

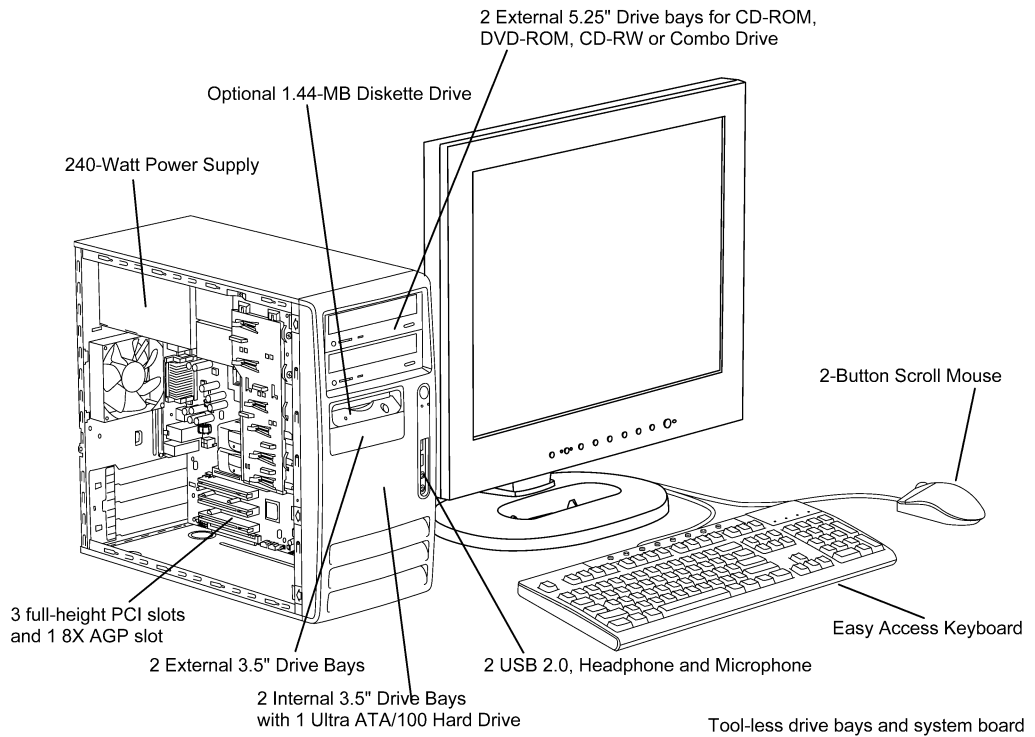
### Overview

#### At A Glance

- AMD Athlon™ XP processors
- NVIDIA nForce2 chipset with Integrated 64-MB NVIDIA GeForce4 MX Graphics
- Integrated dual-monitor VGA connections built in with NVIDIA nView Multi-display software standard
- Supports up to 2-GB of PC 2700 (DDR 333) Synch DRAM Memory
- Dual channel memory support
- 4 rear USB 2.0 ports and 2 front USB 2.0 ports
- Integrated audio with internal speaker
- Integrated 3COM 10/100 NICLOM (Lan on Motherboard)
- 8X AGP slot
- Energy Star compliant with energy-saving features
- Protected by HP Services, including a 3-1-1, standard warranty. Certain restrictions and exclusions apply.

#### Microtower

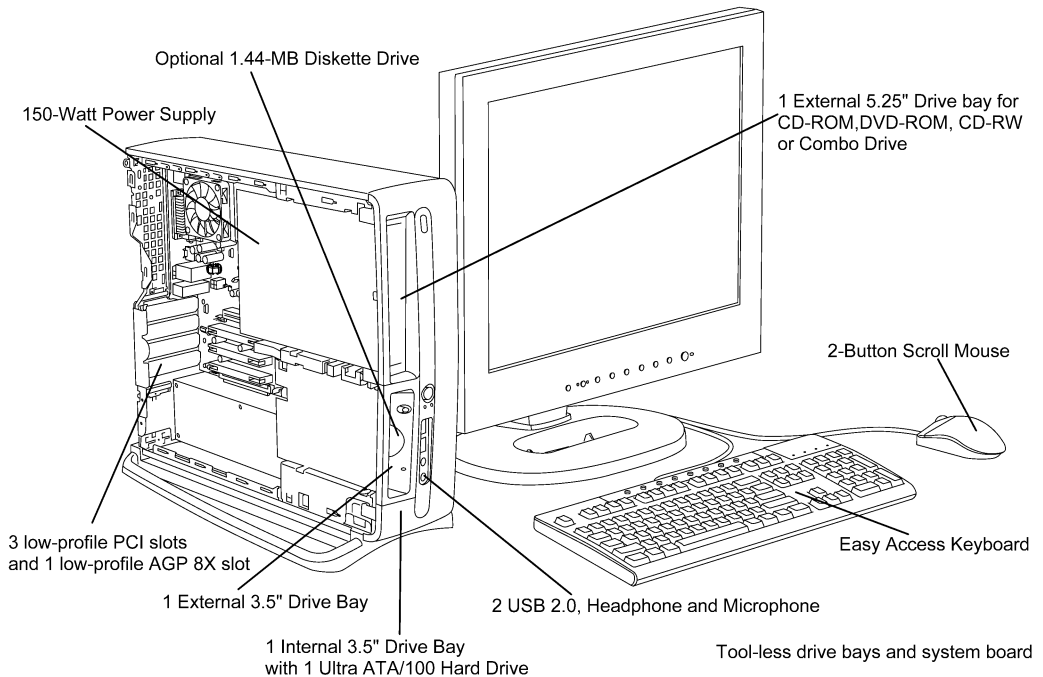
36.8 x 17.5 x 41.4 centimeters / 14.5 x 6.88 x 16.31 inches



Monitor Sold Separately

#### Slim Tower

33.78 x 10 x 38.3 centimeters / 13.3 x 3.95 x 15.1 inches



Monitor Sold Separately



### Standard Features – Select Models

#### Pre-Configured Models

DE643A#ABA	d325m/A2600/40c/256/4U	HP d325 Microtower, nVidia nForce2 chipset, AMD Athlon XP 2600+ (2.13GHz), 256KB ECC L2 cache, 266MHz Front Side Bus, 256MB PC2700 DDR (1x256), Integrated nVidia GeForce4 Dual-Head Graphics, 40GB Ultra ATA Hard Drive (7200 rpm), 48X CD-ROM Drive, Integrated SoundMax III audio with internal speaker, Integrated 3Com 10/100 networking, Microsoft Windows XP Professional SP1, Microsoft Works v7.0, Norton Antivirus 2003, PS/2 Easy Access Internet Keyboard, USB Optical Scroll Mouse, 3-year Parts, 1-year Labor, 1-year Onsite warranty
DE644A#ABA	d325m/A2800/40c/512/4U	HP d325 Microtower, nVidia nForce2 chipset, AMD Athlon XP 2800+ (2.08GHz), 512KB ECC L2 cache, 333MHz Front Side Bus, 512MB PC2700 DDR (1x512), Integrated nVidia GeForce4 Dual-Head Graphics, 40GB Ultra ATA Hard Drive (7200 rpm), 48X CD-ROM Drive, Integrated SoundMax III audio with internal speaker, Integrated 3Com 10/100 networking, Microsoft Windows XP Professional SP1, Microsoft Works v7.0, Norton Antivirus 2003, PS/2 Easy Access Internet Keyboard, USB Optical Scroll Mouse, 3-year Parts, 1-year Labor, 1-year Onsite warranty
DN718A#ABA	d325sT/A2400/40c/256/4U	HP d325 Slim Tower, nVidia nForce2 chipset, AMD Athlon XP 2400+ (2.00GHz), 266KB ECC L2 cache, 266MHz Front Side Bus, 256MB PC2700 DDR (1x256), Integrated nVidia GeForce4 Dual-Head Graphics, 40GB Ultra ATA Hard Drive (7200 rpm), 48X CD-ROM Drive, Integrated SoundMax III audio with internal speaker, Integrated 3Com 10/100 networking, Microsoft Windows XP Professional SP1, Microsoft Works v7.0, Norton Antivirus 2003, PS/2 Easy Access Internet Keyboard, USB Optical Scroll Mouse, 3-year Parts, 1-year Labor, 1-year Onsite warranty

### Standard Features – Custom Components

Processor and Speed - One of the following			Microtower	Slim Tower
<b>AMD Athlon Processors</b>	<b>Front Side Bus</b>	<b>Standard L2 Cache</b>		
AMD Athlon XP 2400+ (2.00-GHz)	266-MHz	256-KB ECC	✓	✓
AMD Athlon XP 2600+ (2.13-GHz)	266-MHz	256-KB ECC	✓	
AMD Athlon XP 2800+ (2.08-GHz)	333-MHz	512-KB ECC	✓	
AMD Athlon XP 3000+ (2.17-GHz)	333-MHz	512-KB ECC	✓	
AMD Athlon XP 3200+ (2.33-GHz)	333-MHz	512-KB ECC	✓	
<b>Hard Drives</b>				
40-GB 7200 rpm SMART III Ultra ATA/100			✓	✓
40-GB 5400 rpm SMART III Ultra ATA/100			✓	✓
80-GB 7200 rpm SMART III Ultra ATA/100			✓	✓
160-GB 7200 rpm SMART III Ultra ATA/100			✓	✓
<b>Standard Memory - One of the following</b>				
128-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 128 DIMM)			✓	✓
256-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 256 DIMM)			✓	✓
256-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 128 DIMM)			✓	✓
512-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 512 DIMM)			✓	✓
512-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 256 DIMM)			✓	✓
1-GB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 1024 DIMM)			✓	✓
1-GB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 512 DIMM)			✓	✓
2-GB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 1024 DIMM)			✓	✓
<b>Removable Storage</b>				
Optional 1.44-MB Diskette Drive			✓	✓
Zip 250 Drive (available in 3.5")			✓	✓
16-MB, 64-MB, or 128-MB Drive Keys			✓	✓
<b>Optical Storage - One of the following</b>				
48X Max CD-ROM Drive			✓	✓
48X/24X/48X CD-RW Drive			✓	✓
16X/40X DVD-ROM with +R Read			✓	✓
48X/24X/48X/16X Combo CD-RW/DVD-ROM Drive			✓	✓
4X DVD+R/+RW Drive			✓	
<b>NOTE: All DVD devices will be restricted to 256-MB or more system memory.</b>				
<b>I/O Card</b>				
IEEE 1394a (FireWire 400) PCI Card			✓	

### Standard Features – Custom Components

	Microtower	Slim Tower
<b>Keyboard</b>		
PS/2 Easy Access Keyboard	✓	✓
Wireless Easy Access Keyboard	✓	✓
<b>Mouse</b>		
PS/2 2-Button Scroll Mouse	✓	✓
USB Optical Scroll Mouse	✓	✓
Wireless Optical Scroll Mouse	✓	✓
<b>Modem</b>		
Lucent V.90 56K Win Modem	✓	✓
<b>Audio</b>		
Integrated Soundmax AC97 audio with premium internal speaker	✓	✓
<b>NIC</b>		
Integrated 3COM 3C920B-EMB Fast Ethernet Controller	✓	✓
Intel Pro 1000 MT NIC FH PCI adapter	✓	
Intel Pro 1000 MT NIC LP PCI adapter		✓
<b>Graphics</b>		
NVIDIA nForce2 GT chipset with Integrated NVIDIA GeForce4 MX 64-MB Graphics	✓	✓
NVIDIA GeForce4 MX-440-8 64-MB DDR Full Height 8X AGP VGA w/TV-out	✓	
NVIDIA GeForce4 MX-440-8 64-MB DDR Low Profile 8X AGP VGA w/TV-out		✓
<b>Operating System – One of the following</b>		
Microsoft Windows XP Home SP1	✓	✓
Microsoft Windows 2000 SP3	✓	✓
Microsoft Windows XP Professional SP1	✓	✓

