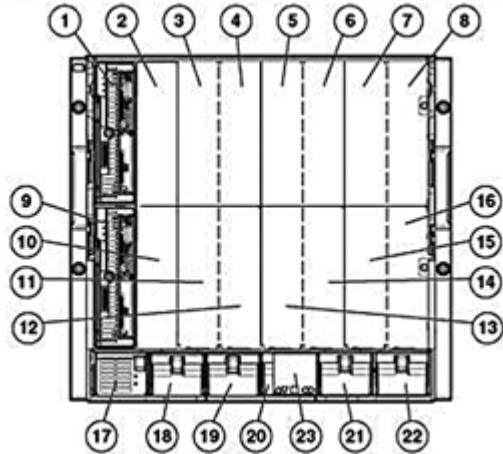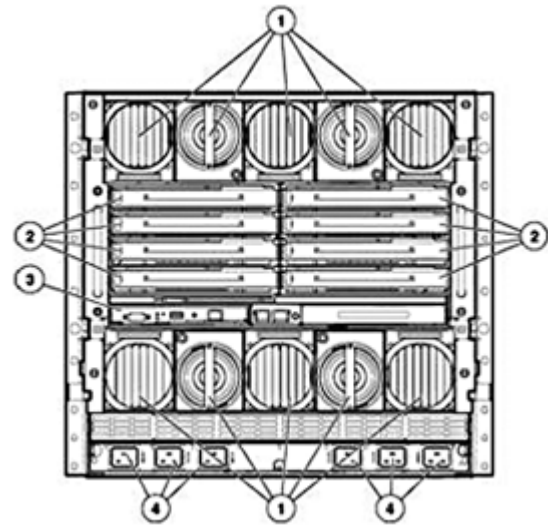## Overview

HP BladeSystem c7000 Enclosure - Front View

1. Device Bay 1
2. Device Bay 2
3. Device Bay 3
4. Device Bay 4
5. Device Bay 5
6. Device Bay 6
7. Device Bay 7
8. Device Bay 8
9. Device Bay 9
10. Device Bay 9
11. Device Bay 11
12. Device Bay 12
13. Device Bay 13
14. Device Bay 14
15. Device Bay 15
16. Device Bay 16
17. Power Supply Bay 1
18. Power Supply Bay 2
19. Power Supply Bay 3
20. Power Supply Bay 4
21. Power Supply Bay 5
22. Power Supply Bay 6
23. Insight Display

HP BladeSystem c7000 Enclosure - Rear View

1. Active Cool 200 Fans & fan bays
2. Interconnect Bays
3. Onboard Administrator
4. Power Inputs

Overview

At A Glance

This document covers the NEBS Level 3 certified HP BladeSystem c7000 Enclosure. This document covers the blades, interconnects, etc. which have passed the NEBS Level 3 and ETSI EN 300 386-2 certifications. Testing and certification is limited to -48VDC powered enclosures. For more information on HP ProLiant Server Blades and HP BladeSystem c-Class Interconnect Components please see the following QuickSpecs:

HP ProLiant c-Class Server Blades:
http://h18000.www1.hp.com/products/quickspecs/division/12534.html
HP BladeSystem c-Class Interconnect QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12524_div/12524_div.html
HP BladeSystem c3000 Enclosure QuickSpecs:
http://h18000.www1.hp.com/products/quickspecs/12790_div/12790_div.html

HP BladeSystem Carrier Grade (CG) solutions start with a BladeSystem c7000 Enclosure, c7000 hot-plug -48VDC power supplies, HP Active Cool Fans, and an optional redundant Onboard Administrator module. Once the enclosure has been selected, the following components can be added: networking interconnect modules, HP ProLiant and Integrity Server Blades, and Insight Control management software. Reference the QuickSpecs listed above.

- **Warranty** - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.
- Enclosure: Three-year parts and labor, on-site limited global warranty. Certain restrictions and exclusions apply
- Enclosure options: Fans, Power Supplies, Onboard Administrator, 1 Year parts only or enclosure warranty
- HP BladeSystem Interconnects: 1 Year parts and labor, on-site regardless of the warranty period for the system in which they are installed
- HP Storage Fibre Channel switches have a maximum warranty period of one (1) year regardless of the warranty period for the system in which they are installed
- SATA hard drives have a one year parts and labor on-site warranty regardless of the system in which they are installed
- SAS Enterprise drives have a 3 year warranty regardless of the system in which they are installed.

