



Compaq AlphaServer GS60 and 8200
DIGITAL UNIX and OpenVMS Systems
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DIGITAL Systems and Options Catalog

Product Description

Compaq AlphaServer GS60 systems offer 6/525 MHz 64-bit Alpha 21264 microprocessors with a large I/O capacity to tackle the most demanding business applications. The AlphaServer Global Solutions (GS) series features mainframe-like performance and capabilities, and high availability computing through clustering with exceptional scalability in every aspect of the system. Systems are packaged in new top gun blue system cabinets and feature up to six independently powerful CPUs with their own data and address paths, 12 Gbytes of error correctable memory, 132 individual PCI slots to configure up to 85 TeraBytes of UltraSCSI storage, and system and I/O bandwidth normally associated with mainframe systems.

DIGITAL AlphaServer 8200 systems offer Alpha 21164 5/625 MHz microprocessors that can be configured with up to six CPUs. With the enormous capacity of the Alpha 64-bit architecture systems support up to 12 GB of memory, and PCI I/O of up to 132 slots—these servers offer room for growth for the largest and most complex applications.

Small enterprises and large departments can have an office server with unprecedented performance, capacity, and reliability. Large databases, complex simulations, data warehousing, and decision support are examples of the kinds of applications the AlphaServer GS60 and 8200 support with ease. For technical and scientific users, the AlphaServer GS60 and 8200 provide supercomputer performance in the office. This office server can provide all the benefits that very large memory/very large database (VLM/VLDB) systems have provided in the past.

ServerWORKS Manager provides advanced server and network management capabilities and is supplied with all AlphaServer systems. Simple Network Management Protocol (SNMP) enables information to pass from the managed system to the console for DIGITAL UNIX, Windows NT, and OpenVMS AlphaServers. Detailed server information is viewable, including system, network, storage, and environmental information. All AlphaServer systems are also supplied with management tools to complement ServerWORKS Manager. For more information, see the StorageWorks Software section of this catalog.

AlphaServer GS60 and 8200 run DIGITAL UNIX or OpenVMS operating systems. Clusters, hot swap disks, RAID, redundant power, ECC memory and data paths, fault management, and Uninterruptable Power Supply (UPS) are all available.

AlphaServer GS60 and 8200 systems come standard with a one-year onsite warranty with guaranteed 4-hour response time. AlphaServer GS60 and 8200 systems require the mandatory selection of installation and/or start-up services.

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Step 1—AlphaServer GS60 and 8200 Systems

- AlphaServer GS60 6/525 Systems require minimum operating system support of:
 - DIGITAL UNIX V4.0E
 - OpenVMS V7.1-2
- Operating systems supported on AlphaServer 8200 5/625 Systems include:
 - DIGITAL UNIX V3.2G, V4.0B, or V4.0D or later
 - OpenVMS V6.2-1H3 or V7.1-1H1 or later
- Software media and documentation required for first system on site. See Step 14 for ordering information.
- Console terminal required to install system. (Unless terminal is available on site).
- Universal single-phase power supply provides the necessary power for system; (requires selection of power cord from Step 2).
- Redundant power supply (N+1) can be added if required.
- For recommended power protection see section after system specifications. Power Management software is included with all AlphaServers. Software communicates with recommended UPS.

AlphaServer GS60 and 8200 Expanded Base Server include:

- AlphaServer GS60 includes: Processor module with two Alpha microprocessor 21264 6/525 MHz CPUs; each CPU includes 4 MB Backup cache.
- AlphaServer 8200 includes: Processor module with two Alpha microprocessor 21164 5/625 MHz¹ CPUs; each CPU includes 4 MB Backup cache.
- System I/O module with four I/O channels (KFIHA-AA).
- AlphaServer GS60 includes 4 GB of memory.
- AlphaServer 8200 includes 1 GB, 2 GB or 4 GB of memory.
- PCI Shelf Mount Box (DWLPB-CA).
- DIGITAL Fast Ethernet network interface card.
- BA656 Internal Storage Drawer.
- UltraSCSI one port Single-ended adapter (KZPBA-CA).
- UltraSCSI 16-bit StorageWorks shelf (DS-BA356-JG) with (DS-BA35X-HJ) 48V dc power supply and (BN38C-01) 1 meter SCSI cable VHDCI male to 68 HD male.
- 4.3 GB 3.5-inch SCSI disk drive.
- 600 MB CD-ROM drive located in BA656
Note: 5.25-inch slot in BA656 is restricted to CD-ROM drive only on Expanded Base Servers.
- PCI Single-ended SCSI controller (KZPAA-AA) and BN21H-02 SCSI cable (connects to CD-ROM only).
- Universal single phase power.
- 48 V dc power supply.
- Shielded console cable included for connection to console terminal.
- Factory Installed Software (FIS).
- Operating system software
 - DIGITAL UNIX base license, Unlimited User license, Server Extension license, Internet Access Software license, **or**
 - OpenVMS base license, DIGITAL Enterprise Integration Package V2.0
- One year hardware product warranty.
- 90 day software product warranty.
- System installation must be ordered separately with AlphaServer GS60 and AlphaServer 8200 systems.

1. AlphaServer 5/625 CPUs clocked at 612.8 MHz for AlphaServer 8200 applications.

AlphaServer GS60 6/525 Dual CPU Expanded Base Servers (Top Gun Blue Enclosures)

Order Number	Operating System	CPU	Memory	SCSI Disk
DA-383GG-A9	DIGITAL UNIX	Two 6/525 MHz	4 GB	4.3 GB
DY-383GG-A9	OpenVMS	Two 6/525 MHz	4 GB	4.3 GB

AlphaServer 8200 5/625 Dual CPU Expanded Base Servers (Top Gun Blue Enclosures)

Order Number	Operating System	CPU	Memory	SCSI Disk
DA-382GG-A9	DIGITAL UNIX	Two 5/625 MHz	4 GB	4.3 GB
DY-382GG-A9	OpenVMS	Two 5/625 MHz	4 GB	4.3 GB

Step 1—AlphaServer GS60 and 8200 Systems (*continued*)**AlphaServer 8200 5/625 Dual CPU Expanded Base Servers (Gray Enclosures)**

Order Number	Operating System	CPU	Memory	SCSI Disk
DA-282GE-C9	DIGITAL UNIX	Two 5/625 MHz	1 GB	4.3 GB
DA-282GF-C9	DIGITAL UNIX	Two 5/625 MHz	2 GB	4.3 GB
DA-282GG-C9	DIGITAL UNIX	Two 5/625 MHz	4 GB	4.3 GB
DY-282GE-C9	OpenVMS	Two 5/625 MHz	1 GB	4.3 GB
DY-282GF-C9	OpenVMS	Two 5/625 MHz	2 GB	4.3 GB
DY-282GG-C9	OpenVMS	Two 5/625 MHz	4 GB	4.3 GB

Step 2—Power Cord

Note: If redundant supply (H7266-AD/AE) is ordered, power cord is included and does not have to be ordered separately.

BN23H-4E **60 Hz**—ac line cord for single phase power, one per cabinet (4.5 m in length)

BN20P-4E **50 Hz**—ac line cord for single phase power, one per cabinet (4.5 m in length)

Step 3—Additional CPU Modules (SMP Expansion Options)

- Up to two additional CPU modules can be added to Expanded Base Servers for system maximum of three CPU modules (2 to 6 CPUs).
- Combining 5/625 MHz and 6/525 MHz CPU modules in same system is not supported.
- For systems configured with more than two processor modules a minimum of two memory modules are recommended for optimal system performance.
- All SMP upgrades include processor module with Alpha microprocessor(s), SMP extension license, and end-user product warranty.

AlphaServer GS60 6/525	AlphaServer 8200 5/625	Operating System	CPU Module Type
762P2-AX	758P2-AX	DIGITAL UNIX	Dual-CPU
762P1-AX	758P1-AX	OpenVMS	Dual-CPU

Step 4—Memory

- Maximum of 12 GB of memory supported on AlphaServer GS60 and 8200 systems.
- Maximum of three memory modules is reduced by one for each additional CPU module and each system I/O module added to configuration.
- Memory modules
 - 1 GB and 2 GB memory modules have built in two-way interleaving; additional interleaving is accomplished by adding more memory modules
 - 4 GB memory modules have built in four-way interleaving. Best performance is achieved when two 2 GB modules are paired with one 4 GB module or one 4 GB memory module is paired with another 4 GB memory module

MS7CC-EA 1 GB memory module

MS7CC-FA 2 GB memory module

MS7CC-GA 4 GB memory module

Step 4a—Prestoserve Non-Volatile Random Access Memory (NVRAM)

- Supported on DIGITAL UNIX systems only.
- Maximum one Prestoserve I/O performance enhancement option supported per system.
- Includes Prestoserve license and documentation kit.

DJ-ML200-CA 8 MB Prestoserve, PCI option—requires DWLPB-CA/CB

Step 5—I/O Expansion Buses

AlphaServer GS60 and 8200 Expanded Base Servers include PCI shelf mount box. Configuration limits exist at I/O bus level and controller level. Verify maximum number of allowable controllers listed in Controller Configuration Table.

- Each DWLPB-CA/CB (PCI shelf mount box) includes 12 PCI slots and required cable for connection to KFTHA-AA I/O channel.
- Maximum of eleven I/O channels usable with up to three KFTHAs.

Note: See Step 12a and Step 12b for restrictions.

