



## GATEKEEPER® GAS PURIFICATION SYSTEM HX SERIES FOR 20, 30, 50 AND 60 NM<sup>3</sup>/HR

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



# *continuous flow, point-of-use purified hydrogen gas*

## Overview

The GateKeeper® Gas Purification System (GPS) HX series is a state-of-the-art continuous service gas purification system from Entegris that brings advanced technology to gas purification. It provides semiconductor manufacturers with an innovative solution for higher wafer yields and lower cost of ownership.

Based on the in-situ regeneration technology, GateKeeper purifiers automatically self-regenerate, guaranteeing a continuous flow of purified process gas. This eliminates the need to send a purifier back for regeneration or install a replacement purifier. As a result, this improves system safety and eliminates environmental concerns.

The GPS HX series delivers ultrapure hydrogen, nitrogen or argon gas to the most critical applications, including semiconductor and LED production. The ultra small footprint and compact

design require minimal fab floor space and allow easy access to serviceable components. Its media provides outlet purity in the parts-per-trillion (ppt) levels. The system uses ambient temperature purification where heating is not required, thereby ensuring resource conservation and lower energy costs. The GPS effectively removes contaminants such as H<sub>2</sub>O, O<sub>2</sub>, CO, CO<sub>2</sub> and non-methane hydrocarbons from hydrogen gas.

## Applications

- Metal Organic Chemical Vapor Deposition (MOCVD)
- Atomic Layer Deposition (ALD)
- Low Temperature Epitaxy (LTE)

## Features and Benefits

Features	Benefits
Removal efficiency	<p>High wafer yields</p> <ul style="list-style-type: none"> <li>• Contaminant removal efficiency ensures a cleaner process in parts-per-trillion levels</li> <li>• Low pressure drop means the system does not require any changes to the inlet pressure</li> </ul> <hr/> <p>System reliability and low cost of ownership</p> <ul style="list-style-type: none"> <li>• Power failures will not harm the system</li> <li>• Use of ambient temperatures, where heating is not required, lowers energy costs and conserves resources</li> <li>• Startup service facilitates integration, field maintenance and upgrades</li> </ul>
Optimized in-situ regeneration technology	<p>GateKeeper purifiers automatically self-regenerate, guaranteeing a continuous flow of pure gas</p> <ul style="list-style-type: none"> <li>• This eliminates the need to send a purifier back for regeneration or install a replacement purifier</li> <li>• Improves system safety and eliminates environmental concerns</li> <li>• Reduces interruptions to process gas flows</li> </ul>
Ultra small footprint	<p>Compact design</p> <ul style="list-style-type: none"> <li>• Uses minimal fab floor space to ensure facility cost savings</li> <li>• Allows customers to effectively utilize shadow footprint of process tools</li> </ul> <hr/> <p>Easy access to components</p> <ul style="list-style-type: none"> <li>• Speeds up installation</li> <li>• Facilitates system hookups to facility</li> </ul>
CE and SEMI® certified HX series gas purification system	<p>Delivers ultrapure hydrogen, nitrogen or argon gas to the most critical applications, including semiconductor and LED production</p> <hr/> <p>Effectively removes contaminants such as H<sub>2</sub>O, O<sub>2</sub>, CO, CO<sub>2</sub> and non-methane hydrocarbons from hydrogen, nitrogen and argon gases</p>

## Product Specifications

Model	GPS20HX	GPS30HX	GPS50HX	GPS60HX
Gases purified:	Hydrogen (H <sub>2</sub> ), nitrogen (N <sub>2</sub> ) or argon (Ar)			
Media type:	Inorganic			
Contaminants removed:	Moisture (H <sub>2</sub> O) <50 in argon and nitrogen		<100 ppt in hydrogen	
	Carbon monoxide (CO)		<1 ppb	
	Carbon dioxide (CO <sub>2</sub> )		<100 ppt	
	Oxygen (O <sub>2</sub> )		<400 ppt	
	Non-methane hydrocarbons (C5 and higher)		<1 ppt	
Operating pressure range:	5.51–17.23 bar (80–250 psig)			
Pressure drop:	<15 psi @ 100 psig and max rated flow			
Maximum flow rate:	20 Nm <sup>3</sup> /hr (311 SLM)	30 Nm <sup>3</sup> /hr (466 SLM)	50 Nm <sup>3</sup> /hr (776 SLM)	60 Nm <sup>3</sup> /hr (932 SLM)
Gas operating temperature:	15°C–40°C (60°F–104°F)			
Outlet filtration (ISO Class 1):	<10 particles per m <sup>3</sup> @ 0.1 µm			
	<2 particles per m <sup>3</sup> @ 0.2 µm			
Leak rating:	1 × 10 <sup>-9</sup> atm cc/sec			

