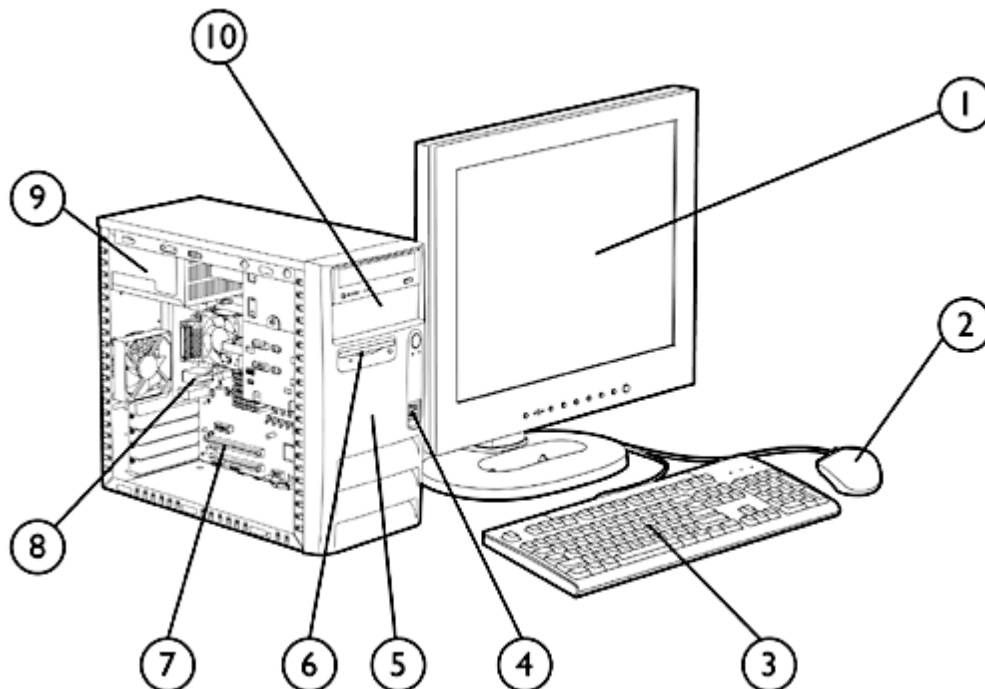


### Overview

**HP recommends  
Windows Vista™ Business**

#### Microtower

14.49 x 6.89 x 15.75 in (368 x 175 x 400 mm – H x W x D)



1. Monitor (sold separately)

2. 2-Button Scroll Mouse

3. HP Standard Keyboard

4. Front I/O – 2 USB 2.0 ports & Mic-in, Headset

5. 2 internal 3.5" bays (2nd HDD expandable via 2nd HDD bracket option)

6. One external 3.5" bay for optional diskette drive or other 3.5" device

7. 2 full-height PCI 2.3 slots, 1 PCI-Ex1 slot for dx2060  
2 full-height PCI2 .3 slots, 1 PCI-Ex1, 1 PCI-Ex16 for dx2180

8. 4 USB 2.0 ports, 1 serial port, 1 parallel port, 2 PS/2, 1 RJ-45, 1 VGA, 1 audio in, 1 audio out, 1 MIC

9. 230-watt max power supply

10. 2 external 5.25" bays for optional optical drives

### Overview

#### At A Glance

- Intel® Pentium® 4 and Celeron® D LGA775 processors
  - Choice of operating systems:
    - Genuine Windows XP 32-bit Home – Cost Reduced (China Only)
    - Genuine Windows XP 32-bit Professional – Cost Reduced (China Only)
    - Genuine Windows XP 32-bit Home SP2
    - Genuine Windows XP 32-bit Professional SP2
    - FreeDos
  - Intel 915GV Express chipset for dx2060, 915G Express chipset for dx2180
  - Intel Integrated Graphic Media Accelerator 900
  - PCI Express I/O bus
  - Integrated 10/100 Network Connection
  - Integrated SATA/150 controller for Serial ATA Hard Drives
  - Integrated Ultra ATA/100 controller for choice of optical drives
  - Single or Dual channel DDR2 SDRAM system memory
  - Integrated audio
  - Energy Star /CCEC compliant with energy-saving features
  - Protected by HP Services, including a 1-1-1 or 3-1-1 standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.
  - Choice of PCI-Ex16 Graphics cards for dx2180
- 

#### What's New

- Intel 915GV chipset ( dx2060 – 915GV)
  - Intel 915G chipset (dx2180 – 915G)
  - Choice of operating systems:
    - Genuine Windows XP 32-bit Home - Cost Reduced (China Only)
    - Genuine Windows XP 32-bit Professional - Cost Reduced (China Only)
    - Genuine Windows XP 32-bit Home SP2
    - Genuine Windows XP 32-bit Professional SP2
  - Integrated 10/100 Network Connection
  - PC2-4200 (533MHz) DDR2 SDRAM
  - Single or Dual Channel memory configurations
  - System ROHS/CCEC compliance
-

### Available Technology and Features

#### Processors (EM64T)

##### Intel Celeron D Processors:

Intel Celeron D 326 Processor (2.53-GHz, 256K L2 cache, 533-MHz FSB)  
Intel Celeron D 331 Processor (2.66-GHz, 256KB L2 cache, 533-MHz FSB)  
Intel Celeron D 336 Processor (2.80-GHz, 256KB L2 cache, 533-MHz FSB)  
Intel Celeron D 341 Processor (2.93-GHz, 256KB L2 cache, 533-MHz FSB)  
Intel Celeron D 346 Processor (3.06-GHz, 256KB L2 cache, 533-MHz FSB)  
Intel Celeron D 351 Processor (3.20-GHz, 256KB L2 cache, 533-MHz FSB)

##### Intel Pentium 4 Processors:

506 – 2.66-GHz, 1-MB L2 cache, 533-MHz FSB  
516 – 2.93-GHz, 1-MB L2 cache, 533-MHz FSB  
519K – 3.06-GHz, 1-MB L2 cache, 533-MHz FSB