DWLPB-CA	PCI shelf mount box for AlphaServer GS60 and 8200 system cabinet only —maximum three per cabinet
DWLPB-CB	PCI shelf mount box for AlphaServer GS60 and 8200 expansion cabinet only —maximum four per cabinet
KFE70-BA ¹	EISA Bridge option; PCI to EISA bridge module set—must reside in first DWLPB-CA in system cabinet only. Converts 12-slot PCI bus to 2 EISA, 6 PCI/EISA, and 2 PCI slots. Includes RX26 diskette drive, mounting hardware, and cables to mount RX26 in processor system unit. Maximum of one EISA Bridge option supported. Option is required to support KZPAC-AA/CA RAID controllers. Includes diskette drive required to run the RAID Configuration Utility (RCU).

1. KFE70-BA and KFE72-FA are not supported concurrently on the same system.

Step 6—System I/O Modules

- KFTHA-AA system I/O module included with Expanded Base Servers.
- Two additional KFTHA modules can be added for a system maximum of three.
- Maximum eleven I/O channels available on AlphaServer GS60 and 8200 (up to three KFTHA-AA modules).

KFTHA-AA	System I/O module with four I/O channels for DWLPB-CA/CB shelf mount boxes.
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Step 7—Storage Controllers

- DIGITAL UNIX V4.0B or later supports 8 SCSI controllers per PCI, maximum 48 per system.
- OpenVMS V6.2-1H3 or later supports 8 SCSI controllers per PCI, maximum 26 per system.
- For maximum controllers per PCI, System Console Firmware Revision 5.2-7 is required.
- KFTHA-AA I/O module included with Expanded Base Servers.
- Tape and optical devices are not supported on KZPAC SCSI RAID controllers.
- For cluster configurations, use Y cable BN39A-0G.

PCI-based UltraSCSI Controllers

KZPBA-CA	PCI-based one port UltraSCSI Single-ended host adapter —Uses one PCI slot.
KZPBA-CB ¹	PCI-based one port UltraSCSI Differential host adapter —Uses one PCI slot.
BN38C-01 ²	1 m VHDCI male to 68-pin HD male UltraSCSI cable, connects KZPBA to front mounted DS-BA356-xx.
BN38C-02 ²	2 m VHDCI male to 68-pin HD male UltraSCSI cable, connects KZPBA to rear mounted DS-BA356-xx.
BN38C-03/05 ²	3/5 m VHDCI male to 68-pin HD male UltraSCSI cable, connects KZPBA to H9B10-xx I/O expansion cabinet.

1. OpenVMS V6.2-1H3 support is for direct attach only. OpenVMS V7.1-1H1 or later supports multi-host SCSI clusters.
2. Manufacturing may substitute correct cable length depending on configuration.

Step 7—Storage Controllers (continued)
PCI-based UltraSCSI Controllers (continued)

KZPAC-AA¹	PCI-based one port RAID (FWSE) Controller (UltraSCSI ready) with 4 MB cache memory— Uses one PCI slot. Allows RAID levels 0, 1 and 5. Includes RAID Array 230/plus subsystem software and documentation kit. KFE70-BA EISA Bridge option required. Tape and optical drives not supported. OpenVMS V6.2-1H3 or V7.1 or later and DIGITAL UNIX V3.2G or V4.0B or later support 4 per PCI, maximum of 4 per system
KZPAC-CA¹	PCI-based three port RAID (FWSE) Controller (Ultra SCSI ready) with 4MB cache memory— Uses two PCI slots. Allows RAID levels 0, 1 and 5. Includes RAID/Array 230/plus subsystem software and documentation kit. KFE70-BA EISA Bridge option required. Tape and optical drives not supported. OpenVMS V6.2-1H3 or V7.1 or later and DIGITAL UNIX V3.2G or V4.0B or later, support 4 per PCI, maximum 4 per system if third port is not used (otherwise maximum of 3 per PCI, 3 per system). Requires BN31K-0E or KZPAC-SB for third port connection.
KZPAC-CB¹	PCI-based three port RAID (FWSE) Controller (Ultra SCSI ready) with 8MB cache memory— Uses two PCI slots. Allows RAID levels 0, 1 and 5. Includes RAID/Array 230/plus subsystem software and documentation kit. KFE70-BA EISA Bridge option required. Tape and optical drives not supported. OpenVMS V6.2-1H3 or V7.1 or later and DIGITAL UNIX V3.2G or V4.0B or later supports, 4 per PCI, maximum of 4 per system if third port is not used (otherwise maximum of 3 per PCI, 3 per system). Requires BN31K-0E or KZPAC-SB for third port connection.
KZPAC-SB²	SCSI cable/bulkhead assembly kit with two ports for KZPAC-CA/CB, allows connection of two third port outputs using one PCI bulkhead slot.
BN31K-0E²	SCSI cable/bulkhead assembly kit with one port for KZPAC-CA/CB, allows connection of one third port output using one PCI bulkhead slot.
BN37A-01³	1.0 m VHDCI male to VHDCI male UltraSCSI cable, connects KZPAC to front mounted DS-BA356-xx.
BN37A-02³	2.0 m VHDCI male to VHDCI male UltraSCSI cable, connects KZPAC to rear mounted DS-BA356-xx.
KZPSC-UB⁴	Battery back up for cache memory option for KZPAC controller.
MS100-BB	8 MB cache memory option; upgrades KZPAC-CA to KZPAC-CB, field installable only.

1. KZPAC options for OpenVMS systems with greater than 1 GB of memory require the following TIMA patch kits: V6.2 kit - ALPDRIV04_062; V7.1 kit - ALPDRIV01_071.
2. SCSI cable/bulkhead assembly kit is required for third port connection. Order BN31K-0E for single KZPAC-CA/CB configuration. Order KZPAC-SB for two KZPAC-CA/CB configurations.
3. Manufacturing may substitute correct cable length depending on configuration.
4. KZPSC-UB is recommended for KZPAC controllers.

DSSI and CI Adapters

KFPSA-AA	PCI-based DSSI Adapter (OpenVMS only)— Requires OpenVMS V6.2-1H2 or later and minimum System Console Firmware Revision 3.09. OpenVMS V6.2-1H3. (End node only) supports 12 per PCI, maximum 24 per system. Note: KFPSA, KFMSB are not supported on same DSSI bus.
BC29S-xx	External shielded cable (MR/MR connectors) Select required length—09, 16, 25, 50 feet.
BC29R-xx	External shielded cable (MR/PS connectors) Select required length—06, 09, 16, 30 feet.
CIPCA-AA	PCI-based CI Adapter (OpenVMS only)— Requires OpenVMS V6.2-1H3 or V7.1, minimum System Console Firmware Revision 4.0-4. OpenVMS V6.2-1H3 and System Console Firmware Revision 4.1-6 supports 4 per PCI, maximum 10 per system. OpenVMS V7.1 and System Console Firmware Revision 4.1-6 supports 4 per PCI, maximum 26 per system. Requires one PCI slot for adapter and one EISA slot for power only. Note: KFE70 option is not required.
CIPCA-BA	Same as CIPCA-AA except uses two PCI slots.
BNCIA-xx	Computer interconnect cable sets—Connects CIPCA to Star Coupler. Select required length—10, 20, or 45 m (10 m = 32.8 ft., 20 m = 65.6 ft., 45 m = 147.6 ft.)

Step 7—Storage Controllers (continued)
PCI-based Fast10 SCSI

KZPSA-BB	PCI-based one port Fast Wide Differential SCSI Adapter —Uses one PCI slot. KZPSA supports DECsafe Available Server and DIGITAL UNIX TruCluster.
BN21K-xx	Fast Wide Differential SCSI cables—68-pin male straight to 68-pin male right-angle. Connects KZPSA-BB Fast Wide Differential SCSI port to DWZZA-VA or DWZZB-VW.
BN21K-01¹	Connects from KZPSA to DWZZB-VW in BA356-xx in system cabinet (front)
BN21K-02¹	Connects from KZPSA to DWZZB-VW in BA356-xx in system cabinet (rear)
BN21K-03¹	Connects from KZPSA to DWZZB-VW in BA356-xx in expansion cabinet (front or rear)
BN21K-05/10	Connects from KZPSA to DWZZB-VW in BA356-xx in SW500 and SW800 cabinets

