

introduction & **hp**  
business pc overview

**hp** vectra xe310  
**hp** vectra xe320  
**hp** vectra vl400  
**hp** vectra vl410  
**hp** vectra vl420  
**hp** e-pc c10/s10  
**hp** e-pc 40  
**hp** e-pc 42

technical  
reference  
manual

**hp** business pcs

[www.hp.com/go/vectrasupport](http://www.hp.com/go/vectrasupport)  
[www.hp.com/go/e-pcsupport](http://www.hp.com/go/e-pcsupport)



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# Information Roadmap

Use the  icon in Acrobat Reader to search for information in this PDF.

The following types of information are available for HP Business PCs:

## Technical Reference



See the *HP Technical Reference Manuals*.

This *Technical Reference Manual* is a technical reference and BIOS document for personnel providing system level support. It is available in PDF format on the HP support web site ([www.hp.com/go/vectrasupport](http://www.hp.com/go/vectrasupport) or [www.hp.com/go/e-pcsupport](http://www.hp.com/go/e-pcsupport)).

It is presented in modular form to provide quick and easy access to technical information on the HP Business PC. It is made up of the following components:

- The *Introduction & HP Business PC Overview* (this document). Provides a quick reference guide to the hardware components and BIOS used in the latest HP Business PCs. It also lists some of the available accessories.
- *Product Description*. Provides technical information specific to a HP Business PC. This includes summary information on product hardware and detailed information on the BIOS. Read this manual to see which hardware components are in the PC.
- *HP Business PC Technology*. Provides an in-depth guide to the hardware in all of the featured HP Business PCs. Subjects covered include chipsets, processors, graphics controllers, hard disk drives and optical drives.

## Installing, Configuring and Upgrading



See the *HP Upgrade Guide* (desktop PCs only) or the *HP Service Handbook Chapter*.

The *Upgrade Guide* will help you upgrade and replace components in your HP Business PC, including the hard drive, memory, battery, power supply, and optical drives. More information is available on the HP support web site ([www.hp.com/go/vectrasupport](http://www.hp.com/go/vectrasupport)).

The *Service Handbook Chapter*, available in PDF format on the HP support web site ([www.hp.com/go/vectrasupport](http://www.hp.com/go/vectrasupport) or [www.hp.com/go/e-pcsupport](http://www.hp.com/go/e-pcsupport)), provides information on:

- HP Business PC configurations
- Replacement parts
- Available accessories.

## Troubleshooting



See the *HP Troubleshooting Guide*.

The *Troubleshooting Guide*, available in PDF format on the HP support web site ([www.hp.com/go/vectrasupport](http://www.hp.com/go/vectrasupport) or [www.hp.com/go/e-pcsupport](http://www.hp.com/go/e-pcsupport)) will help you:

- Troubleshoot your HP Business PC
- Find out where to get more information.

## Discover and use your product

See the *HP Quick Start* card and *HP Quick User's Guide*.



The *Quick Start* card provided with your HP Business PC will help you:

- Set up and begin using your HP Business PC for the first time
- Upgrade and replace components in your HP Business PC, including the hard drive, processor memory, add-on cards and optical drives. More information is available on the HP support web site ([www.hp.com/go/vectrasupport](http://www.hp.com/go/vectrasupport) or [www.hp.com/go/e-pcsupport](http://www.hp.com/go/e-pcsupport)).
- Find out where to get more information.



The *Quick User's Guide* provided with your HP Business PC includes basic troubleshooting information, technical specifications, warranty and legal information.

## Your computer's online information



Your computer may contain online help information on the hard disk. It includes information on:

- Troubleshooting and how to use HP Instant Support
- Linking to useful HP web sites.

## Information on the hp support web site



Refer to the HP support web site ([www.hp.com/go/vectrasupport](http://www.hp.com/go/vectrasupport) or [www.hp.com/go/e-pcsupport](http://www.hp.com/go/e-pcsupport)) for a wide range of information, including:

- Downloadable documentation
- Service and support options
- The latest BIOS, drivers and utilities
- Answers to Frequently Asked Questions.

## System recovery cd-roms



Used for a full system recovery or alternative OS installation. Includes instructions on how to recover your preloaded software including operating system, drivers and utilities.