For additional information please visit: http://www.hp.com/go/bladesystem

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HP BladeSystem c-Class c7000 Enclosure

A BladeSystem c7000 enclosure holds up to 16 server and/or storage blades plus redundant network and storage switches. It includes a shared, multi-terabit high-speed mid-plane for wire-once connectivity of server blades to network and shared storage. Power is delivered through a pooled power backplane that ensures the full capacity of the redundant hot-plug power supplies is available to all blades.

Each c7000 Carrier Grade enclosure is built with the following functions:

- Up to 16 half-height and/or up to 8 full-height server blades and/or storage blades per enclosure.
- Up to 4 different interconnect fabrics (Ethernet, FC) supported simultaneously within the enclosure.
- -48V DC power subsystem .
- HP Thermal Logic technology for lower power consumption and airflow.
- Ten (10) Active Cool 200 fans required for Telco operation
- Redundant hot-plug cooling, redundant hot-plug power supplies, redundant connections, redundant interconnect modules, optional redundant Onboard Administrator management modules.
- Lowest cost of ownership.

An Onboard Administrator management module is built into the enclosure with the following functions:

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-

Overview

- Robust, multiple enclosure setup and control.
- Reports asset and inventory information for the devices in the enclosure.
- Reports thermal and power information, including real-time actual power usage per server and per enclosure.
- Front-mounted Insight Display for easy management within the datacenter.
- Integrated access to all server blade iLOs from a single cable.
- Provides integrated access to interconnect bay device management ports from the single Onboard Administrator cable.
- Single sign-on capability for all devices in the enclosure
- Role-based security locally and/or with LDAP directory services.
- Provides a wizard-based initial setup process for easy configuration.

A BladeSystem c7000 enclosure provides the following benefits:

- With local and remote hardware management integrated across the solution, one full enclosure can be managed as easily as one server.
- Scalable: Management and network interconnects extend scalability beyond a single enclosure, allowing resources to be pooled and shared across multiple enclosures.
- Investment protection: Accommodates multiple server and network designs in one enclosure.
- Lower costs per server, in comparison to rack-mounted servers
- Lower power consumption, in comparison to rack-mounted servers.
- Lower airflow requirements, in comparison to rack-mounted servers

HP BladeSystem c-Class Overview

HP ProLiant & Integrity Server Blades

Delivering best-in-class performance, choice and reliability on Intel® Xeon® and Intel® Itanium 2® processors for Windows, Linux, Solaris, or HP-UX based servers; the HP portfolio of server blades supports a variety of application requirements for scale-out architectures. The HP BL460c Gen8 and BL860i2 have been certified as NEBS Level 3.

For more information please see:
http://h18000.www1.hp.com/products/quickspecs/division/12534.html

Storage

Step 1: Select desired model, configuration and quantity of HP ProLiant server

NOTE: For server blade information, please visit:
http://h18000.www1.hp.com/products/quickspecs/division/12534.html

Step 2: Determine quantity of HP BladeSystem c-Class Enclosures to purchase and choose Required Options (One of the following from each list unless otherwise noted):

NOTE: Each HP BladeSystem c-Class Server Blade Enclosure holds up to 16 half-height blades. Server blanks will be shipped in all empty bays.

Base Server Blade Enclosure Configuration

HP BladeSystem BLc7000 c-Class Server Blade Enclosures	HP BLc7000 BCS CTO c-Class Enclosure	AD361D
	HP BLc7000 Platinum CTO Enclosure w/ trial Insight Control License	681844-B21
	NOTE: CTO models include 1x Onboard Administrator with KVM, 4x Active Cool 200 Fans and 0x power supplies. **NOTE:** The AD361D enclosure is suggested for configurations primarily used with Integrity blades.	

