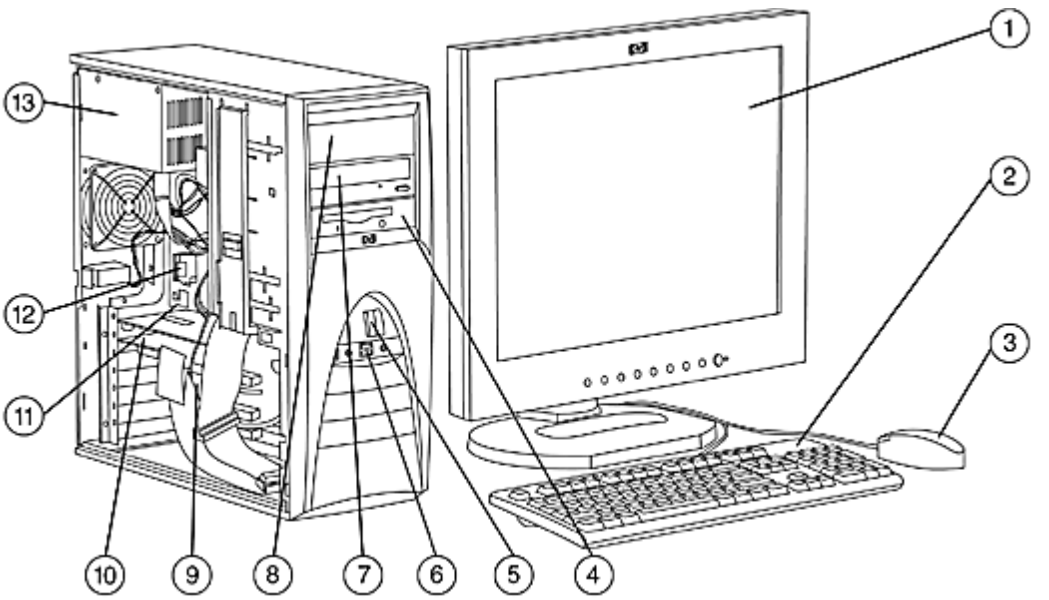
Overview



1. HP monitor (optional)
2. HP keyboard
3. HP mouse
4. Floppy drive
5. On-off button
6. USB connector
7. Optical drive
8. Available drive bay
9. Expansion slots
10. Graphics slot
11. Memory sockets
12. Processor(s)
13. Power Supply

At A Glance

- Choice of operating systems:
  Microsoft Windows XP Professional
  HP Installer Kit for Linux (see http://www.hp.com/workstations/software/linux/ for details)
  Red Hat Linux 7.3 or Red Hat Enterprise WS 3
- Supports Intel® Xeon processors 2.4 to 3.2 GHz
- Smallest dual processor-capable minitower form factor in the industry
- Capable of driving up to 8 monitors
- Up to 1.5 MB cache integrated on processor
- Intel E7505 chipset with 533 MHz front side bus and dual memory channels
- PC2100 ECC Registered DDR SDRAM, expandable to 8 GB
- Integrated Ultra320 SCSI hard drives (10,000 or 15,000 rpm), Ultra ATA/100 hard drives (7,200 rpm) or Serial ATA Drives (7,200 rpm or 10,000 rpm)
- Integrated dual-channel Ultra320 SCSI, Ultra ATA/100 controllers or 4-channel Serial ATA (SATA) RAID PCI Controller
- Internal storage capacity of up to 438 GB (SCSI), 500 GB (Ultra ATA) or 750 GB Serial ATA
- Choice of leadership graphics:
  NVIDIA Quadro NVS 280,
  NVIDIA Quadro NVS 400,
  NVIDIA Quadro4 380 XGL,
  ATI FireGL T2-128,
  NVIDIA Quadro FX1100, and
  NVIDIA Quadro FX3000
- Integrated Gigabit Ethernet adapter

Overview

- Five total slots - four PCI and one AGP 8X
- Five bays (three external and two internal)
- CD-ROM, CD-RW, DVD-ROM, DVD+RW, or combo drive (depending on model)
- Protected by HP services, including a three-year limited warranty in many countries. Certain restrictions and exclusions apply. Three-year onsite labor not available in all countries.

Standard Features

Processor	Intel Xeon processor 2.4 GHz, 2.66 GHz, 2.8 GHz, 3.06 GHz and 3.2 GHz (533 MHz front side bus)	
Operating System	Microsoft Windows XP Professional preinstall - SP1 HP Installation Kit for Linux (supports custom installations of Red Hat 7.2, 7.3, 8.0, 9 and Enterprise Workstation Edition 3.) Red Hat Enterprise Linux WS 3 (update 2)	
Cache Memory	512 KB integrated, full speed L2 cache per processor (2.4 GHz, 2.66 GHz, 2.8 GHz, 3.06 GHz) or 512 KB integrated full speed L2 cache,1 MB integrated, full speed L3 cache (3.2 GHz processors only)	
Processor Upgradability	Upgradable to dual processors	
Memory	Maximum	8 GB of PC2100 ECC Registered DDR SDRAM-266 NOTE: Microsoft Windows supports 4GB; up to 8GB configurations are supported on Linux only.
Network Controller	Integrated Broadcom 5702 Gb (10/100/1000) Network Interface	
Expansion Slots	I/O (Total) PCI - 32-bit/33 MHz AGP Pro50, 8X	5 total slots/4 available 4 slots/4 available 1 slot occupied by choice of graphics card
Expansion Bays	(Total/Available) Internal 3.5 inch External 5.25 inch	5 total/2 available 2 bays/1 available 3 bays/1 available (1 can be used for third HDD with mounting kit)

Standard Features

Interfaces	Parallel	1 25-pin port, rear
	USB 2.0	4 (2 front, 2 rear)
	IEEE Firewire	Optional – 3 (1 front, 2 rear)
	Serial	Two 9-pin connectors (rear)
	Ultra320 SCSI	Two 68-pin connectors (1 rear, 1 internal)
	Ultra ATA/100	2 connectors, primary and secondary (internal)
	Keyboard	1 PS/2 keyboard port (rear)
	Pointing Device	1 PS/2 mouse port (rear)
	Video	Choice of professional graphics options
	Network interface	1 RJ-45 connector (rear)
	Microphone Jack	1 (front)
	Headphone Jack	1 (front)
	Line-In Jack	1 (rear)
	Line-Out Jack	1 (rear)
Storage	Diskette Drive	1.44 MB
	Removable Media	CD-ROM, CD-RW, DVD-ROM, DVD/CD-RW Combo, or DVD+RW
	Hard Drive	40, 80, 160 or 250 GB Ultra ATA (7,200 RPM) 80, 160 or 250 GB Serial ATA (7,200 rpm) 36, 73 or 146 GB Ultra320 SCSI (10,000 rpm) 36 or 74 GB Serial ATA (10,000 rpm) 36 or 73 GB Ultra320 SCSI (15,000 rpm)
	Removable Storage	128 or 256 MB HP Drive Key (USB 2.0)
Graphics *One of the following:*		NVIDIA Quadro NVS 280 (64MB, Dual Display, AGP or PCI) NVIDIA Quadro NVS 400 (64 MB, Quad Display, PCI) NVIDIA Quadro4 380 XGL (64 MB, Dual Display, AGP) ATI FireGL T2-128 (128MB, Dual Display, AGP) NVIDIA Quadro FX1100 (128MB, Dual Display, AGP) NVIDIA Quadro FX3000 (256MB, Dual Display, AGP)
Input Devices		Easy Access keyboard 3-Button Mouse
Audio		AC97/16-bit stereo full-duplex, with internal speaker Sound Blaster Audigy 2 ZS PCI card

Standard Features

Manageability

Bios Features

Advanced Configuration and Power Interface (ACPI) 1.0b
Advanced Power Management (APM) 1.2
Desktop Management Interface (DMI) 2.0
System Management (SM) Bios 2.3.1
Asset Control
Security Management

NIC Hardware

Remote Wakeup
Wake on LAN (WoL)

Web Downloads

System Software Manager
Altiris Express
Insight Agent
Remote ROM Flash
Remote Security
Remote Shut Down

Security

Diskette write and boot control
Flash ROM lock
Keyboard password
Network server mode
Parallel interface control
Power-on password
Serial interface control
Setup password
Cable lock provision

Power Supply

460 watts, with Power Factor Correction

Service and Support

Protected by HP Services including a three-year, limited warranty with three-year parts coverage, three year, on-site service, and three-year labor (in many countries); 7 x 24 hardware technical phone support and on-line support through the Internet; Pre-Failure Warranty coverage of hard drives, memory, and processors.

NOTE: Certain restrictions and exclusions apply. Consult the customer support center for details. Three-year, onsite and labor not available in all countries.

Standard Features Pre-Configured Global Models

X6X/2.4/36S/1/Xd	Processor	Intel Xeon 2.4 GHz
	OS	Microsoft Windows XP Professional
	Cache Memory	512 KB
	Memory	1-GB (2x512) PC2100 DDR SDRAM; 4.2 GB/sec throughput
	Optical Drive	DVD-ROM
	Hard Drive	36-GB Ultra320 SCSI (10,000 rpm)
	Graphics	**Not included in base configuration** – Please Choose a graphics card option below: NVIDIA Quadro NVS 280 NVIDIA Quadro NVS 400 (PCI) NVIDIA Quadro4 380 XGL ATI FireGL T2-128 NVIDIA Quadro FX1100 NVIDIA Quadro FX3000 NOTE: Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP 3-button mouse (PS/2)

X6X/2.4/36S/1/Xd Country Code Key

N. America	DS452AW#ABA	Europe (English, Fr, Ger, It, Dutch, Sp)	DS452AW#AK6
Fr. Canadian	DS452AW#ABC	Switzerland (Eng, It)	DS452AW#ACN
L. America	DS452AW#ABM	Switzerland	DS452AW#AR8
Japan (English)	DS452AW#ACF	Dutch	DS452AW#ABH
Japan (Japanese)	DS452AW#ABJ	Asia/Pacific (English)	DS452AW#AB4
UK	DS452AW#ABU	Korea	DS452AW#AB1
Germany	DS452AW#ABD	China	DS452AW#AB2
France	DS452AW#ABF	Taiwan	DS452AW#AB0
Italy	DS452AW#ABZ	Denmark	DS452AW#ACE
Spain	DS452AW#ABE	Australia/New Zealand	DS452AW#ABG
India	DS452AW#ACI	Thailand	DS452AW#AKL

Standard Features Pre-Configured Global Models

X6X/2.66/36S/1/Xd	Processor	Intel Xeon 2.66 GHz
	OS	Microsoft Windows XP Professional
	Cache Memory	512 KB
	Memory	1-GB (2x512) PC2100 DDR SDRAM; 4.2 GB/sec throughput
	Optical Drive	DVD-ROM
	Hard Drive	36-GB Ultra320 SCSI (10,000 rpm)
	Graphics	**Not included in base configuration** – Please Choose a graphics card option below: NVIDIA Quadro NVS 280 NVIDIA Quadro NVS 400 (PCI) NVIDIA Quadro4 380 XGL ATI FireGL T2-128 NVIDIA Quadro FX1100 NVIDIA Quadro FX3000 NOTE: Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP 3-button mouse (PS/2)

X6X/2.66/36S/1/Xd Country Code Key

N. America	DS730AW#ABA	Europe (English, Fr, Ger, It, Dutch, Sp)	DS452AW#AK6
Fr. Canadian	DS730AW#ABC	Switzerland (Eng, It)	DS730AW#ACN
L. America	DS730AW#ABM	Switzerland	DS730AW#AR8
Japan (English)	DS730AW#ACF	Dutch	DS730AW#ABH
Japan (Japanese)	DS730AW#ABJ	Asia/Pacific (English)	DS730AW#ABH
UK	DS730AW#ABU	Korea	DS730AW#AB1
Germany	DS730AW#ABD	China	DS730AW#AB2
France	DS730AW#ABF	Taiwan	DS730AW#AB0
Italy	DS730AW#ABZ	Denmark	DS730AW#ACE
Spain	DS730AW#ABE	Australia/New Zealand	DS730AW#ABG
India	DS730AW#ACI	Thailand	DS730AW#AKL

Standard Features Pre-Configured Global Models

X6X/2.8/36S/1/Xd	Processor	Intel Xeon 2.8 GHz
	OS	Microsoft Windows XP Professional
	Cache Memory	512 KB
	Memory	1-GB (2x512) PC2100 DDR SDRAM; 4.2 GB/sec throughput
	Optical Drive	DVD-ROM
	Hard Drive	36-GB Ultra320 SCSI (10,000 rpm)
	Graphics	**Not included in base configuration** – Please Choose a graphics card option below: NVIDIA Quadro NVS 280 NVIDIA Quadro NVS 400 (PCI) NVIDIA Quadro4 380 XGL ATI FireGL T2-128 NVIDIA Quadro FX1100 NVIDIA Quadro FX3000 NOTE: Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP 3-button mouse (PS/2)

