



AlphaServer 8200 DIGITAL UNIX and OpenVMS Systems

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DIGITAL Systems and Options Catalog

Product Description

The DIGITAL AlphaServer 8200 is the highest performance office system in the industry. It can be configured with up to six of the world's fastest microprocessors (Alpha microprocessor 21164) with 5/440 MHz or 5/625 MHz CPUs. With the enormous capacity of the Alpha 64-bit architecture—up to 12 GB of memory, and PCI I/O of up to 108 slots—this server offers room for growth for the largest and most complex applications.

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 for 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 8200 runs DIGITAL UNIX or OpenVMS operating systems and offers the reliability and availability features customers require. Clusters, hot swap disks, RAID, redundant power, ECC memory and data paths, fault management, and uninterruptible power supply (UPS) are all available.

Small enterprises and large departments can have an office server with unprecedented performance, capacity, and reliability for those applications previously available on enterprise systems. Large databases, complex simulations, data warehousing, and decision support are examples of the kinds of applications the AlphaServer 8200 can support with ease. And, with up to 12 GB of memory, this office server can provide all the benefits that very large memory/very large database (VLM/VLDB) systems have provided in the past.

For technical and scientific users, the AlphaServer 8200 provides supercomputer performance in the office. The AlphaServer 8200 has single processor floating-point performance that dominates the competition in the generic benchmarks and wins at the application level as well.

The AlphaServer 8200 includes a one year hardware warranty, onsite 4-hour response, 5 days per week. System installation is included with the AlphaServer 8200 5/440 and 5/625 systems.

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Step 1—AlphaServer 8200 Systems

- AlphaServer 8200 5/440 and 5/625 Systems require
 - DIGITAL UNIX V3.2G or DIGITAL UNIX V4.0B, 4.0D, or OpenVMS V6.2-1H3 or V7.1-1H1.
- Software media and documentation required for first system on site. See Step 13 for ordering information.
- Console terminal required to install system. See Step 10 unless terminal is available on site.
- Base Servers include a five-slot backplane—three slots are used by the CPU module, memory module, and system I/O module (KFTIA-AA).
 - Two slots are available for additional CPU, memory, or system I/O module(s).
- CD-ROM drive and a SCSI system disk drive (4.3 GB) are included in a BA656 Internal Storage Drawer,
 - connected via single-ended SCSI-2 port on KFTIA-AA system I/O module.
 - Four additional narrow 3.5-inch StorageWorks devices can be added in the BA656 Internal Storage Drawer.
- Universal single-phase power supply supplies necessary power for system; requires selection of power cord from Step 2 of this section.
- Redundant power supply (N+1) can be added if required.
- For recommended power protection see section after system specifications. UPS Power Management Software is included in ServerWORKS Manager kit. Software communicates with recommended UPS.

AlphaServer 8200 Base Servers include

- Processor module with two Alpha microprocessor 21164 5/440 MHz or 5/625 MHz¹ CPUs; each CPU includes 4 MB Backup cache
 - System I/O module (KFTIA-AA) includes
 - I/O channel
 - Two twisted-pair 802.3/Ethernet
 - Single-ended SCSI-2 port
 - Three Fast Wide Differential (FWD) SCSI-2 ports
 - Three CK-KFTIA-AA Cabinet Kits
 - 1 GB, 2 GB, or 4 GB of memory
 - BA656 Internal Storage Drawer
 - 4.3 GB 3.5-inch SCSI disk drive
 - 600 MB CD-ROM drive
 - Universal single phase power
 - 48 V dc power supply
 - Shielded console cable included for connection to console terminal (BC16E-25)
 - Factory Installed Software (FIS)
 - 5/440 and 5/625 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 V1.0
 - One year hardware product warranty
 - 90-day software product warranty
 - System installation included with AlphaServer 8200 5/440 and 5/625 Base Servers
1. 5/625 CPUs clocked at 612.8 MHz for AlphaServer 8200 applications.

5/440 Dual CPU Base Servers

Order Number	Operating System	CPU	Memory	SCSI Disk
DA-282FE-C9	DIGITAL UNIX	Two 5/440 MHz	1 GB	4.3 GB
DA-282FF-C9	DIGITAL UNIX	Two 5/440 MHz	2 GB	4.3 GB
DA-282FG-B9	DIGITAL UNIX	Two 5/440 MHz	4 GB	4.3 GB
DY-282FE-C9	OpenVMS	Two 5/440 MHz	1 GB	4.3 GB
DY-282FF-C9	OpenVMS	Two 5/440 MHz	2 GB	4.3 GB
DY-282FG-B9	OpenVMS	Two 5/440 MHz	4 GB	4.3 GB

5/625 Dual CPU Base Servers

Order Number	Operating System	CPU	Memory	SCSI Disk
DA-282GF-A9	DIGITAL UNIX	Two 5/625 MHz	2 GB	4.3 GB
DY-282GF-A9	OpenVMS	Two 5/625 MHz	2 GB	4.3 GB

Step 1—Base Systems (continued)**AlphaServer 8200 Expanded Base Server includes**