Required Options (one of the following from each category unless otherwise noted)

c-Class Power Modules (1 per enclosure)	HP BLc7000 -48V DC Power Input Module	AH331A
c-Class Power Supply (Up to 6)	HP c7000 Enclosure 2250W Hot-Plug -48V DC Power Supply (single PSU) **NOTE:** Only compatible with -48V DC Power Input Module.	AH332A
c-Class Active Cool Fan (Up to 6)	6x HP Active Cool 200 Fan Bundle, FIO **NOTE:** The bundle includes a quantity of 6 HP Active Cool 200 Fans so a full enclosure can be configured with a single part number. **NOTE:** NEBS Level 3 certification requires 10 fans.	517520-B21

Storage

Step 3: Select an optional software bundle (if nothing is selected the enclosure will ship with 16 Insight Control Trial Licenses):

HP OneView Software	HP OneView incl 3yr 24x7 Supp Enclosure Bundle 16 Svr E-LTU	E5Y41AAE
	NOTE: Server provisioning capability (i.e. 'Insight Control server provisioning') is included and licensed as part of HP OneView. This capability is ideal for multi-server OS and driver provisioning to ProLiant and BladeSystem servers. A media kit ("HP Insight Control server provisioning USB media kit", BD883A), which includes a USB flash drive, is available for customers who require a physical copy of the software on media. This media kit is separate and in addition to the "HP OneView Media Kit", E5Y37A.	C6N32ABE
	NOTE: Onview licenses ship without media. The HP OneView Media Kit can be ordered separately (part number E5Y37A), or can be downloaded at: http://www.hp.com/go/oneview.	
HP Insight Software	HP Insight Control for BladeSystem including 1yr 24x7 Support Enclosure 8 Svr FIO Electronic License	C6N32A
	NOTE: This license supports HP ProLiant c-Class blade servers.	
	NOTE: Must be purchased as an option to an HP BladeSystem enclosure. FIO can only be ordered as part of a factory-configured platform. Customer will receive a printed license entitlement certificate via physical shipment.	

Step 4: Select optional Redundant Onboard Administrator Capability

HP c7000 Onboard Administrator with KVM Option	456204-B21

NOTE: Models of the c7000 enclosure (part numbers 507019-B21 and AD361C) come with an Onboard Administrator with KVM as standard. Order this part number (456204-B21) when a second redundant Onboard Administrator is desired for a c7000 enclosure.

Step 5: Select 1 or more interconnect modules for each enclosure

The following is a list of various HP BladeSystem c-Class interconnect modules (Virtual Connect, Ethernet, and Fibre Channel), which have been tested for NEBS Level 3 compliance. For detailed interconnect options consult the specific interconnect QuickSpecs: http://h18004.www1.hp.com/products/blades/components/c-class-interconnects.html
A pair of interconnects must be ordered if redundancy is required.
NOTE: Options for specific c-Class interconnects are NOT included in the list below. Consult the individual interconnect QuickSpecs to obtain part numbers for interconnect options such as cables, SFPs, etc.

HP BladeSystem c-Class Network Interconnects	HP Virtual Connect Flex-10/10D Module for c-Class BladeSystem	638526-B21
	HP Virtual Connect FlexFabric 10/24 Enterprise Edition BLc7000 Option	605865-B21
	HP Virtual Connect FlexFabric 10GB/24-port Module for c-Class BladeSystem	571956-B21
	HP 6125G Ethernet Blade Switch	658247-B21
	HP 6125G/XG Ethernet Blade Switch	658250-B21
	HP 6125G/XG Ethernet Blade Switch	658250-B21
	HP 6120G/GX Ethernet Blade Switch	498358-B21
	HP 6120XG Ethernet Blade Switch	516733-B21
	Mellanox SX1018HP Ethernet Blade Switch for c-Class BladeSsytem	689638-B21
	HP GbE2c Layer 2/3 Ethernet Blade Switch for c-Class BladeSystem	438030-B21
	HP 10GbE Ethernet Pass-Thru Module for c-Class BladeSystem	538113-B21
	Ethernet Pass-Through Module for HP BladeSystem	406740-B21
	Cisco Catalyst Blade Switch 3020 for HP c-Class BladeSystem	410916-B21
	Cisco Catalyst Blade Switch 1GbE 3120G for HP c-Class BladeSystem	451438-B21
	Cisco Catalyst 1/10GbE 3120X Blade Switch	451439-B21