1. Manufacturing may substitute correct cable length depending on configuration.

Step 7a—External Storage Controllers

• HSZ70 UltraSCSI RAID Array controllers are supported under DIGITAL UNIX V3.2G, V4.0B or later and OpenVMS V6.2-1H3 for direct attachments or OpenVMS V7.1-1H1 or later for cluster support. See Step 8c for configuration information. • HSZ50 family of SCSI Storage Array Controllers are supported under DIGITAL UNIX V3.2G, V4.0A or later and OpenVMS V6.2-1H3 or later. DIGITAL UNIX requires patch OSF405-034 for dual failover. • HSJ50 family of CI Storage Array Controllers are supported under OpenVMS V6.2-1H3 or later with CIPCA-AA/BA or CIXCD-AC CI controllers. QB-5C4AA-SA software kits are required for each external cache (1 for HSJ50, 2 for HSJ52, 4 for HSJ54). • HSD50 family of DSSI Storage Array Controllers are supported under OpenVMS V6.2-1H3 or later with KFPSA PCI DSSI adapters and minimum SRM console V4.1-6.	• Controllers require KZPSA, KZPBA, KFPSA, or CIPCA SCSI adapters or controllers, as appropriate. • HSZ70 requires QB-5SBAB-SA/SB for Digital UNIX, or QB-5SBAC-SA/SB for OpenVMS. • HSZ50-Ax requires one QB-5CJAA-SA kit • HSZ52-Ax requires two QB-5CJAA-SA kits • HSZ54-AJ requires four QB-5CJAA-SA kits • HSD50-Ax requires one QB-5C5AA-SA kit • HSD52-Ax requires two QB-5C5AA-SA kits • HSJ50-Ax requires one QB-5C4AA-SA kit • HSJ52-Ax requires two QB-5C4AA-SA kits
DS-HSZ70-AH	StorageWorks UltraSCSI RAID Array controller includes 64 MB cache, expandable to 128 MB. Requires DS-HS35X-BC external cache battery and HSZ70 Solution Software kit, order separately.
HSZ50-AF	StorageWorks RAID Array 450/HSZ50 32 MB SCSI controller includes 6 SCSI channels, 36 SCSI device connections in redundant configurations (42 when non-redundant), 32 LUN maximum, 32 MB cache module, single external cache battery system building block.
HSZ50-AH	StorageWorks RAID Array 450/HSZ50 64 MB SCSI controller includes 6 SCSI channels, 36 SCSI device connections in redundant configurations (42 when non-redundant), 32 LUN maximum, 64 MB cache module, single external cache battery system building block.
HSZ50-AJ	StorageWorks RAID Array 450/HSZ50 128 MB SCSI controller includes 6 SCSI channels, 36 dual, 42 single SCSI device connections, 32 LUN maximum, 128 MB cache module, single external cache battery system building block.
HSZ52-AF	StorageWorks RAID Array 450/HSZ50 64 MB dual SCSI controller includes 12 SCSI channels, 36 SCSI device connections, 32 LUN maximum, two cache modules, one dual external cache battery system building block, two external cache batteries, two 2 meter cables.
HSZ52-AH	StorageWorks RAID Array 450/HSZ50 128 MB dual SCSI controller includes 12 SCSI channels, 36 SCSI device connections, 32 LUN maximum, two cache modules, one dual external cache battery system building block, two external cache batteries, two 2 meter cables.
HSZ52-AJ	StorageWorks RAID Array 450/HSZ50 256 MB dual SCSI controller includes 12 SCSI channels, 36 SCSI device connections, 32 LUN maximum, two cache modules, one dual external cache battery system building block, two external cache batteries, two 2 meter cables.
HSZ54-AJ	StorageWorks RAID Array 450/HSZ50 512 MB quad SCSI controller includes 12 SCSI channels, 72 SCSI device connections, 64 LUN maximum, four cache modules, two dual external cache battery system building blocks, four external cache batteries, four 2 meter cables.

Step 7a—External Storage Controllers (continued)

HSJ50-AF	32 MB Cache 6 channel CI array controller with cache battery
HSJ50-AJ	128 MB Cache 6 channel CI array controller with cache battery
HSJ52-AF	Dual 64 MB Cache CI array controller with cache batteries
HSJ52-AH	Dual 128 MB Cache CI array controller with cache batteries
HSJ52-AJ	Dual 256 MB Cache CI array controller with cache batteries
HSJ54-AJ	Quad 512 MB Cache CI array controller with cache batteries
HSD50-AF	DSSI controller , 6 channel, 64MB cache & external cache battery
HSD50-AH	DSSI controller , 6 channel, 32MB cache & external cache battery
HSD50-AJ	DSSI controller , 6 channel, 128MB cache & external cache battery
HSD52-AF	Two DSSI controllers with 32 MB cache with battery
HSD52-AH	Two DSSI controllers with 64 MB cache with battery
HSD52-AJ	Two DSSI controllers with 128 MB cache with battery

Step 8—Storage

When multiple storage devices are configured with the system, specify which devices should be installed inside the system cabinet, inside the system expansion cabinet, or installed in the external StorageWorks cabinet. Line item sequencing will allow Manufacturing to configure storage options in the appropriate cabinet.

- List storage options to be integrated in system cabinet immediately following system part number.
 - List storage options to be integrated in StorageWorks cabinet immediately following StorageWorks cabinet part number.
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Step 8a—Internal Storage—System Cabinet

System cabinet includes one DS-BA356-JG UltraSCSI StorageWorks shelf and one DWLPB-CA PCI shelf. UltraSCSI devices are supported in DS-BA356-JG (single channel) and DS-BA356-JH (dual channel) UltraSCSI StorageWorks shelves inside AlphaServer GS60 or 8200 System cabinet. They are also supported in external StorageWorks cabinets in BA356-SD Rackmount shelves in SW500 and SW800 cabinets. DS-BA356-JG/JH includes BA35X-HG 48V/150W dc power supply and BA35X-RD metric mounting hardware.

- UltraSCSI configurations require UltraSCSI components (controllers, adapters, shelves, disks, and cables).
- UltraSCSI adapters and RAID controllers support UltraSCSI disks at UltraSCSI speeds in UltraSCSI Top Gun Blue shelves (DS-BA356-xx).
- System cabinet provides space for up to six DS-BA356 StorageWorks shelves; each shelf holds a maximum of two 5.25" devices and one 3.5" device or seven 3.5" devices.
- BA656 Internal Storage Drawer included in system cabinet supports CD-ROM drive only.
- UltraSCSI and Fast10 drives can be mixed in DS-BA356 Top Gun Blue UltraSCSI shelf. Drives negotiate maximum transfer speeds with UltraSCSI adapter/controller.

UltraSCSI Options

Each UltraSCSI StorageWorks shelf requires a SCSI controller and SCSI cable to connect controller to shelf. Refer to the UltraSCSI Configuration Guidelines in EK-ULTRA-CG.C01.

Note: See Step 12a and Step 12b for configuration details.

DS-BA356-JG	UltraSCSI Single Channel StorageWorks Shelf —includes 16-bit I/O personality module (DS-BA35X-FA), 48V/150W dc power supply, dc fans, and rackmounting hardware. Supports 16-bit UltraSCSI devices and some 8-bit narrow SCSI devices depending on compliance with minimum revision levels.
DS-BA356-JH	UltraSCSI Dual Channel StorageWorks Shelf —includes 16-bit I/O personality module (DS-BA35X-FB), 48V/150W dc power supply, dc fans, and rackmounting hardware. Supports 16-bit Ultra SCSI devices and some 8-bit narrow SCSI devices depending on compliance with minimum revision levels.

Step 8a—Internal Storage—System Cabinet (*continued*)**Power Option for DS-BA356 StorageWorks Shelves**

- An additional power supply provides N+1 power for DS-BA356-xx StorageWorks shelves.
- Power supply uses 3.5" slot in StorageWorks shelf, reducing total number of devices supported by one.

DS-BA35X-HJ Enhanced 48 V dc 150W Redundant Power Supply for StorageWorks shelf; includes 48 V dc jumper cable for connecting to first power supply in StorageWorks shelf.

SCSI Signal Converter

DS-BA35X-DA **UltraSCSI StorageWorks DOC Signal Converter**—required to convert FWD signals from KZPSA-BB or KZPBA-CB to Single-ended for connection to DS-BA356-JG/JH StorageWorks shelves, field installed only.

DS-BA35X-FA Fast 20 Personality Module for BA356 Single Ended to Single Ended one-Channel, field installed only.

DS-BA35X-FB Fast 20 Personality Module for BA356 Single Ended to Single Ended two-Channel, field installed only.

BN38C-02 Cable for above.

16-bit Wide Drives

DS-RZ1CF-VW 4.3 GB 7200 RPM 16-bit UltraSCSI disk drive—SBB

DS-RZ1DF-VW 9.0 GB 7200 RPM 16-bit UltraSCSI disk drive—SBB

DS-RZ1EF-VW 18.2 GB 7200 RPM 16-bit UltraSCSI disk drive—SBB, not supported with KZPAC

8-bit Disk Drives

DS-RZ1CF-VA 4.3 GB 7200 RPM 8-bit narrow SCSI disk drive—SBB

DS-RZ1DF-VA 9.1 GB 7200 RPM 8-bit narrow SCSI disk drive—SBB

DS-RZ1EF-VA 18.2 GB 7200 RPM 8-bit narrow SCSI disk drive—SBB, not supported with KZPAC

Note: UltraSCSI disk drives run in Fast20 SCSI mode when installed in DS-BA356-xx UltraSCSI StorageWorks shelves connected to UltraSCSI adapters and RAID controllers.

UltraSCSI disk drives run in Fast10 SCSI mode when connected to Fast10 SCSI adapters and controllers.

See Storage Devices—StorageWorks Supported Devices for 8-bit and 16-bit Expansion Table for minimum hardware revision levels.

UltraSCSI disk drives connected to UltraSCSI controllers (KZPAC-xx in Fast20 mode and DS-HSZ70-AH) are not supported in Fast10 (gray) BA356 shelves.

Tape Devices

Tape drives are not supported on KZPAC RAID Array controller.

TLZ09-VA 8.0 GB DAT 3.5" SCSI tape drive in StorageWorks carrier. Requires OpenVMS V6.2-1H3 or later or DIGITAL UNIX V3.2C or later and System Console Firmware Revision 3.0-9.

TLZ9L-VA 32/64 GB DAT tape loader in StorageWorks carrier

DS-TLZ10-VA 12/24 GB 4mm DAT SCSI tape drive in 5.25" StorageWorks carrier

TZ88N-VA 20/40 GB DLT SCSI tape drive in 5.25" StorageWorks carrier

DS-TZ89N-VW 35/70 GB DLT SCSI tape drive in 5.25" StorageWorks carrier

Step 8a—Internal Storage—System Cabinet (*continued*)**Solid State Disks**

- Supported with KZPBA and KZPSA.
- Solid State Disks cannot be combined with RZxx disks/tapes on same SCSI bus.
- 3.5" and 5.25" Solid State Disks are not supported on the same SCSI bus.