# Finding Information

Use the following table to determine where to locate particular types of information:

Type of Information	Location
<ul style="list-style-type: none"> <li>• Support phone numbers</li> <li>• Technical support contact information</li> <li>• Warranty information</li> </ul>	<i>Quick User's Guide</i>
<ul style="list-style-type: none"> <li>• How to set up your computer</li> </ul>	<i>Quick Start Card</i> (details) <i>Quick User's Guide</i> (general information)
<ul style="list-style-type: none"> <li>• Operation of your computer</li> </ul>	Operating system and application manuals
<ul style="list-style-type: none"> <li>• Diagrams and detailed instructions on installing add-on devices</li> <li>• Internal wire connections for adding hard drives, CD-ROM, etc.</li> <li>• Memory expansion and replacing devices</li> </ul>	<i>Upgrade Guide</i> (desktop PCs only)
<ul style="list-style-type: none"> <li>• LAN configuration</li> <li>• LAN controller</li> </ul>	<i>LAN Card Ready Program</i> (when provided, is available on the HP support web site) <i>Technical Reference Manual</i> (this document)
<ul style="list-style-type: none"> <li>• Identifying the problem</li> <li>• Information on errors</li> <li>• Problem solving</li> <li>• Troubleshooting</li> </ul>	<i>Troubleshooting Guide</i>
<ul style="list-style-type: none"> <li>• Parts list</li> <li>• Accessories list</li> </ul>	<i>Service Handbook Chapter</i>
<ul style="list-style-type: none"> <li>• BIOS</li> <li>• Connectors</li> <li>• IRQ</li> <li>• POST setup</li> <li>• Specifications</li> <li>• System board layout</li> <li>• Technical diagrams</li> </ul>	<i>Technical Reference Manual</i> (this document)

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## Conventions

The following conventions are used throughout this manual to identify specific numeric elements:

- Hexadecimal numbers are identified by a lower case h.  
**For example**, 0FFFFFFFh or 32F5h
- Binary numbers and bit patterns are identified by a lower case b.  
**For example**, 1101b or 10011011b

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## Bibliography

Manual, datasheets and other information can be obtained at:

- Technical Reference Manuals*  
**[www.hp.com/go/support](http://www.hp.com/go/support)**
- HP Service Handbook Chapters at:*  
**[www.hp.com/go/vectrasupport](http://www.hp.com/go/vectrasupport) or [www.hp.com/go/e-pcsupport](http://www.hp.com/go/e-pcsupport)**
- HP Product Data Sheets*  
**[www.hp.com/go/library](http://www.hp.com/go/library)**
- Intel Chipsets*  
**[developer.intel.com](http://developer.intel.com)**
- Intel Celeron, Pentium III & Pentium 4 Processors*  
**[www.intel.com/design/celeron/datashts](http://www.intel.com/design/celeron/datashts)**  
**[www.intel.com/design/pentiumIII/datashts](http://www.intel.com/design/pentiumIII/datashts)**  
**[www.intel.com/design/pentium4/datashts](http://www.intel.com/design/pentium4/datashts)**
- Adaptec SCSI Products*  
**[www.adaptec.com](http://www.adaptec.com)**
- Analog Devices AD1885*  
**[www.analogdevices.com](http://www.analogdevices.com)**
- Matrox Millennium G400 and G450 AGP graphics controllers*  
**[www.matrox.com/mga/products/home.htm](http://www.matrox.com/mga/products/home.htm)**
- NVIDIA graphics cards*  
**[www.nvidia.com](http://www.nvidia.com)**
- ATI graphics cards*  
**[www.ati.com](http://www.ati.com)**
- Intel Dynamic Video Memory Technology (used in chipsets 810E, 815 and 845)*  
**[www.intel.com/products](http://www.intel.com/products)**
- Creative Audio*  
**[www.creative.com](http://www.creative.com)**
- Crystal Audio*  
**[www.cirrus.com](http://www.cirrus.com)**
- Intel LAN card*  
**[www.intel.com/support/network](http://www.intel.com/support/network)**

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## HP Business PC product line overview

This document provides a brief overview of the technical features and components of the following HP Business PCs:

- XE310 PCs (Series 1 and Series 2)
- XE320 PCs
- VL400 Desktop, Minitower and Small Form Factor PCs
- VL410 Desktop and Small Form Factor PCs
- VL420 Desktop, Minitower and Small Form Factor PCs
- e-pc c10 and e-pc s10
- e-pc 40 and e-pc 42.