Storage

HP BladeSystem c-Class SAN Interconnect	HP 4GB Fibre ChannelPass-thru Module for c-Class BladeSystem	403626-B21
	HP Virtual Connect 8Gb 24-Port Fibre Channel Module for c-Class BladeSystem	466482-B21
	HP B-series 8/12c SAN Switch for BladeSystem c-Class	AJ820B
	HP B-series 8/24c Power Pack+ SAN Switch for HP BladeSystem c-Class	AJ822B
	HP B-series 8/24c SAN Switch for HP BladeSystem c-Class, Full Fabric	AJ821B
	HP Brocade 8/12c SAN Switch Upgrade LTU	A5517B

c7000 Enclosure Options	HP c7000 Onboard Administrator with KVM	456204-B21
	NOTE: Models of the c7000 enclosure (P/Ns 507019-B21: 507015-B21, 507017-B21, 507016-B21, 507014-B21) come with an Onboard Administrator with KVM as standard. Order (P/N 456204-B21) when a second redundant Onboard Administrator is desired for a c7000 enclosure.	
	HP c7000 Enclosure 10K Rack Ship Bracket Option Kit	433718-B21
	NOTE: The shipping bracket is required for shipping a c7000 enclosure when installed in a HP 10000 G2 rack. It is not required for normal operation.	
	HP BladeSystem Replacement Enclosure Miscellaneous Blanks kit (contains 1 each of Power Supply Blank, Interconnect Module Blank, Onboard Administrator Blank, Active Cool Fan Blank)	412148-B21
	NOTE: This kit should only be ordered to replace lost or damaged blanks.	
	HP c-Class Server Blank and Coupler Option Kit (contains 1 x half-height server blank with coupler)	412150-B21
	NOTE: The coupler allows half-height server blanks to be coupled together to create a full-height server blank.	
	NOTE: This kit should only be ordered to replace lost or damaged blanks.	

Step 6: Select NEBS certified server blades

	HP ProLiant BL460c Gen8 E5-v2 10Gb/20Gb FLB CTO Blade	735151-B21
	HP ProLiant BL460c Gen8 10Gb FLB CTO Blade	641016-B21
	HP ProLiant BL660c Gen 8 Server Blade	679118-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14416_div/14416_div.HTML	

HP PCI Expansion Blade	PCI Expansion Blade - 1 per server blade, uses 1 ½ height bay	448018-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12753_div/12753_div.html	

HP Seismic Rack	HP Seismic Rack Cabinet	AH343A

Storage
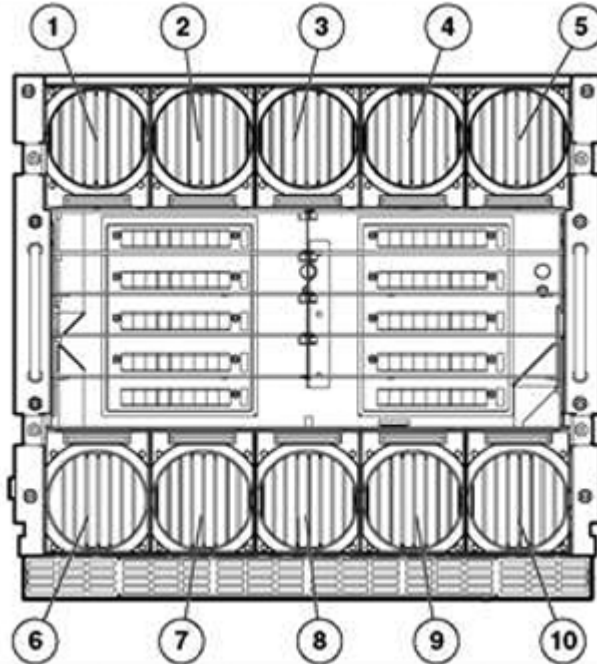
Rack Options for HP Seismic Rack	HP c7000 Enclosure Seismic Kit (one per enclosure) Adds 1U of rack space	AH330A
	HP Seismic cabinet caster kit Aids in moving configured cabinet. Reusable, one set per site.	AH336A
	HP Seismic cabinet concrete anchor (one per cabinet)	AH334A
	HP Seismic cabinet raised floor anchor (one per cabinet)	AH335A
	HP -48VDC Breaker Panel (one per enclosure) Includes 6 80 amp breakers	AH355A
	HP -48VDC 2.0m power cable for Breaker panel (for first c7000)	AH392A
	HP -48VDC 1.3m power cable for Breaker panel (for second c7000)	AH393A
	HP -48VDC 30 amp breaker kit for AH355A For use with -48VDC powered ProLiant and MSA2000 (includes two breakers)	AM336A
	HP Cable Management Tray for PCIe Expansion Blade One per enclosure, if PCIe Expansion Blade is present	AH394A

