

HP Performance-Optimized Datacenter, 12 m (40 ft) User Guide



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Intended audience

This document is for the person who installs, administers, and maintains HP Performance-Optimized Datacenters and their supporting infrastructures. You should be qualified in the design, construction, or maintenance of power, cooling, and IT infrastructures and be trained in recognizing products with hazardous energy levels.

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Site preparation and safety considerations

Before you begin

For more information on site requirements, specifications, water quality requirements, power management requirements, and supported facility connections, see the HP Performance-Optimized Datacenter Site Requirements documentation.

The location of various components or subsystems in your HP POD might vary from this documentation. For final placement specifications, see your operations and maintenance manual.

Safety information

The HP POD is certified to UL 60950/IEC 60950 as an Information Technology Product and Classified according to the National Electric Code NFPA-70, 2008

The HP POD is not suitable for long term human occupancy. The HP POD has service access areas for periodic maintenance and service. These areas must be used only by owner-authorized personnel who are trained in the maintenance and service of the HP POD IT components.



IMPORTANT: Before installing the HP POD, consult your local AHJ for applicable codes and to review site-specific location guidelines. If needed, obtain any necessary permits.

Operator safety

The HP POD is not suitable for long term personnel occupancy.

The HP POD provides service access areas for periodic maintenance and service and is only to be used by owner authorized personnel specifically trained in the maintenance and service of the HP POD IT components.



WARNING: To avoid risk of personal injury, hearing protection must be worn at all times when working inside the HP POD.



WARNING: To avoid risk of personal injury, use caution where slip hazards are present. Any water that drains around the HP POD causes a potential slip hazard.



WARNING: To avoid risk of personal injury or damage to the equipment, do not insert anything inside the electrical busways except the approved HP busway dropboxes.

Component health



CAUTION: During operation of the HP POD, the overhead fan doors must remain closed.

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- △ **CAUTION:** All customer supplied water fittings must be composed of carbon steel, stainless steel, or copper. Do not use cast iron, aluminum, or PVC fittings.
-
- △ **CAUTION:** During operation, avoid leaving the HP POD doors open, to maintain accurate environmental conditions inside the HP POD.
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- △ **CAUTION:** If the HP POD is located outdoors, do not work in the hot aisle during inclement weather.
-

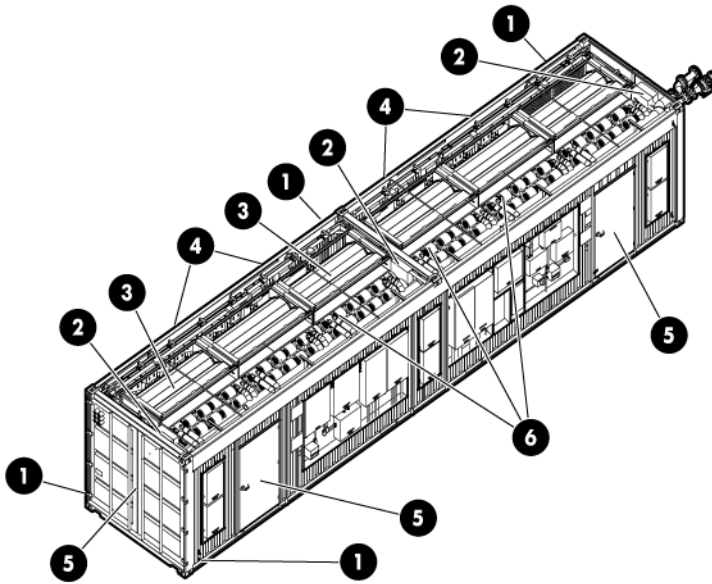
If the chilled water stops flowing into the HP POD:

1. Turn off IT equipment.
2. If weather permits, open the HP POD doors.
3. Review the ECS alarm ("[ECS alarms](#)" on page [37](#)) conditions.

Component identification

HP POD components

HP POD external components

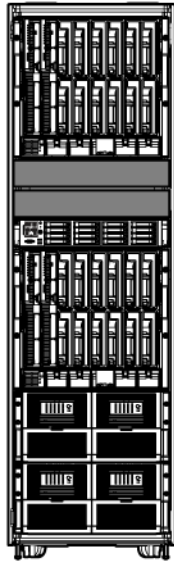


Item	Component	Description
1	Drain lines	Collect water from the drain pans and removes it from the HP POD
2	Electrical busway end feeds	Main source of distributing power throughout the HP POD
3	Heat exchangers	Use chilled water to cool the air
4	Rear service doors	Enable access to the rear of the rack-mounted components
5	Entrance doors	Enable access to the front of the rack-mounted components
6	Fan units	Circulate the cool air throughout the HP POD

Rack components

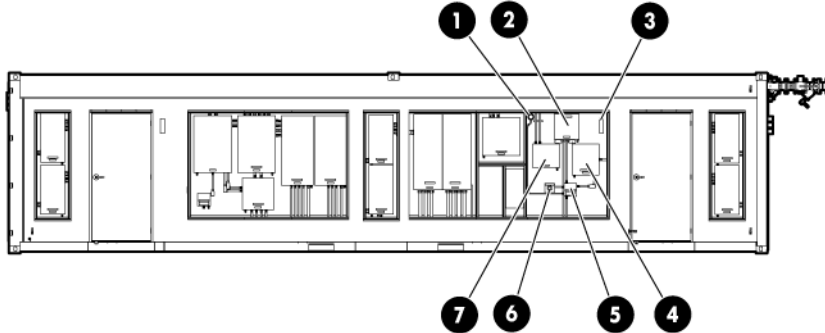
The HP POD has 22 IT racks. The following diagram is an example of a fully-loaded and configured rack. Your rack might include different servers and components.

If any of the racks within the HP POD contain empty U space, then to avoid compromising the integrity of the hold and cold aisle temperatures, you must use the HP POD Filler Panel. Filler panels are available from HP in 10-pack quantities (AQ682A) and 100-pack quantities (AS993A).



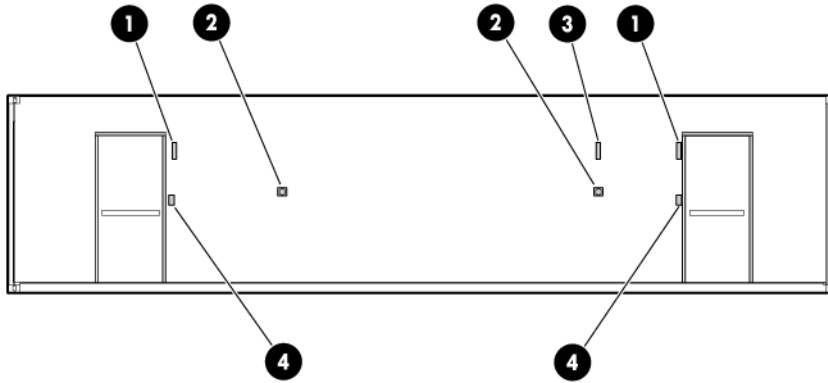
HP POD emergency components

External emergency components



Item	Component	Description
1	Fire strobe and horns	Indication of a fire alarm condition within the HP POD
2	EPO panel	Contains controls and status indicators for the EPO system
3	EPO alarm lamp (red)	Activated when an EPO alarm button is pressed
4	Fire alarm control panel	Contains controls and status indicators for the fire alarm system
5	Fire alarm XFMR	Fire alarm transformer
6	EPO button	Stops power to the HP POD and activates the EPO alarm lamp
7	Smoke detector panel	Samples the air in the HP POD, monitoring smoke

Internal emergency components



Item	Component	Description
1	Internal fire strobe and horn	Indication of a fire alarm condition within the HP POD
2	EPO buttons	Stop power to the HP POD and activates the EPO strobe
3	EPO strobe	Activated when an EPO button is pressed
4	Fire alarm manual pull stations	Activate the fire strobes and horns

Installation

HP POD shipping contents

Standard density 40-ft HP POD

Component	Quantity	Part number
HP 50U rack	22	AT978A
Side panel 50U kit	1	AN991A
50U rack bracket kit	21	AP014A
Rack interface seal kit	21	AP013A
One of the following busway dropboxes and PDU kit		
3-phase HP POD busway dropbox kit	11 (non-redundant) 22 (redundant)	AS613A (NA) AS633A (International)
3-phase HP POD PDU bracket kit	44	AQ683A
PDU	22 (non-redundant) 44 (redundant)	AS614A (NA) AS634A (International)

High density 40-ft HP POD

Component	Quantity	Part number
HP 50U rack	22	AT978A
Side panel 50U kit	1	AN991A
50U rack bracket kit	21	AP014A
Rack interface seal kit	21	AP013A
One of the following busway dropbox and PDU kits		
3-phase HP POD busway dropbox kit	22 (non-redundant) 22 (redundant)	AS613A (NA) AS633A (International)
3-phase HP POD PDU bracket kit	44	AZ683A
PDU	44 (non-redundant) 44 (redundant)	AS614A (NA) AS634A (International)

NOTE: To provide power to your HP POD, you can either:

- Purchase an HP Transformer and HP Switchboard and engineer your site power to support their requirements
 - Non-redundant power—one of each
 - Redundant power—two of each
 - Engineer your own site power
 - Standard HP POD—1200A minimum
 - High density HP POD—1600A minimum
-

The HP POD is delivered with heavy duty filler panels installed in every empty U space of the racks. However, to prevent compromising the integrity of the cold aisle set point temperature when IT equipment is removed for upgrades or maintenance, HP recommends purchasing additional HP POD Filler Panels (AQ682A, AS993A).

The quantity and model of PDUs included with your HP POD are dependent on the IT equipment load they are supporting.