DS-EZ41-VW	134 MB F-20 3.5" Ultra solid state disk
DS-EZ42-VW	268 MB F-20 3.5" Ultra solid state disk
DS-EZ705-VW	536 MB F-20 5.25" Ultra Solid state disk
DS-EZ711-VW	1.1 GB F-20 5.25" Ultra Solid state disk
DS-EZ716-VW	1.6 GB F-20 5.25" Ultra Solid state disk

Step 8b—UltraSCSI RAID Array Controller and UltraSCSI RAID Packaged Solutions**UltraSCSI RAID Array Controller**

DS-HSZ70-AH **StorageWorks UltraSCSI RAID Array controller** includes 64 MB cache, 6 UltraSCSI Single-ended channels, CLI cable kit, controller to controller jumper cable, and two ECB cables. Requires HSZ70 Solutions Software Kit and external cache battery.

ESA 10000 Storage Arrays and RAID Array 7000 (RA7000) Options

- ESA 10000 Storage Arrays and RAID Array 7000 (HSZ70 Product Set) are supported on AlphaServer GS60 and 8200 systems running DIGITAL UNIX V4.0B and OpenVMS V6.2-1H3 or later.
- Currently the HSZ70 is supported on the KZPSA-BB Fast Wide and KZPBA-CB UltraSCSI Differential controller.

See StorageWorks Packaged Solutions in StorageWorks Chapter of *DIGITAL Systems and Options Catalog*, or on the WEB at <http://www.digital.com/info/SOHOME/> for additional configuration information on HSZ70 controllers in ESA 10000 and RA7000.

DS-SWXES-AA/AB ESA 10000 high capacity/general business base unit
 Includes: Data Center 600 mm enclosure
 2 BA370-AA Rackmounted shelves with 5 shelf power supplies each, expandable to 8
 2 HSZ70 six port controllers 64 MB mirrored write back cache each, expandable to 128 MB each
 6 Ultra SCSI expansion cables
 1 10 meter host to controller cable (BN37A-10)
 Serial line assembly with adapters (9 pin and 25 pin)
 Power cord and documentation
 Supports up to 48 drives
Requires: HSZ70 Solutions Software kit for platform, host adapter, and disks to be ordered separately
Options: 64 MB cache upgrade and fully redundant power

DS-SWXES-BA/BB ESA 10000 high bandwidth base unit
 Includes: Data Center 600 mm enclosure
 2 BA370-AA Rackmounted shelves with 5 shelf power supplies each, expandable to 8
 4 HSZ70 six port controllers 64 MB mirrored write back cache each, expandable to 128 MB each
 2 10 meter host to controller cables (BN37A-10)
 Serial line assembly with adapters (9 pin and 25 pin)
 Power cord and documentation
 Supports up to 48 drives
Requires: HSZ70 Solutions Software kit for platform, host adapter, and disks to be ordered separately
Options: 64 MB cache upgrade and fully redundant power

Step 8b—UltraSCSI RAID Array Controller and UltraSCSI RAID Packaged Solutions (*continued*)**ESA 10000 Storage Arrays and RAID Array 7000 (RA7000) Options (*continued*)****DS-SWXES-CA/CB** ESA 10000 dual expansion base unit

Includes: Data Center 600 mm enclosure
 2 BA370-AA Rackmounted shelves with 5 shelf power supplies each, expandable to 8
 12 Ultra SCSI expansion cables
 SW600 cabinet joiner kit
 Power cord and documentation; Supports up to 48 drives

Requires: HSZ70 Solutions Software kit for platform, host adapter, and disks to be ordered separately

Options: Fully redundant power

RAID Array 7000 (RA7000)**DS-SWXES-DA/DB** ESA 10000 single expansion w/ dual controllers base unit

Includes: Data Center 600 mm enclosure
 1 BA370-AA Rackmounted shelf with 5 shelf power supplies, expandable to 8
 2 HSZ70 six port controllers 64 MB mirrored write back cache each, expandable to 128 MB each
 1 10 meter host to controller cable (BN37A-10)
 Serial line assembly with adapters (9 pin and 25 pin)
 Power cord and documentation
 Supports 24 drives, expandable to 48 with BA370 rackmount upgrade.

Requires: HSZ70 Solutions Software kit for platform, host adapter, and disks to be ordered separately

Options: 64 MB cache upgrade, fully redundant power, and BA370 rackmount upgrade.

DS-SWXRA-HA RAID Array 7000 with Dual controllers

Includes: 24 SBB Departmental Cabinet
 2 HSZ70 6 port controllers with 64 MB mirrored write-back cache each, expandable to 128 MB each
 I/O expansion module
 Dual cache battery in SBB with cable
 Five 180 watt power supplies, expandable to eight
 Fully redundant cooling
 Environmental Monitor Unit (EMU)
 5 meter host to controller cable BN37A-05 with BN38E-0B VHDCI to 68 HD conversion cable,
 Serial line kit, controller to controller jumper cable for redundant controllers, and U.S. power cord.

Requires: HSZ70 Solutions Software Kit for platform, host adapter, and disks to be ordered separately

Options: 64 MB cache upgrade, Up to two RA7000 Expansion cabinets. Optional power supplies.

DS-SWXRA-HC RAID Array 7000 with Single controller

Includes: 24 SBB Storage Cabinet
 1 HSZ70 6 port controller with 64 MB mirrored write-back cache, expandable to 128MB
 I/O expansion module
 Single cache battery in SBB with cable
 Five 180 watt power supplies expandable to eight
 Fully redundant cooling
 Environmental Monitor Unit (EMU)
 5 meter host to controller cable BN37A-05 with BN38E-0B VHDCI to 68 HD conversion cable,
 Serial line kit, controller to controller jumper cable for redundant controllers, and U.S. power cord.

Requires: HSZ70 Solutions Software Kit for platform, host adapter, and disks to be ordered separately

Options: Second HSZ70 controller and cache battery; 64 MB cache upgrade; Up to two RA7000 Expansion cabinets. Optional power supplies.

Adapters and Platform Specific Solutions Software

- Each HSZ70 requires an HSZ70 Solutions Software Kit (HSOF).
- HSZ70 Solutions Software Kits with -SA variants included documentation.
 HSZ70 Solutions Software Kits with -SB variants do not include documentation, select for each additional adapter ordered if documentation is available on-site.

Step 8b—UltraSCSI RAID Array Controller and UltraSCSI RAID Packaged Solutions (continued)**HSZ70 Solutions Software Kits include:**

- PCMCIA card containing software for storage controller.
- StorageWorks Command Console (SWCC) software, and software licenses.
- HSZ70 and SWCC supporting documentation.

Select Adapter and HSZ70 Solutions Software Kit for appropriate platform

Supported Adapters	HSZ70 Solutions Software Kit	Host Platform
KZPSA-BB	QB-5SBAB-SA/SB	DIGITAL UNIX
KZPBA-CB	QB-5SBAC-SA/SB	OpenVMS

Cache Upgrade

Select cache upgrade for HSZ70 controllers. Redundant controllers require equal amounts of cache

DS-HSSIM-AB 64 MB Cache Upgrade for HSZ70

Disk Expansion Cabinet

Note: Order Expansion Cable Kit for each Disk Expansion Cabinet selected.

DS-SWXRA-HB Disk Expansion Cabinet, includes 24 disk slots, 5 power supplies, redundant cooling, EMU and PVA, power cable

DS-BNK37-1E Expansion Cable Kit, required for each Disk Expansion Cabinet DS-SWXRA-HB

DS-BA35X-HH 180 Watt Power Supply. Fully redundant power requires three additional power supplies, one additional DS-BA35X-HE power control unit, and one additional DS-SW6XP-AA/AB power distribution unit.

DS-BA35X-HE AC Power Control Unit, required when more than five 180 Watt power supplies are installed. Note: Power cord (BN27S-03) required.

DS-SW6XP-AA/AB SW600 Power Distribution Unit, quantity of 1 required for each SW600 for full power redundancy.

Additional Options

DS-HS35X-BC Single replacement external cache battery, one battery in a single Blue SBB

DS-HS35X-BD Dual replacement external cache battery, two batteries in a single Blue SBB, supports cache of dual redundant controllers. Requires ordering 1 Power Verification and Addressing (PVA) DS-BA35X-EC

DS-BA35X-BA Battery shelf for SW600 cabinet

DS-BA35X-MK Dual speed fan kit

DS-BA35X-MN Single-Ended I/O module

DS-BA35X-EB Environmental Monitor Unit (EMU)

DS-BA35X-EC Power Verification and Addressing (PVA)

BN37A-xx VHDCI male to VHDCI male UltraSCSI cable

BN38E-0B 68-pin HD to VHDCI UltraSCSI conversion cable

H9C10-JC H9A10 Cabinet Joiner Kit for SW600

H8865-AA UltraSCSI Single-Ended external terminator

H8863-AA UltraSCSI Differential external terminator

DS-BA370-AA Rackmountable BA370 shelf includes five 180 W power supplies, eight high power blowers, RETMA and Metric mounting kit.

DS-SW600-AA 60 Hz 600 mm Storage Cabinet includes single phase power distribution unit DS-SW6XP-AA

DS-SW600-AB 50 Hz 600 mm Storage Cabinet includes single phase power distribution unit DS-SW6XP-AA

Step 8c—External Storage Devices

The following list describes available storage devices and capacities. These supported options can be added as required.

Storage Cabinets	Maximum Capacity
SW5XX, SW6XX, SW8XX	1 TB – 2.9 TB
SCSI Disk Drives—See Step 8a	
Tape Drives —See <i>Storage Devices</i> for ordering information	
TZ87, TZ857 ¹ , TZ877, TZ88, TZ885, TZ887, TSZ07, TLZ09, TKZ9E , TKZ9F, TLZ9L, TKZ6x, TL810, TL812, TL820, TL822, TL826, DS-TL893-BA, DS-TL894-BA, DS-TL896-BA, DS-TLZ10-VA	
1. Loader support for DIGITAL UNIX is available via DECnsr.	
Optical Libraries (Optical devices are not supported on KZPAC RAID Array controller.)	
RW546-ZA	36 GB Optical Library, 2 drives
RW551-ZC	73 GB Optical Library, 2 drives
RW552-ZF	147 GB Optical Library, 4 drives
RW555-ZF	294 GB Optical Library, 4 drives
RW557-ZF	547 GB Optical Library, 6 drives

Step 9—Networks and Communications

DE500 network interface card included with Expanded Base Server. **Note:** Connection of system to Ethernet requires twisted-pair cable.