- .. Processor module with two Alpha microprocessor 21164 5/440 MHz or 5/625 MHz¹ CPUs; each CPU includes 4 MB Backup cache
 - .. System I/O module with four I/O channels (KFTHA-AA)
 - .. 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
 - .. Ultra SCSI 16-bit wide StorageWorks shelf
 - DS-BA356-JG with BA35X-HJ 48V dc power supply
 - .. BN38C-02 2M 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" 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)
 - .. Universal single phase power
 - .. 48 V dc power supply
 - .. Shielded console cable included for connection to console terminal
 - .. Factory Installed Software (FIS)
 - .. 5/440 and 5/625 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 V1.0.
 - .. One year hardware product warranty
 - .. 90 day software product warranty
 - .. System installation included with AlphaServer 8200 5/440 and 5/625 Expanded Base Servers.
1. 5/625 CPUs clocked at 612.8 MHz for AlphaServer 8200 applications.

5/440 Dual CPU Expanded Base Servers

Order Number	Operating System	CPU	Memory	SCSI Disk
DA-282FE-E9	DIGITAL UNIX	Two 5/440 MHz	1 GB	4.3 GB
DA-282FF-E9	DIGITAL UNIX	Two 5/440 MHz	2 GB	4.3 GB
DA-282FG-D9	DIGITAL UNIX	Two 5/440 MHz	4 GB	4.3 GB
DY-282FE-E9	OpenVMS	Two 5/440 MHz	1 GB	4.3 GB
DY-282FF-E9	OpenVMS	Two 5/440 MHz	2 GB	4.3 GB
DY-282FG-D9	OpenVMS	Two 5/440 MHz	4 GB	4.3 GB

5/625 Dual CPU Expanded Base Servers

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

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

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

Note: See Step 14 for information on the appropriate power cord to order. If redundant supply (H7266-AD/AE) is ordered, power cord is included and does not have to be ordered separately.

Step 3—Additional CPU Modules (SMP Expansion Options)

- .. Up to two additional CPU modules can be added to Base Servers and Expanded Base Servers and—system maximum of three CPU modules (1 to 6 CPUs).
- .. Combining 5/440 MHz and 5/625 MHz CPU modules in the same system is not supported.
- .. For more than two processor modules in a system, 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.

5/440 Servers	5/625 Servers	Operating System	CPU Module Type
756P2-AX	758P2-AX	DIGITAL UNIX	Dual-CPU
756P1-AX	758P1-AX	OpenVMS	Dual-CPU

Step 4—Memory

- .. Maximum of 12 GB of memory supported on 5/440 MHz and 5/625 MHz CPU systems.
- .. Maximum of three memory modules is reduced by one for each additional CPU module added from Step 3 and each system I/O module added from Step 6.
- .. Memory modules
 - 512 MB through 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-DA 512 MB memory module

MS7CC-EA 1024 MB memory module

MS7CC-FA 2048 MB memory module

MS7CC-GA 4096 MB memory module

Step 4a—Memory Upgrades

Memory upgrades are field installed only (not configured in Manufacturing).

MS7CC-UB 512 MB memory upgrade (32 MB SIMMs); upgrades 512 MB (MS7CC-DA) module to 1 GB (MS7CC-EA) module

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

- .. Supported on DIGITAL UNIX systems only.
- .. Maximum one Prestoserve I/O performance enhancement option 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

PCI I/O bus is available on AlphaServer 8200. (One standard on expanded base servers.) Application and system configuration determine maximum configuration. 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 I/O channel.
- .. Each PCI shelf mount box requires one I/O channel connection to KFTHA-AA or KFTIA-AA, see Step 6.
- .. Maximum of nine I/O channels available (KFTIA plus two KFTHAs)

DWLPB-CA	PCI shelf mount box for AlphaServer 8200 system cabinet only —maximum three per cabinet.
DWLPB-CB	PCI shelf mount box for AlphaServer 8200 expansion cabinet only —maximum four per cabinet.
KFE70-BA	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 one EISA Bridge option supported per system. This option is required to support KZPSC SCSI RAID controllers. It includes diskette drive required to run the RAID Configuration Utility (RCU).

Step 6—System I/O Modules

- .. KFTIA-AA system I/O module included with Base Server; KFTHA-AA included with Expanded Base Server—any combination of KFTIA or KFTHA modules can be added for a system maximum of three.
 - Maximum nine I/O channels available on AlphaServer 8200 (two KFTHA-AA modules, one KFTIA-AA module).

