Small Area VPG+

The VPG+ with a big PLUS in exposure speed - our fastest Volume Pattern Generator of all times!
Small Area Volume Pattern Generator

The Small Area Volume Pattern Generator – the best of both worlds:

The VPG 200 and 400 family of systems has always benefitted from Heidelberg Instruments’ vast experience in small area lithography; and just as much from the field-proven technology employed on the company’s industry standard large area VPG platforms. VPG systems both large and small share the same powerful technology – and in total, they currently pride themselves on in an installation base of more than 50 worldwide. The VPG 200 and 400 excel through high resolution, outstanding image quality, and fast throughput: This makes them the ideal systems for rapid photomask fabrication.

The VPG product line has continuously been improved further as technology advanced and has evolved into the ultra-fast VPG+: any VPG, just like its users, always stands at the cutting edge of technological developments.

Even higher exposure speed: The VPG+ series now features a significantly faster spatial light modulator, custom-made for Heidelberg Instruments and therefore exclusive to the VPG+. The entire exposure engine now operates at a higher rate than ever before and the data path has been vastly enhanced. At the maximum write speed, an exposure will be completed up to three times as fast as with the original VPG: this makes the VPG+ the fastest tool for mask-writing in this market-segment.

Light source and stages: The VPG+ small area systems operate with a high power pulsed UV laser source with a wavelength of 355 nm. The systems can be equipped with air-bearing stages designed to accommodate substrates of up to 8” (VPG+ 200) and 16” (VPG+ 400) respectively.

Alignment, calibration, and environmental control: The systems feature an automated alignment capability allowing multilayer exposures with excellent overlay accuracy and repeatability. The alignment functionality includes distortion compensation and field-by-field alignment. The 2D Stage Map Correction automatically calibrates stage positioning. Rigorous environmental monitoring and feedback control ensure the specified overlay accuracy: software corrections based on precise measurements compensate for any variations in environmental parameters. An integrated metrology system enables self-calibration functions and various critical dimension measurements. Standard data formats are supported.

Applications: The VPG+ 200 and VPG+ 400 are perfectly suited for the production of standard photomasks and also for applications that use i-line resists such as SU-8 and IP 3600. The ability to expose SU-8 in fact makes the VPG+ a perfect solution for rapid prototyping of microfluidics or in other areas where thick negative resists are required. In effect, the Heidelberg Instruments small area VPG+s represent an excellent alternative to any i-line stepper. The systems can be used in a range of demanding fields that require microstructures: typical applications include MEMs, advanced packaging, 3D integration, LED production and compound semiconductors.

Key Features and Options

- NEW Ultra-high-speed exposure engine
- Real time auto focus system
- High power DPSS laser
- Exchangeable write modes
- Camera system for metrology and alignment
- Closed-loop climate chamber
- Automatic substrate loading system
- Stage map correction
- Edge detector system
- Multiple data input formats
- User programmable interface

SPECIFICATIONS

<table>
<thead>
<tr>
<th>WRITE MODE</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
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</thead>
<tbody>
<tr>
<td>Minimum structure size [μm]</td>
<td>0.75</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Address grid [nm]</td>
<td>12.5</td>
<td>25</td>
<td>50</td>
<td>100</td>
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<tr>
<td>Edge roughness [3σ, nm]</td>
<td>40</td>
<td>50</td>
<td>70</td>
<td>150</td>
</tr>
<tr>
<td>CD uniformity [3σ, nm]</td>
<td>65</td>
<td>75</td>
<td>110</td>
<td>300</td>
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<tr>
<td>2nd layer alignment [3σ, nm]</td>
<td>225</td>
<td>350</td>
<td>500</td>
<td>700</td>
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<tr>
<td>Maximum write speed [mm² / minute]</td>
<td>970</td>
<td>3150</td>
<td>6400</td>
<td>13500</td>
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Please note: Specifications depend on individual process conditions and may vary according to equipment configurations. Write speed depends on exposure area. Design and specifications are subject to change without prior notice.