### Standard Features – Custom Components

<b>Software</b> (Microsoft Windows system only)	<b>Microtower</b>	<b>Slim Tower</b>
Norton AntiVirus 2003	✓	✓
Microsoft Works v7.0 (US only)	✓	✓
Microsoft Office XP Small Business Edition	✓	✓
Microsoft Office XP Professional	✓	✓
PDF Complete	✓	✓
Roxio EZ CD Creator v6 (included with all re-writeable optical drives)	✓	✓
CorelWordPerfect (US English only) (on CD)	✓	✓
Intervideo WinDVD v4 (included with all DVD drives)	✓	✓
MyDVD Suite v4 (included on CD with all DVD +R/+RW drives)	✓	✓
HP Restore Plus! Kit / OS CD	✓	✓
Dantz Restrospect Backup v6 (included on CD with all re-writeable optical drives)	✓	✓
Open Office Productivity Suite on CD (LA only)	✓	✓
<b>Security</b>		
Chassis Clamp Lock with Cable (sold as an accessory)	✓	✓
Chassis Clamp Lock without Cable (sold as an accessory)	✓	✓
Rear Port Controller Cover	✓	✓
Solenoid Lock (sold as an accessory)	✓	✓
<b>Miscellaneous</b>		
Tower Stand (included in all configuration)		✓
Wall Mount Bracket with Security Sleeve ( sold as an accessory)		✓
<b>Intelligent Manageability</b>		
Downloadable from HP Intelligent Manageability at: <a href="http://h18000.www1.hp.com/im/">http://h18000.www1.hp.com/im/</a>		

### Standard Features – Base Unit Details

Base Unit Contents	Microtower	Slim Tower
AMD processor, heatsink	✓	✓
System board with NVIDIA nForce2 chipset	✓	✓
(2) ATA Cables	✓	✓
Optional diskette drive with cable	✓	✓
Audio cable	✓	✓
Quick Setup booklet	✓	✓
Getting Started guide	✓	✓
Product Documentation on CD	✓	✓
HP OS CD and HP Restore CD	✓	✓
Warranty booklet	✓	✓
Power Cord	✓	✓
PS/2 Easy Access Keyboard	✓	✓
PS/2 Scroll Mouse or USB Optical Mouse (North America)	✓	✓

#### Expansion Capability

Memory Expansion Slots (Non-ECC)	2 DIMM slots	2 DIMM slots
Maximum Memory Slots	2-GB (1-GB per slot maximum)	2-GB (1-GB per slot maximum)
PCI	3 full-height, full-length	3 low-profile
AGP	1 full-height, full length 8X AGP	1 low-profile AGP 8X
Bays	Total Bays = 6	Total Bays = 3
Internal	(2) 3.5-inch hard drive bays	(1) 3.5 inch ATA Hard Drive
External	(2) full-length 5.25-inch	(1) 5.25 inch full-length
	(2) full-length 3.5-inch	(1) 3.5 inch full length
Wireless Support	PCI card or external USB	PCI card or external USB
USB Support	(2) Front USB 2.0 Ports	(2) Front USB 2.0 Ports
	(4) Rear USB 2.0 Ports	(4) Rear USB 2.0 Ports

**NOTE:** 2 USB ports can be high-speed, (USB 2.0), and divide the total possible 480Mb/s bandwidth. The remaining 4 ports, if used at the same time, are USB 1.1 and divide up a total of 12Mb/s between them.

#### Interfaces (Legacy)

Parallel Port	1	1
Serial Port	1	1
PS/2 Keyboard	1	1
PS/2 Mouse	1	1
VGA Adapter	2	2
Chassis Dimensions (H x W x D) Centimeters	36.8 x 17.5 x 41.4	33.78 x 10 x 38.3
Chassis Dimensions (H x W x D) Inches	14.5 x 6.88 x 16.31	13.3 x 3.95 x 15.1
System Weight	24.0 lbs	22.2 lbs
System Volume	1651 sq. in. (27.0 liters)	859 sq. in. (14.1 liters)
Shipping Weight	32 lbs	30.5 lbs.
Packaged Unit Dimensions (H x W x D)	22.20 x 13.00 x 23.50 in	22.125 x 18.75 x 13.375 in

### Standard Features – Base Unit Details

System Memory	Microtower	Slim Tower
Type/Speed	DDR Synch DRAM PC2700 (333-MHz) Non-ECC and DDR Synch DRAM PC2100 (266-MHz) Non-ECC	DDR Synch DRAM PC2700 (333-MHz) Non-ECC and DDR Synch DRAM PC2100 (266-MHz) Non-ECC
Maximum Memory	2 GB (1-GB per slot maximum)	2 GB (1-GB per slot maximum)
Memory Parity	Not Needed for non-ECC	Not Needed for non-ECC
ECC Memory	Not Supported by chipset	Not Supported by chipset
Serial Presence Detect Support	Supported	Supported
Dual channel memory Support	Yes. Requires two equal size and type memory modules	Yes. Requires two equal size and type memory modules.

#### Supported Features

Processor	AMD Athlon XP	AMD Athlon XP
CPU Bus Speed Supported	333 or 266-MHz FSB	333 or 266-MHz FSB
Memory Type Supported	DDR (ECC not supported by Chipset)	DDR (ECC not supported by Chipset)
Memory Speed Supported	DDR Synch DRAM PC2700 (333 MHz) or PC2100 (266-MHz) Non-ECC	DDR Synch DRAM PC2700 (333 MHz) or PC2100 (266-MHz) Non-ECC
Serial Presence Detect Support	Yes	Yes
Hard Drive Interfaces Supported	SMART III Ultra ATA/100/66/33	SMART III Ultra ATA/100/66/33
Hard Drive Controller (PCI) Supported	SMART III Ultra ATA/100/66/33	SMART III Ultra ATA/100/66/33

#### AMD Athlon XP

Coprocessor	Integrated	Integrated
CPU Socket Type/Number	Socket A	Socket A
CPU Package	FC-PGA	FC-PGA
Front Side Bus Speed	333 or 266-MHz	333 or 266-MHz
Standard L2 Cache	512-KB ECC or 256-KB ECC, depending on processor	512-KB ECC or 256-KB ECC, depending on processor
L2 Cache Architecture / Speed	Full core clock speed	Full core clock speed
Cache Upgradeable To	Not upgradeable - Integrated into Processor	Not upgradeable - Integrated into Processor

#### System Board

Architecture	Athlon XP / PCI / AGP 4X and 8X	Athlon XP / PCI / AGP 4X and 8X
Chipset	NVIDIA nForce2 chipset	NVIDIA nForce2 chipset
I/O Controller	SMSC LPC47B367 Super I/O	SMSC LPC47B367 Super I/O
System Board Form Factor	Standard uATX	Standard uATX
Processor Socket - 462 Pin ZIF	Yes	Yes
DIMM Connectors (2.5V)	Yes (2)	Yes (2)
AGP Connector (1.5V)	Yes (1) 8X AGP	Yes (1) 8X AGP
Integrated AGP Graphics	Yes	Yes
PCI Connectors	Yes (3 on system board)	Yes (3 on system board)
Flash ROM	Yes	Yes
Audio	Yes	Yes
CD ROM IN (Audio)	Yes	Yes
Clear CMOS	Yes	Yes
CPU Fan Header	Yes	Yes
Chassis Fan Header	Yes	Yes
Chassis Speaker Header	Yes	Yes
CMOS Battery Holder - Lithium	Yes	Yes
Hood Lock Header	Yes	Yes
Hood Sense Header	Yes	Yes

### Standard Features – Base Unit Details

System Board <i>(continued)</i>	Microtower	Slim Tower
Multibay Header	No	No
Multiport Header	No	No
NIC supported features:		
WOL (Wake-On-Lan®)	Yes	Yes
AOL (Alert-On-LAN®)	No	No
SOS - Network based alerting	Yes	Yes
ASF (Alert Standards Format)	No	No
PXE (Pre-Boot Execution Environment)	Yes	Yes
Power Supply Header	Yes	Yes
Power Switch, Power LED and Hard Drive LED Header	Yes	Yes
Password Clear Header	Yes	Yes
Riser Connector	No	No
SCSI LED Header	No	No
ACPI-Ready Hardware	Yes	Yes
<ul style="list-style-type: none"> <li>Advanced Configuration and Power Management Interface (ACPI).</li> <li>It allows the system to wake from a low power mode.</li> <li>It controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.</li> </ul>		
Dual-State Power Button	Yes	Yes
<ul style="list-style-type: none"> <li>Power button acts as both an on/off button and suspend-to-sleep button.</li> </ul>		
<b>Chassis</b>		
Color	Carbonite/Silver	Carbonite/Silver
System Board Form Factors Supported	Standard uATX	Standard uATX
Cooling Solutions Supported		
Power Supply Fan (Variable Speed)	Yes	Yes
Processor Fan-Heatsink (Variable Speed)	Yes	Yes
Chassis Fan	Yes	Yes
Front I/O	Standard Front Headphone, Microphone, and (2) USB 2.0	Standard Front Headphone, Microphone, and (2) USB 2.0
Rear I/O	Standard ATX I/O Connectors (4 USB 2.0, 1 VGA, 1 Audio Out, 1 Audio In, 1 Microphone, 1 Serial, 1 Parallel, 2 PS2, 1 RJ45)	Standard ATX I/O Connectors (4 USB 2.0, 1 VGA, 1 Audio Out, 1 Audio In, 1 Microphone, 1 Serial, 1 Parallel, 2 PS2, 1 RJ45)
Internal Speaker	Yes	Yes
Security Locks Supported	Kensington Cable Lock (optional)	Kensington Cable Lock (optional)
	Hood Cover Security Loop (standard but Lock not included)	Hood Cover Security Loop (standard but Lock not included)
	Solenoid Hood lock (optional)	Solenoid Hood lock (optional)



### Standard Features – Base Unit Details

Interfaces	Microtower	Slim Tower
I/O Chip	SMSC LPC47B367 Super I/O	SMSC LPC47B367 Super I/O
Serial Port / UART Type	One Serial Port	One Serial Port
Parallel Port	One Parallel Port	One Parallel Port
USB	6 USB 2.0 ports (4 rear/2 front)	6 USB 2.0 ports (4 rear/2 front)
Infrared Port	No	No
Network	RJ-45	RJ-45
Keyboard	Yes (PS2 and USB)	Yes (PS2 and USB)
Mouse	Yes (PS2 and USB)	Yes (PS2 and USB)
Multibay	No	No
Video	Yes	Yes
Audio	Yes	Yes

#### Power Supply

Power Supply	240-watt ATX power supply – PFC 115v/230v line switch	150-watt ATX power supply – PFC 115v/230v line switch
Full Ranging Input (No Line Select Switch)	No	No
Active Power Factor Correction (APFC) (Input Current is nearly 1/2 a non-APFC PS)	No	No
Passive Power Factor Correction (PFC)	Yes (with line switch set to 230V - No PFC in 115V line switch position)	Yes (with line switch set to 230V - No PFC in 115V line switch position)
Operating Voltage Range	90 to 132VAC, or 180 to 264VAC	90 to 132VAC, or 180 to 264VAC
Rated Voltage Range	100 to 127VAC, or 200 to 240VAC	100 to 127VAC, or 200 to 240VAC
Rated Line Frequency	50-60 Hz	50-60 Hz
Operating Line Frequency Range	47-63 Hz	47-63 Hz
Rated Input Current	6A @ 100VAC/3A @ 200VAC	5A @ 100VAC/2.5A @ 200VAC
Maximum Rated Power	240 watt	150 watt (system rated for 130W maximum)
Heat Dissipation	Max (369W input): 1260 BTU/hr Typical (75W input): 256 BTU/hr Max (369W input): 317 kg-cal/hr Typical (75W input): 65 kg-cal/hr	Max (200W input): 683 BTU/hr Typical (75W input): 256 BTU/hr Max (200W input): 172 kg-cal/hr Typical (75W input): 65 kg-cal/hr
PS Fan	92mm fan integrated in power supply - variable speed for optimum acoustics	PS cooling achieved via ducting of airflow from processor fan.
Processor Fan	Variable speed fan	Variable speed fan