LAN Communications Controllers—PCI based

- Requires DWLPB-CA/CB, PCI shelf mount box.
- System maximum of six DEFPA-AB/DB/UB/MB FDDI controllers (100 Mbit/sec).
- Each adapter/controllers uses one PCI slot.

DE450-CA	PCI-based Ethernet 3-port Adapter. OpenVMS V6.2 and DIGITAL UNIX V3.2G or later, supports 8 per PCI, maximum 8 per system. Two patch kits required to support DE450 with OpenVMS V6.2.
DE500-AA	PCI-based Fast Ethernet (100 Mbit) Adapter. OpenVMS V6.2 and V7.1, and DIGITAL UNIX V3.2G or later, supports 8 per PCI, maximum 8 per system.
DE500-FA	PCI-based Fast Ethernet (10/100-32 bit) Adapter. OpenVMS V7.1-1H1 and DIGITAL UNIX V4.0D or later, supports 8 per PCI, maximum 8 per system.
DE500-BA	PCI-based Fast Ethernet (10/100 Mbit) Adapter. OpenVMS V7.1-1h and DIGITAL UNIX V4.0D or later. supports 8 per PCI, maximum 8 per system.
BN24Q-xx	Category 5 Cross-over Cable for point-to-point, unshielded.
BN28Q-03	Category 5 Cross-over Cable for point-to-point, shielded.
BN25G-xx	Category 5 Straight through for system to repeater or hub, unshielded.
BN26M-xx	Twisted pair, shielded (-03, -04, -07 are the available lengths).
DEFPA-AB	PCI-based FDDI controller Fiber—Single attachment station MultiMode Fiber. OpenVMS V6.2-1H3 and DIGITAL UNIX V3.2G or later, supports 6 per DWLPB, maximum 6 per system. Requires BN34x SC type connecting cable.
DEFPA-DB	PCI-based FDDI controller Fiber—Dual attachment station MultiMode Fiber. OpenVMS V6.2-1H3 and DIGITAL UNIX V3.2G or later, supports 6 per DWLPB, maximum 6 per system. Requires BN34x SC type connecting cable.
BN34A-xx	MultiMode Fiber Optic Duplex cable—SC connector to ST connector
BN34B-xx	MultiMode Fiber Optic Duplex cable—SC connector to SC connector
BN34D-xx	MultiMode Fiber Optic Duplex cable—SC connector to MIC connector

Step 9—Networks and Communications (*continued*)

LAN Communications Controllers—PCI based

DEFPA-MB	PCI-based FDDI controller Copper—Dual attachment station UTP. OpenVMS V6.2-1H3 and DIGITAL UNIX V3.2G or later, supports 6 per DWLPB, maximum 6 per system. Requires BN26x or BN25H connecting cables.
DEFPA-UB	PCI-based FDDI controller Copper—Single attachment station UTP. OpenVMS V6.2-1H3 and DIGITAL UNIX V3.2G or later, supports 6 per DWLPB, maximum 6 per system. Requires BN26x or BN25H connecting cables.
BN26M-xx	8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable.
BN26S-xx	8-pin MP to 8-pin MP, screened, crossover, EIA/TIA Category 5 cable.
BN25H-03	3 m Unshielded twisted pair RJ45 connectors.
DGLPA-FA/UA	PCI-based ATMworks 351 bus adapter —Uses one PCI slot. DIGITAL UNIX V4.0B or later, supports 2 per PCI, maximum 2 per system. DGLPA-FA/UA not supported on the same system as DGLPB-AB (ATMworks 351).
SN-PBXNP-AC	PCI-based Token Ring Adapter —DIGITAL UNIX V3.2G or V4.0B or later, supports 2 per PCI, maximum 2 per system. Minimum system console support required V4.0 AXP CD release. Requires BC26M cable.
PBXDA-AA	PCI-based Asynchronous 4-port Communication Adapter —DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 or later, supports 2 per PCI, maximum 2 PBXDA-xx per system.
PBXDA-AB	PCI-based Asynchronous 8-port Communication Adapter —DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 or later, supports 2 per PCI, maximum 2 PBXDA-xx per system.
PBXDA-AC	PCI-based Asynchronous 16-port Communication Adapter —DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 or later, supports 2 per PCI, maximum 2 PBXDA-xx per system.
PBXDP-AA	PCI-based Synchronous 2-port Communications Controller —DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 and DIGITAL UNIX V4.0B or later, supports 2 PBXDP-xx per system.
PBXDP-AB	PCI-based Synchronous 4-port Communications Controller —DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 and DIGITAL UNIX V4.0B or later, supports 2 PBXDP-xx per system.
PBXDP-AC	PCI-based Synchronous 8-port Communications Controller —DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 or later, supports 2 PBXDP-xx per system.

LAN Communications Controllers—EISA based

- Requires DWLPB-CA and KFE70-BA, EISA bridge module set.
- See EISA Bus IRQ Address Table.

CXI01-AA	Digiboard Asynchronous Xem/ISA Multiport Serial Card with 16 RJ45 PORTS/Xem Port (uses one EISA slot) one per EISA supported, maximum one CXI01-AA per system. Supported on DIGITAL UNIX systems only.
CXI01-AB	Digiboard PORTS/Xem, 16 RJ45 Port Concentrator mounts separately from PCI bus. Maximum of three CXI01-AB can be attached to CXI01-AA; provides up to 48 additional ports. Supported on DIGITAL UNIX systems only.
CXI01-AC	Digiboard RJ45 to DB25 male converter
CXI01-AF	Digiboard RJ45 to DECMI11 adapter—8 per package

Local and Wide Area Communications Servers

Each communications server requires 802.3/Ethernet connection. Depending on server selected, either ThinWire BNC type connection (e.g., BC16M cable) or thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Additional items also required—see the *Network Products Guide*.

Network Connectivity Products

See *Network Products Guide* for details.

Step 9a—MEMORY CHANNEL Controller**DIGITAL UNIX Systems**

- Requires minimum of DIGITAL UNIX V3.2E (DIGITAL UNIX V3.2D plus TruCluster software or MEMORY CHANNEL Driver software).
- Each system node in a MEMORY CHANNEL cluster requires a software license.
- Servers in a compute-server array require a DIGITAL UNIX Driver for MEMORY CHANNEL License.
- Servers in a TruCluster high-availability environment require a TruCluster license for DIGITAL UNIX.
- The following options are not currently supported with MEMORY CHANNEL: DJ-ML200, CIPCA.

OpenVMS Systems

- Requires OpenVMS V7.1 or later and OpenVMS Cluster license.
- On systems with DWLPA-CA/CB and no other PCI option(s) and/or KFE70-BA, a maximum of two CCMAA-BA modules are supported.
- On systems with DWLPA-CA/CB and any PCI option(s) and/or KFE70-BA, a maximum of **one** CCMAA-BA module are supported.
- DWLPB-CA/CB option does not have the restrictions of the DWLPA-CA/CB.

MEMORY CHANNEL requirements for currently installed AlphaServer 8200 systems:

- Console firmware at revision V2.3 or higher.
- CCMAA-BA Adapter must be installed in slots 0-7 of a DWLPA-CA PCI; no restriction for DWLPB-CA PCI bus.
- For two system nodes, order one CCMAA-BA per system and one BC12N-10 cable to connect them.
- For three or more system nodes, order CCMHA-AA (MEMORY CHANNEL Hub) one CCMAA-BA and one BC12N-10 cable per system node.
- CCMHA-AA (MEMORY CHANNEL Hub) is configured with four CCMLA-AA Line Cards and supports up to four nodes. Expansion up to eight system nodes can be achieved by adding up to four additional CCMLA-AA Line Cards, except TruCluster production server configurations.

CCMAA-BA	PCI to MEMORY CHANNEL controller —maximum two supported
CCMHA-AA	MEMORY CHANNEL Hub with four line cards
CCMLA-AA	MEMORY CHANNEL Line Card for use with MEMORY CHANNEL Hub (CCMHA-AA)
BC12N-10	MEMORY CHANNEL Cable
QB-3RLAQ-AA	TruCluster Production Server Software for DIGITAL UNIX
QB-4ZCAQ-AA	DIGITAL UNIX Driver for MEMORY CHANNEL license
QL-MUZAQ-AA	OpenVMS Cluster license for Alpha systems

CCMHA-AA, MEMORY CHANNEL Hub, includes BN19P-2E line cord for Canada, Japan, US operation.
For other regions, order one of the following:

BN19A-2E	Ireland, United Kingdom
BN19S-2E	Egypt, India
BN19C-2E	Central Europe
BN18L-2E	Israel
BN19E-2E	Switzerland
BN24X-2E	Italy
BN19K-2E	Denmark
BN19H-2E	Australia, New Zealand

Step 10— Console Terminal

- VT console terminal with EIA-232 25-pin DSUB connector and printer **required**, (even with KFE72 installed) for system power-up, diagnostics and console display, unless otherwise available.
- Shielded console cable is included for connection to the console terminal.