##### Intel Pentium 4 Processors supporting Hyper-Threading Technology:

521– 2.80-GHz, 1-MB L2 cache, 800-MHz FSB  
531– 3.0-GHz, 1-MB L2 cache, 800-MHz FSB  
541– 3.20-GHz, 1-MB L2 cache, 800-MHz FSB  
551– 3.40-GHz, 1-MB L2 cache, 800-MHz FSB  
630 – 3.00-GHz, 2-MB L2 cache, 800-MHz FSB  
640 – 3.20-GHz, 2-MB L2 cache, 800-MHz FSB  
650 – 3.40-GHz, 2-MB L2 cache, 800-MHz FSB

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#### Operating Systems and Application Software

FreeDos  
Genuine Windows XP Home SP2  
Genuine Windows XP Professional SP2  
Genuine Windows XP Home SP2 – Cost Reduced (China Only)  
Genuine Windows XP Professional SP2 – Cost Reduced (China Only)  
Microsoft Office 2003 Basic (India and SEAT Only)  
Microsoft Office 2003 Small Business (India and SEAT Only)  
Microsoft Office 2003 Professional (India and SEAT Only)  
Adobe Acrobat Reader  
Norton Anti-Virus 2005  
Raxio Cineplayer  
Dantz Restrospect Express 7 (Drop in Box)  
Lightscribe driver (Drop in Box)  
Roxio DigitalMedia Plus (Drop in Box)  
Roxio DigitalMedia Plus (Non – DVD playback) (Drop in Box)  
Redhat Linux (Drop in Box – India)  
SCO Unix (For China Only)  
Altiris Local Recovery  
Sun Java Runtime Environment

### Available Technology and Features

#### Hard Drives

40-GB Serial ATA 1.5-Gb/s Hard drive (7200 rpm)

80-GB Serial ATA 3.0-Gb/s Hard drive (7200 rpm)

160-GB Serial ATA 3.0-Gb/s Hard drive (7200 rpm)

250-GB Serial ATA 3.0-Gb/s Hard drive (7200 rpm)

**NOTE:** The Serial ATA interfaces in the HP Compaq dx2060/dx2180 Microtower support data transfer rates up to 1.5 Gb/s.

#### System Memory – Single Channel Configurations

256-MB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (1 x 256-MB)

512-MB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (1 x 512-MB)

1-GB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (1 x 1-GB)

#### System Memory - Dual Channel Configurations

512-MB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (2 x 256-MB)

1-GB DDR2 SDRAM PC2-4200 (533-MHz) Non-ECC (2 x 512-MB)

2-GB DDR SDRAM PC2-4200 (533-MHz) Non-ECC (2 x 1-GB)

**NOTE:** For best performance, memory speeds and sizes should not be mixed. See memory section for more information.

#### Removable Storage

1.44MB diskette drive

512MB USB HP Drive Key II (USB 2.0)

#### Optical Storage

48X CD-ROM drive

52X CD-ROM drive

48X/32X/48X CD-RW drive

16X/48X DVD-ROM drive

48X/32X Combo CD-RW/DVD-ROM Drive

16X DVD+/-RW Lightscribe Drive (Double Layer/Dual Format)

#### Keyboard

HP PS/2 Standard Keyboard

HP USB Standard Keyboard

#### Mouse

HP PS/2 2-Button scroll mouse

HP USB 2-Button scroll mouse

HP USB 2-Button optical scroll mouse

#### Audio

Realtek ALC653 2-channel audio

3D audio compliant with AC'97 rev. 2.3

### *Available Technology and Features*

**Communication**

Integrated Realtek 8100C 10/100 Network Connection  
Broadcom Netxtreme Gigabit Ethernet PCI Express x1 Adapter  
Agere 56K PCI Soft Modem

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**Graphics**

Intel integrated GMA900 (integrated with the 915GV/915G chipset) – dx2060/dx2180  
nVidia Geforce 6200 TC 64MB w/DVI-I, VGA, TVout PClex16 – dx2180  
nVidia Geforce 6600 128MB w/DVI-I, VGA, TVout PClex16 – dx2180  
ATI Radeon x300SE 128MB PClex16 – dx2180

### System Details

#### Base Unit

- uATX microtower chassis, including power supply and front bezel; featuring five (5) drive bays (2nd HDD via additional bracket) and four PCI expansion slots (Chassis structure from back)
- Microsoft or Linux operating system CD (Varies depending upon countries)
- Active type heatsink
- 90 x 90 x 25mm chassis fan
- Motherboard with Intel 915GV/915G chipset, Realtek 10/100 integrated network interface, integrated graphics and audio, 2 PCI slots, 1 PCI Express x1 slot, 2 DDR2 DIMM memory slots (1 additional PCI Express x 16 for dx2180)
- (1) IDE data cable – (3) headed; supports two Optical drives
- (1/2) SATA data cables – Base on required HDD qty
- Product documentation on CD
- HP system restore CD
- Power cord

<b>Slots</b>	PCI 2.3	Two (2) full-height slots on PCA
	Memory Expansion	Two (2) DIMM slots (2.0GB maximum memory support)
	PClex1	One (1) PClex1 slots on PCA
	PClex16	One (1) PClex1 slots on PCA (dx2180 only)

<b>Bays</b>	Internal	Two (2) 3.50" half-height (default -1, 2nd HDD expansion available as option)
	External	Two (2) 5.25" half-height One (1) 3.50" half-height

<b>USB Support</b>	EHCI high-speed USB 2.0 controller Two (2) front ports; Four (4) rear ports
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<b>Interfaces (Legacy)</b>	One (1) parallel port One (1) serial port One (1) PS/2 keyboard port One (1) PS/2 mouse port One (1) analog VGA video port One (1) line in; one (1) line out; one (1) mic in One (1) RJ45 network port
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<b>Weight &amp; Dimensions</b>	Chassis Dimensions	14.49 x 6.89 x 15.75 in (368 x 175 x 400 mm) (H x W x D)
	Packaged Dimensions	21.85 x 19.72 x 15.83 in (555 x 501 x 402 mm) (L x W x H)
	System Weight	18.48 lb (8.4 kg)
	Shipping Weight	26.62 lb (12.1 kg)

### System Details

<b>Supported Technology &amp; Features</b>	Memory Type	<ul style="list-style-type: none"> <li>• PC2-4200 DDR2 SDRAM (533MHz) non-ECC</li> <li>• Single or dual channel configurations</li> <li>• 2.0GB maximum system memory</li> </ul>
	Hard Drive Interfaces Supported	<ul style="list-style-type: none"> <li>• Serial ATA 1.5-Gb/s and 3.0-Gb/s hard drives are supported</li> <li>• 915GV/915G chipset limits throughput to 1.5 Gb/s</li> </ul>