X6X/2.8/36S/1/Xd Country Code Key

N. America	DS453AW#ABA	Europe (English, Fr, Ger, It, Dutch, Sp)	DS452AW#AK6
Fr. Canadian	DS453AW#ABC	Switzerland (Eng, It)	DS453AW#ACN
L. America	DS453AW#ABM	Switzerland	DS453AW#AR8
Japan (English)	DS453AW#ABJ	Dutch	DS453AW#ABH
Japan (Japanese)	DS453AW#ACF	Asia/Pacific (English)	DS453AW#AB4
UK	DS453AW#ABU	Korea	DS453AW#AB1
Germany	DS453AW#ABD	China	DS453AW#AB2
France	DS453AW#ABF	Taiwan	DS453AW#AB0
Italy	DS453AW#ABZ	Denmark	DS453AW#ACE
Spain	DS453AW#ABE	Australia/New Zealand	DS453AW#ABG
India	DS453AW#ACI	Thailand	DS453AW#AKL

Standard Features Pre-Configured Global Models

X6X/2.8+/40A/1/Xd	Processor	2 - Intel Xeon 2.8 GHz
	OS	Microsoft Windows XP Professional
	Cache Memory	512 KB
	Memory	1-GB (2x512) PC2100 DDR SDRAM; 4.2 GB/sec throughput
	Optical Drive	DVD-ROM
	Hard Drive	40-GB Ultra ATA/100 (7,200 rpm)
	Graphics	**Not included in base configuration** – Please Choose a graphics card option below: NVIDIA Quadro NVS 280 NVIDIA Quadro NVS 400 (PCI) NVIDIA Quadro4 380 XGL ATI FireGL T2-128 NVIDIA Quadro FX1100 NVIDIA Quadro FX3000 NOTE: Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP 3-button mouse (PS/2)

X6X/2.8+/40A/1/Xd Country Code Key

N. America	DS454AW#ABA	Europe (English, Fr, Ger, It, Dutch, Sp)	DS452AW#AK6
Fr. Canadian	DS454AW#ABC	Switzerland (Eng, It)	DS454AW#ACN
L. America	DS454AW#ABM	Switzerland	DS454AW#AR8
Japan (English)	DS454AW#ACF	Dutch	DS454AW#ABH
Japan (Japanese)	DS454AW#ABJ	Asia/Pacific (English)	DS454AW#AB4
UK	DS454AW#ABU	Korea	DS454AW#AB1
Germany	DS454AW#ABD	China	DS454AW#AB2
France	DS454AW#ABF	Taiwan	DS454AW#AB0
Italy	DS454AW#ABZ	Denmark	DS454AW#ACE
Spain	DS454AW#ABE	Australia/New Zealand	DS454AW#ABG
India	DS454AW#ACI	Thailand	DS454AW#AKL

Standard Features Pre-Configured Global Models

X6X/3.0+/40A/1/Xd	Processor	Dual Intel Xeon 3.06 GHz
	OS	Microsoft Windows XP Professional
	Cache Memory	512 KB
	Memory	1-GB (2x512) PC2100 DDR SDRAM; 4.2 GB/sec throughput
	Optical Drive	DVD-ROM
	Hard Drive	40-GB Ultra ATA (7,200 rpm)
	Graphics	**Not included in base configuration** – Please Choose a graphics card option below: NVIDIA Quadro NVS 280 NVIDIA Quadro NVS 400 (PCI) NVIDIA Quadro4 380 XGL ATI FireGL T2-128 NVIDIA Quadro FX1100 NVIDIA Quadro FX3000 NOTE: Please see Part Numbers in After market options/Standalone accessories section.
	Mouse	HP 3-button mouse (PS/2)

X6X/3.0+/40A/1/Xd Country Code Key

N. America	DT495AW#ABA	Europe (English, Fr, Ger, It, Dutch, Sp)	DT495AW#AK6
Fr. Canadian	DT495AW#ABC	Switzerland (Eng, It)	DT495AW#ACN
L. America	DT495AW#ABM	Switzerland	DT495AW#AR8
Japan (English)	DT495AW#ACF	Dutch	DT495AW#ABH
Japan (Japanese)	DT495AW#ABJ	Asia/Pacific (English)	DT495AW#AB4
UK	DT495AW#ABU	Korea	DT495AW#AB1
Germany	DT495AW#ABD	China	DT495AW#AB2
France	DT495AW#ABF	Taiwan	DT495AW#AB0
Italy	DT495AW#ABZ	Denmark	DT495AW#ACE
Spain	DT495AW#ABE	Australia/New Zealand	DT495AW#ABG
India	DT495AW#ACJ	Thailand	DT495AW#AKL

Configure to order options

Processor	Intel Xeon processor 2.4 GHz/533 MHz front side bus, 512 KB L2 cache Intel Xeon processor 2.66 GHz/533 MHz front side bus, 512 KB L2 cache Intel Xeon processor 2.8 GHz/533 MHz front side bus, 512 KB L2 cache Intel Xeon processor 3.06 GHz/533 MHz front side bus, 512 KB L2 cache Intel Xeon processor 3.2 GHz/533 MHz front side bus, 1 MB L3 cache Second Intel Xeon processor 2.4 GHz/533 MHz front side bus, 512 L2 KB cache Second Intel Xeon processor 2.66 GHz/533 MHz front side bus, 512 L2 KB cache Second Intel Xeon processor 2.8 GHz/533 MHz front side bus, 512 L2 KB cache Second Intel Xeon processor 3.06 GHz/533 MHz front side bus, 512 L2 KB cache Second Intel Xeon processor 3.2 GHz/533 MHz front side bus, 1 MB L3 cache NOTE: The second processor must be the same as the first.
Operating System	Microsoft Windows XP Professional SP1a HP Installer Kit for Linux Red Hat Enterprise Linux WS Edition (32-bit Update 2)
Memory	256 MB PC2100 ECC Registered DDR-266 512 MB PC2100 ECC Registered DDR-266 1 GB PC2100 ECC Registered DDR-266 1.5 GB PC2100 ECC Registered DDR-266 2 GB PC2100 ECC Registered DDR-266 3 GB PC2100 ECC Registered DDR-266 4 GB PC2100 ECC Registered DDR-266 6 GB PC 2100 ECC Registered DDR-266 (available for dual-processor Linux systems only) 8 GB PC 2100 ECC Registered DDR-266 (available for dual-processor Linux systems only) NOTE: Microsoft Windows supports 4GB; up to 8GB configurations are supported on Linux only.
Monitors	HP L1925 19-inch TFT Flat Panel Display – Analog/Digital HP L2035 20-inch TFT Flat Panel Display HP L2335 23-inch TFT Widescreen Flat Panel Display HP p1230 22-inch (20.0-inch vis) Performance Natural-flat CRT Monitor
Graphics	NVIDIA Quadro NVS 280 (64MB, Dual Display, AGP) NVIDIA Quadro NVS 280 (64MB, Dual Display, PCI) NVIDIA Quadro NVS 400 (64 MB, Quad Display, PCI) for Windows models only NVIDIA Quadro4 380 XGL (64 MB, Dual Display, AGP) ATI FireGL T2-128 (128MB, Dual Display AGP) NVIDIA Quadro FX1100 (128MB, Dual Display, AGP) NVIDIA Quadro FX3000 (256MB, Dual Display, AGP) for Windows models only

Configure to order options

Optical Drives	48X CD-ROM 48X CD-RW 16X DVD-ROM 48X CD-RW/DVD-ROM combo drive DVD+RW for Windows models only Secondary Optical Drive Cable
Hard Drives	*Ultra320 SCSI Drives* 36 GB Ultra320 SCSI, 10,000 rpm 73 GB Ultra320 SCSI, 10,000 rpm 143 GB Ultra320 SCSI, 10,000 rpm 36 GB Ultra320 SCSI, 15,000 rpm 73 GB Ultra320 SCSI, 15,000 rpm Second 36 GB Ultra320 SCSI, 10,000 rpm Second 73 GB Ultra320 SCSI, 10,000 rpm Second 143 GB Ultra320 SCSI, 10,000 rpm Second 36 GB Ultra320 SCSI, 15,000 rpm Second 73 GB Ultra320 SCSI, 15,000 rpm Third 36 GB Ultra320 SCSI, 10,000 rpm Third 73 GB Ultra320 SCSI, 10,000 rpm Third 143 GB Ultra320 SCSI, 10,000 rpm Third 36 GB Ultra320 SCSI, 15,000 rpm Third 73 GB Ultra320 SCSI, 15,000 rpm *Ultra ATA/100 Drives* 40 GB ATA/100, 7,200 rpm 80 GB ATA/100, 7,200 rpm 160 GB ATA/100, 7,200 rpm 250 GB ATA/100, 7,200 rpm Second 40 GB ATA/100, 7,200 rpm Second 80 GB ATA/100, 7,200 rpm Second 160 GB ATA/100, 7,200 rpm Second 250 GB ATA/100, 7,200 rpm *Serial ATA/100 Drives*

Configure to order options

80 GB SATA/150, 7,200 rpm
160 GB SATA/150, 7,200 rpm
250 GB SATA/150, 7,200 rpm
36 GB SATA/150, 10,000 rpm
74 GB SATA/150, 10,000 rpm

Second 80 GB SATA/150, 7,200 rpm
Second 160 GB SATA/150, 7,200 rpm
Second 250 GB SATA/150, 7,200 rpm
Second 36 GB SATA/150, 10,000 rpm
Second 74 GB SATA/150, 10,000 rpm

Third 80 GB SATA/150, 7,200 rpm
Third 160 GB SATA/150, 7,200 rpm
Third 250 GB SATA/150, 7,200 rpm
Third 36 GB SATA/150, 10,000 rpm
Third 74 GB SATA/150, 10,000 rpm

Removable storage

128 MB HP Drive Key (USB 2.0)
256 MB HP Drive Key (USB 2.0)

Communications

IEEE 1394 Firewire Card
HP Gigabit by Broadcom 10/100/1000 GB NIC Adapter
Intel Pro 1000 MT NIC

Input Devices

HP Easy Access keyboard (PS/2)
No Keyboard Kit
HP Three button mouse (PS/2)
HP Scroll Mouse-Carbon (PS/2)
HP Optical Mouse (USB)
SpaceBall 5000
No Mouse Option

After market options/Standalone accessories

		Part #:
Operating Systems	Red Hat Enterprise Linux WS Edition (32-bit Update 2)	PD862A
2nd Processor	Intel Xeon processor 2.4 GHz, 512 L3 KB cache	AA649B
	Intel Xeon processor 2.66 GHz, 512 L3 KB cache	AA650B
	Intel Xeon processor 2.8 GHz, 512 L3 KB cache	AA651B
	Intel Xeon processor 3.06 GHz, 512 L3 KB cache	AA848B
	Intel Xeon processor 3.06 GHz, 512 KB L2/1 MB L3 cache	DG153B
	Intel Xeon processor 3.2 GHz, 1 MB L3 cache	DP041A
	NOTE: The second processor must be the same as the first.	
Memory (DDR-SDRAM)	128 MB Upgrade Kit PC2100 ECC Registered DDR-266	AA654A
	256 MB Upgrade Kit PC2100 ECC Registered DDR-266	DQ744A
	512 MB Upgrade Kit PC2100 ECC Registered DDR-266	AA656A
	1 GB Upgrade Kit PC2100 ECC Registered DDR-266	AA657A
	2 GB Upgrade Kit PC2100 ECC Registered DDR-266	AA834A
	NOTE: Microsoft Windows supports 4GB; up to 8GB configurations are supported on Linux only.	
Graphics	NVIDIA Quadro NVS 280 (64 MB, Dual Display, PCI)	AA932A
	NVIDIA Quadro NVS 280 (64 MB, Dual Display, AGP)	AA931A
	DVI LFH-59 Cable Kit	DL139A
	NVIDIA Quadro NVS 400 (64 MB, Quad Display, PCI for Windows models only)	AA605A
	NVIDIA Quadro NVS 400 DVI Cables	AA606A
	NVIDIA Quadro4 380 XGL (64 MB, Dual Display, AGP)	AA653A
	ATI FireGL T2-128 (128 MB, Dual Display AGP)	AA929A
	NVIDIA Quadro FX1100 (128 MB, Dual Display, AGP)	DL489A
	NVIDIA Quadro FX3000 (256 MB, Dual Display AGP for Windows models only)	DL488B
Optical Drives	48X CD-ROM	DC143B
	48X/24X/48X CD-RW	DE205A
	16X DVD-ROM	AA620A
	48X CDRW/DVD-ROM combo drive (with Roxio and WinDVD SW)	DE206A
	8X DVD+RW – 400i for Windows models only	DS703A
	8X DVD+RW – 400i for Linux models only	DT839A