Preinstallation checklist

- Tighten the electrical busway interconnects after the HP POD is in its final location and before you begin the installation process.
- All components are delivered to your facility.
- The HP POD, transformer, and switchboard are in their final locations.
- You must have facility power at your final location. You can provide the connection cables from the facility to the transformer and switchboard or purchase connection cables from HP at additional costs.
- You must have facility water at your final location. You can provide the connection hoses from the facility to the tempered water package or purchase connection hoses from HP at additional cost.
- You have properly grounded the HP POD.

Required tools

- 10-ft ladder (2)
- 6-ft ladder (2)
- Tongue-and-groove pliers with 4.25-in capacity jaws
- Screwdriver set
- Ratchet set
- Diagonal cutters
- Heavy-duty tie wraps
- Pipe wrench

Installing the HP POD

The following steps are an overview of the installation procedure for installing an HP POD.

Service professionals must connect your power and water.



IMPORTANT: All wiring in and around the HP POD must be completed by a licensed electrician.



IMPORTANT: All plumbing to and from the HP POD must be completed by a licensed plumber.

Connecting the water

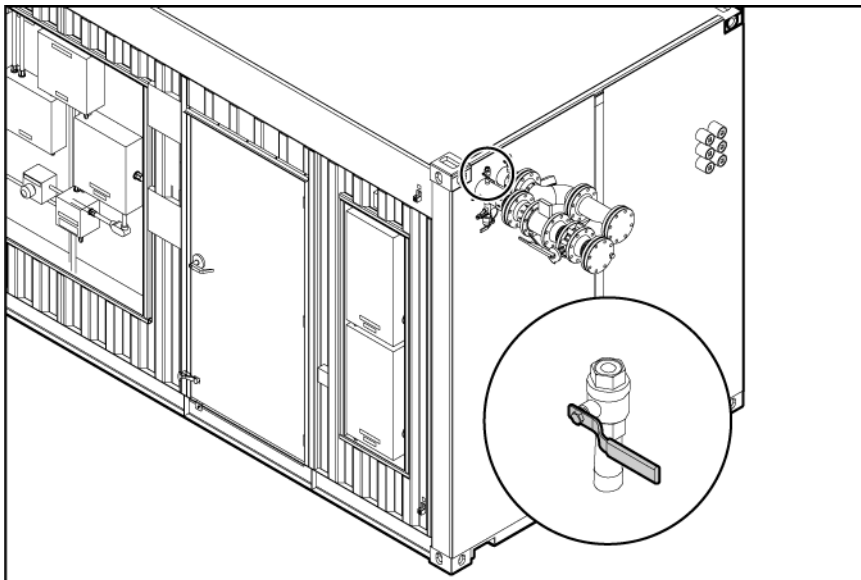


CAUTION: All customer supplied water fittings must be composed of carbon steel, stainless steel, or copper. Do not use cast iron, aluminum, or PVC fittings.

1. Before you connect your facility water to the HP POD, flush the cooling water pipes.
 - a. Connect a 10.16 cm (4 inch) water supply line directly to the HP POD. Connect a 10.16 cm (4 inch) hose to the HP POD return water main and prepare for water to drain away from the HP POD.
 - b. Allow the water to run until it is clean, flushing any contaminants that might have entered the cooling system during shipping or delivery.

NOTE: For easy reference, the water piping is labeled with green tape and white arrows pointing in the direction of the water flow.

2. Connect the 10.16 cm (4 inch) return line to the facility water system.
3. Open the bleeder valve on the HP POD return line.



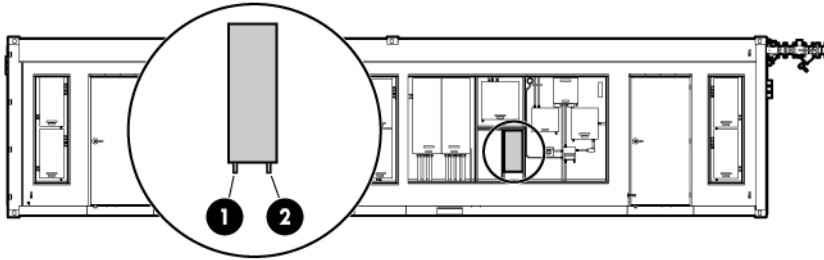
4. When no more air is coming out of the bleeder valve, close the bleeder valve on the HP POD return line.

NOTE: The HP POD pipe design is rated for a maximum pressure rating of 150 psi.

5. Verify that your facility water pressure differential (between supply and return) is within the acceptable range (25 psi maximum).
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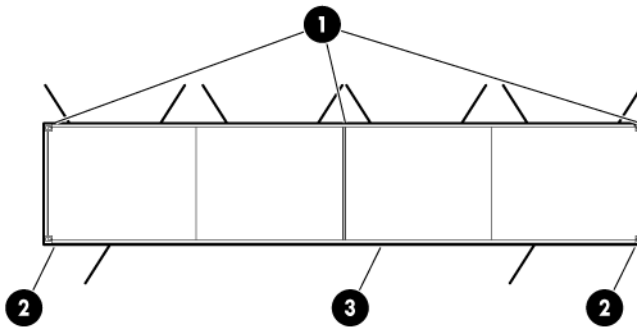
NOTE: For easy reference, the water piping is labeled with green tape and white arrows pointing in the direction of the water flow.

6. (Optional) Connect the HP POD humidifier to the domestic or industrial water drain (1) and supply (2) lines. For more information about the humidifier, see the product documentation.
-



IMPORTANT: Provide freeze protection to the humidifier water supply.

7. Perform one of the following in accordance with local codes:
- If your HP POD is located inside, then HP recommends connecting each drain to the local drain line.
 - If your HP POD is located outside, then you can choose to either:
 - Connect to the local drain line
 - Enable the water to drain off freely in your location



Connecting the power



IMPORTANT: A licensed electrician must connect the power according to the local electric code, consistent with supplier and consulting engineer drawings.

1. Verify that the HP POD, transformer, and switchboard are in the final locations.

NOTE: The following steps detail the connection procedure for a non-redundant power installation. If you are installing your HP POD for redundant power, you will have connections to two transformers and two switchboards.

2. Make the power connections.

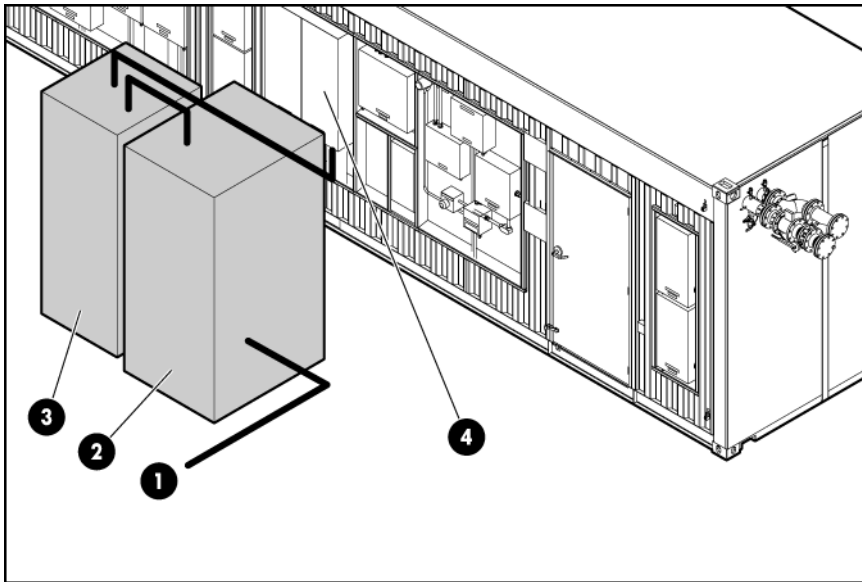
- a. Connect the main power leads from your facility to the transformer (1 to 2).

Each connection is labeled with colored tape, according to local standard requirements.

- b. Connect the transformer to the switchboard (2 to 3).

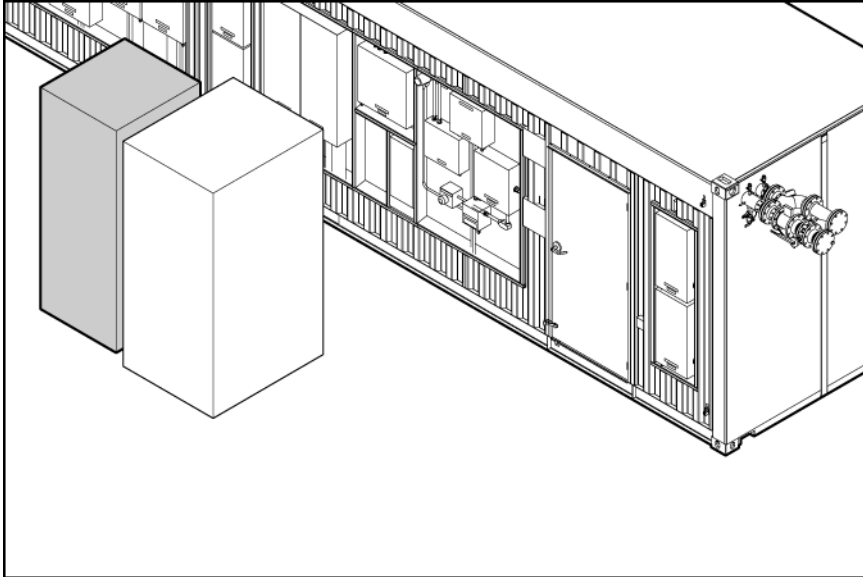
- c. Connect the three 3-inch flexible conduits from the switchboard to the junction box on the HP POD (3 to 4).