#### Environmental and Mechanical Engineering Support Center

<http://env-webserver.ccm.cpqcorp.net/EMESC/default.htm>

#### Power Conservation 'Energy Saver'

Energy Star Compliant	Yes	Yes
APM 1.2 Support	No	No
Screen Blanking	Yes	Yes
Hard Disk 'Idle' Mode	Yes	Yes
System Idle Mode	Yes	Yes
Cache Memory Power-Down	No	No
Blue Angel Compliant (<5w in S5--Power Off)	Yes	Yes
Power Consumption in ES Mode - Suspend to RAM (S3) (Instantly Available PC)	~2W	~2W
Processor/Cache Memory Power-Down (S3)	Yes	Yes
CD-Rom Spins Down when not in use	Yes	Yes

## Standard Features – Base Unit Details

Supported Operating System	Microtower	Slim Tower
DOS	No	No
Windows 3.1	No	No
Windows 95	No	No
Windows 98	No	No
Windows NT 4.X	No	No
Windows 2000 / Windows XP Pro dual-install	No	No
Windows 2000	Yes	Yes
Windows XP Pro	Yes	Yes
Windows XP Home	Yes	Yes
Mandrake Linux 9.1.4 light	Yes	Yes

<b>Intelligent Manageability</b>		
Intelligent Manageability Home Page	<a href="http://h18000.www1.hp.com/im/">http://h18000.www1.hp.com/im/</a>	<a href="http://h18000.www1.hp.com/im/">http://h18000.www1.hp.com/im/</a>
Insight Management Agent	Yes (via web download)	Yes (via web download)
Plug and Play Ready	Yes	Yes
Windows 2000	Yes	Yes
Windows XP Pro	Yes	Yes
Windows XP Home	No	No
Mandrake Linux 9.1	No	No
<b>Boot Support</b>		
Local Diskette Boot	Yes	Yes
Network Boot	Yes (with PXE supported NICs)	Yes (with PXE supported NICs)

### Standard Features – Base Unit Details

ROM Features	Description	Microtower	Slim Tower
Instantly Available PC (Suspend to RAM - S3)	Allows for very low power consumption with quick resume time	Yes	Yes
ROM Based F10 Setup	Allows for reviewing and customizing BIOS settings	Yes	Yes
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human-readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM based F10 Setup	Yes	Yes
Remote System Installation via F12 (PXE)	Allows a new or existing system to boot over the network and download software, including the operating system, that is stored on a management server	Yes	Yes
Failsafe Boot Block ROM	-----	Yes	Yes
Emergency ROM Flash Recovery (BootBlock)	User is alerted with audible tones and keyboard LEDs only	Yes	Yes
CMOS Archive and CMOS Restore	By holding the power button down, allows the last known good BIOS settings (from previous restart) to be restored if the system gets into a locked up state after configuration changes are made	Yes	Yes
Save and Restore CMOS Setup via Diskette	-----	Yes	Yes
Auto Setup when New Hardware Installed	System automatically detects addition of new hardware (e.g. memory, floppy, etc.)	Yes	Yes
Serial, Parallel, USB Enable/Disable Port Control	Allows the user to enable or disable serial, parallel or USB ports	Yes	Yes
Removable Media Write / Boot Control	Prevents the computer from being booted from removable media on supported devices (and can disable writes to media)	Yes	Yes
Remote Boot from Server	Allows a new or existing system to boot over the network and download software, including the operating system, that is stored on a management server	Yes	Yes
Network Server Mode	Allows for secured keyboard-less operation on PS/2 devices	Yes	Yes
Power-On Password	Prevents an unauthorized person from booting up the computer	Yes	Yes
Setup Password	Prevents an unauthorized person from changing the system configuration	Yes	Yes
Memory Change Alert (Requires Insight Management Agent)	Alerts management console if memory is removed or changed	Yes	Yes
Thermal Alert (Requires Insight Management Agent)	<ul style="list-style-type: none"> <li>Monitors the temperature within the chassis.</li> <li>There are three operational states that a computer can experience:                             <ul style="list-style-type: none"> <li>NORMAL – operating under normal temperature ranges</li> <li>ALERTED - operation when excessive temperatures are detected. Will raise a flag so that appropriate action can be taken to avoid shutdown or provide for a smoother system shutdown</li> <li>SHUTDOWN – when excessive temperatures are encountered. Will automatically shutdown the computer without warning before hardware component damage occurs</li> </ul> </li> </ul>	Yes	Yes
Cover Removal Alert (Requires Insight Management Agent for network alerts)	<ul style="list-style-type: none"> <li>Assists with asset security and control by notifying the Network Administrator and end user when the cover has been removed without authorization.</li> <li>Is an electronic switch residing inside the computer which can be set to any one-of-three modes depending on the amount of control desired:                             <ul style="list-style-type: none"> <li>DISABLED - the user/network administrator does not want to be made aware of the computer hood removal</li> <li>NOTIFY USER – notifies user/network administrator that the hood has been removed, but no action required before re-booting the computer</li> <li>SETUP PASSWORD – notifies user/network administrator that the hood has been removed and administrator password is required before the computer will continue to boot</li> </ul> </li> </ul>	Yes	Yes

### Standard Features – Base Unit Details

ROM Features	Description	Microtower	Slim Tower
Master Boot Record Security	Allows for detection of changes to MBR and optional restoration, useful in protecting from viruses	Yes	Yes
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console	Yes	Yes
Power Management	-----	Yes	Yes
ACPI Ready	-----	Yes	Yes
SMBIOS (previously known as DMI)	System Management BIOS, previously known as DMI BIOS, for system management information	Yes	Yes
Keyboard-less Operation	The system can be operated without a keyboard	Yes	Yes
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console	Yes	Yes
Remote Wakeup / Remote Shutdown	<ul style="list-style-type: none"> <li>Allow a system administrator to power on, restart, and power off a client computer from a remote location.</li> <li>This enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM.</li> </ul>	Yes	Yes
ROM Based Setup (F10) and Start-up Diagnostics	-----	Yes	Yes
<b>System Environmental Specs</b>			
Acoustics: Advanced Power Management – On	Seated operator position	Idle (Hard drive spinning but not seeking) = 23 dBA	Idle (Hard drive spinning but not seeking) = 27 dBA
Shock			
Operating (*Using 11-ms half-sine shock pulse)	-----	5 G's* (with no damage being incurred)	5 G's* (with no damage being incurred)
Non-Operating (*Using 11-ms half-sine shock pulse)	-----	10 G's*, positive and negative directions front to back axis: 20 G's* in all other axes	10 G's*, positive and negative directions front to back axis: 20 G's* in all other axes
Vibration			
Operating	-----	Random vibration at 0.000215 G <sup>2</sup> /Hz, 10Hz to 300Hz, (0.25G's nominal)	Random vibration at 0.000215 G <sup>2</sup> /Hz, 10Hz to 300Hz, (0.25G's nominal)
Non-Operating	-----	Random vibration at 0.0005 G <sup>2</sup> /Hz, 10Hz to 500Hz, (0.5G's nominal)	Random vibration at 0.0005 G <sup>2</sup> /Hz, 10Hz to 500Hz, (0.5G's nominal)
Relative Humidity			
Operating (maximum wet bulb temp., non-condensing)	-----	10% to 90% relative humidity (Rh), 28°C	10% to 90% relative humidity (Rh), 28°C
Non-operating (maximum wet bulb temp., non-condensing)	-----	5% to 95% relative humidity (Rh), 38.7°C	5% to 95% relative humidity (Rh), 38.7°C
Altitude Max (un-pressurized)			
Operating (Maximum allowable altitude change rate is 1500 ft/min.)	-----	0 to 3,048 meters/ 10,000 feet – This value may be limited by the type and number of options installed.	0 to 3,048 meters/ 10,000 feet – This value may be limited by the type and number of options installed.
Non-operating (Maximum allowable altitude change rate is 1500 ft/min)	-----	0 to / 9,144 m/30,000 ft	0 to / 9,144 m/30,000 ft

### Standard Features – Base Unit Details

Initial Configuration and Deployment		Microtower	Slim Tower
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human-readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM based F10 Setup	Yes	Yes
Support Software CD	-----	Yes	Yes
HP Software Restore CD	Allows the computer to be restored to its original factory shipping image	Yes	Yes
Altiris eXpress Solutions (30-day trial version)	A suite of solutions that focus on business needs in four areas, saving time and freeing resources to address other crucial issues: <ul style="list-style-type: none"> <li>• Deployment &amp; Migration</li> <li>• Software &amp; Operations Management</li> <li>• Inventory &amp; Asset Management</li> <li>• Help Desk &amp; Problem Resolution</li> </ul>	<a href="http://h18000.www1.hp.com/im/">http://h18000.www1.hp.com/im/</a>	<a href="http://h18000.www1.hp.com/im/">http://h18000.www1.hp.com/im/</a>
Asset Tracking			
Asset Tracking and Security Home Page	-----	<a href="http://h18000.www1.hp.com/im/swdeploy/dt_nb.html">http://h18000.www1.hp.com/im/swdeploy/dt_nb.html</a>	<a href="http://h18000.www1.hp.com/im/swdeploy/dt_nb.html">http://h18000.www1.hp.com/im/swdeploy/dt_nb.html</a>
Asset Tag	<ul style="list-style-type: none"> <li>• Intended to be used as a repository for storing company-specific property asset numbers for easy tracking</li> <li>• Initially set equal to the system serial number</li> <li>• Stored in a protected section of non-volatile memory which can be accessed and modified with the F10 Setup program</li> </ul>	Yes	Yes
DIMM Serial Presence Detect	Detects whether or not memory DIMMs are present and their type	Yes	Yes
Hard drive serial number, model, and manufacturer	Hard drive manufacturer, model, and serial number is stored in the hard drive firmware and reported in ROM based F10 setup	Yes	Yes
Monitor serial number, model & manufacturer		Yes	Yes
System serial number, model, & manufacturer	System serial number, model, & manufacturer stored in a non-volatile memory and can be retrieved with management software or viewed in ROM based F10 setup	Yes	Yes
ROM revision levels	<ul style="list-style-type: none"> <li>• System ROM revision levels are identified by a version number (xx.yy) and reported in ROM based F10 Setup</li> <li>• Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information</li> </ul>	Yes	Yes
System board revision level	<ul style="list-style-type: none"> <li>• Allows management SW to read the revision level of the system board</li> <li>• Revision level is digitally encoded into the hardware and cannot be modified</li> </ul>	Yes	Yes
Memory Change Alert (Intelligent Manageability needed to work)	Alerts management console if memory is removed or changed	Yes	Yes
Ownership Tag	A user defined string stored in a non-volatile memory that is displayed on the BIOS splash screen	Yes	Yes

