GateKeeper® Gas Purification System, 20-60 HX Series

Continuous high-flow, point-of-use, purified hydrogen, nitrogen, or argon gas at a low cost of ownership

Advanced Technology in Gas Purification
The GateKeeper® Gas Purification System (GPS), HX series, is the latest continuous service gas purification system from Entegris. The system brings advanced technology to gas purification providing semiconductor manufacturers with an innovative, efficient and cost-effective solution. It delivers purified hydrogen, nitrogen, or argon gas to the most critical applications, including semiconductor and LED production. The ultra-small footprint and compact design requires minimal fab floor space and allows easy access to serviceable components.

The new "HX" media represents the latest advancement in purification technology from Entegris, providing for outlet purity in the parts-per-trillion (ppt) levels. The system uses ambient temperature purification, so heating is not required for purification. This means resource conservation and lower energy costs. The GPS effectively and efficiently removes contaminants such as moisture, oxygen, carbon monoxide, carbon dioxide and non-methane hydrocarbons from nitrogen, hydrogen, and argon gas.

APPLICATIONS
- Metal organic chemical vapor deposition (MOCVD)
- Applications that require ultra-pure hydrogen, nitrogen, or argon gas
- Atomic layer deposition (ALD)
- Low temperature epitaxy (LTE)

FEATURES & BENEFITS
- Power failure will not damage the purification system
- Purifies to parts-per-trillion (ppt) levels
- Low pressure drop means no changes to inlet pressure are required
- Self-regenerating purifiers provide the lowest cost of ownership
- Ambient temperature purification means lower energy costs and resource conservation
- CE, CSEI (China), and SEMI® certified
- Ethernet connection allows for remote monitoring capability
- Designed for easy field maintenance and upgrades
- Available worldwide through Entegris' global infrastructure
### PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>GPS20HX</th>
<th>GPS30HX</th>
<th>GPS50HX</th>
<th>GPS60HX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gases purified</strong></td>
<td>Hydrogen (H₂), Nitrogen (N₂), Argon (Ar), Helium (He)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Media type</strong></td>
<td>Inorganic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contaminants removed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture (H₂O)</td>
<td>&lt;100 ppt (in H₂)</td>
<td>&lt;50 ppt (in Ar, N₂)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon monoxide (CO)</td>
<td>&lt;1 ppb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon dioxide (CO₂)</td>
<td>&lt;100 ppt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen (O₂)</td>
<td>&lt;400 ppt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen (H₂)</td>
<td>&lt;1000 ppt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CₓHᵧ (45–100 amu)</td>
<td>&lt;5 ppt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CₓHᵧ (&gt;100 amu)</td>
<td>&lt;1 ppt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-methane hydrocarbon (C₅ and higher)</td>
<td>&lt;1 ppt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating pressure range</strong></td>
<td>5.51–17.23 bar (80–250 psig)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pressure drop</strong></td>
<td>&lt;15 psi @ 100 psig and max rated flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum flow rate</strong></td>
<td>20 Nm³/hr (311 slm)</td>
<td>30 Nm³/hr (466 slm)</td>
<td>50 Nm³/hr (776 slm)</td>
<td>60 Nm³/hr (932 slm)</td>
</tr>
<tr>
<td><strong>Gas operating temperature</strong></td>
<td>15°–40°C (60°–104°F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Outlet filtration (ISO Class 1)</strong></td>
<td>&lt;10 particles per m³ @ 0.1 μm, &lt;2 particles per m³ @ 0.2 μm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leak rating</strong></td>
<td>1 x 10⁻⁹ atm cc/sec</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*For N₂ and Ar only.
## SAFETY FEATURES