Each connection is labeled. Two of the conduits power the electrical busway breakers, and one powers the house panel.

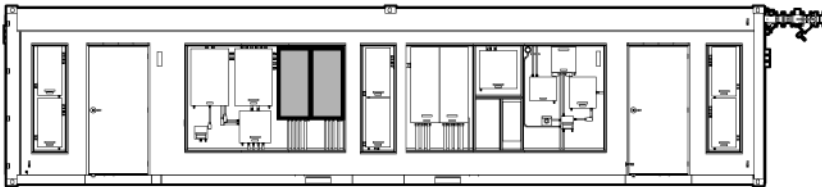


3. Turn on facility power.

4. Close the required breakers on the switchboard.



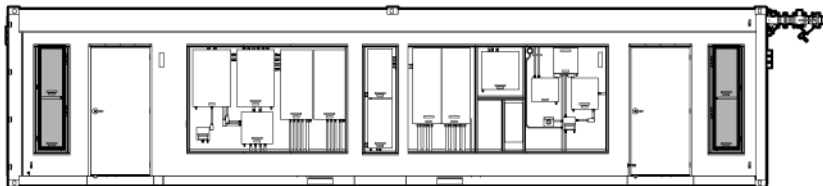
5. Close the main breaker in both of the house panels on the exterior of the HP POD.



6. Close the remaining breakers in the house panel, following the panel schedule on the inside of the house panel.

NOTE: If you are installing a high density HP POD, you must also close the main breaker in the electrical busway 3 panel.

7. Close the main breakers in the electrical busway panels.



8. Inside the HP POD, close the breaker on each drop box that is connected to a rack of IT components.
9. Power up your remaining racks and IT components, following your standard IT startup procedure.

Starting up the HP POD in cold weather



IMPORTANT: When the internal HP POD ambient air temperature is below 50°F (10°C), to ensure that the IT is not subjected to air temperatures that are too cold, you must follow incremental procedures.

1. Verify that all HP POD installation requirements are complete.
 - o All utility connections are complete, with main power breakers open and main water valves off.
 - o All main and branch circuit breakers are open in house panels A and B.
 - o Optional auxiliary power for ECS is connected from an outside power source. The ECS is powered off.
2. When the HP POD interior space temperature is below 50°F (10°C), open the main water valves to enable 240 gal/min of 55° to 75°F (13° to 24°C) water to flow through the heat exchangers. This action warms the air plenum space before starting the blowers.

Portable heaters can be used as supplemental heat to uniformly disperse heat throughout the HP POD. Electric portable heaters must be powered from an outside source.
3. Power up the ECS through auxiliary power so temperature sensors can monitor space temperature.
4. If the HP POD air plenum or hot aisle space temperature is at or above 13°F (-25°C) for at least 60 minutes, then omit this step. While water is flowing through the heat exchangers, monitor the hot aisle space temperature until it has reached -13°F (-25°C) and continue this warm up for 60 minutes before proceeding to the next step.
5. To energize the HP POD blowers, switch the following breakers to the closed position:
 - o Main power
 - o House panel main
 - o All fan power branches

NOTE: With non operating servers, HP POD space temperature rate of change should not exceed 36°F (20° C) per hour. At higher elevation the rate of change must be reduced by 1.8°F (1°C) for every 305 m (1,000 ft) above sea level.

6. Record the cold aisle space temperature through the ECS. The recorded temperature is the starting temperature of the servers.
7. Monitor the cold aisle temperature. Be sure to stay within the temperature rate of change. If the cold aisle temperature rises too quickly, then temporarily suspend heating by powering off the fans or portable heaters. Manually cycle the fans or heaters on and off to stay within the recommended temperature rate of change.
8. When the cold aisle space temperature has reached a minimum of 50°F (10°C), continue to maintain this temperature for at least 60 minutes before proceeding to the next step.
9. Close the Starline busway breakers and all branch circuit breakers in house panels A and B. If the ECS is on auxiliary power, then switch ECS back to house power and disconnect the power source to auxiliary power transformer.

10. Power up the servers and other IT equipment. Also simultaneously power off any portable heaters, if used.

When powering up each server unit, HP recommends that heat be equally distributed across the length of the HP POD. Power on one server unit at a time moving from one rack to the adjacent rack. Do not power on server units in the same rack before moving to the next adjacent rack.

NOTE: HP POD space temperature rate of change should not exceed 18°F (10°C) per hour with operating servers.

11. When the cold aisle space temperature reaches 75°F (24°C), switch the water supply flowing through the HP POD heat exchangers from heating mode to cooling mode.
12. Continue to monitor the cold aisle space temperature, verifying that it does not drop to 50°F (10°F) or below.
13. If the cold aisle space temperature drops to near 50°F (10°C) or below, HP recommends:
 - Raising the cooling water supply temperature to a warmer temperature setpoint.
 - Reducing the cooling water supply flow by manually turning the main water valve to decrease water flow.
14. To enable the HP POD interior temperature space to stabilize, enable the HP POD and the equipment to run at idle for at least 8 hours.

NOTE: Monitor the ECS when the HP PODs goes into peak operation. You might have to increase cooling capacity, and if the main water valve is not fully open, then you must adjust the valve needs.


Commissioning the HP POD

Commissioning your HP POD is an optional service and is customized based on your facility. A typical commissioning process includes the following tests:

- Tighten the electrical busway connections.
- Verify accurate electrical installation.
- Verify accurate mechanical installation.
- Test the operation of the ECS and Cooling controls.
- Test the operation of the smoke detection system.
- Test the operation of EPO system.
- Test the operation of the analog and digital phone system (optional).
- Verify initial IT start-up.
- Conduct an infrared scan of all electrical connections under the start-up IT load.
- Verify accurate cooling under start-up IT load.
- Provide the HP POD operation owner training.

Cooling system

HP POD cooling system

 **CAUTION:** Contaminated supply water might cause decreased cooling capacity or disruption in service. The supply water must meet the guidelines states in the HP Performance-Optimized Datacenter Site Requirements Information document. Damage caused by contaminated supply water is not covered by the warranty.

The HP POD has 12 heat exchangers that maintain temperature and cool the equipment installed in the HP POD. The HP POD receives chilled water from your facility, cycles the water through the heat exchangers to cool the air, and then the fans circulate the cool air throughout the HP POD.

To control the fan speed, you must set a cold aisle temperature through the ECS. A predetermined differential pressure setpoint between the hot aisle temperature and cold aisle temperature is factory set, and cannot be altered. The fan units regulate speeds to maintain the cold aisle temperature and differential pressure between the hot and cold aisle. For more information, see [Controlling the fan speed](#) (on page 19).

Water supply temperature

The temperature of the water supplied to the HP POD must be 13°C to 24°C (55°F to 75°F). Freezing water might cause a blockage and damage to the unit.

The minimum server inlet temperature is 10°C (50°F).

Controlling the fan speed

The HP POD fans operate at variable speeds to maintain two setpoints, programmed into the ECS:

- Hot aisle temperature setpoint
- Differential pressure setpoint between the hot and cold aisles

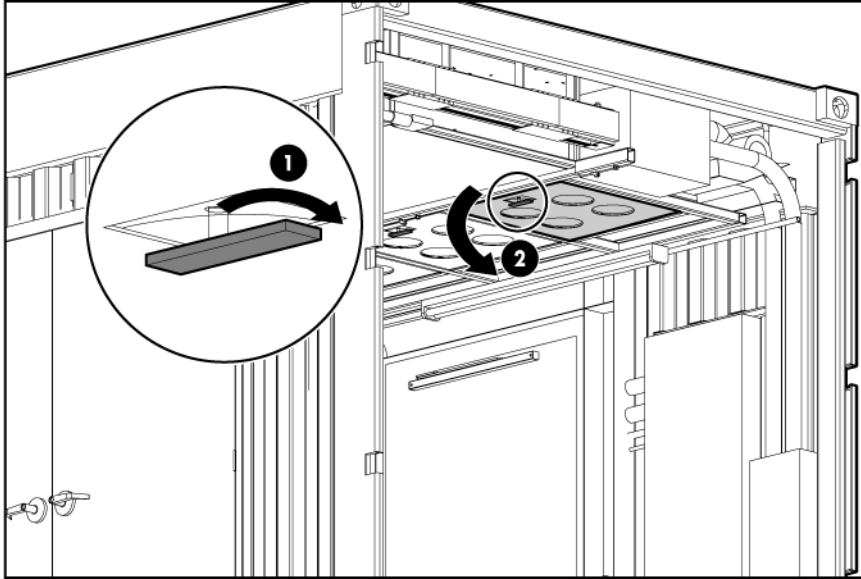
The fan speed adjusts to maintain both setpoints. You cannot manually adjust the fan speed.

Depending on the IT equipment you have installed in your HP POD, you can change both of these factory set parameters to improve the overall efficiency of your system. For more information, contact HP ("[HP contact information](#)" on page 50).

To access the fan units:

1. Unlock the latch for that fan overhead.

2. Pull the overhead down.



Condensation management

- CAUTION:** During operation, avoid leaving the HP POD doors open, to maintain accurate environmental conditions inside the HP POD.

Supply cooling water that is above the dew point inside the HP POD to prevent condensation forming on the heat exchangers.

The heat exchanger drip tray collects any condensation that forms on the heat exchangers. This collected condensate drains out of the HP POD through the heat exchanger condensate drains. HP recommends connecting condensate drains on the HP POD to a facility drain to prevent collection of water near the HP POD.