After market options/Standalone accessories

Hard Drives	*Ultra320 SCSI Drives*	
	36 GB Ultra320 SCSI, 10,000 rpm	AA612A
	73 GB Ultra320 SCSI, 10,000 rpm	AA613A
	146 GB Ultra320 SCSI, 10,000 rpm	AA614A
	36 GB Ultra320 SCSI, 15,000 rpm	AA616A
	73 GB Ultra320 SCSI, 15,000 rpm	AA617A
	Ultra ATA/100 Drives	
	40 GB ATA/100, 7,200 rpm	DC180A
	80 GB ATA/100, 7,200 rpm	DC181A
	160 GB ATA/100, 7,200 rpm	DC189A
	250 GB Ultra ATA/100, 7,200 rpm	DC516A
	Serial ATA Drives (Windows only)	
	80 GB SATA, 7,200 rpm	DE705A
	160 GB SATA, 7,200 rpm	DE706A
	250 GB SATA, 7,200 rpm	DS702A
	36 GB SATA, 10,000 rpm	DU962A
	74 GB SATA, 10,000 rpm	DX760A
Storage Controllers	Ultra320 Dual Channel SCSI Controller Card (PCI)) cable sold separately	AA611A
	Ultra160 SCSI Controller Card (PCI)) cable sold separately	AA610A
	Adaptec SCSI RAID 2120S Card	AA850A
	4-channel Serial ATA (SATA) RAID PCI Controller (A power cable is needed for every 2 drives. Power cords sold separately.)	DM294A
	Cable, 3 part SCSI	DY661A
	Cable, SATA power (1 required for every 2 SATA drives)	DN733A
Backup Devices	HP DAT24i Internal DDS3 tape drive	C1555D
	HP DAT24e External DDS3 tape drive	C1556D
	HP DAT40i Internal DDS4 tape drive	C5686B
	HP DAT40e External DDS4 tape drive	C5687C
	HP DAT72i Internal DAT72 tape drive	Q1522A
	HP DAT72e External DAT72 tape drive	Q1523A
Removable Storage	128 MB HP Drive Key (USB 2.0)	DQ819B
	256 MB HP Drive Key (USB 2.0)	DL973B
Communications	IEEE 1394 Firewire Card	AA638A
	Broadcom GB NIC	DC194A
	Intel Pro 1000 MT NIC	DC193A

After market options/Standalone accessories

Rack Options	Fixed shelf kit	253449-B21
	Sliding Shelf Kit	234672-B21
	Depth Adjustable Rails	332558-B21
Input Devices	HP Easy Access Keyboard (carbonite PS/2)	DC167B
	HP Three button Mouse (carbon – PS/2)	AA778A
	HP Scroll Mouse – (carbon – PS/2)DD440BUSB Optical Mouse (carbon/silver)	AA852A
	USB Two button Optical Mouse (carbonite/silver)	DC172B
Support Software CD	Annual Subscription	272505-001S
	Single CD-ROM (current month)	272505-001
Other	Expansion kit	AA857A
	Remote Workstation Sender Software Module	DM497A
	Remote Workstation Receiver Software Module	DM498A
	Sound Blaster Audigy 2 ZS	DV440A

		Part # Europe/ Asia-Pacific	Part # Americas/ Japan
Monitors	HP L1925 19-inch TFT Flat Panel Display – Analog/Digital	P9626A	P9626A
	HP L2035 20-inch TFT Flat Panel Display	P9614A	P9614A
	HP L2335 23-inch TFT Widescreen Flat Panel Display	P9615A#XXX	P9615A#XXX
	HP p1230 22-inch (20.0-inch vis) Performance Natural-flat CRT Monitor	P9613A	P9613A#ABA (NA only)

NOTE: AssetControl features are accessible with HP workstations featuring Intelligent Manageability.

Memory

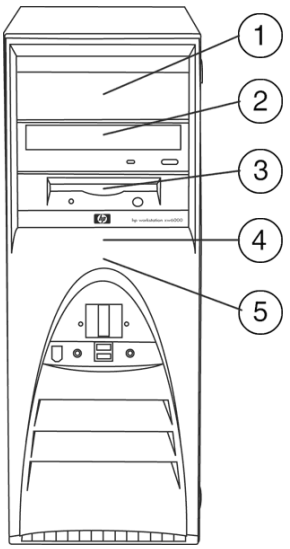
Standard Memory

This system supports 266 MHz DDR SDRAM that is both ECC and Registered* The main board has 4 DIMM slots and ships with either 512-MB or 1-GB as standard, depending on model. It can support a maximum of 8-GB** of RAM when optional memory upgrades are included. Memory must be installed in like pairs.
*The HP Workstation xw6000 does not support the memory modules for the HP Workstation xw4000, which uses a different type of RAM.
**Capacities over 4-GB not supported under Windows XP or Windows 2000

NOTE: This Chart does not represent all possible memory configurations.

Here are memory options available from HP:	*Part #:*
• 128-MB Memory Module Upgrade Kit PC2100 DDR-266 ECC Registered	AA654A
• 256-MB Memory Module Upgrade Kit PC2100 DDR-266 ECC Registered	DQ744A
• 512-MB Memory Module Upgrade Kit PC2100 DDR-266 ECC Registered	AA656A
• 1-GB Memory Module Upgrade Kit PC2100 DDR-266 ECC Registered	AA657A
• 2-GB Memory Module Upgrade Kit PC2100 DDR-266 ECC Registered	AA834A

Drive Bay Locations



Drive Support

	Quantity Supported	Position Supported	Controller
1.44-MB Diskette Drive	Up to 1	1, 2, 3	Integrated
Optical Drives	Up to 2 total		
CD-ROM Drive		1, 2	Integrated Ultra ATA/100
DVD-ROM Drive		1, 2	Integrated Ultra ATA/100
CD-RW Drive		1, 2	Integrated Ultra ATA/100
DVD+RW		1	Integrated Ultra ATA/100
Combo CD-RW/DVD-ROM		1, 2	Integrated Ultra ATA/100

Storage

Hard Drives

Ultra320 SCSI Drives			
1-inch	Up to 3	1, 2, 4, 5	Integrated dual-channel Ultra320 SCSI Controller
36-GB Ultra320 SCSI (10K rpm) 72-GB Ultra320 SCSI (10K rpm) 146-GB Ultra320 SCSI (10K rpm) 36-GB Ultra320 SCSI (15K rpm) 73-GB Ultra320 SCSI (15K rpm)			
Ultra ATA Drives			
1-inch	Up to 2	1, 2, 4, 5	Integrated Ultra ATA/100 Controller
40-GB (7200 rpm) 80-GB (7200 rpm) 160-GB (7200 rpm) 250-GB (7200 rpm)			
Serial ATA Drives			
(Windows or Linux models only)	Up to 3	1, 2, 4, 5	4-channel Serial ATA (SATA) RAID PCI Controller
80-GB (7200 rpm) 160-GB (7200 rpm) 250-GB (7200 rpm) 36-GB (10,000 rpm) 74-GB (10,000 rpm)			

Maximum Storage Capacity

Internal	438-GB SCSI 500-GB Ultra ATA 750-GB Serial ATA

Base Workstation	System Characteristics	Processor	Intel Xeon
		CPU Bus Speed Supported	533 MHz front side bus
		Standard Cache	512 KB integrated, full speed Level 2 1 MB integrated, full speed Level 3 cache with 3.2GHz model processors only Upgradeable to dual processors
		Intel E7505 chipset	Yes
	Expansion Options	Memory Expansion Slots	4 DIMMs
		Memory Type Supported	DDR-266 ECC Memory
		Maximum Memory	4 GB on Windows models 8 GB on Linux models
	Expansion Slots	I/O (Total)	5 total slots/4 available
		PCI - 32-bit/33 MHz	4 slots/4 available
		AGP Pro50, 8X	1 slot occupied by choice of graphics card
	Expansion Bays	(Total/Available)	5 total/2 available
		Internal 3.5 inch	2 bays/1 available
		External 5.25 inch	3 bays/1 available (1 can be used for third HDD with mounting kit)
	Interfaces	Parallel	1 25-pin port, rear
		USB 2.0	4 (2 front, 2 rear)
		IEEE Firewire	Optional - 3 (1 front, 2 rear)
		Serial	Two 9-pin connectors (rear)
		Ultra320 SCSI	Two 68-pin connectors (1 rear, 1 internal)
		Ultra ATA/100	2 connectors, primary and secondary (internal)
		Keyboard	1 PS/2 keyboard port (rear)
		Pointing Device	1 PS/2 mouse port (rear)
		Video	Choice of professional graphics options
		Network interface	1 RJ-45 connector (rear)
		Microphone Jack	1 (front)
		Headphone Jack	1 (front)
		Line-In Jack	1 (rear)
		Line-Out Jack	1 (rear)

Technical Specifications

System Unit	Tower Dimensions (HxWxD)	17.65 x 6.6 x 17.61 in (44.8 x 17 x 44.7 cm)	
	Weight (standard configuration)	26 lb (2 kg)	
	Power Supply	Input current	8.6A @ 115 VAC 4.3A @ 230 VAC
		Line Frequency	50 Hz to 60 Hz
		Maximum Rated Power	720 W input, 460 W output
	Temperature (Values are subject to change)	Operating	50° to 95° F (10° to 35° C)
		Non-operating	4° to 140° F (-15° to 60° C)
	Humidity (non-condensing) (Values are subject to change)	Operating	20% to 80%
		Non-operating	10% to 90%
	Maximum Altitude (nonpressurized)	Operating	10,000 ft (3,048 m)
		Non-operating	30,000 ft (9,144 m)

HP Easy Access Keyboard	**Dimensions** (HxWxD)	18.3 x 6.3 x 1.4 in (46.48 x 16.0 x 3.56 cm)	
	Weight	Approximately 2 lb (0.9 kg)	
	Input Specifications	Operating Voltage	+ 5VDC ± 5%
		Power Consumption	50 mA maximum (with 3 LEDs on)
		System Interface	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
	Mechanical	Languages	30+ available
		Keycaps	Low-profile design
		Switch Actuation	55 g nominal peak force with tactile feedback
		Switch Life	20 million keystrokes (using Hasco modified tester)
		Switch Type	Contamination resistant membrane
		Key Leveling Mechanism	For all double wide and greater length keys
		Cable Length	6 ft (1.8 m)
		PC98-99	Mechanically compliant
		Acoustics	50 dBA maximum sound pressure level
	Environmental	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
1.44-MB Diskette Drive	Size	3.5 in (8.89 cm)	
	LED Indicators (front panel)	Green	
	Read/Write Capacity per Diskette (high/low)	1.44 MB/720 KB	
	Drive Height	One-third	
	Drive Rotation	300 rpm	
	Transfer Rate (high/low)	500/250 KB/s	
	Bytes/Sector	512	
	Sectors/Track (high/low)	18/9	
	Tracks/Side (high/low)	80/80	
	Access Times	Track-to-Track (high/low)	3/6 ms
		Average (high/low)	94/173 ms
		Settling Time	15 ms
		Latency Average	100 ms
	Cylinders (high/low)	80/80	
	Read/Write Heads	Two	
HP 3-Button Mouse	Dimensions/Weight	Height	1.42 in (3.6 cm)
		Length	4.17 in (10.7 cm)
		Width	2.87 in (7.4 cm)
		Weight	5.20 oz (150 g)
	Environmental	Operating Temperature	32° to 104° F (0° to 40° C)
		Non-operating Temperature	-4° to 140° F (-20° to 60° C)
		Operating Humidity	10% to 90% (non condensing at ambient)
	Mechanical	Resolution	400 ± 20% DPI
		Tracking Speed	10 in/s Maximum
		Switch Life	1,000,000 operations (using Hasco modified tester)
		Switch Type	Micro-switches
		Tracking Mechanism Life	155 miles (250 km) at average speed of 10 in/s
		Cable Length	6 ft (1.8 m)
		PC98-99	Mechanically compliant
	Regulatory Approvals	Compliant	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick

Technical Specifications

HP Optical Mouse	Dimensions/Weight	Height	1.5 in (3.8 cm)
		Length	4.5 in (11.6 cm)
		Width	2.5 in (6.3 cm)
		Weight	0.27 lb (0.12 kg)
	Optical Scan	800 dpi scan rate	
	Number of Buttons	2	
HP 2-Button Scroll Mouse	Scroll Wheel	8 mm	
	Maximum Rotation Speed	30 mm/s	
	Switch Type	Light force micro-switch	
	Switch Life	1 million operations	
	Mechanical Life	Minimum 200,000 revolutions	
	Environmental	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
	Electrical	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
	Mechanical	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
	Regulatory Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C -Tick	

Technical Specifications

4-channel Serial ATA (SATA) RAID PCI Controller

Dimensions (H x D)	2.375 x 5.5 in (6 x 14 cm)
RAID level	RAID 0+1 striping/mirroring; RAID 1 mirroring; RAID 0 striping
Data Transfer Rate	Up to 266MB/sec (66 MHz PCI); Up to 133MB/sec (33 MHz PCI)
Cache Memory	64 MB (onboard)
Device Support	Up to (4) Serial ATA/150 Drives
Bus Type	32-bit 33/66MHz PCI bus; PCI 2.3 compliant
BIOS	Optimizes drive performance by drive type; flashable for future upgrades; supports multiple arrays; boots system from any array; BBS compliant; setup menus for custom array creation
48-bit LBA Support	Recognizes drive capacities exceeding 137GB each
Data Protection Features	Mirrors data to second drive or drive pair for RAID 1 and RAID 0+1; offers hot spare support for instant rebuild of failed drive in 2-drive RAID 1
Advanced Data Features	Bus mastering offloads data I/O handling from host CPU; CRC error-checking of Serial ATA and Ultra ATA drives for data reliability during transfers; tagged command queuing and elevator seek for optimized data handling
ACPI Support	S1, S3, & S4
Internal Connectors	4 standard 7-pin SATA connectors
External Connectors	None
System Requirements	Intel PC or equivalent with available PCI slot
Operating Temperature	32° F to 131° F (0° C to 55° C)
Power Requirements	4 amps @ +5V
Operating System Support	Windows 2000 Professional, Windows XP Professional and RedHat Linux
Other	Optimized disk utilization Monitors status of arrays, hard drives, and controller via TCP/IP Synchronizes data in fault-tolerant arrays Email notification for specified array events S.M.A.R.T. support

NOTE: A power cable is needed for every 2 drives. Power cords sold separately.