Technical Specifications

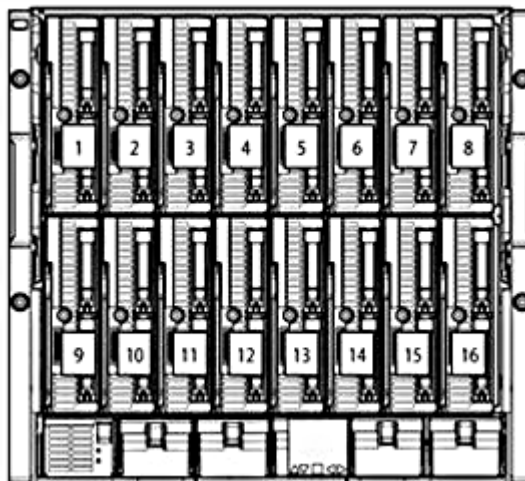## Server Blade and Fan Population Guidelines

Fan bay numbering

Fans must be placed in the following bays

Number of Fans	Fan Bays Used
4	4, 5, 9, 10
6	3, 4, 5, 8, 9, 10
8	1, 2, 4, 5, 6, 7, 9, 10
10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10

NOTE: For correct operation fans and server blades must be installed in the correct bays. The Onboard Administrator will ensure that fans and blades are correctly placed before allowing systems to power on.

Half-height server blade bay numbering
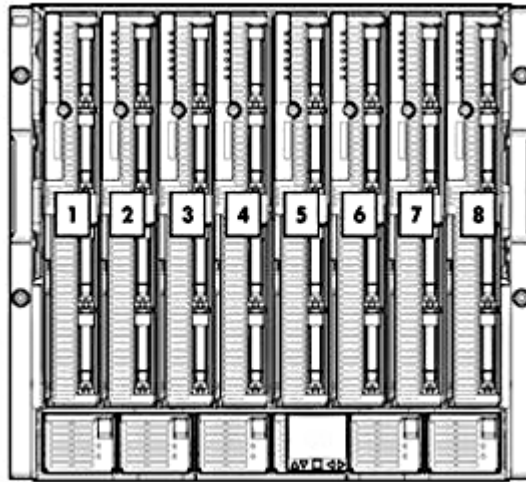

1. Device Bay 1
2. Device Bay 2

9. Device Bay 9
10. Device Bay 10

Technical Specifications

3. Device Bay 3

4. Device Bay 4

5. Device Bay 5

6. Device Bay 6

7. Device Bay 7

8. Device Bay 8

11. Device Bay 11

12. Device Bay 12

13. Device Bay 13

14. Device Bay 14

15. Device Bay 15

16. Device Bay 16

NOTE: Half-height servers should be populated from top and bottom from left to right from the front of the enclosure. So the first two half-height servers would be placed in bays 1 & 9 the second two half-height servers would be placed in bays 2 & 10 and so on until the enclosure is full.
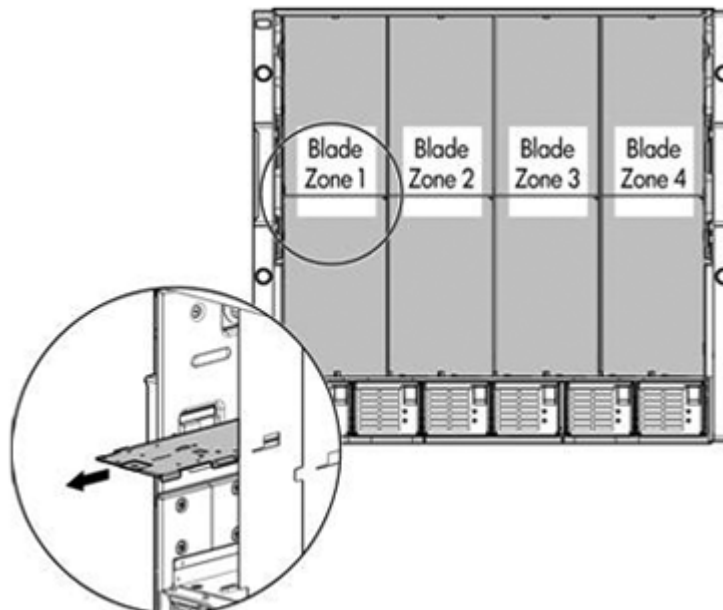
Full-height server blade bay numbering