<b>Intel Pentium 4 Processor without HT Technology</b>	Coprocessor	Integrated
	CPU Socket Type/Number	Socket T LGA775 socket
	CPU Package	LGA775
	Front Side Bus Speed	533-MHz
	Cache Memory	1-MB L2 Advanced Transfer Cache (500 Series)

<b>Intel Pentium 4 Processor with HT Technology</b>	Coprocessor	Integrated
	CPU Socket Type/Number	Socket T LGA775 socket
	CPU Package	LGA 775
	Front Side Bus Speed	800-MHz
	Cache Memory	1-MB L2 Advanced Transfer Cache (500 Series) 2-MB L2 Advanced Transfer Cache (600 Series)

<b>Intel Celeron D CPU</b>	Coprocessor	Integrated
	CPU Socket Type/Number	Socket T LGA775 socket
	CPU Package	LGA 775
	Front Side Bus Speed	533-MHz
	Cache Memory	256-KB L2 Advanced Transfer Cache

<b>Chassis</b>	Front Panel	<ul style="list-style-type: none"> <li>• Power button</li> <li>• Power On LED</li> <li>• HDD Activity LED</li> </ul>
	Cooling Solutions Supported	<ul style="list-style-type: none"> <li>• Power Supply Fan (with speed control)</li> <li>• Active heat sink (variable speed)</li> <li>• Chassis fan (variable speed)</li> </ul>
	Slots Supported	Two (2) full-height, half-length PCI slots One (1) PCIe1 Slot One (1) PCIe16 slot (dx2180 only)
	Front I/O	Two (2) USB 2.0 ports
	Rear I/O	Standard uATX I/O connectors, including four (4) USB 2.0 ports
	Drive Bays	<ul style="list-style-type: none"> <li>• Two (2) 5-1/4" external</li> <li>• One (1) 3-1/2" external</li> <li>• Two (2) 3-1/2" internal (2nd expansion via option)</li> </ul>
	Other	Hook for Padlock

### System Details

- |              |   |
|--------------|---|
| Power Supply | <ul style="list-style-type: none"><li>• 230 watt ATX Power Supply – PFC with 230V only/<br/>non-PCF with a 115v/230v line switch (varies by country/region)</li></ul> |
|--------------|---|

### Unit Environment and Operating Conditions

#### General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

Temperature Range	Operating Temperature: 50° to 95° F (10° to 35° C) Non-operating Temperature: -22° to 140° F( -30° to 60° C)
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Relative Humidity	Operating Humidity 10% to 90% (non condensing at ambient) Non-operating Humidity 5% to 95% (non condensing at ambient)
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Maximum Altitude (unpressurized)	Operating: 8,000 ft (2500 m) Non-operating: 30,000 ft (9000 m)
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**NOTE:** Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

### Motherboard

#### Socket mPGA478B industry standard uATX form factor

- |                             |  |
|-----------------------------|--|
| Processor                   | <ul style="list-style-type: none"><li>• Socket T; LGA 775</li><li>• Support single Intel Pentium 4/Celeron 800/533MHz FSB processors</li></ul>                     |
| PWM                         | <ul style="list-style-type: none"><li>• ON 3 phase power solution</li><li>• Meet Intel FMB 04A spec</li></ul>  |
| Chipset                     | <ul style="list-style-type: none"><li>• Intel 915GV Express</li><li>• Intel ICH6</li></ul>   |
| Super I/O                   | <ul style="list-style-type: none"><li>• ITE IT8712</li></ul>   |
| Front Side Bus<br>Frequency | <ul style="list-style-type: none"><li>• 533/800-MHz</li></ul>  |
| Memory                      | <ul style="list-style-type: none"><li>• 2 x DIMM sockets</li><li>• Support single and dual channel</li><li>• PC2-4200 DDR2 SDRAM</li></ul>                         |
| Clock Generator             | <ul style="list-style-type: none"><li>• IDT CK410/ICS954119</li></ul>  |
| Integrated Graphics         | <ul style="list-style-type: none"><li>• Intel GMA900 (integrated on the 915GV/915G chipset)</li></ul>  |
| Audio                       | <ul style="list-style-type: none"><li>• Realtek ALC653 2 channel audio</li><li>• 3D audio compliant with AC'97 rev. 2.3</li></ul>                                  |
| LAN                         | <ul style="list-style-type: none"><li>• Realtek 8100C 10/100 LAN</li></ul>   |
| IDE                         | <ul style="list-style-type: none"><li>• Support all PIO modes</li><li>• 1xIDE port support up to 2 Optical devices</li><li>• Support Ultra ATA 33/66/100</li></ul> |

### System Details

Expansion Slots	<ul style="list-style-type: none"><li>• 2 x PCI 2.3 slots</li><li>• 1 - PCIe1 slot</li><li>• 1 - PCIe16 slot (dx2180 only)</li></ul>
BIOS	<ul style="list-style-type: none"><li>• 4Mbit flash EEPROM</li><li>• Award BIOS, PnP, ACPI, SMBIOS 2.4, Boot Block, DMI</li></ul>
Manageability	<ul style="list-style-type: none"><li>• WfM 2.0, DMI 2.0, SMBus</li></ul>
Industrial Standard	<ul style="list-style-type: none"><li>• PCI 2.3 compliant</li><li>• USB 2.0</li></ul>
Rear Side I/O Ports	<ul style="list-style-type: none"><li>• 1 x PS/2 keyboard port</li><li>• 1 x PS/2 mouse port</li><li>• 4 x USB 2.0 ports</li><li>• 1 x RJ-45 10/100 port</li><li>• 1 x serial port</li><li>• 1 x parallel port</li><li>• 1 x DB 15 pin analog VGA port</li><li>• 3 x audio ports</li></ul>
On Board I/O Interfaces	<ul style="list-style-type: none"><li>• 1 x ATX power connector</li><li>• 1x+12V power connector</li><li>• 1 x Floppy connector</li><li>• 1 x Front panel connector, Switch, LED (Power/HDD)</li><li>• 2 x Fan headers for CPU, chassis, with voltage/fan speed control</li><li>• 1 x ATAPI headers-CD IN</li><li>• 1 x header to support 2 USB 2.0 ports at front side</li><li>• 1 x IDE connector (Optical drive)</li><li>• 2 x SATA connectors</li><li>• 1 x audio header ( mic in/audio out)</li></ul>
Board Size	<ul style="list-style-type: none"><li>• uATX form factor, PCB size: 9.6 x 9.0 in</li><li>• 4-layer PCB with green color</li></ul>
Additional Features	<ul style="list-style-type: none"><li>• Keyboard/mouse/USB/Lan wake up</li><li>• Support S1, S3, S4 and S5</li><li>• ACPI status</li><li>• Hardware monitor capability</li><li>• CPU fan speed control</li></ul>