Technical Specifications

Adaptec SCSI RAID 2120S Card	Dimensions (H x D)	2.5 x 6.6 in (6.4 x 16.8 cm) Low profile card	
	RAID Level	0, 1, 10, 5, JBOD	
	Data Transfer Rate	Up to 320 MB/s	
	Cache Memory	64 MB (onboard)	
	Device Support	Up to 15 SCSI devices	
	Bus Type	64-bit/66MHz PCI (Also support 32-bit/33MHz PCI)	
	Internal Connectors	One 68-pin high-density	
	External Connectors	One 68-pin VHDCI	
	System Requirements	Intel PC or equivalent with available PCI slot	
	Operating Temperature	32°to 131° F (0°to 55° C)	
	Power Requirements	4 amps @ +5V	
	Operating System Support	Windows 2000 Professional, Windows XP Professional	
	Other	Optimized disk utilization Online RAID Level Migration Online capacity expansion Immediate RAID availability (background initialization) S.M.A.R.T. support	
SpaceBall 5000	Features	Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw)	
	Ball Diameter	2.2 in (5.6 cm)	
	Dimensions/Weight	Height	3.0 in (7.6 cm)
		Length	6.0 in (15.2 cm)
		Width	8.4 in (21.3 cm)
		Weight	2.1 lb (9.94 kg)
	Environmental	Operating Temperature	50° to 104° F (10° to 40° C)
		Non-operating Temperature	43° to 140° F (6° to 60° C)
		Operating Humidity	8% to 80% (non-condensing at ambient)
		Non-operating Humidity	5% to 80% (non-condensing at ambient)
	Mechanical	Force range	0.5 - 8.2N (1.8 – 29.5 oz)
		Torque range	0.085 – 0.33 oz-in. (6.91 Nmm)
		Resolution	10 bits
	Serial Specifications	Connector	9-pin D-subminiature receptacle (DB9S)
		Cable Length	12.8 ft. (3.9 m)
		Data rate	9600 bps
		Flow control	Xon/Xoff
	Regulatory Approvals	Compliant	UL, cUL, EN 950, EN 60950, CSA, FCC, CE Mark, TUV, CISPR 22, EN 50082, IEC 1000 4-2, IEC 1000-4-3, AS/NZS, VCCI, BSMI, C-Tick
Ultra ATA Hard Drives	40 GB, 4200rpm	Capacity	40 GB

	Height	1.0 in (2.54 cm)	
	Width	2.75 in (8.9 cm)	
	Interface	Ultra ATA/100	
	Synchronous Transfer Rate (Maximum)	100 MB/s	
	Seek time (typical reads, including settling)	Single track	3 ms
		Average	13 ms
		Full-stroke	24.0 ms
	Rotational speed	4200 rpm	
	Logical blocks	78,140,160	
	Operating temperature	41° F to 131° F (5° C to 55° C)	
	Average rotational latency	4.2 ms	
80 GB, 7200rpm	**Capacity**	80 GB	
	Height	1.0 in (2.54 cm)	
	Width	3.5 in (8.9 cm)	
	Interface	Ultra ATA/100	
	Synchronous Transfer Rate (Maximum)	100 MB/s	
	Seek time (typical reads, including settling)	Single track	0.8 ms
		Average	9.0 ms
		Full-stroke	17.0 ms
	Rotational speed	7200 rpm	
	Logical blocks	156,301,488	
	Operating temperature	41° F to 131° F (5° C to 55° C)	
	Average rotational latency	4.2 ms	
160 GB, 7200rpm	**Capacity**	160 MB	
	Height	1.0 in (2.54 cm)	
	Width	3.5 in (8.9 cm)	
	Interface	Ultra ATA/100	
	Synchronous Transfer Rate (Maximum)	100 MB/s	
	Seek time (typical reads, including settling)	Single track	0.8 ms
		Average	< 9.1 ms
		Full-stroke	17.0 ms
	Rotational speed	7200 rpm	
	Logical blocks	320,173,056	
	Operating temperature	41° F to 131° F (5° C to 55° C)	
	Average rotational latency	4.2 ms	

	250 GB, 7200rpm	Capacity	250 GB	
		Height	1.0 in (2.54 cm)	
		Width	3.5 in (8.9 cm)	
		Interface	Ultra ATA/100	
		Synchronous Transfer Rate (Maximum)	100 MB/s	
		Seek time (typical reads, including settling)	Single track	0.8 ms
			Average	9.0 ms
			Full-stroke	17.0 ms
		Rotational speed	7200 rpm	
		Logical blocks	488,397,168	
		Operating temperature	41° F to 131° F (5° C to 55° C)	
Ultra320 SCSI Hard Drives	36 GB, 10K rpm	Capacity	36,400 MB	
		Height	1.0 in (2.54 cm)	
		Width	3.5 in (8.9 cm)	
		Interface	Ultra320 SCSI	
		Transfer rate synchronous (maximum)	320 MB/s	
		Seek time (typical reads, including settling)	Single track	0.6 ms
			Average	4.5 ms
			Full-stroke	11.0 ms
		Rotational speed	10,000 rpm	
		Logical blocks	71,631,920	
		Operating temperature	41° F to 131° F (5° C to 55° C)	
	73 GB, 10K rpm	Capacity	73,000 MB	
		Height	1.0 in (2.54 cm)	
		Width	3.5 in (8.9 cm)	
		Interface	Ultra320 SCSI	
		Transfer rate synchronous (maximum)	320 MB/s	
		Seek time (typical reads, including settling)	Single track	0.55 ms
			Average	4.9 ms
			Full-stroke	9.2 ms
		Rotational speed	10,000 rpm	
		Logical blocks	143,374,744	
		Operating temperature	41° F to 131° F (5° C to 55° C)	

	146 GB, 10K rpm	**Capacity**	146,000 MB	
		Height	1.0 in (2.54 cm)	
		Width	3.5 in (8.9 cm)	
		Interface	Ultra320 SCSI	
		Transfer rate synchronous (maximum)	320 MB/s	
		Seek time (typical reads, including settling)	Single track	0.55 ms
			Average	4.9 ms
			Full-stroke	9.2 ms
		Rotational speed	10,000 rpm	
		Logical blocks	143,374,744	
		Operating temperature	41° F to 131° F (5° C to 55° C)	
	73 GB, 15K rpm	**Capacity**	73,000 MB	
		Height	1.0 in (2.54 cm)	
		Width	3.5 in (8.9 cm)	
		Interface	Ultra320 SCSI	
		Transfer rate synchronous (maximum)	320 MB/s	
		Seek time (typical reads, including settling)	Single track	0.4 ms
			Average	3.8 ms
			Full-stroke	6.7 ms
		Rotational speed	15,000 rpm	
		Logical blocks	143,337,744	
		Operating temperature	41° F to 131° F (5° C to 55° C)	
Serial ATA Hard Drives (Windows or Linux models only)	80 GB, 7200rpm	**Capacity**	85,899,345,920 bytes	
		Height	1.0 in (2.54 cm)	
		Width	3.5 in (8.9 cm)	
		Interface	SATA	
		Synchronous Transfer Rate (Maximum)	150 MB/s	
		Buffer	8 MB	
		Seek time (typical reads, includes controller overhead, including settling)	Single track	0.9 ms
			Average	9.3 ms
			Full-stroke	9.2 ms
		Rotational speed	7,200 rpm	
		Logical blocks	160,086,528	
		Operating temperature	41° to 131° F (5° to 55° C)	

160 GB, 7200rpm	Capacity	171,798,691,840 bytes	
	Height	1.0 in (2.54 cm)	
	Width	4 in (10.2 cm)	
	Interface	SATA	
	Synchronous Transfer Rate (Maximum)	150 MB/s	
	Buffer	8 MB	
	Seek time (typical reads, includes controller overhead, including settling)	Single track	0.9 ms
		Average	9.3 ms
		Full-stroke	9.2 ms
	Rotational speed	7,200 rpm	
	Logical blocks	320,173,056	
	Operating temperature	41° to 131° F (5° to 55° C)	
250 GB, 7200rpm	Capacity	250,000,000,000 bytes	
	Height	1 in (2.6 cm)	
	Width	Media diameter: 3.5 in (8.9.x cm)	
		Physical size: 4 in (10.2 cm)	
	Interface	SATA	
	Synchronous Transfer Rate (Maximum)	150 MB/s	
	Buffer	8 MB	
	Seek time (typical reads, includes controller overhead, including settling)	Single track	0.8 ms
		Average	<9.0 ms
		Full-stroke	≤17.0 ms
	Rotational speed	7,200 rpm	
	Logical blocks	490,234,752	
	Operating temperature	41° to 131° F (5° to 55° C)	
36 GB, 10K rpm	Capacity	37,019,566,080 bytes	
	Height	1.028 in (2.54 mm)	
	Width	Media diameter: 3.3 in (84mm)	
		Physical size: 4 in (10.2 cm)	
	Interface	ESATA	
	Synchronous Transfer Rate (Maximum)	150 MB/s	
	Buffer	8 MB	
	Seek time (typical reads, includes controller overhead, including settling)	Single track	0.3 ms
		Average	5.2 ms
		Full-stroke	9.5 ms
	Rotational speed	10,000 rpm	
	Logical blocks	72,303,840	
	Operating temperature	41° to 131° F (5° to 55° C)	

74 GB, 10K rpm	Capacity	74,355,769,344 bytes	
	Height	1.028 in (2.54 mm)	
	Width	Media diameter: 3.3 in (84mm)	
		Physical size: 4 in (10.2 cm)	
	Interface	ESATA	
	Synchronous Transfer Rate (Maximum)	150 MB/s	
	Buffer	8 MB	
	Seek time (typical reads, includes controller overhead, including settling)	Single track	0.3 ms
		Average	4.5 ms
		Full-stroke	10.2 ms
	Rotational speed	10,000 rpm	
	Logical blocks	145,226,112	
	Operating temperature	41° to 131° F (5 to 55° C)	

48X CD-ROM Drive	Capacity	700 MB CD disc	
	Dimensions (HxWxD)	1.63 x 5.83 x 7.27 in (4.13 x 14.6 x 18.5 cm)	
	Weight	1.76 lb (0.8 kg)	
	Interface	ATAPI/EIDE	
	Mounting Orientation	Horizontal or vertical	
	Data Transfer Rates - Read	Digital audio extraction (minimum) -1,200 KB/s (8X) CD read - up to 7,200 KB/s (48X)	
	Media and Formats - Read	Formats: CD-DA, CD-ROM (Mode 1 and 2), CD-XA Ready, Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (FMV), CD Plus, CD-Extra; Media: stamped, CD-R, CD-RW	
	Data Transfer Modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 0 (16.7 MB/s); UltraDMA Mode 2 (33.3 MB/s)	
	Access Times (typical)	Random	< 75 ms @ 48x
		Full-Stroke	< 150 ms
	Start-up Time (typical)	< 7 s (single session)	< 30 s (multisession)
	Stop Time (typical)	< 4 s	
	Read Buffer size	128 KB (minimum)	
	Audio Output	Line-Out	0.7 VRMS
		Signal-to-Noise Ratio	80 dB
		Channel Separation	65 dB
	Configuration Jumper Block	Master, slave, and cable select modes	
	Operating Conditions	Temperature	41° to 122° F (5° to 50° C)
		Humidity	10% to 80%
	Approvals/Environmental	UL 1950 (US and Canada), CSA, SEMKO, TUV; CE, FDA, FCC, IC, C-TICK	
	Operating Systems Supported	Microsoft Windows 2000 and Microsoft Windows XP	

	Supplied Software	None	
16X/40 DVD-ROM Read	Height	5.25-inch, half-height	
	Interface type	ATAPI	
	Dimensions–External, Excluding Bezel (W x H)	5.88 x 1.71 in (14.9 x 4.34 cm)	
	Disc diameter	5 in, 3 in (12 cm, 8 cm)	
	Disc thickness	0.05 inch (1.2 mm)	
	Track pitch	1.6 µm (CD), 0.74 µm (DVD)	
	Disc center hole diameter	0.6 inch (15 mm)	
	Disc formats	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/RW multi-border; DVD+RW; 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	
	Disc capacity	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)
		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)
	Block size (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	
	Access times (typical reads, including settling)	DVD-ROM single layer	< 120 ms
		CD-ROM Mode 1	< 90 ms
		Full stroke DVD	< 240 ms (seek)
		Full stroke CD	< 160 ms (seek)
	Data transfer rates	2600 – 6000 KB/s (40X CAV CD-ROM mode) 8100 – 21,600 KB/s (16X CAV DVD-ROM mode)	
	Data transfer modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)	
	Power	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
	Audio Output Level	0.7 Vrms (typical)	
	Configuration Jumper Block	Master, slave, and cable select modes	
	Data interface connector	40-pin, shrouded and keyed, flat ribbon	
	Environmental (all conditions non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
		Relative humidity (operating)	10% to 85%
		Maximum wet bulb temperature (operating)	86° F (30° C)