<table>
<thead>
<tr>
<th>Features</th>
<th>Descriptions</th>
<th>GPS series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth leakage circuit breaker</td>
<td>Provides additional electrical protection to the system.</td>
<td>Yes</td>
</tr>
<tr>
<td>Over temperature rise condition</td>
<td>Monitored via thermocouple. Heaters sized to prevent runaway conditions. As a secondary precautionary device, a high-temperature hardware interlock is included on all systems.</td>
<td>Yes</td>
</tr>
<tr>
<td>EMO button</td>
<td>When activated, power is removed from the main enclosure. The front panel and controller remain powered. Process gas flow is shut off.</td>
<td>Yes</td>
</tr>
<tr>
<td>Remote EMO</td>
<td>Provides input for remote EMO activation. In the event of an EMO shutdown, the system will send an output signal to an external sensing device that alerts the facility of the alarm.</td>
<td>Yes</td>
</tr>
<tr>
<td>Remote alarm</td>
<td>In the event of a minor alarm in the system not requiring an EMO shutdown, the system will send an output signal to an external sensing device that alerts the facility of the alarm.</td>
<td>Yes</td>
</tr>
<tr>
<td>Visual alarm</td>
<td>Alarm conditions will result in a visual alarm on the top of the system.</td>
<td>Yes</td>
</tr>
<tr>
<td>Audible alarm</td>
<td>Alarm conditions will result in an audible alarm.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**FACILITY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model</th>
<th>GPS 20/30HX</th>
<th>GPS 50/60HX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process gas input</strong></td>
<td>Mechanical connection</td>
<td>½&quot; tube stub</td>
</tr>
<tr>
<td><strong>Process gas output</strong></td>
<td>Mechanical connection</td>
<td>½&quot; tube stub</td>
</tr>
<tr>
<td><strong>Ventilation</strong></td>
<td>Mechanical connection</td>
<td>4&quot; duct</td>
</tr>
<tr>
<td></td>
<td>Exhaust flow</td>
<td>50 cfm</td>
</tr>
<tr>
<td><strong>Power requirements</strong></td>
<td>Mechanical connection</td>
<td>3-pin mechanical disconnect</td>
</tr>
<tr>
<td></td>
<td>Power requirements</td>
<td>200–240 VAC single phase</td>
</tr>
<tr>
<td></td>
<td>Power consumption</td>
<td>100W at idle and online</td>
</tr>
<tr>
<td></td>
<td></td>
<td>500W at regen</td>
</tr>
<tr>
<td><strong>Regeneration</strong></td>
<td>Regen duration</td>
<td>&lt;24 hours for each purifier bed</td>
</tr>
<tr>
<td><strong>Regen gas input</strong></td>
<td>Mechanical connection</td>
<td>½&quot; tube stub</td>
</tr>
<tr>
<td></td>
<td>Gas</td>
<td>Hydrogen system – H₂</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nitrogen system – N₂</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Argon system – H₂</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Helium system – N₂ and H₂</td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>N₂: 4.00 – 4.27 bar (58 – 62 psig)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H₂: 4.55 – 4.83 bar (66 – 77 psig)</td>
</tr>
<tr>
<td><strong>Regen gas output</strong></td>
<td>Mechanical connection</td>
<td>¼&quot; tube stub</td>
</tr>
<tr>
<td><strong>Instrument air</strong></td>
<td>Mechanical connection</td>
<td>¼&quot; compression fitting</td>
</tr>
<tr>
<td></td>
<td>Gas and pressure</td>
<td>CDA or N₂ @ 6.21–10.34 bar (90 – 150 psig)</td>
</tr>
<tr>
<td><strong>Physical requirements</strong></td>
<td>Mounting</td>
<td>Floor</td>
</tr>
<tr>
<td></td>
<td>Recommended maintenance space</td>
<td>3 feet in front of system</td>
</tr>
<tr>
<td></td>
<td>Operating conditions</td>
<td>15°–40°C (60°–104°F) indoor</td>
</tr>
<tr>
<td></td>
<td>Humidity</td>
<td>10%–90% RH noncondensing</td>
</tr>
<tr>
<td><strong>Shipping weight</strong></td>
<td>20/30 240 kg (530 lbs)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50/60 274 kg (605 lbs)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: It is the customer’s responsibility to ensure that the equipment is installed according to local building code requirements.*
### DIMENSIONS