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### Power Supply

- ATX Power Supply – Passive PFC at 230V only/non-PFC with a 115v/230V line switch
- Passive Power Factor Correction (PFC) – with voltage set to 230V
- 50-60 Hz rated line frequency
- 230 watt maximum rated power

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### Power Conservation 'Energy Saver'

- Energy Star compliant
- APM 1.2 support
- Screen blanking
- Hard drive 'Idle' mode
- System Idle mode
- CCEC - China Only (<3 w in S5 – power off)
- <4 watt power consumption in ES mode – suspend to RAM (S3) (instantly available PC)
- Processor/Cache memory power-down (S3)

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### System Environmental

- Values are subject to change without notification and are for reference only.

### System Details

<b>Specs</b>	<ul style="list-style-type: none"> <li>Performance of system, options, and ancillary equipment will vary depending on the system configuration.</li> <li>Levels presented do not account for non-HP/Compaq installed hardware.</li> </ul>	
<b>Ambient Air Temperature</b>	<b>Operating</b>	10° to 35°C at sea level with an altitude de-rating of 1.0°C per every 1000 ft (300 m) above sea level to a maximum of 8,000 ft (2500m), no direct sustained sunlight. Maximum rate of change is 25°C/Hr. The upper limit may be limited by the type and number of options installed.
	<b>Storage</b>	-30° to 60°C – Maximum rate of change: 210°C/Hr.
<b>Humidity</b>	<b>Operating</b>	10% to 90% relative humidity (Rh), 30°C maximum wet bulb temperature, non-condensing
	<b>Storage</b>	10% to 95% relative humidity (Rh), 38.7°C maximum wet bulb temperature, non-condensing
<b>Altitude</b>	<b>Operating</b>	0 to 8,000 feet (0 to 2438.4 meters) – This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1,000 ft/min (304.8 m/min).
	<b>Non-Operating</b>	0 to 30,000 feet (0 to 9,144 meters) – Maximum allowable altitude change rate is 1200 ft/min (365.76 m/min).
<b>Shock</b>	Listed are the levels of shock the product can withstand with NO damage being incurred. The values represent peak input acceleration during an 2~3 ms half-sine shock pulse	
	<b>Non-Operating</b>	35G's (Half-sine Shock) 35G's (Trapezoidal Shock)
<b>Vibration</b>	Listed are the levels of vibration the product can withstand with NO damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range.	
	<b>Operating</b>	Random vibration at 5Hz@0.00025G <sup>2</sup> /Hz, 10Hz@0.01 G <sup>2</sup> /Hz, 100Hz@0.01G <sup>2</sup> /Hz, 300Hz@0.00001G <sup>2</sup> /Hz 5Hz to 300Hz, (0.25 G's nominal).
	<b>Non-Operating</b>	Random vibration at 0.008G <sup>2</sup> /Hz, 10Hz to 500Hz, (2 Grms nominal).

### System Details

#### Acoustic Noise

Listed are the declared A-WEIGHTED SOUND POWER LEVELS (LWAd) and declared average desktop seated operator position A-WEIGHTED SOUND PRESSURE LEVELS (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).

**IDLE** (Fixed disk drive spinning) LWAd = 4.3 Bels (goal), <4.5 Bels (must)  
Desktop Average LpAm = 32 dBA (goals)  
Desktop Average LpAm < 35 dBA (must)

**FIXED DISK** (Random write) LWAd = 5.5 Bels,  
Desktop Average LpAm = 40 dBA

**CD-ROM** (Sequential Reads) LWAd = 5.5 Bels,  
Deskside Average LpAm = 44 dBA

#### Service and Support

On-site Warranty<sup>1</sup>: This 1-1-1 or 3-1-1 limited warranty delivers on-site, next business-day<sup>2</sup> service for parts and labor and includes free telephone support<sup>3</sup> Global coverage<sup>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. One-year onsite and labor are not available in all countries.

**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 Compaq and third-party HP-qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

### After-Market Options

<b>Communication</b>	<b>Modems</b>	
	Agere PCI Hi-Speed 56K International SoftModem	EK694AA
	<b>Wireless Network Interface Cards</b>	
	Wireless A+G PCI Adapter – WW except Americas	PZ928AA
	<b>Network Interface Cards</b>	
	Broadcom NetXtreme Gigabit Ethernet PCI Express x1	EA833AA
	Intel Pro/1000 PT Gb Ethernet PCI Adapter	EH352AA
<hr/>		
<b>Hard Disk Drives</b>	80-GB 7200 rpm SATA 3.0Gb/s Hard Drive	PY276AA
	160-GB 7200 rpm SATA 3.0Gb/s Hard Drive	PY277AA
	250-GB 7200 rpm SATA 3.0Gb/s Hard Drive	PY278AA
<hr/>		
<b>Removable Storage Devices</b>	<b>Diskette Drive</b>	
	1.44 MB Diskette Drive (external)	DC141B
	<b>USB Drive Keys</b>	
	512-MB HP Drive Key II (USB 2.0)	ED516AA
	256-MB HP Drive Key II (USB 2.0)	PH657R
<hr/>		
<b>Input Devices</b>	<b>Keyboards</b>	
	HP PS/2 Standard Keyboard	DT527A#xxx
	HPUSB Standard Keyboard	DT528A#xxx
	<b>Mice</b>	
	HP PS/2 2-Button Scroll Mouse	DD440B
	HP USB scroll Mouse	DD441B
	HP USB 2-Button Optical Scroll Mouse	DC172B
<hr/>		
<b>Memory</b>	<b>PC4200 (533MHz) DDR2 SDRAM non-ECC</b>	
	256-MB DDR2 SDRAM PC4200 (533-MHz) non-ECC	PV558AA
	512-MB DDR2 SDRAM PC4200 (533-MHz) non-ECC	PV560AA
	1- GB DDR2 SDRAM PC4200 (533-MHz) non-ECC	PV557AA
<hr/>		
<b>Audio</b>	HP Satellite Speakers	ZD929AA#xxx
<hr/>		
<b>Optical Drives</b>	48X Max CD-ROM Drive	DC143B
	52X Max CD-ROM (APJ)	AG041AA
	48X/32X/48X CD-RW Drive	DL975B
	48X/32X Combo Drive CD-RW & DVD-ROM	DL976B
	16X/48X DVD-ROM Drive	PR596A
	16X DVD+/-RW Drive Lightscribe Drive (Dual Format, Double Layer Format)	PR595A