For the latest information on any of these PCs refer to the product datasheets available at the following HP web site: [www.hp.com/go/library](http://www.hp.com/go/library)

# HP Vectra XE310 PCs

## NOTE

There are two versions of the HP XE310 PC: Series 1 and Series 2. To identify which model you have, look at the sticker located on the right side of your PC. Series 1 models are labelled 'XE310' and Series 2 models are labelled 'XE310 Series 2'. All information in the following table applies to both Series 1 and Series 2 PCs unless otherwise stated.

Component	Description	
<b>Package Description</b>	1 or 2 free front-access shelves (one if a CD-ROM, DVD-ROM or CD-RW is fitted). Up to 3 PCI accessory board slots.	
	Width: 21cm (8.27in.) Height: 39cm (15.35in.) Depth: 38cm (14.96in.)	
<b>Processor</b>	Series 1	Intel Celeron 800/100 up to 1100/100 with 128KB L2 cache. Intel Pentium III 933/133, 1000/133 with 256KB L2 cache and 2 x 16KB L1 cache.
	Series 2	Intel Celeron 950/100 up to 1200/100 Intel Pentium III 1000/133 up to 1200/133
<b>Preloaded Operating System</b>	Series 1	Windows 98 SE
	Series 2	Windows XP Home Windows XP Professional (or Windows 2000)
<b>System Board:</b>		
<b>Chipset</b>	Series 1	Intel i810e.
	Series 2	Intel i815eg.
<b>Integrated I/O</b>	Series 1	2 USB connectors, 1 serial port, 1 parallel port, 1 Midi port.
	Series 2	4 USB connectors, 1 serial port, 1 parallel port.
<b>Integrated IDE</b>	Series 1	On ICH chip. 2 IDE Ports (Ultra DMA/66)
	Series 2	On ICH chip. 2 IDE Ports (Ultra DMA/100)
<b>Graphics</b>	Series 1	Integrated Intel 810e AGP graphics controller
	Series 2	Integrated Intel 815eg AGP graphics controller
<b>Integrated Audio</b>	Series 1	Cirrus Logic CS4299 integrated AC'97 audio solution
	Series 2	Analog Devices AD1885 integrated AC'97 audio solution
<b>LAN</b>	Series 1	HP 10/100 BT PCI Ethernet Adapter (on some models)
	Series 2	Integrated Intel Pro/100 VE Network Adapter
<b>Mass storage</b>	Hard disks: 20GB IDE, 40GB IDE Floppy drive: standard 1.44 MB 3.5"	
	CD-ROM drive: 48X max IDE (in selected models). Also available as accessory (D9444A)	
	CD-RW drive: 16X, 10X, 40X max (in selected models). Also available as accessory (P1543A)	
	DVD drive: 16X, 40X max (Series 2)	
<b>Main memory</b>	Two SDRAM sockets using: 64MB, 128MB and 256MB 133MHz SDRAM. Maximum of 512MB.	
<b>Input devices</b>	HP Standard Keyboard HP Scrolling Mouse	
<b>Power supply</b>	Input Voltage: 100-127 V 4A, -240V 2A ac (voltage selection switch) Input Frequency: 50/60 Hz Maximum output power: 149W continuous	
<b>Rear connectors</b>	Series 1	Keyboard, mouse, VGA, parallel, 2 x serial, 2 x USB, LAN, 3 x audio, 1 x midi
	Series 2	Keyboard, mouse, VGA, parallel, 1 x serial, 4 x USB, LAN, 3 x audio
<b>BIOS</b>	Series 1	Type: Phoenix BIOS, Version: JD.xx.xx Setup program: in English BIOS error messages: in English.
	Series 2	Type: Phoenix BIOS, Version: JJ.01.xx Setup program: in English BIOS error messages: in English.