VT510-xx	VT510 terminal
LA30N-xx	LA30 printer
LK461-xx	OpenVMS keyboard
SN-LKQ47-xx	DIGITAL UNIX keyboard

Step 11—Graphics Support for DIGITAL UNIX

- Graphics support for AlphaServer GS60 and 8200 running DIGITAL UNIX V4.0D or later can be provided through the combined use of KFE72-FA port option and SN-PBXGB-AA graphics adapter.
- SN-PBXGB-AA requires 17" or 21" Professional Series monitor (Step 11a) and keyboard (Step 11d) for graphics support unless available on site.
- Selection of a video extension cable (Step 11b) and a country specific power cord (Step 11c) is **mandatory** for all monitor variants.
- No EISA or ISA support.

KFE72-FA ¹	Graphics port for AlphaServer GS60 and 8200 DIGITAL UNIX system, includes mouse
SN-PBXGB-AA	PowerStorm 3D30 2D/3D graphics adapter

1. KFE70-BA and KFE72-FA are not supported concurrently on the same system.

Step 11a—Monitors

SN-VRQP7-24/23	17" (16.0" viewable image size) professional series auto-scanning color monitor, Trinitron CRT, 0.25 mm aperture grill pitch, VGA to 1280 x 1024 at 75 Hz, TCO 95, MPR-II, Energy Star, attached 1.8 m video cable. Requires mandatory selection of video extension cable and country specific power cords for all variants. -24 = Northern Hemisphere without power cord. -23 = Southern Hemisphere without power cord..
SN-VRQP1-24/23	21" (19.6" viewable image size) auto-scanning color monitor, Trinitron CRT, 0.25 mm aperture grill pitch, VGA to 1600 x 1200 at 75 Hz NI, TCO 95, Energy Star, includes a 1.8 m video cable. Requires mandatory selection of video extension cable and country specific power cords for all variants. -24 = Northern Hemisphere without power cord. -23 = Southern Hemisphere without power cord.

Step 11b—Video Extension Cable

BN39C-02	1.8 m video extension cable—mandatory for each monitor ordered
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Step 11c—Monitor Power Cords

BN26J-1K	North America, Japan
BN19A-2E	UK/Ireland/Hong Kong
BN19C-2E	Central Europe
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN18L-2E	Israel
BN19Z-2E	Italy
BN19S-2E	India/South Africa

Step 11d— Graphics KeyboardsSN-LKQ47-xx DIGITAL UNIX keyboard

Step 12—Expansion—System Cabinet and I/O Expansion Cabinet

Step 12a—System Cabinet

- System Cabinet includes one single-phase power supply. Provides space for additional redundant (N+1) power supply.
- BA656 Internal Storage Drawer supports CD-ROM drive only.
- Provides space for six DS-BA356-xx SCSI StorageWorks Shelves, three DWLPB-CA (PCI shelf mount boxes) or combination of StorageWorks and PCI shelves.
 - For each DWLPB-CA placed in system cabinet, subtract two DS-BA356-JG/JH shelves from maximum available.
Example: One DWLPB-CA in system cabinet allows for a maximum of four DS-BA356-JG/JH shelves.

Shelf Mount Boxes	Quantity
StorageWorks shelves (DS-BA356-JG/JH)	6 maximum (see limits above)
PCI shelf mount box (DWLPB-CA)	3 maximum

Step 12b—I/O Expansion Cabinet

- I/O Expansion Cabinet includes one single-phase power supply. Provides space for additional redundant (N+1) power supply.
- Maximum two I/O expansion cabinets supported per system.
- Maximum four I/O channels supported in each I/O expansion cabinet.
- Space for 16 DS-BA356-JG/JH SCSI StorageWorks Shelves, four DWLPB-CB (PCI Rack mount boxes) or combination StorageWorks and PCI shelves.
 - For each DWLPB-CB placed in expansion cabinet, subtract two DS-BA356-JG/JH shelves from maximum available.
Example: Three DWLPB-CB in expansion cabinet allows for a maximum of ten DS-BA356-JG/JH shelves.

Shelf Mount Boxes	Quantity
StorageWorks shelf (DS-BA356-JG/JH)	16 maximum (see limits above)
PCI shelf mount box (DWLPB-CB)	4 maximum

H9B10-JA **I/O Expansion Cabinet (top gun blue)**—Single Phase power, maximum two per system**H9B10-EA** **I/O Expansion Cabinet (gray)**—Single Phase power, maximum two per system**Note:** See Step 2 for selection of appropriate power cord—one per I/O expansion cabinet. If redundant supply (H7266-AD/AE) is ordered, power cord is not required.

Step 13—Power Options

- System Cabinets and Expansion Cabinets include one power supply (H7266-AA)—200-240 V AC input voltage, 48 V dc, 2400 watt, output supply.
- An additional power supply provides N+1 power and supports battery backup capability.
- If redundant power supply is ordered, power cord is no longer required.

H7266-AD Single phase 48 V dc redundant power supply—60 Hz power connector, maximum one per cabinet**H7266-AE** Single phase 48 V dc redundant power supply—50 Hz power connector, maximum one per cabinet**Note:** See Specifications for information on appropriate power supply to order.

Step 13a—Battery Backup Options

- Optional battery backup requires H7267-AA for each power supply in System Cabinet and Expansion Cabinet.
- Battery backup provides up to **five minutes** of capacity to power contents of System Cabinet and Expansion Cabinet.

H7267-AA Battery backup option kit—Includes batteries, charger board, installation manual for adding battery backup operation to one power supply (H7266-AA, H7266-AD, H7266-AE). Can be field installed.

Step 14—Software

Select user licenses and additional software as required. **Note:** Media and documentation required for first system on site.

Software Processor Code = Q**DIGITAL UNIX Concurrent Use Licenses**

DIGITAL UNIX Concurrent Use licenses are not specific to a single system and can be moved from one system to another at user discretion.

Note: DIGITAL UNIX AlphaServer GS60 and 8200 Expanded Base Servers include Traditional Unlimited user license.

QL-MT7AM-3B	DIGITAL UNIX Concurrent Use 1-user license
QL-MT7AM-3C	DIGITAL UNIX Concurrent Use 2-user license
QL-MT7AM-3D	DIGITAL UNIX Concurrent Use 4-user license
QL-MT7AM-3E	DIGITAL UNIX Concurrent Use 8-user license
QL-MT7AM-3F	DIGITAL UNIX Concurrent Use 16-user license
QL-MT7AM-3G	DIGITAL UNIX Concurrent Use 32-user license
QL-MT7AM-3H	DIGITAL UNIX Concurrent Use 64-user license
QL-MT7AQ-AA¹	DIGITAL UNIX Traditional unlimited user license
QL-MT5AQ-AA	DIGITAL UNIX developer's extension license
QL-MT6AQ-AA¹	DIGITAL UNIX server extension license
QL-MTJAQ-AA	DECnet/OSI end-system license
QL-MTKAQ-AA	DECnet/OSI extended function license
QB-05SAQ-AA	DECsafe Available Server license and documentation (DIGITAL UNIX only). Media available on layered product CD-ROM. KZMSA or KZPSA adapter required.

1. Included with AlphaServer GS60 and 8200 DIGITAL UNIX Expanded Base Servers.

DIGITAL UNIX Media and Documentation

QA-MT4AA-H8	DIGITAL UNIX media and on-line documentation (base system, complementary products) on CD-ROM
QA-MT4AA-GZ	DIGITAL UNIX full hardcopy documentation
QA-MT4AB-GZ	DIGITAL UNIX end user hardcopy documentation subkit
QA-MT5AA-GZ	DIGITAL UNIX developer's extension hardcopy documentation subkit
QA-MT6AA-GZ	DIGITAL UNIX server extension hardcopy documentation subkit

DIGITAL UNIX Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DIGITAL UNIX
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Step 14—Software (continued)
OpenVMS Concurrent Use Licenses

OpenVMS Concurrent Use license provide the right to interactively use the operating system by the specified number of concurrent users on a designated OpenVMS system. OpenVMS Concurrent Use licenses can be moved from one system to another at user discretion and can be shared in a mixed OpenVMS VAX and OpenVMS Alpha cluster.

QL-MT3AA-3B	OpenVMS Concurrent Use 1-user license
QL-MT3AA-3C	OpenVMS Concurrent Use 2-user license
QL-MT3AA-3D	OpenVMS Concurrent Use 4-user license
QL-MT3AA-3E	OpenVMS Concurrent Use 8-user license
QL-MT3AA-3F	OpenVMS Concurrent Use 16-user license
QL-MT3AA-3G	OpenVMS Concurrent Use 32-user license
QL-MT3AA-3H	OpenVMS Concurrent Use 64-user license
QL-MT3AA-3J	OpenVMS Concurrent Use 128-user license
QL-MT3AA-3K	OpenVMS Concurrent Use 256-user license
QL-MT2AQ-AA	OpenVMS Traditional unlimited user license
QL-MTFAQ-AA	DECnet/OSI end-system license
QL-MTHAQ-AA	DECnet/OSI extended function license

OpenVMS Media and Documentation

QA-MT1AA-H8	OpenVMS media and documentation on CD-ROM
QA-09SAA-GZ	OpenVMS base hardcopy documentation
QA-001AA-GZ	OpenVMS full hardcopy documentation

OpenVMS Layered Products CD-ROM

QA-054AA-H8	Layered products media and documentation for DIGITAL UNIX
QA-03XAA-H8¹	Layered products media and documentation for OpenVMS

1. Includes DIGITAL Enterprise Integration Server for OpenVMS media and documentation.

DIGITAL Enterprise Integration Package—including with AlphaServer GS60 and 8200 OpenVMS Expanded Base Servers

QA-5LVAA-H8	DIGITAL Enterprise Integration Server V1.0 for OpenVMS media and documentation
QP-5LVAQ-AC	DIGITAL Enterprise Integration Server V2.0 for OpenVMS media and documentation. Included in expanded base servers.