### Standard Features – Base Unit Details

Security Features of Chassis		Microtower	Slim Tower
Solenoid Hood Lock	-----	Yes	Yes
Hood Sensor	-----	Yes	Yes
Kensington Lock Support	-----	Yes	Yes
Cable Lock Provision	Allows the user to physically secure computer hardware from theft via a loop on the chassis. With lock installed, this loop also prevents the hood from being removed.	Yes	Yes
Serial, Parallel, USB Enable/Disable	Allows the user to enable or disable serial, parallel or USB ports and hide them from the operating system	Yes	Yes
Port Control	Device which attaches to back of chassis covering external ports and thereby preventing unauthorized access; also aids in cable management	Yes	Yes
Removable Media Write / Boot Control	Prevents the computer from being booted from removable media on supported devices (and can disable writes to media)	Yes	Yes
Power-On Password	Prevents an unauthorized person from booting up the computer	Yes	Yes
Setup Password	Prevents an unauthorized person from changing the system configuration	Yes	Yes
SmartCard Reader	Security device that prevents system access into the operating system unless the user has the appropriate Smartcard	Optional	Optional
<b>Fault Notification and Recovery</b>			
Fault Management Home Page	-----	<a href="http://h18000.www1.hp.com/im/">http://h18000.www1.hp.com/im/</a>	<a href="http://h18000.www1.hp.com/im/">http://h18000.www1.hp.com/im/</a>
SMART Hard Drives, Fault Notification, & Prefailure Warranty	<ul style="list-style-type: none"> <li>Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted</li> <li>Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count</li> <li>By helping users avoid actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure</li> </ul>	Yes	Yes
Surge Tolerant Full Ranging Power Supply	Withstands power surges up to 2000V	Yes	Yes
Ultra ATA Integrity Monitoring (CRC Checking)	<ul style="list-style-type: none"> <li>Provides data transfer verification.</li> <li>Provides proactive notification of hard drive data transmission problems and recommendations for enhancing system performance</li> <li>Detects all the following errors types:                             <ul style="list-style-type: none"> <li>single bit errors</li> <li>double bit errors</li> <li>an odd number of errors</li> <li>error bursts up to 32-bits long</li> </ul> </li> </ul>	Yes	Yes
ATA RAID Controller Option	-----	No	No
<b>System Software Updating</b>			
Support Software CD & website	-----	Yes	Yes

### Standard Features – Base Unit Details

Serviceability Features – System		Microtower	Slim Tower
Dual Color Power LED on Front of Computer	Indicates normal operations and fault conditions	Yes	Yes
Blinking Power LED Codes	Allows for easy problem resolution	Yes	Yes
Diagnostic LED Explanation Table	Number of 1-second blinks (red LED) Diagnosis – followed by a 2 second pause/ repeat: 2 = Processor Thermal Protection Activated 3 = Processor not installed 4 = Power Supply Failure 5 = Memory Error 6 = Video Error 7 = PCA failure (ROM detected failure prior to video) 8 = Invalid ROM, bootblock recover mode	Yes (Available at <a href="http://www.compaq.com/support/techpubs/illustrated_parts_map">http://www.compaq.com/support/techpubs/illustrated_parts_map</a> )	Yes (Available at <a href="http://www.compaq.com/support/techpubs/illustrated_parts_map">http://www.compaq.com/support/techpubs/illustrated_parts_map</a> )
Emergency ROM Flash Recovery	-----	Yes	Yes
Compaq Diagnostic for Windows Software	-----	Yes	Yes
Compaq Configuration Record Software	-----	Yes	Yes
Over-Temp Warning on Screen (Requires IM Agents)	-----	Yes	Yes
HP OS CD (Restore OS CD)	Allows the computer to be restored to its original factory shipping image	Yes	Yes
HP Restore CD (Restores Drivers CD)	Allows the computer to be restored to its original factory shipping image	Yes	Yes
Flash ROM	-----	Yes	Yes
3.3V Aux Power LED on System PCA	-----	Yes	Yes
Dual Function 5V Aux Power LED (ON) / PS_ON LED (OFF) on System PCA	-----	Yes	Yes
Diagnostic Power Switch LED on board	-----	Yes (On when power switch pushed)	Yes (On when power switch pushed)
Clear Password Jumper	-----	Yes	Yes
Clear CMOS Button		Yes	Yes
CMOS Battery Holder for easy Replacement	-----	Yes	Yes
Processor ZIP Socket for easy Upgrade	-----	Yes	Yes
DIMM Connectors for easy Upgrade	-----	Yes	Yes
NIC LEDs (integrated) (Green & Amber)	Used to determine NIC status	Yes (Green On = Network Activity; Amber On = 100Base-TX; Amber Off = 10Base-TX)	Yes (Green On = Network Activity; Amber On = 100Base-TX; Amber Off = 10Base-TX)

### Standard Features – Base Unit Details

Serviceability Features		Microtower	Slim Tower
Tool-less PCI Card Removal	-----	Yes	Yes
Tool-less AGP Card Removal	-----	Yes	Yes
Dual Color Power and Hard Drive LED	Indicates Normal Operations and Fault Conditions	Yes	Yes
Diagnostic LED Explanation Table	-----	Yes (Available at <a href="http://www.compaq.com/support/techpubs/illustrated_parts_map">http://www.compaq.com/support/techpubs/illustrated_parts_map</a> )	Yes (Available at <a href="http://www.compaq.com/support/techpubs/illustrated_parts_map">http://www.compaq.com/support/techpubs/illustrated_parts_map</a> )
Emergency ROM Flash Recovery	-----	Yes	Yes
Smart Cover Sensor (Requires Insight Management Agent for network alerts)	<ul style="list-style-type: none"> <li>Assists with asset security and control by notifying the Network Administrator and end user when the cover has been removed without authorization.</li> <li>Is an electronic switch residing inside the computer which can be set to any one-of-three modes depending on the amount of control desired: <ul style="list-style-type: none"> <li>DISABLED - the network administrator does not want to be made aware of the computer hood removal</li> <li>NOTIFY USER - notifies network administrator that the hood has been removed, but no administrator action required before re-booting the computer</li> <li>SETUP PASSWORD – notifies network administrator that the hood has been removed and administrator password is required before re-booting the computer</li> </ul> </li> </ul>	Yes	Yes
Solenoid Hood Lock	Remote operated system lock	Yes	Yes
Green Pull Tabs, and Quick Release Latches for easy Identification	-----	Yes	Yes
System memory can be upgraded without removing the system board or any internal components	Eases memory upgrading	Yes	Yes
Tool-less Hood Removal	Eases entry to the chassis without use of special tools	Yes (with captive thumbscrews)	Yes
Tool-less Hard Drive, CD & Diskette Removal	No special tools required for removal of devices in the 3.5" and 5.25" bays	Yes	Yes
Tool-less System Board Removal	No special tools required for system board removal	Yes	Yes
Industry-standard CD Bay	-----	Yes	Yes
<b>Serviceability Features – Hard Drives</b>			
Drive Self Tests (DPS)	<ul style="list-style-type: none"> <li>Drive Protection System</li> </ul>	Yes	Yes
DPS Access through F10 Setup during Boot	<ul style="list-style-type: none"> <li>A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user.</li> </ul>	Yes	Yes
DPS Access through Diagnostics for Windows	<ul style="list-style-type: none"> <li>Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard disk drive is the source of the problem and needs to be replaced.</li> <li>The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures</li> </ul>	Yes	Yes
SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	<ul style="list-style-type: none"> <li>Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted</li> <li>Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count</li> </ul>	Yes	Yes
SMART I - Drive Failure Prediction		Yes	Yes
SMART II - Off-Line Data Collection		Yes	Yes
SMART III - Off-Line Read Scanning with Defect Reallocation	<ul style="list-style-type: none"> <li>By helping users avoid actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure</li> </ul>	Yes	Yes



### Standard Features – Base Unit Details

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#### Service and Support

On-site Warranty and Service <sup>Note 1</sup>: This three-year (3-1-1), limited warranty and service offering delivers three years of parts and one year of both labor and on-site repair. Response time is next business-day <sup>Note 2</sup> and includes free telephone support <sup>Note 3</sup> 24 x 7. Global coverage <sup>Note 2</sup> ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering.

**NOTE 1:** Terms and conditions may vary by country. Certain restrictions and exclusions apply.

**NOTE 2:** On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

**NOTE 3:** Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

### After-Market Options

Communications	<i>Wireless</i>		Microtower	Slim Tower
	HP Wireless LAN 802.11b WL215 (WiFi) USB	191810-B22	✓	✓
	HP Wireless LAN 802.11b WL220 (WiFi) FH PCI	DC756B	✓	✓
	<b>Networking</b>			
	Intel Pro 1000 MT NIC FH PCI adapter	DC193A	✓	
	Broadcom NetXtreme Gigabit Ethernet NIC Full Height PCI	DC194A	✓	
	<b>Modem</b>			
	V.90 56K FH PCI Win Modem	239137-001 or DC131A#ABA	✓	✓
	V.92 56K USB Fax Modem	228141-001 or DE585A#ABA	✓	✓
<hr/>				
Graphics	<b>2D Single Head Graphics</b>			
	NVIDIA GeForce4 MX-440-8 64-MB DDR FH&LP 8X AGP VGA w/TV-out	DC663A	✓	✓
	NVIDIA GeForceFX 128-MB DDR FH&LP 8X AGP VGA w/TV-out	DK906A	✓	✓
	<b>2D Multi-Display Graphics</b>			
	NVIDIA Quadro4 100NVS 64-MB DDR FH&LP AGP dualhead with VGA cables	DC665A	✓	✓
	NVIDIA Quadro4 100NVS DVI connector cables (for use with DC665A)	DC157A	✓	✓
<hr/>				
Hard Drives & Controllers	<b>SMART III Ultra ATA/100 Hard Drives with Drive Protection System (DPS)</b>			
	40-GB 7200 rpm Ultra ATA/100 Hard Drive	201066-B21 DC180A	✓	✓
	80-GB 7200 rpm Ultra ATA/100 Hard Drive	250020-B21 DC181A	✓	✓
	160-GB 7200 rpm Ultra ATA/100 Hard Drive	DC189A	✓	✓
<hr/>				
Input/Output Devices	<b>Keyboards</b>			
	PS/2 Easy Access Keyboard	DC167B#ABA	✓	✓
	USB Easy Access Keyboard	DC168B#ABA	✓	✓
	USB Smartcard Keyboard	DC169B	✓	✓
	Wireless Easy Access Keyboard with wireless optical mouse	DC170B	✓	✓
	<b>Mice</b>			
	PS/2 2-Button Scroll Mouse	DD440B	✓	✓
<hr/>				
Memory (DIMMs)	<b>333-MHz (PC2700) DDR DIMMs Non-ECC</b>			
	128-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 128 DIMM)	DC338A	✓	✓
	256-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 256 DIMM)	DC339A	✓	✓
	512-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 512 DIMM)	DC340A	✓	✓
	<b>266-MHz (PC2100) DDR DIMMs Non-ECC</b>			
	128-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 128 DIMM)	282433-B21	✓	✓
	256-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 256 DIMM)	282434-B21 DC164A	✓	✓
	512-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 512 DIMM)	282435-B21 DC165A	✓	✓
	1-GB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 1024 DIMM)	282436-B21	✓	✓