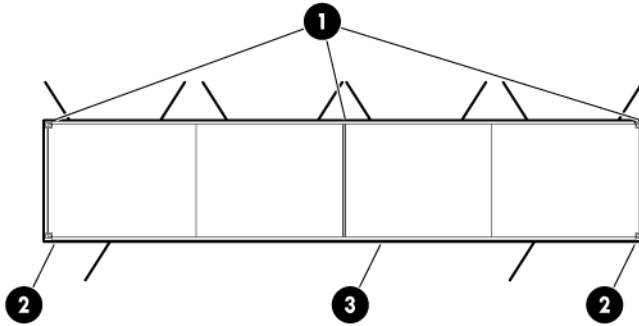
There are three 1.91 cm ($\frac{3}{4}$ inch) condensate drain outlets across the rear of the HP POD directly connected to the heat exchanger drip trays. There are two drains for the water main supply and return lines located on the front of the HP POD.

To avoid excessive buildup of condensate and to conserve energy, raise the cooling water temperature to above the dewpoint to manage condensation while maintaining the necessary cooling capacity.

HP POD drains

- WARNING:** Any water that drains around the HP POD causes a potential slip hazard. Use caution where slip hazards are present.

Water from natural condensation might form. Condensation from the heat exchangers flow to the three condensate drains across the rear of the HP POD (1). The water main drain catches any water from a water main leak (2). The humidifier drain removes excess water from the humidifier (3).



Item	Component
1	Heat exchanger condensate drains
2	Water main supply/return drain
3	Humidifier drain



IMPORTANT: You might have to pipe directly to your local storm or sanitary drain, depending on local jurisdiction.

If your HP POD is located indoors, you can connect to an external drain line. If your HP POD is located outdoors, the drained water will simply drip from the HP POD drains out the back of the HP POD.

HP recommends connecting the condensate drains on the HP POD to a facility drain to prevent collection of water near the HP POD.

Leak detection

If too much water accumulates in a drain tray, then an alarm is triggered and sent through the HP POD ECS, indicating a possible leak. For more information, see HP POD ECS alarms ("[ECS alarms](#)" on page 37).

Water quality requirements

Water quality requirements and specifications

- Closed-loop water must not contain any lime scale deposits or loose debris.
- The water must have a low level of hardness, particularly a low level of carbon hardness. Additionally, the water must not be so soft that it attacks the materials with which it comes into contact.
- The chilled water temperature to be supplied to the HP POD is 13°C to 24°C (55°F to 75°F). Freezing water might cause a blockage and damage to the unit. The heat transfer potential of the water is lower, so the equipment must be derated properly.

Acceptable water quality specifications

Water must be maintained per the following acceptable water quality standards.

Parameter	Range
pH	8.0–10
Specific conductance at 25°C (77°F)	0–2500 μ mhos/cm
Alkalinity ("M" as CaCO ₃)	150–1000 ppm
Sulfur (SO ₄)	0–150 ppm
Chloride (Cl)	0–100 ppm
Hardness (CaCO ₃)	0–350 ppm
Calcium hardness (CaCO ₃)	0–200 ppm
Magnesium hardness (CaCO ₃)	0–150 ppm
Copper (Cu)	< 0.20 ppm
Iron (Fe)	< 3.0 ppm
Aluminum (Al)	< 0.50 ppm
Sodium (Na)	0–1000 ppm
Silica (SiO ₂)	0–150 ppm
Zinc (Zn)	< 1.0 ppm
Manganese (Mn)	< 0.1 ppm
Phosphate Ortho- (PO ₄)	< 3 ppm
Bacteria	< 1000 CFU/ml
Suspended solids	< 10 ppm

If your water is out of range, consult a water quality expert.

Water supply specifications

Feature	Specification
Facility input temperature to HP POD	12° to 24°C (55° to 75°F)
Working pressure	1,034 kPa (150 psi)
HP POD pressure drop	1,732 kPa (25 psi)
HP POD water flow rate	908.5 l/min (240 gal/min)
Cooling water supply and return connections	Two 10.16 cm (4 in) ANSI/ASME 150# flanges
Humidifier(optional)	For requirements, see the humidifier manual

Frost damage

To avoid frost damage, the water temperature must not be allowed to fall below the minimum permissible temperature of +4 °C (+39.2 °F) at any point in the water cycle.

The water cycle must be drained completely using compressed air before storage or transportation at freezing temperatures or below.

△ CAUTION: Failure to completely drain the water system before drainage or transportation might result in heat exchanger rupture if the HP POD is exposed to freezing temperatures or below.

Plumbing materials to avoid

Do not use the following materials in a closed water system:

- Oxidizing biocides
- Aluminum components
- Brass components with high levels of zinc
- Non-stainless steel Iron components

Water precautions

Take the following precautions before installation of the HP POD:

- Verify that all foreign matter and particulates are flushed from the system. Water might be discolored during the initial flushing of the system. Clear running water is the sign that all foreign matter and particulates have been flushed from the system.
- Evaluate the short-term and long-term system requirements against the available water capacity.
- Ensure that the chilled water loop is properly designed for liquid cooling systems and is separate from the sanitary water systems in your building (bathroom, sink, drinking water).
- Ensure facility managers are aware of the additional load being added to the chilled water supply of the building. Be aware that the added heat load might affect other components being cooled by the chilled water plant.

Water temperature

The temperature of the water supplied to the HP POD must be 13°C to 24°C (55°F to 75°F). Freezing water might cause a blockage and damage to the unit.

The minimum server inlet temperature is 10°C (50°F).

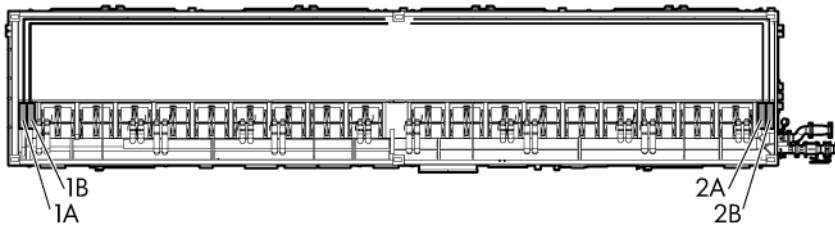
Power management

HP POD power

The electrical busway is a modular, overhead electrical distribution system that supplies power to the HP POD IT loads. The HP POD can be configured for either non-redundant power or redundant power.

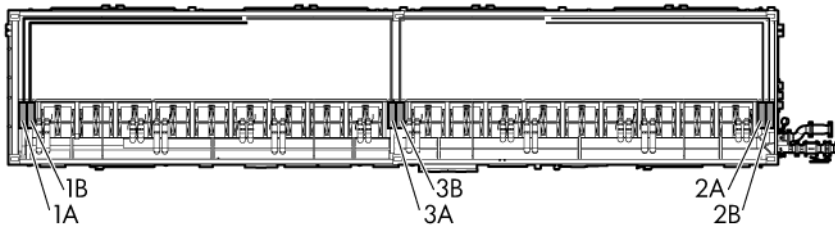
In the standard density HP POD there are four electrical busways.

- Non-redundant power installation—All four busways are powered from the same power source.
- Redundant power installation—The two A-side busways are powered from one power source and the two B-side busways are powered from an independent second power source.

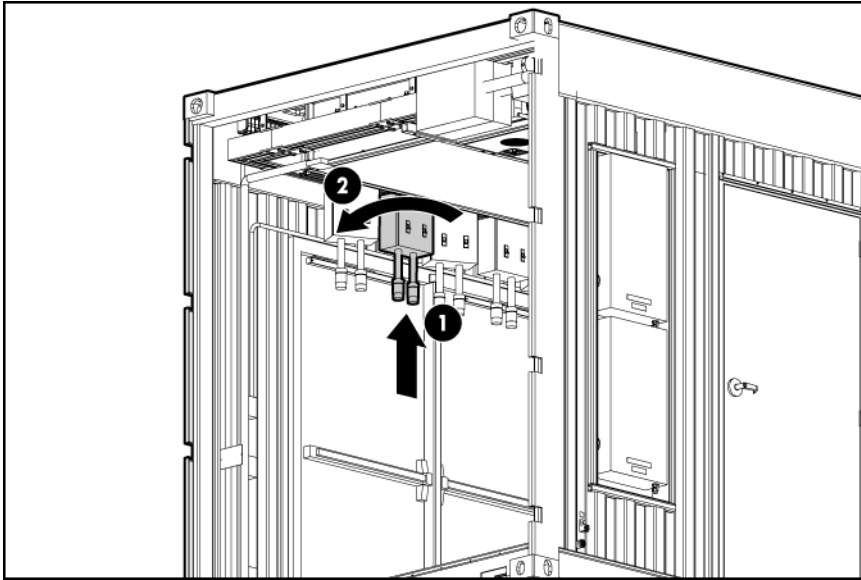


The high density HP POD contains six electrical busways.

- Non-redundant power installation—All six busways are powered from the same power source.
- Redundant power installation—The three A-side busways are powered from one power source and the three B-side busways are powered from an independent second power source.



The internal electrical busways provide a location to connect each of the drop boxes, which then power the PDUs. Stagger the drop boxes on the electrical busways; one connected to the A-side busway and the next connected to the B-side busway.



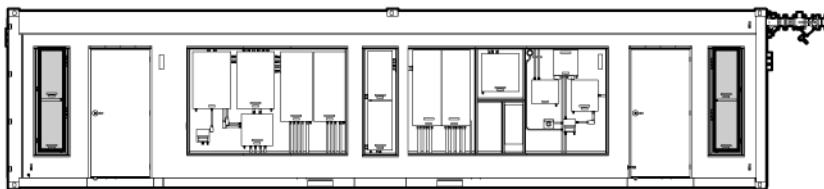
Disabling power

- To disable power to a single PDU, open the drop box breaker feeding that PDU and disconnect the PDU from the drop box.
- To disable power to a single rack, open the corresponding breakers on the drop boxes feeding each of the PDUs installed in that rack.
- To disable power to a single electrical busway, open the appropriate main breaker for that busway on the corresponding electrical busway panel outside of the HP POD.