## HP Vectra XE320 PCs

Component	Description
<b>Package Description</b>	1 or 2 free front-access shelves (one if a CD-ROM, DVD-ROM or CD-RW is fitted) Up to 3 PCI accessory board slots
	Width: 21cm (8.27in.) Height: 39cm (15.35in.) Depth: 38cm (14.96in.)
<b>Processor</b>	Intel Pentium 4 processor: 1.6GHz, 1.7GHz, 1.8GHz, 1.9GHz, 2.0GHz with 256KB L2 cache and 2.0GHz with 512KB L2 cache
<b>Preloaded Operating System</b>	Windows XP Professional (downgrade to Windows 2000 with recovery CD) Windows XP Home
<b>System Board:</b>	
<b>Chipset</b>	Intel 845
<b>Integrated I/O</b>	2 USB connectors, 2 serial ports and 1 parallel port
<b>Integrated IDE</b>	On ICH2 chip. 2 IDE Ports (Ultra ATA 100)
<b>Graphics</b>	Choice of graphics solutions: - ATI Rage 128 Pro with 16MB (Brazil only) or 32MB video memory - NVIDIA TNT2 Vanta 16MB
<b>Integrated Audio</b>	Integrated Analog Devices AD1885 AC'97 Audio
<b>LAN</b>	Integrated Intel Pro/100 VE Network Adapter (10 Base-T/100 Base-TX LAN Interface)
<b>Mass storage</b>	Hard disks: 20GB IDE (5400 rpm), 40GB IDE (5400 rpm) Floppy drive: standard 1.44 MB 3.5"
	CD-ROM drive: 48X max IDE (in selected models). Also available as accessory (D9444A)
	CD-RW drive: 24X, 10X, 40X max (in selected models). Also available as accessory (P8771AV) DVD drive: 16X, 40X max (P1544A)
<b>Main memory</b>	Three SDRAM sockets using: 128MB, 256MB and 512MB 133MHz SDRAM (non-ECC) standard (PC 133 specification). Maximum of 1.5GB (128MB module is minimum module size supported)
<b>Input devices</b>	HP PS/2 Standard Keyboard HP PS/2 Scrolling Mouse
<b>Power supply</b>	Input Voltage: 100-127V 6A, 200-240V 3A ac (voltage selection switch) Input Frequency: 50/60 Hz Maximum output power: 200W continuous
<b>Rear connectors</b>	Keyboard, mouse, parallel, VGA, 2 x serial, 2 x USB, LAN, 3 x audio (stereo-in, stereo-out, microphone-in)
<b>BIOS</b>	Based on American Megatrends Inc. (AMI). BIOS, Version: JN.xx.yy