Step 15—Hardware and Software Supplemental Support Services
Installation Services—AlphaServer GS60 and 8200 Systems

- Installation or Installation & Startup is mandatory for all AlphaServer GS60 and 8200 systems.
- Consult your Compaq Customer Service Account Representative for assistance in choosing the support plan that is most appropriate.
- For more information on Compaq Services see: <http://www.digital.com/services>

FP-8INST-xx	Installation Service Package
FP-8STAR-xx	Installation Service and Startup Package

Step 15—Hardware and Software Supplemental Support Services (*continued*)**System Maintenance Services—AlphaServer GS60 and 8200 Systems**

1-Year	3-Year	System Maintenance Service Packages
FP-801**-12	FP-801**-36	Priority
FP-811**-12	FP-811**-36	Priority NODE
FP-802**-12	FP-802**-36	Priority 24
FP-812**-12	FP-812**-36	Priority 24 NODE
FP-803**-12	FP-803**-36	Priority Plus
FP-813**-12	FP-813**-36	Priority Plus NODE
FP-805**-12	FP-805**-36	Priority Premier

Hardware—Americas and Asia Pacific only

- Systems include one-year hardware warranty, on-site, same day, 4-hour response time.
- Select optional Hardware Supplemental Support Services if required.

AlphaServer GS60 and 8200 Systems with Two CPUs

With less than 2 GB memory	with 2 GB memory	with 4 GB memory	
FM-8D4HR-36	FM-8G4HR-36	FM-8V4HR-36	Years 1-3, 5 x 9, 4-hour response time
FM-8D512-36	FM-8G512-36	FM-8V512-36	Years 1-3, 5 x 12, 4-hour response time
FM-8D616-36	FM-8G616-36	FM-8V616-36	Years 1-3, 6 x 16, 4-hour response time
FM-8D724-36	FM-8G724-36	FM-8V724-36	Years 1-3, 7 x 24, 4-hour response time
FM-8D4HR-60	FM-8G4HR-60	FM-8V4HR-60	Years 1-5, 5 x 9, 4-hour response time
FM-8D512-60	FM-8G512-60	FM-8V512-60	Years 1-5, 5 x 12, 4-hour response time
FM-8D616-60	FM-8G616-60	FM-8V616-60	Years 1-5, 6 x 16, 4-hour response time
FM-8D724-60	FM-8G724-60	FM-8V724-60	Years 1-5, 7 x 24, 4-hour response time

Software—Americas and Asia Pacific only

- Systems include 90-day Conformance to SPD and Telephone Advisory Support. Select optional Software Supplemental Support Services, if required.
- Software service upgrades for DIGITAL UNIX include advisory and remedial software support with new version license rights for DIGITAL UNIX Base, unlimited users and Server Extensions.
- Software service upgrades for OpenVMS include advisory and remedial software support with new version license rights for OpenVMS Base and Enterprise Integration Package.

AlphaServer GS60 and 8200 Two CPU Systems (DIGITAL UNIX)

FM-D82U9-12	12-month 5x9 Bronze Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-D82U9-36	36-month 5x9 Bronze Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-D82U9-60	60-month 5x9 Bronze Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-D82US-12	12-month 7x24 Bronze Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-D82US-36	36-month 7x24 Bronze Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-D82US-60	60-month 7x24 Bronze Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-D82UN-12	12-month Bronze Node Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-D82UN-36	36-month Bronze Node Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-D82UN-60	60-month Bronze Node Software Supplemental Support for DIGITAL UNIX two CPU systems

Step 15—Hardware and Software Supplemental Support Services (*continued*)**AlphaServer GS60 and 8200 Two CPU Systems (OpenVMS)**

FM-D82V9-12	12-month 5x9 Bronze Software Supplemental Support for OpenVMS two CPU systems
FM-D82V9-36	36-month 5x9 Bronze Software Supplemental Support for OpenVMS two CPU systems
FM-D82V9-60	60-month 5x9 Bronze Software Supplemental Support for OpenVMS two CPU systems
FM-D82VS-12	12-month 7x24 Bronze Software Supplemental Support for OpenVMS two CPU systems
FM-D82VS-36	36-month 7x24 Bronze Software Supplemental Support for OpenVMS two CPU systems
FM-D82VS-60	60-month 7x24 Bronze Software Supplemental Support for OpenVMS two CPU systems
FM-D82VN-12	12-month Bronze Node Software Supplemental Support for OpenVMS two CPU systems
FM-D82VN-36	36-month Bronze Node Software Supplemental Support for OpenVMS two CPU systems
FM-D82VN-60	60-month Bronze Node Software Supplemental Support for OpenVMS two CPU systems

Step 15a—Hardware and Software Supplemental Support Services (Europe only)

Europe does not have specific part numbers for Hardware and Software Supplemental Support Services. Prices can be quoted using the Excelsior tool; contact Customer Services Sales in your country for information on Hardware and Software Supplemental Support Services.

Optional Controller Configuration Table

With multiple adapters that provide the same interface available on different I/O buses it is possible to exceed operating system limit on the number of ports supported for that interface. Follow these guidelines for maximum number of ports supported by each operating system. Fill in this table under the relevant area, add up number of controllers/ports available, and verify that operating system limits will not be exceeded. **Do not exceed these values.**

Option Name	A Number of Ports/Buses	B Number of Options	C Total Ports (A * B)	DIGITAL UNIX Limit	OpenVMS Limit
SCSI Options					
Included KFTIA-AA I/O module, one single-ended and three FWD SCSI ports ¹	4	1	4		
Additional KFTIA-AA I/O module, one single-ended and three FWD SCSI ports	4				
KZPSA-BB or KZPBA PCI fast wide differential SCSI adapter	1				
Add column "C" —must be less than or equal to value listed under operating system to be used.				48	26
802.3/Ethernet Options					
Included KFTIA-AA I/O module, two 802.3/Ethernet ports ¹	2	1	2		
Additional KFTIA-AA I/O module, two 802.3/Ethernet ports	2				
DE435-AA PCI 802.3/Ethernet controller, DE450 and DE500	1				
Add column "C" —must be less than or equal to value listed under operating system to be used.				8	8
FDDI Options					
Included KFTIA-AA I/O module, optional FDDI daughter card installed (DEFPZ-AA/UA) ¹	1				
Additional KFTIA-AA I/O module, optional FDDI daughter card installed (DEFPZ-AA/UA)	1				
DEFPA-AB/DB/UB/MB PCI FDDI controller, one port each	1				
Add column "C" —must be less than or equal to value listed under operating system to be used.				8	8

1. Applies to Base Servers only.

EISA Bus IRQ Address Table**Configuration Rules and Information**

- EISA Bus IRQ address assignments are for DIGITAL UNIX and OpenVMS systems only.
- In some cases, the maximum number of each supported device is less than number of EISA bus addresses available; this is due to other limitations.
- Only one device can occupy any given IRQ address; if multiples of a device are configured, each device occupies a separate address.
- Match each device to one available address. (Note: With the table as a worksheet, fill in "0" for each device; fill in only one "0" per column).
- Actual IRQ address assignment will be made by EISA Configuration Utility (ECU), which is run during system manufacture, or in the installed system if EISA bus is reconfigured.

Option	EISA Bus IRQ Addresses										Maximum of Each Supported	
	5	7	8	9	10	11	12	14	15		OpenVMS	DIGITAL UNIX
DW300-AA	0	—	—	0	0	0	—	—	0		1	1
CXI01-AA	NA	NA	NA	NA	NA	NA	NA	NA	NA		0	1
CXI01-AD	NA	NA	NA	NA	NA	NA	NA	NA	NA		0	1

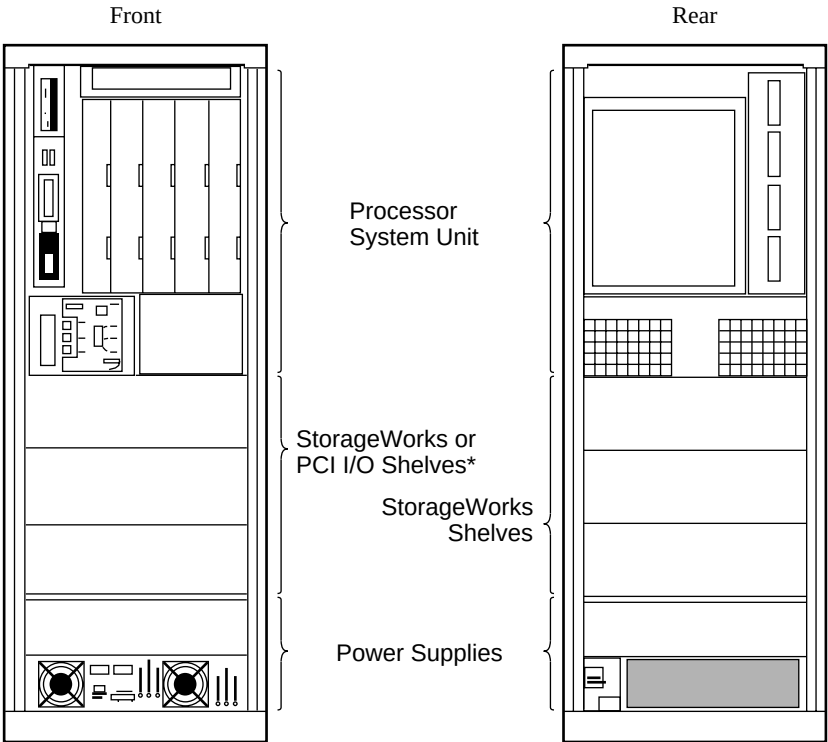
Table Codes:

0 = address is available for device

— = address not available for device

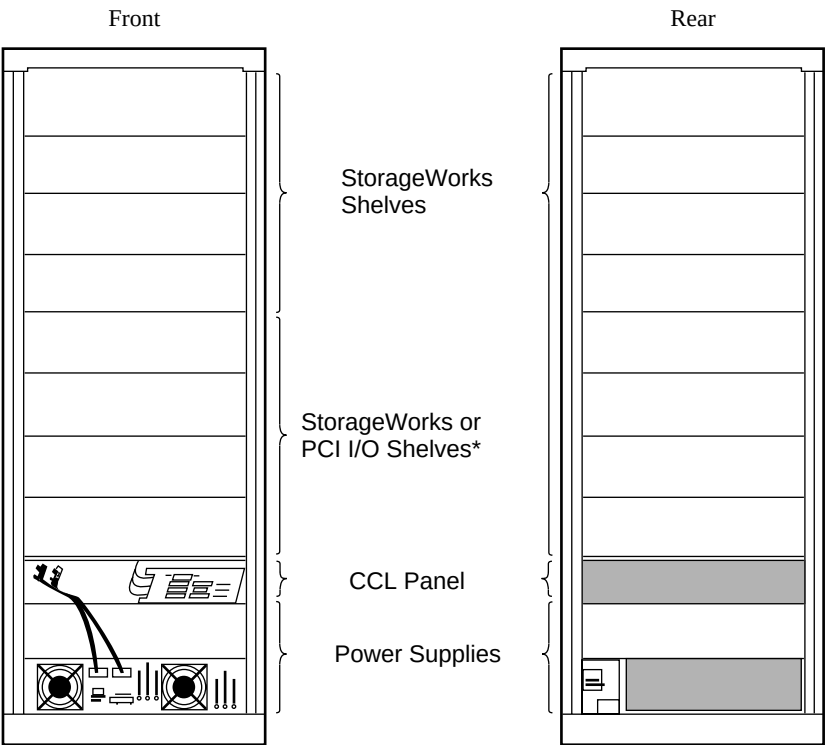
NA = Not Applicable

System Cabinet



BU-3480

Expansion Cabinet



* A PCI I/O shelf extends into the rear of the cabinet.
A StorageWorks shelf cannot be located behind a PCI shelf.

BU-3481

Specifications

Physical Characteristics	Operating	Shipping
Height	170.0 cm (67.0 in)	194.0 cm (76.25 in)
Width	60.0 cm (23.6 in)	91.5 cm (36.0 in)
Depth	92.5 cm (36.4 in)	121.5 cm (47.9 in)
Weight		
Minimum configuration	318 kg (700 lb)	363 kg (800 lb)
Maximum configuration	591 kg ((1300 lb)	636 kg (1400 lb)
Clearances	Operating	Service
Front	1.0 m (40 in)	1.5 m (59 in)
Rear	.75 m (29.5 in)	1.0 m (40 in)
Sides	0	0
Environmental	Operating	Non-Operating
Temperature	10°C to 35°C (50°F to 95°F)	–40°C to 66°C (–40°F to 151°F)
Humidity	10% to 90%	10% to 95%
Altitude	0–2.4 km (0–8200 ft)	9,100 m (30,000 ft)
Vibration	2–22 Hz @ 0.01"da minimum	22–500 Hz @ 0.25g maximum.
Heat dissipation ¹	Minimally configured system¹ (system cabinet) 3200 Btu/hr, 930 W Fully configured system² (system cabinet) 9100 Btu/hr, 2647 W Fully configured system³ (system cabinet with two I/O expansion cabinets) 21,300 Btu/hr, 6234 W	
Regulatory		
Agency approvals	UL Listed to UL1950 CSA Certified to CAN/C22.2 No. 950-M89 FCC Part 15 (Class A) CE Declaration #1259	
Reviewed to	EN 60950/A1, Jan. 1993, European Norm AS/NZS 3260:1993, Australian/New Zealand Standard EMKO-TSE{74-SEC}Summary of Nordic Deviations IEC950, 2nd Ed., 2nd Amend.	
Power Requirements ⁴	US/Canada/Japan	Europe/AP
Nominal AC input line voltage	202-240 (208) V Japan (202) V	202-240 (240) V
Frequency range	50 Hz–60 Hz	50 Hz–60 Hz
Phases	Single-phase line-to-line or line-to-neutral	Single-phase line-to-line or line-to-neutral
Maximum input current	16 A rms	16 A rms
Surge current	80 A peak	80 A peak
Rating	16 A	16 A
Power cord part number	BN23H-4E	BN20P-4E
Power cord length	4.5 m (15 ft)	4.5 m (15 ft)
Power cap (system)	DEC 12-16886-00 NEMA L6-30P	DEC 12-30333-03
Receptacle	NEMA L6-30R	IEC 309 (32 A) ⁵ 2 Pole/3-Wire (220-240 V)
PCS/PDS/PDU/UPS cable	BC26E	

1. Minimally configured system contains one power supply, dual CPU, one memory, one System I/O module, one CD-ROM, and one disk drive.
2. Fully configured system contains two power supplies, one CPU module, two memory modules, two System I/O modules, one CD-ROM, 16 disk drives, two PCI shelves, and two StorageWorks shelves.
3. Fully configured system and two expansion cabinets consists of the above “fully configured system” and two expansion cabinets which each contain one PCI shelf, 14 StorageWorks shelves, and 84 RZ28 disk drives.
4. Power system provides unity power factor which allows full utilization of the input line current (Watts = VA).
5. Receptacle type is Hubbell 332R6 or equivalent.

Recommended On-Line Power Protection/UPS Solutions for AlphaServer 8200 systems

For complete protection, UPS products should be used with data line surge protectors.

4N-GA249-AB	2 wire modem	wall plug in (additional plug in data modules available RN-GA240-xx)
4N-GA249-CA	10BaseT	wall plug in (additional plug in data modules available RN-GA240-xx)
4N-GA510-BF	ThinWire	device port
4N-GA245-xx	Din rail and modules	up to 32 ports

	Receptacle Module for Plug-in Connection			
UPS Model	60 HZ	50 HZ	AlphaServer 8200	External Storage
4N-AEAAJ-CL (60 Hz)	Included	Hardwired	Single phase	None
4N-AEAAJ-CU (50 Hz)				
4N-AEAAJ-BA (60 Hz)	4N-AEACM-BN	Hardwired		SW800
4N-AEAAJ-BE (50 Hz)				

UPS Models

4N-AEAAJ-CL	Prestige 6kVA (4kW), single phase, 60 Hz, 208V-120/208V, 6 ft. cord with L6-30P and (2) L6-30R, (8) 5-15R receptacles. Modular hot-swap design with 7 minutes battery at full load, extendible plug and play batteries and receptacle provisions. Unit includes 3 year hot swap warranty. Substitute -CT for 240V-240/120V operation.
4N-AEAAJ-CU	Prestige 6kVA (4kW) 50 Hz package, single phase, 50/60 Hz, 200-240V in and out, selectable; hardwired input/output.
4N-AEAAJ-BA	PUPS plus 10kVA (7kW), single-phase, 50/60Hz, 176-276V in, 200-240V out, 9 minutes battery at full load; hardwired with optional plug-in output receptacle modules.
4N-AEAAJ-BE	PUPS plus 15kVA (10kW), three-phase, 50/60Hz, 176-256V in, 200-240V out, 10 minutes battery at full load; hardwired with optional plug-in output receptacle modules.
4N-AEAAJ-BE	PUPS plus 15kVA (10kW), three-phase, 50/60Hz, International model rated 380/415V in, 380/415/220V out; hardwired input/output.

Hardware Options

4N-AEACK-BN	PUPS plus 15kVA receptacle module (3) L6-30R, (3) 5-20R, (2) L5-20R
4N-AEACM-BN	PUPS plus 15kVA receptacle module (2) L21-30R, (1) 5-20R2, (2) L6-30R
4N-AEACH-HD	Mobile module stacker for Prestige 6kVA models (includes seismic supports)

UPS Monitoring and Unattended Shutdown Software (for above UPS systems only)

Note: Power Management software is included in ServerWORKS Manager kits shipping with all AlphaServers. Cable kit required, select UPS Communications Cable Kit.

DIGITAL UNIX	OpenVMS	UPS System
4N-AEAES-AK	4N-AEAES-EM	Prestige UPS
4N-AEAES-AK	4N-AEAES-FM	PUPS plus UPS
4N-AEAES-BK	Call for information	Network Management or multi shutdown ¹

1. Requires Connect-UPS Network Adapter (SNMP compatible) for DIGITAL UNIX platform.

DIGITAL UNIX	OpenVMS	
4N-ONLIN-NT ¹	4N-ONLIS-FE	UPS Communications Cable Kit
4N-AEAEO-D*	4N-JMIU4-AB ³ 4 port	Option for multi-systems on one UPS
4N-AEAEO-D* ²	4N-AEAEO-D* ²	Option for SNMP/ServerWORKS Manager interface

1. Requires Connect-UPS Network Adapter, required for DIGITAL UNIX Platform.

2. Suffix * denotes Twisted pair / ThinWire = DA/DC (60Hz); DB/DD (50Hz).

3. Four port multi-interface kit with splitter cable to interface with network adapter and local shutdown signal from UPS. Kits may be daisy chained, kits include software.

A La Carte Software kits available for existing installations

DIGITAL UNIX ¹	OpenVMS	
4N-AEAES-AK	4N-AEAES-EM	Prestige (single system)
4N-AEAES-AK	4N-AEAES-FM	PUPS Plus (single system)
4N-AEAES-BK	See options above	Multi-systems on one UPS or Network Management