KFTHA-AA	System I/O module with four I/O channels for DWLPB-CA/CB boxes.
KFTIA-AA	System I/O module with one I/O channel for DWLPB-CA/CB shelf mount box, includes <ul style="list-style-type: none"> - two 802.3 twisted-pair Ethernet ports—requires BN26M cable per port - one single-ended SCSI-2 port—requires BN21H cable - three FWD (Fast Wide Differential) SCSI-2 ports—requires CK-KFTIA-AA and BN21K cable per port (Note: Base Servers include KFTIA-AA with three CK-KFTIA-AA cabinet kits.) One optional FDDI daughter cards (DEFPZ-xx) can be added to KFTIA-AA—see Step 9 for cables. <ul style="list-style-type: none"> - Single attachment station multi-mode fiber card (DEFPZ-AA) or - Twisted-pair copper card (DEFPZ-UA) Prestoserve (DJ-ML300-BA) can be added to KFTIA-AA
BN26M-xx	Ethernet twisted-pair cable; 8-pin MP to 8-pin MP, screened, EIA/TIA Category 5 cable
CK-KFTIA-AA	Cabinet kit for Fast Wide Differential (FWD) SCSI-2 port. One kit required for each used port on KFTIA -AA—maximum three per KFTIA-AA. Cabinet kit includes Y-cable and FWD terminator.
BN21K-xx	SCSI-2 Fast Wide Differential cables; 68-pin male straight to 68-pin male right-angle. Connects KFTIA-AA FWD SCSI-2 ports to DWZZA-VA or DWZZB-VW (cable lengths in meters).
BN21K-02¹	Connects from KFTIA FWD port to DWZZB-VW in BA356-JB in system cabinet (front)
BN21K-03¹	Connects from KFTIA FWD port to DWZZB-VW in BA356-JB in system cabinet (rear)
BN21K-05/10	Connects from KFTIA FWD port to DWZZB-VW in BA356-JB in expansion cabinet (front or rear) Connects from KFTIA FWD port to DWZZB-VW in BA356-SB in SW500 and SW800 Cabinets

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

Step 7—Storage Controllers

- .. KFTIA-AA I/O module included with Base Server; KFTHA-AA I/O module included with Expanded Base Server.
- .. DWZZA-AA requires minimum revision E02 for connecting any Fast Wide Differential SCSI-2 port from KFTIA-AA or KZPSA-BB to externally mounted TZ8xx tape loaders.
- .. DWZZB-VW Fast Wide Differential Single-ended SCSI Converter requires minimum revision A01 for connecting FWD SCSI-2 signals from KFTIA-AA or KZPSA-BB to BA356-JB StorageWorks Shelf.
- .. System maximum of four KZPSC or KZPAC SCSI RAID controllers.
- .. Tape and optical devices are not supported on KZPSC or KZPAC SCSI RAID controllers.

PCI-based UltraSCSI Storage Controllers

KZPBA-CA	PCI one-port UltraSCSI Single-ended host adapter —Uses one PCI slot. OpenVMS V7.1-H1 supports eight per PCI, maximum twelve per system. Note: KFTIA counts as 4 KZPBA devices per system with OpenVMS or DIGITAL UNIX 4.0B and V4.0D.
KZPBA-CB	PCI one-port UltraSCSI Differential host adapter —Uses one PCI slot. OpenVMS V7.1-H1 supports eight per PCI, maximum twelve per system. Note: KFTIA counts as 4 KZPBA devices per system with OpenVMS or DIGITAL UNIX 4.0B and V4.0D.
BN38C-01	1-meter VHDCI male to 68-pin HD male UltraSCSI cable, connects KZPBA to rear mounted DS-BA356-xx
BN38C-02	2-meter VHDCI male to 68-pin HD male UltraSCSI cable, connects KZPBA to front mounted DS-BA356-xx
KZPAC-AA²	PCI 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. Maximum of 4 per PCI, maximum of 4 per system supported with DIGITAL UNIX V3.2G or V4.0B; OpenVMS V6.2-1H3 or v7.1.
KZPAC-CA²	PCI 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. Maximum of four per PCI, maximum of four per system if third port not used (otherwise maximum of three per PCI, three per system) supported with DIGITAL UNIX V3.2G or V4.0B; OpenVMS V6.2-1H3 or V7.1. Order BN31K-0E or KZPAC-SB for third port connection.
KZPAC-CB²	PCI 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. Maximum of four per PCI, maximum of four per system if third port not used (otherwise maximum of three per PCI, three per system) supported with DIGITAL UNIX V3.2G or V4.0B; OpenVMS V6.2-1H3 or V7.1. Order BN31K-0E or KZPAC-SB for third port connection.
KZPAC-SB	SCSI cable/bulkhead assembly kit with two ports for KZPSC-BA or KZPAC-CA/CB, allows connection of two third-port outputs using one PCI bulkhead slot.
BN37A-01¹	1.0 meter UltraSCSI cable - VHDCI female to 68HD female.
BN37A-02	2.0 meter UltraSCSI cable - VHDCI female to 68HD female.
KZPSC-UB	Battery back-up for cache memory option for KZPAC or KZPSC controller.
MS100-BB	8 MB cache memory option; upgrades KZPAC-CA to KZPAC-CB, field installable only.
MS100-AA³	16 MB Cache memory option for KZPSC-AA/BA, maximum one per controller, field installable only.
MS100-AB³	32 MB Cache memory option for KZPSC-AA/BA, maximum one per controller, field installable only.

1. Manufacturing may substitute correct cable length depending on configuration.
2. 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.
3. Requires AlphaServer 8200 minimum System Console Firmware Revision 3.2.2, OpenVMS V6.2-1H2 and DIGITAL UNIX V3.2D or later operating system software.