	Certifications, approvals	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, CSA C22.2 60950-2000
	Operating systems supported	Microsoft Windows 2000, Windows XP Professional

48/24/48X CD-RW	**Capacity**	700 MB CD disc	
	Dimensions (HxWxD)	1.63 x 5.75 x 7.27 in (4.13 x 14.6 x 18.5 cm)	
	Weight	2.0 lb (0.9 kg)	
	Interface	ATAPI/EIDE	
	Mounting Orientation	Horizontal or vertical	
	Data Transfer Rates – Read	Digital audio extraction (minimum) —1,800 KB/s (12X) CD read — up to 7,200 KB/s (48X) DVD read — up to 21,600 KB/s (16X)	
	Media and Formats - Read	**Formats**: CD-DA, CD-ROM (Mode 1 and 2), CD-ROM XA (Mode 2, Form 1 and 2), Mixed Mode, CD-Plus, CD-Extra, CD-I FMV, Video CD, CD-Text, Photo CD (single and multisession); **Media**: stamped, CD-R, CD-RW	
	Data Transfer Rates - Write	CD-R write — 1200 KB/s (8X) CD-R write — 1800 KB/s (12X) CD-R write — 2400 KB/s (16X) CD-R write — 3000 KB/s (20X) to 6000 KB/s (40X) CD-R write — 7200 KB/s (48X) CD-RW write — 600 KB/s (4X) CD-RW write —1500 KB/s (10X) CD-RW write — 2400 KB/s (16X) CD-RW write —3600 KB/s (24X)	
	Media and Formats - Write	**Formats**: CD-DA, CD-ROM (Mode 1 and 2), CD-ROM XA (Mode 2, Form 1 and 2), Mixed Mode, CD-Plus, CD-Extra, CD-I FMV, Video CD, CD-Text; **Media**: CD-R, CD-RW (including ultra-speed)	
	Write Methods	Disc-at-once, session-at-once,, track-at-once, incremental fixed and variable packet, multisession	
	Data Transfer Modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 2 (33.3 MB/s)	
	Access Times (typical reads, including settling)	CD-ROM Mode 1	100 ms
		Full Stroke CD	160 ms (seek)
	Start-up Time (typical)	<4 s (single session), <30 s (multisession)	
	Stop Time (typical)	<3 s	
	Write Buffer Size	2 MB	
	Audio Output	Line-Out	0.7 VRMS
		Signal-to-Noise Ratio	80 dB
		Channel Separation	70 dB
	Configuration Jumper Block	Master, slave, and cable select modes	
	Operating Conditions	Temperature	41° to 113° F (5° to 45° C)
		Humidity	10% to 80%

	Approvals/ Environmental	MPC-3 compliant, multi-read requirements, UL 1950, 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, DHHS/FDA, EMKO-TSE 07/94, TUV, EN60825-1
	Operating Systems Supported	Microsoft Windows 2000, Windows XP
	Supplied software	Roxio Easy CD Creator 5.3.4: Create or copy CDs and DVDs, including music and data CDs, and data DVDs; Dantz Retrospect Express 6.0: Back up systems to CD, DVD, or tape media.
48/24/48+16X Combo CD-RW/DVD-ROM	Capacity	4.7 and 9.4 GB DVD disc/700 MB CD disc
	Dimensions (HxWxD)	1.63 x 5.75 x 7.27 in (4.13 x 14.6 x 18.5 cm)
	Weight	2.0 lb (0.9 kg)
	Interface	ATAPI/EIDE
	Mounting Orientation	Horizontal or vertical
	Data Transfer Rates – Read	Digital audio extraction (minimum) —1,200 KB/s (8X) CD read — up to 7,200 KB/s (48X) DVD read — up to 21,600 KB/s (16X)
	Media and Formats - Read	CD Formats: CD-DA, CD-ROM (Modes 1 and 2), CD-ROM XA (Mode 2, Form 1 and 2), Mixed mode, CD-Extra, CD-I FMV, Video CD, Photo CD (single and multi-session), CD-Text, CD-Plus CD Media: stamped, CD-R; CD-RW DVD Formats: DVD-ROM, DVD-Video (with application support), DVD-R (version 1.0 and 2.0), DVD-RW (version 1.0 and 1.1), DVD-R multi-border DVD Media: stamped (single or dual layer, single sided), DVD+ RW, DVD+ R, DVD-R, DVD-RW
	Data Transfer Rates - Write	CD-R write — 600 KB/s (4X) CD-R write — 1200 KB/s (8X) CD-R write — 1800 KB/s (12X) CD-R write — 2400 KB/s (16X) CD-R write — 3600 KB/s (24X) CD-R write — 4800 KB/s (32X) CD-R write — 6000 KB/s (40X) CD-R write — 7200 KB/s (48X) CD-RW write — 600 KB/s (4X) CD-RW write —1500 KB/s (10X) CD-RW write — 2400 KB/s (16X) CD-RW write —3600 KB/s (24X)
	Media and Formats - Write	CD Formats: CD-DA, CD-ROM (Mode 1), CD-ROM XA (Mode 2, Form 1 and 2), Mixed mode, CD-Extra, CD-I FMV, Video CD, CD-Plus CD Media: CD-R; CD-RW
	Write Methods	Disc-at-once, session-at-once, track-at-once, incremental fixed and variable packet, multisession
	Data Transfer Modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 2 (33.3 MB/s)

Access Times (typical reads, including settling)	DVD-ROM Single Layer Random	120 ms
	CD-ROM Mode 1	110 ms
	Full Stroke DVD	210 ms
	Full Stroke CD	160 ms
Start-up Time (typical)	<4 seconds (single session), <30 seconds (multisession)	
Stop Time (typical)	4 s	
Write Buffer Size	2 MB (minimum)	
Audio Output	Line-Out	0.7 VRMS
	Signal-to-Noise Ratio	74 dB
	Channel Separation	65 dB
Configuration Jumper Block	Master, slave, and cable select modes	
Operating Conditions	Temperature	41° to 122° F (5° to 50° C)
	Humidity	10% to 85%
Approvals/ Environmental	MPC-3 compliant, multi-read requirements, UL 1950, 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, DHHS/FDA, EMKO-TSE 07/94, TUV, EN60825-1	
Operating Systems Supported	Microsoft Windows 2000, Windows XP	
Supplied software	Intervideo WInDVD 4.0: Play DVD movies; Roxio Easy CD Creator 5.3.4: Create or copy CDs and DVDs, including music and data CDs, and data DVDs; Dantz Retrospect Express 6.0: Back up systems to CD, DVD, or tape media.	

HP 8X DVD+RW – 400I (8X/4X/12X/24X/ 10X/40X DVD+R/+RW)	**Capacity**	4.7 GB 5.25-inch	
	Orientation	Either horizontal or vertical	
	Interface Type	ATAPI	
	Dimensions (W x H x D)	8.0 x 5.9 x 1.7 in (20.3 x 15.0 x 4.4 cm) half-height, tray-load	
	Track Pitch	1.6 um (CD), 0.74 um (DVD)	
	Reference Scanning Velocity	1.2 m/s (CD); 3.49 m/s (DVD SL); 3.84 m/s (DVD DL)	
	Recording Method	Disc-at-once, Track-at-once, and Session-at-once; Variable Packet and Fixed Packet	
	Write Support	DVD+R, DVD+RW, CD-R, CD-RW	
	Read Support	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)	
	Write Speed	**DVD+R**	8X CLV (10800 KB/s)
		DVD+RW	4X CLV (5400 KB/s)
		CD-R	24X CLV (3600 KB/s)
		CD-RW	10X CLV (1500 KB/s)

	Read Speed	DVD-ROM	12X CAV (6750 - 16200 KB/s)
		DVD+R, DVD+RW, DVD-R, DVD-RW	8X CAV (5400 - 10800 KB/s)
		CD-ROM, CD-R, CD-RW, CD-Audio	40X CAV (2550 to 6000 KB/s)
	Date Buffer	Read	2 MB
		Write	2 MB
	Access Time (typical reads, including settling)	Random DVD	< 140 ms (typical)
		Random CD	< 125 ms, (typical)
		Full Stroke DVD	< 250 ms (seek)
		Full Stroke CD	< 210 ms (seek)
	Operating Systems Support	Microsoft® Windows® XP Professional	
	Power Requirement	5 V, +12 V (1.6A, 1.4A)	
	Front Panel Features	Disc loading tray, forced eject hole read/write indicator, eject button	
	Rear Panel Features	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 connec	
	Regulatory Approvals	UL, CSA, CB Report, FIMKO, SEMKO, FCC Class B, FDA, CE Marking, C-Tick, CISPR-229, Korean EMC, Taiwan EMC	
	Option Kit contents	DVD+R/+RW Drive, InterVideo WinDVD, InterVideo WinDVD Creator, Roxio Easy CD Creator, Dantz Retrospect Express Backup Software and DVD+R media.	
Broadcom GB NIC	Connector	RJ-45	
	Controller	Broadcom 5782 PCI LAN Controller	
	Memory	Integrated 96Kb frame buffer memory	
	Data rates supported	10/100/1000 Mbps	
	Compliance	IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
	Bus architecture	PCI 2.2	
	Data path width	32-bit, 33/66 MHz bus interface	
	Data transfer mode	Bus-master DMA	
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
	Power requirement	1.48 watts @ +3.3V AUX supply with 5V tolerance	
	Boot ROM support	Yes	
	Network transfer rate	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	
	Environmental	Operating temperature	32° to 131° F (0° to 55° C)
		Operating humidity	85% at 131° F (55° C)

	Dimensions	4.7 x 2.0 x 0.08 inches (12 x 5 x 1.9 cm)
	Operating system driver support	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility
	Alerting	ASF 1.0
	Kit contents	Broadcom 5782, CD, Broadcom Gigabit Ethernet for HP, drivers, quick install guide, product warranty statement
NVIDIA Quadro NVS 280 Graphics Card	2D controller	Integrated Quadro 280 2-D graphics processor unit (GPU)
	VGA controller	Integrated into the Quadro GPU
	Bus type	AGP 8X
	RAMDAC	Dual 350 MHz
	Memory speed and type	200 MHz 8M x16 DDR
	Memory amount	64 MB
	Texture Memory	Unified with frame buffer
	Form Factor	ATX
	Controller clock speed	275 MHz
	Color planes	32-bit color buffer
	Overlay planes	1 16-bit Video overlay plane
	Maximum vertical refresh rate	120 Hz
	Maximum pixel clock	350 MHz
	Dual Screen support	Yes
	Single DVI Support	Yes
	Dual DVI Support	Yes
	Operating systems	Microsoft Windows 2000: Full native Dual View mode, Span or Big Desktop mode, and Clone mode Microsoft Windows XP: Full native Dual View mode, Span or Big Desktop mode, and Clone mode
	Physical dimensions	2.586 x 6.6 in (6.57 x 16.76 cm)
	High-definition Video Processor (HDVP)	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

Technical Specifications

NVIDIA Quadro NVS 280 Graphics Card display resolutions & refresh rates

Analog Resolution	Maximum Colors Supported	Maximum Refresh Rate
640 x 480	16.7 M	240 Hz
800 x 600	16.7 M	240 Hz
1024 x 768	16.7 M	200 Hz
1152 x 864	16.7 M	170 Hz
1280 x 1024	16.7 M	150 Hz
1600 x 1200	16.7 M	100 Hz
1920 x 1080	16.7 M	85 Hz
1920 x 1200	16.7 M	85 Hz
1920 x 1440	16.7 M	75 Hz
2048 x 1536	16.7 M	60 Hz
Digital Resolution Maximum	**Colors Supported Maximum**	**Refresh Rate**
640 x 480	16.7 M	75 Hz
800 x 600	16.7 M	75 Hz
1024 x 768	16.7 M	75 Hz
1152 x 864	16.7 M	60 Hz
1280 x 1024	16.7 M	60 Hz
1600 x 1200	16.7 M	60 Hz (primary only)