### After-Market Options

			Microtower	Slim Tower
<b>Multimedia</b>	JBL Platinum Series Speakers (carbon)	DE893B		✓
	PC Comm Station Pro (speaker, headphone, wireless keyboard and mouse)	302002-008 P8815A	✓	✓
	PC Comm Station (speaker and headphone)	304251-008 P8814A	✓	✓
<b>Optical Drives</b>	<i>DVD-ROM Drives</i>			
	16X/40X DVD-ROM with +R Read Drive (carbonite)	DC151B	✓	✓
	<i>CD-ROM Drives</i>			
	48X Max CD-ROM Drive (carbonite)	DC143B	✓	✓
	<i>CD-RW Drives</i>			
	48X/24X/48X CD-RW Drive (carbonite)	DC196B	✓	✓
	<i>DVD+RW Drives</i>			
	4X DVD+R/+RW Drive	DC517B	✓	✓
	<i>Combo Drives</i>			
	48X/24X/48X/16X Combo Drive CD-RW & DVD-ROM (carbonite)	DC197B	✓	✓
<b>Removable Storage</b>	ZIP 250 Drive (carbonite)	DC140B	✓	✓
	ZIP 750 Drive (carbonite)	DC518B	✓	✓
	TR5 10/20 GB IDE Tape Drive (carbonite)	DC139B	✓	✓
<b>Security</b>	Chassis clamp lock, universal, with cable	DE818A	✓	✓
	Chassis clamp lock, universal, no cable	DE817A	✓	✓
	Solenoid Lock	252076-B21	✓	
	Solenoid Lock	DE472A		✓
	Rear Port Controller Cover	DE897A	✓	
	Rear Port Controller Cover	DE899A		✓
	Wall Mount Bracket and Security Sleeve	DK412A		✓
<b>PCI Card</b>	PCI to PCMCIA Universal adapter for 3.5inch bay	DC680B	✓	✓
	1394 Firewire PCI Card	DE471A	✓	✓
<b>USB Storage Options</b>	128-MB USB Drive Key (Carbonite) "New Disk-On-Key ID"	DC190B	✓	✓

### Memory

#### HP Business Desktop d325 Series

#### DDR SYNCH DRAM DIMM NON-ECC MEMORY

The HP business desktop d325 PC has two memory DIMM slots and supports dual channel memory configurations. It is not necessary to add memory in pairs or kits, but for best performance, memory should be added in pairs and should be the same type. For example, 2x128-MB memory modules will perform better on some applications than 1x256-MB memory module because of the dual channel memory support on the d325.

#### STANDARD MEMORY

Configurations can be selected with either a 128-MB, 256-MB, 512-MB, 1024-MB, or 2048-MB memory. Memory types supported include PC2100 (DDR266) and PC2700 (DDR333).

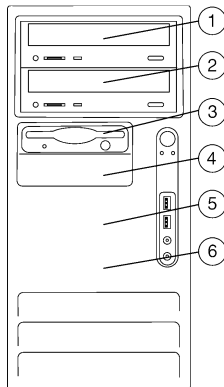
Various combinations of single-DIMM (for future upgradeability) and double-DIMM (for enhanced dual-channel memory performance) will be offered.

Other "mis-matched" memory combinations, such as 384MB (using 1x128-MB and 1x256-MB) will not be offered due to performance limitations of the d325. In these mis-matched configurations, the maximum operation speed is determined by slowest DIMM. After installing a mis-matched configuration, the following message will appear on the screen: "217 Memory DIMM Configuration Warning: Installed memory DIMM configuration is unbalanced. Multiple DIMMs installed of unequal size. For best performance, use a balanced DIMM configuration."

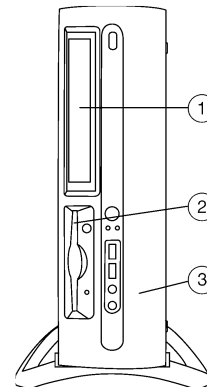
Memory Configuration	Slot 1	Slot 2
128-MB DDR266	128-MB	Empty
256-MB DDR266	128-MB	128-MB
256-MB DDR266	256-MB	Empty
128-MB DDR333	128-MB	Empty
256-MB DDR333	128-MB	128-MB
256-MB DDR333	256-MB	Empty
512-MB DDR333	256-MB	256-MB
512-MB DDR333	512-MB	Empty

**NOTE:** It is not necessary to add memory in pairs or kits. Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations.

## Storage



Microtower



Slim Tower

	Quantity Supported	Position Supported	Controller
<b>Microtower</b>			
Diskette Drive	1	3	Diskette
5.25" Storage Drive Bays	2	1, 2	IDE
3.5" Storage Drive Bays	3	4, 5, 6	IDE
<b>Slim Tower</b>			
Diskette Drive	1	2	Diskette
5.25" Storage Bays	1	1	IDE
3.5" Storage Bay	2	3	IDE

## Technical Specifications – Audio

Integrated ADI 1981A Audio	Type	Integrated	
	AC97 Stereo Codec	Yes	
	OPL3 FM Synthesis Support	Yes	
	Sound Blaster Compatibility	Yes	
	Audio Jacks	Mic-In (20-K ohm Input Impedance)	
		Line-In (12-K ohm Input Impedance)	
		Line-Out * (less than 800 ohms Output Impedance, expects at least a 10-K ohm load)	
		Headphone-Out (2.5 Ohms Output Impedance, expects at least a 32 ohm load)	
	<b>NOTE:</b> *Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally.		
	Sampling	7 kHz – 48 kHz	
Compression	ADPCM, ESPCM		
Wavetable Syntheses (software)	Yes		
3D Positional Sound	No		
Analog Audio	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)	
	Internal Audio Speaker Power Rating	3W	
	Internal Speaker	Yes	
	Internal Tuned Port Speaker	Yes	
	Hardware Equalizer for Internal Speaker	5 Band EQ	
	External Speaker Jack (Line-Out)	Yes	

### Technical Specifications – Communications

Integrated 3Com 3C920B-EMB Fast Ethernet Controller	<b>Manufacturer</b>	3Com		
	<b>Connector</b>	RJ-45		
	<b>Bus</b>	32-bit PCI		
	<b>Media</b>	10BASE-T/100BASE-TX		
	<b>Management capabilities</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, SOS alerting		
	<b>Configuration</b>	<b>Network transfer rate</b>	10BaseT (half-duplex) 10 Mbps 10BaseT (full-duplex) 20 Mbps 100BaseTX (half-duplex) 100 Mbps 100BaseTX (full-duplex) 200 Mbps	
		<b>Data interface</b>	PCI, 32-bit bus mastering	
		<b>I/O address</b>	Automatic I/O address	
		<b>Interrupt level</b>	Automatic IRQ setup	
		<b>Standards compliance</b>	PCI 2.2, PC'99, RWU	
		<b>Drivers</b>	Microsoft Windows Me, Microsoft Windows 2000, Microsoft Windows 9x, Microsoft Windows NT, Windows XP, Linux	
		<b>Remote wakeup</b>	Yes, PME	
		<b>Operating distance</b>	10BASE-T/100BASE-TX up to 100 meters (328 feet)	
		<b>Proactive alert technology</b>	No	
		<b>Environmental operating requirements</b>	<b>Temperature</b>	32° to 131° F (0° to 55° C)
			<b>Humidity (non-condensing)</b>	10% to 90%
			<b>Power management</b>	ACPI
			<b>Network management</b>	Any SNMP management medium including 3Com DynamicAccess® boot services, and 3Com DynamicAccess Managed PC Boot Agent
	<b>Power</b>		+ 3.3 V, 340 mA	
	<b>LED indicators</b>		100-Mbps link, 10-Mbps link, activity	
<b>Dimensions</b>	4.7 x 2.2 inches (12.0 x 5.6 cm)			

### Technical Specifications – Communications

Intel Pro 1000 MT NIC	<b>Connector</b>	RJ-45
	<b>Controller</b>	Intel 82540EM Gigabit Controller
	<b>Memory</b>	Integrated 96Kb frame buffer memory
	<b>Data rates supported</b>	10/100/1000 Mbps
	<b>Compliance</b>	IEEE 802.1A, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	<b>Bus architecture</b>	PCI 2.2
	<b>Data path width</b>	32-bit, 33/66 MHz bus interface
	<b>Data transfer mode</b>	Bus-master DMA
	<b>Hardware certifications</b>	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	<b>Power requirement</b>	5V_PCI with 4.75V to 5.25V operating range
	<b>Boot ROM support</b>	Yes
	<b>Network transfer rate</b>	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T, 1000 Mbps
	<b>Environmental</b>	Operating temperature 32° to 131°F (0° to 55° C) Operating humidity 85% at 131° F (55° C)
	<b>Dimensions</b>	4.7 x 4.7 x 0.8 inches (12.1 x 12.1 x 1.9 cm)
	<b>Operating system driver support</b>	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4
	<b>Management capabilities</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility



### Technical Specifications – Communications

Broadcom NetXtreme Gigabit Ethernet	<b>Connector</b>	RJ-45
	<b>Controller</b>	Broadcom 5782 PCI LAN Controller
	<b>Memory</b>	Integrated 96Kb frame buffer memory
	<b>Data rates supported</b>	10/100/1000 Mbps
	<b>Compliance</b>	IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	<b>Bus architecture</b>	PCI 2.2
	<b>Data path width</b>	32-bit, 33/66 MHz bus interface
	<b>Data transfer mode</b>	Bus-master DMA
	<b>Hardware certifications</b>	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	<b>Power requirement</b>	1.48 watts @ +3.3V AUX supply with 5V tolerance
	<b>Boot ROM support</b>	Yes
	<b>Network transfer rate</b>	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T, 1000 Mbps
	<b>Environmental</b>	Operating temperature 32° to 131°F (0° to 55° C) Operating humidity 85% at 131° F (55° C)
	<b>Dimensions</b>	4.7 x 2.0 x 0.08 inches (12 x 5 x 1.9 cm)
	<b>Operating system driver support</b>	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4
	<b>Management capabilities</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility
	<b>Alerting</b>	ASF 1.0

### Technical Specifications – Communications

Lucent V.90 56K PCI Win Modem	<b>Data Transmission</b>	V.90/K56flex technology speeds: 56,000 Kbps maximum downstream data, controllerless
	<b>NOTE:</b>	56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	<b>Data Speeds</b>	(Upload only) 33,600 / 31,200 / 28,800 / 26,400 / 21,600 / 19,200 / 16,800 / 14,400 / 12,000 / 9,600 / 7,200 / 4,800 / 2,400 / 1,200 / 300
	<b>Data Standards</b>	ITU V.90, ITU-T, V.34bis, V.22bis, V.22bis, V.21, V.23, Bell 212A, and Bell 103
	<b>Fax speeds</b>	14,400 / 12,000 / 9,600 / 7,200 / 4,800 / 2,400 / 1,200 / 300 b/s
	<b>Fax mode capabilities</b>	Group3 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2, Class 1
	<b>Error Correction and Data Compression</b>	V.44 (software upgradeable), 4.2bis, V.42 and MNP2-5
	<b>Power Management</b>	APM and ACPI states D0, D1, D2, and D3; meets PCI 2.2 requirements and PC'99 requirements
	<b>Upgradability</b>	Software driver upgradeable for v.92 and future enhancements
	<b>Video</b>	ITU-T V.80 video ready interface
	<b>Other</b>	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	<b>Operating temperature</b>	32° to 104° F/0° to 40° C
	<b>Operating humidity</b>	20% to 80%, non-condensing
	<b>Power</b>	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
	<b>Chipset</b>	Agere Systems 1648C (Mars 3.2)—Integrated PCI interface with 5-V tolerant buffers and CardBus support
	<b>Dimensions (L X H)</b>	Complies with PCI low profile specifications—6.7 x 2.3 inches (17.0 x 5.8 cm) and supports high- and low-profile brackets
	<b>Connection</b>	Dual, parallel RJ-11 support with auxiliary Tip/Ring connector
	<b>Other features</b>	Digital line protection, call progress monitoring via on-board piezo device, transformer-based DAA design, support for high profile and low profile brackets, PnP ID supports via external EEPROM
	<b>Safety</b>	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark)
	<b>EMC</b>	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	<b>Telecom</b>	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals
	<b>Health</b>	Bare PCB material compliant to 94V-0 or better (marked as such), Microsoft Windows Me health compliant
	<b>Other</b>	PC'99 compliant, PCI version 2.2, WHQL approved; support for ACPI revision 1.1,