### After-Market Options

#### Monitors

##### CRTs

HP s5502 15" (13.8" vis) CRT Monitor	PQ560AA#XXX
HP s7540 17" (16.0" vis) CRT Monitor	PF997AA#XXX
HP v7650 17" (16.0" vis) Flat-face CRT Monitor	PF996AA#XXX

##### TFTs

HP L1506 15" TFT Flat Panel Monitor – Analog only	PX848AA#XXX
HP L1706 17" TFT Flat Panel Monitor – Analog only	PX849AA#XXX
HP L1740 17" TFT Flat Panel Display – Analog/Digital	PL766AA#XXX
HP L1755 17" TFT Flat Panel Display – Analog/Digital	PL777AA#XXX
HP L1906 19" TFT Flat Panel Display – Analog only	PX850AA#XXX
HP L1940T 19" TFT Flat Panel Display – Analog/Digital	EM869AA#XXX
HP L1955 19" TFT Flat Panel Display – Analog/Digital	PD974AA#XXX
HP L2065 20" TFT Flat Panel Display – Analog/Digital	EF227A4#XXX
HP LP2465 24" TFT Widescreen Flat Panel Display – Analog/Digital	EF224A4#XXX

##### GSA Monitors

HP L717g 17" GSA Flat Panel Monitor	EE191AA#XXX
HP L919g 19" GSA Flat Panel Monitor	EE192AA#XXX

##### Options

HP Flat Panel Speaker Bar	EE418AA
HP CRT Monitor Multimedia Base	PM552AA

### Memory

#### 915GV/915G chipset

#### DDR2 SYNCH DRAM NON-ECC MEMORY

The Intel 915GV/915G Express chipset supports non-ECC DDR2 PC2-4200 (533-MHz) memory. 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.

#### MAXIMUM MEMORY (MICROTOWER)

Supports up to 2-GB of DDR2 SYNCH DRAM.

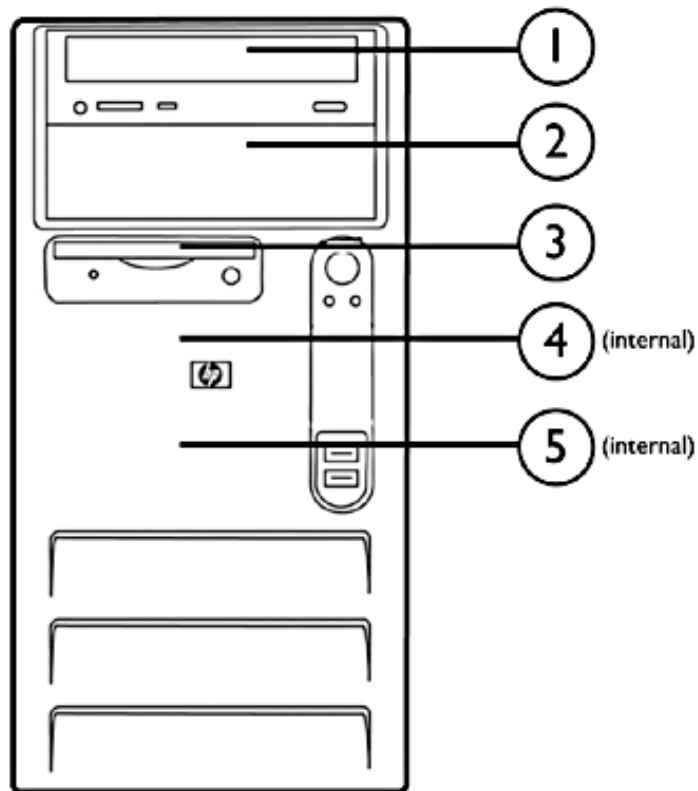
#### POSSIBLE MEMORY CONFIGURATIONS (MICROTOWER)

NOT ALL MEMORY CONFIGURATIONS POSSIBLE ARE REPRESENTED BELOW.

DIMM Size	Slot	
	Channel A	Channel B
	1	2
256-MB	128-MB *	128-MB *
512-MB	512-MB	
512-MB	256-MB *	256-MB *
1-GB	512-MB	512-MB
1-GB	1-GB	
2-GB	1-GB	1-GB

\* HP recommends dual channel configurations for maximum performance

### Storage



### HP Compaq Business Desktop dx2060/dx2180

	Maximum Quantity Supported	Position Supported	Controller
<b>Drive Support</b>			
Diskette Drives	1	3	ICH6
CD-ROM Drives	2	1, 2	IDE ATAPI
DVD-ROM Drives	2	1, 2	IDE ATAPI
CD-RW/Combo Drives	2	1, 2	IDE ATAPI
DVD+/-RW Drives	2	1, 2	IDE ATAPI
3.5" Serial ATA Hard Drives	2	4,5	SATA

### Technical Specifications - Audio

**Integrated Realtek  
ALC653 Audio**

<b>Type</b>	Integrated
<b>AC '97 Stereo Codec</b>	Yes
<b>Sampling</b>	Supports 48 KHz
<b>Power Support</b>	Digital: 3.3V Analog: 5V
<b>Other</b>	Meets performance requirements for audio on PC99/2001 systems High quality differential CD input