NVIDIA Quadro NVS 400 Graphics Card

Form Factor	ATX
Graphics Controller	Integrated Quadro4 2D/3D 128-bit graphics processor unit (GPU)
Bus Type	PCI
RAMDAC	Dual 350 MHz
Memory	64 MB 220 MHz, 4mx 32 DDR per GPU, 32 MB per GPU unified frame buffer
Connectors	Dual LFH-60
Dimensions	Low-profile form factor
Multi-monitor support	1 to 4 displays with nView – with two cards (1 PCI per card), up to 8 monitors can be driven
nView Hardware Architecture	32-bit color 2048x1536 @ 75Hz maximum resolution Dual 350MHz RAMDACs Integrated TMDS Digital Vibrance Control (DVC) High-performance 2D rendering engine Optimized for 32-, 24-, 16-, 15- and 8-bpp modes
High-definition video processor (HDVP)	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
Supported graphics APIs	Fully compliant with OpenGL 1.3 and DirectX 8.1
Available graphics drivers	Microsoft Windows XP and Microsoft Windows 2000, Linux See: http://www.hp.com/support/workstation_drivers/

NVIDIA Quadro NVS 400 Graphics Card display resolutions & refresh rates

	Single CRT display	
Resolution	Maximum Refresh Rate	Bits per Pixel
640 x 480	120 Hz	8, 16, 24
800 x 600	120 Hz	8, 16, 24
1024 x 768	120 Hz	8, 16, 24
1152 x 864	120 Hz	8, 16, 24
1280 x 1024	120 Hz	8, 16, 24
1600 x 1200	100 Hz	8, 16
1600 x 1200	85 Hz	8, 16, 24
1920 x 1080	100 Hz	8, 16
1920 x 1080	75 Hz	8, 16, 24
1920 x 1200	85 Hz	8, 16
1920 x 1200	70 Hz	8, 16, 24
1920 x 1440	75 Hz	8, 16
1920 x 1440	60 Hz	8, 16, 24
2048 x 1536	60 Hz	8, 16

NVIDIA Quadro4 380 XGL Graphics Card

Form Factor	ATX
Graphics Controller	NVIDIA NV18GL GPU
Bus Type	AGP 8x Version 3.0 compliant AGP 4x/2x Version 2.0 compliant
RAMDAC	Dual 350MHz integrated
Memory	64 MB DDR SDRAM unified frame buffer, Z-buffer and Texture storage
Connectors	VGA DB-15 and DVI-I analog/digital monitor outputs, 4-pin mini DIN providing TV output
Dimensions	AGP full height ATX card. 4.25 x 6.875 in (10.795 x 17.463 cm)
Multi-monitor support	Dual monitor
Additional product features	64 MB DDR SDRAM unified frame buffer, Z-buffer and Texture storage 128 KB BIOS 3.3V Flash ROM reprogrammable by SW Hardware Overlay Planes Hardware two-sided lighting Hardware accelerated antialiased points and lines TV Output Diamond exit rule line rasterization for improved line quality 3D Texture support Occlusion Culling Compliant with Microsoft/Intel PC2001 Workstation requirements Video Timings compliant with VESA DMT 1.0 and VESA GTF 1.0 specifications DDC2B+ Monitor support for Windows 2000 and Windows XP ACPI Version 1.0b Power Management support (all modes)
AGP 8x Version 3.0 compliant and 2x/4x Version 2.0 compliant including	Sideband Addressing AGP Texturing (Execute Mode) Fast writes support

NV18GL GPU featuring:	275 MHz engine clock rate 250 MHz memory clock rate 128-bit memory interface VGA controller Dual integrated display controllers supporting up to 1920x1440 @ 85Hz and 2048x1536 @ 75Hz on both displays 4 parallel pixel pipelines 2 parallel geometry engines nfiniteFX II programmable vertex shader technology and NVIDIA OpenGL extensions Full hardware support for NVIDIA Cg shader programming language
Supported graphics APIs	OpenGL 1.3 (and OpenGL 2.0 when available) ICD with immediate mode support for all OGL primitive types DirectX 8 and above
Available graphics drivers	HP-tested Windows 2000, HP-tested Windows XP, HP-tested Linux (1st Calendar Quarter 2003) HP qualified drivers may be preloaded or available from the HP support Web site: http://www.hp.com/support/workstation_drivers/

NVIDIA Quadro4 380 XGL Graphics Card display resolutions & refresh rates

	Monitor 1, 2 Analog/Digital	
Resolution	Maximum Refresh Rate	Bits per Pixel
640x480	240Hz/240Hz	8, 16, 24
800x600	240Hz/200Hz	8, 16, 24
1024x768	170Hz/140Hz	8, 16, 24
1152x864	170Hz/100Hz	8, 16, 24
1280x720	150Hz/120Hz	8, 16, 24
1280x960	150Hz/85Hz	8, 16, 24
1280x1024	150Hz/75Hz	8, 16, 24
1600x900	120Hz/75Hz/ No Digital Display Support	8, 16, 24
1600x1024	100Hz/72Hz/ No Digital Display Support	8, 16, 24
1600x1200	120Hz/60Hz/ No Digital Display Support	8, 16
1600x1200	100Hz/60Hz/ No Digital Display Support	24
1920x1080	100Hz/ No Digital Display Support	8, 16
1920x1080	85Hz/ No Digital Display Support	24
1920x1200	100Hz/ No Digital Display Support	8, 16
1920x1200	85Hz/ No Digital Display Support	24
1920x1440	85Hz/ No Digital Display Support	8, 16
1920x1440	75Hz/ No Digital Display Support	24

	2048x1536	75Hz/ No Digital Display Support	8, 16
	2048x1536	60Hz/ No Digital Display Support	24

ATI FireGL T2-128 Graphics Card	Form Factor	ATX
	Graphics Controller	ATI FGL 9600 VPU
	Bus Type	AGP-8x/4x compliant
	DAC	Dual 400MHz/16-bit
	Memory	128 MB DDR SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	DVI-I and VGA monitor outputs
	Dimensions	Single AGP/ATX card. 230.28 mm x 107.96 mm
	Multi-monitor support	DVI-I and VGA connectors support dual display, maximum resolution of 2048x1536 analog, 1600x1200 digital
	Additional product features	128 MB DDR SDRAM unified frame buffer, Z-buffer and Texture storage 64-KB BIOS Serial Flash ROM, reprogrammable by SW, 3.3V only, no Jumpers 2D and 3D acceleration provided for 16-bit and 32-bit RGB? modes Hardware cursor with full color alpha channel 32-bit (24+8-bit stencil) Z buffer Bus mastering support for 2D/3D display lists and local memory vertex list execution Hardware lighting support for 8 light sources Bilinear, Trilinear and Anisotropic texturing Cubic Environment and Perturbation Bump Mapping Projective Texture, 3D Texture and Video Texture support Full Scene Anti-Aliasing (FSAA) support with up to 6 subsamples Video Engine supports YCrCb (4:2:2, 4:1:0, 4:2:0) to RGB conversion Video scaling and up to 4x4 tap filtering supported for all YUV and RGB16/32 formats Per pixel quad buffering on all screen resolutions VESA compliant Stereoscopic Interface on MiniDin Connector Compliant with Microsoft/Intel PC2001 Workstation requirements Video Timings compliant with VESA DMT 1.0 and VESA GTF 1.0 specifications DDC2B+ Monitor support on all OS platforms ACPI Version 1.0b Power Management support (all modes)
	AGP4x/8x Version 3.0 compliant including	Sideband Addressing AGP Texturing (Execute Mode) AGP Read and AGP Write Support 8X Fast write support

FGL 9600 GPU featuring	VGA controller supporting full standard feature set 2D Engine with 128-bit datapath processing multiple pixels per clock PIXEL TAPESTRY III, 3D rendering engine utilizing 2 parallel pipelines with two texture blending units each capable, of handling up to 8 texels in a single pass, delivering 2.4 Gigatexels/s fill rate CHARISMA ENGINE III, geometry unit utilizing 4 vertex processing engines, capable of executing two instructions per clock cycle each, thus yielding up to 200 million transformed, clipped and lit triangles per second. VIDEO IMMERSION III, industry leading video technology supporting MPEG 2 encode/decode Dual independent display controllers with 4K x 4K address space each 128-bit external frame buffer interface
Supported graphics APIs	OpenGL 1.3 ICD with immediate mode support for all OGL primitive types DirectX 9.0
Processor requirements	Intel Pentium 4, or Xeon processor
Available graphics drivers	Windows 2000 with SP1 (or higher) Windows XP Linux HP qualified drivers may be preloaded or available from the HP support Web site: http://www.hp.com/support/workstation_drivers

ATI FireGL T2-128 Graphics Card display resolutions & refresh rates

ANALOG and DIGITAL Display WITH 15-PIN VGA CONNECTOR

Resolution	Maximum Refresh Rate	Bits per Pixel
640x480	100Hz	16, 32
800x600	100Hz	16, 32
1024x768	100Hz	16, 32
1152x864	100Hz	16, 32
1280x960	100Hz	16, 32
1280x1024	100Hz	16, 32
1600x1000	100Hz	16, 32
1600x1024	85Hz	16, 32
1600x1200	85Hz	16, 32
1792x1344	75Hz	16, 32
1920x1080	75Hz	16, 32
1920x1200	75Hz	16, 32
2048x1536	60Hz	16, 32

DIGITAL MONITOR WITH DVI CONNECTOR

Resolution	Maximum Refresh Rate	Bits per Pixel
640x480	75Hz	16, 32
800x600	75Hz	16, 32
1024x768	75Hz	16, 32
1152x864	75Hz	16, 32
1280x1024	75Hz	16, 32
1600x1000	60Hz	16, 32
1600x1024	60Hz	16, 32
1600x1200	60Hz	16, 32

NVIDIA Quadro FX1100 Graphics Card	Form Factor	ATX
	Graphics Controller	NVIDIA NV36GL GPU
	Bus Type	AGP 8X Version 3.0 compliant
	RAMDAC	Dual 400 MHz integrated
	Memory	128 MB 650MHz DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage
	Connectors	2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
	Multi-monitor support	Dual integrated analog display controllers supporting up to 2048 x1536 @ 85Hz on both displays Dual external digital display controllers supporting up to 1600 x 1200 @ 60Hz on both displays
	Additional product features	128 MB DDR2 SDRAM unified frame buffer, Z-buffer and Texture storage 128 KB BIOS 3.3V Flash ROM reprogrammable by SW Hardware Overlay Planes Hardware two-sided lighting Hardware accelerated antialiased points and lines Quad-buffered Stereo Diamond exit rule line rasterization for improved line quality 3D Texture support Occlusion Culling Compliant with Microsoft®/Intel® PC2001 Workstation requirements Video Timings compliant with VESA DMT 1.0 and VESA GTF 1.0 specifications DDC2B+ Monitor support on all OS platforms ACPI Version 1.0b Power Management support (all modes)
	AGP1x/2x/4x/8x Version 3.0 compliant including	Sideband Addressing AGP Texturing (Execute Mode) Fast writes support
	NV35GL GPU featuring	425 MHz engine clock rate 325 MHz memory clock rate 128-bit memory interface VGA controller 128-bit precision throughout the graphics pipeline 12 bit sub-pixel precision nfiniteFX II programmable vertex and pixel shader technology
	Supported graphics APIs	OpenGL 2.0 ICD with immediate mode support for all OGL primitive types DirectX 8,9
	Available graphics drivers	Microsoft: Windows® XP, Windows 2000 HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html

NVIDIA Quadro FX 1100 Graphics Card display resolutions & refresh rates

	Monitor 1, 2 Analog/Digital	
Resolution	Maximum Refresh Rate	Bits per Pixel
640x480	240Hz/240Hz	8, 16, 32
800x600	240Hz/200Hz	8, 16, 32
1024x768	200Hz/140Hz	8, 16, 32
1152x864	170Hz/100Hz	8, 16, 32
1280x720	150Hz/120Hz	8, 16, 32
1280x960	150Hz/85Hz	8, 16, 32
1280x1024	150Hz/85Hz	8, 16, 32
1600x900	120Hz/75Hz	8, 16, 32
1600x1024	100Hz/72Hz	8, 16, 32
1600x1200	120Hz/60Hz	8, 16
1600x1200	100Hz/60Hz	32
1920x1080	100Hz/na	8, 16
1920x1080	85Hz/na	32
1920x1200	100Hz/na	8, 16
1920x1200	85Hz/na	32
1920x1440	85Hz/na	8,16, 32
2048x1536	85Hz/na	8, 16, 32

NVIDIA Quadro FX3000 Graphics Card

Form Factor	ATX
Graphics Controller	NVIDIA NV35GL GPU
Bus Type	AGP 8X Version 3.0 compliant
RAMDAC	Dual 400MHz integrated
Memory	256 MB DDR SDRAM unified frame buffer, Z-buffer and Texture storage
Connectors	2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output
Dimensions	AGP full height ATX card. 4.25 x 6.875 in (10.795 x 17.463 cm)
Multi-monitor support	Dual integrated display controllers supporting up to 2048x1536 @ 85Hz on both displays

