

### Overview

(Supporting HP-UX on HP Integrity and HP 9000 Servers, and OpenVMS on HP Integrity only)

The HP Modular Smart Array 30 Enclosure (hereafter referred to as "MSA30") is an Ultra320 SCSI disk drive storage enclosure. These enclosures deliver industry-leading data performance, availability, storage density, and upgradeability to meet customers' demanding and growing storage needs. The drive carrier is designed to support the fastest current Ultra320 hard drives on the same SCSI bus.

The HP Modular Smart Array 30 Multi-Initiator (hereafter referred to as "MSA30 MI") builds on the MSA30 design by adding a 4-port I/O Module for the MSA30 to support Multi-Initiator JBOD Clusters. The MSA30 MI will replace the DS2300 and it supports HP-UX on HP Integrity and HP 9000 Servers only. The MSA30 MI does not support ProLiant Servers.

The MSA30 MI also supports HP Serviceguard software on HP-UX. HP Serviceguard monitors the health of each node and rapidly responds to failures in a way that minimizes or eliminates application downtime.

**NOTE:** For more information on Business Critical Servers/Workstations go to:

HP 9000 and HP Integrity connectivity home:

<http://www.hp.com/products1/unixserverconnectivity/index.html>

HP Integrity Server home:

<http://h20341.www2.hp.com/integrity/cache/332341-0-0-0-121.html>

HP 9000 Server home:

[http://www.hp.com/products1/servers/HP9000\\_family\\_overview.html](http://www.hp.com/products1/servers/HP9000_family_overview.html)

HP 9000 and HP Integrity Server-Storage Support Matrices:

[http://www.hp.com/products1/serverconnectivity/support\\_matrices.html](http://www.hp.com/products1/serverconnectivity/support_matrices.html)

HP workstation c8000 features & overview:

<http://www.hp.com/workstations/risc/c8000/>

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### Models

<b>Model MSA30 MI</b>	Rack-mountable, U320 SCSI 14-drive enclosure with dual bus, redundant power supplies, 4-port I/O Module for the MSA30 to support Multi-Initiator JBOD Clusters	359645-B21
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**NOTE 1:** In order to configure the MSA30 MI in a rack, have it cabled and have hard drives added the following part number must be ordered 374875-605.

**NOTE 2:** U320 performance requires a compatible U320 controller. This is noted in the product documentation. A U320 compatible EMU is also required for upgrades to U320 I/O modules

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### Overview

<b>Customer Benefits</b>	<b>Higher Performance</b>	Ultra320 SCSI transfer rates combined with the highest spindle count per U of rack space allows the MSA30 to achieve the greatest I/Os per second.
	<b>High Availability</b>	Serviceguard maximizes application availability while protecting data integrity.
	<b>Storage Capacity</b>	3U rack form factor allows customer to achieve the maximum storage capacity per square foot in the data center.
	<b>Upgradeability</b>	Ultra320 single, dual, or 4-port I/O upgrade modules make upgrading the Storage 4200/4300 Enclosure to Ultra320 quick and easy. <b>NOTE:</b> U320 performance requires a compatible U320 controller. This is noted in the product documentation.
	<b>Investment Protection</b>	With the ability to upgrade, as well as mix and match, existing Ultra2 and/or Ultra3 components with Ultra320, HP makes technology transitions simple and cost effective, and has simplified the transition to the next generation SCSI protocol.
	<b>Reduced Spares Inventory</b>	Universal drives and drive carriers across HP's entire Ultra2, Ultra3, and Ultra320 product offering allow the same drives to be used in servers and external storage.