1. Device Bay 1

2. Device Bay 2

3. Device Bay 3

4. Device Bay 4

5. Device Bay 5

6. Device Bay 6

7. Device Bay 7

8. Device Bay 8

NOTE: Full-height servers should be populated from left to right.

Mixed Configuration - Full Height and Half-Height Population rules

Technical Specifications

The c7000 enclosure is divided into 4 quadrants by the vertical support metalwork. Within each quadrant a removable divider is used to support half height devices. To install a full-height blade in any quadrant this divider must be removed. As a consequence a quadrant can only contain either full-height server blades or half-height server blades.

NOTE: Storage blades and Tape blades can be installed in the same quadrant as both full-height and half-height blades, a bracket ships with each SB40c/Tape Blade that allows a half-height blade to be mounted on top of the storage blade.

NOTE: The lower tape or storage blade cannot be removed without first removing the upper half height blade.

HP BladeSystem c7000 Server Blade Enclosure	**Dimensions**	Height	17.4 in (442 mm)
		Width	17.6 in (447.04 mm)
		Depth	36.4 in (925 mm)
	Shipping Dimensions	Height	29.88 in (759 mm)
		Width	23.88 in (607 mm)
		Depth	39.88 in (1013 mm)
	DC Input Enclosure Weight	Unboxed	151 lb (68.5 Kg)
		Shipping	194 lb (88 Kg)
	Max Enclosure Weight (approximate)	Unboxed	450 lb (204 Kg)
		Shipping	493 lb (223.6 Kg)
	Temperature Range	Operating	50° to 95° F (10° to 35° C)
		Non-Operating	-22° to 140° F (-30° to 60° C)
	Relative Humidity	Operating	10 to 90% relative humidity (Rh), 28° C (82.4° F) maximum wet bulb temperature, non-condensing.
		Non-Operating	5 to 95% relative humidity (Rh), 38.7° C (101.7° F)maximum wet bulb temperature, non-condensing.

NOTE: Operating temperature has an altitude derating of 1.8° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Power	**Input Requirements DC Power**	Rated Input Voltage	-36 to -72 VDC
		Max Input Current per line cord	75A
		Max Input Power per line Cord	2700W
		-48V DC Power	Terminal lug: 45DG 4 AWG ¼ 2H Two-hole lug 45 degree bend 0.25in. (6.4mm) stud hole size 0.63in. (16mm) hole spacing
	Output Specifications (per power supply)	HP 2250W -48V DC Hot-Plug Power Supply	2250W
	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23° C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
		Idle	

Technical Specifications

	Idle	LWAd	7.1 Bels
		LpAm	54 dB
		LWAd	7.2 Bels
		LpAm	54 dB

Option Kits	**Power Supply Option Shipping Dimensions**	Height	8.75 in (223 mm)
		Width	8.63 in (219 mm)
		Depth	35.13 in (892 mm)
		Weight	8.5 lbs (3.85 Kg)
	Fan Option Shipping Dimensions	Height	8.75 in (223 mm)
		Width	9.75 in (248 mm)
		Depth	15.88 in (403 mm)
		Weight	4.0 lbs (1.8 Kg)
	Onboard Administrator Option Shipping Dimensions	Height	2.50 in (63.5 mm)
		Width	9.88 in (251 mm)
		Depth	13.50 in (343 mm)
		Weight	4.0 lbs (1.8 Kg)

Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Power Specifications

NOTE:

To review maximum system power ratings for facilities planning purposes use the Active Answers Power Calculator which is available via the online tool located at URL: http://www.hp.com/go/bladesystem/powercalculator

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