Power distribution: Electrical busway enclosed circuit breaker panels

Standard density HP POD

The standard density HP POD is protected by electrical circuit breaker panels that are located on both ends of the HP POD.



Feature	Specification
Number of busways	4
Frequency	50-60 Hz
Amps (per busway)	225A
Neutral ampacity (per breaker)	225A
Amps derated percentage	10%
Max usable amps (per busway)	202A
Voltage (per busway)	380-415V
Grounding	Aluminum casing
Busway conductors	3 phases + neutral

NA standard density HP POD capacities

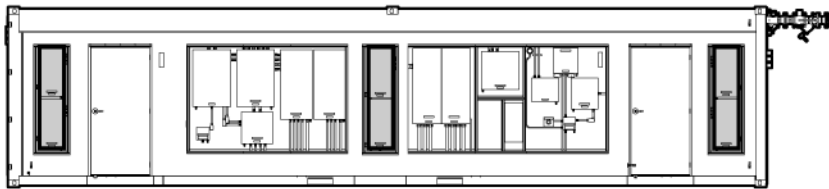
Feature	Capacity
Tier 1 configuration	450 kW
N + N configuration	291 kW
3 phase PDU capacity	17.28 kW
Thermal capacity limit	450 kW

International standard density HP POD capacities

Feature	Capacity
Tier 1 configuration	450 kW
N + N configuration	291 kW
3 phase PDU capacity	22 kW
Thermal capacity limit	450 kW

High density HP POD

The high density HP POD is protected by electrical circuit breaker panels that are located at both ends and in the center of the HP POD.



Feature	Specification
Number of busways	6
Frequency	50-60 Hz

Feature	Specification
Amps (per breaker)	225A
Neutral ampacity (per breaker)	225A
Amps derated percentage	10%
Max usable amps (per breaker)	202A
Voltage (per busway)	380-415V
Grounding	Aluminum casing
Busway conductors	3 phases + neutral

NA high density HP POD capacities

Feature	Capacity
Tier 1 configuration	600 kW
N + N configuration	380 kW
3 phase PDU capacity	17.28 kW
Thermal capacity limit	600 kW

International high density HP POD capacities

Feature	Capacity
Tier 1 configuration	600 kW
N + N configuration	436 kW
3 phase PDU capacity	22 kW
Thermal capacity limit	600 kW

Power distribution: Dropboxes, PDUs, and racks

NA standard density HP POD configurations

Configuration	Number of 3 phase PDUs per HP POD	Number of dropboxes per HP POD	Power capacity per rack	Total HP POD power capacity
4 x 225 Non-redundant	22	11	17.28 kW	450 kW
4 x 225 Redundant	44	22	17.28 kW	291 kW

International standard density HP POD configurations

Configuration	Number of 3 phase PDUs per HP POD	Number of dropboxes per HP POD	Power capacity per rack	Total HP POD power capacity
4 x 225 Non-redundant	22	11	22 kW	450 kW
4 x 225 Redundant	44	22	22 kW	291 kW

NA high density HP POD configurations

Configuration	Number of 3 phase PDUs per HP POD	Number of dropboxes per HP POD	Power capacity per rack	Total HP POD power capacity
6 x 225 Non-redundant	44	22	44 kW	600 kW
6 x 225 Redundant	44	22	17.28 kW	380 kW

International high density HP POD configurations

Configuration	Number of 3 phase PDUs per HP POD	Number of dropboxes per HP POD	Power capacity per rack	Total HP POD power capacity
6 x 225 Non-redundant	44	22	44 kW	600 kW
6 x 225 Redundant	44	22	22 kW	436.5kW

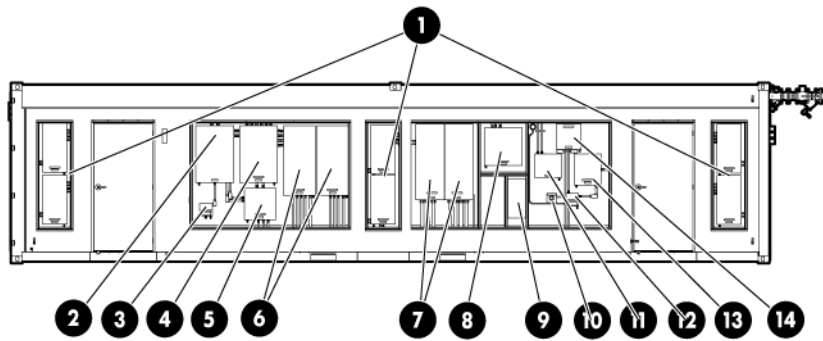
Rack power

Power is provided to each rack by PDUs and drop boxes. The PDUs are powered by the drop boxes attached to each electrical busway.

For more information regarding power shortages to the PDUs or electrical busway drop boxes, see Troubleshooting (on page [43](#)).

Control panel

External control panels



Item	Component	Description
1	Electrical busway enclosed circuit breakers (" Electrical busway enclosed circuit breaker " on page 31)	225A electrical circuit breaker panels that provide overcurrent protection to the electrical busways: <ul style="list-style-type: none"> • Four electrical circuit breaker panels are installed in the standard HP POD. • Six electrical circuit breaker panels are installed in the high density HP POD.
2	ECS panel (" HP POD ECS panel " on page 31)	Environmental Control System panel
3	Auxiliary single-phase branch circuit power*	Provides auxiliary power for the ECS or convenience outlets. 100-120V, 60 Hz or 220-240V, 50 Hz owner-provided power.
4	Fan control (FC) panel (" Fan control panel " on page 33)	Fan speed control panel
5	Redundant relay panel (on page 34)	Automatically transfers house loads from house panel A to house panel B when primary power is lost
6	House panels A and B	125A electrical panel boards that provides all HP POD electrical requirements, except for the IT equipment
7	Junction boxes	Main power input boxes for incoming electrical feeder cables
8	Security panel (" Security panel location " on page 34)	Reserved for installing interface and power requirements for any optional security devices installed.
9	Humidifier (on page 39)*	Maintains the humidity inside the HP POD within a set range
10	EPO button	Emergency power off actuator that stops power to the POD and activates the EPO alarm lamp.
11	Smoke detector panel (on	Air sampling smoke detection system

Item	Component	Description
	page 31)	
12	Fire alarm XFMR	Powers 120V Fire Alarm system components, if required
13	Fire alarm control panel (on page 33)	Contains controls and status indicators for the fire alarm system
14	EPO panel (on page 31)	Contains controls and status indicators for the EPO system

*Optional component ("Optional components" on page 39)

Smoke detector panel

The smoke detector panel contains an aspirating smoke detection system that draws air from the piping network inside the HP POD and monitors the smoke levels in the air. If smoke is detected, the smoke detector panel sends an alarm to the prewired Fire Alarm Control Panel.

No user interface settings are required. Interface is established through the Fire Alarm Control Panel.

For more information, see the product documentation included in the Operations and Maintenance manual.

HP POD ECS panel

The HP POD ECS panel monitors the HP POD environmental conditions and determines optimum operating conditions for the cooling system based on the existing load.

For more information, see Using the ECS (on page 35).

Electrical busway enclosed circuit breaker

The electrical busway panels are enclosed circuit breakers that provide over current protection to each of the electrical busways. For more information, see Electrical busway enclosed circuit breaker (on page 31).

EPO Panel



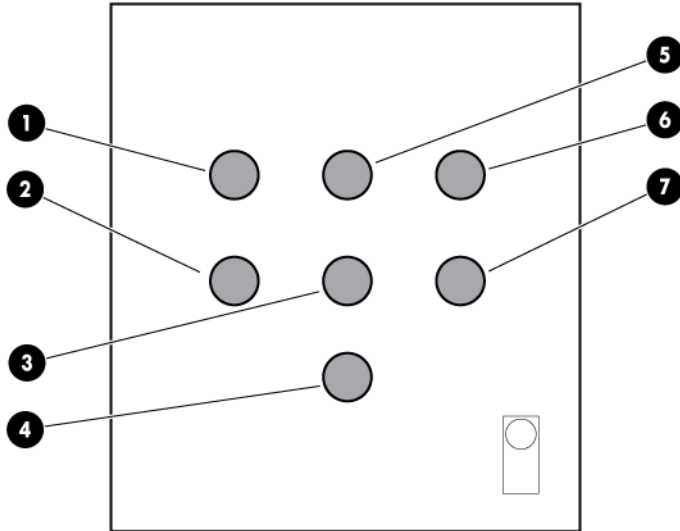
IMPORTANT: If the remote powered 120V branch circuits are operational, they are not turned off during an EPO shutdown.

The EPO panel contains controls and status lamps for the EPO system, which enables all power in the HP POD to be turned off except for emergency lighting. Power to the EPO panel is single-phase 240V AC, provided by the house panel.

Two EPO alarm buttons for directly shutting off non-emergency HP POD power are located inside the HP POD, and one EPO alarm button is located on the outside of the HP POD.

To check that the EPO alarm buttons and alarms are functional, switch to Test mode and then press an EPO alarm button. This procedure activates the EPO alarms without cutting off power to the HP POD.

To enable remote access to the EPO system, switch to Bypass mode.



Callout	Component	Description
1	Power On LED	Indicates the EPO is functional, and operating in Test mode, Armed mode, or Bypass mode.
2	EPO Armed mode LED	Indicates the EPO is operating in Armed mode.
3	Reset button	Resets the EPO system after an EPO alarm has been triggered.
4	Three way key-operated switch	Sets the EPO operating mode (Test, Armed, or Bypass).
5	System alarm/ EPO shutdown (red)	Indicates an EPO alarm has been triggered and non-emergency HP POD power has been shut off.
6	System Test mode LED (amber)	Indicates the EPO is undergoing a system test.
7	EPO Bypass mode LED (green)	Indicates the EPO is in Bypass mode.