Step 7—Storage Controllers (continued)
PCI-based Fast-10 SCSI Controllers

KFPSA-AA	PCI DSSI Adapter (OpenVMS only) —Requires OpenVMS V6.2-1H2 or later; minimum System Console Firmware Revision 3.09. Maximum twelve per PCI, twenty-four per system with OpenVMS V6.2-1H3. (End node only). Note: KFPSA and KFMSB are not supported on same DSSI bus.
BC21Q-xx	External shielded cable (MR/MR connectors) Select required length—09, 16, 25, 50 feet.
BC22Q-xx	External shielded cable (MR/PS connectors) Select required length—16, 25, 50 feet.
CIPCA-AA	PCI CI Adapter (OpenVMS only) —Requires OpenVMS V6.2-1H3 or V7.1, minimum System Console Firmware Revision 4.0-4. Maximum four per PCI, ten per system running OpenVMS V6.2-1H3; maximum four per PCI, 26 per system running OpenVMS V7.1 and System Console Firmware Revision 4.1-6. Uses one PCI slot for adapter and one EISA slot for power only. Note: KFE70 option is not required.
CIPCA-BA	Same as above 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.)
KZPSA-BB	PCI Fast Wide Differential SCSI Adapter. OpenVMS supports eight per PCI, maximum 26 with OpenVMS V6.2-1H3 per system. DIGITAL UNIX supports eight per PCI, maximum 48 total devices (KZPBA's; KZPSA's; and KFTIA's) per systems (uses one PCI slot). Provides one SCSI-2 bus. The KZPSA supports DECsafe Available Server.
BN21K-xx	SCSI-2 Fast Wide Differential cables—68-pin male straight to 68-pin male right-angle. Connects KZPSA-BB Fast Wide Differential SCSI-2 port to DWZZA-VA or DWZZB-VW.
BN21K-01¹	Connects from KZPSA to DWZZB-VW in BA356-JB in system cabinet (front)
BN21K-02¹	Connects from KZPSA to DWZZB-VW in BA356-JB in system cabinet (rear)
BN21K-03¹	Connects from KZPSA to DWZZB-VW in BA356-JB in expansion cabinet (front or rear)
BN21K-05/10	Connects from KZPSA to DWZZB-VW in BA356-SB 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 V4.0D and V3.2G. See Step 8c for configuration information.	..	HSD50 family of DSSI Storage Array Controllers are supported under OpenVMS V6.2-1H3 with KFPSA PCI DSSI adapters and minimum SRM console V4.1-6.
..	HSZ50 family of SCSI Storage Array Controllers are supported under DIGITAL UNIX V3.2G and V4.0A and OpenVMS V6.2-1H3. DIGITAL UNIX requires patch OSF405-034 for dual failover.	-	Controllers require KZPSA, KZPBA, KFPSA, or CIPCA SCSI adapters or controllers, as appropriate.
..	HSJ50 family of CI Storage Array Controllers are supported under OpenVMS V6.2-1H3 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).	-	HSZ70 requires QB-55BAB-SA kits.
		-	HSZ50-Ax requires one QB-5CJAA-SA kit.
		-	HSZ52-Ax requires two QB-5CJAA-SA kits.
		-	HSZ54-AJ requires four QB-5CJAA-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-2 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-2 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-2 device connections, 32 LUN maximum, 128 MB cache module, single external cache battery system building block.		

Step 7a—External Storage Controllers (continued)

HSZ52-AF	StorageWorks RAID Array 450/HSZ50 64 MB dual SCSI controller includes 12 SCSI channels, 36 SCSI-2 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-2 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-2 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-2 device connections, 64 LUN maximum, four cache modules, two dual external cache battery system building blocks, four external cache batteries, four 2-meter cables.
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.

Step 8a—Internal Storage—System Cabinet

UltraSCSI devices are supported in DS-BA356-JB (single channel) and DS-BA356-JH (dual channel) UltraSCSI StorageWorks shelves inside AlphaServer 8200 System cabinet. They are also supported in external StorageWorks cabinets via BA356-SD Rackmount options for SW500 and SW800 cabinets. 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 BA356 StorageWorks shelves; each shelf holds a maximum of two 5.25" devices and one 3.5-inch device or seven 3.5-inch devices.
- .. BA656 Internal Storage Drawer included in base systems; provides space for four additional narrow 5400 RPM and 7200 RPM SCSI 3.5-inch devices.
- .. UltraSCSI and Fast-10 drives can be mixed in DS-BA356 Top Gun Blue UltraSCSI shelf. Drives negotiate maximum transfer speeds with UltraSCSI adapter /controller.

Step 8a—Internal Storage—System Cabinet (continued)**UltraSCSI Options**

Each UltraSCSI StorageWorks shelf ordered requires:

- .. SCSI controller for each active SCSI port
- .. SCSI cables to connect each controller to BA356-xx shelf.

DS-BA356-JG **UltraSCSI Single Channel Storage Works Shelf**—includes 16-bit I/O personality module, 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, 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.