**NOTE:** External Speakers need to be powered externally.

### Technical Specifications - Communications

<b>Agere 56K PCI Modem</b>	<b>Data Transmission</b>	56,000 Kbps maximum downstream data <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-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	<b>Fax Speeds</b>	14,400/12,000/9,600/7,200/4,800/2,400/300 b/s
	<b>Fax Mode Capabilities</b>	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	<b>Error Correction and Data Compression</b>	V.44, 42bis, V.42 and MNP2-5
	<b>Power Management</b>	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	<b>Upgradeability</b>	Driver upgradeable for 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 158° F (0° to 70° C)
	<b>Operating Humidity</b>	20% to 90%, 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 SV92PL – 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 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
	<b>Connection</b>	Single RJ-11 connector
	<b>Other Features</b>	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
	<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 Not available in Korea or the Republic of South Africa.
	<b>Health</b>	Bare PCB material compliant to 94V-0 or better (marked as such)
	<b>Other</b>	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

### Technical Specifications - Communications

<b>Kit Contents</b>	DC132D : Agere Systems PCI International Softmodem with full-height bracket attached, additional low-profile bracket, RJ11 modem cable, driver and documentation CD. <b>NOTE:</b> RJ11 modem adapter is not included. DC131C #xxx: RJ11 modem adapter kit for use with DC132D #ACP: Austria, #ABW: Belgium (Dutch/Flemish), #AKN: Bosnia, Herzegovna, Croatia, Slovenia, Yugoslavia (Slovenian), #AKB: Czech Republic (Czech) & Slovakia, #ABF: France, #ABD: Germany, #AB7: Greece, #AKC: Hungary, #ABT: Israel, #ABZ: Italy, #ABH: Netherlands, #UUW: Nordic Region, #ACB: Russia, #ACQ: South Africa, #ACD: Switzerland, #AB8: Turkey, #ABU: UK, #ABG: Australia, New Zealand, #ACJ: India.
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<b>Broadcom NetXtreme Gigabit Ethernet PCI Express x1 Adapter</b>	<b>Connector</b>	RJ-45
	<b>Controller</b>	Broadcom 5751 PCI-Express LAN Controller
	<b>Memory</b>	Integrated 96Kb frame buffer memory
	<b>Data rates supported</b>	10/100/1000 Mbps
	<b>Compliance</b>	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	<b>Bus architecture</b>	PCI-E
	<b>Data path width</b>	Single channel, PCI-E
	<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>	3.1 watts @ +3.3V AUX supply with 5V tolerance
	<b>Boot ROM support</b>	Yes
	<b>Network transfer mode</b>	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	<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 (full-duplex) 2000 Mbps
	<b>Environmental</b>	<b>Operating temperature</b> 32° to 131°F (0° to 55° C) <b>Operating humidity</b> 85% at 131° F (55° C)
<b>Dimensions</b>	4.4 x 2.2 x 0.08 in (11.2 x 5.5 x 2 cm)	
<b>Management capabilities</b>	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility	
<b>Alerting</b>	N/A	
<b>Kit contents</b>	Broadcom 5751, CD, Broadcom NetXtreme Gigabit Ethernet PCI-E Adapter, drivers, quick install guide, product warranty statement	

### Technical Specifications - Graphics

<b>Integrated Intel GMA900</b>	<b>3D/2D Controller</b>	Support is fully compliant with Microsoft standard API such as Direct Draw, GDI/GDI+ and Direct Show
	<b>VGA Controller</b>	Integrated
	<b>Bus Type</b>	none
	<b>RAMDAC</b>	Integrated 400-MHz DAC
	<b>Memory</b>	Graphics memory is shared with system memory. Graphics memory usage can vary from 8 – 128MB depending on the amount of system memory installed and system load. 16MB is pre-allocated for graphics use at system boot time. Additional memory is allocated for graphics using Intel's Dynamic Video Memory Technology (DVMT) to balance the optimum amount of memory between graphics and other system use. With a 128MB system, graphics memory usage will be 8MB – 32MB depending on system load. With 256MB or more, graphics memory usage will be 8MB – 128MB depending on system load.
	<b>Controller Clock Speed</b>	333 MHz
	<b>Overlay Planes</b>	Single Overlay support with 5x3 filtering
	<b>Maximum Color Depth</b>	32-bits/pixel
	<b>Maximum Vertical Refresh Rate</b>	85 Hz at 2048 x 1536. Varies with mode and configuration. See table below.
	<b>Multi-display Support</b>	Dual independent display
	<b>Graphics/Video API Support</b>	Microsoft DirectX®9, DirectXVA®, VMR9, GDI/GDI+; OpenGL® 1.4

Resolutions Supported <sup>1</sup>	Resolution	Maximum Refresh Rate (Hz)	
		Analog Monitor (HP 7500)	Digital Monitor
		640 x 480	85
800 x 600	85	70	
1024 x 768	85	70	
1152 x 864	85	70	
1280 x 768	60	70	
1280 x 960	85	70	
1280 x 1024	85	70	
1600 x 900	60	70	
1600 x 1200	85	60	
1920 x 1080	60	–	
1920 x 1200	60	–	
1920 x 1440	75	–	
2048 x 1536	75	–	

<sup>1</sup> Modes listed are supported with a single active display. The supported mode list for multiple active displays is a subset of this list. Not all modes will support video playback and some supported modes may use software MC (motion compensation) rather than hardware MC. Not all modes will support 3D acceleration depending on the system configuration (e.g., resolution selected, size of frame buffer, number of installed memory modules, etc.).

**NOTE:** Other resolutions and refresh rates may be selectable but are not recommended.

### Technical Specifications - Input/Output Devices

<b>HP PS/2 or USB Standard Keyboard</b>	<b>Physical characteristics</b>	<b>Keys</b>	104, 105, 106, 107, 109 layout (depending upon country)
		<b>Dimensions (L x W x H)</b>	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		<b>Weight</b>	2 lb (0.9 kg) minimum
	<b>Electrical</b>	<b>Operating voltage</b>	+ 5VDC $\pm$ 5%
		<b>Power consumption</b>	50-mA maximum (with three LEDs ON)
		<b>ESD</b>	CE level 4, 15-kV air discharge
		<b>EMI - RFI</b>	Conforms to FCC rules for a Class B computing device
	<b>Mechanical</b>	<b>MicrosoftPC 99 - 2001</b>	Functionally compliant
		<b>Languages</b>	38 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 switch membrane
		<b>Key-leveling mechanisms</b>	For all double-wide and greater-length keys
		<b>Cable length</b>	6 ft (1.8 m)
		<b>Microsoft PC 99 - 2001</b>	Mechanically compliant
	<b>Environmental</b>	<b>Acoustics</b>	43-dBA maximum sound pressure level
		<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, six surfaces
		<b>Non-operating shock</b>	80 g, six surfaces
		<b>Operating vibration</b>	2-g peak acceleration
		<b>Non-operating vibration</b>	4-g peak acceleration
		<b>Drop (out of box)</b>	26 in (66 cm) on carpet, six-drop sequence
		<b>Drop (in box)</b>	42 in (107 cm) on concrete, 16-drop sequence
	<b>Approvals</b>	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	<b>Ergonomic compliance</b>	ANSI HFS 100, ISO 9241-4, and TUVGS	