After an EPO alarm, reset the EPO system:

1. Use the button key release mechanism to restore the EPO alarm buttons to their normal state.
2. Reset the main breaker in the House panel.
3. Reset the electrical busway breakers.
4. Press the Reset button on the EPO panel.

EPO modes

The EPO panel operates in three modes: Armed, Test, and Bypass. The operating mode is determined by the status of a key-operated selector switch on the EPO panel. The switch status can be reported to a monitoring system that is external to the POD.

Armed mode—Pressing a red EPO button on the POD causes the following events:

- The red System Alarm/EPO Shutdown light on the EPO panel illuminates to indicate that an EPO switch has been activated. (This light remains illuminated until all EPO buttons are restored to their normal state by means of a key release mechanism, and the Reset button on the EPO panel is pressed.)
- The EPO activated relay is energized and sends a signal to the EPO panel to energize the associated control relays.
- The control relays within the EPO panel shut down the affected circuit breakers in the POD.

Test mode—All associated EPO functions are disabled, and the amber System Test Mode light on the EPO panel is illuminated. This mode enables the EPO buttons to be tested without removing power to the POD. When an EPO button is pressed, the EPO Activated relay is energized, and it energizes the associated control relays in the EPO panel. Although the EPO functions are disabled, the horn and strobe alarm are activated. To silence the alarm, press the Reset button on the EPO panel.

Bypass mode—All EPO functions and test functions are disabled. When the EPO panel is operating in this mode, the green EPO Bypass light on the EPO panel is illuminated.

Fan control panel

The Fan Control panel houses the relay system that controls the fan speeds within the HP POD, based on maintaining the cold aisle temperature and aisle differential pressures set through the ECS.

You do not have to access to the Fan Control panel, and no interface setting is required.

Fire alarm control panel

If you connect your central fire alarm system to the fire alarm control panel, any emergency alarm can be sent directly over your facility alarm system. You must engineer and coordinate fire alarm connections between the HP POD and any facility alarm systems.

For more information about the fire alarm control panel, see the product documentation included in the *Operations & Maintenance Guide*.

House panels

The house panel is a 125A panel board that contains the breakers that provide overcurrent protection to all auxiliary HP POD components.

- House panel A provides overcurrent protection to all loads.
- House panel B provides backup power to all auxiliary loads, if the primary power fails.

If a breaker is tripped open, you can access the outside of the House panel and reset the breakers. You can also reset the HP POD components after an EPO alarm. If one or more breakers continually trip, contact HP ("[HP contact information](#)" on page 50).

The standard panel schedule resides inside the panel breaker box and can be referenced when necessary.

House relay transfer panel

The House relay transfer panel automatically transfers the loads from House panel A to House panel B in the event of a power failure.

Redundant relay panel

The house relay transfer panel automatically transfers the loads from house panel A to house panel B in the event of a power failure.

Security panel location

If you decide you want to install a security panel, the HP POD has a predesignated location for a security panel.

Environmental control system

Using the ECS

The HP POD is designed as a standalone system that does not require any connection or controls from a facility building management system. The HP POD ECS can connect to a site BMS through Ethernet cable, connected to the ECS port located in the hot aisle. The HP POD ECS communicates through BACnet protocol. Connecting the HP POD ECS to a site BMS requires additional engineering, labor and costs.

Connecting across different BACnet protocols might require additional engineering labor and coordination between your in-house control manufacturer and HP.

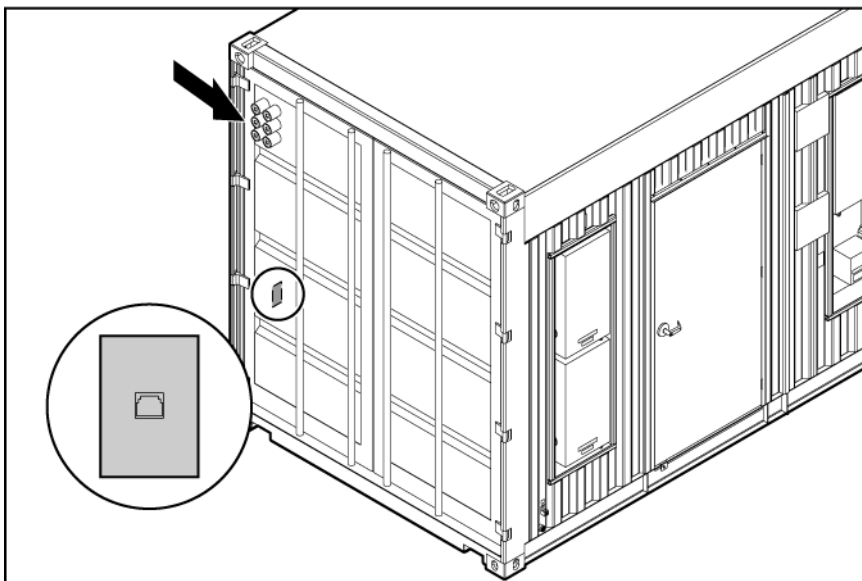
By connecting your HP POD to the ECS system, you can monitor:

- Cold and hot aisle temperatures
- Supply and return water temperatures
- Chilled water flow rate entering the HP POD
- Notification of supported alarms

NOTE: If your site does not have a BMS, then HP POD ECS data can be sent to and viewed from a set IP address, communicating through an Ethernet cable connected to the external communications box.

Managing the ECS from the HP POD

To access the ECS using a laptop at the HP POD, connect an Ethernet cable between your laptop and the designated ECS jack on the inside of the HP POD.

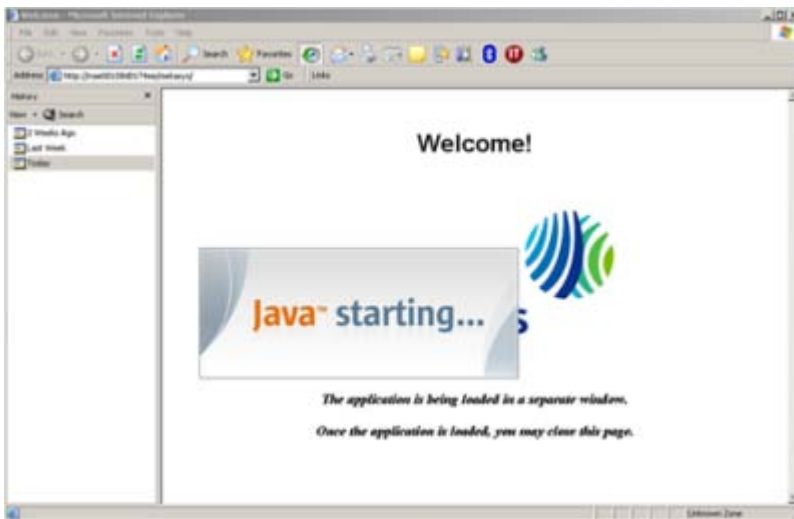


Logging in to the HP POD ECS

1. Install and configure JAVA JRE 1.6.0_07-b06. You must have this version of Java™.



2. For your laptop to use the Ethernet port, turn on DHCP.
3. Plug the Ethernet cable into the designated ECS jack on the interior of the HP POD. A limited connection warning might appear.
4. Retrieve the HP POD MAC address from the inside of the ECS panel on the exterior of the HP POD.
5. Open Microsoft® Internet Explorer.
6. Select the red X in the toolbar to stop the explorer from searching for the proxy.
7. Enter `http://naeXXXXXXXXXXXX/metasys` in the address bar. The XXXXXXXXXXXX variable stands for your unique MAC address. The Johnson Controls welcome screen appears and a Java™ starting window opens.



NOTE: HP will provide your login username and password.

8. Log in to Johnson Controls.



9. To view the status points:
- a. Select the **All Items** tab on the left side of the page.



- b. Select the **User Views** folder. Click the + to expand the folder and see the subcategories.
- c. Select any subcategory to view its status and description.

ECS alarms

The alarms pertaining to the health of the HP POD and its components are relayed through the ECS.

Alarm	Meaning	Solution
Fan failure	One of the fans is not working.	If you are still within your service contract, contact HP service.
Sensor failure	One of the sensors is not working.	If you are still within your service contract, contact HP service.
Leak detection	The drain tray senses water.	Inspect drain trays to determine if water is from normally occurring condensation. If leak is not from normally occurring condensation, then perform the following steps: <ol style="list-style-type: none"> 1 Turn off all IT components, so that the components do not overheat. 2 Turn off the water flowing into your HP POD at the facility line. 3 If you are still within your service contract, contact HP service.

Alarm	Meaning	Solution
		4 If you are not within your service contract, repair the source of the leak.
Change filter*	The return air filters are full.	Replace the return air filters.
High temperature	The cold aisle temperature has surpassed the set point temperature.	Check to make sure that you have water flowing into your HP POD and that the fans are blowing. If you are still within your service contract, contact HP service.
Low temperature	The cold aisle temperature is too low.	Check your HP POD components to make sure components are operating as normal. If you are still within your service contract, contact HP service.