SCSI Signal Converter

DWZZB-VW **Wide SCSI-2 StorageWorks Signal Converter**—required to convert FWD signals from KFTIA-AA and KZPSA-BB to Fast Wide Single-ended for connection to BA356-JG/JH StorageWorks shelves.

16-bit Wide Drives

DS-RZ28M-VZ 2.1 GB 16-bit 5400 RPM SCSI-2 disk drive in 3.5-inch carrier (OpenVMS V6.2-1H3, DIGITAL UNIX V3.2G)

DS-RZ1BB-VW 2.1 GB 7200 RPM 16-bit wide UltraSCSI disk drive

DS-RZ1CB-VW 4.3 GB 7200 RPM 16-bit wide UltraSCSI disk drive

DS-RZ1DB-VW 9.0 GB 7200 RPM 16-bit wide UltraSCSI disk drive

Note: UltraSCSI Fast-20 disk drives run in Fast-10 SCSI mode when connected to Fast-10 SCSI adapters and controllers. UltraSCSI disks drives run in Fast-20 mode when installed in DS-BA356-xx UltraSCSI StorageWorks shelves connected to UltraSCSI adapters and RAID 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 Fast-20 mode, and DS-HSZ70-AH) are not supported in Fast-10 (gray) BA356 shelves.

8-bit Narrow Drives

DS-RZ28M-VZ 2.1 GB 5400 RPM 8-bit narrow SCSI disk drive

DS-RZ28L-VA 2.1 GB 7200 RPM 8-bit narrow SCSI disk drive

DS-RZ29L-VA 4.3 GB 7200 RPM 8-bit narrow SCSI disk drive

DS-RZ40-VA 9.0 GB 7200 RPM 8-bit narrow SCSI disk drive

Tape Devices

TLZ09-VA 8.0 GB DAT 3.5-inch SCSI tape drive in StorageWorks carrier. OpenVMS V6.2-1H3 and DIGITAL UNIX V3.2C required along with System Console Firmware Revision 3.0-9.

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

TKZ9E -VA 2/5/7/10/14 GB 8 mm helical scan tape drive in 5.25-inch StorageWorks carrier

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

TZ89N-VA 35/70 GB DLT 5.25-inch SCSI tape drive in StorageWorks carrier

Note: Tape drives and optical devices are not supported on KZPSC or KZPAC SCSI RAID controller.

Solid State Disks

Supported with KZPSC, KZPSA, KFTIA—cannot be combined with RZxx disks/tapes on same SCSI bus.

EZ31-VW 134 MB Solid State Disk; requires OpenVMS V6.2 or later and DIGITAL UNIX V3.2C or later

EZ32-VW 268 MB Solid State Disk; requires OpenVMS V6.2 or later and DIGITAL UNIX V3.2C or later

EZ64-VA/VW 475 MB Solid State Disk; requires OpenVMS V6.2 or later and DIGITAL UNIX V3.2C or later

EZ69-VA/VW 950 MB Solid State Disk; requires OpenVMS V6.2 or later and DIGITAL UNIX V3.2C or later

Step 8b—External Storage—I/O Expansion Cabinet

I/O expansion cabinet (H9B10-EA) provides space for a maximum of 16 BA356-JB SCSI StorageWorks shelves and a maximum of four DWLPB-CB PCI shelf mount boxes. Disk and tape drives supported are the same as Step 8a. See configuration limitations in Step 11b.

Step 8c—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 8200 systems running DIGITAL UNIX V4.0B and OpenVMS V6.2-1H3.
 - Currently the HSZ70 is supported on the KZPSA-BB Fast Wide and KZPBA-CB UltraSCSI Differential controller.
 - Controller support for HSZ70 KZPSA-BB.
-

ESA 10000 Enterprise Storage Arrays

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

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

Step 8c—UltraSCSI RAID Array Controller and UltraSCSI RAID Packaged Solutions (continued)**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 KZPSA adapter ordered to support HSZ70(s) requires an HSZ70 Solutions Software Kit.
- .. HSZ70 Solutions Software Kits provide tools needed to link ESA 10000 to a wide variety of vendor platforms.
- .. 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.

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
ZKPBA-CB		

Step 8c—UltraSCSI RAID Array Controller and UltraSCSI RAID Packaged Solutions (*continued*)**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

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 Host to controller 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 8d—External Storage Devices

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

Storage Cabinets	Capacity
SW5XX, SW8XX	6–227 GB
SCSI Disk Drives—See Step 8a	
Tape Drives	
TZ87, TZ857 ¹ , TZ877, TZ88, TZ885, TZ887, TSZ07, TLZ09, TKZ9E, TLZ9L, TKZ60, TKZ61, TKZ62, TL810, TL812, TL820, TL822, TL826, DS-TL893-BA, DS-TL894-BA, DS-TL896-BA, DS-TLZ10-VA	See <i>Storage Devices</i> for ordering information.