### Key Features

**NOTE:** All models of the MSA30 (Formerly Storage 4400) Enclosure Family have the following features:

Ultra320 (LVD) support - Delivering data transfer rates up to 320 MB/s per channel

**NOTE:** U320 performance requires a compatible U320 controller. This is noted in the product documentation.

- Multi-initiator support
- 3U rack height.
- Supports up to 14 (1") Ultra320 (as well as legacy Ultra3 and Ultra2 drives) Universal hard disk drives.
- Provides storage capacity of up to 4.2 TB per enclosure (using 300-GB 1" U320 hard drives). Modular design allows the MSA30 to be used in any storage configuration from JBOD (Just a Bunch of Disks) to Smart Array storage enclosures to external RAID arrays. Up to 14 enclosures can be mounted in one 42U rack for a single rack storage capacity of up to 58.80 TB of disk storage (JBOD configuration)
- A common storage platform allows for future storage consolidation to the SAN.
- Award-winning innovative SCA (Single Connect Attach) direct connect drive carrier - provides better cooling and reliability for 10K and 15K drives.
- Hot pluggable disk drives, power supplies, and fans.
- Redundant fans, dual power supplies and single or dual bus I/O module options.
- Environmental Monitoring Unit (EMU) - Monitors environmental conditions within the enclosure and components such as the power supplies and fans.  
NOTE: An U320 compatible EMU is required for a U320 I/O module. This is included with a MSA30 but must be deployed if an upgrade option kit is purchased for a Storage 4200/4300 Enclosure.
- Easy removal of parts provides better serviceability. No tools are required!



### Product Highlights

<b>Upgradeability</b>	Upgrading a Storage 4200/4300 Enclosure to a MSA30 is as easy as swapping out the I/O module and the EMU on the back of the unit. The unit must be powered down to replace the I/O unit. <b>NOTE:</b> U320 performance requires a compatible U320 controller. This is noted in the product documentation. A U320 compatible EMU is also required for upgrades to U320 I/O modules.
<b>Mix and Match</b>	All Ultra320, Ultra3, and Ultra2 devices from HP are compatible with one another so customers can mix and match components in the same storage enclosure or server. When Ultra2, Ultra3, and Ultra320 devices are found on the same Ultra320 SCSI bus, each device will transfer data at its individual interface transfer rate up to the transfer rate of the SCSI bus. (Requires an Ultra320 controller for each drive to reach maximum I/Os as listed here.) <b>NOTE:</b> For customers who operate legacy Models 4310R and 4350R enclosures, the use of 1-inch Universal Ultra2, Ultra3, or Ultra320 disk drives requires the addition of 0.6-inch drive extenders. For configurations using the PCI-X Dual Channel U320 SCSI HBA, (P/N A7173A), mixing disks types (U160 and U320) is not supported in the same MSA30 enclosure.
<b>Hot Pluggable</b>	Hot pluggable technology is designed into drives, redundant power supplies and redundant cooling fans. Hot pluggable components can be replaced without powering down the storage system or stopping I/O operations. This feature significantly enhances data availability.
<b>Auto SCSI ID Selection</b>	SCSI ID is automatically set when a drive is inserted into a drive bay.
<b>LED Indicators</b>	LED indicators provide a quick visual assessment of overall system storage status. The MSA30 has three LEDs in the front, for EMU Status, power and fault. LED status and fault indicators for the fans and power supplies are located in the back of the enclosure.
<b>Rack Density</b>	The MSA30 models have a 3U height.
<b>Environment Monitoring Unit (EMU)</b>	Each MSA30 model is equipped with a hot-pluggable EMU that constantly monitors the enclosure, the power supplies, and fans to ensure suggested operating tolerances are maintained. <b>NOTE:</b> A U320 compatible EMU is required for a U320 I/O module.
<b>4-port, Dual Bus I/O Module</b>	The dual bus I/O module allows four SCSI channels to access a single MSA30. This allows for greater fault tolerance (controller duplexing) or provides access from two different servers to two separate storage areas.
<b>Fault Tolerance</b>	With the dual bus, 4-port I/O module, redundant power supplies and fans, the MSA30 provides a high level of system availability. The MSA30 MI can be configured for RAID levels 0, 1, 0 + 1, 5 and RAID ADG when using a HP Smart Array RAID controller. <b>NOTE:</b> HP Serviceguard/Multi-initiator configurations are NOT supported when using Smart Array RAID controllers.



### Product Highlights

#### Manageability

Depending on the host controller, the MSA30 is managed by HP Insight Manager or Storage Command Console.