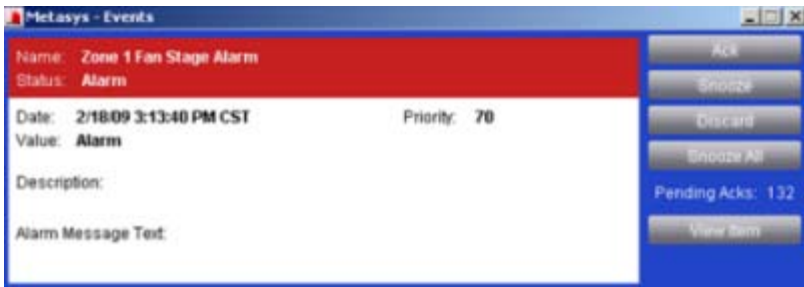
*The change filter alarm is only relayed to your ECS if you have the optional filter replacement sensor installed.

Snoozing alarms

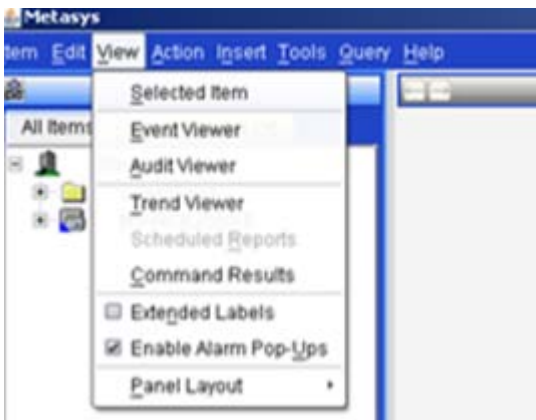
While viewing HP POD status points, alarms will continue to pop up on your menu bar. The alarms are normal during the commissioning process.

To snooze the alarms:

1. When the alarm pane appears, select **Snooze**.



2. Select **View** from the Main Menu bar.
3. Select the **Enable Alarm Pop-Ups** to uncheck the box. The alarms will no longer appear until you re-enable the alarm pop-ups.



Optional components

Cold weather protection

The cold weather protection option provides additional insulation that enables HP POD operations in temperatures as low as -20°F (-29°C). You must follow cold weather start-up procedures while operating in environments below 50°F (10°C) ambient temperatures.

Air filter sensor

The air filter sensor is an optional component that, if installed, alerts you to change your air filters. The sensors are located near each of the eighteen air filters. If the air filters are full and need to be replaced, an alert is sent to the facility ECS, if connected. HP offers an air filter media kit, part number AT979A.

Fire protection system

Each HP POD is equipped with a fire alarm panel with releasing capabilities that can be interfaced with site fire alarm systems. Optionally, the HP POD can be equipped with fire suppression systems based on 3M Novec 1230 fluid or FM200 gas. Consult local AHJs before ordering a fire suppression system to ensure that it complies with local requirements.

Humidifier

The humidifier option maintains the humidity within the HP POD within a set range, according to ASHRAE standards.

Maintaining the humidity helps to minimize static electricity within the HP POD.

Controlled access

The HP POD controlled access option adds magnet locks and 12-digit keypads to the hot and cold aisle doors. This option enables you to provide controlled access to the hot and cold aisle without need for keys.

Transformers and switchboards

HP offers several transformers and switchboards to supply your power needs.

On-site connections include:

- From your main facility power to the primary side of the transformer
- From the transformer to the switchboard
- From the feeder breaker lugs within the switchboard assembly to the HP POD

The standard cables should allow for placing the transformer and switchboard approximately 3.0 m (10 ft) away from the HP POD. Installation costs assume that connections are within the 3.0 m (10 ft) recommendation. If you place the transformer and switchboard more than 3.0 m (10 ft) away from the HP POD, additional planning and costs are involved.

Frequently asked questions

HP POD frequently asked questions

Question	Answer
Can I keep the HP POD on the trailer?	Yes, if you choose to lease the trailer from HP or if you purchase your own trailer and have the HP POD installed on your trailer prior to shipment. You must also: <ul style="list-style-type: none"> • Ensure that the site is stable and has been prepared correctly for the additional weight of the trailer. • Provide a work platform to access exterior panels.
What cooling capacity ranges are available in the HP POD?	The HP POD is capable of cooling rack-mounted components consuming up to 600 kW of electrical power.
What electrical power capacity ranges are available in the HP POD?	The standard HP POD is capable of powering components up to 450 kW of electrical power. The high density HP POD is capable of powering components up to 600 kW of electrical power.
Can the level of heat removal be regulated in proportion to the waste heat generated?	Yes, the control system automatically adjusts the air flow to remove heat generated in the HP POD.
Does the HP POD require maintenance?	Yes, general maintenance is outlined in this document. Contact HP service for additional information.
Does condensation form?	During normal operation some condensation might form, but the condensation does not reach any rack-mounted components or cause any damage. Excess condensation from the heat exchangers is collected and drained through three condensate drains across the rear of the HP POD. In most cases, the condensation evaporates prior to reaching the condensate drains.
How does the HP POD control humidity?	The relative humidity is maintained between 30–70%. If additional humidity is required (consistently below 30%), consider installing the optional humidifier (on page 39).
Does the air flow within the HP POD produce static electricity?	The humidity of the HP POD is maintained between 30–70% to ensure that dangerous levels of static electricity cannot build.
Is the HP POD weather resistant?	If there is an external leak, the HP POD is weatherproof and has sufficient protection against the encroachment of water inside the HP POD.
What happens if there is an internal leak?	If there is an internal leak, the water collects in the condensation drain pans or the water main drain pan. The additional water present in the condensation drain pan triggers a Leak Detection alarm, sent over the ECS.
What will happen if water stops flowing to the HP POD?	An EPO will occur automatically if the hot aisle temperature exceeds 66°C (150°F). If the ECS is connected to the site ECS, a high temperature alarm will be sent to the ECS.

Question	Answer
	HP recommends shutting down all IT components or pressing any EPO button to manually power down the servers, to maintain server health, until the root problem can be solved.
At what smoke level will an alarm be issued?	You can set the four different ranges at which the ASSD panel smoke detector issues an alarm. For more information, see the smoke detector manual supplied with the HP POD.
Can I switch out my servers and other rack-mounted components?	The HP POD supports any IT equipment that uses front to rear air flow cooling to maintain thermal integrity. If you must remove a server or other rack-mounted component for any prolonged period, you must replace it with a similar component or a heavy-duty blanking panel so that the HP POD interior can maintain thermal integrity.
How will I be notified if there is an emergency in the HP POD?	The smoke alarm automatically detects incipient fires and activates several different types of fire alarms: <ul style="list-style-type: none"> • Visible—Internal and external HP POD strobes • Audible—Horn • Remote notification through the building fire alarm control panel (optional) Water emergencies are detected through the ECS. If connected to a site ECS, these alarm conditions are relayed to the site ECS.

Troubleshooting

HP POD troubleshooting

Issue	Resolution
The water is not flowing, or flowing too slowly.	Verify that all applicable valves are open. Inspect the water lines for blockage, unblock, or replace them as necessary.
The HP POD is overheating.	<p>If the fan is not functioning, check the integrity of the electrical connection to the fan. If the electrical connection seems OK, replace the fan.</p> <p>If the fan is functioning, check for a kink or blockage in the water line to the heat exchanger.</p> <p>Make sure there is no empty U space in the racks. A heavy duty filler panel should cover every empty location.</p> <p>Contact HP service.</p>
The strobe lights are flashing.	Either the EPO or the fire alarm system has been activated. Get out of the HP POD immediately and follow standard emergency procedures for your facility.
There is a leak inside the HP POD.	Locate and note the source of the leak. Prevent the leaking water from contacting any electrical equipment. Repair the leak as soon as possible.
There is no power to one rack.	<ol style="list-style-type: none">1 Verify that the racks on either side of the rack have power.2 Check the status of the busway dropbox for that rack.<ul style="list-style-type: none">• If a breaker has tripped, reset the breaker box and verify that power has been restored to the rack.• If none of the busway dropbox breakers has tripped, check the status of the PDUs for the rack. If the input or output breakers have tripped, reset the PDU and verify that power has been restored to the rack.• If none of the breakers on the busway dropbox or PDUs have tripped, replace the busway dropbox.
There is no power to multiple racks.	<ol style="list-style-type: none">1 Verify that the HP POD is receiving power.2 Check the status of each of the electrical busway panels. If one of the breakers has tripped, reset the breaker and verify that power has been restored to the racks.3 Check the status of the connection transformer and switchboard. If one of the breakers has tripped, reset the breaker and verify that power has been restored to the racks.
There is no power to the HP POD.	Check the status of the connection transformer and switchboard. If one of the breakers has tripped, reset the breaker and verify that power has been restored to the HP POD.