### Technical Specifications – Graphics

Integrated NVIDIA GeForce4 MX 64-MB Graphics	<b>3D/2D Controller</b>	Integrated GeForce4 MX Graphics Processing Unit (GPU)		
	<b>VGA Controller</b>	Integrated		
	<b>Bus Type</b>	AGP8X for external graphics cards (Internal graphics is disabled if external AGP Graphics card is installed)		
	<b>RAMDAC</b>	Integrated 300-MHz DAC		
	<b>Memory</b>	Graphics memory is shared with system memory. Graphics memory usage can vary from 16 – 128MB depending on the amount of system memory installed and system BIOS settings.		
	<b>Memory (Shared)</b>	16-128MB DDR		
	<b>Memory Bandwidth (max Shared)</b>	5.3 GB/second		
	<b>Triangles/Second (Max)</b>	24 million		
	<b>Fill Rate (Max)</b>	760 Million texels/second		
	<b>Controller Clock Speed</b>	200 MHz		
	<b>Overlay Planes</b>	Support is fully compliant with Microsoft standard API such as Direct Draw and Direct Show.		
	<b>Max Color Depth</b>	32-bits/pixel		
	<b>Maximum Vertical Refresh Rate</b>	85 Hz at 1920x1200, 75Hz at 1920x1440, 60Hz at 2048x1536		
	<b>Multi-display Support</b>	"Yes. Two VGA ports integrated in system motherboard."		
<b>Operating Systems</b>		Microsoft Windows XP and Windows 2000		
<b>Graphics API Support</b>		Complete Microsoft DirectX® support, including DirectX 8.1; complete OpenGL® 1.3 support. Compatible with DirectX 9. NVIDIA Shading Rasterizer with 24 of 26 DX8 pixel shading functions and full set of OpenGL 1.3 pixel combiner operations in hardware.		
<b>Resolutions Supported</b>	<b>Resolution</b>	<b>Maximum Refresh Rate (Hz)</b>	<b>Resolution</b>	<b>Maximum Refresh Rate (Hz)</b>
	320 x 200	75	1280 x 1024	85
	320 x 240	75	1600 x 900	85
	400 x 300	75	1600 x 1200	85
	480 x 360	75	1920 x 1200	85
	512 x 384	75	1920 x 1440	75
	640 x 400	85	2048 x 1536	60
	640 x 480	85		
	800 x 600	85		
	1024 x 768	85		

### Technical Specifications – Graphics

NVIDIA GeForce4 MX 440 Graphics Controller	<b>3D/2D Controller</b>	NV18 128-bit Graphics Processing Unit (GPU)	
	<b>VGA Controller</b>	Integrated	
	<b>Bus Type</b>	AGP8X	
	<b>RAMDAC</b>	350-MHz DAC	
	<b>Memory</b>	64-MB 128-bit DDR frame buffer memory	
	<b>Controller Clock Speed</b>	275 MHz	
	<b>Overlay Planes</b>	1	
	<b>Stencil Planes</b>	8-bit	
	<b>Alpha Planes</b>	8-bit	
	<b>Z-buffer</b>	32-bit	
	<b>Total Bits/Pixel</b>	32-bits/pixel	
	<b>Maximum Vertical Refresh Rate</b>	75 Hz at 2048 x 1536	
	<b>Maximum Colors</b>	32-bit color	
	<b>Multi-display Support</b>	Includes support for one CRT and TV simultaneously (VGA and S-Video connectors)	
	<b>Operating Systems</b>	Microsoft Windows XP and Windows 2000	
	<b>Graphics API Support</b>	Complete Microsoft DirectX® support, including DirectX 8.1; complete OpenGL® 1.3 support	
<b>Resolutions Supported</b>	<b>Resolution</b>	<b>Maximum Refresh Rate (Hz)</b>	
	640 x 480	150	
	800 x 600	150	
	1024 x 768	120	
	1280 x 1024	100	
	1600 x 1200	85	
	1920 x 1080	75	
	1920 x 1200	75	
	1920 x 1440	75	

### Technical Specifications – Graphics

<b>NVIDIA Quadro4 100 NVS Graphics Controller</b>	<b>3D/2D Controller</b>	Integrated Quadro4 2D/3D 128-bit graphics processor unit (GPU)
	<b>VGA Controller</b>	Integrated into the Quadro4 GPU
	<b>Bus Type</b>	AGP 4x or PCI
	<b>RAMDAC</b>	Dual 350 MHz
	<b>Memory Speed and Type</b>	166MHz 8Mx16 DDR
	<b>Memory Amount</b>	64 MB
	<b>Texture Memory</b>	Unified with frame buffer
	<b>Form Factor</b>	ATX and SFF
	<b>Controller Clock Speed</b>	250 MHz
	<b>Color Planes</b>	32-bit color buffer
	<b>Overlay Planes</b>	1 16-bit Video overlay plane, software emulation for OpenGL overlay planes
	<b>Stencil Planes</b>	8-bit stencil buffer
	<b>Alpha Planes</b>	8-bit alpha buffer
	<b>Z-buffer</b>	24-bit
	<b>Total bits/pixel</b>	64
	<b>Maximum Vertical Refresh Rate</b>	120 MHz
	<b>Maximum Pixel Clock</b>	350 MHz
	<b>Dual Screen Support</b>	Yes, with nView
	<b>Single DVI Support</b>	Yes
	<b>Dual DVI Support</b>	Yes
	<b>Operating Systems</b>	Microsoft Windows XP, Microsoft Windows 2000
	<b>nView Hardware Architecture</b>	32-bit color 2048 x 1536 @ 60 Hz maximum resolution 2D rendering engine optimized for 32-, 24-, 16-, 15-, and 8-bpp modes
	<b>High-definition Video Processor (HDVP)</b>	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
<b>Resolution</b>	<b>Maximum Colors Supported</b>	<b>Maximum Refresh Rate</b>
640 x 480	16.7 M	120 Hz
800 x 600	16.7 M	120 Hz
1024 x 768	16.7 M	120 Hz
1152 x 864	16.7 M	120 Hz
1280 x 1024	16.7 M	120 Hz
1600 x 1200	64 K	100 Hz
1600 x 1200	16.7 M	85 Hz
1920 x 1080	64 K	100 Hz
1920 x 1080	16.7 M	75 Hz
1920 x 1200	64 K	85 Hz
1920 x 1200	16.7 M	70 Hz
1920 x 1440	64 K	75Hz
1920 x 1440	16.7M	60Hz
2048 x 1536	64 K	60Hz

### Technical Specifications – Hard Drives

7200 rpm SMART III Ultra ATA/100 Hard Drives 160-GB

<b>Capacity</b>	160,000 MB	
<b>Rotational Speed</b>	7200 rpm	
<b>Interface</b>	Ultra ATA/100	
<b>Height</b>	1 in/25.4 mm	
<b>Width</b>	3.5 in/88.9 mm	
<b>Transfer Rate Synchronous (Maximum)</b>	100 MB/s	
<b>Seek Time</b> (typical reads, including settling)	Single Track	1.2 ms
	Average	8 ms
	Full-Stroke	18 ms
<b>Physical Configuration</b>	Logical Blocks	157,278,240
<b>Operating Temperature</b>	41° to 131°F/5° to 55°C	

80-GB

<b>Capacity</b>	80,000 MB	
<b>Rotational Speed</b>	7200 rpm	
<b>Interface</b>	Ultra ATA/100	
<b>Height</b>	1 in/25.4 mm	
<b>Width</b>	3.5 in/88.9 mm	
<b>Transfer Rate Synchronous (Maximum)</b>	100 MB/s	
<b>Seek Time</b> (typical reads, including settling)	Single Track	1.2 ms
	Average	8 ms
	Full-Stroke	18 ms
<b>Physical Configuration</b>	Logical Blocks	157,278,240
<b>Operating Temperature</b>	41° to 131°F/5° to 55°C	

40-GB

<b>Capacity</b>	40,000 MB	
<b>Rotational Speed</b>	7200 rpm	
<b>Interface</b>	Ultra ATA/100	
<b>Height</b>	1 in/25.4 mm	
<b>Width</b>	3.5 in/88.9 mm	
<b>Transfer Rate Synchronous (Maximum)</b>	100 MB/s	
<b>Seek Time</b> (typical reads, including settling)	Single Track	1.2 ms
	Average	8 ms
	Full-Stroke	18 ms
<b>Physical Configuration</b>	Logical Blocks	78,165,360
<b>Operating Temperature</b>	41° to 131°F/5° to 55°C	

### Technical Specifications – Hard Drives

5400 rpm SMART III Ultra ATA/100 Hard Drives 80-GB

<b>Capacity</b>	80,000 MB	
<b>Rotational Speed</b>	5400 rpm	
<b>Interface</b>	Ultra ATA/100	
<b>Height</b>	1 in/25.4 mm	
<b>Width</b>	3.5 in/88.9 mm	
<b>Transfer Rate Synchronous (Maximum)</b>	100 MB/s	
<b>Seek Time (typical reads, including settling)</b>	Single Track	1.2 ms
	Average	8 ms
	Full-Stroke	18 ms
<b>Physical Configuration</b>	Logical Blocks	78,165,360
<b>Operating Temperature</b>	41° to 131°F/5° to 55°C	

40-GB

<b>Capacity</b>	40,000 MB	
<b>Rotational Speed</b>	5400 rpm	
<b>Interface</b>	Ultra ATA/100	
<b>Transfer Rate Synchronous (Maximum)</b>	66 MB/s	
<b>Height</b>	1 in/25.4 mm	
<b>Width</b>	3.5 in/88.9 mm	
<b>Seek Time (typical reads, including settling)</b>	Single Track	1.5 ms
	Average	10.5 ms
	Full-Stroke	23 ms
<b>Physical Configuration</b>	Logical Blocks	39,102,336
<b>Operating Temperature</b>	41° to 131°F/5° to 55°C	

### Technical Specifications – Input/Output Devices

USB Easy Access Smartcard Keyboard	Physical characteristics	<b>Keys</b>	104, 105, 106, 107, 109 layout (depending upon country) plus eight programmable keys for Internet, shortcuts, or multimedia
		<b>Form factor</b>	USB basic smartcard keyboard
		<b>Colors</b>	Carbon
		<b>Dimensions (H x W x D)</b>	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)
		<b>Weight</b>	2 lb (0.9 kg) minimum
Easy Access Keyboard (PS/2 or USB)	Dimensional	<b>Dimensions (HxWxD)</b>	1.4 x 18.3 x 6.3 in/36 x 465 x160 mm
		<b>Weight</b>	Approximately 2 lbs/0.9 kg
	Electrical	<b>Operating Voltage</b>	+5VDC ± 5%
		<b>Power Consumption</b>	50 mA maximum (with 3 LEDs on)
		<b>System Interface</b>	PS/2 mini-din connector
		<b>ESD</b>	CE level 4, 15 kV air discharge
		<b>EMI-RFI</b>	Conforms to FCC rules for a Class B computing device
	Mechanical	<b>PC98</b>	Functionally compliant
		<b>Languages</b>	30+ available
		<b>Keycaps</b>	Low-profile design
		<b>Switch Actuation</b>	55 g nominal peak force with tactile feedback
		<b>Switch Life</b>	20 million keystrokes (using Hasco modified tester)
		<b>Switch Type</b>	Contamination resistant membrane
		<b>Key Leveling Mechanism</b>	For all double wide and greater length keys
		<b>Cable Length</b>	6 ft/1.8 m
		<b>PC98-99</b>	Mechanically compliant
		<b>Acoustics</b>	50 dBA maximum sound pressure level
	Environmental	<b>Operating Temperature</b>	50° to 122° F/10° to 50° C
		<b>Non-operating Temperature</b>	-22° to 140° F/-30° to 60° C
		<b>Operating Humidity</b>	10% to 90% (non condensing at ambient)
<b>Non-operating Humidity</b>		20% to 80% (non condensing at ambient)	
<b>Operating Shock</b>		40 g, 6 surfaces	
<b>Non-operating Shock</b>		80 g, 6 surfaces	
<b>Operating Vibration</b>		2 g peak acceleration	
<b>Non-operating Vibration</b>		4 g peak acceleration	
Wireless/Optical Mouse	Dimensional	<b>Dimensions (H x L x W)</b>	1.76 x 5.11 x 2.92 in (44.7 x 130.0 x 74.2 mm)
		<b>Weight - Without Two AA Alkaline Batteries</b>	0.24 lb (110 g)
	System requirements	Microsoft Windows 2000 or XP	
		Available USB port for the receiver	
	Approvals	<b>Product Safety</b>	UL, CSA, TUV (Europe only), CE Mark
		<b>Ergonomics</b>	ANSI; ISO (Europe only); GS Mark (Germany only)
		<b>EMC</b>	FCC; CISPR; ACA, BSMI, MIC, VCCI
		<b>CE Mark</b>	EN 55022:1998; EN 55024
		<b>Design Guidelines for PCs</b>	PC 99 – connector overmold colors; PC 2001 – full functionality
		<b>Telecom</b>	All local telecom requirements and approvals for intended markets
<b>USA</b>		FCC Part 15 Equipment Certificate; CFR 47, Part 15; other local requirements	