# HP Vectra VL400 PCs

Component	Desktop	Minitower	Small Form Factor
<b>Package Description</b>	1 or 2 free front-access shelves (one if a CD-ROM, DVD-ROM or CD-RW is fitted). Up to 4 accessory board slots (3 PCI, 1 AGP). (2 ISA slot extension kit available as an accessory.)	2 or 3 Free Front-access shelves (two if a CD-ROM, DVD-ROM or CD-RW is fitted) Up to 4 accessory board slots (3 PCI, 1 AGP). (2 ISA slot extension kit available as an accessory.)	1 Slim free front-access shelf, or 1 slim CD-ROM or DVD-ROM may be fitted. Up to 3 PCI accessory board slots. (Alternatively, riser card with 1 PCI and 1 combo PCI-ISA is available as an accessory.)
	Width: 43.5cm (17.13in.) Height: 13.5cm (5.32in.) Depth: 43cm (16.93in.)	Width: 20.6cm (8.15in.) Height: 46.9cm (18.46in.) Depth: 45.5cm (17.9in.)	Width: 36.6cm (14.4in.) Height: 10.1cm (3.98in.) Depth: 40.7cm (16.14in.)
<b>Processor</b>	Intel Celeron 566/66, 633/66 with 128KB L2 cache. Intel Pentium III 667/133, 733/133, 800/133, 867/133, 933/133, 1000/133 with 256KB L2 cache and 2 x 16KB L1 cache.		
<b>Operating System</b>	Either Windows 2000 (with Windows NT4 SP6 as alternative on CD-ROM), or Windows 95 (with Windows 98 SE as alternative on CD-ROM).		
<b>System Board:</b>			
<b>Chipset</b>	Intel i815.		
<b>Integrated I/O</b>	2 USB connectors, 2 serial ports and 1 parallel port.		
<b>Integrated IDE</b>	On ICH chip. 2 IDE Ports (Ultra DMA/66).		
<b>Graphics</b>	Integrated Intel 815 AGP graphics controller using 9-10MB of system memory (with 4 MB memory upgrade accessory, 8 MB system memory is used). Matrox Millennium G450 Dual Head 4X AGP or PCI graphics controller with 16MB of video memory (graphics card, on some models only).		
<b>Integrated Audio</b>	CrystalClear CS4299 PCI Audio Codec '97 2.1		
<b>Integrated LAN</b>	3COM 3C390 Fast Etherlink 10/100 Base-TX		
<b>Mass storage</b>	Hard disks: 10GB IDE, 15GB IDE, 30GB IDE, 9.1GB SCSI Floppy drive: standard 1.44 MB 3.5"		
	CD-ROM drive: 48X max IDE (in selected models). Also available as accessory (D9444A) DVD drive: 8X, 40X (in selected models) Also available as accessory (D7521A) CD-RW drive: 4X, 4X, 24X. Also available as accessory (D9524A) ZIP drive: accessory D9446A.		
<b>Main memory</b>	Two SDRAM sockets using: 64MB, 128MB, 256MB and 512MB 133MHz SDRAM. Maximum of 512MB (only one 512MB module is supported).		
<b>Expansion cards (available as accessories)</b>	HP Matrox G450 AGP: accessory D7518A NVIDIA GeForce2MX graphic card: accessory P2289A HP Ultra II SCSI adapter card: accessory D9529A HP 10/100 3Com 3C905C-TX network interface card: accessory (single card) D7522B HP 10/100 Intel Pro/100+ management adapter: accessory (single card) D7506A HP 10/100BT PCI Ethernet Card: accessory D7508B.		
<b>Input devices</b>	HP Standard Keyboard HP Multimedia Keyboard: accessory C4742A HP Standard Mouse HP Scrolling Mouse: accessory C4736A		
<b>Power supply</b>	Input Voltage: 100-127 V 4A, 200-240V 2A ac (voltage selection switch) Input Frequency: 50/60 Hz Maximum output power: 120W continuous	Input Voltage: 100-127 V 6A, 200-240V 3A ac (voltage selection switch) Input Frequency: 50/60 Hz Maximum output power: 200W continuous	Input Voltage: 100-127 V 2500mA, 200-240V 1300mA ac (voltage selection switch). Input Frequency: 50/60 Hz Maximum output power: 100W continuous
<b>Rear connectors</b>	Keyboard, mouse, VGA, parallel, 2 x serial, 2 x USB, LAN, 3 x audio		
<b>BIOS</b>	Type: Phoenix BIOS, Version: IP.xx.xx Setup program: English only, BIOS error messages: Available in French, German, Italian, Spanish, Danish, Dutch, Finnish, Portuguese, Norwegian, Swedish, English.		