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#### Compatibility and Integration Testing

Intensive compatibility and performance testing with HP 9000 and HP Integrity servers ensures the highest level of integration available in the industry. For a complete list of supported HP servers please refer to the QuickSpecs and/or User Guide of the array controller or Host Bus adapter that you are planning to use. The list of supported array controllers and SCSI adapters is provided under "Related Options, Controllers".

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#### Product Kit Contents

##### Model MSA30 MI

Redundant power supplies, 4-port I/O module, 14 drive blanks, warranty card, mounting hardware, Enclosure 4400 user guide, EMU booklet, HP SmartStart CD Kit, documentation CD, four 12-ft VHDCI to VHDCI SCSI cables and two IEC-C13 power cord with IEC-320-C13 plug.

**NOTE:** Power cord for Japan will be included in orders marked for Japan.

**NOTE:** To maintain proper cooling and airflow, a drive blank or drive must occupy all bays during operation.



### Service and Support, HP Care Pack, and Warranty Information

#### Service and Support

Three-year limited warranty, including hardware diagnostic support, pre-failure warranty (coverage of processors, memory and SCSI hard drives). The warranty is fully supported by HP Services and a worldwide network of resellers and service providers. In addition 90-day's getting started software telephone support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services.

**NOTE:** Limited warranty includes 3 year parts, 0 years labor, 0 years on-site support

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses
- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMware-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

Service includes HP branded hardware options qualified for the storage enclosure, purchased at the same time or afterwards, internal to the enclosure. These will be covered at the same service level and coverage period as the storage enclosure.

**NOTE:** For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/carepack>

**NOTE:** For more complete information on HP Services offerings, customers and resellers, please visit us at: <http://www.hp.com/hps>

**NOTE:** Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

**NOTE:** The information contained herein is subject to change without notice and is provided "as is" without warranty of any kind.

**NOTE:** The warranties for HP products and services are set forth in the express limited warranty statements accompanying such products and services.

**NOTE:** Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

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#### Warranty

MSA30: Three-year limited warranty.

**NOTE:** Certain restrictions and exclusions apply.

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### Service and Support, HP Care Pack, and Warranty Information

#### HP Care Pack Information Flexible Onsite Care Packs

1 Year Next Day, Hardware	HA101A1-7GT
1 Year 4 Hour 5-Day x 13-Hour Coverage, Hardware	HA103A1-7GT
1 Year 4 Hour 24x7, Hardware	HA104A1-7GT
1 Year 6 Hour Call to Repair 7-Day x 24-Hour Coverage, Hardware	HA105A1-7GT
1 Year Support Plus	HA109A1-7GT
1 Year Support Plus 24	HA110A1-7GT
3 Year Next Day, Hardware	HA101A3-7GT
3 Year 4 Hour 5-Day x 13-Hour Coverage Hardware	HA103A3-7GT
3 Year 4 Hour 7-Day x 24-Hour Coverage Hardware	HA104A3-7GT
3 Year 6 Hour Call to Repair 7-Day x 24-Hour Coverage, Hardware	HA105A3-7GT
3 Year Support Plus	HA109A3-7GT
3 Year Support Plus 24	HA110A3-7GT
Installation	HA113A1-564

#### Fixed Onsite Care Packs

3 Year Next Business Day, 5-Day x 9-Hour Coverage, Electronic	U8128E
3 Year Four Hour, 5-Day x 13-Hour Coverage, Electronic	U8129E
3 Year Four Hour, 7-Day x 24-Hour Coverage, Electronic	U8130E
3 Year Six Hour, Call to Repair, 7-Day x 24-Hour Coverage, Electronic	U8131E
1 Year Next Business Day, 5-Day x 9-Hour Coverage, Electronic	U8151E
1 Year Four Hour, 5-Day x 13-Hour Coverage, Electronic	U8152E
1 Year Four Hour, 7-Day x 24-Hour Coverage, Electronic	U8153E
1 Year Six Hour, Call to Repair, 7-Day x 24-Hour Coverage, Electronic	U8154E
Hardware Installation, Electronic	U8132E