Step 8d—External Storage Devices (continued)

Optical Libraries

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

1. Loader support for DIGITAL UNIX is available via DECnsr.

Step 9—Networks and Communications

Two twisted-pair 802.3/Ethernet controllers on KFTIA-AA system I/O module are included with each Base Server; DE500 network interface card included with Expanded Base Server. See Step 6 for twisted-pair Ethernet cable part number. Optional DEFPZ-AA/UA (FDDI) daughter card can be installed on KFTIA-AA system I/O module. Select additional devices if required. **Note:** Connection of system to Ethernet requires twisted-pair cable. *See Network Products Guide* for details.

LAN Communications Controllers—KFTIA-AA daughter cards

- .. Maximum one FDDI controller daughter card per KFTIA-AA I/O module
- .. System maximum of three FDDI controller daughter cards.

DEFPZ-AA	FDDI controller Fiber—Single attachment station —daughter card for mounting on KFTIA-AA. Requires BN24x cable.
BN24E-xx	Fiber-Optic Cable, Dual 2.5 mm Bayonet “ST” type connectors
BN24D-xx	Fiber-Optic Cable, Dual 2.5 mm Bayonet “ST” type connector to FDDI “MIC” connector
DEFPZ-UA	FDDI controller Fiber—Twisted-pair copper —daughter card for mounting on KFTIA-AA. Requires BN26x cable.
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

LAN Communications Controllers—PCI based

- .. Requires DWLPB-CA/CB, PCI shelf mount box.
- .. System maximum of six DEFPA-AB/DB/UB/MB FDDI controllers.

DE450-CA	PCI-to-Ethernet 3-port Adapter (uses one PCI slot). OpenVMS (V6.2) and DIGITAL UNIX (V3.2C) support eight per PCI, maximum eight per system. Two patch kits required to support DE450 with OpenVMS V6.2.
DE500-AA	Fast Ethernet (100 Mbit) PCI Adapter (uses one PCI slot). OpenVMS (V6.2 and V7.1) and DIGITAL UNIX (V3.2C) support eight per PCI, maximum eight per system.
DE500-XA	Fast Ethernet (100 Mbit) PCI Adapter (uses one PCI slot). OpenVMS (V6.2 and V7.1) and DIGITAL UNIX (V3.2C) support eight per PCI, maximum eight per system.
DE500-FA	Fast Ethernet (10/100-32 bit) PCI Adapter (uses one PCI slot). OpenVMS (V7.1-1.H.1) and DIGITAL UNIX (V3.2 to V.0D) support eight per PCI, maximum eight per system.
DE500-BA	Fast Ethernet (100 Mbit) PCI Adapter (uses one PCI slot). OpenVMS (V6.2 and V7.1) and DIGITAL UNIX (V3.2C) support eight per PCI, maximum eight per system.
DEFPA-AB	FDDI controller Fiber—Single attachment station MultiMode Fiber (uses one PCI slot). OpenVMS and DIGITAL UNIX support six per DWLPB, maximum six per system with DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 operating system releases. Requires BN34x SC type connecting cable.
DEFPA-DB	FDDI controller Fiber—Dual attachment station MultiMode Fiber (uses one PCI slot). OpenVMS and DIGITAL UNIX support six per DWLPB, maximum six per system with DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 operating system releases. 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	FDDI controller Copper—Dual attachment station UTP (uses one PCI slot). OpenVMS and DIGITAL UNIX support six per DWLPB, maximum six per system with DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 operating system releases. Requires BN26x or BN25H connecting cables.
DEFPA-UB	FDDI controller Copper—Single attachment station UTP (uses one PCI slot). OpenVMS and DIGITAL UNIX support six per DWLPB, maximum six per system with DIGITAL UNIX V3.2G and OpenVMS V6.2-1H3 operating system releases. 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-meter Unshielded twisted pair RJ45 connectors
DGLPB-AB	ATMworks 350 ATM PCI bus adapter (uses one PCI slot). DIGITAL UNIX V4.0a supports four per PCI, maximum four per system.
SN-PBXNP-AC	PCI Token Ring Adapter. Uses one PCI slot. Digital UNIX V3.2G or V4.0B supports two per PCI, maximum two per system. Minimum system console support for this adapter is V4.0 AXP CD release. Requires BC26M cable.
PBXDA-AA	PCI Asynchronous 4-port Communication Adapter. OpenVMS V6.2-1H3 supports two per PCI, maximum two per system.
PBXDA-AB	PCI Asynchronous 8-port Communication Adapter. OpenVMS V6.2-1H3 supports two per PCI, maximum two per system.
PBXDA-AC	PCI Asynchronous 16-port Communication Adapter. OpenVMS V6.2-1H3 supports two per PCI, maximum two 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) supports one per EISA, maximum one CXI01-AA or one CXI01-AD 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-AD	Digiboard Asynchronous EPC/X Multiport Serial Card with 16 RJ45 Port EPC/CON-16 Concentrator —(uses one EISA slot) supports one per EISA, maximum one CXI01-AA or one CXI01-AD per system. Supported on DIGITAL UNIX systems only.
CXI01-AE	Digiboard EPC/CON-16 Concentrator mounts separately from PCI bus. Maximum of three CXI01-AE can be attached to CXI01-AD; 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 DECMJ11 adapter—eight 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 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, DNSSES-AA, CIPCA, CIXCD

OpenVMS Systems

- .. Requires OpenVMS V7.1 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
- .. DNSSES-AA is not currently supported with MEMORY CHANNEL.