## Safety Features

Feature	Description	GPS Series
Earth leakage circuit breaker	Provides additional electrical protection to the system.	Yes
Over temperature rise condition	Monitored via thermocouple. Heaters sized to prevent runaway conditions. As a secondary precautionary device, a high-temperature hardware interlock is included on all systems.	Yes
EMO button	When activated, power is removed from the main enclosure. The front panel and controller remain powered. Process gas flow is shut off.	Yes
Remote EMO	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.	Yes
Remote alarm	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.	Yes
Visual alarm	Alarm conditions will result in a visual alarm on the top of the system.	Yes
Audible alarm	Alarm conditions will result in an audible alarm.	Yes

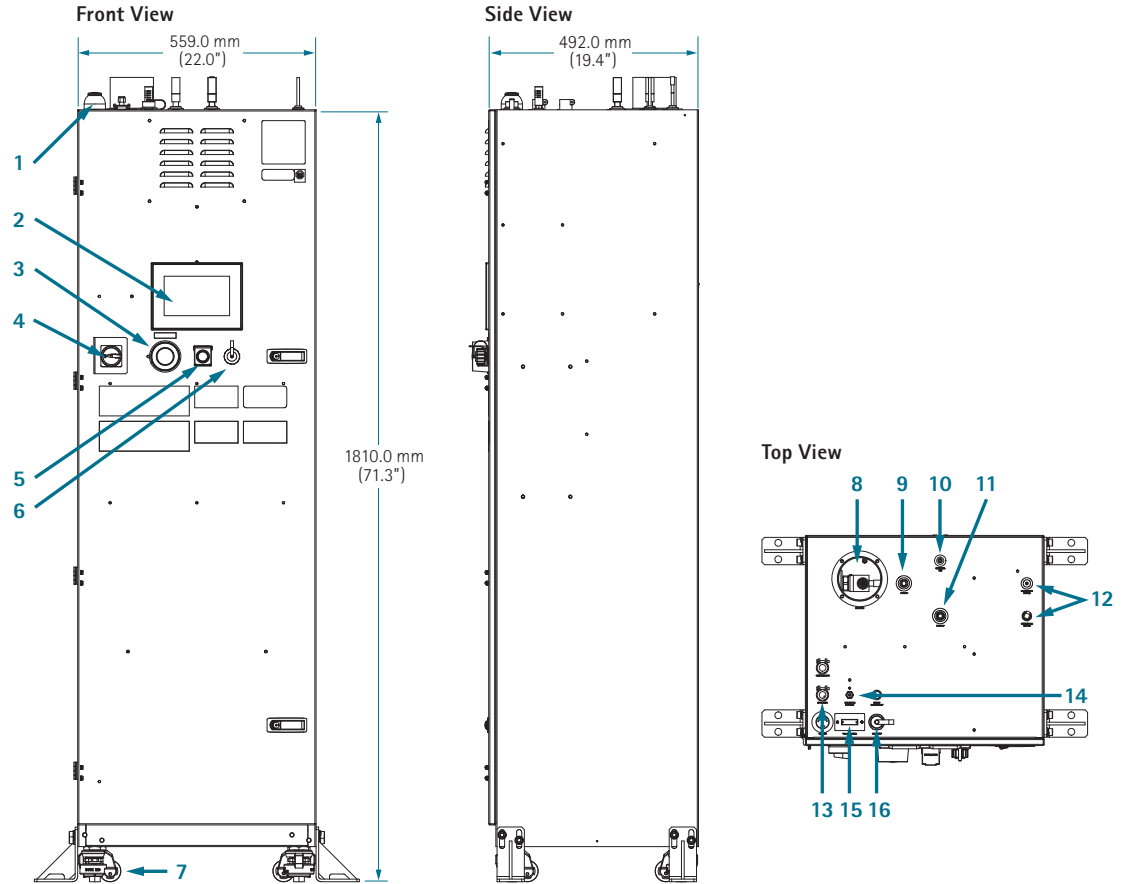
## Facility Specifications

		GPS 20/30HX	GPS 50/60HX	
Process gas input:	Mechanical connection	1/2" tube stub	3/4" tube stub	
Process gas output:	Mechanical connection	1/2" tube stub	3/4" tube stub	
Ventilation:	Mechanical connection	4" duct		
	Exhaust flow	50 cfm		
Power requirements:	Mechanical connection	3-pin mechanical disconnect		
	Power requirements	200–240 VAC single phase		
	Power consumption	100W at idle and online 500W at regen		
Regeneration:	Regen duration	<24 hours for each purifier bed		
Regen gas input:	Mechanical connection	3/8" tube stub		
	Gas	Hydrogen system – Nitrogen Nitrogen and argon system – Hydrogen		
	Pressure	N <sub>2</sub>	4.00 – 4.27 bar (58 – 62 psig)	
		H <sub>2</sub>	4.55 – 4.83 bar (66 – 77 psig)	
Regen gas output:	Mechanical connection	1/4" tube stub		
Instrument air:	Mechanical connection	1/4" compression fitting		
	Gas and pressure	CDA or N <sub>2</sub> @ 6.21–10.34 bar (90–150 psig)		
Physical requirements:	Mounting	Floor		
	Recommended maintenance space	3 feet in front of system		
	Operating conditions	15°C–40°C (60°F–104°F) indoor		
	Humidity	10%–90% RH noncondensing		
Shipping weight:		181 kg (400 lb)	205 kg (450 lb)	

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

## Models GPS20HX, GPS30HX, GPS50HX, GPS60HX

### Dimensions



### System Features

1	Indicator light	Glowes green, yellow or red to provide visual indication of system status; includes audible alarm.