# HP Vectra VL410 PCs

Component	Desktop	Small Form Factor
<b>Package Description</b>	1 or 2 free front-access shelves (one if a CD-ROM, DVD-ROM or CD-RW is fitted). Up to 4 accessory board slots (3 PCI, 1 AGP).	1 Slim free front-access shelf, or 1 slim CD-ROM or DVD-ROM may be fitted. Up to 3 PCI accessory board slots. (Alternatively, riser card with 1 PCI is available as an accessory.)
	Width: 43.5cm (17.13in.) Height: 13.5cm (5.32in.) Depth: 43cm (16.93in.)	Width: 36.6cm (14.4in.) Height: 10.1cm (3.98in.) Depth: 41.0cm (16.14in.)
<b>Processor</b>	Intel Celeron 766/66, 800/100, 850/100, 900 (possibly higher)/100 with 128KB cache.	
<b>Operating System</b>	Windows 2000 SP1 (with Windows NT4 SP6 available on CD-ROM as a downgrade option), Windows 98 SE, Windows NT4 SP6 or Windows XP.	
<b>System Board:</b>		
<b>Chipset</b>	Intel i815E Step B.	
<b>Integrated I/O</b>	4 USB connectors, 1 serial port, 1 optional serial port and 1 parallel port.	
<b>Integrated IDE</b>	On ICH2 chip. 2 IDE Ports (Ultra DMA/100).	
<b>Graphics</b>	Integrated Intel 815 AGP graphics controller using 10-11MB of system memory with 4MB GPA memory upgrade (7-13MB of system memory is used without memory upgrade) Add-on AGP Nvidia GeForce2 MX 32MB SGRAM (on some models only).	
<b>Integrated Audio</b>	Analog Devices AD1885 integrated AC'97 audio solution.	
<b>Integrated LAN</b>	Integrated Intel Pro/100 VE Network Adapter (10 Base-T/100 Base-TX LAN Interface) or optional 3COM LAN card.	
<b>Mass storage</b>	Hard disks: 20GB IDE (5400 rpm), 40GB IDE (7200 rpm) Floppy drive: standard 1.44 MB 3.5".	
	CD-ROM drive: 48X max IDE (in selected models). Also available as accessory (D9444A) DVD drive: 16X, 40X (in selected models) Also available as accessory (P1544A) Optional CD-RW drive: 16X, 10X, 40X: accessory (P1543A) Optional ZIP drive (250MB): accessory P1983A.	
<b>Main memory</b>	Two DIMM sockets using: 64MB, 128MB and 256MB 133MHz SDRAM. Maximum of 512MB (2 x 256MB).	
<b>Expansion cards (available as accessories)</b>	NVIDIA GeForce2MX graphic card: accessory P2289A	
	HP 10/100 3Com 3C905C-TX network interface card: accessory (single card) D7522B HP 10/100 Intel Pro/100+ management adapter: accessory (single card) D7506A HP 10/100BT PCI Ethernet Card: accessory D7508B.	
<b>Input devices</b>	HP Standard Keyboard HP Cordless Keyboard and Mouse kit HP PS2 Windows Keyboard: accessory C4735B HP USB Enhanced Internet Keyboard HP Standard Mouse HP PS2 Scrolling Mouse: accessory C4736B HP USB Optical Scrolling Mouse	
<b>Power supply</b>	Input Voltage: 100-127 V 4A, 200-240V 2A ac (voltage selection switch) Input Frequency: 50/60 Hz Maximum output power: 120W continuous	Input Voltage: 100-127 V 2500mA, 200-240V 1300mA ac (voltage selection switch) Input Frequency: 50/60 Hz Maximum output power: 114W continuous
<b>Rear connectors</b>	Keyboard, mouse, VGA, parallel, 1 x serial, 4 x USB, LAN, 3 x audio	
<b>BIOS</b>	Type: Phoenix BIOS, Version: IV.xx.xx.NN where NN is the language, BIOS error messages: Available in French, German, Italian, Spanish, Danish, Dutch, Finnish, Portuguese, Norwegian, Swedish, English.	

