GateKeeper® Gas Purification System, 90-120 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

SPECIFICATIONS

Model[1]	GPS90HX	GPS100HX	GPS120HX
Gases purified	Hydrogen (H_2), Nitrogen (N_2), Argon (Ar)		
Media type	Inorganic		
Contaminants removed	Carbon monoxide (CO): <1 ppb		
	Carbon dioxide (CO_2): <100 ppt		
	Oxygen (O_2): <400 ppt		
	Non-methane hydrocarbons (C_5 and higher): <1 ppt		
	Hydrogen (H_2): <1 ppb		
	Moisture (H_2O): <50 ppt in Ar and N_2; <100 ppt in H_2		
Operating pressure range	5.51 – 17.23 bar (80 – 250 psig)		
Pressure drop	<15 psi @ 100 psig and max rated flow		
Maximum flow rate	90 Nm^3/hr (1397 slm)	100 Nm^3/hr (1553 slm)	120 Nm^3/hr (1863 slm)
Gas operating temperature	15° – 40°C (60° – 104°F)		
Outlet filtration (ISO® Class 1)	<10 particles per m^3 at 0.1 µm, <2 particles per m^3 at 0.2 µm		
Leak rating	1 x 10^{-9} atm cc/sec		

SAFETY FEATURES

Features	Description
Earth leakage circuit breaker	Provides additional electrical protection to the system.
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.
Rate-of-rise detector	If the detector senses a rapid increase in temperature inside the system enclosure, an EMO alarm will be activated and shut down the system.
EMO button	When activated, power is removed from the main enclosure. The front panel and controller remain powered. Process gas flow is shut off.
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.
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.
Visual alarm	Alarm conditions will result in a visual alarm on the top of the system.
Audible alarm	Alarm conditions will result in an audible alarm.
Hydrogen detector	Activates an EMO alarm and shuts down the system in the event of a hydrogen gas leak inside the system enclosure.