### Related Options

**NOTE:** Some of the options listed below may be discontinued.

Upgrade I/O Module	Ultra320 4-Port Upgrade I/O Module	335882-B21 (70-41003-02)
Controllers & Adapters Supported	PCI Dual Channel Ultra160 SCSI Adapter OS Support: HP-UX 11i v1; HP-UX 11i v2.	A6829A
	PCI Ultra160 SCSI Adapter OS Support: HP-UX 11i v1; HP-UX 11i v2.	A6828A
	PCI 2 Port 100Base-T & 2 Port Ultra2 SCSI OS Support: HP-UX 11i v1; HP-UX 11i v2.	A5838A
	PCI-X Dual Channel U320 SCSI HBA OS Support: OpenVMS 8.2-1, HP-UX 11.11, 11.23PI <b>NOTE:</b> For configurations using the HBA (P/N A7173A), mixing disks types (U160 and U320) is not supported in the same MSA30 enclosure.	A7173A
	PCI-X 2-Port U320 SCSI and 2-Port Gigabit Ethernet Combination Card OS Support: HP-UX 11.11, 11.23PI <b>NOTE:</b> Smart Array controllers (A9890A, A9891A, A7143A, A9826A, A9825A) are NOT supported in HP Serviceguard/Multi-initiator configurations <b>NOTE:</b> When used in integrity servers; A5838A does not support boot or Serviceguard.	AB290A
	Power Options	Redundant Power Supply, 499 watts <b>NOTE:</b> Replaces part number 119826-B21 - Redundant power supply, 375 watts).
	Enclosure Ultra320 Single Bus I/O Module	287484-B21
	Enclosure Ultra320 Dual Bus I/O Module	287483-B21
	Enclosure Tower to Rack Conversion Kit	150213-B21
	39-ft (12m) VHDCI to VHDCI SCSI Cable	150214-B21
	24-ft (7m) VHDCI to VHDCI SCSI Cable <b>NOTE:</b> Configuration restrictions apply, please see modular array QuickSpecs for details: <a href="http://h18006.www1.hp.com/storage/arrayssystems.html">http://h18006.www1.hp.com/storage/arrayssystems.html</a> .	164604-B21
HP Rack 5000 Series	HP 5642 Rack-Unassembled (Graphite Carbon) <b>NOTE:</b> Please see the HP Rack 5642 QuickSpecs for additional part numbers and Technical Specifications such as height, width, depth, weight, and color: <a href="http://h18000.www1.hp.com/products/quickspecs/12074_div/12074_div.HTML">http://h18000.www1.hp.com/products/quickspecs/12074_div/12074_div.HTML</a> (Worldwide) <b>NOTE:</b> For additional information regarding Rack Cabinets, please see the following URL: <a href="http://www.hp.com/go/rackandpower">http://www.hp.com/go/rackandpower</a> .	358254-B21
Rack Options for Rack 5000 Series	Stabilizer Kit for 5642 Rack (Graphite Carbon) <b>NOTE:</b> The stabilizing kit is used to prevent rack from tipping over.	374493-B21
	Baying Kit for 5642 Rack (Graphite Carbon) <b>NOTE:</b> The baying kit is used to join two or more HP 5642 racks.	374499-B21



### Related Options

HP Rack 10000 Series (Graphite Metallic)	10642 (42U) Infrastructure Rack (Low Voltage)	379006-001
	10642 (42U) Infrastructure Rack (High Voltage)	379005-001
	HP S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
	HP 10842 (42U) Rack Cabinet - Pallet	257415-B21
	HP 10842 (42U) Rack Cabinet - Shock Pallet	257415-B22
	HP 10647 (47U) Rack Cabinet - Pallet	245160-B21
	HP 10647 (47U) Rack Cabinet - Crated	245160-B23
	HP 10622 (22U) Rack Cabinet - Pallet	245163-B21
	HP 10622 (22U) Rack Cabinet - Shock Pallet	245163-B22
	HP 10622 (22U) Rack Cabinet - Crated	245163-B23

**NOTE:** xxxxx-B21 (pallet) used to ship empty racks shipped on a truck. xxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels). xxxxx-B23 (crated) used for air shipments of empty racks.