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 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

- .. Console terminal with EIA-232 25-pin DSUB connector and printer required unless otherwise available.
- .. Shielded console cable is included for connection to the console terminal.

VT510-xx VT510 terminal
LA30N-xx LA30 printer
LK461-xx/LK46W-xx Keyboard

Step 11—Expansion—System Cabinet and I/O Expansion Cabinet

Step 11a—System Cabinet

- .. System Cabinet includes one single-phase power supply. Provides space for additional redundant (N+1) power supply.
- .. BA656 Internal Storage Drawer included in system cabinet; provides space to accommodate four additional 3.5" narrow SCSI devices including one tape device.
- .. Provides space for six BA356-JB 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 11b—I/O Expansion Cabinet

- .. I/O expansion cabinet includes one single-phase power supply.
 - provides space for additional redundant (N+1) power supply.
- .. 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-EA **I/O Expansion Cabinet**—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 12—Power Options

- .. Power options are available for AlphaServer 8200 system and expansion cabinets.
- .. System cabinet and expansion cabinet includes one power supply (H7266-AA)—200-240 V AC input voltage, 48 V dc, 2400 watt, output supply.
- .. Power system supports N+1 power redundancy and 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 12a—Battery Backup Options

- .. Optional battery backup requires addition of H7267-AA to each power supply in system cabinet and expansion cabinets.
- .. Battery backup provides up to five minutes of capacity to power contents of system and expansion cabinets.

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 12b—Power Option for BA356 StorageWorks Shelves

- .. Provides N+1 power for BA356-JB StorageWorks shelves.
- .. Occupies one slot in StorageWorks shelf.

DS-BA35X-HJ 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.

Step 13—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 8200 5/440 MHz and 5/625 MHz CPU Base Servers and 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 in 5/440 MHz and 5/625 MHz DIGITAL UNIX Base and 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 13—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—included in 5/440 and 5/625 Base Servers and 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 14—Hardware and Software Supplemental Support Services

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 8200

One CPU with less than 2 GB memory	Two CPUs with less than 2 GB memory	Two CPUs with 2 GB memory	Two CPUs with 4 GB memory	
FM-8U4HR-36	FM-8D4HR-36	FM-8G4HR-36	FM-8V4HR-36	Years 1-3, 5 x 9, 4-hour response time
FM-8U512-36	FM-8D512-36	FM-8G512-36	FM-8V512-36	Years 1-3, 5 x 12, 4-hour response time
FM-8U616-36	FM-8D616-36	FM-8G616-36	FM-8V616-36	Years 1-3, 6 x 16, 4-hour response time
FM-8U724-36	FM-8D724-36	FM-8G724-36	FM-8V724-36	Years 1-3, 7 x 24, 4-hour response time
FM-8U4HR-60	FM-8D4HR-60	FM-8G4HR-60	FM-8V4HR-60	Years 1-5, 5 x 9, 4-hour response time
FM-8U512-60	FM-8D512-60	FM-8G512-60	FM-8V512-60	Years 1-5, 5 x 12, 4-hour response time
FM-8U616-60	FM-8D616-60	FM-8G616-60	FM-8V616-60	Years 1-5, 6 x 16, 4-hour response time
FM-8U724-60	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 and OpenVMS include advisory and remedial software support with new version license rights for operating system and DIGITAL NAS Base Server 200 for the time period indicated.

AlphaServer 8200 One CPU Systems

FM-82UOS-12	12-month Software Supplemental Support for DIGITAL UNIX one CPU systems
FM-82UOS-36	36-month Software Supplemental Support for DIGITAL UNIX one CPU systems
FM-82UOS-60	60-month Software Supplemental Support for DIGITAL UNIX one CPU systems
FM-82UVM-12	12-month Software Supplemental Support for OpenVMS one CPU systems
FM-82UVM-36	36-month Software Supplemental Support for OpenVMS one CPU systems
FM-82UVM-60	60-month Software Supplemental Support for OpenVMS one CPU systems

AlphaServer 8200 Two CPU Systems

FM-82DOS-12	12-month Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-82DOS-36	36-month Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-82DOS-60	60-month Software Supplemental Support for DIGITAL UNIX two CPU systems
FM-82DVM-12	12-month Software Supplemental Support for OpenVMS two CPU systems
FM-82DVM-36	36-month Software Supplemental Support for OpenVMS two CPU systems
FM-82DVM-60	60-month Software Supplemental Support for OpenVMS two CPU systems

Step 14a—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 Excelerator tool; contact MCS 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 that each operating system supports. 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**