Additional product features	256 MB DDR SDRAM unified frame buffer, Z-buffer and Texture storage 128 KB BIOS 3.3V Flash ROM reprogrammable by SW Hardware Overlay Planes Hardware two-sided lighting Hardware accelerated antialiased points and lines Quad-buffered Stereo Diamond exit rule line rasterization for improved line quality 3D Texture support 12-bit subpixel precision 128-bit precision graphics pipeline Occlusion Culling Dual Link DVI on one output enabling driving digital displays up to 2048x1536 Compliant with Microsoft/Intel PC2001 Workstation requirements Video Timings compliant with VESA DMT 1.0 and VESA GTF 1.0 specifications DDC2B+ Monitor support on all OS platforms ACPI Version 1.0b Power Management support (all modes)
AGP8xVersion 3.0 compliant including	Sideband Addressing AGP Texturing (Execute Mode) Fast write support
NV35GL GPU featuring	400 MHz engine clock rate 425 MHz memory clock rate 256-bit memory interface VGA controller 8 parallel pixel pipelines 3 parallel geometry engines nfiniteFX II programmable dual Vertex Shader and Pixel Shader technology
Supported graphics APIs	OpenGL 1.5 ICD with immediate mode support for all OGL primitive types DirectX 9
Available graphics drivers	Windows 2000 Windows XP HP-tested Linux HP qualified drivers may be preloaded or available from the HP support Web site: See: http://www.hp.com/support/workstation_drivers/

NVIDIA Quadro FX 3000 Graphics Card display resolutions & refresh rates

	Monitor 1, 2 Analog/Digital	
Resolution	Maximum Refresh Rate	Bits per Pixel
640x480	240Hz/240Hz	8, 16, 32
800x600	240Hz/200Hz	8, 16, 32
1024x768	200Hz/140Hz	8, 16, 32
1152x864	170Hz/100Hz	8, 16, 32
1280x720	150Hz/120Hz	8, 16, 32
1280x960	150Hz/85Hz	8, 16, 32
1280x1024	150Hz/85Hz	8, 16, 32
1600x900	120Hz/75Hz	8, 16, 32
1600x1024	100Hz/72Hz	8, 16, 32
1600x1200	120Hz/60Hz	8, 16
1600x1200	100Hz/60Hz	32
1920x1080	100Hz/60Hz in Dual Link Mode	8, 16
1920x1080	85Hz/60Hz in Dual Link Mode	32
1920x1200	100Hz/60Hz in Dual Link Mode	8, 16
1920x1200	85Hz/60Hz in Dual Link Mode	32
1920x1440	85Hz/60Hz in Dual Link Mode	8,16, 32
2048x1536	85Hz/60Hz in Dual Link Mode	8, 16, 32
3840x1200	21Hz/24Hz	8, 16, 32
3840x2400	13Hz	8, 16, 32

Sound Blaster Audigy 2 ZS PCI card

Audio Quality	Sound Blaster 24-bit ADVANCED HD Quality
Signal to Noise Ratio (SNR)	108dB
Max. Audio Resolution Playback	24-bit/192kHz in Stereo 24-bit/96kHz in 5.1 DVD-Audio Quality
Max. Recording/ Sampling Rate	24-bit/96kHz
DACs	24-bit/192kHz
Max. No. of 3D Voices	64
Max. Channels in 3D Positional Audio	7.1
EAX® and EAX® ADVANCED HD™	Yes including Hardware Acceleration of EAX and/or EAX ADVANCED HD
Connectors	PCI 2.1 or higher compliant slot Analog Speakers Support for Headphone, 2.1, 4.1, 5.1, 6.1, 7.1 Digital Speakers Support for Headphone, 2.1, 4.1, 5.1 and 24-bit/96kHz speakers One High Speed FireWire® port

Additional product features	Music Playback/ Music Creation	Integrated Digital Music Player
		Integrated Digital Music Ripping (in Player) - MP3 & WMA
		True Bit Accurate Recording w/o SRC
		Advanced Resolution DVD-Audio Playback
		EAX® Music Enhancements
		EAX Effects
		CMSS 3D Up mixing of Stereo to Multi-Channels
		Audio Clean-up
		Smart Volume Management (SVM)
		Karaoke
		Multi-Channel Graphic Equalizer
		Bass Boost
		Virtual Surround over 2 Channel or Headphones
		Full Support for Windows® Media 9 24-bit/96kHz 5.1 content
		ASIO Low Latency Multi-Track Recording Support (16-bit/48kHz)
		ASIO 2.0 Direct Monitoring
	Movies	THX Certification
		THX Setup Console
		Dolby Digital 5.1 Playback
		Dolby Digital EX 6.1 Playback
		DTS-ES 6.1 Playback
	Gaming	EAX
		EAX ADVANCED HD
		Hardware Acceleration of EAX &/or EAX ADVANCED HD
		Up to 64 3D Voices
		7.1 Max. Channels in 3D Positional Audio
		Speaker Calibration for Optimal 3D Positional Audio
Minimum system requirements	System RAM	128MB
	Hard disk	600MB free space Additional 4GB free space (Disk Type: ATA-100, 7,200rpm) for DVD movies, games and internet radio.
	Operating System	Windows XP SP1

	Additional requirements for DVD movies, games and internet radio	Graphics card	DirectX® 9 and OpenGL® compliant 3D accelerator with at least 16MB of texture RAM
		Soft-DVD player	Intervideo's WinDVD® 2000 or CyberLink's PowerDVD® 3.0 and above recommended
		DVD drive	2nd generation 6X DVD-ROM drive or later with DMA support for DVD Movie and Audio playback
		Internet radio	56kbps modem or faster and an active Internet connection
HP L1925 19-inch TFT Flat Panel Monitor	Panel	Type	Thin film transistor (TFT)
		Viewable Image Area (diagonal)	19 in (48.25 cm) maximum viewable
		Screen Opening (WxH)	14.9 x 11.9 in (37.8 x 30.3 cm)
		Viewing Angle (typical)	170 degrees horizontal/170 degrees vertical (10:1 minimum contrast ratio)
		Brightness (typical)	Up to 250 nits (cd/m^2)
		Contrast Ratio (typical)	Up to 500:1 (typical)
		Response Rate (typical)	<20 ms (typical rise + fall)
		Pixel Pitch	0.294 mm
		Color Depth Support	16.7 million colors
	Video Input	Plug and Play	Yes (supports VESA DDC2B; PC2001 compliant)
		Input Signal	Two connectors: one 15-pin mini D-sub analog VGA; and one DVI-I (VGA analog or digital)
		Input Impedance	75 ohms ± 2%
		Sync Input	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green
		Video Cable	VGA and DVI-D
		Video Cable Length	78 in (2.0 m)
	Signal Interface/ Performance	Horizontal Frequency	30 to 82 kHz
		Vertical Frequency	56 to 75 Hz
		Graphics Controller	Pixelworks 131
		Native Resolution	1280x1024@75Hz analog 1280x 1024@60Hz digital
		Maximum Resolution (Analog)	1280x1024@75Hz analog
		Maximum Resolution (Digital)	1280x1024@75Hz analog

On Screen Display (OSD) Controls	Preset VESA Graphic Modes (non-interlaced)	640 x 480 @ 60 Hz, 72 Hz, 75 Hz 800 x 600 @ 60 Hz, 72 Hz, 75 Hz 1024 x 768 @ 60 Hz, 75 Hz 1280 x 1024 @ 60 Hz, 75 Hz
	Preset MAC Mode	832 x 624 @ 75 Hz 1152 x 870 @75 Hz
	Preset VGA Mode	640 x 480 @ 60 Hz, 72 Hz
	Preset SUN Mode	1152x900@66Hz
	Fail Safe Mode	Yes (limits out of range signal messages)
	Maximum Pixel Clock Speed	140 MHz
	User Programmable Modes	Yes, 10
	Anti-Glare	Yes
	Anti-Static	Yes
	AssetControl	Yes (accessible on HP/Compaq desktops featuring Intelligent Manageability)
	Default Color Temperature	Yes (6500k, 9300k, Custom User)
	Buttons or Switches	Power on/off; 4-button OSD; second level OSD buttons include auto adjust and dual-input switch
	Languages	English, Spanish, French, German, Dutch, Italian
	User Controls	Size and Positioning Contrast Brightness Clock, Clock Phase Selectable Color Temperature Input Selection Factory Reset Individual Color Contrast Full-screen Resolution
Power	Power Supply	Auto-ranging, 90 to 265 VAC; internal power supply, 47.5-63 Hz
	Input Power	100 ~ 240 VAC
	Nominal Current	1.5 A maximum
	Frequency	50 ~ 60 Hz
	Average	33 watts when displaying standard office software
	Maximum	< 40 watts
	Power Saving	< 2 watts
	Off Mode	< 1 watts (switch off)
	Power Cable Length	70 in (1.8 m); non-captive

Mechanical	Dimensions (H x W x D)	Unpacked w/ stand minimum height	14.8 x 16.4 x 8.2 in (39.8 x 41.6 x 20.8 cm)
		Unpacked w/ stand maximum height	20 x 16.4 x 8.2 in (50.8 x 41.6 x 20.8 cm)
		Base Area (Footprint d x w)	8.2 x 12.2 in (20.8 x 30.9 cm)
		Panel only (w/o stand) (h x w x d)	13.5 x 16.4 x 2.6 in (34.2 x 41.6 x 6.6 cm)
		Packaged	26.0 x 26.0 x 26.0 in (66.0 x 66.0 x 66.0 cm)
	Weight	Unpacked w/ stand	17.6 lb (8 kg)
		Unpacked w/o stand	12 lb (5.5 kg)
		Packaged	23.5 l (10.7 kg)
	Tilt Range	-5° to +20°	
	Swivel Range	± 45° horizontal swivel	
	Height Adjustable	Yes (4.3 in/110 mm adjustment range)	
	Pivot Rotation	Yes, 90 °	
	Base	Ships attached and is removable after installation	
Environmental	Temperature – Operating	41° to 95° F (5° to 35° C)	
	Temperature – Non-operating	-4° to 140° F (-20° to 60° C)	
	Humidity – Operating	20% to 80%	
	Humidity – Non-operating	5% to 95%	
	Altitude – Operating	0 to 13,000 ft (0 to 4,000 m)	
	Altitude – Non-operating	0 to 40,000 ft (0 to 12,192 m)	
Options	PC Comm Station	Communication/audio hub that includes two stereo speakers (8 PMPO each), integrated microphone/dual function headset (phone and PC support), and USB port. Optional, part number 304251-008 (US) or P8814A (EMEA).	
Other	Accessories Included	VGA cable, DVI-D cable, user CD-ROM with Portrait software	
	User Guide Languages	English	
	Warranty Languages	English	
	Color	Carbon/Silver	
	VESA Mounting	Yes (swing arm/ wall mount not included; base is shipped attached and must be removed for mounting options)	
	VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)	
	Kensington Lock-ready	Yes	

	Certification and Compliance	Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 9241-3,7,8 VDT Guidelines, ISO 13406-2 Compliant (Pixel Defect Guidelines), Mexican NOM Approval, MIC Requirements (New Zealand), MPR-II Compliant, Nordic Approvals (Nemko, Fimko, Demko, Semko), PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Windows Certification
	Compatibility	VESA Video Signal Standard (VSIS) Compliant video cards have been tested and proven compatible for use with the HP Flat Panel Monitor L1925. The HP L1925 has been tested for use with Compaq Evo PCs and Thin Clients and Compaq D315 Business PCs. NOTE: Features are subject to change without notice.
	Service and Warranty	Limited three-year parts and repair labor, service provider labor, and on-site service. Next Business Day advanced exchange direct replacement service available during warranty period. Certain restrictions and exclusions apply. For details, contact HP Customer Support at 970-635-1000 (USA) or 905-206-4663 (Canada).