2	Touch screen	Provides detailed system status and information.
3	EMO	When activated, power is removed from the cabinet. The system shuts down. The front panel and controller remain powered.
4	Main system switch	Powers the system on and off.
5	Start	Used to begin system operations and to clear alarms.
6	USB port	USB connection for data log retrieval and system updates.
7	Casters	Casters with integrated leveling feet; includes seismic restraints.
8	Exhaust vent	Allows ventilation.
9	Process gas input	Inlet gas (not purified).
10	Regen gas vent	Exhausts regen gas.
11	Process gas output	Outlet gas (purified).
12	Regen gas inputs	Customer-supplied regeneration gas line for nitrogen.
13	Power	System power connection.
14	Instrument air	Supplies gas to the air-operated control valves.
15	Remote alarm interface	Allows for remote alarm input and output with female 15-pin DB connector.
16	Ethernet port	RJ-45 connector for Modbus <sup>®</sup> TCP/IP and remote browser-based web access.

## 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

Model	Description
GPS20HX	Enclosed model for use with applications requiring a flow rate up to 20 m <sup>3</sup> /hr
GPS30HX	Enclosed model for use with applications requiring a flow rate up to 30 m <sup>3</sup> /hr
GPS50HX	Enclosed model for use with applications requiring a flow rate up to 50 m <sup>3</sup> /hr
GPS60HX	Enclosed model for use with applications requiring a flow rate up to 60 m <sup>3</sup> /hr

Options	GPS Series
Passive backup	Yes
Passive backup with integrated Gatekeeper backup purifier in series configuration	Yes
Automatic bypass valve	Yes
Automatic bypass valve with integrated GateKeeper backup purifier in parallel configuration	Yes
Inlet and outlet pressure transducers	Yes
Moisture indicator	Yes
Process gas mass flow meter with totalizer	Yes
400V input power	Yes

## For More Information

Please call your Regional Customer Service Center today to learn what Entegris can do for you. Visit [www.entegris.com](http://www.entegris.com) and select the Customer Service link for the center nearest you.

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