# HP Vectra VL420 PCs

Component	Desktop	Minitower	Small Form Factor
<b>Package Description</b>	2 front-accessible shelves for CD-ROM, DVD-ROM or CD-RW drive. 2 internal shelves for standard 3.5in hard disk drive (one pre-installed). 4 accessory board slots (3 PCI, 1 AGP).	3 front-accessible shelves for CD-ROM, DVD-ROM or CD-RW drive (2 full length, 1 short length). 2 internal shelves for standard 3.5in hard disk drive (one pre-installed). 4 accessory board slots (3 PCI, 1 AGP).	1 slim front-accessible shelf for CD-ROM, DVD-ROM or CD-RW drive. 1 internal shelf for standard 3.5in hard disk drive (one pre-installed). 4 low profile accessory board slots (3 PCI, 1 AGP).
	Width: 43.5cm (17.13in.) Height: 13.5cm (5.31in.) Depth: 43cm (16.92in.)	Width: 20.5cm (8.07in.) Height: 47.6cm (18.74in.) Depth: 44.7cm (17.6in.)	Width: 34.0cm (13.38in.) Height: 9.5cm (3.74in.) Depth: 40.5cm (15.95in.)
<b>Processor</b>	Intel Pentium 4 processor: 1.5GHz, 1.6GHz, 1.7GHz, 1.8GHz, 1.9GHz, 2.0GHz, 2.2GHz (and latest available frequencies).		
<b>Operating System</b>	Either Windows 2000 Professional, Windows XP Professional, Windows 98 Second Edition, Windows XP Home Edition or Linux Operating Systems.		
<b>Chipset</b>	Intel 845.		
<b>Integrated I/O</b>	4 USB connectors (2 front, 2 rear), 2 serial ports, 1 parallel port, audio (microphone, line in, line out).		
<b>Graphics</b>	Choice of graphics solutions: - ATI Rage 128 Pro with 16MB video memory - ATI Rage 128 Ultra with 32MB video memory - NVIDIA GeForce2 MX graphics AGP4X card with 32MB video memory and DualHead - NVIDIA TNT2 Vanta 16MB - NVIDIA GeForce3 Ti200 with 64MB video memory.	Choice of graphics solutions: - Low profile ATI Rage 128 Pro with 16MB video memory - Low profile ATI Rage 128 Ultra with 32MB video memory - Low profile NVIDIA GeForce2 MX graphics AGP4X card with 32MB video memory - Low profile NVIDIA TNT2 Vanta 16MB.	
<b>Audio</b>	Integrated Analog Devices AD1885 AC'97 Audio	- Integrated Analog Devices AD1885 AC'97 Audio - Sound Blaster Live 5.1 card (optional)	Integrated Analog Devices AD1885 AC'97 Audio
<b>LAN</b>	Integrated Intel Pro/100 VE Network Adapter (10 Base-T/100 Base-TX LAN Interface) or optional 3COM LAN card.		Integrated Intel Pro/100 VE Network Adapter (10 Base-T/100 Base-TX LAN Interface) or optional low profile 3COM LAN card.
<b>SCSI</b>	HP Adaptec Ultra 160 SCSI adapter card.		N/A
<b>Mass storage</b>	Choice of hard disk drives: - Ultra ATA/100: 20GB (5400 rpm), 40GB (5400 rpm), 20GB (7200 rpm), 40GB (7200 rpm) or 80GB (7200 rpm) - Ultra 160 SCSI: 18GB (10000 rpm) or 36GB (10000 rpm) Floppy drive: standard 1.44MB 3.5"	- Ultra ATA/100: 20GB (5400 rpm), 40GB (5400 rpm), 20GB (7200 rpm), 40GB (7200 rpm) or 80GB (7200 rpm) - Floppy drive: standard 1.44MB 3.5"	
	CD-ROM drive: 48X IDE. DVD drive: 16X/40X IDE (WinDVD MPEG2 decoding software from InterVideo included). CD-RW drive: 16X/10X/40X IDE (DLA and MyCD software from Veritas included).	Slim CD-ROM drive: 24X IDE. Slim DVD drive: 8X/24X. Slim CD-RW drive: 8X/8X/24X IDE.	
<b>Main memory</b>	Three SDRAM sockets using: 64MB, 128MB, 256MB and 512MB 133MHz SDRAM (non-ECC) standard (PC 133 specification). Maximum of 1.5GB (64MB module is minimum module size supported).		
<b>Input devices</b>	HP PS2 Windows keyboard: accessory C4735B HP USB Internet keyboard: accessory C4768A HP PS2 scrolling mouse: accessory C4736B HP multimedia keyboard: accessory C4742B HP USB scrolling optical mouse: accessory C4766A HP cordless keyboard and mouse kit: accessory P5911A		
<b>Power supply</b>	Input Voltage: 100-127 V 5A, 200-240V 3A ac (voltage selection switch) Input Frequency: 50/60 Hz Minimum available output power: 185W	Input Voltage: 100-127 V 5A, 200-240V 3.5A ac (voltage selection switch) Input Frequency: 50/60 Hz Minimum available output power: 250W	Input Voltage: 100-127 V 4A, 200-240V 2A ac (voltage selection switch) Input Frequency: 50/60 Hz Minimum available output power: 165W
<b>Connectors</b>	Keyboard, mouse, VGA, parallel, 2 x serial, 4x USB (2 rear, 2 front), 1 Ethernet port (10 Base T/100 Base-TX), 3 x audio (stereo-in, stereo-out, microphone-in).		
<b>BIOS</b>	Based on American Megatrends Inc. (AMI). BIOS, Version: BB.MM.mmLL (for example JA.01.01US), where: BB = BIOS letter, MM = Major BIOS version, mm = Minor BIOS version, LL = localization of the BIOS.		