**NOTE:** It is mandatory to use a shock pallet in order to ship racks with equipment installed.

**NOTE:** Please see the Rack 10000 QuickSpecs for additional part number and Technical Specifications such as height, width, depth, weight, and color:  
[http://h18000.www1.hp.com/products/quickspecs/10995\\_div/10995\\_div.HTML](http://h18000.www1.hp.com/products/quickspecs/10995_div/10995_div.HTML)  
 (Worldwide)

**NOTE:** For additional information regarding Rack Cabinets, please see the following URL: <http://www.hp.com/go/rackandpower>

HP Rack System/E41 (41U)	A4902A
HP Rack System/E41 (41U)	A4902D
HP Rack System/E33 (33U)	A4901A
HP Rack System/E33 (33U)	A4901D
HP Rack System/E25 (25U)	A4900A
42U EVA cab 60 Hz (based on Series 10,000 rack system)	338042-B21
42U EVA cab 50 Hz (based on Series 10,000 rack system)	338043-B21
36U EVA cab 60 Hz (based on Series 10,000 rack system)	338044-B21
36U EVA cab 50 Hz (based on Series 10,000 rack system)	338045-B21
22U EVA cab 60 Hz (based on Series 10,000 rack system)	338046-B21
42U Modular Storage Cabinet 60 Hz (Opal)	180311-B21
42U Modular Storage Cabinet 50 Hz (Opal)	180312-B22
36U Modular Storage Cabinet 60 Hz (Opal)	180313-B21
36U Modular Storage Cabinet 50 Hz (Opal)	180314-B22
22U Modular Storage Cabinet 60 Hz (Opal)	180315-B21
22U Modular Storage Cabinet 50 Hz (Opal)	180316-B22
41U Modular Storage Cabinet 60 Hz (Blue)	180317-B21
41U Modular Storage Cabinet 50 Hz (Blue)	180318-B22





### Related Options

**NOTE:** It is mandatory to use a shock pallet in order to ship racks with equipment installed.

**NOTE:** Each Modular Storage Cabinet (42U, 41U, 36U, and 22U) comes with redundant 220 to 240V PDUs and power cables to accommodate Modular Array configurations. For more details on Modular Array solutions, see:

<http://h18006.www1.hp.com/storage/arraysystems.html>

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Legacy Racks Supported	Rack 7142	165753-001
	Rack 9142	120663-B21
	Rack 9136	120664-B21
	Rack 9122	120665-B21

**NOTE:** Certain power support and cooling restrictions apply when housing a maximum number of Model 4314R or Model 4354R enclosures in one of the supported HP racks. Please refer to <http://h18006.www1.hp.com/storage/index.html> for more information.

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### Universal SCSI Drives

Ultra 320 Drives	HP 300GB U320 15K Universal HDD	411089-B22
	HP 300GB U320 10K Universal HDD	350964-B22
	HP 146GB U320 10K Universal HDD	286716-B22
	HP 72GB U320 10K Universal HDD	286714-B22
	HP 146GB U320 15K Universal HDD	347708-B22
	HP 72GB U320 15K Universal HDD	286778-B22
	HP 36GB U320 15K Universal HDD	286776-B22
	0.6-inch (1.52 cm) Drive Extenders (package of 4)	148649-B21

1. Ultra 2 and Ultra3 drives are also supported in 4300 configurations.

2. For pre-existing 10-bay solutions, drive height extenders are attached to 1 in drives for use in 1.6 in drive bay.

**NOTE:** Go to the [HP SCSI Hard Drive Compatibility](http://www.hp.com/products/harddiskdrives) table for complete drive compatibility information (<http://www.hp.com/products/harddiskdrives>). Using hard drives in unsupported configurations will result in voiding the warranty and could result in damage to the drive and/or loss of data.