### Technical Specifications – Input/Output Devices

<b>2-Button Scroll Mouse (PS/2 or USB)</b>	<b>Scroll Wheel</b>	8 mm	
	<b>Maximum Rotation Speed</b>	30 mm/s	
	<b>Switch Type</b>	Light force micro-switch	
	<b>Switch Life</b>	1 million operations	
	<b>Mechanical Life</b>	Minimum 200,000 revolutions	
	<b>Environmental</b>	Operating Temperature	50° to 122° F/10° to 50° C
		Non-operating Temperature	-22° to 140° F/-30° to 60° C
		Operating Humidity	10% to 90% (non condensing at ambient)
		Non-operating Humidity	20% to 80% (non condensing at ambient)
		Operating Shock	40 g, 6 surfaces
		Non-operating Shock	80 g, 6 surfaces
		Operating Vibration	2 g peak acceleration
		Non-operating Vibration	4 g peak acceleration
	<b>Electrical</b>	Operating Voltage	+5VDC ± 10%
		Power Consumption	15mA
		System Consumption	PS/2 mini-din connector
		ESD	CE level 4, 15 kV air discharge
		EMI-RFI	Conforms to FCC rules for a Class B computing device
		PC98	Functionally compliant
	<b>Mechanical</b>	Resolution	400 ± 20% DPI
Tracking Speed		10 in/s maximum	
Acceleration		100 in/s	
Switch Actuation		85 g nominal peak force	
Switch Life		1,000,000 operations (using Hasco modified tester)	
Cable Length		2 m	
PC98-99		Mechanically compliant	
<b>Regulatory Approvals</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick		
<b>USB Optical Scroll Mouse</b>	<b>Dimensions (H x L x W)</b>	1.5 x 4.5 x 2.5 in/3.8 x 11.6 x 6.3 cm	
	<b>Weight</b>	0.27 lb/0.12 kg	
	<b>Cable length</b>	72.8 in/185 cm	
	<b>System requirements</b>	IBM-compatible PC Microsoft® Windows® 95, 98, 2000, Me, and XP Available USB port	

### Technical Specifications – Optical Storage

<b>48X Max CD-ROM Drive</b>	<b>Interface</b>	ATAPI IDE
	<b>Data Buffer</b>	16.6 Mbps
	<b>Data Transfer Rate</b>	Sustained—150 Kbps minimum Variable (CD)—3,000 to 7,200 Kbps (audio)
	<b>Disk Rotation Technology</b>	CAV (Constant Angular Velocity)
	<b>Access Time (ms)</b>	Random: <100 ms Full-stroke seek: <150 ms
	<b>Average Access Time</b>	< 80 ms
	<b>Cache Buffer (standard/maximum)</b>	128 KB
	<b>Disk Formats Read</b>	Multi-session Photo CD, multi-read CD-ROM, CD text, audio CD, CD-I, CD-RW, CD-R, CD-Extra, CD-ROM XA
	<b>Disk Formats Written</b>	None
	<b>Disk Capacity (CD)</b>	650 MB
	<b>Block Size</b>	Mode 1—2,048 bytes Mode 2—2,340/2,336 bytes CD-DA—2,352 bytes CD-XA—2,328 bytes
	<b>Diameter</b>	12 cm; 8 cm
	<b>Thickness</b>	1.2 mm
	<b>Track Pitch</b>	1.6 μm
	<b>Audio Output Level</b>	Line-out—0.7 V @ 47 Kohm Headphone—0.6 V @ 32 ohm
	<b>Startup Time</b>	<7 seconds (typical); < 30 seconds with multi-session
	<b>Operating Conditions</b>	Temperature 41° to 113° F (5° to 45° C) Relative Humidity 10% to 80%
	<b>Dimensions (H x W x D, maximum)</b>	1.7 x 5.9 x 8.2 inches (4.3 x 15.0 x 20.8 cm)
	<b>Weight</b>	2.6 pounds (1200 g)
	<b>Operating Systems Supported</b>	Microsoft® Windows® NT 4.0, Microsoft Windows 2000, and Microsoft Windows XP.
	<b>MPEG Playback Graphics Solution Support</b>	None

### Technical Specifications – Optical Storage

48X/24X/48X CD-RW Drive	<b>Orientation</b>	Either horizontal or vertical	
	<b>Disc Loading Mechanism</b>	Half-height, tray load	
	<b>Interface Type</b>	ATAPI IDE	
	<b>Dimensions—external (W x H x D)</b>	7.99 x 5.88 x 1.71 in/203 x 149.5 x 43.5 mm	
	<b>Weight</b>	2.6 lb/1.2 kg	
	<b>Disc Diameter</b>	12 cm, 8 cm	
	<b>Disc Thickness</b>	1.2 mm	
	<b>Track Pitch</b>	1.6 $\mu$ m	
	<b>Disc Center Hole Diameter</b>	15 mm	
	<b>Reference Scanning Velocity</b>	1.2 m/s	
	<b>Recording/Playing Time</b>	80 minutes with CD-R media	
	<b>Read Only Disc Parameters</b>	<b>Formats and Modes Supported</b>	CD-ROM—Mode 1; CD-ROM XA—Mode 2 (forms 1 and 2); CD digital audio; CD Extra; CD-I—Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD
		<b>Capacity</b>	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
		<b>Block Size</b>	Mode 1—2,048 and 2,352 bytes; mode 2, form 1—2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2—2,328; 2,336; 2,340 and 2,352 bytes; CD-DA—2,352 and 2,368 bytes
	<b>Writeable Disc Parameters</b>	<b>Disc Type</b>	CD-R and CD-RW
		<b>Write Methods</b>	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
		<b>Format and Modes Supported</b>	CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD
		<b>Capacity</b>	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
		<b>Block Size</b>	Mode 1—2,048 bytes; mode 2, form 1—2,048 and 2,352 bytes; mode 2, form 2—2,352 bytes; CD-DA ---2,352 bytes
	<b>Access Times (typical)</b>	<b>Random</b>	< 120 ms
		<b>Full Stroke</b>	< 200 ms
	<b>Data Transfer Rates</b>	<b>Sustained</b>	CD-R write—1,800 KB/s (12X)
			CD-R write—2400 KB/s (16X)
			CD-RW write (1-4X media) —600 KB/s (4X)
			CD-RW write (4-10X media) —1,500 KB/s (10X)
			CD-RW write (4-12X media) —1,800 KB/s (12X)
		CD-RW read—3,600 KB/s (24X)	
	<b>Variable</b>	Digital audio extraction (minimum) —7,200 KB/s (48X)	
		CD-RW write—2,400 to 3,600 KB/s (16X to 24X)	
		CD-RW write—2,400 to 4,800 KB/s (16X to 32X)	
		CD-RW write—2,400 to 6,000 KB/s (16X to 40X)	
CD-RW write—2,400 to 7,200 KB/s (16X to 48X)			
CD-ROM, CD-R read—1,500 to 7,200 KB/s (10X to 48X)			

### Technical Specifications – Optical Storage

48X/24X/48X CD-RW Drive (continued)	<b>Data Transfer Modes</b>	ATA PIO mode 4 (16.7MB/s) ; ATA multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s) ;ATA UltraDMA mode 1 (24 MB/s) ; ATA UltraDMA mode 2 (33 MB/s) – default.		
	<b>Cache Buffer</b>	2 MB (minimum)		
	<b>Start-up Time (single)</b>	< 7 seconds typical		
	<b>Start-up Time (multi-session)</b>	< 30 seconds typical		
	<b>Stop Time</b>	< 4 seconds		
	<b>Power</b>	Source	Four-pin, DC power receptacle	
		DC power requirement	5 VDC $\pm$ 5%—100 mV ripple p-p	
			12 VDC $\pm$ 5%—200 mV ripple p-p	
		DC current	5 VCD	< 1A (typical) < 1200 mA (maximum)
			12 VCD	< 600 mA (typical) < 1.2A (maximum)
	Total Drive Power (Standby mode)	< 2.5 watt		
<b>Audio Output Level</b>	0.7 Vrms			
<b>Configuration Jumper Block</b>	Master, slave and cable select modes			
<b>Data Interface Connector</b>	50-pin IDE interface			
<b>Environmental</b> (all conditions, non-condensing)	Temperature (operating)	Operating 41° to 122° F (5° to 50° C)		
	Relative Humidity (operating)	10% to 85%		
	Maximum Wet Bulb Temperature (operating)	84° F (29° C)		

### Technical Specifications – Optical Storage

16X/40X DVD-ROM with +R Read Drive	<b>Height</b>	5.25-in, half-height		
	<b>Interface Type</b>	ATAPI		
	<b>Dimensions– External, Excluding Bezel (W x H)</b>	5.88 x 1.71 in (149.5 x 43.5 mm)		
	<b>Disc Diameter</b>	12 cm, 8 cm		
	<b>Disc Thickness</b>	1.2 mm		
	<b>Track Pitch</b>	1.6 µm (CD), 0.74 µm (DVD)		
	<b>Disc Center Hole Diameter</b>	15 mm		
	<b>Disc Formats</b>	DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW		
	<b>Disc Capacity</b>	DVD-ROM	4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7 GB (DVD+R)	
		CD-ROM	540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm)	
	<b>Block Size (bytes)</b>	DVD-ROM – 2048; CD-ROM Mode 0 – 2352; CD-ROM Mode 1 – 2352, 2340, 2336, 2048; CD-ROM Mode 2 – 2352, 2340, 2336, 2048		
	<b>Access Times (typical reads, including settling)</b>	DVD-ROM Single Layer	< 120 ms	
		CD-ROM Mode 1	< 90 ms	
		Full Stroke DVD	< 240 ms (seek)	
		Full Stroke CD	< 160 ms (seek)	
	<b>Data Transfer Rates</b>	2600 – 6000 KB/s (40X CAV CD-ROM mode)		
		8100 – 21,600 KB/s (16X CAV DVD-ROM mode)		
	<b>Data Transfer Modes</b>	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)		
	<b>Power</b>	Source	Four-pin, DC power receptacle	
		DC Power Requirement	5 VDC ± 5% – 100 mV ripple p-p	
			12 VDC ± 5% – 200 mV ripple p-p	
	DC Current	5 VDC – <800 mA typical, < 1000 mA maximum 12 VDC – < 870 mA typical		
	<b>Audio Output Level</b>	0.7 Vrms (typical)		
<b>Configuration Jumper Block</b>	Master, slave, and cable select modes			
<b>Data Interface Connector</b>	40-pin, shrouded and keyed, flat ribbon			
<b>Environmental (all conditions non-condensing)</b>	Temperature (operating)	41° to 122° F (5° to 50° C)		
	Relative Humidity (operating)	10% to 85%		
	Maximum Wet Bulb	86° F (30° C)		
	Temperature (operating)			
<b>Certifications, Approvals</b>	MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, SEMKO, NEMKO, DEMKO, FIMKO, EN 60825-1, UL 60950, and CSA C22.2 60950-2000.			
<b>Operating Systems Supported</b>	Microsoft Windows NT, Microsoft Windows 2000, and Microsoft Windows XP.			