### Technical Specifications - Input/Output Devices

<b>HP 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>	<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	
		<b>Electrical</b>	<b>Operating Voltage</b>	+ 5VDC ± 10%
			<b>Power Consumption</b>	15mA
	<b>System Consumption</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			
<b>Mechanical</b>	<b>PC98</b>		Functionally compliant	
	<b>Resolution</b>	400 ± 20% DPI		
	<b>Tracking Speed</b>	10 in/s maximum		
	<b>Acceleration</b>	100 in/s		
	<b>Switch Actuation</b>	85 g nominal peak force		
	<b>Switch Life</b>	1,000,000 operations (using Hasco modified tester)		
	<b>Cable Length</b>	2 m		
<b>Regulatory Approvals</b>	<b>PC98-99</b>	Mechanically compliant		
		UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick		

### Technical Specifications - Hard Drives

#### Serial ATA Hard Drives 40 GB (7200 rpm)

<b>Capacity</b>	40,020,664,320 bytes	
<b>Height</b>	1 in (2.6 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>	1.5 Gb/s	
<b>Buffer</b>	2 MB	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.0 ms
	<b>Average</b>	8.5 ms
	<b>Full-Stroke</b>	18.0 ms
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	78,165,360	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

#### 80 GB\*

<b>Capacity</b>	80,026,361,856 bytes	
<b>Height</b>	1 in (2.6 cm)	
<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>	Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>	1.5 Gb/s	
<b>Buffer</b>	8 MB	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.0 ms
	<b>Average</b>	8.5 ms
	<b>Full-Stroke</b>	18.0 ms
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	156,301,488	
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	

### Technical Specifications - Hard Drives

<b>160 GB*</b>	<b>Capacity</b>	160,041,885,696 bytes	
	<b>Height</b>	1 in (2.6 cm)	
	<b>Width</b>	Media diameter: 3.5 in (8.9.x cm) Physical size: 4 in (10.2 cm)	
	<b>Interface</b>	Serial ATA	
	<b>Synchronous Transfer Rate (Maximum)</b>	1.5 Gb/s	
	<b>Buffer</b>	8 MB	
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.0 ms
		<b>Average</b>	8.5 ms
		<b>Full-Stroke</b>	18 ms
	<b>Rotational Speed</b>	7,200 rpm	
	<b>Logical Blocks</b>	312,581,808	
	<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)	
	<b>250 GB*</b>	<b>Capacity</b>	250,059,350,016 bytes
<b>Height</b>		1 in (2.6 cm)	
<b>Width</b>		Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
<b>Interface</b>		Serial ATA	
<b>Synchronous Transfer Rate (Maximum)</b>		3.0 Gb/s	
<b>Buffer</b>		8 MB	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)		<b>Single Track</b>	0.8 ms
		<b>Average</b>	<9.0 ms
		<b>Full-Stroke</b>	<17 ms
<b>Rotational Speed</b>		7,200 rpm	
<b>Logical Blocks</b>		488,397,168	
<b>Operating Temperature</b>		41° to 131°F (5° to 55°C)	

**NOTE:** \* Although this drive is rated for a 3.0-Gb/s transfer rate, the Serial ATA interfaces in the HP Compaq dx2060/dx2180 Microtower support data transfer rates up to 1.5 Gb/s.

### Technical Specifications - Optical Storage

<b>48X CD-ROM Drive</b>	<b>Interface</b>	ATAPI		
	<b>Data Transfer Rate</b>	Variable (Audio CD) - 1,800 to 3,600 KB/s (24X) Max	Variable (CD-ROM, CD-R)-2,400 to 7,200 KB/s (48x) Max	
	<b>Access Time (ms)</b>	Random: <125 ms	Full-stroke seek: <210 ms	
	<b>Data Buffer</b>	2MB		
	<b>Disk Formats Read</b>	CD-ROM Mode 1, CD-ROM XA (Mode 2, Form 1 and 2), CD Digital Audio, CD-EXTRA, CD-I (Mode 2, Form 1 and 2) and CD-I Ready, CD-Text, CD-Bridge, Photo CD (Single and Multi Session), Video CD, CD-R and CD-RW Multi-Session		
	<b>Disk Formats Written</b>	None		
	<b>Disk Capacity (CD)</b>	180MB, 540MB, 650 MB, and 700MB		
	<b>Block Size</b>	Mode 1-2,048, 2,352 bytes Mode 2-1, 2,048, 2,328, 2,336, 2,340, 2,353 bytes Mode 2-2, 2,328, 2,336, 2,340, 2,352 bytes CD-DA-2,352, 2,368 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>	<b>Temperature</b>	41° to 122° F (5° to 50° C)	
		<b>Relative Humidity</b>	10% to 90%	
	<b>Dimensions (H x W x D, maximum)</b>	1.7 x 5.9 x 8.0 in (4.3 x 15.0 x 20.3 cm)		
	<b>Weight</b>	2.6 lb (1200 g)		
	<hr/>			
	<b>48X/32X/48X CD-RW Drive</b>	<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 (20.3 x 14.93 x 4.34 cm)		
<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 µm		
<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		

### Technical Specifications - Optical Storage

<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>Disc type</b>	CD-R and CD-RW
<b>Writeable disc parameters</b>	<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>CD-RW write</b>	4800 KB/s (up to 32X)
	<b>CD-ROM, CD-R read</b>	7200 KB/s (up to 48X)
	<b>CD-RW read</b>	7200 KB/s (up to 32X)
	<b>CD-R write</b>	7200 KB/s (up to 48X)
<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	