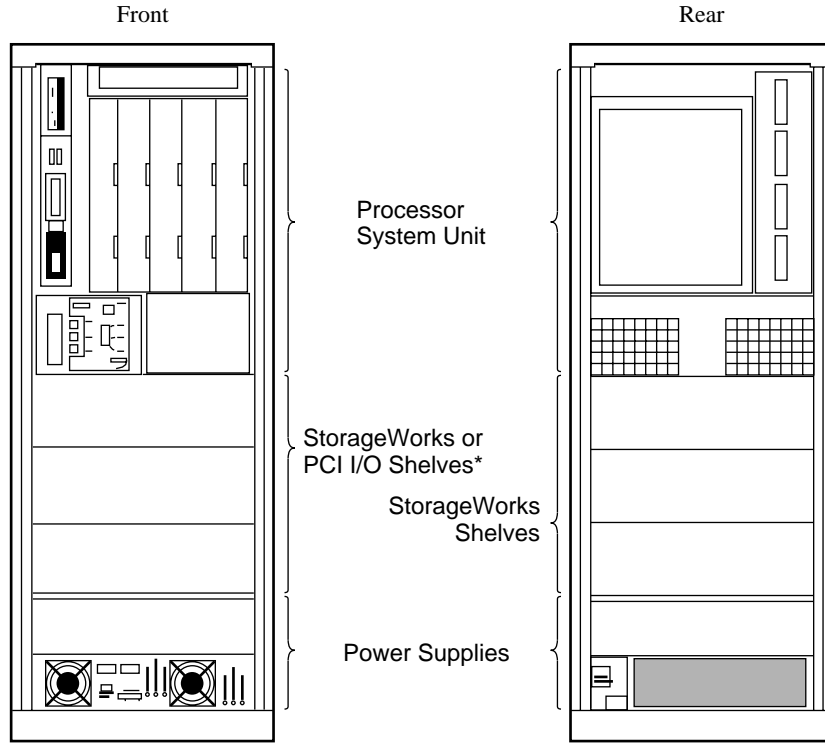
- .. EISA Bus IRQ address assignments are for DIGITAL UNIX and OpenVMS systems only.
- .. In some cases, the maximum number of each supported device is less than number of EISA bus addresses available; this is due to other limitations.
- .. Only one device can occupy any given IRQ address; if multiples 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:

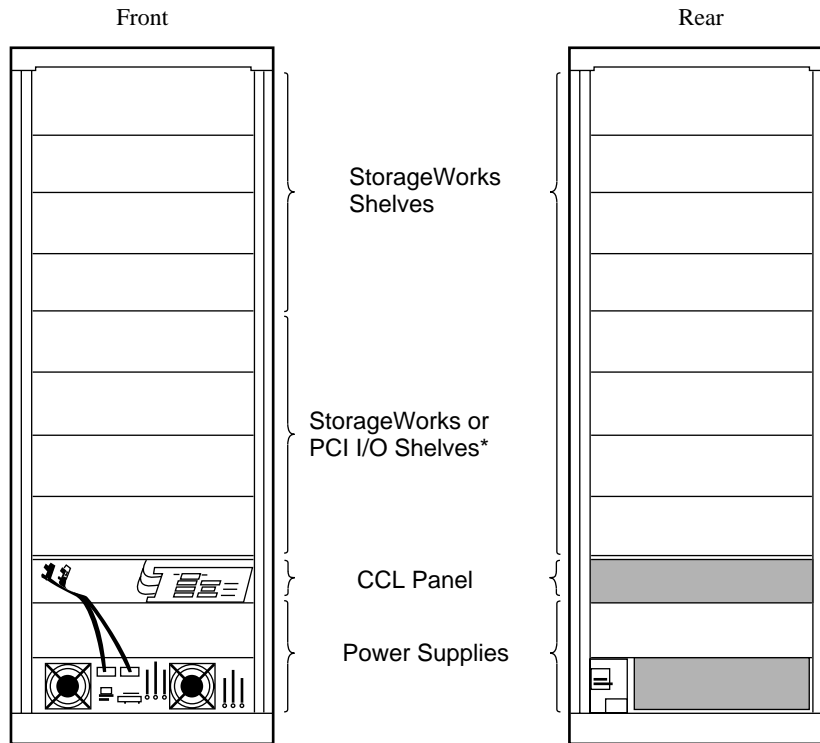
- 0 = address is available for device
- = address not available for device
- NA = Not Applicable

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, one CPU module, one memory, one System I/O module, one CD-ROM, and one RZ28 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 RZ28 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

UPS Model	Receptacle Module for Plug-in Connection		AlphaServer 8200	External Storage
	60 HZ	50 HZ		
4N-AEAAJ-CL (60 Hz) 4N-AEAAJ-CU (50 Hz)	Included	Hardwired	Single phase	None
4N-AEAAL-BA	4N-AEACK-BN	Hardwired		SW500 or Expansion Cabinet
4N-AEAAN-BA (60 Hz) 4N-AEAAN-BE (50 Hz)	4N-AEACM-BN	Hardwired		SW800

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-AEAAL-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-AEAAN-BA	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-AEAAN-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 systems, suffixes denote twisted pair/ThinWire
4N-AEAEO-DA/DC for 60Hz applications; 4N-AEAEO-DE/DD for 50Hz applications.

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. Connect-UPS Network Adapter, required for AlphaServer 8200 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