr>
</tbody>
</table>

* UV Grid lamps sizes are actually larger than listed, UV treatment area is generally 1" larger than the lamp dimensions shown. Custom systems and modifications are possible. Please inquire.

Supplemental Information

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Appendix A: Novascan PSD and PSDP UV Ozone System Publications

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C. W. Tsao, L. Hromada, J. Liu, P. Kumar and D. L. DeVoe Low temperature bonding of PMMA and COC microfluidic substrates using UV/ozone surface treatment Lab Chip 2007, 7, 499 – 505


J. Chouinard , A. Khalil, P. Vermette Method of imaging low density lipoproteins by atomic force microscopy Microscopy Research and Technique 2007 Volume 70, Issue 10 , Pages 904 - 907


M. Tencer, R. Charbonneau and P. Berini Confinement and deposition of solution droplets on solvophilic surfaces using a flat high surface energy guide Lab Chip 2007, 7, 483 – 489

W. Bian and L. Tung Structure-Related Initiation of Reentry by Rapid Pacing in Monolayers of Cardiac Cells Circ. Res. published online Feb 9, 2006


M Surtchev1, N R de Souzal,3 and B Jérôme The initial stages of the wearing process of thin polystyrene films studied by atomic force microscopy 2005 Nanotechnology 16 1213-1220


I D Johnston, M C Tracey, J B Davis and C K L Tan Micro throttle pump employing displacement amplification in an elastomeric substrate J. Micromech. Microeng. 2005 15 1831-1839