Specifications

Standard density HP POD specifications

Features	Specifications
Dimensions	12 m x 2.4m x 2.7m (40 ft x 8 ft x 9.5 ft)
Maximum weight	11,340 kg (25,000 lb) empty- 50,348 kg (111,000 lb) fully-loaded
Maximum power/ cooling	450 kW Standard HP POD
Maximum rack quantity	22 racks
Rack Units (RU) per rack	50 RU
Rack Units (RU) total	1100 RU
Nominal power/ cooling per rack Nonredundant mode	20.45 kW – North America & International
Nominal power/ cooling per rack Redundant mode	13.22 kW – North America & International
Maximum power/ cooling per rack Nonredundant mode	34.56 kW – North America 44 kW – International
Maximum power/ cooling per rack Redundant mode	17.28 kW – North America 22 kW – International
Power input voltage	380-415 Wye connected, 225A, 3 Phase, 50/60 Hz, with neutral (4 feeders required)
Power distributed internally	4 225A electrical busways 220-240/380-415 VAC, 50/60 Hz
Customer access	Double-door on one end Customer access—Two 1 m x 2.1 m (3 ft x 7 ft) doors to the cold aisle Rear component access—Four 1.8 m x 2.1 m (6 ft x 7 ft) doors to the hot aisle
Network supported	Bulk cable pass-through-fiber Bulk cable pass-through-copper (Optional) External rated DEMARC box

High-density HP POD specifications

Features	Specifications
Dimensions	12 m x 2.4m x 2.7m (40 ft x 8 ft x 9.5 ft)

Features	Specifications
Maximum weight	11,340 kg (25,000 lb) empty- 50,348 kg (111,000 lb) fully-loaded
Maximum power/ cooling	600 kW Standard HP POD
Maximum rack quantity	22 racks
Rack Units (RU) per rack	50 RU
Rack Units (RU) total	1100 RU
Nominal power/ cooling per rack Nonredundant mode	27.27 kW – North America & International
Nominal power/ cooling per rack Redundant mode	17.28 kW – North America 19.84 kW – International
Maximum power/ cooling per rack Nonredundant mode	34.56 kW – North America 44 kW – International
Maximum power/ cooling per rack Redundant mode	17.28 kW – North America 22 kW – International
Power input voltage	380-415 Wye connected, 225A, 3 Phase, 50/60 Hz, with neutral (6 feeders required)
Power distributed internally	6 225A electrical busways 220-240/380-415 VAC, 50/60 Hz
Customer access	Double-door on one end Customer access—Two 1 m x 2.1 m (3 ft x 7 ft) doors to the cold aisle Rear component access—Four 1.8 m x 2.1 m (6 ft x 7 ft) doors to the hot aisle
Network supported	Bulk cable pass-through-fiber Bulk cable pass-through-copper (Optional) External rated DEMARC box

Electrical specifications

Panel information

Feature	Busway endfeed panels	House panels
Number of panels	<ul style="list-style-type: none"> • 4 (Standard density HP POD) • 6 (High density HP POD) 	2
Capacity	225A, 3-phase	125A, 3-phase
Poles (per panel)	1, 3-pole enclosed circuit breaker	30 pole positions

Input circuit breaker information

Feature	Electrical busway breakers	House breakers
Number of breakers	1 per busway	1 per panel (main)
Main breaker size	225A	125A (main)
Branch circuit breaker size	N/A	Up to 30 poles
General characteristics	<ul style="list-style-type: none"> • 3-pole • 100% rated • thermalmagnetic trip • 25 kA interrupt capacity • provide with shunt trip coil 	<ul style="list-style-type: none"> • 1-pole or 2-pole • sized per panel schedule • thermalmagnetic trip • 14 kA interrupt capacity

Fire alarm panel connections

The electrical layout of the fire alarm system is as described in the schematic drawing supplied with the HP POD.

Water supply specifications

Feature	Specification
Facility input temperature to HP POD	12° to 24°C (55° to 75°F)
Working pressure	1,034 kPa (150 psi)
HP POD pressure drop	1,732 kPa (25 psi)
HP POD water flow rate	908.5 l/min (240 gal/min)
Cooling water supply and return connections	Two 10.16 cm (4 in) ANSI/ASME 150# flanges
Humidifier(optional)	For requirements, see the humidifier manual

Rack specifications

Standard HP POD racks (AT978A)

Feature	Specification
U height	50U
Width	546 mm (21.5 in)
Depth	1,000 mm (39.4 in)
Maximum load weight	1,360.7 kg (3,000 lb)

Thermal and air flow performance

Maximum thermal and air flow performance parameters	HP POD specification
Air temperature—Inlet to rack-mounted components	Hot aisle setpoint temperature in ECS
Chilled water temperature	12°–24°C (55°–75°F)
Total rack-mounted component air flow	Variable as required to maintain hot aisle setpoint temperature
Heat rejection capacity	600 kW

Environmental specifications

Feature	Specification
Operating temperature	-18°C to 54°C (0°F to 130°F). Supports to -29°C (-20°F) with optional cold weather protection installation.
Non-operating temperature*	-29°C to 54°C (-20°F to 130°F)
Operating humidity	<ul style="list-style-type: none"> • 0% to 100% relative noncondensing
Non-operating humidity*	<ul style="list-style-type: none"> • 5 to 95% relative noncondensing • 39°C (102°F) maximum wet bulb temperature
Operating altitude	-76.2 to 3,048 m (-250 to 10,000 ft)
Non-operating altitude	-76.2 to 9,144 m (-250 to 30,000 ft)

*For nonoperating specifications, consider the temperature of computer and IT equipment inside the HP POD. The HP POD must be drained before it is moved to a new location. For areas prone to freezing, take the appropriate water freeze protection precautions.

Maintenance

HP POD and component maintenance schedule

Component to be inspected	Frequency
Electrical connections and wiring—Visual	Every 30 days
Electrical connections and wiring—Thermal scans	Every 180 days
Air filter replacement (HP offers an air media kit, part number AT979A)	Every 30 days (* or as required)
Condensation and water main drainage system (leaks)—Visual	Every 30 days
Condensation and water main drainage system (leaks)—Functional	Every 90 days
Busway interconnects (tightened)	Every 180 days
Water quality	Every 120 days
EPO system	Every 180 days
Third-party OEM components (fire alarm/suppression system, humidifier, and so on)	For cut sheets of each component, see the operator and maintenance documentation

* If filter consistently needs replacement at 20 days, increase the frequency of inspections.

After moving the HP POD inspect and tighten all electrical connections.

Periodic maintenance

Perform periodic inspections to ensure the HP POD will continue to perform to design parameters. During period inspections, pay special attention to electrical connections and wiring.

Electrical connections and wiring

Perform visual inspections every 30 days of all wiring terminations.

Perform thermal scans every 180 days of all wiring terminations.

Electrical busway maintenance

Periodically tighten the electrical busway connections. HP recommends tightening the electrical busway connections every six months.

Inspect the busway drop boxes for loose connections, and tighten if necessary.



CAUTION: Perform this maintenance only if power has been disconnected to the HP POD or the busway breakers are in the open position.

Water system maintenance

You must maintain your water system quality. Consult a water treatment specialist to perform the following maintenance:

Flush the HP POD

How often you must flush the HP POD depends on how often you shutdown the HP POD and the water quality.

Maintain water quality

The water treatment specialist must periodically take a water sample and add new chemical treatments to the HP POD water or tempered water package as needed to maintain the specified water quality ("[Water quality requirements](#)" on page 22).

Air filter replacement

There are six air filters inside the HP POD.

If you have the optional air filter sensor (on page 39) installed, you are notified through your ECS when you need to change a filter.

If you do not have the sensor installed, HP recommends periodically inspecting and changing each air filter. You can replace an air filter during normal HP POD operation.

Heat exchanger maintenance

The heat exchanger requires no maintenance. If particulates are present in the cooling water, a filter must be fitted immediately upstream from the water inlet fittings. Check the functionality of the condensation drainage system regularly. Regularly perform visual inspections for leaks (annually).

Drains

HP recommends visually checking drains for blockages every 30 days and functionally testing drains every 90 days.

Third-party components

Consult the provided Operations and Maintenance manual for other required maintenance items.

EPO system maintenance

HP recommends functionally testing the EPO system every 180 days.

Before you contact HP

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Product identification number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP contact information

For the name of the nearest HP authorized reseller:

- See the Contact HP worldwide (in English) webpage (<http://welcome.hp.com/country/us/en/wwcontact.html>).

For HP technical support:

- In the United States, for contact options see the Contact HP United States webpage (http://welcome.hp.com/country/us/en/contact_us.html). To contact HP by phone:
 - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
 - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, refer to the HP website (<http://www.hp.com/hps>).
- In other locations, see the Contact HP worldwide (in English) webpage (<http://welcome.hp.com/country/us/en/wwcontact.html>).

Regulatory compliance notices

Regulatory compliance identification numbers

For the purpose of regulatory compliance certifications and identification, this product has been assigned a unique regulatory model number. The regulatory model number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this regulatory model number. The regulatory model number is not the marketing name or model number of the product.

Federal Communications Commission notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Canadian notice

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union regulatory notice

Products bearing the CE marking comply with the following EU Directives:

- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- Ecodesign Directive/2009/125/EC, where applicable
- Machinery Directive 98/37/EEC

CE compliance of this product is valid if powered with the correct CE-Marked AC adapter provided by HP.

Compliance with these directives implies conformity to applicable harmonized European standards (European Norms) that are listed in the EU Declaration of Conformity issued by HP for this product or product family and available (in English only) either within the product documentation or at the following HP website (<http://www.hp.eu/certificates>) (type the product number in the search field).

The compliance is indicated by one of the following conformity markings placed on the product:

For non-telecommunications products and for EU harmonized telecommunications products, such as Bluetooth® within power class below 10mW.



For EU non-harmonized telecommunications products (If applicable, a 4-digit notified body number is inserted between CE and !).



Please refer to the regulatory label provided on the product.

The point of contact for regulatory matters is Hewlett-Packard GmbH, Dept./MS: HQ-TRE, Herrenberger Strasse 140, 71034 Boeblingen, GERMANY.

Disposal of waste equipment by users in private households in the European Union



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

BSMI notice

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Chinese notice

Class A equipment

声明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取可行的措施。

Korean class A notice

A급 기기 (업무용 방송통신기기)	이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.
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Japanese class A notice

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

Acronyms and abbreviations

AHJ

Authority Having Jurisdiction

ASHRAE

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ASSD

air sampling smoke detector

BPMS

branch power monitor system

ECS

environmental control system

EPMS

electrical power monitor system

EPO

emergency power off

FAQ

frequently asked questions

FC

fan control

HEX

heat exchanger

ISO

International Organization for Standardization

NA

North American

NEMA

National Electrical Manufacturers Association

PDU

power distribution unit

POD

Performance-Optimized Datacenter

TVSS

Transient Voltage Surge Suppression

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