### Technical Specifications

<table>
<thead>
<tr>
<th>Standard Features</th>
<th>Optional Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single lane conveyor</td>
<td>Ultrasonic atomizer at 1-15 Cps (fluid)</td>
</tr>
<tr>
<td>USB3.0 CMOS vision alignment camera</td>
<td>Pneumatic atomizer at 1-400 Cps (fluid)</td>
</tr>
<tr>
<td>Laser height detecting module</td>
<td>IR laser curing module</td>
</tr>
<tr>
<td>Audible alarm, light stack</td>
<td>UV light curing module</td>
</tr>
<tr>
<td>SMEA In line communication</td>
<td>50 μm minimum printed feature width</td>
</tr>
<tr>
<td>300 mm heated plate/vfctchuck</td>
<td>20 μm minimum printed feature width</td>
</tr>
</tbody>
</table>

### Motion System Specifications

| Motion profile                  | X/Y coordinated, Z automated            |
| Drive type                     | X/Y: linear motors; Z: ball screw       |
| Printing area                   | 315 mm X 425 mm X 30 mm                 |
| Positional accuracy (full travel X/Y, Z) | X/Y: ±30 μm @ 3σ; Z: ±10 μm @ 3σ |
| Positional repeatability (full travel X/Y, Z) | X/Y: ±10 μm @ 3σ; Z: ±5 μm @ 3σ |

### Printing Specifications

| Minimum feature width/thickness | 20 μm / 100 nm                            |
| Maximum feature width/thickness (1 Pass) | 2.5 mm / <10 μm                           |
| Ink viscosity range             | 1-500 Cps                                 |
| Ink max particle size           | D50: <500 nm                               |

### Facilities Requirements

| Power                           | 200-250V single phase 50/60Hz              |
| Clean dry air                   | 90 PSI (6 bar)                             |
| Nitrogen (99.999% purity req)   | 50 PSI @ 28 SLPM Max.                      |
| System dimensions               | 1260 x 770 x 1450 mm (D x W x H)          |
| System weight                   | 1980 lbs. (900 kg)                         |
| Standard compliance             | CE                                       |

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### High Density Printed Electronics

**Aerosol Jet® AJHD**

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### Features

- Printed line widths from 20 μm to over 1 mm, layer thickness as low as 100 nm, dispensed volumes well below 1 pl.
- Non-contact digital printing of wiring and circuitry onto non-planar substrates.
- Fully automated compact digital printing & dispensing.

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*Disclaimer: All figures are protype and subject to change based on need.*
Aerosol Jet AJHD Series

**Fine Feature Material Deposition Solution**

The AJHD in-line system brings Optomec’s Aerosol Jet digital printed electronics to high volume manufacturing. Enabling the printing & dispensing a variety of different materials at unparalleled resolution. With the ability to deposit discrete features down to 20 microns and single pass thickness ranging from 100 nm up to several microns.

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**System Features Include:**

- High accuracy linear motors
- Bi-directional single lane board conveyor
- Removable 300 mm heated vacuum platen
- Body recognition vision alignment & automatic visual inspection
- Teach & learn OR digital CAD to path programming

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**Aerosol Jet Process**

1. **Atomization:**

   Nano-particle based liquid inks are atomized into a distribution of particles.

2. **Droplet Sorting, Densification:**

   The droplets generated are sorted to isolate those in the 2-5 micron range. The density of the mist is increased to maximize the output.

3. **Aerodynamic Focusing:**

   The mist is focused with a nitrogen sheath, protecting the nozzle while focusing & accelerating the mist into a beam ranging from 20 µm to over 2 mm (Nozzle dep.).

4. **High Stand-off Printing:**

   The mist beam exits the nozzle at velocities approaching 100 m/s enabling the print head to be 2-5+ mm from the surface without feature resolution loss, enabling printing onto non-planar substrates.

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**Application Examples**

- **Advanced Packaging**
  - Printed wires to connect bare die to surrounding circuitry without wirebonds

- **Precision Dispensing**
  - Conductive epoxies, UV curable adhesives, drugs, biological reactants, and more

- **Printed Passives**
  - Printed resistors, capacitors, inductors, etc at novel, enabling feature sizes

- **Non-Planar Printing**
  - High stand-off printing (up to 5mm) for depositing/ printing on non-planar parts

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**Material Recipes**

Digital process recipes are available to expedite production ramp-up & increase yield.

Aerosol jettable materials include:

- Conductors (Ag, Cu, Au, Pt, Ni, etc.)
- Insulators & Adhesives
- Ceramics
- Resist (Etch, Photo)
- More...

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**Digital Printed Electronics**

**Material Flexibility**

**World-Leading Resolution**

**Non-Planar Trace Printing**