### Technical Specifications – Optical Storage

<b>48X Combo CD-RW/DVD-ROM</b>	5.25-inch, half-height, tray-load	
	<b>Color</b>	Carbonite
	<b>Orientation</b>	Either horizontal or vertical
	<b>Interface Type</b>	ATAPI
	<b>Dimensions (W x H x D)</b>	5.77 x 1.71 x 7.36 in (146.5 x 43.5 x 187 mm) (external, excluding bezel)
	<b>Disc Diameter</b>	12 cm, 8 cm
	<b>Disc Thickness</b>	0.05 in (1.2 mm)
	<b>Track Pitch</b>	1.6 um (CD), 0.74 um (DVD)
	<b>Disc Center Hole Diameter</b>	0.6 in (15 mm)
	<b>Reference Scanning Velocity</b>	1.2 m/s (CD); 3.49 m/s (DVD SL); 3.84 m/s (DVD DL)
<b>Read Only Disc Parameters</b>	<b>Formats and Modes Supported</b>	CD-ROM—Mode 1; CD-ROM XA—Mode 2 (forms 1 and 2); CD-Bridge; CD digital audio; CD Extra; CD-I—Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD; DVD (single- and double-layer); DVD-R; DVD-RW; DVD-RW Multi-Border; DVD+R; DVD+R Multi-Session , and DVD+RW
	<b>Capacity</b>	180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm); 4.7 GB (DVD-5); 8.54 GB (DVD-9); 9.4 GB (DVD-10)
	<b>Block Size</b>	Mode 1—2,048 and 2,352 bytes; mode 2, form 1—2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2—2,328; 2,336; 2,340 and 2,352 bytes; CD-DA—2,352 bytes; DVD—2,048 bytes
<b>Writeable Disc Parameters</b>	<b>Disc Type</b>	CD-R and CD-RW
	<b>Write Methods</b>	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
	<b>Format and Modes Supported</b>	CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD; CD-Bridge; Video CD
	<b>Capacity</b>	180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (mode 2, 12 cm);
	<b>Block Size</b>	CD-DA—2,352 bytes; mode 0— 2,336 and 2,352 bytes; mode 1—2,048 and 2,352 bytes; mode 2—2,336 and 2,352; mode 2, form 1— 2,048 and 2,352 bytes; mode 2, form 2—2,324 and 2,352 bytes
<b>Access Times</b> (typical reads, including settling)	<b>Random DVD</b>	< 140 ms (typical)
	<b>Random CD</b>	< 125 ms, (typical)
	<b>Full Stroke DVD</b>	< 250 ms (seek)
	<b>Full Stroke CD</b>	< 210 ms (seek)
<b>Maximum Data Transfer Rates</b>	<b>CD-R write</b>	7200 KB/s (48X) Max
	<b>CD-RW write</b>	1500 KB/s (10X) Max
	<b>CD-ROM, CD-R, CD-RW read</b>	7200 KB/s (48X) Max
	<b>DVD ROM read</b>	21,632 KB/s (16X) Max

### Technical Specifications – Optical Storage

<b>48X Combo CD-RW/DVD-ROM</b> (continued)	<b>Data Transfer Modes</b>	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s); ATA UltraDMA mode 1 (24 MB/s), mode 2 (33 MB/s); ATA UltraDMA Mode 3 44 Mbytes/s (default)
	<b>Cache Buffer</b>	2 MB (minimum)
	<b>Startup Time (single)</b>	< 7 seconds (typical)
	<b>Startup Time (multi-session)</b>	< 30 seconds (typical)
	<b>Stop Time</b>	< 4 seconds
<b>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
	<b>DC Power Requirement</b>	5 VDC $\pm$ 5%—100 mV ripple p-p
		12 VDC $\pm$ 5%—200 mV ripple p-p
	<b>DC Current</b>	5 VDC (< 1000 mA typical, < 1600 mA maximum)
		12 VDC (< 600 mA typical, < 1400 mA maximum)
<b>Total Drive Power (standby mode)</b>	< 2.5 Watt	
<b>Audio Output Level</b>	0.7 Vrms (typical)	
<b>Configuration Jumper Block</b>	Master, slave, and cable select modes	
<b>Data Interface Connector</b>	40-pin, shrouded and keyed, flat ribbon	
<b>Environmental</b> (all conditions non-condensing)	<b>Temperature (operating)</b>	41° to 122° F (5° to 50° C)
	<b>Relative humidity (operating)</b>	10% to 90%
	<b>Maximum wet bulb temperature (operating)</b>	86° F (30° C)
<b>Certifications, Requirements</b>	MPC-3 compliant, multi-read requirements, ACA AS/NZS 3548, ANSI C63.4-1992, ATAPI Spec SFF-8020, ATA Spec X3T9.2, CB Bulletin No. 92A, CSA C22.2 No. 950-1995, C.I.S.P.R. Pub 22, EMKO-TSE 207/94, TUV or VDE EN60 950, EN60825-1, Microsoft PC2001 certification, Microsoft Logo for Windows XP, 2000, and NT4	
<b>Operating Systems Supported</b>	Microsoft Windows 2000, Windows XP Professional, Windows XP Home	

### Technical Specifications – Optical Storage

<b>4X DVD+R/+RW Drive</b>	<b>Recording Method</b>	Disc-at-once, Track-at-once, and Session-at-once; Variable Packet and Fixed Packet		
	<b>Interface</b>	ATAPI ATA/ATAPI-5 and SFF-8090 Version 5		
	<b>Disc Recording Capacity</b>	4.7 GB		
	<b>Write Support</b>	DVD+R, DVD+RW, CD-R, CD-RW		
	<b>Read Support</b>	DVD-ROM (single- and dual-layer), DVD+R, DVD+RW, DVD-R, DVD-RW, CD-ROM Mode 1, CD-ROM XA (Mode 2, forms 1 and 2), CD TEXT, Photo CD single- and multi-session), CD-DA (Audio CD), CD-Extra, CD-R, CD-RW (supports AM2)		
	<b>Write Speed</b>	<b>DVD+R</b>	4X CLV (5400 KB/s)	
		<b>DVD+RW</b>	2.4X CLV (3250 KB/s)	
		<b>CD-R</b>	16X CLV (2400 KB/s)	
		<b>CD-RW</b>	10X CLV (1500 KB/s)	
	<b>Read Speed</b>	<b>DVD-ROM (single)</b>	12X CAV (6750 - 16200 KB/s)	
		<b>DVD-ROM (dual)</b>	7X CAV (4050 - 9450 KB/s)	
		<b>DVD+R, DVD+RW, DVD-R, DVD-RW</b>	5X CAV (2700 - 6750 KB/s)	
		<b>CD-ROM, CD-R</b>	40X CAV (2550 to 6000 KB/s)	
		<b>CD-RW</b>	32X CAV (1950 to 4800 KB/s)	
		<b>CD-Audio</b>	32X CAV (1950 to 4800 KB/s)	
	<b>Data Buffer</b>	<b>Read</b>	2 MB	
		<b>Write</b>	2 MB	
	<b>Access Time (random average)</b>	DVD-ROM — 140 ms CD-ROM — 125 ms (CD-ROM Mode 1 disc are used)		
	<b>Data Transfer Rates</b>	2400 Kbytes/sec. (maximum) to CD-R media 1500 Kbytes/sec. (maximum) to CD-RW media		
	<b>System Configuration</b>	Intel Pentium III Processor or later with 128 MB of memory (required); 256 MB recommended 2-D or 3-D graphics cards on primary disk drive for operating system and application software; second disk drive for audio and video data		
	<b>Operating Systems Support</b>	Microsoft Windows 2000, Windows XP Professional, Windows XP Home		
	<b>Mounting Orientation</b>	Horizontal and vertical		
	<b>Power Requirement</b>	5 V, +12 V (1.6A, 1.4A)		
<b>Size</b>	8.0 x 5.9 x 1.7 in (20.3 x 15.0 x 4.4 cm)			
<b>Front Panel Features</b>	Disc loading tray, forced eject hole read/write indicator, eject button			
<b>Rear Panel Features</b>	ATAPI interface, digital audio output 1, analog audio output, device configuration jumper, DC input DC Power Connector, 4 pin; Line Out Connector, 4 pin; IDE Bus Connector, 40 pin; Configuration Jumper Pins; Label to identify each connector			
<b>Regulatory Approvals</b>	UL, CSA, CB Report, FIMKO, SEMKO, FCC Class B, FDA, CE Marking, C-Tick, CISPR-229, Korean EMC, Taiwan EMC			



### Technical Specifications – Removable Storage

1.44-MB Diskette Drive	<b>LED Indicators</b> (front panel)	3.5 in.
	<b>Read/Write Capacity per diskette</b> (high/low density)	Green
	<b>Drive Supported</b>	1.44 MB/720 KB
	<b>Drive Height</b>	One
	<b>Drive Rotation</b>	One-third
	<b>Transfer Rate</b> (high/low)	300 rpm
	<b>Bytes/Sector</b>	500/250 Kb/s
	<b>Sectors/Track</b> (high/low)	512
	<b>Tracks/Side</b> (high/low)	18/9
	<b>Access Times</b>	80/80
		Track-to-Track (high/low)
	Average (high/low)	169/94 ms
	Settling Time	15 ms
	Latency Average	100 ms

USB Drive Key	<b>Dimensions</b> (HxWxD)	0.9 x 0.6 x 3.2 inches(2.3 x 1.5 x 8.2 cm)
	<b>Weight</b>	0.05 pounds (0.02 kg)
	<b>USB Specification</b>	1.1
	<b>Transfer Rate</b>	Read-1023 KB/Sec; Write-850 KB/Sec
	<b>Storage Media</b>	Solid state flash memory, no moving parts
	<b>Power Supply</b>	USB Bus-powered, no external power required
	<b>Capacity</b>	64MB and 128MB

Zip 250 Drive	<b>Interface</b>	ATAPI IDE	
	<b>Media format supported</b>	Zip disk	
	<b>Media capacity</b>	250 MB	
	<b>Access time</b>	29 ms (average)	
	<b>Drive rotational speed</b>	2,941 rpm	
	<b>Size</b>	Fits into a 5.25-inch bay (with bracket)	
	<b>Data transfer rate</b>	Maximum sustained	2.4 Mbps
			1.4 Mbps
			1.4 Mbps (100 MB), 2.4 MB/s (250 MB)
			0.3 Mbps (100 MB), 2.4 MB/s (250 MB)
<b>Operating conditions</b>	Temperature	50° to 125° F (10° to 51.5° C)	
	Humidity	20% to 80%	
	<b>Compatible operating system</b>	Microsoft Windows 2000 and Windows NT 4.0	

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