**Models GPS20HX, GPS30HX, GPS50HX, GPS60HX**

<table>
<thead>
<tr>
<th>Models</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS20HX</td>
<td>492.0 mm (19.4&quot;)</td>
</tr>
<tr>
<td>GPS30HX</td>
<td>559.0 mm (22.0&quot;)</td>
</tr>
<tr>
<td>GPS50HX</td>
<td>1810.0 mm (71.3&quot;)</td>
</tr>
<tr>
<td>GPS60HX</td>
<td>492.0 mm (19.4&quot;)</td>
</tr>
</tbody>
</table>

**System features**

<table>
<thead>
<tr>
<th>System features</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Indicator light</td>
<td>Glows green, yellow, or red to provide visual indication of system status, includes audible alarm.</td>
</tr>
<tr>
<td>2. Touch screen</td>
<td>Provides detailed system status and information.</td>
</tr>
<tr>
<td>3. EMO</td>
<td>When activated, power is removed from the cabinet. The system shuts down. The front panel and controller remain powered.</td>
</tr>
<tr>
<td>4. Main system switch</td>
<td>Powers the system on and off.</td>
</tr>
<tr>
<td>5. Start</td>
<td>Used to begin system operations and to clear alarms.</td>
</tr>
<tr>
<td>6. Casters</td>
<td>Casters with integrated leveling feet; includes seismic restraints.</td>
</tr>
<tr>
<td>7. Exhaust vent</td>
<td>Allows ventilation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System features</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Instrument air</td>
<td>Supplies gas to the air-operated control valves.</td>
</tr>
<tr>
<td>13. Power</td>
<td>System power connection.</td>
</tr>
<tr>
<td>15. Ethernet port</td>
<td>RJ-45 connector for Modbus® TCP/IP and remote browser-based web access.</td>
</tr>
</tbody>
</table>
ENCLOSURE INFORMATION

The GateKeeper HX series enclosure is designed for indoor applications only. The enclosure includes leveling feet with integrated casters and seismic restraint brackets to secure the system to the floor. The front door provides easy access to all serviceable components. The backup purifier is accessible from the front door.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Model</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS20HX</td>
<td>Enclosed model for use with applications requiring a flow rate up to 20 m³/hr</td>
</tr>
<tr>
<td>GPS30HX</td>
<td>Enclosed model for use with applications requiring a flow rate up to 30 m³/hr</td>
</tr>
<tr>
<td>GPS50HX</td>
<td>Enclosed model for use with applications requiring a flow rate up to 50 m³/hr</td>
</tr>
<tr>
<td>GPS60HX</td>
<td>Enclosed model for use with applications requiring a flow rate up to 60 m³/hr</td>
</tr>
</tbody>
</table>

SYSTEM OPTIONS

<table>
<thead>
<tr>
<th>Options</th>
<th>GPS series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic bypass valve</td>
<td>Yes</td>
</tr>
<tr>
<td>Automatic bypass valve with integrated GateKeeper backup purifier in parallel configuration</td>
<td>Yes</td>
</tr>
<tr>
<td>Inlet and outlet pressure transducers</td>
<td>Default</td>
</tr>
<tr>
<td>Moisture indicator</td>
<td>Yes</td>
</tr>
<tr>
<td>Process gas mass flow meter with totalizer</td>
<td>Yes</td>
</tr>
<tr>
<td>400V input power</td>
<td>Yes</td>
</tr>
</tbody>
</table>

REFERENCE

1 The media reference “HX” shown here will be represented by Gas name in the product nomenclature, like N2 (Nitrogen), H2 (Hydrogen), He (Helium), Ar (Argon) 
e.g., Product P/N will reflect GPS90N2 (for Nitrogen Purification System)

FOR MORE INFORMATION

Please call your Regional Customer Service Center today to learn what Entegris can do for you. Visit entegris.com and select the Contact Us link to find the customer service center nearest you.

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