### Technical Specifications - Optical Storage

<b>Power</b>	<b>Source</b>	Four-pin, DC power receptacle
	<b>DC power requirement</b>	5 VDC 5%-100 mV ripple p-p 12 VDC 5%-200 mV ripple p-p
	<b>DC current</b>	5 VCD < 1A (typical) < 1600 mA (maximum) 12 VCD < 600 mA (typical) < 1.4A (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)	<b>Temperature</b> (operating)	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b> (operating)	10% to 90%
	<b>Maximum Wet Bulb Temperature</b> (operating)	84° F (29° C)
<b>Certifications, requirements</b>	ACA AS/NZS 3548, ANSI C63.4-1992, CB Test Certificate for IEC 950, CE Mark, CFR 47 part 15, CNS 13438, CSA C22.2 No. 60950, DHHS/FDA - 1040, EN60825, EN55022:1998, EN55024, EN60950:2000, ICES-003 class B, IEC 61000 4-2 - 4-11, Nordic EN60 950, TUV or VDE EN60 950, UL 60950, C.I.S.P.R. Publication 22 Class B, BSMI, Microsoft® P2001, Microsoft Logo for Windows® 98, 2000 and XP	

<b>16X/40X DVD-ROM</b>	<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

### Technical Specifications - Optical Storage

<b>Disc Capacity</b>	<b>DVD-ROM</b>	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)
	<b>CD-ROM</b>	40 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</b> (bytes)	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</b> (typical reads, including settling)	<b>DVD-ROM Single Layer</b>	120 ms (typical)
	<b>CD-ROM Mode 1</b>	90 ms (typical)
	<b>Full Stroke DVD</b>	240 ms (seek) (typical)
	<b>Full Stroke CD</b>	160 ms (seek) (typical)
<b>Maximum Data Transfer Rates</b>	<b>CD-ROM Read</b>	6000 KB/s (40X) Max
	<b>DVD-ROM Read</b>	21,600 KB/s (16X) Max
<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>	<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 – <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</b> (all conditions non-condensing)	<b>Temperature</b> (operating)	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b> (operating)	10% to 90%
	<b>Maximum Wet Bulb Temperature</b> (operating)	86° F (30° C)
<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>Kit Contents</b>	16X/40X DVD-ROM Drive, Roxio CinePlayer software, and installation guide.	

48X/32X/48X/16X  
Combo CD-RW/DVD-  
ROM

<b>Height</b>	5.25-inch, half-height, tray-load
<b>Color</b>	Carbonite
<b>Orientation</b>	Either horizontal or vertical
<b>Interface Type</b>	ATAPI

### Technical Specifications - Optical Storage

<b>Dimensions (W x H x D)</b>	5.77 x 1.71 x 7.36 in (14.66 x 4.34 x 18.69 cm) (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 (typical reads, including settling)</b>	<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)

### Technical Specifications - Optical Storage

<b>Data transfer rates</b>	<b>CD-R write</b>	7200 KB/s (up to 48X)	
	<b>CD-RW write</b>	1500 KB/s (10X) Max	
<b>Data transfer modes</b>	<b>CD-ROM, CD-R, CD-RW read</b>	7200 KB/s (up to 48X)	
	<b>DVD ROM read</b>	21,632 KB/s (16X ) Max	
	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>	<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>Operating Conditions (all conditions non-condensing)</b>	<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		

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<b>16X DVD+/-RW Drive</b>	<b>Height</b>	5.25-inch, half-height, tray-load
	<b>Orientation</b>	Either horizontal or vertical
	<b>Interface type</b>	ATAPI/EIDE
	<b>Disc recording capacity</b>	8.5 GB DL or 4.7 GB standard
	<b>Dimensions (W x H x D)</b>	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)
	<b>Weight (max)</b>	2.6 lb (1.2 kg)

### Technical Specifications - Optical Storage

<b>Write speed</b>	DVD+R	Up to 16X
	DVD+RW	Up to 4X
	DVD+R DL	Up to 2.4X
	DVD-R	Up to 8X
	DVD-RW	Up to 4X
	CD-R	Up to 40X
	CD-RW	Up to 24X
<b>Read speed</b>	DVD+R/-R/+RW/-RW	Up to 16X
	DVD-ROM	Up to 16X
	CD-R/RW	Up to 40X
<b>Access time</b> (typical reads, including settling)	<b>Random</b>	DVD: < 130 ms (typical), CD: < 120 ms (typical)
	<b>Full Stroke</b>	DVD: < 240 ms (seek), CD: < 200 ms (seek)
	<b>Startup Time</b>	Single-session: < 7 seconds (typical), Multi-session: < 30 seconds (typical)
	<b>Stop Time</b>	< 4 seconds
	<b>Cache Buffer</b>	2 MB (minimum)
	<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 3 (44.4 MB/s -default)
	<b>Power</b>	<b>Source</b>
<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</b> (standby mode)		< 2.5 Watt
<b>Audio output</b>		<b>Line-Out</b> 0.7 VRMS <b>Signal-to-Noise Ratio</b> 74 dB <b>Channel Separation</b> 65 dB
<b>Environmental conditions</b> (operating - non-condensing)	<b>Temperature</b>	41° to 122° F (5° to 50° C)
	<b>Relative humidity</b>	10% to 90%
	<b>Maximum wet bulb temperature</b>	86° F (30° C)
<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>Regulatory approvals</b>	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec T13.1153D, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft PC2001 certification, Microsoft Logo for Windows XP and 2000.	

### *Technical Specifications - Optical Storage*

**Option kit contents** 16X DVD+/-RW drive, Roxio DigitalMedia Plus, Dantz Retrospect Express Backup Software, installation guide, and DVD+R media.

### Technical Specifications - Removable Storage

<b>1.44-MB Diskette Drive</b>	<b>Size</b>	3.5 in (8.89 cm)
	<b>LED Indicators</b> (front panel)	Green
	<b>Read/Write Capacity per Diskette</b> (high/low)	1.44 MB/720 KB
	<b>Drive Height</b>	One-third
	<b>Drive Rotation</b>	300 rpm
	<b>Transfer Rate</b> (high/low)	500/250 KB/s
	<b>Bytes/Sector</b>	512
	<b>Sectors/Track</b> (high/low)	18/9
	<b>Tracks/Side</b> (high/low)	80/80
	<b>Access Times</b>	Track-to-Track (high/low) 3/6 ms Average (high/low) 94/173 ms Settling Time 15 ms Latency Average 100 ms
	<b>Cylinders</b> (high/low)	80/80
	<b>Read/Write Heads</b>	Two

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