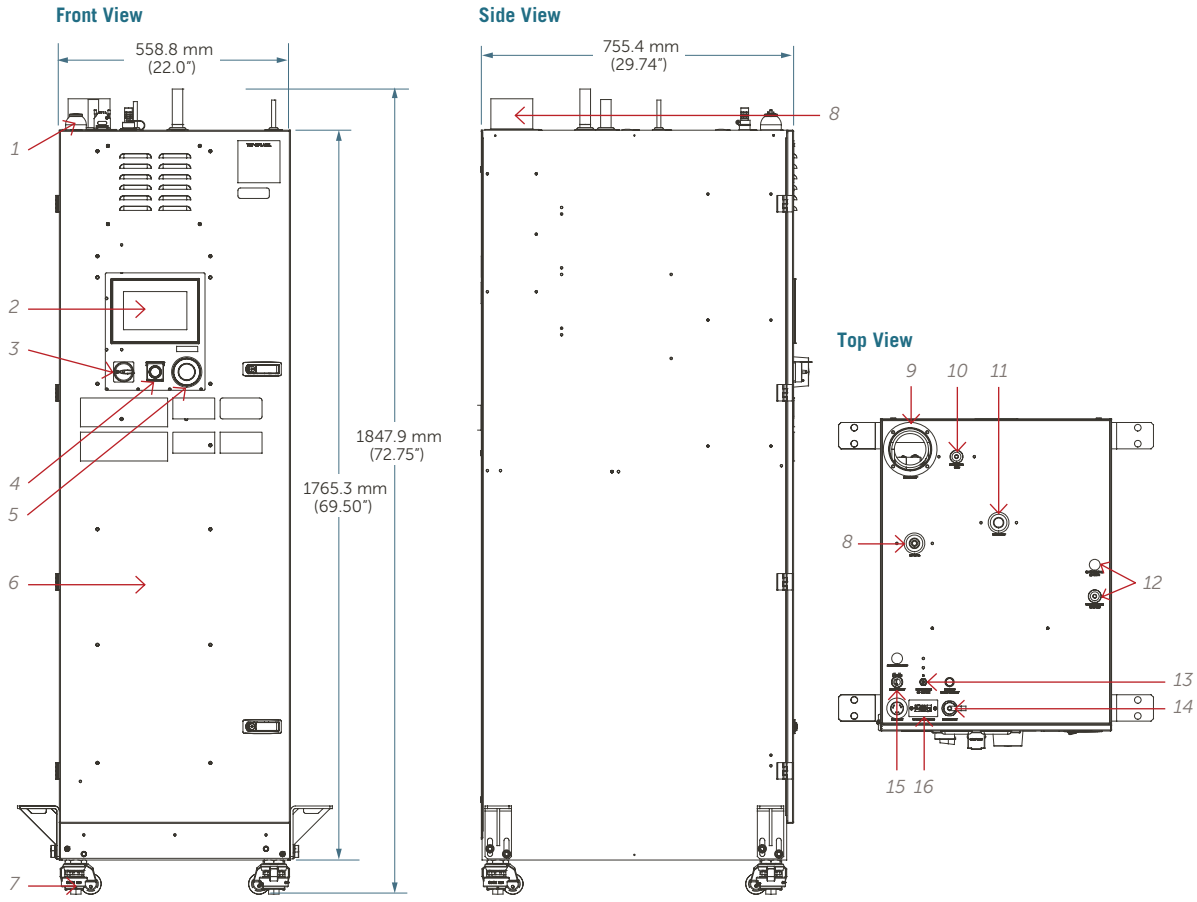
FACILITY SPECIFICATIONS

Model[1]		GPS90HX	GPS100HX	GPS120HX
Process gas input	Mechanical connection	1" tube stub		
Process gas output	Mechanical connection	1" tube stub		
Ventilation	Mechanical connection	4" duct		
	Exhaust flow	72 CFM		
Power requirements	Mechanical connection	3-pin mechanical disconnect		
	Power requirements	200–240 VAC single phase		
	Power consumption	150 W at idle and online; 1500 W for 6 hours during heating and 150 W for 3 hours during cool down		
Regeneration	Regen duration	≤12 hours for each purifier bed		
Regen gas input	Mechanical connection	N_2: ⅜" tube stub		
		H_2: ¼" tube stub		
Regen gas output	Mechanical connection	⅜" tube stub		
Instrument air	Mechanical connection	¼" compression fitting		
	Gas and pressure	CDA or N_2 @ 80–150 psig		
Physical requirements	Mounting	Floor		
	Recommended maintenance space	3 feet in front of system		
	Operating conditions	15°–40°C indoor (60°–104°F indoor)		
	Humidity	10–90% RH noncondensing		
Shipping weight		299 kg (660 lb)		

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

DIMENSIONS

Models GPS90HX, GPS100HX, GPS120HX[1]



SYSTEM FEATURES

Features	Description
1. Indicator light	Glows green, yellow, or red to provide visual indication of system status, includes audible alarm.
2. Touch screen	Provides detailed system status and information.
3. Main system switch	Powers the system on and off.
4. Start/Clear	Used to begin system operations and to clear alarms.
5. EMO	When activated, power is removed from the cabinet. The system shuts down. Front panel and controller remain powered.
6. USB port	USB connection for data log retrieval and system updates (inside cabinet door).
7. Casters	Casters with integrated leveling feet, includes seismic restraints.

Features	Description
8. Process gas input	Inlet gas (not purified).
9. Exhaust vent	Allows ventilation.
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. Instrument air	Supplies gas to the air operated control valves.
14. Ethernet port	RJ-45 connector for Modbus® TCPIP and remote browser-based web access.
15. Power	System power connection.
16. Remote alarm interface	Allows for remote alarm input and output with female 15-pin DB connector.

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[1]	Description
GPS90HX	Enclosed model for use with applications requiring a flow rate up to 90 m^3/hr
GPS100HX	Enclosed model for use with applications requiring a flow rate up to 100 m^3/hr
GPS120HX	Enclosed model for use with applications requiring a flow rate up to 120 m^3/hr

SYSTEM OPTIONS

Automatic bypass valve
Automatic bypass valve with integrated GateKeeper backup purifier in parallel configuration
Inlet and outlet pressure transducers
Moisture indicator
Process gas mass flowmeter with totalizer
400 V input power

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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