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SCSI Cable Options	<i>Cables for use with Smart Array controllers</i>	
	12-ft VHDCI to 68-pin SCSI Cable	341177-B21
	24-ft VHDCI to VHDCI SCSI Cable	164604-B21
	39-ft VHDCI to VHDCI SCSI Cable	150214-B21



### Technical Specifications

<b>Protocol Support</b>	Wide Ultra320 (LVD) Wide Ultra3 (LVD) Wide Ultra2 (LVD)
<b>O/S Support</b>	HP-UX 11.00 HP-UX 11i v1 HP-UX 11i v2 OpenVMS 8.2-1 Defined by specific HP array controller or SCSI adapter used; please refer to the QuickSpecs and/or User Guide of the specific array controller or SCSI adapter
<b>Dimensions (HxWxD)</b>	Rack 5.2 x 19 x 20.5 in (13.1 x 47.88 x 51.66 cm)
<b>Shipping Dimensions (HxWxD)</b>	Rack 34.25 x 14.5 x 31.25 in (86.31 x 36.54 x 78.75 cm)
<b>Weight</b>	Rack 68 lb (30.9 kg)
<b>Shipping Dimensions (HxWxD)</b>	MSA30 MI (Multi-Indicator) 34.38 x 34.375 x 12 in (87.33 x 87.313 x 30.48 cm) MSA30 SB (Single Bus) 34.38 x 34.375 x 12 in (87.33 x 87.313 x 30.48 cm) MSA30 DB (Dual Bus) 34.38 x 34.375 x 12 in (87.33 x 87.313 x 30.48 cm) Ultra320 4-Port Upgrade I/O Module 14.5 x 11.5 x 3.1 in (36.8 x 29.2 x 8 cm) Redundant Power Supply, 499 watts 12.75 x 8 x 3.75 in (32.13 x 20.16 x 9.45 cm)
<b>LED Indicators (on front panel)</b>	EMU Status LED (left) Enclosure Power LED (middle) Fault LED (right)
<b>Drive LED Indicators (on drive trays)</b>	Drive LED (top) On Line LED (middle) Drive Failure LED (bottom)
<b>Enclosure LED Indicators (back of unit)</b>	I/O Module (top) EMU (middle) Power supplies (bottom)
<b>Input Requirements</b>	Nominal Line Voltage 110 to 240 V AC Range Line Voltage 90 to 264 V AC Line Frequency 47 to 63 Hz Typical Input Current 2.3A at 120 V AC
<b>Relative Humidity (non-condensing)</b>	Operating 10% to 90% Shipping 5% to 90%
<b>Controllers and Adapters Supported with MSA30 MI</b>	PCI-X RAID Smart Array 6402 U320, 2CH PCI-X RAID Smart Array 6404 U320, 4CH PCI 4-Channel RAID160 SA SCSI Controller Smart Array 5302 with 128MB cache Smart Array 5304 with 256MB cache PCI Dual Channel Ultra160 SCSI Adapter



### Technical Specifications

	PCI Ultra160 SCSI Adapter
	PCI 2 Port 100Base-T & 2 Port Ultra2 SCSI
	Windows and Linux Ultra160 SCSI Adapter
	Windows, Linux 2 port Ultra160 SCSI HBA
<b>I/O Module Connector</b>	Very High Density Cable Interconnect (VHDCI)
<b>Power</b>	377 Watts per supply (load)
<b>BTU (220 volts)</b>	Single power supply 14 drives 1164 BTUs/hour
	Single power supply 5 drives 536 BTUs/hour
	Single power supply 1 drive 273 BTUs/hour
	Dual power supply 14 drives 1232 BTUs/hour
	Dual power supply 5 drives 625 BTUs/hour
	Dual power supply 1 drive 352 BTUs/hour
<b>Temperature Range</b>	Operating 50° to 94° F (10° to 35° C°)
	Shipping -40° to 151° F (-40° to 66° C)

**NOTE:** To maintain proper cooling and airflow, a drive blank or drive must occupy all bays during operation.

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The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.