HP L2035 20-inch TFT Flat Panel Monitor	Panel	Type	20-inch Active Matrix TFT (thin film transistor)
		Viewable Image Area (diagonal)	20.1 in (51 cm)
		Screen Opening (W x H)	16.2 x 12.17 in (41.1 x 30.9 cm)
		Viewing Angle (typical)*	Up to 170° H/170° V (10:1 minimum contrast ratio)
		Brightness (typical*	Up to 250 nits (cd/m^2)
		Contrast Ratio (typical)*	Up to 400:1
		Response Rate (typical)*	16 ms (typical, rise + fall)
		Pixel Pitch	0.255 mm
		Color Depth Support	16.7 million colors
		*All specifications are provided by the component manufacturers. Performance specifications represent the highest specification of all HP's component manufacturers' typical level specifications for performance. Actual performance may vary either higher or lower.	
	On Screen Display (OSD) Controls	Buttons or Switches	PiP (Picture in Picture), Input select, auto adjust, OSD up, OSD down, OSD menu select, power
		Languages	English, French, German, Spanish, Italian
		User Controls	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset

Signal Interface/ Performance	Horizontal Frequency	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
	Vertical Frequency	48 to 85 Hz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
	Graphics Controller	Pixelworks PW171
	Native Resolution	1600 x 1200 @ 60 Hz (recommended)
	Preset VESA Graphic Modes (non-interlaced)	1600 x 1200 @ 60 Hz, 75 Hz (VGA input) 1280 x 1024 @ 60 Hz, 75 Hz, 85 Hz 1280 x 960 @ 60 Hz 1152 x 900 @ 66 Hz 1024 x 768 @ 60 Hz, 75 Hz, 85 Hz 800 x 600 @ 60 Hz, 85 Hz 640 x 480 @ 60 Hz, 75 Hz, 85 Hz
	Text Mode	720 x 400 @ 70 Hz
	Mac Mode	1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz
	Sun Mode	1152 x 900 @ 66 Hz
	Maximum Pixel Clock Speed	202 MHz (VGA input); 162 MHz (DVI input)
	User Programmable Modes	Yes, 10
	Anti-Glare	Yes
	Anti-Static	Yes
	Default Color Temperature	6500 K
Video Input	Plug and Play	Yes
	Input Signal	Four connectors, including one 15-pin mini D-sub VGA, one DVI-I (VGA analog and digital input), one composite video, and one s-video
	Input Impedance	75 ohms ± 10%
	Sync Input	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green
	Video Cable	VGA to VGA; VGA to DVI-I; DVI-D to DVI-I
	Video Cable Length	5.9 ft (1.8 m)
Power	Input Power	Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz
	Frequency	47.5 to 63 Hz
	Maximum	< 75 watts
	Power Saving	< 5 watts
	Power Cable Length	5.9 ft (1.8 m)

Mechanical	Dimensions (H x W x D)	Unpacked w/stand	17.36 to 20.9 x 17.8 x 8.27 in (44.1 to 53.1 x 45.2 x 21.0 cm)
		Unpacked w/o stand (head only)	14.29 x 17.8 x 3.19 in (36.3 x 45.2 x 8.1 cm)
		Packaged	11.5 x 21.9 x 23.9 in (29.2 x 55.6 x 60.6 cm)
	Weight	Unpacked	With stand: 20.28 lb (9.2 kg); Without stand: 12.35 lb (5.6 kg)
		Packaged	26.9 lb (12.2 kg)
	Tilt Range	-5° to + 25° vertical	
	Swivel Range	-35° to + 35°	
	Height Adjustable	Yes, range 3.54 in (9.0 cm)	
	Pivot Rotation	Yes	
	Base	Attached	
Environmental	Temperature – Operating	46° to 95° F (10° to 35° C)	
	Temperature – Non-operating	6° to 140° F (-10° to 60° C)	
	Humidity – Operating	20% to 80% non-condensing	
	Humidity – Non-operating	5% to 85%	
	Altitude – Operating	+12,000 ft	
	Altitude – Non-operating	+40,000 ft	
Options	HP Desktop Access Center	Sold separately, the HP Desktop Access Center features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions; part number DK985A. For more information, refer to the HP Desktop Access Center QuickSpecs.	

	Other	Accessories Included	VGA to VGA cable – connects the graphic card's VGA analog connector to the monitor's input #1 (VGA analog) connector VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector DVI-D to DVI-I cable – connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector
		User Guide Languages	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
		Warranty Languages	English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese
		Color	Carbonite/Silver
		VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)
		Kensington Lock-Ready	Yes
	Certification and Compliance	Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 9241-3,7,8 VDT Guidelines, ISO 13406-2 Pixel Defect Guidelines, Mexican NOM Approval, MIC Requirements (New Zealand), MPR-II Compliant, Nordic Approvals (Nemko, Fimko, Demko, Semko), PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Windows Certification (Microsoft® Windows® 98, Microsoft Windows 2000, and Microsoft Windows XP)	
	Compatibility	Compatible with platforms using the VESA standard video modes and HP Compaq Business Desktops d500, d300, and d200 Series, Compaq Evo Desktops, and HP Business Desktops d300 series.	
	Service and Warranty	Limited three years parts, labor, and on-site service, including backlight. Availability varies by region. Certain restrictions and exclusions apply. Consult HP Customer Service for details.	
HP L2335 23-inch TFT Widescreen Flat Panel Display	Panel	Type	23-inch Active Matrix TFT (thin film transistor)
		Viewable Image Area (diagonal)	23 in (58.4 cm)
		Screen Opening (W x H)	19.53 x 12.24 in (49.6 x 31.1 cm)
		Viewing Angle (typical)*	Up to 170° H/170° V (10:1 minimum contrast ratio)
		Brightness (typical)*	Up to 250 nits (cd/m^2)
		Contrast Ratio (typical)*	Up to 350:1
		Response Rate (typical)*	25 ms (typical, rise + fall)

	Pixel Pitch	0.258 mm
	Color Depth Support	16.7 million colors
	* All specifications are provided by the component manufacturers. Performance specifications represent the highest specification of all HP's component manufacturers' typical level specifications for performance. Actual performance may vary either higher or lower.	
On Screen Display (OSD) Controls	Buttons or Switches	PiP (Picture in Picture), Input Select, Auto Adjust, OSD Up, OSD Down, OSD Menu Select, Power
	Languages	English, French, German, Spanish, Italian
	User Controls	Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset
Signal Interface/ Performance	Horizontal Frequency	30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz)
	Vertical Frequency	48 to 85 Hz (VGA and DVI input)
	Graphics Controller	Pixelworks PW172
	Native Resolution	1920 x 1200 @ 60 Hz (recommended)
	Preset VESA Graphic Modes (non-interlaced)	1920 x 1200 @ 60Hz 1600 x 1200 @ 60 Hz, 75 Hz 1280 x 1024 @ 60 Hz, 75Hz, 85 Hz 1280 x 960 @ 60 Hz 1152 x 900 @ 66 Hz 1024 x 768 @ 60 Hz, 75 Hz, 85 Hz 800 x 600 @ 60 Hz, 75Hz 640 x 480 @ 60 Hz, 75 Hz
	Text Mode	720 x 400 @ 70 Hz
	Mac Mode	1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz
	Sun Mode	1152 x 900 @ 66 Hz
	Maximum Pixel Clock Speed	202 MHz (VGA input); 162 MHz (DVI input)
	User Programmable Modes	Yes, 10
	Anti-Glare	Yes
	Anti-Static	Yes
	Default Color Temperature	6500 K

Video Input	Plug and Play	Yes	
	Input Signal	Five connectors, including one 15-pin mini D-sub VGA, one DVI-I (VGA analog and digital input), one composite video, one s-video, component video	
	Input Impedance	75 ohms ± 10%	
	Sync Input	Separate sync (HSYNC/VSYNC); composite sync, Sync on Green	
	Video Cable	VGA to VGA; VGA to DVI-I; DVI-D to DVI-I	
	Video Cable Length	5.9 ft (1.8 m)	
Power	Input Power	Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz	
	Frequency	47.5 to 63 Hz	
	Maximum	< 100 watts	
	Power Saving	< 5 watts	
	Power Cable Length	5.9 ft (1.8 m)	
Mechanical	Dimensions (H x W x D)	Unpacked	17.36 to 20.90 x 21.46 x 8.27 in (44.1 to 53.1 x 54.5 x 21.0 cm)
		Unpacked w/o stand (head only)	14.57 x 21.46 x 3.35 in (37.0 x 54.5 x 8.5 cm)
	Weight	Unpacked	22.27 lb (10.1 kg)
		Packaged	30.87 lb (14.0 kg)
	Tilt Range	-5° to + 25° vertical	
	Swivel Range	-35° to + 35°	
	Height Adjustable	Yes, range 3.54 in (9.0 cm)	
	Pivot Rotation	Yes	
	Base	Attached	
Environmental	Temperature – Operating	46° to 95° F (10° to 35° C)	
	Temperature – Non-operating	6° to 140° F (-10° to 60° C)	
	Humidity – Operating	20% to 80% non-condensing	
	Humidity – Non-operating	5% to 85%	
	Altitude – Operating	+12,000 ft	
	Altitude – Non-operating	+40,000 ft	

	Options	HP Desktop Access Center	Sold separately, the HP Desktop Access Center Features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions; part number DK985A. For more information, refer to the HP Desktop Access Center QuickSpecs.
	Other	Accessories Included	VGA to VGA cable - connects the graphic card's VGA analog connector to the monitor's input #1 (VGA analog) connector VGA to DVI-I cable - connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector DVI-D to DVI-I cable - connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector
		User Guide Languages	English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish
		Warranty Languages	English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese
		Color	Carbonite/silver
		VESA External Mounting	Yes (Standard 4 hole pattern, 100 mm)
		Kensington Lock-Ready	Yes
	Certification and Compliance		Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 9241-3,7,8 VDT Guidelines, ISO 13406-2 Pixel Defect Guidelines, Mexican NOM Approval, MIC Requirements (New Zealand), MPR-II Compliant, Nordic Approvals (Nemko, Fimko, Demko, Semko), PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Windows Certification (Microsoft® Windows® 98, Microsoft Windows 2000, and Microsoft Windows XP).
	Compatibility		Compatible with platforms using the VESA standard video modes and HP Compaq Business Desktops d500, d300, and d200 Series, Compaq Evo Desktops, and HP Business Desktops d300 series.
	Service and Warranty		Limited three years parts, labor, and on-site service, including backlight. Availability varies by region. Certain restrictions and exclusions apply. Consult HP Customer Service for details.
HP p1230 22-inch CRT Monitor	Tube Type		Diamondtron NF Aperture Grille CRT
	Picture Tube Size (diagonal)		22 in (55 cm)

Viewable Image Area (diagonal)	20 in (51 cm)
Aperture Grille Pitch	0.24 mm
Screen Curvature	Flat
Horizontal Frequency (kHz)	30 to 140 kHz
Vertical Frequency (Hz)	50 to 160 Hz
Maximum Resolution	2048 x 1536 @ 85 Hz (GTF)
Recommended Resolution	1600 x 1200 @ 85 Hz or 1280 x 1024 @ 85 Hz
Preset VESA Graphic Modes (non-interlaced)	1920 x 1440 @ 60 Hz, 75 Hz 1792 x 1344 @ 60 Hz, 75 Hz 1600 x 1200 @ 75 Hz, 85 Hz 1280 x 1024 @ 60 Hz, 75 Hz, 85 Hz 1024 x 768 @ 75 Hz, 85 Hz 800 x 600 @ 75 Hz, 85 Hz 640 x 480 @ 60 Hz, 85 Hz
Preset MAC Mode	1152 x 870 @ 75 Hz
Preset VGA Mode	640 x 480 @ 60 Hz and 720 x 400 @ 70 Hz
Maximum Pixel Clock Speed	420 MHz
User Programmable Modes	15 (10 preset modes and 5 additional modes)
Anti-Glare	Yes
Anti-Static	Yes
Asset Control	Yes
Default Color Temperature	9300 K
Buttons or Switches	OSD menu, brigthness, contrast, Super Bright, dual input, power on/off
Languages	English, Spanish, French, German, Italian, Japanese
User Controls	Brightness, contrast, pincushion, pincushion balance, trapezoid, tilt (rotation), color temperature, degauss, parallelogram, individual color control, zoom, moiré cancellation, convergence, corner purity, image control, language, OSD control, factory reset
Plug and Play	Yes, DDC/CI compatible
Input Signal	Two 15-pin D-sub connections
Input Impedance	75 ohms
Sync Input	Separate sync (HSYNC/VSYNC)
Video Cable	Detachable 15-pin D-sub mini connector (included)
Video Cable Length	70 in (1.8 m); non-captive
Power Supply	Universal 100-120/220-240 VAC
Frequency	50/60 Hz
Maximum	135 watts
Power Saving	2 watts maximum
Off Mode	0 watts
Power Cable Length	70 in (1.8 m); non-captive

Technical Specifications

Dimensions (HxWxD)	Unpacked (including pedestal)	19.1 x 19.5 x 18.8 in (48.6 x 49.5 x 47.7 cm)
	Packaged	25.6 x 25.0 x 25.4 in (65.1 x 63.6 x 64.6 cm)
Weight	Unpacked	66.1 lb (30 kg)
	Packaged	77.1 lb (35 kg)
Tilt Range	10° upward and 5° downward	
Swivel Range	90°either side of center	
Temperature – Operating	41° to 90° F (5° to 35° C) Non-condensing	
Temperature – Non-operating	-4° to 140° F (-20° to 60° C)	
Humidity – Operating	10% to 90% non-condensing	
Humidity – Non-operating	10% to 90%	
Altitude – Operating	0 to 7,200 ft (0 to 2,195 m)	
Altitude – Non-operating	0 to 30,000 ft (0 to 9,144 m)	
Accessories Included	Power cable, video cable (D-sub to D-sub), documentation kit	
User Guide Languages	English, French, German, Spanish, Italian, Dutch, Brazilian Portuguese, Danish, Finnish, Greek, Japanese, Korean, Latin American Spanish, Norwegian, Polish, Russian, Slovenian, Turkish, Swedish, Traditional Chinese, Simplified Chinese	
Warranty Languages	English, French, Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Japanese, Korean, T. Chinese, S. Chinese	
Color	Carbon and silver	
Certification and Compliance	MPR-II (Low Emissions), TCO '03, Energy Star Compliant, UL Listing, ISO9241-3 VOT Guidelines Approval, FCC Approval, CE Mark (including PFC), GS Mark	
Compatibility	Compatible with platforms using the VESA standard video modes and HP Compaq Business Desktops d500, d300, and d200 Series, Compaq Evo Desktops, HP workstations, and HP Business Desktops d300 series.	
Warranty	Limited three-year parts and repair labor, service provider labor, and on-site service. Next business day advanced exchange direct replacement service available during warranty period. Certain restrictions and exclusions apply.	

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