# HP e-pcs

Component	HP e-pc 42	HP e-pc 40	HP e-pc c10/s10
<b>Package Description</b>	No free access shelves		
	Width: 9.5cm (3.7in); Height: 25.0cm (9.8in); Depth: 28.0cm (11.0in).		Width: 8.9cm (3.5 in); Height: 24.0cm (9.4in); Depth: 27.2cm (10.7in).
<b>Processor</b>	Intel Pentium 4 up to 1.8GHz with 256K L2 cache and Intel Pentium 4 at 2.0GHz and higher with 512K L2 cache	Intel Celeron 900MHz and above, with 128K cache	Intel Celeron 500/66, 533/66, 633/66, 700/66, 733/66, 766/66, 800/66 Intel Pentium III 600EB/133, 667/133, 800/133, 866/133, 933/133, 1000/133
<b>System Board:</b>			
<b>Chipset</b>	Intel 845	Intel 815E (with B stepping to support higher frequency Celeron processors)	Intel 810E
<b>Integrated I/O</b>	On ICH2 chip. 4 USB connectors, 1 serial port and 1 parallel port, 2 PS/2 (keyboard, mouse), 1 15-pin VGA connector, audio ports (stereo-in, stereo-out, microphone in)		On ICH chip. 2 USB connectors, 1 serial port and 1 parallel port, 2 PS/2 (keyboard, mouse), 1 15-pin VGA connector, audio ports (stereo-in, stereo-out, microphone in)
<b>Integrated IDE</b>	On ICH2 chip. 2 IDE Ports (Ultra ATA 100)		On ICH chip. 2 IDE Ports (Ultra ATA 66)
<b>Integrated Graphics</b>	ATI Rage 128 Pro 4XL with 16 MB DDR (Double Data Rate) graphics memory	Intel 815E integrated graphics with Direct AGP and Dynamic Video Memory Technology. Uses main system memory rather than dedicated graphics memory.	Intel 810E integrated graphics with Direct AGP and Dynamic Video Memory Technology.
<b>Integrated Audio</b>	16-bit Audio Codec '97 ADI 1885 Codec		CS4299: CrystalClear Sound Fusion Audio Codec '97
<b>Integrated LAN</b>	Integrated Intel Pro/100 VE Network Adapter (10 Base-T/100 Base-TX LAN Interface)		3COM 10/100 Mbps 3C905C-TX Network Interface (RJ-45 Ethernet port (10/100Base-T)
<b>Mass storage</b>	Hard disks: 20 and 40GB 5400rpm IDE Ultra ATA100 (7200rpm if requested) CD-ROM drive: 24X max-speed slim CD-ROM (in selected models) CD-DVD drive: 8X max-speed slim DVD drive (in selected models) CD-RW drive: 8X/8X/24X max-speed slim CD-RW (in selected models) USB Floppy drive: external USB floppy drive available as accessory D9510B	Hard disks: 20GB 5400rpm IDE Ultra ATA100 (7200rpm if requested) CD-ROM drive: 24X max-speed slim CD-ROM (in selected models) USB Floppy drive: external USB floppy drive available as accessory D9510A	Hard disks: 8.4GB IDE, 10GB IDE, 20GB, 40GB IDE CD-ROM drive: 24X max-speed slim CD-ROM (in selected models) DVD drive: 8X max-speed (in selected models) CD-RW drive: Available as accessory C4505A USB Floppy drive: Available as accessory D9510A
<b>Main memory</b>	Two SDRAM sockets for 133MHz, non-ECC 64MB, 128MB, 256MB, 512MB memory modules. Maximum 1GB (two 512MB modules).	Two SDRAM sockets for 133MHz, non-ECC 64MB, 128MB, 256MB memory modules. Maximum 512MB (two 256MB modules).	One SDRAM socket using: 64MB, 128MB, 256MB
<b>Input devices</b>	HP Standard keyboard or USB Internet keyboard on selected models HP Scrolling Mouse or USB Optical Scrolling mouse on selected models		HP Standard Keyboard HP Scrolling Mouse
<b>Power supply</b>	External 145W max. power supply 100-240V, 50/60Hz, auto-ranging	External 110W max. power supply 100-240V, 50/60Hz, auto-ranging	External 60W max. power supply
<b>BIOS</b>	Type: AmiBIOS Version: JB.xx.yy Setup program: English only BIOS error messages: English only	Type: AmiBIOS Version: IW.xx.yy Setup program: English only BIOS error messages: English only	Type: AmiBIOS Version: IN.xx.yy Setup program: English only BIOS error messages: English only







The Technical Reference Manual contains the following documents downloadable from the web site [www.hp.com/go/support](http://www.hp.com/go/support) in PDF format:

- **Introduction & HP Business PC Overview**  
The document you are reading. Describes how to use the Technical Reference Manual and provides a brief overview of the most recent HP Business PCs.
- **Product Description**  
One manual is provided for each HP Business PC. Each manual provides detailed BIOS information and summary information on the hardware components in the HP PC.
- **HP Business PC Technology**  
A detailed look at the hardware components in the latest HP Business PCs. Includes information on processors, chip-sets, graphic controllers, network interfaces, connectors and sockets.